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How to use this manual

Overview

1. Overview

(a) General repair operations can be divided into the following 3 main steps:

(1) Diagnosis.

(2) Removal, installation, replacement, disassembly, reassembly, inspection and adjustment.

(3) Final inspection.

(b) This manual describes "removal, installation, replacement, disassembly, reassembly, inspection and adjustment", but omits "final inspection".

(c) The following basic operations are omitted from this manual, but must be performed in actual operation.

(1) Use a jack or lift.

(2) Clean the removed parts if necessary.

(3) Visual inspection.

2. Preparation work

(a) Use repair special tool (SST) as appropriate according to repair situation. Always use SST if necessary and follow correct steps.

(b) For specific details of all SST part numbers in this manual, please consult spare part department.

3. Repair Step

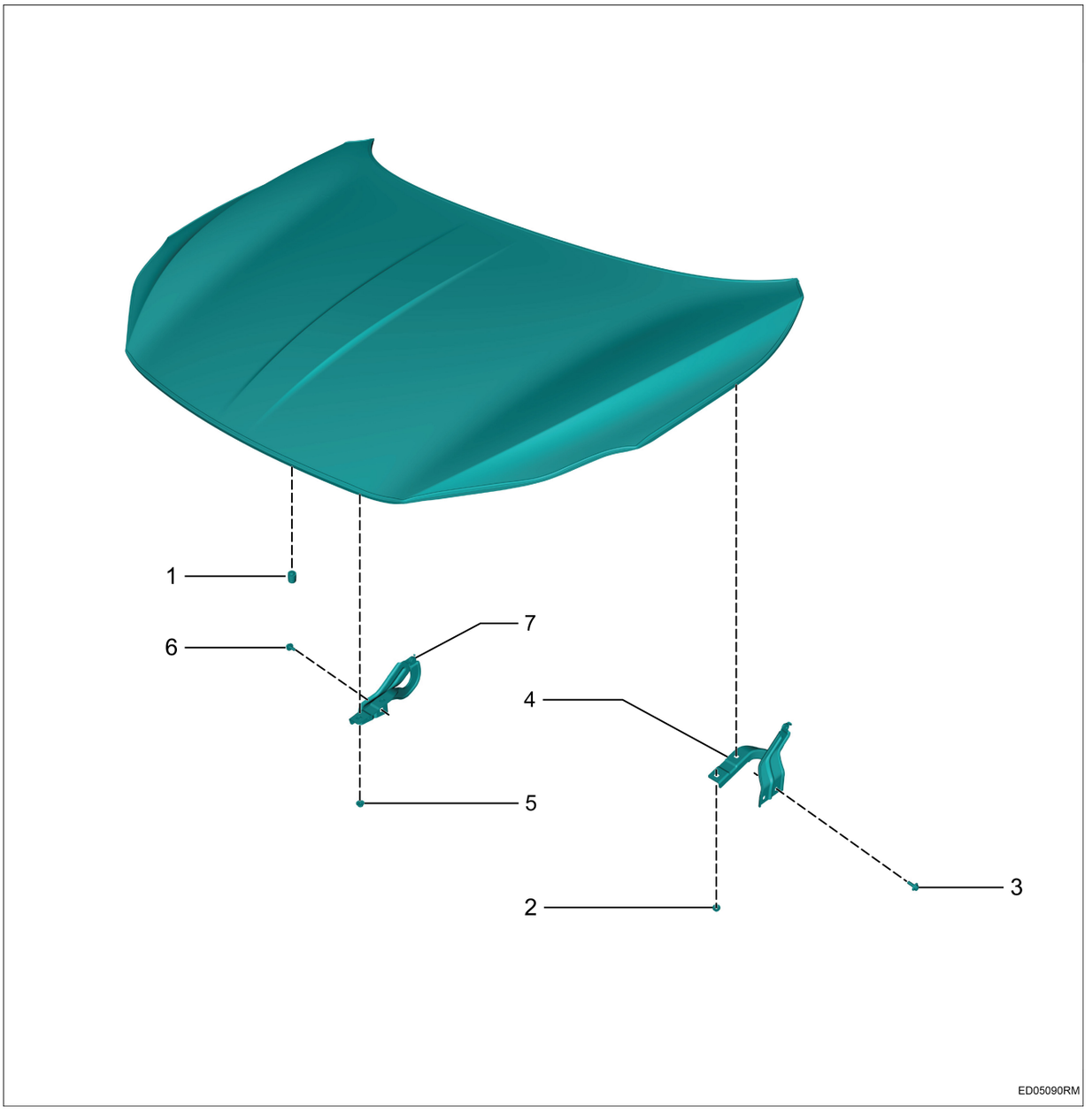
(a) List component diagrams in each chapter if necessary.

(b) Parts catalog is illustrated in the "parts diagram" section to ensure that component installation is properly understood.

(c) The steps of repair procedure are numbered, and major components involved in this step are accompanied by corresponding numbered illustrations. Some instructions also contain important hints or additional information about a program that should be referred to when repairing the corresponding part.

For example:

IN



1. Buffer block
   - X4
2. Hexagon flange nut
   - X2
   - Torque: 20 ~ 30 N·m
3. Hexagon flange nut
   - X2
   - Torque: 20 ~ 30 N·m

(d) The steps for removal and installation of operation items are described only for important parts.

(e) Only items indicated are described in the steps, and operations and contents are represented in illustrations. Details such as operation methods, standard values and precautions are described in description.

(f) As there are similar models with same illustrations, the information provided in this manual may be slightly different from the actual models.

(g) Details explain how the job is done and provide other information such as repair specifications and precautions.

4. International System of Units

(a) The units used in this manual meet International System of Units (SI UNIT) standard.

For example:

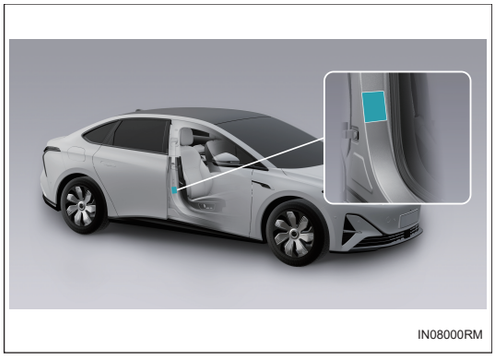
Torque: 30 N • m

IN

Vehicle identification number and serial number

Imprinted position

1. Manufacturer name plate

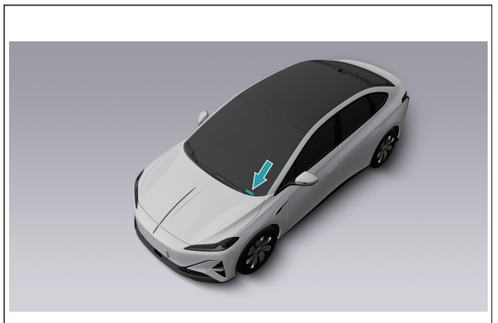


IN08000RM

(a) The manufacturer name plate is located on right B-pillar.

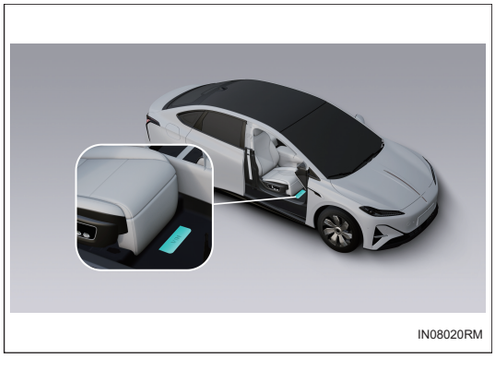
(b) The manufacturer name plate includes the following items: Manufacturing country, manufacturer, vehicle identification number, brand, vehicle model, seating capacity, maximum allowable total mass, drive motor model, drive motor peak power, power battery system rated voltage, power battery system rated capacity and production date.

2. Vehicle identification number



IN08010RM

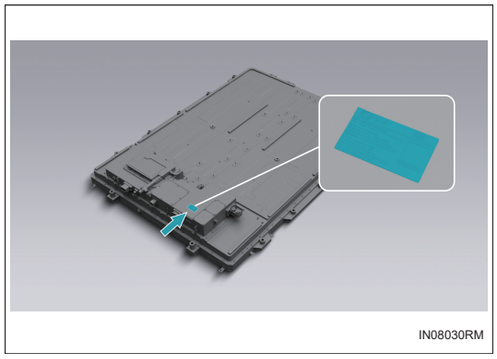
(a) Attached to the lower part of front windshield at the top left of instrument panel.



IN08020RM

(b) Imprinted under the front passenger seat.

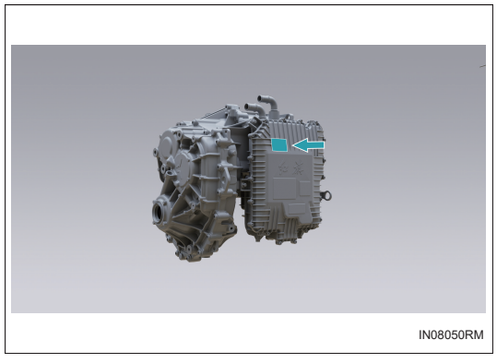
3. Power battery number



IN08030RM

(a) The battery number and battery nameplate are located on the battery case.

4. Motor number (CAM190PT6)



IN08050RM

(a) The motor number and motor nameplate are located on the electric drive body.

IN

Instructions and precautions for service work

Qualification requirements for repair technicians

1. Qualification for repair

(a) Repair technicians need to have a low voltage electrician operation certificate and a technical training certificate to use this manual for vehicle repair.



Certificate number: XXXXXXXXXXXXXXXXX
Full name: XXX Gender: Male
Work category: Electrician operation
Quasi-operational item: Low voltage electrician operation

Date of initial collection: 20170317
Validity period: 20170317-20230316
Review date: 20200317

The People's Republic of China
Special operation certificate

Review record_____

Supervised by the State Administration of Work Safety
IN01000RM

High voltage safety

1. Meaning of high voltage safety

(a) The high voltage system with a B-level voltage range on electric vehicles may pose a risk of electric shock to drivers, passengers, and operators during vehicle trial production, production, use, and maintenance.

(b) High voltage safety of electric vehicles: to prevent electric shock injury to the human body caused by high voltage contact.

2. Basic knowledge of high voltage safety

(a) Electric shock protection tools - insulation gloves.

(1) Usage precautions of insulation gloves.

- Confirm that insulation gloves are the correct type.
- Inflation inspection must be conducted before use, and if any damage is found, it cannot be used.
- After use, the internal and external dirt should be wiped clean.

- Storage should be kept dry and avoid the influence of substances such as acids, alkalis, and oils.
- Regular inspections must be conducted after 6 months of use.

Warning:

Regular inspections must be conducted after 6 months of use.

3. Electric shock accident handling

(a) Protect the site.

(1) Disconnect the power supply (high voltage power off/remove service switch), check the power off status and prevent reconnection!

(b) Handle accident injuries.

(1) If it is a "serious injury", immediately call the emergency number.

(2) If it is a "minor injury", seek medical attention after emergency treatment.

(c) Accident analysis.

(1) Timely inspect the site with relevant superiors, safety officers, safety experts, and parties involved (if possible).

(2) Before using the problematic vehicle again, it needs to be tested by electrical professionals.

(3) Please analyze the cause of the accident and prepare an accident report in the relevant section.

4. Electrical fire rescue

(a) Report to the fire department.

(b) Confirm the type of fire.

(1) When thoroughly checking the fire, do not come into contact with any high voltage components and always use insulated tools for inspection.

(2) Fire not caused by batteries.

- If encountering a small fire and the flame does not spread to the high voltage battery section, carbon dioxide or ABC dry powder fire extinguishers can be used to extinguish the fire.

(3) Fire caused by battery type.

- If the high voltage battery is bent or damaged in a fire, or if there is suspicion of a problem with the battery, a large amount of water should be used to extinguish the fire.
- It may take 24 hours for the battery to catch fire and completely extinguish it. Using a thermal imaging camera can confirm whether the high voltage battery has completely cooled down. If there is no thermal imaging camera, it is necessary to monitor whether the battery will reignite. Smoking indicates that the battery is still very hot, and even if it no longer smokes, it should be monitored for at least another hour.
- To avoid the risk of battery reignition, it is recommended to place the battery in an open area.

(c) Safety precautions for electric shock.

(1) Always assume that all high voltage components are energized!

(2) To avoid electric shock accidents, do not directly touch any part of the vehicle and always use insulated tools.

(3) Cutting, crushing, or touching high voltage components can cause serious electric shock or short circuit accidents.

(d) Other safety precautions.

(1) If the battery catches fire and releases toxic gases, unrelated personnel must be evacuated.

(2) Have self-protection awareness, wear protective equipment, and do not inhale toxic fumes.

(3) Inflatable cylinders, gas pillars, and other components used to store gas can reach the extreme temperature of boiling liquid expansion and steam explosion. Before detecting the "hot zone" of the accident, appropriate and finely protected disassembly should be carried out.

(4) Carbon dioxide fire extinguishers should not be used to extinguish fires on individuals, as there is a risk of suffocation.

5. Precautions for faulty vehicle

(a) Employees wearing medical auxiliary electronic devices should avoid approaching faulty vehicles, motors, or high voltage systems that may have a negative impact on the following medical auxiliary electronic devices.

- Analgesic pump in the body.
- Implanted defibrillators.
- Cardiac pacemaker.
- Insulin pump.
- Hearing aids.

Precautions

1. Precautions for high voltage operation (inspection and maintenance of high voltage system)

Notice:

Electric vehicles have a high voltage exceeding the safe voltage of human body, so they must be inspected and repaired by professionals who have received relevant training, and must be operated according to the correct method.

When there is a malfunction in the vehicle, personnel wearing electronic medical devices such as pacemakers and insulin pumps should be prohibited from approaching and operating the vehicle.

When operating the vehicle, avoid wearing metal ornaments such as watches etc. to avoid short circuit accidents.

(a) Preparation work

Preparation items	Contents
Dedicated operation site	Unrelated personnel should be prohibited from approaching to prevent accidental electric shock caused by misoperation of unrelated personnel.
Insulation gloves/insulation shoes	Insulation gloves should have a rated voltage of not less than 500 VAC/700 VDC to prevent electric shock accidents caused by direct contact with high voltage live parts.
Insulation tape	The insulation tape is orange in color and is used to wrap around damaged or exposed high voltage live parts.
High voltage hazard warning board	It should be placed on the roof to prevent unauthorized personnel from approaching the vehicle for misoperation.

IN

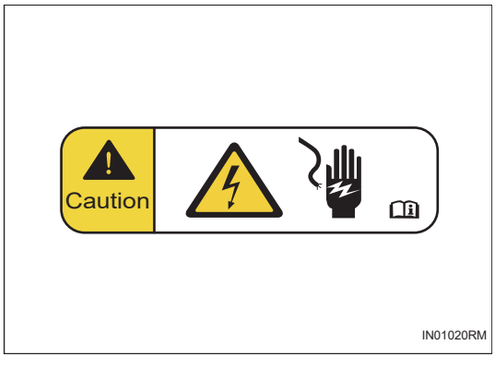


(1) High voltage hazard warning board

(b) Identification of high voltage components

Warning:

Some high voltage components may only have the identification of lightning in a triangle.



(1) The color of high voltage wire harness and high voltage connector is orange;

(2) Non wire harness type high voltage components are labeled with high voltage marks, and the identification style is generally shown in the figure.

2. Safe operation steps for disconnecting high voltage circuit

Notice:

- **If the high voltage circuit is not properly disconnected before disassembling the vehicle, it may cause serious electric shock accidents or even death.**
- **Even after disconnecting the high voltage circuit, the high voltage battery still carries high voltage, so it is forbidden to touch the high voltage battery case and its interior with bare hands. The high voltage system may contain high voltage electricity, and it is prohibited to touch high voltage components with bare hands.**

Warning:

- ***The high voltage capacitors in the motor controller and DC/DC and other high voltage components still retain some electrical energy after the high voltage system is powered off. The residual electrical energy will be reduced to below 60 VDC within 2 minutes and fully released within 5 minutes.***
- ***After unlocking the service switch, turning ignition switch to START (READY) position may cause failure.***

(a) Turn ignition switch to OFF.

(b) Disconnect the low voltage battery negative terminal.

(c) Check the type of insulating gloves and confirm that its rated voltage exceeds 500 VAC/700 VDC; Make sure the insulation gloves are dry and free of dirt and air leakage. When wearing, the sleeves should be placed inside the gloves.

(d) Unlock the low voltage service switch and lock it with a safety lock to avoid the risk of electric shock caused by misoperation by others.

(e) Wait for 5 minutes until the capacitor discharge in the high voltage circuit ends.

(f) Use insulation devices such as insulation tape to protect exposed high voltage live parts in an all-round way to ensure that high voltage live parts cannot be directly touched.

3. Safe operation steps for restoring high voltage circuit

(a) Check the type of insulating gloves and confirm that its rated voltage exceeds 500 VAC/700 VDC; Make sure the insulation gloves are dry and free of dirt and air leakage. When wearing, the sleeves should be placed inside the gloves.

(b) Remove insulation devices such as insulation tape.

(c) Check the low voltage service switch.

(d) Connect the negative battery cable.

(e) Turn ignition switch to START, instrument cluster displays Ready status.

4. Airbag and seat belt pretensioner

(a) Turn power to OFF.

(1) After confirming diagnostic connection cable, turn ignition switch to OFF and remove

negative battery terminal for 60 seconds before starting operation.

Note:

Since airbag pretensioner system is equipped with a backup power supply, airbag may deploy if starting operation within 60 seconds after negative battery terminal is removed.

(b) General precautions.

(1) Perform electrical inspection with a digital multimeter.

(2) Follow precautions on label around the system.

(3) Do not disassemble.

(4) Do not measure resistance.

(c) Precautions when disposing of airbag and pretensioner (before deploying).

(1) Do not dispose of it in an undeployed state (be sure to use SST to make it deploy).

(2) Please inform the surrounding personnel in advance because the sound is loud when deploying.

(3) Be sure to deploy it outdoors, away from residential areas, in a safe, flat area.

(4) When deploying airbag and pretensioner, use SST and stay 5 meters away from airbag and pretensioner.

(d) Precautions when disposing of airbag and pretensioner (after deploying).

(1) As the temperature of some parts of airbag and pretensioner reaches several hundred degrees after deployment, it should be placed for more than 30 minutes after deployment.

(e) Precautions for driver airbag assembly, front passenger airbag assembly and pretensioner.

(1) When operating, even if it is temporarily removed, deployed side should be placed facing upward.

(2) Do not overlap airbags or place other items on them.

(f) Wire harness and connector.

(1) Most of wire harness in this system is integrated with instrument panel wire

harness assembly, and all connectors are in standard yellow. If wire harness is disconnected or connector is damaged, repair or replace it immediately.

(g) Handling of vehicle after collision.

(1) When using an electric welding machine, remove airbag and seat belt pretensioner before operating.

(2) Airbag sensor assembly may be impacted, remove sensor assembly before operating.

5. Vehicle insulation resistance inspection: Measure with insulation meter, if the insulation resistance value is below 2.5 MΩ, it is considered to be faulty value, if the insulation resistance value is above 2.5 MΩ, it is considered to be normal value.

(a) Inspection tool

Tool name	Tool requirements
Insulation meter	Measuring range not less than 100 MΩ with a 500 V test voltage band
Insulation gloves	Withstand voltage not less than DC 500 V

(b) Preparation work

(1) Vehicle equipment is intact and has no other faults except insulation;

(2) Vehicle is stationary and is powered off at high voltage;

(3) Disconnect the negative battery, and disconnect the low voltage service switch;

(4) Confirm whether the insulation meter has been calibrated; Check whether the probe and test wire of insulation meter are intact; The actual test voltage output of the insulation meter 500 V test voltage band should not be lower than DC 400V;

(5) Check whether the insulation gloves are certified, check whether the insulation gloves are dry, and whether there is air leakage.

(c) Inspection steps:

(1) Power battery troubleshooting

Step 1. Clear the insulation fault of vehicle, make sure that the vehicle is powered on at low voltage and powered off at high voltage, and the vehicle remains stationary for more than 1 minute. At this time, if the instrument cluster reports an insulation fault, it can be

preliminarily judged that there is an insulation fault in the battery pack. If the insulation fault is not reported, proceed to step 2.

Step 2. After completing the preparation work, wear insulation gloves and set the test voltage of the insulation meter to 500 VDC. Check insulation resistance in other high voltage components.

(2) Rear electric drive assembly and rear DC bus troubleshooting

Remove the bottom protector to reveal energy conversion and distribution unit assembly. Disconnect the connector at the end of the energy conversion and distribution unit assembly that connects to the rear electric drive system, and separately measure the insulation resistance between the two terminals of the DC bus end connector and the vehicle body ground. (Contact the red probe of the insulation meter with the positive terminal of the connector, contact black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test); Then contact the red probe of insulation meter with the negative terminal of connector, and contact the black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test). Be careful not to let probe touch the internal shielding structure of the connector during measurement. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in the rear electric drive system and rear DC bus; If the resistance value is less than 2.5 MΩ, it can be determined that there is an insulation fault in the rear electric drive system or rear DC bus. If the resistance value is less than 2.5 MΩ, continue to disconnect the connector at the rear electric drive system assembly end, and measure the insulation resistance between two terminals of DC bus and shielding layer. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in this section of wire harness, and there is an insulation fault in the rear electric drive system; If the resistance value

is less than 2.5 MΩ, it can be determined that there is an insulation fault in the DC bus.

(3) Front electric drive assembly and front DC bus troubleshooting (4WD configuration)

Disconnect the connector at the end of the energy conversion and distribution unit assembly that connects to the front electric drive system, and separately measure the insulation resistance between the two terminals of the DC bus end connector and the vehicle body ground. (Contact the red probe of the insulation meter with the positive terminal of the connector, contact black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test); Then contact the red probe of insulation meter with the negative terminal of connector, and contact the black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test). Be careful not to let probe touch the internal shielding structure of the connector during measurement. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in the front electric drive system and front DC bus; If the resistance value is less than 2.5 MΩ, it can be determined that there is an insulation fault in the front electric drive system or front DC bus. If the resistance value is less than 2.5 MΩ, continue to disconnect the connector at the front electric drive system assembly end, and measure the insulation resistance between two terminals of DC bus and shielding layer. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in this section of wire harness, and there is an insulation fault in the front electric drive system; If the resistance value is less than 2.5 MΩ, it can be determined that there is an insulation fault in the DC bus.

(4) A/C compressor assembly and A/C compressor high voltage wire harness, water heating PTC assembly and related high voltage wire harness troubleshooting

Disconnect the "one-to-two" harness connector at the end of the energy

conversion and distribution unit assembly, measure the insulation resistance between two terminals of this wire harness end connector and body ground. (Contact the red probe of the insulation meter with the positive terminal of the connector, contact black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test); Then contact the red probe of insulation meter with the negative terminal of connector, and contact the black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test). Be careful not to let probe touch the internal shielding structure of the connector during measurement. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in the A/C compressor, water heating PTC and related high voltage wire harness, ask a battery professional for assistance in troubleshooting the battery pack; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation fault in the A/C compressor, water heating PTC or this section of high voltage wire harness. If the resistance value is less than 2.5 MΩ, continue to disconnect the connector at the A/C compressor assembly end, measure the insulation resistance between two terminals of wire harness end connector connected with A/C compressor assembly and body ground. (Contact the red probe of the insulation meter with the positive terminal of the connector, contact black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test); Then contact the red probe of insulation meter with the negative terminal of connector, and contact the black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test). Be careful not to let probe touch the internal shielding structure of the connector during measurement. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in the A/C compressor and this section of high voltage wire harness, continue troubleshooting the water heating PTC and

related wire harness; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation fault in the A/C compressor or related wire harness. Continue to disconnect the connector at the A/C compressor assembly end, and measure the insulation resistance between two terminals of this section of the high voltage wire harness and shielding layer. If both the resistance values are not less than 2.5 MΩ, it can be determined that there is no insulation problem in this section of wire harness, and there is insulation problem in A/C compressor; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation problem in the high voltage wire harness. Disconnect the connector at water heating PTC assembly end, measure the insulation resistance between two terminals of water heating PTC assembly wire harness end connector and body ground. (Contact the red probe of the insulation meter with the positive terminal of the connector, contact black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test); Then contact the red probe of insulation meter with the negative terminal of connector, and contact the black probe of the insulation meter with body ground for testing (press and hold the test button on the probe during the test). Be careful not to let probe touch the internal shielding structure of the connector during measurement. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in the water heating PTC and this section of high voltage wire harness, continue troubleshooting the energy conversion and distribution unit assembly connected to the one-to-two high voltage wire harness; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation fault in the water heating PTC assembly or related wire harness. Continue to disconnect the connector at the water heating PTC assembly end, and measure the insulation resistance between two terminals of the high voltage wire harness and shielding layer. If both the resistance values are not less than 2.5 MΩ, it can be determined that there is no

insulation problem in this section of wire harness, and there is insulation problem in water heating PTC; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation problem in the high voltage wire harness.

(5) Energy conversion and distribution unit assembly to one into two high voltage wire harness

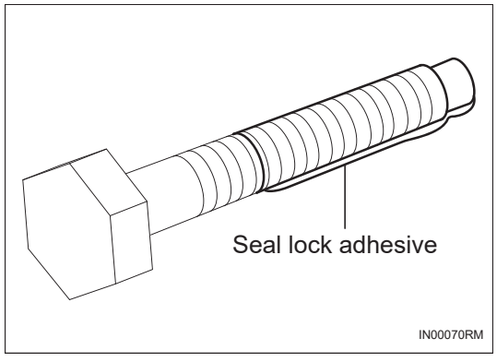
At this time, the high voltage wire harness of this section is disconnected from each high voltage assembly. Measure the insulation resistance between two terminals of this section of high voltage wire harness and shielding layer from the connector at any terminal. If the resistance value is not less than 2.5 MΩ, it can be determined that there is no insulation fault in this section of wire harness, and perform professional troubleshooting with battery; If the resistance value is less than 2.5 MΩ, it can be determined that there is insulation fault in this section of high voltage wire harness.

6. Basic proceedings

(a) Operating instructions.

1	Clothing	• Always wear clean work clothes. • Must wear a helmet and safety shoes.
2	Vehicle protection	• Before starting operation, prepare radiator cover, fender apron cover, seat cover and floor mat.
3	Safety operation	• Secure the vehicle with wheel stoppers. • When more than two people operate, confirm the security of each other. • Prevent personal injury caused by high temperature, rotation, swing and vibration during operating. • After jacking up with lift, put bracket in the specified position to support the vehicle. • Use safety device to support after lifting vehicle.
4	Preparation of tools and measuring instruments	• Tool stand, SST, measuring instruments, grease, cotton yarn and replacement parts should be prepared before operating.

5	Operations of removal, disassembly and reassembly	• Always confirm problem symptoms fully before performing effective operations. • When construction is complex, write a note or make assembly marks without affecting function. • Clean the removed parts if necessary and reassemble after checking.
6	Remove parts	• Do not mess or dirty the removed parts and put them in order. • Replace gasket, O-ring, self-locking nut and other non-reusable parts with new parts as instructed. • Replacement parts should be packed in boxes and provided to customers.



(b) Pre-coated parts.

(1) Pre-coated parts are bolts and nuts that are coated with seal lock adhesive before leaving factory.

(2) If pre-coated parts have been retightened, loosened or moved in any way, it must be reapplied with the specified seal lock adhesive.

Note:

Check torque with lower limit value of standard torque range.

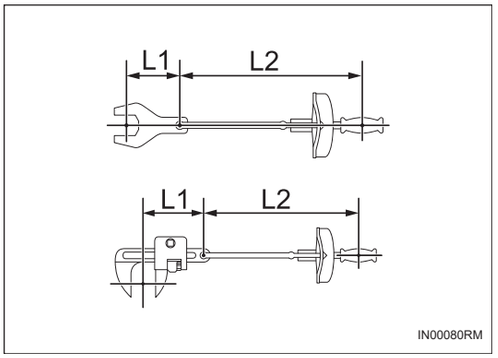
(3) When reusing pre-coated parts, remove the old seal lock adhesive and dry parts with compressed air. Then apply a proper amount of new seal lock adhesive on parts.

(4) After seal lock adhesive is applied, it must be installed within specified time.

(c) Gasket.

(1) Apply seal lock adhesive to gasket to prevent leakage if necessary.

IN



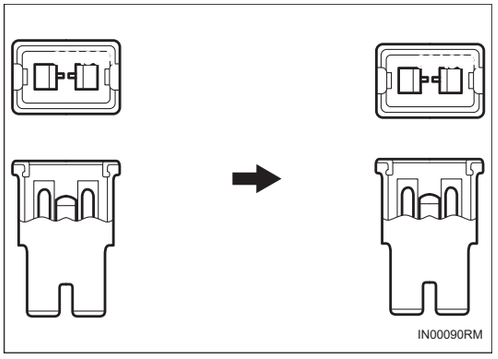
(d) Bolt, nut and screw. Strictly comply with all technical specifications for tightening torque and always use a torque wrench.

(e) Torque when torque wrench is used in conjunction with extension tool.

(1) If extension tool is used in conjunction with torque wrench, and tighten to torque specifications specified in this manual with torque wrench, the actual torque will be too large and parts will be damaged.

(2) Formula: T' = L2/(L1 + L2) × T

T'	Reading on torque wrench (N • m)
T	Torque (N • m)
L1	Length of extension tool (cm)
L2	Length of torque wrench (cm)



(f) Replace the fuse.

(1) Check that fuse wire is not damaged when checking fuse.

(2) When replacing fuse, ensure that the rated amperage of new fuse is correct. Do not use fuses greater than or less than the rated amperage.

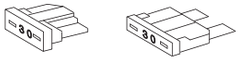
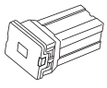
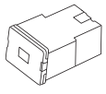
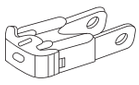
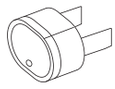
Illustration	Symbol	Part name	Abbreviation
		Fuse	FUSE
		Medium current fuse	M-FUSE
		High current fuse	H-FUSE

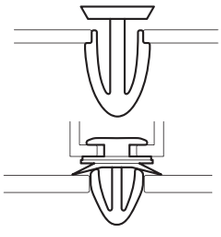
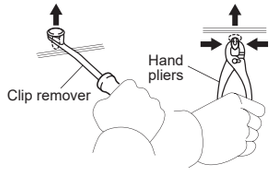
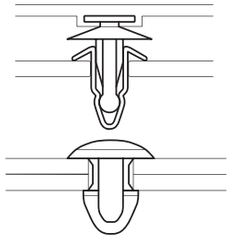
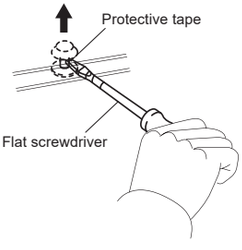
Illustration	Symbol	Part name	Abbreviation
		Fuse	FL
		Circuit protector	CB

(g) Clip

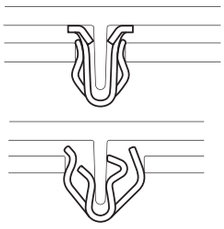
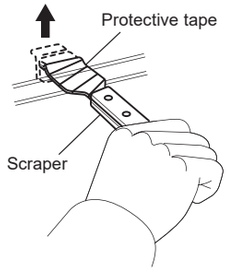
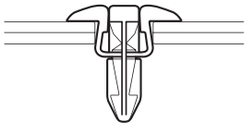
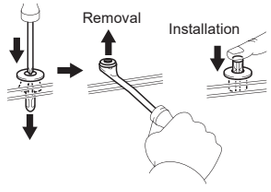
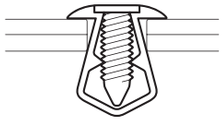
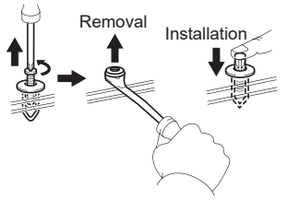
(1) The illustration shows the removal and installation of body part clips.

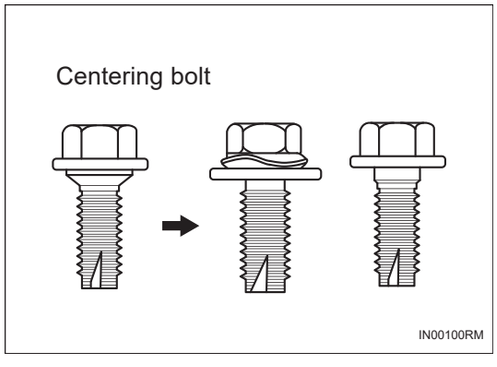
Note:

If clip is damaged during operating, it must be replaced with a new one.

Shape (example)	Removal and installation
Clip 	
Clip 	

IN

Shape (example)	Removal and installation
Claw 	
Clip 	
Clip 	



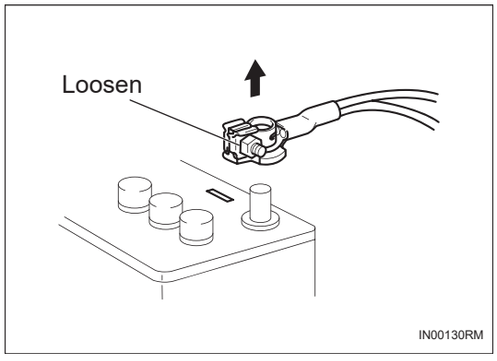
(h) Precautions when adjusting clearance.

(1) When centering bolts are used on hinges of front compartment cover, doors, luggage compartment door, etc., adjust clearance after replacing spare bolts.

(i) Use jack to support, lift and lower the vehicle.

(1) Always observe precautions when using jack to support, lift and lower the vehicle.

7. Electrical system



(a) Removal and installation of battery terminal.

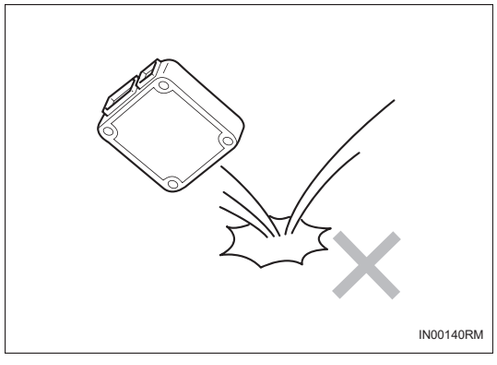
(1) When operating on electrical system, remove battery terminal in advance to prevent burning caused by short circuit.

(2) When removing and installing battery terminal, turn ignition switch to OFF and turn off light switch, loosen terminal nut completely, and do not pry it.

(3) If battery terminal is removed, the stored information, such as clock, radio, and diagnosis will be deleted, so the contents should be confirmed in advance.

(b) Calibration when removing and installing battery terminal.

System name	Operation name
Power window control system	Calibration



(c) Handling of electronic parts.

(1) Do not disassemble ECU. (If integrated circuit terminal is touched, integrated circuit may be damaged due to static electricity.)

(2) Do not impact electronic parts such as ECU, sensor and relay. If it falls, replace it with a new one.

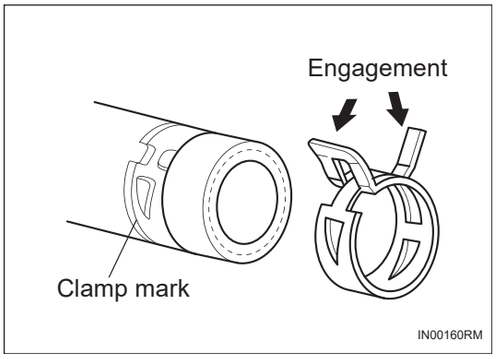
(3) Electronic parts should avoid the influence of high temperature and high humidity environment.

(4) When using steam to clean front compartment, be careful not to get water directly on electronic parts, air filter and other related parts.

(5) Do not touch connector terminal to prevent deformation and static electricity.

(6) Do not use an impact wrench to remove or install temperature sensor.

8. Handling of hose clamp



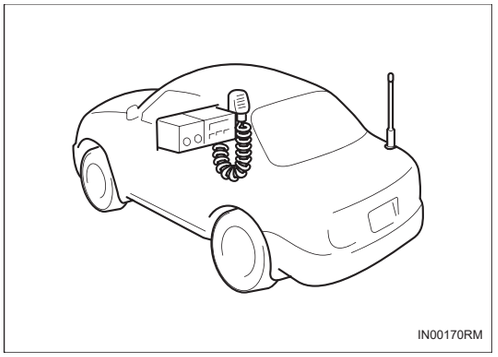
(a) Before removing hose, check insertion depth of hose and position of clamp so that hose can be reset.

(b) If clamp is deformed or elastic is weakened, replace it with a new one.

(c) When reusing hose, install clamp according to clamp trace of hose.

(d) After installing clamp, fasten clamp in direction shown by the arrow in illustration.

9. Installation of mobile communication equipment



(a) Be sure to install it far away from ECU, sensors and other vehicle electronic systems.

(b) For accessory, correctly install following each installation instruction.

(c) Do not install high power mobile communication equipment.

10. Inspection and maintenance of headlight

(a) When headlight comes on, do not touch high voltage port.

(b) Do not cover headlight for more than 3 minutes when it comes on.

Note:

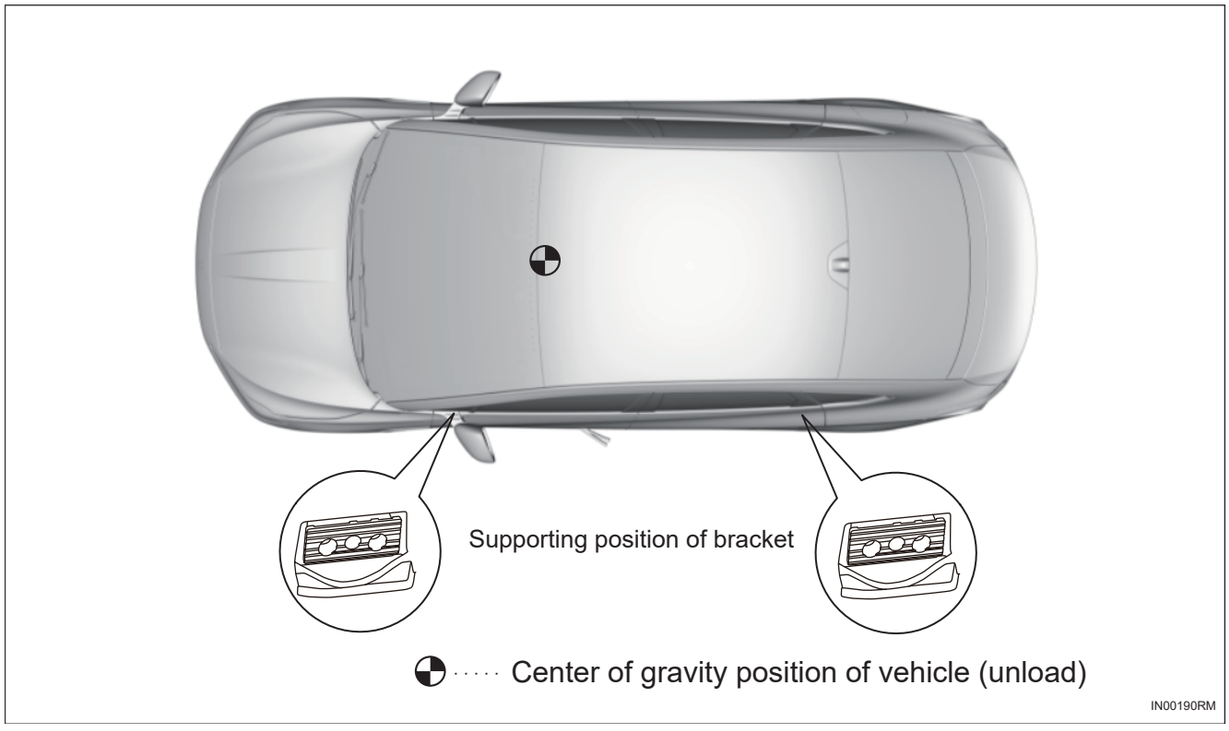
- Strictly follow headlight operation precautions during inspection and maintenance.
- The external lens of headlight is made of resin, so long operation will cause it to deform due to overheating.

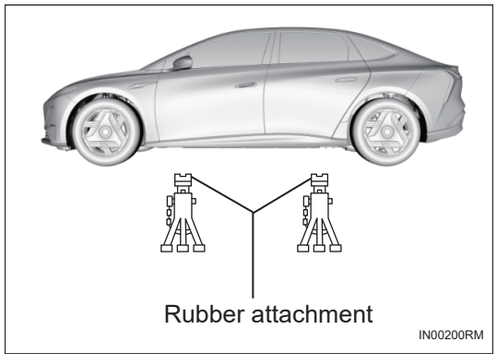
Jack, bracket and support position

1. Precautions for vehicle condition when lifting vehicle

(a) Take the principle that vehicle is close to unload, do not jack up and lift the vehicle with heavy loads.

(b) If heavy parts such as engine and transmission are removed, the center of gravity of vehicle will move. Therefore, do not make it slip to balance the loads.





2. Usage precautions of jack and bracket

(a) Always use stopper when operating on level ground.

(b) Use bracket with rubber attachment as shown in illustration.

(c) Jack and bracket should be properly supported in the specified position.

(d) When jacking up front wheels, release parking brake and only put stoppers on rear sides of rear wheels. When jacking up rear wheels, only put stoppers on front sides of front wheels.

(e) When jacking up only front or rear wheels, put stoppers on front and rear sides of landing wheels.

Note:

When only using jack to support the vehicle, do not operate or park, be sure to use bracket to support.

(f) When lowering jack only with front wheels lifting up, release parking brake, put stoppers on front and rear sides of rear wheels. When lowering jack only with rear wheels lifting up, put stoppers on front and rear sides of front wheels.

Note:

Do not use wheel jack at oil pan.

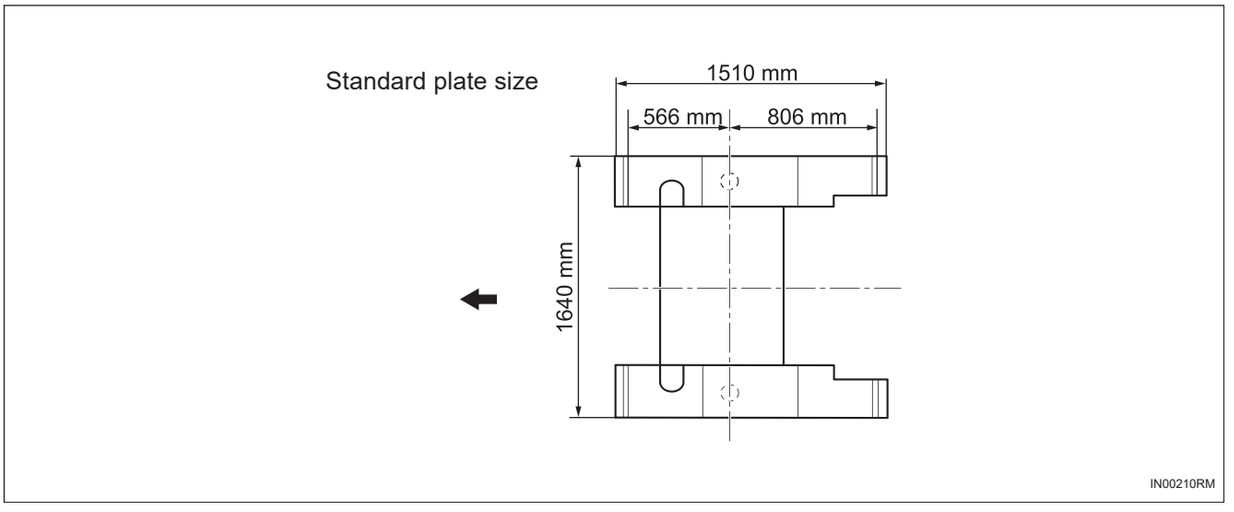
IN

3. Precautions for using a plate type lift

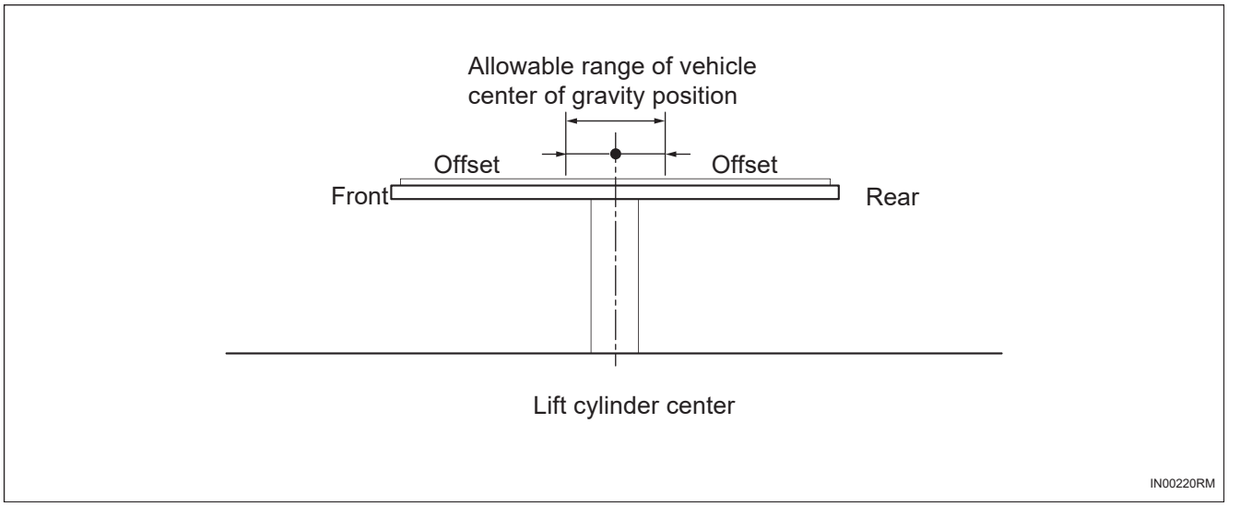
(a) Follow lift operation manual for safe operation.

Note:

If standard plate size is not used or lift support position is improper and greatly deviates from the center of gravity of the vehicle, the stability of vehicle will be significantly reduced and the body may be damaged.



(b) When using a plate lift to lift the vehicle, ensure that the center of gravity of the vehicle is within the allowable range of the center of gravity position of the lift.



Note:

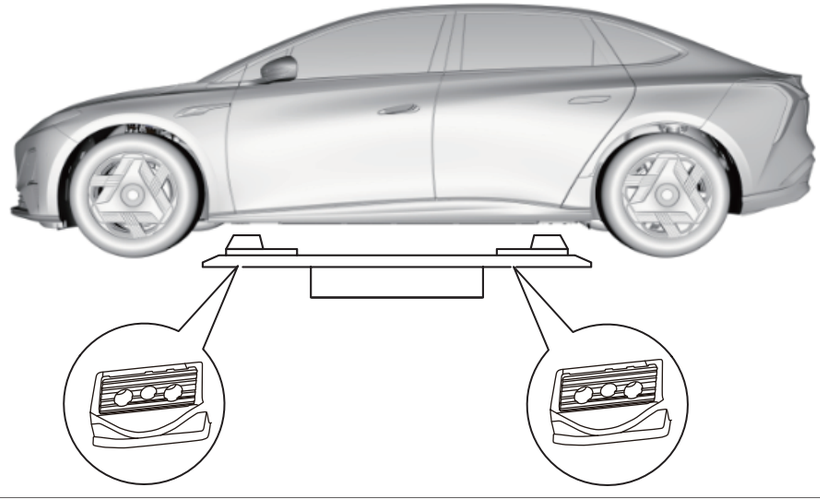
- If the center of gravity of the vehicle deviates from the allowable range of the center of gravity position of lift, the vehicle will sway when lifting.
- If you do not know the allowable gravity position of the vehicle, consult each lift manufacturer.

(c) The vehicle must enter the designated position.

Fixed position of the vehicle in left and right direction	• Enter the center of lift.
Fixed position of the vehicle in front and rear direction	• The rubber end of plate type buffer should be aligned with the lower end of attachment. (Part A, part C) • Adjust upper end of attachment at front notch of front side bracket support position of the vehicle so that it does not collide with threshold strip and is aligned with notch. (Part B)

(d) Shake the vehicle after lifting it to confirm if it is stable.

Plate type lift

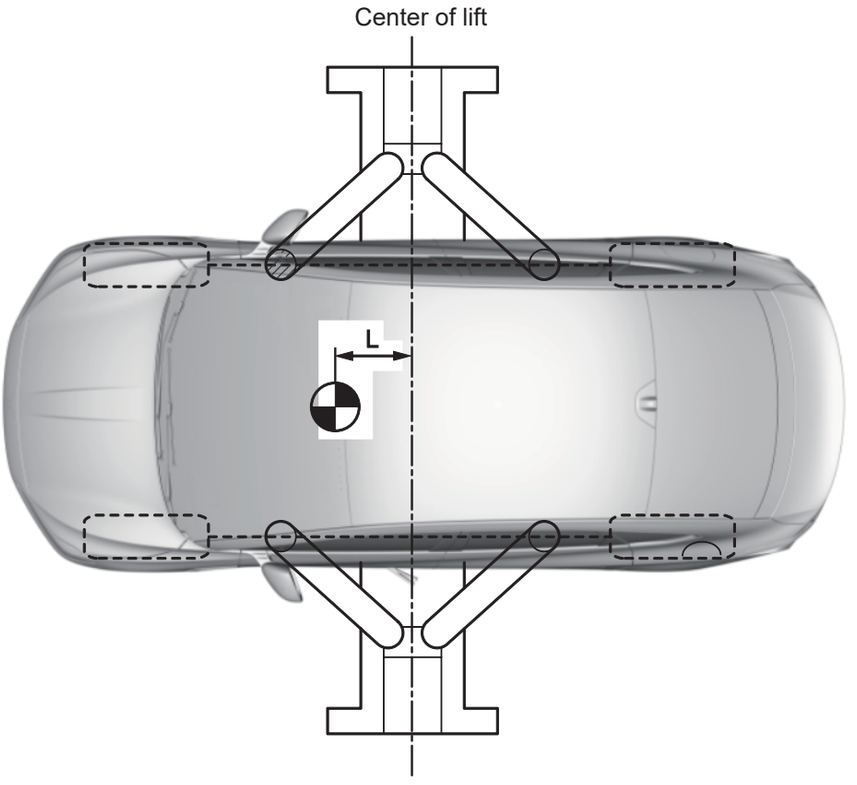


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4. Precautions for using a swing arm type lift

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Swing arm type lift



(a) Follow lift operation manual for safe operation.

(b) Use bracket with rubber attachment as shown in illustration.

(c) The vehicle parking position should make the center of lift and the center of gravity of the vehicle as close as possible (L should be small).

(d) The vehicle is in a horizontal state. Adjust the height of support position to prevent colliding with threshold strip, so that the groove of support position is consistent with support position of bracket.

(e) The rocker arm must be locked during operation.

(f) Lift tire and gently shake the vehicle to confirm if it is stable.

5. Precautions for using four-post lift and wheel lift

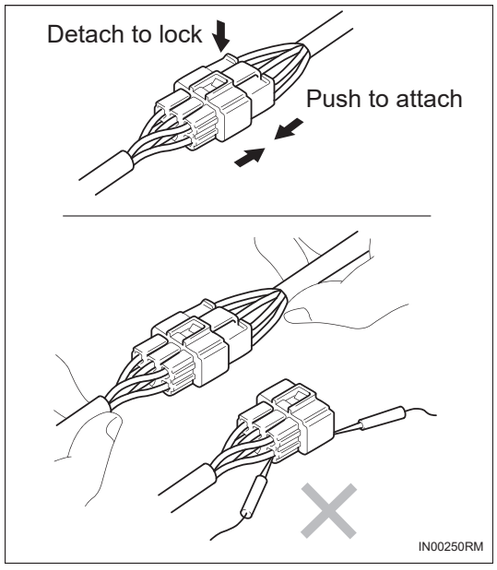
(a) Follow lift operation manual for safe operation.

(b) Do not make free wheel frame damage tire and wheel.

(c) Secure the vehicle with stoppers.

Inspection method and step of circuit

1. Basic inspection



(a) Resistance measurement conditions of electronic parts.

(1) Unless otherwise mentioned, all resistance measurements should be performed at an outside temperature of 20° C. If measurement is performed immediately after driving vehicle (high temperature), resistance value will exceed the specified value, so the measurement should be performed after engine is cooled.

(b) Connector operation.

(1) When disconnecting connector with lock, push fitting part of connector to easily move lock claw, and then release the lock.

(2) When disconnecting connector, do not pull wire harness, directly hold connector to disconnect.

(3) Before connecting connector, check if connector terminal is deformed, damaged, or fallen off.

(4) When connecting connector with lock, insert it firmly until locking sound is heard.

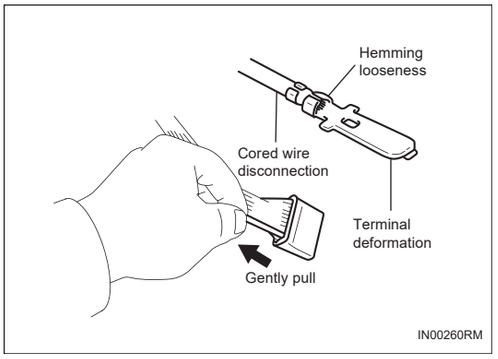
(5) When checking connectors with a digital multimeter, use a tiny probe to check from the back (wire harness side).

Caution:

- **Waterproof connector cannot be checked from the back, so they should be checked by connecting auxiliary wire harness.**
- **Do not move the inserted probe at will to prevent damage to terminal.**

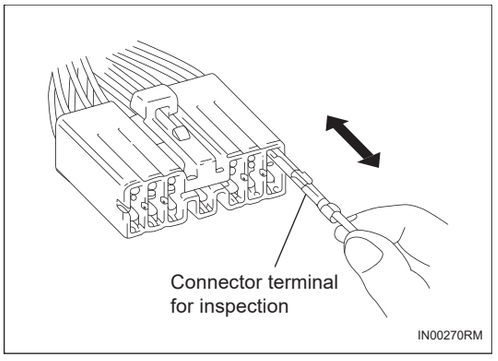
(c) Inspection method of connector.

IN



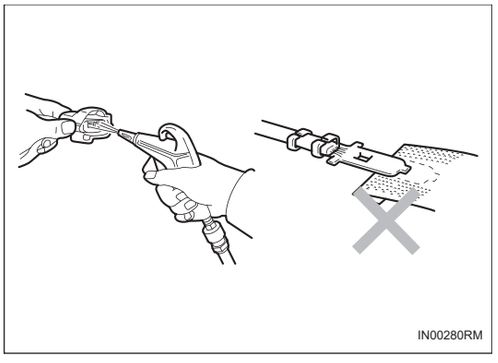
(1) Hold connector case while connecting connector to check if it is fully inserted and locked. (Inserted state)

(2) When disconnecting connector, gently pull wire harness to check (terminal falling off, loose hemming of terminal, disconnected core). Visually check for rust, metal debris, water, or foreign objects, and check terminal for bending, corrosion, or deformation.



(3) Prepare a terminal identical to connector terminal and insert it into socket terminal. Check inserted condition and sliding tightness to ensure that the contact pressure of terminal is appropriate.

(d) Maintenance method of connector terminal.

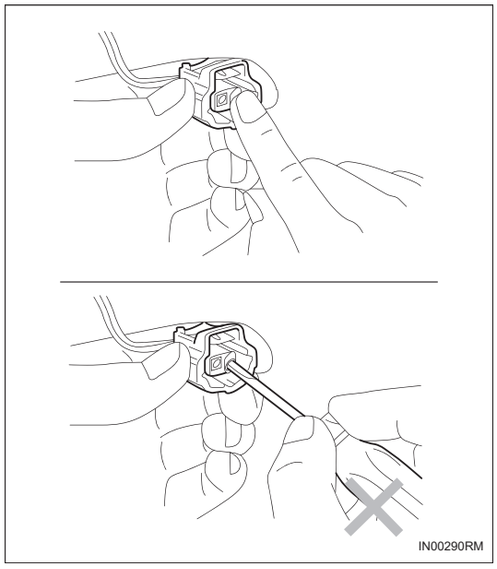


(1) If there is dirt at contact point, use an air gun or rag, etc. to clean. At this time, do not polish with sandpaper, etc. to prevent damage to contact point surface electroplating layer.

(2) If contact pressure is abnormal, replace socket terminal. If connector terminal is gold plated (golden), use gold plated socket terminal; If it is tinned (silver), use tinned socket terminal.

(3) If contact point is normal, clean contact point with an air gun and apply connector grease (this method can prevent oxidation and wear of the contact point).

(e) Connector grease.



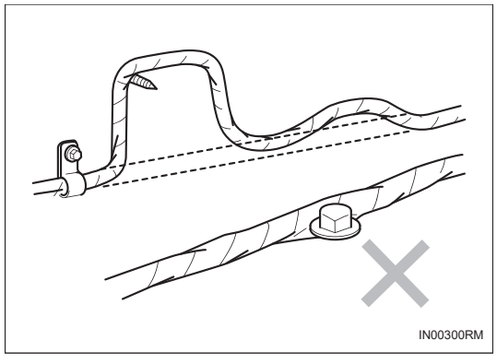
(1) Apply grease (white) to prevent terminal corrosion to connectors that are prone to water, such as alternator and headlight.

(2) When grease on connector is insufficient or terminal is repaired, apply connector grease on socket terminals by hand.

Note:

- Do not get dirt on it.
- Do not use tools such as a screwdriver to apply.

(3) If grease is applied to rubber parts (except O-ring and rubber plug of waterproof connector), it will deteriorate and discolor. If this occurs, wipe it immediately.



(f) Operation of wire harness.

(1) When removing wire harness, check conditions of wire harness and clip before operating, so that it can be restored to original state.

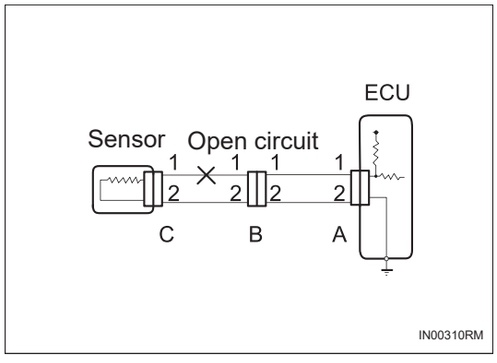
(2) Do not twist or stretch wire harness unless necessary.

(3) Do not rotate, slide or vibrate wire harness, and keep it away from hot parts and parts with sharp corners (plate end, screw tip, etc.).

(4) Do not squeeze wire harness when installing part.

(5) Do not damage wire harness covering. If it is damaged, replace it with a new one or wrap it with vinyl tape, etc.

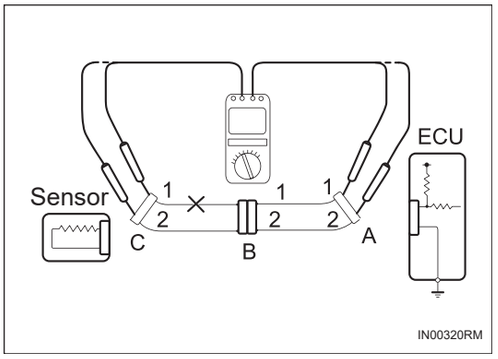
2. Check for open



(a) As shown in illustration, when there is open in wire harness, check continuity or voltage to determine the specific open circuit.

(b) Check continuity.

IN



(1) Disconnect connectors A and C and measure resistance between them.

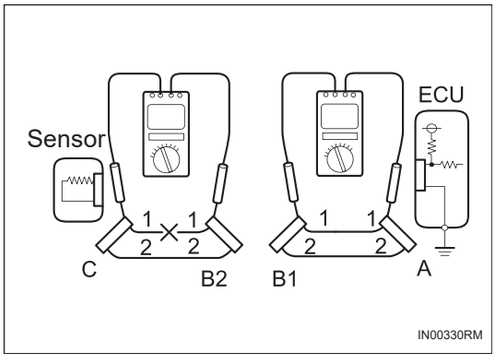
Standard value: 1 Ω or less

Note:

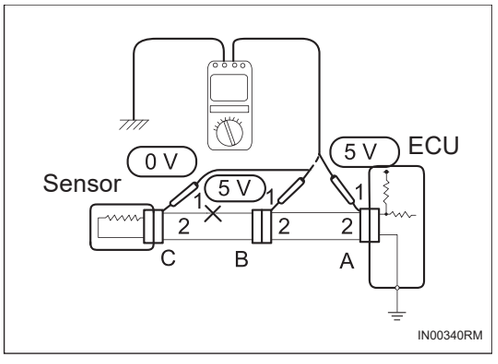
Measure resistance by gently shaking wire harness up and down, left and right.

(2) As shown in illustration, there is no continuity (open) between terminal 1 of connector A and terminal 1 of connector C, and there is continuity between terminal 2 of connector A and terminal 2 of connector C. In this case, there is open in circuit between terminal 1 of connector A and terminal 1 of connector C.

(3) Disconnect connector B and measure the resistance between connectors.



(4) As shown in illustration, there is continuity between terminal 1 of connector A and terminal 1 of connector B1, and there is no continuity (open) between terminal 1 of connector B2 and terminal 1 of connector C. In this case, there is open in circuit between terminal 1 of connector B2 and terminal 1 of connector C.



(c) Check voltage.

(1) In the circuit with voltage applied to terminal of ECU connector, the open circuit can be determined by voltage inspection.

(2) As shown in illustration, keep each connector connected, use ECU 5 V output terminal to measure voltage between body ground and terminal 1 of connector A, and then measure voltage between terminal 1 of connector B and terminal 1 of connector C.

(3) When the following conditions are met, there is open in wire harness between terminal 1 of connector B and terminal 1 of connector C.

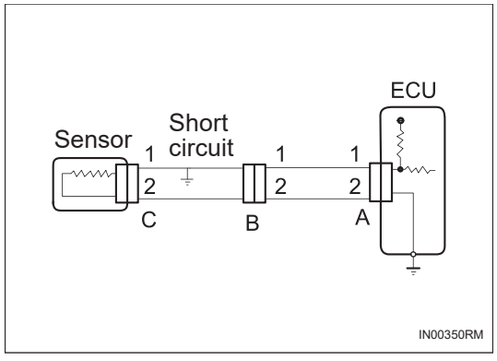
Standard value:

5 V between terminal 1 of connector A and body ground

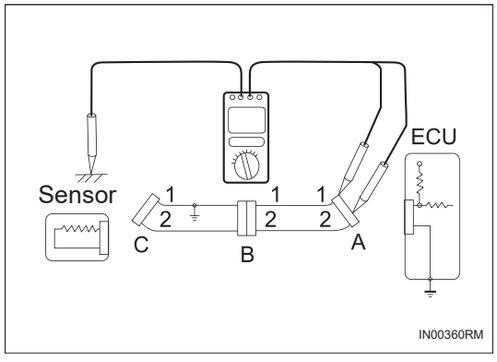
5 V between terminal 1 of connector B and body ground

0 V between terminal 1 of connector C and body ground

3. Check for short



(a) As shown in illustration, when there is short in wire harness ground, check continuity of ground to determine shorted circuit.



(b) Perform continuity inspection of ground.

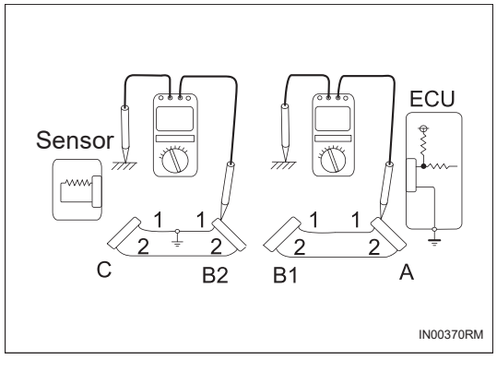
(1) Disconnect connectors A and C, and measure the resistance between terminals 1 and 2 of connector A and body ground.

Standard value: 10 kΩ or more

Note:

Measure resistance by gently shaking wire harness up and down, left and right.

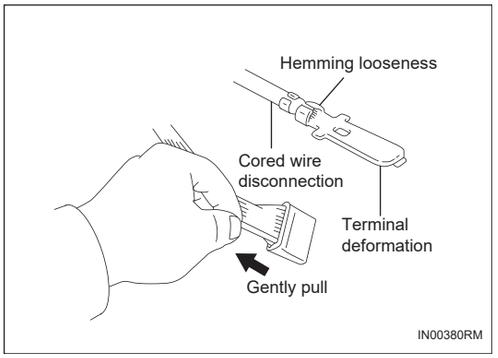
(2) As shown in illustration, there is continuity (short) between terminal 1 of connector A and body ground, and there is no continuity between terminal 2 of connector A and body ground. In this case, there is short in circuit between terminal 1 of connector A and terminal 1 of connector C.



(3) Disconnect connector B and measure the resistance between terminal 1 of connector A and body ground, and measure the resistance between terminal 1 of connector B2 and body ground. If there is no continuity between terminal 1 of connector A and body ground, and there is continuity (short) between terminal 1 of connector B2 and body ground, there is short in circuit between terminal 1 of connector B2 and terminal 1 of connector C.

4. Visual inspection and contact pressure inspection

IN



(a) Disconnect connectors at both ends.

(b) Check if there are rust or foreign objects on connector terminal.

(c) Check if hemming part is loose or damaged, and check if terminal is firmly fixed in locking position.

(d) Prepare a connector terminal, insert it into socket terminal and then pull it out.

Note:

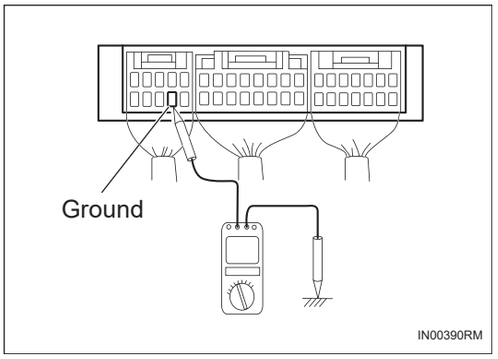
If the test terminal can be pulled out easily compared to other terminals, the contact is poor.

5. Check and replace ECU

Note:

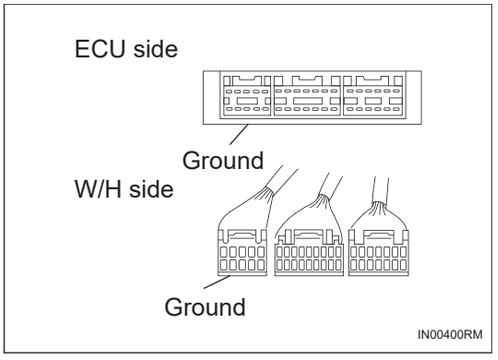
- Connector remains connected to ECU and is checked from the back of wire harness connector.
- If the measurement conditions are not specified, check with engine stopped and ignition switch turned to ON.

(a) First check ECU ground circuit, if there is a fault, repair it. If it is normal, ECU may be faulty. Replace it with a normal ECU, and then check to see if problem symptom has resolved.



(1) Measure the resistance between ECU ground terminal and body ground.

Standard value: 1 Ω or less



(2) Disconnect ECU connector, ensure that ECU and wire harness ground terminal are not bent, check contact pressure.

Terms in this manual

Abbreviated vocabulary

Abbreviated vocabulary	Definition
B+	Battery positive
CAN	Controller area network
CAN_H	High data line
CAN_L	Low data line
Comfort	Comfort
CO	Carbon monoxide
Diagnosis	Diagnosis
DTC	Diagnostic trouble code
FUSE	Fuse
GND	Ground
HI	High
HQ-VDS	Diagnostic tester
Information	Information
LF	Front left
LR	Rear left
RF	Front right
RR	Rear right
MAX	Max
MIL	Malfunction indicator light
MIN	Minimum
OBD	Diagnostic interface
OFF	OFF
ON	ON
SST	Special repair tool
USB	Universal serial bus
VIN	Vehicle identification number
ACU	Airbag control unit
ADS	Anti-fog sensor
AGS	Active intake grille
ALU	Ambient light driver
AMP	Power amplifier
APTC	Air-heating positive temperature coefficient heater
AQS	Air quality sensor
BLE	Bluetooth
BMS	Battery management system

IN

Abbreviated vocabulary	Definition
Compressor	Compressor
CS	Combination switch
DCU	Door controller
DK	Digital key
EBS	Battery sensor
ECF	Electronic cooling fan
ECP	Electronic water pump
EPS	Steering power system
ETC	Electronic toll collection system
EXV	Electronic expansion valve
Fragrance	Fragrance
HAD	Advanced automatic driving controller
HVCH	High pressure heater
IBC	Integrated brake control unit
ICC	Intelligent communication terminal
IFC	Smart front camera
INS	Inertial navigation system
ION	Ion generator
Lamp	Light control unit
MCU	Motor control unit
MFS	Multi-function steering wheel switch
NFC_ENT	Near field communication entry module
NFC_ST	Near field communication start module
DCDC&OBC	Charger
OBD	On-board diagnosis
OutletMotor	Air outlet motor
PDC	Area control unit
PCDU	Energy conversion and distribution unit
Radar	Millimeter wave radar
RFR	Radio frequency transceiver
RLS	Solar/rain sensor
SCU	Seat controller
SWITCH	Switch
TICU	Trailer controller
VDC	Central computing unit (intelligent vehicle control platform control unit)
UWB	Ultra-bandwidth antenna

Abbreviated vocabulary	Definition
WCM	Wireless charging
WMM	Electric wiper controller

Power

Electric drive system

Rear electric drive system transmission oil DL-1
Rear electric drive system assembly DL-3
Rear electric drive system breather DL-5
Rear electric drive system output shaft oil seal DL-7
Inverter assembly DL-10

Charging system

Service switch DL-17
Battery assembly DL-21

Power battery system

Power battery assembly DL-25
Power battery unit DL-37
Pressure sensor assembly DL-55
Excitation fuse DL-57
Battery control unit assembly DL-61
Energy conversion and distribution unit assembly DL-62

High voltage wire harness system

High voltage wire harness cover plate assembly DL-68
One into multiple high voltage wire harness assembly DL-70
Charging dust plug assembly DL-73
Charging high voltage wire harness assembly DL-76
Water heating PTC high voltage wire harness assembly DL-84
DC bus assembly DL-87
AC high voltage wire harness assembly DL-90

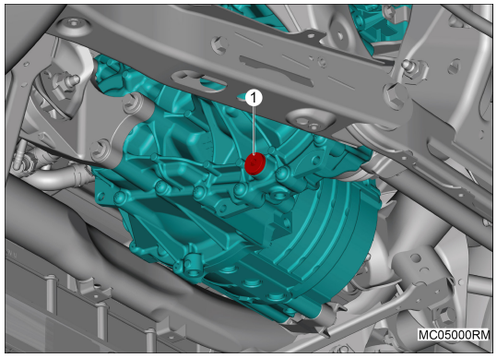
DL

Electric drive system

Rear electric drive system transmission oil

Draining

1. **Remove rear suspension bottom protector I assembly (See page WS-47)**
2. **Drain rear electric drive system transmission oil**
   (a) Park the vehicle on lifting table in a level place with the gear in "P" position.

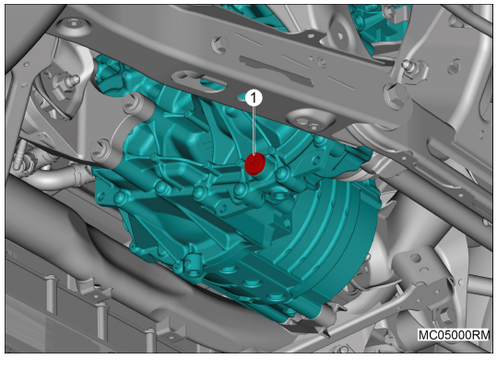


   (b) Remove drain plug
      (1) Using inner hexagon wrench, remove the drain plug assembly -1- and sealing gasket.

   (c) Drain the transmission oil. Let it stand until no oil flows out.

      Notice:

      - **Please handle the drained transmission oil properly.**

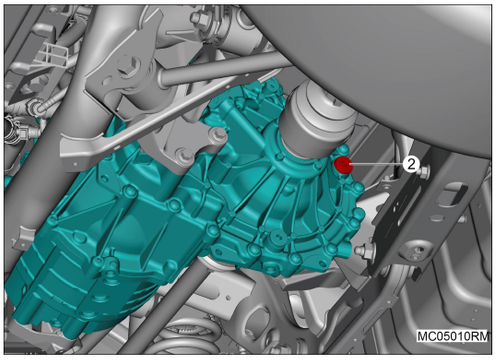


   (d) Install the drain bolt.
      (1) Install sealing gasket, and using inner hexagon wrench, install drain plug assembly -1-.
         - Torque: 25 ~ 31 N • m

Filling

1. **Fill rear electric drive system transmission oil**

DL



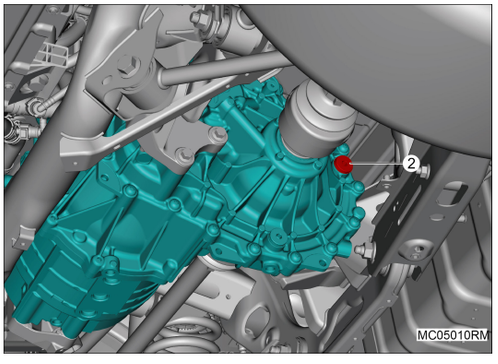
(a) Remove the filler bolt.

(1) Using inner hexagon wrench, remove filler plug assembly -2- and sealing gasket.

(b) Use electric drive system transmission oil filling tool to fill electric drive system transmission oil.

(c) Standard capacity:

First charging capacity for new engine	Charging amount for after-sales maintenance	Oil type
0.8 L ± 0.05 L	0.8 L ± 0.05 L	1704810-VK01 (FUCHS BluEV EG DHTF 3932)



(d) Install the filler bolt.

(1) Install the sealing gasket and use inner hexagon wrench to install the filler plug assembly -2-.

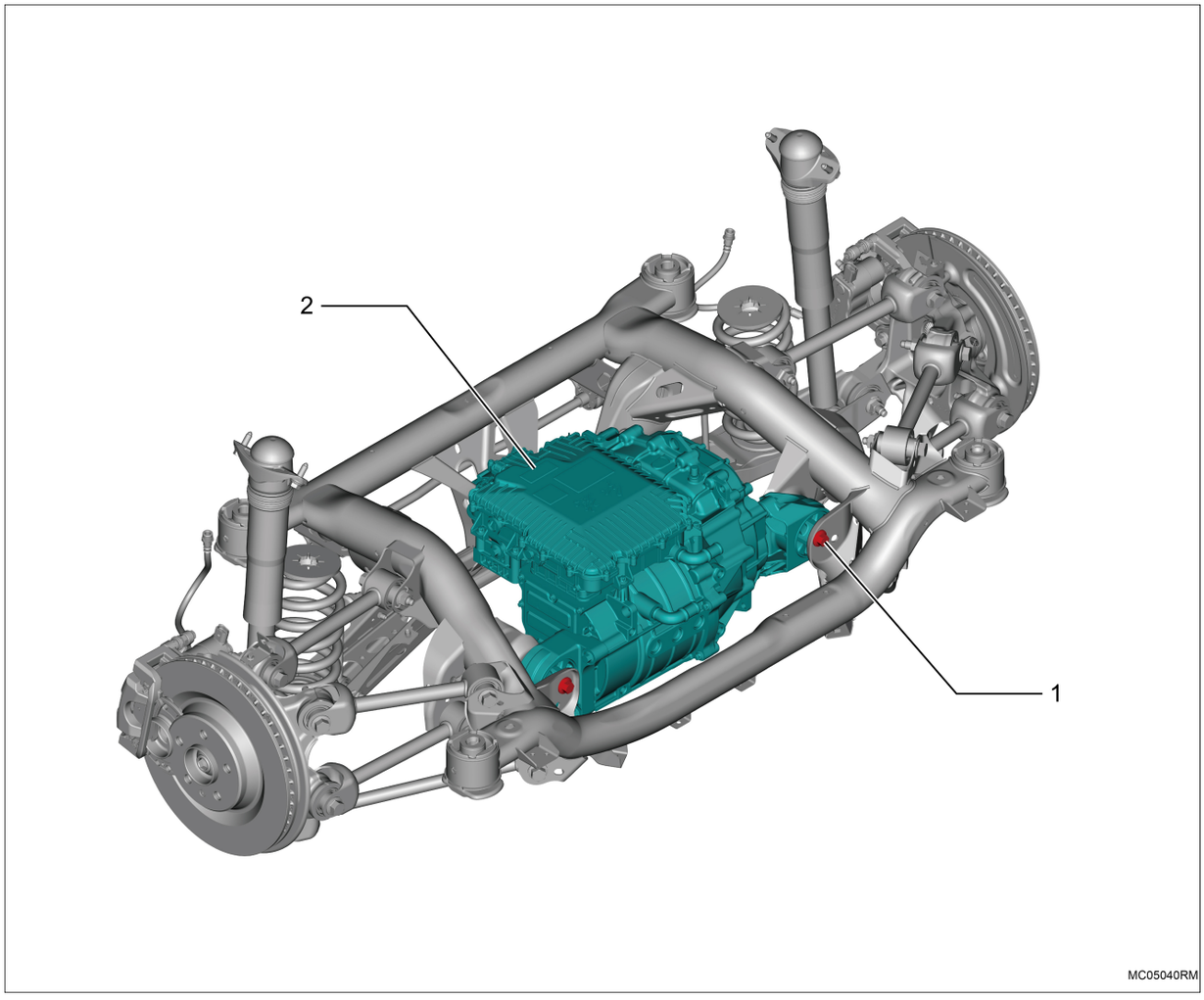
- Torque: 25 ~ 31 N • m

2. Install rear suspension bottom protector l assembly (See page WS-47)

Rear electric drive system assembly

Components

DL



1. **Hexagon flange bolt**
   - X3
   - Torque: 170 ~ 190 N • m
2. **Rear electric drive system assembly**

Removal

1. **Check for DTCs**

   Caution:

   - **After removing the battery, confirm that no fault in power battery voltage system insulation is output. If the relevant DTC is output, troubleshoot the DTC first.**

2. **Disconnect negative battery terminal (See page DL-21)**
3. **Detach service switch (See page DL-17)**

DL

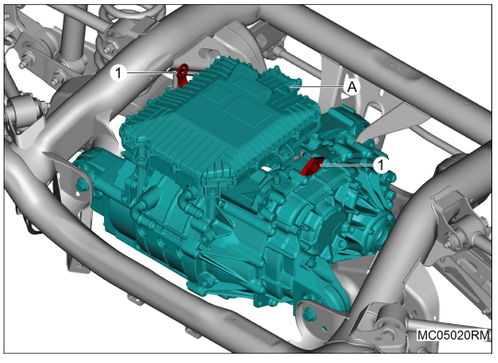
Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

4. **Remove rear suspension bottom protector I assembly (See page WS-47)**
5. **Drain coolant (See page RE-76)**
6. **Remove rear sub frame assembly (See page DP-98)**
7. **Remove rear left drive shaft assembly (See page DP-41)**
8. **Remove rear right drive shaft assembly (See page DP-41)**
9. **Remove rear electric drive system assembly**

Note:

- Many people are required to remove rear electric drive system assembly.

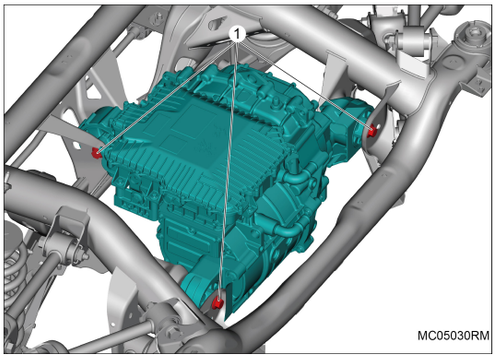


(a) Install it to the rear electric drive system assembly -A- hanger blocks -1- with lifting tool.

(b) Lift the lifting tool to allow the sling in a stressed state.

Notice:

- **Do not lift it excessively when the mounting assembly bolt is not removed, otherwise, the rear electric drive system may be damaged.**



(c) Remove the bolt -1-.

(d) Slowly lift the lifting tool and lift the rear electric drive system assembly from rear sub frame assembly.

Notice:

- **Make sure that there are no wires and hoses connected with rear electric drive assembly.**
- **When lifting the rear electric drive system assembly, do not touch other components.**

10. **Remove rear motor front left mounting assembly (See page DP-1)**
11. **Remove rear motor front right mounting assembly (See page DP-1)**

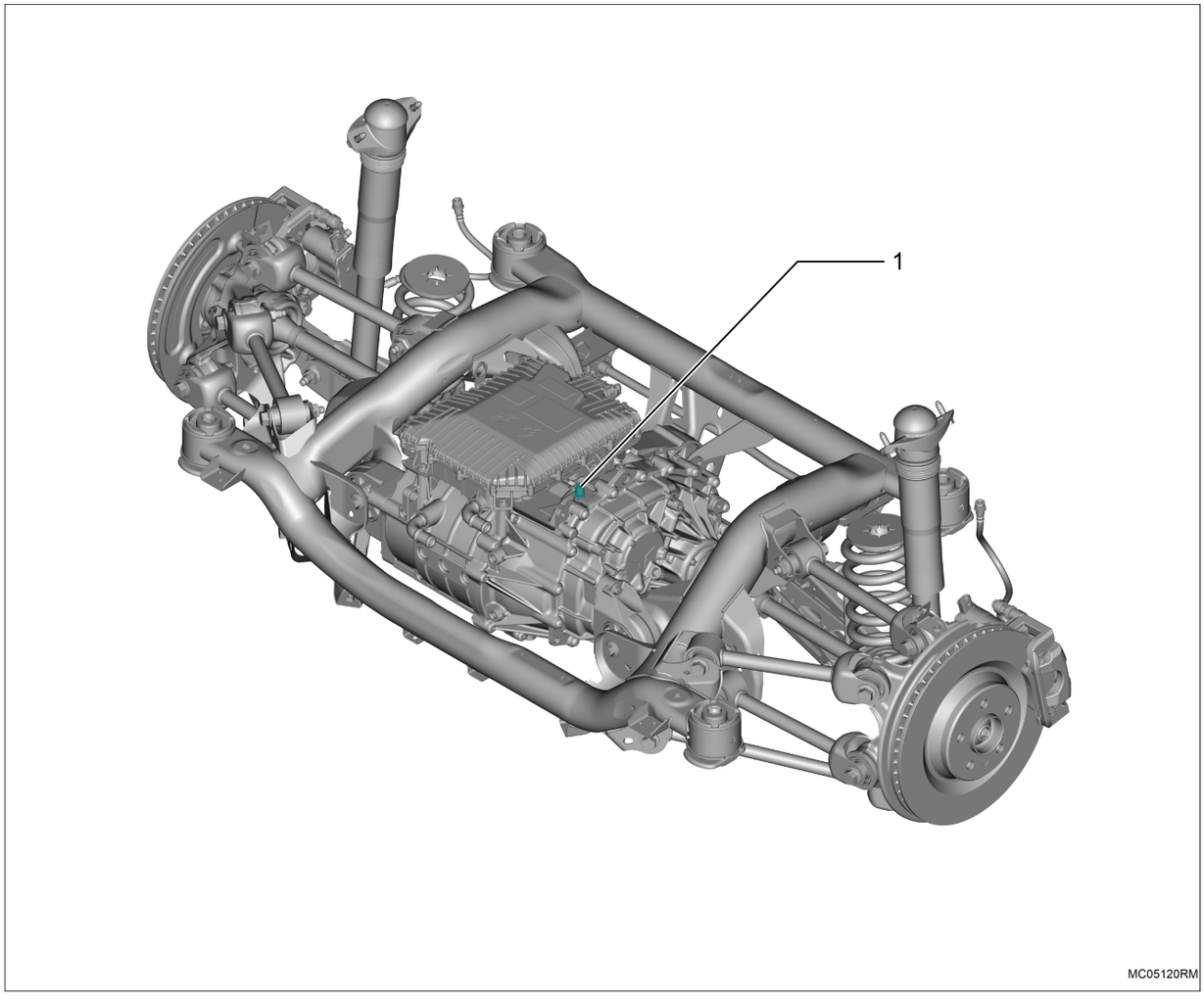
12. **Remove rear motor rear mounting assembly. (See page DP-1)**

Installation

1. **Installation is in the reverse order of removal.**

Rear electric drive system breather

Components

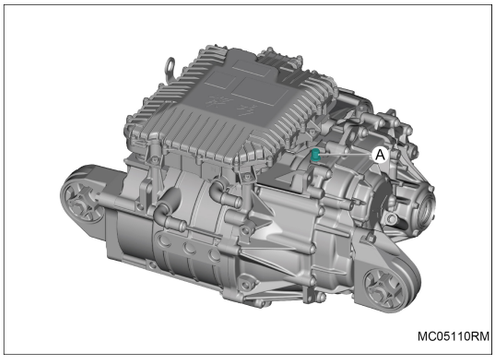


1. **Breather**

Removal

1. **Remove rear electric drive system assembly (See page DL-3)**
2. **Remove breather**

DL



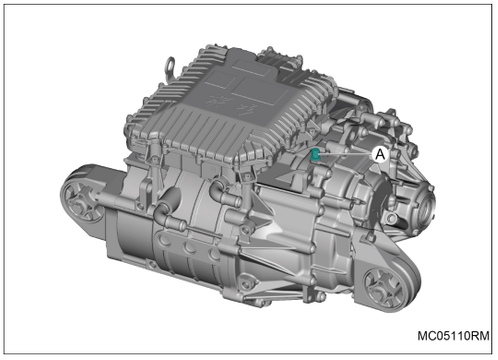
(a) Use a suitable tool to remove breather -A-.

Notice:

- **During operation, prevent foreign objects from entering the inside of motor system.**

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



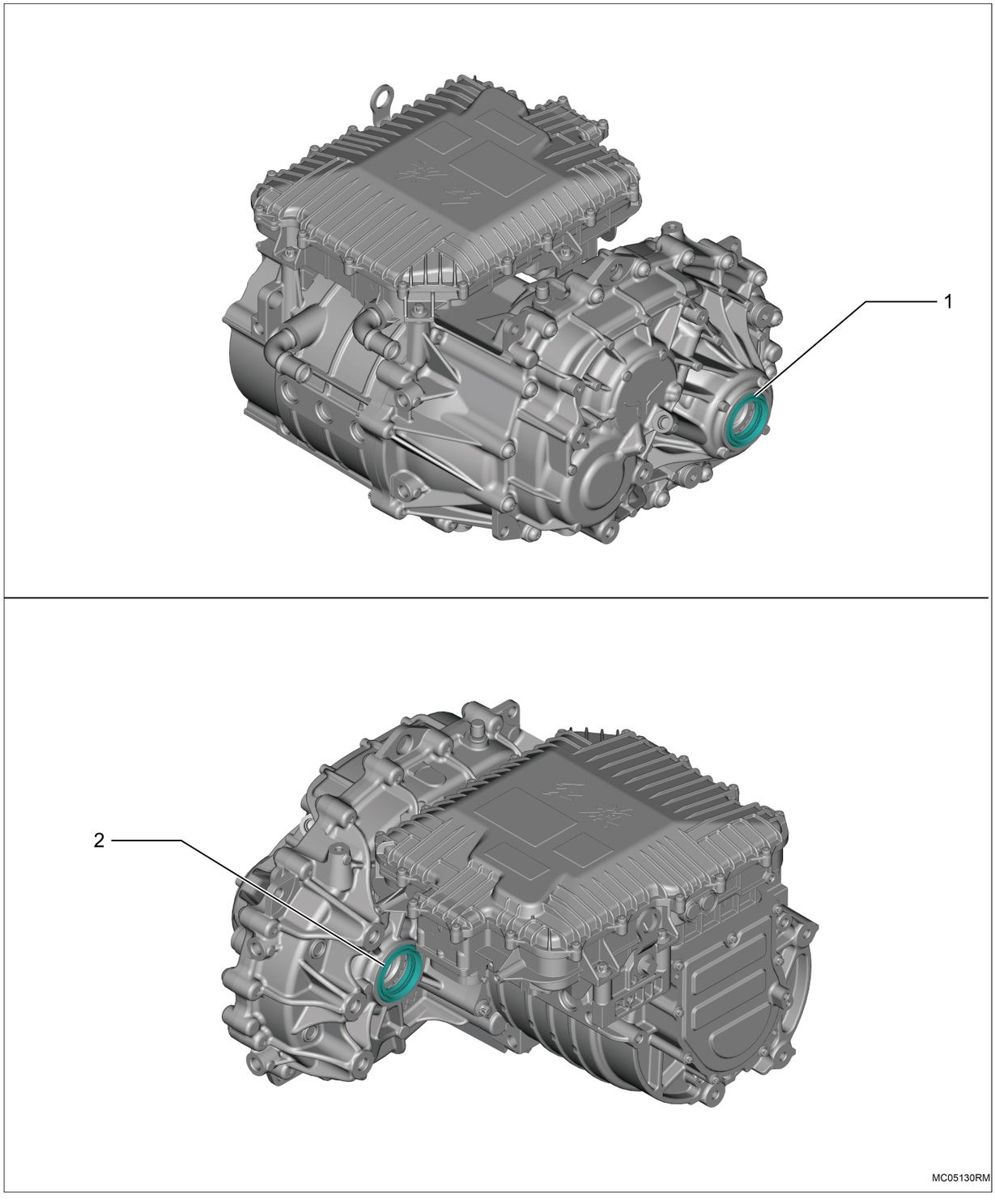
(a) Use SST (9503210HF01) to install a new breather -A-.

Notice:

- **During operation, prevent foreign objects from entering the inside of motor system.**

Rear electric drive system output shaft oil seal

Components

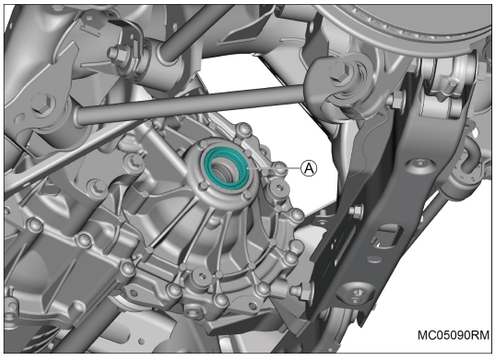


1. **Left output shaft oil seal**
2. **Right output shaft oil seal**

DL

Removal

1. **Remove rear left drive shaft assembly (See page DP-41)**
2. **Remove rear right drive shaft assembly (See page DP-41)**
3. **Remove left output shaft oil seal**

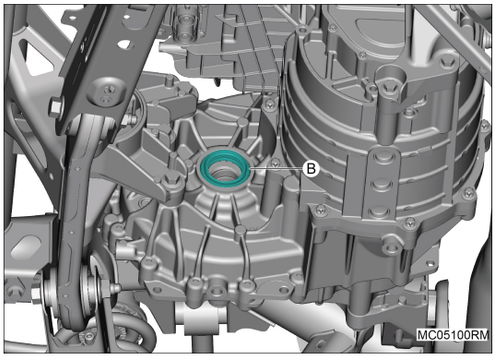


(a) Use a screwdriver to remove left output shaft oil seal -A- from differential.

Notice:

- **Apply adhesive tape to the tip of screwdriver before use.**
- **Be careful not to damage the oil seal and contact surface.**

4. **Remove right output shaft oil seal**



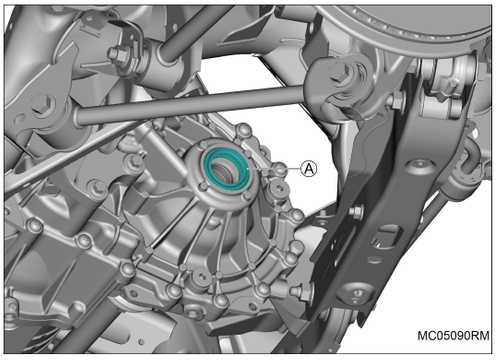
(a) Use a screwdriver to remove right output shaft oil seal -B- from differential.

Notice:

- **Apply adhesive tape to the tip of screwdriver before use.**
- **Be careful not to damage the oil seal and contact surface.**

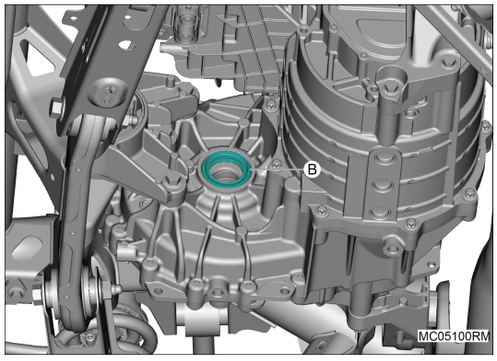
Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Remove left output shaft oil seal**



(a) Use a hammer to tap SST (9503710HF01), install the new oil seal -A- to the corresponding hole, so that the end surface of oil seal is flush with the housing machined end surface.

3. **Remove right output shaft oil seal**

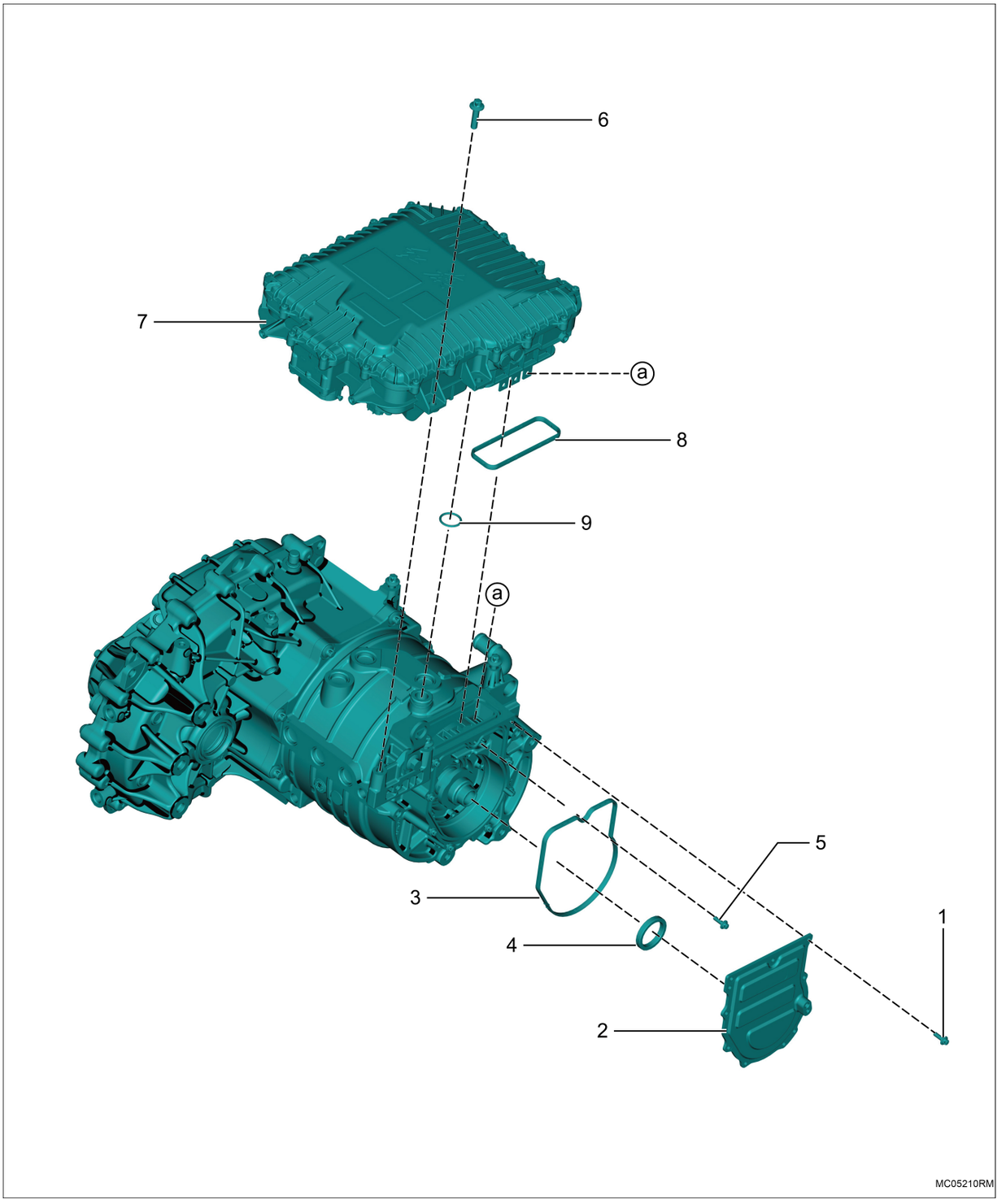


(a) Use a hammer to tap SST (9503710HF01), install the new oil seal -B- to the corresponding hole, so that the end surface of oil seal is flush with the housing machined end surface.

DL

Inverter assembly

Components



1. Outer hexagon flange bolt

- X9
- Bolts cannot be reused.
- Torque: 4.2 ~ 5.1 N • m

2. Motor rear end cover

3. End cover plate seal ring

- Not reusable.

4. Bearing protector ring assembly

5. Outer hexagon flange bolt

- X3
- Bolts cannot be reused.
- Initial tightening torque: 4.2 ~ 5.1 N • m; Recheck the torque after tightening.
- Screw-in speed ≤ 100 rpm, locking speed is 20 rpm.

6. Outer hexagon flange bolt

- X5
- Bolts cannot be reused.
- Install the bolts diagonally, and recheck the torque after tightening.
- Initial tightening torque: 1.8 ~ 2.2 N • m.
- Screw-in speed ≤ 100 rpm, locking speed is 20 rpm.
- Final tightening torque: 17.1 ~ 20.9 N•m, screwing speed ≤ 100 rpm, locking speed is 20 rpm.

7. Inverter assembly

8. Motor high voltage cable port sealing ring

- Not reusable.

9. Water pipe seal ring

- Not reusable.

Removal

1. Check for DTCs

Caution:

- **After removing the battery, confirm that no fault in power battery voltage system insulation is output. If the relevant DTC is output, troubleshoot the DTC first.**

2. Turn vehicle power supply to OFF mode

3. Disconnect negative battery terminal (See page DL-21)

Caution:

- **Wait 5 minutes before disconnecting the negative battery terminal cable.**

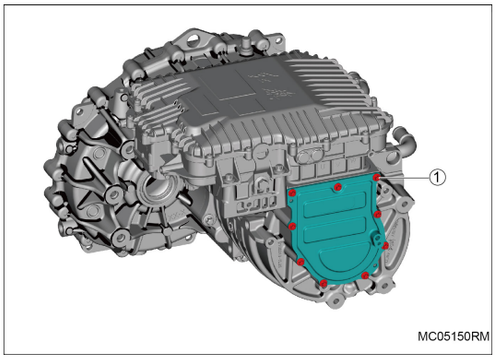
4. Detach service switch (See page DL-17)

DL

Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

5. **Remove rear suspension bottom protector I assembly (See page WS-47)**
6. **Drain coolant (See page RE-76)**
7. **Remove rear electric drive system assembly (See page DL-3)**
8. **Remove motor rear end cover**



(a) (For example) Remove all bolts -1-.

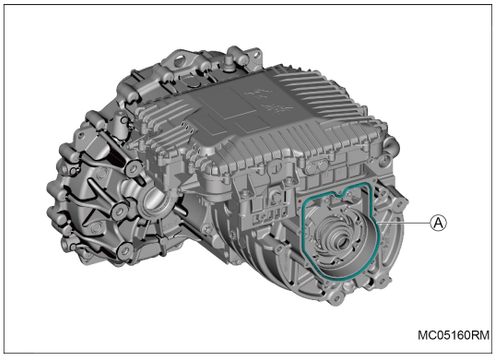
Note:

- Bolts cannot be reused.

Notice:

- **Do not allow dirt to enter inside of drive motor.**
- **Do not damage the motor rear end cover assembly.**

9. **Remove end cover plate seal ring**

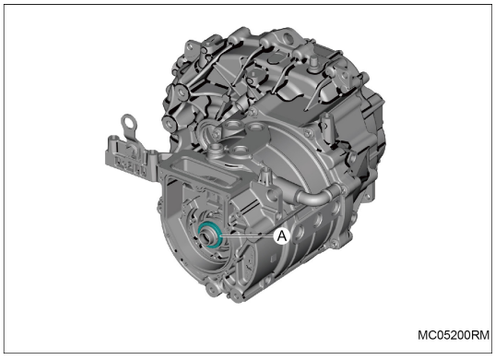


(a) Remove the end cover plate seal ring -A-.

Note:

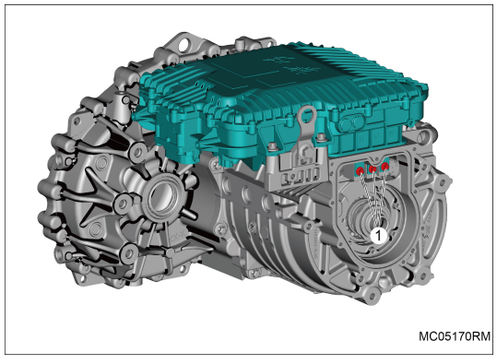
- The end cover plate seal ring cannot be reused.

10. **Remove bearing protective ring assembly**



(a) Remove the bearing guard ring assembly -A-.

11. **Remove inverter assembly**



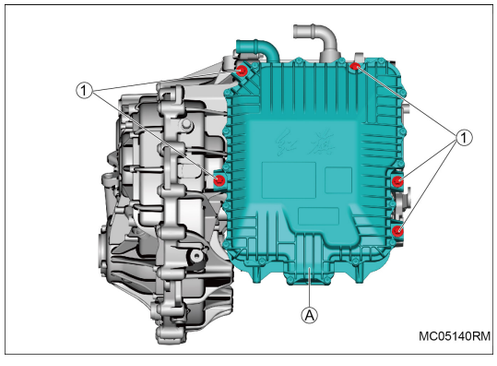
(a) Remove the three-phase bus bar coupling bolts -1-.

Notice:

- **Do not drop bolt inside the motor.**
- **Align the pin hole of inverter main case with the positioning pin of drive motor during installation, and align the three-phase bus bars of inverter and drive motor; Do not allow dirt to enter inside of drive motor.**

Note:

- Bolts cannot be reused.



(b) Remove bolts -1-, and remove inverter assembly -A- upward.

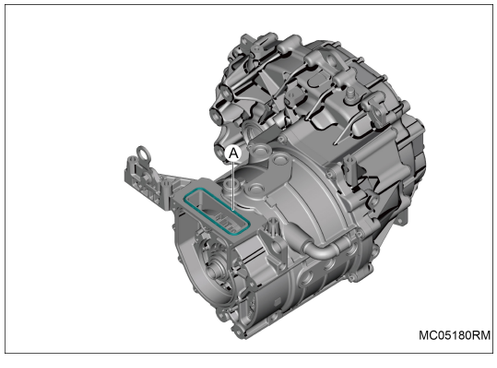
Notice:

- **Do not drop bolt inside the motor.**

Note:

- Bolts cannot be reused.

12. Remove motor high voltage wire harness port seal ring



(a) Remove the motor high voltage wire harness port seal ring -A-.

Note:

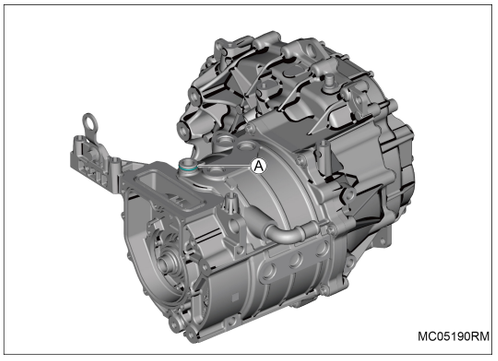
- High voltage cable port sealing ring of the motor must not be reused.

Notice:

- **Make sure that the seal ring of drive motor is intact and completely placed in the seal groove of drive motor. If the seal ring is damaged, replace it with a new one.**

13. Remove water pipe seal ring

DL



(a) Remove the water pipe seal ring -A-.

Note:

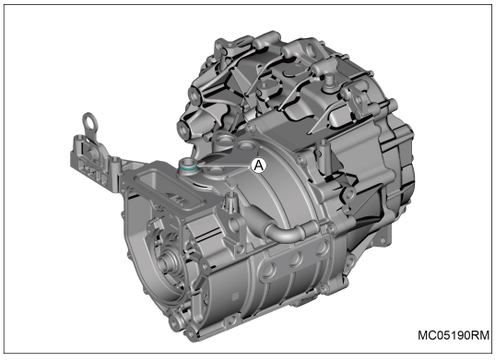
- Never reuse the water pipe seal ring.

Notice:

- **Make sure that the seal ring of water pipe is intact and completely placed in the seal groove of drive motor. If the seal ring is damaged during installation, replace it with a new one.**

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



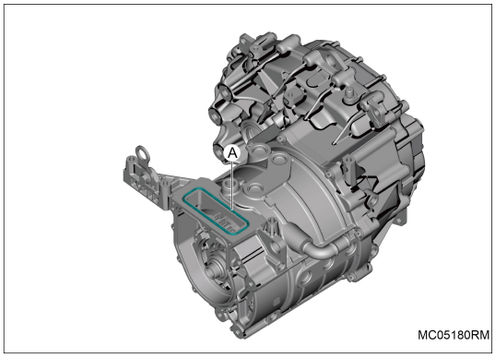
(a) Install the water pipe seal ring -A-.

Note:

- Never reuse the water pipe seal ring.

Notice:

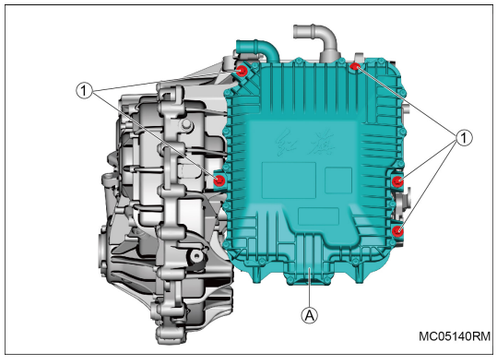
- **Make sure that the seal ring of water pipe is intact and completely placed in the seal groove of drive motor. If the seal ring is damaged during installation, replace it with a new one.**



(b) Replace the motor high voltage wire connector seal ring -A- with a new one.

Notice:

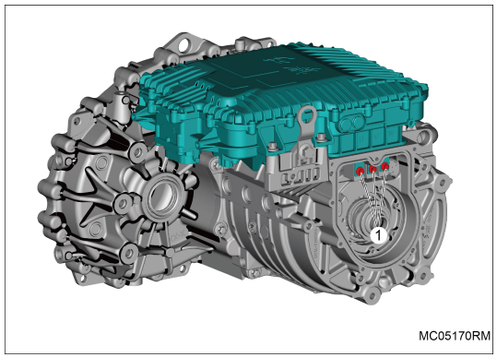
- **Make sure that the seal ring at high voltage wire harness port of motor is intact and completely placed in the seal groove of drive motor. If the seal ring is damaged, replace it with a new one.**
- **Align the pin hole of inverter main case with the positioning pin of drive motor during installation, and align the three-phase bus bars of inverter and drive motor; Do not allow dirt to enter inside of drive motor.**



(c) Install the inverter assembly -A- downwards and install the bolts -1-.

Note:

- Bolts cannot be reused.
- Install the bolts diagonally, and recheck the torque after tightening.
- Initial tightening torque: 1.8 ~ 2.2 N • m.
- Screw-in speed ≤ 100 rpm, locking speed is 20 rpm.
- Final tightening torque: 17.1 ~ 20.9 N•m, screwing speed ≤ 100 rpm, locking speed is 20 rpm.



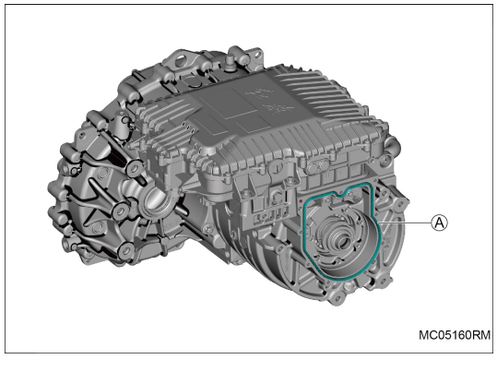
(d) Install the three-phase bus bar coupling bolts -1-.

Notice:

- **Do not drop bolt inside the motor.**

Note:

- Bolts cannot be reused.
- Initial tightening torque: 4.2 ~ 5.1 N • m; Recheck the torque after tightening.
- Screw-in speed ≤ 100 rpm, locking speed is 20 rpm.



(e) Install the end cover plate seal ring -A-.

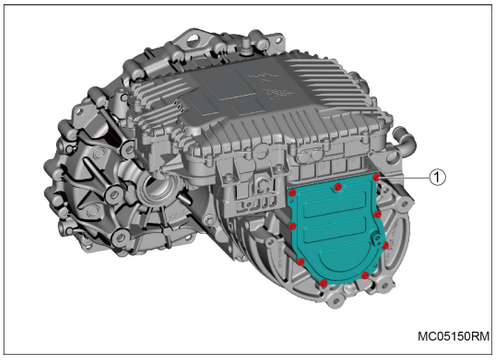
Notice:

- **Do not allow dirt to enter inside of drive motor.**

Note:

- The end cover plate seal ring cannot be reused.

DL



(f) Install the motor rear end cover with bolts -1-.

- Tightening torque: 4.2 ~ 5.1 N • m

Note:

- Bolts cannot be reused.
- Tighten the motor rear end cover fixing bolts diagonally.

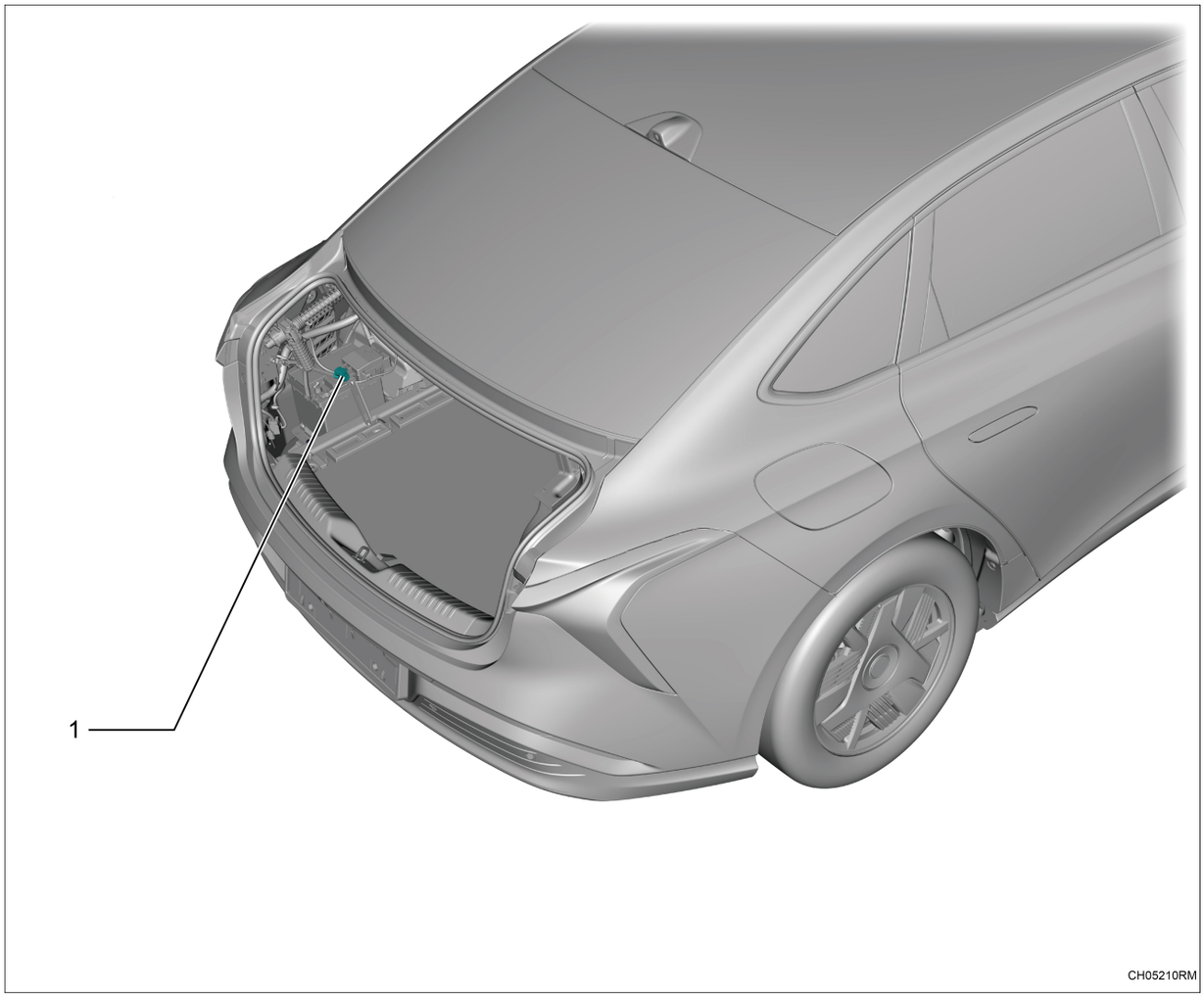
Notice:

- **Do not allow dirt to enter inside of drive motor.**
- **Do not damage the motor rear end cover assembly.**

Charging system

Service switch

Components



1. Service switch

DL

Safe power off operation

Notice:

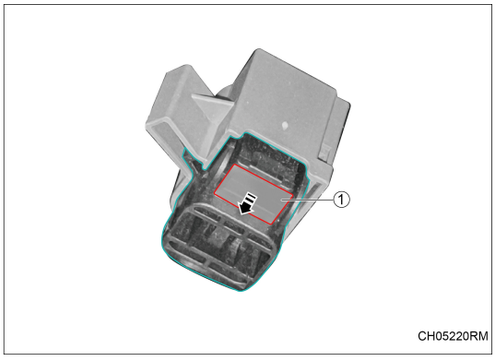
- **Before performing the following work, please carefully read the precautions for high voltage operation (inspection and maintenance of high voltage system) and strictly follow the regulations in the precautions for operation!**
- **If the high voltage circuit is not properly disconnected before disassembling the vehicle, it may cause serious electric shock accidents or even death.**
- **Even after disconnecting the high voltage circuit, the high voltage battery still carries high voltage, so it is forbidden to touch the high voltage battery case and its interior with bare hands.**

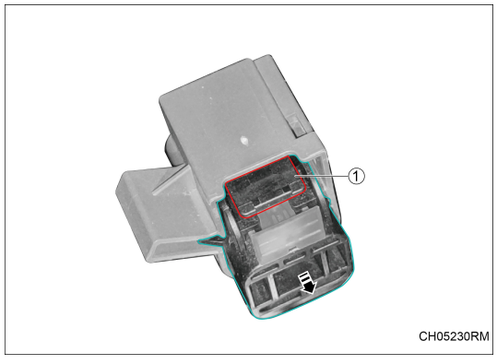
Warning:

- ***If the vehicle is connected to a charging gun, remove the charging gun first.***
- ***The high voltage capacitors in the motor controller and DC/DC and other high voltage components still retain some electrical energy after the high voltage system is powered off. The residual electrical energy will be reduced to below 60 VDC within 2 minutes and fully released within 5 minutes.***
- ***Turn vehicle power supply to OFF mode***
- ***After unlocking the service switch, turning vehicle power supply to ON mode may cause failure.***

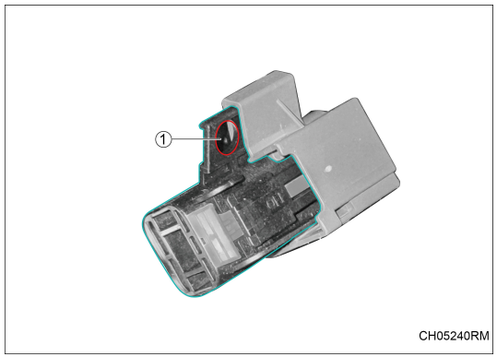
1. **Vehicle is powered off (Do not allow opening/ closing the door after power-off) (See page DL-21)**
2. **Safe power off operation**

   (a) Lift first safety lock plate -1- in the direction of -arrow-.





(b) Press position -1- and lift in direction of -arrow-.



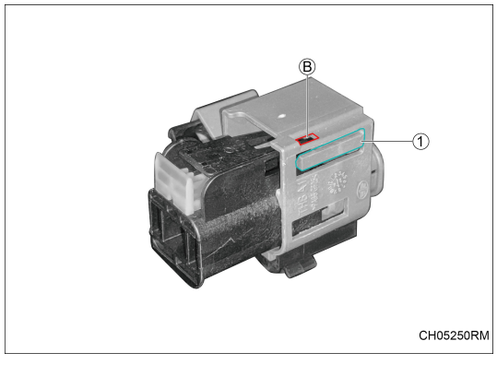
(c) Install safety lock to lock ring -1-, high voltage system is safely powered off at this time.

Restore high voltage circuit

Notice:

- **Before performing the following work, please carefully read the precautions for high voltage operation (inspection and maintenance of high voltage system) and strictly follow the regulations in the precautions for operation!**

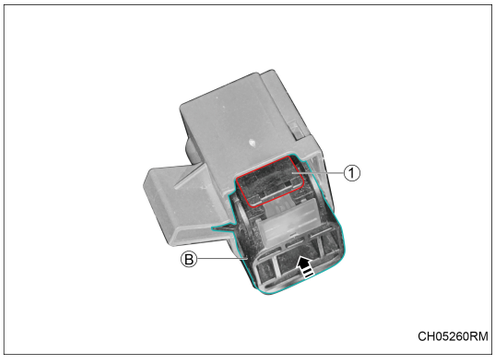
1. Restore high voltage circuit



(a) Unlock the safety lock.

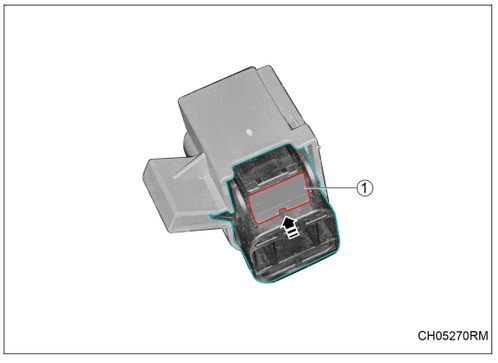
(b) Insert the tool into service switch unlock hole -B-, and detach locking claw -1-.

DL



(c) Press the safety lock plate -1-.

(d) Press service switch -B- in the direction of -arrow- to resume high voltage circuit.

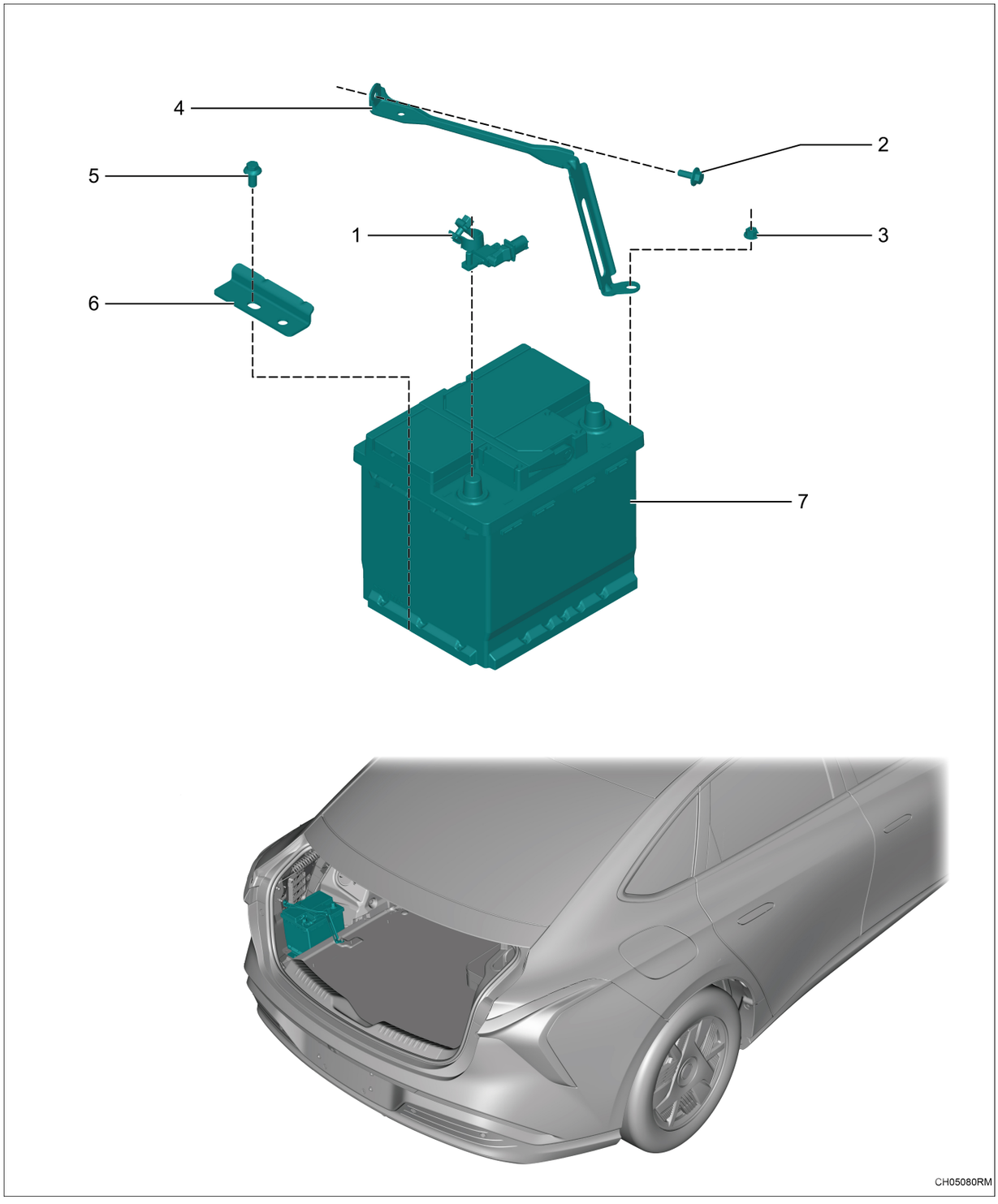


(e) Push safety lock plate -1- in direction of -arrow-.

2. Connect negative battery terminal (See page DL-21)

Battery assembly

Components



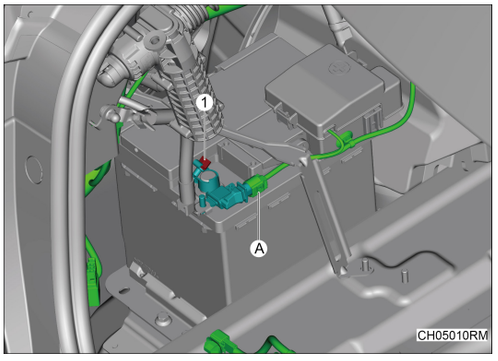
1. **Battery sensor assembly**
   - Torque: 5 ~ 7 N • m
2. **Hexagon flange bolt**
   - Torque: 8.1 ~ 9.8 N • m

DL

3. **Hexagon flange nut**
   - Torque: 8.1 ~ 9.8 N • m
4. **Battery upper pressure plate assembly**
5. **Hexagon flange bolt**
   - X2
   - Torque: 17 ~ 21 N • m
6. **Battery lower pressure plate assembly**
7. **Battery assembly**
   - Battery voltage (12 V)
   - Maintenance-free battery

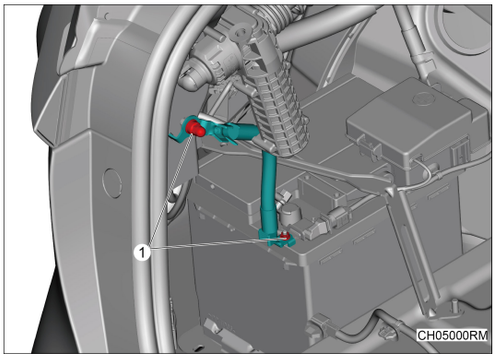
Removal

1. **Remove luggage compartment left service port cover assembly (See page NS-157)**
2. **Disconnect negative battery terminal**



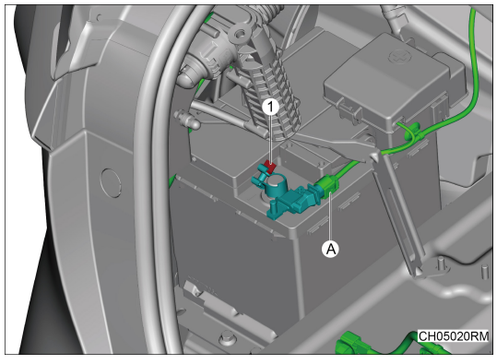
   (a) Loosen the nut -1-.
   (b) Disconnect the wire harness connector -A-.
   (c) Detach the battery sensor assembly upwards.

3. **Remove luggage compartment left cover assembly (See page NS-157)**
4. **Remove battery negative wire harness assembly**



   (a) Remove the nut -1-.

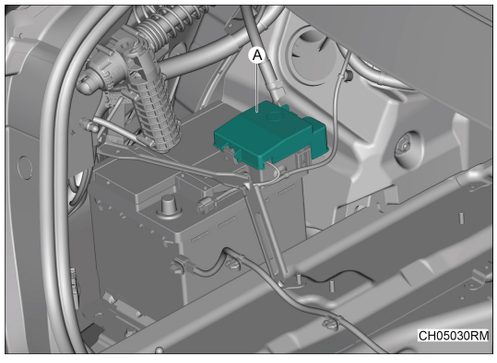
5. **Remove battery**



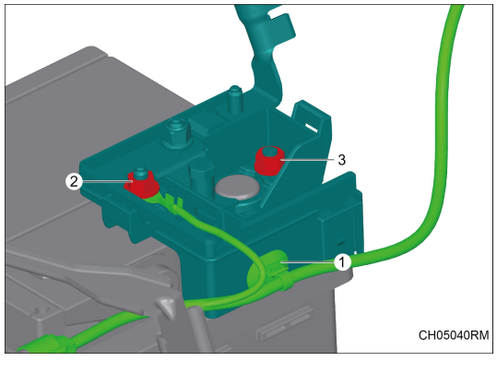
(a) Disconnect the wire harness connector -A-.

(b) Loosen the nut -1-.

(c) Remove the negative battery terminal.



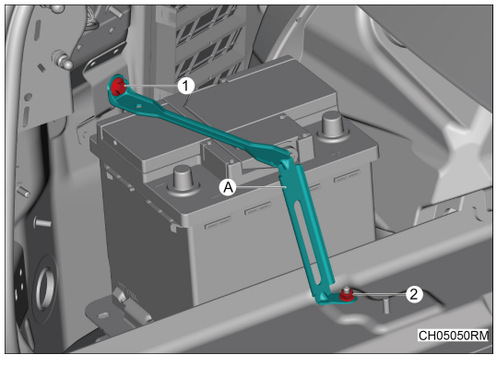
(d) Open the battery protective cover -A-.



(e) Disengage the wire harness fixing clips -1-.

(f) Loosen nut -2-, and disconnect wire harness terminal.

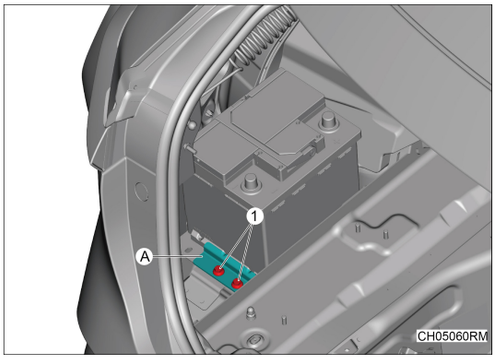
(g) Loosen nut -3-, and disconnect positive battery terminal.



(h) Remove bolt -1- and nut -2-.

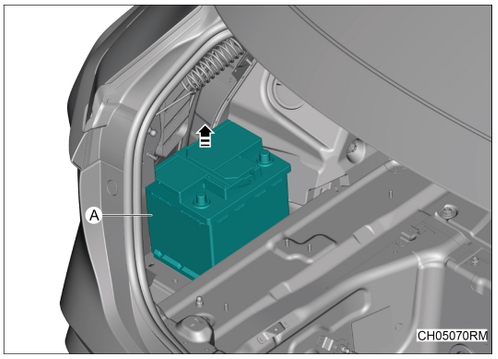
(i) Remove the battery upper pressure plate assembly -A-.

DL



(j) Remove the bolt -1-.

(k) Remove the battery lower pressure plate -A-.



(l) Remove the battery -A- in the direction of -arrow-.

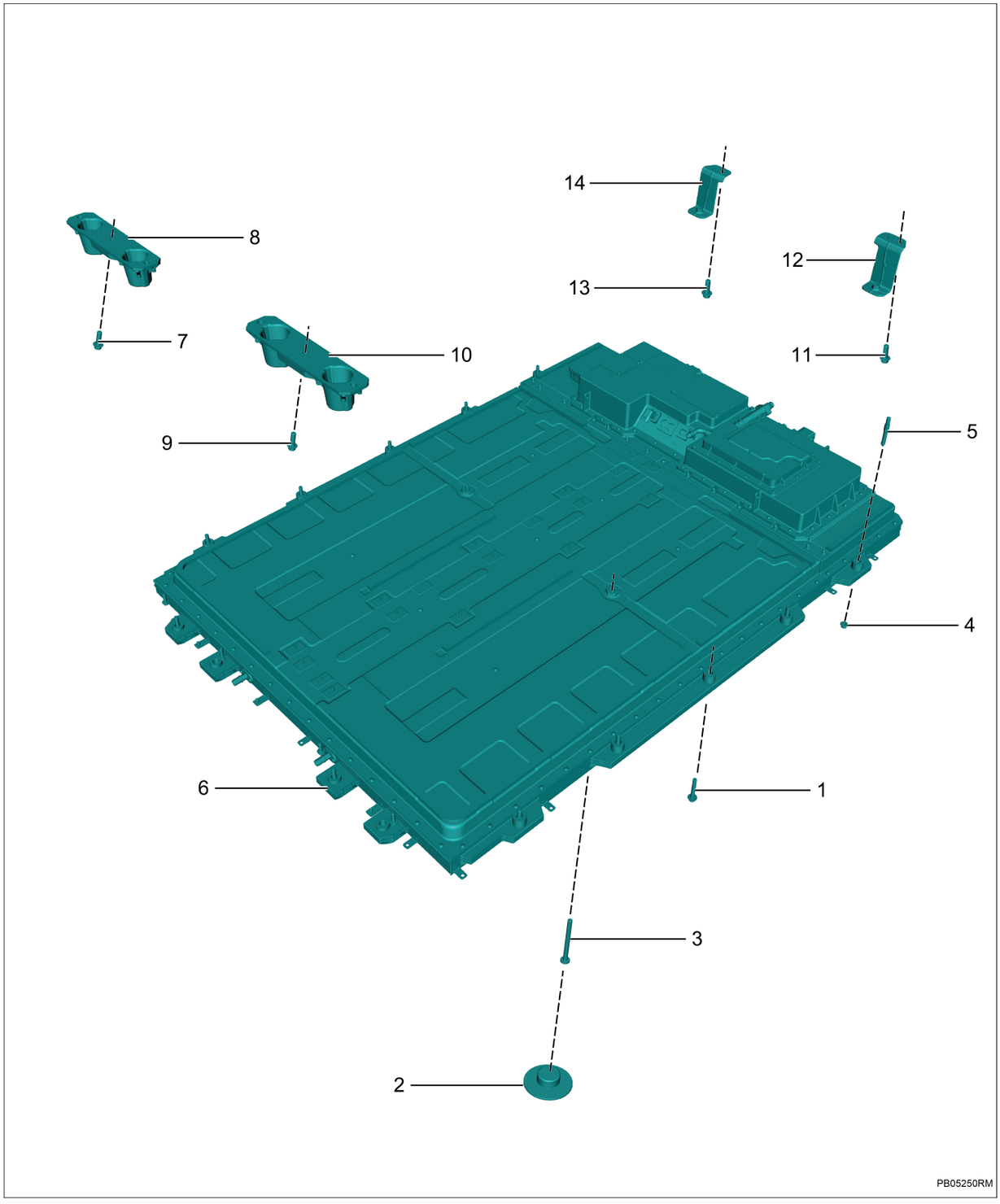
Installation

1. Installation is in the reverse order of removal.

Power battery system

Power battery assembly

Components (only for models with 62 kWh battery)



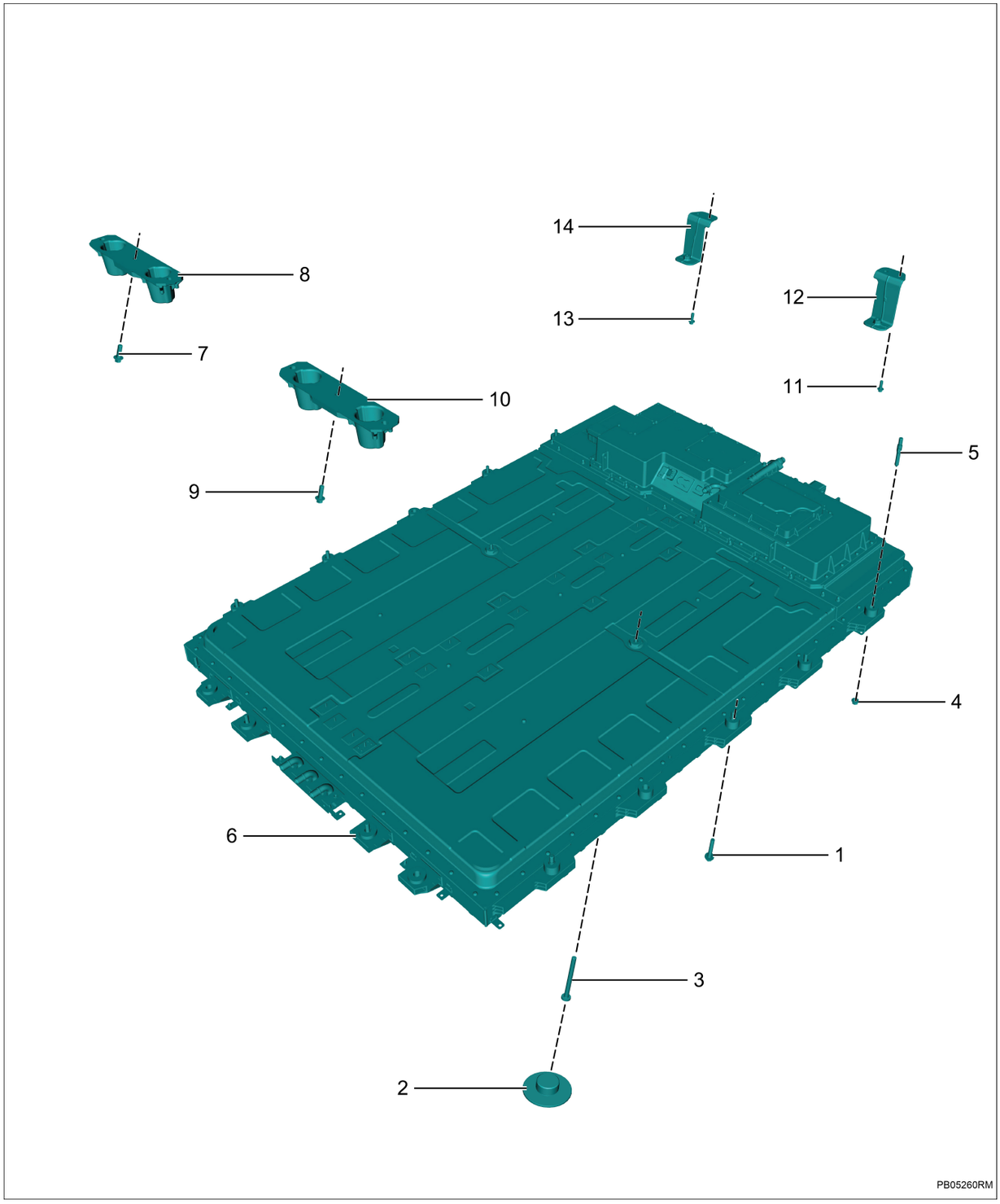
1. **Hexagon flange bolt**

- X14
- Torque: 95 ~ 120 N • m

2. **Fastener - inner hexagon screw**
   - X2
   - Torque: 54 ~ 66 N • m
3. **Inner hexagon pan head screw**
   - X2
   - Torque: 25 ~ 28 N • m
4. **Hexagon flange nut**
   - X2
   - Torque: 95 ~ 120 N • m
5. **Fastener - stud**
   - X2
   - Torque: 22 ~ 28 N • m
6. **Power battery assembly (only for models with 62 kWh battery)**
7. **Hexagon flange bolt**
   - X3
   - Torque: 54 ~ 66 N • m
8. **Front battery fixing bracket assembly (left)**
9. **Hexagon flange bolt**
   - X3
   - Torque: 54 ~ 66 N • m
10. **Front battery fixing bracket assembly (right)**
11. **Hexagon flange bolt**
    - X2
    - Torque: 54 ~ 66 N • m
12. **Left battery fixing bracket assembly**
13. **Hexagon flange bolt**
    - X2
    - Torque: 54 ~ 66 N • m
14. **Right battery fixing bracket assembly**

DL

Components (only for models with 85 kWh battery)



1. **Hexagon flange bolt**
   - X14
   - Torque: 95 ~ 120 N • m
2. **Fastener - inner hexagon screw**

- X2
- Torque: 54 ~ 66 N • m

3. Inner hexagon pan head screw

- X2
- Torque: 25 ~ 28 N • m

4. Hexagon flange nut

- X2
- Torque: 95 ~ 120 N • m

5. Fastener - stud

- X2
- Torque: 22 ~ 28 N • m

6. Power battery assembly (only for models with 85 kWh battery)

7. Hexagon flange bolt

- X3
- Torque: 54 ~ 66 N • m

8. Front battery fixing bracket assembly (left)

9. Hexagon flange bolt

- X3
- Torque: 54 ~ 66 N • m

10. Front battery fixing bracket assembly (right)

11. Hexagon flange bolt

- X2
- Torque: 54 ~ 66 N • m

12. Left battery fixing bracket assembly

13. Hexagon flange bolt

- X2
- Torque: 54 ~ 66 N • m

14. Right battery fixing bracket assembly

Maintenance requirements

1. Maintenance requirements

(a) Maintain vehicle or battery samples every three months.

2. Maintenance program

(a) Use diagnostic tester to read the minimum battery cell voltage. If the minimum cell voltage is less than or equal to “3.256V”, charge 20% of the battery power indicated on the nameplate.

(b) Before selling the vehicle that has been stored for more than 3 months, charge it until the charging gun stops automatically.

Removal

1. **Check for DTCs**

   Caution:

   - **Before removing the battery, confirm that no fault in power battery voltage system insulation is output. If the relevant DTC is output, troubleshoot the DTC first.**

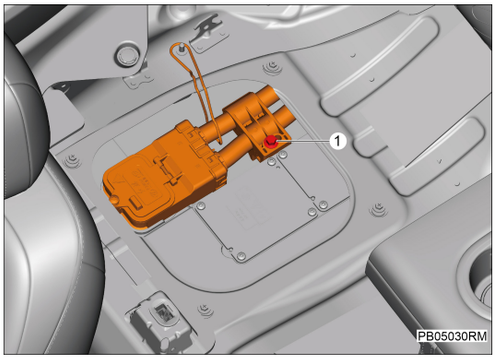
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Detach service switch (See page DL-17)**

   Caution:

   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**

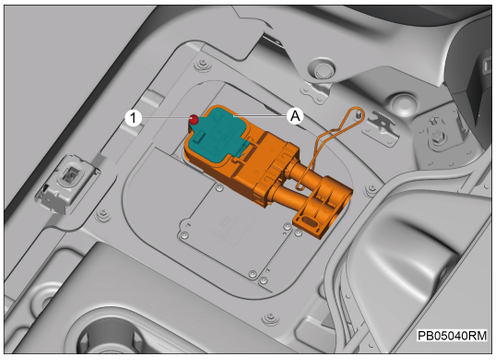
4. **Remove engine bottom protector assembly (See page WS-40)**
5. **Remove rear suspension bottom protector I assembly (See page WS-47)**
6. **Remove rear suspension bottom protector bracket I (See page WS-47)**
7. **Remove rear suspension bottom protector bracket II (See page WS-47)**
8. **Remove left doorsill trim panel protector II (See page WS-111)**
9. **Remove right doorsill trim panel protector II (See page WS-111)**
10. **Remove rear left lower spoiler assembly (See page WS-32)**
11. **Remove rear right lower spoiler assembly (See page WS-32)**
12. **Remove high-voltage wire harness mounting cover plate assembly (See page DL-68)**
13. **Remove power battery assembly**

DL

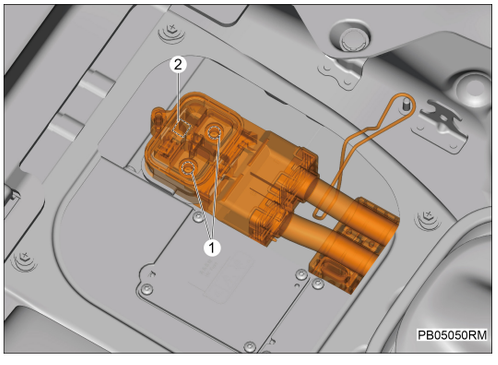


(a) Remove the bolt -1-.

(b) Detach the charging high voltage wire harness assembly bracket.

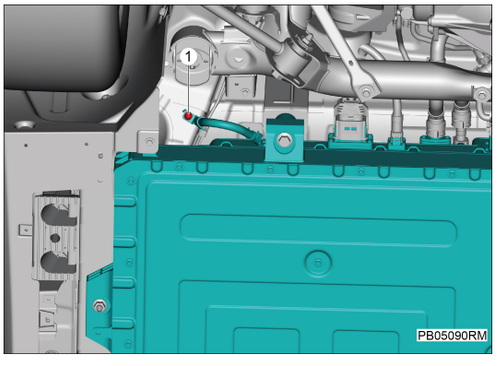


(c) Remove screw -1- and open seal protective cover -A-.



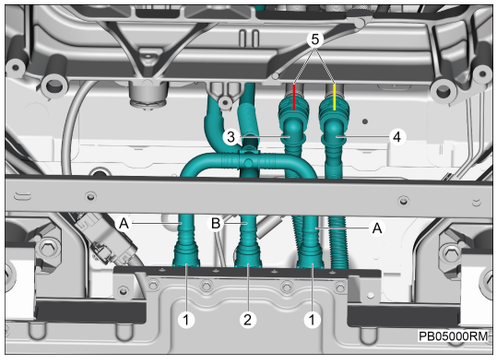
(d) Remove fixing screws -1- from charging high voltage wire harness assembly terminal.

(e) Remove fixing screw -2- from charging high voltage wire harness assembly.



(f) Remove the nut -1-.

(g) Detach the battery equipotential balance line assembly.



(h) Disconnect connectors -1-2-, and detach inlet pipe I assembly -A- and outlet pipe I assembly -B-. (Only for models with 85 kWh battery)

Note:

- When detaching the water pipe, coolant will flow out. Please collect the discharged coolant into a container.

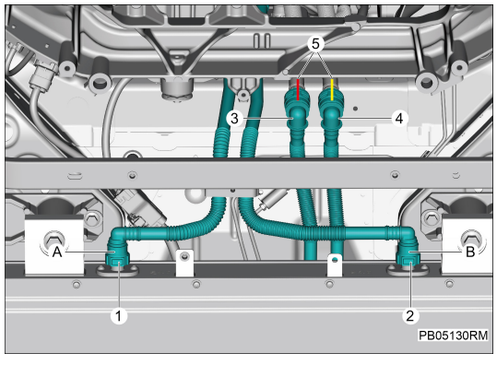
(i) Disconnect the rear motor cooling pipe assembly -3-4-. (Only for models with 85 kWh battery)

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -5- in the figure.**

Note:

- When detaching the water pipe, coolant will flow out. Please collect the discharged coolant into a container.



(j) Disconnect connectors -1-2-, and detach inlet pipe I assembly -A- and outlet pipe I assembly -B-. (Only for models with 62 kWh battery)

Note:

- When detaching the water pipe, coolant will flow out. Please collect the discharged coolant into a container.

(k) Disconnect the rear motor cooling pipe assembly -3-4-. (Only for models with 62 kWh battery)

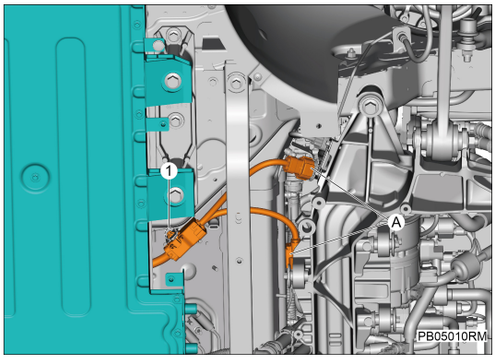
Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -5- in the figure.**

Note:

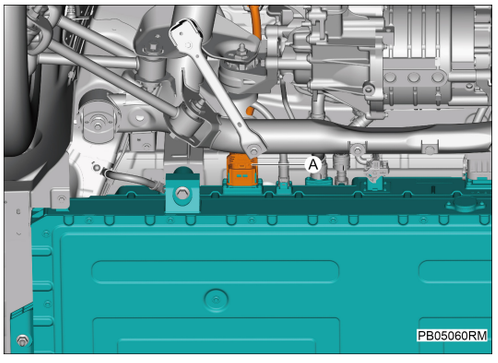
- When detaching the water pipe, coolant will flow out. Please collect the discharged coolant into a container.

DL

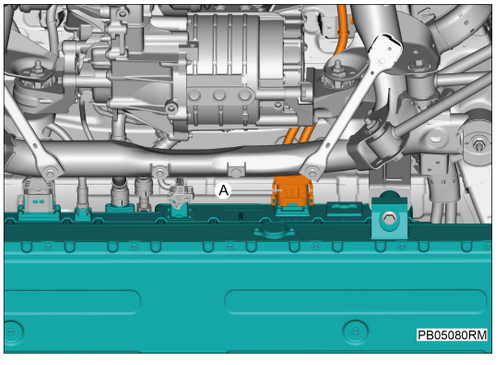


(l) Disconnect one into multiple high voltage wire harness assembly connector -A-.

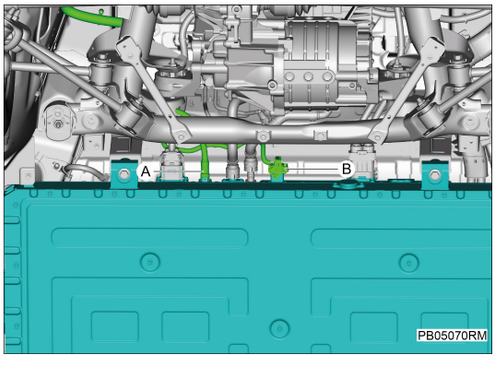
(m) Disengage the wire harness fixture -1-.



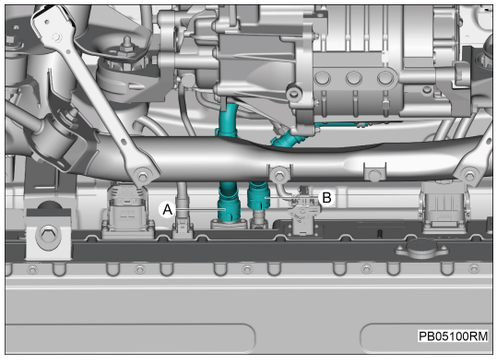
(n) Disconnect the charging high voltage wire harness assembly connector -A-.



(o) Disconnect the DC bus high voltage wire harness assembly connector -A-.



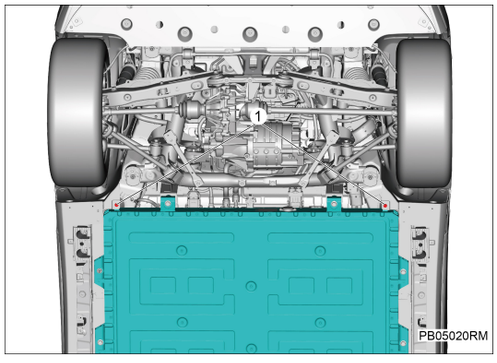
(p) Disconnect the low voltage wire harness connectors -A-B-.



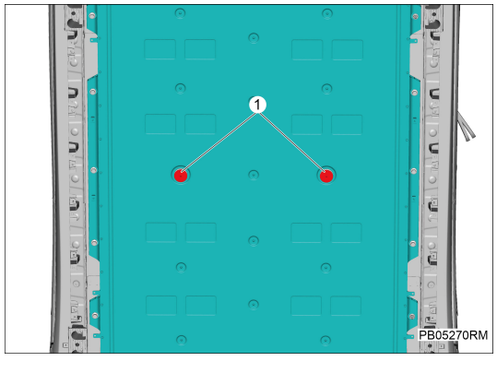
(q) Disconnect the rear motor cooling pipe assembly -A-B-.

Note:

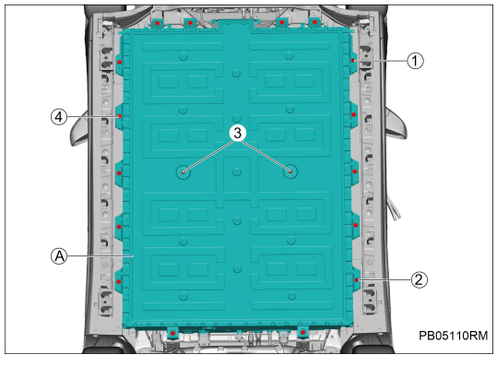
- When detaching the water pipe, coolant will flow out. Please collect the discharged coolant into a container.



(r) Remove the bolt -1-.



(s) Remove the fastener - inner hexagon screws -1-. (Only for models with 85 kWh battery)



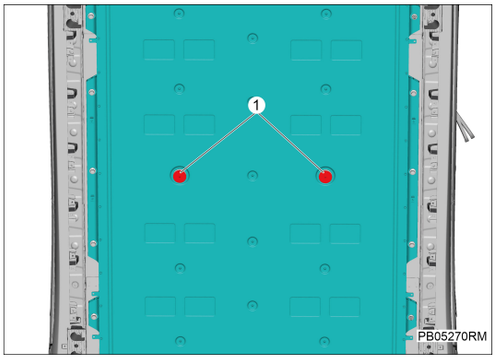
(t) (For example) Remove all power battery assembly fixing nuts -1-2- and bolts -3-4-. (Only for models with 85 kWh battery)

Notice:

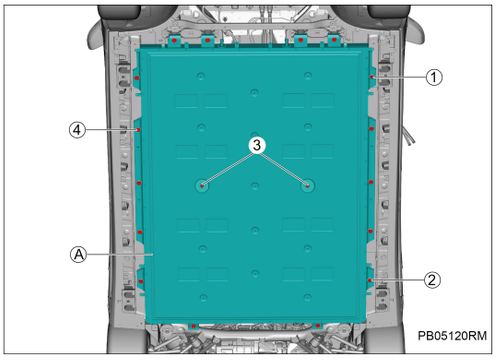
- **Push the lift under the vehicle and adjust it to the proper height.**

(u) Remove the power battery assembly -A-. (Only for models with 85 kWh battery)

DL



(v) Remove the fastener - inner hexagon screws -1-. (Only for models with 62 kWh battery)



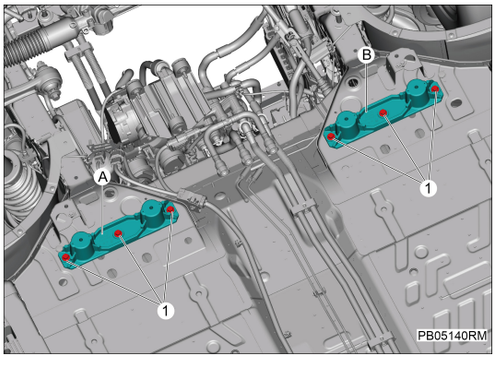
(w) (For example) Remove all power battery assembly fixing nuts -1-2- and bolts -3-4-. (Only for models with 62 kWh battery)

Notice:

- **Push the lift under the vehicle and adjust it to the proper height.**

(x) Remove the power battery assembly -A-. (Only for models with 62 kWh battery)

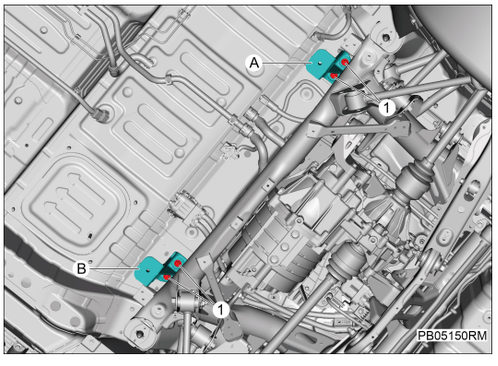
14. Remove battery front fixing bracket



(a) Remove the bolt -1-.

(b) Remove the battery fixing brackets -A-B-.

15. Remove battery rear fixing bracket



(a) Remove the bolt -1-.

(b) Remove the battery left fixing bracket -A-.

(c) Remove the battery right fixing bracket -B-.

16. Remove one into multiple high voltage wire harness assembly (See page DL-70)

17. Remove rear motor cooling pipe assembly (See page RE-92)

18. Remove energy conversion and distribution unit assembly (See page DL-62)

Installation

1. Installation is in the reverse order of removal.

Disposal

1. Precautions for storage of scrapped power battery

(a) It is prohibited to place waste power battery in open space to prevent them from being flooded by rain.

(b) For batch waste battery storage, the containers used in the storage facility should ensure that their storage requirements are met, ensure the integrity of the discarded battery housing, eliminate adverse effects on the environment, and establish safety management and emergency mechanisms in case of danger.

(c) Store in a well ventilated and clean environment.

(d) Do not place in direct sunlight areas.

(e) It must be kept away from heat sources that can heat up the external of power battery by 60 degrees.

(f) It must be placed flat in the packaging box.

(g) Do not drop power battery and avoid surface impact.

2. Precautions for transportation of scrapped power battery

(a) After the power battery is scrapped, it is necessary to collect and transport it in specialized container that meets national standards according to its type.

(b) The container for storing and shipping power battery should be designed according to the characteristics of power battery, which should be not easy to damage or deformation, and the materials used can effectively prevent leakage and diffusion.

(c) Containers with waste power batteries must be labeled with classification markings required by national standards.

(d) Before and during the packaging and transportation of waste power battery, its structural integrity should be ensured. Waste power battery should not be broken or crushed to

prevent leakage and pollution of harmful components in the battery.

3. Precautions for pollution prevention and control of scrapped power battery

(a) The collection, transportation, disassembly, regeneration smelting and other activities of lithium batteries require strict compliance with the above requirements.

(b) Lithium batteries should be recycled and disposal by other means is prohibited.

(c) The management method refers to GB/T 38698.1, in which the batteries are classified into three categories, A\B\C, for management.

(d) The shell of lithium batteries should be kept intact during collection and transportation to prevent environmental pollution from liquid leakage.

4. Recycle standard

(a) The power battery assembly belongs to dangerous goods and needs to be recycled by a specialized recycling agency. It is prohibited for individuals to dispose of the power battery assembly without authorization.

5. Transportation requirements

(a) Sea transport and air transport: Sea transport and air transport need to use special packaging certified for hazardous packaging. Ordinary packaging is not allow to be transported by sea or air; Air transport needs to meet MH/T 1020-2009 standard and pass UN38.3 test. The ambient temperature around power battery packaging box should not exceed 45℃, and ensure that the product is not be drenched or exposed to sunlight.

(b) Land transport: Power batteries need to be transported according to relevant national standards in domestic land transportation. Logistics companies need to hold a road transport license. During transportation, it should be avoid squeezing and collision between battery packs or between battery pack and transport vehicle due to sudden braking. The ambient temperature around power battery packaging box should not exceed 45℃, and ensure that the product is not be drenched or exposed to sunlight.

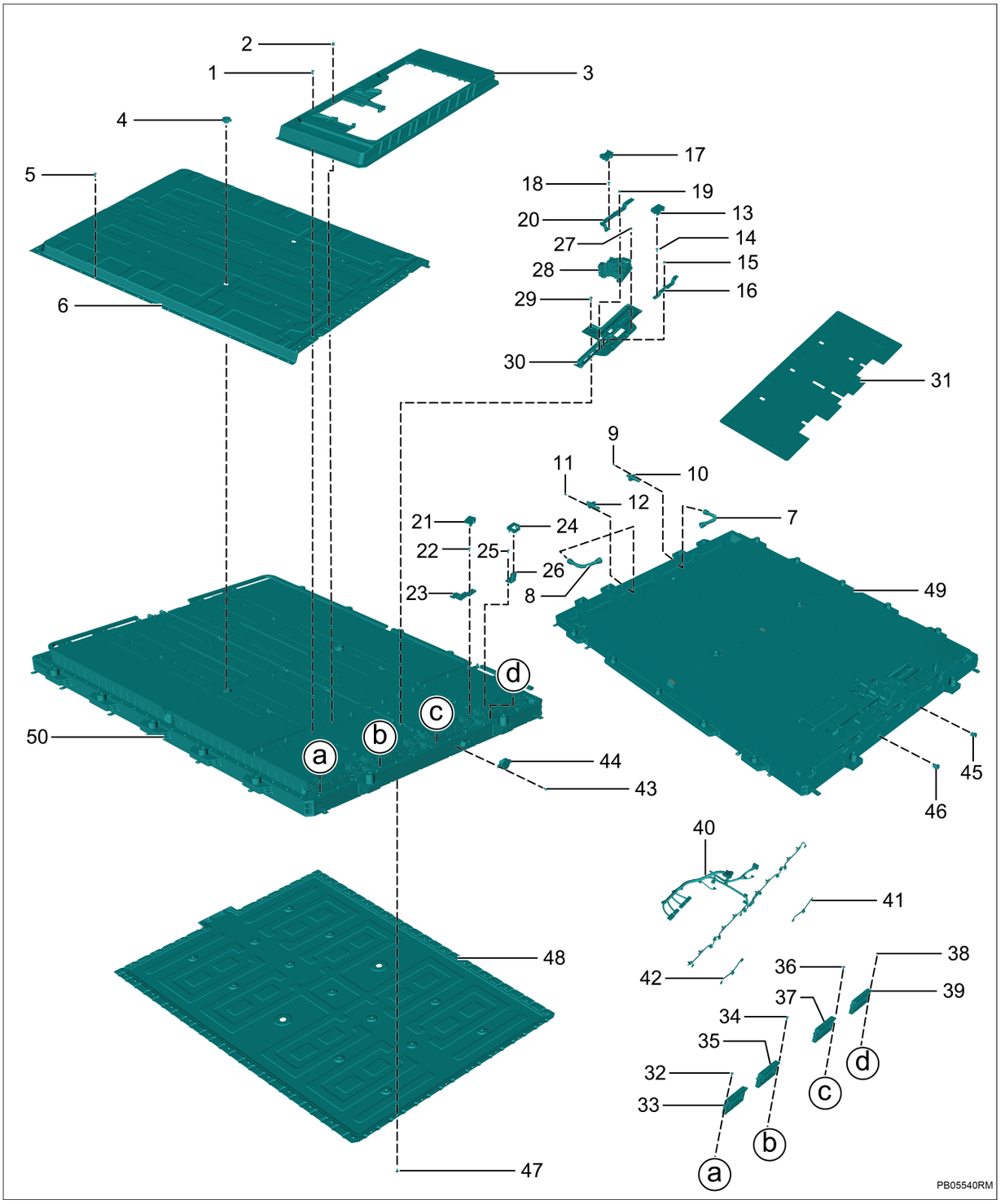
Power battery unit

Safety precautions for operation

1. **When disassembling and repairing the power battery, professional insulated tools should be used, and wear insulation gloves and insulation shoes; Do not wear jewelry, watches and other metal ornaments; Operators are prohibited to operate with bare hands;**
2. **Operators should receive professional knowledge and safety training on battery If encountering uncertain factors during operation, it is necessary to consult a dedicated person for confirmation before implementation, and arbitrary operation is prohibited;**
3. **Before disassembling the power battery, please confirm the status of battery, and pay attention to the insulation condition and relay status;**
4. **At the end of the operation, clean up the operation tools and materials in time to make sure that no metal objects, dust, materials, etc. are left inside the power battery to avoid potential short circuits and driving noise;**
5. **Strictly prevent any form of short circuit.**

DL

Components



1. **Screw**
   - X26
   - Torque: 9 ~ 11 N • m
2. **Hexagon flange nut**
   - X11

- Torque: 9 ~ 11 N • m

3. **Rear of upper box body assembly**
4. **Nut**
   - X2
   - Torque: 55 ~ 65 N • m
5. **Screw**
   - X56
   - Torque: 9 ~ 11 N • m
6. **Front of upper box body assembly**
7. **Inlet pipe assembly**
   - Only equipped with 62 kWh battery
8. **Outlet pipe assembly**
   - Only equipped with 62 kWh battery
9. **Screw**
   - X2
   - Torque: 3 ~ 5 N • m
10. **Inlet pipe joint**
    - Only equipped with 62 kWh battery
11. **Screw**
    - X2
    - Torque: 3 ~ 5 N • m
12. **Outlet pipe joint**
    - Only equipped with 62 kWh battery
13. **Output pole protective cover II**
14. **Screw**
    - X2
    - Torque: 9 ~ 11 N • m
15. **Hexagon flange nut**
    - Torque: 9 ~ 11 N • m
16. **Connecting bar assembly III**
17. **Output pole protective cover I**
18. **Screw**
    - X2
    - Torque: 9 ~ 11 N • m
19. **Hexagon flange nut**
    - Torque: 9 ~ 11 N • m
20. **Connecting bar assembly I**
21. **Output pole protective cover III**

22. **Screw**
    - X2
    - Torque: 9 ~ 11 N • m
23. **Connecting bar assembly IV**
24. **Output pole protective cover IV**
25. **Screw**
    - X2
    - Torque: 9 ~ 11 N • m
26. **Connecting bar assembly II**
27. **Hexagon flange nut**
    - X4
    - Torque: 9 ~ 11 N • m
28. **Fuse bracket**
29. **Screw**
    - X6
    - Torque: 9 ~ 11 N • m
30. **Copper bar fixing bracket assembly**
31. **Fire-proof plate**
32. **Screw**
    - X2
    - Torque: 6 ~ 8 N • m
33. **Power battery slave control unit assembly**
34. **Screw**
    - X2
    - Torque: 6 ~ 8 N • m
35. **Power battery slave control unit assembly**
36. **Screw**
    - X2
    - Torque: 6 ~ 8 N • m
37. **Power battery slave control unit assembly**
38. **Screw**
    - X2
    - Torque: 6 ~ 8 N • m
39. **Power battery slave control unit assembly**
40. **Low voltage wire harness assembly**
41. **Low voltage wire harness assembly**
42. **Low voltage wire harness assembly**
43. **Screw**

- X2
- Torque: 5 ~ 7 N • m

44. Power battery anti-explosion valve

- Only equipped with 85 kWh battery

45. Anti-explosion valve assembly

- Only equipped with 62 kWh battery
- Torque: 4.5 ~ 5.5 N • m

46. Non-breathable anti-explosion valve assembly

- Only equipped with 62 kWh battery
- Torque: 4.5 ~ 5.5 N • m

47. Screw

- X57
- Torque: 9 ~ 11 N • m

48. Power battery bottom protector

49. Power battery body

- Only equipped with 62 kWh battery

50. Power battery body

- Only equipped with 85 kWh battery

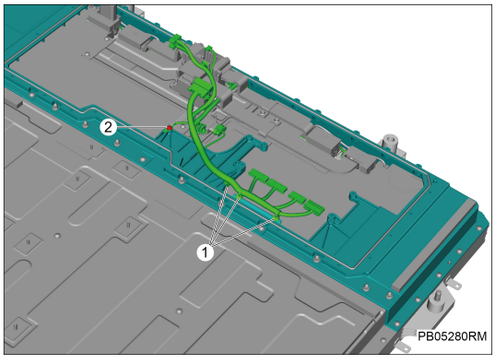
Removal

Caution:

- **High voltage on-board power will endanger life.**
- **Electric shock may cause death or serious body injury.**
- **Wear clothing tested by arcing.**
- **Wear insulated helmet that protects face.**
- **Wear insulation gloves.**
- **Wear insulation shoes.**
- **Cut off voltage of high voltage on-board power by personnel with appropriate qualifications.**

1. **Remove fuse (See page DL-57)**
2. **Remove energy conversion and distribution unit assembly (See page DL-62)**
3. **Remove battery control unit assembly (See page DL-61)**
4. **Remove pressure sensor assembly (See page DL-55)**
5. **Remove rear of upper box body assembly**

DL



(a) Detach the wire harness fixing clamps -1-.

(b) Remove the screws -2-.

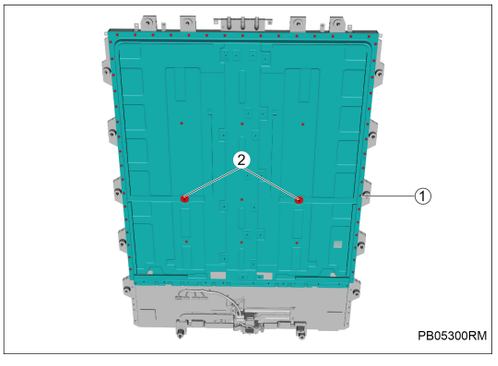
(c) Detach the negative grounding terminals.



(d) (For example) Remove all screws -1- and nuts -2-.

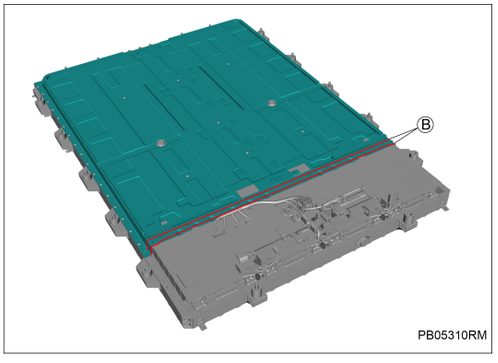
(e) Remove the rear of upper box body assembly.

6. Remove front of upper box body assembly



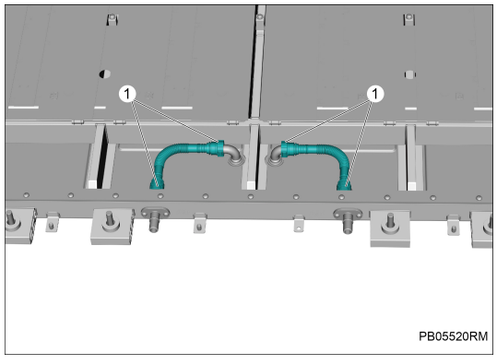
(a) Remove the screw -1- and nuts -2-.

(b) Remove the front of upper box body assembly.



(c) Apply sealant to the red ring -B- area at the engagement between the front of upper box assembly and the rear of upper box assembly during installation.

7. Remove power battery internal inlet and outlet pipe assembly (only equipped with 62 kWh battery)

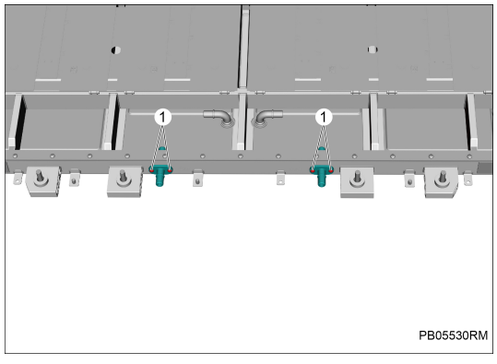


(a) Detach the pipe connectors -1-.

(b) Remove the power battery internal inlet and outlet pipe assembly.

DL

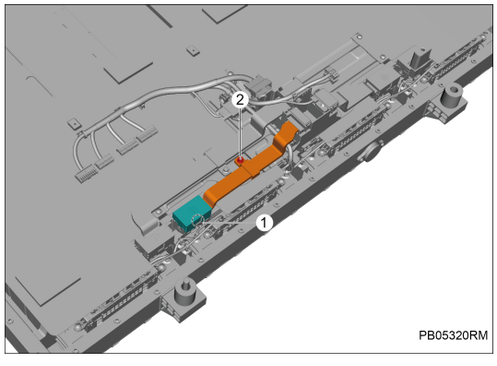
8. Remove water pipe connector (only equipped with 62 kWh battery)



(a) Remove the screws -1-.

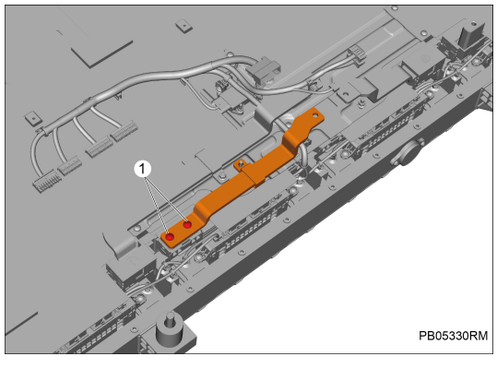
(b) Remove the power battery water pipe connector.

9. Remove connecting bar assembly III



(a) Press claw -1-, and remove output pole protective cover II.

(b) Remove the fixing nuts -2-.

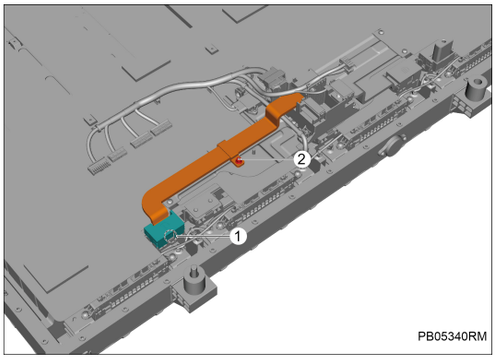


(c) Remove the screws -1-.

(d) Remove the connecting bar assembly between modules.

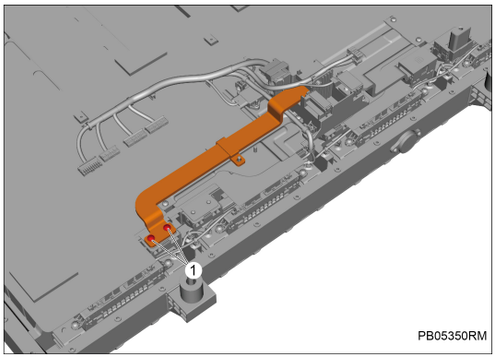
10. Remove connecting bar assembly I

DL



(a) Press claw -1-, and remove output pole protective cover I.

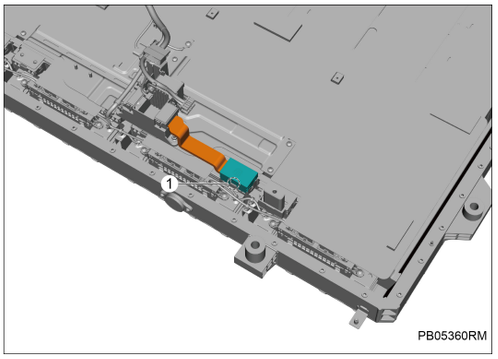
(b) Remove the fixing nuts -2-.



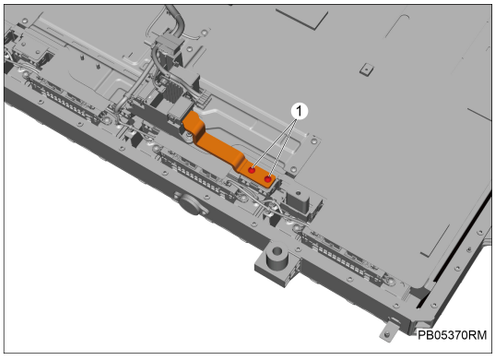
(c) Remove the screws -1-.

(d) Remove the connecting bar assembly between modules I.

11. Remove connecting bar assembly IV



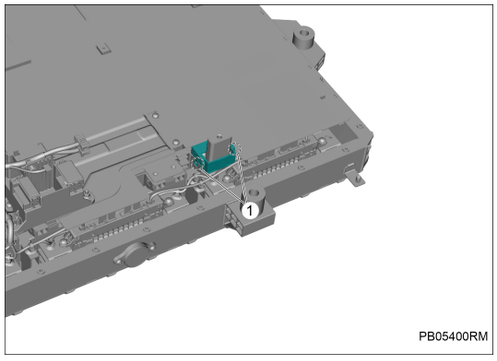
(a) Press claw -1-, and remove output pole protective cover III.



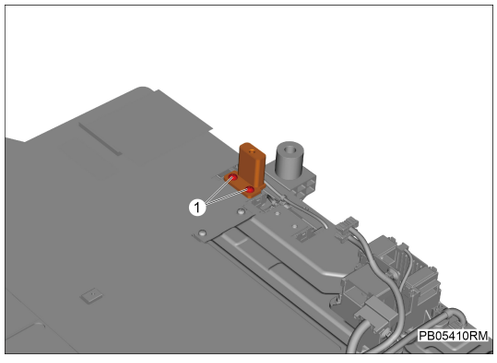
(b) Remove the screws -1-.

(c) Remove the connecting bar assembly IV.

12. Remove connecting bar assembly between II



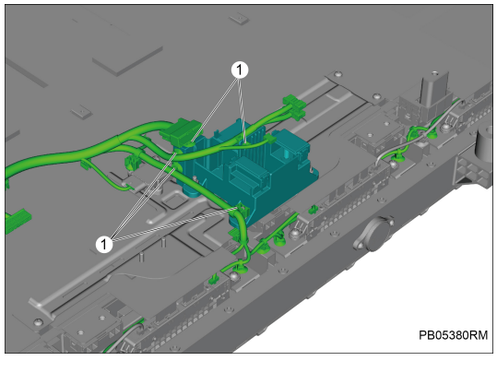
(a) Detach claws -1-, and remove the output pole protective cover IV.



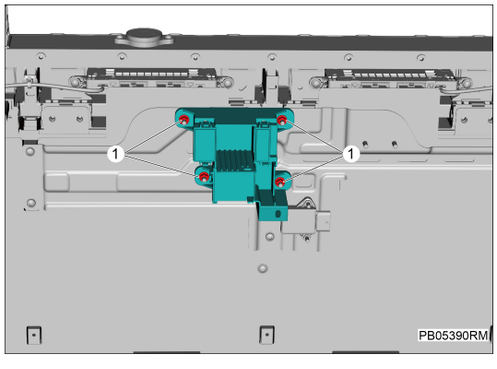
(b) Remove the screws -1-.

(c) Remove the connecting bar assembly II.

13. Remove fuse bracket



(a) Disengage the wire harness fixing clips -1-.

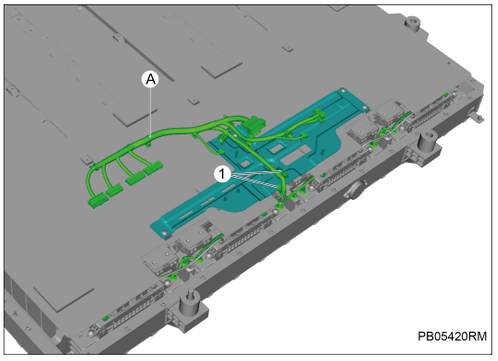


(b) Remove the nut -1-.

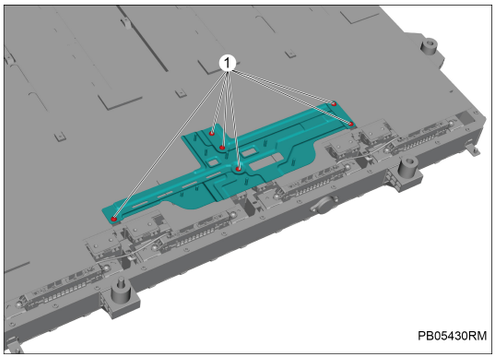
(c) Remove the fuse bracket.

14. Remove copper bar fixing bracket assembly

DL



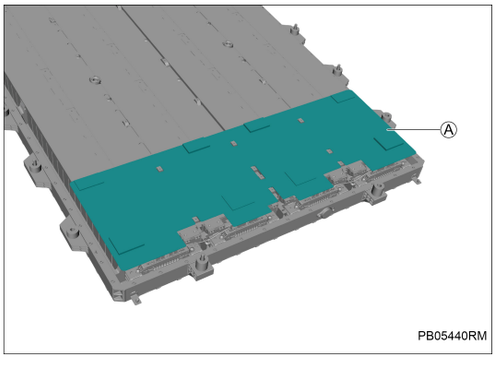
(a) Detach the wire harness fixing claws -1-, and set wire harness -A- aside.



(b) Remove the screws -1-.

(c) Remove the copper bar fixing bracket assembly.

15. Remove fire-proof plate

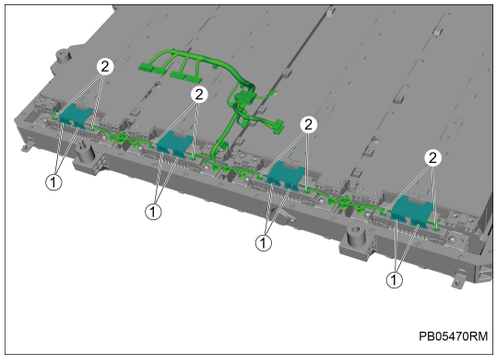


(a) Remove the fire-proof plate -A-.

Caution:

- **Do not break the fire-proof plate during removal.**

16. Remove power battery slave control unit assembly



(a) Detach the sub-board wire harness connectors -1-.

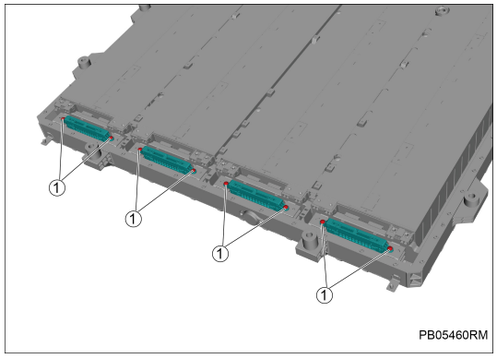
Caution:

- **When detaching sub-board wire harness connectors -1-, use a plastic crow plate to pry up carefully, do not operate with brute force.**
- **Maximum plugging and unplugging number of the connector: 5 times.**

(b) Disconnect the wire harness connectors -2-.

Note:

- Disconnect the wire harness connector from left to right.
- Install the wire harness connector from right to left.
- Purpose: Avoid damage to the power battery slave control unit sampling chip.



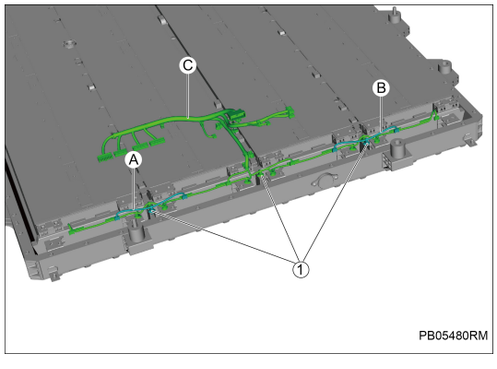
(c) Remove the screws -1-.

(d) Remove the power battery slave control unit assembly.

Notice:

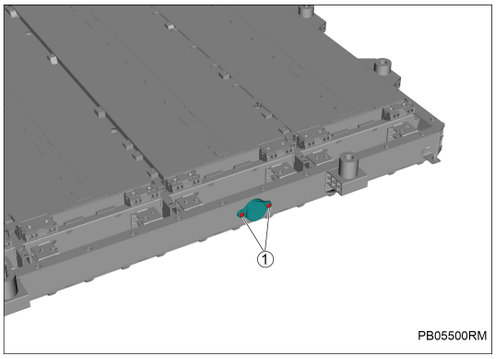
- **Pay attention to assembling according to the direction indicated by the power battery slave control unit I, otherwise it cannot be assembled.**
- **The slave controller must be disposed after mechanical (e.g. drop, impact) damage and must not be used in the vehicle. BMS with obvious physical damage on the appearance shall not be used.**

17. Remove the low voltage wire harness assembly



(a) Detach all wire harness clips (such as -1-), and remove the low voltage wire harness assemblies -A-C-.

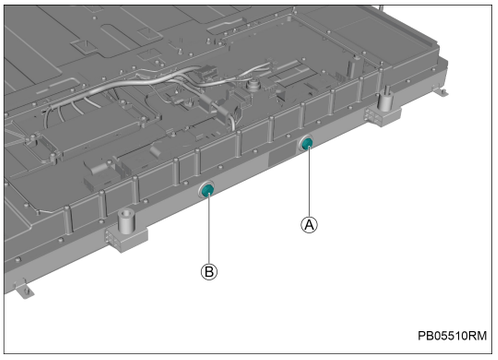
DL



18. Remove power battery anti-explosion valve (only equipped with 85 kWh battery)

(a) Remove the screws -1-.

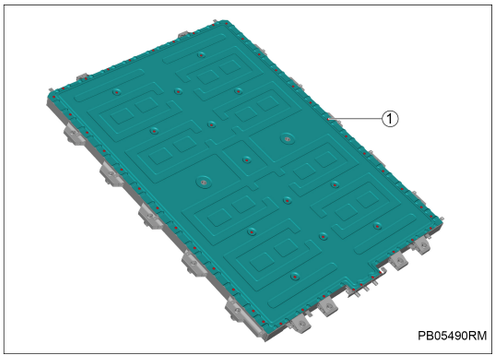
(b) Remove the power battery anti-explosion valve.



19. Remove power battery anti-explosion valve (only equipped with 62 kWh battery)

(a) Rotate and remove the power battery anti-explosion valve assembly -A-.

(b) Rotate and remove the power battery non-breathable anti-explosion valve assembly -B-.



20. Remove power battery bottom protector

(a) (For example) Remove all screws -1-.

(b) Remove the power battery bottom protector.

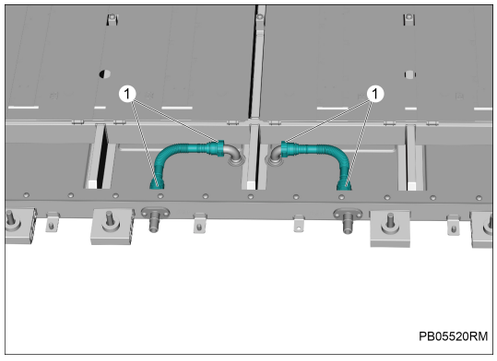
Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

Note:

- Paint after calibrating fastener torque.

2. Install power battery internal inlet and outlet pipe assembly (only equipped with 62 kWh battery)



(a) Connect the pipe joints -1-.

(b) Install the power battery internal inlet and outlet pipe assembly.

Notice:

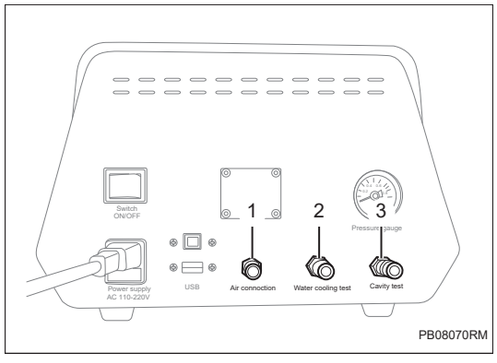
- **After the inlet and outlet pipe assembly is connected with the cooling plate and the joint, airtightness test needs to be performed.**
- **Test air pressure: 200 ± 10 kPa, inflate for 10 seconds, maintain pressure for 60 seconds, test for 40 seconds, leakage rate ≤ 5ml/min.**

Airtightness test

Note:

- Perform sealing test after each opening of high voltage power battery.

1. Sealing test on high voltage power battery cavity (only for models with 62 kWh battery)



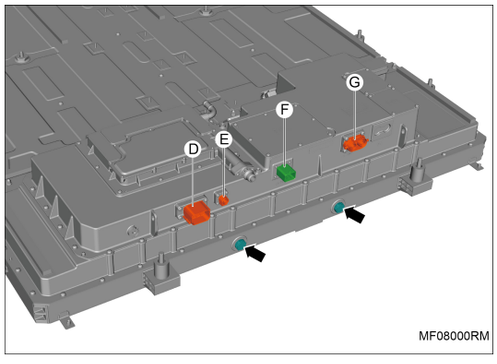
(a) Connect the air tube to full-automatic airtightness tester air source interface -1-.

(b) Select the corresponding interface -3- according to the detection item.

(c) Connect the other end of air tube to high voltage power battery connector test kit.

Notice:

- **After connecting, please confirm again. Do not connect the air tube wrongly, otherwise, it may cause damage to high voltage power battery.**



(d) Install the battery pack anti-explosion valve sealing tool SST (9503010 – HX01) onto power battery anti-explosion valve -arrow-.

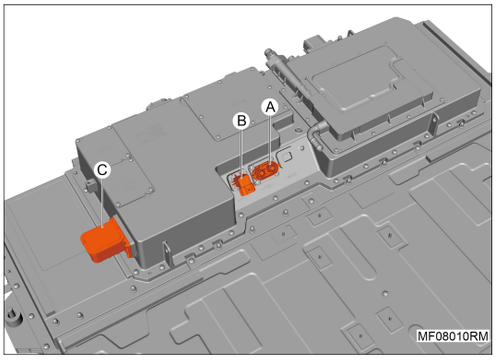
(e) Install the OBC&DC/DC high voltage connector SST (9503815HS01) -D-.

(f) Install the DC/DC positive high voltage connector SST (9503835HS01) -E-.

(g) Install the low voltage connector SST (9503840HS01) -F-.

(h) Install the rear drive high voltage connector SST (9503840HS01) -G-.

DL



(i) Install the front drive high voltage connector SST (9503820HS01) -A-.

(j) Install the air conditioning high voltage connector SST (9503825HS01) -B-.

(k) Install the charging high voltage connector SST (9503810HS01) -C-.

(l) Operate the full-automatic airtightness tester to select the vehicle model.

Note:

Each number represents a different vehicle model, 1-2-3-4 and so on.

(m) Follow the prompt to operate the full-automatic airtightness tester for automatic test.

(1) Cavity airtightness test standard:

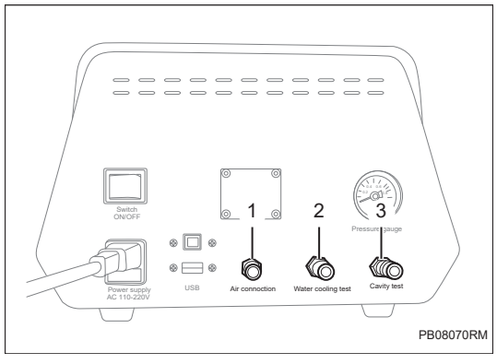
Parameters	Leakage rate	Voltage stabiliz-ation time	Detecti-on time	Pressu-re setting	Cavity capacity
Cavity airtightness test	< 15 sccm	60 s	60 s	4 KPa	75 L

(n) After the automatic testing of fully automatic airtightness tester is completed, it will prompt whether it is qualified.

Note:

- If it prompts not qualified, it indicates that there is leakage.
  - If leakage is determined, perform leakage inspection.

2. Sealing test on high voltage power battery cavity (only for models with 85 kWh battery)



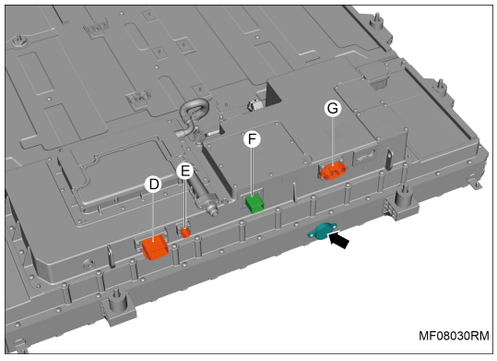
(a) Connect the air tube to full-automatic airtightness tester air source interface -1-.

(b) Select the corresponding interface -3- according to the detection item.

(c) Connect the other end of air tube to high voltage power battery connector test kit.

Notice:

- **After connecting, please confirm again. Do not connect the air tube wrongly, otherwise, it may cause damage to high voltage power battery.**



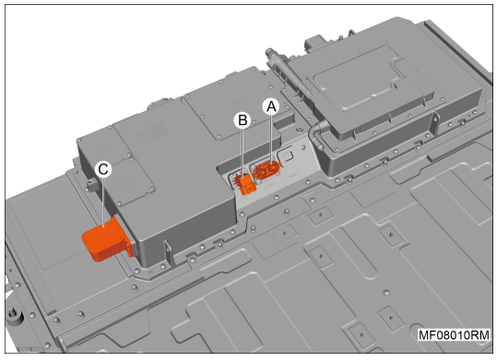
(d) Install the battery pack anti-explosion valve sealing tool SST (9503785HA01) onto power battery anti-explosion valve -arrow-.

(e) Install the OBC&DC/DC high voltage connector SST (9503815HS01) -D-.

(f) Install the DC/DC positive high voltage connector SST (9503835HS01) -E-.

(g) Install the low voltage connector SST (9503840HS01) -F-.

(h) Install the rear drive high voltage connector SST (9503840HS01) -G-.



(i) Install the front drive high voltage connector SST (9503820HS01) -A-.

(j) Install the air conditioning high voltage connector SST (9503825HS01) -B-.

(k) Install the charging high voltage connector SST (9503810HS01) -C-.

(l) Operate the full-automatic airtightness tester to select the vehicle model.

Note:

Each number represents a different vehicle model, 1-2-3-4 and so on.

(m) Follow the prompt to operate the full-automatic airtightness tester for automatic test.

(1) Cavity airtightness test standard:

DL

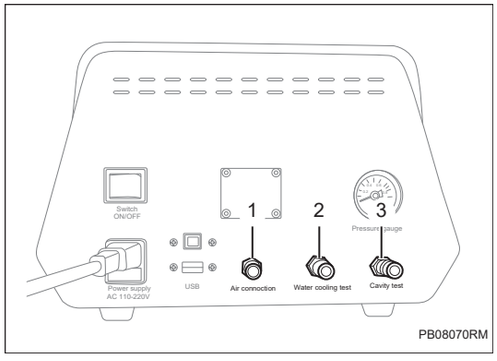
Parameters	Leakage rate	Voltage stabiliz-ation time	Detecti-on time	Pressu-re setting	Cavity capacity
Cavity airtightness test	< 15 sccm	60 s	60 s	4 KPa	75 L

(n) After the automatic testing of fully automatic airtightness tester is completed, it will prompt whether it is qualified.

Note:

- If it prompts not qualified, it indicates that there is leakage.
  - If leakage is determined, perform leakage inspection.

3. Sealing test on high voltage power battery water channel (only for models with 85 kWh battery)



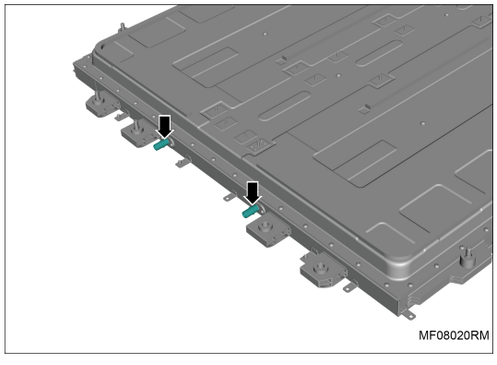
(a) Connect the air tube to full-automatic airtightness tester air source interface -1-.

(b) Select the corresponding interface -2- according to the detection item.

(c) Connect the other end of air tube to high voltage power battery cooling system inlet pipe test kit.

Notice:

After connecting, please confirm again. Do not connect the air tube wrongly, otherwise, it may cause damage to high voltage power battery.



(d) Install the cooling system test tool SST (9503735HA01).

(e) Operate the full-automatic airtightness tester to select the vehicle model.

Note:

Each number represents a different vehicle model, 1-2-3-4 and so on.

(f) Follow the prompt to operate the full-automatic airtightness tester for automatic test.

(1) Airtightness test standard on water cooling system:

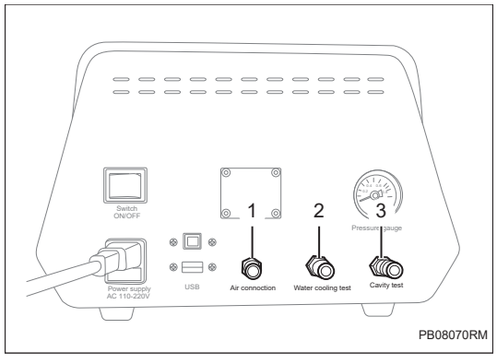
Parameters	Leakage rate	Voltage stabiliz-ation time	Detecti-on time	Pressu-re setting	Cavity capacity
Airtightness test on water cooling system	< 5 sccm	60 s	40 s	200 KPa	4.76 L

(g) After the automatic testing of fully automatic airtightness tester is completed, it will prompt whether it is qualified.

Note:

- If it prompts not qualified, it indicates that there is leakage.
  - If leakage is determined, perform leakage inspection.

4. Sealing test on high voltage power battery water channel (only for models with 85 kWh battery)



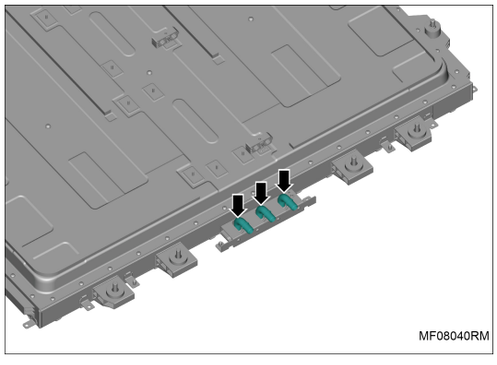
(a) Connect the air tube to full-automatic airtightness tester air source interface -1-.

(b) Select the corresponding interface -2- according to the detection item.

(c) Connect the other end of air tube to high voltage power battery cooling system inlet pipe test kit.

Notice:

After connecting, please confirm again. Do not connect the air tube wrongly, otherwise, it may cause damage to high voltage power battery.



(d) Install the cooling system test tool SST (9503735HA01).

(e) Operate the full-automatic airtightness tester to select the vehicle model.

Note:

Each number represents a different vehicle model, 1-2-3-4 and so on.

(f) Follow the prompt to operate the full-automatic airtightness tester for automatic test.

(1) Airtightness test standard on water cooling system:

Parameters	Leakage rate	Voltage stabiliz-ation time	Detecti-on time	Pressu-re setting	Cavity capacity
Airtightness test on water cooling system	< 5 sccm	60 s	40 s	200 KPa	4.76 L

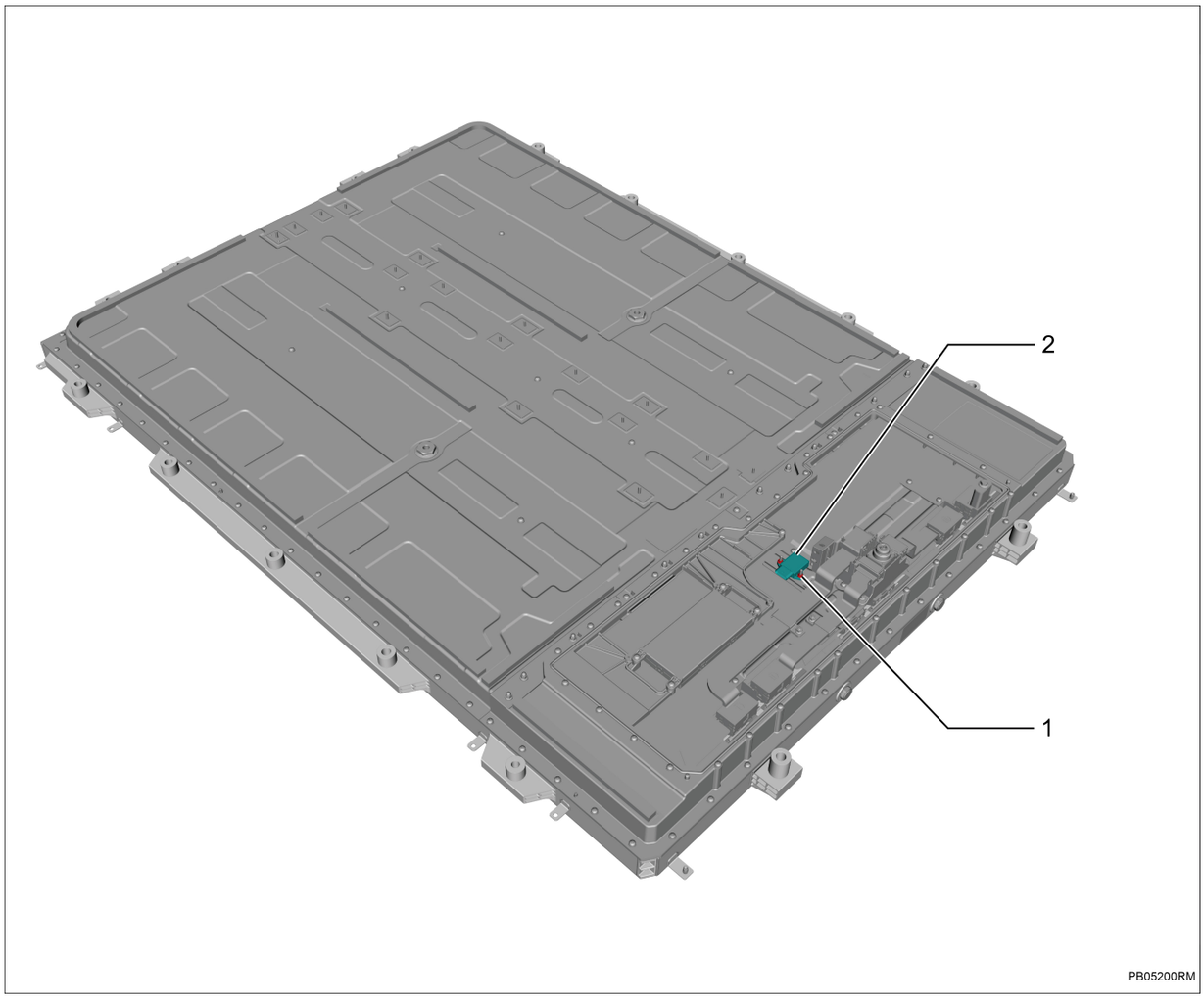
(g) After the automatic testing of fully automatic airtightness tester is completed, it will prompt whether it is qualified.

Note:

- If it prompts not qualified, it indicates that there is leakage.
  - If leakage is determined, perform leakage inspection.

Pressure sensor assembly

Components



1. **Hexagon flange nut**
   - X2
   - Torque: 5 ~ 7 N • m
2. **Pressure sensor**

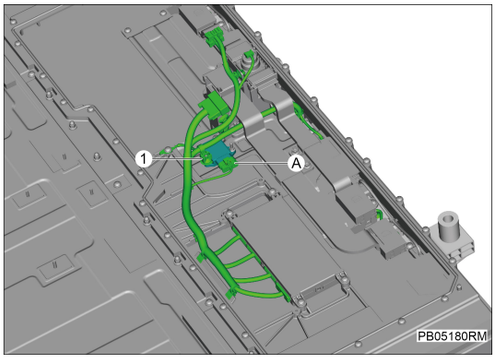
DL

Removal

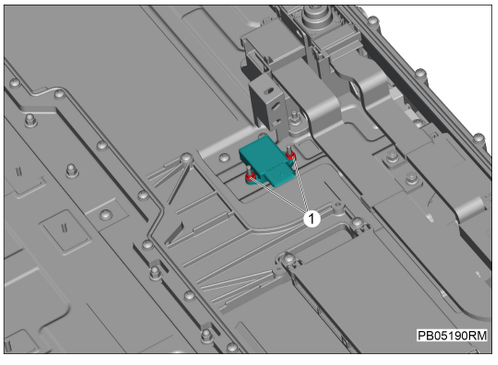
Caution:

- **High voltage on-board power will endanger life.**
- **Electric shock may cause death or serious body injury.**
- **Wear clothing tested by arcing.**
- **Wear insulated helmet that protects face.**
- **Wear insulation gloves.**
- **Wear insulation shoes.**
- **Cut off voltage of high voltage on-board power by personnel with appropriate qualifications.**

1. **Remove energy conversion and distribution unit assembly (See page DL-62)**
2. **Remove pressure sensor assembly**



(a) Detach wire harness fixing clip -1-, and disconnect wire harness connector -A-.



(b) Remove the nut -1-.

(c) Remove the pressure sensor.

Installation

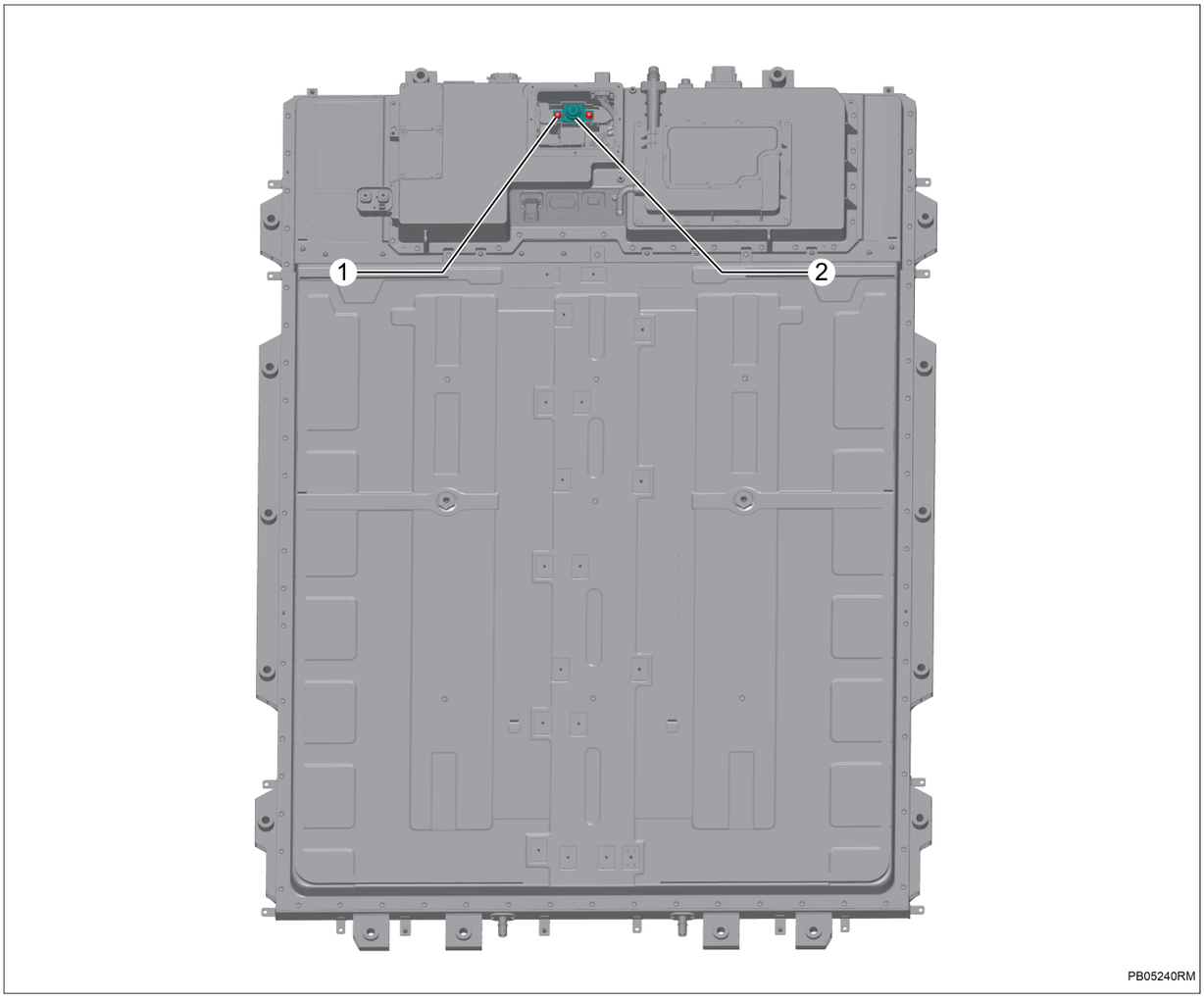
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Note:

   - Paint after calibrating fastener torque

Excitation fuse

Components



1. **Hexagon flange nut**
   - X2
   - Torque: 11 ~ 13 N • m
2. **Excitation fuse**

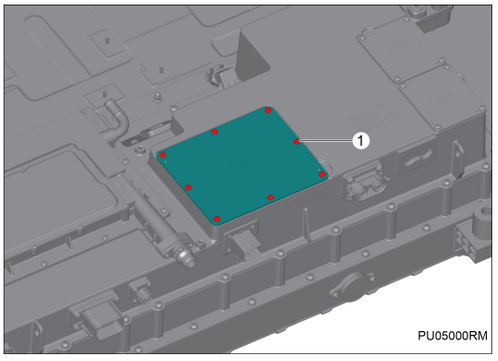
DL

Removal

Caution:

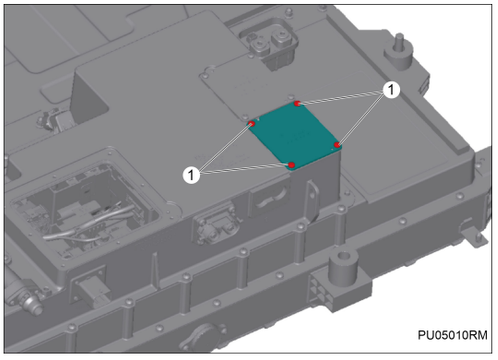
- **High voltage on-board power will endanger life.**
- **Electric shock may cause death or serious body injury.**
- **Wear clothing tested by arcing.**
- **Wear insulated helmet that protects face.**
- **Wear insulation gloves.**
- **Wear insulation shoes.**
- **Cut off voltage of high voltage on-board power by personnel with appropriate qualifications.**

1. **Remove power battery assembly (See page DL-25)**
2. **Remove excitation fuse**



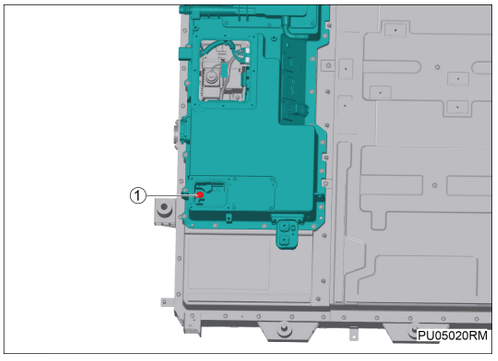
(a) (For example) Remove all screws -1-.

(b) Remove the battery assembly main positive assembly cover plate.



(c) Remove the screws -1-.

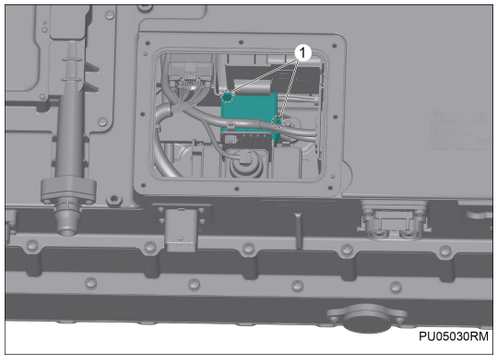
(d) Remove the battery main negative assembly cover plate.



(e) Use a multimeter to measure the voltage of main negative -1- to ground. The normal voltage is less than 3 V.

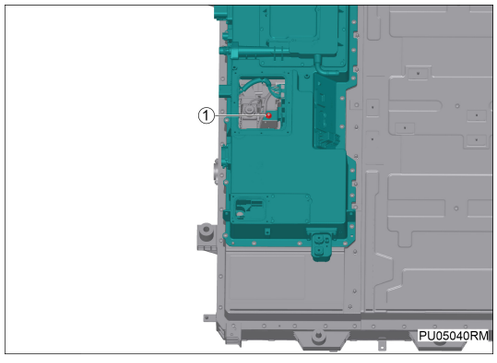
Notice:

- **If the voltage is normal, go to next step.**
- **If the voltage is abnormal, it is necessary to determine if the battery has insulation problems by professional. Do not perform any operation.**



(f) Press the claw -1-.

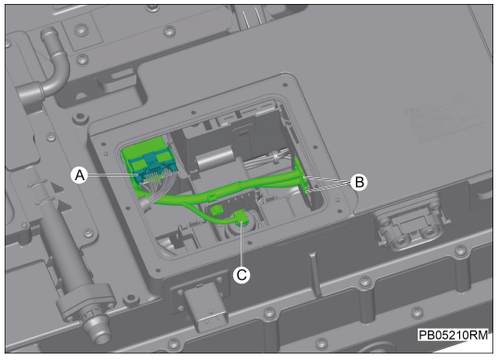
(g) Remove the main positive copper bar insulation protective cover.



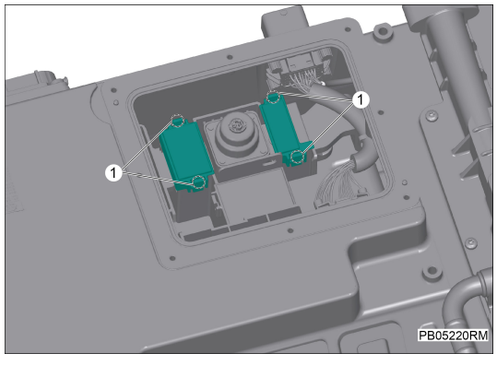
(h) Use a multimeter to measure the voltage between main positive copper bar fixing nut -1- and ground. The normal voltage is less than 3 V.

Notice:

- **If the voltage is normal, go to next step.**
- **If the voltage is abnormal, it is necessary to determine if the battery has insulation problems by professional. Do not perform any operation.**

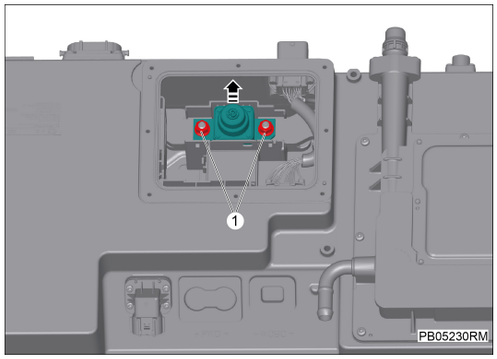


(i) Disconnect the wire harness connectors -A-C-.



(j) Press claws -1-, and remove the excitation fuse connection copper bar insulation protective cover.

DL



(k) Remove the nut -1-.

(l) Remove the excitation fuse in the direction of -arrow-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Note:

   - Paint after calibrating fastener torque.

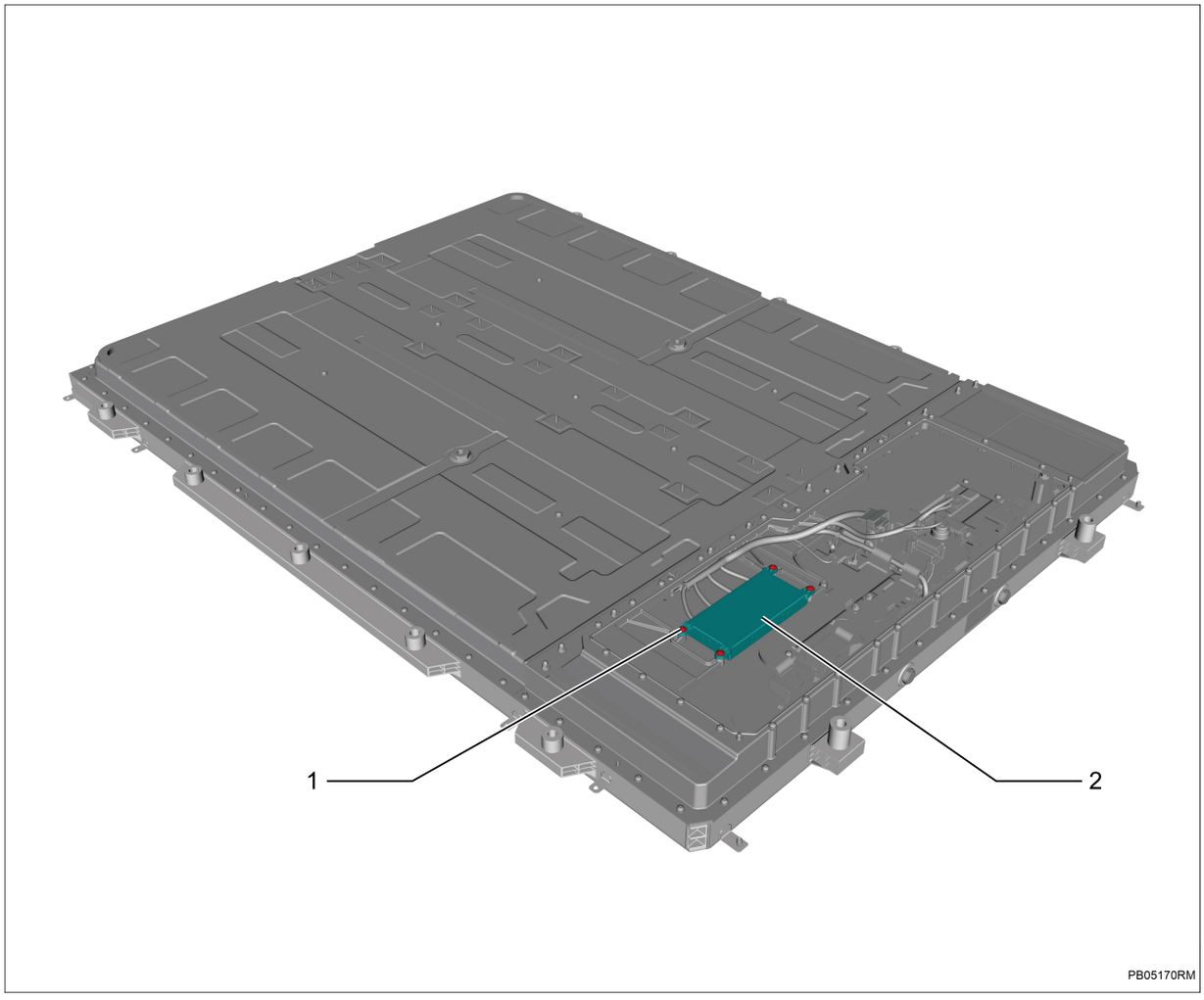
2. **Install excitation fuse**

   (a) Before installing the new excitation fuse, potential equalization is performed by using voltage measurement gear of multimeter. Test the voltage on both sides of the mounting point until the voltage is less than 1 V. Install the excitation fuse within 1 minute.

   (b) Purpose: Perform potential equalization at both ends of the excitation fuse. Avoid damage to power battery slave control unit sampling chip.

Battery control unit assembly

Components



1. **Screw**
   - X4
   - Torque: 6 ~ 8 N • m
2. **Battery control unit assembly**

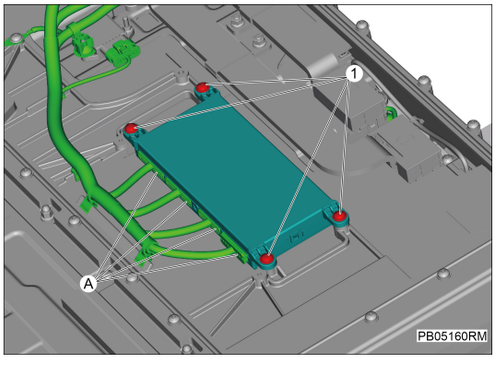
DL

Removal

Caution:

- **High voltage on-board power will endanger life.**
- **Electric shock may cause death or serious body injury.**
- **Wear clothing tested by arcing.**
- **Wear insulated helmet that protects face.**
- **Wear insulation gloves.**
- **Wear insulation shoes.**
- **Cut off voltage of high voltage on-board power by personnel with appropriate qualifications.**

1. **Remove energy conversion and distribution unit assembly (See page DL-62)**
2. **Remove battery control unit assembly**



(a) Disconnect the battery control unit assembly wire harness connectors -A-.

Note:

- Do not disconnect excitation fuse high voltage connection, only disconnect the low voltage connection.
- Purpose: The low voltage connection is set on the basis of the complete high voltage circuit. Avoid damage to the power battery slave control unit sampling chip.

(b) Remove the screws -1-.

(c) Remove the battery control unit assembly.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Note:

- Paint after calibrating fastener torque.

Energy conversion and distribution unit assembly

Safety precautions for operation

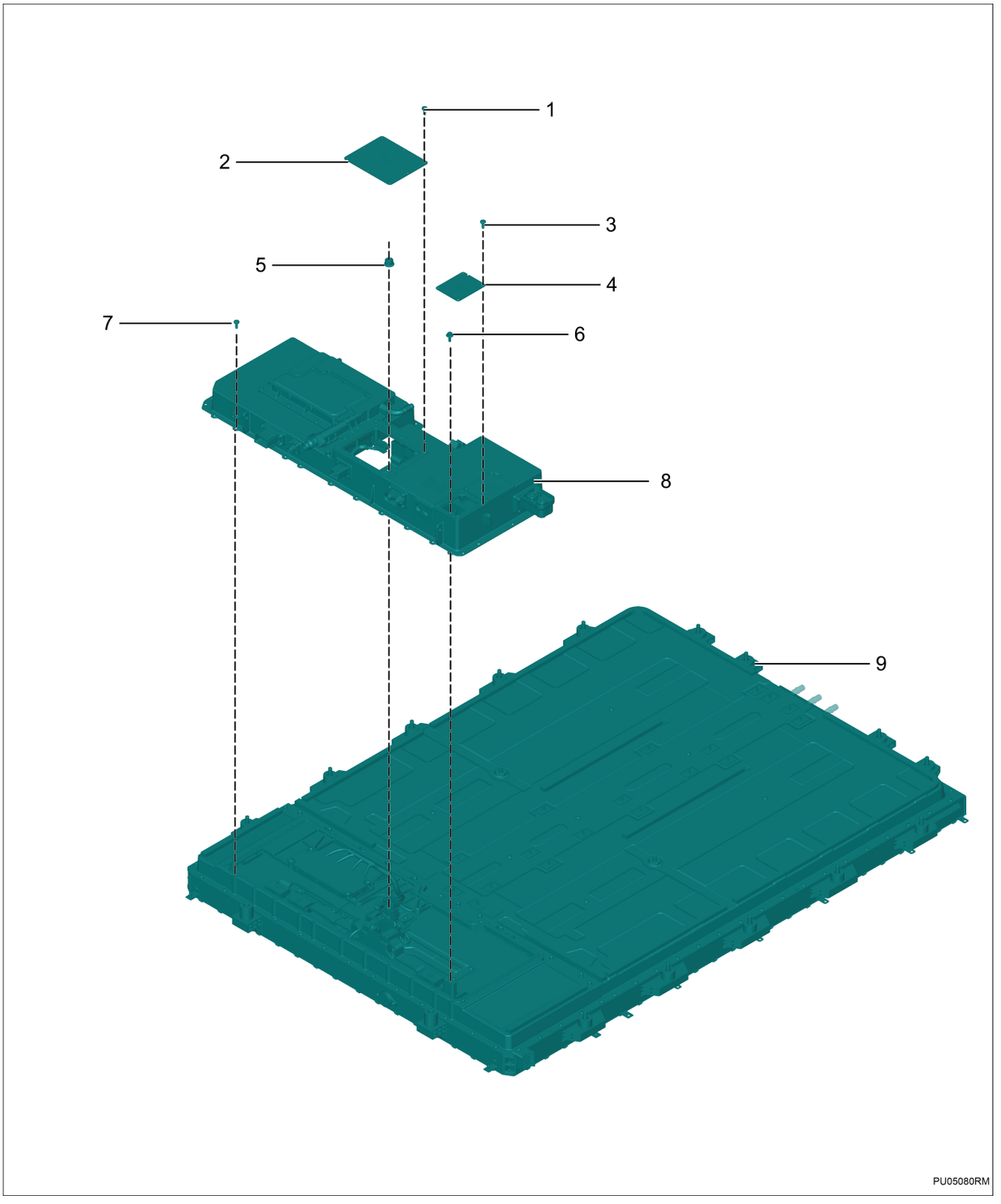
1. **When disassembling and repairing the power battery, professional insulated tools should be used, and wear insulation gloves and insulation shoes; Do not wear jewelry, watches and other**

metal ornaments; Operators are prohibited to operate with bare hands;

2. **Operators should receive professional knowledge and safety training on battery If encountering uncertain factors during operation, it is necessary to consult a dedicated person for confirmation before implementation, and arbitrary operation is prohibited;**
3. **Before disassembling the power battery, please confirm the status of battery, and pay attention to the insulation condition and relay status;**
4. **At the end of the operation, clean up the operation tools and materials in time to make sure that no metal objects, dust, materials, etc. are left inside the power battery to avoid potential short circuits and driving noise;**
5. **Strictly prevent any form of short circuit.**

DL

Components



1. **Screw**
   - X5
   - Torque: 4 ~ 6 N • m
2. **Battery assembly main positive cover plate**
3. **Screw**

- X4
- Torque: 4 ~ 6 N • m

4. Battery main negative assembly cover plate

5. Hexagon flange nut

- Torque: 18 ~ 22 N • m

6. Hexagon flange bolt

- Torque: 18 ~ 22 N • m

7. Screw

- X30
- Torque: 9 ~ 11 N • m

8. Energy conversion and distribution unit assembly

9. Power battery assembly

Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Detach service switch (See page DL-17)

Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

3. Remove power battery assembly (See page DL-25)

4. Disconnect one into multiple high voltage wire harness assembly connector (See page DL-70)

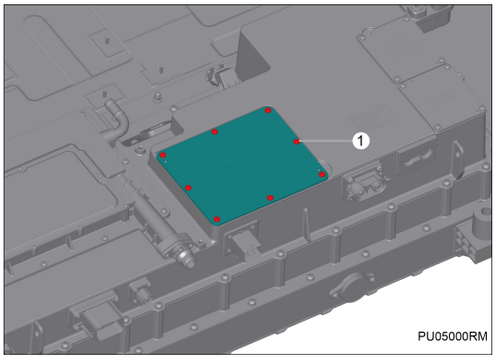
5. Remove rear motor cooling pipe assembly (See page RE-92)

6. Remove energy conversion and distribution unit assembly

Caution:

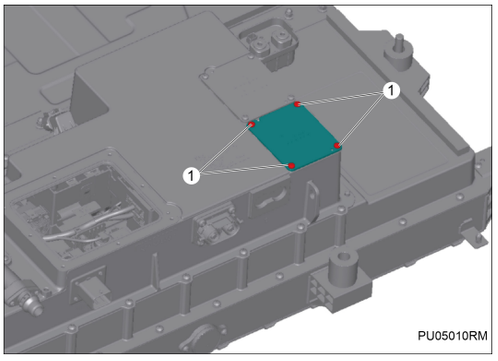
- **High voltage on-board power will endanger life.**
- **Electric shock may cause death or serious body injury.**
- **Wear clothing tested by arcing.**
- **Wear insulated helmet that protects face.**
- **Wear insulation gloves.**
- **Wear insulation shoes.**
- **Cut off voltage of high voltage on-board power by personnel with appropriate qualifications.**

DL



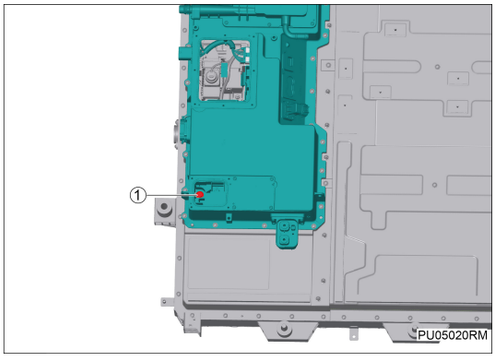
(a) (For example) Remove all screws -1-.

(b) Remove the battery assembly main positive assembly cover plate.



(c) Remove the screws -1-.

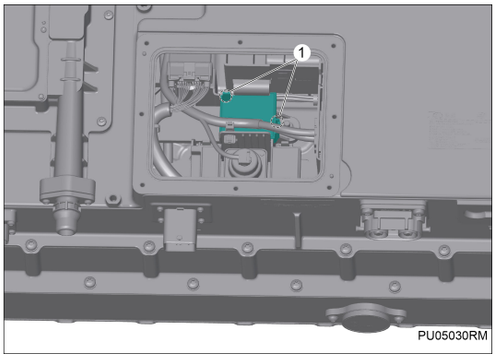
(d) Remove the battery main negative assembly cover plate.



(e) Use a multimeter to measure the voltage of main negative -1- to ground. The normal voltage is less than 3 V.

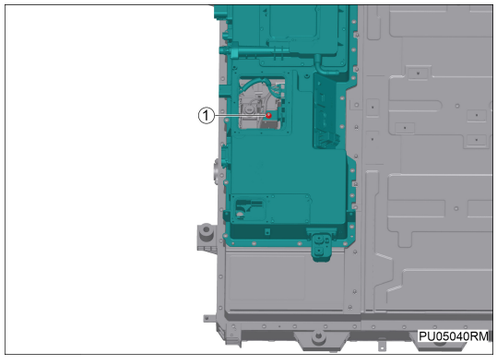
Notice:

- **If the voltage is normal, go to next step.**
- **If the voltage is abnormal, it is necessary to determine if the battery has insulation problems by professional. Do not perform any operation.**



(f) Press the claw -1-.

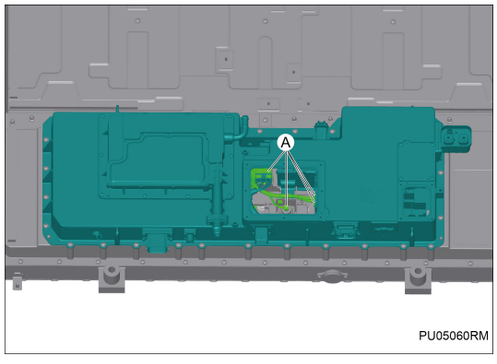
(g) Remove the main positive copper bar insulation protective cover.



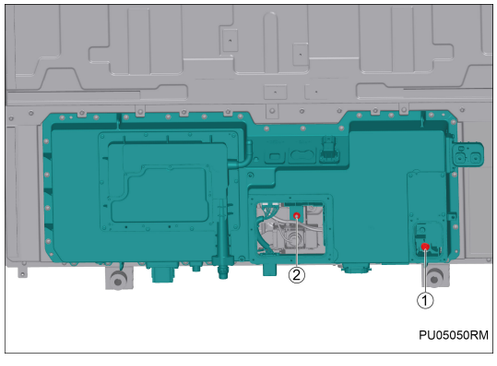
(h) Use a multimeter to measure the voltage between main positive copper bar fixing nut -1- and ground. The normal voltage is less than 3 V.

Notice:

- **If the voltage is normal, go to next step.**
- **If the voltage is abnormal, it is necessary to determine if the battery has insulation problems by professional. Do not perform any operation.**



(i) Disconnect the wire harness connector -A-.



(j) Remove the main negative fixing bolt -1-.

(k) Remove the main positive fixing nut -2-.

Caution:

- **The main positive power fixing nut -2- and copper bar has high voltage. Professional personnel should wear standard insulation equipment when removing.**
- **The voltage between battery main positive and battery main positive is up to 370 - 420 V. It is not allowed to touch them at the same time.**



(l) (For example) Remove screws -1-.

(m) Remove the energy conversion and distribution unit assembly -A-.

Installation

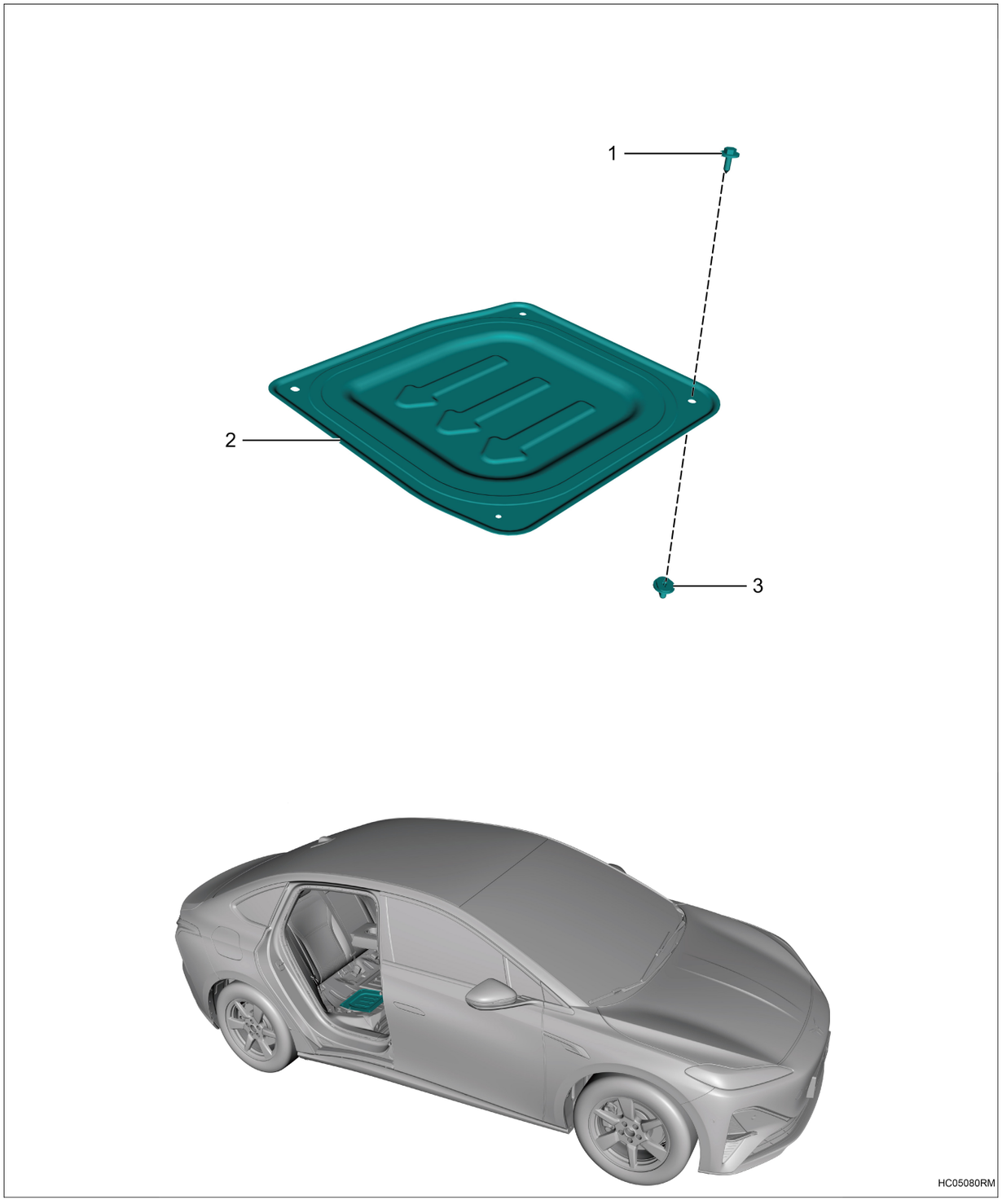
1. **Installation is in the reverse order of removal.**

DL

High voltage wire harness system

High voltage wire harness cover plate assembly

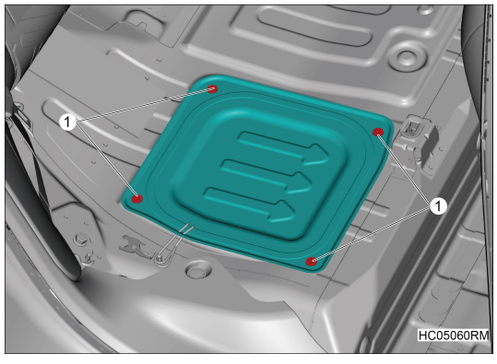
Components



1. **Hexagon head self-tapping screw**
   - X4
   - Torque: 2.0 ~ 3.0 N • m
2. **High-voltage wire harness mounting cover plate**
3. **Hexagon head insert nut**
   - X4

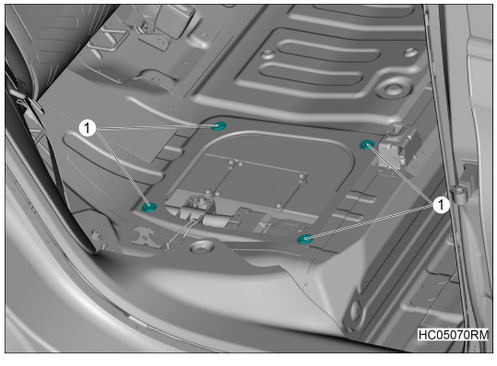
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear seat cushion assembly (See page NS-92)**
3. **Remove high-voltage wire harness mounting cover plate**



(a) Remove the screws -1-.

(b) Remove high voltage wire harness mounting cover plate.



(c) Pry off and detach the insert nuts -1-.

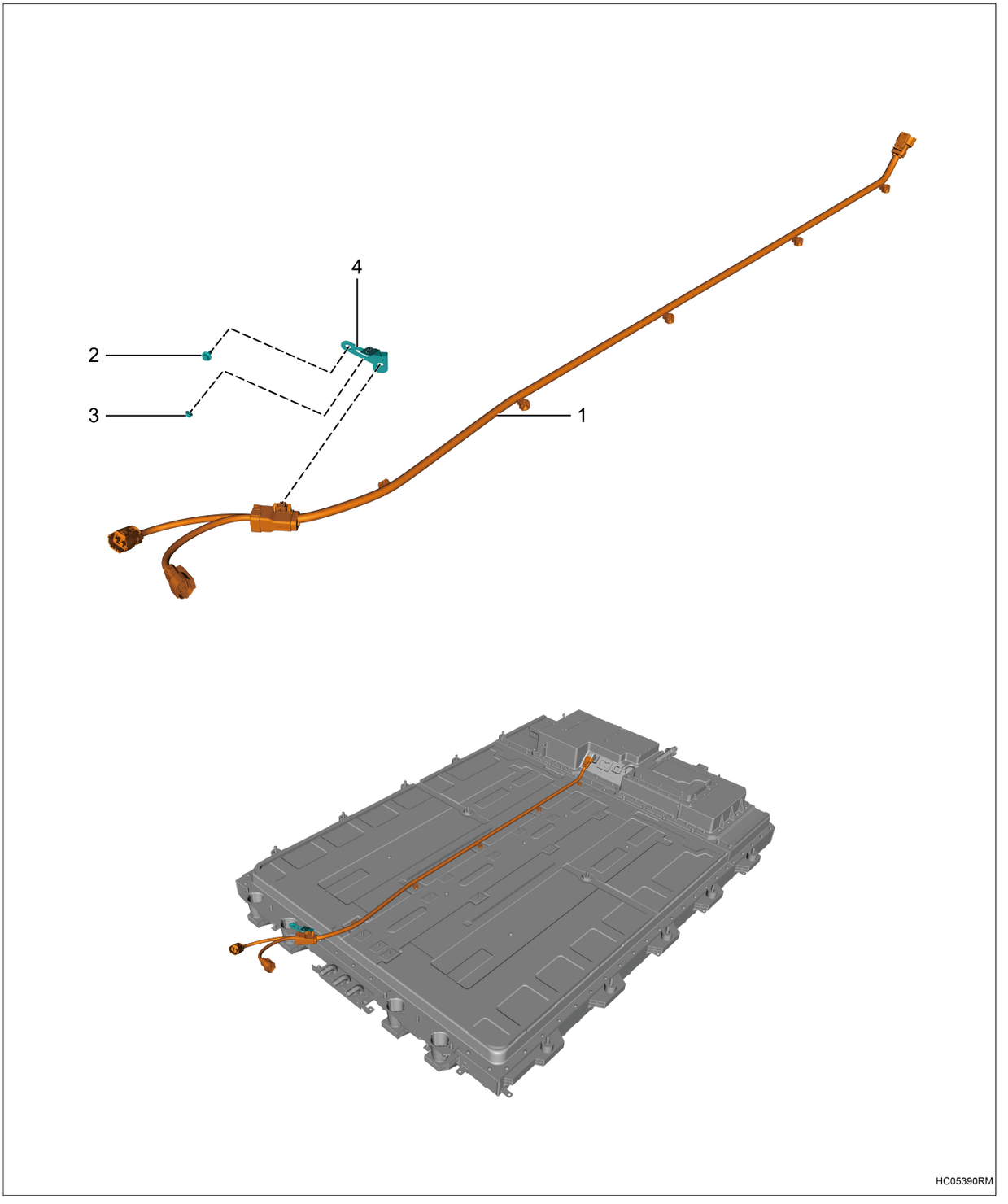
Installation

1. **Installation is in the reverse order of removal.**

DL

One into multiple high voltage wire harness assembly

Components



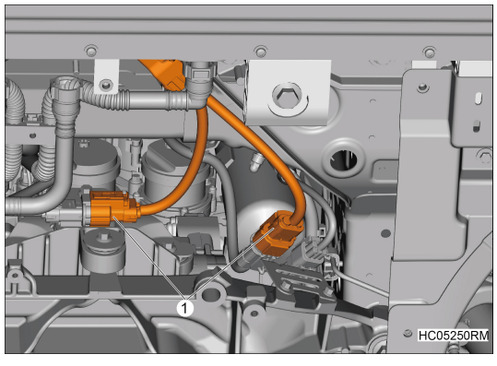
1. **One into multiple high voltage wire harness assembly**
2. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m

3. **Hexagon flange nut**
   - Torque: 8 ~ 10 N • m
4. **One into multiple high voltage wire harness bracket**

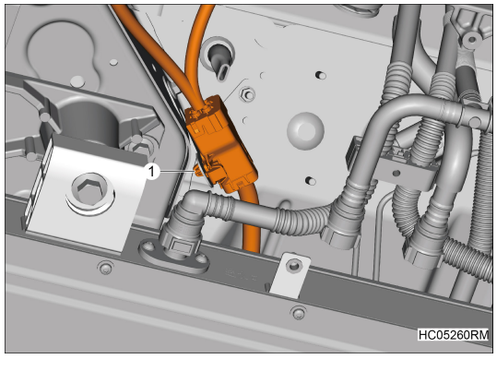
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove engine bottom protector (See page WS-40)**
4. **Remove one into multiple high voltage wire harness assembly**

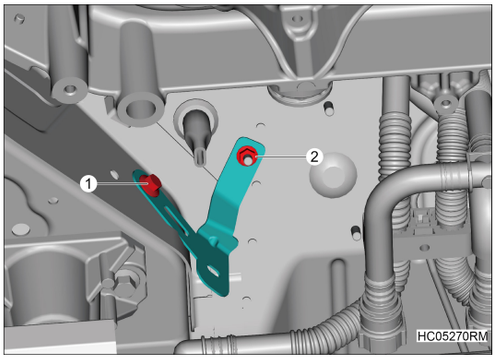


(a) Disconnect the wire harness connectors -1-.



(b) Disengage the wire harness fixing clips -1-.

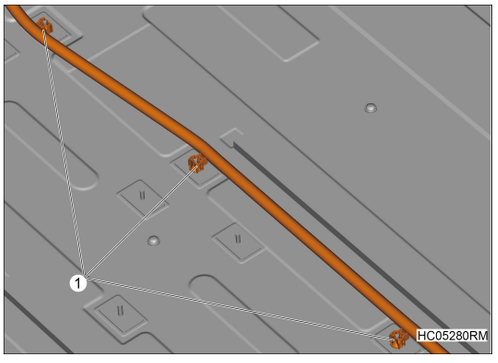
DL



(c) Remove the bolt -1-.

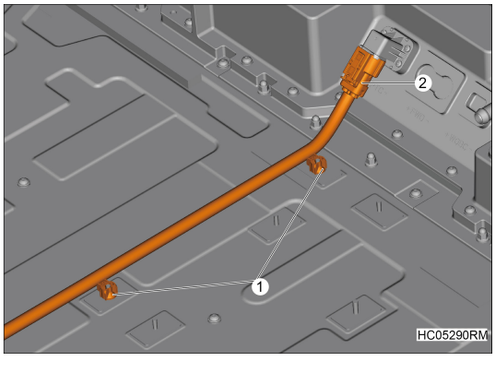
(d) Remove the nut -2-.

(e) Remove the one into multiple high voltage wire harness bracket.



(f) Remove power battery assembly (See page DL-25)

(g) Disengage the wire harness fixing clips -1-.



(h) Disengage the wire harness fixing clips -1-.

(i) Disconnect the wire harness connectors -2-.

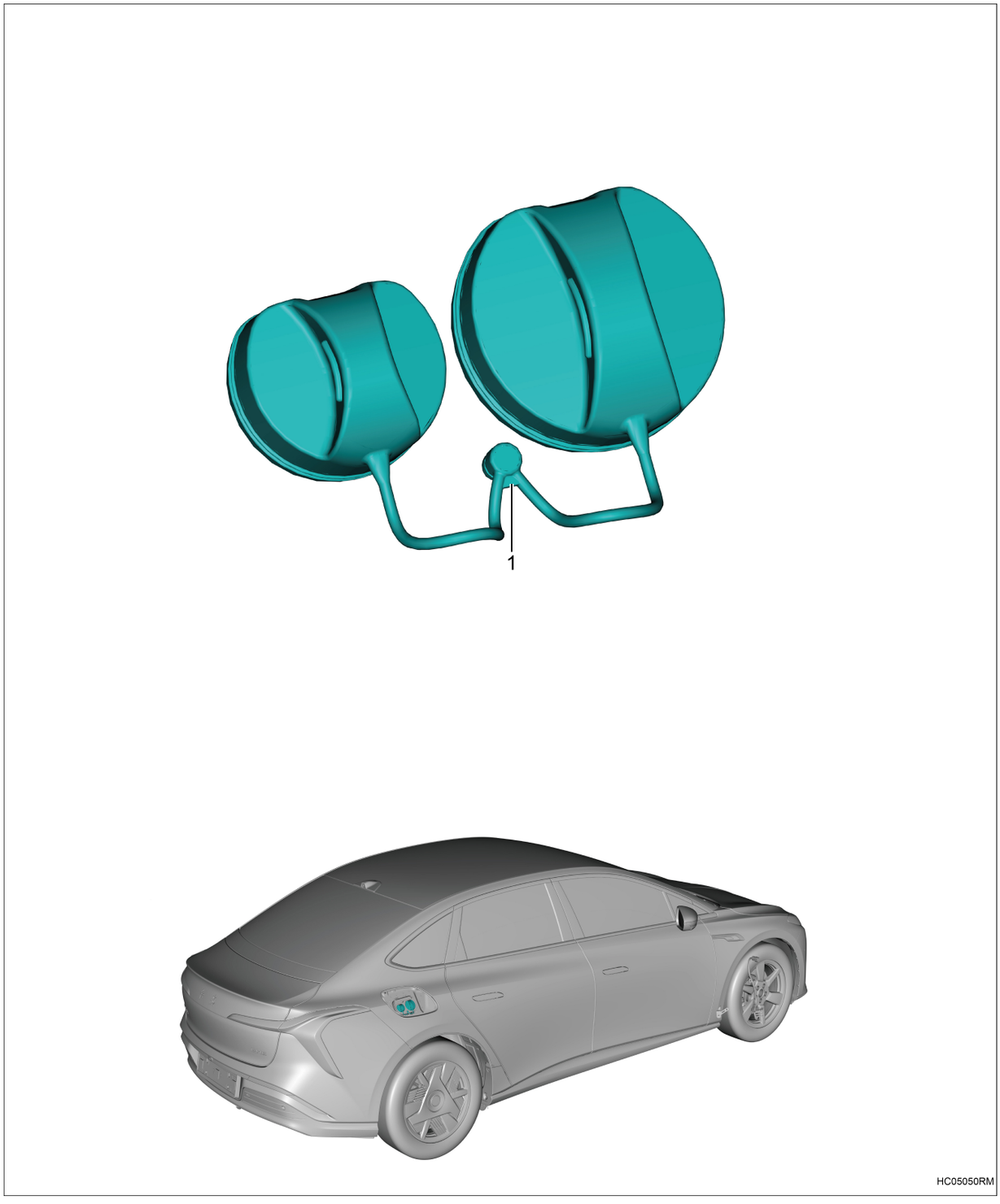
(j) Remove the one into multiple high voltage wire harness assembly.

Installation

1. Installation is in the reverse order of removal.

Charging dust plug assembly

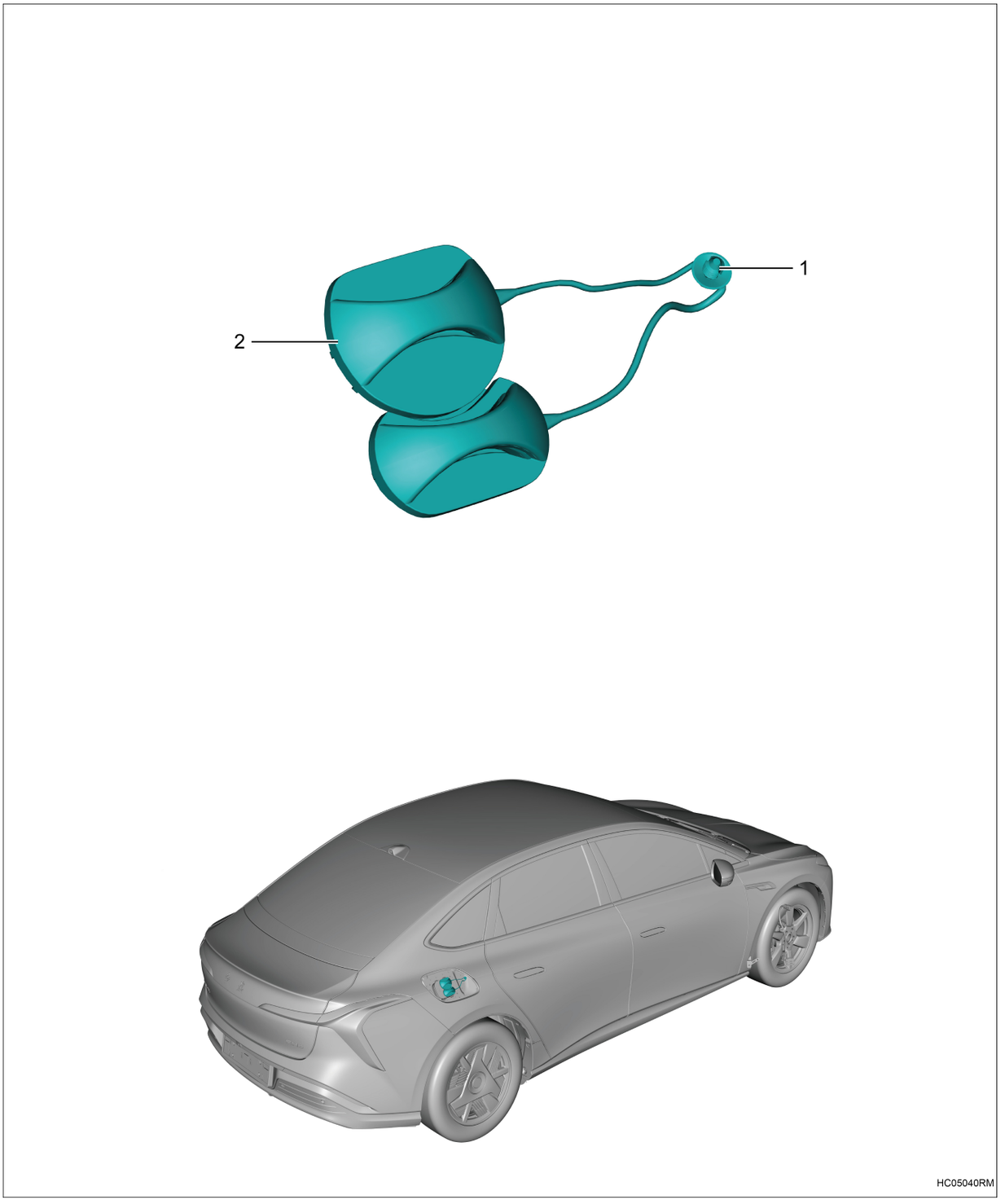
Components (Asia)



1. Charging socket dust plug

DL

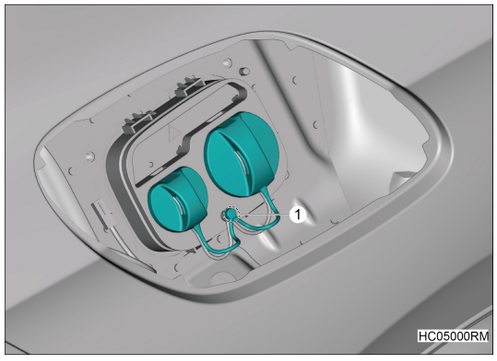
Components (Europe)



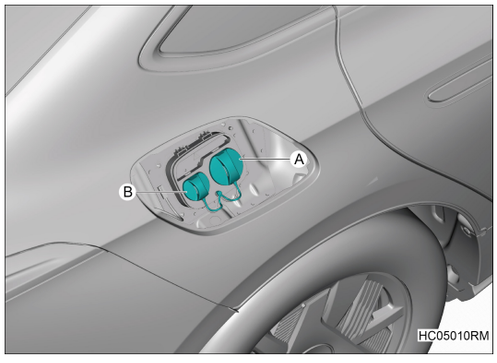
1. **Connecting rope clip**
2. **Charging socket dust plug**

Removal

1. **Remove charging dust plug (Asian version)**

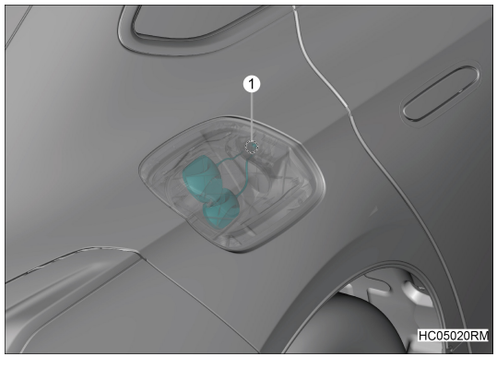


(a) Unplug the charging dust plug fixing rubber column -1- with force.

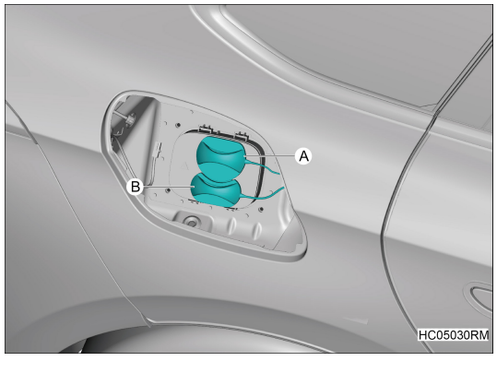


(b) Remove the charging dust plugs -A-B-.

2. Remove charging dust plug (European version)



(a) Unplug the charging dust plug fixing rubber column -1- with force.



(b) Remove the charging dust plugs -A-B-.

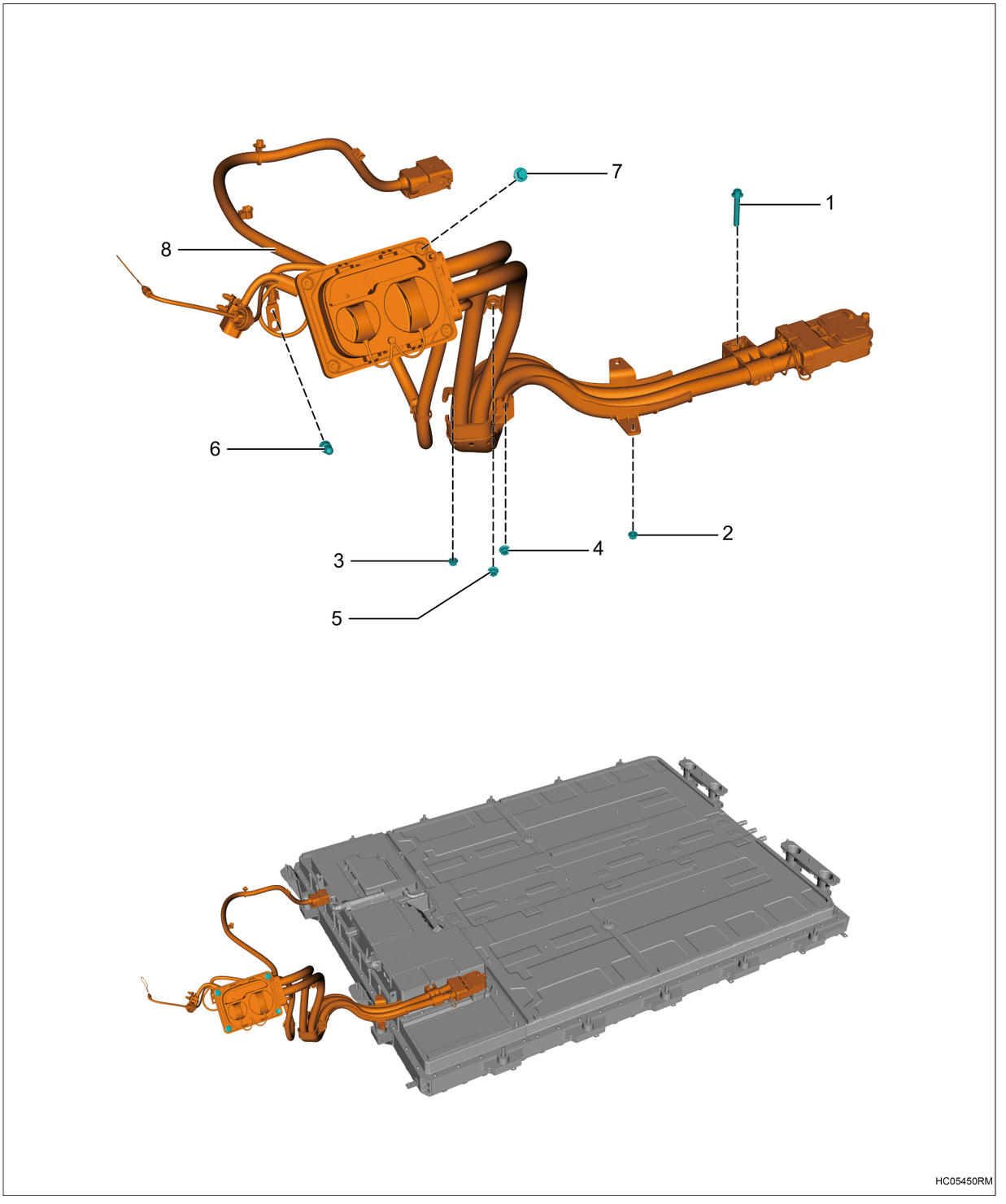
Installation

1. Installation is in the reverse order of removal.

DL

Charging high voltage wire harness assembly

Components



1. **Hexagon flange bolt**
   - Torque: 17 ~ 21 N • m
2. **Hexagon flange nut**

- X2
- Torque: 8 ~ 10 N • m

3. Hexagon flange nut

- Torque: 8 ~ 10 N • m

4. Hexagon flange stud

- Torque: 8 ~ 10 N • m

5. Hexagon flange nut

- Torque: 8 ~ 10 N • m

6. Hexagon flange stud

- Torque: 8 ~ 10 N • m

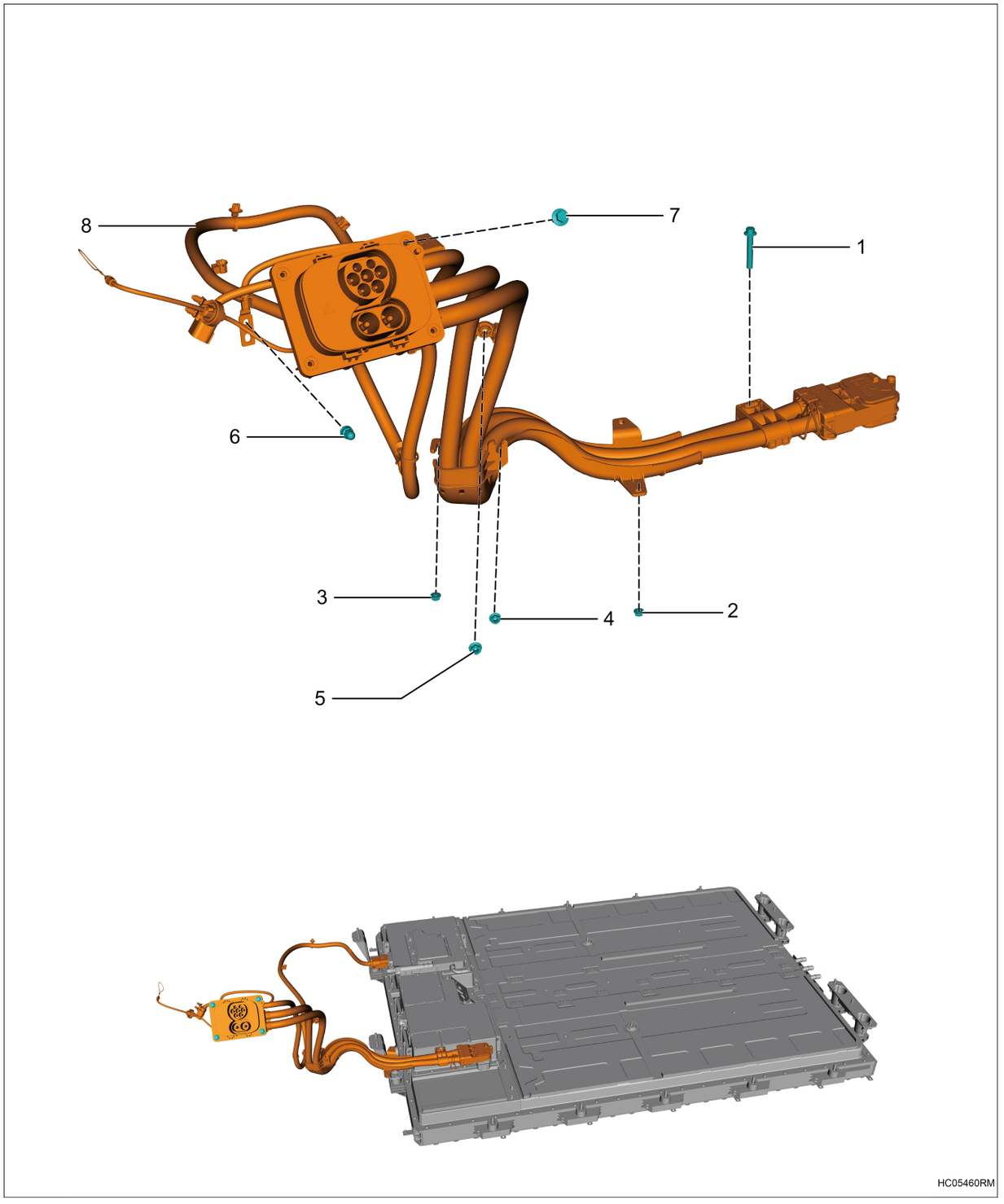
7. Hexagon flange bolt

- X4
- Torque: 8 ~ 10 N • m

8. Charging high voltage wire harness assembly

DL

Components (Europe)



1. **Hexagon flange bolt**
   - Torque: 17 ~ 21 N • m
2. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m

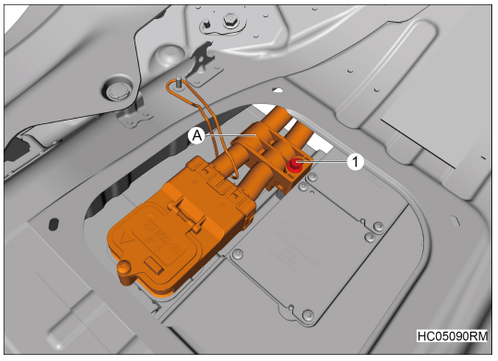
3. **Hexagon flange nut**
   - Torque: 8 ~ 10 N • m
4. **Hexagon flange stud**
   - Torque: 8 ~ 10 N • m
5. **Hexagon flange nut**
   - Torque: 8 ~ 10 N • m
6. **Hexagon flange stud**
   - Torque: 8 ~ 10 N • m
7. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
8. **Charging high voltage wire harness assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

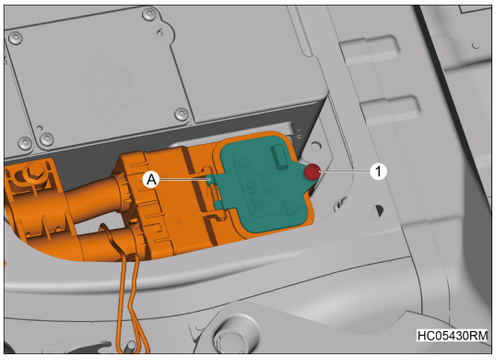
   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove rear suspension bottom protector (See page WS-47)**
4. **Remove rear right wheel (See page DP-116)**
5. **Remove rear right wheel protector (See page WS-37)**
6. **Remove charging port cover sub-assembly (See page WS-52)**
7. **Remove charging dust plug assembly (See page DL-73)**
8. **Remove rear seat cushion assembly (See page NS-92)**
9. **Remove high-voltage wire harness mounting cover plate (See page DL-68)**
10. **Remove luggage compartment side cover (See page NS-157)**
11. **Remove charging high voltage wire harness assembly**

DL



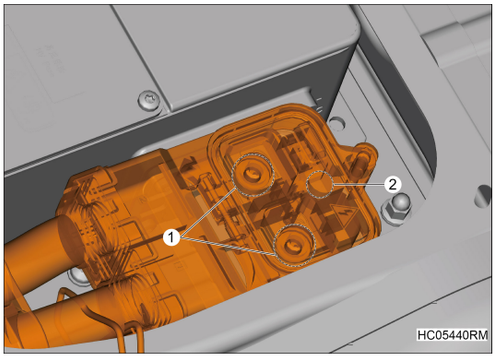
(a) Remove the wire harness fixture bolt -1- from high voltage wire harness assembly.

(b) Detach charging high voltage wire harness assembly bracket -A-.



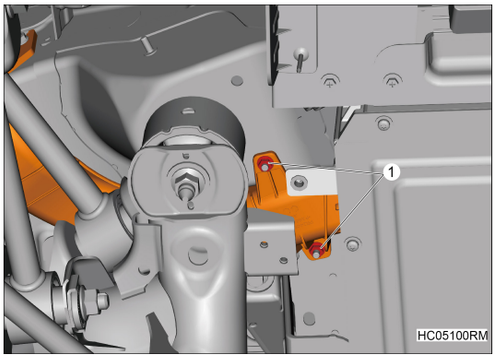
(c) Remove the bolt -1-.

(d) Open the seal protective cover -A-.

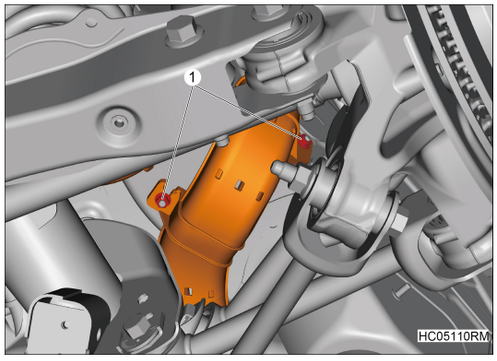


(e) Remove the bolt -1-.

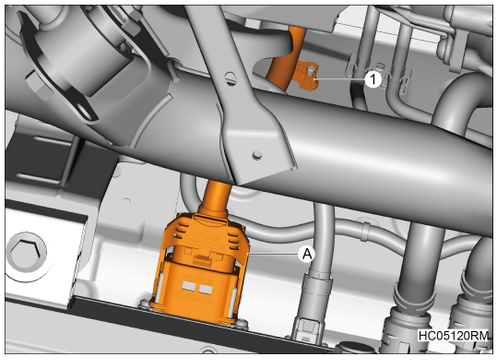
(f) Remove the screws -2-.



(g) Remove the nut -1-.

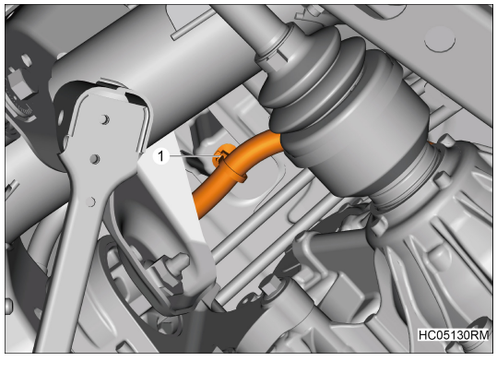


(h) Remove the nut -1-.

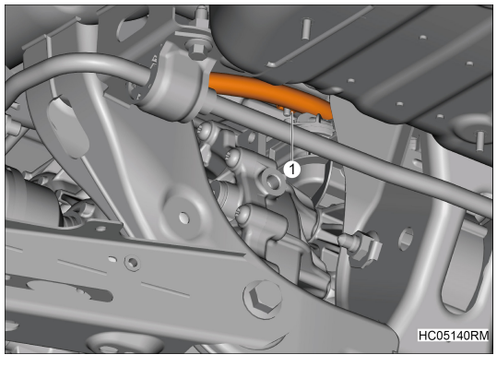


(i) Disconnect the charging high voltage wire harness connector -A-.

(j) Disengage the wire harness fixing clips -1-.

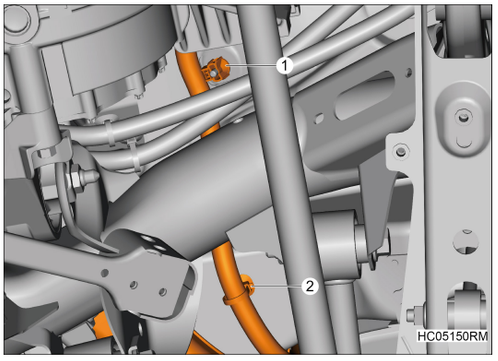


(k) Disengage the wire harness fixing clips -1-.

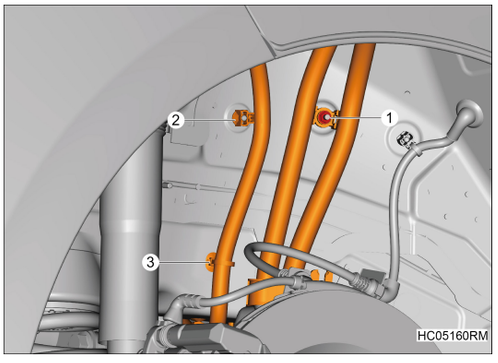


(l) Disengage the wire harness fixing clips -1-.

DL

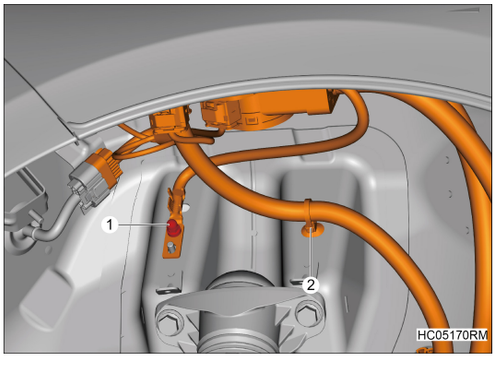


(m) Detach the wire harness fixing clips -1-2-.



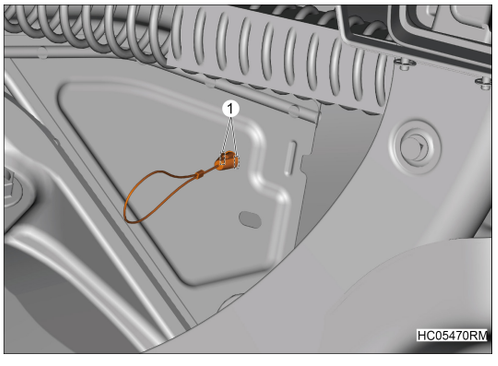
(n) Remove the nut -1-.

(o) Detach the wire harness fixing clips -2-3-.

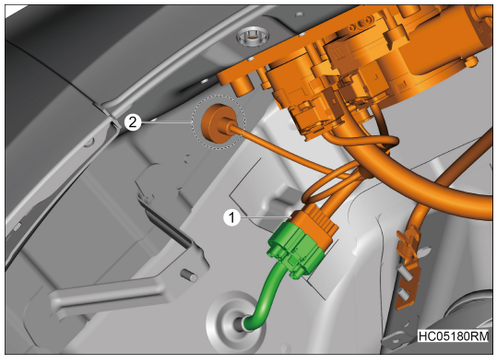


(p) Remove fixing nut -1- from ground terminal.

(q) Disengage the wire harness fixing clips -2-.

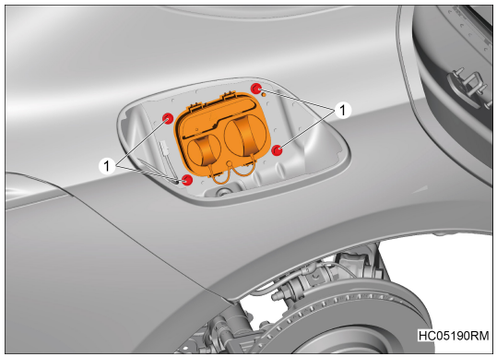


(r) Press the clips -1- and detach charging port cover assembly emergency opening cable.



(s) Detach the wire harness connector -1-.

(t) Detach the charging port cover assembly emergency opening cable -2-.



(u) Remove the bolt -1-.

(v) Remove the charging high voltage wire harness assembly.

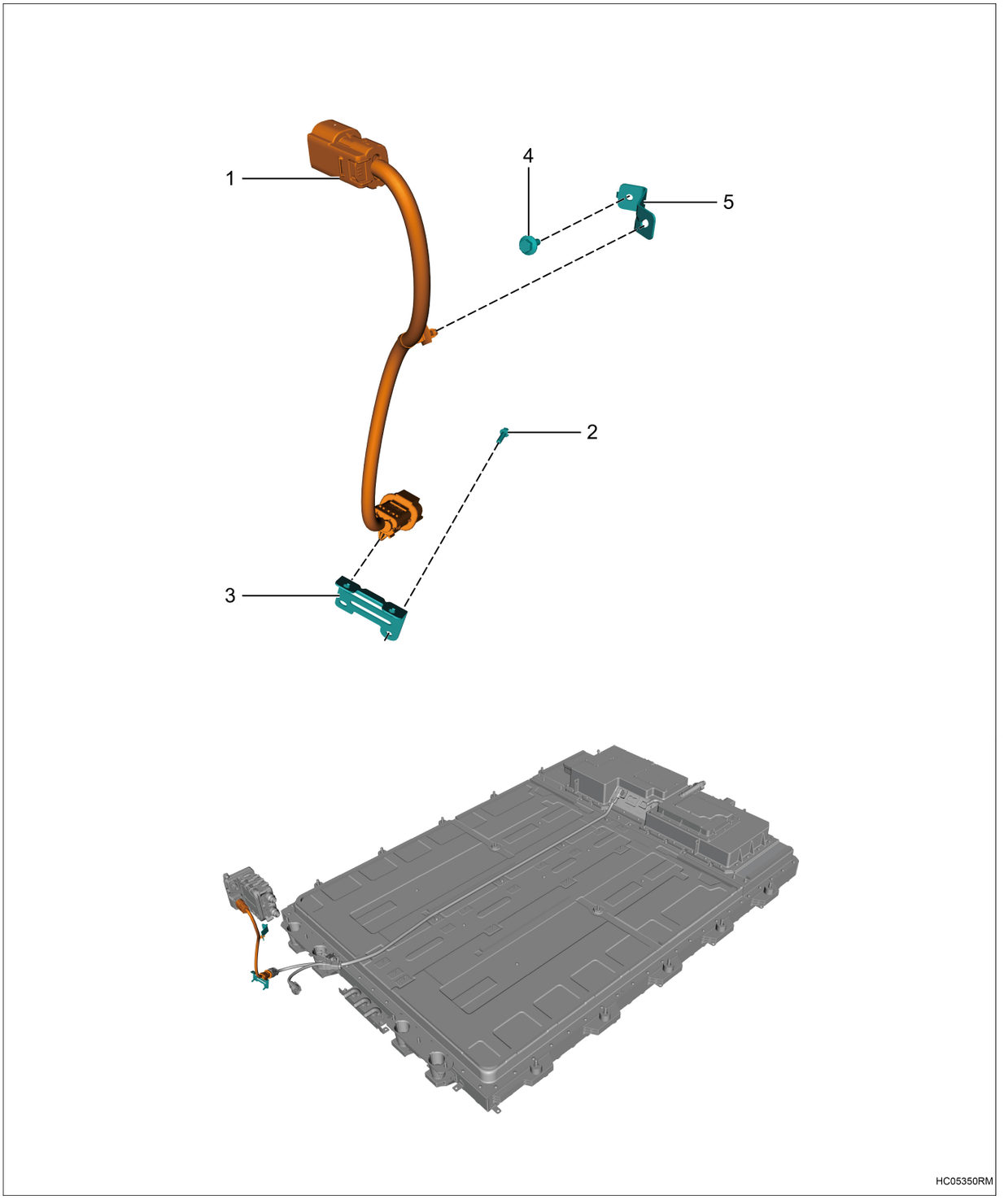
Installation

1. Installation is in the reverse order of removal.

DL

Water heating PTC high voltage wire harness assembly

Components



1. **Water heating PTC high voltage wire harness assembly**
2. **Hexagon flange bolt**
   - X2

- Torque: 8 ~ 10 N • m

3. PTC high voltage wire harness bracket

4. Hexagon flange nut

- Torque: 8 ~ 10 N • m

5. Water heating PTC high voltage wire harness bracket

Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Detach service switch (See page DL-17)

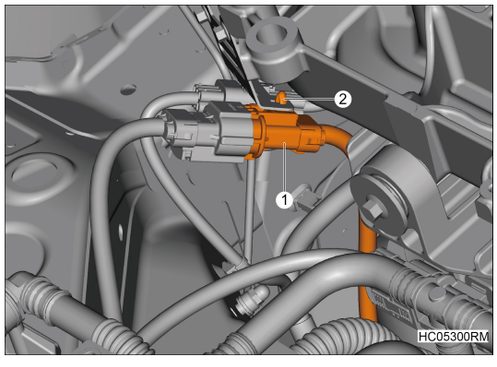
Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

3. Remove engine bottom protector (See page WS-40)

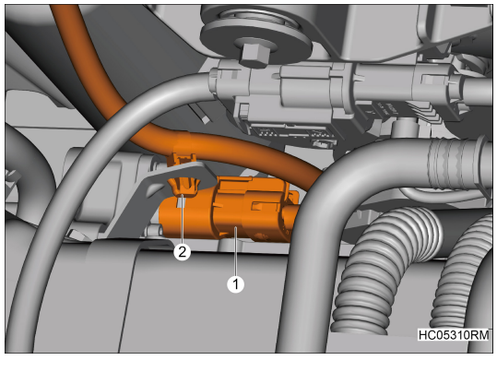
4. Remove thermal management module (See page RE-98)

5. Remove water heating PTC high voltage wire harness assembly



(a) Disconnect the wire harness connectors -1-.

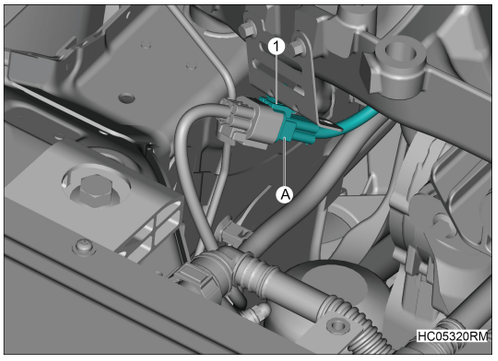
(b) Disengage the wire harness fixing clips -2-.



(c) Disconnect the wire harness connectors -1-.

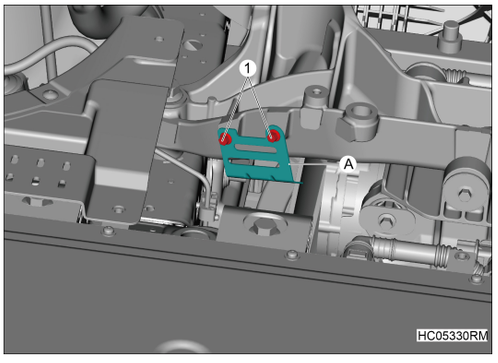
(d) Disengage the wire harness fixing clips -2-.

6. Remove PTC high voltage wire harness bracket



(a) Disconnect the wire harness connector -A-.

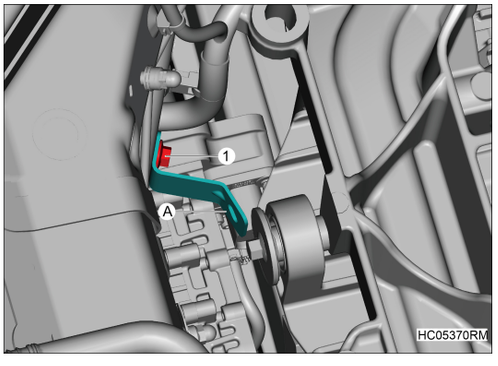
(b) Disengage the wire harness fixing clips -1-.



(c) Remove the bolt -1-.

(d) Remove the wire harness bracket -A-.

7. Remove water heating PTC high voltage wire harness bracket



(a) Remove the bolt -1-.

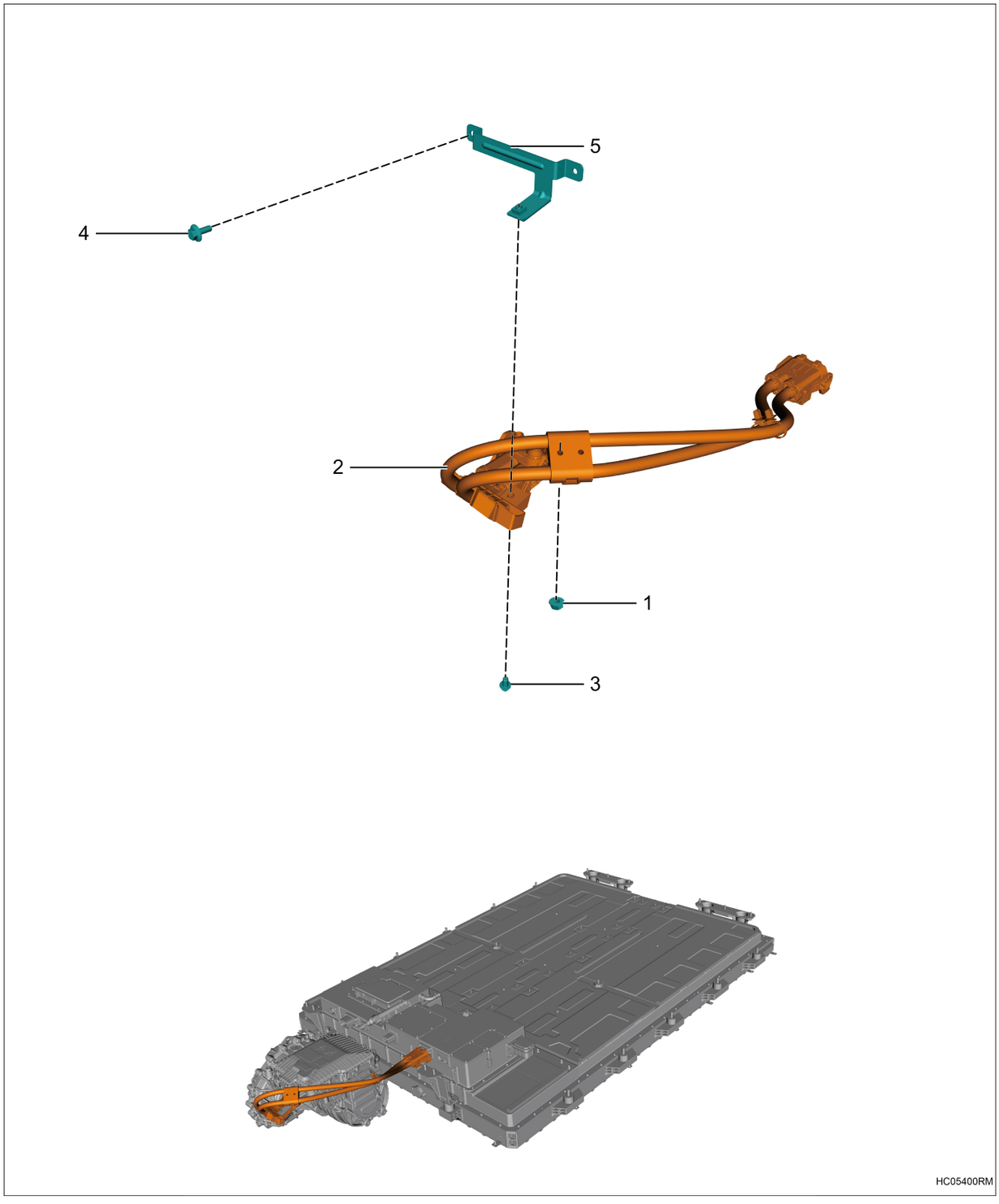
(b) Remove the wire harness bracket -A-.

Installation

1. Installation is in the reverse order of removal.

DC bus assembly

Components



1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
2. **DC bus II assembly**
3. **Hexagon flange bolt**

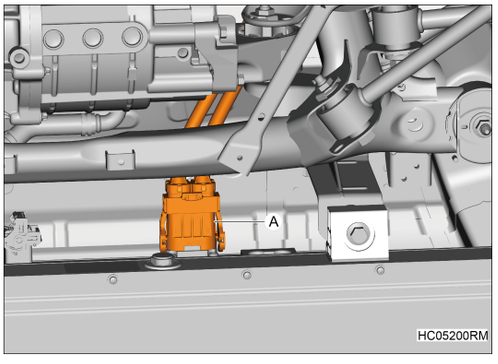
- Torque: 8 ~ 10 N • m

4. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 10 N • m
5. **DC bus II assembly bracket**

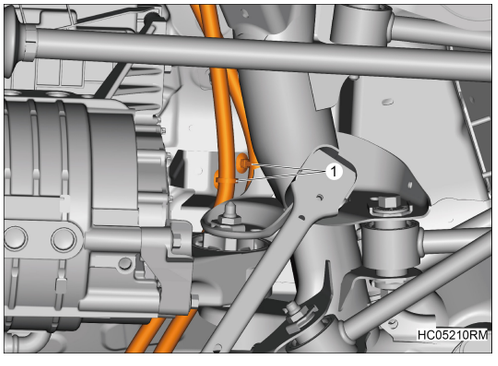
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

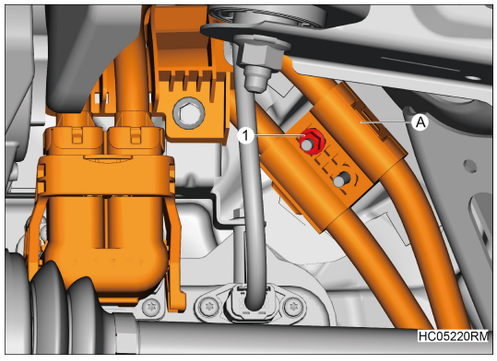
   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove rear suspension bottom protector (See page WS-47)**
4. **Remove DC bus II assembly**



(a) Detach the wire harness connectors -A-.

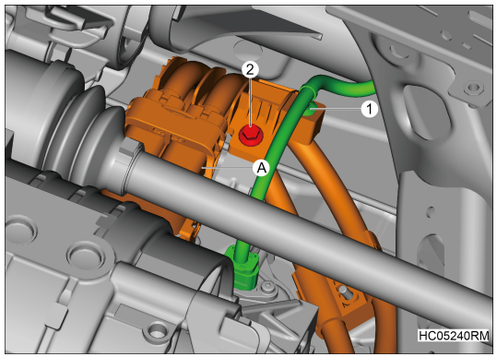


(b) Disengage the wire harness fixing clips -1-.



(c) Remove the bolt -1-.

(d) Detach the wire harness fixing bracket -A-.

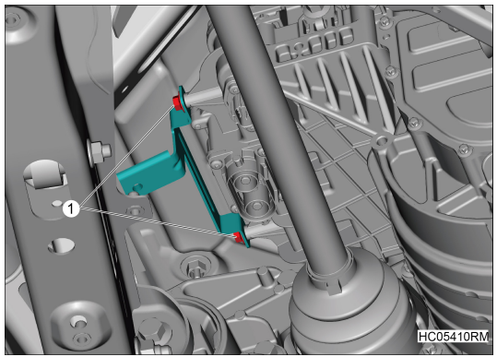


(e) Detach the wire harness clip -1-.

(f) Remove the fixing bolt -2- from DC bus wire harness bracket.

(g) Disconnect the DC bus wire harness connector -A-.

5. Remove DC bus II assembly bracket



(a) Remove the bolt -1-.

(b) Remove DC bus II assembly bracket.

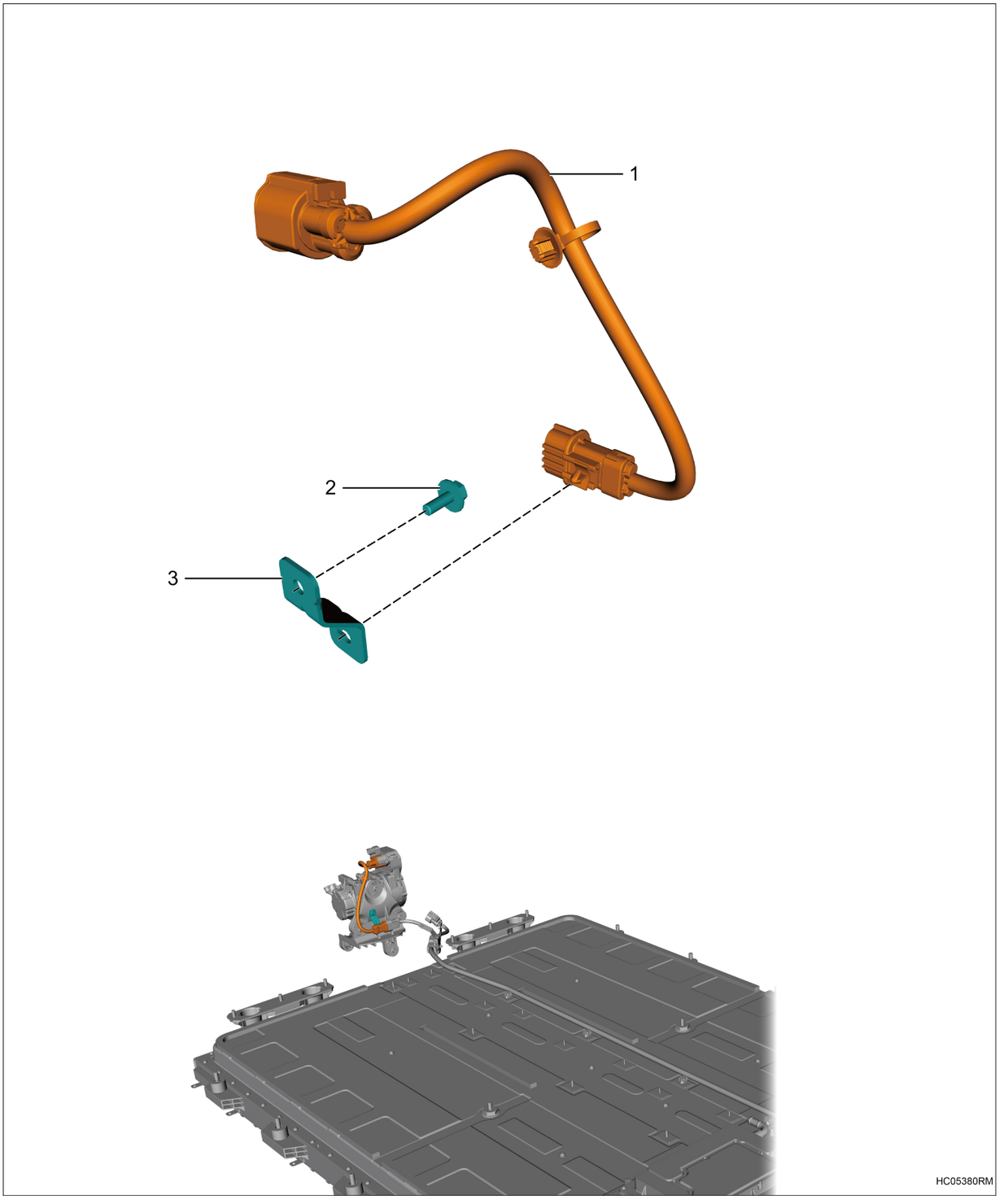
Installation

1. Installation is in the reverse order of removal.

DL

AC high voltage wire harness assembly

Components



1. **AC high voltage wire harness assembly**
2. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m

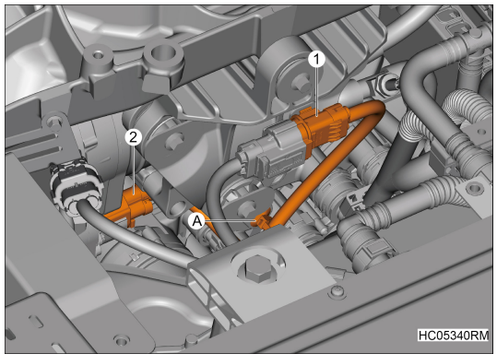
3. A/C high voltage wire harness bracket

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:

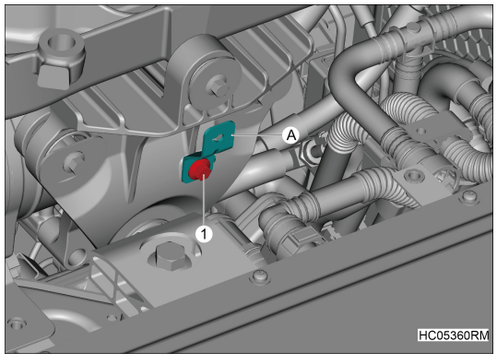
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove engine bottom protector (See page WS-40)**
4. **Remove A/C high voltage wire harness assembly**



   (a) Disconnect the wire harness connectors -1-2-.

   (b) Disengage the wire harness fixing clip -A-.

5. **Remove A/C high voltage wire harness bracket**



   (a) Remove the bolt -1-.

   (b) Remove the wire harness bracket -A-.

Installation

1. **Installation is in the reverse order of removal.**

Chassis

Mounting system

Rear motor mounting DP-1

Brake system

Brake fluid DP-4
Front wheel speed sensor DP-6
Rear wheel speed sensor DP-9
Front brake caliper assembly DP-12
Rear brake caliper assembly DP-17
Front brake disc DP-22
Rear brake disc DP-25
Brake pedal DP-28
Separated fluid reservoir assembly DP-31
Integrated brake control assembly DP-33
Brake pipe assembly DP-36

Drive train

Rear drive shaft assembly DP-41

Steering system

Steering wheel DP-45
Steering column assembly DP-47
Power steering gear outer rod ball DP-50
Dual gear assisted type power steering gear with rod assembly DP-52

Suspension system

Front wheel alignment DP-54
Rear wheel alignment DP-56
Designed load DP-57
Hub bearing unit inspection DP-59
No.1 front lower control arm assembly DP-60
No.2 lower control arm assembly DP-62
No.2 rear upper control arm assembly DP-65
No.2 rear lower control arm assembly DP-68
Front upper control arm assembly DP-71
Front shock absorber support seat lateral stabilizer bar assembly DP-73
Front sub frame assembly DP-76
Toe-in control arm assembly DP-80
Front strut assembly DP-83
Front stabilizer bar and connecting rod DP-88
Front steering knuckle assembly DP-91
Rear upper control arm assembly DP-94
Rear lower control arm assembly DP-96
Rear sub frame assembly DP-98
Rear strut assembly DP-102
Rear stabilizer bar DP-106
Rear stabilizer bar connecting rod assembly DP-108
Rear coil spring DP-110

Rear steering knuckle assembly DP-113

Wheel system

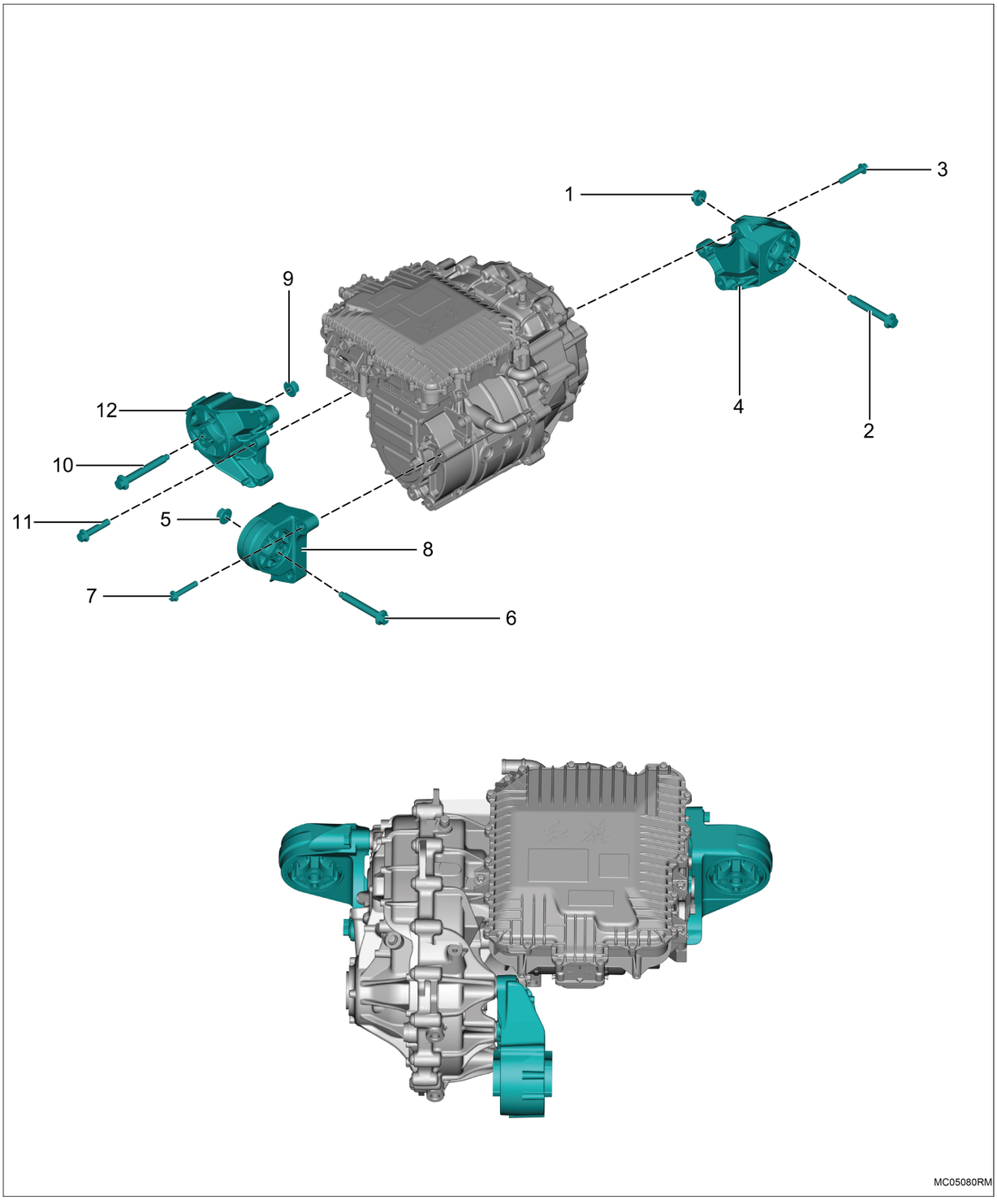
Wheel and tire DP-116
Tire pressure monitoring sensor DP-121

Mounting system

Rear motor mounting

Components

DP



1. **Hexagon flange nut**
2. **Hexagon flange bolt**

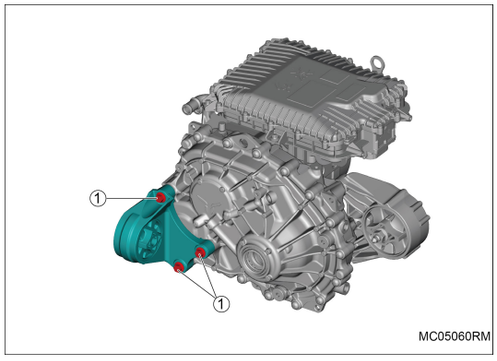
- Torque: 170 ~ 190 N • m

3. **Hexagon flange bolt**
   - X3
   - Torque: 60 ~ 70 N • m
4. **Rear motor front left mounting assembly**
5. **Hexagon flange nut**
6. **Hexagon flange bolt**
   - Torque: 170 ~ 190 N • m
7. **Hexagon flange bolt**
   - X3
   - Torque: 60 ~ 70 N • m
8. **Rear motor front right mounting assembly**
9. **Hexagon flange nut**
10. **Hexagon flange bolt**
    - Torque: 170 ~ 190 N • m
11. **Hexagon flange bolt**
    - X3
    - Torque: 60 ~ 70 N • m
12. **Rear motor rear mounting assembly**

Removal

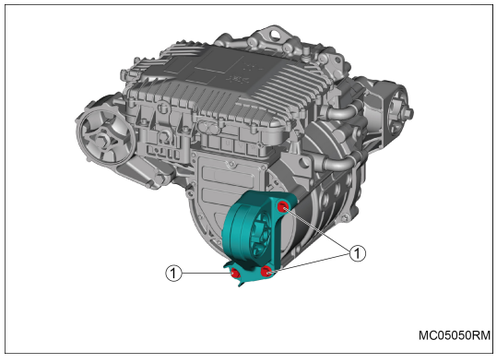
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove rear electric drive system assembly (See page DL-3)**
4. **Remove rear motor front left mounting assembly**



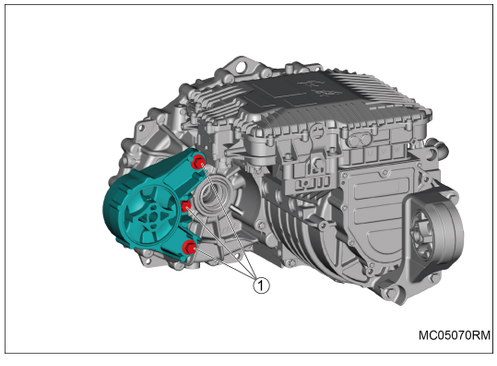
(a) Remove the bolt -1-.

5. Remove rear motor front right mounting assembly



(a) Remove the bolt -1-.

6. Remove rear motor rear mounting assembly.



(a) Remove the bolt -1-.

Installation

1. Installation is in the reverse order of removal.

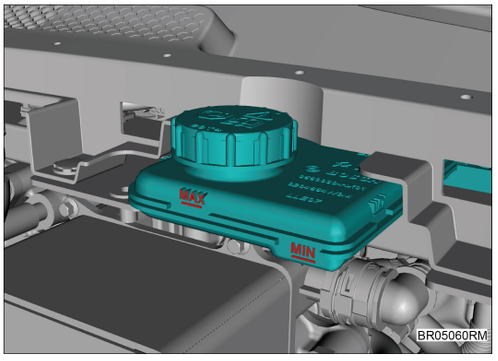
DP

Brake system

Brake fluid

On-vehicle inspection

1. Check brake fluid



(a) Check if the brake fluid level in integrated brake control assembly reservoir is between MAX and MIN marks.

Note:

- If fluid level is lower than the MIN mark, add brake fluid.
- Check brake system for leakage. If there is abnormal, repair or replace malfunctioning parts.

Replacement of brake fluid

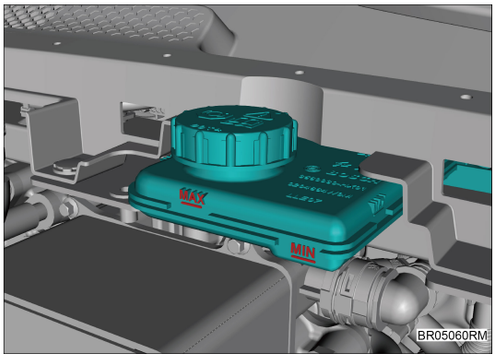
Note:

- If any operation is performed on the brake system or if air is suspected in the brake line, bleed the brake system.

1. Add brake fluid to the reservoir, and make sure that there is sufficient brake fluid in reservoir.

Brake fluid type (meet GB 12981-2012 standard)	Brake fluid capacity
BASF hydraulan 404 (DOT4)	0.85 ± 0.01 L

2. Bleed brake pipe



(a) Before bleeding the brake system, move the shift lever to P and apply the parking brake.

(b) While bleeding the brake system, add brake fluid to the level between MIN and MAX marks.

(c) If brake fluid splashes onto any paint or rubber surface, immediately wash it off.

(d) Detach dust cap, and connect the plastic pipe to the bleeder screw.

(e) Depress the brake pedal for several times, and depress and hold the pedal to release the bleeder screw.

(f) Tighten bleeder screw when the brake fluid does not overflow.

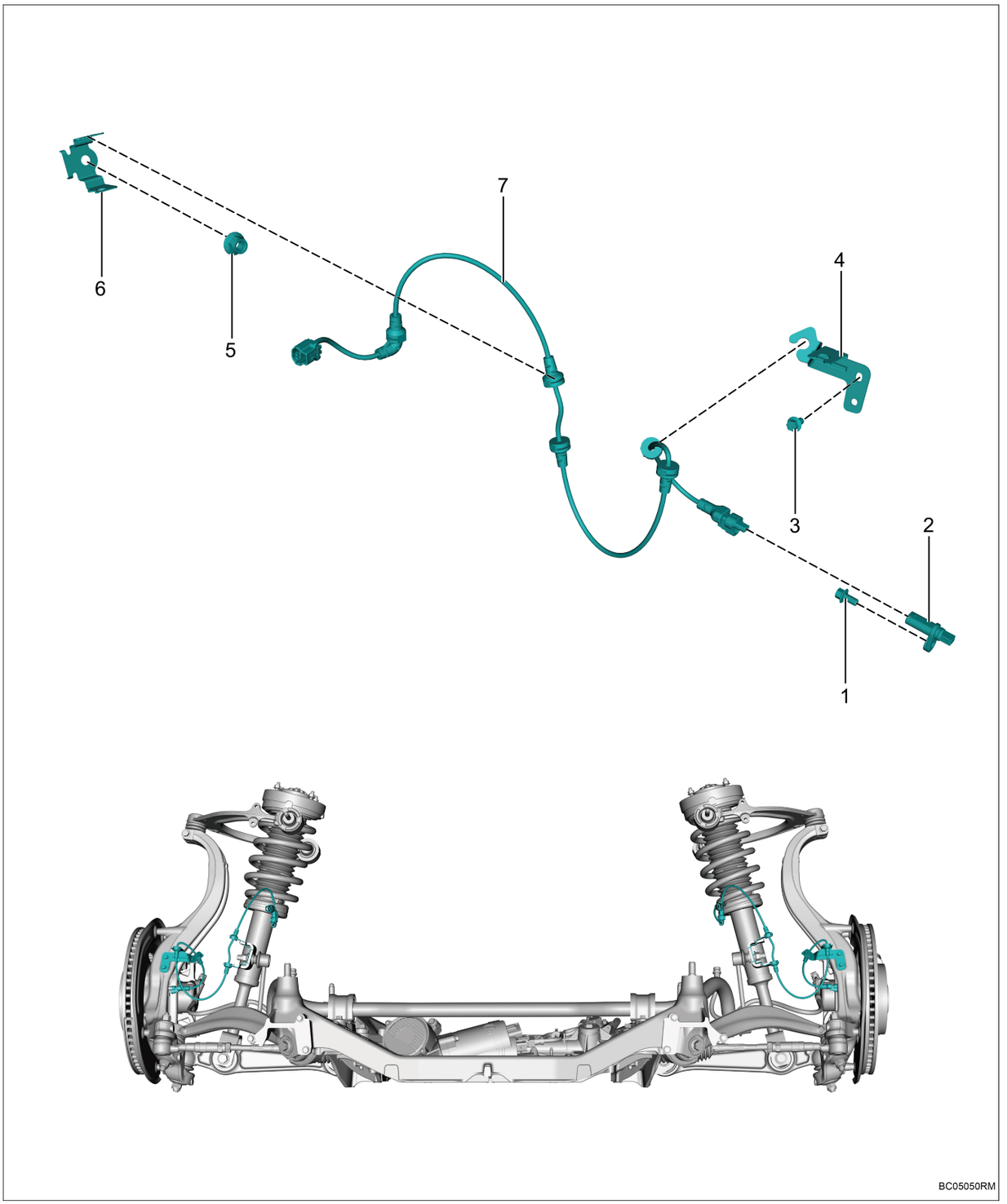
(g) Repeat for several times until there is no bubbles in the discharged brake fluid.

(h) Tighten the bleeder screw.

Front wheel speed sensor

Components

DP



1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
2. **Front left wheel speed sensor assembly**
3. **Hexagon flange bolt**

- X2
- Torque: 8 ~ 12 N • m

4. Wire harness metal bracket

5. Hexagon flange nut

- Torque: 100 ~ 120 N • m

6. Wire harness metal bracket

7. Front left wheel speed assembly

Removal

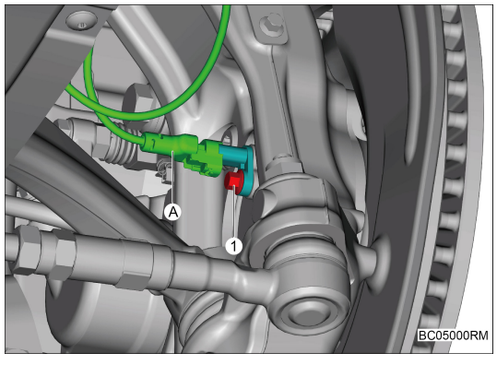
Note:

- Use same removal orders for right and left sides.

1. Disconnect negative battery terminal (See page DL-21)

2. Remove front wheels of vehicle (See page DP-116)

3. Remove front wheel speed sensor

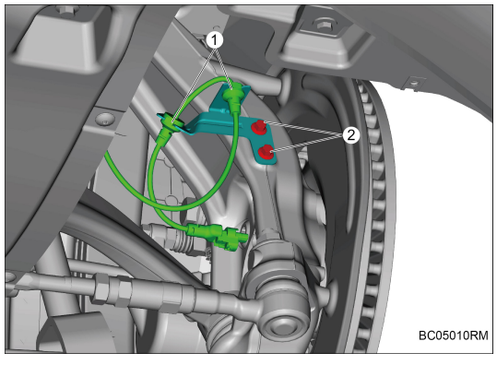


(a) Disconnect the wire harness connector -A-.

(b) Remove the bolt -1-.

(c) Remove the front wheel speed sensor.

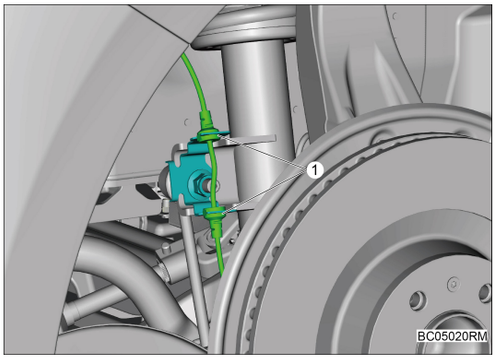
4. Remove front wheel speed sensor bracket



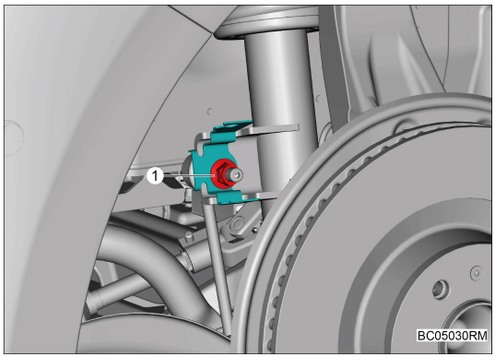
(a) Detach the front left wheel wire harness fixture -1-.

(b) Remove the bolt -2-.

(c) Remove the wire harness metal bracket.



(d) Detach the front left wheel wire harness fixture -1-.

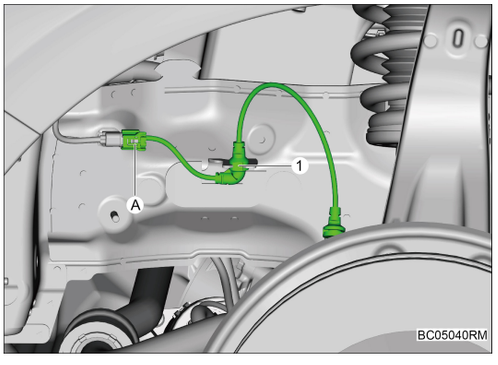


(e) Remove the nut -1-.

(f) Remove the wire harness metal bracket.

Note:

- When removing nut -1-, use the internal stop and external moving tool.



(g) Detach the front left wheel wire harness fixture -1-.

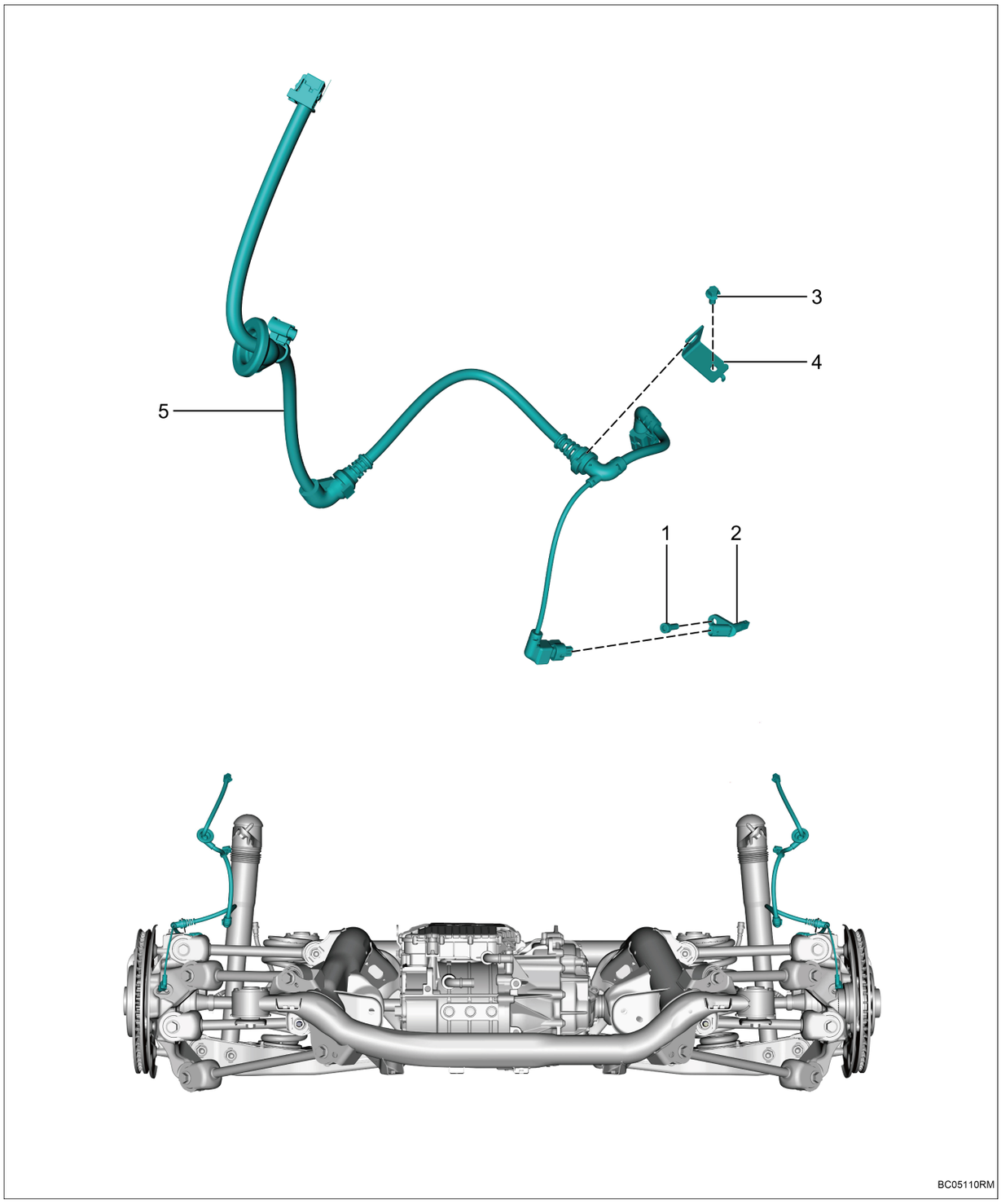
(h) Disconnect the wire harness connector -A-.

Installation

1. **Installation is in the reverse order of removal.**

Rear wheel speed sensor

Components



1. **Inner hexagon socket cap screw**
   - Torque: 8 ~ 10 N • m
2. **Rear left wheel speed sensor assembly**
3. **Hexagon flange bolt**

- Torque: 8 ~ 10 N • m

4. **Rear left wheel wire harness metal bracket**
5. **Rear left wheel wire harness assembly**

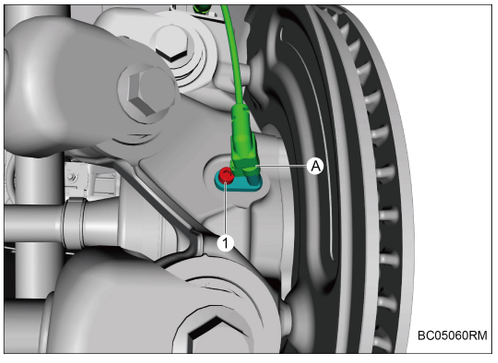
DP

Removal

Note:

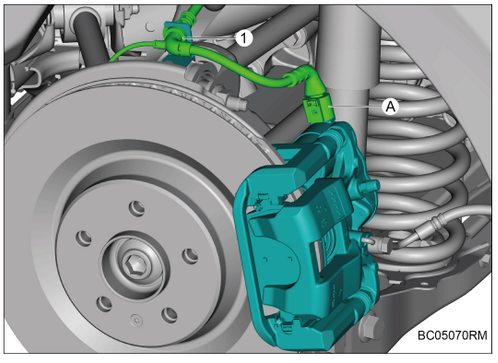
- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove rear wheel speed sensor**



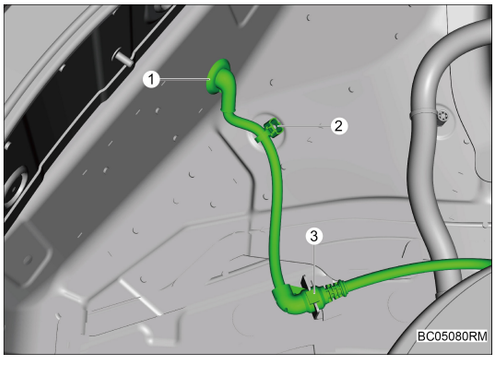
(a) Disconnect the wire harness connector -A-.
(b) Remove the bolt -1-.
(c) Remove the rear wheel speed sensor.

4. **Remove brake pad alarm wire harness**

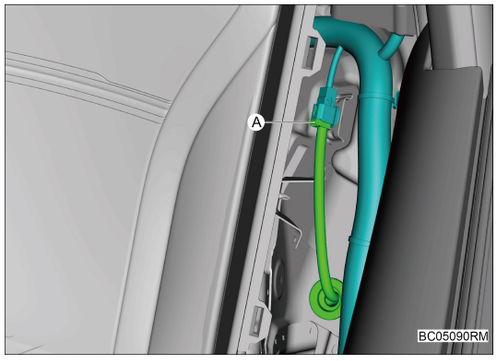


(a) Disconnect the electronic parking wire harness -A-.
(b) Detach the rear left wire harness fixing clip -1-.

5. **Remove rear seatback side wing assembly (See page NS-108)**
6. **Remove rear left wheel wire harness assembly**



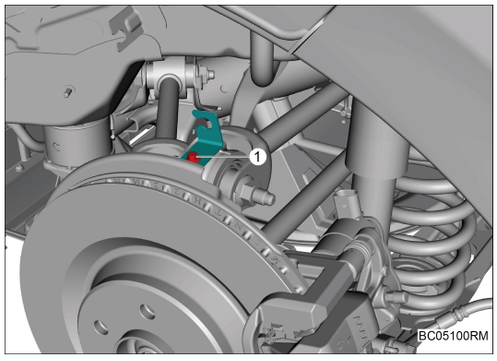
(a) Detach the wire harness protector -1-.
(b) Detach the rear left wire harness fixing clip -2-.
(c) Disengage the wire harness fixture -3-.



(d) Disconnect the wire harness connector -A-.

(e) Remove the rear left wheel wire harness assembly.

7. Remove rear left wheel wire harness metal bracket



(a) Remove the bolt -1-.

(b) Remove the wire harness metal bracket.

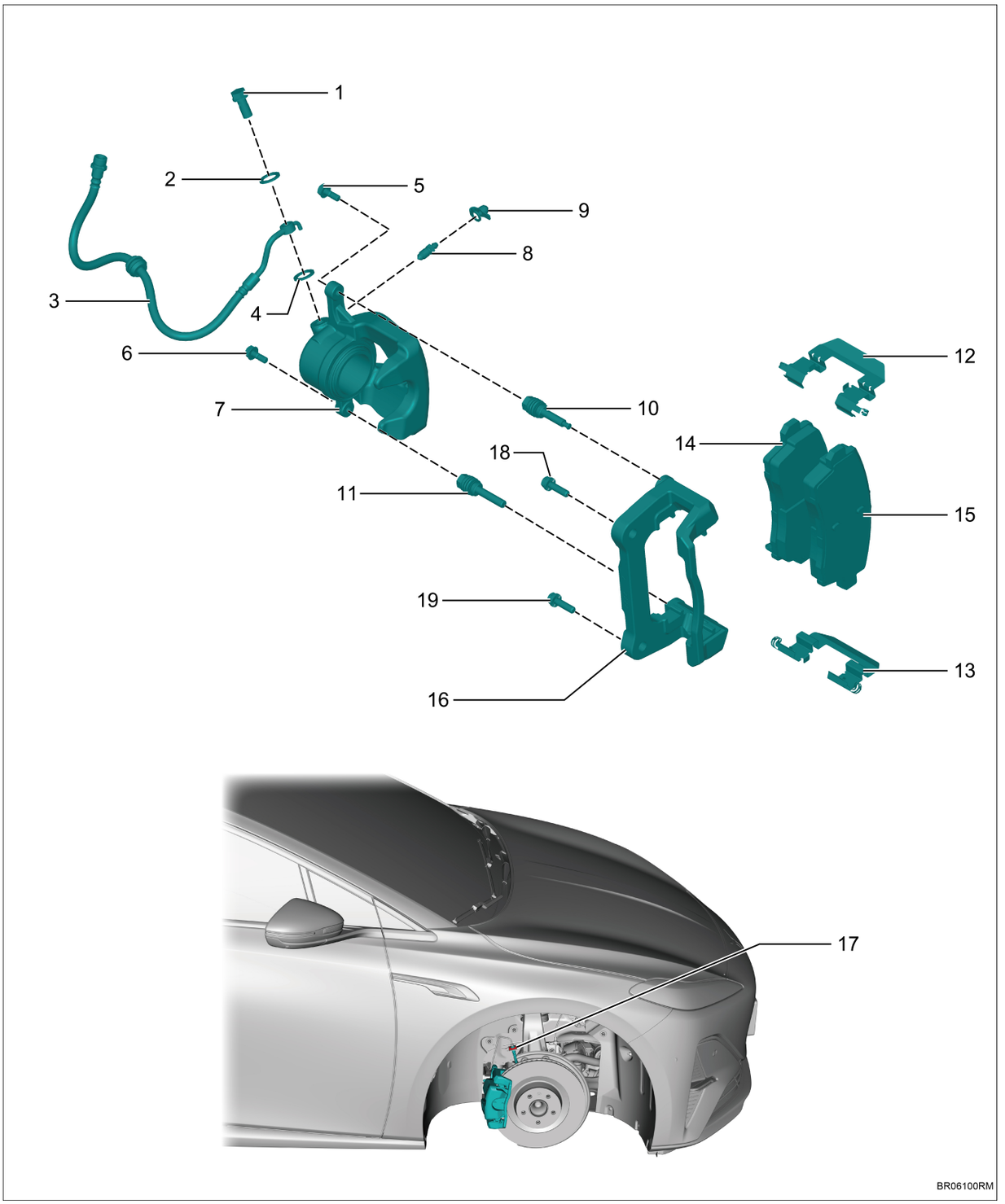
Installation

1. Installation is in the reverse order of removal.

Front brake caliper assembly

Components

DP



1. **Coupling bolt**
   - Torque: 22 ~ 29 N • m
2. **Gasket-hollow bolt**
3. **Front brake hose assembly**

4. **Gasket-hollow bolt**
5. **Hexagon flange bolt**
   - Torque: 30 ~ 35 N • m
6. **Hexagon flange bolt**
   - Torque: 30 ~ 35 N • m
7. **Brake caliper body**
8. **Bleeder screw**
9. **Bleeder screw cover**
10. **Pin**
11. **Pin**
12. **Brake lining snap spring assembly**
13. **Brake lining snap spring assembly**
14. **Front inside brake lining**
15. **Front outside brake lining**
16. **Front brake caliper bracket**
17. **Brake hose clamping piece**
18. **Combination bolt**
    - Torque: 195 ~ 215 N • m
19. **Combination bolt**
    - Torque: 195 ~ 215 N • m

Removal

Note:

- Use same removal orders for right and left sides.

1. **Raise the vehicle.**
2. **Remove front wheels of vehicle (See page DP-116)**
3. **Drain brake fluid (See page DP-4)**

   Note:

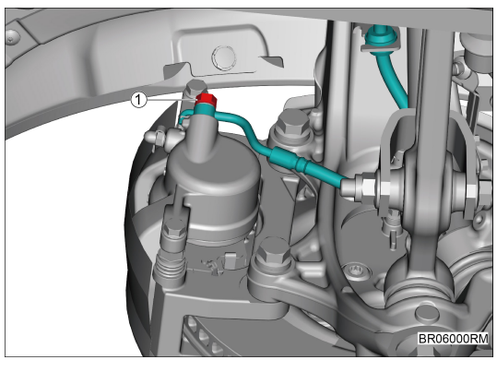
   - It is not necessary to drain the brake fluid when removing brake lining.
4. **Remove front brake caliper body assembly**

   (a) Remove the bolt -1-.

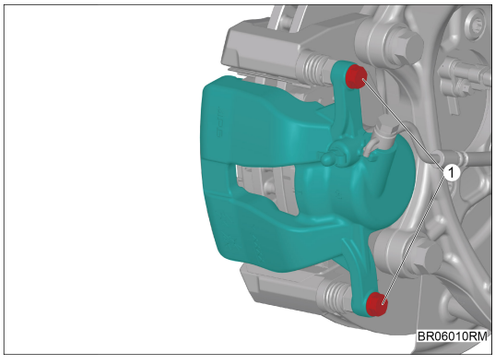
   (b) Detach the front left brake hose assembly.

   Note:

   - It is not necessary to disconnect front brake hose assembly when removing brake lining.



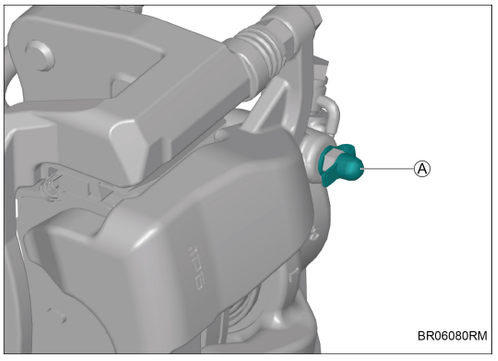
DP



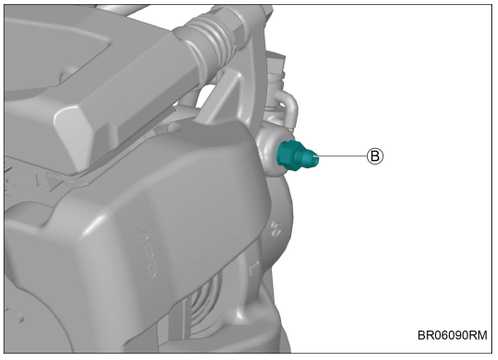
(c) Remove the bolt -1-.

(d) Detach the front brake caliper body assembly.

5. Remove bleeder screw

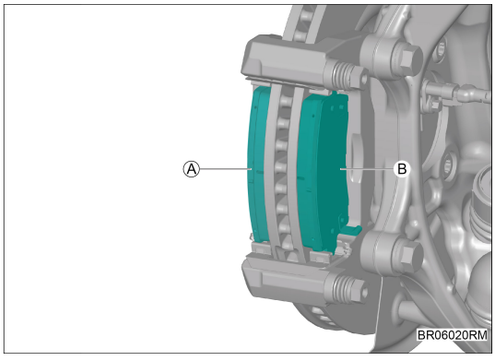


(a) Remove the bleeder screw cover -A-.



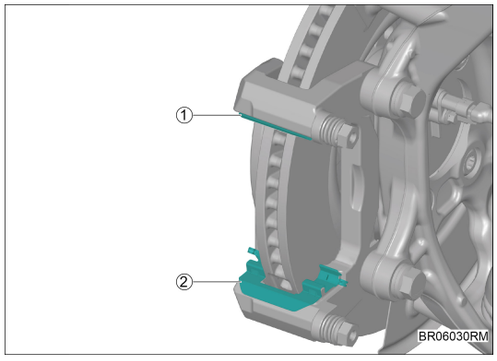
(b) Remove the bleeder screw -B-.

6. Remove brake lining



(a) Remove the front outside brake lining assembly -A-.

(b) Remove the front inside brake lining assembly -B-.

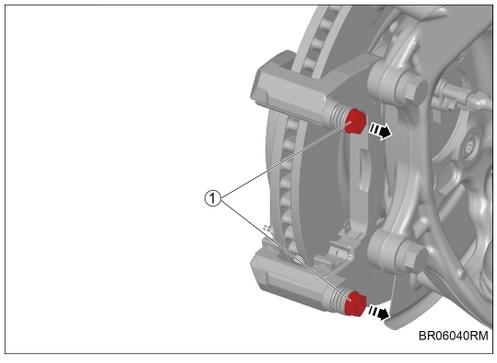


(c) Remove the brake lining snap spring assemblies -1-2-.

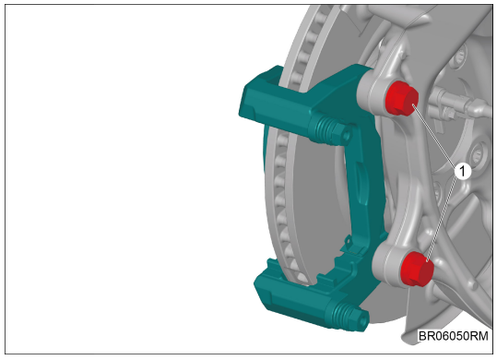
(d) The standard thickness of the lining is as follows:

	Pad thickness	
Standard thickness	Total thickness of front inside brake lining 16.1 mm	Friction material thickness 9 mm
	Total thickness of front outside brake lining 15.8 mm	Friction material thickness 9 mm
Minimum thickness	Total thickness of front inside brake lining 9.1 mm	Friction material thickness 2 mm
	Total thickness of front outside brake lining 8.8 mm	Friction material thickness 2 mm

7. Remove front brake caliper bracket



(a) Remove the pin -1- in the direction of -arrow-.

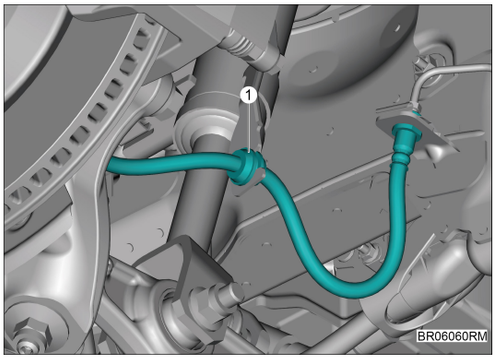


(b) Remove the bolt -1-.

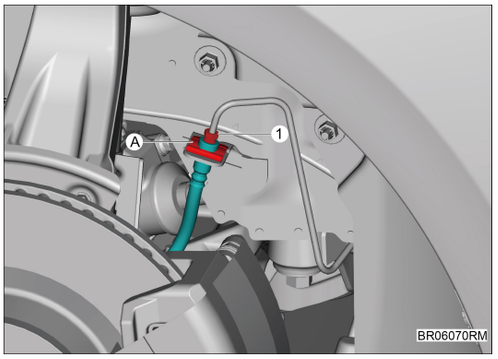
(c) Remove the front brake caliper bracket.

8. Remove front brake hose assembly

DP



(a) Detach the front brake hose fixture -1-.



(b) Detach the fluid pipe assembly nut -1-.

(c) Remove the front brake hose clamping piece -A-.

Installation

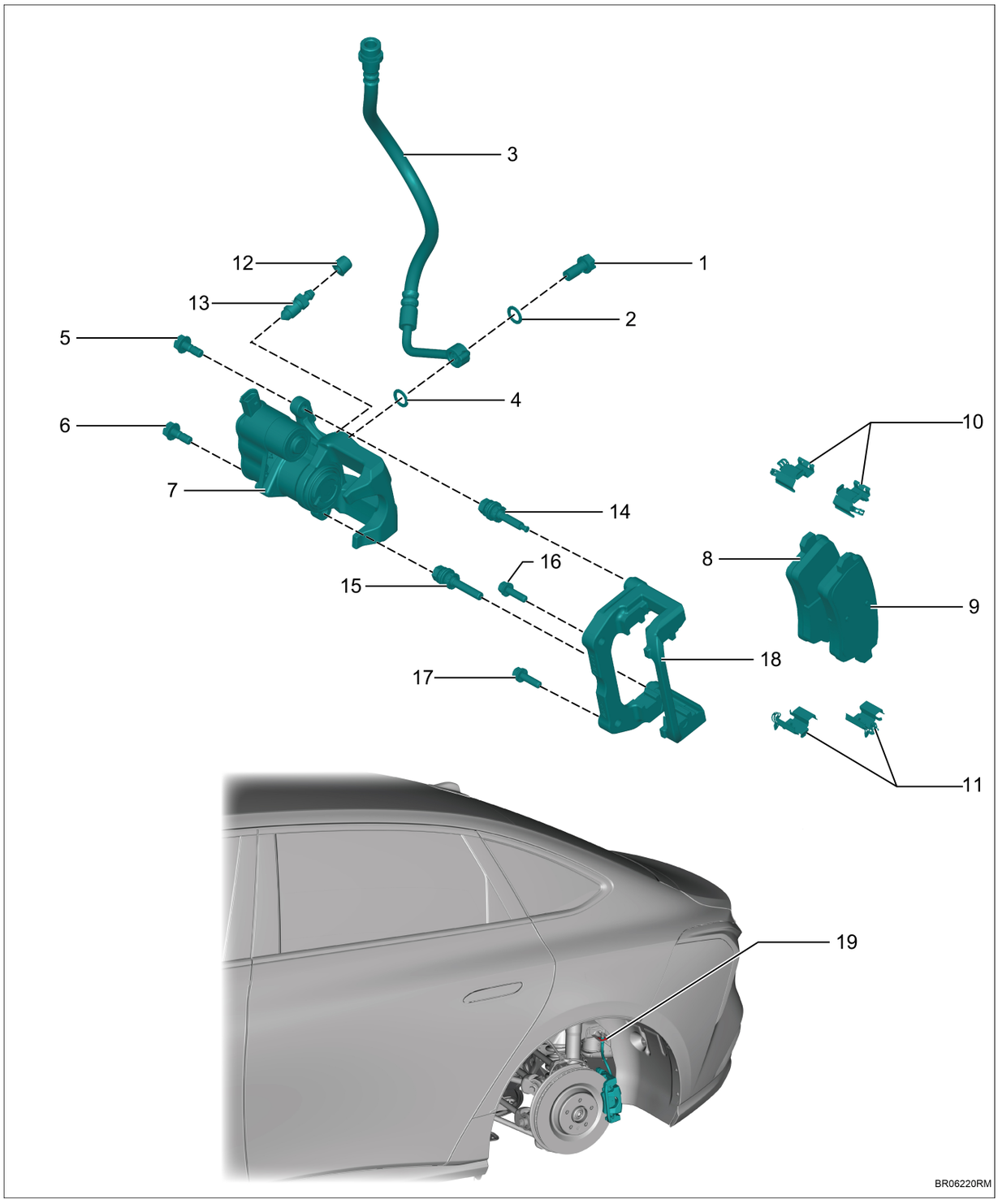
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **After replacing the brake pad, please depress the brake pedal several times before driving.**

Rear brake caliper assembly

Components



1. **Coupling bolt**
   - Torque: 22 ~ 29 N • m
2. **Gasket-hollow bolt**
3. **Rear brake hose assembly**

4. **Gasket-hollow bolt**
5. **Hexagon flange bolt**
   - Torque: 30 ~ 33 N • m
6. **Hexagon flange bolt**
   - Torque: 30 ~ 33 N • m
7. **Rear brake caliper body assembly**
8. **Rear inside brake lining assembly**
9. **Rear outside brake lining assembly**
10. **Brake lining snap spring**
11. **Brake lining snap spring**
12. **Bleeder screw cover**
13. **Bleeder screw**
14. **Pin**
15. **Pin**
16. **Combination bolt**
    - Torque: 100 ~ 120 N • m
17. **Combination bolt**
    - Torque: 100 ~ 120 N • m
18. **Rear brake caliper bracket**
19. **Brake hose clamping piece**

Removal

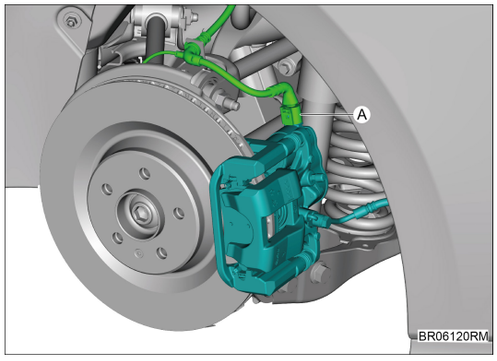
Note:

- Use same removal orders for right and left sides.

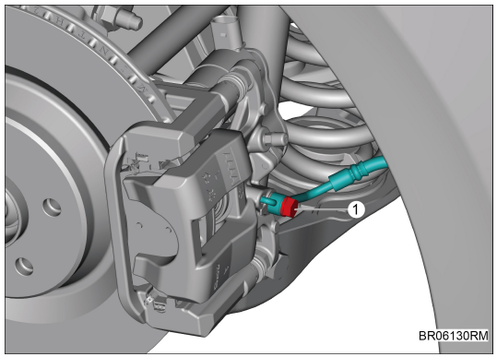
1. **Turn ignition switch to ON.**
2. **Connect diagnostic tester HQ-VDS and enter service mode to release caliper.**
3. **Raise the vehicle.**
4. **Remove rear wheels of vehicle (See page DP-116)**
5. **Disconnect negative battery terminal (See page DL-21)**
6. **Drain brake fluid (See page DP-4)**

   Note:

   - It is not necessary to drain the brake fluid when removing brake lining.
7. **Remove rear brake caliper body assembly**



(a) Disconnect the EPB motor wire harness connector -A-.

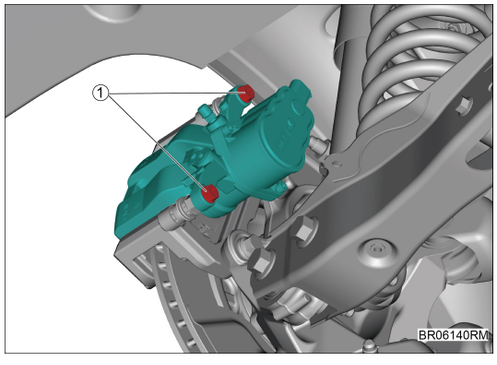


(b) Remove the bolt -1-.

(c) Detach the rear left brake hose assembly.

Note:

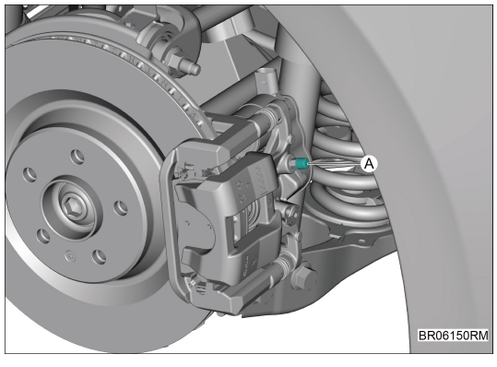
- It is not necessary to disconnect rear brake hose assembly when removing brake lining.



(d) Remove the bolt -1-.

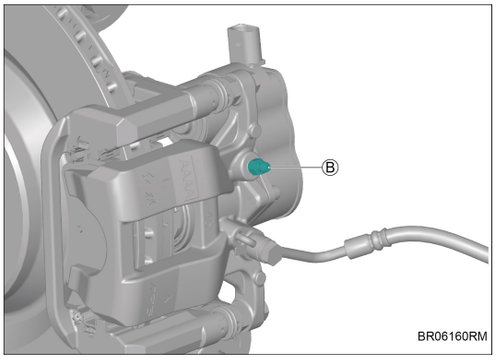
(e) Remove the rear brake caliper body assembly.

8. Remove bleeder screw



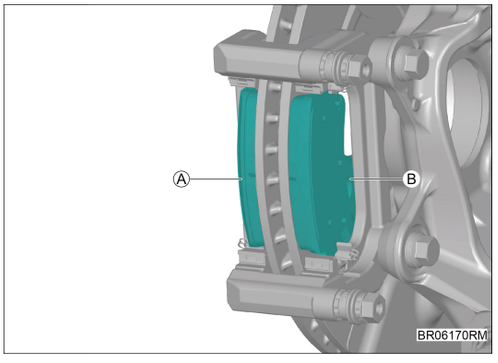
(a) Remove the bleeder screw cover -A-.

DP



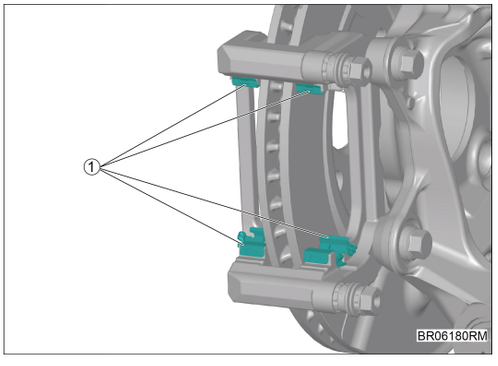
(b) Remove the bleeder screw -B-.

9. Remove brake lining



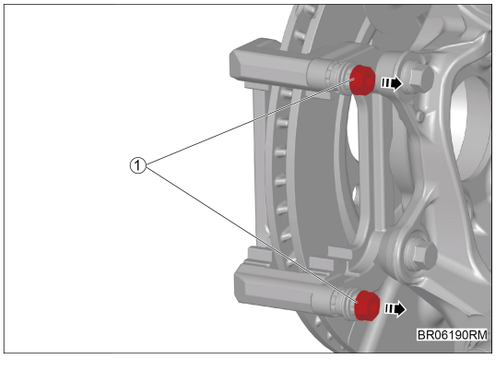
(a) Remove the brake plates -A-B-.

	Pad thickness	
Standard thickness	Total thickness of rear inside brake lining 15.4 mm	Friction material thickness 8 mm
	Total thickness of rear outside brake lining 15.1 mm	Friction material thickness 8 mm
Minimum thickness	Total thickness of rear inside brake lining 9.9 mm	Friction material thickness 2.5 mm
	Total thickness of rear outside brake lining 9.6 mm	Friction material thickness 2.5 mm

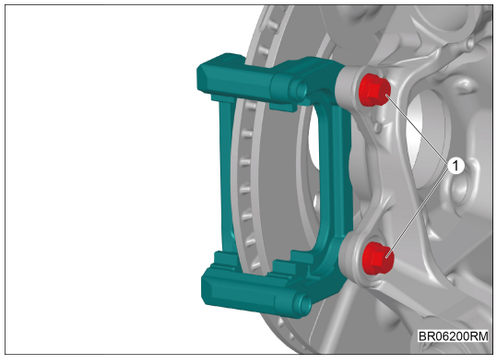


(b) Remove the brake pad spring bracket -1-.

10. Remove brake caliper bracket



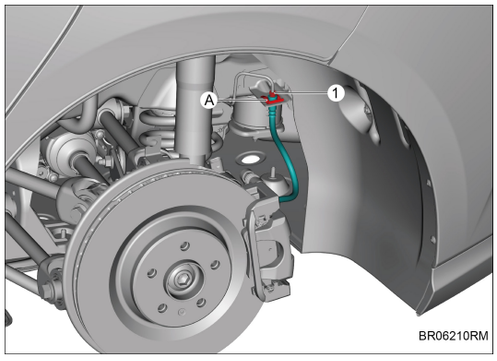
(a) Remove the pin -1- in the direction of -arrow-.



(b) Remove the bolt -1-.

(c) Remove the rear brake caliper bracket.

11. Remove rear brake hose



(a) Detach the brake fluid pipe assembly nut -1-.

(b) Remove the rear brake hose clamping piece -A-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

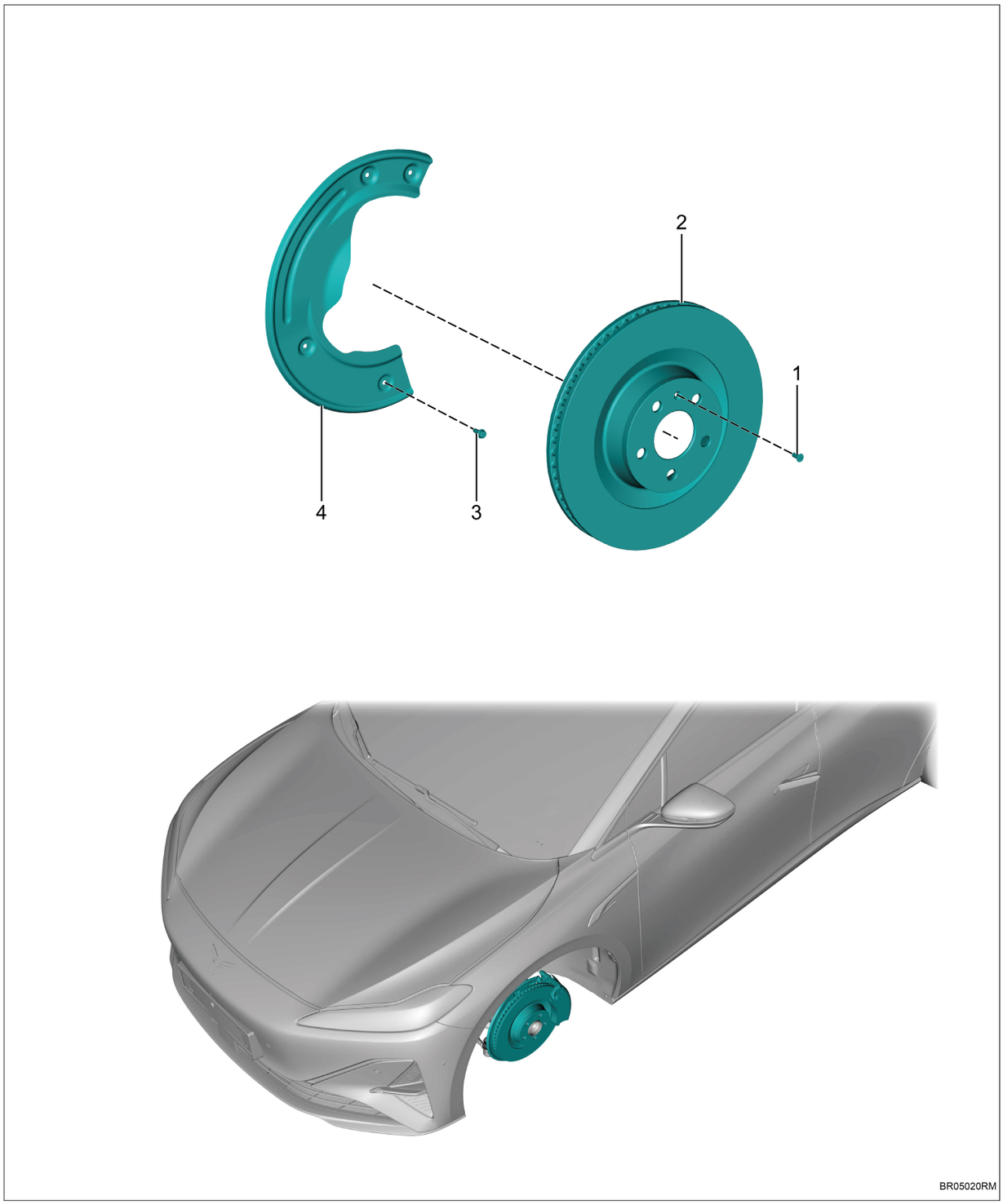
Notice:

- **After replacing the brake pad, please depress the brake pedal several times before driving.**

Front brake disc

Components

DP



1. **Screw**
   - Torque: 8 ~ 12 N • m
   - Non-reusable part
2. **Front brake disc**

3. Hexagon flange bolt

- X4
- Torque: 8 ~ 12 N • m

4. Front left dust disc

Removal

Note:

- Use same removal orders for right and left sides.

1. Raise the vehicle.

2. Remove front wheels of vehicle (See page DP-116)

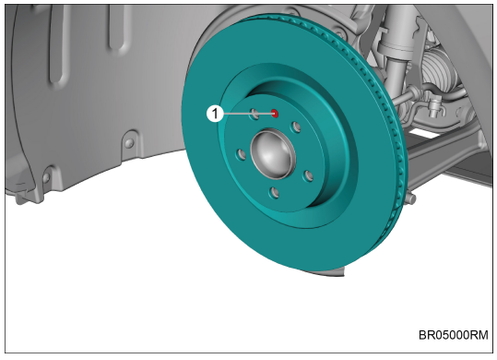
3. Remove front brake caliper assembly (See page DP-12)

Note:

- After removal, hang front brake caliper assembly with hook without disconnecting the fluid pipe.

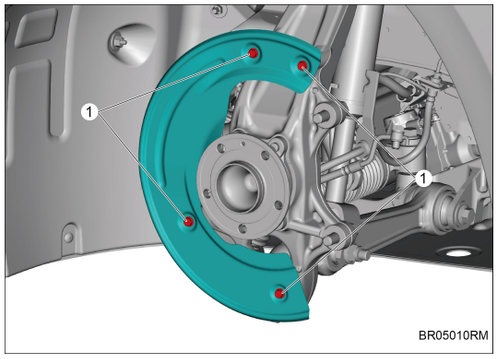
4. Remove front brake disc

(a) Remove the screw -1-.



5. Remove front left dust disc

(a) Remove the bolt -1-.



Inspection

1. Check brake disc thickness

(a) Measure brake disc thickness with a micrometer.

Standard thickness	28 mm
Minimum thickness	26 mm

DP

Note:

- If brake disc thickness is less than the minimum value, replace front brake disc.

2. **Check brake disc axial runout**

   (a) Fix the front brake disc with the brake disc locating screw and wheel bolt.

   (b) Wipe the surface of brake disc friction ring with a clean cloth.

   (c) Hub bearing unit assembly axial runout.

   (d) Using a dial indicator, measure the axial runout of brake disc at the position 10 mm away from the front brake disc outer edge.

   Note:

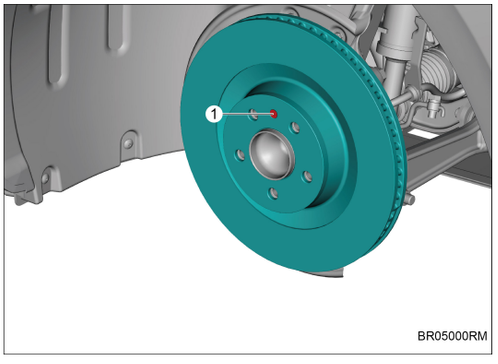
   - Maximum brake disc axial runout: 0.06 mm.

   Note:

   - The magnetic of dial indicator should be away from the hub bearing unit assembly and speed sensor.
   - Connect the dial indicator to shock absorber, if the axial runout is more than the maximum value, change the installation position of the brake disc on the hub bearing unit assembly to reduce the axial runout. If axial runout still exceeds the maximum value after changing the installation position, replace the front brake disc.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



   (a) Install the screw -1-.

   Notice:

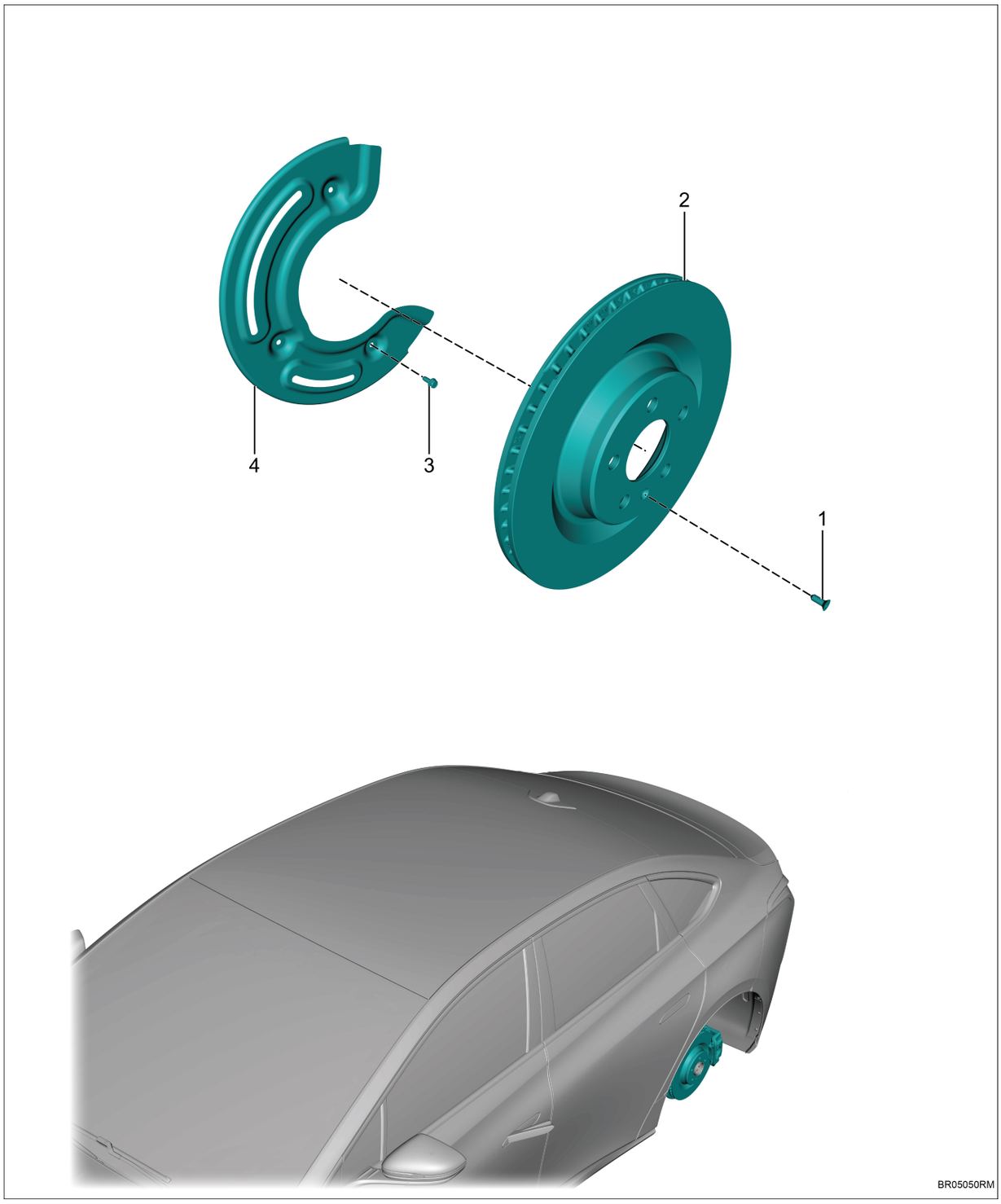
   - **Remove the thread adhesive from the threaded hole before installation.**

   Note:

   - Screws are non-reusable parts.

Rear brake disc

Components



1. **Screw**
   - Torque: 8 ~ 12 N • m
   - Non-reusable part
2. **Rear brake disc**

3. Hexagon flange bolt

- X3
- Torque: 8 ~ 12 N • m

DP **4. Rear left dust disc**

Removal

Note:

- Use same removal orders for right and left sides.

1. Raise the vehicle.

2. Remove rear wheels of vehicle (See page DP-116)

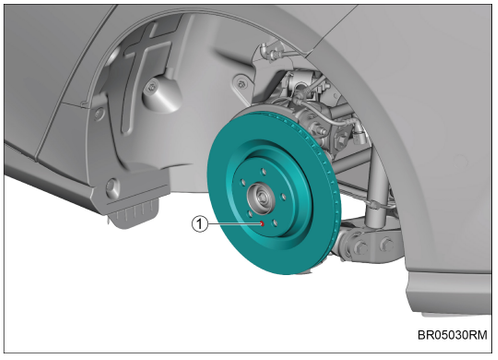
3. Remove rear brake caliper assembly (See page DP-17)

Note:

- After removal hang rear brake caliper assembly with hook without disconnecting the fluid pipe.

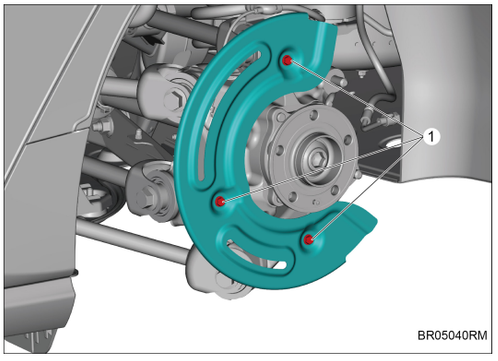
4. Remove rear brake disc

(a) Remove the screw -1-.



5. Remove rear left dust disc

(a) Remove the bolt -1-.



Inspection

1. Check brake disc thickness

(a) Measure brake disc thickness with a micrometer.

Standard thickness	24 mm
Minimum thickness	22 mm

Note:

- If brake disc thickness is less than the minimum value, replace rear brake disc.

2. **Check the brake disc axial runout.**

   (a) Fix the rear brake disc with the brake disc locating screw and wheel bolt.

   (b) Wipe the surface of brake disc friction ring with a clean cloth.

   (c) Check the hub bearing unit assembly axial runout.

   (d) Using a dial indicator, measure the axial runout of brake disc at the position 10 mm away from the rear brake disc outer edge.

   Note:

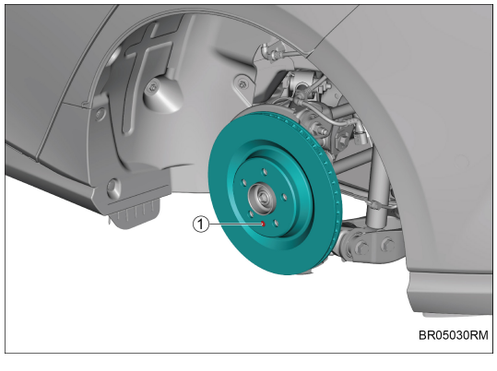
   - Maximum brake disc axial runout: 0.06 mm

   Note:

   - The magnetic of dial indicator should be away from the hub bearing unit assembly and speed sensor.
   - Connect the dial indicator to shock absorber, if the axial runout is more than the maximum value, change the installation position of the brake disc on the hub bearing unit assembly to reduce the axial runout. If axial runout still exceeds the maximum value after changing the installation position, replace the rear brake disc.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



   (a) Install the screw -1-.

   Notice:

   - **Remove the thread adhesive from the threaded hole before installation.**

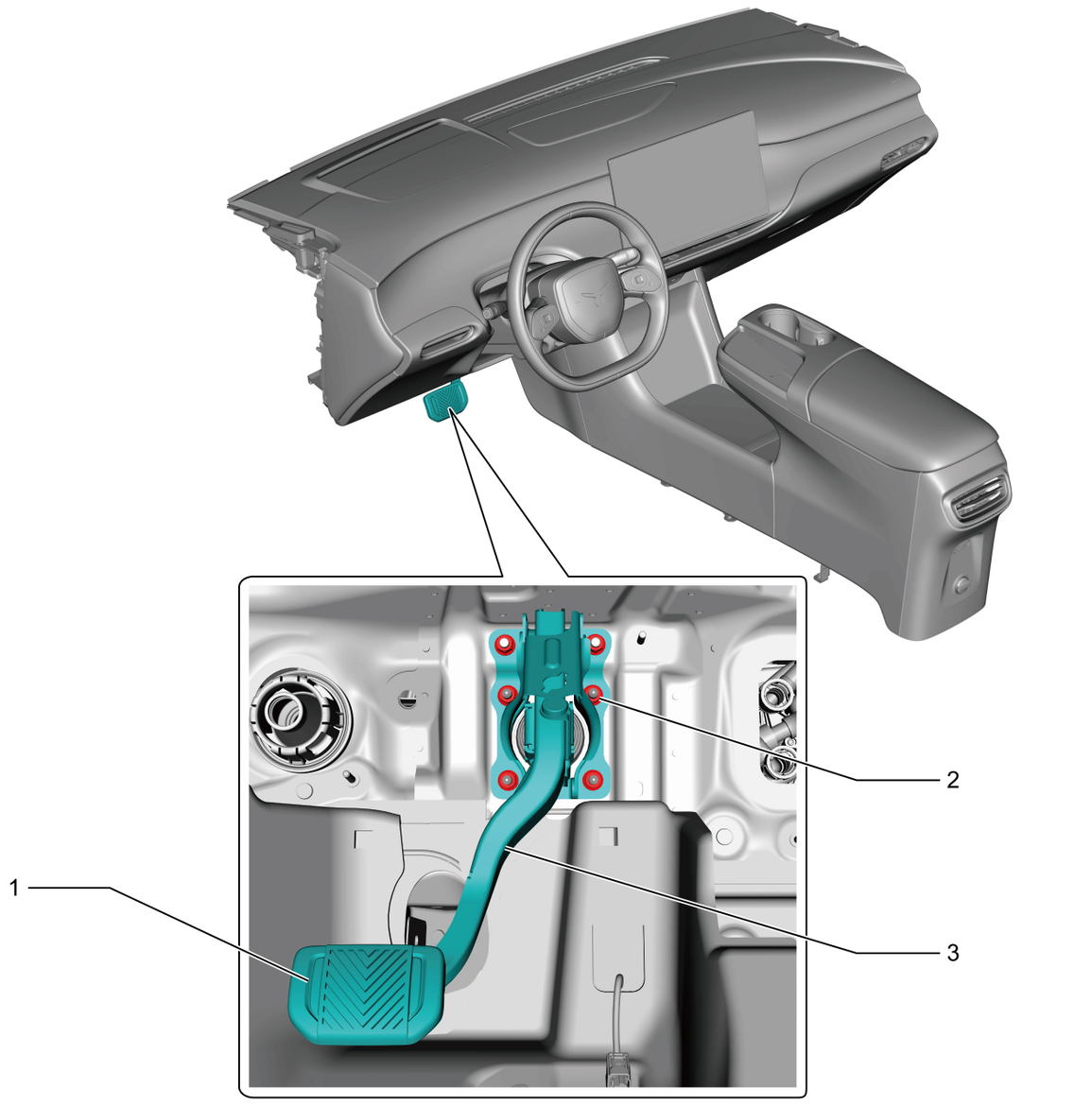
   Note:

   - Screws are non-reusable parts.

Brake pedal

Components

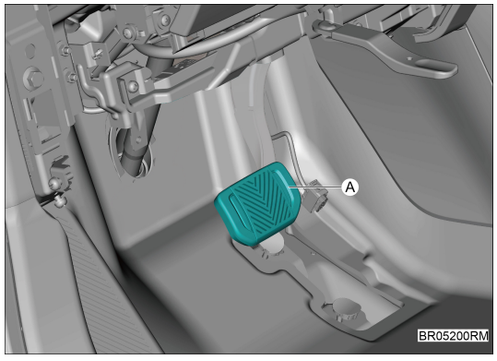
DP



1. **Pedal pad**
2. **Hexagon flange nut**
   - X6
   - Pre-tightening torque: 8 N • m
   - Torque: 20.6 ~ 27.5 N • m
3. **Brake pedal and bracket assembly**

Removal

1. Remove pedal pad



(a) Remove the pedal pad -A-.

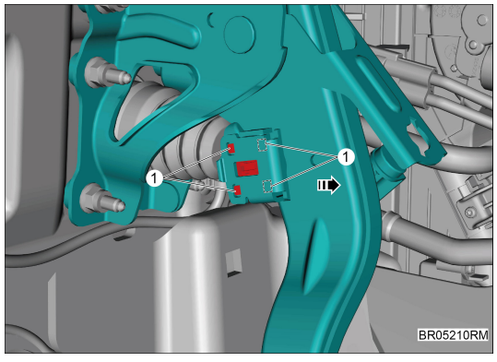
2. Disconnect negative battery terminal (See page DL-21)

3. Remove lower left protector assembly (See page NS-40)

4. Remove brake pedal

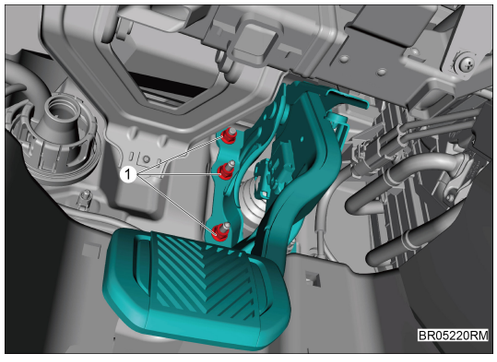
Note:

- Brake pedal free travel: ⩽ 12 mm
- Brake pedal travel: 172 mm



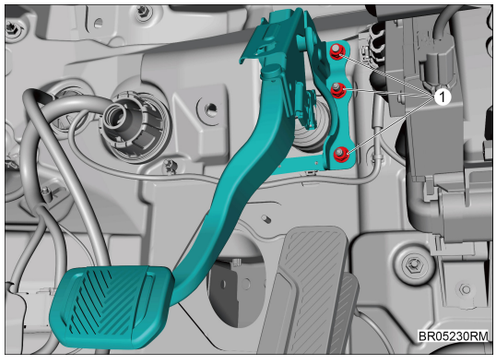
(a) Detach 4 fixing claws -1- in total on left and right sides.

(b) Pull the brake pedal in the direction of -arrow-.



(c) Remove the nut -1-.

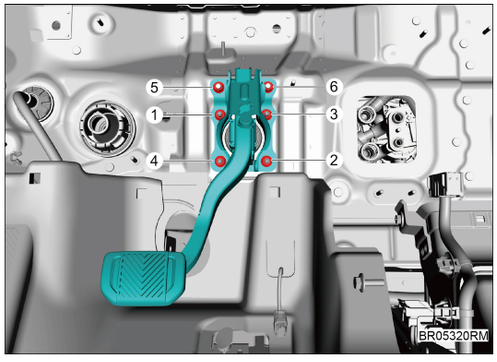
DP



(d) Remove the nut -1-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



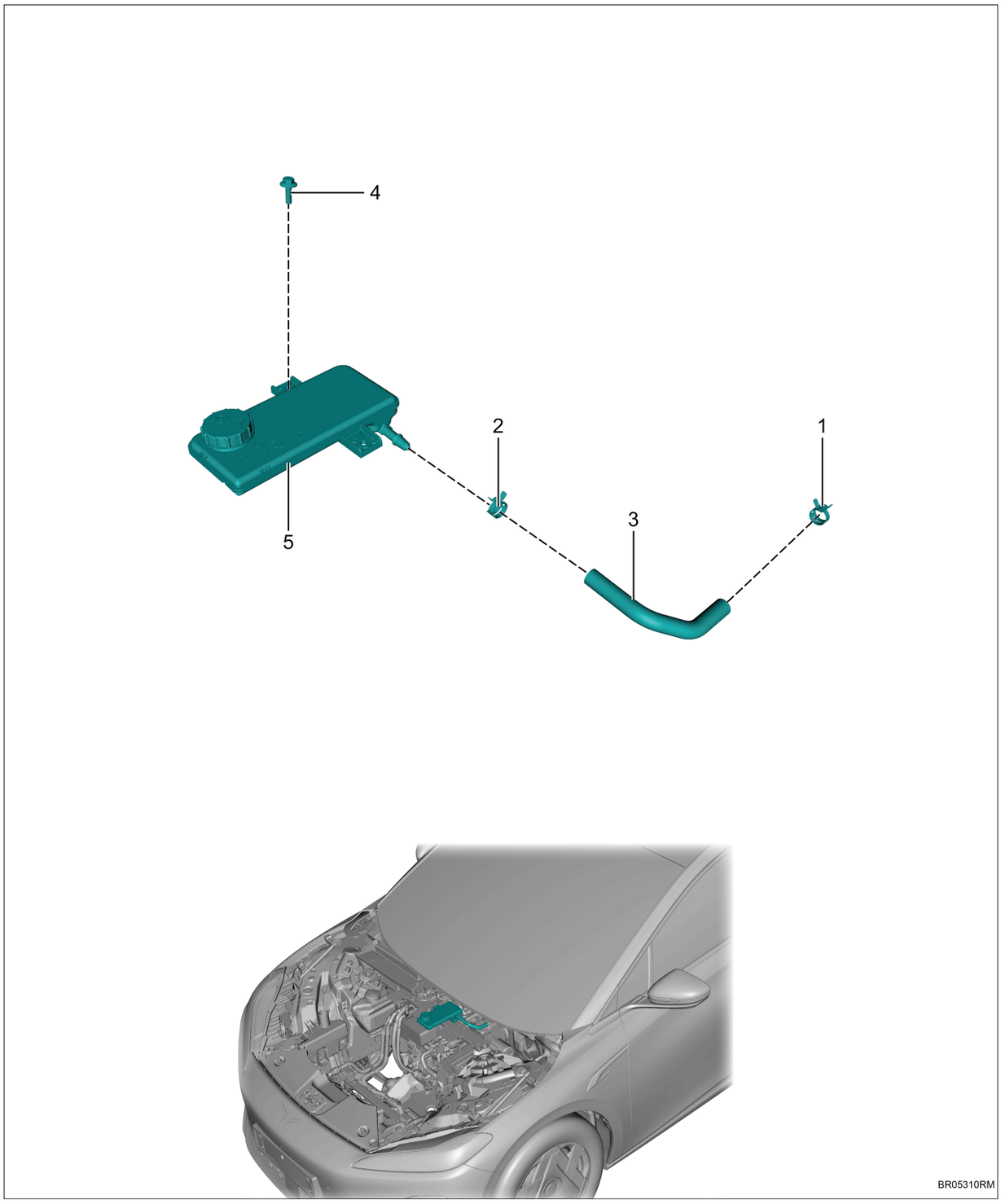
(a) Pre-tighten nuts, then finally tighten them.

(b) Installation sequence for nuts is -1-2-3-4-5-6-.

- Pre-tightening torque: 8 N • m
- Torque: 20.6 ~ 27.5 N • m

Separated fluid reservoir assembly

Components



1. **Steel belt type elastic hose clamp**
2. **Steel belt type elastic hose clamp**
3. **Reservoir connecting pipe**
4. **Hexagon flange bolt**

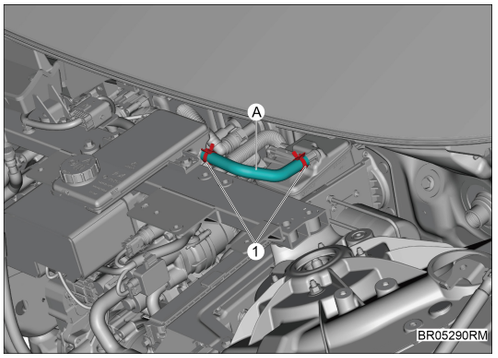
- X2
- Torque: 8 ~ 12 N • m

5. Separated fluid reservoir assembly

DP

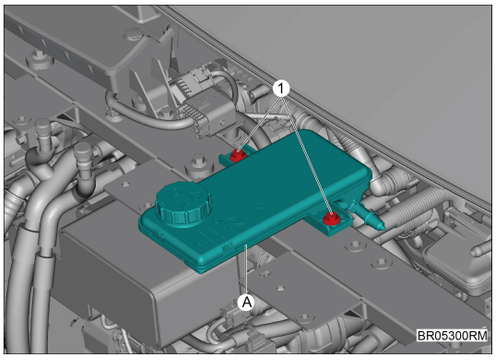
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment upper protector (See page WS-79)**
3. **Drain brake fluid (See page DP-4)**
4. **Remove separated fluid reservoir assembly**



(a) Detach the hose clamp -1-.

(b) Detach the reservoir connecting hose -A-.



(c) Remove the bolt -1-.

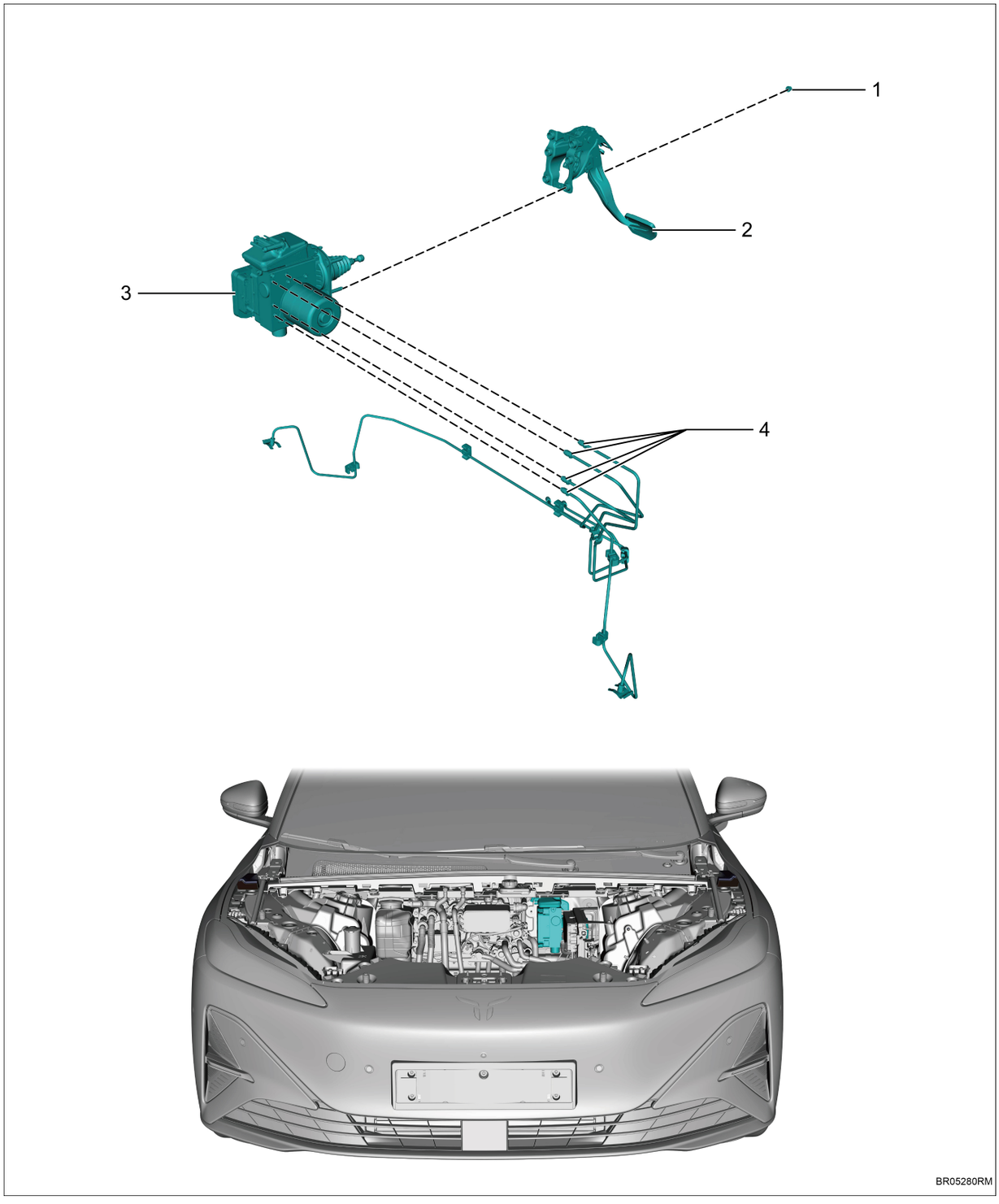
(d) Remove the separated fluid reservoir assembly -A-.

Installation

1. **Installation is in the reverse order of removal.**

Integrated brake control assembly

Components



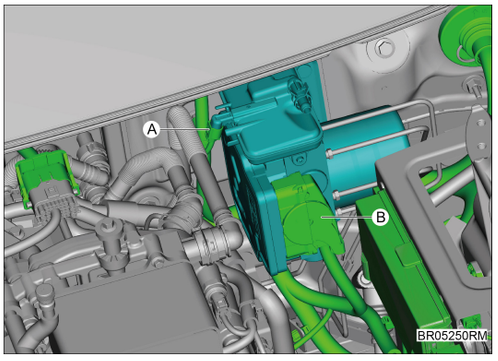
1. **Hexagon flange locking nut**
   - X6
   - Torque: 20.6 ~ 27.5 N • m
2. **Brake pedal and bracket assembly**

3. **Integrated brake control assembly**
4. **Brake fluid pipe nut**
   - Torque: 14 ~ 18 N • m

DP

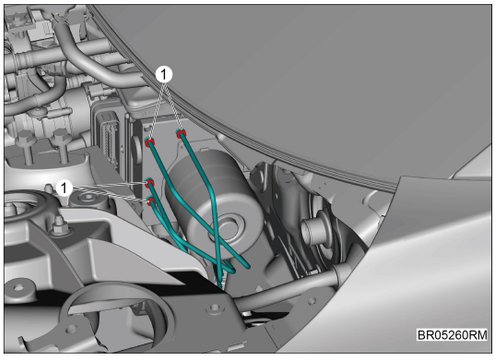
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment storage box (See page WS-83)**
3. **Remove water channel cover plate (See page WS-86)**
4. **Drain brake fluid (See page DP-4)**
5. **Remove front PDC fixing bracket assembly (See page ZC-128)**
6. **Remove instrument panel lower left protector (See page NS-29)**
7. **Remove brake pedal (See page DP-28)**
8. **Remove separated fluid reservoir (See page DP-31)**
9. **Remove integrated brake control assembly**

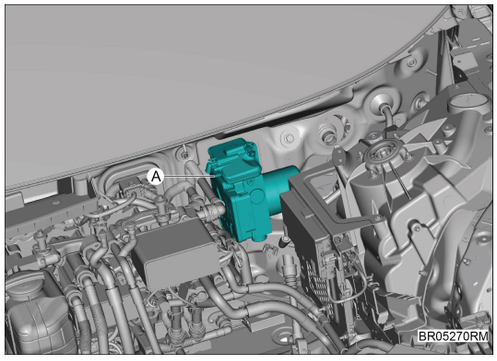


(a) Disconnect the brake fluid level sensor wire harness connector -A-.

(b) Disconnect the integrated brake control assembly wire harness connector -B-.



(c) Detach the fuel pipe nut -1-.



(d) Remove the integrated brake control assembly -A-.

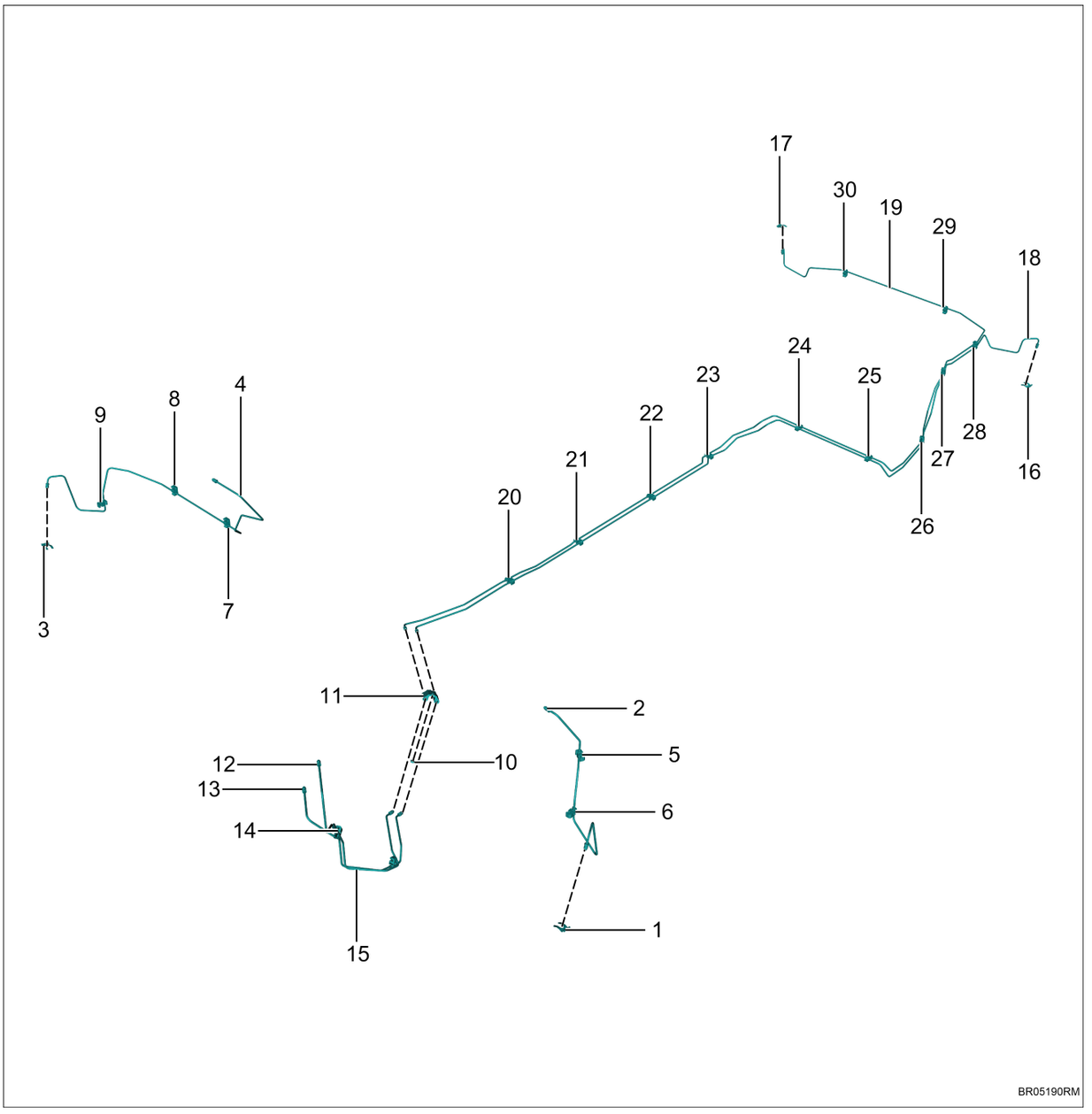
Installation

1. Installation is in the reverse order of removal.

Brake pipe assembly

Components

DP



1. **Clamping piece - front brake hose**
2. **Front left brake pipe assembly**
   - Through hole block cover
3. **Clamping piece - front brake hose**
4. **Front right brake pipe assembly**
5. **Dual pipe clamp**
6. **Dual pipe clamp**
7. **Dual pipe clamp**

8. **Dual pipe clamp**
9. **Dual pipe clamp**
10. **Hexagon flange nut**
    - Torque: 8 ~ 12 N • m
11. **Two-way joint**
12. **Rear left brake pipe assembly I**
    - Through hole block cover
13. **Rear right brake pipe assembly I**
    - Through hole block cover
14. **Dual pipe clamp**
15. **Dual pipe clamp**
16. **Clamping piece - rear brake hose**
17. **Clamping piece - rear brake hose**
18. **Rear left brake pipe assembly II**
19. **Rear right brake pipe assembly II**
20. **Dual pipe clamp**
21. **Dual pipe clamp**
22. **Dual pipe clamp**
23. **Dual pipe clamp**
24. **Dual pipe clamp**
25. **Dual pipe clamp**
26. **Dual pipe clamp**
27. **Dual pipe clamp**
28. **Dual pipe clamp**
29. **Dual pipe clamp**
30. **Dual pipe clamp**
31. **Dual pipe clamp**
32. **Dual pipe clamp**
33. **Dual pipe clamp**

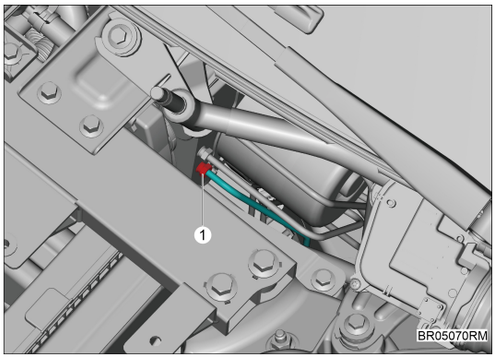
Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove water channel cover plate assembly (See page WS-86)**
3. **Remove front left wheel protector (See page WS-32)**
4. **Drain brake fluid (See page DP-4)**

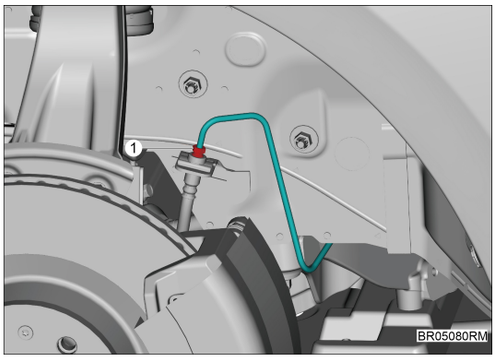
DP

5. Remove engine bottom protector (See page WS-40)

6. Remove front left brake fluid pipe



(a) Detach the fuel pipe nut -1-.

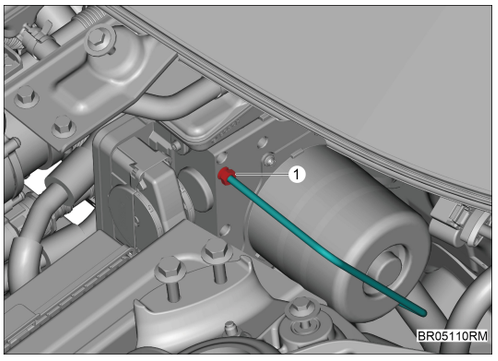


(b) Detach the fuel pipe nut -1-.

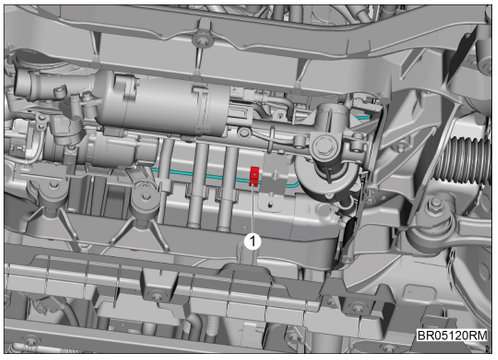
(c) Remove the brake fluid pipe at an appropriate angle.

7. Remove front right wheel (See page DP-116)

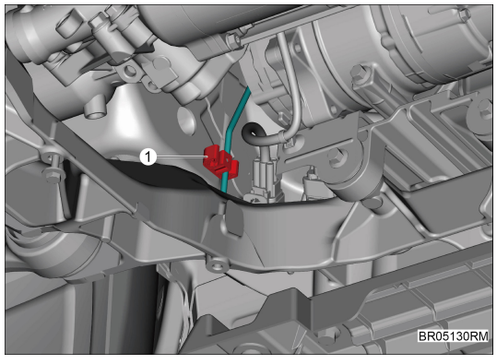
8. Remove front right brake fluid pipe



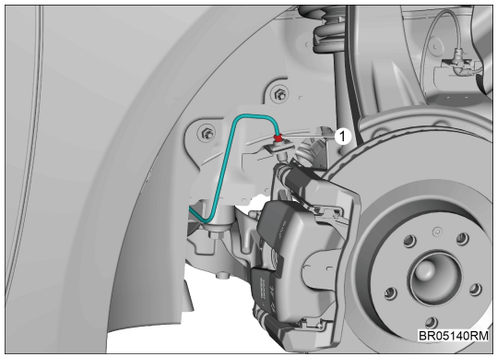
(a) Detach the fuel pipe nut -1-.



(b) Detach the fluid pipe fixing clamp -1-.



(c) Detach the fluid pipe fixing clamp -1-.

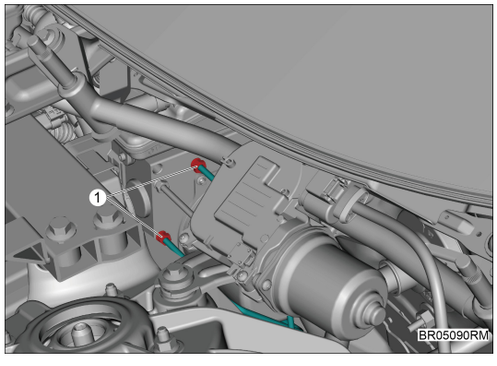


(d) Detach the fuel pipe nut -1-.

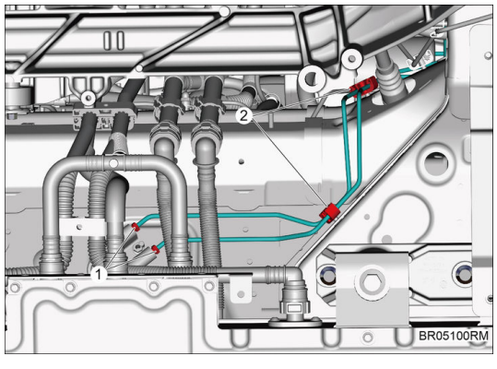
(e) Remove the brake fluid pipe at an appropriate angle.

9. Remove front wiper motor link assembly (See page WS-62)

10. Remove rear left and rear right brake fluid pipe assemblies I



(a) Detach the fuel pipe nut -1-.



(b) Detach the fuel pipe nut -1-.

(c) Detach the fluid pipe fixing clamp -2-.

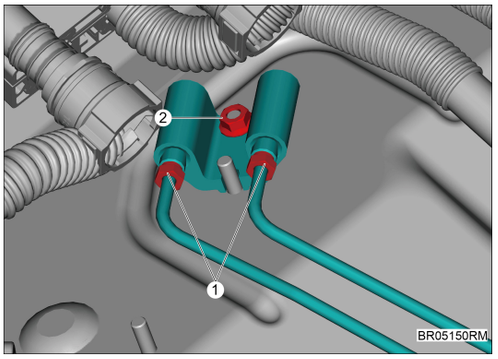
(d) Remove the rear left and rear right brake fluid pipe assemblies I at an appropriate angle.

11. Remove rear sub frame (See page DP-98)

12. Remove power battery assembly (See page DL-25)

DP

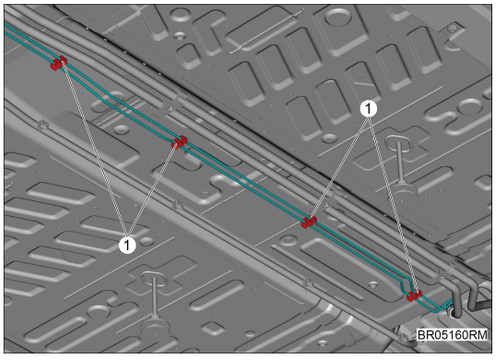
13. Remove rear brake line assembly



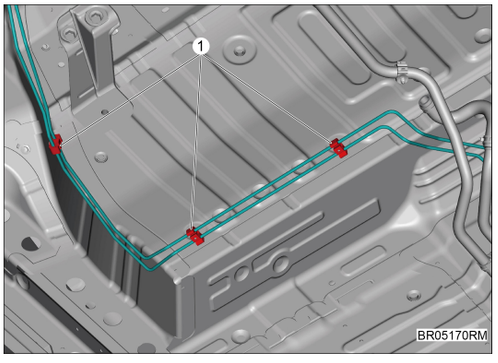
(a) Detach the two-way fuel pipe nut -1-.

(b) Remove the nut -2-.

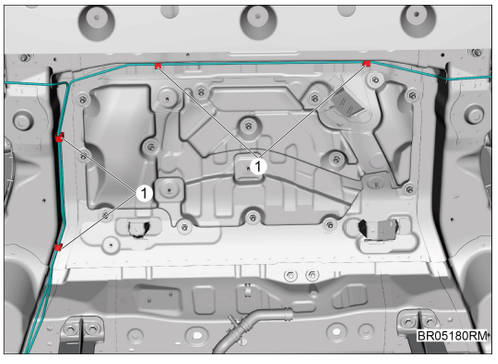
(c) Remove the two-way joint.



(d) Detach the fuel pipe fixing clamp -1- on bottom of body.



(e) Detach the power battery side fluid pipe fixing clamp -1-.



(f) Detach the fuel pipe fixing clamp -1- above rear suspension.

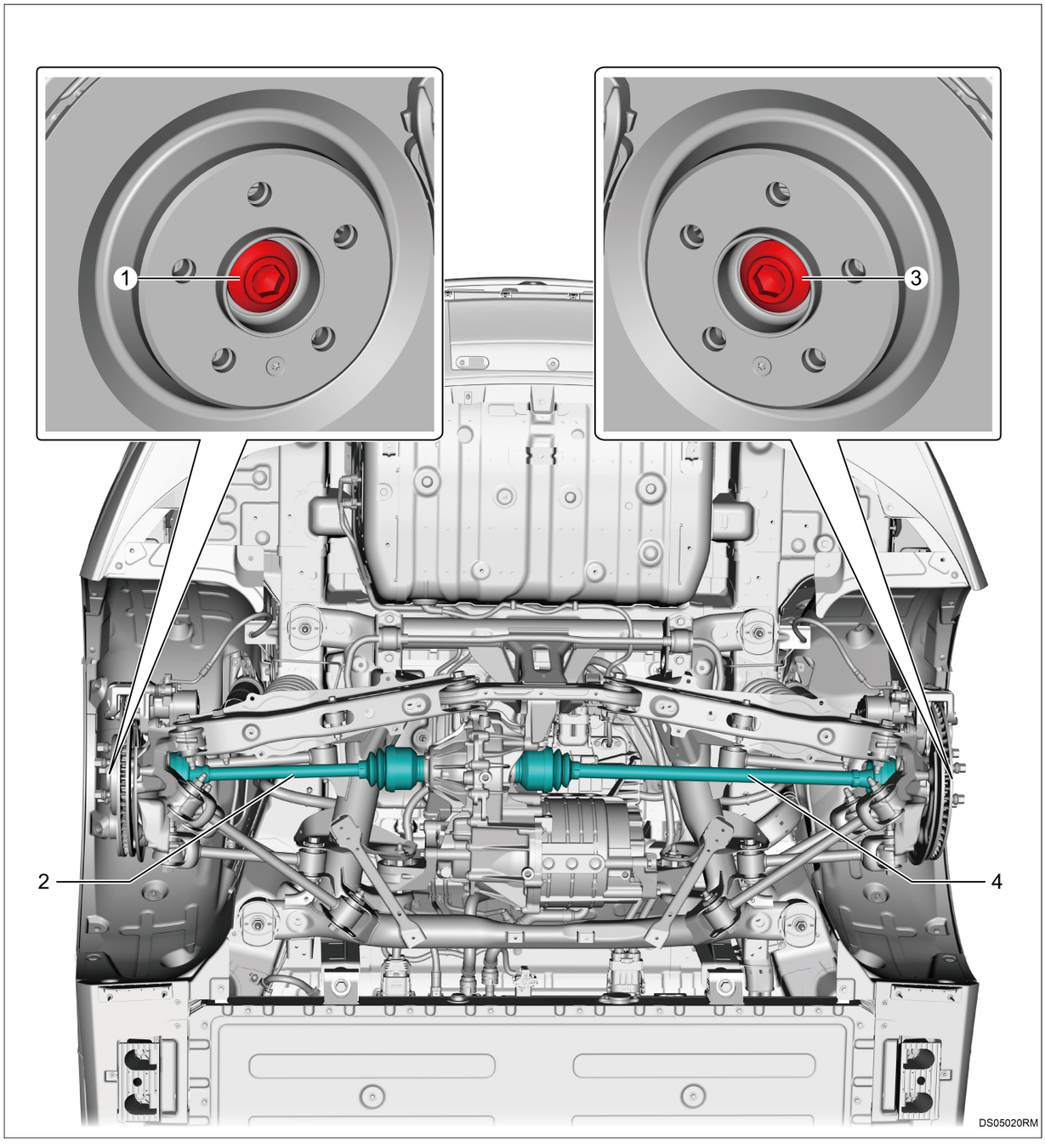
Installation

1. Installation is in the reverse order of removal.

Drive train

Rear drive shaft assembly

Components



1. **Combination bolt**
   - Tightening torque: 135 ~ 165 N • m + 81° ~ 99°
   - Monitoring torque: 280 ~ 520 N • m
2. **Rear left drive shaft assembly**
3. **Combination bolt**

- Tightening torque: 135 ~ 165 N • m + 81° ~ 99°
- Monitoring torque: 280 ~ 520 N • m

4. Rear right drive shaft assembly

DP

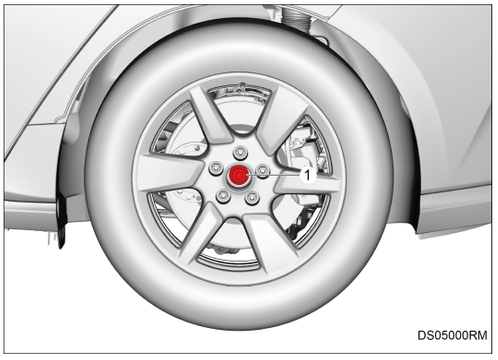
Removal

1. Remove wheel trim cover assembly (See page DP-116)

2. Remove drive shaft combination bolt

Note:

- Use same removal orders for right and left sides.



(a) Remove the drive shaft combination bolt -1-.

3. Raise the vehicle.

4. Remove rear suspension bottom protector (See page WS-47)

5. Remove rear steering knuckle (See page DP-113)

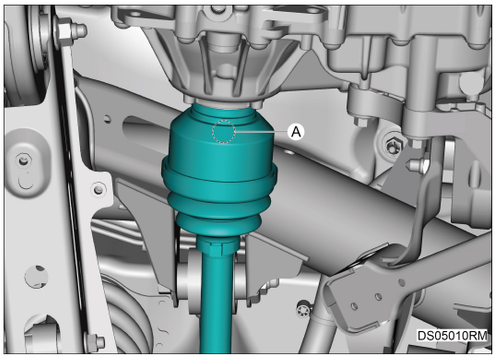
6. Remove rear left drive shaft assembly

Note:

- Use same removal orders for right and left sides.

Caution:

- **During removal, it is not allowed to hang downwards beyond the allowable angle (movable joint: 26°, fixed joint: 50°) to avoid excessive bending that may cause the universal joint disengagement.**



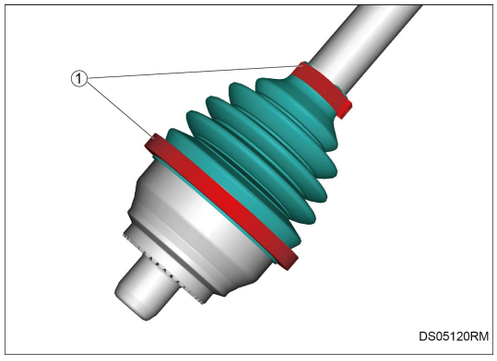
(a) Tap the rear left drive shaft assembly at -A- position.

Caution:

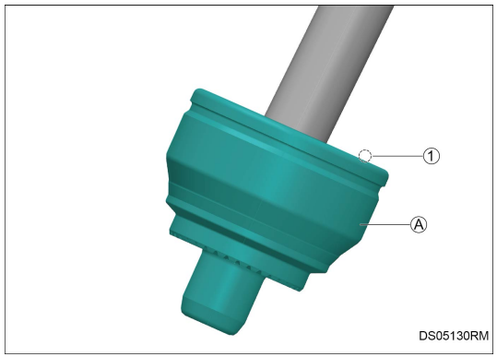
- **Be careful not to damage the dust boot and speed sensor rotor.**

(b) Remove the rear left drive shaft assembly.

7. Remove wheel end universal joint



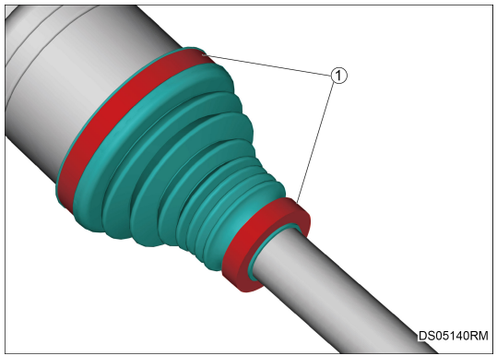
(a) Remove clamping ring -1- and detach dust boot.



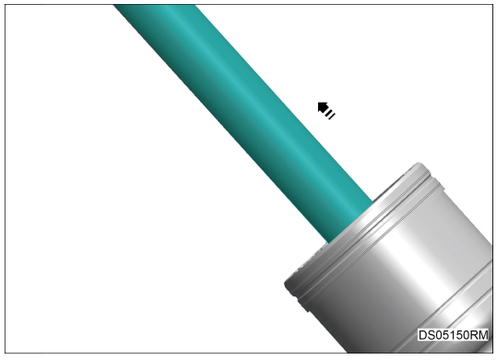
(b) Use a rubber hammer to strike the outer edge -1- of universal joint firmly.

(c) Remove the wheel end universal joint -A-.

8. Remove movable ball cage type universal joint



(a) Remove clamping ring -1- and detach dust boot.



(b) Pull the drive shaft in direction of -arrow-.

(c) Detach snap spring, and remove bearing.

Inspection

1. Check rear drive shaft

(a) Check that outer universal joint does not have excessive clearance in radial direction.

(b) Check that inner universal joint slides smoothly in thrust direction.

(c) Check that inner universal joint does not have excessive clearance in radial direction.

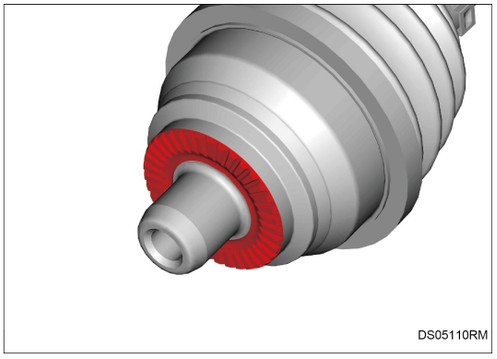
(d) Check 2 universal joint dust boots for damage.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Caution:

   - **Add enough ball cage oil during installation.**
   - **Do not damage the oil seal during insertion.**
   - **Tap the top of the outer universal joint with a hammer.**

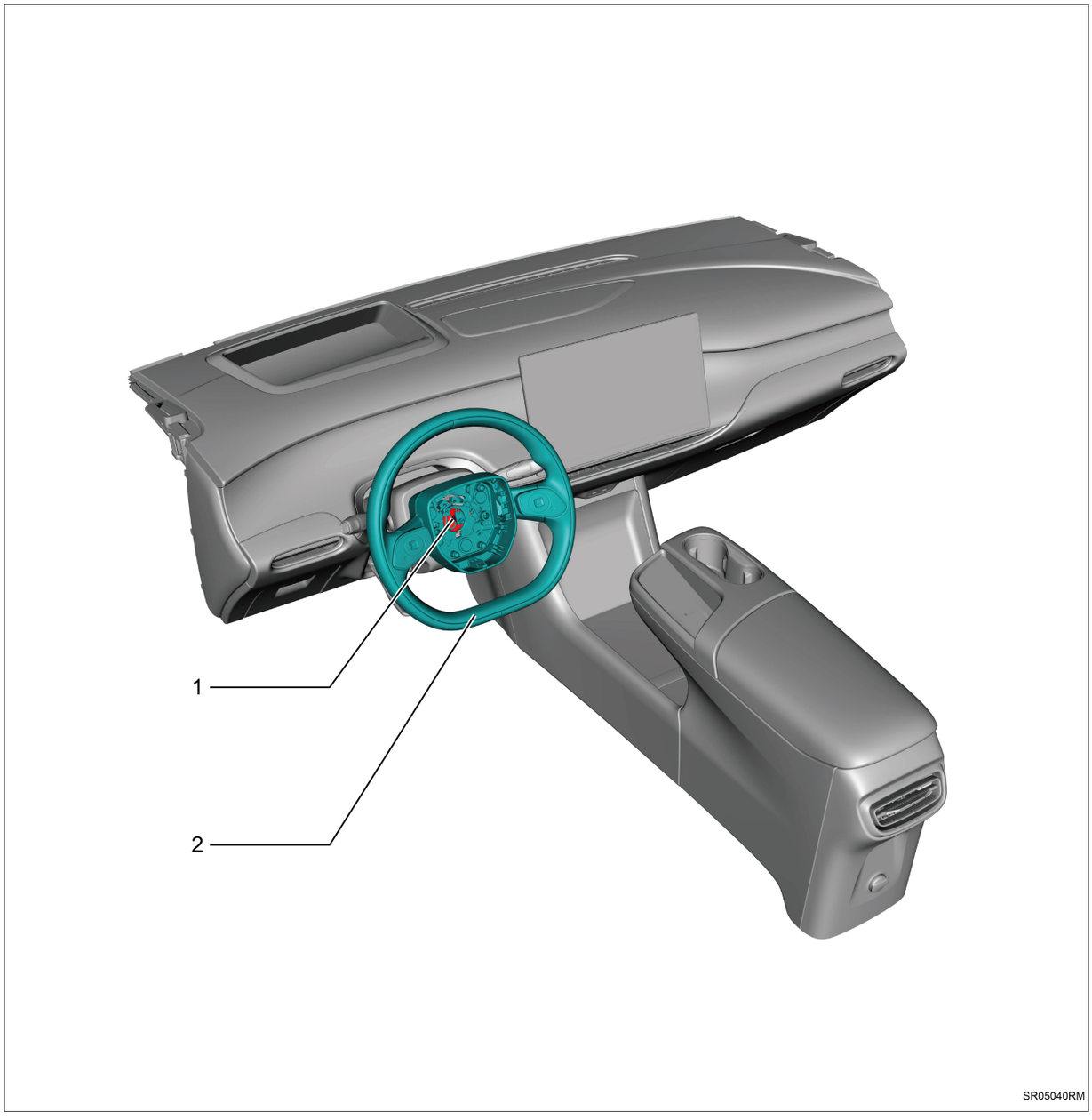


(a) The teeth and grooves of the hub bearing end face spline and the drive shaft universal joint end face spline should be mutually engaged during installation.

Steering system

Steering wheel

Components

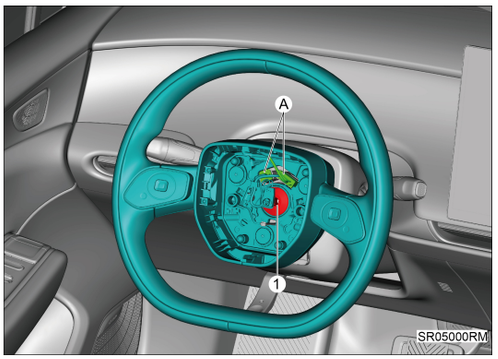


1. **Bolt**
   - Tightening torque: 30 ～ 34.5 N • m + (90° ～105°)
2. **Steering wheel**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**

DP



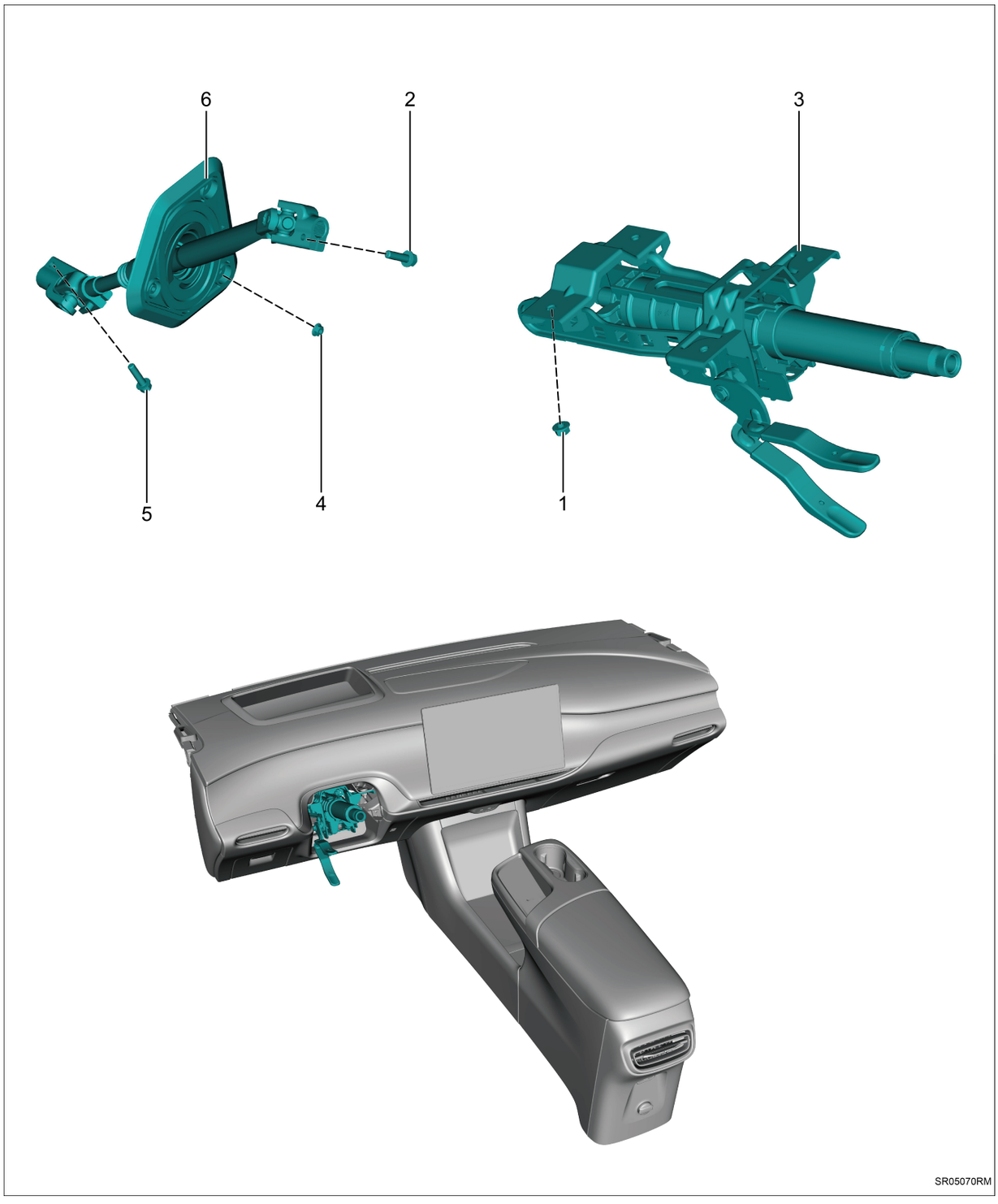
2. **Remove driver airbag (See page ZC-63)**
3. **Remove steering wheel**
   (a) Disconnect the wire harness connector -A-.
   (b) Remove the bolt -1-.

Installation

1. **Installation is in the reverse order of removal.**

Steering column assembly

Components



1. **Nut**
   - X4
   - Torque: 17 ~ 21 N • m
2. **Hexagon flange bolt**

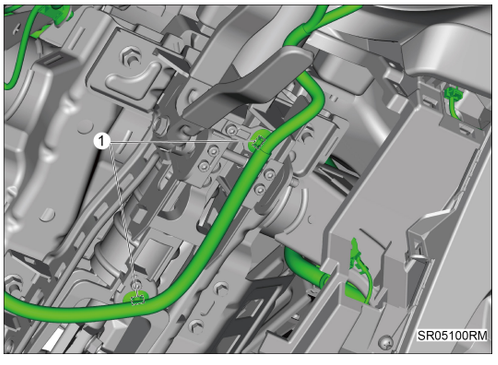
DP

- Torque: 32 ~ 44 N • m

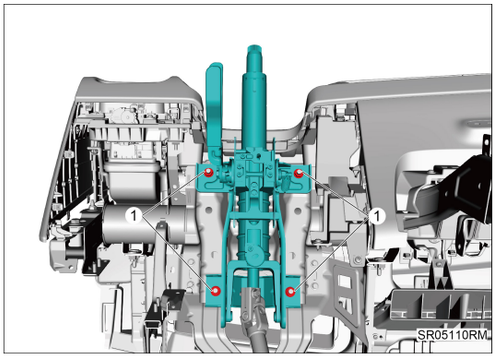
3. **Mechanical steering column assembly**
4. **Hexagon flange nut**
   - X3
   - Torque: 3.5 ~ 5.5 N • m
5. **Hexagon flange bolt**
   - Torque: 32 ~ 44 N • m
6. **Steering intermediate shaft with dust boot assembly**

Removal

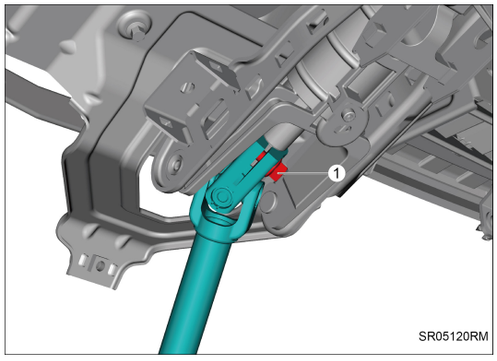
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove steering wheel (See page DP-45)**
3. **Remove steering column cover (See page NS-19)**
4. **Remove spiral cable (See page ZC-120)**
5. **Remove combination switch (See page ZC-122)**
6. **Remove lower left protector assembly (See page NS-29)**
7. **Remove front left foot duct I (See page RE-47)**
8. **Remove mechanical steering column assembly**



(a) Disengage the wire harness fixing clip -1-.



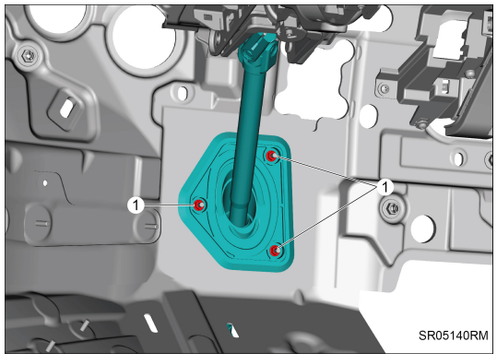
(b) Remove the bolt -1-.



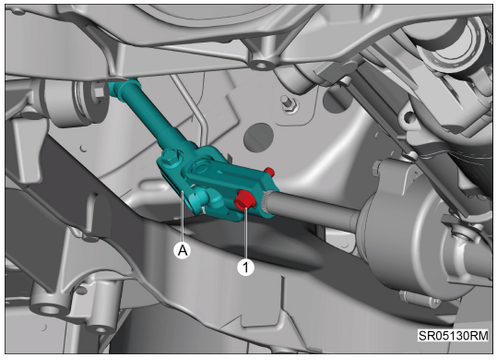
(c) Adjust to the appropriate angle and remove the bolt -1-.

9. Remove engine bottom protector (See page WS-40)

10. Remove steering intermediate shaft with dust boot assembly



(a) Remove the nut -1-.



(b) Remove bolt -1- to separate steering intermediate shaft with dust boot assembly -A- from steering gear.

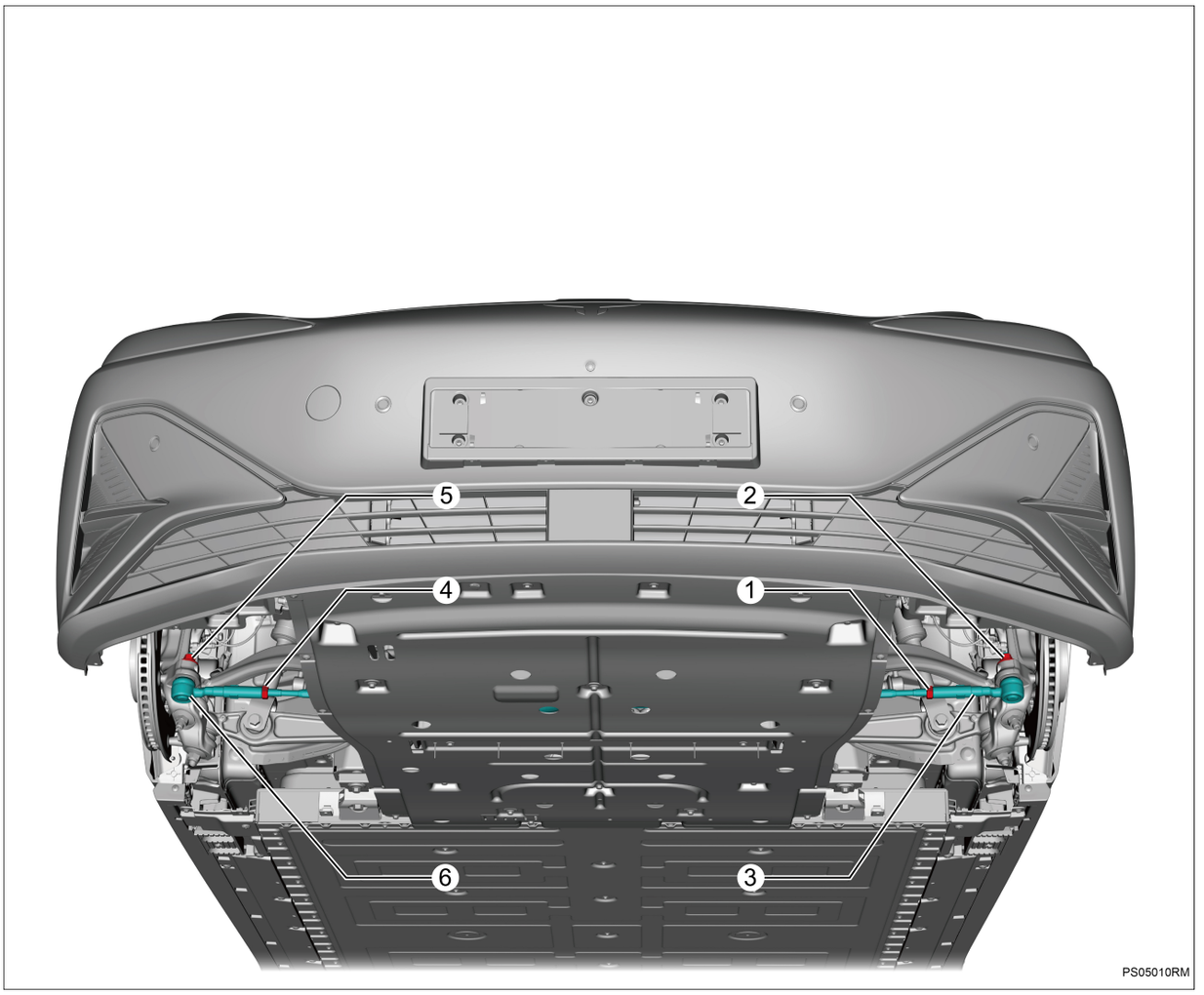
Installation

1. Installation is in the reverse order of removal.

Power steering gear outer rod ball

Components

DP



1. **Hexagon flange nut**
   - Torque: 51 ~ 92 N • m
2. **Hexagon flange nut**
   - Torque: 68.6 ~ 98 N • m
3. **Power steering gear outer rod ball (left)**
4. **Hexagon flange nut**
   - Torque: 51 ~ 92 N • m
5. **Hexagon flange nut**
   - Torque: 68.6 ~ 98 N • m
6. **Power steering gear outer rod ball (right)**

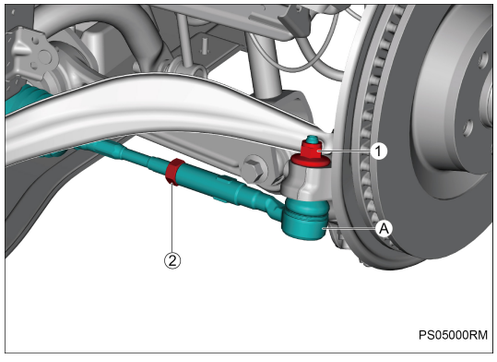
Removal

1. **Raise the vehicle.**
2. **Remove front wheels of vehicle (See page DP-116)**

3. Remove power steering gear outer rod ball

Note:

- Use same removal orders for right and left sides.
- When separating steering knuckle and ball, special tools should be used to push ball assembly out, and it is not allowed to be stressed at an angle. During removing, if ball pin is mistakenly pushed out, both steering knuckle and ball can not be used again.



(a) Remove the nut -1-.

(b) Detach the nut -2-.

(c) Use SST (39H7034010B) to remove the outer rod ball -A-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

(a) Check dust boot and ball

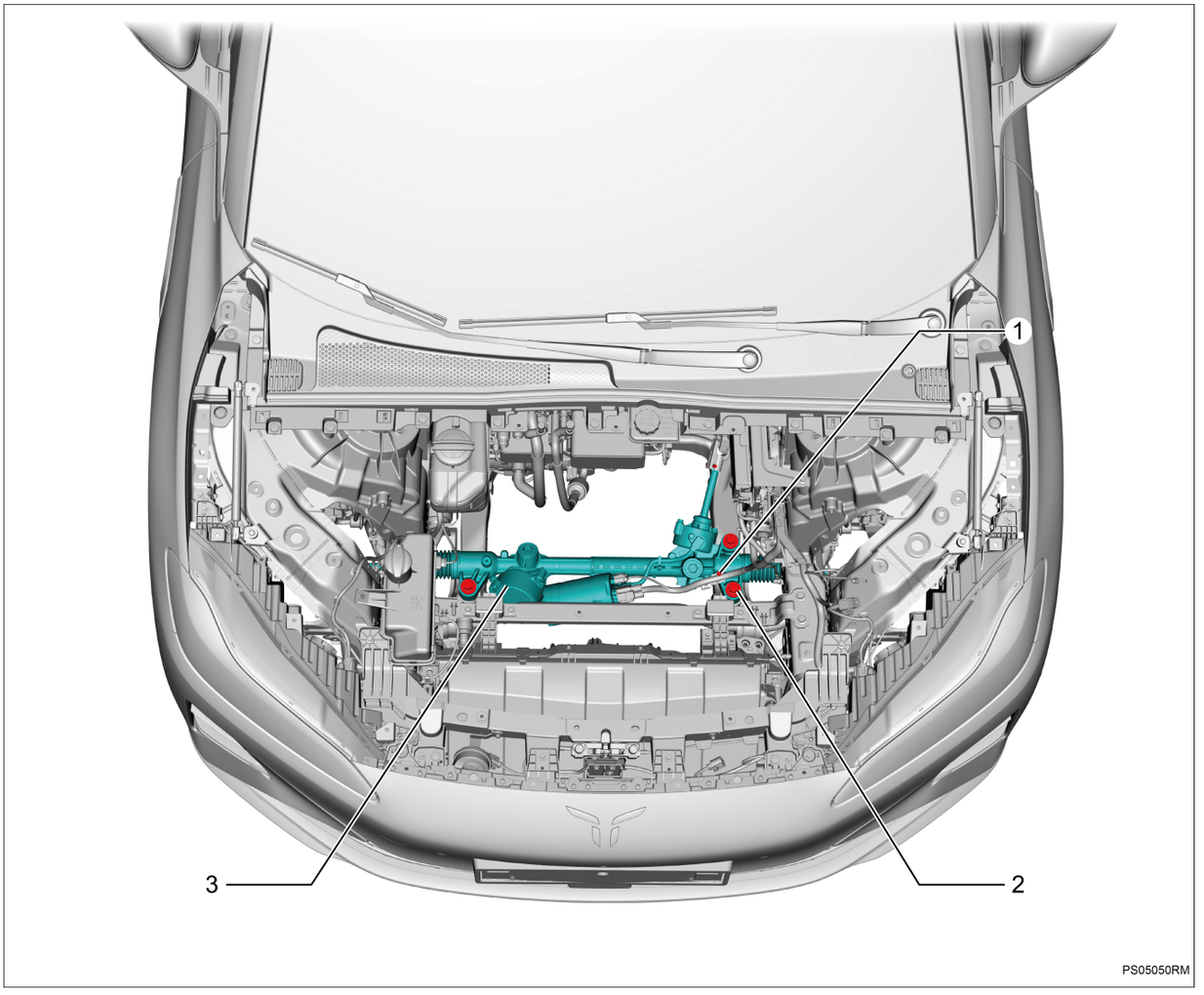
Note:

- Check if dust boot is damaged and leaks grease during installation. Once grease leaks, new parts must be replaced.
- Ball pin thread surface shall not contain grease, foreign matter and other impurities.

DP

Dual gear assisted type power steering gear with rod assembly

Components

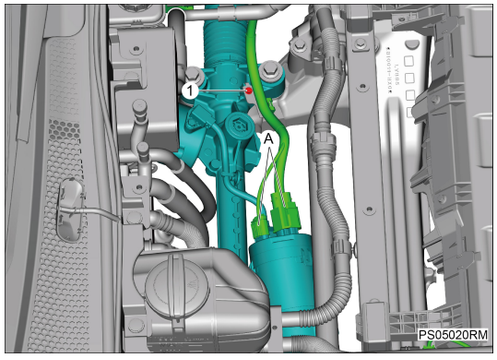


1. **Hexagon flange bolt**
   - Torque: 8 ~ 12 N • m
2. **Hexagon flange bolt**
   - X3
   - Tightening torque: 45 ~ 55 N • m + (54° ~ 66°)
   - Monitoring torque: 120 ~ 140 N • m
   - Not reusable
3. **Dual gear assisted type power steering gear with rod assembly**

Removal

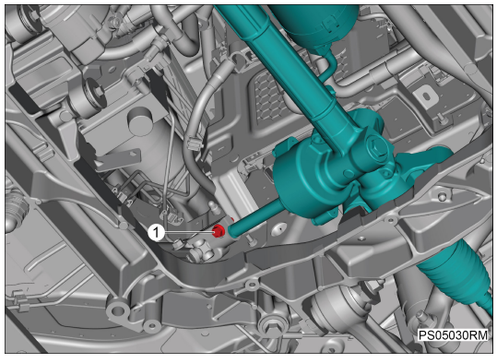
1. **Raise the vehicle.**
2. **Disconnect negative battery terminal (See page DL-21)**

3. **Remove front compartment storage box assembly (See page WS-83)**
4. **Remove front wheels of vehicle (See page DP-116)**
5. **Remove engine bottom protector assembly (See page WS-40)**
6. **Remove power steering gear outer rod ball (See page DP-50)**
7. **Remove dual gear assisted type power steering gear with rod assembly**

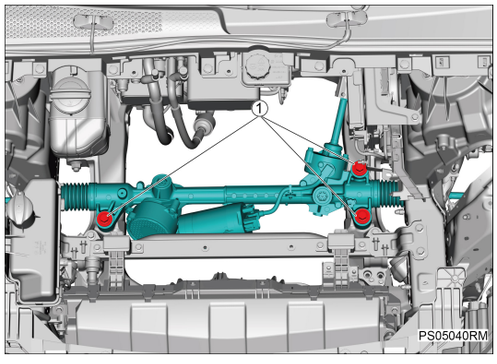


(a) Disconnect the wire harness connector -A-.

(b) Remove fixing bolt -1- from wire harness bracket.



(c) Remove the bolt -1-.



(d) Remove the bolt -1-.

(e) Remove the dual gear assisted type power steering gear with rod assembly.

Installation

1. **Installation is in the reverse order of removal.**

DP

Suspension system

Front wheel alignment

Inspection

1. **Before adjusting the front wheel alignment, the following inspections and repairs should be performed to ensure the correctness of the alignment sampling values and alignment adjustment methods.**

   Note:

   - Perform wheel alignment only with four-wheel aligner approved by Hongqi.
   - When performing adjustment, relevant standard values should be reached as accurately as possible.

   (a) The vehicle must be in a cool state.

   (b) Check wheel suspension, steering system and steering tie rod for undesirable clearance and damage, and repair it if necessary.

   (c) Tire inflation pressure is as specified.

   (d) When a vehicle is riven on the shaft measuring platform in a state of no tension, it is necessary to make the shaft components stress-free by several times of the vehicle front and reset.

   (e) In order to bring steering system back to intermediate position, stop steering wheel by a balanced movement before starting input measurement and starting adjustment operation. (Using special tool)

   (f) The meaning of a vehicle in the unloaded position is the weight of the vehicle when it is ready for operation (fuel tank and window washer fluid tank filled, spare wheel, on-board tools, vehicle jack), excluding the driver.

   (g) Specified installation and calibration of measured value receiver must follow manual provided by aligner manufacturer.

   (h) Axle test stand and four-wheel aligner computer will deviate from their original calibration/setting after a certain amount of time, therefore perform calibration at least once a year within the scope of maintenance.

2. **Necessity of four-wheel alignment**

   (a) The vehicle has a rideability defect.

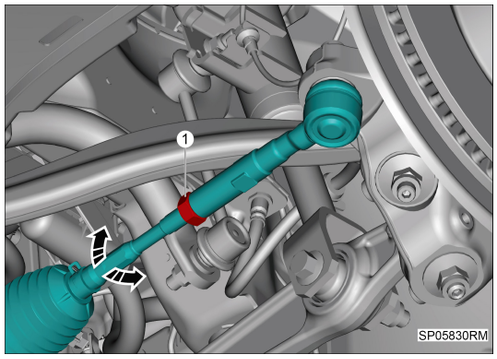
   (b) Damage caused by accident.

(c) Axle parts has been removed or replaced.

(d) Tire on one side is worn.

Adjustment

1. Loosen outer tie rod assembly nut -1-, rotate left and right in direction of -arrow- to adjust to middle value.



2. In unloaded state, rotate inner tie rod to make its toe-in value reach the standard value:

Toe-in value

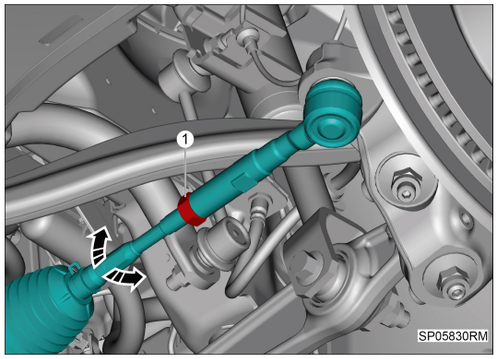
Item	Specified condition	Difference between left wheel and right wheel
Front wheel toe-in	10.28′ ± 5′	± 5′
Front wheel camber	-11.06′ ± 30′	± 30′
Kingpin caster	6° 11′ ± 45′	± 45′
Kingpin inclination	8° 16′ ± 45′	-

3. The length difference between left and right tie rod assemblies should be less than 3 mm.

4. Make sure that corrugated cover is not twisted.

5. Tighten the outer tie rod assembly nut -1-.

- Torque: 51 ~ 92 N • m



DP

Rear wheel alignment

Inspection

1. **Before adjusting the rear wheel alignment, perform the following inspection and maintenance to ensure that the alignment sampling value and alignment adjustment method are correct.**

   (a) Check if the inflation pressure of the rear wheels is within the specified range and if the wear on the tread is almost same.

   (b) Ensure that the vehicle is unloaded.

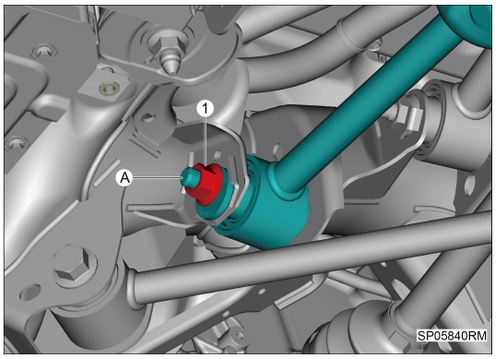
   (c) Check the tire and wheel for runout.

   (d) Check the vehicle balance height (See page DP-57)

   (e) Check each component of rear suspension for looseness or damage.

Adjustment

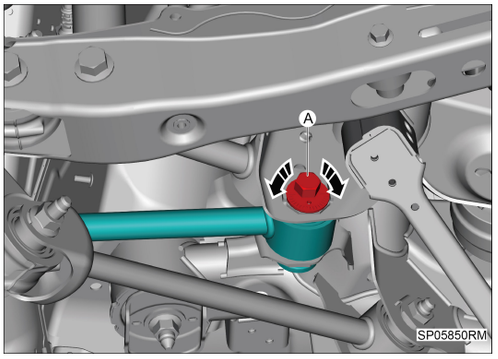
1. **Adjust rear wheel toe-in**



   (a) Loosen fixing nut -1- of toe-in control arm assembly eccentric bolt -A-.

   Note:

   - Just loosen the nut. The eccentric bolt and eccentric washer must be in the slot.

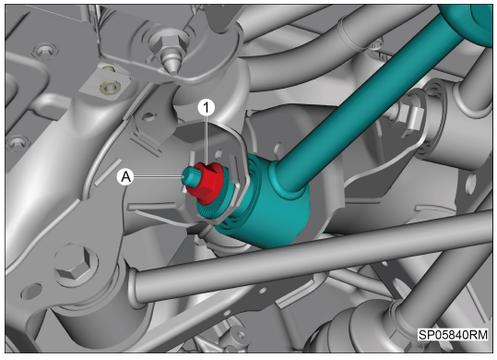


   (b) Rotate eccentric bolt -A- left and right to adjust to the standard value.

2. **Rotate eccentric bolt to make the toe-in value reach the standard value**

Toe-in value and camber

Item	Specified condition	Difference between left wheel and right wheel
Rear wheel toe-in	β = 4′ ± 5′	-
	2β = 8′ ± 10′	
Rear wheel camber	-1° 7′ ± 45′	Within ± 45′



(a) Hold the toe-in control arm assembly eccentric bolt -A- and tighten the nut -1-.

- Torque: 122 ~ 152 N • m
- Target torque: 137 N • m

Designed load

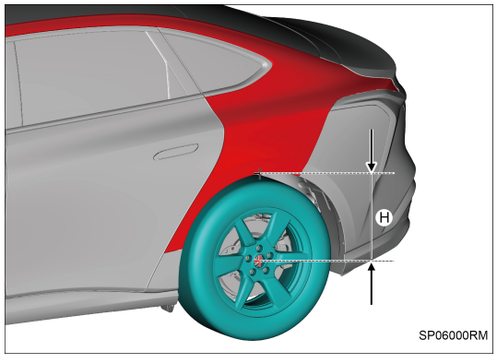
Designed load location

1. Designed load location (measurement method 1)

(a) Use measuring tools to measure vehicle body height under designed load (vehicle body height is as shown in the table below).

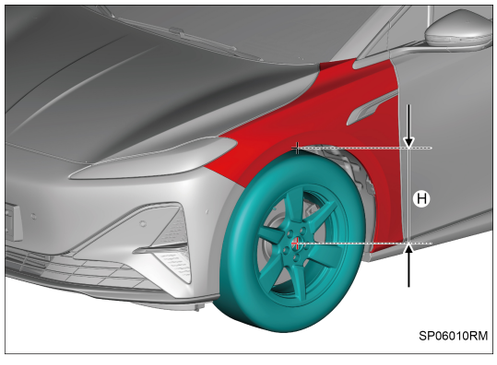
Notice:

- **Wheel arch section at upper measurement point.**



Rear body height

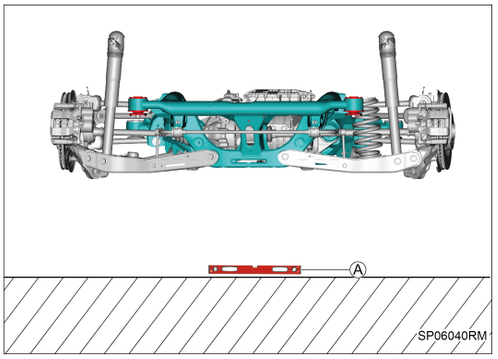
Item	Unloaded (offline)	Designed load	Difference between left wheel and right wheel
Height H	415.2 ± 10	401.6 ± 10	± 10



Front body height

Item	Unloaded (offline)	Designed load	Difference between left wheel and right wheel
Height H	416.5 ± 10	401 ± 10	± 10

DP

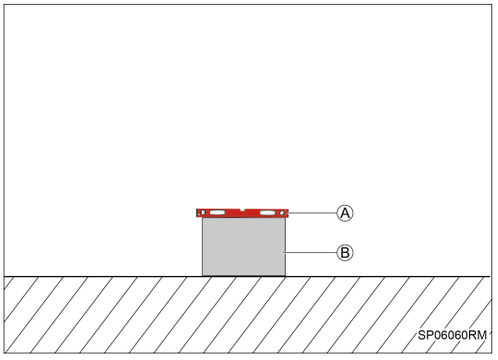


2. Designed load location (measurement method 2)

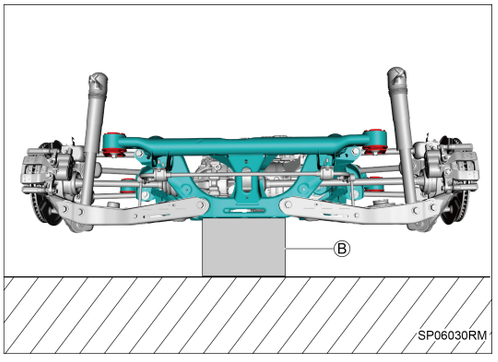
(a) Place the rear suspension assembly on flat ground, and the angle is as shown in the illustration.

Notice:

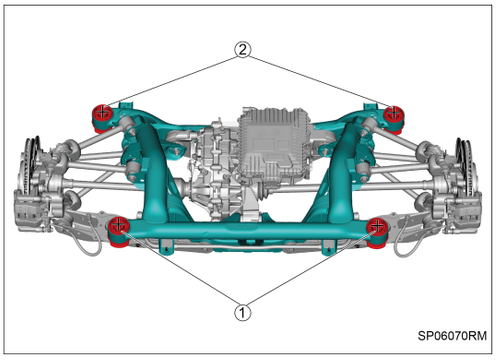
- **Before placing the suspension on the ground, use a high precision level -A- to measure the front, rear, left, and right of the ground, and ensure that it is level simultaneously.**



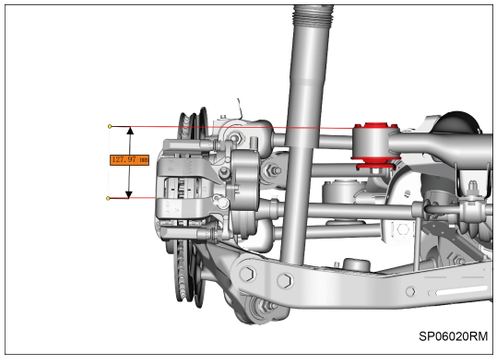
(b) Use a high-precision spirit level -A- to measure the block -B-, and the front, back, left and right are all level simultaneously.



(c) Place the rear suspension assembly on block -B-.



(d) Use a high-precision spirit level -A- to measure the rear suspension assembly points -1-2-, and the front, back, left and right are all level simultaneously.



(e) Use the height difference between brake disc center -A- and subframe -B- to find the load position.

(f) The Z-direction height difference between brake disc center -A- and subframe -B- as shown in illustration.

Hub bearing unit inspection

Inspection

Note:

- Use same removal orders for right and left sides.

1. **Remove wheel (See page DP-116)**
2. **Remove brake caliper body assembly (See page DP-12)**
3. **Remove brake disc (See page DP-25)**
4. **Check front hub bearing unit assembly runout**

   (a) Check runout of the front hub bearing unit assembly bearing surface with a dial indicator.

   Notice:

   - **Ensure that dial indicator is perpendicular to measurement surface.**
   - **If runout exceeds the standard value, replace the front hub bearing unit assembly.**
   - **Standard value: 0.05 mm**

5. **Check rear hub bearing unit assembly runout**

   (a) Check runout of the rear hub bearing unit assembly bearing surface with a dial indicator.

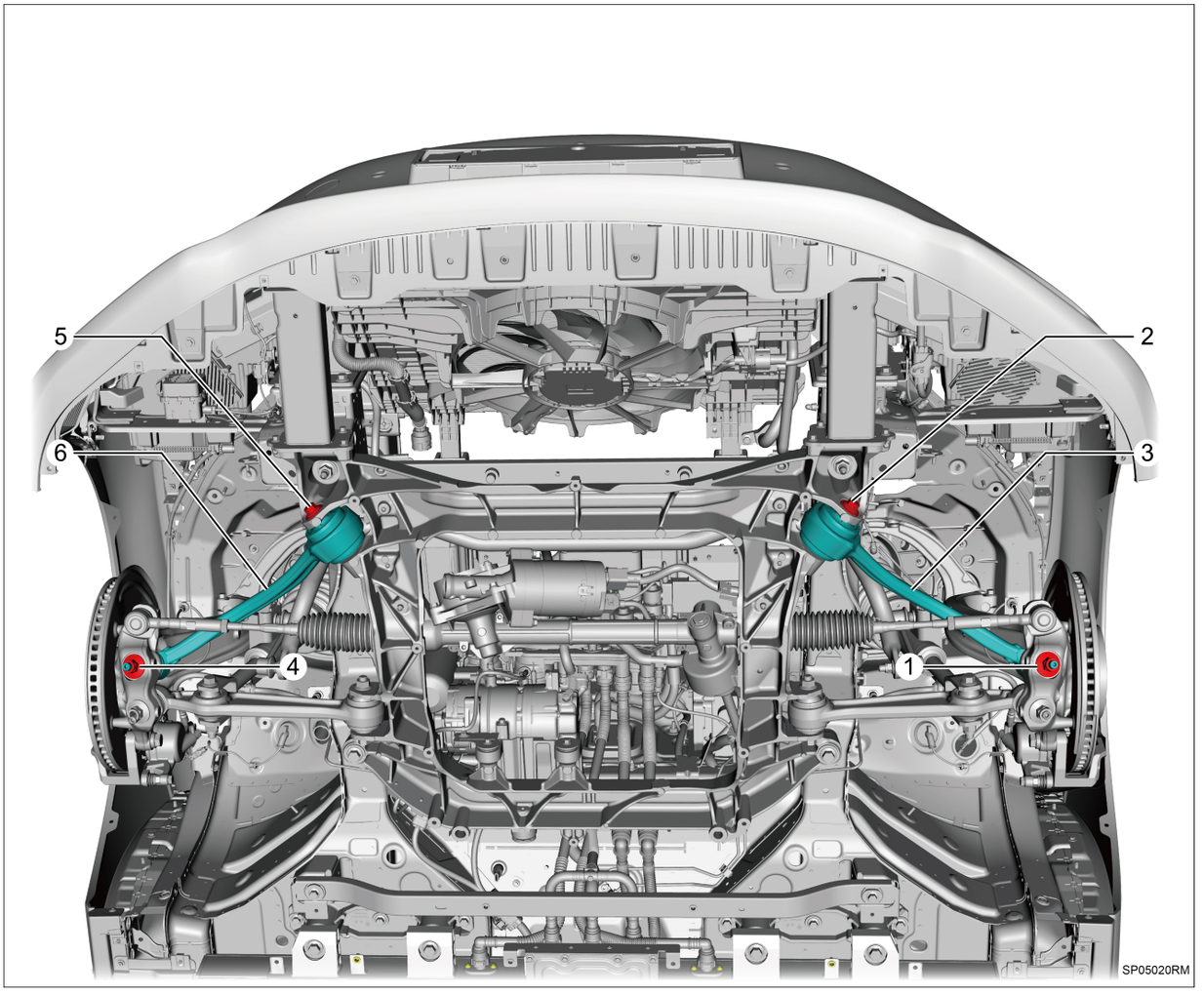
   Notice:

   - **Ensure that dial indicator is perpendicular to measurement surface.**
   - **If runout exceeds the standard value, replace the rear hub bearing unit assembly.**
   - **Standard value: 0.05 mm**

DP

No.1 front lower control arm assembly

Components



1. **Non-metal insert hexagon locking nut**
   - Torque: 130 ~ 160 N • m
   - Not reusable
2. **Hexagon flange bolt**
   - Torque: 135 ~ 165 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 205 ~ 320 N • m
   - Not reusable
3. **No.1 front left lower control arm assembly (left)**
4. **Non-metal insert hexagon locking nut**
   - Torque: 130 ~ 160 N • m
   - Not reusable
5. **Hexagon flange bolt**

- Torque: 135 ~ 165 N • m + rotation angle of (80° ~ 100°)
- Monitoring torque: 205 ~ 320 N • m
- Not reusable

6. No.1 front right lower control arm assembly (right)

Removal

1. Raise the vehicle.

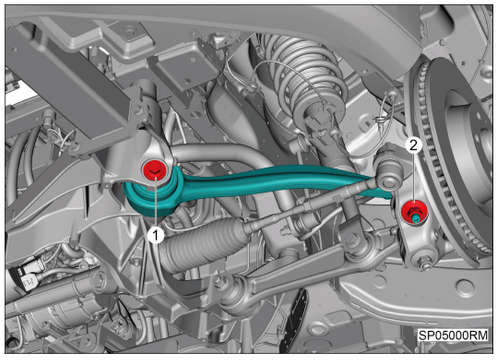
2. Remove wheel assembly (See page DP-116)

3. Remove engine bottom protector assembly (See page WS-40)

4. Remove No.1 front left lower control arm assembly

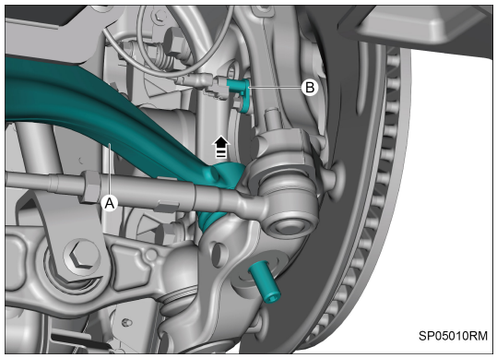
Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

(b) Remove the nut -2-.



(c) Detach the No.1 front lower control arm ball head in direction of -arrow-.

Note:

- To avoid damaging the front wheel speed sensor assembly -B-, please remove it before removal. (See page DP-6)

(d) Remove the No.1 front lower control arm -A-.

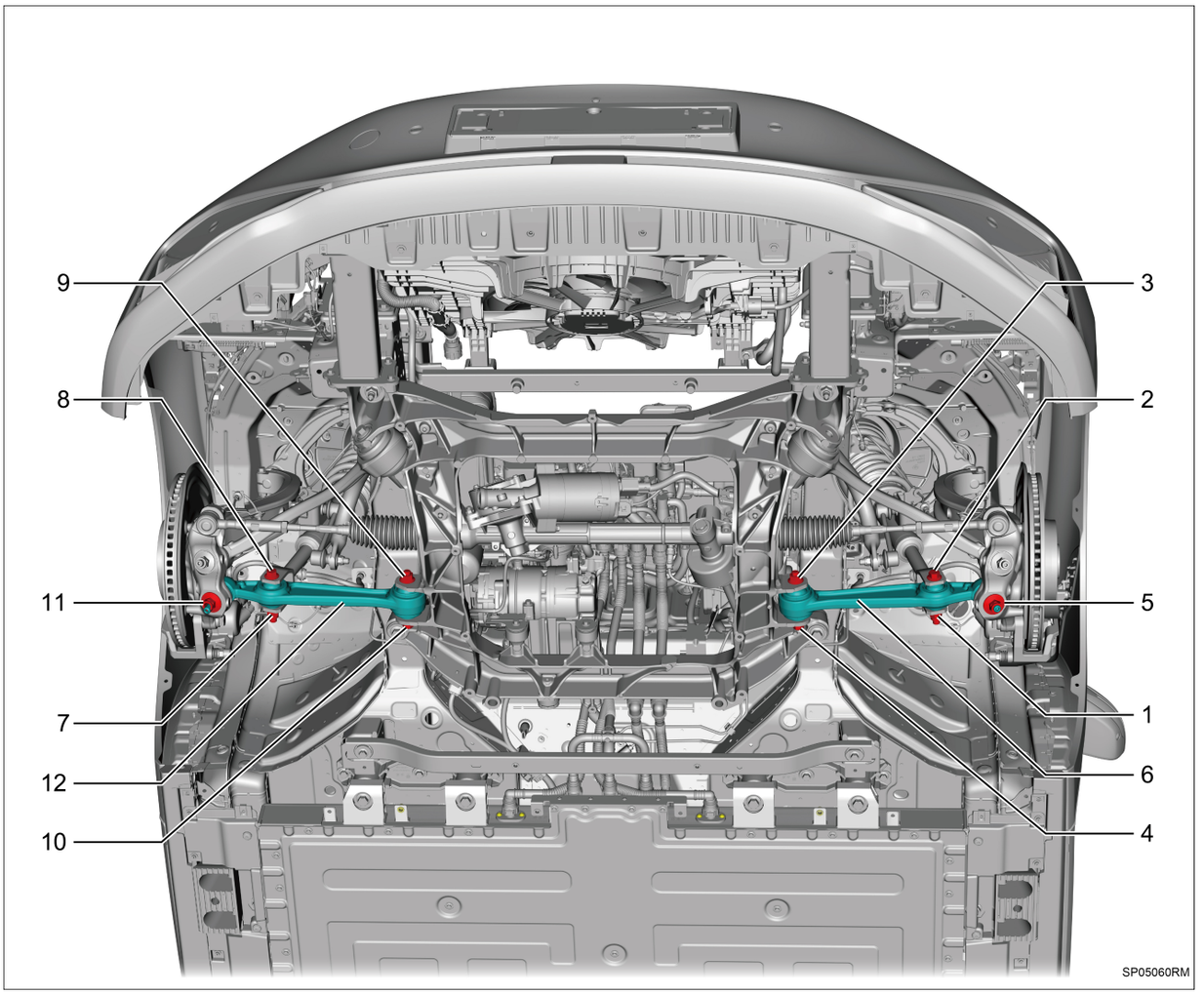
Installation

1. Installation is in the reverse order of removal.

No.2 lower control arm assembly

Components

DP



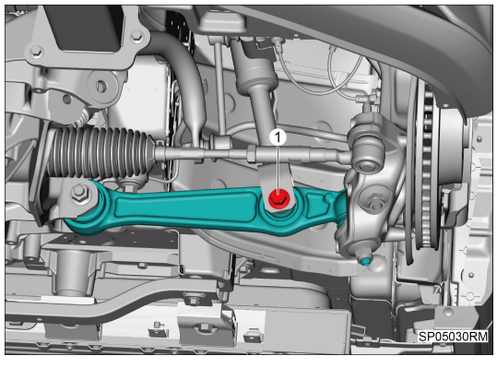
1. **Hexagon flange nut**
   - Torque: 108 ~ 132 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 180 ~ 260 N • m
   - Not reusable
2. **Hexagon flange bolt**
3. **Hexagon flange nut**
4. **Hexagon flange bolt**
   - Torque: 108 ~ 132 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 160 ~ 220 N • m
5. **Non-metal insert hexagon locking nut**
   - Torque: 130 ~ 160 N • m
   - Not reusable
6. **No.2 lower control arm assembly (left)**

7. **Hexagon flange nut**
   - Torque: 108 ~ 132 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 180 ~ 260 N • m
   - Not reusable
8. **Hexagon flange bolt**
9. **Hexagon flange nut**
10. **Hexagon flange bolt**
    - Torque: 108 ~ 132 N • m + rotation angle of (80° ~ 100°)
    - Monitoring torque: 160 ~ 220 N • m
11. **Non-metal insert hexagon locking nut**
    - Torque: 130 ~ 160 N • m
    - Not reusable
12. **No.2 lower control arm assembly (right)**

Removal

1. **Raise the vehicle.**
2. **Remove wheel assembly (See page DP-116)**
3. **Remove engine bottom protector assembly (See page WS-40)**
4. **Remove No.1 front left lower control arm assembly (See page DP-60)**
5. **Remove No.2 lower control arm assembly**

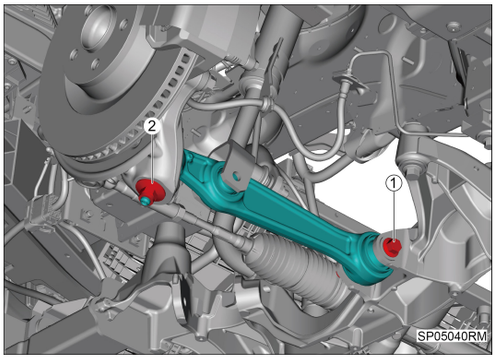
   Note:
   - Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

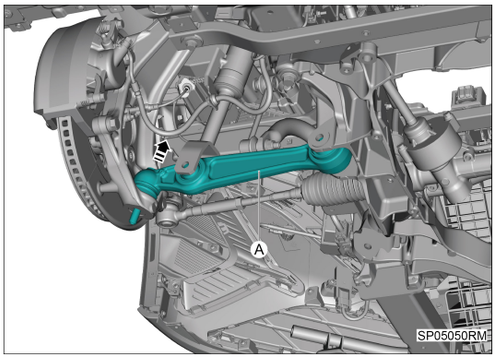
(b) Detach the front left shock absorber assembly.

DP



(c) Remove the bolt -1-.

(d) Remove the nut -2-.



(e) Detach the No.2 front lower control arm ball head in direction of -arrow-.

(f) Remove the No.2 front lower control arm -A-.

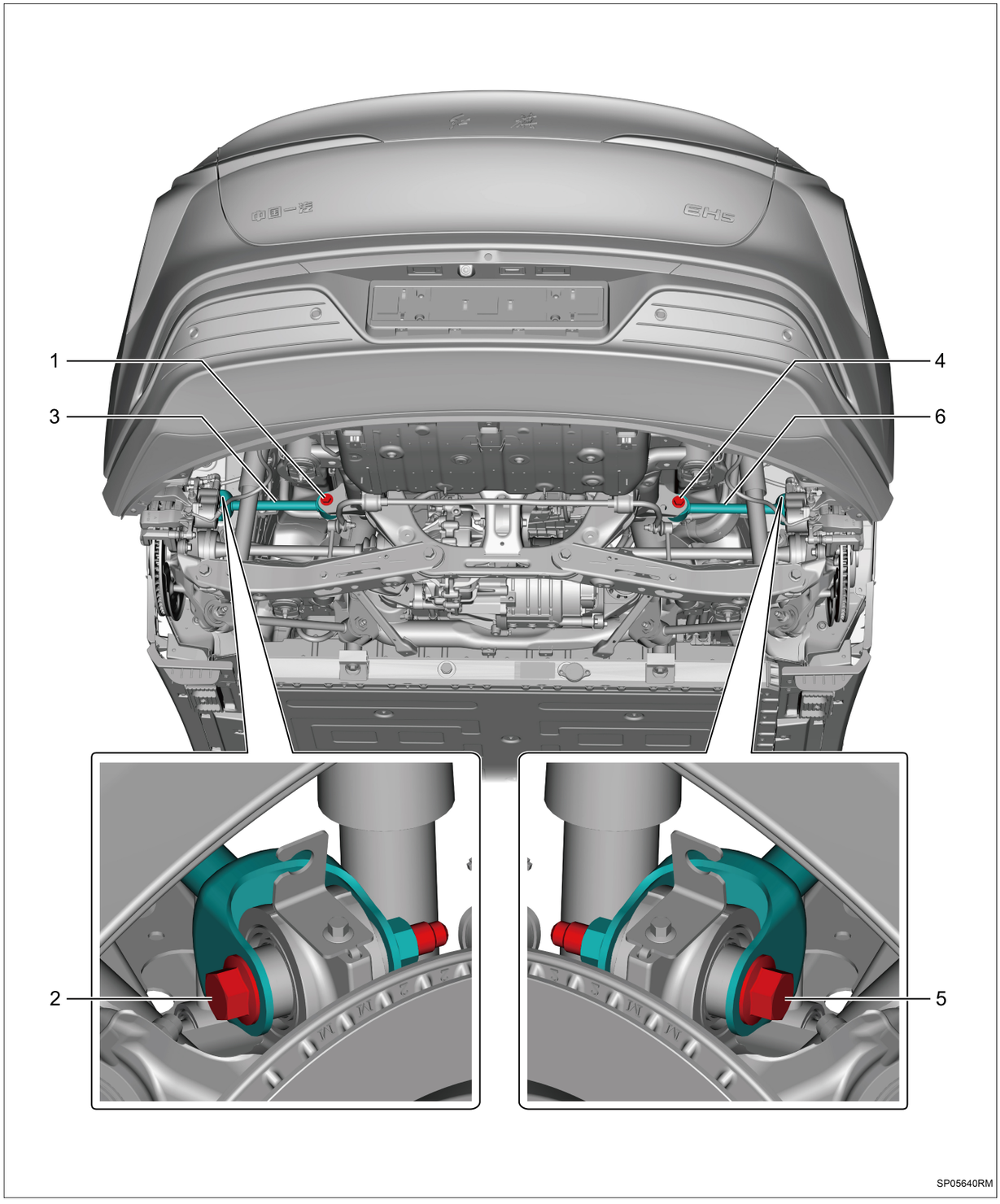
Installation

1. Installation is in the reverse order of removal.

No.2 rear upper control arm assembly

Components

DP



1. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m

- Target torque: 200 N • m

2. Hexagon flange bolt

- Torque: 185 ~ 215 N • m
- Target torque: 200 N • m

3. No.2 rear upper control arm assembly (left)

4. Hexagon flange bolt

- Torque: 185 ~ 215 N • m
- Target torque: 200 N • m

5. Hexagon flange bolt

- Torque: 185 ~ 215 N • m
- Target torque: 200 N • m

6. No.2 rear upper control arm assembly (right)

Removal

1. Raise the vehicle.

2. Remove rear wheels of vehicle (See page DP-116)

3. Remove rear suspension bottom protector I (See page WS-47)

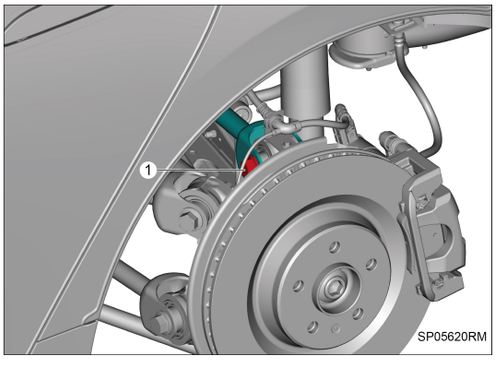
4. Remove left No.2 rear lower control arm assembly (See page DP-68)

5. Remove the coil spring (See page DP-110)

6. Remove No.2 rear upper control arm assembly

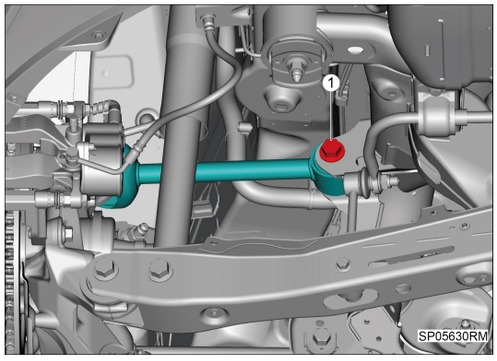
Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

(b) Detach the No.2 rear upper control arm assembly.



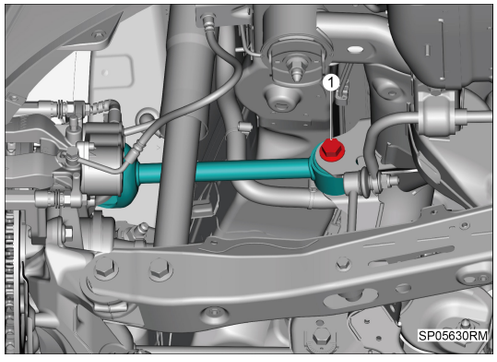
(c) Remove the bolt -1-.

(d) Remove the No.2 rear upper control arm assembly.

DP

Installation

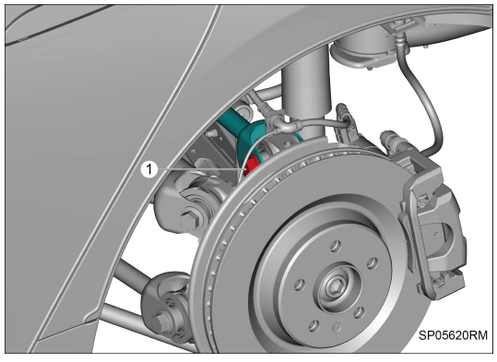
1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) Install the bolt -1-.

Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**



(b) Install the bolt -1-.

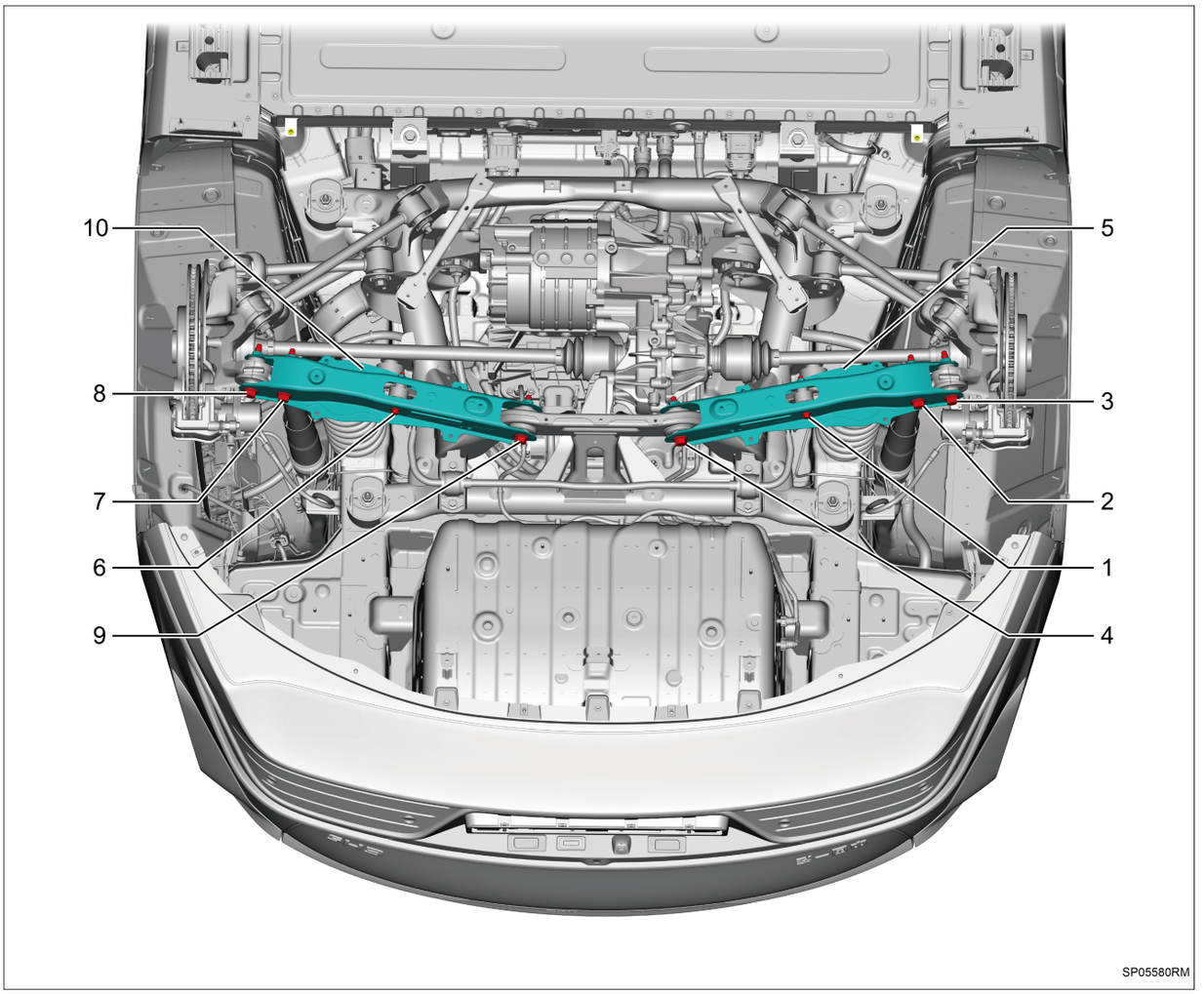
Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**

No.2 rear lower control arm assembly

Components

DP



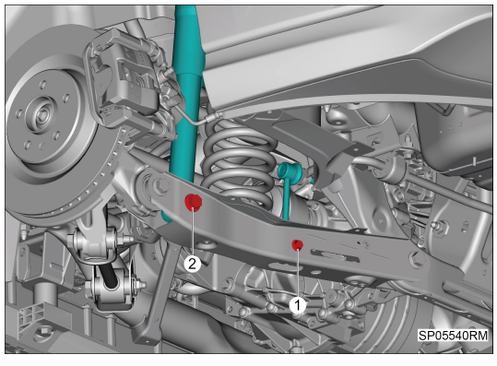
1. **Hexagon flange bolt**
   - Torque: 60 ~ 72 N • m
   - Target torque: 66 N • m
2. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
3. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
4. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
5. **No.2 rear lower control arm assembly (left)**

6. **Hexagon flange bolt**
   - Torque: 60 ~ 72 N • m
   - Target torque: 66 N • m
7. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
8. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
9. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
10. **No.2 rear lower control arm assembly (right)**

Removal

1. **Raise the vehicle.**
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove rear suspension bottom protector I (See page WS-47)**
4. **Remove No.2 rear lower control arm assembly**

   Note:
   - Use same removal orders for right and left sides.

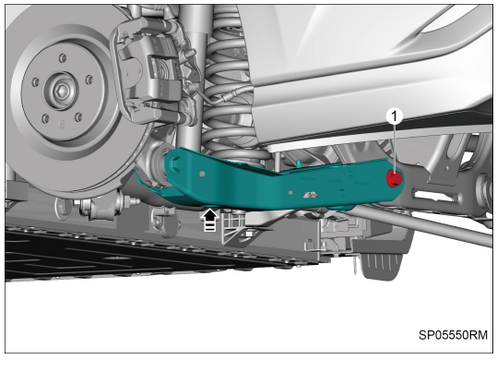


(a) Remove the bolt -1-.

(b) Detach the rear stabilizer bar connecting rod assembly.

(c) Remove the bolt -2-.

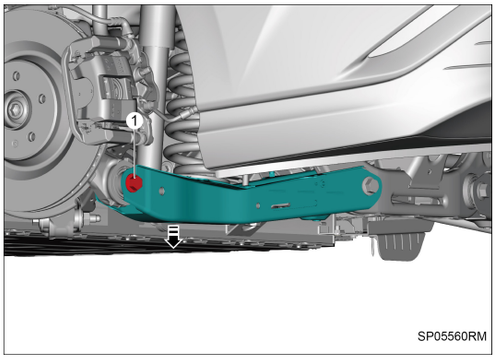
(d) Detach the rear strut assembly.



(e) Detach the bolt -1-.

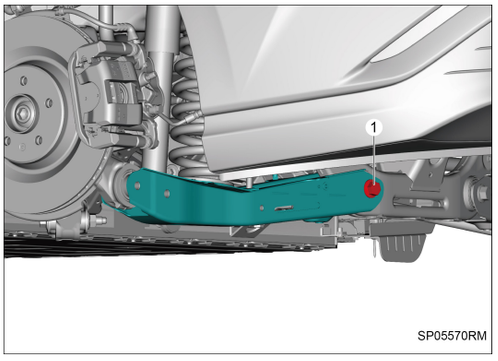
Note:
- It is not required to remove the bolt, loosen the bolt so that it is not in the tightened state.

(f) Use transmission carrier to support in direction of -arrow-.



(g) Remove the bolt -1-.

(h) Detach the rear steering knuckle.



(i) Slowly lower the transmission carrier in the direction of -arrow-.

Note:

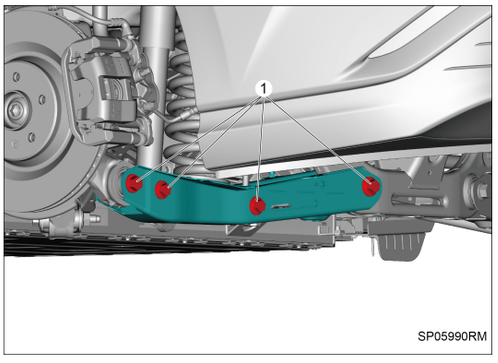
- Release the rear coil spring.

(j) Remove the bolt -1-.

(k) Remove the No.2 rear lower control arm assembly.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



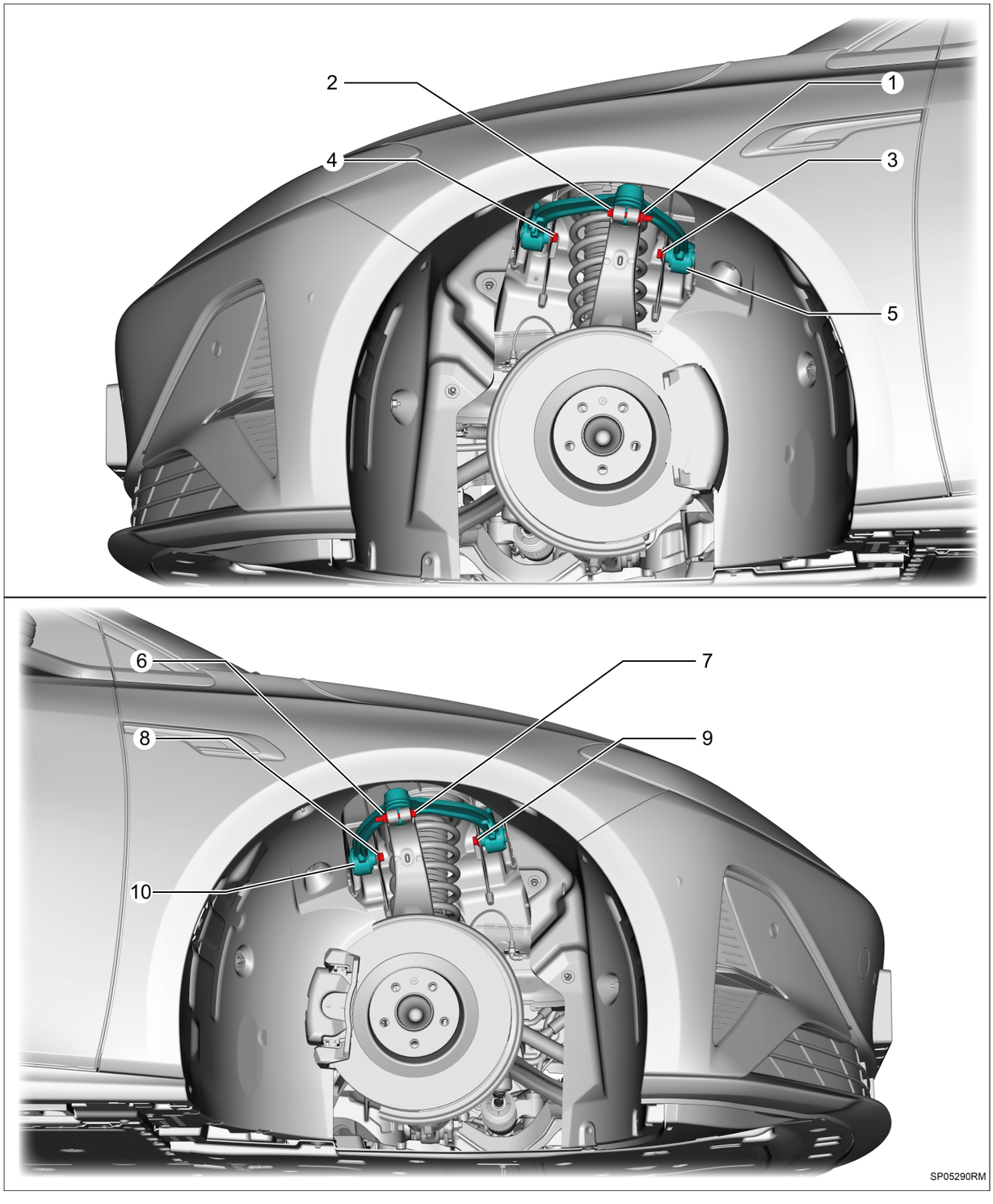
(a) Install the bolt -1-.

Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**

Front upper control arm assembly

Components



1. **Hexagon flange nut**
   - Torque: 40 ~ 59 N • m
2. **Hexagon flange bolt**
3. **Hexagon flange bolt**

- Torque: 45 ~ 55 N • m + rotation angle of (80° ~ 100°)
- Monitoring torque: 60 ~ 120 N • m
- Not reusable

4. Hexagon flange bolt

- Torque: 45 ~ 55 N • m + rotation angle of (80° ~ 100°)
- Monitoring torque: 60 ~ 120 N • m
- Not reusable

5. Upper control arm assembly (left)

6. Hexagon flange nut

- Torque: 40 ~ 59 N • m

7. Hexagon flange bolt

8. Hexagon flange bolt

- Torque: 45 ~ 55 N • m + rotation angle of (80° ~ 100°)
- Monitoring torque: 60 ~ 120 N • m
- Not reusable

9. Hexagon flange bolt

- Torque: 45 ~ 55 N • m + rotation angle of (80° ~ 100°)
- Monitoring torque: 60 ~ 120 N • m
- Not reusable

10. Upper control arm assembly (right)

Removal

1. Raise the vehicle.

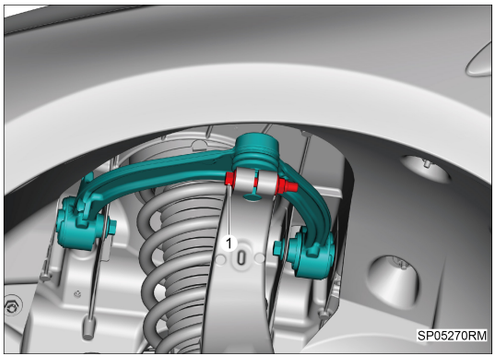
2. Remove front wheels of vehicle (See page DP-116)

3. Remove front left strut assembly (See page DP-83)

4. Remove upper control arm assembly

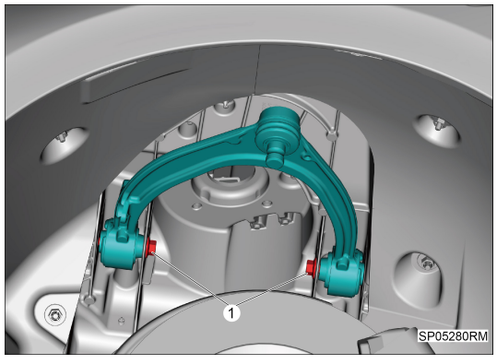
Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

(b) Detach the upper control arm assembly ball.



(c) Remove the bolt -1-.

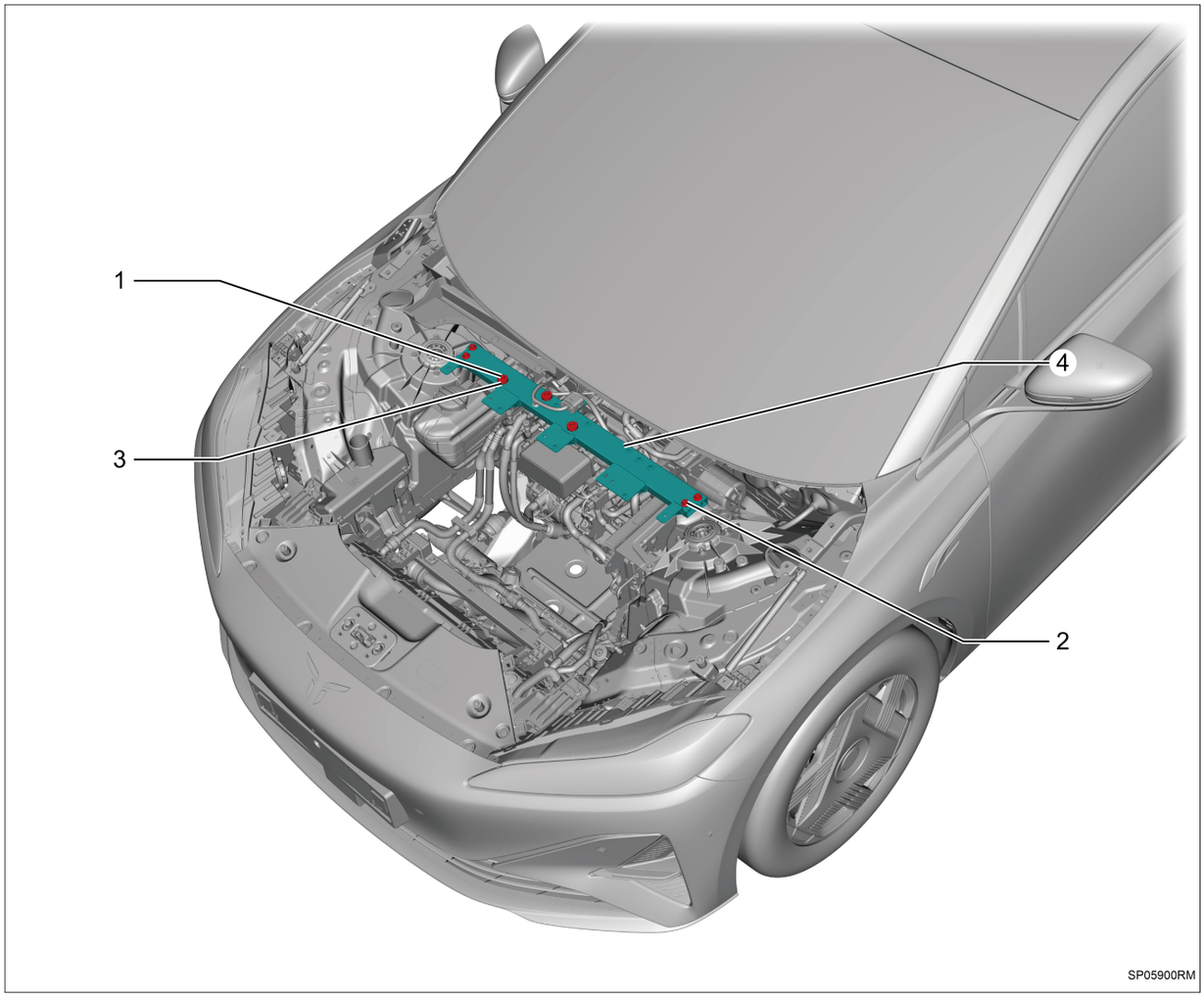
(d) Remove the upper control arm assembly.

Installation

1. Installation is in the reverse order of removal.

Front shock absorber support seat lateral stabilizer bar assembly

Components



1. Hexagon flange bolt

- X3
- Torque: 17 ~ 21 N • m

2. Hexagon flange bolt

- X4
- Torque: 17 ~ 21 N • m

3. ITM mounting upper rubber pad

- ITM mounting lower rubber pad
- X3

4. Front shock absorber lateral stabilizer bar assembly

Removal

1. Disconnect negative battery terminal (See page DL-21)

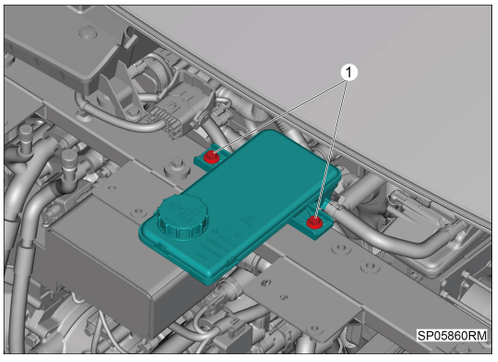
2. Remove water channel cover plate assembly (See page WS-86)

3. Remove front wiper motor link assembly (See page WS-62)

4. Remove wiper fixing bracket I assembly (See page WS-62)

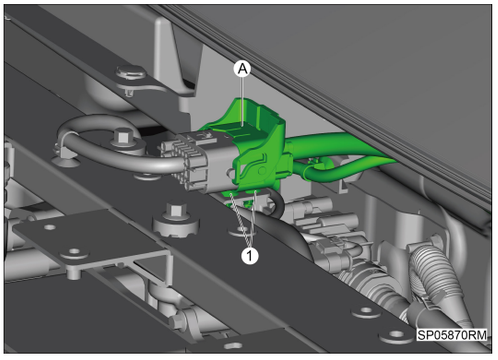
5. Remove water channel guide plate assembly (See page WS-89)

6. Remove front shock absorber support seat lateral stabilizer bar assembly



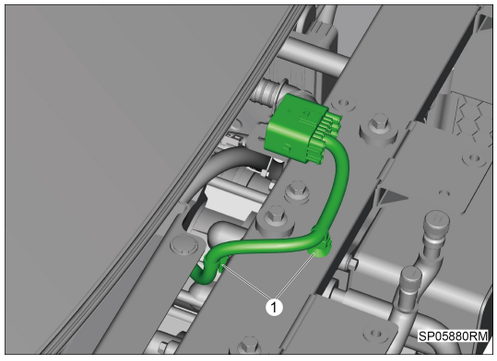
(a) Remove the bolt -1-.

(b) Detach the separated fluid reservoir assembly.

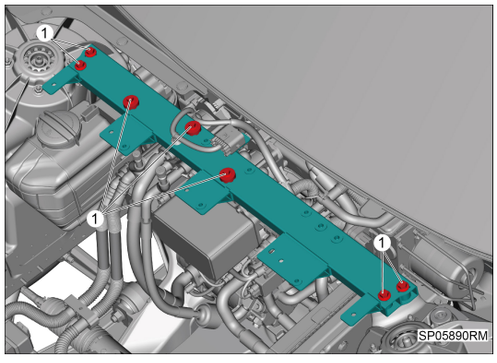


(c) Disconnect the wire harness connector -A-.

(d) Detach the wire harness connector fixing clip -1-.



(e) Detach the wire harness connector fixing clip -1-.



(f) Remove the bolt -1-.

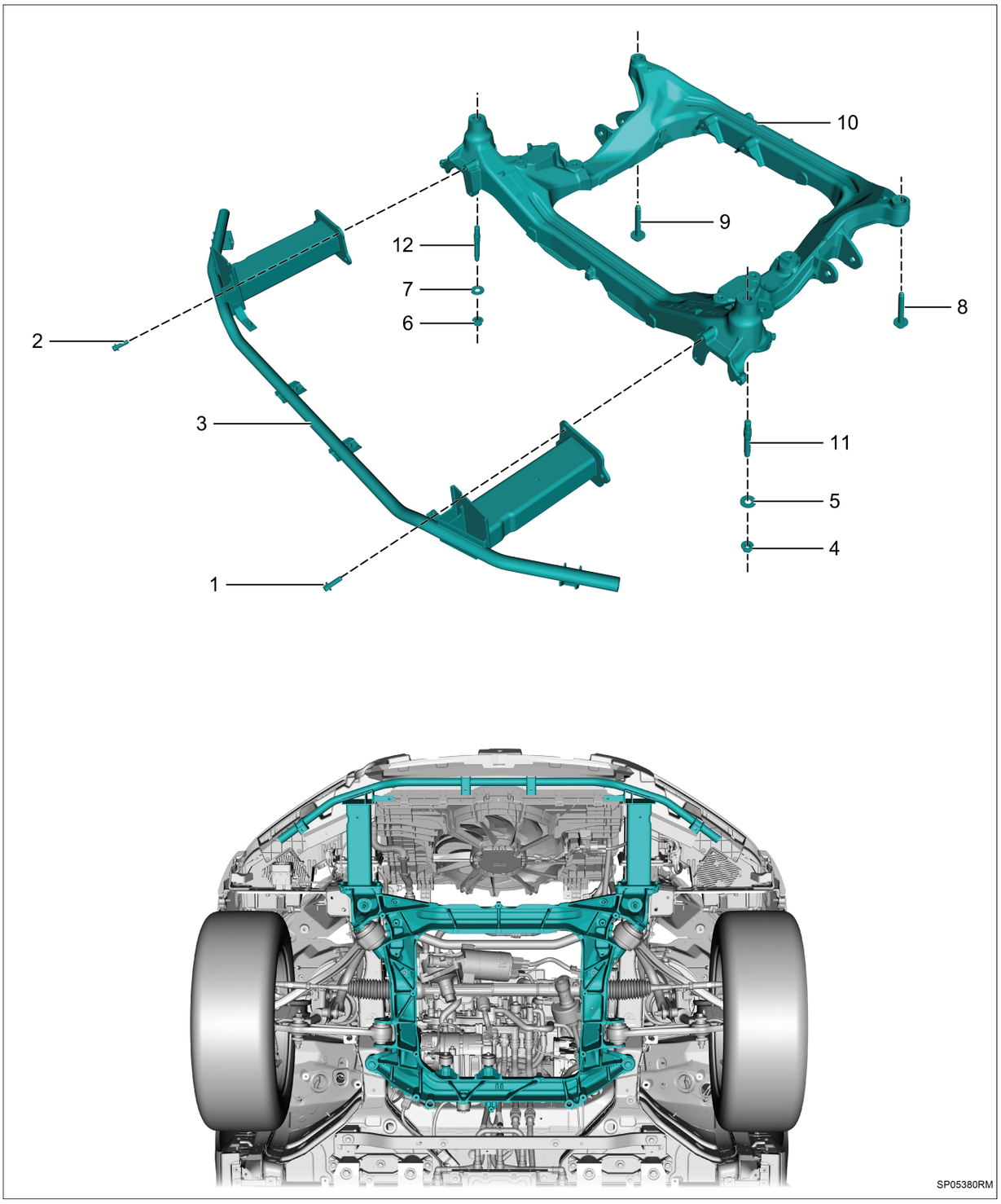
Installation

1. Installation is in the reverse order of removal.

Front sub frame assembly

Components

DP



1. **Hexagon flange bolt**
   - X3
   - Torque: 27 ~ 33 N • m
2. **Hexagon flange bolt**

- X3
- Torque: 27 ~ 33 N • m

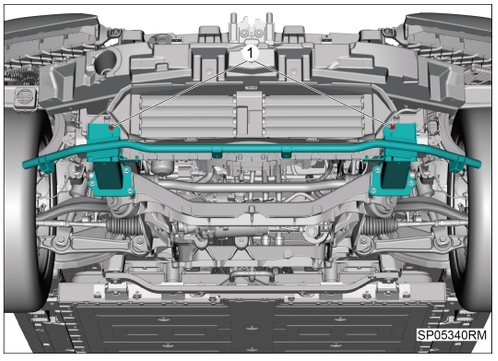
3. **Front sub frame anti-collision beam with crash box welding assembly**
4. **Hexagon flange nut**
   - Torque: 72 ~ 88 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 130 ~ 230 N • m
5. **Washer**
6. **Hexagon flange nut**
   - Torque: 72 ~ 88 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 130 ~ 230 N • m
7. **Washer**
8. **Hexagon flange bolt**
   - Torque: 72 ~ 88 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 130 ~ 230 N • m
9. **Hexagon flange bolt**
   - Torque: 72 ~ 88 N • m + rotation angle of (80° ~ 100°)
   - Monitoring torque: 130 ~ 230 N • m
10. **Front sub frame**
11. **Stud**
    - Torque: 20 ~ 40 N • m
12. **Stud**
    - Torque: 20 ~ 40 N • m

Removal

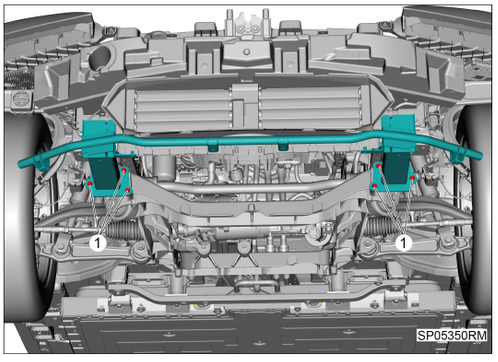
1. **Raise the vehicle.**
2. **Remove engine bottom protector assembly (See page WS-40)**
3. **Remove front compartment bottom protector bracket II (See page WS-40)**
4. **Remove engine bottom protector left fixing bracket (See page WS-40)**
5. **Remove front compartment bottom protector right fixing bracket (See page WS-40)**
6. **Remove pedestrian warning speaker (See page ZC-118)**
7. **Remove front left lower spoiler (See page WS-32)**
8. **Remove front right lower spoiler (See page WS-32)**
9. **Remove front bumper cover assembly (See page WS-1)**

DP

10. **Remove compressor bracket assembly (See page RE-53)**
11. **Remove fixing bolt between No.1 front left lower control arm assembly and sub frame (See page DP-60)**
12. **Remove fixing bolt between No.2 lower control arm assembly and sub frame (See page DP-62)**
13. **Remove fixing bolt between front stabilizer bar cover plate and sub frame (See page DP-88)**
14. **Remove fixing bolt between dual gear assisted type power steering gear with rod assembly and sub frame (See page DP-52)**
15. **Remove front sub frame anti-collision beam with crash box welding assembly**



(a) Remove the nut -1-.



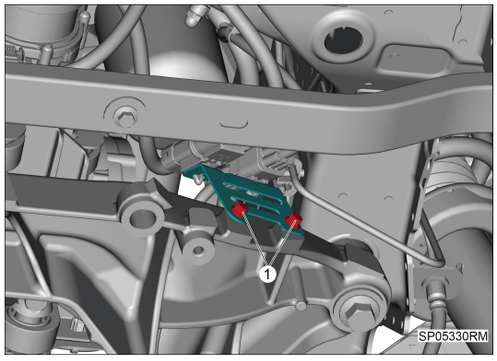
(b) Remove the bolt -1-.

(c) Remove the front sub frame anti-collision beam with crash box welding assembly.

16. **Remove front sub frame assembly**

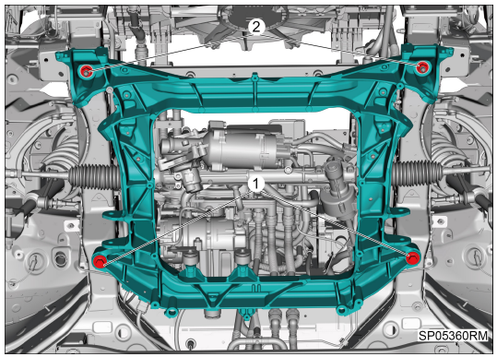
Notice:

- **Make sure that there are no wires and hoses connected with front sub frame assembly.**
- **When lowering the front sub frame assembly, do not touch the body and other components.**



(a) Remove the bolt -1-.

(b) Detach the PTC I high voltage wire harness bracket.



(c) Remove the bolt -1-.

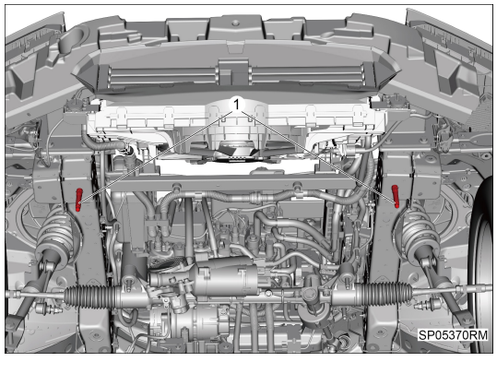
(d) Remove the nut -2-.

(e) Remove the front sub frame assembly.

Note:

- It requires two people to work together for removal during lowering.

17. Remove stud



(a) Remove the stud -1-.

Installation

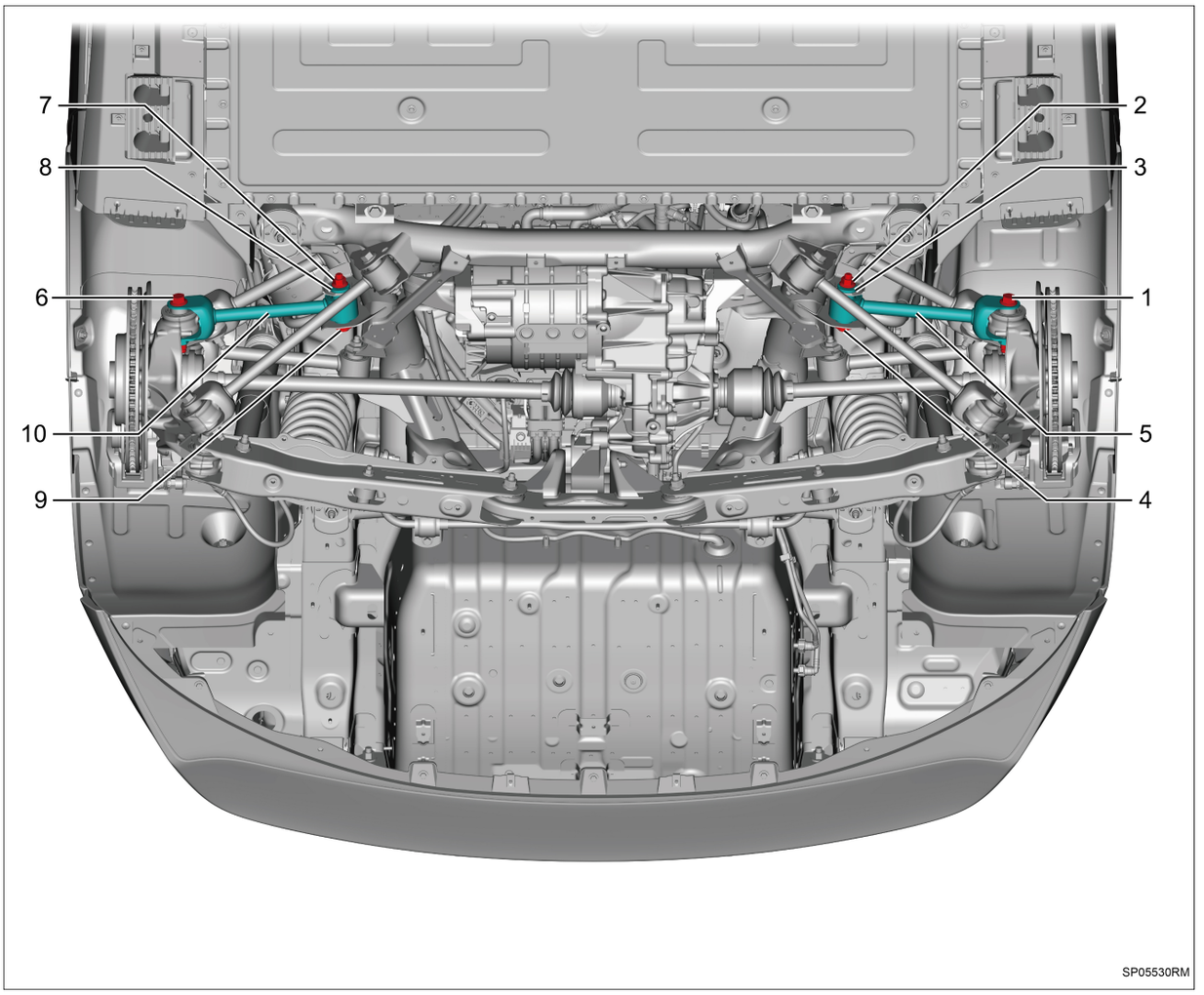
1. Installation is in the reverse order of removal, and pay attention to the followings:

(a) Readjust vehicle positioning value (See page DP-54)

Toe-in control arm assembly

Components

DP



1. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
2. **Hexagon flange nut**
   - Torque: 122 ~ 152 N • m
   - Target torque: 137 N • m
3. **Rear adjustable cam assembly**
4. **Adjustable cam**
   - The eccentric side of the eccentric cam faces downward and needs to be fully engaged into the limit slot of the sub frame.
5. **Toe-in control arm assembly (left)**
6. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m

7. Hexagon flange nut

- Torque: 122 ~ 152 N • m
- Target torque: 137 N • m

8. Rear adjustable cam assembly

9. Adjustable cam

- The eccentric side of the eccentric cam faces downward and needs to be fully engaged into the limit slot of the sub frame.

10. Toe-in control arm assembly (right)

Removal

1. Raise the vehicle.

2. Remove rear wheels of vehicle (See page DP-116)

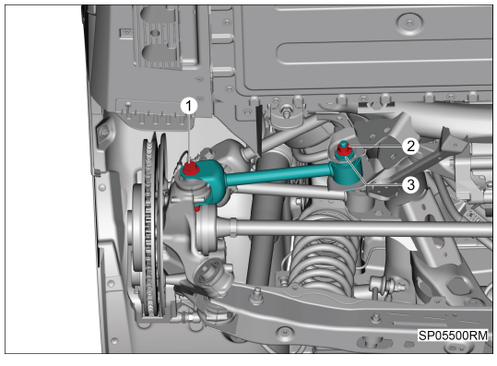
3. Remove rear suspension bottom protector l (See page WS-47)

4. Remove rear suspension bottom protector bracket assembly l (See page WS-47)

5. Remove toe-in control arm assembly

Note:

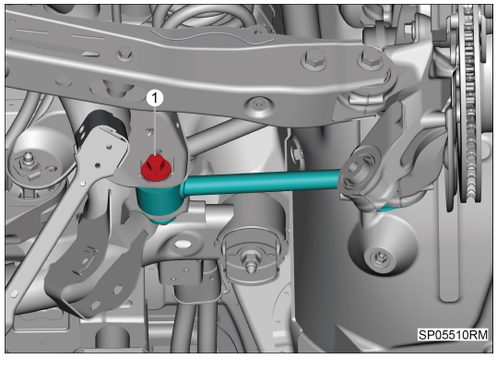
- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

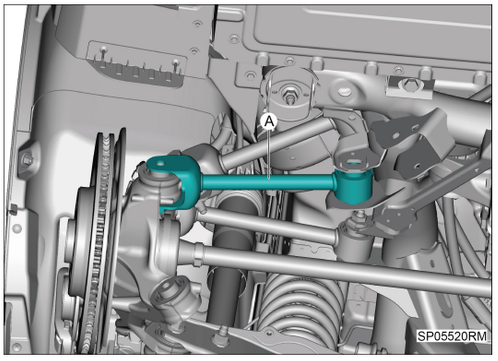
(b) Remove the nut -2-.

(c) Remove the adjustable cam -3-.



(d) Remove the rear adjustment bolt and adjustable cam -1-.

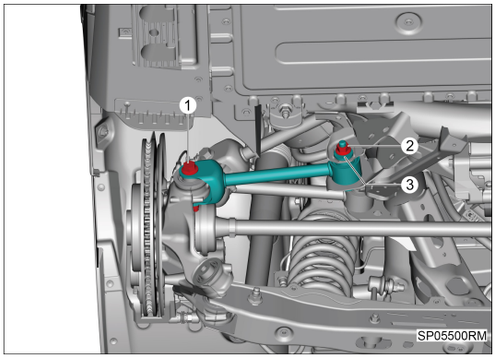
DP



(e) Remove the toe-in control arm assembly -A-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



(a) Install the adjustable cam -3-.

(b) Install nut -2- and bolt -1-.

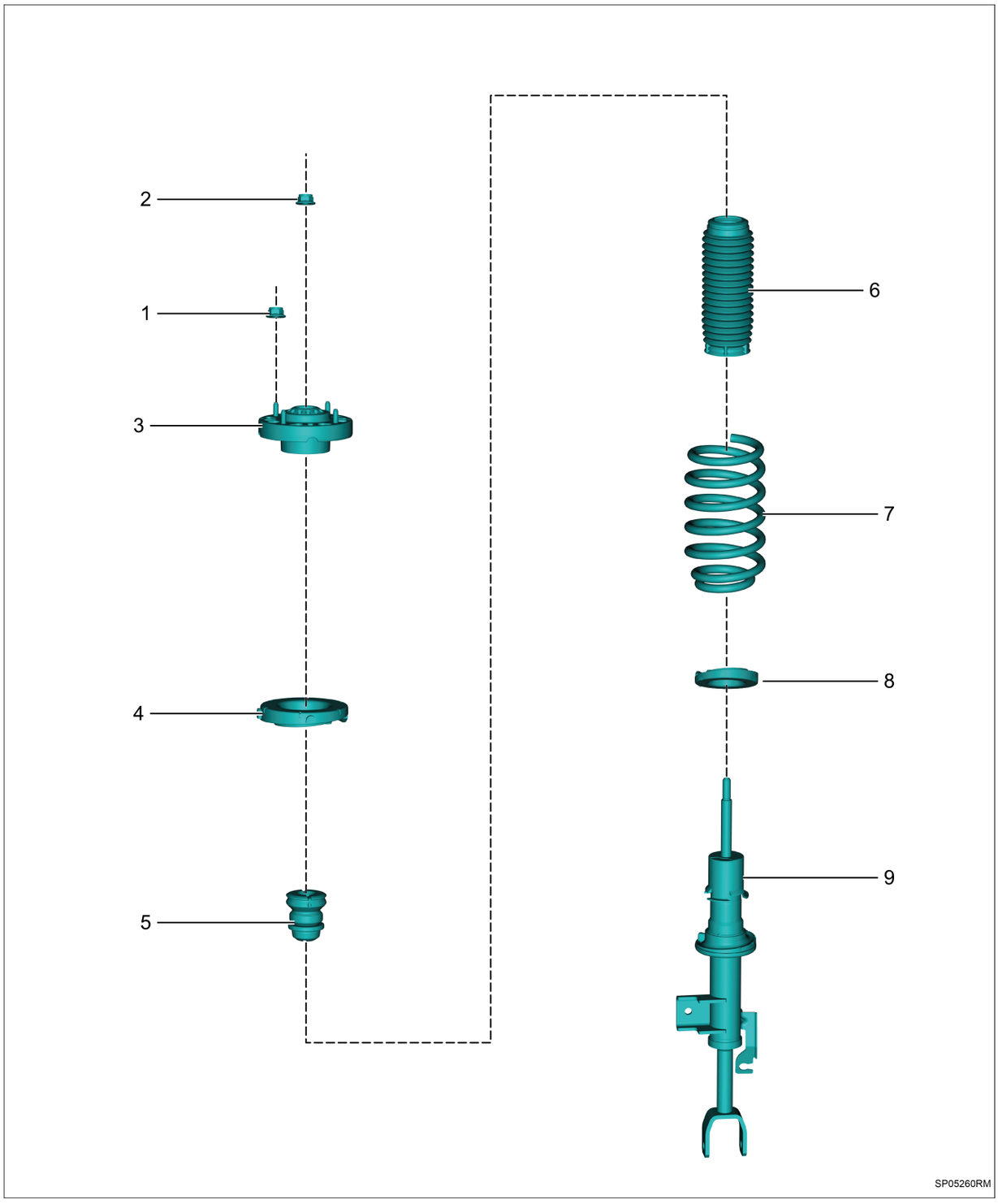
Notice:

- **It is necessary to tighten bolts and nuts at the design load position (See page DP-57)**

(c) Readjust vehicle positioning value (See page DP-54)

Front strut assembly

Components



1. Hexagon flange nut

- X4
- Torque: 24 ~ 36 N • m
- Tighten in a diagonal manner

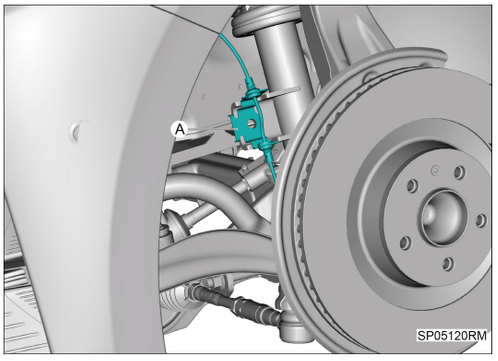
2. **Non-metal insert hexagon flange locking nut**
   - Torque: 47 ~ 62 N • m
   - Not reusable
3. **Upper mounting assembly**
4. **Spring upper cushion**
5. **Front buffer block**
6. **Dust boot**
7. **Coil spring**
8. **Spring lower cushion**
9. **Front shock absorber assembly**

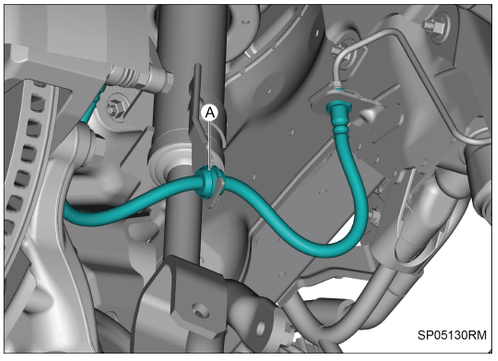
Removal

1. **Raise the vehicle.**
2. **Remove front wheels of vehicle (See page DP-116)**
3. **Remove No.2 lower control arm assembly (See page DP-62)**
4. **Remove fixing bolt between front stabilizer bar connecting rod assembly and front left strut assembly (See page DP-88)**
5. **Remove water channel cover plate assembly (See page WS-86)**
6. **Remove front left strut assembly**

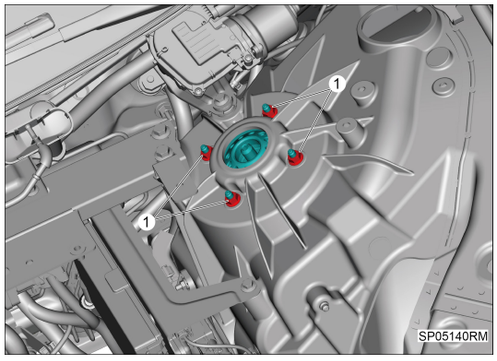
   Note:
   - Use same removal orders for right and left sides.

   (a) Detach the wire harness and wire harness metal bracket -A-.

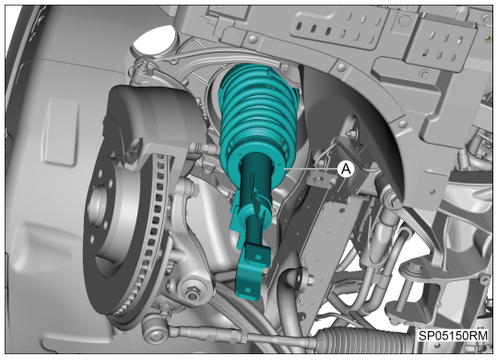




(b) Detach the brake fluid pipe fixture -A-.

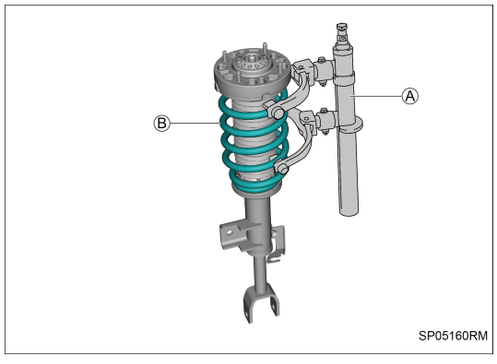


(c) Remove the nut -1-.



(d) Remove the front left strut assembly -A- at an appropriate angle.

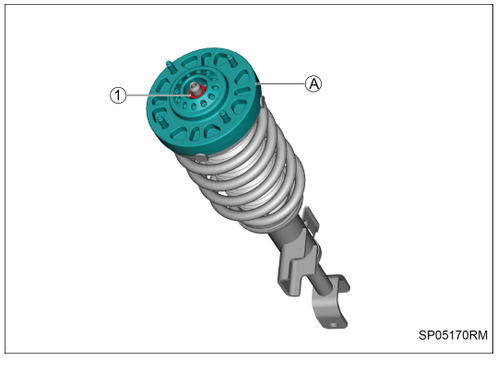
7. Disassemble front strut assembly



(a) Use SST (39H7029020B) -A- to compress the front coil spring -B-.

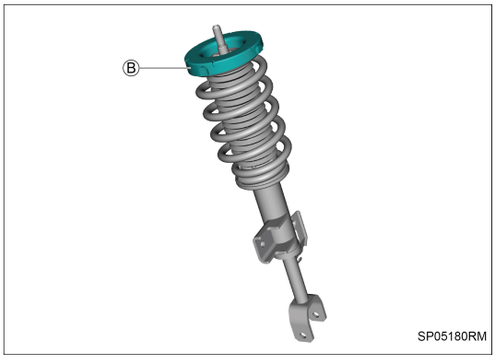
Note:

- Do not use an impact wrench to compress coil spring, which will damage special tool.

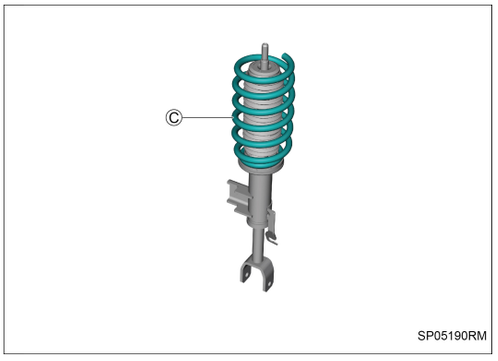


(b) Use SST (9503410HF01) to remove nut -1-.

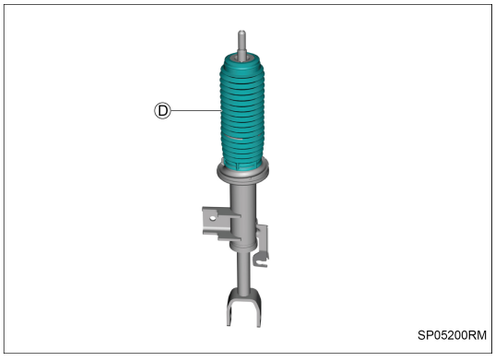
(c) Remove the upper mounting assembly -A-.



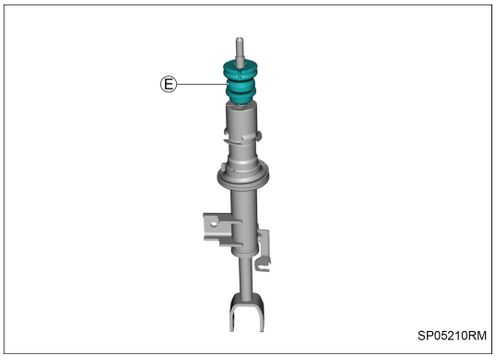
(d) Remove the spring upper cushion -B-.



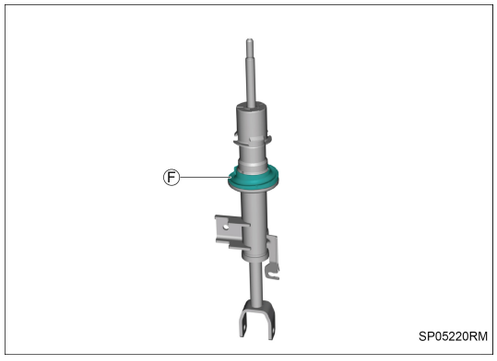
(e) Remove the coil spring -C-.



(f) Remove the dust boot -D-.



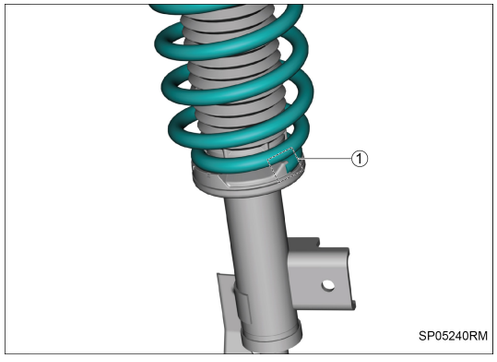
(g) Remove the front buffer block -E-.



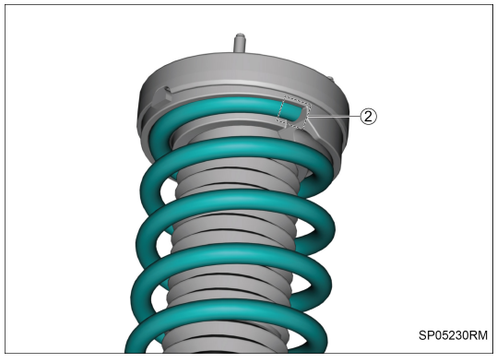
(h) Remove the spring lower cushion -F-.

Installation

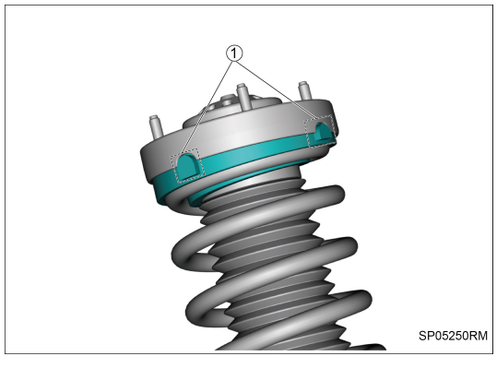
1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) As indicated by -1- in the figure, the clearance between the spring lower end and the limit end face of the spring lower cushion is less than 2 mm.



(b) As indicated by -2- in the figure, the spring upper end is in contact with the limit end face of the spring upper cushion.

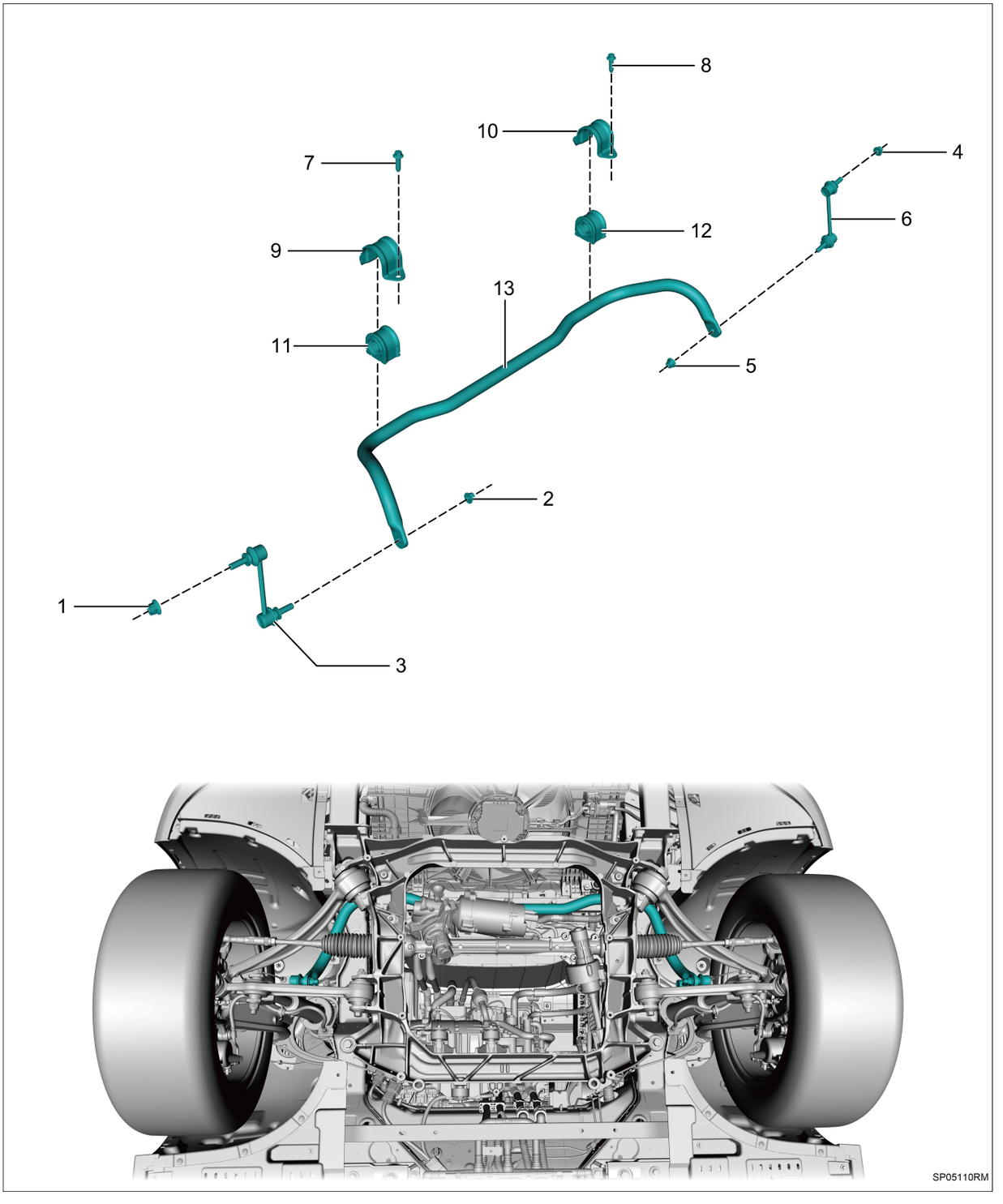


(c) Two positioning protrusions -1- of spring upper cushion must be embedded in two positioning grooves of upper mounting.

DP

Front stabilizer bar and connecting rod

Components



1. **Non-metal insert hexagon locking nut**
   - Torque: 100 ~ 120 N • m
2. **Non-metal insert hexagon locking nut**

- Torque: 100 ~ 120 N • m

3. **Front stabilizer bar connecting rod assembly**
4. **Non-metal insert hexagon locking nut**
   - Torque: 100 ~ 120 N • m
5. **Non-metal insert hexagon locking nut**
   - Torque: 100 ~ 120 N • m
6. **Front stabilizer bar connecting rod assembly**
7. **Hexagon flange bolt**
   - X2
   - Torque: 50 ~ 70 N • m
8. **Hexagon flange bolt**
   - X2
   - Torque: 50 ~ 70 N • m
9. **Front stabilizer bar cover plate**
10. **Front stabilizer bar cover plate**
11. **Front stabilizer bar bushing**
12. **Front stabilizer bar bushing**
13. **Front stabilizer bar**

Removal

Note:

- Use same removal orders for right and left sides.

1. **Raise the vehicle.**
2. **Remove front wheels of vehicle (See page DP-116)**
3. **Remove engine bottom protector assembly (See page WS-40)**
4. **Remove front left stabilizer bar connecting rod assembly**

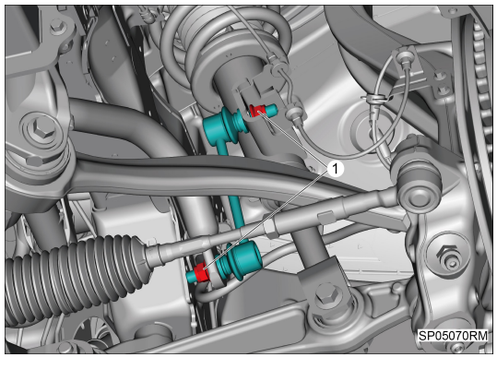
   Note:

   - Use same removal orders for right and left sides.

   (a) Remove the nut -1-.

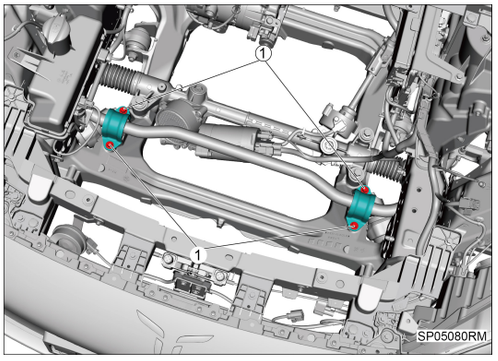
   Note:

   - When removing front stabilizer bar connecting rod, use the internal stop and external moving tool to remove it.



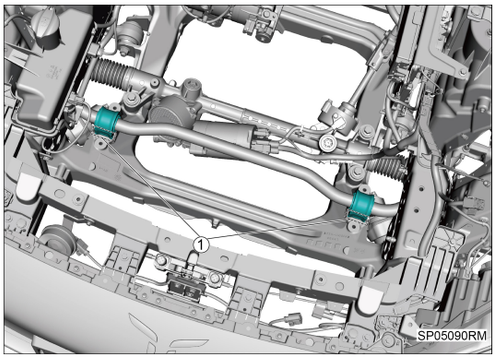
5. **Remove front stabilizer bar bushing**

DP



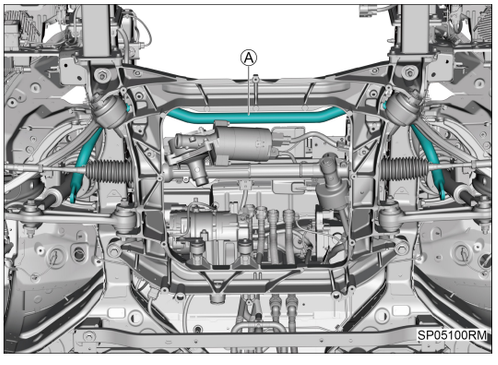
(a) Remove the bolt -1-.

(b) Remove the front stabilizer bar cover plate.



(c) Remove the front stabilizer bar bushings from the opening -1-.

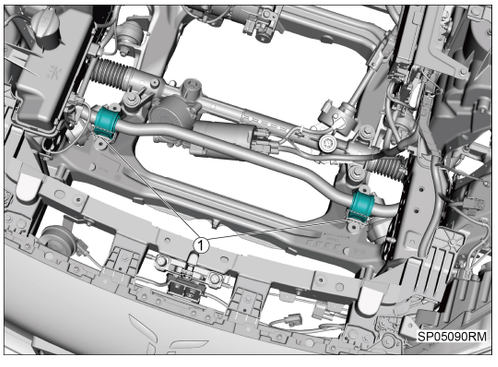
6. Remove front stabilizer bar



(a) Remove the front stabilizer bar -A- at an appropriate angle.

Installation

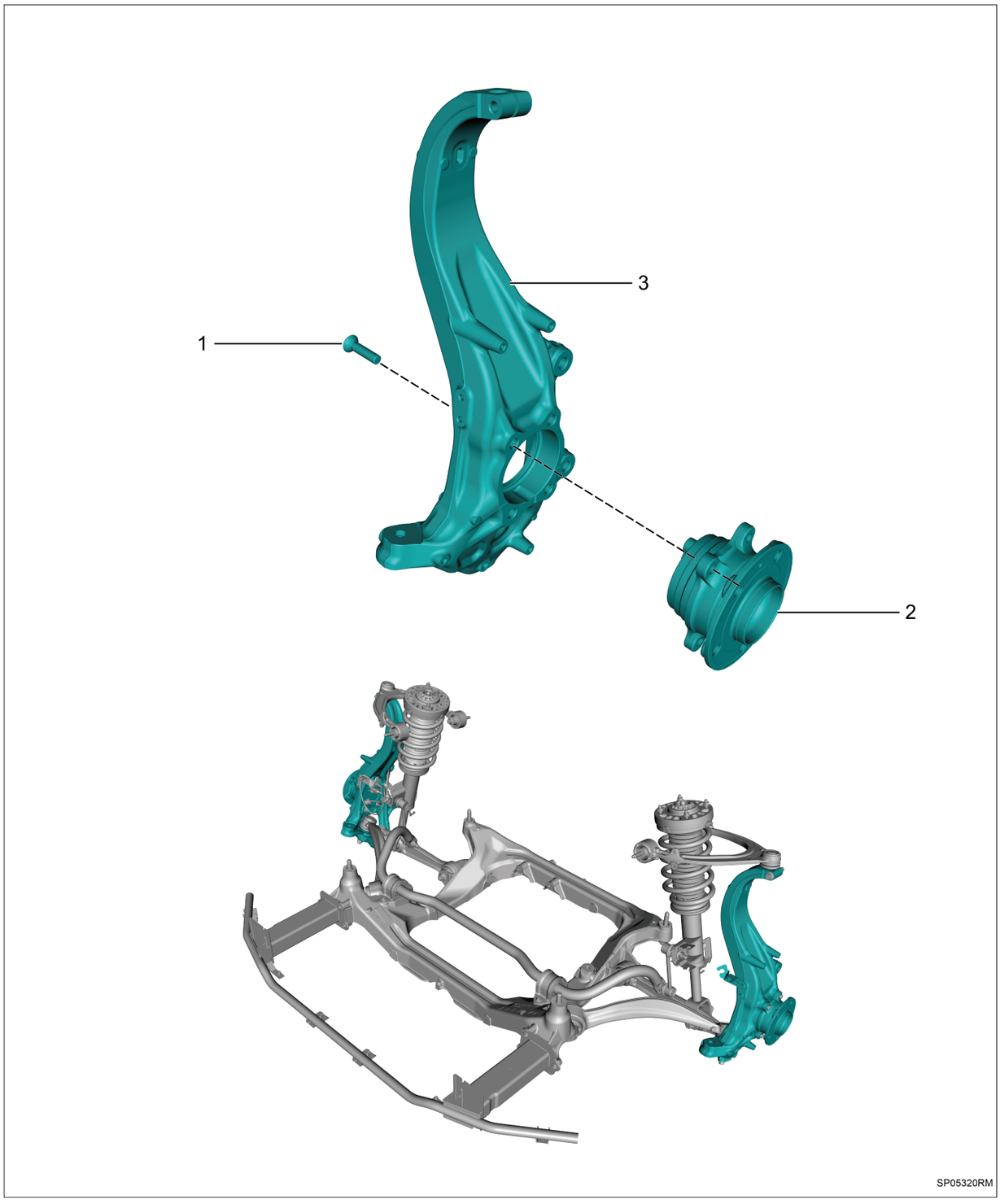
1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) Install the front stabilizer bar bushing -1-, and it is required to apply grease or soapy water.

Front steering knuckle assembly

Components



1. Inner twelve floral spherical bolt

- X4
- Torque: 52 ~ 68 N • m + (rotation angle) 125 ~ 145°
- Monitoring torque: 140 ~ 280 N • m

- Maintenance torque: 180 ～ 240 N • m
- Not reusable

2. Hub bearing assembly

3. Front steering knuckle assembly

DP

Removal

Note:

- Use same removal orders for right and left sides.

1. Raise the vehicle.

2. Remove front wheels of vehicle (See page DP-116)

3. Remove front brake caliper assembly

Note:

- It is not necessary to disconnect the fluid pipe of front brake caliper assembly, use iron wire to hang it to the vehicle body first.

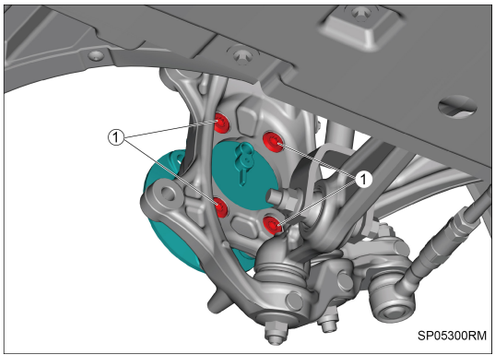
(See page DP-12)

4. Remove front brake disc (See page DP-22)

5. Remove front dust disc (See page DP-22)

6. Remove front wheel speed sensor assembly

7. Remove front hub bearing assembly



(a) Remove the bolt -1-.

(b) Remove the front hub bearing assembly.

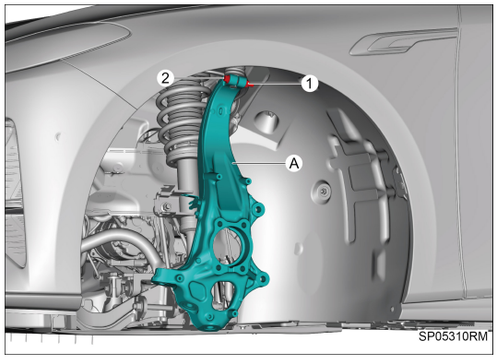
8. Remove front left wheel wire harness bracket (See page DP-6)

9. Detach fixing bolts from power steering gear outer rod ball (See page DP-50)

10. Remove No.1 front left lower control arm assembly (See page DP-60)

11. Remove No.2 lower control arm assembly (See page DP-62)

12. Remove front steering knuckle assembly



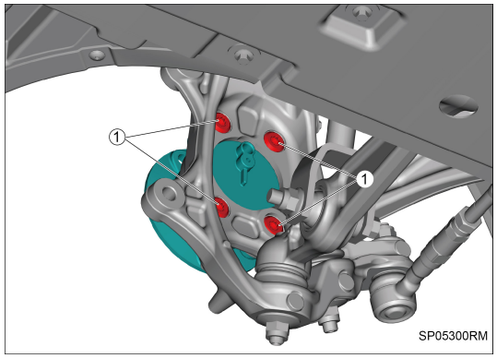
(a) Remove the nut -1-.

(b) Remove the bolt -2-.

(c) Remove the front steering knuckle assembly -A-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

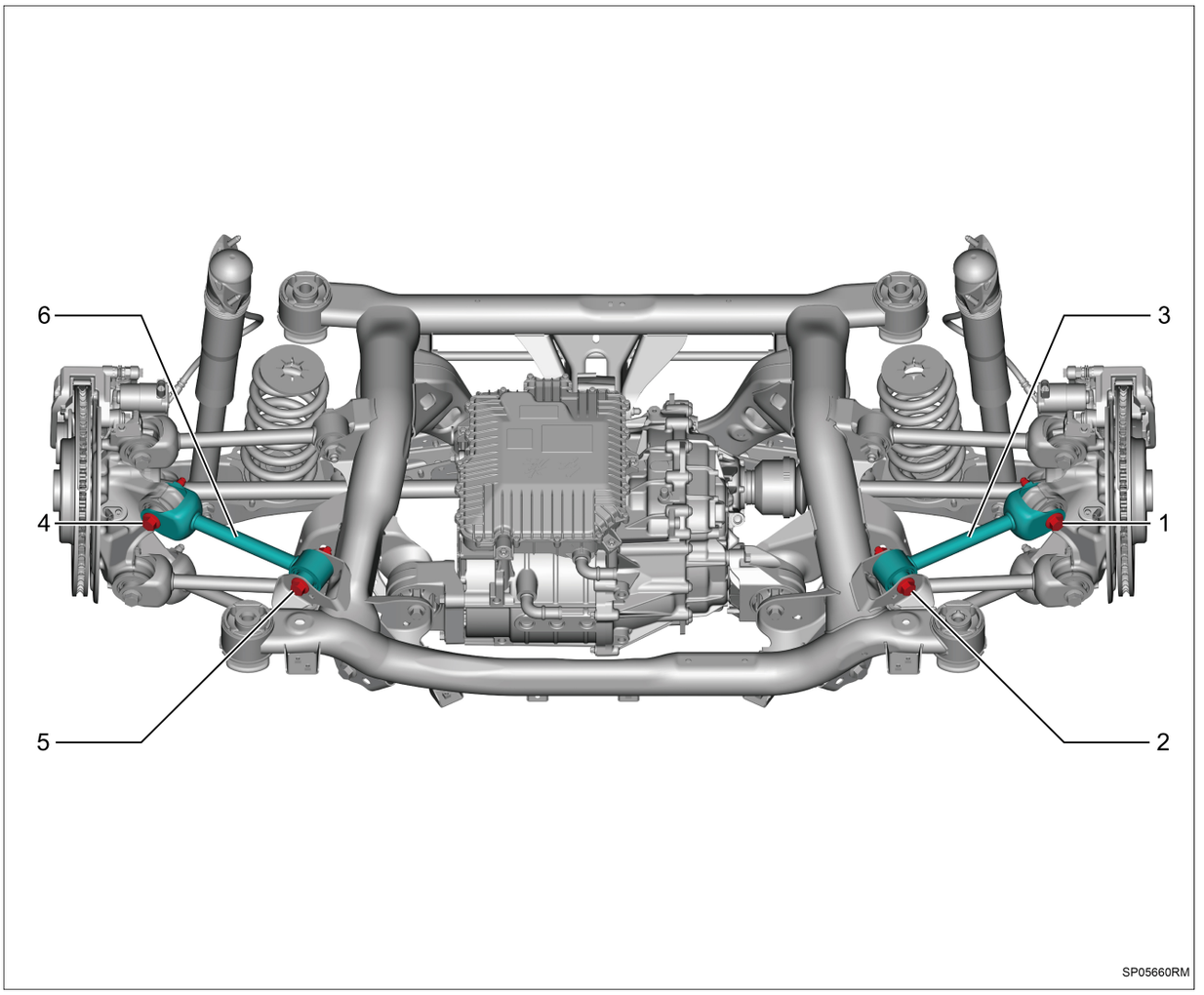


(a) Diagonally tighten front hub bearing assembly bolt -1-, and tighten 4 shafts at the same time.

Rear upper control arm assembly

Components

DP



1. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
2. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
3. **Rear upper control arm assembly (left)**
4. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
5. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m

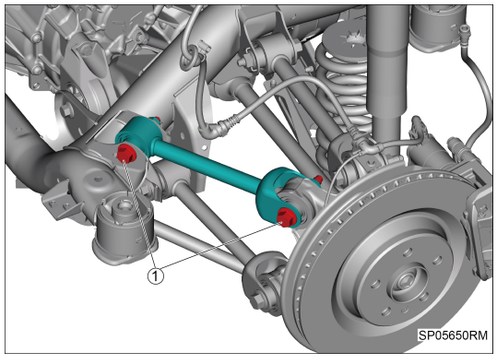
6. Rear upper control arm assembly (right)

Removal

1. **Raise the vehicle.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove rear wheels of vehicle (See page DP-116)**
4. **Remove rear sub frame assembly (See page DP-98)**
5. **Remove rear upper control arm assembly**

Note:

- Use same removal orders for right and left sides.

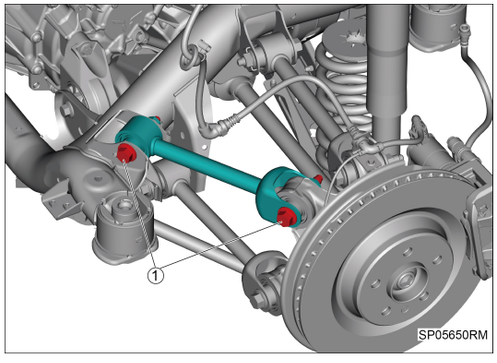


(a) Remove the bolt -1-.

(b) Remove the rear upper control arm assembly.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



(a) Install the bolt -1-.

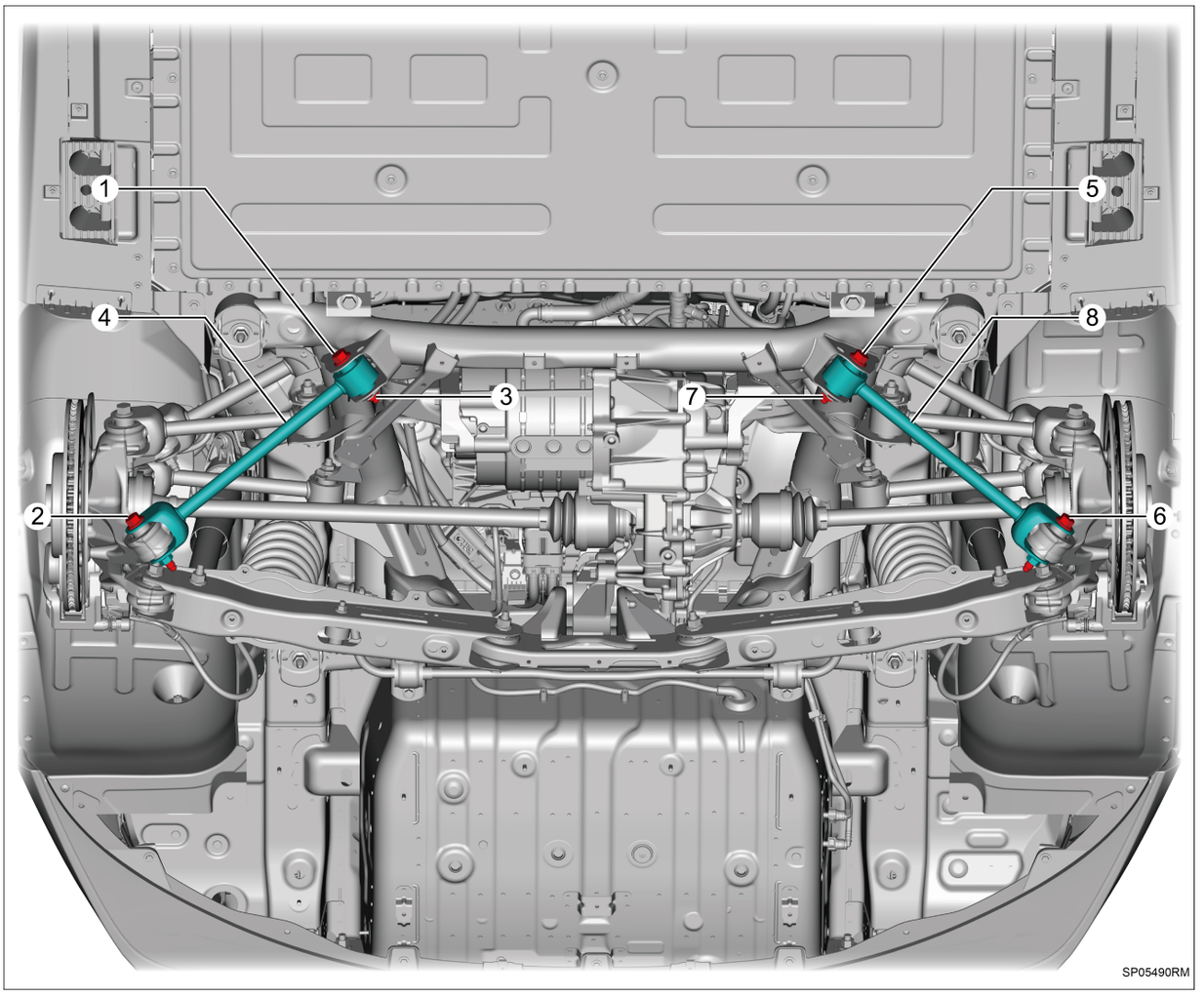
Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**

DP

Rear lower control arm assembly

Components



1. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
2. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
3. **Hexagon flange nut**
4. **Rear lower control arm assembly (left)**
5. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
6. **Hexagon flange bolt**
   - Torque: 165 ~ 195 N • m

- Target torque: 180 N • m

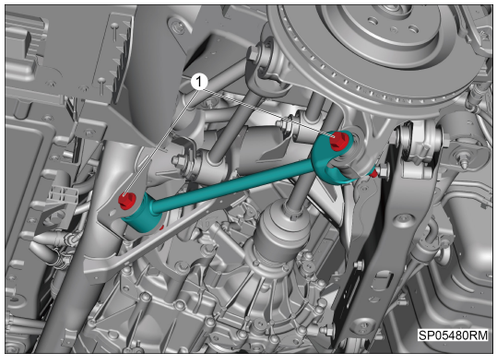
7. **Hexagon flange nut**
8. **Rear lower control arm assembly (right)**

Removal

1. **Raise the vehicle.**
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove rear suspension bottom protector I (See page WS-47)**
4. **Remove rear suspension bottom protector bracket assembly (See page WS-47)**
5. **Remove rear lower control arm assembly**

   Note:

   - Use same removal orders for right and left sides.

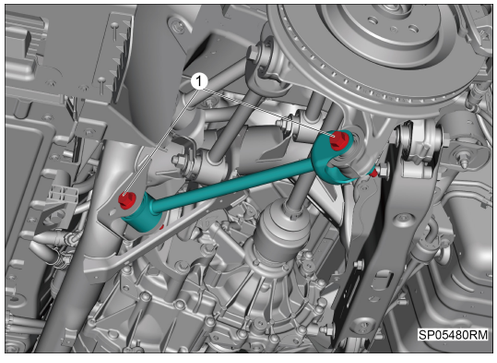


(a) Remove the bolt -1-.

(b) Remove the rear lower control arm assembly.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



(a) Install the bolt -1-.

Notice:

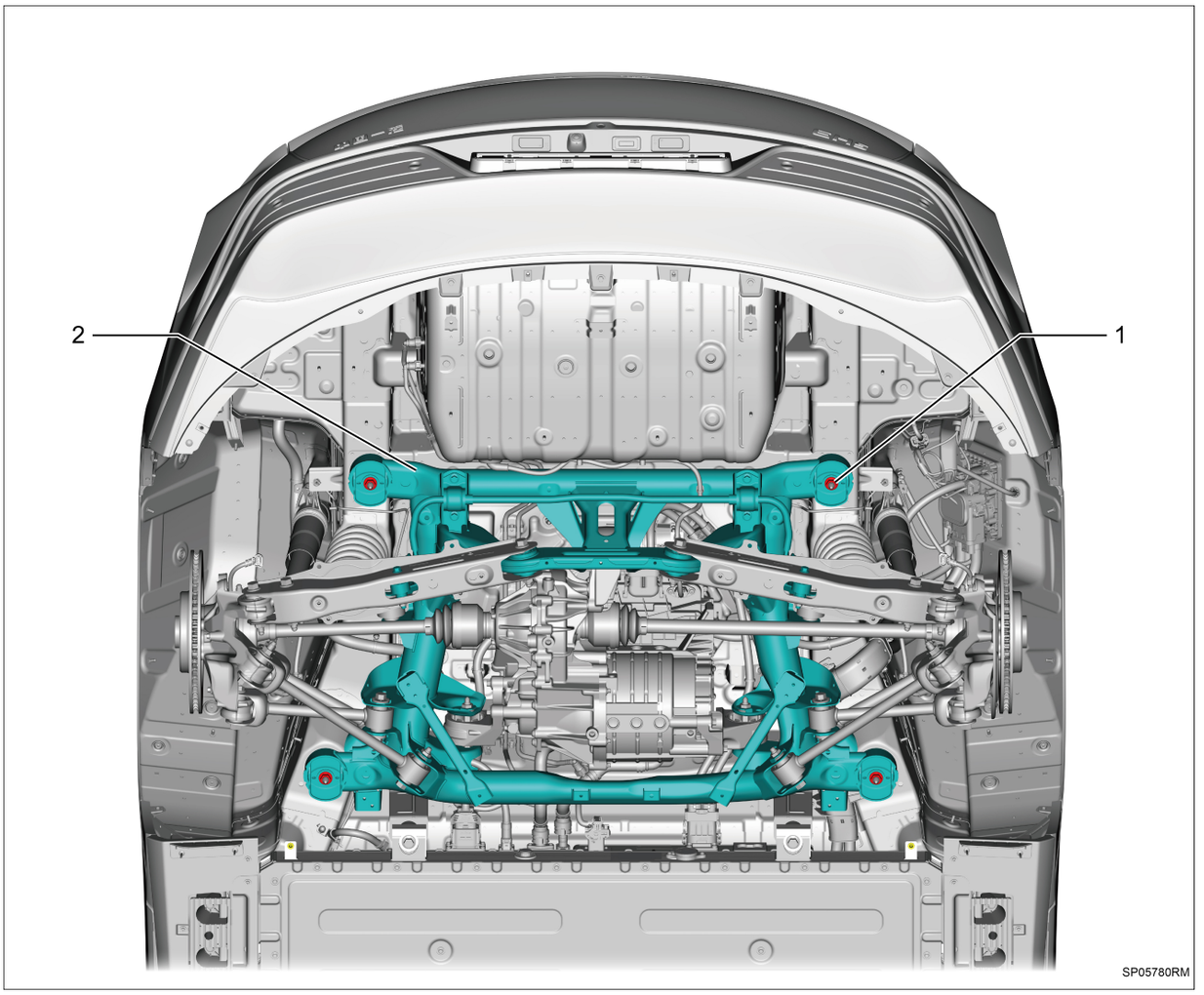
- **It is necessary to tighten bolts at the design load position (See page DP-57)**

(b) Readjust vehicle positioning value (See page DP-54)

Rear sub frame assembly

Components

DP



1. **Hexagon flange nut**
   - X4
   - Torque: 165 ~ 195 N • m
   - Target torque: 180 N • m
2. **Rear sub frame assembly**

Removal

Note:

- Use same removal orders for right and left sides.

1. **Raise the vehicle.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Detach service switch (See page DL-17)**

Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

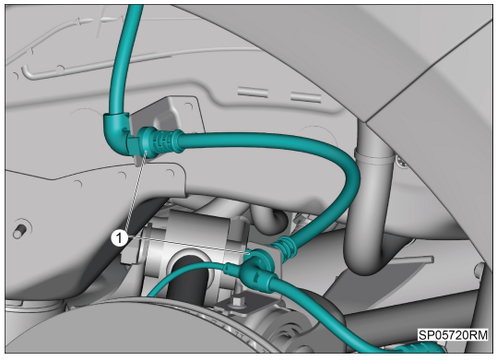
4. **Drain coolant (See page RE-76)**
5. **Remove rear wheels of vehicle (See page DP-116)**
6. **Remove rear brake caliper assembly (See page DP-17)**

   Note:

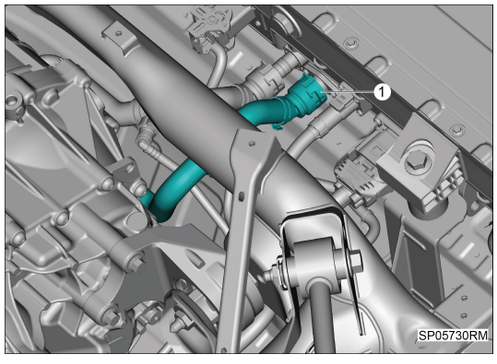
   - After removal hang rear brake caliper assembly with hook without disconnecting the fluid pipe.
7. **Remove rear wheel speed sensor assembly (See page DP-9)**
8. **Remove rear sub frame assembly**

   Note:

   - Two people are required to remove rear sub frame assembly.



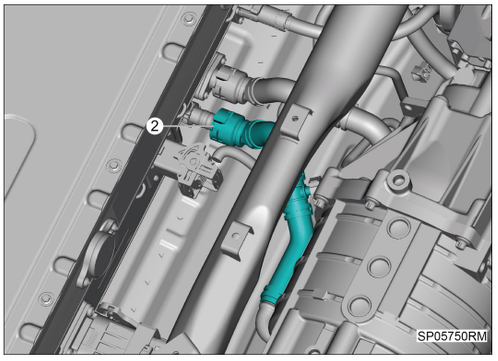
(a) Detach the rear wheel wire harness assembly wire harness fixture -1-.



(b) Detach the connector -1-.

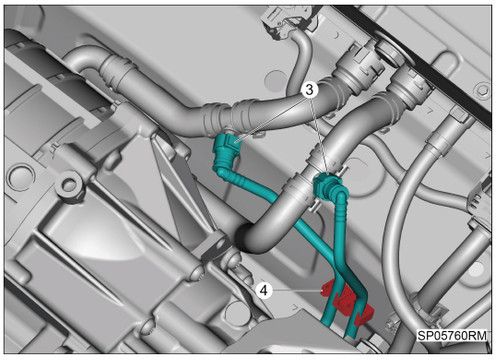
(c) Disconnect the rear motor inlet hose assembly.

DP



(d) Detach the connector -2-.

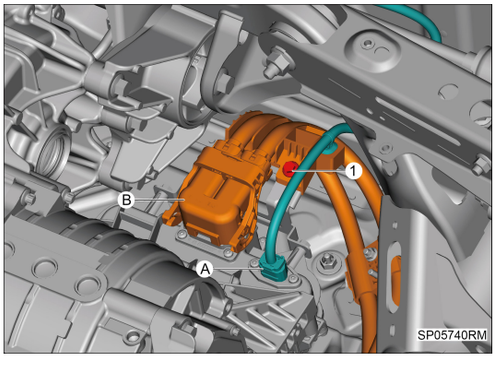
(e) Disconnect the rear motor outlet hose assembly.



(f) Detach the connector -3-.

(g) Detach the dual pipe clamp fixed by bolt -4-.

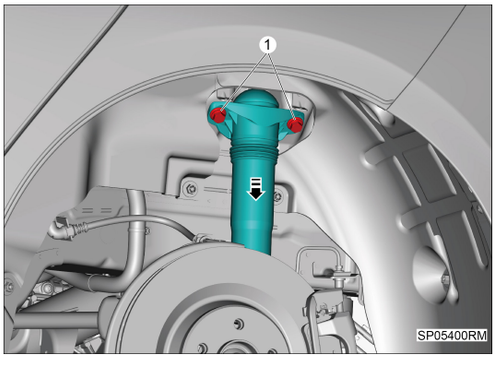
(h) Disconnect the underfloor HAD inlet and outlet nylon pipe assembly



(i) Remove the bolt -1-.

(j) Disconnect the low voltage wire harness connector -A-.

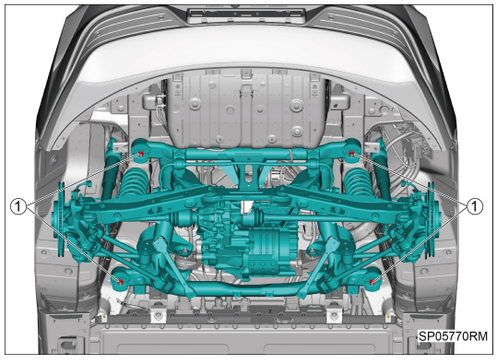
(k) Disconnect the high voltage DC bus II high voltage wire harness assembly -B-.



(l) Remove the bolt -1-.

(m) Push it in direction of -arrow-.

(n) Using a transmission carrier, lift rear electric drive system and rear sub frame assembly slowly.



(o) Remove the nut -1-.

(p) Remove the rear suspension and electric drive assembly.

(q) Slowly lower transmission carrier and keep rear electric drive system and rear sub frame assembly from tilting.

Notice:

- **Make sure that there are no wires and hoses connected with electric drive assembly.**
- **When lowering the rear suspension and electric drive assembly, do not touch the body and other components.**

9. **Remove rear upper control arm assembly (See page DP-94)**
10. **Remove No.2 rear lower control arm assembly (See page DP-68)**
11. **Remove rear lower control arm assembly (See page DP-96)**
12. **Remove toe-in control arm assembly (See page DP-80)**
13. **Remove No.2 rear upper control arm assembly (See page DP-65)**
14. **Remove rear stabilizer bar connecting rod assembly (See page DP-108)**
15. **Remove rear electric drive system assembly (See page DL-3)**

Installation

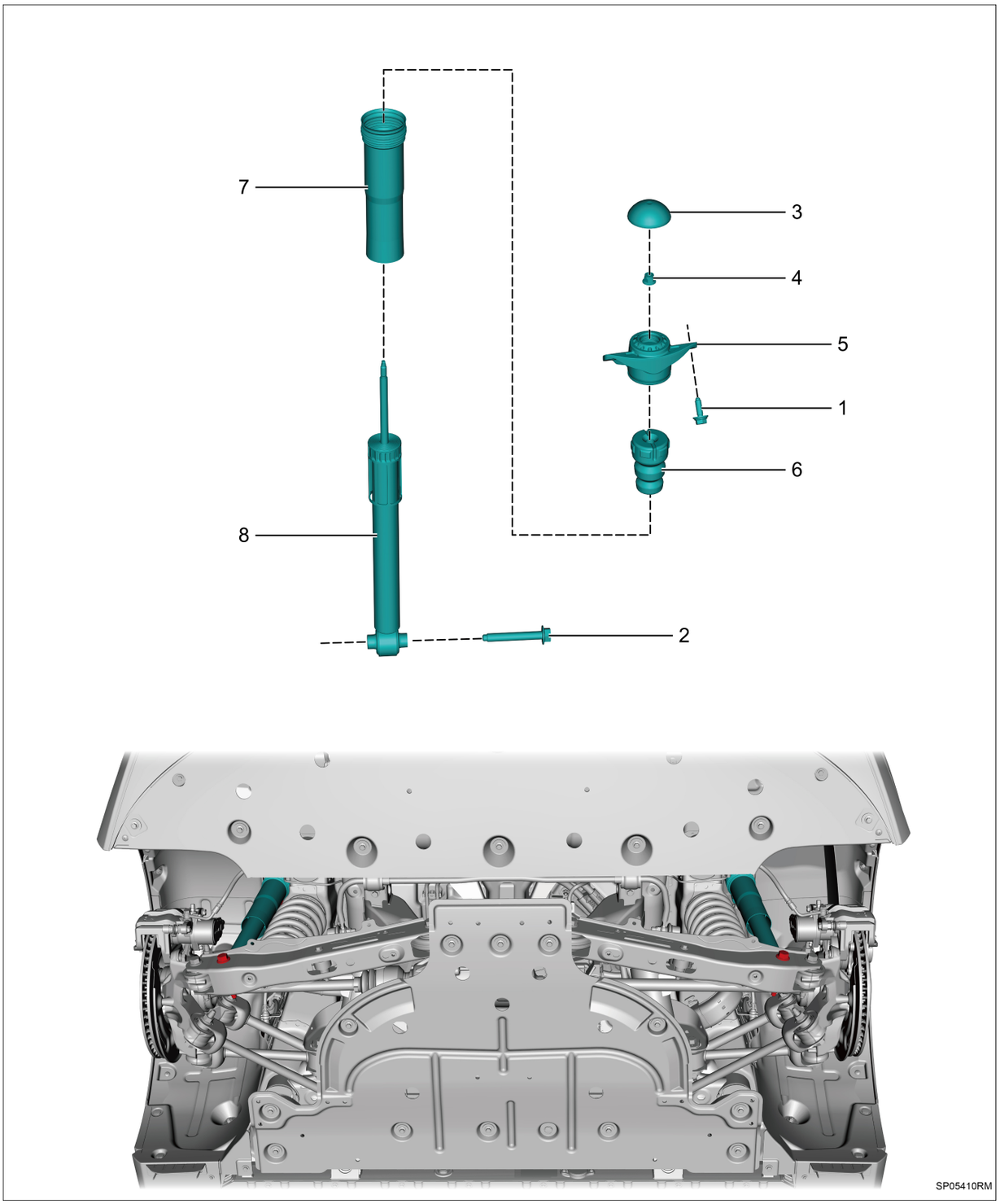
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   (a) Readjust vehicle positioning value (See page DP-56)

Rear strut assembly

Components

DP



1. Hexagon flange bolt

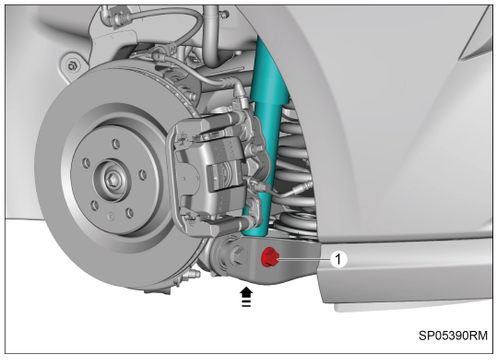
- X2
- Torque: 65 ~ 85 N • m
- Target torque: 75 N • m

2. **Hexagon flange bolt**
   - Torque: 185 ~ 215 N • m
   - Target torque: 200 N • m
3. **Rear strut upper cover**
4. **Non-metal insert hexagon locking nut**
   - Torque: 26 ~ 34 N • m
5. **Rear upper mounting assembly**
6. **Rear buffer block**
7. **Rear dust boot**
8. **Rear shock absorber assembly**

Removal

1. **Raise the vehicle.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove rear wheels of vehicle (See page DP-116)**
4. **Remove rear strut assembly**

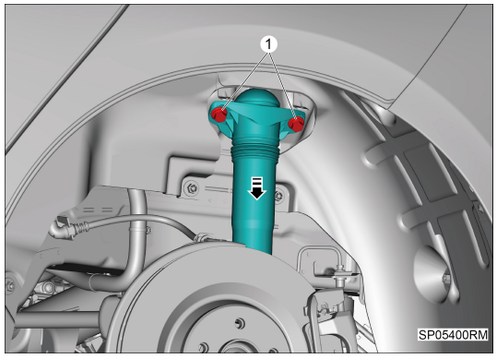
   Note:
   - Use same removal orders for right and left sides.



(a) Support the left No.2 rear lower control arm assembly with a transmission carrier in the direction of -arrow-.

(b) Remove the bolt -1-.

(c) Detach the rear strut assembly.



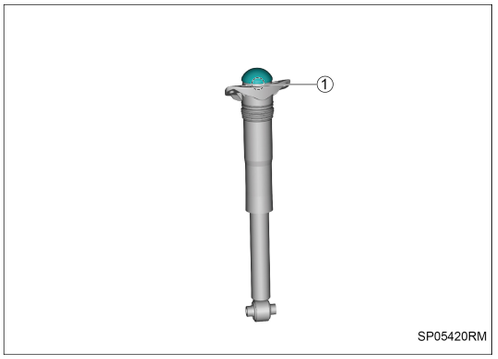
(d) Remove the bolt -1-.

(e) Push it in direction of -arrow-.

(f) Remove the rear strut assembly at an appropriate angle.

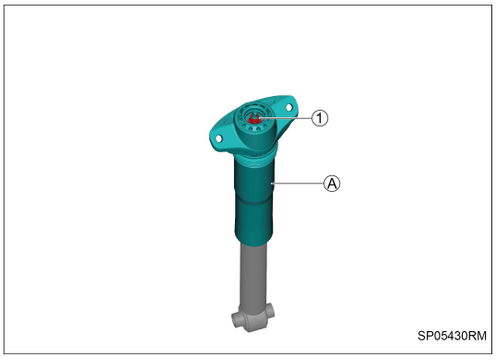
5. **Disassemble rear strut assembly**

DP



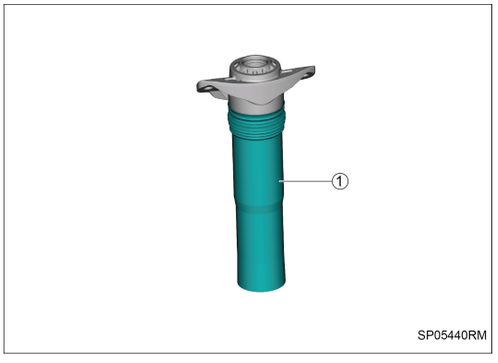
(a) Pry off at the -1- position.

(b) Remove the rear strut upper cover.

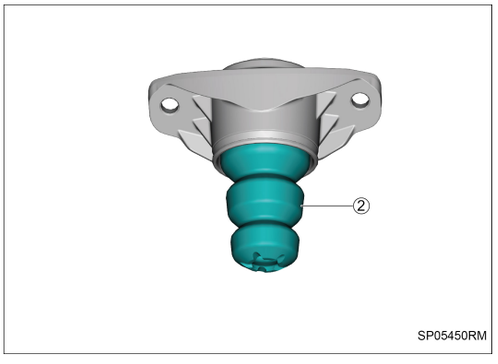


(c) Use SST (9503410HF01) to remove nut -1-.

(d) Remove the rear upper mounting assembly -A-.



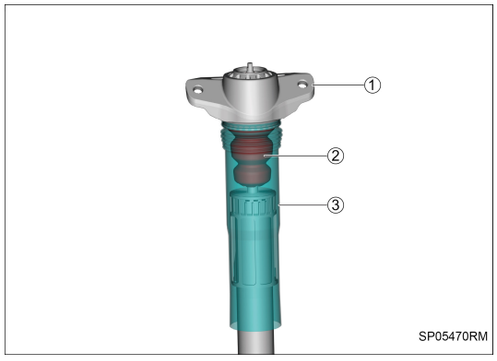
(e) Remove the dust boot -1-.



(f) Remove the rear buffer block -2-.

Installation

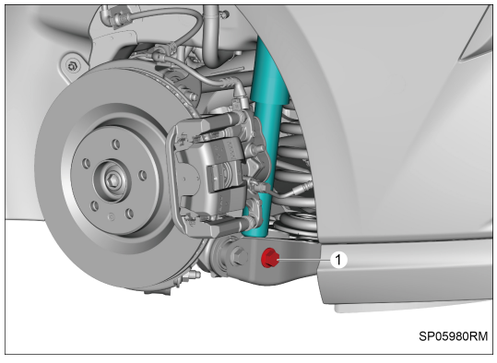
1. **Installation is in the reverse order of removal, and pay attention to the followings:**



(a) The rear upper mounting assembly -1- is first interference-fitted with rear buffer block -2-, and then snap-fitted with dust boot -3-.

(b) Press the rear buffer block -2- into the rear upper mounting assembly -1- with a press, and the pressing force is required to be greater than 2000 N. Pull the buffer block -3- at a speed of 50 mm/min, with a pull-out force of no less than 42 N.

(c) Fix the upper mounting assembly with a fixture, and pull the dust boot at a speed of 50 mm/min. The pull-out force is required to be greater than 80 N.



(d) Install the bolt -1-.

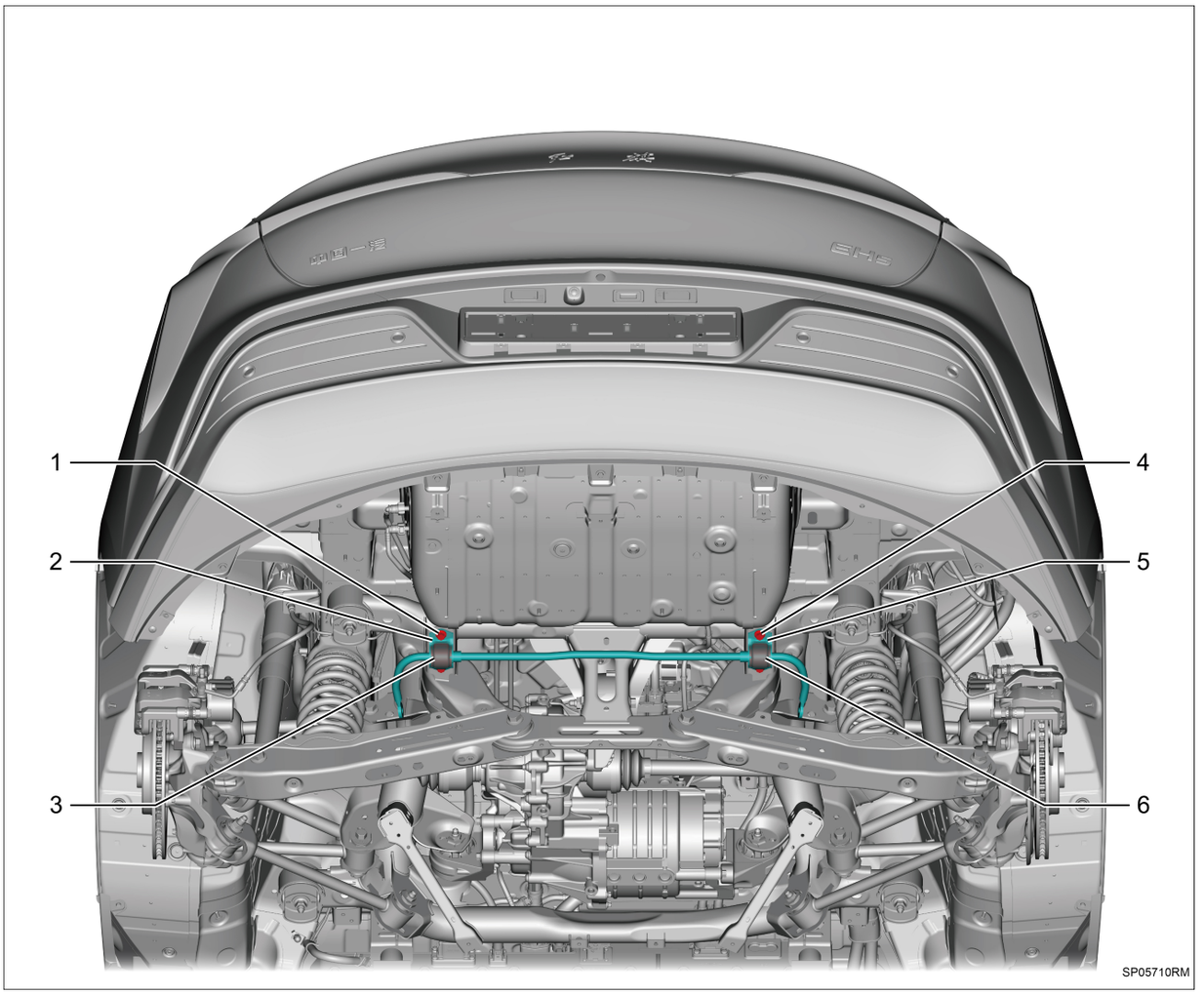
Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**

Rear stabilizer bar

Components

DP

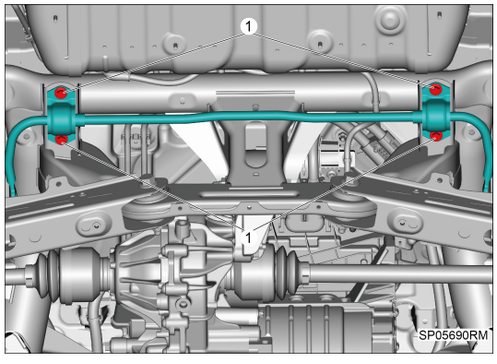


1. **Hexagon flange bolt**
   - X2
   - Torque: 50 ~ 70 N • m
2. **Rear stabilizer bar cover plate**
3. **Rear stabilizer bar bushing**
4. **Hexagon flange bolt**
   - X2
   - Torque: 50 ~ 70 N • m
5. **Rear stabilizer bar cover plate**
6. **Rear stabilizer bar bushing**
7. **Rear stabilizer bar**

Removal

1. **Raise the vehicle.**

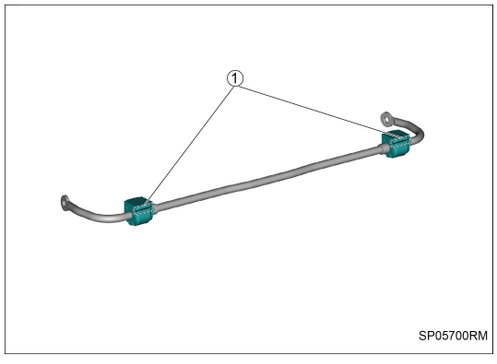
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove rear suspension bottom protector I (See page WS-47)**
4. **Remove rear stabilizer bar connecting rod assembly (See page DP-108)**
5. **Remove rear stabilizer bar**



(a) Remove the bolt -1-.

(b) Remove the rear stabilizer bar cover plate.

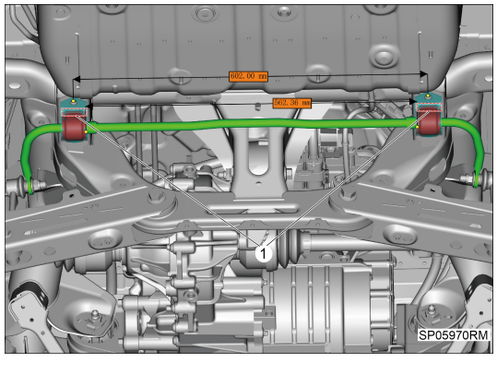
(c) Remove the rear stabilizer bar.



(d) Remove the rear stabilizer bar bushings from the opening -1-.

Installation

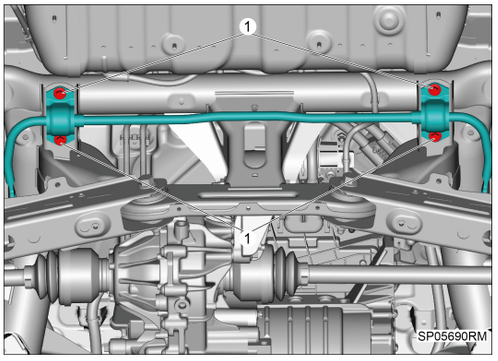
1. **Installation is in the reverse order of removal, and pay attention to the followings:**



(a) Install the rear stabilizer bar bushing, and it is required to apply grease or soapy water.

(b) The opening of rear stabilizer bar bushing -A- faces backwards during installation.

(c) There are angle and size requirements for the rear stabilizer bar bushing and cover plate relative to the stabilizer bar end (as shown in illustration).



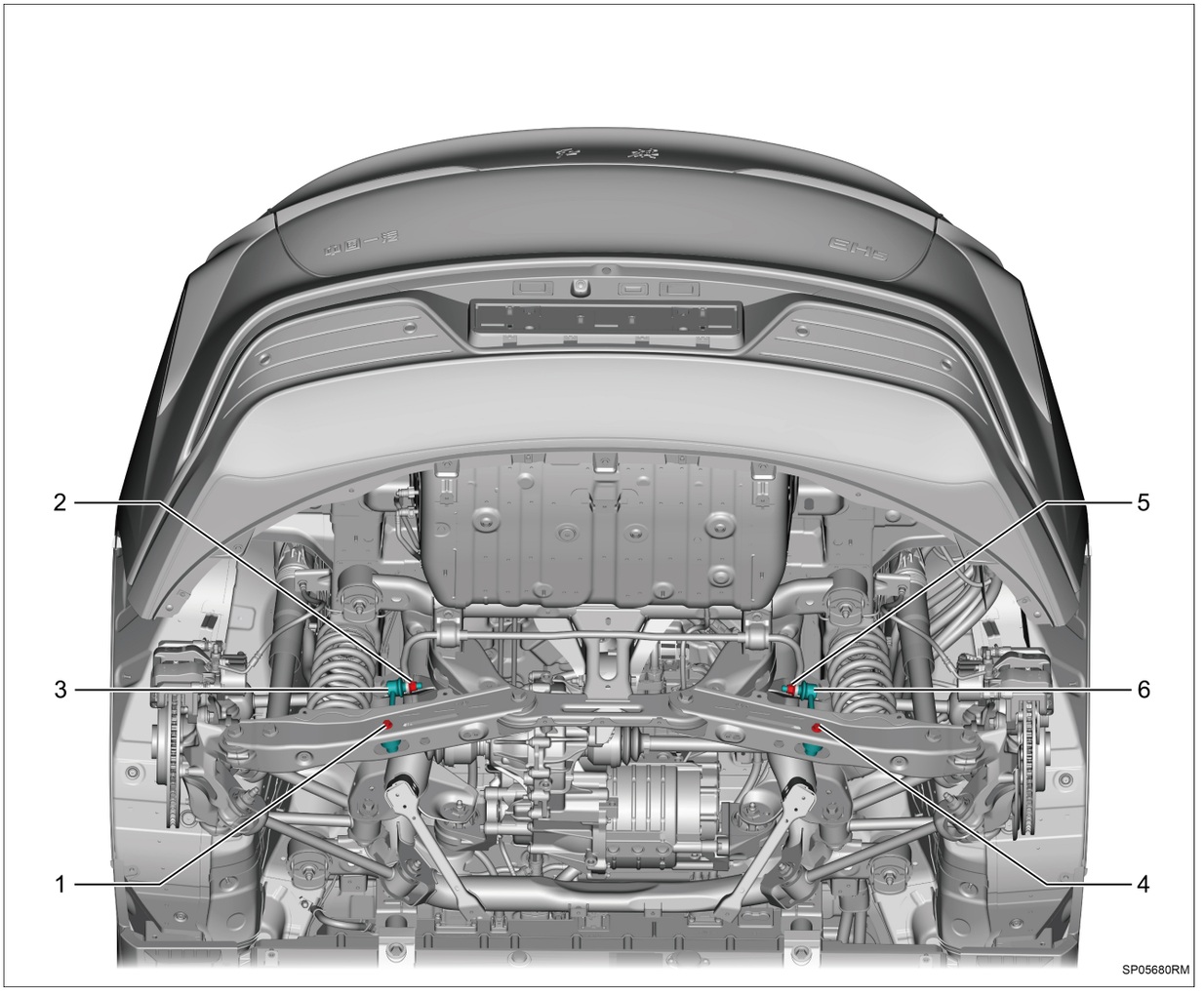
(d) Install the bolt -1-.

Notice:

- **It is necessary to tighten bolts at the design load position (See page DP-57)**

Rear stabilizer bar connecting rod assembly

Components



1. **Hexagon flange bolt**
   - Torque: 60 ~ 72 N • m
   - Target torque: 66 N • m
2. **Non-metal insert hexagon locking nut**

- Torque: 51 ~ 63 N • m

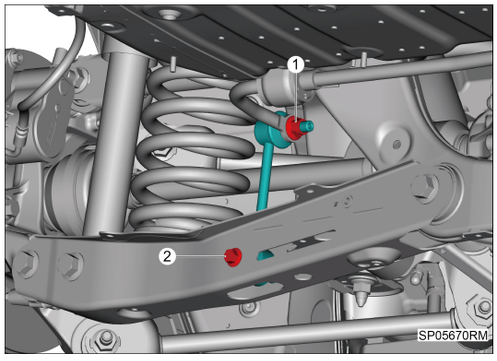
3. **Rear stabilizer bar connecting rod assembly (left)**
4. **Hexagon flange bolt**
   - Torque: 60 ~ 72 N • m
   - Target torque: 66 N • m
5. **Non-metal insert hexagon locking nut**
   - Torque: 51 ~ 63 N • m
6. **Rear stabilizer bar connecting rod assembly (right)**

Removal

1. **Raise the vehicle.**
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove rear suspension bottom protector I (See page WS-47)**
4. **Remove rear stabilizer bar connecting rod assembly**

   Note:

   - Use same removal orders for right and left sides.



   (a) Remove the nut -1-.

   Note:

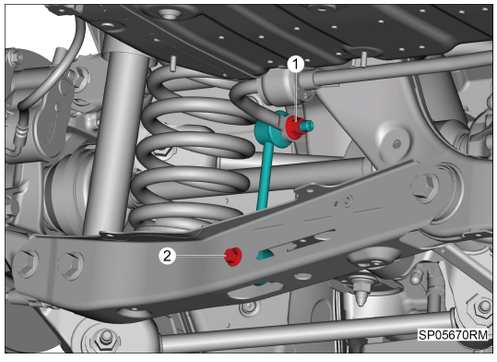
   - When removing rear stabilizer bar connecting rod, use the internal stop and external moving tool to remove it.

   (b) Remove the bolt -2-.

   (c) Remove the rear stabilizer bar connecting rod assembly.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**



   (a) Install the bolt -2-.

   Notice:

   - **It is necessary to tighten bolts at the design load position (See page DP-57)**

   (b) Install the nut -1-.

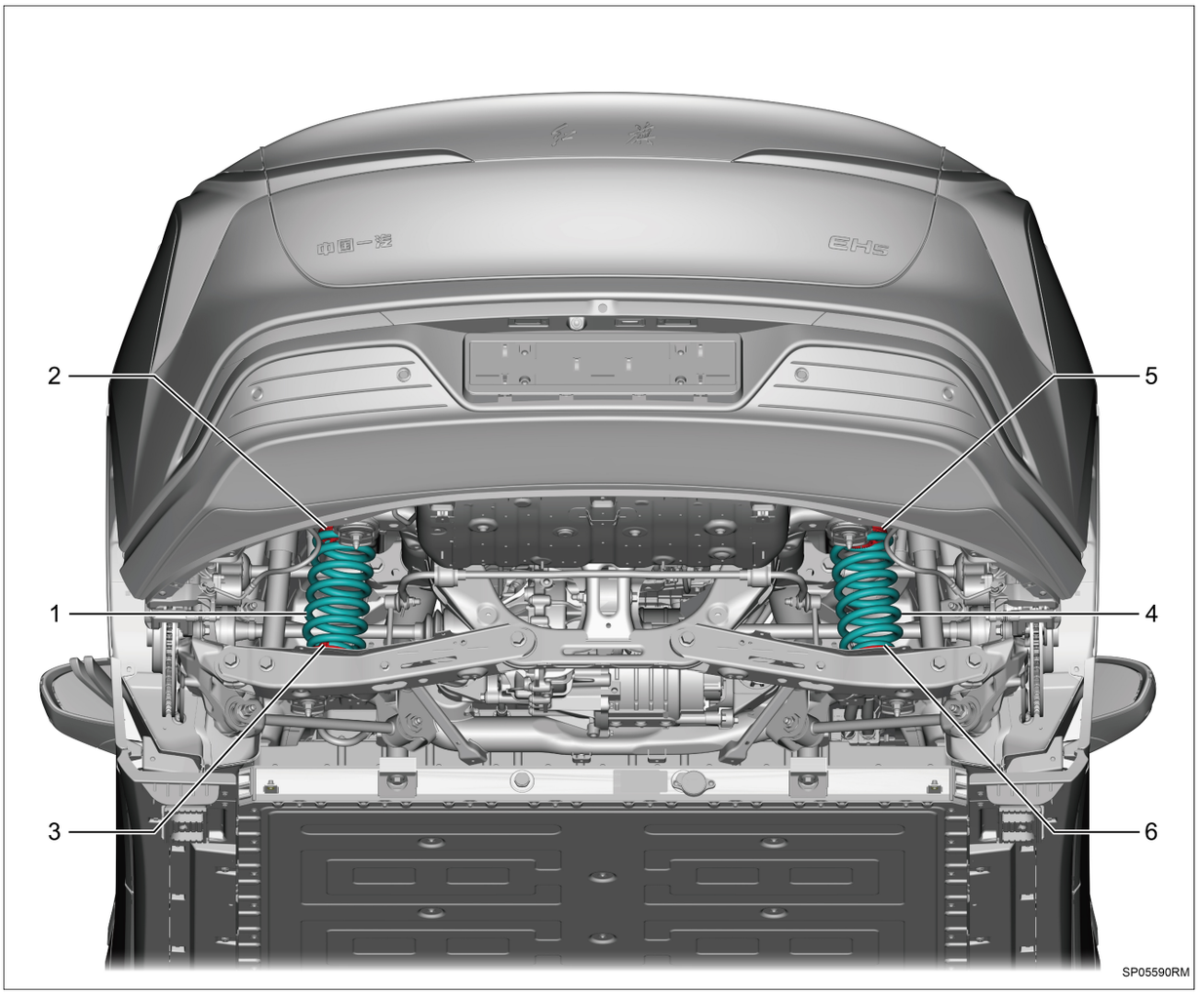
   Note:

   - When installing rear stabilizer bar connecting rod, use the internal stop and external moving tool to install it.

Rear coil spring

Components

DP



1. **Rear coil spring (left)**
2. **Rear spring upper cushion**
3. **Rear spring lower cushion**
4. **Rear coil spring (right)**
5. **Rear spring upper cushion**
6. **Rear spring lower cushion**

Removal

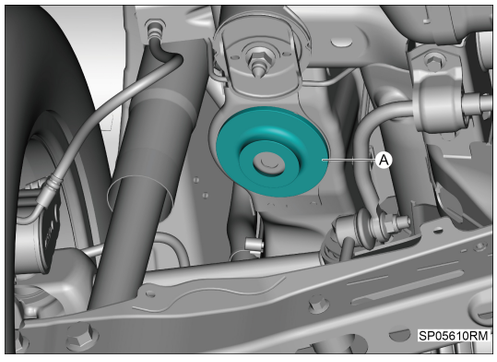
1. **Raise the vehicle.**
2. **Remove rear wheels of vehicle (See page DP-116)**
3. **Remove No.2 rear lower control arm assembly (See page DP-68)**
4. **Remove rear coil spring**

Note:

- Use same removal orders for right and left sides.

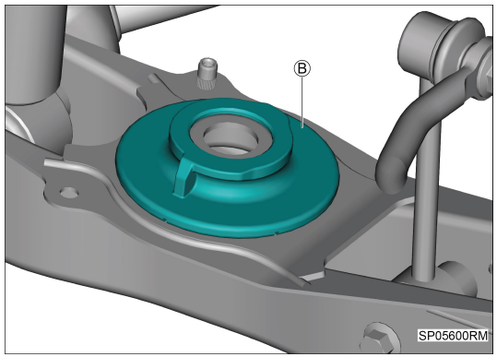
(a) For removal procedures, refer to relevant contents of Suspension - Removal of No.2 rear lower control arm assembly (See page DP-68)

5. Remove rear spring upper cushion



(a) Pry off the rear spring upper cushion -A- to remove it.

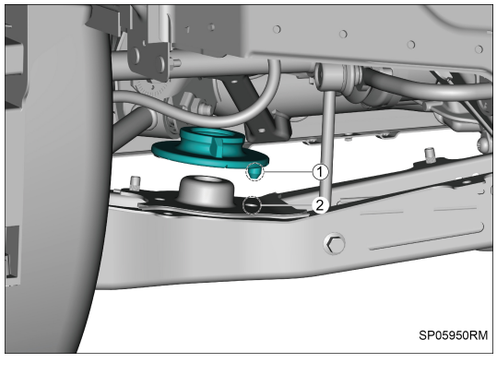
6. Remove rear spring lower cushion



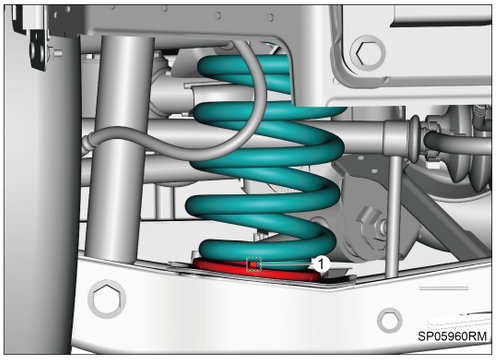
(a) Pry off the rear spring lower cushion -B- to remove it.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



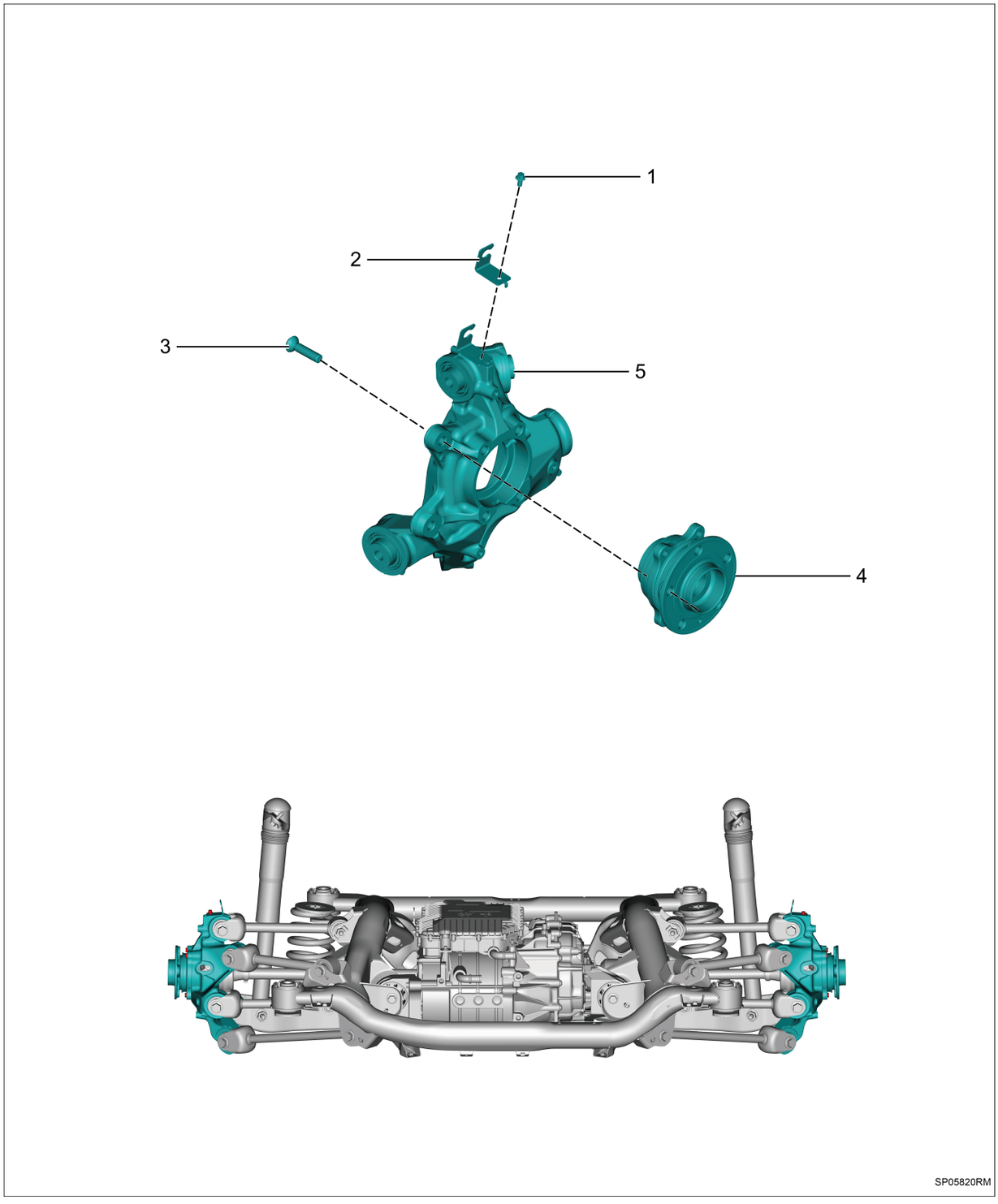
(a) The locating pin -1- of spring lower cushion must be embedded in the locating hole -2- of rear lower control arm.



(b) As indicated by -1- in the figure, the spring lower end is aligned with the step on the spring lower cushion.

Rear steering knuckle assembly

Components



1. **Hexagon flange bolt**
   - Torque: 8 ~ 12 N • m
2. **Wire harness metal bracket**
3. **Inner twelve floral spherical bolt**

- X4
- Torque: 52 ~ 68 N • m + (rotation angle) 125 ~ 145°
- Monitoring torque: 140 ~ 280 N • m
- Maintenance torque: 190 ~ 240 N • m
- Non-reusable part

4. Hub bearing assembly

5. Rear steering knuckle assembly

Removal

Note:

- Use same removal orders for right and left sides.

1. Raise the vehicle.

2. Remove drive shaft bolt (See page DP-41)

3. Remove rear wheels of vehicle (See page DP-116)

4. Remove rear brake caliper assembly

Note:

- After removal hang rear brake caliper assembly with hook without disconnecting the fluid pipe.

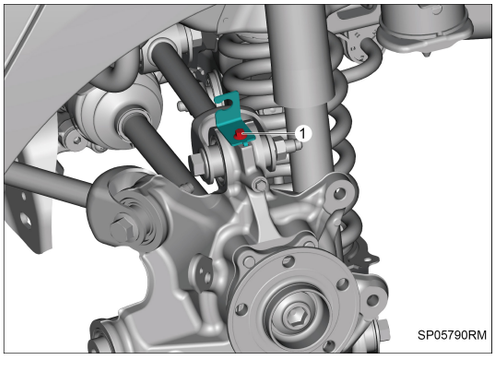
(See page DP-17)

5. Remove rear brake disc (See page DP-25)

6. Remove rear dust disc (See page DP-25)

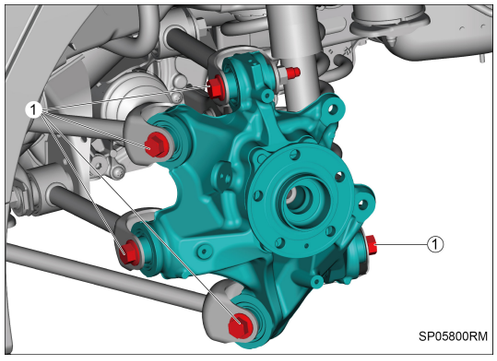
7. Remove rear wheel speed sensor assembly (See page DP-9)

8. Remove wire harness metal bracket



(a) Remove the bolt -1-.

9. Remove rear steering knuckle assembly



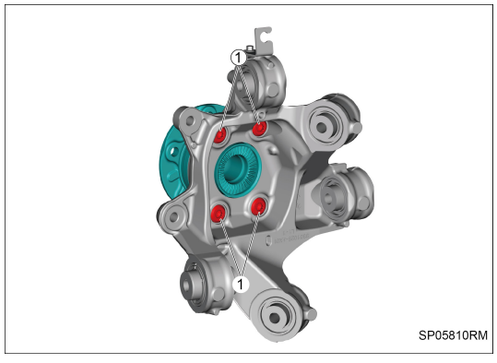
(a) Remove the bolt -1-.

Note:

- For bolt installation torque, refer to the corresponding control arm - components.

(b) Remove the rear steering knuckle assembly.

10. Remove rear hub bearing assembly

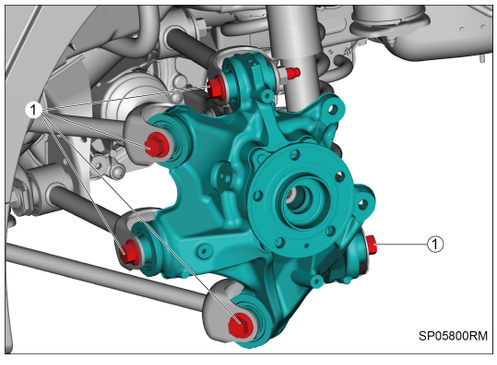


(a) Remove the bolt -1-.

(b) Remove the rear hub bearing assembly -A-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) Install the bolt -1-.

Notice:

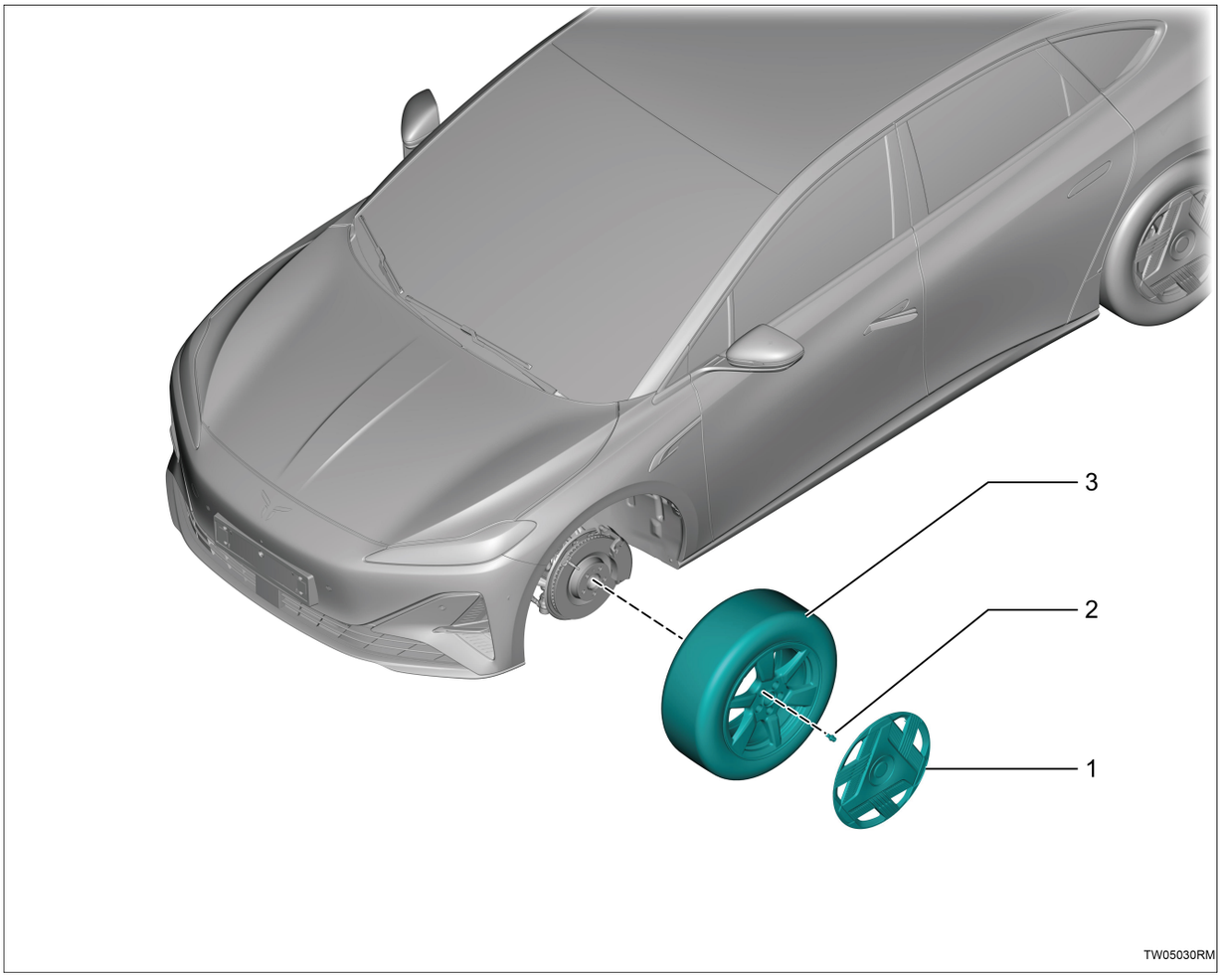
- **It is necessary to tighten bolts at the design load position (See page DP-57)**

Wheel system

Wheel and tire

DP

Components



1. **Wheel trim cover assembly**
2. **Wheel bolt**
   - X5
   - Torque: 150 ~ 170 N • m
3. **Wheel**

On-vehicle inspection

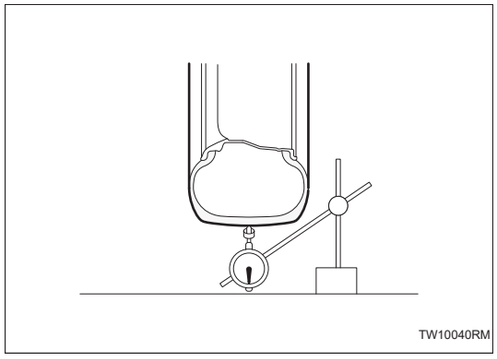
1. **Check tire**

   (a) Check if the tire is worn and if the inflation pressure is normal.

Inflation pressure	Front wheel (kpa)	Rear wheel (kpa)
Three people	250 (2.5)	270 (2.7)

ECO	300 (3.0)	300 (3.0)
Full-loaded	290 (2.9)	290 (2.9)

Specifications	Front wheel	Rear wheel
Tire size	235/50 R18	235/50 R18
Wheel size	18×8J	18×8J

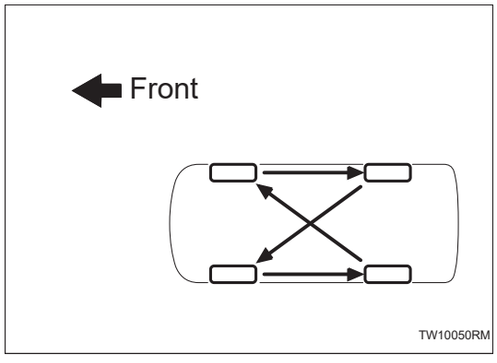

TW10040RM

(b) Check runout of the tire with a dial indicator.

Note:

- Tire runout: 1.5mm or less

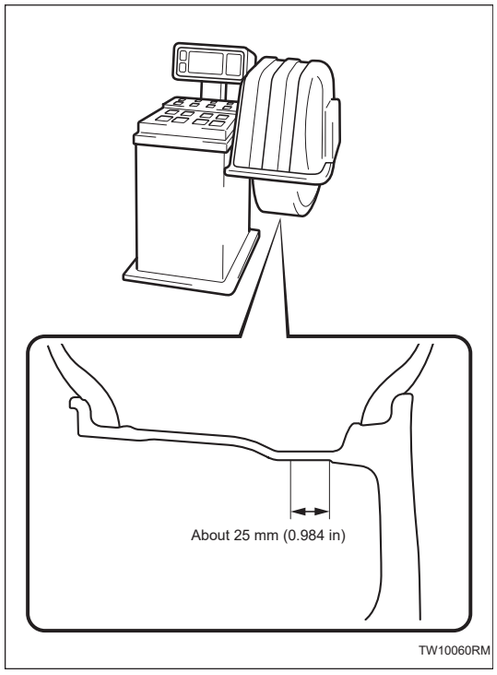
2. Tire rotation



TW10050RM

(a) Perform tire rotation as shown in the illustration.

3. Check balance of wheels



(a) Wheel dynamic balance requirements.

Note:

- Inner requirement for residual imbalance ⩽ 8g; Outer requirement for residual imbalance ⩽ 8g

Warning:

- ***Use detergent to remove dirt, oil, and water from the adhesive surface of balance weight.***
- ***Do not touch the adhesive surface of the tape.***
- ***Paste the adhesive type balance weight onto the flat position shown in the illustration.***
- ***Use your fingers to forcefully push and press the balance weight until it sticks in place.***
- ***Do not reuse balance weight.***

Note:

The inner balance weight should be installed on the rim with clip.

Check and adjust the balance of the wheels on the vehicle as necessary.

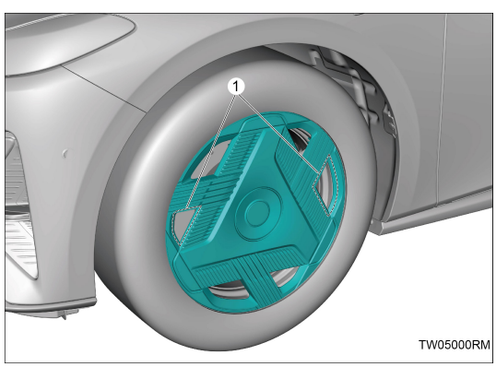
4. **Check bearing looseness of hub and bearing assembly.**
5. **Check hub and bearing assembly runout.**
6. **Check hub and bearing assembly end face runout.**

Removal

1. **Remove wheel trim cover assembly**

Note:

- Use same removal orders for all wheel trim cover assemblies.

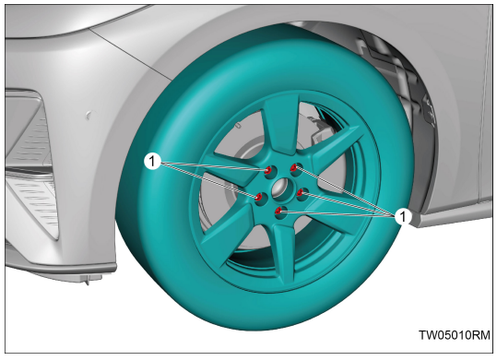


(a) Hold the -1- position with both hands and pull out, remove the wheel trim cover assembly.

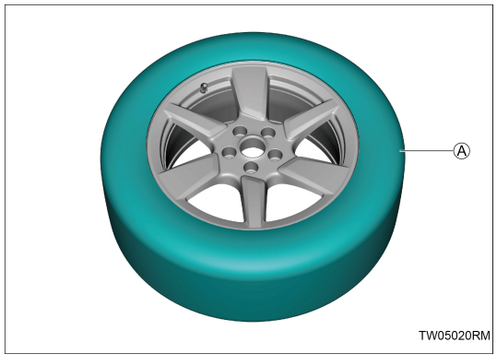
Notice:

- **Do not pry with a screwdriver to avoid damaging the paint surface of hub.**
- **Do not apply excessive impact and force when removing wheel trim cover assembly.**

2. **Raise the vehicle.**
3. **Remove wheel**



(a) Remove the bolt -1-.



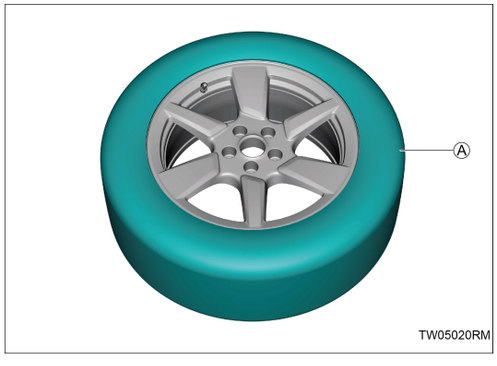
(b) Using a tire remover, remove the wheel tire -A-.

Notice:

- **Drain the internal pressure of tire first before removal.**
- **Do do not damage the tire pressure sensor when removing the tire.**

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

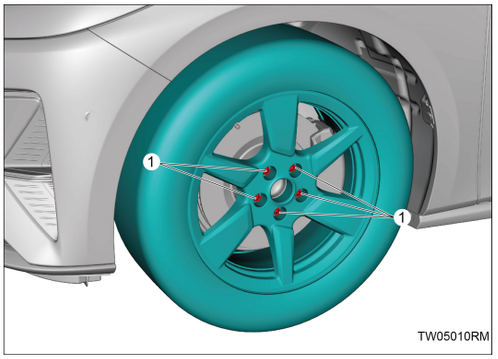


(a) Using a tire remover, install wheel tire -A-.

Notice:

- **Do not damage the tire pressure sensor when installing the tire.**

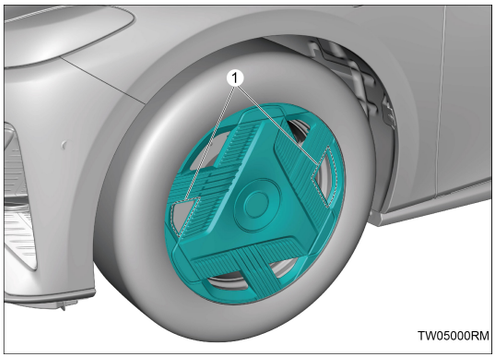
2. **Tire model details: Wheel and tire - on-vehicle inspection (See page DP-116)**
3. **Tire pressure details: Wheel and tire - on-vehicle inspection (See page DP-116)**
4. **Install wheel**



(a) Install the bolt -1-.

Note:

- When installing the tire, tighten the bolt -1- diagonally.



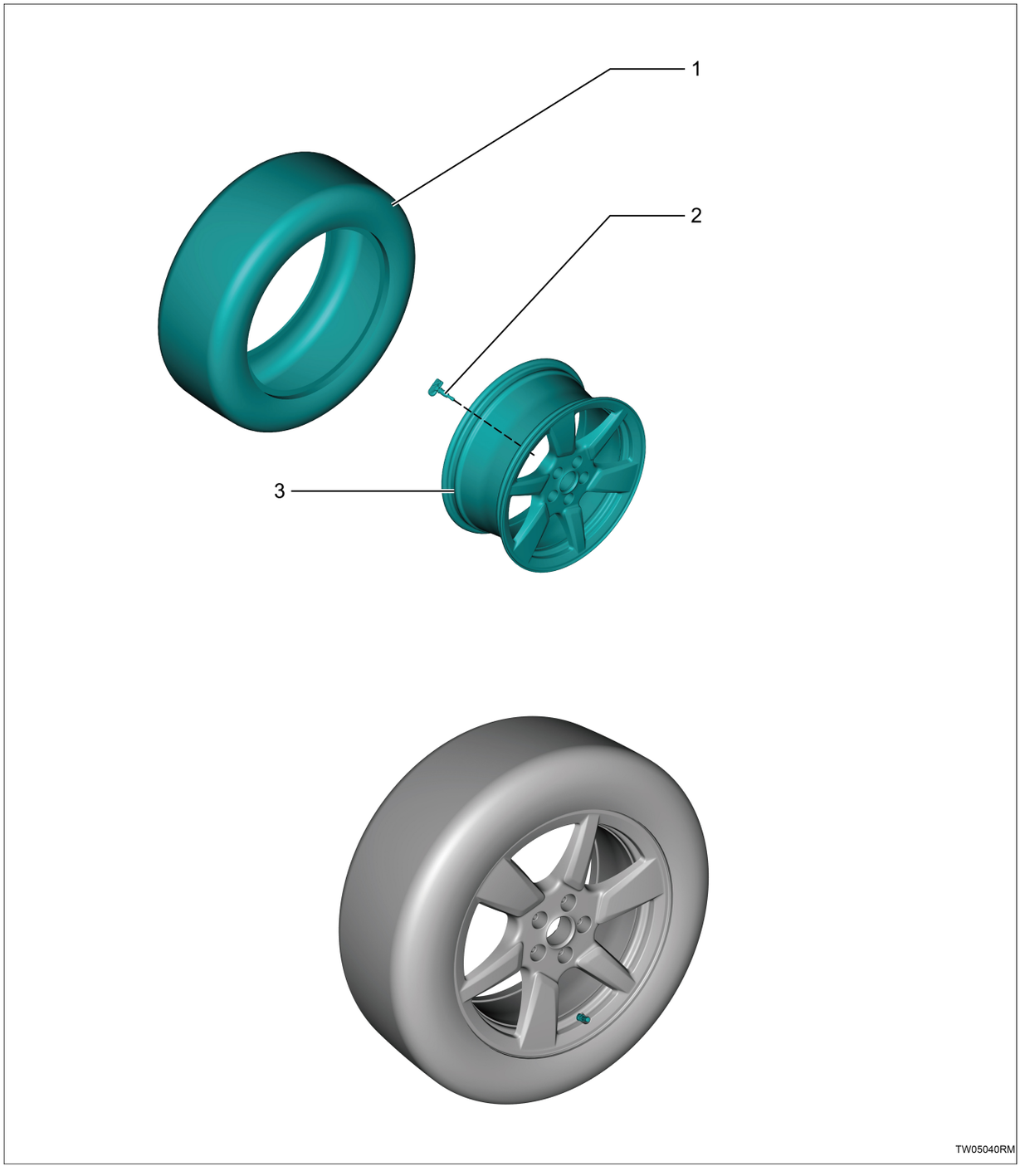
(b) Hold the -1- position with both hands and press, install the wheel trim cover assembly.

Notice:

- **Do not apply excessive impact and force when installing wheel trim cover assembly.**

Tire pressure monitoring sensor

Components



1. **Tire**
2. **Tire pressure sensor assembly**
3. **Aluminum alloy wheel**

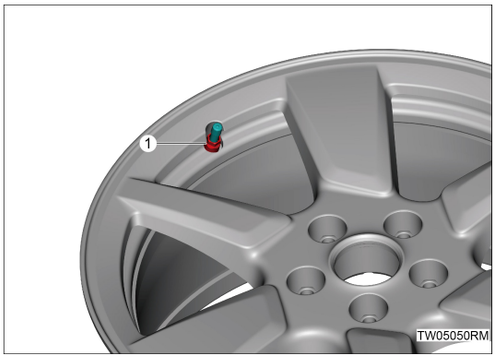
Removal

1. **Raise the vehicle.**

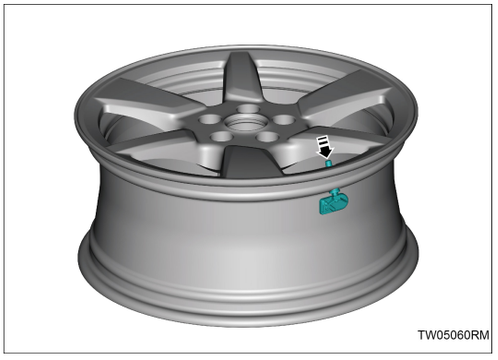
DP

2. Remove vehicle wheel (See page DP-116)

3. Remove tire pressure monitoring sensor



(a) Remove the nut -1-.



(b) Push it in direction of -arrow-.

Installation

1. Installation is in the reverse order of removal.

Interior

Seat belt system

Child seat upper lock hook NS-1
Front seat belt NS-3
Rear seat belt NS-6
Driver seat belt pretensioner end plate assembly NS-10

Instrument panel system

Instrument panel end cover NS-13
Instrument panel right trim strip NS-15
Instrument panel left trim strip NS-17
Steering column cover NS-19
Instrument panel center trim panel NS-22
Instrument panel middle protector NS-25
Instrument panel bottom protector NS-27
Instrument panel lower left protector assembly NS-29
Glove box assembly NS-33
Middle speaker cover assembly NS-36
Head up display trim cover assembly NS-38
Instrument panel assembly NS-40

Auxiliary fascia console system

Auxiliary fascia console assembly NS-49

Seat system

Front seat assembly NS-67
Seat intelligent terminal assembly NS-90
Rear seat NS-92
Seatback side wing assembly NS-108

Protector system

Front door protector NS-111
Rear door protector NS-119
Front doorsill protector NS-126
Rear doorsill protector NS-128
A-pillar protector NS-130
B-pillar protector NS-133
C-pillar protector NS-137
Package rack protector assembly NS-140

Luggage compartment system

Side hinge trim cover NS-143
Luggage compartment carpet assembly NS-145
Luggage compartment carpet lower storage box I NS-148
Luggage compartment lower cover NS-150
Luggage compartment rear end protector NS-151
Luggage compartment door cover assembly NS-153
Luggage compartment side cover NS-157
Luggage compartment front carpet assembly NS-160

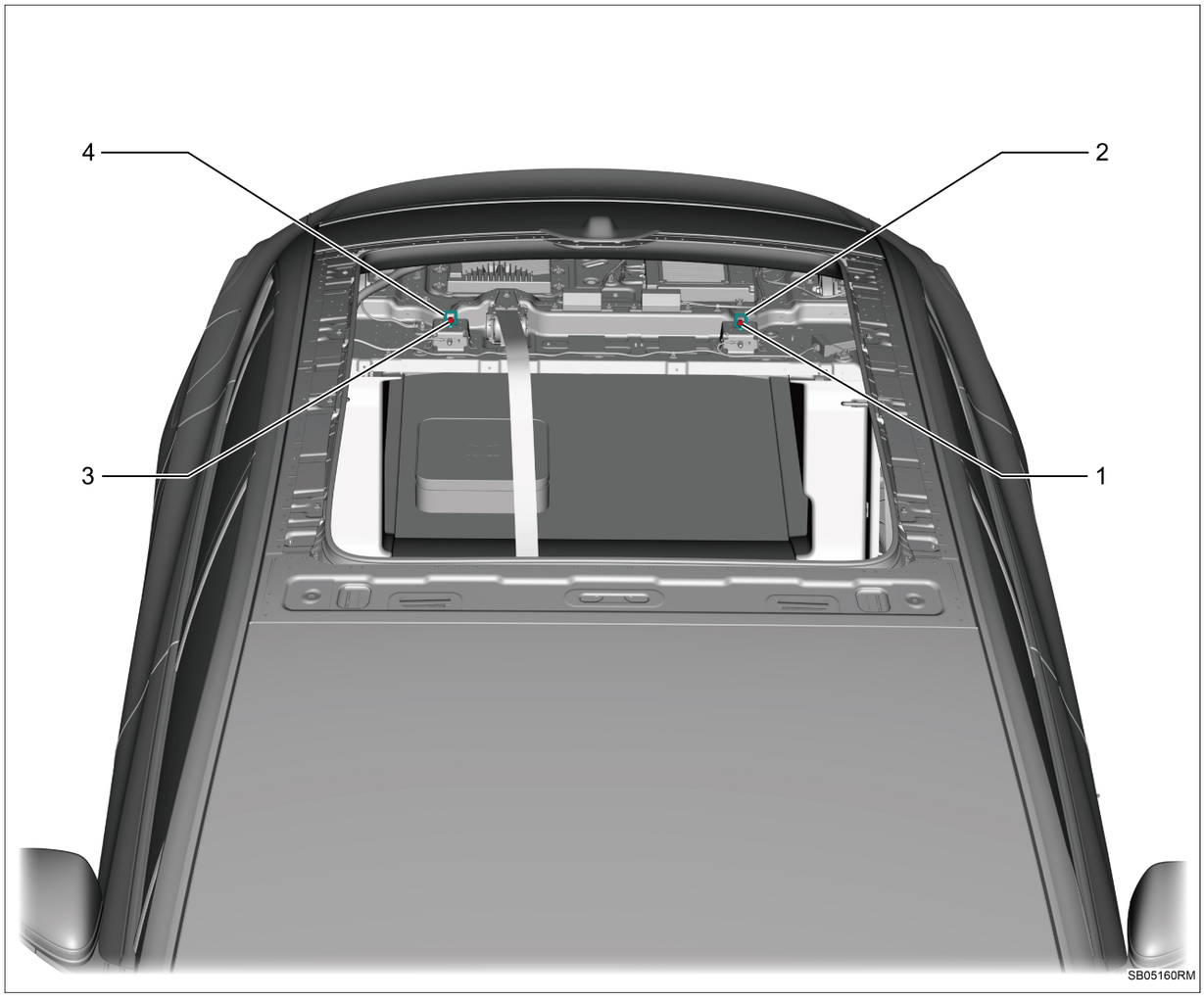
Roof and carpet

Carpet and gasket NS-162
Inside rear view mirror trim cover NS-165
Sun visor assembly NS-169
Roof NS-172
Cowl panel gasket assembly NS-178
Inside rear view mirror NS-180

Seat belt system

Child seat upper lock hook

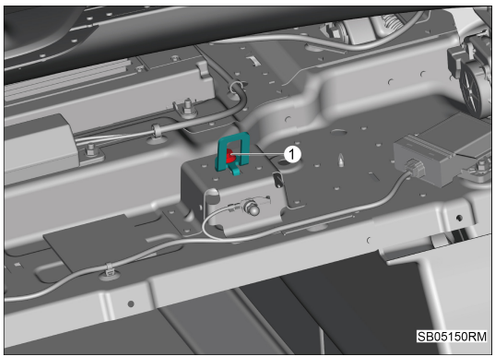
Components



1. **Hexagon flange bolt**
   - Torque: 22 ~ 30 N • m
2. **Child seat upper lock hook (left)**
3. **Hexagon flange bolt**
   - Torque: 22 ~ 30 N • m
4. **Child seat upper lock hook (right)**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove package rack protector assembly (See page NS-140)**
3. **Remove child seat upper lock hook**



Note:

- Use same removal orders for right and left sides.

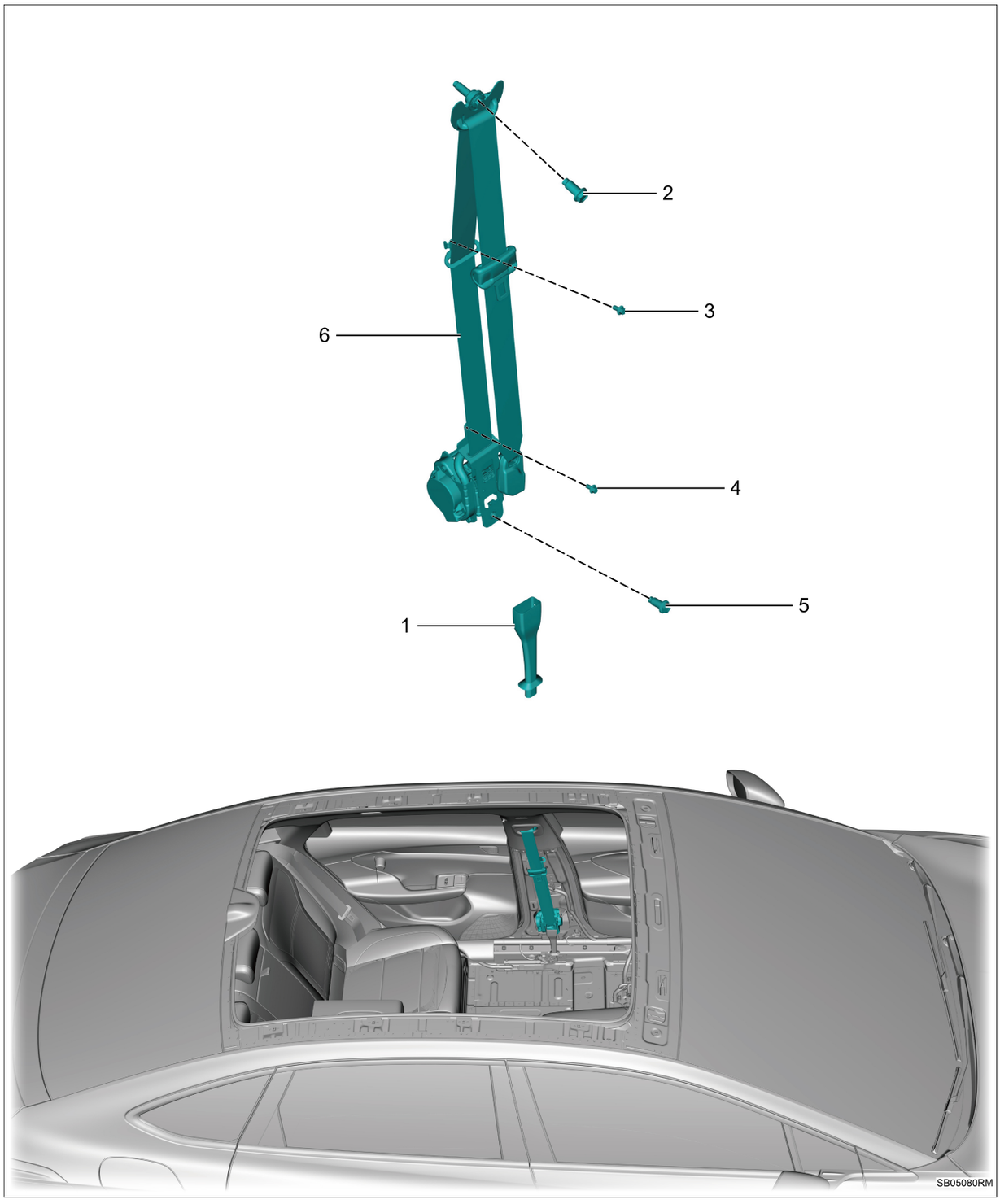
(a) Remove the bolt -1-.

Installation

1. Installation is in the reverse order of removal.

Front seat belt

Components



1. **Seat belt pretensioner end plate boot**
2. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
3. **Hexagon flange bolt**

- Torque: 8 ~ 10 N • m

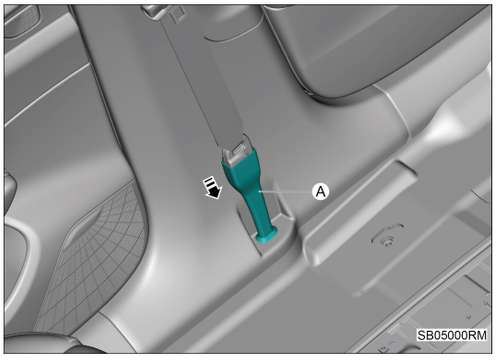
4. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
5. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
6. **Driver seat belt assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove driver seat belt assembly**

   Note:

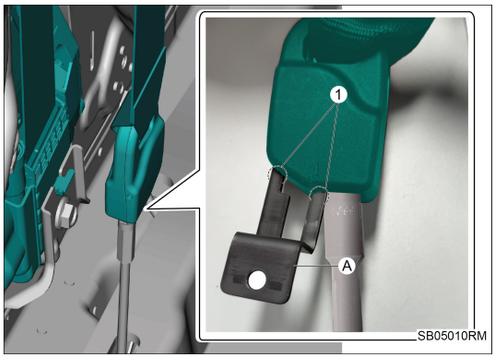
   - Use same removal orders for right and left sides.



(a) Remove the seat belt pretensioner end plate boot -A- in direction of -arrow-.

Note:

- Adjust the driver seat to the foremost position before removal.

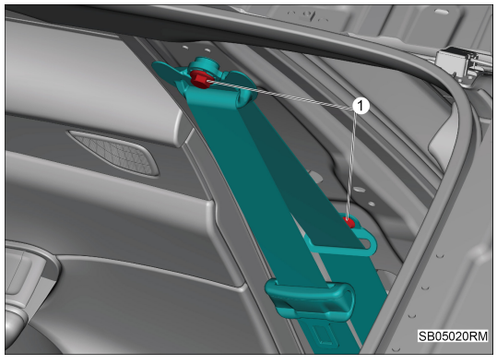


(b) Insert the special tool -A- into the hole -1- and push firmly.

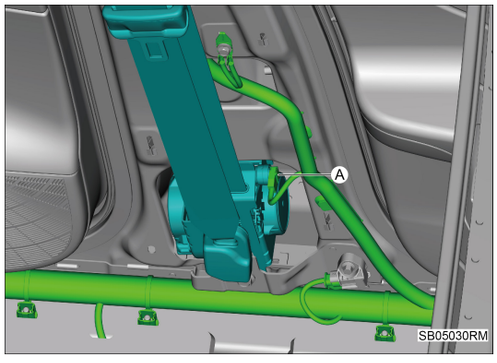
(c) Detach the seat belt buckle and the end plate pretensioner lock hook.

(d) Remove B-pillar lower protector (See page NS-133)

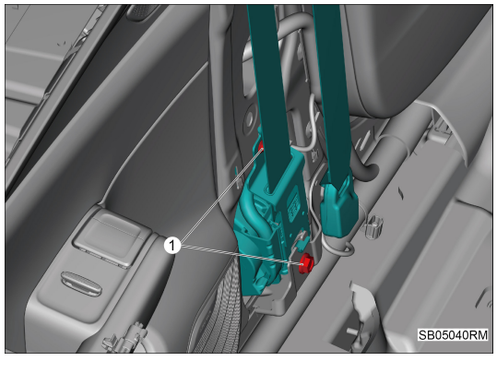
(e) Remove B-pillar upper protector (See page NS-133)



(f) Remove the bolt -1-.



(g) Disconnect the wire harness connector -A-.



(h) Remove the bolt -1-.

(i) Remove the driver side seat belt.

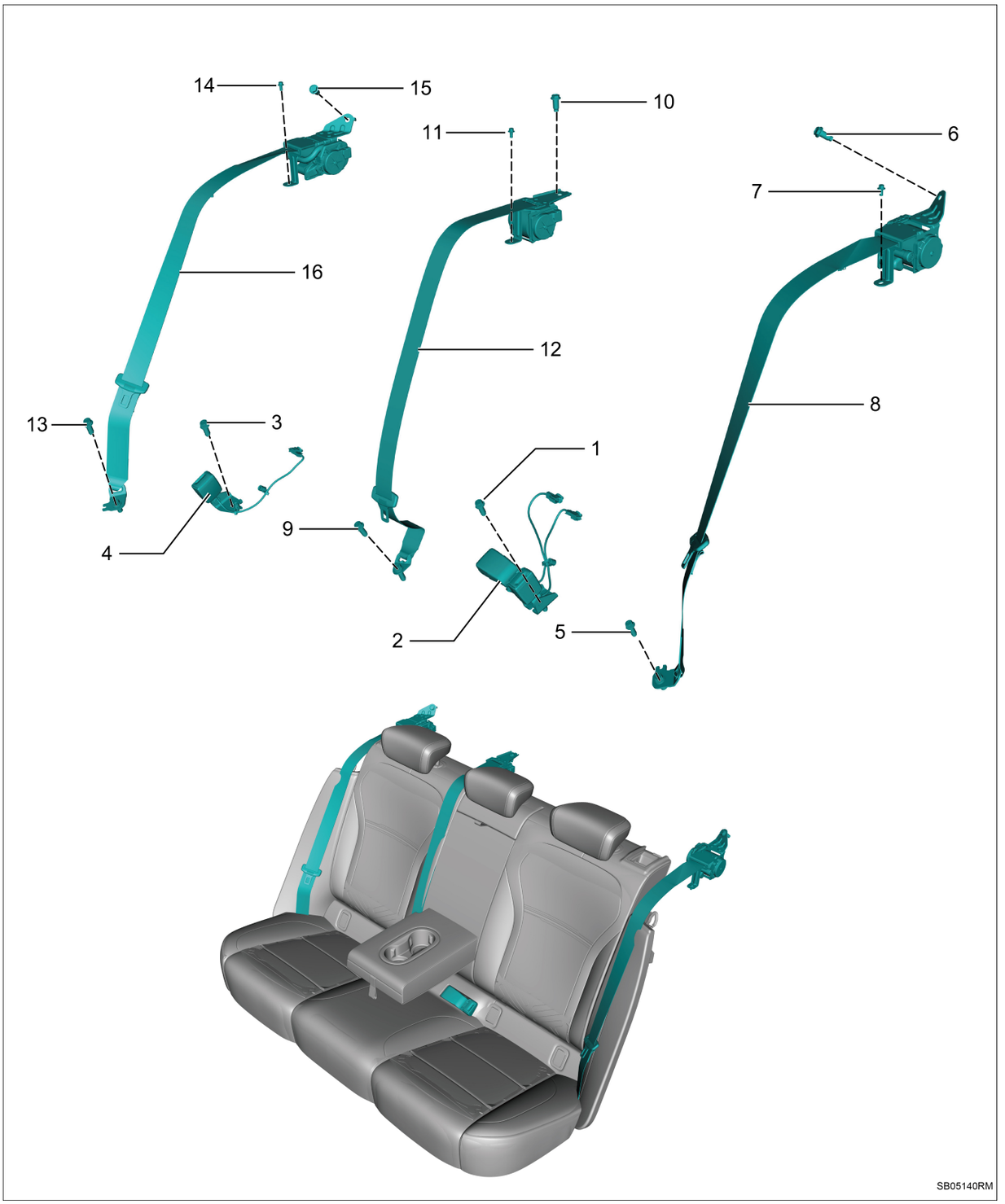
Installation

1. **Installation is in the reverse order of removal.**

NS

Rear seat belt

Components



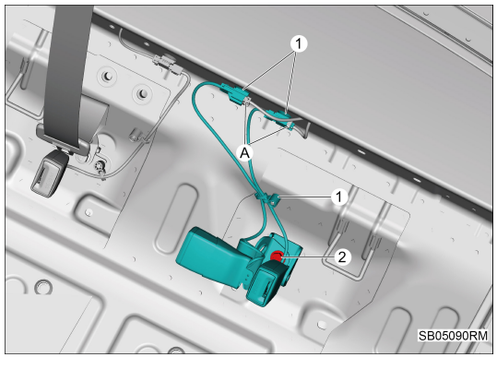
1. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
2. **Rear seat belt double buckle assembly**
3. **Hexagon flange bolt**

- Torque: 39.2 ~ 54 N • m

4. **Rear right seat belt buckle assembly**
5. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
6. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
7. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
8. **Rear left seat belt assembly**
9. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
10. **Hexagon flange bolt**
    - Torque: 39.2 ~ 54 N • m
11. **Hexagon flange bolt**
    - Torque: 8 ~ 10 N • m
12. **Rear center seat belt assembly**
13. **Hexagon flange bolt**
    - Torque: 39.2 ~ 54 N • m
14. **Hexagon flange bolt**
    - Torque: 39.2 ~ 54 N • m
15. **Hexagon flange bolt**
    - Torque: 8 ~ 10 N • m
16. **Rear right seat belt assembly**

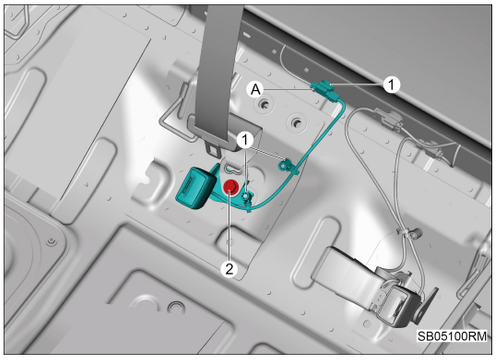
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear seat cushion assembly (See page NS-92)**
3. **Remove rear seat belt double buckle assembly**



   (a) Disconnect the wire harness connector -A-.
   (b) Disengage the wire harness fixing clip -1-.
   (c) Remove the bolt -2-.

4. **Remove rear right seat belt buckle assembly**



(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixing clip -1-.

(c) Remove the bolt -2-.

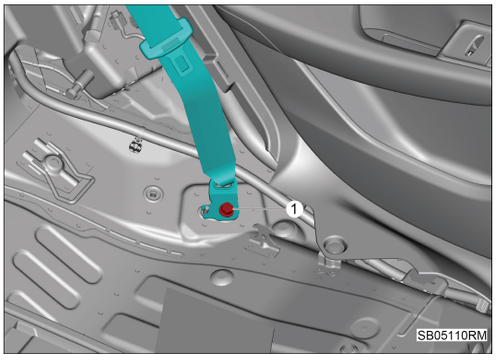
5. Remove rear seatback assembly (See page NS-92)

6. Remove package rack protector assembly (See page NS-140)

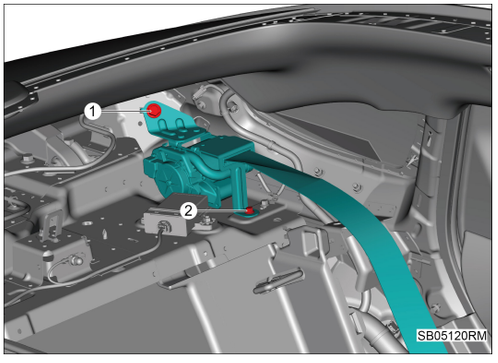
7. Remove rear left seat belt assembly

Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

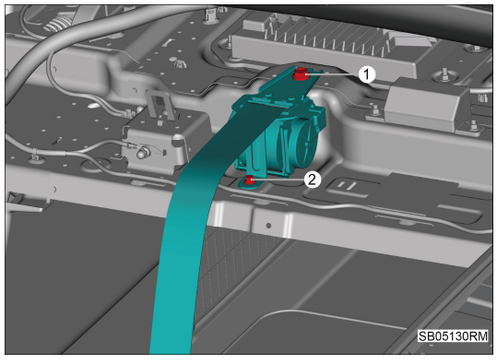


(b) Disconnect the wire harness connector.

(c) Remove the bolts -1-2-.

(d) Remove the rear left seat belt assembly.

8. Remove rear center seat belt assembly



(a) Remove the bolts -1-2-.

(b) Remove the rear center seat belt assembly.

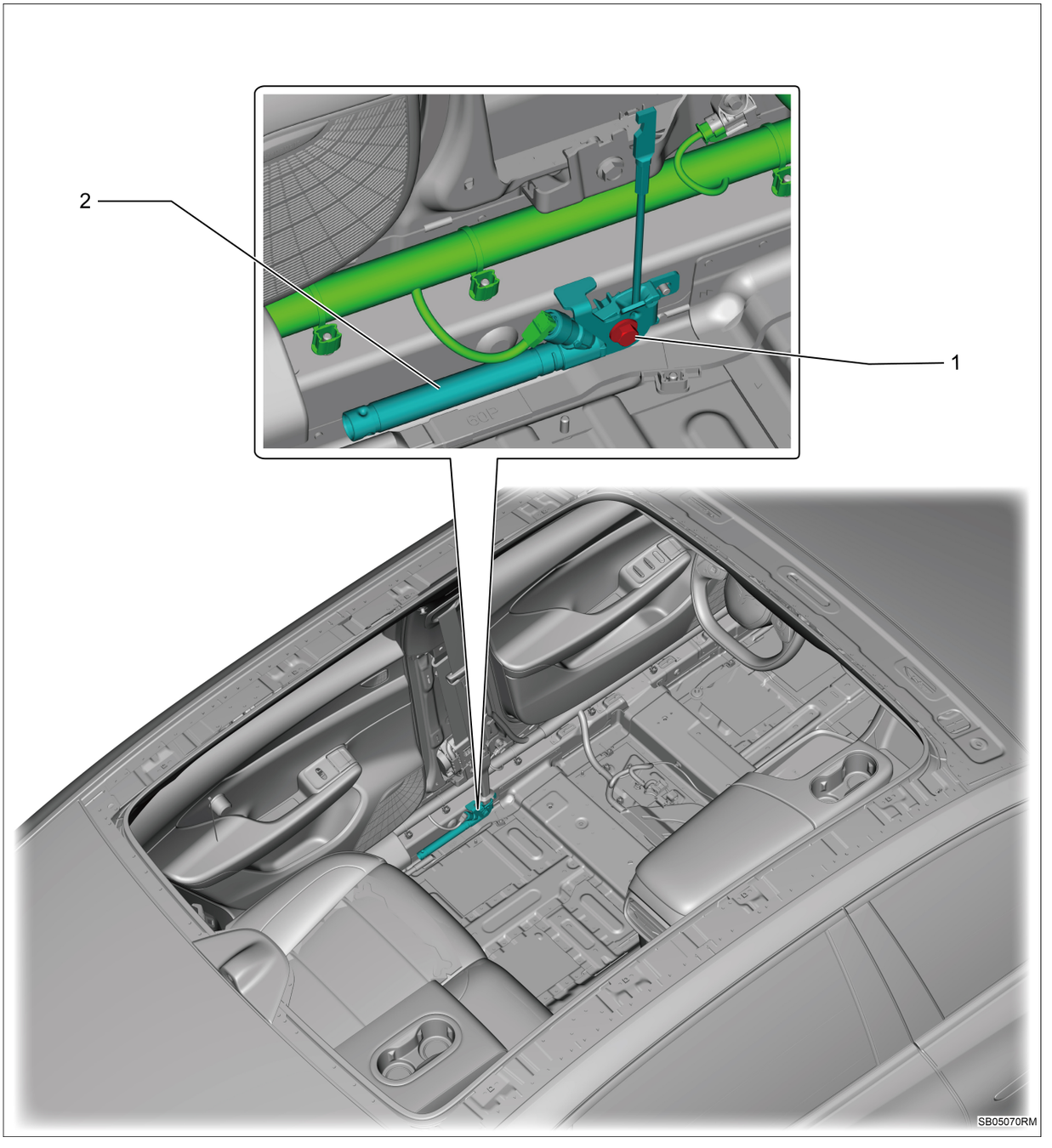
Installation

1. Installation is in the reverse order of removal.

Driver seat belt pretensioner end plate assembly

Components

NS



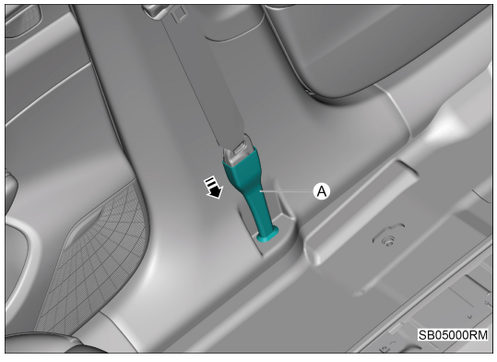
1. **Hexagon flange bolt**
   - Torque: 39.2 ~ 54 N • m
2. **Driver seat belt pretensioner end plate assembly**
   - Right side is the same as left side.

Removal

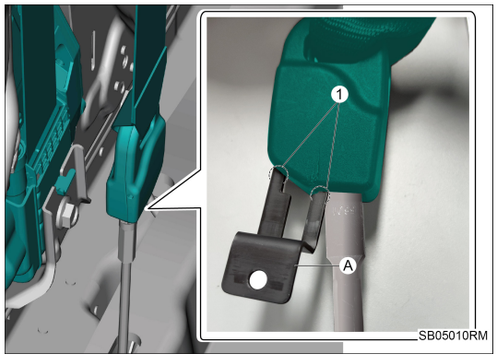
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove driver seat belt pretensioner end plate assembly**

Note:

- Use same removal orders for right and left sides.



(a) Remove the seat belt pretensioner end plate boot -A- in direction of -arrow-.



(b) Insert the special tool -A- into the hole -1- and push firmly.

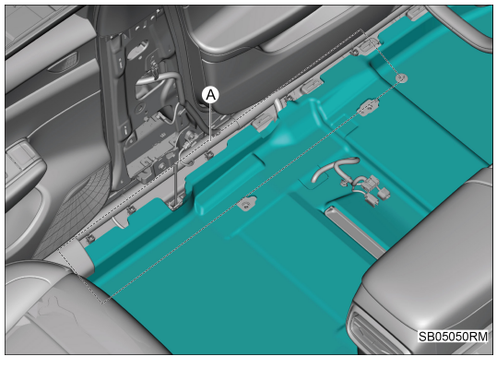
(c) Detach the seat belt buckle and the end plate pretensioner lock hook.

(d) Remove driver seat (See page NS-67)

(e) Remove B-pillar lower protector (See page NS-133)

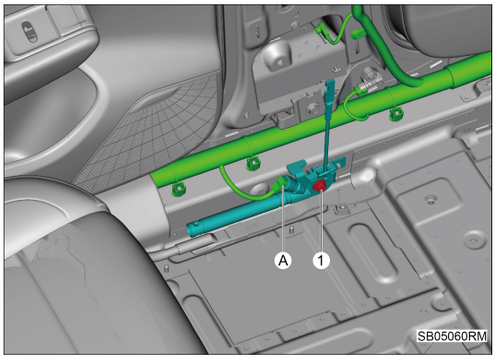
(f) Remove B-pillar upper protector (See page NS-133)

(g) Remove front left doorsill protector (See page NS-126)



(h) Lift up the carpet -A-.

NS



(i) Disconnect the wire harness connector -A-.

(j) Remove the bolt -1-.

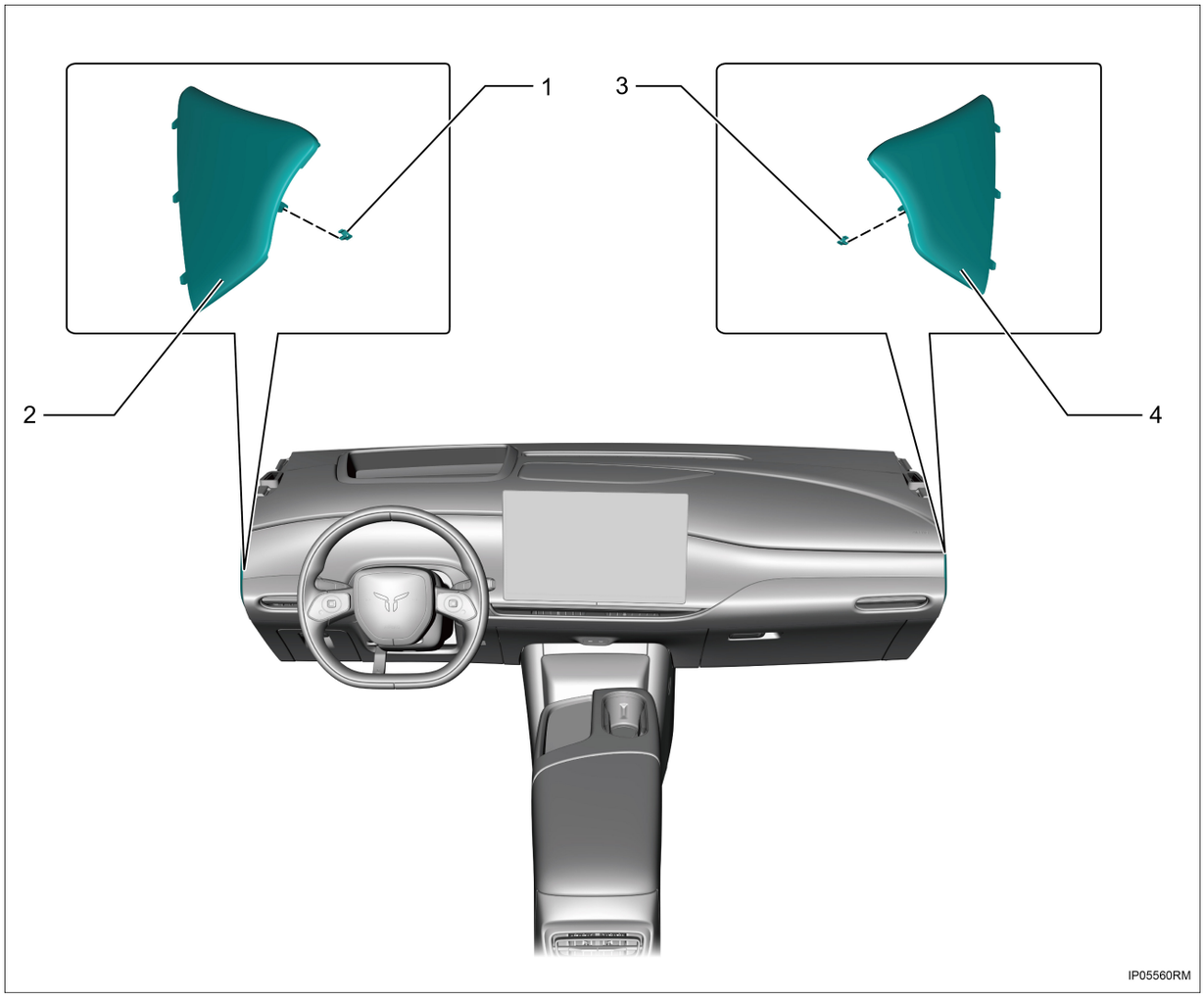
Installation

1. Installation is in the reverse order of removal.

Instrument panel system

Instrument panel end cover

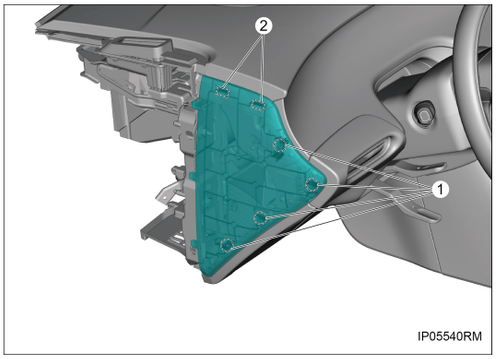
Components



1. **Clip**
   - X4
2. **Left end cover**
3. **Clip**
   - X4
4. **Right end cover**

Removal

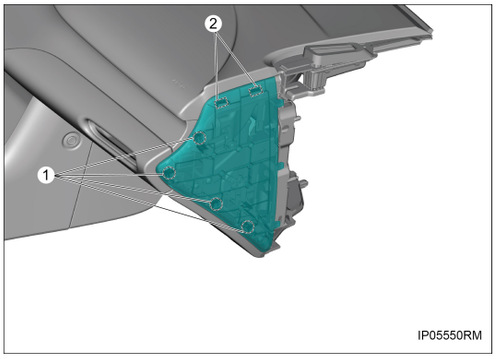
1. **Remove left end cover assembly**



(a) Detach the clip -1-.

(b) Detach the claw -2-.

2. Remove right end cover assembly



(a) Detach the clip -1-.

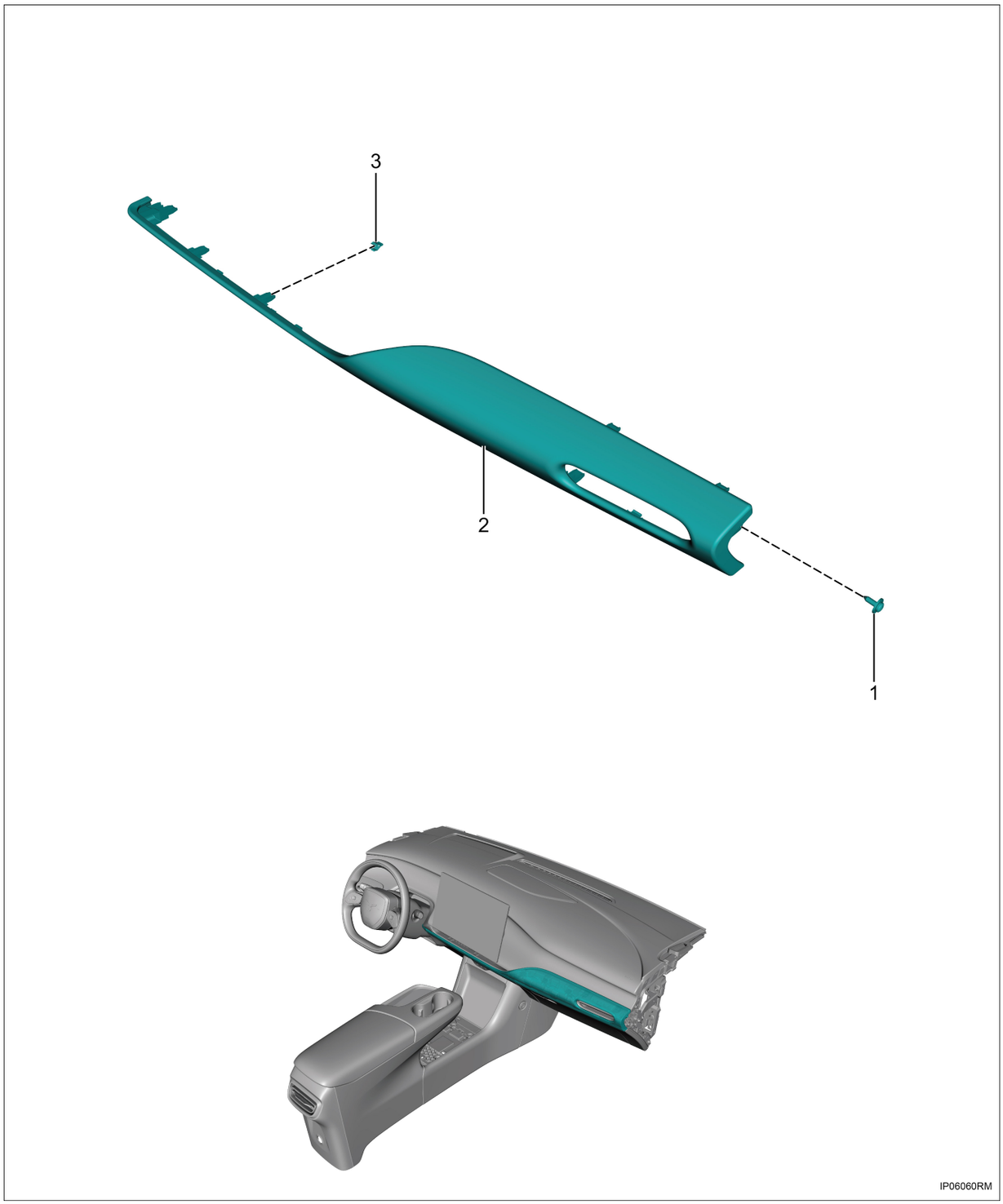
(b) Detach the claw -2-.

Installation

1. Installation is in the reverse order of removal.

Instrument panel right trim strip

Components

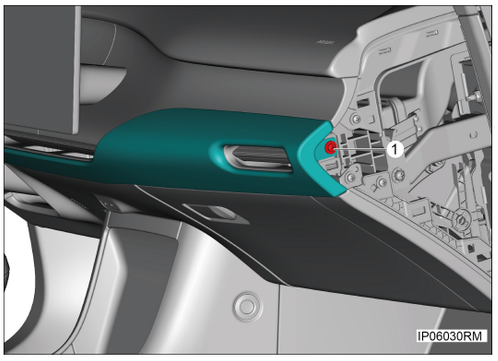


1. **Cross recess pan head self-tapping screw and flat washer set**
   - Torque: 3.3 ~ 4.3 N • m
2. **Instrument panel right trim strip**
3. **Spring plate**

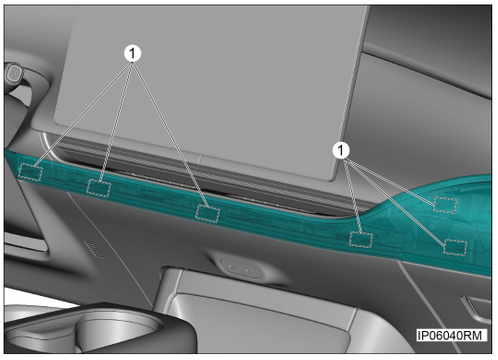
- X13

Removal

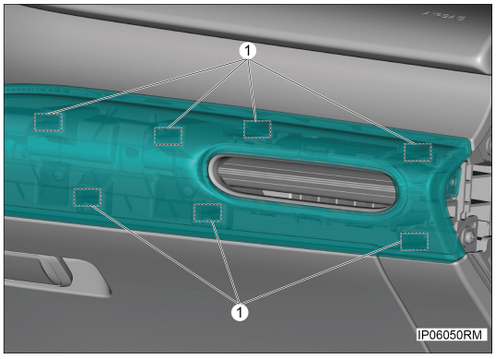
1. **Remove right end cover (See page NS-13)**
2. **Remove instrument panel right trim strip**



(a) Remove the screw -1-.



(b) Detach the spring plate -1-.



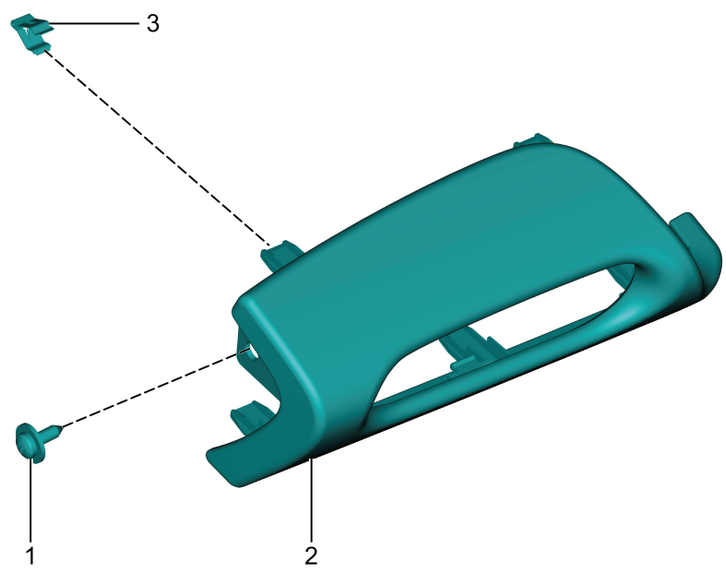
(c) Detach the spring plate -1-.

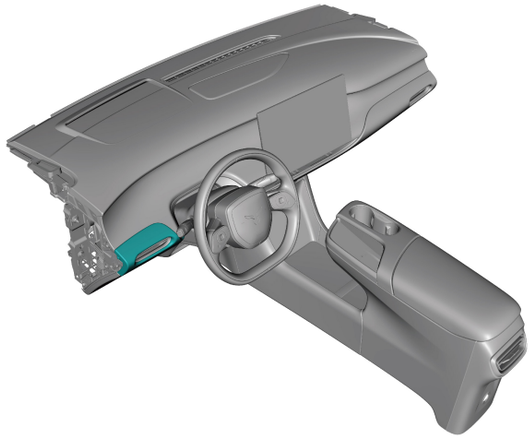
Installation

1. **Installation is in the reverse order of removal.**

Instrument panel left trim strip

Components





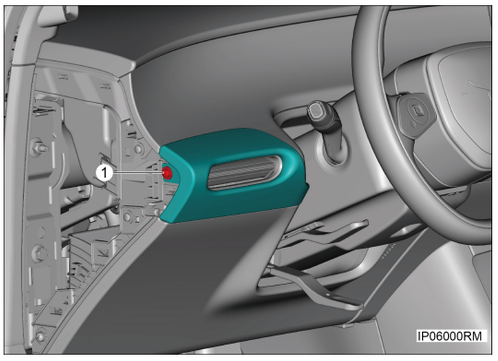
IP06020RM

1. **Cross recess pan head self-tapping screw and flat washer set**
   - Torque: 3.3 ~ 4.3 N • m
2. **Instrument panel left trim strip**
3. **Spring plate**

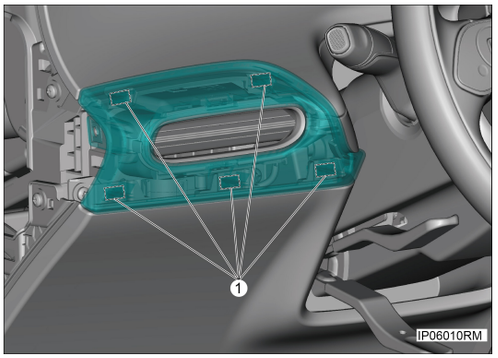
- X5

Removal

1. **Remove left end cover (See page NS-13)**
2. **Remove instrument panel left trim strip**



(a) Remove the screw -1-.



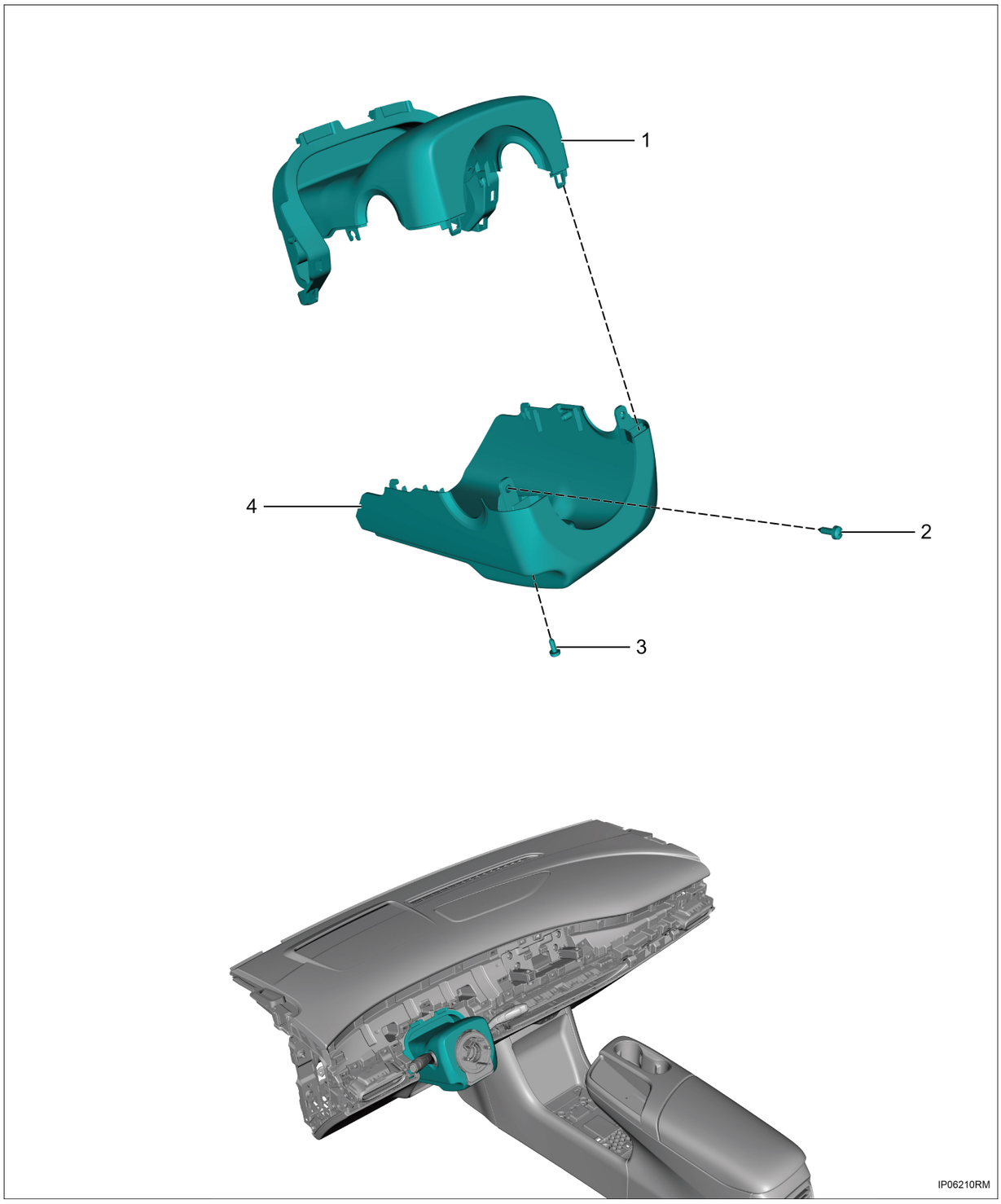
(b) Detach the spring plate -1-.

Installation

1. **Installation is in the reverse order of removal.**

Steering column cover

Components



1. **Steering column assembly upper cover**
2. **Screw**
   - x2
3. **Screw**

4. Steering column assembly lower cover

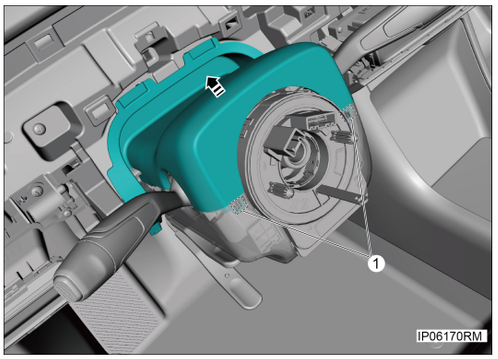
NS

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove steering wheel (See page DP-45)**
3. **Remove lower left protector (See page NS-29)**
4. **Remove steering column lower cover**

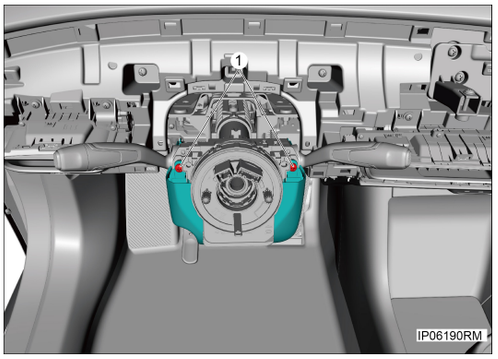
Note:

- Adjust the driver seat to proper operating position.

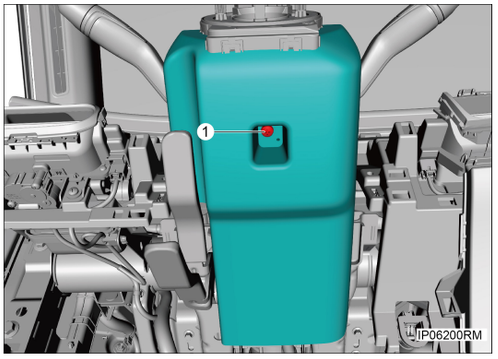


(a) Detach the claw -1-.

(b) Detach the steering column upper cover in direction of -arrow-.

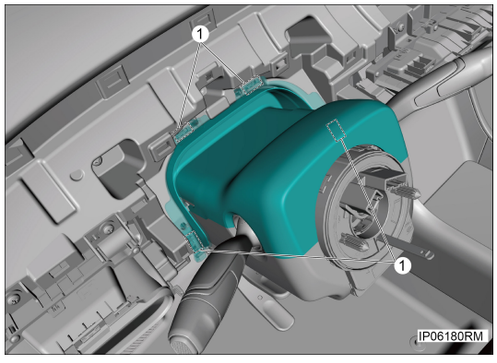


(c) Remove the screw -1-.



(d) Remove the screw -1-.

5. **Remove left trim panel**
6. **Remove steering column upper cover**



(a) Detach the claw -1-.

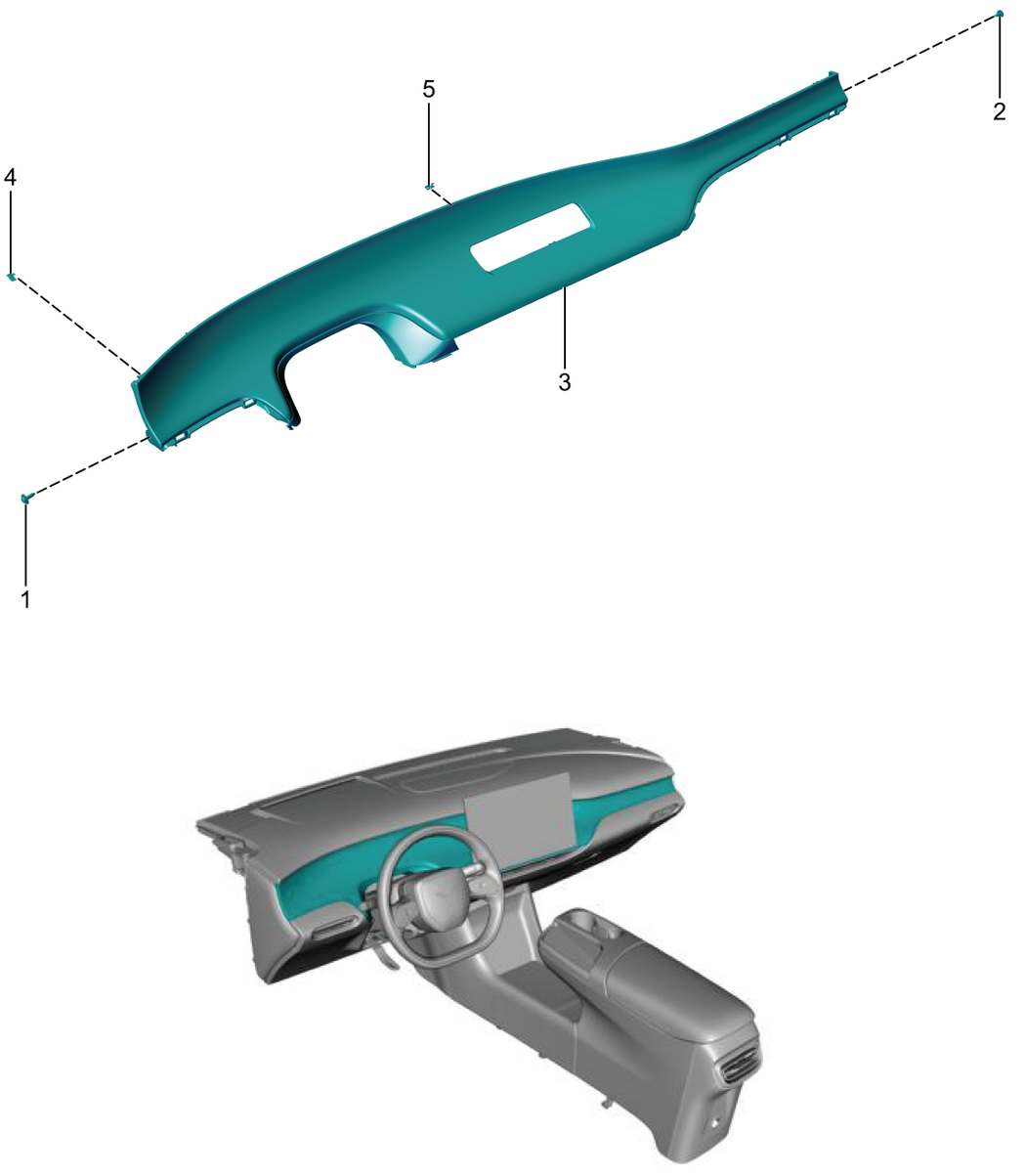
(b) Remove steering column upper cover.

Installation

1. Installation is in the reverse order of removal.

Instrument panel center trim panel

Components



1. **Self-tapping screw**
2. **Self-tapping screw**
3. **Instrument panel center trim strip**
4. **Spring plate**

- X29

5. Spring plate

- X8

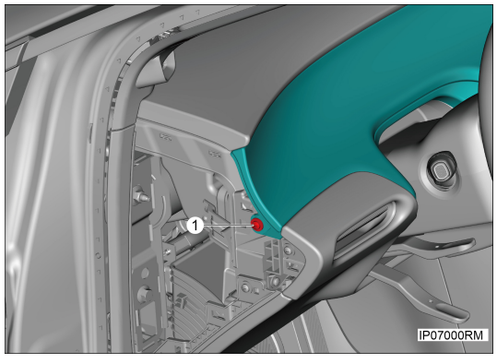
Removal

1. Remove right end cover (See page NS-13)

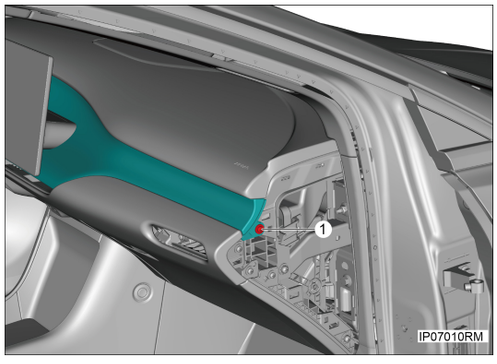
2. Remove left end cover (See page NS-13)

3. Remove main display (See page ZC-85)

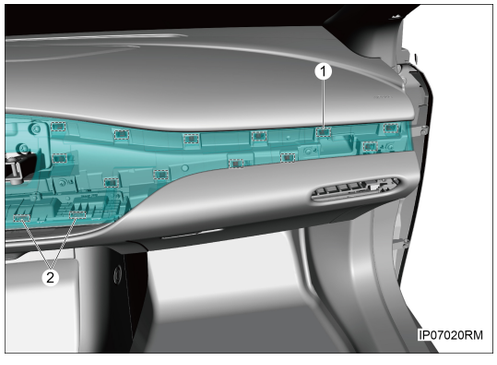
4. Remove instrument panel center trim panel



(a) Remove the screw -1-.



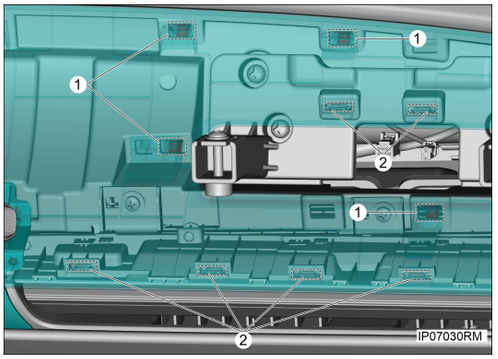
(b) Remove the screw -1-.



(c) (For example) Detach all spring plates -1-.

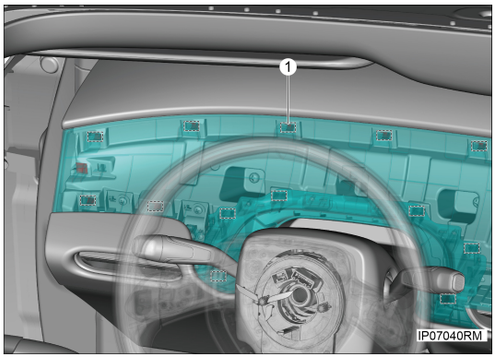
(d) Detach the claw -2-.

NS



(e) Detach the spring plate -1-.

(f) Detach the claw -2-.



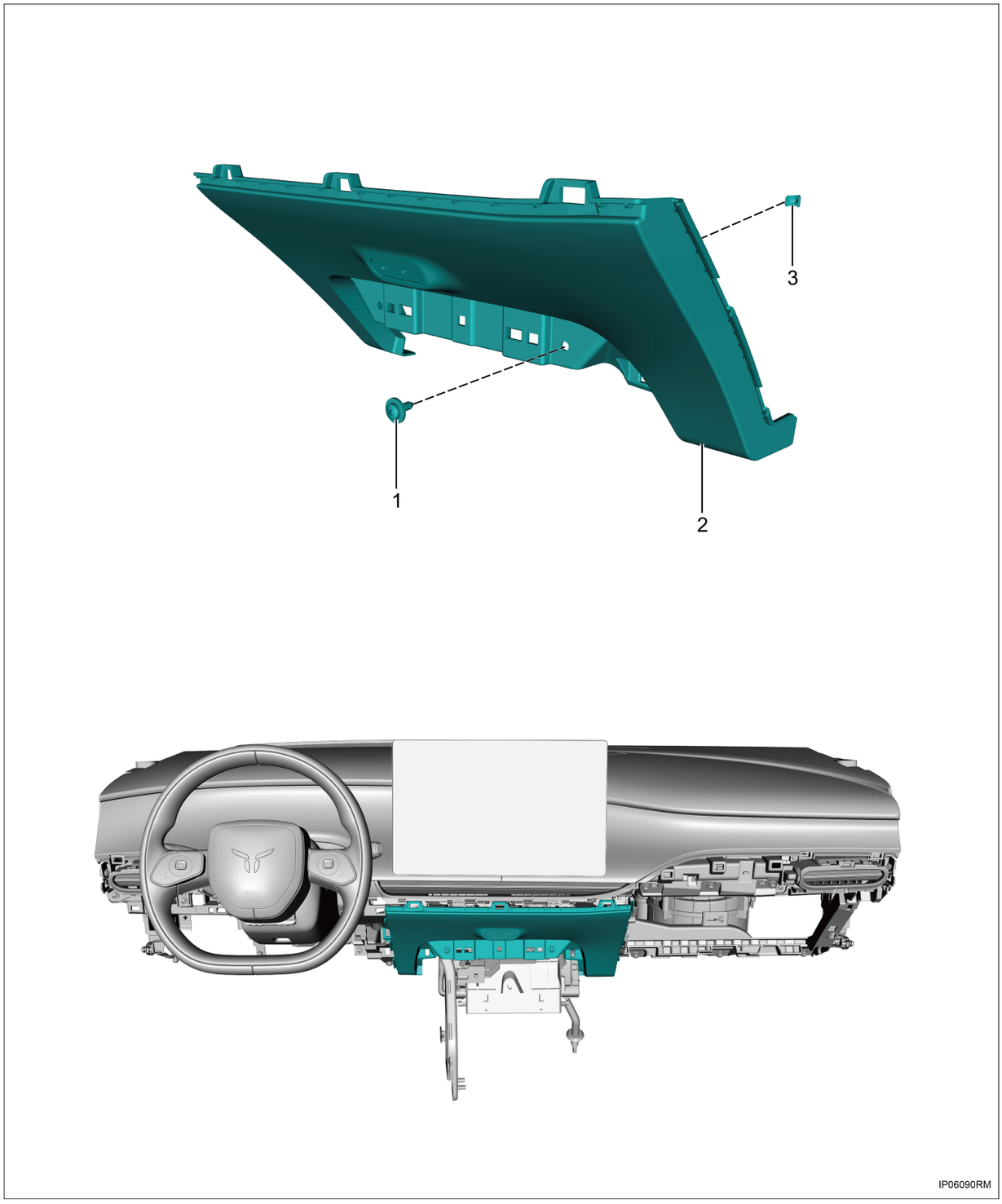
(g) (For example) Detach all spring plates -1-.

Installation

1. Installation is in the reverse order of removal.

Instrument panel middle protector

Components



1. **Cross recess pan head self-tapping screw and flat washer set**
   - X2
   - Torque: 3.3 ~ 4.3 N • m
2. **Instrument panel middle part**

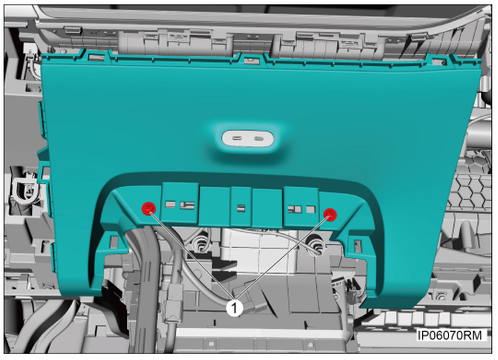
3. Spring plate

- X9

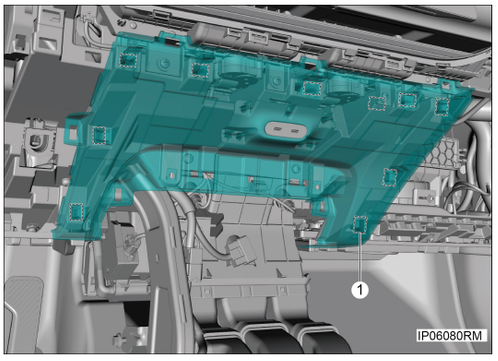
NS

Removal

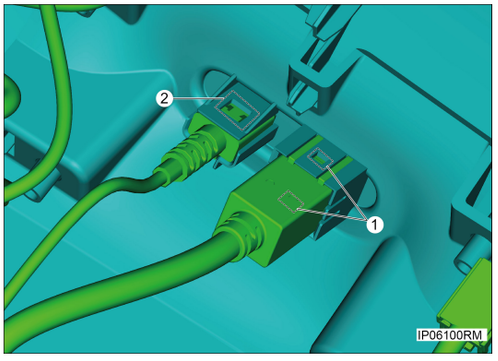
1. **Remove right trim strip (See page NS-15)**
2. **Remove left trim strip (See page NS-17)**
3. **Remove main display assembly (See page ZC-85)**
4. **Remove instrument panel center trim panel (See page NS-22)**
5. **Remove auxiliary fascia console assembly (See page NS-49)**
6. **Remove instrument panel middle protector**



(a) Remove the screw -1-.



(b) (For example) Detach all spring plates -1-.



(c) Detach the USB connecting wire harness claw -1- .

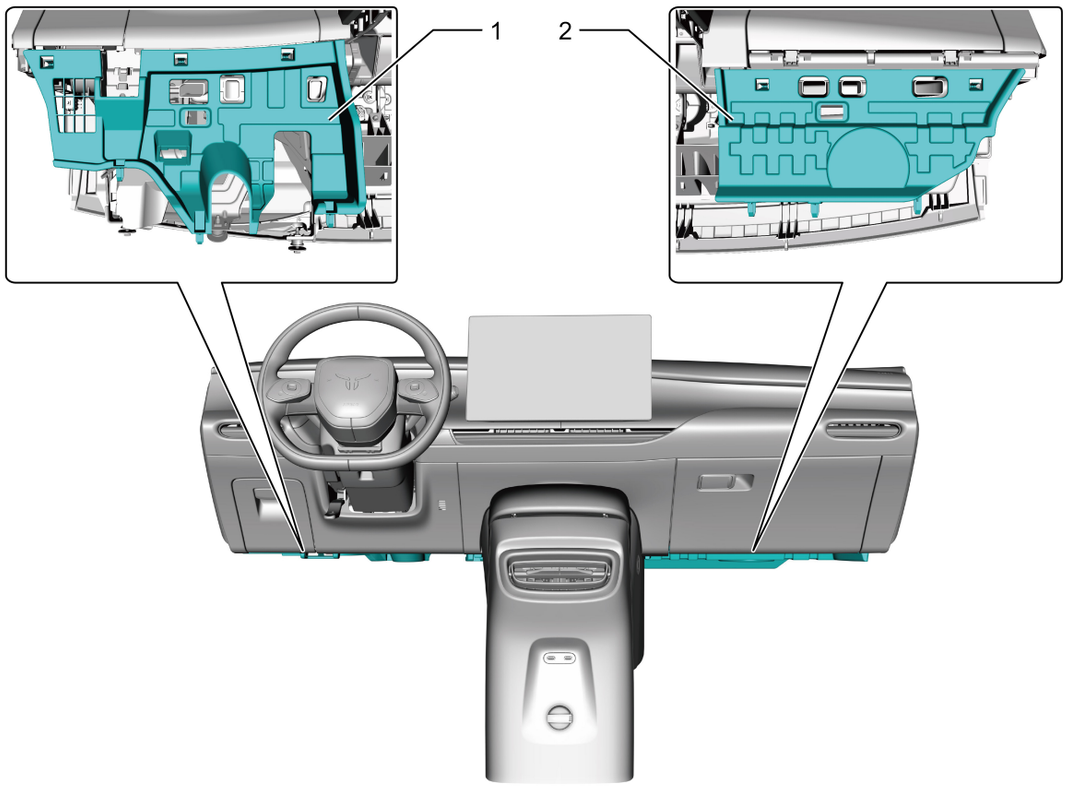
(d) Detach the USB connecting wire harness claw -2- .

Installation

1. **Installation is in the reverse order of removal.**

Instrument panel bottom protector

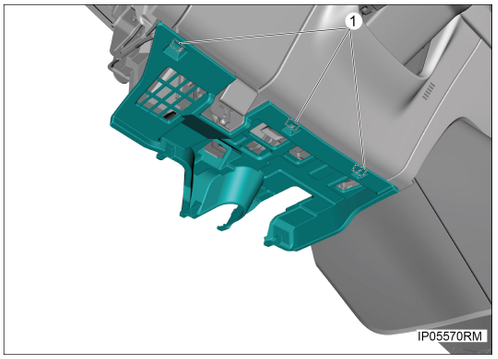
Components



1. **Lower left bottom protector**
2. **Lower right bottom protector**

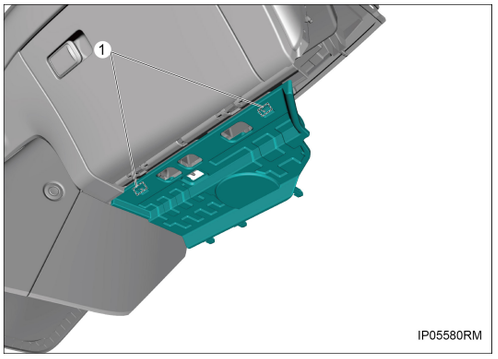
Removal

1. **Remove foot ambient light assembly (See page ZC-32)**
2. **Remove lower left bottom protector**



(a) Detach the claw -1-.

3. Remove lower right bottom protector



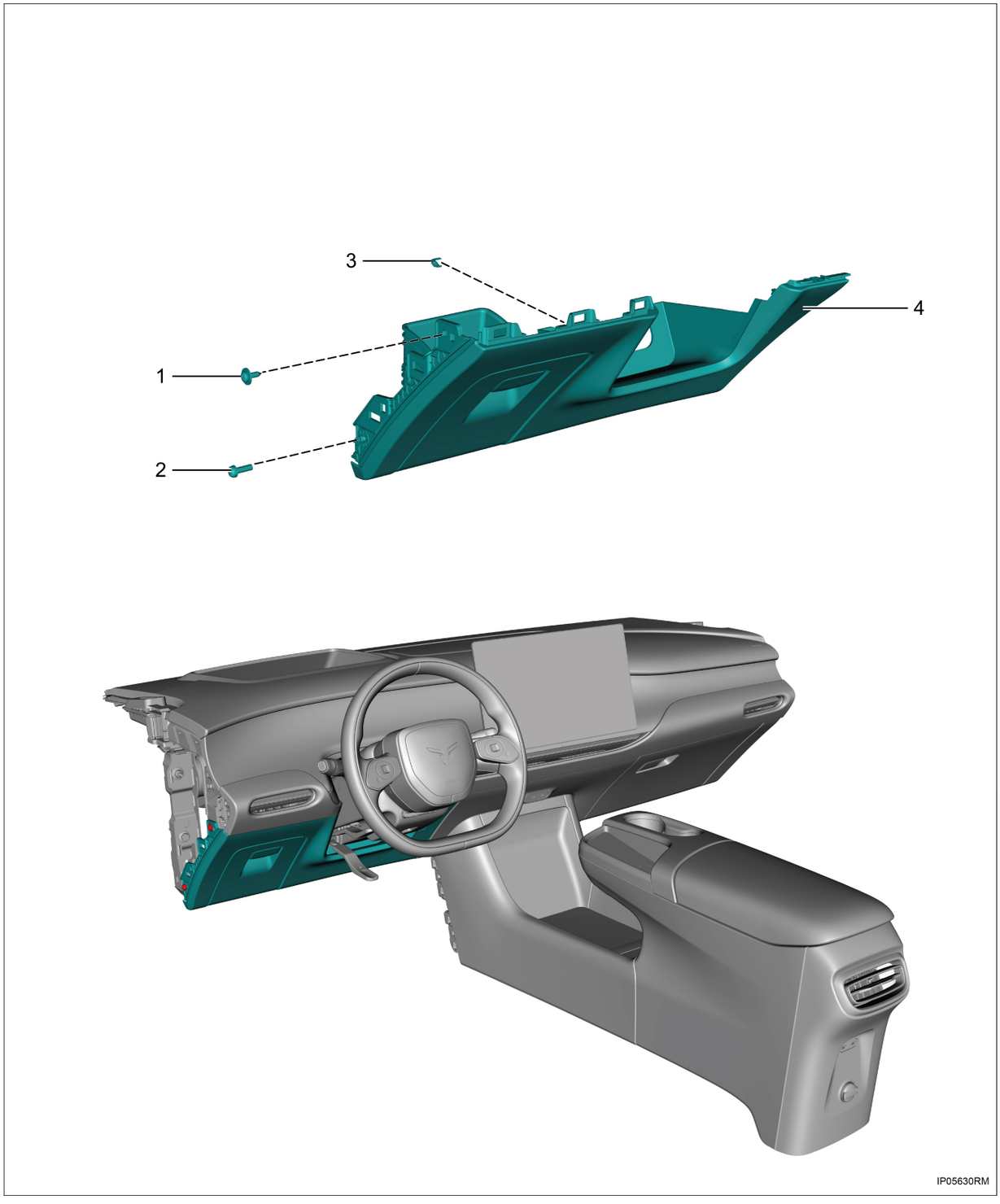
(a) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Instrument panel lower left protector assembly

Components



1. Screw

- X2
- Torque: 3.3 ~ 4.3 N • m

2. Screw

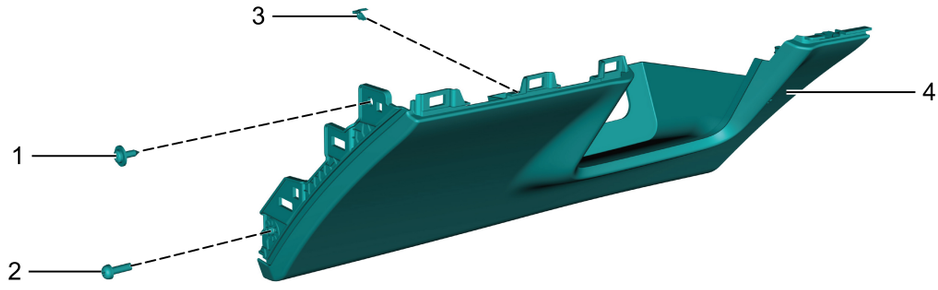
- X3
- Torque: 2 ~ 4 N • m

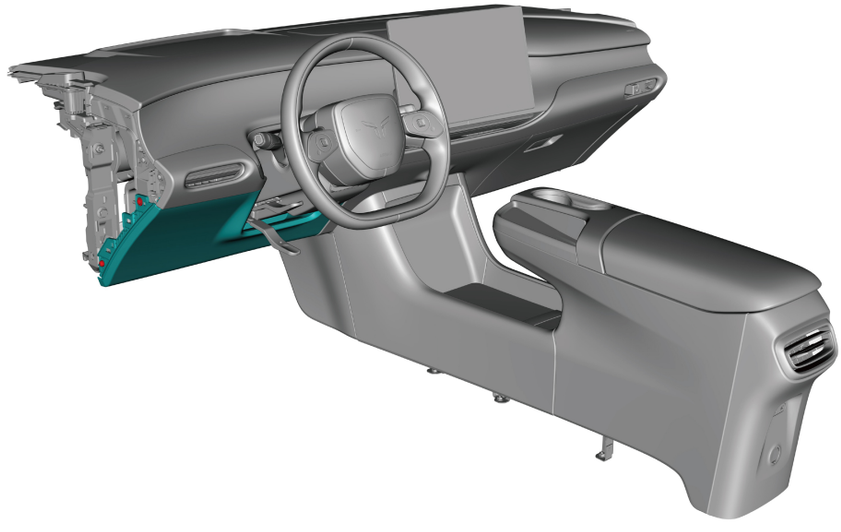
3. Clip

- X7

4. Instrument panel lower left protector assembly

Components





IP06300RM

1. **Screw**
   - X2
   - Torque: 3.3 ~ 4.3 N • m
2. **Screw**
   - X3

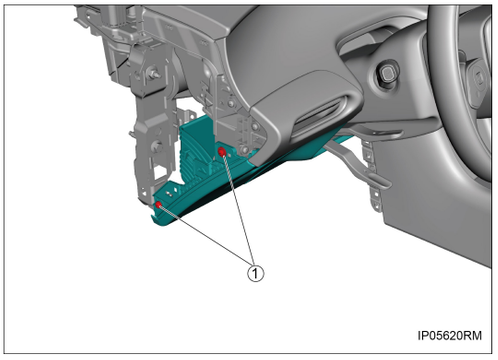
- Torque: 2 ~ 4 N • m

3. **Clip**
   - X7
4. **Instrument panel lower left protector assembly**

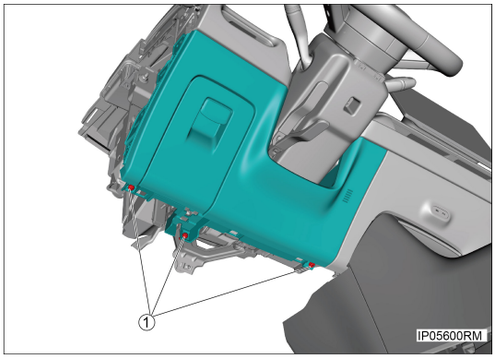
NS

Removal

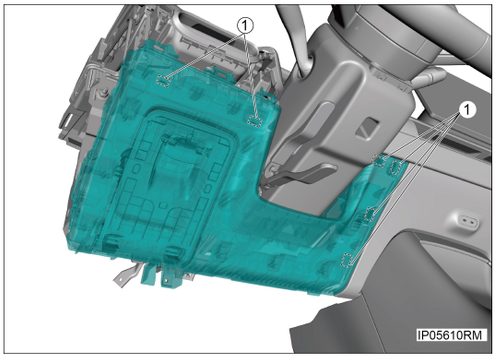
1. **Remove left end cover (See page NS-13)**
2. **Remove instrument panel bottom protector (See page NS-27)**
3. **Remove instrument panel left trim strip assembly (See page NS-17)**
4. **Remove front compartment cover inside opening handle assembly (See page CS-53)**
5. **Remove instrument panel lower left protector assembly**



(a) Remove the screw -1-.



(b) Remove the screw -1-.



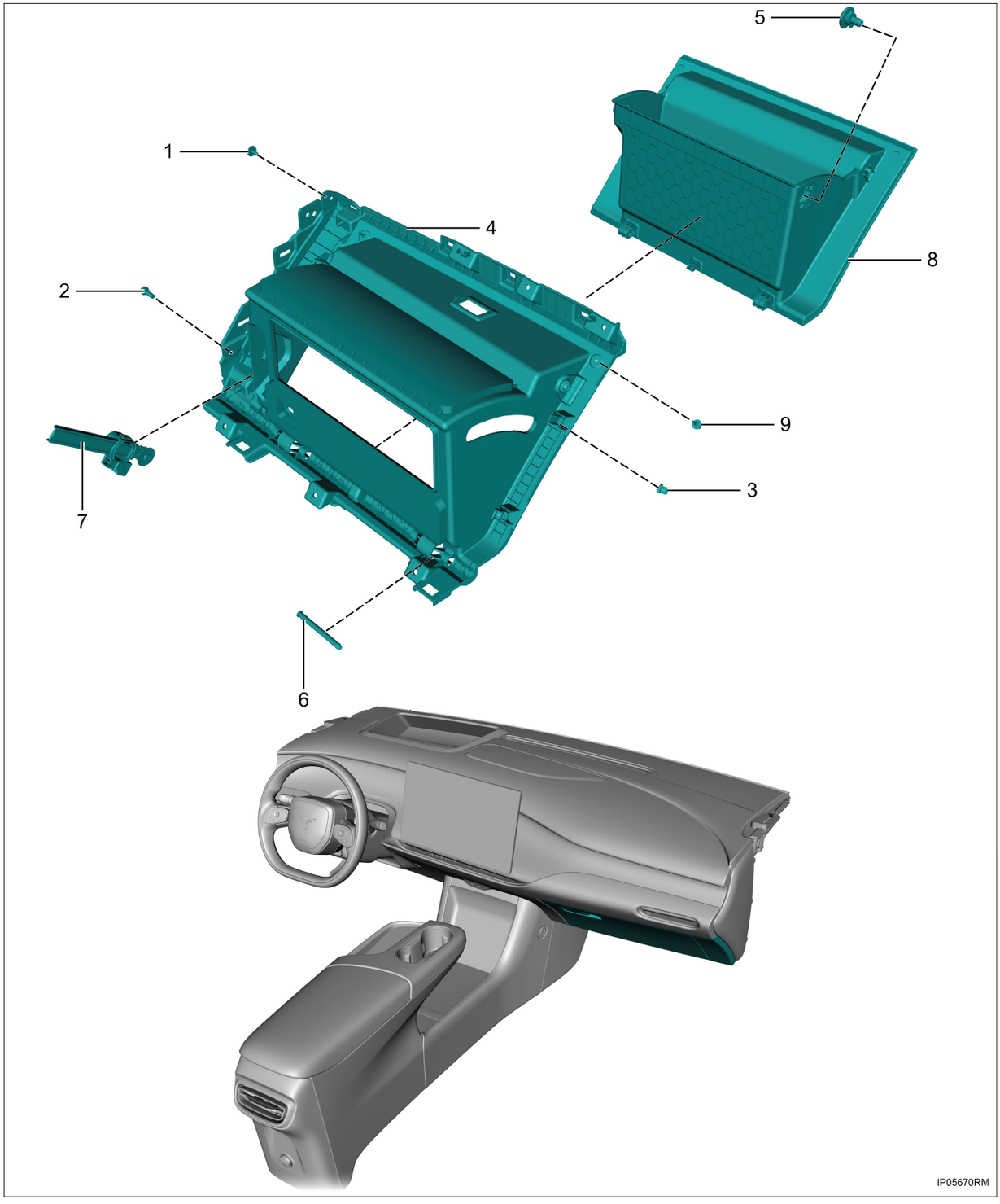
(c) Detach the spring plate -1-.

Installation

1. **Installation is in the reverse order of removal.**

Glove box assembly

Components



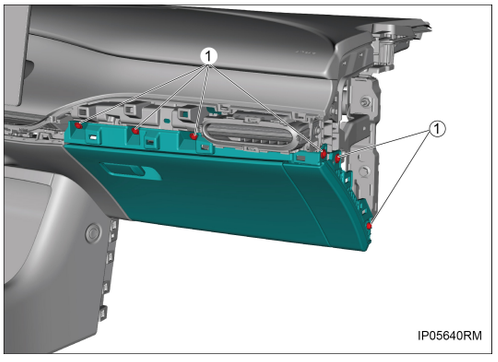
1. **Screw**

- X8
- Torque: 3.3 ~ 4.3 N • m

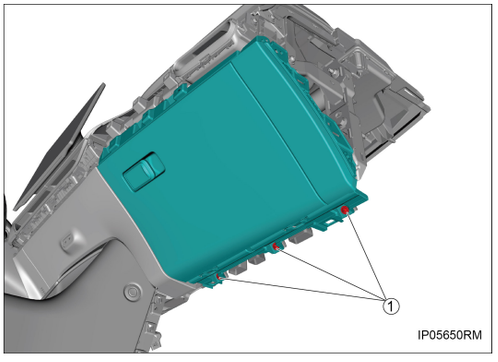
2. **Screw**
   - Torque: 2 ~ 4 N • m
3. **Clip**
   - X3
4. **Glove box body assembly**
5. **Opening cushion pin**
6. **Hinge shaft**
7. **Damper rack**
8. **Glove box cover assembly**
9. **Buffer button**

Removal

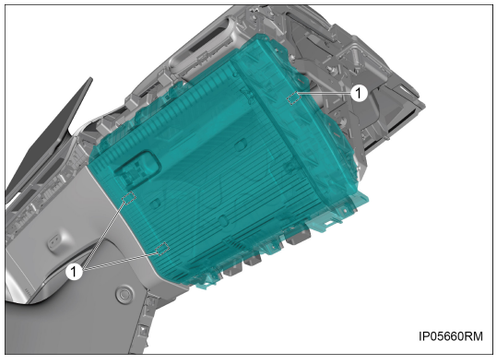
1. **Remove right end cover (See page NS-13)**
2. **Remove instrument panel bottom protector (See page NS-27)**
3. **Remove instrument panel right trim strip assembly (See page NS-15)**
4. **Remove glove box assembly**



(a) Remove the screw -1-.

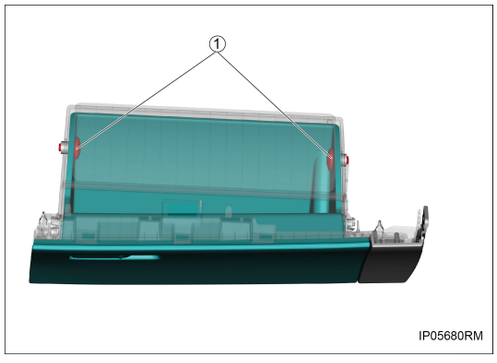


(b) Remove the screw -1-.

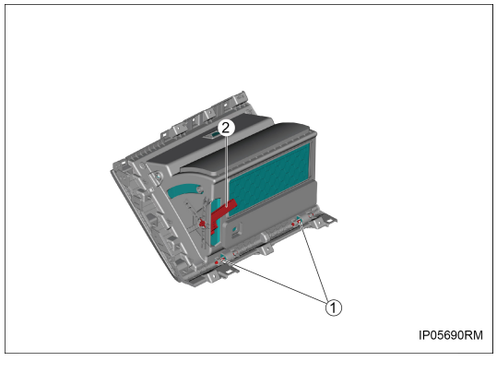


(c) Detach the clip -1-.

(d) Disconnect the damper wire harness connector.

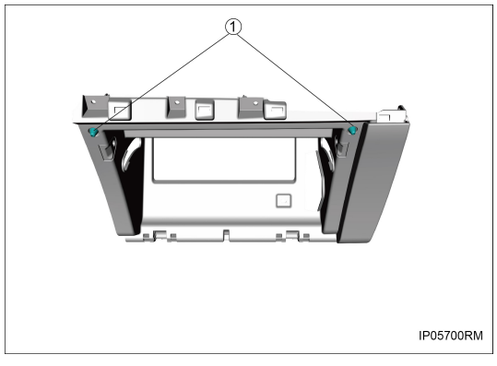


(e) Remove the opening cushion pin -1-.



(f) Push the hinge shaft -1-.

(g) Detach the damper rack -2-.



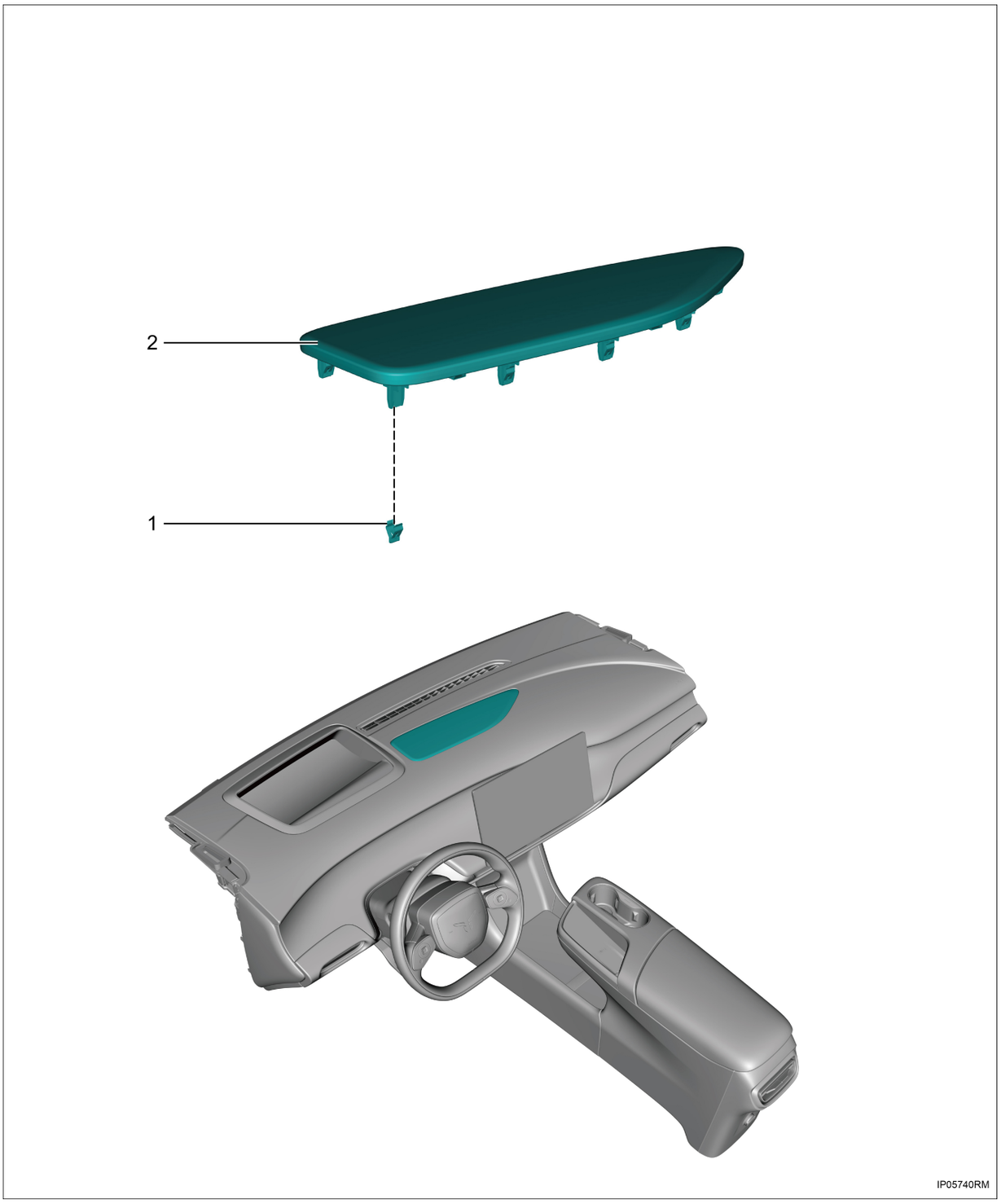
(h) Remove the buffer button -1-.

Installation

1. Installation is in the reverse order of removal.

Middle speaker cover assembly

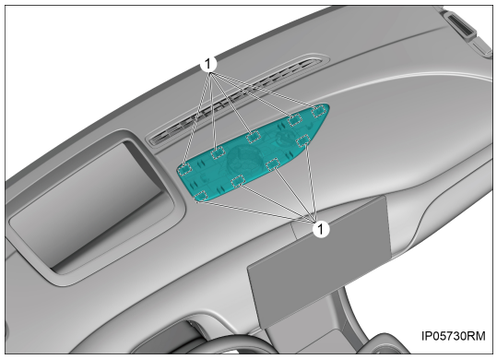
Components



1. **Clip**
   - X9
2. **Middle speaker cover assembly**

Removal

1. Remove middle speaker cover assembly



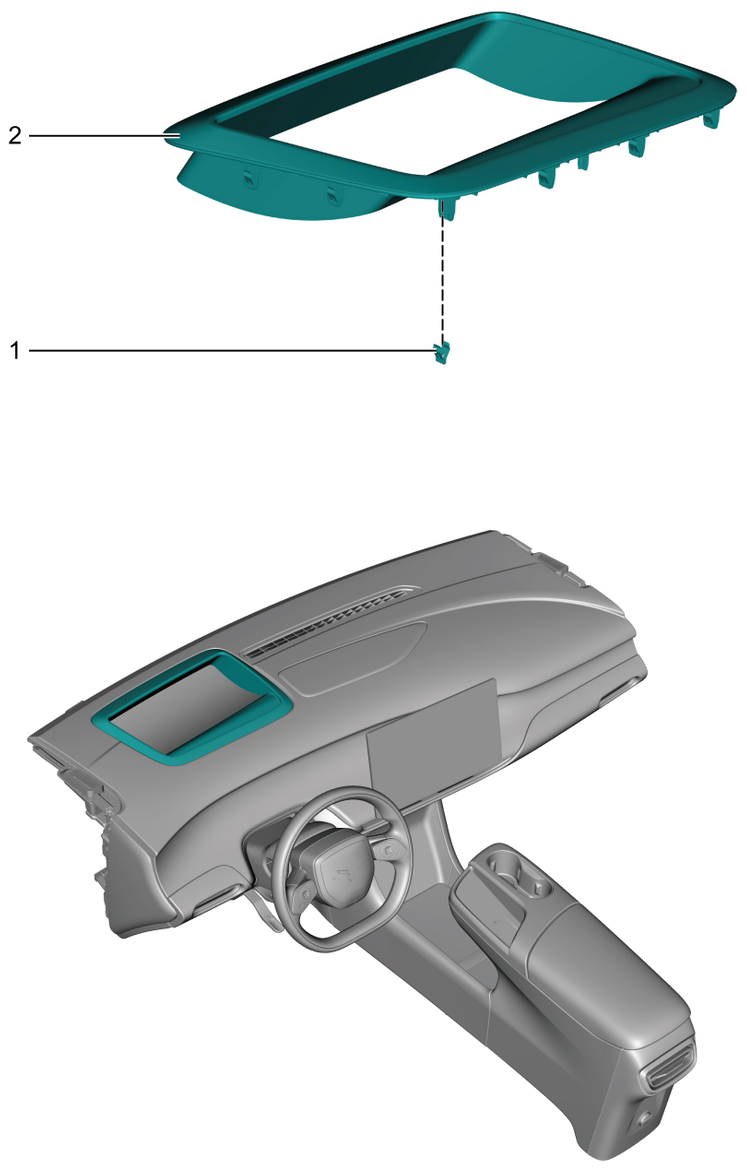
(a) Detach the spring plate -1-.

Installation

1. Installation is in the reverse order of removal.

Head up display trim cover assembly

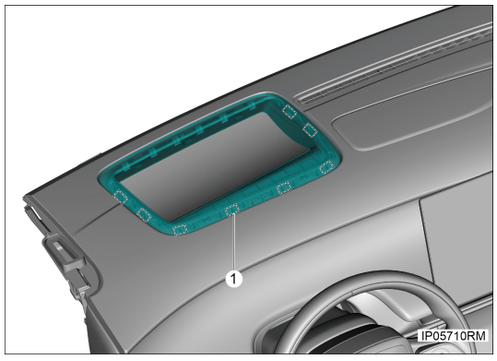
Components



1. **Clip**
   - X8
2. **Head up display trim cover assembly**

Removal

1. Remove head up display trim cover assembly



(a) (For example) Detach all clips -1-.

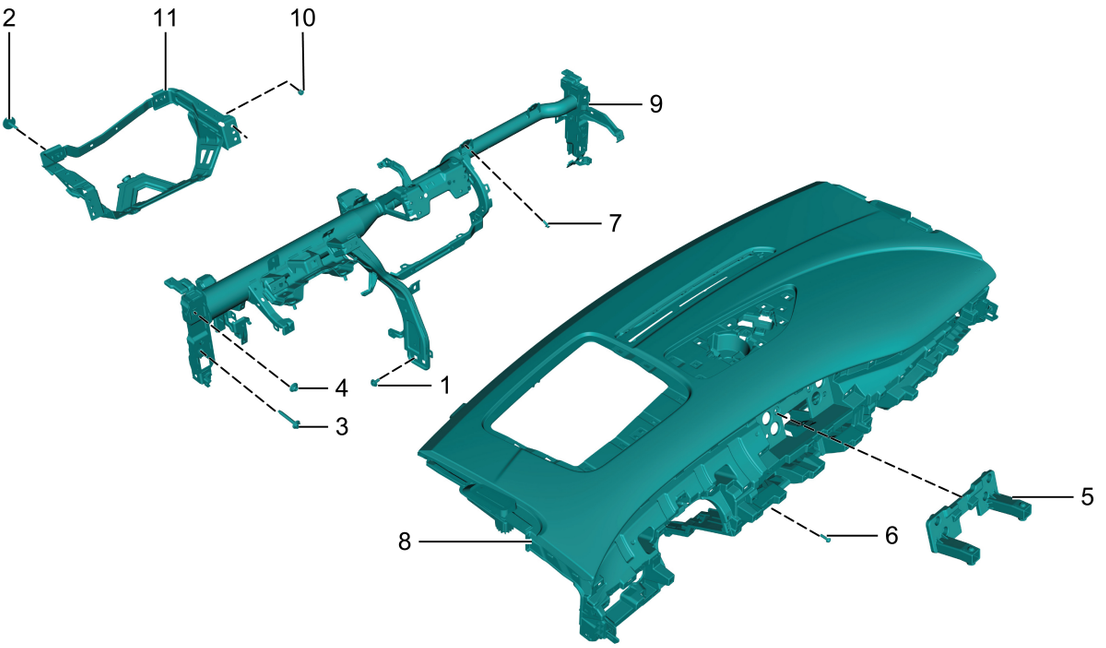
Installation

1. Installation is in the reverse order of removal.

Instrument panel assembly

Components

NS



1. **Bolt**
   - X2
   - Torque: 19 ~ 25 N • m
2. **Bolt**
   - X3
   - Torque: 19 ~ 25 N • m
3. **Bolt**
   - X2

- Torque: 19 ~ 25 N • m

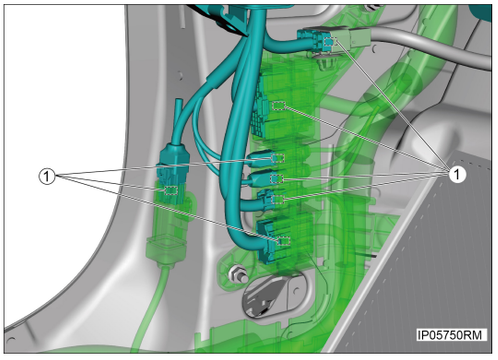
4. **Nut**
   - X2
   - Torque: 19 ~ 25 N • m
5. **Screw**
   - X14
6. **Fixing bracket I**
7. **Bolt**
   - X2
   - Torque: 2 ~ 4 N • m
8. **Instrument panel frame**
9. **Instrument panel crossmember**
10. **Nut**
    - X4
    - Torque: 19 ~ 25 N • m
11. **Head up display fixing bracket**

Removal

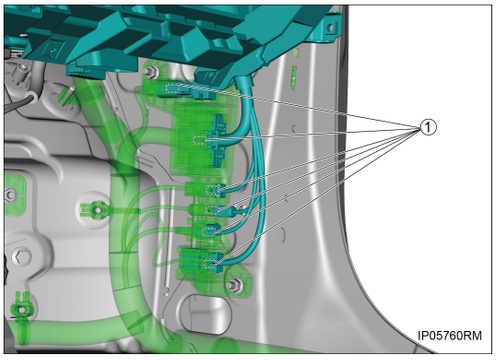
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove head up display trim cover (See page NS-38)**
3. **Remove middle speaker assembly (See page NS-36)**
4. **Remove central defroster nozzle (See page RE-38)**
5. **Remove instrument panel end cover (See page NS-13)**
6. **Remove main display assembly (See page ZC-85)**
7. **Remove instrument panel left trim strip (See page NS-17)**
8. **Remove instrument panel right trim strip (See page NS-15)**
9. **Remove instrument panel bottom protector (See page NS-27)**
10. **Remove instrument panel lower left protector (See page NS-29)**
11. **Remove instrument panel center trim panel (See page NS-22)**
12. **Remove glove box assembly (See page NS-33)**
13. **Remove auxiliary fascia console assembly (See page NS-49)**

NS

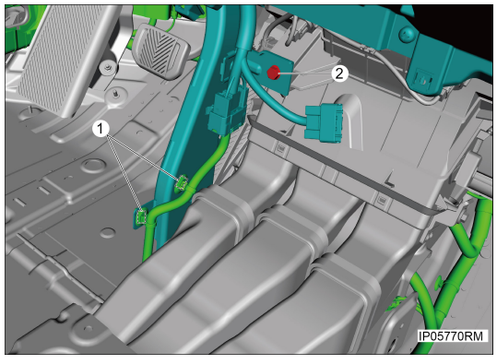
14. **Remove middle protector (See page NS-25)**
15. **Remove instrument panel outlet assembly (See page RE-41)**
16. **Remove steering column assembly (See page DP-47)**
17. **Remove A-pillar protector (See page NS-130)**
18. **Remove inside temperature sensor assembly (See page RE-17)**
19. **Remove left foot air duct (See page RE-47)**
20. **Remove right foot duct (See page RE-47)**
21. **Remove water channel cover plate assembly (See page WS-86)**
22. **Remove front wiper motor link assembly (See page WS-62)**
23. **Remove wiper fixing bracket I assembly (See page WS-62)**
24. **Remove single USB charging port assembly (See page ZC-11)**
25. **Remove instrument panel body assembly**



(a) Disconnect the left wire harness connector -1-.

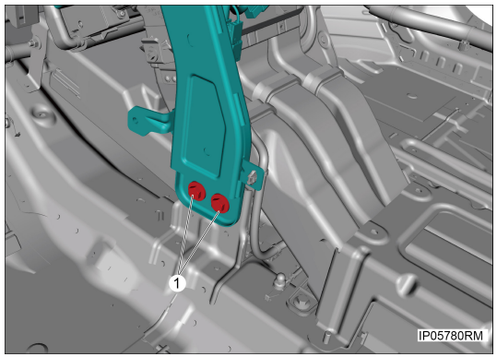


(b) Disconnect the right wire harness connector -1-.

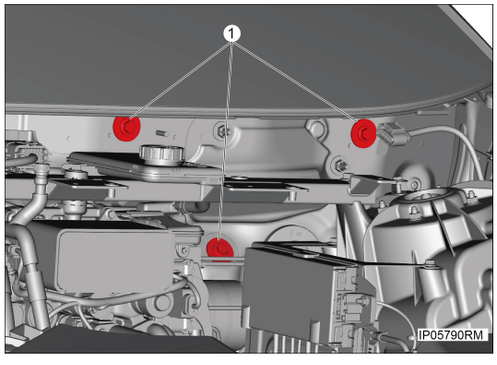


(c) Disengage the wire harness fixing clip -1-.

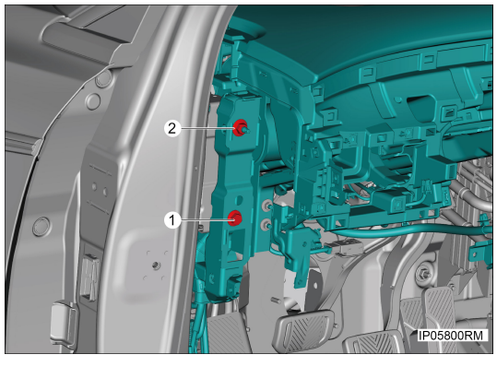
(d) Remove the bolt -2-.



(e) Remove the bolt -1-.

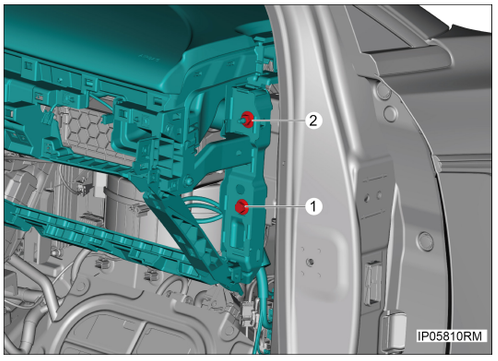


(f) Remove the bolt -1-.



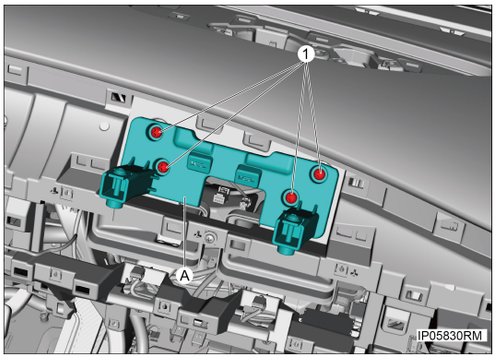
(g) Remove the left bolt -1-.

(h) Remove the left nut -2-.



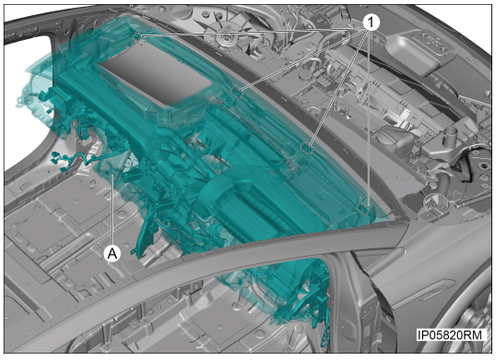
(i) Remove the right bolt -1-.

(j) Remove the right nut -2-.



(k) Remove the screw -1-.

(l) Remove the fixing bracket I-A-.



(m) Detach the claw -1-.

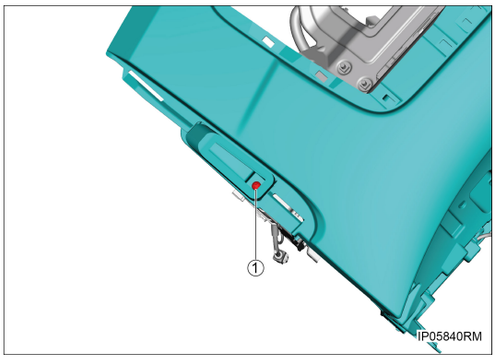
(n) Remove instrument panel body assembly -A- at an appropriate angle.

26. Remove instrument panel outlet filter assembly (See page RE-44)

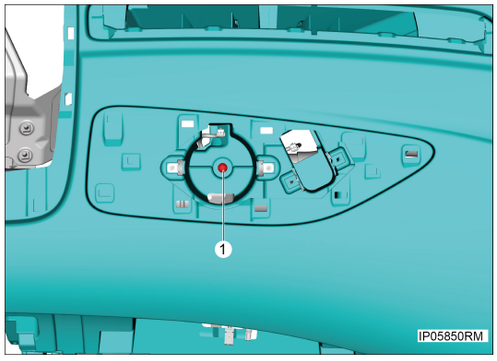
27. Remove front passenger airbag assembly (See page ZC-66)

28. Remove defroster transition duct assembly (See page RE-47)

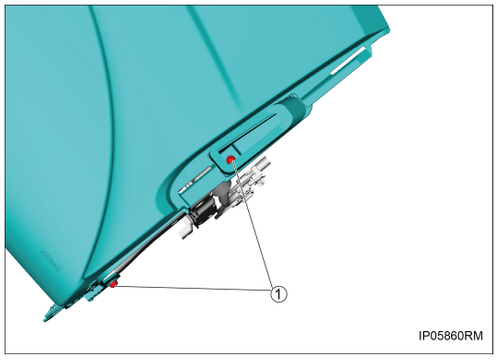
29. Remove instrument panel frame



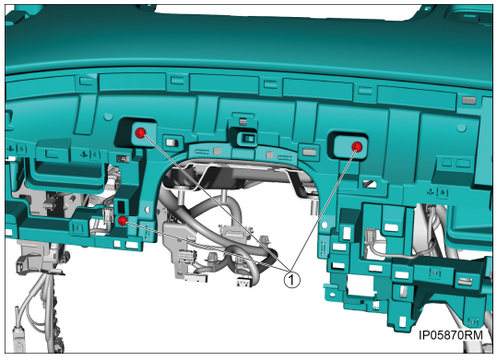
(a) Remove the screw -1-.



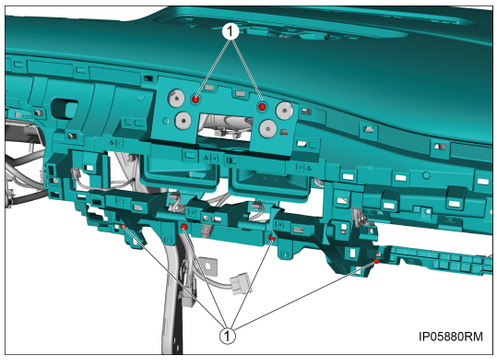
(b) Remove the screw -1-.



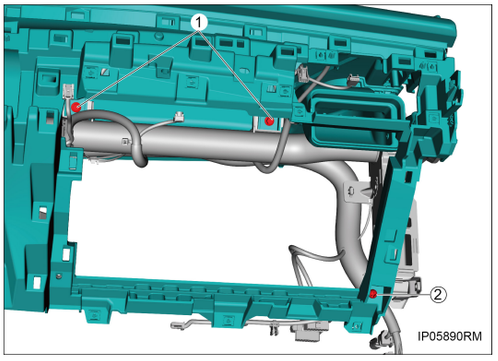
(c) Remove the screw -1-.



(d) Remove the screw -1-.

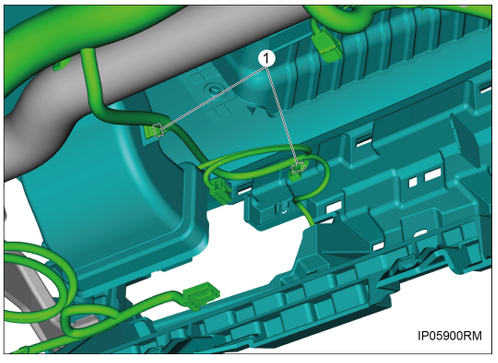


(e) Remove the screw -1-.

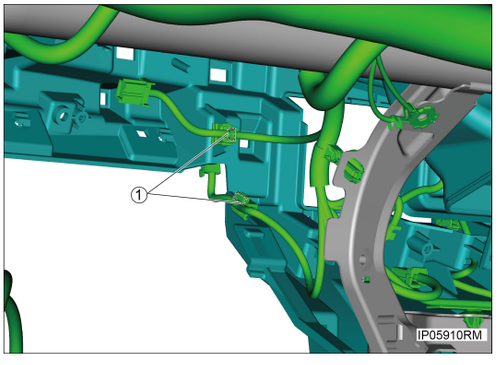


(f) Remove the bolt -1-.

(g) Remove the screw -2-.



(h) Disengage the wire harness fixing clip -1-.



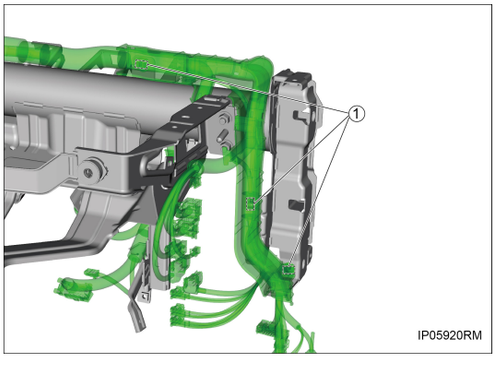
(i) Disengage the wire harness fixing clip -1-.

(j) Remove the instrument panel frame.

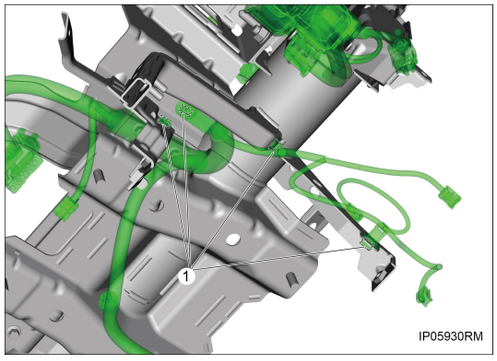
30. Remove head up display assembly (See page ZC-114)

31. Remove instrument panel face air duct (See page RE-47)

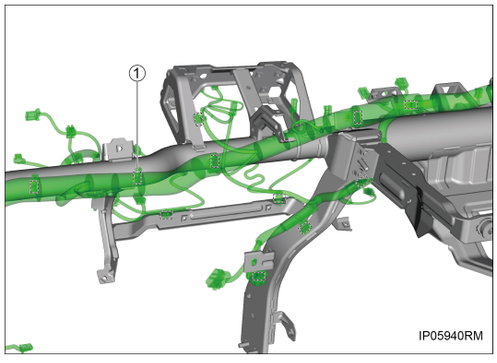
32. Remove instrument panel wire harness assembly



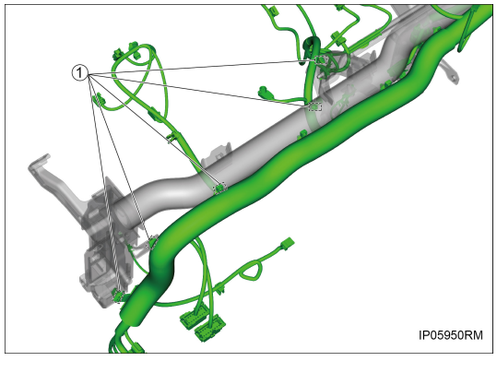
(a) Disengage the wire harness fixing clip -1-.



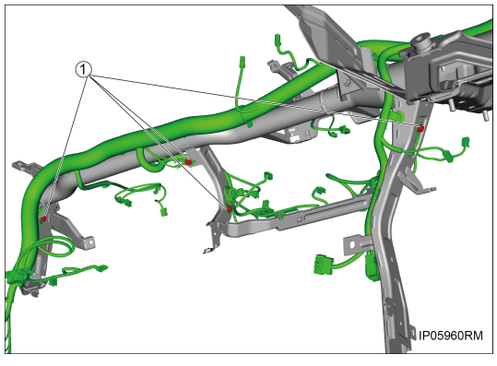
(b) Disengage the wire harness fixing clip -1-.



(c) (For example) Detach all wire harness fixing clip -1-.



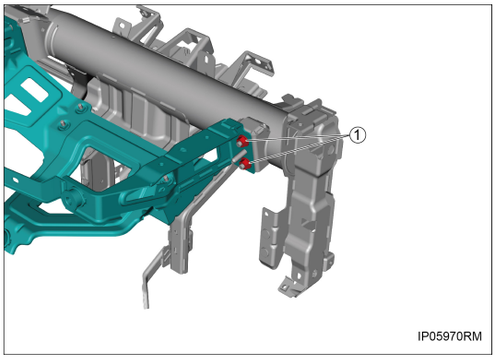
(d) Disengage the wire harness fixing clip -1-.



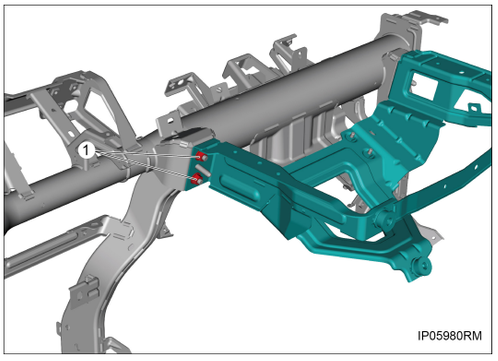
(e) Remove the bolt -1-.

(f) Remove the instrument panel wire harness assembly.

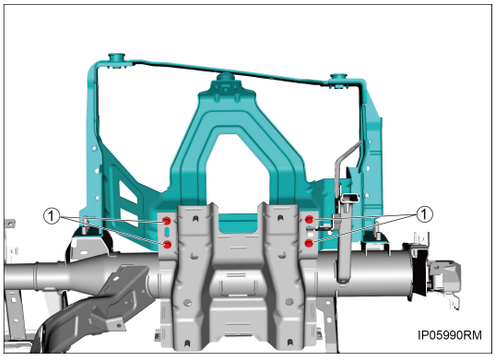
33. Remove head up display fixing bracket assembly



(a) Remove the left nut -1-.



(b) Remove the right nut -1-.



(c) Remove the bolt -1-.

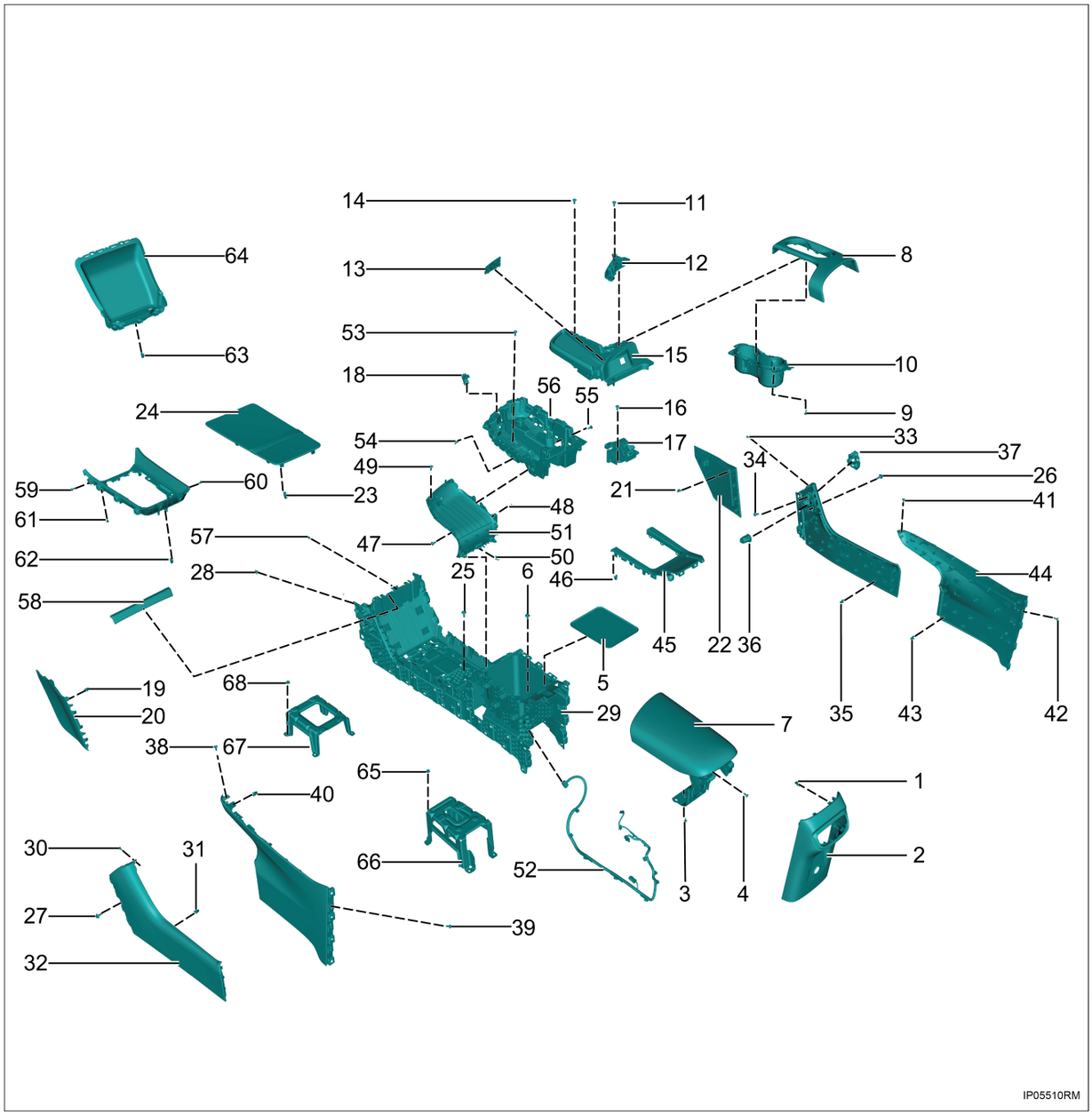
Installation

1. Installation is in the reverse order of removal.

Auxiliary fascia console system

Auxiliary fascia console assembly

Components



1. **Clip**
   - X10
2. **Rear end plate assembly**
3. **Screw**
4. **Screw**
   - X4
5. **Armrest box bottom plate**

6. **Hexagon flange bolt**
   - X4
   - Torque: 3 ~ 5 N • m
7. **Armrest assembly**
8. **Armrest trim panel**
9. **Screw**
   - X6
10. **Cup holder body assembly**
11. **Screw**
    - X3
12. **Trim panel II**
13. **Trim panel III**
14. **Screw**
    - X5
15. **Trim panel assembly**
16. **Screw**
    - X3
17. **Lock assembly**
18. **Auxiliary fascia console ambient light assembly**
19. **Clip**
    - X4
20. **Front left extension panel**
21. **Clip**
    - X4
22. **Front right extension panel**
23. **Clip**
    - X10
24. **Middle trim panel**
25. **Hexagon flange bolt**
    - X4
    - Torque: 3 ~ 5 N • m
26. **Hexagon flange bolt**
    - Torque: 3 ~ 5 N • m
27. **Hexagon flange bolt**
    - Torque: 3 ~ 5 N • m
28. **Clip**
    - X4
29. **Auxiliary fascia console frame**

30. Screw

- X2

31. Clip

- X15

32. Left trim panel assembly

33. Screw

- X2

34. Screw

- X3

35. Clip

- X15

36. Right trim panel assembly

37. Screw

- X3

38. Screw

- X3

39. Clip

- X19

40. Auxiliary fascia console left protector

41. Screw

- X3

42. Screw

- X3

43. Clip

- X19

44. Auxiliary fascia console right protector

45. Rear cover plate assembly

46. Clip

- X9

47. Screw

- X2

48. Screw

- X3

49. Screw

- X2

50. Clip

- X3

51. Front cover plate assembly

52. Front auxiliary fascia console wire harness assembly

53. Screw

- X4

54. Screw

55. Screw

56. Auxiliary fascia console upper frame

57. Screw

58. Center trim strip

59. Screw

- X4

60. Screw

- X4

61. Screw

- X3

62. Center storage box

63. Clip

- X9

64. Center storage box panel

65. Hexagon flange nut

- X4
- Torque: 8 ~ 12 N • m

66. Rear fixing bracket

67. Hexagon flange nut

- X4
- Torque: 8 ~ 12 N • m

68. Middle fixing bracket

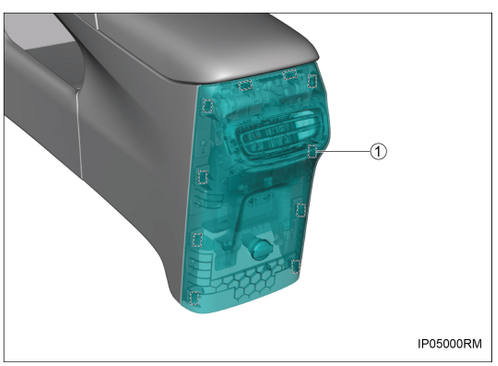
Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Remove rear end plate assembly

(a) (For example) Detach all clips -1-.

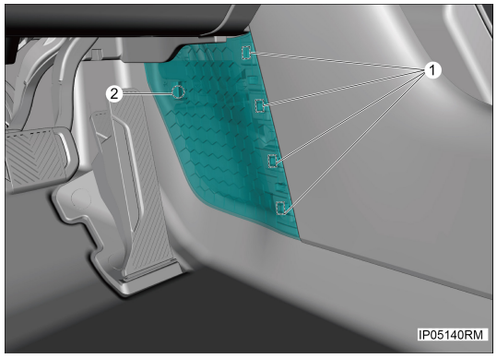
(b) Disconnect the wire harness connector.



3. **Remove rear part of rear cooling air duct assembly (See page RE-47)**
4. **Remove dual USB charging port assembly (See page ZC-9)**
5. **Remove USB holder (See page ZC-9)**
6. **Remove auxiliary fascia console outlet assembly (See page RE-45)**
7. **Remove front left extension panel**

Note:

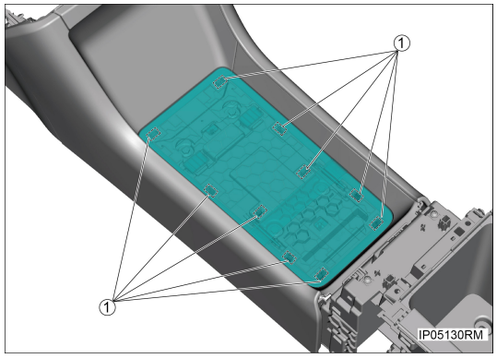
- Use same removal orders for right and left sides.



(a) Detach the clip -1-.

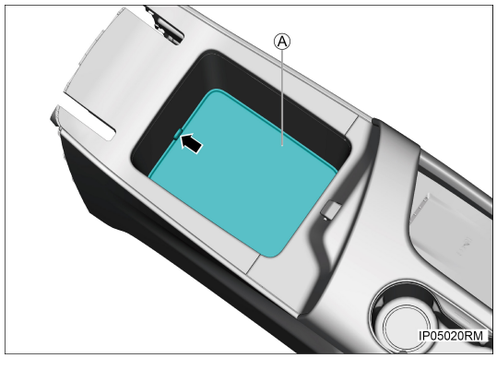
(b) Detach the claw -2-.

8. **Remove center trim panel**



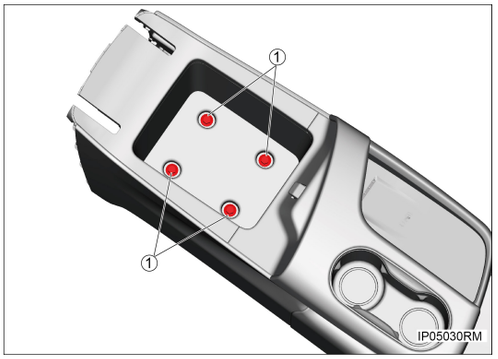
(a) Detach the clip -1-.

9. **Remove auxiliary fascia console assembly**

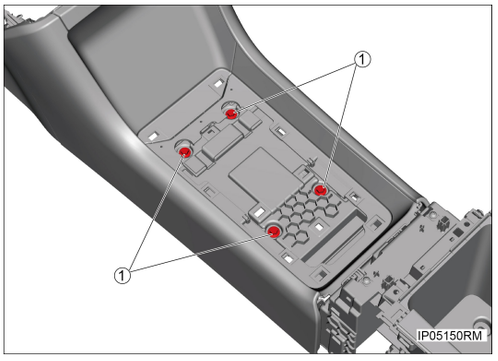


(a) Lift -arrow- to remove armrest box bottom plate -A-.

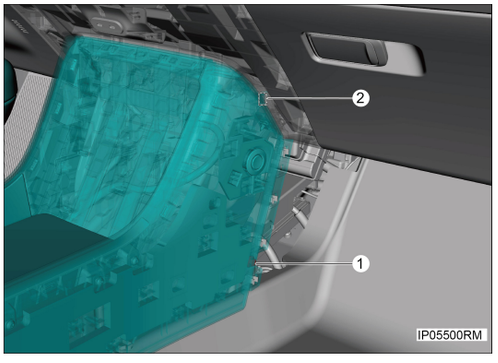
NS



(b) Remove the bolt -1-.

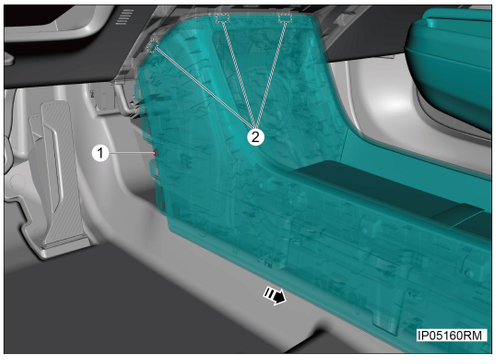


(c) Remove the bolt -1-.



(d) Remove the right bolt -1-.

(e) Detach the clip -2-.



(f) Remove the left bolt -1-.

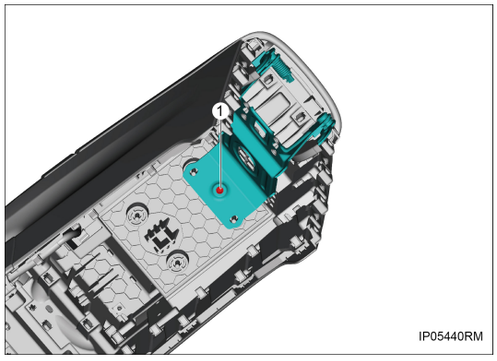
(g) Detach the clip -2-.

(h) Disconnect the wire harness connector.

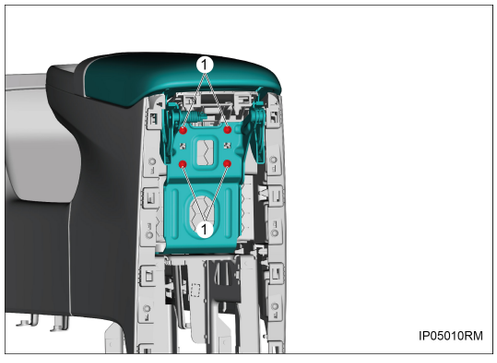
(i) Remove the auxiliary fascia console assembly -A- in the direction of -arrow-.

10. Remove digital key interior antenna assembly (See page ZC-104)

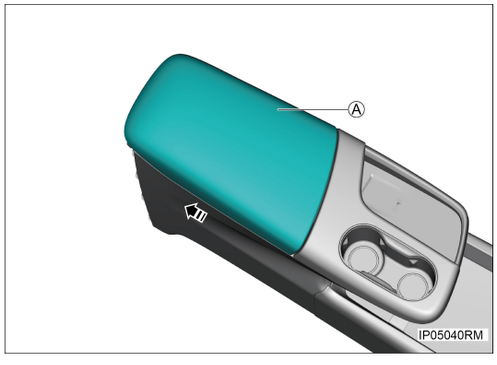
11. Remove armrest assembly



(a) Remove the lower screw -1-.

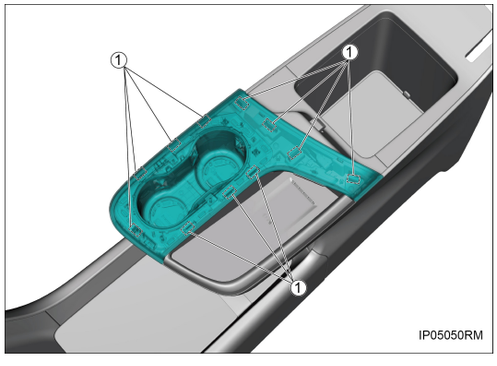


(b) Remove the rear screw -1-.



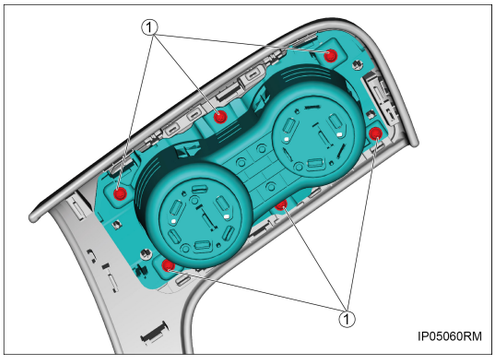
(c) Remove armrest assembly -A- in the direction of -arrow-.

12. Remove armrest trim panel assembly



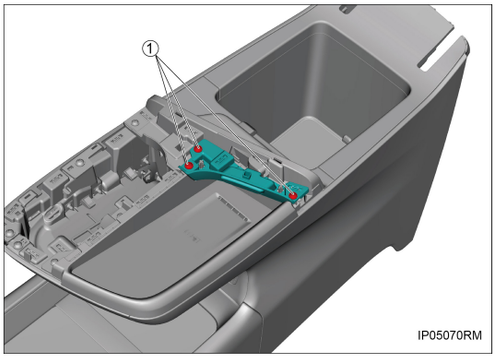
(a) Detach the claw -1-.

13. Remove cup body assembly



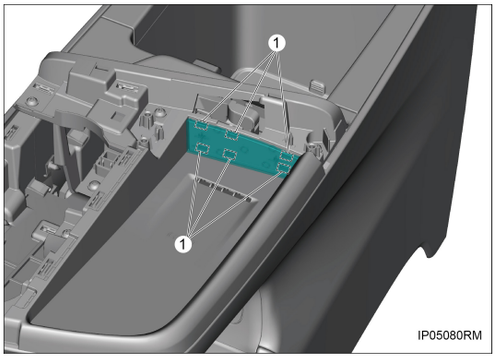
(a) Remove the screw -1-.

14. Remove trim panel II



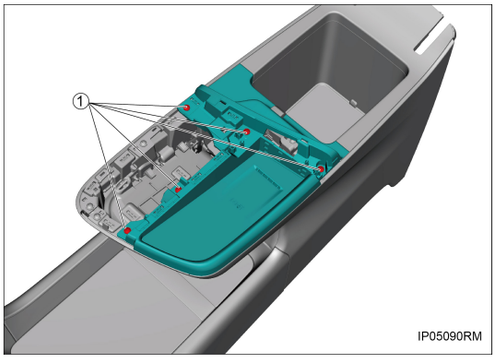
(a) Remove the screw -1-.

15. Remove trim panel III

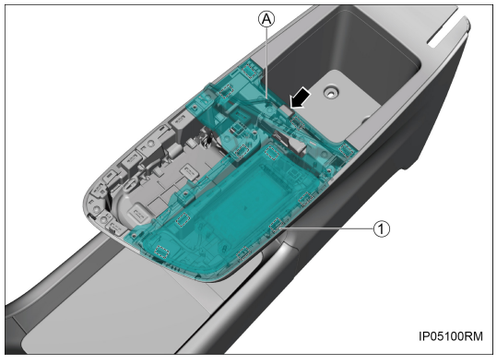


(a) Detach the claw -1-.

16. Remove trim panel assembly



(a) Remove the screw -1-.

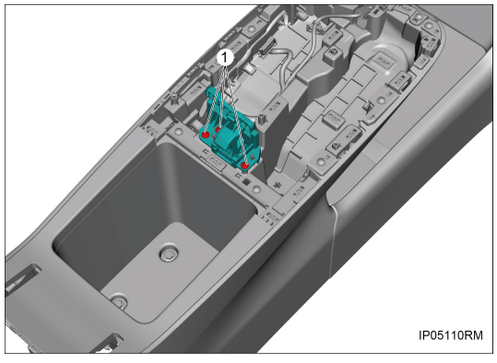


(b) (For example) Detach all claws -1-.

(c) Press lock tab I indicated by -arrow-.

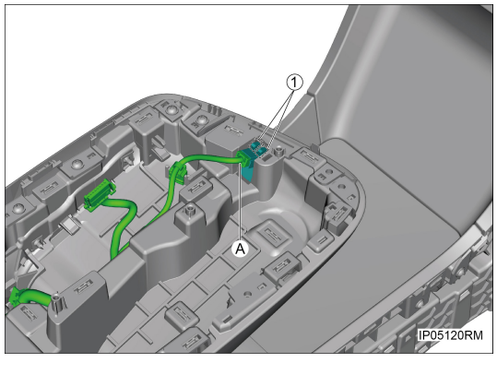
(d) Remove the trim panel assembly -A-.

17. Remove lock assembly



(a) Remove the screw -1-.

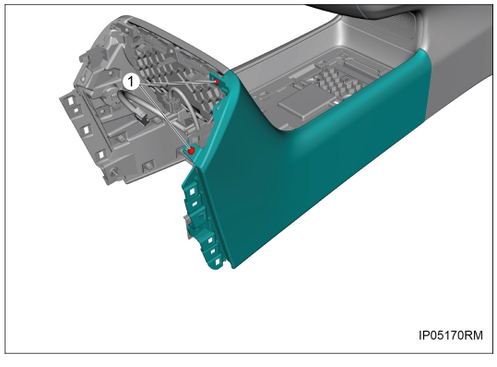
18. Remove auxiliary fascia console ambient light assembly



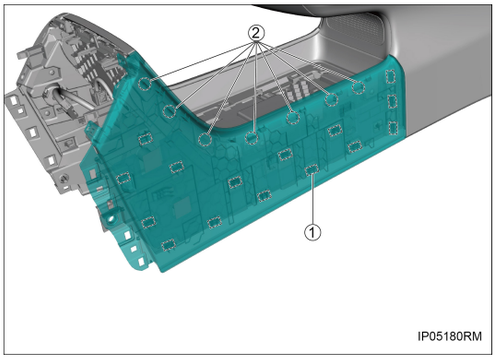
(a) Detach the claw -1-.

(b) Disconnect the wire harness connector -A-.

19. Remove left trim panel assembly



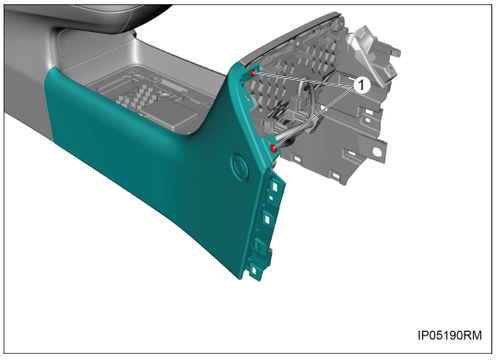
(a) Remove the screw -1-.



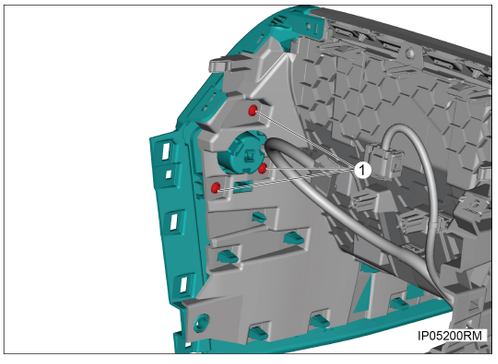
(b) (For example) Detach all clips -1-.

(c) Detach the claw -2-.

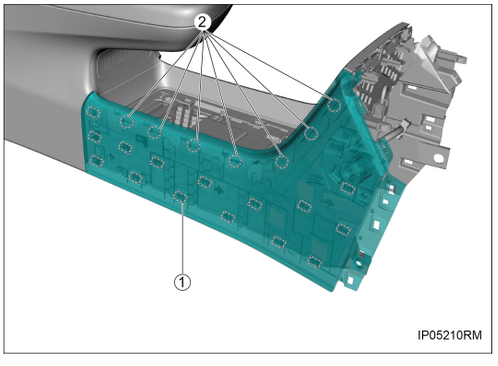
20. Remove right trim panel assembly



(a) Remove the external screw -1- from right trim panel.

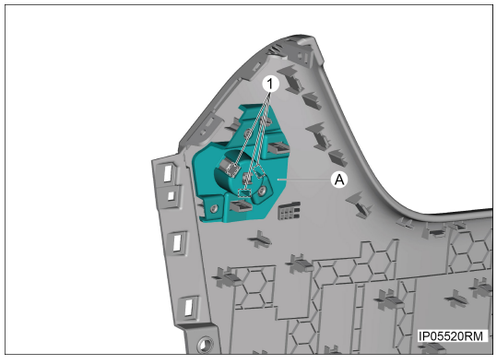


(b) Remove the internal screw -1- from right trim panel.

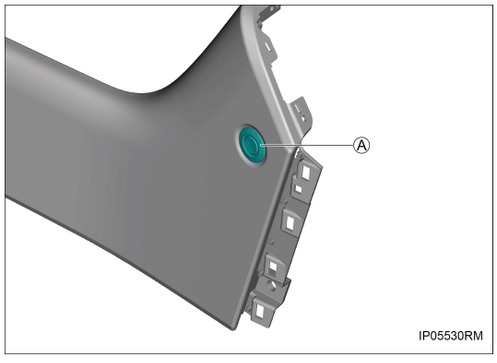


(c) (For example) Detach all clips -1-.

(d) Detach the claw -2-.

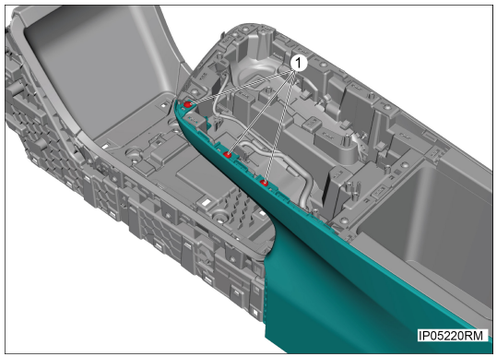


(e) Detach claw -1-, and remove the reinforcement bracket -A-.

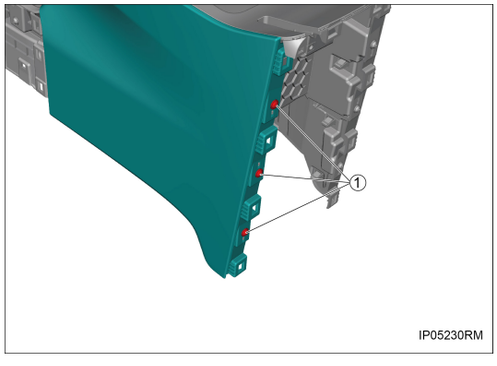


(f) Remove the hook assembly -A-.

21. Remove auxiliary fascia console left protector

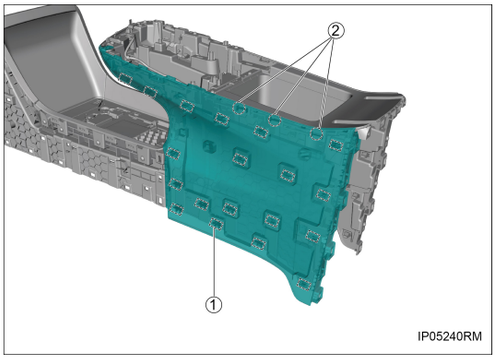


(a) Remove the upper screw -1-.



(b) Remove the rear screw -1-.

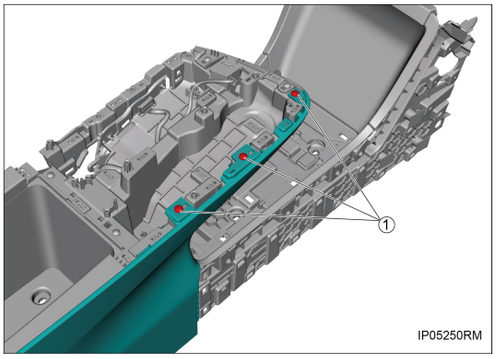
NS



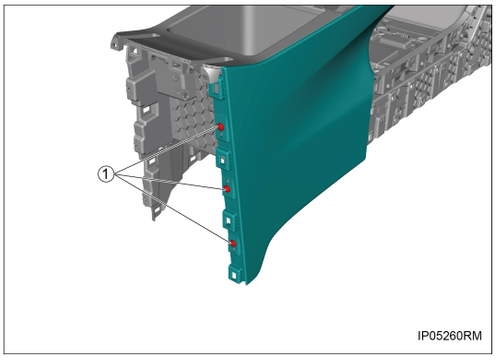
(c) (For example) Detach all clips -1-.

(d) Detach the claw -2-.

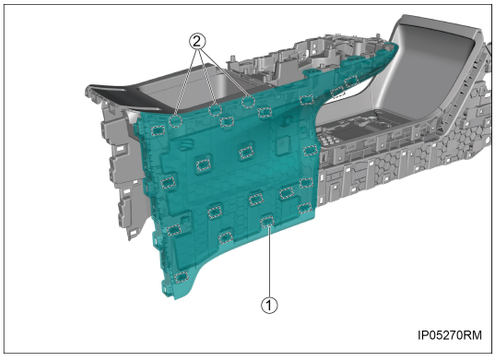
22. Remove auxiliary fascia console right protector



(a) Remove the upper screw -1-.



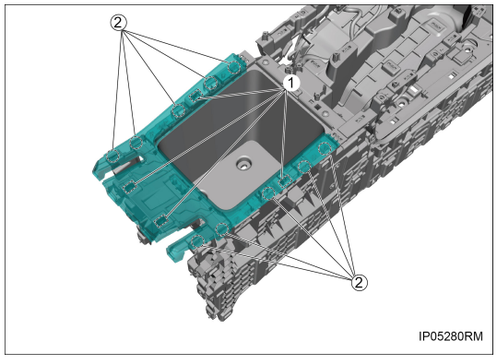
(b) Remove the rear screw -1-.



(c) (For example) Detach all clips -1-.

(d) Detach the claw -2-.

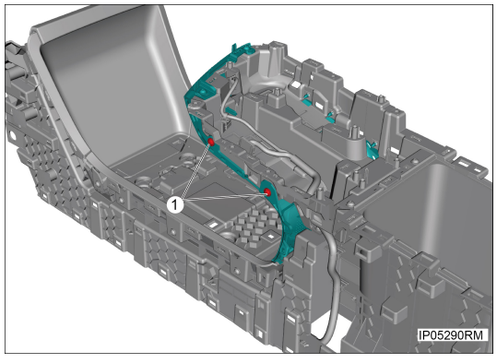
23. Remove rear cover plate assembly



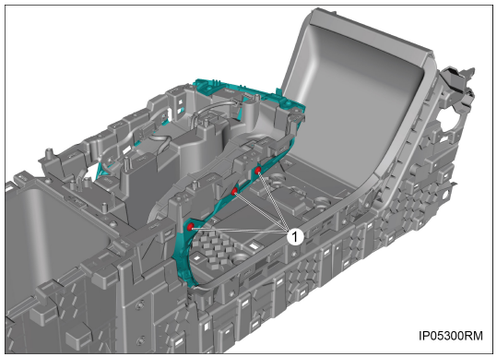
(a) Detach the clip -1-.

(b) Detach the claw -2-.

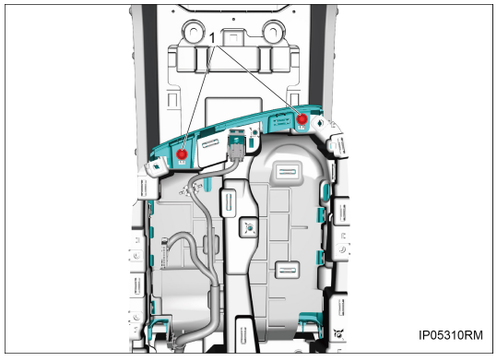
24. Remove front cover plate assembly



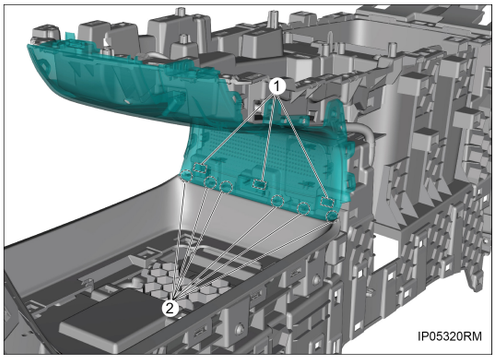
(a) Remove the left screw -1-.



(b) Remove the right screw -1-.



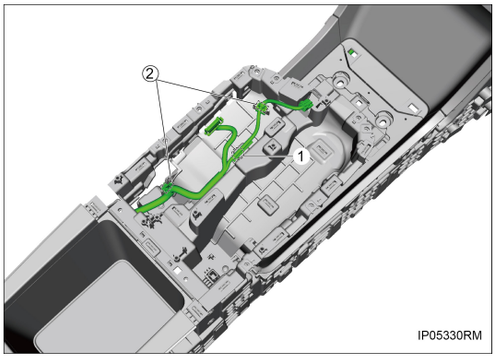
(c) Remove the upper screw -1-.



(d) Detach the clip -1-.

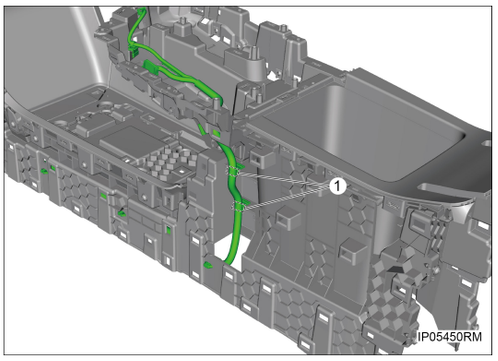
(e) Detach the claw -2-.

25. Remove front auxiliary fascia console wire harness assembly

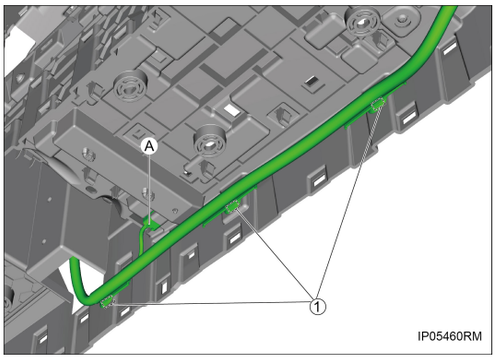


(a) Detach the upper wire harness fixing clip -1-.

(b) Detach the upper wire harness fixing claw -2-.

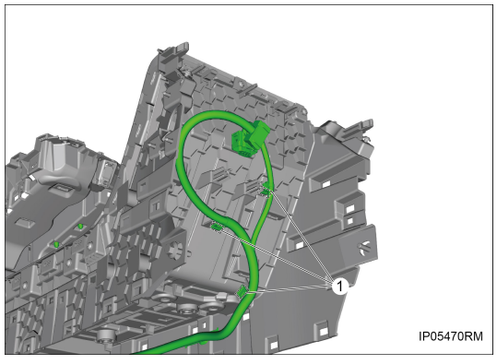


(c) Detach the left wire harness fixing claw -1-.



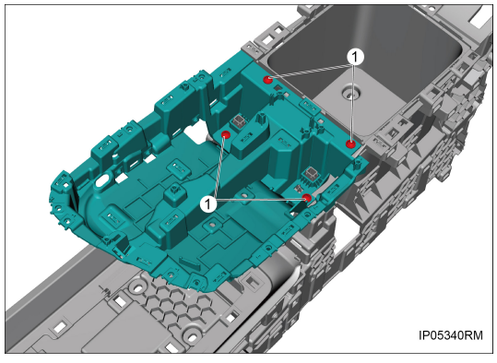
(d) Detach the lower wire harness fixing clip -1-.

(e) Disconnect the low frequency antenna wire harness connector -A-.



(f) Detach the front wire harness fixing claw -1-.

26. Remove auxiliary fascia console upper frame



(a) Remove the upper screw -1-.

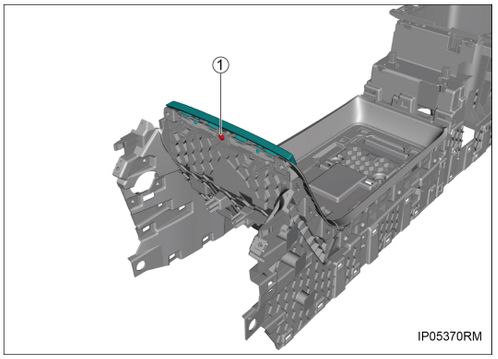


(b) Remove the left screw -1-.

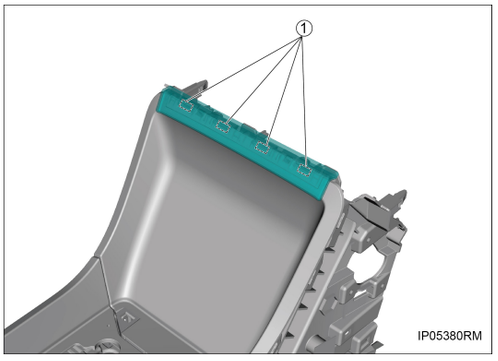


(c) Remove the right screw -1-.

27. Remove center trim strip

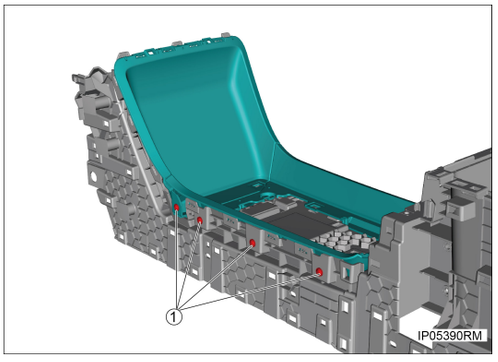


(a) Remove the screw -1-.

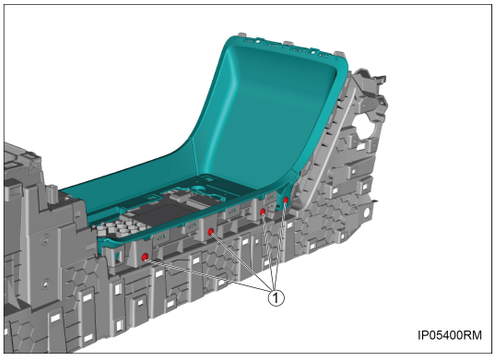


(b) Detach the claw -1-.

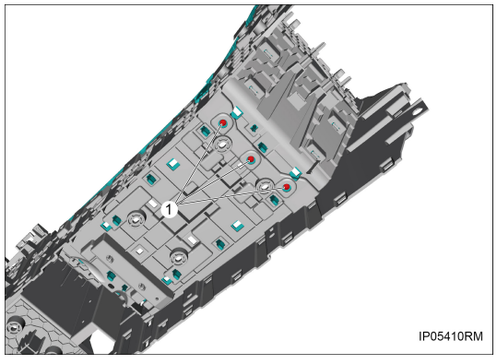
28. Remove center storage box assembly



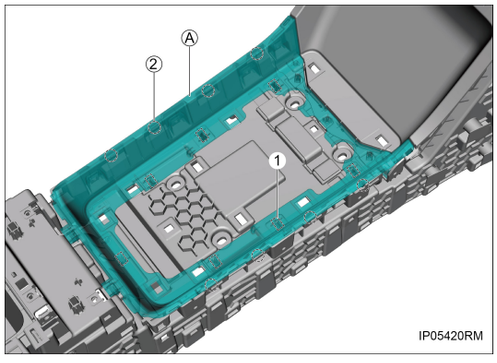
(a) Remove the left screw -1-.



(b) Remove the right screw -1-.



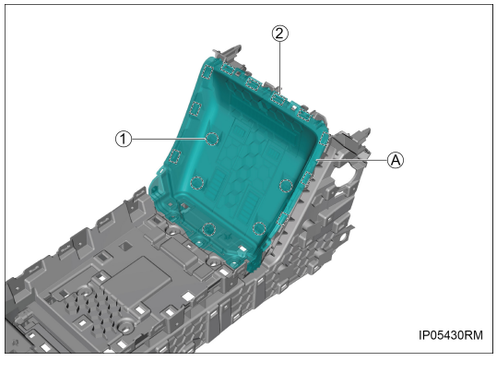
(c) Remove the lower screw -1-.



(d) (For example) Detach all clips -1-.

(e) (For example) Detach all claws -2-.

(f) Remove the center storage box -A-.

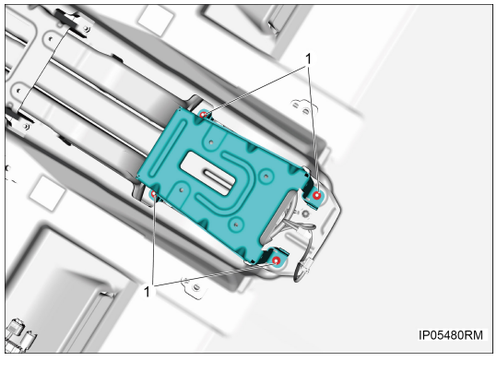


(g) Detach the clip -1-.

(h) (For example) Detach all claws -2-.

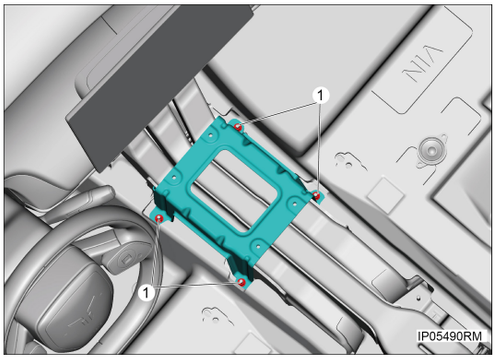
(i) Remove the center storage box panel -A-.

29. Remove rear fixing bracket



(a) Remove the nut -1-.

30. Remove middle fixing bracket



(a) Remove the nut -1-.

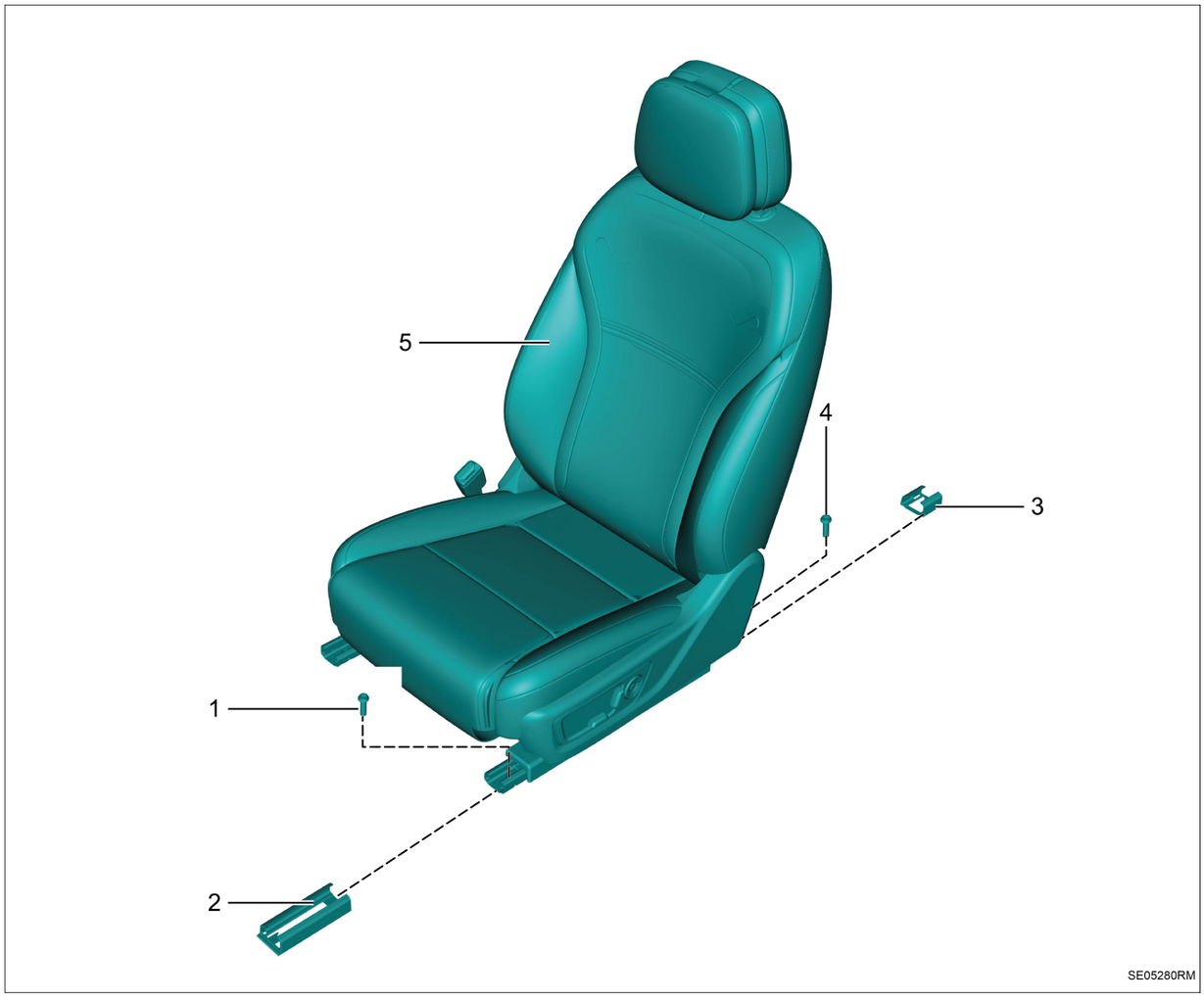
Installation

1. Installation is in the reverse order of removal.

Seat system

Front seat assembly

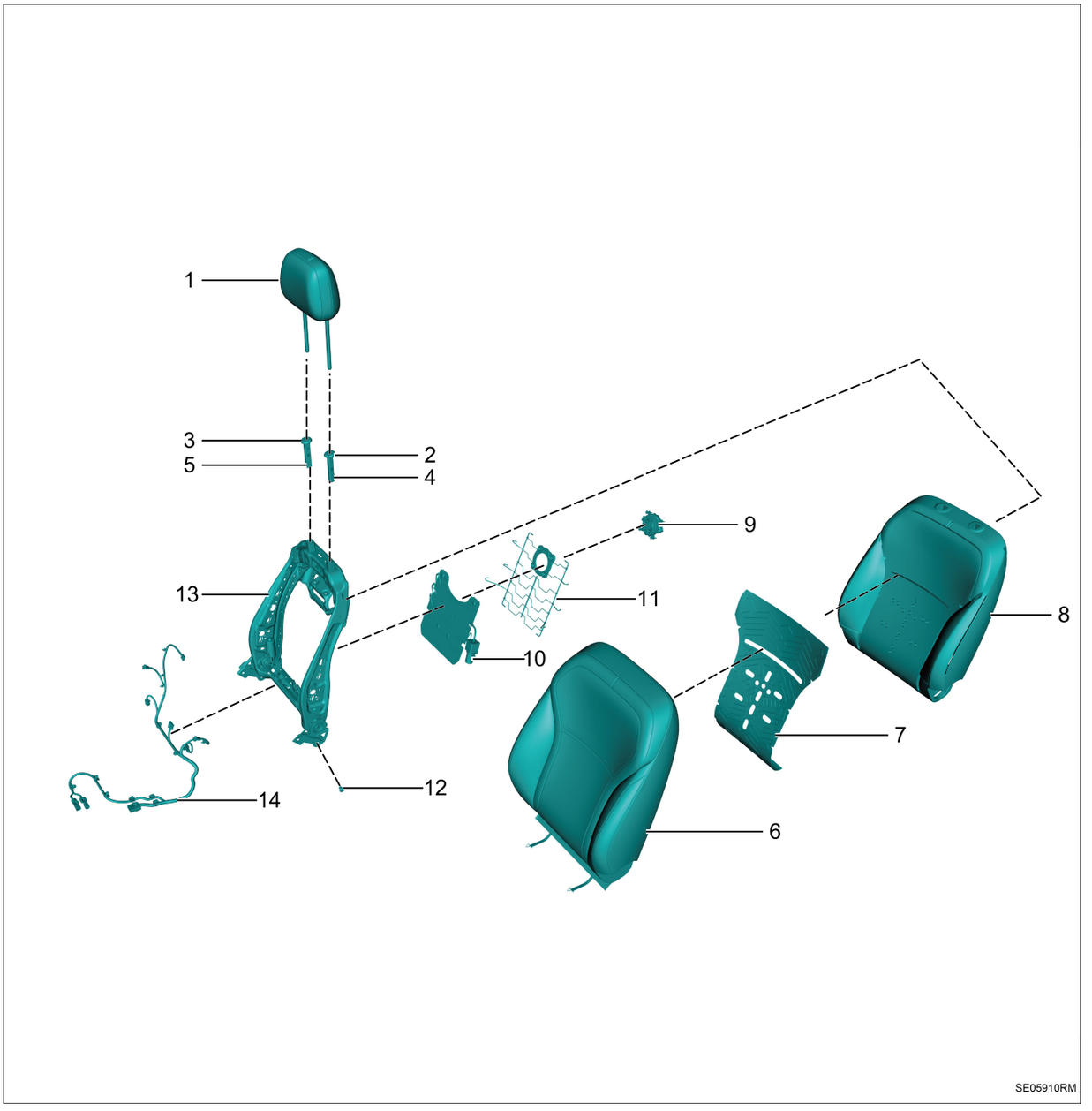
Components



1. **Screw**
   - X2
   - Torque: 39 ~ 51 N • m
2. **Driver seat front left track cover**
3. **Driver seat rear left track cover**
4. **Screw**
   - X2
   - Torque: 39 ~ 51 N • m
5. **Driver seat assembly**

NS

Components



1. **Front seat headrest cushion**
2. **Front seat headrest guide sleeve trim cover**
3. **Front seat headrest guide sleeve trim cover**
4. **Front seat headrest guide sleeve**
5. **Front seat headrest guide sleeve**
6. **Driver seatback cover assembly**
7. **Front seatback heater cushion assembly**
8. **Driver seatback foam assembly**
9. **Front seatback fan assembly**
10. **Front seatback pneumatic system assembly**

11. Seatback curtain assembly

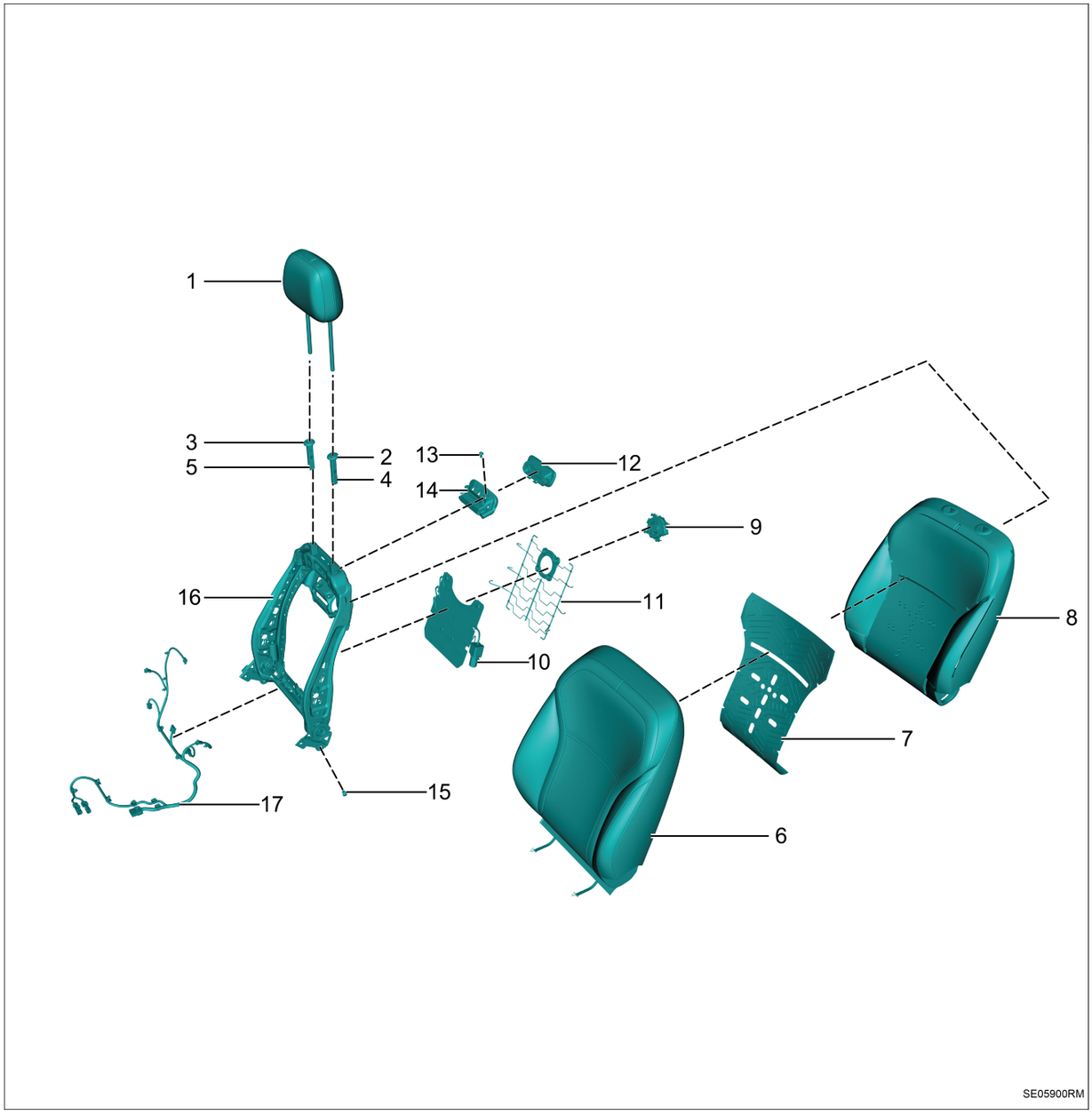
12. Screw

- X4
- Torque: 32.5 ~ 39.5 N • m

13. Driver seatback frame assembly

14. Driver seatback wire harness assembly

Components



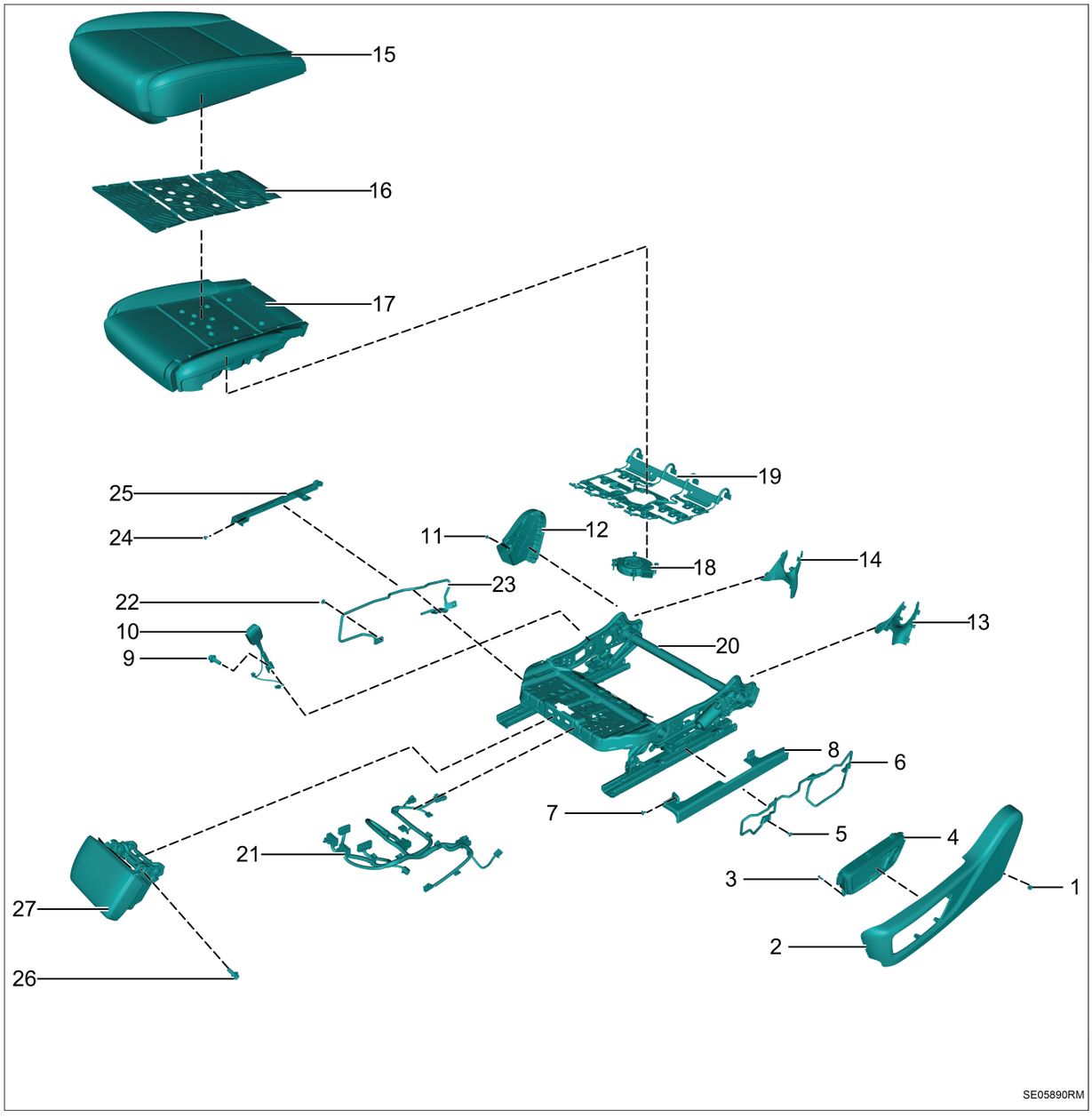
1. Front seat headrest cushion

2. Front seat headrest guide sleeve trim cover

3. Front seat headrest guide sleeve trim cover

4. **Front seat headrest guide sleeve**
5. **Front seat headrest guide sleeve**
6. **Driver seatback cover assembly**
7. **Front seatback heater cushion assembly**
8. **Driver seatback foam assembly**
9. **Front seatback fan assembly**
10. **Front seatback pneumatic system assembly**
11. **Seatback curtain assembly**
12. **Seatback interface assembly**
13. **Screw**
    - X4
    - Torque: 7.2 ~ 8.8 N • m
14. **Seatback interface base assembly**
15. **Screw**
    - X4
    - Torque: 32.5 ~ 39.5 N • m
16. **Driver seatback frame assembly**
17. **Driver seatback wire harness assembly**

Components



1. **Screw**
2. **Driver seat left protector**
3. **Screw**
   - X7
4. **Driver seat adjustment switch**
5. **Screw**
   - X3
6. **Driver seat cushion protector steel wire l assembly**
7. **Screw**
   - X2

8. **Driver seat left track cover**
9. **Bolt**
   - Torque: 39.2 ~ 54 N • m
10. **Driver seat belt buckle assembly**
11. **Screw**
12. **Driver seat right protector**
13. **Driver seat left protector inner shield**
14. **Driver seat right protector inner shield**
15. **Driver seat cushion cover assembly**
16. **Front seat cushion heater cushion assembly**
17. **Driver seat cushion foam assembly**
18. **Front seat cushion fan assembly**
19. **Seat steel wire curtain assembly**
20. **Driver seat cushion frame assembly**
21. **Front seat cushion wire harness assembly**
22. **Screw**
    - X3
23. **Front passenger seat right track cover**
24. **Screw**
    - X2
25. **Front passenger seat cushion protector steel wire I assembly**
26. **Bolt**
    - X4
    - Torque: 25 ~ 30 N • m
27. **Front seat leg rest assembly (only for models equipped with leg rest)**

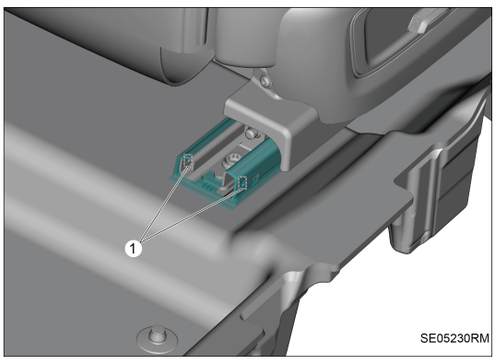
Removal

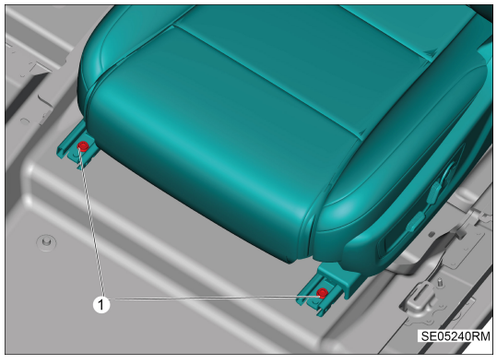
1. **Remove driver seat assembly**

   Note:

   - Use same removal orders for front passenger seat and driver seat.

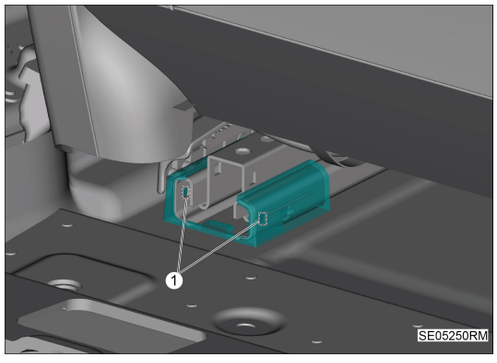
   (a) Detach claw -1- and remove driver seat front left track cover.





(b) Adjust the driver seat assembly backward to the suitable position.

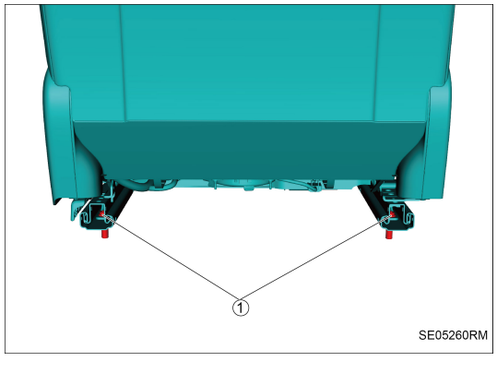
(c) Remove the screw -1-.



(d) Detach claw -1- and remove driver seat rear left track cover.

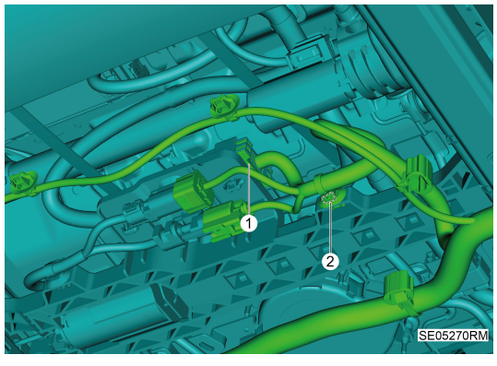
Note:

- Use same removal orders for right and left sides.



(e) Adjust the driver seat assembly forward to the suitable position.

(f) Remove the screw -1-.



(g) Disconnect negative battery terminal before disconnecting wire harness connector. (See page DL-21)

(h) Disconnect the wire harness connector -1-.

(i) Disengage the wire harness fixing clip -2-.

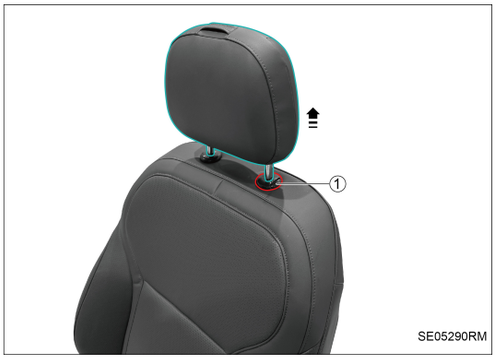
(j) Remove driver seat assembly from inside the vehicle at an appropriate angle.

Note:

- Be careful not to scratch the door trim panel and inner trim panel when removing.

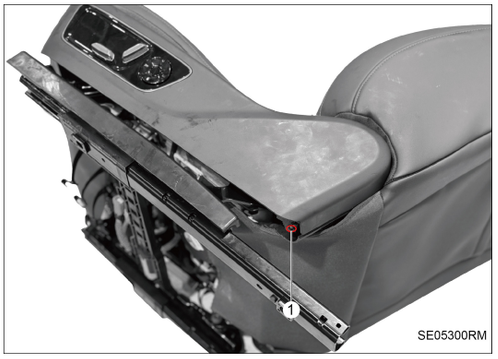
2. Remove driver seat headrest assembly

NS

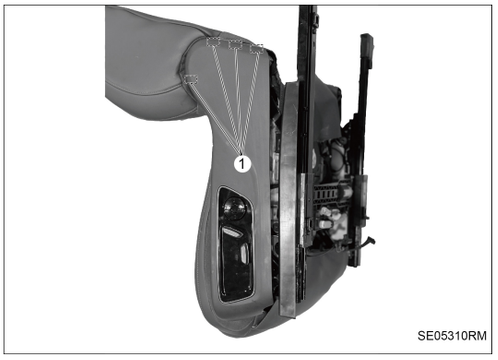


(a) Press the unlock button -1-, and lift in direction of -arrow-.

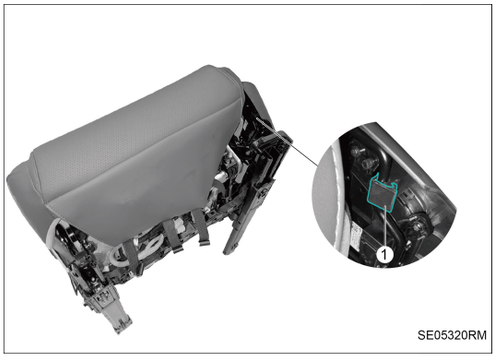
3. Remove driver seat left protector



(a) Remove the screw -1-.



(b) Detach the claw -1-.

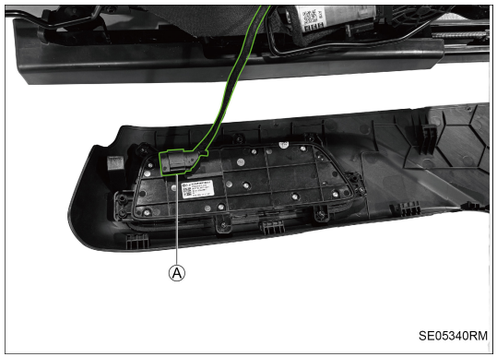


(c) Detach the claw -1-.



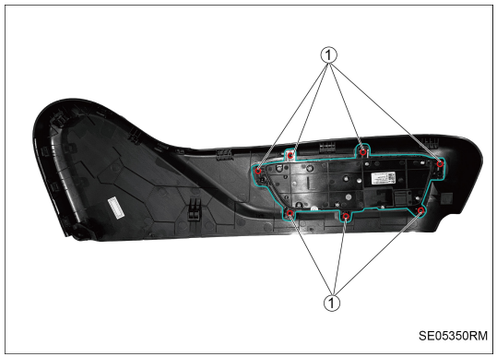
(d) Lift in direction of -arrow-.

(e) Remove the driver seat left protector -A-.



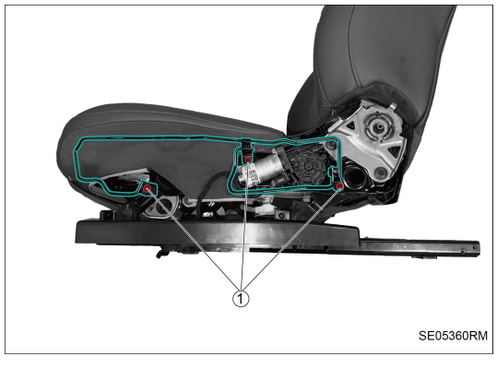
(f) Disconnect the wire harness connector -A-.

4. Remove driver seat adjustment switch



(a) Remove the screw -1-.

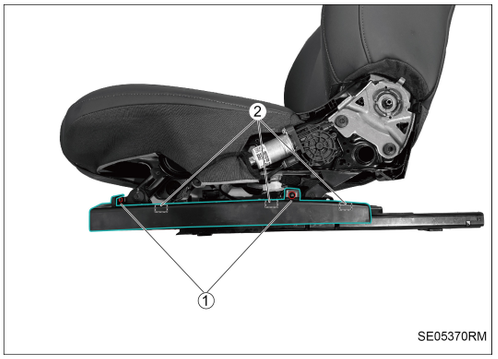
5. Remove driver seat cushion protector steel wire l assembly



(a) Remove the screw -1-.

(b) Remove the driver seat cushion protector steel wire l assembly.

6. Remove driver seat left track cover

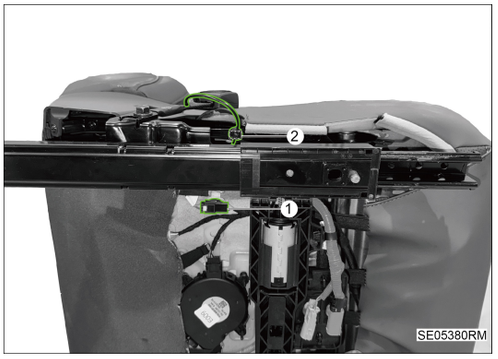


(a) Remove the screw -1-.

(b) Detach the claw -2-.

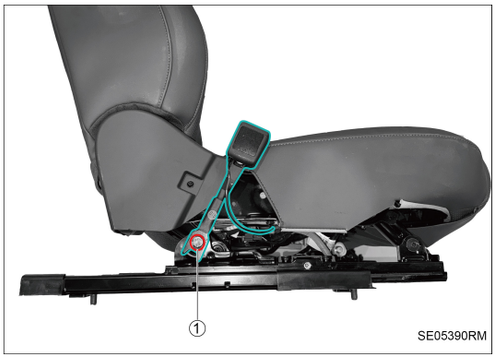
(c) Remove the driver seat left track cover.

7. Remove driver seat belt buckle assembly



(a) Disconnect the wire harness connector -1-.

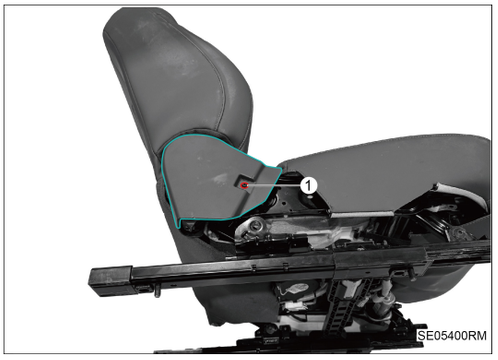
(b) Disengage the wire harness fixing clip -2-.



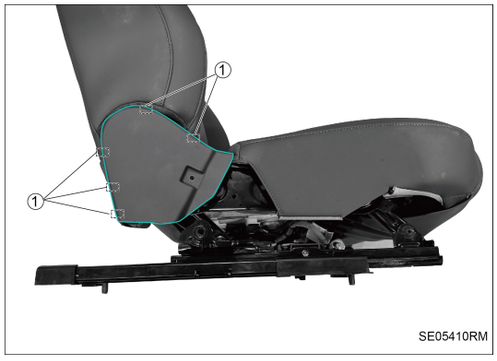
(c) Remove the bolt -1-.

(d) Remove the driver seat belt buckle assembly.

8. Remove driver seat right protector



(a) Remove the screw -1-.



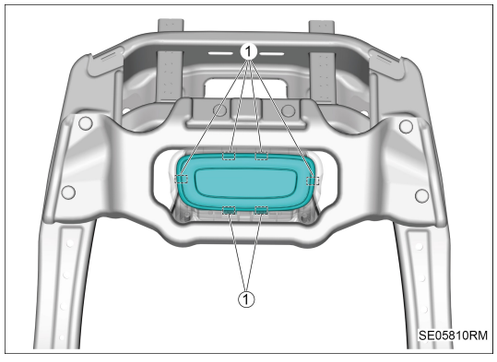
(b) Detach the claw -1-.

(c) Lift in the direction of -arrow- and remove the driver seat right protector.

9. Remove driver seat airbag assembly (See page ZC-63)

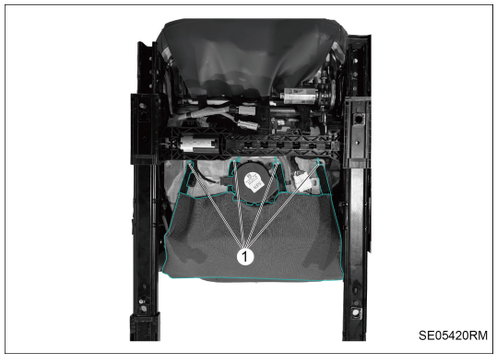
10. Remove driver seat right airbag assembly (See page ZC-63)

11. Remove seatback port assembly (only for Asia)

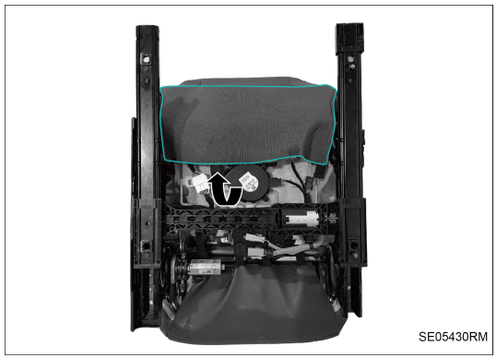


(a) Detach the claw -1-.

12. Remove driver seatback cover assembly

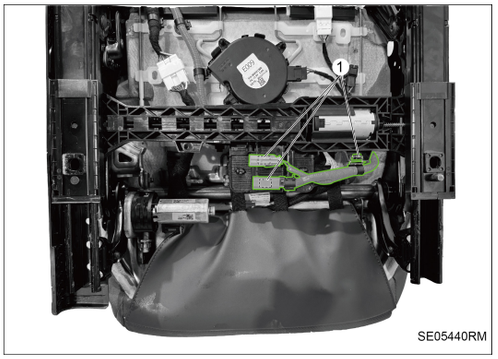


(a) Detach the hook -1-.

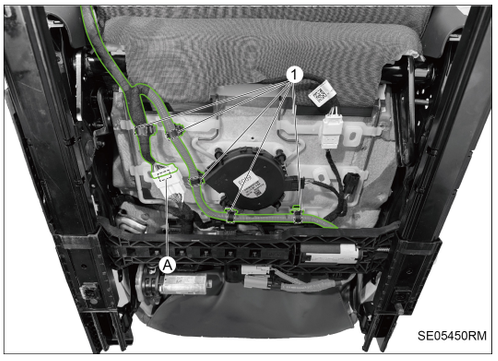


(b) Lift seat cushion cover in direction of -arrow-.

NS

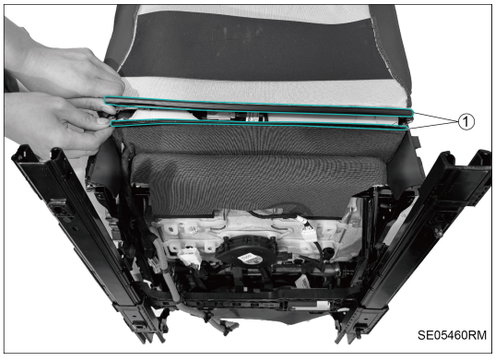


(c) Disengage the wire harness fixing clip -1-.

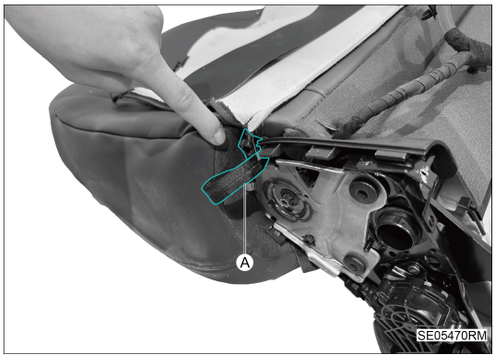


(d) Disengage the wire harness fixing clip -1-.

(e) Disconnect the wire harness connector -A-.



(f) Pry off and detach the seatback cover clamping strip -1-.



(g) Pull out seatback cover zipper -A-.



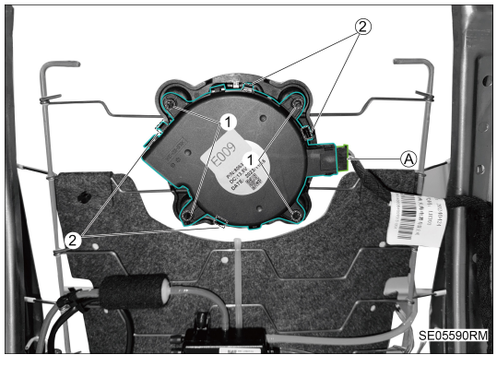
(h) Open zipper -A- of seatback cover.



(i) Detach the seatback cover left clip -1-.



(j) Detach the seatback cover right clip -1-.

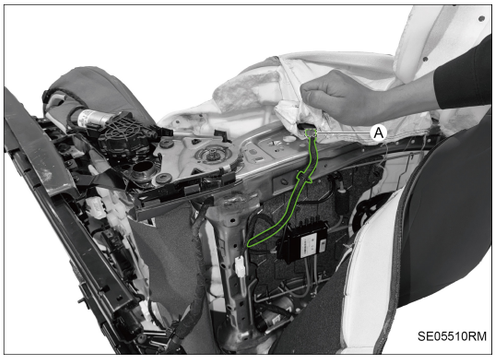


(k) Disconnect the wire harness connector -A-.

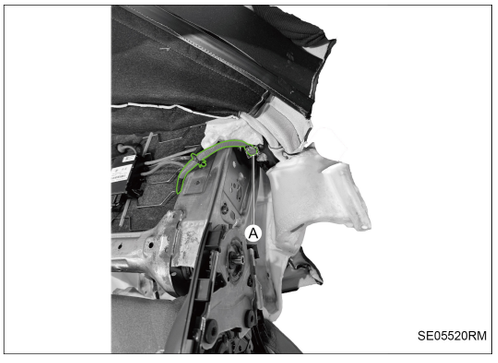
(l) Detach the weatherstrip mounting point -1-.

(m) Detach the rubber fixing pin -2-.

(n) Lift up and remove front seatback fan assembly.



(o) Disconnect the left seat airbag wire harness connector -A-. (Only for Asia)



(p) Disconnect the right seat airbag wire harness connector -A-. (Only for Asia)



(q) Detach the claw -1-.

(r) Remove the front seat headrest guide sleeve trim cover.



(s) Detach the claw -1-.

(t) Remove the front seat headrest guide sleeves -A- in the direction of -arrow-.



(u) Remove the driver seatback cover and foam assembly -A- in the direction of -arrow-.



(v) Turn over the cover -A-.

(w) (For example) Detach all seatback cover fixing snap rings -1-.

13. Remove front seatback heater cushion assembly

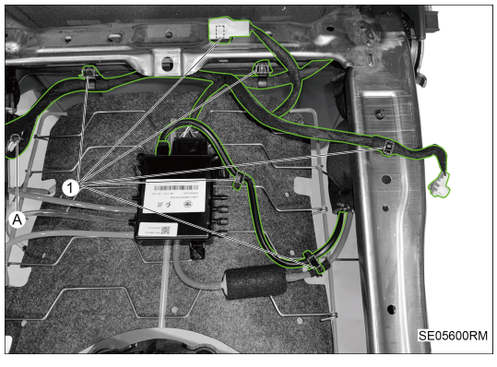


(a) Remove the front seatback heating cushion assembly -A- in the direction of -arrow-.

Notice:

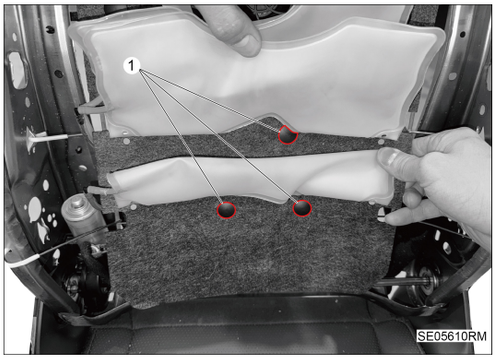
- **The seatback heating cushion is bonded by double-sided adhesive, be careful not to damage the seatback foam when removing.**

14. Remove front seatback pneumatic system assembly

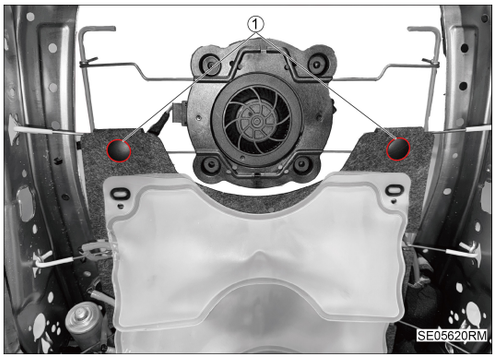


(a) Disengage the wire harness fixing clip -1-.

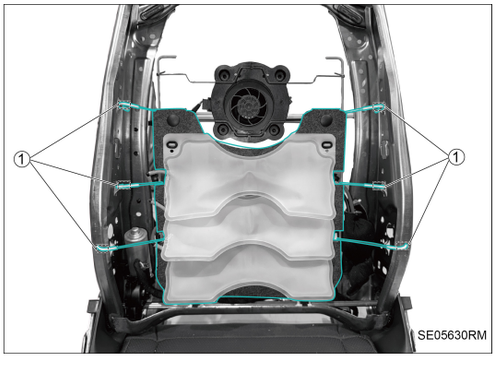
(b) Disconnect the wire harness connector -A-.



(c) Detach the massage air cushion lower clip -1-.

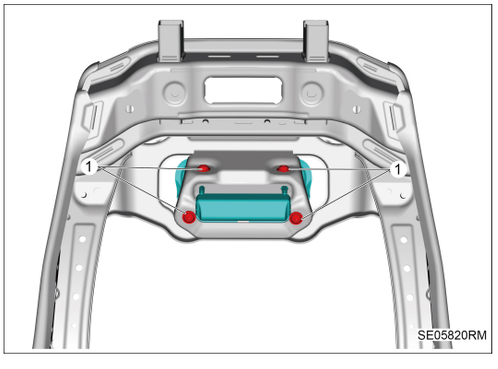


(d) Detach the massage air cushion upper clip -1-.



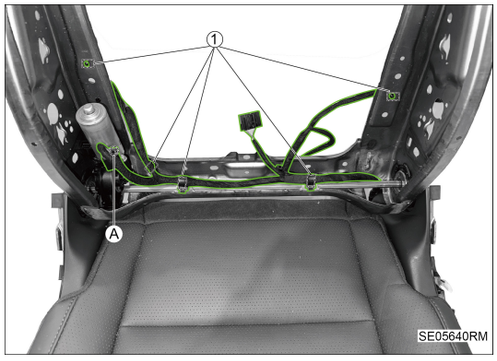
(e) Detach the hook -1-.

15. Remove seatback port base assembly (only for Asia)



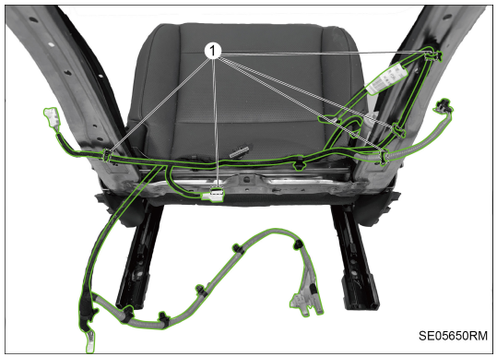
(a) Remove the screw -1-.

16. Remove driver seatback wire harness assembly



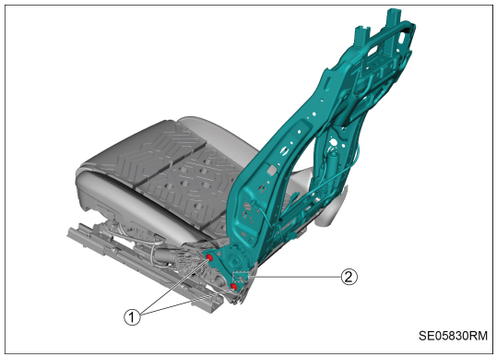
(a) Disengage the wire harness fixing clip -1-.

(b) Disconnect the wire harness connector -A-.



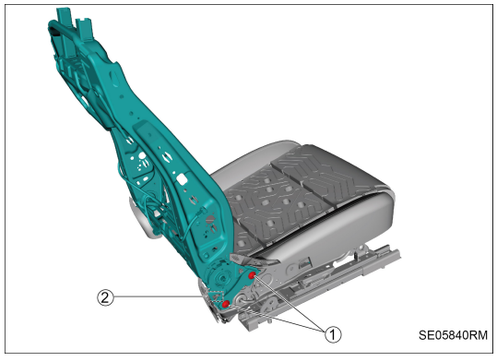
(c) Disengage the wire harness fixing clip -1-.

17. Remove driver seatback frame assembly



(a) Remove the screw -1-.

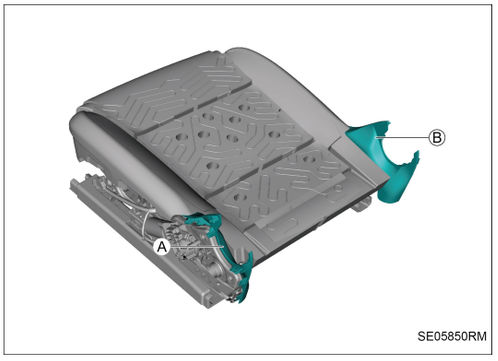
(b) Detach the claw -2-.



(c) Remove the screw -1-.

(d) Detach the claw -2-.

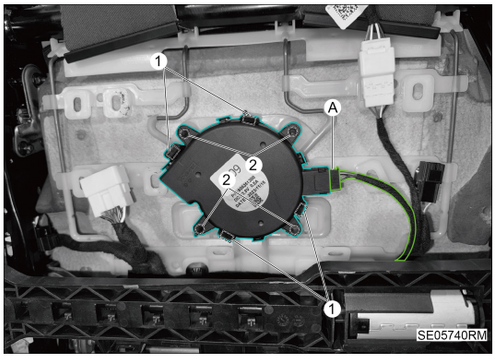
18. Remove driver seat protector inner panel



(a) Remove the driver seat left protector inner panel -A-.

(b) Remove the driver seat right protector inner panel -B-.

19. Remove front seat cushion fan assembly



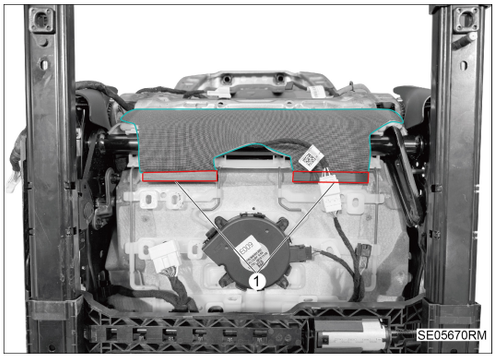
(a) Disconnect the wire harness connector -A-.

(b) Detach the weatherstrip mounting point -1-.

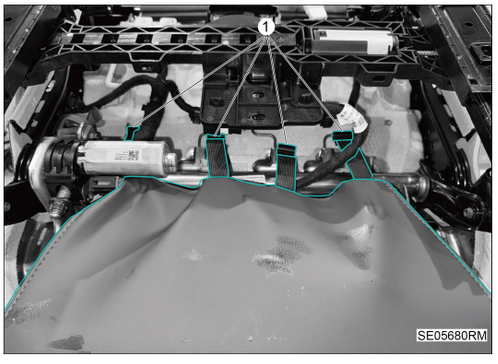
(c) Detach the rubber fixing pin -2-.

(d) Lift up and remove front seat cushion fan assembly.

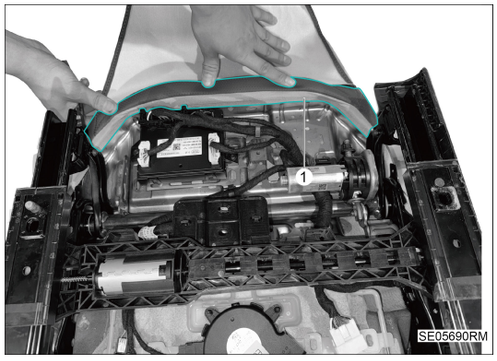
20. Remove driver seat cushion cover assembly



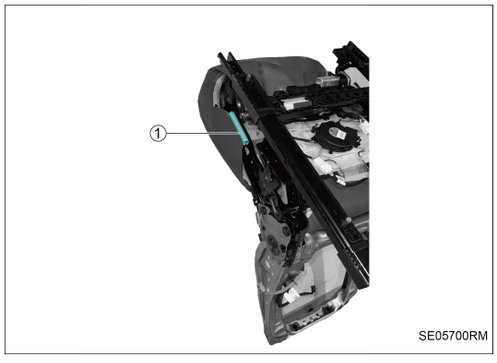
(a) Pry off and detach the driver seat cushion cover clamping strip -1-.



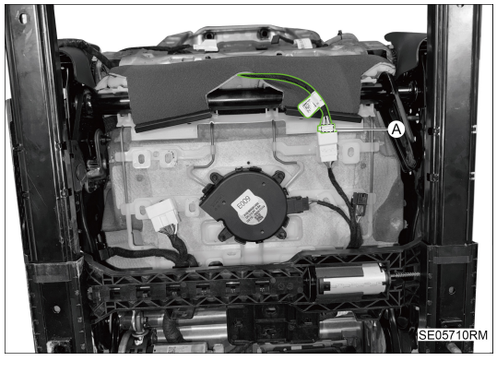
(b) Detach the hook -1-.



(c) Pry off and detach the driver seat cushion cover clamping strip -1-.



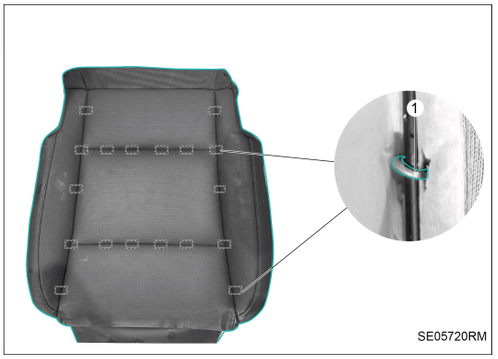
(d) Pry off and detach the driver seat cushion cover clamping strip -1-.



(e) Disconnect the wire harness connector -A-.



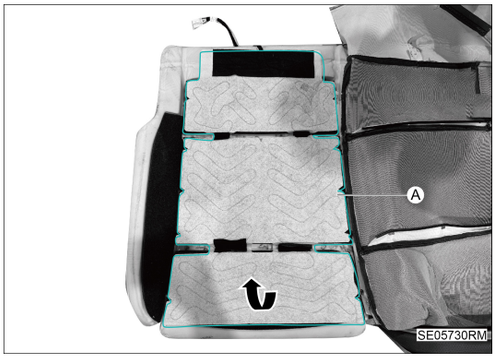
(f) Remove the driver seat cushion cover and foam assembly in the direction of -arrow-.



(g) Turn over the cover -A-.

(h) (For example) Detach all seatback cover fixing snap rings -1-.

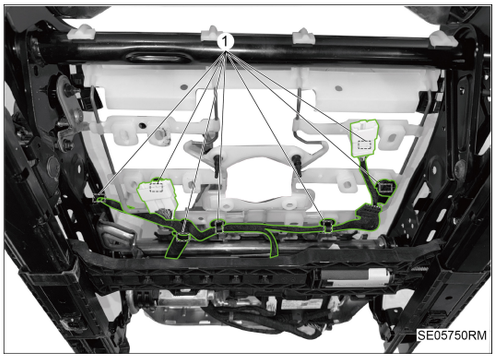
21. Remove seat cushion heating cushion assembly



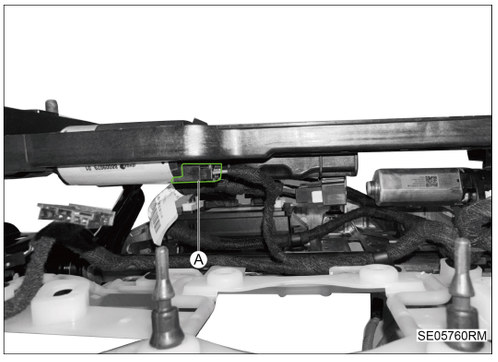
(a) Remove the seat cushion heating cushion assembly -A- in the direction of -arrow-.

22. Remove driver seat intelligent terminal assembly (See page NS-90)

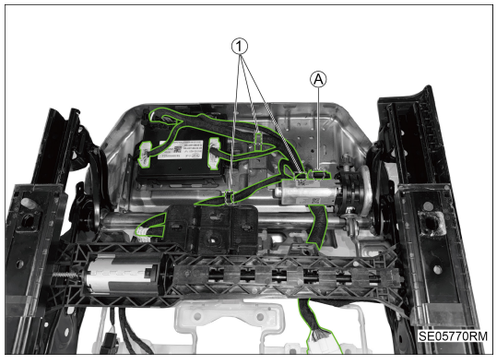
23. Remove front left seat cushion wire harness assembly



(a) Disengage the wire harness fixing clip -1-.

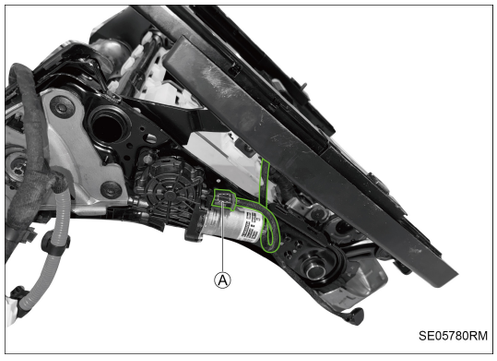


(b) Disconnect the wire harness connector -A-.



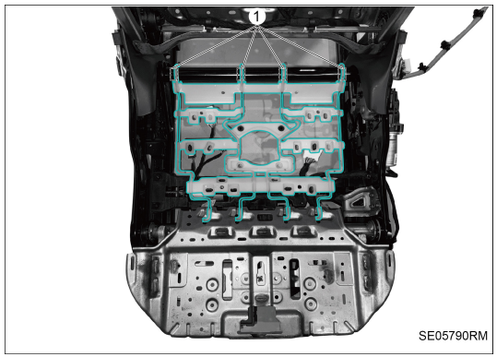
(c) Disengage the wire harness fixing clip -1-.

(d) Disconnect the wire harness connector -A-.

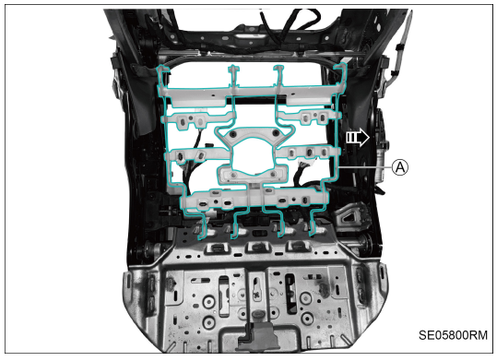


(e) Disconnect the wire harness connector -A-.

24. Remove seat cushion steel wire curtain assembly



(a) Detach the hook -1-.



(b) Lift the seat cushion steel wire curtain assembly -A- and remove it in the direction of -arrow-.

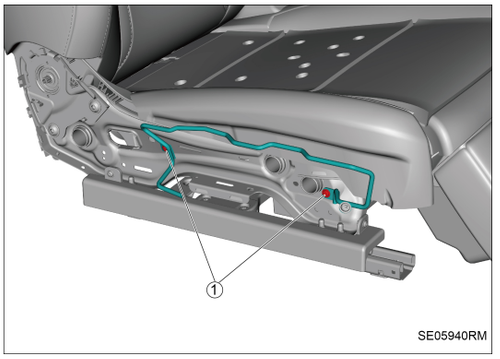
25. Remove front passenger seat

Note:

- Use same removal orders for front passenger seat and driver seat.

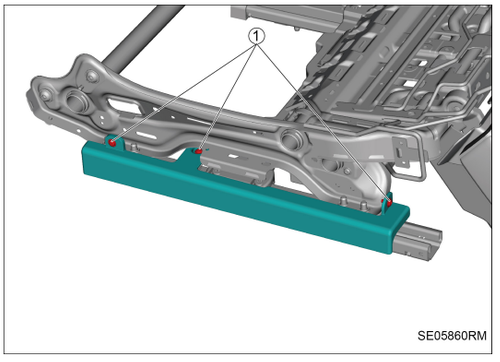
NS

26. Driver seat cushion protector steel wire I assembly (only for front passenger seat)



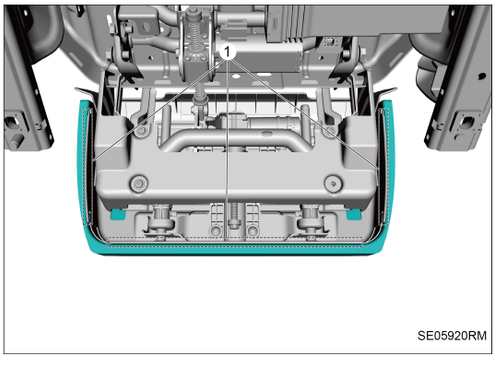
(a) Remove the screw -1-.

27. Remove front passenger seat right track cover (only for front passenger seat)



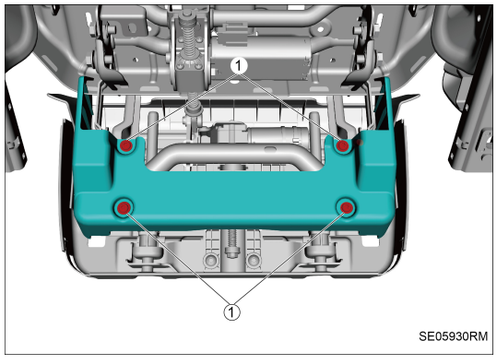
(a) Remove the screw -1-.

28. Remove front seat leg rest cover assembly (only for models equipped with leg rest)



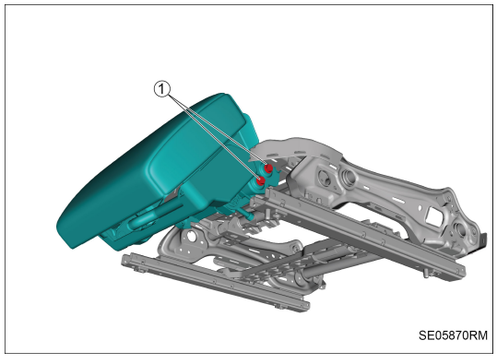
(a) Pry off and detach the front seat leg rest cover clamping strip -1-.

29. Remove leg rest rear cover plate assembly (only for models equipped with leg rest)

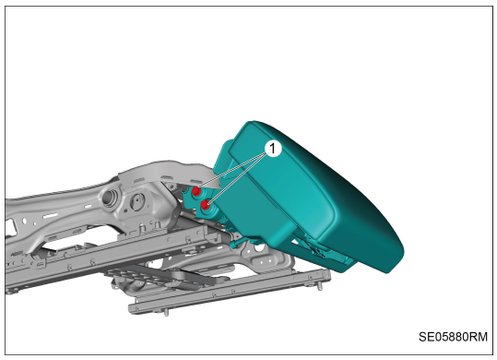


(a) Remove the screw -1-.

30. Remove front seat leg rest assembly (only for models equipped with leg rest)



(a) Remove the bolt -1-.



(b) Remove the bolt -1-.

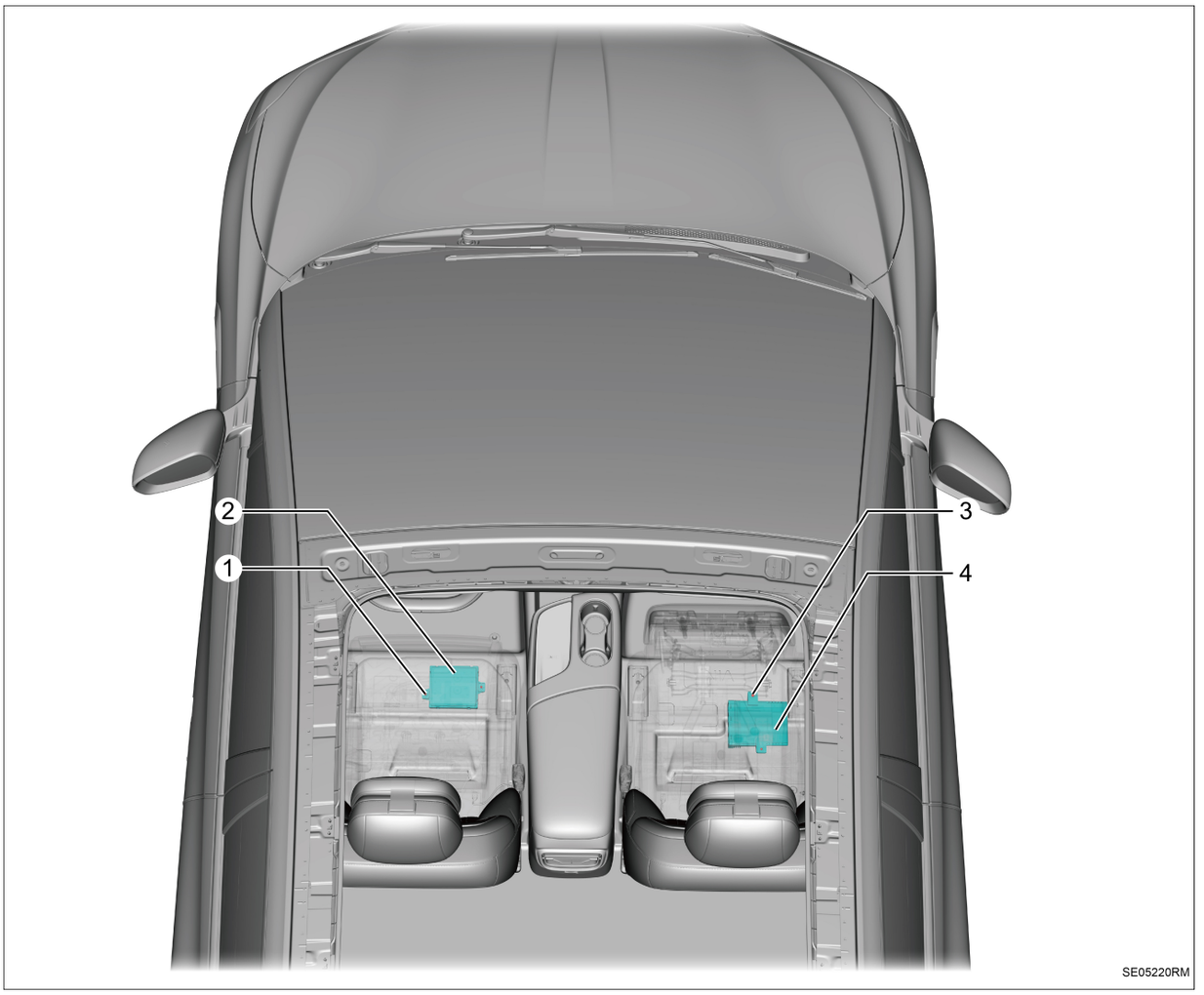
Installation

1. Installation is in the reverse order of removal.

NS

Seat intelligent terminal assembly

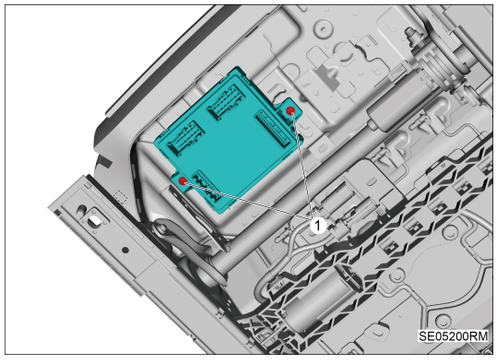
Components



1. **Screw**
   - X2
2. **Driver seat intelligent terminal assembly**
3. **Screw**
   - X2
4. **Front right seat intelligent terminal assembly**

Removal

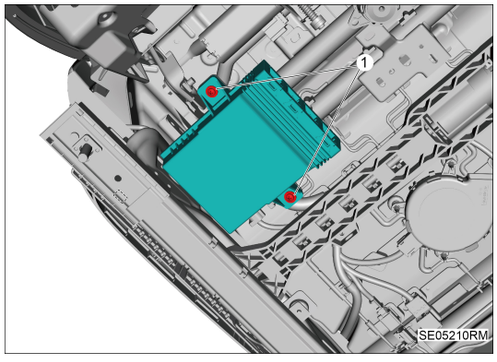
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front seat assembly (See page NS-67)**
3. **Remove driver seat intelligent terminal assembly**



(a) Remove the screw -1-.

(b) Disconnect the wire harness connector.

4. Remove front passenger seat intelligent terminal assembly



(a) Remove the screw -1-.

(b) Disconnect the wire harness connector.

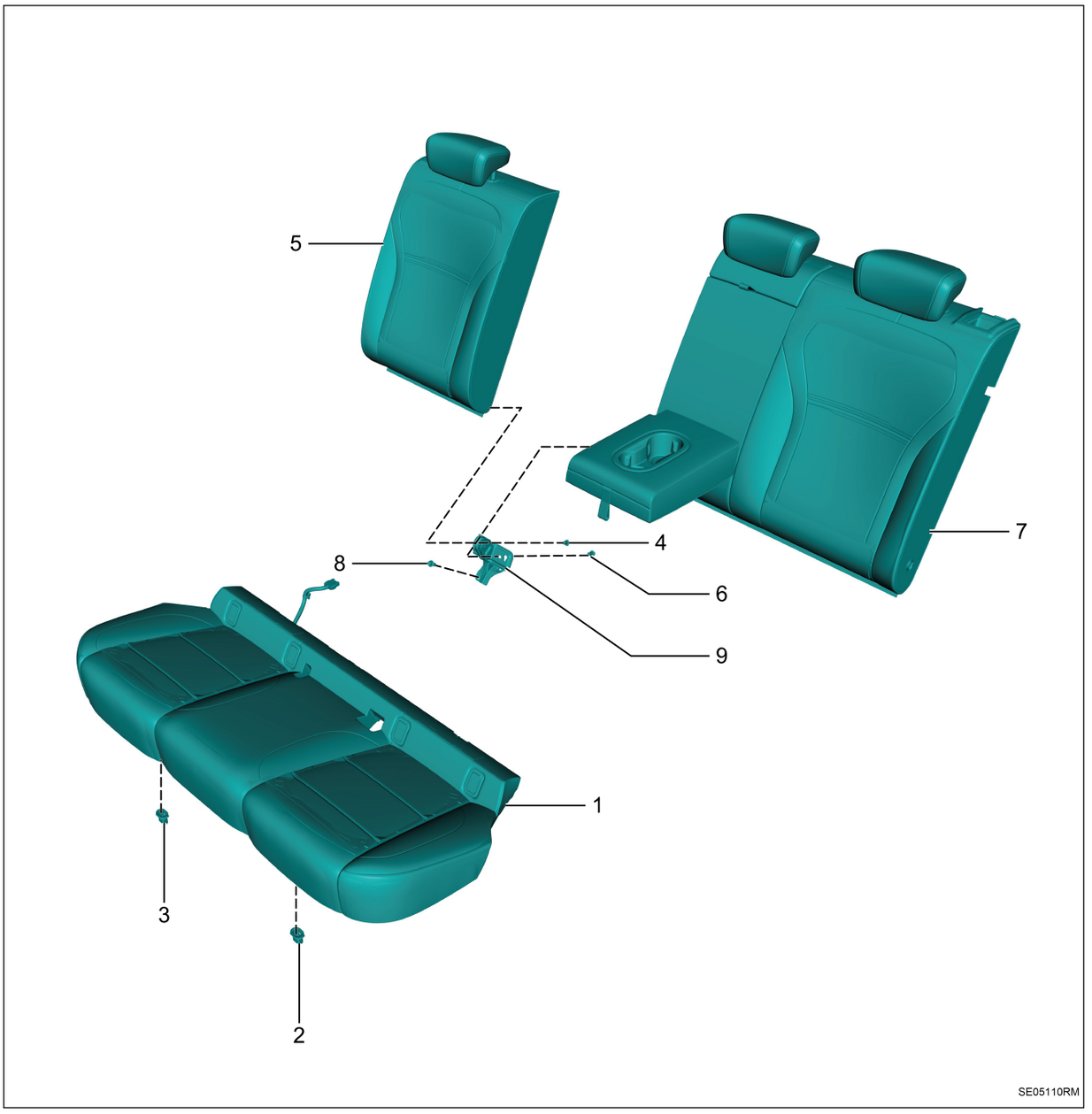
Installation

1. Installation is in the reverse order of removal.

Rear seat

Components

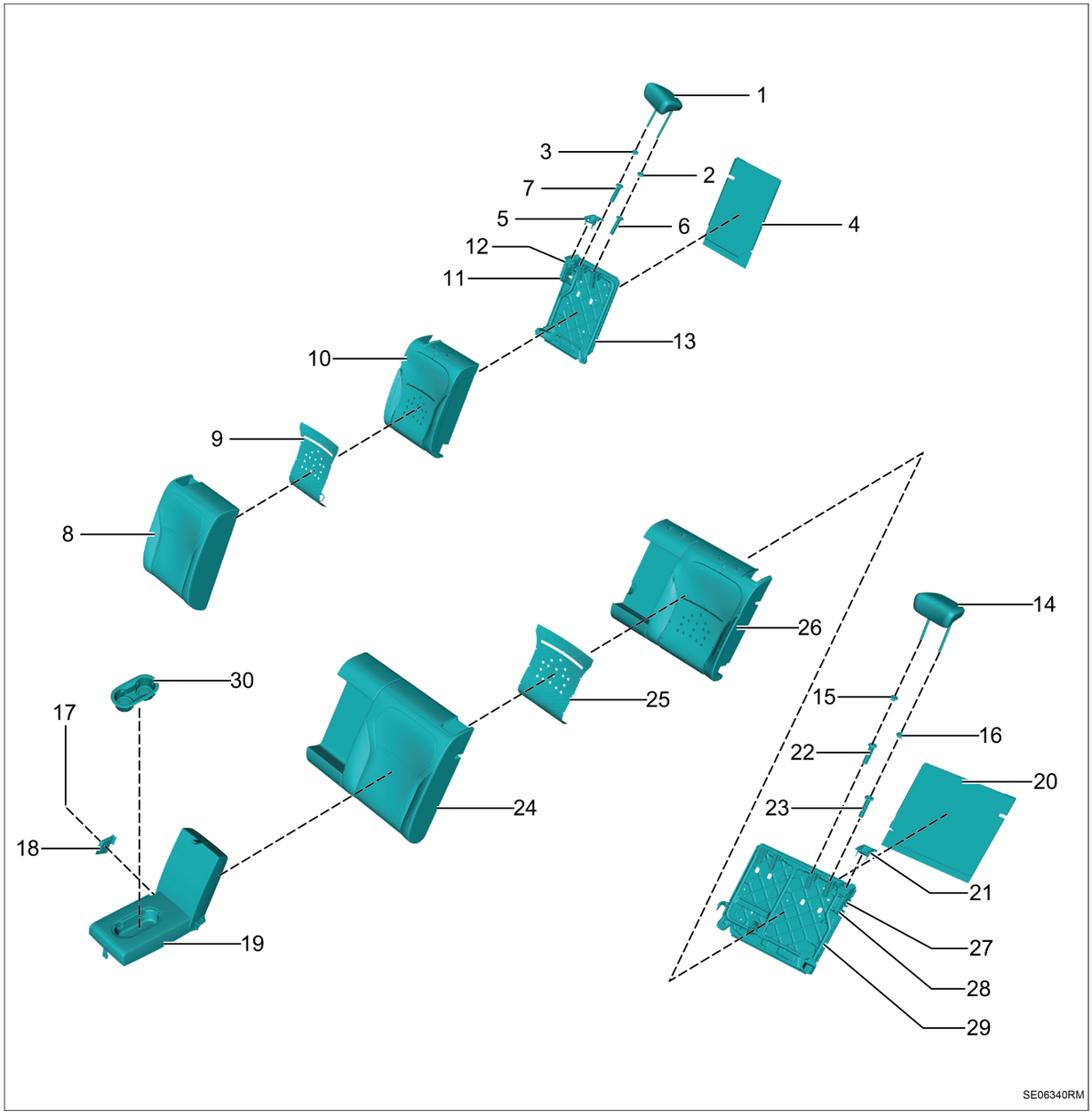
NS



1. **Rear left seat cushion assembly**
2. **Rear seat cushion striker -A-**
3. **Rear seat cushion striker -B-**
4. **Hexagon flange bolt**
   - Torque: 39 ~ 51 N • m
5. **Rear right seatback assembly**
6. **Hexagon flange bolt**
   - Torque: 39 ~ 51 N • m

7. **Rear left seatback assembly**
8. **Hexagon flange bolt**
   - X3
   - Torque: 39 ~ 51 N • m
9. **Rear seatback bracket**

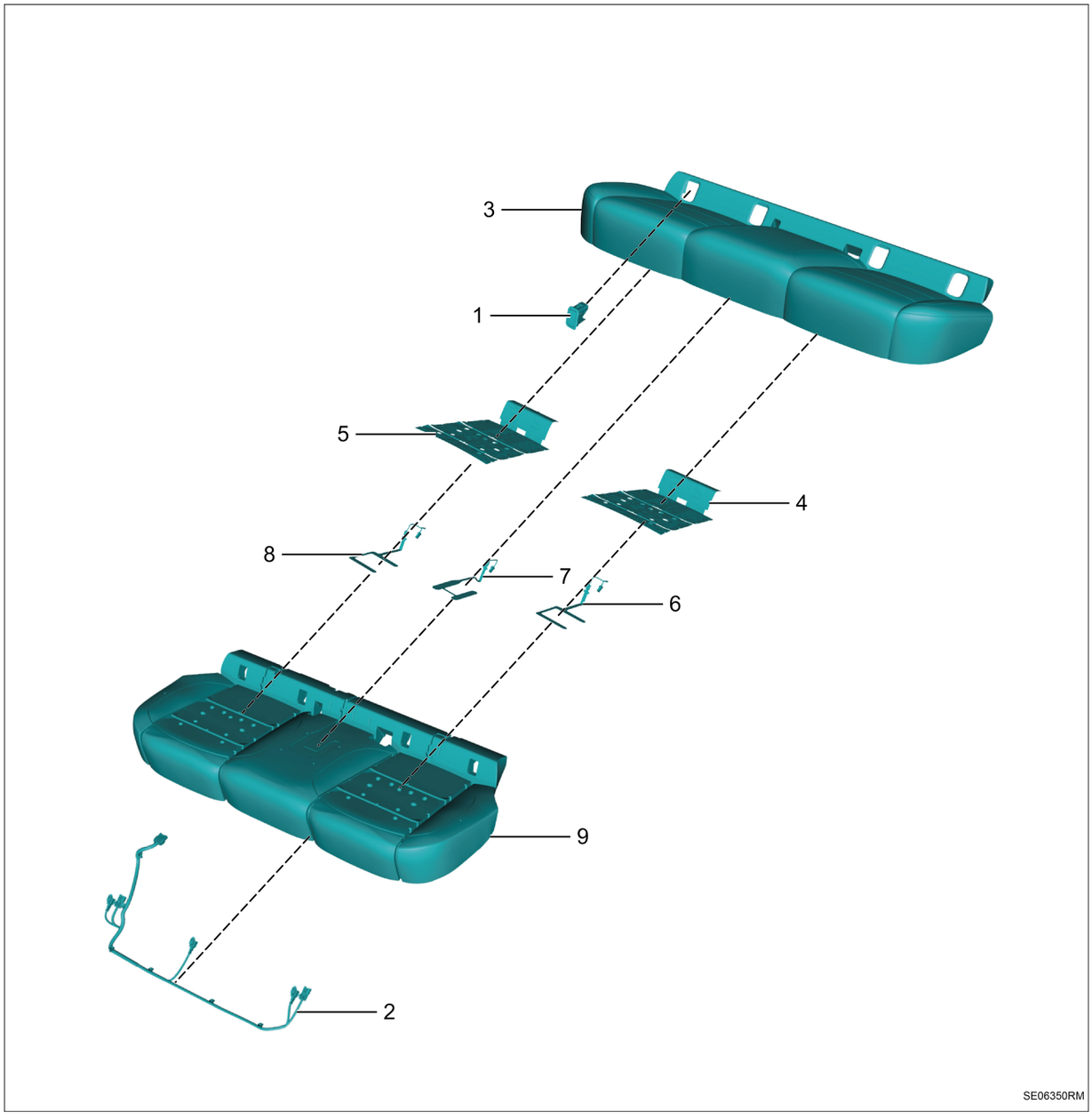
Components



1. **Rear right seat headrest assembly**
2. **Rear seat headrest guide sleeve assembly - with button trim cover**
3. **Rear seat headrest guide sleeve assembly - without button trim cover**
4. **Rear right seatback plate felt assembly**

5. **Unlock handle trim cover**
6. **Rear seat headrest guide sleeve assembly - with button**
7. **Rear seat headrest guide sleeve assembly - without button**
8. **Rear right seatback cover assembly**
9. **Rear right seatback heater cushion assembly**
10. **Rear right seat foam assembly**
11. **Socket cap bolt**
    - X2
    - Torque: 22 ~ 30 N • m
12. **Rear right seatback lock**
13. **Rear right seatback frame assembly**
14. **Rear left seat headrest assembly**
    - X2
15. **Rear seat headrest guide sleeve assembly - without button trim cover**
    - X2
16. **Rear seat headrest guide sleeve assembly - with button trim cover**
    - X2
17. **Armrest box fixing screw**
    - Torque: 2.3 ~ 2.7 N • m
18. **Armrest pivot cover**
19. **Armrest box assembly**
20. **Rear left seatback plate felt assembly**
21. **Unlock handle trim cover**
22. **Rear seat headrest guide sleeve assembly - without button**
    - X2
23. **Rear seat headrest guide sleeve assembly - with button**
    - X2
24. **Rear left seatback cover assembly**
25. **Rear left seatback heater cushion assembly**
26. **Rear left seatback foam assembly**
27. **Socket cap bolt**
    - X2
    - Torque: 22 ~ 30 N • m
28. **Rear left seatback lock**
29. **Rear left seatback frame assembly**
30. **Rear armrest cup holder assembly**

Components

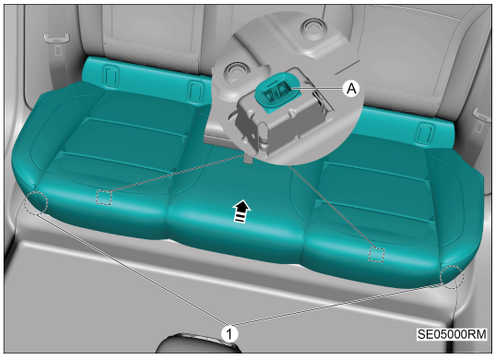


1. **Child seat lower fixing point cover assembly**
2. **Rear left seat cushion wire harness assembly**
3. **Rear seat cushion cover assembly**
4. **Rear seat cushion heater cushion assembly**
5. **Rear seat cushion heater cushion assembly**
6. **Seat occupancy sensor assembly**
7. **Seat occupancy sensor assembly**
8. **Seat occupancy sensor assembly**
9. **Rear seat cushion foam assembly**

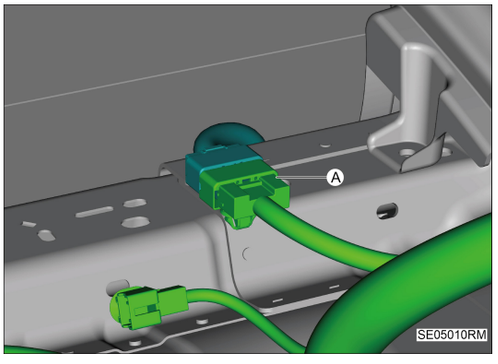
NS

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment front carpet (See page NS-160)**
3. **Remove rear seat cushion assembly**



(a) Hold the -1- position and forcefully lift in the direction of arrow to detach it from the internal connecting clip -A-.

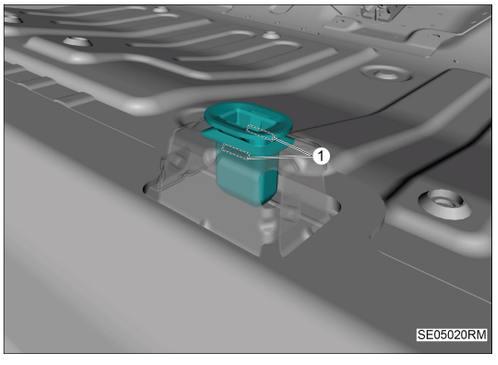


(b) Disconnect the rear seat cushion wire harness connector -A-.

4. **Remove rear seat cushion buckle**

Note:

- Use same removal orders for right and left sides.

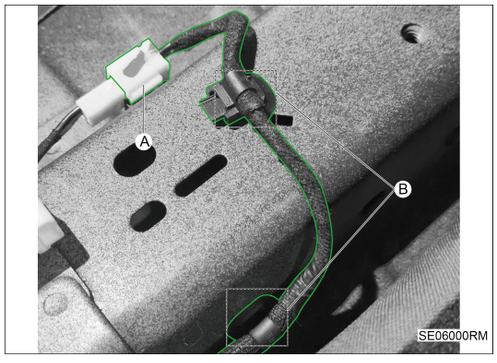


(a) Detach the clip -1-.

5. **Remove rear right seatback assembly**

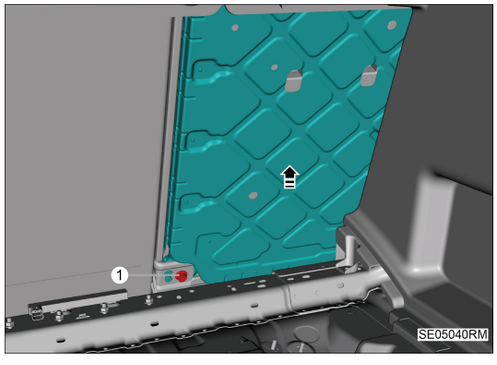


(a) Pull the unlock handle -1- to lay down the seat.



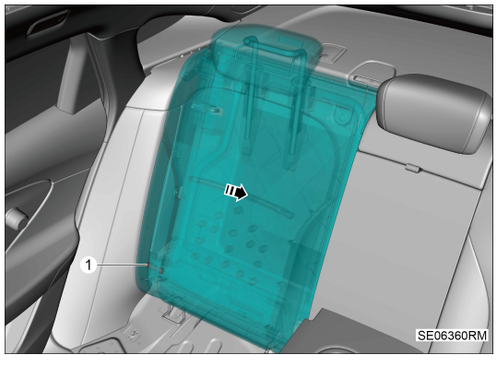
(b) Detach the rear right seatback wire harness connector -A-.

(c) Disengage the wire harness fixing clip -B-.



(d) Remove the bolt -1-.

(e) Lift the rear right seat in direction of -arrow-.



(f) Pull the rear right seatback in the direction of -arrow-.

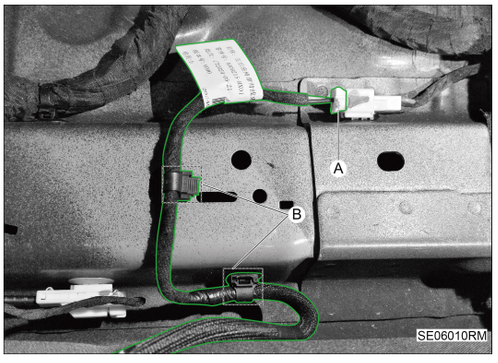
(g) Detach the seatback pivot -1-.

6. Remove rear left seatback assembly

NS

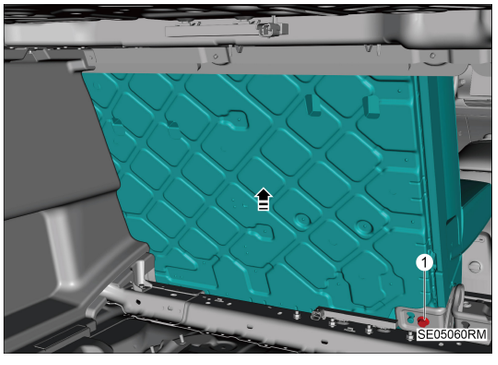


(a) Pull the unlock handle -1- to lay down the seat.



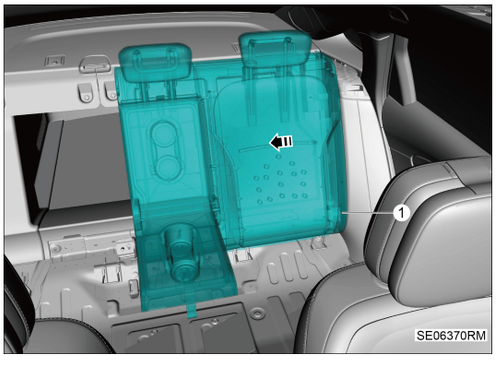
(b) Disconnect the rear left seatback wire harness connector -A-.

(c) Disengage the wire harness fixing clip -B-.



(d) Remove the bolt -1-.

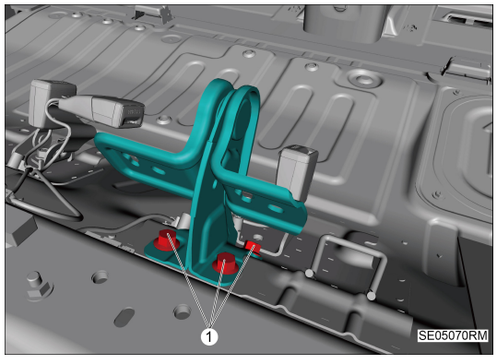
(e) Lift the rear left seat in direction of -arrow-.



(f) Pull the rear left seatback in the direction of -arrow-.

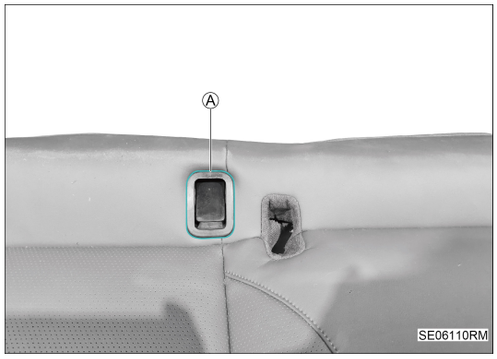
(g) Detach the seatback pivot -1-.

7. Remove rear seatback bracket

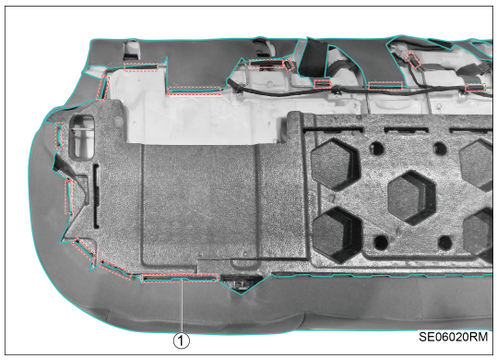


(a) Remove the bolt -1-.

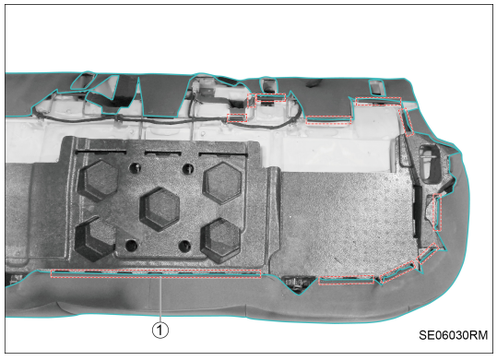
8. Remove rear seat cushion cover and foam assembly



(a) Remove the child seat lower fixing point cover -A-.

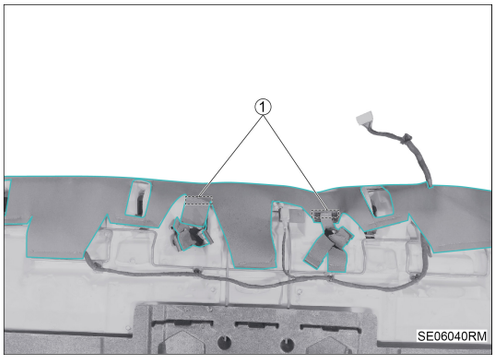


(b) (For example) Detach all clamping strips -1-.

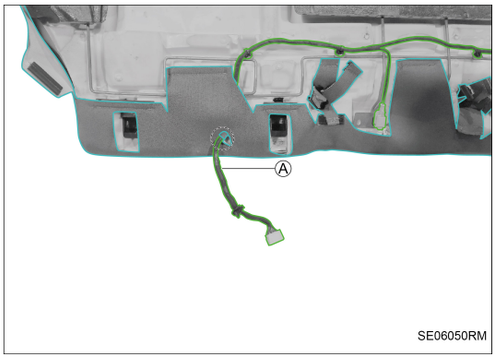


(c) (For example) Detach all clamping strips -1-.

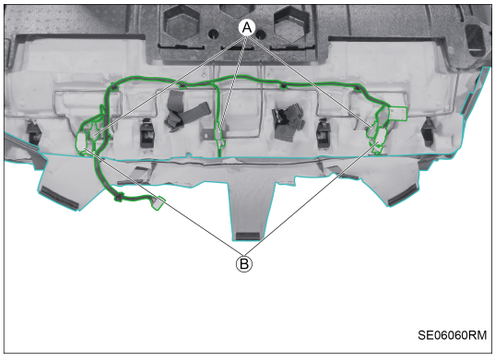
NS



(d) Detach the fixing hook and loop fastener -1-.

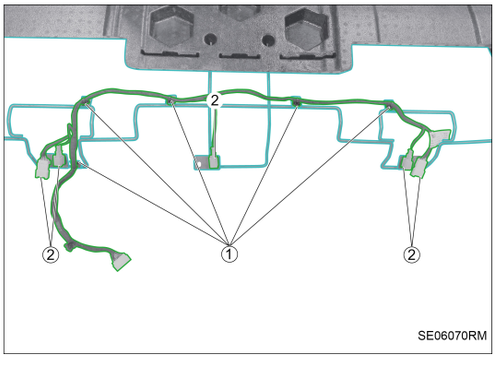


(e) Detach the wire harness -A- from notch of seat cover.



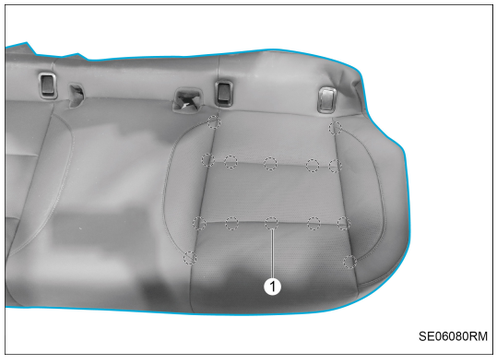
(f) Disconnect the wire harness connector -A-.

(g) Disconnect the wire harness connector -B-.



(h) Disengage the wire harness fixing clip -1-.

(i) Disengage the wire harness fixing clip -2-.

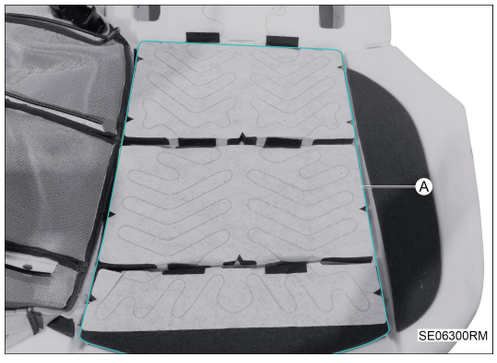


(j) (For example) Remove all C-ring clamps -1-.

Note:

- The position of right C-ring clamp is the same as that of the left side.

(k) Detach the rear seat cushion foam assembly.



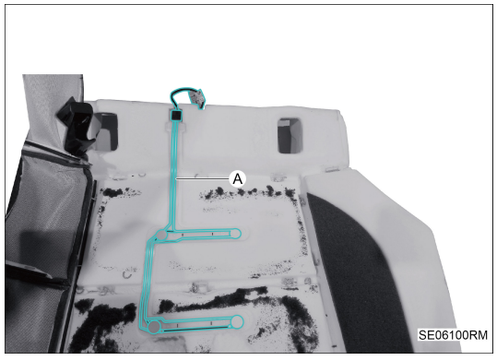
(l) Peel off the seat cushion heating and sponge cushion -A-.

Note:

- Use same seat cushion heater and cushion pad for right and left sides.

Notice:

- **The cushion heater is bonded by double-sided adhesive, be careful not to damage the rear seat cushion foam when removing.**

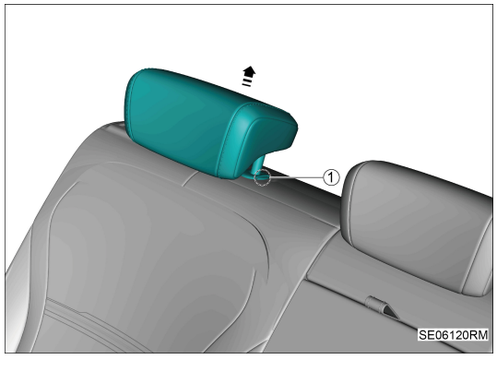


(m) Remove the seat occupancy sensor -A-.

Note:

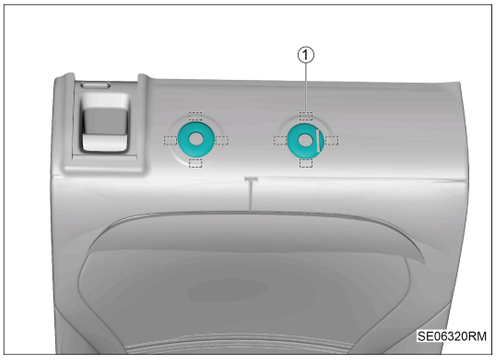
- Use same seat occupancy sensor for right and left sides.

9. Remove rear right seatback headrest assembly



(a) Press the position indicated by -1-, and remove the rear seat headrest assembly in the direction of -arrow-.

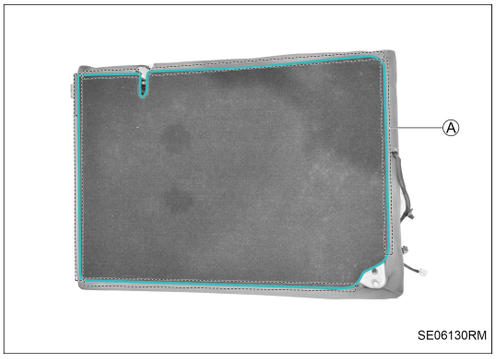
10. Remove seat headrest guide sleeve trim cover



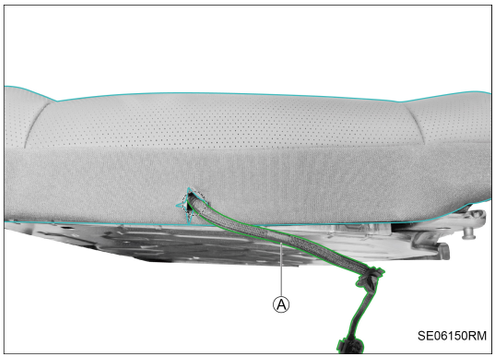
(a) (For example) Detach all clips -1-.

(b) Remove the seat headrest guide sleeve trim cover.

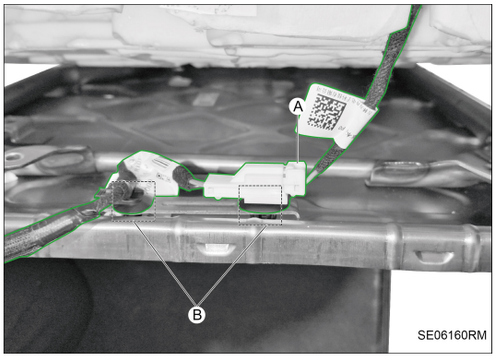
11. Remove rear right seatback cover and foam



(a) Detach the seatback felt frame closing strip -A-.

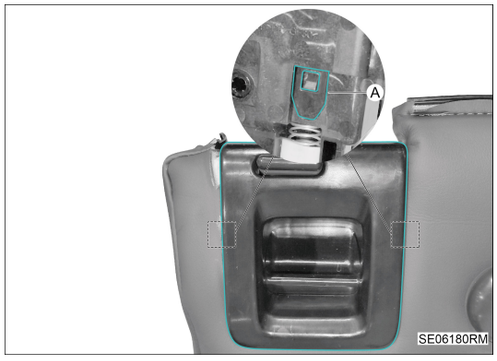


(b) Detach the wire harness -A- from seat cover.



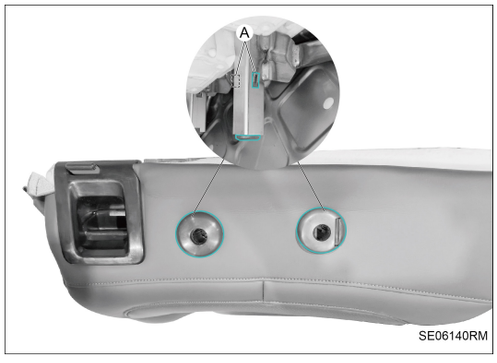
(c) Detach the wire harness connector -A-.

(d) Disengage the wire harness fixing clip -B-.



(e) Detach the claw -A-.

(f) Remove the handle trim cover.



(g) Detach the claw -A-.

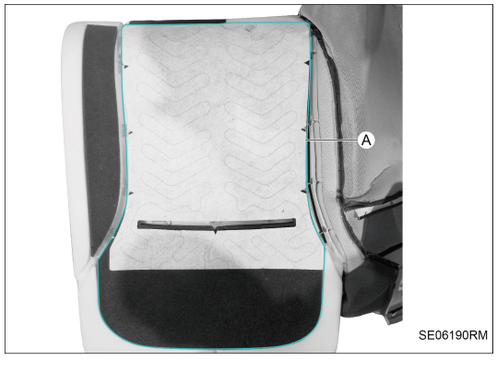
(h) Remove the seat headrest guide sleeve.

(i) Remove the rear right seatback cover and foam.



(j) (For example) Remove all C-ring clamps -1-.

(k) Detach the rear seatback foam assembly.

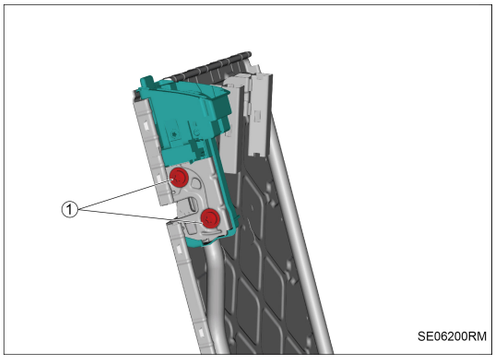


(l) Peel off the seat heating and sponge cushion -A-.

Notice:

- **The seatback heating cushion is bonded by double-sided adhesive, be careful not to damage the seatback foam when removing.**

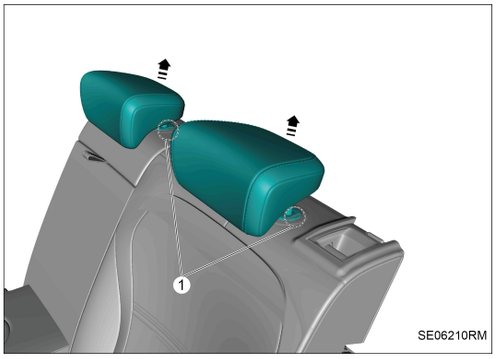
NS



(m) Remove the screw -1-.

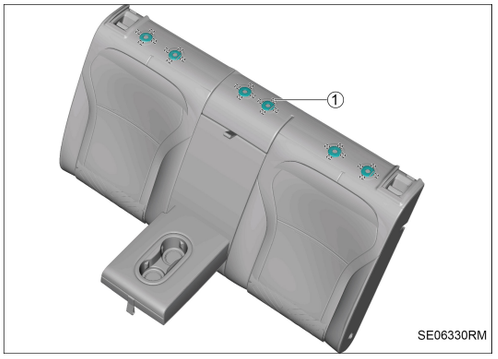
(n) Remove the rear seatback lock.

12. Remove rear left seatback headrest assembly



(a) Press the position indicated by -1-, and remove the rear seat headrest assembly in the direction of -arrow-.

13. Remove seat headrest guide sleeve trim cover



(a) (For example) Detach all clips -1-.

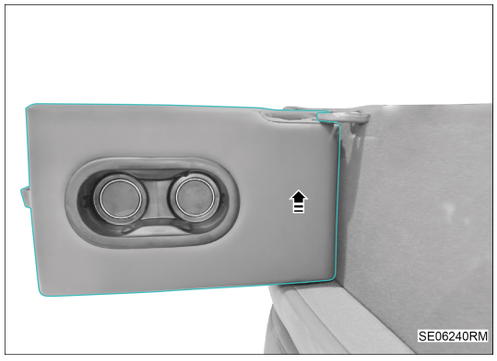
(b) Remove the seat headrest guide sleeve trim cover.

14. Remove the rear seat armrest assembly.

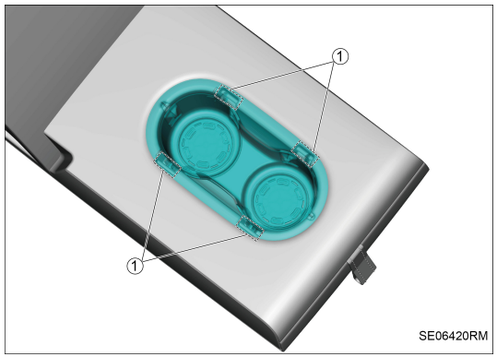


(a) Remove the screw -1-.

(b) Remove the armrest pivot cover -A-.



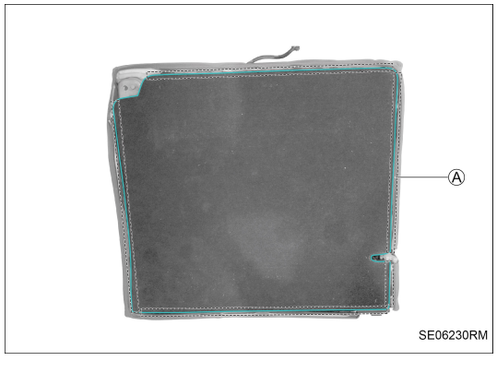
(c) Remove the armrest box assembly in the direction of -arrow-.



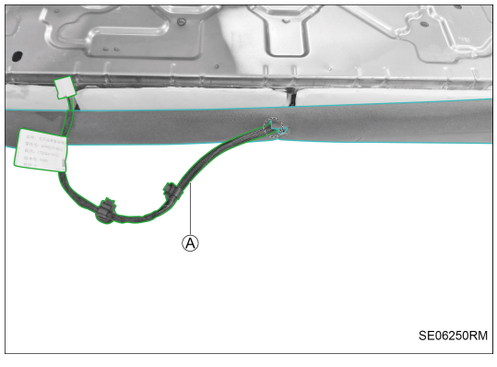
(d) Detach the clip -1-.

(e) Remove the rear armrest cup holder assembly.

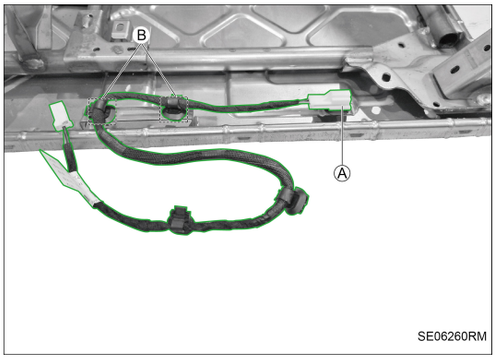
15. Remove rear left seatback cover and foam



(a) Detach the seatback felt frame closing strip -A-.



(b) Detach the wire harness -A- from seat cover.



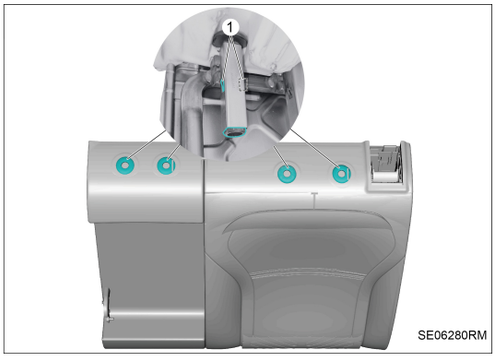
(c) Disengage the wire harness fixing clip -A-.

(d) Disengage the wire harness fixing clip -B-.



(e) Detach the claw -1-.

(f) Remove the handle trim cover.



(g) Detach the clip -1-.

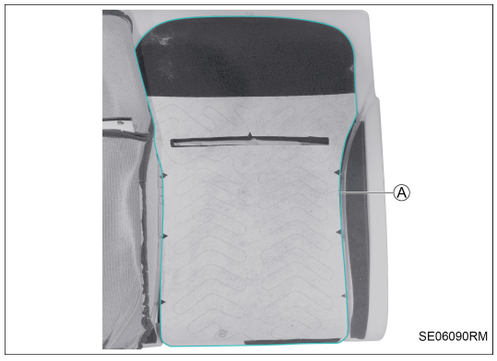
(h) Remove the seat headrest guide sleeve.

(i) Remove the rear left seatback cover and foam.



(j) Use diagonal pliers to cut the C-type clamping screw fixing point -1- at the rear end of seat cushion.

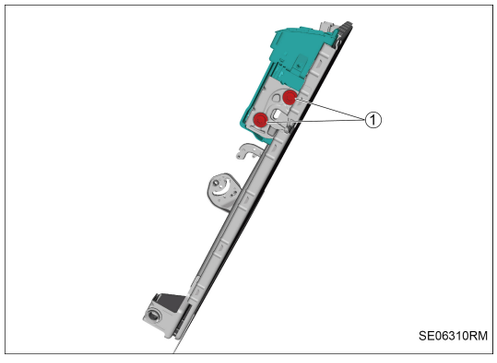
(k) Detach the rear seatback foam assembly.



(l) Peel off the seat heating and sponge cushion -A-.

Notice:

- **The seatback heating cushion is bonded by double-sided adhesive, be careful not to damage the seatback foam when removing.**



(m) Remove the screw -1-.

(n) Remove the rear seatback lock.

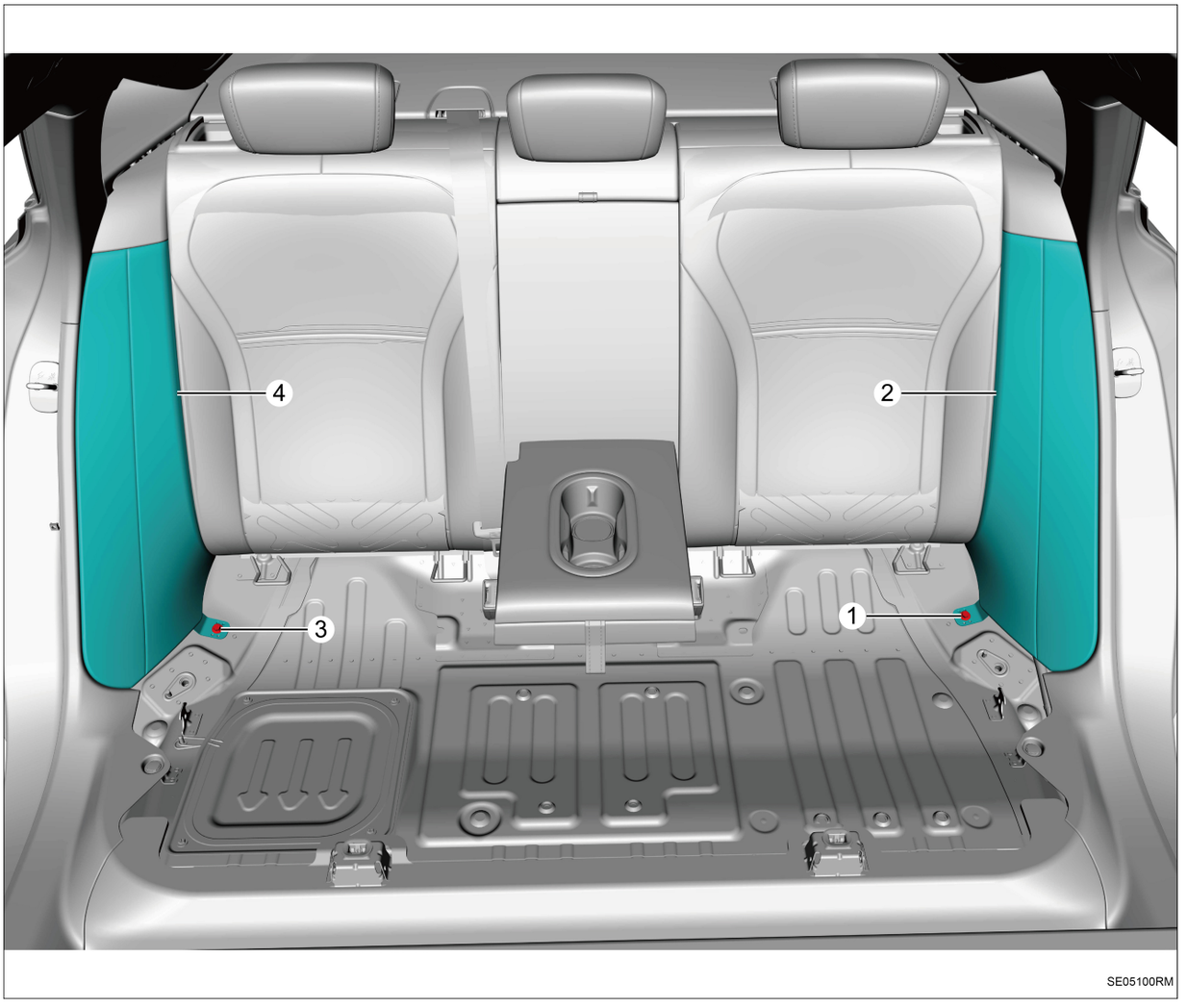
Installation

1. Installation is in the reverse order of removal.

NS

Seatback side wing assembly

Components



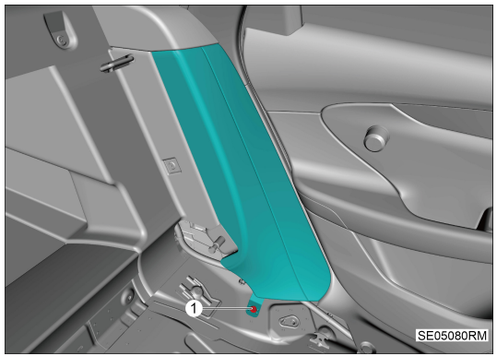
1. **Hexagon flange bolt**
   - Torque: 21 ~ 31 N • m
2. **Rear left seatback side wing assembly**
3. **Hexagon flange bolt**
   - Torque: 21 ~ 31 N • m
4. **Rear right seatback side wing assembly**

Removal

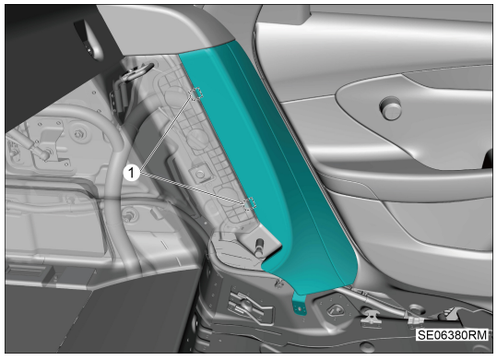
1. **Remove rear seat cushion assembly (See page NS-92)**
2. **Fold down rear left seatback (See page NS-92)**
3. **Fold down rear right seatback (See page NS-92)**
4. **Remove C-pillar lower left protector trim panel (See page NS-137)**

5. **Remove C-pillar lower right protector trim panel (See page NS-137)**

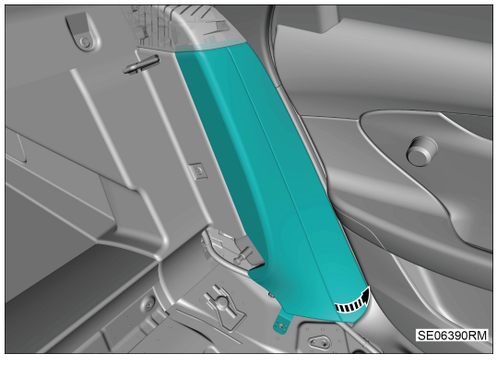
6. **Remove rear left seatback side wing assembly**



(a) Remove the bolt -1-.

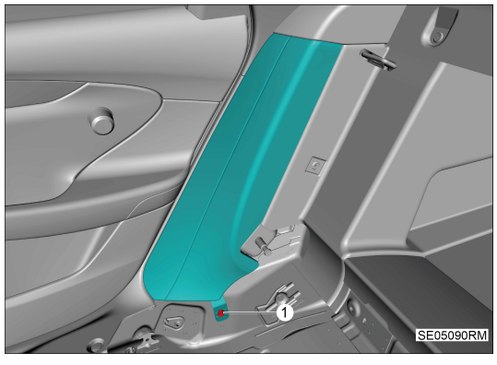


(b) Detach the clip -1-.

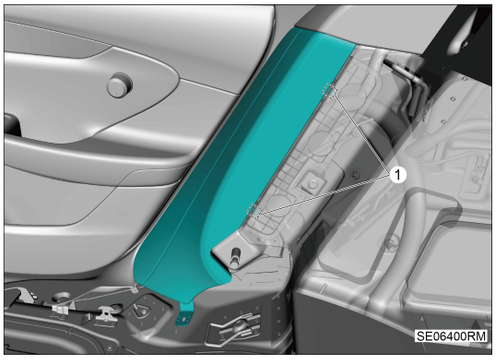


(c) Detach the rear left seatback side wing assembly in direction of -arrow-.

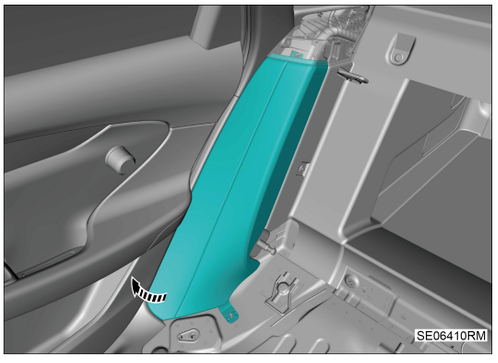
7. **Remove rear right seatback side wing assembly**



(a) Remove the bolt -1-.



(b) Detach the clip -1-.



(c) Detach the rear left seatback side wing assembly in direction of -arrow-.

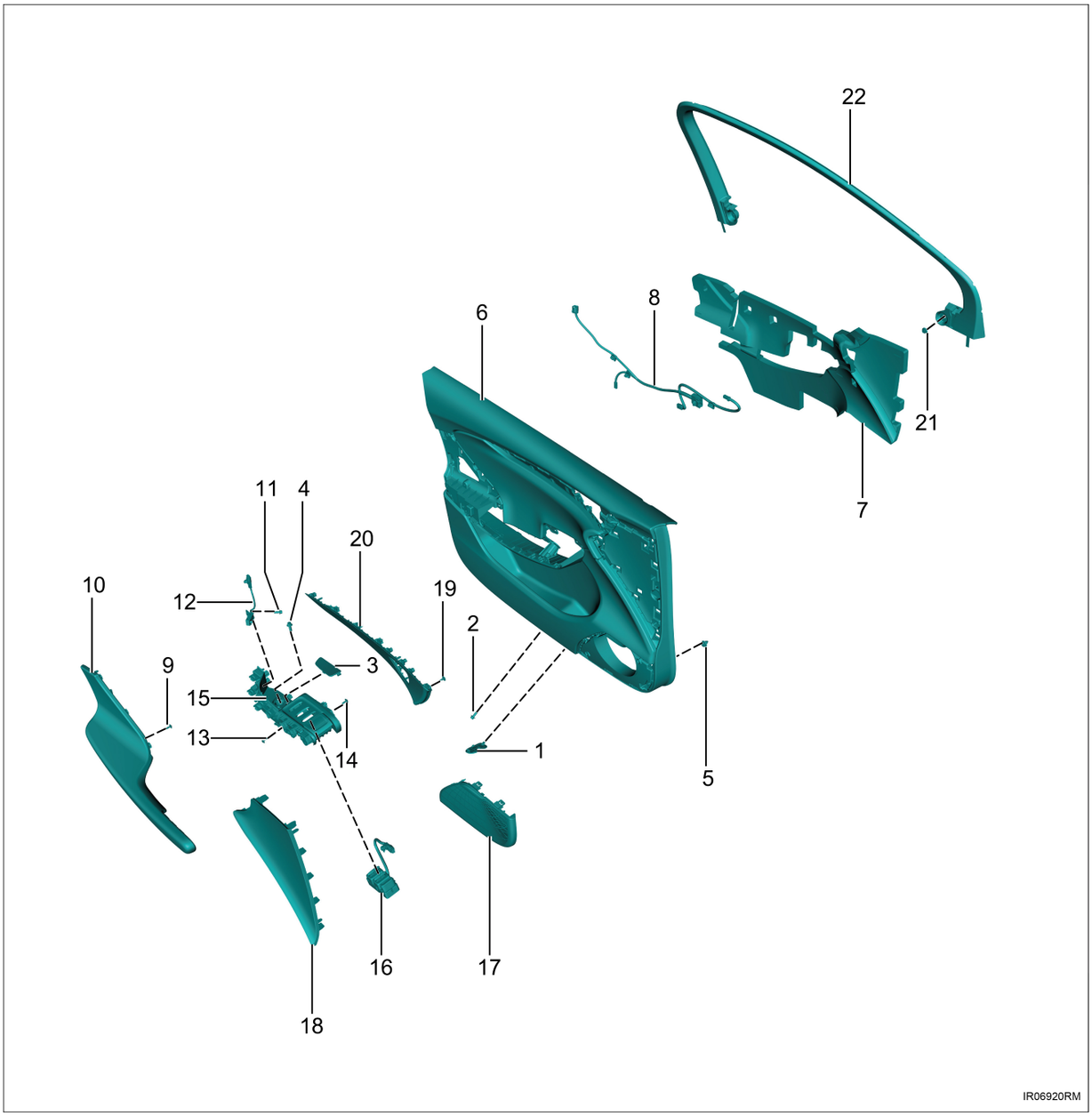
Installation

1. **Installation is in the reverse order of removal.**

Protector system

Front door protector

Components



1. **Front left door screw trim cover**
2. **Hexagon flange bolt**
   - Torque: 8 ~ 12 N • m
3. **Front left door screw trim cover II**
4. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 12 N • m

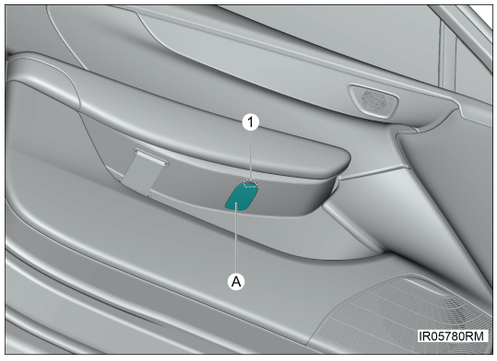
5. **Clip**
   - X9
6. **Front door protector**
7. **Front left door sound-absorbing felt l**
8. **Front left door inner panel wire harness assembly**
9. **Self-tapping screw**
   - X9
10. **Front left door armrest**
11. **Self-tapping screw**
    - X2
12. **Front left door ambient light l assembly**
13. **Self-tapping screw**
    - X3
14. **Self-tapping screw**
    - X7
15. **Front left door inside handle assembly**
16. **Driver window regulator switch assembly**
17. **Front left door speaker cover l**
18. **Front left door upper trim panel**
19. **Self-tapping screw**
    - X10
20. **Front left door trim panel**
21. **Clip**
    - X2
22. **Front left door frame trim panel**

Removal

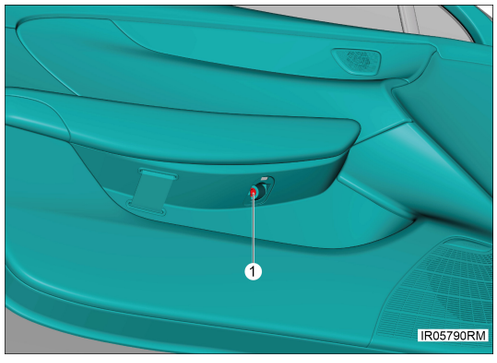
Note:

- Use same removal orders for right and left sides.

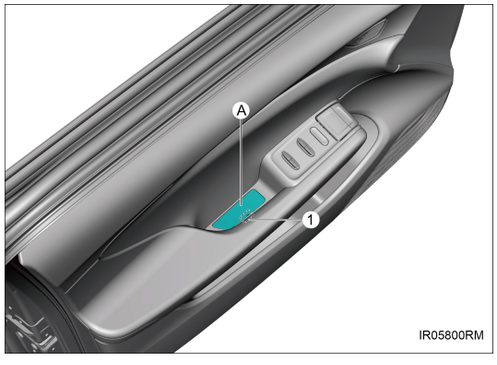
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front door protector**



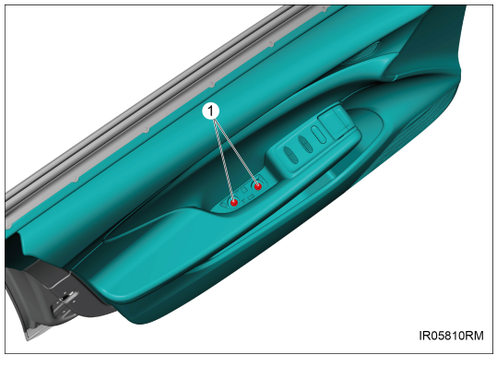
(a) Pry the position -1-, and remove the front left door screw trim cover -A-



(b) Remove the bolt -1-.

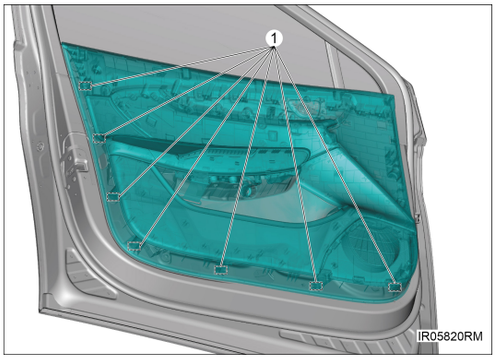


(c) Pry the position -1-, and open the front left door screw trim cover II -A-.

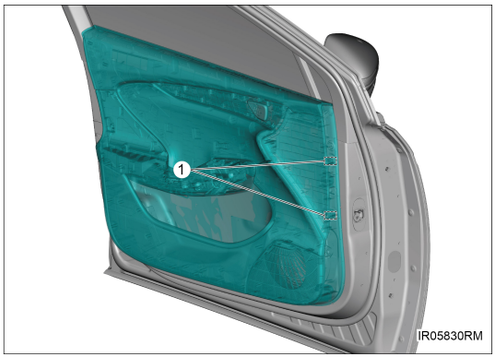


(d) Remove the bolt -1-.

NS

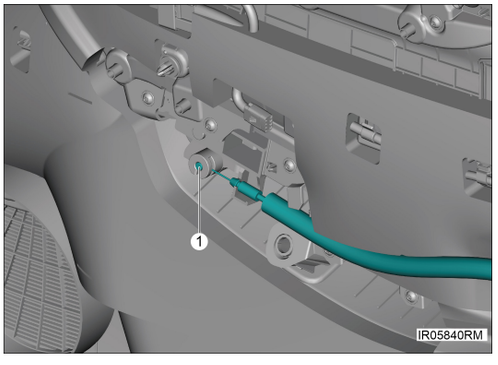


(e) Detach the clip -1-.



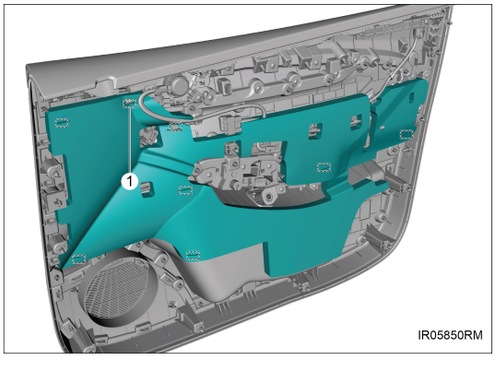
(f) Detach the clip -1-.

(g) Disconnect the wire harness connector.



(h) Detach the front left door inner opening cable -1-.

3. Remove front left door sound-absorbing felt I

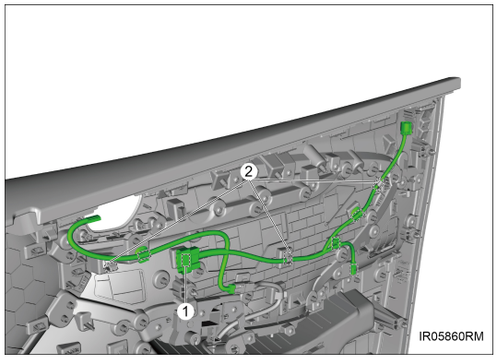


(a) (For example) Detach all hooks -1-.

4. Remove tweeter assembly (See page ZC-82)

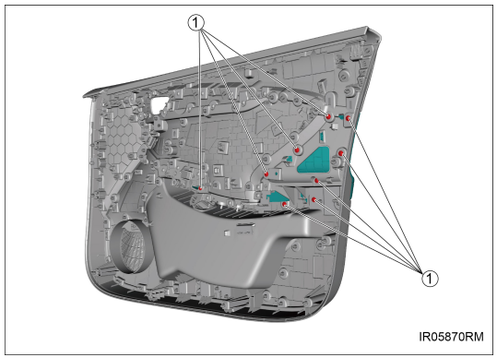
5. Remove smart entry low frequency antenna II (See page ZC-53)

6. Remove front left door inner panel wire harness assembly

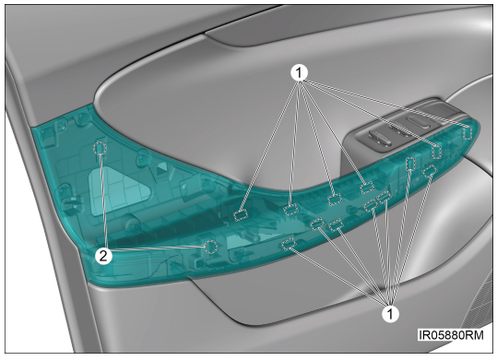


(a) (For example) Detach all wire harness fixing clip -1- and hook -2-.

7. Remove front left door armrest

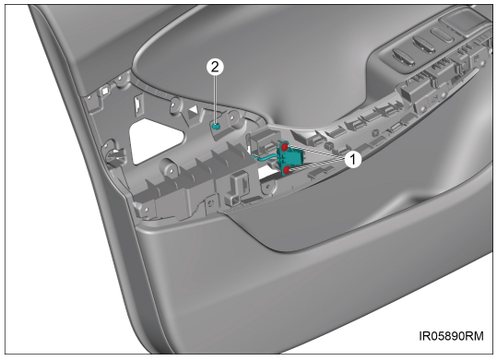


(a) Remove the screw -1-.



(b) Detach clip -1- and claw -2-.

8. Remove front left door ambient light I assembly

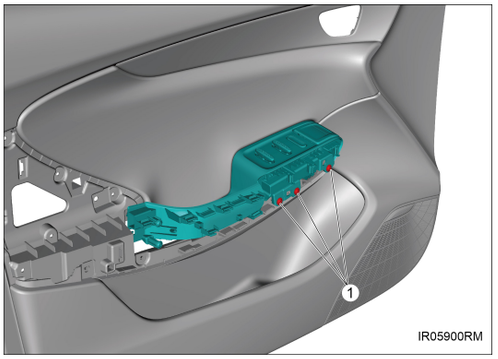


(a) Remove the screw -1-.

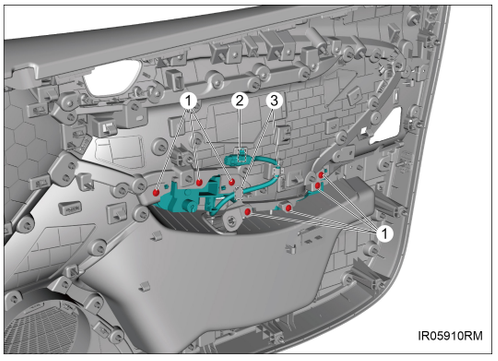
(b) Disengage the wire harness fixing clip -2-.

9. Remove front left door inside handle assembly

NS



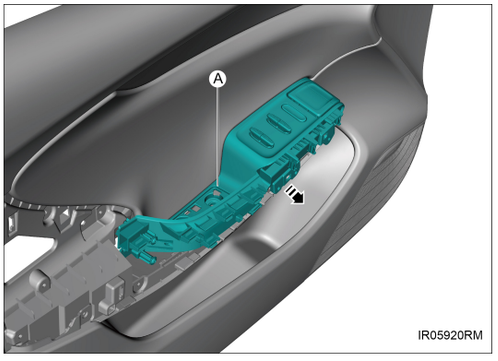
(a) Remove the front left door inside handle front screw -1-.



(b) Remove the front left door inside handle rear screw -1-.

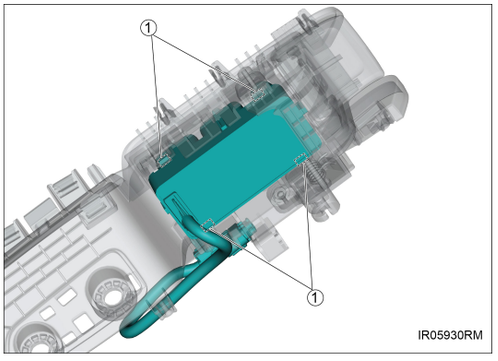
(c) Detach the connector fixing clip -2-.

(d) Detach the hook -3-.



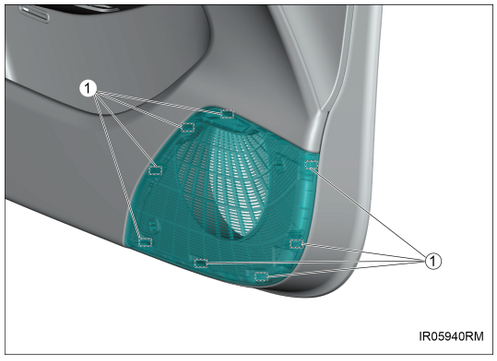
(e) Remove the front left door inside handle assembly -A- in the direction of -arrow-.

10. Remove driver window regulator switch assembly



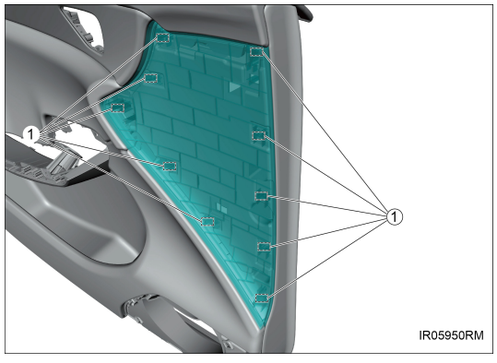
(a) Detach the claw -1-.

11. Remove front left door speaker cover l



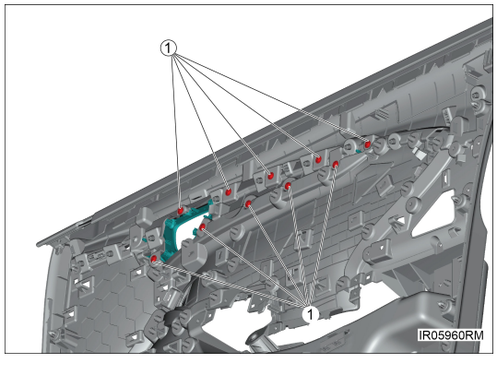
(a) Detach the claw -1-.

12. Remove front left door upper trim panel

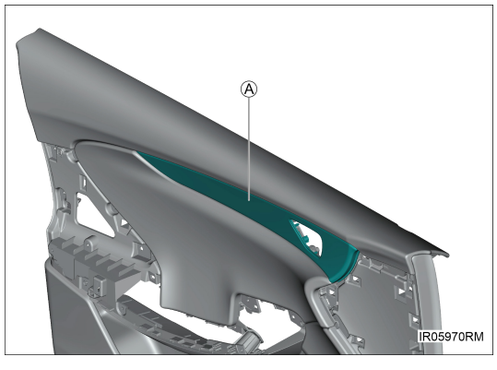


(a) Detach the claw -1-.

13. Remove front left door trim panel

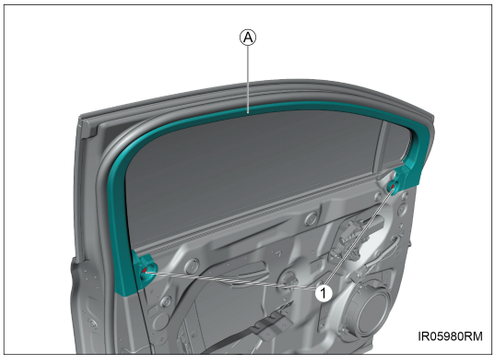


(a) Remove the screw -1-.



(b) Remove the front left door trim panel -A-.

14. Remove front left door frame trim panel



(a) Detach the clip -1-.

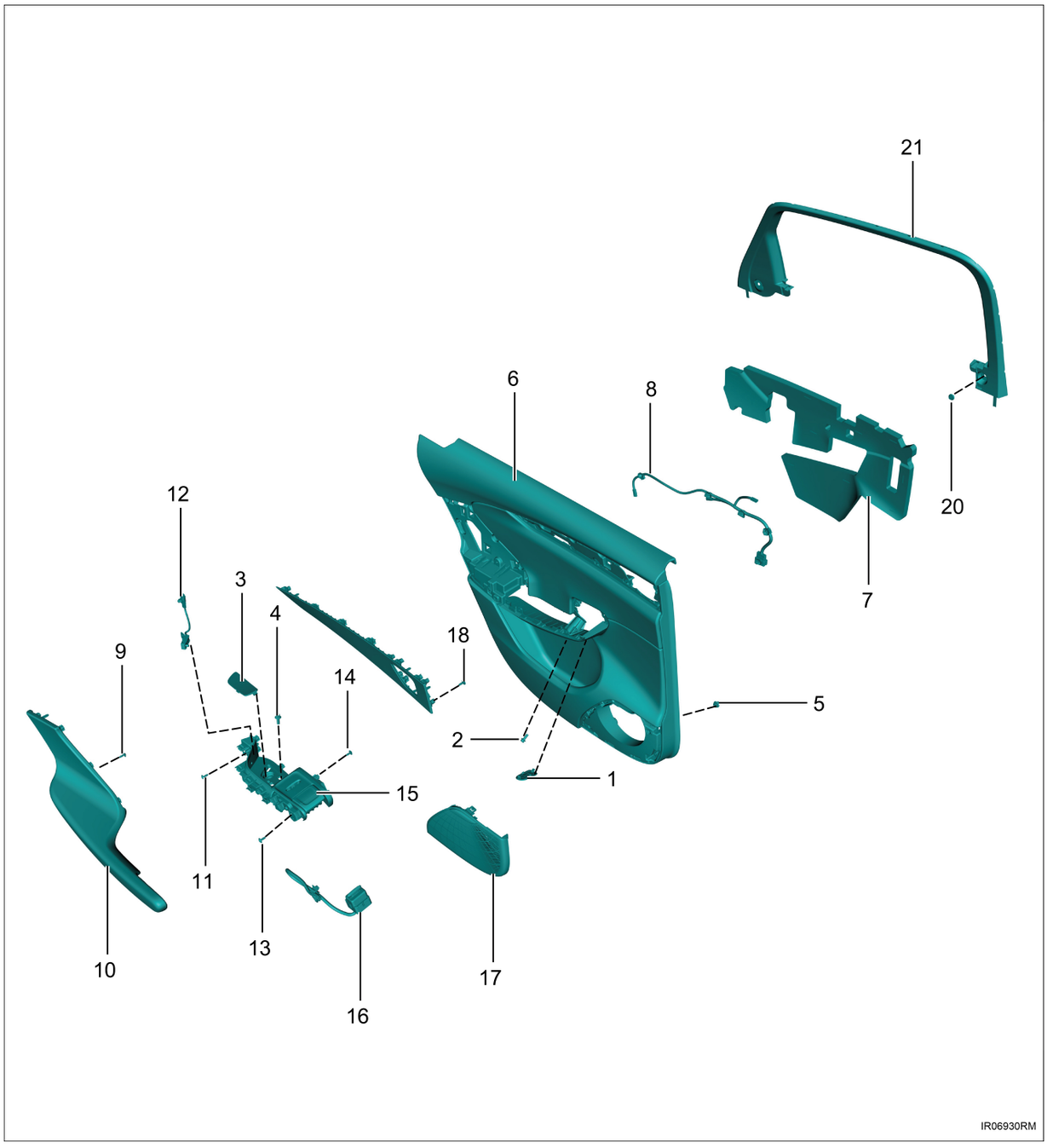
(b) Remove the front left door trim panel -A-.

Installation

1. Installation is in the reverse order of removal.

Rear door protector

Components



1. **Rear left door screw trim cover**
2. **Hexagon flange bolt**
   - Torque: 8 ~ 12 N • m
3. **Rear left door screw trim cover II**
4. **Hexagon flange bolt**
   - X2

- Torque: 8 ~ 12 N • m

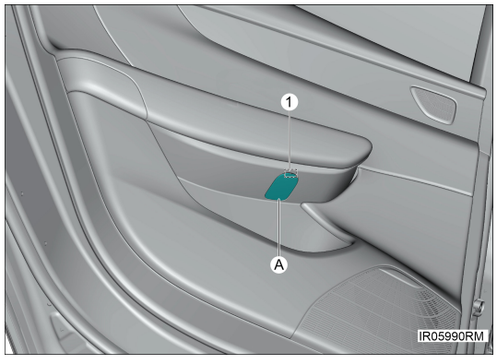
5. **Clip**
   - X8
6. **Rear door protector**
7. **Rear left door sound-absorbing felt I**
8. **Rear left door inner panel wire harness assembly**
9. **Self-tapping screw**
   - X12
10. **Rear left door armrest**
11. **Self-tapping screw**
    - X2
12. **Rear left door ambient light I assembly**
13. **Self-tapping screw**
    - X2
14. **Self-tapping screw**
    - X7
15. **Rear left door inside handle assembly**
16. **Front passenger window regulator switch assembly**
17. **Rear left door speaker cover assembly I**
18. **Self-tapping screw**
    - X11
19. **Rear left door trim panel**
20. **Clip**
    - X2
21. **Rear left door frame trim panel**

Removal

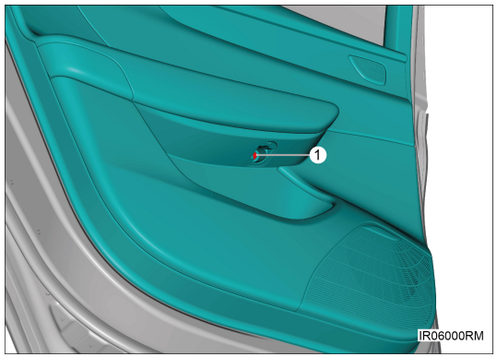
Note:

- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear door protector assembly**



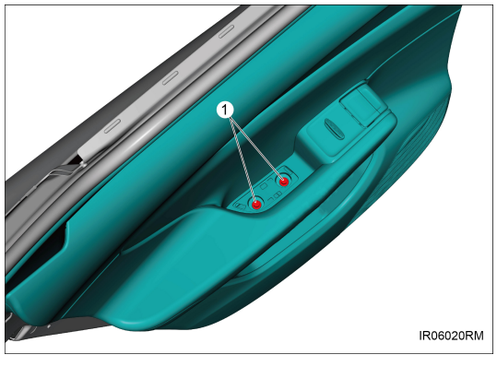
(a) Pry the position -1-, and remove the rear left door screw trim cover -A-.



(b) Remove the bolt -1-.

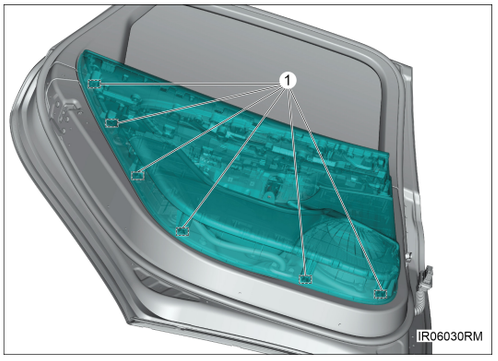


(c) Pry the position -1-, and remove the rear left door screw trim cover II -A-.

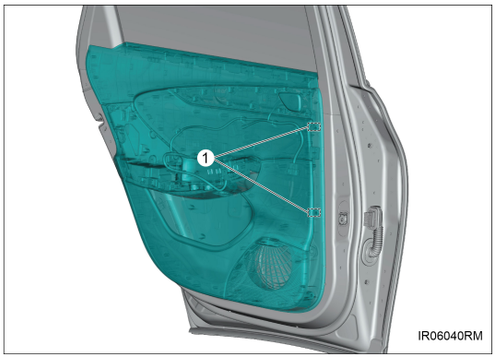


(d) Remove the bolt -1-.

NS

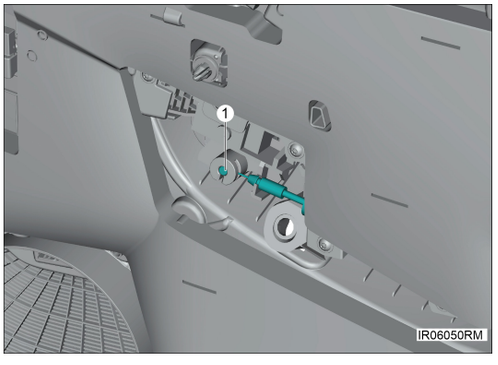


(e) Detach the clip -1-.



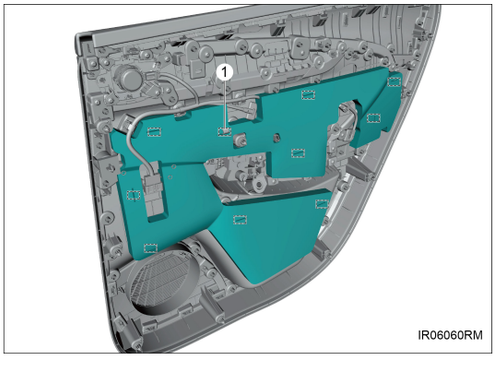
(f) Detach the clip -1-.

(g) Disconnect the wire harness connector.



(h) Detach the rear left door inner opening cable -1-.

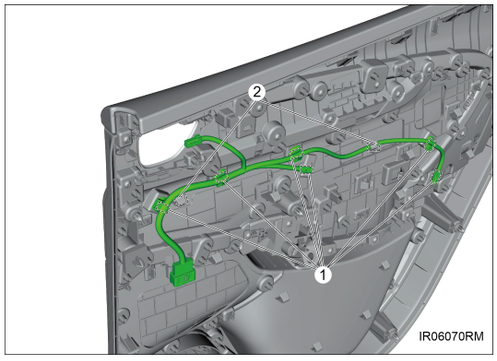
3. Remove rear left door sound-absorbing felt I



(a) (For example) Detach all hooks -1-.

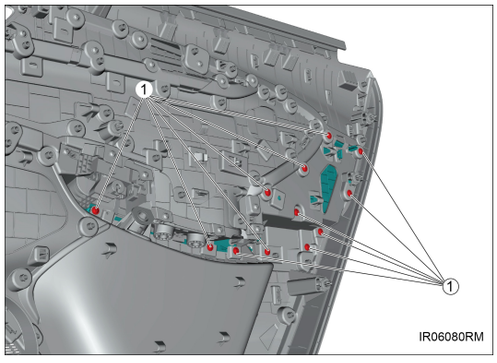
4. Remove tweeter assembly (See page ZC-82)

5. Remove rear left door inner panel wire harness assembly

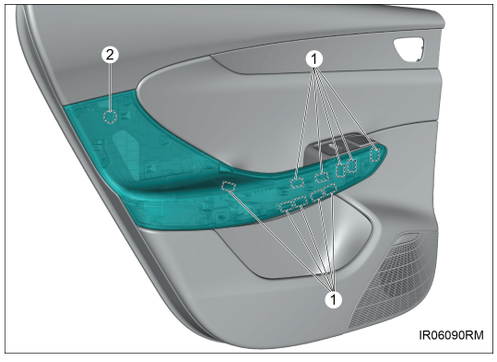


(a) (For example) Detach all wire harness fixing clip -1- and hook -2-.

6. Remove rear left door armrest

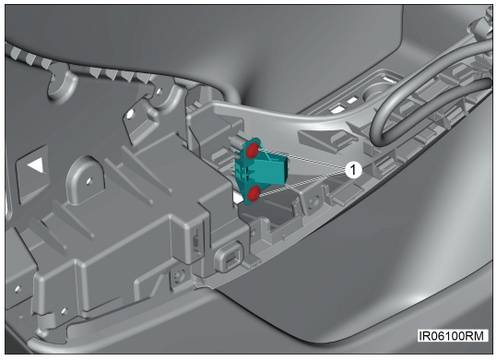


(a) Remove the screw -1-.



(b) Detach clip -1- and claw -2-.

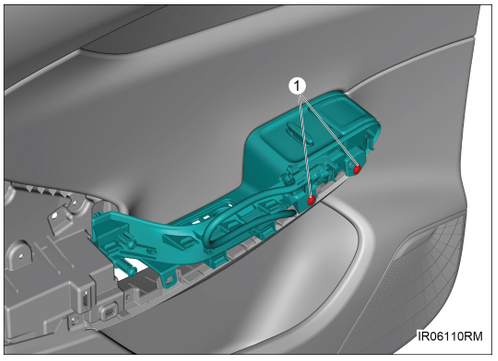
7. Remove rear left door ambient light I assembly



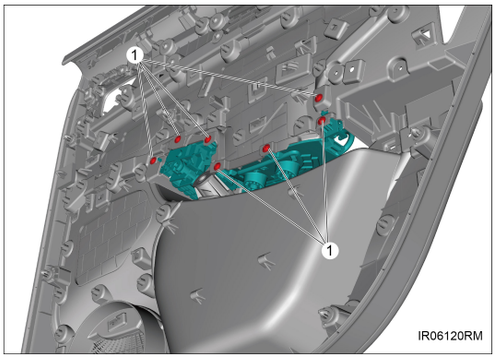
(a) Remove the screw -1-.

8. Remove rear left door inside handle assembly

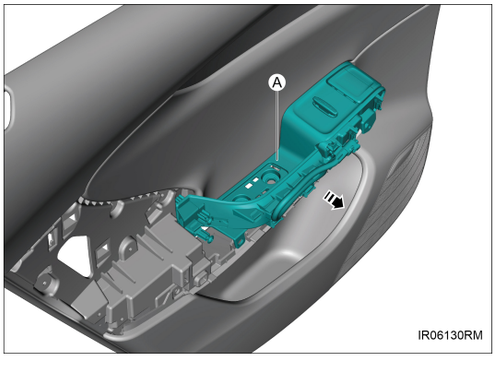
NS



(a) Remove the front screw -1- from rear left door inside handle assembly.

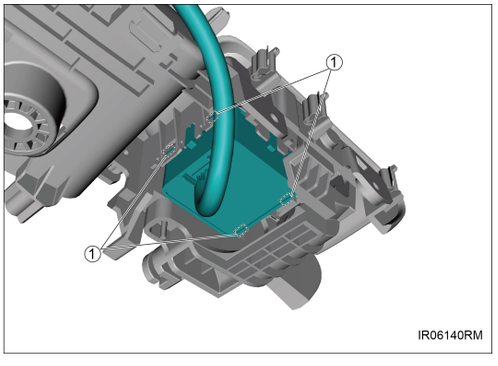


(b) Remove the front left door inside handle rear screw -1-.



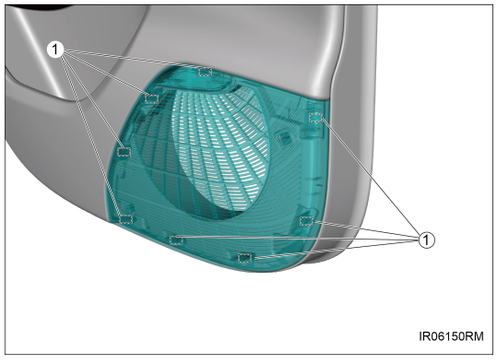
(c) Remove the front left door inside handle assembly -A- in the direction of -arrow-.

9. Remove front passenger window regulator switch assembly



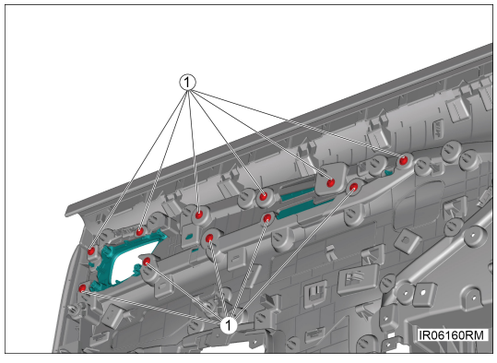
(a) Detach the claw -1-.

10. Remove rear left door speaker cover assembly l

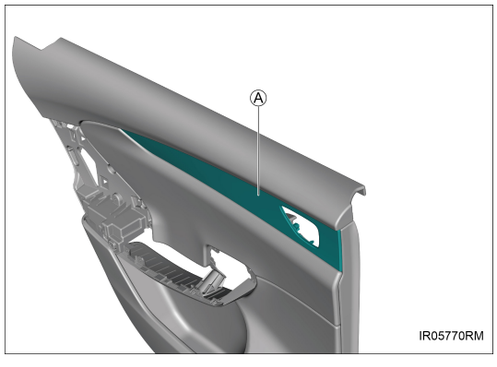


(a) Detach the claw -1-.

11. Remove rear left door trim panel

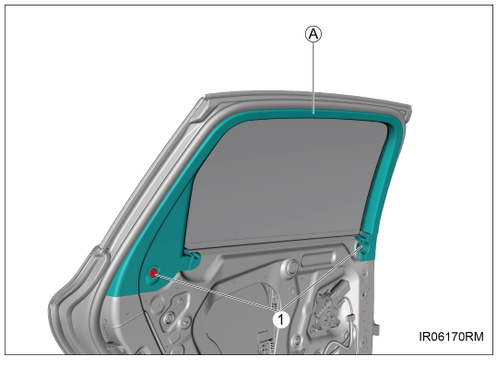


(a) Remove the screw -1-.



(b) Remove the front left door trim panel -A-.

12. Remove rear left door frame trim panel



(a) Detach the clip -1-.

(b) Remove the rear left door frame trim panel -A-.

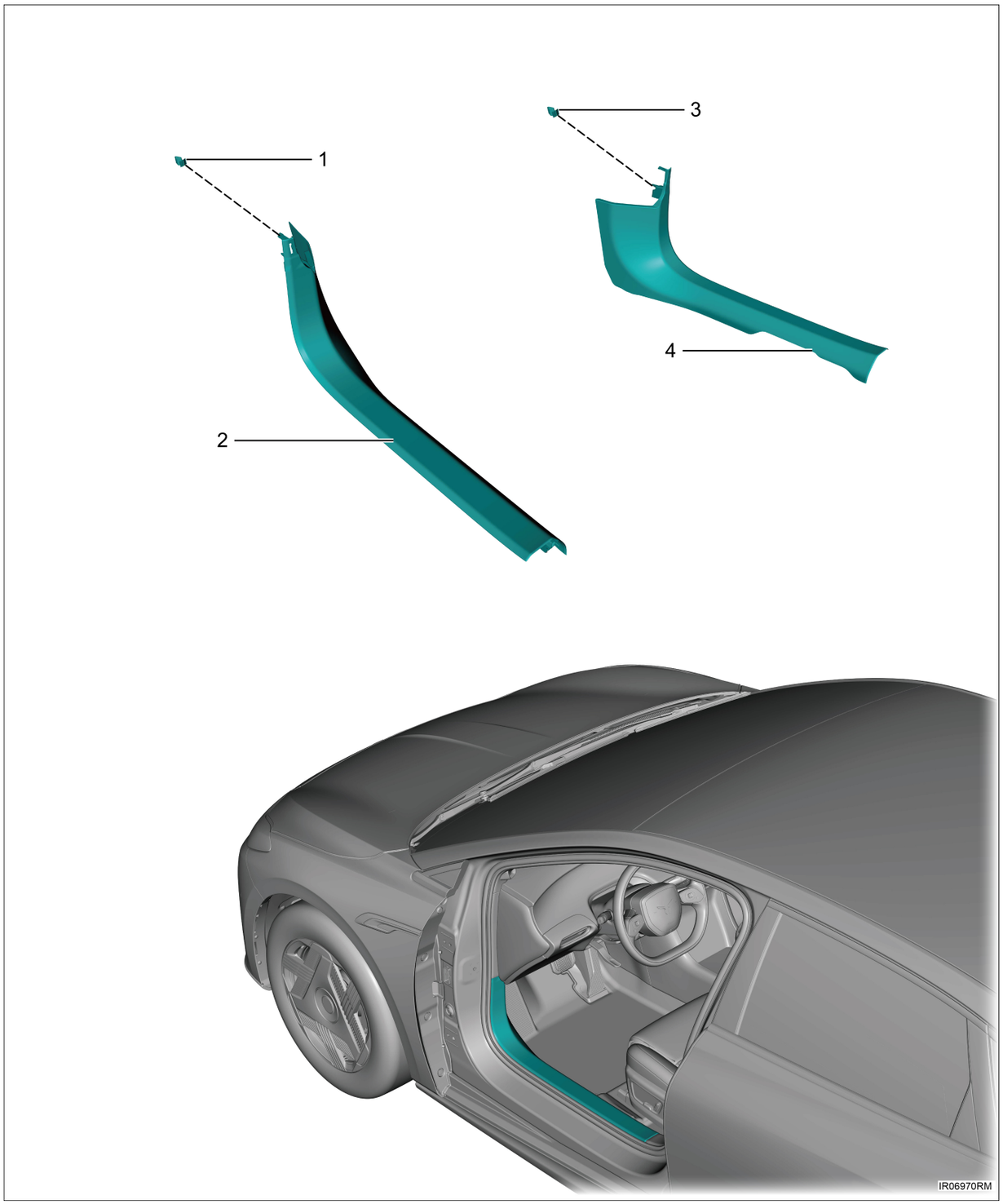
Installation

1. Installation is in the reverse order of removal.

NS

Front doorsill protector

Components



1. **Clip**
   - X5
2. **Front left doorsill protector**
3. **Clip**

- X5

4. Front right doorsill protector

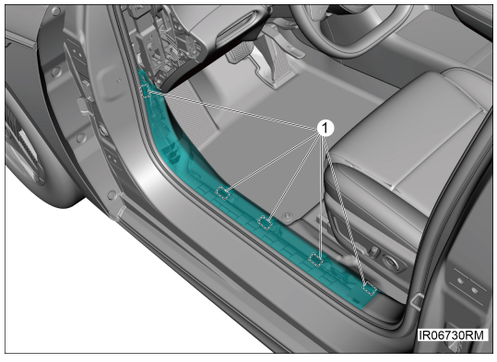
Removal

1. **Remove left end cover (See page NS-13)**
2. **Remove A-pillar lower left protector (See page NS-130)**
3. **Remove front left doorsill protector**

   Note:

   - Use same removal orders for right and left sides.

   (a) Detach the clip -1-.

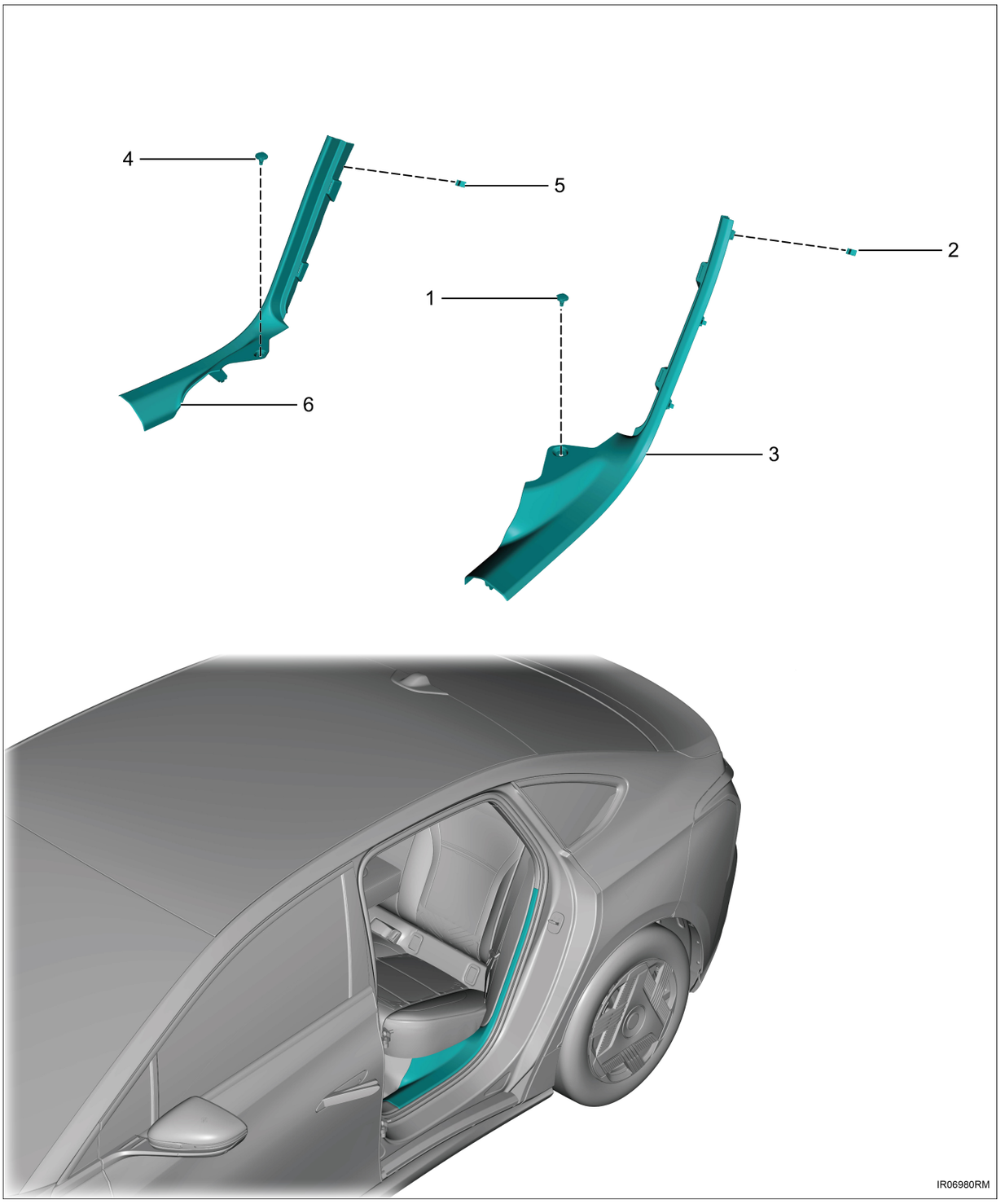


Installation

1. **Installation is in the reverse order of removal.**

Rear doorsill protector

Components



1. **Clip**
2. **Clip**
   - X5
3. **Rear left doorsill protector**

4. **Clip**
5. **Clip**
   - X5
6. **Rear right doorsill protector**

Removal

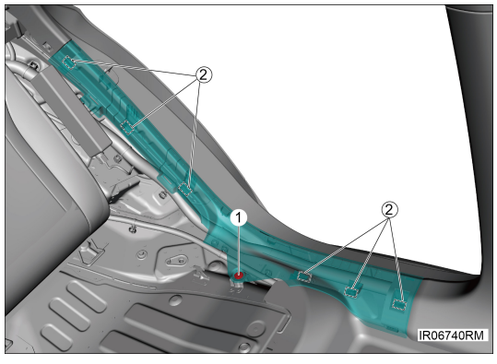
1. **Remove rear seat cushion assembly (See page NS-92)**
2. **Remove rear left seatback side wing assembly (See page NS-108)**
3. **Remove rear left doorsill protector**

   Note:

   - Use same removal orders for right and left sides.

   (a) Detach the clip -1-.

   (b) Detach the clip -2-.



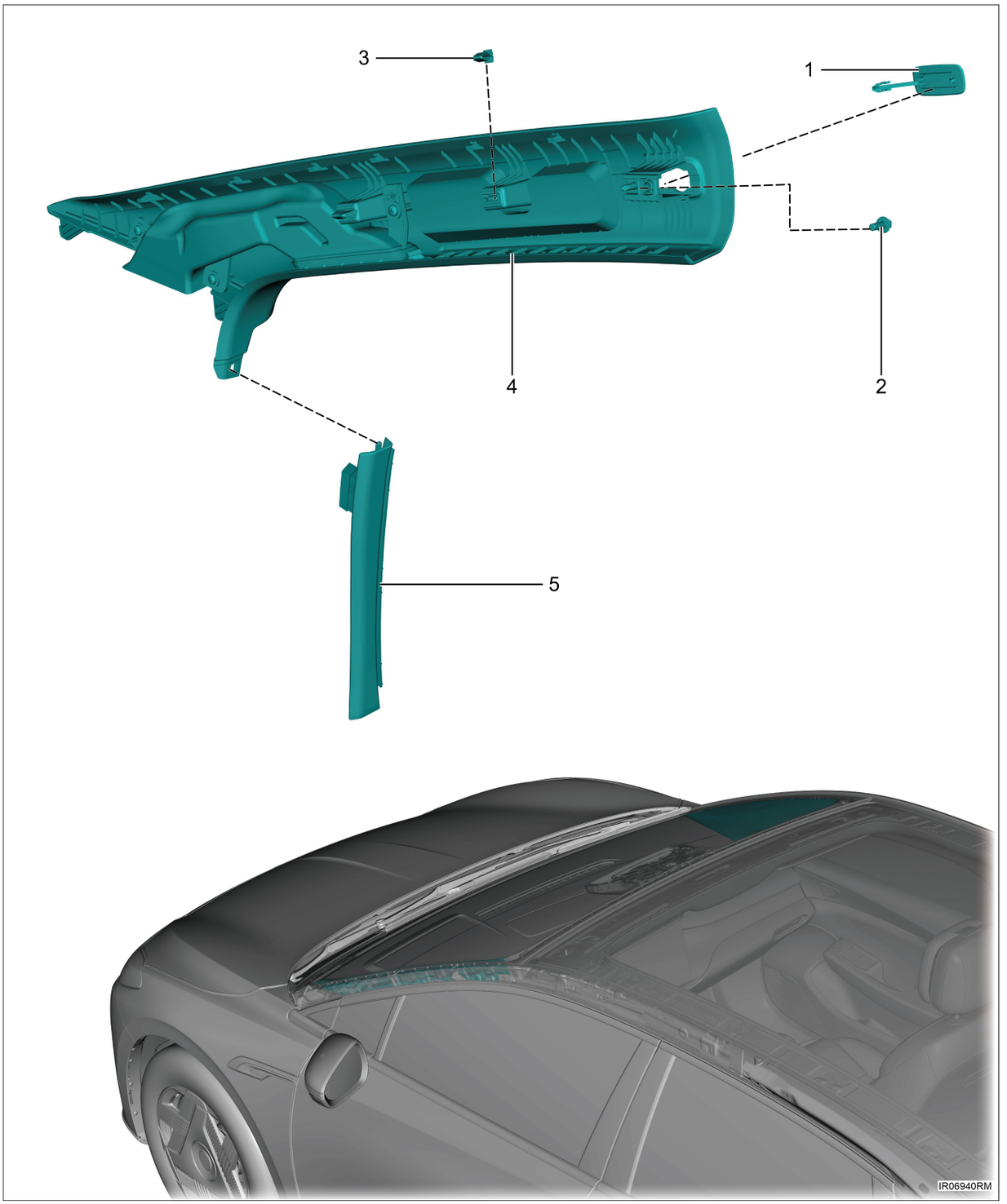
Installation

1. **Installation is in the reverse order of removal.**

NS

A-pillar protector

Components



1. **A-pillar left trim cover**
2. **Hexagon flange bolt**
   - Torque: 3 ~ 5 N • m
3. **Clip**

- X2

4. **Left A-pillar upper protector**
5. **Left A-pillar lower protector**

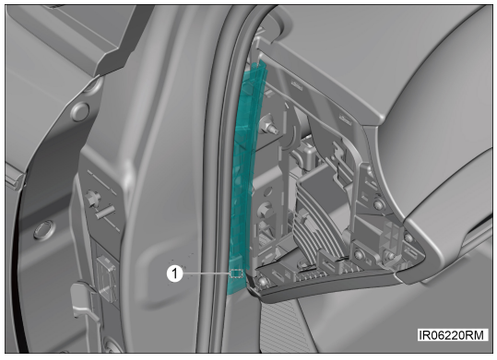
Removal

1. **Remove left end cover (See page NS-13)**
2. **Remove left A-pillar lower protector**

   Note:

   - Use same removal orders for right and left sides.

   (a) Detach the claw -1-.

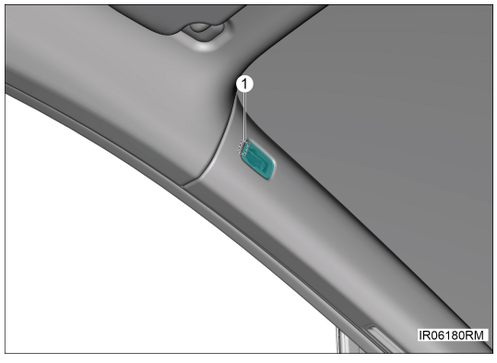


3. **Disconnect negative battery terminal (See page DL-21)**
4. **Remove left A-pillar upper protector**

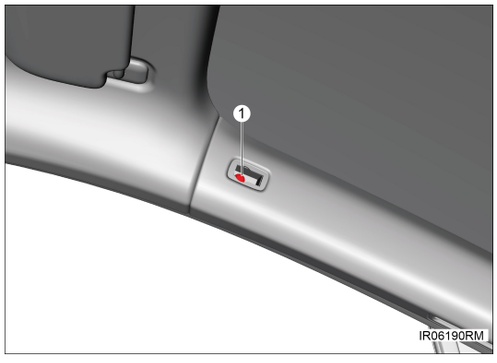
   Note:

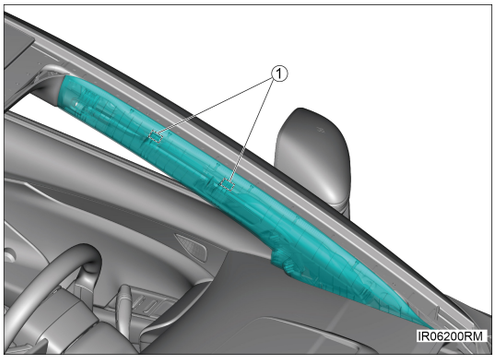
   - Use same removal orders for right and left sides.

   (a) Detach claw -1-, and detach the A-pillar left trim cover.



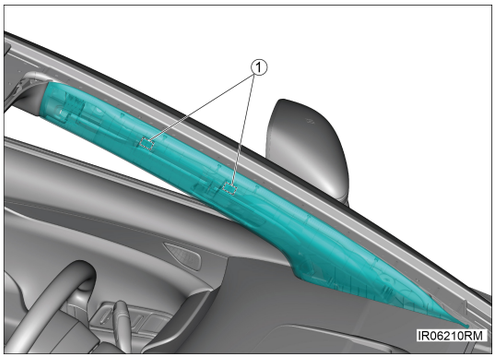
   (b) Remove the bolt -1-.





(c) Detach the clip -1-.

(d) Disconnect the driver status monitoring camera wire harness connector. (Only for model with driver status monitoring)



(e) Detach the clip -1-.

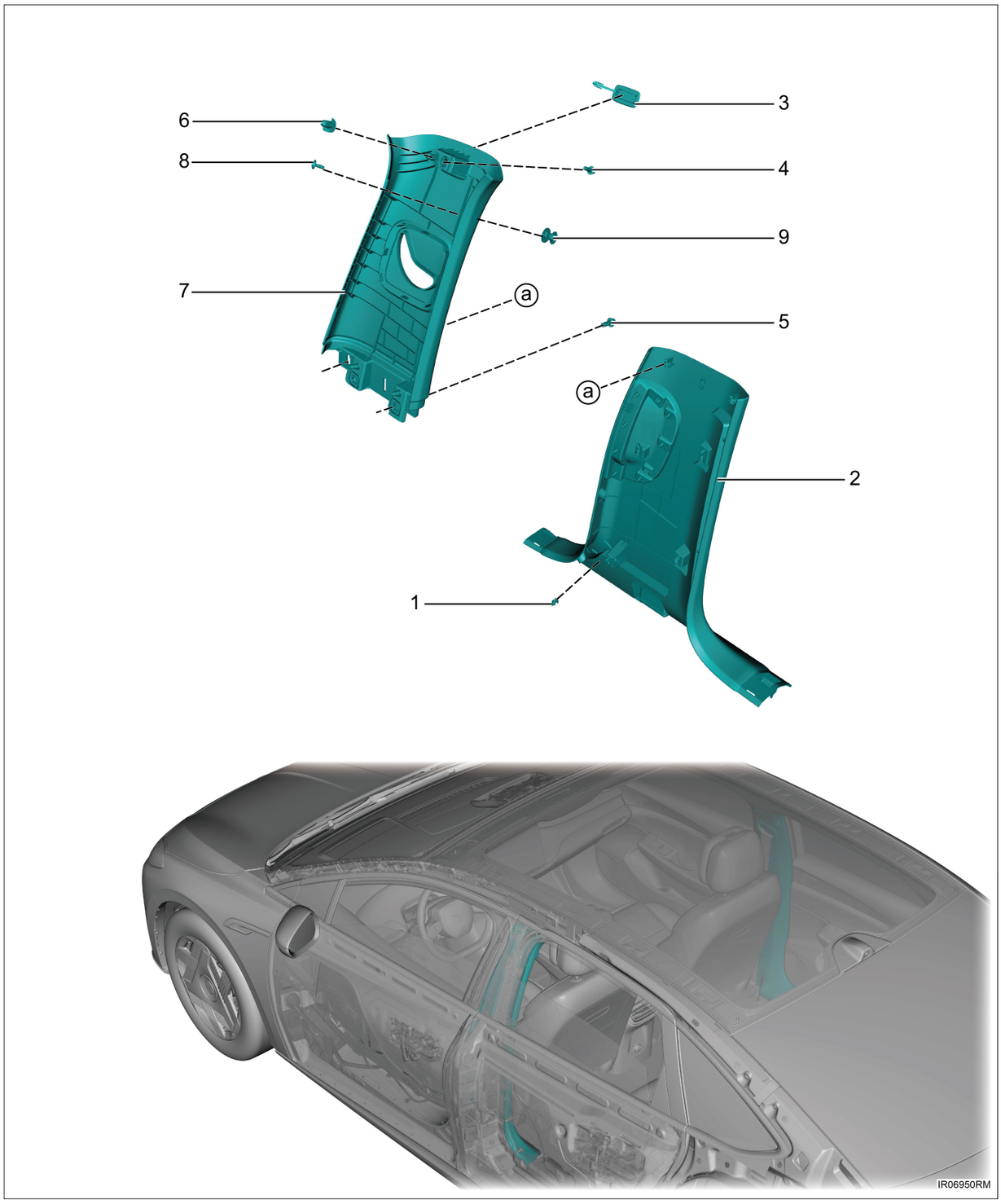
5. **Remove left defroster duct (See page RE-14)**
6. **Remove driver status monitoring camera assembly (only for model equipped with driver status monitoring) (See page ZC-137)**

Installation

1. **Installation is in the reverse order of removal.**

B-pillar protector

Components



1. **Clip**
   - X4
2. **B-pillar lower left protector**
3. **B-pillar left trim cover**

4. **Hexagon flange bolt**
   - Torque: 3 ~ 5 N • m
5. **Hexagon flange bolt**
   - X2
   - Torque: 3 ~ 5 N • m
6. **Clip**
7. **B-pillar upper protector**
8. **Screw**
9. **Coat and hat hook**

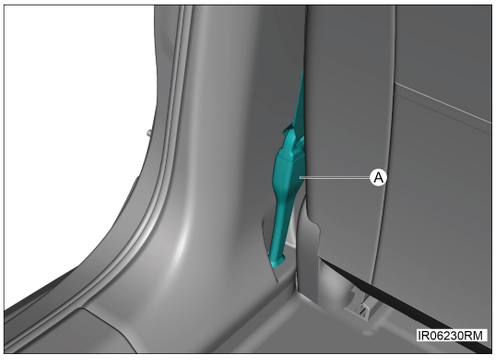
NS

Removal

Note:

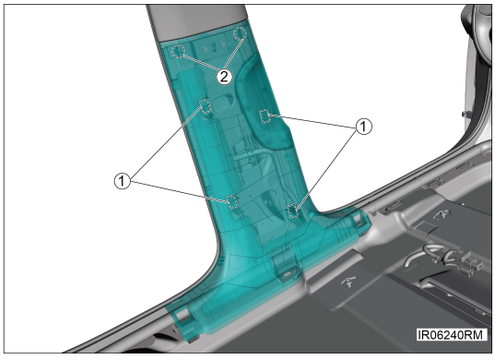
- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front left doorsill protector (See page NS-126)**
3. **Remove rear left doorsill protector (See page NS-126)**
4. **Remove B-pillar lower left protector**



(a) Adjust the driver seat to the foremost position.

(b) Detach connection -A- between driver seat belt pretensioner and driver seat belt. (See page NS-10)



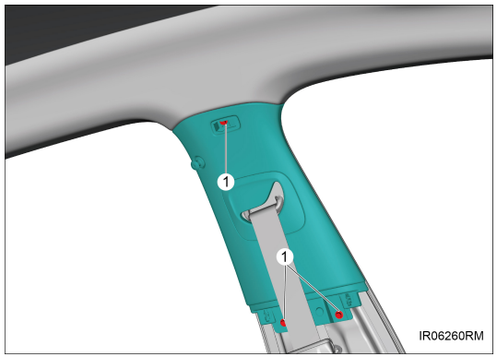
(c) Detach the clip -1-.

(d) Detach the claw -2-.

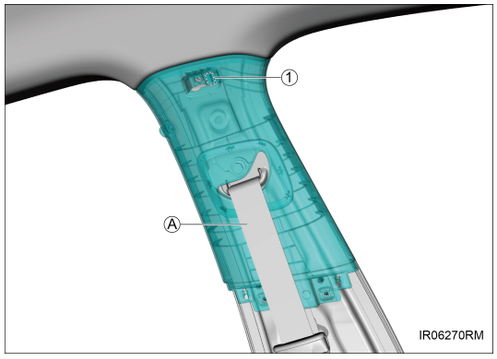
5. **Remove B-pillar upper protector**



(a) Detach claw -1-, and detach the B pillar left trim cover -A-.



(b) Remove the bolt -1-.

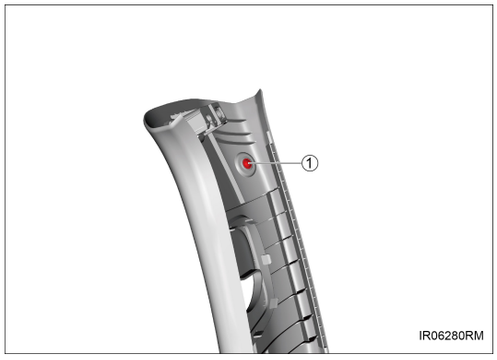


(c) Detach the clip -1-.

(d) Remove the B-pillar upper protector.

(e) Detach the seat belt -A- from B-pillar upper protector.

6. Remove coat and hat hook



(a) Remove the screw -1-.



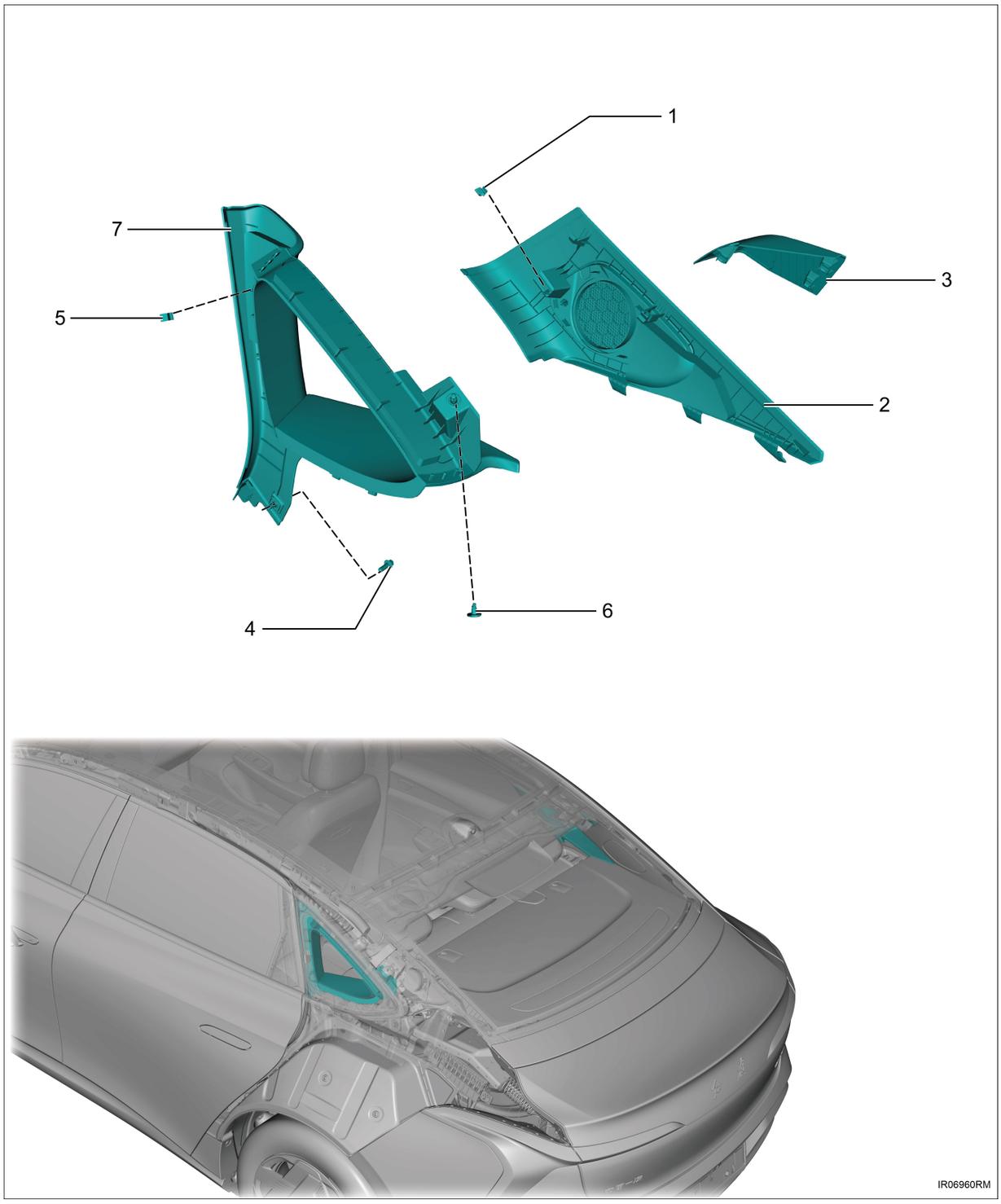
(b) Remove the coat and hat hook -A-.

Installation

1. Installation is in the reverse order of removal.

C-pillar protector

Components



1. **Clip**
2. **D-pillar upper left protector**
3. **C-pillar lower left protector trim panel**
4. **Hexagon flange nut**

- Torque: 3 ~ 5 N • m

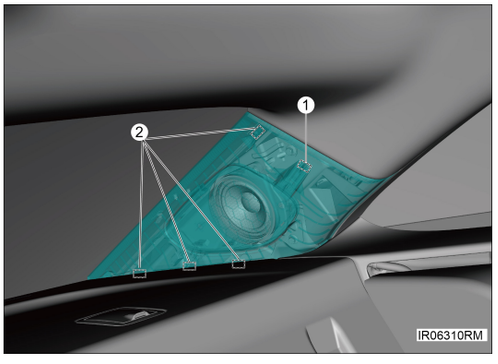
5. **Clip**
   - X2
6. **Clip**
7. **C-pillar upper left protector**

Removal

Note:

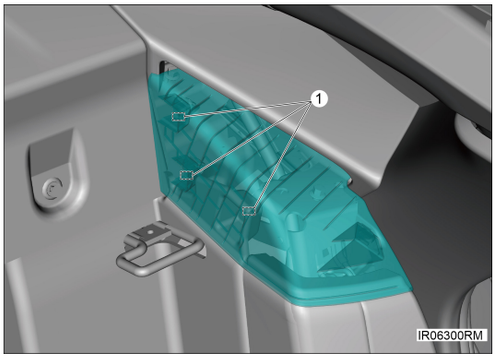
- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove D-pillar upper left protector**



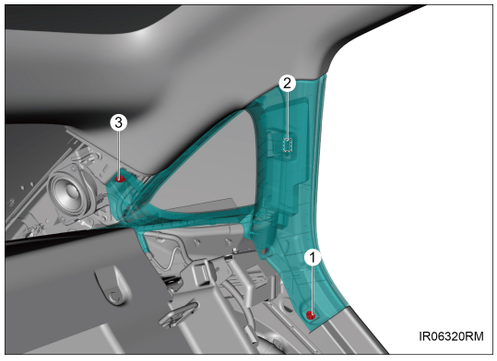
   (a) Detach the clip -1-.
   (b) Detach the claw -2-.

3. **Remove rear seatback assembly (See page NS-92)**
4. **Remove C-pillar lower left protector trim panel**



   (a) Detach the claw -1-.

5. **Remove rear left seatback side wing assembly (See page NS-108)**
6. **Remove rear left doorsill protector (See page NS-128)**
7. **Remove C-pillar upper left protector**



(a) Remove the bolt -1-.

(b) Remove the clip -3-.

(c) Remove the clip -2-.

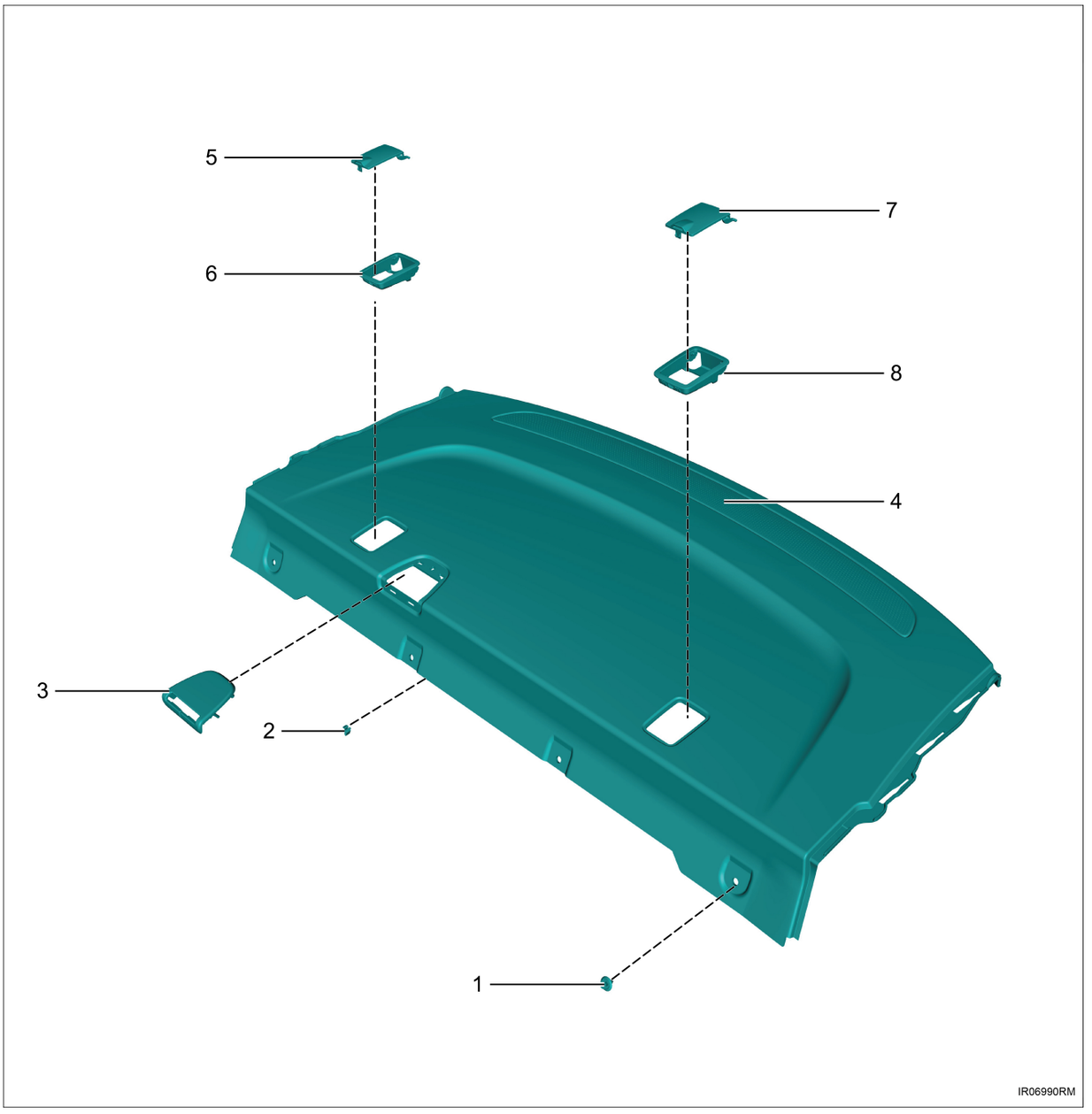
Installation

1. Installation is in the reverse order of removal.

Package rack protector assembly

Components

NS



1. **Clip**
   - X4
2. **Clip**
   - X4
3. **Rear seat belt middle guide cover**
4. **Package rack protector assembly**
5. **Child seat lock hook trim cover**
6. **Child seat lock hook trim base**

7. Child seat lock hook trim cover

8. Child seat lock hook trim base

Removal

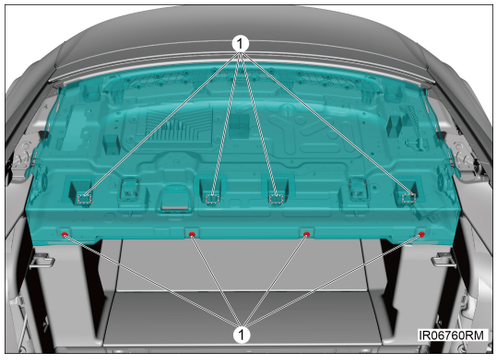
1. Disconnect negative battery terminal (See page DL-21)

2. Lay down rear seatback (See page NS-92)

3. Remove D-pillar upper protector (See page NS-137)

4. Remove C-pillar upper protector assembly (See page NS-137)

5. Remove package rack protector assembly



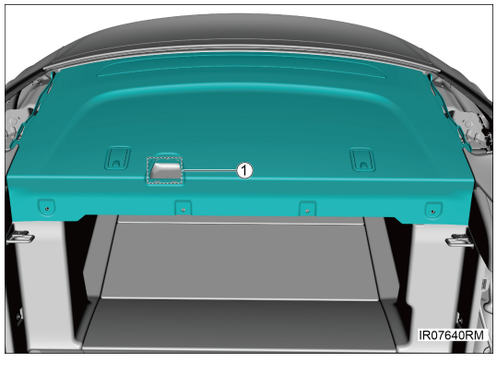
(a) Detach the clip -1-.

(b) Detach the clip -2-.



(c) Detach the claw -1-.

(d) Remove the rear seat belt middle guide cover.



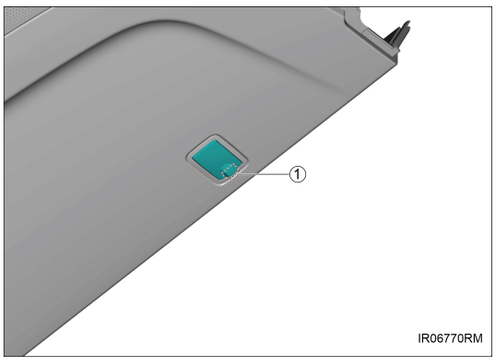
(e) Take out the seat belt from position -1-.

(f) Remove the package rack assembly.

6. Remove child seat lock hook trim cover

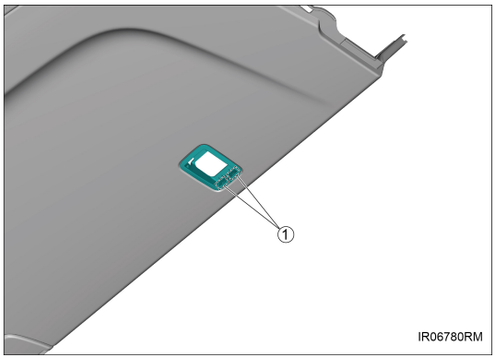
Note:

Use same removal orders for right and left sides.



(a) Detach the claw -1-.

7. Remove child seat lock hook trim base



(a) Detach the claw -1-.

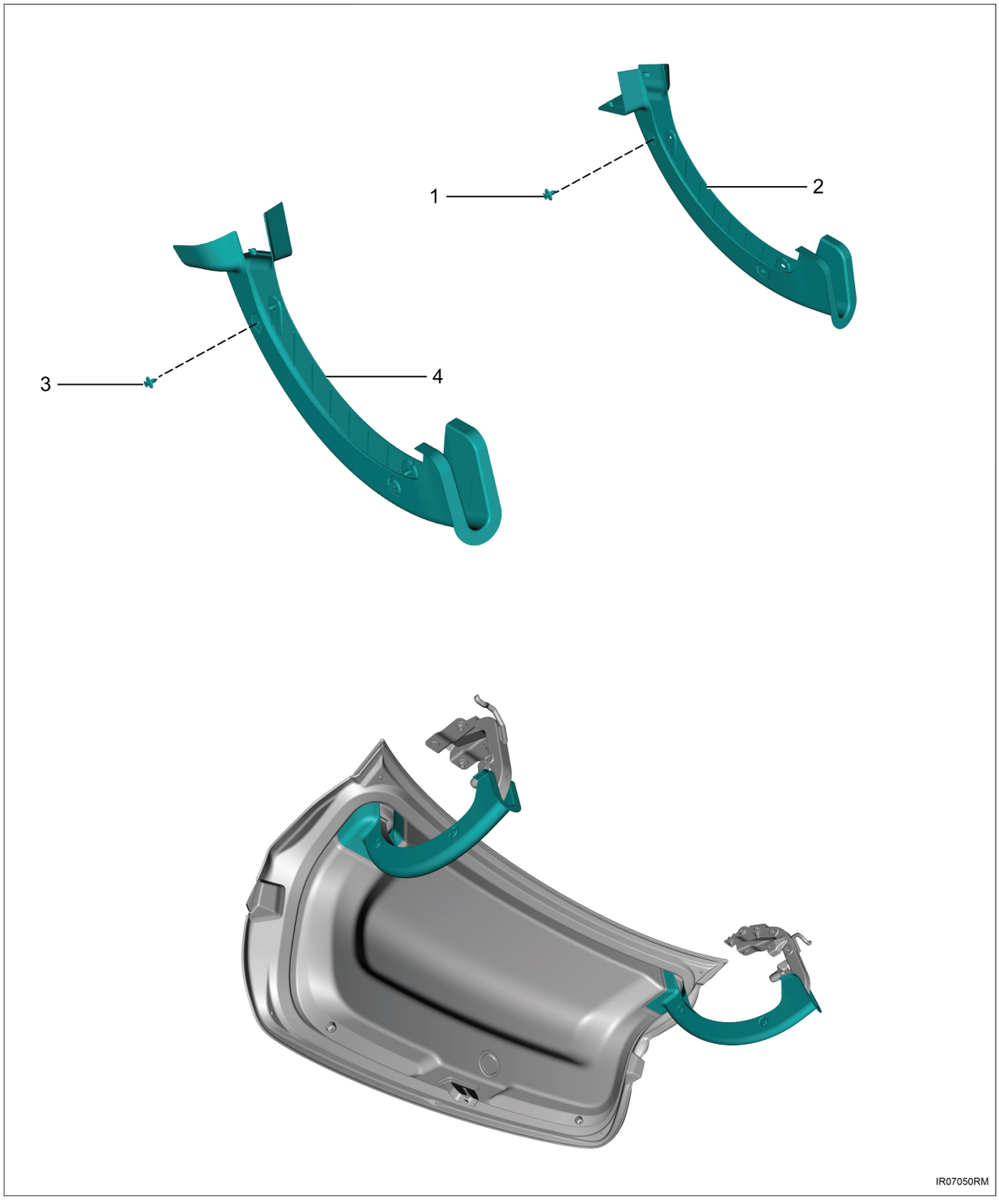
Installation

1. Installation is in the reverse order of removal.

Luggage compartment system

Side hinge trim cover

Components



1. Clip

- X4

2. Left hinge trim cover

3. Clip

- X4

4. Right hinge trim cover

NS

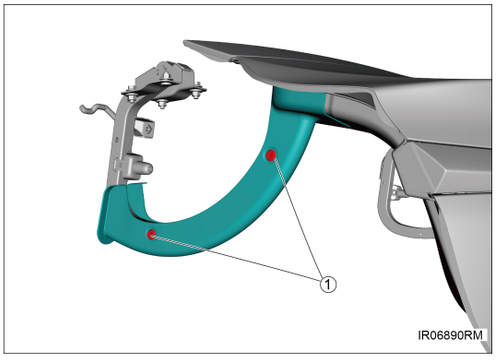
Removal

1. Remove left hinge trim cover

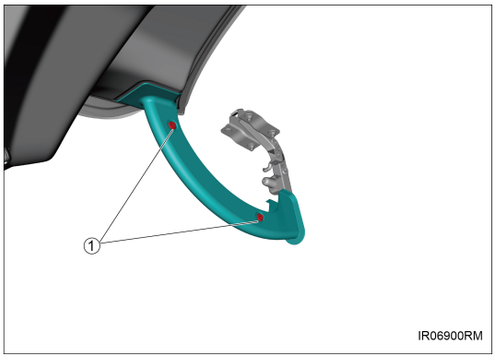
Note:

- Use same removal orders for right and left sides.

(a) Remove the outside clip -1-.



(b) Remove the inside clip -1-.

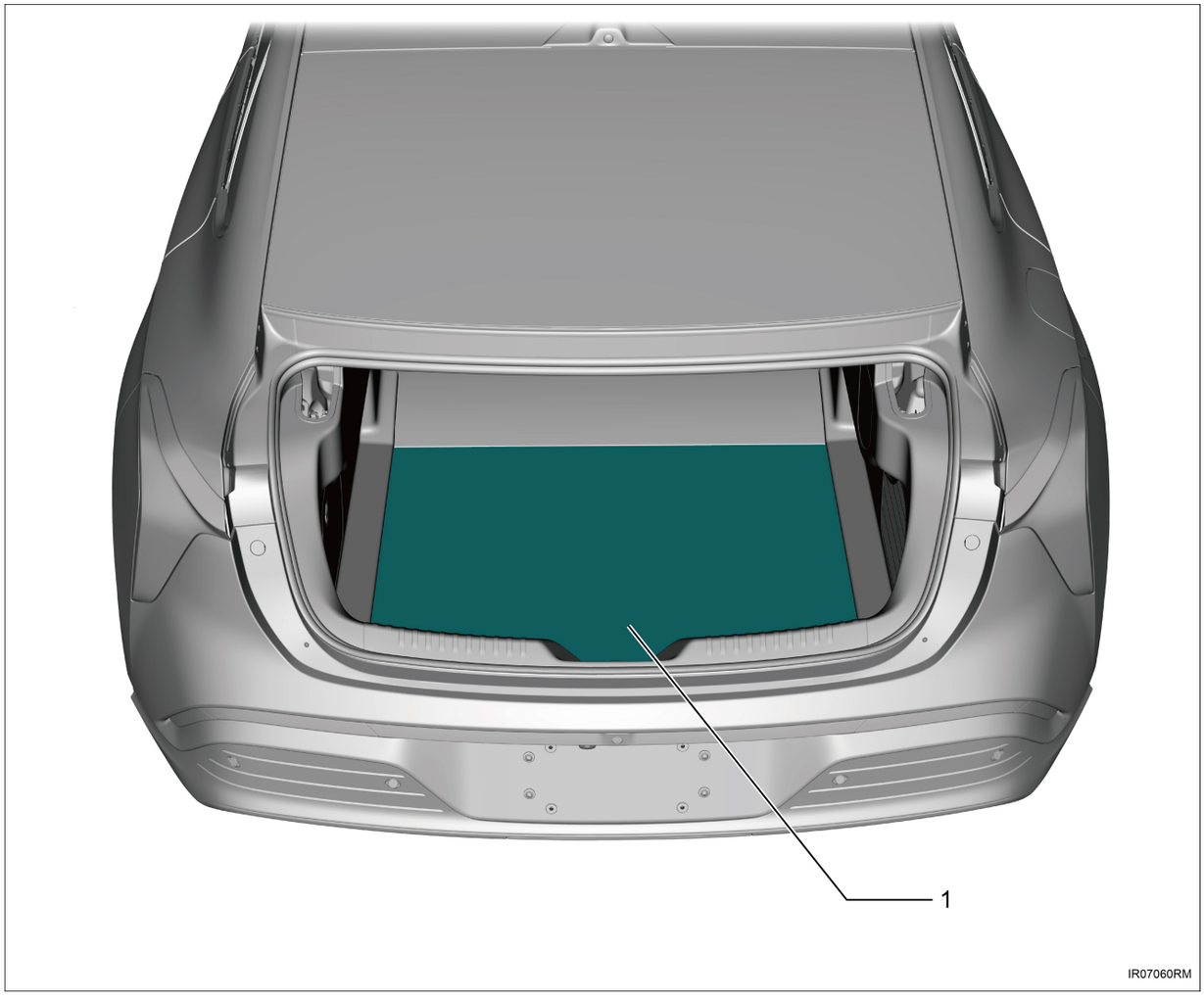


Installation

1. Installation is in the reverse order of removal.

Luggage compartment carpet assembly

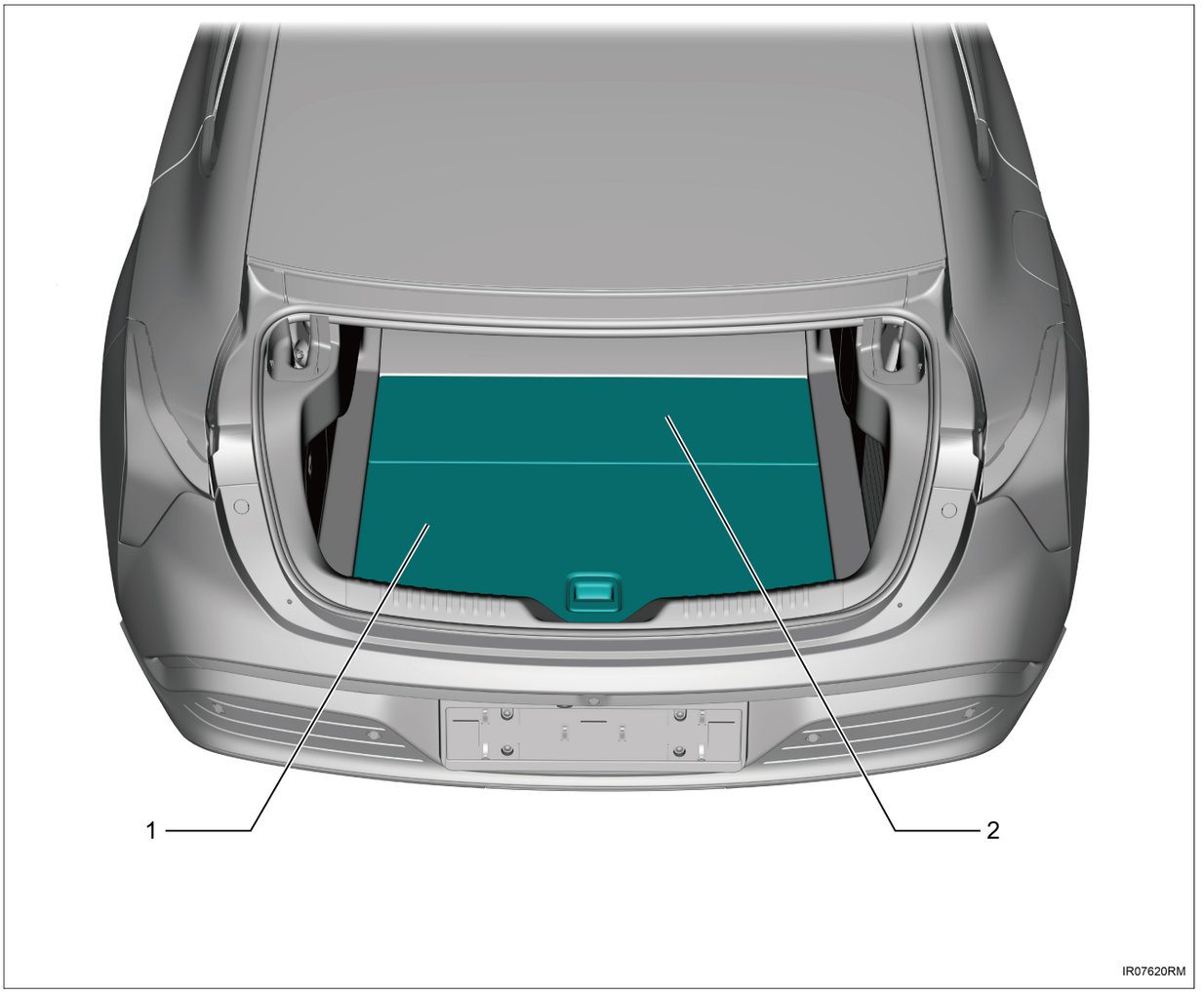
Components



1. **Luggage compartment carpet assembly**

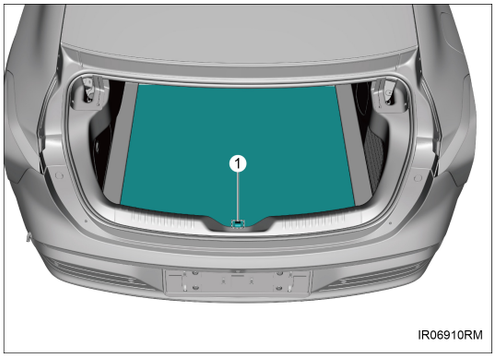
NS

Components



1. **Luggage compartment carpet assembly**
2. **Luggage compartment carpet front cover plate**

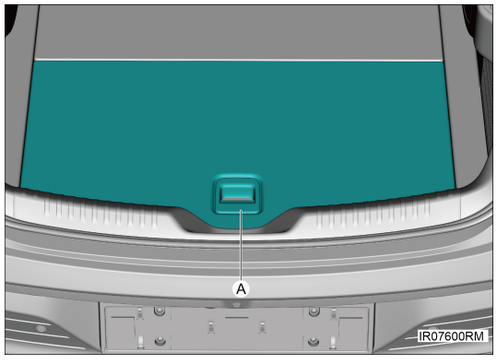
Removal



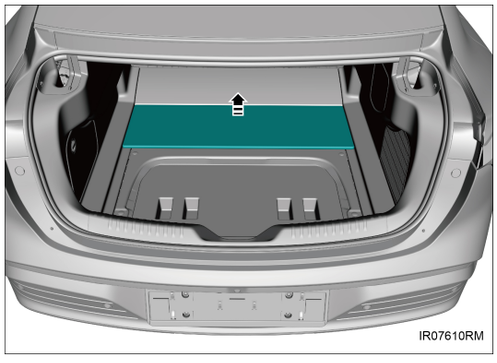
1. **Remove luggage compartment carpet assembly**

   (a) Open luggage compartment door, and pull up -1- to take out luggage compartment carpet assembly from the interior.

2. **Remove luggage compartment carpet assembly (depending on configuration)**



(a) Open luggage compartment door, pull luggage compartment carpet handle -A- to take out luggage compartment carpet from the interior.



(b) Remove the luggage compartment carpet front cover plate from inside the vehicle in the direction of -arrow-.

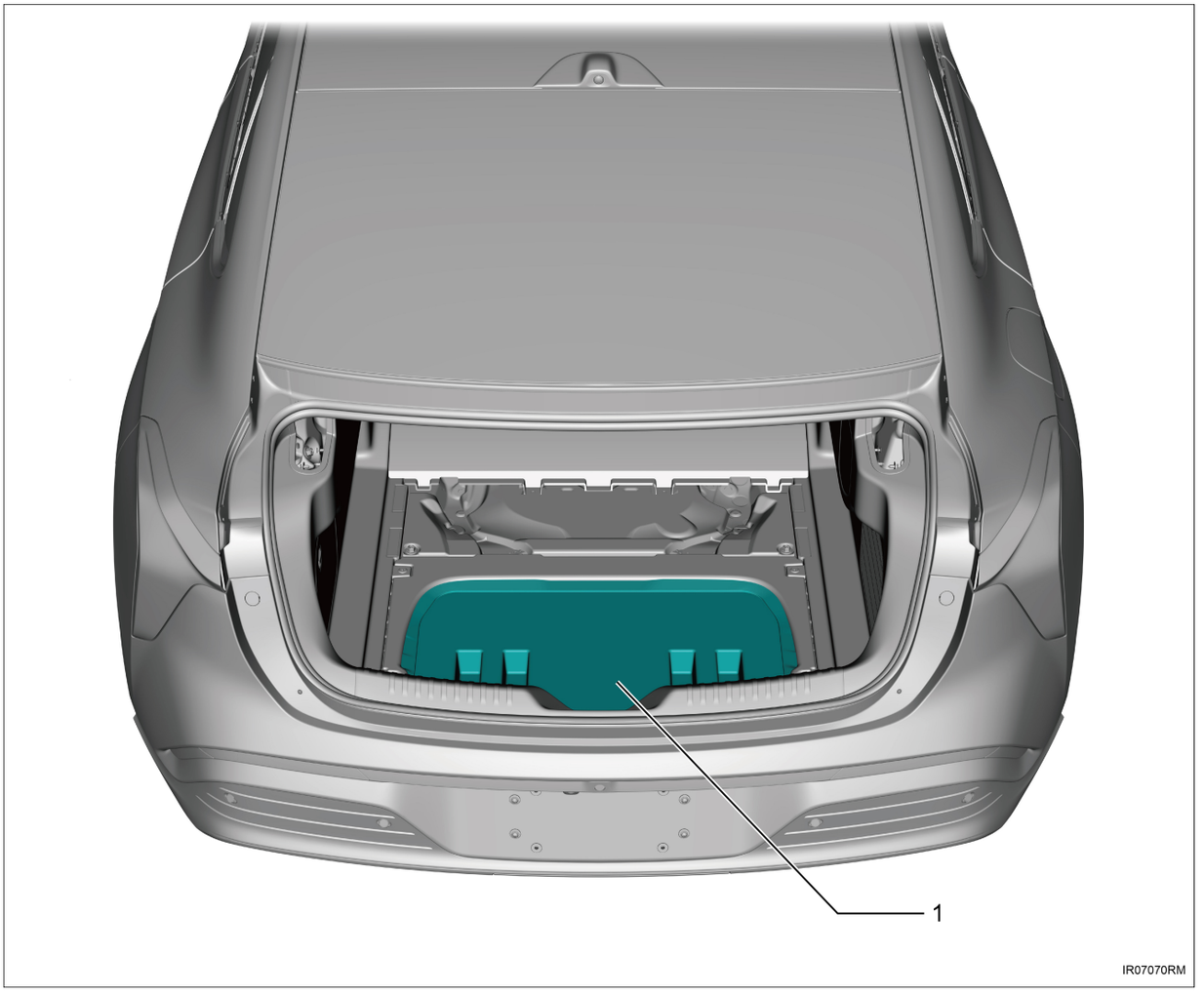
Installation

1. Installation is in the reverse order of removal.

Luggage compartment carpet lower storage box I

Components

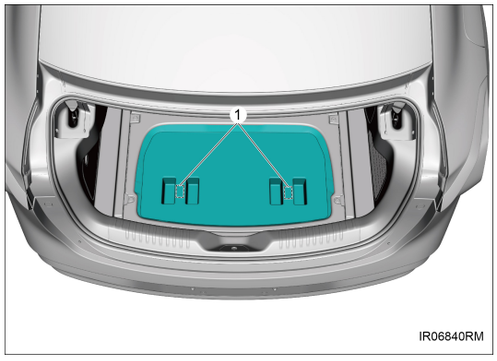
NS



1. **Luggage compartment carpet lower storage box I**

Removal

1. **Remove luggage compartment carpet (See page NS-145)**
2. **Remove luggage compartment carpet lower storage box I (only for Asia)**



(a) Open luggage compartment door, pull up -1- to take out luggage compartment carpet lower storage box I from the interior.

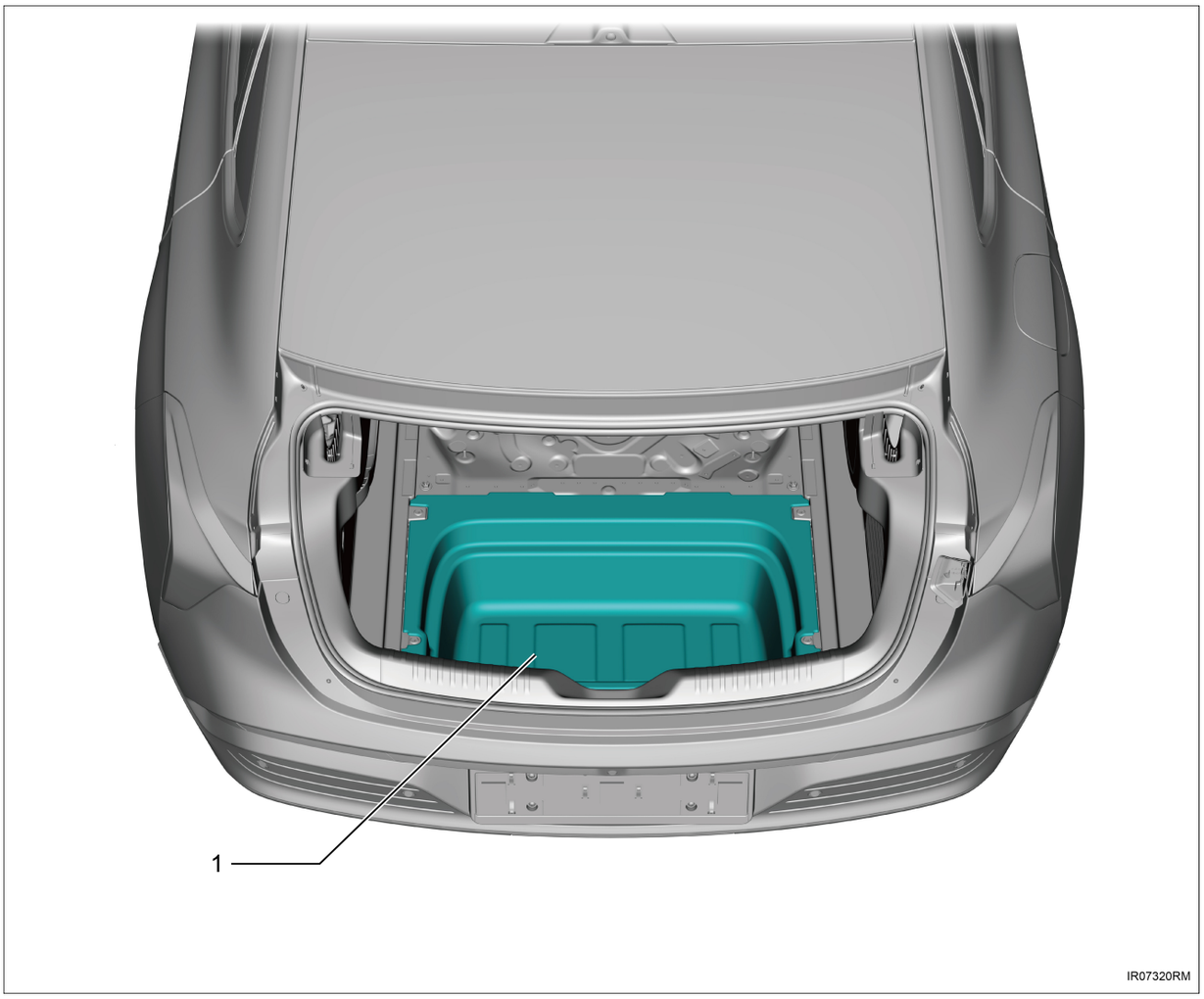
Installation

1. Installation is in the reverse order of removal.

NS

Luggage compartment lower cover

Components

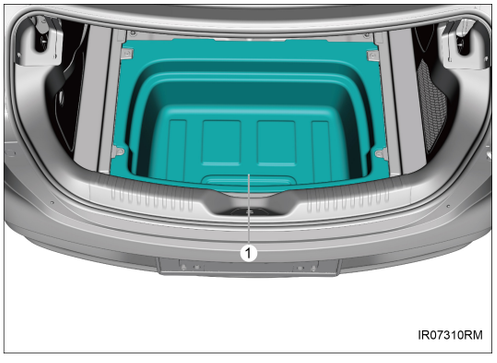


1. Luggage compartment lower cover

Removal

1. **Remove luggage compartment carpet (See page NS-145)**
2. **Remove luggage compartment lower cover (only for Europe)**

   (a) Open luggage compartment door, take out luggage compartment lower cover from the interior at an appropriate angle.

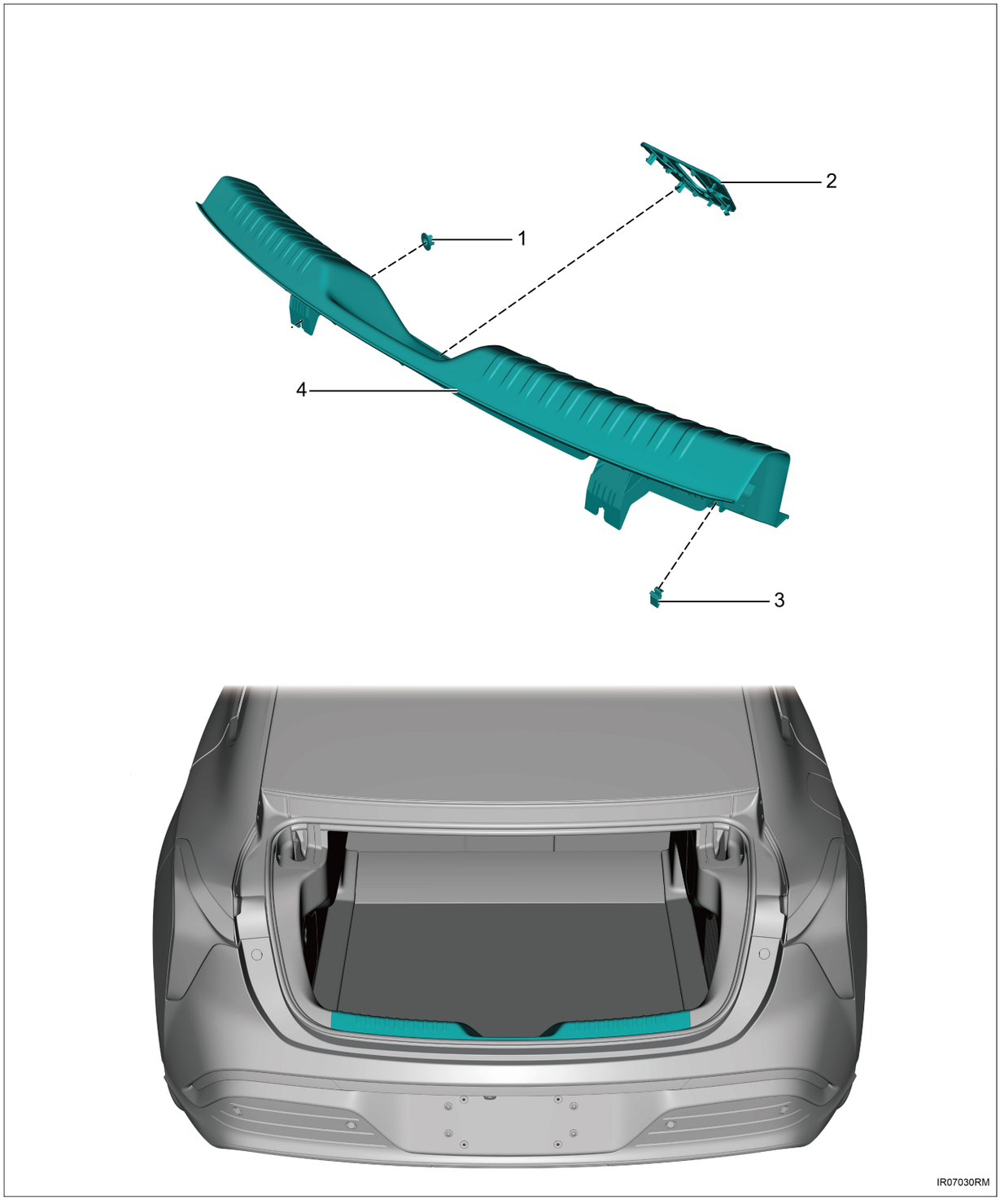


Installation

1. **Installation is in the reverse order of removal.**

Luggage compartment rear end protector

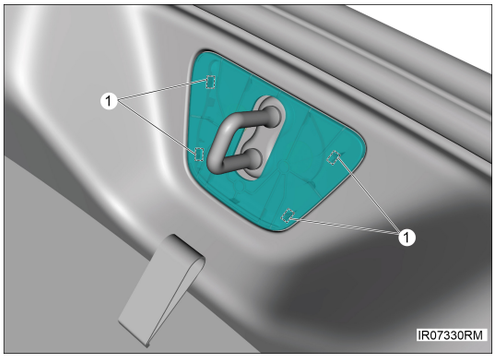
Components



1. **Luggage compartment lock trim cover**
2. **Plastic flange nut**
   - X2
3. **Clip**
   - X4
4. **Luggage compartment rear end protector**

Removal

1. **Open the luggage compartment door.**
2. **Remove luggage compartment lock trim cover**



   (a) Detach the claw -1-.

3. **Remove luggage compartment carpet (See page NS-145)**
4. **Remove luggage compartment carpet lower storage box I (See page NS-148)**

   (Only for Asia)

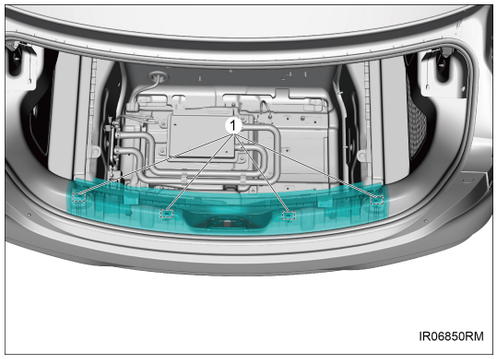
5. **Remove luggage compartment lower cover (See page NS-150)**

   (Only for Europe)

6. **Remove luggage compartment rear end protector**



   (a) Remove the plastic flange nut -1-.



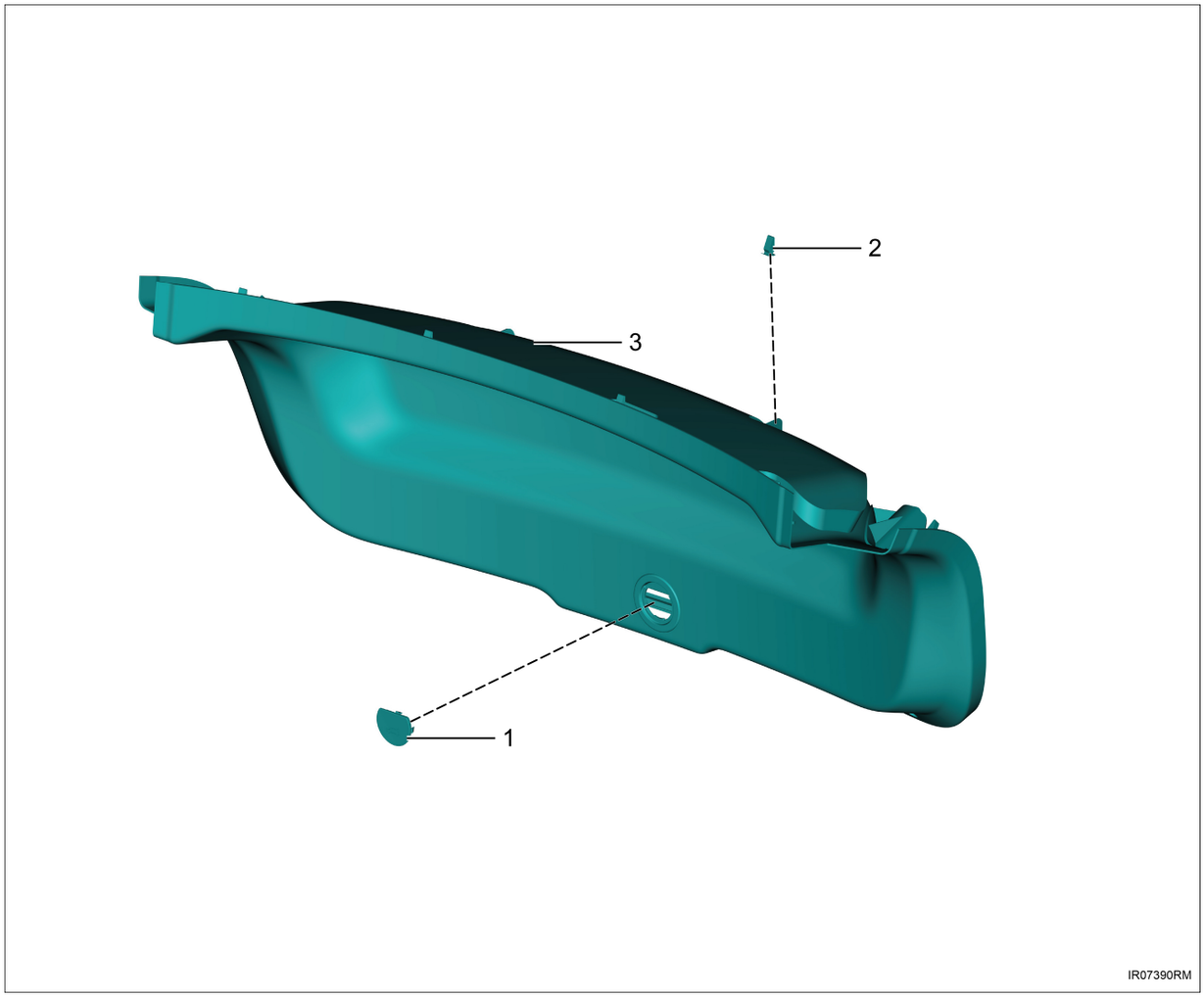
(b) Detach the clip -1-.

Installation

1. Installation is in the reverse order of removal.

Luggage compartment door cover assembly

Components



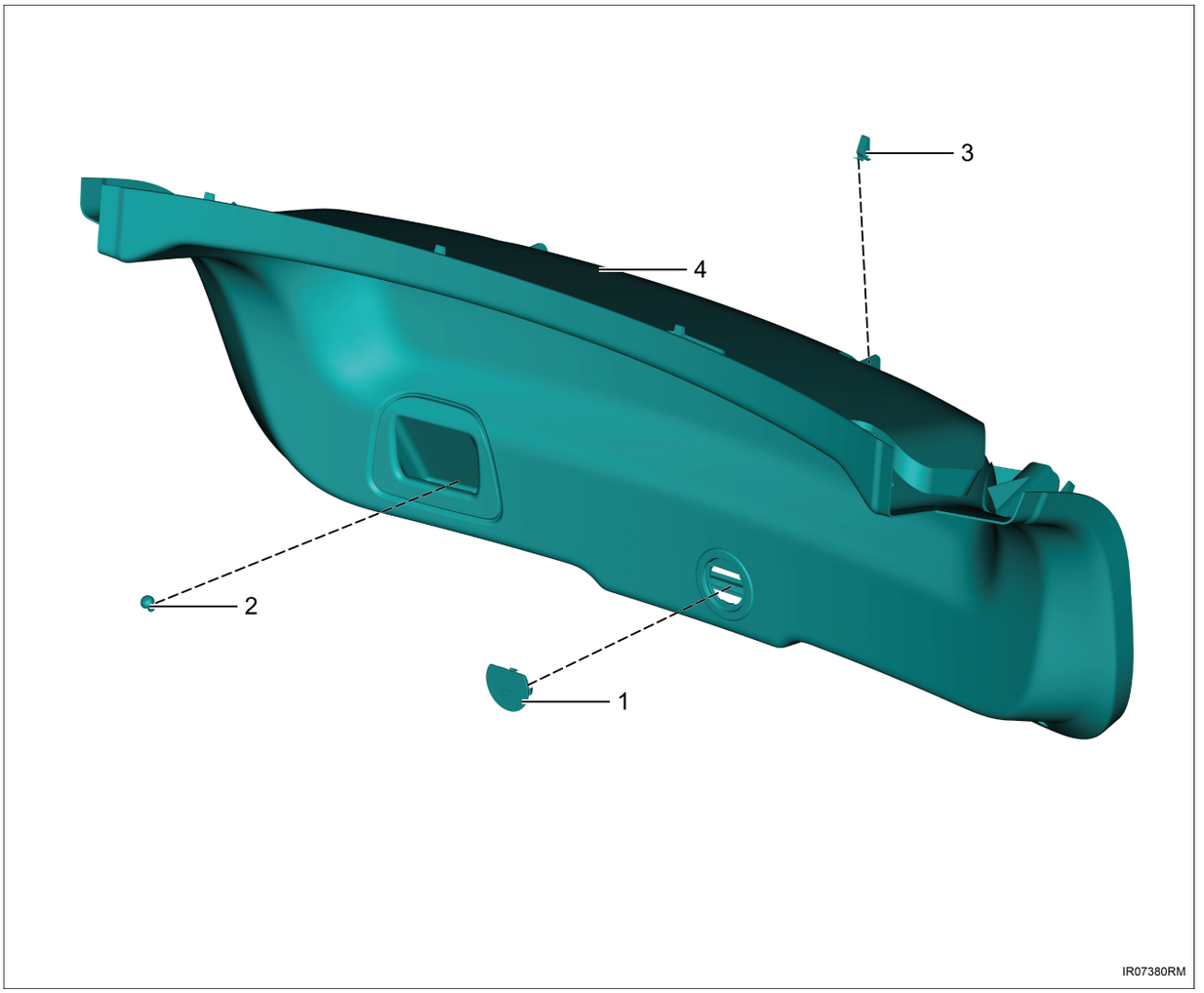
1. Luggage compartment door emergency unlock trim cover

2. Clip

- X10

3. Luggage compartment door cover assembly

Components



1. Luggage compartment door emergency unlock trim cover

2. Screw

3. Clip

- X10

4. Luggage compartment door cover assembly

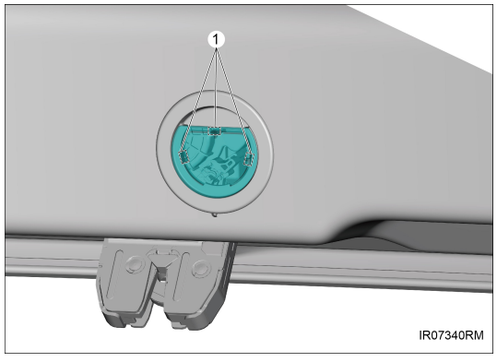
Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Remove luggage compartment door lock boot (See page CS-56)

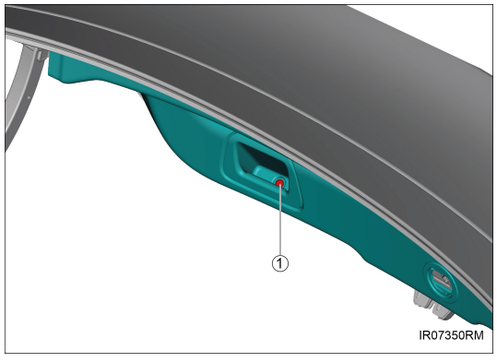
3. Remove luggage compartment close/opener switch assembly (See page ZC-1)

4. Remove luggage compartment door emergency unlock trim cover

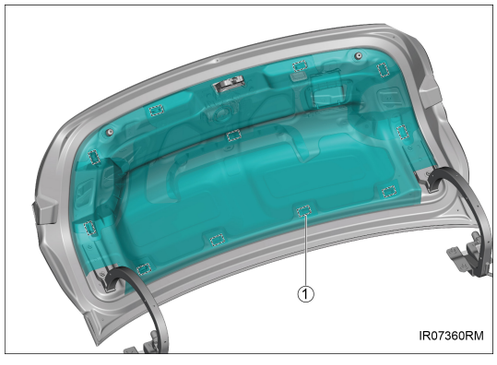


(a) Detach the claw -1-.

5. Remove luggage compartment door cover assembly (only for equipping with luggage compartment door handle)

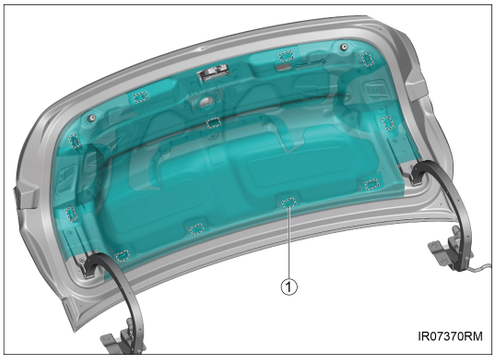


(a) Remove the screw -1-.



(b) (For example) Detach all clips -1-, and remove luggage compartment door cover assembly.

6. Remove luggage compartment door cover assembly (only for equipping with luggage compartment close/opener switch assembly)



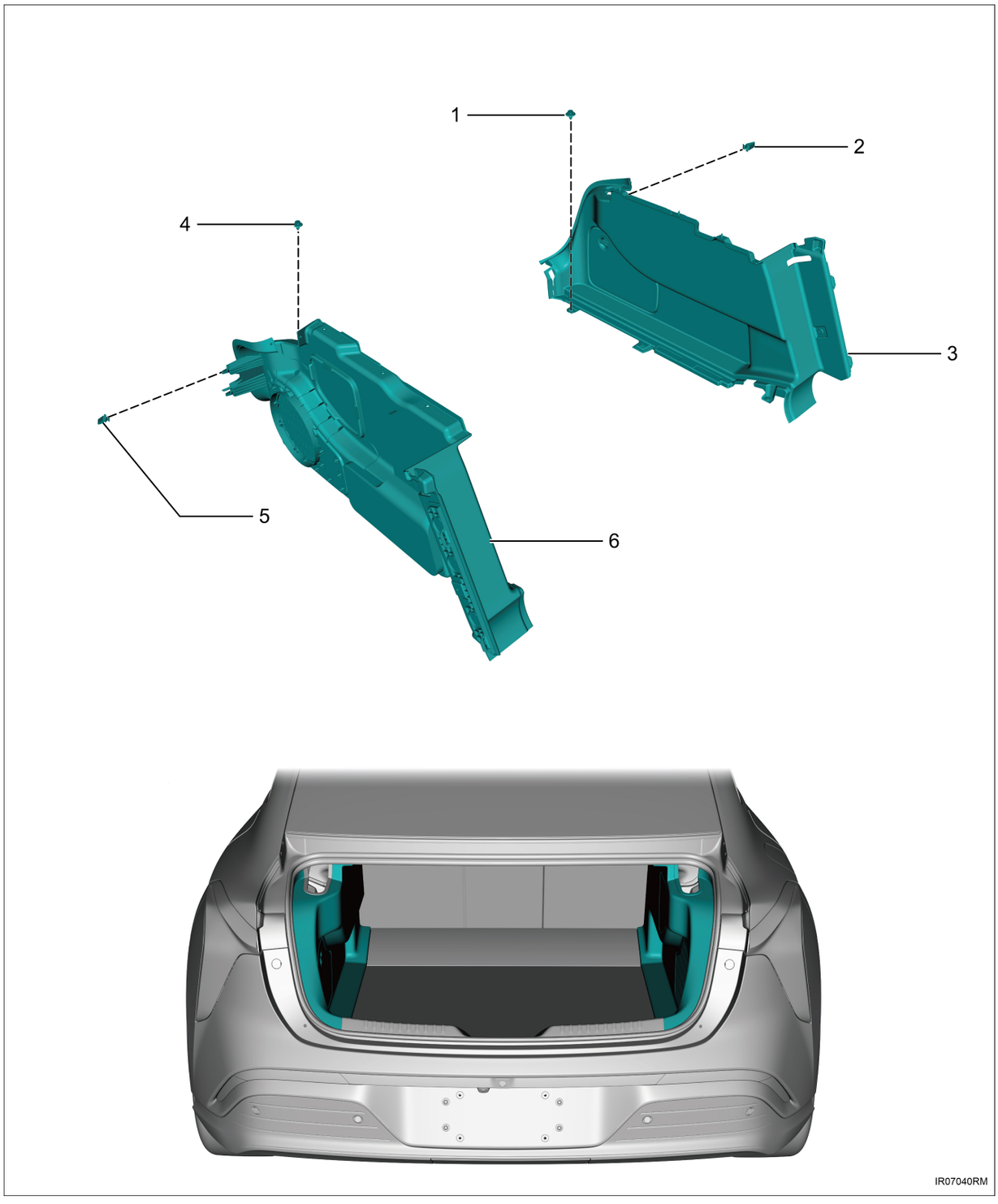
(a) (For example) Detach all clips -1-, and remove luggage compartment door cover assembly.

Installation

1. Installation is in the reverse order of removal.

Luggage compartment side cover

Components



1. **Clip**
   - X7
2. **Clip**
   - X2

3. **Left side of luggage compartment cover**
4. **Clip**
   - X7
5. **Clip**
   - X2
6. **Luggage compartment right cover**

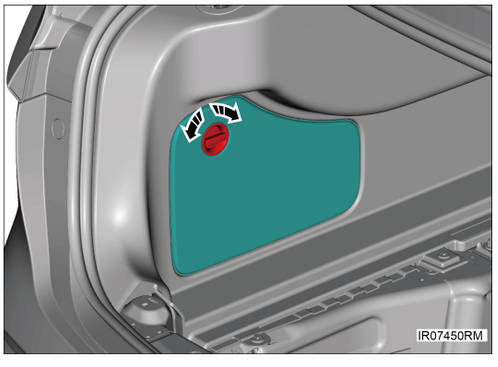
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment carpet (See page NS-145)**
3. **Remove luggage compartment carpet lower storage box I (See page NS-148)**

   (Only for Asia)
4. **Remove luggage compartment lower cover (See page NS-150)**

   (Only for Europe)
5. **Remove luggage compartment rear end protector (See page NS-151)**
6. **Remove luggage compartment left service port cover (only for luggage compartment left cover)**

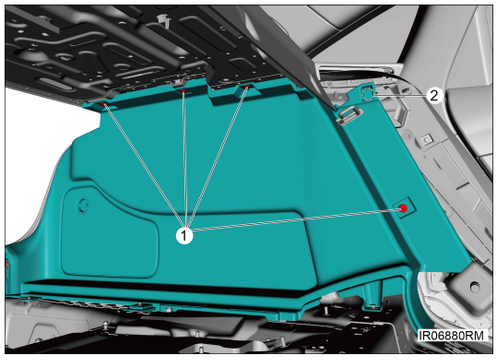
   (a) Rotate in direction of -arrow- and remove the left service port cover.



7. **Remove rear seat cushion (See page NS-92)**
8. **Fold down rear seatback (See page NS-92)**
9. **Remove rear seatback side wing assembly (See page NS-108)**
10. **Remove fixing clip from front part of luggage compartment package rack (See page NS-140)**
11. **Remove luggage compartment front carpet assembly (See page NS-160)**
12. **Remove luggage compartment left cover**

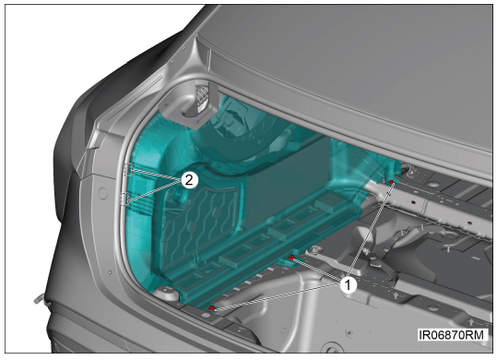
Note:

- Use same removal orders for right and left sides.



(a) Detach the luggage compartment left cover upper clip -1-

(b) Detach the claw -2-.



(c) Detach the luggage compartment left cover lower clip -1- and detach the clip -2-.

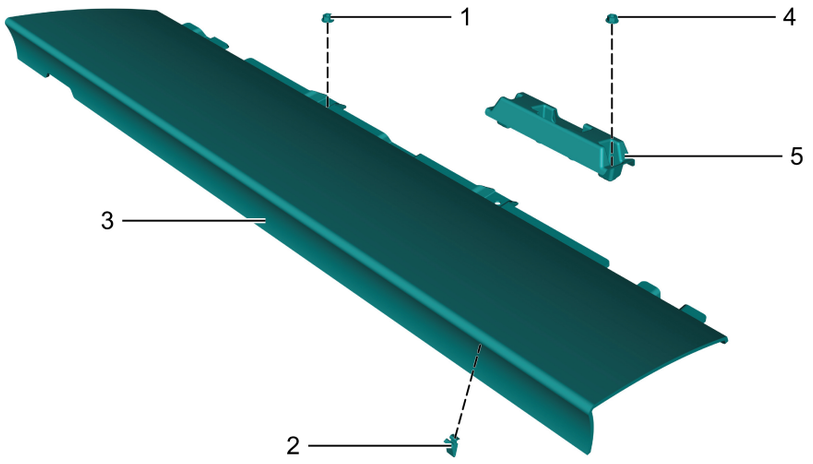
Installation

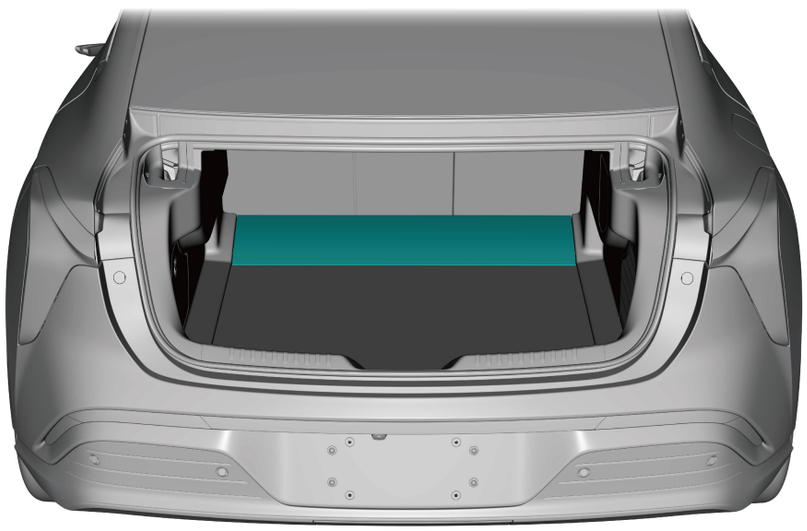
1. **Installation is in the reverse order of removal.**

Luggage compartment front carpet assembly

Components

NS





IR07020RM

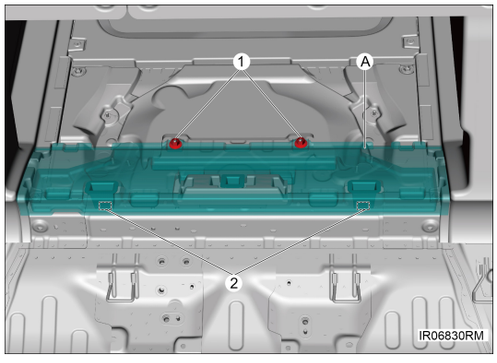
1. **Plastic flange nut**
   - X2
2. **Clip**

- X3

3. **Luggage compartment front carpet assembly**
4. **Nut**
   - X2
   - Torque: 3 ~ 5 N • m
5. **Luggage compartment lower fixing bracket**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear seat cushion assembly (See page NS-92)**
3. **Fold down rear seatback assembly (See page NS-92)**
4. **Remove luggage compartment carpet (See page NS-145)**
5. **Remove luggage compartment front carpet assembly**

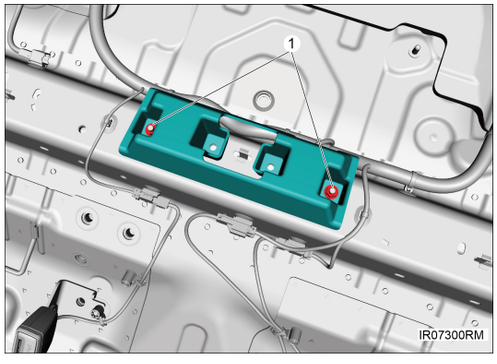


   (a) Remove the nut -1-.

   (b) Detach the clip -2-.

   (c) Take luggage compartment front carpet -A- out of vehicle at an appropriate angle.

6. **Remove luggage compartment lower fixing bracket**



   (a) Remove the nut -1-.

Installation

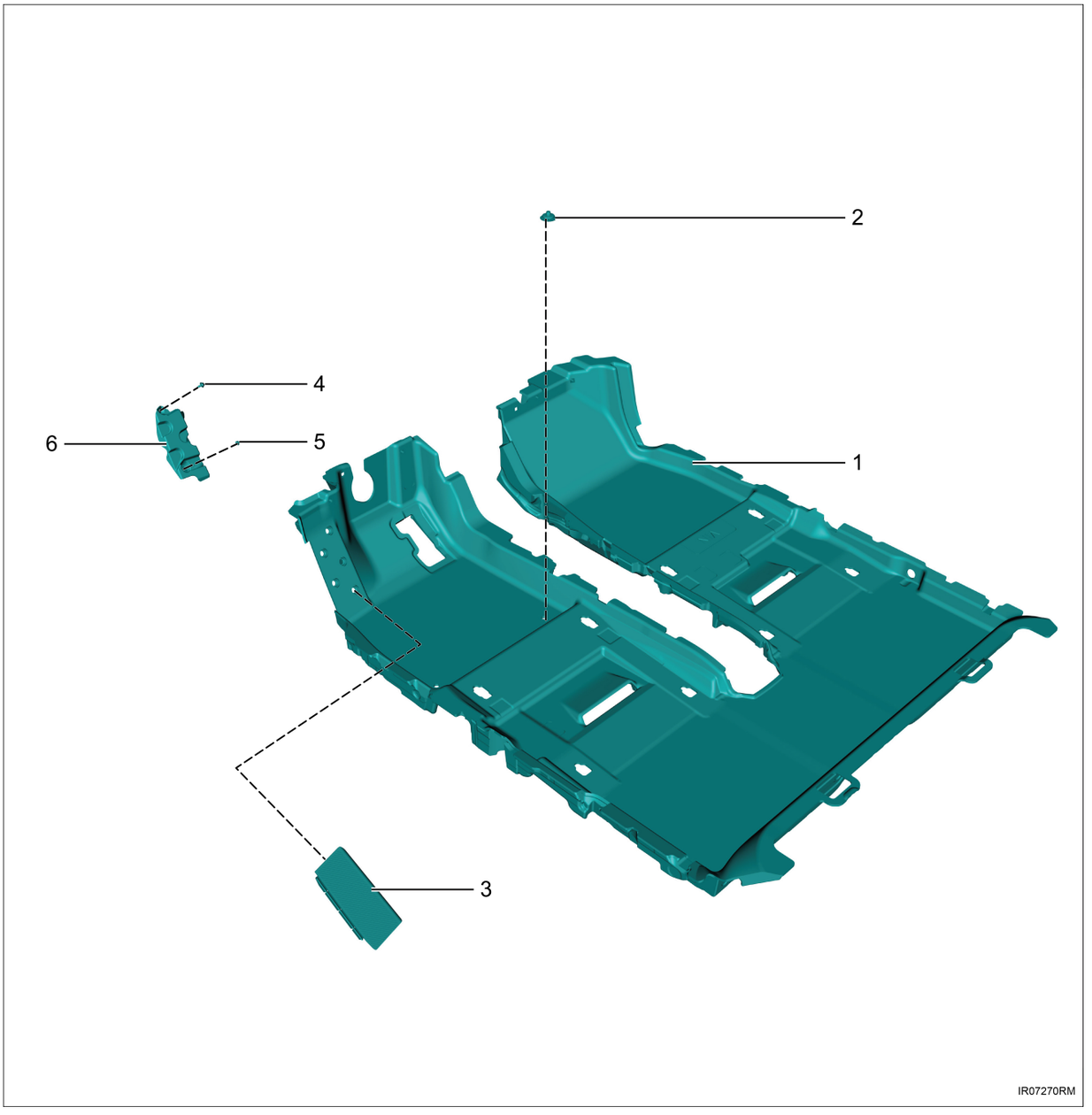
1. **Installation is in the reverse order of removal.**

Roof and carpet

Carpet and gasket

Components

NS



1. **Carpet assembly**
2. **Clip - carpet**
   - X2
3. **Floor mat assembly**
4. **Hexagon flange bolt**
   - Torque: 3 ~ 5 N • m
5. **Hexagon flange nut**

- X2
- Torque: 3 ~ 5 N • m

6. Front left carpet lower bracket

Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Remove A-pillar lower protector (See page NS-130)

3. Remove front doorsill protector (See page NS-126)

4. Remove rear doorsill protector (See page NS-128)

5. Remove B-pillar lower protector (See page NS-133)

6. Remove accelerator pedal assembly (See page ZC-7)

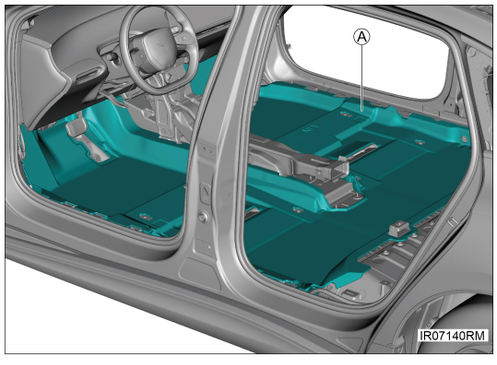
7. Remove driver seat assembly (See page NS-67)

8. Remove front passenger seat assembly (See page NS-67)

9. Remove rear seat cushion assembly (See page NS-92)

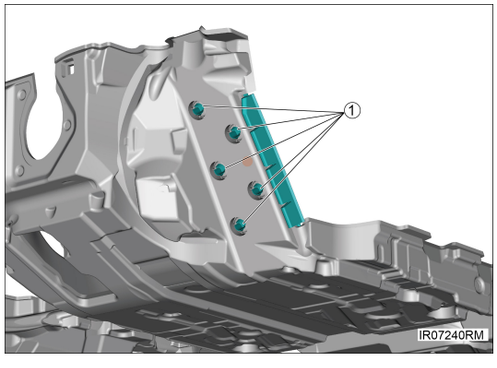
10. Remove auxiliary fascia console assembly (See page NS-49)

11. Remove carpet assembly

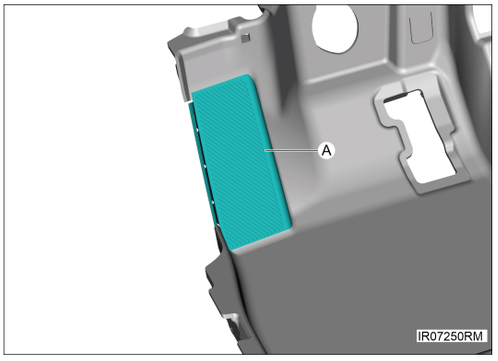


(a) Take out carpet -A- from vehicle at an appropriate angle.

12. Remove floor mat

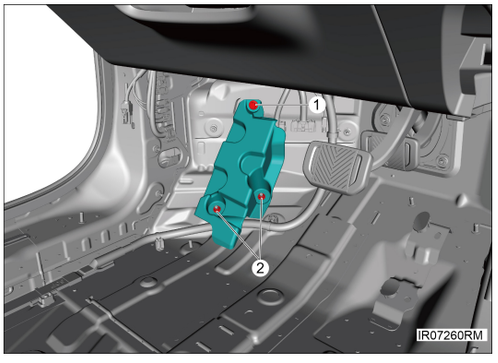


(a) Detach the claw -1-.



(b) Remove the floor mat -A-.

13. Remove front left carpet lower bracket



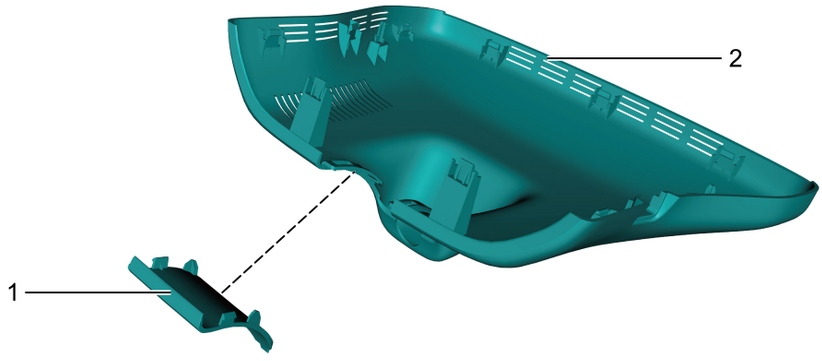
(a) Remove bolt -1- and nut -2-.

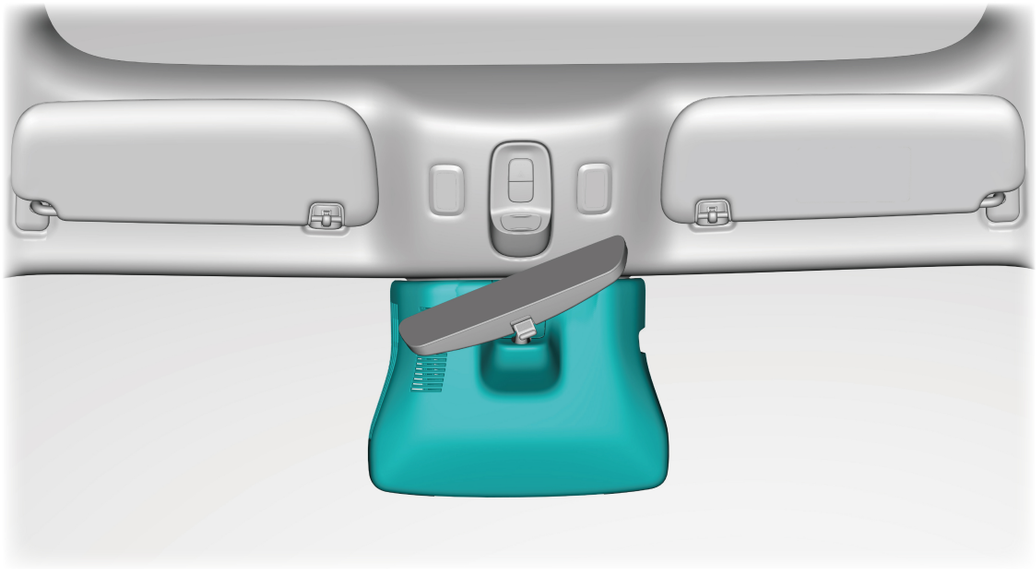
Installation

1. Installation is in the reverse order of removal.

Inside rear view mirror trim cover

Components



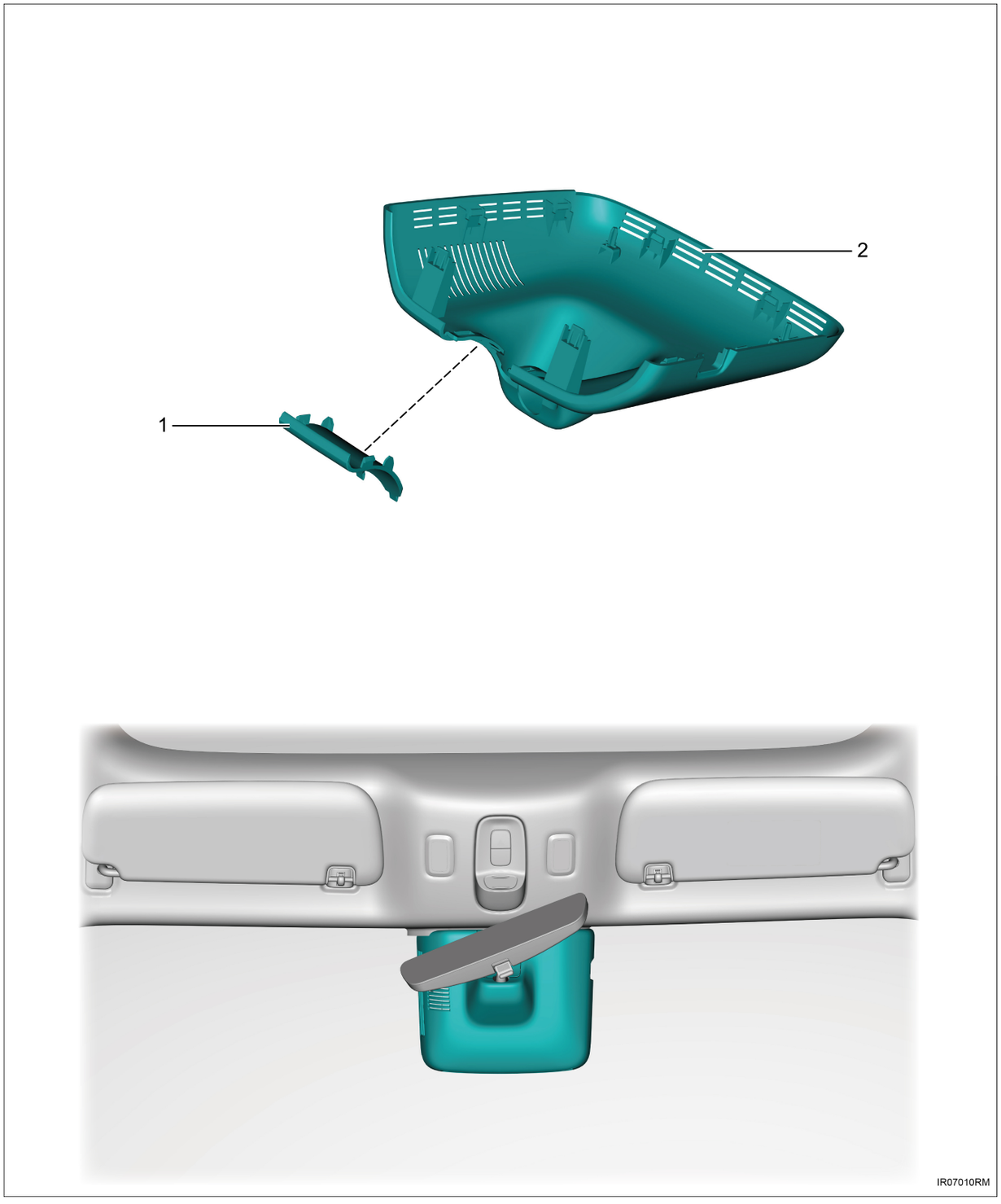


IR07000RM

1. **Inside rear view mirror trim cover II**
2. **Inside rear view mirror trim cover I**

NS

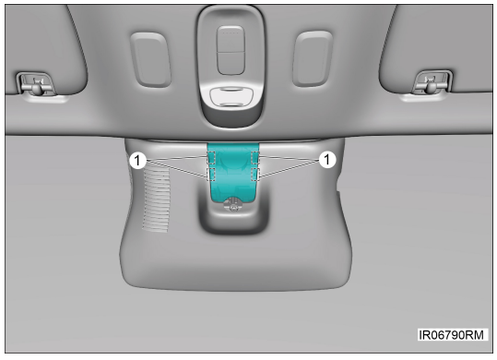
Components



1. **Inside rear view mirror trim cover II**
2. **Inside rear view mirror trim cover I**

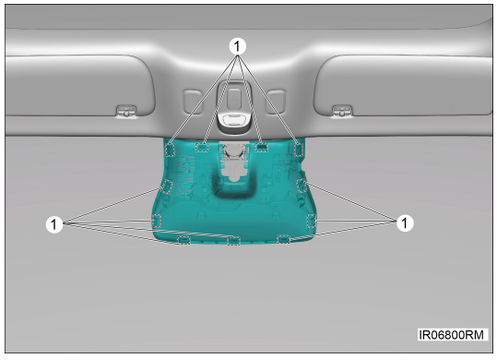
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove inside rear view mirror trim cover II (Asia)**



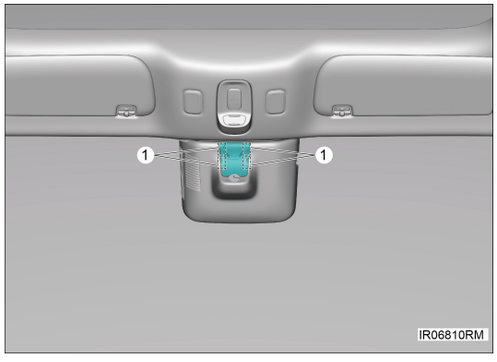
(a) Detach the claw -1-.

3. **Remove inside rear view mirror trim cover I (Asia)**



(a) Detach the claw -1-.

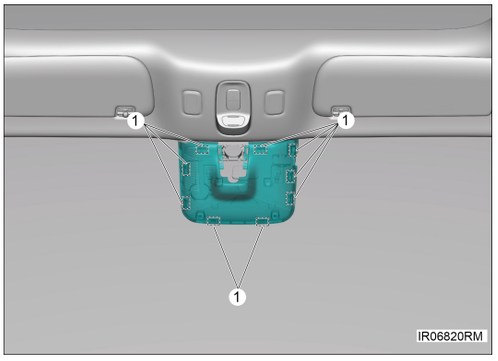
4. **Remove inside rear view mirror trim cover II (Europe)**



(a) Detach the claw -1-.

5. **Remove inside rear view mirror trim cover I (Europe)**

NS



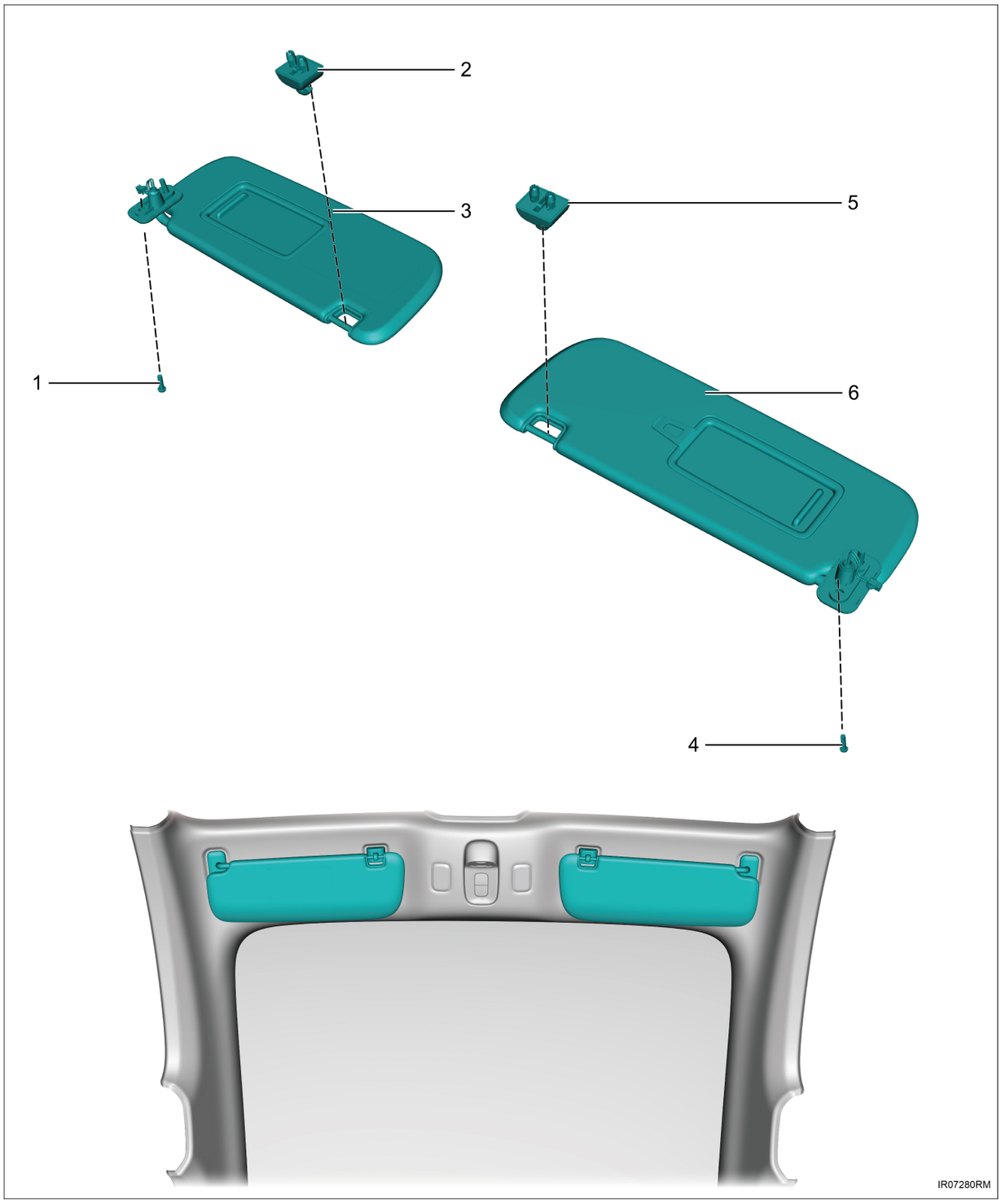
(a) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Sun visor assembly

Components



1. **Cross recess pan head screw**
   - X2
   - Torque: 2.5 ~ 3.5 N • m
2. **Sun visor holder**

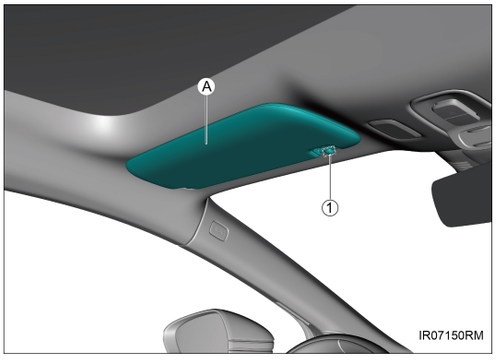
3. **Right sun visor assembly**
4. **Cross recess pan head screw**
   - X2
   - Torque: 2.5 ~ 3.5 N • m
5. **Sun visor holder**
6. **Left sun visor assembly**

Removal

Note:

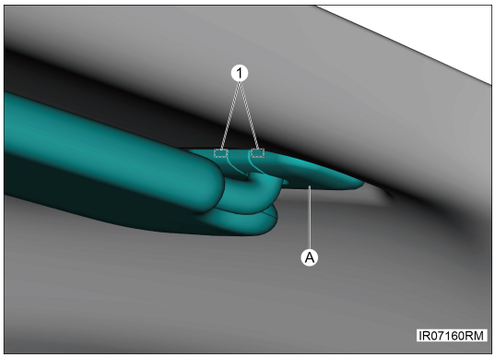
- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove sun visor assembly**

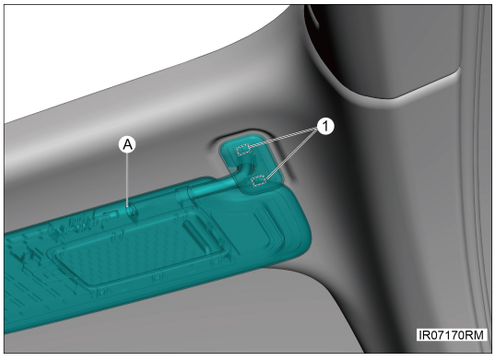


(a) Detach the sun visor fixing shaft -1-.

(b) Rotate the sun visor assembly -A- to door side and detach it.



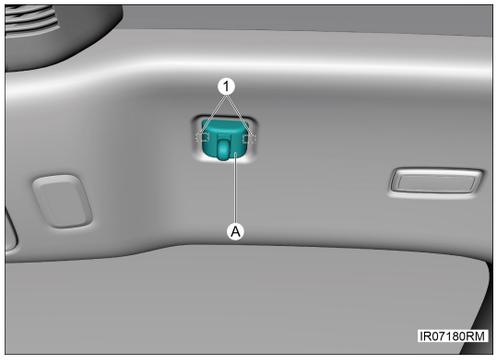
(c) Pry off and detach claw -1- and detach the sun visor holder cover -A-.



(d) Remove screw -1- and detach sun visor assembly.

(e) Disconnect the wire harness connector, and remove the sun visor assembly -A-.

3. **Remove sun visor holder**



(a) Pry the trim cover -1-.

(b) Remove the sun visor holder -A-.

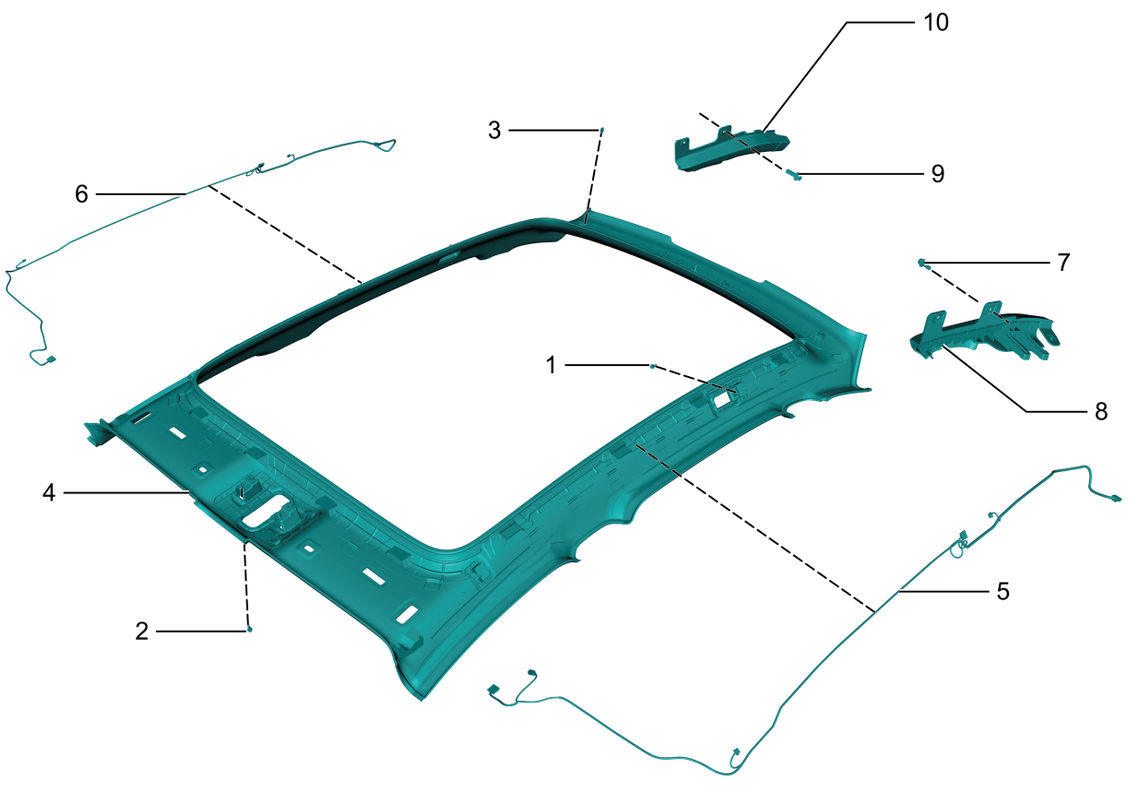
Installation

1. Installation is in the reverse order of removal.

Roof

Components

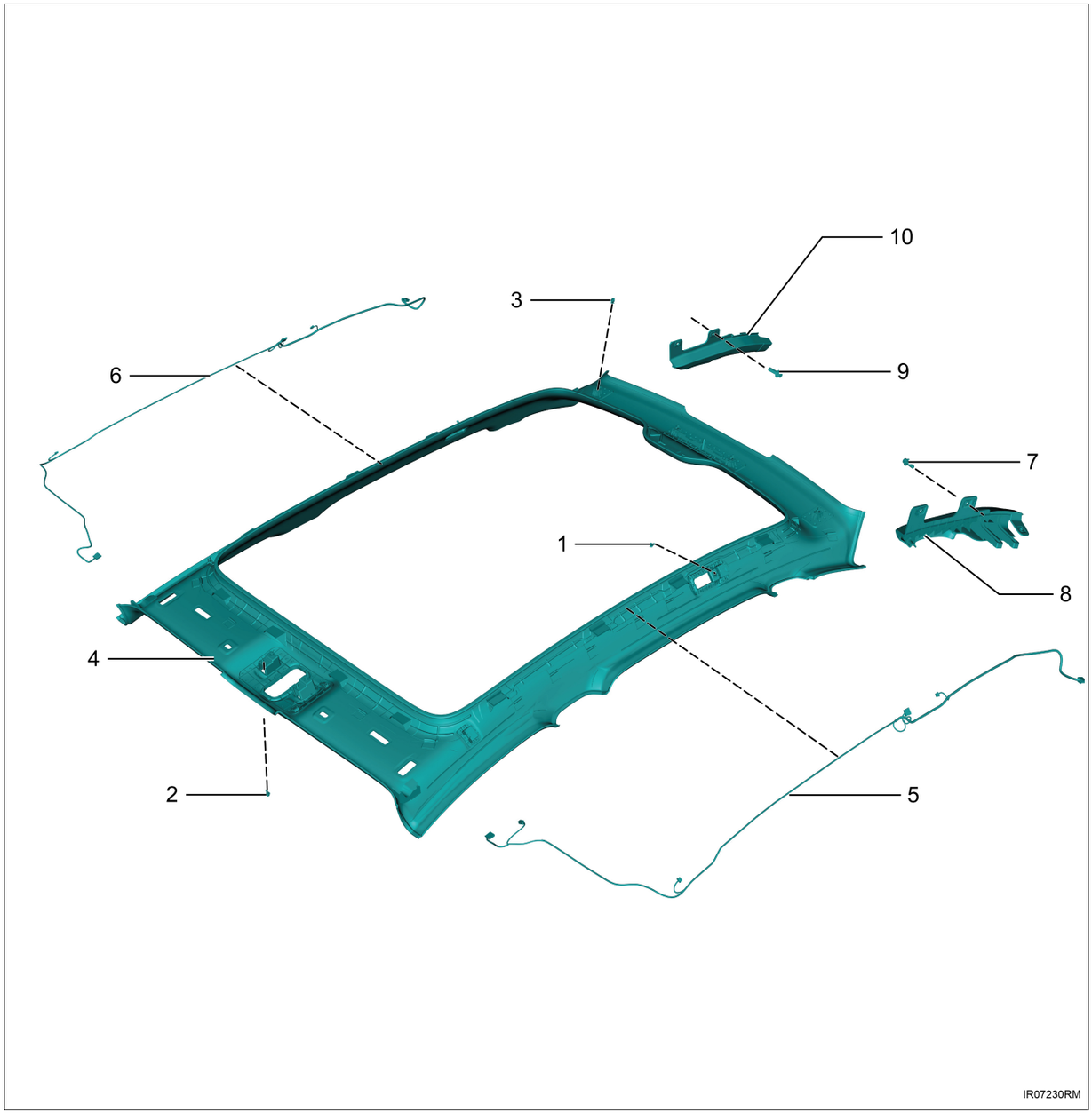
NS



1. **Hexagon flange bolt**
   - X2
   - Torque: 3 ~ 5 N • m
2. **Hexagon flange bolt**
   - X2
   - Torque: 3 ~ 5 N • m
3. **Clip**
   - X4

4. **Roof assembly**
5. **Roof wire harness assembly I**
6. **Roof wire harness assembly II**
7. **Hexagon flange bolt**
   - X6
   - Torque: 3 ~ 5 N • m
8. **Rear left reinforcement bracket**
9. **Rear right reinforcement bracket**

Components



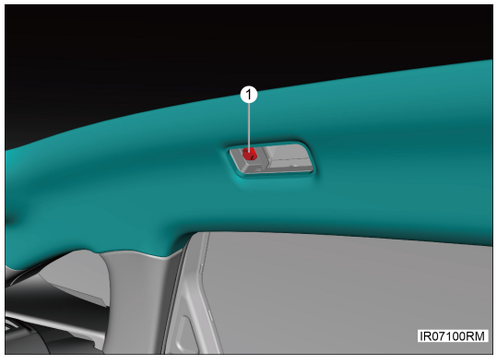
1. **Hexagon flange bolt**

- X2
- Torque: 3 ~ 5 N • m

2. **Hexagon flange bolt**
   - X2
   - Torque: 3 ~ 5 N • m
3. **Clip**
   - X4
4. **Roof assembly**
5. **Roof wire harness assembly I**
6. **Roof wire harness assembly II**
7. **Hexagon flange bolt**
   - X6
   - Torque: 3 ~ 5 N • m
8. **Rear left reinforcement bracket**
9. **Rear right reinforcement bracket**

Removal

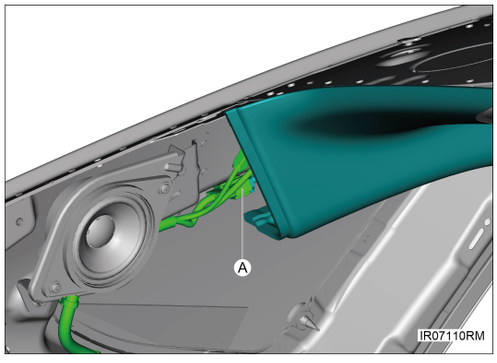
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove A-pillar upper protector assembly (See page NS-130)**
3. **Remove B-pillar upper protector assembly (See page NS-133)**
4. **Remove D-pillar upper protector (See page NS-137)**
5. **Remove C-pillar upper protector assembly (See page NS-137)**
6. **Remove sun visor assembly (See page NS-169)**
7. **Remove sun visor holder assembly (See page NS-169)**
8. **Remove vanity mirror light assembly (See page ZC-22)**
9. **Remove front map light assembly (See page ZC-36)**
10. **Remove rear map light assembly (See page ZC-36)**
11. **Remove roof switch assembly (See page ZC-5)**
12. **Remove roof assembly**



(a) Remove the bolt -1-.

Note:

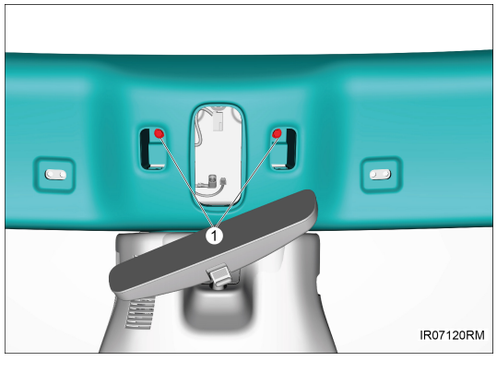
- Use same removal orders for right and left sides.



(b) Disconnect the left D-pillar wire harness connector -A-.

Note:

- Use same removal orders for right and left sides.

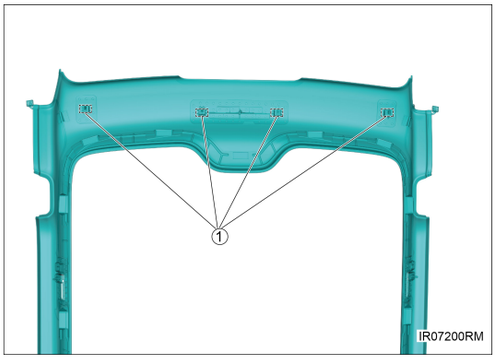


(c) Remove the front fixing bolt -1-.

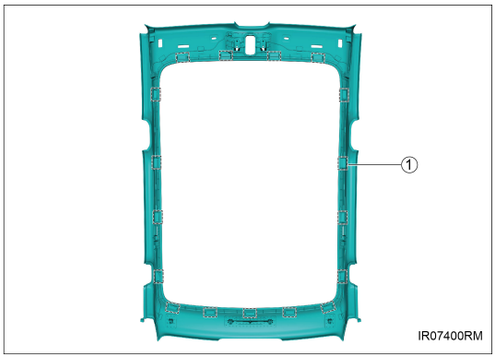


(d) Detach the rear clip -1- from roof assembly.

NS



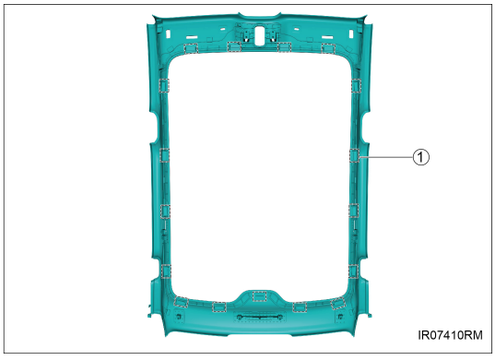
(e) Remove rear clip -1- from roof assembly. (Only for model with rear camera)



(f) (For example) Pull down to detach all roof fixing hook and loop fasteners -1-, and remove roof assembly.

Notice:

- **There will be a few creases when the roof assembly is removed from the vehicle.**
- **The crease-free removal method requires removing the front windshield. (See page CS-3)**



(g) (For example) Pull down to detach all roof fixing hook and loop fasteners -1-, and remove roof assembly (only for models with rear camera).

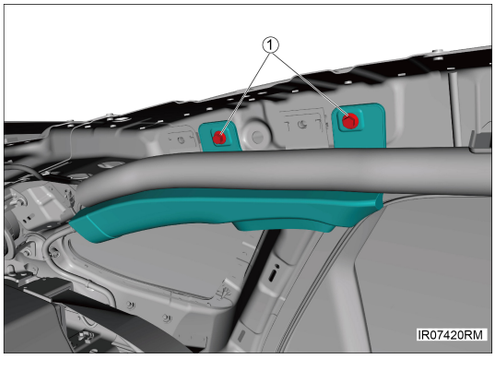
Notice:

- **There will be a few creases when the roof assembly is removed from the vehicle.**
- **The crease-free removal method requires removing the front windshield. (See page CS-3)**

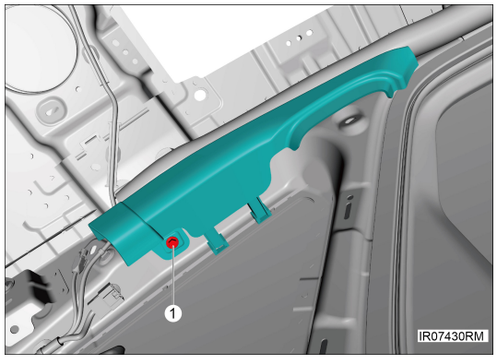
13. Remove rear left reinforcement bracket

Note:

- Use same removal orders for right and left sides.



(a) Remove the upper bolt -1-.



(b) Remove the lower bolt -1-.

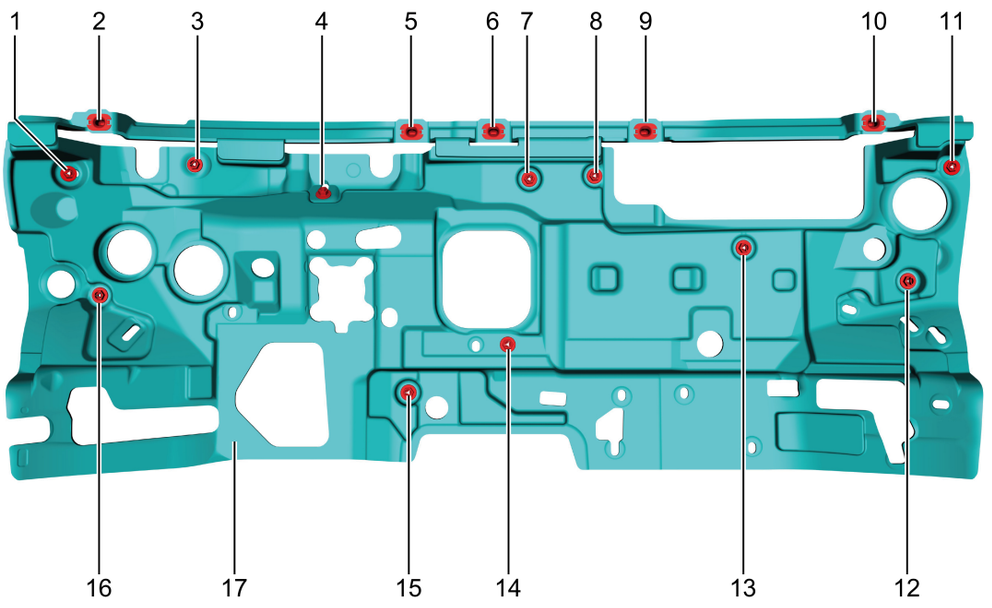
Installation

1. Installation is in the reverse order of removal.

Cowl panel gasket assembly

Components

NS



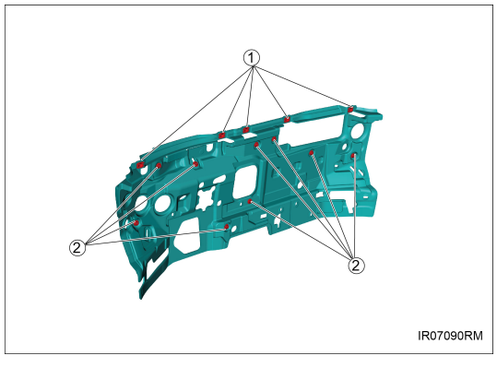
IR07210RM

1. **Plastic flange nut**
2. **Clip**
3. **Plastic flange nut**
4. **Plastic flange nut**
5. **Clip**
6. **Clip**
7. **Plastic flange nut**
8. **Plastic flange nut**

9. **Clip**
10. **Clip**
11. **Plastic flange nut**
12. **Plastic flange nut**
13. **Plastic flange nut**
14. **Plastic flange nut**
15. **Plastic flange nut**
16. **Plastic flange nut**
17. **Cowl panel gasket assembly**

Removal

1. **Remove auxiliary fascia console assembly (See page NS-49)**
2. **Remove instrument panel assembly (See page NS-40)**
3. **Remove brake pedal and bracket assembly (See page DP-28)**
4. **Remove steering intermediate shaft with dust boot assembly (See page DP-47)**
5. **Remove front HVAC assembly (See page RE-19)**
6. **Remove cowl panel gasket assembly**



(a) Remove the clip -1-.

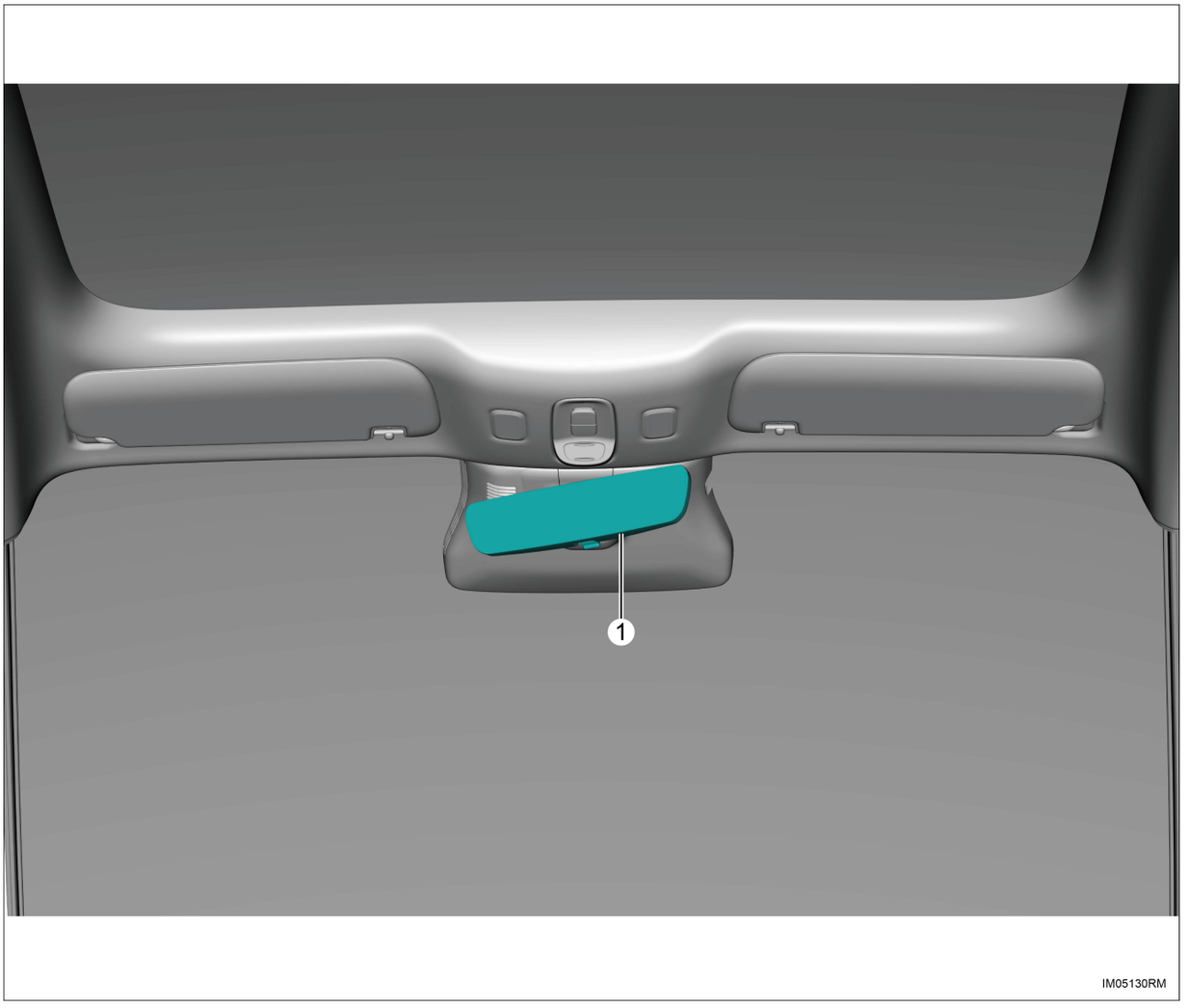
(b) Remove the plastic flange nut -2-.

Installation

1. **Installation is in the reverse order of removal.**

Inside rear view mirror

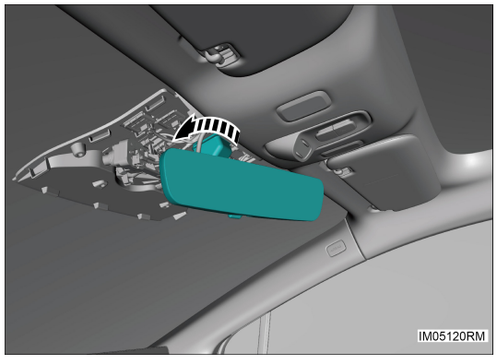
Components



1. **Inside rear view mirror assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove inside rear view mirror trim cover I (See page NS-165)**
3. **Remove inside rear view mirror trim cover II (See page NS-165)**
4. **Remove inside rear view mirror assembly**



(a) Rotate in direction of -arrow- and remove inside rear view mirror assembly.

Installation

1. Installation is in the reverse order of removal.

Exterior

Bumper system

Front bumper assembly WS-1
Rear bumper assembly WS-13
Bumper crossmember WS-20
Rear bumper attachment assembly WS-28

Bottom protector system

Front wheel protector WS-32
Rear wheel protector WS-37
Engine bottom protector assembly WS-40
Rear suspension bottom protector assembly WS-47
Lifting block WS-50

Functional part system

Charging port cover assembly WS-52
Rain sensor assembly WS-54
Front wiper blade WS-58
Front wiper arm WS-60
Front wiper motor link assembly WS-62
Washer nozzle assembly WS-65
Washer pump WS-68
Washer fluid level sensor WS-70
Washer fluid reservoir assembly WS-72
Outside rear view mirror WS-74

Front compartment protector system

Front compartment upper protector WS-79
Front compartment storage box WS-83
Water channel cover plate assembly WS-86
Water channel baffle assembly WS-89
Wing rear protector WS-92
Front compartment cover heat insulator WS-94
Front compartment cover lock upper protector WS-96
Front end frame assembly WS-98

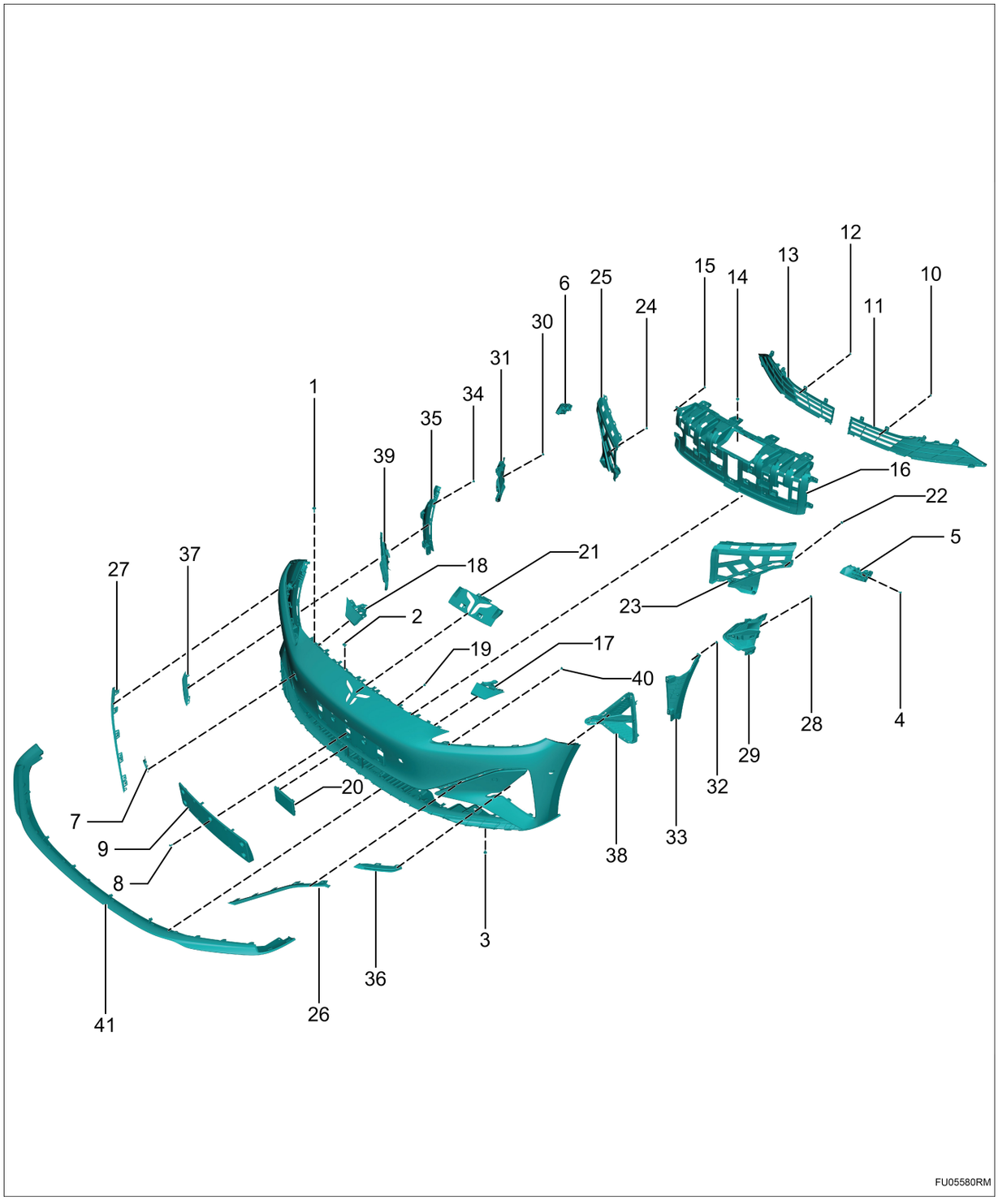
Ornament system

Vehicle logo WS-101
Wing trim strip WS-104
Luggage compartment door trim strip WS-107
Door trim strip WS-109
Doorsill trim panel WS-111
B-pillar, C-pillar trim cover plate assemblies WS-116
Door cover plate WS-119

Bumper system

Front bumper assembly

Components



1. Combination bolt

- X6

- Torque: 3.0 ~ 5.0 N • m

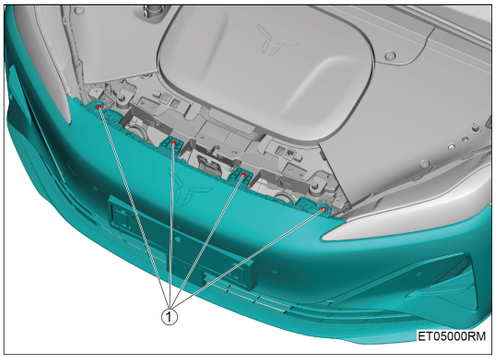
2. **Clip**
   - X2
3. **Combination bolt**
   - X4
   - Torque: 3.0 ~ 5.0 N • m

4. **Self-tapping screw**
   - X4
   - Torque: 1 ~ 2 N • m
5. **Front bumper left bracket**
6. **Front bumper right bracket**
7. **Front bumper towing hook cover**
8. **Self-tapping screw**
   - X5
9. **Front bumper license plate holder**
10. **Self-tapping screw**
    - X7
11. **Front bumper left grille**
12. **Self-tapping screw**
    - X7
13. **Front bumper right grille**
14. **Self-tapping screw**
    - X6
15. **Self-tapping screw**
    - X5
16. **Front bumper center bracket**
17. **Front bumper left ornament IV**
18. **Front bumper right ornament IV**
19. **Self-tapping screw**
    - X4
20. **Front bumper center ornament I**
21. **Front bumper center ornament II**
22. **Self-tapping screw**
    - X2
23. **Front bumper left support panel I**
24. **Self-tapping screw**
    - X2
25. **Front bumper right support panel I**

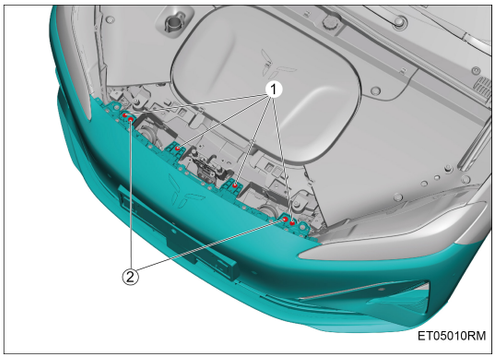
26. **Front bumper left trim strip I**
27. **Front bumper right trim strip I**
28. **Self-tapping screw**
    - X5
29. **Front bumper left deflector I**
30. **Self-tapping screw**
    - X5
31. **Front bumper right deflector I**
32. **Self-tapping screw**
    - X4
33. **Front bumper left deflector II**
34. **Self-tapping screw**
    - X4
35. **Front bumper right deflector II**
36. **Front bumper left ornament III**
37. **Front bumper right ornament III**
38. **Front bumper left ornament II**
39. **Front bumper right ornament II**
40. **Self-tapping screw**
    - X8
41. **Front bumper lower protector**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment cover lock upper protector (See page WS-96)**
3. **Raise the vehicle.**
4. **Remove front wheel assembly (See page DP-116)**
5. **Remove engine bottom protector assembly (See page WS-40)**
6. **Remove front bumper assembly**

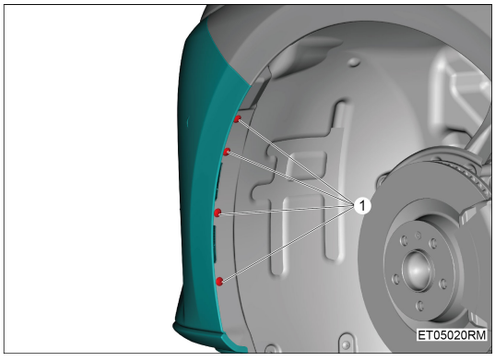


(a) Remove the bolt -1-.



(b) Remove the bolt -1-.

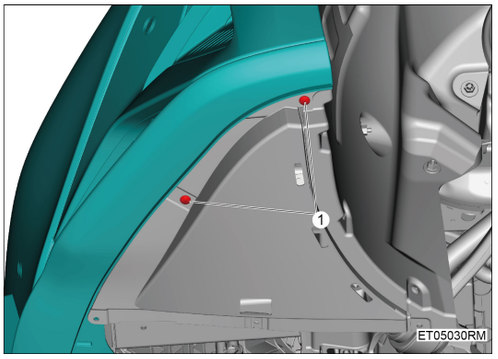
(c) Remove the clip -2-.



(d) Remove the screw -1-.

Note:

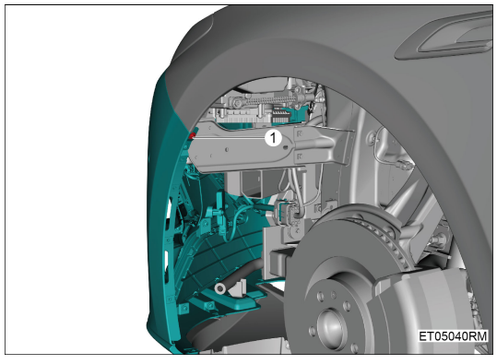
- Use same removal orders for right and left sides.



(e) Remove the screw -1-.

Note:

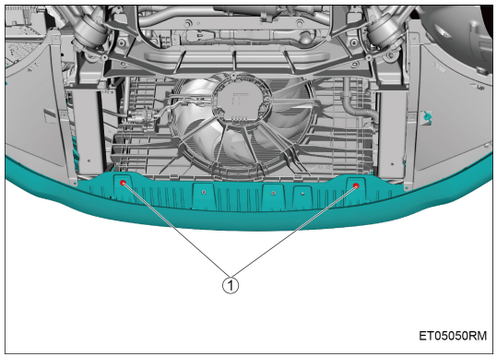
- Use same removal orders for right and left sides.



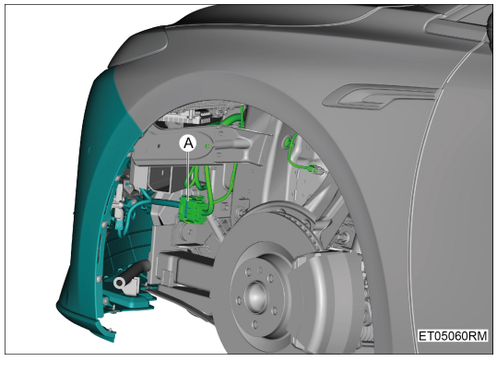
(f) Detach the front left wheel house and remove screw -1-.

Note:

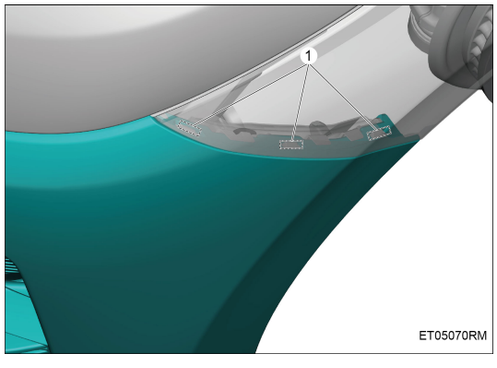
- Use same removal orders for right and left sides.



(g) Remove bolt -1- from lower part of front bumper assembly.



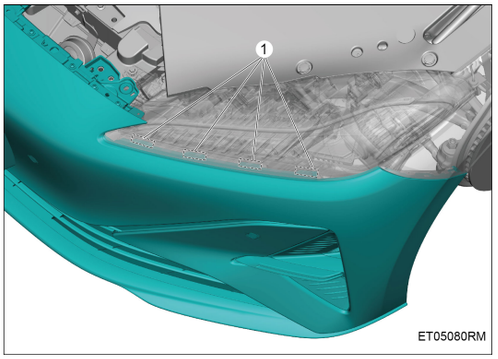
(h) Disconnect the front bumper wire harness connector -A-.



(i) Detach the left claw -1- from front bumper assembly.

Note:

- Use same removal orders for right and left sides.



(j) Detach the lower claw -1- from front combination light assembly.

Note:

- Use same removal orders for right and left sides.

(k) Remove the front bumper assembly.

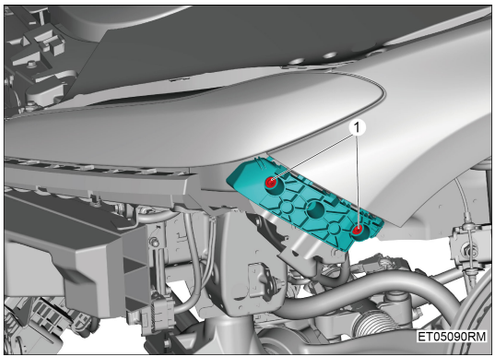
Note:

- Remove front bumper assembly with two people working together on the left and right sides.

7. Remove front bumper left bracket

Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

8. Remove front mark light assembly

9. Remove outside temperature sensor assembly (See page RE-16)

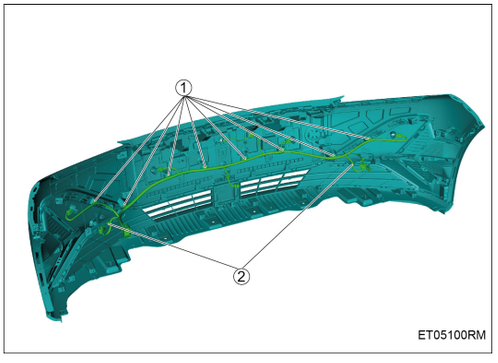
10. Remove digital key front antenna assembly (See page ZC-106)

11. Remove front ultrasonic sensor (See page ZC-124)

12. Remove ultrasonic sensor bracket (See page ZC-124)

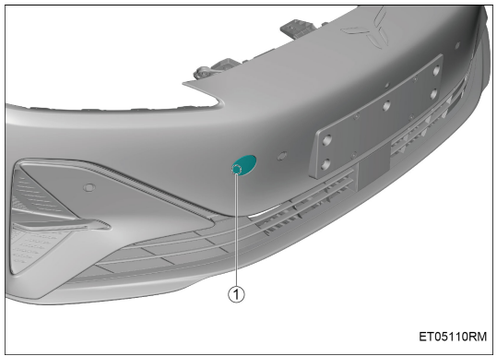
13. Remove front camera and bracket assembly (See page ZC-146)

14. Remove front bumper wire harness assembly



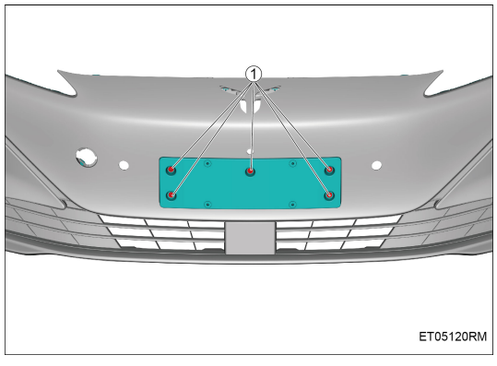
(a) (For example) Detach all clips -1-2-.

15. Remove front bumper towing hook cover

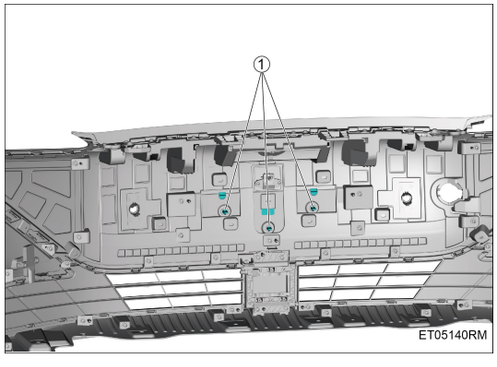


(a) Press the position indicated by -1- and remove front bumper towing hook cover.

16. Remove front bumper license plate holder (Asia)

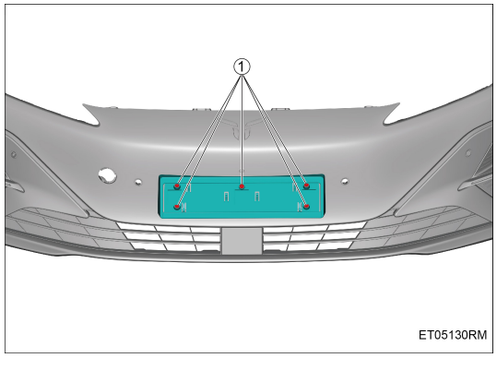


(a) Remove the screw -1-.

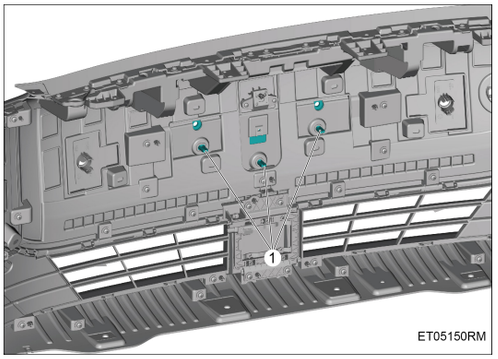


(b) Detach the claw -1-.

17. Remove front bumper license plate holder (Europe)



(a) Remove the screw -1-.

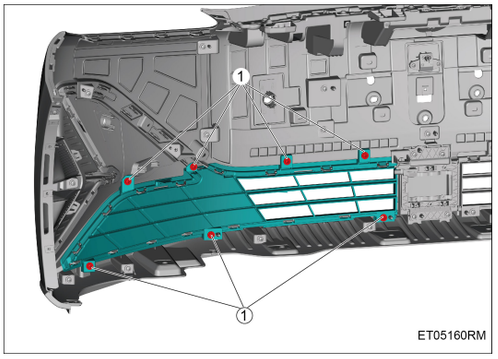


(b) Detach the claw -1-.

18. Remove front bumper left grille

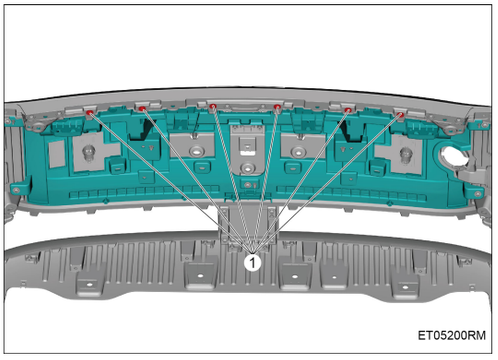
Note:

- Use same removal orders for right and left sides.

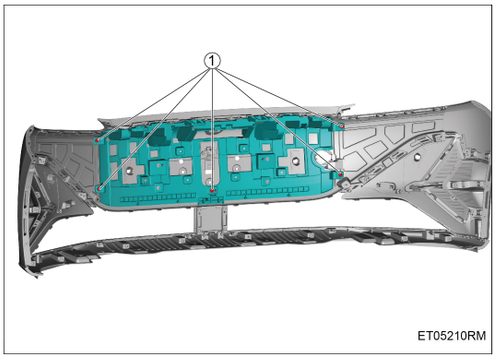


(a) Remove the screw -1-.

19. Remove front bumper center bracket



(a) Remove the screw -1-.

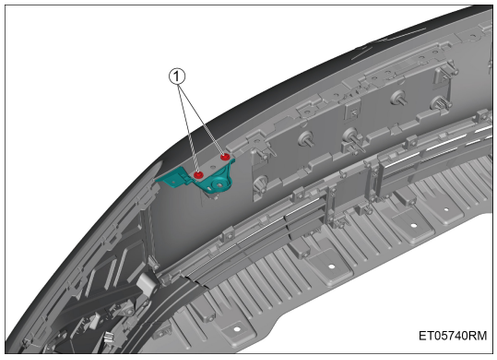


(b) Remove the screw -1-.

20. Remove front bumper left ornament IV

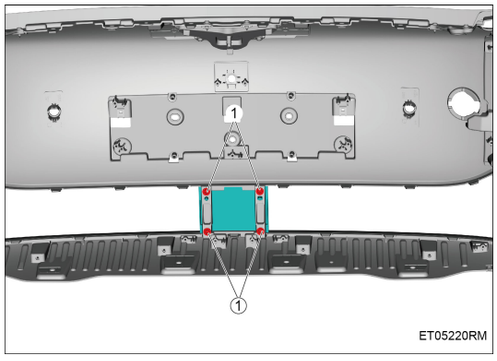
Note:

- Use same removal orders for right and left sides.



(a) Remove the screw -1-.

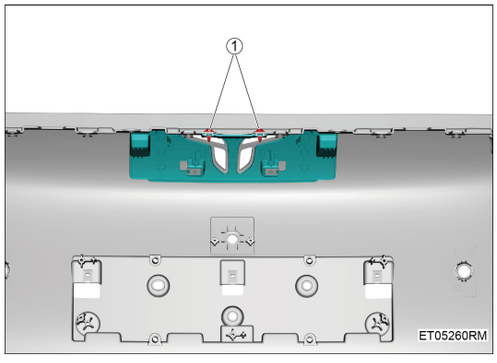
21. Remove front bumper center ornament I



(a) Remove the screw -1-.

22. Remove front millimeter wave radar assembly (See page ZC-110)

23. Front bumper center ornament II

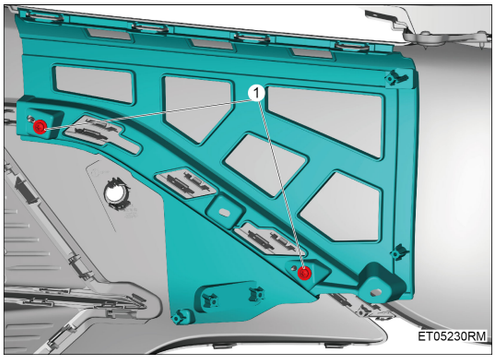


(a) Remove the screw -1-.

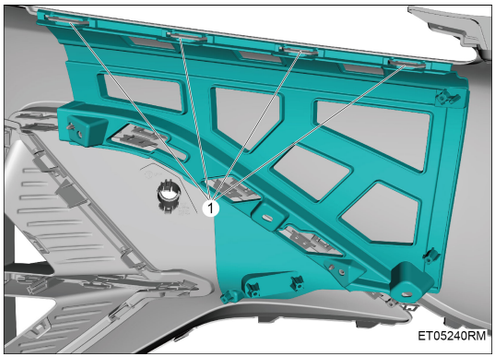
24. Remove front bumper left support panel I

Note:

- Use same removal orders for right and left sides.



(a) Remove the screw -1-.

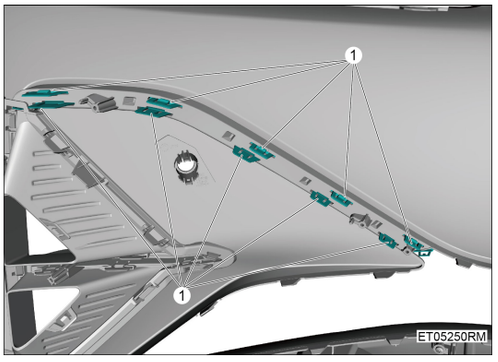


(b) Detach the claw -1-.

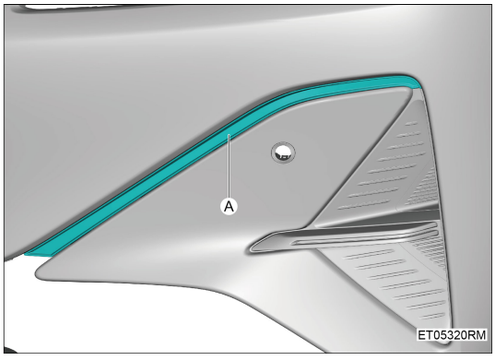
25. Remove front bumper left trim strip l

Note:

- Use same removal orders for right and left sides.



(a) Detach the claw -1-.

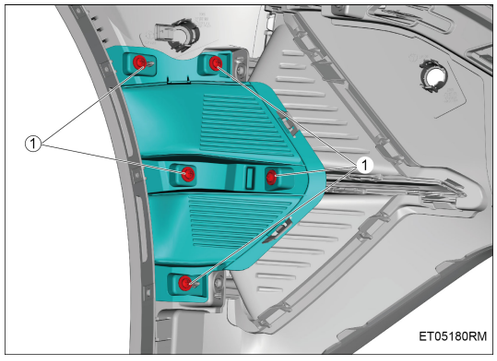


(b) Remove the front bumper left trim strip l-A-.

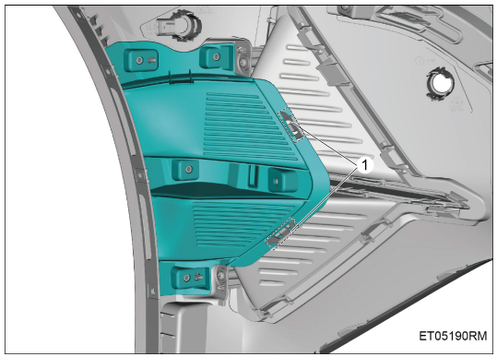
26. Remove front bumper left deflector l

Note:

- Use same removal orders for right and left sides.



(a) Remove the screw -1-.

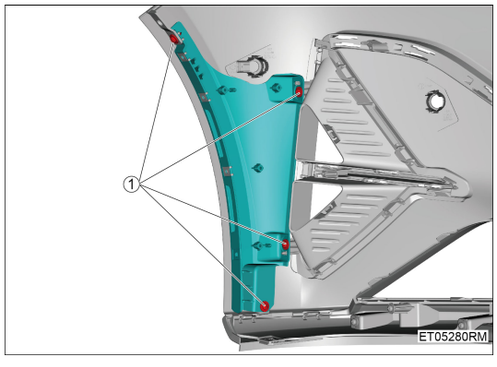


(b) Detach the claw -1-.

27. Remove front bumper left deflector II

Note:

- Use same removal orders for right and left sides.

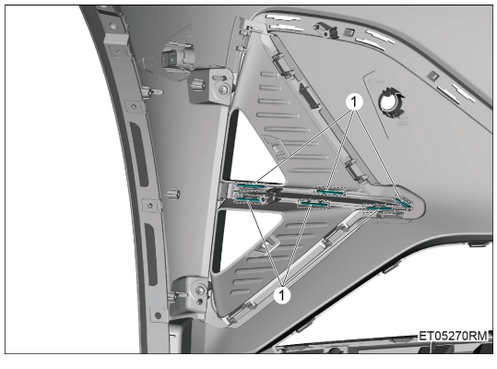


(a) Remove the screw -1-.

28. Remove front bumper left ornament III

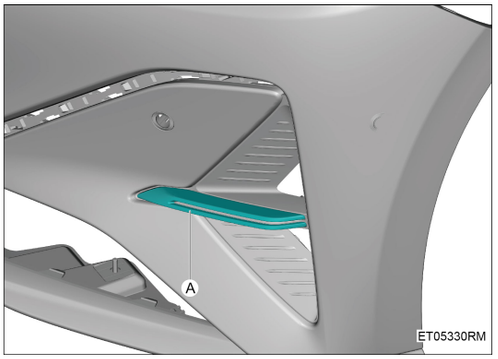
Note:

- Use same removal orders for right and left sides.



(a) Detach the claw -1-.

WS

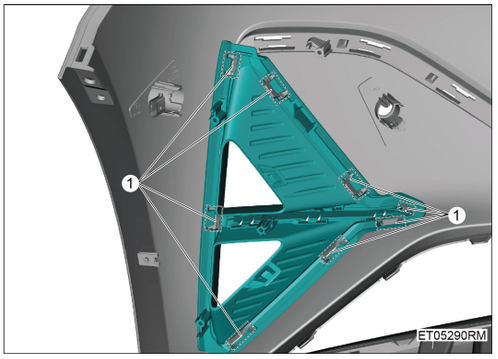


(b) Remove the front bumper left ornament III-A-.

29. Remove front bumper left ornament II

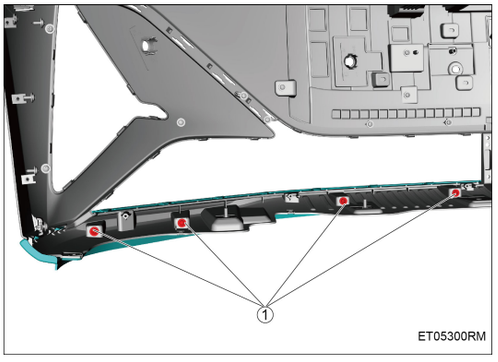
Note:

- Use same removal orders for right and left sides.

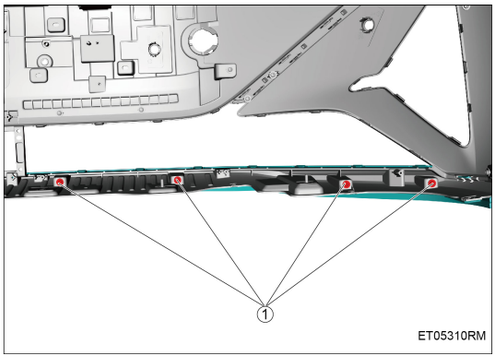


(a) Detach the claw -1-.

30. Remove front bumper lower protector



(a) Remove the left screw -1-.



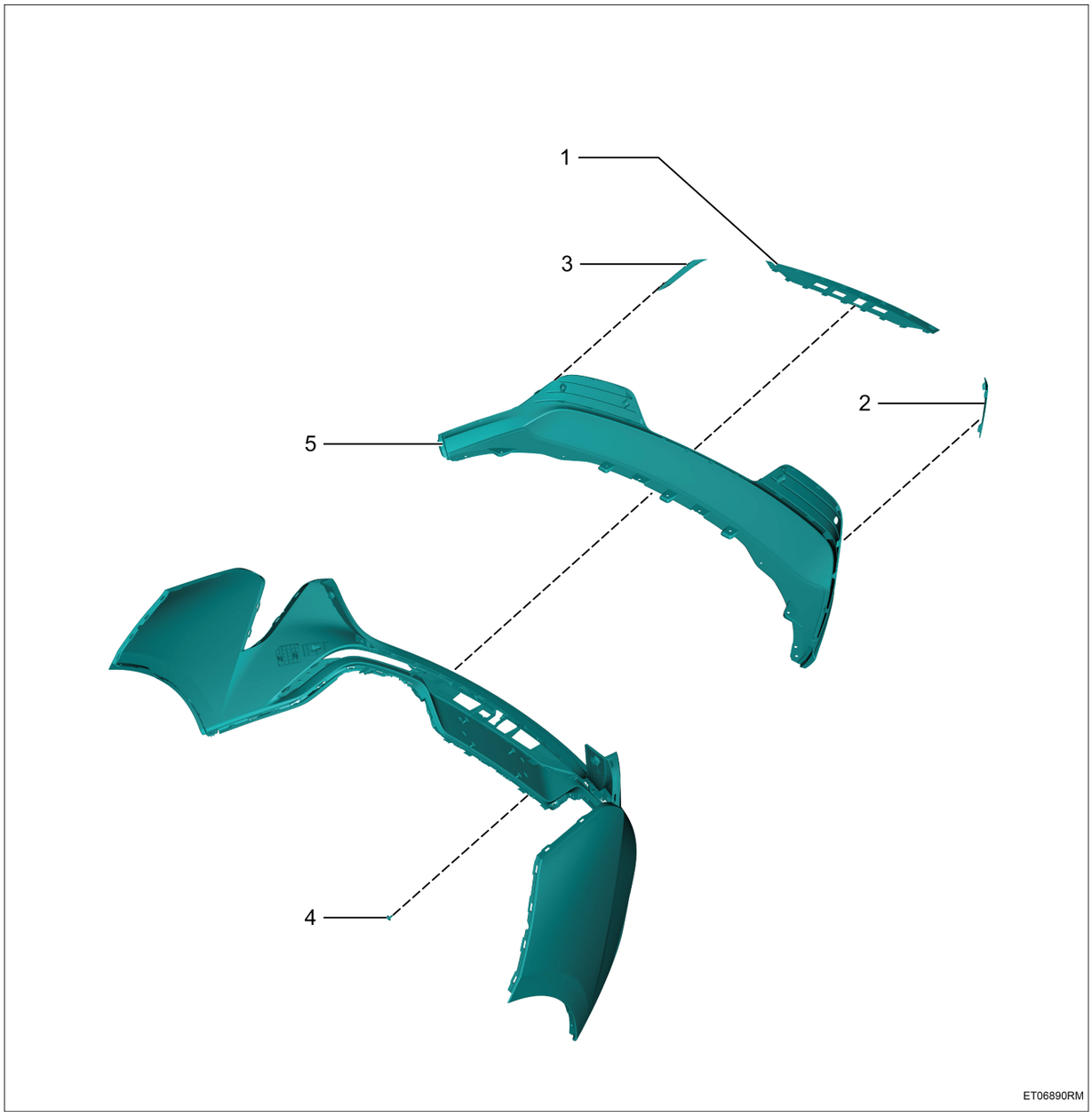
(b) Remove the right screw -1-.

Installation

1. **Installation is in the reverse order of removal.**

Rear bumper assembly

Components

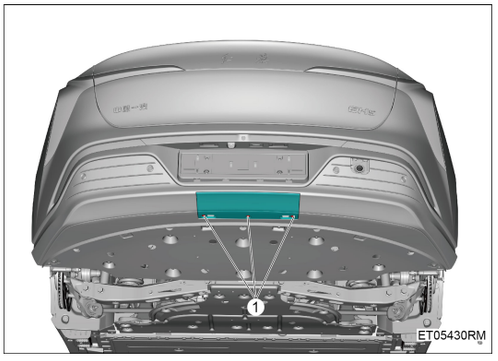


1. **Rear bumper center ornament I**
2. **Rear bumper left ornament I**
3. **Rear bumper right ornament I**
4. **Cross recess pan head self-tapping screw and flat washer set**
   - X4
   - Torque: 2.0 ~ 3.0 N • m

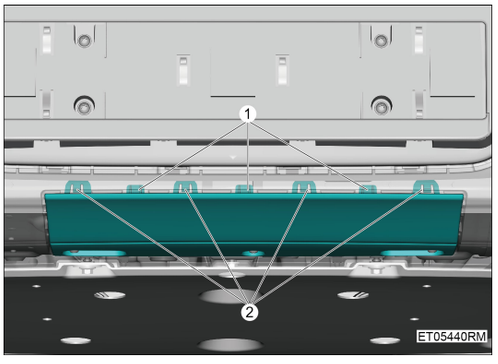
5. Remove rear bumper lower cover

Removal

1. **Raise the vehicle.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove rear bumper towing hook cover II (Europe)**

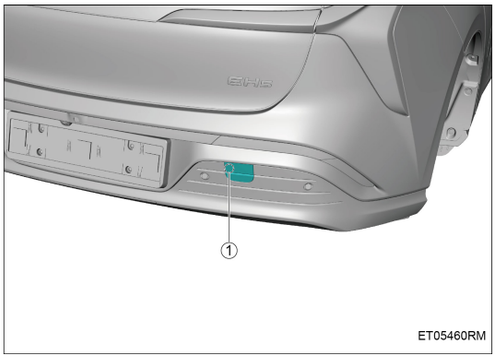


(a) Remove the screw -1-.



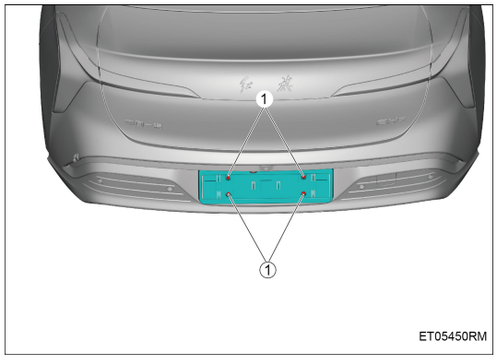
(b) Detach the claw -1-2-.

4. **Remove rear bumper towing hook cover**



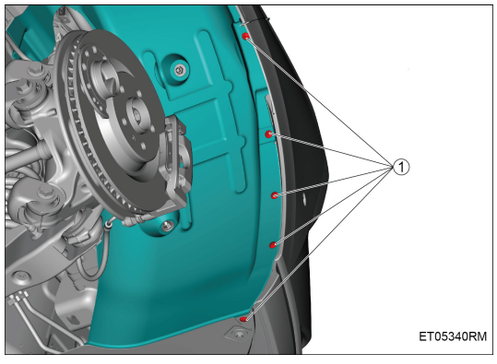
(a) Press the position indicated by -1-.

5. **Remove rear license plate holder (Europe)**



(a) Remove the screw -1-.

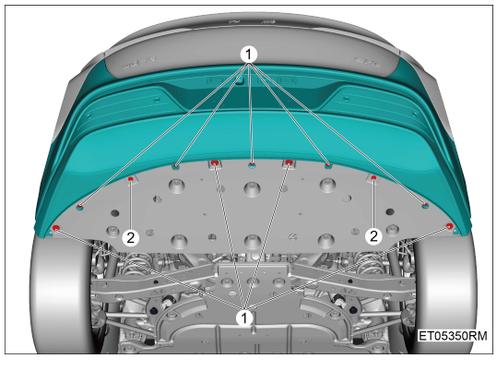
6. **Remove luggage compartment left cover (See page NS-157)**
7. **Remove rear left combination light II (See page ZC-27)**
8. **Remove rear right combination light II (See page ZC-27)**
9. **Remove rear bumper assembly**



(a) Remove the screw -1-.

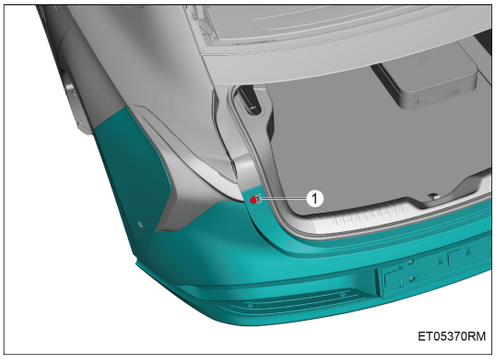
Note:

- Use same removal orders for right and left sides.



(b) Remove the bolt -1-.

(c) Remove the clip -2-.



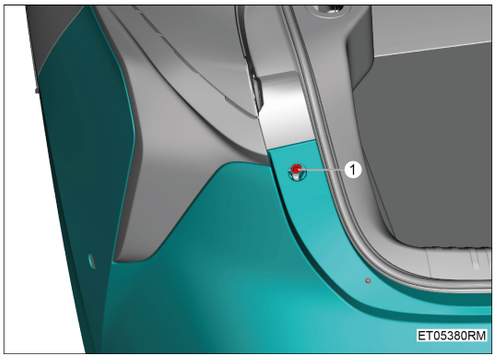
(d) Pry off at the -1- position and remove rear bumper left ornament II.

Note:

- Use same removal orders for right and left sides.

Notice:

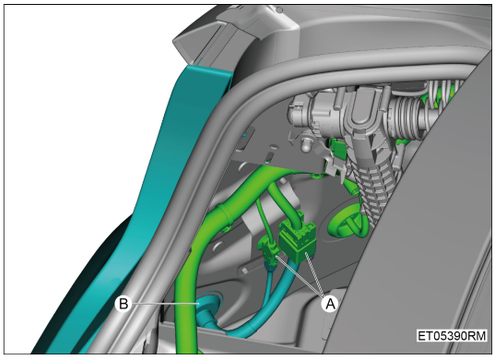
- **Be careful not to damage the rear bumper cover and rear bumper left ornament II when prying off.**



(e) Remove the screw -1-.

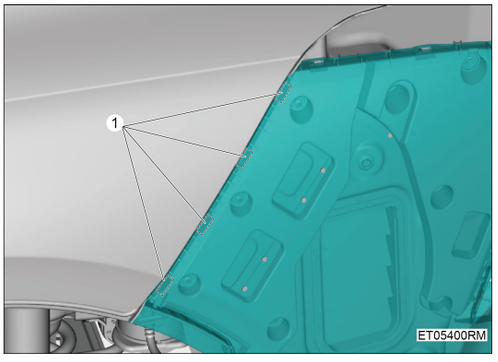
Note:

- Use same removal orders for right and left sides.



(f) Disconnect the wire harness connector -A-.

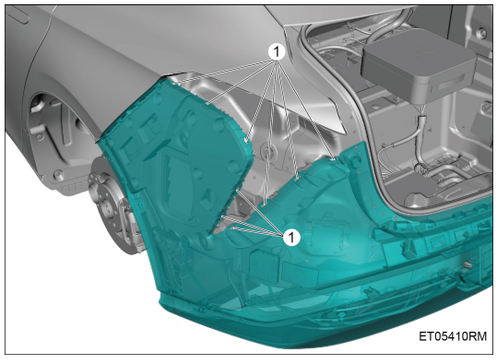
(g) Disengage the wire harness fixture -B-.



(h) Detach the claw -1-.

Note:

- Use same removal orders for right and left sides.

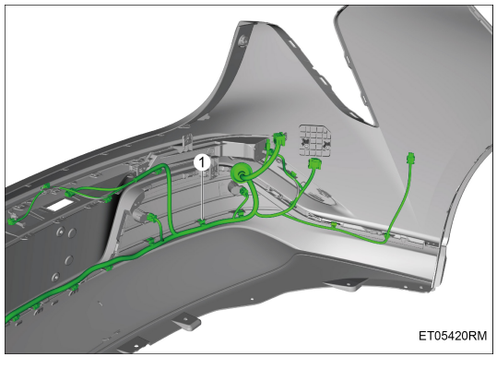


(i) Detach the claw -1-.

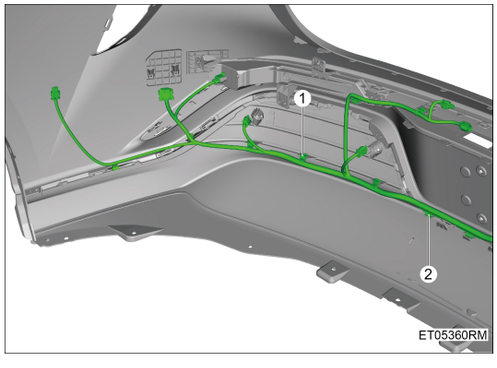
Note:

- Use same removal orders for right and left sides.
- Remove rear bumper assembly with two people working together on the left and right sides.

10. **Remove rear ultrasonic sensor assembly (See page ZC-126)**
11. **Remove ultrasonic sensor bracket (See page ZC-126)**
12. **Remove digital key rear antenna assembly (See page ZC-108)**
13. **Remove rear left combination light III assembly (See page ZC-30)**
14. **Remove rear camera and bracket assembly (See page ZC-148)**
15. **Remove luggage compartment outside opener switch assembly (See page ZC-3)**
16. **Remove license plate light assembly (See page ZC-34)**
17. **Remove rear bumper wire harness assembly**

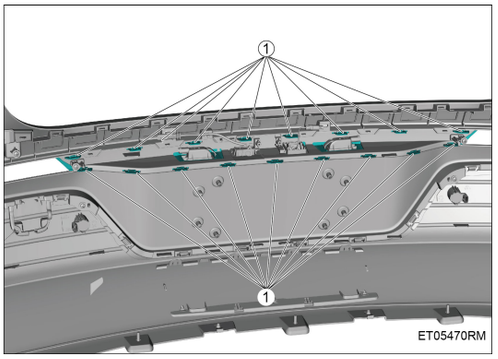


(a) (For example) Detach all wire harness fixing clip -1-.

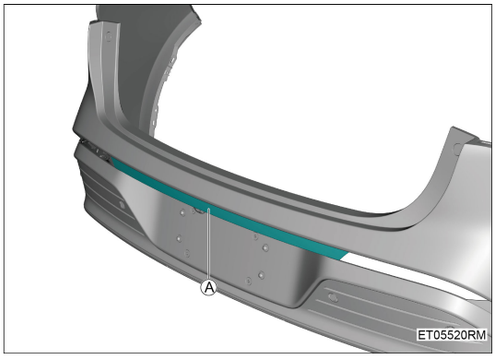


(b) (For example) Detach all wire harness fixing clips -1-2-.

18. Remove rear bumper center ornament I



(a) Detach the claw -1-.

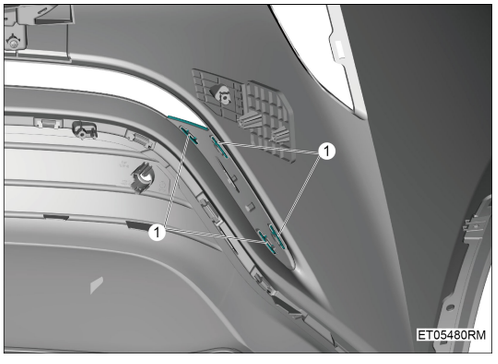


(b) Remove the rear bumper center ornament I-A-.

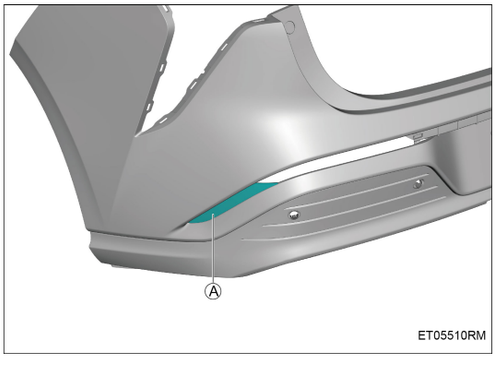
19. Remove rear bumper left ornament I

Note:

- Use same removal orders for right and left sides.

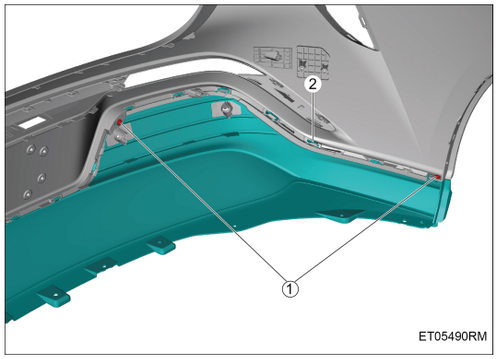


(a) Detach the claw -1-.



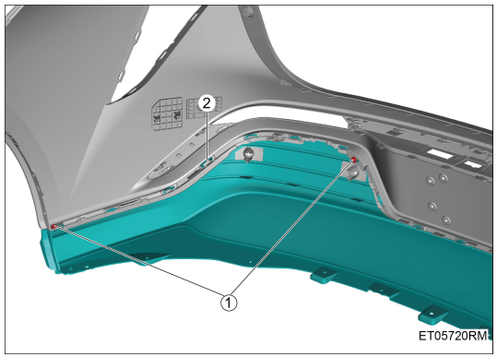
(b) Remove the rear bumper left ornament I-A-.

20. Remove rear bumper lower cover (Asia)



(a) Remove the screw -1-.

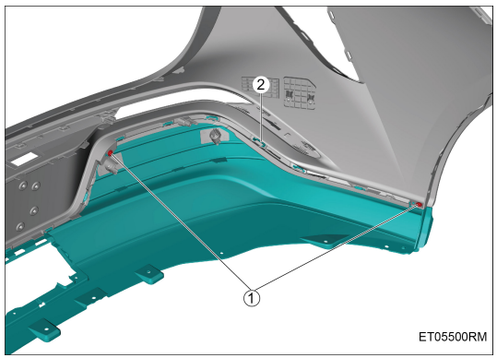
(b) (For example) Detach all claws -2-.



(c) Remove the screw -1-.

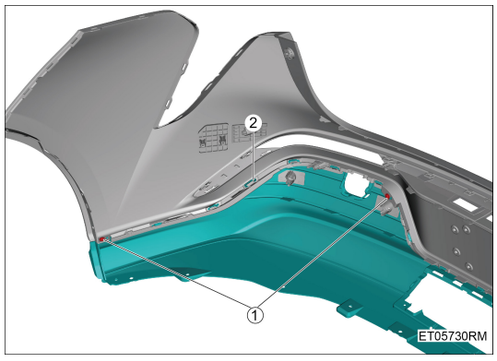
(d) (For example) Detach all claws -2-.

21. Remove rear bumper lower cover (Europe)



(a) Remove the screw -1-.

(b) (For example) Detach all claws -2-.



(c) Remove the screw -1-.

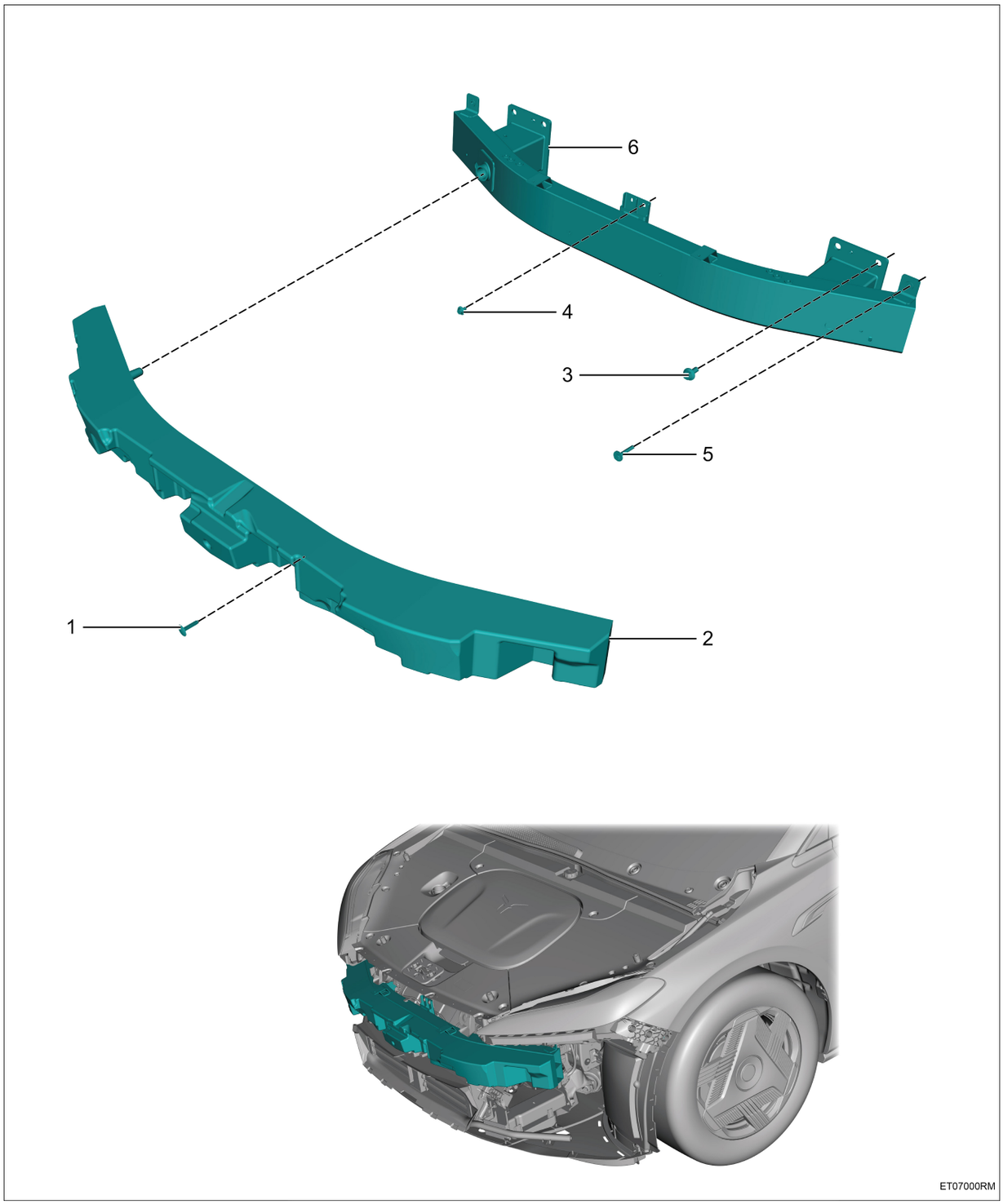
(d) (For example) Detach all claws -2-.

Installation

1. Installation is in the reverse order of removal.

Bumper crossmember

Components



1. **Clip**
   - X2
2. **Front bumper buffer beam**
3. **Hexagon flange bolt**

- X8
- Torque: 40 ~ 50 N • m

4. Hexagon flange bolt

- X2

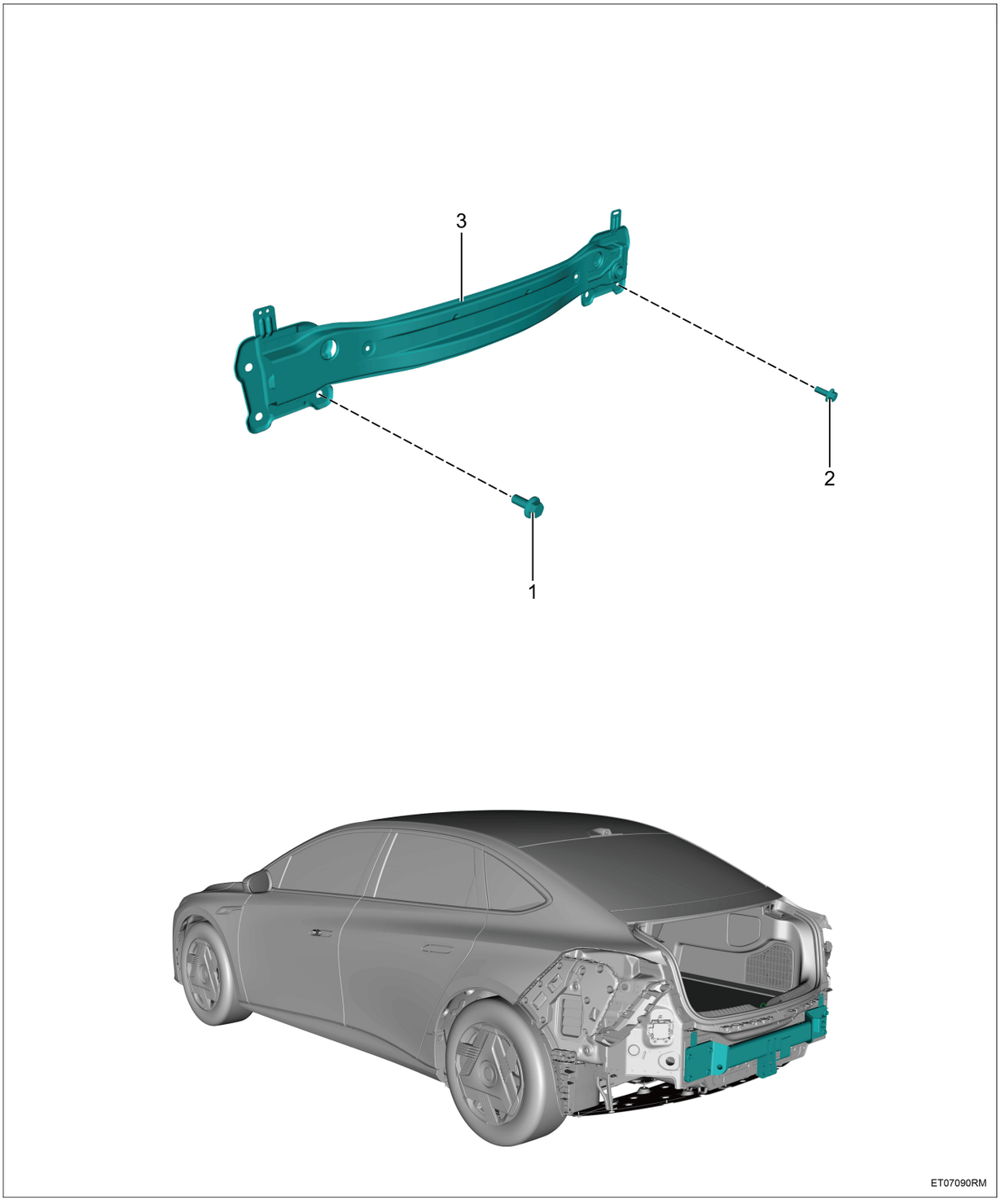
5. Hexagon flange bolt

- X2

6. Front bumper crossmember

WS

Components (Asia)

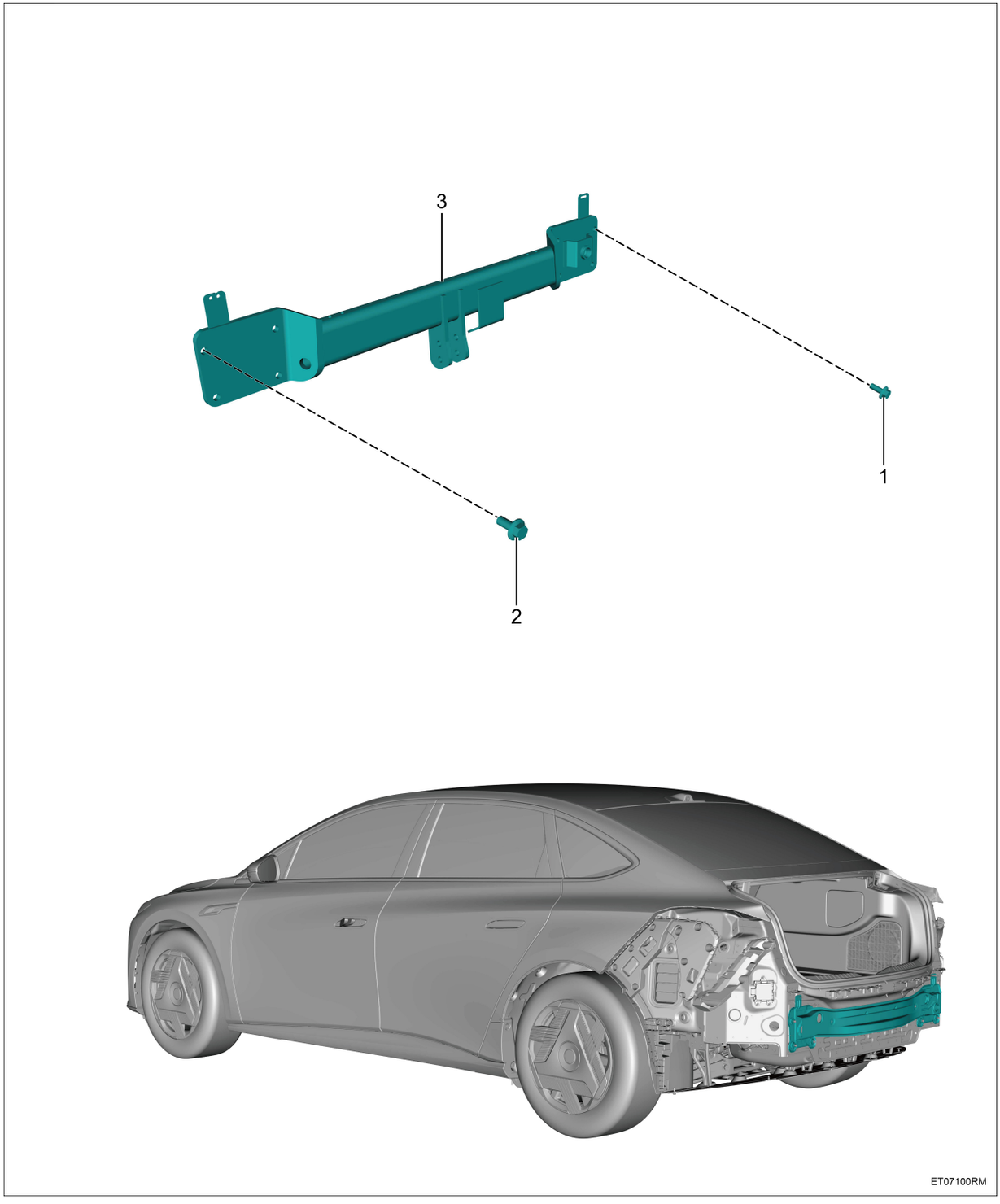


1. **Hexagon flange bolt**
   - X4
   - Torque: 40 ~ 50 N • m
2. **Hexagon flange bolt**
   - X4

- Torque: 40 ~ 50 N • m

3. Rear bumper crossmember (Asia)

Components (Europe)



1. Hexagon flange bolt

- X4

- Torque: 40 ~ 50 N • m

2. Hexagon flange bolt

- X4
- Torque: 40 ~ 50 N • m

3. Rear bumper crossmember (Europe)

WS

Removal

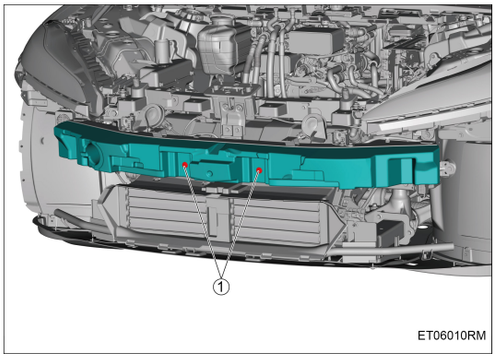
1. Remove front bumper assembly (See page WS-1)

2. Remove frontal collision sensor bracket assembly (See page ZC-68)

3. Remove front combination light assembly (See page ZC-18)

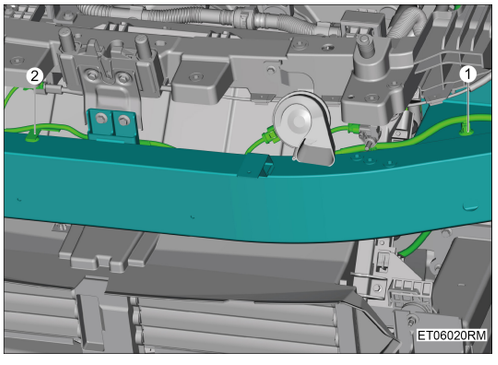
4. Remove front bumper buffer beam

(a) Remove the clip -1-.

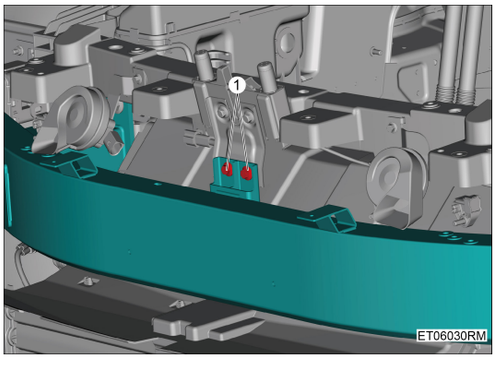


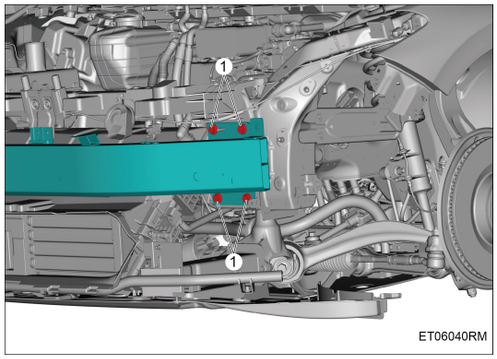
5. Remove front bumper crossmember

(a) Detach the wire harness fixing clip -1-2-.

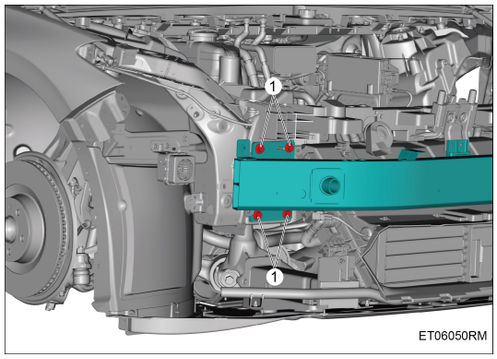


(b) Remove the bolt -1-.



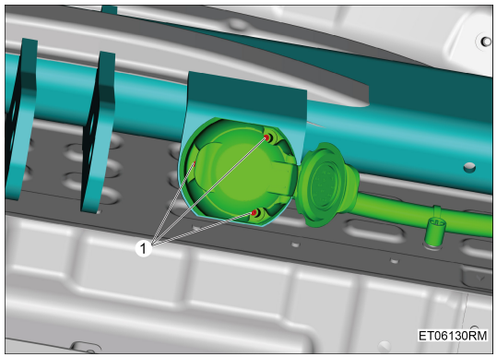


(c) Remove the left bolt -1-.

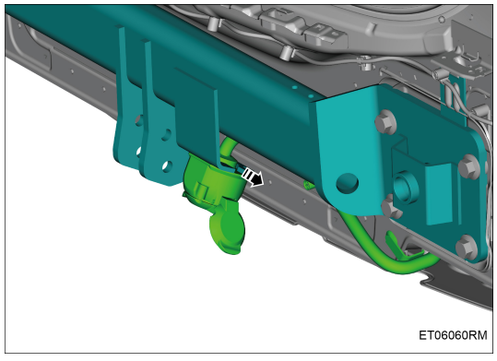


(d) Remove the right bolt -1-.

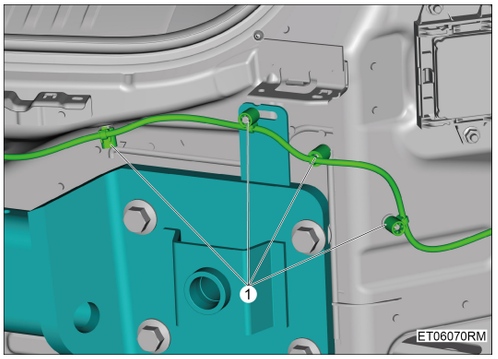
6. **Remove rear bumper assembly (See page WS-13)**
7. **Remove traction type towing hook fixing bracket assembly (Europe)**



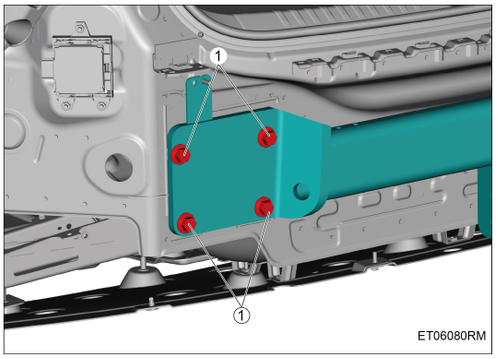
(a) Remove the fixing screw -1- from trailer power supply socket assembly.



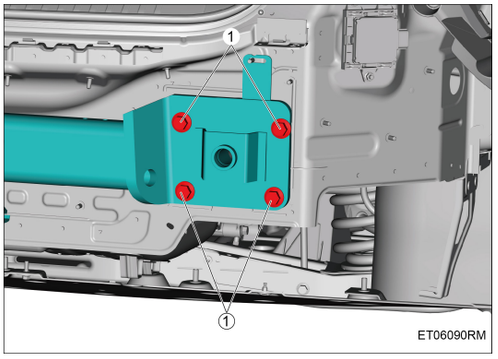
(b) Detach the trailer power supply socket assembly in direction of -arrow-.



(c) Disengage the wire harness fixtures -1-.

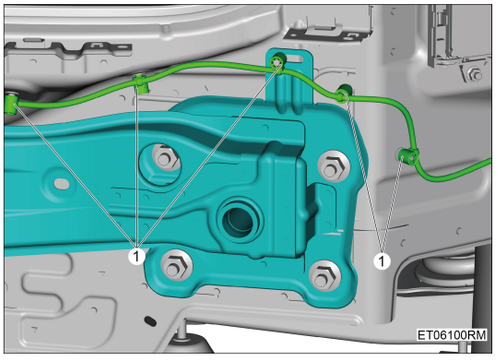


(d) Remove bolt -1- from left side of towing hook fixing bracket assembly.

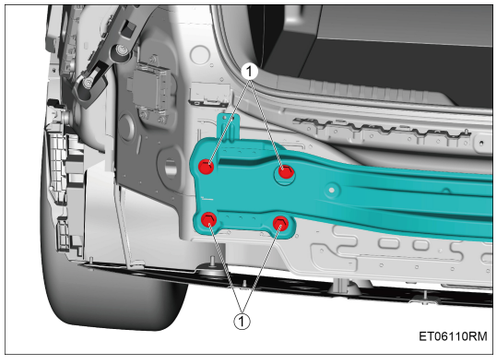


(e) Remove bolt -1- from right side of towing hook fixing bracket assembly.

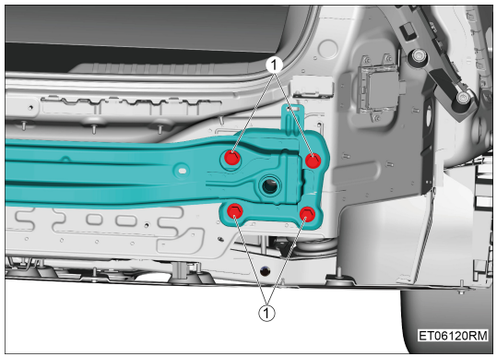
8. Remove rear bumper crossmember (Asia)



(a) Disengage the wire harness fixtures -1-.



(b) Remove the bolt -1- from rear left bumper crossmember fixing support.



(c) Remove the bolt -1- from rear right bumper crossmember fixing support.

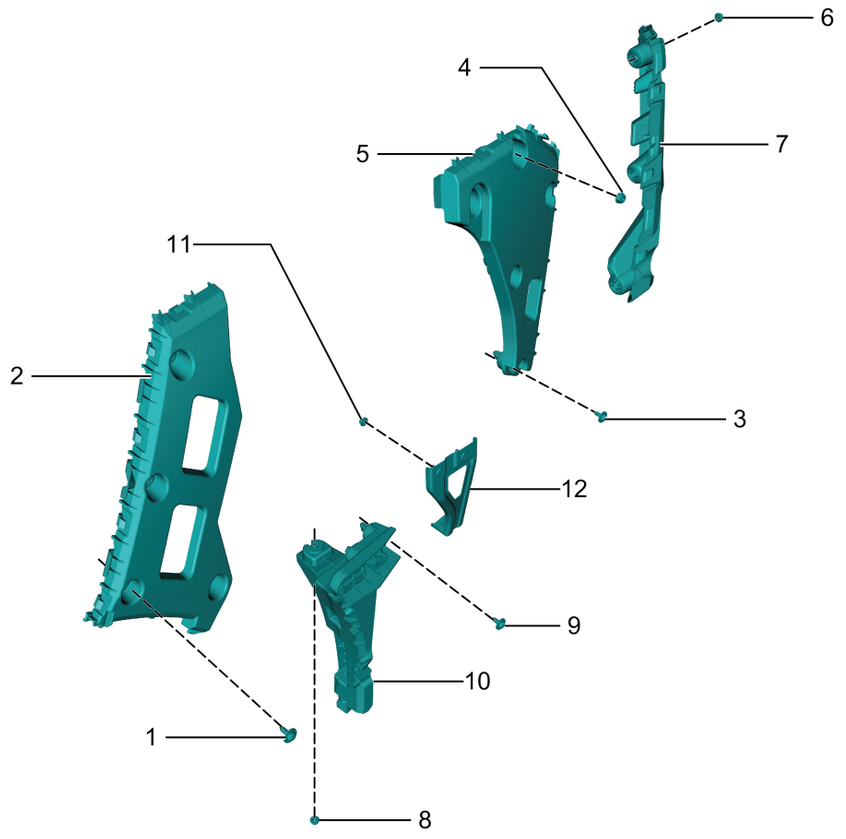
Installation

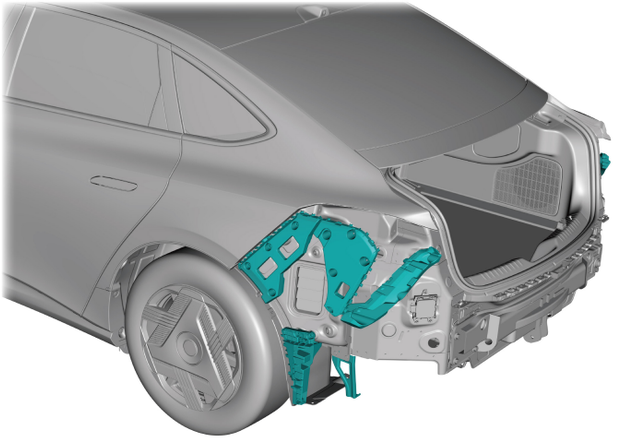
1. **Installation is in the reverse order of removal.**

WS

Rear bumper attachment assembly

Components





ET06900RM

1. **Cross recess pan head self-tapping screw and flat washer set**
   - X4
   - Torque: 1.0 ~ 2.0 N • m
2. **Rear bumper left bracket I**

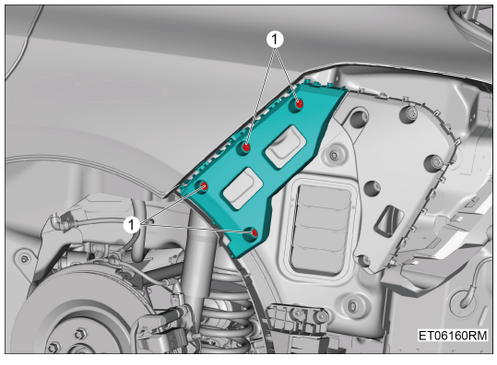
3. **Cross recess pan head self-tapping screw and flat washer set**
   - X3
   - Torque: 3.0 ~ 5.0 N • m
4. **Hexagon flange nut**
   - X2
   - Torque: 1.0 ~ 2.0 N • m
5. **Rear bumper left bracket II**
6. **Hexagon flange nut**
   - X3
   - Torque: 3.0 ~ 5.0 N • m
7. **Rear bumper left bracket III**
8. **Hexagon flange nut**
   - Torque: 3.0 ~ 5.0 N • m
9. **Cross recess pan head self-tapping screw and flat washer set**
   - X2
   - Torque: 1.0 ~ 2.0 N • m
10. **Rear bumper left bracket IV**
11. **Hexagon flange nut**
    - X2
    - Torque: 8 ~ 10 N • m
12. **Rear bumper left bracket V**

Removal

1. **Remove rear bumper assembly (See page WS-13)**
2. **Remove rear bumper left bracket I**

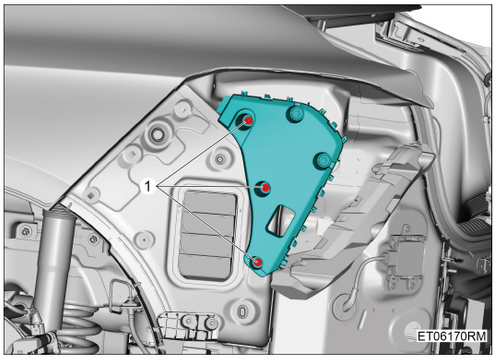
   Note:
   - Use same removal orders for right and left sides.

   (a) Remove the screw -1-.

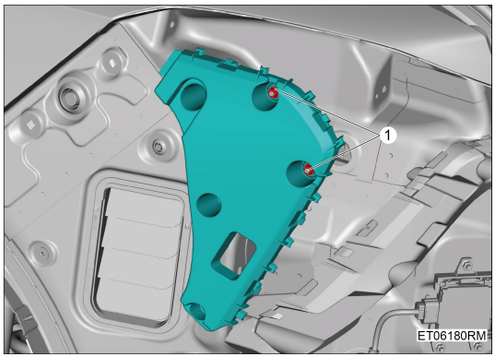


3. **Remove rear bumper left bracket II**

   Note:
   - Use same removal orders for right and left sides.



(a) Remove the screw -1-.

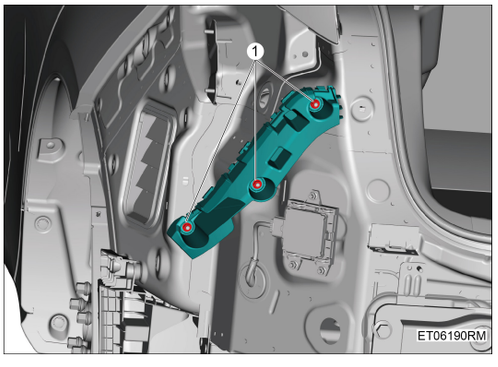


(b) Remove the nut -1-.

4. Remove rear bumper left bracket III

Note:

- Use same removal orders for right and left sides.

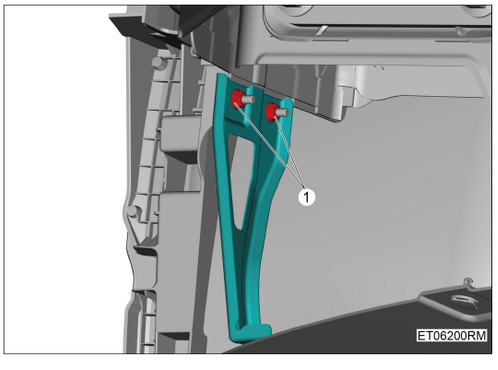


(a) Remove the nut -1-.

5. Remove rear bumper left bracket IV

Note:

- Use same removal orders for right and left sides.

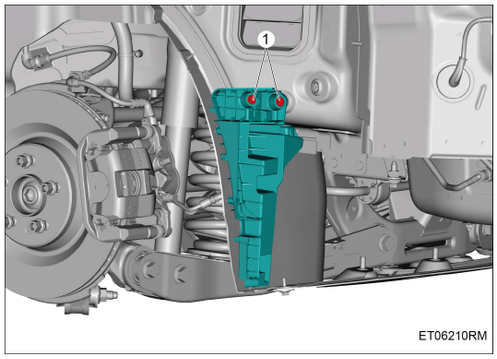


(a) Remove the nut -1-.

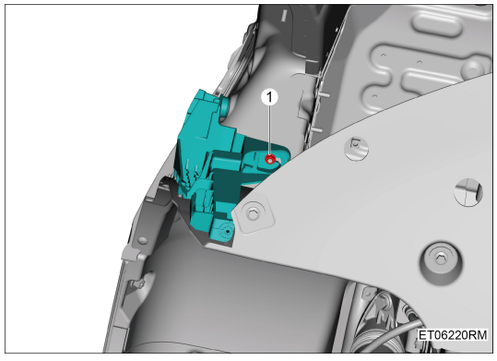
6. Remove rear bumper left bracket V

Note:

- Use same removal orders for right and left sides.



(a) Remove the screw -1-.



(b) Remove the nut -1-.

Installation

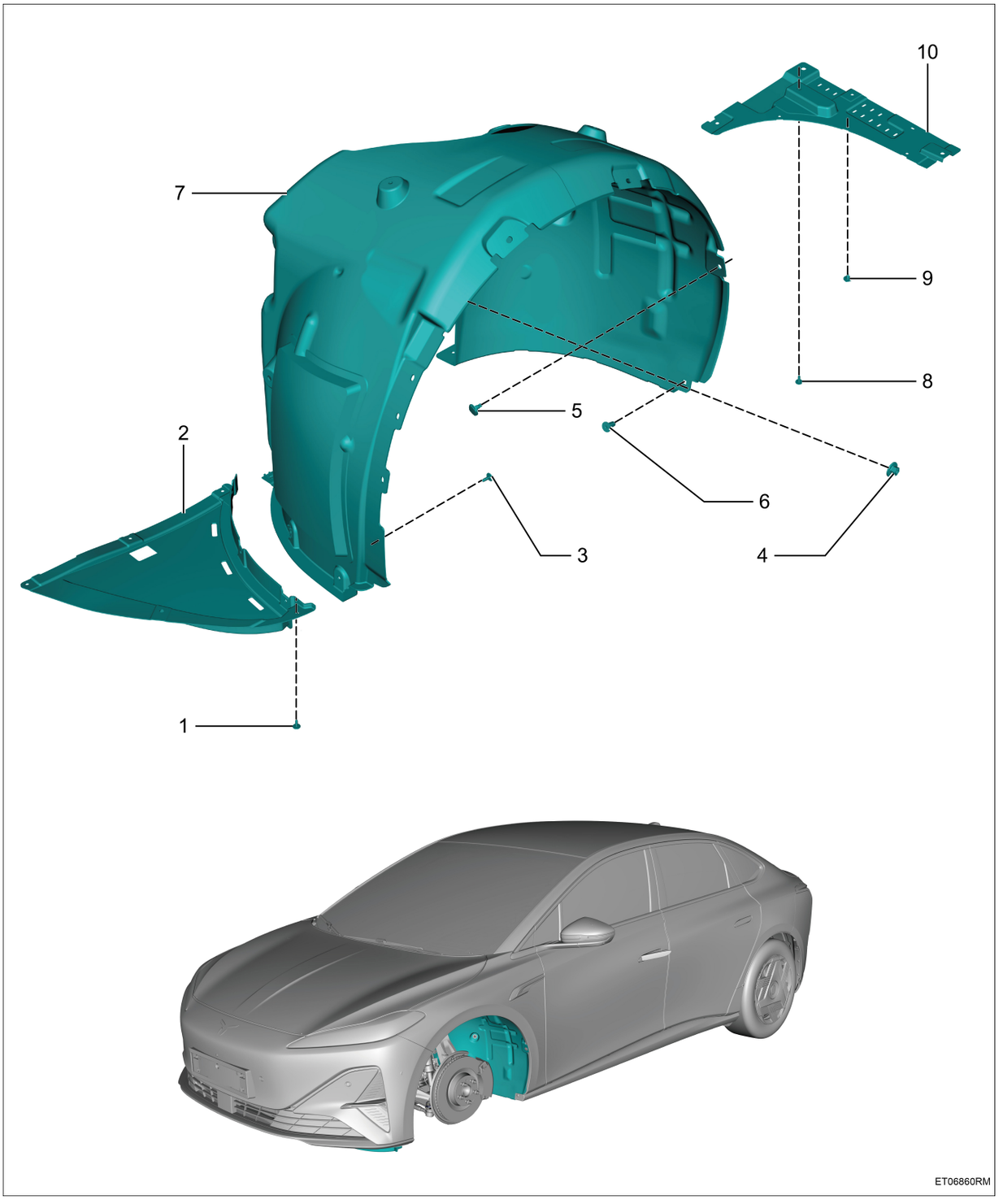
1. Installation is in the reverse order of removal.

Bottom protector system

Front wheel protector

Components

WS



1. Self-tapping screw

- X5

- Torque: 2.0 ~ 3.0 N • m

2. **Front left lower spoiler**
3. **Self-tapping screw**
   - X7
   - Torque: 2.0 ~ 3.0 N • m
4. **Pressure cap nut**
   - X9
5. **Clip**
   - X3
6. **Insert nut**
7. **Front left wheel protector**
8. **Combination bolt**
   - X3
   - Torque: 3.0 ~ 5.0 N • m
9. **Self-tapping screw**
   - X3
   - Torque: 2.0 ~ 3.0 N • m
10. **Rear left lower spoiler**

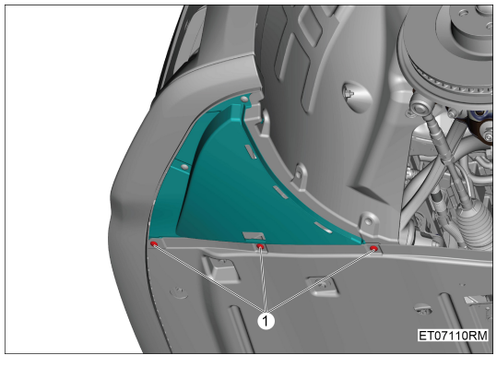
Removal

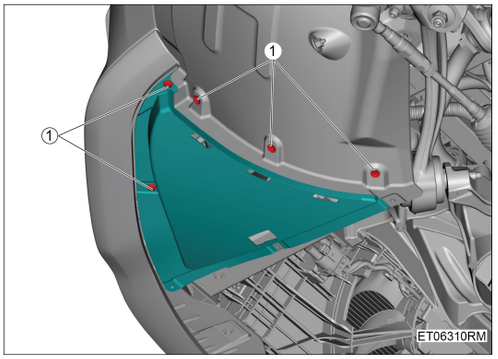
1. **Raise the vehicle.**
2. **Remove front wheel assembly (See page DP-116)**
3. **Remove front left lower spoiler**

   Note:

   - Use same removal orders for right and left sides.

   (a) Remove the screw -1-.



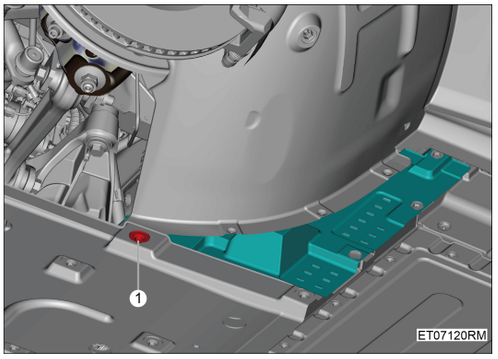


(b) Remove the screw -1-.

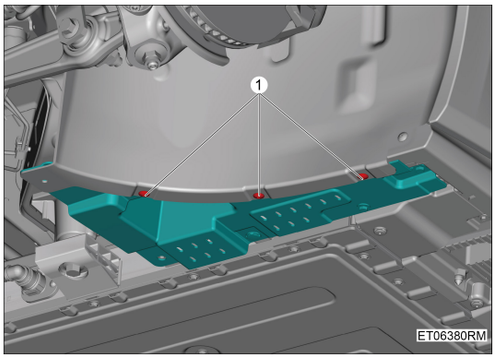
4. Remove rear left lower spoiler (only for models with 62 kWh battery)

Note:

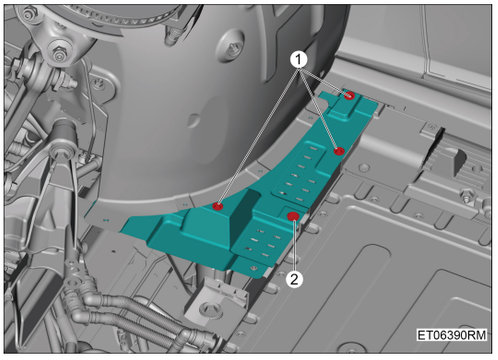
- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.



(b) Remove the screw -1-.



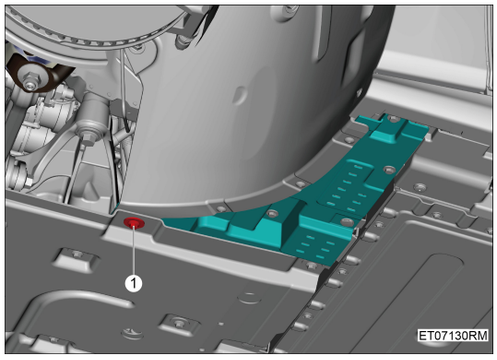
(c) Remove the bolt -1-.

(d) Remove the clip -2-.

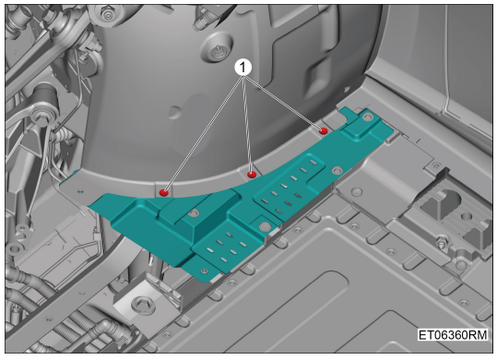
5. Remove rear left lower spoiler (only for models with 85 kWh battery)

Note:

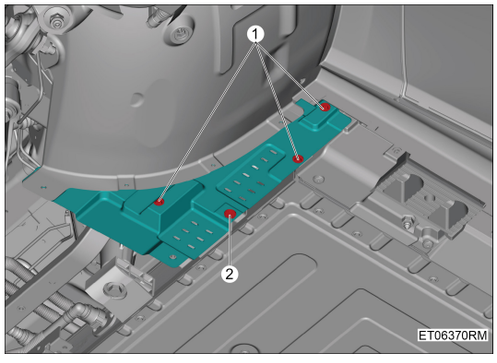
- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.



(b) Remove the screw -1-.



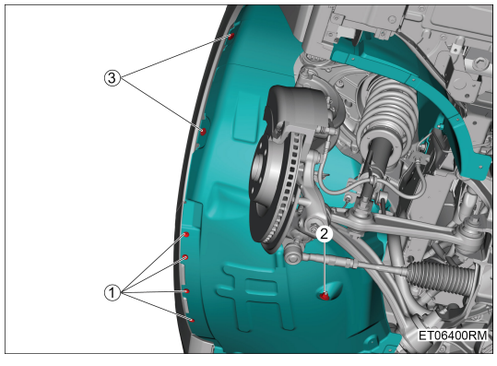
(c) Remove the bolt -1-.

(d) Remove the clip -2-.

6. Remove front left wheel protector assembly

Note:

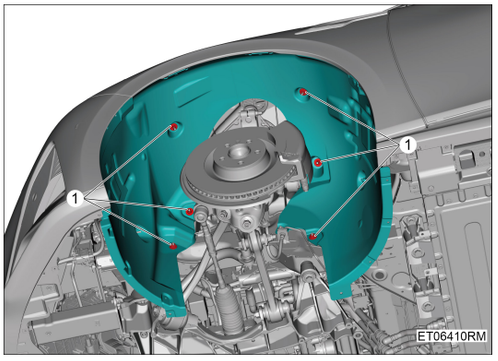
- Use same removal orders for right and left sides.



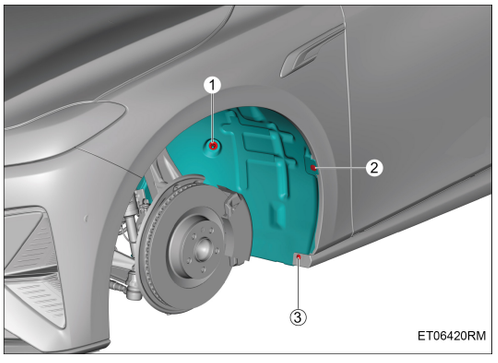
(a) Remove the screw -1-.

(b) Remove the pressure cap nut -2-.

(c) Remove the clip -3-.



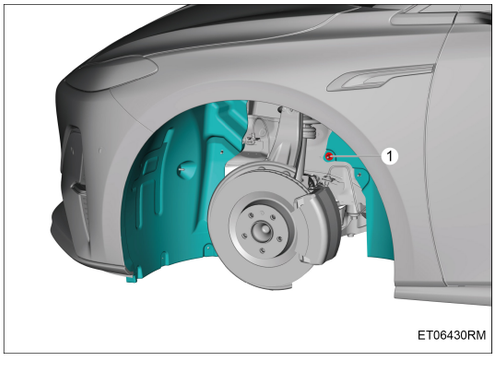
(d) Remove the pressure cap nut -1-.



(e) Remove the pressure cap nut -1-.

(f) Remove the clip -2-.

(g) Remove the screw -3-.



(h) Remove the pressure cap nut -1-.

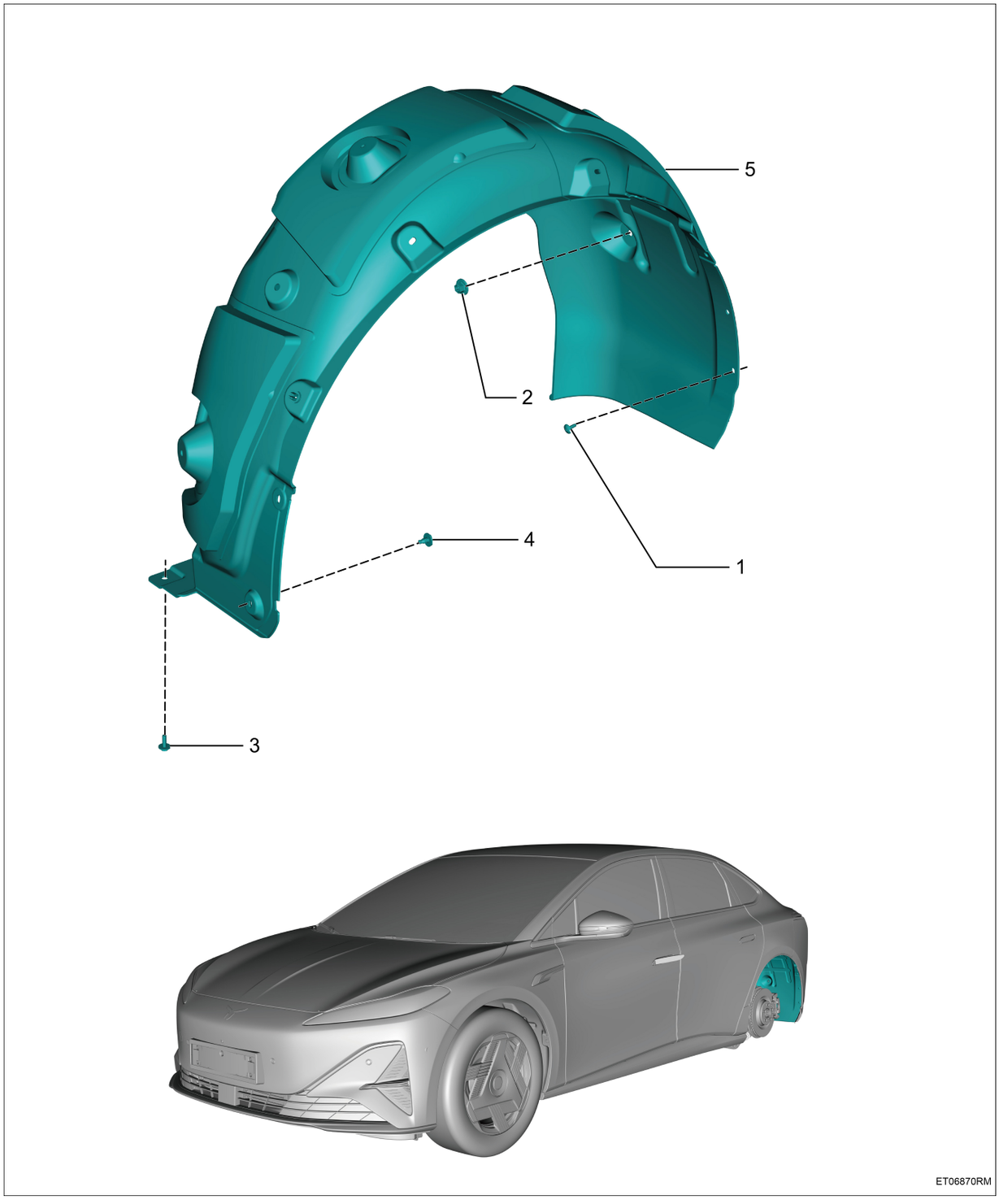
(i) Remove front left wheel protector assembly at an appropriate angle.

Installation

1. Installation is in the reverse order of removal.

Rear wheel protector

Components



1. **Self-tapping screw**
   - X5
   - Torque: 2.0 ~ 3.0 N • m
2. **Pressure cap nut**

- X10

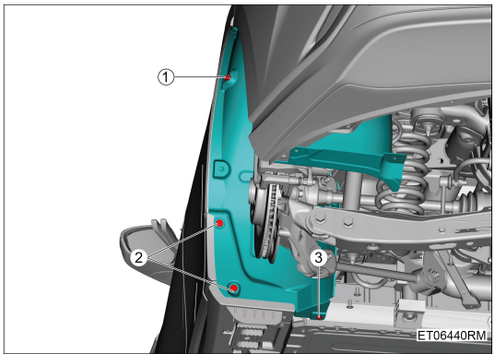
3. **Combination bolt**
   - Torque: 3.0 ~ 5.0 N • m
4. **Clip**
   - X2
5. **Rear left wheel protector**

WS

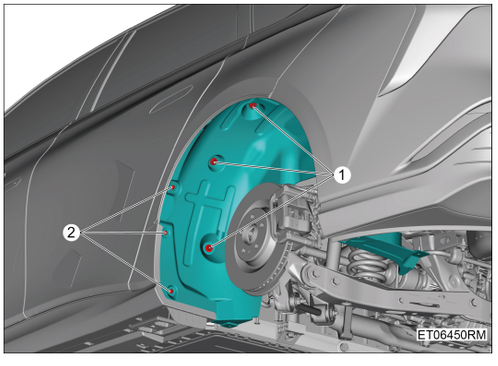
Removal

1. **Raise the vehicle.**
2. **Remove rear left wheel assembly (See page DP-116)**
3. **Remove rear right wheel assembly (See page DP-116)**
4. **Remove rear left wheel protector**

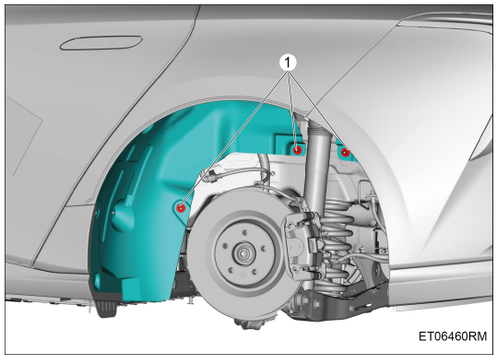
   Note:
   - Use same removal orders for right and left sides.



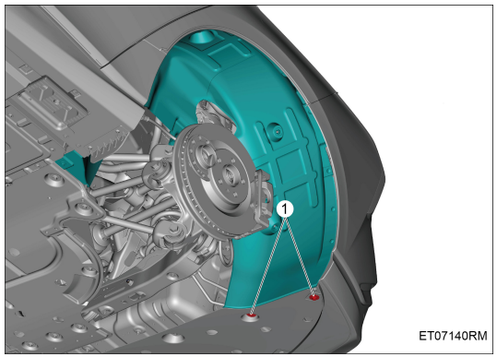
(a) Remove the nut -1-.
(b) Remove the clip -2-.
(c) Remove the bolt -3-.



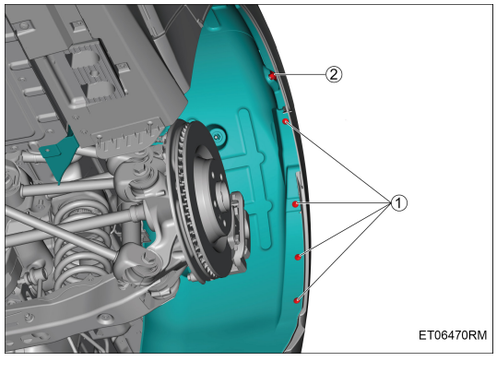
(d) Remove the pressure cap nut -1-.
(e) Remove the screw -2-.



(f) Remove the pressure cap nut -1-.

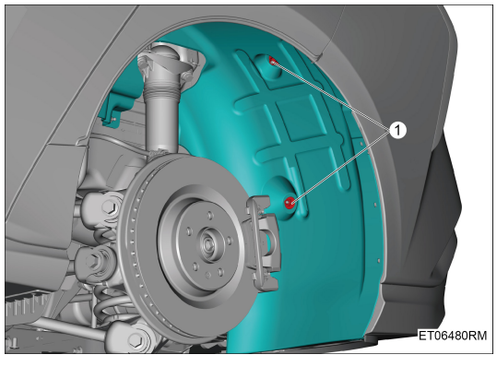


(g) Remove the bolt -1-.



(h) Remove the screw -1-.

(i) Remove the bolt -2-.



(j) Remove the pressure cap nut -1-.

(k) Remove front left wheel protector assembly at an appropriate angle.

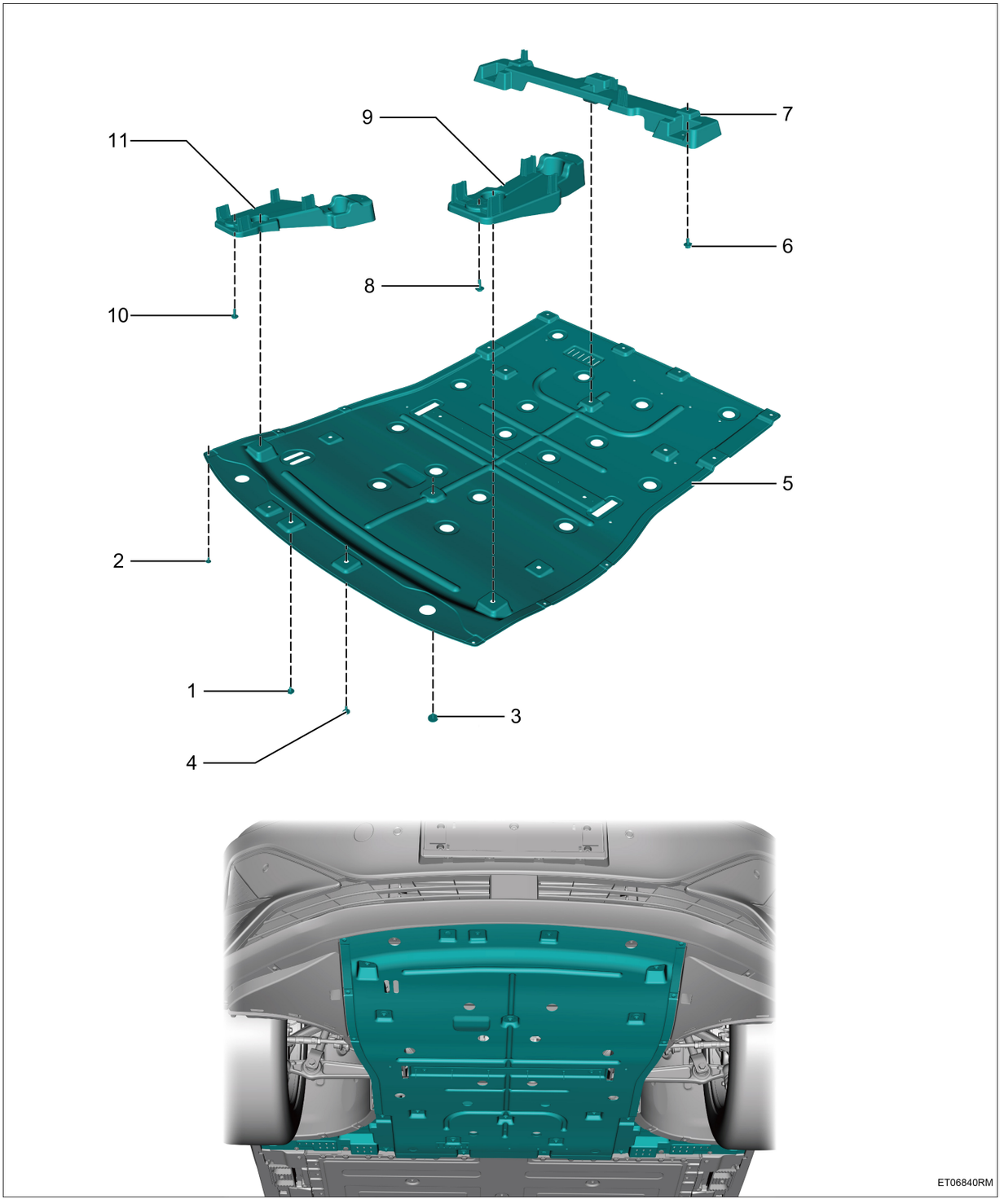
Installation

1. Installation is in the reverse order of removal.

WS

Engine bottom protector assembly

Components (only for models with 62 kWh battery)



1. **Clip**
2. **Self-tapping screw**
   - X6

- Torque: 2.0 ~ 9.0 N • m

3. Combination bolt

- X13
- Torque: 6.0 ~ 8.0 N • m

4. Combination bolt

- X4
- Torque: 6.0 ~ 8.0 N • m

5. Engine bottom protector

6. Combination bolt

- X3
- Torque: 6.0 ~ 8.0 N • m

7. Engine bottom protector bracket I

8. Combination bolt

- X2
- Torque: 6.0 ~ 8.0 N • m

9. Engine bottom protector left fixing bracket

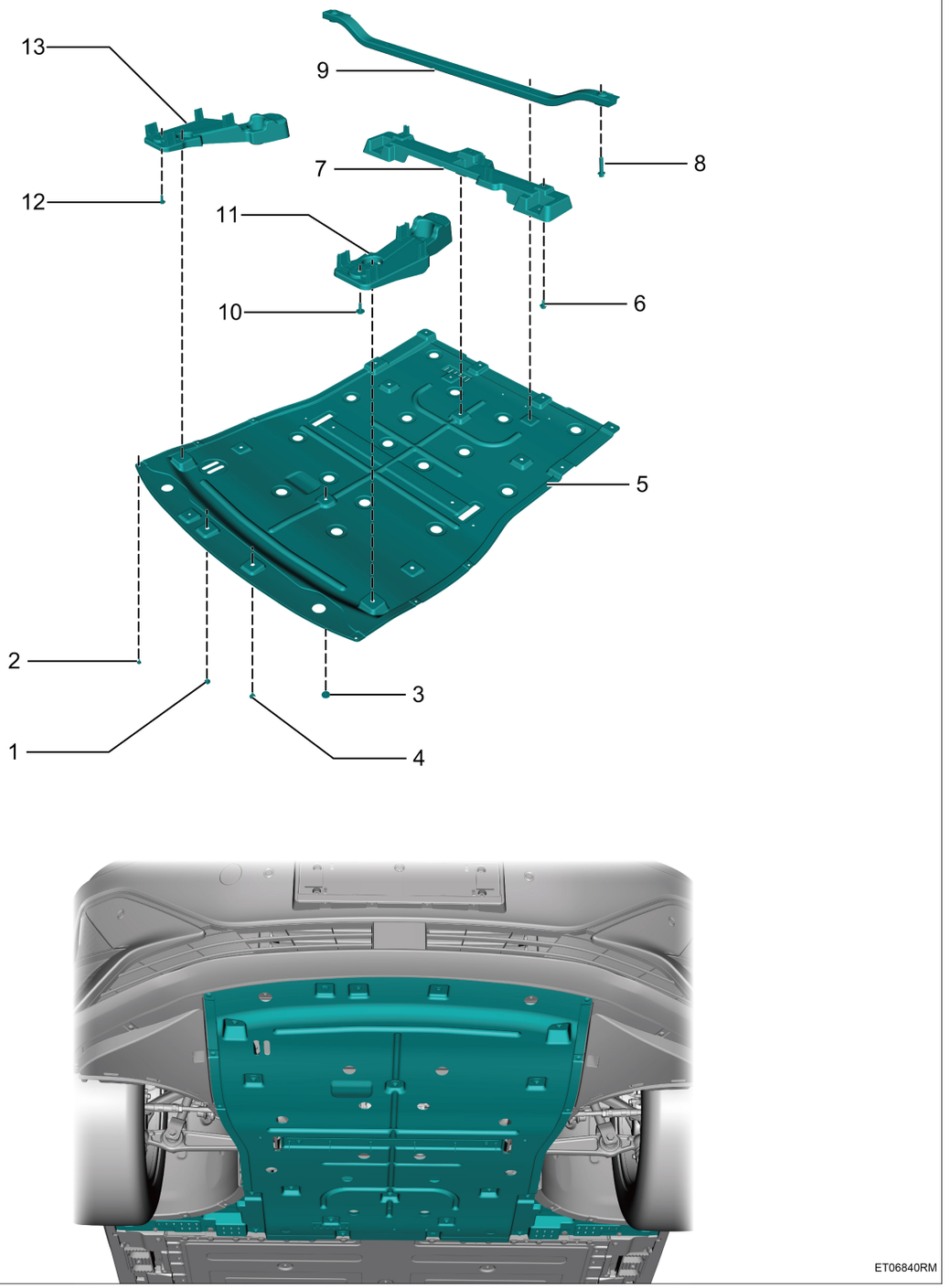
10. Combination bolt

- X2
- Torque: 6.0 ~ 8.0 N • m

11. Engine bottom protector right fixing bracket

WS

Components (only for models with 82 kWh battery)



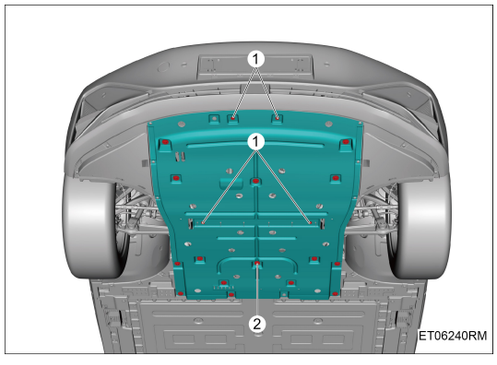
1. **Clip**
2. **Self-tapping screw**
   - X6
   - Torque: 2.0 ~ 2.9 N • m

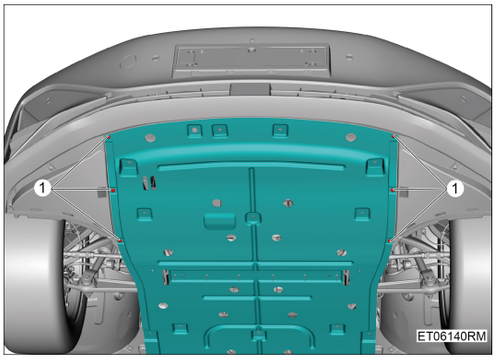
3. **Combination bolt**
   - X13
   - Torque: 6.0 ~ 8.0 N • m
4. **Combination bolt**
   - X4
   - Torque: 6.0 ~ 8.0 N • m
5. **Engine bottom protector**
6. **Combination bolt**
   - X3
   - Torque: 6.0 ~ 8.0 N • m
7. **Engine bottom protector bracket I**
8. **Hexagon flange bolt - thick rod**
   - X2
   - Torque: 38.0 ~ 46.0 N • m
9. **Front protector bracket sub-assembly**
10. **Combination bolt**
    - X2
    - Torque: 6.0 ~ 8.0 N • m
11. **Engine bottom protector left fixing bracket**
12. **Combination bolt**
    - X2
    - Torque: 6.0 ~ 8.0 N • m
13. **Engine bottom protector right fixing bracket**

Removal

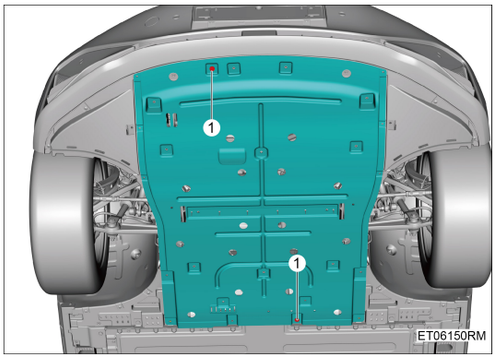
1. **Raise the vehicle.**
2. **Remove front compartment bottom protector (only for 62 kWh electric models)**

   (a) (For example) Remove all bolts -1-2-.



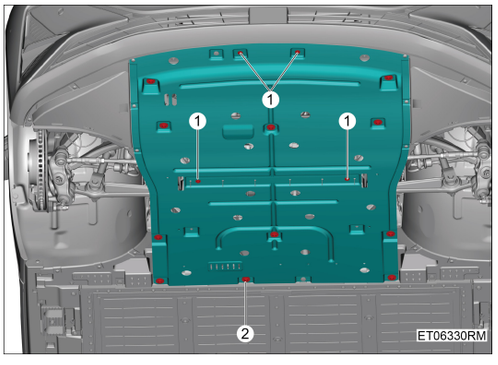


(b) Remove the screw -1-.

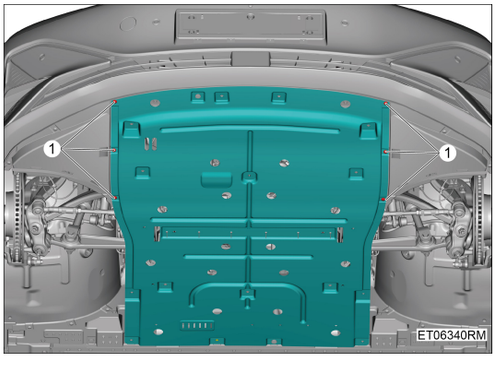


(c) Remove the clip -1-.

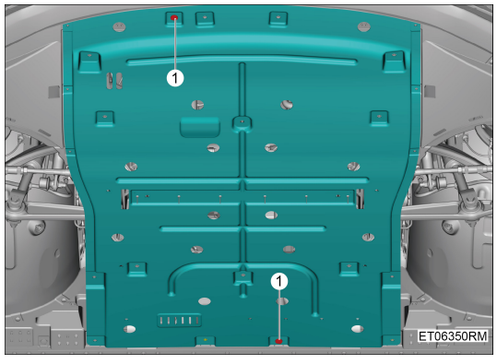
3. Remove front compartment bottom protector (only for models with 85 kWh battery)



(a) (For example) Remove all bolts -1-2-.



(b) Remove the screw -1-.

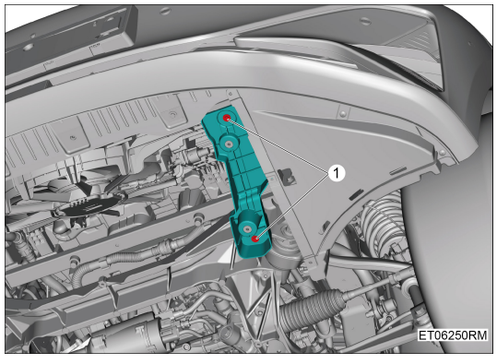


(c) Remove the clip -1-.

4. Remove engine bottom protector left fixing bracket

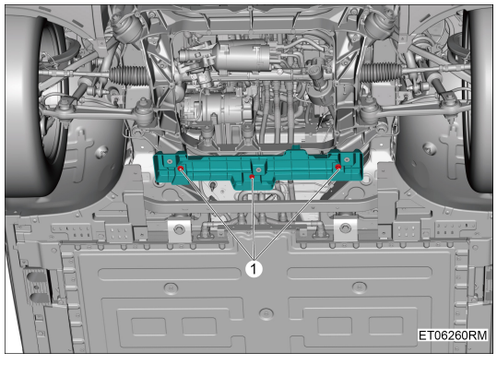
Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

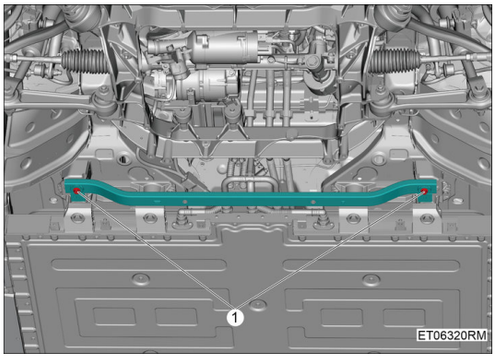
5. Remove front compartment bottom protector bracket assembly II



(a) Remove the bolt -1-.

6. Remove rear lower spoiler (See page WS-32)

7. Remove front protector sub-assembly bracket assembly (only for models with 85 kWh battery)



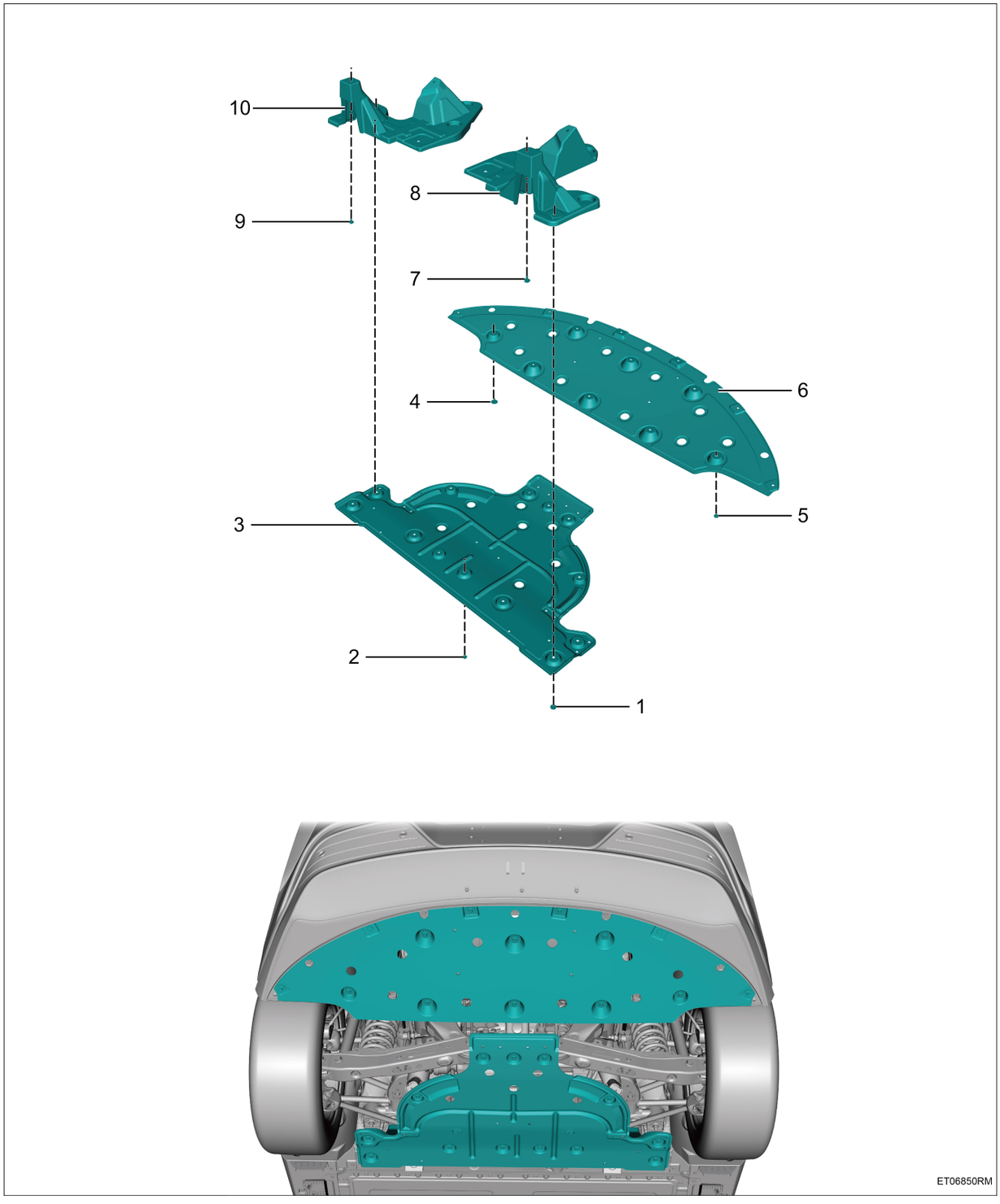
(a) Remove the bolt -1-.

Installation

1. Installation is in the reverse order of removal.

Rear suspension bottom protector assembly

Components



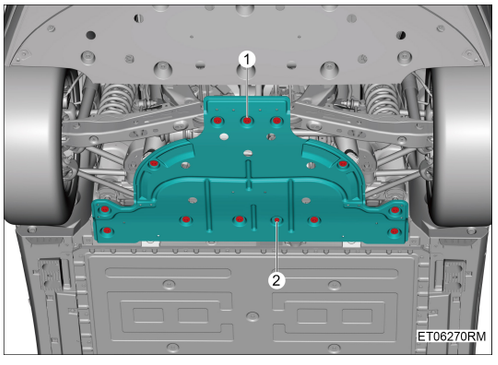
1. Combination bolt

- X9
- Torque: 6.0 ~ 8.0 N • m

2. **Clip**
3. **Rear suspension bottom protector I**
4. **Combination bolt**
   - X12
   - Torque: 6.0 ~ 8.0 N • m
5. **Clip**
   - X2
6. **Rear suspension bottom protector II**
7. **Combination bolt**
   - X2
   - Torque: 6.0 ~ 8.0 N • m
8. **Rear suspension bottom protector bracket I**
9. **Combination bolt**
   - X2
   - Torque: 6.0 ~ 8.0 N • m
10. **Rear suspension bottom protector bracket II**

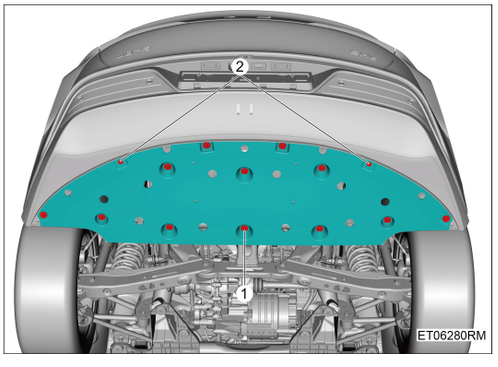
Removal

1. **Raise the vehicle.**
2. **Remove rear suspension bottom protector I**

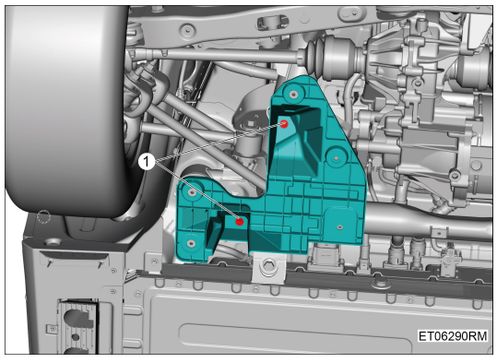


   (a) (For example) Remove all bolts -1-.
   (b) Remove the clip -2-.

3. **Remove rear suspension bottom protector II**

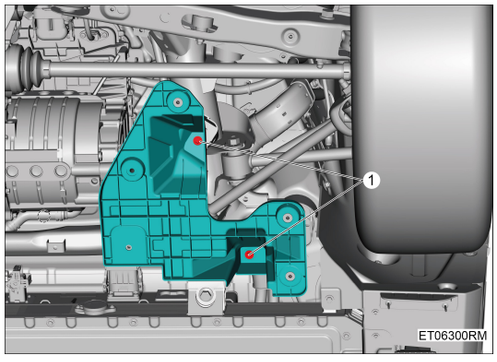


   (a) (For example) Remove all bolts -1-.
   (b) Remove the clip -2-.



4. Remove rear suspension bottom protector bracket I

(a) Remove the bolt -1-.



5. Remove rear suspension bottom protector bracket II

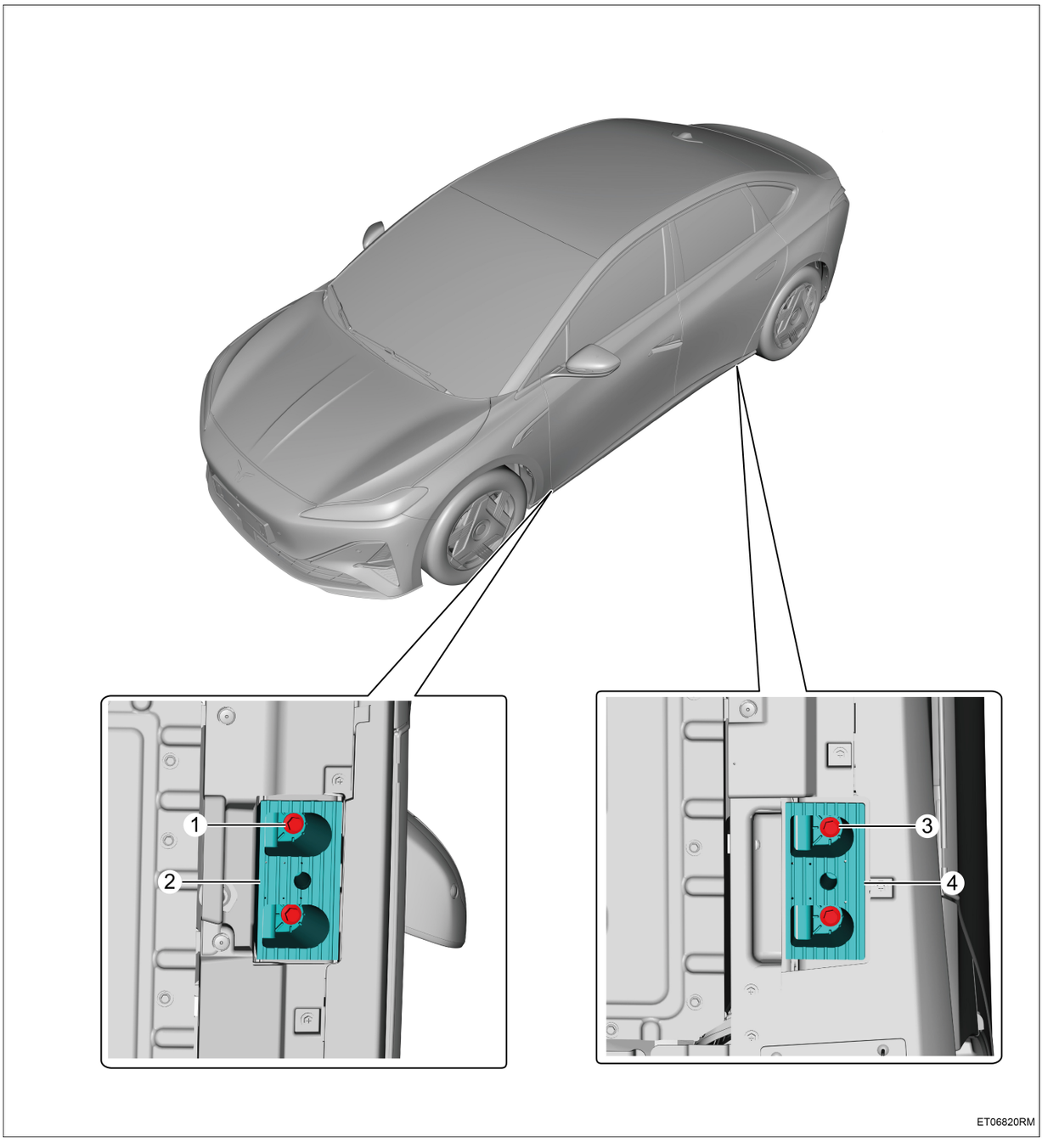
(a) Remove the bolt -1-.

Installation

1. Installation is in the reverse order of removal.

Lifting block

Components



1. **Hexagon flange bolt**
   - X2
   - Torque: 11 ~ 15 N • m
2. **Front lifting block**
3. **Hexagon flange bolt**
   - X2

- Torque: 11 ~ 15 N • m

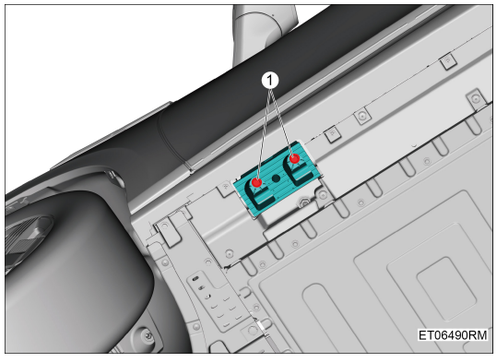
4. Rear lifting block

Removal

1. Remove front lifting block

Note:

- Use same removal orders for right and left sides.

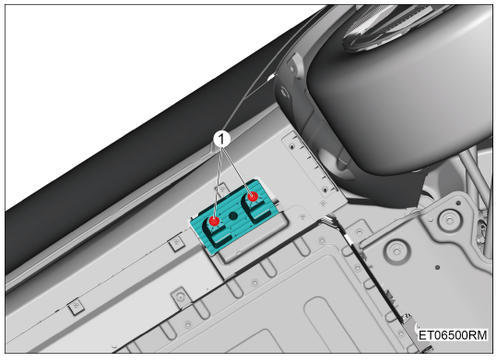


(a) Remove the bolt -1-.

2. Remove rear lifting block

Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

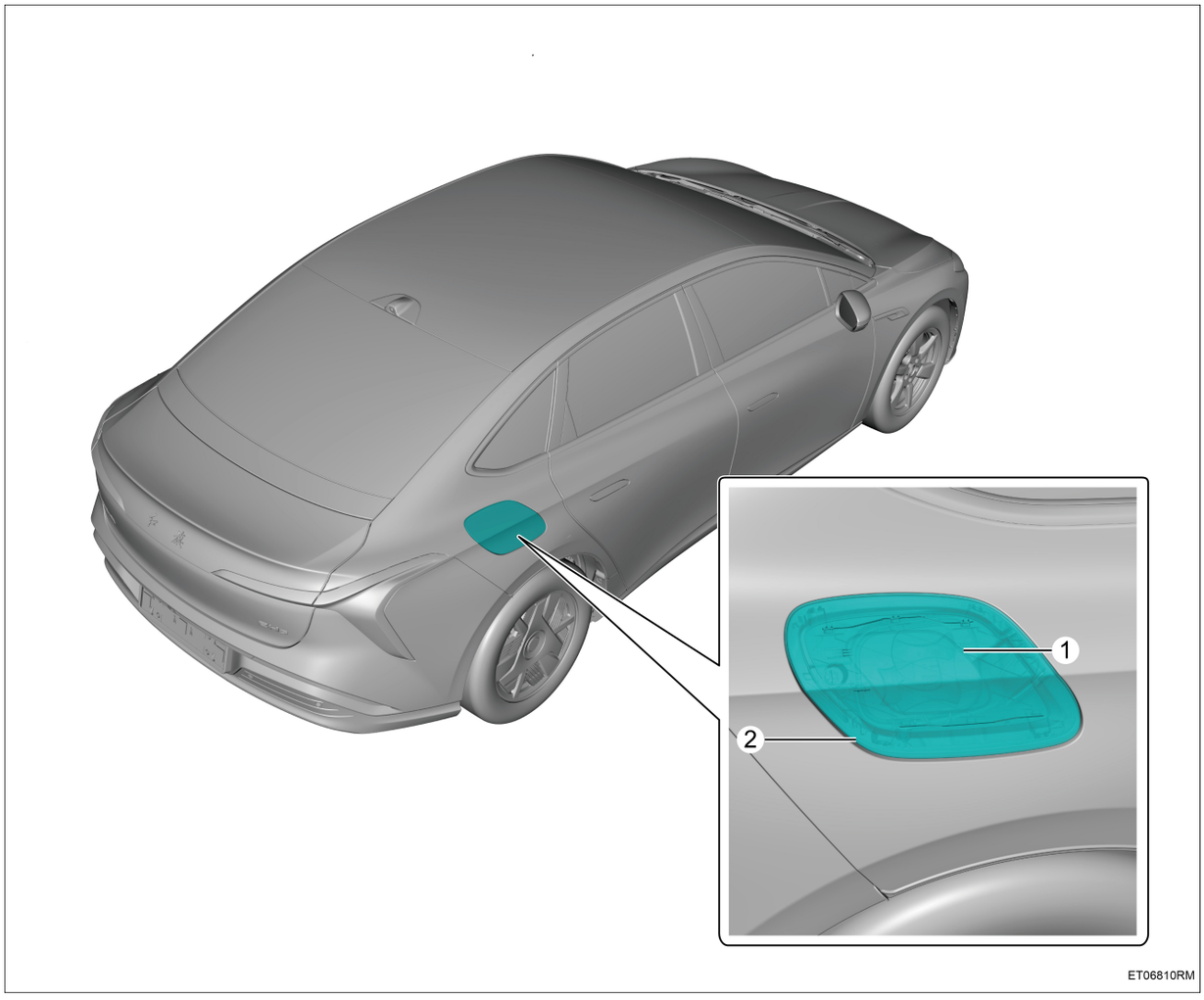
Installation

1. Installation is in the reverse order of removal.

Functional part system

Charging port cover assembly

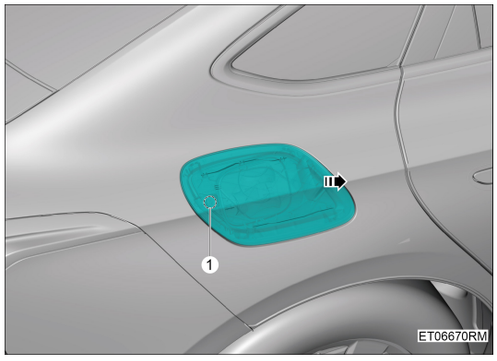
Components



1. **Charging port cover outer panel**
2. **Charging port cover assembly**

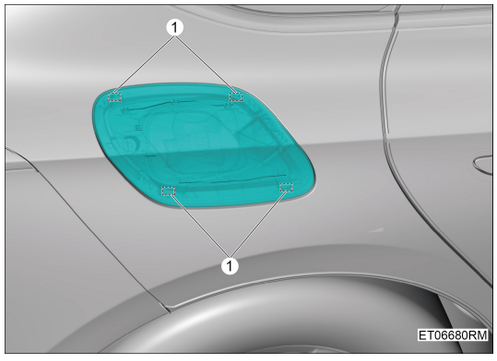
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove charging port cover outer panel**



(a) Pry off claw -1- and push charging port cover outer panel in direction of -arrow- to remove it.

3. Remove charging port cover assembly



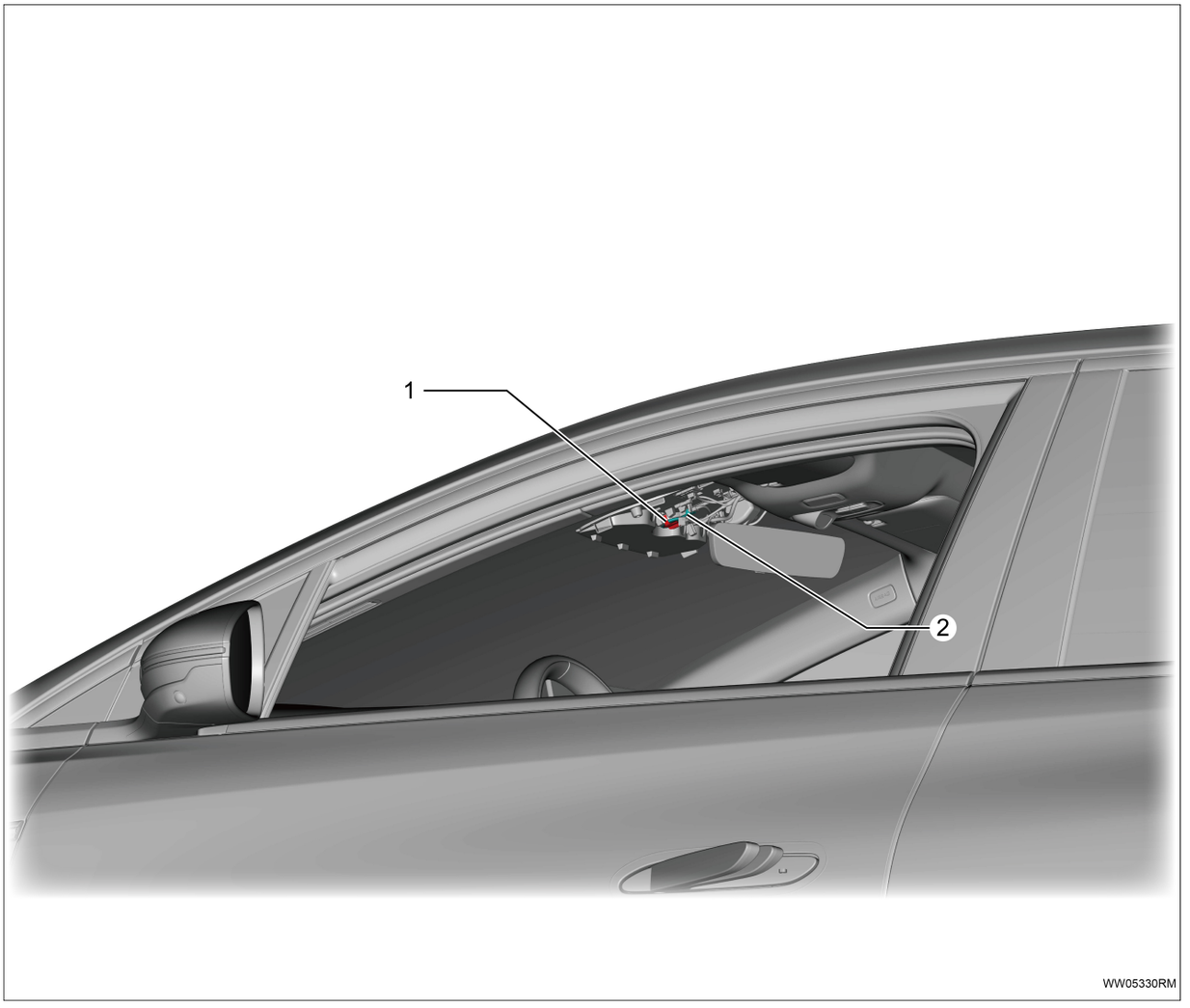
(a) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

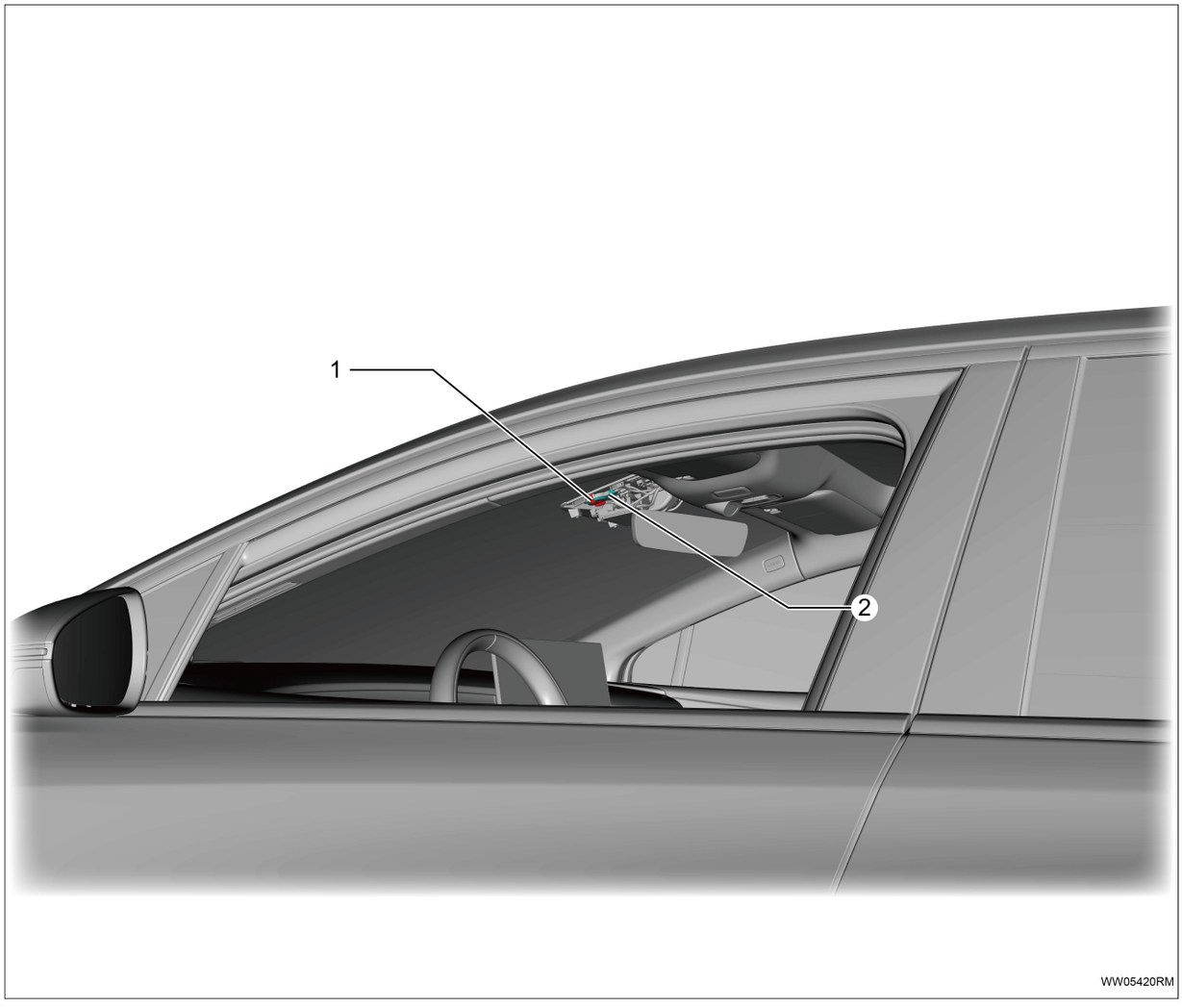
Rain sensor assembly

Components (Asia)



1. **Spring retainer**
2. **Rain sensor assembly**

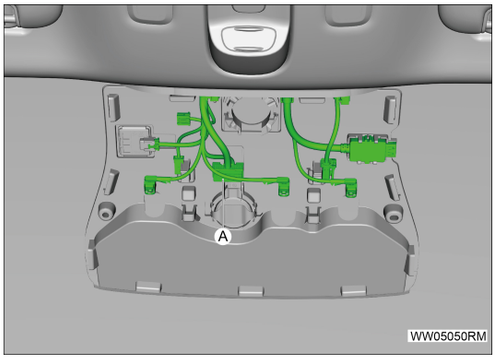
Components (Europe)



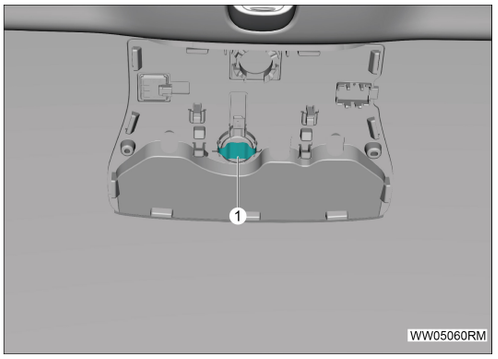
1. **Spring retainer**
2. **Rain sensor assembly**

Removal

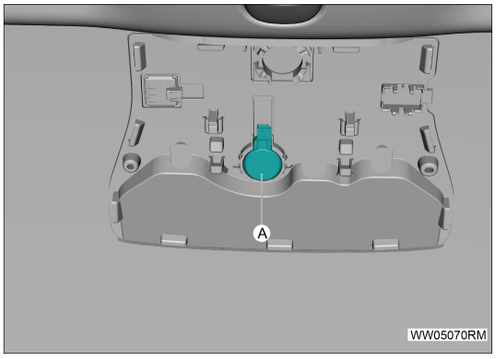
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove inside rear view mirror trim cover I (See page NS-165)**
3. **Remove inside rear view mirror trim cover II (See page NS-165)**
4. **Remove inside rear view mirror (See page NS-180)**
5. **Remove front camera with bracket assembly (See page ZC-139)**
6. **Remove rain sensor assembly (Asia)**



(a) Disconnect the wire harness connector -A-.

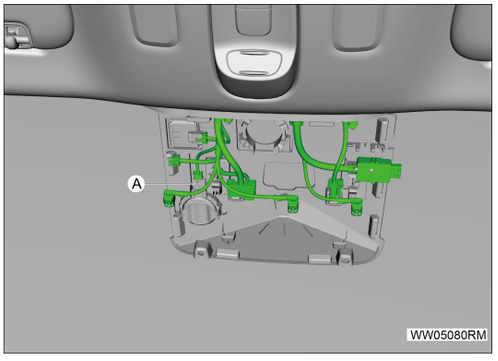


(b) Remove the spring retainer -1-.

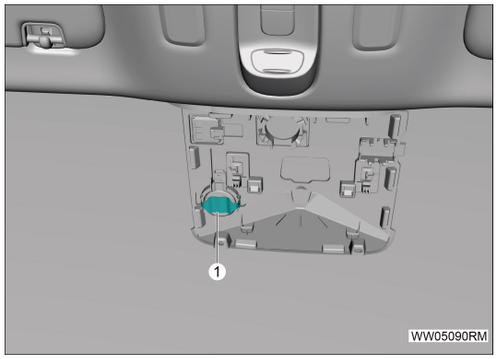


(c) Detach the rain sensor assembly -A-.

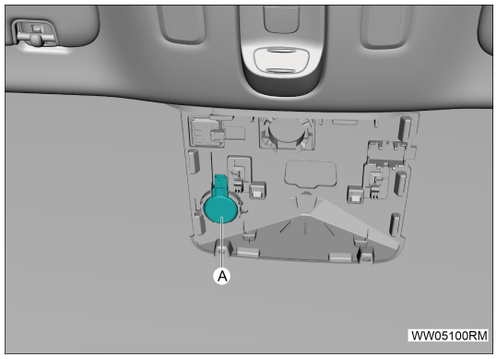
7. Remove rain sensor assembly (Europe)



(a) Disconnect the wire harness connector -A-.



(b) Remove the spring retainer -1-.



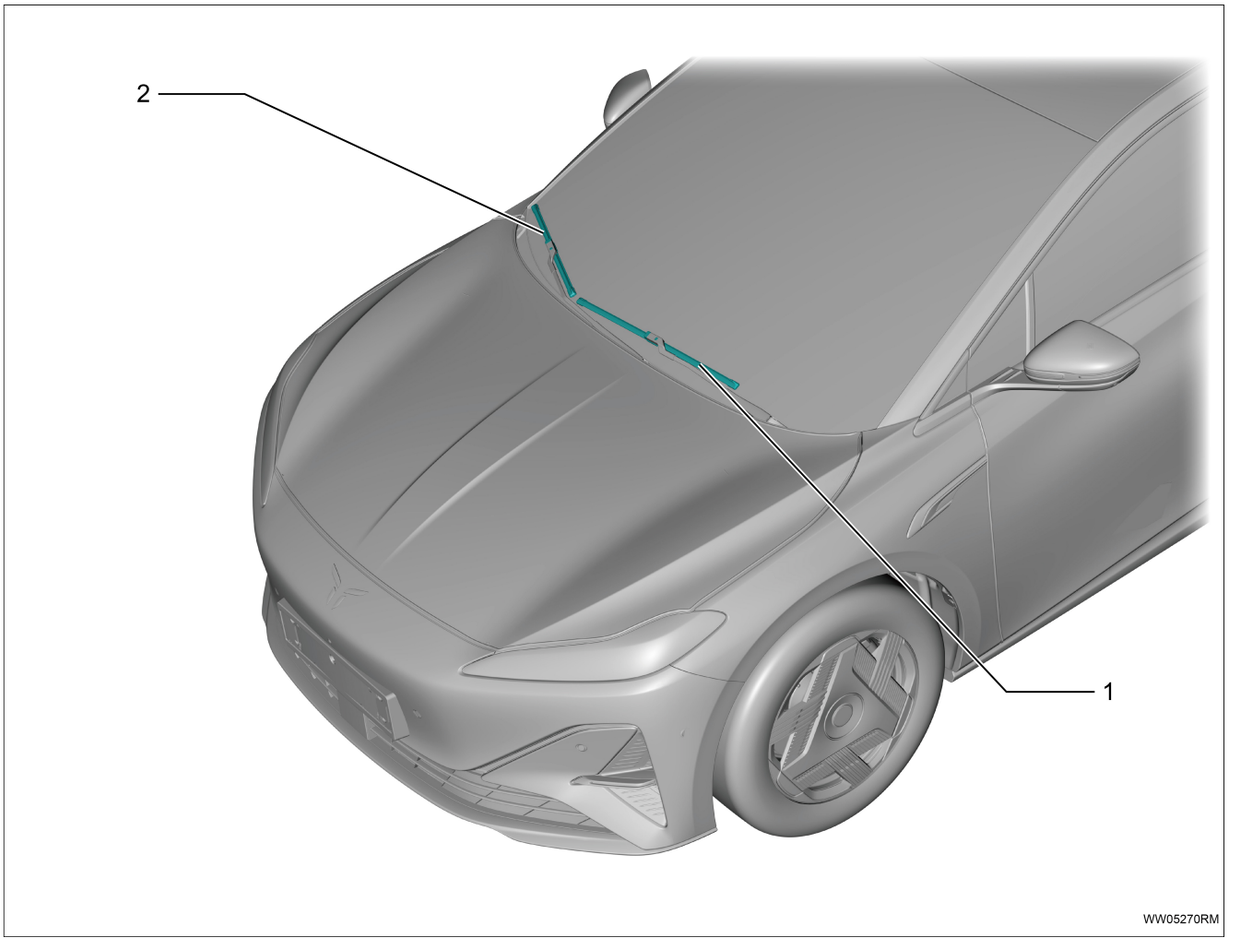
(c) Detach the rain sensor assembly -1-.

Installation

1. Installation is in the reverse order of removal.

Front wiper blade

Components



1. **Main wiper blade**
2. **Sub wiper blade**

Removal

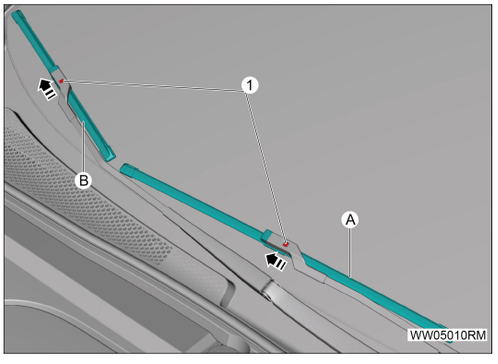
1. **Remove front wiper blade**

   Note:

   - Adjust it to service mode before removal.

   (a) Press the position indicated by -1-, and push out in the direction of -arrow-.

   (b) Remove the main wiper blade -A- and the sub wiper blade -B-.



Installation

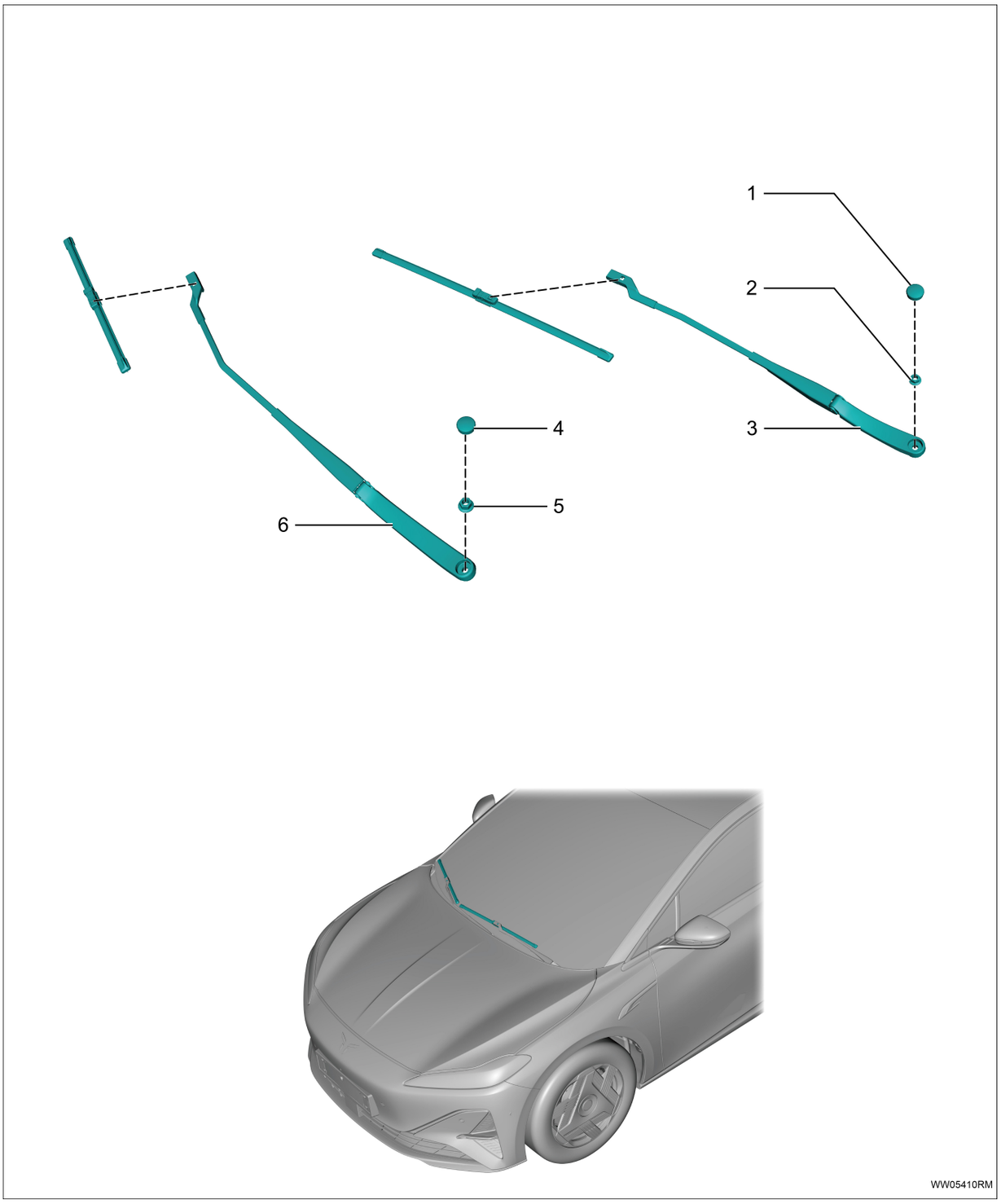
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **The length of main wiper blade is different from that of sub wiper blade, be careful to distinguish between them when installing.**

Front wiper arm

Components



1. **Nut trim cover**
2. **Hexagon flange nut**
   - Torque: 23 ~ 27 N • m
3. **Main wiper arm**

4. Nut trim cover

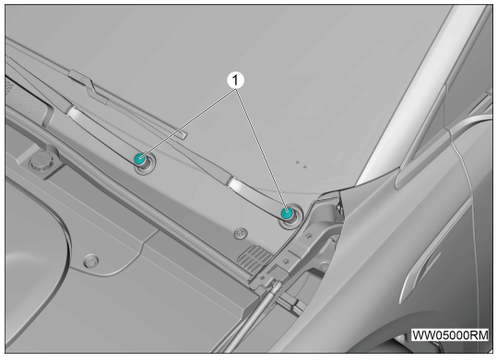
5. Hexagon flange nut

- Torque: 23 ~ 27 N • m

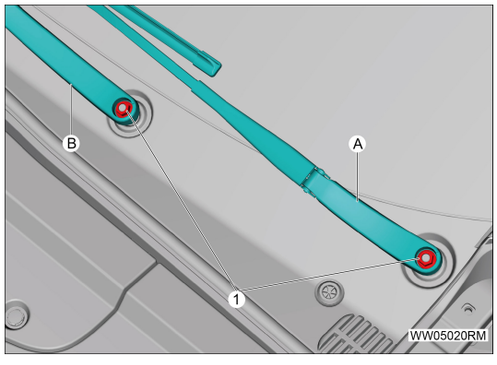
6. Sub wiper arm

Removal

1. Remove front wiper arm



(a) Remove the trim cover -1-.



(b) Remove the nut -1-.

(c) Use SST (9503510HF01) to remove main wiper arm -A- and sub wiper arm -B-.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

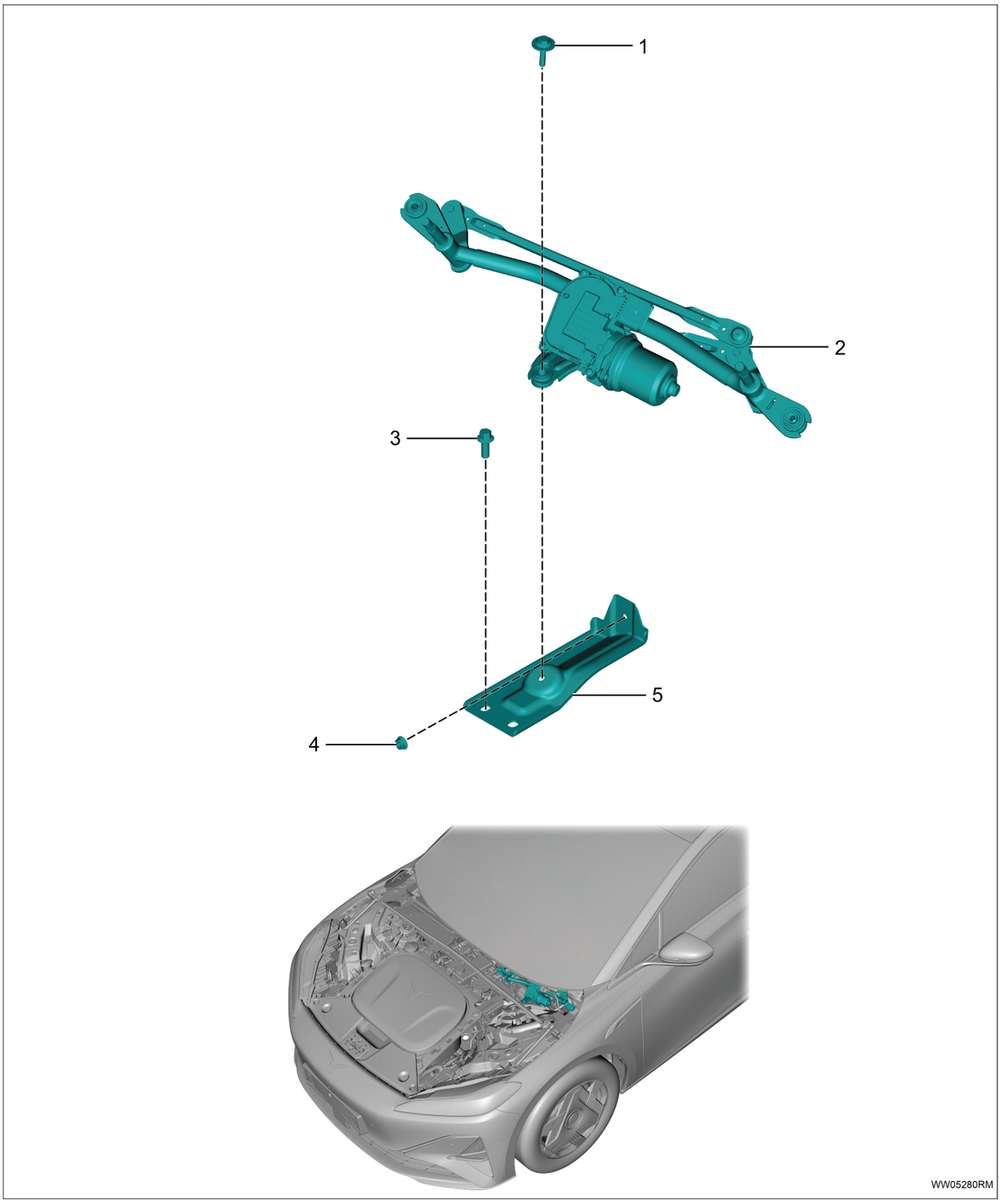
Notice:

- **The lengths of the windshield wiper arms on the driver side and the passenger side are different, please pay attention to the distinction during installation.**

WS

Front wiper motor link assembly

Components

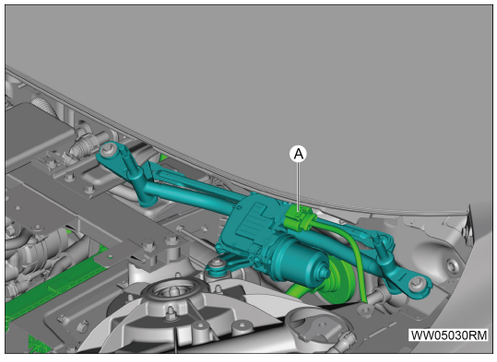


1. **Hexagon flange bolt**
   - X3
   - Torque: 8 ~ 12 N • m
2. **Front wiper motor link assembly**

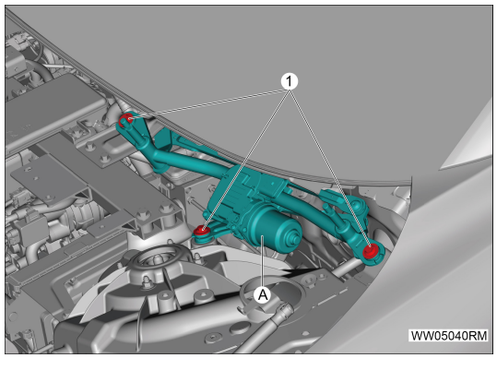
3. **Hexagon flange bolt**
   - X2
   - Torque: 32 ~ 38 N • m
4. **Hexagon flange nut**
   - Torque: 8 ~ 12 N • m
5. **Wiper fixing bracket I**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front wiper arm (See page WS-60)**
3. **Remove water channel cover plate assembly (See page WS-86)**
4. **Remove front wiper motor link assembly**



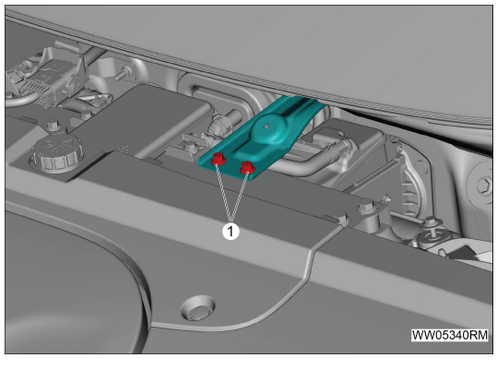
(a) Disconnect the wire harness connector -A-.



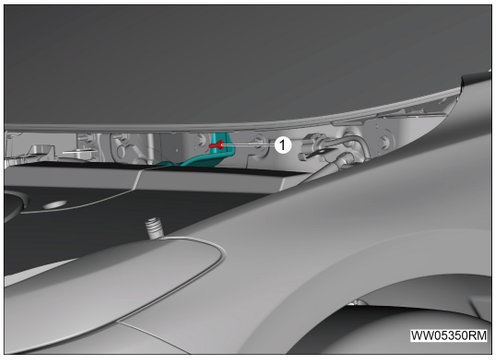
(b) Remove the bolt -1-.

(c) Remove front wiper motor link assembly -A- from body with an appropriate angle.

5. **Remove wiper fixing bracket I**



(a) Remove the bolt -1-.



(b) Remove the nut -1-.

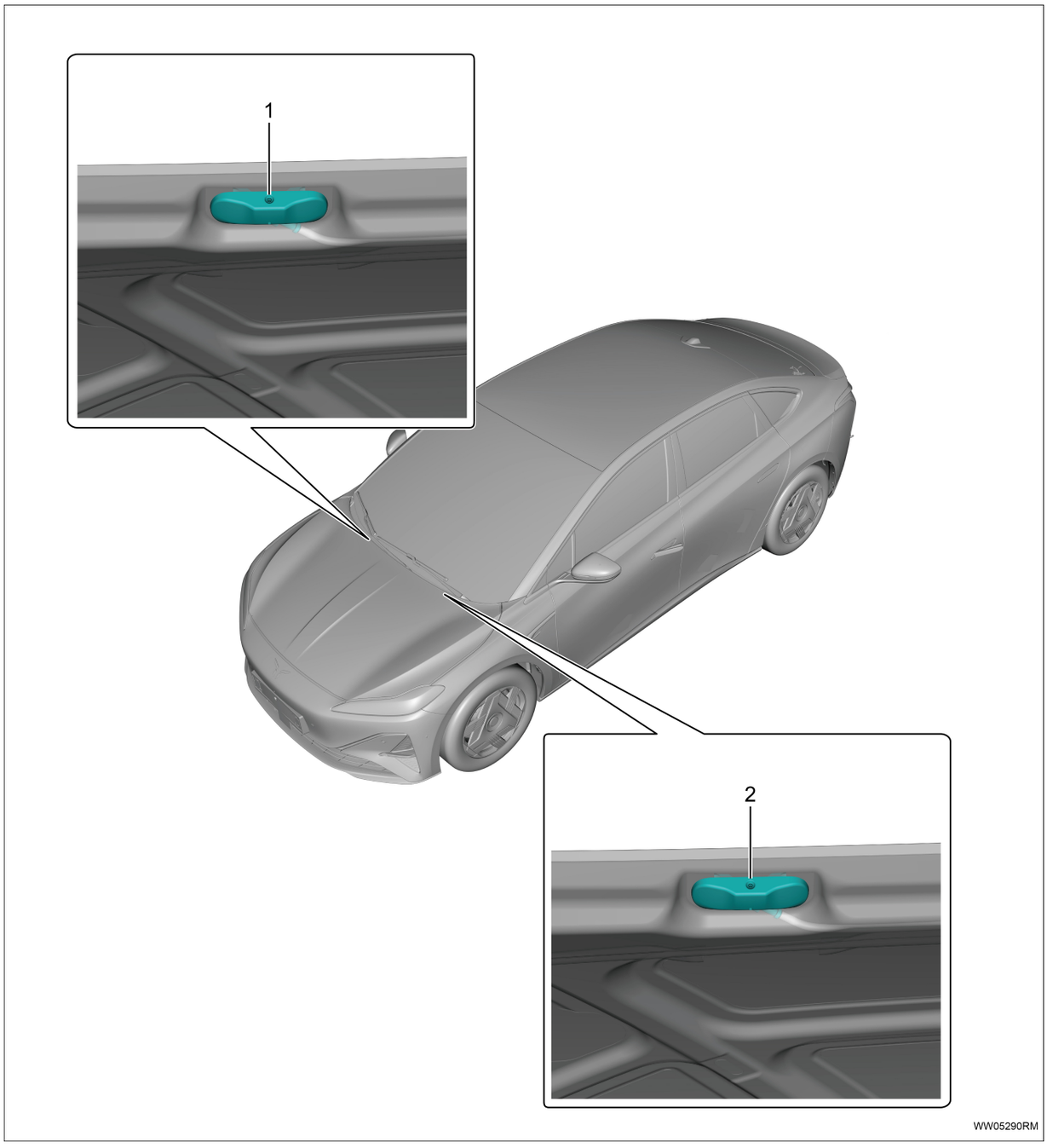
(c) Remove the wiper fixing bracket I.

Installation

1. Installation is in the reverse order of removal.

Washer nozzle assembly

Components



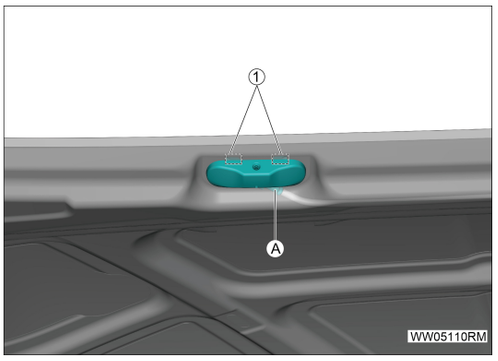
1. **Right washer nozzle assembly**
2. **Left washer nozzle assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**

WS

2. **Remove front right wheel protector (See page WS-32)**
3. **Remove left washer nozzle assembly**

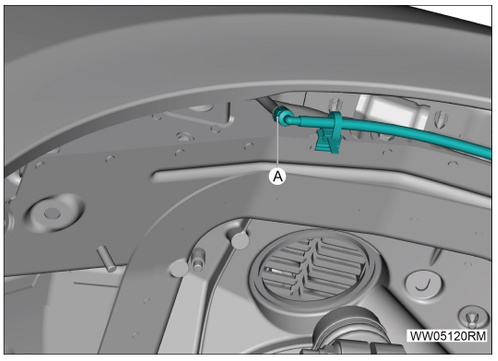


(a) Pry off at the -1- position, and detach the washer nozzle.

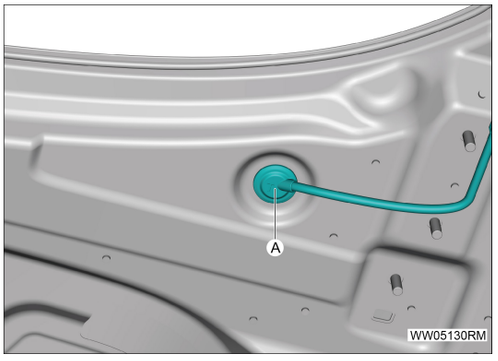
(b) Detach the water pipe -A-.

Note:

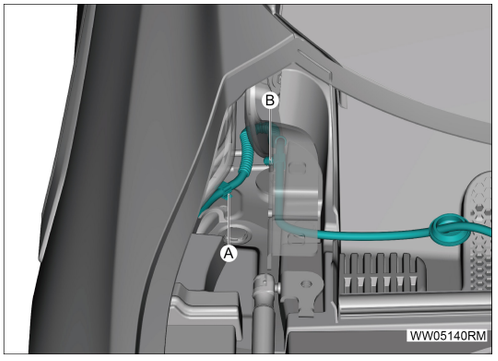
- Use same removal orders for right and left sides.



(c) Detach the connection -A-.

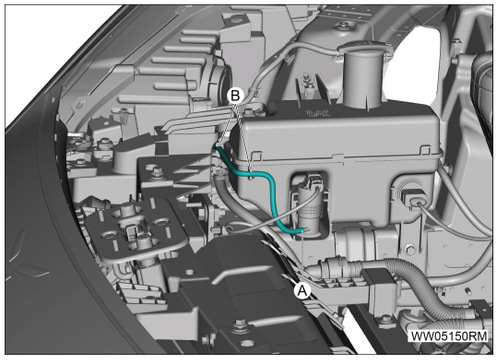


(d) Detach the water pipe boot -A-.



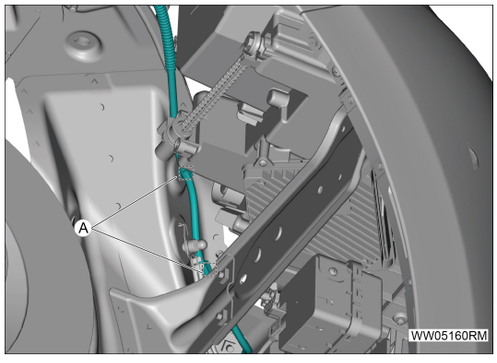
(e) Disengage the pipe fixing clips -A-B-.

4. **Remove front compartment storage box (See page WS-83)**
5. **Remove front water pipe assembly**

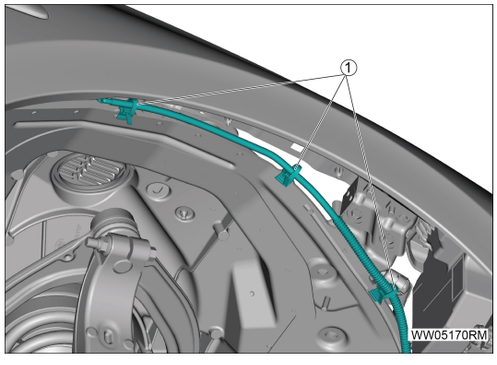


(a) Detach the front water pipe -A-.

(b) Detach the water pipe fixing claw -B-.



(c) Detach the water pipe clip -A-.



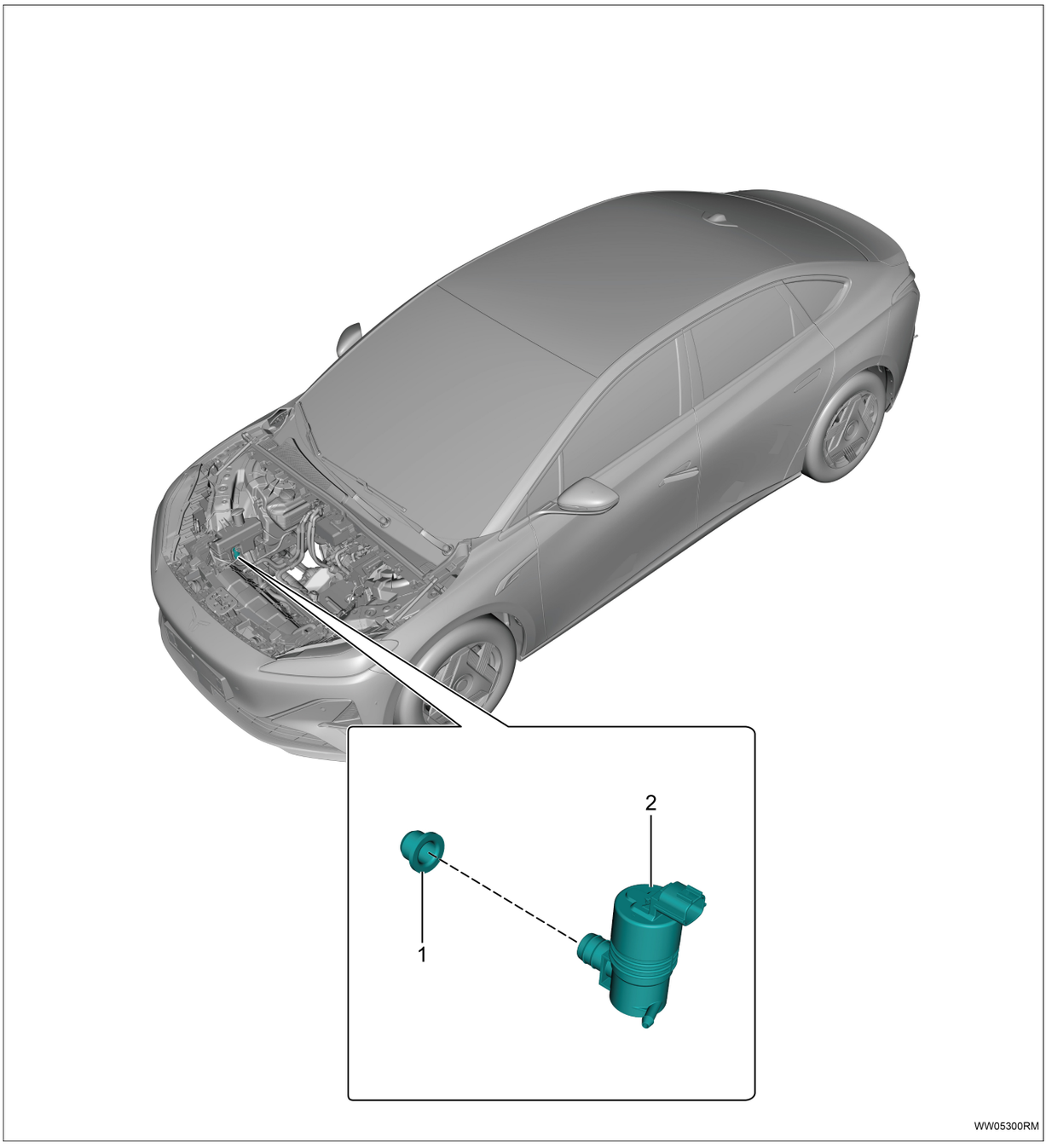
(d) Detach the water pipe clip -A-.

Installation

1. Installation is in the reverse order of removal.

Washer pump

Components



1. **Washer pump seal ring**
2. **Washer fluid reservoir assembly**

Removal

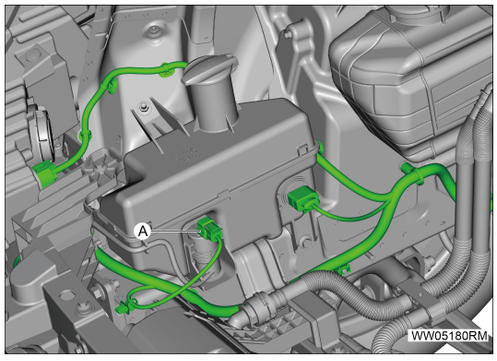
1. **Disconnect negative battery terminal (See page DL-21)**

2. Remove front compartment storage box (See page WS-83)

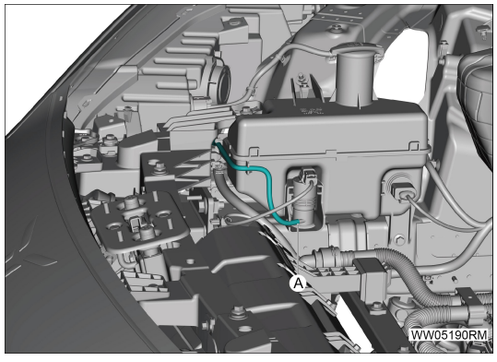
3. Remove washer pump

Note:

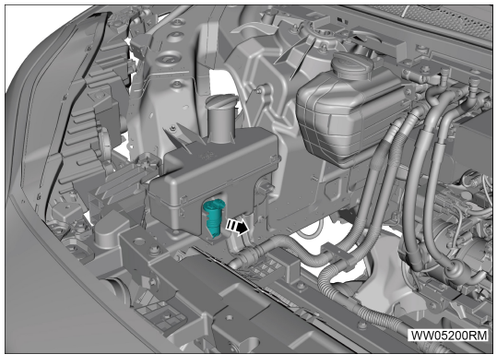
- Drain washer before removing.



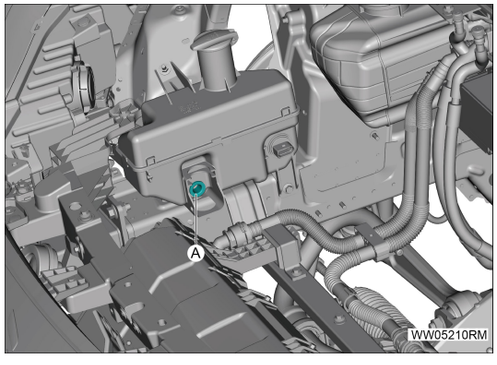
(a) Disconnect the wire harness connector -A-.



(b) Detach the front water pipe assembly -A-.



(c) Remove the washer pump in the direction of -arrow-.



(d) Remove the washer pump seal ring -A-.

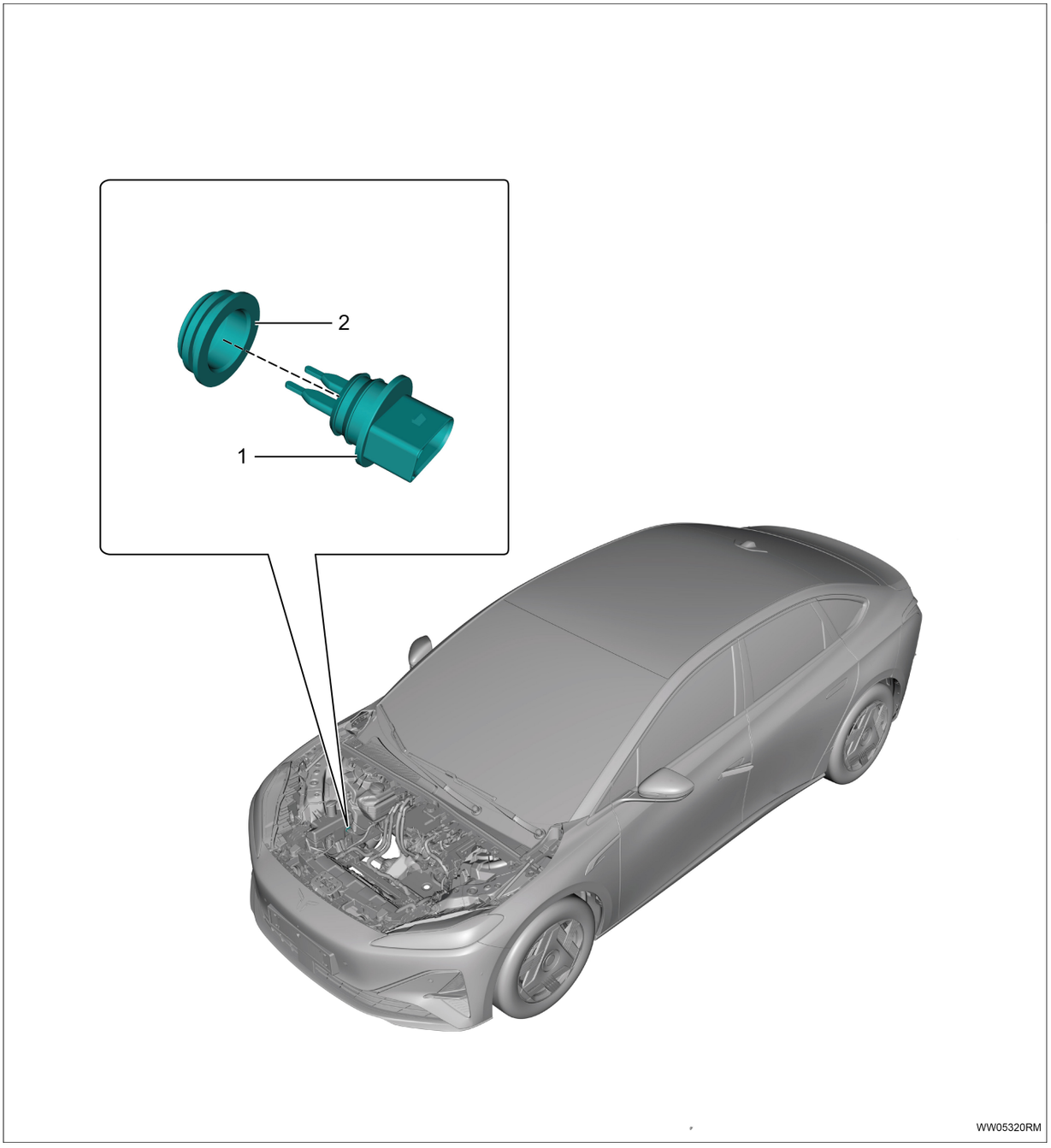
WS

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**
   (a) Check if washer pump seal ring is damaged during installation.

Washer fluid level sensor

Components



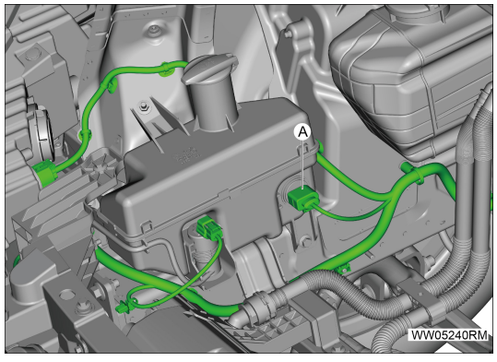
1. **Fluid level sensor**
2. **Fluid level sensor seal ring**

Removal

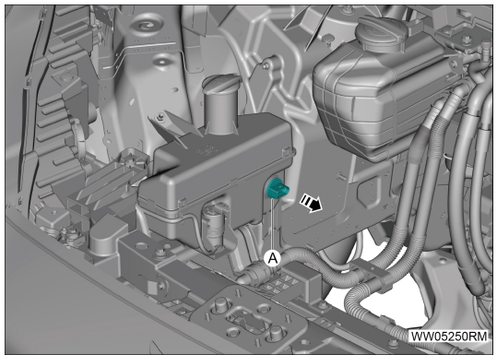
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment storage box (See page WS-83)**
3. **Remove washer fluid level sensor**

Note:

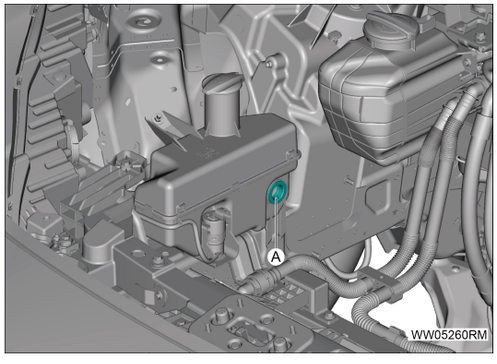
- Drain washer before removing.



(a) Disconnect the wire harness connector -A-.



(b) Pull out the washer fluid level sensor -A- in the direction of -arrow-.



(c) Remove the washer fluid level sensor seal ring -A-.

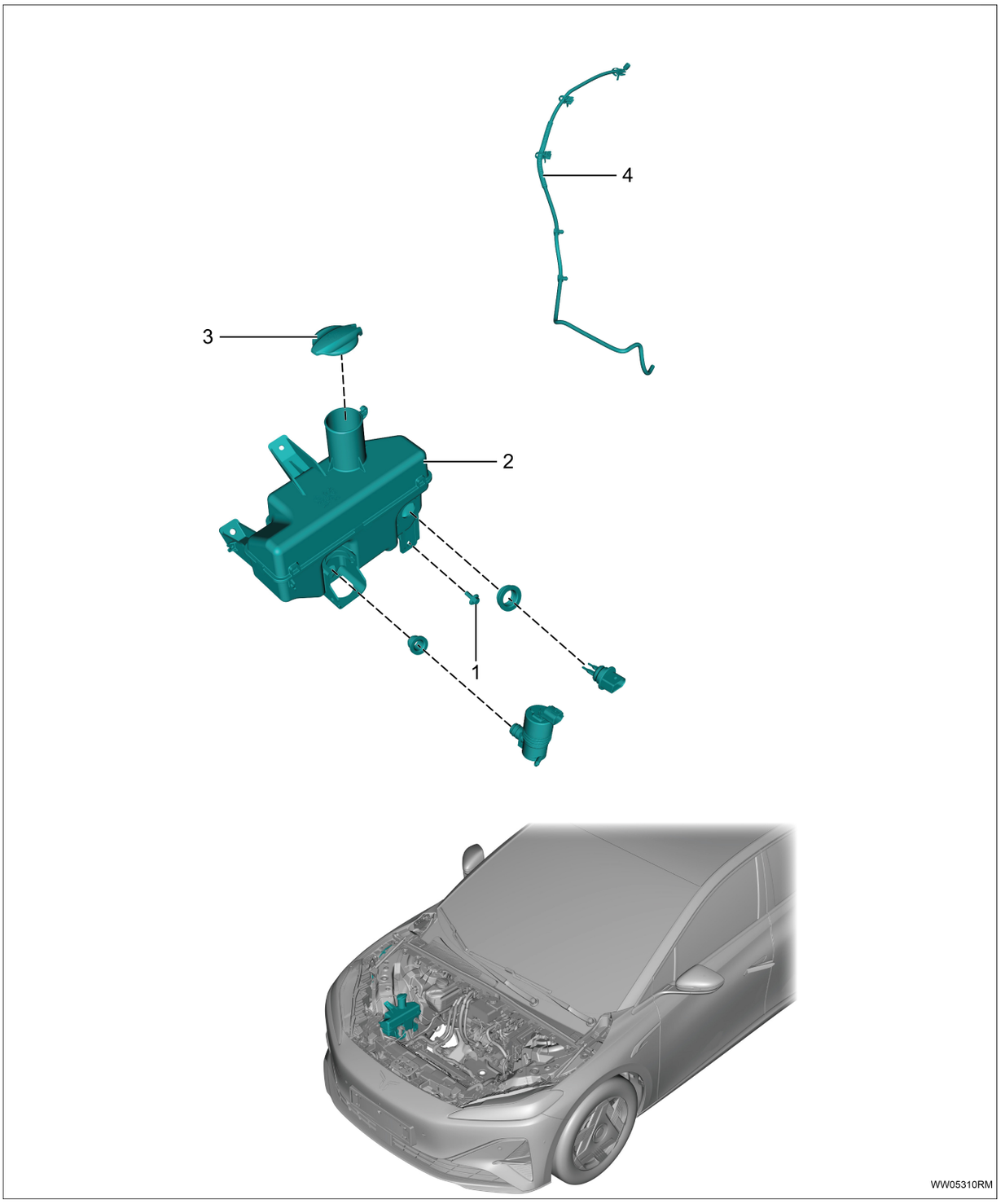
Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

(a) Check if washer fluid level sensor seal ring is damaged during installation.

Washer fluid reservoir assembly

Components

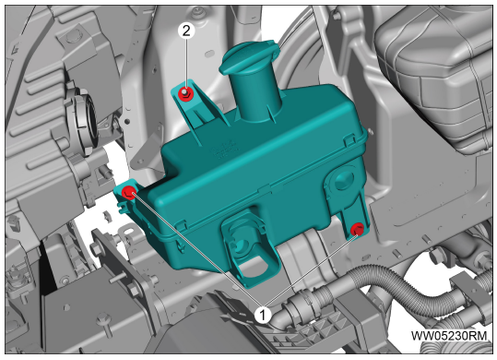


1. **Hexagon flange bolt**
   - X3
   - Torque: 7 ~ 9 N • m
2. **Washer fluid reservoir assembly**

3. **Washer fluid reservoir upper cover**
4. **Front water pipe assembly**

Removal

1. **Remove front compartment upper protector assembly (See page WS-79)**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove washer pump (See page WS-68)**
4. **Remove fluid level sensor (See page WS-70)**
5. **Remove washer fluid reservoir**
   (a) Remove the bolt -1-.
   (b) Remove the nut -2-.



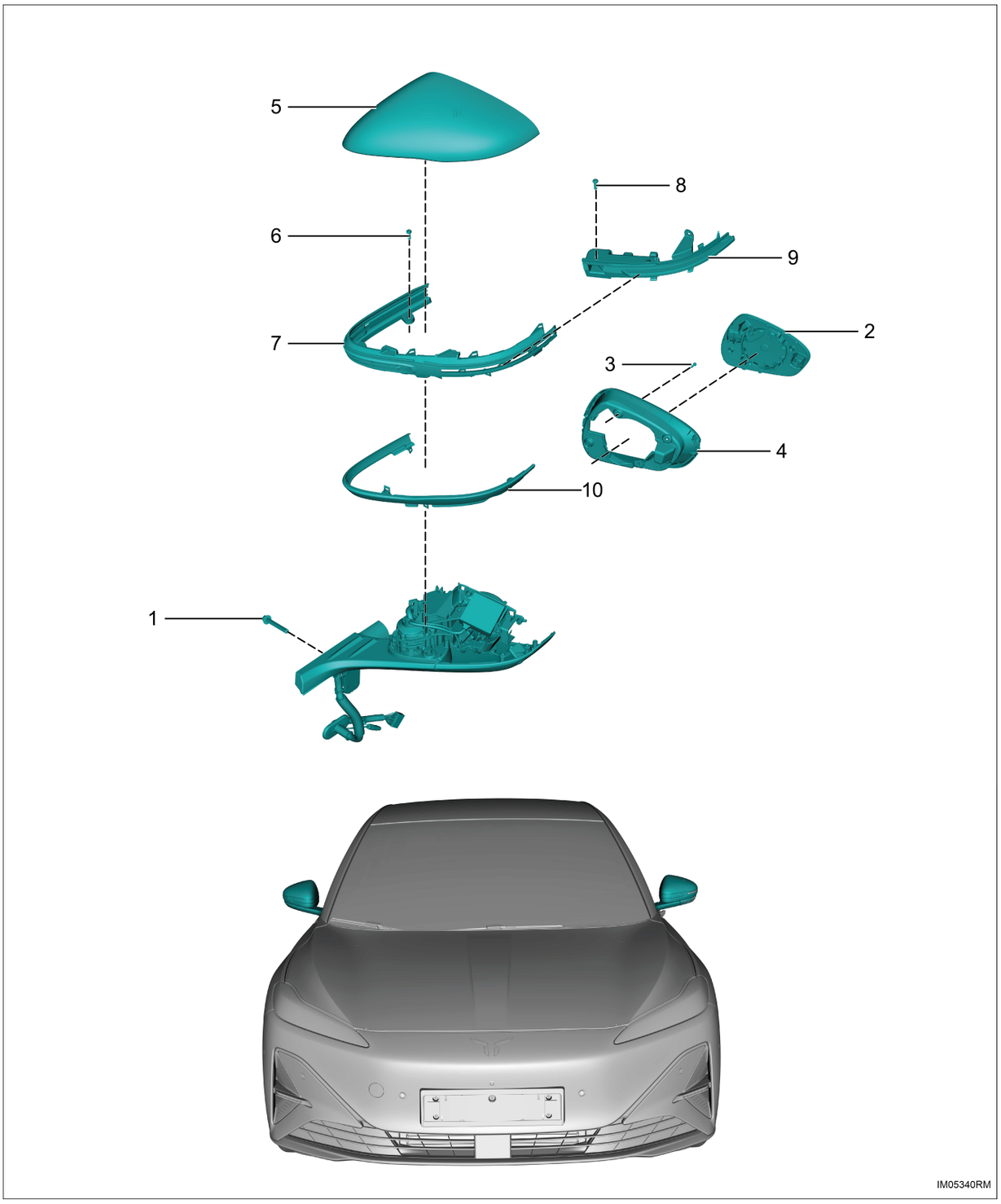
Installation

1. **Installation is in the reverse order of removal.**

WS

Outside rear view mirror

Components



1. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 12 N • m
2. **Left len assembly**

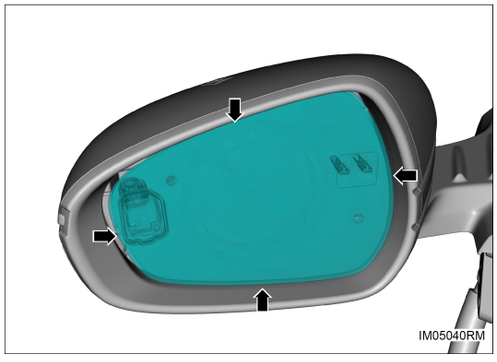
3. **Screw**
   - X4
4. **Left mirror ring**
5. **Left mirror housing**
6. **Screw**
   - X2
7. **Left outside rear view mirror ornament**
8. **Left outside rear view mirror trim strip**
9. **Screw**
   - X2
10. **Left turn signal light assembly**
11. **Left outside rear view mirror ornament**

Removal

Note:

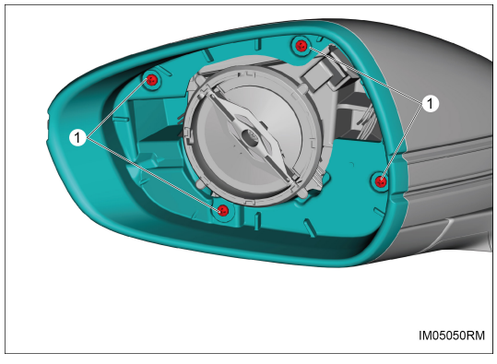
- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove left lens assembly**



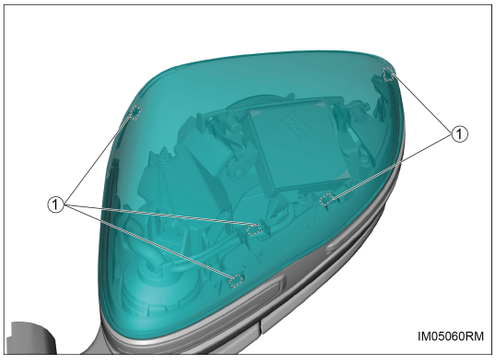
   (a) Pry at the -arrow- position.
   (b) Disconnect the wire harness connector terminal.
   (c) Detach the left rear view mirror heating terminal.
   (d) Remove the left lens assembly.

3. **Remove left mirror ring**



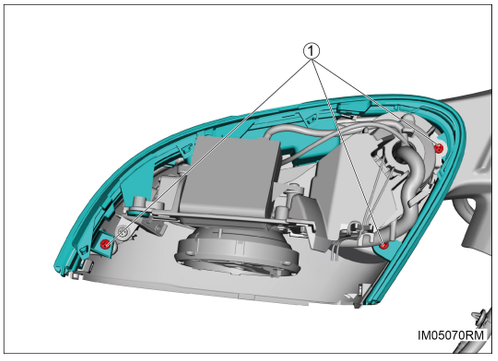
   (a) Remove the screw -1-.

4. **Remove left mirror case**

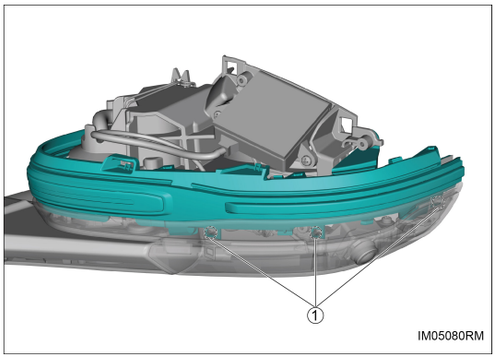


(a) Detach the claw -1-.

5. Remove left outside rear view mirror trim strip

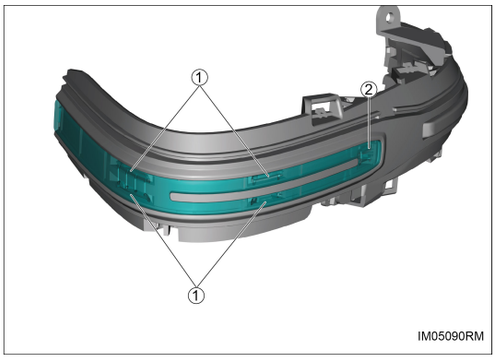


(a) Remove the screw -1-.



(b) Detach the clip -1-.

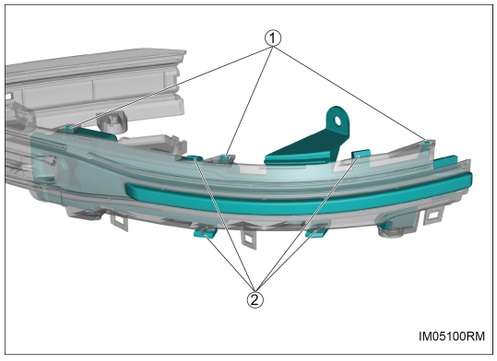
6. Remove left outside rear view mirror ornament II



(a) Detach the clip -1-.

(b) Detach the clip -2-.

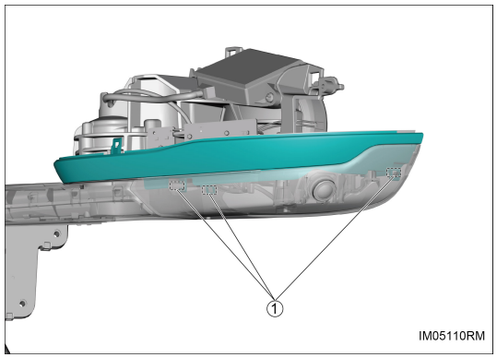
7. Remove left turn signal light assembly



(a) Detach the claw -1-.

(b) Detach the claw -2-.

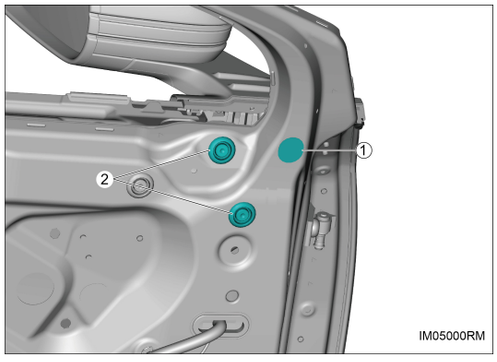
8. Remove left outside rear view mirror ornament



(a) Detach the claw -1-.

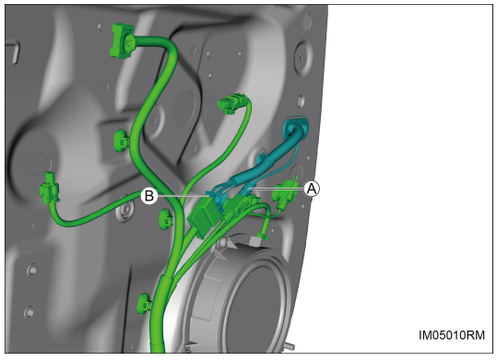
9. Remove door protector (See page NS-111)

10. Remove left outside rear view mirror assembly

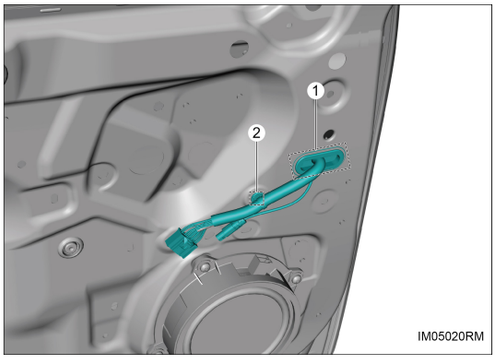


(a) Detach the patch -1-.

(b) Detach the block cover -2-.

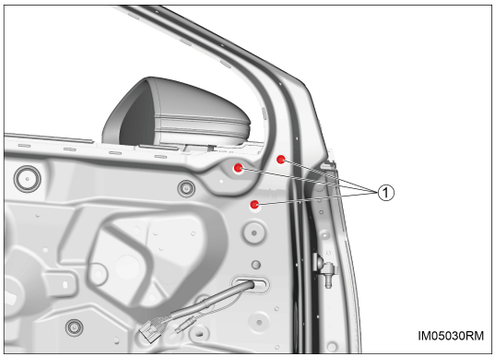


(c) Detach the wire harness connectors -A-B-.



(d) Detach wire harness protector -1-.

(e) Detach the clip -2-.



(f) Remove the bolt -1-.

(g) Remove the left outside rear view mirror assembly.

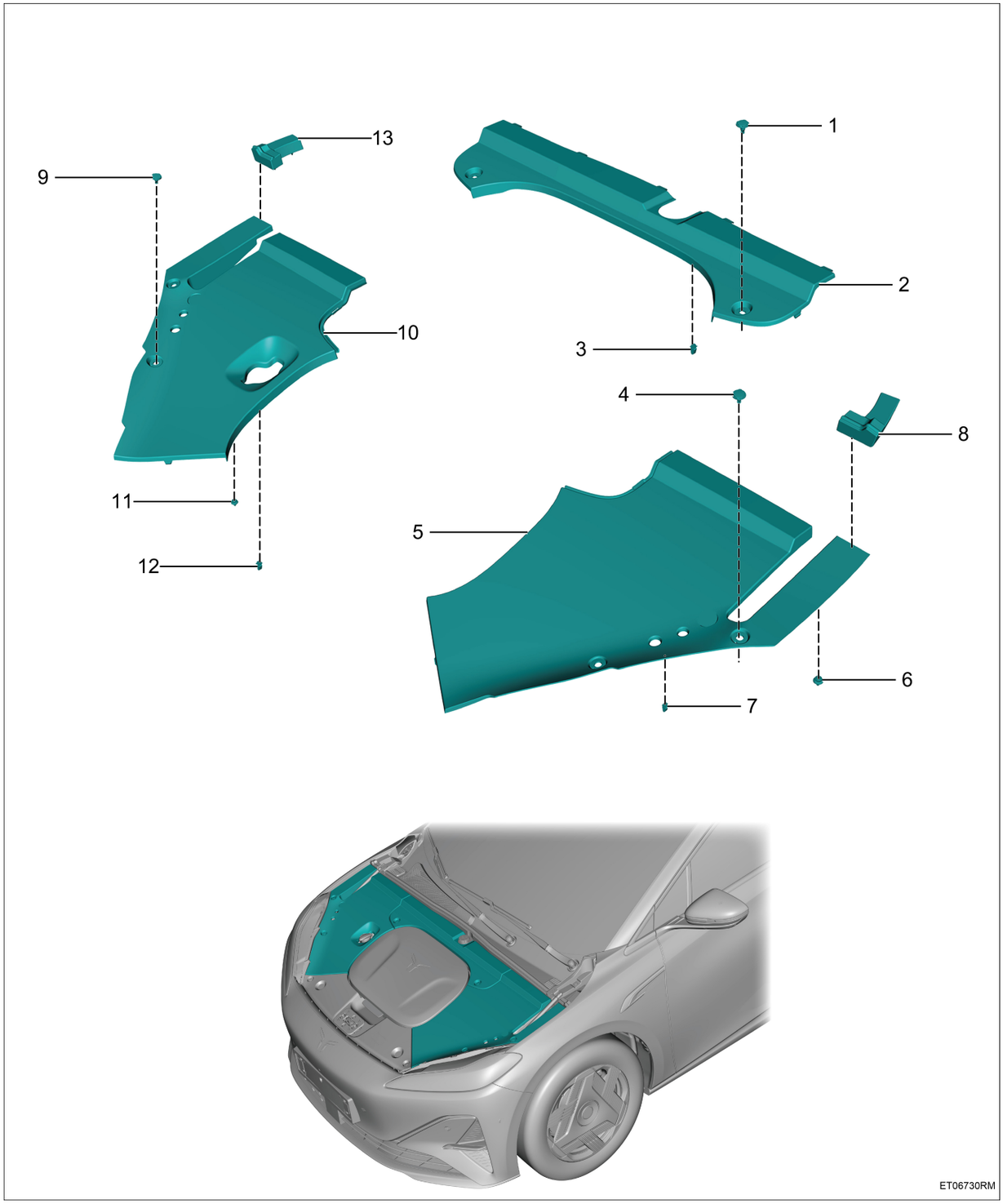
Installation

1. Installation is in the reverse order of removal.

Front compartment protector system

Front compartment upper protector

Components



1. **Clip**

- X2

2. **Front compartment upper rear protector assembly**
3. **Clip**
   - X3
4. **Clip**
   - X2

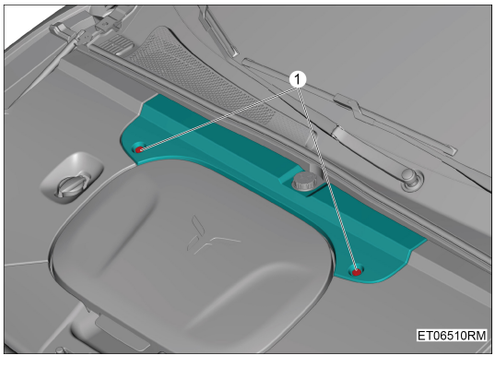
WS

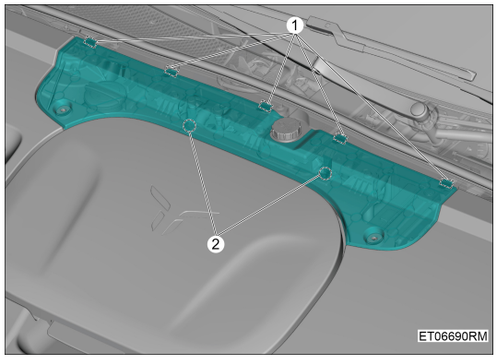
5. **Front compartment upper left protector**
6. **Clip**
   - X4
7. **Clip**
   - X7
8. **Front compartment cover left sealing block assembly**
9. **Clip**
   - X2
10. **Front compartment upper right protector**
11. **Clip**
    - X4
12. **Clip**
    - X7
13. **Front compartment cover right sealing block assembly**

Removal

1. **Open the front compartment cover.**
2. **Remove front compartment rear upper protector assembly**

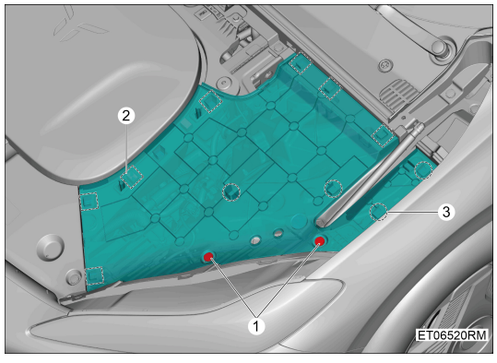
   (a) Remove the clip -1-.





(b) Detach the claws -1-2-.

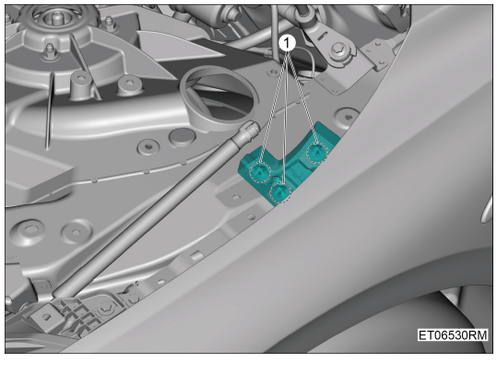
3. Remove front compartment upper left protector



(a) Remove the clip -1-.

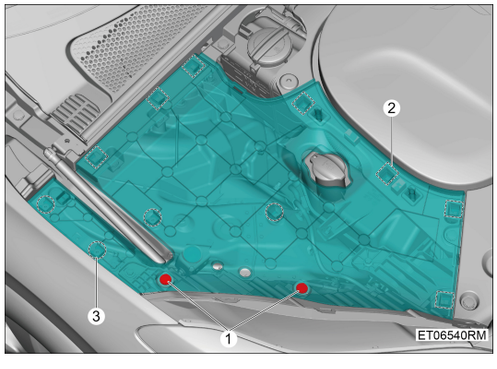
(b) (For example) Detach all claws -2-3-.

4. Remove front compartment cover left sealing block assembly



(a) Detach the claw -1-.

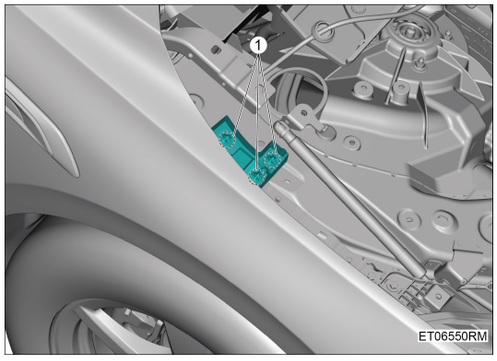
5. Remove front compartment upper right protector



(a) Remove the clip -1-.

(b) (For example) Detach all claws -2-3-.

6. Remove front compartment cover right sealing block assembly



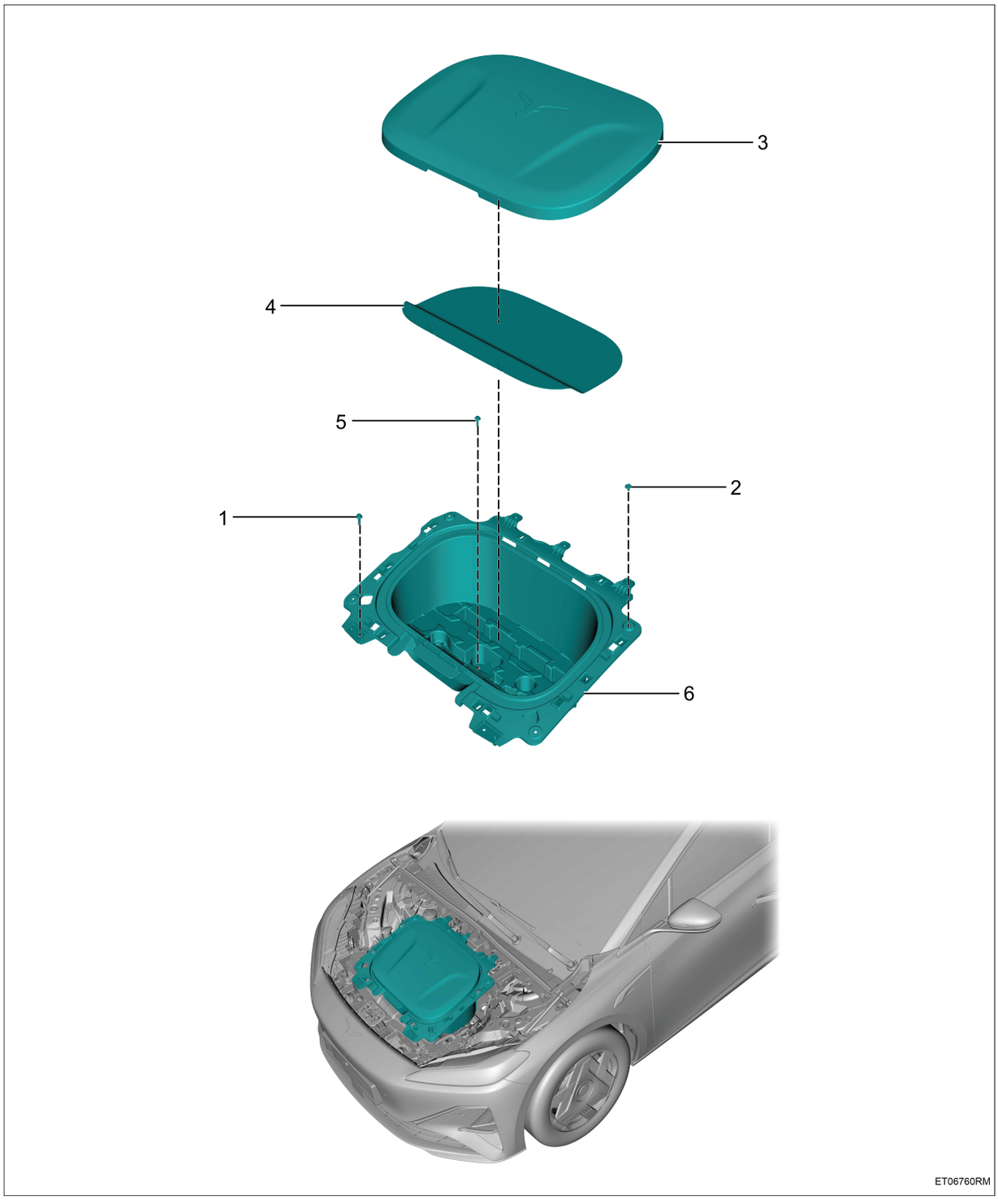
(a) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Front compartment storage box

Components



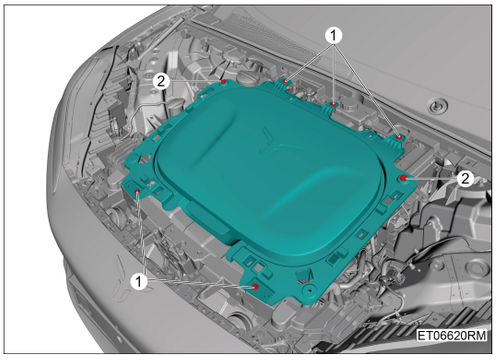
1. **Hexagon flange bolt**
   - X5
   - Torque: 7.0 ~ 9.0 N • m
2. **Clip**

- X2

3. **Front compartment storage box cover**
4. **Front compartment storage box trim cushion**
5. **Hexagon flange nut**
   - X2
   - Torque: 7.0 ~ 9.0 N • m
6. **Front compartment storage box**

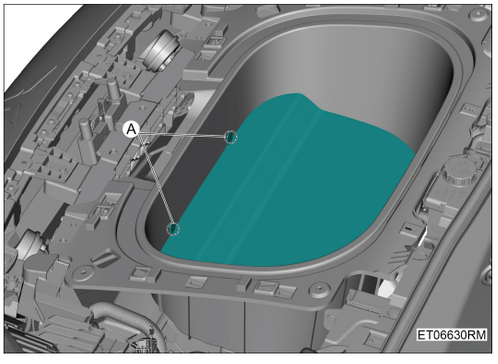
Removal

1. **Remove front compartment rear upper protector assembly (See page WS-79)**
2. **Remove front compartment upper left protector assembly (See page WS-79)**
3. **Remove front compartment upper right protector assembly (See page WS-79)**
4. **Remove front compartment cover lock upper protector (See page WS-96)**
5. **Remove front compartment storage box**



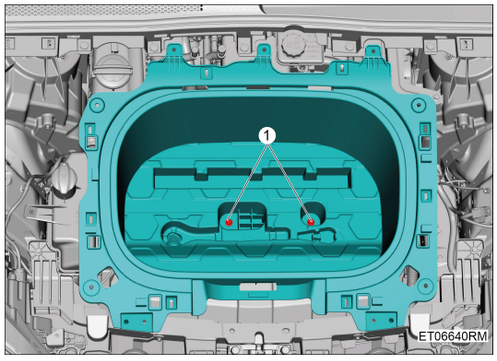
(a) Remove the bolt -1-.

(b) Remove the clip -2-.



(c) Lift -A-.

(d) Remove the front compartment storage box trim cushion.



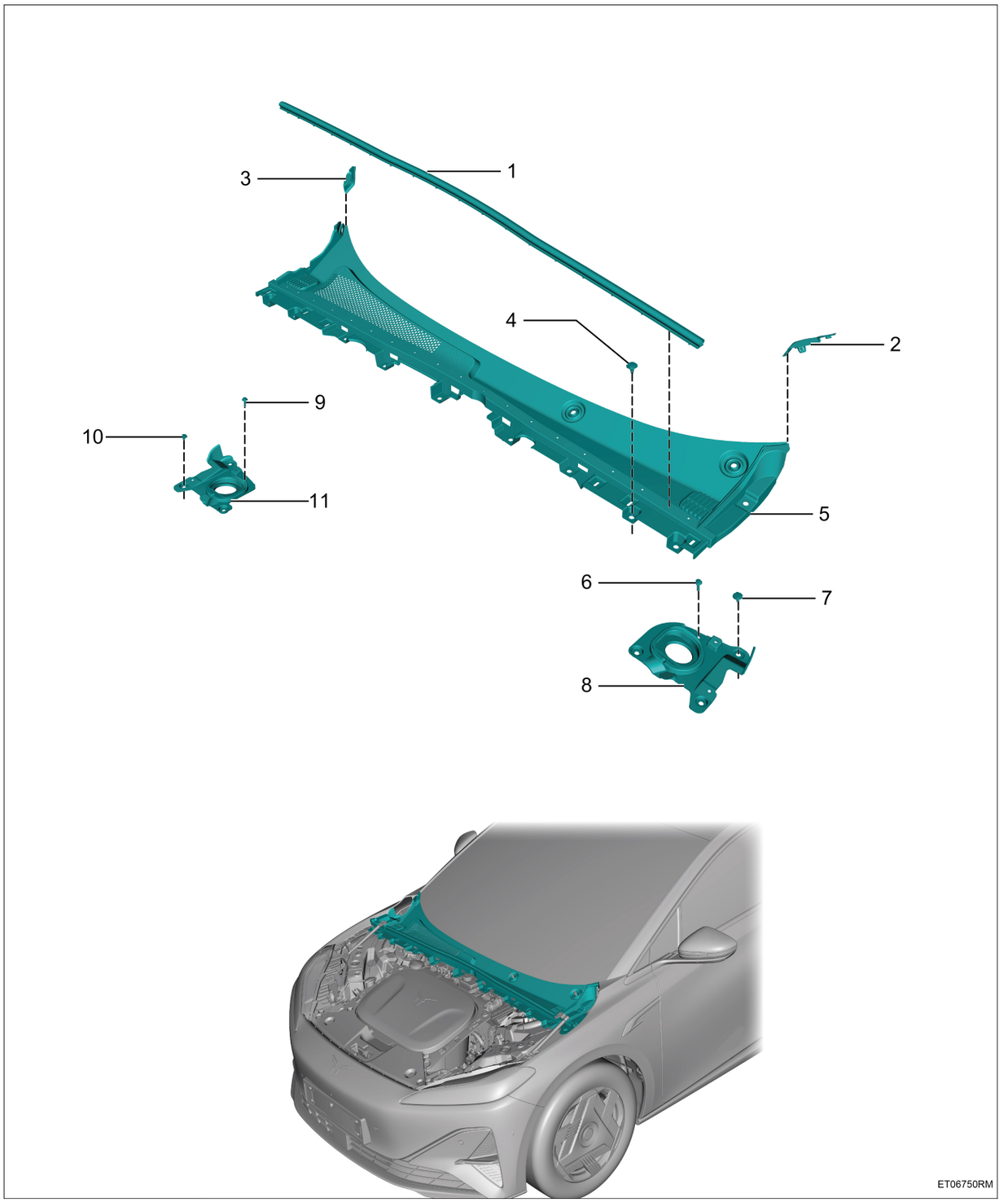
(e) Remove the bolt -1-.

Installation

1. Installation is in the reverse order of removal.

Water channel cover plate assembly

Components



1. **Front compartment cover water channel weatherstrip assembly**
2. **Trim cover - front left wing**
3. **Trim cover - front right wing**
4. **Clip**

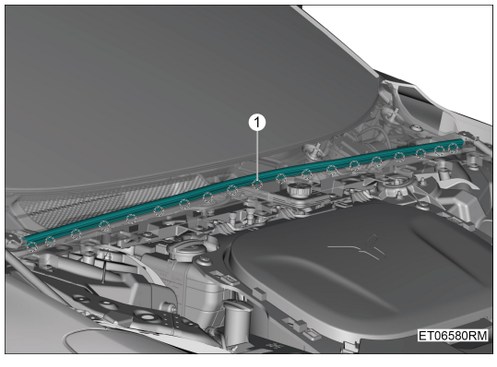
- X11

5. **Water channel cover plate assembly**
6. **Hexagon flange bolt**
   - Torque: 2 ~ 3 N • m
7. **Clip**
   - X3
8. **Front compartment upper left protector trim panel assembly**
9. **Hexagon flange bolt**
   - Torque: 2 ~ 3 N • m
10. **Clip**
    - X3
11. **Front compartment upper left protector trim panel assembly**

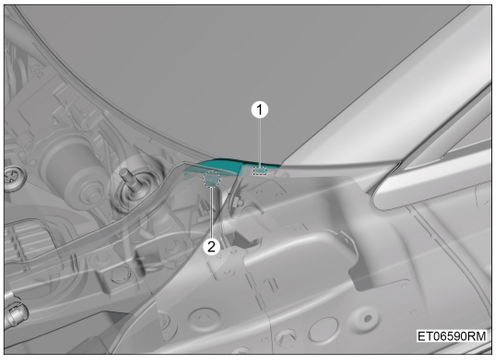
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment upper left protector (See page WS-79)**
3. **Remove front compartment upper right protector (See page WS-79)**
4. **Remove front wiper arm (See page WS-60)**
5. **Remove front compartment cover water channel weatherstrip**

   (a) (For example) Detach all claws -1-.



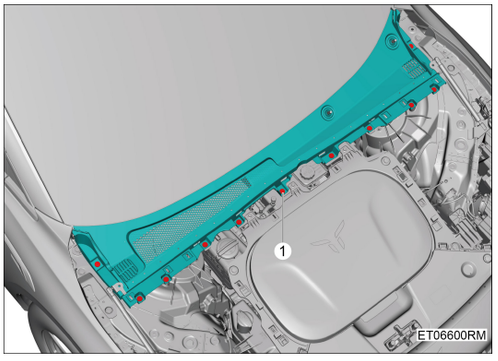
6. **Remove trim cover - front left wing**



(a) Detach the clip -1-.

(b) Detach the clip -2-.

7. Remove water channel cover plate assembly

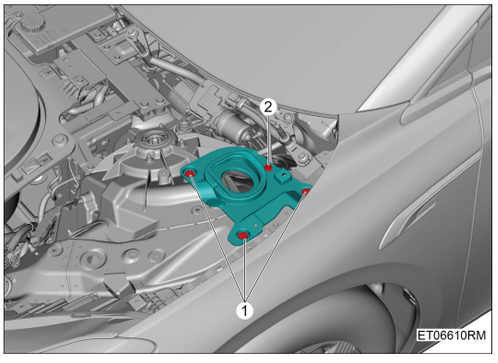


(a) (For example) Detach all clips -1-.

8. Remove front compartment upper left protector trim panel assembly

Note:

- Use same removal orders for right and left sides.



(a) Remove the clip -1-.

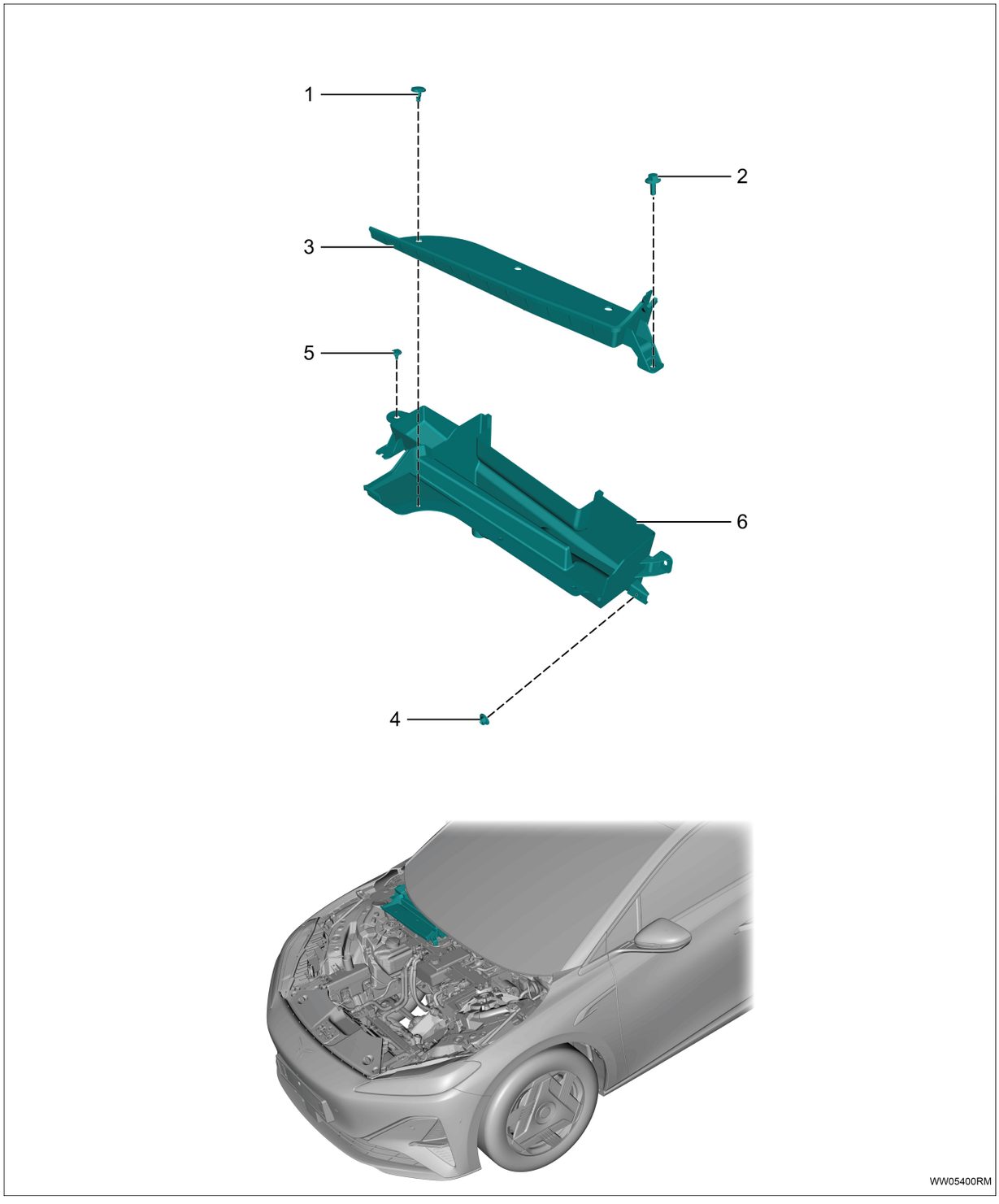
(b) Remove the bolt -2-.

Installation

1. Installation is in the reverse order of removal.

Water channel baffle assembly

Components

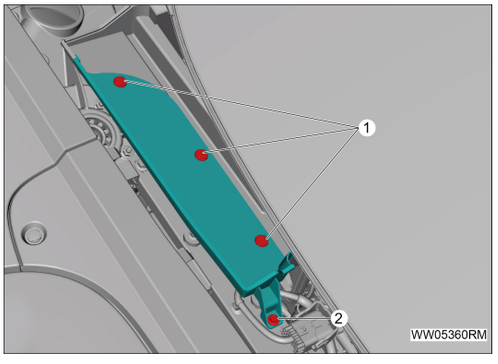


1. **Clip**
   - X3
2. **Hexagon flange bolt**
   - Torque: 6 ~ 8 N • m

3. **Water channel guide plate assembly**
4. **Hexagon flange nut**
   - X2
   - Torque: 6 ~ 8 N • m
5. **Clip**
6. **Water channel baffle assembly**

Removal

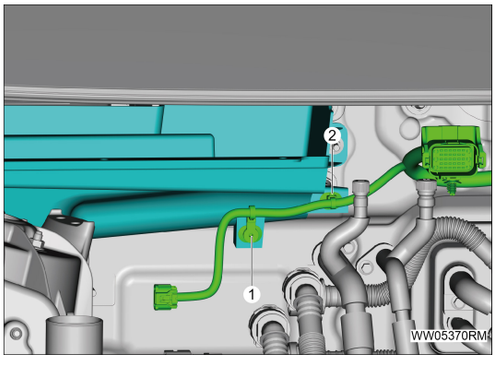
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove water channel cover plate assembly (See page WS-86)**
3. **Remove water channel guide plate assembly**



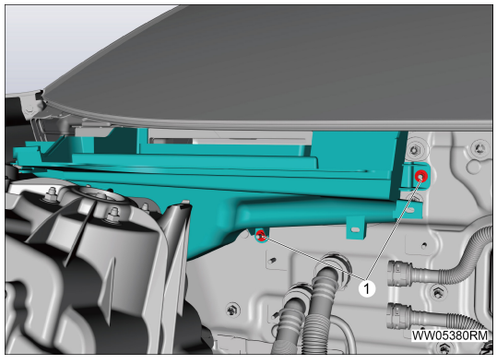
   (a) Remove the clip -1-.

   (b) Remove the bolt -2-.

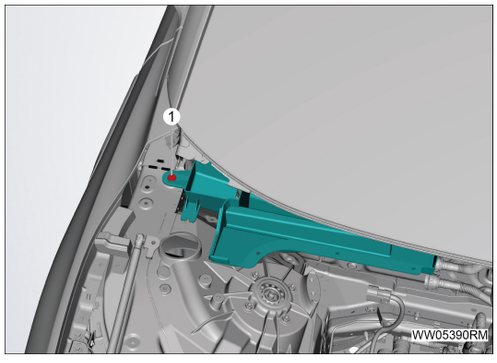
4. **Remove front shock absorber lateral stabilizer bar (See page DP-73)**
5. **Remove thermal management integrated module (See page RE-98)**
6. **Remove water channel baffle assembly**



   (a) Detach the wire harness fixing clips -1-2-.



(b) Remove the nut -1-.



(c) Remove the clip -1-.

(d) Remove the drain hose.

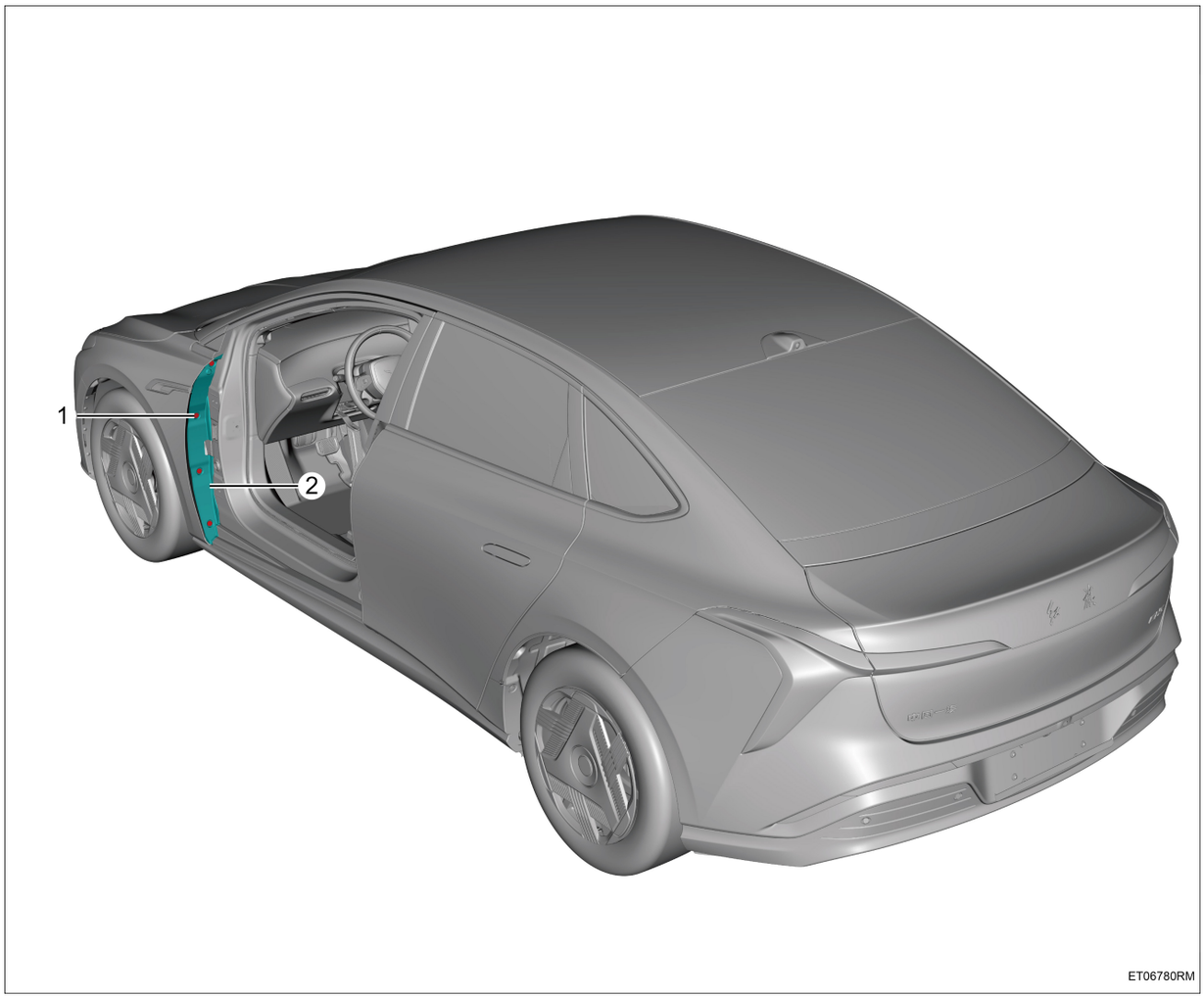
(e) Remove the water channel baffle assembly at an appropriate angle.

Installation

1. Installation is in the reverse order of removal.

Wing rear protector

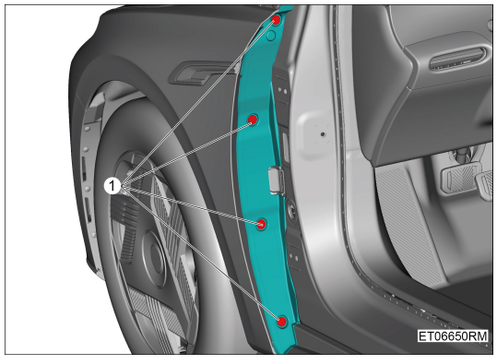
Components



1. **Clip**
   - X4
2. **Left wing rear protector**

Removal

1. **Open the front door.**
2. **Remove wing rear protector**



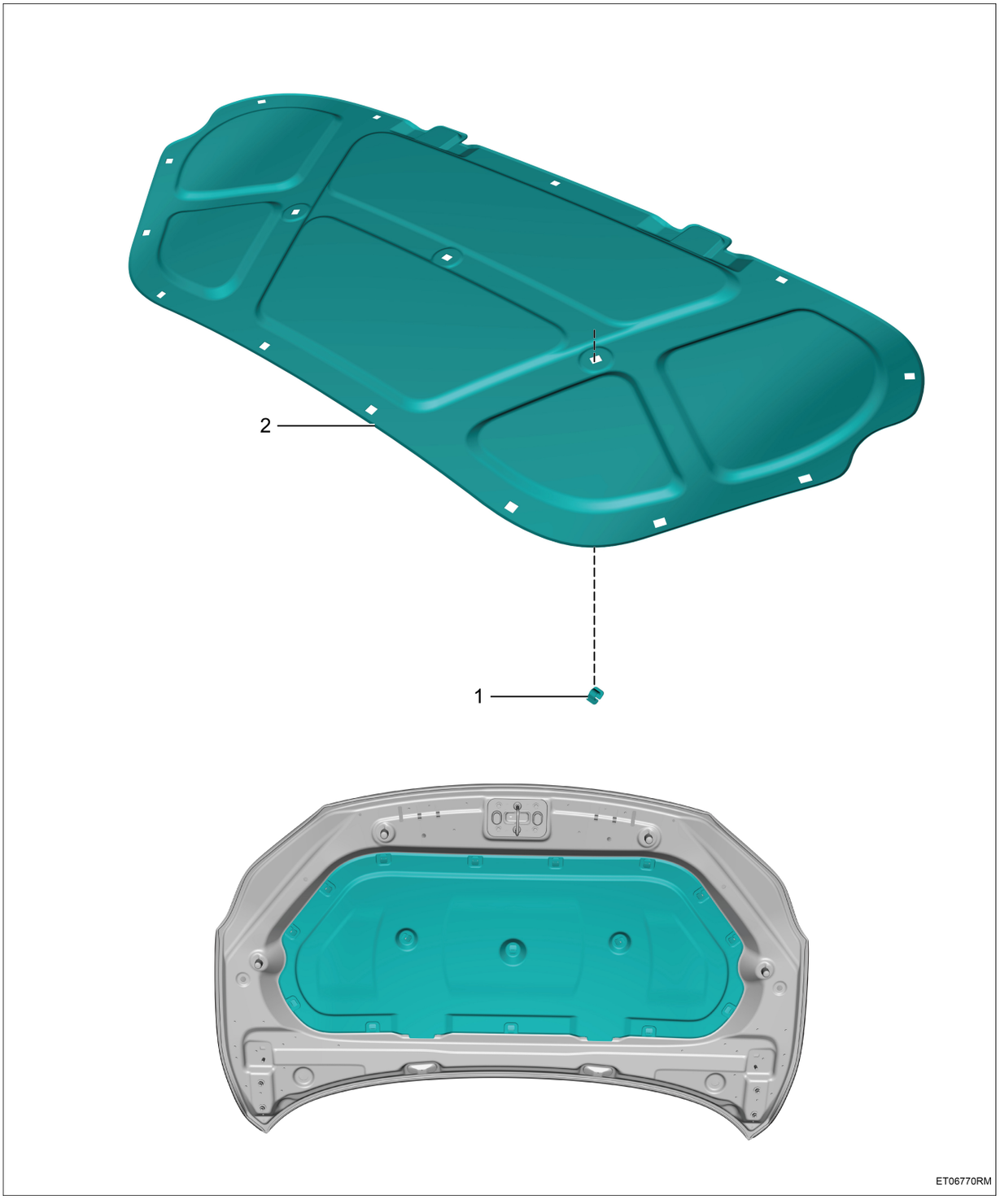
(a) Detach the clip -1-.

Installation

1. Installation is in the reverse order of removal.

Front compartment cover heat insulator

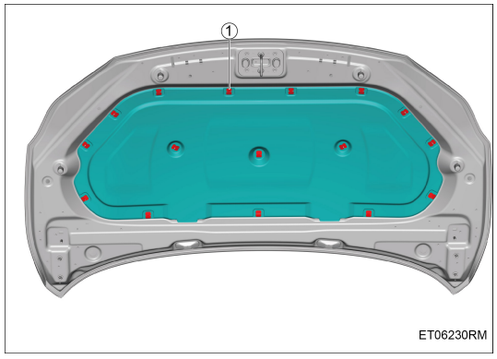
Components



1. **Clip**
   - X16
2. **Engine heat insulator**

Removal

1. **Open the front compartment cover.**
2. **Remove front compartment cover heat insulator**



(a) (For example) Detach all clips -1-.

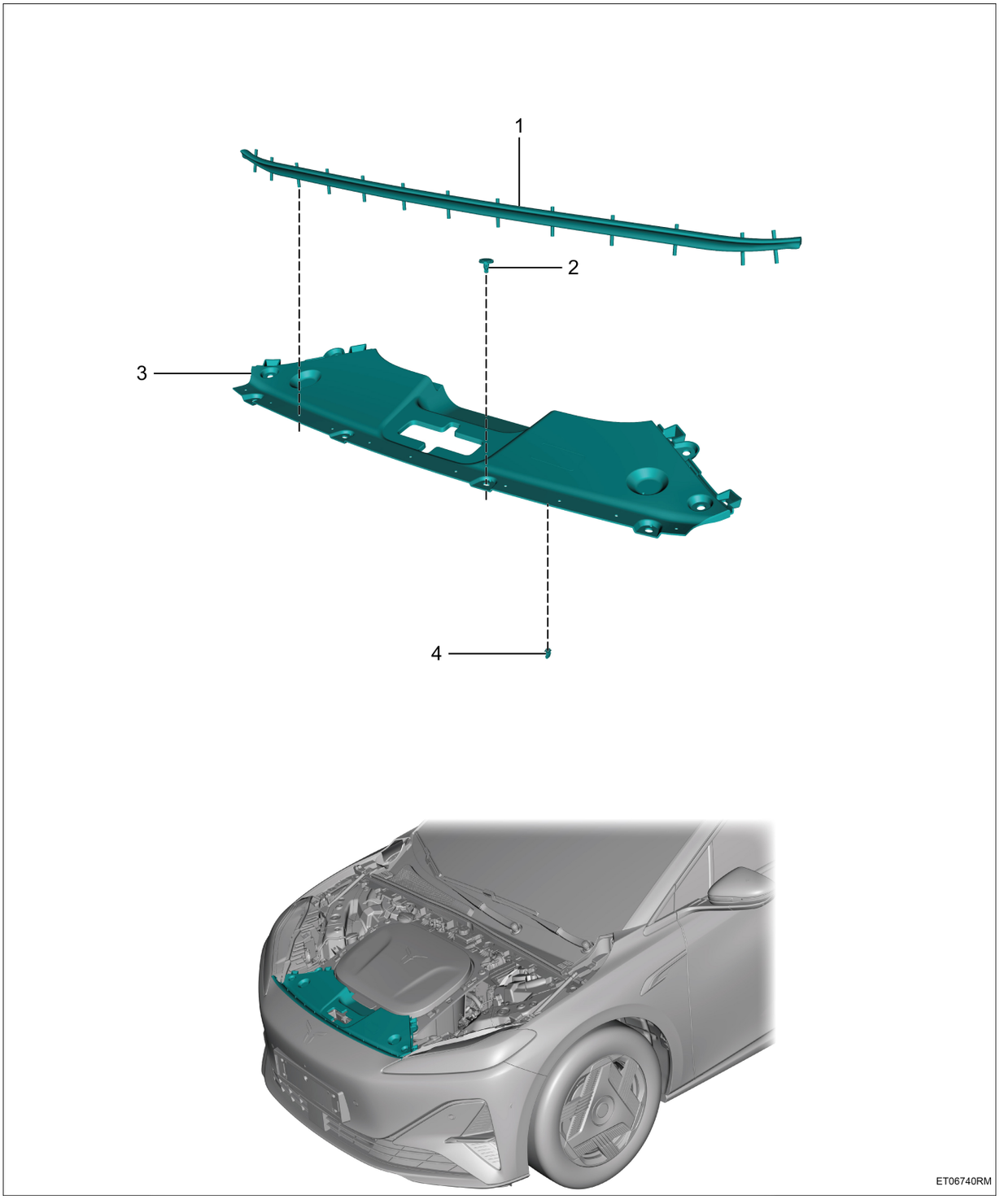
Installation

1. **Installation is in the reverse order of removal.**

Front compartment cover lock upper protector

Components

WS



1. **Front compartment cover front anti-noise weatherstrip assembly**
2. **Clip**
   - X8

3. Front compartment lock upper protector

4. Clip

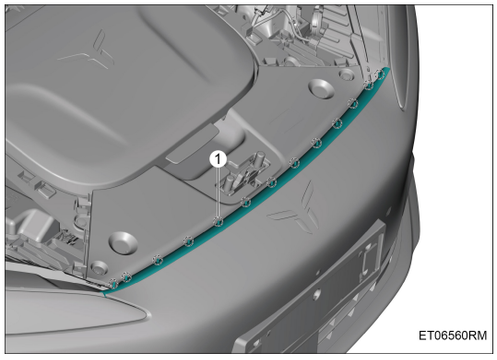
- X2

Removal

1. Remove front compartment upper left protector assembly (See page WS-79)

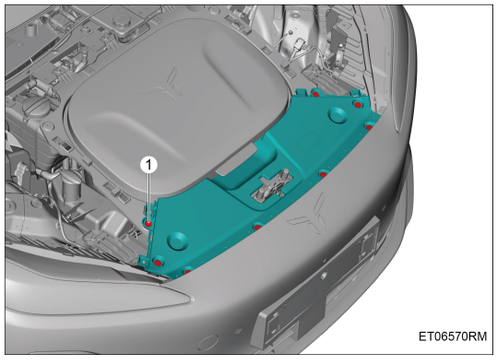
2. Remove front compartment upper right protector assembly (See page WS-79)

3. Front compartment cover front anti-noise weatherstrip assembly



(a) (For example) Detach all clips -1-.

4. Remove front compartment cover lock upper protector



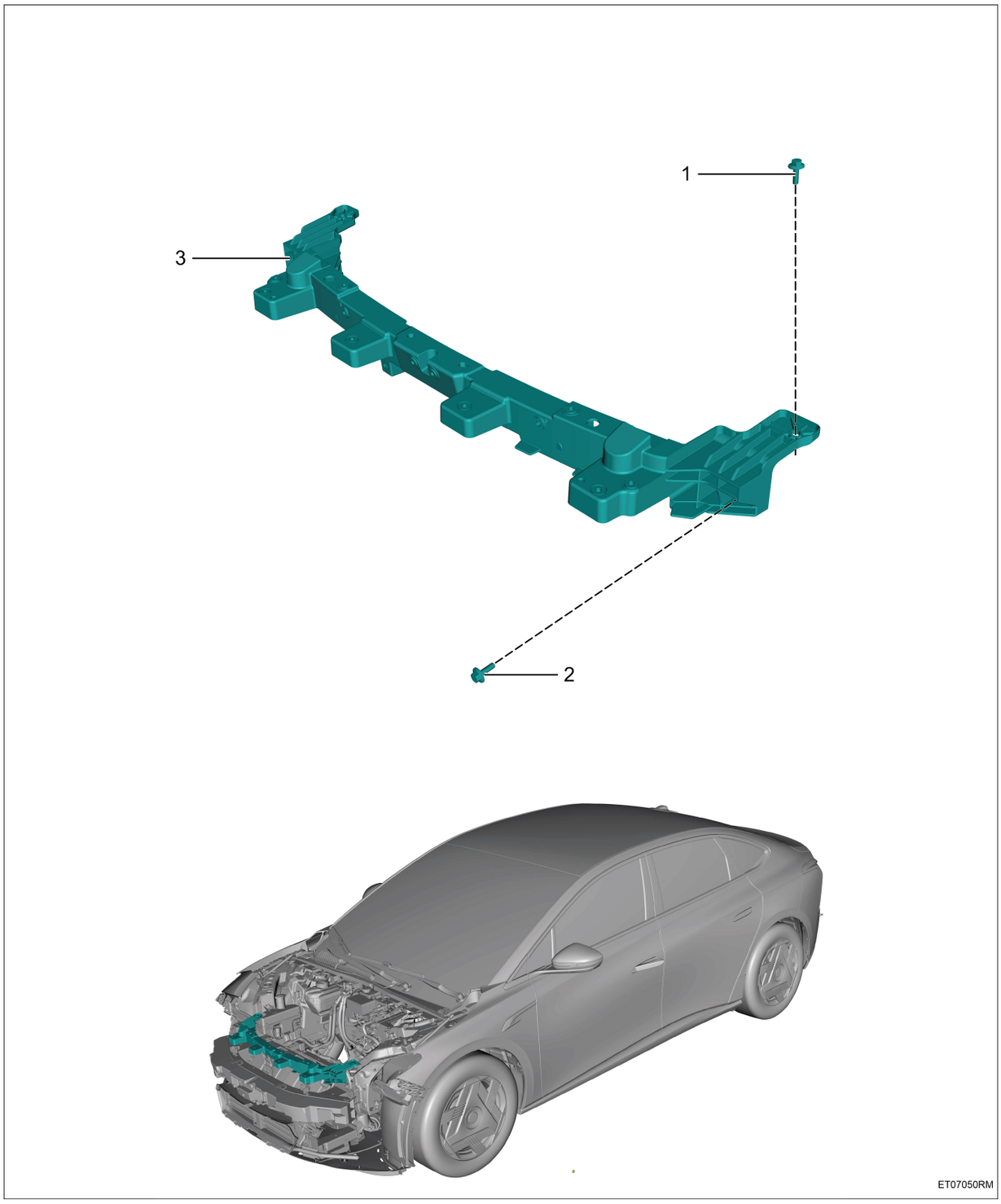
(a) (For example) Remove all clips -1-.

Installation

1. Installation is in the reverse order of removal.

Front end frame assembly

Components



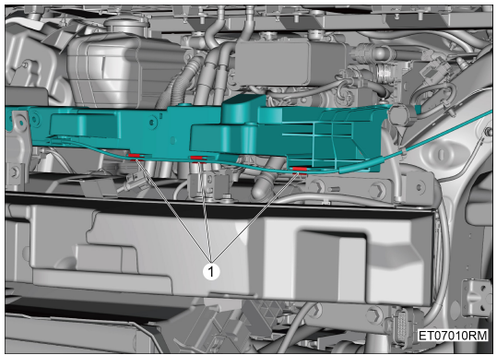
1. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Hexagon flange bolt**

- X4
- Torque: 8 ~ 10 N • m

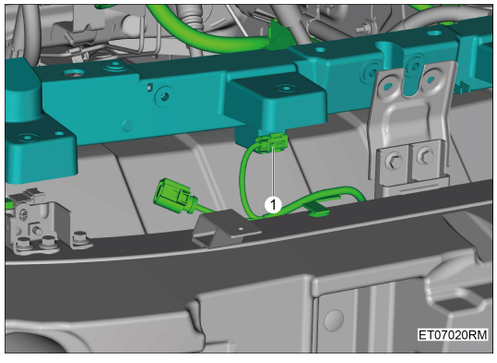
3. Front end frame assembly

Removal

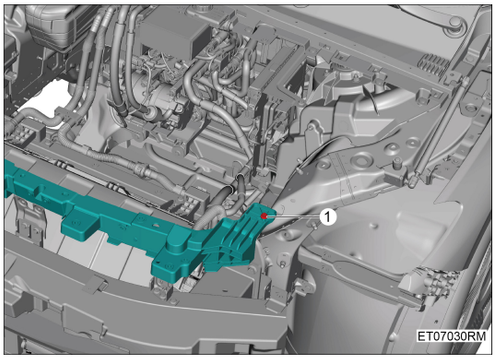
1. **Remove front compartment storage box (See page WS-79)**
2. **Remove front compartment cover lock upper protector (See page WS-96)**
3. **Remove front bumper assembly (See page WS-1)**
4. **Remove high pitched horn with bracket assembly (See page ZC-44)**
5. **Remove low pitched horn with bracket assembly (See page ZC-44)**
6. **Remove front combination light (See page ZC-18)**
7. **Remove front compartment cover lock (See page CS-49)**
8. **Remove front end frame assembly**



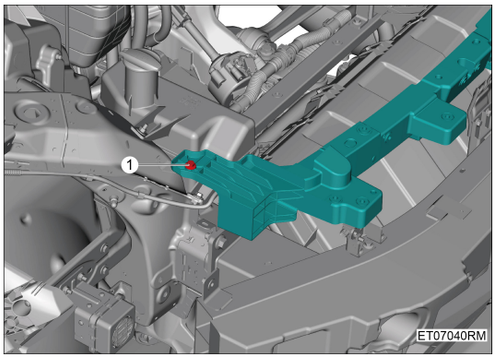
(a) Detach the opening cable clamps -1-.



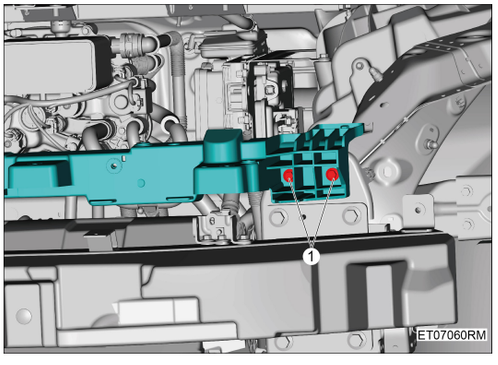
(b) Disengage the wire harness fixing clip -1-.



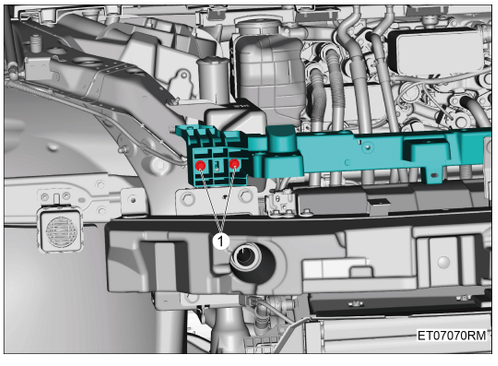
(c) Remove the left bolt -1-.



(d) Remove the right bolt -1-.



(e) Remove the left bolt -1-.



(f) Remove the right bolt -1-.

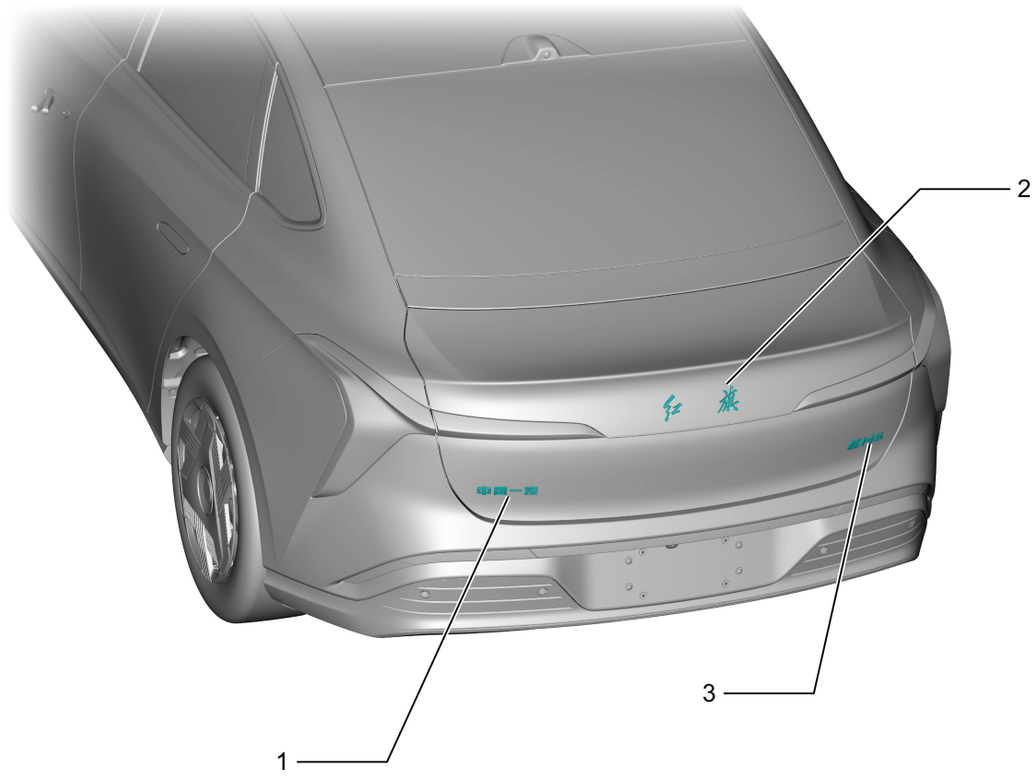
Installation

1. Installation is in the reverse order of removal.

Ornament system

Vehicle logo

Components

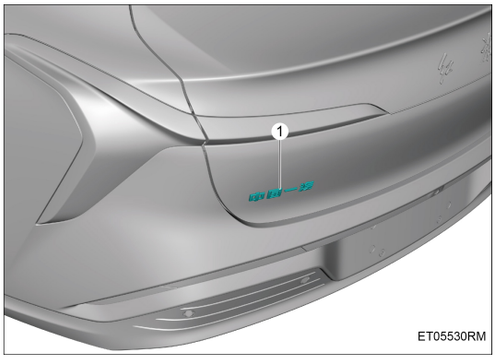


ET06740RM

1. **Word mark "China FAW"**
2. **Luggage compartment cover "Hongqi" emblem**
3. **Word mark "EH5"**

Removal

1. **Remove emblem "China FAW"**



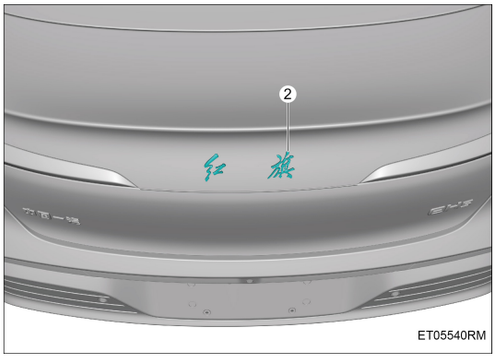
(a) Use paper tape to paste the surrounding area of emblem "China FAW".

(b) Use a plastic crow plate to remove emblem -1- from luggage compartment door outer panel.

Notice:

- **Be careful not to damage the paint surface when using a plastic crow plate to remove the emblem.**

2. Remove emblem "Hongqi"



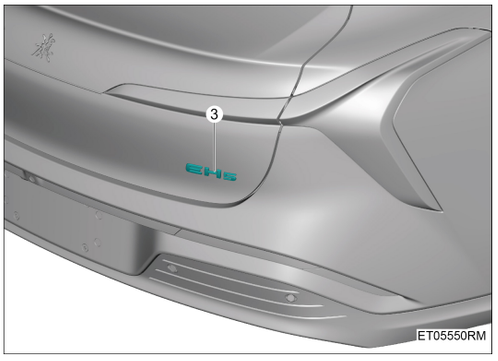
(a) Use paper tape to paste the surrounding area of emblem "Hongqi".

(b) Use a plastic crow plate to remove emblem -2- from luggage compartment door outer panel.

Notice:

- **Be careful not to damage the paint surface when using a plastic crow plate to remove the emblem.**

3. Remove emblem "EH5"



(a) Use paper tape to paste the surrounding area of emblem "EH5".

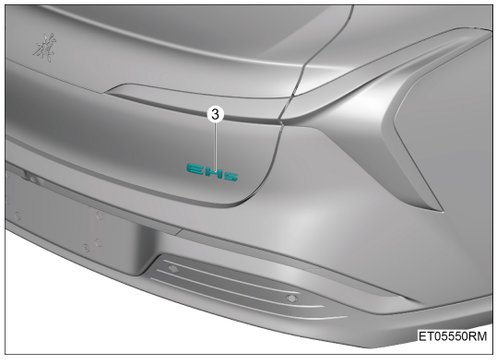
(b) Use a plastic crow plate to remove emblem -3- from luggage compartment door outer panel.

Notice:

- **Be careful not to damage the paint surface when using a plastic crow plate to remove the emblem.**

Installation

1. Install emblem "EH5"

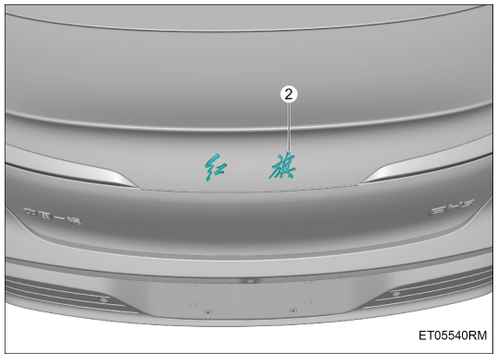


(a) Install the emblem "EH5" -3- to luggage compartment door outer panel with 3M tape.

Note:

- Heat the luggage compartment cover outer panel and emblem to 20℃ ~ 30℃.
- Apply pressure with a roller (pressure of 30 N).
- Clean the surface of luggage compartment cover outer panel with ethanol to ensure that it is free of oil, dust, foreign matters, etc.
- No dust, moisture, etc. is allowed to adhere to the surface of 3M tape.
- The corners and edges of name plate should be ensured in good paste.

2. Install emblem "Hongqi"

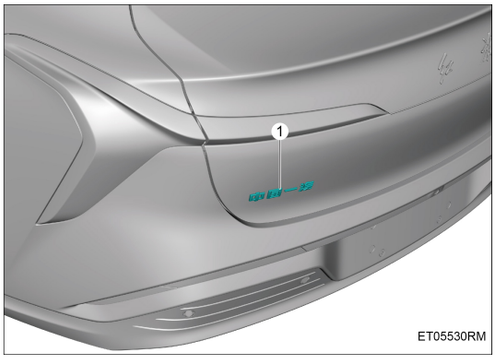


(a) Install the emblem "Hongqi" -2- to luggage compartment door outer panel with 3M tape.

Note:

- Heat the luggage compartment cover outer panel and emblem to 20℃ ~ 30℃.
- Apply pressure with a roller (pressure of 30 N).
- Clean the surface of luggage compartment cover outer panel with ethanol to ensure that it is free of oil, dust, foreign matters, etc.
- No dust, moisture, etc. is allowed to adhere to the surface of 3M tape.
- The corners and edges of name plate should be ensured in good paste.

3. Install emblem "China FAW"



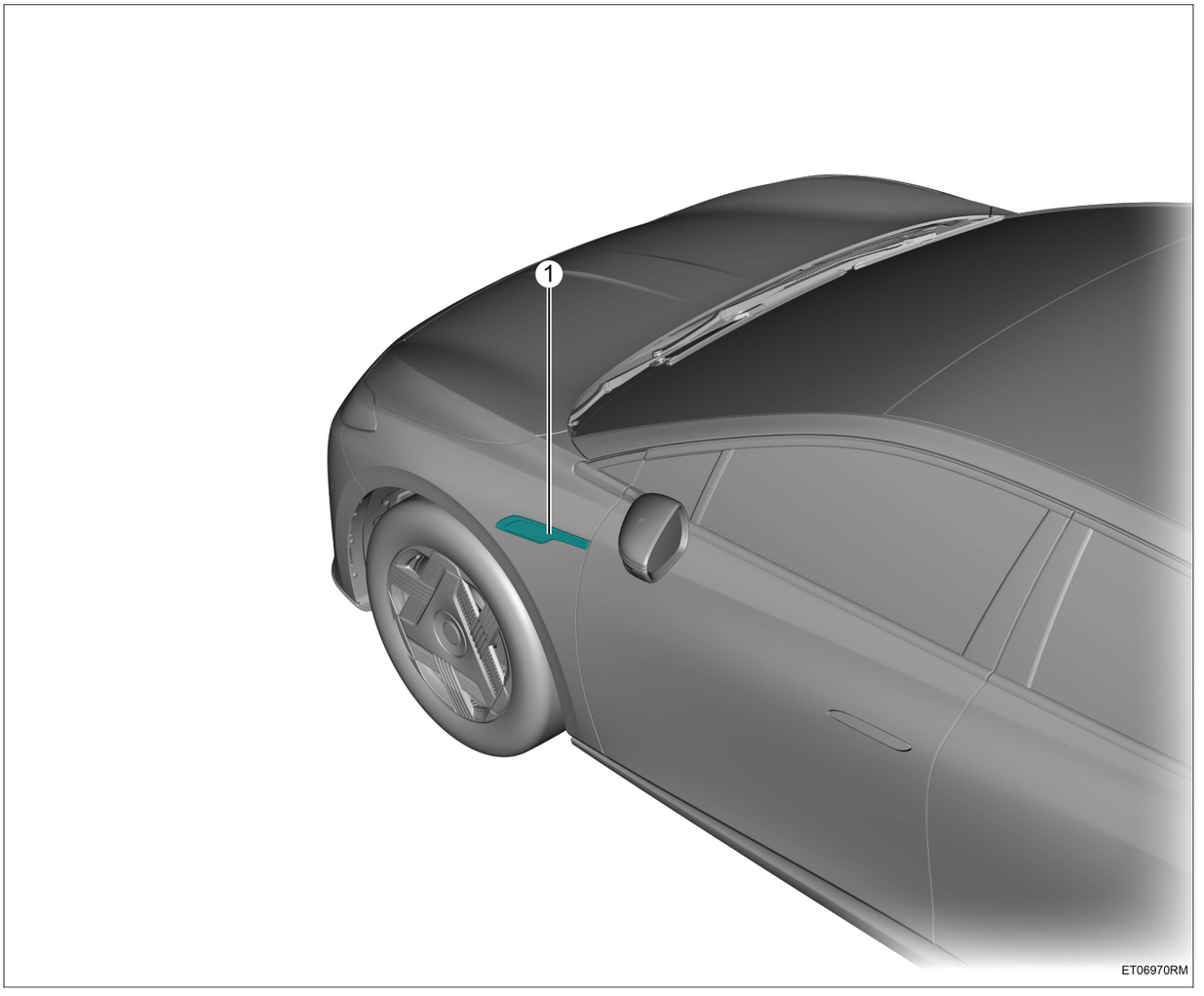
(a) Install the emblem "China FAW" -1- to luggage compartment door outer panel with 3M tape.

Note:

- Heat the luggage compartment cover outer panel and emblem to 20℃ ~ 30℃.
- Apply pressure with a roller (pressure of 30 N).
- Clean the surface of luggage compartment cover outer panel with ethanol to ensure that it is free of oil, dust, foreign matters, etc.
- No dust, moisture, etc. is allowed to adhere to the surface of 3M tape.
- The corners and edges of name plate should be ensured in good paste.

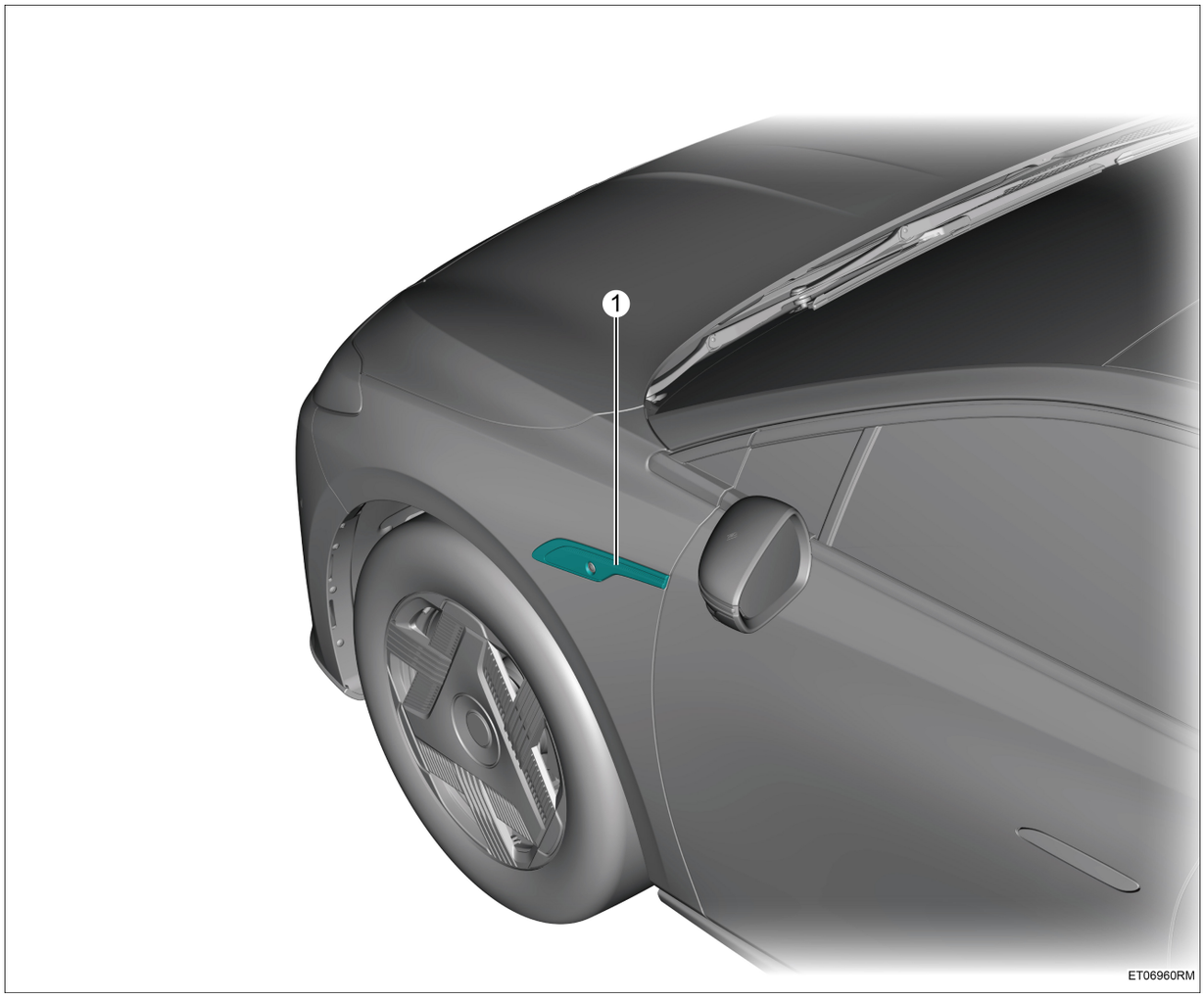
Wing trim strip

Components



1. Wing trim strip

Components



1. Wing trim strip

Removal

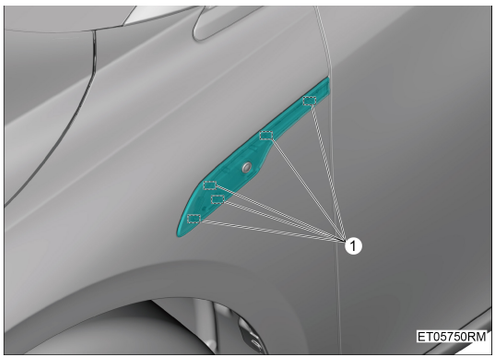
1. **Remove rear left side camera assembly (only for models equipped with rear camera) (See page ZC-152)**
2. **Remove rear right side camera assembly (only for models equipped with rear camera) (See page ZC-152)**
3. **Remove wing trim strip assembly (only for models equipped with rear camera)**

   Note:

   - Use same removal orders for right and left sides.

Notice:

- **Be careful not to damage rear left side camera assembly during removal**

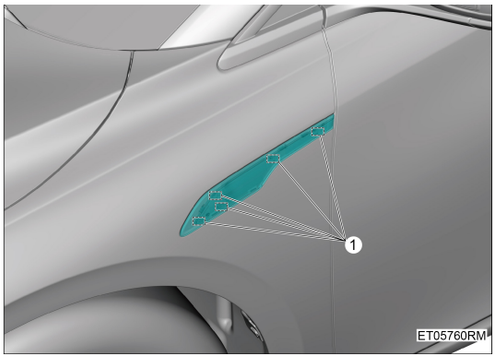


(a) Detach the clip -1-.

4. Remove wing trim strip assembly

Note:

- Use same removal orders for right and left sides.



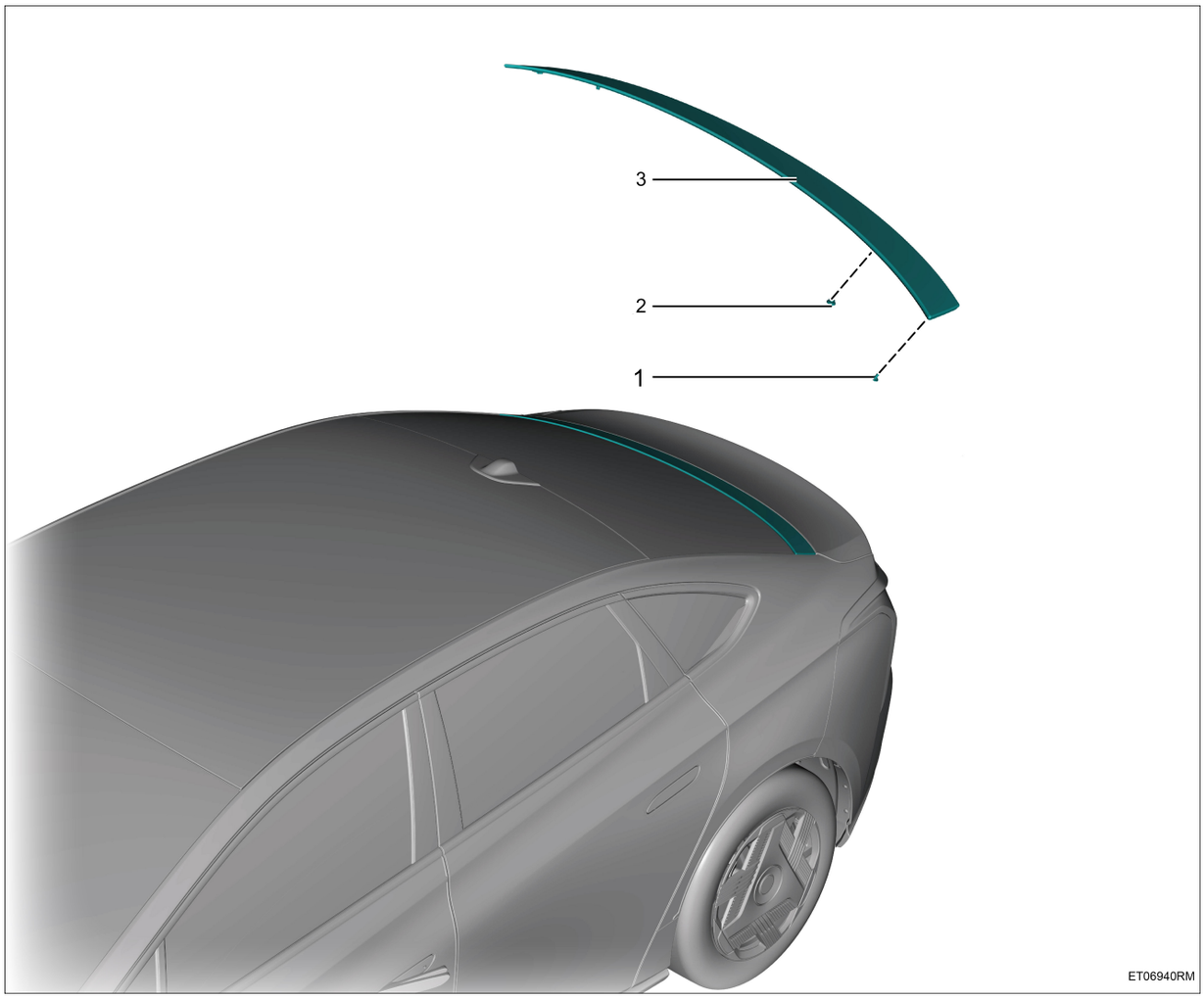
(a) Detach the clip -1-.

Installation

1. Installation is in the reverse order of removal.

Luggage compartment door trim strip

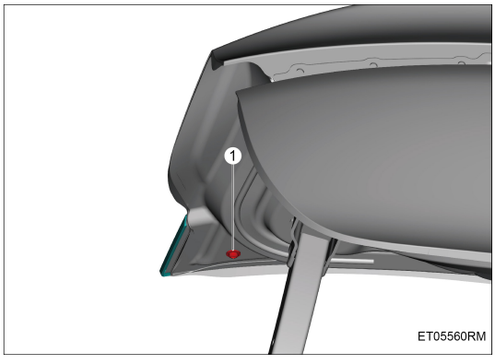
Components



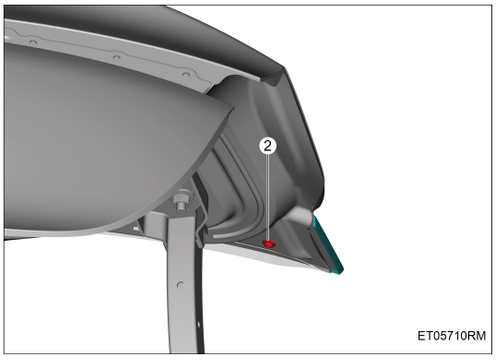
1. **Cross recess pan head self-tapping screw**
   - X2
   - Torque: 2 ~ 3 N • m
2. **Clip**
   - X10
3. **Luggage compartment door trim strip**

Removal

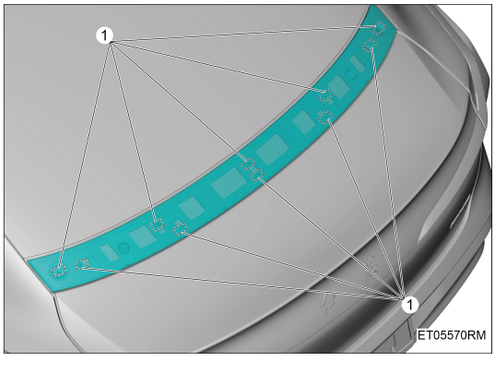
1. **Open the luggage compartment door assembly.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove luggage compartment door trim strip**



(a) Remove the left screw -1- from luggage compartment door trim strip.



(b) Remove the right screw -2- from luggage compartment door trim strip.



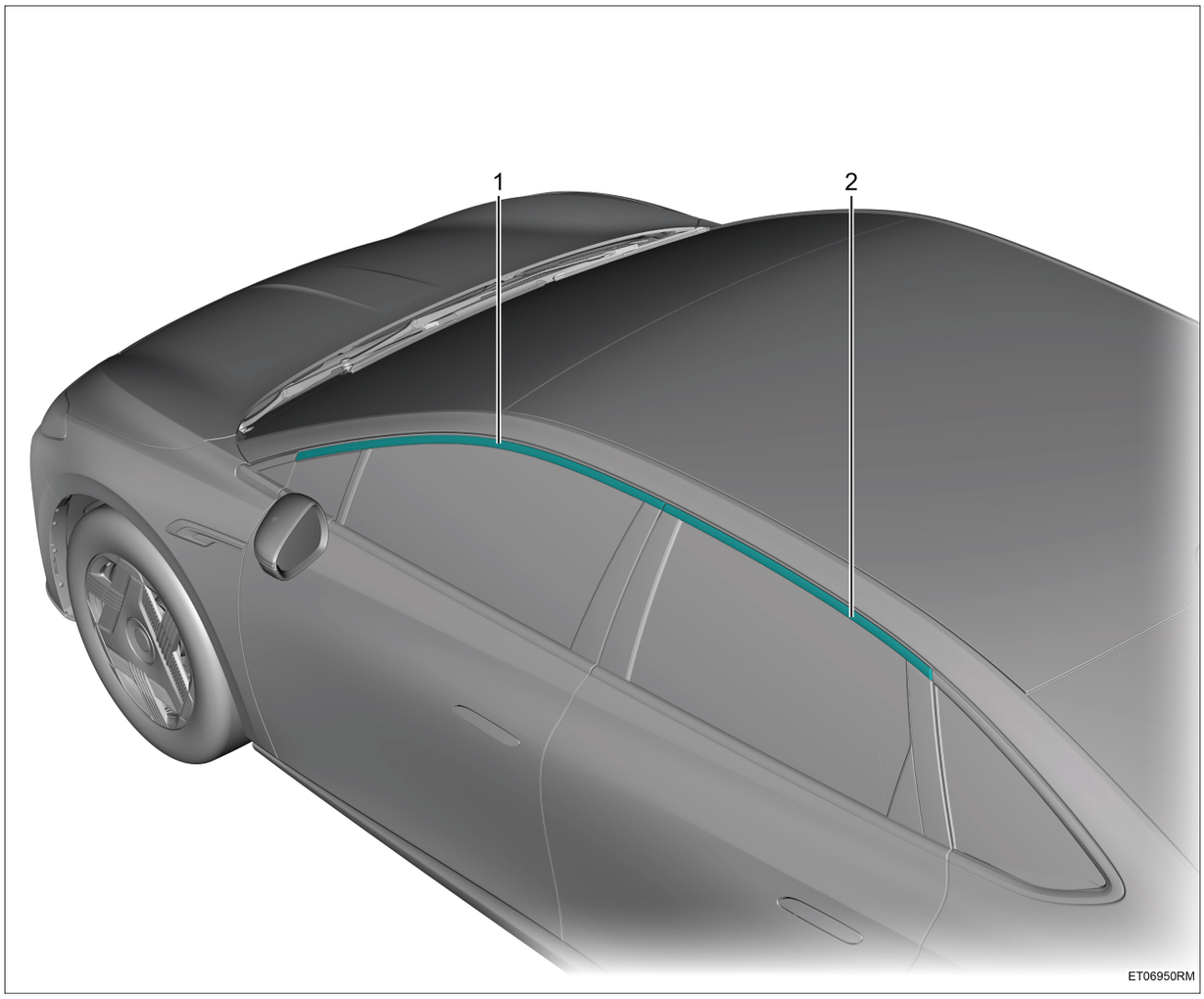
(c) Detach the clip -1-.

Installation

1. **Installation is in the reverse order of removal.**

Door trim strip

Components



1. Door trim strip

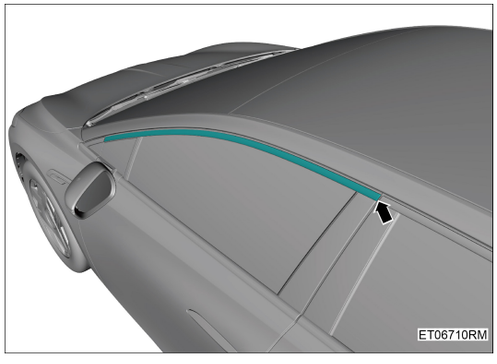
Removal

1. Remove front left door trim strip assembly

Note:

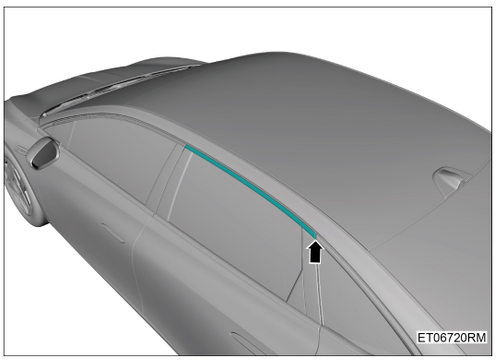
- Use same removal orders for right and left sides.

(a) Use a plastic crow plate to pry off at the -arrow- position to detach the slot.



Notice:

- **When using a plastic crow plate to remove the front left door trim strip assembly, be careful not to damage the paint surface and windshield.**



2. Remove rear left door trim strip assembly

Note:

- Use same removal orders for right and left sides.

(a) Use a plastic crow plate to pry off at the -arrow- position to detach the slot.

Notice:

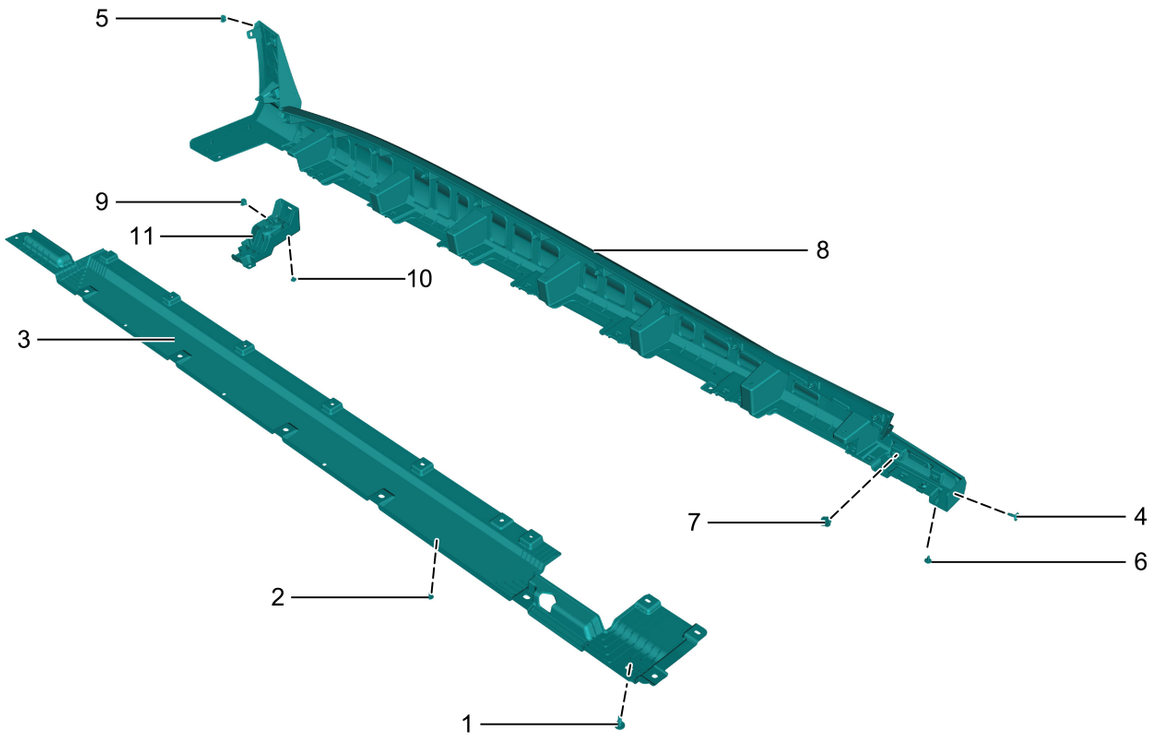
- **When using a plastic crow plate to remove the rear left door trim strip assembly, be careful not to damage the paint surface and windshield.**

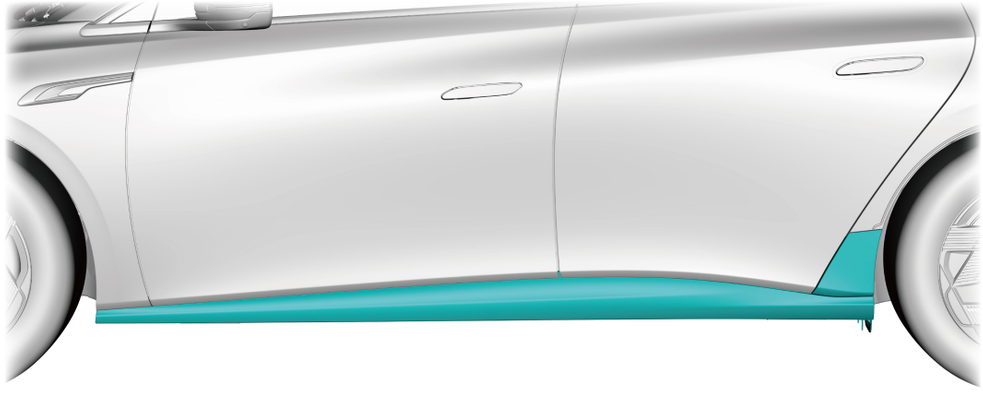
Installation

1. Installation is in the reverse order of removal.

Doorsill trim panel

Components





ET06980RM

1. **Hexagon head self-tapping screw**
   - X9
   - Torque: 2 ~ 3 N • m
2. **Clip**

- X7

3. **Left doorsill trim panel protector II**
4. **Self-tapping screw**
   - Torque: 2 ~ 3 N • m
5. **Clip**
6. **Hexagon head self-tapping screw**
   - X7
   - Torque: 2 ~ 3 N • m
7. **Clip**
   - X15
8. **Left doorsill trim panel assembly**
9. **Clip**
10. **Hexagon head self-tapping screw**
    - X2
    - Torque: 2 ~ 3 N • m
11. **Right doorsill trim panel bracket I**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove the rear left lower spoiler (See page WS-32)**
3. **Remove left doorsill trim panel protector II (only equipped with 2WD long range 85 kWh power battery)**

   Note:

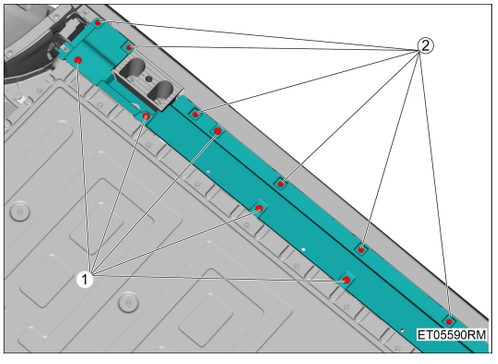
   - Use same removal orders for right and left sides.

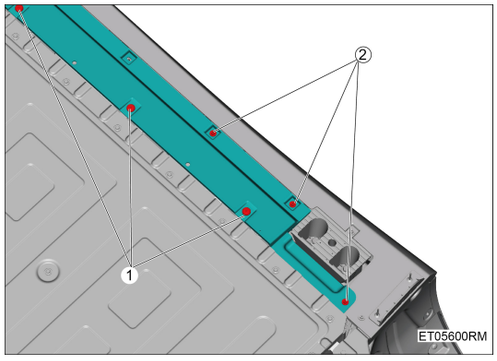
   Notice:

   - **When the lift is lifting, observe that the lift block does not exceed the inner edge of the vehicle body lifting block.**

   (a) Remove the front fixing clip -1-.

   (b) Remove the front fixing screw -2-.





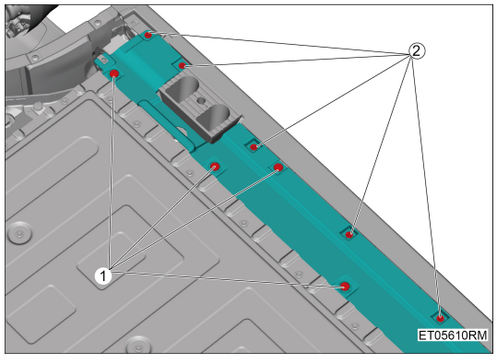
(c) Remove the rear fixing clip -1-.

(d) Remove the rear fixing screw -2-.

4. Remove left doorsill trim panel protector ll (only equipped with 2WD basic 62 kWh power battery)

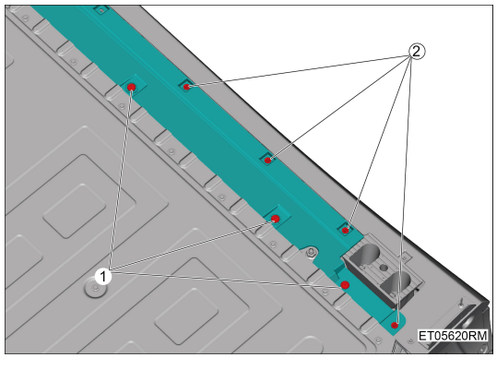
Note:

- Use same removal orders for right and left sides.



(a) Remove the front fixing clip -1-.

(b) Remove the front fixing screw -2-.



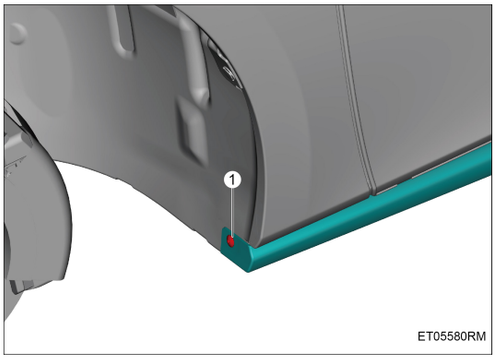
(c) Remove the rear fixing clip -1-.

(d) Remove the rear fixing screw -2-.

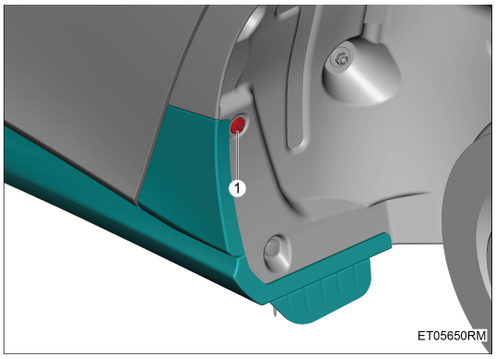
5. Remove left doorsill trim panel assembly

Note:

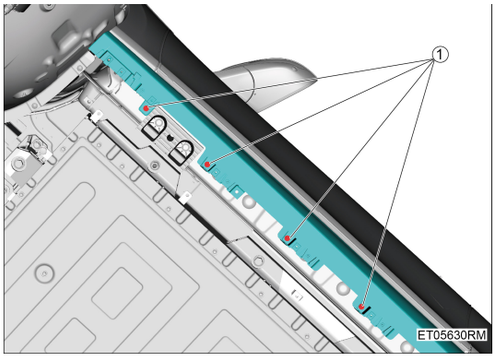
- Use same removal orders for right and left sides.



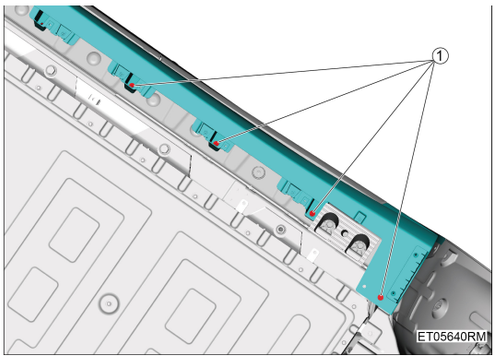
(a) Remove front screw -1- from doorsill trim panel assembly.



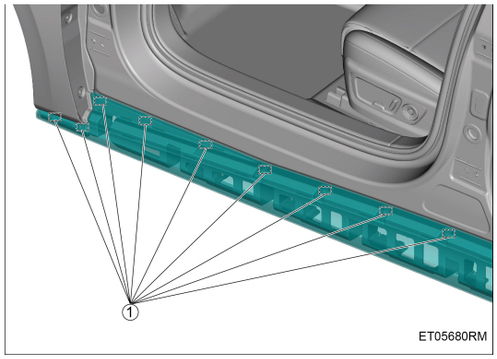
(b) Detach rear clip -1- from doorsill trim panel assembly.



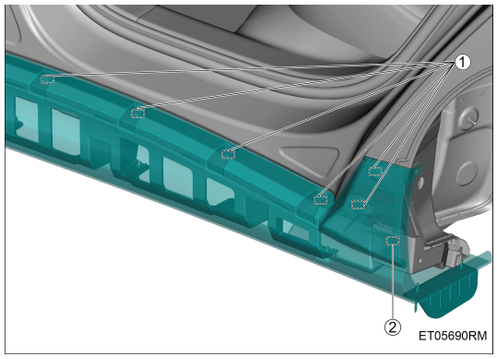
(c) Remove the bolt -1-.



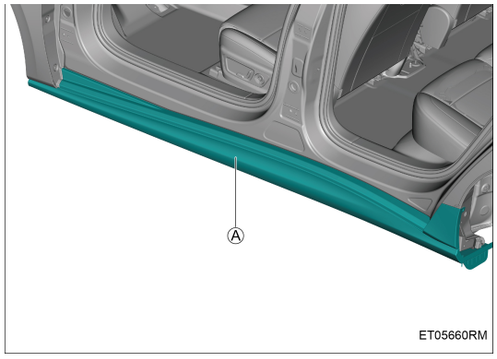
(d) Remove the bolt -1-.



(e) Detach front clip -1- from doorsill trim panel assembly.



(f) Detach rear clips -1-2- from doorsill trim panel assembly.



(g) Remove the left doorsill trim panel assembly -A-.

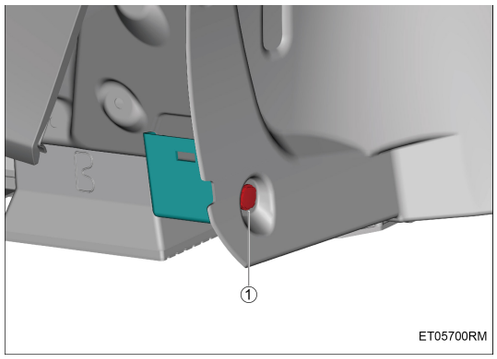
Notice:

- **Do not apply excessive impact and force during removal to prevent doorsill trim panel assembly from being damaged.**

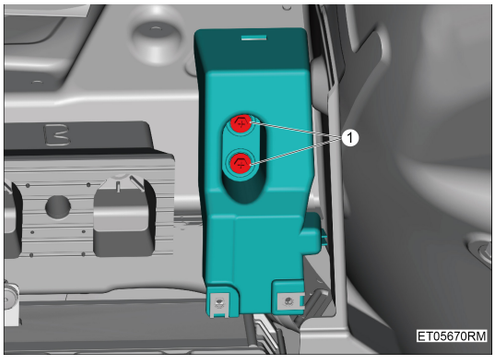
6. Remove left doorsill trim panel bracket l assembly

Note:

- Use same removal orders for right and left sides.



(a) Detach the clip -1-.



(b) Remove the screw -1-.

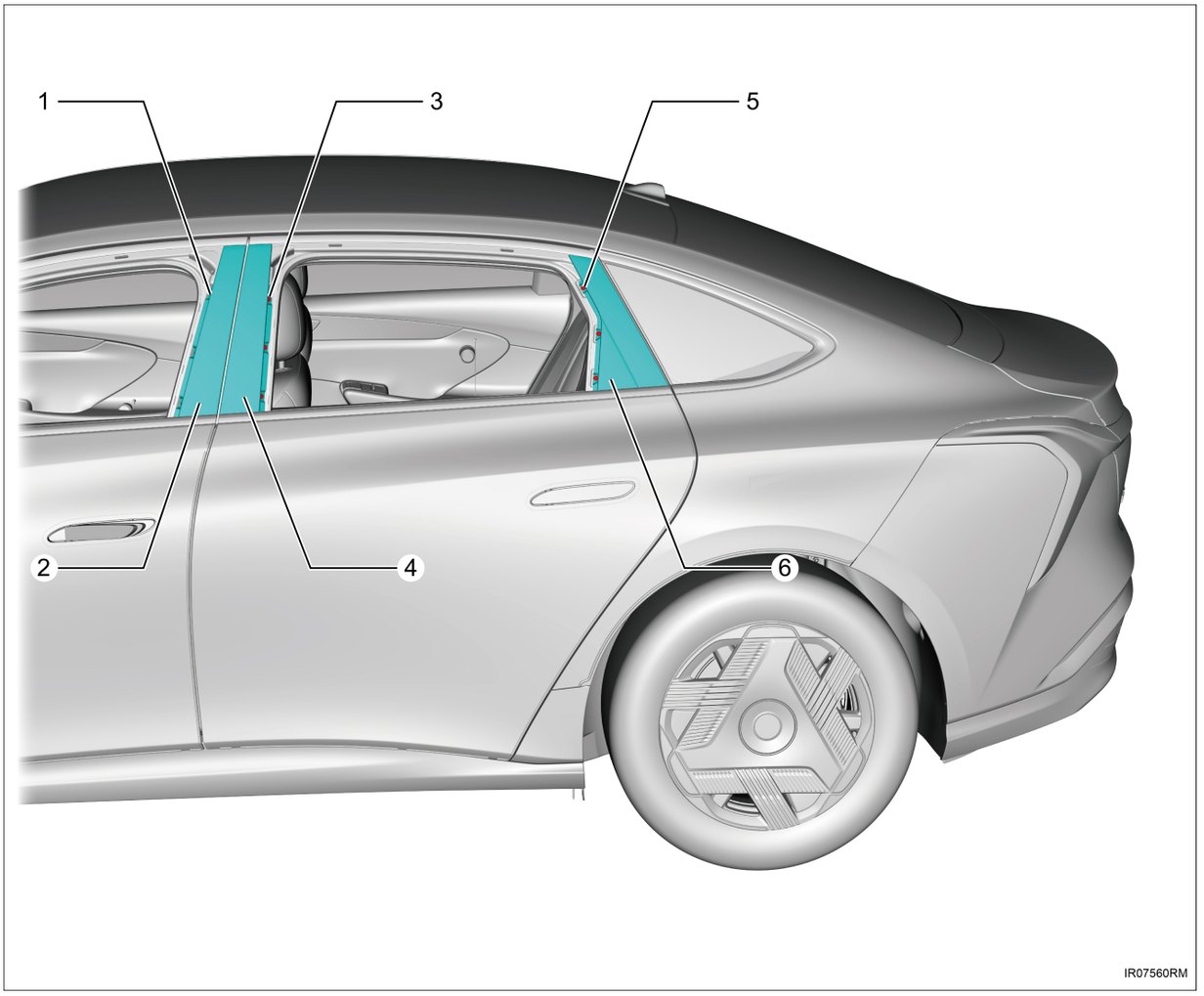
WS

Installation

1. Installation is in the reverse order of removal.

B-pillar, C-pillar trim cover plate assemblies

Components



1. Inner hexagon self-tapping screw

- X3

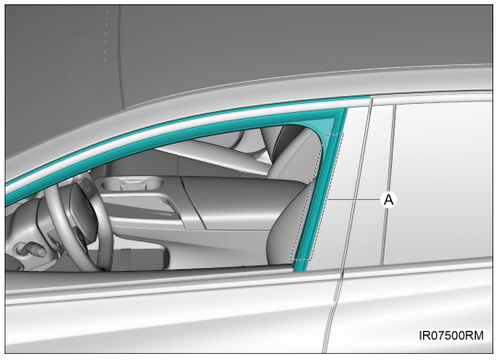
2. **Front left door B-pillar trim cover plate assembly**
3. **Inner hexagon self-tapping screw**
   - X3
4. **Rear left door B-pillar trim cover plate assembly**
5. **Inner hexagon self-tapping screw**
   - X3
6. **Rear left door C-pillar trim cover plate assembly**

Removal

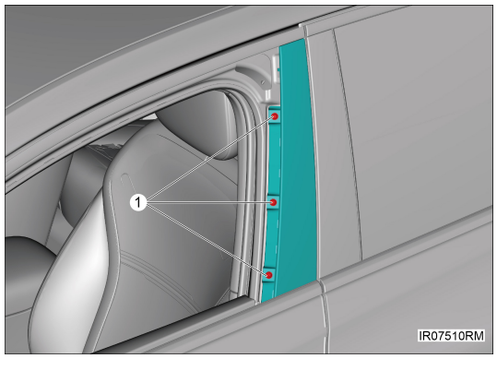
Note:

- Use same removal orders for right and left sides.
- Lower the front window to the lowest position.

1. **Remove front left door B-pillar trim panel assembly**

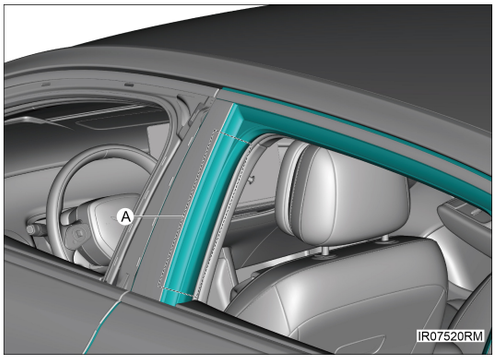


(a) As shown in illustration, detach the front left door glass run assembly -A-.

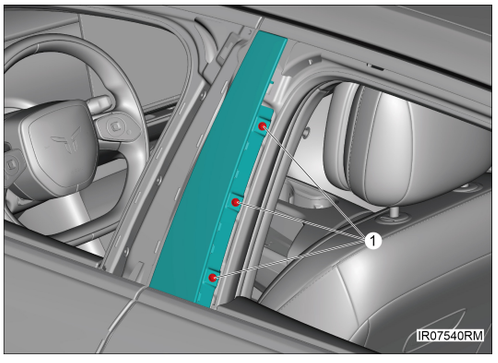


(b) Remove the screw -1-.

2. **Remove rear left door B-pillar trim cover plate assembly**

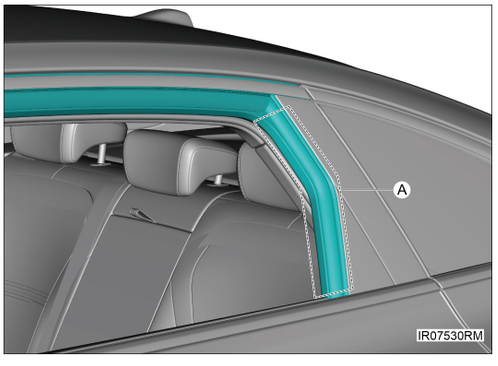


(a) As shown in illustration, detach the front left door glass run assembly -A-.

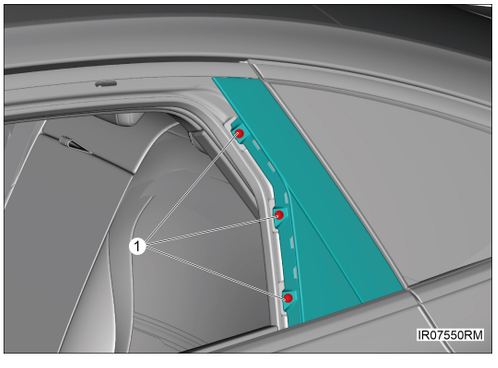


(b) Remove the screw -1-.

3. Remove front left door B-pillar trim panel assembly



(a) As shown in illustration, detach the front left door glass run assembly -A-.



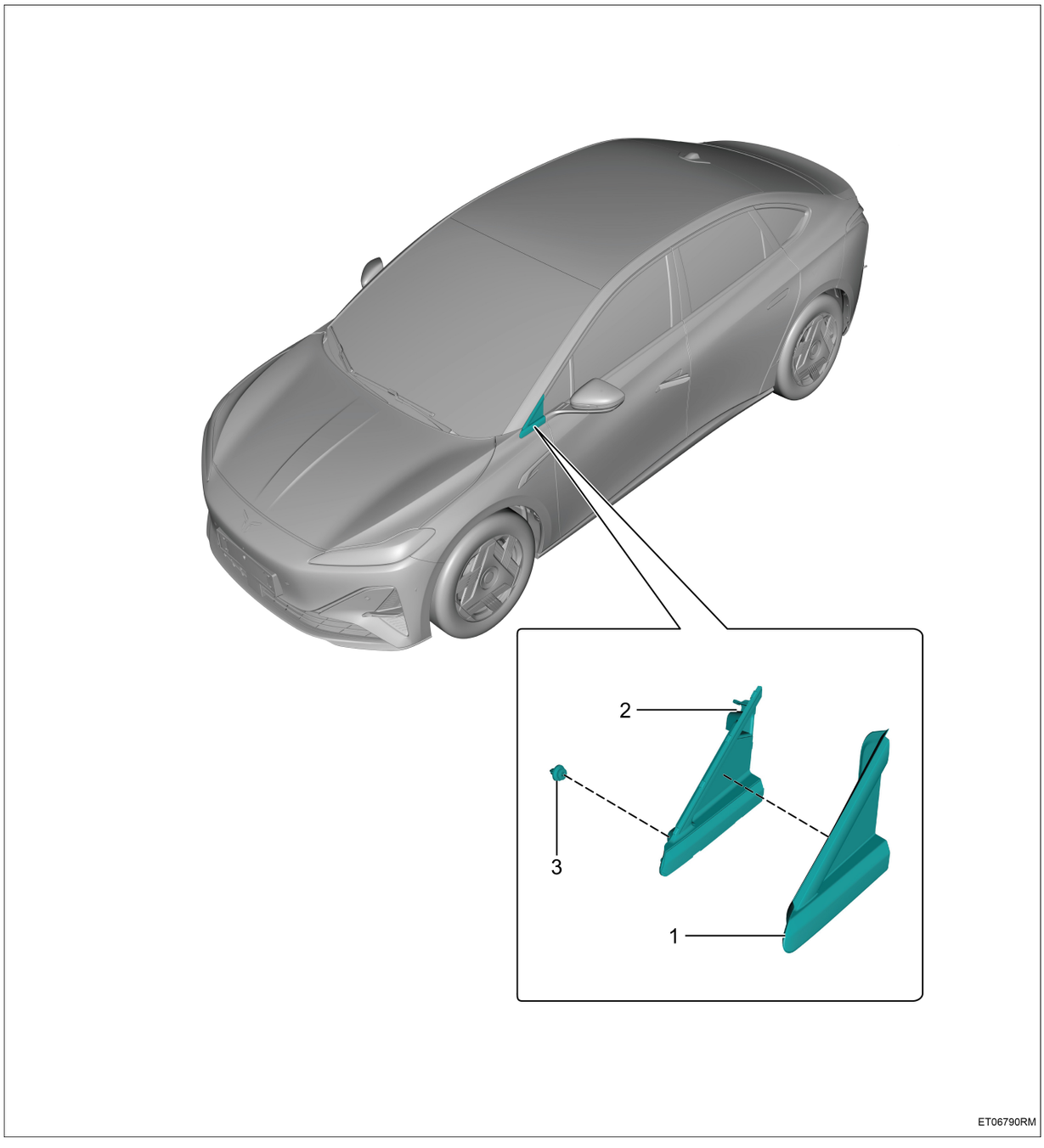
(b) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Door cover plate

Components



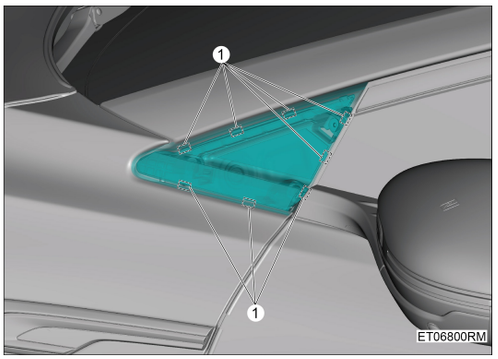
1. **Front left door trim cover plate**
2. **Front left door trim panel base**
3. **Clip**
   - X3

Removal

1. **Remove front left door trim cover plate**

Note:

- Use same removal orders for right and left sides.

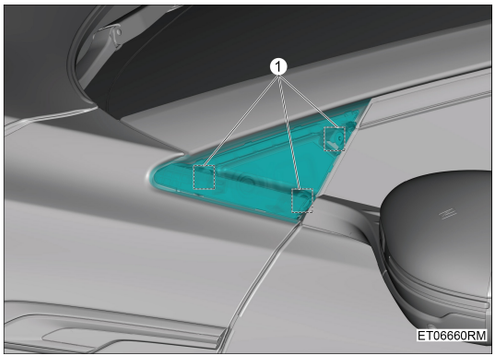


(a) Detach the clip -1-.

2. Remove front left door trim panel base

Note:

- Use same removal orders for right and left sides.



(a) Detach the clip -1-.

Installation

1. Installation is in the reverse order of removal.

Heat management

Air conditioning system

Refrigerant RE-1
A/C element RE-9
Anti-fog sensor RE-11
Defroster duct RE-14
Outside temperature sensor assembly RE-16
Inside temperature sensor assembly RE-17
HVAC assembly RE-19
Air outlet assembly RE-38
Instrument panel outlet assembly RE-41
Air outlet filter assembly RE-44
Auxiliary fascia console outlet assembly RE-45
A/C air duct RE-47
Compressor assembly RE-53
Active intake grille assembly RE-57
A/C condenser assembly RE-61
A/C high and low pressure hose assembly - I RE-63
A/C high and low pressure hose assembly - II RE-66
A/C high and low pressure hose assembly - III RE-69
High pressure aluminum pipe assembly - condenser RE-73

Cooling system

Coolant RE-76
Radiator assembly RE-79
Electric fan assembly RE-81
Motor cooling pipe I RE-83
Motor cooling pipe II RE-85
Motor cooling pipe III RE-89
Motor cooling pipe IV RE-92
Thermal management integrated module assembly RE-98
Thermal management module ACC RE-102
Thermal management module chiller RE-104
Thermal management module CV valve RE-107
Thermal management module EXV and ERV coils RE-109
Thermal management module EXV and ERV valve cores RE-112
Thermal management module SOV coil RE-115
Thermal management module SOV valve core RE-117
Thermal management module five-way valve RE-119
Thermal management module water-cooled condenser RE-121
Thermal management module water pump RE-124
Thermal management module water temperature sensor RE-127
Thermal management module expansion tank RE-129
Thermal management module high pressure PT and low pressure PT RE-132
Thermal management module manifold and brazed valve plate RE-134
High pressure water heating heater assembly RE-136

Air conditioning system

Refrigerant

On-vehicle inspection

1. Using manifold pressure gauge set, check the refrigerant pressure.

Note:

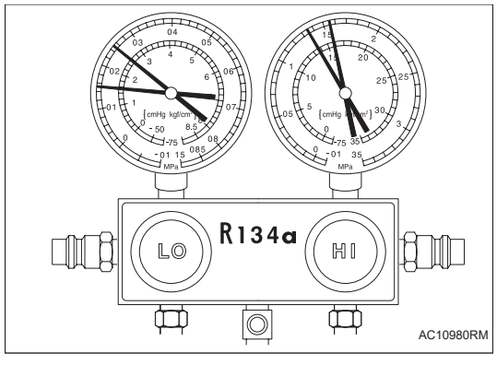
- The following examples are manifold pressure gauge set reading and corresponding A/C system malfunctions.

(a) After following conditions are met, read pressure values on manifold pressure gauge：

- Park the vehicle in the shade.
- All doors are open.
- High voltage powers on.
- Turn on A/C switch.
- A/C switches to inner circulation.
- Temperature is set to max cool.
- Blower speed is set to high.
- Intake port temperature is 30 to 35° C.

(b) Air conditioning system operates normally.

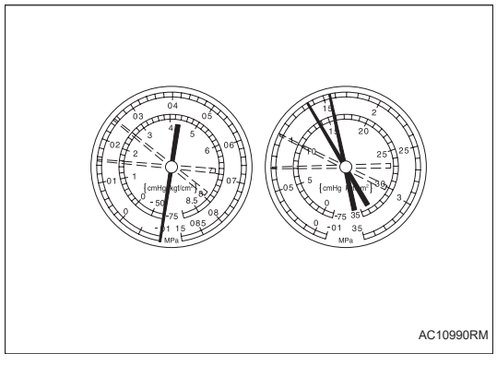
(1) Pressure gauge reading



Standard value	
Low pressure side	0.15 to 0.25 MPa
High pressure side	1.37 to 1.57 MPa

(c) Air conditioning system operates abnormally.

(1) During operation, pressure on low pressure side circulates between normal and vacuum



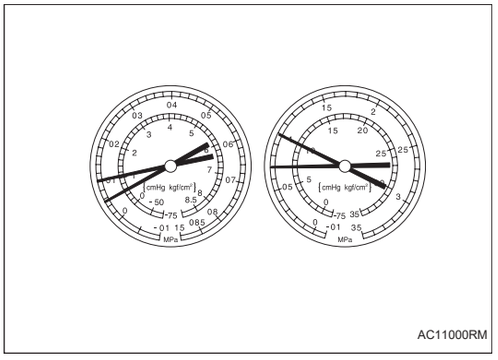
Symptom	A/C system performs discontinuous cooling operation and finally cannot cool
Possible cause	Moisture in A/C system is frozen in the expansion valve orifice, which results in temporary stop of refrigerant circulation
	After the system stops, warm up again, ice melts and operation return to normal temporarily
Diagnosis	Cooler drier (integrated in the condenser reservoir) moisture is saturated

RE

	Moisture in A/C system is frozen in the expansion valve orifice, which prevents refrigerant from circulating
Corrective treatment	Replace cooler drier
	Remove the moisture in A/C system by discharging air repeatedly
	Refill proper amount of new or purified refrigerant to A/C system

Note:

- Moisture exists in A/C system in the above example.



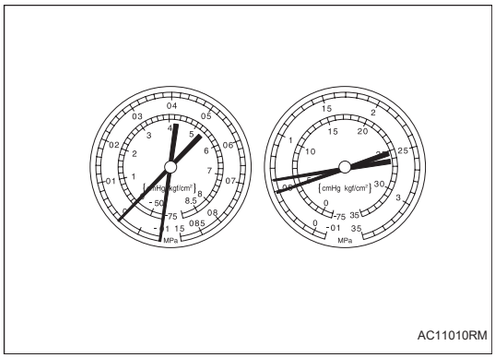
AC11000RM

(2) Pressure is too low for low pressure side and high pressure side

Symptom	Cooling performance is poor
	A/C system cannot cool efficiently
Possible cause	Refrigerant leakage in A/C system
Diagnosis	Refrigerant is insufficient
	Refrigerant leakage
Corrective treatment	Check refrigerant for leakage, and repair as necessary
	Refill proper amount of new or purified refrigerant to A/C system
	If gauge indicates the pressure is close to 0, it is necessary to drain the A/C system after repairing the leaking area

Note:

- Refrigerant is insufficient in the above example.



AC11010RM

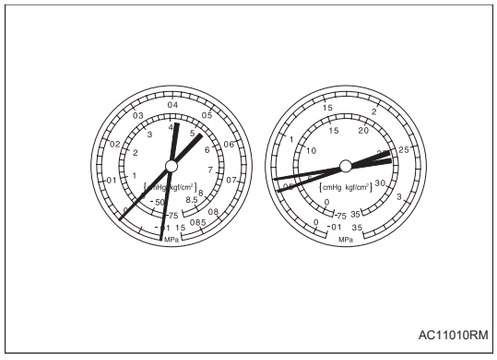
(3) Pressure is too low for low pressure side and high pressure side

Symptom	A/C system cannot cool efficiently (system cools occasionally)
	Frost or condensation is exists on lines on both sides of reservoir/drier or expansion valve
Possible cause	Moisture or dirt in the A/C system blocks the flow of refrigerant.
	Expansion valve stuck in OFF position
Diagnosis	Refrigerant does not circulate
Corrective treatment	Replace expansion valve
	Replace condenser

	Drain the A/C system and refill proper amount of new or purified refrigerant

Note:

- Refrigerant circulation is poor in the above example.

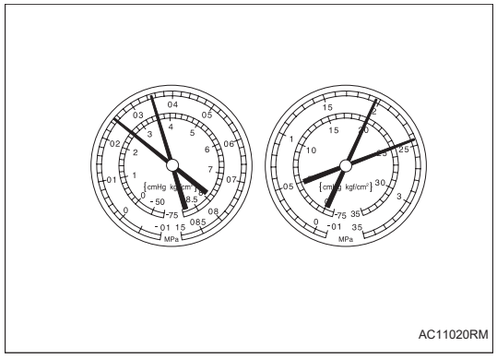

AC11010RM

(4) The low pressure side displays vacuum, while the high pressure side displays very low pressure

Symptom	A/C system cannot cool efficiently (system cools occasionally)
	Frost or condensation is exists on lines on both sides of reservoir/drier or expansion valve
Possible cause	Moisture or dirt in the A/C system blocks the flow of refrigerant.
	Expansion valve stuck in OFF position
Diagnosis	Refrigerant does not circulate
Corrective treatment	Replace expansion valve
	Replace condenser
	Drain the A/C system and refill proper amount of new or purified refrigerant

Note:

- Refrigerant does not circulate in the example above.

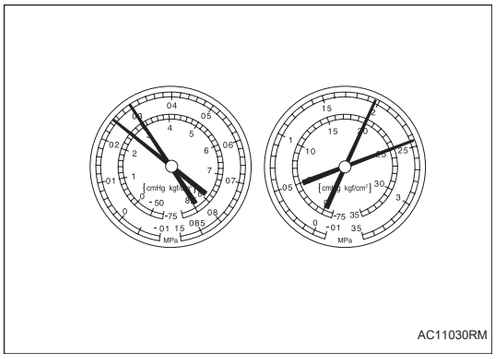

AC11020RM

(5) Pressure is too high for low pressure side and high pressure side

Symptom	A/C system cannot cool efficiently
Possible cause	Excessive refrigerant leads to insufficient performance
	Poor cooling effect of the condenser
Diagnosis	Excessive refrigerant in A/C system resulted from overfilling during refilling
	Insufficient refrigeration effect of condenser due to condenser fin blockage or cooling fan fault
Corrective treatment	Clean condenser
	Check condenser cooling fan working condition
	If the above corrective measures are all normal, check the refrigerant amount and refill the A/C system with an appropriate amount of new or purified refrigerant

Note:

- In the above example, the A/C system is overfilled or refrigeration efficiency of condenser is insufficient.



RE

(6) Pressure is too high for low pressure side and high pressure side

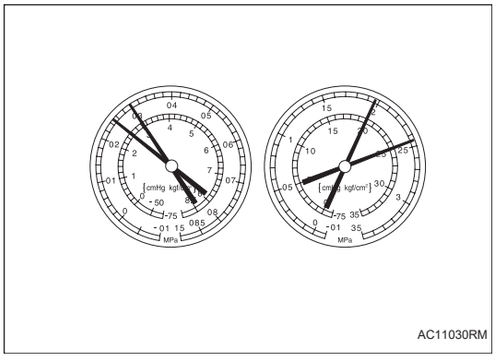
Symptom	A/C system cannot be cooled
	Low pressure line overheats and cannot be touched
Possible cause	Air remains in air conditioning system
Diagnosis	Air remains in air conditioning system
	Vacuum cleaning is insufficient when draining the A/C system
Corrective treatment	Replace cooler drier
	Check the compressor oil for dirt or insufficient
	Drain the A/C system and refill with new or purified refrigerant

Note:

- These gauge indications appear when the A/C system is turned on and then refill without draining the system.

Notice:

- **Air remains in air conditioning system in the example above.**

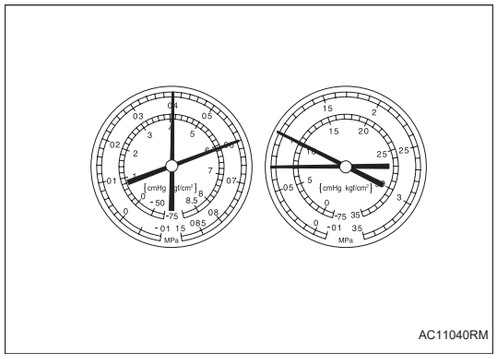


(7) Pressure is too high for low pressure side and high pressure side

Symptom	A/C system cannot cool efficiently
	Frost or a large amount of condensation is on low pressure side line
Possible cause	Expansion valve is stuck in ON position or refrigerant metering error
Diagnosis	Excessive refrigerant in the low pressure line
	Excessive opening of expansion valve
Corrective treatment	Replace expansion valve

Note:

- In the above example, expansion valve is faulty.



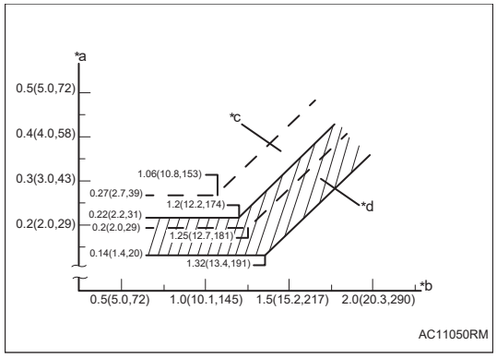
(8) Pressure is too high for low pressure side and high pressure side, or pressure is too low for high pressure side

Symptom	A/C system cannot cool efficiently
Possible cause	Internal leakage of the compressor
Diagnosis	Low compression capacity
	Leakage of damaged valve or other compressor components
Corrective treatment	Replace compressor

Note:

- In the above example, the compressor has insufficient compression capacity.

(d) Pressure gauge reading (reference)



*a	Pressure on low pressure side is 0.15 MPa
*b	Pressure on high pressure side is 1.37 MPa
*c	High speed area of blower
*d	Low speed area of blower

Replacement

1. Recover refrigerant from refrigerant system

(a) High voltage powers on.

(b) Operate the cooler compressor under the following conditions:

Item	Condition
Operating time	3 minutes or more
Temperature setting	Max cool
Blower speed	High
A/C switch	ON

This collects most of the compressor oil from different components of the A/C system into the A/C compressor.

Note:

- It is unnecessary to operate the cooler compressor if A/C does not operate due to compressor lock.

(c) Turn off A/C.

(d) Recover the refrigerant from A/C system using refrigerant recycling device.

Note:

- Please use the refrigerant recycling device according to the manufacture instructions.

2. Refrigerant oil specification

(a) Use the specified refrigerant oil, otherwise, the compressor will be damaged.

Compressor oil type	Standard capacity
POE, ND-11 (density 0.98)	270 (0,+15) ml

Replace the following parts	Refrigerant oil refill amount
Compressor assembly	The original compressor is weighed as A and the new compressor is weighed as B, pour (B-A) weight of compressor oil out of the new compressor. During operation, avoid foreign objects and moisture from entering the compressor and compressor oil
A/C condenser assembly	40 ml
Thermal management integrated module assembly	The original thermal management integrated module assembly is weighed as Mg after removing the coolant part. After replacing with the new thermal management integrated module, replenish (Mg-6465 g) + 40 ml after removing the coolant part, including the wire harness and valve coil, excluding the water-cooled condenser.
Low pressure hose assembly - I	10 ml
High pressure hose assembly - I	10 ml
Low pressure hose assembly - II	10 ml
High pressure hose assembly - II	10 ml
Low pressure hose assembly - III	10 ml
High pressure hose assembly - III	10 ml
High pressure aluminum pipe assembly	10 ml
Evaporator	40 ml

Notice:

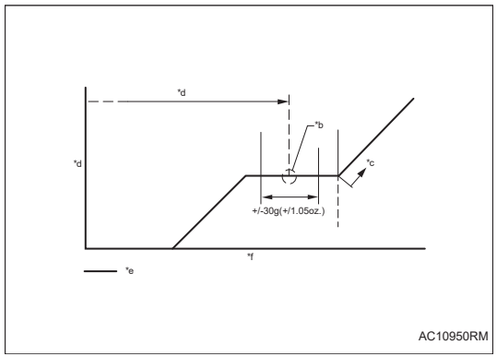
- **Please use the refrigerant recycling device according to the manufacture instructions.**

3. Refrigerant type

(a) Use the specified refrigerant, otherwise, the compressor will be damaged.

Refrigerant type	Filling amount
R134a	1100 ± 15 g

(b) Perform vacuum cleaning operation with vacuum pump or proper device, and fill the A/C system with refrigerant.



*a	Standard charging capacity
*b	Average value within normal range
*c	Overcharged
*d	High pressure
*e	Auxiliary cooling system
*f	Refrigerant amount

Note:

- Do not turn on the A/C switch before filling the A/C system with refrigerant. Otherwise, the compressor may operate without refrigerant, causing the compressor to overheat.
- Check the refrigerant amount according to the quantity (weight).

Note:

- When using the refrigerant recycling device, make sure there is enough refrigerant for filling the system. Refrigerant recycling device cannot completely recover the refrigerant from A/C system.

4. Compressor warms up

(a) Keep the A/C switch ON for at least 2 minutes to warms up the compressor.

Note:

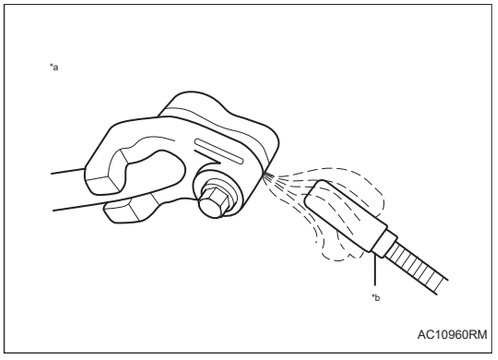
- Be sure to warm up the compressor to prevent damage when turning on the A/C after removing and installing the A/C system line (including compressor).

5. Check refrigerant for leakage

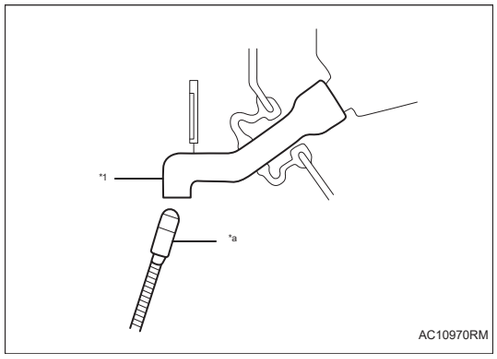
(a) After recharging refrigerant for A/C system, use halogen leakage detector to check refrigerant for leakage.

(b) Conduct test under following conditions:

- Turn ignition switch to OFF.
- Ensure the ventilation is well (halogen leakage detector may react to volatile gases which are not from refrigerant, such as gasoline vapor and exhaust gas).
- Repeat the inspection for 2 or 3 times.
- Measure the pressure to confirm that residual refrigerant is in the A/C system.



(c) Use halogen leakage detector to check A/C system for refrigerant leakage.



(d) Turn off the power supply of halogen leakage detector, place it close to discharge hose and open the detector.

Note:

- Leave the cooling device for 15 minutes or more after blower motor stops.
- Place the halogen leakage detector sensor under the discharge hose.
- When the halogen leakage detector approaches the discharge hose, make sure that the halogen leakage detector does not respond to volatile gases. If interference of volatile gases is unavoidable, raise the vehicle to check for leakage.

(e) If no refrigerant leakage is detected at the discharge hose, remove the blower motor control device from the cooling device. Insert the halogen leakage detector sensor into the device, and check for leakage.

(f) Disconnect the pressure sensor connector for 20 minutes. Place the halogen leakage detector sensor close to the pressure sensor, and check for leakage.

Note:

- When checking for leakage, it indicates leakage if oil stain is on the connection.

RE

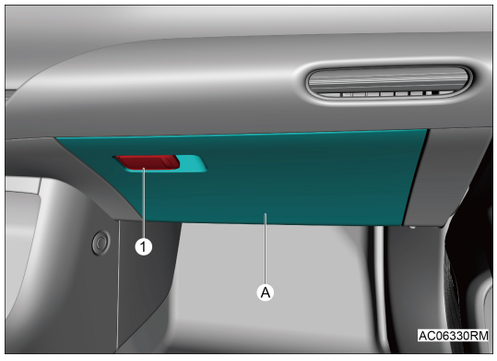
A/C element

Replacement

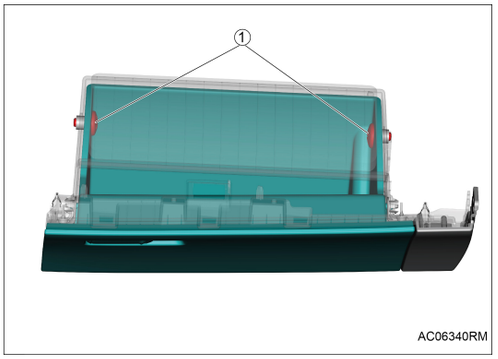
Note:

- Set A/C system to inner circulation mode before removal.

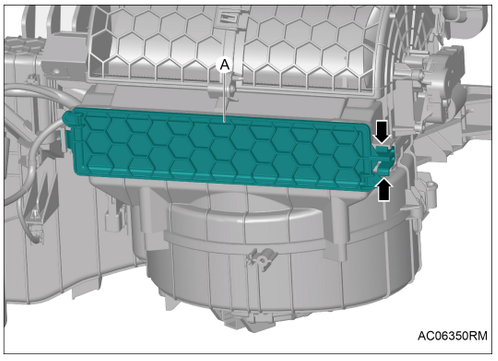
1. Remove A/C element



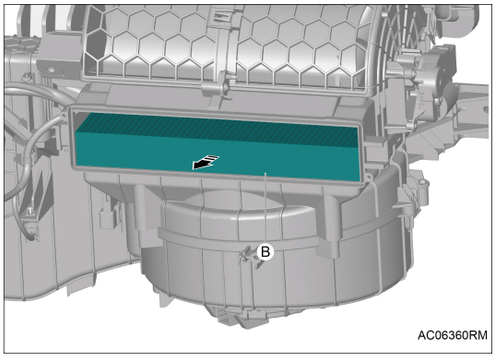
(a) Pull the handle -1-, and open the glove box assembly -A-.



(b) Remove the cushion pin -1-.



(c) Press claw -arrow- and remove the cover plate -A-.



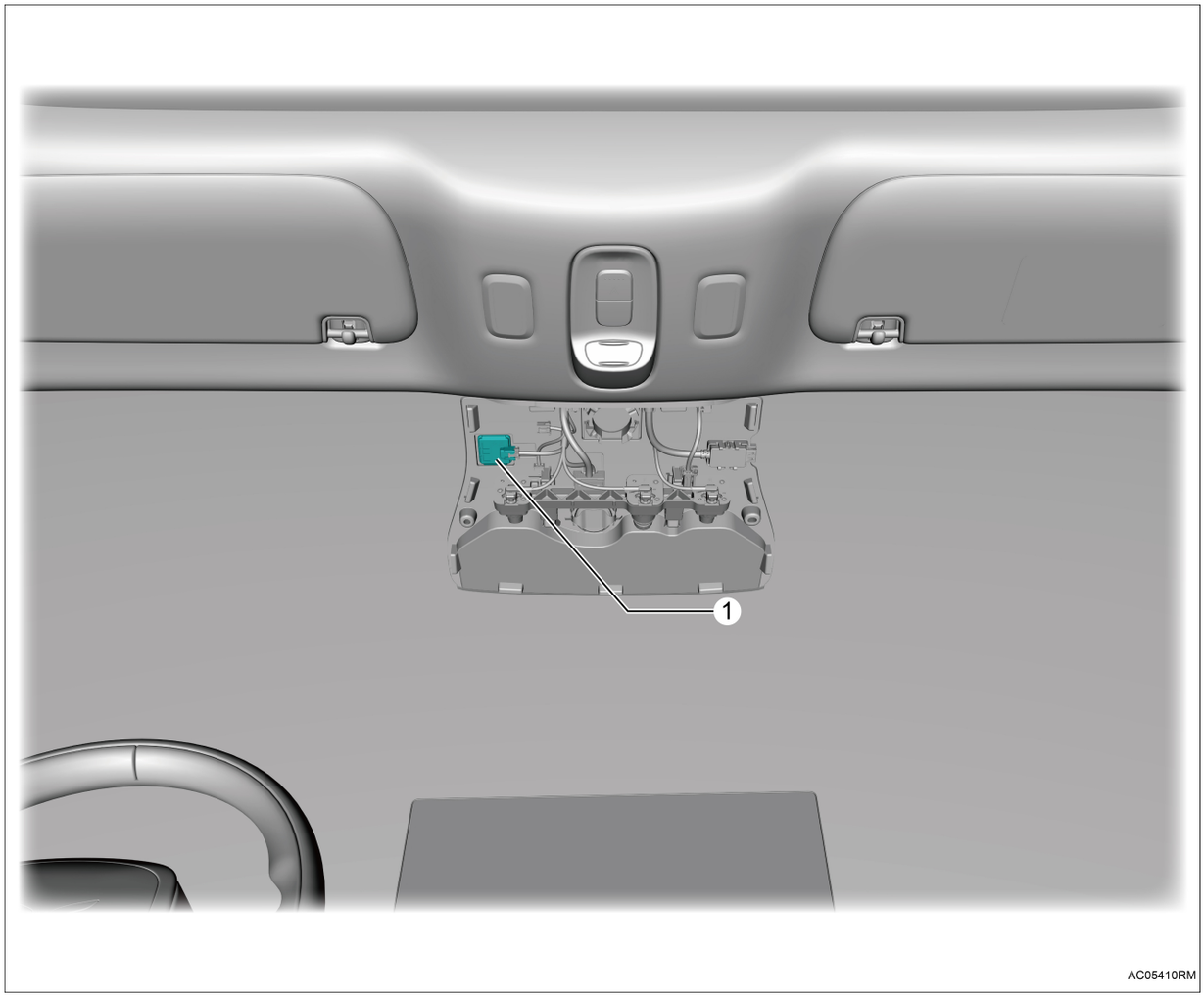
(d) Pull out the A/C element -B- outward in the direction of -arrow-.

Notice:

- **The air flow direction is marked on the element when installing and do not install it in reverse.**

Anti-fog sensor

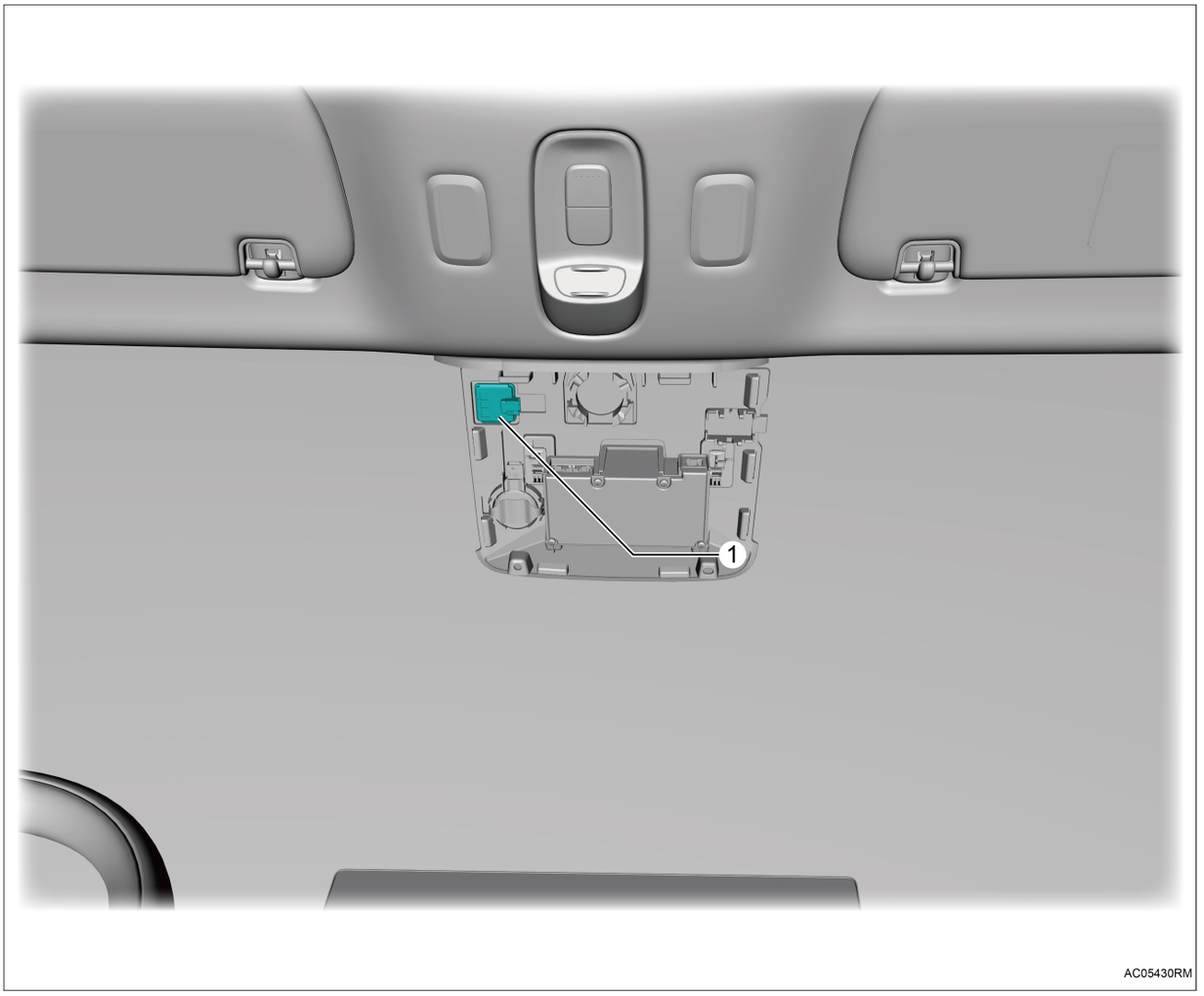
Components



1. Anti-fog sensor

RE

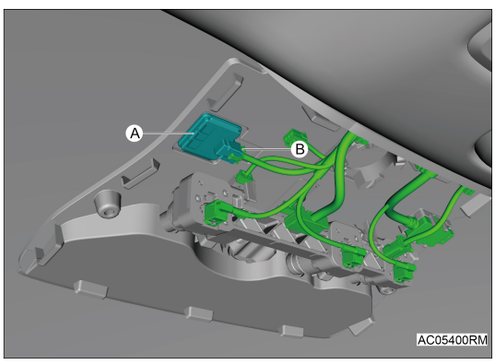
Components



1. Anti-fog sensor

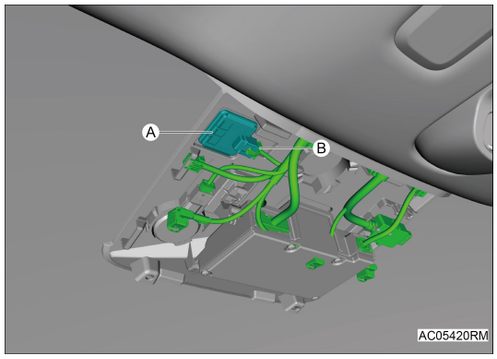
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove inside rear view mirror trim cover I (See page NS-180)**
3. **Remove anti-fog sensor (only for Asian version)**



(a) Disconnect the wire harness connector -B-.

(b) Remove the anti-fog sensor -A-.



4. Remove anti-fog sensor (only for European version)

(a) Disconnect the wire harness connector -B-.

(b) Remove the anti-fog sensor -A-.

Installation

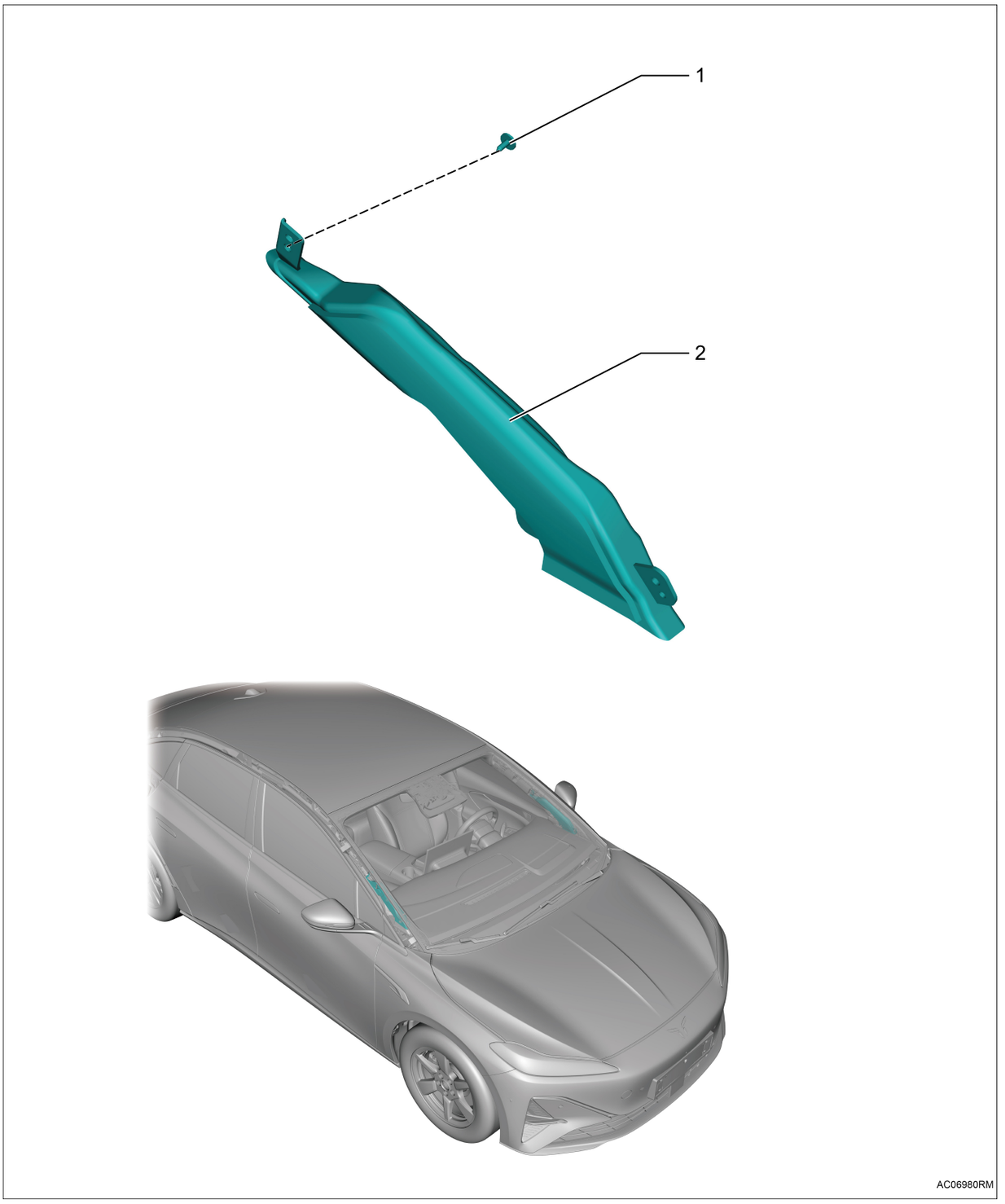
1. Installation is in the reverse order of removal, and pay attention to the followings:

Notice:

- **Before bonding, there should be no dirt or dust on the surface of the glass. The bonding environment temperature is 20° C ～ 40° C and the humidity is less than 65%RH.**
- **Peal off the protective film before bonding. Press it evenly with 100 kPa for 5 s to 10 s. Never apply external force for at least 1 hour after installation. After the anti-fog sensor is bonded to the glass, apply 50 N pull-out force in the vertical direction of anti-fog sensor to ensure that the anti-fog sensor should not fall off.**

Defroster duct

Components



1. **Screw**
   - X3
2. **Left defroster duct**

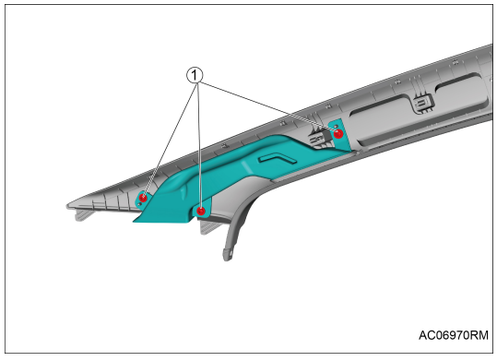
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove A-pillar upper protector (See page NS-130)**
3. **Remove left defroster duct**

   Note:

   • Use same removal orders for right and left sides.

   (a) Remove the screw -1-.



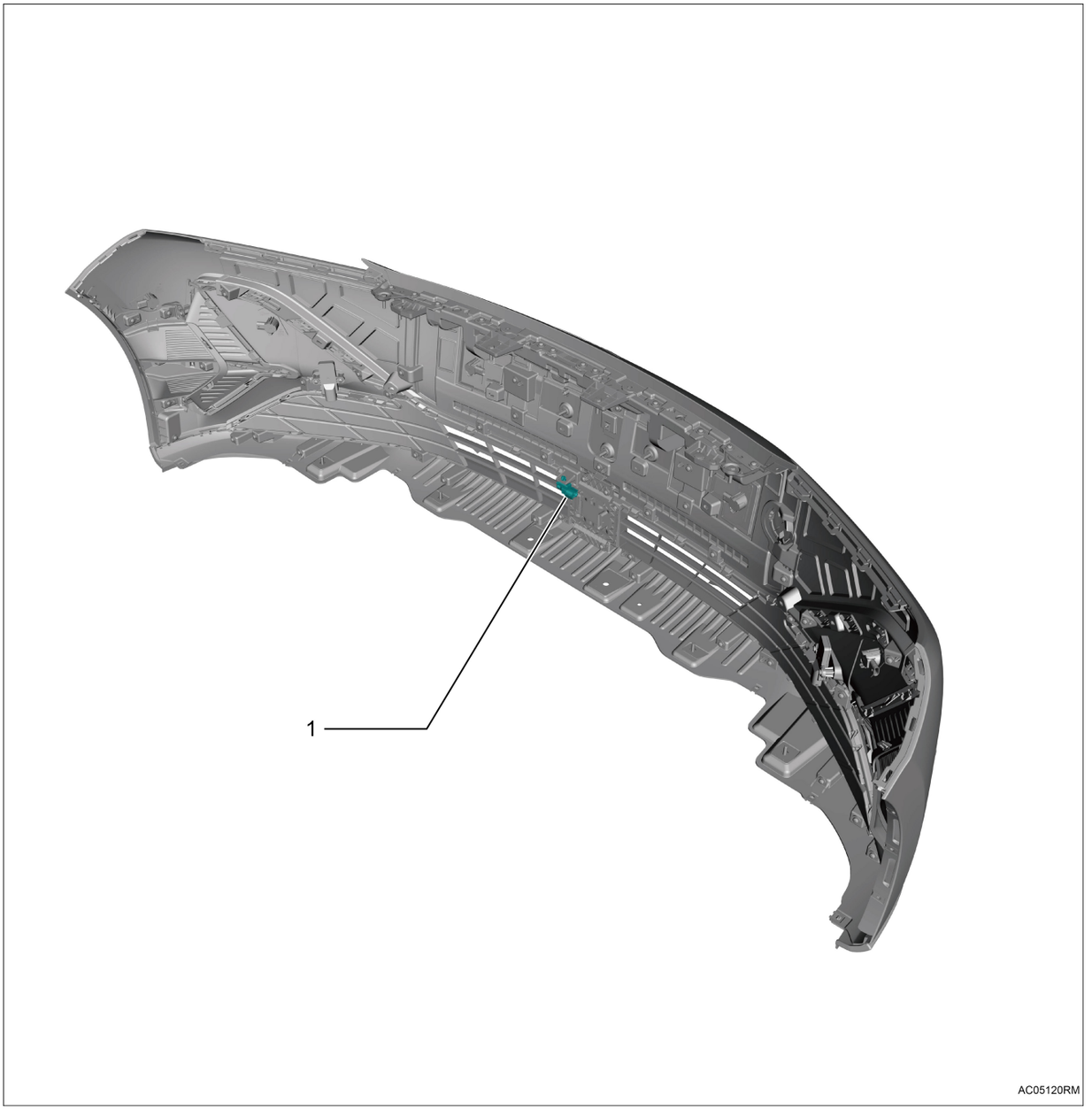
Installation

1. **Installation is in the reverse order of removal.**

Outside temperature sensor assembly

Components

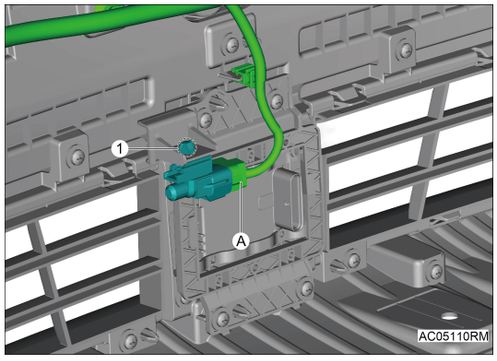
RE



1. Outside temperature sensor assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove outside temperature sensor assembly**



(a) Disconnect the wire harness connector -A-.

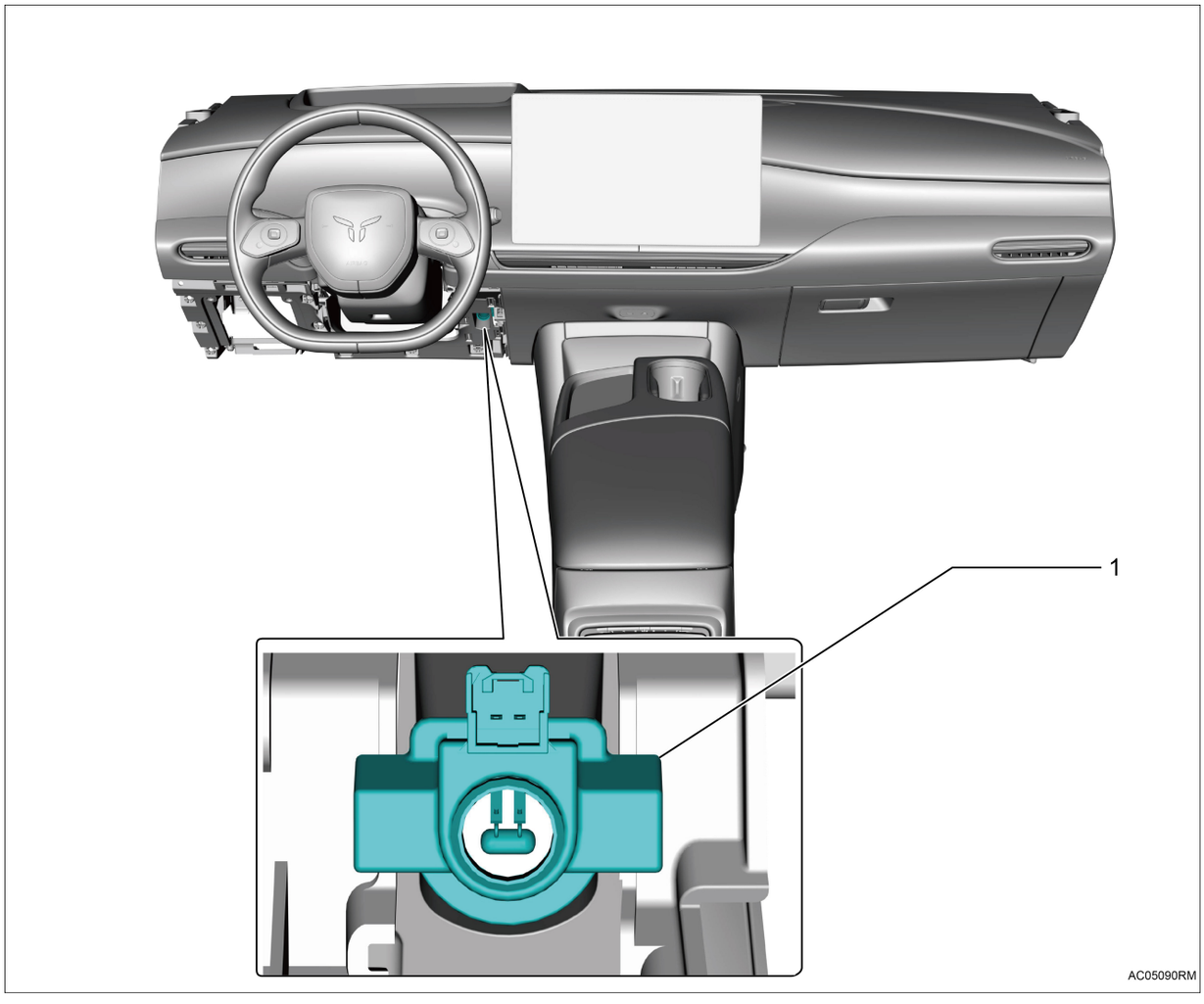
(b) Disengage the wire harness fixing clip -1-.

Installation

1. Installation is in the reverse order of removal.

Inside temperature sensor assembly

Components

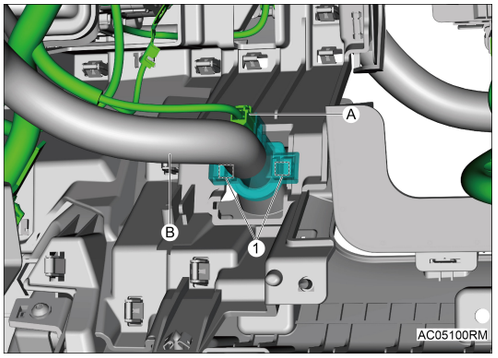


1. Inside temperature sensor assembly

RE

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove lower left protector assembly (See page NS-29)**
3. **Remove inside temperature sensor assembly**



(a) Detach the hose -B-.

(b) Disconnect the wire harness connector -A-.

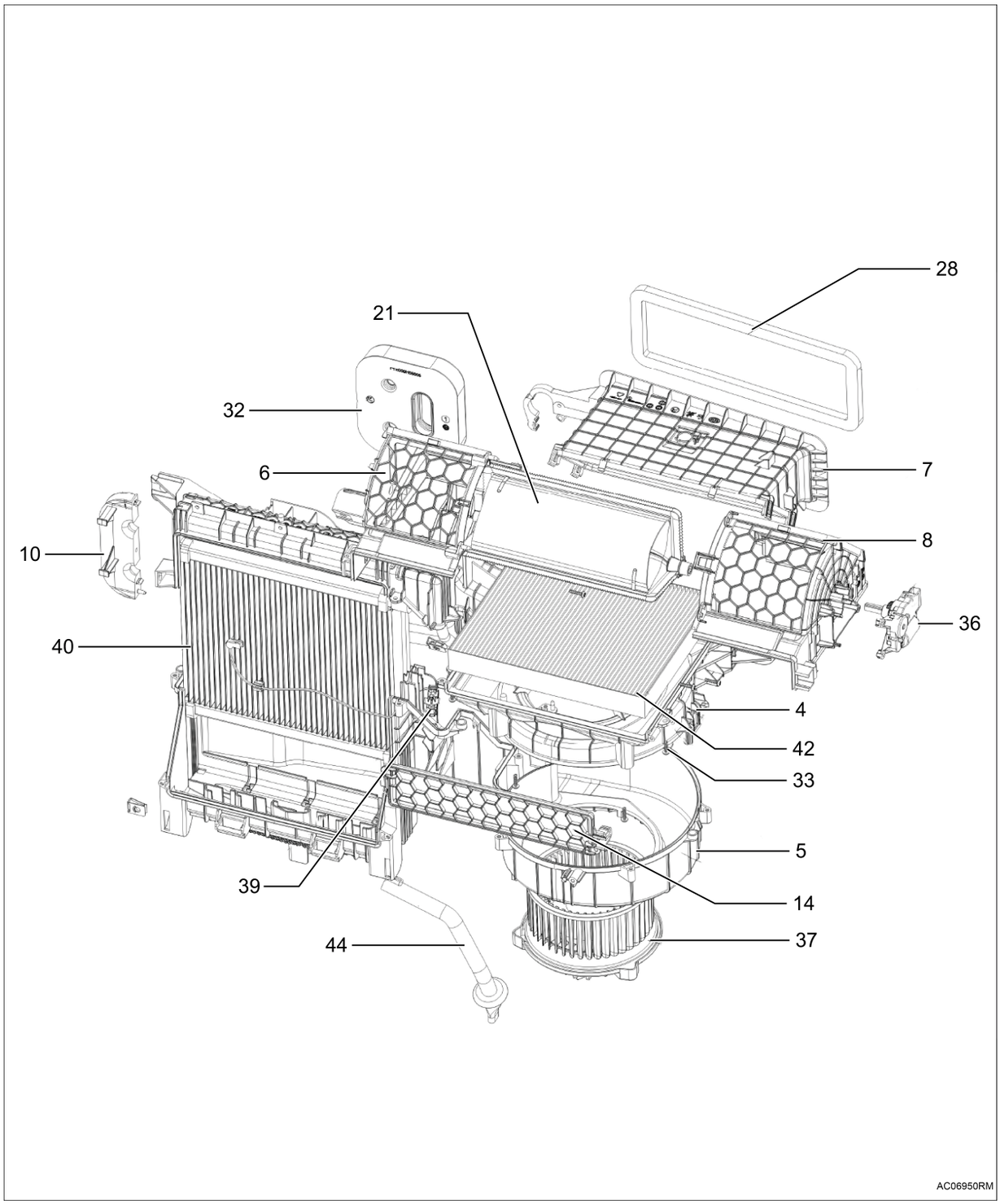
(c) Detach the claw -1-.

Installation

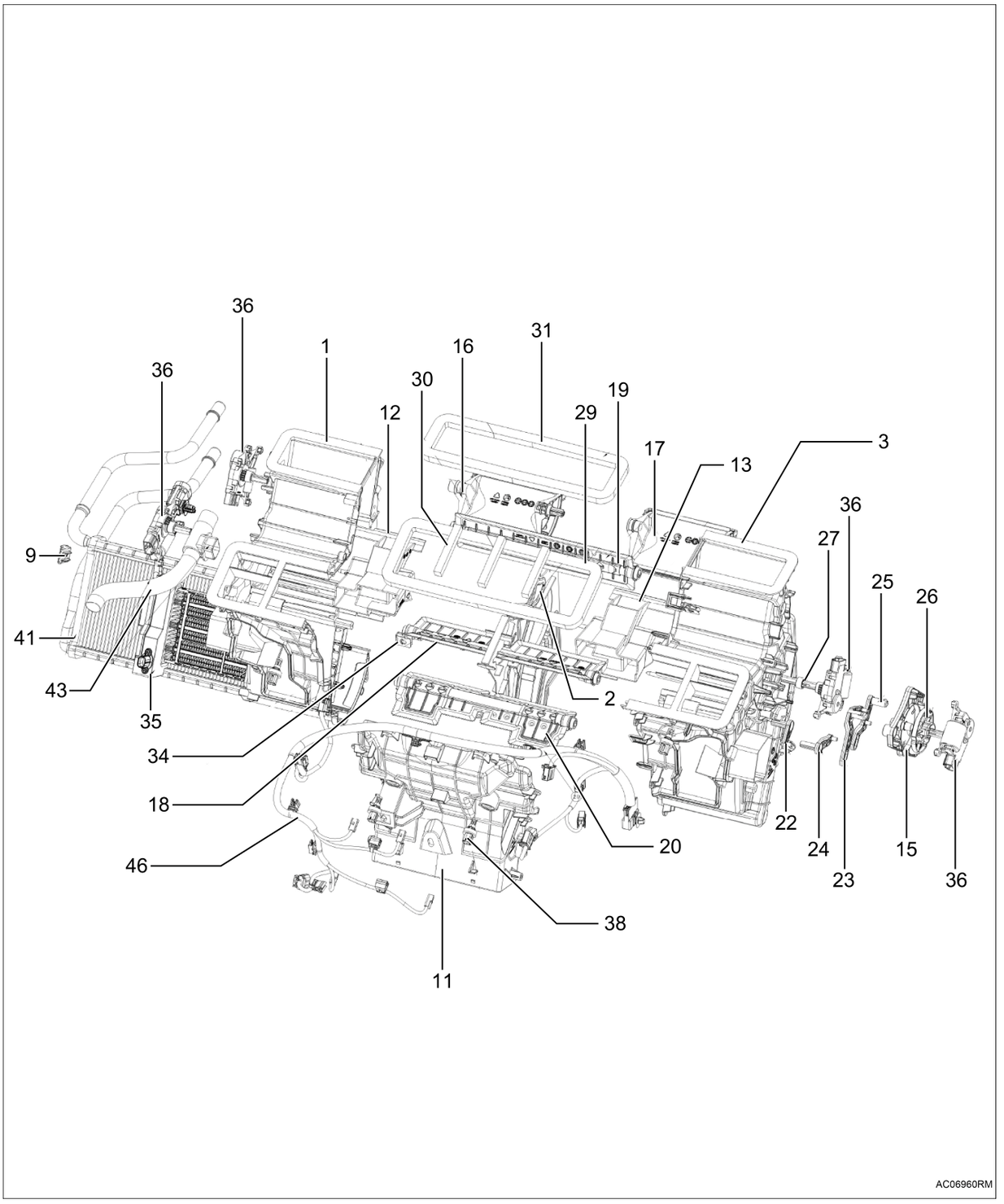
1. **Installation is in the reverse order of removal.**

HVAC assembly

Components



RE

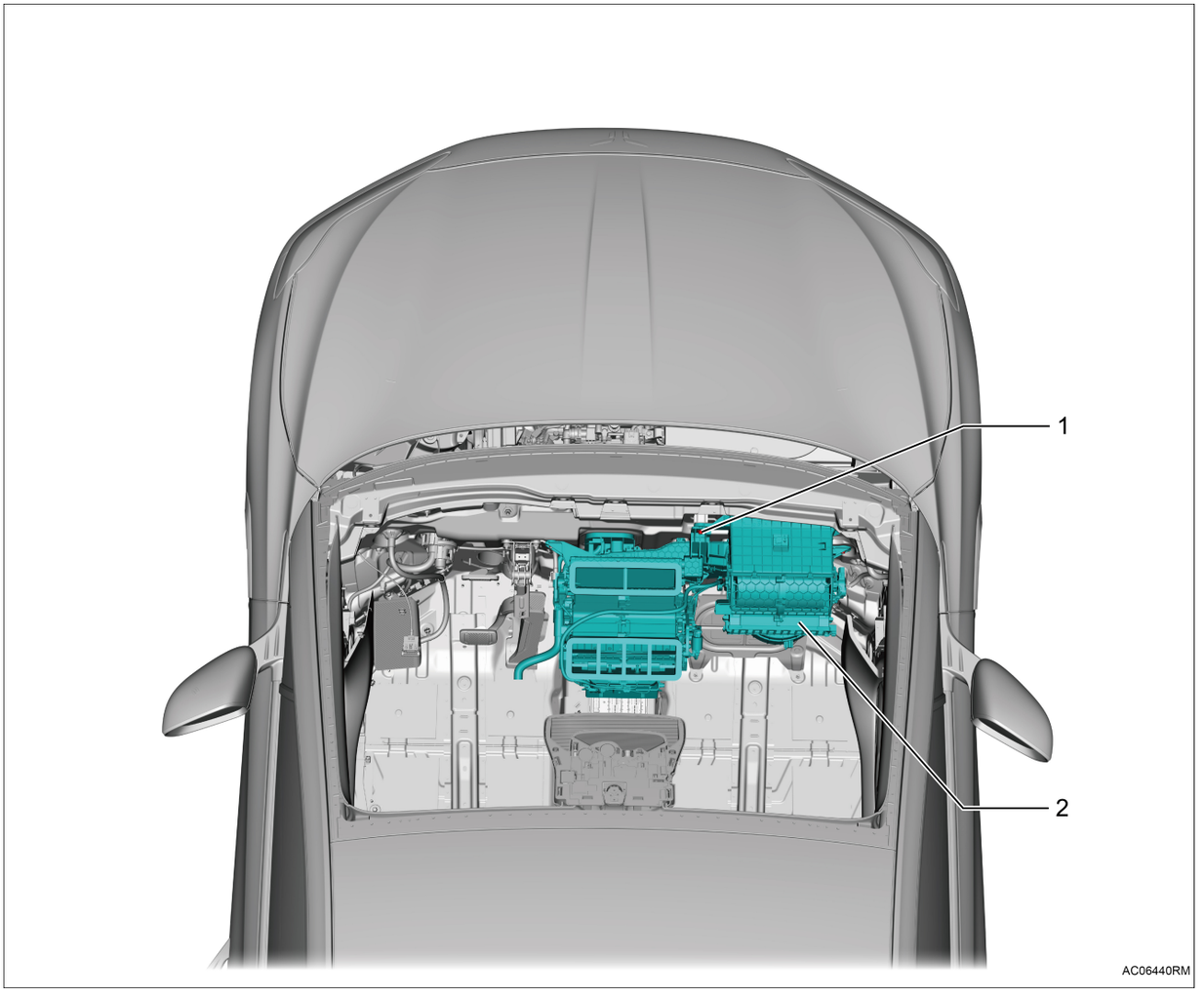


1. **Heater box left housing**
2. **Center partition**
3. **Heater box right housing**
4. **Evaporator upper housing**
5. **Evaporator lower housing**
6. **Inlet box left housing**

7. **Blower inlet housing**
8. **Inlet box right housing**
9. **Fixing plate I**
10. **Heating water pipe fixing plate**
11. **Rear face housing**
12. **Partition I**
13. **Partition II**
14. **A/C element cover plate**
15. **Bracket**
16. **Left temperature damper assembly**
17. **Right temperature damper assembly**
18. **Left face damper assembly**
19. **Defroster damper assembly**
20. **Foot damper assembly**
21. **Inlet damper assembly**
22. **Crank I**
23. **Crank II**
24. **Crank III**
25. **Crank IV**
26. **Main drive disk**
27. **Circulation actuator crank**
28. **Intake port sealing foam**
29. **Housing sponge I**
30. **Housing sponge II**
31. **Housing sponge III**
32. **Foam - front cowl**
33. **Screw**
34. **Leaf spring nut**
35. **Heater PTC heater assembly**
36. **Servo motor assembly**
37. **Blower motor assembly**
38. **Air temperature sensor assembly**
39. **Evaporator temperature sensor**
40. **Evaporator core assembly**
41. **Warm air element assembly**
42. **Air filter element**
43. **Inside temperature sensor hose assembly**
44. **Drain hose assembly**

45. A/C wire harness

Components

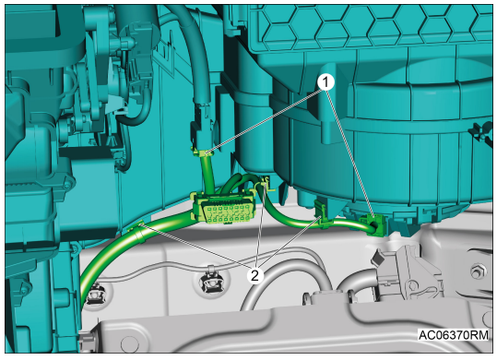


1. **Hexagon flange nut**
   - X5
   - Torque: 6 ~ 8 N • m
2. **Front HVAC assembly**

Removal

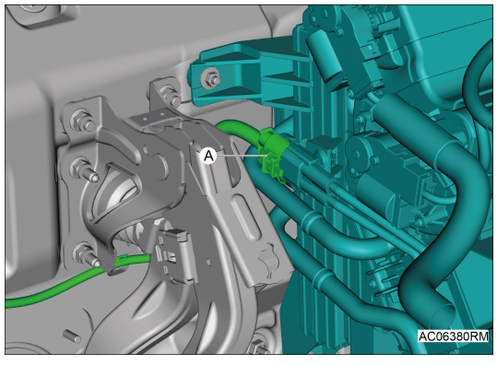
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Recover refrigerant from refrigerant system (See page RE-1)**
3. **Drain coolant (See page RE-76)**
4. **Remove water channel cover plate assembly (See page WS-86)**

5. **Remove wiper fixing bracket I assembly (See page WS-62)**
6. **Remove front shock absorber support seat lateral stabilizer bar (See page DP-73)**
7. **Remove auxiliary fascia console assembly (See page NS-49)**
8. **Remove instrument panel assembly (See page NS-40)**
9. **Remove instrument panel crossmember (See page NS-40)**
10. **Remove front part of rear foot duct assembly (See page RE-47)**
11. **Remove front HVAC assembly**

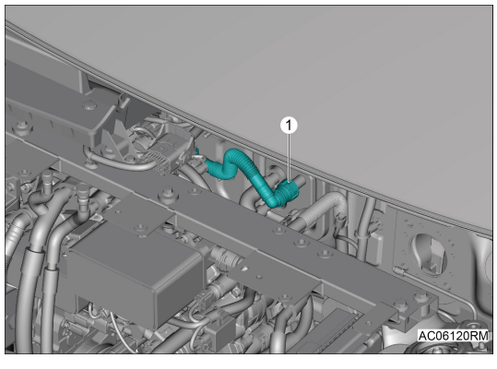


(a) Disconnect the wire harness connectors -1-.

(b) Detach the wire harness fixing claw -2-.

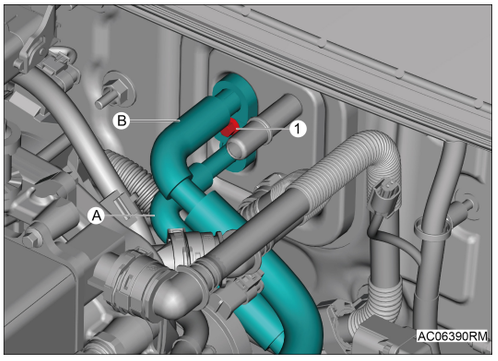


(c) Disconnect the PTC wire harness connector -A-. (Only for model with heater PTC)



(d) Disconnect the joint -1-.

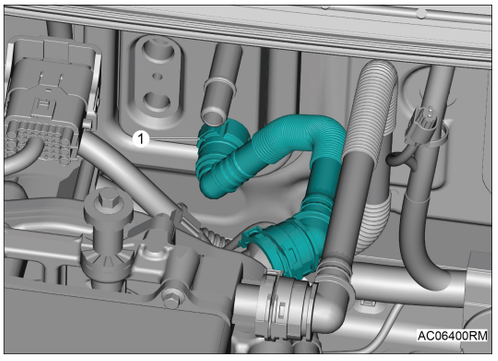
(e) Detach the PTC outlet pipe assembly.



(f) Remove the bolt -1-.

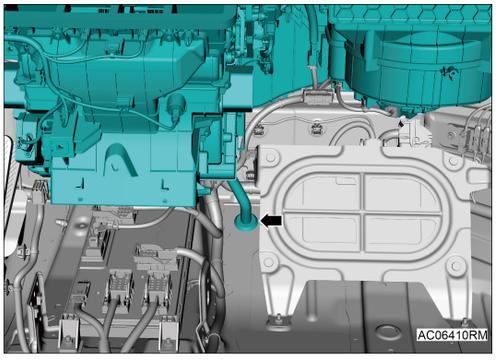
(g) Detach the high pressure hose assembly -III-A-.

(h) Detach the low pressure hose assembly -III-B-.

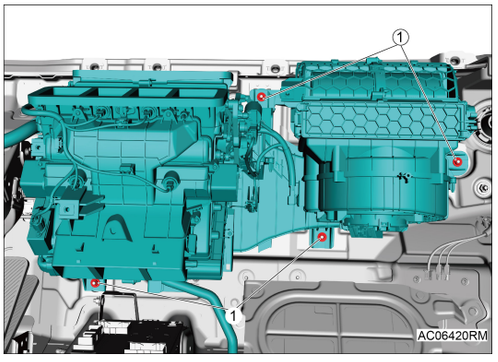


(i) Disconnect the joint -1-.

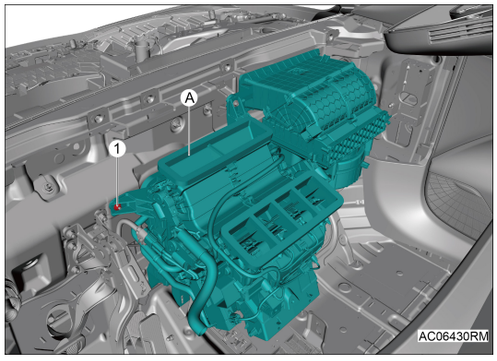
(j) Detach the heating outlet pipe assembly I.



(k) Detach the front HVAC assembly drain hose -arrow-.



(l) Remove fixing nut -1- from front HVAC assembly.

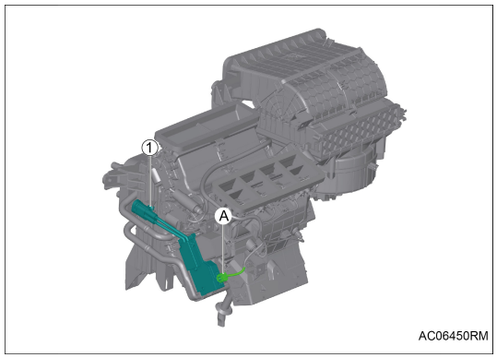


(m) Remove the nut -1-.

(n) Remove the front HVAC assembly -A-.

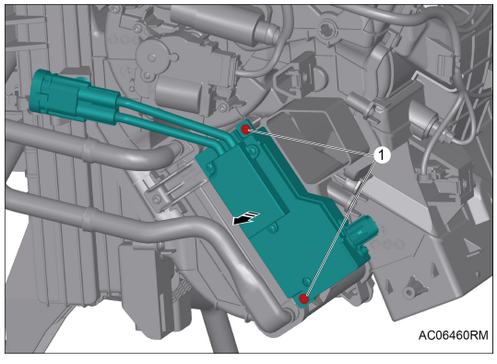
Disassembly of HVAC

1. Remove heater PTC heater assembly



(a) Disconnect the wire harness connector -A-.

(b) Detach the wire harness connector fixing clip -1-.



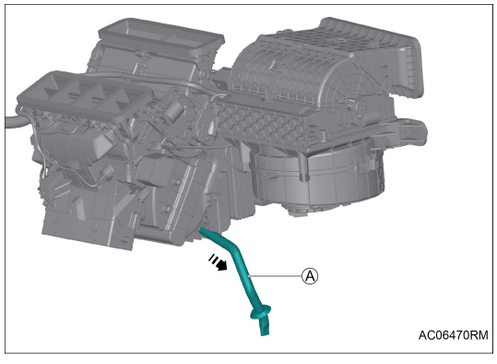
(c) Remove the screw -1-.

(d) Pull out the heater PTC heater assembly in the direction of -arrow-.

Notice:

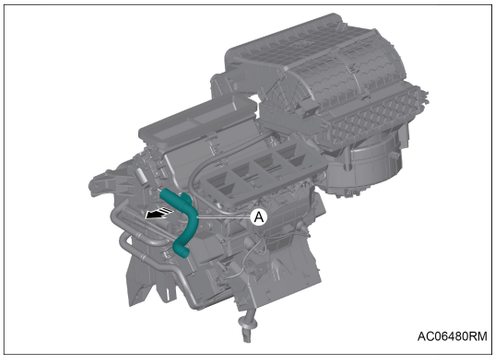
- **Pull out horizontally in the lateral direction.**

2. Remove drain hose assembly



(a) Pull out the drain hose assembly -A- with force in direction of -arrow-.

3. Remove inside temperature sensor hose assembly



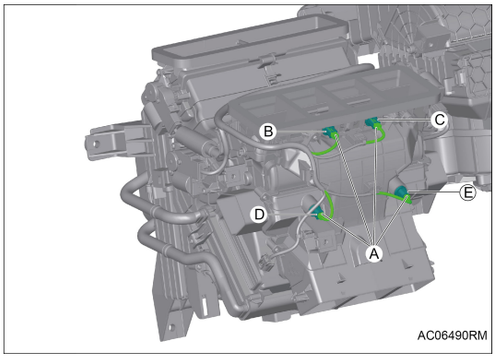
(a) Pull out the inside temperature sensor hose assembly -A- with force in direction of -arrow-.

RE

4. Remove air temperature sensor assembly

Note:

- The sensor has an anti-falling structure, and it needs to be pulled out destructively.



(a) Disconnect the wire harness connector -A-.

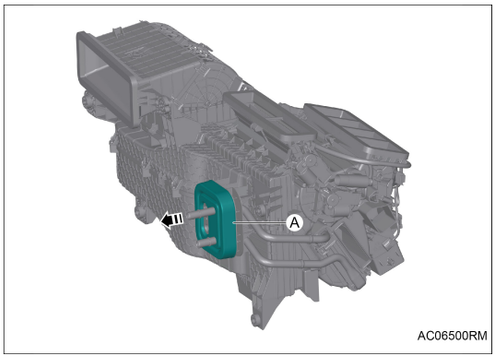
(b) Rotate and pull out the left face air temperature sensor assembly -B-.

(c) Rotate and pull out the right face air temperature sensor assembly -C-.

(d) Rotate and pull out the left foot air temperature sensor assembly -D-.

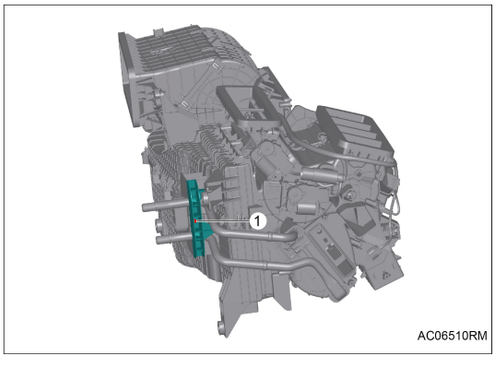
(e) Rotate and pull out the right foot air temperature sensor assembly -E-.

5. Remove cowl foam



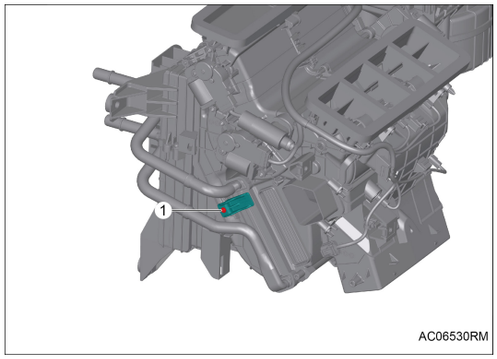
(a) Remove the front cowl foam -A- in the direction of -arrow-.

6. Remove warm air element assembly



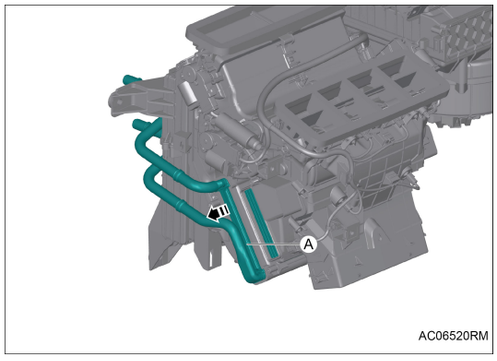
(a) Remove the screw -1-.

(b) Remove the warm air element pipe cover plate.



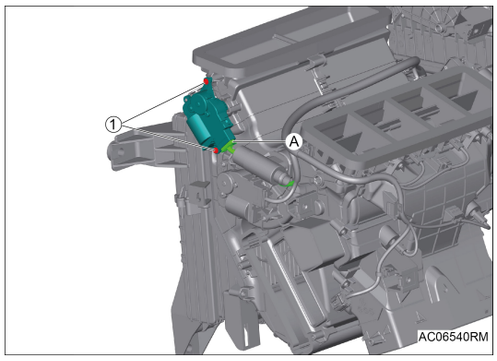
(c) Remove the screw -1-.

(d) Remove the warm air element cover plate.



(e) Pull to remove the warm air element -A- in the direction of -arrow-.

7. Remove servo motor - defroster damper

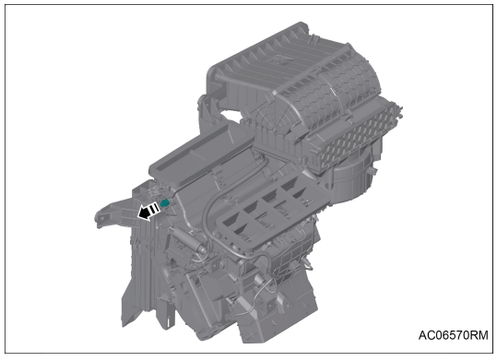


(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

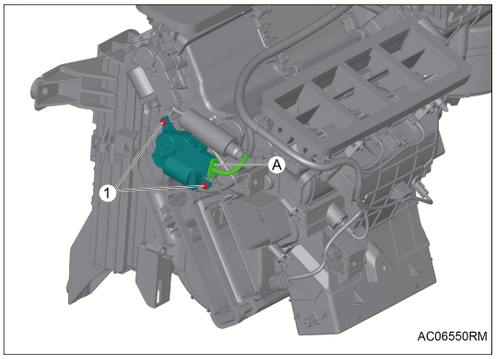
(c) Remove the servo motor - defroster damper.

8. Remove defroster mode damper connecting rod set



(a) Remove defroster mode damper connecting rod set in direction of -arrow-.

9. Remove servo motor - left temperature damper



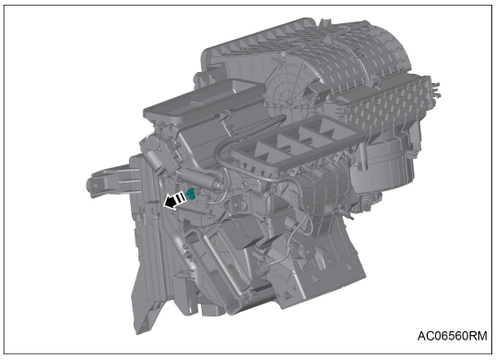
(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

(c) Remove the servo motor - left temperature damper.

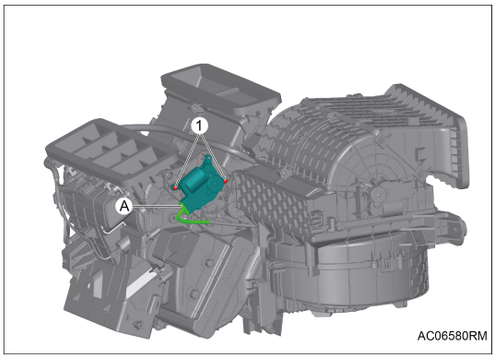
RE

10. Remove left temperature damper connecting rod set



(a) Remove left temperature damper connecting rod set in direction of -arrow-.

11. Remove servo motor - mode damper

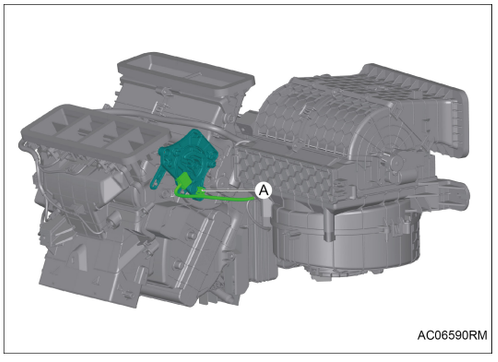


(a) Disconnect the wire harness connector -A-.

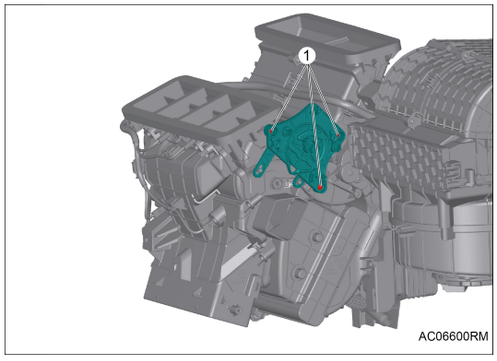
(b) Remove the screw -1-.

(c) Remove the servo motor - mode damper.

12. Remove mode disc bracket



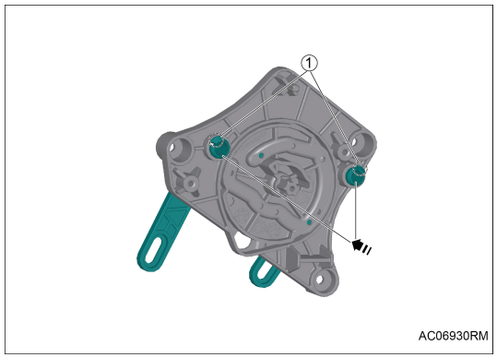
(a) Disengage the wire harness fixing clip -A-.



(b) Remove the screw -1-.

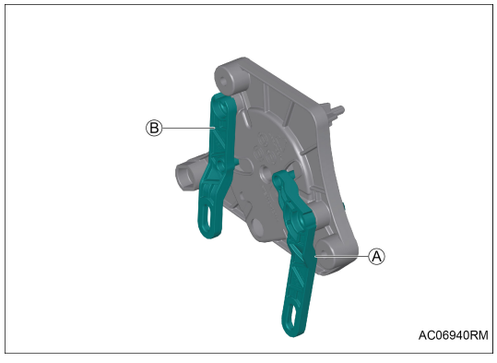
(c) Remove the mode disc bracket.

13. Remove crank II and crank IV



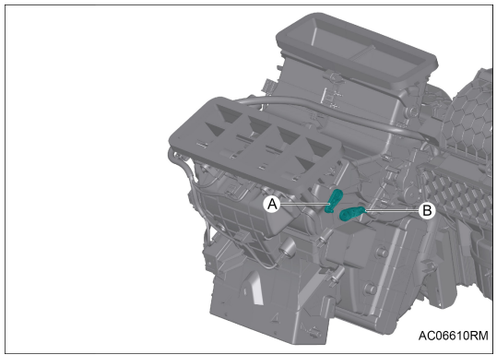
(a) Press the claw -1-.

(b) Press the mode disc bracket in the direction of -arrow-.



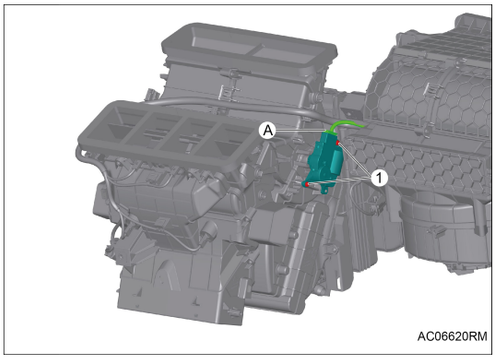
(c) Remove crank II -A- and crank IV -B-.

14. Remove crank I and crank III



(a) Pull outwards and remove crank I -A- and crank III -B-.

15. Remove servo motor - right temperature damper



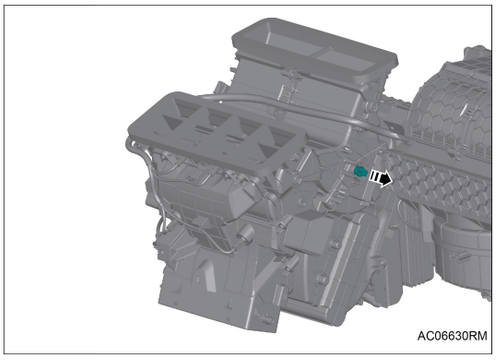
(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

(c) Remove the servo motor - right temperature damper.

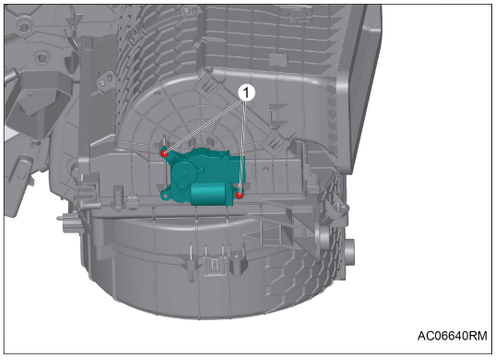
RE

16. Remove right temperature damper connecting rod set



(a) Remove right temperature damper connecting rod set in direction of -arrow-.

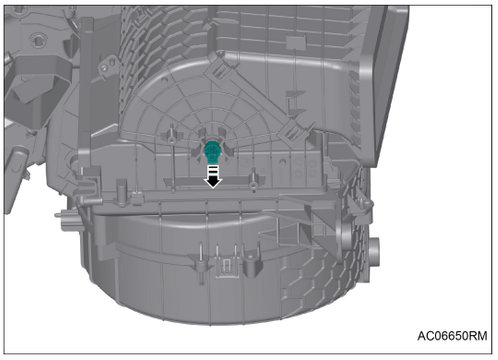
17. Remove servo motor - inner/outer circulation damper



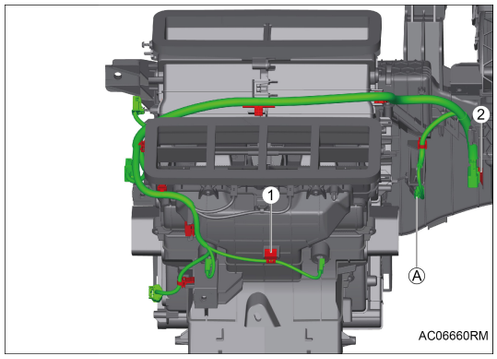
(a) Remove the screw -1-.

(b) Remove the servo motor - inner/outer circulation damper.

18. Remove inner/outer circulation damper connecting rod set



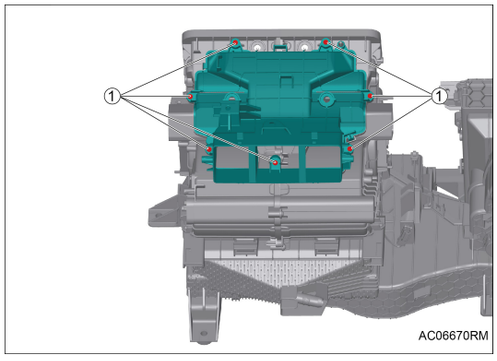
(a) Remove right temperature damper connecting rod set in direction of -arrow-.



19. Remove body transition wire harness assembly I

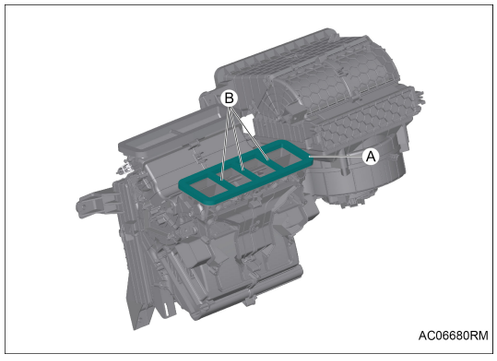
(a) Disconnect the evaporator temperature sensor wire harness connector -A-.

(b) (For example) Detach all wire harness fixing clamp -1- and clip -2-.



20. Remove rear face housing

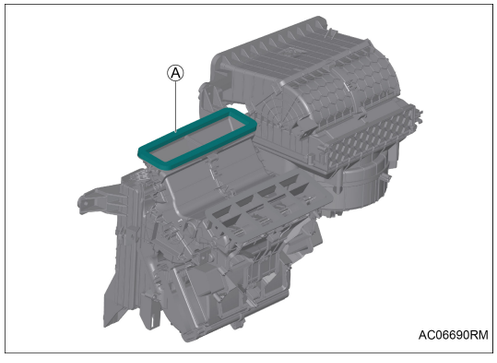
(a) Remove the screw -1-.



21. Remove housing sponge

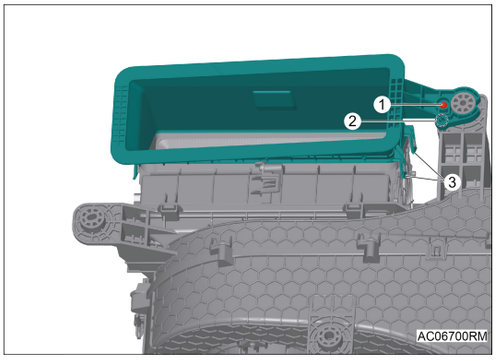
(a) Remove the housing sponge I -A-.

(b) Remove the housing sponge II -B-.



(c) Remove the housing sponge III -A-.

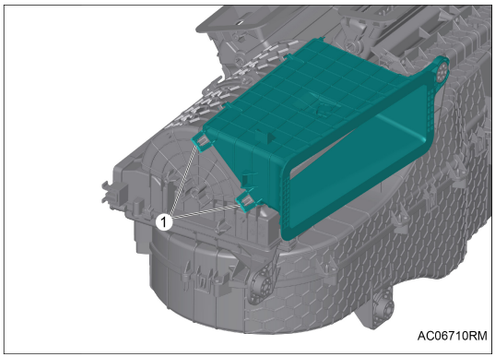
22. Remove blower air intake housing



(a) Remove the screw -1-.

(b) Detach the engagement point -2-.

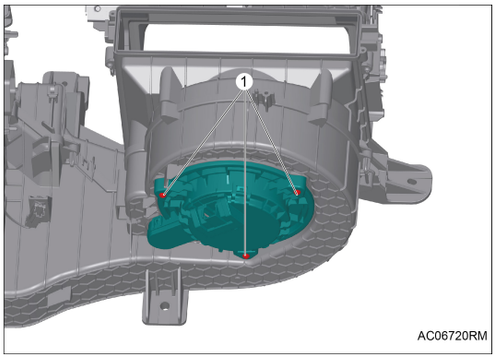
(c) Detach the claw -3-.



(d) Detach the claw -1-.

(e) Remove the blower air intake housing.

23. Remove blower motor assembly

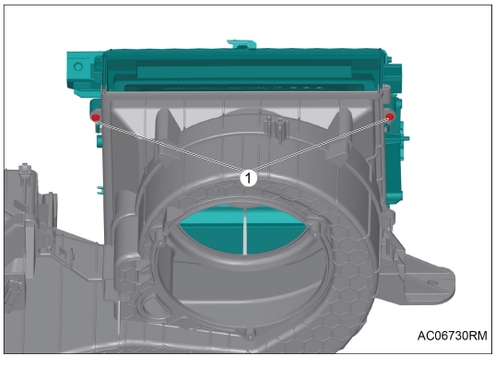


(a) Remove the screw -1-.

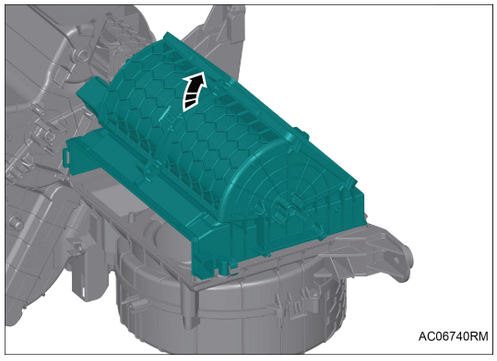
Notice:

- **Please keep it properly and be careful not to bump the fan blade after vertical removal.**

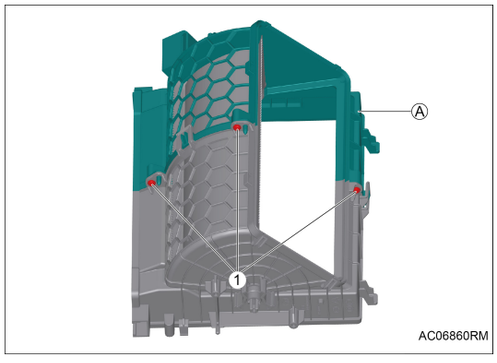
24. Remove intake box left and right housing



(a) Remove the screw -1-.



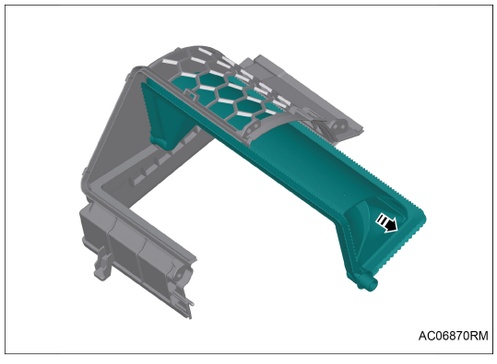
(b) Rotate in the direction of -arrow- to remove intake box left and right housing.



(c) Remove the screw -1-.

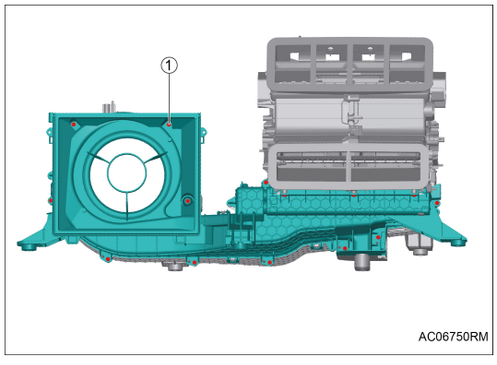
(d) Remove the right housing -A- from air intake box.

25. Remove intake damper assembly

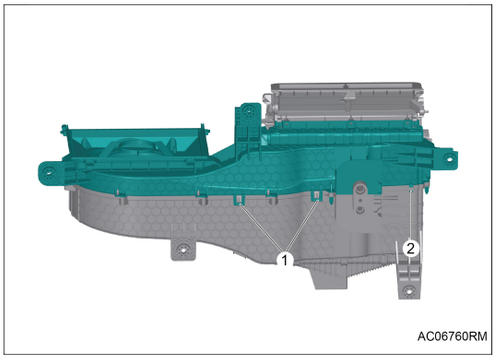


(a) Remove the intake damper assembly in the direction of -arrow-.

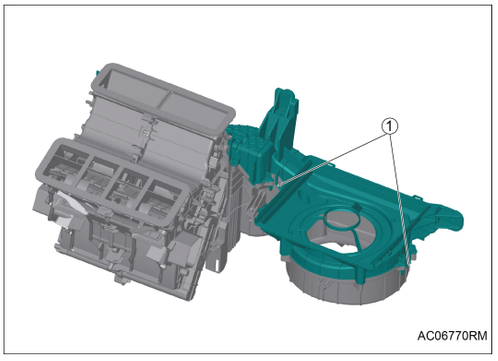
26. Remove evaporator upper case



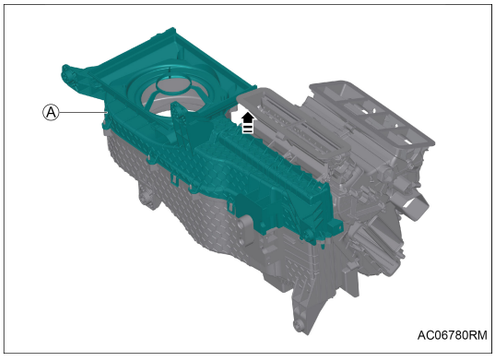
(a) (For example) Remove all screws -1-.



(b) Detach the claws -1-2-.

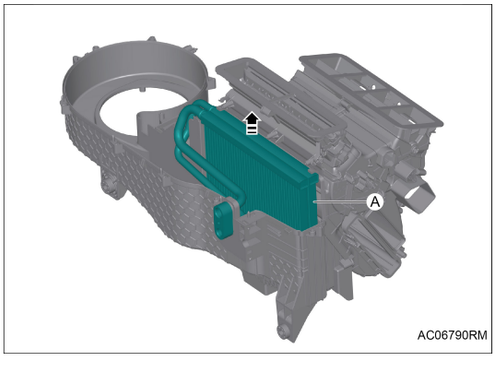


(c) Detach the claw -1-.

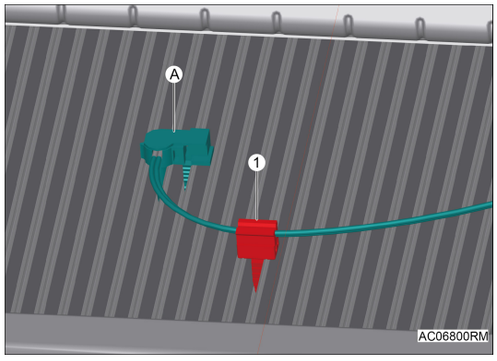


(d) Remove evaporator upper case -A- in the direction of -arrow-.

27. Remove evaporator core assembly



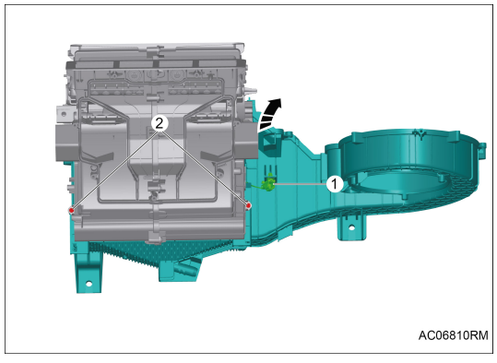
(a) Remove the evaporator core assembly -A- in the direction of -arrow-.



(b) Detach the evaporator temperature sensor wire harness fixing clip -1-.

(c) Detach the evaporator temperature sensor -A-.

28. Remove evaporator lower case

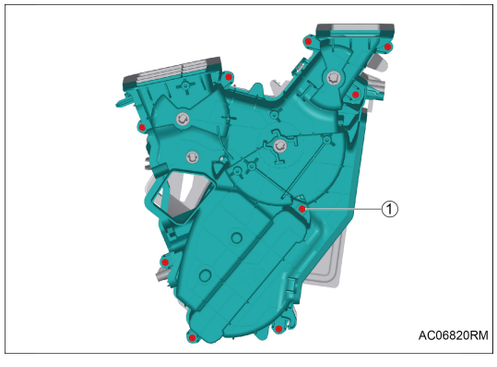


(a) Detach the evaporator temperature sensor wire harness connector fixing clip -1-.

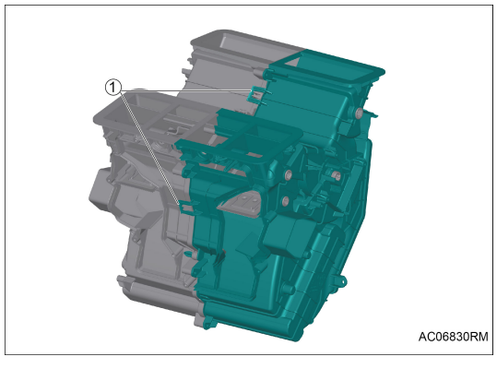
(b) Remove the screw -2-.

(c) Rotate in the direction of -arrow- to remove evaporator lower case.

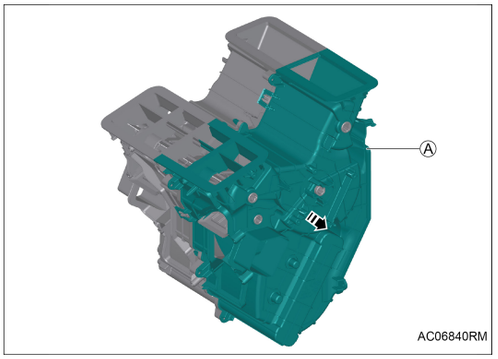
29. Remove heating box right housing



(a) (For example) Remove all screws -1-.



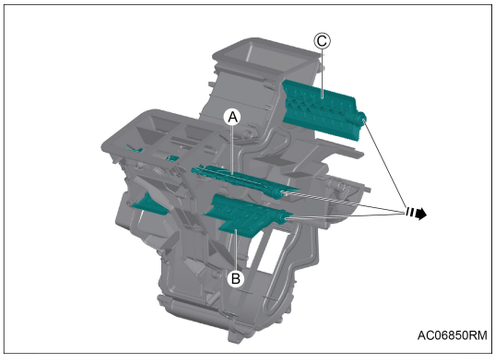
(b) Detach the claw -1-.



(c) Detach heating box right housing -A- carefully in direction of -arrow-.

RE

30. Remove damper

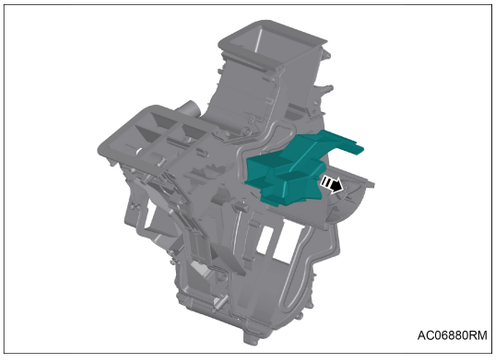


(a) Remove the left face damper -A- in the direction of -arrow-.

(b) Remove the foot damper -B- in the direction of -arrow-.

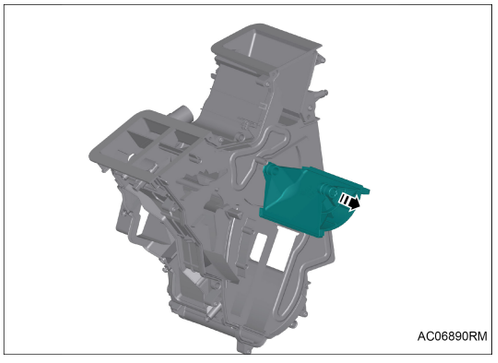
(c) Remove the defroster damper -C- in the direction of -arrow-.

31. Remove partition II



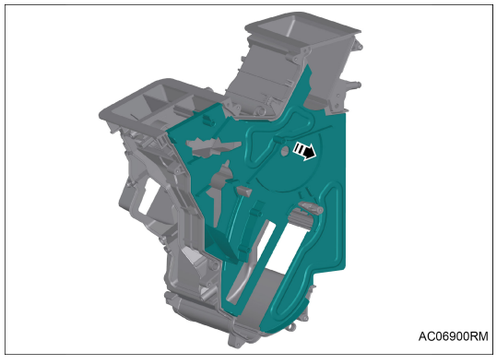
(a) Remove the partition II in the direction of -arrow-.

32. Remove right temperature damper assembly



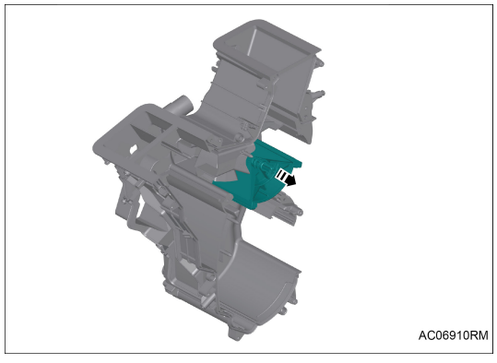
(a) Remove the right temperature damper assembly in the direction of -arrow-.

33. Remove middle partition



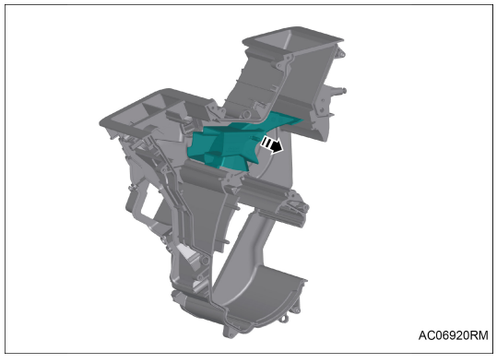
(a) Remove the middle partition II in the direction of -arrow-.

34. Remove left temperature damper assembly



(a) Remove the left temperature damper assembly in the direction of -arrow-.

35. Remove partition I



(a) Remove the partition I in the direction of -arrow-.

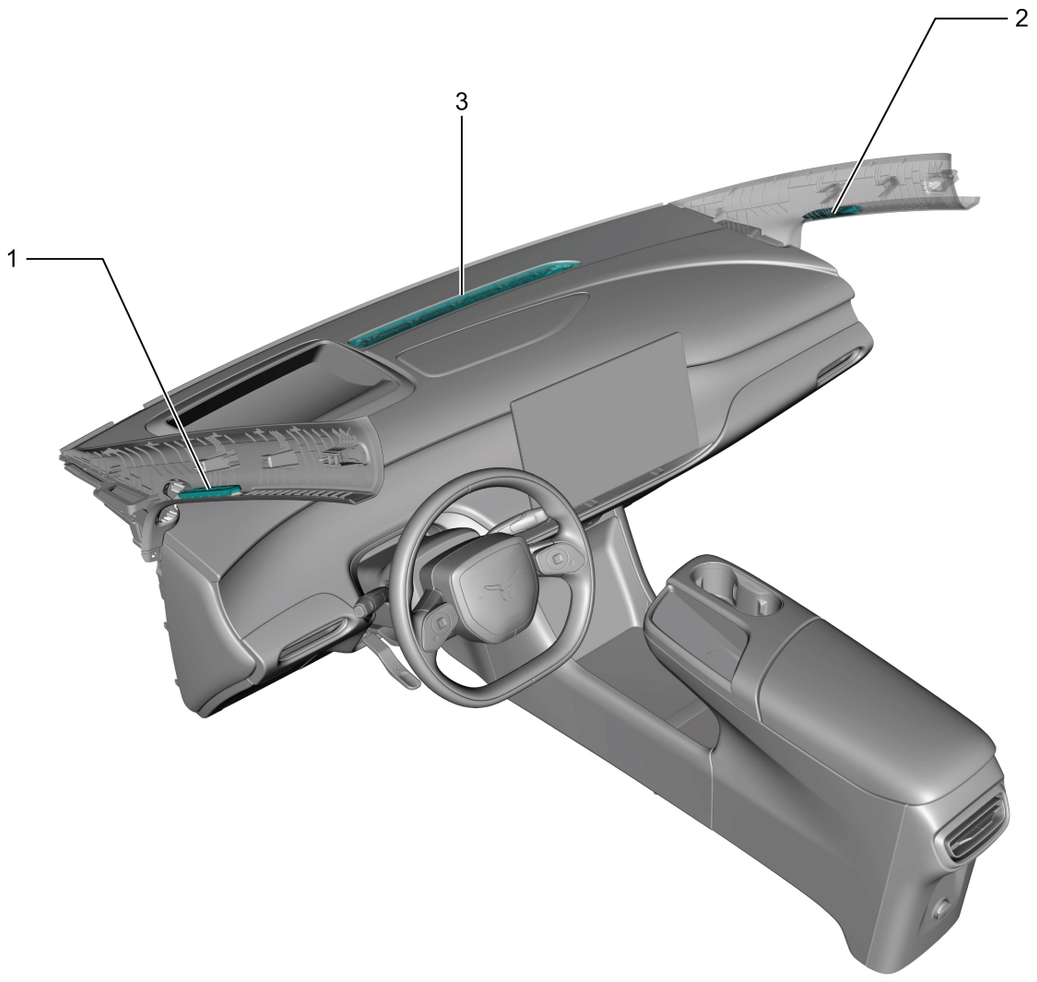
36. Installation is in the reverse order of removal.

Installation

1. Installation is in the reverse order of removal.

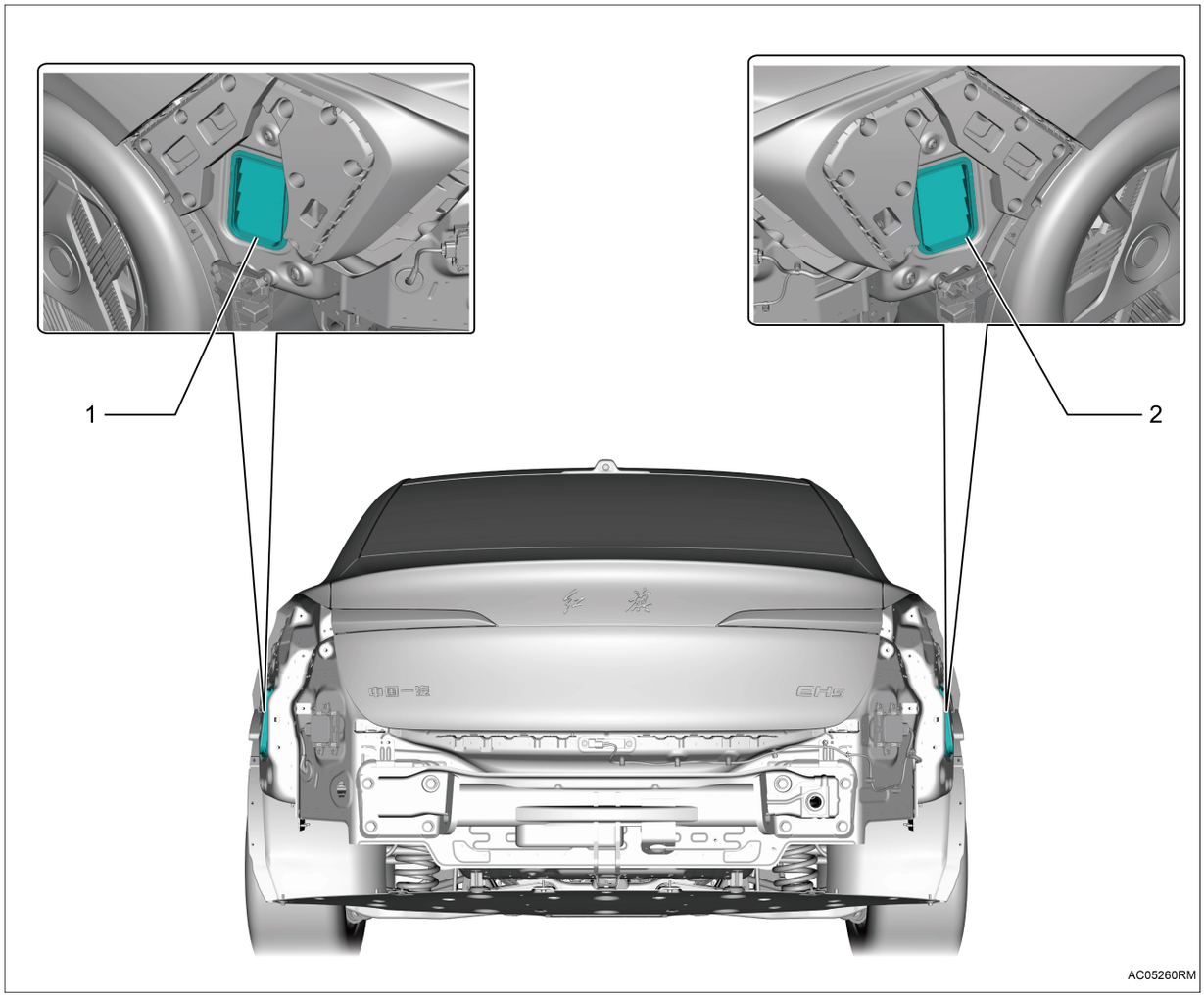
Air outlet assembly

Components



1. **Left defroster assembly**
2. **Right defroster assembly**
3. **Center duct outlet assembly**

Components

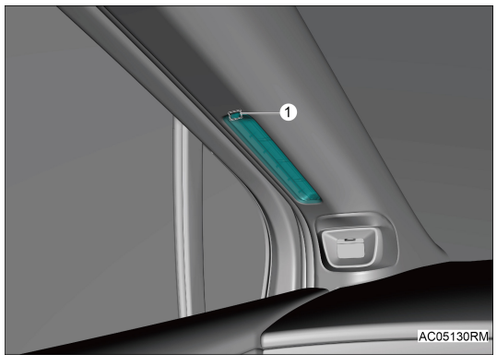


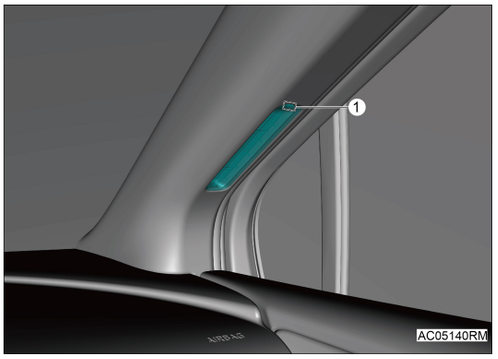
1. **Left air outlet assembly**
2. **Right air outlet assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove left defroster nozzle**

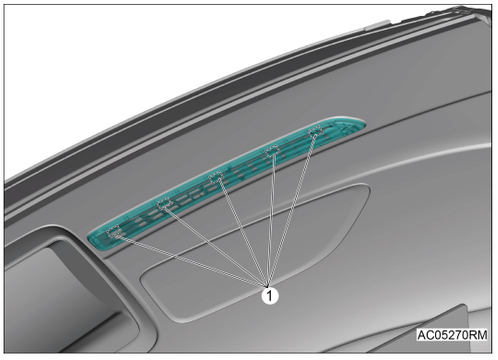
   (a) Detach the claw -1-.





3. Remove right defroster nozzle

(a) Detach the claw -1-.



4. Remove central defroster nozzle

(a) Detach the claw -1-.

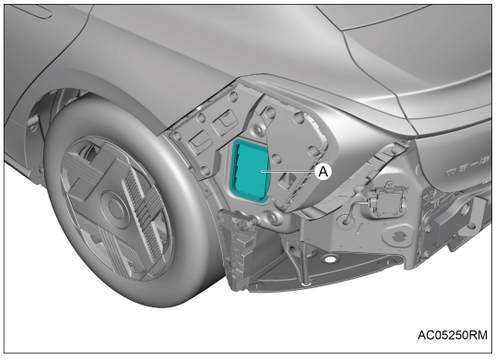
5. Remove rear bumper assembly (See page WS-13)

6. Remove air outlet assembly

Note:

- Use same removal orders for right and left sides.

(a) Use a suitable tool to insert it to pry the left air outlet assembly -A-.

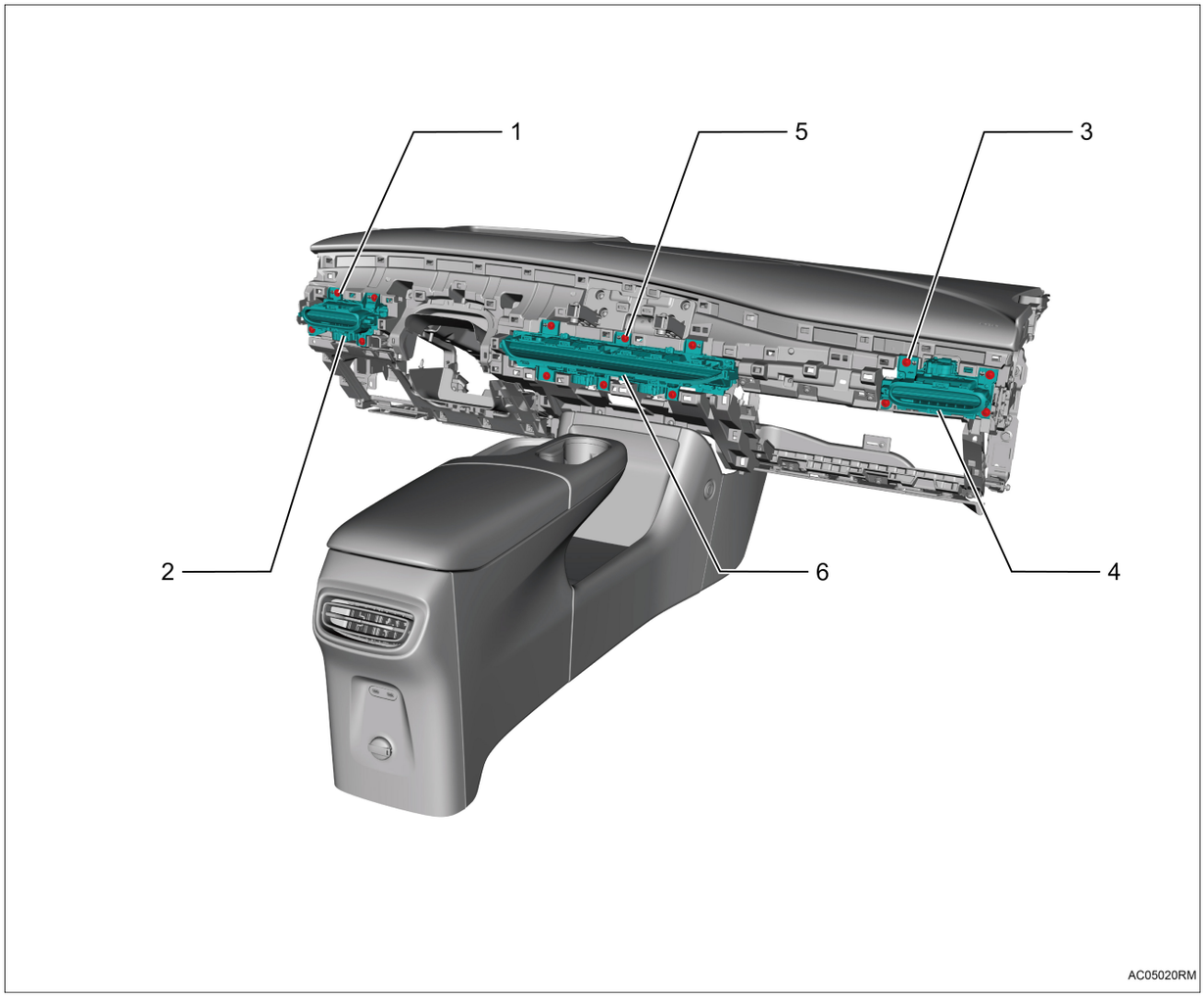


Installation

1. Installation is in the reverse order of removal.

Instrument panel outlet assembly

Components

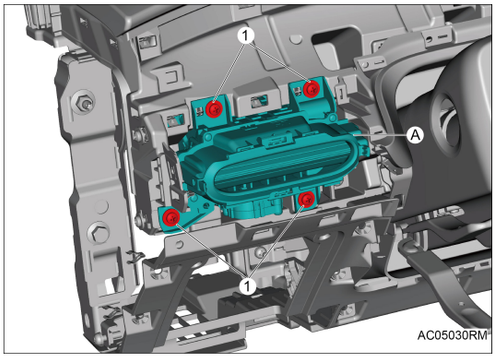


1. **Screw**
   - X4
   - Torque: 3.3 ~ 4.3 N • m
2. **Instrument panel left outlet assembly**
3. **Screw**
   - X4
   - Torque: 3.3 ~ 4.3 N • m
4. **Instrument panel right side outlet assembly**
5. **Screw**
   - X6
   - Torque: 3.3 ~ 4.3 N • m
6. **Instrument panel center outlet assembly**

RE

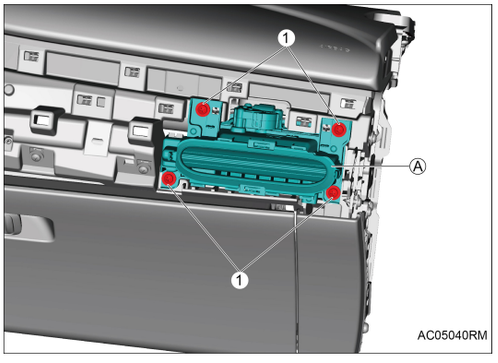
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove main display assembly (See page ZC-85)**
3. **Remove instrument panel left trim strip (See page NS-17)**
4. **Remove instrument panel right trim strip (See page NS-15)**
5. **Remove instrument panel center trim panel**
6. **Remove instrument panel lower left protector assembly (See page NS-29)**
7. **Remove instrument panel left outlet assembly**



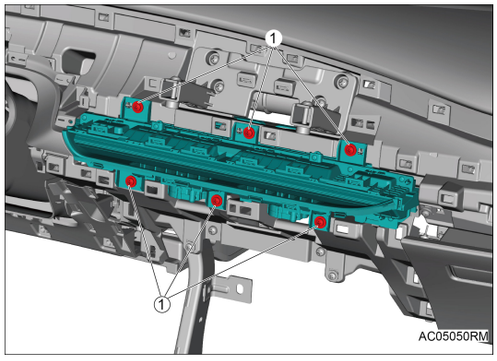
   (a) Remove the screw -1-.
   (b) Disconnect the wire harness connector.
   (c) Remove the instrument panel left outlet assembly -A-.

8. **Remove instrument panel right outlet assembly**

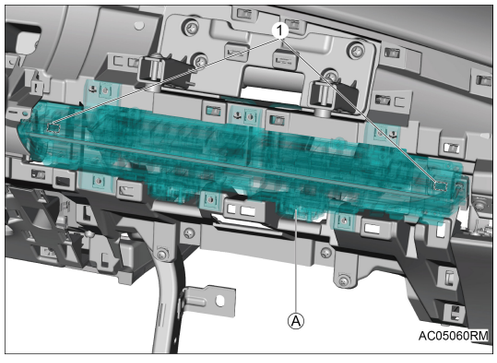


   (a) Remove the screw -1-.
   (b) Disconnect the wire harness connector.
   (c) Remove the instrument panel right outlet assembly -A-.

9. **Remove auxiliary fascia console assembly (See page NS-49)**
10. **Remove middle protector assembly (See page NS-25)**
11. **Remove instrument panel center outlet assembly**



(a) Remove the screw -1-.



(b) Detach the clip -1-.

(c) Remove the instrument panel center outlet assembly -A-.

Installation

1. Installation is in the reverse order of removal.

RE

Air outlet filter assembly

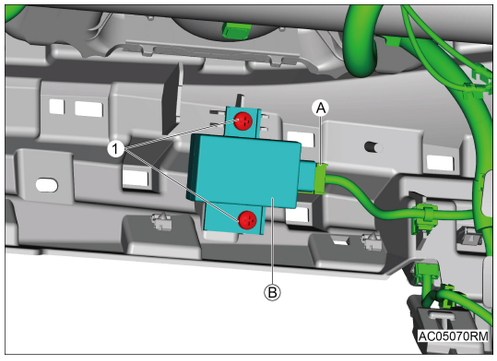
Components



1. **Screw**
   - X2
   - Torque: 2 ~ 3 N • m
2. **Instrument panel outlet filter assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove glove box assembly (See page NS-19)**
3. **Remove instrument panel outlet filter assembly**



(a) Remove the screw -1-.

(b) Disconnect the wire harness connector -A-.

(c) Remove the instrument panel outlet filter assembly -B-.

Installation

1. Installation is in the reverse order of removal.

Auxiliary fascia console outlet assembly

Components



1. Screw

- X5

2. Auxiliary fascia console outlet assembly

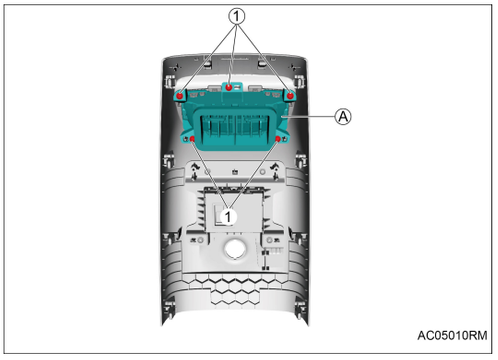
Removal

1. Disconnect negative battery terminal (See page DL-21)

2. Remove rear end plate (See page NS-49)

3. Remove rear part of rear cooling air duct assembly (See page RE-47)

4. Remove auxiliary fascia console outlet assembly



(a) Remove the screw -1-.

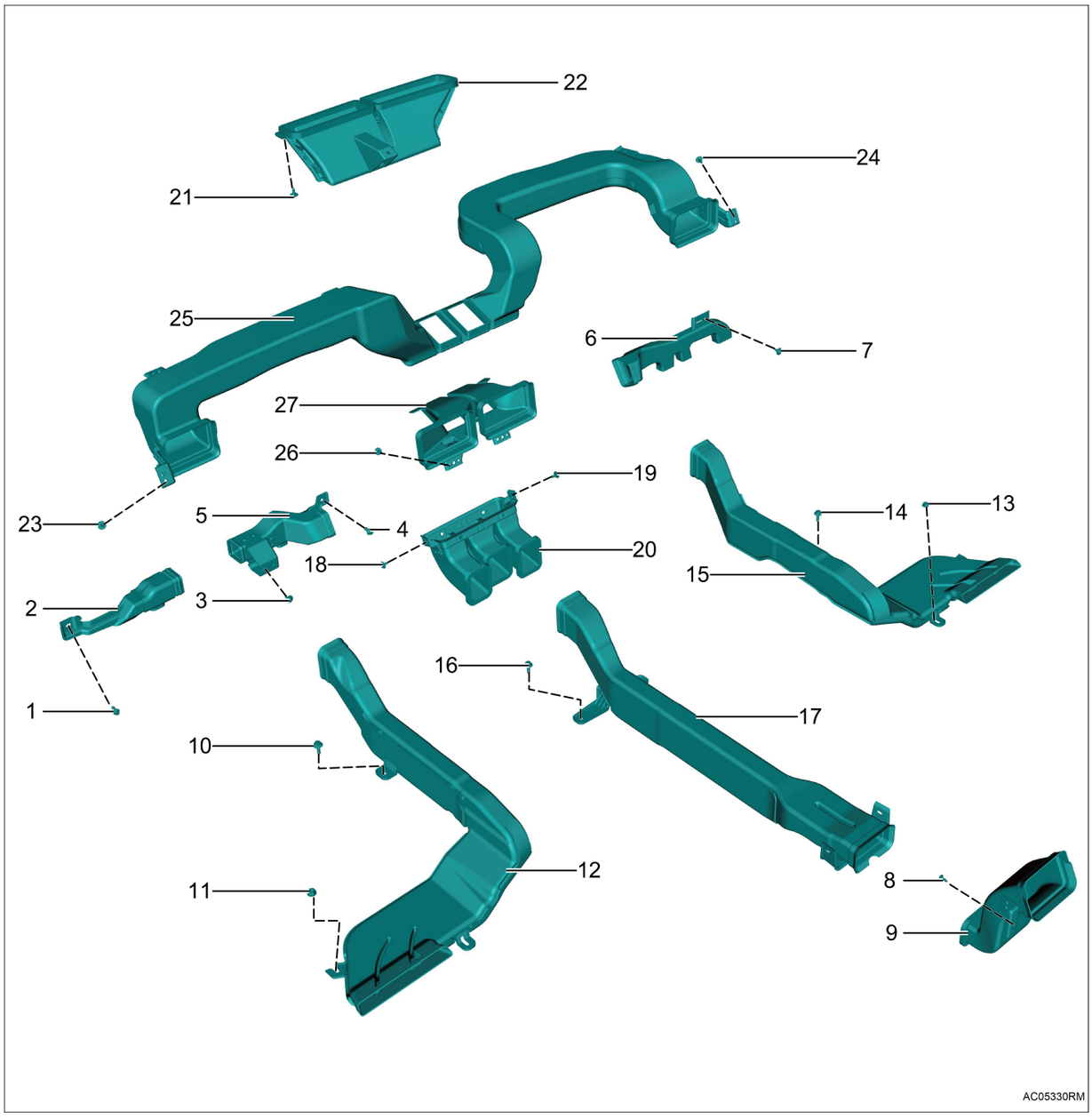
(b) Remove the auxiliary fascia console outlet assembly -A-.

Installation

1. Installation is in the reverse order of removal.

A/C air duct

Components



1. **Screw**
   - Torque: 2 ~ 4 N • m
2. **Front left foot duct I**
3. **Screw**
4. **Bolt**
   - Torque: 2 ~ 4 N • m
5. **Front left foot duct**
6. **Screw**

- Torque: 2 ~ 3 N • m

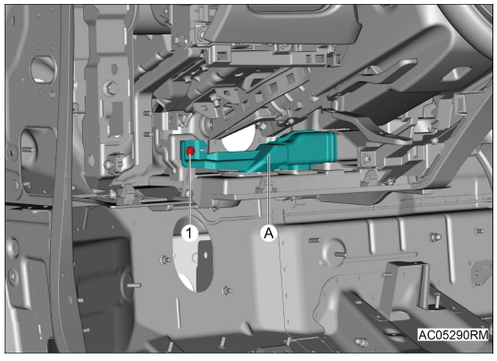
7. **Front right foot duct**
8. **Screw**
   - X2
9. **Rear part of rear cooling air duct assembly**
10. **Bolt**
    - Torque: 3 ~ 5 N • m

RE

11. **Hexagon flange nut**
    - X2
    - Torque: 3 ~ 5 N • m
12. **Rear left foot duct**
13. **Bolt**
    - Torque: 3 ~ 5 N • m
14. **Hexagon flange nut**
    - X2
    - Torque: 3 ~ 5 N • m
15. **Rear right foot duct**
16. **Bolt**
    - X2
    - Torque: 3 ~ 5 N • m
17. **Front part of rear cooling air duct assembly**
18. **Screw**
    - Torque: 2 ~ 3 N • m
19. **Screw**
    - Torque: 2 ~ 3 N • m
20. **Front part of rear foot duct assembly**
21. **Screw**
    - X3
    - Torque: 2 ~ 4 N • m
22. **Defroster transition duct assembly**
23. **Screw**
    - X3
24. **Screw**
    - X3
25. **Side face duct**
26. **Screw**
    - X2
27. **Central face duct**

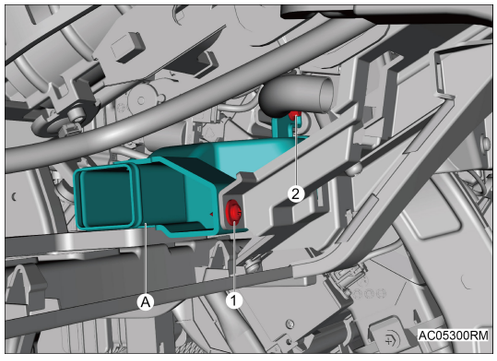
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove lower left protector assembly (See page NS-29)**
3. **Remove the front left foot duct assembly**



(a) Remove the bolt -1-.

(b) Remove the front left foot duct I -A-.

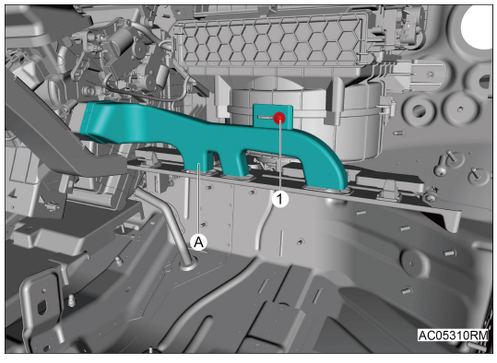


(c) Remove the screw -1-.

(d) Remove the bolt -2-.

(e) Remove the front left foot duct assembly -A-.

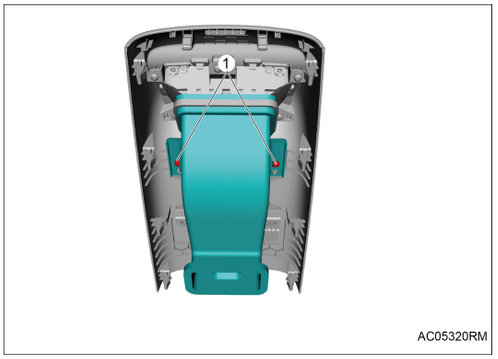
4. **Remove glove box (See page NS-33)**
5. **Remove front right foot duct assembly**



(a) Remove bolt -1- and front right foot duct I -A-.

6. **Remove rear end plate assembly (See page NS-49)**
7. **Remove rear part of rear cooling air duct assembly**

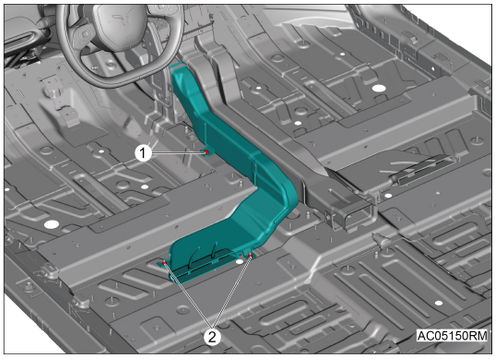
RE



(a) Remove the screw -1-.

RE

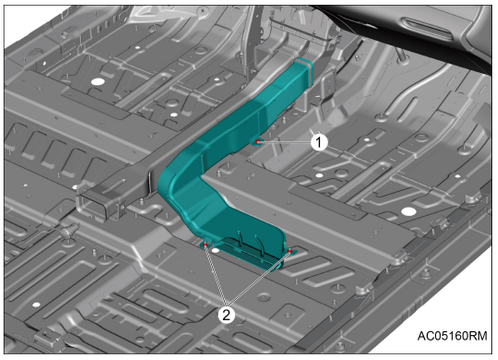
8. **Remove front seat assembly (See page NS-67)**
9. **Remove rear seat assembly (See page NS-92)**
10. **Remove auxiliary fascia console assembly (See page NS-49)**
11. **Remove carpet assembly (See page NS-162)**
12. **Remove rear left foot duct**



(a) Remove the bolt -1-.

(b) Remove the nut -2-.

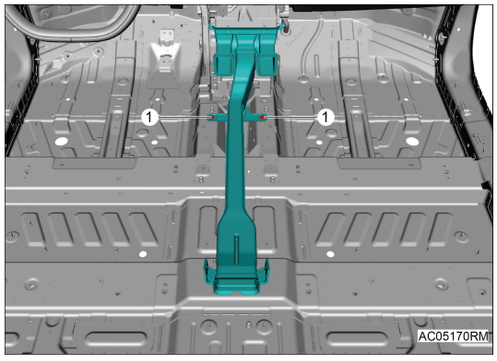
13. **Remove rear right foot duct**



(a) Remove the bolt -1-.

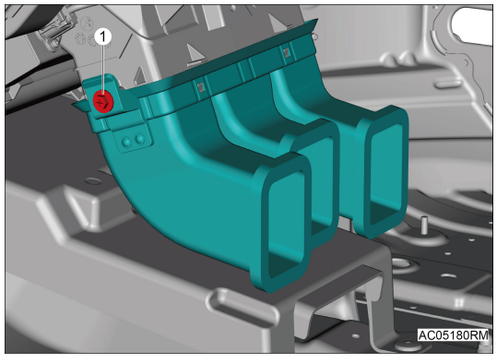
(b) Remove the nut -2-.

14. **Remove front part of rear cooling air duct assembly**

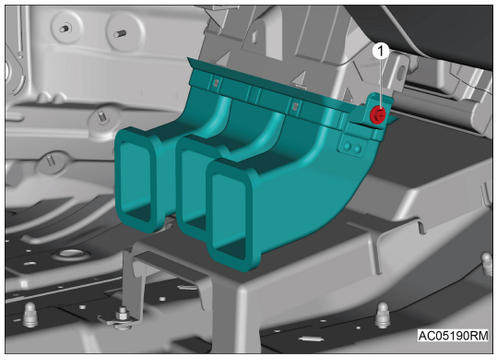


(a) Remove the bolt -1-.

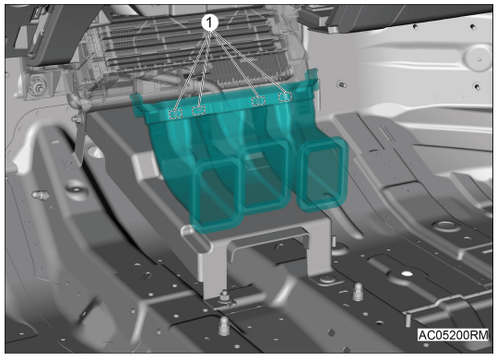
15. Remove front part of rear foot duct assembly



(a) Remove the left screw -1-.



(b) Remove the right screw -1-.

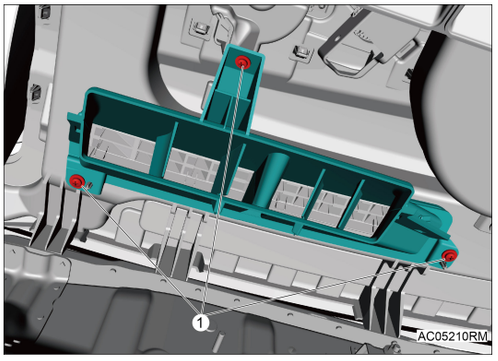


(c) Detach the claw -1-.

(d) Remove the front part of rear cooling air duct assembly.

16. Remove instrument panel assembly (See page NS-40)

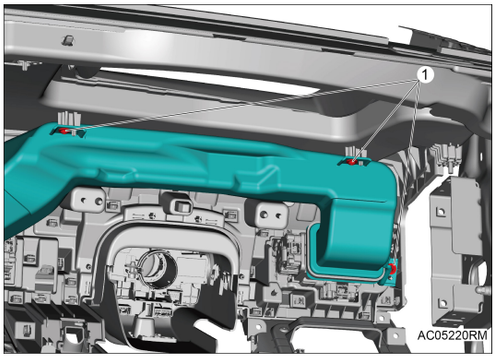
17. Remove defroster transition duct assembly



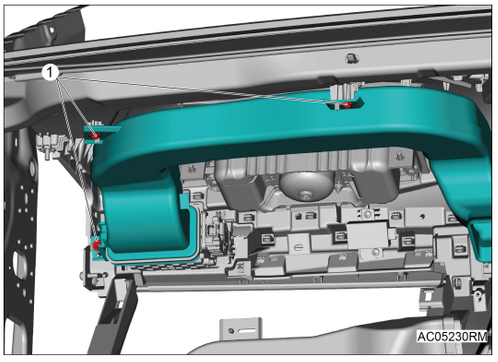
(a) Remove the screw -1-.

RE

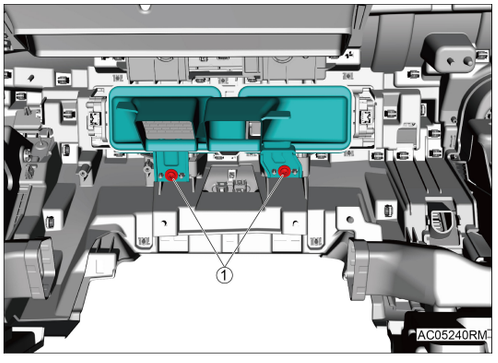
18. Remove instrument panel face air duct assembly



(a) Remove the left face duct screw -1-.



(b) Remove the right face duct screw -1-.



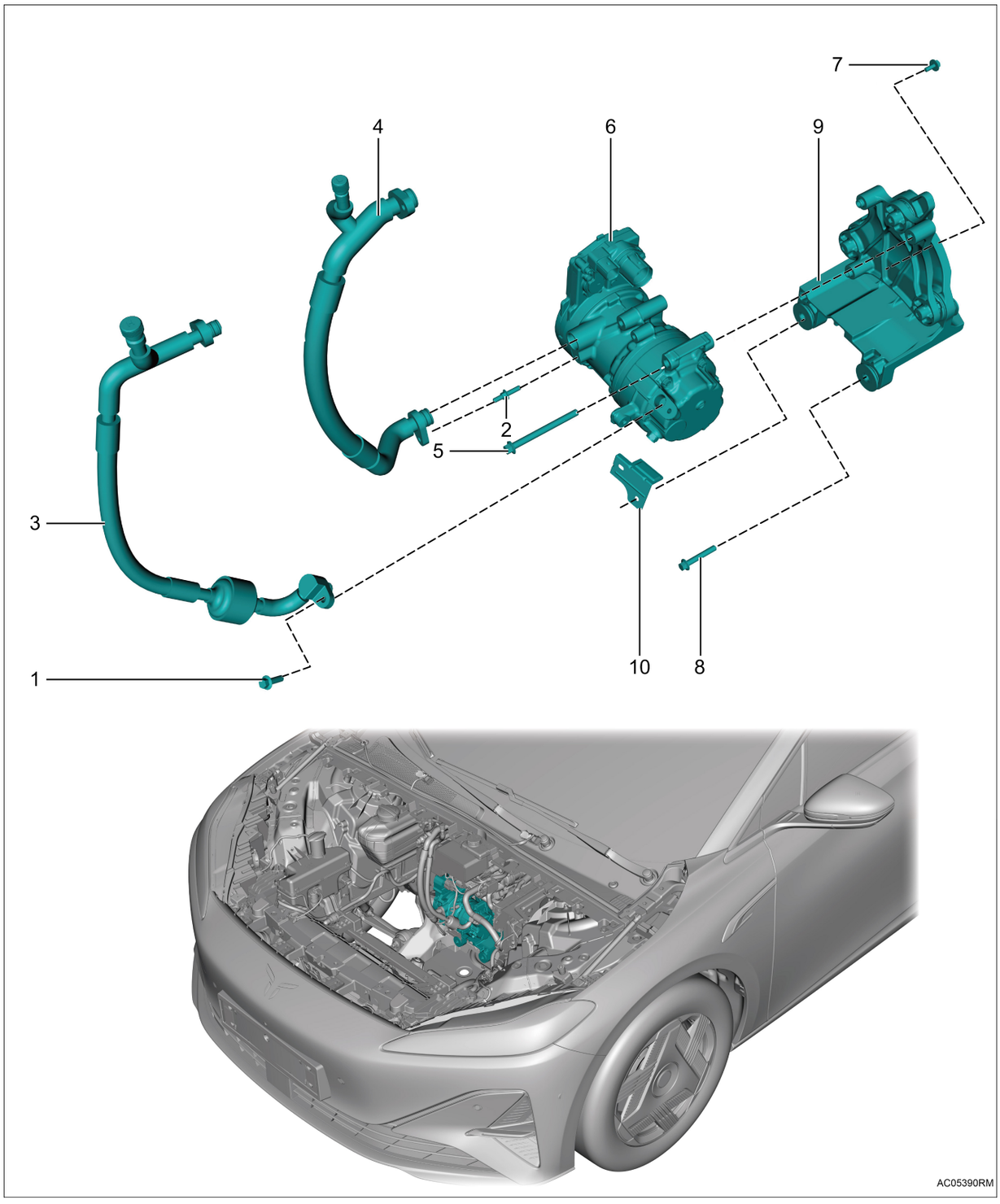
(c) Remove the screw -1- from center face duct.

Installation

1. Installation is in the reverse order of removal.

Compressor assembly

Components



1. Hexagon flange bolt

- Torque: 8 ~ 10 N • m

2. Bolt

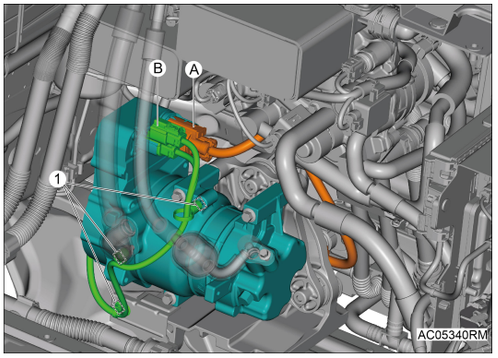
- Torque: 8 ~ 10 N • m

3. **High pressure hose assembly - I**
4. **Low pressure hose line assembly - I**
5. **Hexagon flange bolt**
   - X3
   - Torque: 17 ~ 21 N • m
6. **Compressor assembly**
7. **Bolt**
   - Torque: 8 ~ 10 N • m
8. **Hexagon flange bolt**
   - X3
   - Torque: 17 ~ 21 N • m
9. **Wire harness metal bracket**
10. **Compressor bracket**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

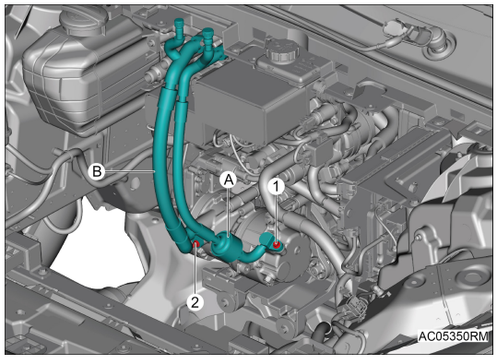
   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Recover refrigerant from refrigerant system (See page RE-1)**
4. **Remove engine bottom protector (See page WS-40)**
5. **Remove front compartment storage box (See page WS-83)**
6. **Remove electric compressor assembly**



   (a) Disengage the wire harness fixing clip -1-.

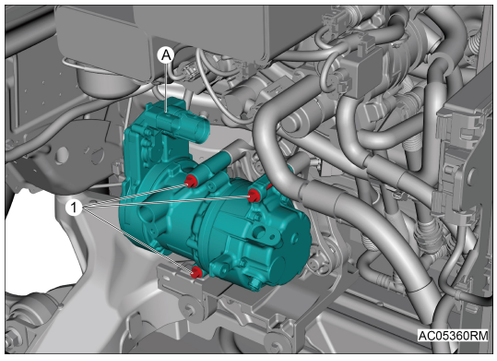
   (b) Disconnect high voltage wire harness connectors -A- and low voltage wire harness connector -B-.

   Caution:
   - **After disconnection, wrap the connector port with high voltage insulating tape to prevent electric leakage.**



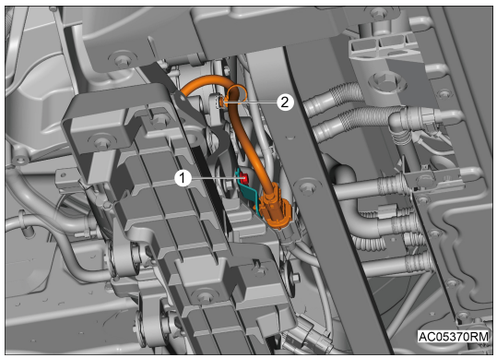
(c) Remove the bolts -1-2-.

(d) Disconnect high pressure hose assembly -I-B- and low pressure hose line assembly -I-A-.



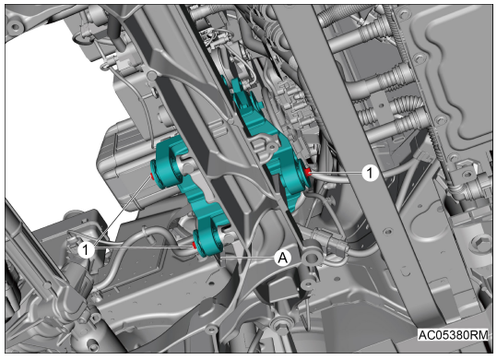
(e) Remove bolt -1- and compressor assembly -A-.

7. Remove compressor bracket assembly



(a) Remove the bolt -1-.

(b) Detach the wire harness clip -2-.



(c) Remove the bolt -1-.

(d) Remove the wire harness metal bracket -A-.

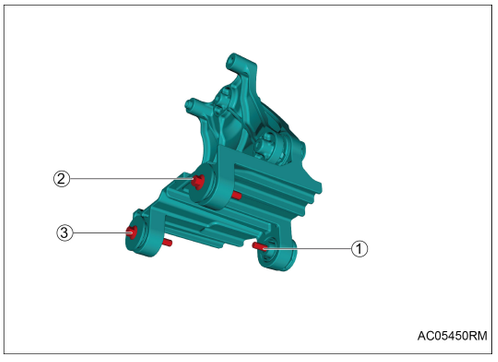
Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

Notice:

- **Fully apply compressor oil to the new O-ring assembly surface.**

2. Install compressor bracket assembly



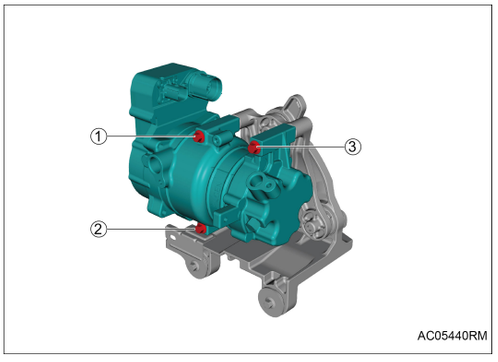
(a) Install the compressor bracket assembly with bolts -1-3-.

- Torque: 17 ~ 21 N • m

Notice:

- **When assembling the compressor bracket assembly, pre-tighten bolt -1- first, and then tighten bolts in the order of -2-3-1-.**

3. Install compressor assembly



(a) Install the compressor assembly with bolts -4-6-.

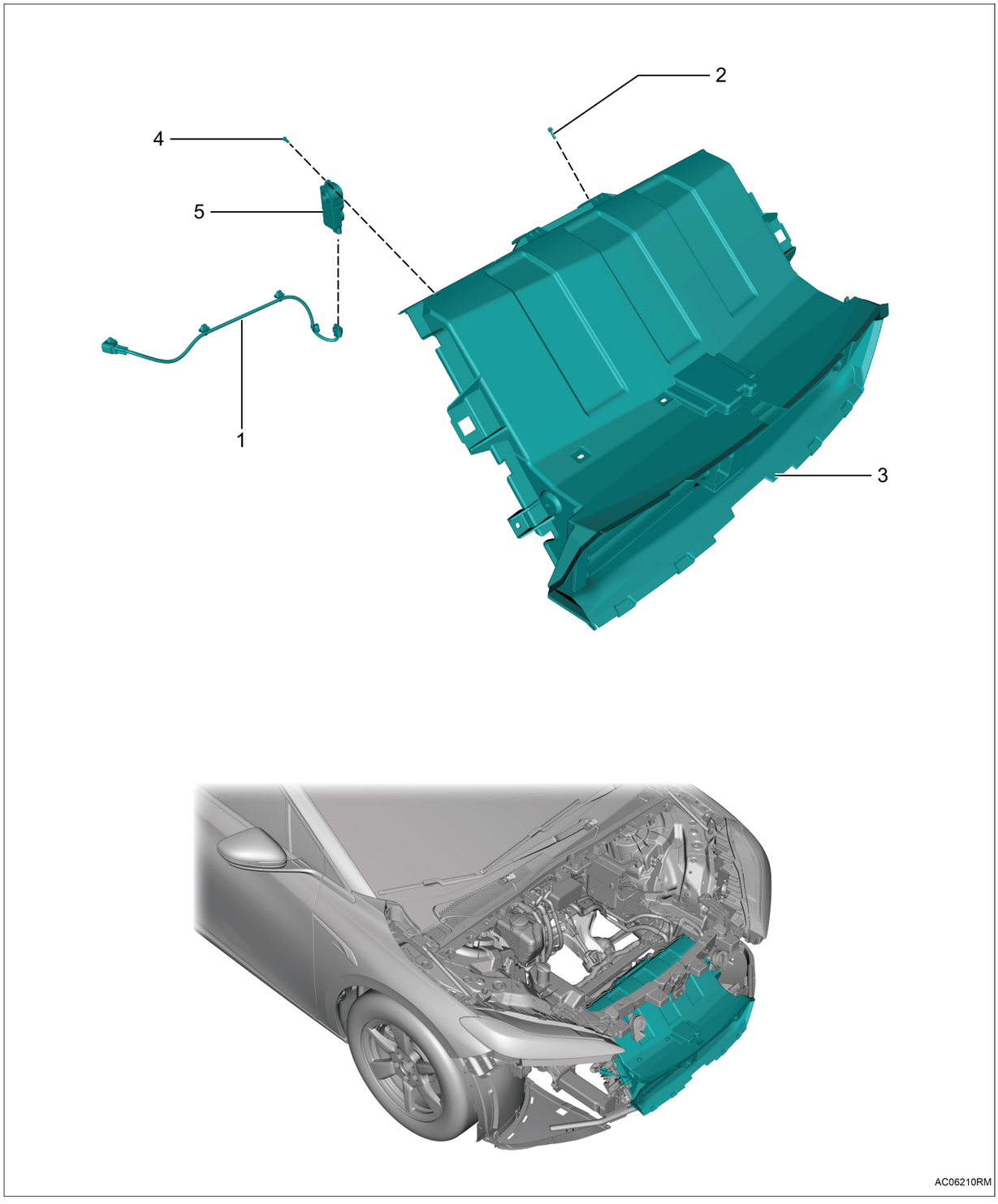
- Torque: 17 ~ 21 N • m

Notice:

- **When assembling the compressor assembly, pre-tighten bolt -1- first, and then tighten bolts in the order of -2-3-1-.**

Active intake grille assembly

Components

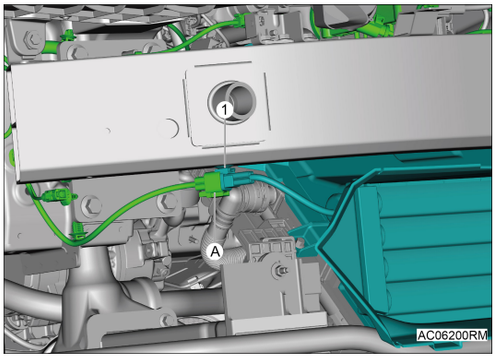


1. **Active grille front wire harness assembly**
2. **Hexagon flange bolt**
   - X4
   - Torque: 6 ~ 8 N • m

3. **Active intake grille body assembly**
4. **Screw**
5. **Active intake grille control motor**

Removal

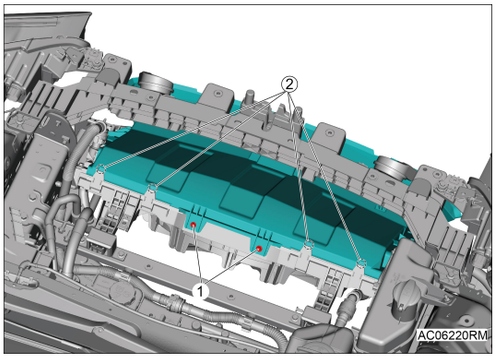
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove active intake grille body assembly**



(a) Disconnect the wire harness connector -A-.

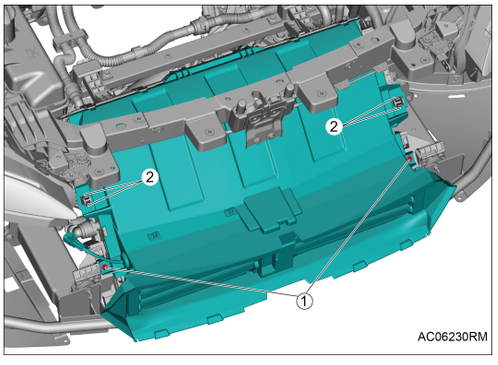
(b) Disengage the wire harness fixing clip -1-.

(c) Remove front bumper crossmember assembly (See page WS-20)



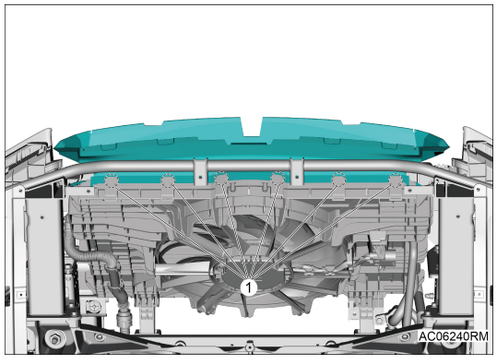
(d) Remove the bolt -1-.

(e) Detach the claw -2-.



(f) Remove the bolt -1-.

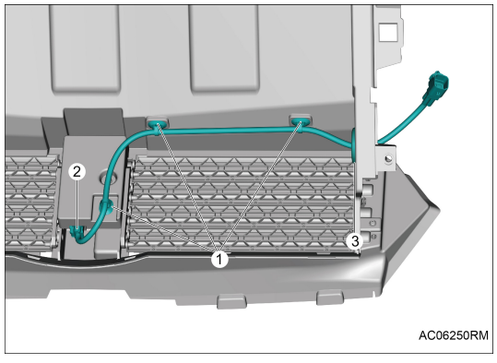
(g) Detach the claw -2-.



(h) Detach the claw -1-.

(i) Remove the active intake grille body assembly.

4. Remove front grille wire harness assembly

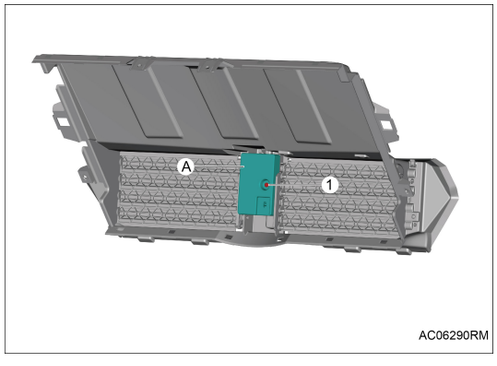


(a) Disengage the wire harness fixing clip -1-.

(b) Disconnect the wire harness connector -2-.

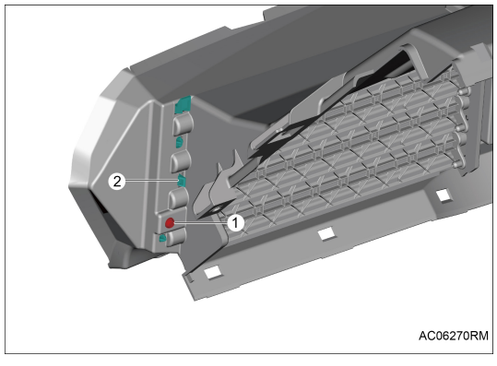
(c) Disengage the wire harness fixture -3-.

5. Remove active intake grille control motor



(a) Remove the screw -1-.

(b) Remove the active intake grille control motor cover -A-.

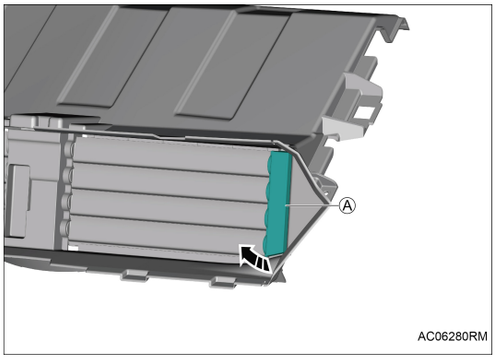


(c) Remove the screw -1-.

(d) Detach the claw -2-.

Note:

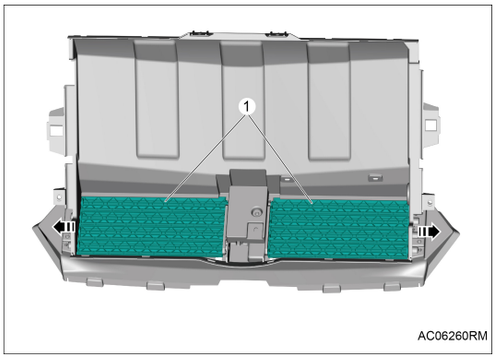
- Use same removal order for right side.



(e) Rotate in the direction of -arrow- to remove grille pressure plate -A-.

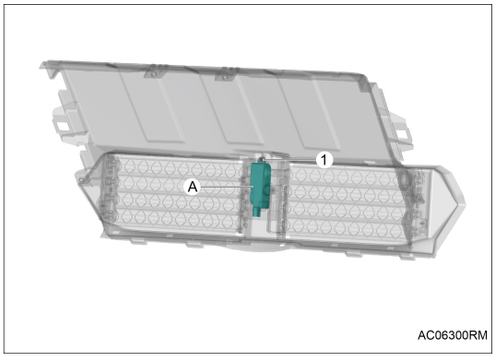
Note:

- Use same removal order for right side.



(f) Slowly and manually rotate the griller blade -1-.

(g) Remove grille blade in direction of -arrow-.



(h) Remove the screw -1-.

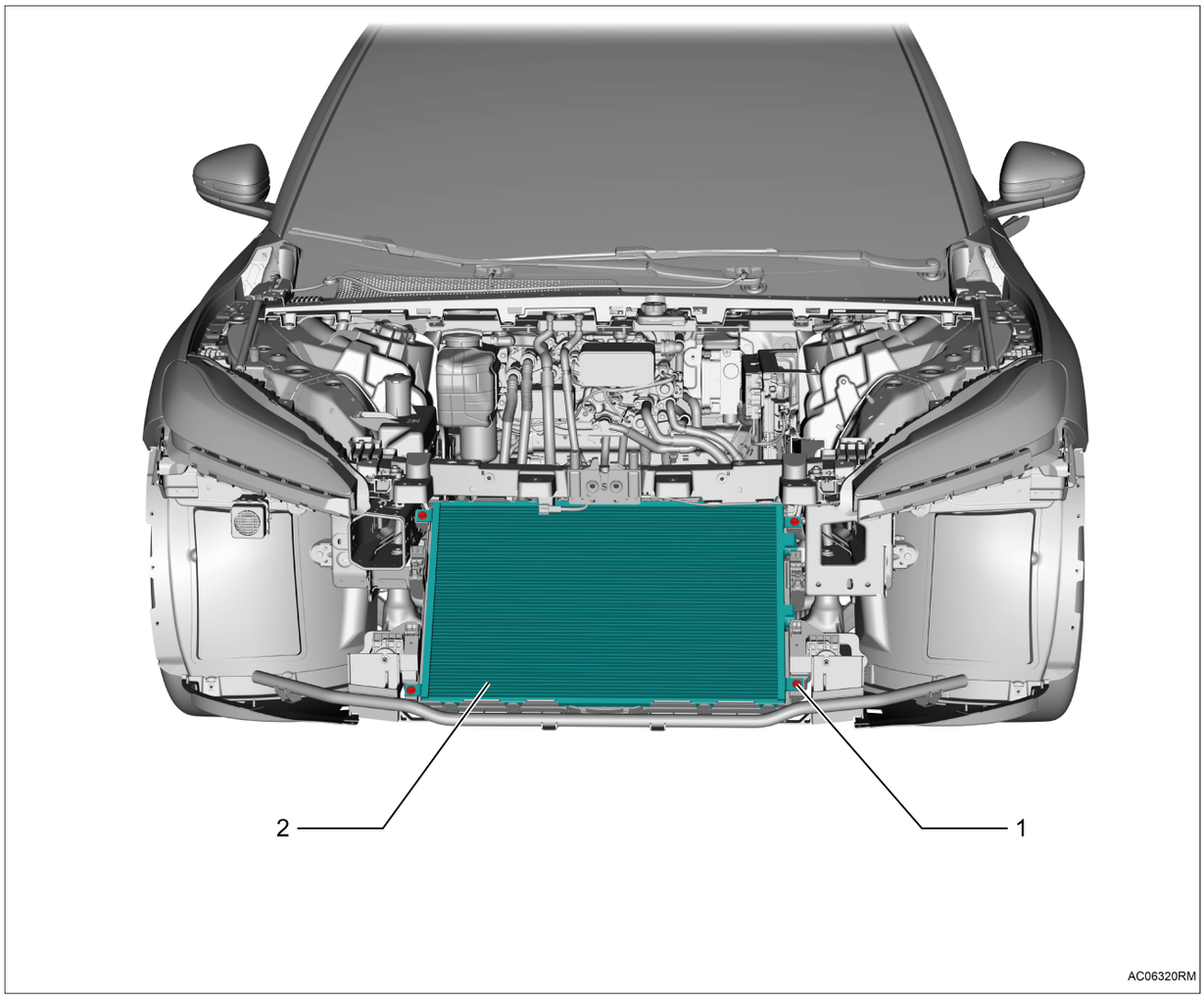
(i) Remove the active intake grille control motor -A-.

Installation

1. **Installation is in the reverse order of removal.**

A/C condenser assembly

Components



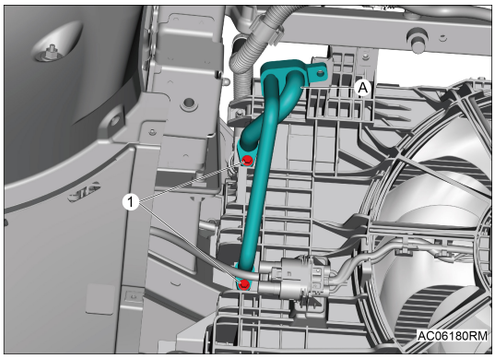
1. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Condenser assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

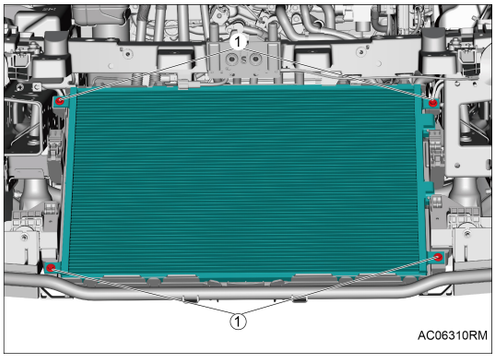
   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**

3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove front bumper crossmember assembly (See page WS-20)**
6. **Remove active intake grille assembly (See page RE-57)**
7. **Remove radiator assembly (See page RE-79)**
8. **Remove condenser assembly**



(a) Remove the bolt -1-.

(b) Detach the high pressure aluminum pipe assembly - condenser -A-.



(c) Remove the bolt -1-.

(d) Remove the condenser assembly.

Installation

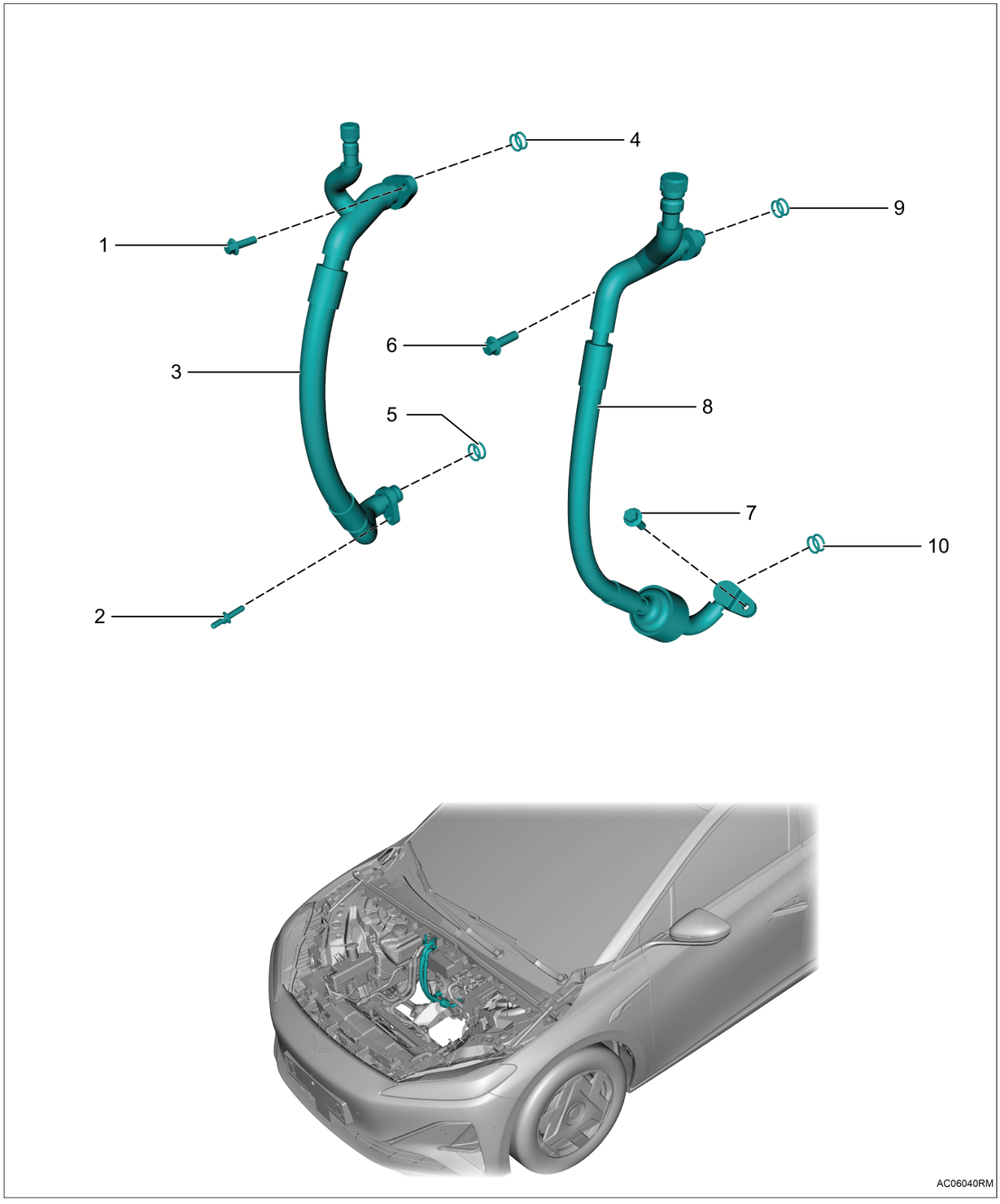
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **Fully apply compressor oil to the new O-ring assembly surface.**

A/C high and low pressure hose assembly - I

Components



1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
2. **Shaft shoulder stud**

- Torque: 8 ~ 10 N • m

3. **Low pressure hose assembly - I**
4. **O-ring V**
5. **O-ring VI**
6. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
7. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
8. **High pressure hose assembly - I**
9. **O-ring**
10. **O-ring II**

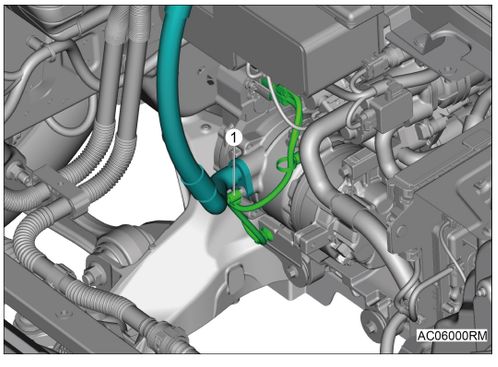
Removal

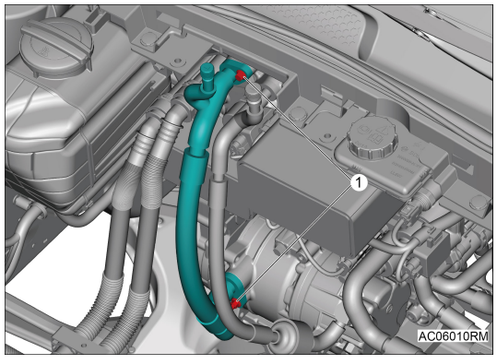
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:

   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Recover refrigerant from refrigerant system (See page RE-1)**
4. **Remove front compartment storage box assembly (See page WS-83)**
5. **Remove low pressure hose assembly - I**

   (a) Disengage the wire harness fixing clip -1-.

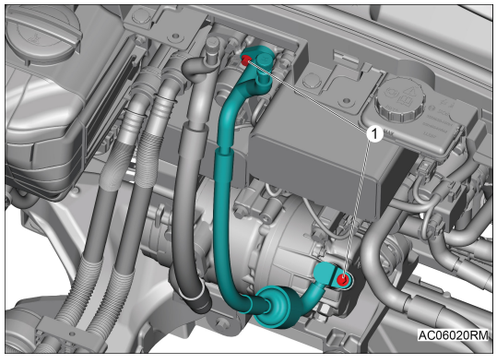




(b) Remove the bolt -1-.

(c) Remove the low pressure hose assembly - I.

6. Remove high pressure hose assembly - I



(a) Remove the bolt -1-.

(b) Remove the high pressure hose assembly - I.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:

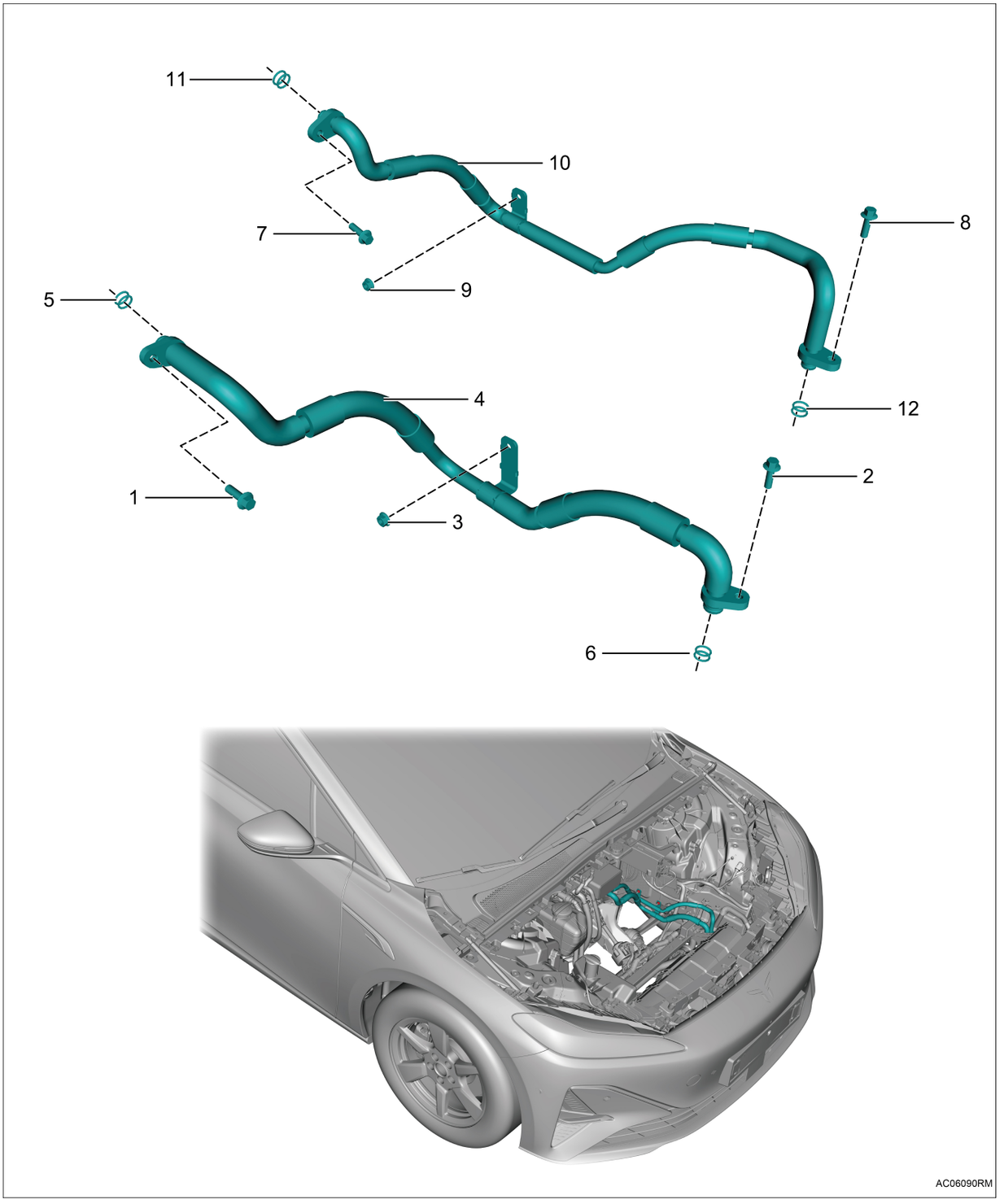
Notice:

- **Fully apply compressor oil to the new O-ring assembly surface.**

RE

A/C high and low pressure hose assembly - II

Components



1. Hexagon flange bolt

- Torque: 8 ~ 10 N • m

2. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
3. **Hexagon flange nut**
   - Torque: 8 ~ 10 N • m
4. **Low pressure hose assembly - II**
5. **O-ring IV**
6. **O-ring IV**
7. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
8. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
9. **Hexagon flange nut**
   - Torque: 8 ~ 10 N • m
10. **High pressure hose assembly - II**
11. **O-ring II**
12. **O-ring II**

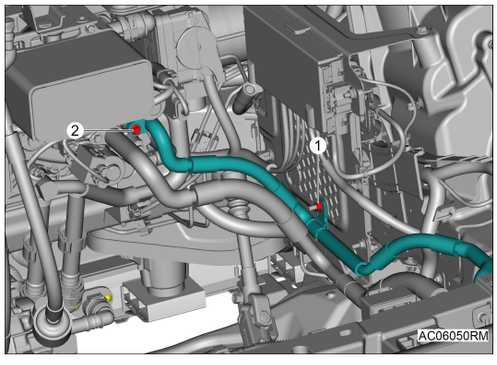
Removal

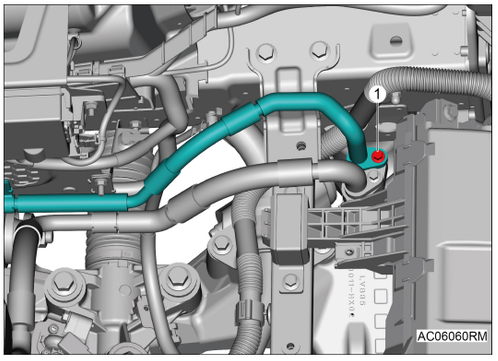
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Recover refrigerant from refrigerant system (See page RE-1)**
4. **Remove front compartment storage box assembly (See page WS-83)**
5. **Remove high pressure hose assembly - II**

   (a) Remove the nut -1-.

   (b) Remove the bolt -2-.



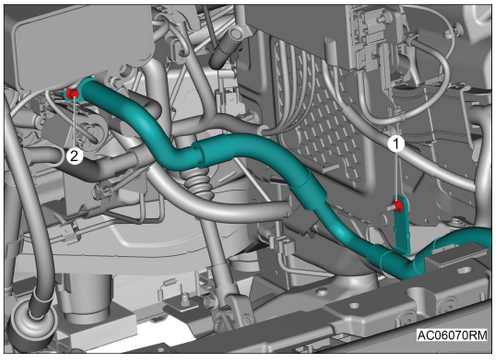


(c) Remove the bolt -1-.

(d) Remove the high pressure hose assembly - II.

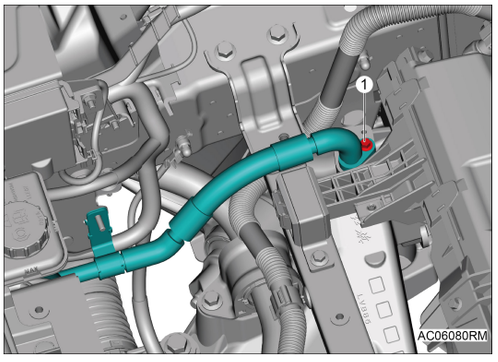
RE

6. Remove low pressure hose assembly - II



(a) Remove the nut -1-.

(b) Remove the bolt -2-.



(c) Remove the bolt -1-.

(d) Remove the low pressure hose assembly - II.

Installation

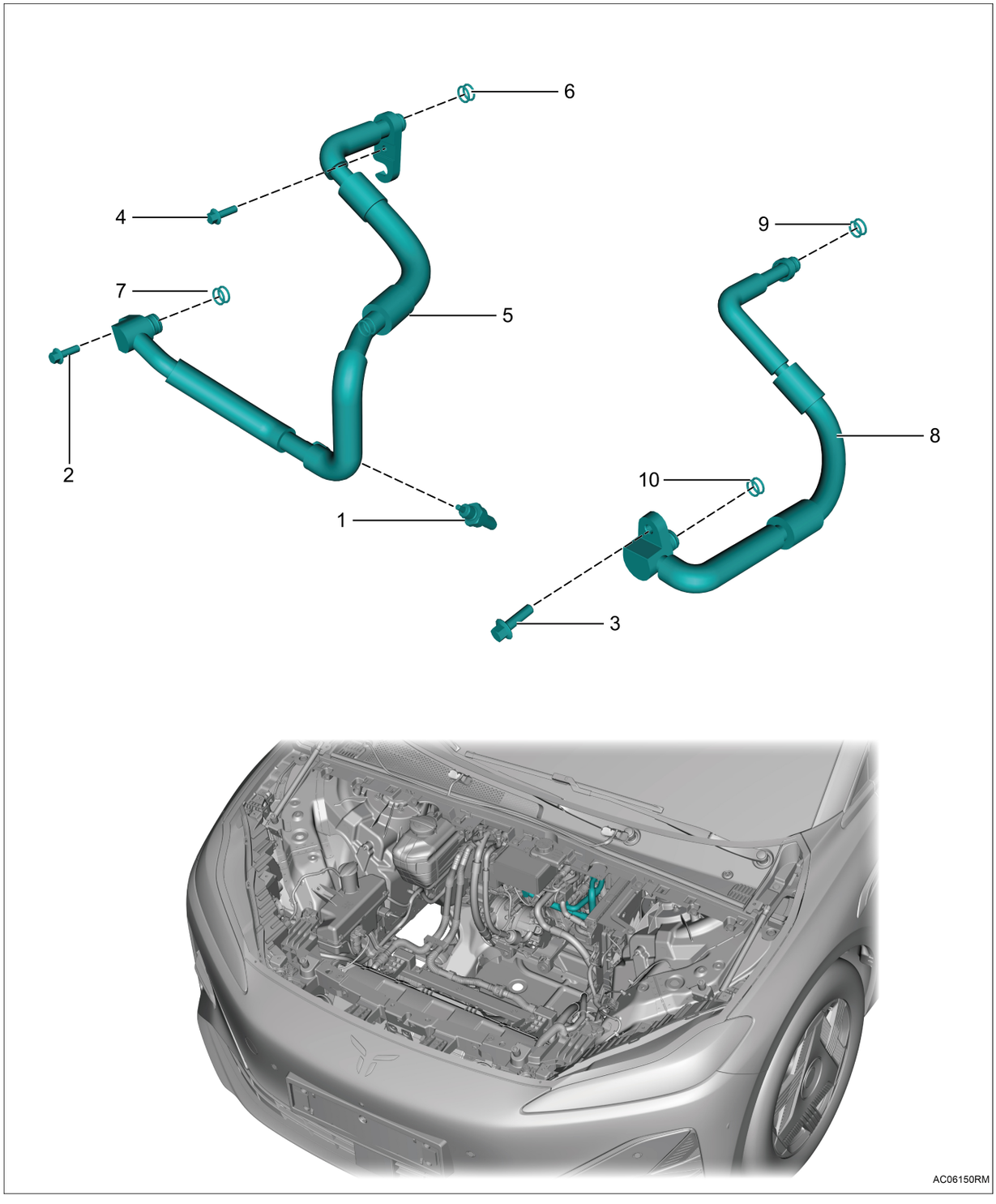
1. Installation is in the reverse order of removal, and pay attention to the followings:

Notice:

- **Fully apply compressor oil to the new O-ring assembly surface.**

A/C high and low pressure hose assembly - III

Components



1. **Refrigerant temperature sensor assembly**
2. **Hexagon flange bolt**

- Torque: 8 ~ 10 N • m

3. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
4. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
5. **Low pressure hose assembly - III**
6. **O-ring IV**
7. **O-ring IV**
8. **High pressure hose assembly - III**
9. **O-ring II**
10. **O-ring II**

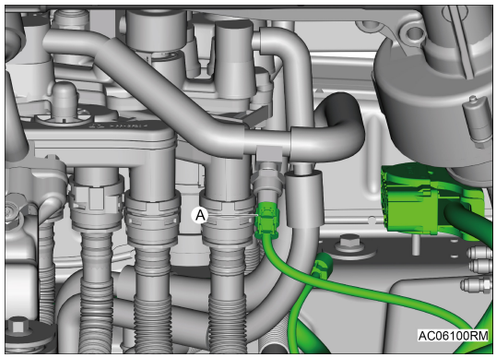
Removal

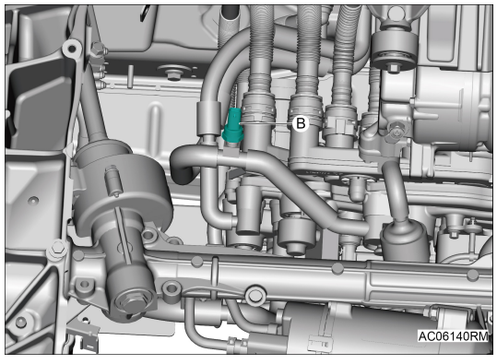
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:

   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Recover refrigerant from refrigerant system (See page RE-1)**
4. **Remove engine bottom protector assembly (See page WS-40)**
5. **Remove refrigerant temperature sensor assembly**

   (a) Disconnect the wire harness connector -A-.



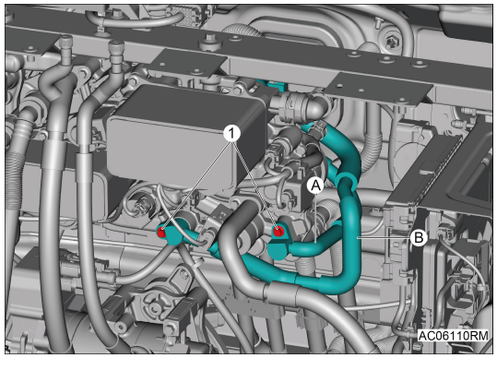


(b) Rotate and remove the refrigerant temperature sensor assembly -B-.

6. **Remove front compartment storage box assembly (See page WS-83)**
7. **Remove water channel cover plate assembly (See page WS-86)**
8. **Remove wiper fixing bracket I assembly (See page WS-62)**
9. **Remove separated fluid reservoir assembly (See page DP-31)**

   Note:

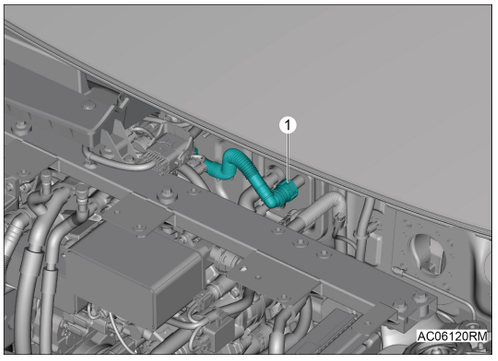
   - It is not required to disconnect the reservoir connecting hose, and set the separated fluid reservoir assembly aside.
10. **Remove front shock absorber support seat lateral stabilizer bar (See page DP-73)**
11. **Remove high pressure hose assembly - II (See page RE-66)**
12. **Remove high and low pressure hose assembly - III**



(a) Remove the bolt -1-.

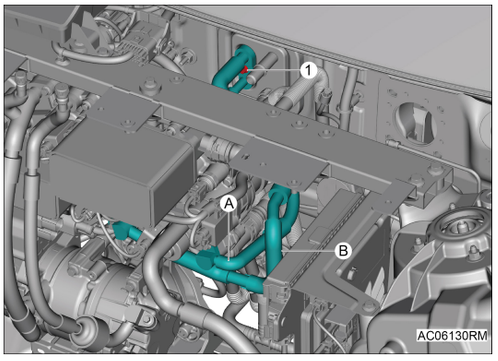
(b) Detach the high pressure hose assembly -III-A-.

(c) Detach the low pressure hose assembly -III-B-.



(d) Disconnect the joint -1-.

(e) Detach the PTC outlet pipe assembly.



(f) Remove the bolt -1-.

(g) Remove the high pressure hose assembly -III-A-.

(h) Remove the low pressure hose assembly -III-B-.

Installation

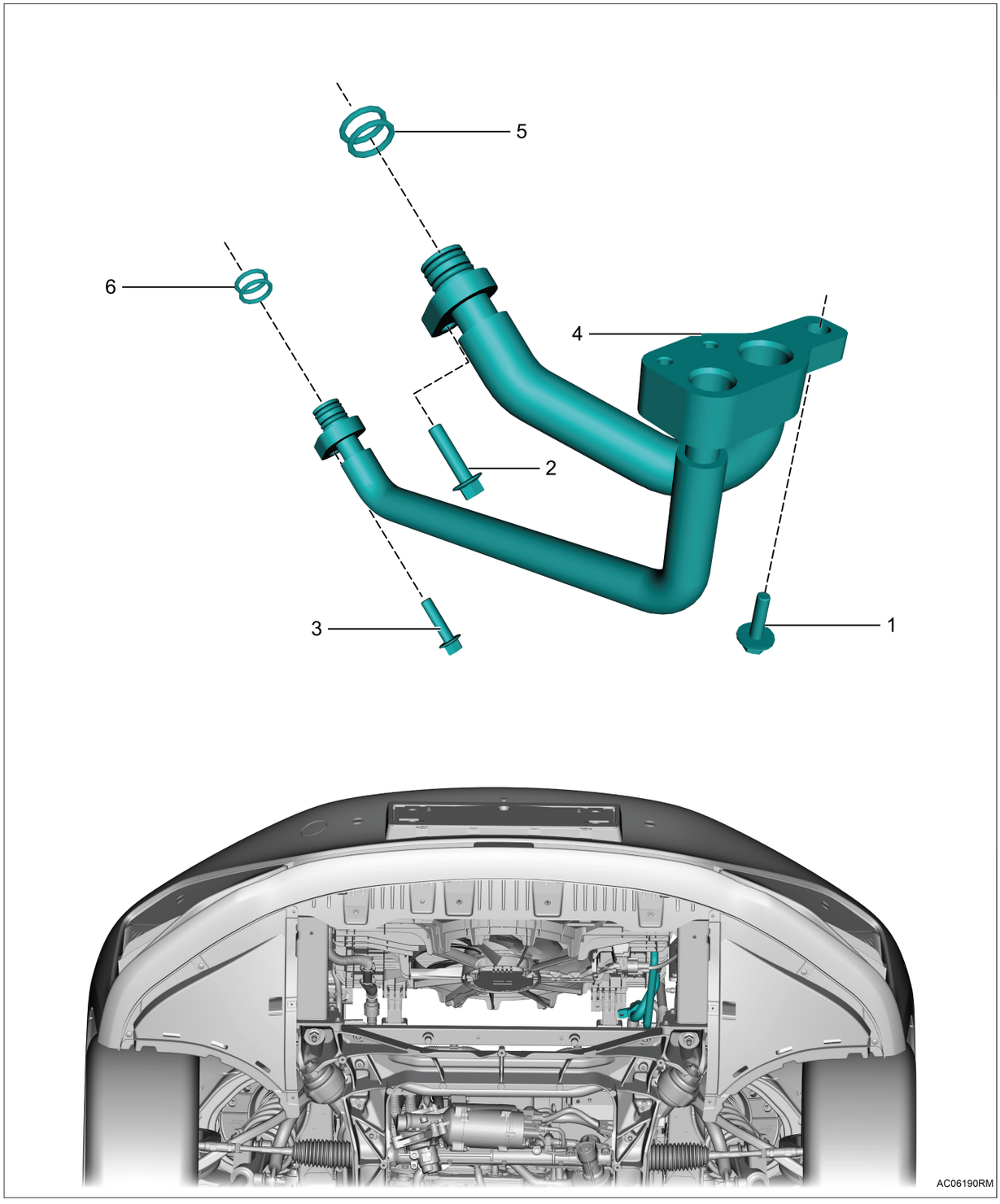
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **Fully apply compressor oil to the new O-ring assembly surface.**

High pressure aluminum pipe assembly - condenser

Components



1. Hexagon flange bolt

- Torque: 8 ~ 10 N • m

2. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
3. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
4. **High pressure aluminum pipe assembly - condenser**
5. **O-ring**
6. **O-ring II**

RE

Removal

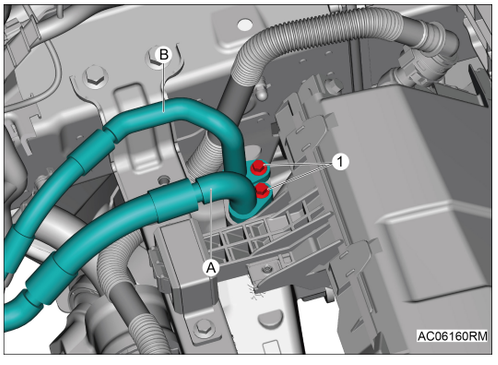
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

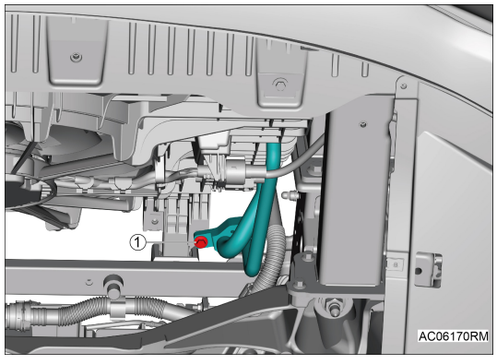
   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Recover refrigerant from refrigerant system (See page RE-1)**
4. **Remove front compartment storage box assembly (See page WS-83)**
5. **Remove engine bottom protector (See page WS-40)**
6. **Remove high pressure aluminum pipe assembly - condenser**

   (a) Remove the bolt -1-.

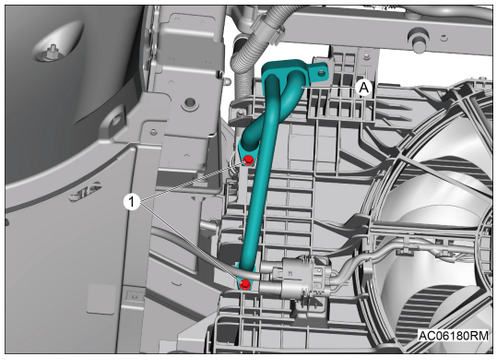
   (b) Detach the low pressure hose assembly -II -A-.

   (c) Detach the high pressure hose assembly -II -B-.





(d) Remove the bolt -1-.



(e) Remove the bolt -1-.

(f) Remove the high pressure aluminum pipe assembly - condenser -A-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **Fully apply compressor oil to the new O-ring assembly surface.**

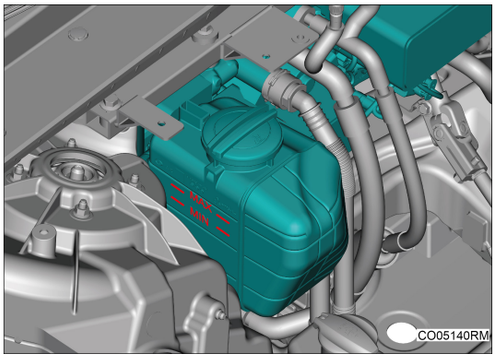
RE

Cooling system

Coolant

On-vehicle inspection

1. **Check coolant for leakage.**
2. **Check coolant level in reservoir**



(a) When engine is cold, the coolant level should be between MAX and MIN lines.

Note:

- If coolant level is below MIN line, check for coolant leakage and add special coolant to MAX line.

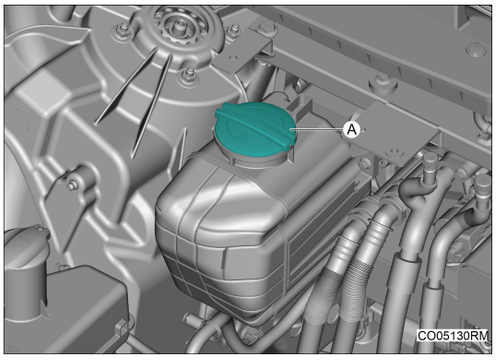
Replacement

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

Caution:

- **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
- **Wear insulation gloves.**

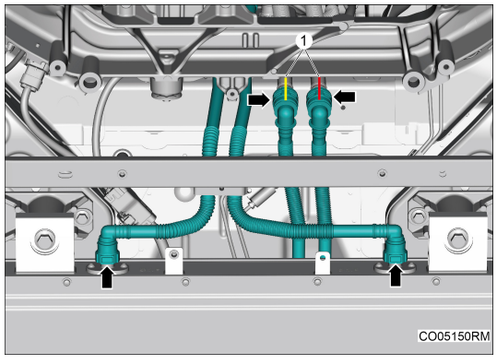
3. **Remove engine bottom protector (See page WS-40)**
4. **Drain coolant**



(a) Remove the expansion tank pressure cap -A-.

Note:

- Do not remove expansion tank pressure cap until it cools down.
- Pressurized hot coolant and steam may flow out and cause serious burns.



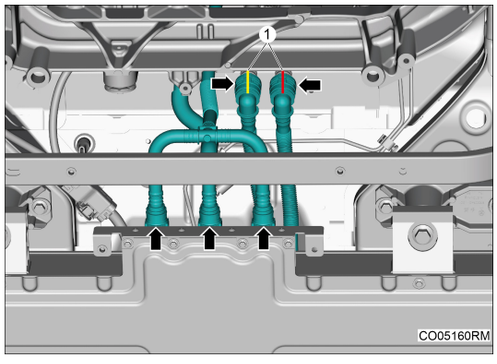
(b) Detach the water pipe connectors -arrow- at the lowest point of the vehicle, use an air pump to inflate into the pipe and drain the coolant. (Only for models with 62 kWh battery)

Notice:

- **Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1- in the figure.**

Note:

- Collect coolant into a container and dispose of it according to regulations in your area.



(c) Detach the water pipe connectors -arrow- at the lowest point of the vehicle, use an air pump to inflate into the pipe and drain the coolant. (Only for models with 85 kWh battery)

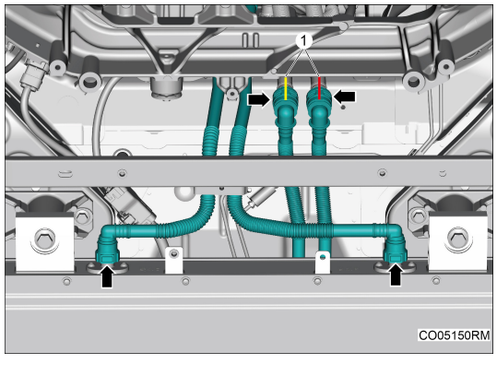
Notice:

- **Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1- in the figure.**

Note:

- Collect coolant into a container and dispose of it according to regulations in your area.

5. **Reset service switch (See page DL-17)**
6. **Connect negative battery terminal (See page DL-21)**
7. **Add coolant**

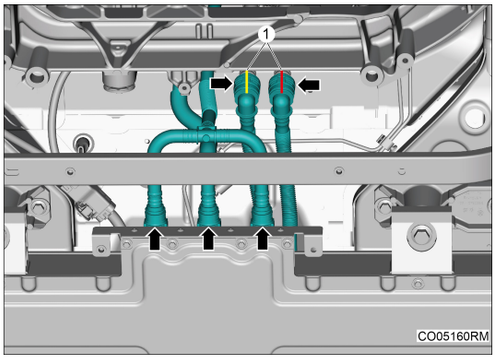


(a) Install the water pipe joint -arrow-. (Only for models with 62 kWh battery)

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1- in the figure.**

RE



RE

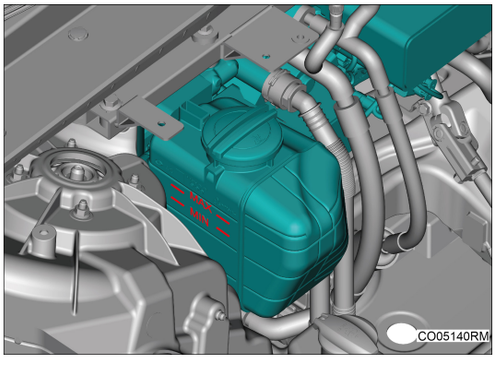
(b) Install the water pipe joint -arrow-. (Only for models with 85 kWh battery)

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1- in the figure.**

(c) Add special coolant to expansion tank filler port.

Applications	Standard capacity	Coolant type
Models with 62 kWh battery (non-optional HAD)	13.2 ± 0.3 L	BASF G30-91 (pink)
Models with 62 kWh battery (optional HAD)	13.5 ± 0.3 L	
Models with 85 kWh battery (non-optional HAD)	13.2 ± 0.3 L	
Models with 85 kWh battery (optional HAD)	13.5 ± 0.3 L	



(d) During repair, the liquid level of expansion tank should be observed in time, and when coolant is below MIN line, it is necessary to refill in time.

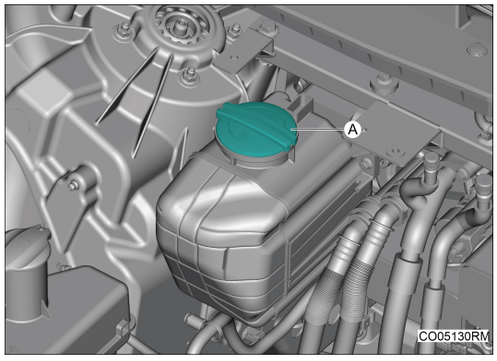
(e) Turn on the ignition switch, connect diagnostic tester HQ-VDS to enter coolant filling mode.

Notice:

- **When filling, do not switch shift lever to D, R, or use A/C.**
- **During entering the filling mode, the vehicle will prompt the coolant overtemperature fault light, which is normal, it indicates that the function has been successfully entered.**
- **After the filling mode ends, the fault light will be canceled.**

(f) After exiting the filling mode, it is necessary to manually add the coolant to the level between MAX and MIN lines.

(g) If the filling mode fails, check the DTC with diagnostic tester.

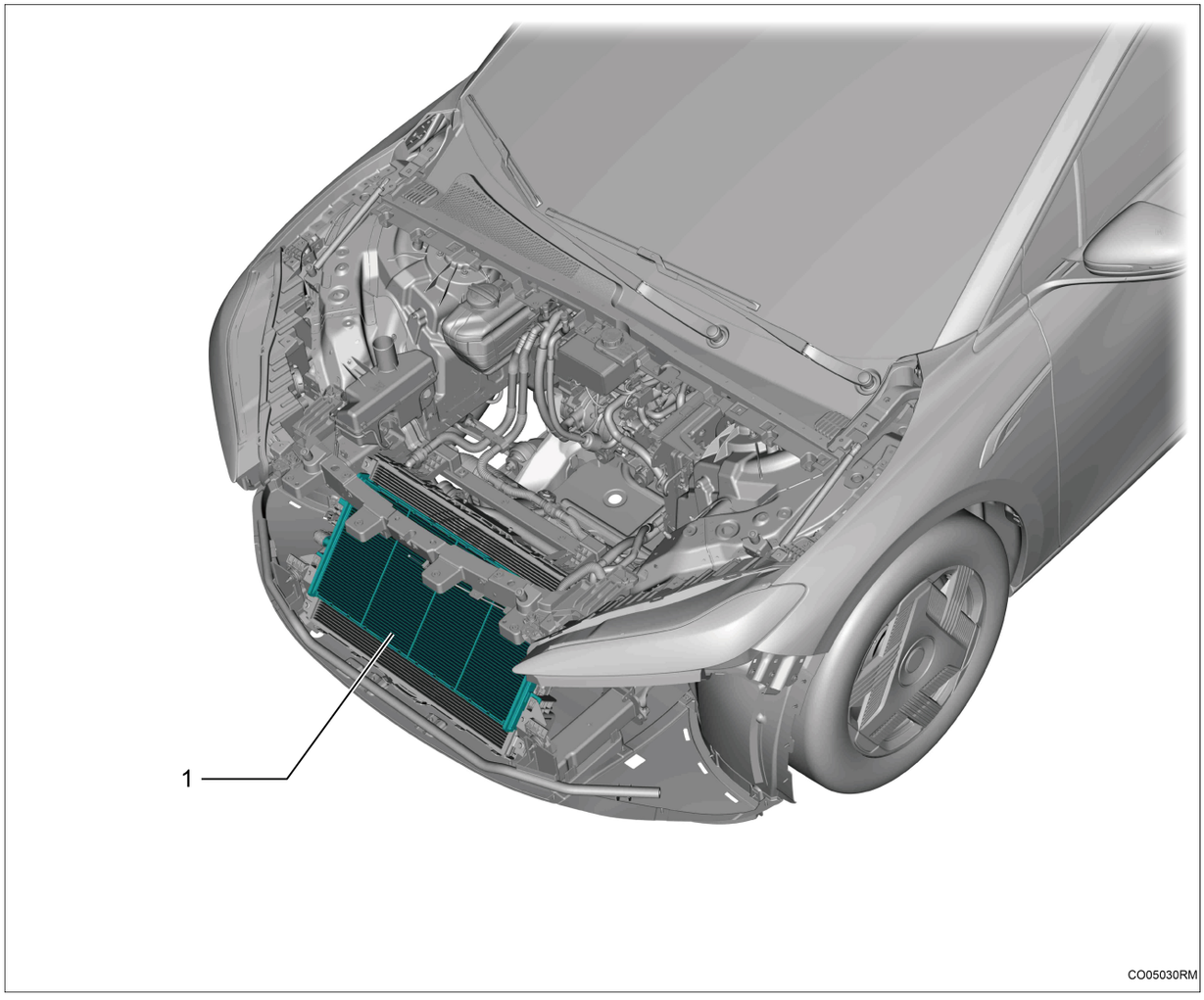


(h) Install the expansion tank pressure cap -A-.

8. **Check coolant for leakage.**
9. **Install engine bottom protector (See page WS-40)**

Radiator assembly

Components

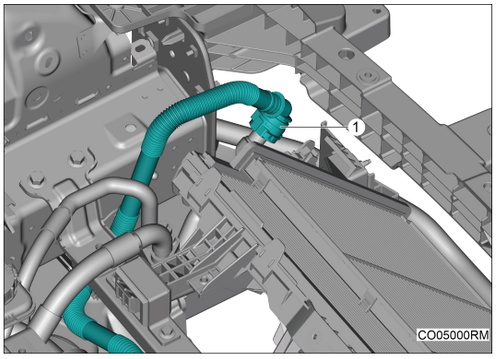


1. **Radiator assembly**

RE

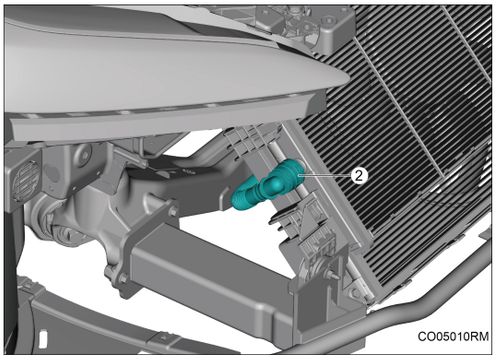
Removal

1. **Remove front bumper assembly (See page WS-1)**
2. **Remove front bumper crossmember assembly (See page WS-20)**
3. **Drain coolant (See page RE-76)**
4. **Remove active intake grille assembly (See page RE-57)**
5. **Remove radiator assembly**



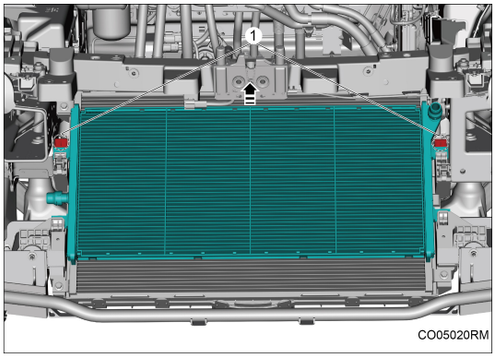
(a) Detach the quick connector -1-.

(b) Disconnect the radiator outlet pipe I assembly.



(c) Detach the quick connector -2-.

(d) Disconnect the radiator inlet pipe I assembly.



(e) Press the claw -1-.

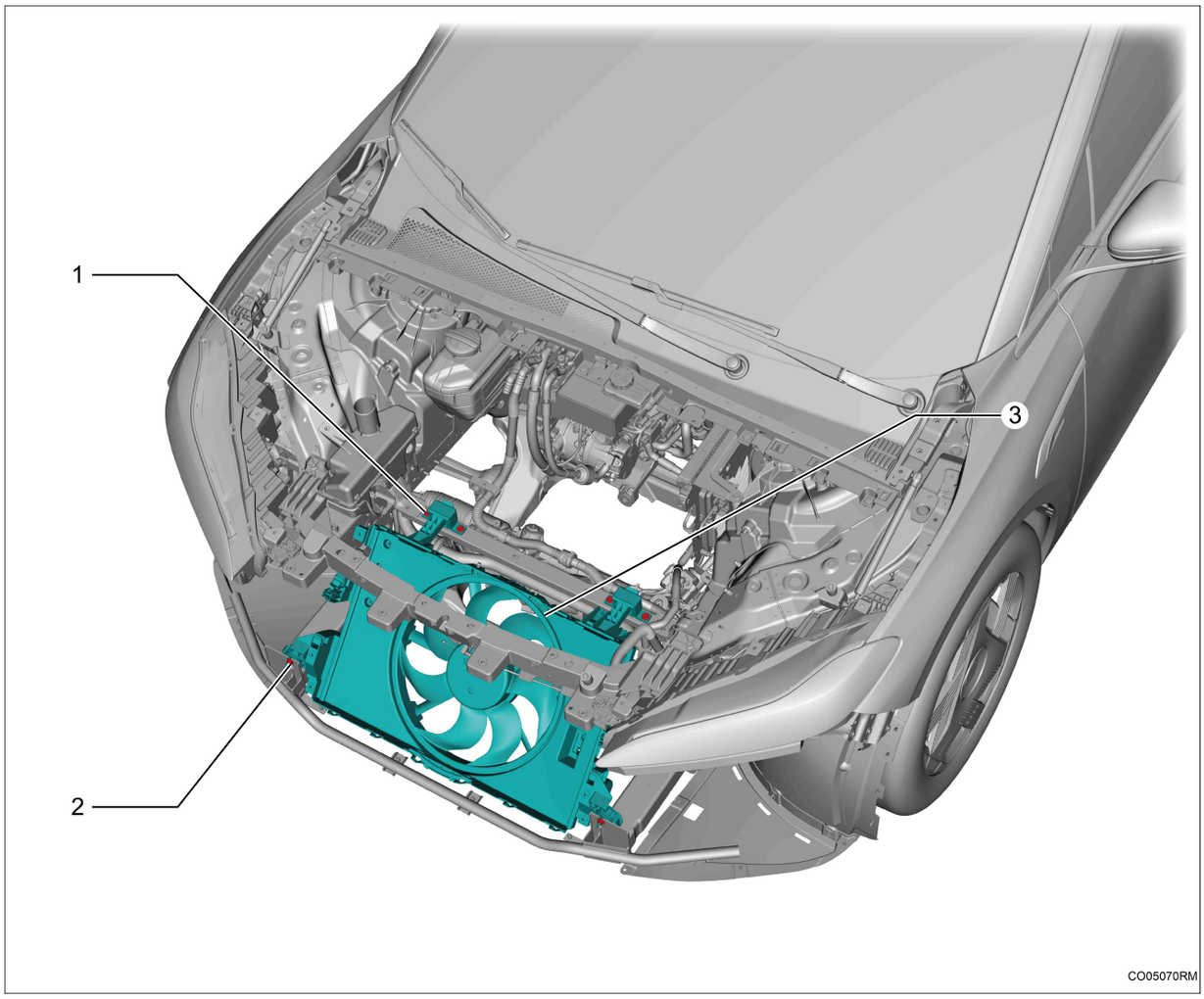
(f) Remove the radiator assembly in the direction of -arrow-.

Installation

1. **Installation is in the reverse order of removal.**

Electric fan assembly

Components



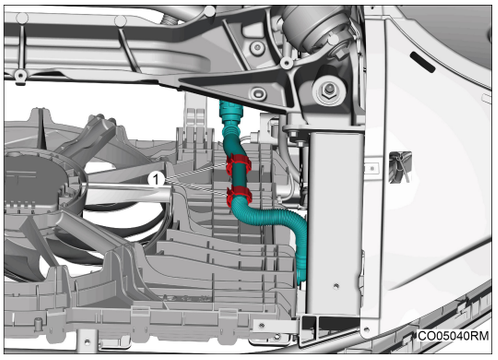
1. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
3. **Electric fan assembly**

Removal

1. **Remove front bumper assembly (See page WS-1)**
2. **Remove front bumper crossmember assembly (See page WS-20)**
3. **Recover refrigerant from refrigerant system (See page RE-1)**

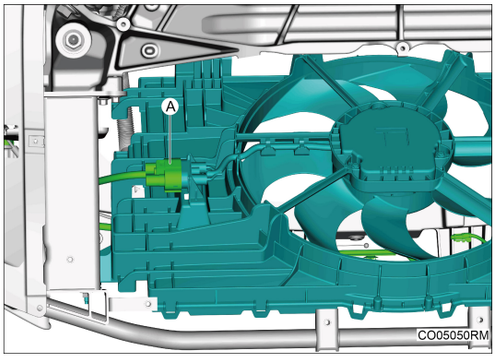
RE

4. **Drain coolant (See page RE-76)**
5. **Remove active intake grille assembly (See page RE-57)**
6. **Remove radiator assembly (See page RE-79)**
7. **Remove high pressure aluminum pipe assembly - condenser (See page RE-73)**
8. **Remove condenser (See page RE-61)**
9. **Remove electric fan assembly**

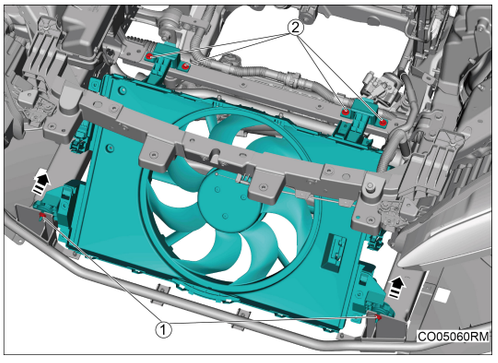


(a) Detach the pipe clamps -1-.

(b) Detach the radiator inlet pipe I assembly.



(c) Disconnect the wire harness connector -A-.



(d) Remove the nut -1-.

(e) Remove the bolt -2-.

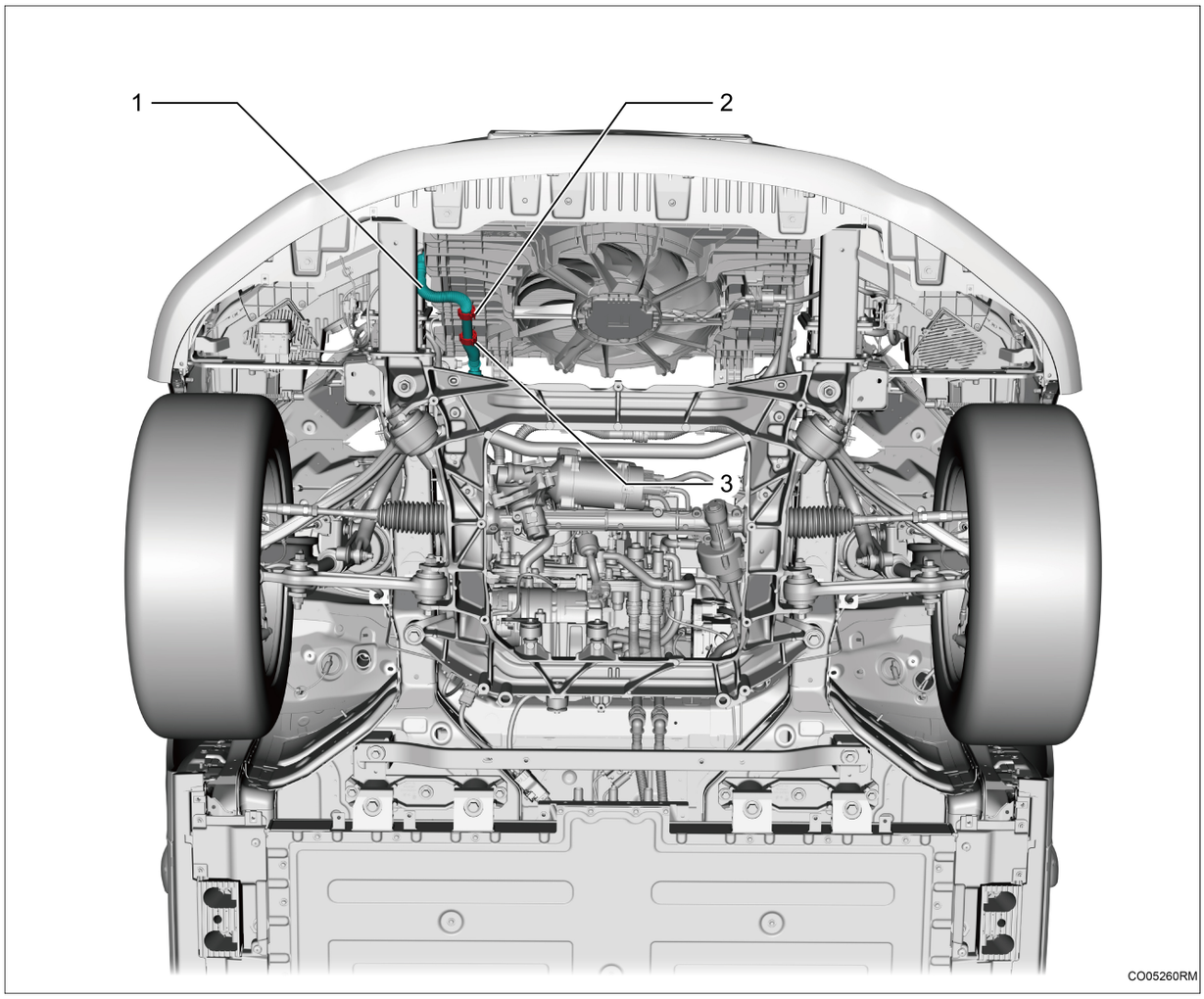
(f) Lift in the direction of -arrow- and remove the electric fan assembly with an appropriate angle.

Installation

1. **Installation is in the reverse order of removal.**

Motor cooling pipe I

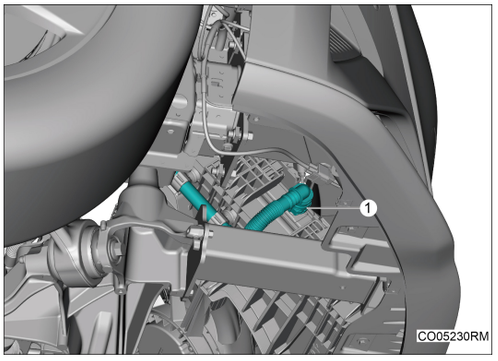
Components



1. **Radiator inlet pipe I**
2. **Pipe clamp - 21 single pipe clamp fixed by clip**
3. **Pipe clamp - 21 single pipe clamp fixed by clip**

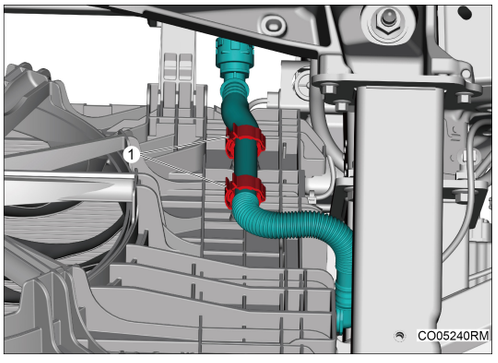
Removal

1. **Remove engine bottom protector (See page WS-40)**
2. **Drain coolant (See page RE-76)**
3. **Remove front compartment storage box assembly (See page WS-83)**
4. **Remove radiator inlet pipe I with pipe clamp assembly**

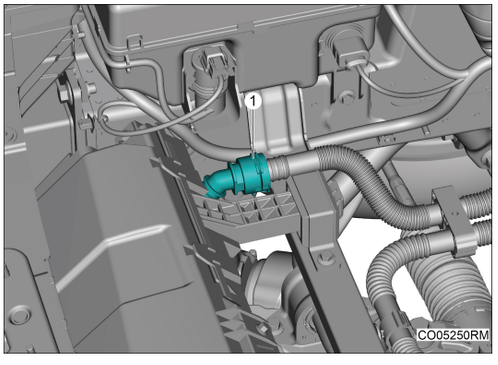


(a) Detach the connector -1-.

(b) Detach the radiator inlet pipe I.



(c) Detach the single pipe clamps fixed by clip -1-.



(d) Detach the connector -1-.

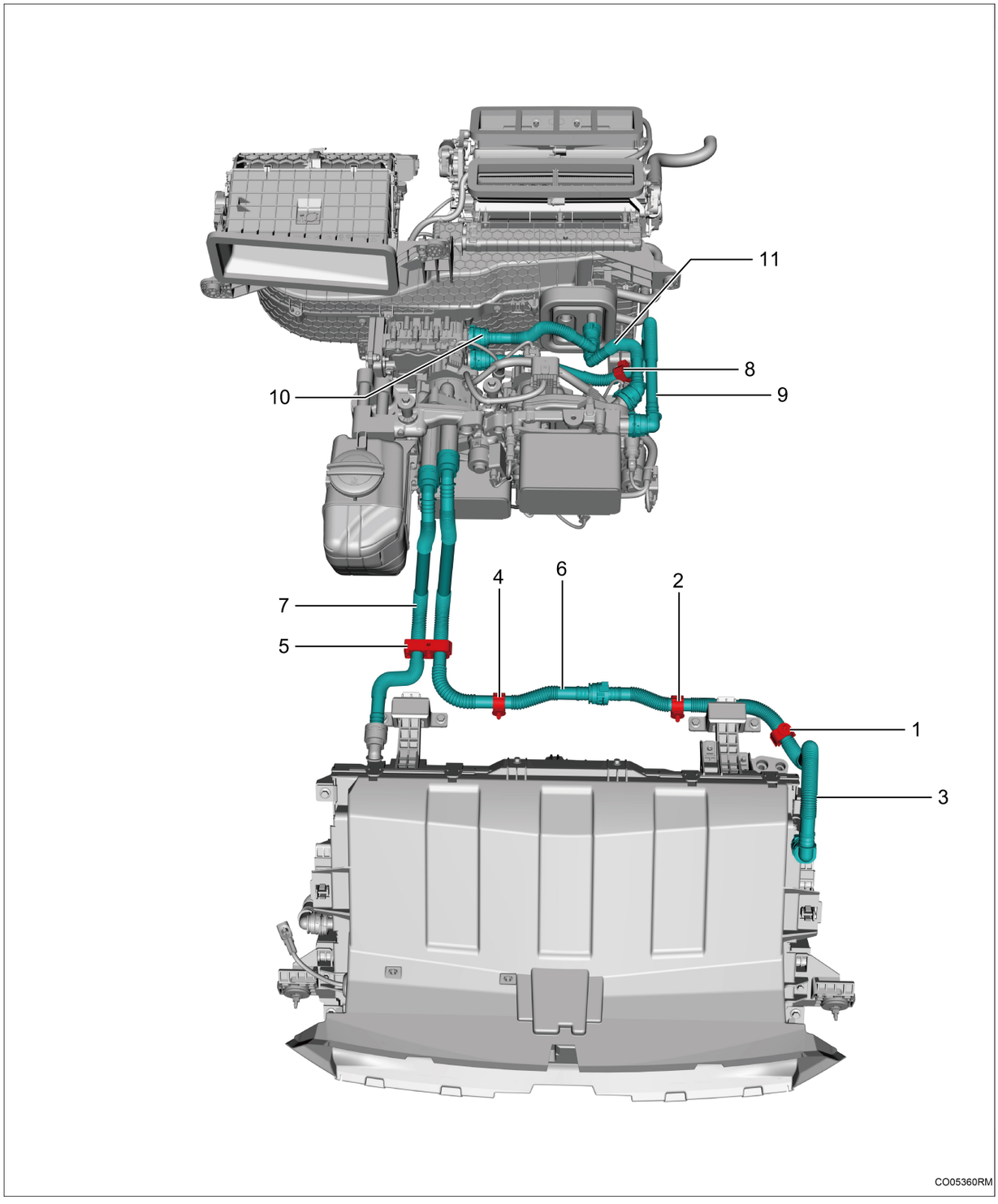
(e) Remove the radiator inlet pipe I.

Installation

1. Installation is in the reverse order of removal.

Motor cooling pipe II

Components



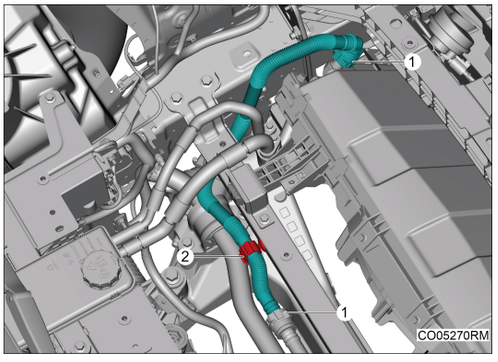
1. **Pipe clamp - 21 single pipe clamp fixed by clip**
2. **Pipe clamp - 21 single pipe clamp fixed by clip**
3. **Radiator outlet pipe I assembly**
4. **Pipe clamp - 21 single pipe clamp fixed by clip**

5. **Pipe clamp - 21 dual pipe clamp fixed by bolt**
6. **Radiator outlet pipe II assembly**
7. **Radiator inlet pipe assembly II**
8. **Pipe clamp - 21 single pipe clamp fixed by clip**
9. **PTC inlet pipe assembly**
10. **PTC outlet pipe assembly**
11. **Heater outlet pipe assembly I**

RE

Removal

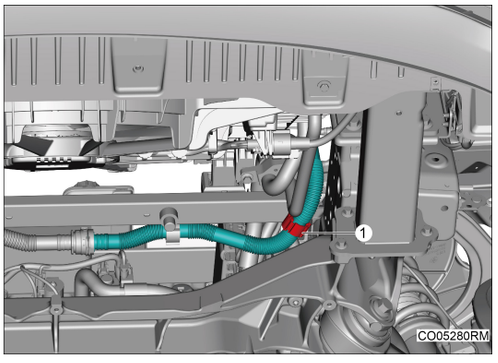
1. **Remove engine bottom protector (See page WS-40)**
2. **Drain coolant (See page RE-76)**
3. **Remove front compartment storage box assembly (See page WS-83)**
4. **Remove radiator outlet pipe I assembly**



(a) Detach the connector -1-.

(b) Disconnect the radiator outlet pipe I assembly.

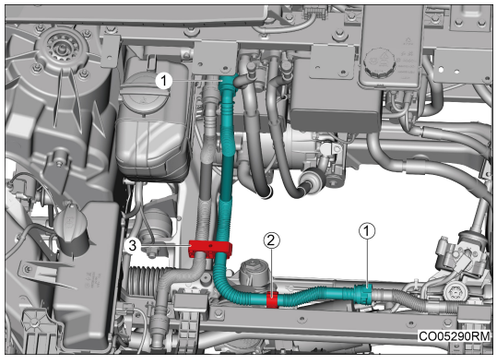
(c) Detach the single pipe clamp fixed by clip -2-.



(d) Detach the single pipe clamps fixed by clip -1-.

(e) Remove the radiator outlet pipe I assembly.

5. **Remove radiator outlet pipe assembly II**



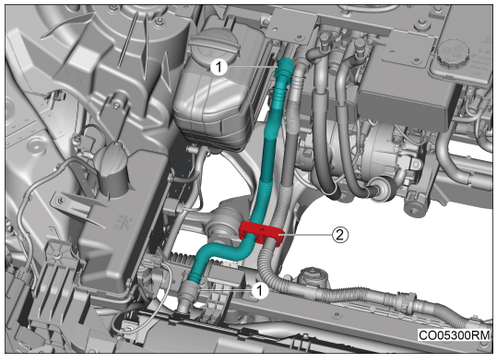
(a) Detach the connector -1-.

(b) Detach the single pipe clamp fixed by clip -2-.

(c) Detach the dual pipe clamp fixed by bolt -3-.

(d) Remove the radiator outlet pipe assembly II.

6. Remove radiator inlet pipe II assembly

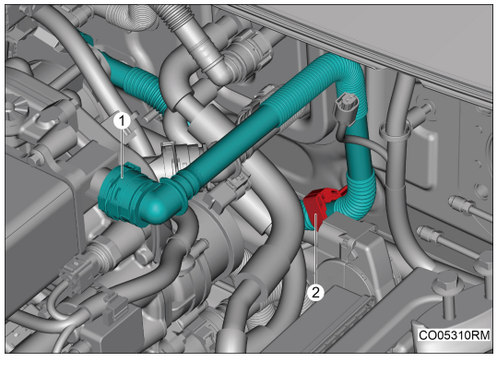


(a) Detach the connector -1-.

(b) Detach the dual pipe clamp fixed by bolt -2-.

(c) Remove the radiator inlet pipe II assembly.

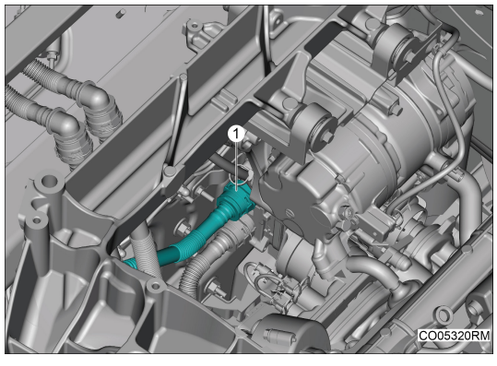
7. Remove PTC inlet pipe with pipe clamp assembly



(a) Detach the connector -1-.

(b) Detach the PTC inlet pipe with pipe clamp assembly.

(c) Detach the single pipe clamp fixed by clip -2-.



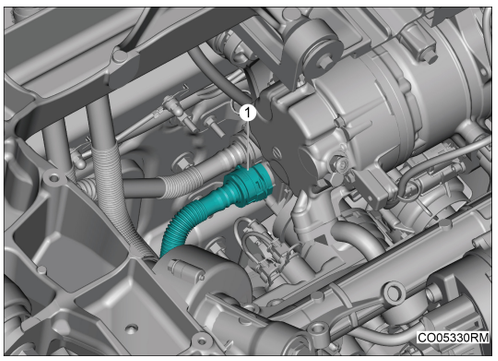
(d) Detach the connector -1-.

(e) Remove the PTC inlet pipe with pipe clamp assembly.

8. Remove water channel cover plate assembly (See page WS-86)

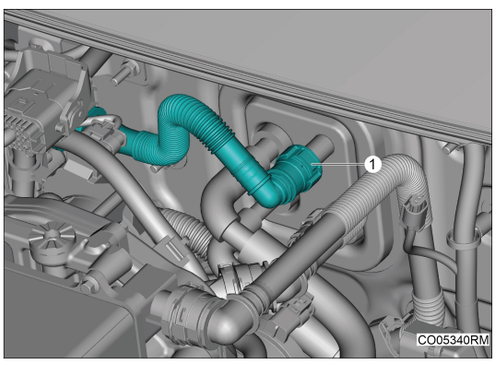
9. Remove front shock absorber longitudinal stabilizer bar (See page DP-73)

10. Remove PTC outlet pipe assembly



(a) Detach the connector -1-.

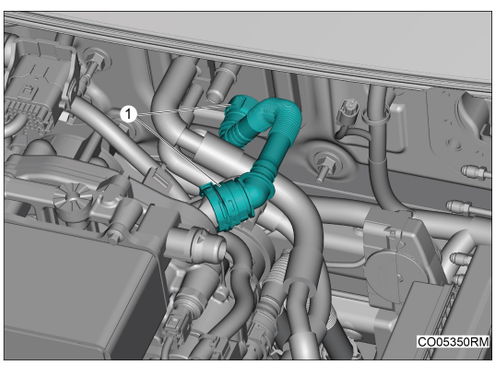
(b) Detach the PTC outlet pipe assembly.



(c) Detach the connector -1-.

(d) Remove the PTC outlet pipe assembly.

11. Remove heating outlet pipe assembly I



(a) Detach the connector -1-.

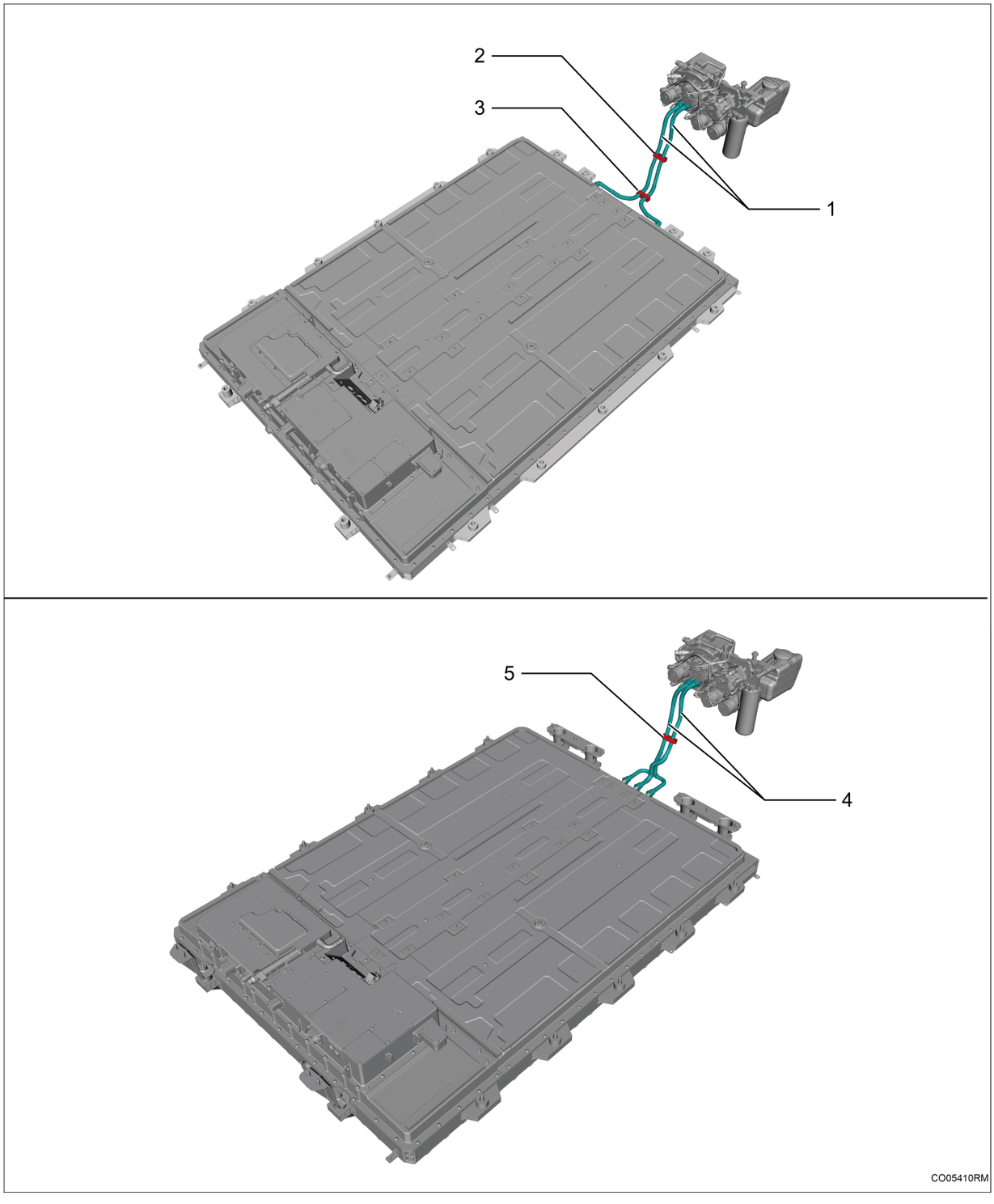
(b) Remove the heating outlet pipe assembly I.

Installation

1. Installation is in the reverse order of removal.

Motor cooling pipe III

Components



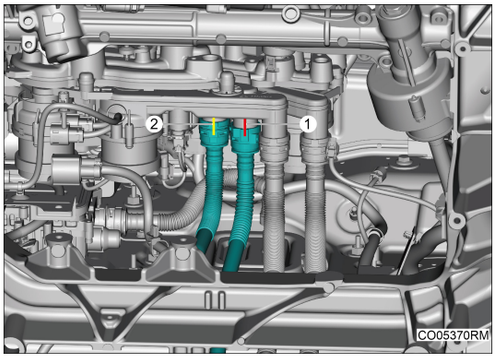
1. **Battery cooling water pipe assembly (only for models with 62 kWh battery)**
2. **Dual pipe clamp fixed by bolt**
3. **Dual pipe clamp fixed by bolt**
4. **Battery cooling water pipe assembly (only for models with 85 kWh battery)**

5. Dual pipe clamp fixed by bolt

RE

Removal

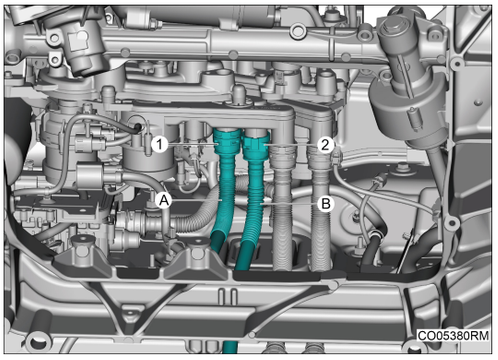
1. **Remove engine bottom protector (See page WS-40)**
2. **Drain coolant (See page RE-76)**
3. **Remove battery cooling water pipe assembly (only for models with 62 kWh battery)**



(a) Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1-2- in the figure.

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1-2- in the figure.**

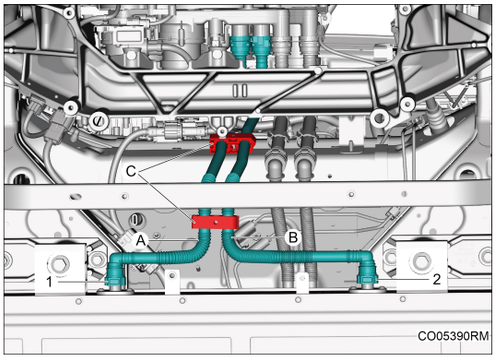


(b) Detach the quick connector -1-.

(c) Disconnect the battery water inlet pipe assembly -A-.

(d) Detach the quick connector -2-.

(e) Detach the battery outlet pipe assembly -B-.



(f) Remove the dual pipe clamps fixed by bolt -C-.

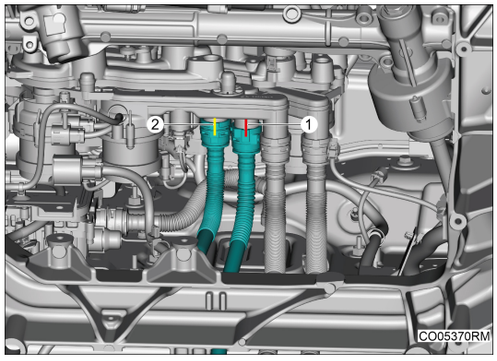
(g) Detach the quick connector -1-.

(h) Remove the battery inlet pipe assembly -A-.

(i) Detach the quick connector -2-.

(j) Remove the battery outlet pipe assembly -B-.

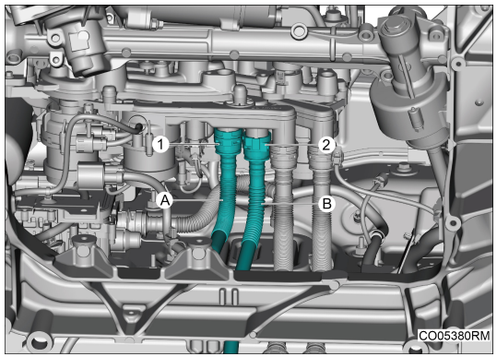
4. **Remove battery cooling water pipe assembly (only for models with 85 kWh battery)**



(a) Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1-2- in the figure.

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1-2- in the figure.**

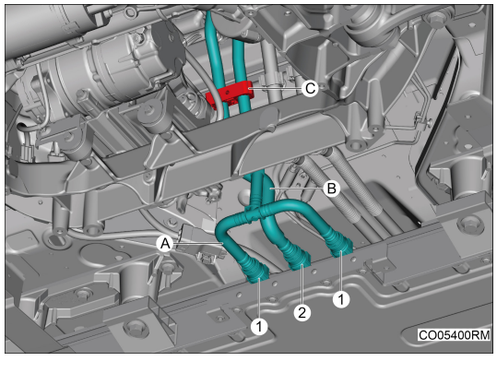


(b) Detach the quick connector -1-.

(c) Disconnect the battery water inlet pipe assembly -A-.

(d) Detach the quick connector -2-.

(e) Detach the battery outlet pipe assembly -B-.



(f) Remove the dual pipe clamps fixed by bolt -C-.

(g) Detach the quick connector -1-.

(h) Remove the battery inlet pipe assembly -A-.

(i) Detach the quick connector -2-.

(j) Remove the battery outlet pipe assembly -B-.

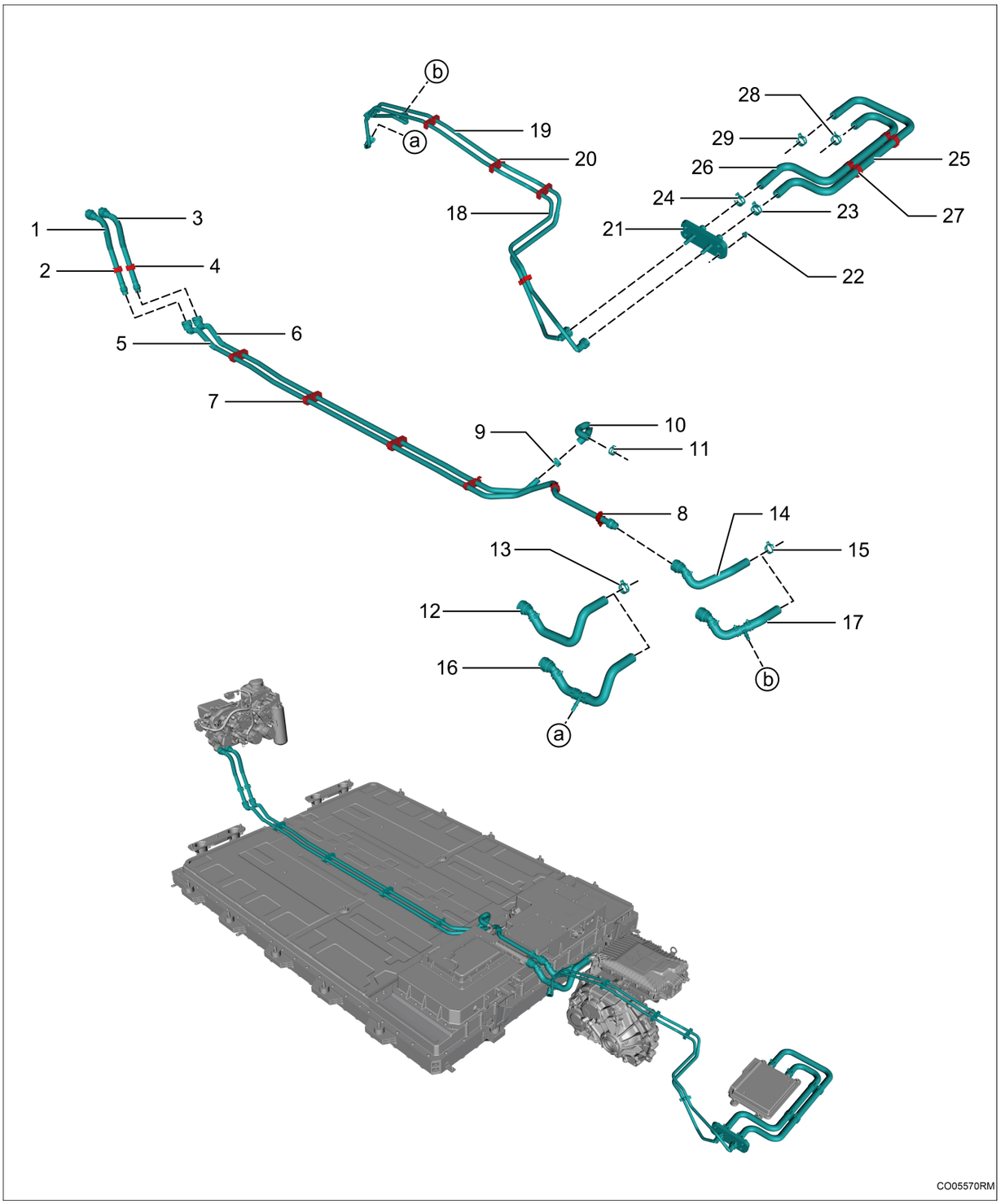
Installation

1. **Installation is in the reverse order of removal.**

RE

Motor cooling pipe IV

Components

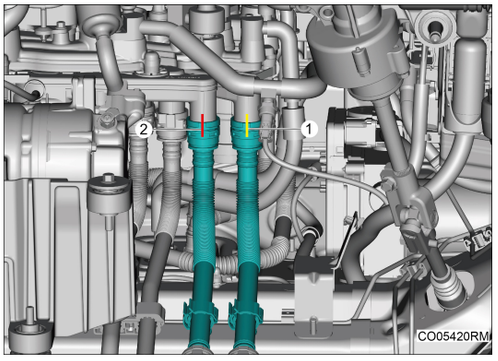


1. **Rear motor outlet pipe assembly I**
2. **Pipe clamp - 18 single pipe clamp fixed by clip**
3. **Rear motor inlet pipe assembly I**
4. **Pipe clamp - 18 single pipe clamp fixed by clip**

5. **Center passage outlet pipe assembly**
6. **Center passage inlet pipe assembly**
7. **Pipe clamp - 18 dual pipe clamp fixed by bolt**
   - X4
8. **Pipe clamp - 18 single pipe clamp fixed by clip**
   - X2
9. **Steel belt type elastic hose clamp**
10. **Multiple-in-one inlet hose**
11. **Steel belt type elastic hose clamp**
12. **Rear motor inlet hose assembly**
13. **Steel belt type elastic hose clamp**
14. **Rear motor outlet hose assembly**
15. **Steel belt type elastic hose clamp**
16. **Rear motor inlet hose assembly (only for models equipped with HAD)**
17. **Rear motor outlet hose assembly (only for models equipped with HAD)**
18. **Underfloor HAD inlet nylon pipe assembly**
19. **Underfloor HAD outlet nylon pipe assembly**
20. **Pipe clamp - Φ20 dual pipe clamp fixed by clip**
    - X4
21. **Joint assembly - waterproof bushing**
22. **Nut**
    - X4
23. **Steel belt type elastic hose clamp**
24. **Steel belt type elastic hose clamp**
25. **HAD inlet hose**
26. **HAD outlet hose**
27. **Pipe clamp - Φ20 dual pipe clamp fixed by clip**
    - X2
28. **Steel belt type elastic hose clamp**
29. **Steel belt type elastic hose clamp**

Removal

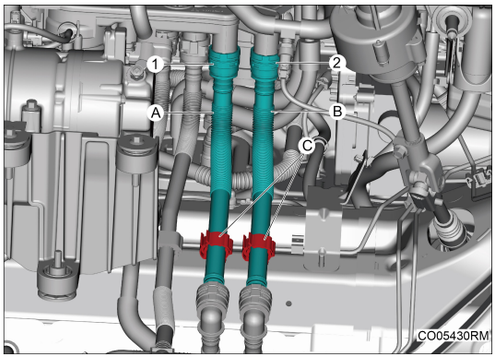
1. **Remove engine bottom protector (See page WS-40)**
2. **Drain coolant (See page RE-76)**
3. **Remove battery cooling water pipe assembly**



(a) Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1-2- in the figure.

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1-2- in the figure.**



(b) Detach the single pipe clamps fixed by clip -C-.

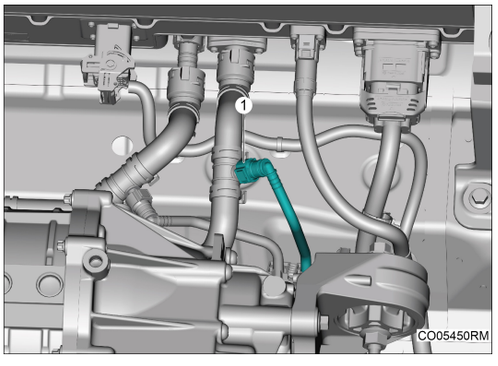
(c) Detach the quick connector -1-.

(d) Remove the rear motor inlet pipe assembly I -A-.

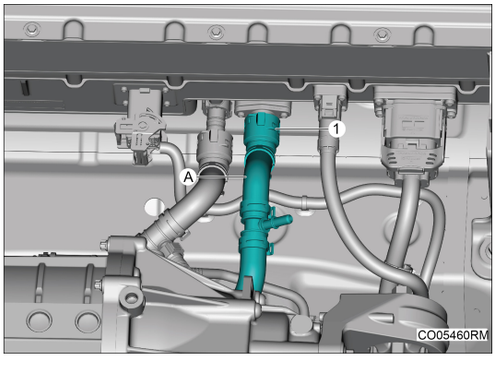
(e) Detach the quick connector -2-.

(f) Remove the rear motor outlet pipe assembly I -B-.

4. Remove rear motor inlet hose assembly (only for models with HAD)

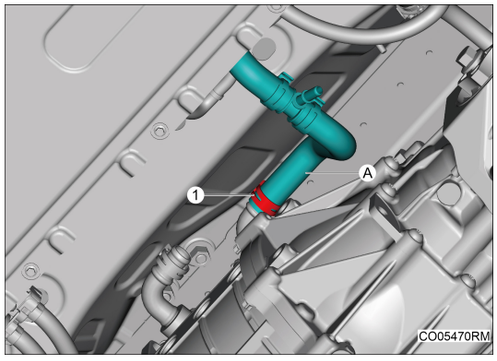


(a) Detach the underfloor HAD inlet nylon pipe assembly -1-.



(b) Detach the quick connector -1-.

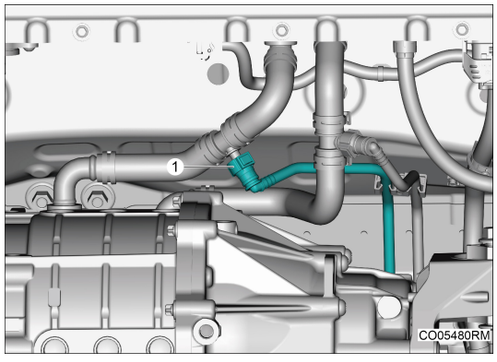
(c) Detach the rear motor inlet hose assembly -A-.



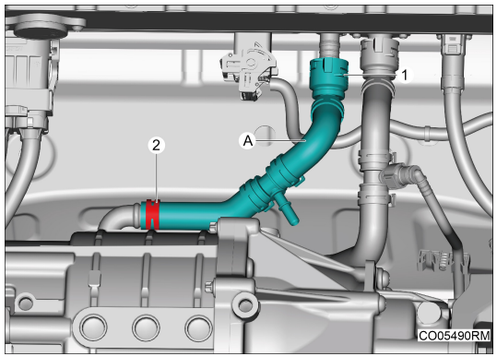
(d) Detach the steel belt type hose clamp -1-.

(e) Remove the rear motor inlet hose assembly -A-.

5. Remove rear motor outlet hose assembly (only for models with HAD)



(a) Detach the underfloor HAD outlet nylon pipe assembly -1-.

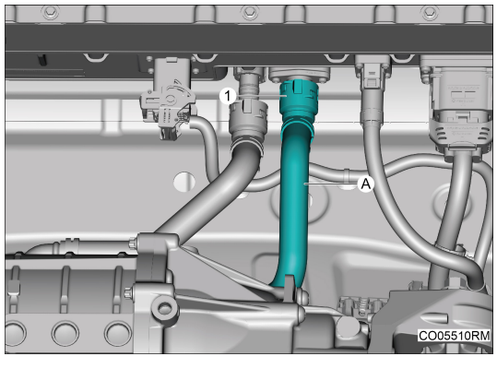


(b) Detach the quick connector -1-.

(c) Detach the steel belt type hose clamp -2-.

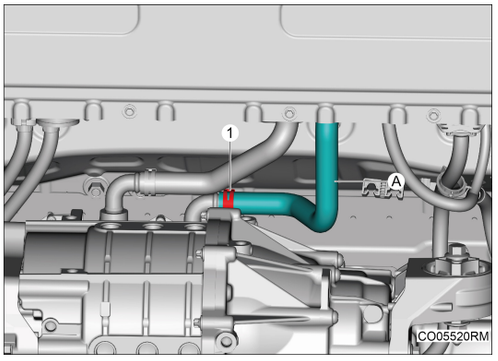
(d) Remove the rear motor outlet hose assembly -A-.

6. Remove rear motor inlet hose assembly



(a) Detach the quick connector -1-.

(b) Detach the rear motor inlet hose assembly -A-.

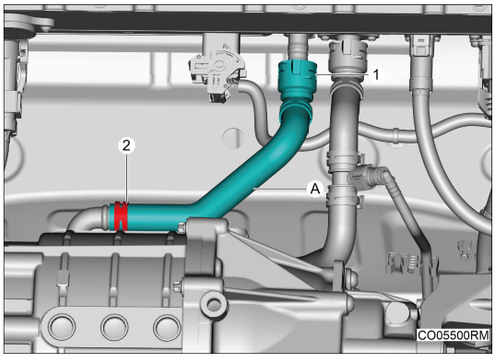


(c) Detach the steel belt type hose clamp -1-.

(d) Remove the rear motor inlet hose assembly -A-.

RE

7. Remove rear motor outlet hose assembly



(a) Detach the quick connector -1-.

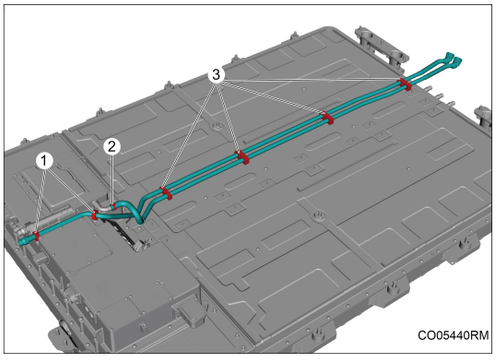
(b) Detach the steel belt type hose clamp -2-.

(c) Remove the rear motor outlet hose assembly -A-.

8. Remove rear suspension bottom protector I (See page WS-47)

9. Remove power battery assembly (See page DL-25)

10. Remove rear motor cooling pipe assembly



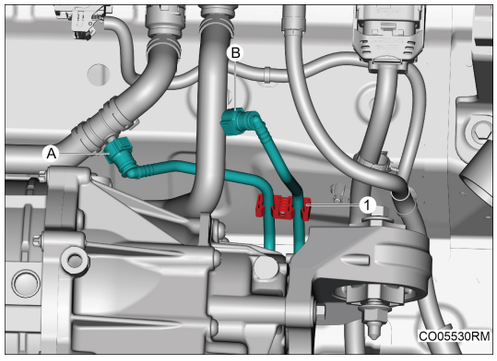
(a) Detach the single pipe clamps fixed by clip -1-.

(b) Detach the dual pipe clamp fixed by bolt -2-.

(c) Detach the steel belt type elastic hose clamp -3-.

11. Remove rear suspension bottom protector II (See page WS-47)

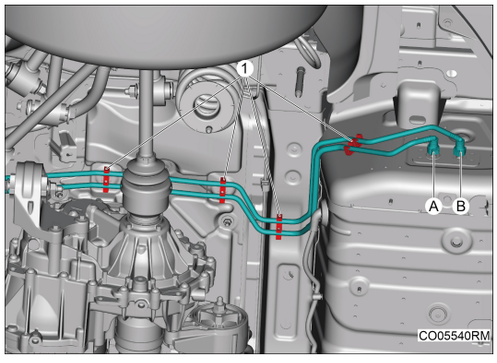
12. Remove floor lower HAD water pipe assembly (only for models with HAD)



(a) Detach the underfloor HAD inlet nylon pipe assembly -A-.

(b) Detach the underfloor HAD inlet nylon pipe assembly -B-.

(c) Detach the dual pipe clamp fixed by bolt -1-.



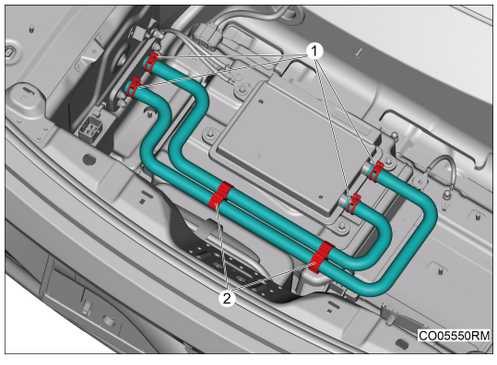
(d) Detach the underfloor HAD inlet nylon pipe assembly -A-.

(e) Detach the underfloor HAD inlet nylon pipe assembly -B-.

(f) Detach the dual pipe clamp fixed by bolt -1-.

13. Remove luggage compartment carpet lower storage box I (See page NS-148)

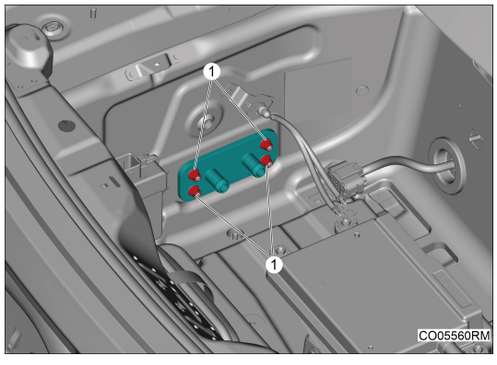
14. Remove HAD cooling line assembly



(a) Detach the steel belt type elastic hose clamp -1-.

(b) Detach the dual pipe clamps fixed by clip -2-.

15. Remove waterproof bushing connector assembly



(a) Remove the nut -1-.

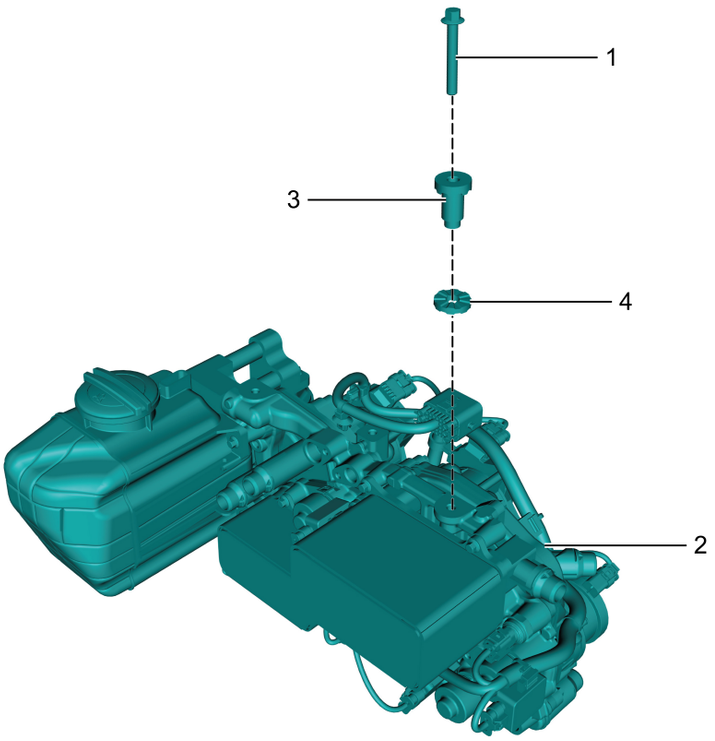
Installation

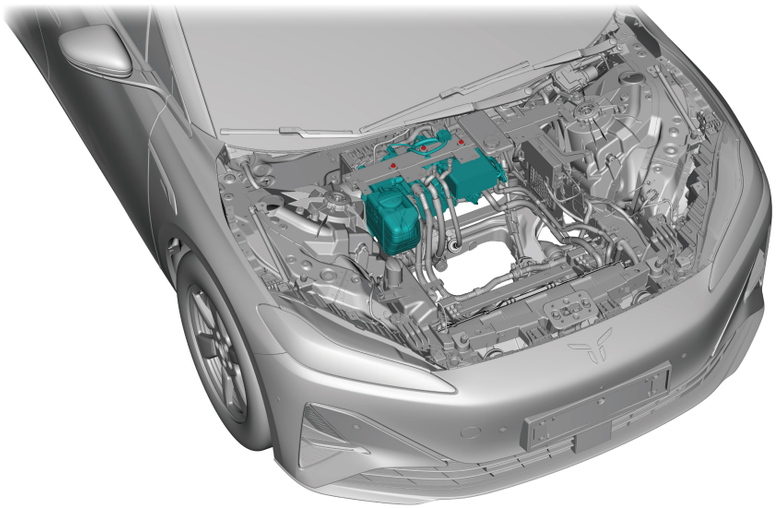
1. **Installation is in the reverse order of removal.**

Thermal management integrated module assembly

Components

RE





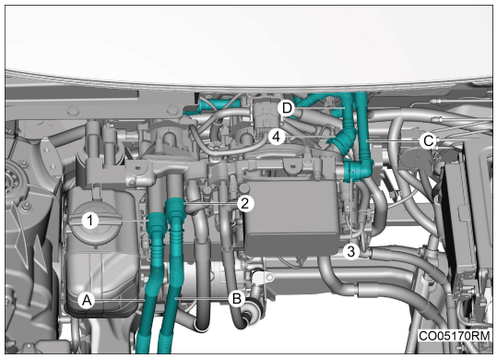
CO05220RM

1. **Hexagon flange bolt**
   - X3
   - Torque: 17 ~ 21 N • m
2. **Thermal management integrated module assembly**
3. **ITM upper mounting assembly**
4. **ITM mounting lower rubber pad**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove engine bottom protector (See page WS-40)**
4. **Remove water channel cover plate assembly (See page WS-86)**
5. **Remove wiper fixing bracket I assembly (See page WS-62)**
6. **Recover refrigerant from refrigerant system (See page RE-1)**
7. **Drain coolant (See page RE-76)**
8. **Remove thermal management integrated module assembly**

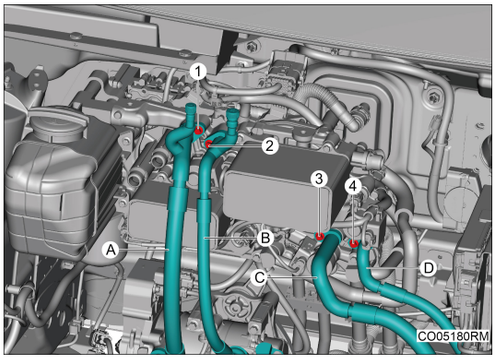


(a) Detach the quick connector -1- and disconnect the radiator inlet pipe II assembly -A-.

(b) Detach the quick connector -2- and disconnect the radiator outlet pipe II assembly -B-.

(c) Detach the quick connector -3- and disconnect the PTC inlet pipe assembly -C-.

(d) Detach the quick connector -4- and disconnect the heating outlet pipe assembly I -D-.

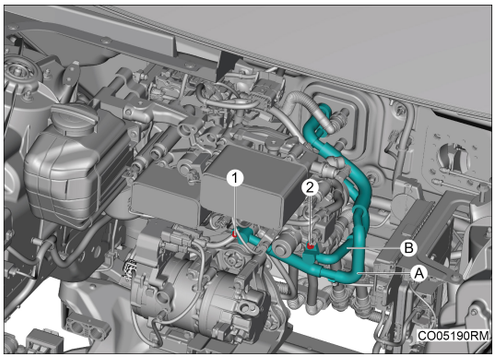


(e) Remove bolt -1-, and detach low pressure hose assembly -I-A-.

(f) Remove bolt -2-, and detach high pressure hose assembly -I-B-.

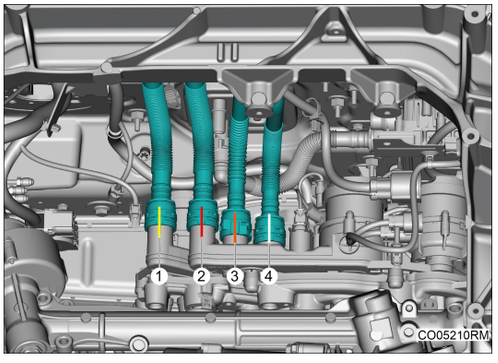
(g) Remove bolt -3-, and detach low pressure hose assembly -II-C-.

(h) Remove bolt -4-, and detach high pressure hose assembly -II-D-.



(i) Remove bolt -1-, and detach low pressure hose assembly -III-A-.

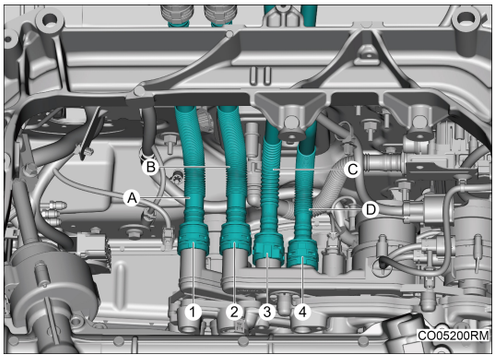
(j) Remove bolt -2-, and detach high pressure hose assembly -III-B-.



(k) Before disconnecting the water pipe connectors, use a marker or colored tape to make a distinction mark, as indicated by -1-4- in the figure.

Notice:

- **Before installing the water pipe connectors, identify the color marked by a marker or colored tape for installation, as indicated by -1-4- in the figure.**



(l) Detach the quick connector -1- and disconnect the rear motor outlet pipe assembly I -A-.

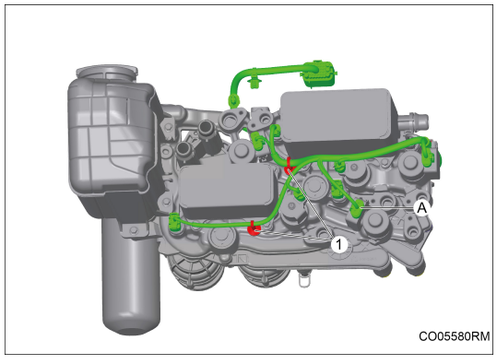
(m) Detach the quick connector -2- and disconnect the rear motor outlet pipe assembly I -B-.

(n) Detach the quick connector -3- and disconnect the battery inlet pipe assembly -C-.

(o) Detach the quick connector -4- and disconnect the battery outlet pipe assembly -D-.

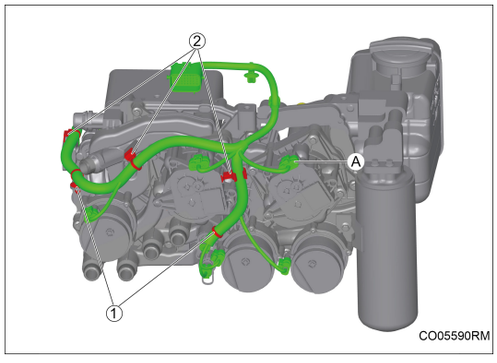
9. **Remove front shock absorber longitudinal stabilizer bar (See page DP-73)**

10. **Remove thermal management integrated module assembly wire harness**



(a) Disengage the wire harness fixing clip -1-.

(b) (For example) Disconnect all wire harness connectors -A-.



(c) Disengage the wire harness fixing clip -1-.

(d) Detach the wire harness fixing clamps -2-.

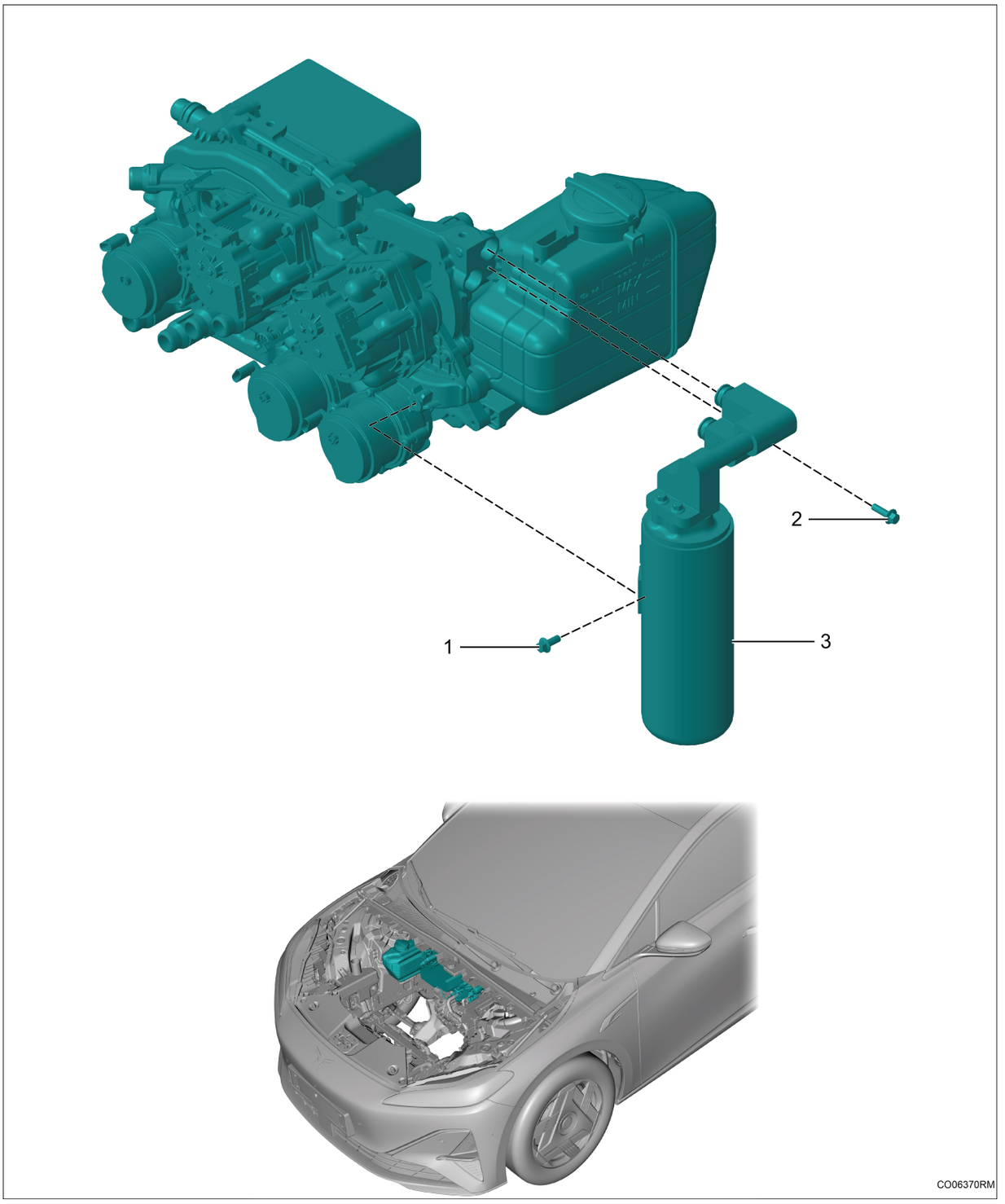
(e) (For example) Disconnect all wire harness connectors -A-.

Installation

1. Installation is in the reverse order of removal.

Thermal management module ACC

Components

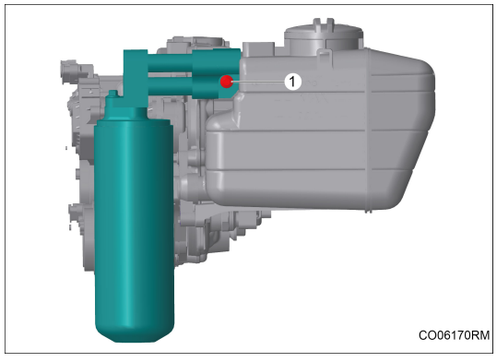


1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
2. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m

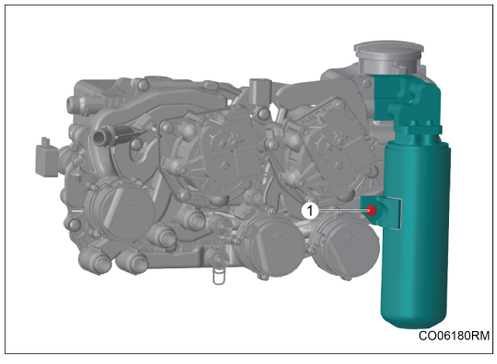
3. ACC

Removal

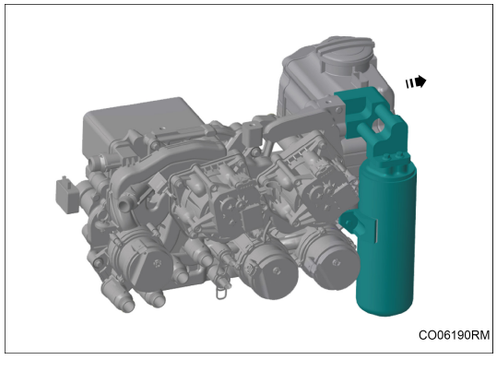
1. **Remove thermal management integrated module assembly (See page RE-98)**
2. **Remove thermal management module ACC**



(a) Remove the bolt -1-.



(b) Remove the bolt -1-.



(c) Detach the ACC in direction of -arrow-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **When removing ACC, it should be pulled out vertically. Do not shake it to avoid scratching the sealing surface of the valve plate.**

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

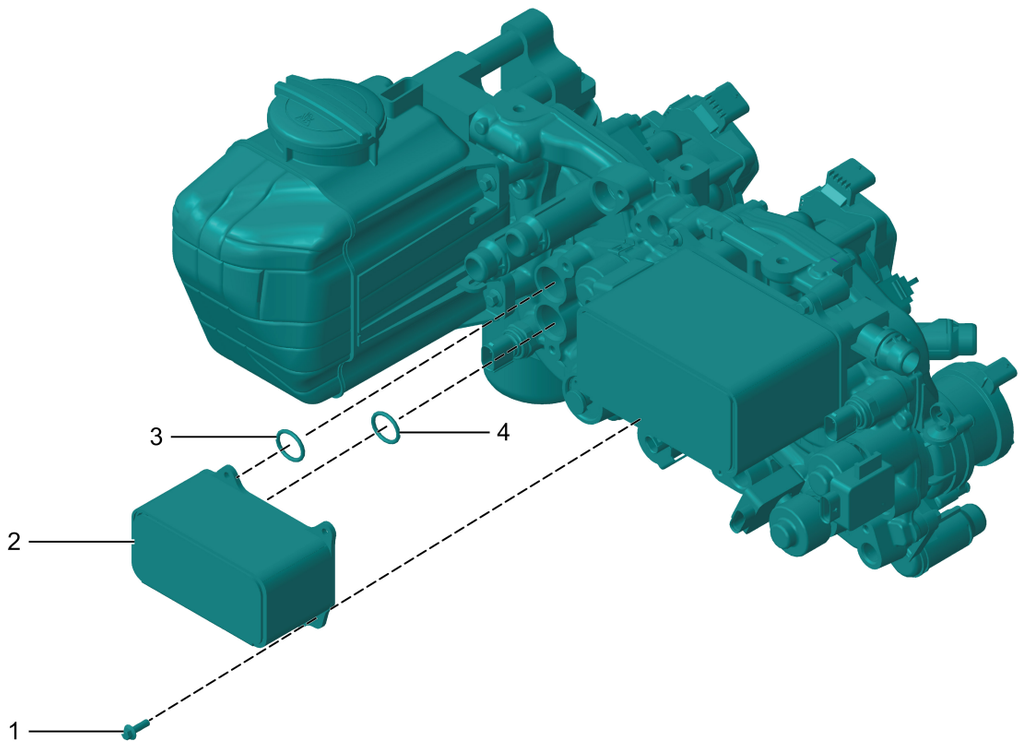
- **Oil: POE lubricant;**
- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**

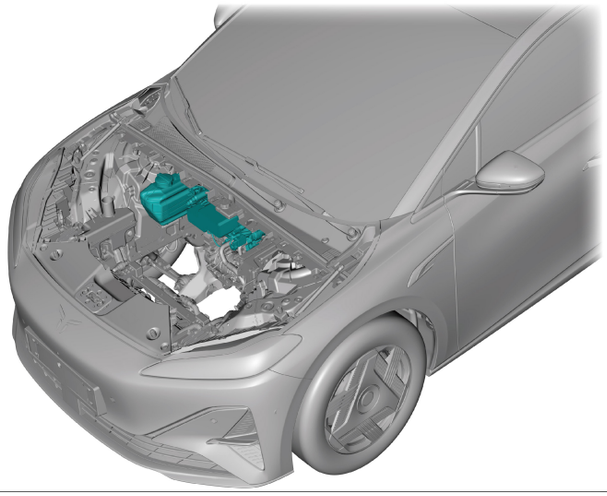
RE

RE

Thermal management module chiller

Components





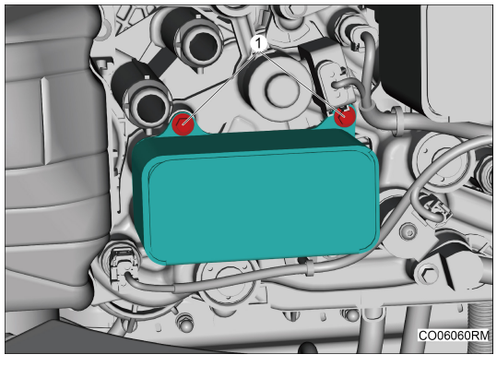
CO06380RM

1. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Chiller**

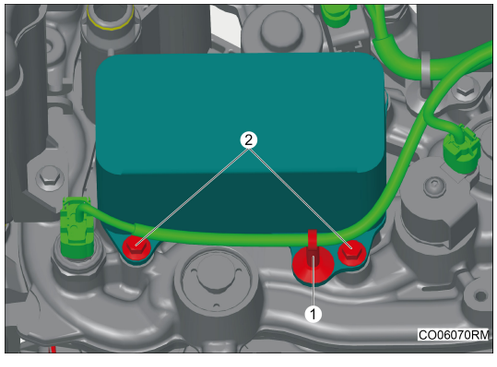
3. **O-ring**
4. **O-ring**

Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove high pressure hose I (See page RE-98)**
6. **Remove low pressure hose assembly I (See page RE-98)**
7. **Remove radiator inlet pipe II (See page RE-98)**
8. **Remove radiator outlet pipe II (See page RE-98)**
9. **Remove Chiller assembly**

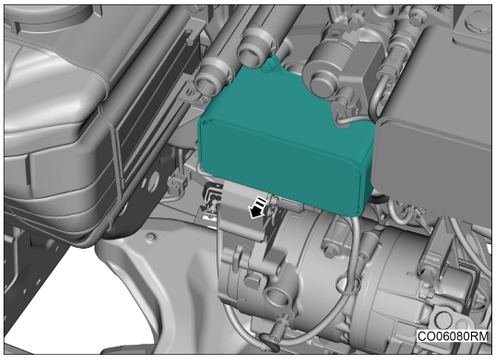


(a) Remove the bolt -1-.



(b) Remove bolt -2- from lower part of Chiller assembly.

(c) Remove the wire harness fixing clip -1- from the lower part of Chiller assembly.



RE

(d) Remove the chiller in the direction of -arrow-.

Notice:

- **Chiller O-ring is dirty or damaged, it cannot be reused and should be replaced with a new one.**
- **If the manifold sealing gasket is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Installation

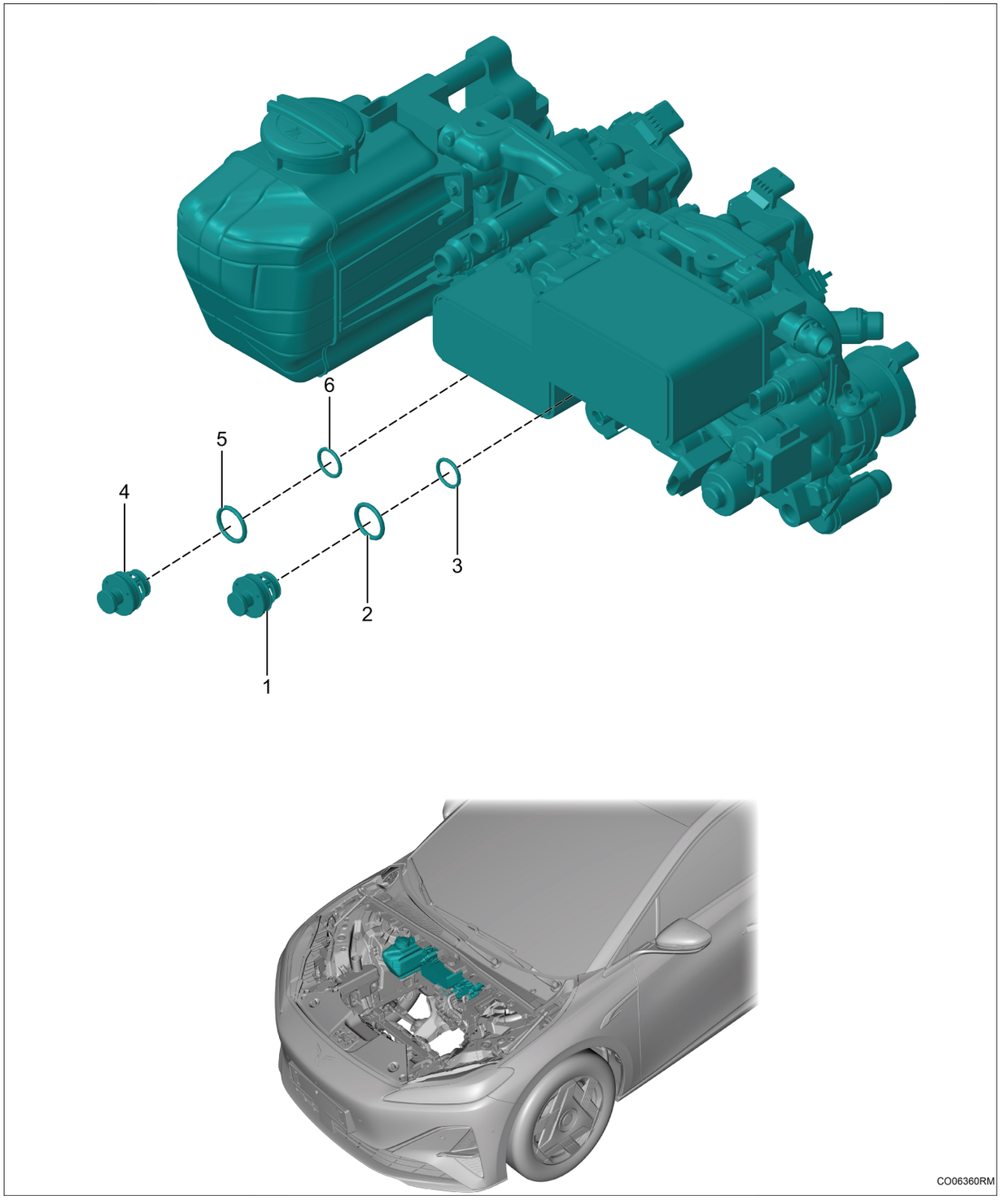
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **Oil: POE lubricant.**
   - **Apply oil to the O-ring before installation.**
   - **Tightening order for bolt: Tighten diagonally.**
   - **If the O-ring and sealing gasket are dirty or damaged, they cannot be reused and should be replaced with new ones.**

Thermal management module CV valve

Components

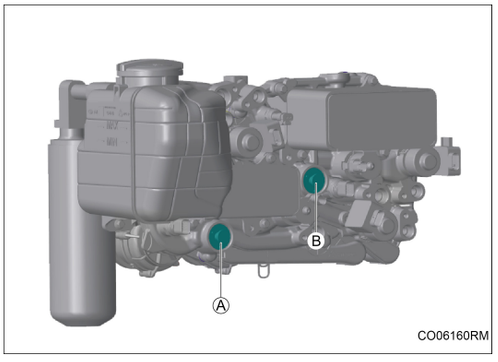


1. **CV valve**
2. **O-ring**
3. **O-ring**

4. **CV valve**
5. **O-ring**
6. **O-ring**

Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Remove high pressure hose I (See page RE-98)**
5. **Remove low pressure hose assembly I (See page RE-98)**
6. **Remove radiator inlet pipe II (See page RE-98)**
7. **Remove radiator outlet pipe II (See page RE-98)**
8. **Recover refrigerant from refrigerant system (See page RE-1)**
9. **Remove thermal management CV valve**



(a) Use a snap ring plier to remove CV snap spring and pull out -A-.

(b) Use a snap ring plier to remove CV snap spring and pull out -B-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **When removing CV, it should be pulled out vertically. Do not shake it to avoid scratching the sealing surface of the valve plate.**

Installation

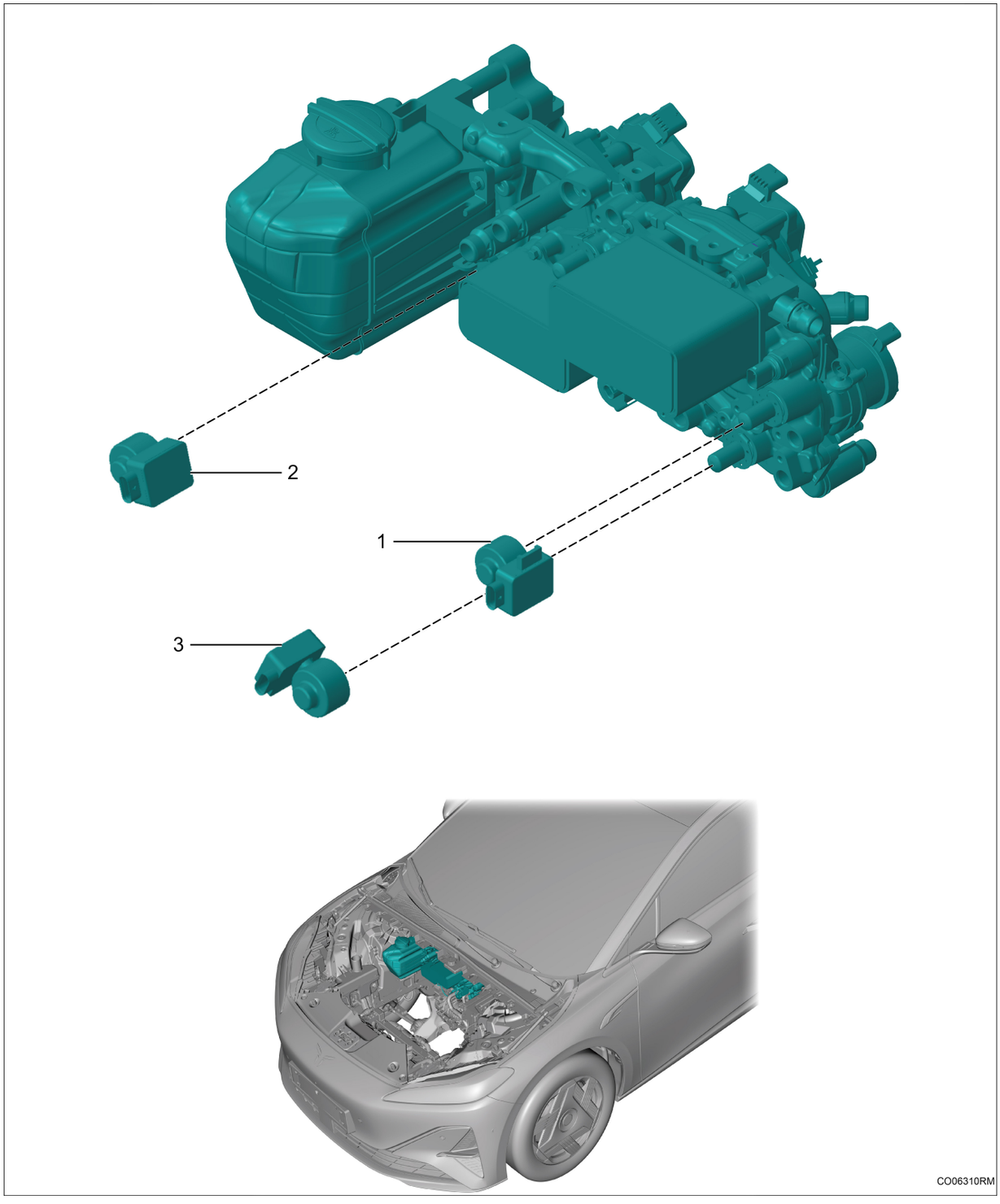
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

- **Oil: POE lubricant.**
- **Apply oil to the O-ring before installation.**
- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**

Thermal management module EXV and ERV coils

Components

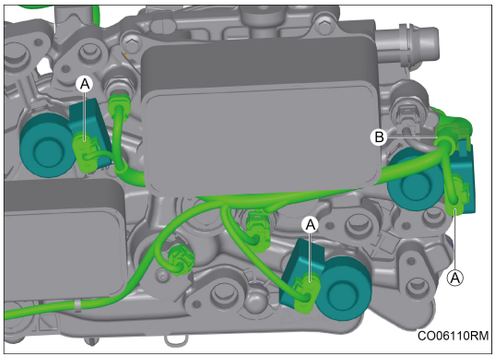


1. **ERV coil**
2. **EXV coil**
3. **EXV coil**

RE

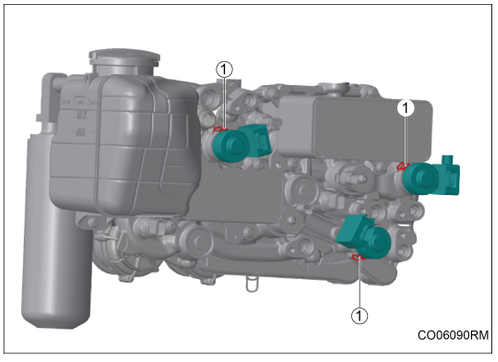
Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Remove high pressure hose I (See page RE-98)**
5. **Remove low pressure hose assembly I (See page RE-98)**
6. **Recover refrigerant from refrigerant system (See page RE-1)**
7. **Remove ERV and EXV coil**



(a) Detach the wire harness connectors -A-.

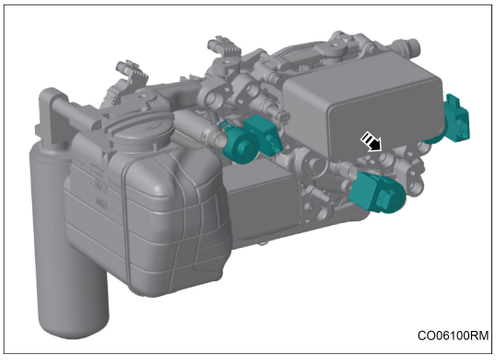
(b) Disengage the wire harness fixing clip -B-.



(c) Use a tool to pry side iron sheets -1-.

Notice:

- **When the coil iron sheet is deformed, replace the coil with a new one.**



(d) Detach the ERV and EXV coil in direction of -arrow-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

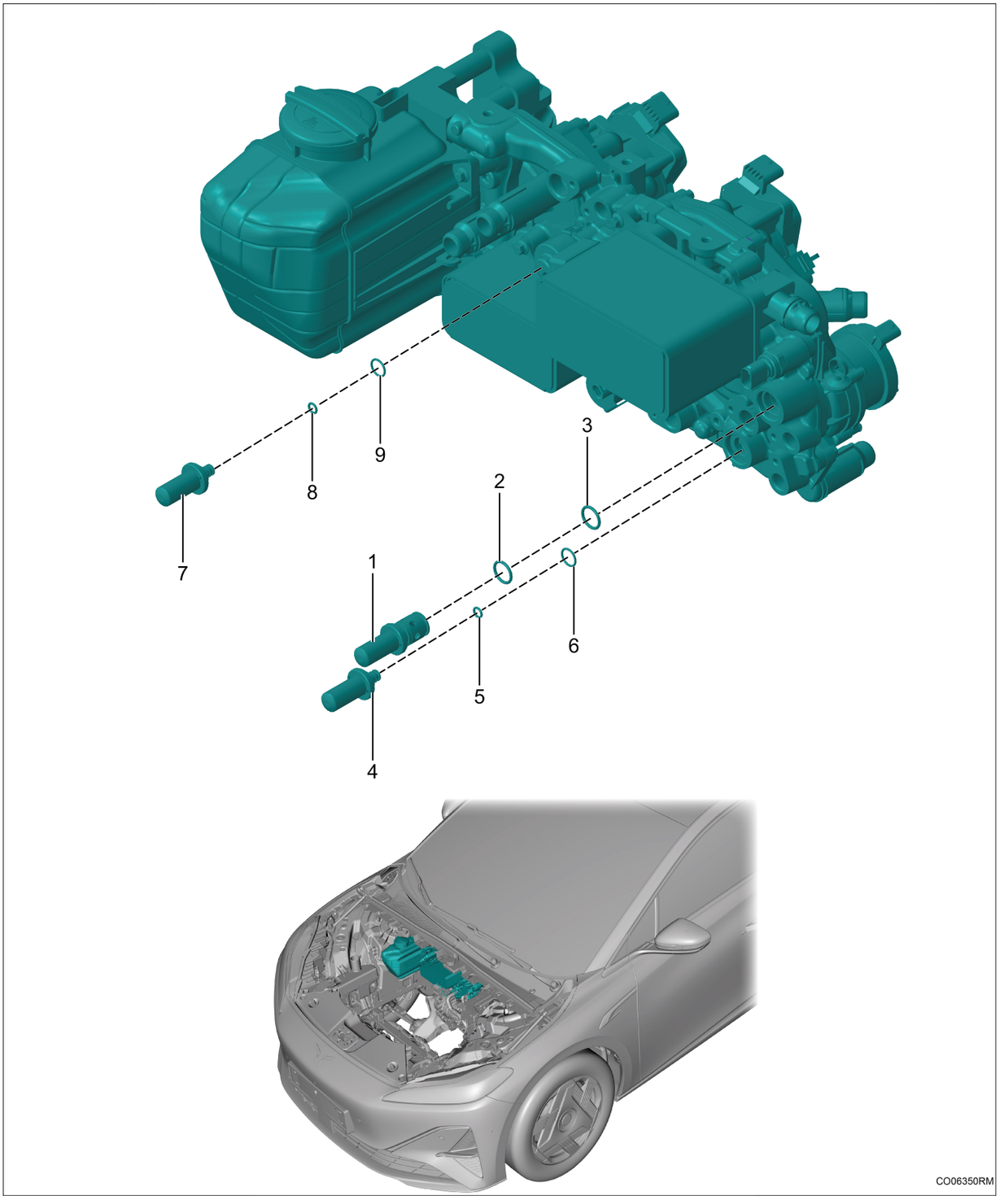
   Notice:

   - **After pressing the coil, pull the coil to confirm if it can be pulled.**
   - **If it can be pulled, the coil needs to be replaced.**

RE

Thermal management module EXV and ERV valve cores

Components



1. **ERV valve core**
   - Torque: 14 ~ 16 N • m
2. **O-ring**

3. **O-ring**
4. **EXV valve core**
   - Torque: 14 ~ 16 N • m
5. **O-ring**
6. **O-ring**
7. **EXV valve core**
   - Torque: 14 ~ 16 N • m
8. **O-ring**
9. **O-ring**

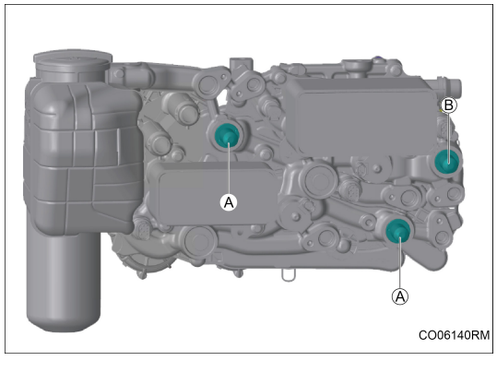
Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Remove high pressure hose I (See page RE-98)**
5. **Remove low pressure hose assembly I (See page RE-98)**
6. **Recover refrigerant from refrigerant system (See page RE-1)**
7. **Remove ERV and EXV coil (See page RE-109)**
8. **Remove ERV and EXV valve core**

   (a) Use the socket to remove the ERV and EXV valve cores -A-B-.

   Notice:

   - **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**



Installation

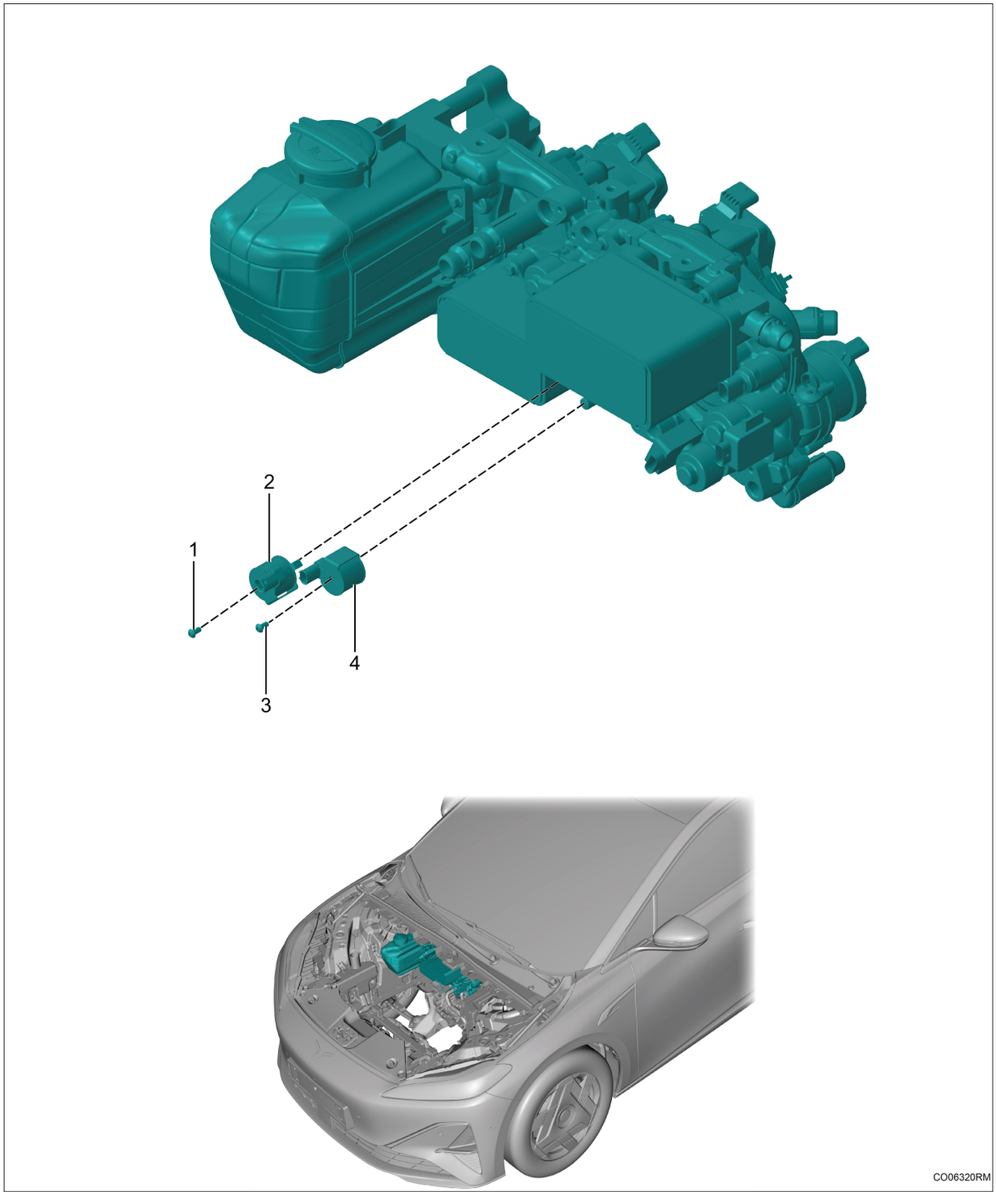
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

- **Oil: POE lubricant.**
- **Apply oil to the O-ring before installation.**
- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **ERV is pre-installed, it is necessary to be pressed vertically without skewing.**

Thermal management module SOV coil

Components



1. **Screw**
   - Torque: 3.2 ~ 4 N • m
2. **SOV coil**

3. **Screw**
   - Torque: 3.2 ~ 4 N • m
4. **SOV coil**

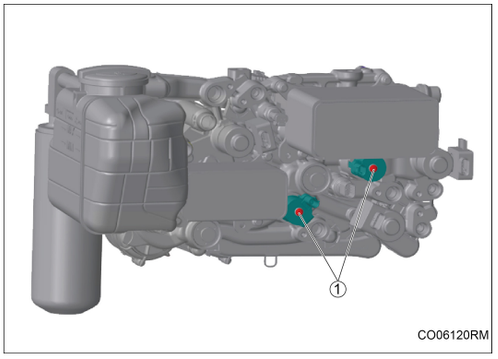
Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove thermal management module SOV coil**

   Notice:

   - **When the coil iron sheet is deformed, replace the coil with a new one.**

   (a) Remove the screw -1-, and pull out SOV coil.



Installation

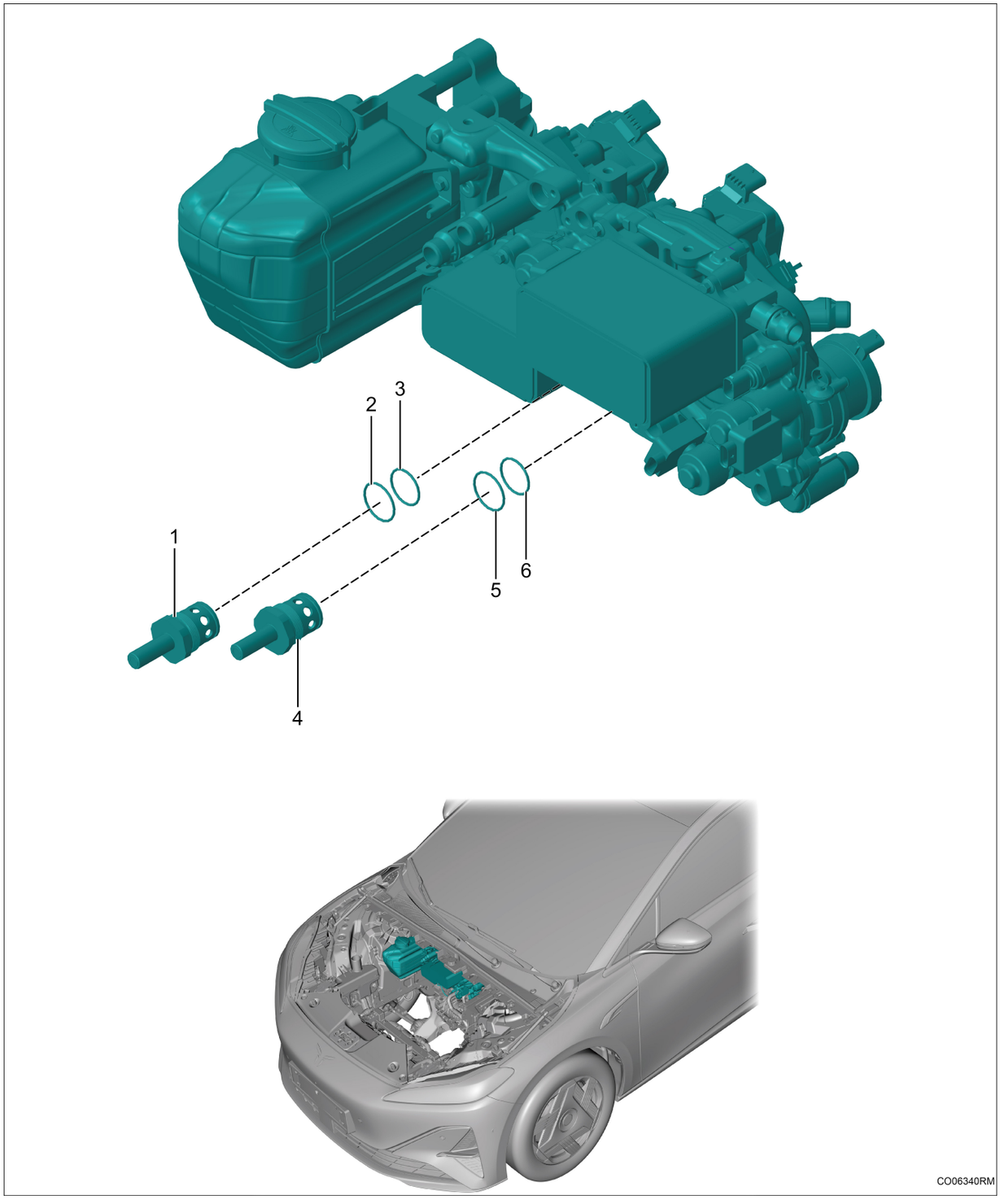
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **After pressing the coil, pull the coil to confirm if it can be pulled.**
   - **If it can be pulled, the coil needs to be replaced.**

Thermal management module SOV valve core

Components



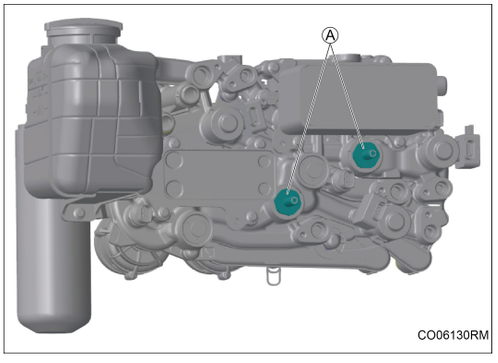
1. **SOV valve core**
   - Torque: 14 ~ 16 N • m
2. **O-ring**

3. **O-ring**
4. **SOV valve core**
   - Torque: 14 ~ 16 N • m
5. **O-ring**
6. **O-ring**

RE

Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove thermal management module SOV coil (See page RE-115)**
6. **Remove thermal management module SOV valve core**



(a) Use the socket to remove the SOV valve core -A-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **When removing SOV valve core, it should be pulled out vertically. Do not shake it to avoid scratching the sealing surface of the valve plate.**

Installation

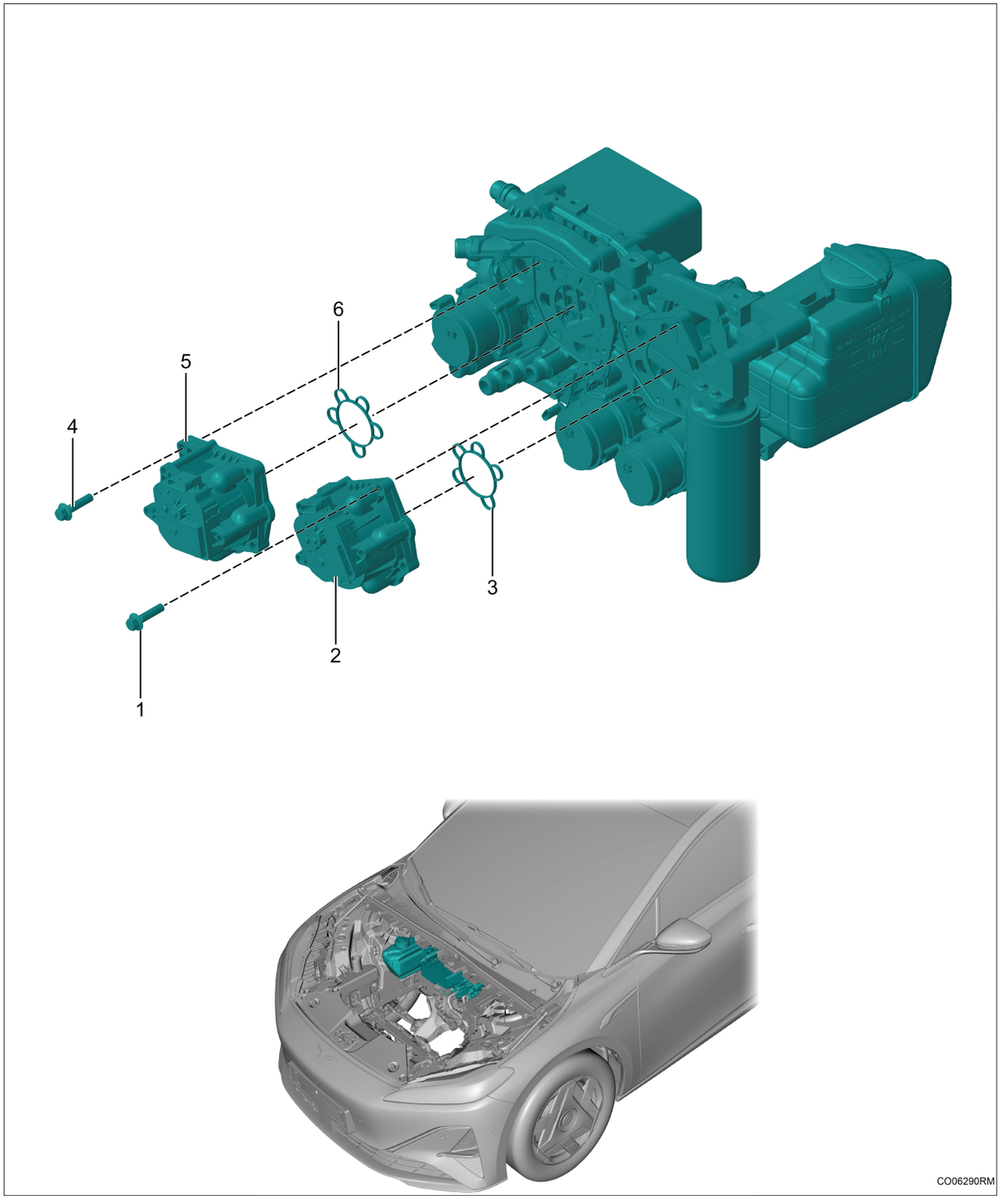
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

- **Oil: POE lubricant.**
- **Apply oil to the O-ring before installation.**
- **Bolt torque: 14 ~ 16 N • m.**
- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**

Thermal management module five-way valve

Components



1. Hexagon flange bolt

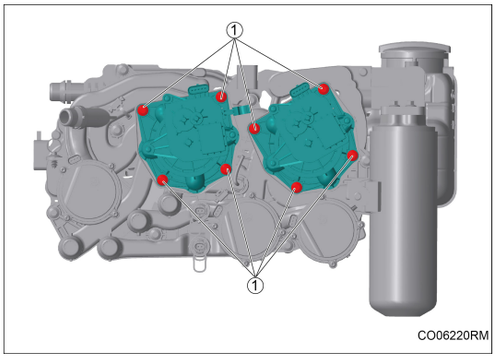
- X4
- Torque: 8 ~ 10 N • m

2. **Five-way valve**
3. **Gasket**
4. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
5. **Five-way valve**
6. **Gasket**

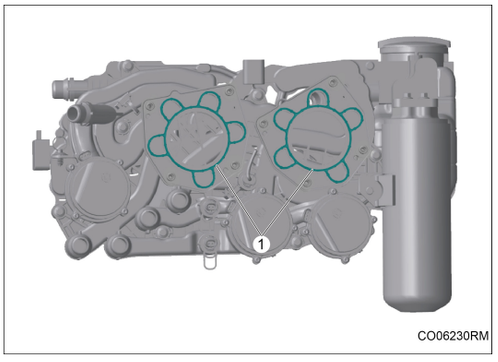
RE

Removal

1. **Remove thermal management integrated module assembly (See page RE-98)**
2. **Remove thermal management five-way valve**



(a) Remove the bolt -1-.



(b) Remove the gasket -1-.

Notice:

- **If the sealing gasket is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Installation

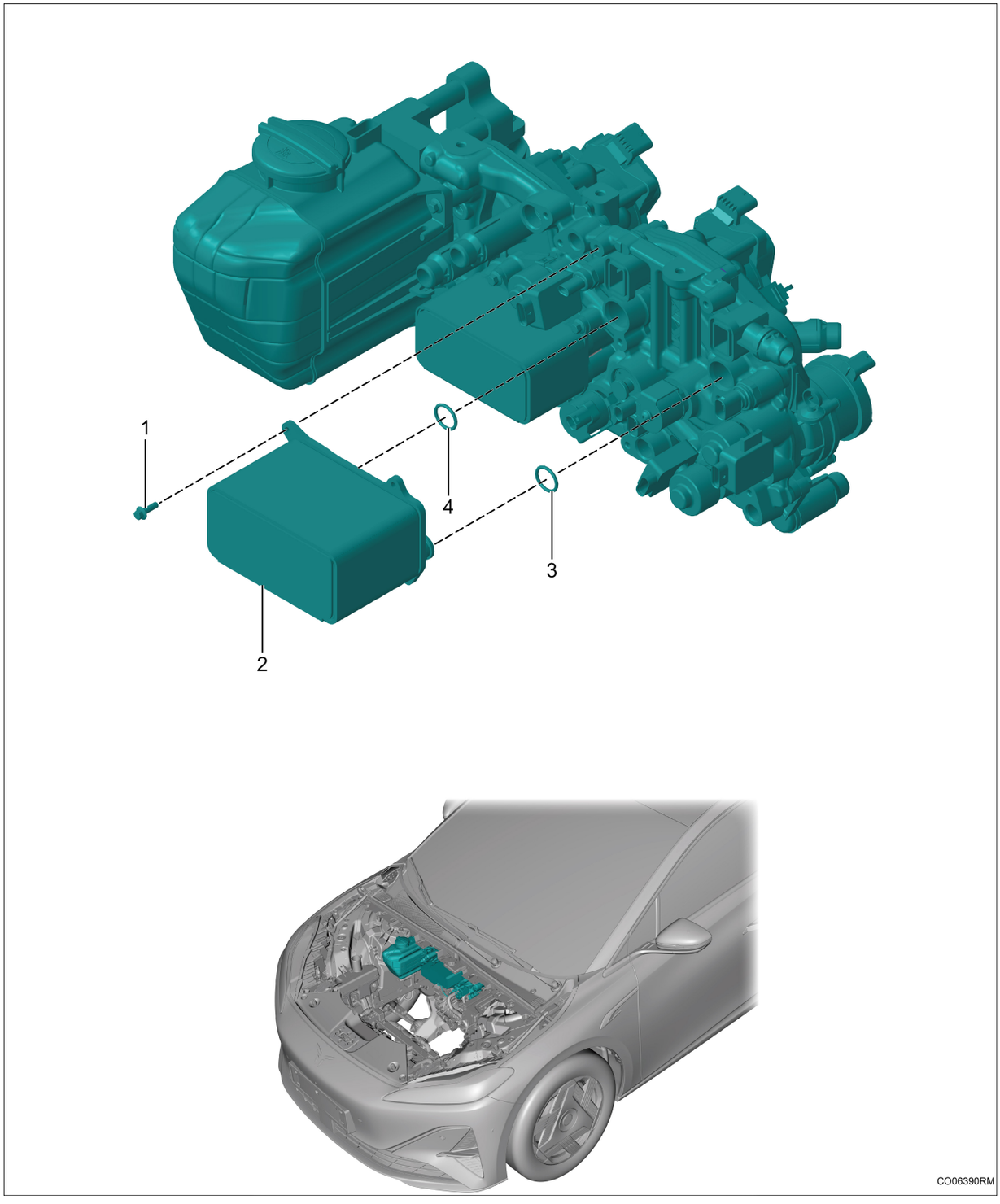
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

- **Tightening order for bolt: Tighten diagonally.**
- **If the sealing gasket is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Thermal management module water-cooled condenser

Components



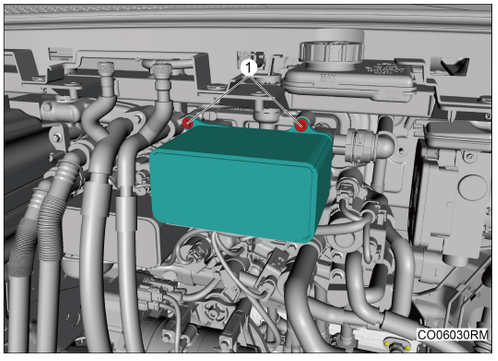
1. Hexagon flange bolt

- X4
- Torque: 8 ~ 10 N • m

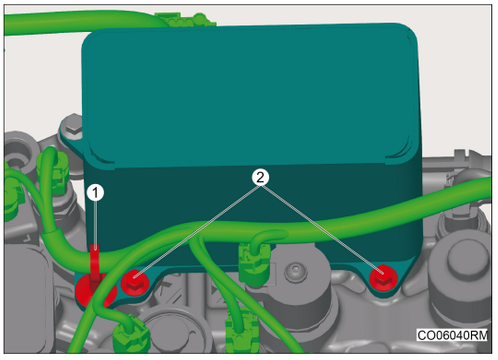
2. **LCC**
3. **O-ring**
4. **O-ring**

Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove water-cooled condenser**

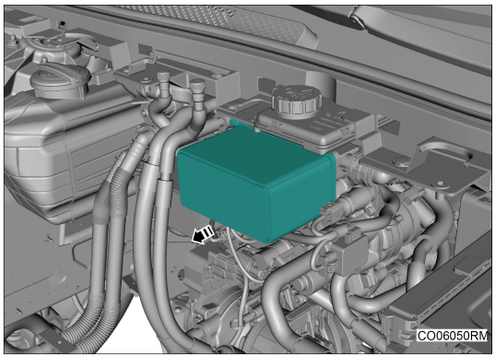


(a) Remove the bolt -1-.



(b) Disengage the wire harness fixing clip -1-.

(c) Remove the lower bolt -2- from water-cooled condenser.



(d) Remove the water-cooled condenser in the direction of -arrow-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **If the manifold sealing gasket is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

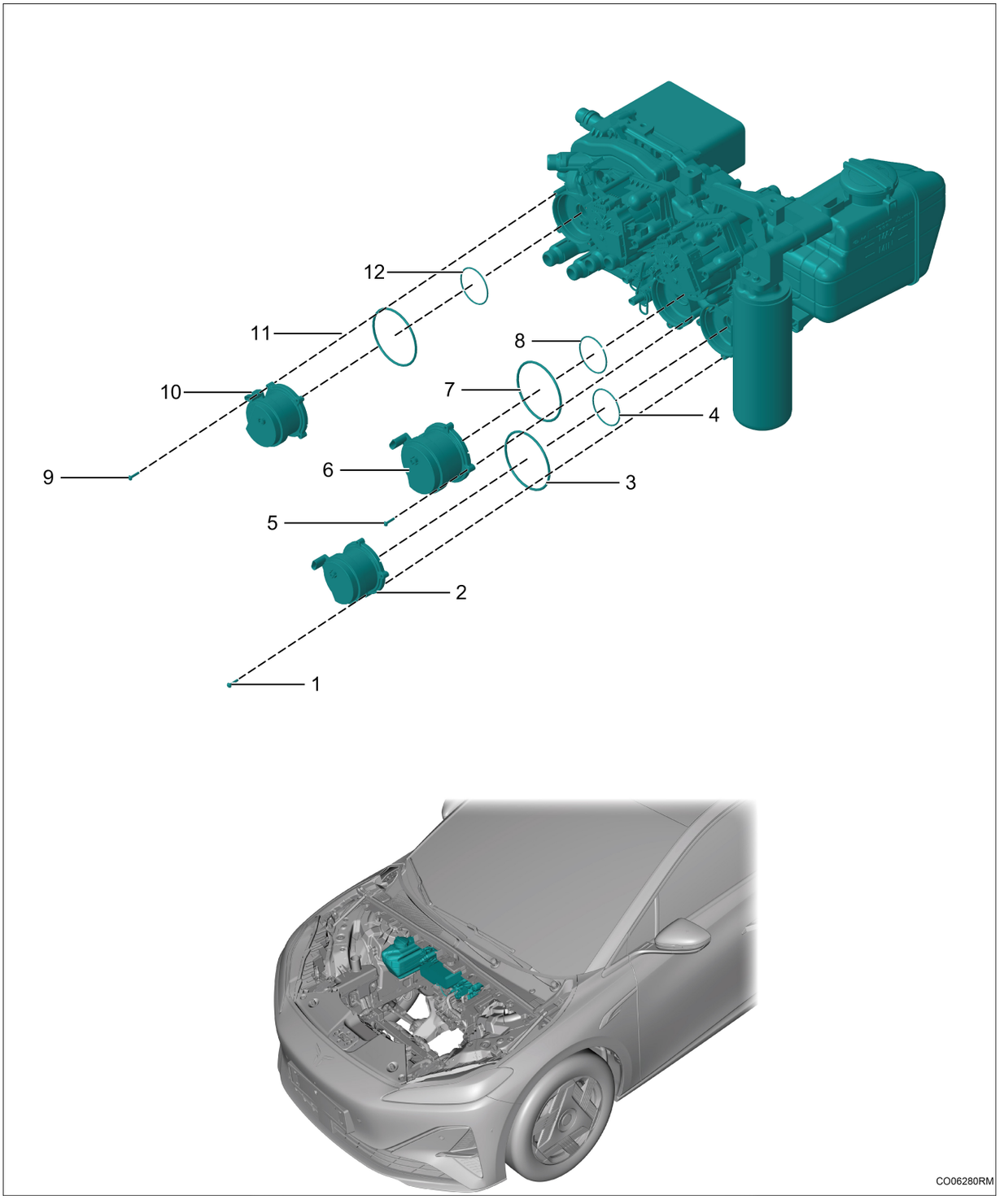
   Notice:

   - **Oil: POE lubricant.**
   - **Apply oil to the O-ring before installation.**
   - **Tightening order for bolt: Tighten diagonally.**
   - **If the O-ring and sealing gasket are dirty or damaged, they cannot be reused and should be replaced with new ones.**

RE

Thermal management module water pump

Components



1. Bolt

- X4
- Torque: 8 ~ 10 N • m

2. 110 W water pump

3. Gasket

4. Gasket

5. Bolt

- X4
- Torque: 8 ~ 10 N • m

6. 110 W water pump

7. Gasket

8. Gasket

9. Bolt

- X4
- Torque: 8 ~ 10 N • m

10. 60 W water pump

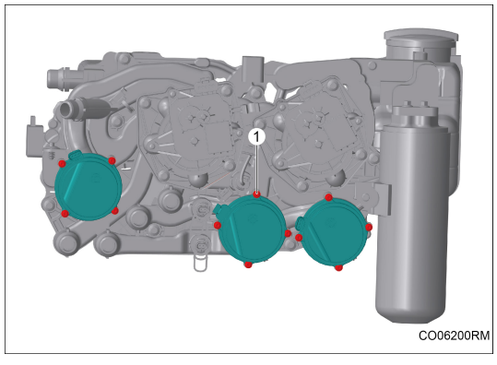
11. Gasket

12. Gasket

Removal

1. Remove thermal management integrated module assembly (See page RE-98)

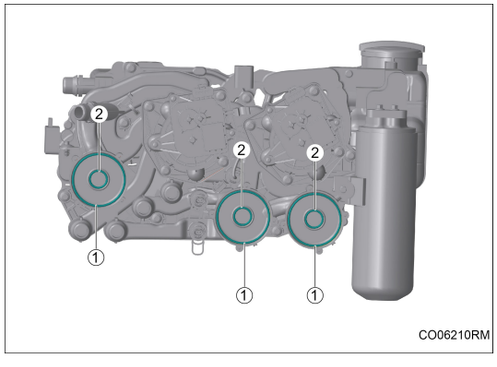
2. Remove thermal management module water pump



(a) (For example) Remove all water pump bolts -1-.

Notice:

- **1 water pump with 60 W on the left and 2 water pump with 110 W on the right, pay attention to distinction when placing.**



(b) Remove the water pump O-ring -1-.

(c) Remove the water pump O-ring -2-.

Notice:

- **If the water pump O-ring is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Installation

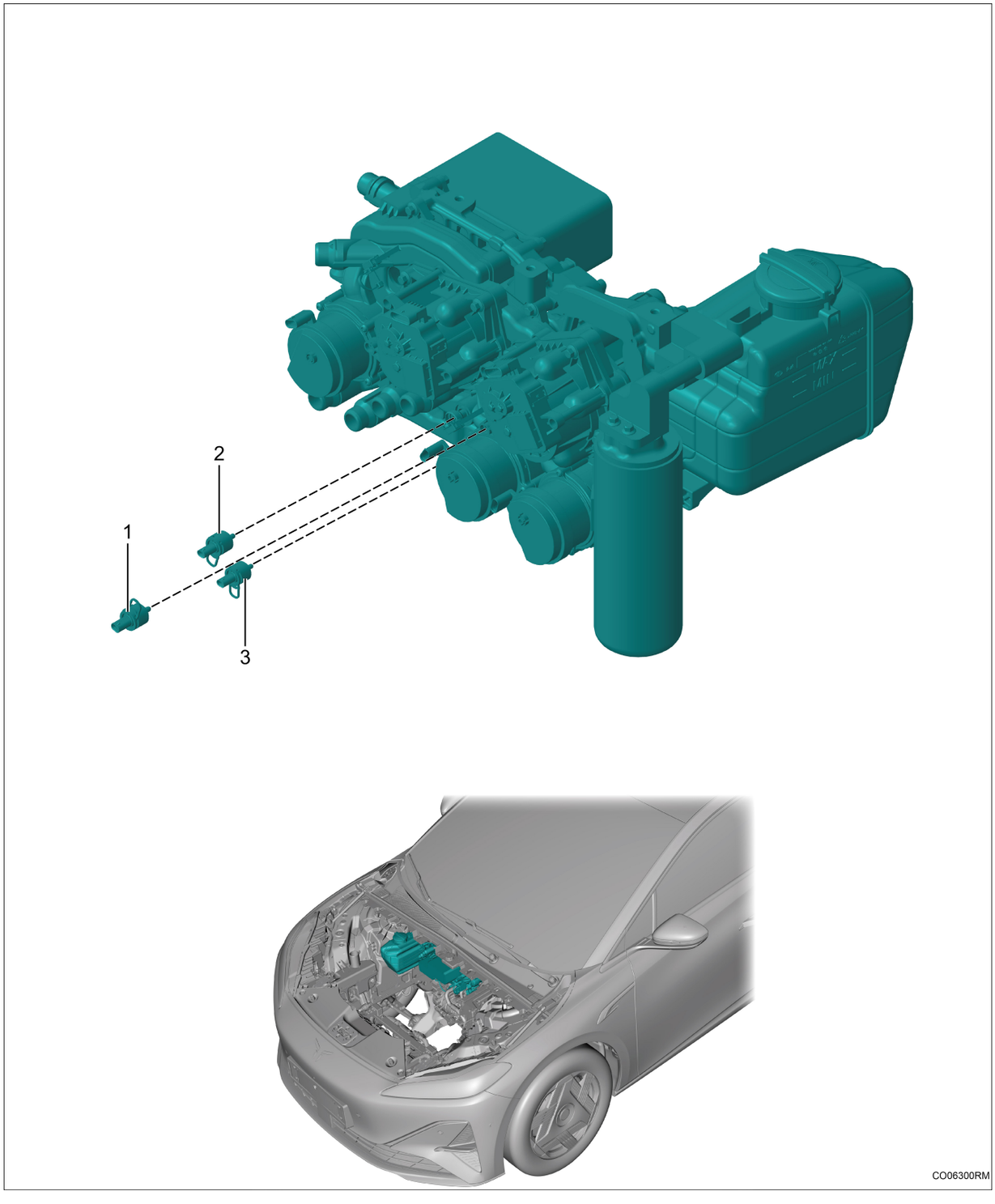
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   Notice:

   - **Oil: POE lubricant.**
   - **Apply oil to the O-ring before installation.**
   - **Tightening order for bolt: Tighten diagonally.**
   - **If the sealing gasket is dirty or damaged, it cannot be reused and should be replaced with a new one.**
   - **Pay attention to distinguishing between 60 W water pump and 110 W water pump.**

Thermal management module water temperature sensor

Components

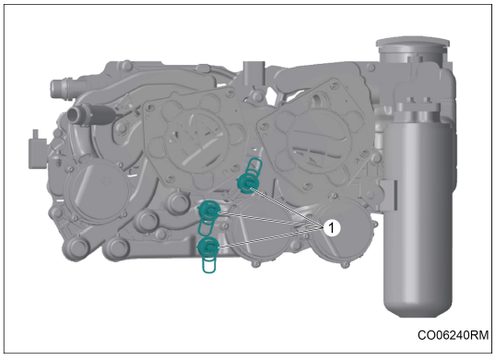


1. **Coolant temperature sensor**
2. **Coolant temperature sensor**
3. **Coolant temperature sensor**

RE

Removal

1. **Remove thermal management integrated module assembly (See page RE-98)**
2. **Remove thermal management module coolant temperature sensor**



(a) Pull out the snap spring of coolant temperature sensor and remove the coolant temperature sensor -1-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **When using a tool to remove the snap spring, do not scratch manifold.**

Installation

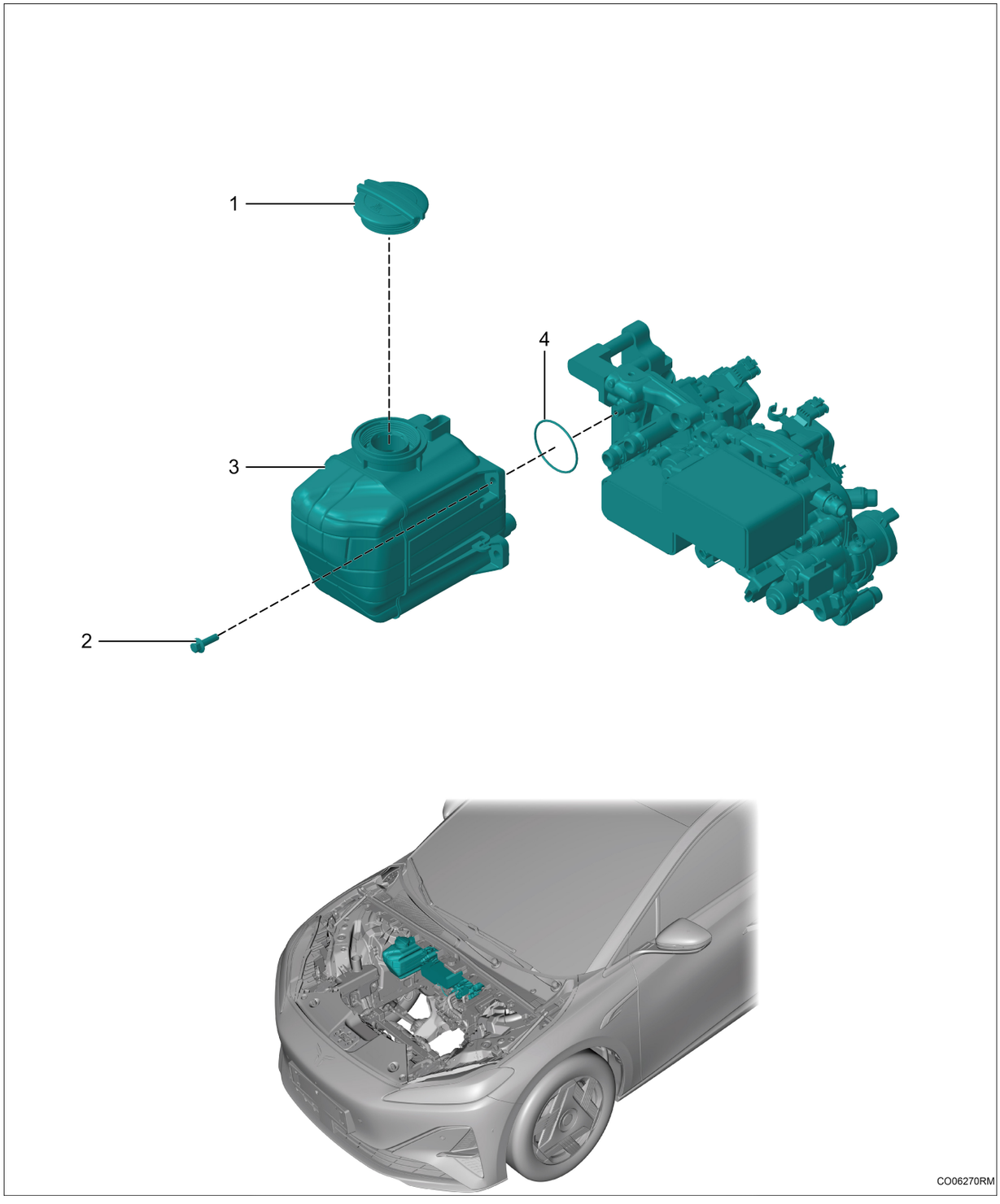
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**
- **When using a tool to remove the snap spring, do not scratch manifold.**

Thermal management module expansion tank

Components



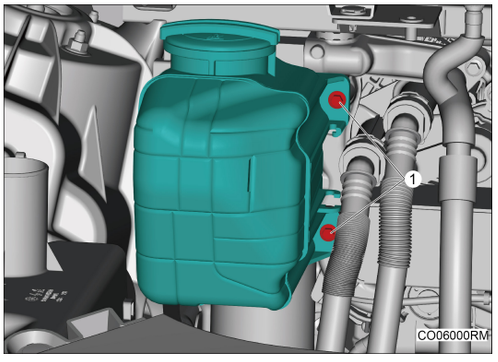
1. **Expansion tank cap**
2. **Bolt**
   - X3

- Torque: 8 ~ 10 N • m

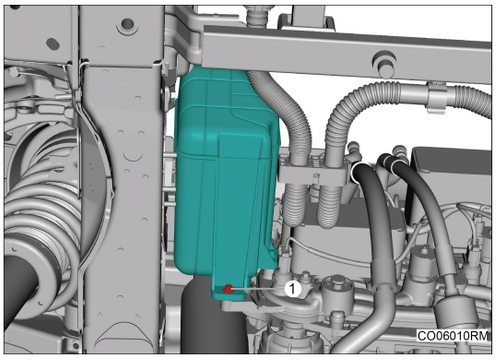
3. **Expansion tank**
4. **O-ring**

Removal

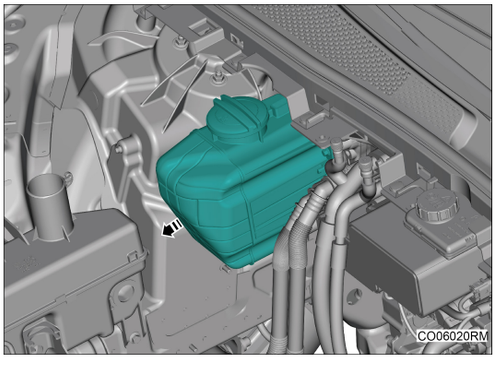
1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Remove expansion tank**



(a) Remove the bolt -1-.



(b) Remove the lower bolt -1- from expansion tank.



(c) Remove the expansion tank in the direction of -arrow-.

Notice:

- **If the O-ring of the expansion tank is dirty or damaged, it cannot be reused and should be replaced with a new one.**

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

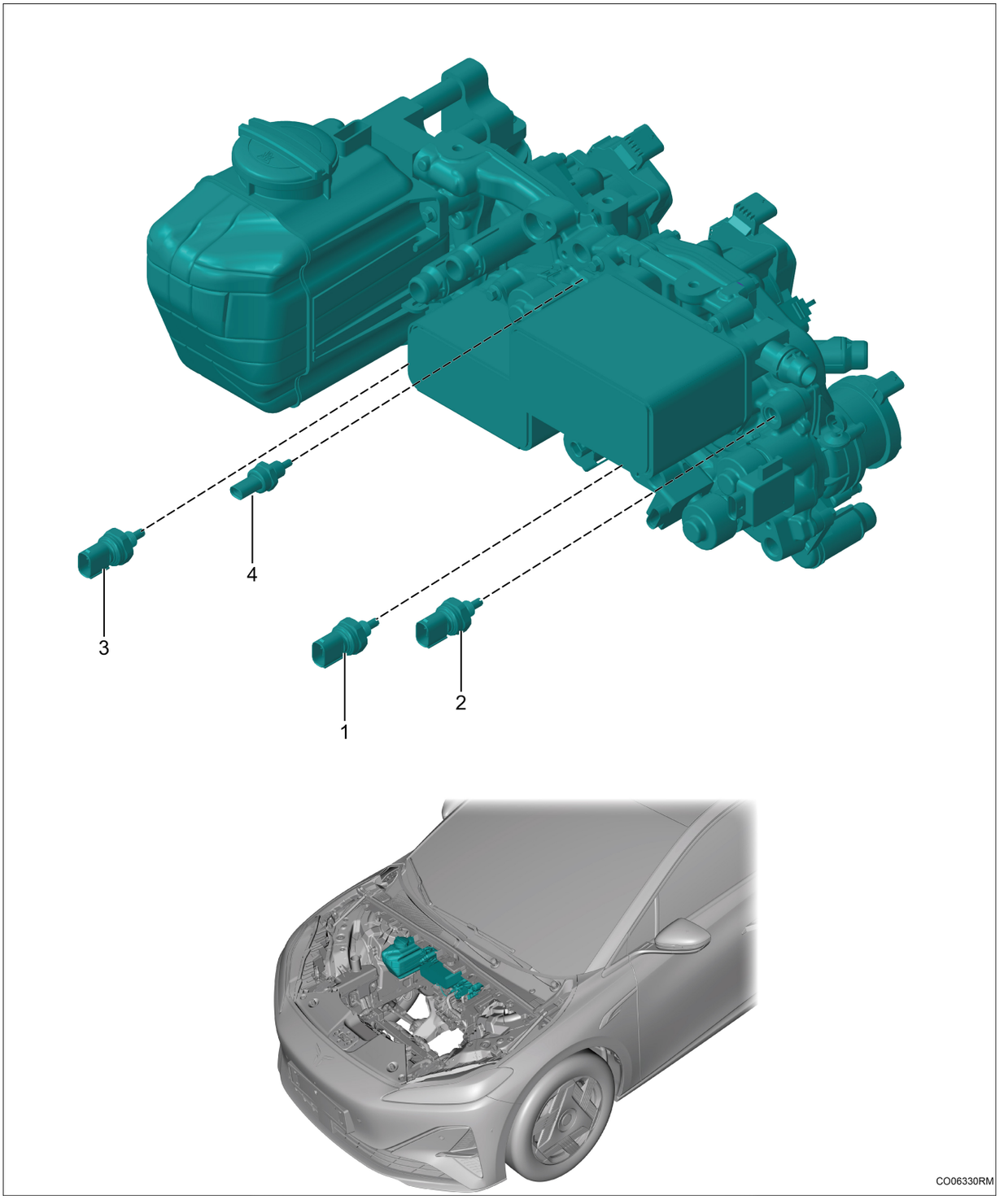
Notice:

- **Oil: Methyl silicone oil.**
- **Apply oil to the O-ring before installation.**
- **If the O-ring and sealing gasket are dirty, damaged, they cannot be reused and should be replaced with new ones.**

Thermal management module high pressure PT and low pressure PT

Components

RE

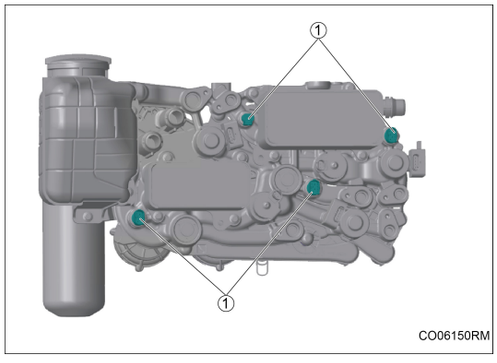


1. **High pressure PT**
2. **High pressure PT**
3. **High pressure PT**

4. Low pressure PT

Removal

1. **Remove front compartment storage box (See page WS-83)**
2. **Remove engine bottom protector (See page WS-40)**
3. **Drain coolant (See page RE-76)**
4. **Recover refrigerant from refrigerant system (See page RE-1)**
5. **Remove thermal management module SOV coil (See page RE-115)**
6. **Remove thermal management module high pressure PT and low pressure PT**



(a) Use the socket to remove the high pressure PT and low pressure PT -1-.

Notice:

- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

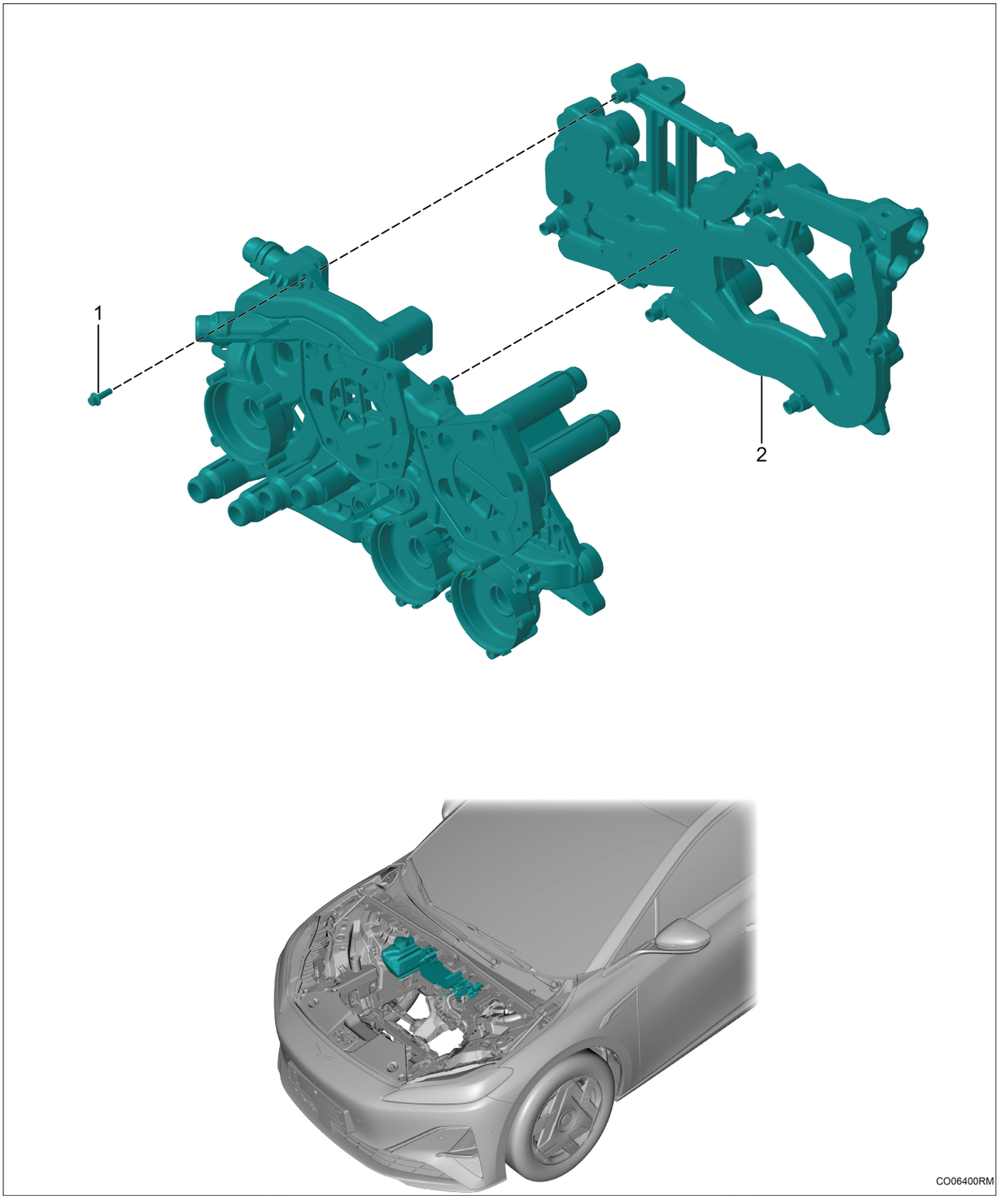
Notice:

- **Oil: POE lubricant.**
- **Pay attention to the tightening position of high pressure PT (black) and low pressure PT (white) to prevent screwing incorrectly.**
- **If the O-ring is dirty, damaged, it cannot be reused and should be replaced with a new one.**

Thermal management module manifold and brazed valve plate

Components

RE



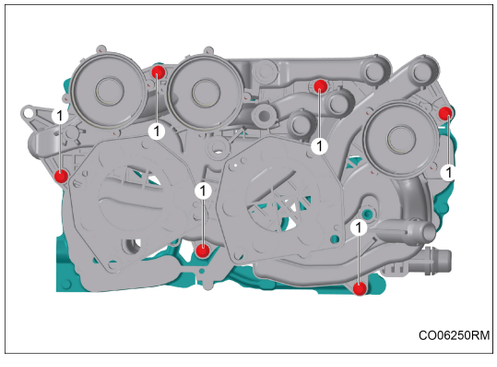
1. Hexagon flange bolt

- X7
- Torque: 8 ~ 10 N • m

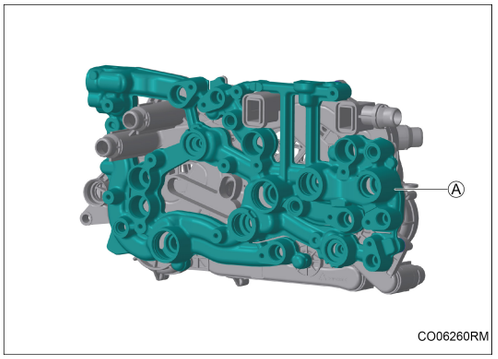
2. Manifold and brazed valve plate

Removal

1. **Remove thermal management integrated module assembly (See page RE-98)**
2. **Remove thermal management ACC (See page RE-102)**
3. **Remove thermal management module Chiller (See page RE-104)**
4. **Remove thermal management module CV valve (See page RE-107)**
5. **Remove thermal management module EXV and ERV valve cores (See page RE-112)**
6. **Remove thermal management module EXV and ERV coils (See page RE-109)**
7. **Remove thermal management module SOV valve core (See page RE-117)**
8. **Remove thermal management module SOV coil (See page RE-115)**
9. **Remove thermal management module high pressure PT and low pressure PT (See page RE-132)**
10. **Remove thermal management module expansion tank (See page RE-129)**
11. **Remove thermal management module water pump (See page RE-124)**
12. **Remove thermal management module water-cooled condenser (See page RE-121)**
13. **Remove thermal management module coolant temperature sensor (See page RE-127)**
14. **Remove thermal management module five-way valve (See page RE-119)**
15. **Remove thermal management module manifold and brazed plate**



(a) Remove the bolt -1-.



(b) Remove the manifold and brazed valve plate -A-.

RE

Installation

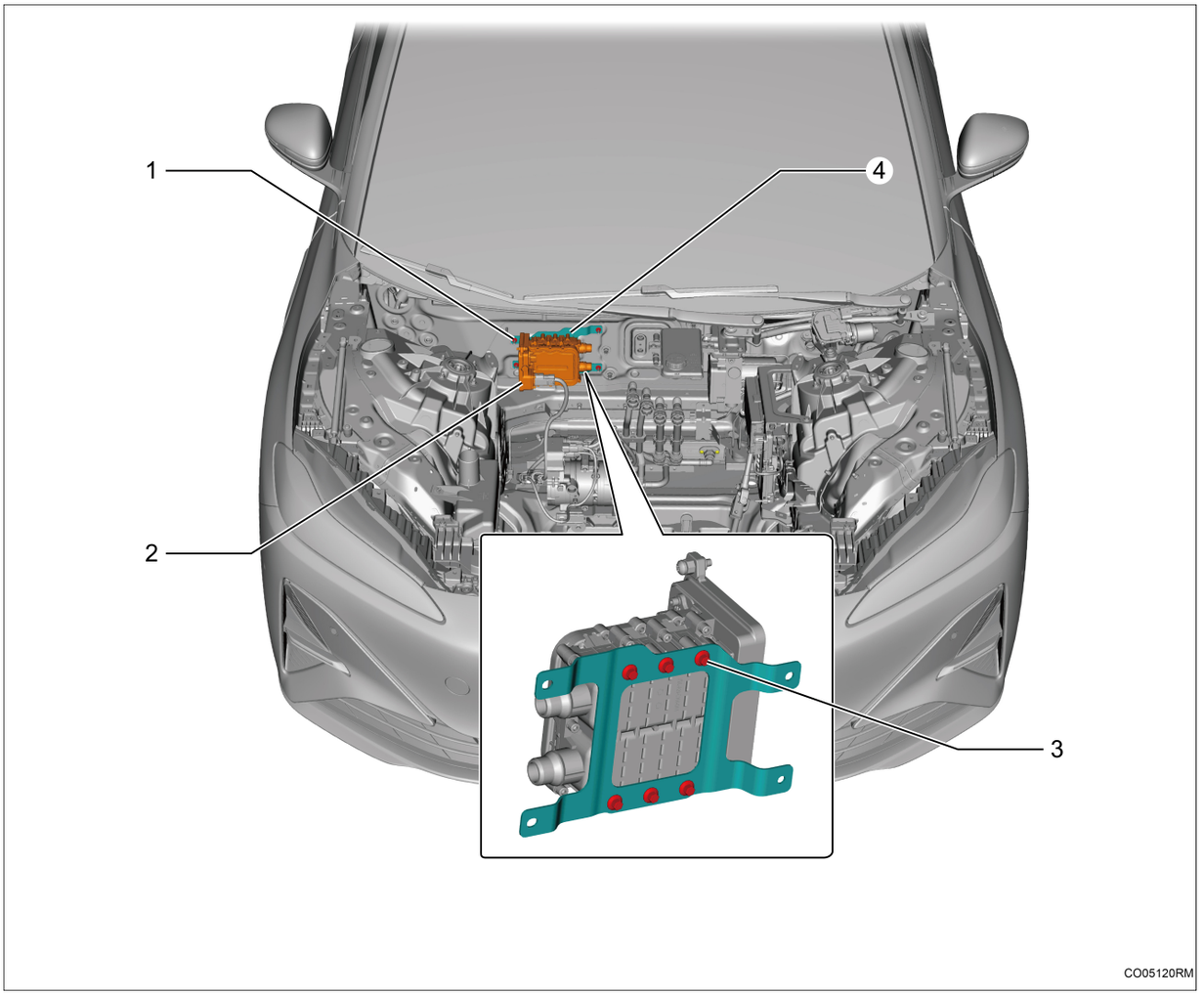
1. **Installation is in the reverse order of removal**

   Notice:

   - **Tightening order for screw: Tighten diagonally.**

High pressure water heating heater assembly

Components

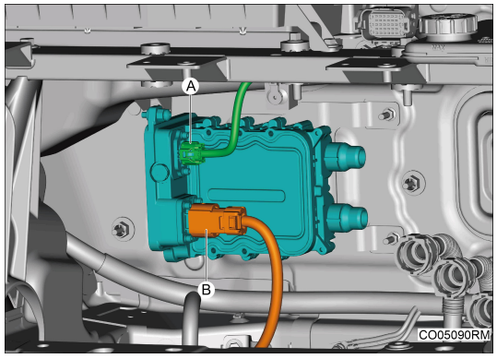


1. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
2. **High pressure water heating heater assembly**
3. **Bolt**
   - X6
   - Torque: 8 ~ 10 N • m
4. **High pressure water heating heater bracket**

Removal

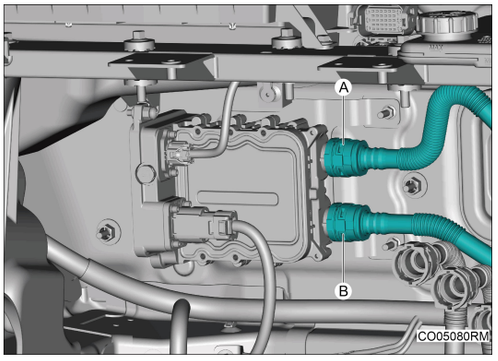
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Detach service switch (See page DL-17)**

   Caution:
   - **Detach service switch and wait for the high voltage components to discharge completely, then wait for 5 minutes before proceeding.**
   - **Wear insulation gloves.**
3. **Remove engine bottom protector (See page WS-40)**
4. **Remove front compartment storage box assembly (See page WS-83)**
5. **Remove water channel cover plate assembly (See page WS-86)**
6. **Drain coolant (See page RE-76)**
7. **Remove thermal management integrated module assembly (See page RE-98)**
8. **Remove high pressure water heating heater assembly**



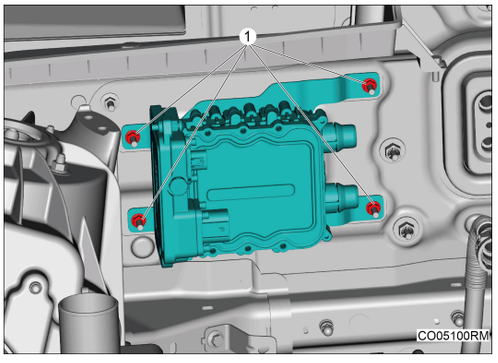
(a) Disconnect the low voltage wire harness connector -A-.

(b) Disconnect the high voltage wire harness connector -B-.



(c) Detach the connector -A- and disconnect the PTC outlet pipe assembly.

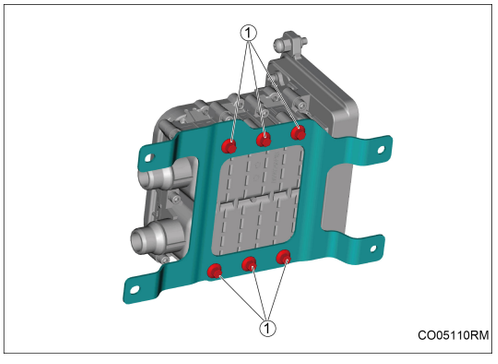
(d) Detach the connector -B- and disconnect the PTC inlet pipe assembly.



(e) Remove the nut -1-.

(f) Remove the high pressure water heating heater with bracket assembly.

9. Remove high pressure water heating heater bracket



(a) Remove the bolt -1-.

(b) Remove the high pressure water heating heater bracket.

Installation

1. Installation is in the reverse order of removal.

Body door cover

Doors & front compartment cover system

Front wing CS-1
Door assembly CS-6
Door control system CS-12
Front door power glass regulator assembly CS-15
Rear door power glass regulator assembly CS-19
Trailer identification controller CS-23
Front compartment cover assembly CS-25
Front compartment cover air spring assembly CS-28
Luggage compartment door assembly CS-31
Luggage compartment door electric support rod assembly CS-35

Door lock system

Door lock assembly CS-38
Door outside handle CS-44
Front compartment cover lock assembly CS-49
Front compartment cover opening cable assembly CS-53
Luggage compartment door lock assembly CS-56

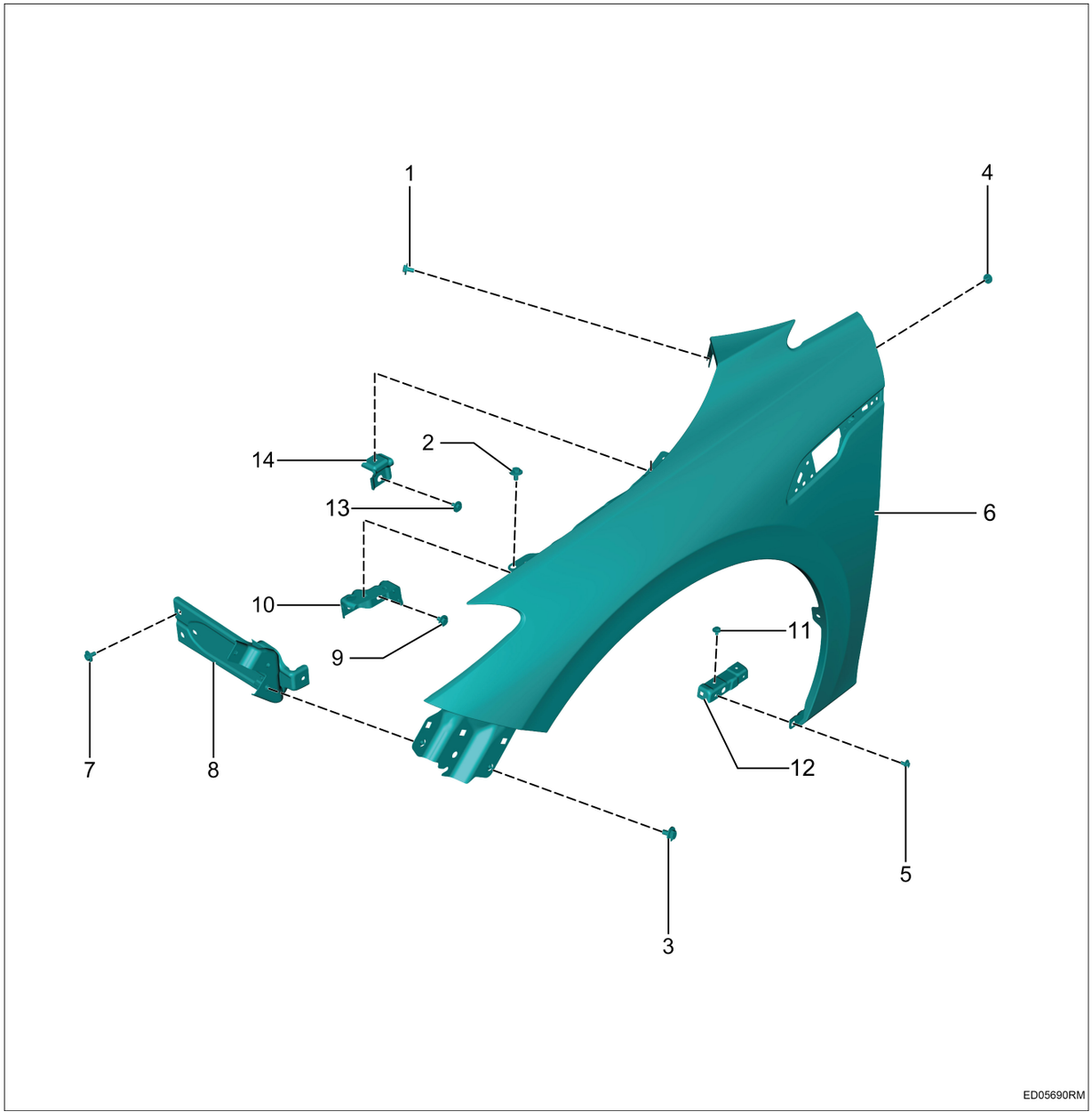
Windshield glass

Quarter window CS-1
Front windshield assembly CS-3
Rear windshield assembly CS-7
Sunroof assembly CS-11

Doors & front compartment cover system

Front wing

Components



1. **Combination bolt**
   - Torque: 6 ~ 12 N • m
2. **Combination bolt**
   - X3
   - Torque: 6 ~ 12 N • m
3. **Combination bolt**

- X3
- Torque: 6 ~ 12 N • m

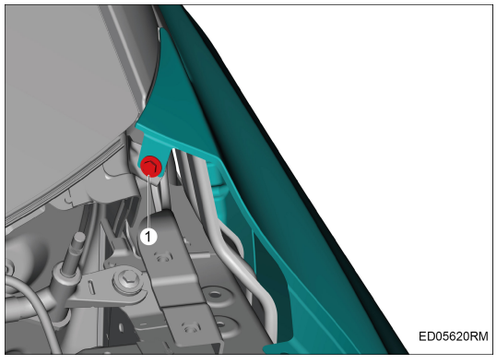
4. **Combination bolt**
   - Torque: 6 ~ 12 N • m
5. **Combination bolt**
   - X2
   - Torque: 6 ~ 12 N • m
6. **Front left wing assembly**
7. **Combination bolt**
   - X2
   - Torque: 6 ~ 12 N • m
8. **Front left wing connecting plate assembly**
9. **Combination bolt**
   - X2
   - Torque: 6 ~ 12 N • m
10. **Wing bracket I assembly**
11. **Combination bolt**
    - X2
    - Torque: 6 ~ 12 N • m
12. **Wing bracket II assembly**
13. **Combination bolt**
    - Torque: 6 ~ 12 N • m
14. **Wing bracket II assembly**

Removal

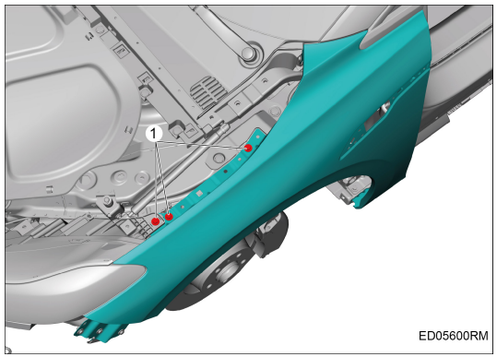
Note:

- Use same removal orders for right and left sides.

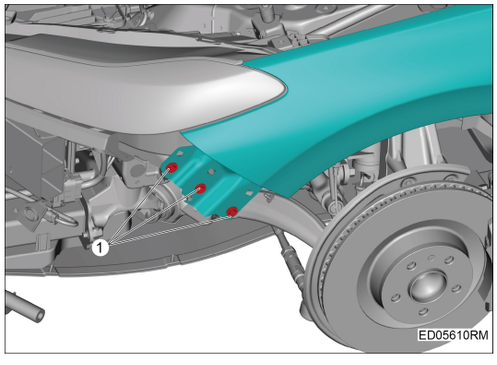
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front wheel protector assembly (See page WS-32)**
3. **Remove front bumper assembly (See page WS-1)**
4. **Remove water channel cover plate assembly (See page WS-86)**
5. **Remove left doorsill trim panel assembly (See page WS-111)**
6. **Remove left wing rear protector (See page WS-92)**
7. **Remove wing trim strip (See page WS-104)**
8. **Remove front left wing assembly**



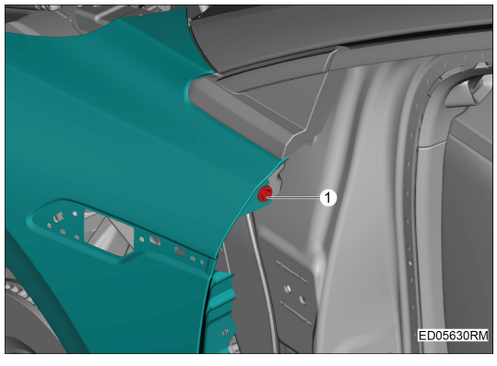
(a) Remove the bolt -1-.



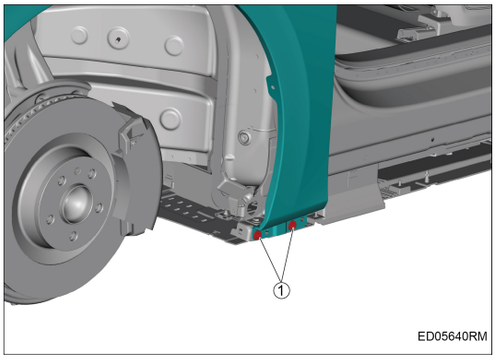
(b) Remove the bolt -1-.



(c) Remove the bolt -1-.



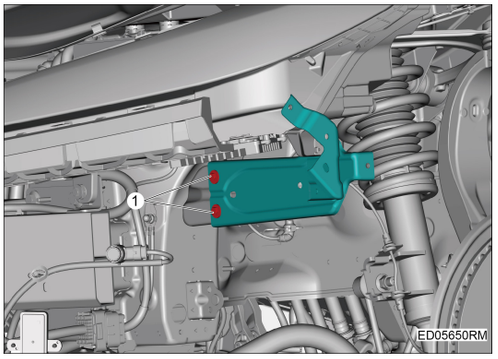
(d) Remove the bolt -1-.



(e) Remove the bolt -1-.

CS

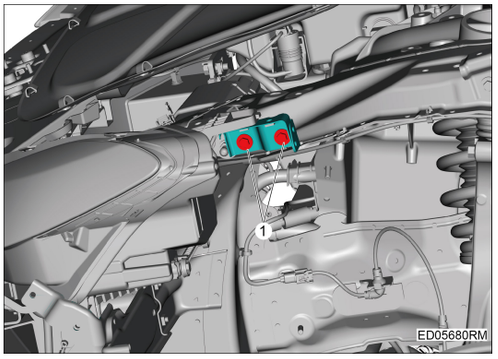
9. Front left wing connecting plate assembly



(a) Remove the bolt -1-.

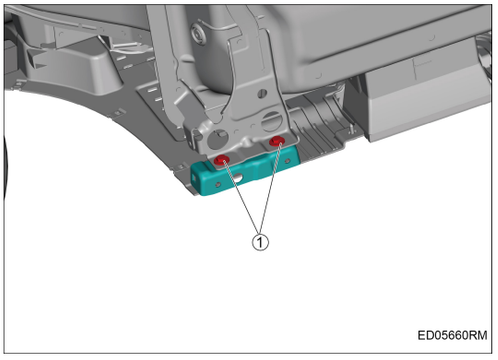
(b) Remove the front left wing connecting plate assembly.

10. Remove wing bracket I assembly

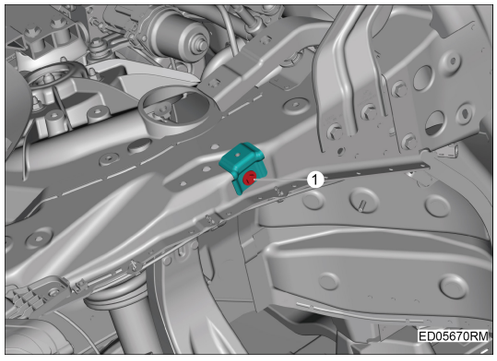


(a) Remove the bolt -1-.

11. Remove wing bracket II assembly



(a) Remove the bolt -1-.



(b) Remove the bolt -1-.

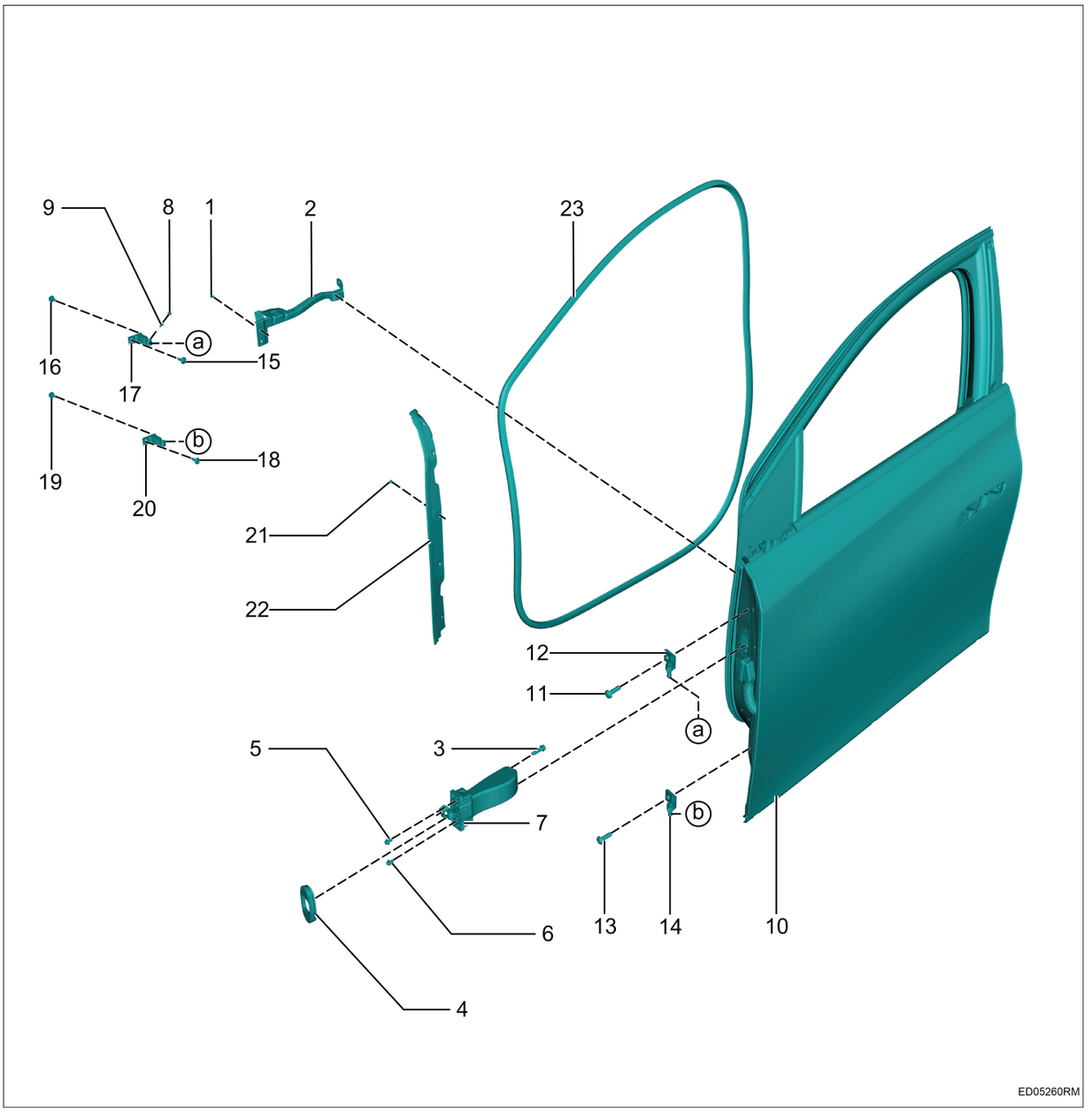
Installation

1. Installation is in the reverse order of removal.

CS

Door assembly

Components



1. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 12 N • m
2. **Front left door armrest bracket**
3. **Hexagon flange bolt**
   - Torque: 21.3 ~ 31.9 N • m
4. **Front door check block cover**
5. **Hexagon flange bolt**

- Torque: 21.3 ~ 31.9 N • m

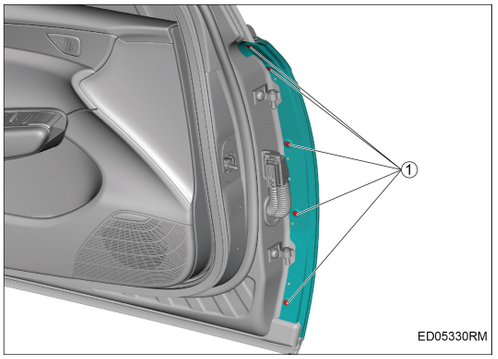
6. **Hexagon flange bolt**
   - Torque: 21.3 ~ 31.9 N • m
7. **Door check assembly**
8. **Tighten screw protector**
9. **Tighten screw**
10. **Door assembly**
11. **Inner hexagon pan head screw**
    - Torque: 8 ~ 12 N • m
12. **Door upper hinge door hinge assembly**
13. **Inner hexagon pan head screw**
    - Torque: 8 ~ 12 N • m
14. **Door lower hinge door hinge assembly**
15. **Hexagon flange bolt**
    - Torque: 21.3 ~ 31.9 N • m
16. **Hexagon flange bolt**
    - Torque: 21.3 ~ 31.9 N • m
17. **Door upper hinge body hinge assembly**
18. **Hexagon flange bolt**
    - Torque: 21.3 ~ 31.9 N • m
19. **Hexagon flange bolt**
    - Torque: 21.3 ~ 31.9 N • m
20. **Door lower hinge body hinge assembly**
21. **Clip**
22. **Door anti-noise weatherstrip assembly**
23. **Door anti-noise weatherstrip assembly**

Removal

Note:

- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front door protector (See page NS-111)**
3. **Remove front left door anti-noise weatherstrip**

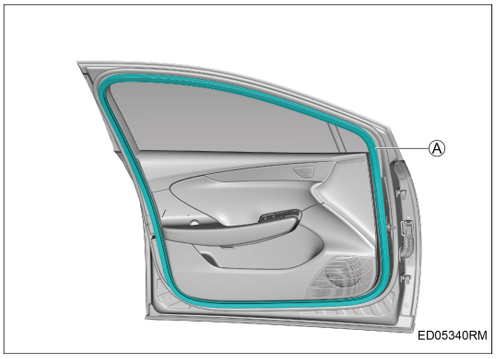


(a) Remove the clip -1-.

(b) Remove the front left door anti-noise weatherstrip.

CS

4. Remove front left door anti-noise weatherstrip assembly



(a) Remove the front left door anti-noise weatherstrip assembly -A-.

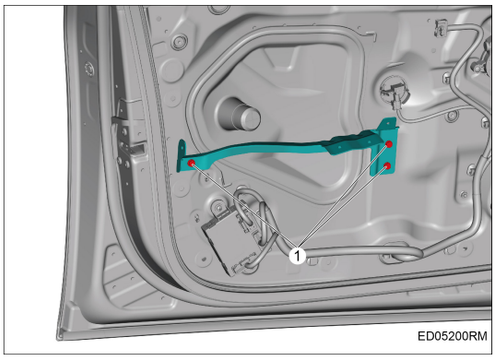
5. Remove front door power glass regulator assembly (See page CS-15)

6. Remove outside rear view mirror assembly (See page WS-74)

7. Remove door lock body assembly (See page CS-38)

8. Remove door control intelligent terminal assembly (See page CS-12)

9. Remove front left door armrest bracket



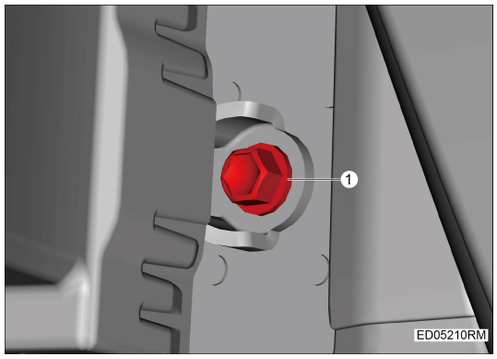
(a) Remove the bolt -1-.

10. Remove front door speaker assembly (See page ZC-93)

11. Remove front door check assembly

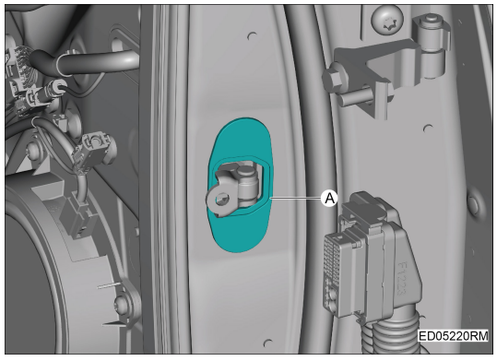
Note:

- Use same removal sequence for all door.

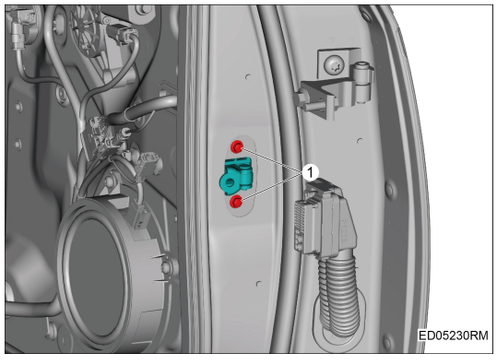


(a) Remove the bolt -1-.

(b) Detach the front door check assembly.



(c) Remove the front door check block cover -A-.



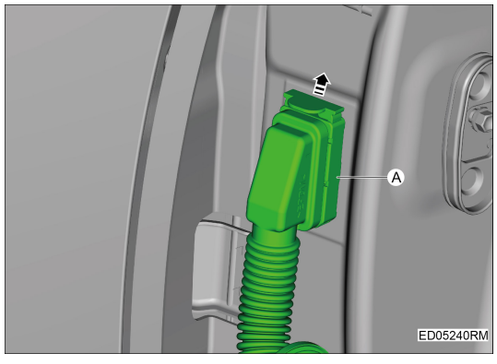
(d) Remove the bolt -1-.

(e) Remove the door check assembly.

12. Remove front left door assembly

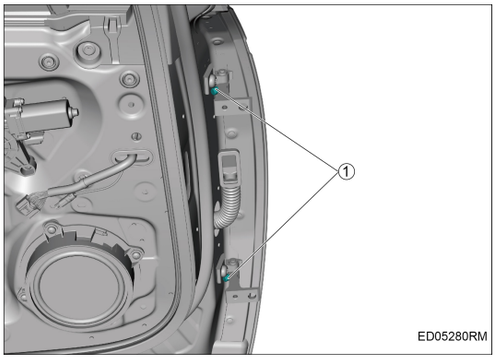
Note:

- Use same removal sequence for all door.

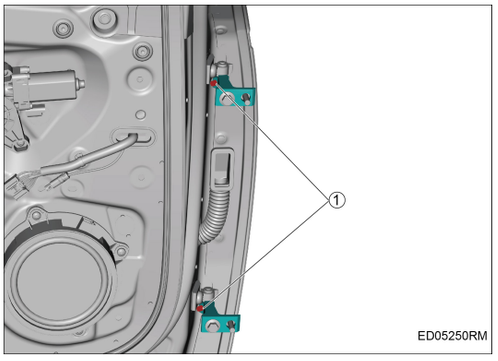


(a) Lift locking device in direction of -arrow-.

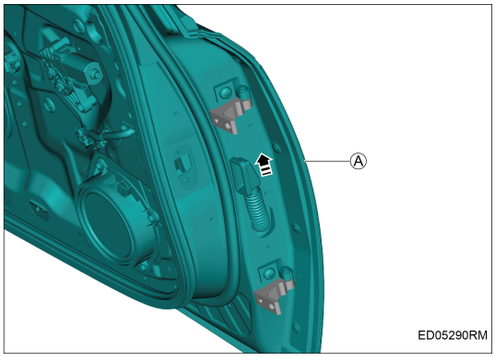
(b) Disconnect the wire harness connector -A-.



(c) Detach the tightening screw protector -1-.



(d) Detach the tightening screw -1-.



(e) Lift in direction of -arrow- and remove the front left door assembly -A-.

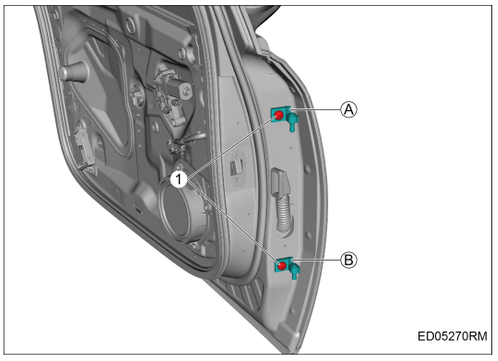
Notice:

- **Two people are required to remove front left door assembly.**

13. Remove front left door hinge door hinge

Note:

- Use same removal sequence for all door.



(a) Remove the bolt -1-.

(b) Remove the front left door hinge door hinges -A-B-.

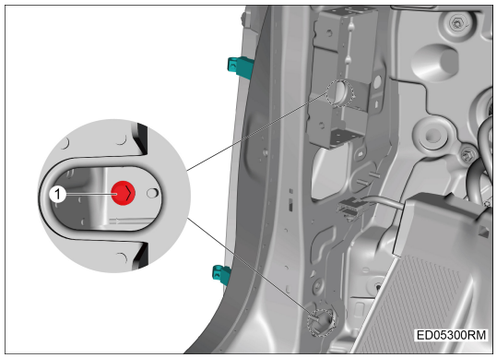
14. Remove instrument panel body (See page NS-40)

15. Remove B-pillar lower left protector (only for removal of rear door hinge body hinge) (See page NS-133)

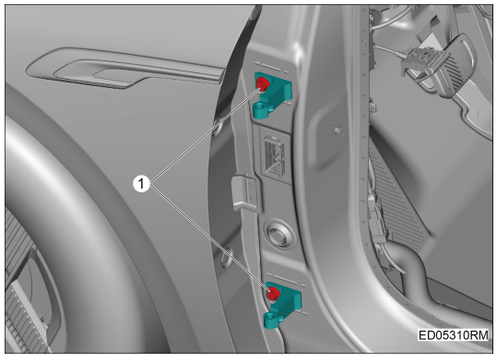
16. Remove door hinge body hinge

Note:

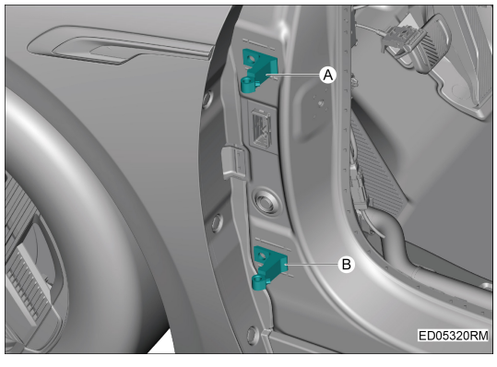
- Use same removal sequence for all door.



(a) Remove the bolt -1-.



(b) Remove the bolt -1-.



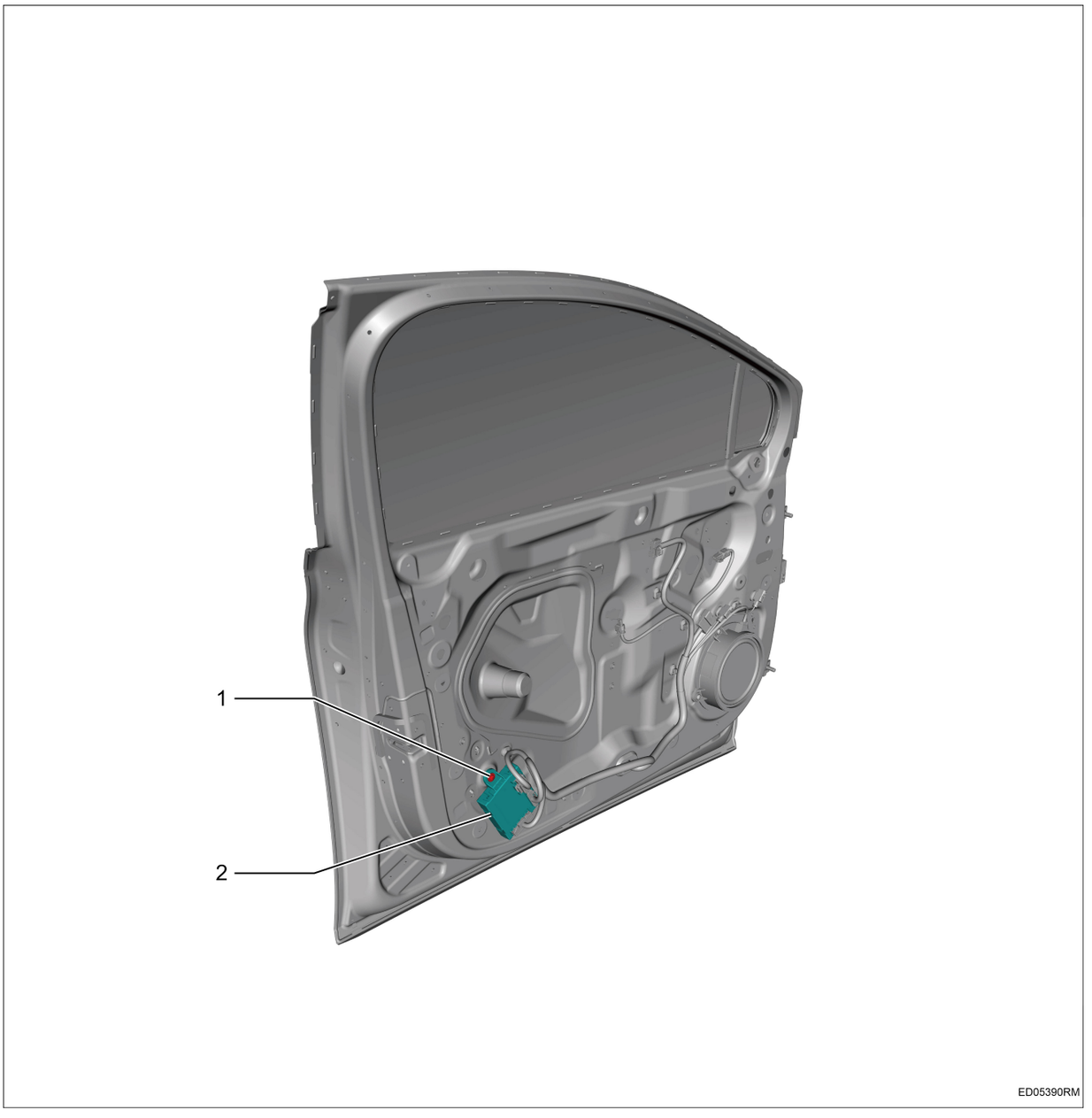
(c) Remove the front left door upper and lower hinge body hinges -A-B-.

Installation

1. Installation is in the reverse order of removal.

Door control system

Components



1. **Screw**
   - X2
   - Torque: 2.0 ~ 3.0 N • m
2. **Front left door control intelligent terminal assembly**

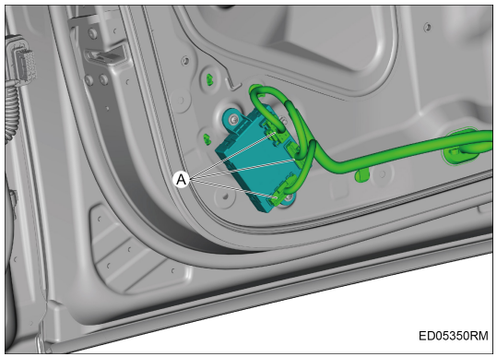
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front door protector (See page NS-111)**

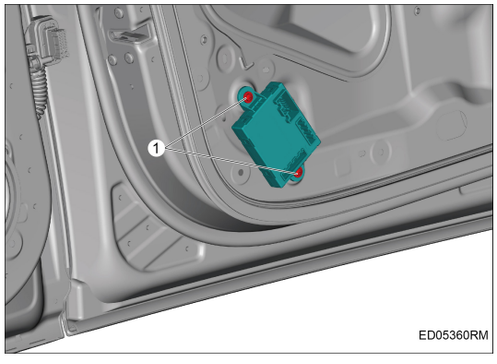
3. Remove front left door control intelligent terminal assembly

Note:

- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.



(b) Remove the screw -1-.

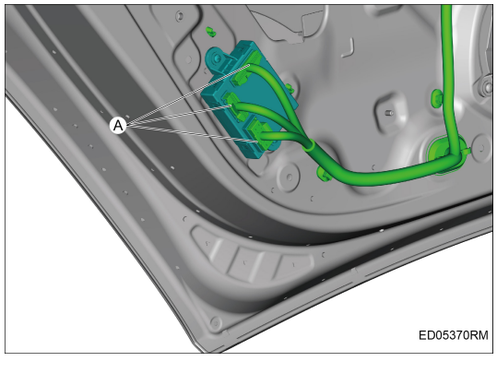
(c) Remove the front left door control intelligent terminal assembly.

4. Remove rear door protector (See page NS-111)

5. Remove rear left door control intelligent terminal assembly

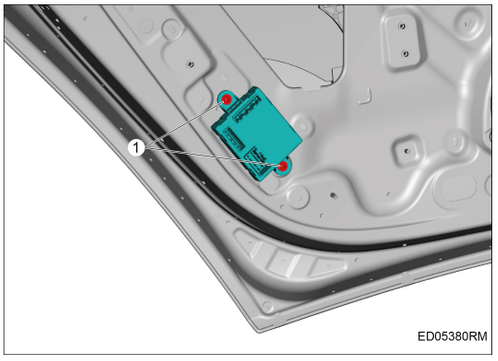
Note:

- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

CS



(b) Remove the screw -1-.

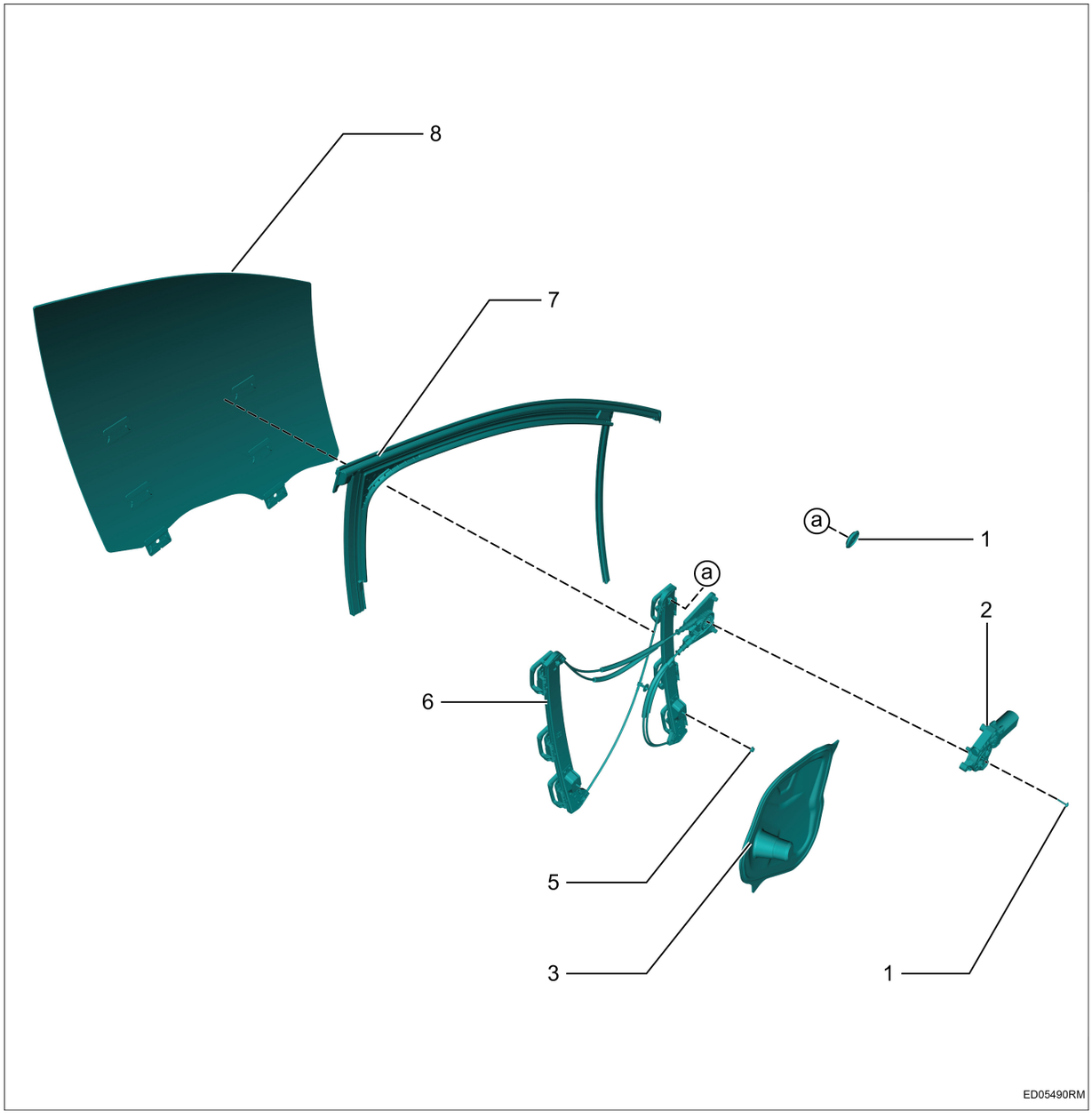
(c) Remove the rear left door control intelligent terminal assembly.

Installation

1. Installation is in the reverse order of removal.

Front door power glass regulator assembly

Components



1. **Screw**
   - X3
   - Torque: 2.5 ~ 3.5 N • m
2. **Front door power glass regulator motor**
3. **Front left door sealing curtain I**
4. **Block cover**
   - X3

5. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
6. **Front door power glass regulator assembly**
7. **Front door glass run assembly**
8. **Door glass**

Removal

Note:

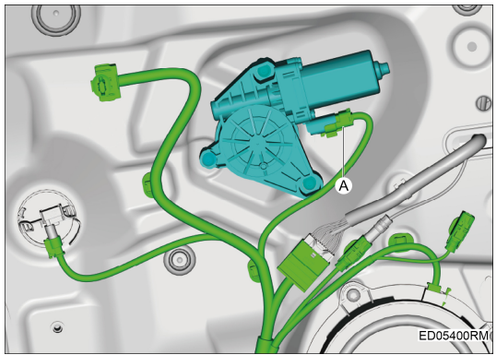
- Use same removal orders for right and left sides.

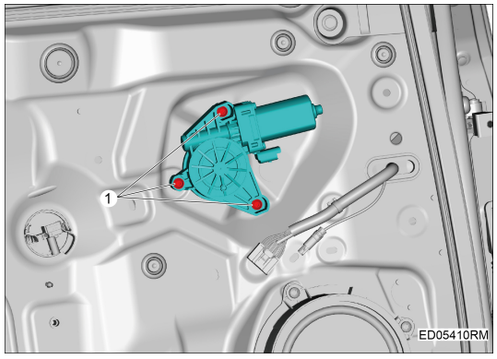
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front door protector (See page NS-111)**
3. **Remove front door power glass regulator assembly**

   Note:

   - Please lower the window glass in the middle position before removal.

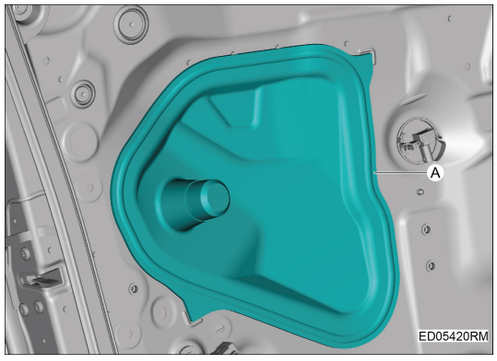
   (a) Disconnect the wire harness connector -A-.



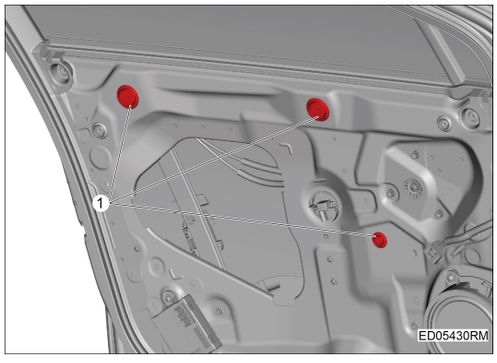


   (b) Remove the screw -1-.

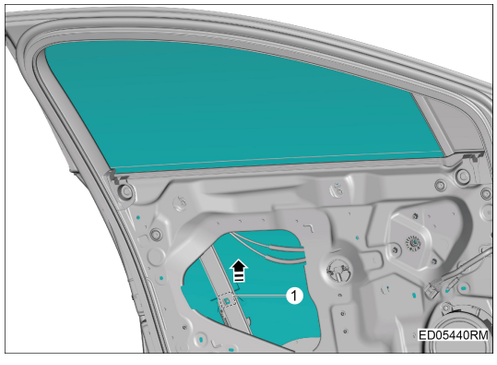
   (c) Remove the front left door regulator motor assembly.



(d) Remove the door sealing curtain -A-.

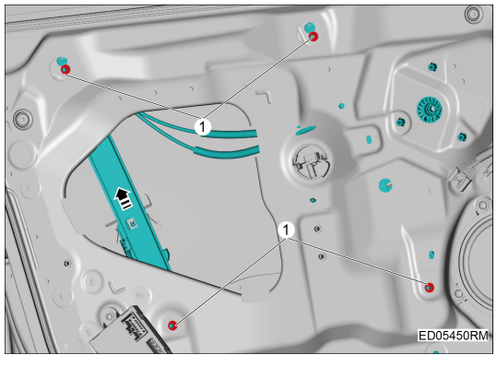


(e) Remove the block cover -1-.



(f) Use suitable tool to insert to hole -1- to push.

(g) Lift the front door glass in direction of -arrow-.

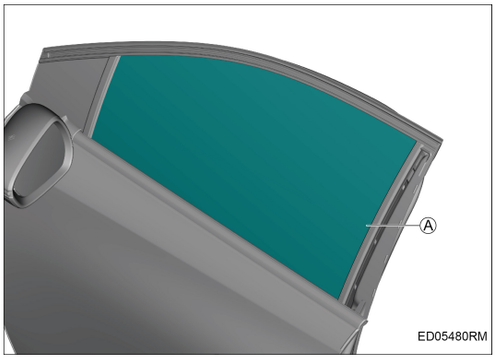


(h) Detach the nut -1-.

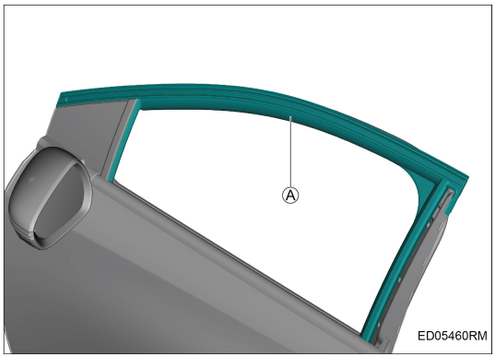
(i) Push in direction of -arrow- to remove front door glass regulator.

4. **Remove front left door B-pillar trim cover plate assembly (See page WS-116)**
5. **Remove front left door frame trim panel (See page NS-111)**
6. **Remove front door glass assembly**

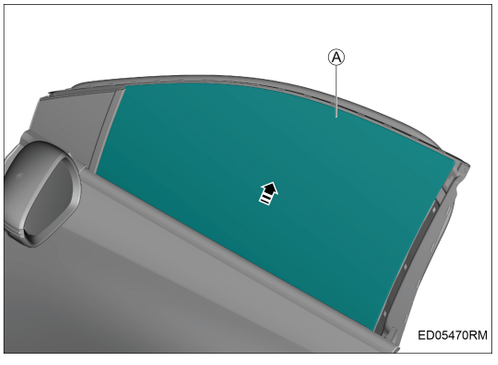
CS



(a) Push the front door glass assembly -A- inside the door.



(b) Remove the front door glass run assembly -A-.



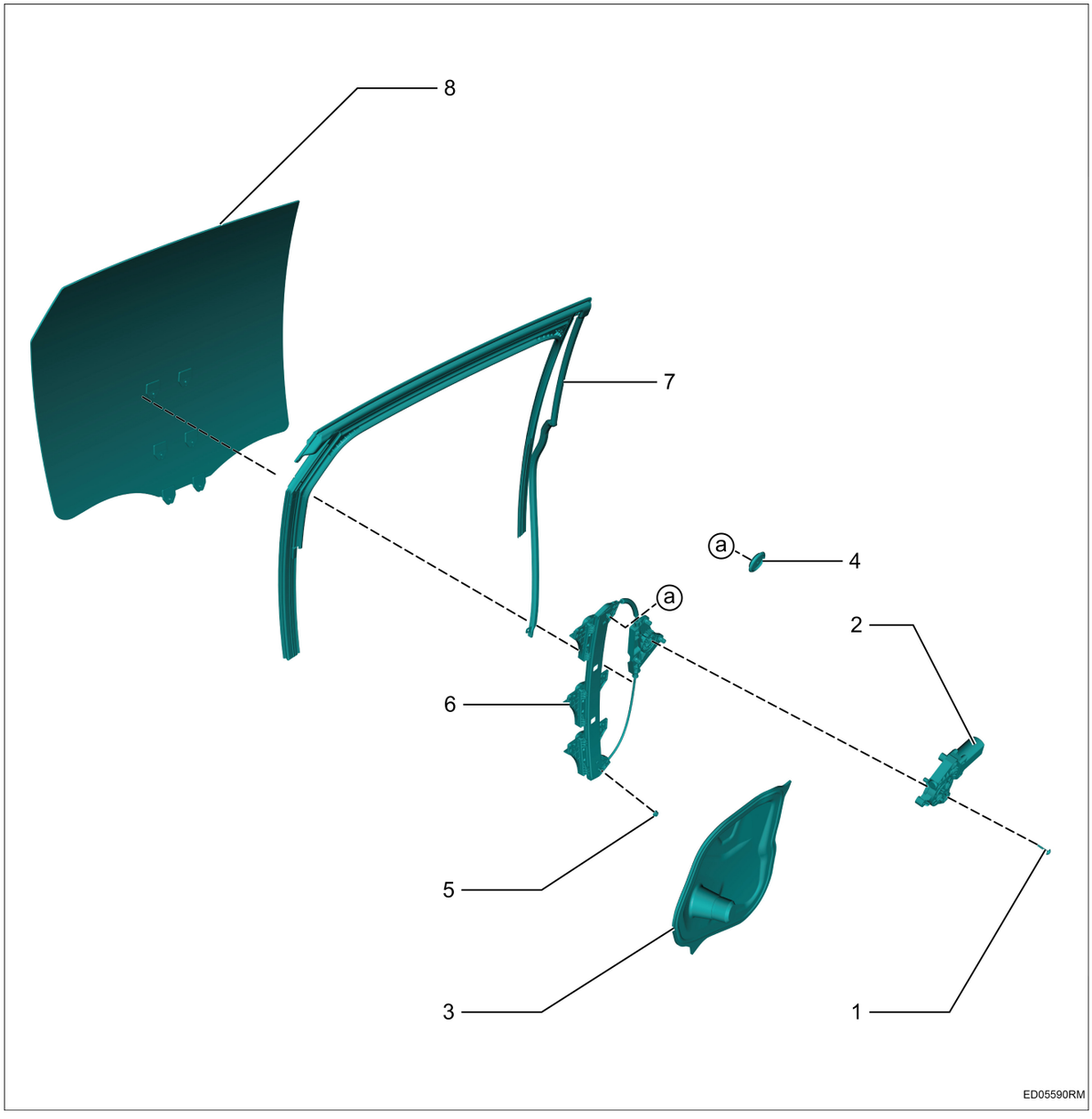
(c) Remove the front door glass assembly -A- in direction of -arrow-.

Installation

1. Installation is in the reverse order of removal.

Rear door power glass regulator assembly

Components



1. **Screw**
   - X3
   - Torque: 2.5 ~ 3.5 N • m
2. **Rear door power glass regulator motor**
3. **Rear left door sealing curtain I**
4. **Block cover**
   - X3

5. **Hexagon flange nut**
   - X4
   - Torque: 8.0 ~ 10.0 N • m
6. **Rear door power glass regulator assembly**
7. **Rear door glass run assembly**
8. **Door glass**

Removal

Note:

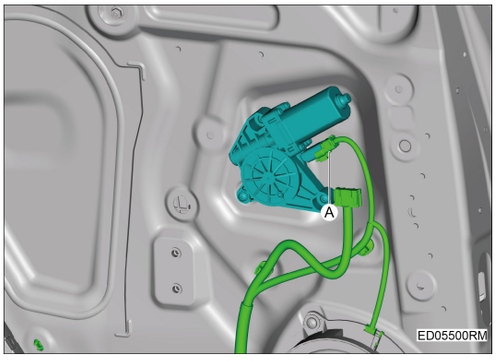
- Use same removal orders for right and left sides.

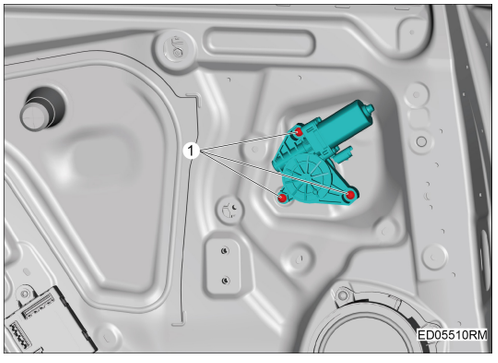
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear door protector (See page NS-111)**
3. **Remove rear door power glass regulator assembly**

   Note:

   - Please lower the window glass in the middle position before removal.

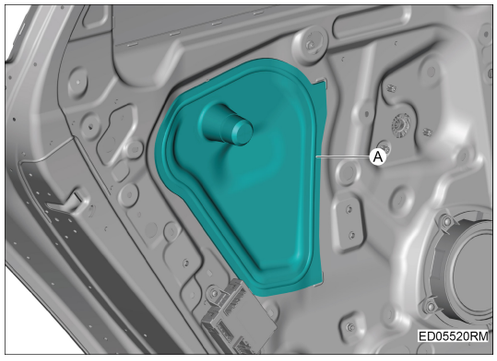
   (a) Disconnect the wire harness connector -A-.



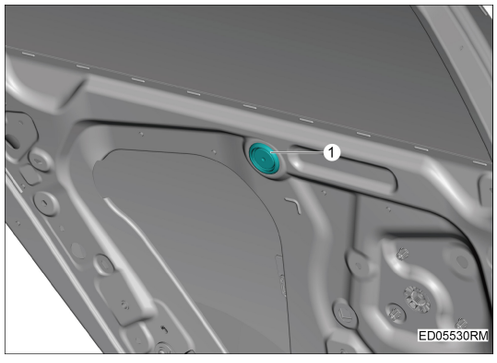


   (b) Remove the screw -1-.

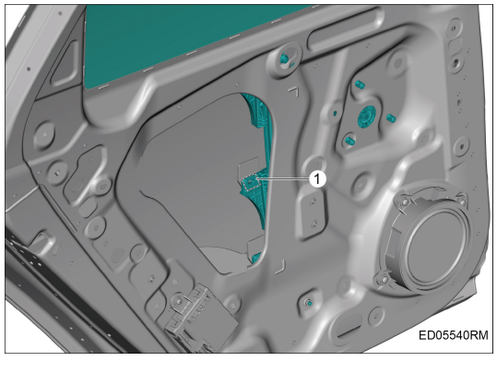
   (c) Remove the rear left door regulator motor assembly.



(d) Remove the door sealing curtain -A-.

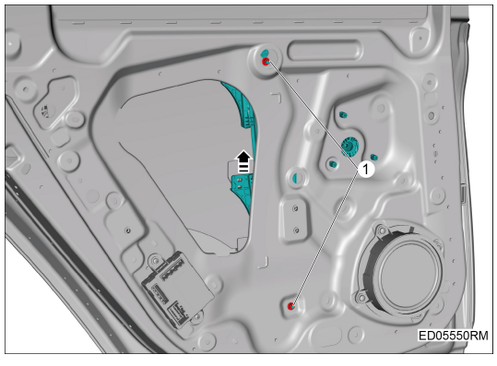


(e) Remove the block cover -1-.



(f) Use suitable tool to insert to hole -1- to push.

(g) Lift the rear door glass in direction of -arrow-.

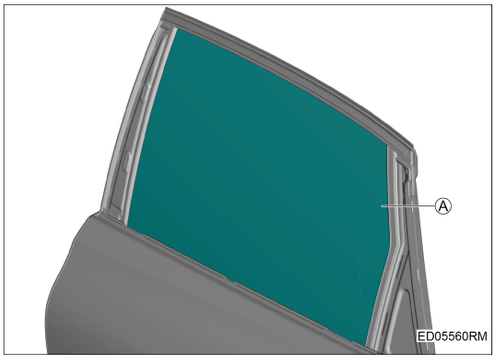


(h) Detach the nut -1-.

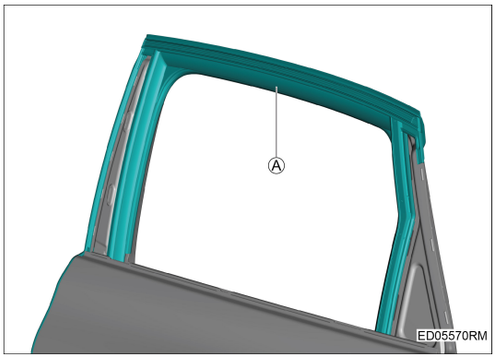
(i) Push in direction of -arrow- to remove rear door glass regulator.

4. **Remove rear left door B-pillar trim cover plate assembly (See page WS-116)**
5. **Remove rear left door frame trim panel (See page NS-111)**
6. **Remove rear door glass assembly**

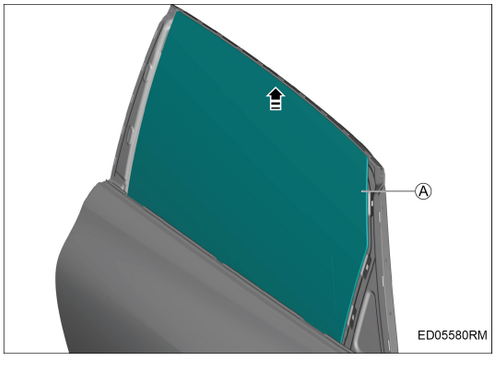
CS



(a) Push the rear door glass assembly -A- inside the door.



(b) Remove the rear door glass run assembly -A-.



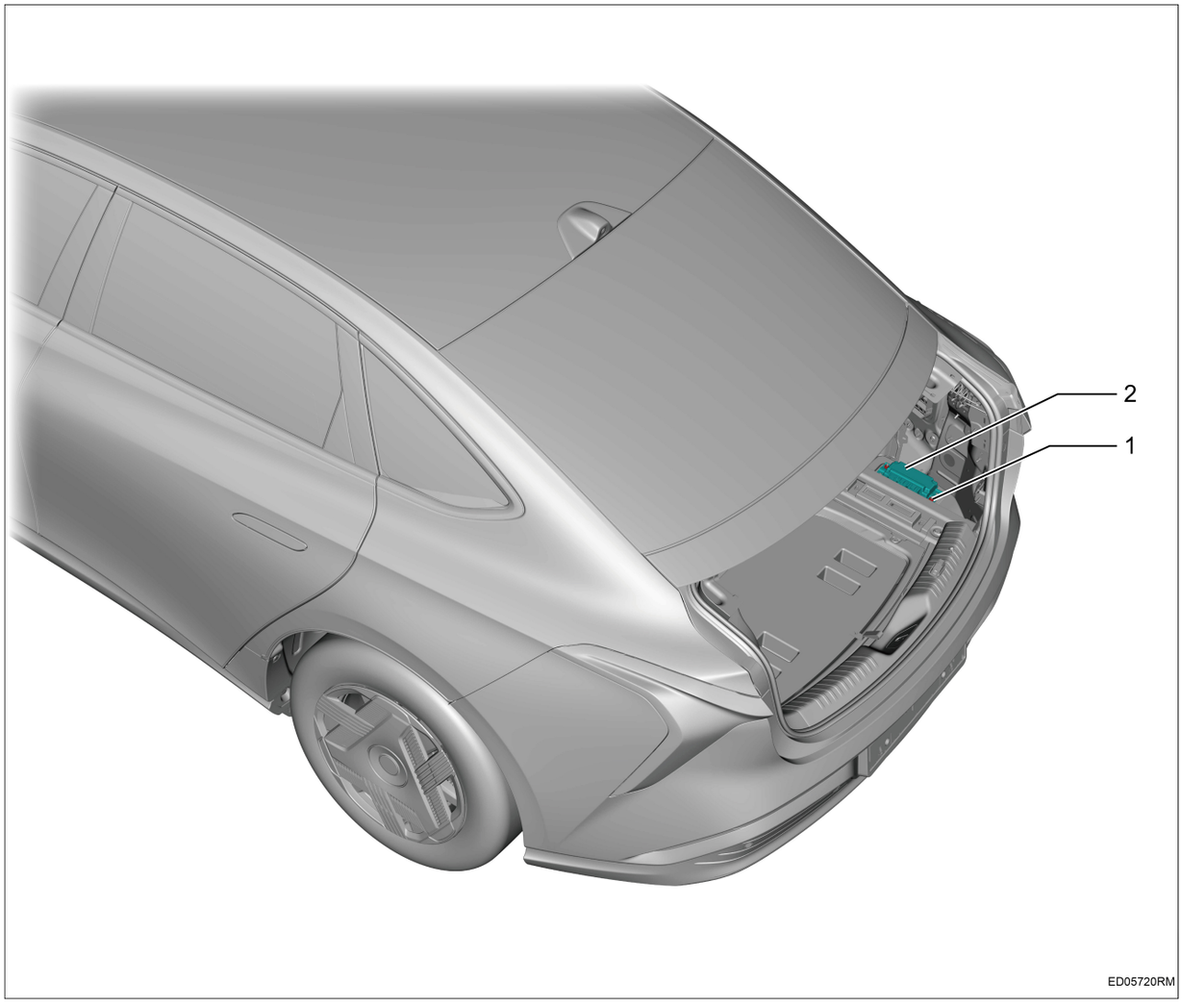
(c) Remove the rear door glass assembly -A- in the direction of -arrow-.

Installation

1. Installation is in the reverse order of removal.

Trailer identification controller

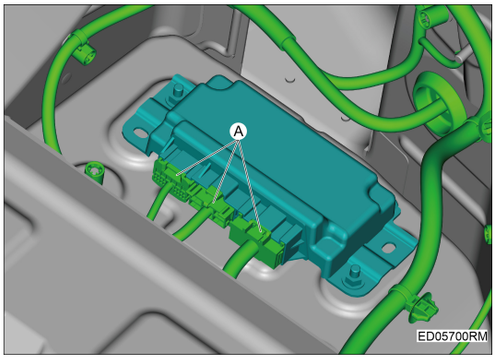
Components



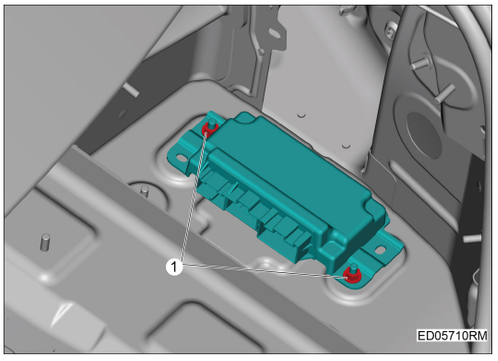
1. **Nut**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Trailer identification controller**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment right cover assembly (See page NS-157)**
3. **Remove subwoofer assembly (See page ZC-87)**
4. **Remove trailer identification controller**



(a) Detach the wire harness -A-.



(b) Remove the nut -1-.

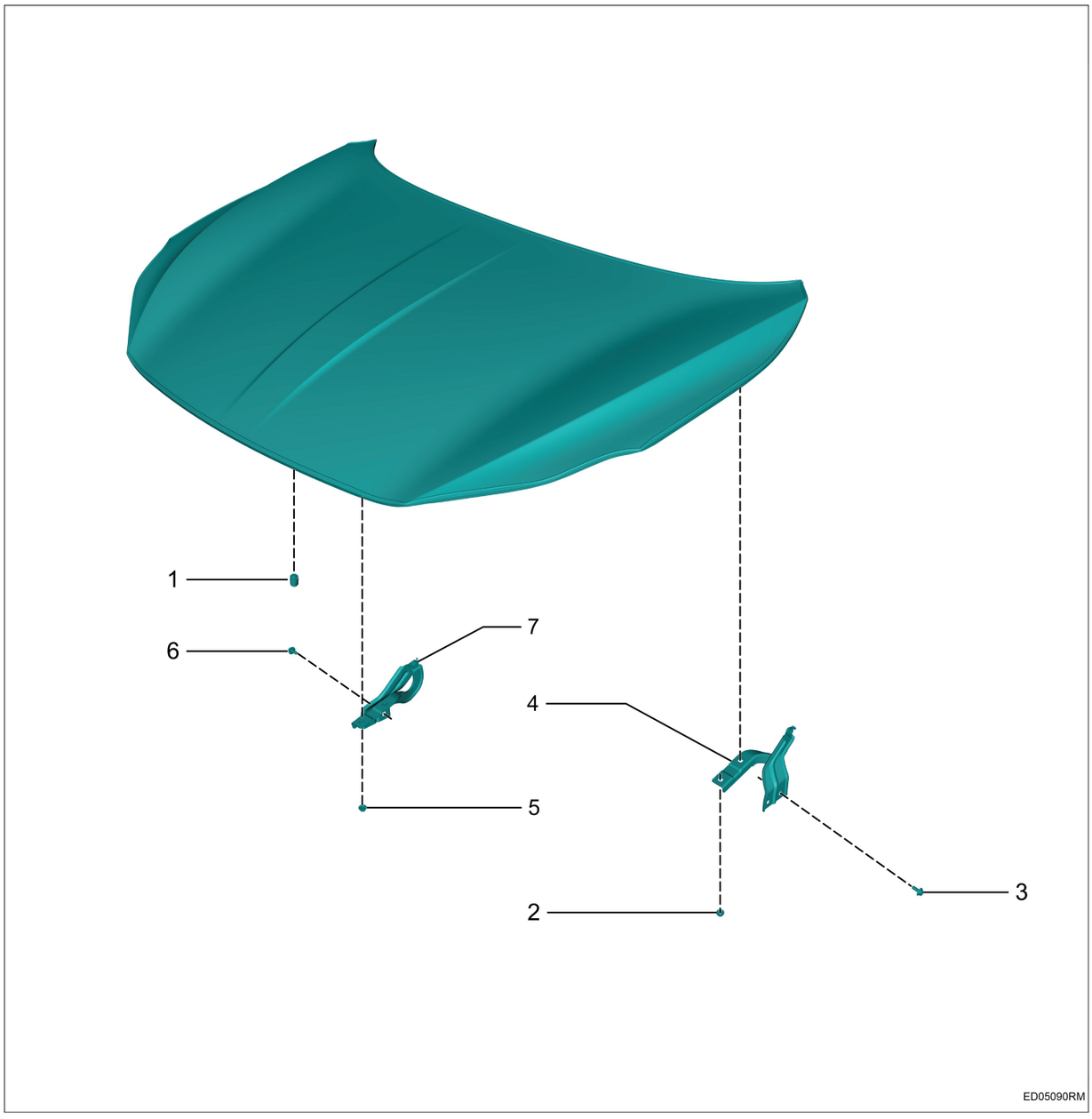
(c) Remove the trailer identification controller.

Installation

1. **Installation is in the reverse order of removal.**

Front compartment cover assembly

Components



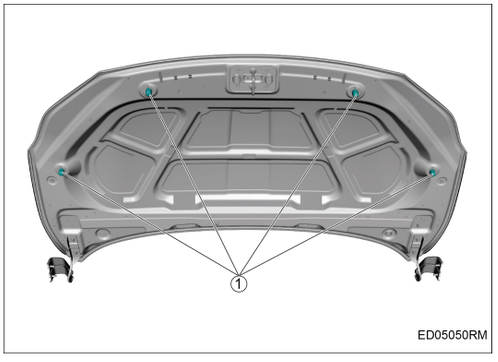
1. **Buffer block**
   - X4
2. **Hexagon flange nut**
   - X2
   - Torque: 20 ~ 30 N • m
3. **Hexagon flange bolt**
   - X2
   - Torque: 20 ~ 30 N • m

4. **Front compartment cover left hinge assembly**
5. **Hexagon flange nut**
   - X2
   - Torque: 20 ~ 30 N • m
6. **Hexagon flange bolt**
   - X2
   - Torque: 20 ~ 30 N • m
7. **Front compartment cover right hinge assembly**

Removal

1. **Remove front compartment cover heat insulator (See page WS-94)**
2. **Remove air spring assembly (See page CS-28)**
3. **Remove washer nozzle assembly (See page WS-65)**
4. **Remove buffer block**

   (a) Rotate to remove buffer blocks -1-.

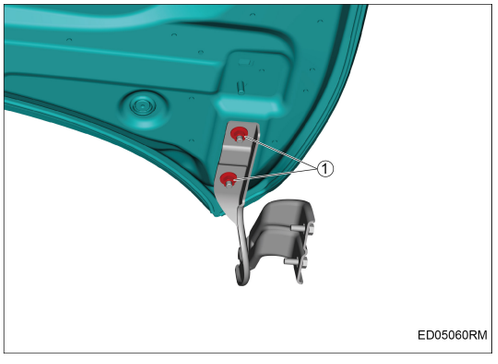


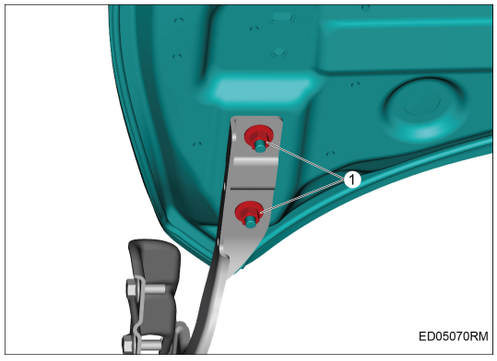
5. **Remove front compartment cover lock ring assembly (See page CS-49)**
6. **Remove front compartment cover assembly**

   Notice:

   - **Two people are required to remove front compartment cover assembly.**

   (a) Remove fixing nuts -1- from left side.





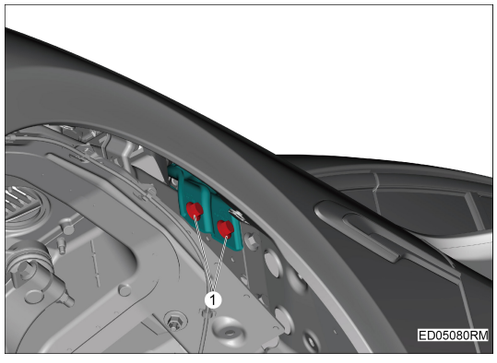
(b) Remove fixing nuts -1- from right side.

7. Remove front wheel protector (See page WS-32)

8. Remove front compartment cover left hinge assembly

Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

(b) Remove the front compartment cover left hinge.

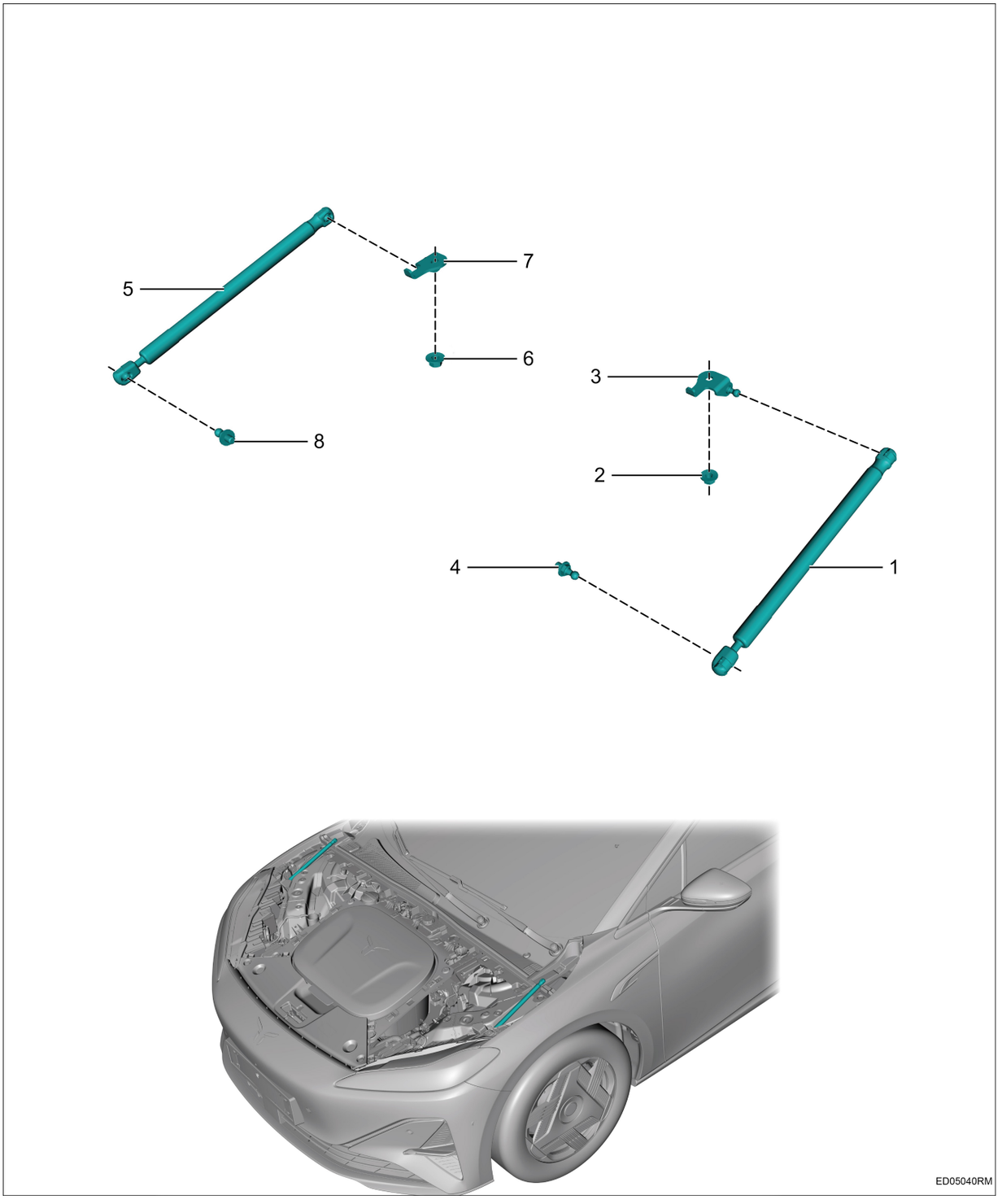
Installation

1. Installation is in the reverse order of removal.

CS

Front compartment cover air spring assembly

Components



1. **Left air spring assembly**
2. **Hexagon flange nut**
   - Torque: 17 ~ 23 N • m

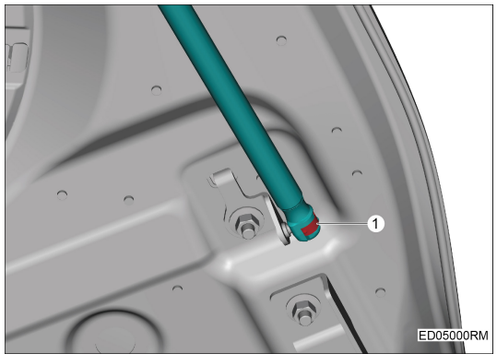
3. **Left air spring bracket**
4. **Ball head bolt**
   - Torque: 17 ~ 23 N • m
5. **Right air spring assembly**
6. **Hexagon flange nut**
   - Torque: 17 ~ 23 N • m
7. **Right air spring bracket**
8. **Ball head bolt**
   - Torque: 17 ~ 23 N • m

Removal

1. **Remove front compartment upper left protector (See page WS-79)**
2. **Remove front compartment upper right protector (See page WS-79)**
3. **Remove air spring assembly**

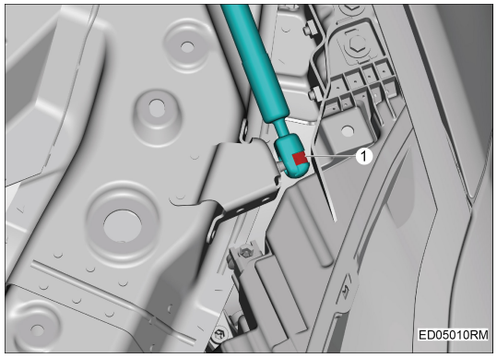
   Note:

   - Use same removal orders for right and left sides.



   (a) Detach the clip -1-.

   (b) Detach the front compartment air spring assembly.



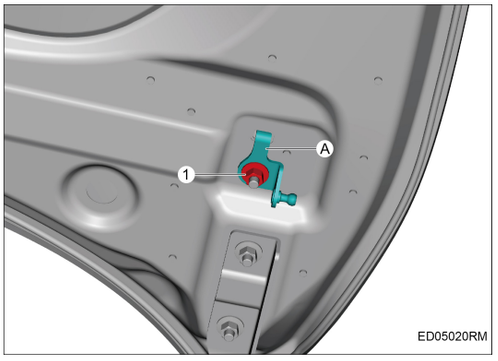
   (c) Detach the clip -1-.

   (d) Remove the front compartment air spring assembly.

4. **Remove left air spring bracket assembly**

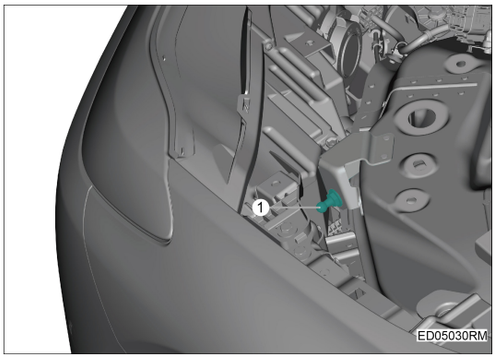
   Note:

   - Use same removal orders for right and left sides.



(a) Remove the nut -1-.

(b) Remove the air spring bracket -A-.



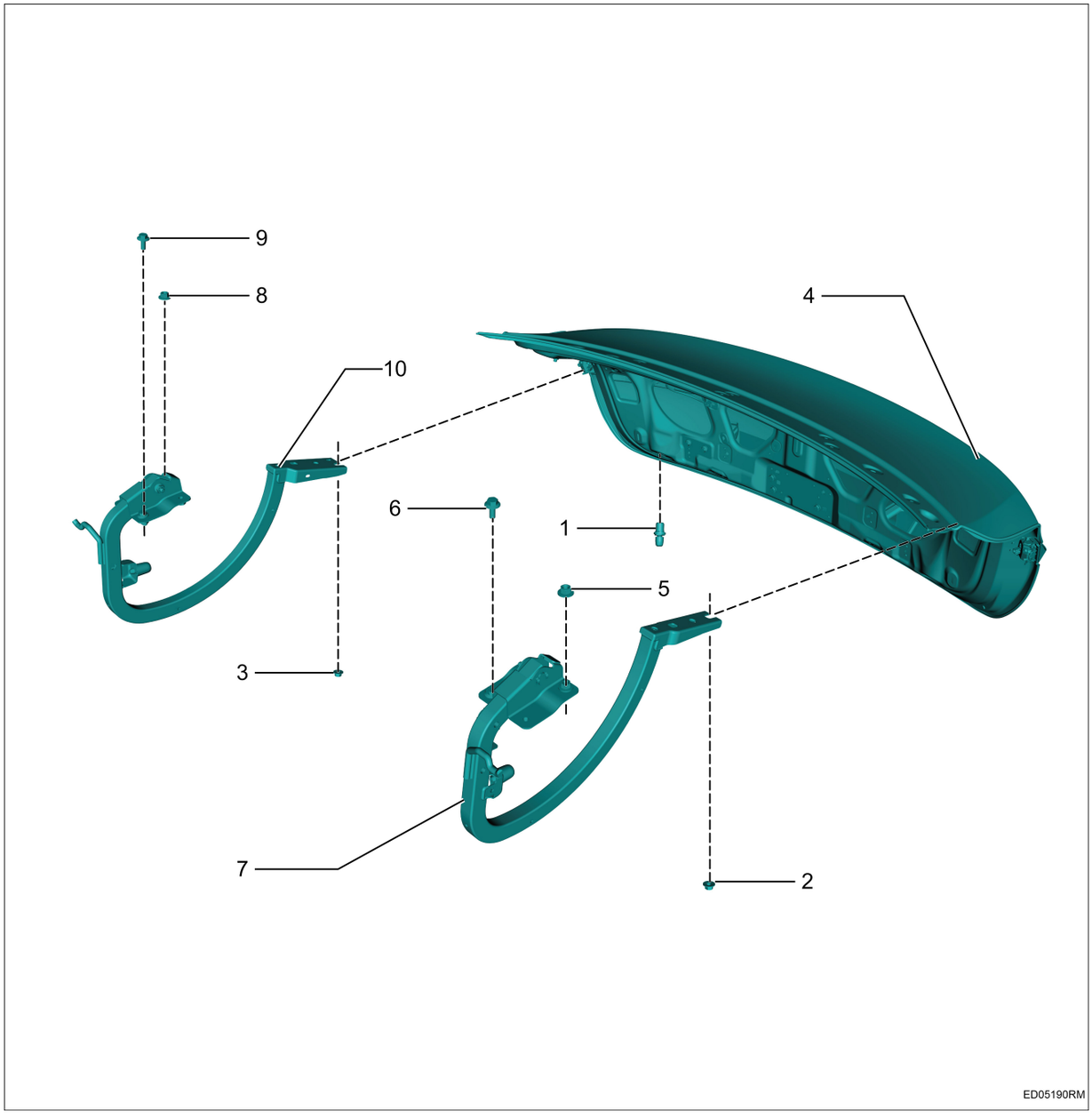
(c) Remove the ball head bolt -1-.

Installation

1. Installation is in the reverse order of removal.

Luggage compartment door assembly

Components



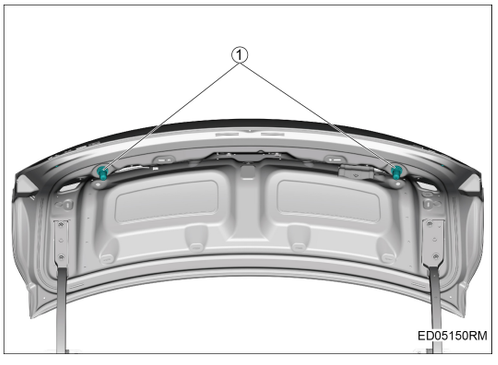
1. **Adjustable stopper assembly**
2. **Combination nut**
   - X2
   - Torque: 20 ~ 30 N • m
3. **Combination nut**
   - X2
   - Torque: 20 ~ 30 N • m

4. **Luggage compartment door assembly**
5. **Combination nut**
   - Torque: 20 ~ 30 N • m
6. **Combination bolt**
   - X3
   - Torque: 20 ~ 30 N • m
7. **Luggage compartment door left hinge assembly**
8. **Combination nut**
   - Torque: 20 ~ 30 N • m
9. **Bolt**
   - X3
   - Torque: 20 ~ 30 N • m
10. **Luggage compartment door right hinge assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove side hinge trim cover (See page NS-143)**
3. **Remove luggage compartment door protector assembly (See page NS-153)**
4. **Remove luggage compartment door lock assembly (See page CS-56)**
5. **Remove adjustable stopper assembly**

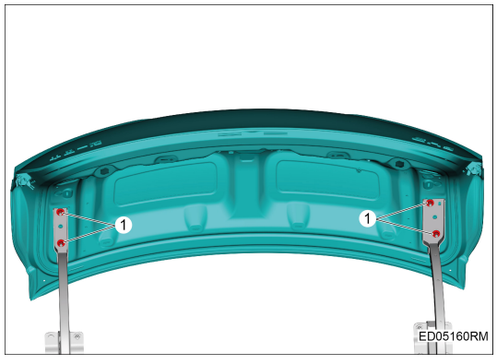
   (a) Remove the adjustable stopper assembly -1-.



6. **Remove luggage compartment door assembly**

   Notice:

   - **Two people work together to remove the luggage compartment door assembly during removal.**



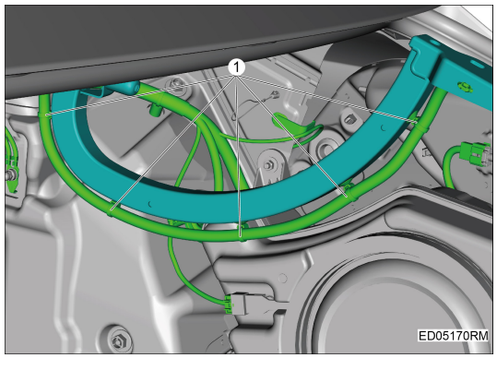
(a) Remove the nut -1-.

(b) Remove the luggage compartment door assembly.

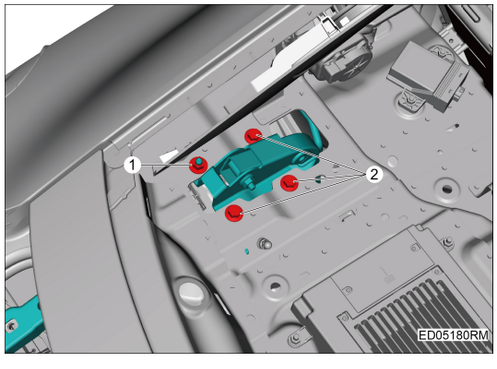
7. **Remove luggage compartment side cover assembly (See page NS-157)**
8. **Remove luggage compartment door tension spring assembly (See page CS-35)**
9. **Remove luggage compartment door electric support rod assembly (only for models equipped with electric support rod) (See page CS-35)**
10. **Remove package rack protector assembly (See page NS-140)**
11. **Remove luggage compartment electric support rod bracket (See page CS-35)**
12. **Remove luggage compartment door left hinge assembly**

Note:

- Use same removal orders for right and left sides.



(a) Disengage the wire harness fixing clips -1-.



(b) Remove the nut -1-.

(c) Remove the bolt -2-.

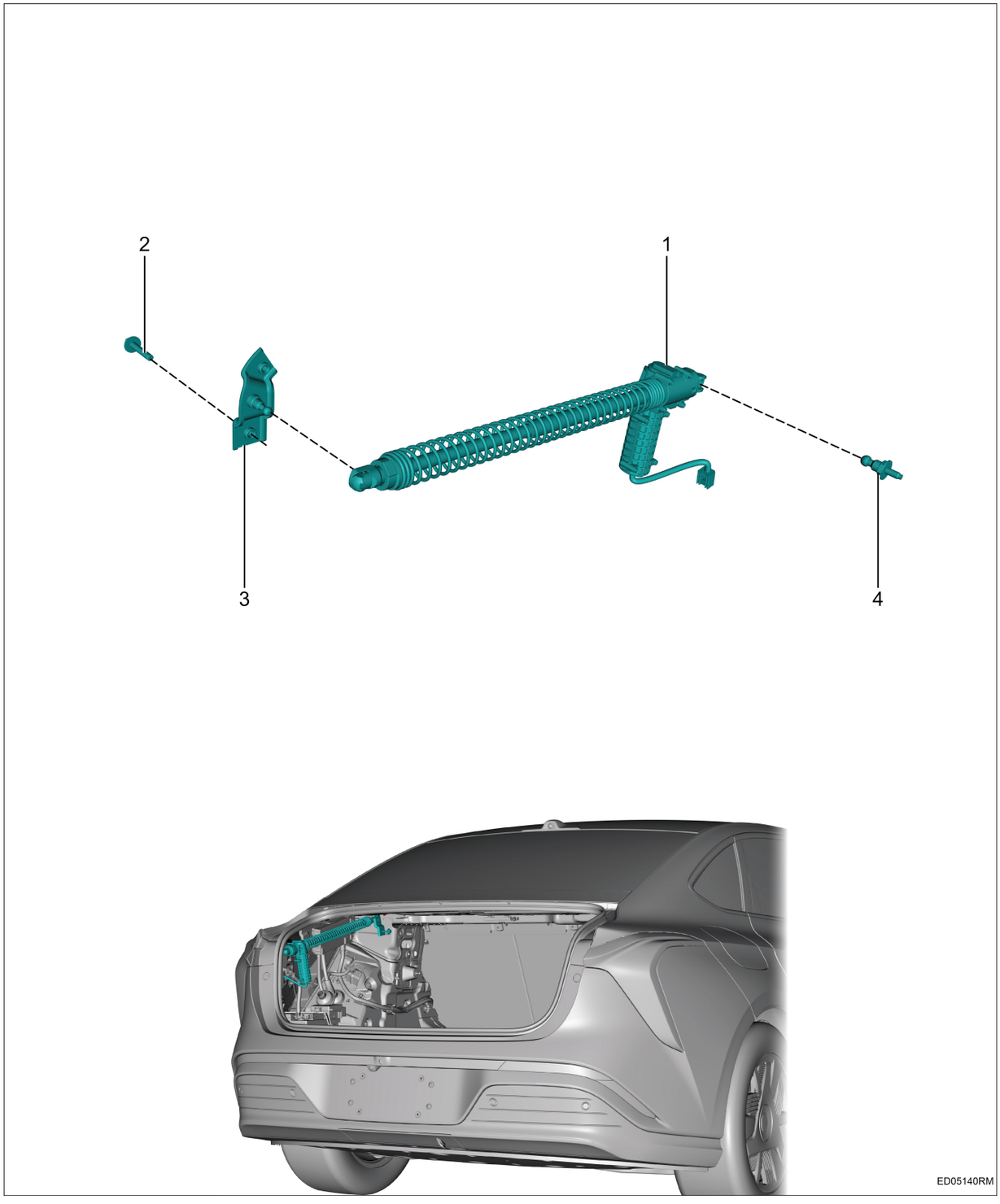
(d) Remove the luggage compartment door left hinge assembly.

Installation

1. **Installation is in the reverse order of removal.**

Luggage compartment door electric support rod assembly

Components



1. Hexagon flange bolt

- X2
- Torque: 17 ~ 23 N • m

2. Luggage compartment door electric bracket assembly

3. Electric support rod assembly

4. Ball head bolt

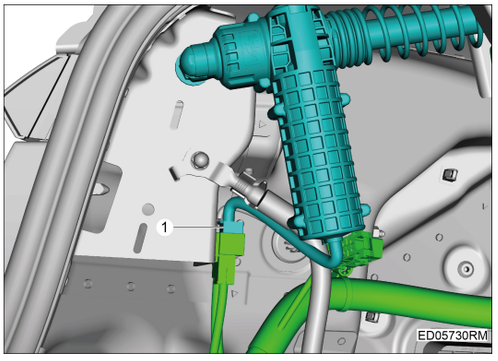
- Torque: 17 ~ 23 N • m

Removal

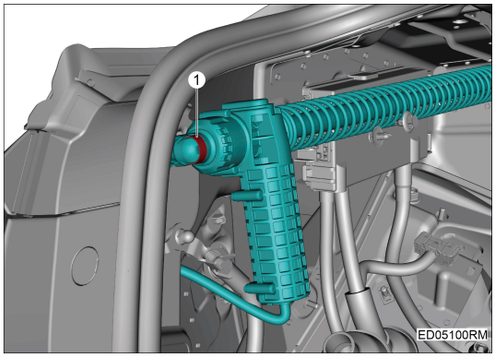
1. Disconnect negative battery terminal (See page DL-21)

2. Remove luggage compartment left cover assembly (See page NS-157)

3. Remove luggage compartment door electric support rod assembly (only for models equipped with electric support rod)

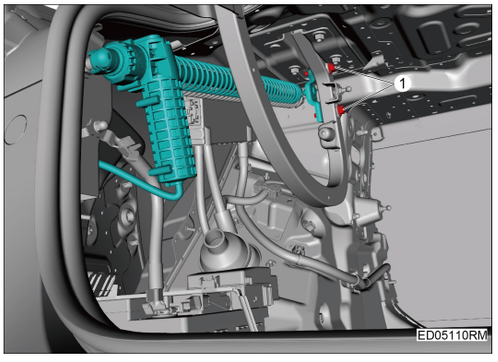


(a) Disconnect the wire harness connector -1-.



(b) Detach the clip -1-.

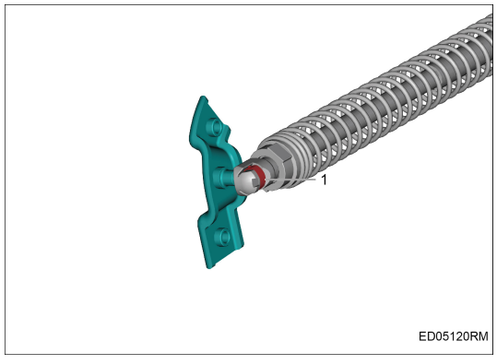
(c) Detach the luggage compartment door electric support rod assembly.



(d) Remove the bolt -1-.

(e) Remove the luggage compartment door electric support rod assembly.

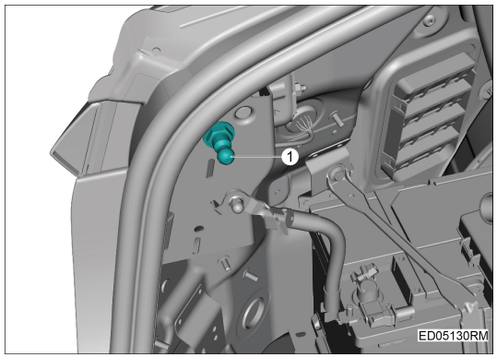
4. Remove luggage compartment electric support rod bracket



(a) Detach the clip -1-.

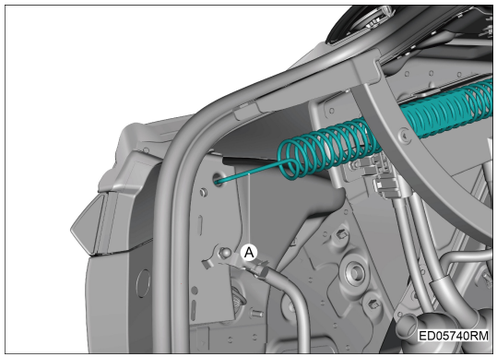
(b) Remove the luggage compartment electric support rod bracket.

5. Remove ball head bolt

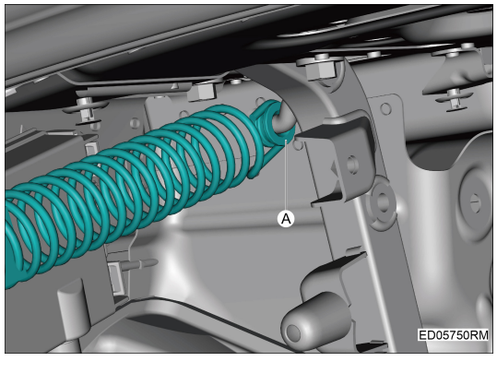


(a) Detach the ball head bolt -1-.

6. Remove luggage compartment tension spring assembly



(a) Detach the luggage compartment tension spring -A-.



(b) Detach the luggage compartment tension spring -A-.

(c) Remove the luggage compartment tension spring assembly.

Installation

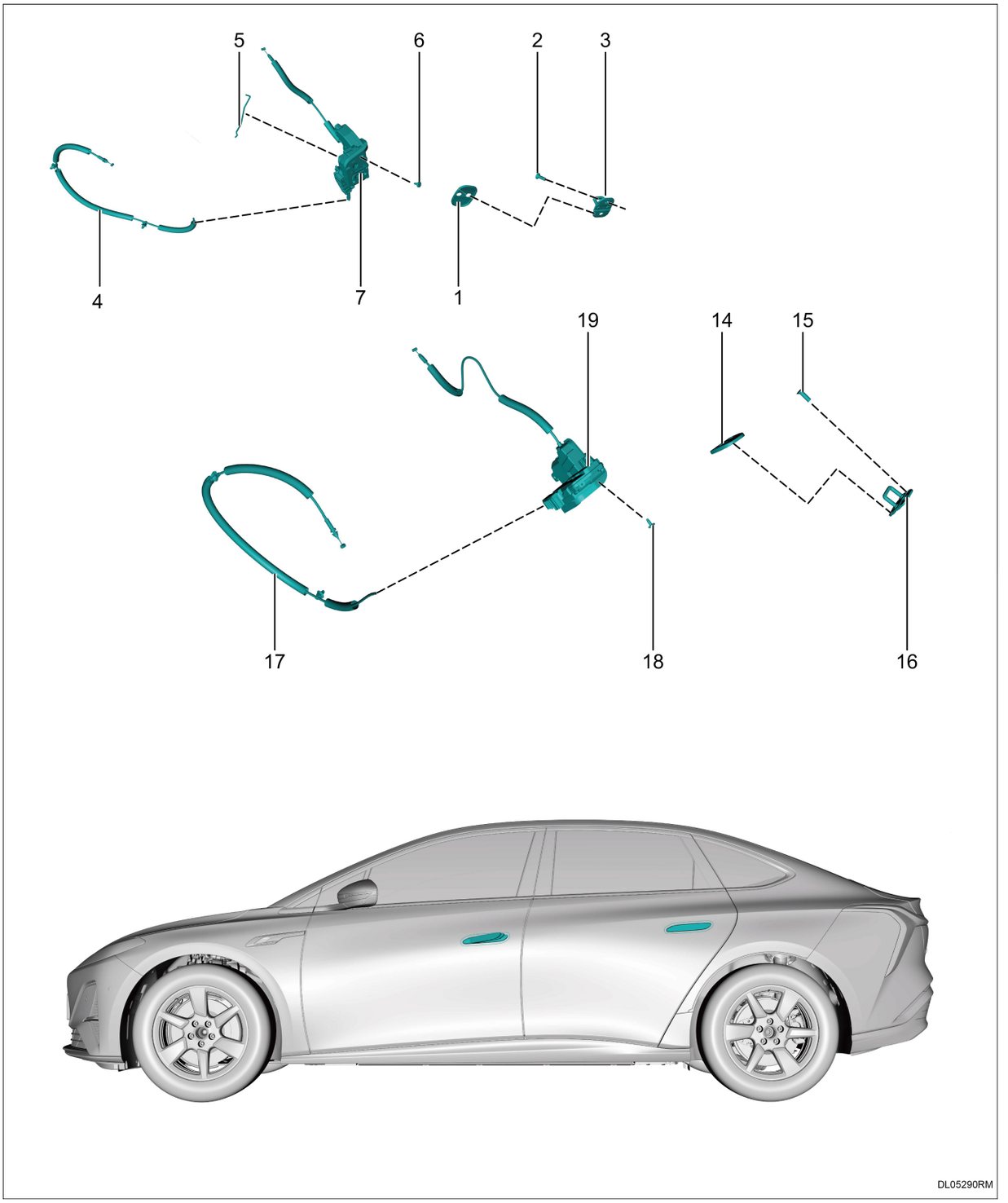
1. Installation is in the reverse order of removal.

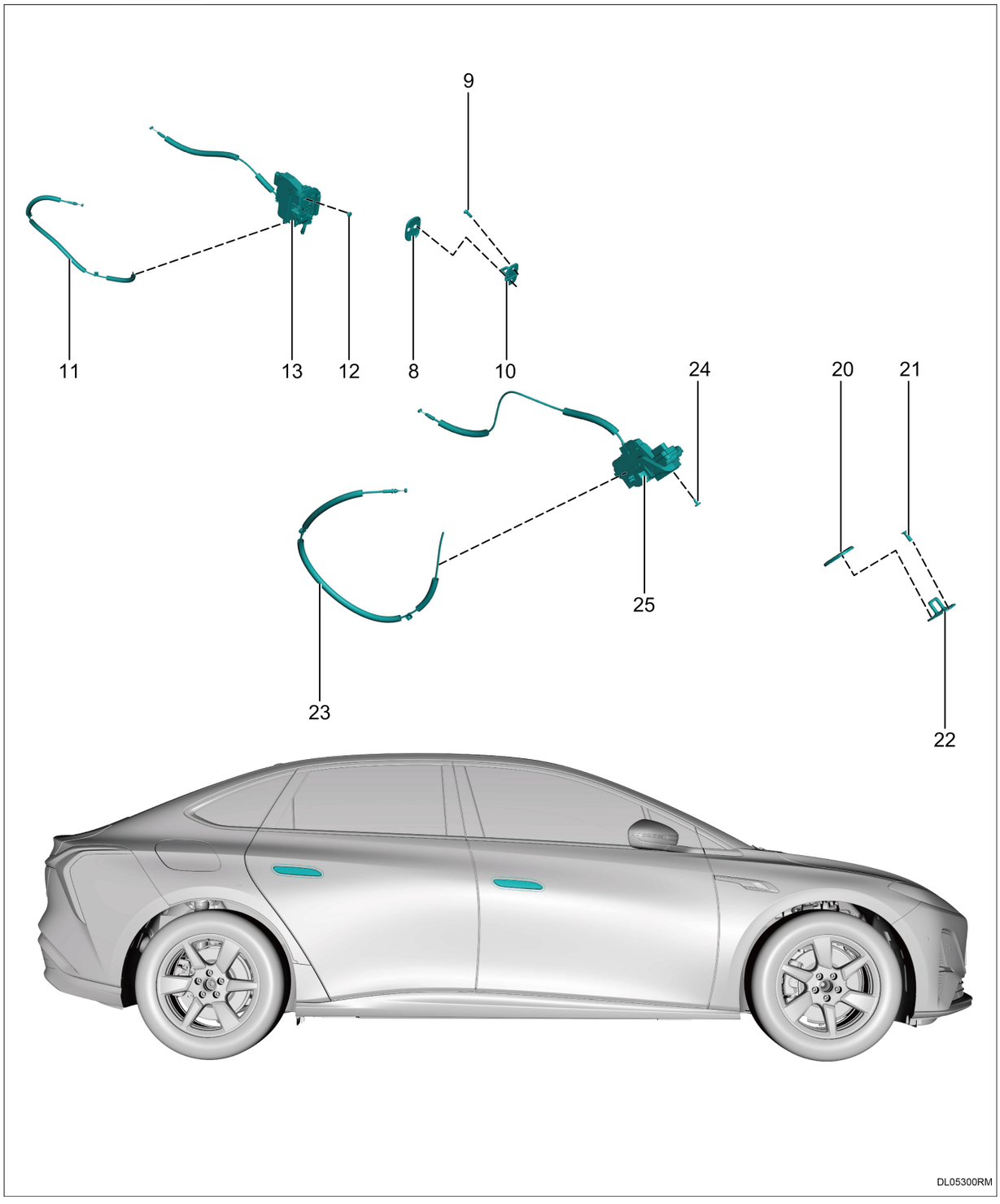
CS

Door lock system

Door lock assembly

Components





1. **Door lock pin trim cover**
2. **Screw**
   - X2
   - Torque: 18 ~ 25 N • m
3. **Lock pin**
4. **Front door outside opening cable (left)**

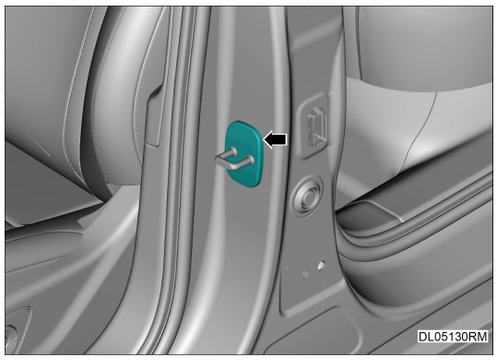
5. **Front left door key cylinder lever**
6. **Inner hexagon pan head screw**
   - X3
   - Torque: 7 ~ 11 N • m
7. **Front door lock body assembly (left)**
8. **Door lock pin trim cover**
9. **Screw**
   - X2
   - Torque: 18 ~ 25 N • m
10. **Lock pin**
11. **Front door outside opening cable (right)**
12. **Inner hexagon pan head screw**
    - X3
    - Torque: 7 ~ 11 N • m
13. **Front door lock body assembly (right)**
14. **Door lock pin trim cover**
15. **Screw**
    - X2
    - Torque: 18 ~ 25 N • m
16. **Lock pin**
17. **Rear door outside opening cable (left)**
18. **Inner hexagon pan head screw**
    - X3
    - Torque: 7 ~ 11 N • m
19. **Rear door lock body assembly (left)**
20. **Door lock pin trim cover**
21. **Screw**
    - X2
    - Torque: 18 ~ 25 N • m
22. **Lock pin**
23. **Rear door outside opening cable (right)**
24. **Inner hexagon pan head screw**
    - X3
    - Torque: 7 ~ 11 N • m
25. **Rear door lock body assembly (right)**

Removal

1. **Remove door lock ring assembly**

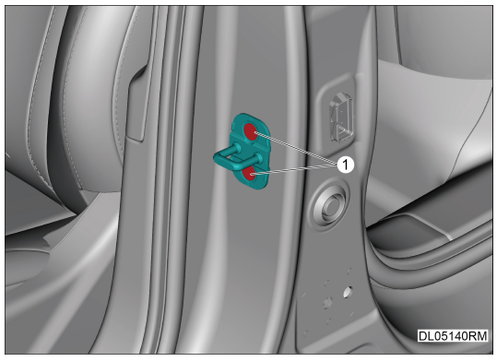
Note:

- Use same removal sequence for all door lock ring assembly



(a) Insert a suitable tool into the position indicated by -arrow- and pry it.

(b) Remove the lock pin trim cover.



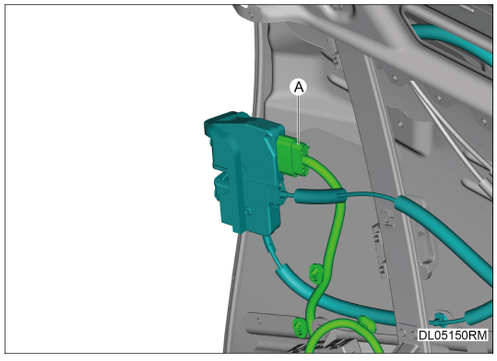
(c) Remove the screw -1-.

(d) Remove the door lock ring assembly.

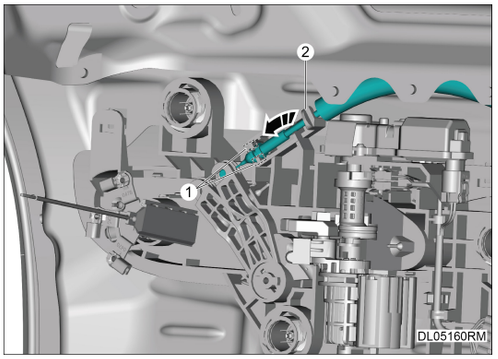
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove front door protector assembly (See page NS-111)**
4. **Remove front left door lock assembly**

Note:

- Use same removal sequence for all door.



(a) Disconnect the wire harness connector -A-.

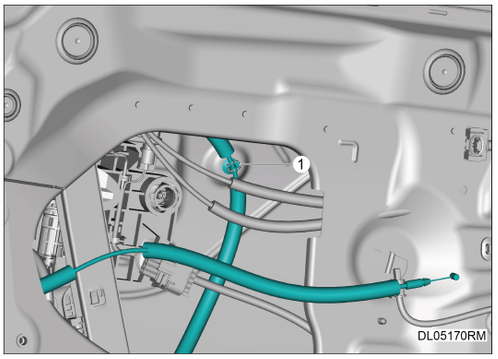


(b) Detach the claw -1-.

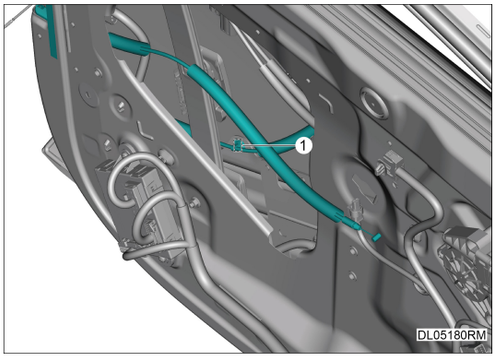
(c) Detach the hook -2-.

(d) Remove the door outside handle cable by rotating in direction of -arrow-.

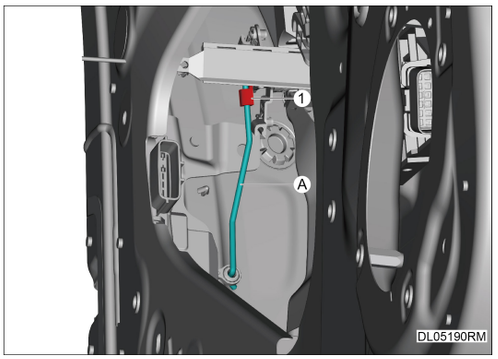
CS



(e) Detach the clip -1-.

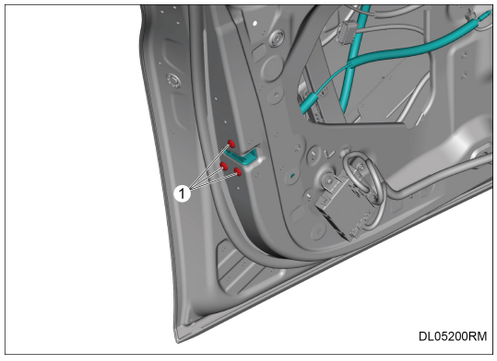


(f) Detach the clip -1-.



(g) Detach the front left door key cylinder lever locking device -1-.

(h) Remove the front left door key cylinder lever -A- (only for front left door).



(i) Remove the bolt -1-.

(j) Remove the front left door lock assembly.

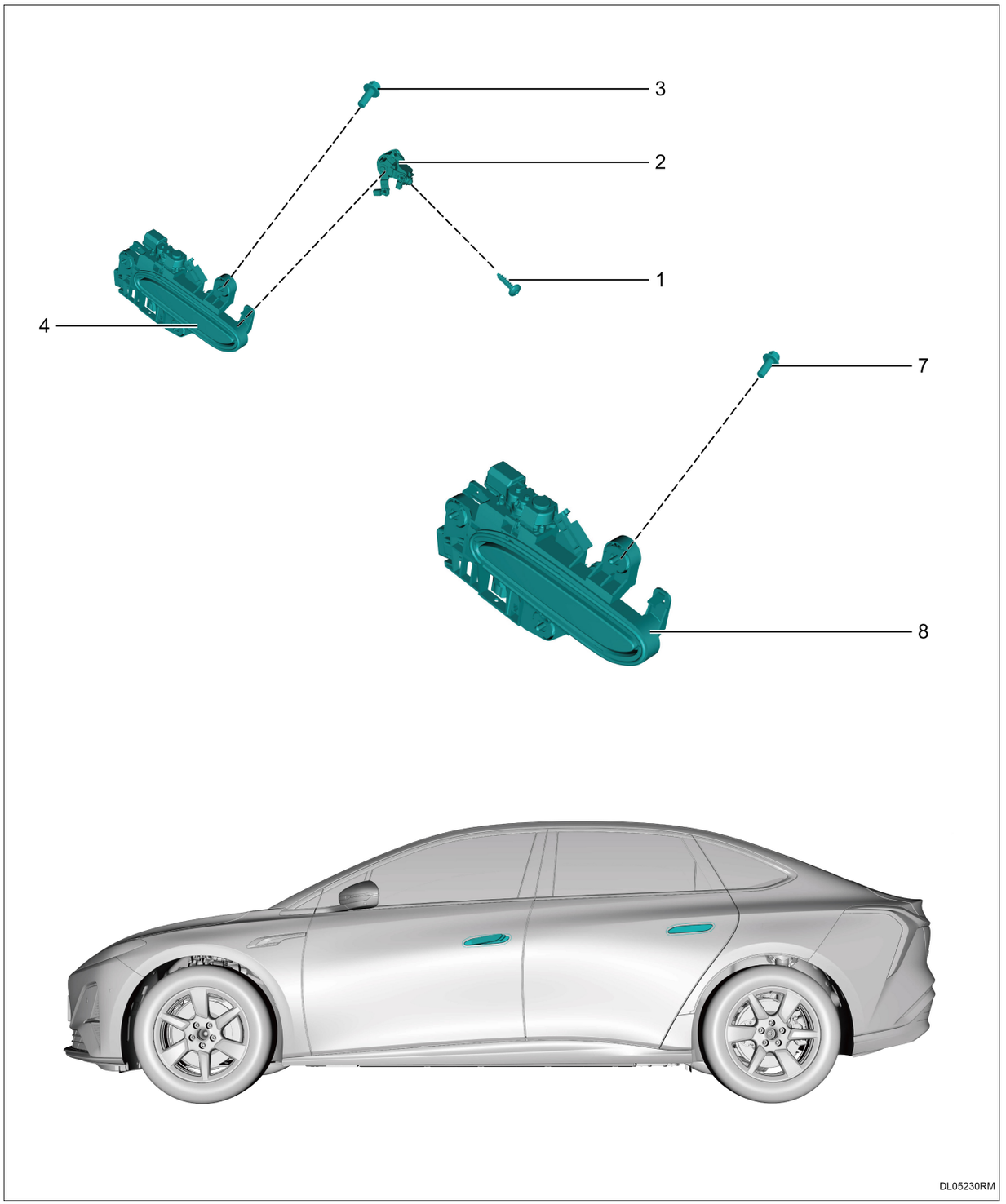
Installation

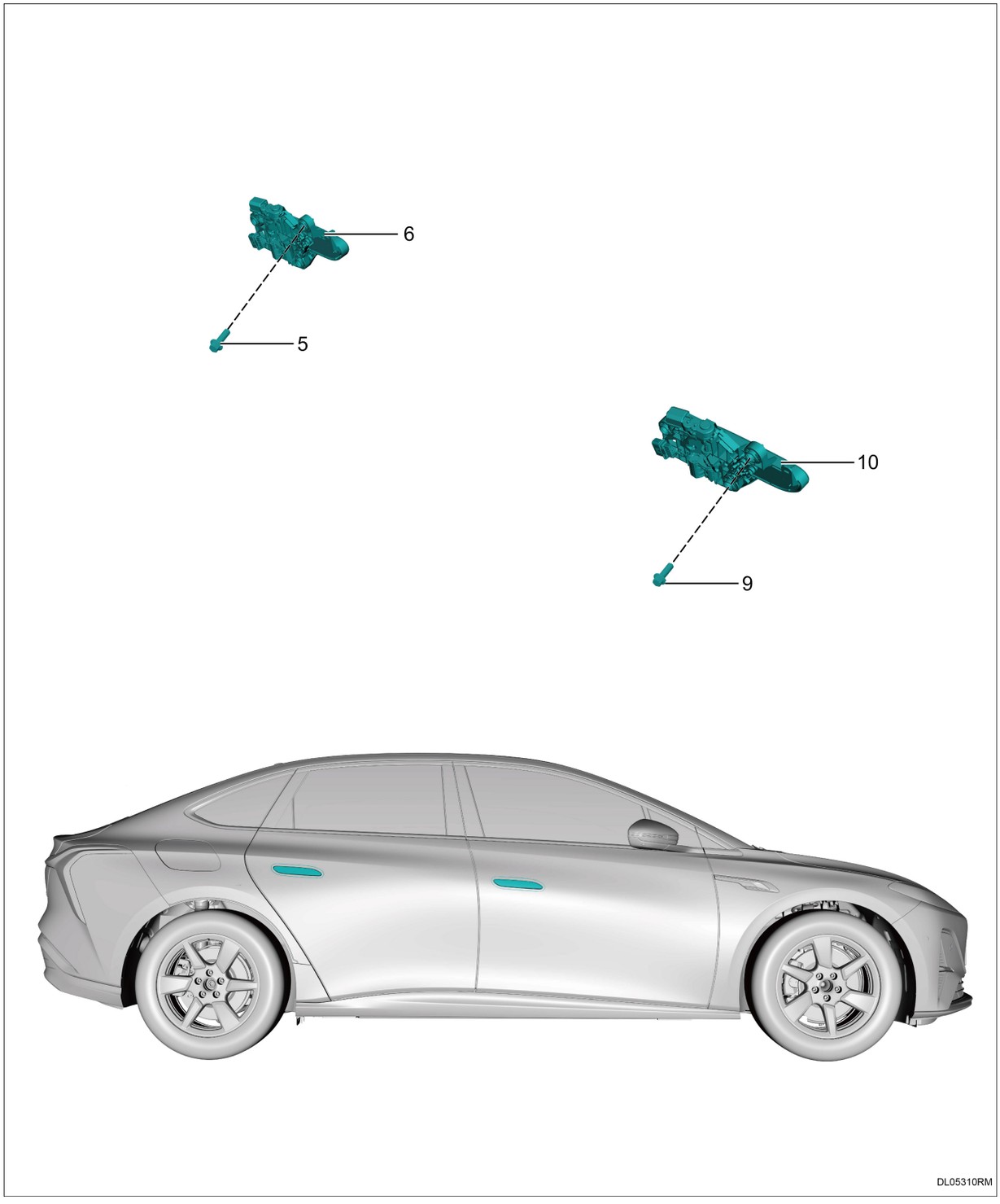
1. Installation is in the reverse order of removal.

CS

Door outside handle

Components





1. **Screw**
   - Torque: 7 ~ 9 N • m
2. **Front left door key cylinder assembly**
3. **Inner hexagon pan head screw**
   - X3
   - Torque: 7 ~ 9 N • m

4. **Front door outside handle assembly (left)**
5. **Screw**
   - X3
   - Torque: 7 ~ 9 N • m
6. **Front door outside handle assembly (right)**
7. **Screw**
   - X3
   - Torque: 7 ~ 9 N • m
8. **Rear door outside handle assembly (left)**
9. **Screw**
   - X3
   - Torque: 7 ~ 9 N • m
10. **Rear door outside handle assembly (right)**

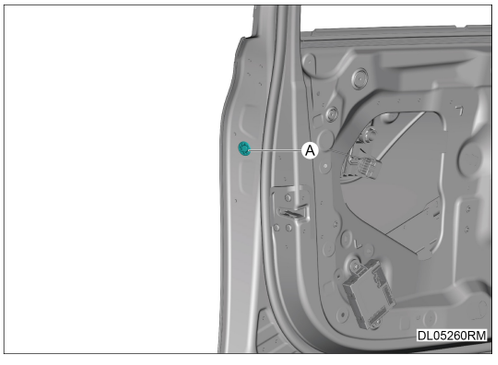
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front left door protector (See page NS-111)**
3. **Remove key cylinder assembly**

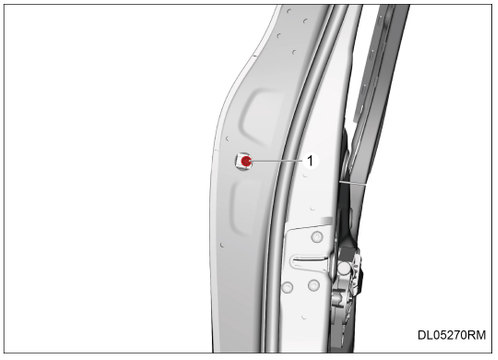
   Note:

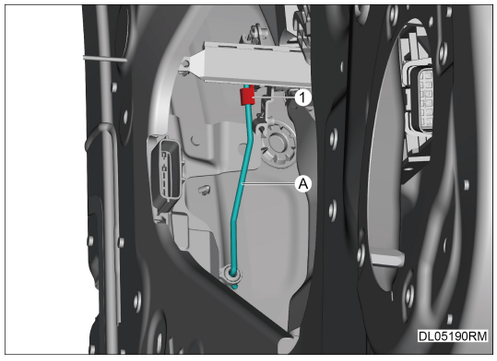
   - Only apply to driver door.

   (a) Detach the block cover -A-.

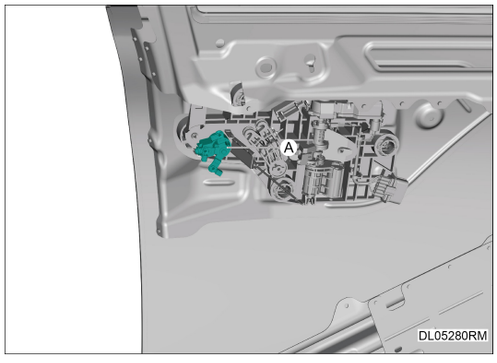


   (b) Remove the screw -1-.





(c) Detach the front left door key cylinder lever locking device -1-.



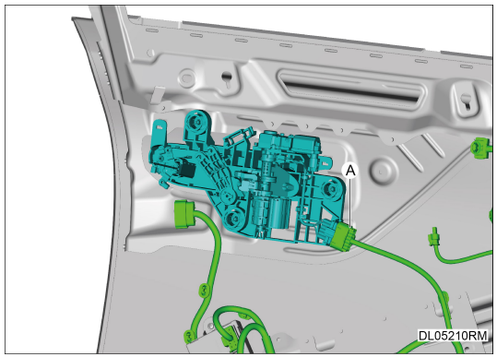
(d) Pull out the key cylinder assembly -A-.

CS

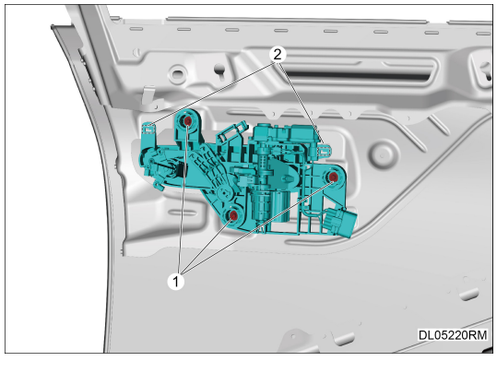
4. Remove front left door outside handle assembly

Note:

- Only apply to driver door.



(a) Disconnect the wire harness connector -A-.



(b) Remove the screw -1-.

(c) Detach the claw -2-.

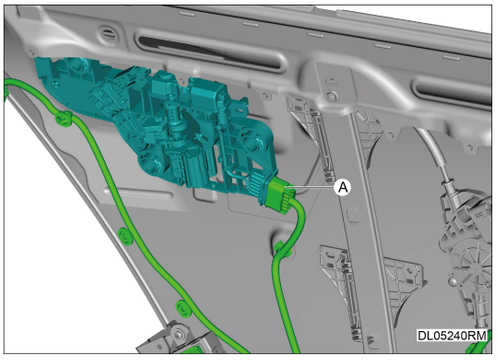
(d) Remove the front left door outside handle assembly.

5. Remove rear left door protector (See page NS-119)

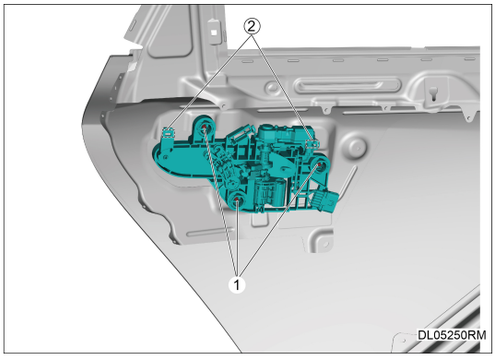
6. Remove rear left door outside handle assembly

Note:

- Only apply to front passenger door and rear door.



(a) Disconnect the wire harness connector -A-.



(b) Remove the screw -1-.

(c) Detach the claw -2-.

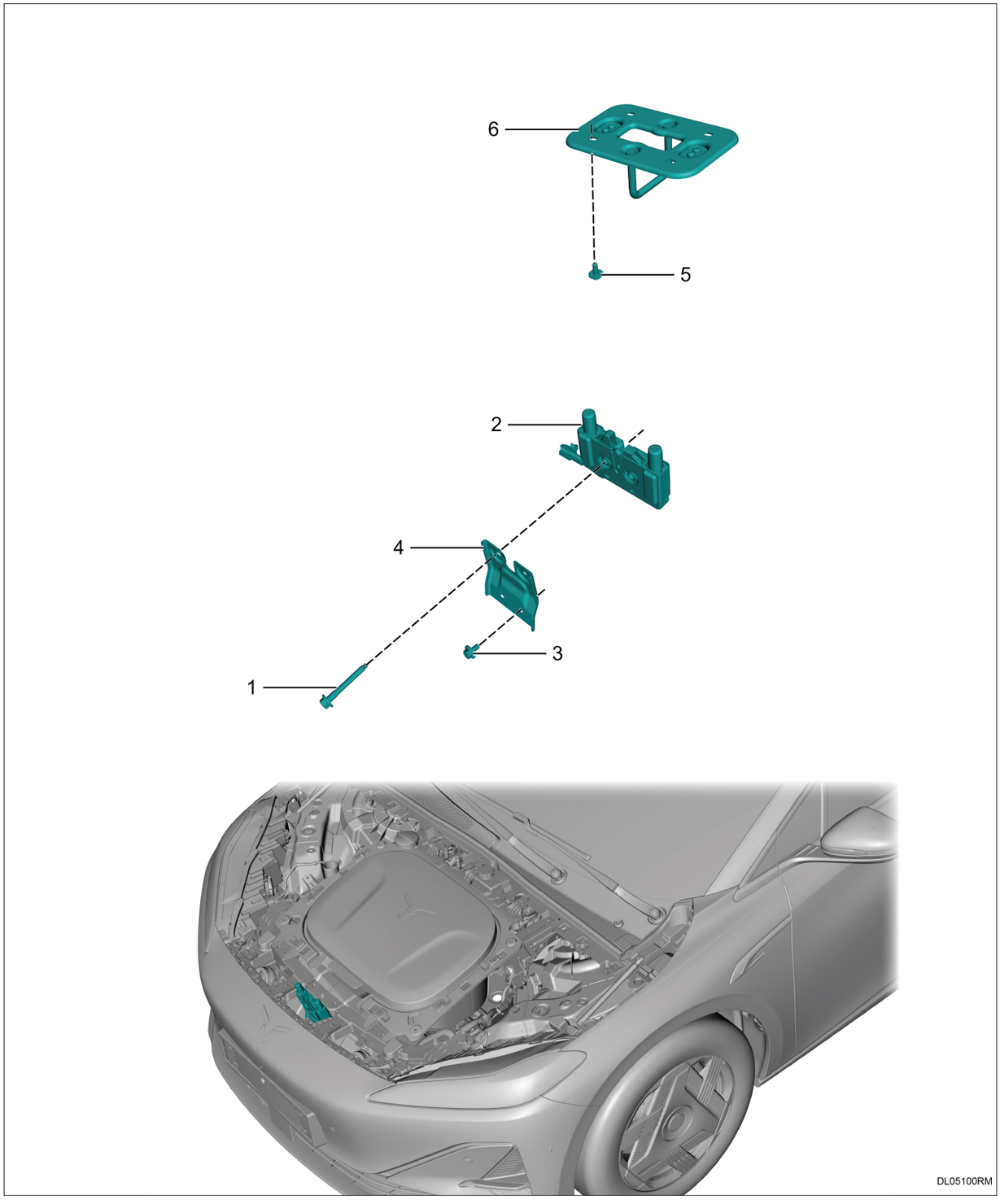
(d) Remove the rear left door outside handle seat assembly.

Installation

1. Installation is in the reverse order of removal.

Front compartment cover lock assembly

Components



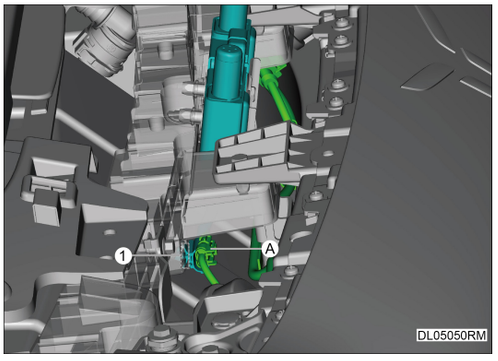
1. Combination bolt

- X2
- Torque: 10.5 ~ 14.5 N • m

2. **Front compartment cover lock assembly**
3. **Combination bolt**
   - X2
   - Torque: 8 ~ 10 N • m
4. **Lock plate**
5. **Combination bolt**
   - X4
   - Torque: 8 ~ 12 N • m
6. **Left front compartment cover lock ring assembly**

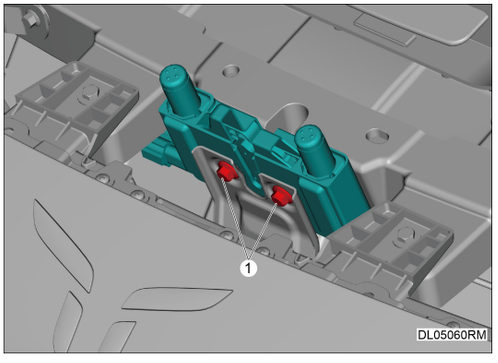
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment cover lock upper protector assembly (See page WS-79)**
3. **Remove front compartment cover lock assembly**

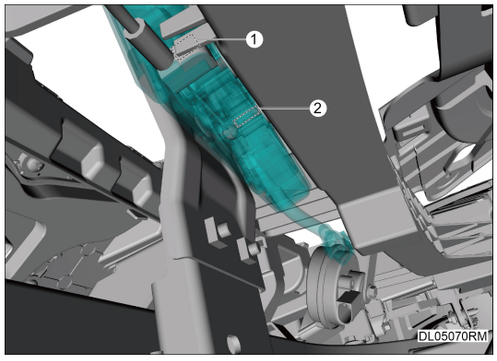


(a) Disconnect the wire harness connector -A-.

(b) Detach the wire harness clip -1-.



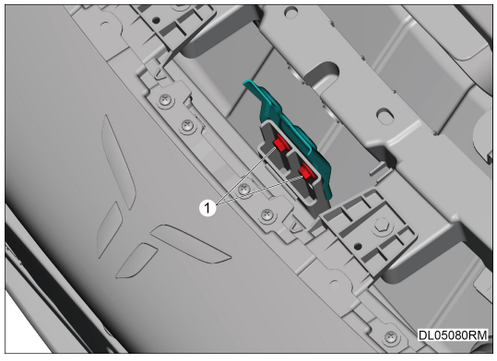
(c) Remove the bolt -1-.



(d) Detach the front compartment cover lock assembly fixing slot -1-.

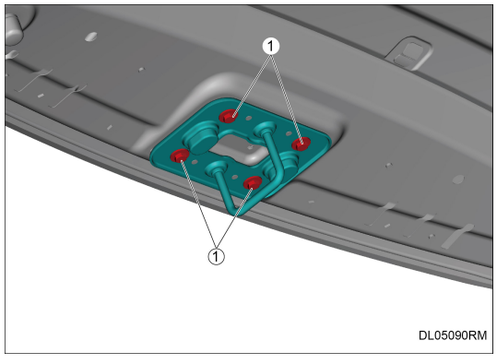
(e) Detach front compartment cover opening cable from opening -2-.

4. Remove lock plate



(a) Remove the bolt -1-.

5. Remove front compartment cover lock ring assembly



(a) Remove the bolt -1-.

(b) Remove the front compartment cover lock ring assembly.

Installation

1. Installation is in the reverse order of removal.

Inspection

1. Check front compartment cover lock assembly

(a) Check that tightening bolts are loose.

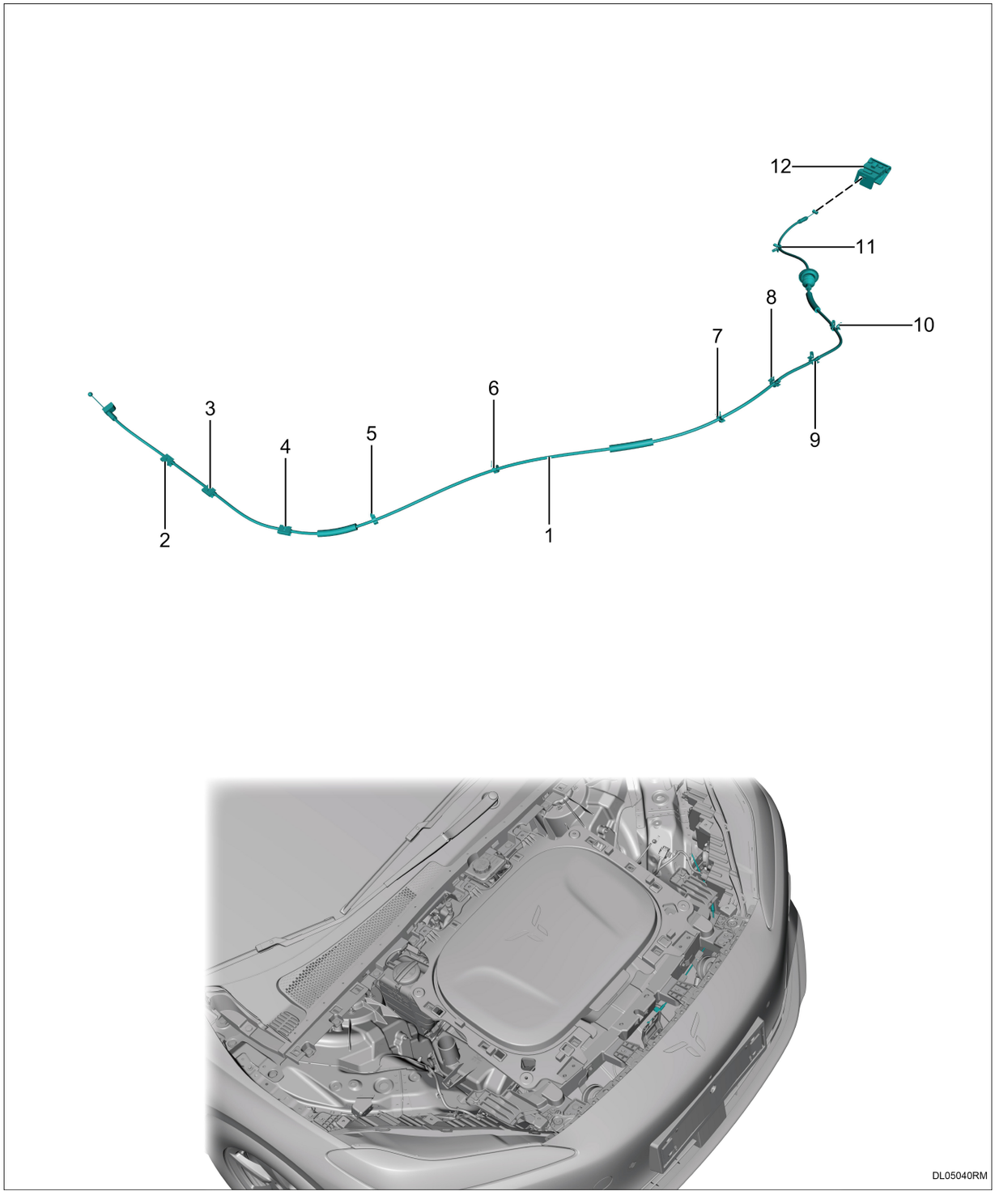
(b) Check that there is debris inside lock body.

(c) Check that lock function is normal.

(d) Apply appropriate amount of antirust oil and lubricant on engaged part surfaces between lock and lock ring.

Front compartment cover opening cable assembly

Components



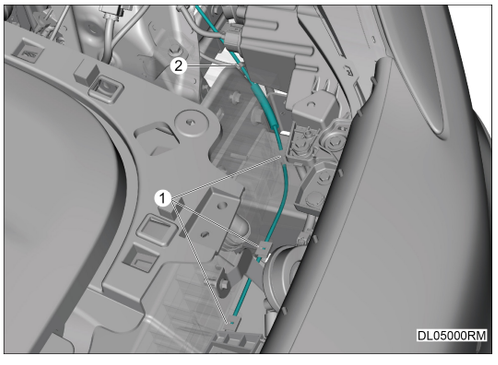
1. **Front compartment cover opening cable sub-assembly**
2. **Wire clamp**
3. **Wire clamp**

4. **Wire clamp**
5. **Cable clip**
6. **Cable clip**
7. **Cable clip**
8. **Cable clip**
9. **Cable clip**
10. **Cable clip**
11. **Cable clip**
12. **Front compartment cover inside opening handle**

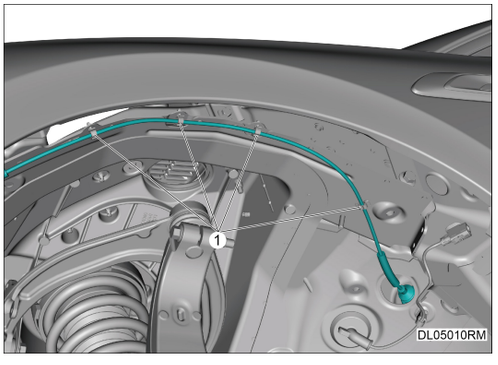
CS

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front left wheel protector (See page WS-32)**
3. **Remove front compartment cover lock upper protector assembly (See page WS-79)**
4. **Remove front compartment cover lock assembly (See page CS-56)**
5. **Remove front compartment cover opening cable assembly**



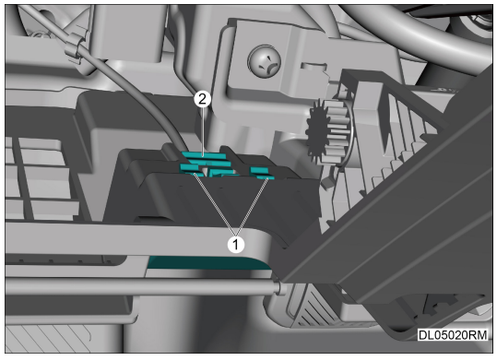
(a) Detach the fixing clips -1-2-.



(b) Detach the fixing clips -1-.

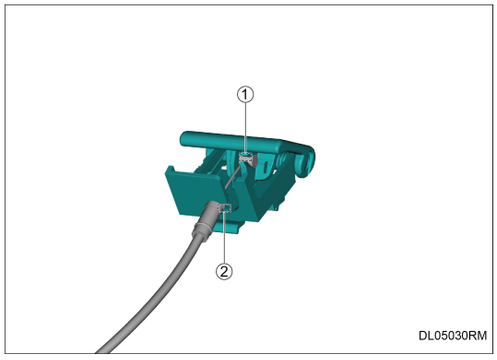
(c) Detach the sealing boot -2-.

6. **Remove lower left bottom protector (See page NS-29)**



7. Remove front compartment cover inside opening handle

(a) Detach the fixing claws -1-2-.



(b) Detach front compartment cover opening cable from openings -1-2-.

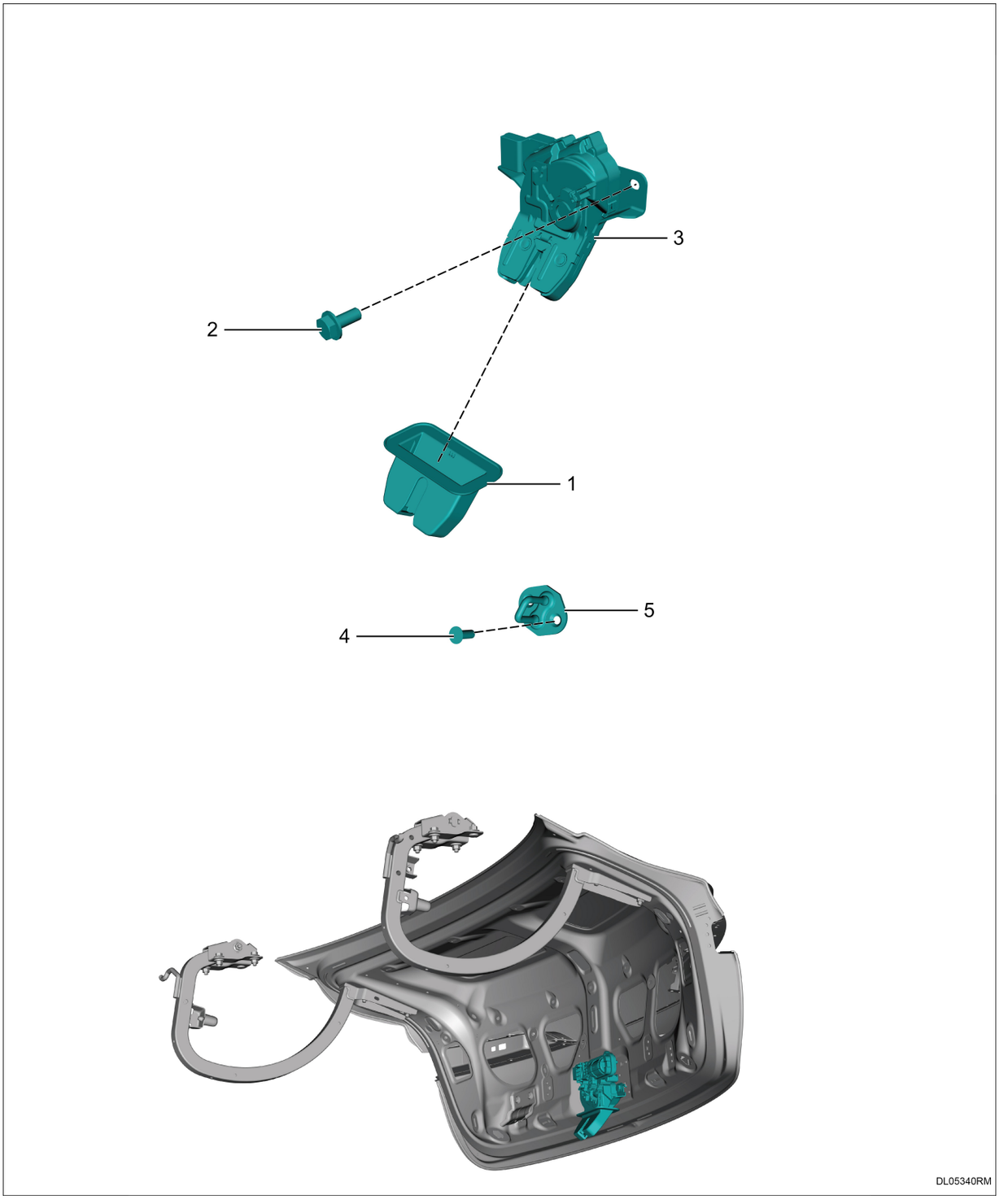
Installation

1. Installation is in the reverse order of removal.

CS

Luggage compartment door lock assembly

Components



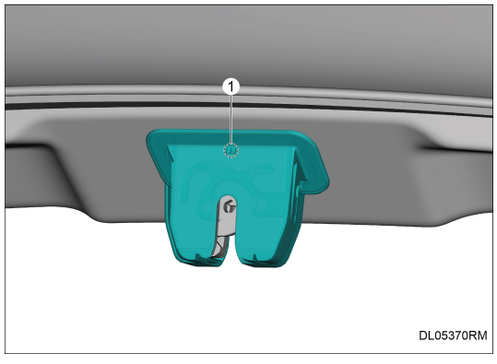
1. **Luggage compartment door lock sheath**
2. **Hexagon flange bolt**
   - X2

- Torque: 17 ~ 23 N • m

3. **Luggage compartment door lock assembly**
4. **Hexagon flange bolt**
   - X2
   - Torque: 17 ~ 23 N • m
5. **Luggage compartment door lock ring assembly**

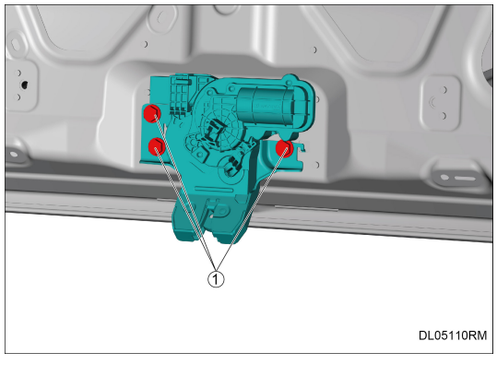
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment door cover assembly (See page NS-157)**
3. **Remove luggage compartment door lock boot**



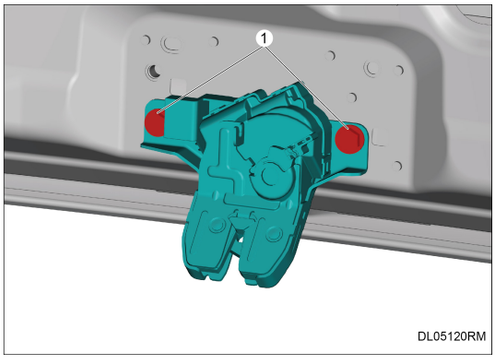
   (a) Detach claw -1-, and remove the luggage compartment door lock sheath.

4. **Remove luggage compartment door lock assembly (type 1)**



   (a) Disconnect the wire harness connector.
   (b) Remove the bolt -1-.

5. **Remove luggage compartment door lock assembly (type 2)**



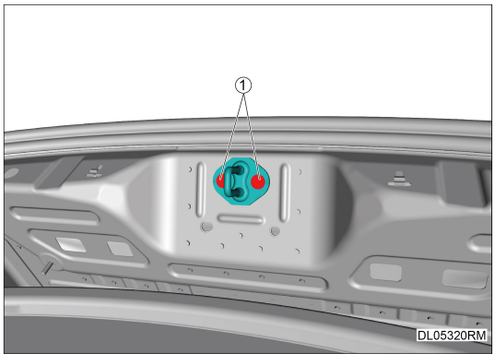
(a) Disconnect the wire harness connector.

(b) Remove the bolt -1-.

CS

6. **Remove luggage compartment rear end protector (See page NS-157)**

7. **Remove luggage compartment door lock ring assembly**



(a) Remove the bolt -1-.

(b) Remove the luggage compartment door lock ring assembly.

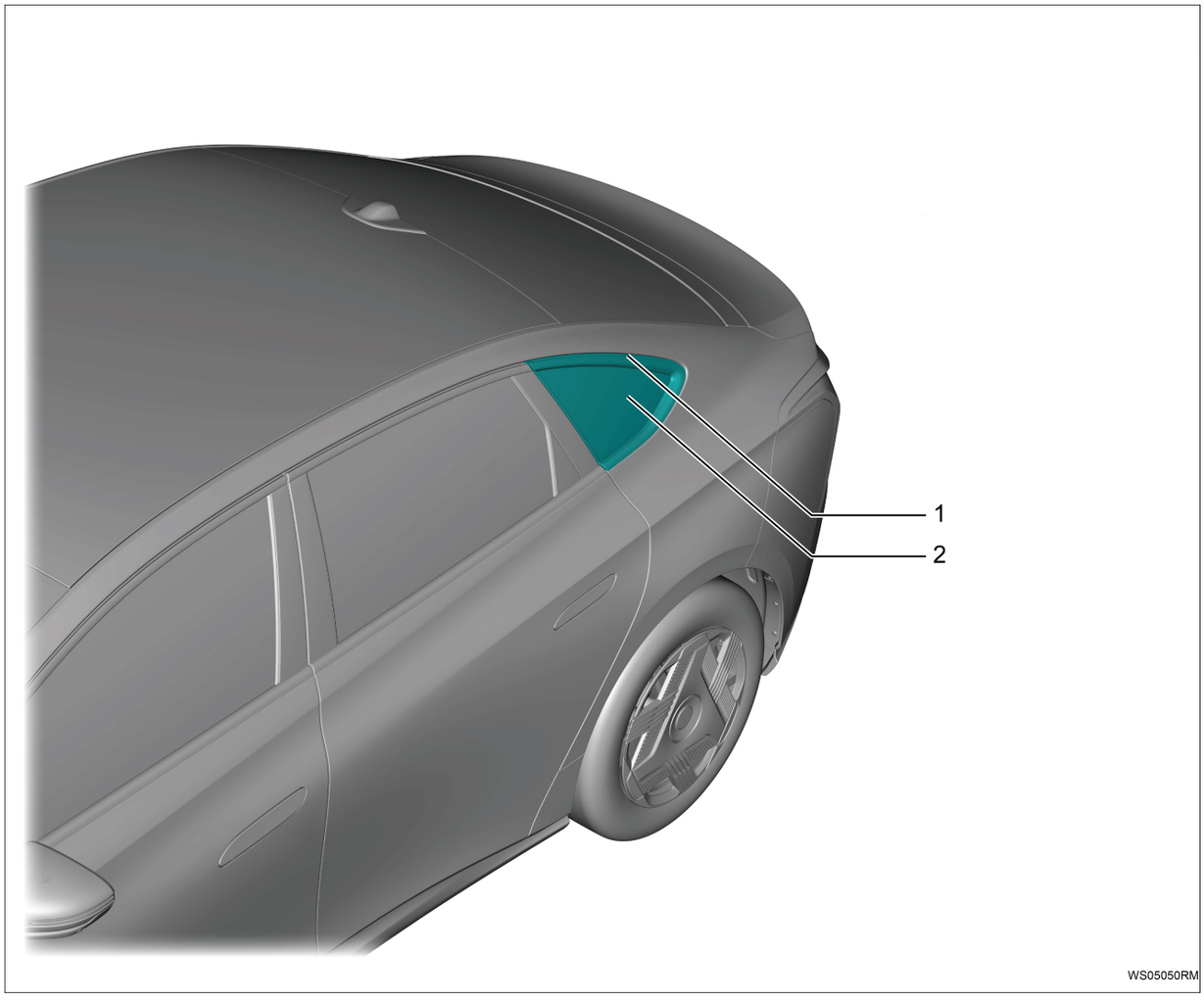
Installation

1. **Installation is in the reverse order of removal.**

Windshield glass

Quarter window

Components



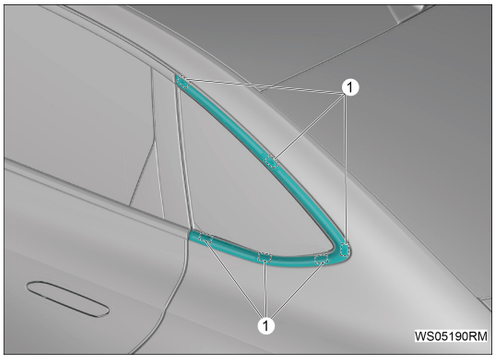
1. **Quarter window trim strip I**
2. **Quarter window assembly**

Removal

1. **C-pillar upper left protector assembly (See page NS-137)**
2. **Remove left quarter window assembly**

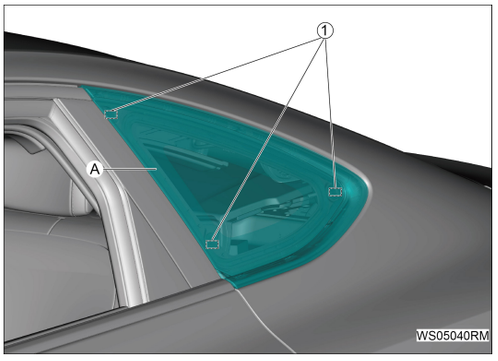
   Note:

   - Use same removal orders for right and left sides.



(a) (For example) Detach all claws -1-, and remove left quarter window trim strip I -A-.

CS



(b) Use a suitable tool to cut the left quarter window assembly -A-.

Note:

- According to the cutting position and situation, use a sealing scraper and steel wire for operation.

Notice:

- **Maintain a right angle between the handle and the top of glass when using the scraper, so that the scraper blade is parallel to the glass surface and top of glass, and then move the scraper to cut through the adhesive.**

(c) Detach clips -1- after cutting, and remove left quarter window assembly -A-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Clean the vehicle body**



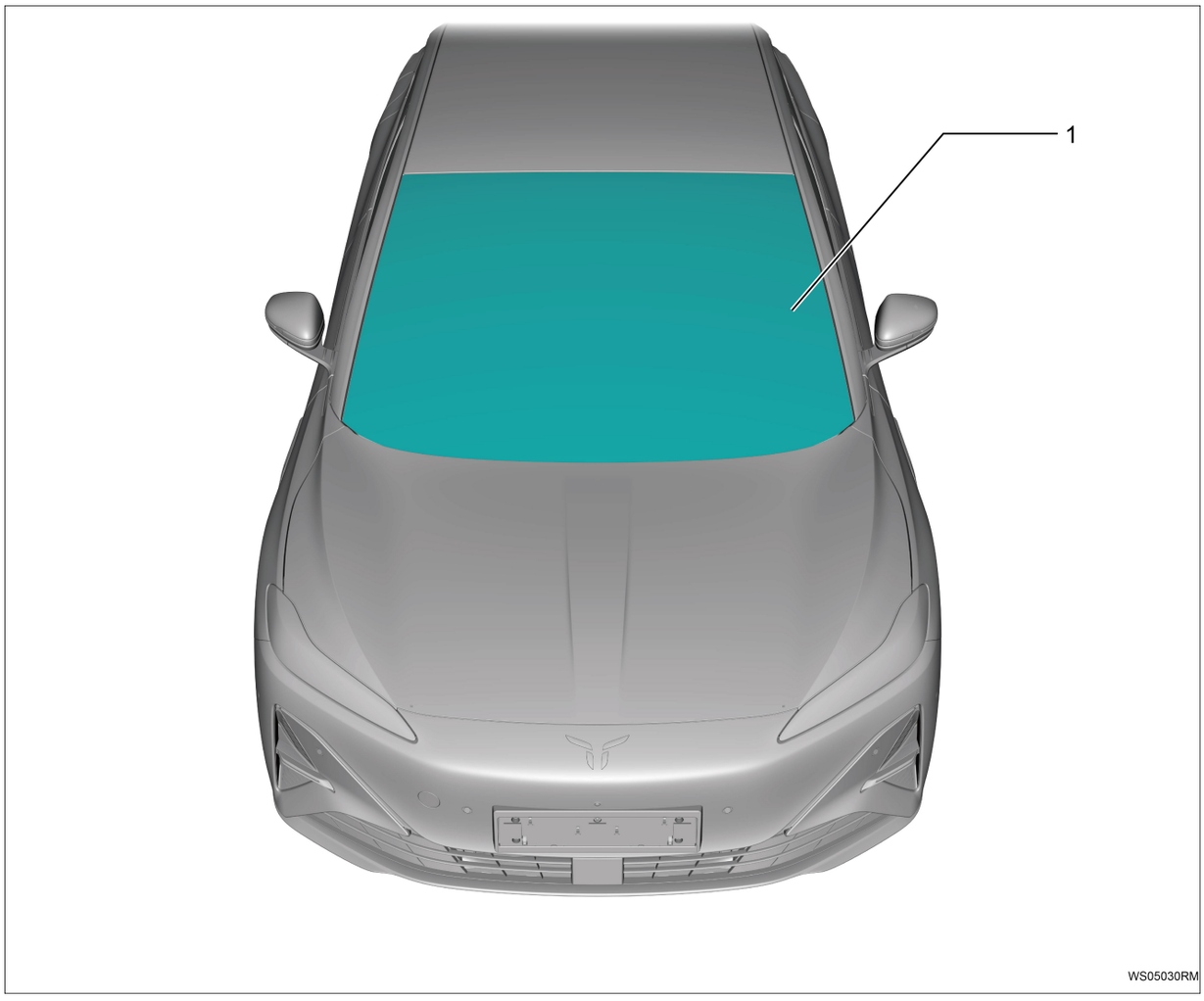
(a) Remove the residual adhesive sticking to vehicle body.

Notice:

- **The thickness of residual adhesive is not allowed to exceed 2 mm.**

Front windshield assembly

Components



1. Front windshield assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove water channel cover plate assembly (See page WS-86)**
3. **Remove inside rear view mirror assembly (See page NS-180)**
4. **Remove front camera with bracket assembly (See page ZC-146)**
5. **Remove rain sensor assembly (See page WS-54)**
6. **Remove anti-fog sensor assembly (See page RE-11)**

7. **Remove A-pillar upper protector (See page NS-130)**

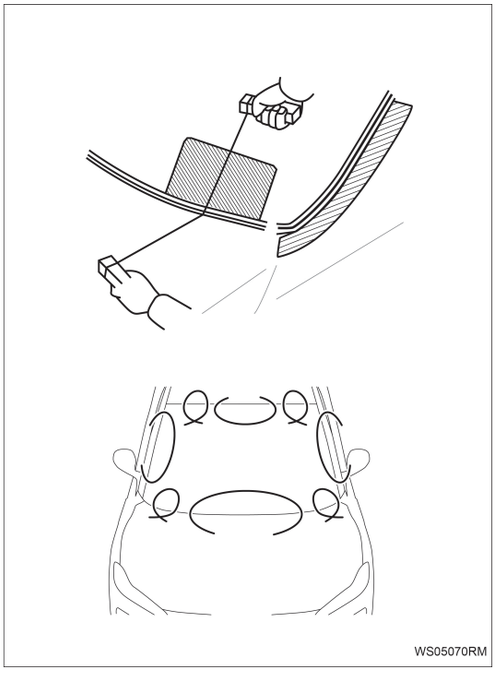
8. **Remove front windshield glass assembly**

Note:

- According to the cutting position and situation, use a windshield sealing scraper and steel wire for operation.

Notice:

- **Maintain a right angle between the handle and the top of glass when using the scraper, so that the scraper blade is parallel to the glass surface and top of glass, and then move the scraper to cut through the adhesive.**

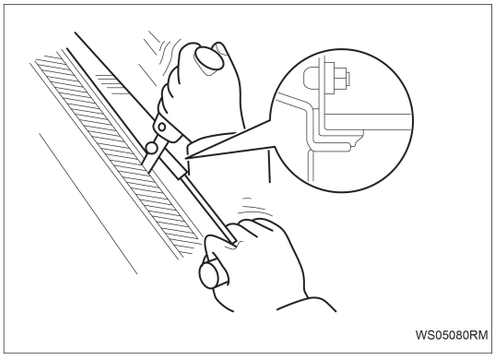


(a) Apply protective tape to the body surface around the front windshield assembly.

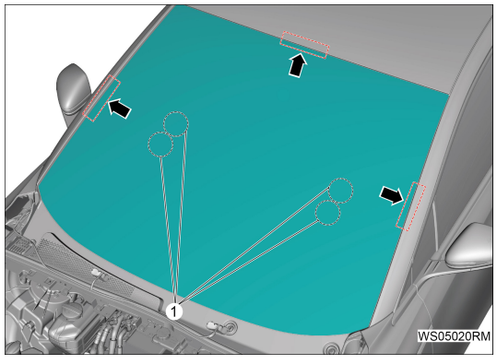
(b) Pass a steel wire through the clearance between body and front windshield assembly from inside of vehicle.

(c) Tie wooden blocks and similar items at both ends of the steel wire.

(d) Pull the steel wire along the front windshield assembly to cut through the adhesive.



(e) Place a plastic protective plate between steel wire and instrument panel to prevent scratching the instrument panel when removing the front windshield assembly.



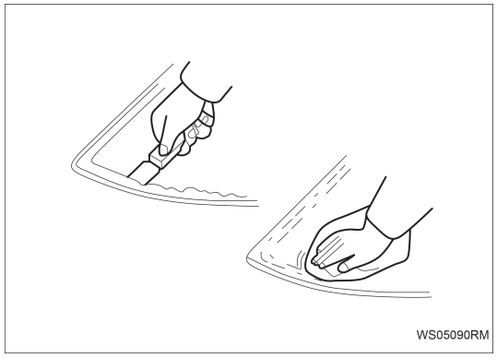
(f) As shown in illustration, if the front windshield assembly continues to be used, assembly marks -arrow- should be made on the front windshield assembly and the vehicle body.

(g) Attract the suction cup to the front windshield position -1-.

(h) Remove the front windshield assembly.

Installation

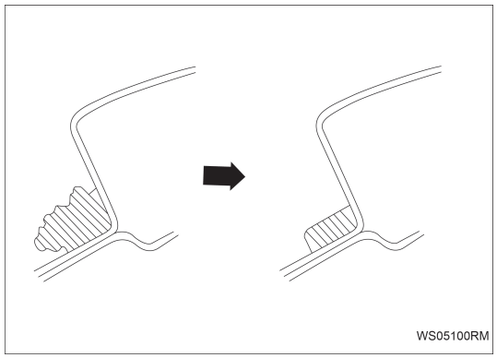
1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Clean front windshield assembly**



(a) Remove the adhesive sticking to front windshield assembly.

(b) Clean the glass with non-residual solvent.

3. **Clean the vehicle body**

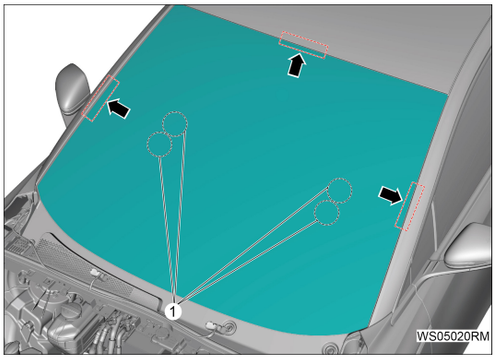


(a) Remove the residual adhesive sticking to vehicle body.

Notice:

- **The thickness of residual adhesive is not allowed to exceed 2 mm.**

4. **Install front windshield assembly**



CS

(a) Install the front windshield assembly with adhesive.

(b) Apply primer at the adhesive coating position (on the body and glass).

(c) Apply adhesive to the windshield assembly according to △ section.

(d) Operation before installing glass:

(e) Move the glass to the vehicle body with suction cups and fix it to the glass so that the gaps of the upper part and both sides are equal, the position is shown as -arrow-.

(f) Confirm that it does not interfere with the installation of trim strip.

(g) Apply rubber tape to the glass and body parts and make matchmark with a pen. (When installing new glass)

(h) When reusing glass, confirm and correct the position of the matchmark.

(i) Check the fitting position of the front windshield assembly clip pin from inside the vehicle.

(j) After the matchmark and gap are aligned, slightly tap the coating position on the edge of the glass to ensure the adhesion.

Notice:

- **It will take 24 hours for the glass adhesive to fully solidify.**

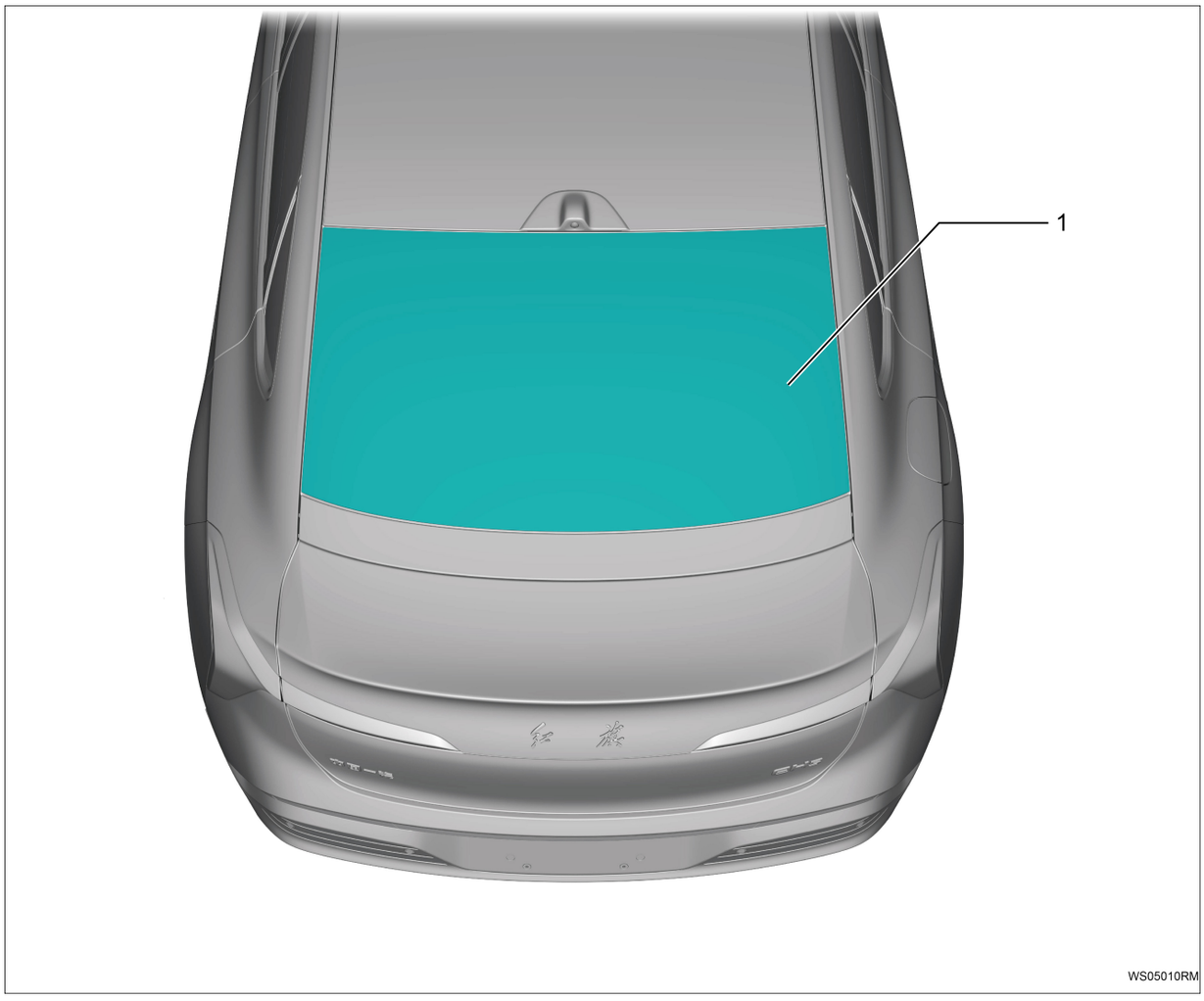
5. Check for leakage and repair

(a) Perform the leakage test after adhesive has completely hardened.

(b) Seal any leaks with automatic glass sealant.

Rear windshield assembly

Components



1. Rear windshield assembly

Removal

1. **Remove D-pillar upper protector (See page NS-137)**
2. **Remove package rack protector assembly (See page NS-140)**
3. **Remove rear windshield assembly**

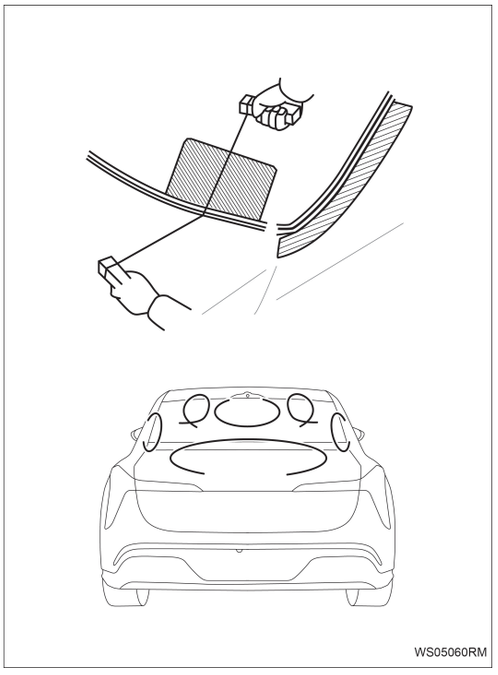
   Note:

   - According to the cutting position and situation, use a windshield sealing scraper and steel wire for operation.

CS

Notice:

- **Maintain a right angle between the handle and the top of glass when using the scraper, so that the scraper blade is parallel to the glass surface and top of glass, and then move the scraper to cut through the adhesive.**



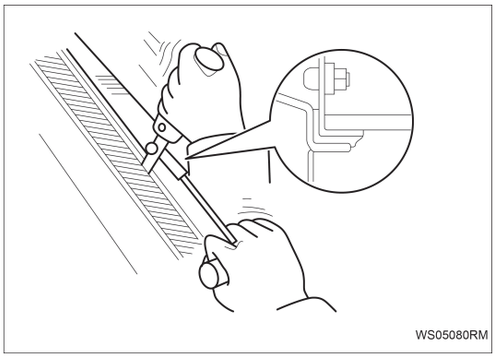
(a) Disconnect the rear windshield heater wire harness connector terminal.

(b) Apply protective tape to the body surface around the rear windshield assembly.

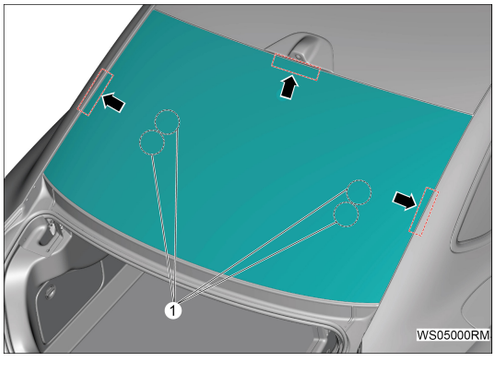
(c) Pass a steel wire through the clearance between body and rear windshield assembly from inside of vehicle.

(d) Tie wooden blocks and similar items at both ends of the steel wire.

(e) Pull the steel wire along the rear windshield assembly to cut through the adhesive.



(f) Place a plastic protective plate between steel wire and package rack protector to prevent scratching the package rack protector when removing the rear windshield assembly.



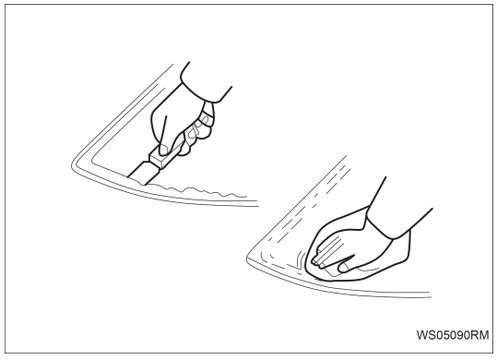
(g) As shown in illustration, if the rear windshield assembly continues to be used, assembly marks -arrow- should be made on the rear windshield assembly and the vehicle body.

(h) Attract the suction cup to the rear windshield positions -1-.

(i) Remove the rear windshield assembly.

Installation

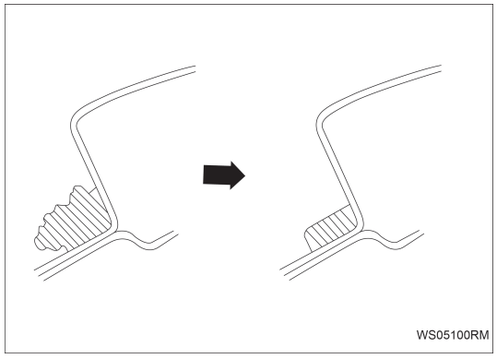
1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Clean rear windshield assembly**



(a) Remove the adhesive sticking to rear windshield assembly.

(b) Clean the glass with non-residual solvent.

3. **Clean the vehicle body**



(a) Remove the residual adhesive sticking to vehicle body.

Notice:

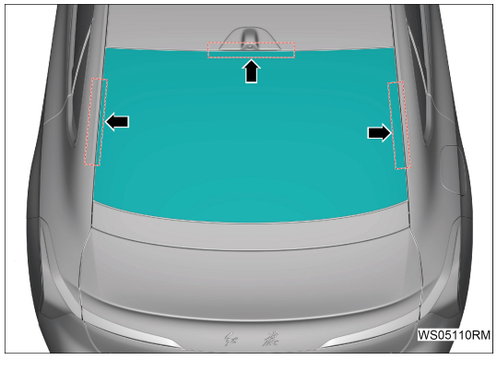
- **The thickness of residual adhesive is not allowed to exceed 2 mm.**

4. **Install rear windshield assembly**

(a) Install the rear windshield assembly with adhesive.

(b) Apply primer at the adhesive coating position (on the body and glass).

(c) Apply adhesive to the windshield assembly according to △ section.



(d) Operation before installing glass:

(e) Move the glass to the vehicle body with suction cups and fix it to the glass so that the gaps of the upper part and both sides are equal, the position is shown as -arrow-.

(f) Confirm that it does not interfere with the installation of trim strip.

(g) Apply rubber tape to the glass and body parts and make matchmark with a pen. (When installing new glass)

(h) When reusing glass, confirm and correct the position of the matchmark.

(i) Check the fitting position of the rear windshield assembly clip pin from inside the vehicle.

(j) After the matchmark and gap are aligned, slightly tap the coating position on the edge of the glass to ensure the adhesion.

Notice:

- **It will take 24 hours for the glass adhesive to fully solidify.**

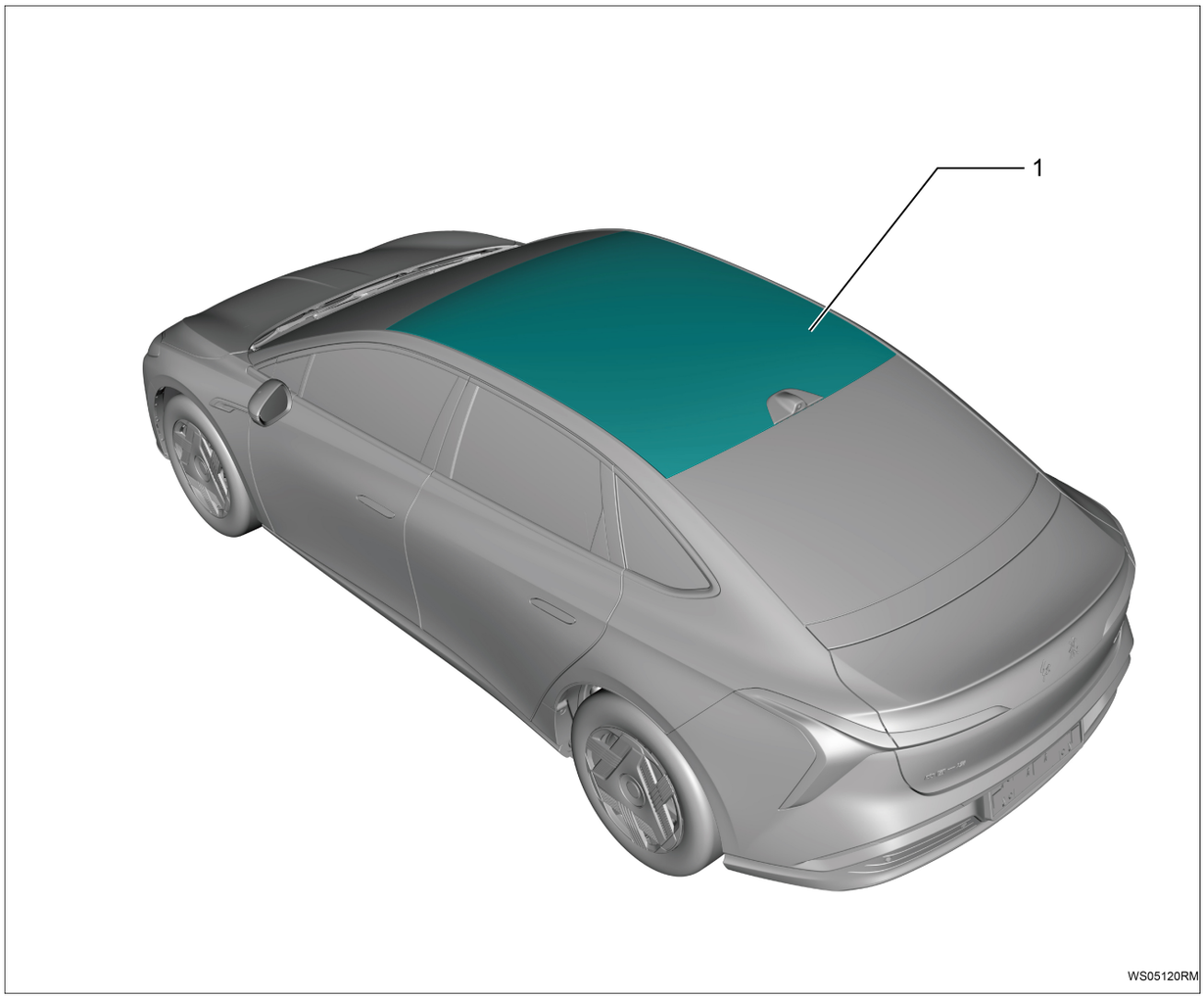
5. Check for leakage and repair

(a) Perform the leakage test after adhesive has completely hardened.

(b) Seal any leaks with automatic glass sealant.

Sunroof assembly

Components



1. Sunroof assembly

Removal

1. **Remove roof assembly (See page NS-172)**
2. **Remove rear camera trim cover (See page ZC-150)**
3. **Remove sunroof assembly**

   Note:

   - According to the cutting position and situation, use a windshield sealing scraper and steel wire for operation.

CS

Notice:

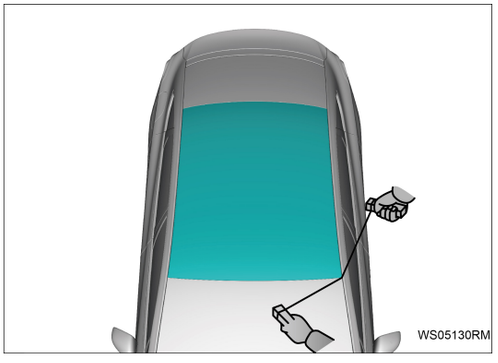
- **Maintain a right angle between the handle and the top of glass when using the scraper, so that the scraper blade is parallel to the glass surface and top of glass, and then move the scraper to cut through the adhesive.**

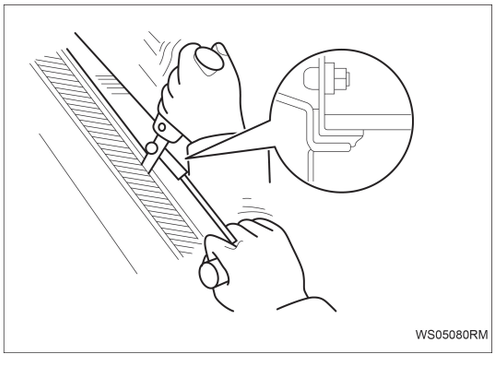
(a) Apply protective tape to the body surface around the sunroof assembly.

(b) Pass a steel wire through the clearance between body and sunroof assembly from inside of vehicle.

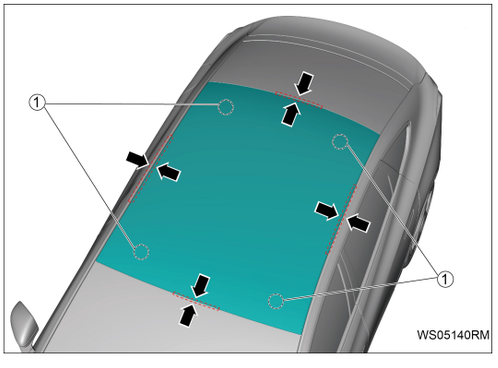
(c) Tie wooden blocks and similar items at both ends of the steel wire.

(d) Pull the steel wire along the sunroof assembly to cut through the adhesive.





(e) Place a plastic protective plate between steel wire and vehicle body quarter panel to prevent scratching the vehicle body quarter panel when removing the sunroof assembly.



Note:

- During installation, it should be performed by four people simultaneously to prevent damage to the sunroof assembly.

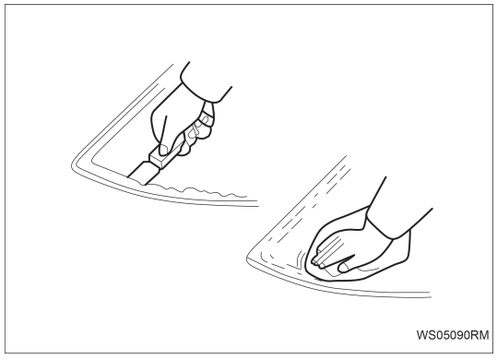
(f) As shown in illustration, if the sunroof assembly continues to be used, assembly marks -arrow- should be made on the sunroof assembly and the vehicle body.

(g) Attract the suction cup to the sunroof glass positions -1-.

(h) Remove the sunroof assembly.

Installation

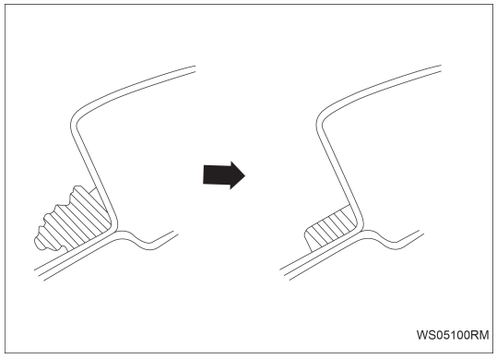
1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Clean sunroof assembly**



(a) Remove the adhesive sticking to sunroof assembly.

(b) Clean the glass with non-residual solvent.

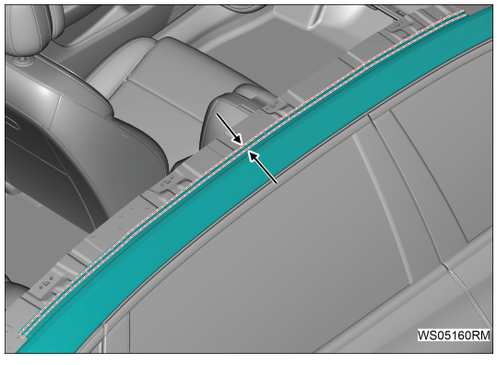
3. **Clean the vehicle body**



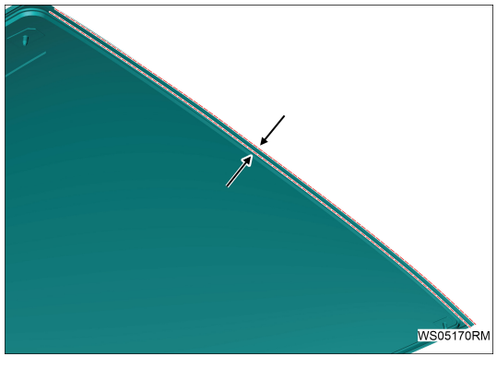
(a) Remove the residual adhesive sticking to vehicle body.

Notice:

- **The thickness of residual adhesive is not allowed to exceed 2 mm.**

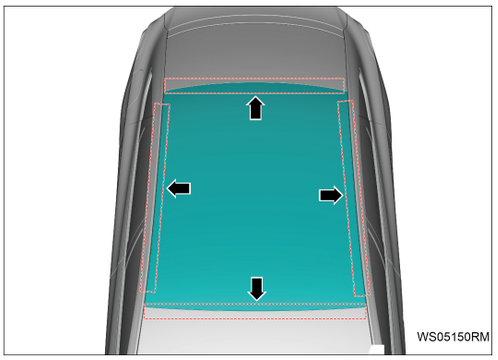


(b) The width of sheet metal cleaning area is ⩾ 14.



(c) The width of glass cleaning area is ⩾ 12.

4. **Install sunroof assembly**



(a) Install the sunroof assembly with adhesive.

(b) Apply primer at the adhesive coating position (on the body and glass).

(c) Apply adhesive to the sunroof assembly according to △ section.

(d) Operation before installing glass:

(e) Move the glass to the vehicle body with suction cups and fix it to the glass so that the gaps of the upper part and both sides are equal, the position is shown as -arrow-.

(f) Confirm that it does not interfere with the installation of trim strip.

(g) Apply rubber tape to the glass and body parts and make matchmark with a pen. (When installing new glass)

(h) When reusing glass, confirm and correct the position of the matchmark.

(i) Check the fitting position of sunroof assembly clip pin from inside the vehicle.

(j) After the matchmark and gap are aligned, slightly tap the coating position on the edge of the glass to ensure the adhesion.

Notice:

- **It will take 24 hours for the glass adhesive to fully solidify.**

5. Check for leakage and repair

(a) Perform the leakage test after adhesive has completely hardened.

(b) Seal any leaks with automatic glass sealant.

Electrical components

Switch

Luggage compartment closed switch assembly ZC-1
Luggage compartment outside opener switch assembly ZC-3
Roof switch assembly ZC-5

Accelerator pedal

Accelerator pedal assembly ZC-7

Backup power supply

Dual USB charging port assembly ZC-9
Single USB charging port assembly ZC-11
Backup power supply assembly ZC-13

Lighting system

Flag light assembly ZC-15
Front combination light assembly ZC-18
Vanity mirror light assembly ZC-22
Rear combination light I assembly ZC-24
Rear combination light II assembly ZC-27
Rear combination light III assembly ZC-30
Foot ambient light assembly ZC-32
License plate light assembly ZC-34
Map light ZC-36
High mounted stop light ZC-38

Antenna assembly

High precision GNSS antenna ZC-40
Communication antenna assembly I ZC-42

Horn system

Horn ZC-44

Immobilizer system

Interior low frequency antenna ZC-46
Outside low frequency antenna ZC-49
Radio frequency transceiver assembly ZC-51
Smart entry low frequency antenna ZC-53
Smart key ZC-55

Safety restraint system

Side curtain shield airbag assembly ZC-60
Front seat airbag ZC-63
Front passenger airbag assembly ZC-66
Accelerator collision sensor assembly ZC-68
Pressure side collision sensor assembly ZC-71
Rear seat airbag ZC-73
Airbag control unit assembly ZC-74
Driver airbag assembly ZC-76

Intelligent driving system

Advanced automatic driving controller assembly ZC-79

Audio entertainment system

Mid tweeter assembly ZC-82
Main display assembly ZC-85
Sub Woofer assembly ZC-87
Infotainment controller assembly ZC-89
Power amplifier assembly ZC-91
Door speaker assembly ZC-93
Microphone assembly ZC-96
Radio antenna amplifier assembly ZC-98
Radio antenna filter assembly ZC-100

Bluetooth control system

Digital key main module assembly ZC-102
Digital key inner antenna assembly ZC-104
Digital key front antenna assembly ZC-106
Digital key rear antenna assembly ZC-108

Millimeter wave radar system

Front millimeter wave radar assembly ZC-110
Rear corner millimeter wave radar ZC-112

Head up display control system

Head up display ZC-114

On-board telematics system

Intelligent domain controller assembly ZC-116

Pedestrian warning control system

Pedestrian warning speaker assembly ZC-118

Combination switch control system

Spiral cable ZC-120
Combination switch assembly ZC-122

Reversing radar control system

Front ultrasonic sensor ZC-124
Rear ultrasonic sensor ZC-126

Intelligent area control system

Intelligent area controller I assembly ZC-128
Intelligent area controller II assembly ZC-132
Intelligent area controller III assembly ZC-135

Driver fatigue monitoring system

Driver status monitoring camera assembly ZC-137

Smart camera control system

Front camera with bracket assembly ZC-139
Interior monitoring camera protector assembly ZC-142
Intelligent interior monitoring front camera assembly ZC-144
Front camera and bracket assembly ZC-146
Rear camera and bracket assembly ZC-148

Rear camera trim cover. ZC-150
Rear camera assembly ZC-152

Intelligent vehicle control platform control system

Intelligent vehicle control platform assembly ZC-154

Mobile phone wireless charging control system

Intelligent start-up wireless charger assembly. ZC-156

Switch

Luggage compartment closed switch assembly

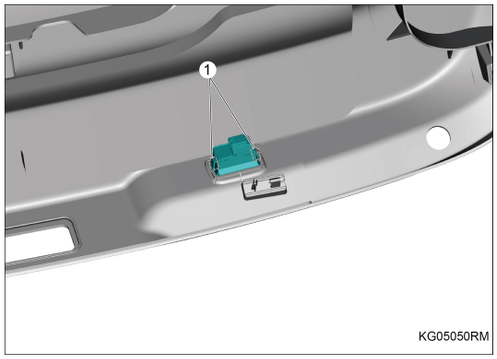
Components



1. **Luggage compartment closed switch assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment door cover assembly (See page NS-153)**
3. **Remove luggage compartment closed switch assembly**



(a) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Luggage compartment outside opener switch assembly

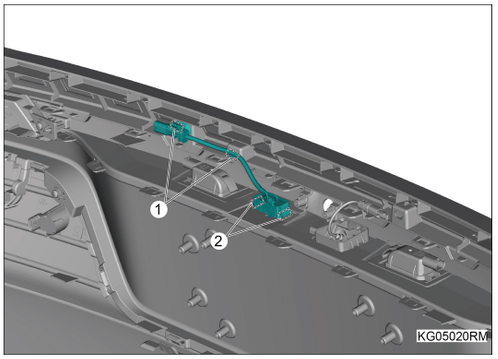
Components



1. **Luggage compartment outside opener switch assembly**

Removal

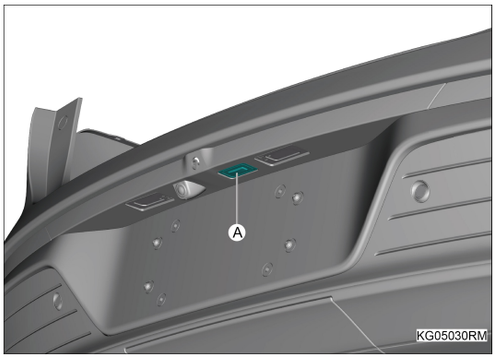
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-1)**
3. **Remove luggage compartment outside opener switch assembly**



(a) Detach the clip -1-.

(b) Detach the claw -2-.

(c) Disconnect the wire harness connector.



(d) Remove the luggage compartment outside opener switch assembly -A-.

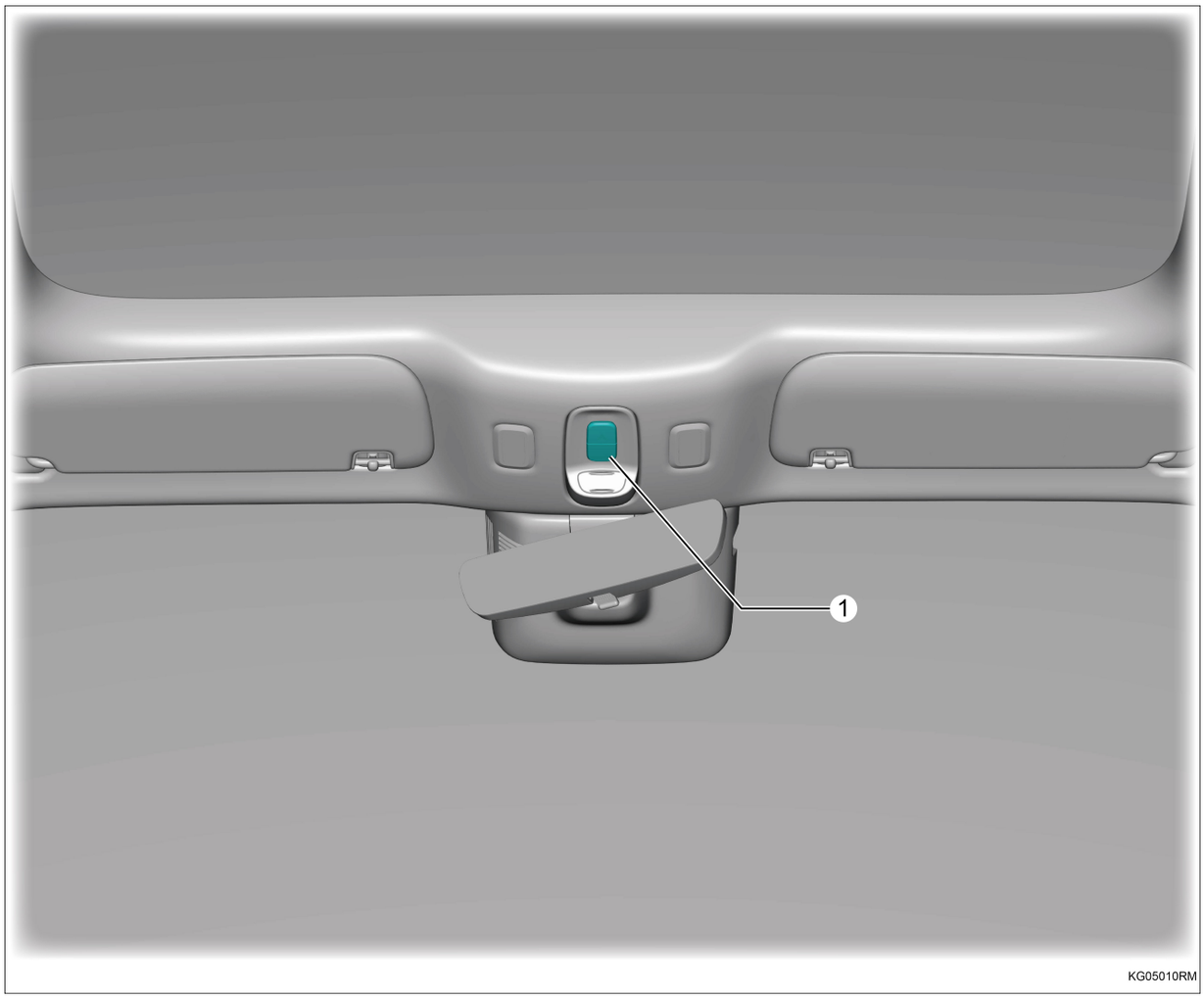
ZC

Installation

1. **Installation is in the reverse order of removal.**

Roof switch assembly

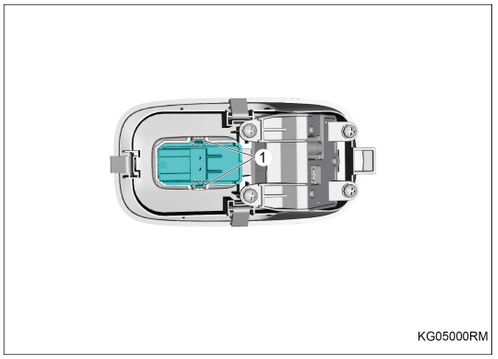
Components



1. Roof switch assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove interior monitoring camera protector assembly (See page ZC-144)**
3. **Remove roof switch assembly**



(a) Detach the claw -1-.

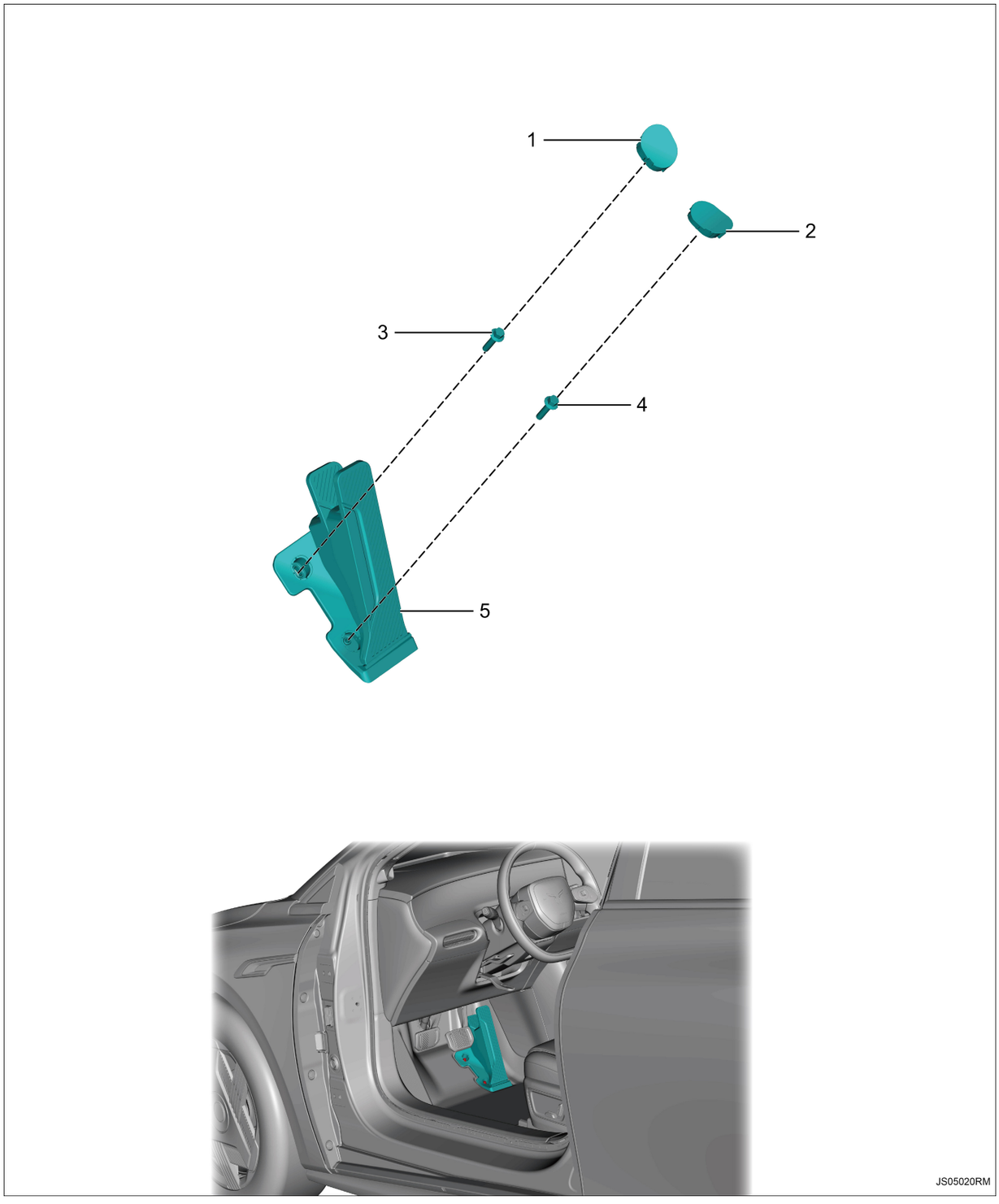
Installation

1. Installation is in the reverse order of removal.

Accelerator pedal

Accelerator pedal assembly

Components

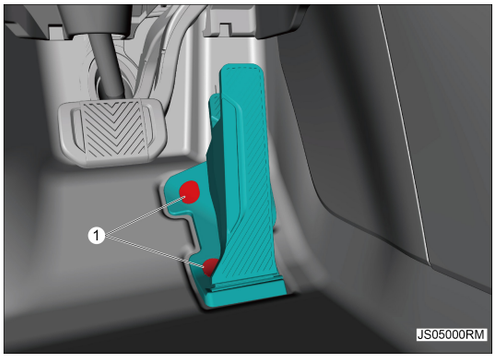


1. **Baffle**
2. **Baffle**

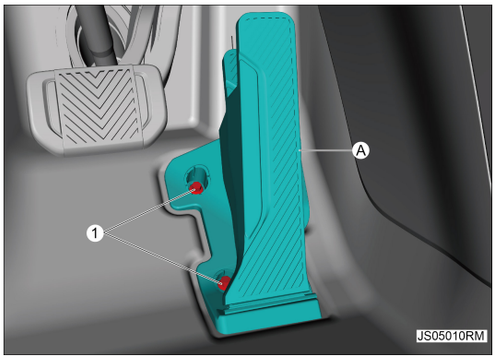
3. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
4. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
5. **Accelerator pedal assembly**

Removal

1. **Remove accelerator pedal assembly**



(a) Remove the baffles -1-.



(b) Remove the bolt -1-.

(c) Detach the wire harness connector, and remove the accelerator pedal -A-.

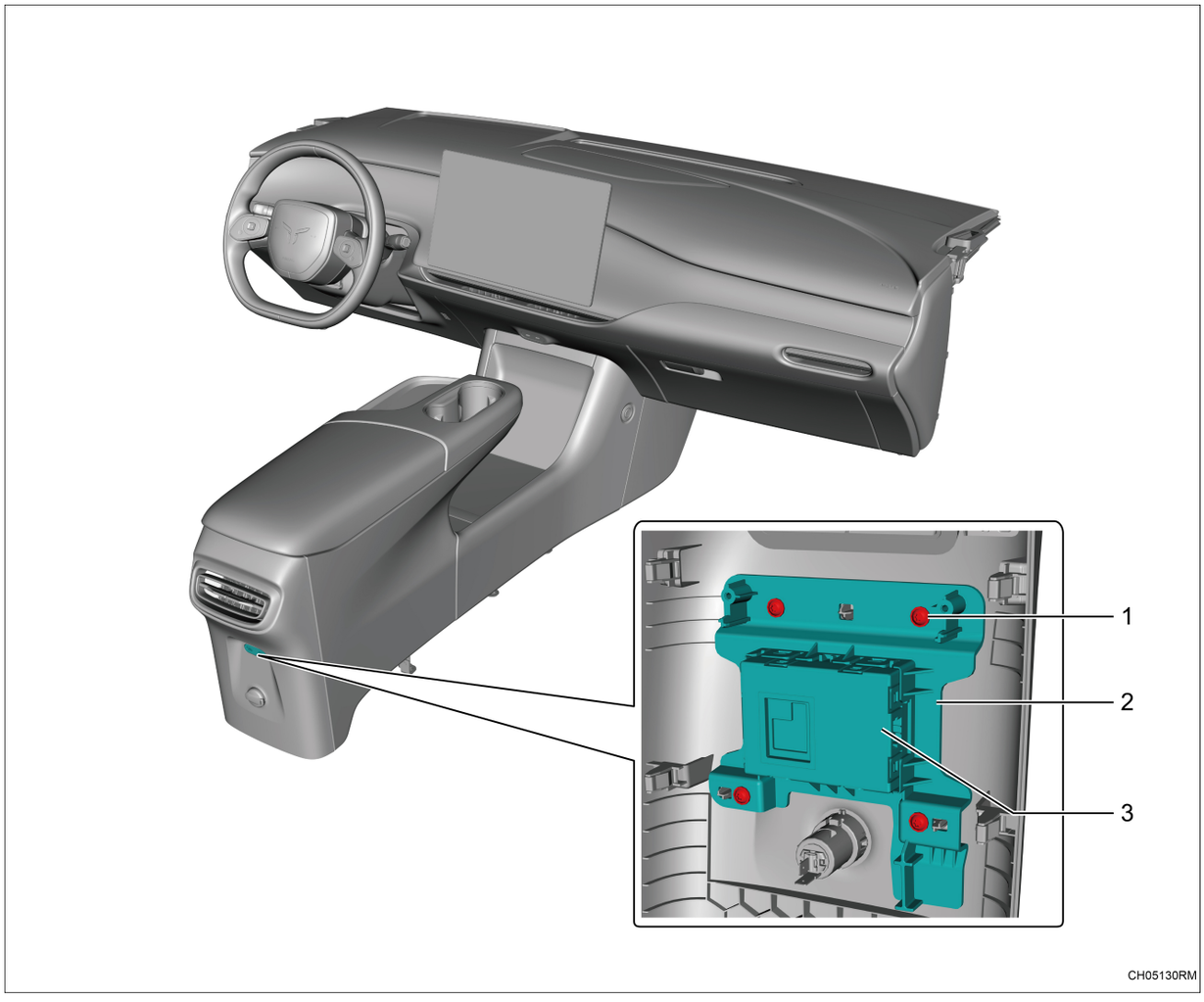
Installation

1. **Installation is in the reverse order of removal.**

Backup power supply

Dual USB charging port assembly

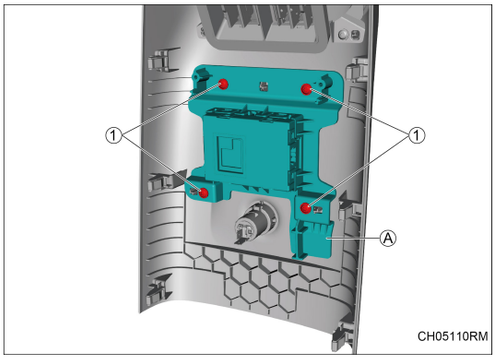
Components



1. **Screw**
   - X4
2. **USB holder**
3. **Dual USB charging port assembly**

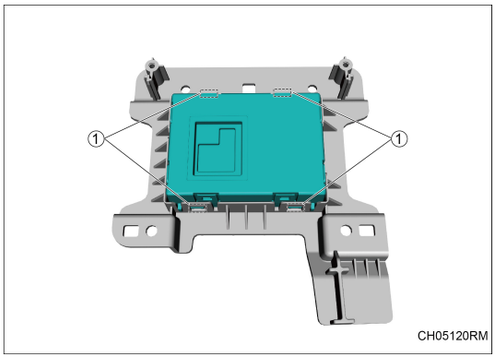
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear end plate assembly (See page NS-49)**
3. **Remove rear part of rear cooling air duct assembly (See page RE-47)**
4. **Remove dual USB charging port assembly**



(a) Remove the screw -1-.

(b) Remove the USB holder -A-.



(c) Detach the claw -1-.

(d) Remove the dual USB charging port assembly.

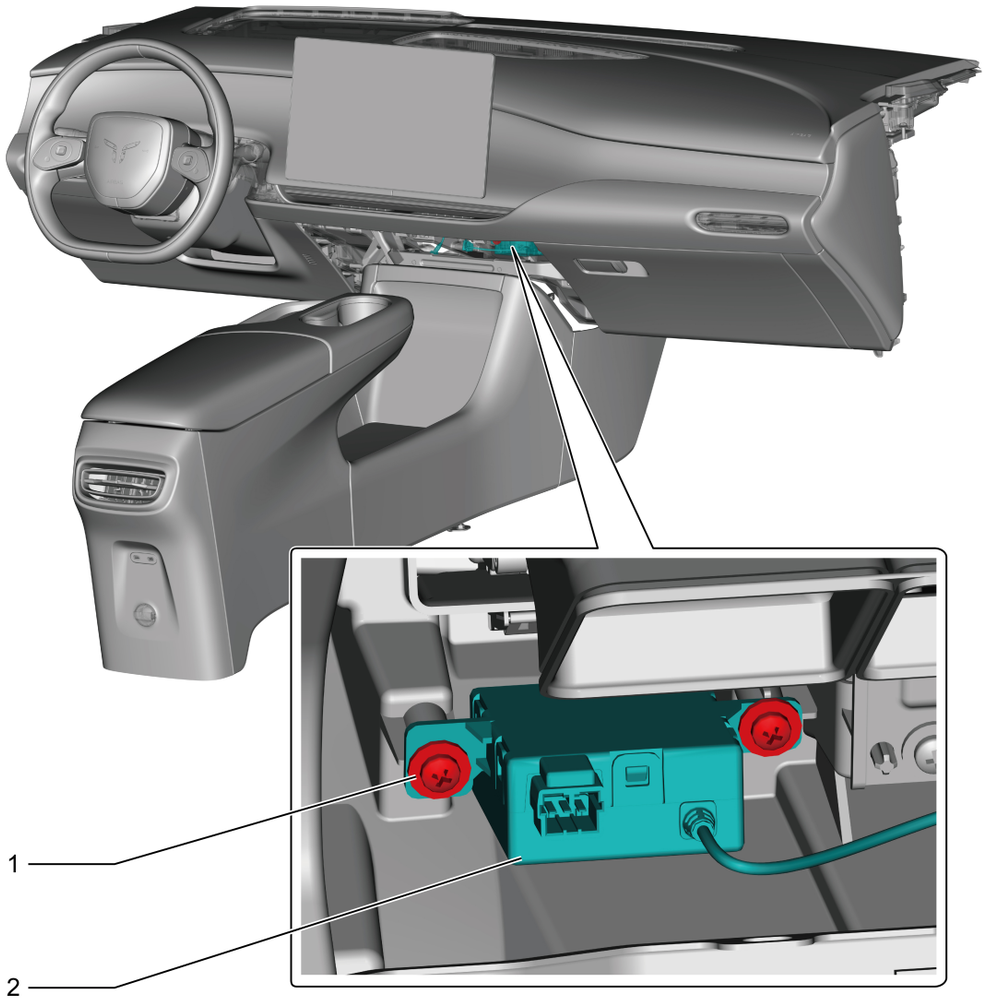
ZC

Installation

1. Installation is in the reverse order of removal.

Single USB charging port assembly

Components

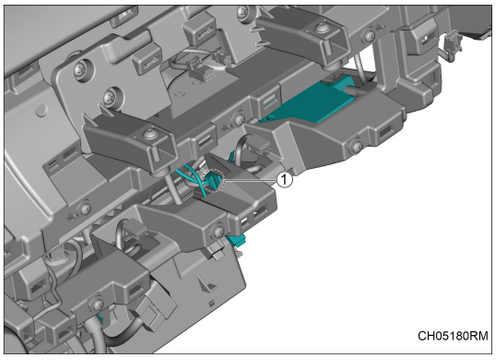


1. **Screw**
   - X2
2. **Single USB charging port assembly**

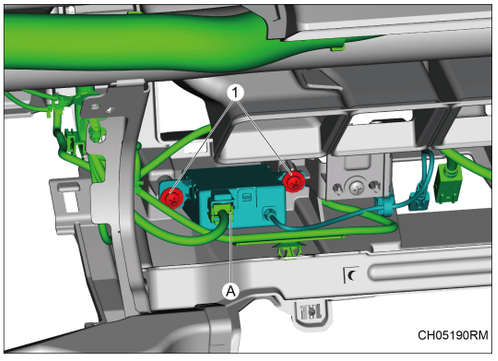
Removal

1. **Disconnect negative battery terminal (See page DL-21)**

2. **Remove glove box assembly (See page NS-33)**
3. **Remove auxiliary fascia console assembly (See page NS-49)**
4. **Remove middle protector assembly (See page NS-25)**
5. **Remove dual USB charging port assembly**



(a) Disengage the wire harness fixing clip -1-.



(b) Disconnect the wire harness connector -A-.

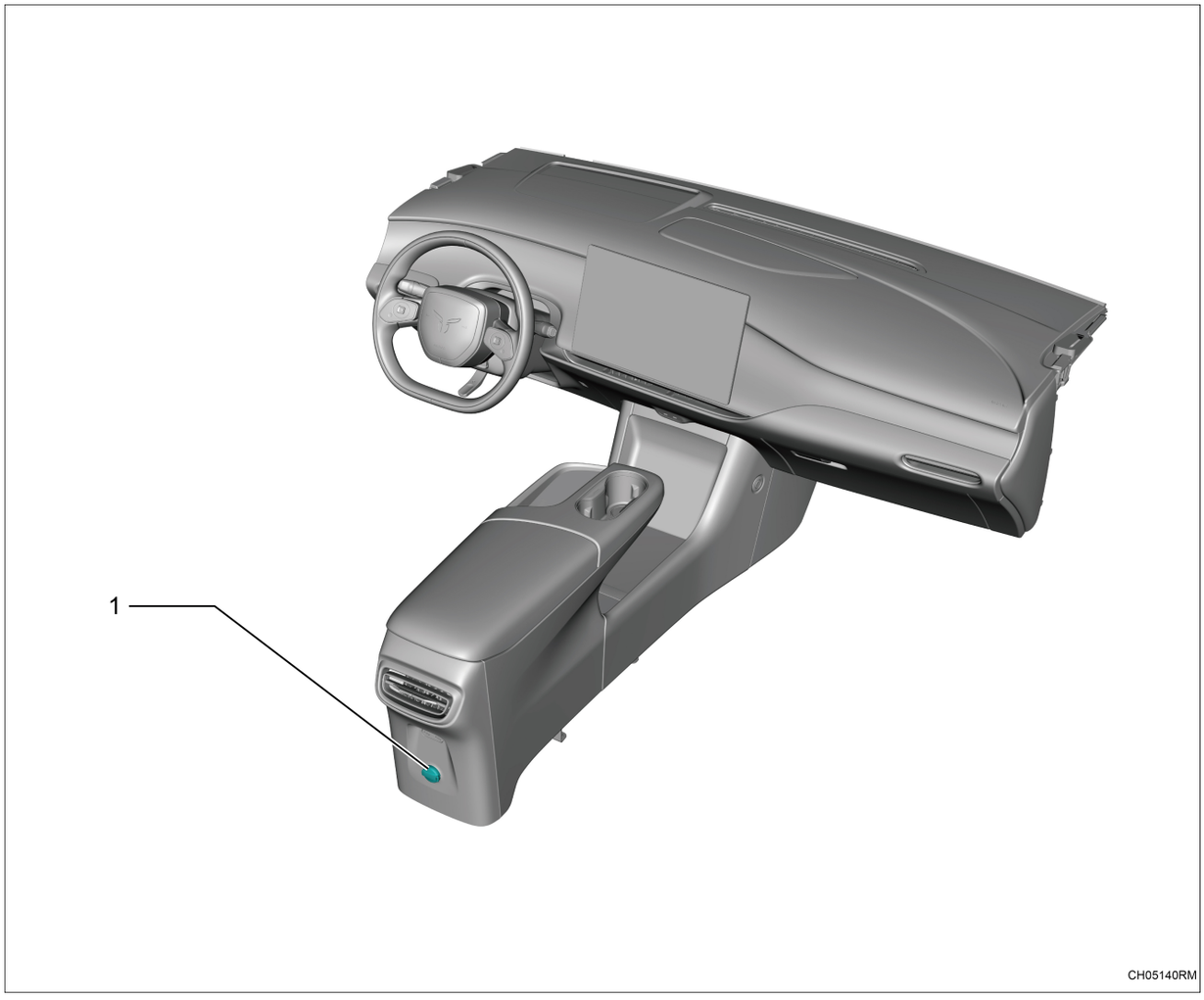
(c) Use a suitable tool to remove screw -1-.

Installation

1. **Installation is in the reverse order of removal.**

Backup power supply assembly

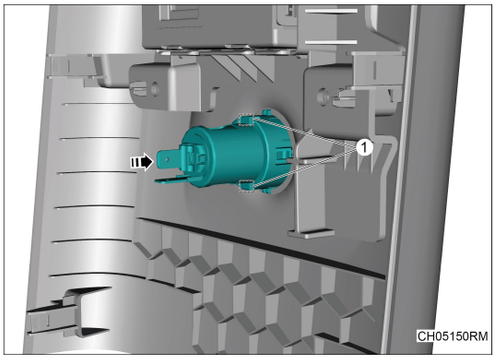
Components



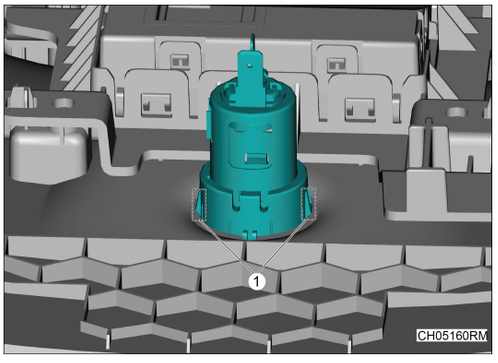
1. Backup power supply assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear end plate assembly (See page NS-49)**
3. **Remove rear part of rear cooling air duct assembly (See page RE-47)**
4. **Remove backup power supply assembly**



(a) Pry off and detach claws -1-.
(b) Press it in the direction of -arrow-.



(c) Press and detach the claws -1-.
(d) Remove the backup power supply mounting ring.



(e) Remove the backup power supply assembly -A-.

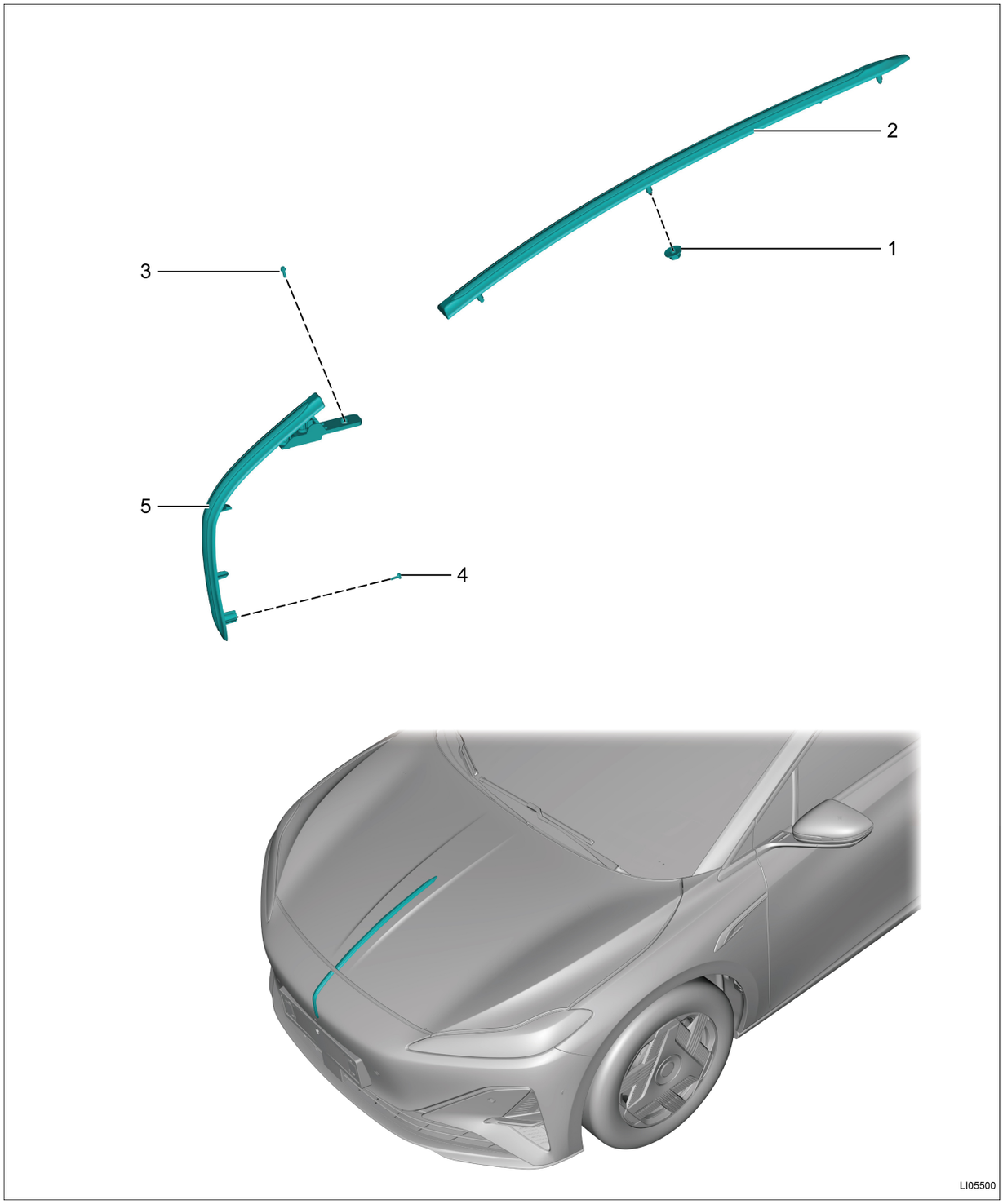
Installation

1. **Installation is in the reverse order of removal.**

Lighting system

Flag light assembly

Components



1. Nut

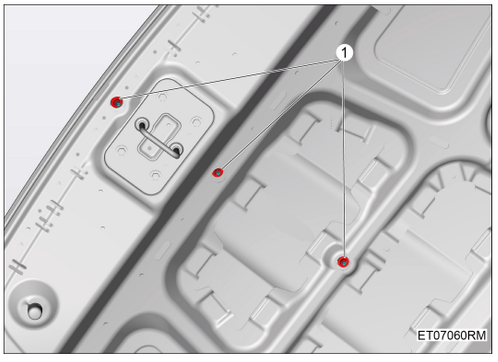
- X3

- Torque: 0 ~ 0 N • m

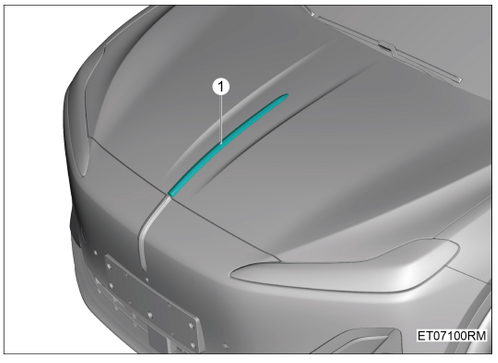
2. **Bolt**
   - Torque: 0 ~ 0 N • m
3. **Rear flag light**
4. **Screw**
5. **Front flag light**

Removal

1. **Remove front compartment cover heat insulator assembly (See page WS-94)**
2. **Remove front compartment storage box assembly (See page WS-83)**
3. **Remove front bumper assembly (See page WS-1)**
4. **Remove flag light**



(a) Remove the nut -1-.

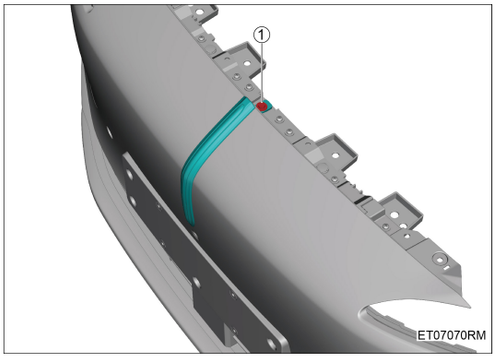


(b) Use paper tape to paste the surrounding area of rear flag light.

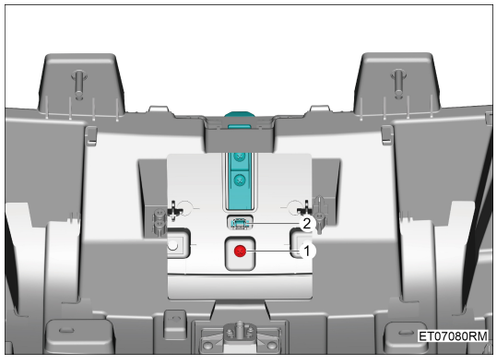
(c) Use a plastic crow plate to remove rear flag light -1- from front compartment cover.

Notice:

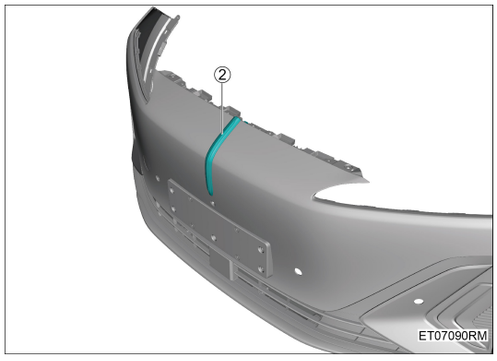
- **Be careful not to damage the paint surface when using a plastic crow plate to remove the flag light.**



(d) Remove the bolt -1-.



(e) Remove the screw -1-.



(f) Use paper tape to paste the surrounding area of front flag light.

(g) Use a plastic crow plate to remove front flag light -2- from front bumper.

Notice:

- **Be careful not to damage the paint surface when using a plastic crow plate to remove the flag light.**

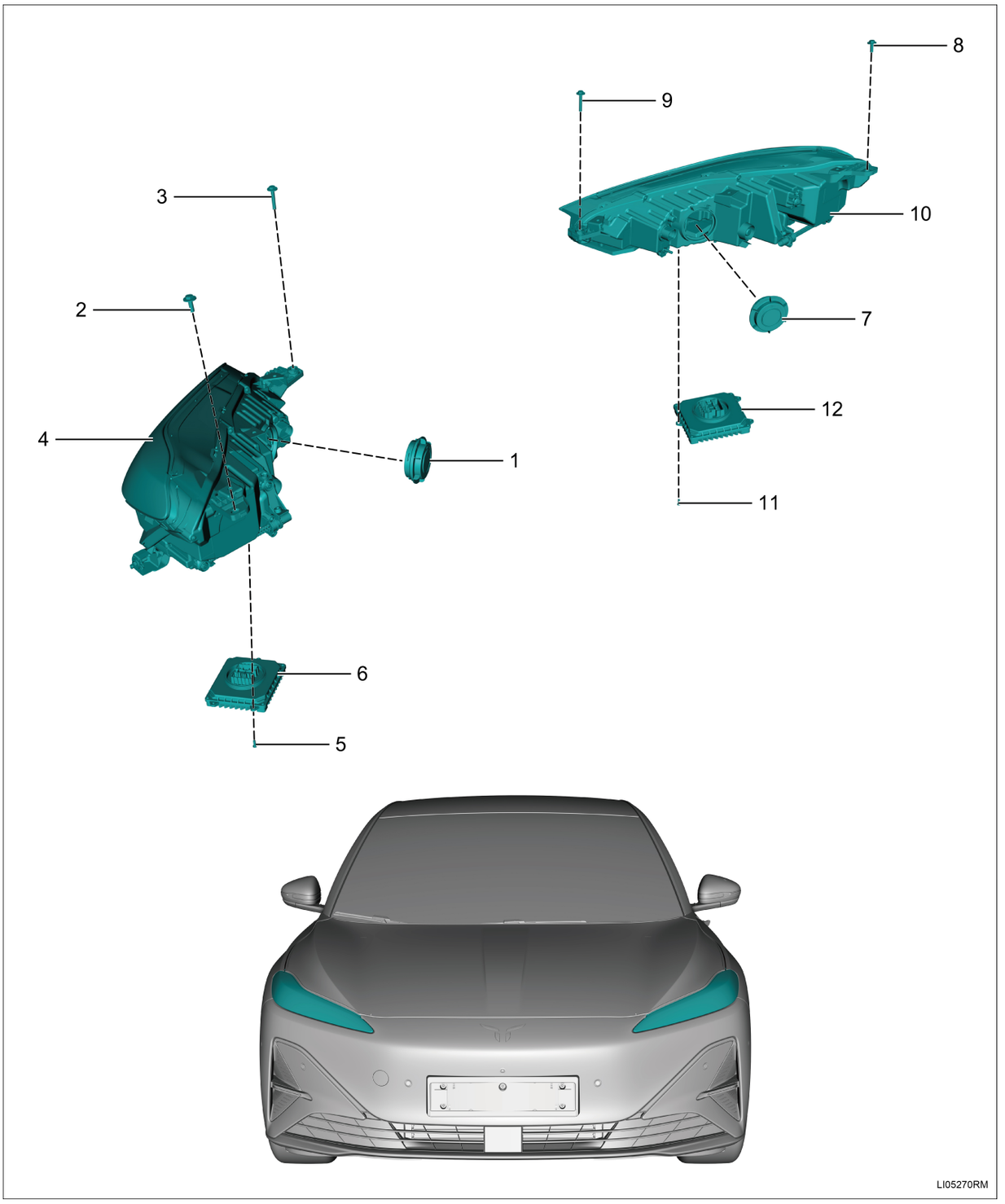
ZC

Installation

1. **Installation is in the reverse order of removal.**

Front combination light assembly

Components



1. **Front light desiccant**
2. **Combination bolt**
   - X2
   - Torque: 4 ~ 6 N • m

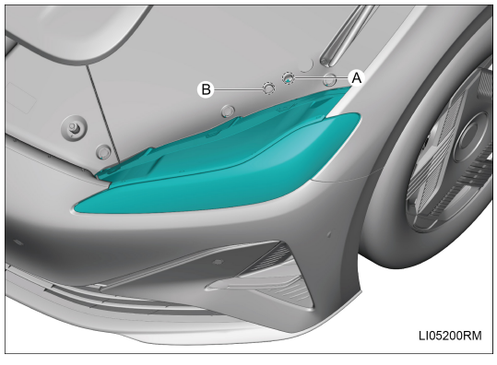
3. **Combination bolt**
   - X2
   - Torque: 4 ~ 6 N • m
4. **Front left combination light assembly**
5. **Screw**
   - X3
6. **Front combination light driver II assembly**
7. **Front light desiccant**
8. **Combination bolt**
   - X2
   - Torque: 4 ~ 6 N • m
9. **Combination bolt**
   - X2
   - Torque: 4 ~ 6 N • m
10. **Front right combination light assembly**
11. **Screw**
    - X3
12. **Front combination light driver II assembly**

Adjustment

Note:

- Use same adjustment sequence for right and left sides.

1. **Open the front compartment cover assembly.**
2. **Front combination light assembly adjustment**



(a) Insert a suitable tool into reserved holes to adjust front combination light assembly knobs -A-B-.

Notice:

- **-A- is up/down adjustment.**
- **-B- is left/right adjustment.**

(b) Rotate tool left and right to adjust.

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment upper left protector (See page WS-79)**

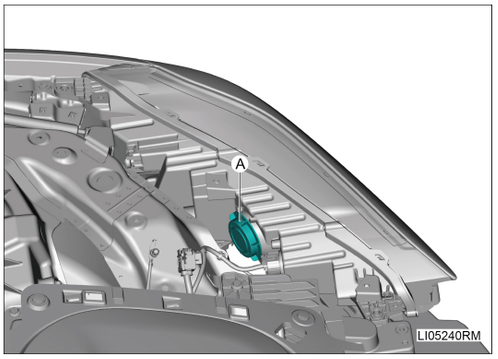
Note:

- Use same removal orders for right and left sides.

3. **Remove front light desiccant**

Note:

- Use same removal orders for right and left sides.



(a) Rotate and remove the front light desiccant -A-.

4. **Remove front bumper (See page WS-1)**
5. **Remove front bumper left bracket (See page WS-1)**

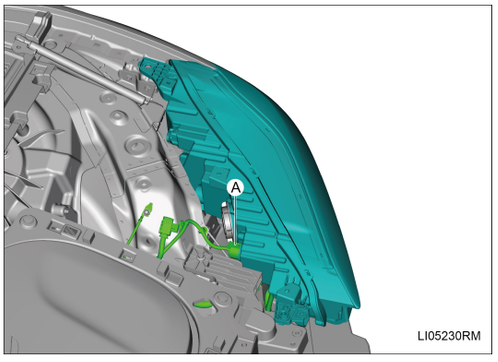
Note:

- Use same removal orders for right and left sides.

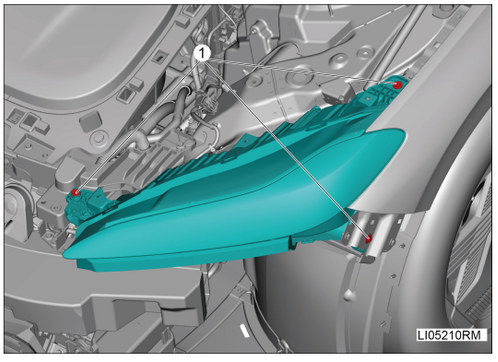
6. **Remove front combination light assembly**

Note:

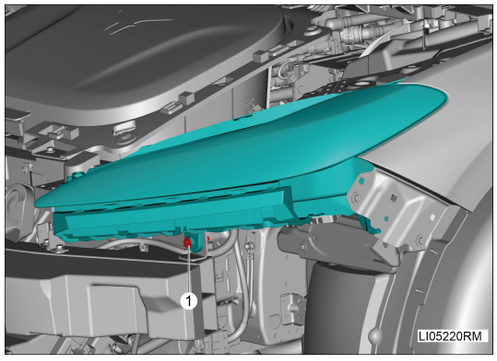
- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

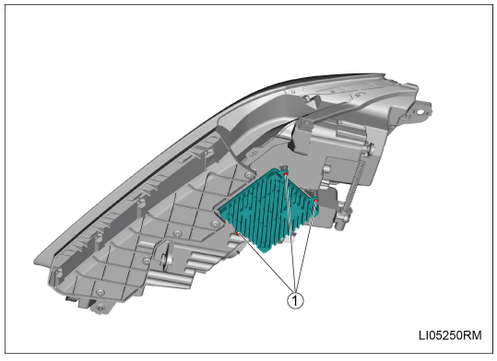


(b) Remove the bolt -1-.



(c) Remove bolt -1-, and remove front combination light I assembly forward from body.

7. Remove front combination light driver II assembly



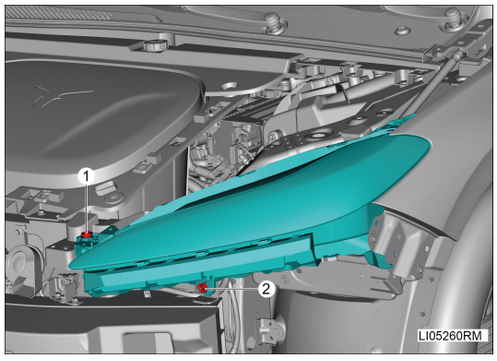
(a) Remove the screw -1-.

(b) Remove the front combination light driver from front combination light.

(c) Disconnect the connector.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) Align the headlight with the contours of body and front bumper, and check the clearance size after installation.

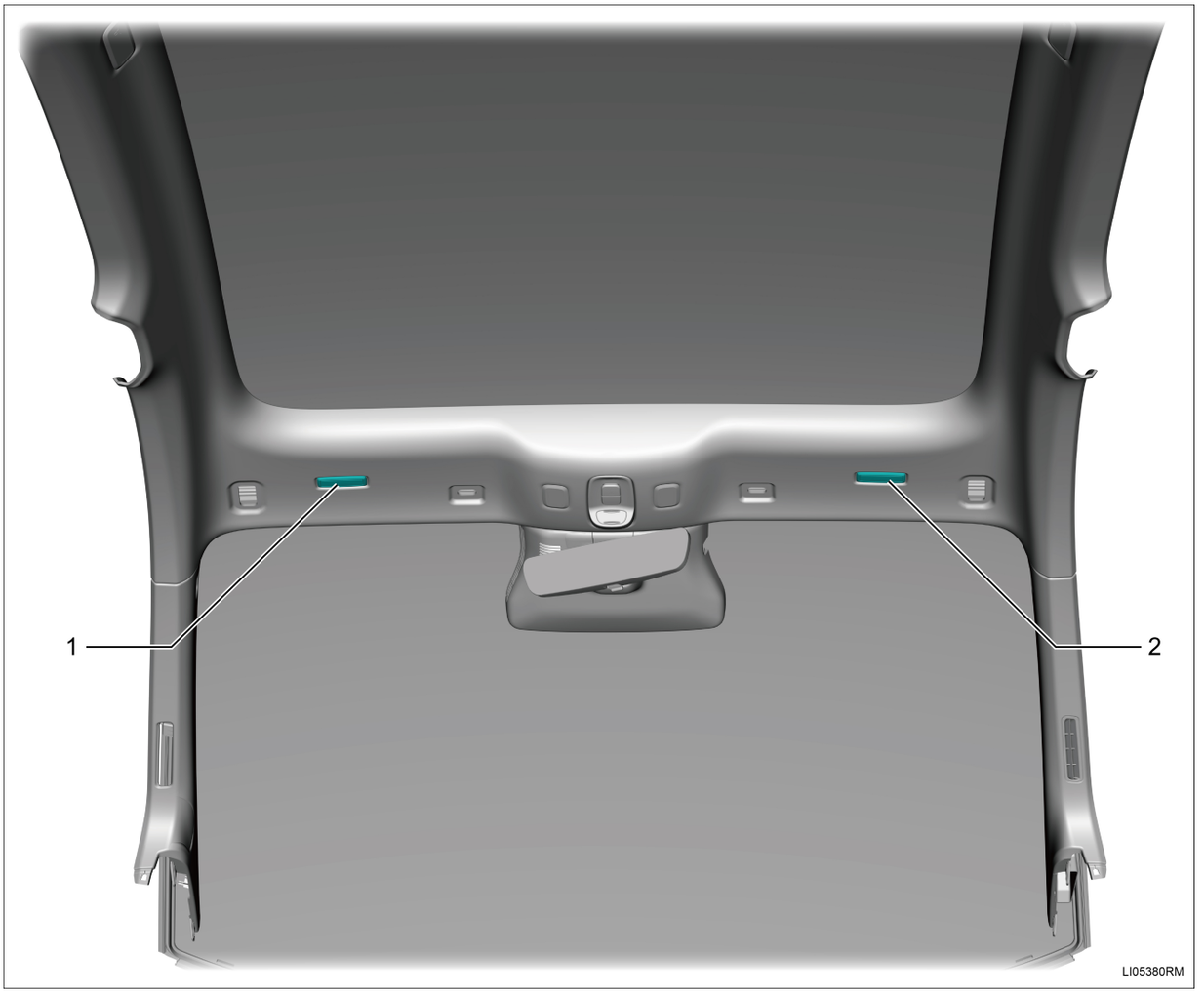
(b) If the clearance size is unreasonable, the nuts -1-2- need to be adjusted.

Notice:

- **Nut -2- needs to be adjusted to fit the sheet metal (control standard clearance ⩽ 0.5 mm).**

Vanity mirror light assembly

Components



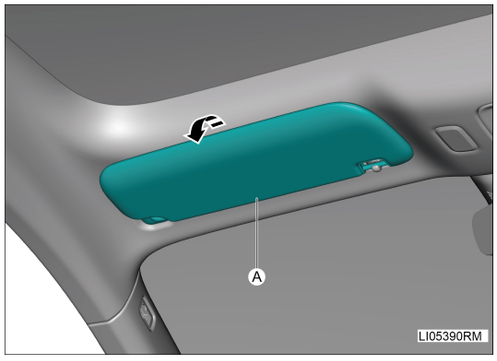
1. **Left vanity mirror light assembly**
2. **Right vanity mirror light assembly**

Removal

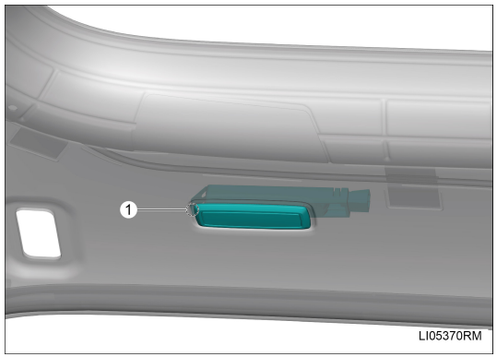
Note:

- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove vanity mirror light assembly**



(a) Rotate the sun visor assembly -A-.



(b) Detach the clip -1-.

(c) Disconnect the wire harness connector.

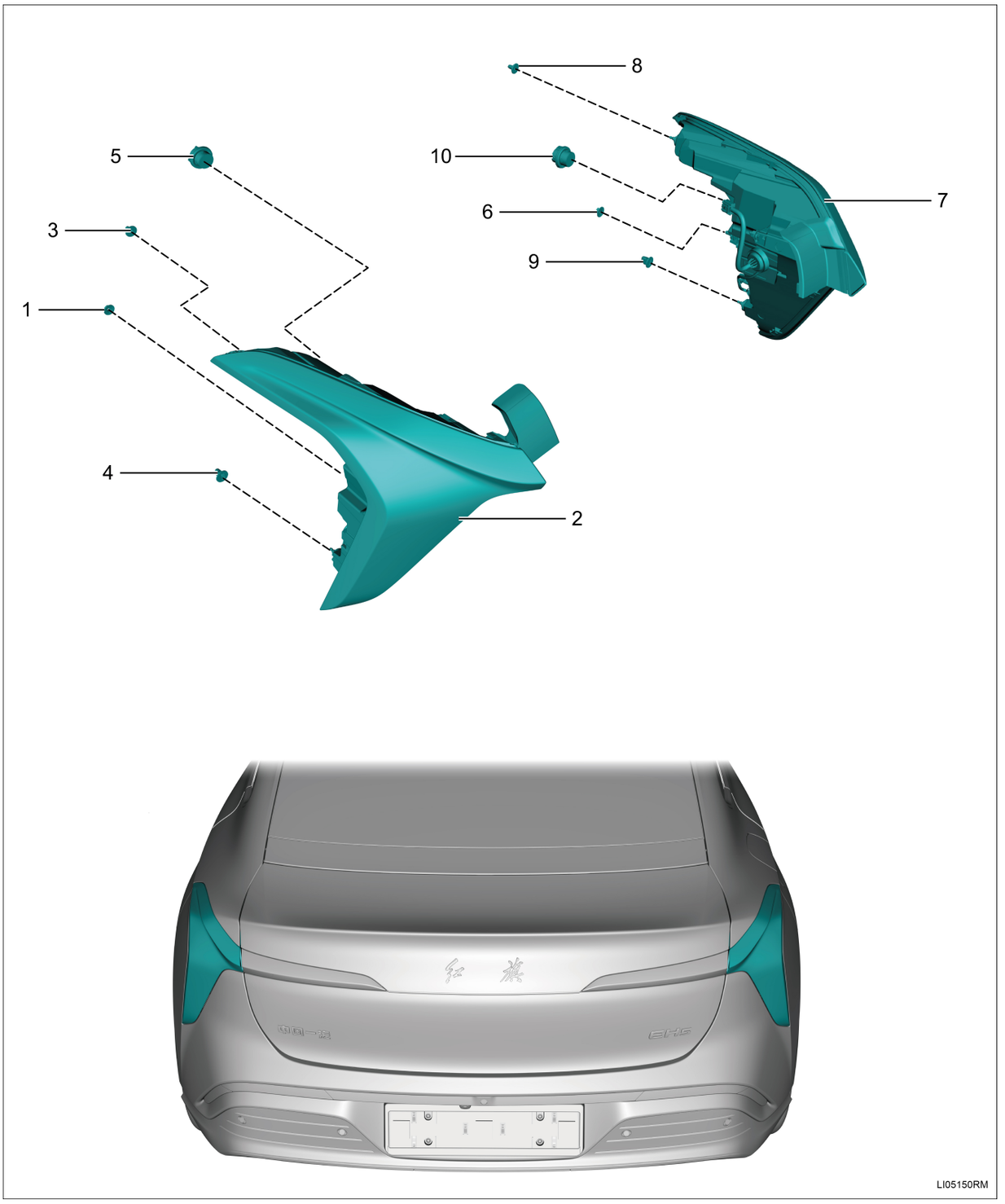
ZC

Installation

1. Installation is in the reverse order of removal.

Rear combination light I assembly

Components



1. **Hexagon flange nut**
   - X2
   - Torque: 2.5 ~ 3.5 N • m
2. **Rear left combination light I assembly**

3. **Clip A assembly**
4. **Clip B assembly**
5. **Rear light desiccant**
6. **Hexagon flange nut**
   - X2
   - Torque: 2.5 ~ 3.5 N • m
7. **Rear right combination light I assembly**
8. **Clip A assembly**
9. **Clip B assembly**
10. **Rear light desiccant**

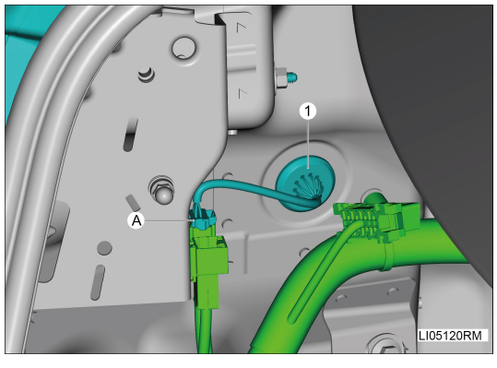
ZC

Removal

Note:

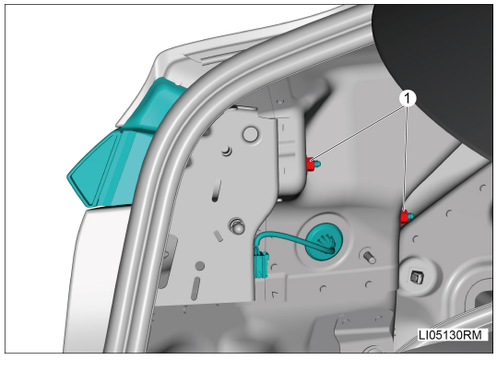
- Use same removal orders for right and left sides.

1. **Open the luggage compartment door.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove luggage compartment side cover assembly (See page NS-157)**
4. **Remove subwoofer assembly (only for removal of rear right combination light I assembly) (See page ZC-87)**
5. **Remove rear left combination light I assembly**

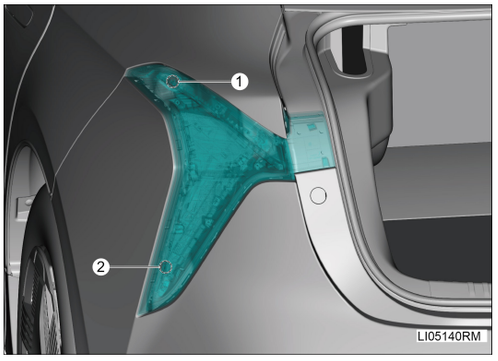


(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixture -1-.

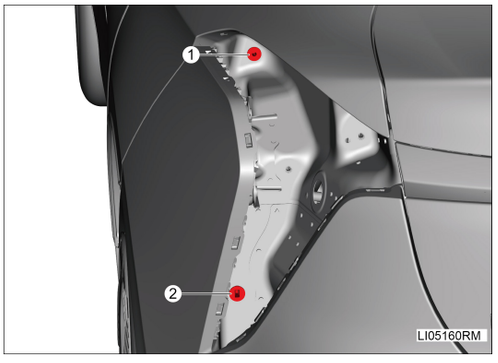


(c) Remove the nut -1-.



(d) Detach the clip A assembly -1- and clip B assembly -2-.

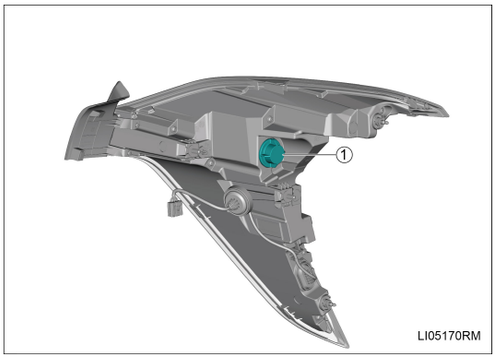
(e) Remove rear combination light assembly from body.



(f) Remove the clip A assembly -1-.

(g) Remove the clip B assembly -2-.

6. Remove rear light desiccant



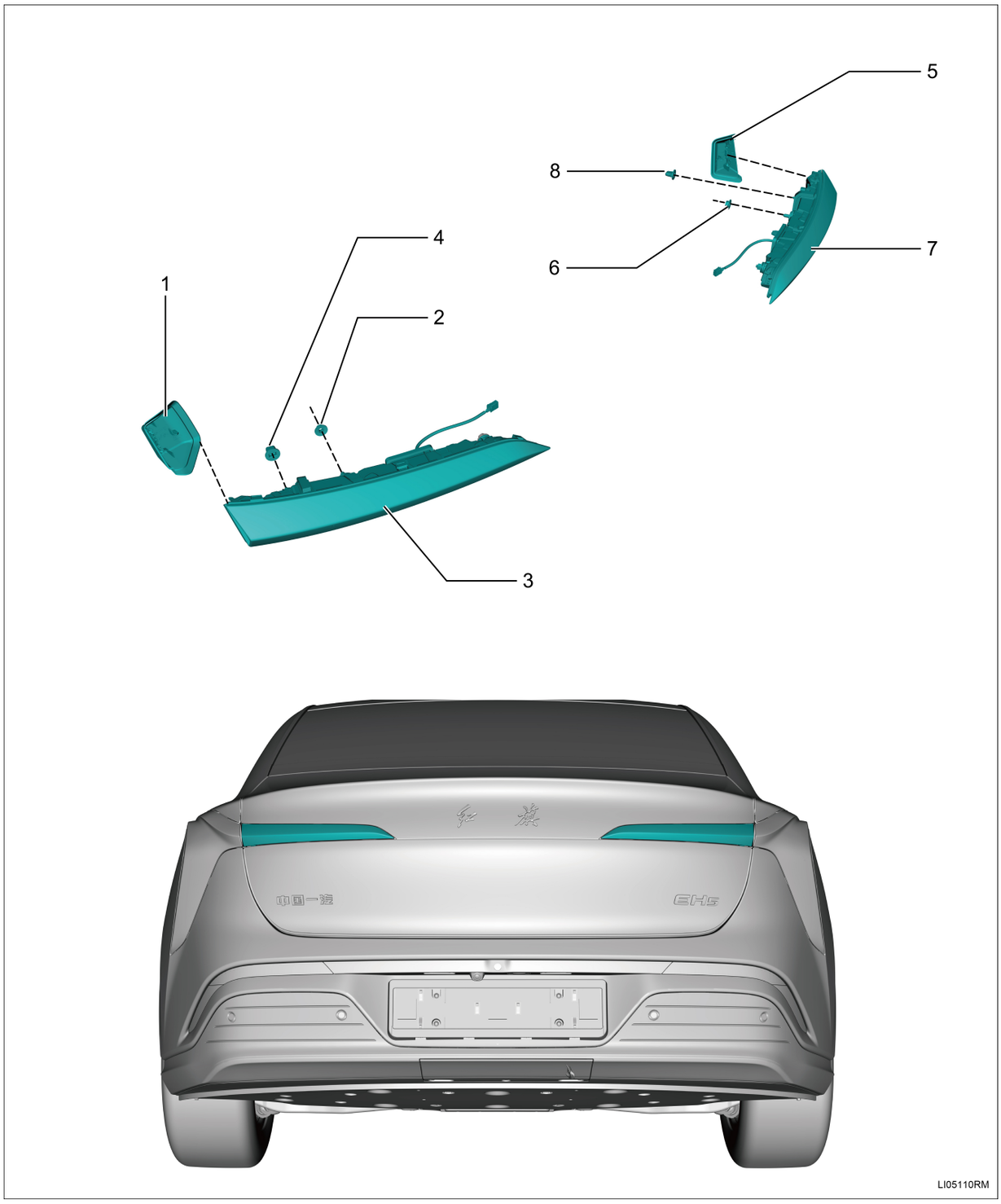
(a) Rotate and remove the rear light desiccant -1-.

Installation

1. Installation is in the reverse order of removal.

Rear combination light II assembly

Components



1. **Rear left combination light II cover plate**
2. **Hexagon flange nut**
   - X2
   - Torque: 2.5 ~ 3.5 N • m

3. **Rear left combination light II assembly**
4. **Clip B assembly**
5. **Rear right combination light II cover plate**
6. **Hexagon flange nut**
   - X2
   - Torque: 2.5 ~ 3.5 N • m
7. **Rear right combination light II assembly**
8. **Clip B assembly**

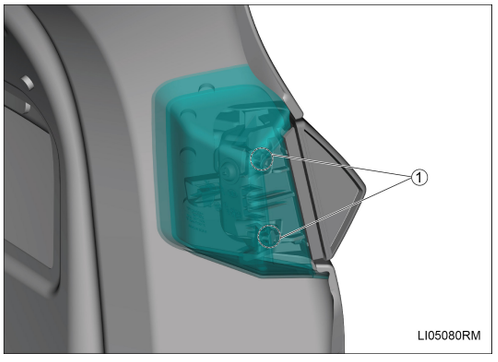
Removal

1. **Open the luggage compartment door.**
2. **Disconnect negative battery terminal (See page DL-21)**
3. **Remove rear left combination light II cover plate**

   Note:

   - Use same removal orders for right and left sides.

   (a) Pry off and detach claws -1-.

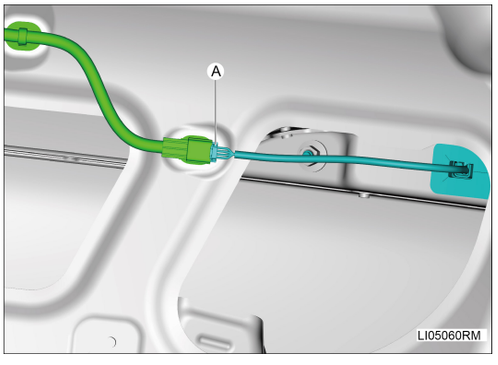


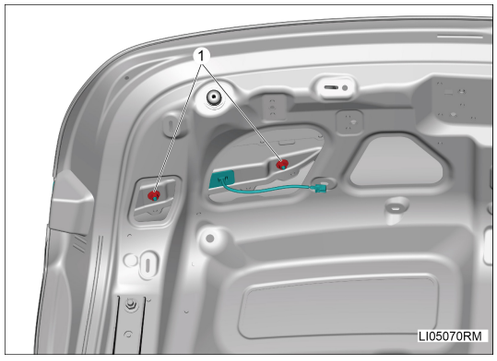
4. **Remove luggage compartment door cover assembly (See page NS-153)**
5. **Remove rear left combination light II assembly**

   Note:

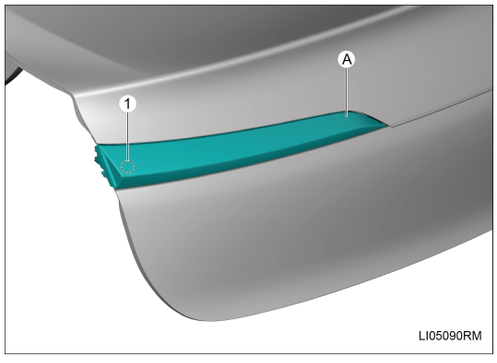
   - Use same removal orders for right and left sides.

   (a) Disconnect the wire harness connector -A-.



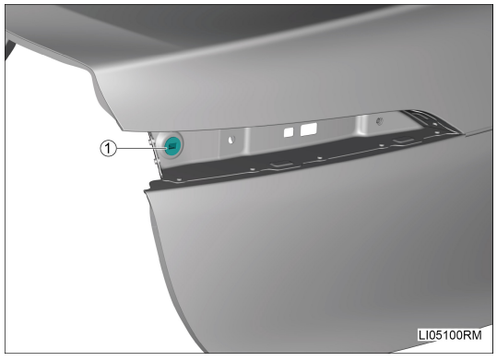


(b) Remove the nut -1-.



(c) Detach the clip -1-.

(d) Remove rear left combination light II assembly -A- from luggage compartment door.



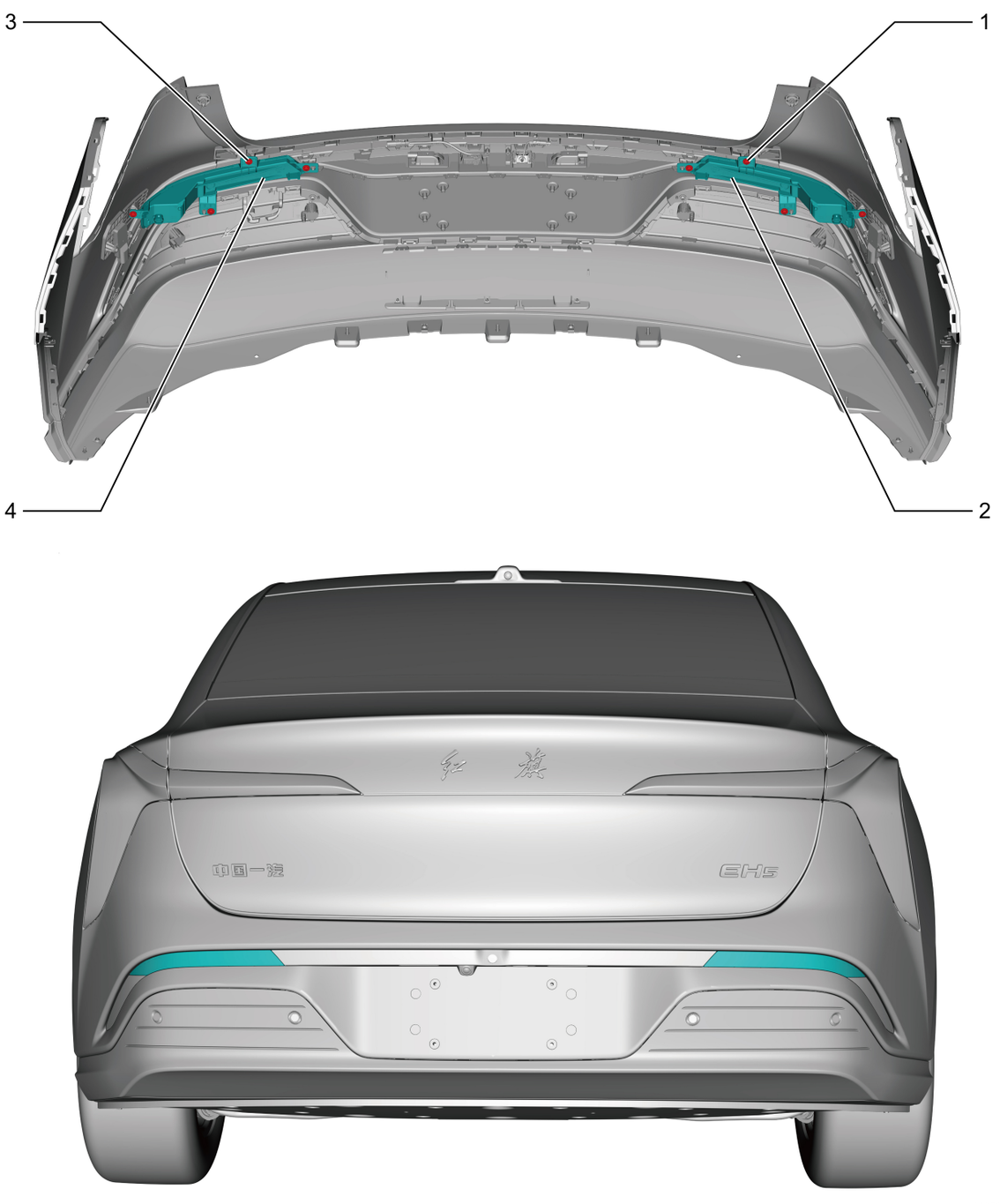
(e) Detach the claw to remove clip B assembly -1-.

Installation

1. Installation is in the reverse order of removal.

Rear combination light III assembly

Components



1. **Cross recess pan head self-tapping screw and flat washer set**
   - X4
2. **Rear left combination light III assembly**
3. **Cross recess pan head self-tapping screw and flat washer set**

- X4

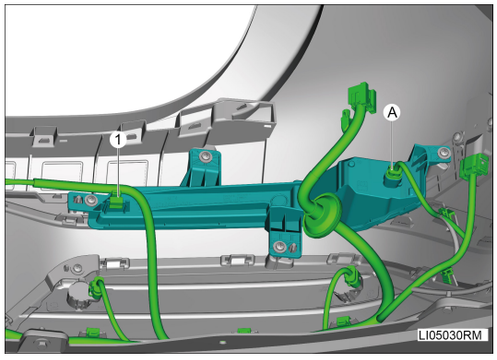
4. Rear right combination light III assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-13)**
3. **Remove rear combination light III assembly**

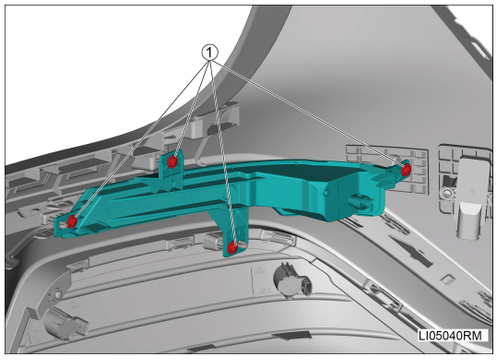
Note:

- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixing clip -1-.



(c) Remove the screw -1-.

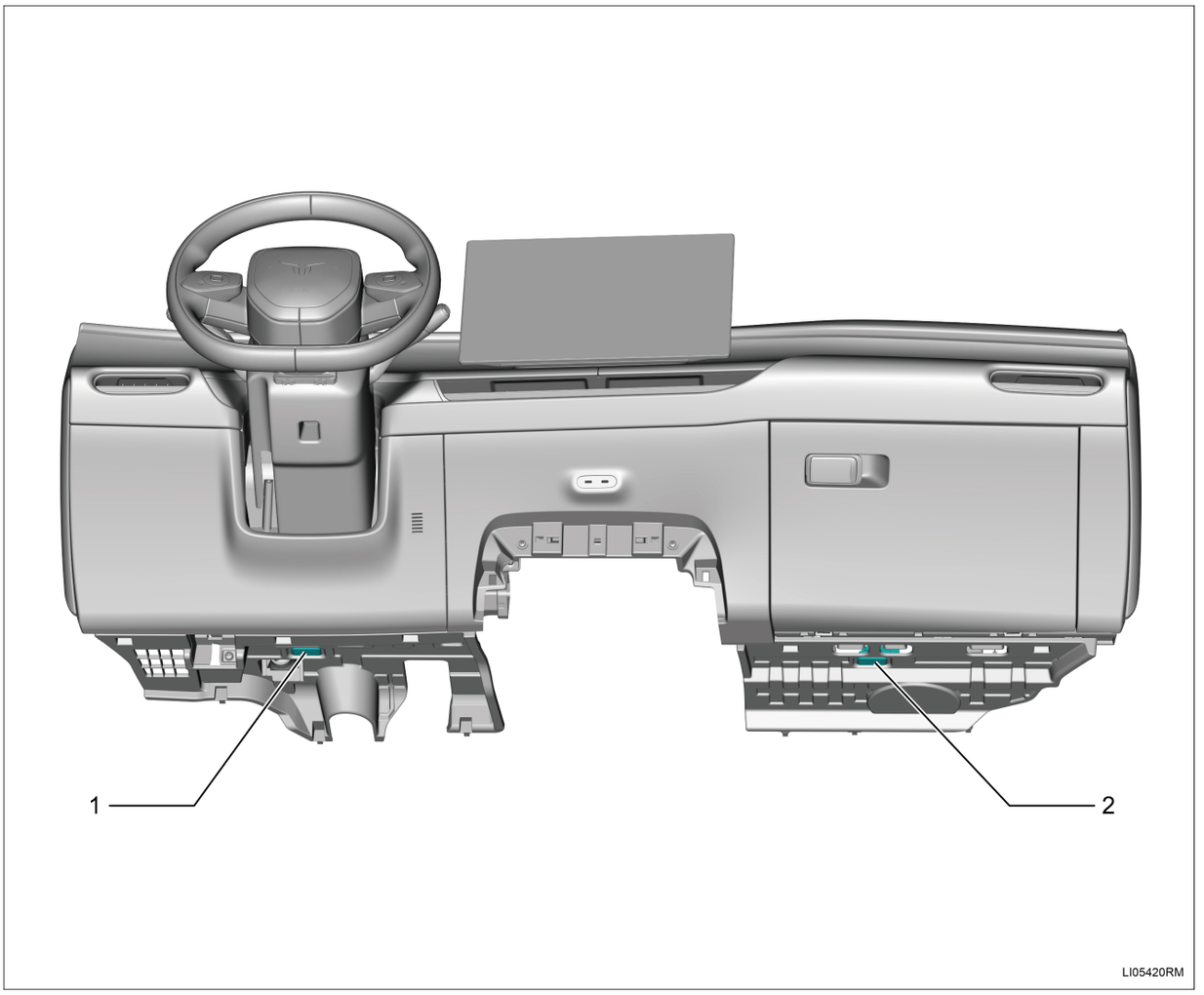
Installation

1. **Installation is in the reverse order of removal.**

ZC

Foot ambient light assembly

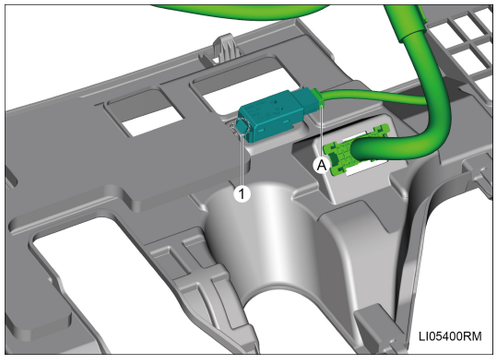
Components



1. **Left foot ambient light assembly**
2. **Right foot ambient light assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove lower left bottom protector (See page NS-29)**
3. **Remove left foot ambient light assembly**

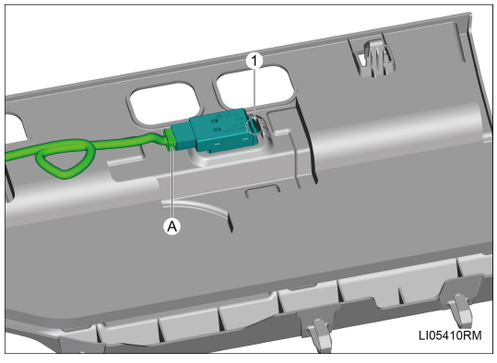


(a) Disconnect the wire harness connector -A-.

(b) Detach the claw -1-.

4. **Remove lower right bottom protector (See page NS-29)**

5. **Remove right foot ambient light assembly**



(a) Disconnect the wire harness connector -A-.

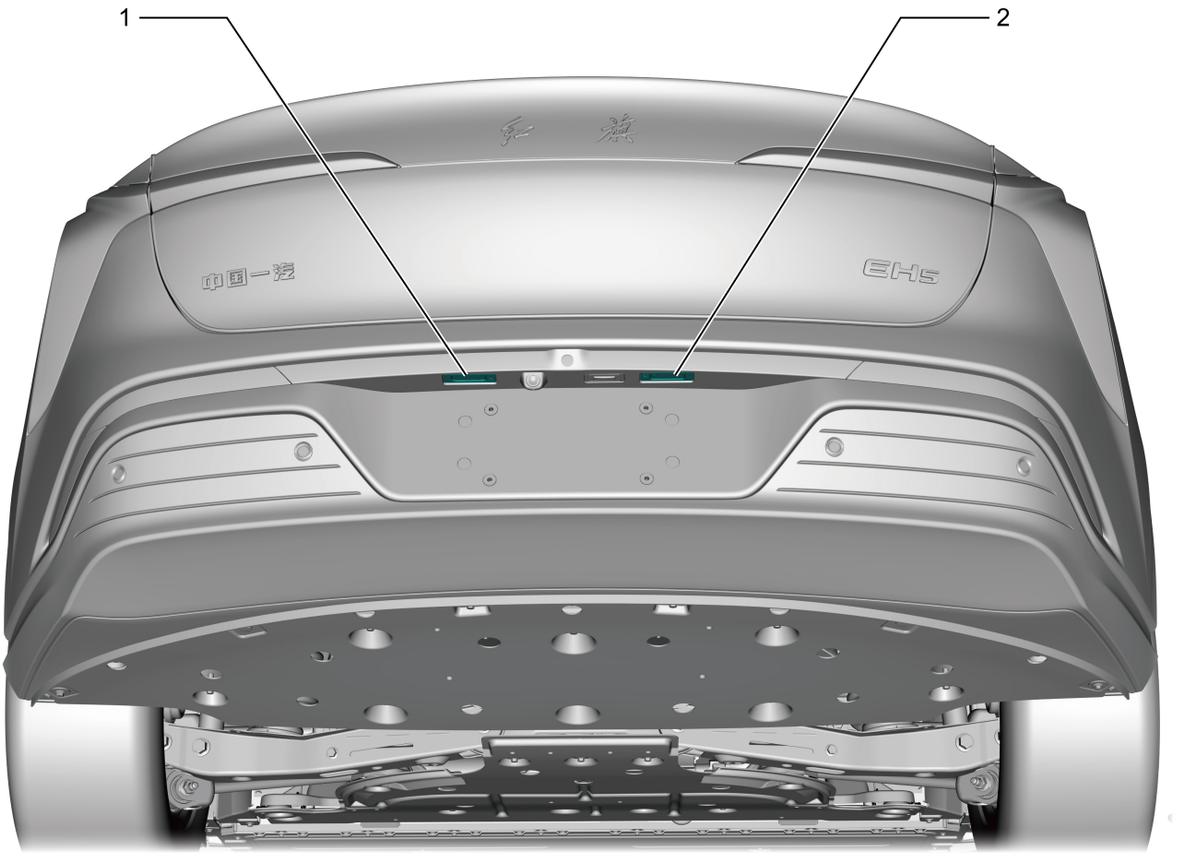
(b) Detach the claw -1-.

Installation

1. **Installation is in the reverse order of removal.**

License plate light assembly

Components

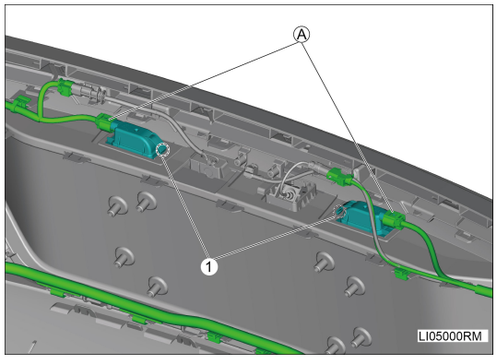


LI05020RM

1. **Left license plate light assembly**
2. **Right license plate light assembly**

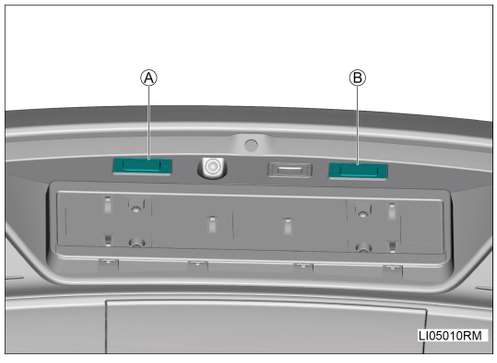
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-13)**
3. **Remove license plate light assembly**



(a) Disconnect the wire harness connector -A-.

(b) Detach the claw -1-.



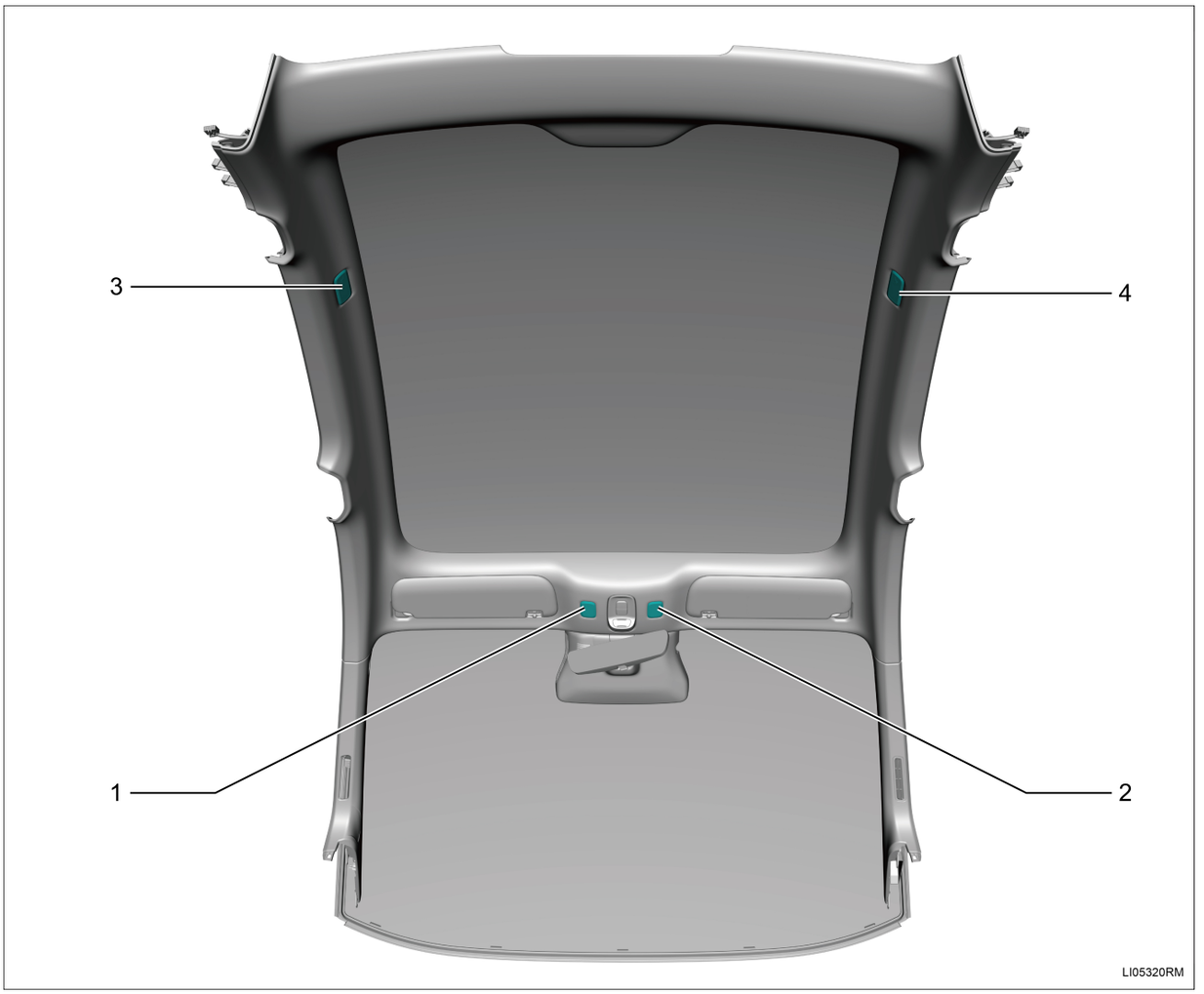
(c) Remove license plate light assemblies -A-B- outward.

Installation

1. Installation is in the reverse order of removal.

Map light

Components



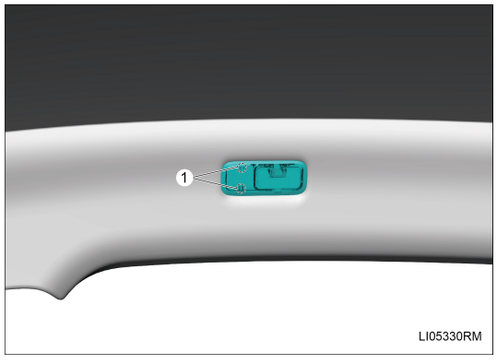
1. **Front left map light assembly**
2. **Front right map light assembly**
3. **Rear left map light assembly**
4. **Rear right map light assembly**

Removal

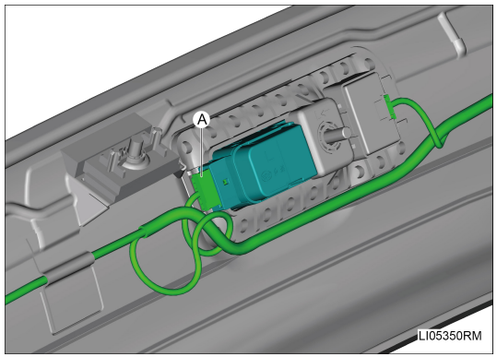
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear map light**

   Note:

   - Use same removal orders for right and left sides.

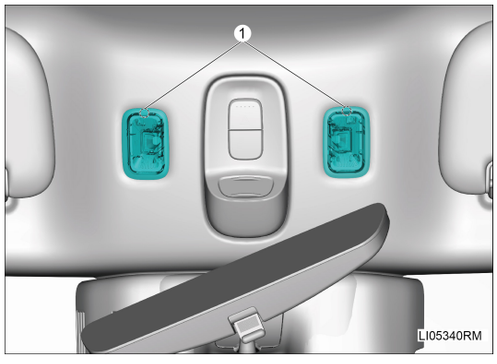


(a) Detach the claw -1-.

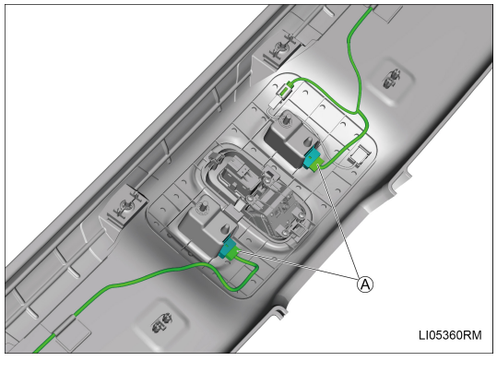


(b) Disconnect the wire harness connector -A-.

3. Remove front map light



(a) Detach the claw -1-.



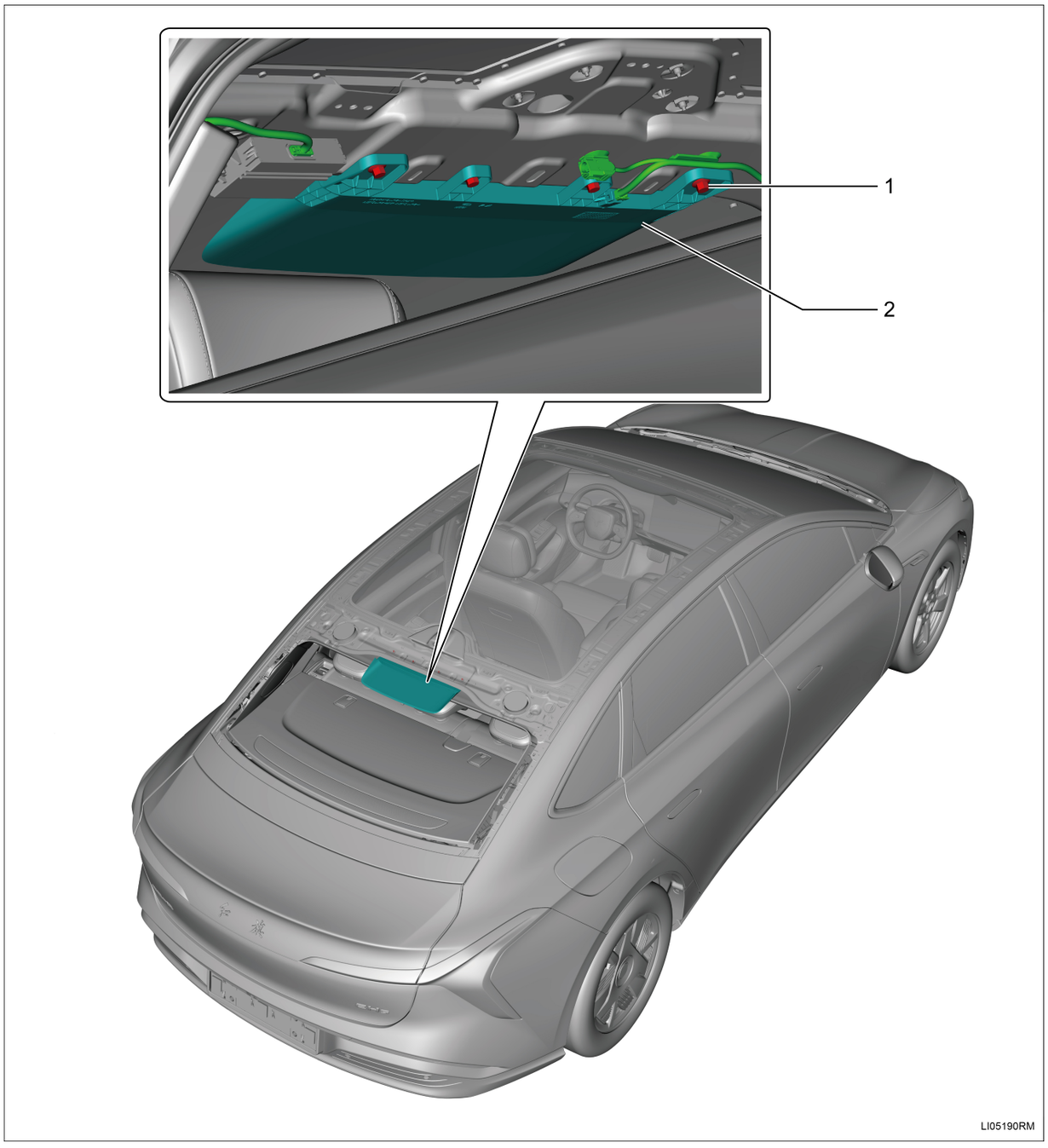
(b) Disconnect the wire harness connector -A-.

Installation

1. Installation is in the reverse order of removal.

High mounted stop light

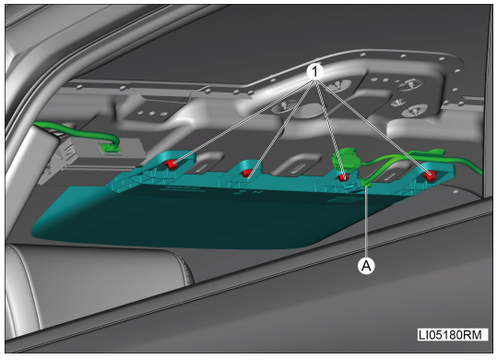
Components



1. **Hexagon flange bolt**
   - X4
   - Torque: 4 ~ 6 N • m
2. **High mounted stop light**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove roof assembly (See page NS-172)**
3. **Remove high mounted stop light**



(a) Disconnect the wire harness connector -A-.

(b) Remove the bolt -1-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

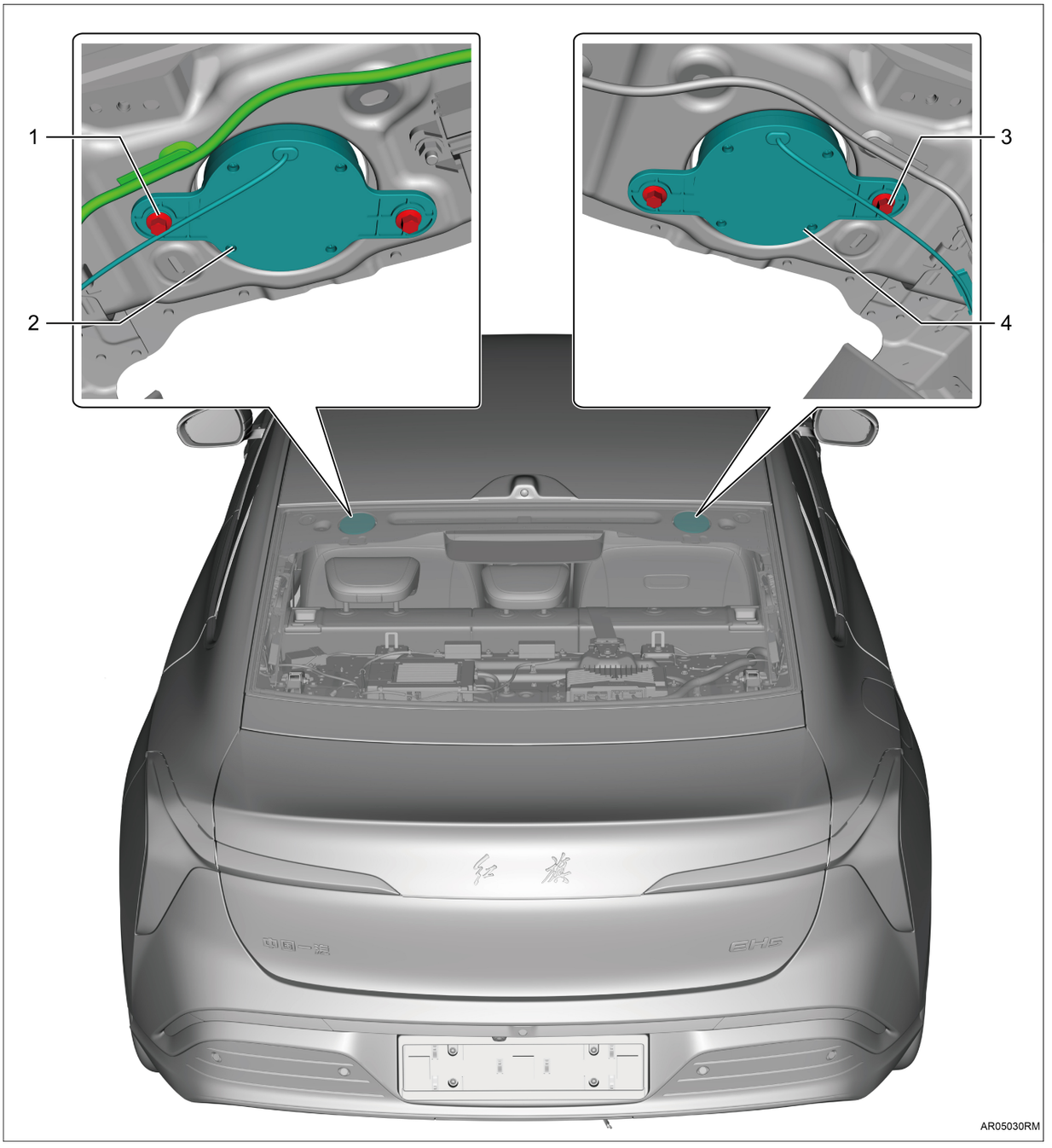
Note:

- If the LED is damaged, whole high mounted stop light must be replaced.

Antenna assembly

High precision GNSS antenna

Components



1. **Hexagon flange bolt**
   - X2
   - Torque: 7 ~ 9 N • m
2. **High precision GNSS antenna assembly (left)**
3. **Hexagon flange bolt**

- X2
- Torque: 7 ~ 9 N • m

4. High precision GNSS antenna assembly (right)

Removal

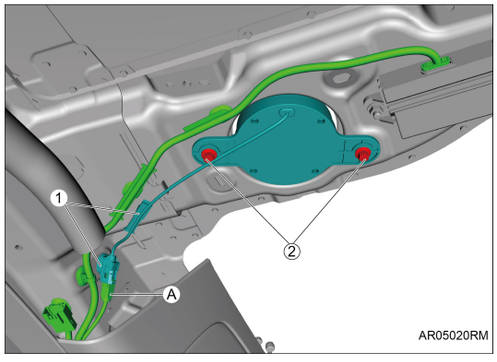
1. Disconnect negative battery terminal (See page DL-21)

2. Remove roof assembly (See page NS-172)

3. Remove left high precision GNSS antenna assembly

Note:

- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixing clip -1-.

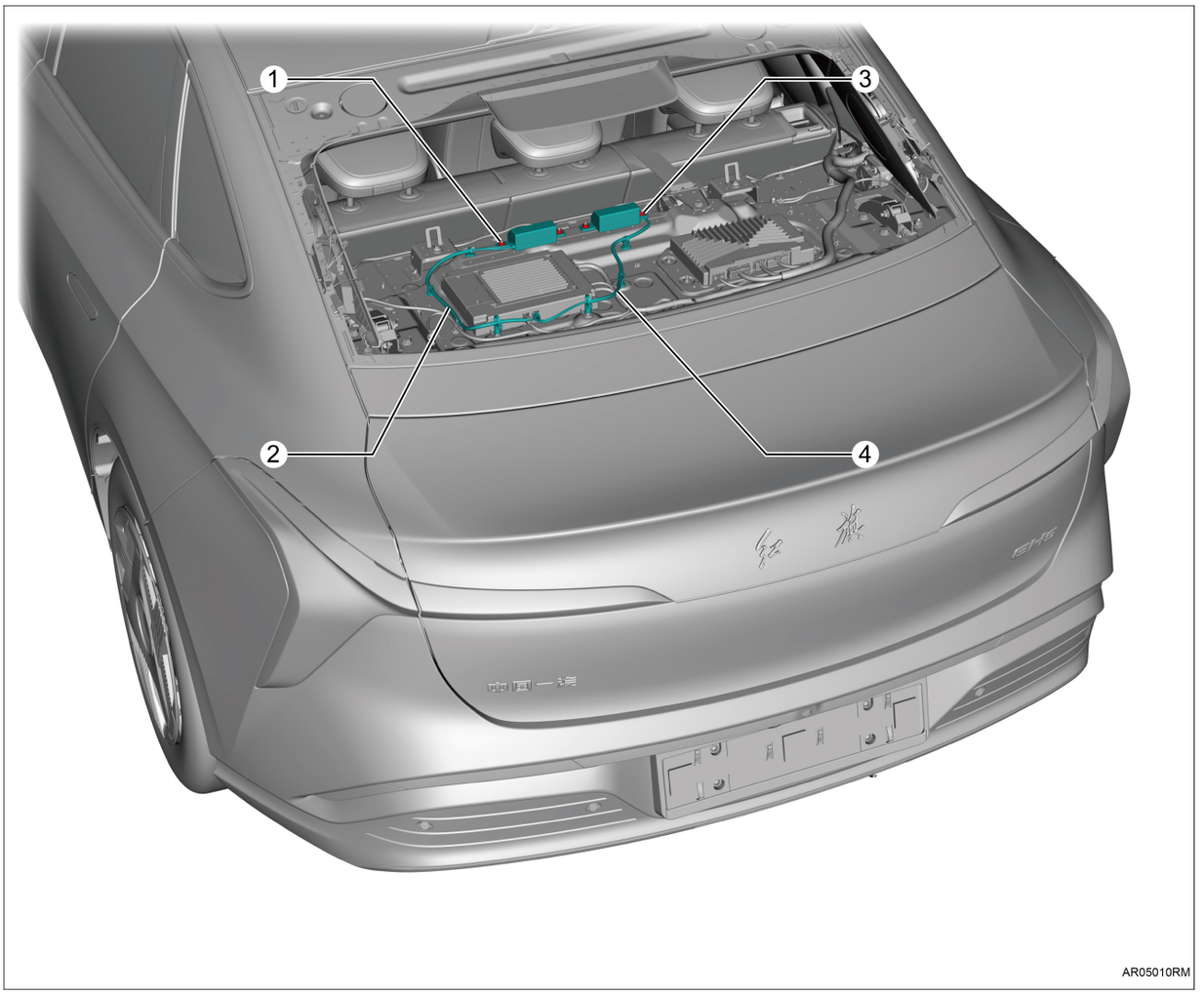
(c) Remove the bolt -2-.

Installation

1. Installation is in the reverse order of removal.

Communication antenna assembly I

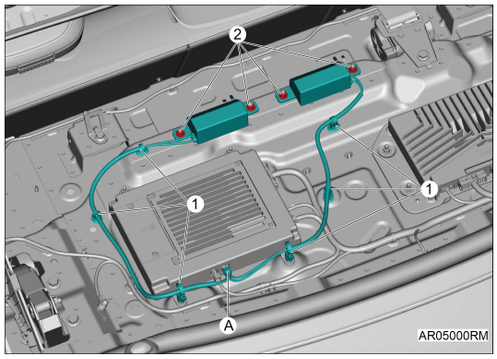
Components



1. **Hexagon flange nut**
   - X2
   - Torque: 7 ~ 9 N • m
2. **Communication antenna assembly I**
3. **Hexagon flange nut**
   - X2
   - Torque: 7 ~ 9 N • m
4. **Communication antenna assembly I**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove package rack protector assembly (See page NS-140)**



3. Remove communication antenna assembly I

(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixing clip -1-.

(c) Remove the nut -2-.

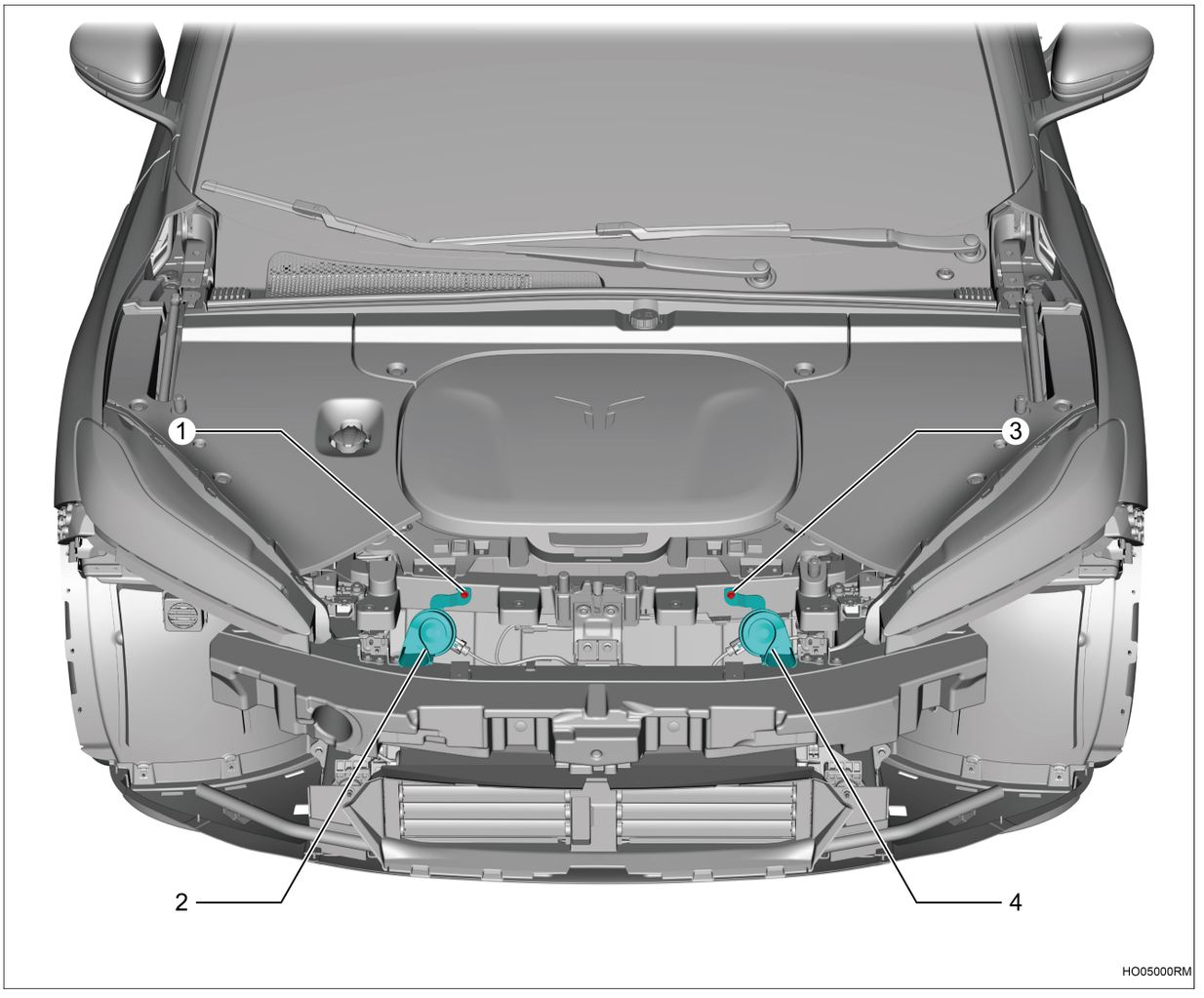
Installation

1. Installation is in the reverse order of removal.

Horn system

Horn

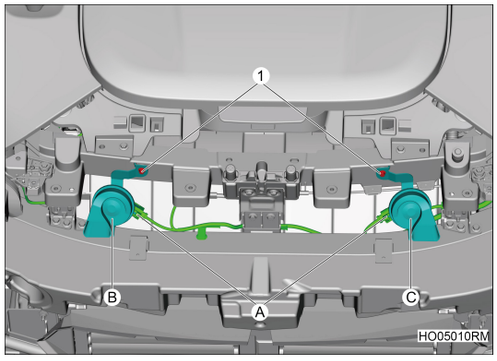
Components



1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
2. **High pitched horn with bracket assembly**
3. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
4. **Low pitched horn with bracket assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove horn with bracket assembly**



(a) Disconnect the wire harness connector -A-.

(b) Remove the bolt -1-.

(c) Remove the high pitched horn with bracket assembly -B-.

(d) Remove the low pitched horn with bracket assembly -C-.

Inspection

1. Check low pitched horn assembly

Note:

- Use same inspection sequence for high pitched horn and low pitched horn.

(a) Apply battery voltage according to table below and check operation of low pitched horn.

OK:

Measurement condition	Specified condition
Battery positive (+) → low pitched horn connector 1# Battery negative (-) → horn body	Operation sound of low pitched horn assembly

If result is not as specified, replace the low pitched horn.

Installation

1. Installation is in the reverse order of removal.

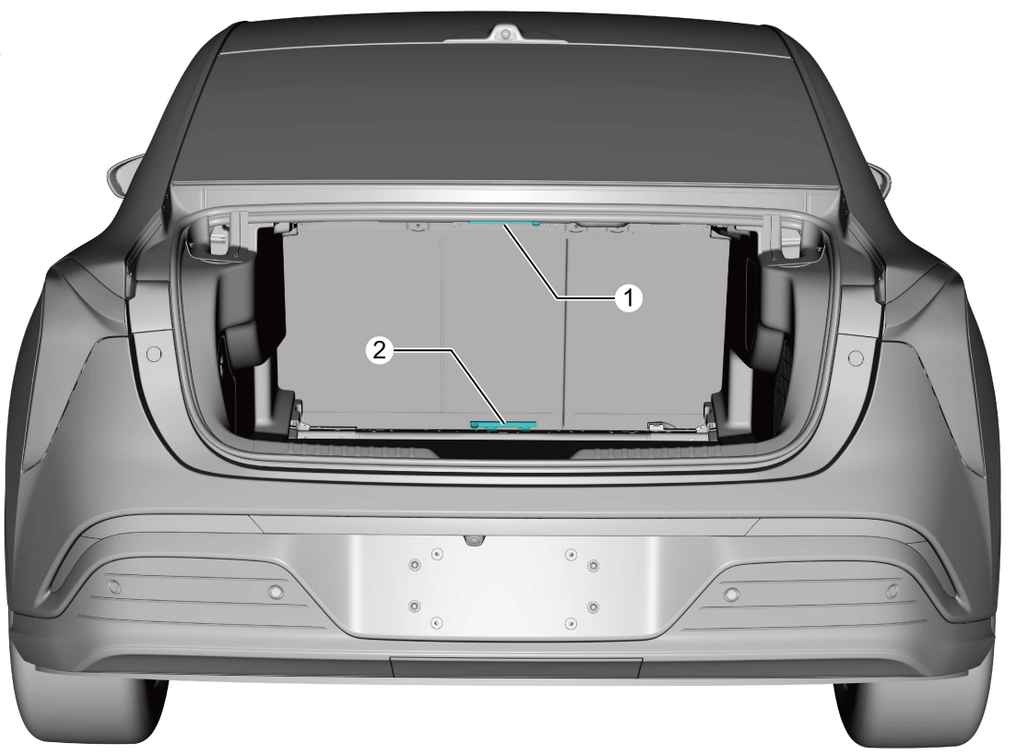
ZC

Immobilizer system

Interior low frequency antenna

Components

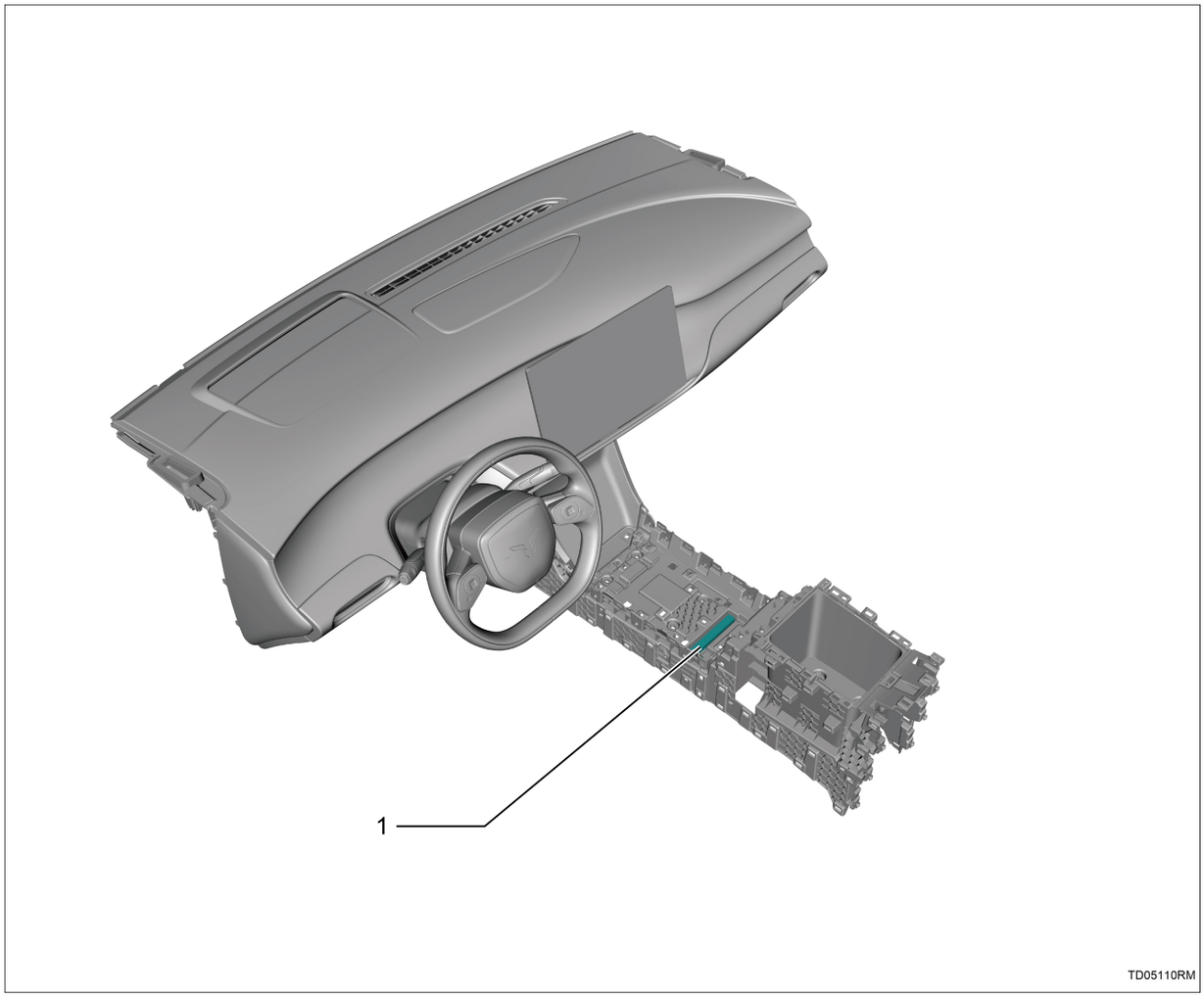
ZC



TD05040RM

1. **Interior low frequency antenna (under the package rack)**
2. **Interior low frequency antenna (inside the luggage compartment)**

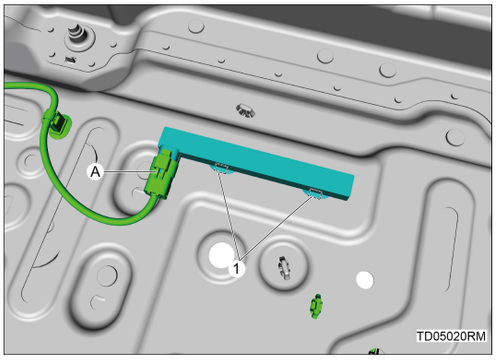
Components



1. Front interior low frequency antenna

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove package rack protector assembly (See page NS-140)**
3. **Remove interior low frequency antenna (under the package rack)**



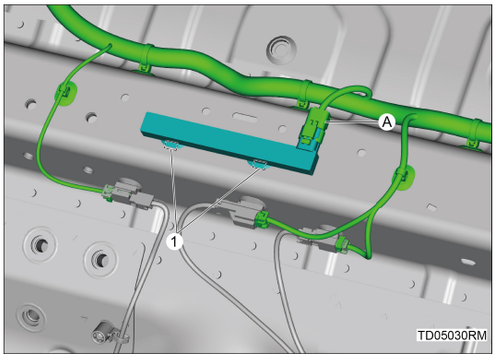
(a) Disconnect the wire harness connector -A-.

(b) Detach the clip -1- downwards.

(c) Remove the interior low frequency antenna.

4. Remove luggage compartment lower fixing bracket (See page NS-160)

5. Remove interior low frequency antenna (inside the luggage compartment)



(a) Disconnect the wire harness connector -A-.

(b) Detach the clip -1- downwards.

(c) Remove the interior low frequency antenna.

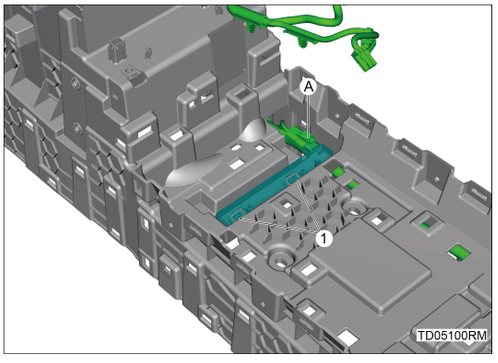
6. Remove auxiliary fascia console assembly (See page NS-49)

7. Remove left trim panel (See page NS-49)

8. Remove right trim panel (See page NS-49)

9. Remove center storage box (See page NS-49)

10. Remove low frequency antenna (inside auxiliary fascia console)



(a) Disconnect the wire harness connector -A-.

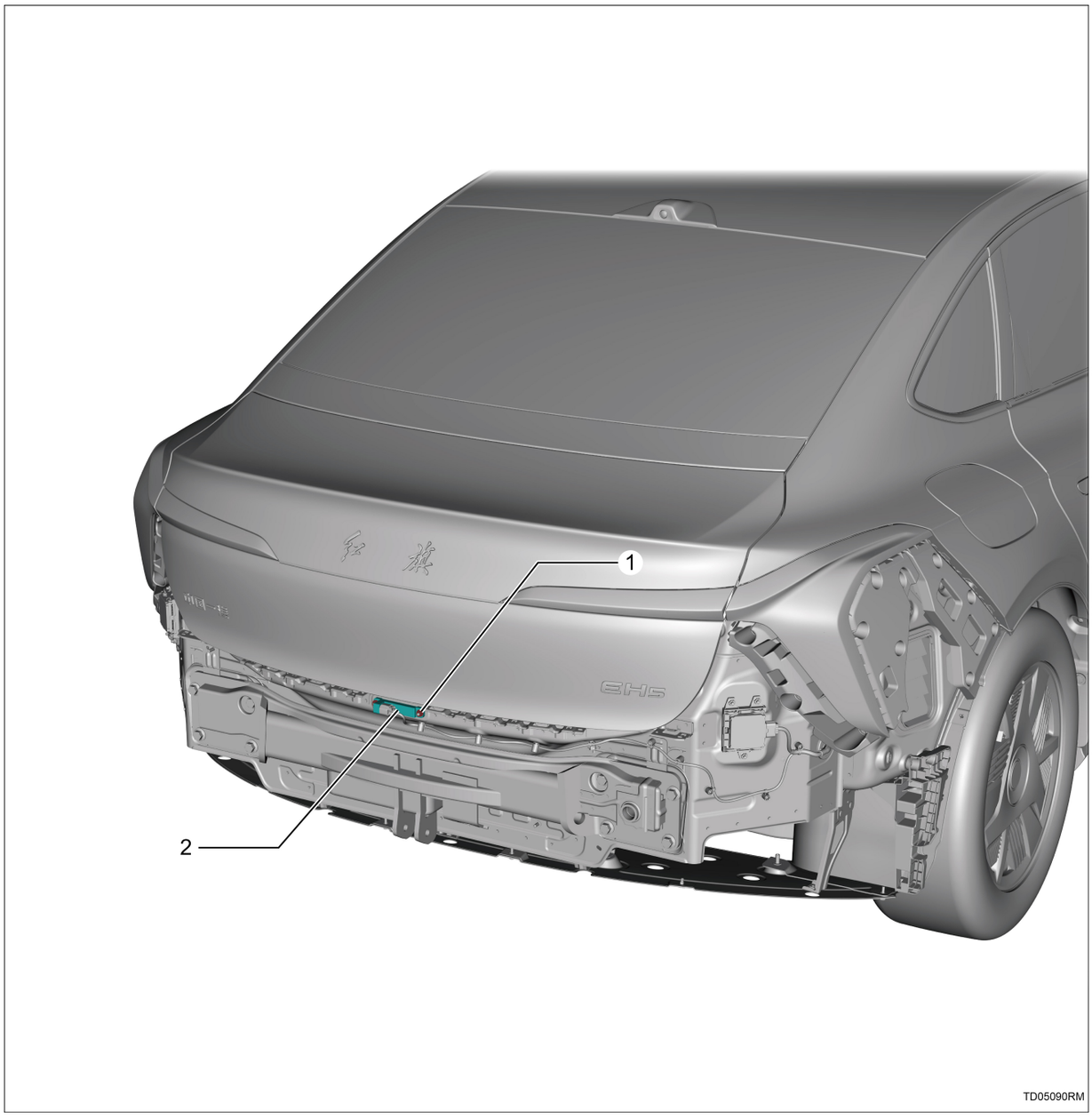
(b) Detach the clip -1- downwards.

Installation

1. Installation is in the reverse order of removal.

Outside low frequency antenna

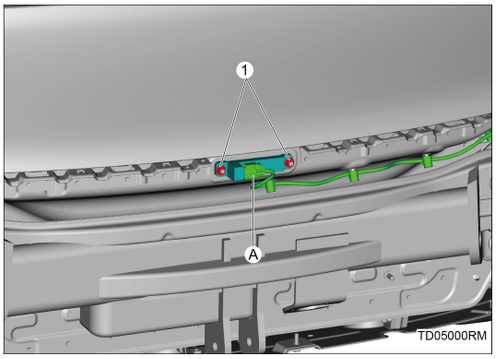
Components



1. **Hexagon flange nut**
   - X2
   - Torque: 2.5 ~ 4 N • m
2. **Rear outside low frequency antenna**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-13)**



3. Remove outside low frequency antenna

(a) Disconnect the wire harness connector -A-.

(b) Remove the nut -1-.

Installation

1. Installation is in the reverse order of removal.

Radio frequency transceiver assembly

Components



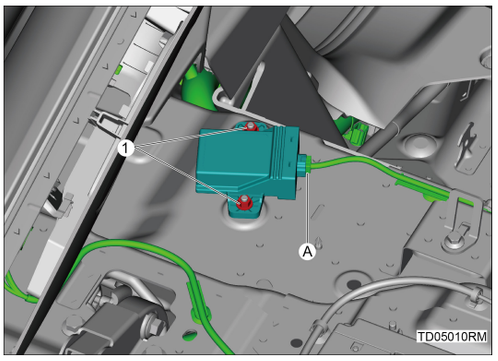
1. **Hexagon flange nut**
   - X2
   - Torque: 2 ~ 4 N • m
2. **Radio frequency transceiver assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**

2. Remove package rack protector assembly (See page NS-140)

3. Remove radio frequency transceiver



(a) Disconnect the wire harness connector -A-.

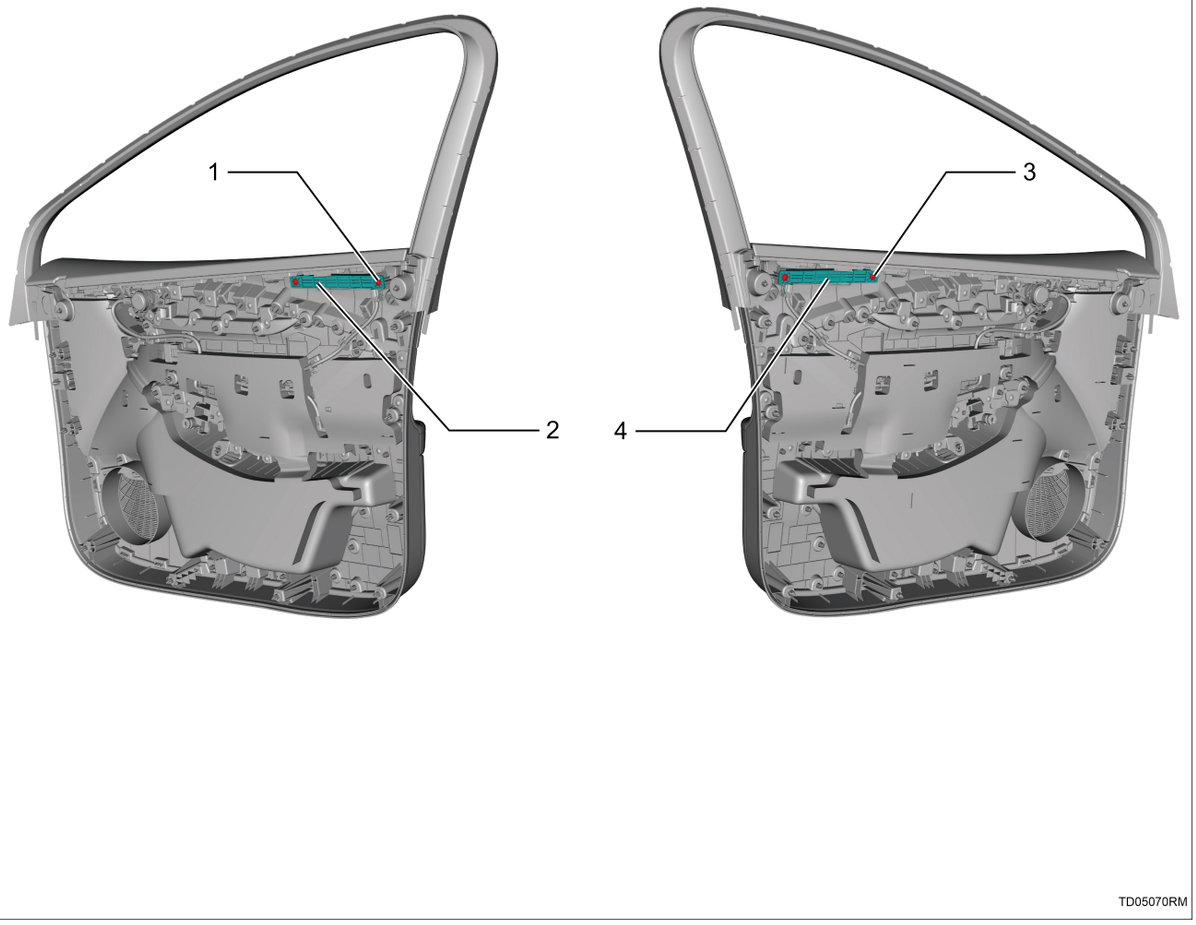
(b) Remove the nut -1-.

Installation

1. Installation is in the reverse order of removal.

Smart entry low frequency antenna

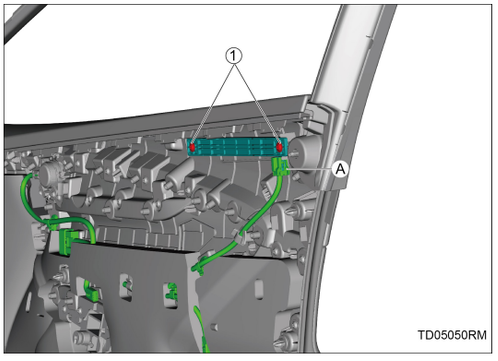
Components



1. **Inner hexagon pan head screw**
   - X2
2. **Smart entry low frequency antenna II (left)**
3. **Inner hexagon pan head screw**
   - X2
4. **Smart entry low frequency antenna II (right)**

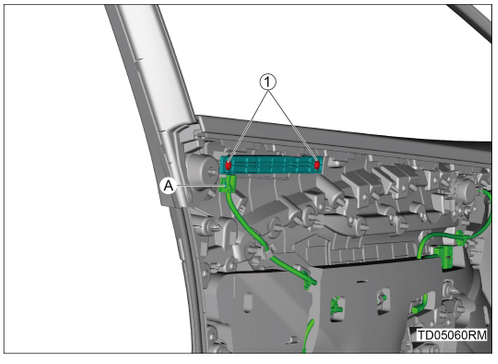
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front left door protector (See page NS-111)**
3. **Remove smart entry low frequency antenna II (left)**



   (a) Disconnect the wire harness connector -A-.
   (b) Remove the screw -1-.

4. **Remove front right door protector (See page NS-111)**
5. **Remove smart entry low frequency antenna II (right)**



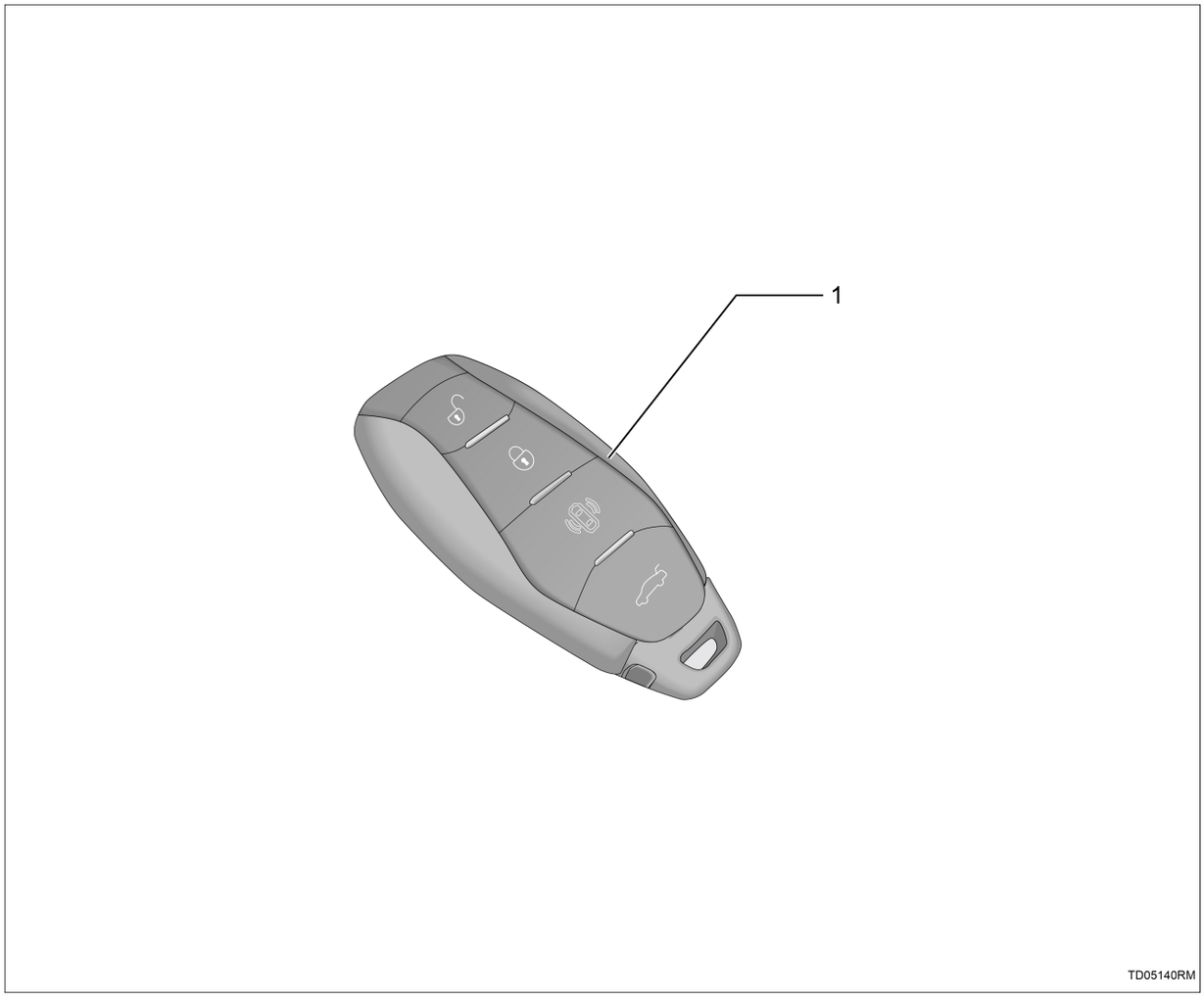
   (a) Disconnect the wire harness connector -A-.
   (b) Remove the screw -1-.

Installation

1. **Installation is in the reverse order of removal.**

Smart key

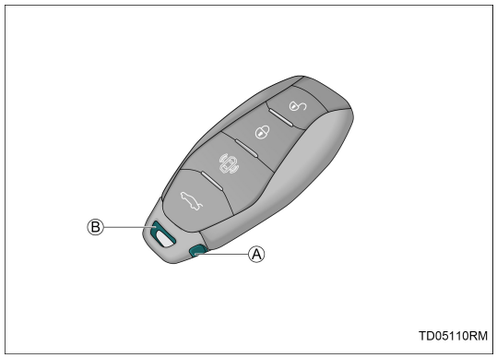
Components



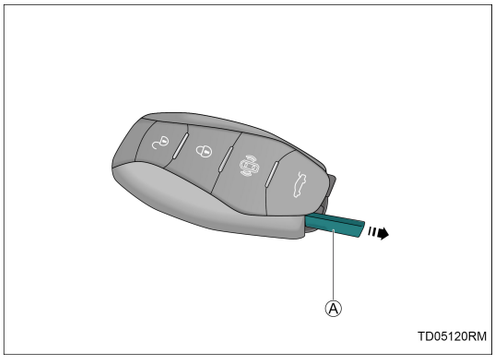
1. Smart key assembly

Removal

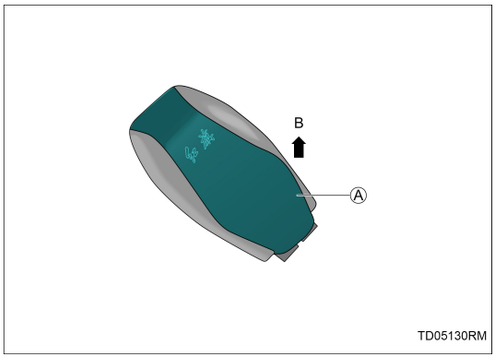
1. Remove smart key



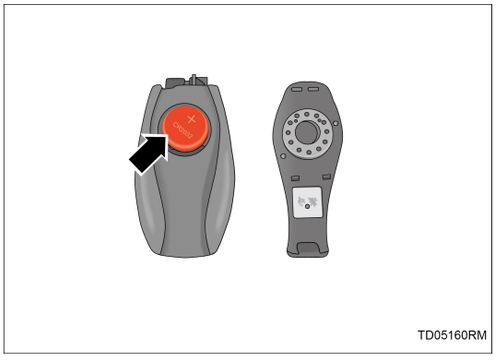
(a) Press the lock button -A- to remove smart key upper cover -B-.



(b) Pull out the mechanical key -A- in direction of -arrow-.



(c) Firmly open the battery compartment rear cover -A- in direction of arrow -B-.



(d) Remove the smart key battery gently.

Caution:

- **Do not press the terminal with finger.**
- **Do not forcefully pry the smart key battery, as the terminals may be damaged.**
- **Do not touch the smart key battery with wet hands, water may cause rust.**
- **Do not touch or move any components inside the smart key housing, this may interfere with normal operation.**
- **When replacing the smart key battery, static electricity on the body should be eliminated by touching the vehicle, etc. to avoid damage to the electronic transmitter housing before starting operation.**

Inspection

1. Check smart key

(a) Check smart key housing operation.

(1) Remove smart key battery from mart key housing.

(2) Install smart key battery with a new or normally functioning one.

Caution:

- **When replacing the smart key battery, static electricity on the body should be eliminated by touching the vehicle, etc. to avoid damage to the smart key housing before starting operation.**

Note:

- If there is no new or normally functioning battery, 2 new 1.5 V batteries can be connected in series first. Then, connect lead to dry battery and apply 3 V voltage to transmitter housing as shown in illustration.

(3) Test the smart key housing by aligning keyboard with vehicle and pressing smart key housing switch approximately 1 m away from the driver door handle outside the vehicle.

Normal: The door lock can be operated by the transmitter housing, and LED comes on more than once.

Note:

- The range of operation varies depending on the user, the method of holding smart key housing, and the location.
- If there are strong radio waves or electrical noise interference in the area, the weak radio waves of the smart key housing may be affected. The operating area of the smart key housing may be reduced or the smart key housing may not work.

(b) Check smart key battery capacity

(1) Remove smart key battery from smart key housing that cannot work.

(2) Connect one lead to the negative terminal with tape or equivalent.

Caution:

- **Do not wrap the lead around the terminal, wedge the lead between terminals, or weld it. Otherwise, the terminals may be deformed or damaged, and the smart key battery cannot be installed correctly.**

(3) Carefully pull out the lead from the position shown in the illustration and install the smart key battery that previously removed.

Caution:

- **When replacing transmitter battery, static electricity on the body should be eliminated by touching the vehicle, etc. to avoid damage to the smart key housing before starting operation.**

(4) Check the smart key battery voltage.

Note:

- When measuring the battery voltage, operate the lock sensor of door handle and bring the smart key housing to the range of operation for measurement.

Standard voltage:

Multimeter connection	Condition	Specified condition
Transmitter battery positive (+) - transmitter battery negative (-)	Turn ENGINE START STOP switch to OFF, all doors closed and lock sensor touched	2.5 to 3.2 V

If result is not as specified, replace the smart key battery.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**
2. **Install smart key**

(a) Install the new smart key battery with positive (+) side facing up.

- The battery model is CR 2032

Caution:

- **Be careful not to bend the transmitter battery electrode during insertion.**
- **Keep the interior of smart key housing cover free of dust and oil.**
- **When replacing the smart key battery, static electricity on the body should be eliminated by touching the vehicle, etc. to avoid damage to the electronic transmitter housing before starting operation.**

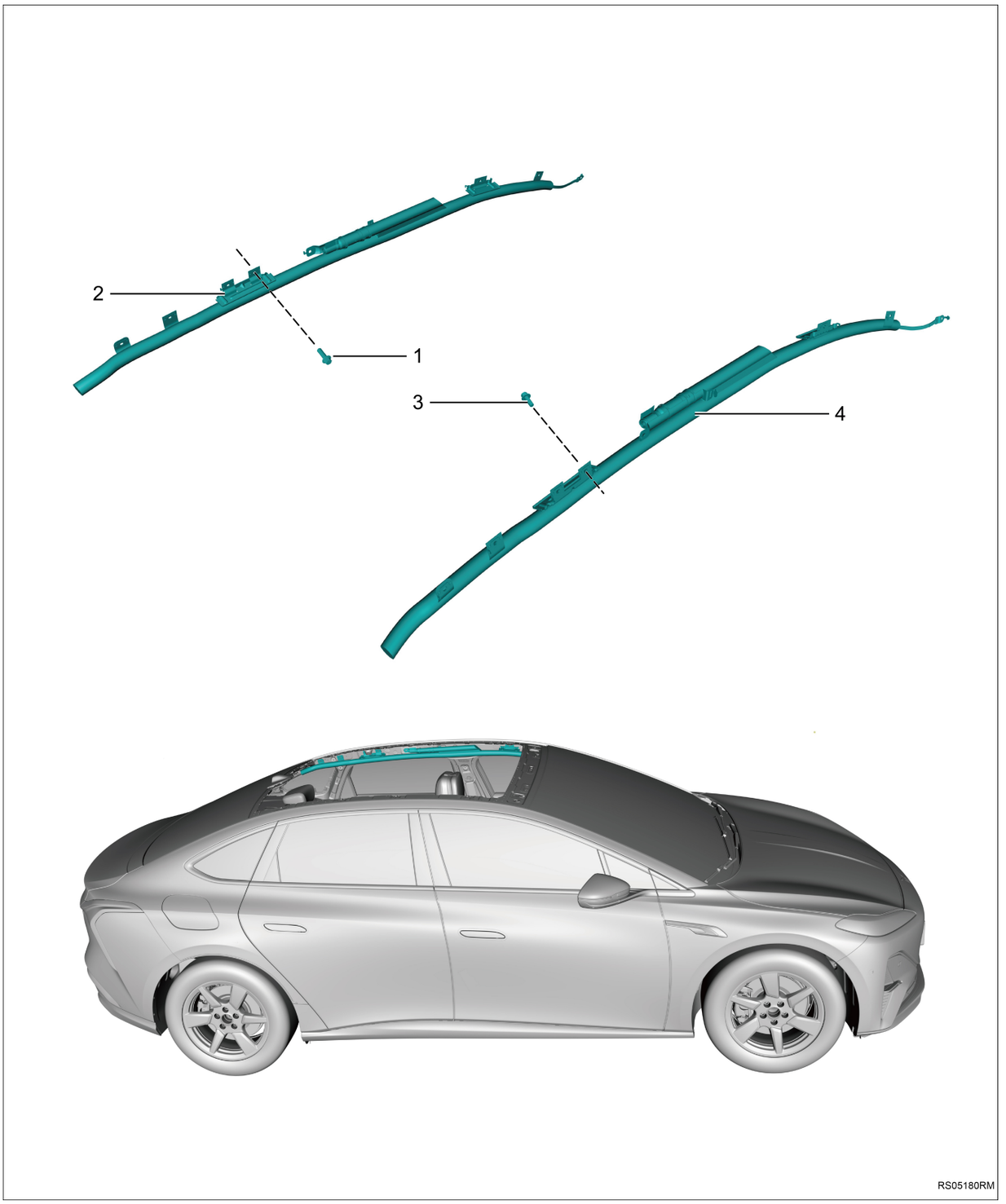
(b) Press a switch on the smart key, check that the LED cones on.

Normal: When the switch is pressed, the transmitter LED comes on.

Safety restraint system

Side curtain shield airbag assembly

Components



1. Hexagon flange bolt

- X8

- Torque: 8 ~ 10 N • m

2. **Left curtain shield airbag assembly**
3. **Hexagon flange bolt**
   - X8
   - Torque: 8 ~ 10 N • m
4. **Right curtain shield airbag assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**

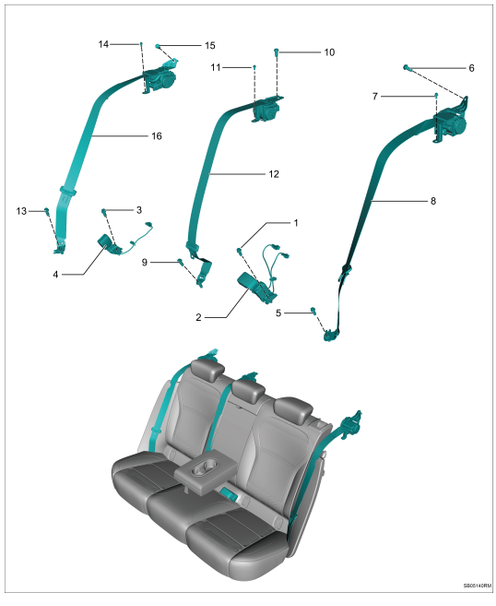
   Notice:

   - **Wait for 90 seconds after disconnecting cable to prevent airbag from deploying.**

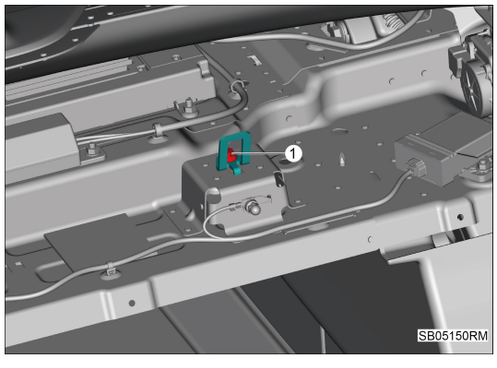
2. **Remove roof assembly (See page NS-172)**
3. **Remove left curtain shield airbag assembly**

   Note:

   - Use same removal orders for right and left sides.

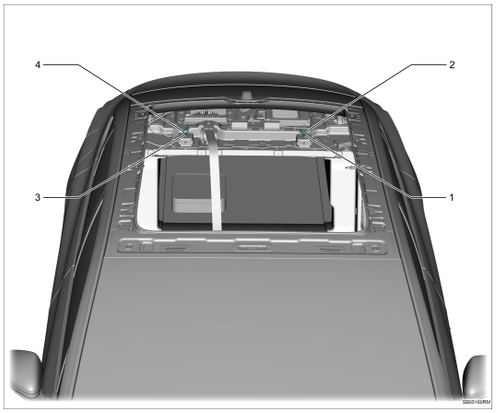


(a) Disconnect the wire harness connector -A-.

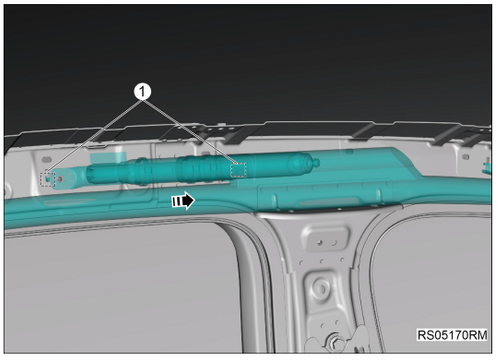


(b) Remove the side curtain shield airbag assembly front bolt -1-.

ZC



(c) Remove the side curtain shield airbag assembly rear bolt -1-.



(d) Detach the claw -1-.

(e) Push side curtain shield airbag in direction of -arrow- to remove it.

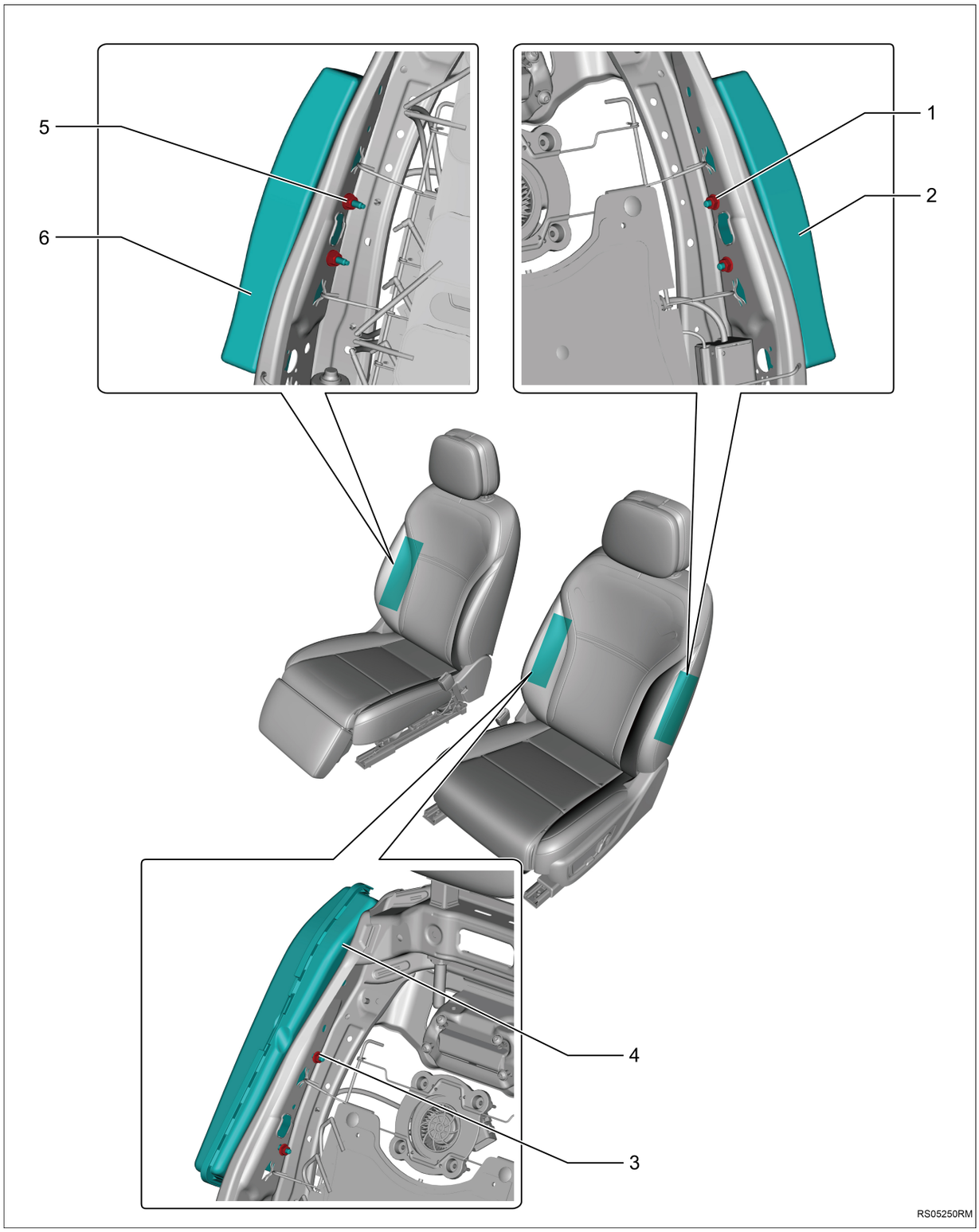
Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   (a) The connector should be pushed all the way to the limit position until a click is heard.

Front seat airbag

Components



1. Nut

- X2

- Torque: 8 ~ 10 N • m

2. **Front left seat left airbag assembly**
3. **Nut**
   - X2
   - Torque: 8 ~ 10 N • m
4. **Front left seat right airbag assembly**
5. **Nut**
   - X2
   - Torque: 8 ~ 10 N • m
6. **Front right seat airbag assembly**

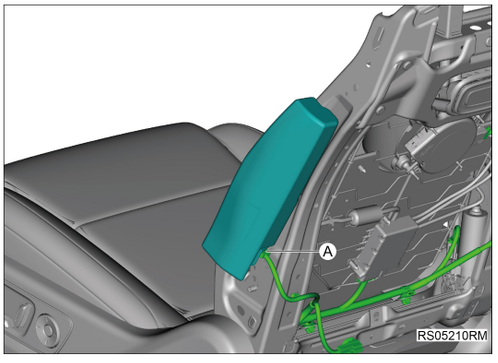
ZC

Removal

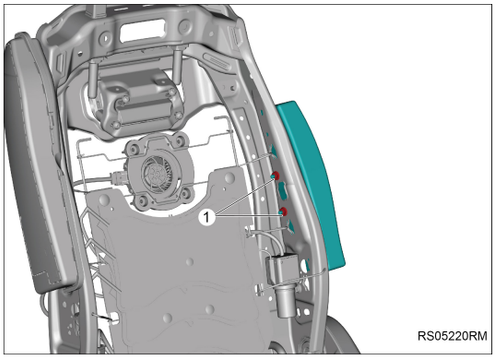
Note:

- Use same removal orders for right and left sides.

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front left seatback cover assembly (See page NS-67)**
3. **Remove front left seatback foam assembly (See page NS-67)**
4. **Remove front left seat left airbag assembly**



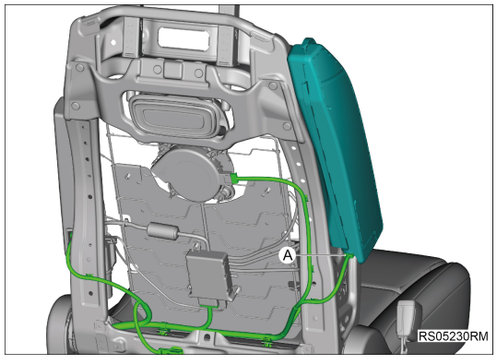
(a) Disconnect the wire harness connector -A-.



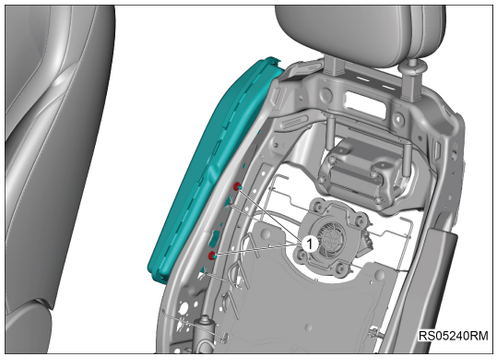
(b) Remove the nut -1-.

(c) Remove the front left seat left airbag assembly.

5. **Remove front left seat right airbag assembly (only for driver seat)**



(a) Disconnect the wire harness connector -A-.



(b) Remove the nut -1-.

(c) Remove the front left seat right airbag assembly.

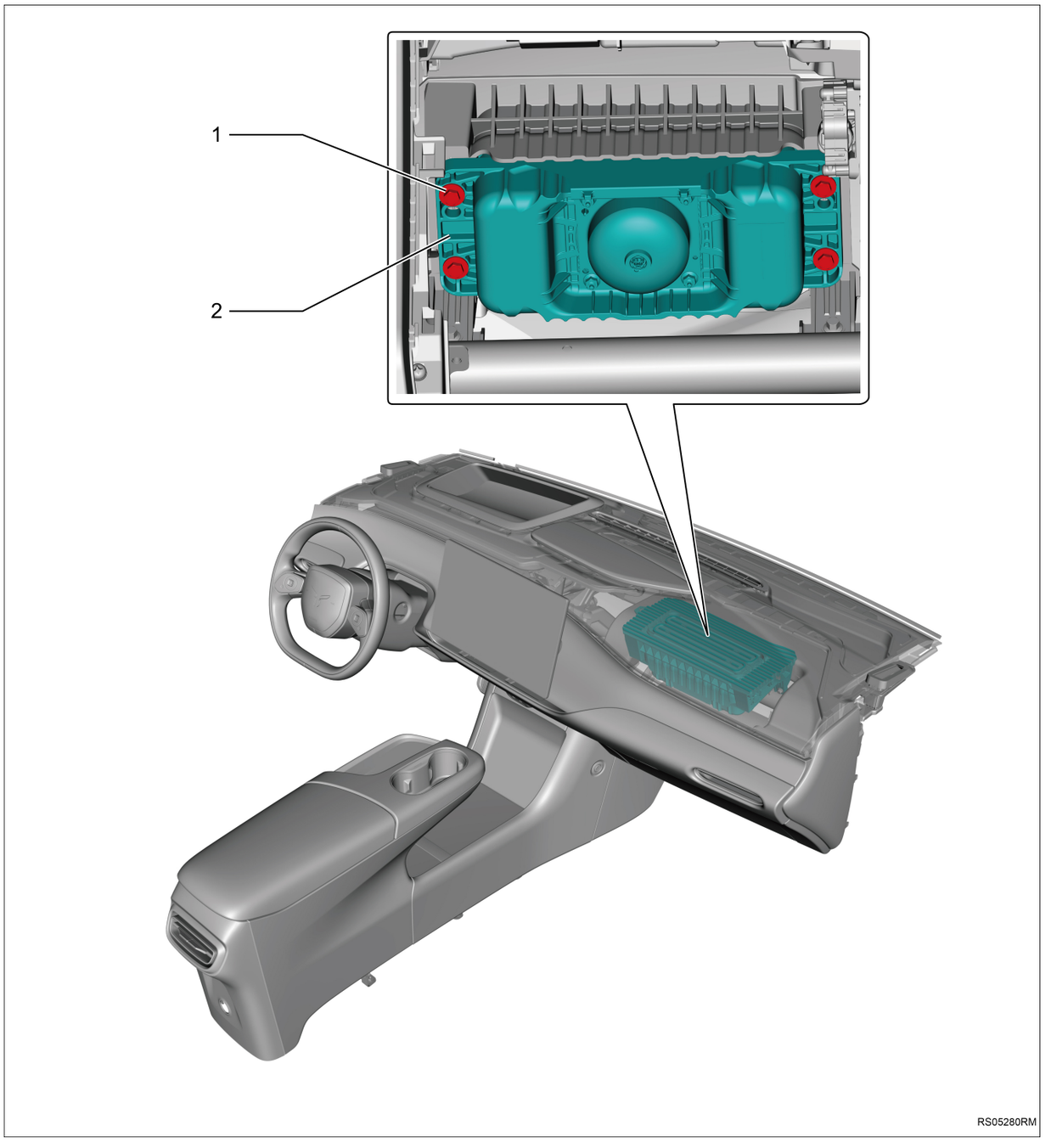
ZC

Installation

1. Installation is in the reverse order of removal.

Front passenger airbag assembly

Components



1. **Combination bolt**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Front passenger airbag assembly**

Removal

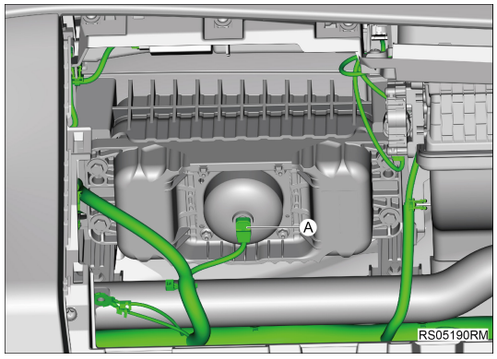
1. **Disconnect negative battery terminal (See page DL-21)**

   Notice:

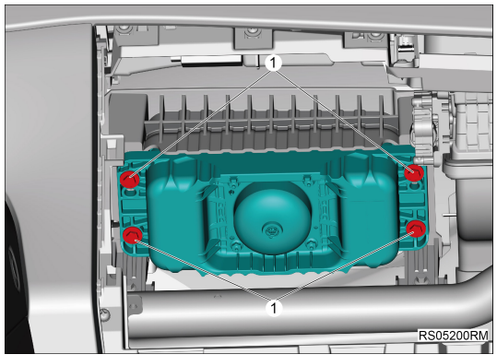
   - **Wait for 90 seconds after disconnecting cable to prevent airbag from deploying.**

2. **Remove glove box assembly (See page NS-33)**

3. **Remove front passenger airbag assembly**



(a) Disconnect the wire harness connector -A-.



(b) Remove the bolt -1-.

(c) Remove front passenger airbag assembly at an appropriate angle.

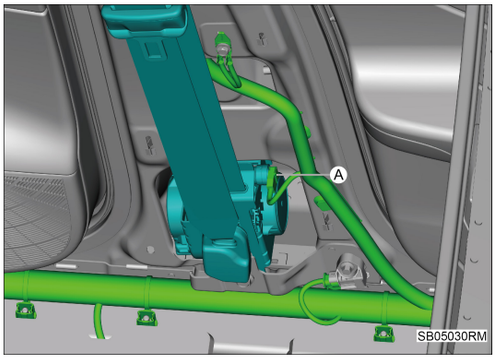
Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

   (a) The connector should be pushed all the way to the limit position until a click is heard.

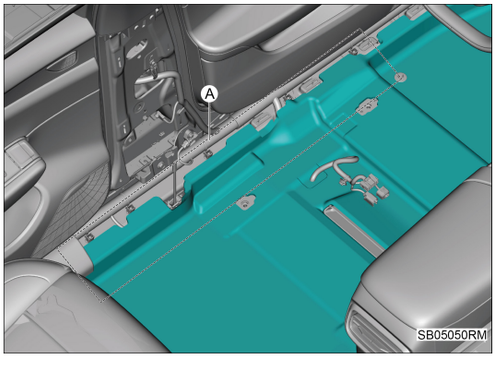
Accelerator collision sensor assembly

Components



1. **Hexagon flange bolt**
   - X3
   - Torque: 8 ~ 12 N • m
2. **Left frontal collision sensor bracket assembly**
3. **Hexagon flange bolt**
   - X3
   - Torque: 8 ~ 12 N • m
4. **Right frontal collision sensor bracket assembly**
5. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
6. **Left acceleration collision sensor assembly (front)**
7. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
8. **Right acceleration collision sensor assembly (front)**

Components



1. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m

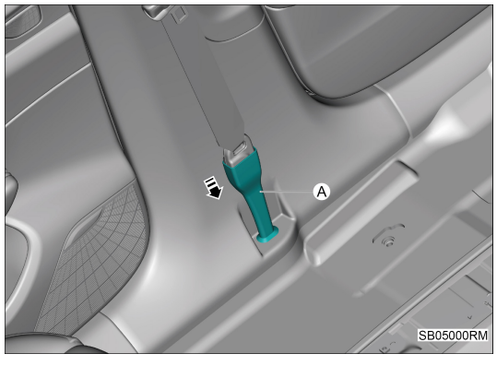
2. **Center acceleration collision sensor assembly (left)**
3. **Hexagon flange bolt**
   - Torque: 8 ~ 10 N • m
4. **Center acceleration collision sensor assembly (right)**

Removal

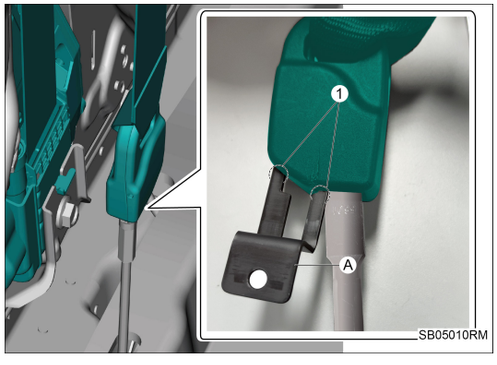
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove low pitched horn with bracket assembly (only for removal of front left acceleration collision sensor assembly) (See page ZC-44)**
4. **Remove acceleration collision sensor assembly (front)**

   Note:

   - Use same removal orders for right and left sides.

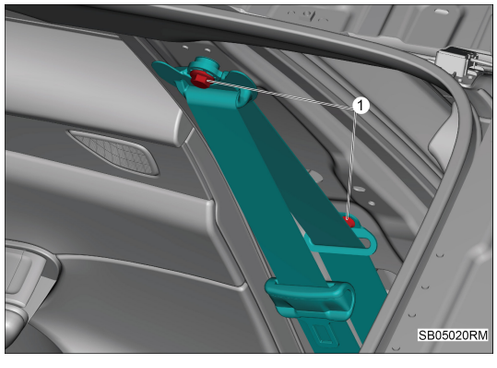


(a) Disconnect the wire harness connector -A-.



(b) Remove the bolt -1-.

(c) Remove the frontal collision sensor and bracket.



(d) Remove the bolt -1-.

(e) Remove the frontal collision sensor.

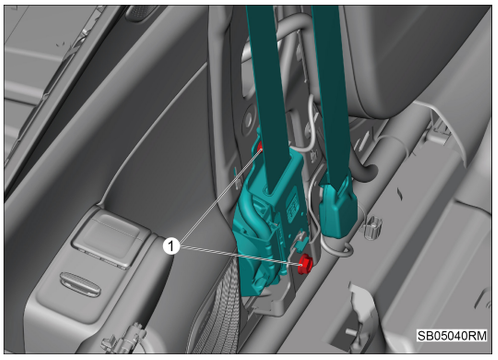
5. **Remove B-pillar lower protector (See page NS-133)**
6. **Remove acceleration collision sensor assembly (middle)**

   Note:

   • Use same removal orders for right and left sides.

   (a) Disconnect the wire harness connector -A-.

   (b) Remove the bolt -1-.

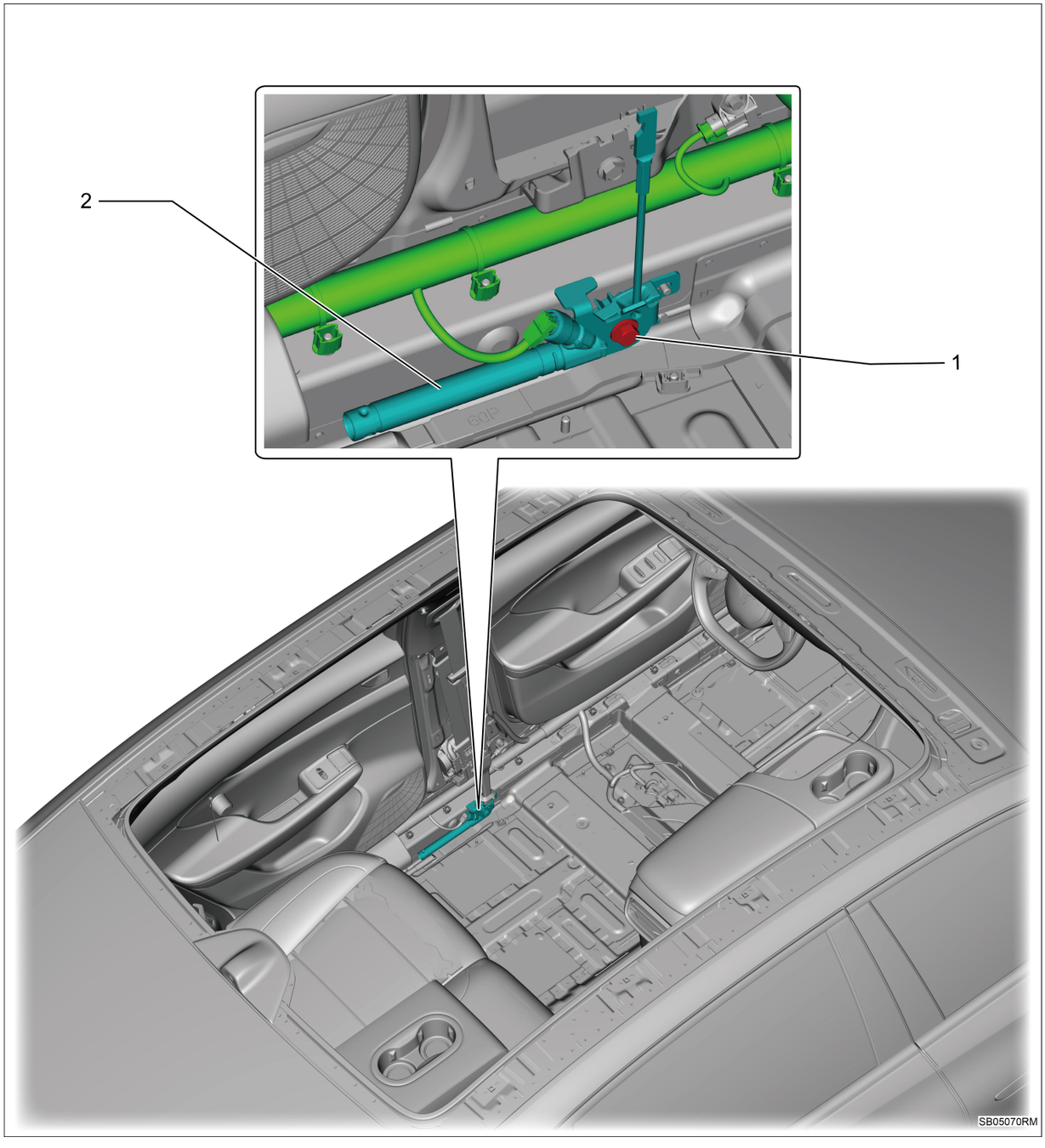


Installation

1. **Installation is in the reverse order of removal.**

Pressure side collision sensor assembly

Components



1. **Left pressure side collision sensor assembly**
2. **Right pressure side collision sensor assembly**

Removal

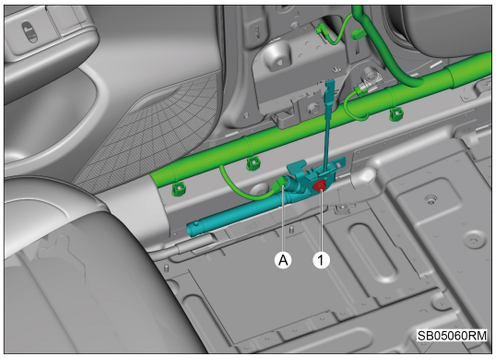
1. **Disconnect negative battery terminal (See page DL-21)**

2. Remove front door protector (See page NS-111)

3. Remove pressure side collision sensor assembly

Note:

- Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

(b) Rotate left and right in direction of -arrow-.

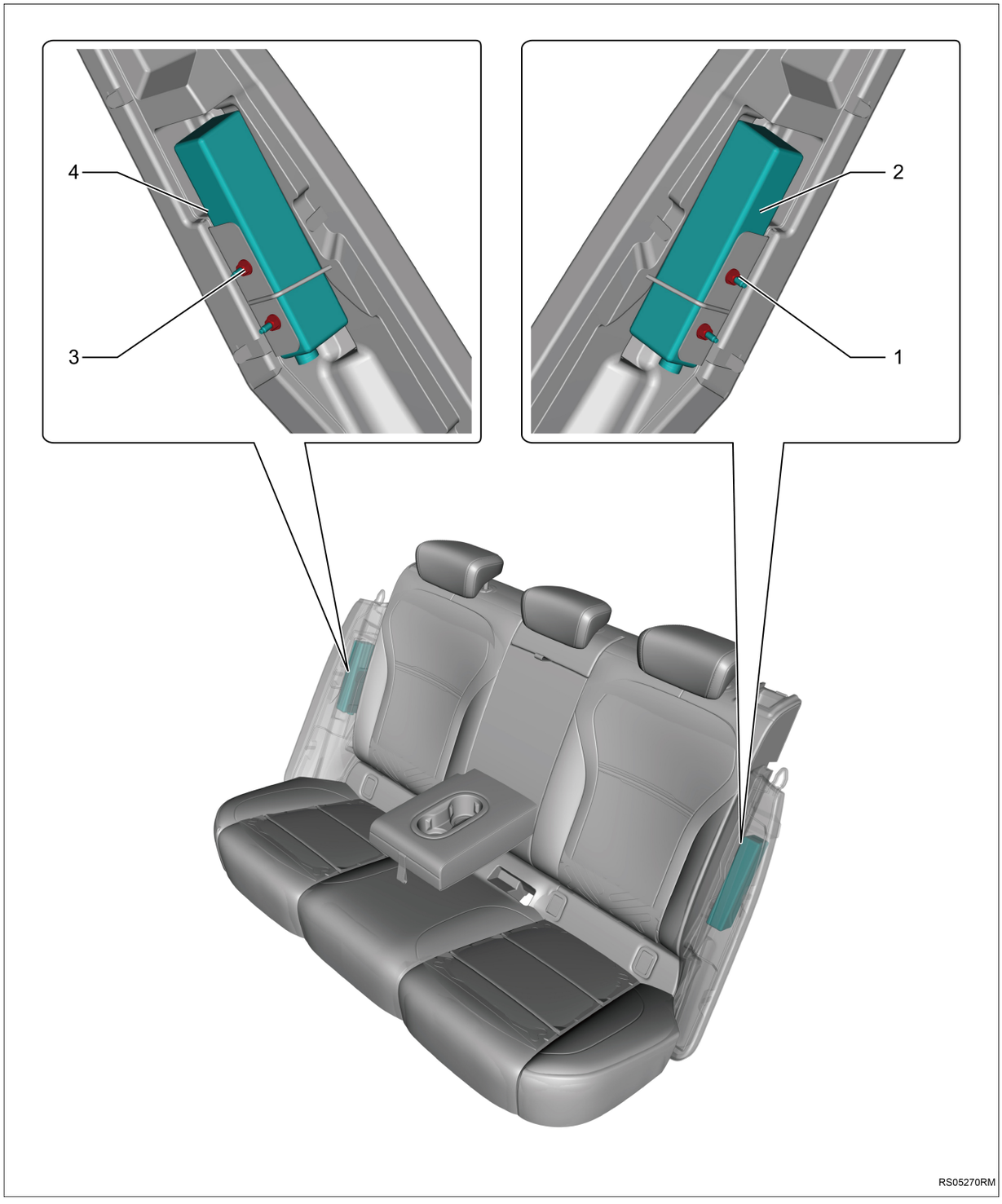
(c) Remove the pressure side collision sensor assembly.

Installation

1. Installation is in the reverse order of removal.

Rear seat airbag

Components



1. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Rear left seat airbag assembly**

3. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
4. **Rear right seat airbag assembly**

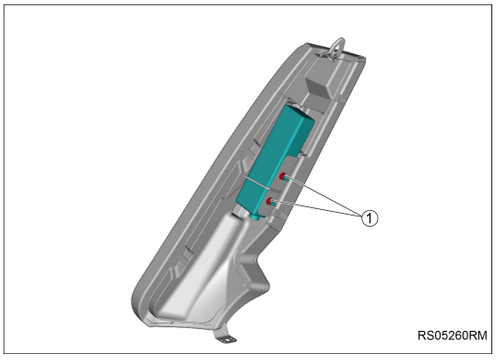
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear seatback side wing assembly (See page NS-108)**
3. **Remove rear left seat airbag assembly**

   Note:
   - Use same removal orders for right and left sides.

   (a) Remove the nut -1-.

   (b) Press and remove the rear left seat airbag assembly.

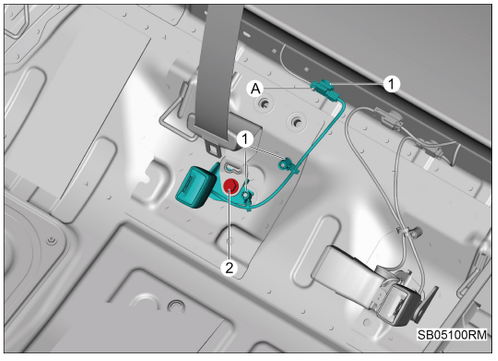


Installation

1. **Installation is in the reverse order of removal.**

Airbag control unit assembly

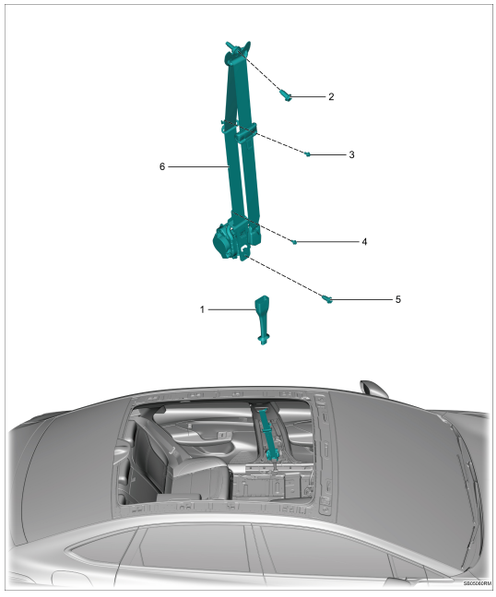
Components



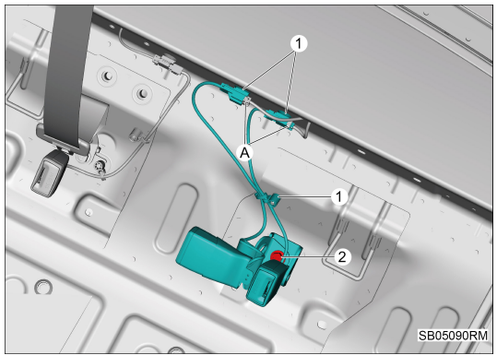
1. **Hexagon flange nut**
   - X3
   - Torque: 8 ~ 10 N • m
2. **Airbag control unit assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove auxiliary fascia console assembly (See page NS-49)**
3. **Remove front part of rear cooling air duct assembly (See page RE-47)**
4. **Remove airbag control unit assembly**



(a) Disconnect the wire harness connector -A-.



(b) Remove the nut -1-.

Installation

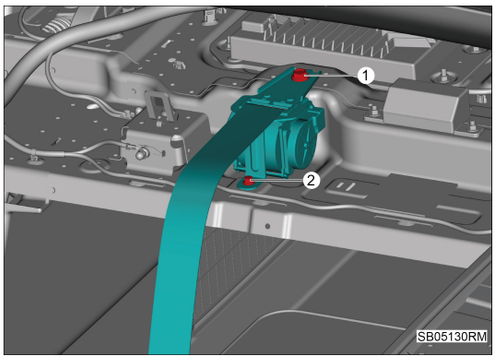
1. **Installation is in the reverse order of removal, and pay attention to the followings:**

(a) The connector should be pushed all the way to the limit position until a click is heard.

ZC

Driver airbag assembly

Components



1. Driver airbag assembly

On-vehicle inspection

1. Check driver airbag (vehicle that is not involved in a collision)

(a) Perform the diagnosis system inspection.

(b) Perform visual inspection for defects with driver airbag installed on vehicle.

(1) Defects are as follows:

- Scratches on surface and groove of steering wheel trim cover
- Small cracks on surface and groove of steering wheel trim cover
- Obvious discoloration on surface and groove of steering wheel trim cover

Note:

– If any defect is found, replace driver airbag with a new one.

2. Check driver airbag (vehicle that is involved in a collision but airbag is not deployed)

(a) Perform diagnosis system inspection

(b) Perform visual inspection for defects with steering wheel trim cover removed from vehicle.

(1) Defects are as follows:

- Scratches on surface and groove of steering wheel trim cover
- Small cracks on surface and groove of steering wheel trim cover
- Obvious discoloration on surface and groove of steering wheel trim cover

- Cracks or other damage on connector
- Steering wheel assembly is deformed
- Contact plate of horn button on steering wheel trim cover is deformed
- When installing new steering wheel trim cover onto steering wheel assembly, there may be interference or uneven clearance between steering wheel trim cover and steering wheel assembly

Note:

– If any defect is found, replace driver airbag with a new one.

ZC

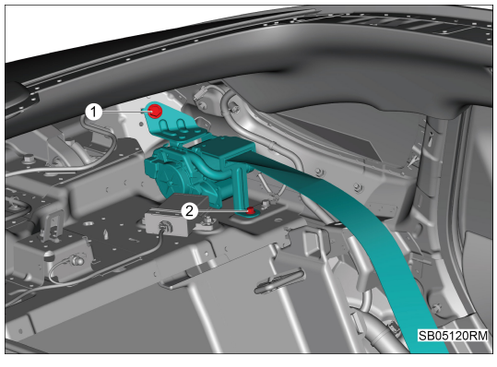
Removal

1. **Disconnect negative battery terminal (See page DL-21)**

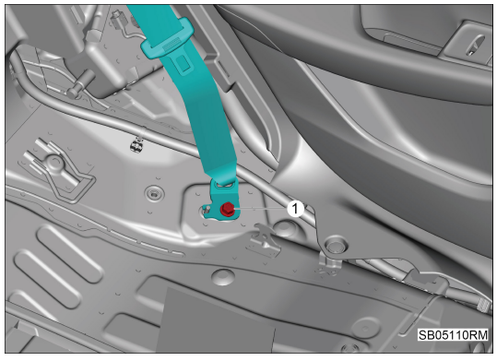
   Notice:

   - **Wait for 90 seconds after disconnecting cable to prevent airbag from deploying.**

2. **Remove driver airbag assembly**



(a) Use a flat-blade screwdriver to insert into -1- and push firmly.



(b) Disconnect the wire harness connector.

(c) Remove the driver airbag assembly -A- in the direction of -arrow-.

Installation

1. **Installation is in the reverse order of removal, and pay attention to the followings:**

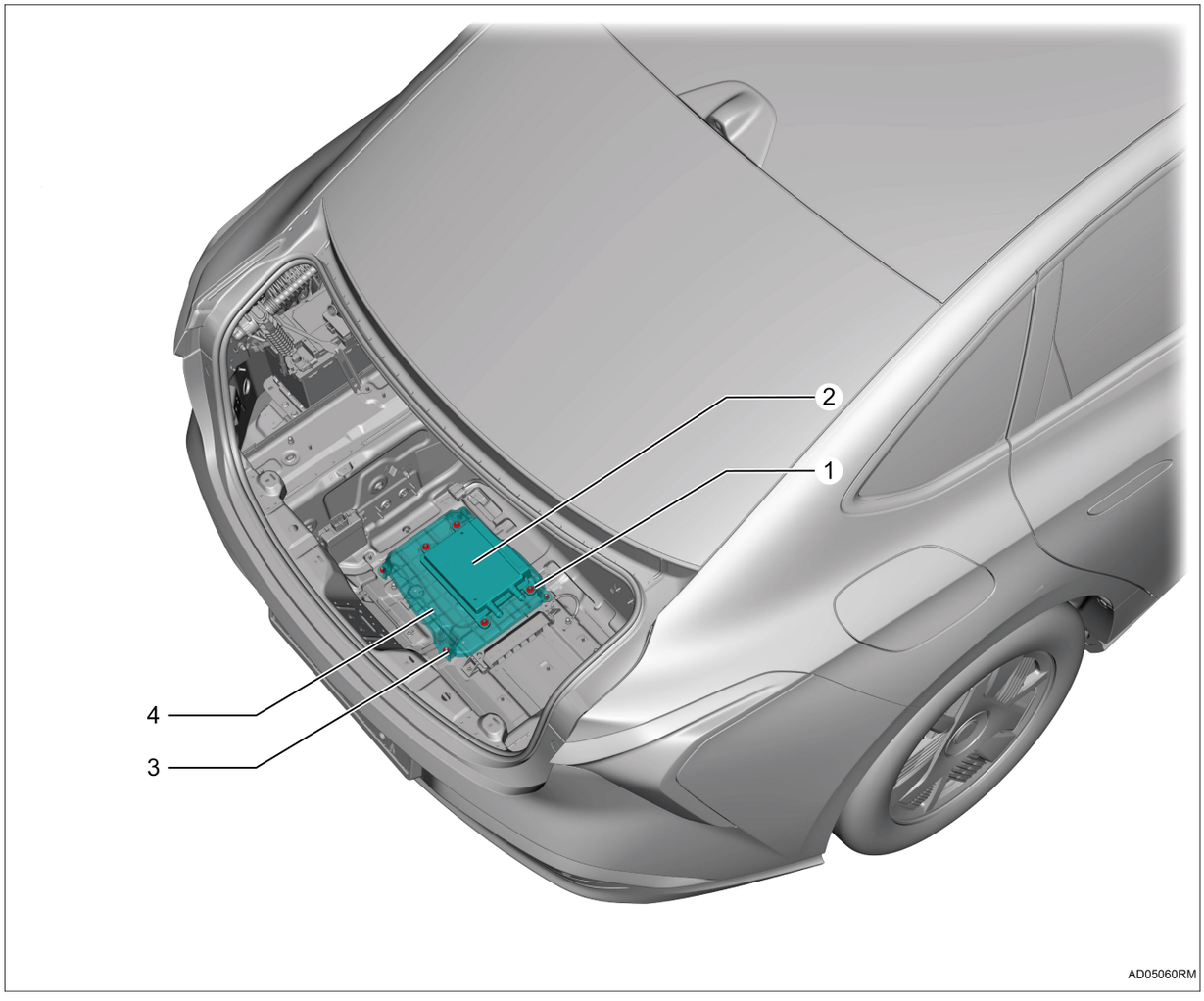
(a) The connector should be pushed all the way to the limit position until a click is heard.

(b) Place driver airbag on steering wheel, press securely until a click is heard.

Intelligent driving system

Advanced automatic driving controller assembly

Components

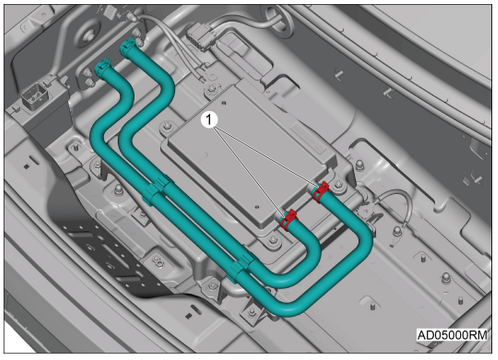


1. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Advanced automatic driving controller assembly**
3. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
4. **Automatic driving controller bracket assembly**

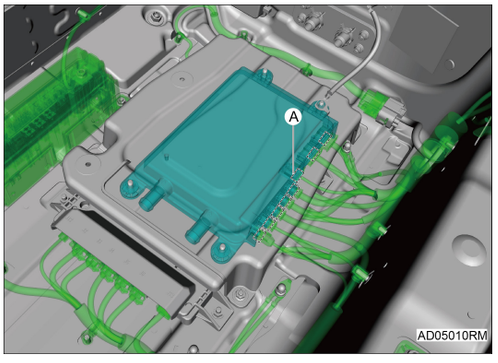
ZC

Removal

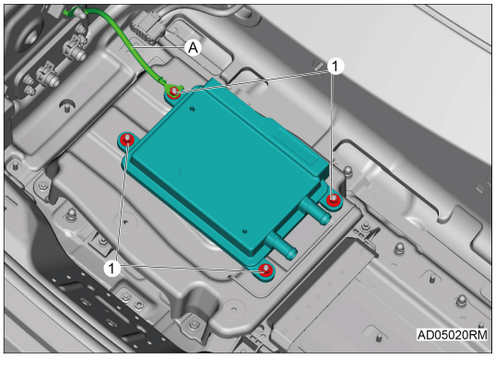
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment cover assembly (See page NS-157)**
3. **Drain coolant (See page RE-76)**
4. **Remove advanced automatic driving controller assembly**



(a) Detach the hose clamp -1-.



(b) (For example) Disconnect all wire harness connectors -A-.

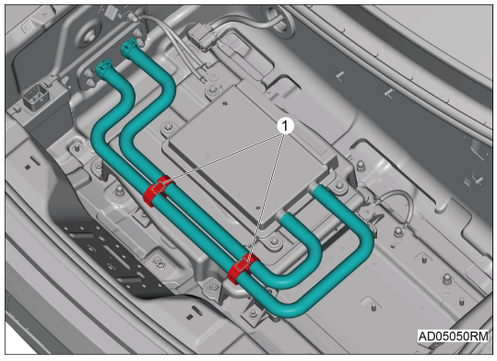


(c) Remove the nut -1-.

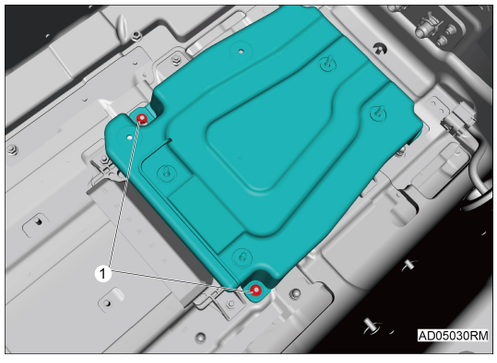
(d) Detach the wire harness terminal -A-.

(e) Remove the advanced automatic driving controller assembly.

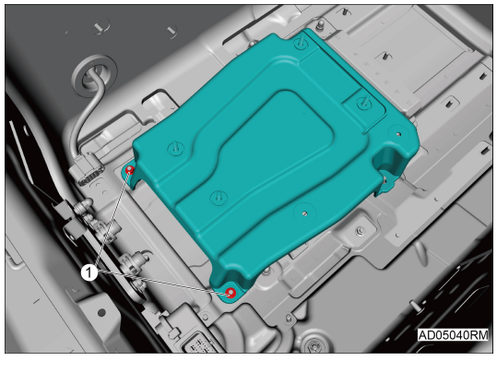
5. **Remove automatic driving controller bracket assembly**



(a) Detach the fixing clip -1-.



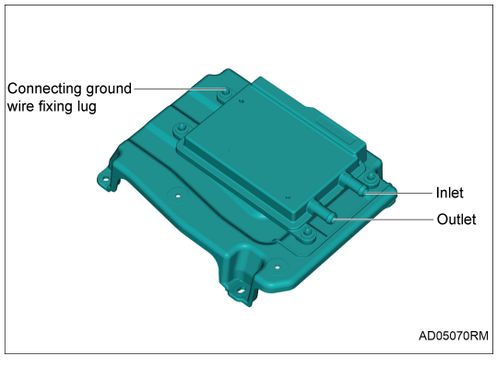
(b) Remove fixing nuts -1- from left side of automatic driving controller bracket.



(c) Remove fixing nuts -1- from right side of automatic driving controller bracket.

Installation

1. Installation is in the reverse order of removal, and pay attention to the followings:



(a) Connect the wire harness end connector with the advanced automatic driving controller board end connector until a "click" sound is heard.

(b) Ensure the connection is reliable, and install the advanced automatic driving controller on rear floor assembly.

(c) Connect the HAD inlet and outlet hoses to the HAD inlet and outlet respectively, fix the pipe ports with clamps, ensure that the locking mechanism is locked and the connection is reliable.

Audio entertainment system

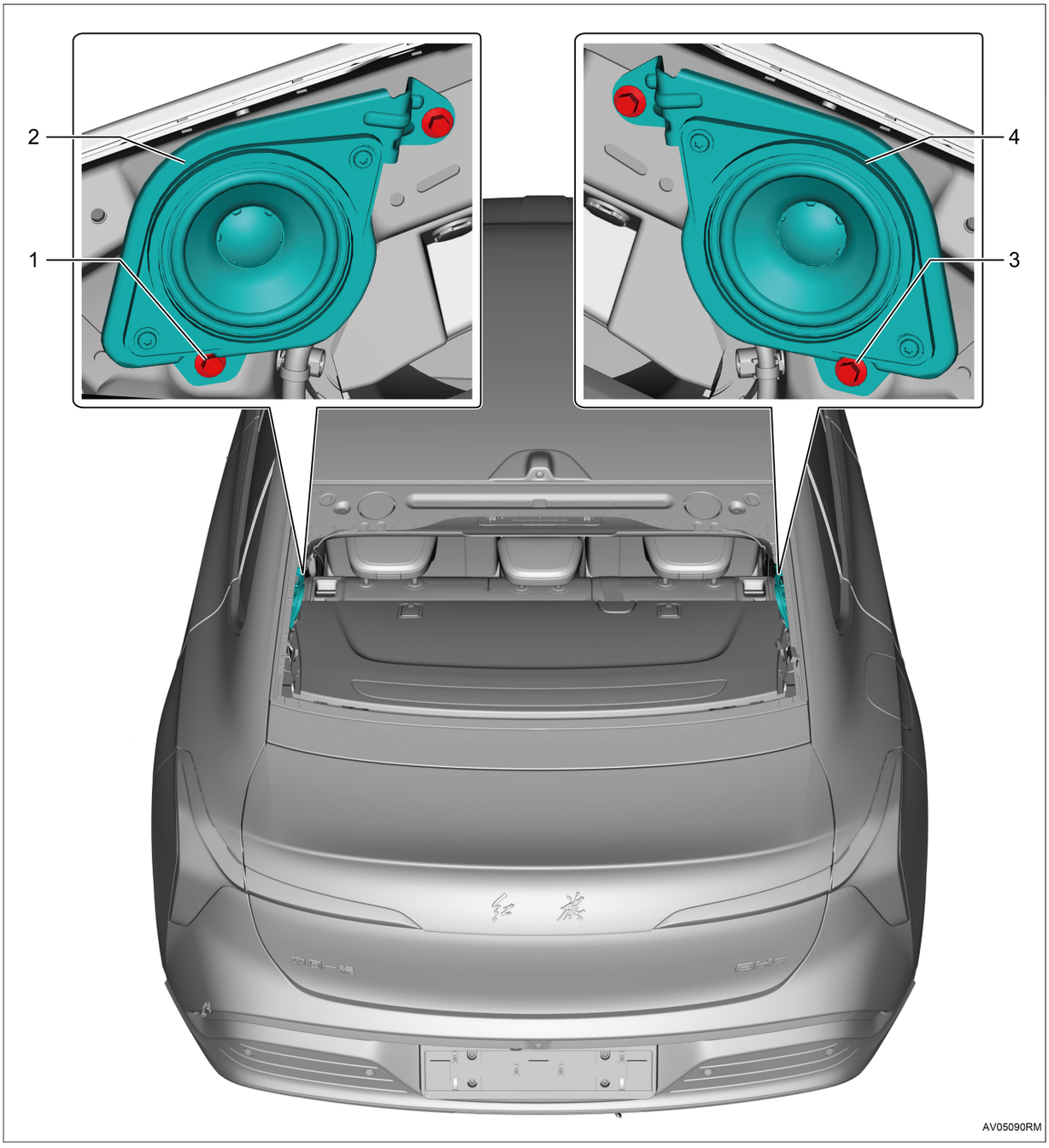
Mid tweeter assembly

Components



1. **Screw**
   - X2
   - Torque: 2 ~ 4 N • m
2. **Instrument cluster middle mid tweeter assembly**

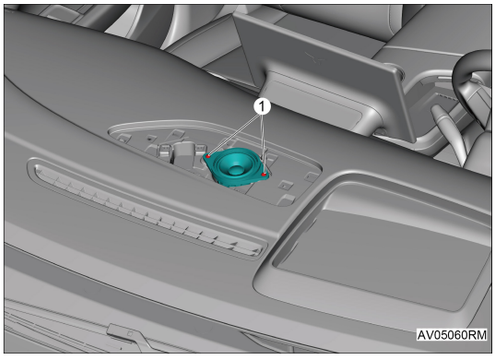
Components



1. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 10 N • m
2. **D-pillar mid tweeter assembly (left)**
3. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 10 N • m
4. **D-pillar mid tweeter assembly (right)**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove middle speaker cover (See page NS-36)**
3. **Remove instrument cluster middle mid tweeter assembly**



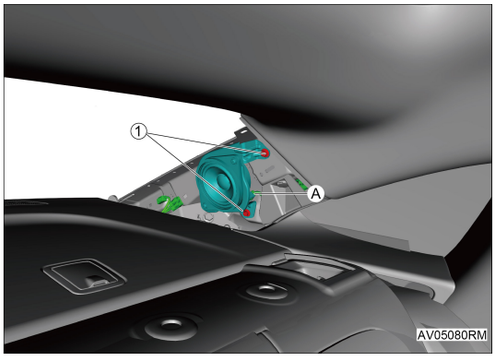
(a) Remove the screw -1-.

(b) Disconnect the wire harness connector.

4. **Remove D-pillar upper left protector (See page NS-137)**
5. **Remove D-pillar mid tweeter assembly**

Note:

- Use same removal orders for right and left sides.



(a) Remove the bolt -1-.

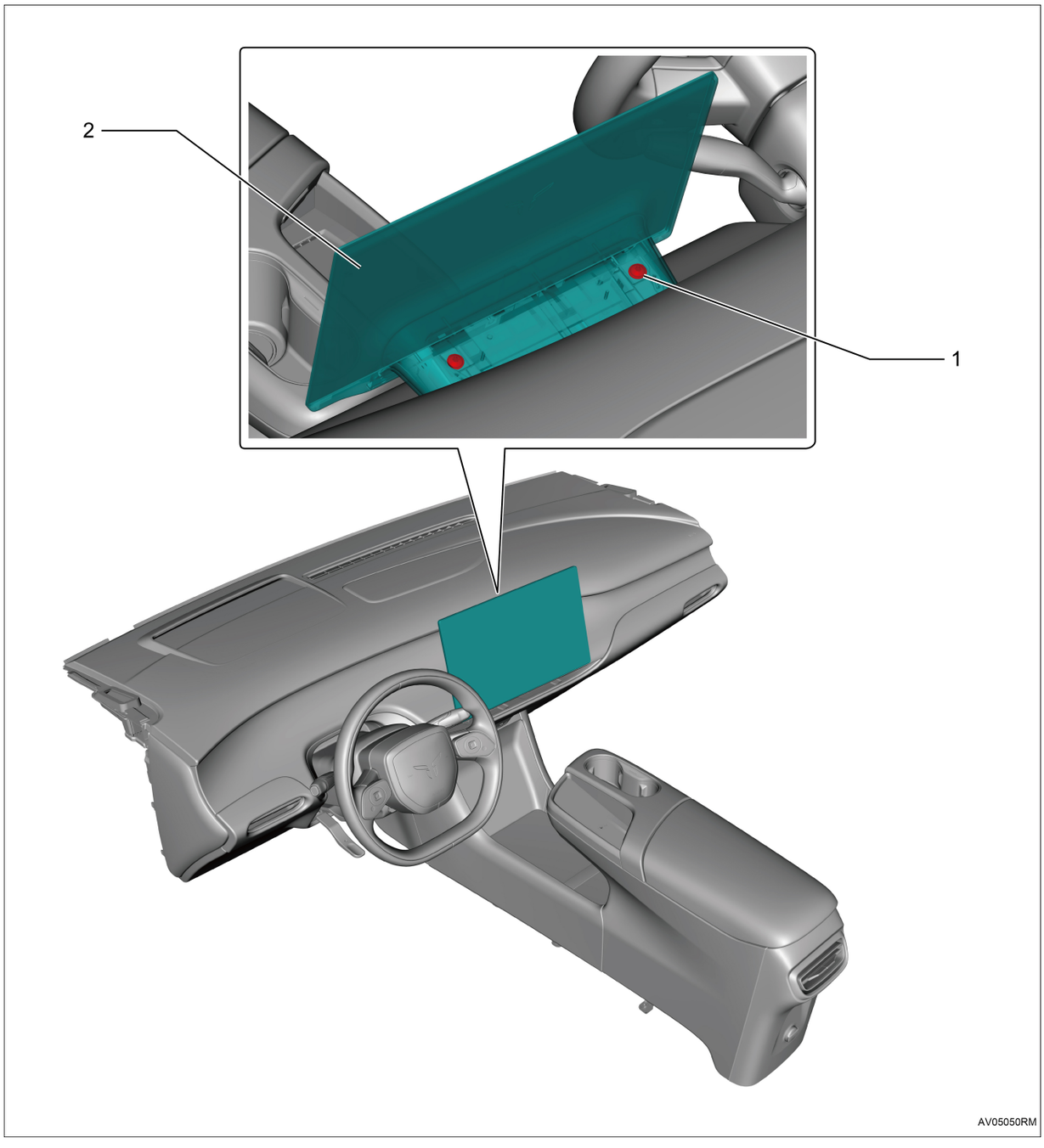
(b) Disconnect the wire harness connector -A-.

Installation

1. **Installation is in the reverse order of removal.**

Main display assembly

Components

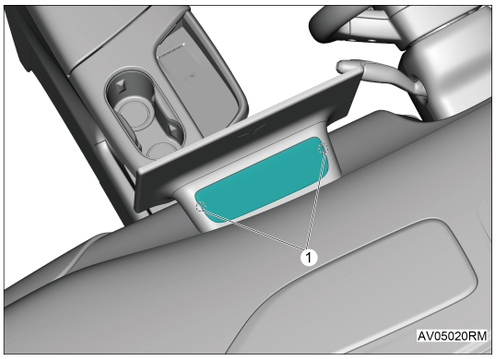


1. **Inner hexagon pan head flange screw**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Main display assembly**

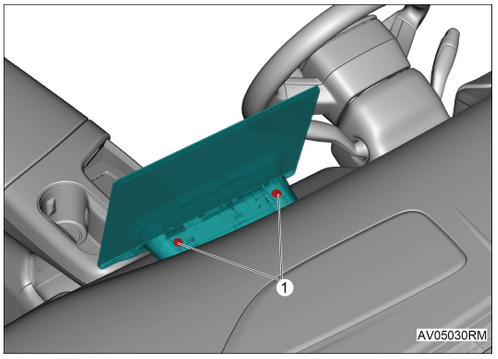
ZC

Removal

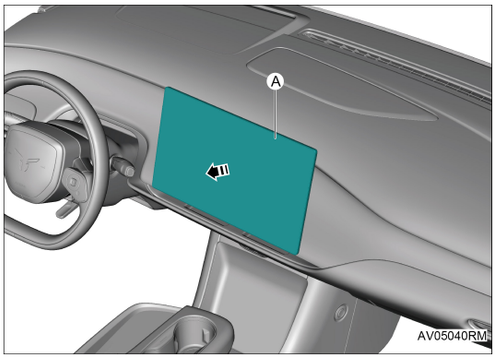
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove main display assembly**



(a) Pry off at the -1- position, and remove main display assembly trim cover.



(b) Remove the screw -1-.



(c) Pull to detach the main display assembly -A- in the direction of -arrow-.

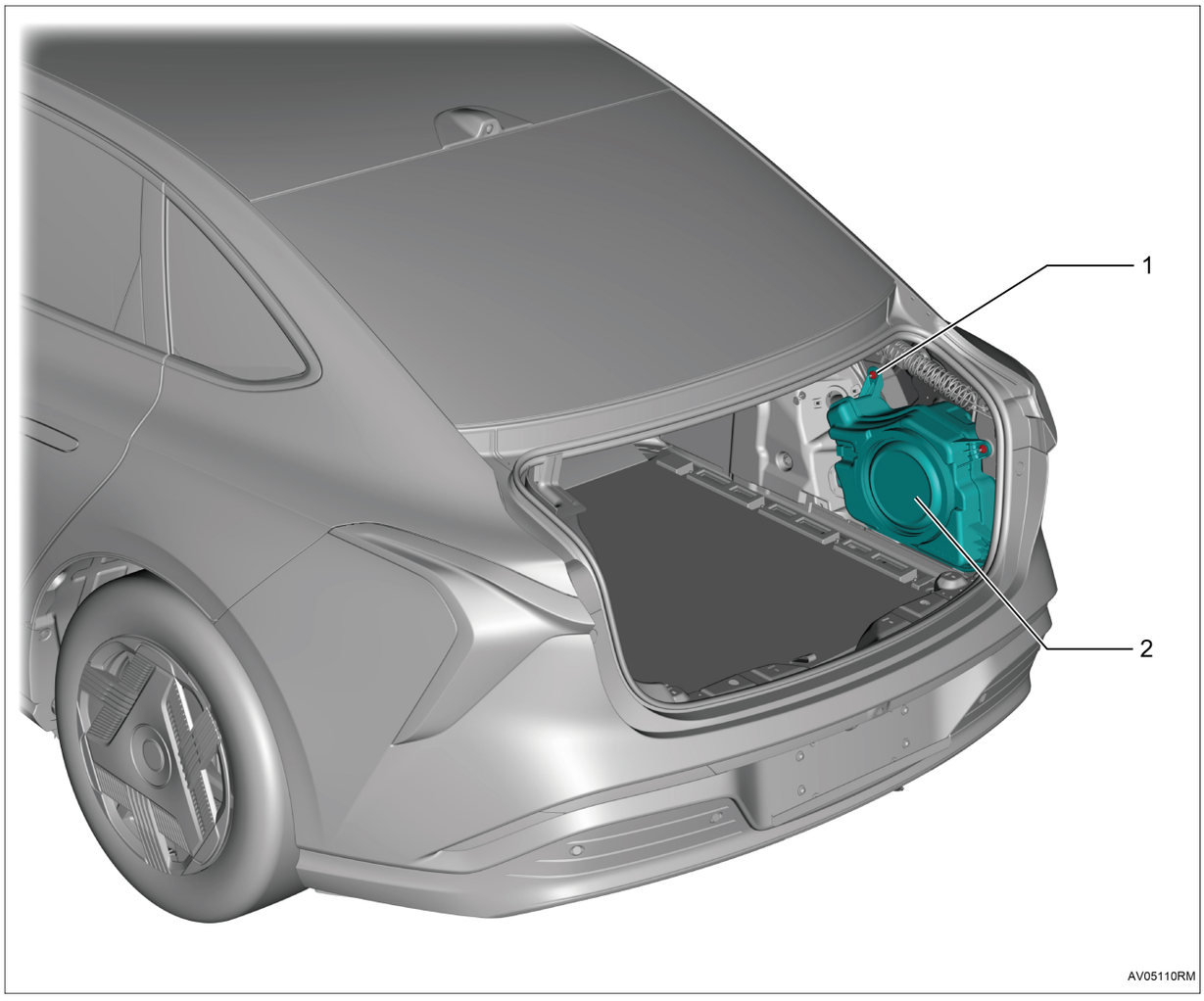
(d) Disconnect the wire harness connector.

Installation

1. **Installation is in the reverse order of removal.**

Sub Woofer assembly

Components

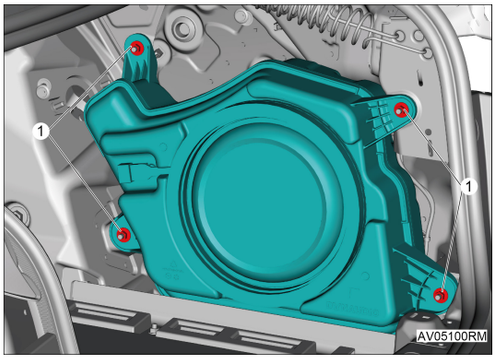


ZC

1. **Hexagon flange nut**
   - X4
   - Torque: 6 ~ 8 N • m
2. **Sub Woofer assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove luggage compartment right cover (See page NS-157)**
3. **Remove subwoofer assembly**



(a) Disconnect the wire harness connector.

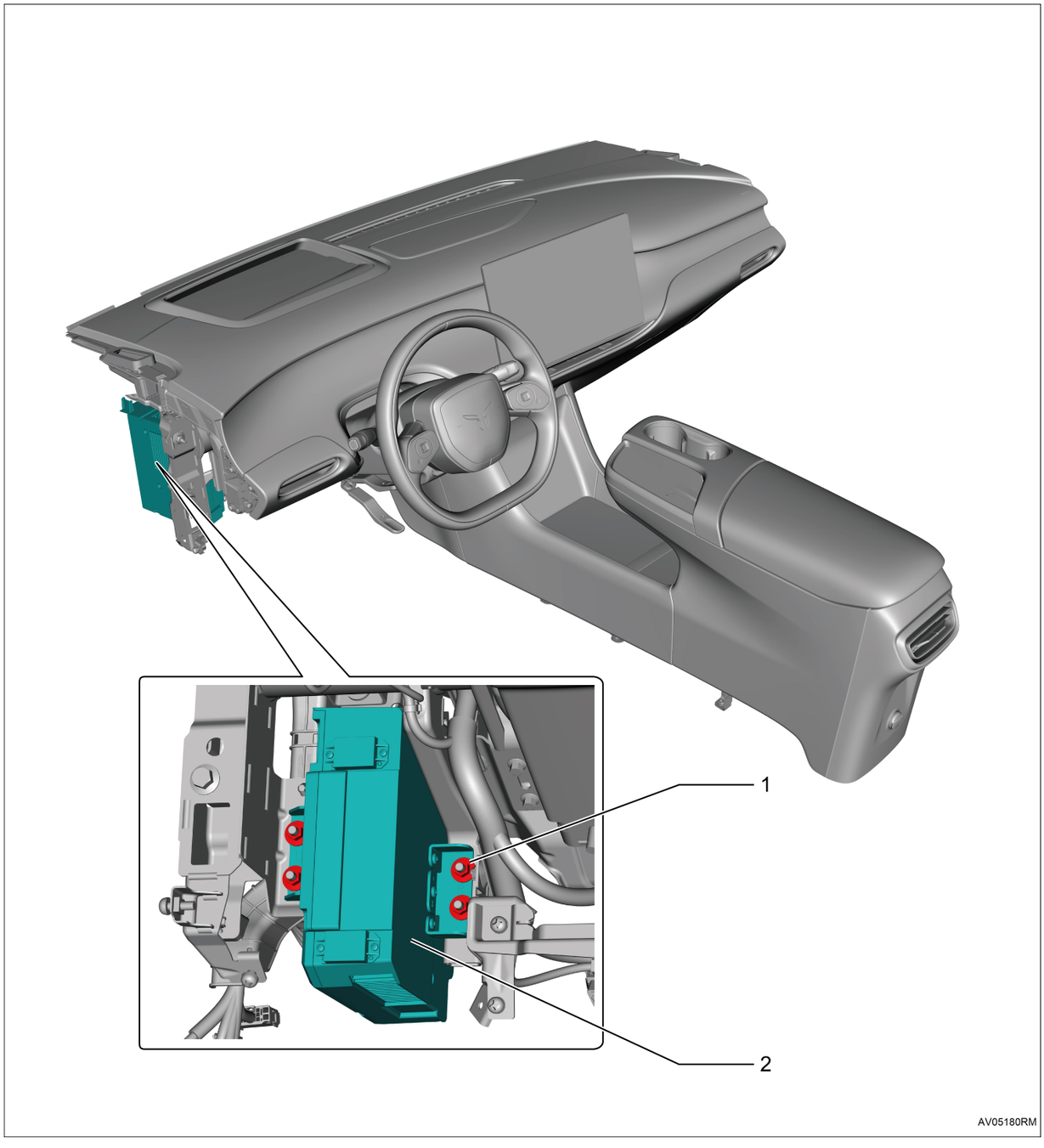
(b) Remove the nut -1-.

Installation

1. Installation is in the reverse order of removal.

Infotainment controller assembly

Components

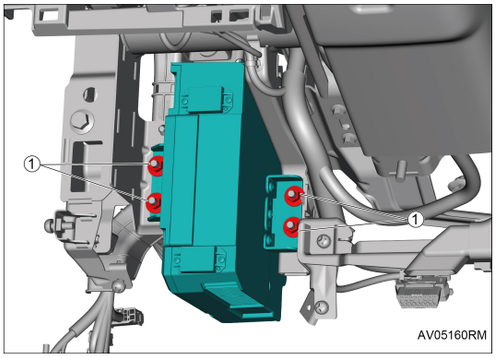


1. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Infotainment controller assembly**

ZC

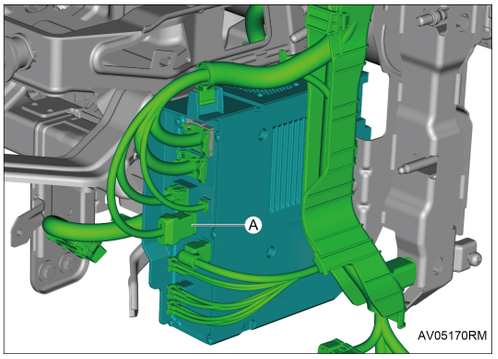
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove lower left protector assembly (See page NS-29)**
3. **Remove infotainment controller assembly**



(a) Remove nuts -1-, and pull out infotainment controller assembly outward.

(b) Disconnect the wire harness connector.



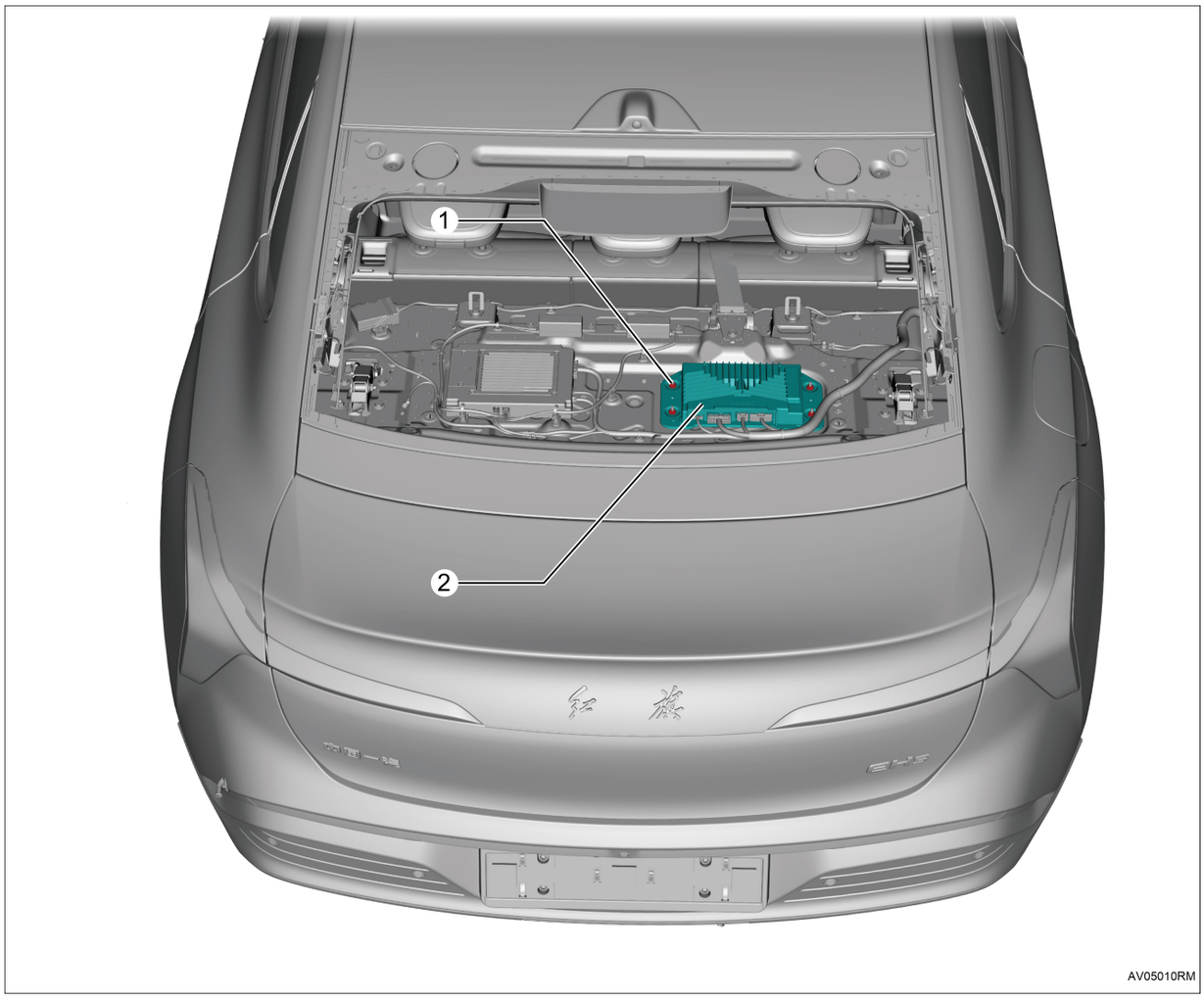
(c) (For example) Disconnect all wire harness connectors -A-.

Installation

1. **Installation is in the reverse order of removal.**

Power amplifier assembly

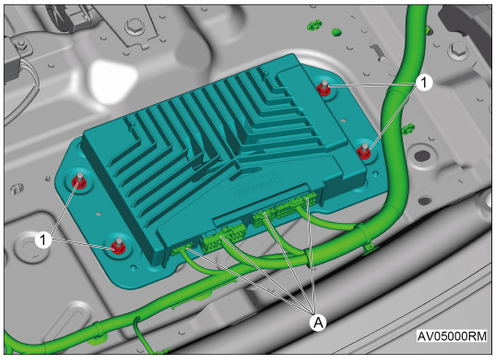
Components



1. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Power amplifier assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove package rack protector assembly (See page NS-140)**
3. **Remove power amplifier assembly**



(a) Disconnect the wire harness connector -A-.

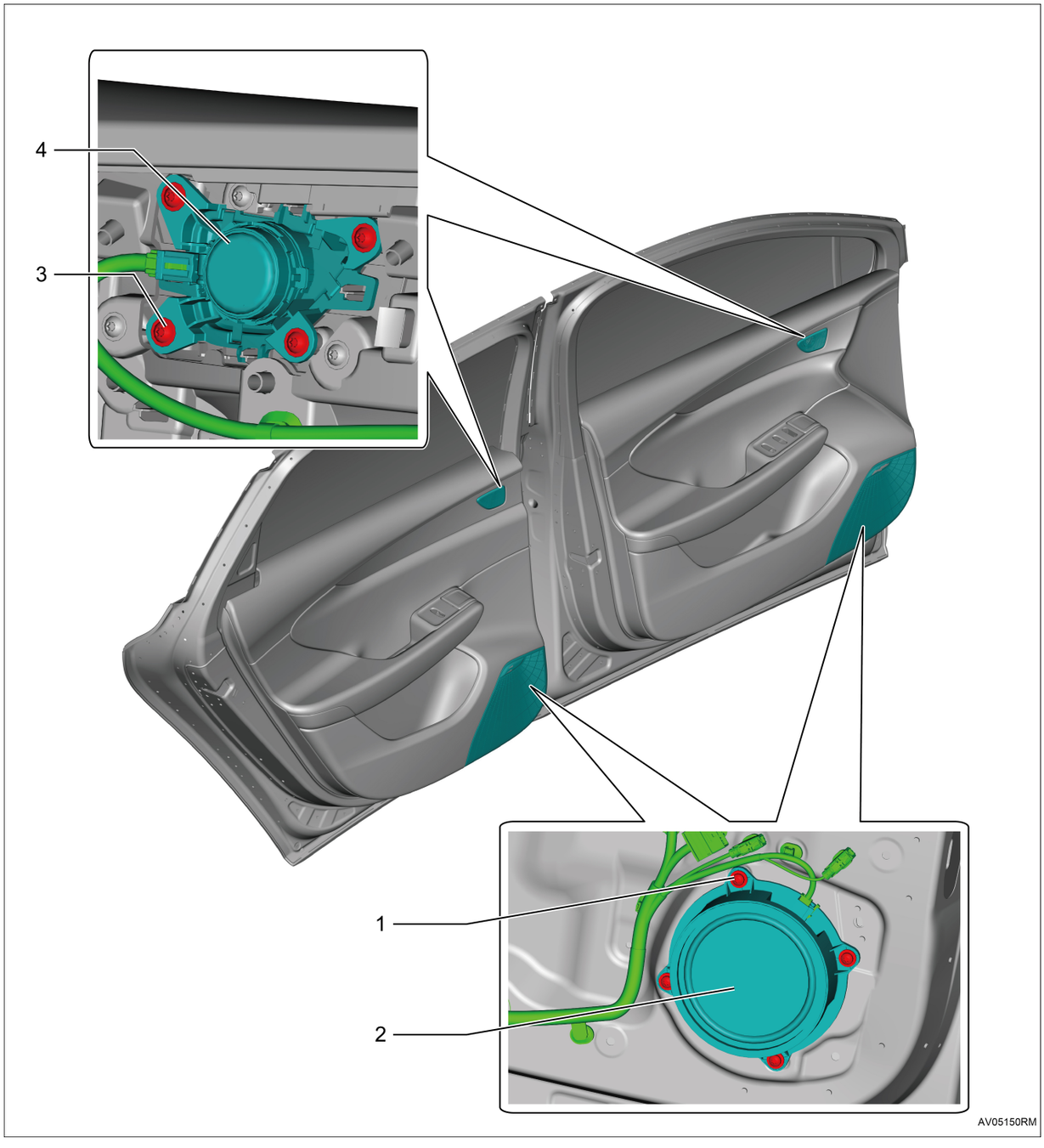
(b) Remove the nut -1-.

Installation

1. Installation is in the reverse order of removal.

Door speaker assembly

Components



1. **Inner hexagon pan head screw and flat washer set**
   - X4
   - Torque: 4 ~ 6 N • m
2. **Door speaker assembly**
3. **Self-tapping screw**
   - X4

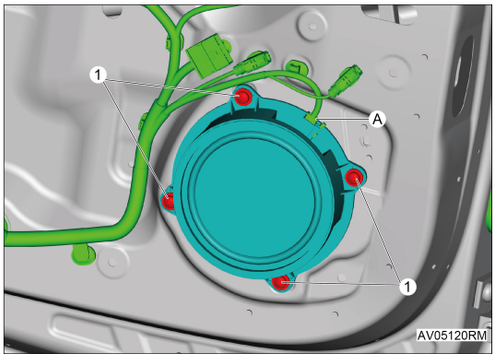
4. Door tweeter assembly and speaker cover holder

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front door protector assembly (See page NS-111)**
3. **Remove front door speaker assembly (type 1)**

Note:

- Use same removal orders for right and left sides.
- Use same removal sequence for rear door speaker and front door speaker.



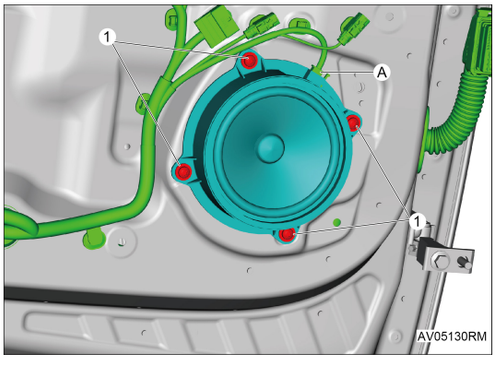
(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

4. **Remove front door speaker assembly (type 2)**

Note:

- Use same removal orders for right and left sides.



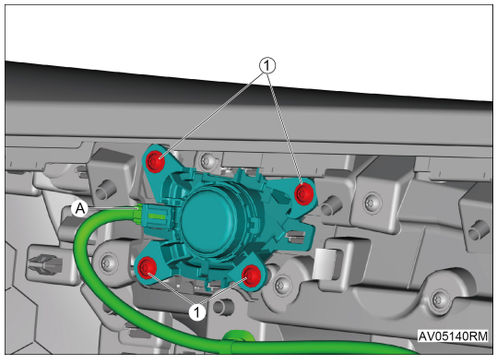
(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

5. **Remove front door tweeter assembly and speaker cover holder**

Note:

- Use same removal orders for right and left sides.
- Use same removal sequence for rear door tweeter and front door tweeter.



(a) Disconnect the wire harness connector -A-.

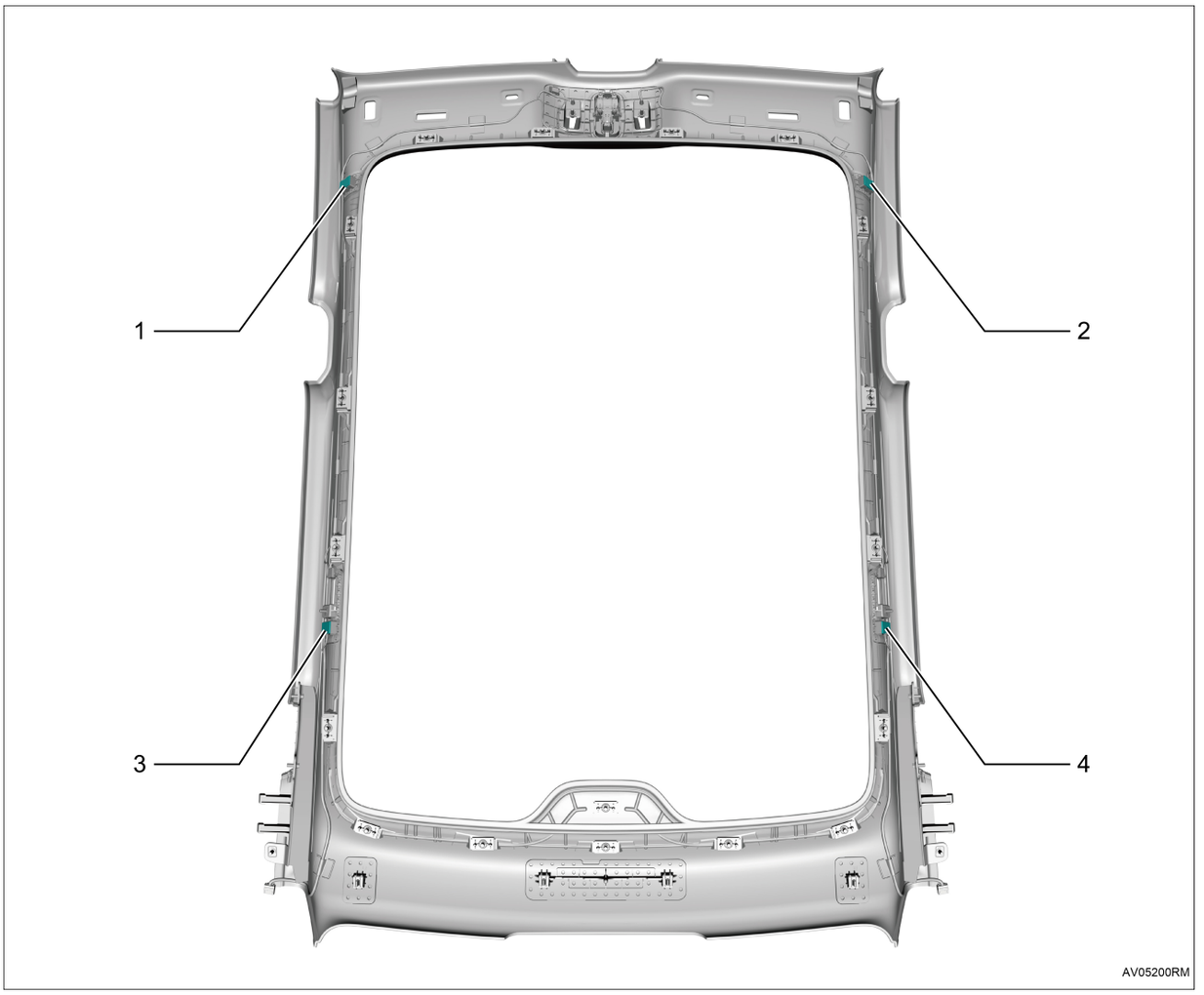
(b) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Microphone assembly

Components



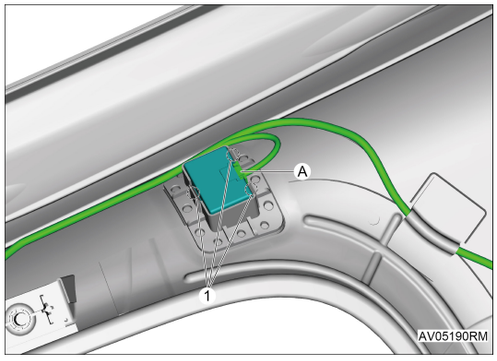
1. **Microphone assembly (front left)**
2. **Microphone assembly (front right)**
3. **Microphone assembly (rear left)**
4. **Microphone assembly (rear right)**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove roof assembly (See page NS-172)**
3. **Remove microphone assembly**

   Note:

   - Use same removal orders for all roof microphone assemblies.



(a) Disconnect the wire harness connector -A-.

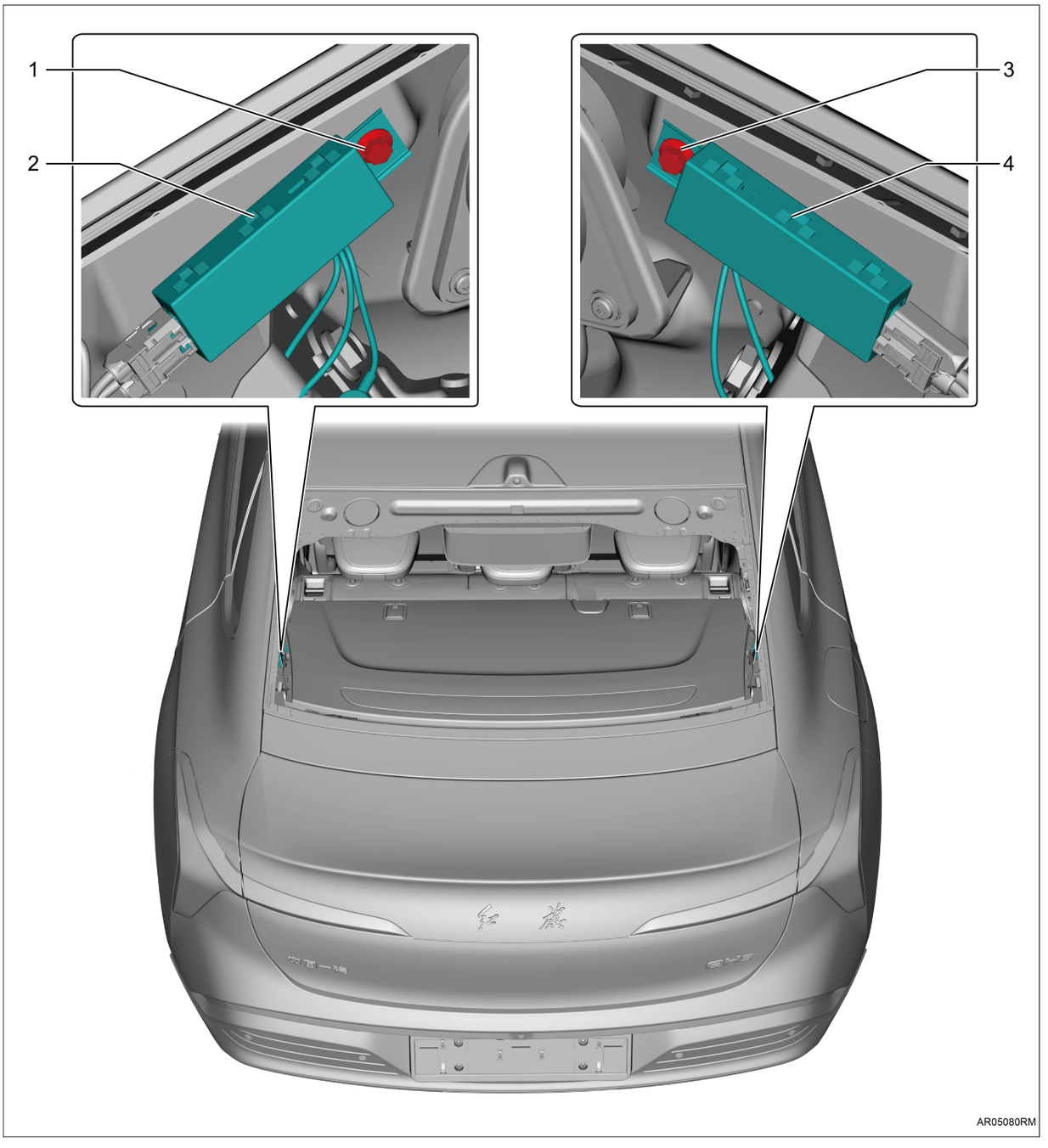
(b) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Radio antenna amplifier assembly

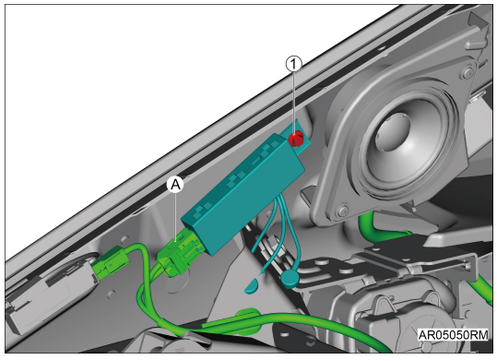
Components



1. **Hexagon flange bolt**
   - Torque: 7 ~ 9 N • m
2. **Radio antenna amplifier assembly I**
3. **Hexagon flange bolt**
   - Torque: 7 ~ 9 N • m
4. **Radio antenna amplifier assembly II**

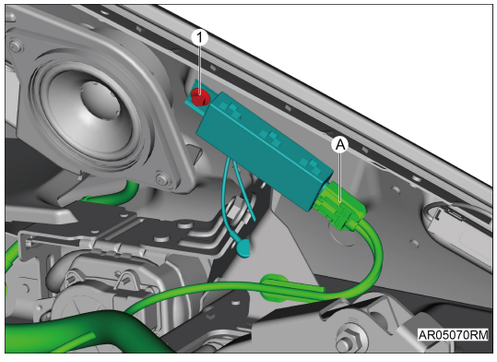
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove D-pillar upper left protector (See page NS-137)**
3. **Remove radio antenna amplifier assembly I**



   (a) Disconnect the wire harness connector -A-.
   (b) Detach the button plugs.
   (c) Remove the bolt -1-.

4. **Remove radio antenna amplifier assembly II**



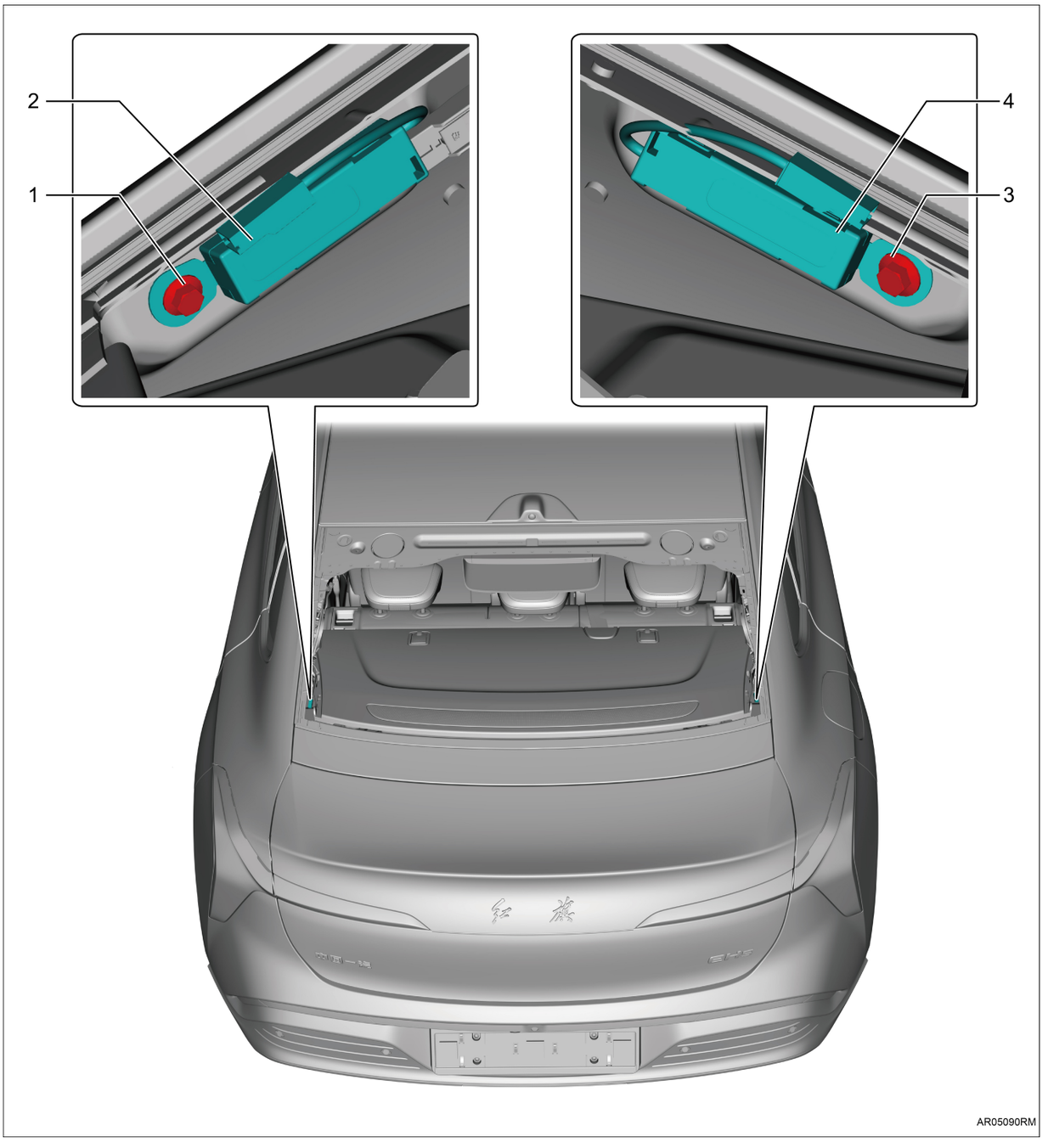
   (a) Disconnect the wire harness connector -A-.
   (b) Detach the button plugs.
   (c) Remove the bolt -1-.

Installation

1. **Installation is in the reverse order of removal.**

Radio antenna filter assembly

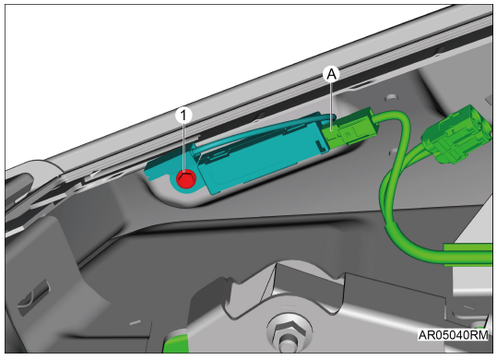
Components



1. **Hexagon flange bolt**
   - Torque: 7 ~ 9 N • m
2. **Antenna filter (positive) assembly**
3. **Hexagon flange bolt**
   - Torque: 7 ~ 9 N • m
4. **Antenna filter (negative) assembly**

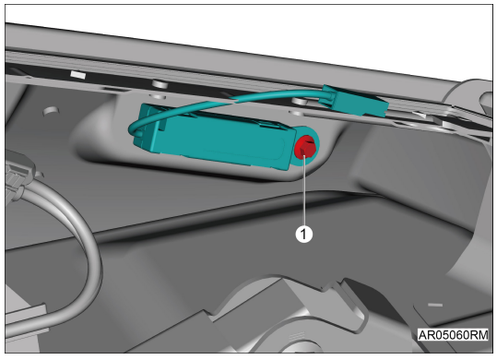
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove D-pillar upper left protector (See page NS-137)**
3. **Remove antenna filter (positive) assembly**



   (a) Disconnect the wire harness connector -A-.
   (b) Detach the wire harness terminals.
   (c) Remove the bolt -1-.

4. **Removal antenna filter (negative) assembly**



   (a) Detach the wire harness terminals.
   (b) Remove the bolt -1-.

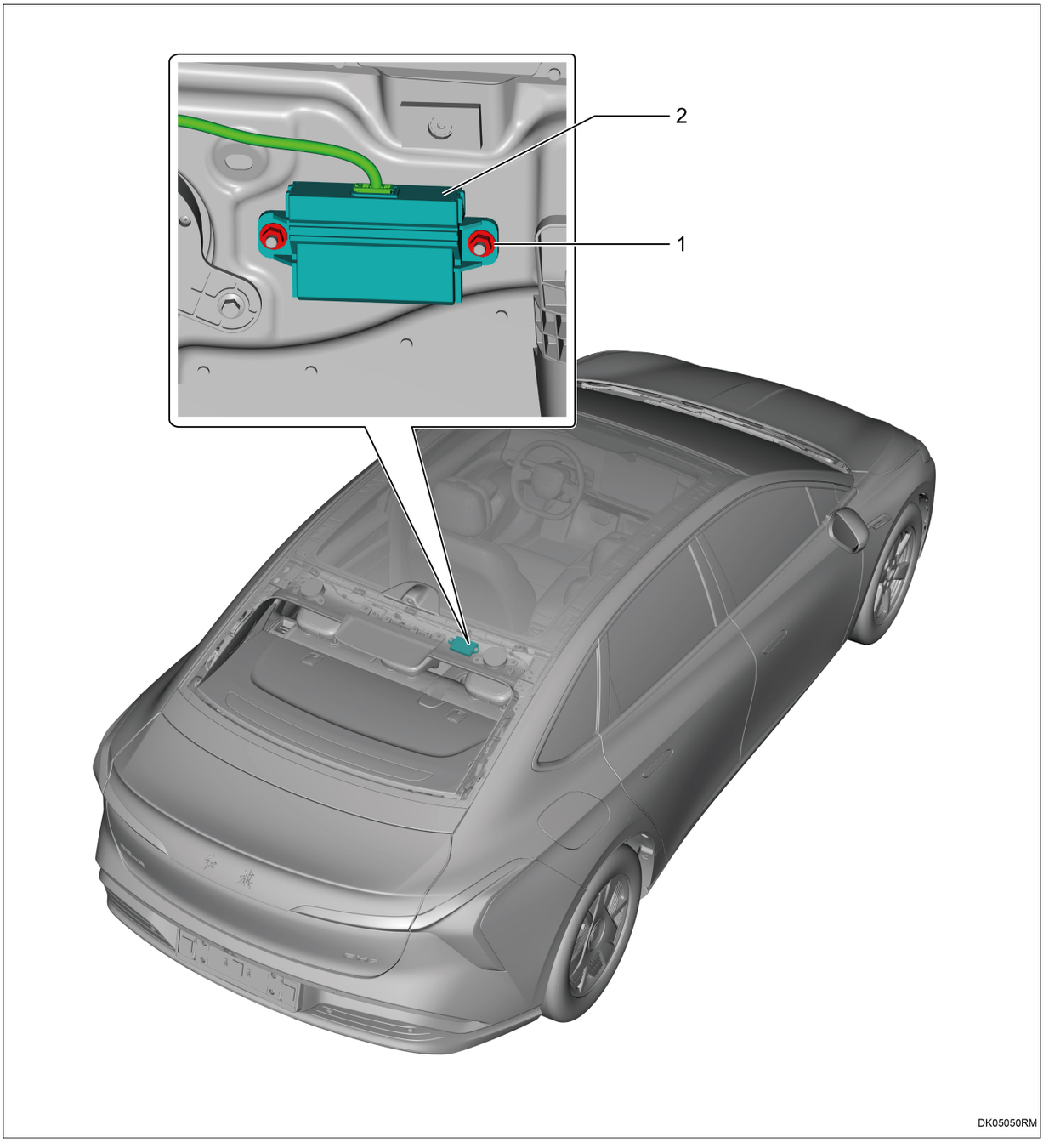
Installation

1. **Installation is in the reverse order of removal.**

Bluetooth control system

Digital key main module assembly

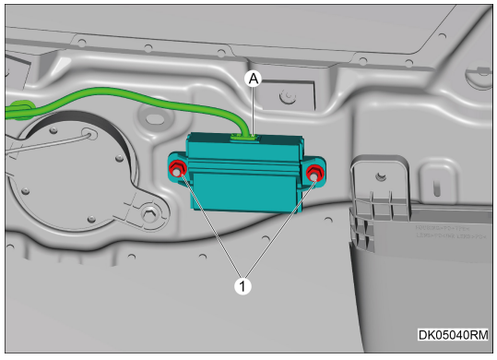
Components



1. **Hexagon flange nut**
   - X2
   - Torque: 2 ~ 4 N • m
2. **Digital key main module assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove roof assembly (See page NS-172)**
3. **Remove digital key main module assembly**



(a) Disconnect the wire harness connector -A-.

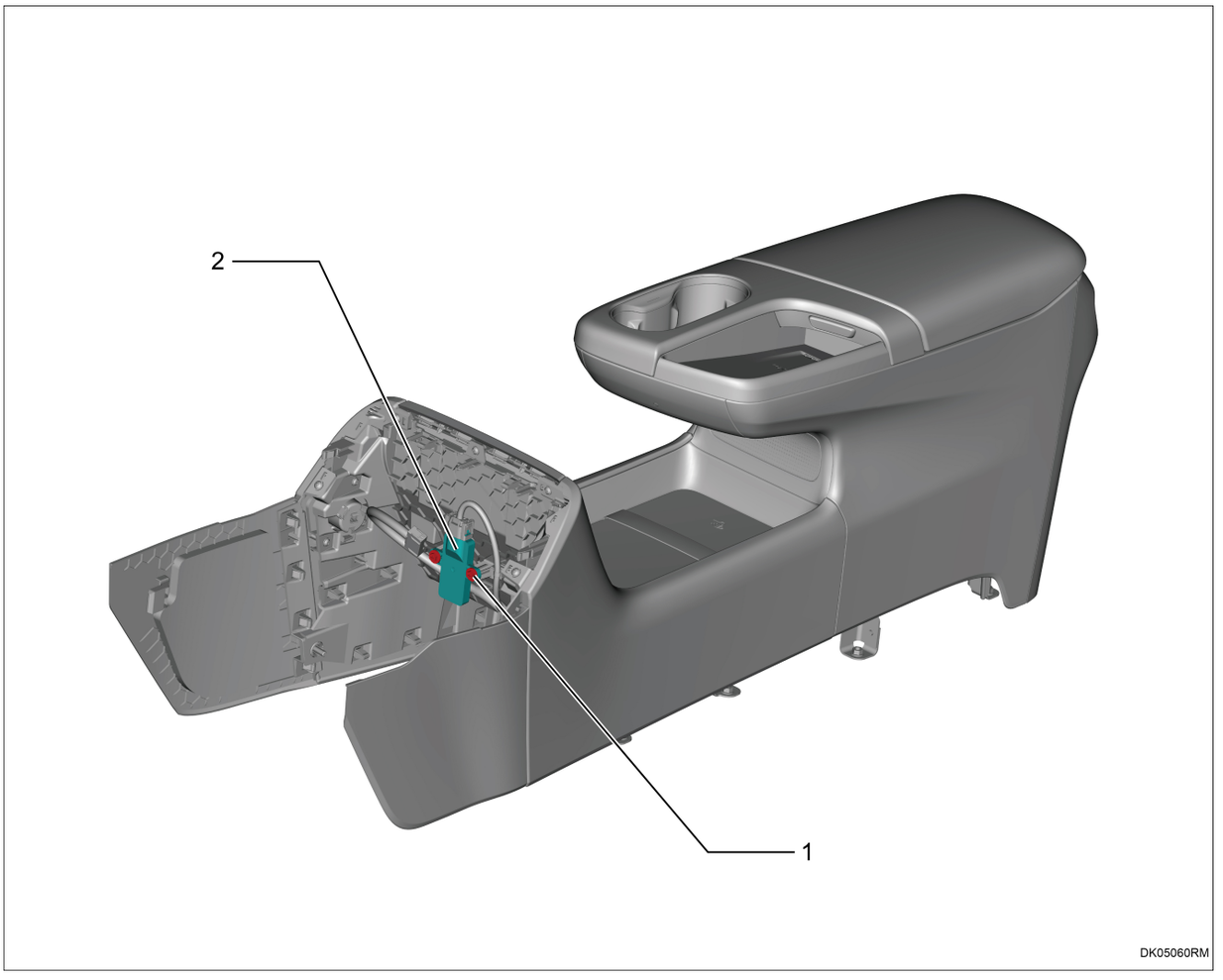
(b) Remove the nut -1-.

Installation

1. **Installation is in the reverse order of removal.**

Digital key inner antenna assembly

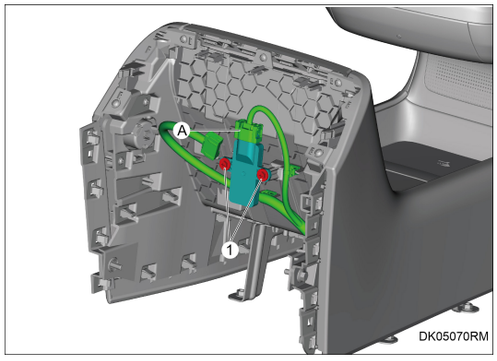
Components



1. **Screw**
   - X2
2. **Digital key inner antenna assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove auxiliary fascia console assembly (See page NS-49)**
3. **Remove digital key interior antenna assembly**



(a) Disconnect the wire harness connector -A-.

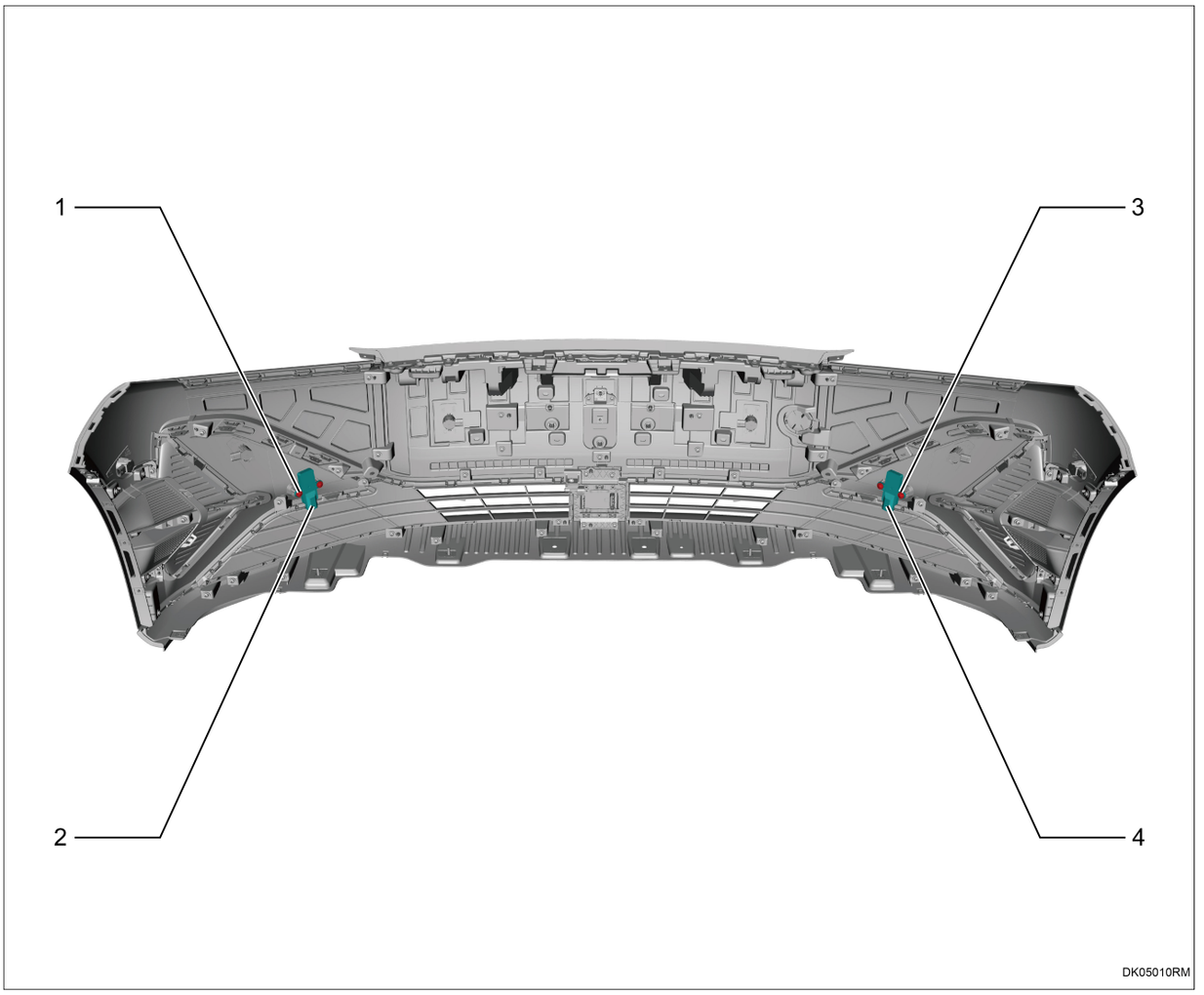
(b) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Digital key front antenna assembly

Components

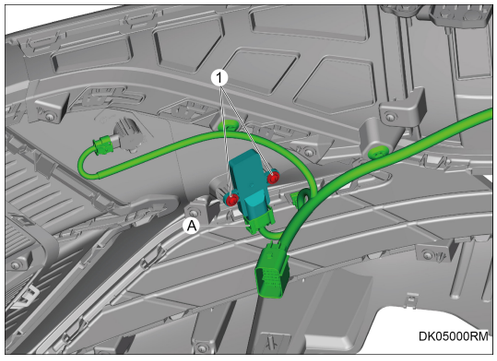


1. **Screw**
   - X2
2. **Digital key front antenna assembly (left)**
3. **Screw**
   - X2
4. **Digital key front antenna assembly (right)**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove digital key front antenna assembly**

   Note:
   - Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

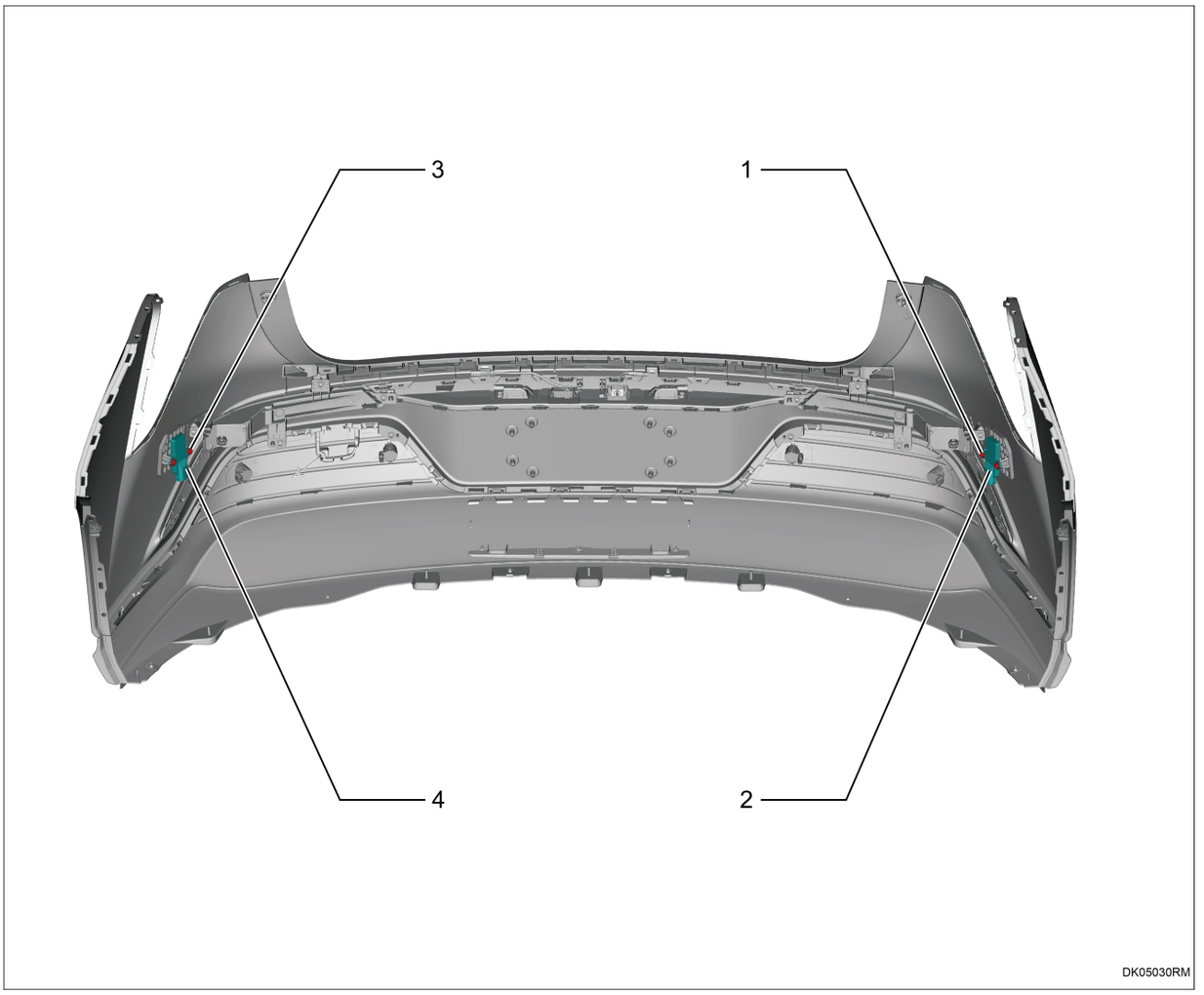
(b) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Digital key rear antenna assembly

Components



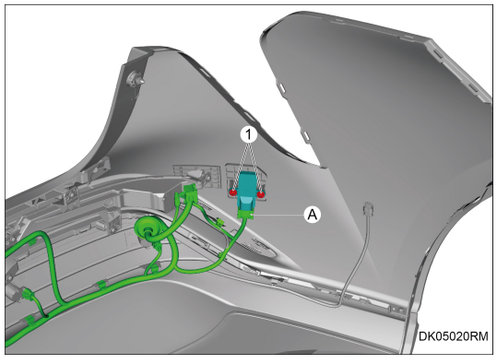
1. **Screw**
   - X2
2. **Digital key rear antenna assembly (left)**
3. **Screw**
   - X2
4. **Digital key rear antenna assembly (right)**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-13)**
3. **Remove digital key rear antenna assembly**

   Note:

   - Use same removal orders for right and left sides.



(a) Disconnect the wire harness connector -A-.

(b) Remove the screw -1-.

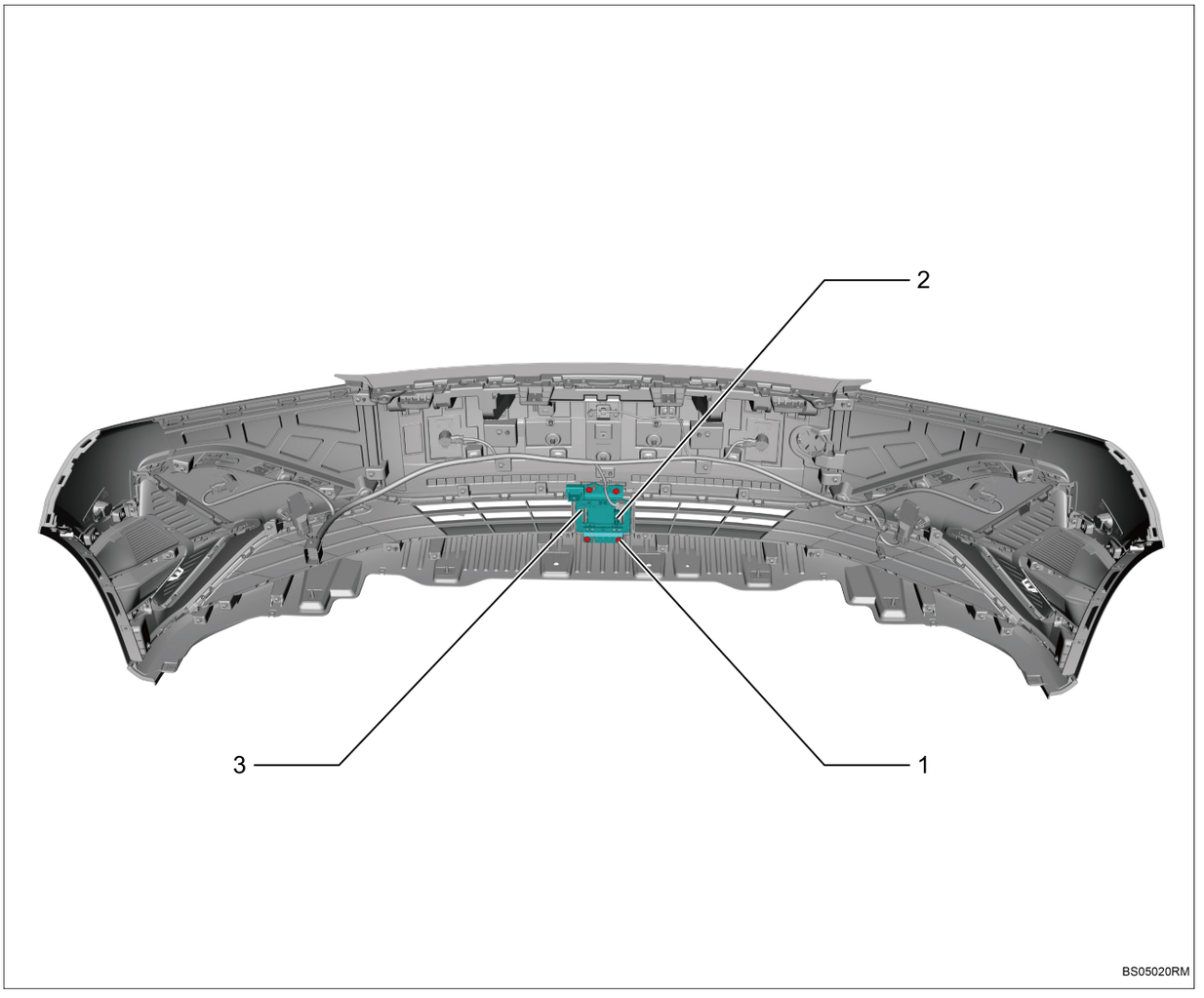
Installation

1. Installation is in the reverse order of removal.

Millimeter wave radar system

Front millimeter wave radar assembly

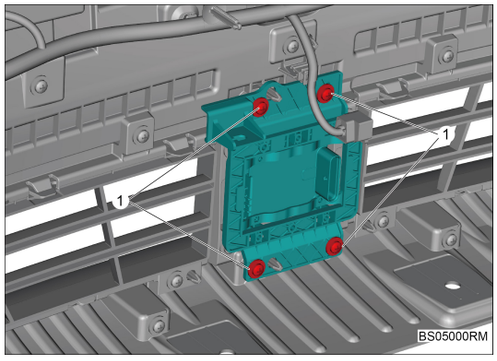
Components



1. **Cross recess pan head self-tapping screw and flat washer set**
   - X4
2. **Front millimeter wave radar assembly**
3. **Front bumper - radar bracket**

Removal

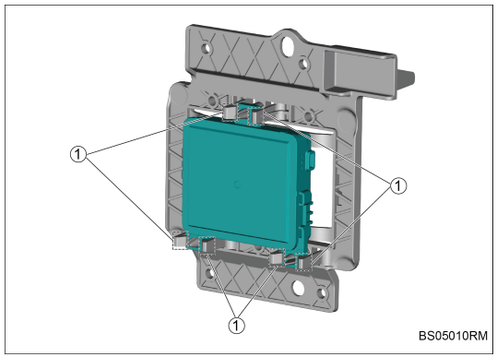
1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove outside temperature sensor assembly (See page RE-17)**
4. **Remove front millimeter wave radar assembly**



(a) Disconnect the wire harness connector.

(b) Remove the screw -1-.

(c) Remove front bumper lower bracket and front millimeter wave radar assembly.



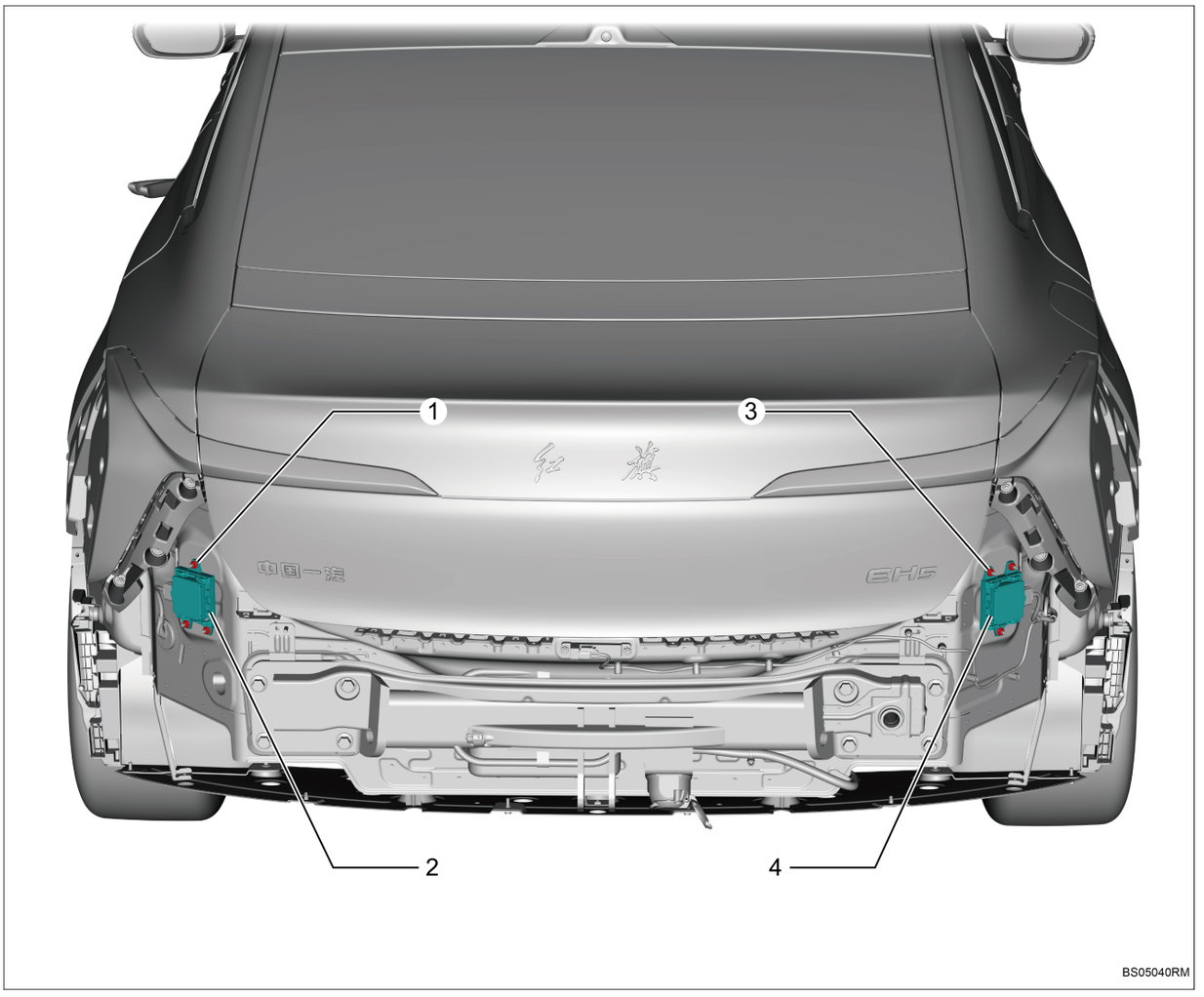
(d) Detach claws -1- and remove front millimeter wave radar assembly.

Installation

1. Installation is in the reverse order of removal.

Rear corner millimeter wave radar

Components



1. **Hexagon flange nut**
   - X3
   - Torque: 6 ~ 8 N • m
2. **Rear left corner millimeter wave radar assembly**
3. **Hexagon flange nut**
   - X3
   - Torque: 6 ~ 8 N • m
4. **Rear right corner millimeter wave radar assembly**

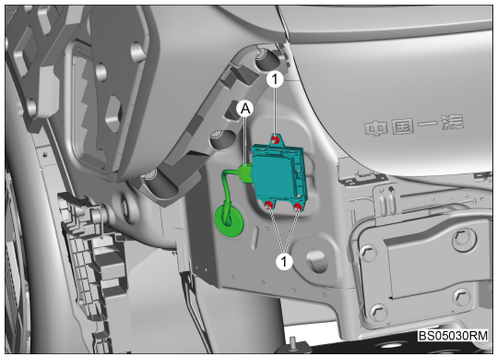
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-13)**

3. Remove rear left corner millimeter wave radar assembly

Note:

- Use same removal orders for right and left sides.



(a) Remove the nut -1-.

(b) Disconnect the wire harness connector -A-.

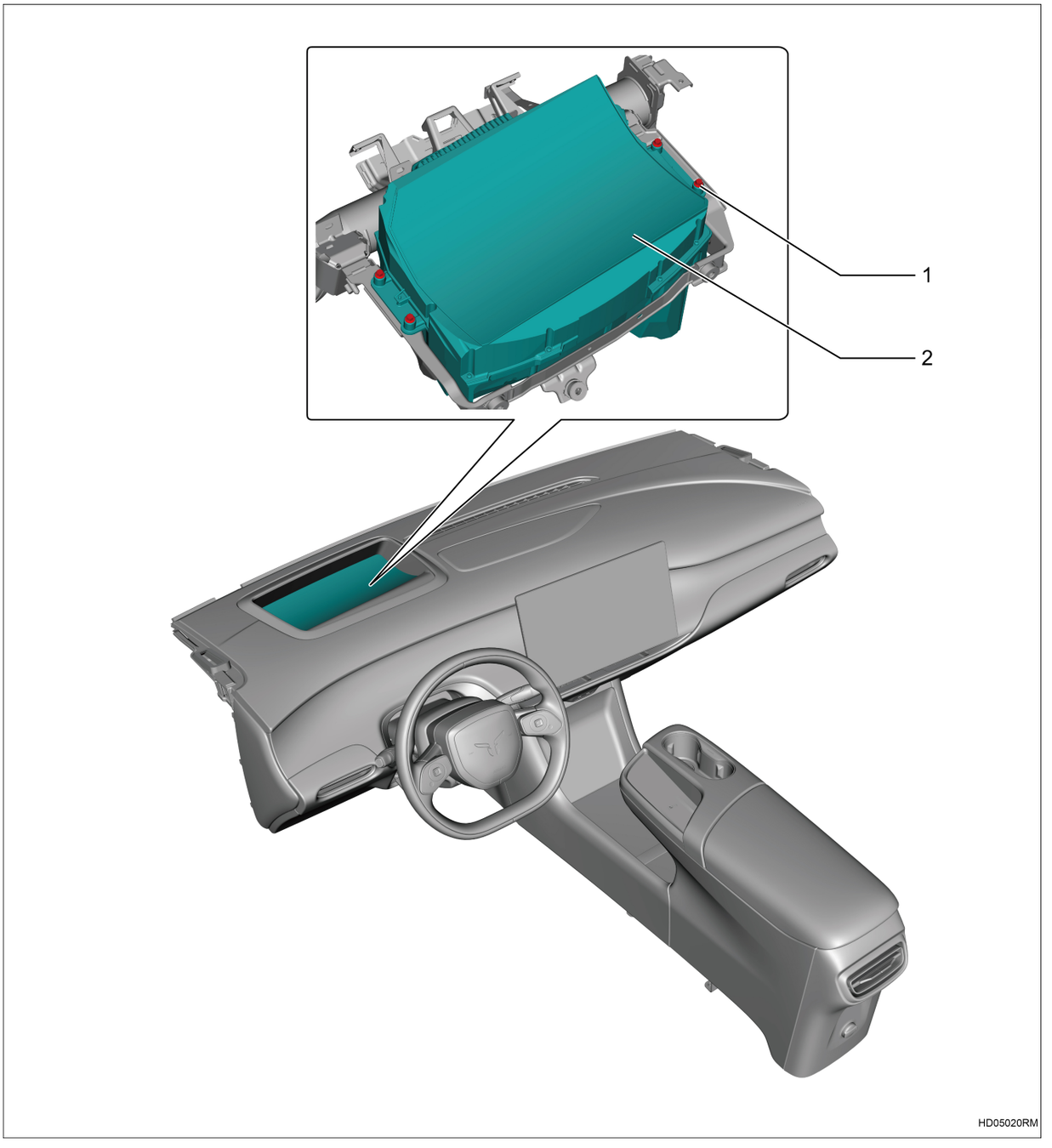
Installation

1. Installation is in the reverse order of removal.

Head up display control system

Head up display

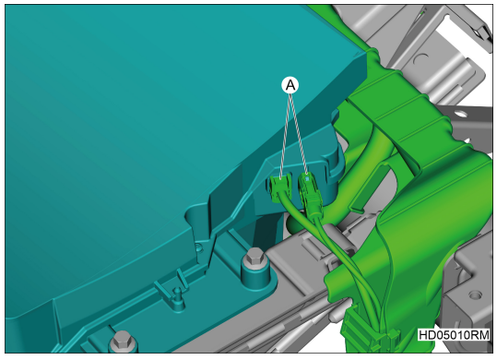
Components



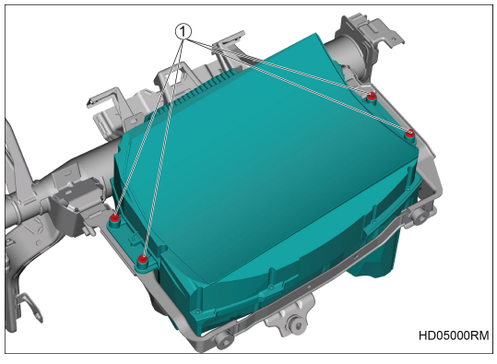
1. **Hexagon flange bolt**
   - X4
   - Torque: 8 ~ 10 N • m
2. **Head up display**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove instrument panel body assembly (See page NS-40)**
3. **Remove head up display**



(a) Disconnect the wire harness connector -A-.



(b) Remove the bolt -1-.

Installation

1. **Installation is in the reverse order of removal.**

On-board telematics system

Intelligent domain controller assembly

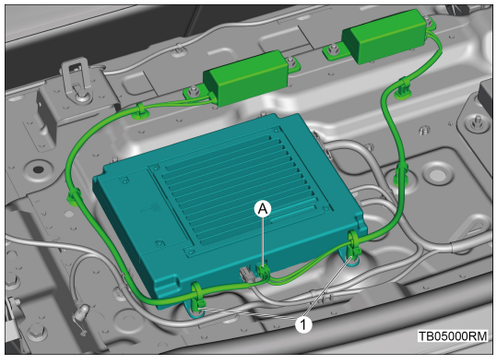
Components



1. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 12 N • m
2. **Intelligent domain controller assembly**

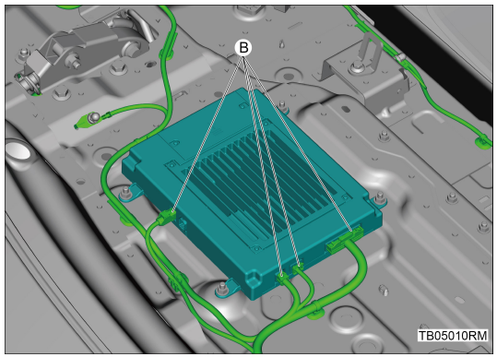
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove package rack protector assembly (See page NS-140)**
3. **Remove intelligent domain controller assembly**

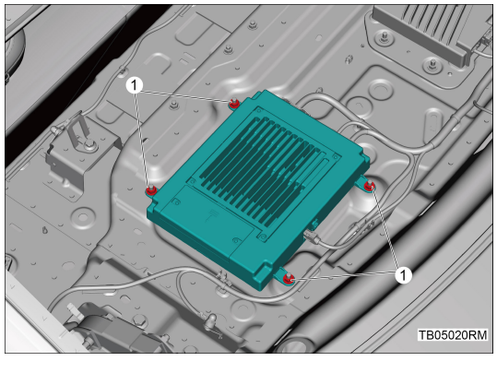


(a) Disengage the wire harness fixing clip -1-.

(b) Disconnect the wire harness connector -A-.



(c) Disconnect the wire harness connector -B-.



(d) Remove the nut -1-.

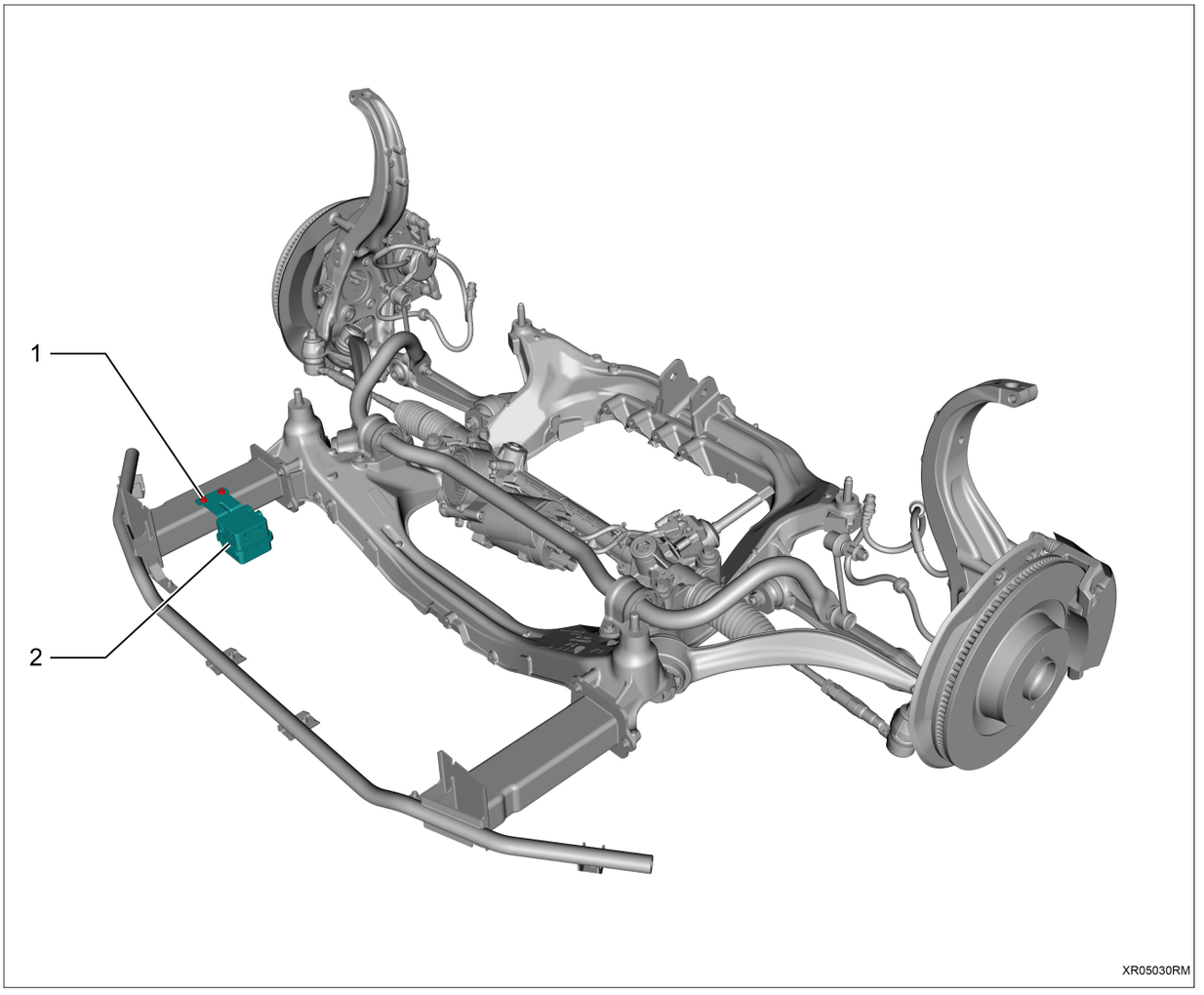
Installation

1. Installation is in the reverse order of removal.

Pedestrian warning control system

Pedestrian warning speaker assembly

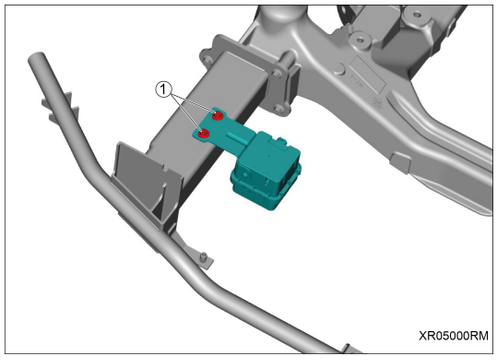
Components



1. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Pedestrian warning speaker assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front right wheel protector assembly (See page WS-32)**



3. **Remove engine bottom protector (See page WS-40)**
4. **Remove pedestrian warning speaker assembly**
   (a) Disconnect the wire harness connector -A-.
   (b) Remove the nut -1-.

Installation

1. **Installation is in the reverse order of removal.**

Combination switch control system

Spiral cable

Components



1. **Spiral cable assembly**

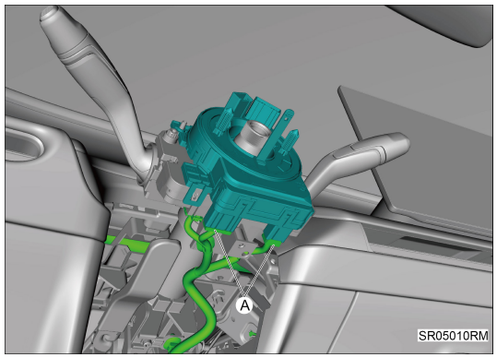
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove steering wheel (See page DP-45)**

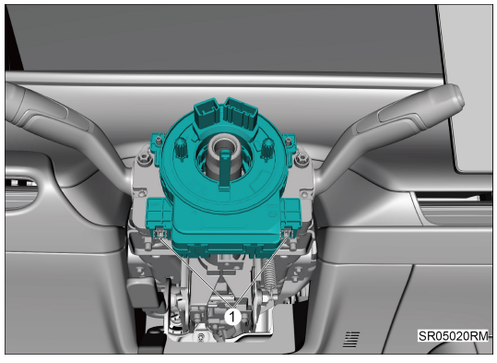
3. **Remove steering column cover (See page NS-19)**
4. **Remove spiral cable**

Note:

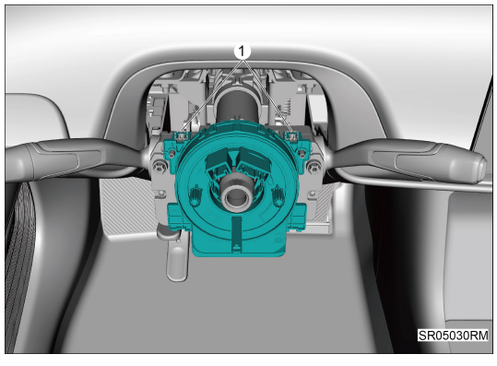
- Align wheels and mark the position with marker before removing spiral cable.



(a) Disconnect the spiral cable wire harness connector -A-.



(b) Detach the claw -1-.



(c) Detach the claw -1-.

Note:

Secure the spiral cable with paper tape to prevent movement and damage after removing it.

(d) Remove the spiral cable.

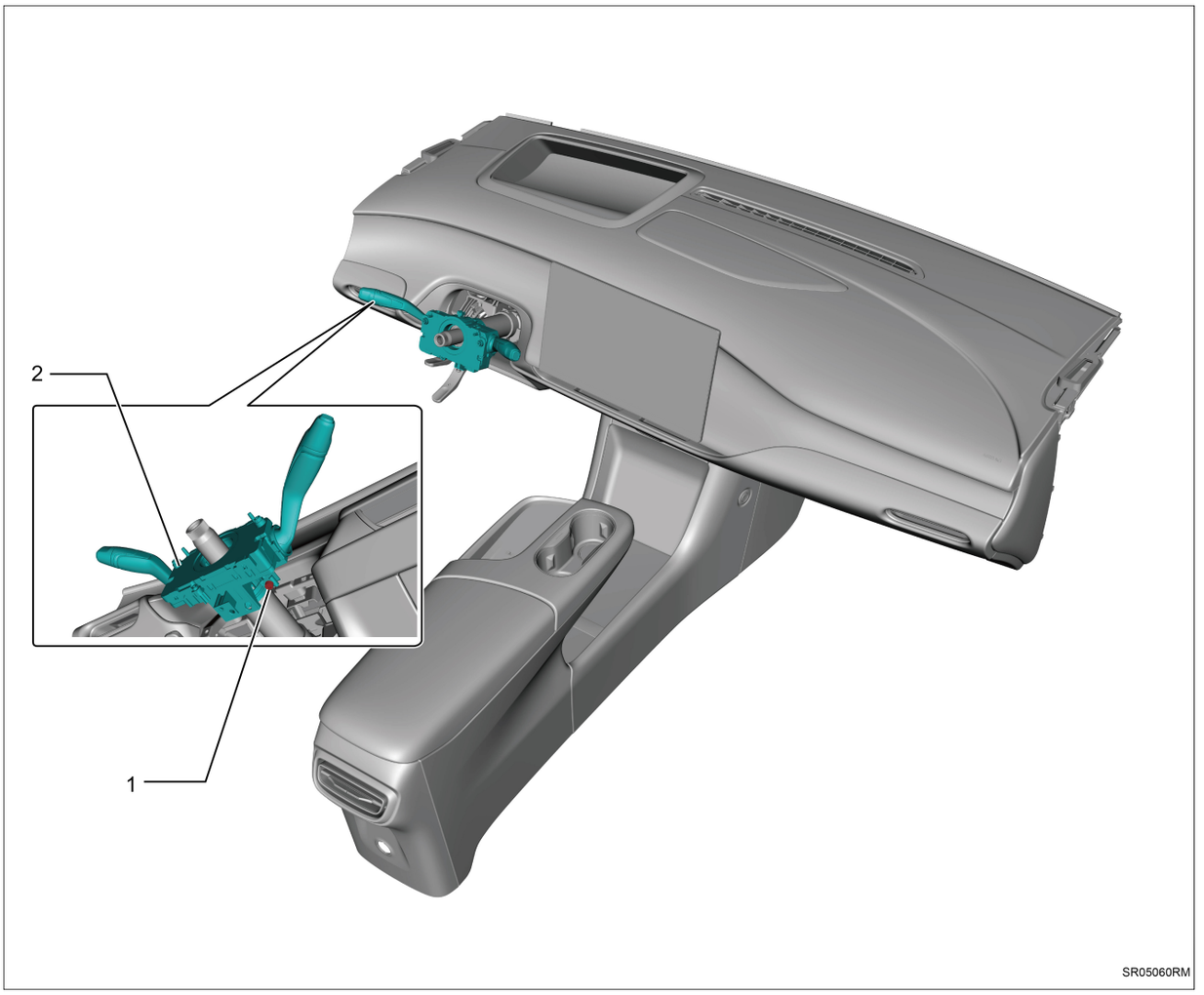
Installation

1. **Installation is in the reverse order of removal.**

ZC

Combination switch assembly

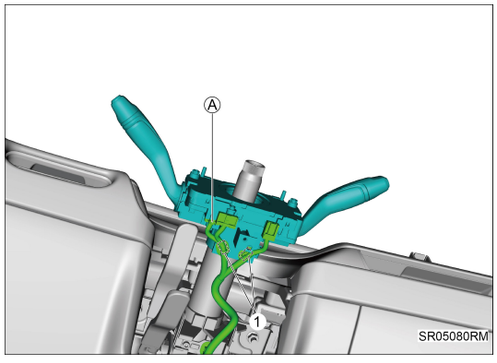
Components



1. **Inner hexagon bolt**
   - Torque: 4 ~ 5 N • m
2. **Combination switch**

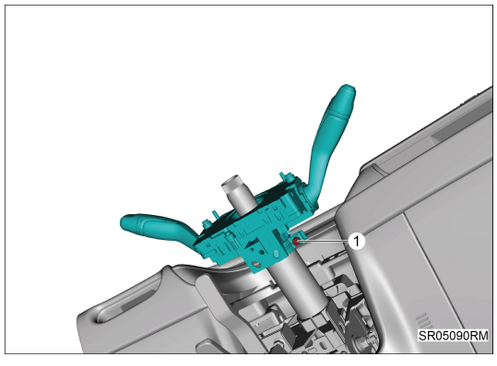
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove steering wheel (See page DP-45)**
3. **Remove steering column cover (See page NS-19)**
4. **Remove spiral cable (See page ZC-120)**
5. **Remove combination switch**



(a) Disconnect the wire harness connector -A-.

(b) Disengage the wire harness fixing clip -1-.



(c) Remove the bolt -1-.

Installation

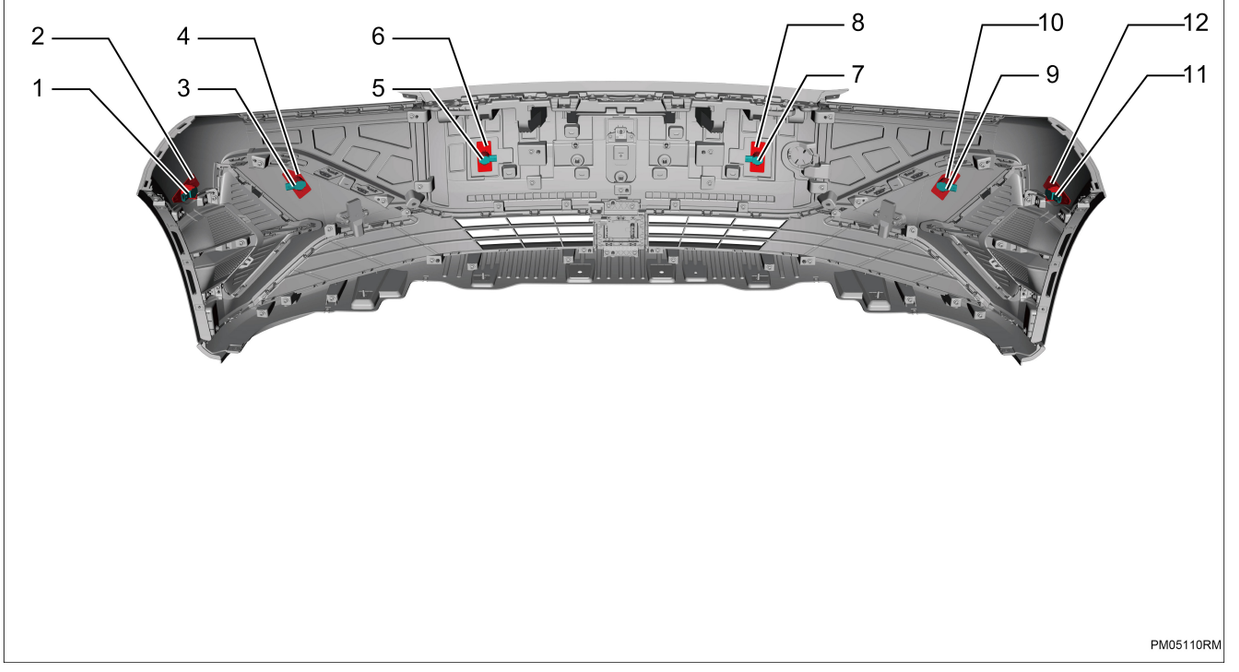
1. Installation is in the reverse order of removal.

Reversing radar control system

Front ultrasonic sensor

Components

ZC



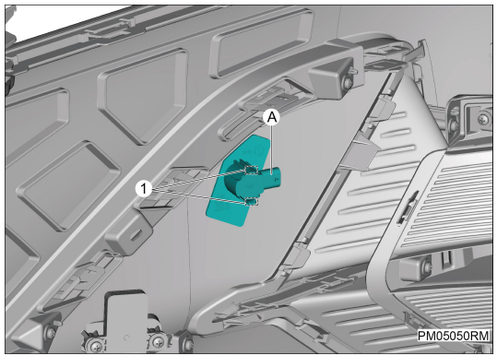
1. **Long distance narrow angle ultrasonic sensor assembly**
2. **Front left side ultrasonic sensor bracket**
3. **Long distance wide angle ultrasonic sensor assembly**
4. **Front left corner ultrasonic sensor bracket**
5. **Long distance wide angle ultrasonic sensor assembly**
6. **Front left center ultrasonic sensor bracket**
7. **Long distance wide angle ultrasonic sensor assembly**
8. **Front right center ultrasonic sensor bracket**
9. **Long distance wide angle ultrasonic sensor assembly**
10. **Front right corner ultrasonic sensor bracket**
11. **Long distance narrow angle ultrasonic sensor assembly**
12. **Front right side ultrasonic sensor bracket**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove front ultrasonic sensor**

Note:

- Use same removal orders for all front long distance ultrasonic sensor and ultrasonic sensor assemblies.



(a) Disconnect the wire harness connector.

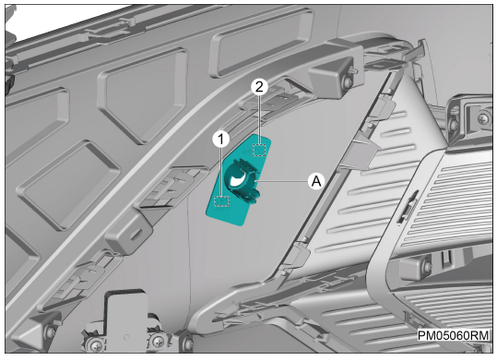
(b) Detach the claw -1-.

(c) Remove the ultrasonic sensor -A-.

4. **Remove bumper ultrasonic sensor bracket**

Note:

- Use same removal orders for all front bumper ultrasonic sensor brackets.



(a) Mark -1- at ultrasonic sensor bracket position.

(b) Mark -2- on ultrasonic sensor bracket installation direction.

(c) Carefully pry to remove ultrasonic sensor bracket -A-.

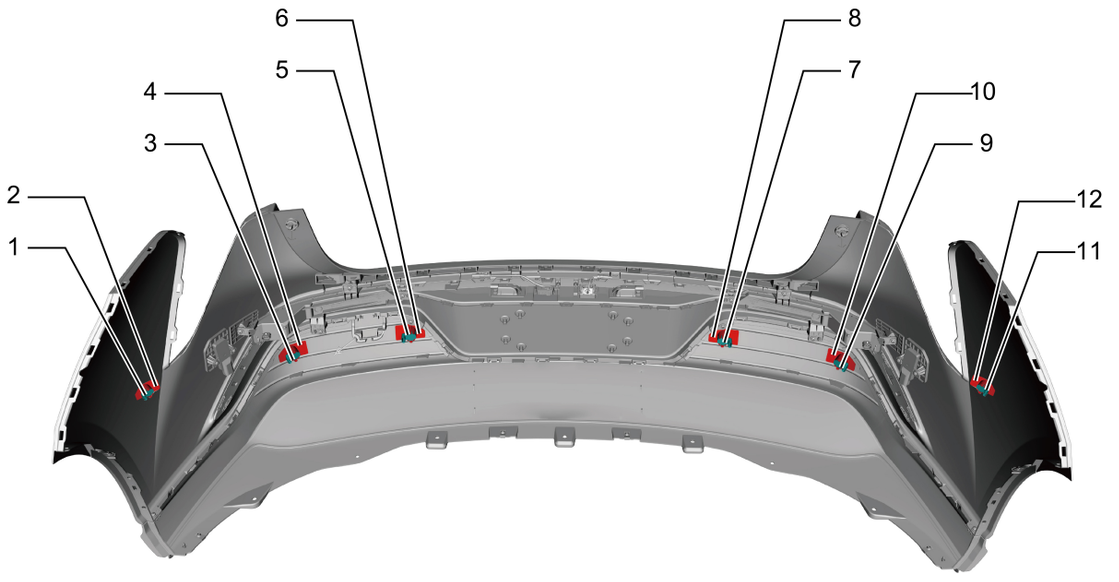
Installation

1. **Installation is in the reverse order of removal.**

ZC

Rear ultrasonic sensor

Components



PM05120RM

1. **Long distance narrow angle ultrasonic sensor assembly**
2. **Rear right side ultrasonic sensor bracket**
3. **Long distance ultrasonic sensor assembly (Z-direction)**
4. **Rear right corner ultrasonic sensor bracket**
5. **Long distance ultrasonic sensor assembly (Z-direction)**
6. **Rear right center ultrasonic sensor bracket**
7. **Long distance ultrasonic sensor assembly (Z-direction)**
8. **Rear left center ultrasonic sensor bracket**

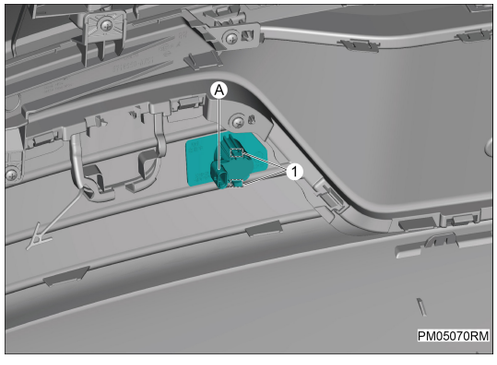
9. **Long distance ultrasonic sensor assembly (Z-direction)**
10. **Rear left corner ultrasonic sensor bracket**
11. **Long distance narrow angle ultrasonic sensor assembly**
12. **Rear left side ultrasonic sensor bracket**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear bumper assembly (See page WS-13)**
3. **Remove rear ultrasonic sensor**

Note:

- Use same removal orders for all rear long distance ultrasonic sensor and ultrasonic sensor assemblies.



(a) Disconnect the wire harness connector.

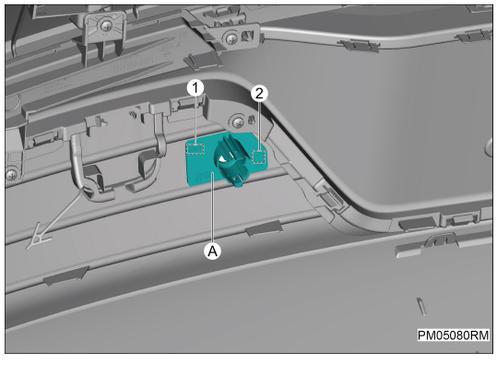
(b) Detach the claw -1-.

(c) Remove the ultrasonic sensor assembly -A-.

4. **Remove bumper ultrasonic sensor bracket**

Note:

- Use same removal orders for all rear bumper ultrasonic sensor brackets.



(a) Mark -1- at ultrasonic sensor bracket position.

(b) Mark -2- on ultrasonic sensor bracket installation direction.

(c) Carefully pry to remove ultrasonic sensor bracket -A-.

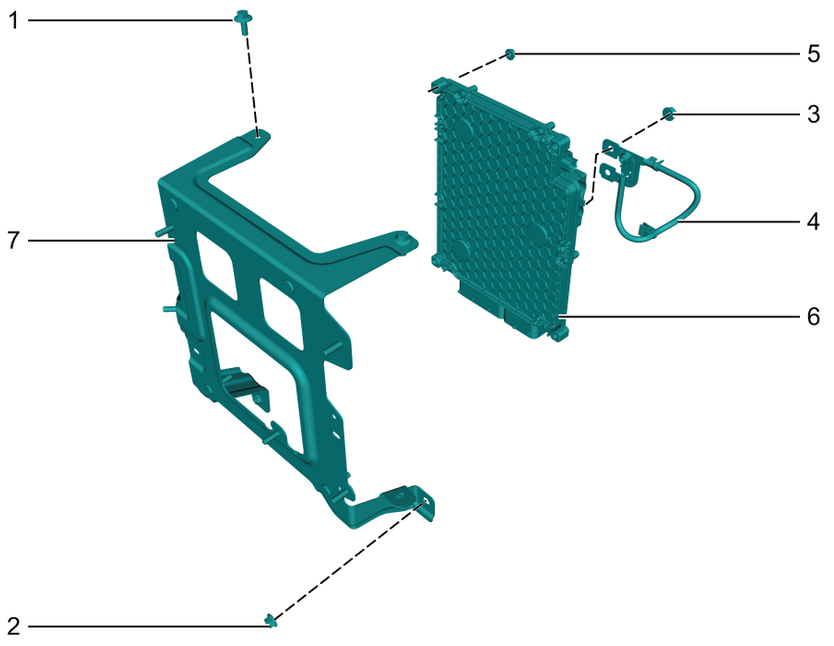
Installation

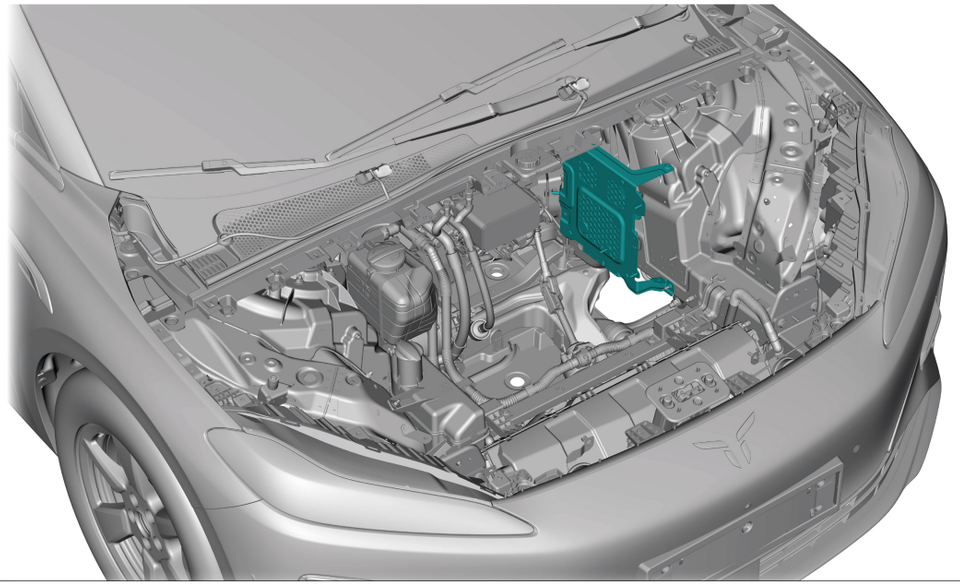
1. **Installation is in the reverse order of removal.**

Intelligent area control system

Intelligent area controller I assembly

Components





1. Bolt

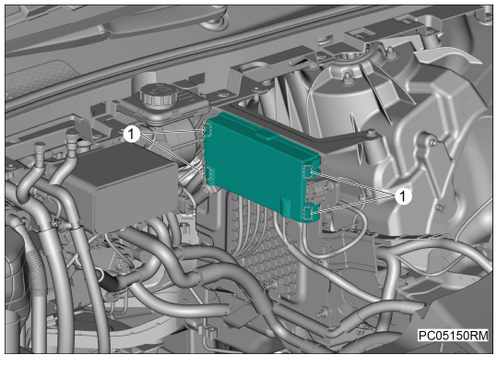
- X2

- Torque: 8 ~ 10 N • m

2. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
3. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
4. **Power supply wire harness assembly II**
5. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 10 N • m
6. **Intelligent area controller I assembly**
7. **Front PDC fixing bracket**

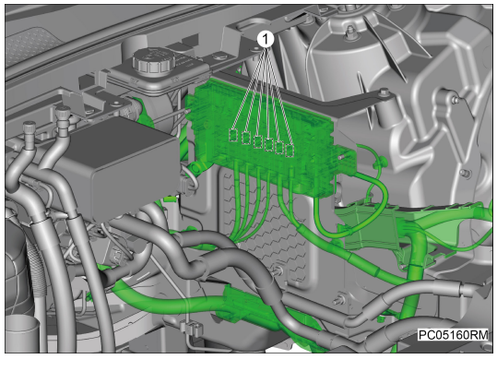
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front compartment storage box assembly (See page WS-83)**
3. **Remove transfer distribution box assembly**



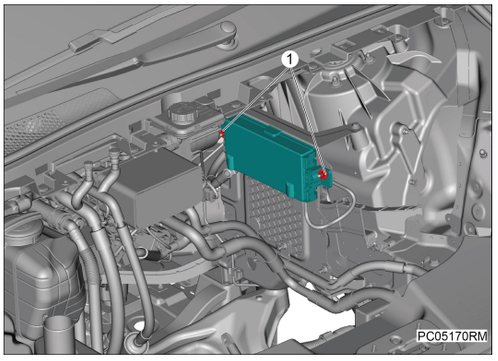
(a) Detach the claw -1-.

(b) Detach the transfer distribution box protective cover.



(c) Remove the nut -1-.

(d) Detach the wire harness connector terminals.

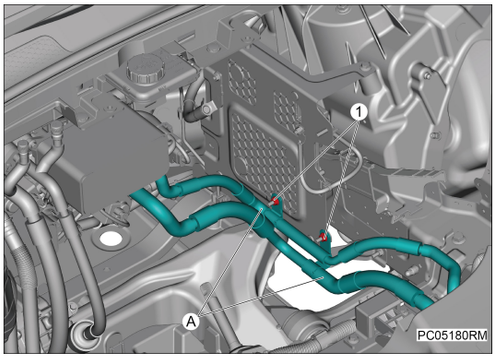


(e) Remove the nut -1-.

(f) Remove the transfer distribution box assembly.

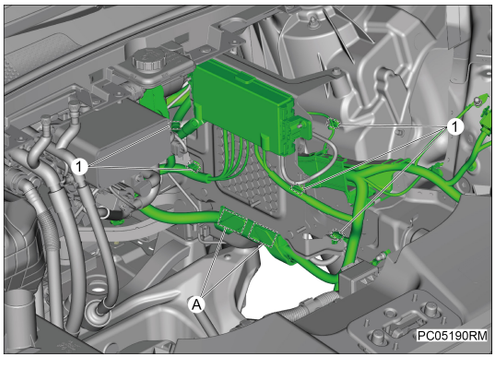
4. Remove water channel cover plate (See page WS-86)

5. Remove front PDC and fixing bracket



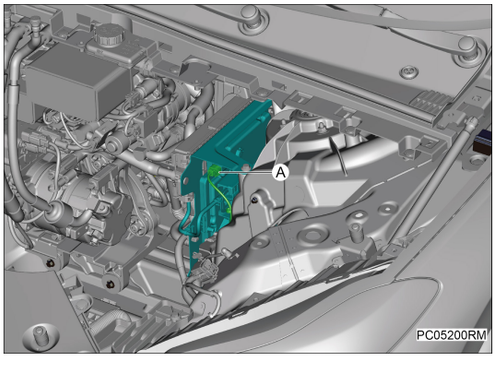
(a) Remove the nut -1-.

(b) Detach the hoses -A-.

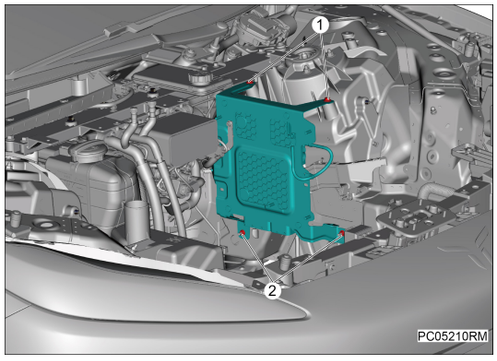


(c) Disengage the wire harness fixing clip -1-.

(d) Disconnect the wire harness connector -A-.



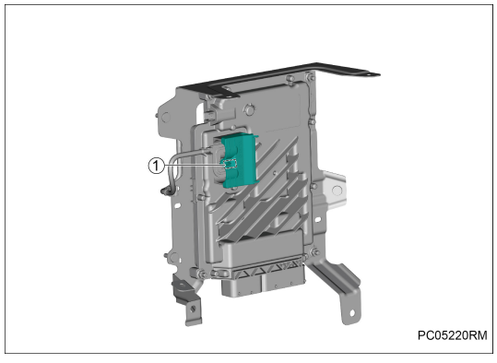
(e) Disconnect the wire harness connector -A-.



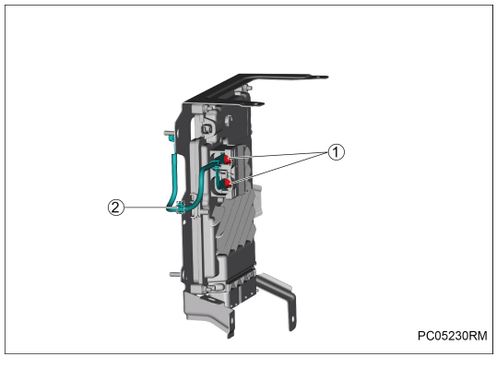
(f) Remove the bolt -1-.

(g) Remove the nut -2-.

6. Remove intelligent area controller I assembly



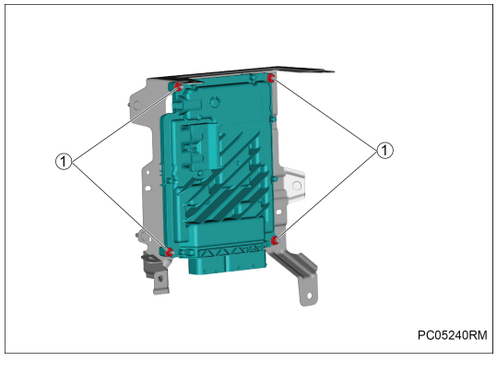
(a) Press the claw -1-, and open the terminal protective cover.



(b) Remove the nut -1-.

(c) Disengage the wire harness fixing clip -2-.

(d) Remove the power supply wire harness assembly II.



(e) Remove the nut -1-.

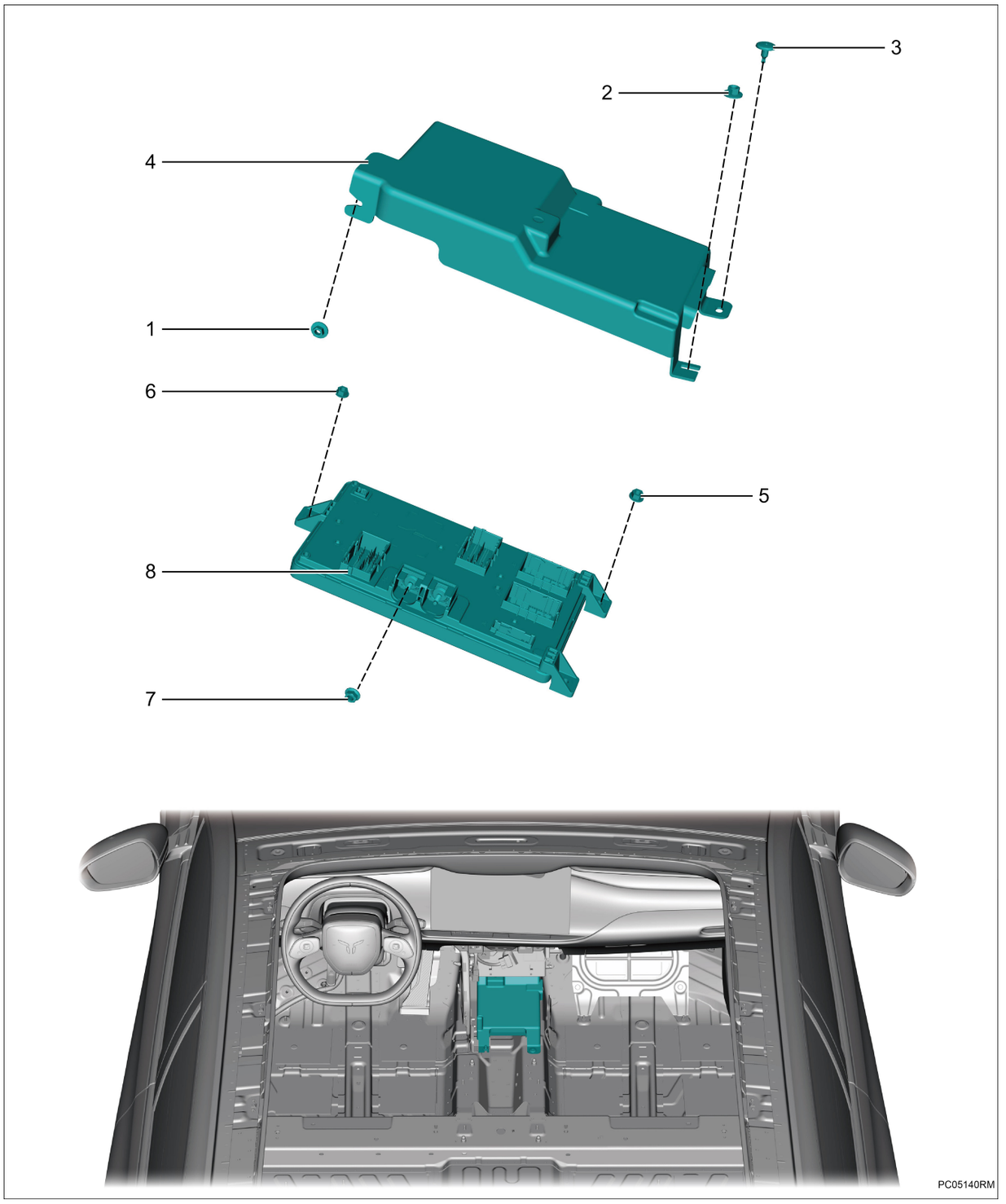
Installation

1. Installation is in the reverse order of removal.

ZC

Intelligent area controller II assembly

Components

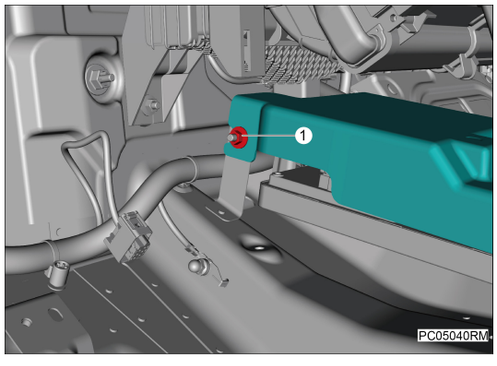


1. **Hexagon flange nut**
   - Torque: 7 ~ 9 N • m
2. **Hexagon flange nut**
   - Torque: 7 ~ 9 N • m

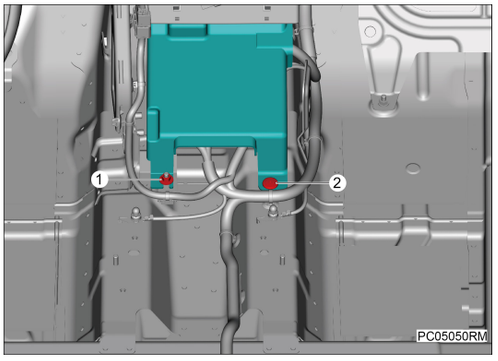
3. **Clip**
4. **Water baffle assembly**
5. **Hexagon flange nut**
   - X2
   - Torque: 7 ~ 9 N • m
6. **Hexagon flange nut**
   - Torque: 7 ~ 9 N • m
7. **Hexagon flange nut**
   - X2
   - Torque: 7 ~ 9 N • m
8. **Intelligent area controller II**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front seat assembly (See page NS-67)**
3. **Remove carpet assembly (See page NS-162)**
4. **Remove auxiliary fascia console assembly (See page NS-49)**
5. **Remove rear left foot duct (See page RE-47)**
6. **Remove rear right foot duct (See page RE-47)**
7. **Remove front part of rear cooling air duct assembly (See page RE-47)**
8. **Remove front part of rear foot duct assembly (See page RE-47)**
9. **Remove water baffle assembly**



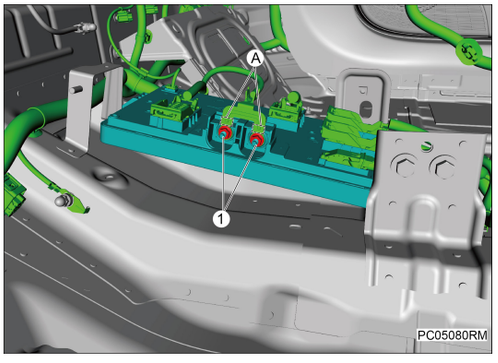
(a) Remove the nut -1-.



(b) Remove the nut -1-.

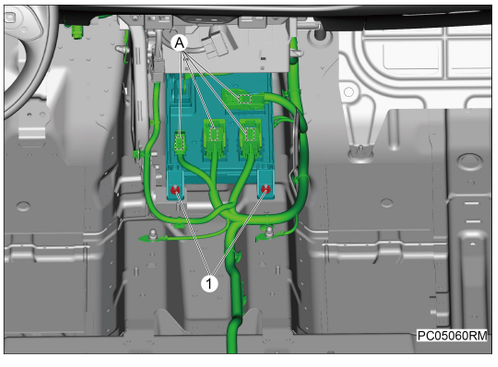
(c) Remove the clip -2-.

10. Remove intelligent area controller II assembly



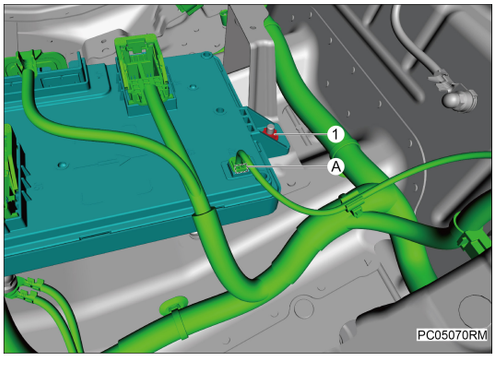
(a) Remove the nut -1-.

(b) Detach the wire harness terminal -A-.



(c) Remove the nut -1-.

(d) Disconnect the wire harness connector -A-.



(e) Remove the nut -1-.

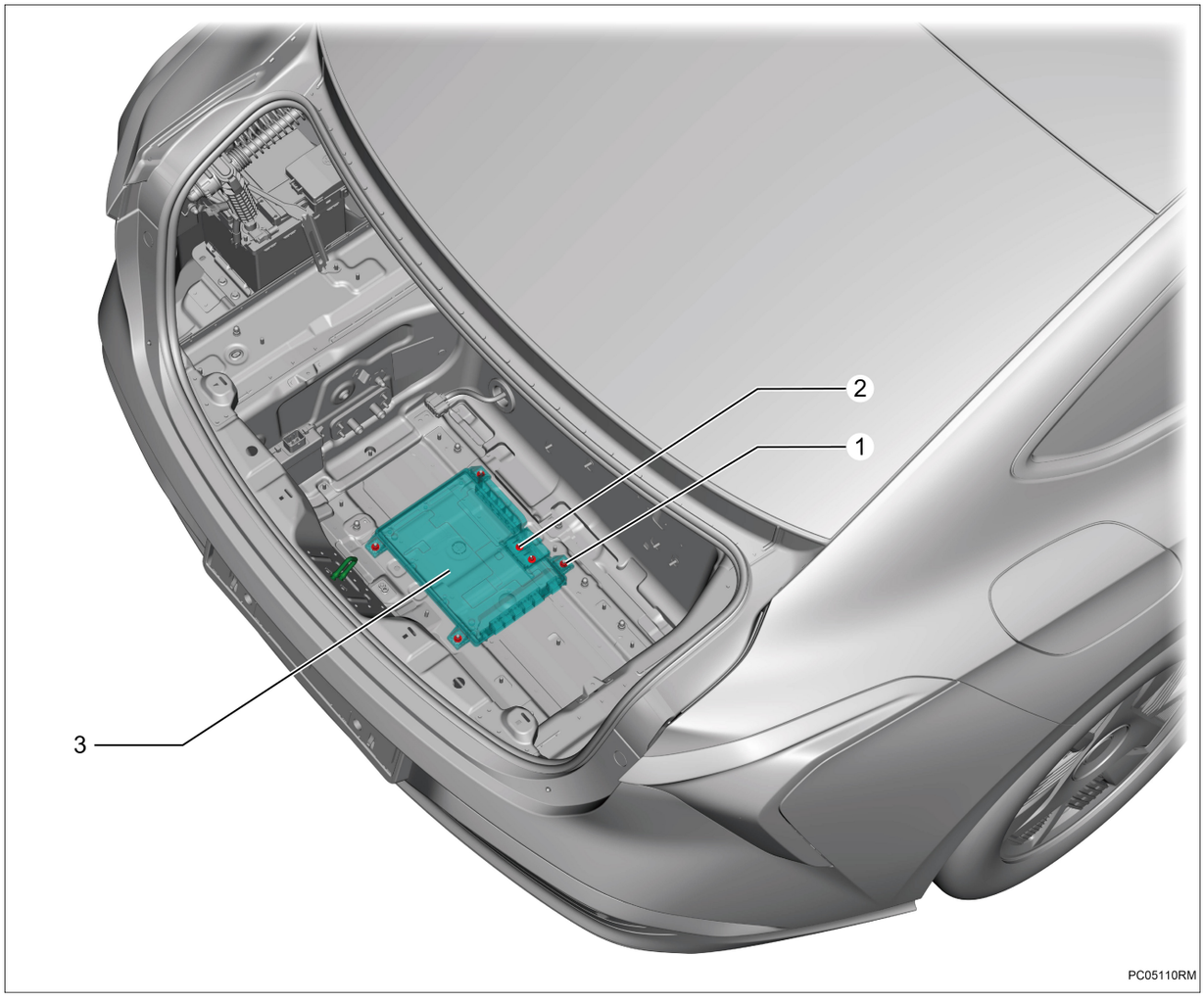
(f) Disconnect the wire harness connector -A-.

Installation

1. Installation is in the reverse order of removal.

Intelligent area controller III assembly

Components

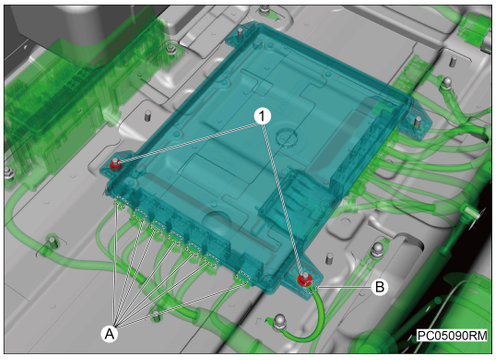


1. **Hexagon flange nut**
   - X4
   - Torque: 7 ~ 9 N • m
2. **Hexagon flange nut**
   - X2
   - Torque: 7 ~ 9 N • m
3. **Intelligent area controller III**

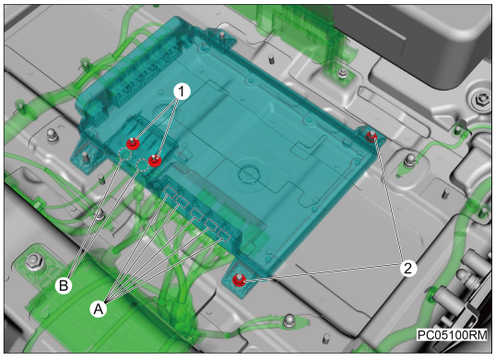
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove advanced automatic driving controller assembly (See page ZC-79)**

3. **Remove automatic driving controller bracket assembly (See page ZC-79)**
4. **Remove intelligent area controller III**



(a) Disconnect the wire harness connector -A-.
(b) Detach the ground wire terminal -B-.
(c) Remove the nut -1-.



(d) Disconnect the wire harness connector -A-.
(e) Remove the nut -1-.
(f) Detach the wire harness connector terminals -B-.
(g) Remove the nut -2-.
(h) Remove the intelligent area controller III.

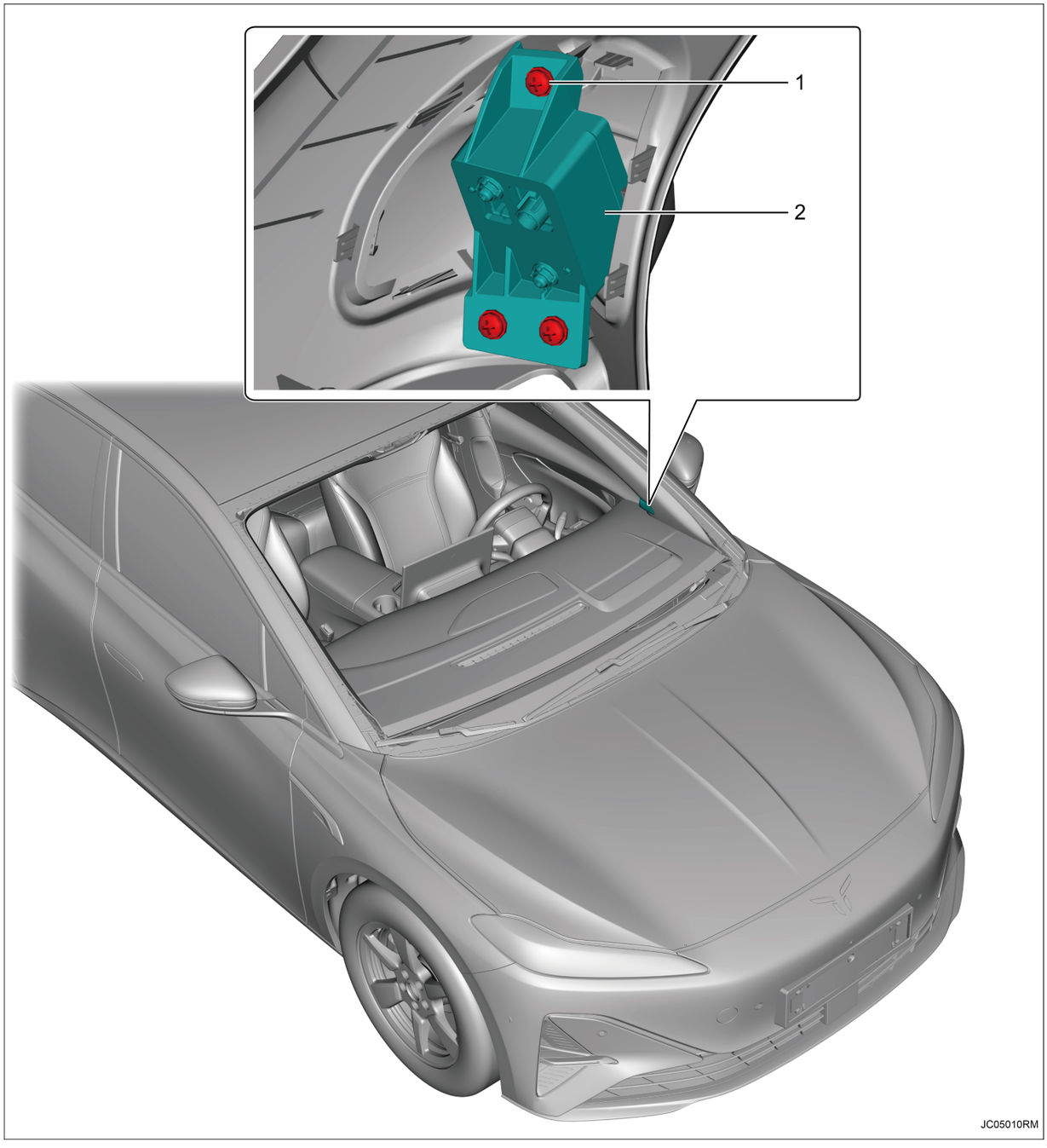
Installation

1. **Installation is in the reverse order of removal.**

Driver fatigue monitoring system

Driver status monitoring camera assembly

Components



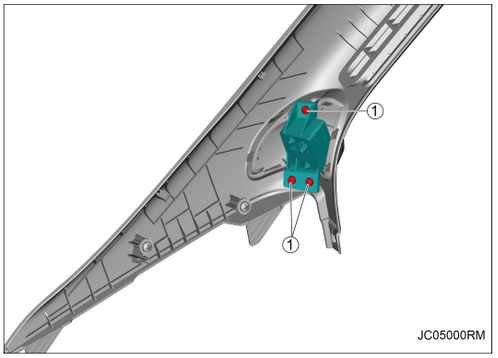
1. Screw

- X3

2. Driver status monitoring camera assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove A-pillar upper left protector (See page NS-130)**
3. **Remove left defroster duct (See page RE-47)**
4. **Remove driver status monitoring camera assembly**



(a) Remove the screw -1-.

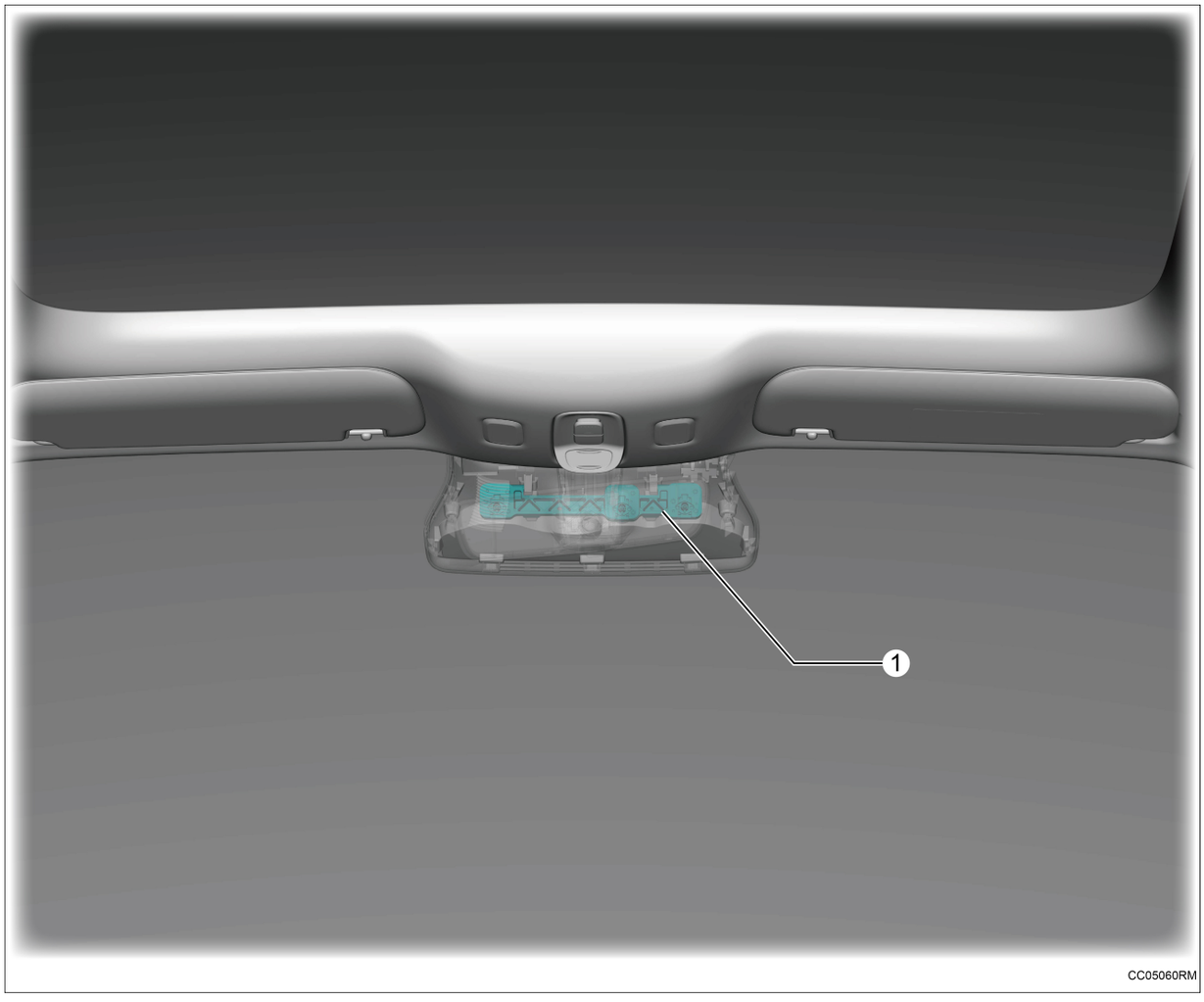
Installation

1. **Installation is in the reverse order of removal.**

Smart camera control system

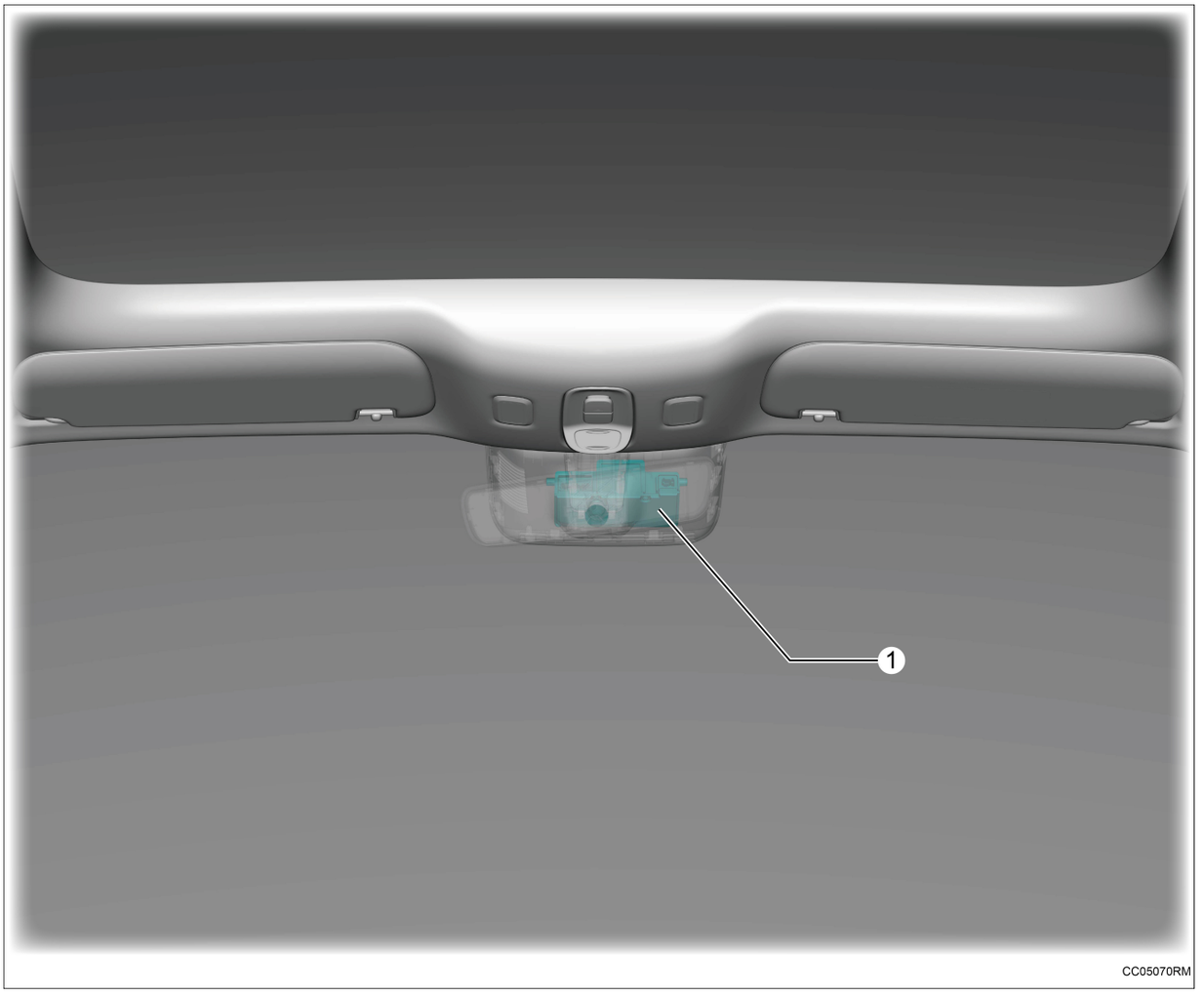
Front camera with bracket assembly

Components



1. Front camera with bracket assembly

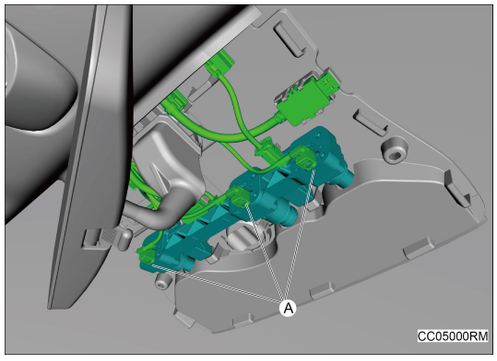
Components



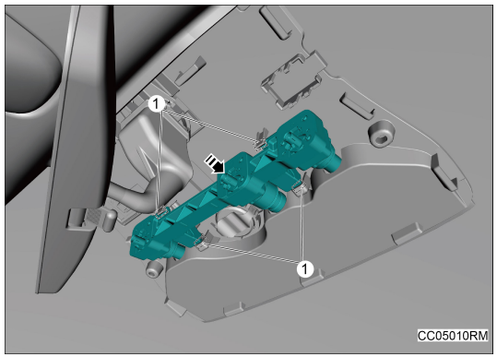
1. Front camera with bracket assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove inside rear view mirror trim cover II (See page NS-165)**
3. **Remove inside rear view mirror trim cover I (See page NS-165)**
4. **Remove front camera with bracket assembly (Asia)**



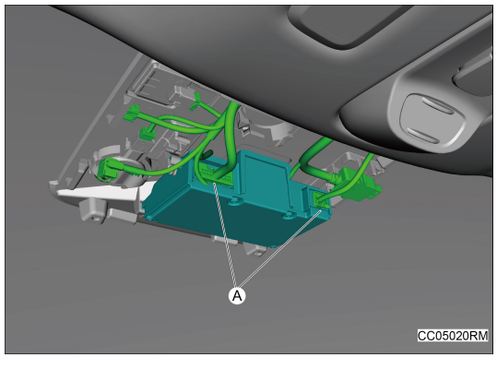
(a) Disconnect the wire harness connector -A-.



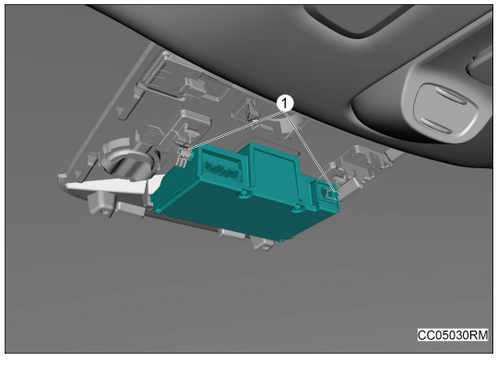
(b) Detach the claw -1-.

(c) Press firmly in direction of arrow.

5. Remove front camera with bracket assembly (Europe)



(a) Disconnect the wire harness connector -A-.



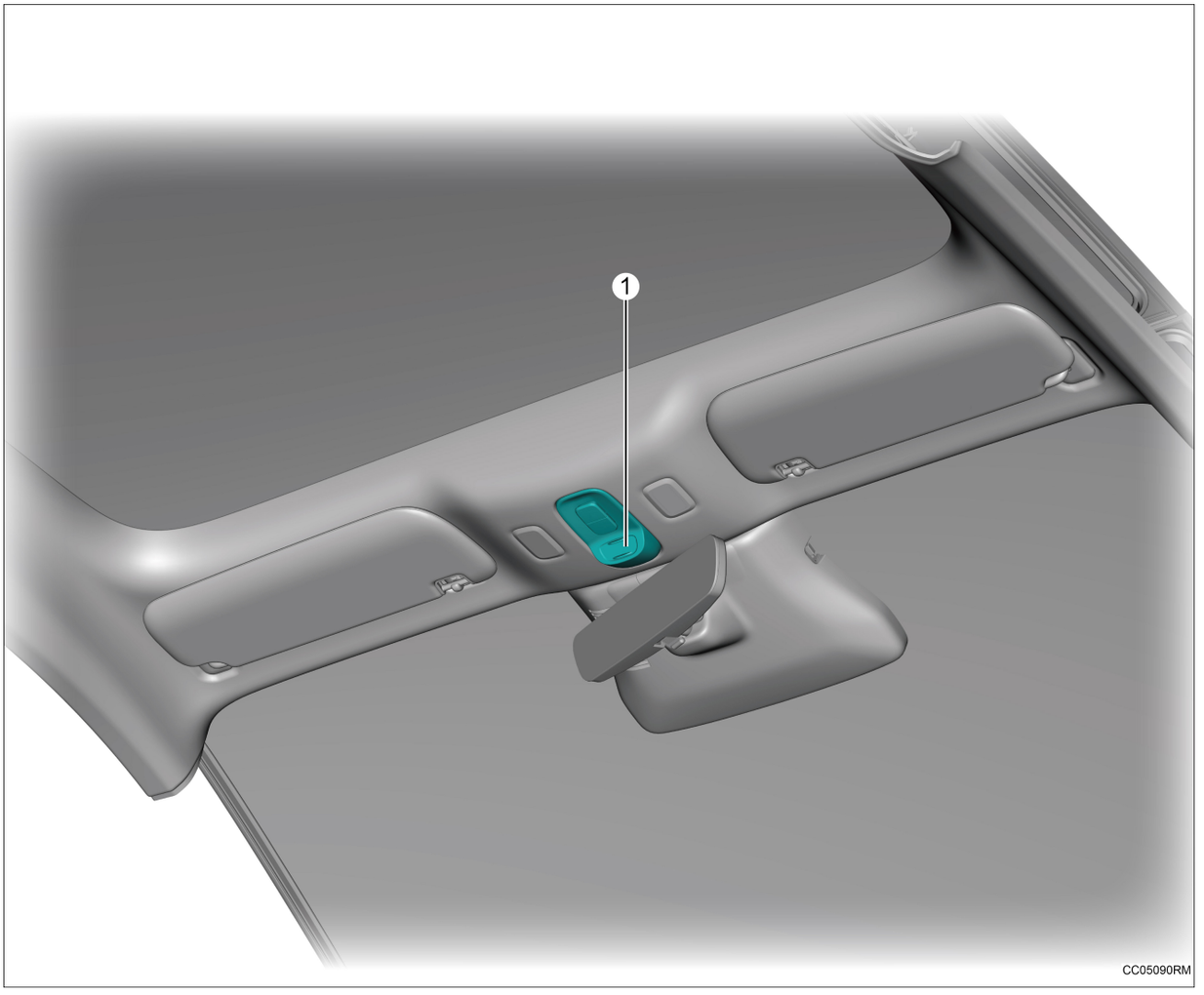
(b) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Interior monitoring camera protector assembly

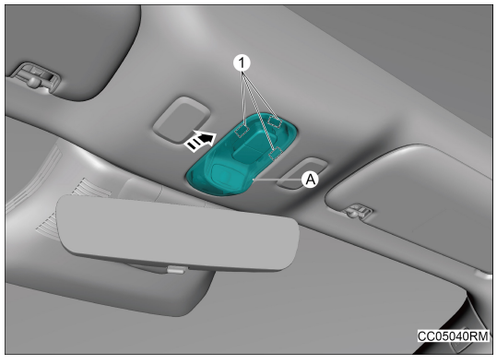
Components



1. **Interior monitoring camera protector assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove interior monitoring camera protector assembly**



(a) Detach the claw -1-.

(b) Remove the interior monitoring camera protective cover assembly -A- in the direction of -arrow-.

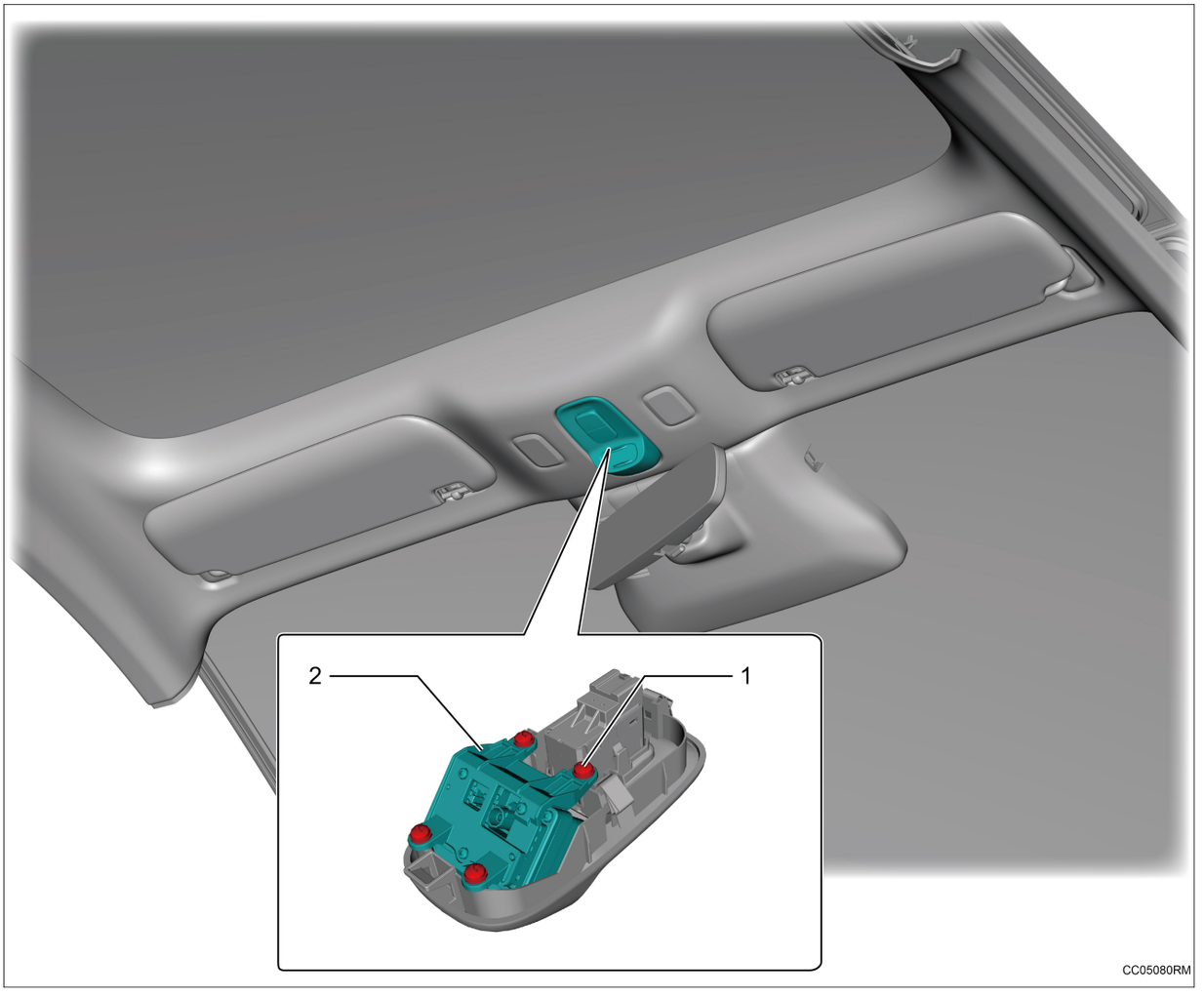
(c) Disconnect the wire harness connector.

Installation

1. Installation is in the reverse order of removal.

Intelligent interior monitoring front camera assembly

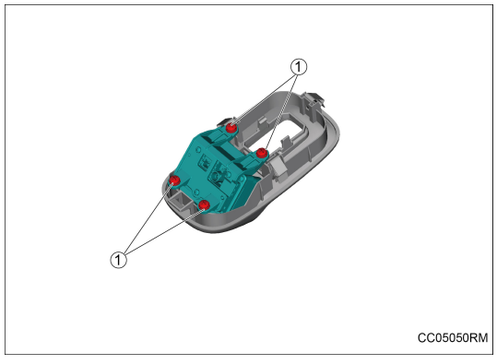
Components



1. **Cross recess pan head screw**
   - X4
2. **Intelligent interior monitoring front camera assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove interior monitoring camera protector assembly (See page ZC-142)**
3. **Remove intelligent interior monitoring front camera assembly**



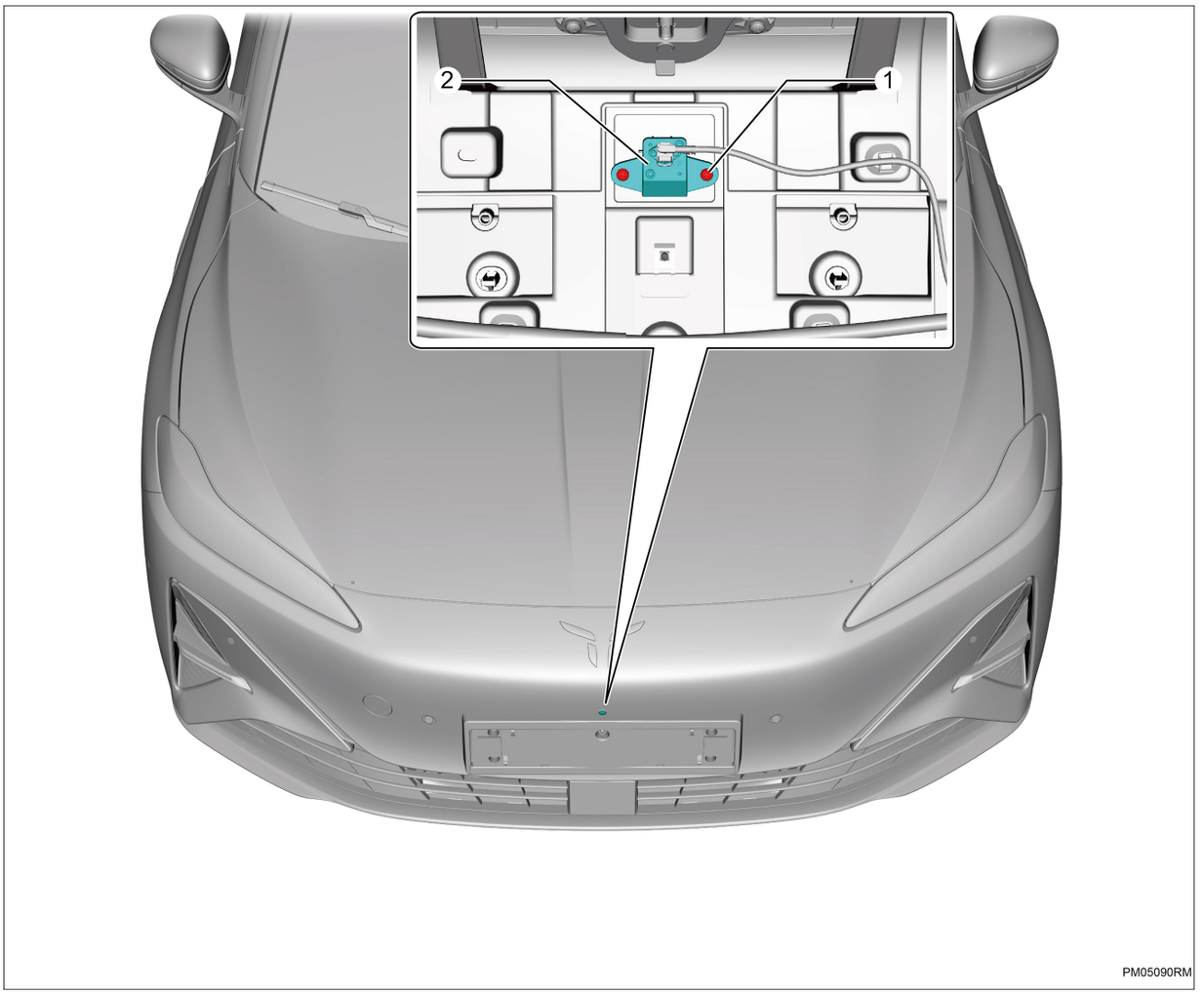
(a) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Front camera and bracket assembly

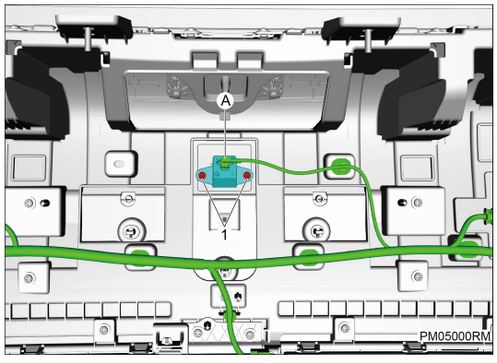
Components



1. **Screw**
   - X2
2. **Front camera and bracket assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-1)**
3. **Remove front camera and bracket assembly**



(a) Disconnect the front camera wire harness connector -A-.

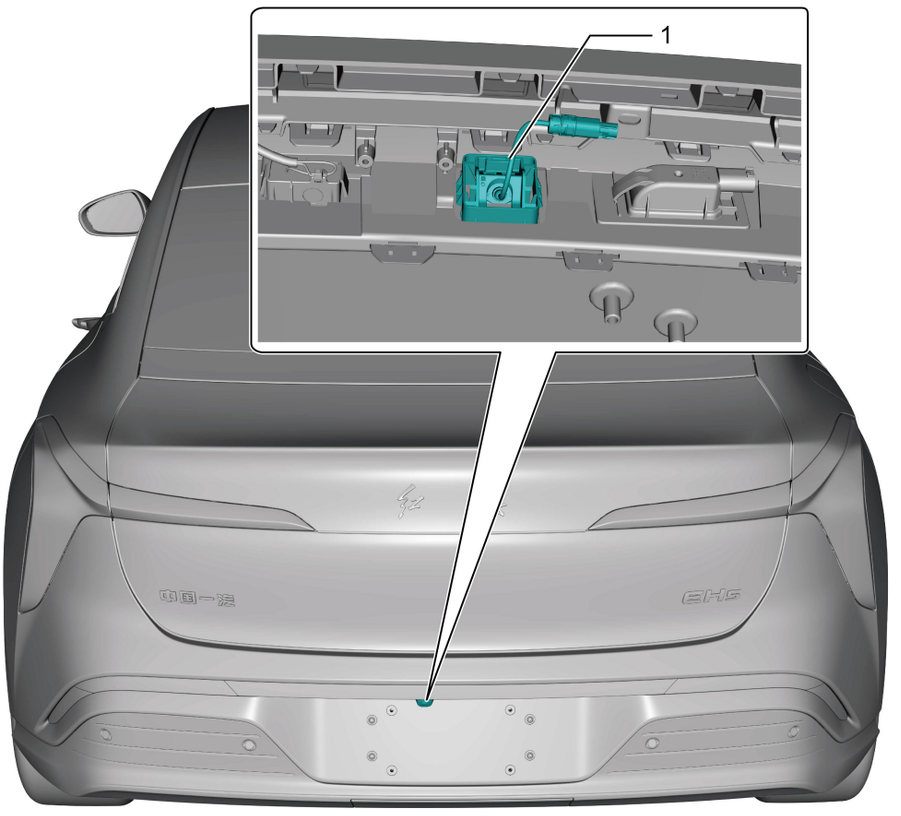
(b) Remove the screw -1-.

Installation

1. Installation is in the reverse order of removal.

Rear camera and bracket assembly

Components

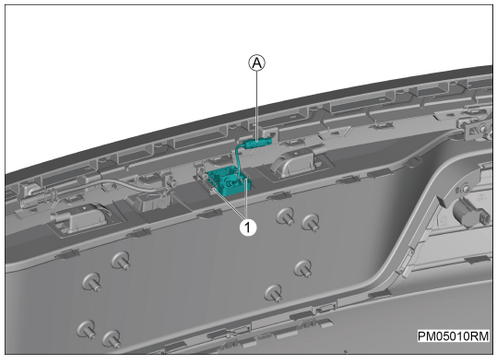


PM05100RM

1. Rear camera and bracket assembly

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove front bumper assembly (See page WS-13)**
3. **Remove rear camera and bracket assembly**



(a) Disconnect the wire harness connector -A-.

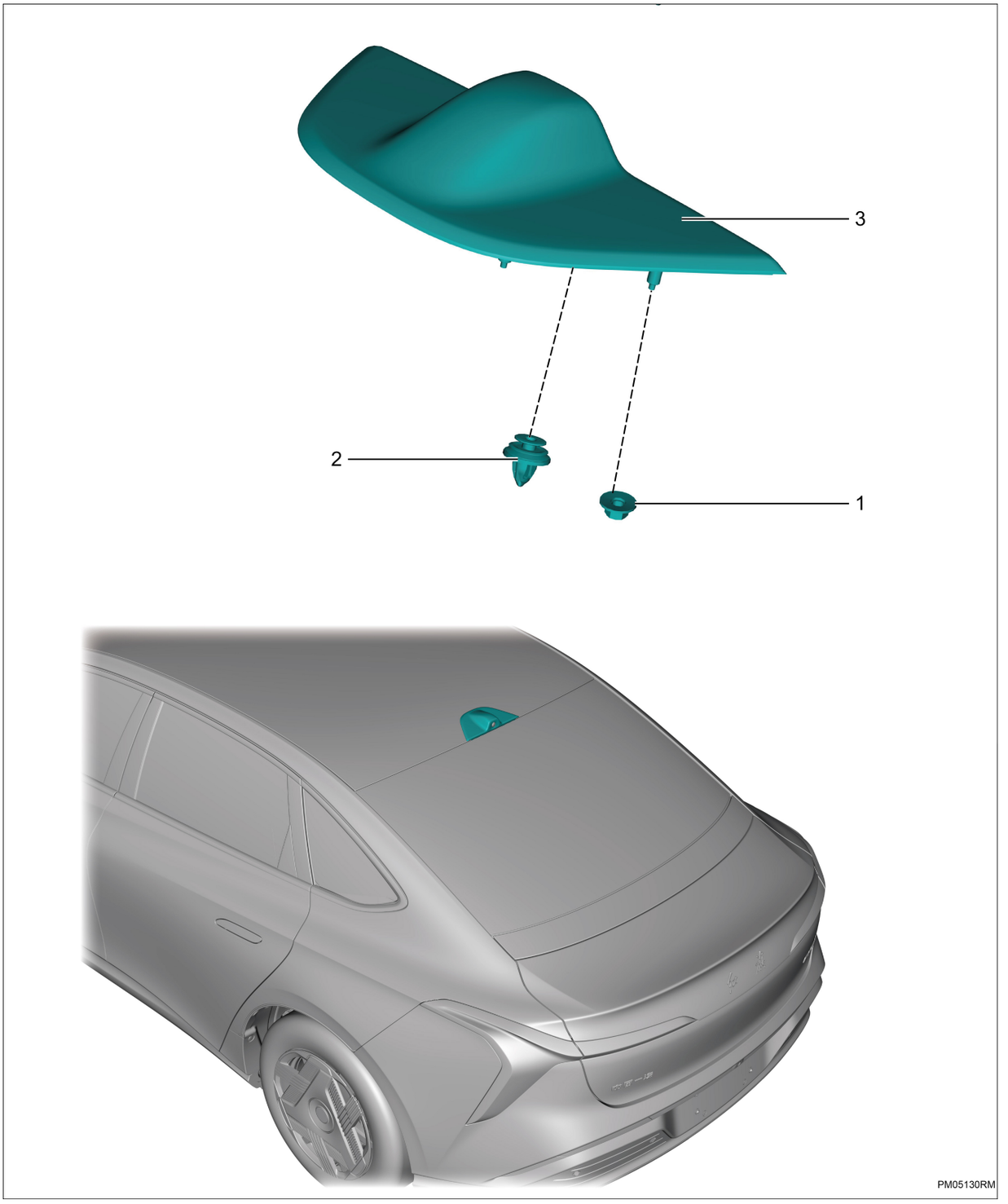
(b) Detach the claw -1-.

Installation

1. Installation is in the reverse order of removal.

Rear camera trim cover

Components

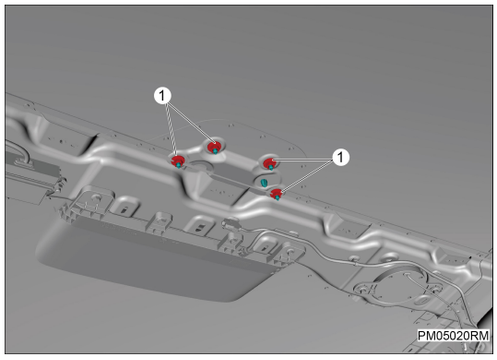


1. **Combination nut**
   - X4
   - Torque: 3 ~ 5 N • m
2. **Clip**

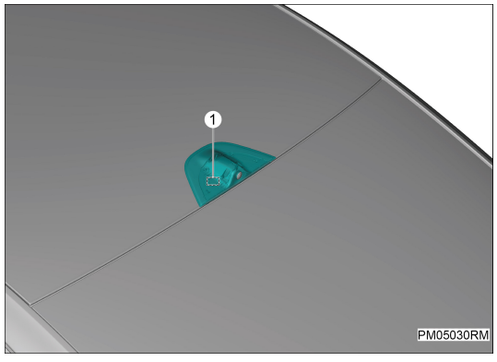
3. Rear camera trim cover

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove roof (See page NS-172)**
3. **Remove rear camera trim cover**



(a) Remove the nut -1-.



(b) Remove the clip -1-.

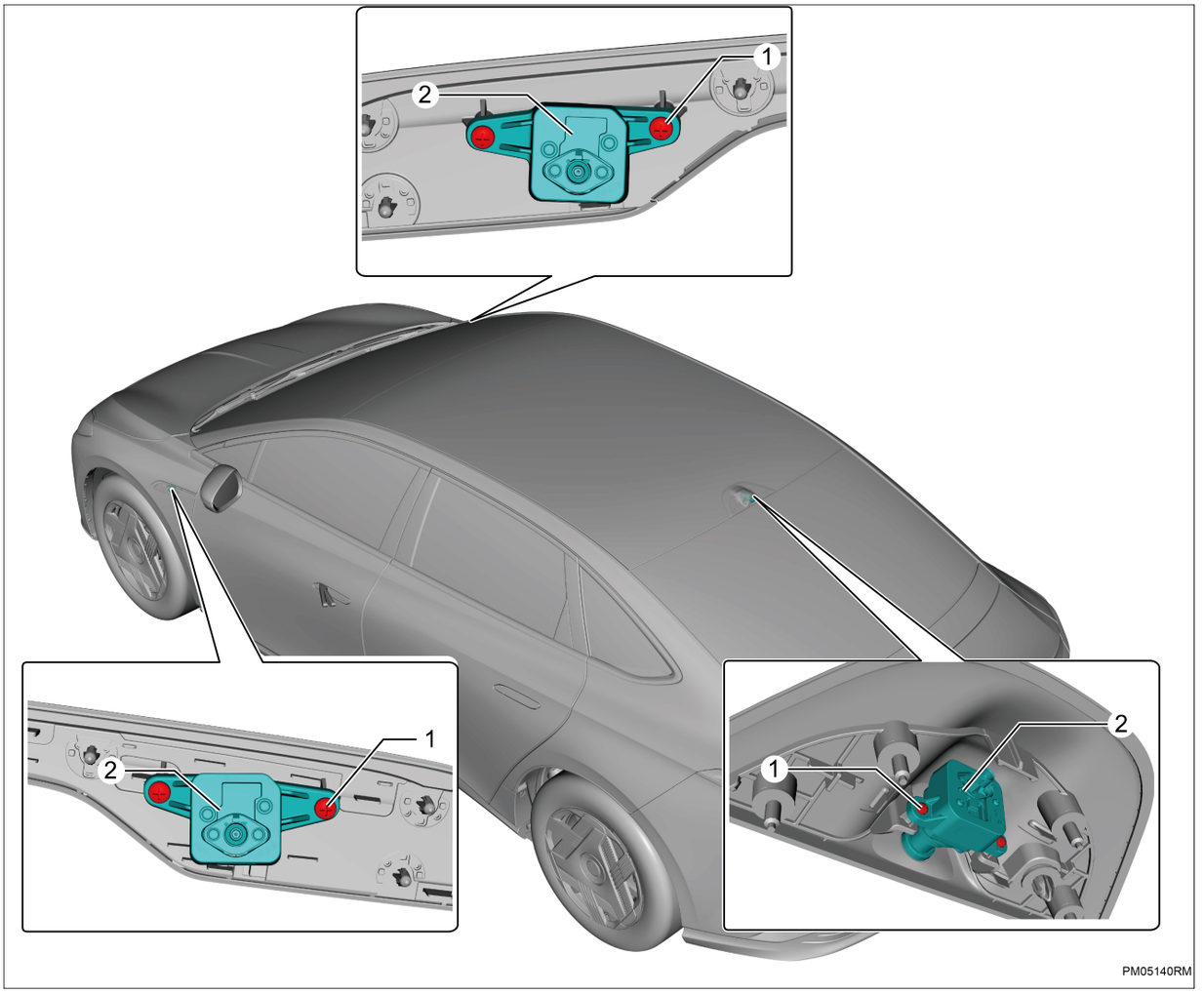
(c) Disconnect the wire harness connector.

Installation

1. **Installation is in the reverse order of removal.**

Rear camera assembly

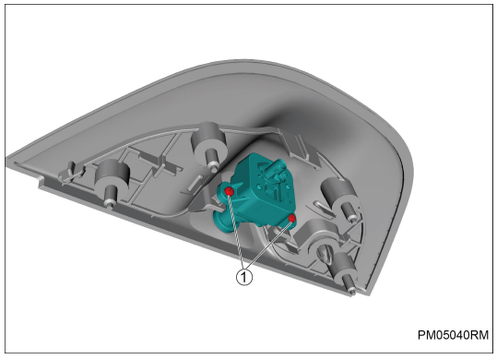
Components



1. **Cross recess pan head self-tapping screw**
   - X2
   - Torque: 0.7 ~ 1 N • m
2. **Rear camera assembly**
3. **Cross recess pan head self-tapping screw**
   - X2
   - Torque: 0.7 ~ 1 N • m
4. **Rear left side camera assembly**
5. **Cross recess pan head self-tapping screw**
   - X2
   - Torque: 0.7 ~ 1 N • m
6. **Rear right side camera assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear camera trim cover (See page ZC-150)**
3. **Remove rear camera assembly**

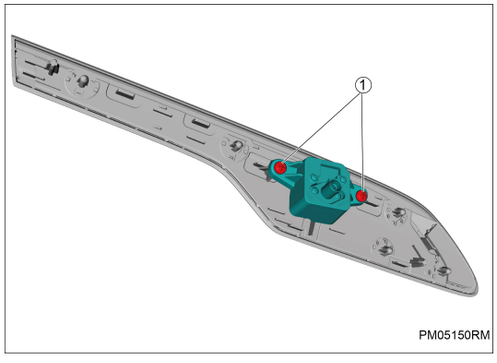


(a) Remove the screw -1-.

4. **Remove left rear camera side assembly**

Note:

- Use same removal orders for right and left sides.



(a) Remove the screw -1-.

Installation

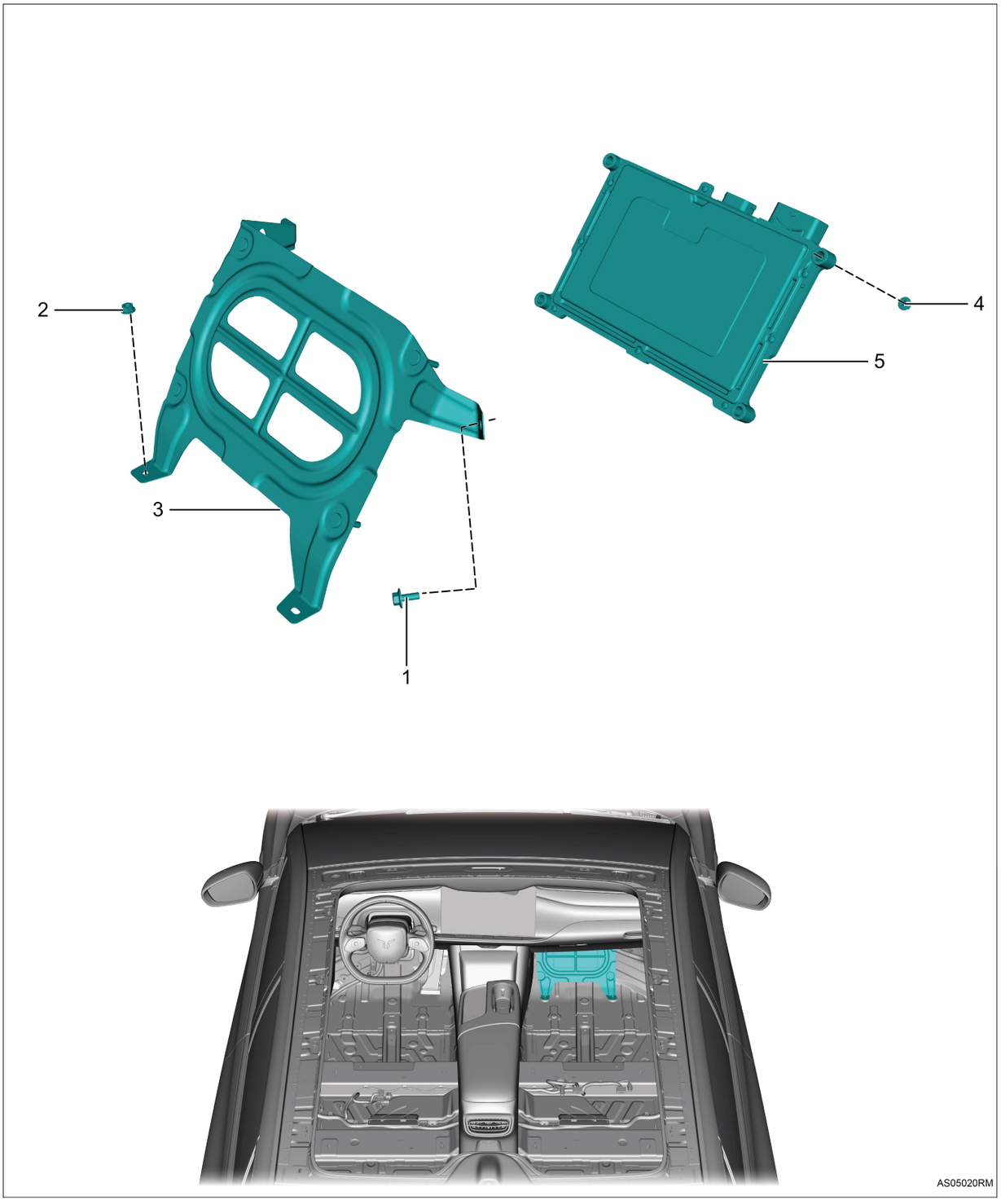
1. **Installation is in the reverse order of removal.**

Intelligent vehicle control platform control system

Intelligent vehicle control platform assembly

Components

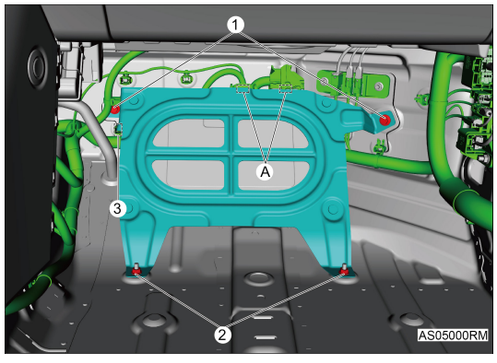
ZC



1. **Hexagon flange bolt**
   - X2
   - Torque: 8 ~ 10 N • m
2. **Hexagon flange nut**
   - X2
   - Torque: 8 ~ 10 N • m
3. **VDC fixing bracket**
4. **Hexagon flange nut**
   - X4
   - Torque: 8 ~ 12 N • m
5. **Intelligent vehicle control platform logic assembly**

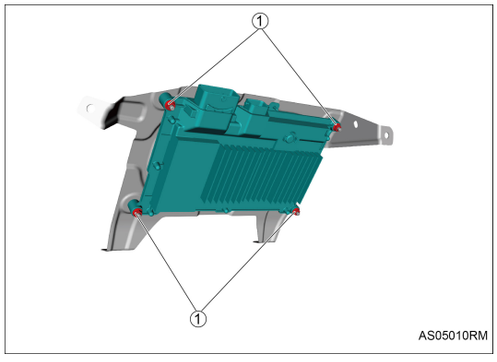
Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove carpet assembly (See page NS-162)**
3. **Remove VDC fixing bracket**



   (a) Remove the bolt -1-.
   (b) Remove the nut -2-.
   (c) Lift the VDC fixing bracket upwards.
   (d) Detach the wire harness fixing clip -3-.
   (e) Disconnect the wire harness connector -A-.

4. **Remove intelligent vehicle control platform assembly**



   (a) Remove the nut -1-.

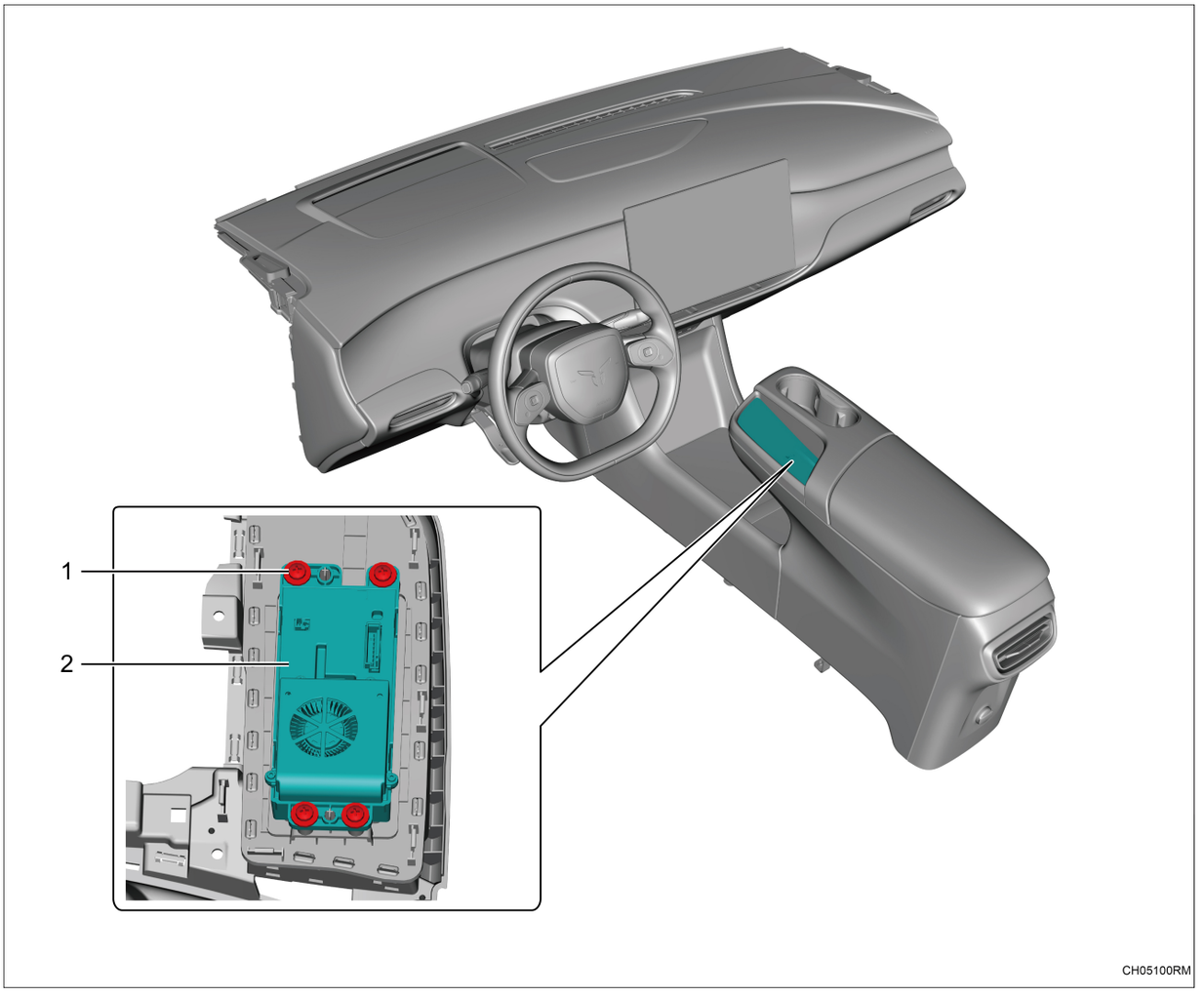
Installation

1. **Installation is in the reverse order of removal.**

Mobile phone wireless charging control system

Intelligent start-up wireless charger assembly

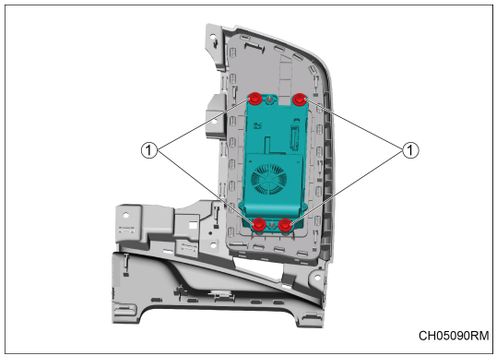
Components



1. **Screw**
   - X4
   - Torque: 2 ~ 3 N • m
2. **Intelligent start-up wireless charger assembly**

Removal

1. **Disconnect negative battery terminal (See page DL-21)**
2. **Remove rear upper cover plate assembly (See page NS-49)**



3. **Remove trim panel assembly (See page NS-49)**
4. **Remove smart starting wireless charger assembly**
   (a) Remove the bolt -1-.

Installation

1. **Installation is in the reverse order of removal.**

DTC

Intelligent area control system

Front intelligent area control unit ZD-1
B201E90 ..... ZD-29
B203111 ..... ZD-35
B203112 ..... ZD-35
B203211 ..... ZD-38
B203311 ..... ZD-42
B203312 ..... ZD-42
B203411 ..... ZD-46
B203412 ..... ZD-46
B203811 ..... ZD-51
B204311 ..... ZD-55
B204312 ..... ZD-55
B204313 ..... ZD-55
B204511 ..... ZD-60
B204512 ..... ZD-60
B204513 ..... ZD-60
B205A00 ..... ZD-66
B205B00 ..... ZD-66
B205C00 ..... ZD-66
B205D00 ..... ZD-66
B205E00 ..... ZD-66
B205F00 ..... ZD-66
B206000 ..... ZD-66
B206100 ..... ZD-66
B206200 ..... ZD-66
B206300 ..... ZD-73
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B206F00 ..... ZD-80
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B208A00 ..... ZD-103
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B209200 ..... ZD-111
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B209500 ..... ZD-112
B209600 ..... ZD-112
B209700 ..... ZD-112
B209800 ..... ZD-112
B209900 ..... ZD-120
B209A00 ..... ZD-120
B209B00 ..... ZD-120
B209C00 ..... ZD-120
B209D00 ..... ZD-120
B209E00 ..... ZD-121
B209F00 ..... ZD-121
B20A000 ..... ZD-121
B20A100 ..... ZD-121
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B20A300 ..... ZD-128
B20A400 ..... ZD-128
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B20C100 ..... ZD-151
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B20C500 ..... ZD-151
C207410 ..... ZD-158
C207510 ..... ZD-158
C207610 ..... ZD-158
C210046 ..... ZD-163
C210047 ..... ZD-163
C210A17 ..... ZD-167
C211117 ..... ZD-167
P300190 ..... ZD-168
P300290 ..... ZD-169
P300390 ..... ZD-170
P300490 ..... ZD-171
P300590 ..... ZD-171
P300690 ..... ZD-173
P300790 ..... ZD-174
P300890 ..... ZD-175
P300990 ..... ZD-177
P300A90 ..... ZD-178

P300B90 ..... ZD-179
P300C90 ..... ZD-183
P300D90 ..... ZD-183
P300E90 ..... ZD-183
P300F90 ..... ZD-183
P301090 ..... ZD-183
P301190 ..... ZD-191
P301290 ..... ZD-191
P301390 ..... ZD-191
P301490 ..... ZD-191
P301590 ..... ZD-191
P306E11 ..... ZD-191
P301690 ..... ZD-198
P301790 ..... ZD-198
P301890 ..... ZD-198
P301990 ..... ZD-198
P301A90 ..... ZD-198
P306F11 ..... ZD-198
P301B90 ..... ZD-205
P301C90 ..... ZD-205
P301D90 ..... ZD-205
P301E90 ..... ZD-205
P301F90 ..... ZD-205
P307011 ..... ZD-205
P302090 ..... ZD-213
P302190 ..... ZD-213
P302290 ..... ZD-213
P302390 ..... ZD-213
P302490 ..... ZD-220
P302590 ..... ZD-220
P302690 ..... ZD-220
P302790 ..... ZD-220
P302890 ..... ZD-227
P302990 ..... ZD-227
P302A90 ..... ZD-227
P302B90 ..... ZD-227
P305E13 ..... ZD-234
P305E11 ..... ZD-234
P305E12 ..... ZD-234
P305E19 ..... ZD-234
P302F90 ..... ZD-241
P303090 ..... ZD-241
P303190 ..... ZD-241
P305E1A ZD-241
P305E1B ZD-241
P305E1C ZD-242
P305F13 ..... ZD-242
P305F19 ..... ZD-248

P305F1A ZD-248
P305F1B ZD-248
P305F1C ZD-248
P303890 ..... ZD-254
P303990 ..... ZD-254
P303A90 ..... ZD-254
P303B90 ..... ZD-254
P303C90 ..... ZD-254
P303D90 ..... ZD-254
P306811 ..... ZD-255
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P307A11 ..... ZD-262
P305811 ..... ZD-266
P307B11 ..... ZD-266
P305911 ..... ZD-270
P307C11 ..... ZD-270
P305A11 ..... ZD-274
B205211 ..... ZD-274
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P307E11 ..... ZD-279
P305C13 ..... ZD-283
P305C11 ..... ZD-283
P305C12 ..... ZD-283
P305C19 ..... ZD-283
P305C1A ZD-283
P305C1B ZD-283
P305C1C ZD-284
P305D13 ..... ZD-290
P305D11 ..... ZD-290
P305D12 ..... ZD-290
P305D19 ..... ZD-290
P305D1A ZD-290
P305D1B ZD-290
P305D1C ZD-290
P305F11 ..... ZD-297
P305F12 ..... ZD-297
P306011 ..... ZD-301
P306012 ..... ZD-301
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Middle intelligent area control unit ZD-450
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U008188 ZD-750
U008988 ZD-756
U009288 ZD-761
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U014887 ZD-766
U014B87 ZD-766
U014A87 ZD-766
U02DB87 ZD-766
U011C87 ZD-766
U020887 ZD-766
U021187 ZD-766
U015187 ZD-766
U024887 ZD-766
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Rear intelligent area control unit. ZD-783
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C251900 ZD-808
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C251B00 ZD-808
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B240C90 ZD-814
B240D90 ZD-814
B240E90 ZD-814
B240F90 ZD-814
B241090 ZD-815
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C242990 ZD-817
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U02BE87 ..... ZD-1016
U029A87 ..... ZD-1016
U015387 ..... ZD-1016
U014B87 ..... ZD-1016
U014A87 ..... ZD-1016
U014C87 ..... ZD-1016
U014687 ..... ZD-1016
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U014F87 ..... ZD-1016
U014787 ..... ZD-1016
U02A487 ..... ZD-1016
U014697 ..... ZD-1016
U224287 ..... ZD-1024
U224387 ..... ZD-1024
U146E8A ZD-1024

Intelligent vehicle control platform control system

Intelligent vehicle control platform control unit ZD-1029
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B175D71 ..... ZD-1042
B175E71 ..... ZD-1042
B175F71 ..... ZD-1042
B176071 ..... ZD-1042
B152000 ..... ZD-1043
B170000 ..... ZD-1044
B170100 ..... ZD-1045
B175800 ..... ZD-1047
B175900 ..... ZD-1048
B176171 ..... ZD-1049
B176271 ..... ZD-1049
B176371 ..... ZD-1049
B176471 ..... ZD-1049
P1B0F11 ..... ZD-1051
P1B1011 ..... ZD-1051
P1B1B4B ZD-1053
P1B1C4B ZD-1063
P1B1D01 ..... ZD-1073
P1B1D16 ..... ZD-1073
P1B1D17 ..... ZD-1073
P1B1D1C ZD-1073
P1B391D ZD-1073
B173201 ..... ZD-1073
B173317 ..... ZD-1073
B173316 ..... ZD-1073
B17331C ZD-1073

B17351C ZD-1073
P1B7C00 ..... ZD-1074
P1B1E17 ..... ZD-1079
P1B1E16 ..... ZD-1079
P1B1F17 ..... ZD-1079
P1B1F16 ..... ZD-1079
P1B2017 ..... ZD-1079
P1B2016 ..... ZD-1079
P1B2117 ..... ZD-1079
P1B2116 ..... ZD-1080
P1B2B00 ..... ZD-1087
P1B2F29 ..... ZD-1089
P1B2200 ..... ZD-1092
P1B3A42 ..... ZD-1092
P1B3B00 ..... ZD-1092
B173542 ..... ZD-1092
B173600 ..... ZD-1092
B173700 ..... ZD-1092
B174000 ..... ZD-1092
B174186 ..... ZD-1092
B174D00 ..... ZD-1092
B174E00 ..... ZD-1092
B174F00 ..... ZD-1092
B150900 ..... ZD-1092
B150A00 ..... ZD-1092
B150E00 ..... ZD-1092
B150F86 ..... ZD-1092
P1B4700 ..... ZD-1093
P1B4800 ..... ZD-1093
P1B4900 ..... ZD-1093
P1B7D00 ..... ZD-1093
P1B7E00 ..... ZD-1093
P1B7F00 ..... ZD-1093
P1B0200 ..... ZD-1097
P1B0300 ..... ZD-1097
P1B057E ZD-1097
P1B057F ZD-1097
P1B384B ZD-1102
B17344B ZD-1102
B15074B ZD-1102
P1B1100 ..... ZD-1103
P1B1200 ..... ZD-1103
P1B1400 ..... ZD-1103
P1B2729 ..... ZD-1103
P1B2829 ..... ZD-1103
P1B2A29 ..... ZD-1104
P1B2329 ..... ZD-1106
P1B2429 ..... ZD-1107

P1B2529 ..... ZD-1107
P1B2629 ..... ZD-1107
P1B2D29 ..... ZD-1107
P1B2929 ..... ZD-1109
P1B2E29 ..... ZD-1110
P1B3000 ..... ZD-1112
P1B314B ZD-1112
P1B324B ZD-1112
P1B334B ZD-1112
P1B3400 ..... ZD-1118
P1B4600 ..... ZD-1120
P213800 ..... ZD-1125
U1A00AA ZD-1131
U114687 ..... ZD-1132
U014787 ..... ZD-1132
U014887 ..... ZD-1133
U014A87 ..... ZD-1133
U114687 ..... ZD-1133
U041782 ..... ZD-1133
U041783 ..... ZD-1133
U112987 ..... ZD-1133
U041882 ..... ZD-1133
U041883 ..... ZD-1133
U113187 ..... ZD-1133
U042082 ..... ZD-1133
U042083 ..... ZD-1133
U110387 ..... ZD-1133
U040482 ..... ZD-1133
U040483 ..... ZD-1133
U115187 ..... ZD-1133
U045282 ..... ZD-1133
U045283 ..... ZD-1133
U114787 ..... ZD-1133
U042282 ..... ZD-1133
U042283 ..... ZD-1133
U014697 ..... ZD-1133
U014A97 ..... ZD-1133
U114697 ..... ZD-1133
U124287 ..... ZD-1134
U054982 ..... ZD-1134
U054983 ..... ZD-1134
U0148A7 ..... ZD-1134
U129A87 ..... ZD-1134
U129287 ..... ZD-1134
U129887 ..... ZD-1134
U059B82 ..... ZD-1134
U059B83 ..... ZD-1134
U059982 ..... ZD-1134

U059983 ..... ZD-1134
U059382 ..... ZD-1134
U059383 ..... ZD-1134
U008988 ..... ZD-1145
U009288 ..... ZD-1145
U005588 ..... ZD-1145

Intelligent communication domain control system

Intelligent communication domain control unit ZD-1151
B14A016 ..... ZD-1156
B14A017 ..... ZD-1156
B14A100 ..... ZD-1160
B14A201 ..... ZD-1161
B14A271 ..... ZD-1161
B14A300 ..... ZD-1167
B14A400 ..... ZD-1167
B14A500 ..... ZD-1169
B14A608 ..... ZD-1173
B14A708 ..... ZD-1173
B14A800 ..... ZD-1173
B14A900 ..... ZD-1175
B14AA00 ..... ZD-1177
B14AC08 ..... ZD-1182
B14C600 ..... ZD-1182
B14B300 ..... ZD-1183
B14B500 ..... ZD-1188
B14B600 ..... ZD-1192
B14B700 ..... ZD-1192
B14B800 ..... ZD-1192
B14B900 ..... ZD-1192
B14BA00 ..... ZD-1195
B14BB00 ..... ZD-1195
B14BC00 ..... ZD-1198
B14BD00 ..... ZD-1198
B14BE00 ..... ZD-1203
B14C800 ..... ZD-1203
B14C900 ..... ZD-1203
B14C400 ..... ZD-1205
B14CB00 ..... ZD-1207
B14CC00 ..... ZD-1208
B14CE00 ..... ZD-1208
B14CD00 ..... ZD-1210
U146E8A ZD-1211
U008988 ..... ZD-1215

Power motor control system

Electric rear drive system inverter ZD-1220
P1D0101 ..... ZD-1225
P1D0201 ..... ZD-1225

P1D0301 ..... ZD-1225
P1D0401 ..... ZD-1225
P1D0501 ..... ZD-1226
P1D0600 ..... ZD-1226
P1D0701 ..... ZD-1231
P1D0817 ..... ZD-1231
P1D0901 ..... ZD-1234
P1D0916 ..... ZD-1235
P1D0917 ..... ZD-1237
P1D0E19 ..... ZD-1239
P1D0F19 ..... ZD-1239
P1D1000 ..... ZD-1239
P1D1100 ..... ZD-1244
P1D114B ZD-1244
P1D1200 ..... ZD-1247
P1D124B ZD-1247
P1D1300 ..... ZD-1249
P1D134B ZD-1249
P1D144B ZD-1251
P1D1500 ..... ZD-1252
P1D1C00 ..... ZD-1254
P1D1D00 ..... ZD-1254
P1D2600 ..... ZD-1254
P1D2200 ..... ZD-1255
P1D2400 ..... ZD-1256
P1D2500 ..... ZD-1257
P1D2700 ..... ZD-1258
P1D2800 ..... ZD-1258
P1D2900 ..... ZD-1259
P1D2A00 ..... ZD-1260
P1D2F00 ..... ZD-1264
P1D3000 ..... ZD-1264
P1D5616 ..... ZD-1268
P1D5617 ..... ZD-1268
U300316 ..... ZD-1272
U300317 ..... ZD-1272
U005588 ..... ZD-1276
U029387 ..... ZD-1282
U029A87 ..... ZD-1282
U014687 ..... ZD-1282
U059482 ..... ZD-1282
U059483 ..... ZD-1282

Power battery control system

Power battery control unit (PB62) ZD-1289
P1D9116 ..... ZD-1300
P1D91F0 ..... ZD-1300
P1D91F1 ..... ZD-1300
P1D9117 ..... ZD-1303

P1D9312 ..... ZD-1305
P1D9313 ..... ZD-1307
P1D9612 ..... ZD-1310
P1D9613 ..... ZD-1312
P1D964C ZD-1315
P1DA188 ..... ZD-1317
P1DAC00 ..... ZD-1318
P1DB000 ..... ZD-1321
P1DB100 ..... ZD-1321
P1DB300 ..... ZD-1323
P1D8B74 ..... ZD-1323
P1DB600 ..... ZD-1324
P1DBA00 ..... ZD-1326
P1DBC00 ..... ZD-1327
P1DC900 ..... ZD-1328
P1DC901 ..... ZD-1328
P1DC912 ..... ZD-1330
P1DC913 ..... ZD-1333
P1DC9F0 ..... ZD-1334
P1DC9F1 ..... ZD-1334
P1DD200 ..... ZD-1336
P1DE300 ..... ZD-1337
P1DE3F0 ..... ZD-1338
P1DE600 ..... ZD-1341
P1DB500 ..... ZD-1341
P1DF411 ..... ZD-1344
P1F2A00 ..... ZD-1347
P1F2C00 ..... ZD-1350
P1F2E00 ..... ZD-1353
P1F2F00 ..... ZD-1354
P1D8016 ..... ZD-1355
P1D8116 ..... ZD-1355
P1D8117 ..... ZD-1356
P1D82F0 ..... ZD-1357
P1D8400 ..... ZD-1361
P1D8500 ..... ZD-1362
P1D8698 ..... ZD-1364
P1D8798 ..... ZD-1365
P1D8800 ..... ZD-1366
P1D8A18 ..... ZD-1367
P1DCC00 ..... ZD-1368
P1D8C1A ZD-1369
P1D8D1A ZD-1369
P1DAA01 ..... ZD-1371
P1DAD00 ..... ZD-1372
P1D81F2 ..... ZD-1372
P1DAE00 ..... ZD-1373
P1DB885 ..... ZD-1375

P1DB900 ZD-1377
P1DBF00 ZD-1378
P1DC017 ZD-1379
P1D8017 ZD-1379
P1DC117 ZD-1381
P1D8217 ZD-1381
P1DCD00 ZD-1383
P1DCE00 ZD-1385
P1DCE23 ZD-1385
P1DCEF0 ZD-1386
P1DDF1D ZD-1386
P1DDFF0 ZD-1386
P1DDFF1 ZD-1387
P1DDFF2 ZD-1387
P1DDFF3 ZD-1389
P1DDFF4 ZD-1390
P1DE700 ZD-1391
P1D8A00 ZD-1393
P1D81F3 ZD-1394
P1D82F1 ZD-1395
P1D88F1 ZD-1396
P1D9044 ZD-1399
P1DEF00 ZD-1399
P1D9411 ZD-1401
P1D9412 ZD-1403
P1D9413 ZD-1405
P1D9511 ZD-1408
P1D9512 ZD-1411
P1D9513 ZD-1413
P1D9711 ZD-1415
P1D9712 ZD-1417
P1D9713 ZD-1419
P1D9811 ZD-1421
P1D9812 ZD-1423
P1D9813 ZD-1425
P1D9911 ZD-1427
P1D9A11 ZD-1427
P1D9B11 ZD-1427
P1D9C11 ZD-1427
P1D9912 ZD-1428
P1D9A12 ZD-1429
P1D9B12 ZD-1429
P1D9D12 ZD-1430
P1DA288 ZD-1432
P1DA300 ZD-1434
P1DA400 ZD-1434
P1D82F2 ZD-1434
P1DA598 ZD-1436

P1DDBF0 ..... ZD-1437
P1DBD00 ..... ZD-1438
P1DD300 ..... ZD-1440
P1DD3F0 ..... ZD-1440
P1DDDF0 ..... ZD-1442
P1DDDF1 ..... ZD-1445
P1DDDF2 ..... ZD-1448
P1DDDF4 ..... ZD-1451
P1DDDF5 ..... ZD-1454
P1DE000 ..... ZD-1457
P1DE400 ..... ZD-1458
P1DE800 ..... ZD-1459
P1DE9F0 ..... ZD-1461
P1DFB4B ZD-1463
P1DFC4B ZD-1463
P1F2900 ..... ZD-1463
P1F234B ZD-1465
P1F4102 ..... ZD-1467
P1F4104 ..... ZD-1470
P1F4000 ..... ZD-1470
P1F4200 ..... ZD-1472
P1F4211 ..... ZD-1473
P1F4212 ..... ZD-1475
U005588 ..... ZD-1477
U129887 ..... ZD-1481
U114B87 ..... ZD-1481
U114A87 ..... ZD-1481
U044B82 ..... ZD-1481
U044B83 ..... ZD-1481
U129287 ..... ZD-1481
U114687 ..... ZD-1481
U115187 ..... ZD-1481
U045282 ..... ZD-1481
U045283 ..... ZD-1481
U059982 ..... ZD-1481
U059983 ..... ZD-1481
P1DE7F0 ..... ZD-1488

Power battery control system

Power battery control unit (PB85) ZD-1490
P1D8A18 ..... ZD-1498
P1D8C1A ZD-1498
P1D8D1A ZD-1499
P1D9D12 ..... ZD-1500
P1D82F0 ..... ZD-1501
P1D964C ZD-1504
P1D8016 ..... ZD-1506
P1D8116 ..... ZD-1506
P1D8017 ..... ZD-1507

P1D8117 ..... ZD-1508
P1D8400 ..... ZD-1508
P1D8500 ..... ZD-1510
P1D8698 ..... ZD-1512
P1D8800 ..... ZD-1515
P1D9116 ..... ZD-1516
P1D91F0 ..... ZD-1516
P1D91F1 ..... ZD-1516
P1D9117 ..... ZD-1519
P1D9312 ..... ZD-1520
P1D9313 ..... ZD-1522
P1D9612 ..... ZD-1525
P1D9613 ..... ZD-1527
P1DA188 ..... ZD-1529
P1DA288 ..... ZD-1530
P1DA300 ..... ZD-1532
P1DA400 ..... ZD-1532
P1DA598 ..... ZD-1533
P1DAA01 ..... ZD-1534
P1DAC00 ..... ZD-1535
P1DAD00 ..... ZD-1538
P1D81F2 ..... ZD-1538
P1DAE00 ..... ZD-1539
P1DB000 ..... ZD-1543
P1DB100 ..... ZD-1543
P1DB300 ..... ZD-1544
P1D8B74 ..... ZD-1544
P1DB600 ..... ZD-1545
P1DB885 ..... ZD-1546
P1DB900 ..... ZD-1549
P1DBA00 ..... ZD-1549
P1DBC00 ..... ZD-1550
P1DBD00 ..... ZD-1550
P1DBF00 ..... ZD-1552
P1DC9F0 ..... ZD-1553
P1DC9F1 ..... ZD-1553
P1DC017 ..... ZD-1554
P1DC117 ..... ZD-1555
P1D8217 ..... ZD-1555
P1DC900 ..... ZD-1557
P1DC901 ..... ZD-1557
P1DC912 ..... ZD-1558
P1DC913 ..... ZD-1559
P1DCC00 ..... ZD-1561
P1DCD00 ..... ZD-1562
P1DCE00 ..... ZD-1563
P1DCE23 ..... ZD-1563
P1DCEF0 ..... ZD-1563

P1DD200 ZD-1564
P1DD300 ZD-1565
P1DD3F0 ZD-1565
P1DDF1D ZD-1566
P1DDFF0 ZD-1568
P1DDFF1 ZD-1569
P1DDFF2 ZD-1570
P1DDFF3 ZD-1572
P1DDFF4 ZD-1573
P1DE3F0 ZD-1573
P1DE7F0 ZD-1576
P1DE300 ZD-1577
P1DE600 ZD-1577
P1DB500 ZD-1577
P1DE700 ZD-1580
P1DF411 ZD-1582
P1F2A00 ZD-1584
P1F2C00 ZD-1586
P1F234B ZD-1588
U005588 ZD-1589
U129887 ZD-1589
U044B82 ZD-1589
U044B83 ZD-1589
U114B87 ZD-1589
U114A87 ZD-1589
U129287 ZD-1590
U114687 ZD-1590
U115187 ZD-1590
U045282 ZD-1590
U045283 ZD-1590
U059982 ZD-1590
U059983 ZD-1590
P1D8A00 ZD-1591
P1D81F3 ZD-1593
P1D82F1 ZD-1593
P1D82F2 ZD-1594
P1D88F1 ZD-1596
P1D9044 ZD-1598
P1DEF00 ZD-1598
P1D9411 ZD-1599
P1D9412 ZD-1601
P1D9413 ZD-1603
P1D9511 ZD-1605
P1D9512 ZD-1606
P1D9513 ZD-1608
P1D9711 ZD-1610
P1D9712 ZD-1611
P1D9713 ZD-1613

P1D9811 ..... ZD-1615
P1D9812 ..... ZD-1617
P1D9813 ..... ZD-1618
P1D9911 ..... ZD-1620
P1D9A11 ..... ZD-1620
P1D9B11 ..... ZD-1620
P1D9C11 ..... ZD-1620
P1D9912 ..... ZD-1622
P1D9A12 ..... ZD-1622
P1D9B12 ..... ZD-1622
P1DDBF0 ..... ZD-1624
P1DDDF0 ..... ZD-1625
P1DDDF1 ..... ZD-1627
P1DDDF2 ..... ZD-1629
P1DDDF4 ..... ZD-1631
P1DDDF5 ..... ZD-1633
P1DE000 ..... ZD-1635
P1DE9F0 ..... ZD-1636
P1DE400 ..... ZD-1639
P1DE800 ..... ZD-1639
P1DFB4B ZD-1641
P1DFC4B ZD-1641
P1F2900 ..... ZD-1641
P1F4102 ..... ZD-1642
P1F4104 ..... ZD-1645
P1F4000 ..... ZD-1645

Energy conversion and distribution control system

Energy conversion and distribution unit ZD-1646
P1E0A92 ..... ZD-1652
P1E0F87 ..... ZD-1654
P1E1C17 ..... ZD-1656
P1E1D16 ..... ZD-1656
P1E1F19 ..... ZD-1658
P1E2019 ..... ZD-1658
P1E2B17 ..... ZD-1660
P1E2C12 ..... ZD-1660
P1E2E19 ..... ZD-1662
P1E2F19 ..... ZD-1664
P1E3A22 ..... ZD-1665
P1E3B21 ..... ZD-1666
P1E3C12 ..... ZD-1668
P1E3D11 ..... ZD-1668
P1E3E22 ..... ZD-1669
P1E3F21 ..... ZD-1670
P1E4D1D ZD-1672
P1E4F12 ..... ZD-1673
P1E5011 ..... ZD-1674
P1E5A1C ZD-1675

P1E5C12 ..... ZD-1677
P1E5D11 ..... ZD-1677
P1E0087 ..... ZD-1679
P1E0288 ..... ZD-1679
P1E0329 ..... ZD-1679
P1E0417 ..... ZD-1681
P1E0516 ..... ZD-1681
P1E0622 ..... ZD-1685
P1E0721 ..... ZD-1685
P1E641C ZD-1687
P1E0812 ..... ZD-1689
P1E0911 ..... ZD-1689
P1E1036 ..... ZD-1691
P1E1137 ..... ZD-1691
P1E1217 ..... ZD-1691
P1E1316 ..... ZD-1691
P1E1412 ..... ZD-1694
P1E1511 ..... ZD-1694
P1E1712 ..... ZD-1694
P1E1811 ..... ZD-1694
P1E1619 ..... ZD-1696
P1E1919 ..... ZD-1696
P1E1A19 ..... ZD-1696
P1E1B19 ..... ZD-1696
P1E2222 ..... ZD-1698
P1E2321 ..... ZD-1698
P1E2811 ..... ZD-1698
P1E2912 ..... ZD-1698
P1E2422 ..... ZD-1701
P1E2521 ..... ZD-1701
P1E2622 ..... ZD-1701
P1E2721 ..... ZD-1701
P1E3017 ..... ZD-1704
P1E3116 ..... ZD-1704
P1E3217 ..... ZD-1704
P1E3419 ..... ZD-1706
P1E3592 ..... ZD-1708
P1E3616 ..... ZD-1709
P1E3717 ..... ZD-1710
P1E3817 ..... ZD-1712
P1E3916 ..... ZD-1712
P1E4012 ..... ZD-1714
P1E4111 ..... ZD-1714
P1E4219 ..... ZD-1716
P1E4313 ..... ZD-1718
P1E4549 ..... ZD-1720
P1E4812 ..... ZD-1722
P1E4911 ..... ZD-1723

P1E4A12 ..... ZD-1723
P1E5112 ..... ZD-1725
P1E5247 ..... ZD-1727
P1E5349 ..... ZD-1729
P1E5448 ..... ZD-1730
P1E5612 ..... ZD-1732
P1E5843 ..... ZD-1734
P1E5948 ..... ZD-1735
P1E6022 ..... ZD-1737
P1E6121 ..... ZD-1737
P1E6211 ..... ZD-1737
P1E6312 ..... ZD-1737
P1E6517 ..... ZD-1740
P1E6616 ..... ZD-1740
P1E6714 ..... ZD-1742
P1E6815 ..... ZD-1742
P1E6911 ..... ZD-1742
P1E1E17 ..... ZD-1748
U029A87 ..... ZD-1750
U014B87 ..... ZD-1750
U044B82 ..... ZD-1750
U044B83 ..... ZD-1750
U059B82 ..... ZD-1750
U059B83 ..... ZD-1751
U005588 ..... ZD-1756

Brake control

Integrated brake controller ZD-1760
C004900 ..... ZD-1772
C006108 ..... ZD-1777
C006208 ..... ZD-1777
C006308 ..... ZD-1779
C006B06 ..... ZD-1781
C007200 ..... ZD-1781
C007204 ..... ZD-1782
C0072FB ZD-1782
C006BFC ZD-1782
C007208 ..... ZD-1788
C0072FC ZD-1788
C00A900 ..... ZD-1793
C00A100 ..... ZD-1793
C00A000 ..... ZD-1793
C003208 ..... ZD-1793
C003200 ..... ZD-1793
C003108 ..... ZD-1794
C00B900 ..... ZD-1794
C00AA00 ..... ZD-1801
C00A300 ..... ZD-1801
C00A200 ..... ZD-1801

C003508 ..... ZD-1801
C003500 ..... ZD-1802
C003408 ..... ZD-1802
C00BA00 ..... ZD-1802
C00AB00 ..... ZD-1809
C00A500 ..... ZD-1809
C00A400 ..... ZD-1809
C003808 ..... ZD-1809
C003800 ..... ZD-1810
C003708 ..... ZD-1810
C00BB00 ..... ZD-1810
C00AC00 ..... ZD-1817
C00A700 ..... ZD-1817
C00A600 ..... ZD-1817
C003B08 ..... ZD-1817
C003B00 ..... ZD-1818
C003A08 ..... ZD-1818
C00BC00 ..... ZD-1818
C054300 ..... ZD-1825
C054200 ..... ZD-1825
C053F00 ..... ZD-1825
C053D00 ..... ZD-1825
C007500 ..... ZD-1825
C056C00 ..... ZD-1826
C004510 ..... ZD-1826
C0044FC ZD-1826
C055E00 ..... ZD-1832
C055FFB ZD-1838
C059700 ..... ZD-1838
C0595FC ZD-1842
C058900 ..... ZD-1842
C058800 ..... ZD-1842
C058AFC ZD-1842
C059000 ..... ZD-1842
C0590FC ZD-1842
C059100 ..... ZD-1842
C0591FC ZD-1842
C059200 ..... ZD-1842
C0592FC ZD-1842
C059300 ..... ZD-1842
C0593FC ZD-1843
C059400 ..... ZD-1843
C059592 ..... ZD-1843
C05B000 ..... ZD-1851
C055F92 ..... ZD-1851
C104D04 ..... ZD-1856
C104D04 ..... ZD-1857
C1099FC ZD-1859

C109908 ..... ZD-1859
C109904 ..... ZD-1859
C121208 ..... ZD-1867
C200004 ..... ZD-1868
C2A1700 ..... ZD-1869
P056024 ..... ZD-1872
P056023 ..... ZD-1872
C190004 ..... ZD-1872
C190104 ..... ZD-1872
C1901FC ZD-1873
P25C700 ..... ZD-1879
P25C600 ..... ZD-1879
C057A00 ..... ZD-1879
C057900 ..... ZD-1879
C054100 ..... ZD-1879
C059900 ..... ZD-1880
P06B800 ..... ZD-1880
P06B8FC ZD-1880
P057B00 ..... ZD-1880
P057C00 ..... ZD-1880
P057D00 ..... ZD-1880
P057E00 ..... ZD-1880
P05DD00 ..... ZD-1880
P05DE00 ..... ZD-1880
P05DF00 ..... ZD-1880
P05E009 ..... ZD-1880
C057E00 ..... ZD-1880
C05C24B ZD-1880
C05C300 ..... ZD-1880
C061900 ..... ZD-1880
C1000FC ZD-1880
C102001 ..... ZD-1880
P05FF09 ..... ZD-1880
P05FF03 ..... ZD-1881
C100004 ..... ZD-1881
P05CB00 ..... ZD-1881
C100104 ..... ZD-1881
C100047 ..... ZD-1881
U006488 ..... ZD-1893
U115187 ..... ZD-1898
U129387 ..... ZD-1898
U116487 ..... ZD-1898
U115587 ..... ZD-1898
U124587 ..... ZD-1898
U014887 ..... ZD-1898
U114687 ..... ZD-1898
U013187 ..... ZD-1898
U020887 ..... ZD-1898

U119987 ..... ZD-1898
U114B87 ..... ZD-1898
U014C87 ..... ZD-1898
U113887 ..... ZD-1898
U112887 ..... ZD-1898
U044B84 ..... ZD-1898
U044B86 ..... ZD-1898
U054482 ..... ZD-1898
U054483 ..... ZD-1898
U054484 ..... ZD-1898
U054486 ..... ZD-1898
U042484 ..... ZD-1898
U042486 ..... ZD-1898
U050984 ..... ZD-1898
U050986 ..... ZD-1898
U049A84 ..... ZD-1898
U042082 ..... ZD-1899
U042083 ..... ZD-1899
U042084 ..... ZD-1899
U042086 ..... ZD-1899
C046008 ..... ZD-1899
U045282 ..... ZD-1899
U045283 ..... ZD-1899
U045284 ..... ZD-1899
U045286 ..... ZD-1899
U059482 ..... ZD-1899
U059483 ..... ZD-1899
U059484 ..... ZD-1899
U059486 ..... ZD-1899
U0594F6 ..... ZD-1899
C108C08 ..... ZD-1899
U043984 ..... ZD-1899
U043986 ..... ZD-1899
U054684 ..... ZD-1899
U054686 ..... ZD-1899
U042384 ..... ZD-1899
U042386 ..... ZD-1899
U041782 ..... ZD-1900
U041783 ..... ZD-1900
U041784 ..... ZD-1900
U041786 ..... ZD-1900
U044784 ..... ZD-1900
U044884 ..... ZD-1900

Power steering system-A

Electric power steering control unit ZD-1911
U300317 ..... ZD-1915
U300316 ..... ZD-1915
C190021 ..... ZD-1919

C190101 ..... ZD-1919
C19021C ZD-1921
C190504 ..... ZD-1921
C190C62 ..... ZD-1921
C190D16 ..... ZD-1921
C190E96 ..... ZD-1921
C190F62 ..... ZD-1921
C191019 ..... ZD-1922
C191128 ..... ZD-1922
C190301 ..... ZD-1925
C190454 ..... ZD-1926
C190602 ..... ZD-1928
C19074B ZD-1930
C190804 ..... ZD-1931
C190904 ..... ZD-1931
C190A01 ..... ZD-1931
C190B01 ..... ZD-1934
U006488 ..... ZD-1937
U012987 ..... ZD-1941
U041582 ..... ZD-1941
U041583 ..... ZD-1941
U041586 ..... ZD-1941
U014687 ..... ZD-1941
U059482 ..... ZD-1941
U059483 ..... ZD-1941
U059486 ..... ZD-1941
U054482 ..... ZD-1941
U054483 ..... ZD-1941
U054486 ..... ZD-1941
U045282 ..... ZD-1941
U045283 ..... ZD-1941
U045286 ..... ZD-1941
U114687 ..... ZD-1941
U129387 ..... ZD-1941
U115187 ..... ZD-1941
U124387 ..... ZD-1941
U113887 ..... ZD-1941
U119887 ..... ZD-1941
U114A87 ..... ZD-1941
U043382 ..... ZD-1941
U043383 ..... ZD-1941
U043386 ..... ZD-1942

Power steering system-B

Electric power steering control unit ZD-1949
C160017 ..... ZD-1953
C160022 ..... ZD-1953
C160116 ..... ZD-1954
C160121 ..... ZD-1954

C160213 ..... ZD-1957
C16034B ZD-1959
C160300 ..... ZD-1959
C160404 ..... ZD-1960
C160411 ..... ZD-1960
C160504 ..... ZD-1960
C160511 ..... ZD-1960
C160654 ..... ZD-1962
C160754 ..... ZD-1963
C16081C ZD-1963
C160926 ..... ZD-1963
C160A1C ZD-1963
C160B85 ..... ZD-1963
C160C48 ..... ZD-1963
C160D42 ..... ZD-1963
C160E41 ..... ZD-1965
C161014 ..... ZD-1965
C160F64 ..... ZD-1966
C161148 ..... ZD-1966
C161100 ..... ZD-1966
U006488 ..... ZD-1968
U012987 ..... ZD-1971
U041582 ..... ZD-1971
U041583 ..... ZD-1971
U041586 ..... ZD-1971
U014687 ..... ZD-1971
U059482 ..... ZD-1971
U059483 ..... ZD-1971
U059486 ..... ZD-1971
U054482 ..... ZD-1972
U054483 ..... ZD-1972
U054486 ..... ZD-1972
U045282 ..... ZD-1972
U045283 ..... ZD-1972
U045286 ..... ZD-1972
U114687 ..... ZD-1972
U129387 ..... ZD-1972
U115187 ..... ZD-1972
U124387 ..... ZD-1972
U113887 ..... ZD-1972
U119887 ..... ZD-1972
U114A87 ..... ZD-1972
U043382 ..... ZD-1972
U043383 ..... ZD-1972
U043386 ..... ZD-1972

Supplemental restraint system

Supplemental restraint ZD-1980
B1A0411 ..... ZD-1995

B1A0412 ..... ZD-1995
B1A041A ZD-1995
B1A041B ZD-1995
B1A042B ZD-1996
B1A0456 ..... ZD-2007
B1A1011 ..... ZD-2017
B1A1012 ..... ZD-2017
B1A1056 ..... ZD-2029
B1A1216 ..... ZD-2036
B1A1217 ..... ZD-2036
B1A1600 ..... ZD-2040
B1A2900 ..... ZD-2041
B1A1F00 ..... ZD-2041
B1A2800 ..... ZD-2041
B000111 ..... ZD-2042
B000112 ..... ZD-2042
B00011A ZD-2043
B00011B ZD-2043
B00012B ZD-2043
B000156 ..... ZD-2054
B001011 ..... ZD-2064
B001012 ..... ZD-2065
B00101A ZD-2065
B00101B ZD-2065
B00102B ZD-2065
B001056 ..... ZD-2075
B002011 ..... ZD-2085
B002012 ..... ZD-2085
B00201A ZD-2085
B00201B ZD-2085
B00202B ZD-2085
B002056 ..... ZD-2096
B002111 ..... ZD-2107
B002112 ..... ZD-2107
B00211A ZD-2107
B00211B ZD-2107
B00212B ZD-2107
B002156 ..... ZD-2114
B002811 ..... ZD-2121
B002812 ..... ZD-2121
B00281A ZD-2121
B00281B ZD-2121
B00282B ZD-2121
B002856 ..... ZD-2132
B002911 ..... ZD-2142
B002912 ..... ZD-2142
B00291A ZD-2142
B00291B ZD-2142

B00292B ZD-2143
B002956 ..... ZD-2150
B003011 ..... ZD-2157
B003012 ..... ZD-2157
B00301A ZD-2157
B00301B ZD-2157
B00302B ZD-2157
B003056 ..... ZD-2168
B003811 ..... ZD-2178
B003812 ..... ZD-2178
B00381A ZD-2178
B00381B ZD-2178
B00382B ZD-2178
B003856 ..... ZD-2189
B007011 ..... ZD-2199
B007012 ..... ZD-2199
B00701A ZD-2199
B00701B ZD-2199
B00702B ZD-2199
B007056 ..... ZD-2206
B007211 ..... ZD-2213
B007212 ..... ZD-2213
B00721A ZD-2213
B00721B ZD-2213
B00722B ZD-2213
B007256 ..... ZD-2220
B007311 ..... ZD-2227
B007312 ..... ZD-2227
B00731A ZD-2227
B00731B ZD-2227
B00732B ZD-2227
B007356 ..... ZD-2234
B007511 ..... ZD-2241
B007512 ..... ZD-2241
B00751A ZD-2241
B00751B ZD-2241
B00752B ZD-2241
B007556 ..... ZD-2248
B007911 ..... ZD-2255
B007912 ..... ZD-2255
B00791A ZD-2255
B00791B ZD-2255
B00792B ZD-2255
B007956 ..... ZD-2262
B009013 ..... ZD-2269
B009011 ..... ZD-2269
B009012 ..... ZD-2269
B00902B ZD-2269

B009056 ..... ZD-2276
B009086 ..... ZD-2281
B009091 ..... ZD-2281
B009096 ..... ZD-2281
B009113 ..... ZD-2287
B009111 ..... ZD-2287
B009112 ..... ZD-2287
B00912B ZD-2287
B009156 ..... ZD-2294
B009186 ..... ZD-2300
B009191 ..... ZD-2300
B009196 ..... ZD-2300
B009213 ..... ZD-2306
B009211 ..... ZD-2306
B009212 ..... ZD-2306
B00922B ZD-2306
B009256 ..... ZD-2313
B009286 ..... ZD-2319
B009291 ..... ZD-2319
B009296 ..... ZD-2319
B009513 ..... ZD-2325
B009511 ..... ZD-2325
B009512 ..... ZD-2325
B00952B ZD-2325
B009556 ..... ZD-2332
B009586 ..... ZD-2338
B009591 ..... ZD-2338
B009596 ..... ZD-2338
B009613 ..... ZD-2344
B009611 ..... ZD-2344
B009612 ..... ZD-2344
B00962B ZD-2344
B009656 ..... ZD-2351
B009686 ..... ZD-2357
B009691 ..... ZD-2357
B009696 ..... ZD-2357
B009713 ..... ZD-2363
B009711 ..... ZD-2363
B009712 ..... ZD-2363
B00972B ZD-2363
B009756 ..... ZD-2370
B009786 ..... ZD-2376
B009791 ..... ZD-2376
B009796 ..... ZD-2376
U002888 ..... ZD-2382
U014687 ..... ZD-2387
U020887 ..... ZD-2387
U112987 ..... ZD-2387

U113187 ..... ZD-2387
U114F87 ..... ZD-2387
U114A87 ..... ZD-2387
U114B87 ..... ZD-2387
U114887 ..... ZD-2387
U114787 ..... ZD-2387
U114687 ..... ZD-2387
U041782 ..... ZD-2388
U041783 ..... ZD-2388

Audio entertainment system

Infotainment control unit ZD-2396
B140016 ..... ZD-2406
B140017 ..... ZD-2406
B140100 ..... ZD-2410
B140200 ..... ZD-2410
B140300 ..... ZD-2410
B140400 ..... ZD-2411
B140302 ..... ZD-2416
B140301 ..... ZD-2416
B140500 ..... ZD-2418
B140501 ..... ZD-2418
B140502 ..... ZD-2418
B140503 ..... ZD-2418
B141602 ..... ZD-2418
B140544 ..... ZD-2420
B140542 ..... ZD-2420
B14074B ZD-2424
B140A00 ..... ZD-2426
B140B00 ..... ZD-2426
B141002 ..... ZD-2428
B141001 ..... ZD-2428
B141003 ..... ZD-2428
B141302 ..... ZD-2430
B141301 ..... ZD-2430
B141303 ..... ZD-2430
B141304 ..... ZD-2430
B141402 ..... ZD-2433
B141502 ..... ZD-2435
B142000 ..... ZD-2437
B140144 ..... ZD-2438
B140142 ..... ZD-2438
B140244 ..... ZD-2442
B140242 ..... ZD-2442
B140344 ..... ZD-2447
B140342 ..... ZD-2447
B140444 ..... ZD-2451
B140442 ..... ZD-2451
U14468A ZD-2456

U004688 ..... ZD-2459
U014687 ..... ZD-2463
U014887 ..... ZD-2463
B14C016 ..... ZD-2468
B14C017 ..... ZD-2468
B14C808 ..... ZD-2471
B14C100 ..... ZD-2472
B14C200 ..... ZD-2472
B14C413 ..... ZD-2472
B14C513 ..... ZD-2472
B14C998 ..... ZD-2476
B14CA98 ..... ZD-2476
B14C601 ..... ZD-2478
B14C701 ..... ZD-2478
Power amplifier ZD-2481
B148017 ..... ZD-2488
B148016 ..... ZD-2488
B148011 ..... ZD-2493
B148012 ..... ZD-2493
B148001 ..... ZD-2493
B148013 ..... ZD-2493
B148111 ..... ZD-2499
B148112 ..... ZD-2499
B148101 ..... ZD-2499
B148113 ..... ZD-2499
B148211 ..... ZD-2505
B148212 ..... ZD-2505
B148201 ..... ZD-2505
B148213 ..... ZD-2505
B148311 ..... ZD-2510
B148312 ..... ZD-2510
B148301 ..... ZD-2510
B148313 ..... ZD-2510
B148411 ..... ZD-2516
B148412 ..... ZD-2516
B148401 ..... ZD-2516
B148413 ..... ZD-2516
B148511 ..... ZD-2522
B148512 ..... ZD-2522
B148501 ..... ZD-2522
B148513 ..... ZD-2522
B148611 ..... ZD-2528
B148612 ..... ZD-2528
B148601 ..... ZD-2528
B148613 ..... ZD-2528
B148711 ..... ZD-2534
B148712 ..... ZD-2534
B148701 ..... ZD-2534

B148713 ..... ZD-2534
B148811 ..... ZD-2540
B148812 ..... ZD-2540
B148801 ..... ZD-2540
B148813 ..... ZD-2540
B148911 ..... ZD-2546
B148912 ..... ZD-2546
B148901 ..... ZD-2546
B148913 ..... ZD-2546
B148A11 ..... ZD-2552
B148A12 ..... ZD-2552
B148A01 ..... ZD-2552
B148A13 ..... ZD-2552
B148B11 ..... ZD-2558
B148B12 ..... ZD-2558
B148B01 ..... ZD-2558
B148B13 ..... ZD-2558
B148E11 ..... ZD-2564
B148E12 ..... ZD-2564
B148E10 ..... ZD-2564
B148E13 ..... ZD-2564
U004688 ..... ZD-2570
U014687 ..... ZD-2575
U011B87 ..... ZD-2575

Lighting system

Front combination light ZD-2581
B151016 ..... ZD-2587
B151017 ..... ZD-2587
B151304 ..... ZD-2590
B151204 ..... ZD-2591
B15124B ZD-2591
B151414 ..... ZD-2591
B151614 ..... ZD-2591
B151256 ..... ZD-2594
B15141E ZD-2596
B151511 ..... ZD-2596
B151512 ..... ZD-2596
B151513 ..... ZD-2596
B15161E ZD-2599
B151711 ..... ZD-2599
B151712 ..... ZD-2600
B151713 ..... ZD-2600
B15181E ZD-2603
B151911 ..... ZD-2603
B151912 ..... ZD-2604
B151913 ..... ZD-2604
B151814 ..... ZD-2604
B151A1E ZD-2608

B151B11 ..... ZD-2608
B151B12 ..... ZD-2608
B151B13 ..... ZD-2608
B151A14 ..... ZD-2608
B151C1E ZD-2613
B151D11 ..... ZD-2613
B151D12 ..... ZD-2613
B151D13 ..... ZD-2613
B151C14 ..... ZD-2613
B151E1E ZD-2618
B151F11 ..... ZD-2618
B151F12 ..... ZD-2618
B151F13 ..... ZD-2618
B151E14 ..... ZD-2618
B15201E ZD-2622
B152111 ..... ZD-2622
B152112 ..... ZD-2622
B152113 ..... ZD-2622
B152014 ..... ZD-2622
B152411 ..... ZD-2626
B152412 ..... ZD-2626
B152413 ..... ZD-2627
B152511 ..... ZD-2627
B152512 ..... ZD-2627
B152513 ..... ZD-2627
B152611 ..... ZD-2627
B152612 ..... ZD-2627
B152613 ..... ZD-2627
B152711 ..... ZD-2627
B152712 ..... ZD-2627
B152713 ..... ZD-2627
B152811 ..... ZD-2627
B152812 ..... ZD-2627
B152813 ..... ZD-2627
B152911 ..... ZD-2633
B152A04 ..... ZD-2633
B152B04 ..... ZD-2634
B152C04 ..... ZD-2634
B152D01 ..... ZD-2634
B152E01 ..... ZD-2634
B152F01 ..... ZD-2634
U014687 ..... ZD-2637
U002888 ..... ZD-2642
B152214 ..... ZD-2646
B15221E ZD-2646
B152311 ..... ZD-2646
B152312 ..... ZD-2647
B152313 ..... ZD-2647

Rear combination light. ZD-2651
B153016 . . . . . ZD-2658
B153017 . . . . . ZD-2658
B153304 . . . . . ZD-2662
B153204 . . . . . ZD-2662
B15324B ZD-2663
B153256 . . . . . ZD-2664
B15341E ZD-2666
B153511 . . . . . ZD-2666
B153512 . . . . . ZD-2666
B153513 . . . . . ZD-2666
B153414 . . . . . ZD-2666
B15361E ZD-2670
B153711 . . . . . ZD-2670
B153712 . . . . . ZD-2670
B153713 . . . . . ZD-2670
B153614 . . . . . ZD-2670
B15381E ZD-2673
B153911 . . . . . ZD-2674
B153912 . . . . . ZD-2674
B153913 . . . . . ZD-2674
B153814 . . . . . ZD-2674
B153A1E ZD-2677
B153B11 . . . . . ZD-2677
B153B12 . . . . . ZD-2678
B153B13 . . . . . ZD-2678
B153A14 . . . . . ZD-2678
B153E14 . . . . . ZD-2681
B153E1E ZD-2682
B153F11 . . . . . ZD-2682
B153F12 . . . . . ZD-2682
B153F13 . . . . . ZD-2682
B18A204 . . . . . ZD-2685
B18A304 . . . . . ZD-2685
B18A401 . . . . . ZD-2686
B18A501 . . . . . ZD-2686
U014887 . . . . . ZD-2688
U002888 . . . . . ZD-2694
B153C14 . . . . . ZD-2699
B153D11 . . . . . ZD-2699
B153D12 . . . . . ZD-2699
B153D13 . . . . . ZD-2699
B18A011 . . . . . ZD-2702
B18A012 . . . . . ZD-2702
B18A013 . . . . . ZD-2702
B18A111 . . . . . ZD-2702
B18A112 . . . . . ZD-2702
B18A113 . . . . . ZD-2702

B153C1E ZD-2705

Seat system

Driver seat control unit ZD-2708
B15B017 ..... ZD-2719
B15B016 ..... ZD-2719
B15B117 ..... ZD-2719
B15B217 ..... ZD-2719
B15B317 ..... ZD-2719
B15B116 ..... ZD-2719
B15B216 ..... ZD-2719
B15B316 ..... ZD-2720
B15B129 ..... ZD-2724
B15B229 ..... ZD-2729
B15B329 ..... ZD-2733
B15B429 ..... ZD-2733
B15B811 ..... ZD-2737
B15B815 ..... ZD-2738
B15B511 ..... ZD-2742
B15B515 ..... ZD-2742
B15B611 ..... ZD-2745
B15B615 ..... ZD-2746
B15B711 ..... ZD-2749
B15B715 ..... ZD-2749
B15B907 ..... ZD-2753
B15BA07 ..... ZD-2753
B15BB07 ..... ZD-2754
B15BC07 ..... ZD-2754
B15BD07 ..... ZD-2754
B15BE07 ..... ZD-2754
B15BF07 ..... ZD-2754
B15C007 ..... ZD-2754
B15C411 ..... ZD-2763
B15C415 ..... ZD-2763
B15C511 ..... ZD-2767
B15C515 ..... ZD-2767
B15C611 ..... ZD-2771
B15C615 ..... ZD-2771
B15C711 ..... ZD-2771
B15C715 ..... ZD-2771
B15C815 ..... ZD-2771
U102388 ..... ZD-2776
U133086 ..... ZD-2776
U133186 ..... ZD-2776
U134086 ..... ZD-2776
U024987 ..... ZD-2776
U024A87 ..... ZD-2776
U025187 ..... ZD-2776
U034086 ..... ZD-2776

U035986 ..... ZD-2776
U014687 ..... ZD-2783
U002888 ..... ZD-2789
Front passenger seat control unit ZD-2794
B15D007 ..... ZD-2804
B15D107 ..... ZD-2804
B15D207 ..... ZD-2804
B15D307 ..... ZD-2804
B15D407 ..... ZD-2804
B15D507 ..... ZD-2804
B15D607 ..... ZD-2804
B15D707 ..... ZD-2804
B15DC07 ..... ZD-2804
B15D011 ..... ZD-2813
B15D015 ..... ZD-2813
B15D017 ..... ZD-2816
B15D117 ..... ZD-2816
B15D016 ..... ZD-2816
B15D116 ..... ZD-2816
B15D111 ..... ZD-2820
B15D115 ..... ZD-2821
B15D129 ..... ZD-2825
B15D211 ..... ZD-2828
B15D215 ..... ZD-2828
B15D311 ..... ZD-2828
B15D315 ..... ZD-2828
B15D329 ..... ZD-2833
B15D429 ..... ZD-2836
B15D529 ..... ZD-2836
B15D611 ..... ZD-2840
B15D615 ..... ZD-2840
B15D811 ..... ZD-2840
B15D815 ..... ZD-2840
B15D915 ..... ZD-2840
B15D711 ..... ZD-2847
B15D715 ..... ZD-2847
U002888 ..... ZD-2851
U014687 ..... ZD-2855
U102388 ..... ZD-2861
U134186 ..... ZD-2861
U025287 ..... ZD-2861
U034186 ..... ZD-2861

Door control system

Front left door control unit ZD-2866
B110017 ..... ZD-2875
B110016 ..... ZD-2875
B110111 ..... ZD-2879
B110211 ..... ZD-2879

B110311 ..... ZD-2879
B110411 ..... ZD-2879
B110918 ..... ZD-2886
B110919 ..... ZD-2886
B110A19 ..... ZD-2891
B110B19 ..... ZD-2891
B110C19 ..... ZD-2895
B110D19 ..... ZD-2895
B110E11 ..... ZD-2899
B110F11 ..... ZD-2899
B111011 ..... ZD-2899
B111111 ..... ZD-2899
B111211 ..... ZD-2902
B111511 ..... ZD-2908
B111611 ..... ZD-2908
B111811 ..... ZD-2909
B111A19 ..... ZD-2911
B111E19 ..... ZD-2914
B111F19 ..... ZD-2917
U002888 ..... ZD-2921
U014687 ..... ZD-2926
U020087 ..... ZD-2926
U020187 ..... ZD-2926
U020287 ..... ZD-2926
U015187 ..... ZD-2926
Front right door control unit ZD-2933
B114017 ..... ZD-2939
B114016 ..... ZD-2939
B114111 ..... ZD-2943
B114318 ..... ZD-2948
B114319 ..... ZD-2948
B114419 ..... ZD-2954
B114519 ..... ZD-2954
B114619 ..... ZD-2958
B114719 ..... ZD-2958
B114819 ..... ZD-2962
B114A19 ..... ZD-2965
B114F19 ..... ZD-2968
U002888 ..... ZD-2972
U014687 ..... ZD-2977
U019987 ..... ZD-2977
U015187 ..... ZD-2977
Rear left door control unit ZD-2983
B118017 ..... ZD-2987
B118016 ..... ZD-2987
B118111 ..... ZD-2991
B118518 ..... ZD-2996
B118519 ..... ZD-2996

B118A19 ..... ZD-3001
B118F19 ..... ZD-3004
U002888 ..... ZD-3007
U014687 ..... ZD-3013
U019987 ..... ZD-3013
U015187 ..... ZD-3013
Rear right door control unit. ZD-3019
B11C017 ..... ZD-3024
B11C016 ..... ZD-3024
B11C111 ..... ZD-3028
B11C518 ..... ZD-3033
B11C519 ..... ZD-3033
B11CA19 ..... ZD-3039
B11CF19 ..... ZD-3042
U002888 ..... ZD-3045
U014687 ..... ZD-3050
U019987 ..... ZD-3050
U015187 ..... ZD-3050

Trailer identification control system

Trailer identification controller ZD-3057
B12A012 ..... ZD-3062
B12A011 ..... ZD-3062
B12A013 ..... ZD-3062
B12A112 ..... ZD-3064
B12A111 ..... ZD-3064
B12A113 ..... ZD-3064
B12A212 ..... ZD-3066
B12A211 ..... ZD-3066
B12A213 ..... ZD-3066
B12A312 ..... ZD-3068
B12A311 ..... ZD-3068
B12A313 ..... ZD-3068
B12A412 ..... ZD-3070
B12A411 ..... ZD-3070
B12A413 ..... ZD-3070
B12A512 ..... ZD-3072
B12A511 ..... ZD-3072
B12A513 ..... ZD-3072
B12A612 ..... ZD-3074
B12A611 ..... ZD-3074
B12A613 ..... ZD-3074
B12A801 ..... ZD-3076
B12A817 ..... ZD-3076
B12A816 ..... ZD-3076
B12A916 ..... ZD-3080
B12A911 ..... ZD-3080
B12A912 ..... ZD-3080
B12AB17 ..... ZD-3084

B12AB16 ..... ZD-3084
U300316 ..... ZD-3088
U300317 ..... ZD-3088
U002888 ..... ZD-3093
U112187 ..... ZD-3098
U124587 ..... ZD-3098
U014087 ..... ZD-3098
U014687 ..... ZD-3098

Mobile phone wireless charging control system

Mobile phone wireless charging controller ZD-3104
B17D04B ZD-3107
B17D176 ..... ZD-3107
B17D186 ..... ZD-3109
B168017 ..... ZD-3113
B168016 ..... ZD-3113
U002888 ..... ZD-3117
U014687 ..... ZD-3122
U019987 ..... ZD-3122
U020087 ..... ZD-3122
U129387 ..... ZD-3122

Front millimeter wave radar system

Front millimeter wave radar ZD-3129
C12E217 ..... ZD-3133
C12E316 ..... ZD-3133
C12E000 ..... ZD-3136
C12E600 ..... ZD-3136
C12E100 ..... ZD-3138
C12E400 ..... ZD-3139
C12E500 ..... ZD-3140
C12E700 ..... ZD-3141
B213100 ..... ZD-3142
B213300 ..... ZD-3144
B213500 ..... ZD-3144
B214800 ..... ZD-3144
B213200 ..... ZD-3144
B214400 ..... ZD-3144
B213900 ..... ZD-3144
B214300 ..... ZD-3144
B214000 ..... ZD-3144
B214500 ..... ZD-3144
B214100 ..... ZD-3144
B214700 ..... ZD-3144
B214200 ..... ZD-3144
B214600 ..... ZD-3144
B213700 ..... ZD-3144
B213800 ..... ZD-3144
B213600 ..... ZD-3144

B213400 ..... ZD-3144
B214900 ..... ZD-3144
B221000 ..... ZD-3145
U024287 ..... ZD-3149
U129387 ..... ZD-3149
U112187 ..... ZD-3150
U113187 ..... ZD-3150
U014787 ..... ZD-3150
U114087 ..... ZD-3150
U116487 ..... ZD-3150
U113887 ..... ZD-3150
U059482 ..... ZD-3150
U059483 ..... ZD-3150
U059484 ..... ZD-3150
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U041583 ..... ZD-3150
U041584 ..... ZD-3150
U041586 ..... ZD-3150
U042082 ..... ZD-3150
U042083 ..... ZD-3150
U042084 ..... ZD-3150
U042086 ..... ZD-3150
U042284 ..... ZD-3150
U054984 ..... ZD-3151
U007C88 ..... ZD-3162

Combination switch control system

Combination switch ZD-3167
B101016 ..... ZD-3170
B101017 ..... ZD-3170
B100101 ..... ZD-3173
B100201 ..... ZD-3174
B100301 ..... ZD-3175
B100401 ..... ZD-3176
B100501 ..... ZD-3177
B100601 ..... ZD-3178
B100701 ..... ZD-3179
B100801 ..... ZD-3180
B100901 ..... ZD-3181
B101001 ..... ZD-3182
B101101 ..... ZD-3183
B101201 ..... ZD-3184
B101301 ..... ZD-3185
U014687 ..... ZD-3186
U002888 ..... ZD-3192

Blind spot detection electronic control system

Rear left corner millimeter wave radar ZD-3196
C134017 ..... ZD-3202

C134016 ..... ZD-3202
C134100 ..... ZD-3205
C134200 ..... ZD-3205
C134300 ..... ZD-3205
C134400 ..... ZD-3205
C134500 ..... ZD-3205
C13464B ZD-3208
C134700 ..... ZD-3210
C134804 ..... ZD-3211
C134904 ..... ZD-3211
C134A00 ..... ZD-3212
C134B00 ..... ZD-3213
C134C00 ..... ZD-3215
U024287 ..... ZD-3216
U023D87 ..... ZD-3216
U114087 ..... ZD-3216
U119987 ..... ZD-3217
U120087 ..... ZD-3217
U120287 ..... ZD-3217
U120187 ..... ZD-3217
U129387 ..... ZD-3217
U113187 ..... ZD-3217
U014787 ..... ZD-3217
U112187 ..... ZD-3217
U123187 ..... ZD-3217
U12FF87 ..... ZD-3217
U054986 ..... ZD-3217
U042284 ..... ZD-3217
U049A84 ..... ZD-3217
U050184 ..... ZD-3217
U050284 ..... ZD-3217
U050384 ..... ZD-3217
U053484 ..... ZD-3217
U059482 ..... ZD-3217
U059483 ..... ZD-3217
U059484 ..... ZD-3217
U059486 ..... ZD-3217
U044782 ..... ZD-3217
U044783 ..... ZD-3217
U044784 ..... ZD-3218
U044786 ..... ZD-3218
U041582 ..... ZD-3218
U041583 ..... ZD-3218
U041584 ..... ZD-3218
U041586 ..... ZD-3218
U042082 ..... ZD-3218
U042083 ..... ZD-3218
U042084 ..... ZD-3218

U042086 ..... ZD-3218
U05FF84 ..... ZD-3218
U053284 ..... ZD-3218
U053286 ..... ZD-3218
U007B88 ..... ZD-3228
Rear right corner millimeter wave radar ZD-3232
C136017 ..... ZD-3238
C136016 ..... ZD-3238
C136100 ..... ZD-3241
C136200 ..... ZD-3241
C136300 ..... ZD-3241
C136400 ..... ZD-3241
C136500 ..... ZD-3241
C13664B ZD-3244
C136700 ..... ZD-3246
C136804 ..... ZD-3247
C136904 ..... ZD-3247
C136B00 ..... ZD-3248
U024287 ..... ZD-3250
U023D87 ..... ZD-3250
U114087 ..... ZD-3250
U119987 ..... ZD-3250
U120087 ..... ZD-3250
U120287 ..... ZD-3250
U120187 ..... ZD-3250
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U112187 ..... ZD-3250
U123187 ..... ZD-3250
U12FF87 ..... ZD-3250
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U042083 ..... ZD-3251
U042084 ..... ZD-3251
U042086 ..... ZD-3251
U05FF84 ..... ZD-3251
U053284 ..... ZD-3251
U053286 ..... ZD-3251
U007B88 ..... ZD-3261

Automatic driving system

Advanced automatic driving control unit ZD-3265
B16A000 ..... ZD-3280
U1A50A2 ..... ZD-3280
U1A50A3 ..... ZD-3280
B16A037 ..... ZD-3282
B16A00A ZD-3283
B16A01A ZD-3283
B16A022 ..... ZD-3283
B16A00B ZD-3286
B16A00C ZD-3287
B16A00D ZD-3289
B16A00E ZD-3290
B16A00F ZD-3291
B16A001 ..... ZD-3292
B16A002 ..... ZD-3292
B16A003 ..... ZD-3297
B16A013 ..... ZD-3297
B16A01B ZD-3297
B16A004 ..... ZD-3299
B16A014 ..... ZD-3299
B16A01C ZD-3299
B16A04A ZD-3302
B16A04B ZD-3304
B16A04C ZD-3305
B16A04D ZD-3307
B16A04F ZD-3309
B16A005 ..... ZD-3310
B16A015 ..... ZD-3310
B16A01D ZD-3311
B16A006 ..... ZD-3313
B16A016 ..... ZD-3313
B16A01E ZD-3313
B16A007 ..... ZD-3316
B16A017 ..... ZD-3316
B16A01F ZD-3316
B16A008 ..... ZD-3319
B16A018 ..... ZD-3319

B16A020 ..... ZD-3319
B16A009 ..... ZD-3322
B16A019 ..... ZD-3322
B16A021 ..... ZD-3322
B16A010 ..... ZD-3325
B16A011 ..... ZD-3326
B16A012 ..... ZD-3328
B16A023 ..... ZD-3329
B16A024 ..... ZD-3330
B16A027 ..... ZD-3331
B16A028 ..... ZD-3333
B16A029 ..... ZD-3333
B16A030 ..... ZD-3334
B16A031 ..... ZD-3336
B16A032 ..... ZD-3337
B16A033 ..... ZD-3339
B16A034 ..... ZD-3340
B16A035 ..... ZD-3342
B16A036 ..... ZD-3343
B16A038 ..... ZD-3345
B16A039 ..... ZD-3346
B16A040 ..... ZD-3347
B16A041 ..... ZD-3349
B16A042 ..... ZD-3350
B16A043 ..... ZD-3351
B16A04E ZD-3351
B16A044 ..... ZD-3353
B16A045 ..... ZD-3354
B16A046 ..... ZD-3355
B16A047 ..... ZD-3357
B16A048 ..... ZD-3358
B16A049 ..... ZD-3360
B16A050 ..... ZD-3361
B16A051 ..... ZD-3363
B16A052 ..... ZD-3365
B16A053 ..... ZD-3366
B16A054 ..... ZD-3368
B16A055 ..... ZD-3369
B16A056 ..... ZD-3371
B16A057 ..... ZD-3373
U1A50A7 ..... ZD-3374
U1A51A7 ..... ZD-3374
U1A52A7 ..... ZD-3374
U1A53A7 ..... ZD-3374
U1A54A7 ..... ZD-3374
U1A55A7 ..... ZD-3374
U1A54A6 ..... ZD-3374
U1A55A6 ..... ZD-3375

U147C8A ZD-3377
U003788 ZD-3381
U007C88 ZD-3382
U014687 ZD-3387
U041883 ZD-3387
U041886 ZD-3387
U059482 ZD-3387
U059483 ZD-3387
U059486 ZD-3387
U041782 ZD-3387
U041783 ZD-3387
U041786 ZD-3387
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U042086 ZD-3387
U045282 ZD-3387
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U045286 ZD-3387
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U044683 ZD-3387
U044782 ZD-3387
U044783 ZD-3387
U040482 ZD-3387
U040483 ZD-3387
U040486 ZD-3387
U02DC87 ZD-3388
U053582 ZD-3388
U053583 ZD-3388
U053586 ZD-3388
U1A50A0 ZD-3388
U1A50A1 ZD-3388
U1A51A5 ZD-3388
U1A52A5 ZD-3388
U1A53A5 ZD-3388

Digital key control system

Digital key main module ZD-3398
B111716 ZD-3406
B111717 ZD-3406
B111718 ZD-3410
B111719 ZD-3410
B178491 ZD-3414
B179155 ZD-3418
B179255 ZD-3420
B179355 ZD-3421
B179455 ZD-3423
B179555 ZD-3425
B179655 ZD-3426
U238087 ZD-3428

U238187 ..... ZD-3435
U238287 ..... ZD-3441
U238387 ..... ZD-3447
U238487 ..... ZD-3453
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U008588 ..... ZD-3471
U014787 ..... ZD-3477

Smart front camera control system

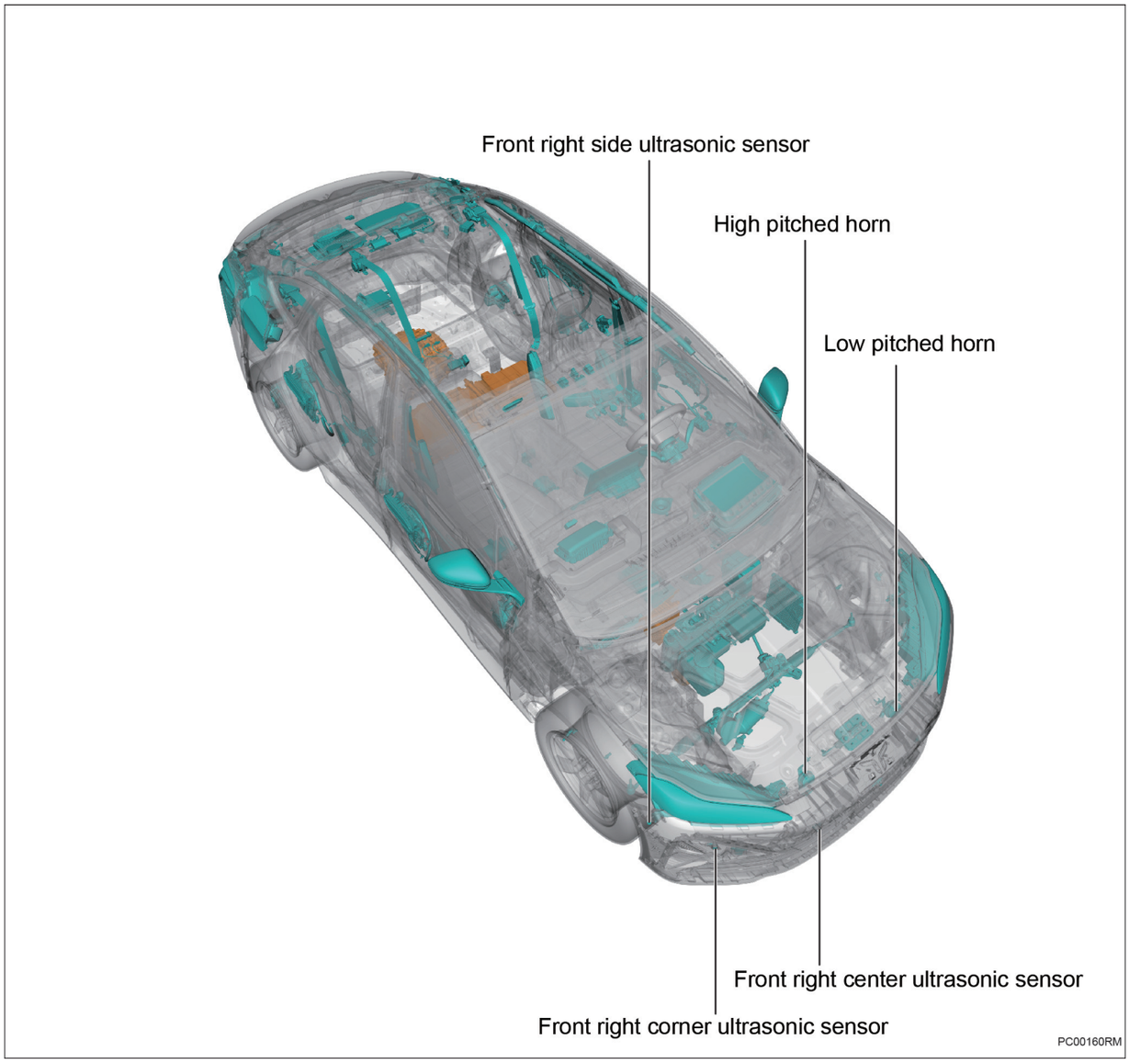
Smart camera ZD-3484
B16A017 ..... ZD-3489
B16A016 ..... ZD-3489
B16A04B ZD-3493
B16A051 ..... ZD-3494
B16A001 ..... ZD-3496
B16A004 ..... ZD-3496
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B16A053 ..... ZD-3496
B16A104 ..... ZD-3496
B16A009 ..... ZD-3496
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U040483 ..... ZD-3512
U044D86 ..... ZD-3512
U008388 ..... ZD-3522
U023987 ..... ZD-3527
U023D87 ..... ZD-3527
U053682 ..... ZD-3527
U053683 ..... ZD-3527
U053686 ..... ZD-3527
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U053883 ..... ZD-3527
U053886 ..... ZD-3527
U147C8A ZD-3532

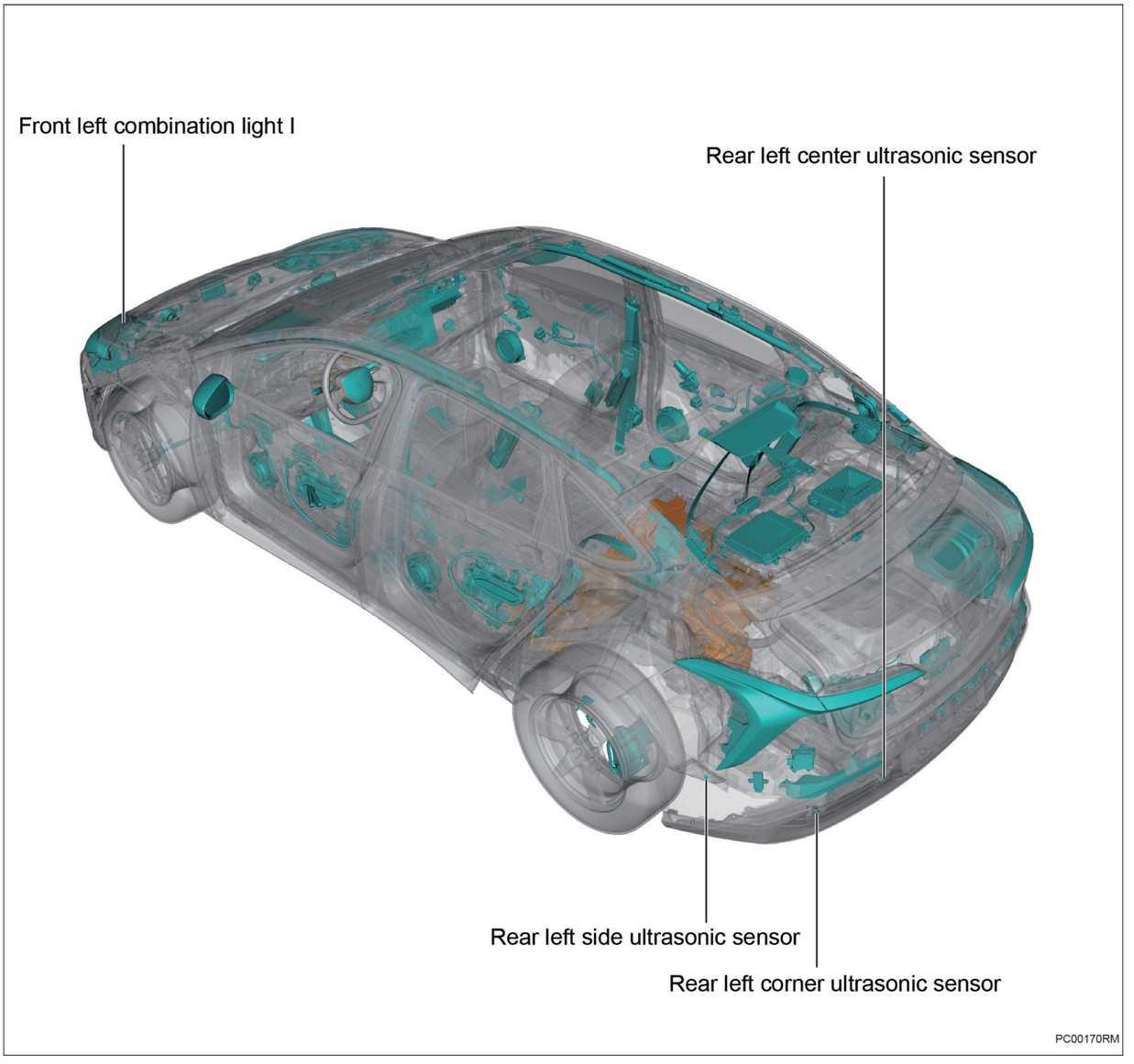
Intelligent area control system

Front intelligent area control unit

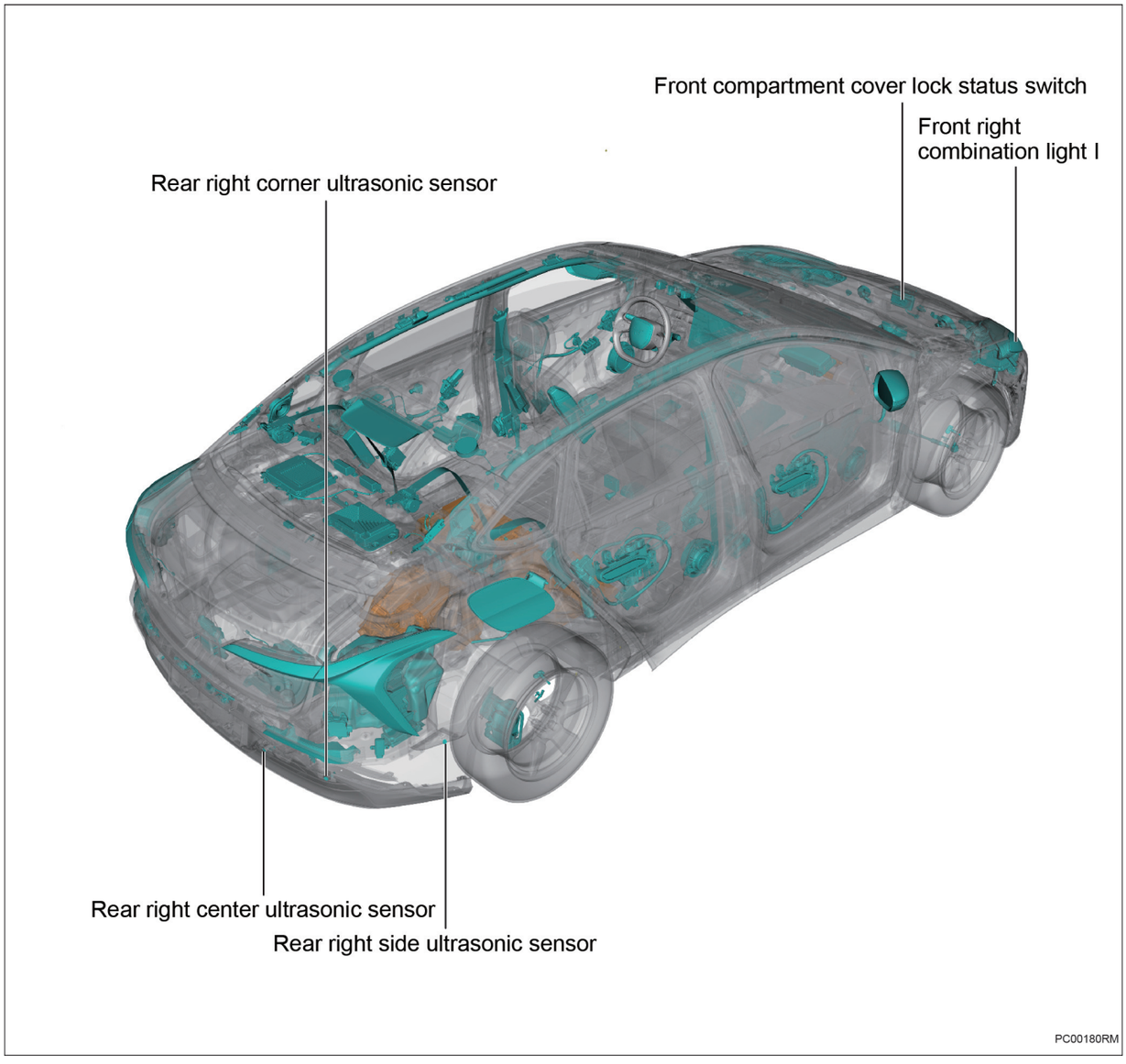
Part position



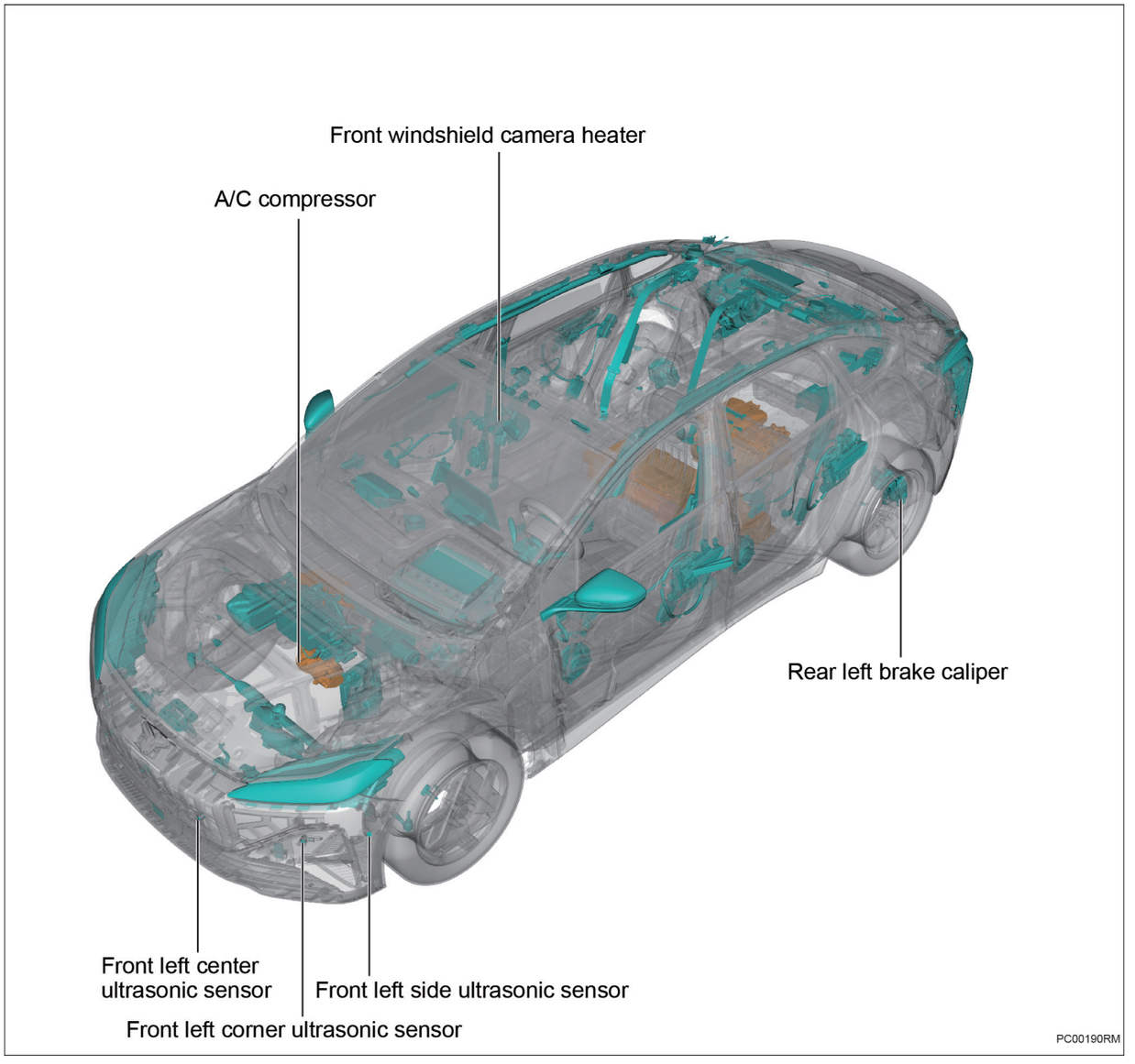
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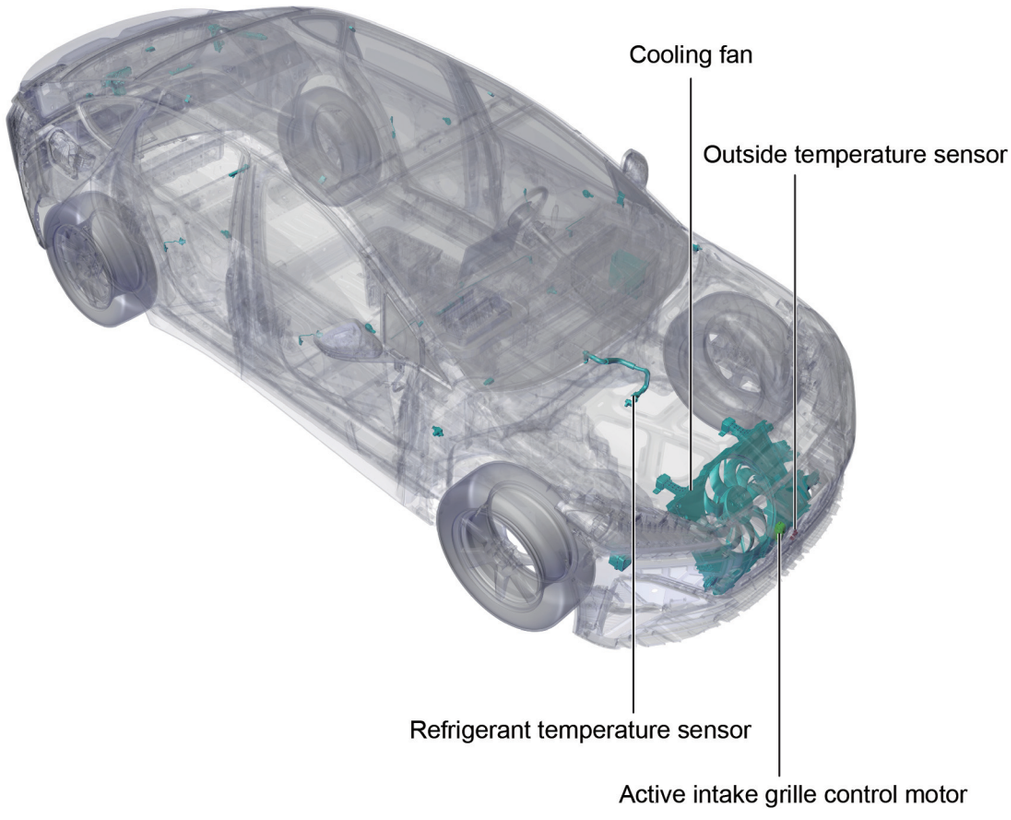
Part position



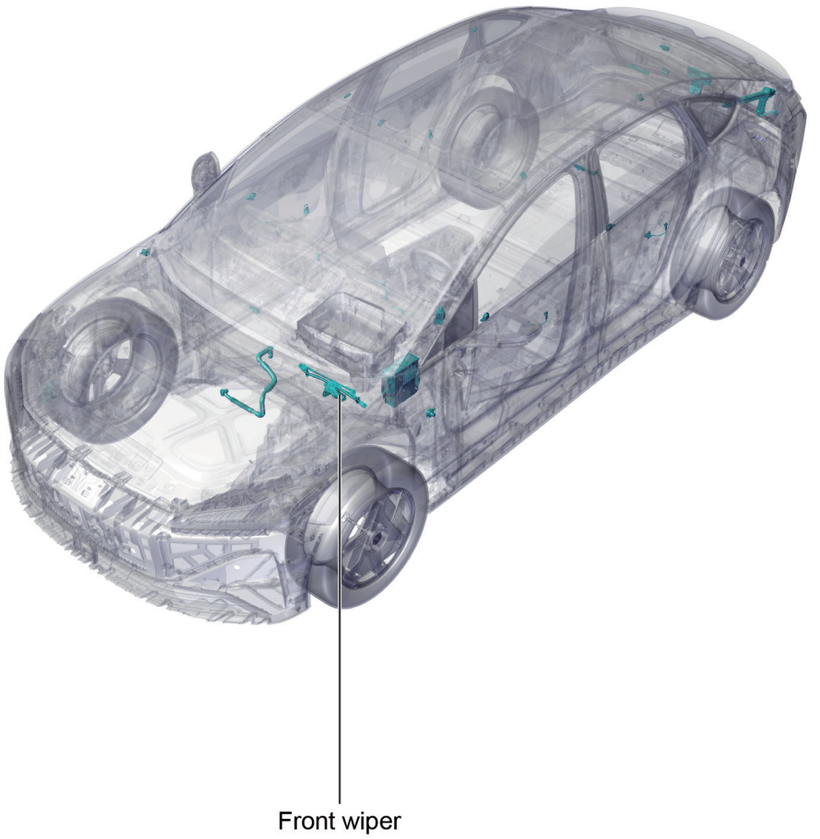
Part position



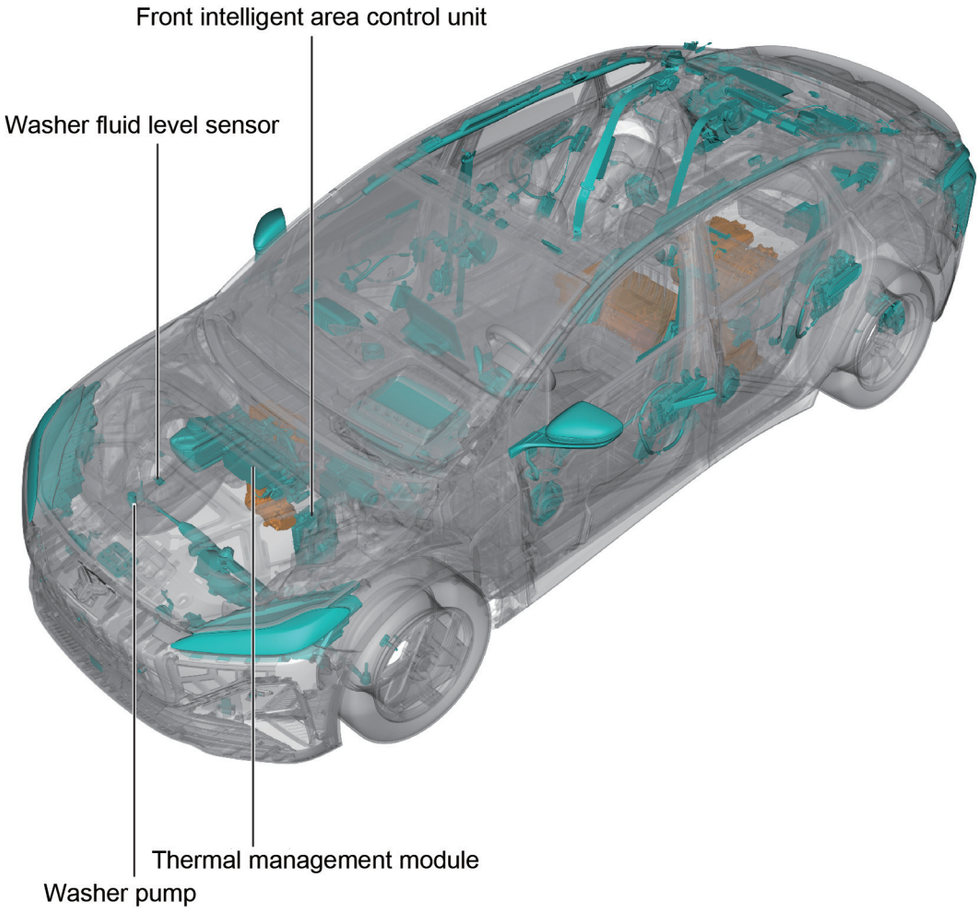
Part position



Part position

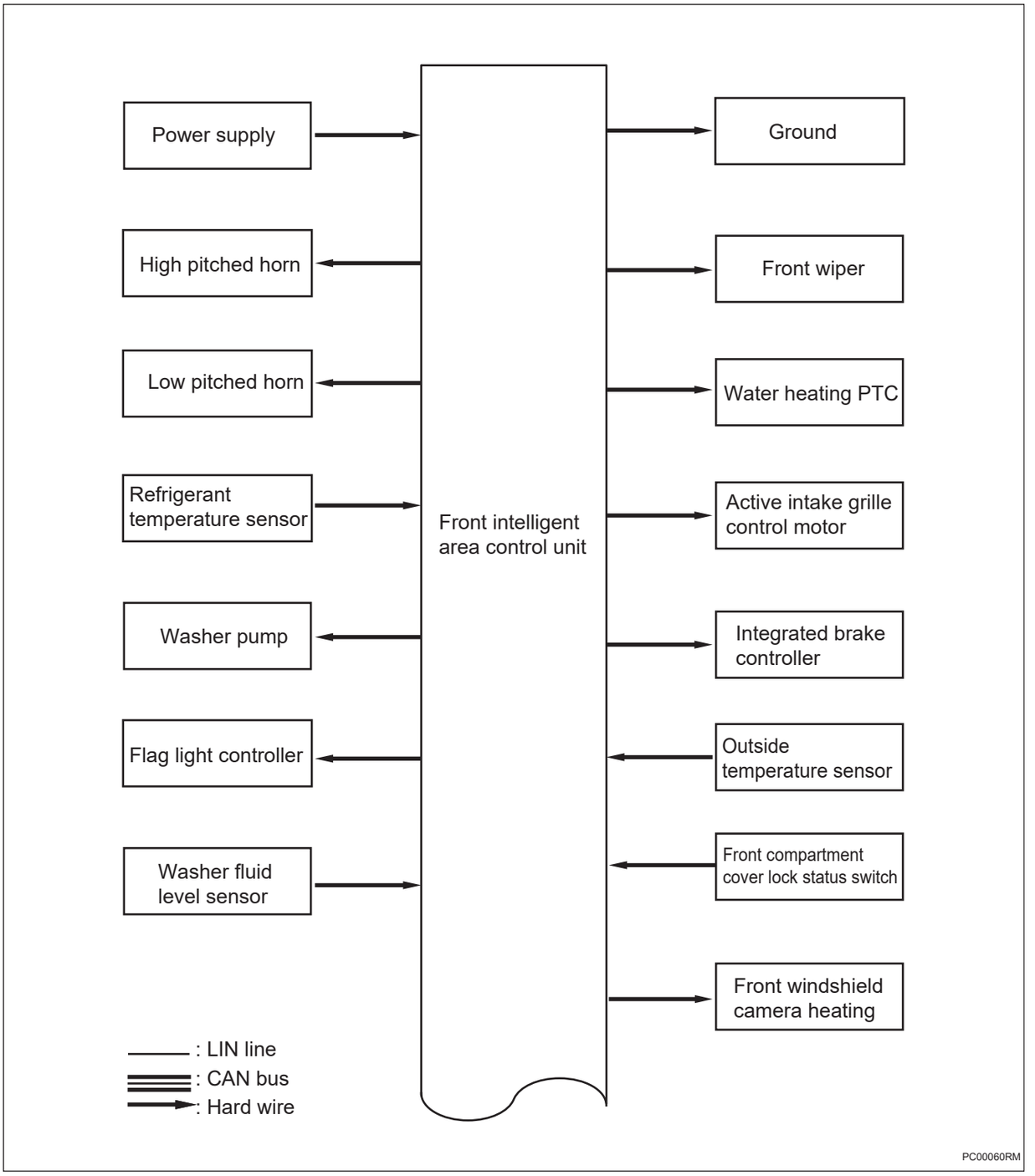


Part position

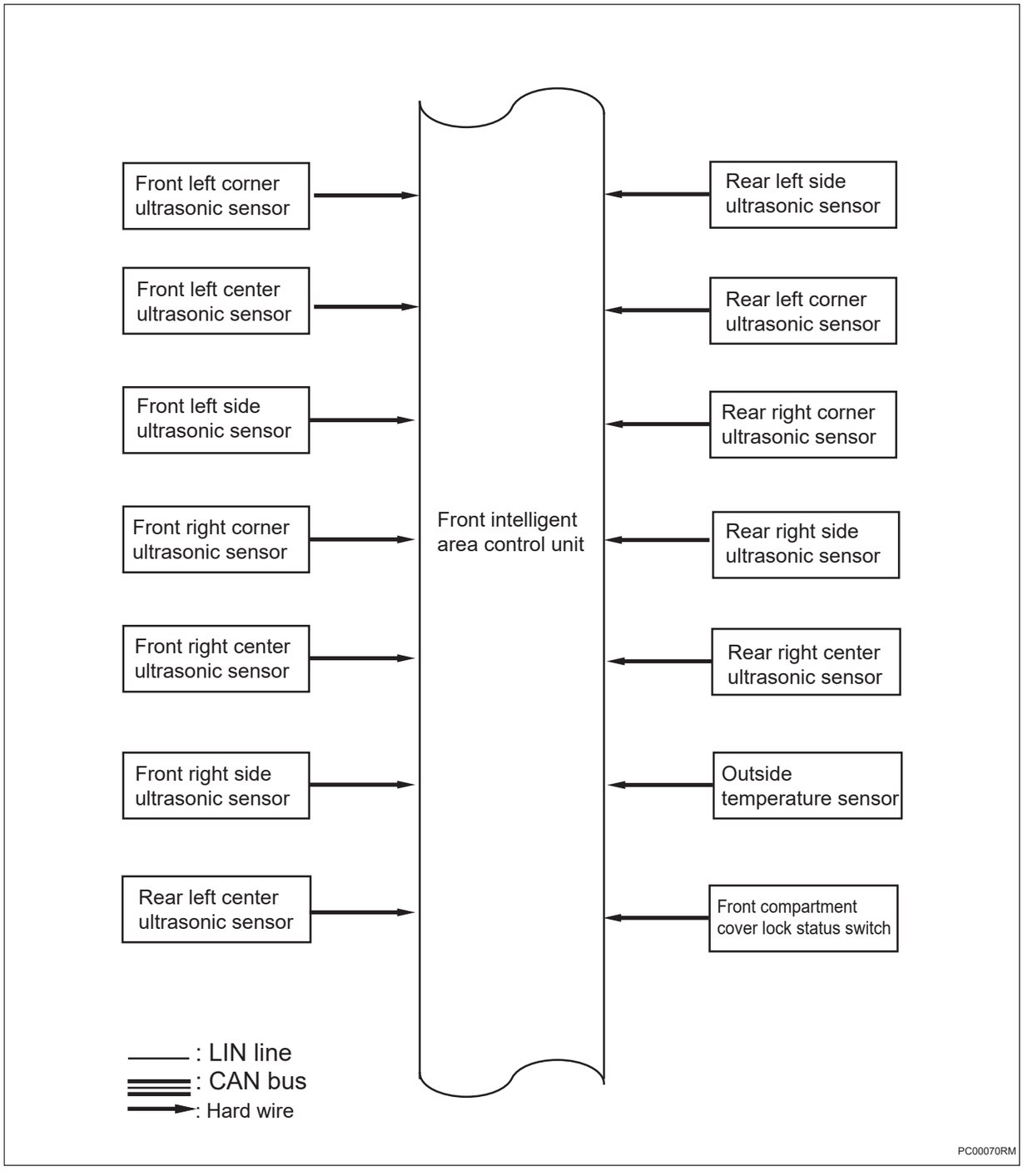


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System diagram

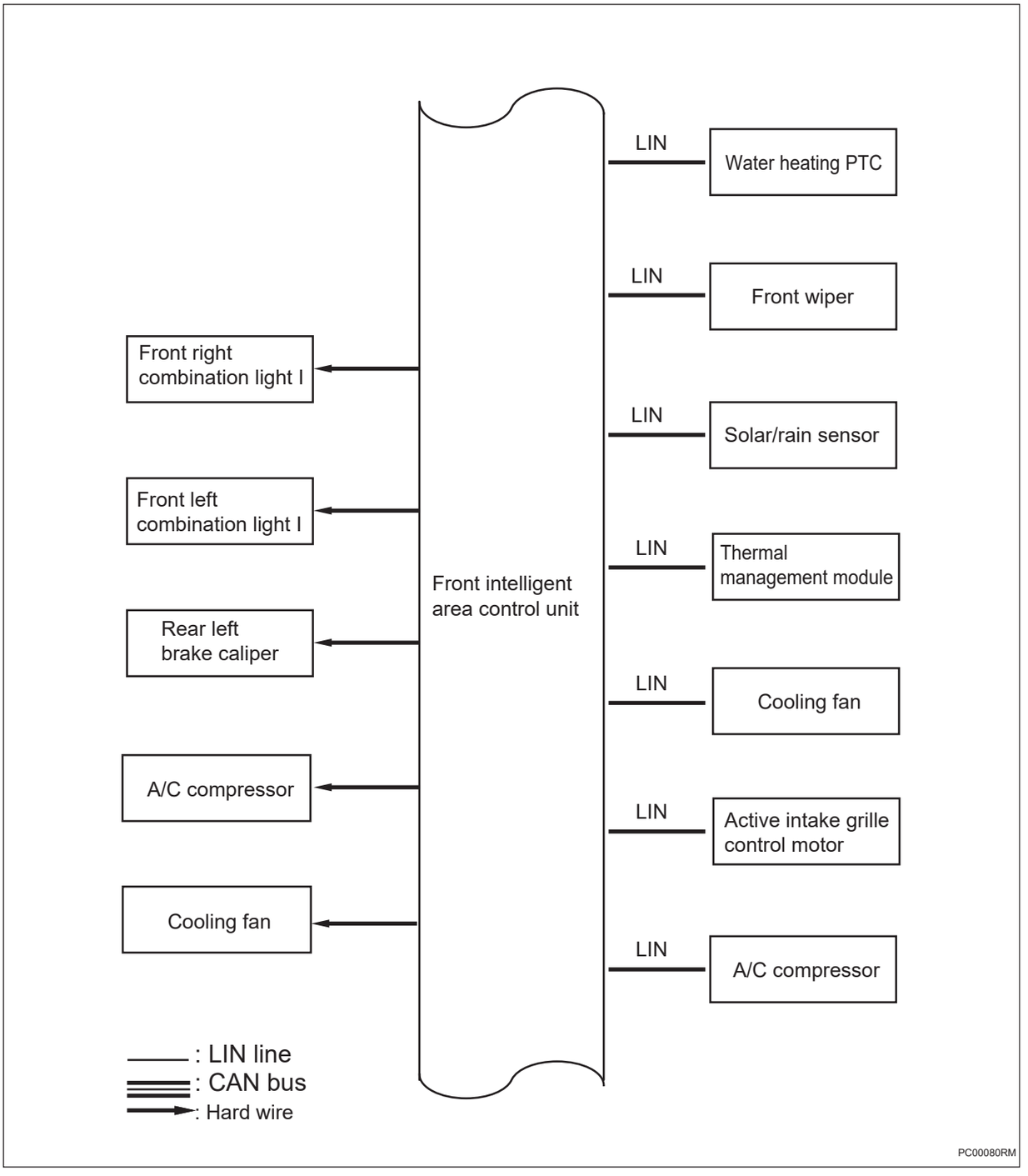


System diagram



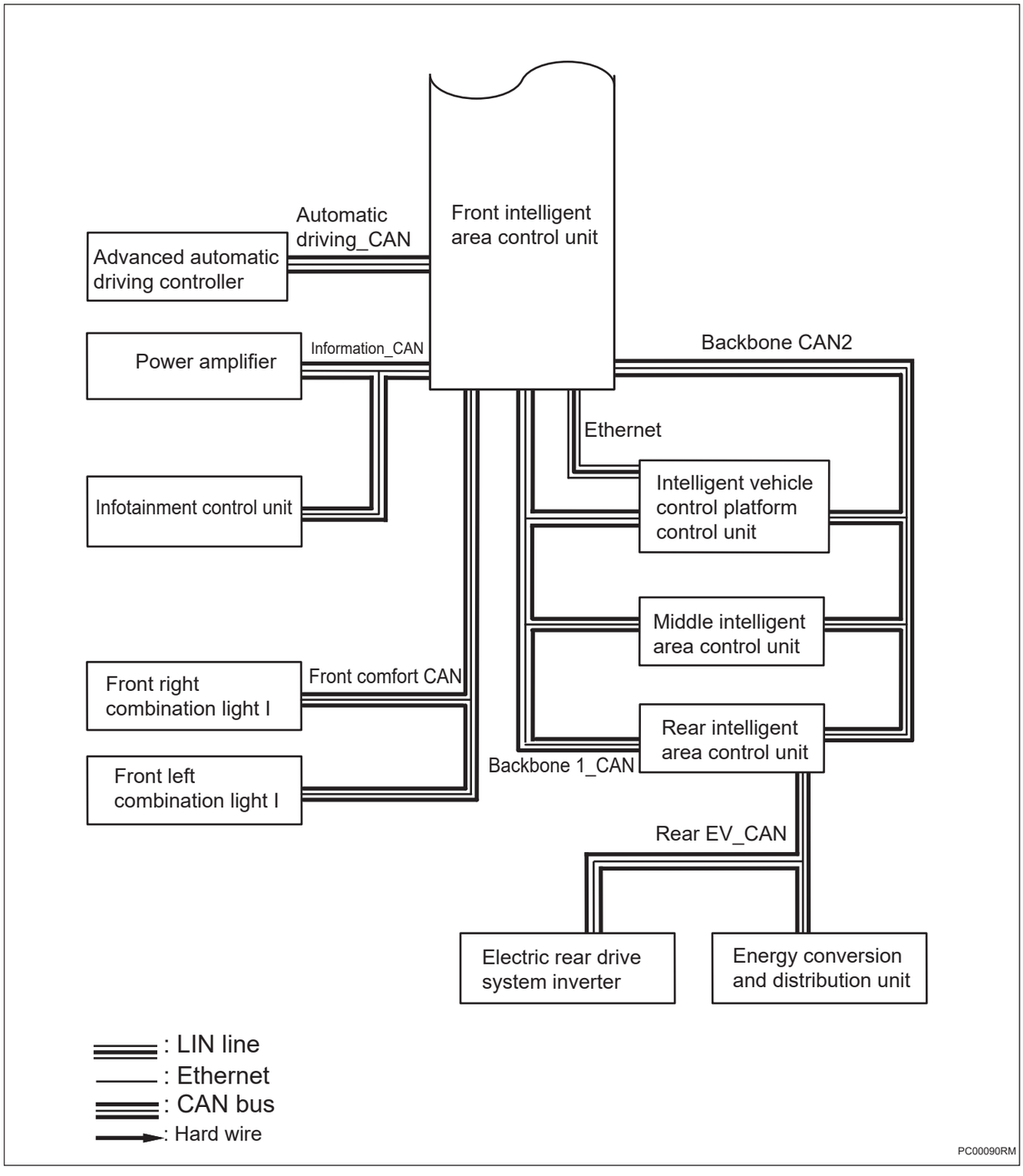
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System diagram



ZD

System diagram



System description

1. System function and composition

(a) PDC is mainly responsible for sensor signal collection, actuator driving, regional data routing, and regional power supply distribution.

(b) The vehicle is equipped with three intelligent area control units, namely, front intelligent area control unit, middle intelligent area control unit and rear intelligent area control unit.

(c) The front intelligent area control unit is mainly responsible for driving, signal collection, data routing and power supply distribution of related loads such as air conditioning and vehicle comfort.

(d) The middle intelligent area control unit is mainly responsible for driving, signal collection, data acquisition and power supply distribution of related loads such as air conditioning and vehicle comfort.

(e) The rear intelligent area control unit is mainly responsible for driving, signal collection, data routing and power supply distribution of related loads such as chassis and vehicle comfort.

2. Intelligent power distribution management

(a) PDC needs to meet the requirements of power supply mode management and achieve on-demand power distribution.

(b) PDC integrated power distribution module can realize different ECU demanded power distribution according to functional scenarios. According to scenario requirements, the power is only supplied to specified ECUs in a certain time sequence and can be woken up by network segments. After the function is complete, the network segment sleeps in time and the power distribution is cut off, so that energy consumption is minimized. For example, when power battery is charged, the power is only supplied to ECU (BMS, PDC I, CSC, DCDC, etc.) according to identified charging scenarios. After charging is finished, the network segment sleeps and the power is cut off.

3. Thermal management module function

(a) Thermal management module integrates functions of electric water pump, electric control water valve, expansion tank, intermediate heat exchanger, and water-cooled condenser.

Data parameter

Front intelligent area control unit

Item	Maximum	OK	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	—	80	—

Water heating PTC (high voltage)

Item	Maximum	Normal	Minimum
Operating voltage (V)	550	350	210
Operating current (A)	30	15.7	15.7

Water heating PTC

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.16	0.13	0.1

Cooling fan

Item	Maximum	Normal	Minimum
Operating voltage (V)	18	13.5	8
Operating current (A)	38	31.7	5

A/C compressor (low voltage)

Item	Maximum	Normal	Minimum
Operating voltage (V)	18	12	8
Operating current (A)	0.5	—	—

A/C compressor (high voltage)

Item	Maximum	Normal	Minimum
Operating voltage (V)	521	288	200
Operating current (A)	25	14	0

Front wiper

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	6.5	3.3	⩽ 55

Front combination light I

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	13.23	5.30	4.46

Washer pump

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	5.5	4	—

Washer fluid level sensor

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	—	50 μA	—
Operating resistance (kΩ)	More than 10 KΩ	The resistance is 10 kΩ ~ 2 MΩ X when there is washer fluid, and the resistance value is close to infinity when there is no washer fluid	—

Rear left brake caliper

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	12	6	—

Active intake grille control motor

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	0.4	0.35	0.0001

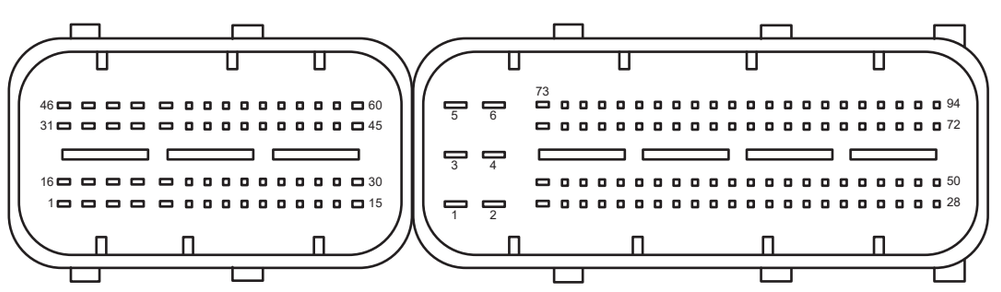
Front compartment cover lock status switch

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	2	100 mA	5 mA

Outside temperature sensor

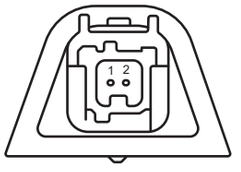
Item	Maximum	Normal	Minimum
Operating voltage (V)	—	5	—
Operating current (A)	—	—	—

ECU terminal



Front intelligent area control unit C

Front intelligent area control unit B



Front intelligent area control unit E

PC00050RM

Front intelligent area control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	Ground	31	High pitched horn (mechanical) - HSD
2	—	32	—
3	—	33	Pressure/temperature sensor power supply (multiple), electronic expansion valve power supply (multiple)
4	Front windshield local heater 1 (L2.9 DJI trinocular camera)	34	—
5	—	35	—
6	Electric water valve 1 (heater) HBD+	36	—

Front intelligent area control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
7	Electric water valve 1 (heater) HBD-	37	—
8	Electric water valve 2 (battery cooling) HBD+	38	CANFD3 H (including IBC, EPS, RWS)
9	Electric water valve 2 (battery cooling) HBD-	39	—
10	Ultrasonic radar communication (FLS/FLC/FLM)	40	—
11	Ultrasonic radar communication (FRM/FRC/FRS)	41	Outside temperature sensor for A/C pipe
12	Ultrasonic radar communication (RLS/RLC/RLM)	42	PT-H1-T signal
13	Ultrasonic radar communication (RRM/RRC/RRS)	43	—
14	Outside temperature sensor simulation collection	44	—
15	—	45	—
16	—	46	Low pitched horn (mechanical) - HSD
17	—	47	Ground
18	—	48	Water pump 3 (heater water pump) power distribution (60 w/80 w)
19	—	49	Water pump 1 (motor water pump) power distribution (110 w)
20	—	50	Water pump 2 (battery water pump) power distribution (110 w)
21	Ultrasonic radar power supply (FLC/FRC/RLC/RRC)	51	—
22	Ultrasonic radar power supply (FLS/FRM/RLS/RRM)	52	—
23	—	53	CANFD3 L (including IBC, EPS, RWS, diagnosis refresh CAN)
24	—	54	—
25	—	55	A/C compressor LIN node power distribution
26	High voltage interlock PWM collection	56	—
27	High voltage interlock PWM output	57	—
28	—	58	—
29	Front compartment cover lock microswitch 1 digital collection	59	—
30	—	60	—

Front intelligent area control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	Front combination light driver 1 assembly (left) - power supply	48	CANFD6 H (backbone network CAN2)
2	Front combination light driver 2 assembly (right) - power supply	49	CANFD7 Hi(CSC/Info)
3	Left EPB electronic caliper- (releasing direction)	50	CANFD8 Hi(HAD/ADAS)
4	Left EPB electronic caliper+ (clamping direction)	51	Front washer fluid pump HBD+
5	VDC power distribution	52	Electric water valve 1 (heater) sensor collection
6	Ground	53	Electric water valve 2 (battery cooling) sensor collection
7	—	54	PT-H1-P signal
8	—	55	PT-H2-P signal
9	—	56	PT-L2-P signal
10	—	57	—
11	—	58	Washer fluid level sensor simulation collection 1
12	SOV valve 1 HSD	59	—
13	—	60	—
14	Front LOGO light power supply	61	PT-H2-T signal
15	SOV valve 2 HSD	62	—
16	—	63	—
17	—	64	High pressure water heating heater (HVCH) power distribution
18	—	65	—
19	—	66	—
20	—	67	—
21	—	68	—
22	-	69	—
23	—	70	—
24	—	71	—
25	—	72	—
26	CANFD6 L (backbone network CAN2)	73	Front washer fluid pump HBD
27	CANFD7 Lo(CSC/Info)	74	—
28	CANFD8 Lo(HAD/ADAS)	75	Compressor outlet exhaust temperature sensor
29	Electronic wiper control power distribution	76	—
30	—	77	—
31	IG hard wire signal KL15 signal	78	—

Front intelligent area control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
32	Ultrasonic radar power supply (FLM/FRS/RLM/RRS)	79	—
33	Left active intake grille and right active intake grille power distribution	80	—
34	—	81	—
35	—	82	—
36	Sensor ground	83	—
37	Sensor 5 V power supply	84	LIN2(ECP_2/ECP_3/HVCH/EXV_2)
38	PT-L2-T signal	85	LIN3(AGS/Compressor/ECF/ECP_1/EXV_1/EXV_3)
39	Coolant temperature sensor 1 (motor) simulation collection	86	LIN4 (WMM/RLS)
40	Coolant temperature sensor 2 (battery) simulation collection	87	—
41	Coolant temperature sensor 3 (heater) simulation collection	88	—
42	—	89	—
43	—	90	—
44	—	91	—
45	—	92	—
46	CAN5 H (Lamp_FL/LampFR)	93	CANFD1 H (backbone network CAN)
47	CAN5 L (Lamp_FL/LampFR)	94	CANFD1 L (backbone network CAN)

Front intelligent area control unit E			
Pin number	**Definition**	**Pin number**	**Definition**
1	VDC_ETH1_N	2	VDC_ETH1_P

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B20A200	Short to ground in RMR sensor signal circuit	(See page ZD-128)
B20A300	Open in RMR sensor signal circuit	(See page ZD-128)
B20A400	RMR sensor residual vibration fault	(See page ZD-128)
B20A500	RMR sensor internal fault	(See page ZD-128)
B20A600	RMR sensor covered	(See page ZD-128)
B20A700	Short to power supply in RMR sensor signal circuit	(See page ZD-128)
B20A800	RMR sensor power supply voltage fault	(See page ZD-128)
B20A900	Short to ground in RMR sensor power supply	(See page ZD-128)
B20AA00	Short to battery in RMR sensor power supply	(See page ZD-128)

DTC	Detection Items	See page
B20AB00	Short to ground in RML sensor signal circuit	(See page ZD-135)
B20AC00	Open in RML sensor signal circuit	(See page ZD-135)
B20AD00	RML sensor residual vibration fault	(See page ZD-135)
B20AE00	RML sensor internal fault	(See page ZD-135)
B20AF00	RML sensor covered	(See page ZD-135)
B20B000	Short to power supply in RML sensor signal circuit	(See page ZD-135)
B20B100	RML sensor power supply voltage fault	(See page ZD-135)
B20B200	Short to ground in RML sensor power supply	(See page ZD-135)
B20B300	Short to battery in RML sensor power supply	(See page ZD-135)
B20B400	Short to ground in RL sensor signal circuit	(See page ZD-143)
B20B500	Open in RL sensor signal circuit	(See page ZD-143)
B20B600	RL sensor residual vibration fault	(See page ZD-143)
B20B700	RL sensor internal fault	(See page ZD-143)
B20B800	RL sensor covered	(See page ZD-143)
B20B900	Short to power supply in RL sensor signal circuit	(See page ZD-143)
B20BA00	RL sensor power supply voltage fault	(See page ZD-143)
B20BB00	Short to ground in RL sensor power supply	(See page ZD-143)
B20BC00	Short to battery in RL sensor power supply	(See page ZD-143)
B20BD00	Short to ground in RLS sensor signal circuit	(See page ZD-151)
B20BE00	Open in RLS sensor signal circuit	(See page ZD-151)
B20BF00	RLS sensor residual vibration fault	(See page ZD-151)
B20C000	RLS sensor internal fault	(See page ZD-151)
B20C100	RLS sensor covered	(See page ZD-151)
B20C200	Short to power supply in RLS sensor signal circuit	(See page ZD-151)
B20C300	RLS sensor power supply voltage fault	(See page ZD-151)
B20C400	Short to ground in RLS sensor power supply	(See page ZD-151)
B20C500	Short to battery in RLS sensor power supply	(See page ZD-151)
B201E90	Wiper fault	(See page ZD-29)
B205A00	Short to ground in FLS sensor signal circuit	(See page ZD-66)
B205B00	Open in FLS sensor signal circuit	(See page ZD-66)
B205C00	FLS sensor residual vibration fault	(See page ZD-66)
B205D00	FLS sensor internal fault	(See page ZD-66)
B205E00	FLS sensor covered	(See page ZD-66)

DTC	Detection Items	See page
B205F00	Short to power supply in FLS sensor signal circuit	(See page ZD-66)
B206000	FLS sensor power supply voltage fault	(See page ZD-66)
B206100	Short to ground in FLS sensor power supply	(See page ZD-66)
B206200	Short to battery in FLS sensor power supply	(See page ZD-66)
B206C00	Short to ground in FML sensor signal circuit	(See page ZD-80)
B206D00	Open in FML sensor signal circuit	(See page ZD-80)
B206E00	FML sensor residual vibration fault	(See page ZD-80)
B206F00	FML sensor internal fault	(See page ZD-80)
B207000	FML sensor covered	(See page ZD-80)
B207100	Short to power supply in FML sensor signal circuit	(See page ZD-80)
B207200	FML sensor power supply voltage fault	(See page ZD-80)
B207300	Short to ground in FML sensor power supply	(See page ZD-80)
B207400	Short to battery in FML sensor power supply	(See page ZD-80)
B207E00	Short to ground in FR sensor signal circuit	(See page ZD-96)
B207F00	Open in FR sensor signal circuit	(See page ZD-96)
B208000	FR sensor residual vibration fault	(See page ZD-96)
B208100	FR sensor internal fault	(See page ZD-96)
B208200	FR sensor covered	(See page ZD-96)
B208300	Short to power supply in FR sensor signal circuit	(See page ZD-96)
B208400	FR sensor power supply voltage fault	(See page ZD-96)
B208500	Short to ground in FR sensor power supply	(See page ZD-96)
B208600	Short to battery in FR sensor power supply	(See page ZD-96)
B203111	Short to ground fault in IG hard wire signal KL15	(See page ZD-35)
B203112	Short to power supply fault in IG hard wire signal KL15	(See page ZD-35)
B203211	Short to ground in electronic wiper power distribution	(See page ZD-38)
B203311	Short to ground in high pitched horn (mechanical)	(See page ZD-42)
B203312	Short to power supply in high pitched horn (mechanical)	(See page ZD-42)
B203411	Short to ground in low pitched horn (mechanical)	(See page ZD-46)
B203412	Short to power supply in low pitched horn (mechanical)	(See page ZD-46)
B203811	Short to ground in front combination light driver 1 assembly (left) - power supply	(See page ZD-51)

DTC	Detection Items	See page
B204311	Short to ground in front windshield heater 1	(See page ZD-55)
B204312	Short to power supply in front windshield heater 1	(See page ZD-55)
B204313	Open in front windshield heater 1	(See page ZD-55)
B204511	Short to ground in front washer fluid pump	(See page ZD-60)
B204512	Short to power supply in front washer fluid pump	(See page ZD-60)
B204513	Open in front washer fluid pump	(See page ZD-60)
B206300	Short to ground in FL sensor signal circuit	(See page ZD-73)
B206400	Open in FL sensor signal circuit	(See page ZD-73)
B206500	FL sensor residual vibration fault	(See page ZD-73)
B206600	FL sensor internal fault	(See page ZD-73)
B206700	FL sensor covered	(See page ZD-73)
B206800	Short to power supply in FL sensor signal circuit	(See page ZD-73)
B206900	FL sensor power supply voltage fault	(See page ZD-73)
B206A00	Short to ground in FL sensor power supply	(See page ZD-73)
B206B00	Short to battery in FL sensor power supply	(See page ZD-73)
B207500	Short to ground in FMR sensor signal circuit	(See page ZD-88)
B207600	Open in FMR sensor signal circuit	(See page ZD-88)
B207700	FMR sensor residual vibration fault	(See page ZD-88)
B207800	FMR sensor internal fault	(See page ZD-88)
B207900	FMR sensor covered	(See page ZD-88)
B207A00	Short to power supply in FMR sensor signal circuit	(See page ZD-88)
B207B00	FMR sensor power supply voltage fault	(See page ZD-88)
B207C00	Short to ground in FMR sensor power supply	(See page ZD-88)
B207D00	Short to battery in FMR sensor power supply	(See page ZD-88)
B208700	Short to ground in FRS sensor signal circuit	(See page ZD-103)
B208800	Open in FRS sensor signal circuit	(See page ZD-103)
B208900	FRS sensor residual vibration fault	(See page ZD-103)
B208A00	FRS sensor internal fault	(See page ZD-103)
B208B00	FRS sensor covered	(See page ZD-103)
B208C00	Short to power supply in FRS sensor signal circuit	(See page ZD-103)
B208D00	FRS sensor power supply voltage fault	(See page ZD-103)
B208E00	Short to ground in FRS sensor power supply	(See page ZD-103)

DTC	Detection Items	See page
B208F00	Short to battery in FRS sensor power supply	(See page ZD-103)
B209000	Short to ground in RRS sensor signal circuit	(See page ZD-111)
B209100	Open in RRS sensor signal circuit	(See page ZD-111)
B209200	RRS sensor residual vibration fault	(See page ZD-111)
B209300	RRS sensor internal fault	(See page ZD-111)
B209400	RRS sensor covered	(See page ZD-111)
B209500	Short to power supply in RRS sensor signal circuit	(See page ZD-111)
B209600	RRS sensor power supply voltage fault	(See page ZD-111)
B209700	Short to ground in RRS sensor power supply	(See page ZD-111)
B209800	Short to battery in RRS sensor power supply	(See page ZD-111)
B209900	Short to ground in RR sensor signal circuit	(See page ZD-120)
B209A00	Open in RR sensor signal circuit	(See page ZD-120)
B209B00	RR sensor residual vibration fault	(See page ZD-120)
B209C00	RR sensor internal fault	(See page ZD-120)
B209D00	RR sensor covered	(See page ZD-120)
B209E00	Short to power supply in RR sensor signal circuit	(See page ZD-120)
B209F00	RR sensor power supply voltage fault	(See page ZD-120)
B20A000	Short to ground in RR sensor power supply	(See page ZD-120)
B20A100	Short to battery in RR sensor power supply	(See page ZD-120)
C207410	EPB caliper motor circuit fault (open)	(See page ZD-158)
C207510	EPB caliper motor circuit fault (short to ground)	(See page ZD-158)
C207610	EPB caliper motor circuit fault (short to power supply)	(See page ZD-158)
C210046	Power supply voltage low (total)	(See page ZD-163)
C210047	Power supply overvoltage (total)	(See page ZD-163)
C210A17	PMIC chip QT1 power supply overvoltage fault	(See page ZD-167)
C211117	PMIC chip QUC overvoltage fault	(See page ZD-167)
P300A90	Electric compressor A/C system abnormal	(See page ZD-178)
P300B90	A/C compressor feedback fault	(See page ZD-179)
P300C90	Cooling fan voltage fault	(See page ZD-183)
P300D90	Cooling fan overtemperature fault	(See page ZD-183)
P300E90	Cooling fan hardware fault	(See page ZD-183)
P300F90	Cooling fan blocked fault	(See page ZD-183)

DTC	Detection Items	See page
P301090	Cooling fan overcurrent fault	(See page ZD-183)
P301B90	Heater water pump voltage fault	(See page ZD-205)
P301C90	Heater water pump overtemperature fault	(See page ZD-205)
P301D90	Heater water pump hardware fault	(See page ZD-205)
P301E90	Heater water pump blocked fault	(See page ZD-205)
P301F90	Heater water pump idling fault	(See page ZD-205)
P307011	Short to ground in water pump 3 (heater water pump) power distribution	(See page ZD-205)
P305E13	Short to ground in PT_H1_T acquisition	(See page ZD-234)
P305E11	Short to power supply/open in PT_H1_T acquisition	(See page ZD-234)
P305E12	Short to ground in PT_H1_P acquisition	(See page ZD-234)
P305E19	Short to power supply/open in PT_H1_P acquisition	(See page ZD-234)
P305E1A	Short to ground in PT_H2_T acquisition	(See page ZD-241)
P305E1B	Short to power supply/open in PT_H2_T acquisition	(See page ZD-241)
P305E1C	Short to ground in PT_H2_P acquisition	(See page ZD-241)
P305F13	Short to power supply/open in PT_H2_P acquisition	(See page ZD-241)
P305A11	Short to ground in outside temperature sensor simulation acquisition	(See page ZD-274)
B205211	Outside temperature sensor simulation acquisition rationality fault	(See page ZD-274)
P307D11	Short to power supply/open in outside temperature sensor simulation acquisition	(See page ZD-274)
P305B11	Short to ground in water-cooled condenser inlet temperature sensor simulation acquisition (exhaust temperature sensor at outlet of compressor)/refrigerant temperature sensor 1	(See page ZD-279)
P307E11	Short to power supply/open in water-cooled condenser inlet temperature sensor simulation acquisition (exhaust temperature sensor at outlet of compressor)/refrigerant temperature sensor 1	(See page ZD-279)
P305C13	Open in electric water valve 1	(See page ZD-283)
P305C11	Short to ground in electric water valve 1	(See page ZD-283)
P305C12	Short to power supply in electric water valve 1	(See page ZD-283)
P305C19	Electric water valve 1 overcurrent fault	(See page ZD-283)
P305C1A	Electric water valve 1 initialization fault	(See page ZD-283)
P305C1B	Electric water valve 1 blocked fault	(See page ZD-283)
P305C1C	Electric water valve 1 internal (chip) fault	(See page ZD-283)

DTC	Detection Items	See page
P305D13	Open in electric water valve 2	(See page ZD-290)
P305D11	Short to ground in electric water valve 2	(See page ZD-290)
P305D12	Short to power supply in electric water valve 2	(See page ZD-290)
P305D19	Electric water valve 2 overcurrent fault	(See page ZD-290)
P305D1A	Electric water valve 2 initialization fault	(See page ZD-290)
P305D1B	Electric water valve 2 blocked fault	(See page ZD-290)
P305D1C	Electric water valve 2 internal (chip) fault	(See page ZD-290)
P300190	A/C compressor overvoltage fault	(See page ZD-168)
P300290	Electric compressor high voltage abnormal	(See page ZD-169)
P300390	A/C compressor overtemperature fault	(See page ZD-170)
P300490	Short in A/C compressor internal fault_ electric compressor output	(See page ZD-171)
P300590	Open in A/C compressor internal fault_ electric compressor output	(See page ZD-171)
P300690	A/C compressor internal fault_electric compressor overload	(See page ZD-173)
P300790	A/C compressor temperature sensor fault	(See page ZD-174)
P300890	A/C compressor current sensor fault	(See page ZD-175)
P300990	A/C compressor CPU fault	(See page ZD-177)
P301190	Motor water pump voltage fault	(See page ZD-191)
P301290	Motor water pump overtemperature fault	(See page ZD-191)
P301390	Motor water pump hardware fault	(See page ZD-191)
P301490	Motor water pump blocked fault	(See page ZD-191)
P301590	Motor water pump idling fault	(See page ZD-191)
P306E11	Short to ground in water pump 1 (motor water pump) power distribution	(See page ZD-191)
P301690	Battery water pump voltage fault	(See page ZD-198)
P301790	Battery water pump overtemperature fault	(See page ZD-198)
P301890	Battery water pump hardware fault	(See page ZD-198)
P301990	Battery water pump blocked fault	(See page ZD-198)
P301A90	Battery water pump idling fault	(See page ZD-198)
P306F11	Short to ground in water pump 2 (battery water pump) power distribution	(See page ZD-198)
P302090	Electronic expansion valve 1 feedback fault	(See page ZD-213)
P302190	Electronic expansion valve 1 coil fault	(See page ZD-213)
P302290	Electronic expansion valve 1 voltage fault	(See page ZD-213)
P302390	Electronic expansion valve 1 overtemperature fault	(See page ZD-213)
P302490	Electronic expansion valve 2 feedback fault	(See page ZD-220)

DTC	Detection Items	See page
P302590	Electronic expansion valve 2 coil fault	(See page ZD-220)
P302690	Electronic expansion valve 2 voltage fault	(See page ZD-220)
P302790	Electronic expansion valve 2 overtemperature fault	(See page ZD-220)
P302890	Electronic expansion valve 3 feedback fault	(See page ZD-227)
P302990	Electronic expansion valve 3 coil fault	(See page ZD-227)
P302A90	Electronic expansion valve 3 voltage fault	(See page ZD-227)
P302B90	Electronic expansion valve 3 overtemperature fault	(See page ZD-227)
P305F11	Short to ground in PT_L1_T acquisition	(See page ZD-297)
P305F12	Short to power supply/open in PT_L1_T acquisition	(See page ZD-297)
P305F19	Short to ground in PT_L2_T acquisition	(See page ZD-248)
P305F1A	Short to power supply/open in PT_L2_T acquisition	(See page ZD-248)
P305F1B	Short to ground in PT_L2_P acquisition	(See page ZD-248)
P305F1C	Short to power supply/open in PT_L2_P acquisition	(See page ZD-248)
P303890	Active intake grille over-rotation fault	(See page ZD-254)
P303990	Active intake grille blocked fault	(See page ZD-254)
P303A90	Active intake grille electrical fault	(See page ZD-254)
P303B90	Active intake grille undervoltage fault	(See page ZD-254)
P303C90	Active intake grille overvoltage fault	(See page ZD-254)
P303D90	Active intake grille overtemperature fault	(See page ZD-254)
P306811	Short to ground in left active intake grille + right active intake grille power distribution	(See page ZD-254)
P305711	Short to ground in coolant temperature sensor 1 (motor) simulation acquisition	(See page ZD-262)
P307A11	Short to power supply/open in coolant temperature sensor 1 (motor) simulation acquisition	(See page ZD-262)
P305811	Short to ground in coolant temperature sensor 2 (battery) simulation acquisition	(See page ZD-266)
P307B11	Short to power supply/open in coolant temperature sensor 2 (battery) simulation acquisition	(See page ZD-266)
P305911	Short to ground in coolant temperature sensor 3 (heater) simulation acquisition	(See page ZD-270)
P307C11	Short to power supply/open in coolant temperature sensor 3 (heater) simulation acquisition	(See page ZD-270)
P306011	Short to ground fault in SOV valve 1	(See page ZD-301)
P306012	Short to power supply fault in SOV valve 1	(See page ZD-301)

DTC	Detection Items	See page
P306013	Open fault in SOV valve 1	(See page ZD-301)
P306111	Short to ground fault in SOV valve 2	(See page ZD-305)
P306112	Short to power supply fault in SOV valve 2	(See page ZD-305)
P306113	Open fault in SOV valve 2	(See page ZD-305)
P306611	Short to ground fault in A/C compressor LIN node power distribution	(See page ZD-310)
P306711	Short to ground fault in high voltage water heater (HVCH) power distribution	(See page ZD-314)
P307311	Short to ground fault in PDCF high voltage interlock	(See page ZD-318)
P307312	Short to power supply fault in PDCF high voltage interlock	(See page ZD-318)
P307313	Open fault in PDCF high voltage interlock	(See page ZD-318)
B205019	VDC electronic fuse overload	(See page ZD-349)
B205011	Short to ground in VDC electronic fuse	(See page ZD-349)
B20501A	VDC electronic fuse MOS saturation shutdown	(See page ZD-349)
B20501B	VDC electronic fuse unable to enter sleep	(See page ZD-349)
B20501C	VDC electronic fuse MOS stuck	(See page ZD-349)
B20501D	VDC electronic fuse overtemperature	(See page ZD-349)
B20501E	VDC electronic fuse SPI communication fault	(See page ZD-349)
C205E10	EPB switch acquisition error	(See page ZD-351)
C205F10	EPB switch stuck	(See page ZD-351)
C206010	Overtemperature fault in switch identification part of EPB driver chip	(See page ZD-351)
C206116	EPB pre-drive chip power supply undervoltage fault	(See page ZD-351)
C206117	EPB pre-drive chip power supply overvoltage fault	(See page ZD-351)
C206210	EPB pre-drive chip internal reset fault	(See page ZD-351)
C206310	EPB pre-drive chip internal crystal oscillator fault	(See page ZD-351)
C206410	EPB pre-drive chip internal initialization configuration and self-check fault	(See page ZD-351)
C206510	EPB pre-drive chip internal charge pump fault	(See page ZD-351)
C206610	EPB pre-drive chip watchdog fault	(See page ZD-351)
C206710	EPB pre-drive chip overtemperature fault	(See page ZD-351)
C206810	EPB pre-drive chip charge pump undervoltage fault	(See page ZD-351)
C206919	EPB pre-drive chip detected overcurrent fault	(See page ZD-351)

DTC	Detection Items	See page
C206A10	EPB pre-drive chip detected abnormal H-bridge high and low side MOSFET	(See page ZD-351)
C206B10	SPI communication failure between EPB MCU and pre-drive chip	(See page ZD-351)
C206C10	Communication interrupted between EPB pre-drive chip and MCU SPI	(See page ZD-351)
C206D10	SPI communication address check failure fault between MCU and pre-drive chip	(See page ZD-351)
C206E10	MCU SPI transmission failure	(See page ZD-351)
C206F10	Pre-drive chip detected sampling synchronization fault	(See page ZD-351)
C207010	EPB MCU detects pre-drive chip sampling synchronization signal detection function abnormality fault	(See page ZD-351)
C207110	EPB current sampling consistency fault	(See page ZD-351)
C207210	EPB pre-drive chip sampling stuck fault	(See page ZD-351)
C207310	EPB pre-drive chip ADC conversion failure fault	(See page ZD-351)
C207710	EPB H-bridge shutdown bridge arm voltage abnormal fault	(See page ZD-351)
C207810	EPB drive circuit or actuator fault	(See page ZD-351)
C207910	EPB detects abnormal current fault when motor is not driven	(See page ZD-351)
C207A10	EPB drive anti-reversion open fault	(See page ZD-351)
C207B10	EPB drive anti-reversion rationality fault	(See page ZD-351)
C207C10	SPI communication CRC check failure between EPB pre-drive chip and MCU	(See page ZD-351)
C207D10	EPB current sampling offset calculation not completed for a long time	(See page ZD-351)
C207E10	EPB pre-drive chip self-check timeout fault	(See page ZD-351)
C208011	EPB caliper motor overcurrent fault (software protection)	(See page ZD-351)
C208111	HSB and PBC request clamping conflict failure	(See page ZD-351)
C208211	HSB and PBC request releasing conflict failure	(See page ZD-351)
C208311	HSB does not allow caliper action failure	(See page ZD-351)
C208411	External shutdown EPB H-bridge fault	(See page ZD-351)
C200100	EPB-HOST response error - left	(See page ZD-351)
C200200	EPB - no brake disc - left	(See page ZD-351)
C200300	EPB - motor stuck - left	(See page ZD-351)
C200400	EPB - clamping force insufficient - left	(See page ZD-351)
C200500	EPB - unloaded current too high - left	(See page ZD-351)
C200600	EPB - actuator damaged - left	(See page ZD-351)

DTC	Detection Items	See page
C200700	EPB - caliper status inconsistent or unknown - left	(See page ZD-351)
C200A00	Host not available - left	(See page ZD-351)
C200B00	EPB - excessive current fluctuation - left	(See page ZD-351)
C201100	EPB - invalid data storage area - left	(See page ZD-351)
C201400	EPB - dynamic anti-lock brake failure - left	(See page ZD-351)
C200800	EPB - abnormal voltage during operation - left	(See page ZD-367)
C200C00	EPB - power supply voltage too low - left	(See page ZD-367)
C200D00	EPB - power supply voltage too high - left	(See page ZD-367)
C200900	EPB - maintenance mode - left	(See page ZD-369)
C200F00	EPB - wheel speed signal error - left	(See page ZD-449)
C201000	EPB - abnormal power off - left	(See page ZD-370)
C201200	EPB - excessive gradient - left	(See page ZD-371)
C201300	EPB - configuration code error - left	(See page ZD-372)
C211800	Low power supply voltage (SR power grid)	(See page ZD-372)
C211900	Power supply overvoltage (SR power grid)	(See page ZD-372)
C211A00	Low power supply voltage (QM power grid)	(See page ZD-372)
C211B00	Power supply overvoltage (QM power grid)	(See page ZD-372)
P306B11	Short to ground fault in PT sensor/TXV power supply terminal	(See page ZD-376)
B200900	Motor fault	(See page ZD-396)
B203911	Short to ground in front combination light driver 2 assembly (right) - power supply	(See page ZD-401)
C200E00	EPB - assembly inspection not completed - left	(See page ZD-448)
U008988	Backbone network 1 CAN bus off	(See page ZD-380)
U205187	Backbone network 2 CAN bus off	(See page ZD-380)
U014C87	HAD/IFC node lost	(See page ZD-386)
U114787	PDCM node lost	(See page ZD-386)
U014887	PDCR node lost	(See page ZD-386)
U014B87	VDC397 node lost	(See page ZD-386)
U014A87	VDC821 node lost	(See page ZD-386)
U14628A	PDCF backbone network Eth1 connection establishment failure	(See page ZD-392)
U204688	Information CAN bus off	(See page ZD-386)
U011B87	CSC node lost	(See page ZD-386)
U02DE87	Power amplifier controller node lost	(See page ZD-386)
U003788	Driving assist/extension CAN bus off	(See page ZD-380)

DTC	Detection Items	See page
U015287	VDC397F node lost	(See page ZD-386)
U011087	Motor control unit 1 node lost	(See page ZD-386)
U006488	Chassis 1 CAN bus off	(See page ZD-380)
U013187	Electric power steering control unit node lost	(See page ZD-386)
U012987	Integrated brake control unit node lost	(See page ZD-386)
U002888	Body/comfort CAN bus off	(See page ZD-380)
U02E387	Front left light controller node lost	(See page ZD-386)
U01E387	Front right light controller node lost	(See page ZD-386)
U103888	LIN2 physical bus error (WMM)	(See page ZD-440)
U103988	LIN3 physical bus error (TM_LIN1)	(See page ZD-444)
U103A88	LIN4 physical bus error (TM_LIN2)	(See page ZD-397)
U010287	A/C compressor node lost	(See page ZD-324)
U136086	A/C compressor communication error	(See page ZD-324)
U02F887	Active intake grille controller node lost	(See page ZD-339)
U131186	Active intake grille controller LIN communication error	(See page ZD-339)
U026087	Electronic cooling fan node lost	(See page ZD-334)
U136186	Electric cooling fan communication error	(See page ZD-334)
U026187	Electric cooling water pump 1 node lost	(See page ZD-410)
U136286	Electric cooling water pump 1 communication error	(See page ZD-410)
U026287	Electric cooling water pump 2 node lost	(See page ZD-415)
U136386	Electric cooling water pump 2 communication error	(See page ZD-415)
U026387	Electric cooling water pump 3 node lost	(See page ZD-420)
U136486	Electric cooling water pump 3 communication error	(See page ZD-420)
U023187	Solar/rain sensor node lost	(See page ZD-405)
U130086	Solar/rain sensor LIN communication error	(See page ZD-405)
U02FF87	Electric wiper module node lost	(See page ZD-344)
U130886	Electric wiper module LIN communication error	(See page ZD-344)
U026887	Electronic expansion valve 1 node lost	(See page ZD-425)
U139186	Electronic expansion valve 1 LIN communication error	(See page ZD-425)
U026987	Electronic expansion valve 2 node lost	(See page ZD-430)
U139286	Electronic expansion valve 2 LIN communication error	(See page ZD-430)
U026A87	Electronic expansion valve 3 node lost	(See page ZD-435)

DTC	Detection Items	See page
U139B86	Electronic expansion valve 3 LIN communication error	(See page ZD-435)
U020687	High voltage heater node lost	(See page ZD-329)
U136986	High voltage heater communication error	(See page ZD-329)

DTC B201E90 Wiper fault

Description

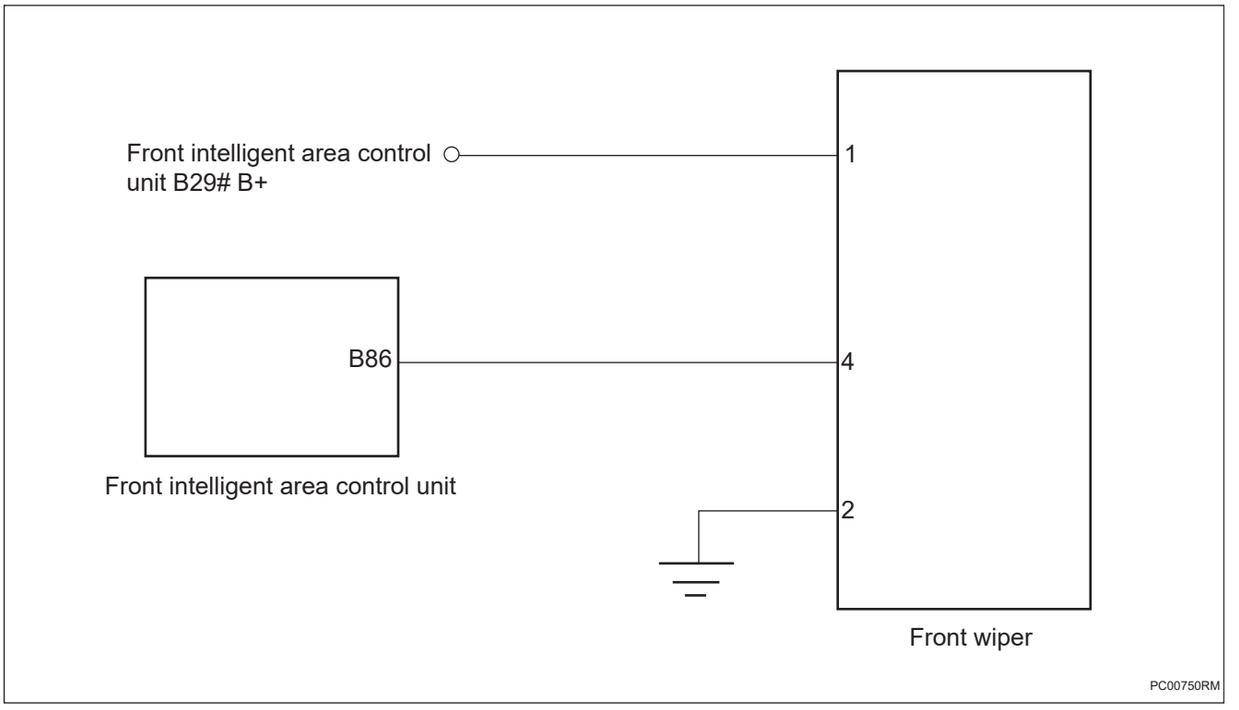
When front wiper is faulty, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B201E90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	WMMFaultSt = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Front wiper

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B201E90	• Wiper motor does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check front wiper**

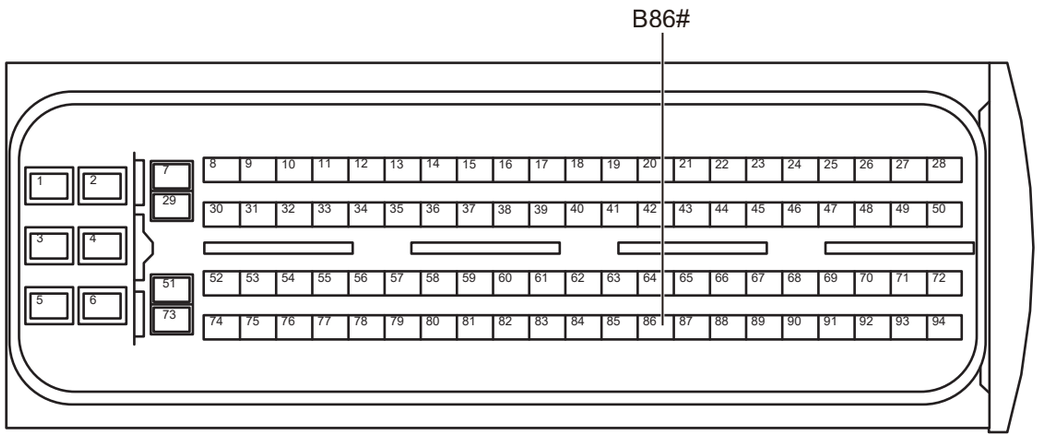
(a) Check front wiper mechanism for proper installation.

(b) Check front wiper mechanism for foreign objects.

NG → **Perform repair according to malfunction**

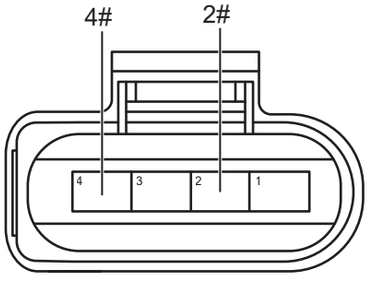
OK

2	**Check for open in front wiper wire harness and connector**



Front intelligent area control unit B connector

PC00631RM



Front wiper connector

PC00760RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front wiper connector.

(e) According to value in the table, measure resistance.

Standard value

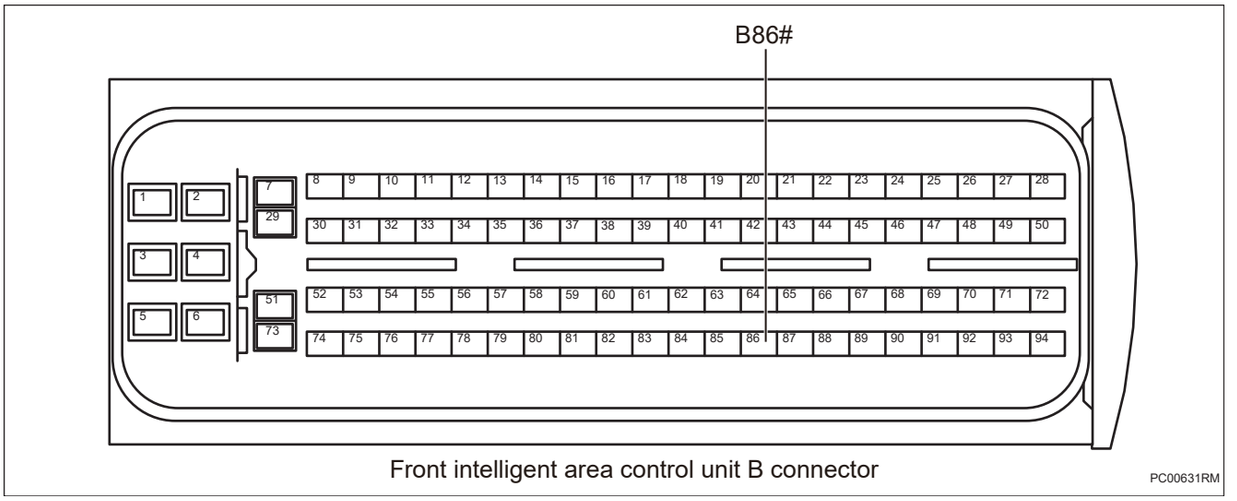
Multimeter connection	Detection condition	Specified condition
Front wiper connector 4# - front intelligent area control unit connector B86#	Always connected	Less than 1 Ω
Front wiper connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to ground in front wiper wire harness and connector



Front intelligent area control unit B connector

(a) According to value in the table, measure resistance.

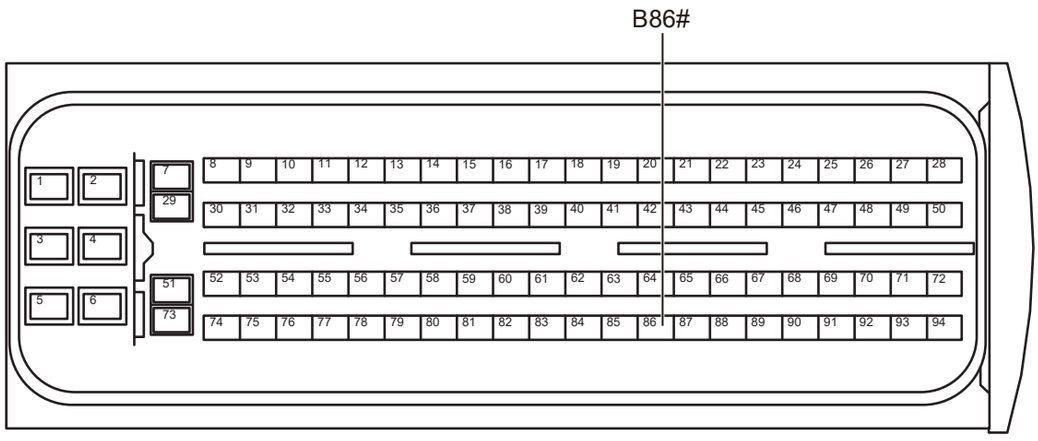
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

4	**Check for short to power supply in front wiper wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

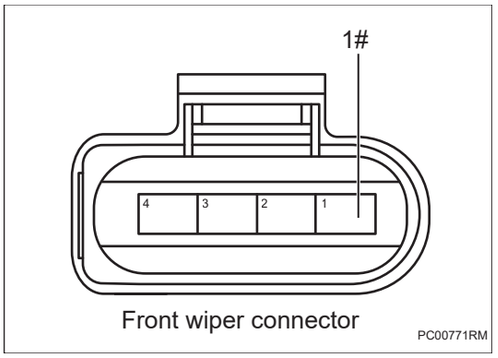
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Check front wiper power supply



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Front wiper connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace front wiper (See page WS-62)

(a) Replace the front wiper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B203111**	**Short to ground fault in IG hard wire signal KL15**
DTC	**B203112**	**Short to power supply fault in IG hard wire signal KL15**

Description

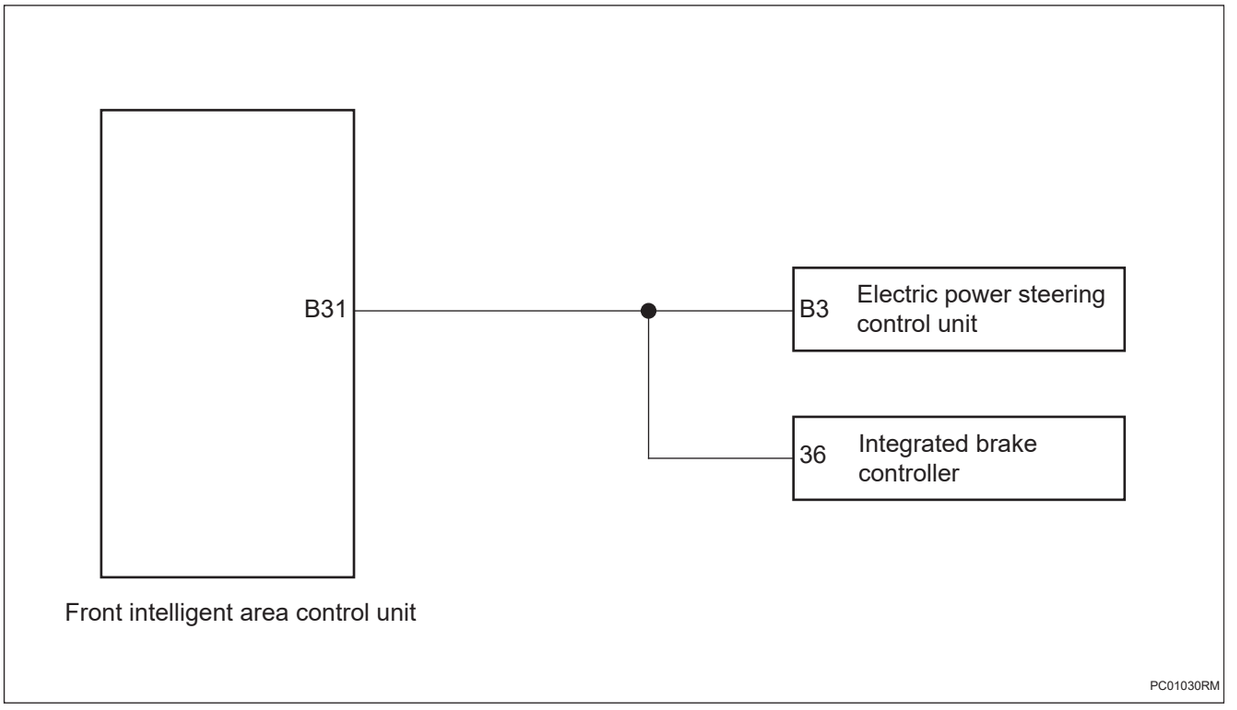
When there is short in IG hard wire signal circuit, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203111	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH38 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric power steering control unit • Integrated brake controller
B203112	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH38 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric power steering control unit • Integrated brake controller

Fault symptom

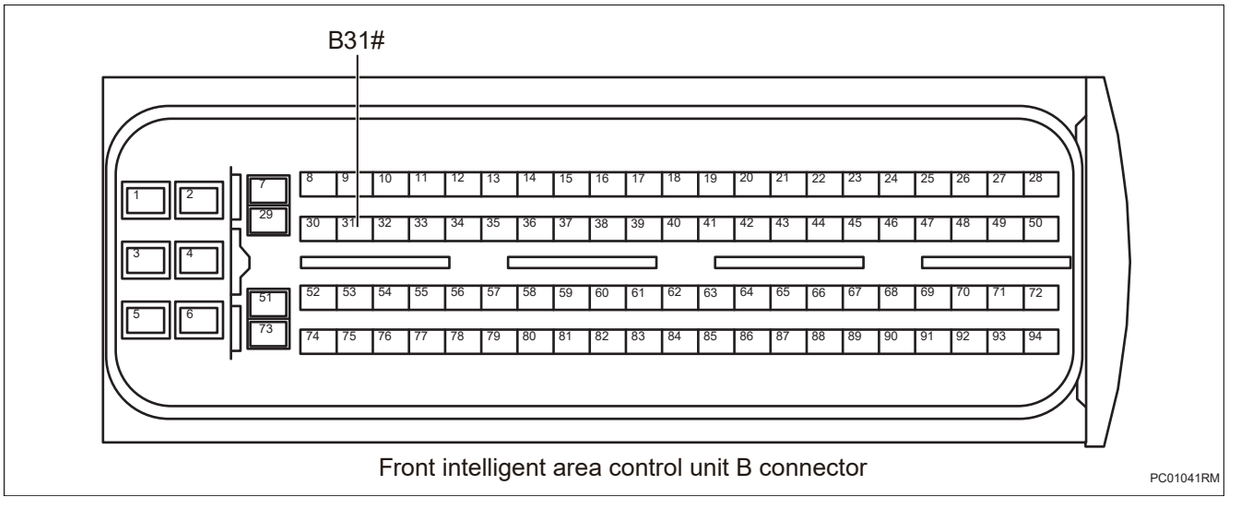
DTC No.	Fault symptom	Warning light/indicator
B203111	• IG signal dose not operate or operates abnormally	Not come on
B203112	• IG signal dose not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) According to value in the table, measure resistance.

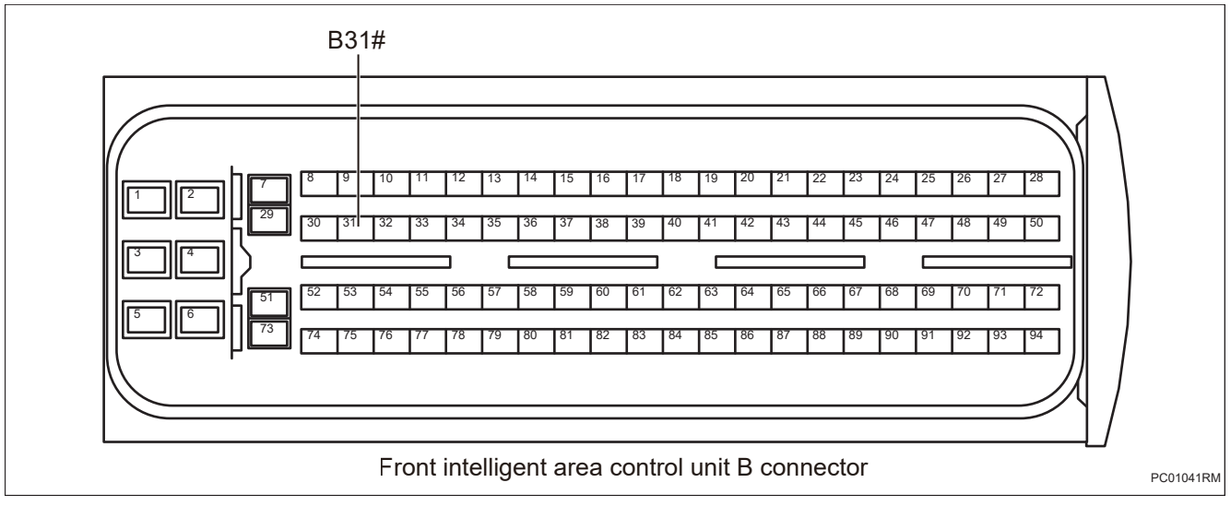
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B31# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear intelligent area control unit wire harness and connector**



Front intelligent area control unit B connector

PC01041RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B31# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Check electric power steering control unit/integrated brake controller**

OK

Diagnosis ends

DTC	B203211	Short to ground in electronic wiper power distribution

Description

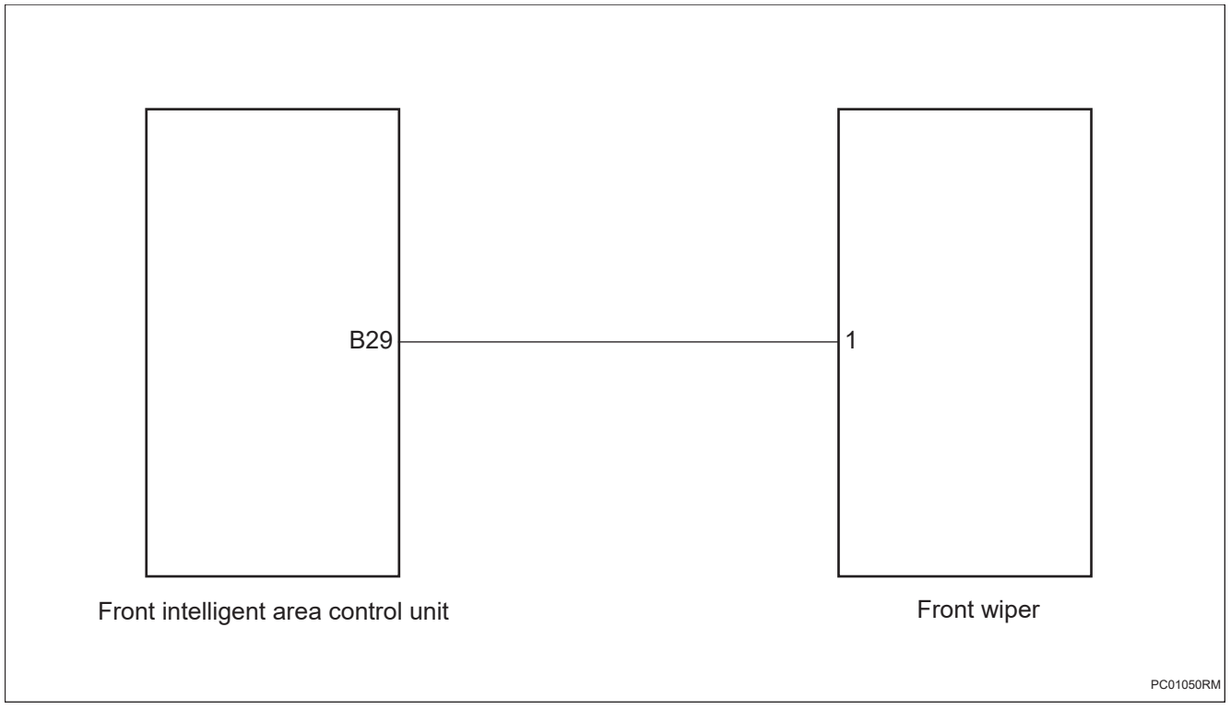
When front wiper power supply circuit is short, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203211	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH29 short to GND	5	Event-based	10 ms	• Front wiper • Wire harness and connector • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B203211	• Electronic wiper dose not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check front wiper wire harness and connector**

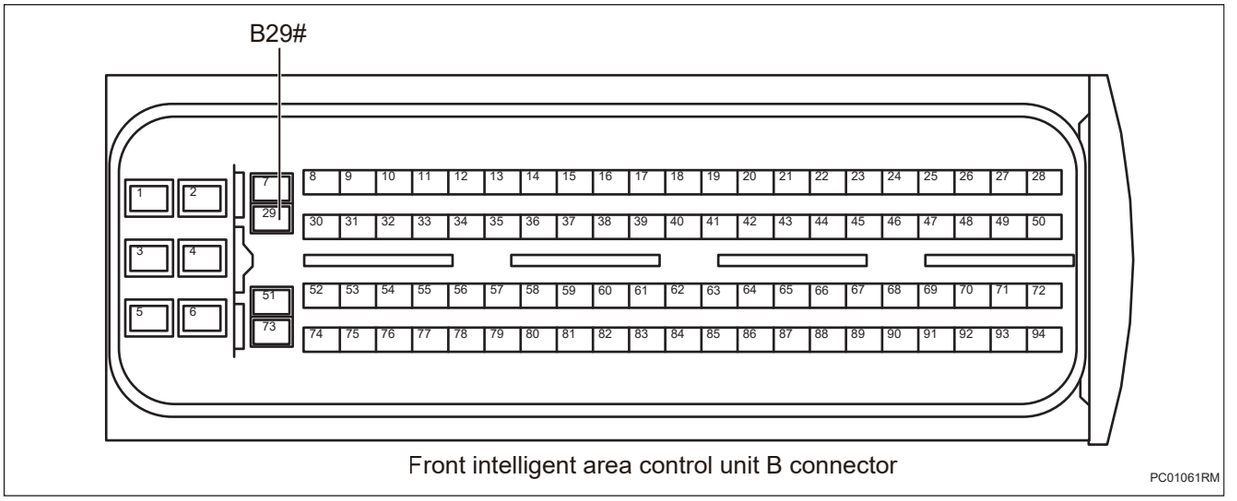
(a) Check if front wiper wire harness and connector is damaged.

(b) Check for short to each other in front wiper wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front wiper wire harness and connector**



Front intelligent area control unit B connector

PC01061RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front wiper connector.

(e) According to value in the table, measure resistance.

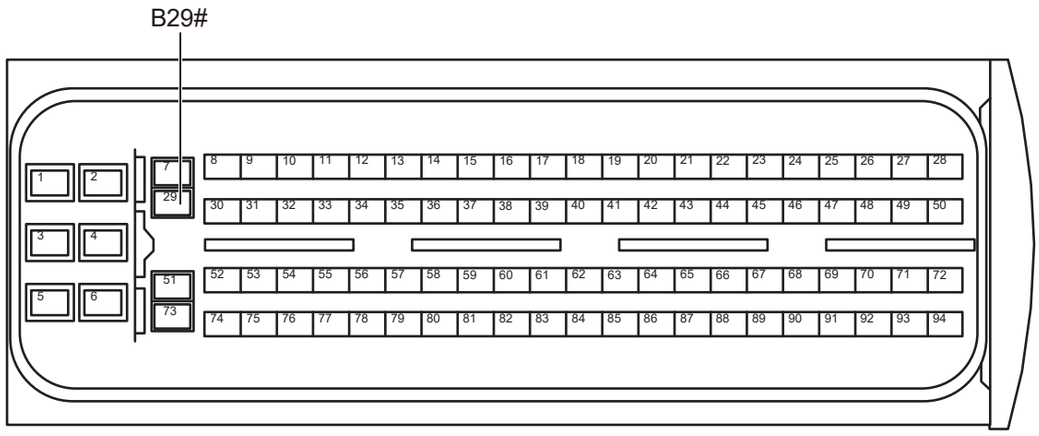
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B29# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in front wiper wire harness and connector



Front intelligent area control unit B connector

PC01061RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B29# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace front wiper (See page WS-62)

(a) Replace the front wiper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

ZD

Diagnosis ends

DTC	**B203311**	**Short to ground in high pitched horn (mechanical)**
DTC	**B203312**	**Short to power supply in high pitched horn (mechanical)**

Description

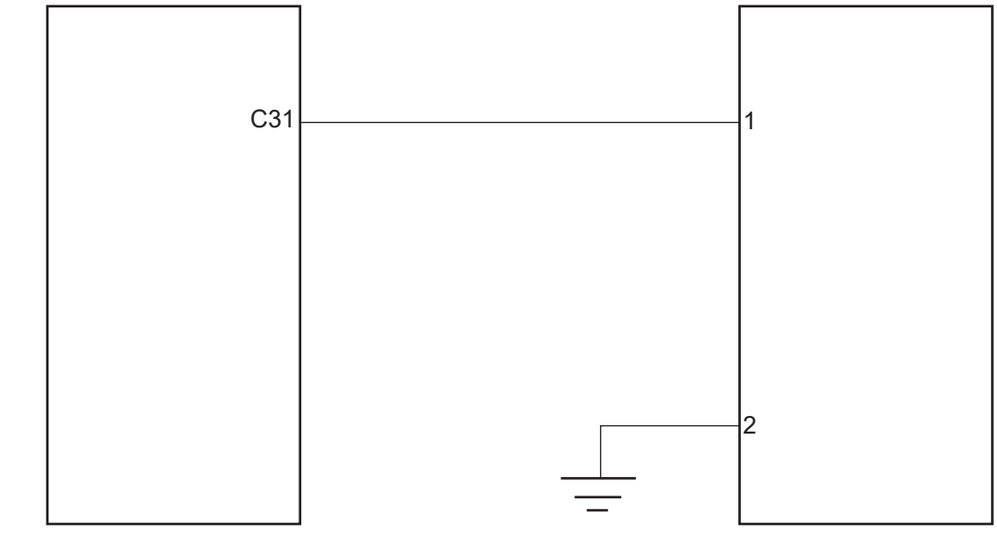
When there is short or open in high pitched horn, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203311	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH27 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pitched horn
B203312	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH27 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pitched horn

Fault symptom

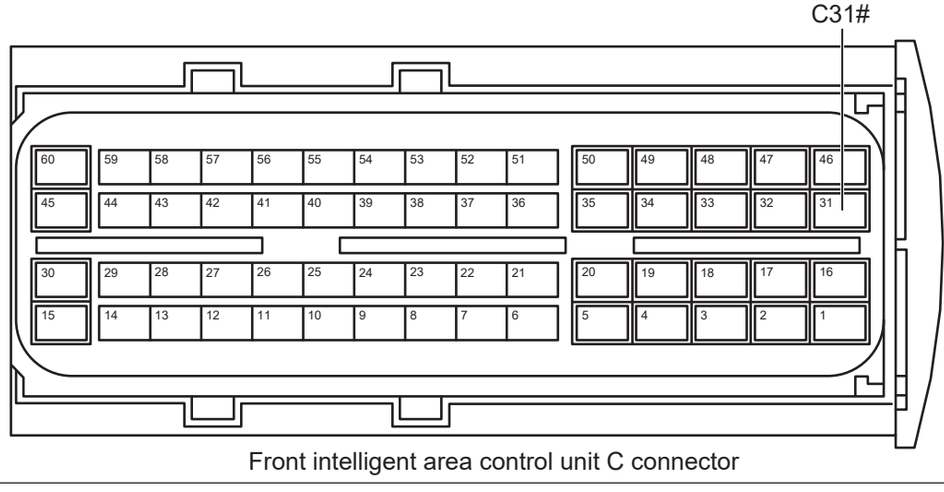
DTC No.	Fault symptom	Warning light/indicator
B203311	• High pitched horn does not operate or operates abnormally	Not come on
B203312	• High pitched horn does not operate or operates abnormally	Not come on

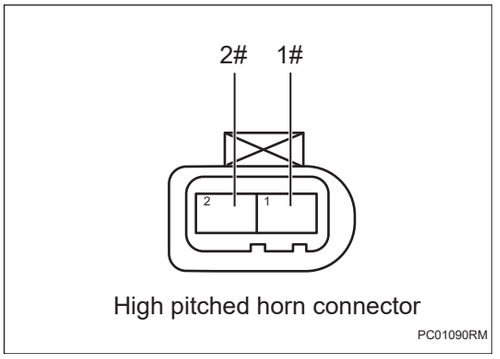
Circuit diagram



Inspection procedure

1	Check for open in high pitched horn wire harness and connector





High pitched horn connector
PC01090RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Disconnect the front intelligent area control unit connector.
(d) Disconnect the high pitched horn connector.
(e) According to value in the table, measure resistance.

Standard value

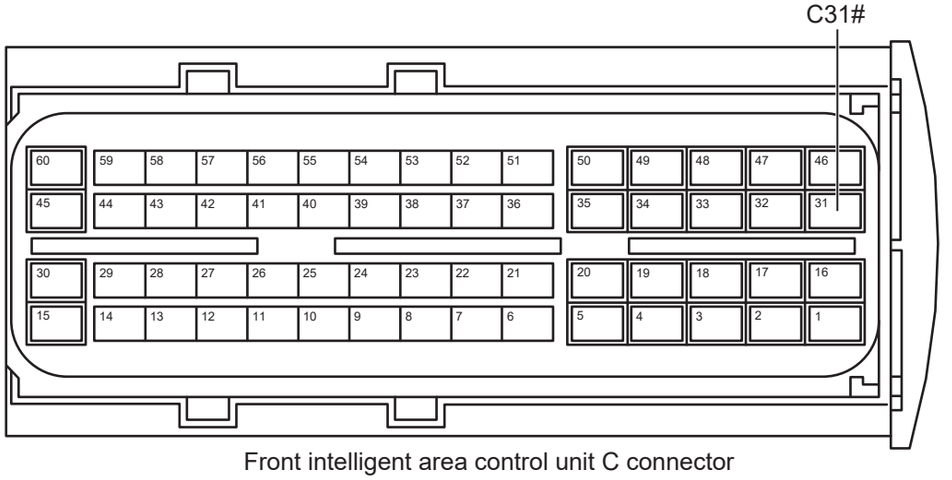
Multimeter connection	Detection condition	Specified condition
High pitched horn connector 1# - front intelligent area control unit connector C31#	Always connected	Less than 1 Ω
High pitched horn connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in high pitched horn wire harness and connector**



Front intelligent area control unit C connector
PC01081RM

(a) According to value in the table, measure resistance.

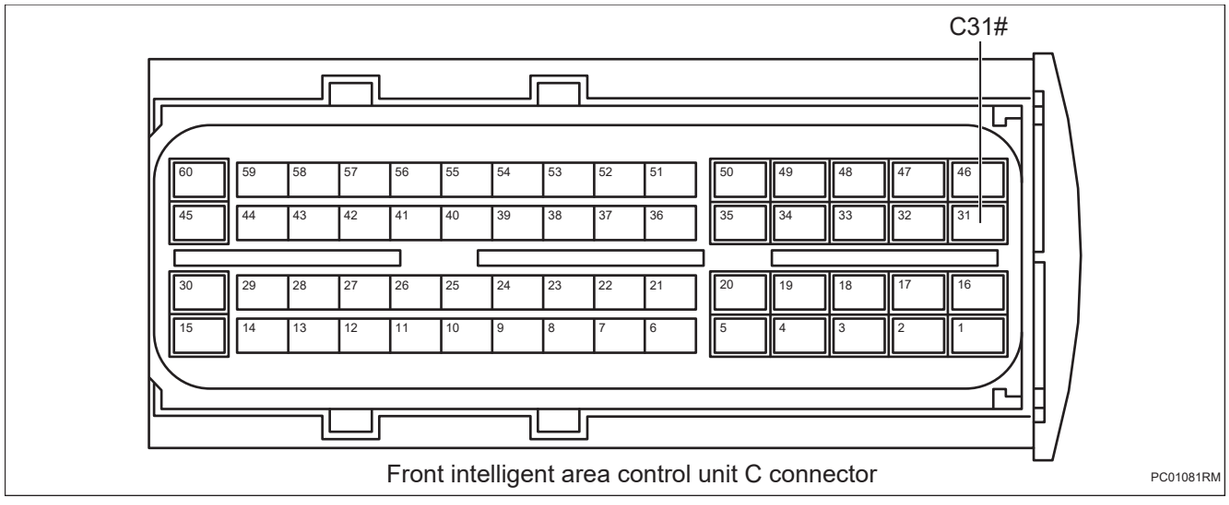
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C31# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in high pitched horn wire harness and connector



Front intelligent area control unit C connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C31# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace high pitched horn (See page ZC-44)

(a) Replace the high pitched horn.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B203411**	**Short to ground in low pitched horn (mechanical)**
DTC	**B203412**	**Short to power supply in low pitched horn (mechanical)**

Description

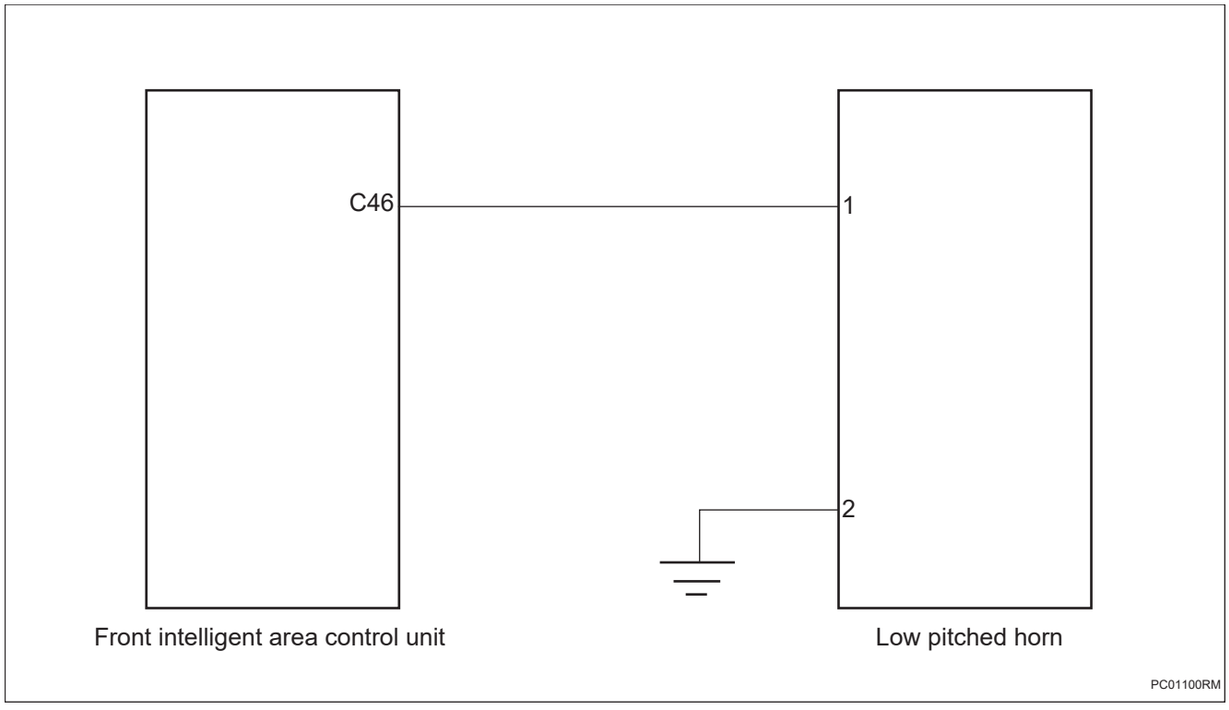
When there is short or open in low pitched horn, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203411	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH28 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pitched horn
B203412	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH28 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pitched horn

Fault symptom

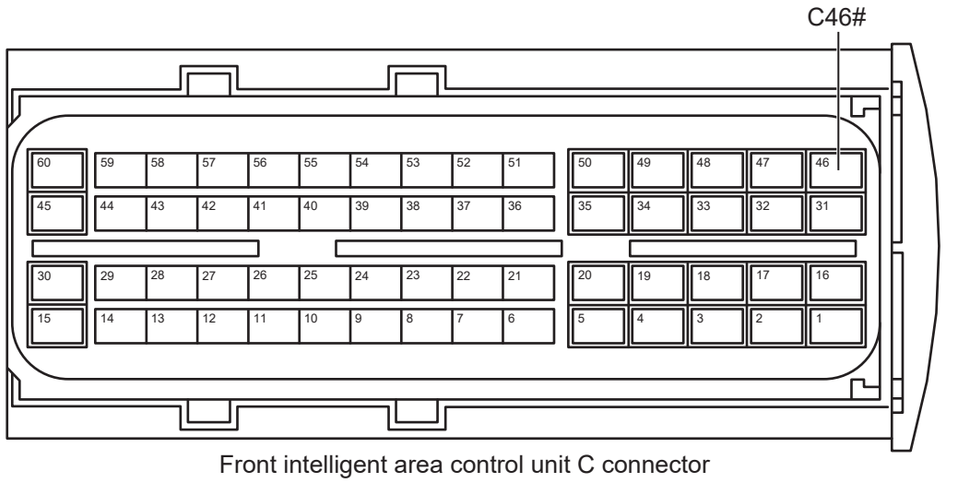
DTC No.	Fault symptom	Warning light/indicator
B203411	• Low pitched horn dose not operate or operates abnormally	Not come on
B203412	• Low pitched horn dose not operate or operates abnormally	Not come on

Circuit diagram



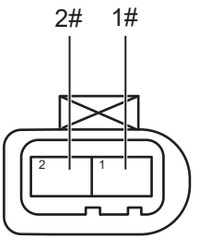
Inspection procedure

1	**Check for open in low pitched horn wire harness and connector**



Front intelligent area control unit C connector

PC01111RM



Low pitched horn connector

PC01121RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the low pitched horn connector.

(e) According to value in the table, measure resistance.

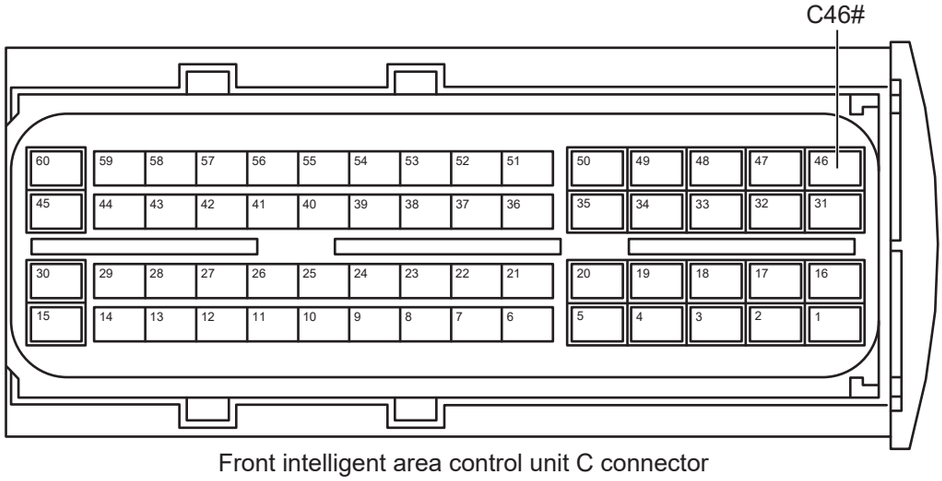
Standard value

Multimeter connection	Detection condition	Specified condition
Low pitched horn connector 1# - front intelligent area control unit connector C46#	Always connected	Less than 1 Ω
Low pitched horn connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in low pitched horn wire harness and connector**



Front intelligent area control unit C connector PC01111RM

(a) According to value in the table, measure resistance.

Standard value

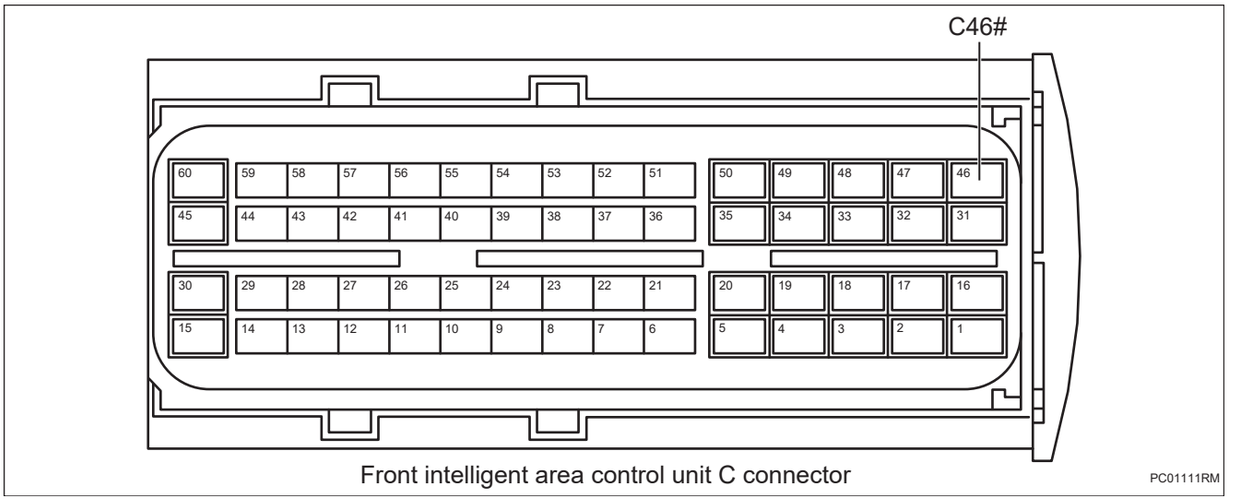
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C46# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in low pitched horn wire harness and connector**



Front intelligent area control unit C connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C46# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace low pitched horn (See page ZC-44)**

(a) Replace the low pitched horn.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B203811	Short to ground in front combination light driver 1 assembly (left) - power supply

Description

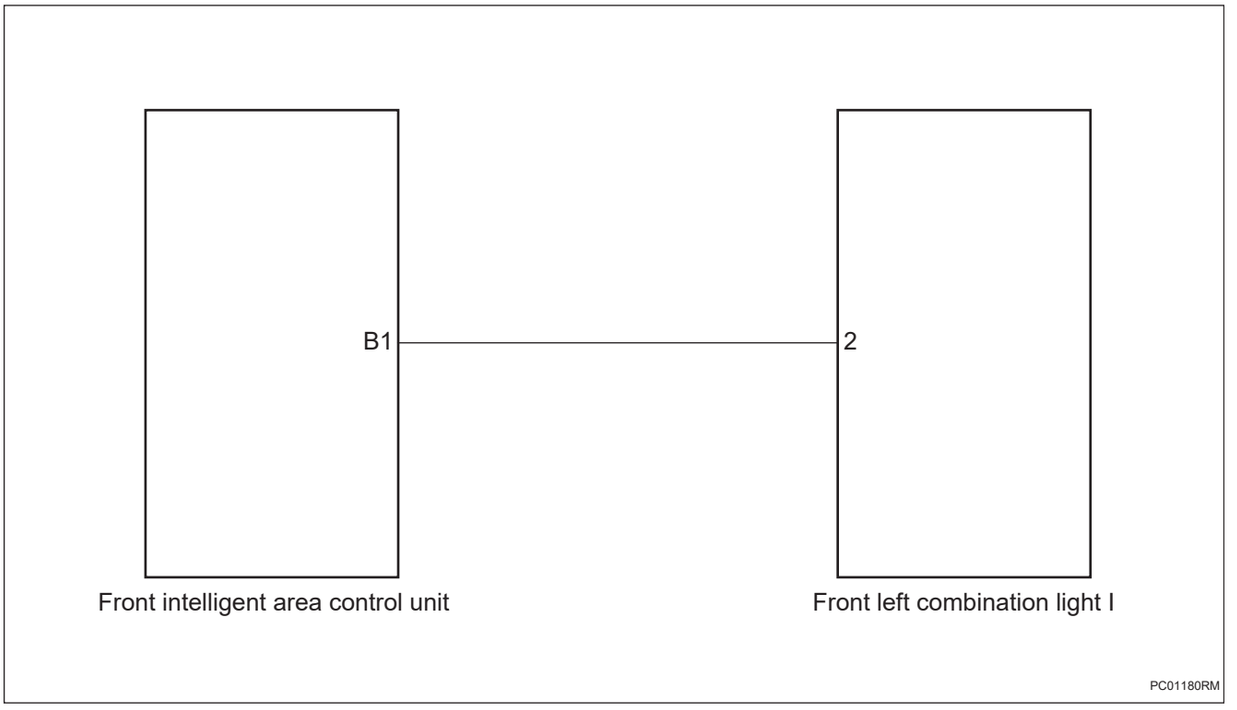
When front left combination light I power supply circuit is short, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203811	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH35 short to GND	5	Event-based	10 ms	• Front left combination light I • Wire harness and connector • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B203811	• Front combination light driver 1 assembly (left) does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check front left combination light I wire harness and connector**

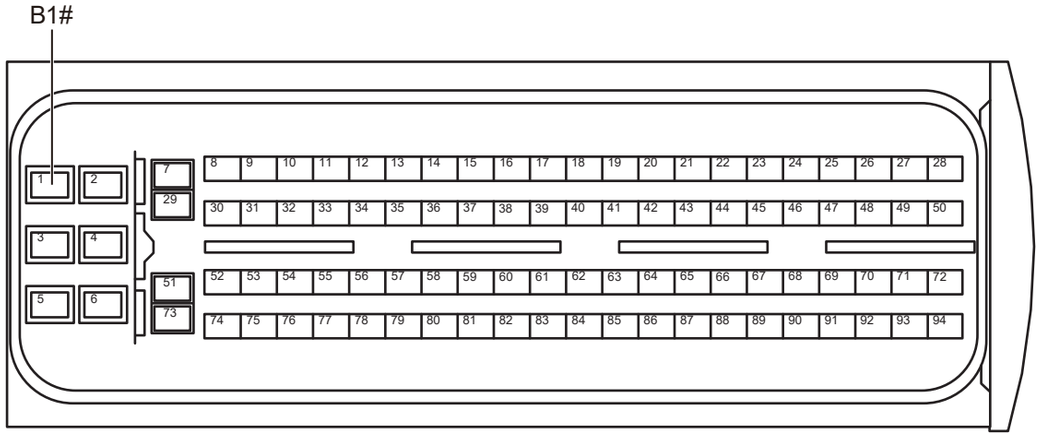
(a) Check front left combination light I wire harness and connector for damage.

(b) Check for short to each other in front left combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front left combination light l wire harness and connector**



Front intelligent area control unit B connector

PC01191RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front left combination light l connector.

(e) According to value in the table, measure resistance.

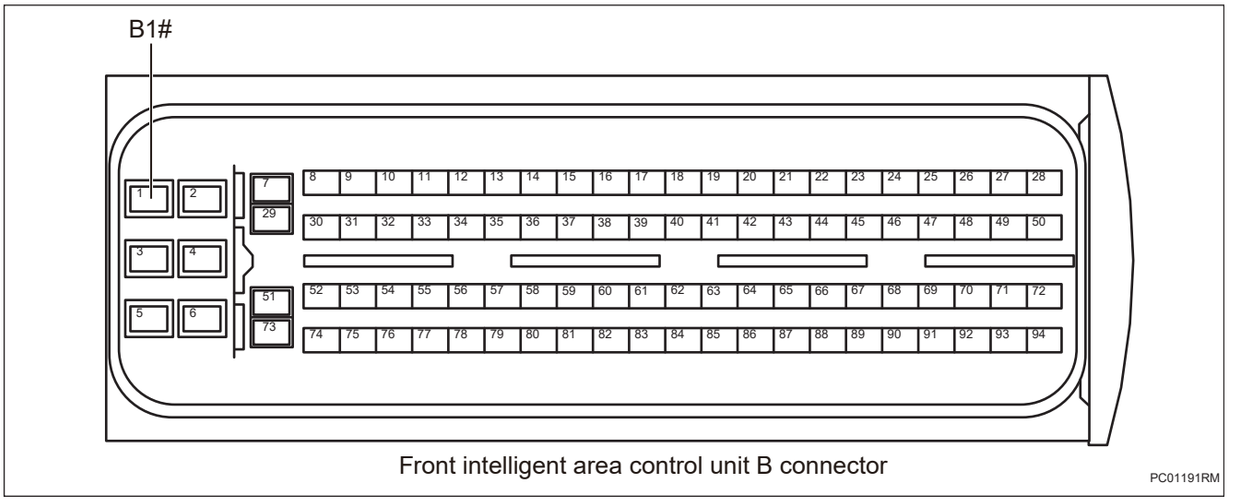
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in front left combination light l wire harness and connector



Front intelligent area control unit B connector

PC01191RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B1# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace front left combination light l (See page ZC-18)

(a) Replace the front left combination light l.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B204311**	**Short to ground in front windshield heater 1**
DTC	**B204312**	**Short to power supply in front windshield heater 1**
DTC	**B204313**	**Open in front windshield heater 1**

Description

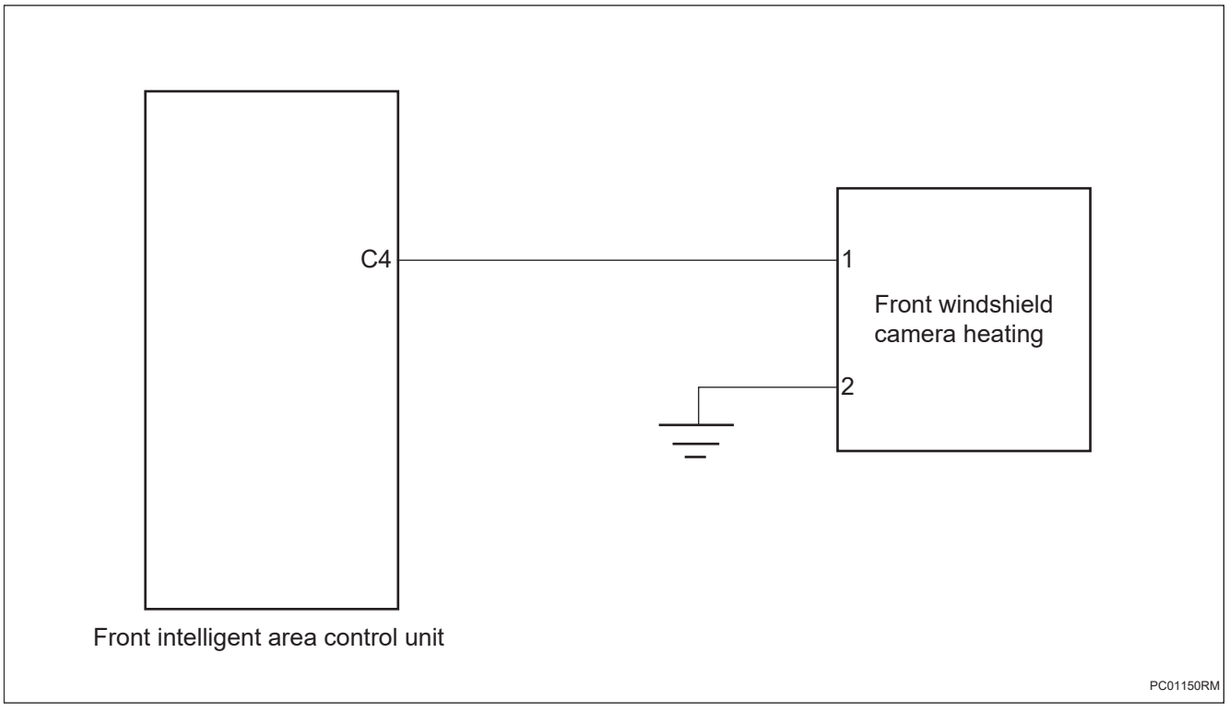
When short or open fault occurs in front windshield camera heater, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B204311	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Fr Win Heatg Ena = 0x1	• ODH51 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Front windshield camera heater
B204312	• Diagnostic voltage range .(9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Fr Win Heatg Ena = 0x1	• ODH51 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Front windshield camera heater
B204313	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Fr Win Heatg Ena = 0x1	• ODH51 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Front windshield camera heater

Fault symptom

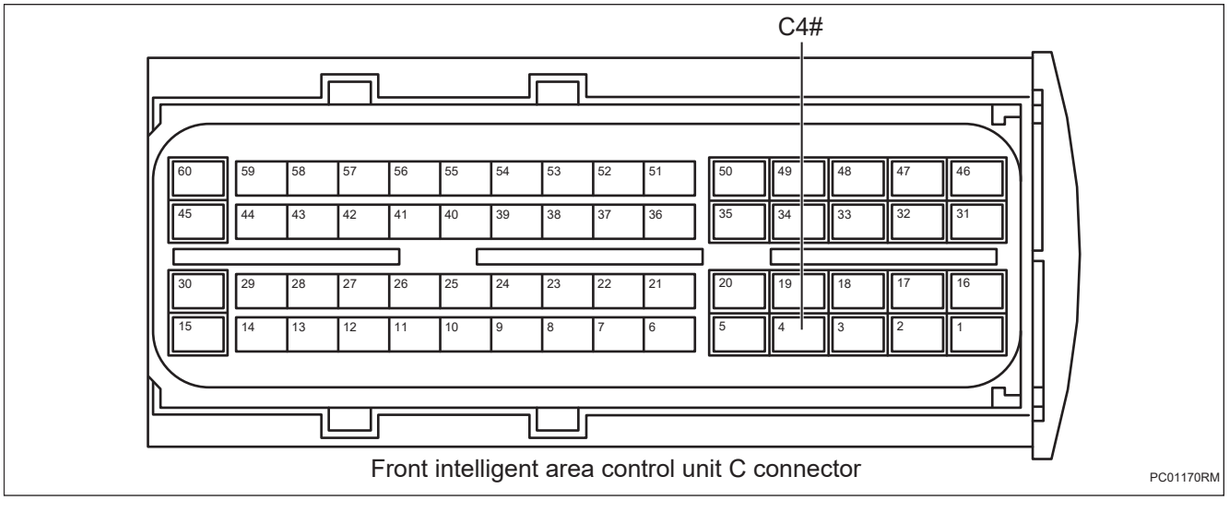
DTC No.	Fault symptom	Warning light/indicator
B204311	• Front windshield heater does not operate or operates abnormally	Not come on
B204312	• Front windshield heater does not operate or operates abnormally	Not come on
B204313	• Front windshield heater does not operate or operates abnormally	Not come on

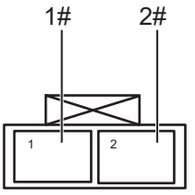
Circuit diagram



Inspection procedure

1	**Check for open in front windshield camera heater wire harness and connector**





Front windshield camera heating connector

PC01160RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front windshield camera heating connector.

(e) According to value in the table, measure resistance.

Standard value

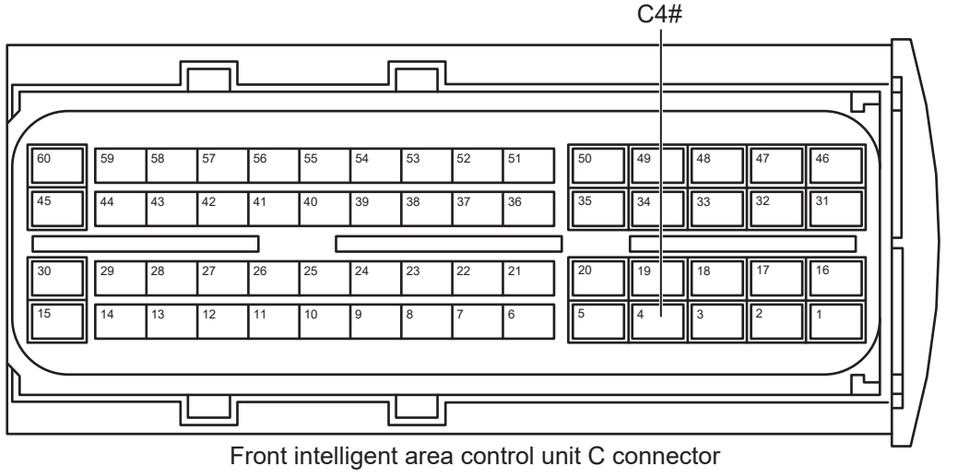
Multimeter connection	Detection condition	Specified condition
Front windshield camera heater connector 1# - front intelligent area control unit connector C4#	Always connected	Less than 1 Ω
Front windshield camera heater connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front windshield camera heater wire harness and connector**



Front intelligent area control unit C connector

PC01170RM

(a) According to value in the table, measure resistance.

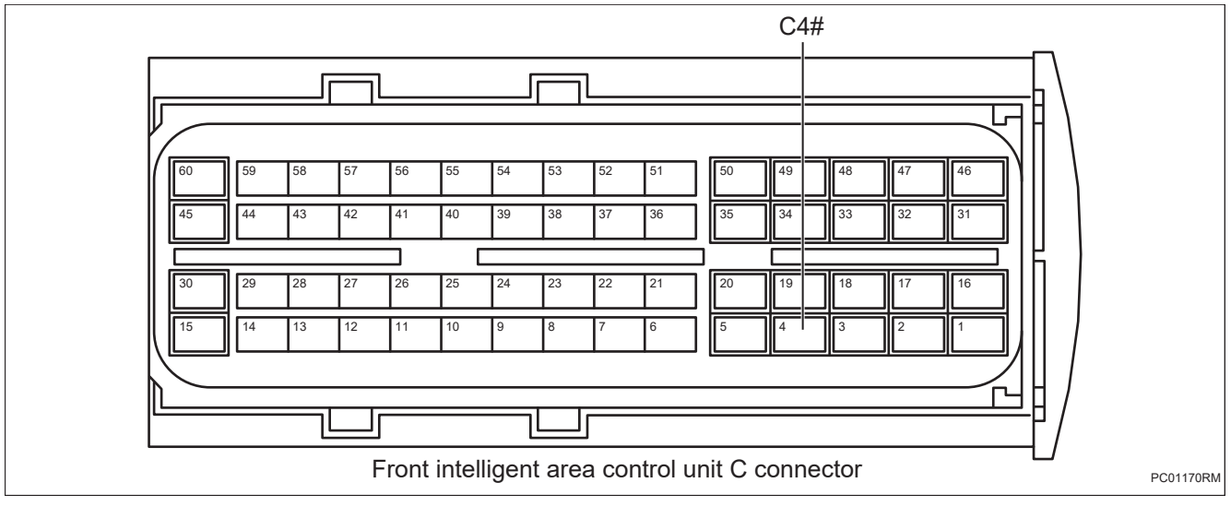
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in front windshield camera heater wire harness and connector**



Front intelligent area control unit C connector

PC01170RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front windshield camera heater (See page CS-3)**

(a) Replace the front windshield camera heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B204511**	**Short to ground in front washer fluid pump**
DTC	**B204512**	**Short to power supply in front washer fluid pump**
DTC	**B204513**	**Open in front washer fluid pump**

Description

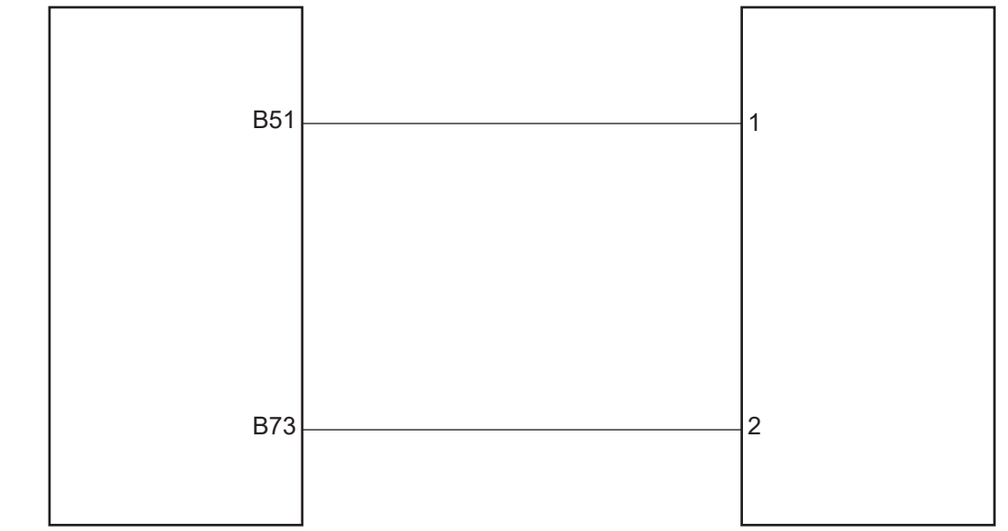
When short or open fault occurs in washer pump, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B204511	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Re Wipr Ena = 0x1	• OHB09/ OHB10 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Washer pump
B204512	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Re Wipr Ena = 0x1	• OHB09/ OHB10 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Washer pump
B204513	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode & gCFG _ u8Re Wipr Ena = 0x1	• OHB09/ OHB10 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Washer pump

Fault symptom

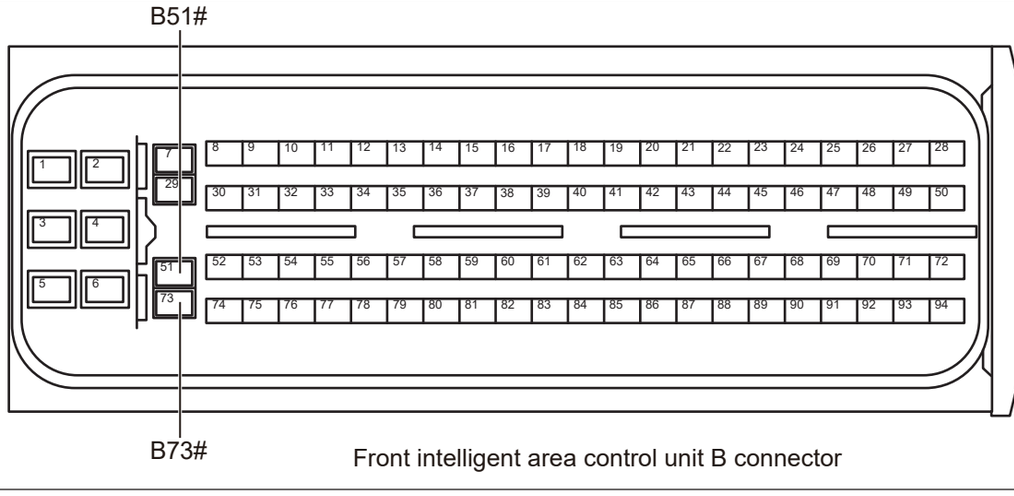
DTC No.	Fault symptom	Warning light/indicator
B204511	• Front washer fluid pump does not operate or operates abnormally	Not come on
B204512	• Front washer fluid pump does not operate or operates abnormally	Not come on
B204513	• Front washer fluid pump does not operate or operates abnormally	Not come on

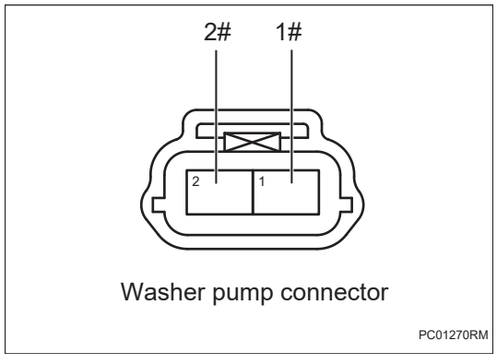
Circuit diagram



Inspection procedure

1	**Check for open in washer pump wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the washer pump connector.

(e) According to value in the table, measure resistance.

Standard value

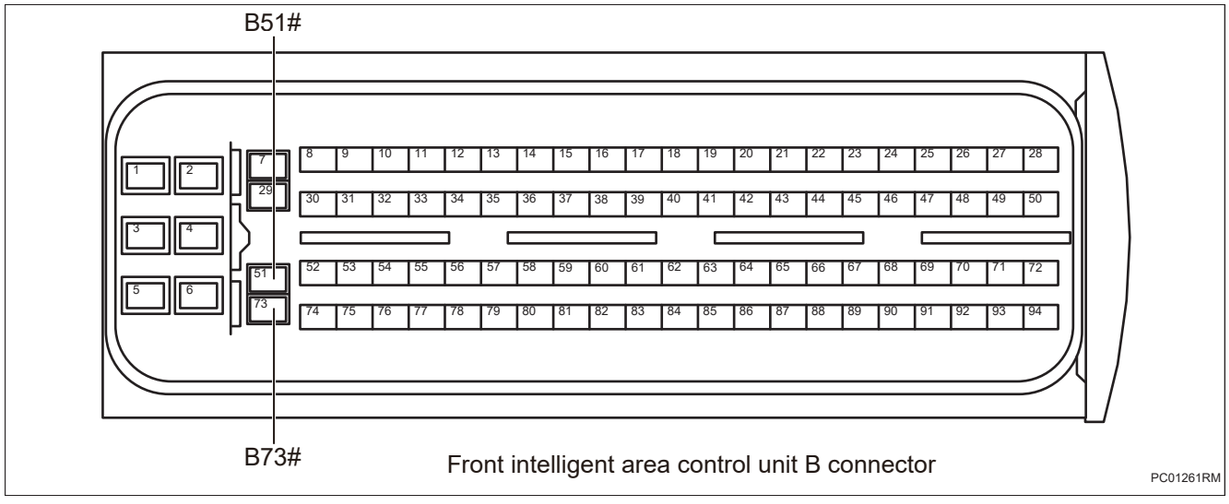
Multimeter connection	Detection condition	Specified condition
Washer pump connector 1# - front intelligent area control unit connector B51#	Always connected	Less than 1 Ω
Washer pump connector 2# - front intelligent area control unit connector B73#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in washer pump wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

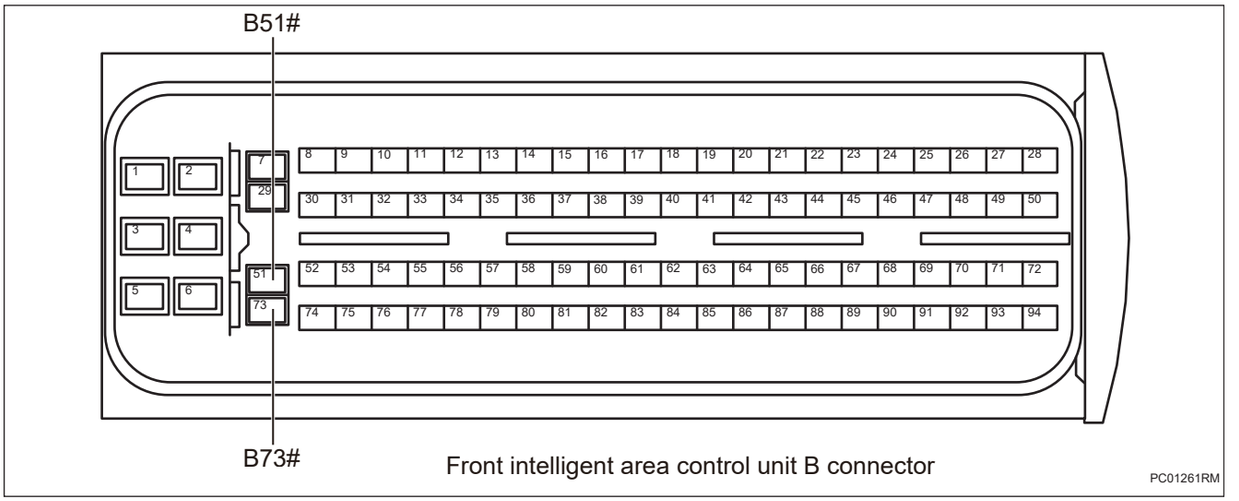
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B51# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B73# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Check for short to power supply in washer pump wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B51# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B73# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace washer pump (See page WS-68)**

(a) Replace the washer pump.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B205A00	Short to ground in FLS sensor signal circuit
DTC	B205B00	Open in FLS sensor signal circuit
DTC	B205C00	FLS sensor residual vibration fault
DTC	B205D00	FLS sensor internal fault
DTC	B205E00	FLS sensor covered
DTC	B205F00	Short to power supply in FLS sensor signal circuit
DTC	B206000	FLS sensor power supply voltage fault
DTC	B206100	Short to ground in FLS sensor power supply
DTC	B206200	Short to battery in FLS sensor power supply

Description

When short or open or internal fault occurs in front left side ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B205A00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B205B00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B205C00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor

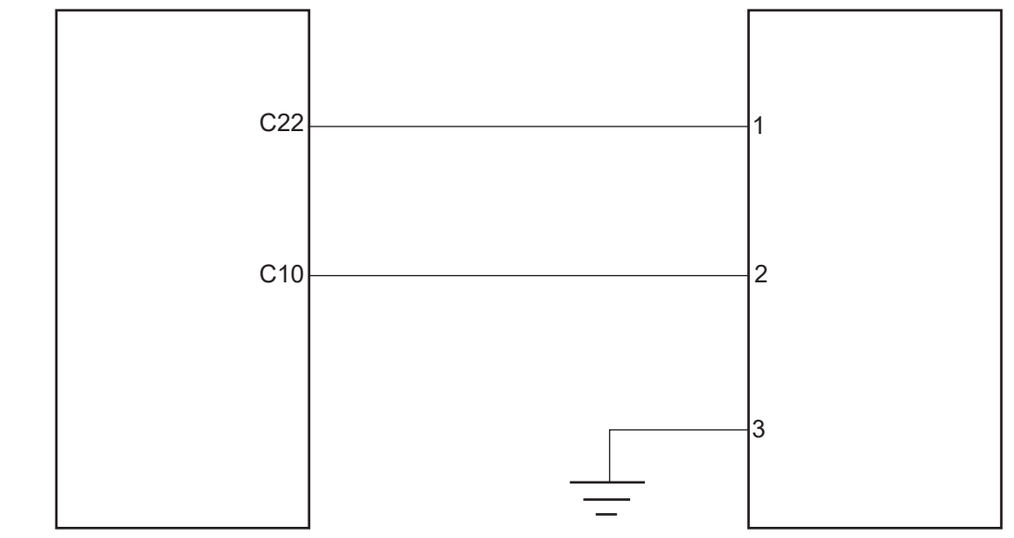
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		USS _ Fault Status _ enum = 3 is detected				
B205D00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B205E00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B205F00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B206000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B206100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor
B206200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FLS. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front left side ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B205A00	• Sensor stops detecting, and the data is invalid	Not come on
B205B00	• Sensor stops detecting, and the data is invalid	Not come on
B205C00	• Sensor stops detecting, and the data is invalid	Not come on
B205D00	• Sensor stops detecting, and the data is invalid	Not come on
B205E00	• Sensor stops detecting, and the data is invalid	Not come on
B205F00	• Sensor stops detecting, and the data is invalid	Not come on
B206000	• Sensor stops detecting, and the data is invalid	Not come on
B206100	• Sensor stops detecting, and the data is invalid	Not come on
B206200	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check front left side ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

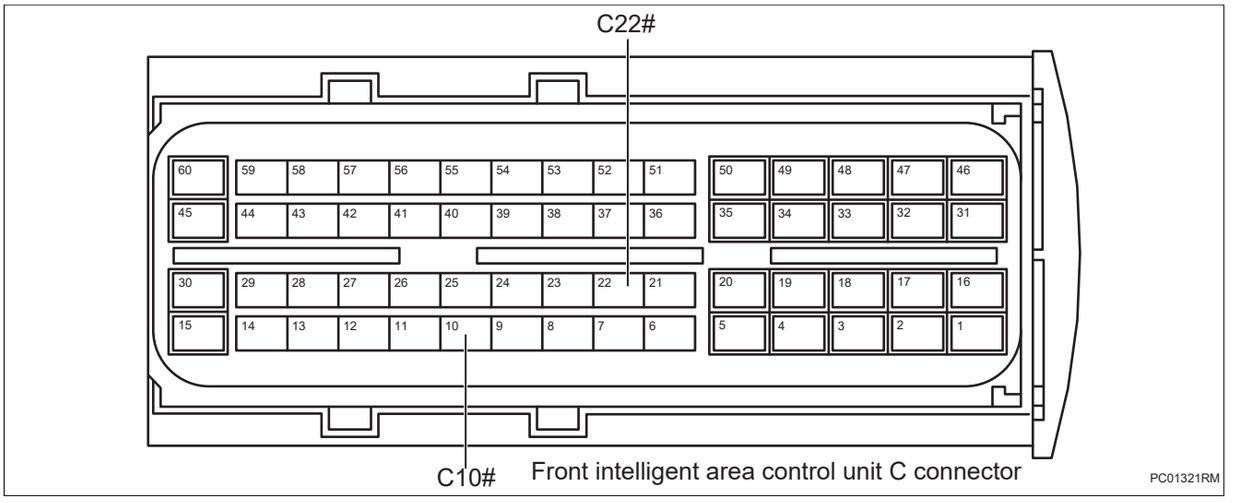
(b) Check ultrasonic sensor for proper installation.

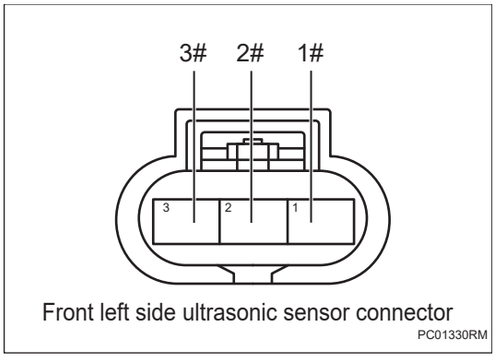
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	Check for open in front left side ultrasonic sensor wire harness and connector





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front left side ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

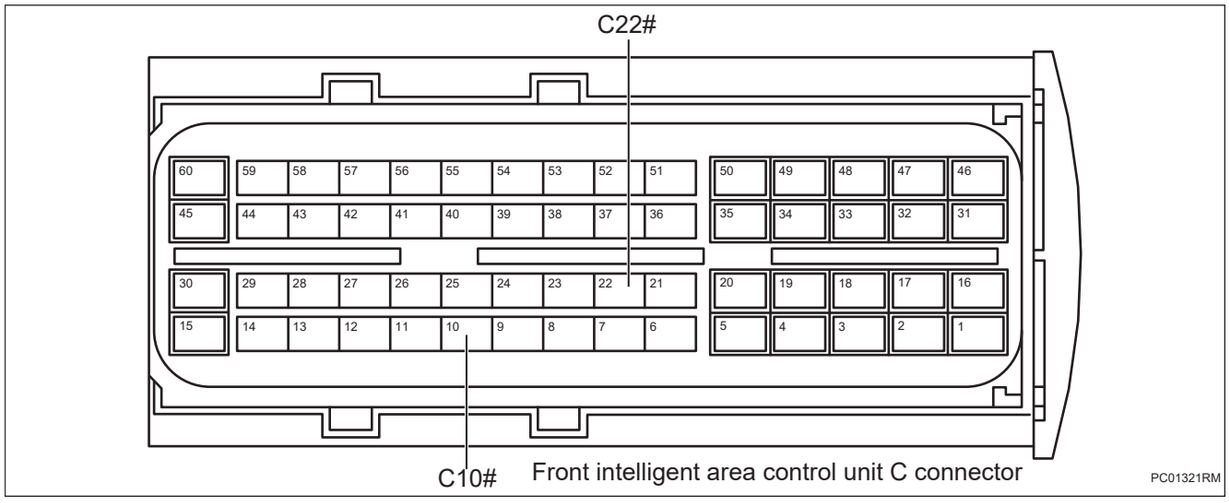
Standard value

Multimeter connection	Detection condition	Specified condition
Front left side ultrasonic sensor connector 2# - front intelligent area control unit connector C10#	Always connected	Less than 1 Ω
Front left side ultrasonic sensor connector 1# - front intelligent area control unit connector C22#	Always connected	Less than 1 Ω
Front left side ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left side ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

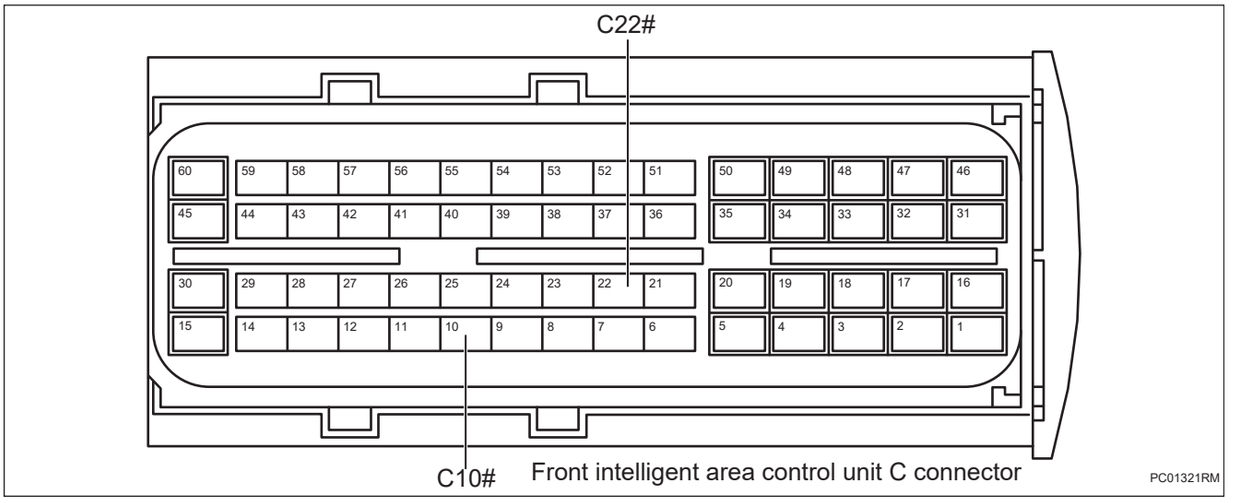
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front left side ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace front left side ultrasonic sensor (See page ZC-124)**

(a) Replace the front left side ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B206300**	**Short to ground in FL sensor signal circuit**
DTC	**B206400**	**Open in FL sensor signal circuit**
DTC	**B206500**	**FL sensor residual vibration fault**
DTC	**B206600**	**FL sensor internal fault**
DTC	**B206700**	**FL sensor covered**
DTC	**B206800**	**Short to power supply in FL sensor signal circuit**
DTC	**B206900**	**FL sensor power supply voltage fault**
DTC	**B206A00**	**Short to ground in FL sensor power supply**
DTC	**B206B00**	**Short to battery in FL sensor power supply**

Description

When short or open or internal fault occurs in front left corner ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B206300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B206800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206A00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor
B206B00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FL. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front left corner ultrasonic sensor

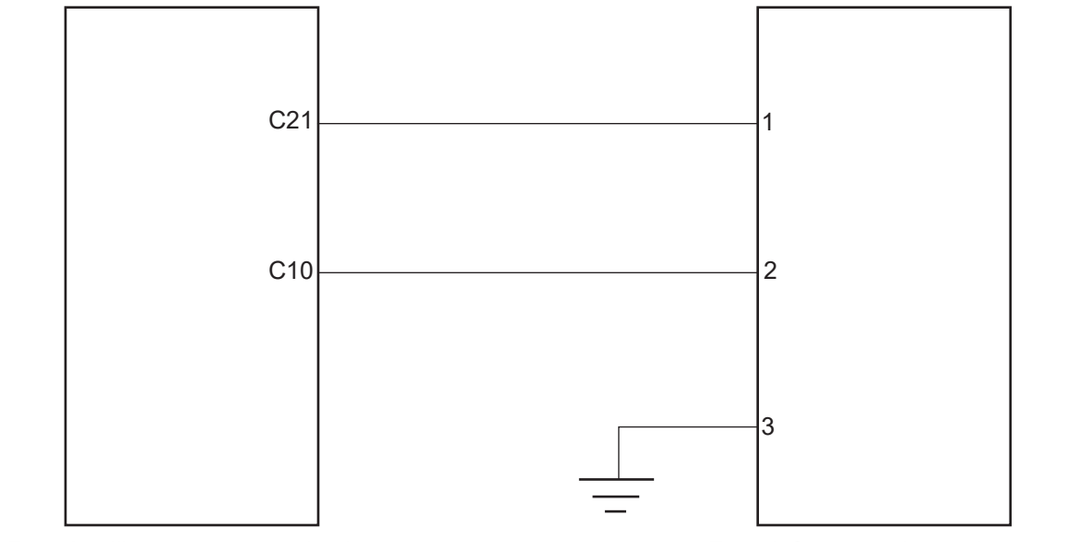
Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B206300	• Sensor stops detecting, and the data is invalid	Not come on
B206400	• Sensor stops detecting, and the data is invalid	Not come on
B206500	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B206600	• Sensor stops detecting, and the data is invalid	Not come on
B206700	• Sensor stops detecting, and the data is invalid	Not come on
B206800	• Sensor stops detecting, and the data is invalid	Not come on
B206900	• Sensor stops detecting, and the data is invalid	Not come on
B206A00	• Sensor stops detecting, and the data is invalid	Not come on
B206B00	• Sensor stops detecting, and the data is invalid	Not come on

ZD

Circuit diagram



Inspection procedure

1	Check front left corner ultrasonic sensor

(a) Check ultrasonic sensor for dirt.

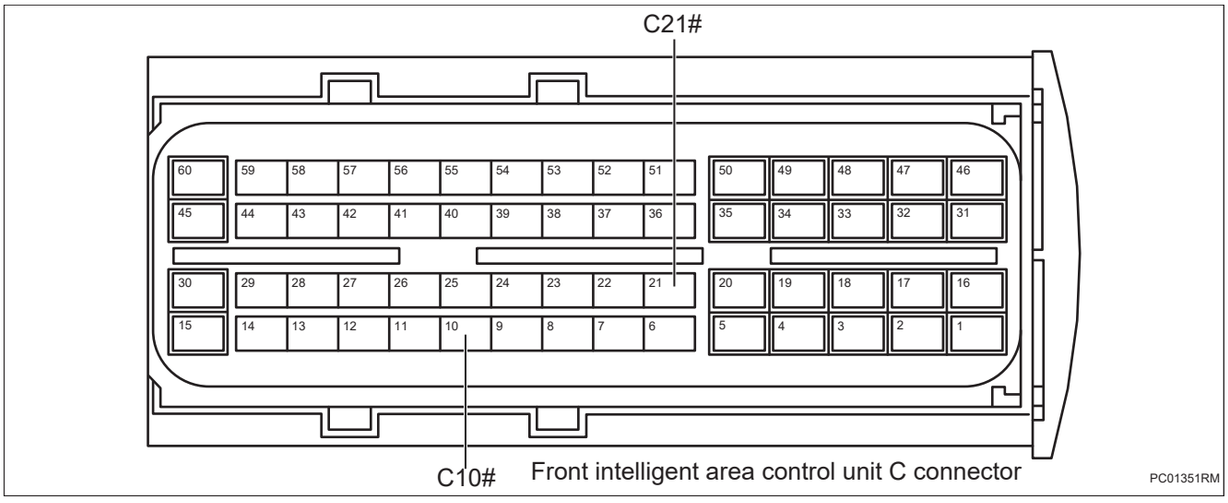
(b) Check ultrasonic sensor for proper installation.

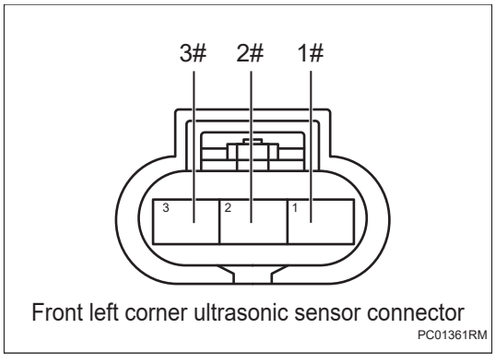
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in front left corner ultrasonic sensor wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect front left corner ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

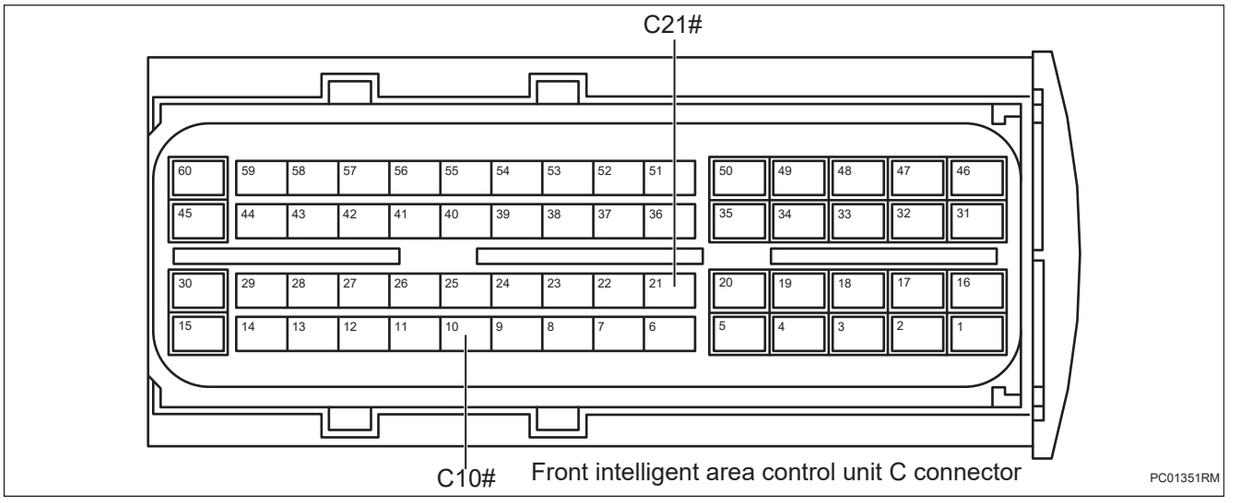
Multimeter connection	Detection condition	Specified condition
Front left corner ultrasonic sensor connector 2# - front intelligent area control unit connector C10#	Always connected	Less than 1 Ω
Front left corner ultrasonic sensor connector 1# - front intelligent area control unit connector C21#	Always connected	Less than 1 Ω
Front left corner ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in front left corner ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

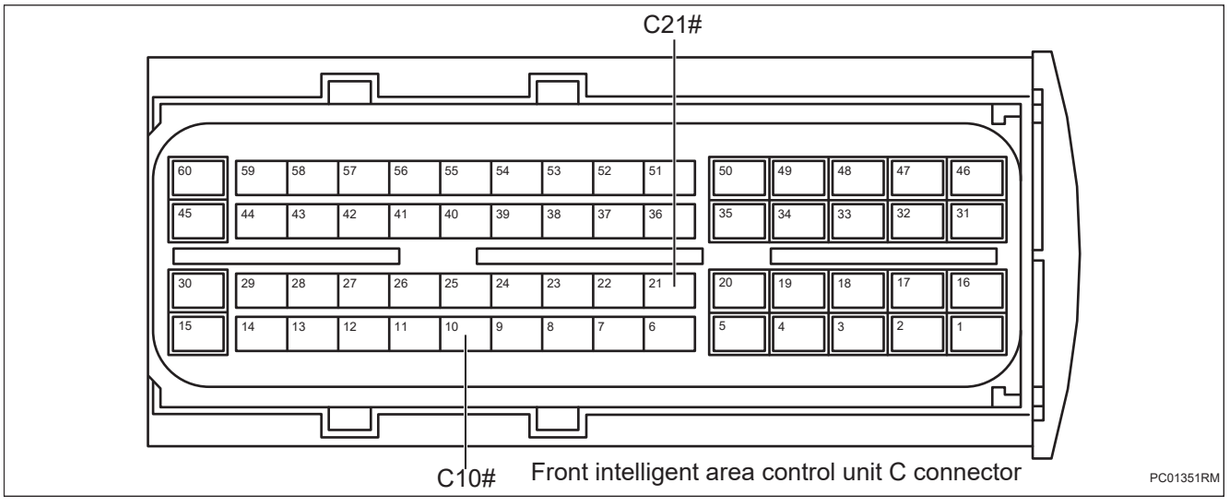
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in front left corner ultrasonic sensor wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace front left corner ultrasonic sensor (See page ZC-124)

(a) Replace front left corner ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

ZD

Diagnosis ends

DTC	B206C00	Short to ground in FML sensor signal circuit
DTC	B206D00	Open in FML sensor signal circuit
DTC	B206E00	FML sensor residual vibration fault
DTC	B206F00	FML sensor internal fault
DTC	B207000	FML sensor covered
DTC	B207100	Short to power supply in FML sensor signal circuit
DTC	B207200	FML sensor power supply voltage fault
DTC	B207300	Short to ground in FML sensor power supply
DTC	B207400	Short to battery in FML sensor power supply

Description

When short or open or internal fault occurs in front left center ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B206C00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B206D00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B206E00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B206F00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B207000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor

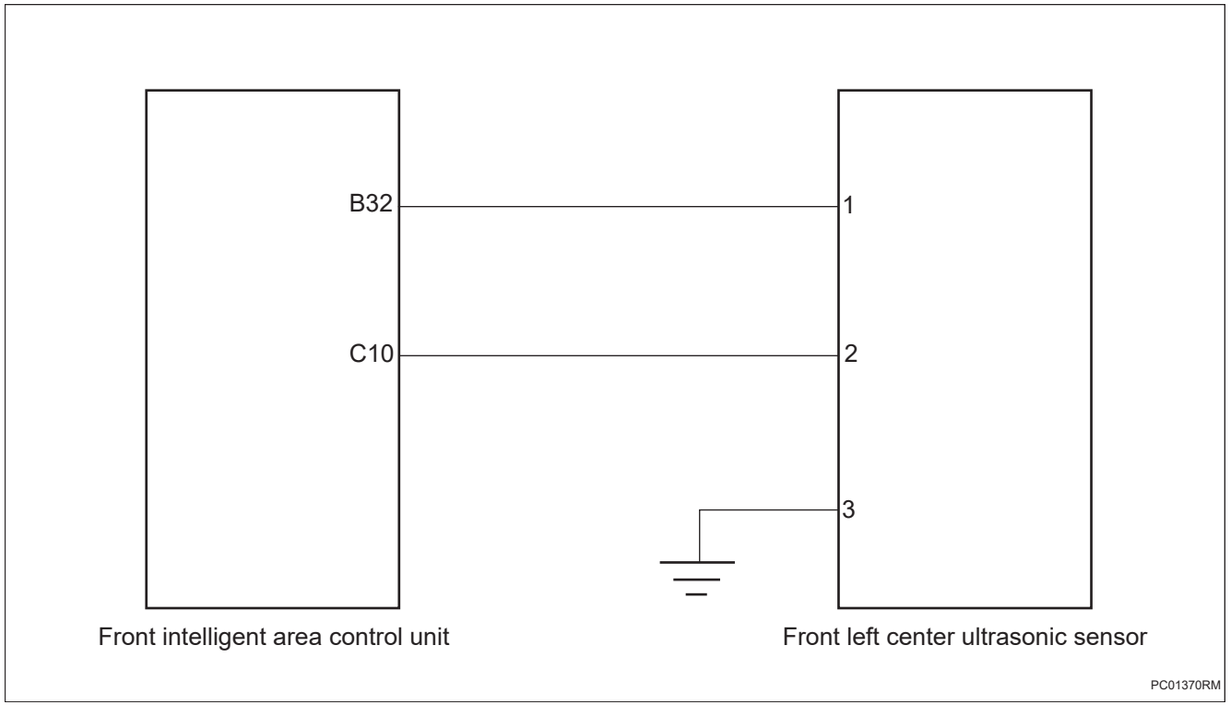
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B207100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B207200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B207300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor
B207400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FML. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front left center ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B206C00	• Sensor stops detecting, and the data is invalid	Not come on
B206D00	• Sensor stops detecting, and the data is invalid	Not come on
B206E00	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B206F00	• Sensor stops detecting, and the data is invalid	Not come on
B207000	• Sensor stops detecting, and the data is invalid	Not come on
B207100	• Sensor stops detecting, and the data is invalid	Not come on
B207200	• Sensor stops detecting, and the data is invalid	Not come on
B207300	• Sensor stops detecting, and the data is invalid	Not come on
B207400	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check front left center ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

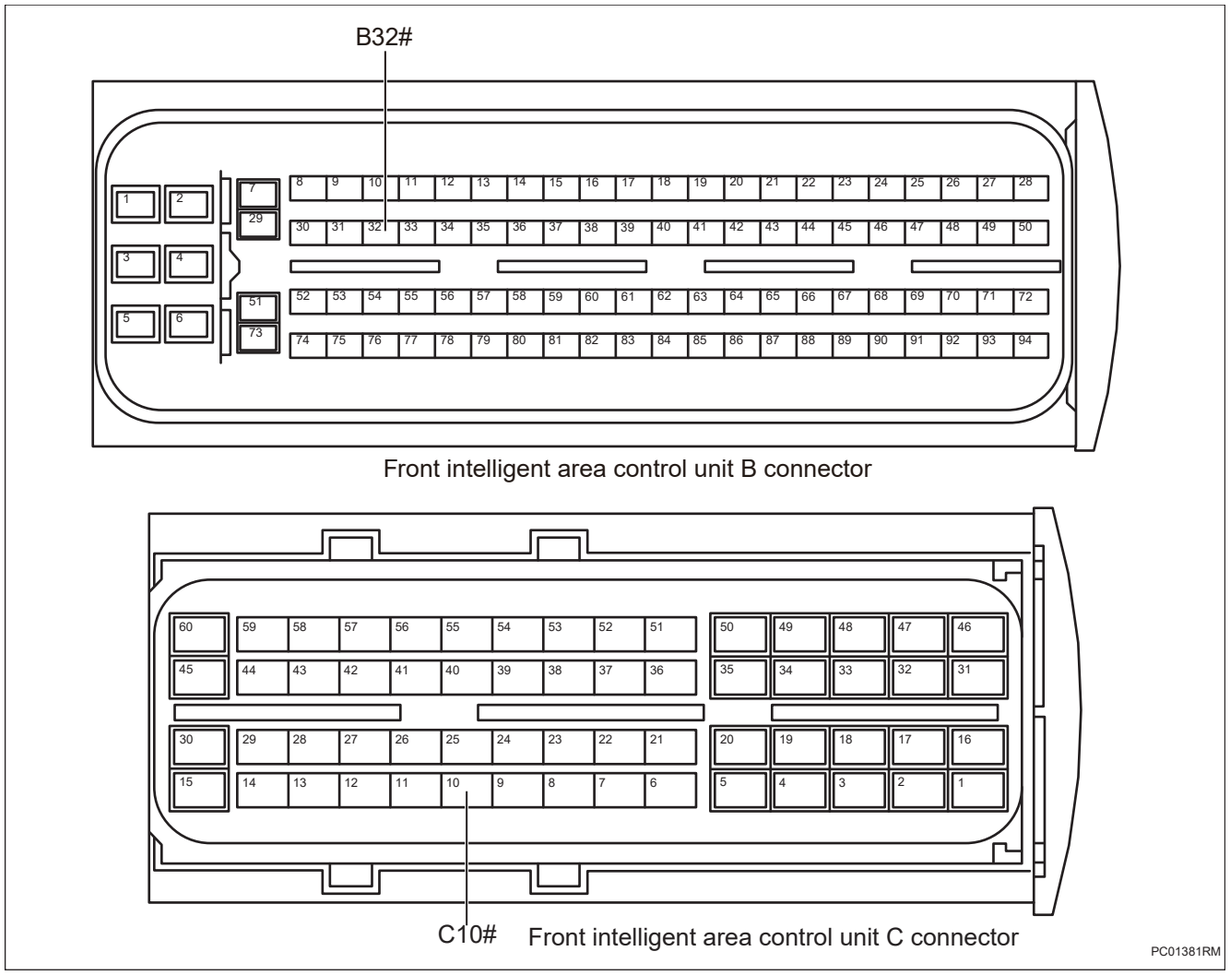
(b) Check ultrasonic sensor for proper installation.

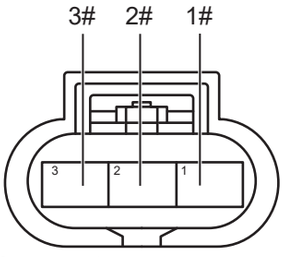
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in front left center ultrasonic sensor wire harness and connector**





Front left center ultrasonic sensor connector

PC01391RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect front left center ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

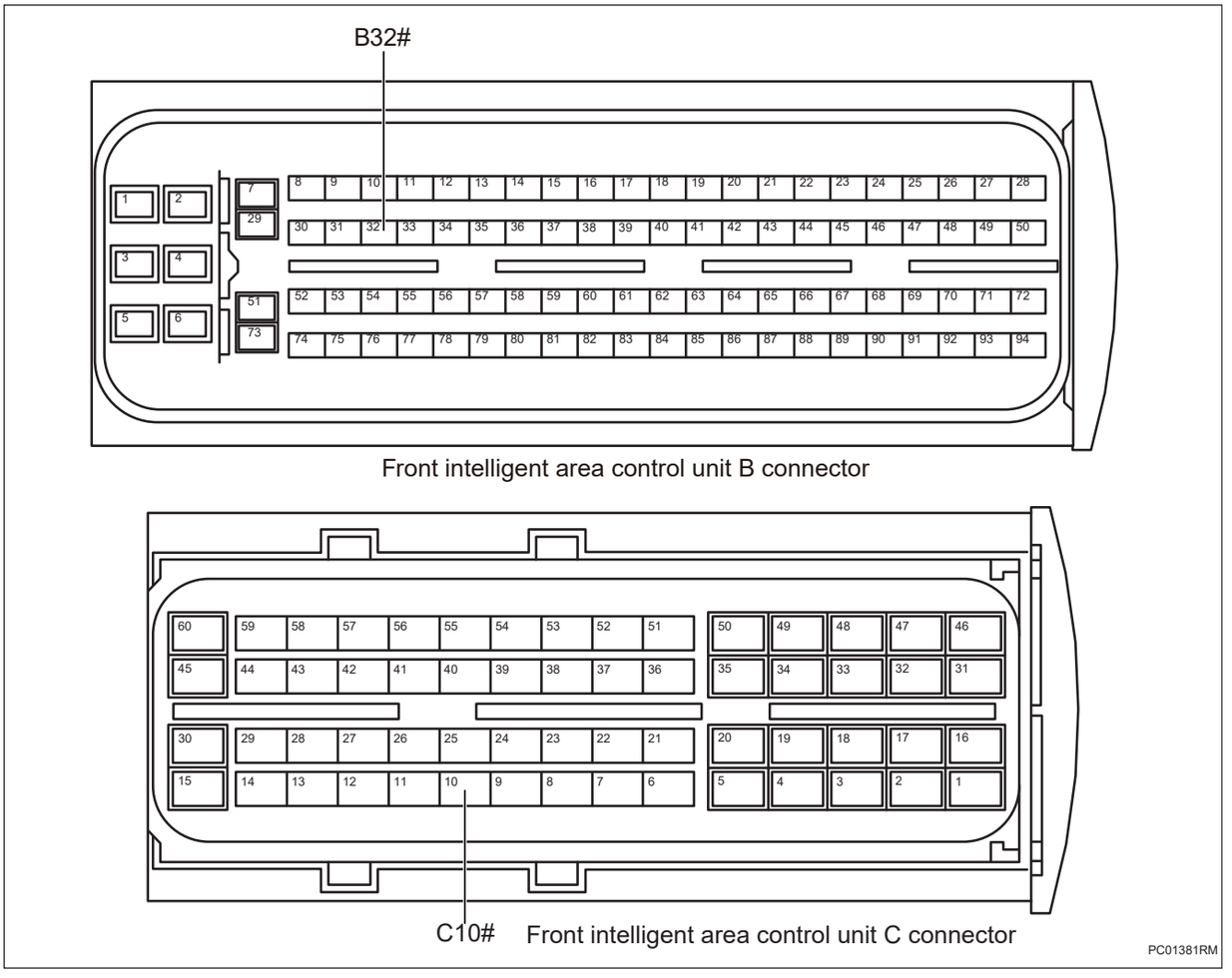
Standard value

Multimeter connection	Detection condition	Specified condition
Front left center ultrasonic sensor connector 2# - front intelligent area control unit connector C10#	Always connected	Less than 1 Ω
Front left center ultrasonic sensor connector 1# - front intelligent area control unit connector B32#	Always connected	Less than 1 Ω
Front left center ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in front left center ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

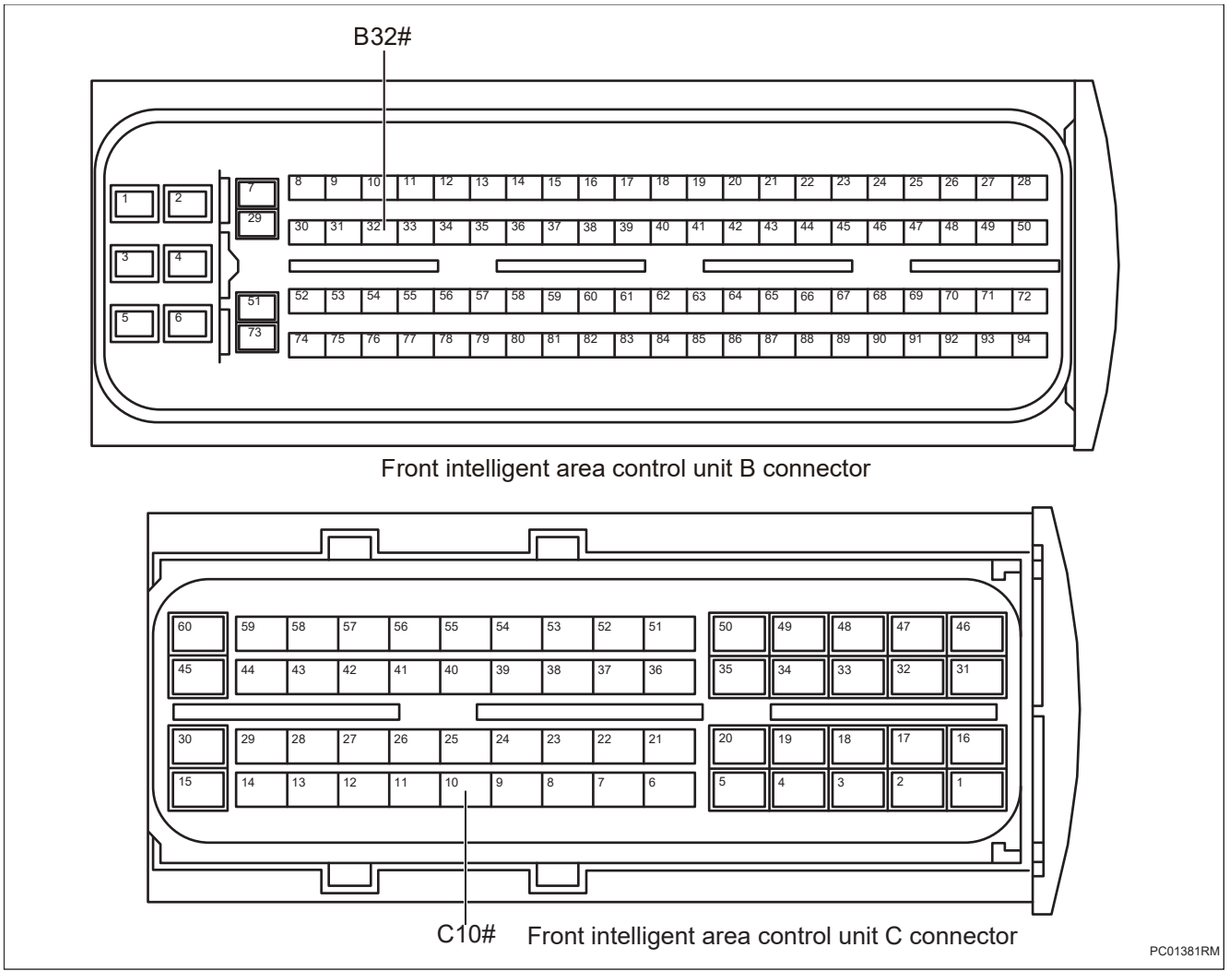
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B32# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left center ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B32# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left center ultrasonic sensor (See page ZC-124)**

(a) Replace front left center ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B207500**	**Short to ground in FMR sensor signal circuit**
DTC	**B207600**	**Open in FMR sensor signal circuit**
DTC	**B207700**	**FMR sensor residual vibration fault**
DTC	**B207800**	**FMR sensor internal fault**
DTC	**B207900**	**FMR sensor covered**

DTC	**B207A00**	**Short to power supply in FMR sensor signal circuit**
DTC	**B207B00**	**FMR sensor power supply voltage fault**
DTC	**B207C00**	**Short to ground in FMR sensor power supply**
DTC	**B207D00**	**Short to battery in FMR sensor power supply**

Description

When short or open or internal fault occurs in front right center ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B207500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		USS _ Fault Status _ enum = 4 is detected				
B207900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207A00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207B00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor

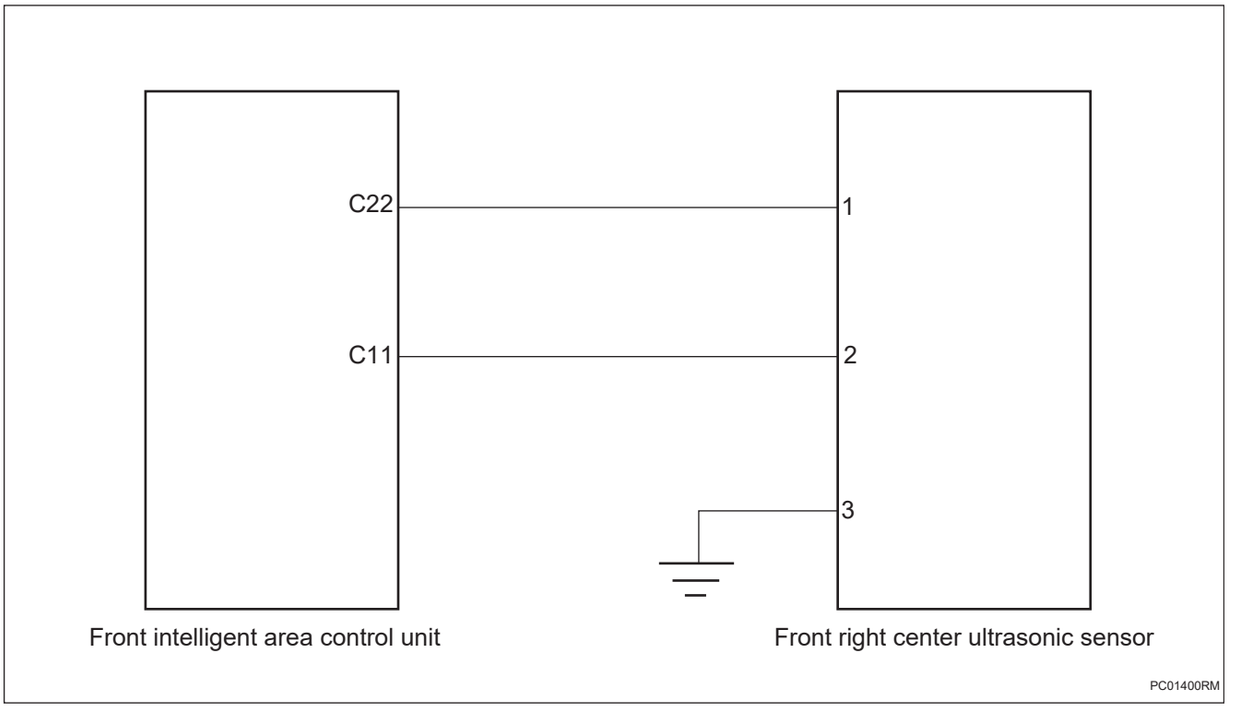
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B207C00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor
B207D00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FMR. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front right center ultrasonic sensor

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B207500	• Sensor stops detecting, and the data is invalid	Not come on
B207600	• Sensor stops detecting, and the data is invalid	Not come on
B207700	• Sensor stops detecting, and the data is invalid	Not come on
B207800	• Sensor stops detecting, and the data is invalid	Not come on
B207900	• Sensor stops detecting, and the data is invalid	Not come on
B207A00	• Sensor stops detecting, and the data is invalid	Not come on
B207B00	• Sensor stops detecting, and the data is invalid	Not come on
B207C00	• Sensor stops detecting, and the data is invalid	Not come on
B207D00	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check front right center ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

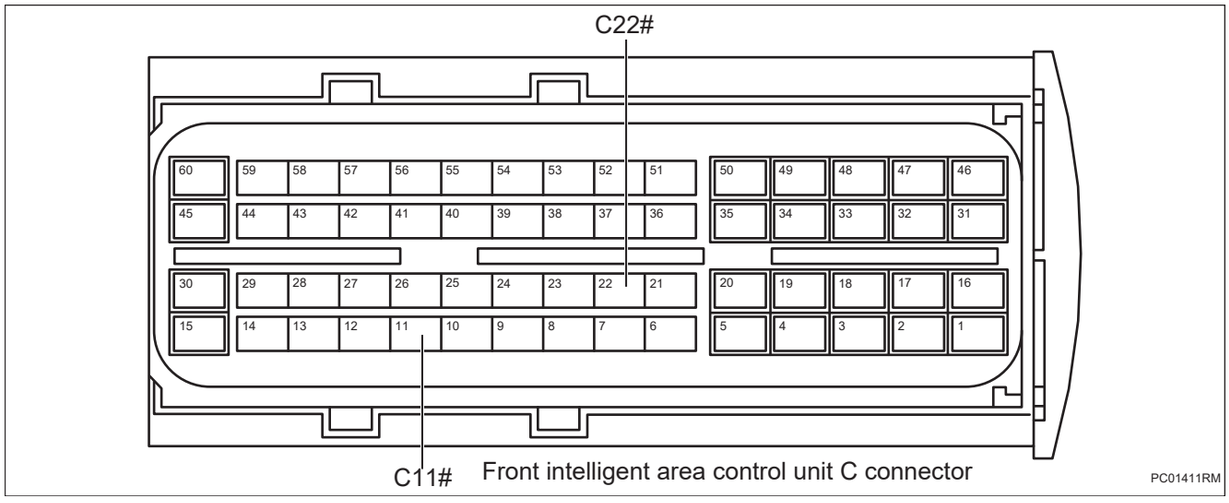
(b) Check ultrasonic sensor for proper installation.

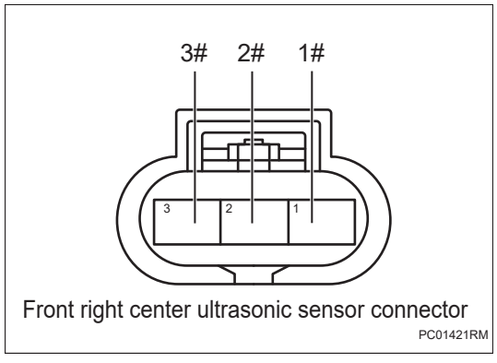
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in front right center ultrasonic sensor wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect front right center ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

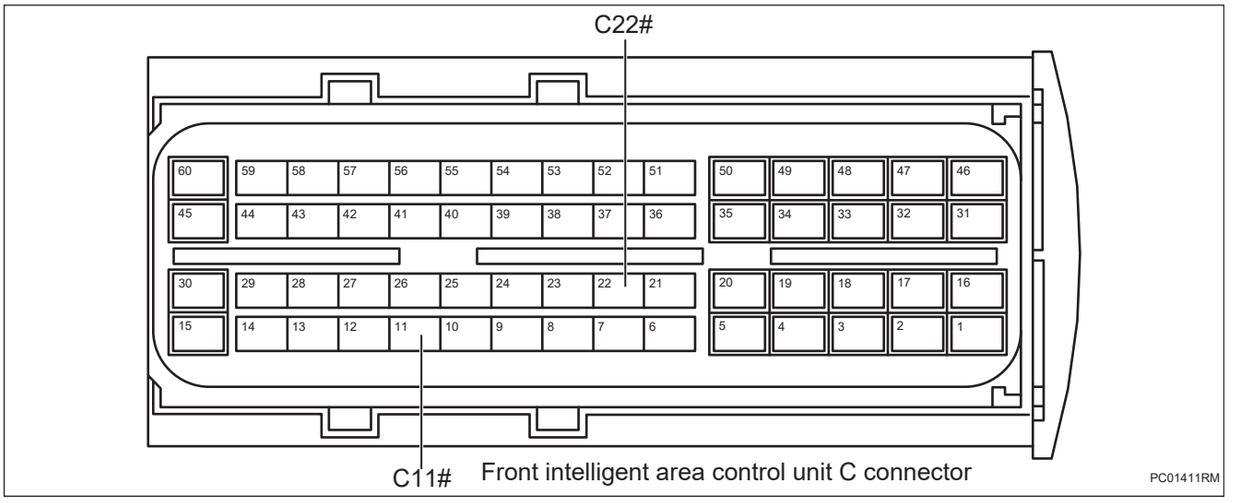
Multimeter connection	Detection condition	Specified condition
Front right center ultrasonic sensor connector 2# - front intelligent area control unit connector C11#	Always connected	Less than 1 Ω
Front right center ultrasonic sensor connector 1# - front intelligent area control unit connector C22#	Always connected	Less than 1 Ω
Front right center ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to ground in front right center ultrasonic sensor wire harness and connector



(a) According to value in the table, measure resistance.

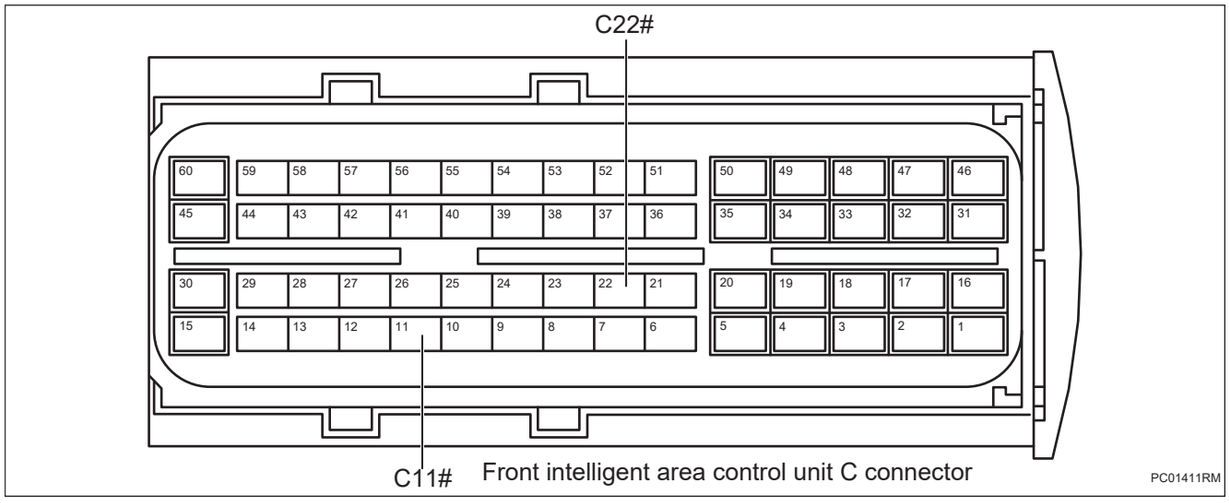
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in front right center ultrasonic sensor wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace front right center ultrasonic sensor (See page ZC-124)

(a) Replace front right center ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

ZD

Diagnosis ends

DTC	B207E00	Short to ground in FR sensor signal circuit
DTC	B207F00	Open in FR sensor signal circuit
DTC	B208000	FR sensor residual vibration fault
DTC	B208100	FR sensor internal fault
DTC	B208200	FR sensor covered
DTC	B208300	Short to power supply in FR sensor signal circuit
DTC	B208400	FR sensor power supply voltage fault
DTC	B208500	Short to ground in FR sensor power supply
DTC	B208600	Short to battery in FR sensor power supply

Description

When short or open or internal fault occurs in front right corner ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B207E00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B207F00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor

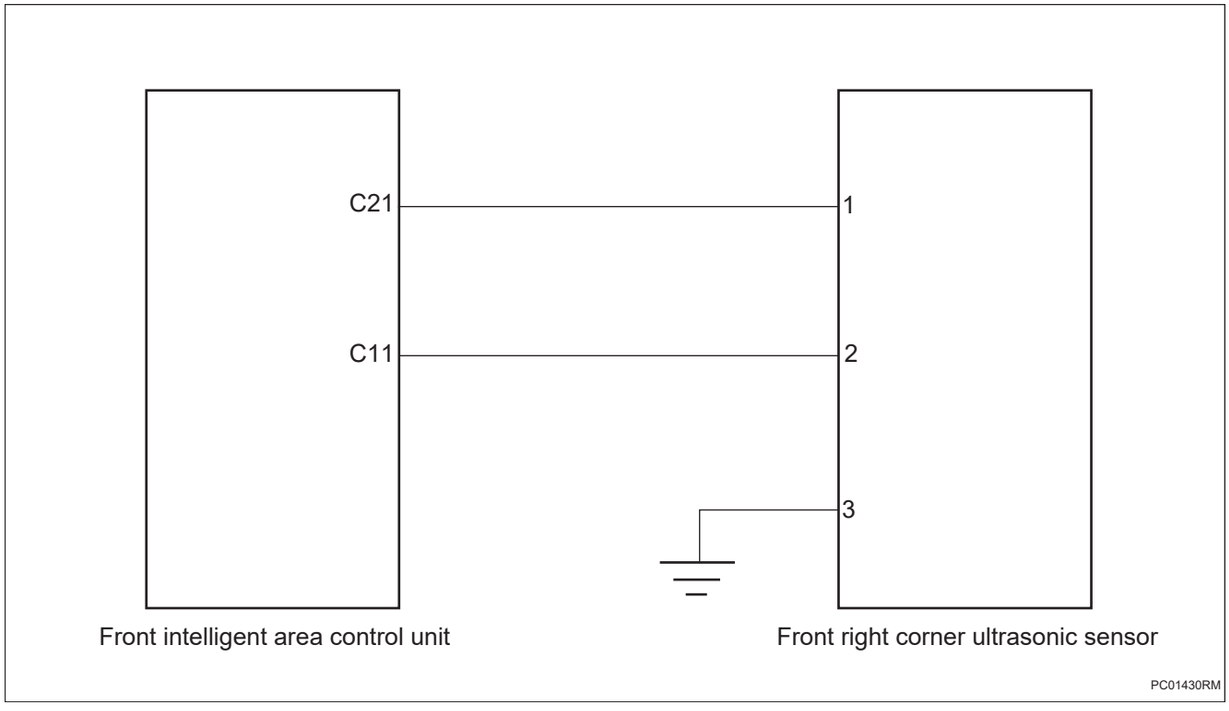
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B208300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor
B208600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FR. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front right corner ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B207E00	• Sensor stops detecting, and the data is invalid	Not come on
B207F00	• Sensor stops detecting, and the data is invalid	Not come on
B208000	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B208100	• Sensor stops detecting, and the data is invalid	Not come on
B208200	• Sensor stops detecting, and the data is invalid	Not come on
B208300	• Sensor stops detecting, and the data is invalid	Not come on
B208400	• Sensor stops detecting, and the data is invalid	Not come on
B208500	• Sensor stops detecting, and the data is invalid	Not come on
B208600	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check front right corner ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

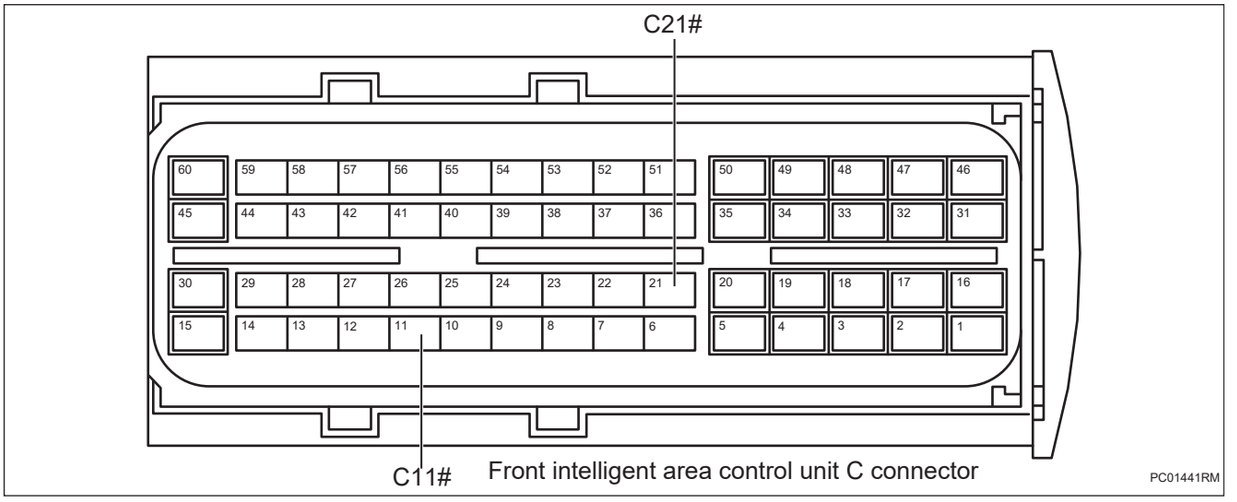
(b) Check ultrasonic sensor for proper installation.

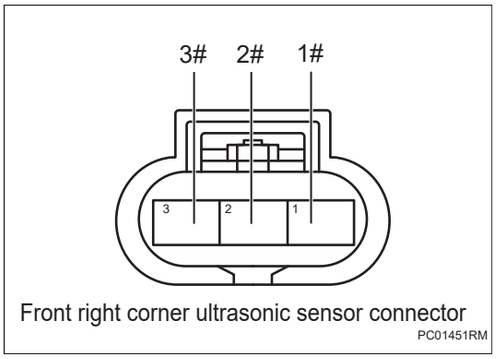
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	Check for open in front right corner ultrasonic sensor wire harness and connector





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect front right corner ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

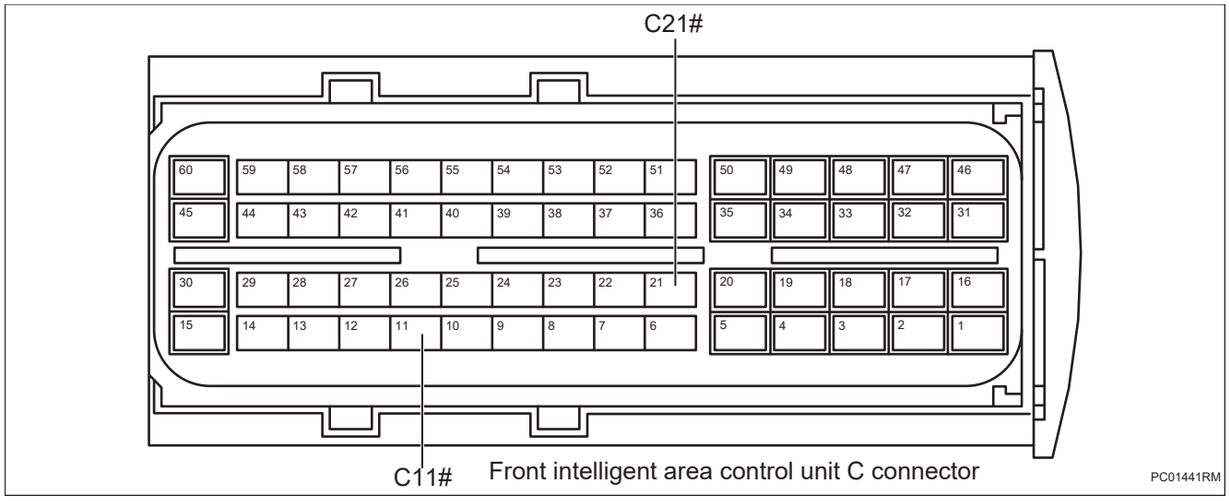
Standard value

Multimeter connection	Detection condition	Specified condition
Front right corner ultrasonic sensor connector 2# - front intelligent area control unit connector C11#	Always connected	Less than 1 Ω
Front right corner ultrasonic sensor connector 1# - front intelligent area control unit connector C21#	Always connected	Less than 1 Ω
Front right corner ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front right corner ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

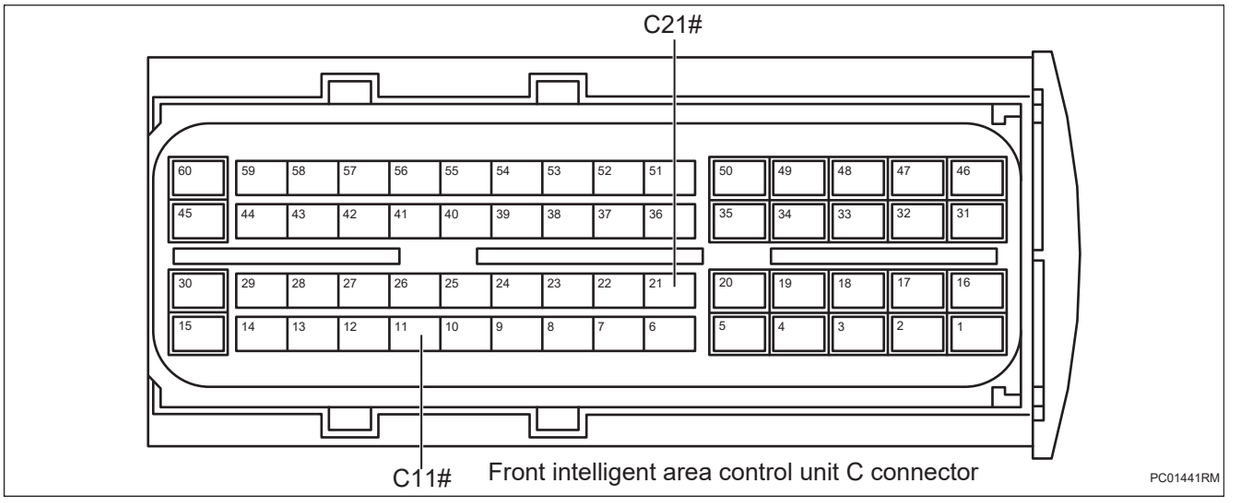
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front right corner ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front right corner ultrasonic sensor (See page ZC-124)**

(a) Replace front right corner ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

DTC	B208700	Short to ground in FRS sensor signal circuit
DTC	B208800	Open in FRS sensor signal circuit
DTC	B208900	FRS sensor residual vibration fault
DTC	B208A00	FRS sensor internal fault
DTC	B208B00	FRS sensor covered
DTC	B208C00	Short to power supply in FRS sensor signal circuit
DTC	B208D00	FRS sensor power supply voltage fault
DTC	B208E00	Short to ground in FRS sensor power supply
DTC	B208F00	Short to battery in FRS sensor power supply

Description

When short or open or internal fault occurs in front right side ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B208700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208A00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208B00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B208C00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208D00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208E00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor
B208F00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ FRS. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Front right side ultrasonic sensor

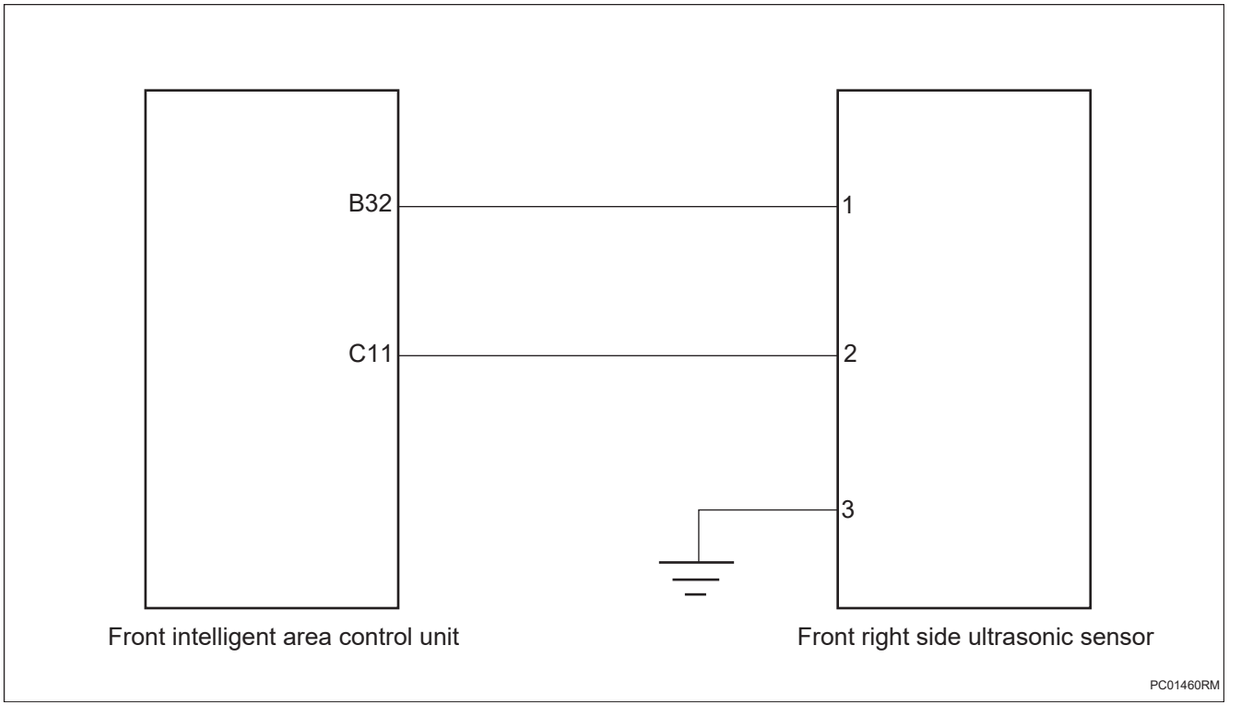
Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B208700	• Sensor stops detecting, and the data is invalid	Not come on
B208800	• Sensor stops detecting, and the data is invalid	Not come on
B208900	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B208A00	• Sensor stops detecting, and the data is invalid	Not come on
B208B00	• Sensor stops detecting, and the data is invalid	Not come on
B208C00	• Sensor stops detecting, and the data is invalid	Not come on
B208D00	• Sensor stops detecting, and the data is invalid	Not come on
B208E00	• Sensor stops detecting, and the data is invalid	Not come on
B208F00	• Sensor stops detecting, and the data is invalid	Not come on

ZD

Circuit diagram



Inspection procedure

1	**Check front right side ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

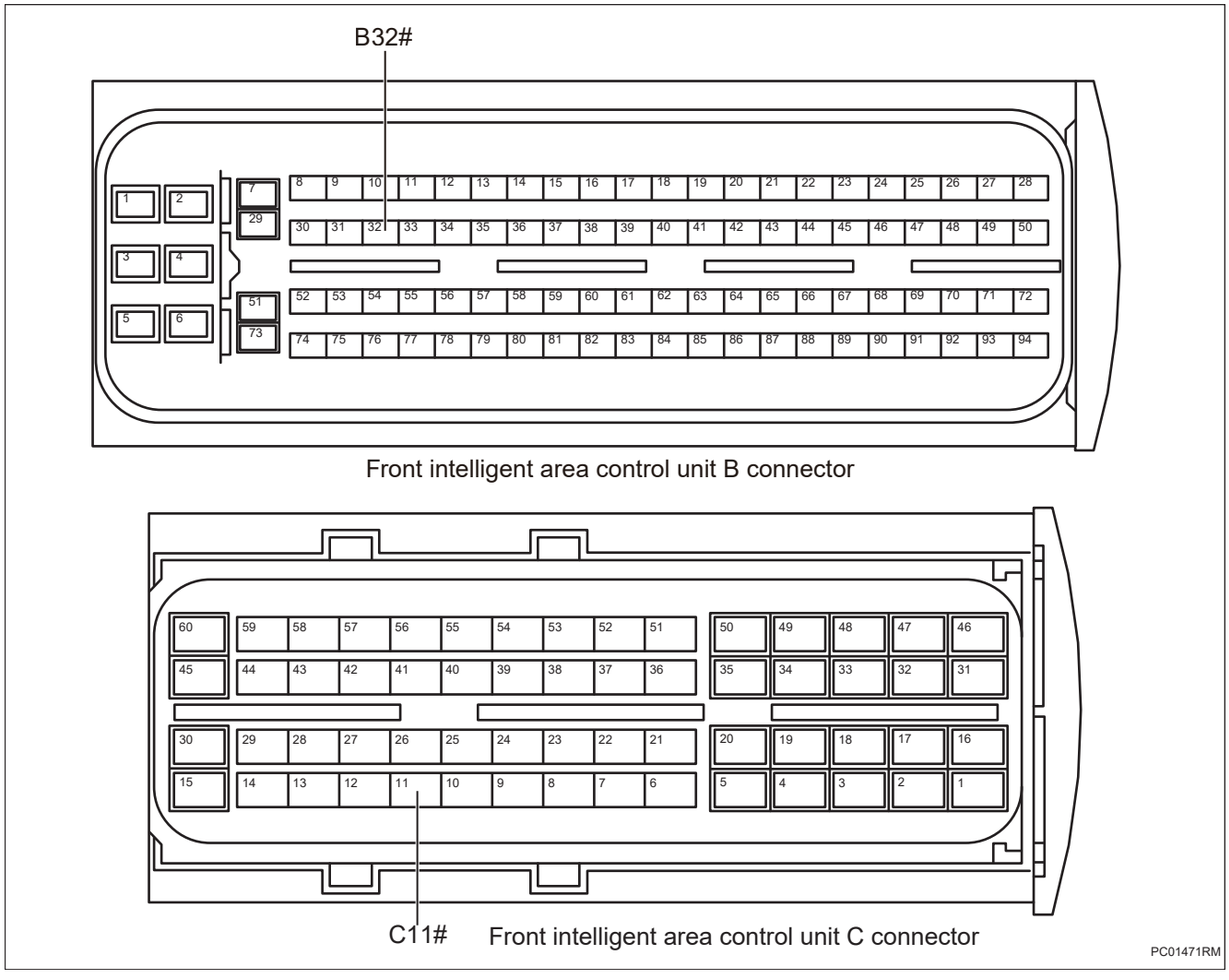
(b) Check ultrasonic sensor for proper installation.

(c) Check ultrasonic sensor for damage.

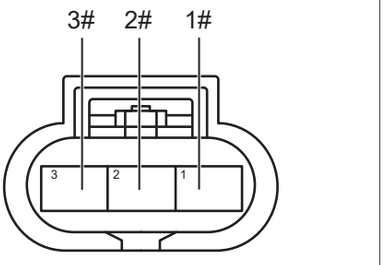
NG	**Perform repair according to malfunction**

OK

2	**Check for open in front right side ultrasonic sensor wire harness and connector**



ZD



Front right side ultrasonic sensor connector
PC01481RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front right side ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

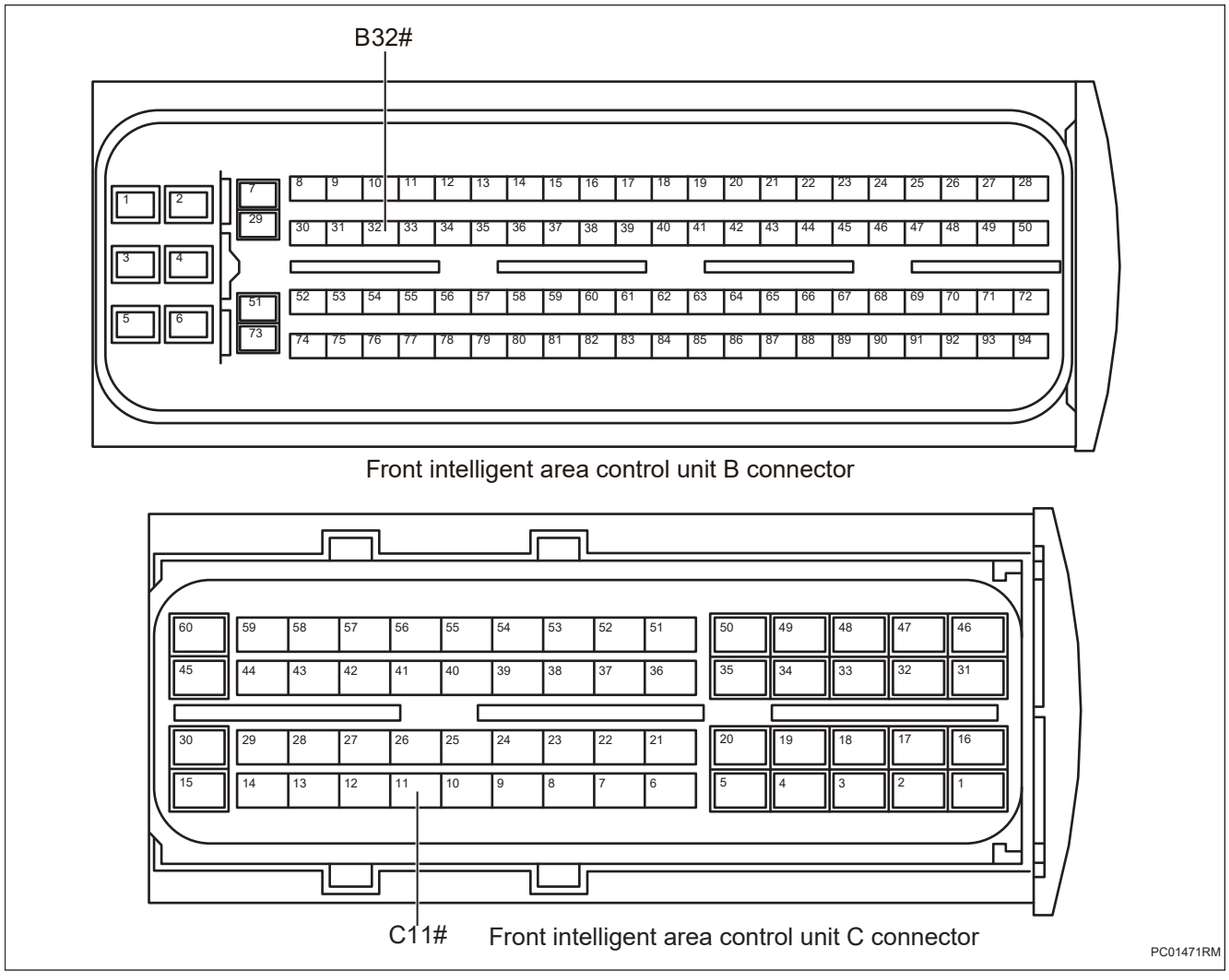
Multimeter connection	Detection condition	Specified condition
Front right side ultrasonic sensor connector 2# - front intelligent area control unit connector C11#	Always connected	Less than 1 Ω
Front right side ultrasonic sensor connector 1# - front intelligent area control unit connector B32#	Always connected	Less than 1 Ω
Front right side ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

ZD

3	**Check for short to ground in front right side ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

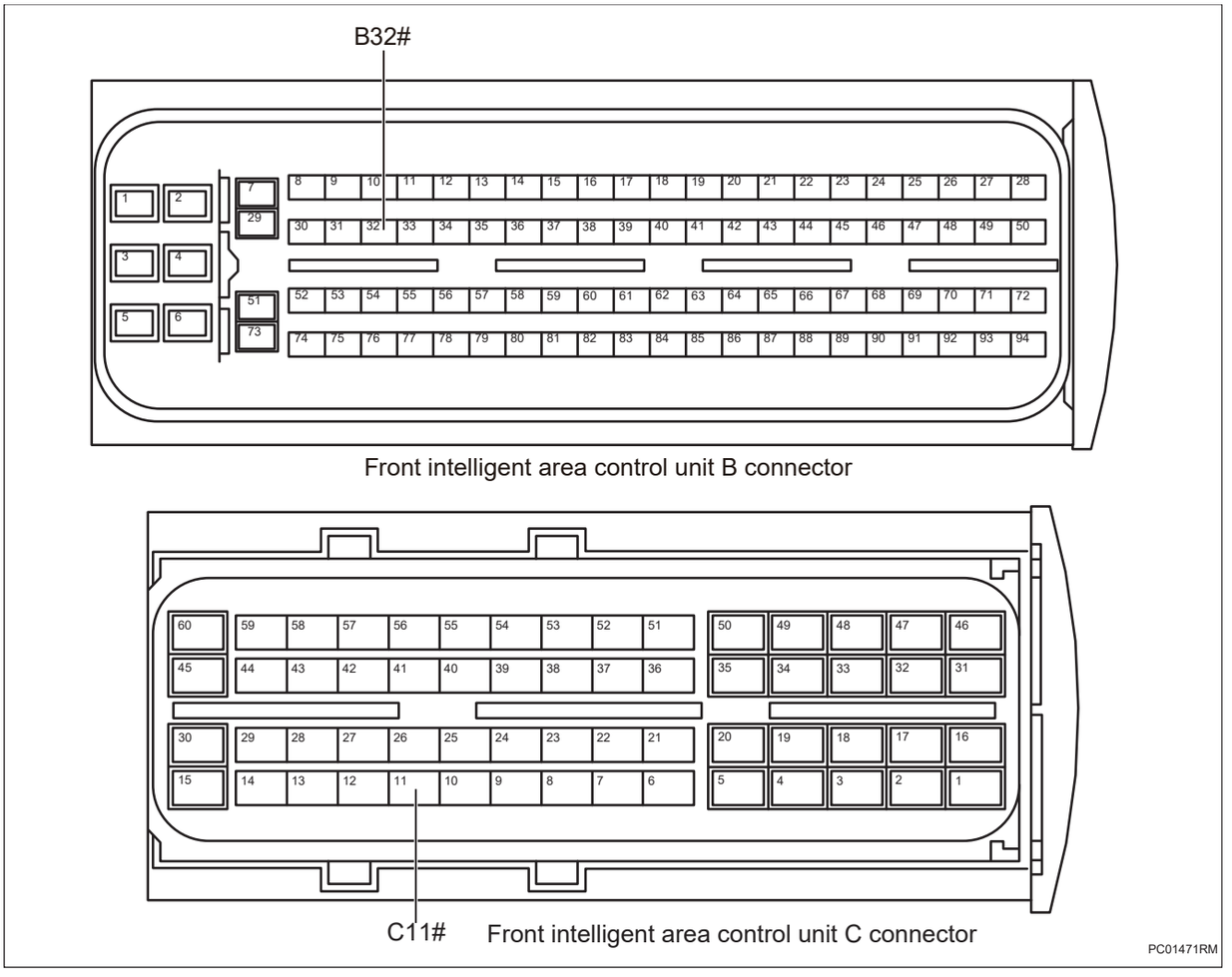
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B32# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front right side ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B32# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace front right side ultrasonic sensor (See page ZC-124)

(a) Replace the front right side ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B209000	Short to ground in RRS sensor signal circuit
DTC	B209100	Open in RRS sensor signal circuit
DTC	B209200	RRS sensor residual vibration fault
DTC	B209300	RRS sensor internal fault
DTC	B209400	RRS sensor covered

DTC	B209500	Short to power supply in RRS sensor signal circuit
DTC	B209600	RRS sensor power supply voltage fault
DTC	B209700	Short to ground in RRS sensor power supply
DTC	B209800	Short to battery in RRS sensor power supply

Description

When short or open or internal fault occurs in rear right side ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B209000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor

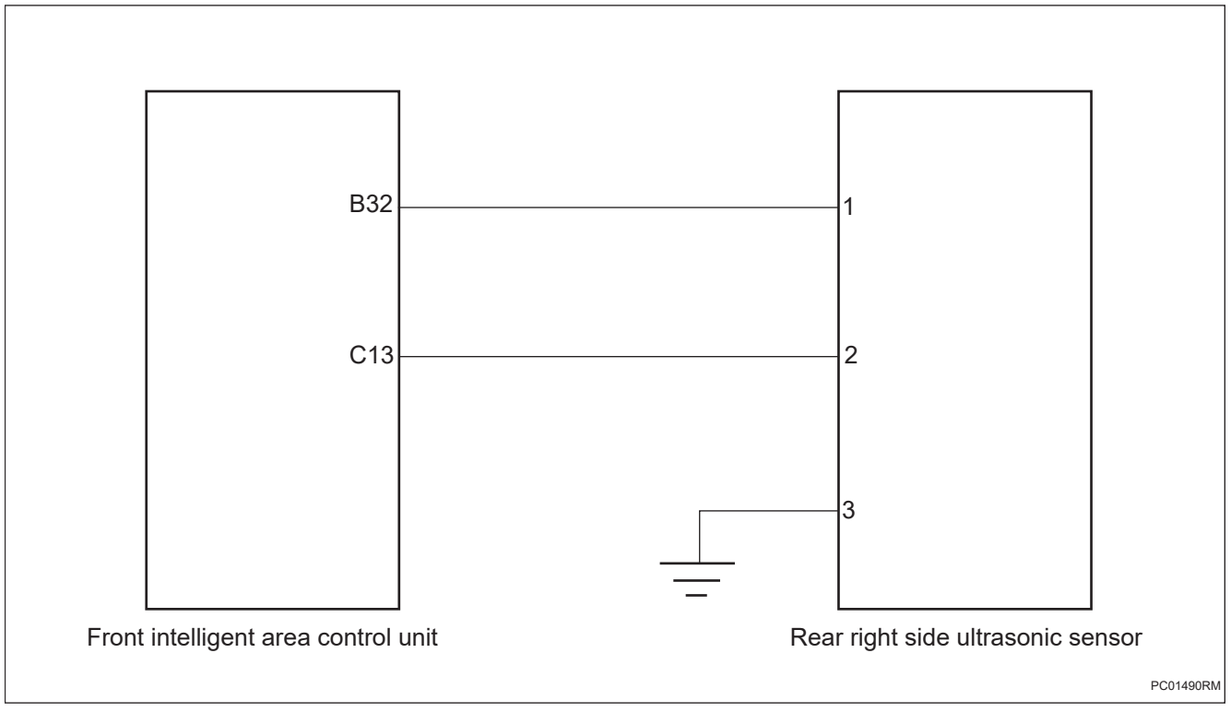
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		USS _ Fault Status _ enum = 4 is detected				
B209400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B209700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor
B209800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RRS. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear right side ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B209000	• Sensor stops detecting, and the data is invalid	Not come on
B209100	• Sensor stops detecting, and the data is invalid	Not come on
B209200	• Sensor stops detecting, and the data is invalid	Not come on
B209300	• Sensor stops detecting, and the data is invalid	Not come on
B209400	• Sensor stops detecting, and the data is invalid	Not come on
B209500	• Sensor stops detecting, and the data is invalid	Not come on
B209600	• Sensor stops detecting, and the data is invalid	Not come on
B209700	• Sensor stops detecting, and the data is invalid	Not come on
B209800	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check rear right side ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

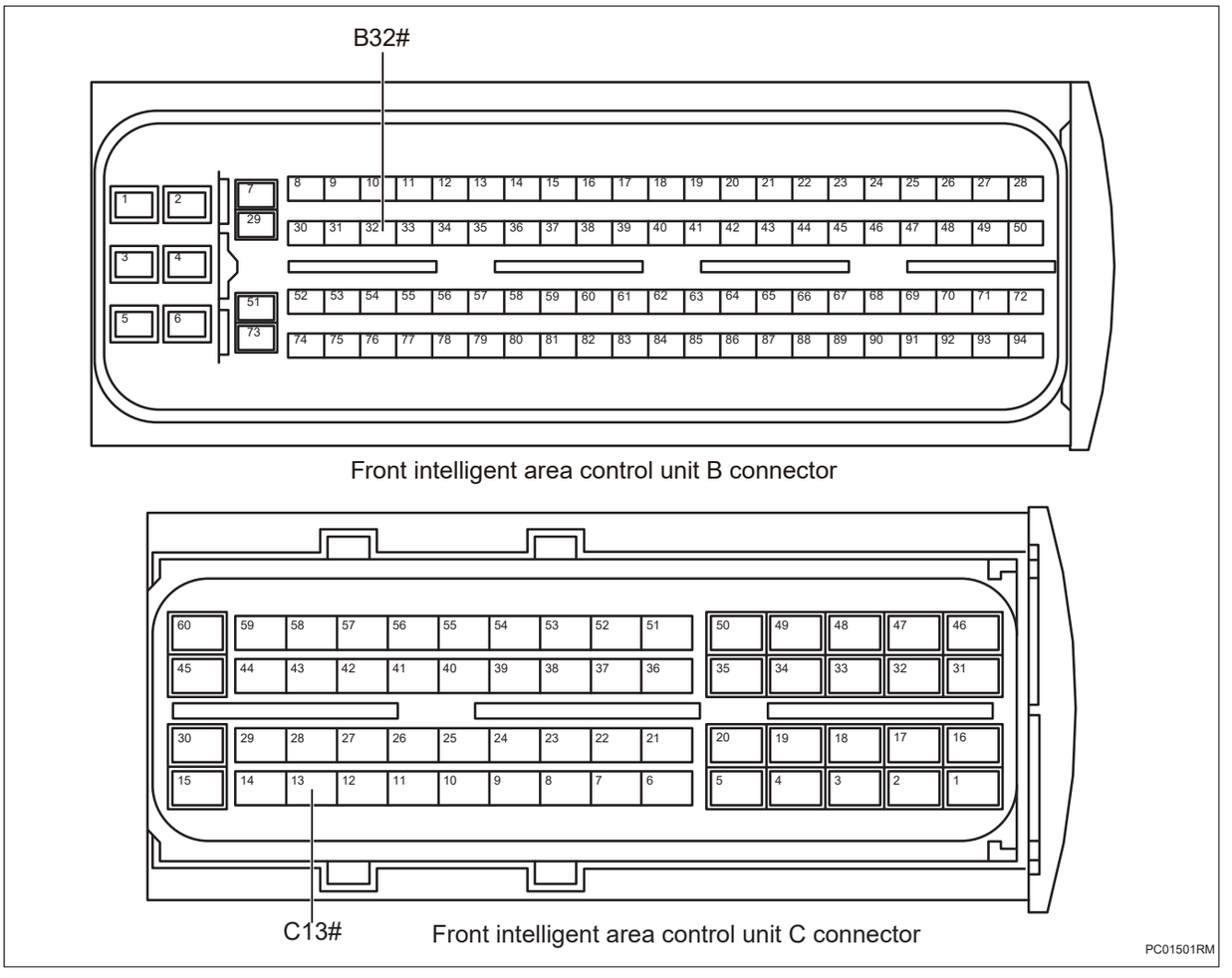
(b) Check ultrasonic sensor for proper installation.

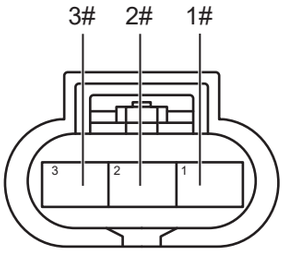
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in rear right side ultrasonic sensor wire harness and connector**





Rear right side ultrasonic sensor connector
PC01511RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear right side ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

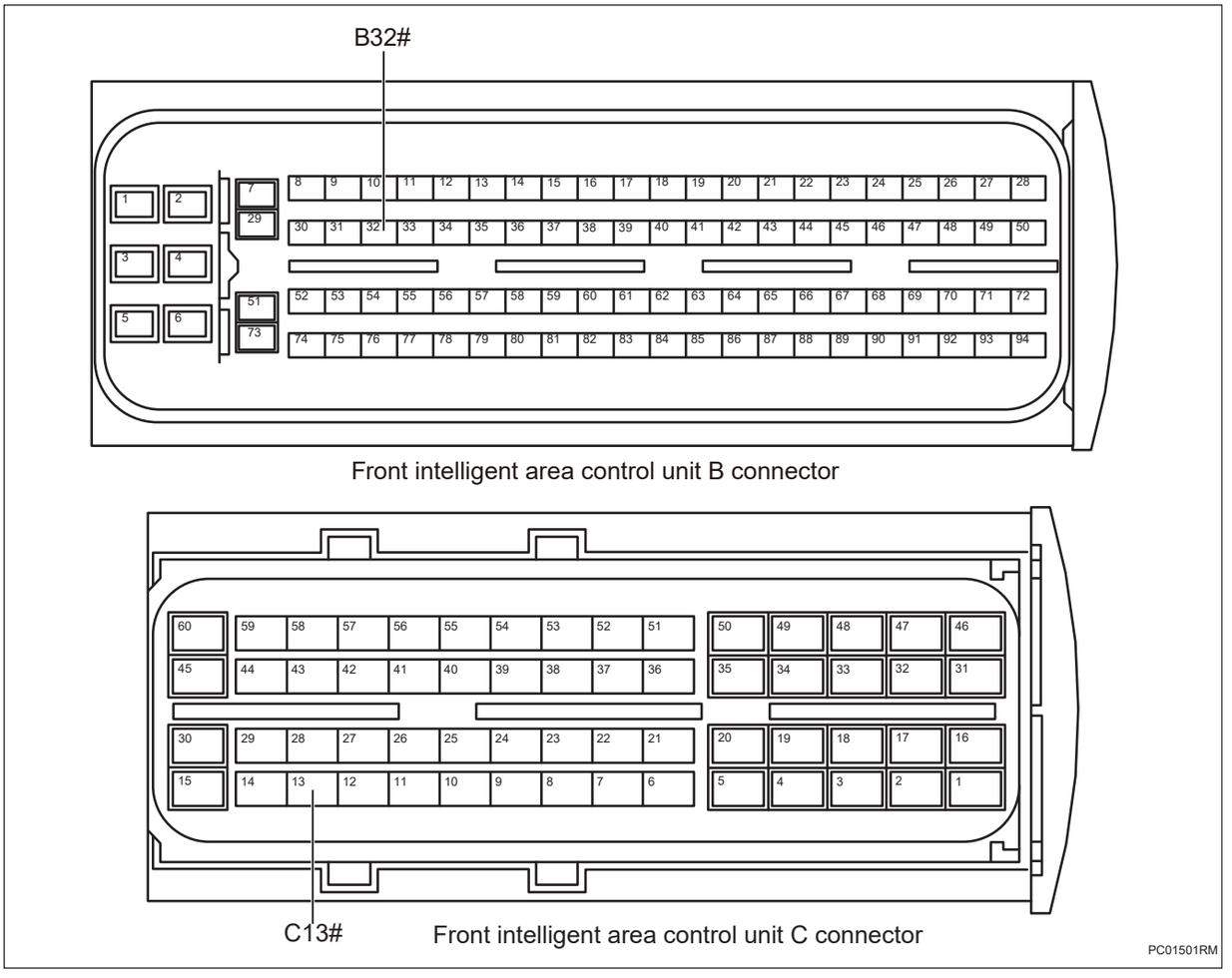
Multimeter connection	Detection condition	Specified condition
Rear right side ultrasonic sensor connector 2# - front intelligent area control unit connector C13#	Always connected	Less than 1 Ω
Rear right side ultrasonic sensor connector 1# - front intelligent area control unit connector B32#	Always connected	Less than 1 Ω
Rear right side ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in rear right side ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

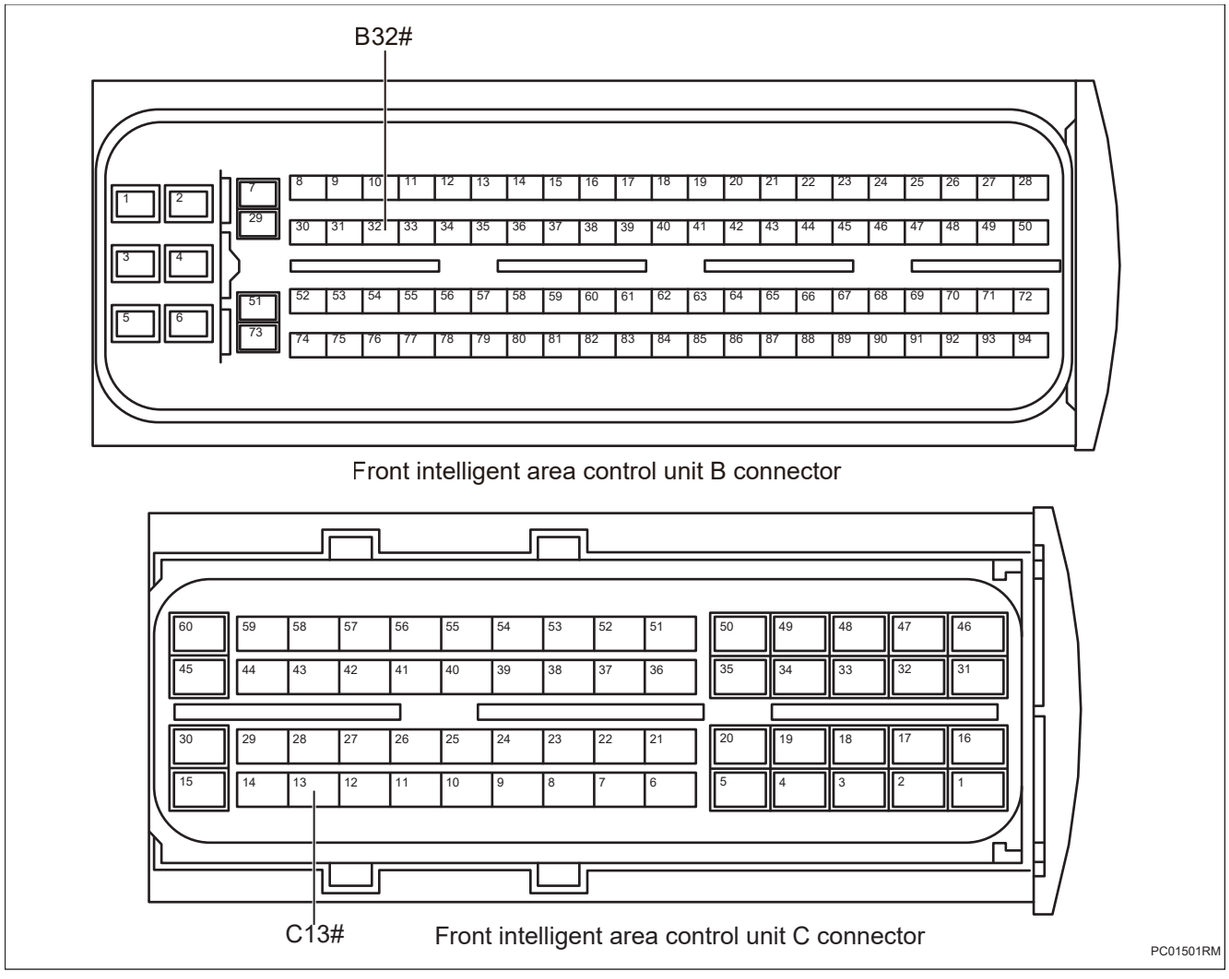
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B32# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right side ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B32# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace rear right side ultrasonic sensor (See page ZC-126)

(a) Replace the rear right side ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B209900	Short to ground in RR sensor signal circuit
DTC	B209A00	Open in RR sensor signal circuit
DTC	B209B00	RR sensor residual vibration fault
DTC	B209C00	RR sensor internal fault
DTC	B209D00	RR sensor covered

DTC	**B209E00**	**Short to power supply in RR sensor signal circuit**
DTC	**B209F00**	**RR sensor power supply voltage fault**
DTC	**B20A000**	**Short to ground in RR sensor power supply**
DTC	**B20A100**	**Short to battery in RR sensor power supply**

Description

When short or open or internal fault occurs in rear right corner ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B209900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B209A00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B209B00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B209C00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		USS _ Fault Status _ enum = 4 is detected				
B209D00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B209E00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B209F00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor

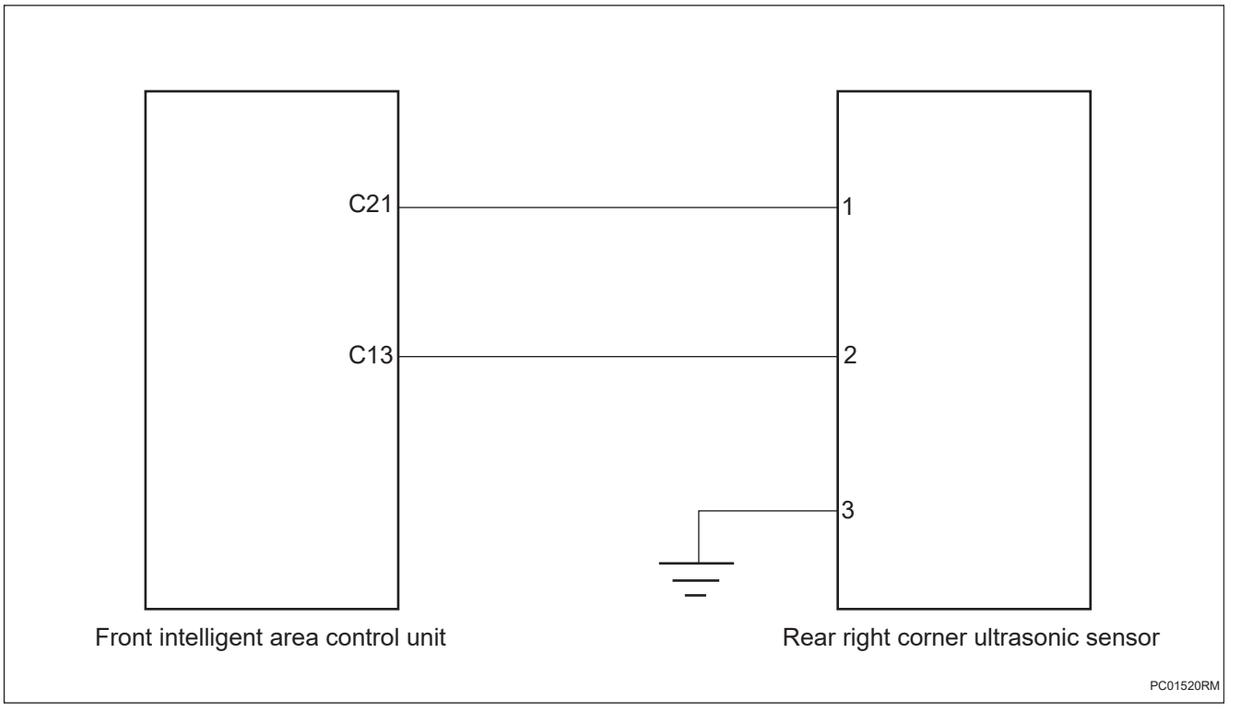
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20A000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor
B20A100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RR. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear right corner ultrasonic sensor

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B209900	• Sensor stops detecting, and the data is invalid	Not come on
B209A00	• Sensor stops detecting, and the data is invalid	Not come on
B209B00	• Sensor stops detecting, and the data is invalid	Not come on
B209C00	• Sensor stops detecting, and the data is invalid	Not come on
B209D00	• Sensor stops detecting, and the data is invalid	Not come on
B209E00	• Sensor stops detecting, and the data is invalid	Not come on
B209F00	• Sensor stops detecting, and the data is invalid	Not come on
B20A000	• Sensor stops detecting, and the data is invalid	Not come on
B20A100	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check rear right corner ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

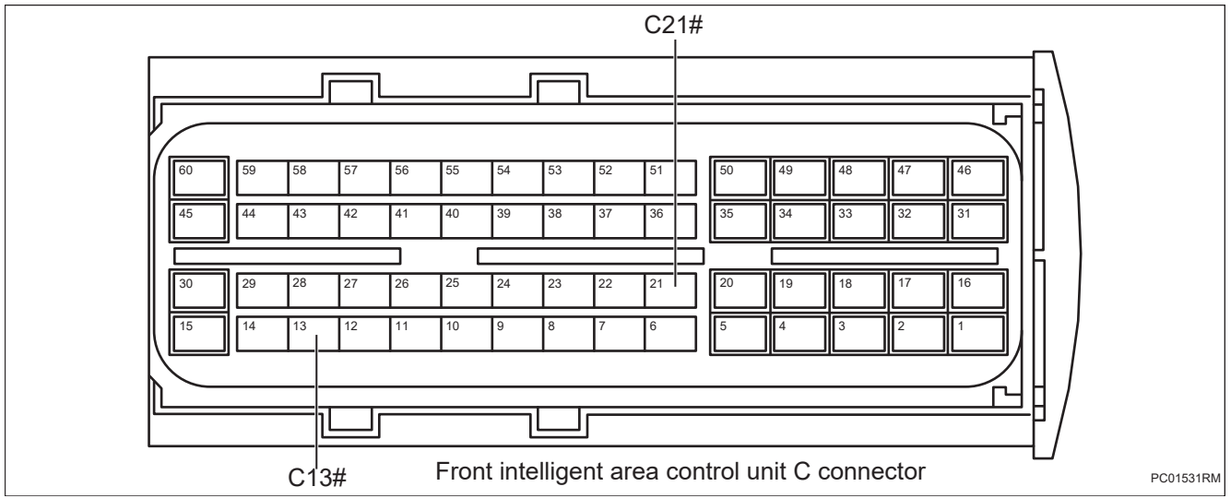
(b) Check ultrasonic sensor for proper installation.

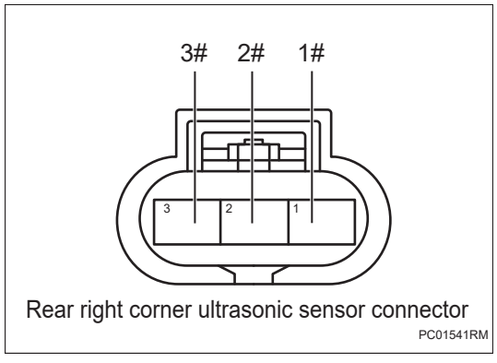
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in rear right corner ultrasonic sensor wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear right corner ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

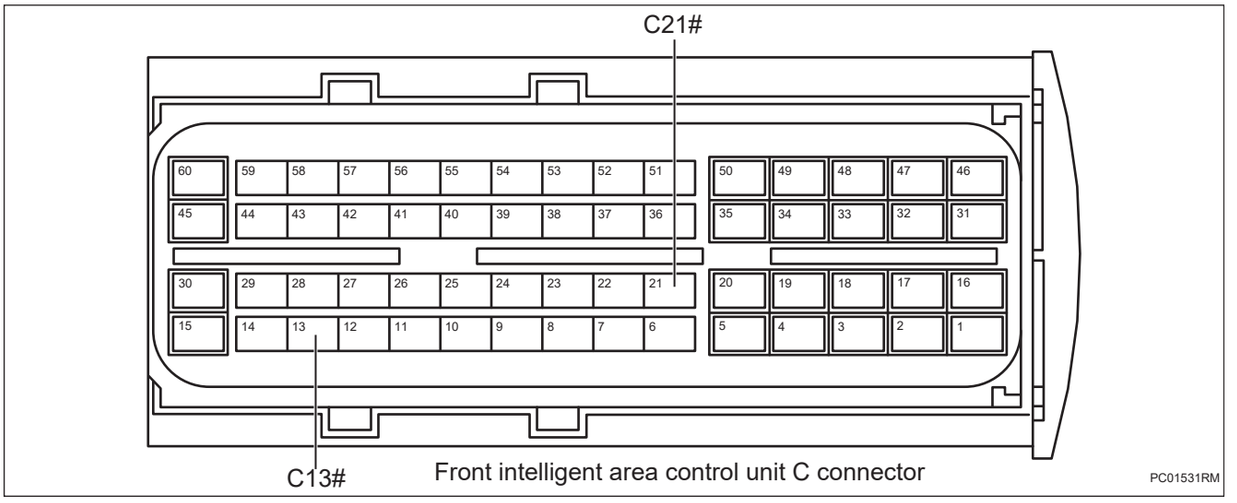
Multimeter connection	Detection condition	Specified condition
Rear right corner ultrasonic sensor connector 2# - front intelligent area control unit connector C13#	Always connected	Less than 1 Ω
Rear right corner ultrasonic sensor connector 1# - front intelligent area control unit connector C21#	Always connected	Less than 1 Ω
Rear right corner ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to ground in rear right corner ultrasonic sensor wire harness and connector



(a) According to value in the table, measure resistance.

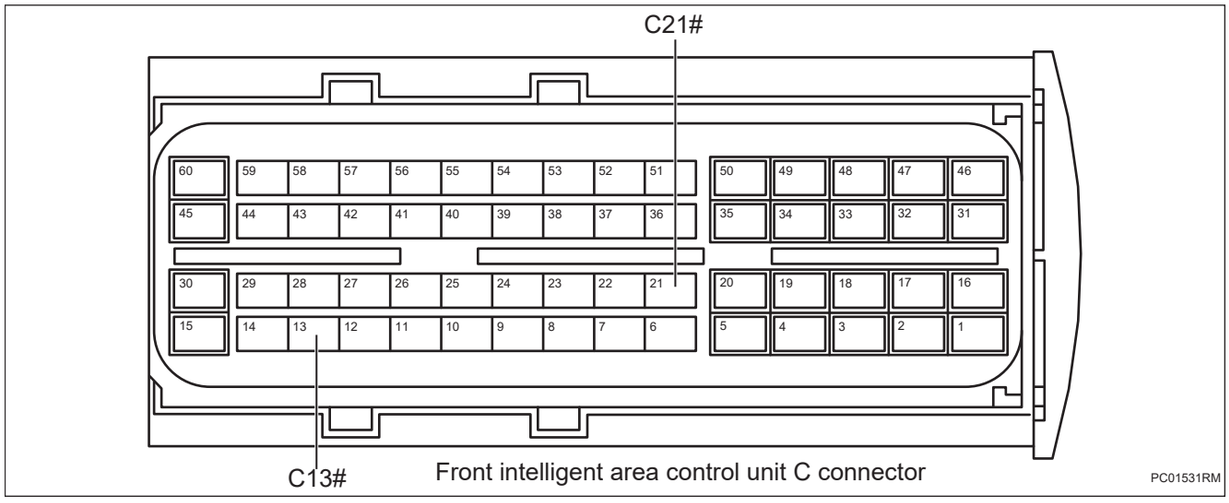
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right corner ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear right corner ultrasonic sensor (See page ZC-126)**

(a) Replace rear right corner ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

ZD

Diagnosis ends

DTC	B20A200	Short to ground in RMR sensor signal circuit
DTC	B20A300	Open in RMR sensor signal circuit
DTC	B20A400	RMR sensor residual vibration fault
DTC	B20A500	RMR sensor internal fault
DTC	B20A600	RMR sensor covered
DTC	B20A700	Short to power supply in RMR sensor signal circuit
DTC	B20A800	RMR sensor power supply voltage fault
DTC	B20A900	Short to ground in RMR sensor power supply
DTC	B20AA00	Short to battery in RMR sensor power supply

Description

When short or open or internal fault occurs in rear right center ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20A200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor

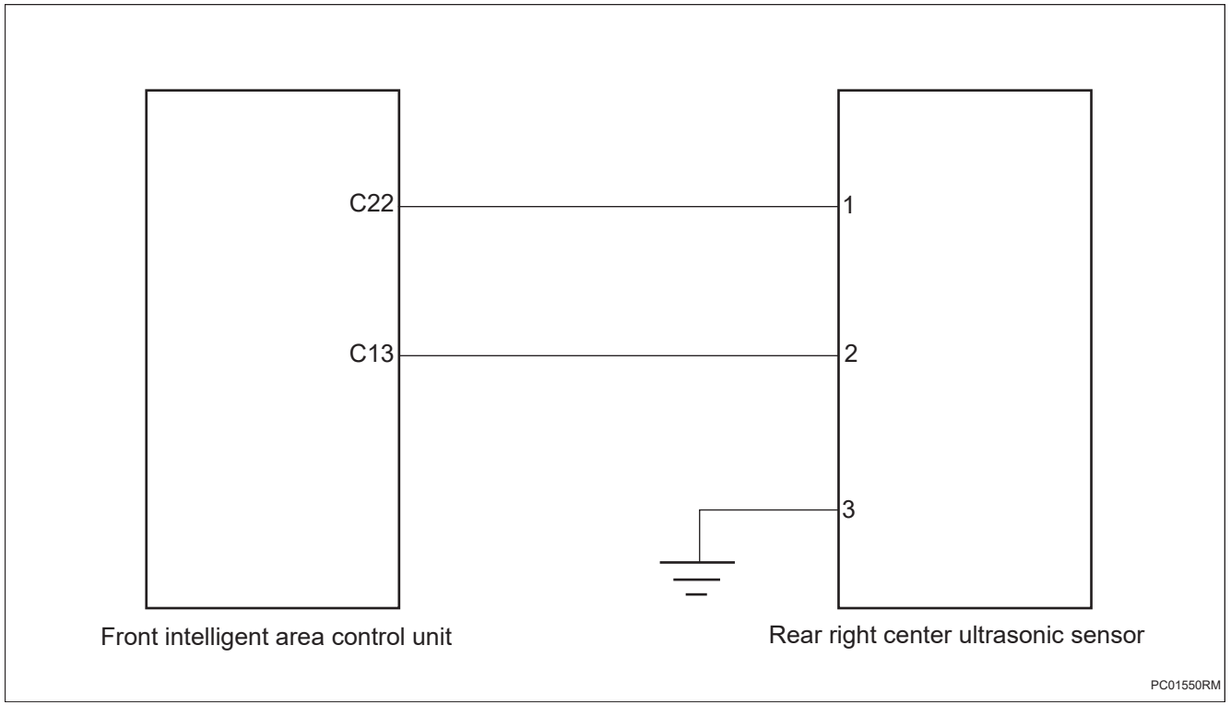
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20A700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20A900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor
B20AA00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RMR. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear right center ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B20A200	• Sensor stops detecting, and the data is invalid	Not come on
B20A300	• Sensor stops detecting, and the data is invalid	Not come on
B20A400	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B20A500	• Sensor stops detecting, and the data is invalid	Not come on
B20A600	• Sensor stops detecting, and the data is invalid	Not come on
B20A700	• Sensor stops detecting, and the data is invalid	Not come on
B20A800	• Sensor stops detecting, and the data is invalid	Not come on
B20A900	• Sensor stops detecting, and the data is invalid	Not come on
B20AA00	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check rear right center ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

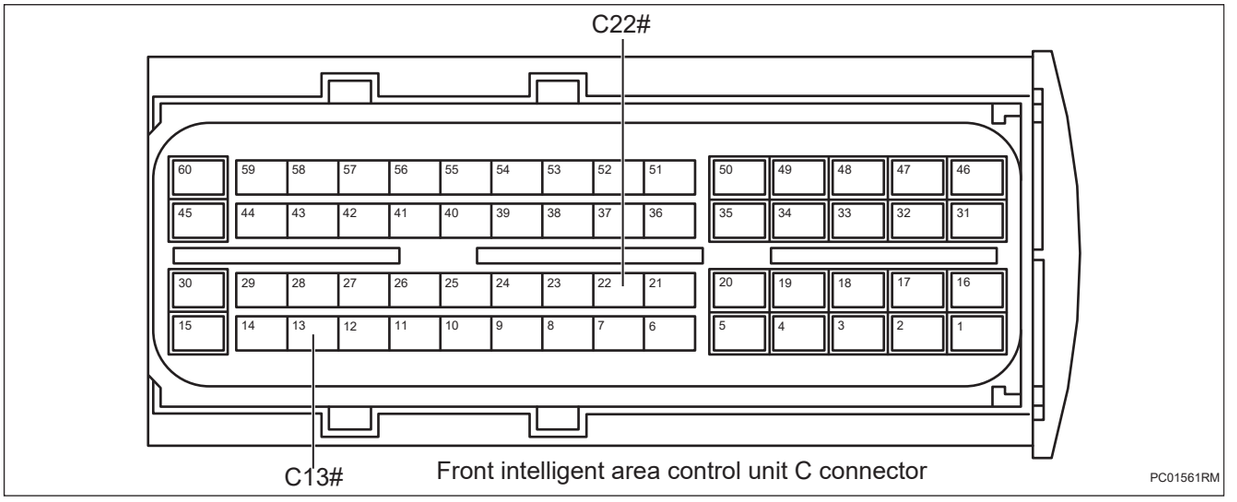
(b) Check ultrasonic sensor for proper installation.

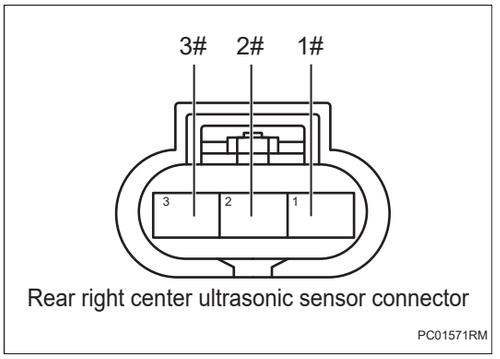
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	Check for open in rear right center ultrasonic sensor wire harness and connector





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear right center ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

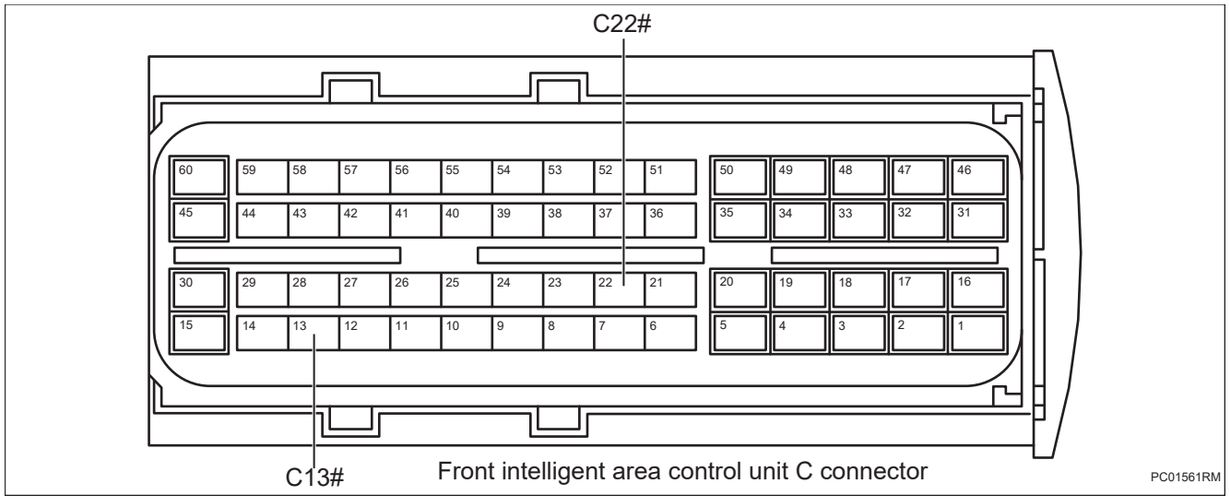
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right center ultrasonic sensor connector 2# - front intelligent area control unit connector C13#	Always connected	Less than 1 Ω
Rear right center ultrasonic sensor connector 1# - front intelligent area control unit connector C22#	Always connected	Less than 1 Ω
Rear right center ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear right center ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

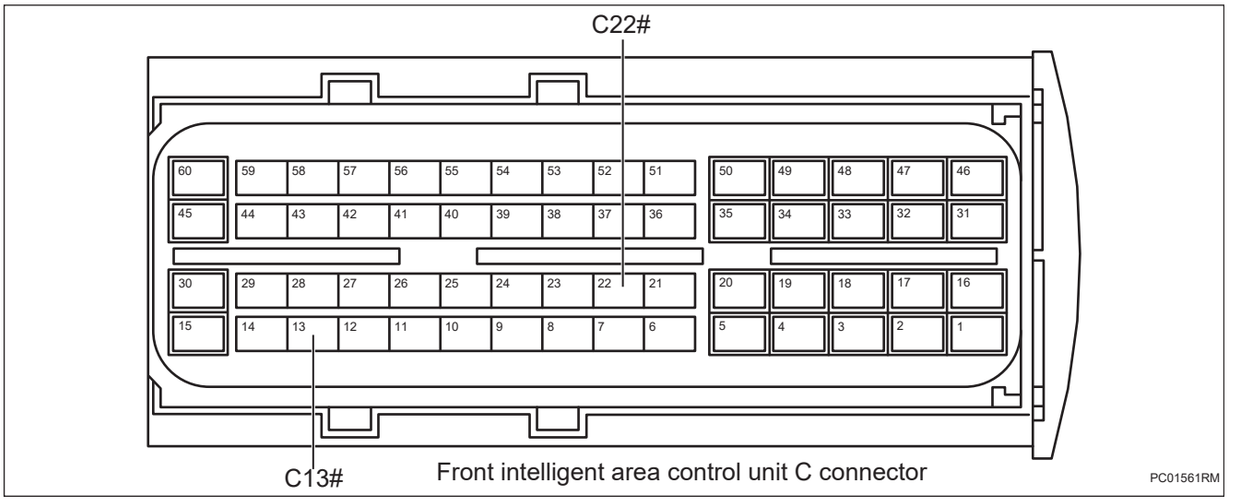
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in rear right center ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear right center ultrasonic sensor (See page ZC-126)**

(a) Replace rear right center ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:
No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B20AB00	Short to ground in RML sensor signal circuit
DTC	B20AC00	Open in RML sensor signal circuit
DTC	B20AD00	RML sensor residual vibration fault
DTC	B20AE00	RML sensor internal fault
DTC	B20AF00	RML sensor covered
DTC	B20B000	Short to power supply in RML sensor signal circuit
DTC	B20B100	RML sensor power supply voltage fault
DTC	B20B200	Short to ground in RML sensor power supply
DTC	B20B300	Short to battery in RML sensor power supply

Description

When short or open or internal fault occurs in rear left center ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20AB00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20AC00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20AD00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20AE00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20AF00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor

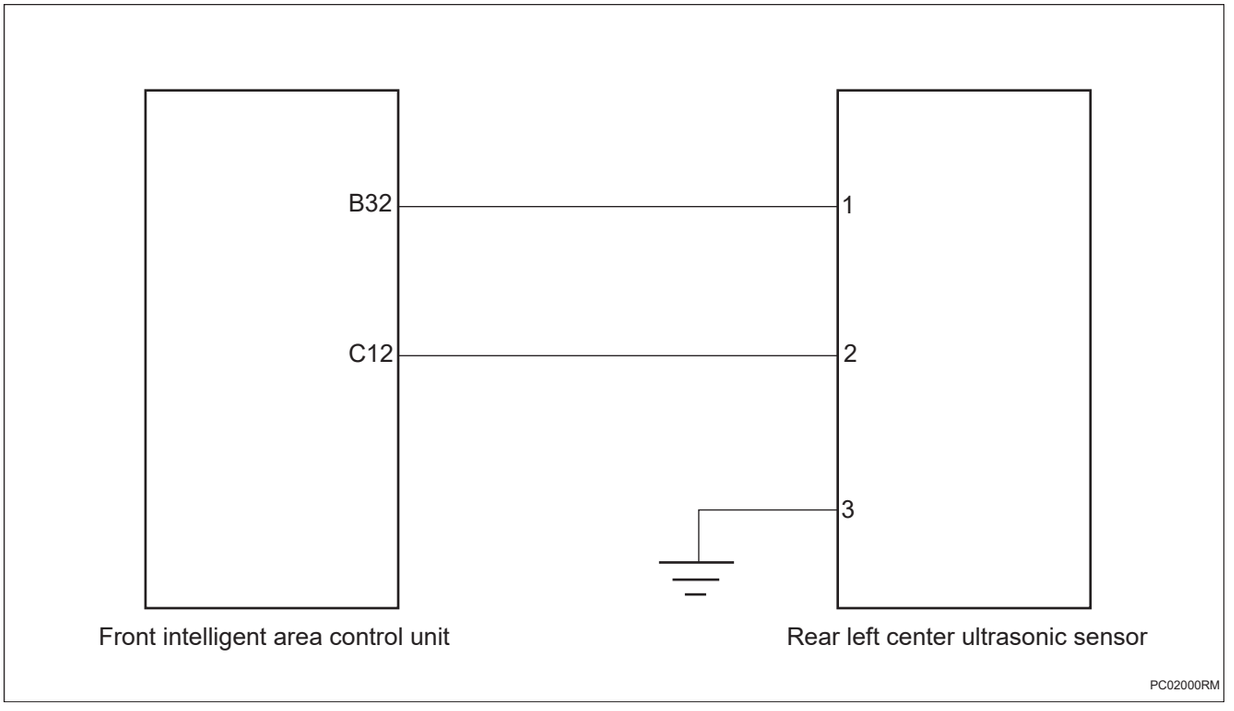
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20B000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20B100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20B200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor
B20B300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RML. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear left center ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B20AB00	• Sensor stops detecting, and the data is invalid	Not come on
B20AC00	• Sensor stops detecting, and the data is invalid	Not come on
B20AD00	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B20AE00	• Sensor stops detecting, and the data is invalid	Not come on
B20AF00	• Sensor stops detecting, and the data is invalid	Not come on
B20B000	• Sensor stops detecting, and the data is invalid	Not come on
B20B100	• Sensor stops detecting, and the data is invalid	Not come on
B20B200	• Sensor stops detecting, and the data is invalid	Not come on
B20B300	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	Check rear left center ultrasonic sensor

(a) Check ultrasonic sensor for dirt.

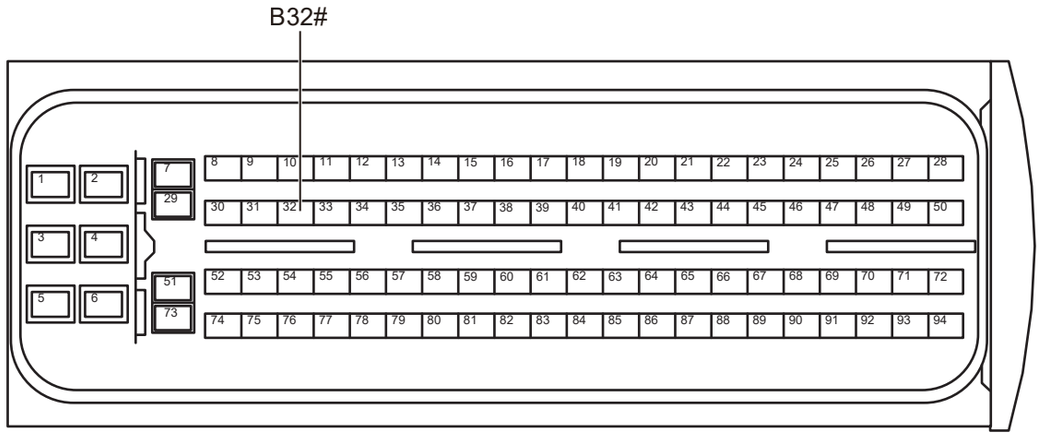
(b) Check ultrasonic sensor for proper installation.

(c) Check ultrasonic sensor for damage.

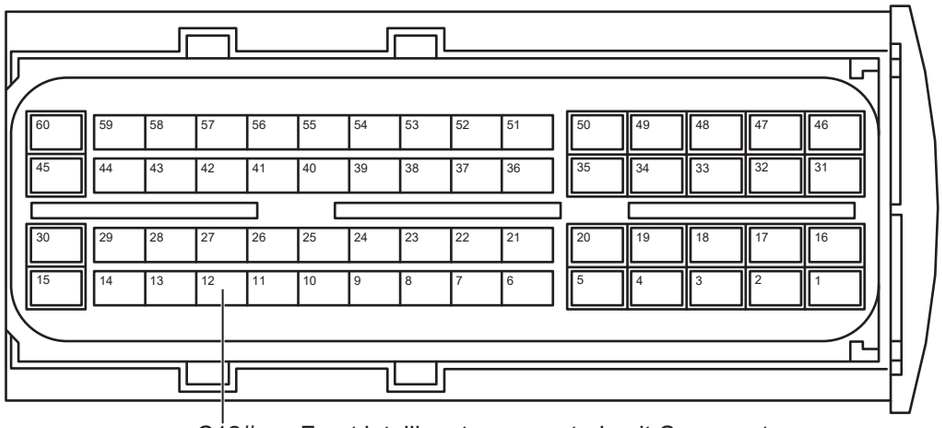
NG → **Perform repair according to malfunction**

OK

2	**Check for open in rear left center ultrasonic sensor wire harness and connector**



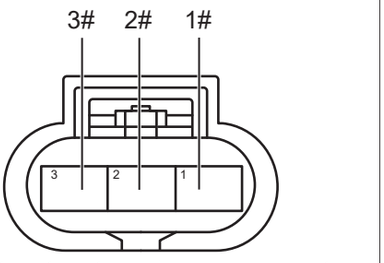
Front intelligent area control unit B connector



C12# Front intelligent area control unit C connector

PC02011RM

ZD



Rear left center ultrasonic sensor connector

PC02021RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear left center ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

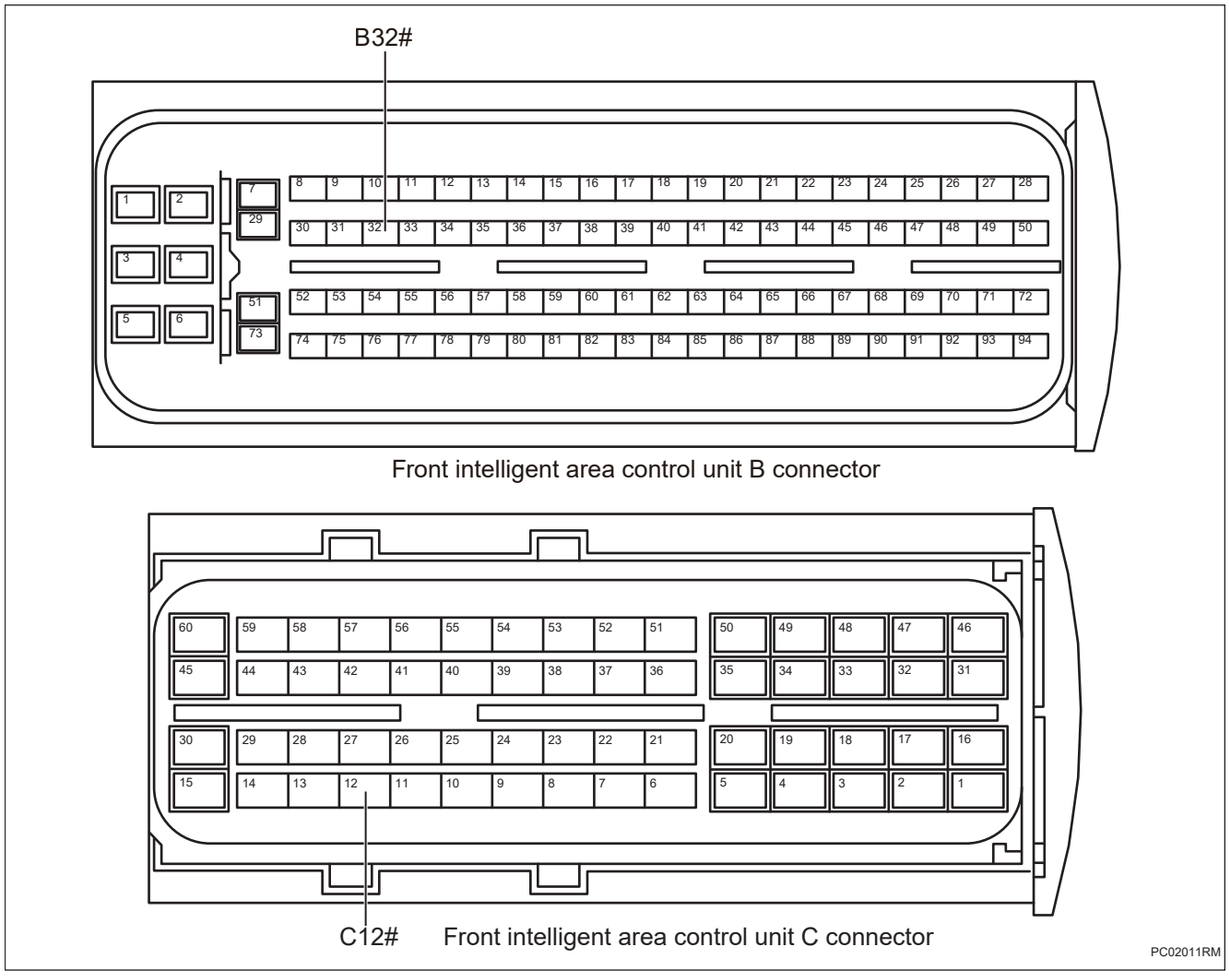
Multimeter connection	Detection condition	Specified condition
Rear left center ultrasonic sensor connector 2# - front intelligent area control unit connector C12#	Always connected	Less than 1 Ω
Rear left center ultrasonic sensor connector 1# - front intelligent area control unit connector B32#	Always connected	Less than 1 Ω
Rear left center ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in rear left center ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

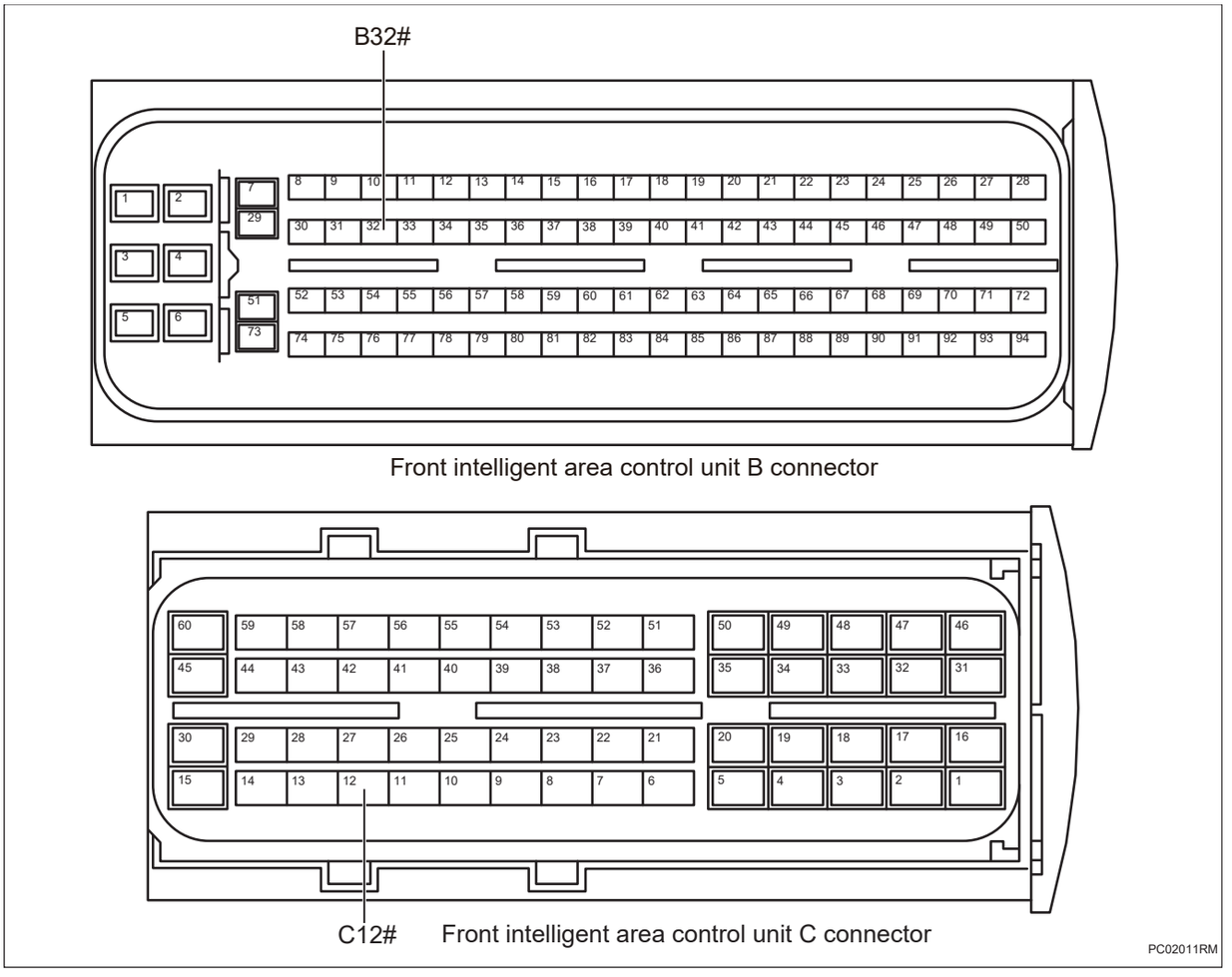
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B32# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left center ultrasonic sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B32# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace rear left center ultrasonic sensor (See page ZC-126)

(a) Replace rear left center ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

DTC	B20B400	Short to ground in RL sensor signal circuit
DTC	B20B500	Open in RL sensor signal circuit
DTC	B20B600	RL sensor residual vibration fault
DTC	B20B700	RL sensor internal fault
DTC	B20B800	RL sensor covered

DTC	**B20B900**	**Short to power supply in RL sensor signal circuit**
DTC	**B20BA00**	**RL sensor power supply voltage fault**
DTC	**B20BB00**	**Short to ground in RL sensor power supply**
DTC	**B20BC00**	**Short to battery in RL sensor power supply**

Description

When short or open or internal fault occurs in rear left corner ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20B400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20B500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20B600	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20B700	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor

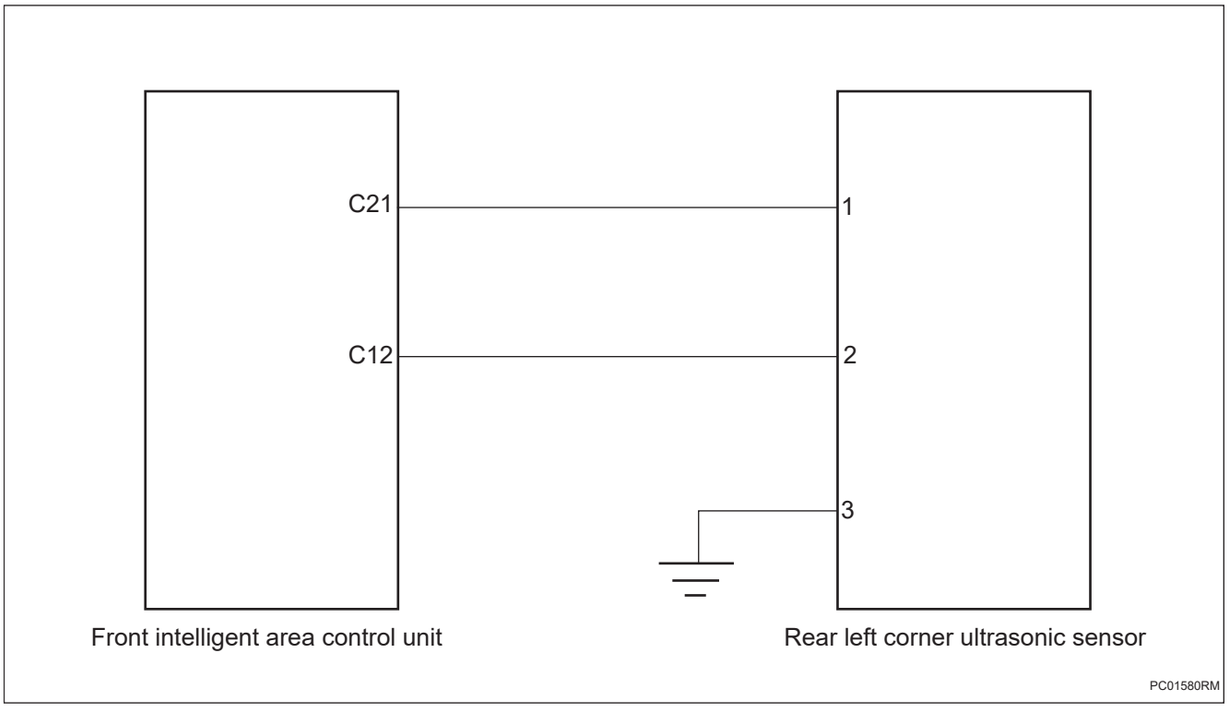
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		USS _ Fault Status _ enum = 4 is detected				
B20B800	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20B900	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20BA00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20BB00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor
B20BC00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RL. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear left corner ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B20B400	• Sensor stops detecting, and the data is invalid	Not come on
B20B500	• Sensor stops detecting, and the data is invalid	Not come on
B20B600	• Sensor stops detecting, and the data is invalid	Not come on
B20B700	• Sensor stops detecting, and the data is invalid	Not come on
B20B800	• Sensor stops detecting, and the data is invalid	Not come on
B20B900	• Sensor stops detecting, and the data is invalid	Not come on
B20BA00	• Sensor stops detecting, and the data is invalid	Not come on
B20BB00	• Sensor stops detecting, and the data is invalid	Not come on
B20BC00	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check rear left corner ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

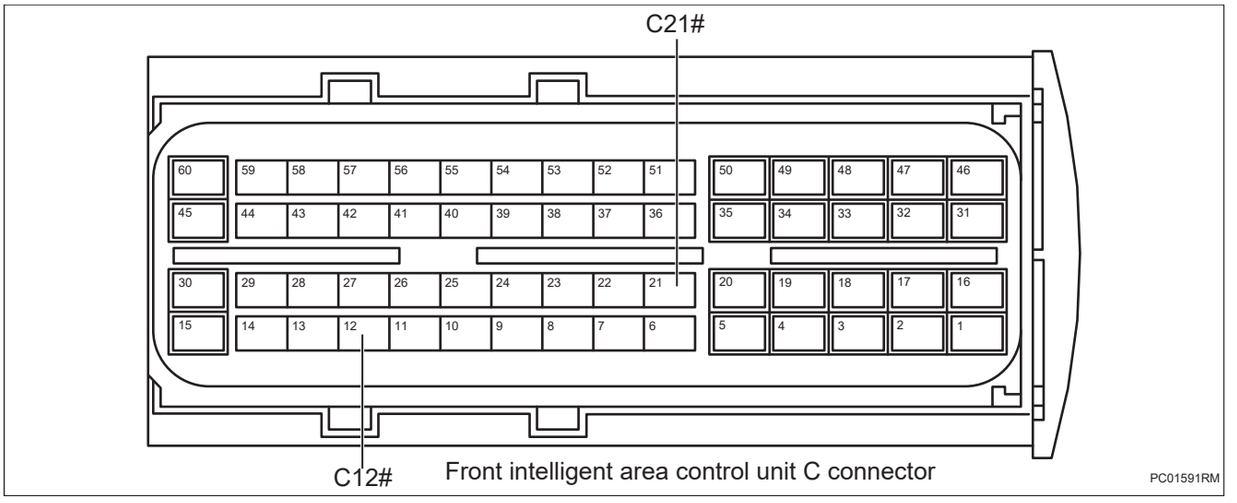
(b) Check ultrasonic sensor for proper installation.

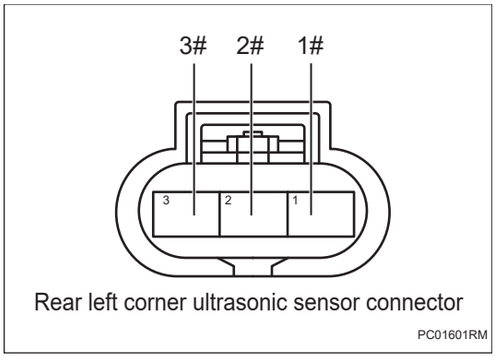
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	Check for open in rear left corner ultrasonic sensor wire harness and connector





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear left corner ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

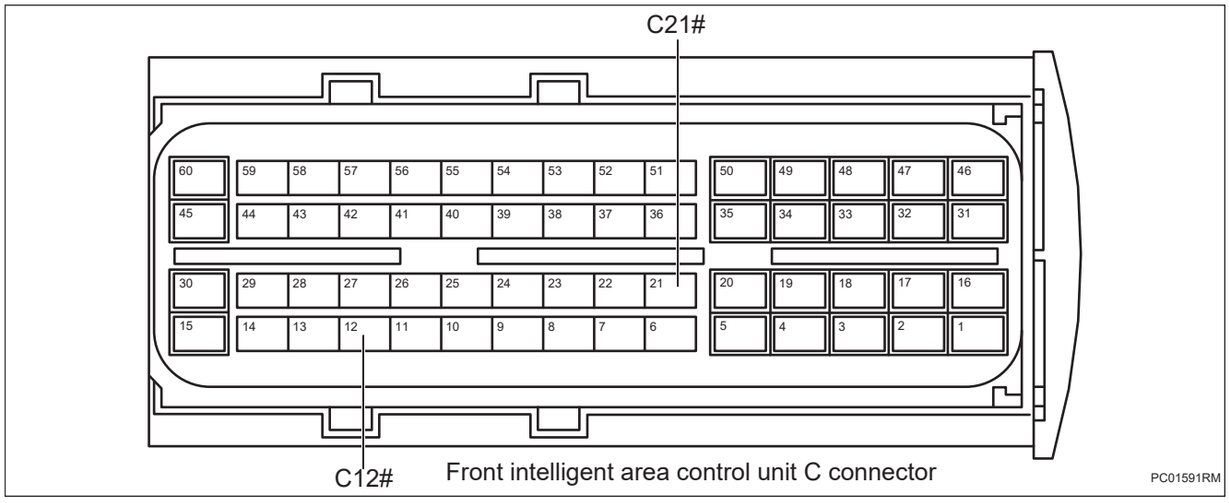
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner ultrasonic sensor connector 2# - front intelligent area control unit connector C12#	Always connected	Less than 1 Ω
Rear left corner ultrasonic sensor connector 1# - front intelligent area control unit connector C21#	Always connected	Less than 1 Ω
Rear left corner ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left corner ultrasonic sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

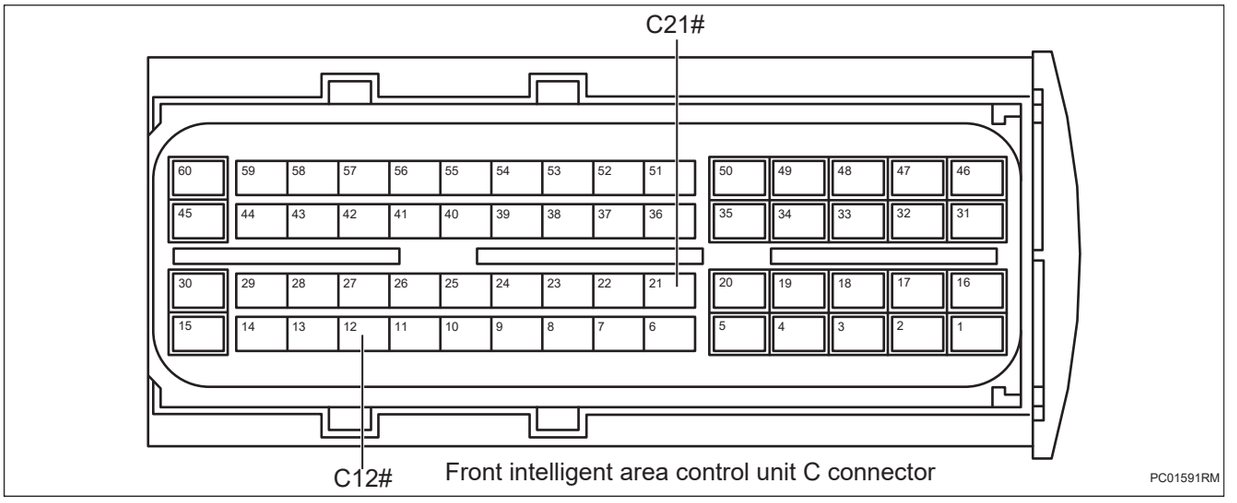
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to power supply in rear left corner ultrasonic sensor wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace rear left corner ultrasonic sensor (See page ZC-126)

(a) Replace rear left corner ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

DTC	B20BD00	Short to ground in RLS sensor signal circuit
DTC	B20BE00	Open in RLS sensor signal circuit
DTC	B20BF00	RLS sensor residual vibration fault
DTC	B20C000	RLS sensor internal fault
DTC	B20C100	RLS sensor covered
DTC	B20C200	Short to power supply in RLS sensor signal circuit
DTC	B20C300	RLS sensor power supply voltage fault
DTC	B20C400	Short to ground in RLS sensor power supply
DTC	B20C500	Short to battery in RLS sensor power supply

Description

When short or open or internal fault occurs in rear left side ultrasonic sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20BD00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 1 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20BE00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 2 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20BF00	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 3 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20C000	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 4 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20C100	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 5 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor

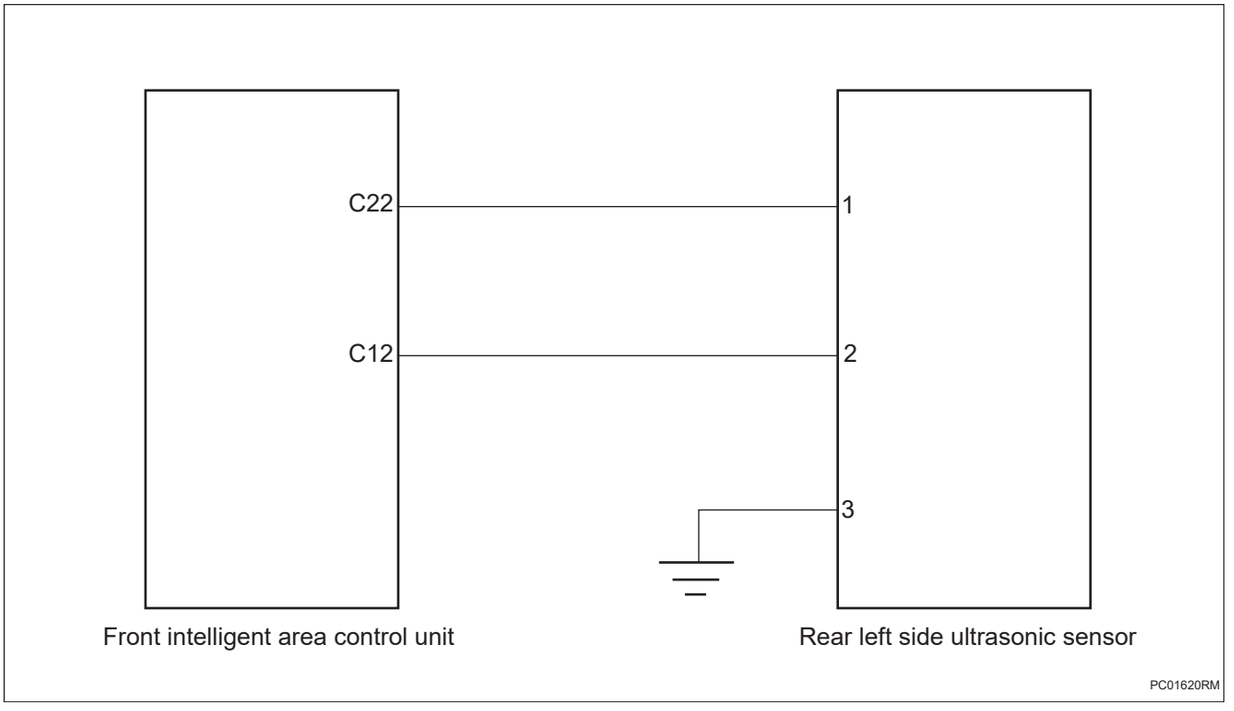
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B20C200	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 6 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20C300	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 7 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20C400	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 8 is detected	3	Event-based	50 ms	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor
B20C500	• Voltage is between 9 V and 16 V	• Signal Sf _ USS _ Original Info Group _ struct. SF _ USS _ RLS. Sf _ USS _ Fault Status _ enum = 9 is detected	1	Event-based	When sensor is powered on	• Front intelligent area control unit • Wire harness and connector • Rear left side ultrasonic sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B20BD00	• Sensor stops detecting, and the data is invalid	Not come on
B20BE00	• Sensor stops detecting, and the data is invalid	Not come on
B20BF00	• Sensor stops detecting, and the data is invalid	Not come on

DTC No.	Fault symptom	Warning light/indicator
B20C000	• Sensor stops detecting, and the data is invalid	Not come on
B20C100	• Sensor stops detecting, and the data is invalid	Not come on
B20C200	• Sensor stops detecting, and the data is invalid	Not come on
B20C300	• Sensor stops detecting, and the data is invalid	Not come on
B20C400	• Sensor stops detecting, and the data is invalid	Not come on
B20C500	• Sensor stops detecting, and the data is invalid	Not come on

Circuit diagram



Inspection procedure

1	**Check rear left side ultrasonic sensor**

(a) Check ultrasonic sensor for dirt.

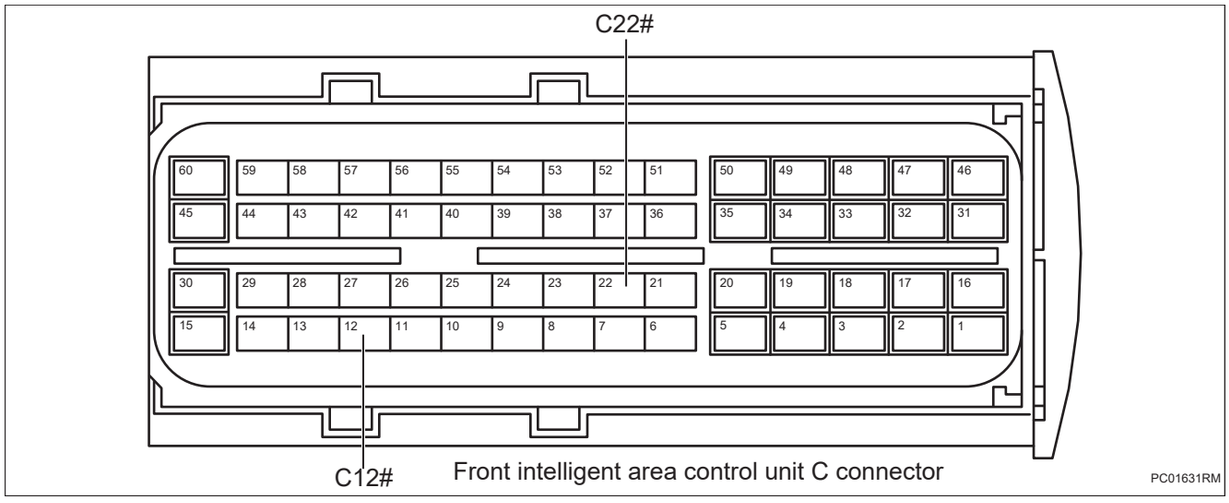
(b) Check ultrasonic sensor for proper installation.

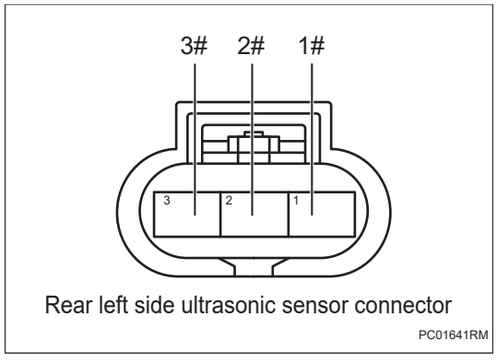
(c) Check ultrasonic sensor for damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in rear left side ultrasonic sensor wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear left side ultrasonic sensor connector.

(e) According to value in the table, measure resistance.

Standard value

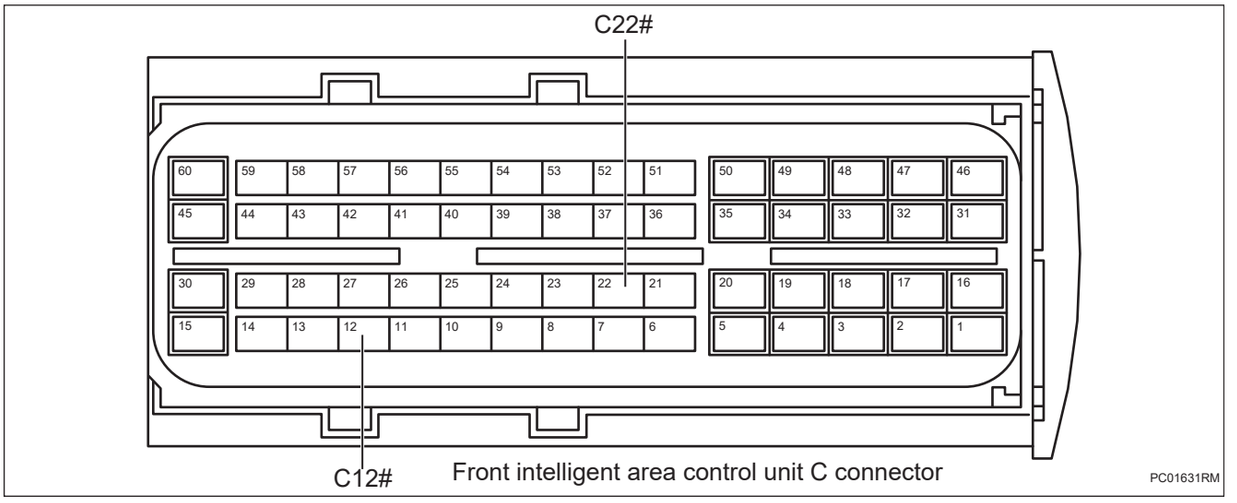
Multimeter connection	Detection condition	Specified condition
Rear left side ultrasonic sensor connector 2# - front intelligent area control unit connector C12#	Always connected	Less than 1 Ω
Rear left side ultrasonic sensor connector 1# - front intelligent area control unit connector C22#	Always connected	Less than 1 Ω
Rear left side ultrasonic sensor connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to ground in rear left side ultrasonic sensor wire harness and connector



(a) According to value in the table, measure resistance.

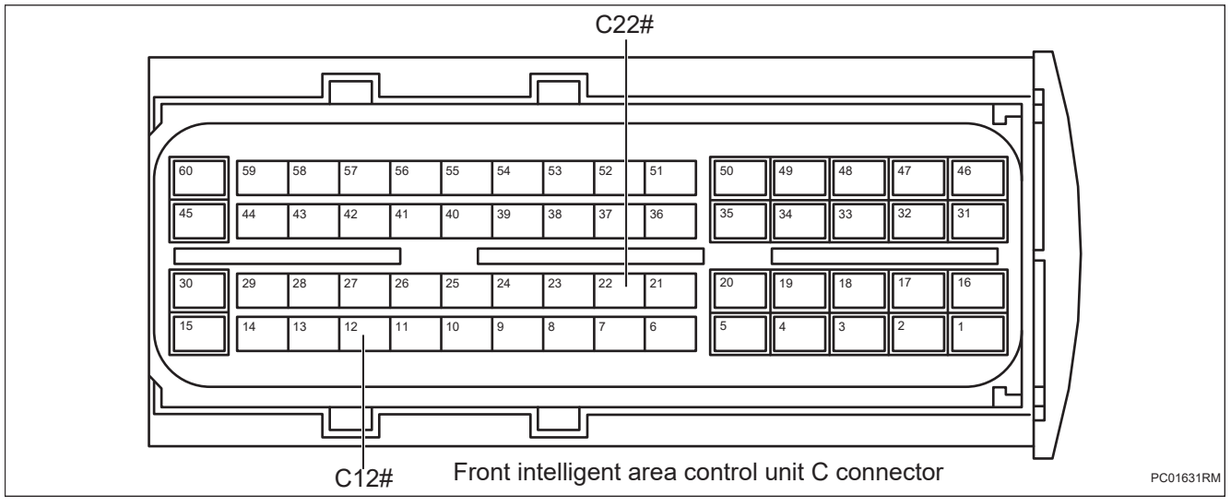
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear left side ultrasonic sensor wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace rear left side ultrasonic sensor (See page ZC-126)

(a) Replace the rear left side ultrasonic sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

ZD

Diagnosis ends

DTC	C207410	EPB caliper motor circuit fault (open)
DTC	C207510	EPB caliper motor circuit fault (short to ground)
DTC	C207610	EPB caliper motor circuit fault (short to power supply)

Description

When short or open fault occurs in rear left brake caliper, the front intelligent area control unit records DTC.

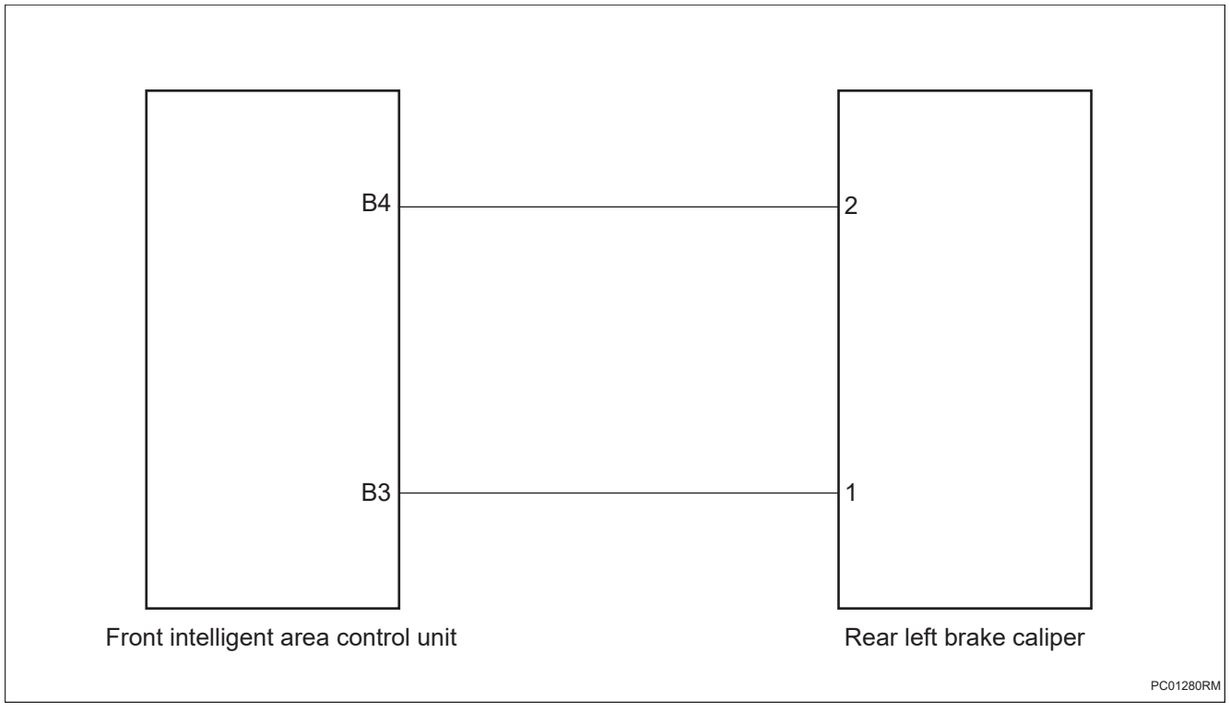
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C207410	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB caliper line open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207510	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB caliper line short to ground	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207610	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB caliper line shour to battery	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper

ZD

Fault symptom

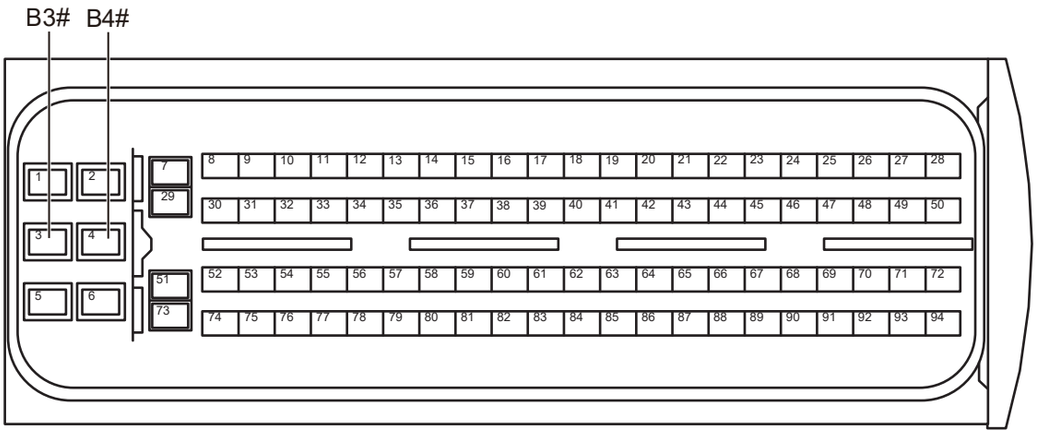
DTC No.	Fault symptom	Warning light/indicator
C207410	• EPB dose not operate or operates abnormally	Not come on
C207510	• EPB dose not operate or operates abnormally	Not come on
C207610	• EPB dose not operate or operates abnormally	Not come on

Circuit diagram



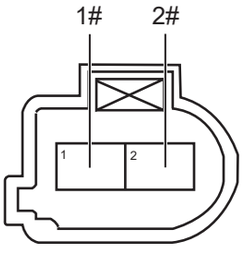
Inspection procedure

1	Check for open in rear left brake caliper wire harness and connector



Front intelligent area control unit B connector

PC01291RM



Rear left brake caliper connector

PC01300RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear left brake caliper connector.

(e) According to value in the table, measure resistance.

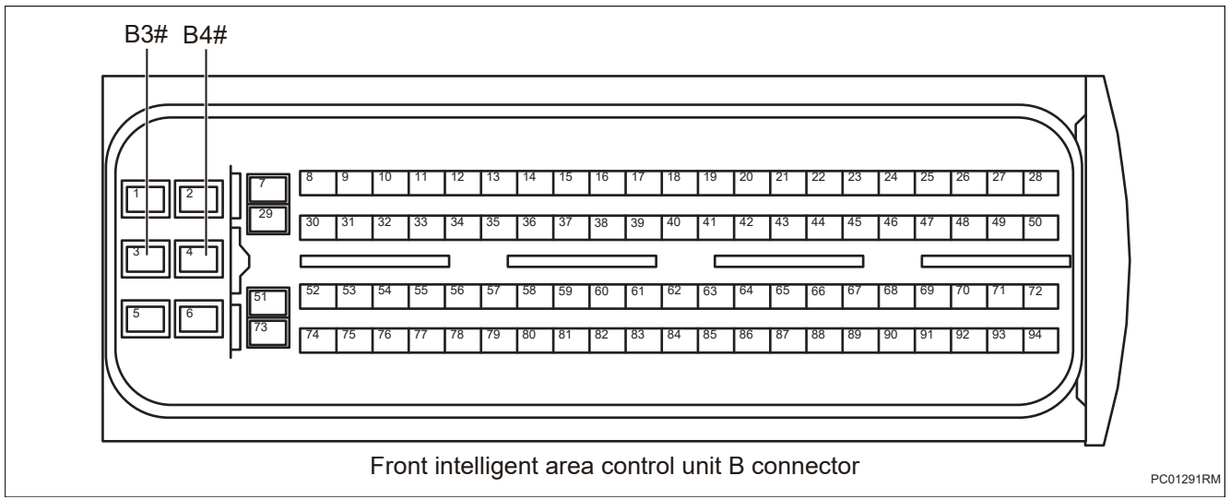
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left brake caliper connector 1# - front intelligent area control unit connector B3#	Always connected	Less than 1 Ω
Rear left brake caliper connector 2# - front intelligent area control unit connector B4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left brake caliper wire harness and connector**



Front intelligent area control unit B connector

PC01291RM

ZD

(a) According to value in the table, measure resistance.

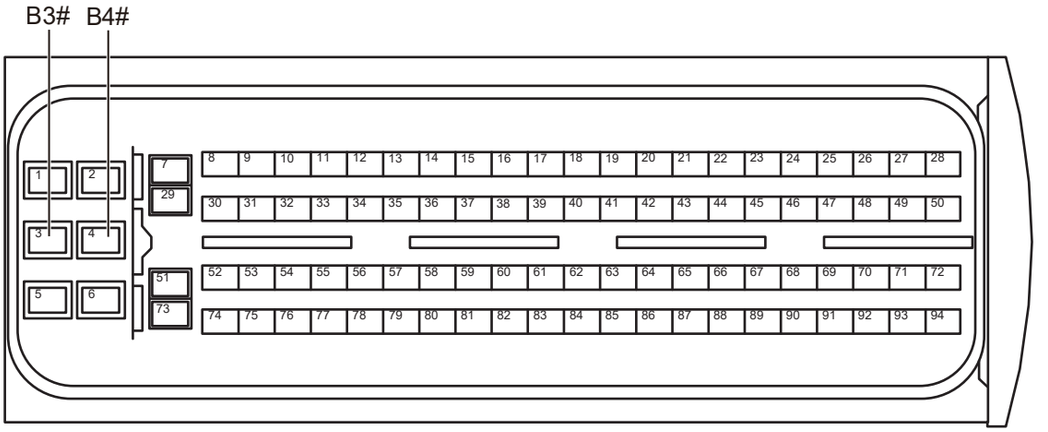
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B3# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in rear left brake caliper wire harness and connector**



Front intelligent area control unit B connector

PC01291RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace rear left brake caliper (See page DP-17)**

(a) Replace the rear left brake caliper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**C210046**	**Power supply voltage low (total)**
DTC	**C210047**	**Power supply overvoltage (total)**

Description

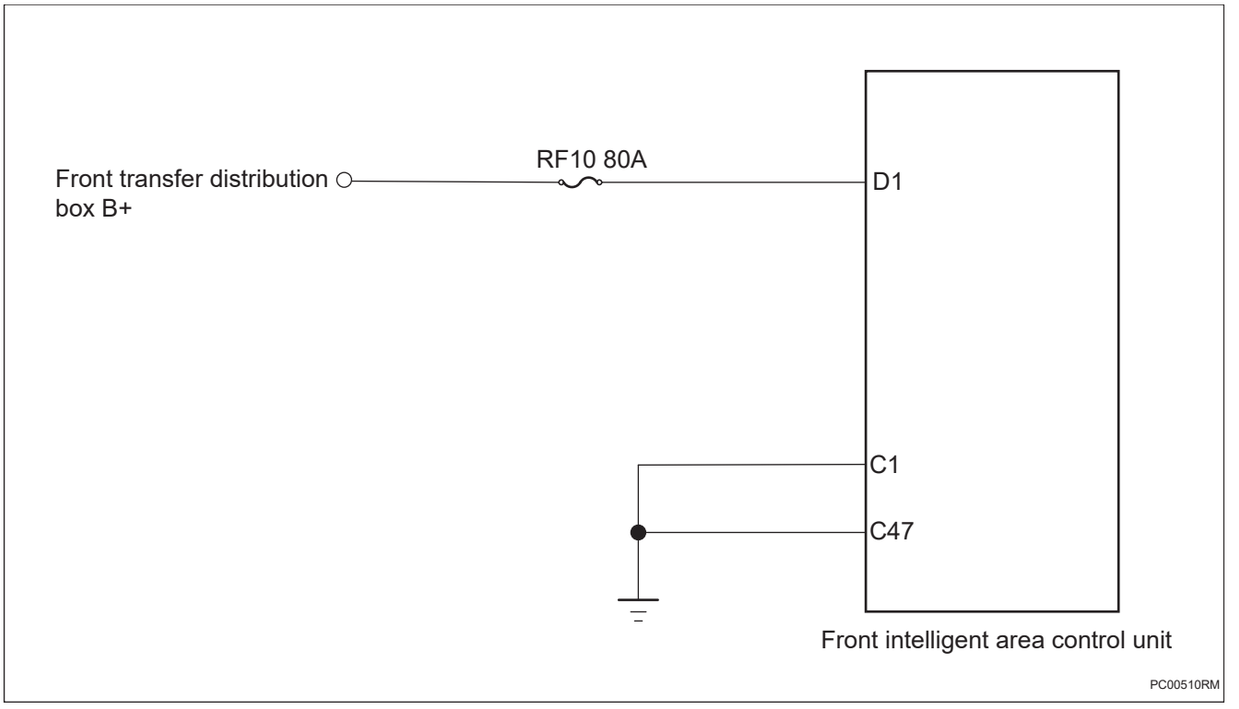
When power supply voltage of front intelligent area control unit is too high or too low, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C210046	• PDC wakeup & PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system
C210047	• PDC wakeup & PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C210046	• ECU communication function is limited, IO function is limited	Not come on
C210047	• ECU communication function is limited, IO function is limited	Not come on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 30 seconds, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

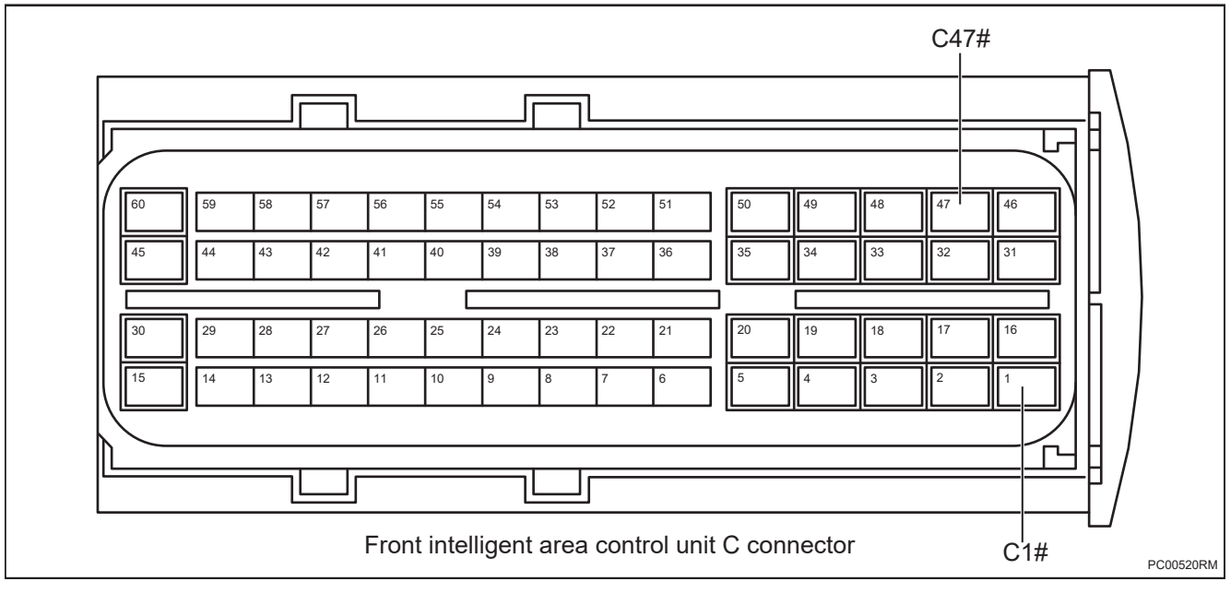
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	Battery voltage

NG → **Check and repair charging system**

OK

3	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) According to value in the table, measure resistance.

ZD

Standard value

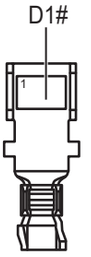
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check front intelligent area control unit power supply



Front intelligent area control unit D connector

PC00531RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	C210A17	PMIC chip QT1 power supply overvoltage fault
DTC	C211117	PMIC chip QUC overvoltage fault

Description

When front intelligent area control unit internal fault occurs, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C210A17	• PDC wakeup & PDC not in OTA mode	MONSF1. TRK1OV=1	1	Event-based	10 ms	• Front intelligent area control unit
C211117	• PDC wakeup & PDC not in OTA mode	MONSF1. UCOV=1	1	Event-based	10 ms	• Front intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C210A17	• ECU communication function is limited, IO function is limited	Not come on
C211117	• ECU communication function is limited, IO function is limited	Not come on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	P300190	A/C compressor overvoltage fault

Description

When undervoltage or overvoltage fault is detected in A/C compressor, the front intelligent area control unit records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300190	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC_ Power Mode = Standby || Driving) & PDC Not in OTA Mode	High Voltage Fault=0x2	3 times in a row	Event-based	10 ms	• High voltage wire harness • Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300190	• Compressor stop	Not come on

Inspection procedure

1	Check A/C compressor high voltage wire harness

(a) Check if A/C compressor high voltage wire harness is connected properly.

(b) Check if A/C compressor high voltage wire harness is damaged.

NG → **Perform repair according to malfunction**

OK

2	Check power battery

(a) Check if power battery has overvoltage or undervoltage fault.

(b) Check if power battery is faulty.

NG → Perform repair according to malfunction

DTC	P300290	Electric compressor high voltage abnormal

Description

When abnormal high voltage fault is detected in A/C compressor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300290	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• High Voltage Fault = 0x3	3 times in a row	Event-based	10 ms	• A/C compressor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300290	• Compressor stop	Not come on

Inspection procedure

1	Clear DTCs

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

ZD

OK

Diagnosis ends

DTC	P300390	A/C compressor overtemperature fault

Description

When A/C compressor overtemperature fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300390	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC_ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Temp fault > 0x0	3 times in a row	Event-based	10 ms	• Air conditioning system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300390	• Compressor stop	Not come on

Inspection procedure

1	**Lower temperature of A/C compressor**

(a) Lower the A/C compressor temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Check A/C system**

OK

Diagnosis ends

DTC	P300490	Short in A/C compressor internal fault_ electric compressor output
DTC	P300590	Open in A/C compressor internal fault_ electric compressor output

Description

When short or open fault is detected in A/C compressor internal output circuit, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300490	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Internal Error = 0x1	3 times in a row	Event-based	10 ms	• A/C compressor
P300590	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Internal Error = 0x2	3 times in a row	Event-based	10 ms	• A/C compressor

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300490	• Compressor stop	Not come on
P300590	• Compressor stop	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

OK

Diagnosis ends

DTC	**P300690**	**A/C compressor internal fault_electric compressor overload**

Description

When A/C compressor overload fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300690	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Internal Error = 0x3	3 times in a row	Event-based	10 ms	• Air conditioning system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300690	• Compressor stop	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

OK

Diagnosis ends

ZD

DTC	P300790	A/C compressor temperature sensor fault

Description

When A/C compressor temperature sensor fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300790	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	TempSensorError = 0x1	3 times in a row	Event-based	10 ms	• A/C compressor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300790	• Compressor stop	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

OK

Diagnosis ends

DTC	P300890	A/C compressor current sensor fault

Description

When A/C compressor temperature sensor hardware fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300890	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Current Sensor Error = 0x1	3 times in a row	Event-based	10 ms	• Air conditioning system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300890	• Compressor stop	Not come on

Inspection procedure

1	Clear DTCs

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

OK

Diagnosis ends

DTC	P300990	A/C compressor CPU fault

Description

When A/C compressor CPU fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300990	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	CPUError = 0x1	3 times in a row	Event-based	10 ms	• Air conditioning system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300990	• Compressor stop	Not come on

Inspection procedure

1	Clear DTCs

(a) Vehicle is powered off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace A/C compressor (See page RE-53)**

OK

Diagnosis ends

DTC	P300A90	Electric compressor A/C system abnormal

Description

When electric compressor A/C system fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300A90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Motor Control Fault = 0x3	3 times in a row	Event-based	10 ms	• Air conditioning system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300A90	• Compressor stop	Not come on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Check A/C system**

OK

Diagnosis ends

DTC	P300B90	A/C compressor feedback fault

Description

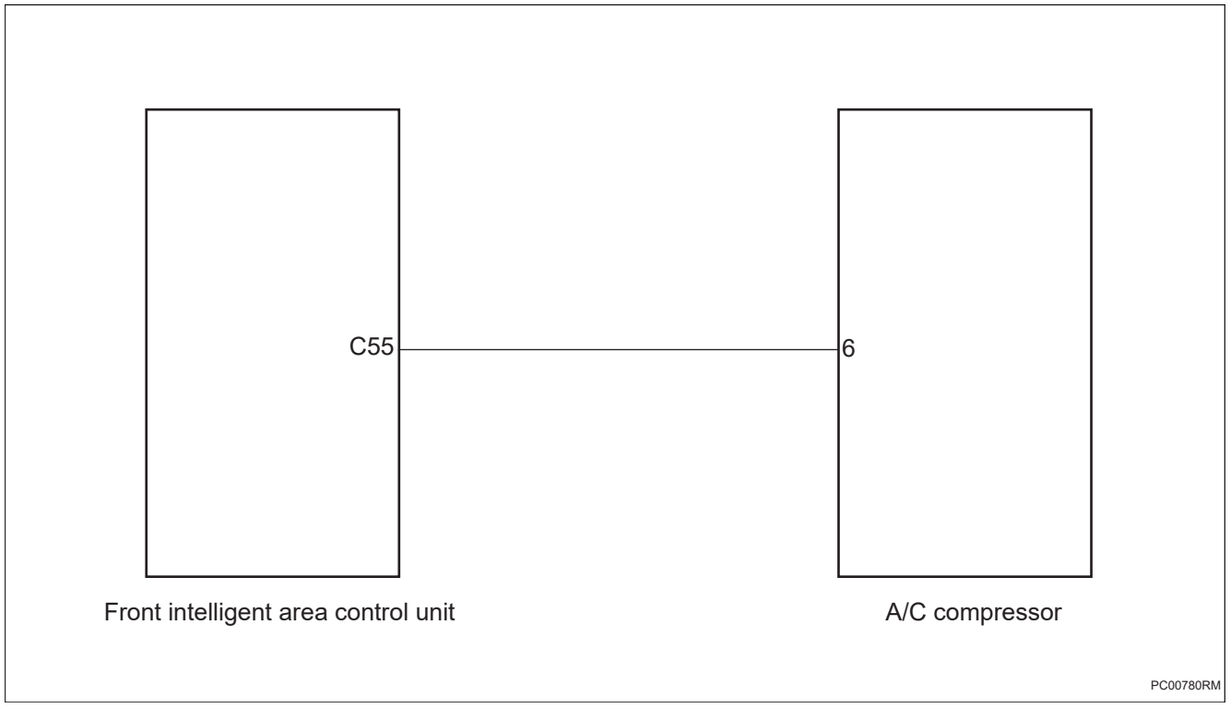
When A/C compressor feedback signal is abnormal, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300B90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	Compressor _ ResponseError = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • A/C compressor

Fault symptom

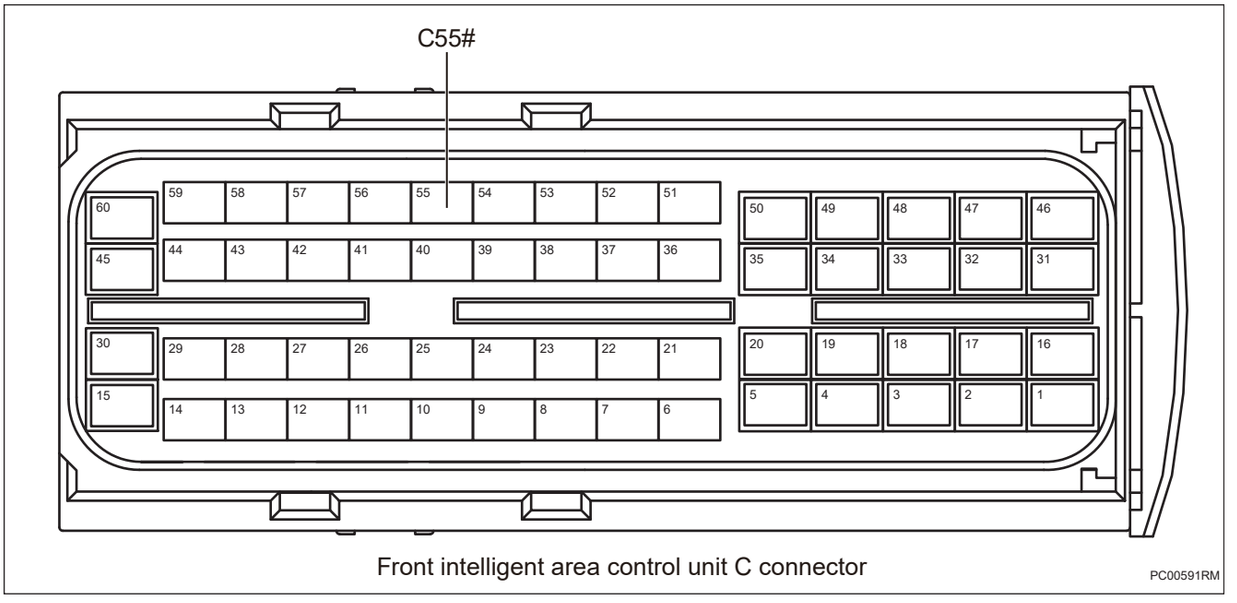
DTC No.	Fault symptom	Warning light/indicator
P300B90	• Compressor stop	Not come on

Circuit diagram



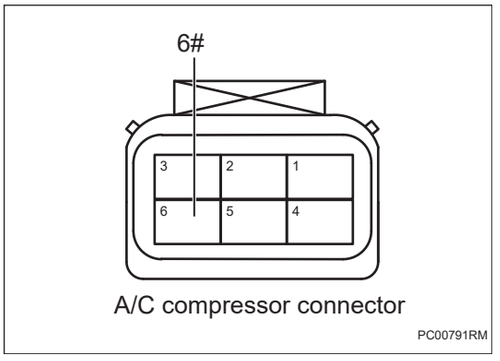
Inspection procedure

1	**Check for open in A/C compressor wire harness and connector**



Front intelligent area control unit C connector

PC00591RM



A/C compressor connector

PC00791RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the A/C compressor connector.

(e) According to value in the table, measure resistance.

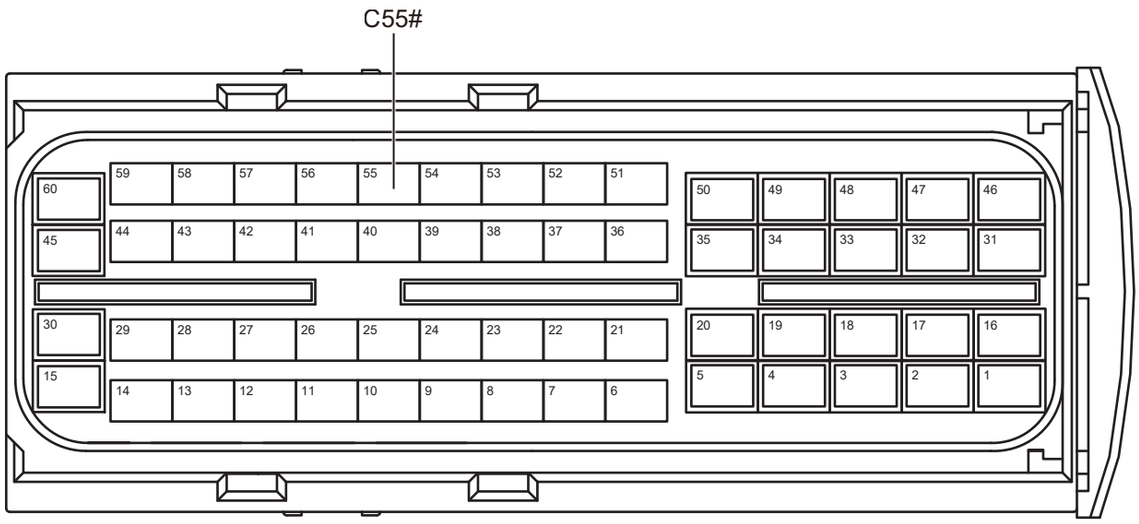
Standard value

Multimeter connection	Detection condition	Specified condition
A/C compressor connector 6# - front intelligent area control unit connector C55#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in A/C compressor wire harness and connector**



Front intelligent area control unit C connector

PC00591RM

(a) According to value in the table, measure resistance.

Standard value

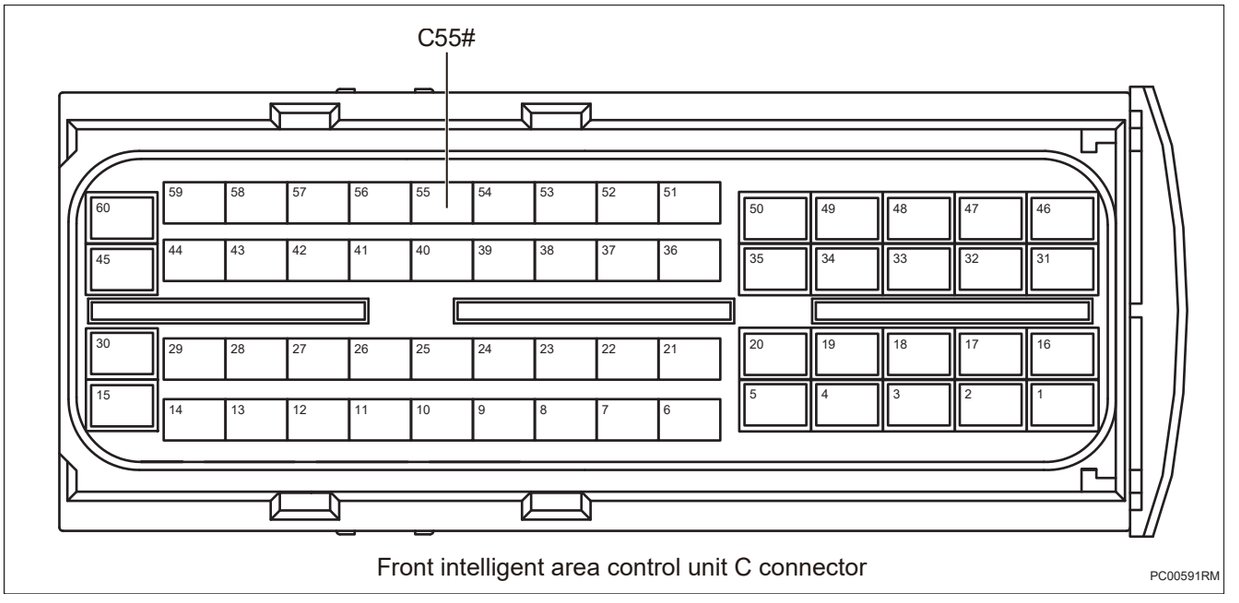
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C55# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to power supply in A/C compressor wire harness and connector



Front intelligent area control unit C connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C55# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace A/C compressor (See page RE-53)

(a) Replace the A/C compressor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	P300C90	Cooling fan voltage fault
DTC	P300D90	Cooling fan overtemperature fault
DTC	P300E90	Cooling fan hardware fault
DTC	P300F90	Cooling fan blocked fault
DTC	P301090	Cooling fan overcurrent fault

Description

When a cooling fan related fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300C90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECF _ State # ECF _ Voltage Error = 0x1 undervolta-ge • #ECF _ State # ECF _ Voltage Error = 0x2 overvoltage	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Cooling fan
P300D90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECF _ State # ECF _ Over Temp Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Cooling fan
P300E90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECF _ State # ECF _ Hardware Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Cooling fan

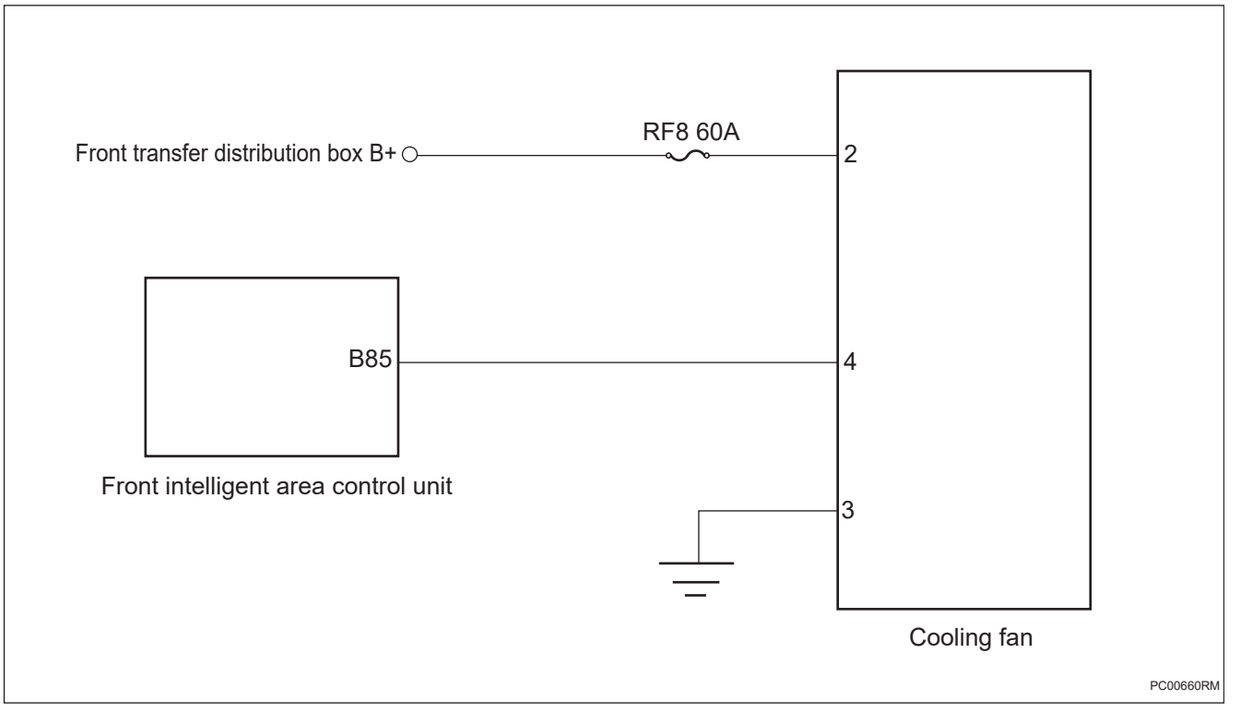
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P300F90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECF _ State # ECF _ Stall Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Cooling fan
P301090	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECF _ State # ECF _ Over Current Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Cooling fan

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P300C90	• Cooling fan does not operate or operates abnormally	Not come on
P300D90	• Cooling fan does not operate or operates abnormally	Not come on
P300E90	• Cooling fan does not operate or operates abnormally	Not come on
P300F90	• Cooling fan does not operate or operates abnormally	Not come on
P301090	• Cooling fan does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check cooling fan**

(a) Check cooling fan for proper installation.

(b) Check if cooling fan is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check cooling system**

(a) Check if coolant level is normal.

(b) Check cooling system for blockage or leakage.

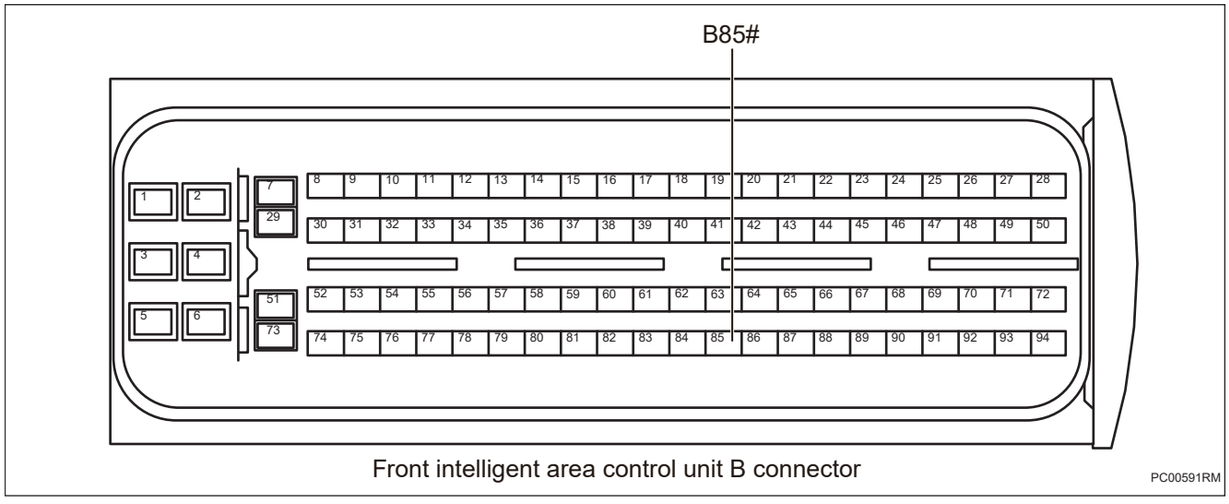
(c) Check if the radiator is dirty.

(d) Check if thermal management module operates normally.

NG → **Perform repair according to malfunction**

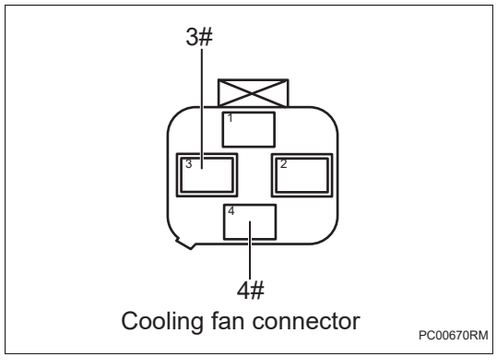
OK

3	**Check for open in cooling fan wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Cooling fan connector

PC00670RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the cooling fan connector.

(e) According to value in the table, measure resistance.

Standard value

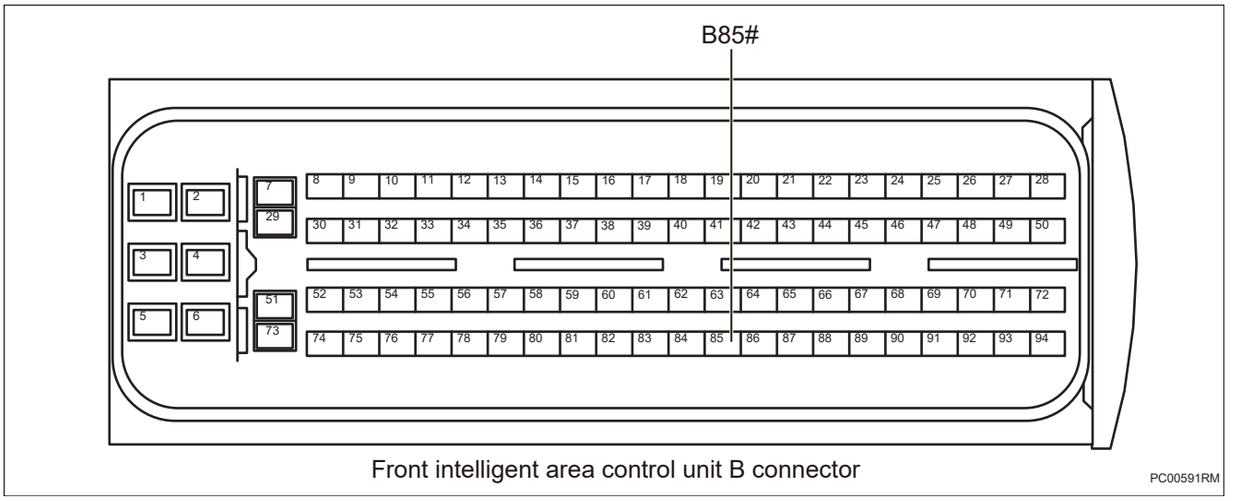
Multimeter connection	Detection condition	Specified condition
Cooling fan connector 4# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Cooling fan connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to ground in cooling fan wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

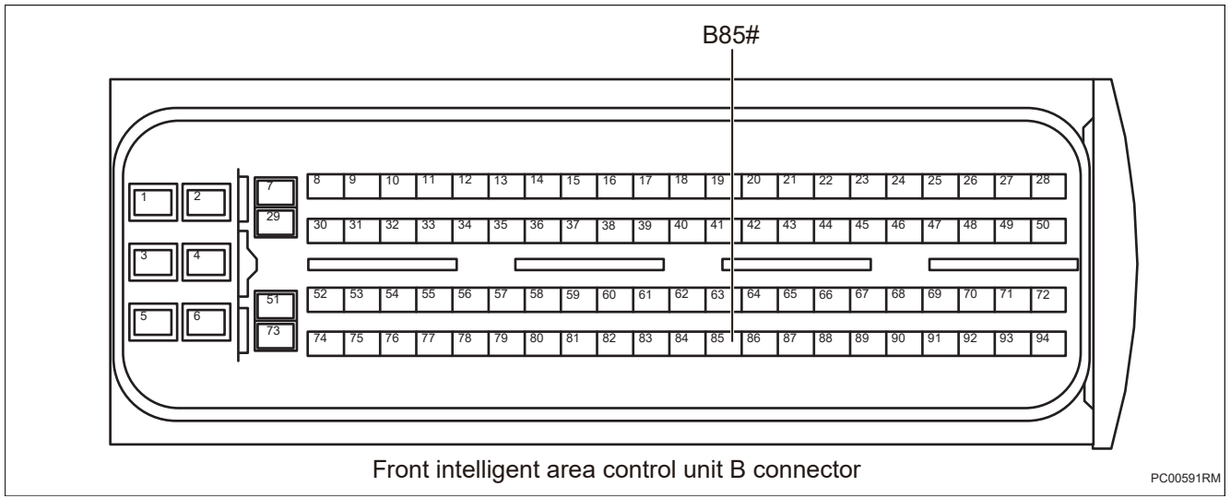
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in cooling fan wire harness and connector**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

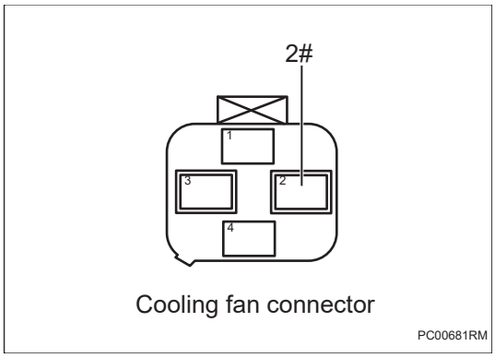
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Check cooling fan power supply



Cooling fan connector

PC00681RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Cooling fan connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace cooling fan (See page RE-81)

(a) Replace the cooling fan.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P301190**	**Motor water pump voltage fault**
DTC	**P301290**	**Motor water pump overtemperature fault**
DTC	**P301390**	**Motor water pump hardware fault**
DTC	**P301490**	**Motor water pump blocked fault**
DTC	**P301590**	**Motor water pump idling fault**
DTC	**P306E11**	**Short to ground in water pump 1 (motor water pump) power distribution**

Description

When voltage, overtemperature, blockage or idling fault occurs in electric water pump 1, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P301190	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• # ECP1 _ 1#ECP1 _ Voltage Error = 0x1 undervolta-ge • # ECP1 _ 1#ECP1 _ Voltage Error = 0x2 overvoltage	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)
P301290	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP1 _ 1#ECP1 _ Over Temp Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)

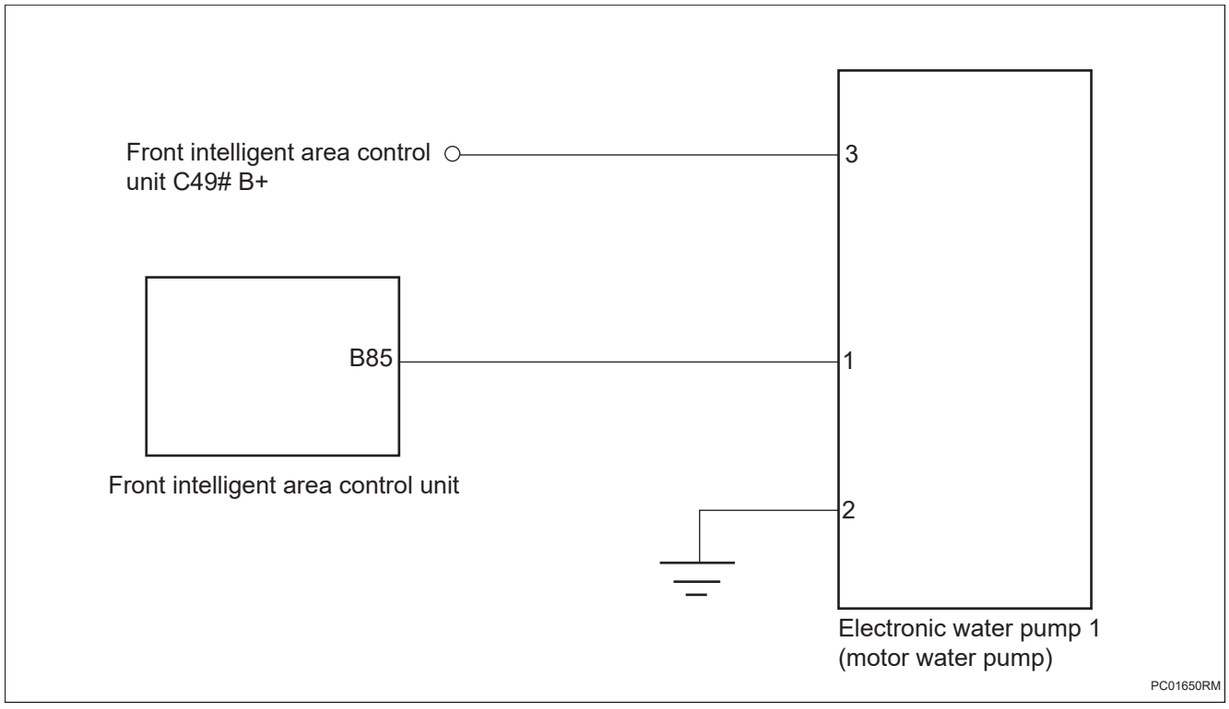
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P301390	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP1 _ 1#ECP1 _ Hardware Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)
P301490	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP1 _ 1#ECP1 _ Stall Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)
P301590	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP1 _ 1#ECP1 _ Noload Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)
P306E11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH30 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P301190	• Motor water pump not operating or malfunctioning	Not come on
P301290	• Motor water pump not operating or malfunctioning	Not come on
P301390	• Motor water pump not operating or malfunctioning	Not come on
P301490	• Motor water pump not operating or malfunctioning	Not come on

DTC No.	Fault symptom	Warning light/indicator
P301590	• Motor water pump not operating or malfunctioning	Not come on
P306E11	• Water pump 1 (motor water pump) does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check electric water pump 1**

(a) Check if cooling system level is normal.

(b) Check cooling system for blockage or leakage.

(c) Check if electric water pump is installed properly.

NG → **Perform repair according to malfunction**

OK

2	**Check operating temperature of electric water pump 1**

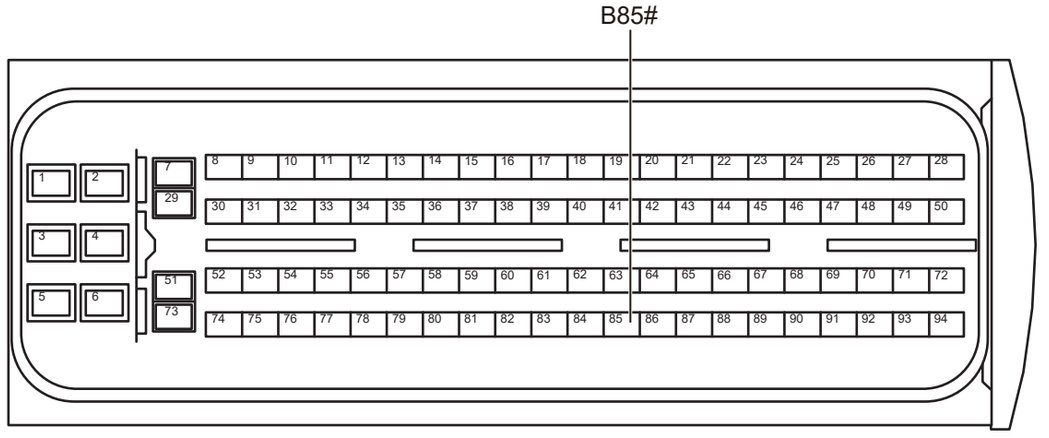
(a) Lower the electric water pump temperature to the normal temperature.

(b) Run the electric water pump and check for any overtemperature fault.

NG → **Perform repair according to malfunction**

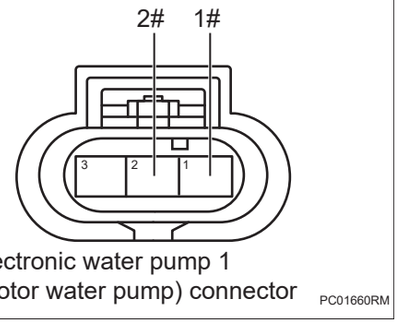
OK

3	**Check for open in electric water pump 1 (motor water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Electronic water pump 1 (motor water pump) connector

PC01660RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 1 (motor water pump) connector.

(e) According to value in the table, measure resistance.

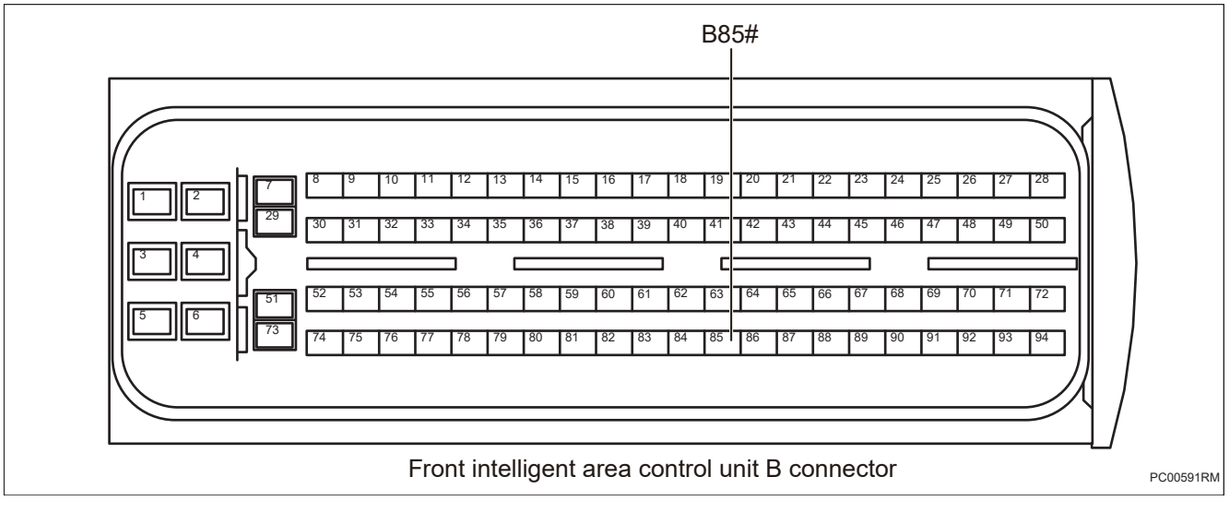
Standard value

Multimeter connection	Detection condition	Specified condition
Electric water pump 1 (motor water pump) connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electric water pump 1 (motor water pump) connector 2# - body ground	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in electric water pump 1 (motor water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

(a) According to value in the table, measure resistance.

Standard value

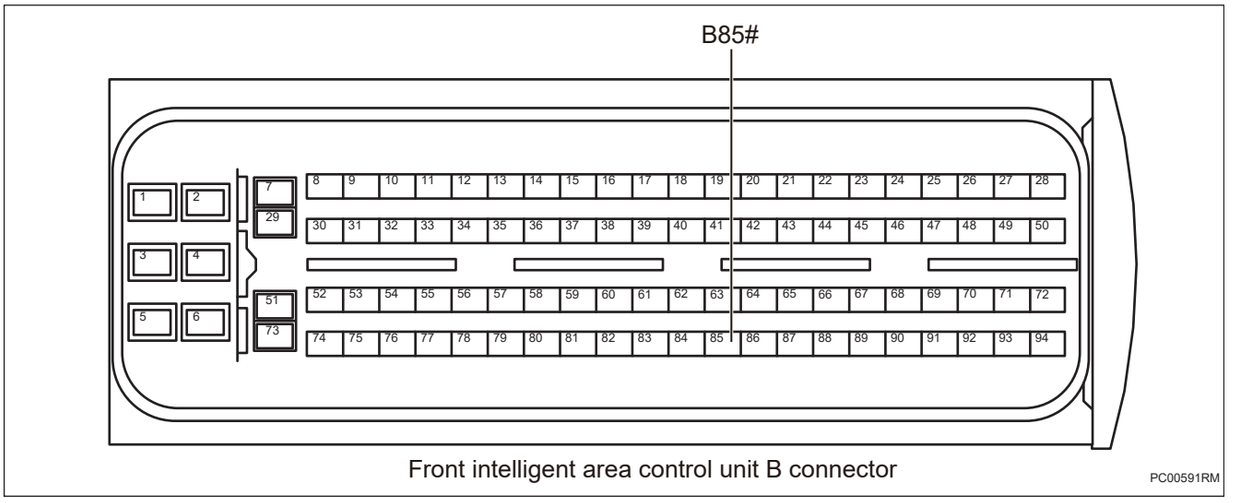
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG	**Check and repair or replace wire harness and connector**

OK

ZD

5	Check for short to power supply in electric water pump 1 (motor water pump) wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

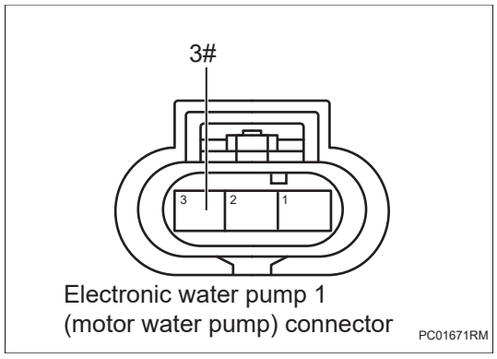
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Check electric water pump 1 (motor water pump) power supply



Electronic water pump 1 (motor water pump) connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 1 (motor water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace electric water pump 1 (motor water pump) (See page RE-98)

(a) Replace the electric water pump 1 (motor water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P301690**	**Battery water pump voltage fault**
DTC	**P301790**	**Battery water pump overtemperature fault**
DTC	**P301890**	**Battery water pump hardware fault**
DTC	**P301990**	**Battery water pump blocked fault**
DTC	**P301A90**	**Battery water pump idling fault**
DTC	**P306F11**	**Short to ground in water pump 2 (battery water pump) power distribution**

Description

When voltage, overtemperature, blockage or idling fault occurs in electric water pump 2, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P301690	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP2_ 1 # ECP2_ Voltage Error =0x1 undervolta-ge • #ECP2_ 1ECP2_ Voltage Error =0x2 overvoltage	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)
P301790	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby ||	• #ECP2_ 1#ECP2_ Over Temp Error =0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	Driving) & PDC Not in OTA Mode					
P301890	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP2_ 1#ECP2_ Hardware Error =0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)
P301990	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP2_ 1#ECP2_ Stall Error =0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)
P301A90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP2_ 1#ECP2_ Noload Error =0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)
P306F11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH31 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)

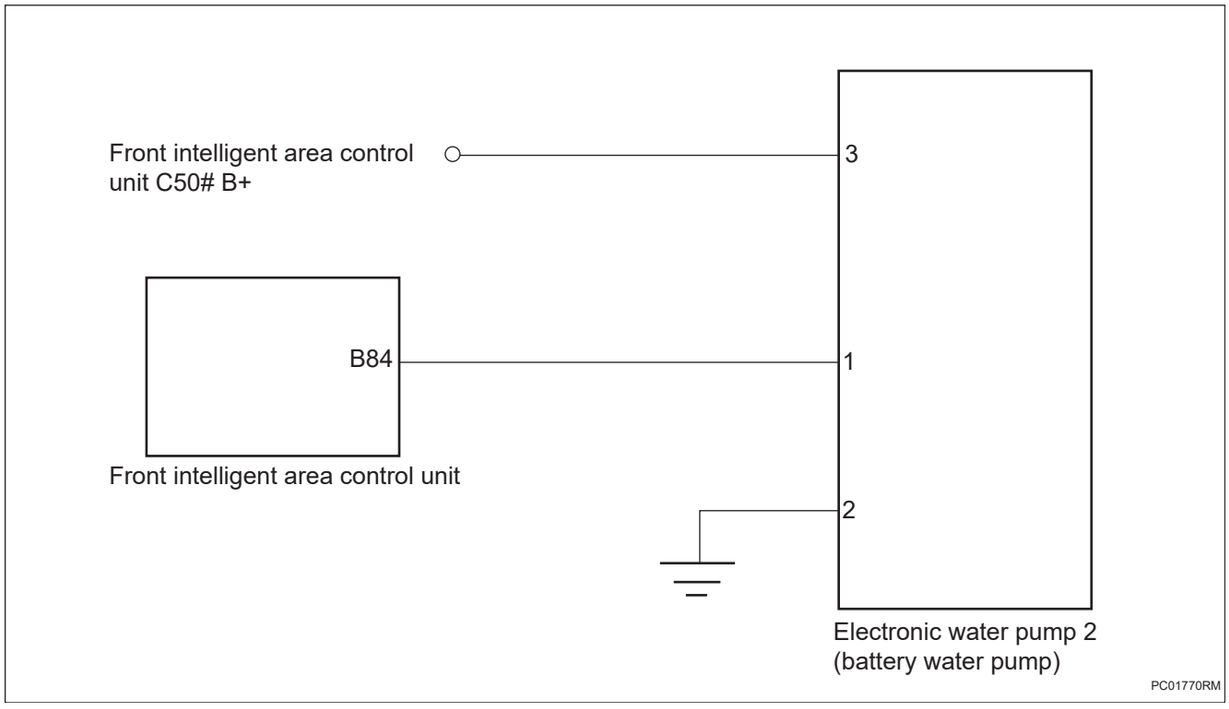
Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P301690	• Battery water pump dose not operate or operates abnormally	Not come on
P301790	• Battery water pump dose not operate or operates abnormally	Not come on
P301890	• Battery water pump dose not operate or operates abnormally	Not come on

ZD

DTC No.	Fault symptom	Warning light/indicator
P301990	• Battery water pump dose not operate or operates abnormally	Not come on
P301A90	• Battery water pump dose not operate or operates abnormally	Not come on
P306F11	• Water pump 2 (motor water pump) does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check electric water pump 2**

(a) Check if cooling system level is normal.

(b) Check cooling system for blockage or leakage.

(c) Check if electric water pump is installed properly.

NG → **Perform repair according to malfunction**

OK

2	**Check operating temperature of electric water pump 2**

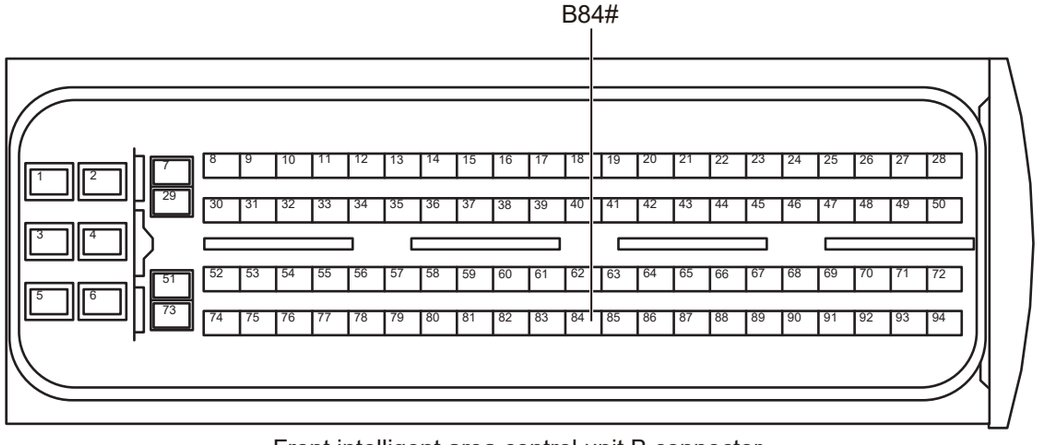
(a) Lower the electric water pump temperature to the normal temperature.

(b) Run the electric water pump and check for any overtemperature fault.

NG → **Perform repair according to malfunction**

OK

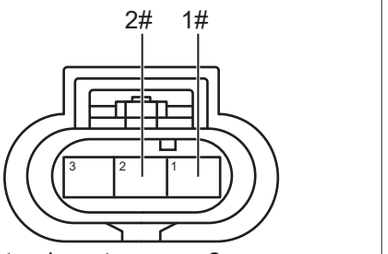
3	**Check for open in electric water pump 2 (battery water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

ZD



Electronic water pump 2 (battery water pump) connector PC01781RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 2 (battery water pump) connector.

(e) According to value in the table, measure resistance.

Standard value

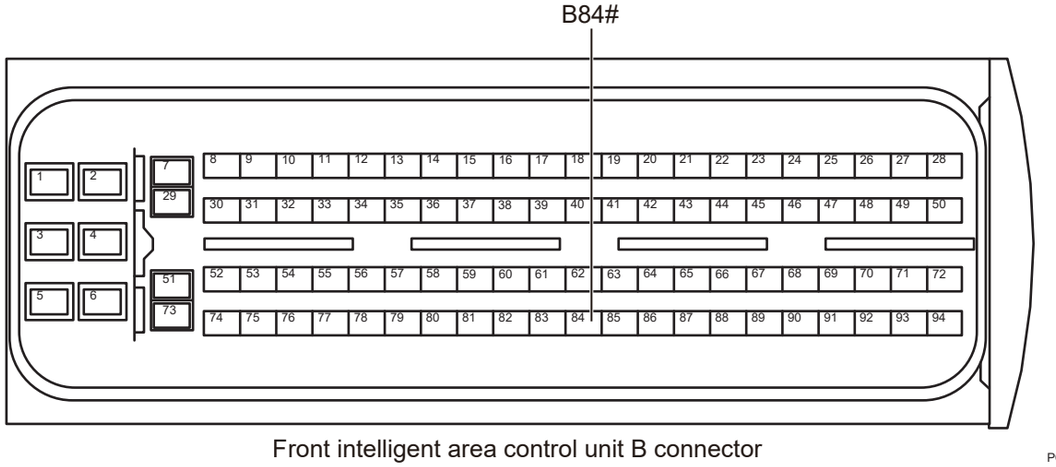
Multimeter connection	Detection condition	Specified condition
Electric water pump 2 (battery water pump) connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electric water pump 2 (battery water pump) connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in electric water pump 2 (battery water pump) wire harness and connector**



Front intelligent area control unit B connector PC00631RM

(a) According to value in the table, measure resistance.

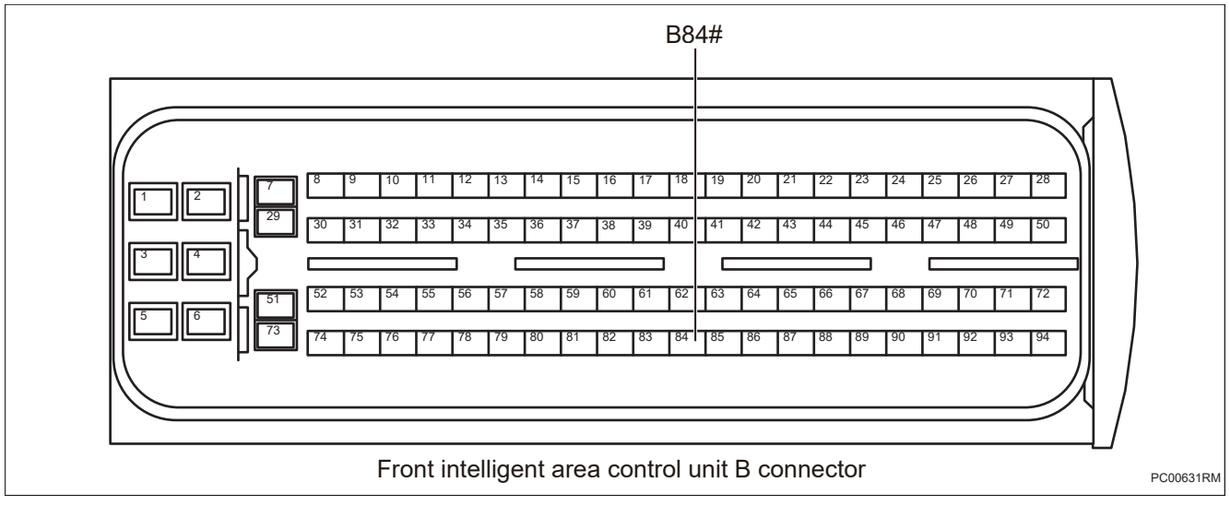
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in electric water pump 2 (battery water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

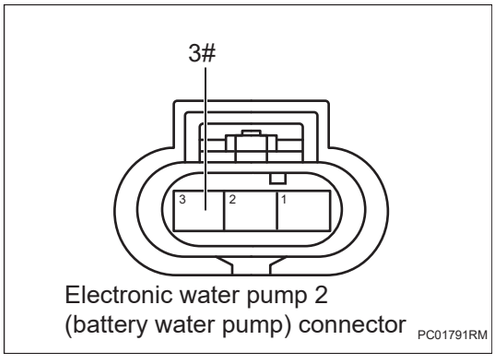
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Check electric water pump 2 (battery water pump) power supply



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 2 (battery water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace electric water pump 2 (battery water pump) (See page RE-98)

(a) Replace the electric water pump 2 (battery water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P301B90**	**Heater water pump voltage fault**
DTC	**P301C90**	**Heater water pump overtemperature fault**
DTC	**P301D90**	**Heater water pump hardware fault**
DTC	**P301E90**	**Heater water pump blocked fault**
DTC	**P301F90**	**Heater water pump idling fault**
DTC	**P307011**	**Short to ground in water pump 3 (heater water pump) power distribution**

Description

When voltage, overtemperature, blockage or idling fault occurs in electric water pump 3, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P301B90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP3 _ 1#ECP3 _ Voltage Error = 0x1 undervolta-ge • #ECP3 _ 1#ECP3 _ Voltage Error = 0x2 overvoltage	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)
P301C90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP3 _ 1#ECP3 _ Over Temp Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)
P301D90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP3 _ 1#ECP3 _ Hardware Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)
P301E90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• #ECP3 _ 1#ECP3 _ Stall Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)

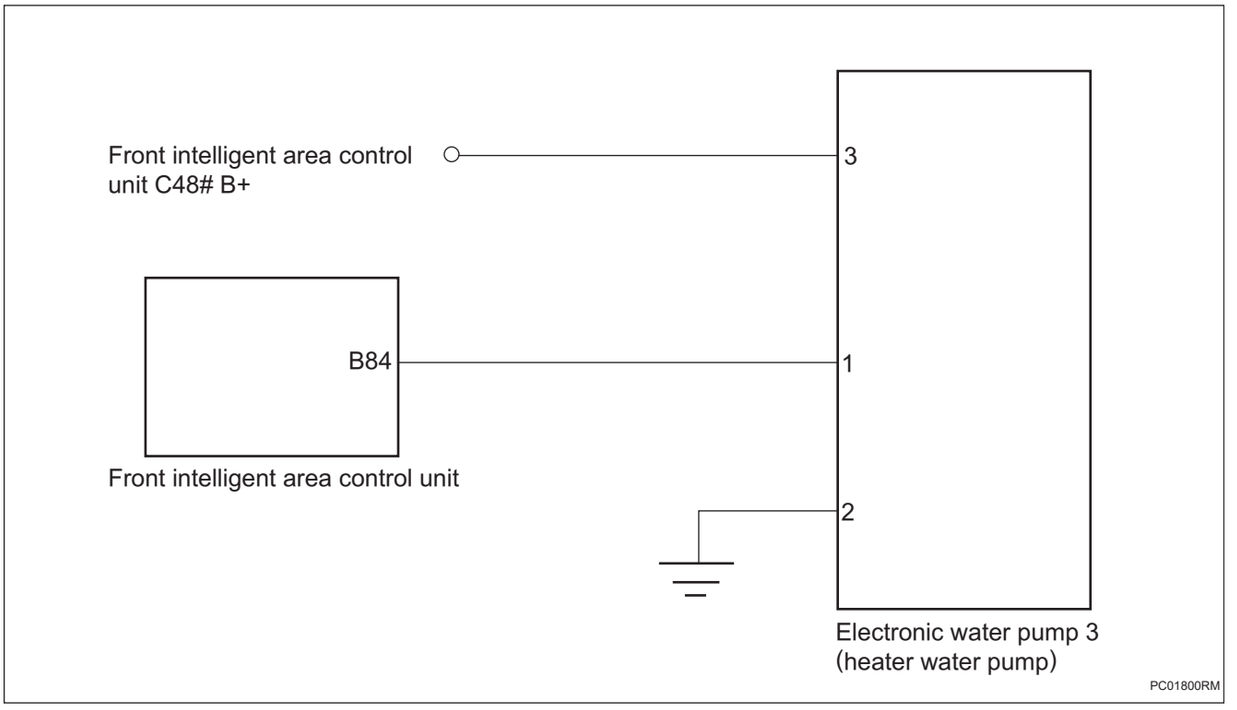
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P301F90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC_ PowerMod-e= Standby|| Driving) & PDC Not in OTA Mode	• #ECP3 _ 1#ECP3 _ Noload Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)
P307011	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH34 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P301B90	• Heater water pump does not operate or operates abnormally	Not come on
P301C90	• Heater water pump does not operate or operates abnormally	Not come on
P301D90	• Heater water pump does not operate or operates abnormally	Not come on
P301E90	• Heater water pump does not operate or operates abnormally	Not come on
P301F90	• Heater water pump does not operate or operates abnormally	Not come on
P307011	• Water pump 3 (motor water pump) does not operate or operates abnormally	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Check electric water pump 2**

(a) Check if cooling system level is normal.

(b) Check cooling system for blockage or leakage.

(c) Check if electric water pump is installed properly.

NG → **Perform repair according to malfunction**

OK

2	**Check operating temperature of electric water pump 2**

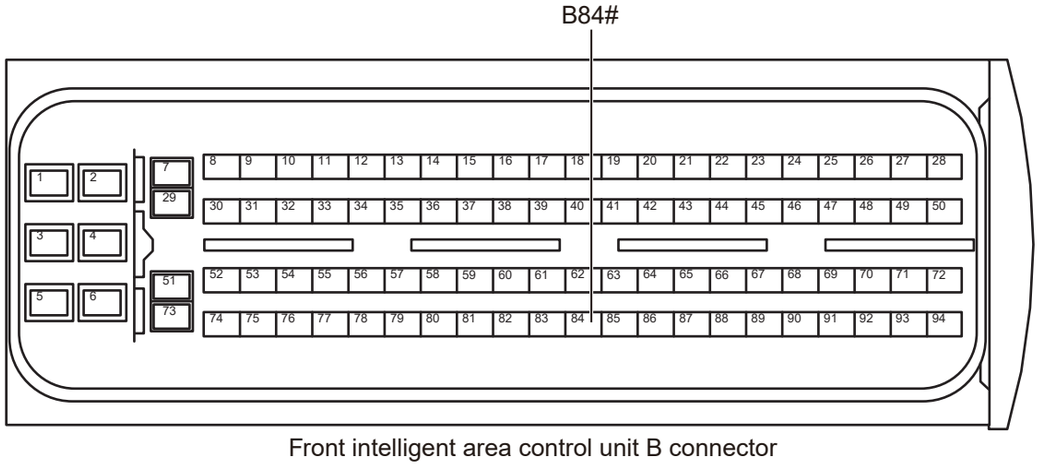
(a) Lower the electric water pump temperature to the normal temperature.

(b) Run the electric water pump and check for any overtemperature fault.

NG → **Perform repair according to malfunction**

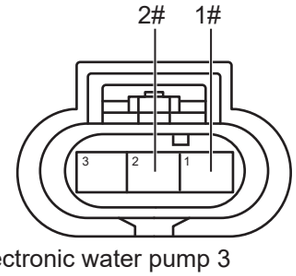
OK

3	**Check for open in electric water pump 3 (heater water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00631RM



Electronic water pump 3
(heater water pump) connector

PC01811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 3 (heater water pump) connector.

(e) According to value in the table, measure resistance.

Standard value

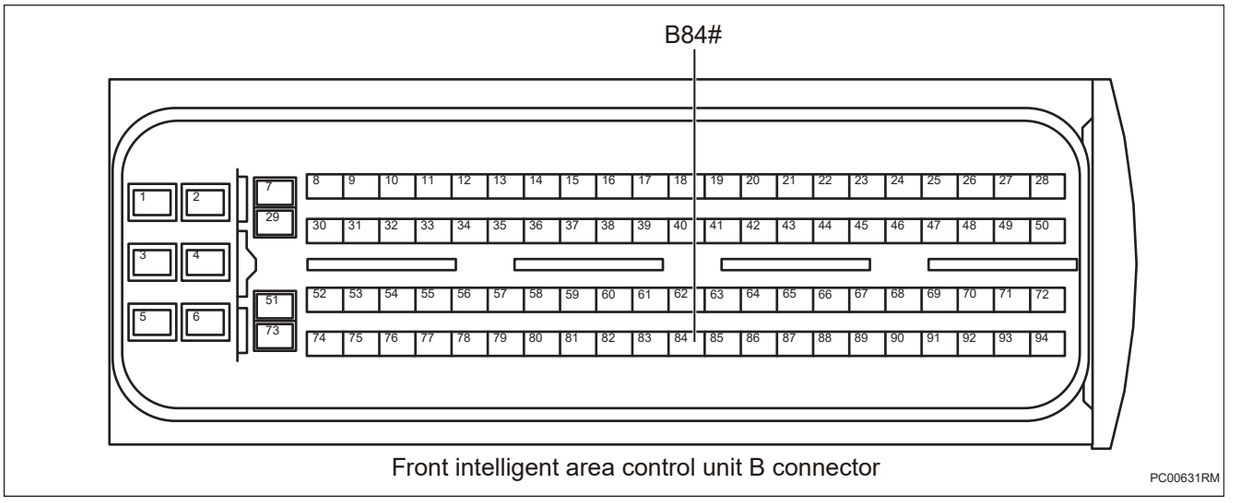
Multimeter connection	Detection condition	Specified condition
Electric water pump 3 (heater water pump) connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electric water pump 3 (heater water pump) connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to ground in electric water pump 3 (heater water pump) wire harness and connector



Front intelligent area control unit B connector

PC00631RM

ZD

(a) According to value in the table, measure resistance.

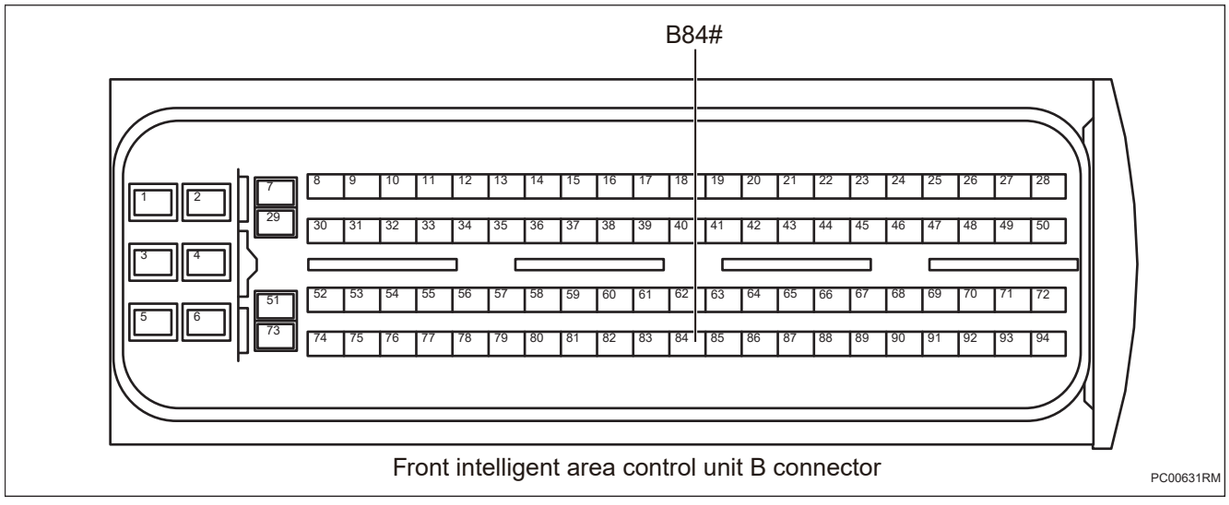
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in electric water pump 3 (heater water pump) wire harness and connector**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

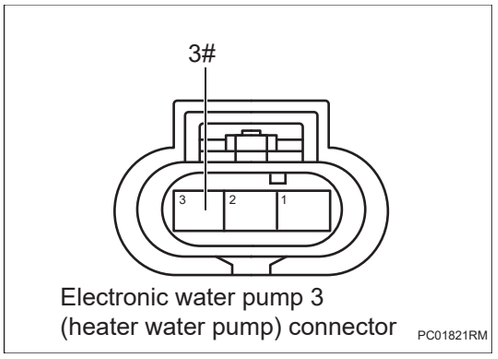
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	Check electric water pump 3 (heater water pump) power supply



Electronic water pump 3 (heater water pump) connector PC01821RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 3 (heater water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace electric water pump 3 (heater water pump) (See page RE-98)

(a) Replace the electric water pump 3 (heater water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P302090**	**Electronic expansion valve 1 feedback fault**
DTC	**P302190**	**Electronic expansion valve 1 coil fault**
DTC	**P302290**	**Electronic expansion valve 1 voltage fault**
DTC	**P302390**	**Electronic expansion valve 1 overtemperature fault**

Description

When feedback, voltage, overtemperature or internal coil fault occurs in electronic expansion valve 1, the front intelligent area control unit records DTC.

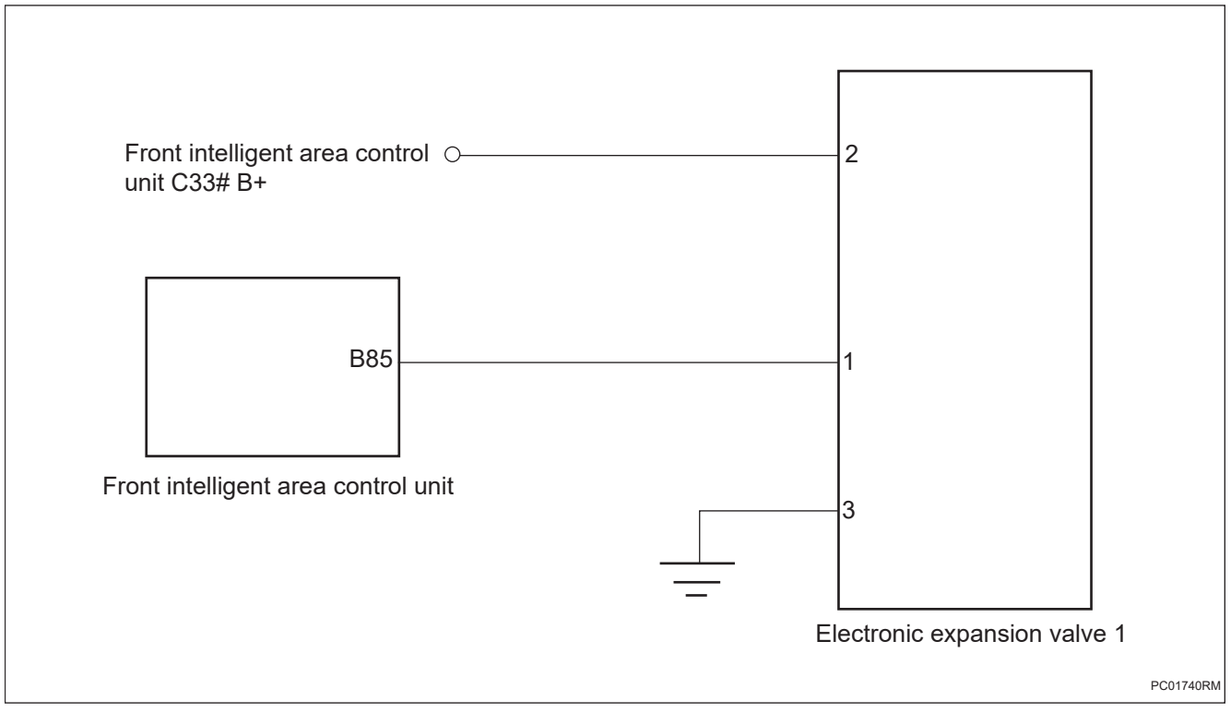
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302090	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV1 _ Response Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1
P302190	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV1 _ Fault State = 0x1 or0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302290	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV1 _ Voltage State = 0x1 or 0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1
P302390	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV1 _ Temp Warning = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P302090	• Electronic expansion valve 1 dose not operate or operates abnormally	Not come on
P302190	• Electronic expansion valve 1 dose not operate or operates abnormally	Not come on
P302290	• Electronic expansion valve 1 dose not operate or operates abnormally	Not come on
P302390	• Electronic expansion valve 1 dose not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check cooling system**

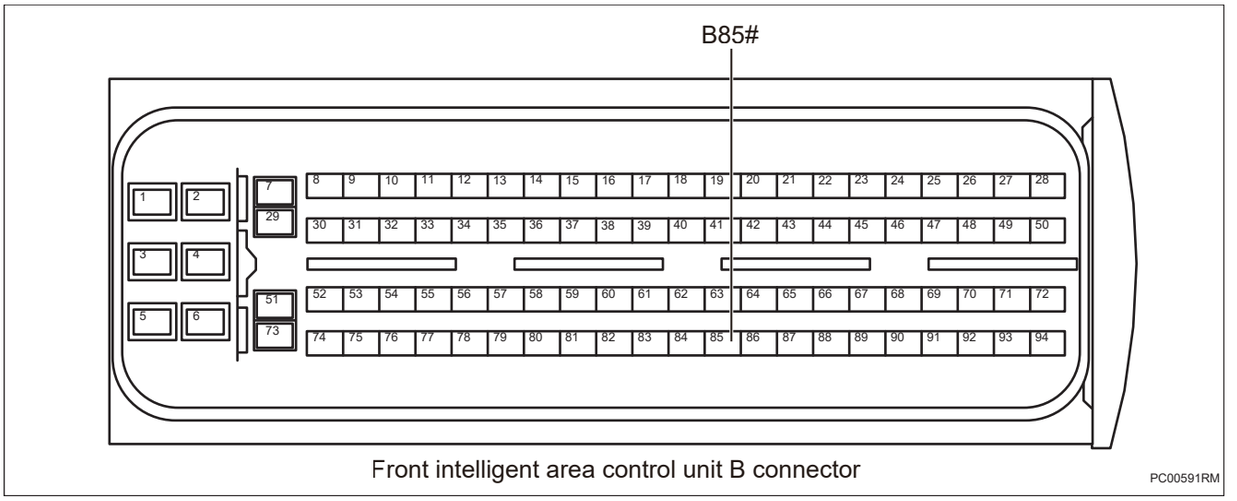
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

NG → **Perform repair according to malfunction**

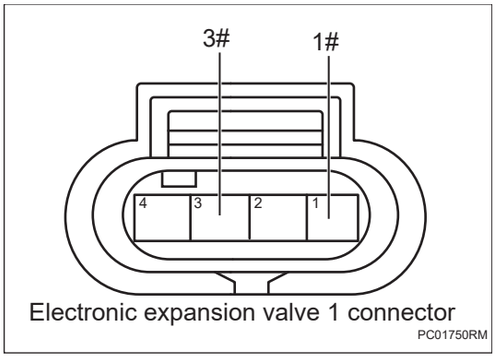
OK

2	**Check for open in electronic expansion valve 1 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Electronic expansion valve 1 connector

PC01750RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 1 connector.

(e) According to value in the table, measure resistance.

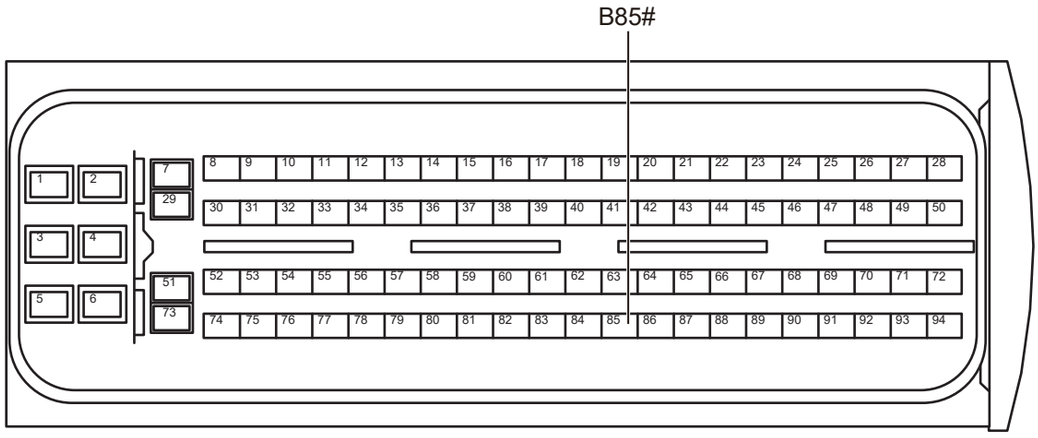
Standard value

Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 1 connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electronic expansion valve 1 connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in electronic expansion valve 1 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

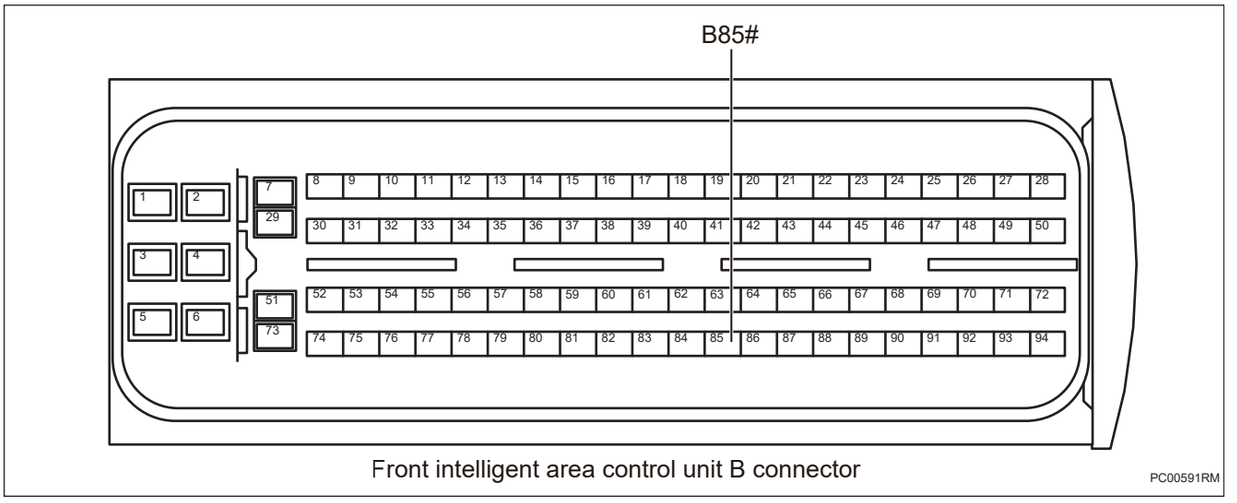
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in electronic expansion valve 1 wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

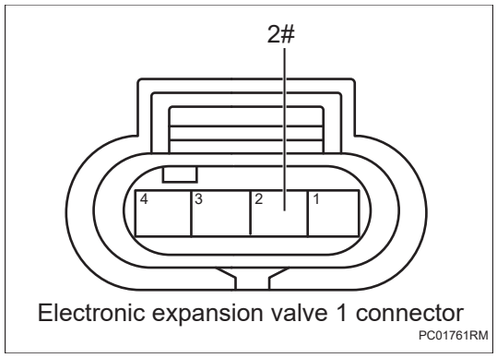
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Check electric expansion valve 1 power supply



Electronic expansion valve 1 connector
PC01761RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace electronic expansion valve 1 (See page RE-98)

(a) Replace the electronic expansion valve 1.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P302490**	**Electronic expansion valve 2 feedback fault**
DTC	**P302590**	**Electronic expansion valve 2 coil fault**
DTC	**P302690**	**Electronic expansion valve 2 voltage fault**
DTC	**P302790**	**Electronic expansion valve 2 overtemperature fault**

Description

When feedback, voltage, overtemperature or internal coil fault occurs in electronic expansion valve 2, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302490	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV2 _ Response Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2
P302590	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV2 _ Fault State = 0x1 or0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2

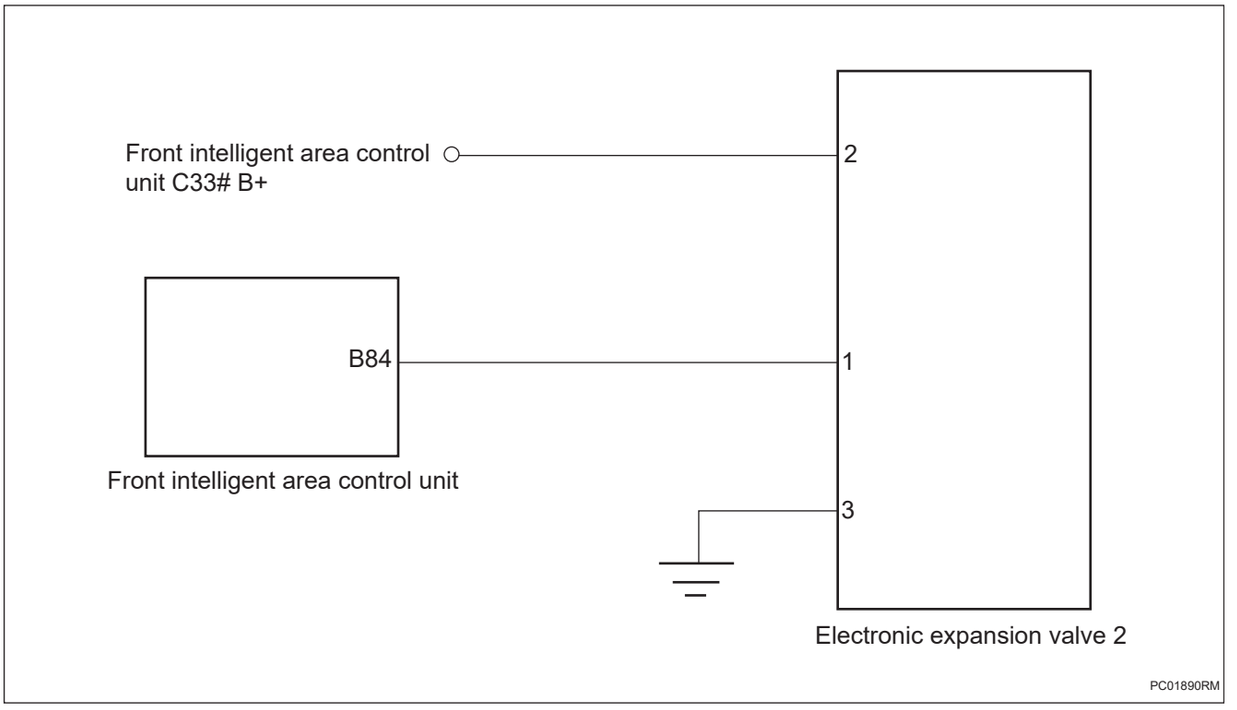
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302690	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV2 _ Voltage State = 0x1 or 0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2
P302790	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV2 _ Temp Warning = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P302490	• Electronic expansion valve 2 dose not operate or operates abnormally	Not come on
P302590	• Electronic expansion valve 2 dose not operate or operates abnormally	Not come on
P302690	• Electronic expansion valve 2 dose not operate or operates abnormally	Not come on
P302790	• Electronic expansion valve 2 dose not operate or operates abnormally	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Check cooling system**

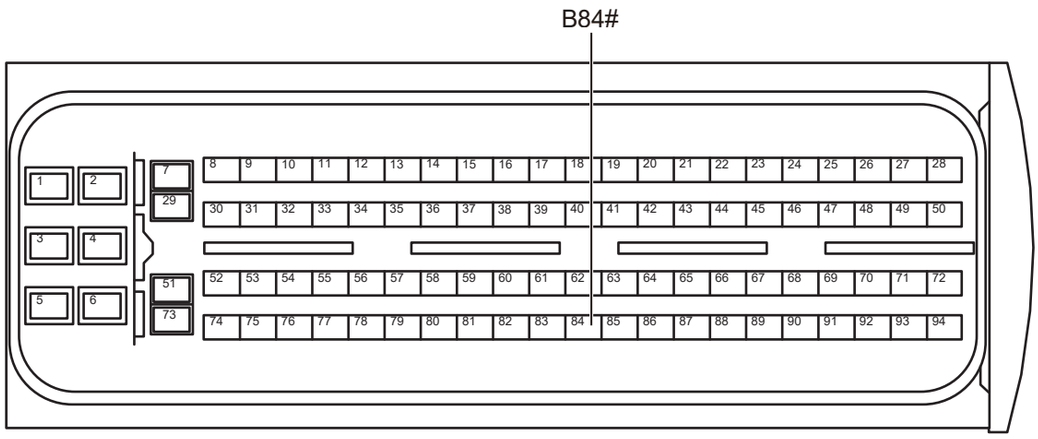
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

NG → **Perform repair according to malfunction**

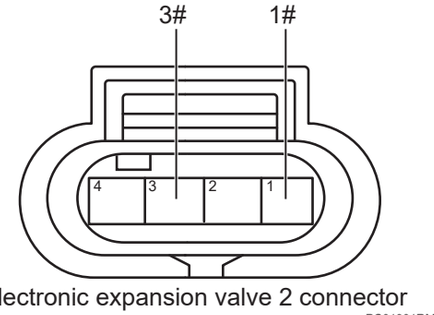
OK

2	**Check for open in electronic expansion valve 2 wire harness and connector**



Front intelligent area control unit B connector

PC00631RM



Electronic expansion valve 2 connector

PC01901RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 2 connector.

(e) According to value in the table, measure resistance.

Standard value

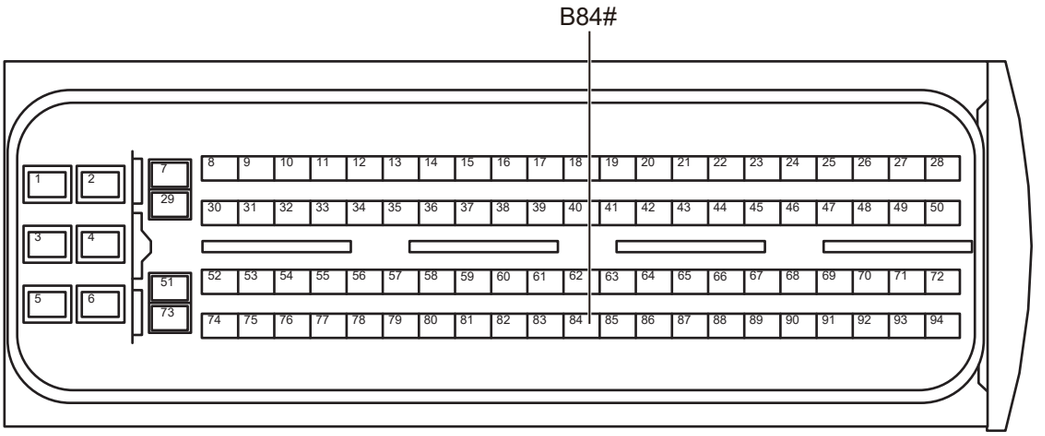
Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 2 connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electronic expansion valve 2 connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to ground in electronic expansion valve 2 wire harness and connector



Front intelligent area control unit B connector

PC00631RM

ZD

(a) According to value in the table, measure resistance.

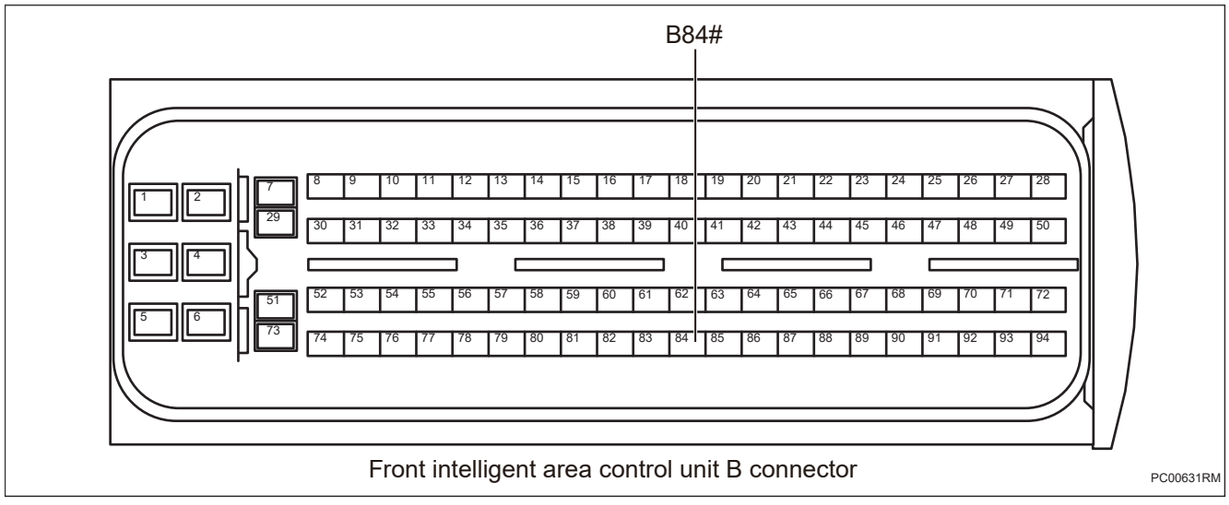
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in electronic expansion valve 2 wire harness and connector**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

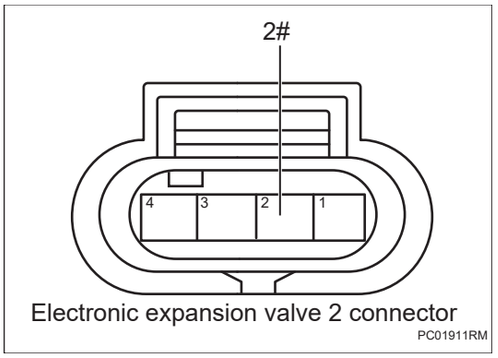
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	Check electric expansion valve 2 power supply



Electronic expansion valve 2 connector
PC01911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 2 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace electronic expansion valve 2 (See page RE-98)

(a) Replace the electronic expansion valve 2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P302890**	**Electronic expansion valve 3 feedback fault**
DTC	**P302990**	**Electronic expansion valve 3 coil fault**
DTC	**P302A90**	**Electronic expansion valve 3 voltage fault**
DTC	**P302B90**	**Electronic expansion valve 3 overtemperature fault**

Description

When feedback, voltage, overtemperature or internal coil fault occurs in electronic expansion valve 3, the front intelligent area control unit records DTC.

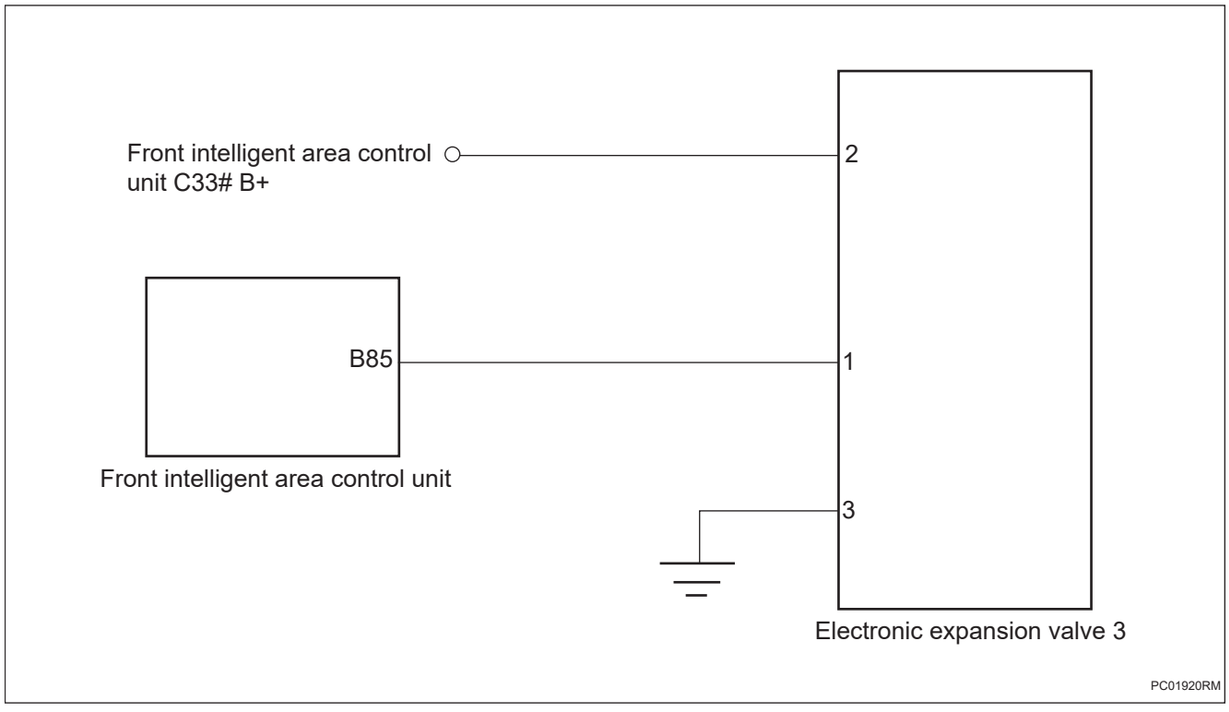
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302890	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV3 _ Response Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3
P302990	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV3 _ Fault State= 0x1 or 0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P302A90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV3 _ Voltage State = 0x1 or 0x2	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3
P302B90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• EXV3 _ Temp Warning = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P302890	• Electronic expansion valve 3 dose not operate or operates abnormally	Not come on
P302990	• Electronic expansion valve 3 dose not operate or operates abnormally	Not come on
P302A90	• Electronic expansion valve 3 dose not operate or operates abnormally	Not come on
P302B90	• Electronic expansion valve 3 dose not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check cooling system**

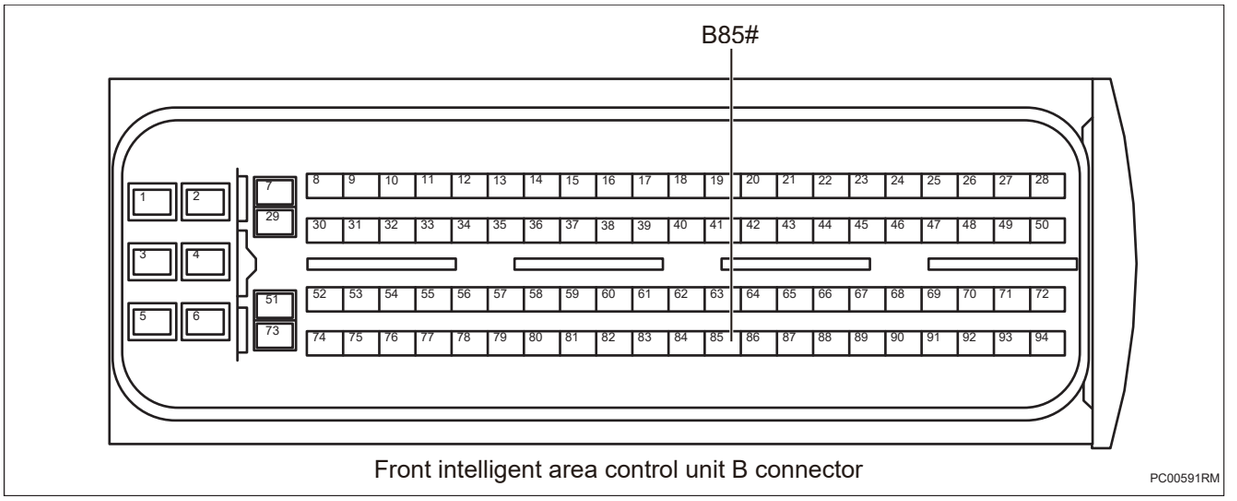
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

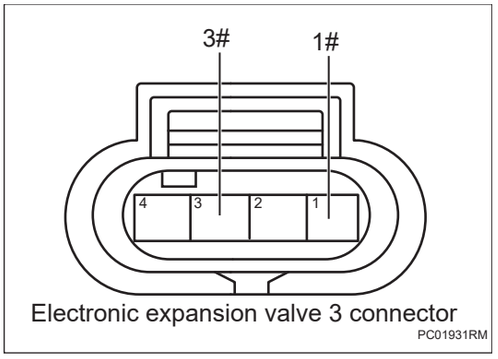
NG → **Perform repair according to malfunction**

OK

2	**Check for open in electronic expansion valve 3 wire harness and connector**



Front intelligent area control unit B connector
PC00591RM



Electronic expansion valve 3 connector
PC01931RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 3 connector.

(e) According to value in the table, measure resistance.

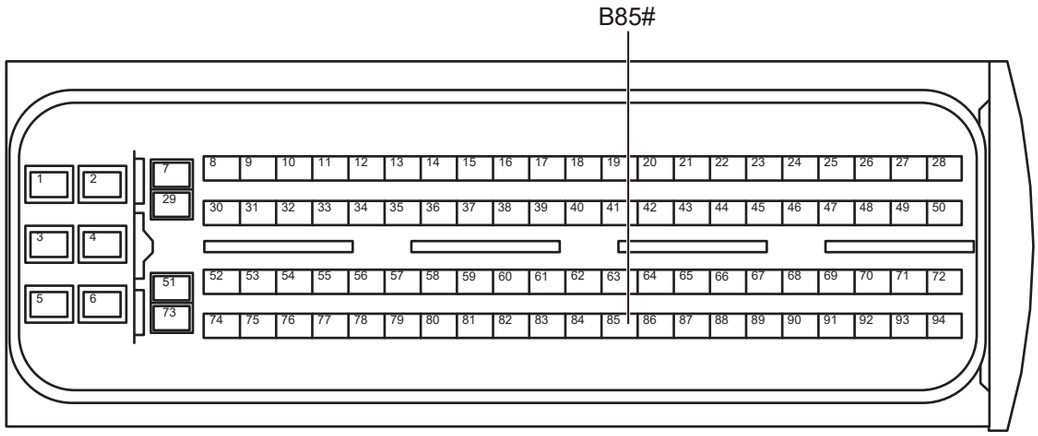
Standard value

Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 3 connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electronic expansion valve 3 connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in electronic expansion valve 3 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

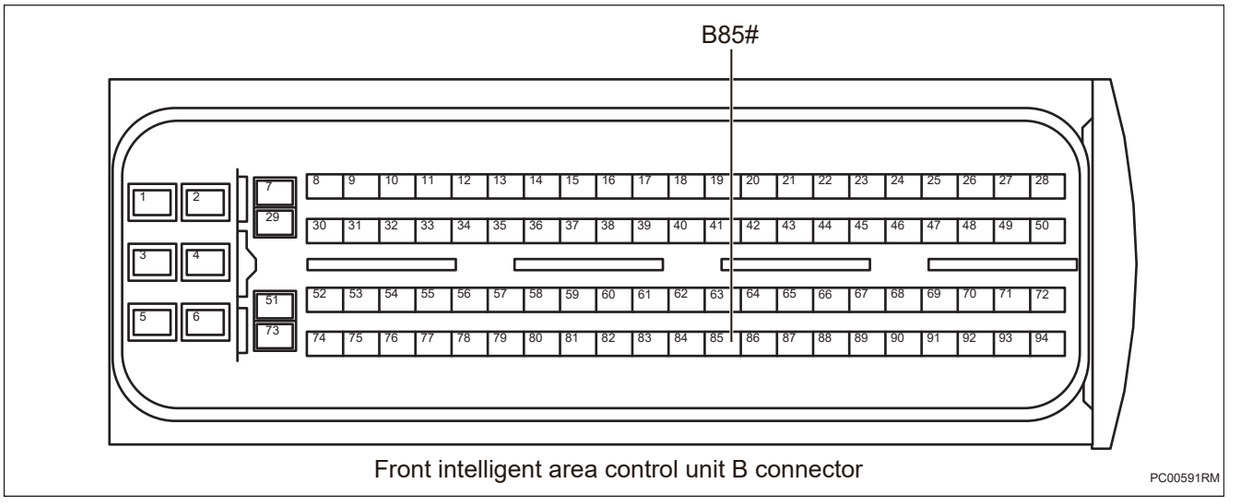
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in electronic expansion valve 3 wire harness and connector



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

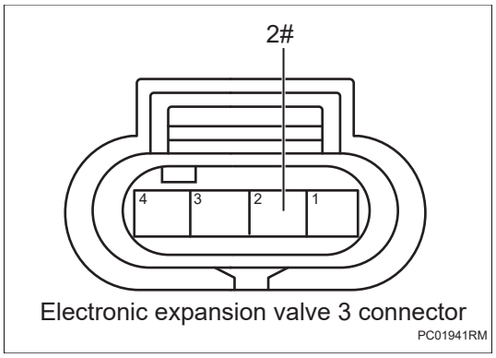
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Check electric expansion valve 3 power supply



Electronic expansion valve 3 connector
PC01941RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 3 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace electronic expansion valve 3 (See page RE-98)

(a) Replace the electronic expansion valve 3.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P305E13**	**Short to ground in PT_H1_T acquisition**
DTC	**P305E11**	**Short to power supply/open in PT_H1_T acquisition**
DTC	**P305E12**	**Short to ground in PT_H1_P acquisition**
DTC	**P305E19**	**Short to power supply/open in PT_H1_P acquisition**

Description

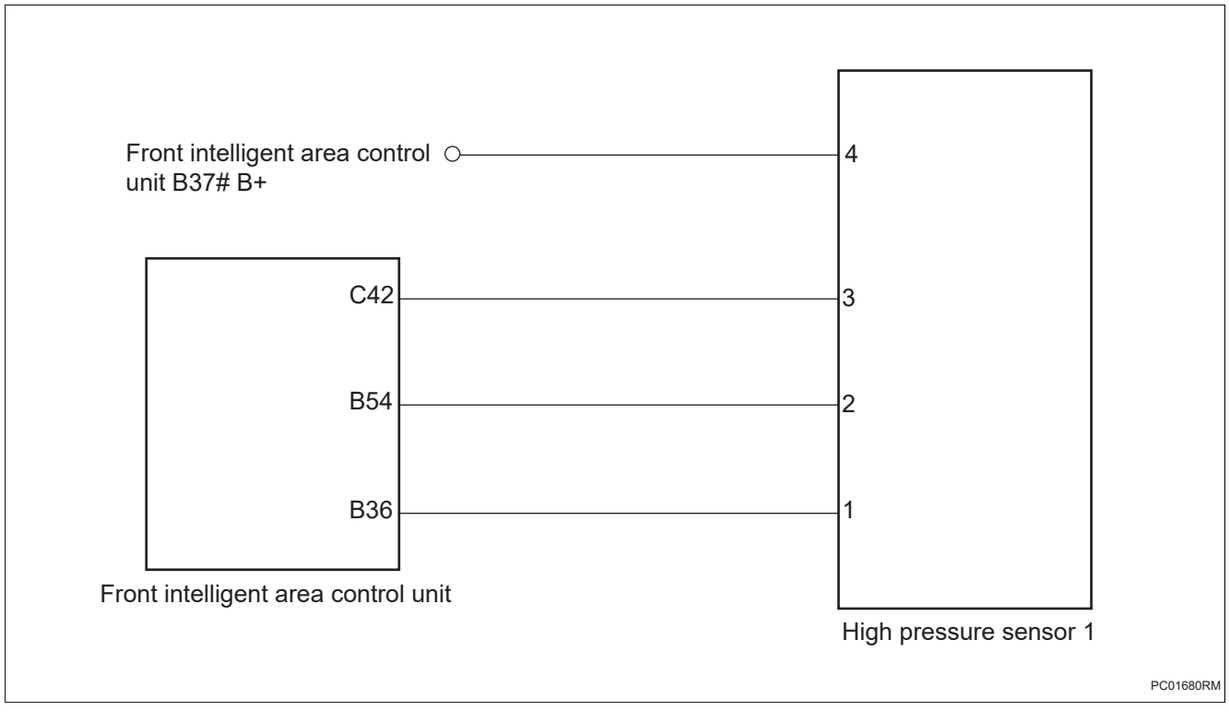
When temperature, pressure, checksum faults occur in high pressure sensor 1, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305E13	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN24 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 1
P305E11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN24 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 1
P305E12	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN33 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 1
P305E19	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN33 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 1

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305E13	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305E11	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305E12	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305E19	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on

Circuit diagram



Inspection procedure

1	**Check A/C system pressure**

(a) Check if A/C system pressure is normal.

(b) Check for leakage fault in A/C system.

NG → **Perform inspection and repair according to malfunction**

OK

2	**Check cooling system**

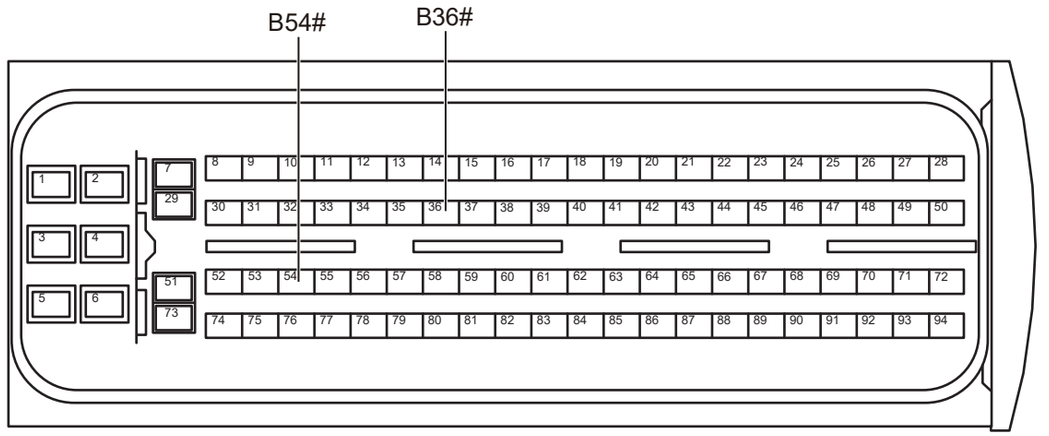
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

NG → **Perform inspection and repair according to malfunction**

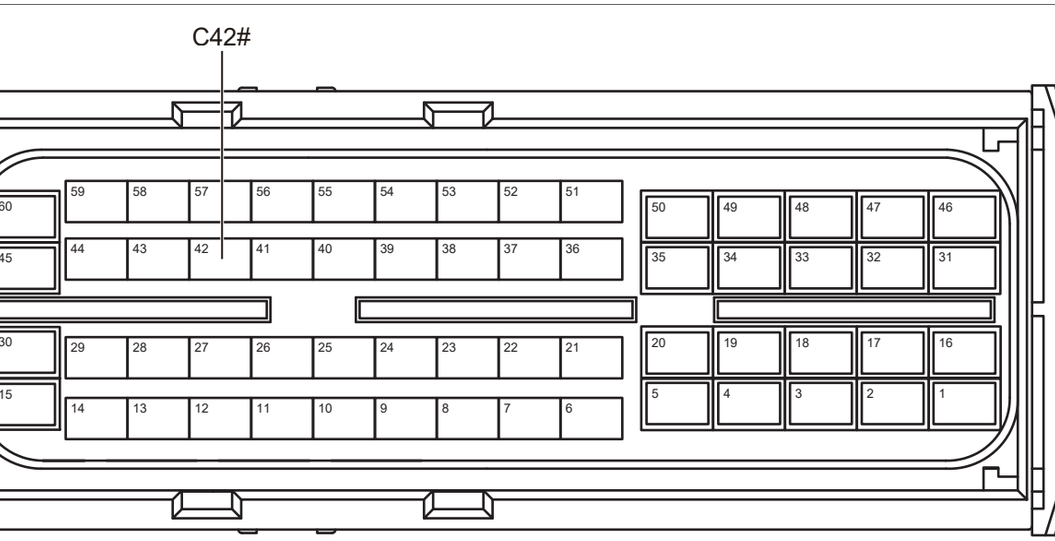
OK

3	**Check for open in high pressure sensor 1 wire harness and connector**



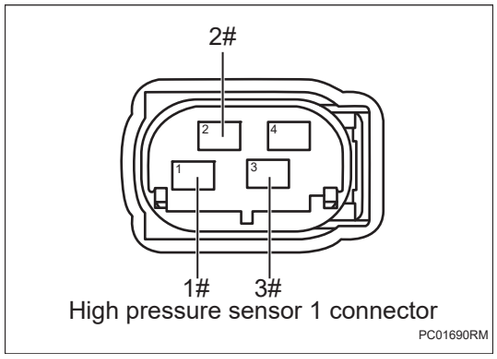
Front intelligent area control unit B connector

PC00591RM



Front intelligent area control unit C connector

PC03101RM



High pressure sensor 1 connector
PC01690RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the high pressure sensor 1 connector.

(e) According to value in the table, measure resistance.

Standard value

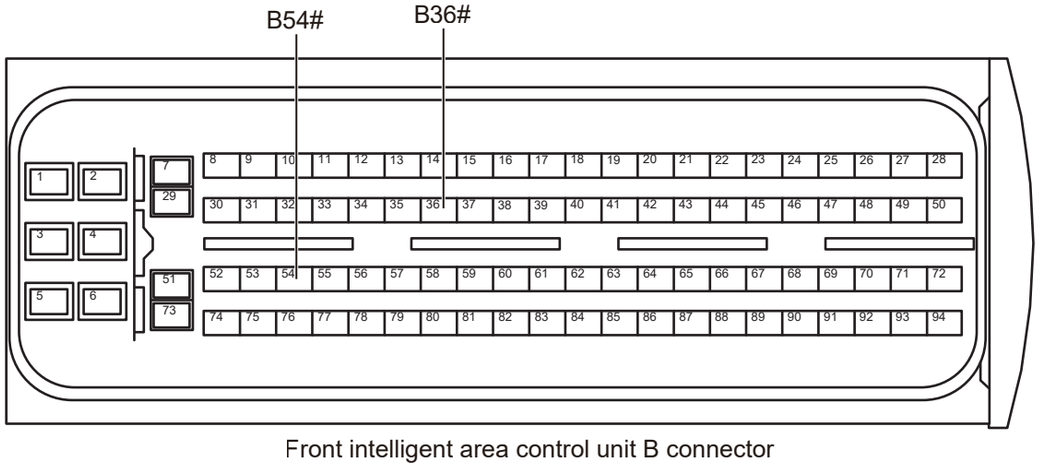
Multimeter connection	Detection condition	Specified condition
High pressure sensor 1 connector 3# - front intelligent area control unit connector C42#	Always connected	Less than 1 Ω
High pressure sensor 1 connector 2# - front intelligent area control unit connector B54#	Always connected	Less than 1 Ω
High pressure sensor 1 connector 1# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

ZD

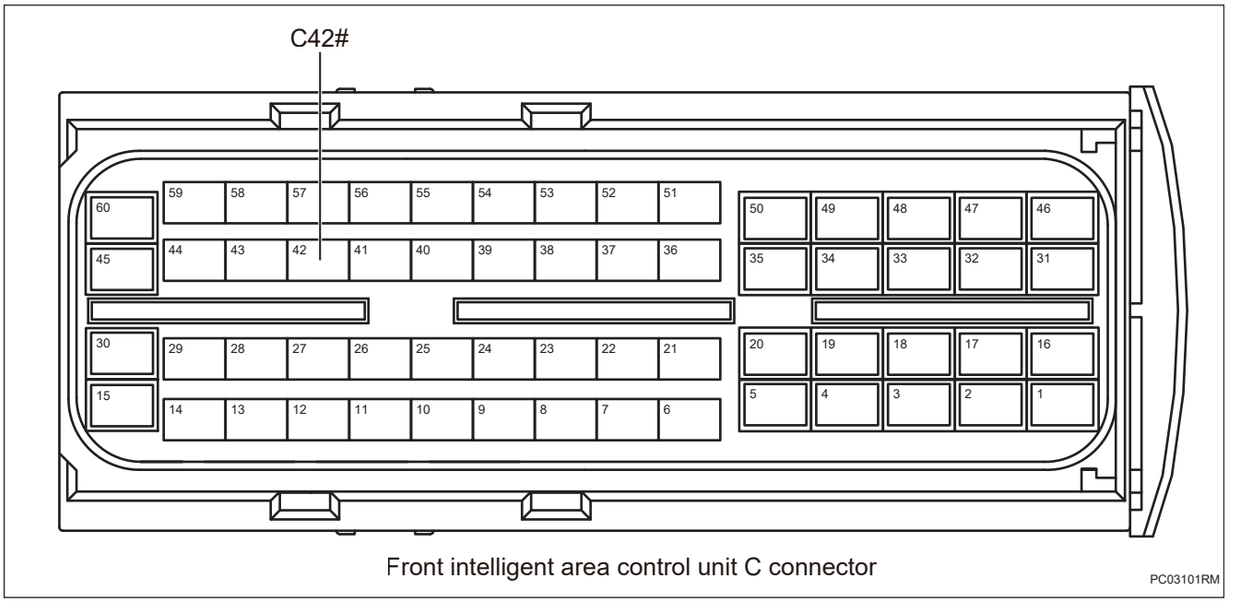
NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in high pressure sensor 1 wire harness and connector**



Front intelligent area control unit B connector
PC00591RM



Front intelligent area control unit C connector

PC03101RM

(a) According to value in the table, measure resistance.

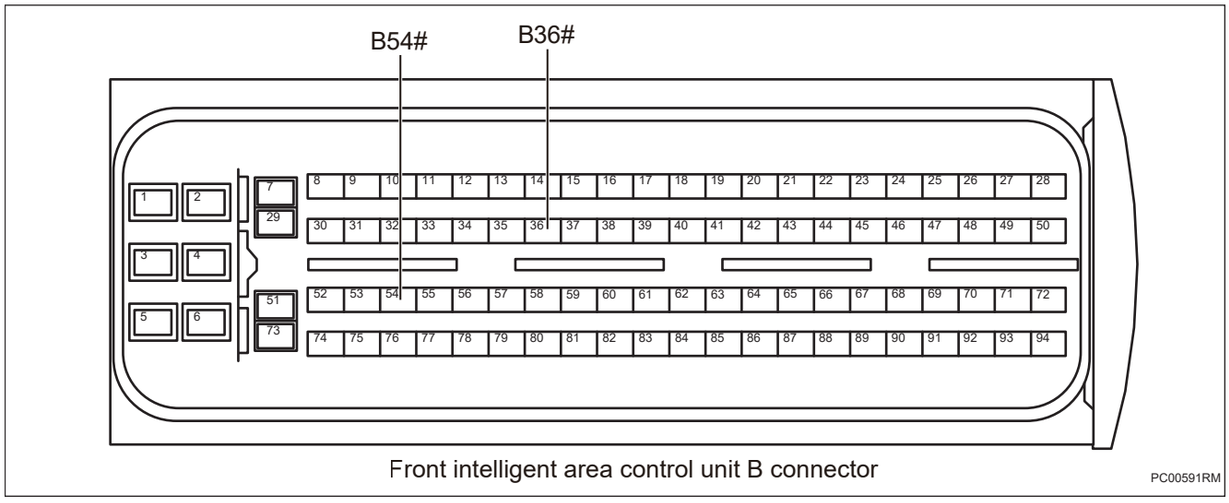
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B54# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C42# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B36# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

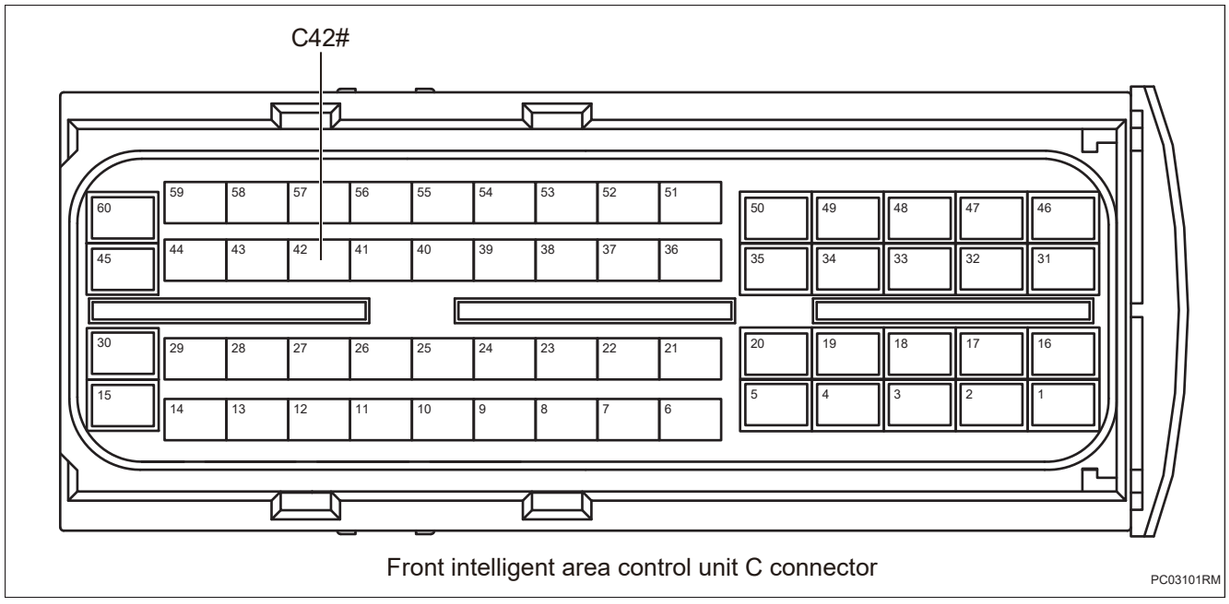
OK

5	**Check for short to power supply in high pressure sensor 1 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Front intelligent area control unit C connector

PC03101RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

ZD

Standard value

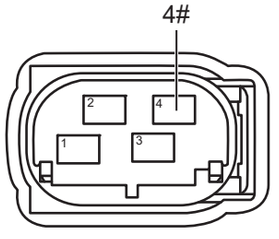
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B54# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B36# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C42# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Check high pressure sensor 1 power supply



High pressure sensor 1 connector

PC01701RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
High pressure sensor 1 connector 4# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace high pressure sensor 1 (See page RE-98)

(a) Replace the high pressure sensor 1.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → Replace front intelligent area control unit (See page ZC-128)

OK

Diagnosis ends

DTC	P302F90	High pressure/temperature sensor 2 pressure fault
DTC	P303090	High pressure/temperature sensor 2 temperature fault
DTC	P303190	High pressure/temperature sensor 2 checksum error
DTC	P305E1A	Short to ground in PT_H2_T acquisition
DTC	P305E1B	Short to power supply/open in PT_H2_T acquisition

DTC	P305E1C	Short to ground in PT_H2_P acquisition
DTC	P305F13	Short to power supply/open in PT_H2_P acquisition

Description

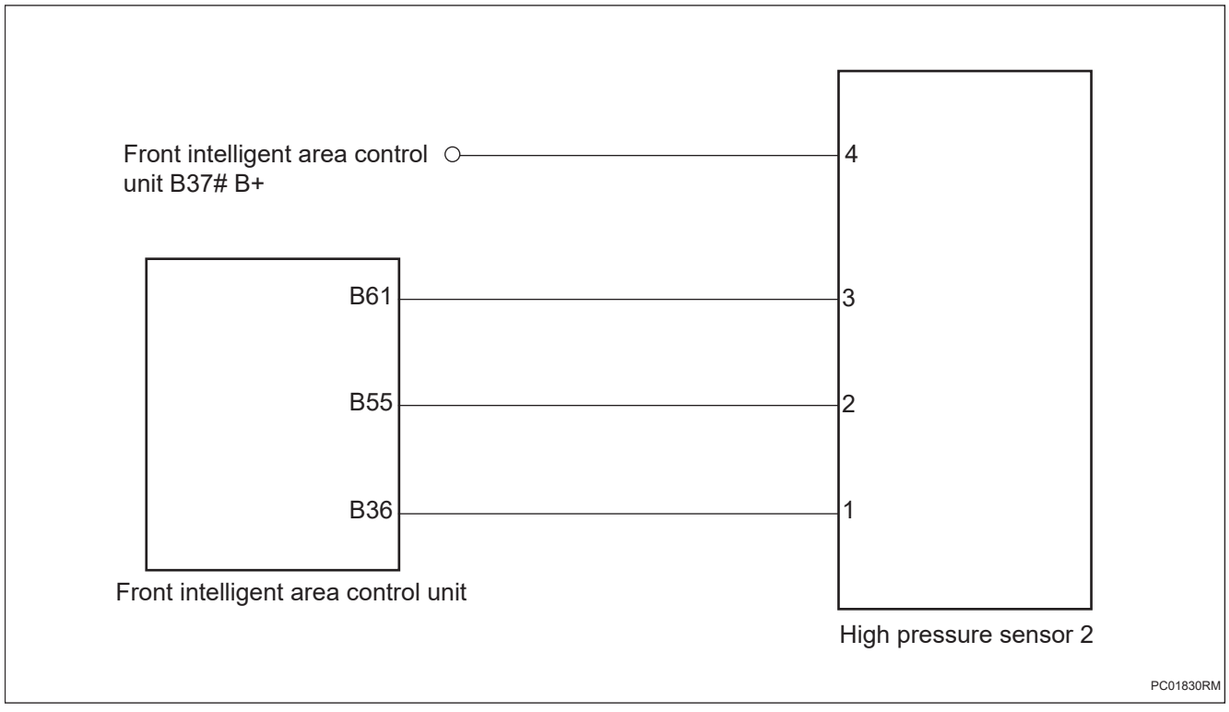
When temperature, pressure, checksum faults occur in high pressure sensor 2, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305E1A	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN04 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 2
P305E1B	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN04 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 2
P305E1C	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN34 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 2
P305F13	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN34 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • High pressure sensor 2

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305E1A	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305E1B	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305E1C	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on
P305F13	• Unreasonable temperature collected by high pressure/temperature sensor	Not come on

Circuit diagram



Inspection procedure

1	**Check A/C system pressure**

(a) Check if A/C system pressure is normal.

(b) Check for leakage fault in A/C system.

NG → **Perform inspection and repair according to malfunction**

OK

2	**Check cooling system**

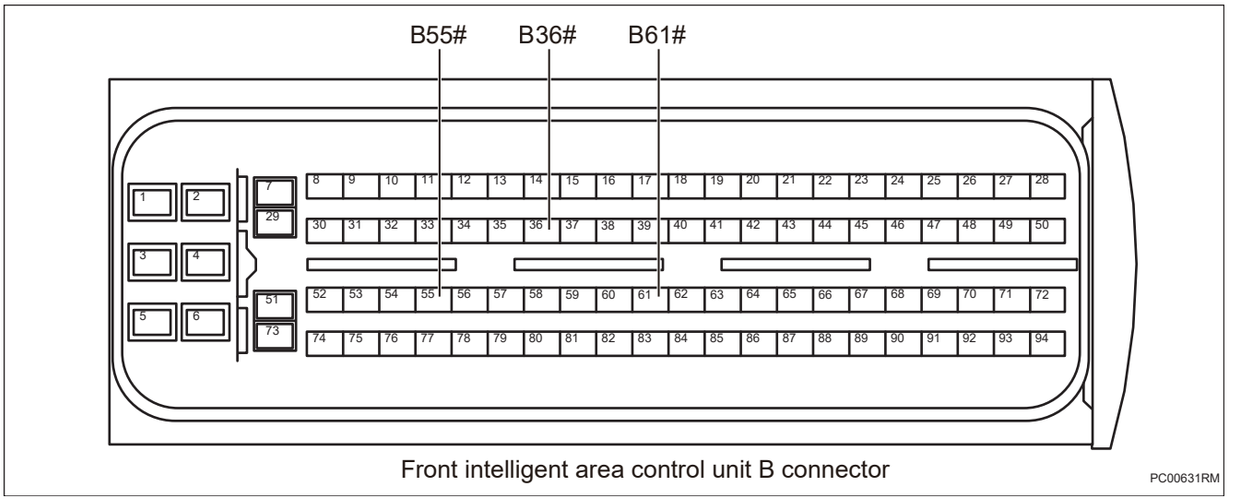
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

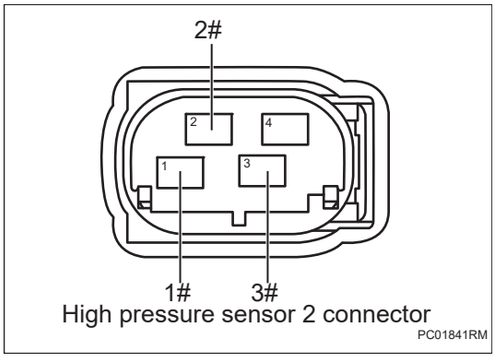
NG → **Perform inspection and repair according to malfunction**

OK

3	**Check for open in high pressure sensor 2 wire harness and connector**



Front intelligent area control unit B connector
PC00631RM



High pressure sensor 2 connector
PC01841RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the high pressure sensor 2 connector.

(e) According to value in the table, measure resistance.

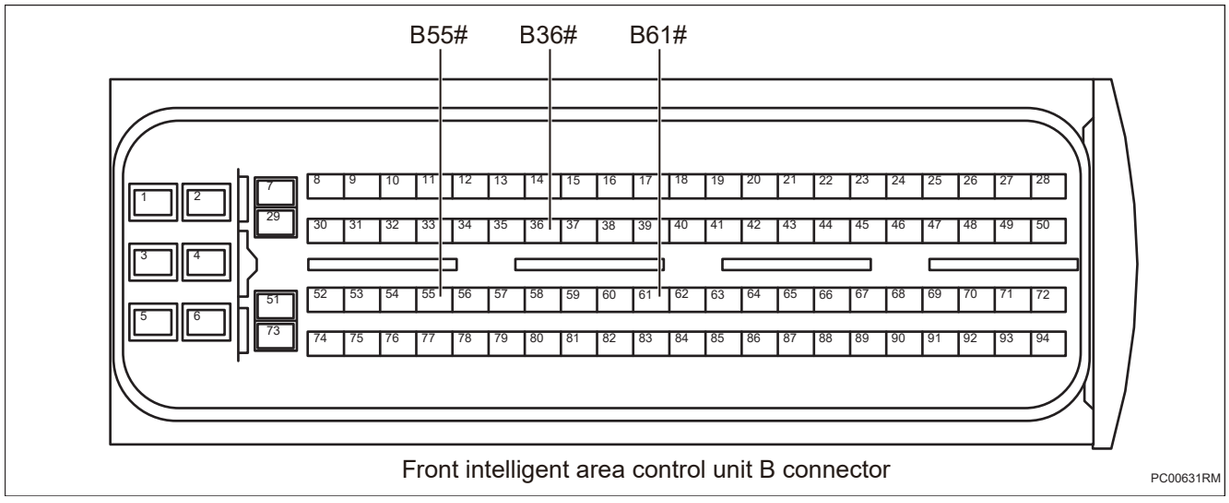
Standard value

Multimeter connection	Detection condition	Specified condition
High pressure sensor 2 connector 3# - front intelligent area control unit connector B61#	Always connected	Less than 1 Ω
High pressure sensor 2 connector 2# - front intelligent area control unit connector B55#	Always connected	Less than 1 Ω
High pressure sensor 2 connector 1# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

4	**Check for short to ground in high pressure sensor 2 wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

ZD

(a) According to value in the table, measure resistance.

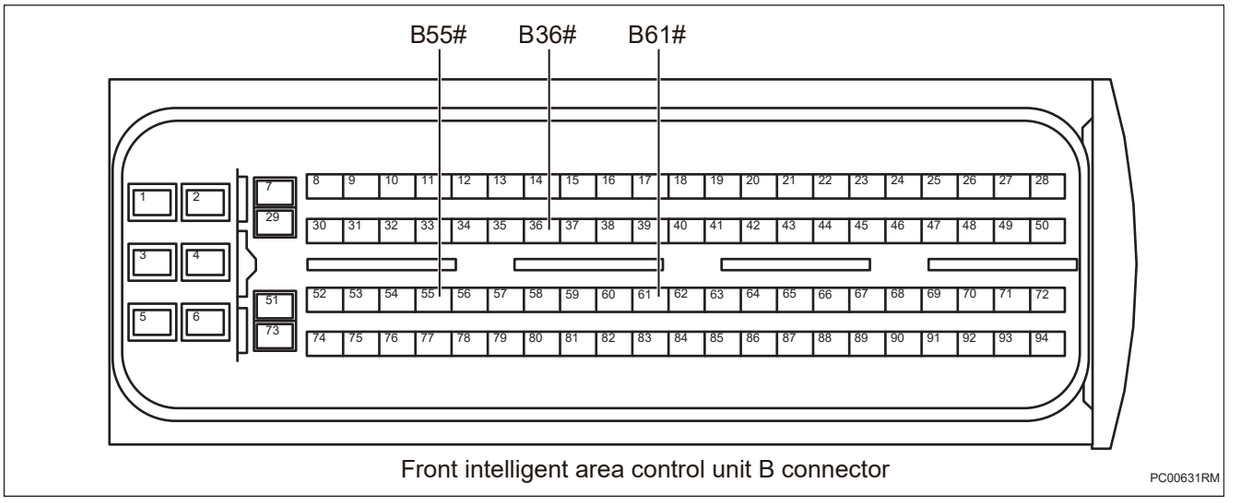
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B55# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B61# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	Check for short to power supply in high pressure sensor 2 wire harness and connector



Front intelligent area control unit B connector

PC00631RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

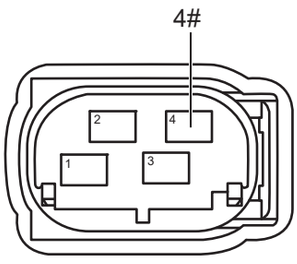
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B55# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B61# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Check high pressure sensor 2 power supply



High pressure sensor 2 connector
PC01851RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
High pressure sensor 2 connector 4# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace high pressure sensor 2 (See page RE-98)

(a) Replace the high pressure sensor 2.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P305F19**	**Short to ground in PT_L2_T acquisition**
DTC	**P305F1A**	**Short to power supply/open in PT_L2_T acquisition**
DTC	**P305F1B**	**Short to ground in PT_L2_P acquisition**
DTC	**P305F1C**	**Short to power supply/open in PT_L2_P acquisition**

Description

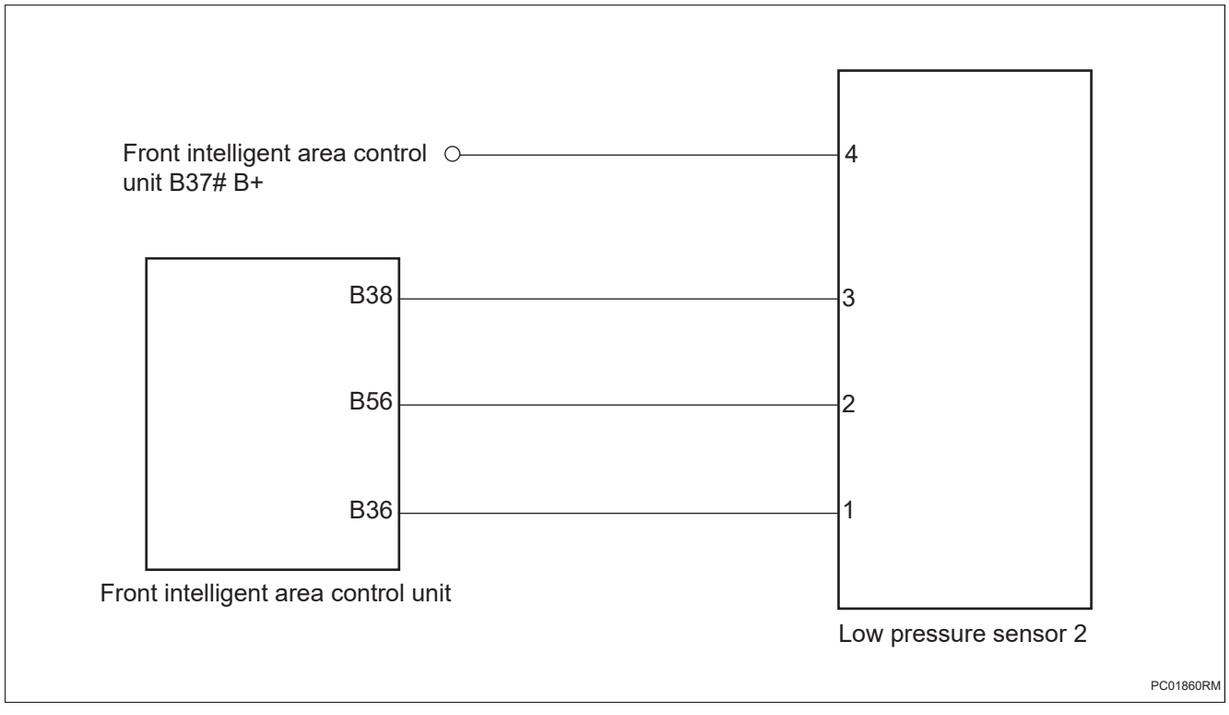
When temperature, pressure, checksum faults occur in low pressure sensor 2, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305F19	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN26 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pressure sensor 2
P305F1A	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN26 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pressure sensor 2
P305F1B	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN35 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pressure sensor 2
P305F1C	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN35 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Low pressure sensor 2

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305F19	• Temperature collected by low pressure / temperature sensor is unreasonable	Not come on
P305F1A	• Temperature collected by low pressure / temperature sensor is unreasonable	Not come on
P305F1B	• Temperature collected by low pressure / temperature sensor is unreasonable	Not come on
P305F1C	• Temperature collected by low pressure / temperature sensor is unreasonable	Not come on

Circuit diagram



Inspection procedure

1	**Check A/C system pressure**

(a) Check if A/C system pressure is normal.

(b) Check for leakage fault in A/C system.

NG → **Perform inspection and repair according to malfunction**

OK

2	**Check cooling system**

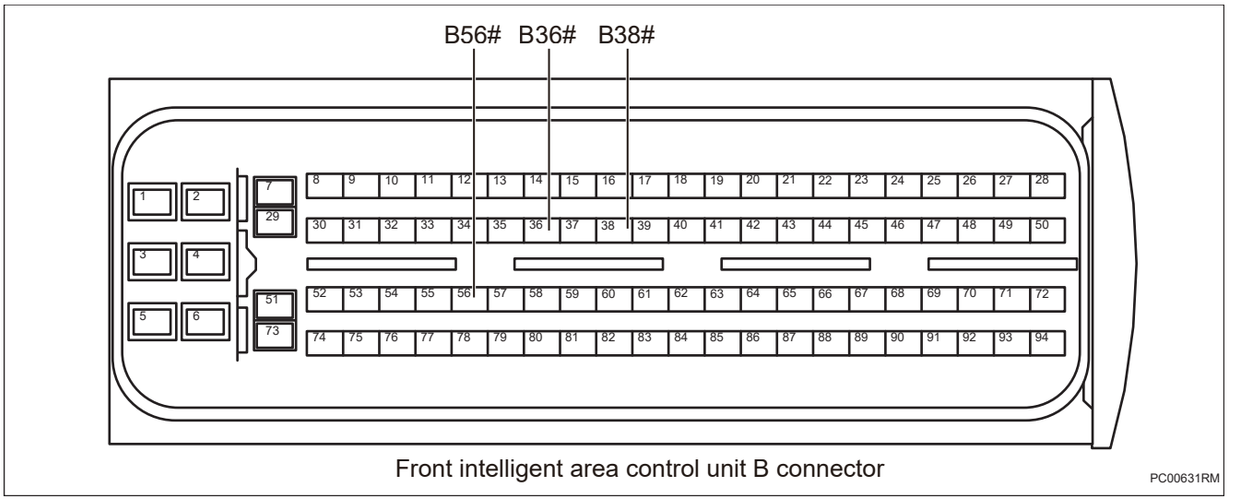
(a) Check if cooling system operates normally.

(b) Check if ambient temperature is abnormal.

NG → **Perform inspection and repair according to malfunction**

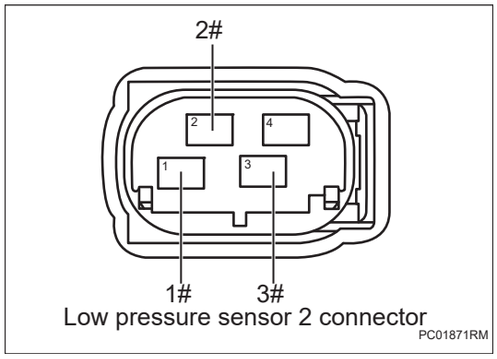
OK

3	**Check for open in low pressure sensor 2 wire harness and connector**



Front intelligent area control unit B connector

PC00631RM



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the low pressure sensor 2 connector.

(e) According to value in the table, measure resistance.

Standard value

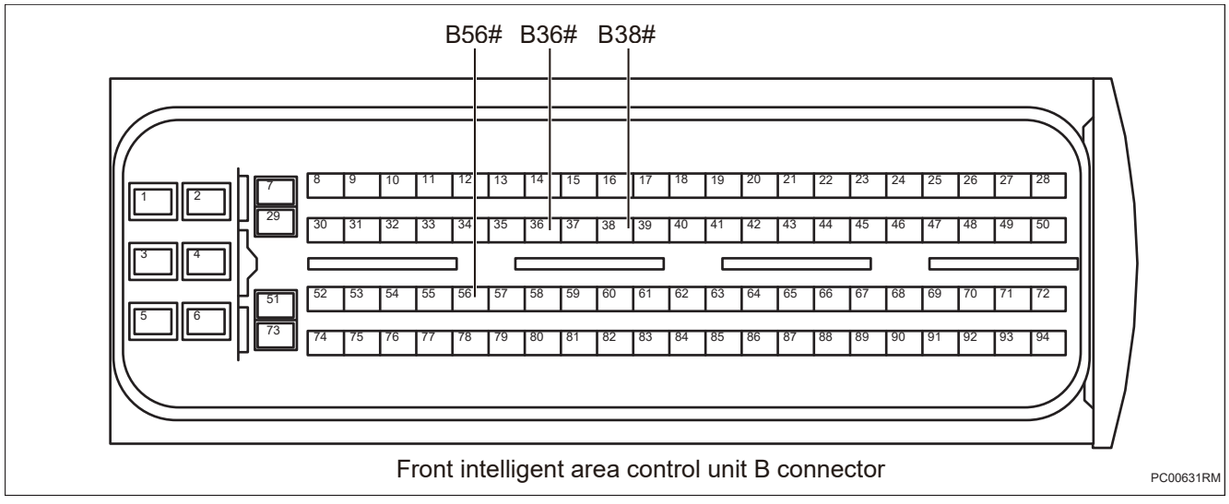
Multimeter connection	Detection condition	Specified condition
Low pressure sensor 2 connector 3# - front intelligent area control unit connector B38#	Always connected	Less than 1 Ω
Low pressure sensor 2 connector 2# - front intelligent area control unit connector B56#	Always connected	Less than 1 Ω
Low pressure sensor 2 connector 1# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in low pressure sensor 2 wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

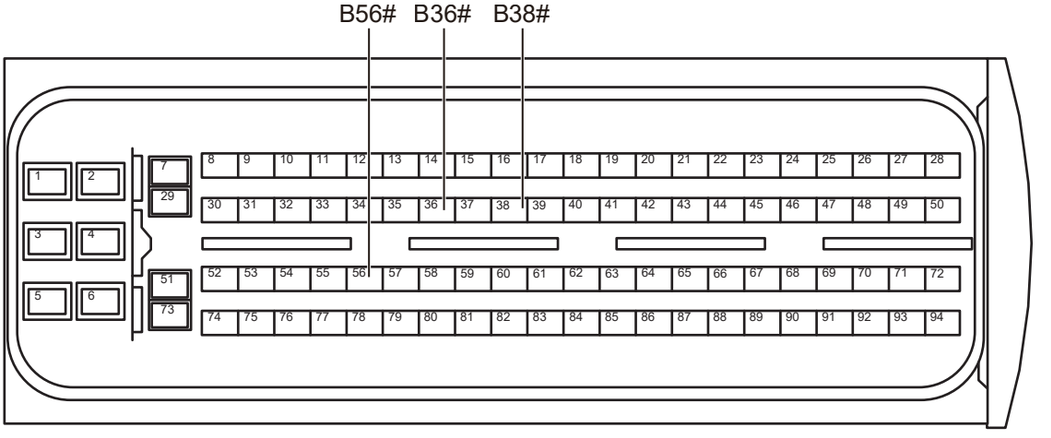
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B38# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B56# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in low pressure sensor 2 wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

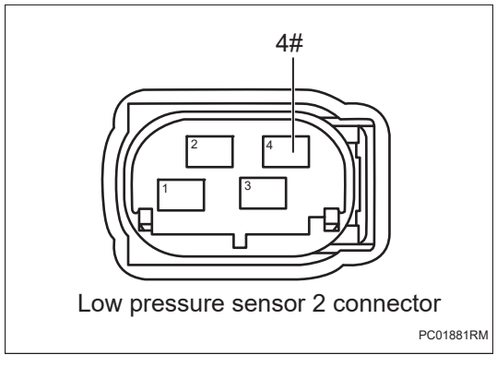
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B38# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B56# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check low pressure sensor 2 power supply**



Low pressure sensor 2 connector
PC01881RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Low pressure sensor 2 connector 4# - body ground	Turn ignition switch to "ON"	5.5 - 4.5 V

NG → **Check and repair or replace wire harness and connector**

OK

7	Replace the low pressure sensor 2 (See page RE-98)

(a) Replace the low pressure sensor 2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

Diagnosis ends

DTC	P303890	Active intake grille over-rotation fault
DTC	P303990	Active intake grille blocked fault
DTC	P303A90	Active intake grille electrical fault
DTC	P303B90	Active intake grille undervoltage fault
DTC	P303C90	Active intake grille overvoltage fault
DTC	P303D90	Active intake grille overtemperature fault

DTC	P306811	Short to ground in left active intake grille + right active intake grille power distribution

Description

When active intake grille control motor related fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P303890	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• AGS _ Overtravel Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
P303990	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• AGS _ Blockage Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
P303A90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• AGS _ Electrical Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
P303B90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• AGS _ Under Volt Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor

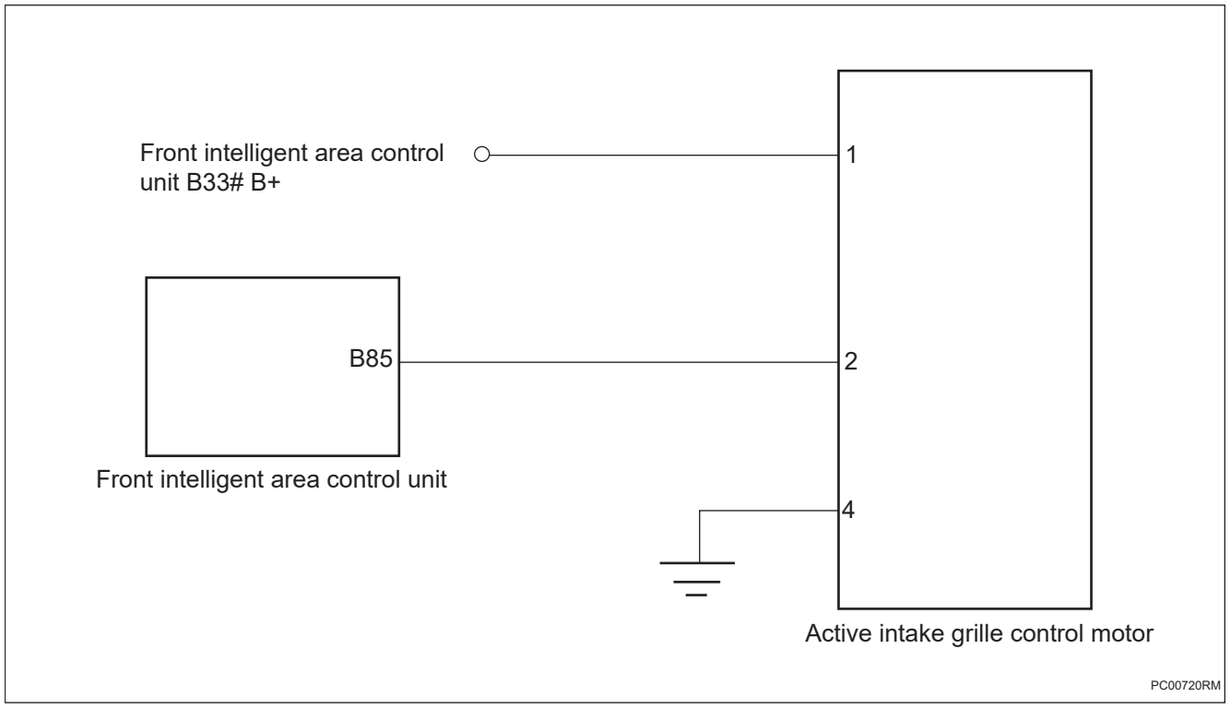
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P303C90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• AGS _ Over Volt Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
P303D90	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC_ PowerMod-e= Standby|| Driving) & PDC Not in OTA Mode	• AGS _ Over Temp Error = 0x1	3 times in a row	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
P306811	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH40 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P303890	• At blade over-travel position, the motor maintains the current position/opens the blade and reports over-turn fault	Not come on
P303990	• At blade blocked position, the motor drives the blade to open/move in the closing direction and reports block fault	Not come on
P303A90	• When a short circuit occurs in the internal circuit or coil of the motor, the motor stops operating and reports a fault	Not come on
P303B90	• When the external power supply voltage is lower than the limit, the motor drives the blades to start/stop running and report a fault	Not come on
P303C90	• When the external power supply voltage exceeds the limit, the motor drives the blades to start/stop running and report a fault	Not come on

DTC No.	Fault symptom	Warning light/indicator
P303D90	• When the rising external temperature causes the internal temperature of the motor exceeds the limit, the motor drives the blades to start/stop running and report a fault	Not come on
P306811	• Active intake grille does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check active intake grille control motor**

(a) Check active intake grille and control motor for proper installation.

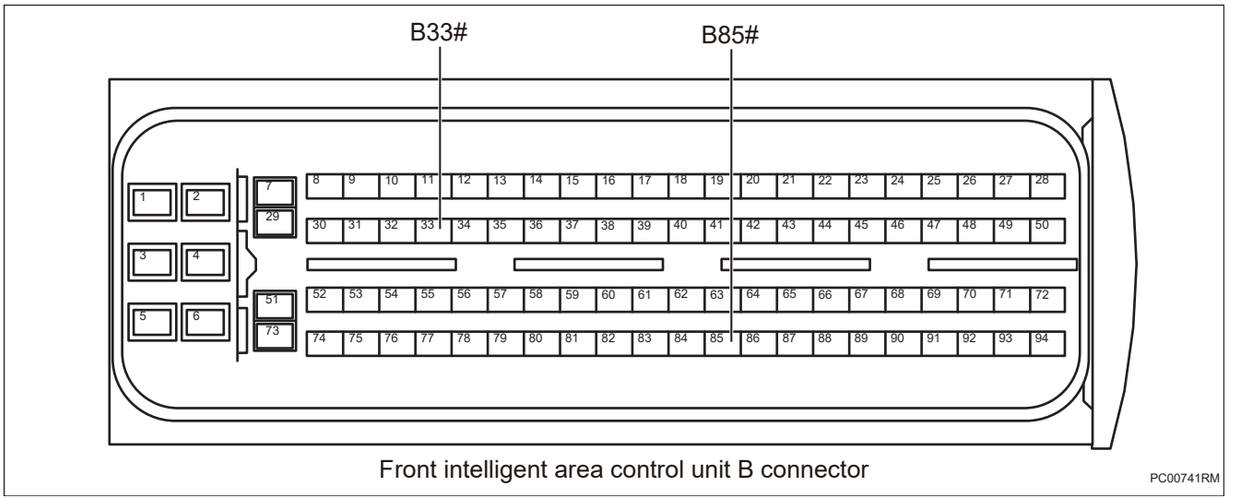
(b) Check active intake grille and control motor for damage.

(c) Check active intake grille mechanical body for foreign objects blockage.

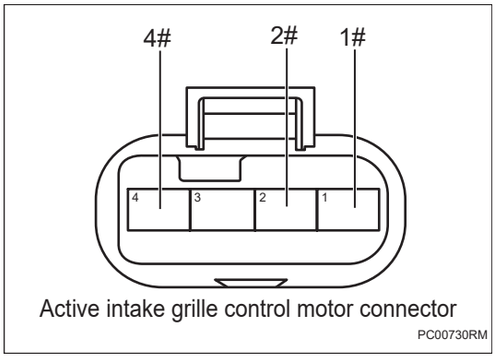
NG → **Perform repair according to malfunction**

OK

2	**Check for open in active intake grille control motor wire harness and connector**



Front intelligent area control unit B connector
PC00741RM



Active intake grille control motor connector
PC00730RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the active intake grille control motor connector.

(e) According to value in the table, measure resistance.

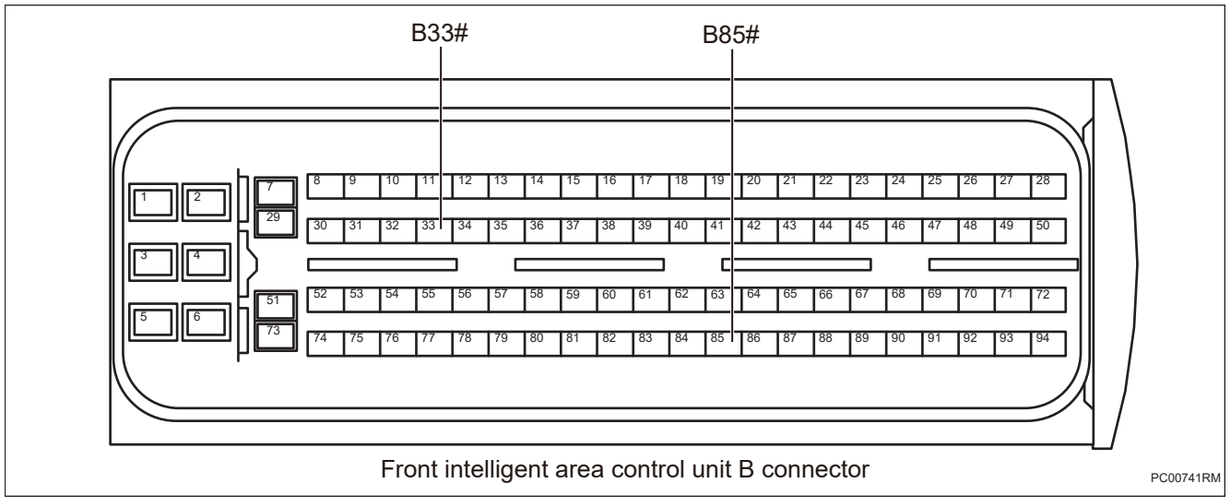
Standard value

Multimeter connection	Detection condition	Specified condition
Active intake grille control motor connector 2# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Active intake grille control motor connector 1# - front intelligent area control unit connector B33#	Always connected	Less than 1 Ω
Active intake grille control motor connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in active intake grille control motor wire harness and connector**



Front intelligent area control unit B connector

ZD

(a) According to value in the table, measure resistance.

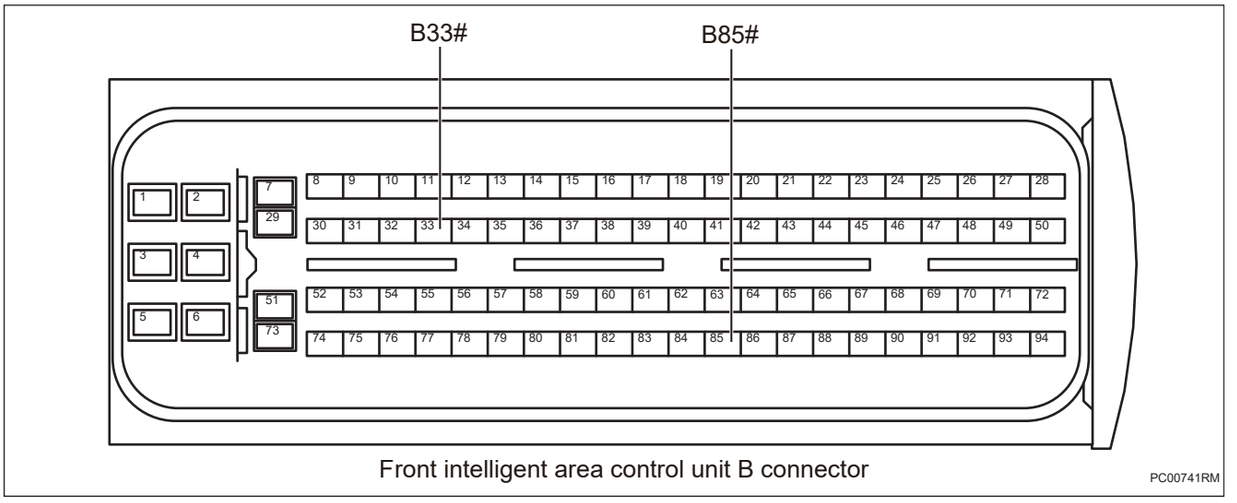
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B33# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in active intake grille control motor wire harness and connector



Front intelligent area control unit B connector

PC00741RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

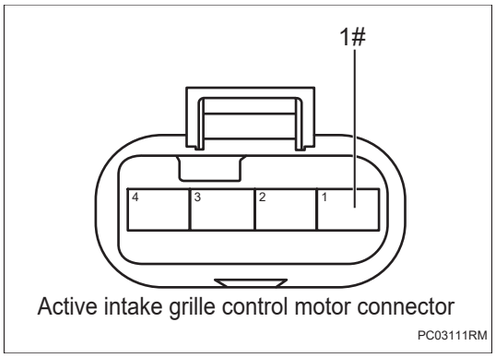
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B33# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Check active intake grille control motor power supply



Active intake grille control motor connector
PC03111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Active intake grille control motor connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace active intake grille control motor (See page RE-57)

(a) Replace the active intake grille control motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P305711**	**Short to ground in coolant temperature sensor 1 (motor) simulation acquisition**
DTC	**P307A11**	**Short to power supply/open in coolant temperature sensor 1 (motor) simulation acquisition**

Description

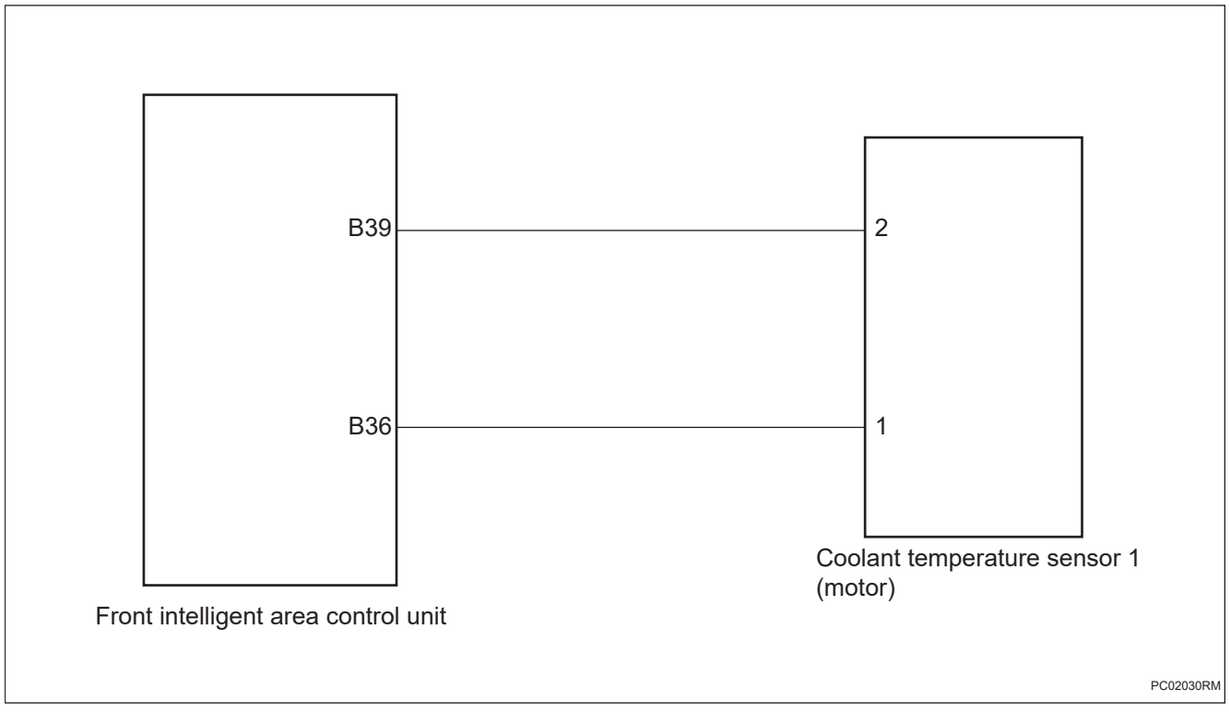
When coolant temperature sensor 1 (motor) is short or open, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305711	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN07 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 1 (motor)
P307A11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN07 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 1 (motor)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305711	• The temperature collected by coolant temperature sensor 1 (motor) is unreasonable	Not come on
P307A11	• The temperature collected by coolant temperature sensor 1 (motor) is unreasonable	Not come on

Circuit diagram



Inspection procedure

1	**Check coolant temperature sensor 1 (motor) resistance**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the coolant temperature sensor 1 (motor) connector.

(d) According to value in the table, measure resistance.

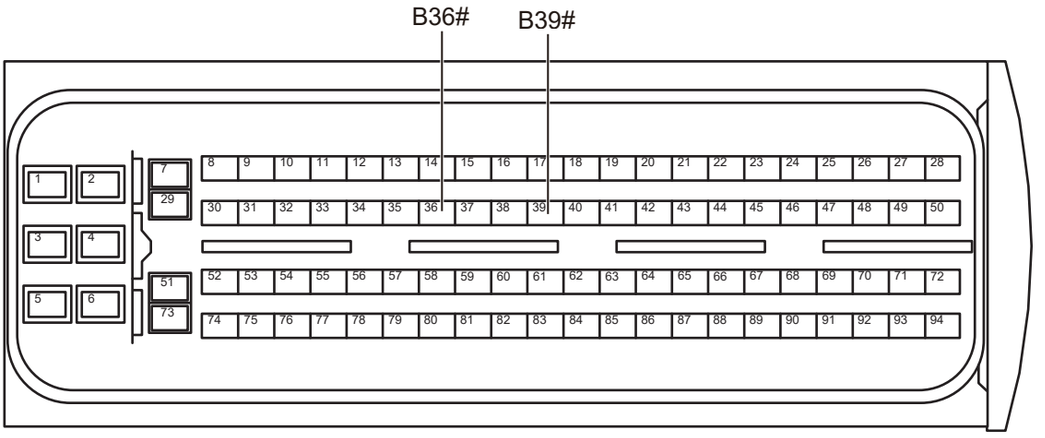
Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 1 (motor) 1# - coolant temperature sensor 1 (motor) 2#	20° C	2.436 ~ 2.636 KΩ

NG → **Replace coolant temperature sensor 1 (See page RE-98)**

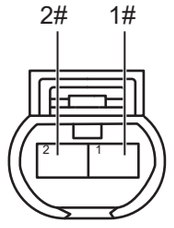
OK

2	**Check for open in coolant temperature sensor 1 (motor) wire harness and connector**



Front intelligent area control unit B connector

PC02041RM



Coolant temperature sensor 1 (motor) connector

PC02050RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

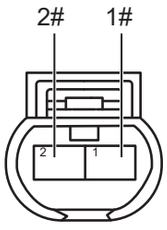
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - coolant temperature sensor 1 (motor) connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B39# - coolant temperature sensor 1 (motor) connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in coolant temperature sensor 1 (motor) wire harness and connector



Coolant temperature sensor 1 (motor) connector

PC02050RM

(a) According to value in the table, measure resistance.

Standard value

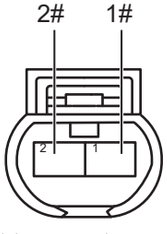
Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 1 (motor) connector 1# - body ground	Always connected	10 KΩ or more
Coolant temperature sensor 1 (motor) connector 2# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in coolant temperature sensor 1 (motor) wire harness and connector



Coolant temperature sensor 1 (motor) connector

PC02050RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 1 (motor) connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Coolant temperature sensor 1 (motor) connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P305811**	**Short to ground in coolant temperature sensor 2 (battery) simulation acquisition**
DTC	**P307B11**	**Short to power supply/open in coolant temperature sensor 2 (battery) simulation acquisition**

Description

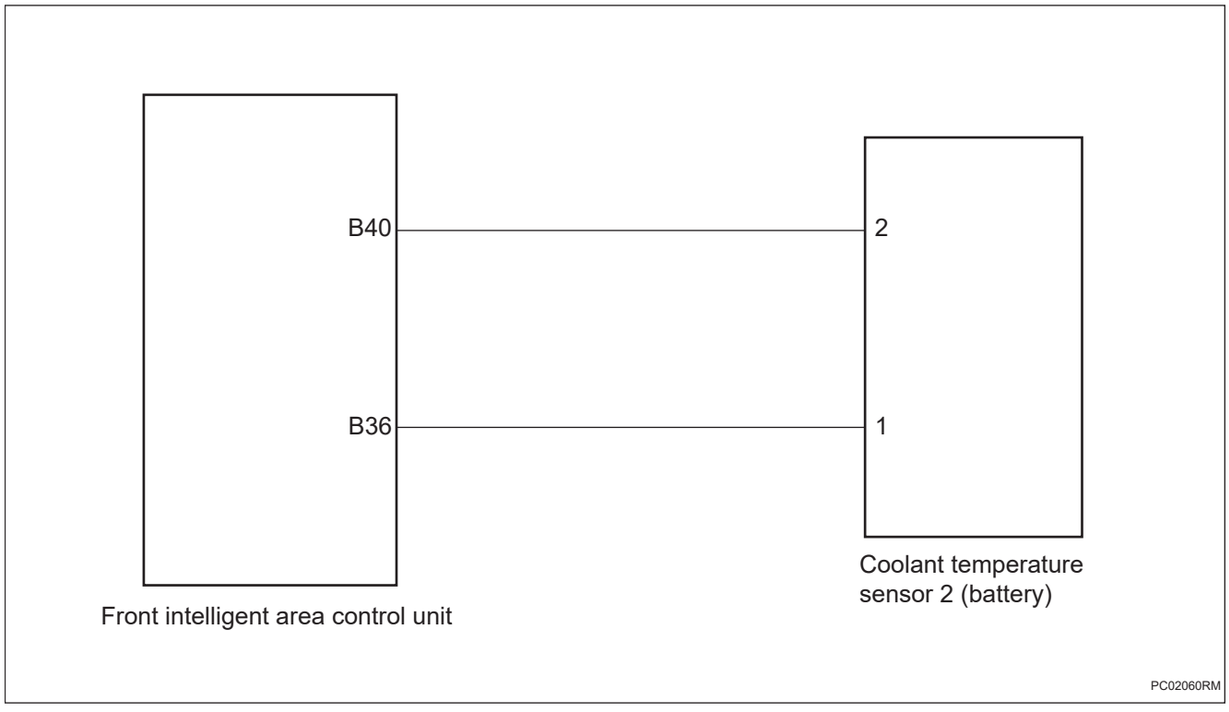
When coolant temperature sensor 2 (battery) is short or open, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305811	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN08 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 2 (battery)
P307B11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN08 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 2 (battery)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305811	• The temperature collected by coolant temperature sensor 2 (battery) is unreasonable	Not come on
P307B11	• The temperature collected by coolant temperature sensor 1 (motor) is unreasonable (<-41)	Not come on

Circuit diagram



Inspection procedure

1	**Check coolant temperature sensor 2 (battery) resistance**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the coolant temperature sensor 2 (battery) connector.

(d) According to value in the table, measure resistance.

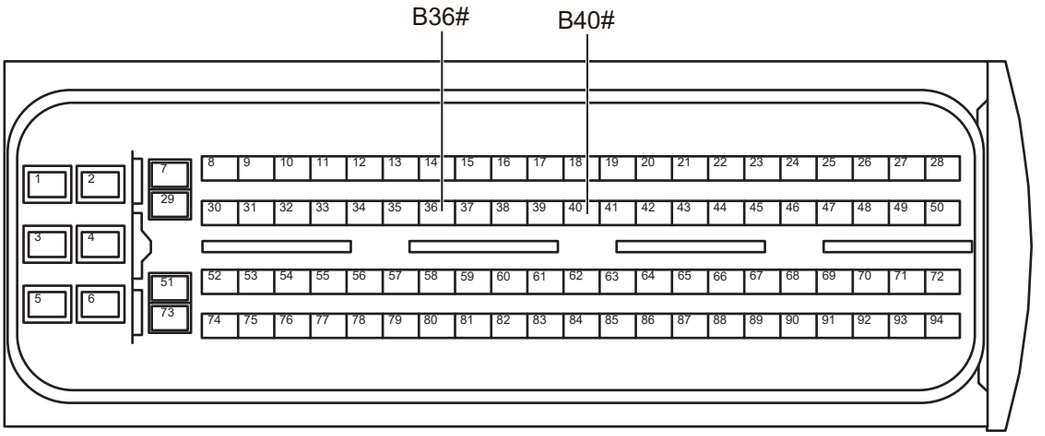
Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 2 (battery) 1# - coolant temperature sensor 2 (battery) 2#	20° C	2.436 ~ 2.636 KΩ

NG → **Replace coolant temperature sensor 1 (See page RE-98)**

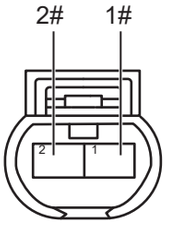
OK

2	**Check for open in coolant temperature sensor 2 (battery) wire harness and connector**



Front intelligent area control unit B connector

PC02071RM



Coolant temperature sensor 2 (battery) connector

PC02081RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

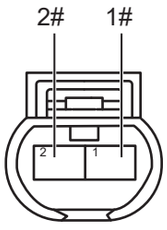
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - coolant temperature sensor 2 (battery) connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B40# - coolant temperature sensor 2 (battery) connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in coolant temperature sensor 2 (battery) wire harness and connector



Coolant temperature sensor 2 (battery) connector

PC02081RM

(a) According to value in the table, measure resistance.

Standard value

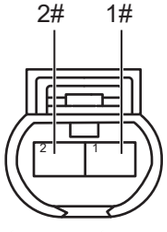
Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 2 (battery) connector 1# - body ground	Always connected	10 KΩ or more
Coolant temperature sensor 2 (battery) connector 2# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in coolant temperature sensor 2 (battery) wire harness and connector



Coolant temperature sensor 2 (battery) connector

PC02081RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 2 (battery) connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Coolant temperature sensor 2 (battery) connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P305911**	**Short to ground in coolant temperature sensor 3 (heater) simulation acquisition**
DTC	**P307C11**	**Short to power supply/open in coolant temperature sensor 3 (heater) simulation acquisition**

Description

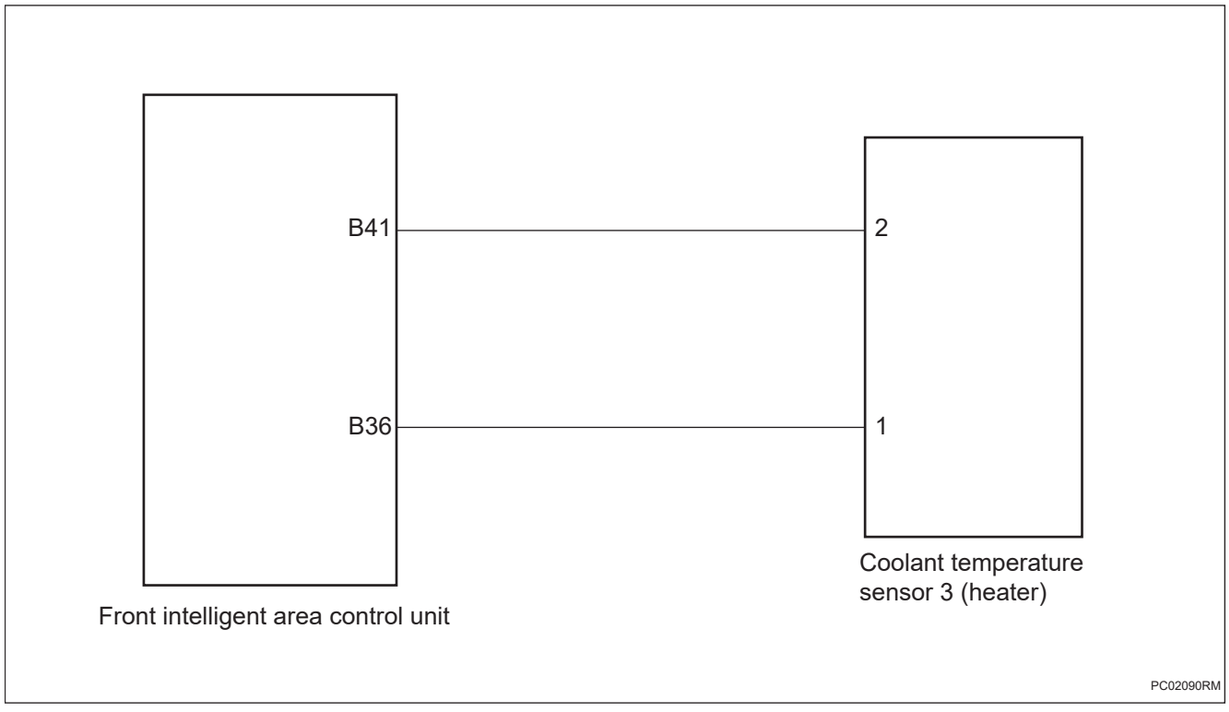
When coolant temperature sensor 3 (heater) is short or open, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305911	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN09 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 3 (heater)
P307C11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN09 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Coolant temperature sensor 3 (heater)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305911	• The temperature collected by coolant temperature sensor 3 (heater) is unreasonable	Not come on
P307C11	• The temperature collected by coolant temperature sensor 1 (motor) is unreasonable (<-42)	Not come on

Circuit diagram



Inspection procedure

1	**Check coolant temperature sensor 3 (heater) resistance**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the coolant temperature sensor 3 (heater) connector.

(d) According to value in the table, measure resistance.

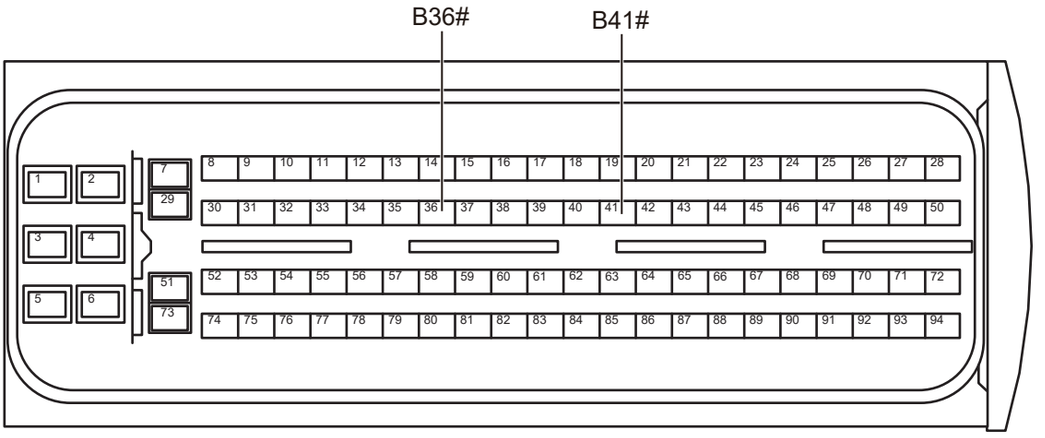
Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 3 (heater) 1# - coolant temperature sensor 3 (heater) 2#	20° C	2.436 ~ 2.636 KΩ

NG → **Replace coolant temperature sensor 1 (See page RE-98)**

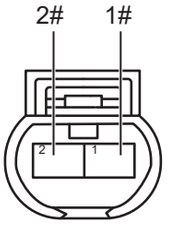
OK

2	**Check for open in coolant temperature sensor 3 (heater) wire harness and connector**



Front intelligent area control unit B connector

PC02101RM



Coolant temperature sensor 3 (heater) connector

PC02111RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

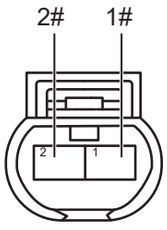
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - coolant temperature sensor 3 (heater) connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B41# - coolant temperature sensor 3 (heater) connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in coolant temperature sensor 3 (heater) wire harness and connector



Coolant temperature sensor 3 (heater) connector

PC02111RM

(a) According to value in the table, measure resistance.

Standard value

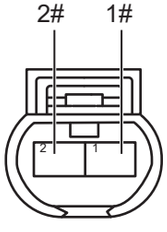
Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 3 (heater) connector 1# - body ground	Always connected	10 KΩ or more
Coolant temperature sensor 3 (heater) connector 2# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in coolant temperature sensor 3 (heater) wire harness and connector



Coolant temperature sensor 3 (heater) connector

PC02111RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Coolant temperature sensor 3 (heater) connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Coolant temperature sensor 3 (heater) connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P305A11**	**Short to ground in outside temperature sensor simulation acquisition**
DTC	**B205211**	**Outside temperature sensor simulation acquisition rationality fault**
DTC	**P307D11**	**Short to power supply/open in outside temperature sensor simulation acquisition**

ZD

Description

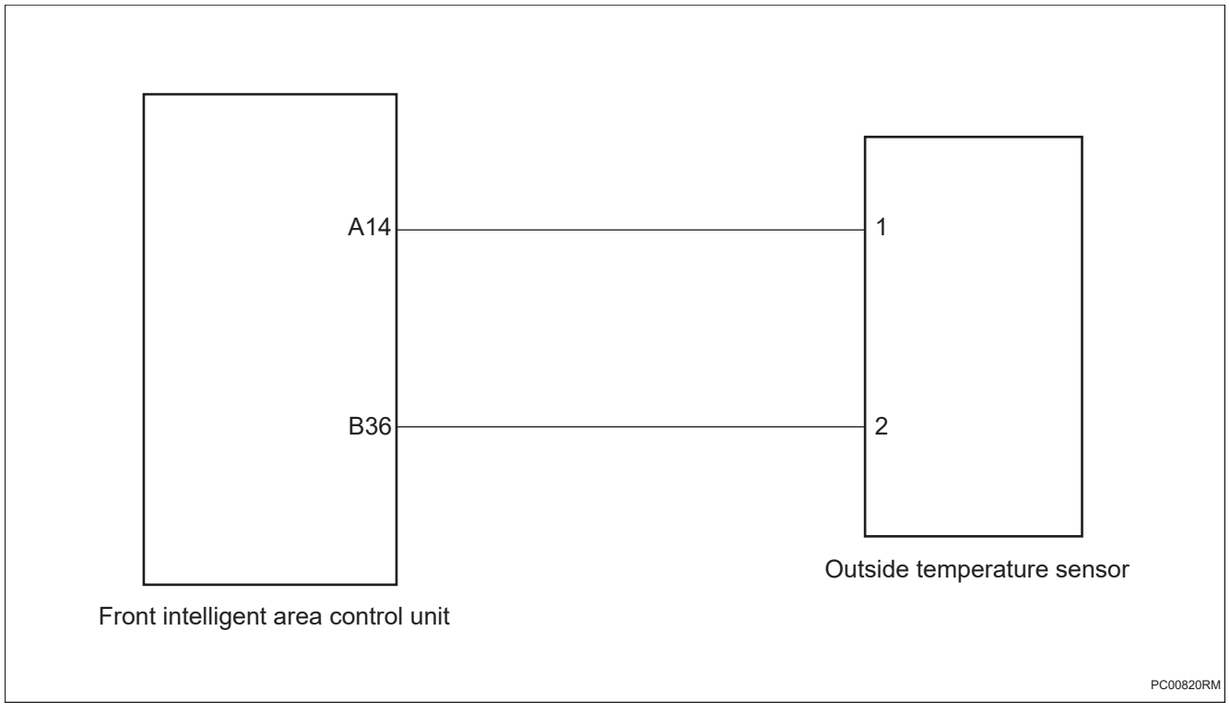
When there is short, open, or abnormal signal in outside temperature sensor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305A11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN12 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Outside temperature sensor
B205211	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN12 reasonability range fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Outside temperature sensor
P307D11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN12 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Outside temperature sensor

Fault symptom

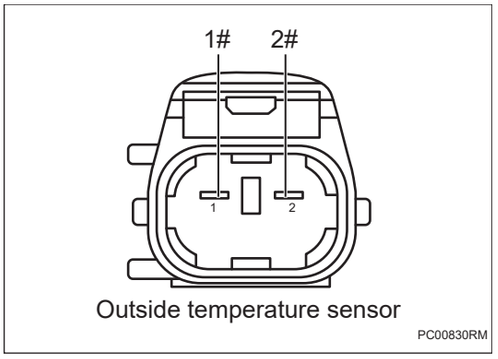
DTC No.	Fault symptom	Warning light/indicator
P305A11	• The temperature collected by outside temperature sensor is unreasonable	Not come on
B205211	• The temperature collected by outside temperature sensor is unreasonable	Not come on
P307D11	• The temperature collected by outside temperature sensor is unreasonable	Not come on

Circuit diagram



Inspection procedure

1	**Check outside temperature sensor resistance**



Outside temperature sensor
PC00830RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the outside temperature sensor connector.

(d) According to value in the table, measure resistance.

Standard value

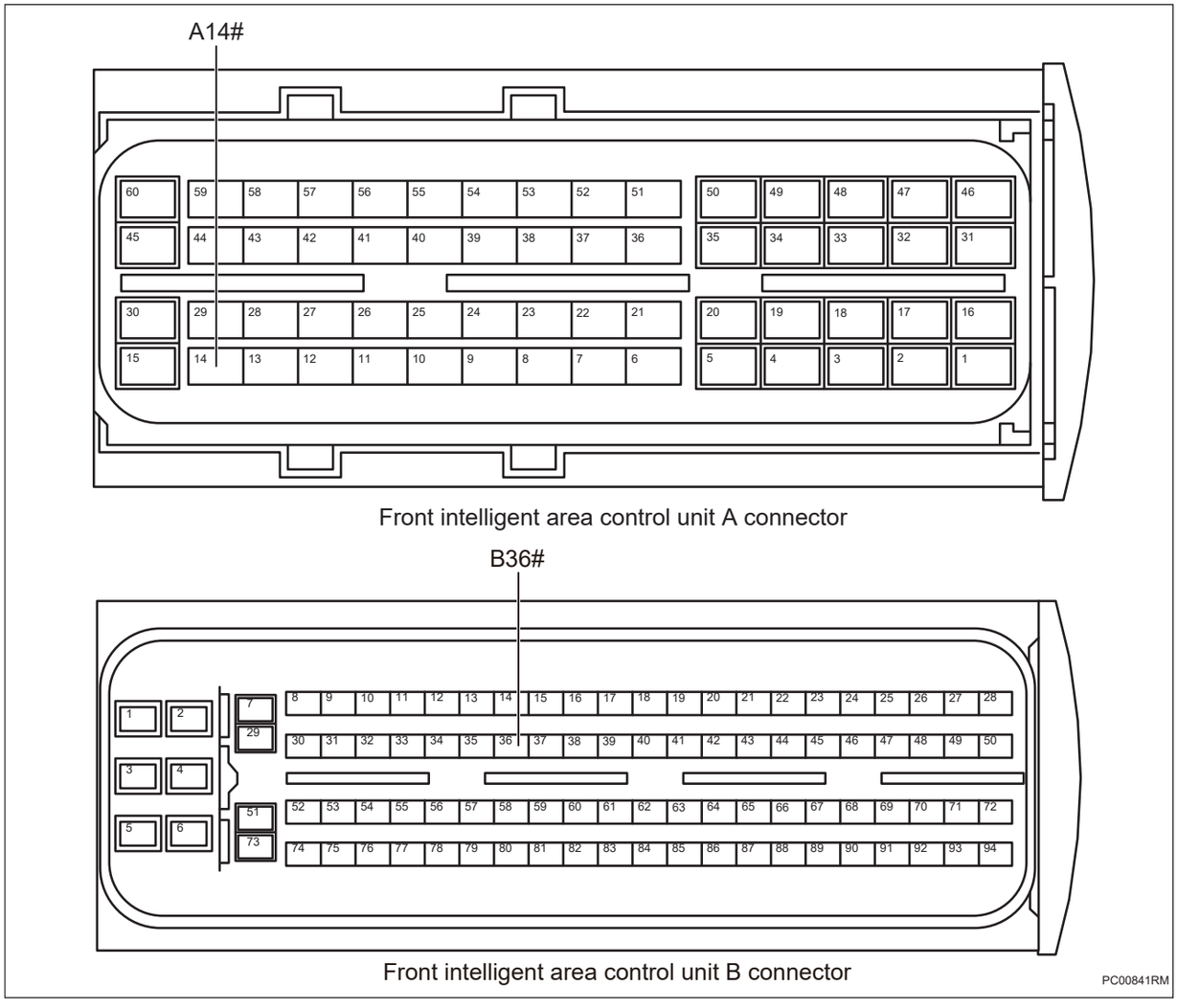
Multimeter connection	Detection condition	Specified condition
Outside temperature sensor 1# - outside temperature sensor 2#	-20° C	18.71 ~ 20.30 KΩ
Outside temperature sensor 1# - outside temperature sensor 2#	0° C	6.402 ~ 6.798 KΩ
Outside temperature sensor 1# - outside temperature sensor 2#	20° C	2.436 ~ 2.636 KΩ
Outside temperature sensor 1# - outside temperature sensor 2#	40° C	1.031 ~ 1.136 KΩ

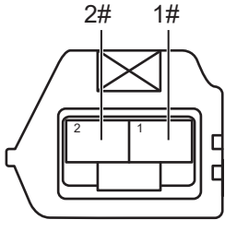
NG → **Replace outside temperature sensor (See page RE-16)**

OK

ZD

2	**Check for open in outside temperature sensor wire harness and connector**





Outside temperature sensor connector

PC00850RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

Standard value

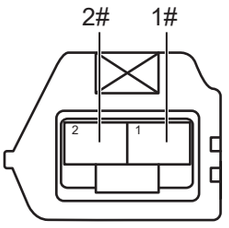
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - outside temperature sensor connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A14# - outside temperature sensor connector 1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in outside temperature sensor wire harness and connector**



Outside temperature sensor connector

PC00850RM

(a) According to value in the table, measure resistance.

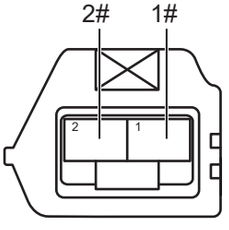
Standard value

Multimeter connection	Detection condition	Specified condition
Outside temperature sensor connector 1# - body ground	Always connected	10 KΩ or more
Outside temperature sensor connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in outside temperature sensor wire harness and connector**



Outside temperature sensor connector

PC00850RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Outside temperature sensor connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Outside temperature sensor connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P305B11**	**Short to ground in water-cooled condenser inlet temperature sensor simulation acquisition (exhaust temperature sensor at outlet of compressor)/refrigerant temperature sensor 1**
DTC	**P307E11**	**Short to power supply/open in water-cooled condenser inlet temperature sensor simulation acquisition (exhaust temperature sensor at outlet of compressor)/refrigerant temperature sensor 1**

Description

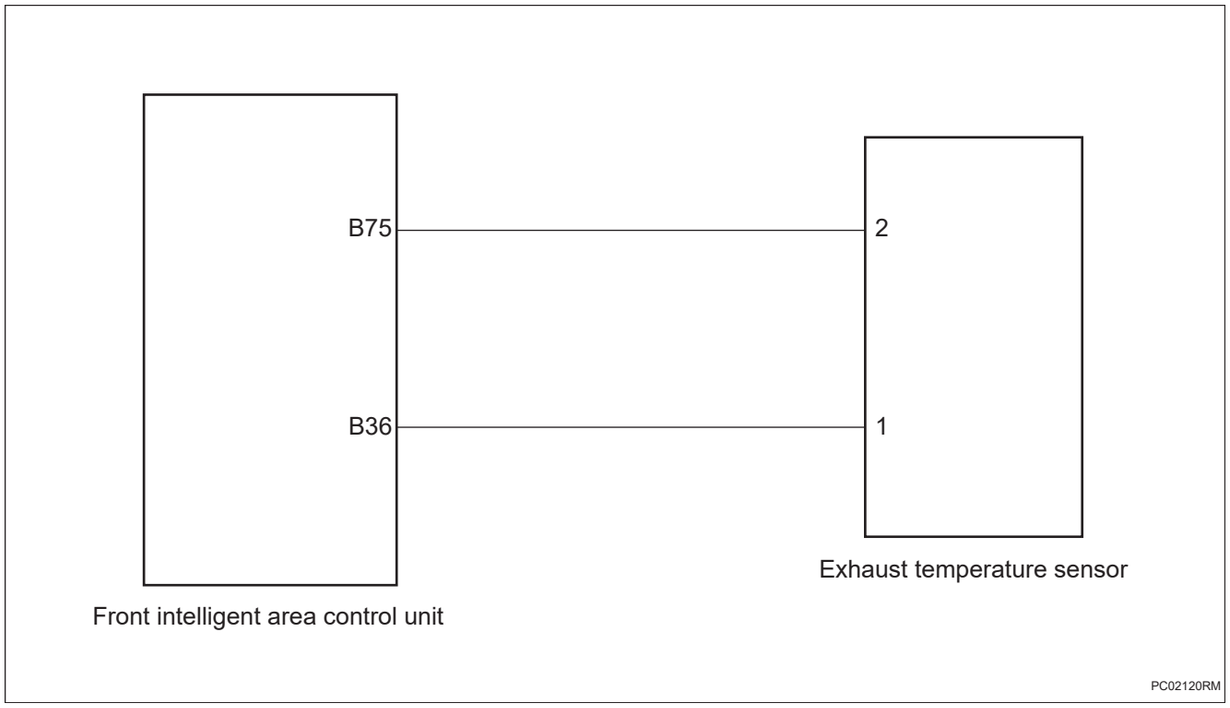
When exhaust temperature sensor circuit is short or open, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305B11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN13 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Exhaust temperature sensor
P307E11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN13 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Exhaust temperature sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305B11	• The temperature collected by water-cooled condenser inlet temperature sensor is unreasonable	Not come on
P307E11	• The temperature of water-cooled condenser inlet temperature sensor is unreasonable (<-41)	Not come on

Circuit diagram



Inspection procedure

1	**Check exhaust temperature sensor resistance**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the exhaust temperature sensor connector.

(d) According to value in the table, measure resistance.

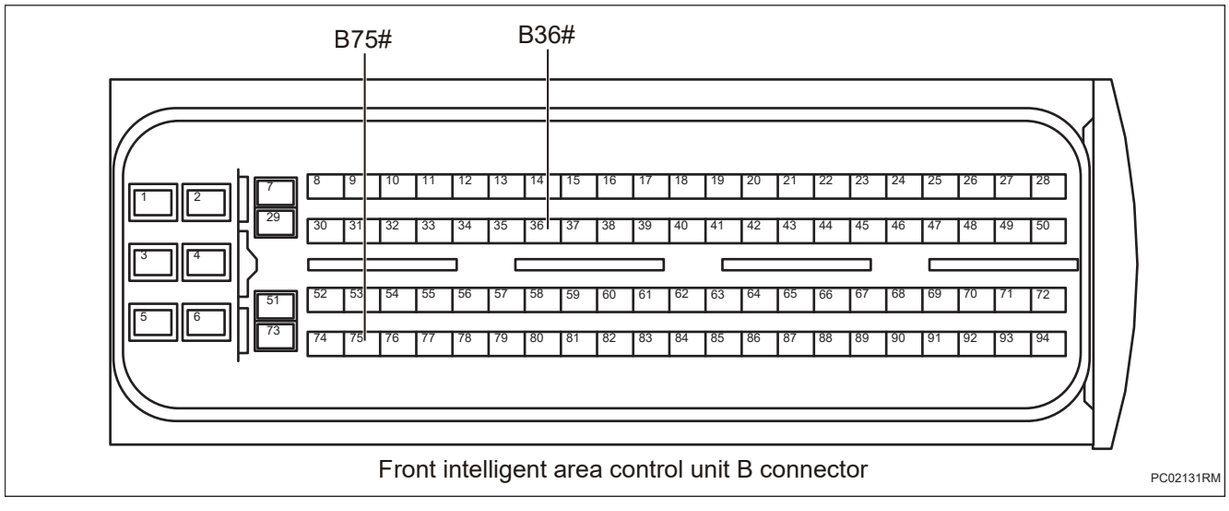
Standard value

Multimeter connection	Detection condition	Specified condition
Exhaust temperature sensor 1# - exhaust temperature sensor 2#	20° C	2.436 ~ 2.636 KΩ

NG → **Replace coolant temperature sensor 1 (See page RE-98)**

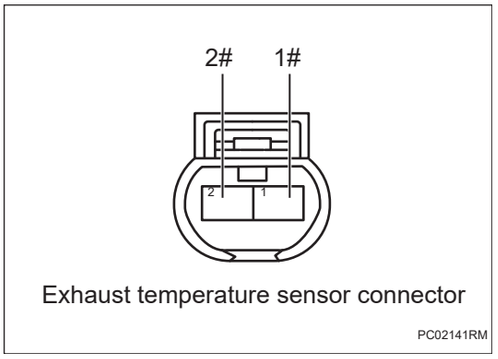
OK

2	**Check for open in exhaust temperature sensor wire harness and connector**



Front intelligent area control unit B connector

PC02131RM



Exhaust temperature sensor connector

PC02141RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

Standard value

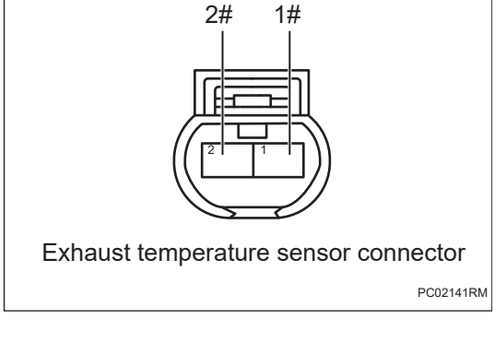
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - exhaust temperature sensor connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B75# - exhaust temperature sensor connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in exhaust temperature sensor wire harness and connector**



Exhaust temperature sensor connector

PC02141RM

(a) According to value in the table, measure resistance.

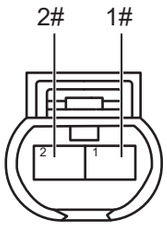
Standard value

Multimeter connection	Detection condition	Specified condition
Exhaust temperature sensor connector 1# - body ground	Always connected	10 KΩ or more
Exhaust temperature sensor connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in exhaust temperature sensor wire harness and connector**



Exhaust temperature sensor connector

PC02141RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Exhaust temperature sensor connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Exhaust temperature sensor connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P305C13**	**Open in electric water valve 1**
DTC	**P305C11**	**Short to ground in electric water valve 1**
DTC	**P305C12**	**Short to power supply in electric water valve 1**
DTC	**P305C19**	**Electric water valve 1 overcurrent fault**
DTC	**P305C1A**	**Electric water valve 1 initialization fault**
DTC	**P305C1B**	**Electric water valve 1 blocked fault**

DTC	P305C1C	Electric water valve 1 internal (chip) fault

Description

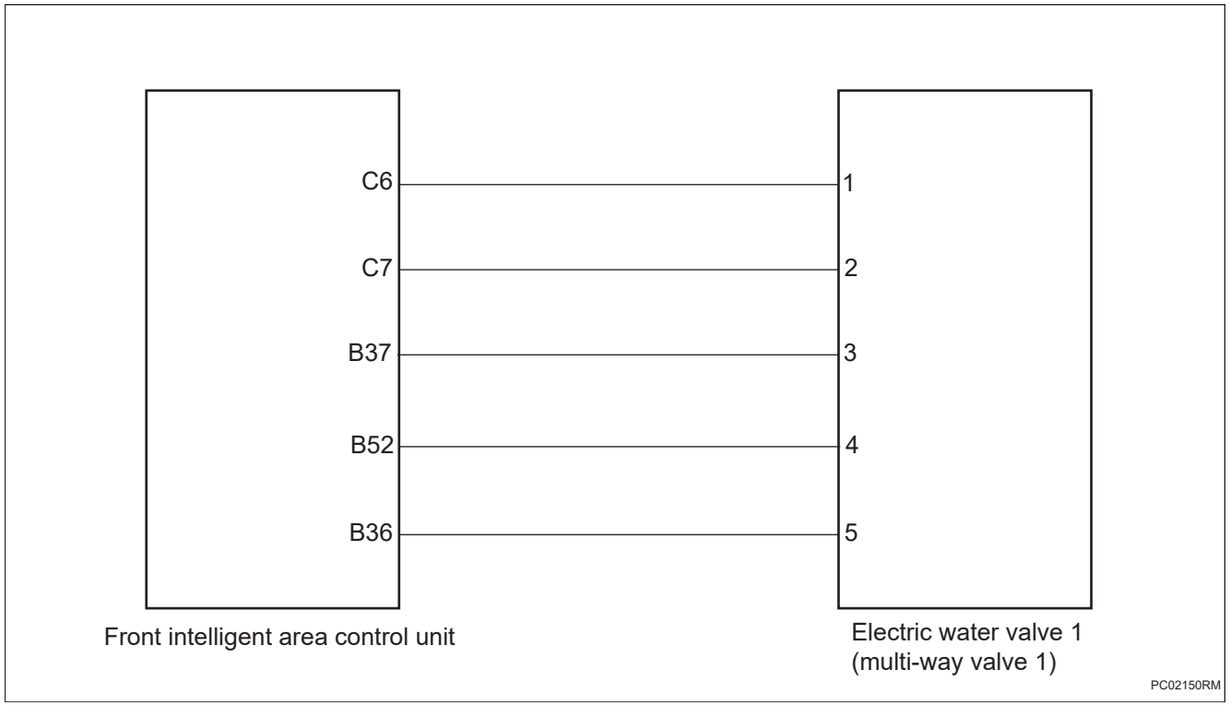
When there is short, open or internal fault in electric water valve 1 (multi-way valve 1), the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305C13	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB01/ OHB02 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB01/ OHB02 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C12	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB01/ OHB02 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C19	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB01/ OHB02 over current	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C1A	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV1 Initialize Failed	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C1B	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV1 Stall Error	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)
P305C1C	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV1 Chip Error	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 1 (multi-way valve 1)

Fault symptom

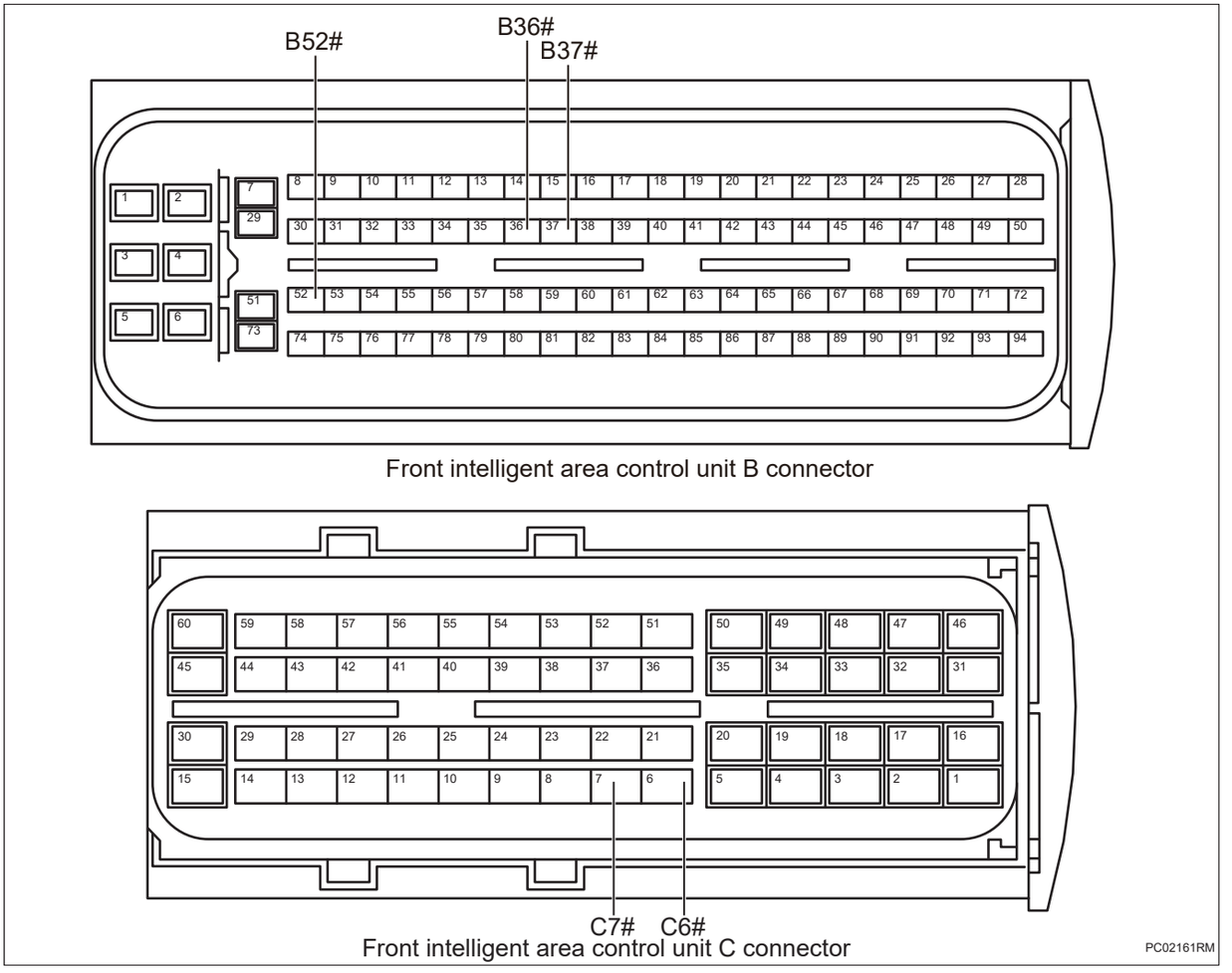
DTC No.	Fault symptom	Warning light/indicator
P305C13	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C11	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C12	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C19	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C1A	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C1B	• Electric water valve 1 does not operate or operates abnormally	Not come on
P305C1C	• Electric water valve 1 does not operate or operates abnormally	Not come on

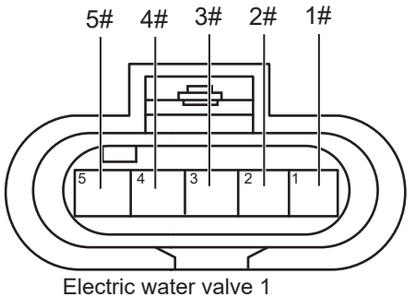
Circuit diagram



Inspection procedure

1	**Check for open in electric water valve 1 (multi-way valve 1) wire harness and connector**





Electric water valve 1
(multi-way valve 1) connector PC02170RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water valve 1 (multi-way valve 1) connector.

(e) According to value in the table, measure resistance.

Standard value

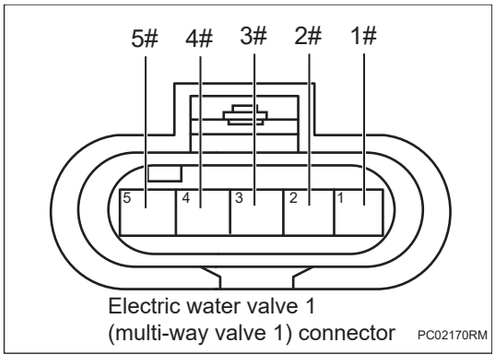
Multimeter connection	Detection condition	Specified condition
Electric water valve 1 (multi-way valve 1) connector 1# - front intelligent area control unit connector C6#	Always connected	Less than 1 Ω
Electric water valve 1 (multi-way valve 1) connector 2# - front intelligent area control unit connector C7#	Always connected	Less than 1 Ω
Electric water valve 1 (multi-way valve 1) connector 3# - front intelligent area control unit connector B37#	Always connected	Less than 1 Ω
Electric water valve 1 (multi-way valve 1) connector 4# - front intelligent area control unit connector B52#	Always connected	Less than 1 Ω
Electric water valve 1 (multi-way valve 1) connector 5# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electric water valve 1 (multi-way valve 1) wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

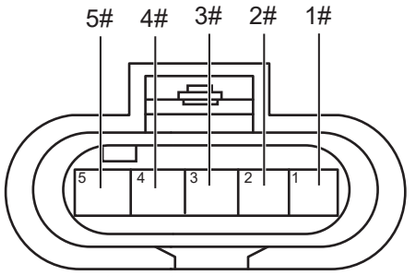
Multimeter connection	Detection condition	Specified condition
Electric water valve 1 (multi-way valve 1) connector 1# - body ground	Always connected	10 KΩ or more
Electric water valve 1 (multi-way valve 1) connector 2# - body ground	Always connected	10 KΩ or more
Electric water valve 1 (multi-way valve 1) connector 3# - body ground	Always connected	10 KΩ or more
Electric water valve 1 (multi-way valve 1) connector 4# - body ground	Always connected	10 KΩ or more
Electric water valve 1 (multi-way valve 1) connector 5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

ZD

3	**Check for short to power supply in electric water valve 1 (multi-way valve 1) wire harness and connector**



Electric water valve 1
(multi-way valve 1) connector PC02170RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric water valve 1 (multi-way valve 1) connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 1 (multi-way valve 1) connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 1 (multi-way valve 1) connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 1 (multi-way valve 1) connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 1 (multi-way valve 1) connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace electric water valve 1 (multi-way valve 1) (See page RE-98)**

(a) Replace the electric water valve 1 (multi-way valve 1).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

ZD

Diagnosis ends

DTC	P305D13	Open in electric water valve 2
DTC	P305D11	Short to ground in electric water valve 2
DTC	P305D12	Short to power supply in electric water valve 2
DTC	P305D19	Electric water valve 2 overcurrent fault
DTC	P305D1A	Electric water valve 2 initialization fault
DTC	P305D1B	Electric water valve 2 blocked fault
DTC	P305D1C	Electric water valve 2 internal (chip) fault

Description

When there is short, open or internal fault in electric water valve 2 (multi-way valve 2), the front intelligent area control unit records DTC.

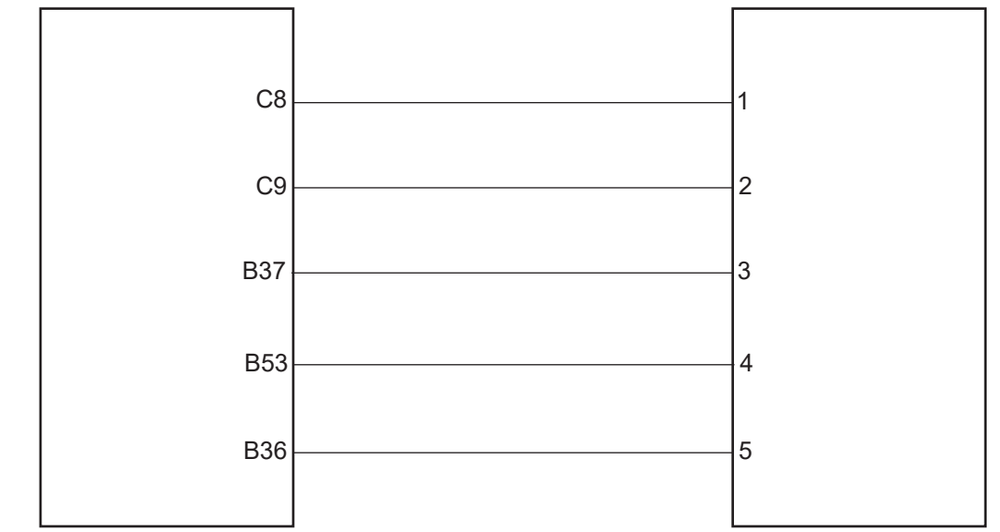
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305D13	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB03/ OHB04 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB03/ OHB04 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D12	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB03/ OHB04 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D19	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	OHB03/ OHB04 over current	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D1A	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV2 Initialize Failed	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D1B	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV2 Stall Error	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)
P305D1C	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ECV2 Chip Error		Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric water valve 2 (multi-way valve 2)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P305D13	• Electric water valve 2 does not operate or operates abnormally	Not come on
P305D11	• Electric water valve 2 does not operate or operates abnormally	Not come on

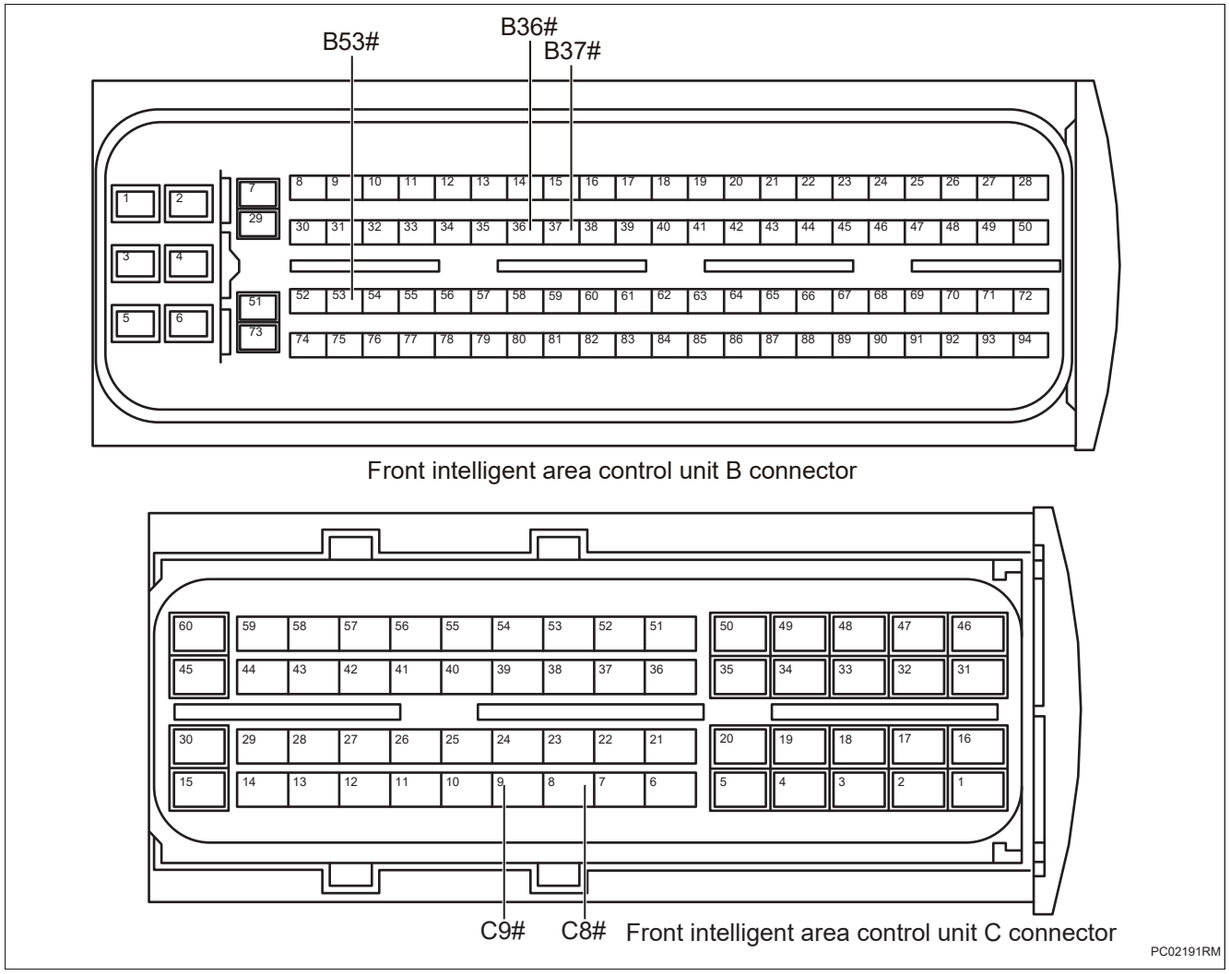
DTC No.	Fault symptom	Warning light/indicator
P305D12	• Electric water valve 2 does not operate or operates abnormally	Not come on
P305D19	• Electric water valve 2 does not operate or operates abnormally	Not come on
P305D1A	• Electric water valve 2 does not operate or operates abnormally	Not come on
P305D1B	• Electric water valve 2 does not operate or operates abnormally	Not come on
P305D1C	• Electric water valve 2 does not operate or operates abnormally	Not come on

Circuit diagram

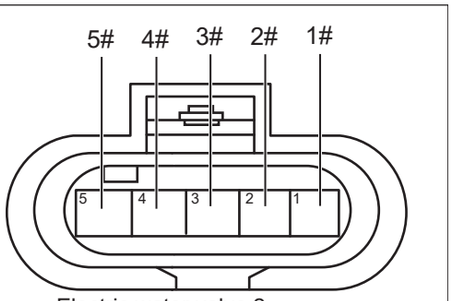


Inspection procedure

1	**Check for open in electric water valve 2 (multi-way valve 2) wire harness and connector**



ZD



Electric water valve 2
(multi-way valve 2) connector PC02201RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water valve 2 (multi-way valve 2) connector.

(e) According to value in the table, measure resistance.

Standard value

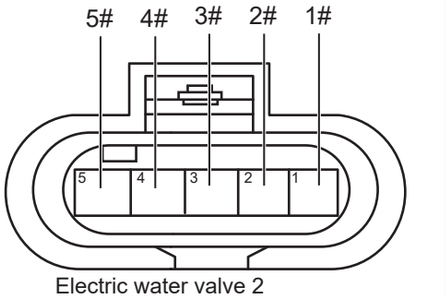
Multimeter connection	Detection condition	Specified condition
Electric water valve 2 (multi-way valve 2) connector 1# - front intelligent area control unit connector C8#	Always connected	Less than 1 Ω
Electric water valve 2 (multi-way valve 2) connector 2# - front intelligent area control unit connector C9#	Always connected	Less than 1 Ω
Electric water valve 2 (multi-way valve 2) connector 3# - front intelligent area control unit connector B37#	Always connected	Less than 1 Ω
Electric water valve 2 (multi-way valve 2) connector 4# - front intelligent area control unit connector B53#	Always connected	Less than 1 Ω
Electric water valve 2 (multi-way valve 2) connector 5# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in electric water valve 2 (multi-way valve 2) wire harness and connector



(a) According to value in the table, measure resistance.

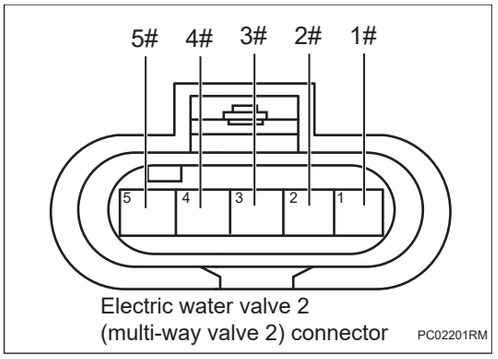
Standard value

Multimeter connection	Detection condition	Specified condition
Electric water valve 2 (multi-way valve 2) connector 1# - body ground	Always connected	10 KΩ or more
Electric water valve 2 (multi-way valve 2) connector 2# - body ground	Always connected	10 KΩ or more
Electric water valve 2 (multi-way valve 2) connector 3# - body ground	Always connected	10 KΩ or more
Electric water valve 2 (multi-way valve 2) connector 4# - body ground	Always connected	10 KΩ or more
Electric water valve 2 (multi-way valve 2) connector 5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in electric water valve 2 (multi-way valve 2) wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric water valve 2 (multi-way valve 2) connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 2 (multi-way valve 2) connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 2 (multi-way valve 2) connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 2 (multi-way valve 2) connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric water valve 2 (multi-way valve 2) connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace electric water valve 2 (multi-way valve 2) (See page RE-98)

(a) Replace the electric water valve 2 (multi-way valve 2).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P305F11**	**Short to ground in PT_L1_T acquisition**
DTC	**P305F12**	**Short to power supply/open in PT_L1_T acquisition**

Description

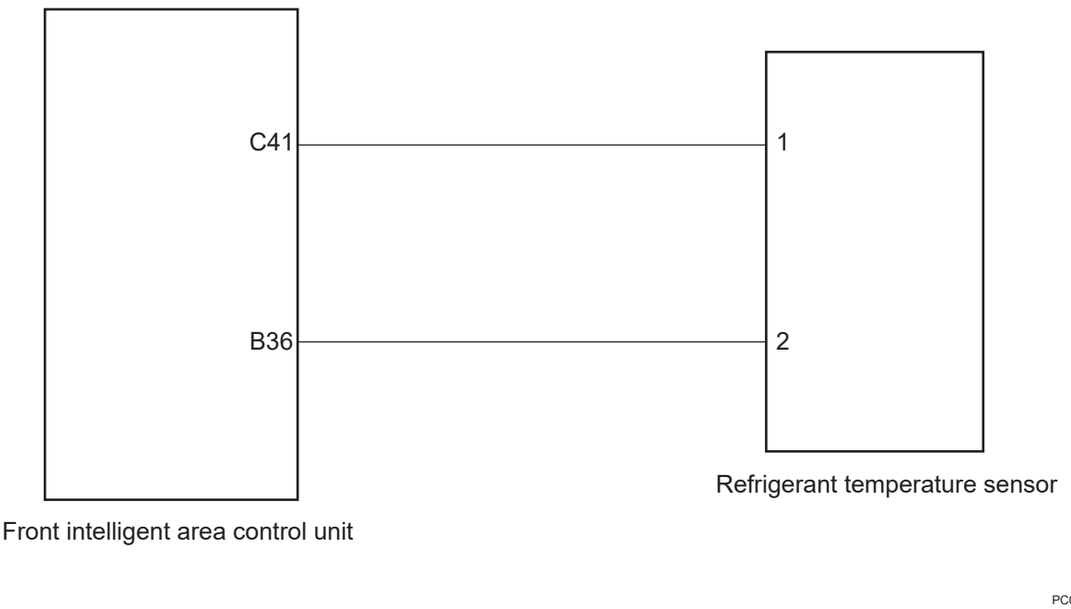
When refrigerant temperature sensor circuit is short or open, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P305F11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN25 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Refrigerant temperature sensor
P305F12	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IAN25 short to BAT or Open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Refrigerant temperature sensor

Fault symptom

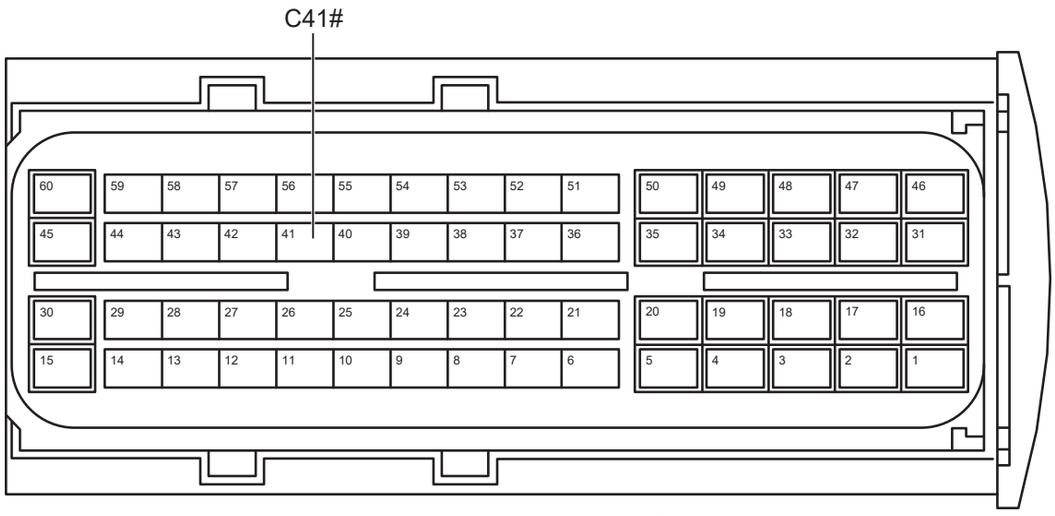
DTC No.	Fault symptom	Warning light/indicator
P305F11	• Unreasonable temperature collected by evaporator outlet temperature sensor	Not come on
P305F12	• Unreasonable temperature collected by evaporator outlet temperature sensor	Not come on

Circuit diagram

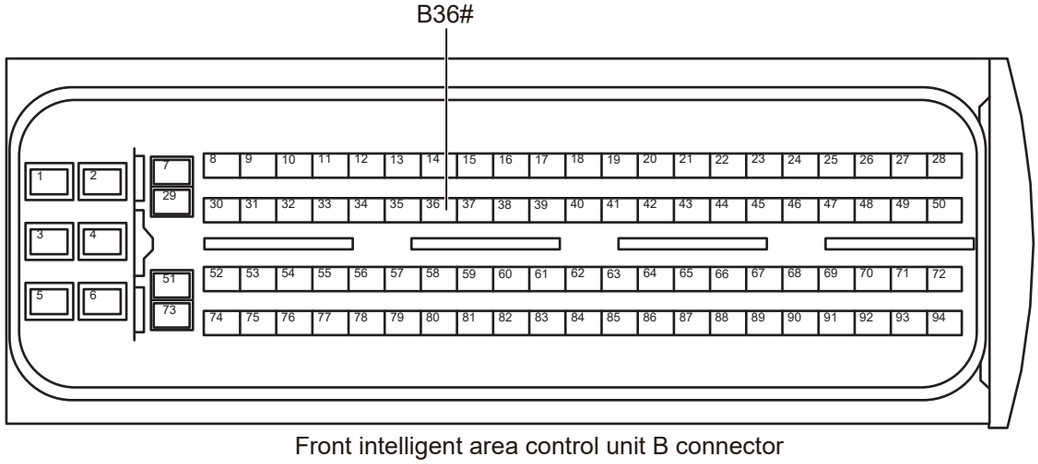


Inspection procedure

1	**Check for open in refrigerant temperature sensor wire harness and connector**

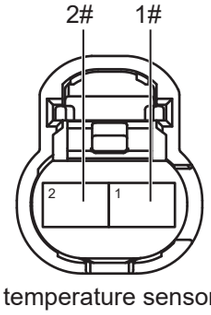


Front intelligent area control unit C connector



Front intelligent area control unit B connector

PC00901RM



Refrigerant temperature sensor connector

PC00910RM

(a) Disconnect the front intelligent area control unit connector.

(b) According to value in the table, measure resistance.

Standard value

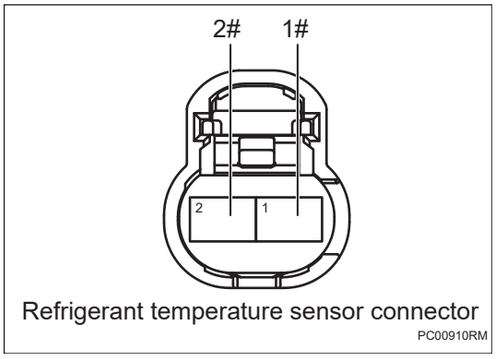
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - refrigerant temperature sensor connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector C41# - refrigerant temperature sensor connector 1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in refrigerant temperature sensor wire harness and connector**



Refrigerant temperature sensor connector
PC00910RM

(a) According to value in the table, measure resistance.

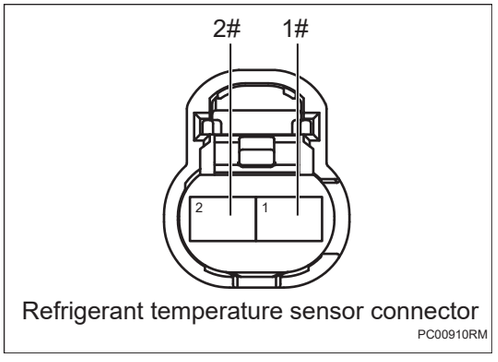
Standard value

Multimeter connection	Detection condition	Specified condition
Refrigerant temperature sensor connector 1# - body ground	Always connected	10 KΩ or more
Refrigerant temperature sensor connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in refrigerant temperature sensor wire harness and connector**



Refrigerant temperature sensor connector
PC00910RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Refrigerant temperature sensor connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Refrigerant temperature sensor connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	**P306011**	**Short to ground fault in SOV valve 1**
DTC	**P306012**	**Short to power supply fault in SOV valve 1**
DTC	**P306013**	**Open fault in SOV valve 1**

Description

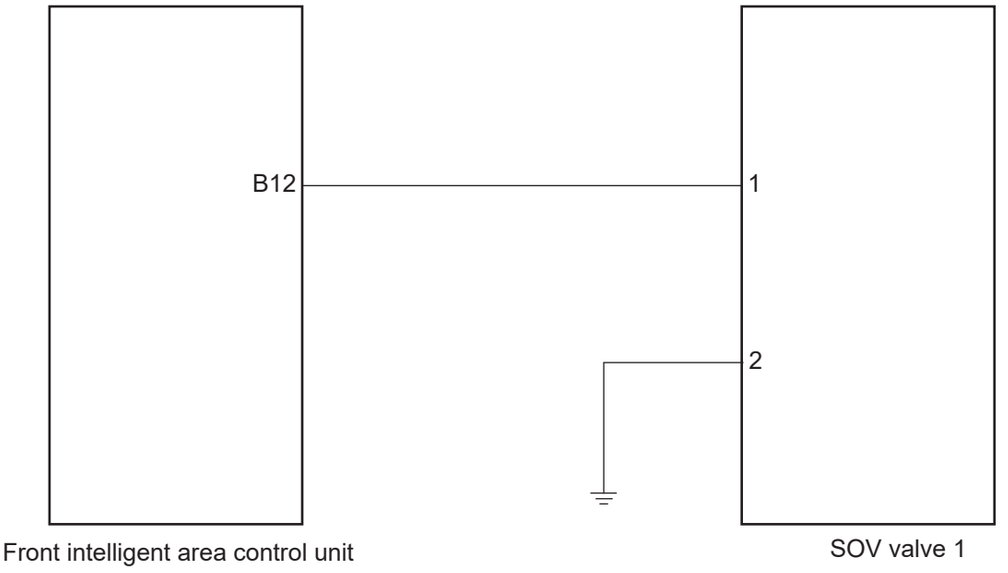
When there is short or open in SOV valve 1, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P306011	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH32 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 1
P306012	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH32 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 1
P306013	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH32 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 1

Fault symptom

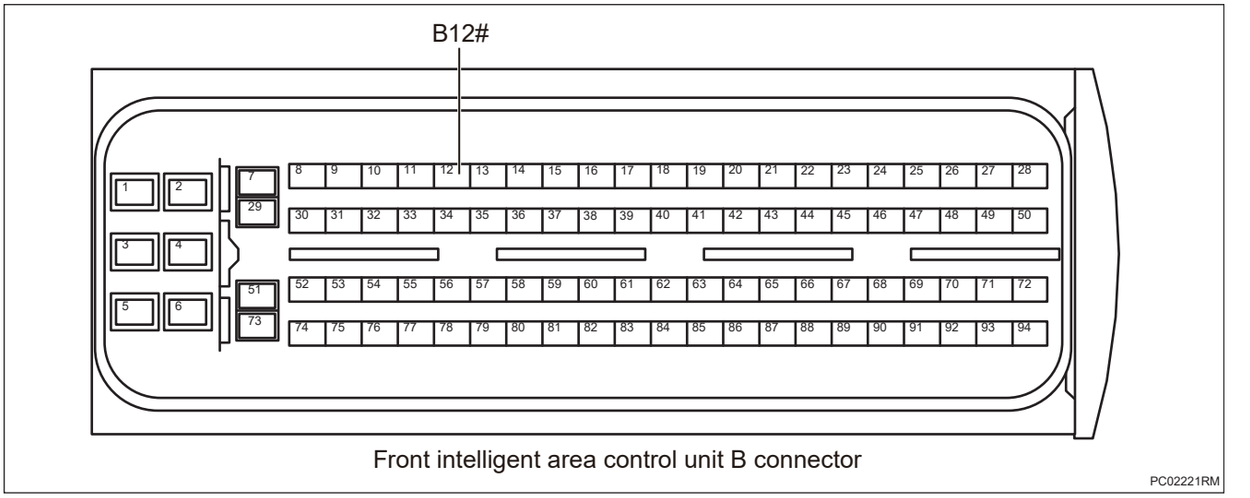
DTC No.	Fault symptom	Warning light/indicator
P306011	• SOV valve 1 does not operate or operates abnormally	Not come on
P306012	• SOV valve 1 does not operate or operates abnormally	Not come on
P306013	• SOV valve 1 does not operate or operates abnormally	Not come on

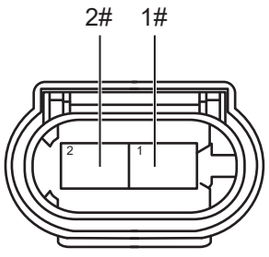
Circuit diagram



Inspection procedure

1	**Check for open in SOV valve 1 wire harness and connector**





SOV valve 1 connector

PC02230RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the SOV valve 1 connector.

(e) According to value in the table, measure resistance.

Standard value

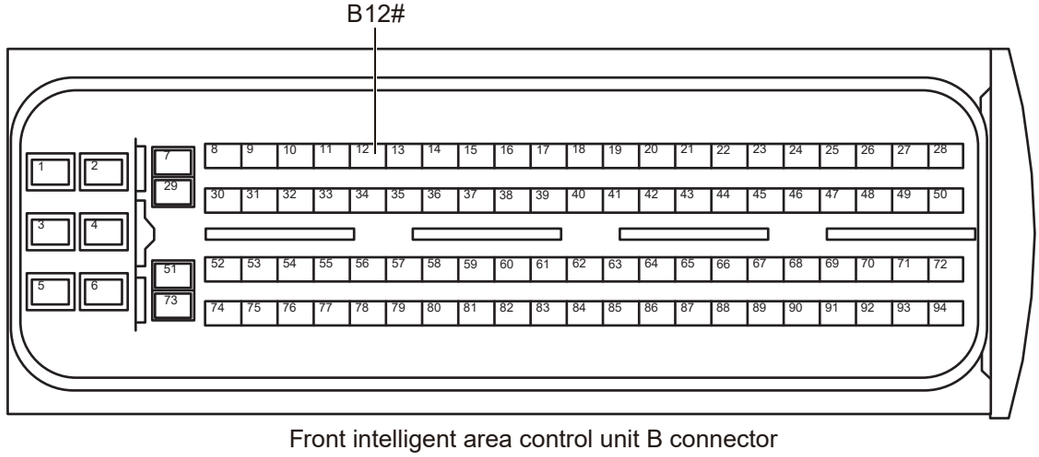
Multimeter connection	Detection condition	Specified condition
SOV valve 1 connector 1# - front intelligent area control unit connector B12#	Always connected	Less than 1 Ω
SOV valve 1 connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in SOV valve 1 wire harness and connector**



Front intelligent area control unit B connector

PC02221RM

(a) According to value in the table, measure resistance.

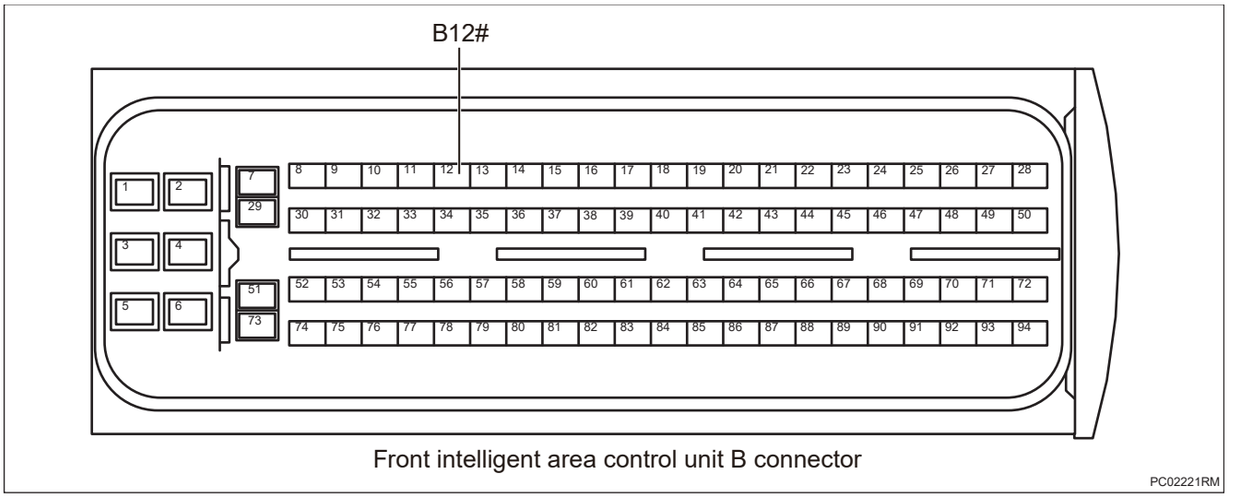
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in SOV valve 1 wire harness and connector



Front intelligent area control unit B connector

PC02221RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace SOV valve 1 (See page RE-98)**

(a)

(b) Replace the SOV valve 1.

(c) Connect HQ-VDS diagnostic tester.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**P306111**	**Short to ground fault in SOV valve 2**
DTC	**P306112**	**Short to power supply fault in SOV valve 2**
DTC	**P306113**	**Open fault in SOV valve 2**

Description

When there is short or open in SOV valve 2, the front intelligent area control unit records DTC.

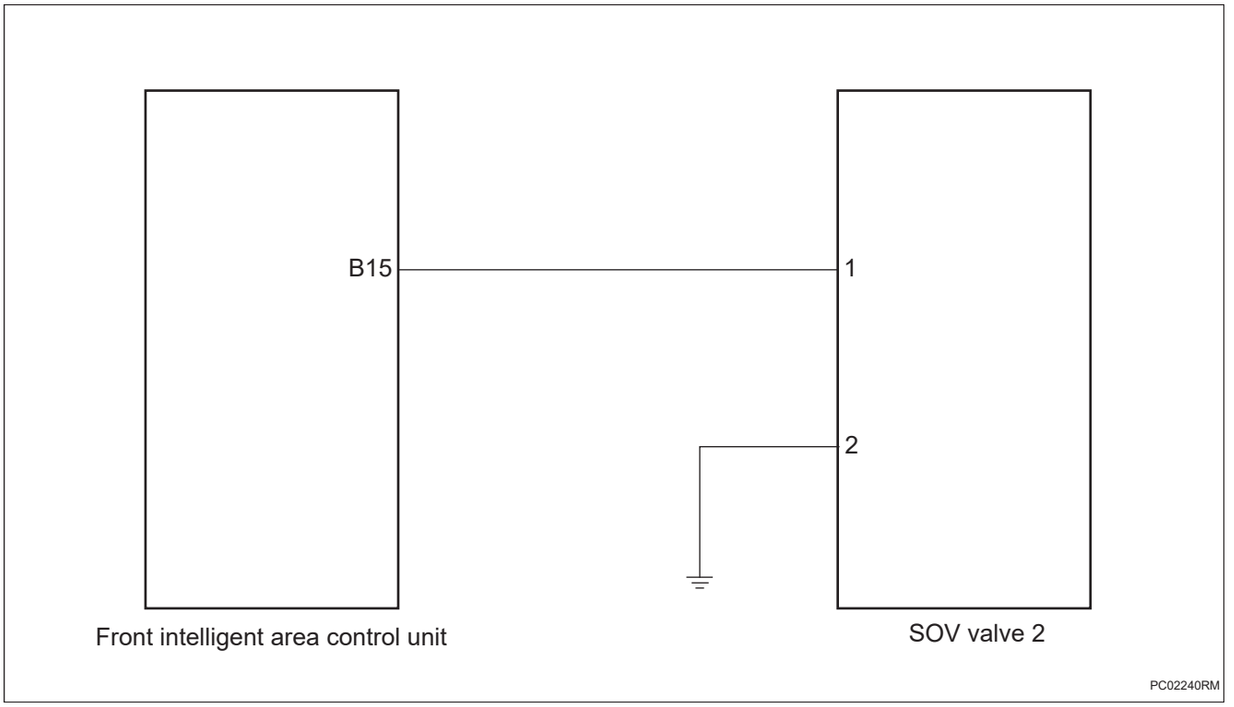
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P306111	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH11 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 2
P306112	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH11 short to BAT	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 2
P306113	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH11 open circuit	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • SOV valve 2

ZD

Fault symptom

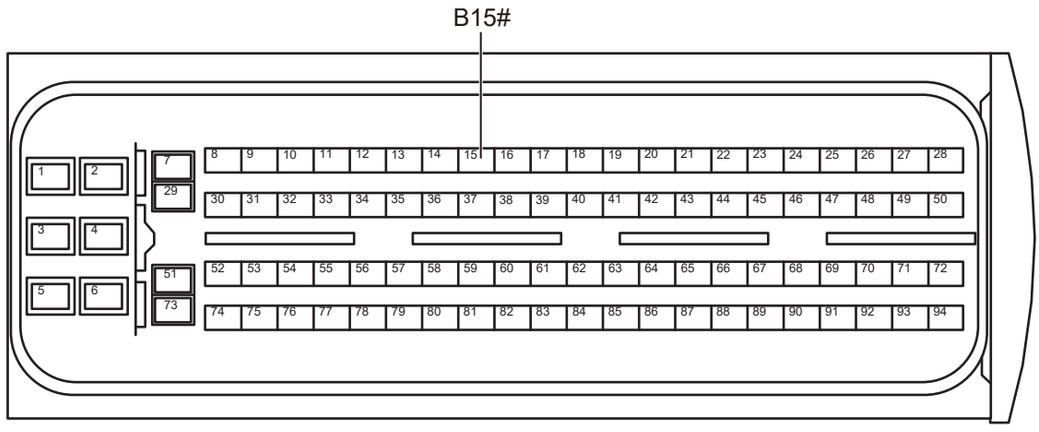
DTC No.	Fault symptom	Warning light/indicator
P306111	• SOV valve 2 does not operate or operates abnormally	Not come on
P306112	• SOV valve 2 does not operate or operates abnormally	Not come on
P306113	• SOV valve 2 does not operate or operates abnormally	Not come on

Circuit diagram



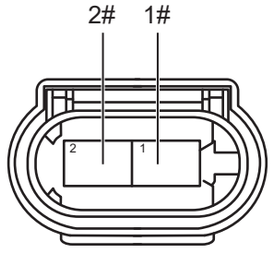
Inspection procedure

1	**Check for open in SOV valve 2 wire harness and connector**



Front intelligent area control unit B connector

PC02251RM



SOV valve 2 connector

PC02261RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the SOV valve 2 connector.

(e) According to value in the table, measure resistance.

Standard value

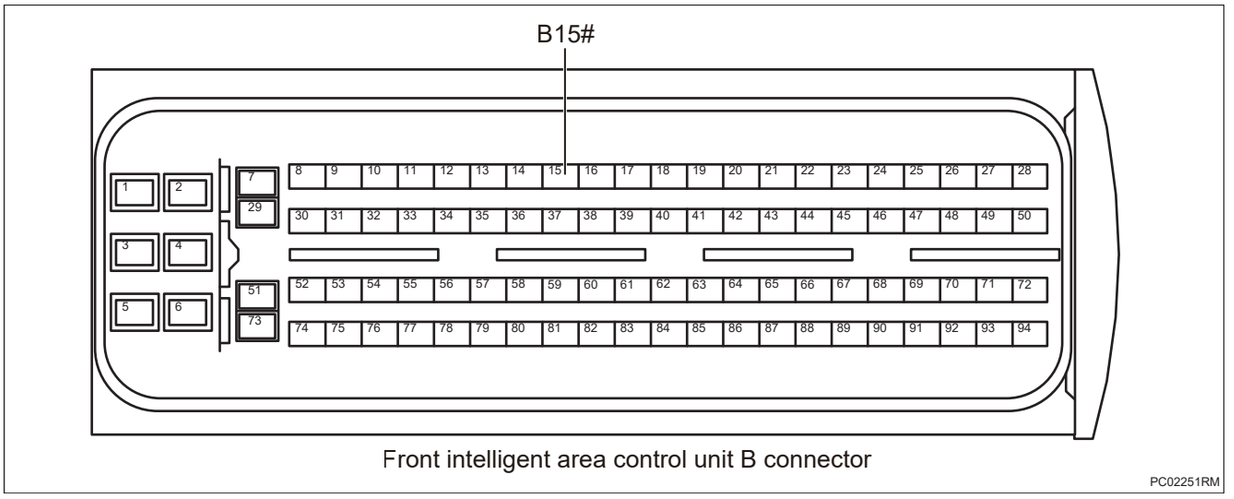
Multimeter connection	Detection condition	Specified condition
SOV valve 2 connector 1# - front intelligent area control unit connector B15#	Always connected	Less than 1 Ω
SOV valve 2 connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	Check for short to ground in SOV valve 2 wire harness and connector



Front intelligent area control unit B connector

PC02251RM

ZD

(a) According to value in the table, measure resistance.

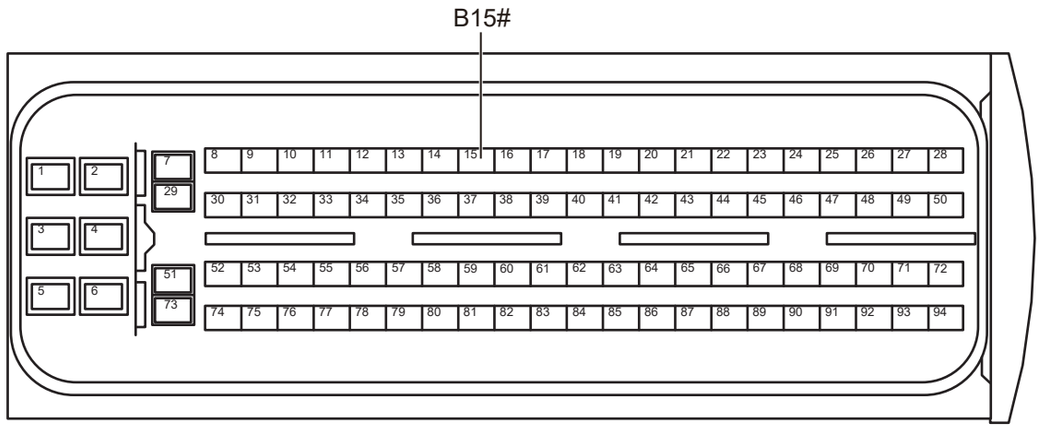
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in SOV valve 2 wire harness and connector**



Front intelligent area control unit B connector

PC02251RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace SOV valve 2 (See page RE-98)**

(a) Replace the SOV valve 2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

ZD

Diagnosis ends

DTC	P306611	Short to ground fault in A/C compressor LIN node power distribution

Description

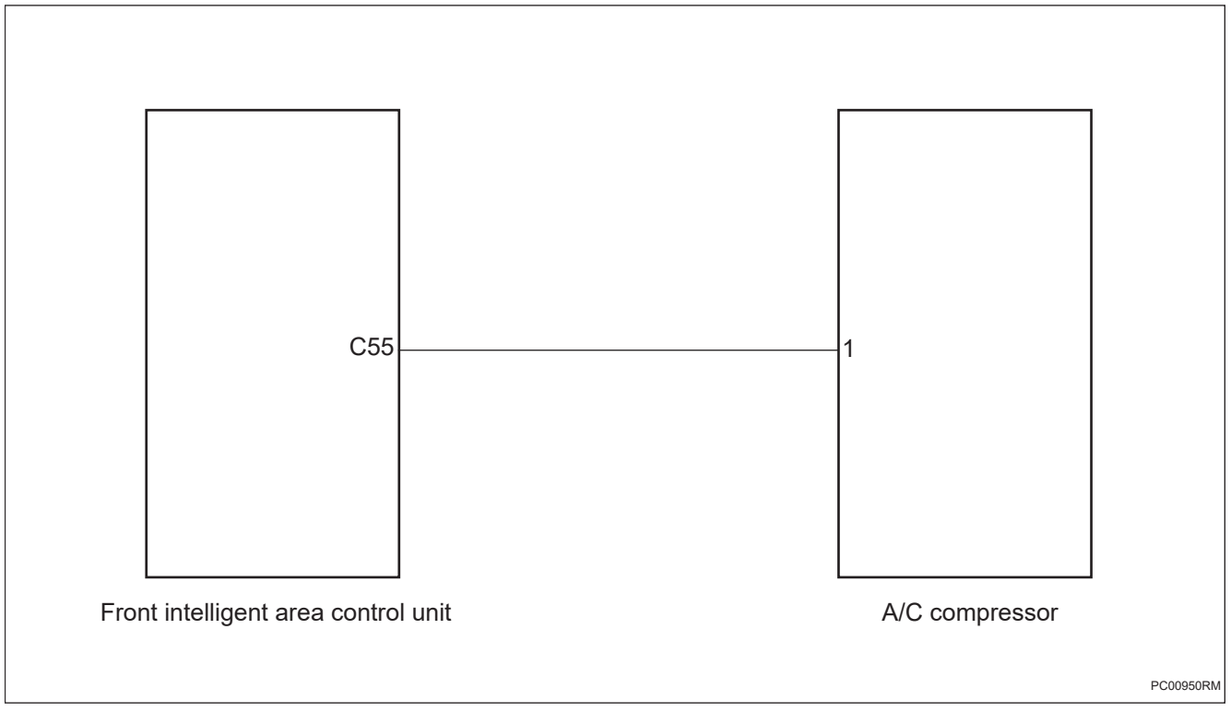
When A/C compressor LIN node power supply circuit is short, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P306611	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH09 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • A/C compressor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P306611	• A/C compressor does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check A/C compressor wire harness and connector**

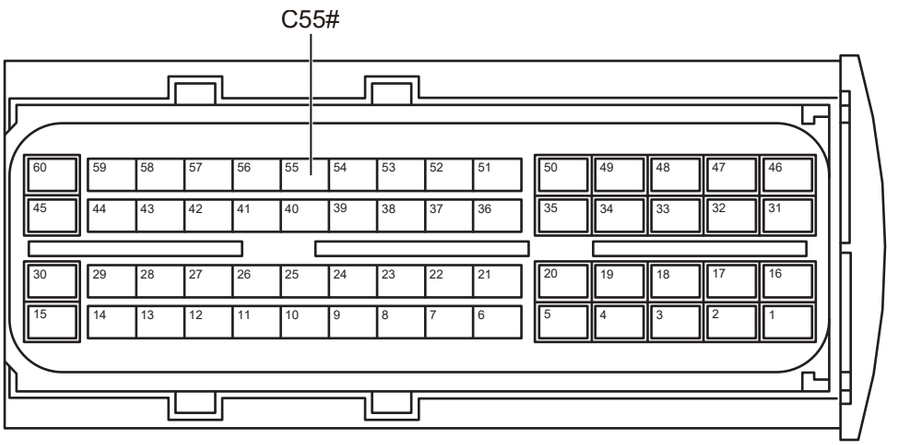
(a) Check if A/C compressor wire harness and connector are damaged.

(b) Check if A/C compressor wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in A/C compressor wire harness and connector



Front intelligent area control unit C connector

PC00961RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the A/C compressor connector.

(e) According to value in the table, measure resistance.

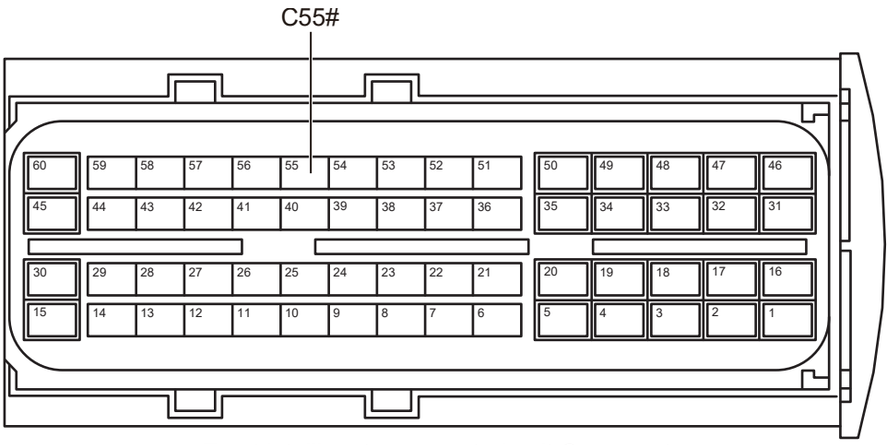
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C55# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in A/C compressor wire harness and connector**



Front intelligent area control unit C connector

PC00961RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C55# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace A/C compressor (See page RE-53)**

(a) Replace the A/C compressor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	P306711	Short to ground fault in high voltage water heater (HVCH) power distribution

Description

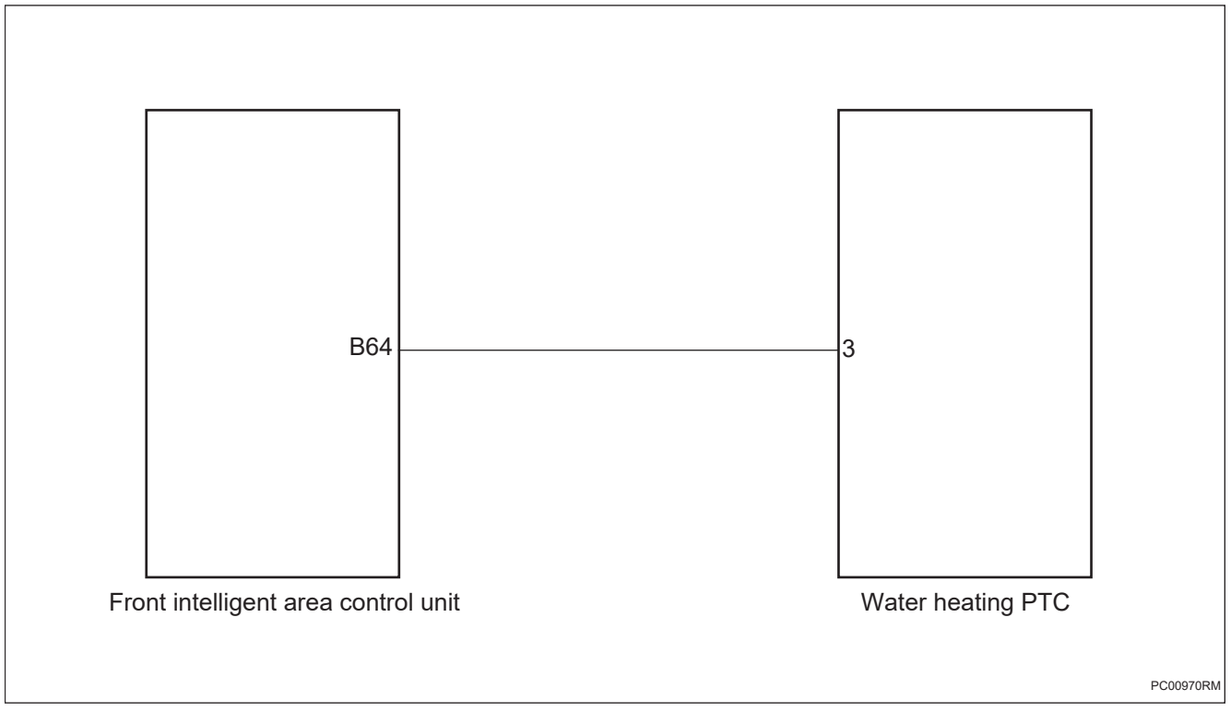
When water heating PTC power supply circuit is short, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P306711	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	ODH15 short to GND	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Water heating PTC

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P306711	High pressure water heating heater does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check water heating PTC wire harness and connector**

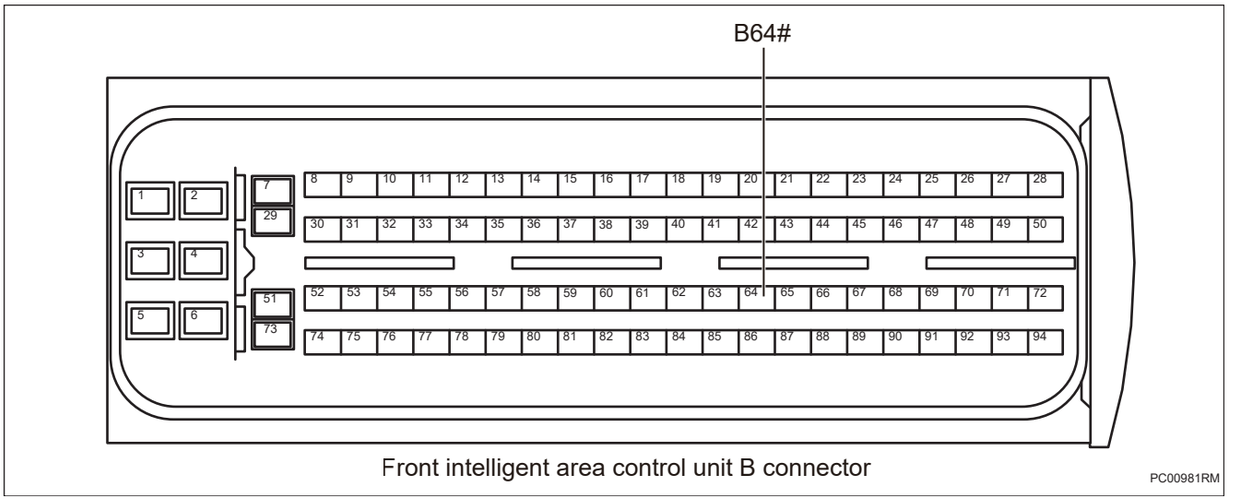
(a) Check if water heating PTC wire harness and connector are damaged.

(b) Check if water heating PTC wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in water heating PTC wire harness and connector



Front intelligent area control unit B connector

PC00981RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the water heating PTC connector.

(e) According to value in the table, measure resistance.

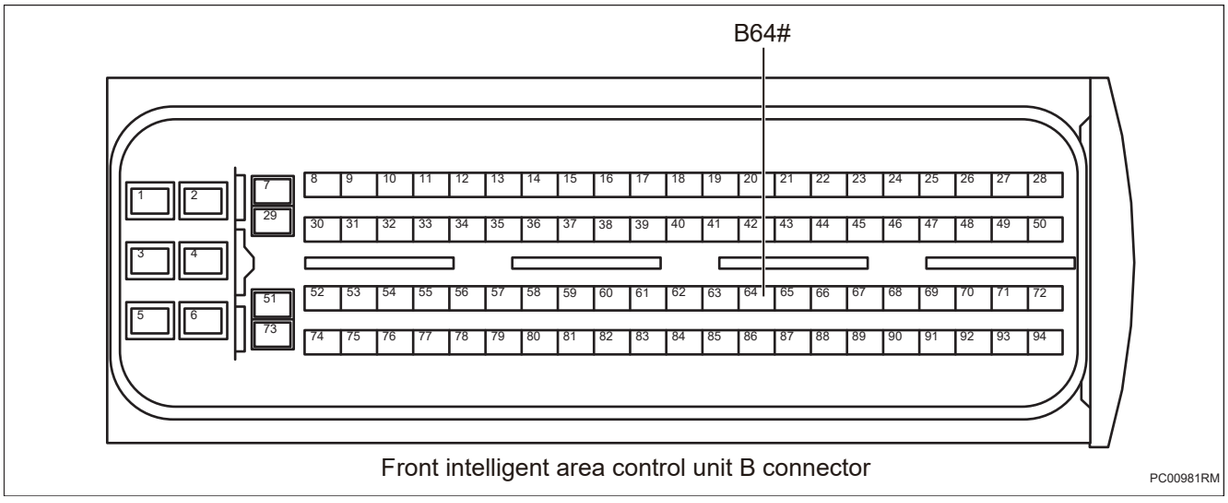
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B64# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in water heating PTC wire harness and connector**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B64# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace water heating PTC (See page RE-136)**

(a) Replace the water heating PTC.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

ZD

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

DTC	P307311	Short to ground fault in PDCF high voltage interlock
DTC	P307312	Short to power supply fault in PDCF high voltage interlock
DTC	P307313	Open fault in PDCF high voltage interlock

Description

When there is short or open in front intelligent area control unit interlock circuit, the front intelligent area control unit records DTC.

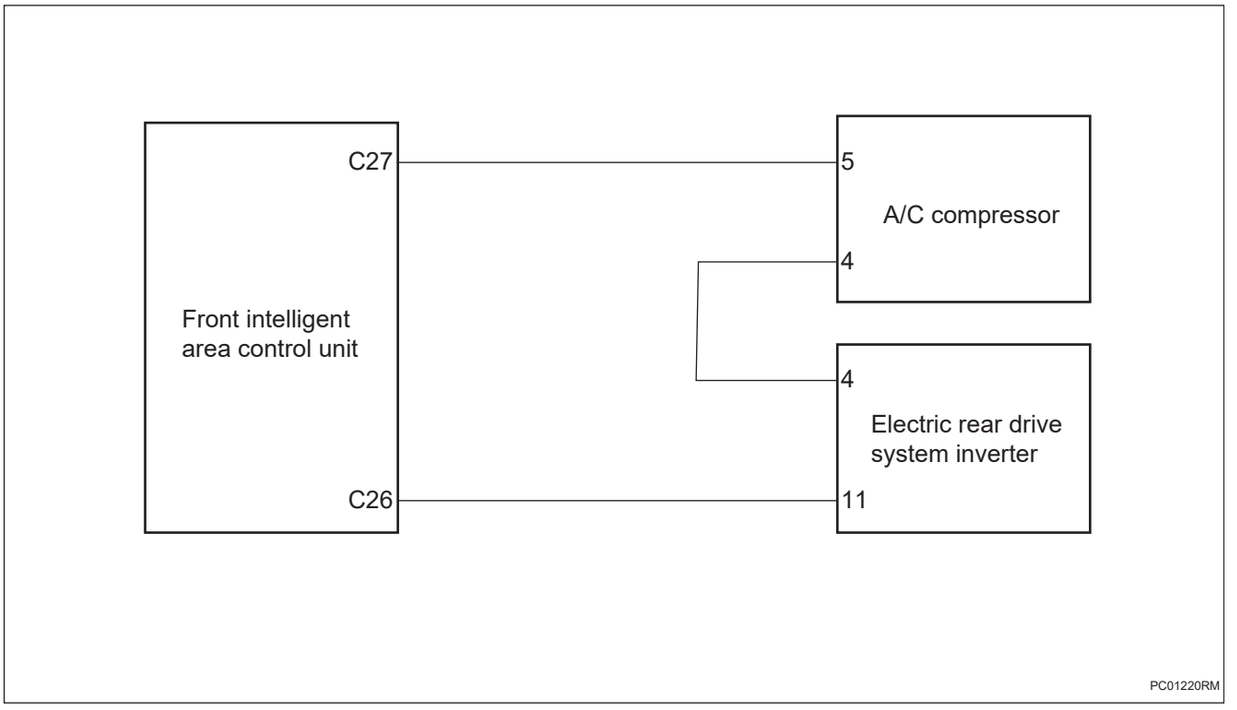
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P307311	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• PDCF HVIL short to GND, send PDCF_Inter Lock Error = 2	100	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric rear drive system inverter • A/C compressor
P307312	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• PDCF HVIL short to battery, send PDCF_Inter Lock Error = 3	100	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric rear drive system inverter • A/C compressor
P307313	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• PDCF HVIL open circuit, send PDCF_Inter Lock Error = 1	100	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Electric rear drive system inverter • A/C compressor

ZD

Fault symptom

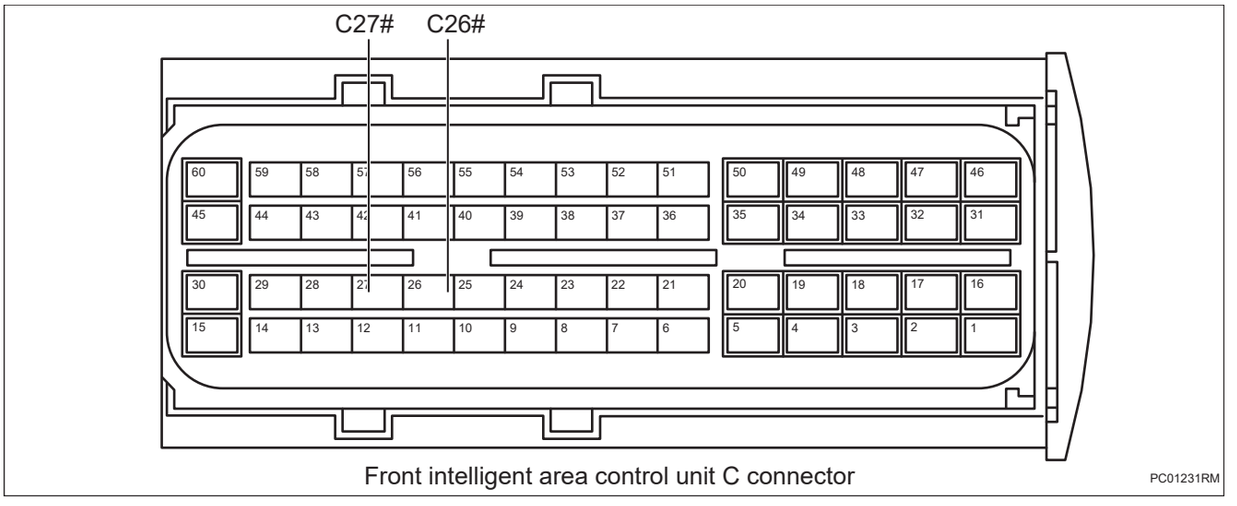
DTC No.	Fault symptom	Warning light/indicator
P307311	• High voltage interlock abnormal	Not come on
P307312	• High voltage interlock abnormal	Not come on
P307313	• High voltage interlock abnormal	Not come on

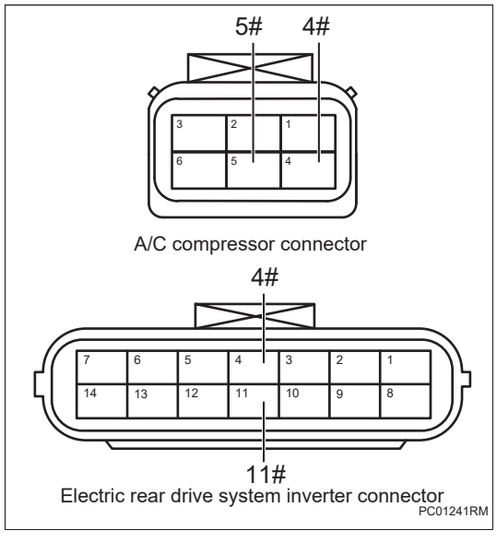
Circuit diagram



Inspection procedure

1	**Check for open in front intelligent area control unit wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric rear drive system inverter connector.

(e) Disconnect the A/C compressor connector.

(f) According to value in the table, measure resistance.

Standard value

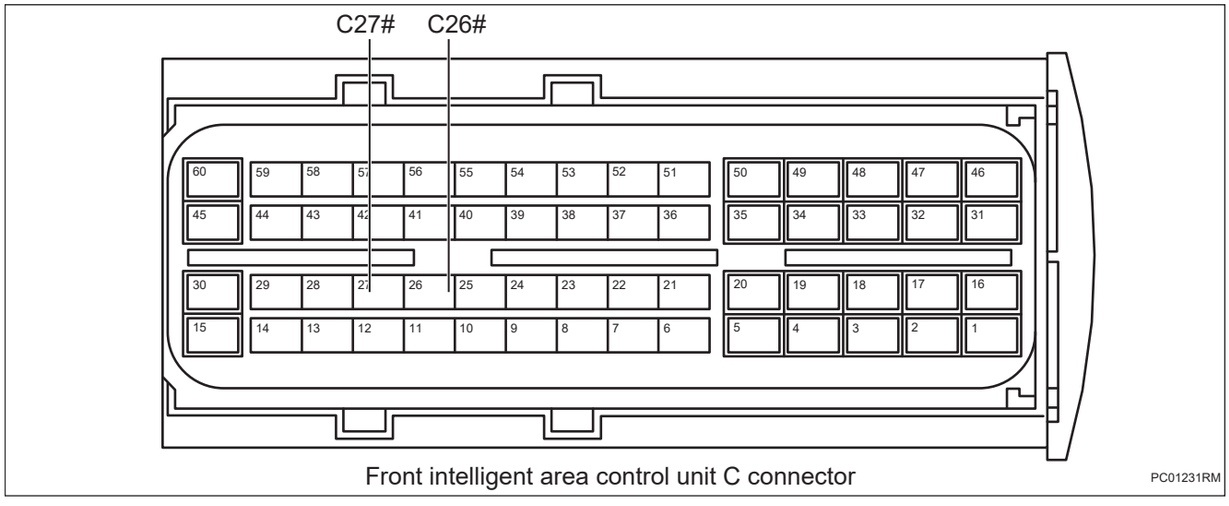
Multimeter connection	Detection condition	Specified condition
A/C compressor connector 5# - front intelligent area control unit connector C27#	Always connected	Less than 1 Ω
A/C compressor connector 4# - electric rear drive system inverter connector 4#	Always connected	Less than 1 Ω
Rear electric drive system inverter connector 11# - front intelligent area control unit connector C26#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front intelligent area control unit wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

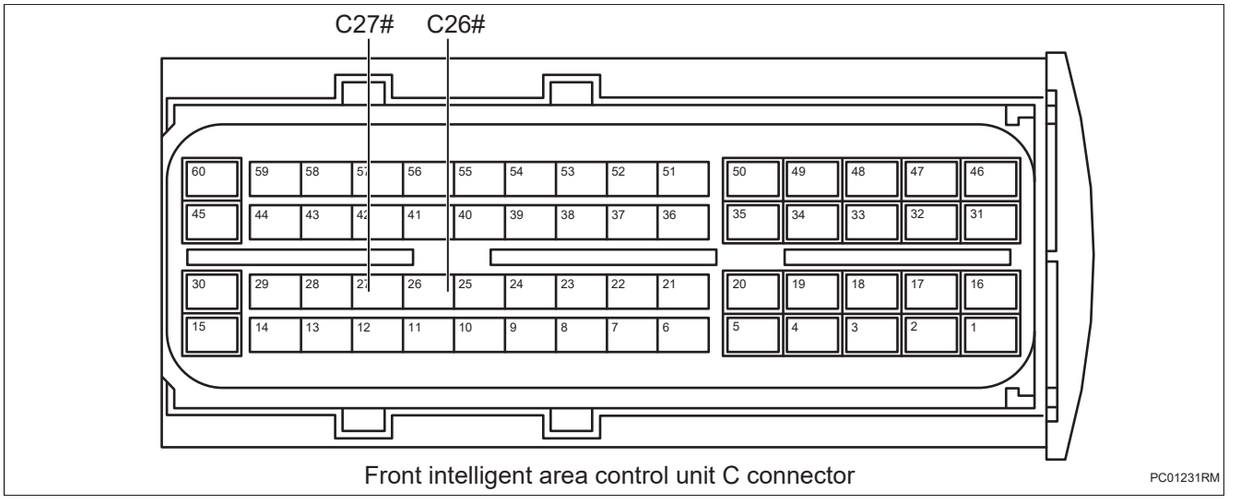
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C26# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector C27# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in front intelligent area control unit wire harness and connector**



Front intelligent area control unit C connector

PC01231RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector C27# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace A/C compressor/electric rear drive system inverter (See page RE-53) (See page DL-3)**

(a) Replace the A/C compressor/electric rear drive system inverter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

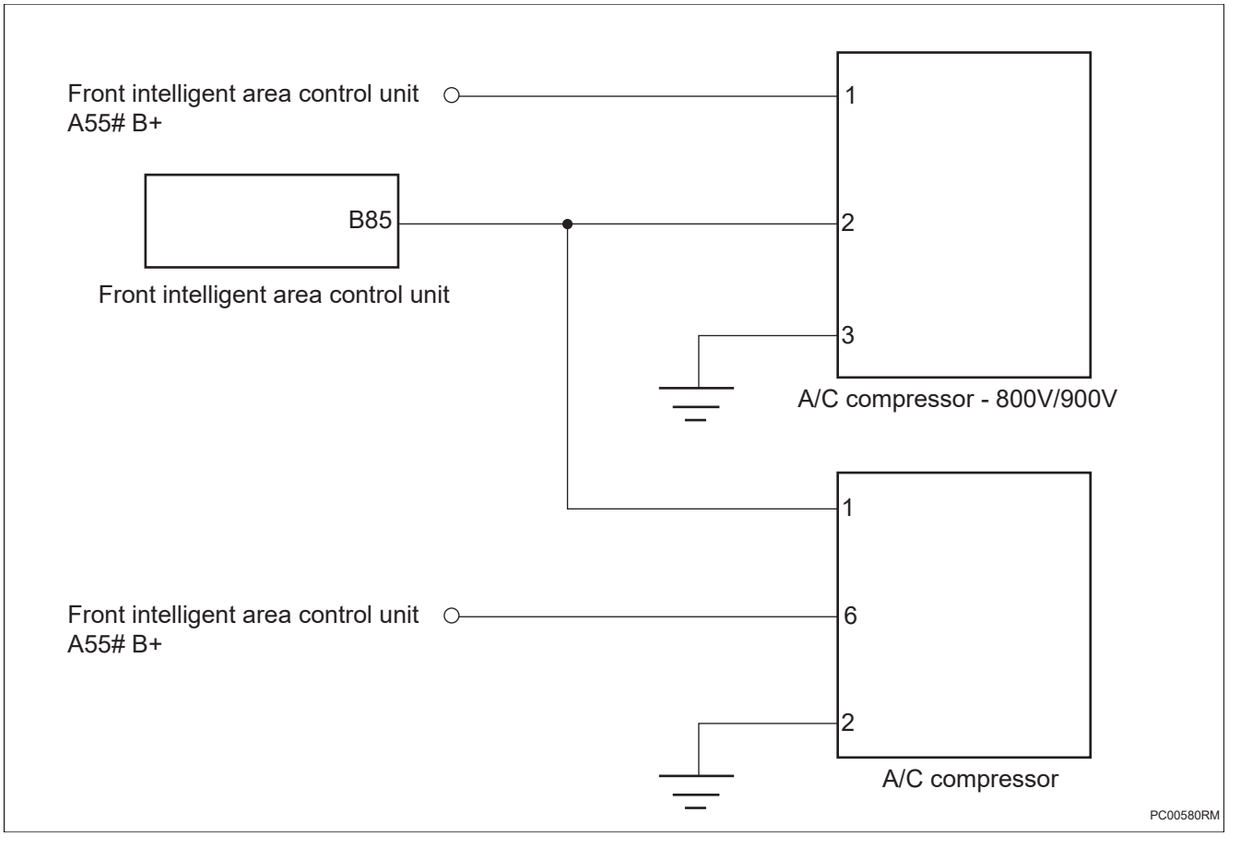
DTC	**U010287**	**A/C compressor node lost**
DTC	**U136086**	**A/C compressor communication fault**

Description

When A/C compressor LIN communication is abnormal, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U010287	(a) A/C compressor node lost.	• Front intelligent area control unit • Wire harness and connector • A/C compressor • A/C compressor - 800 V/900 V
U136086	(a) A/C compressor communication fault.	• Front intelligent area control unit • Wire harness and connector • A/C compressor • A/C compressor - 800 V/900 V

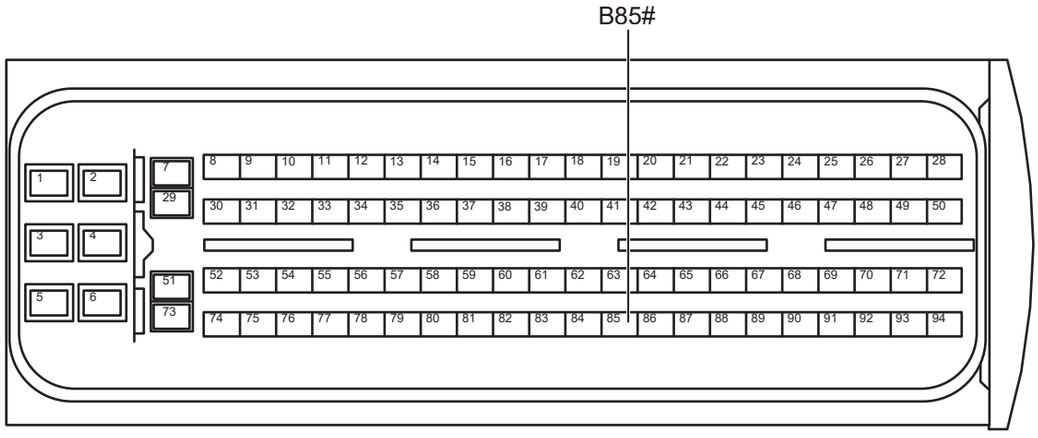
Circuit diagram



Inspection procedure

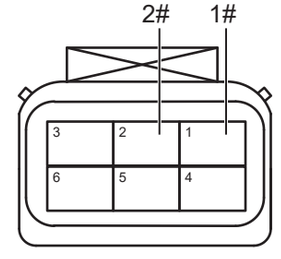
Note: Taking A/C compressor fault as an example, and DTC analysis steps for A/C compressor-800V/900V are similar.

1	**Check for open in A/C compressor wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



A/C compressor connector

PC00600RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the A/C compressor connector.

(e) According to value in the table, measure resistance.

Standard value

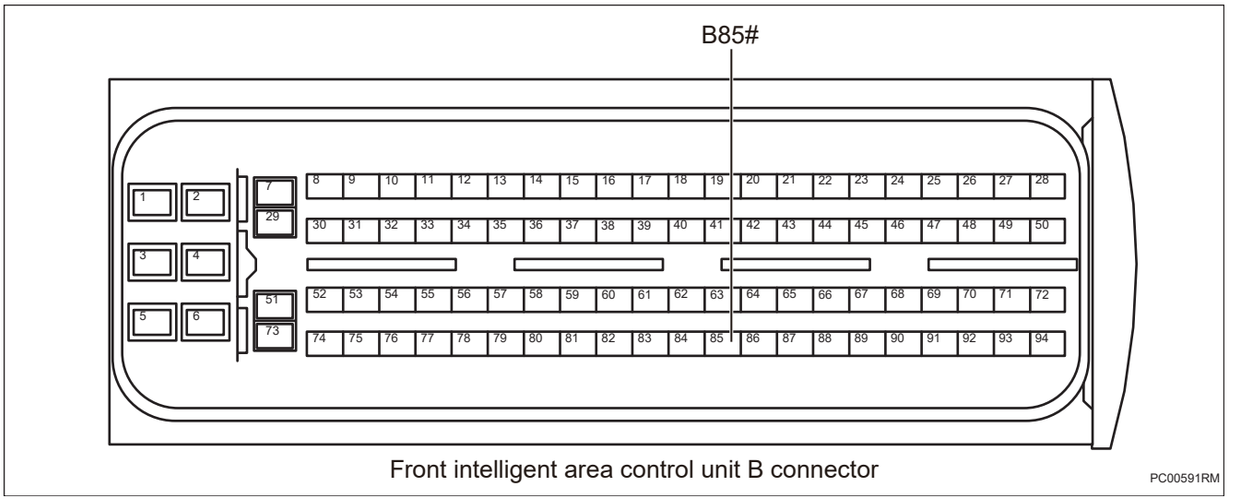
Multimeter connection	Detection condition	Specified condition
A/C compressor connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
A/C compressor connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	Check for short to ground in A/C compressor wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

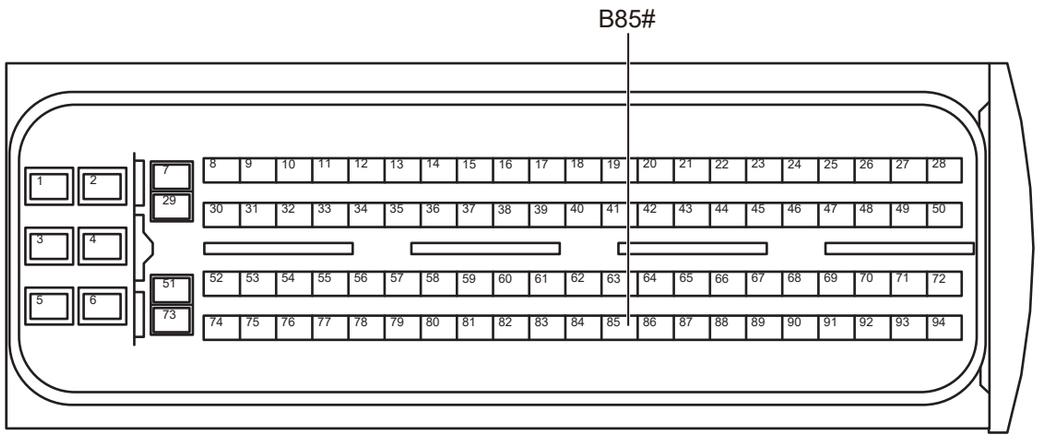
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in A/C compressor wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

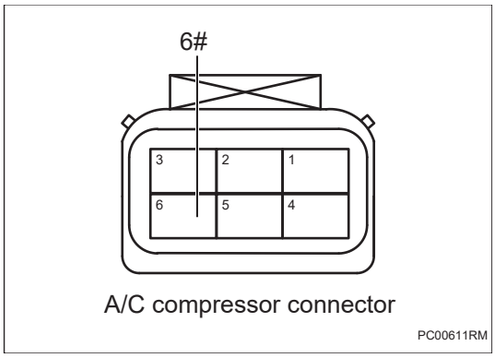
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check A/C compressor power supply



A/C compressor connector
PC00611RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
A/C compressor connector 6# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace A/C compressor (See page RE-53)

(a) Replace the A/C compressor.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

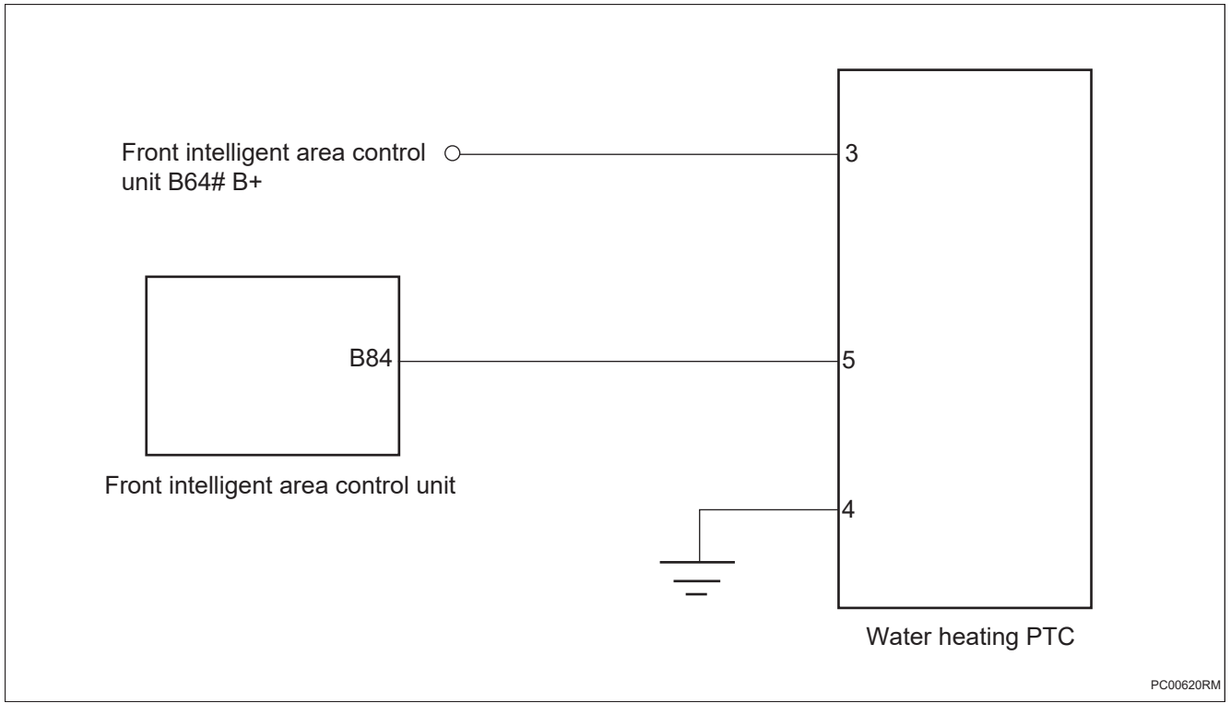
DTC	**U020687**	**High voltage heater node lost**
DTC	**U136986**	**High voltage heater communication error**

Description

When water heating PTC LIN communication is abnormal, the front intelligent area control unit records DTC.

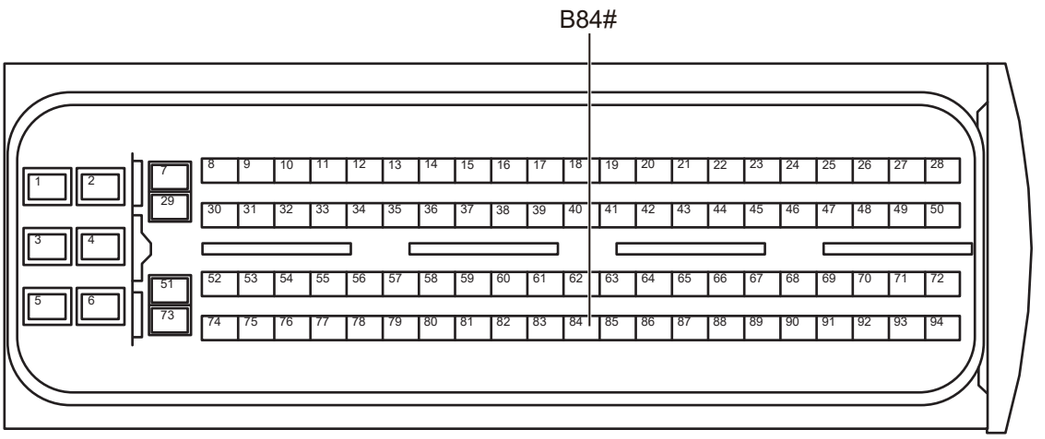
DTC No.	DTC detection condition	Faulty area
U020687	(a) High voltage heater node lost.	• Front intelligent area control unit • Wire harness and connector • Water heating PTC
U136986	(a) High voltage heater communication fault.	• Front intelligent area control unit • Wire harness and connector • Water heating PTC

Circuit diagram

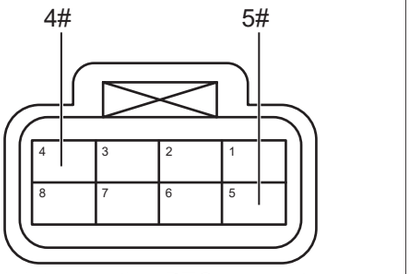


Inspection procedure

1	**Check for open in water heating PTC wire harness and connector**



Front intelligent area control unit B connector
PC00631RM



Water heating PTC connector
PC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the water heating PTC connector.

(e) According to value in the table, measure resistance.

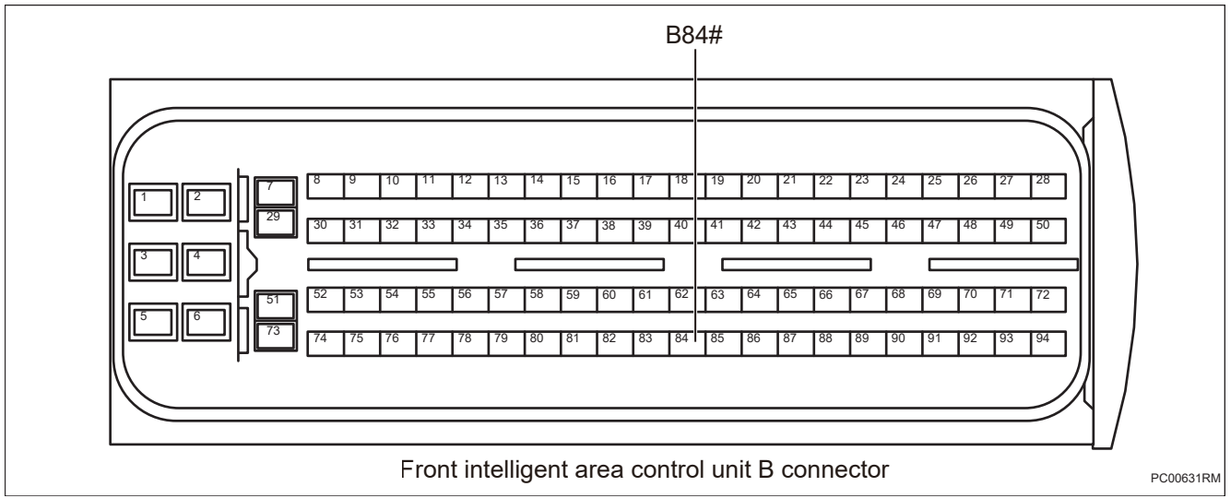
Standard value

Multimeter connection	Detection condition	Specified condition
Water heating PTC connector 5# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Water heating PTC connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in water heating PTC wire harness and connector



Front intelligent area control unit B connector

(a) According to value in the table, measure resistance.

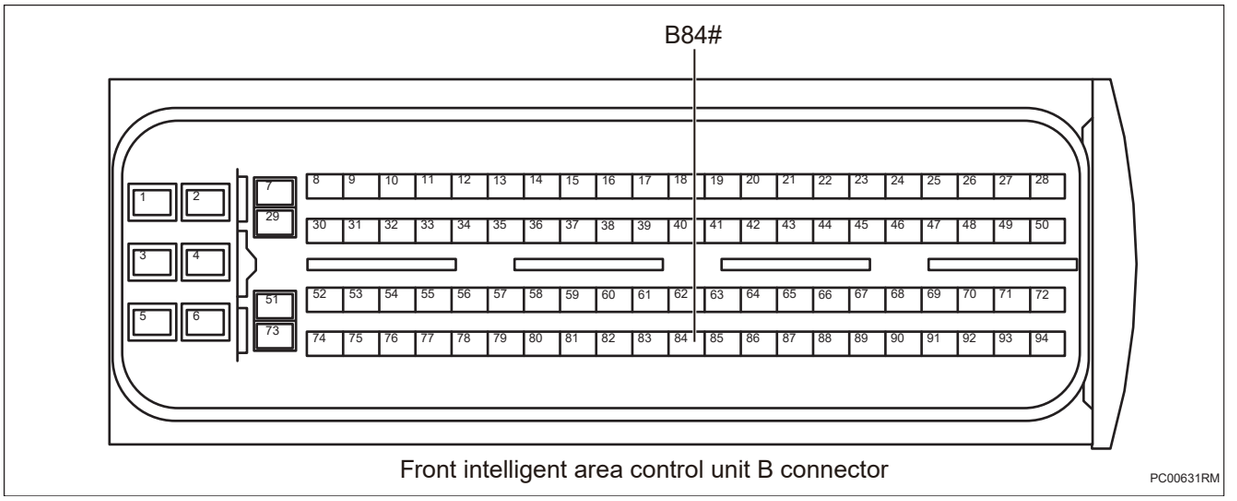
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in water heating PTC wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

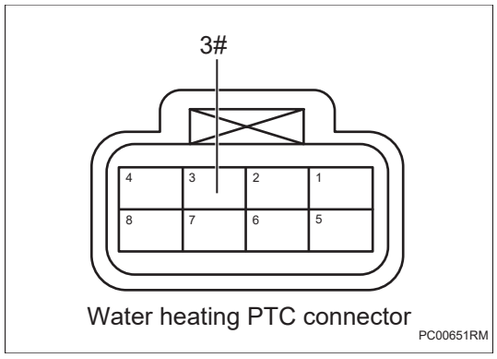
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check water heating PTC power supply



Water heating PTC connector
PC00651RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Water heating PTC connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace water heating PTC (See page RE-136)

(a) Replace the water heating PTC.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

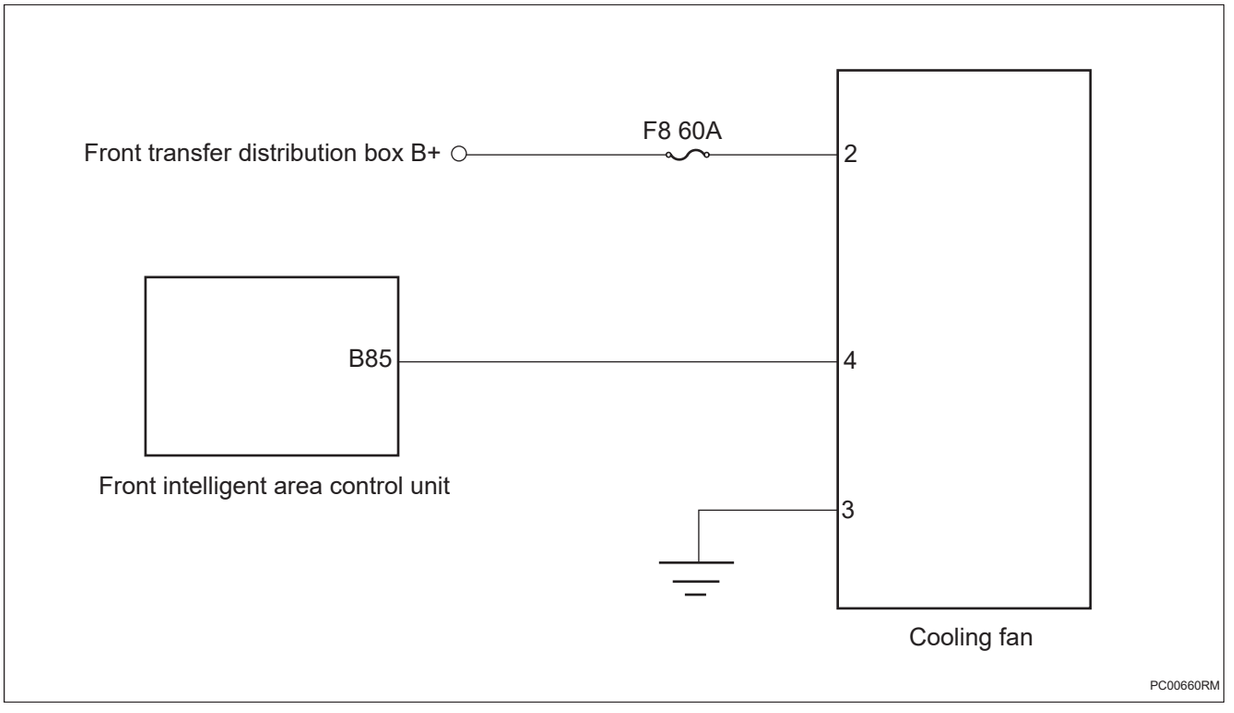
DTC	**U026087**	**Electronic cooling fan node lost**
DTC	**U136186**	**Electric cooling fan communication error**

Description

When cooling fan LIN communication is abnormal, the front intelligent area control unit records DTC.

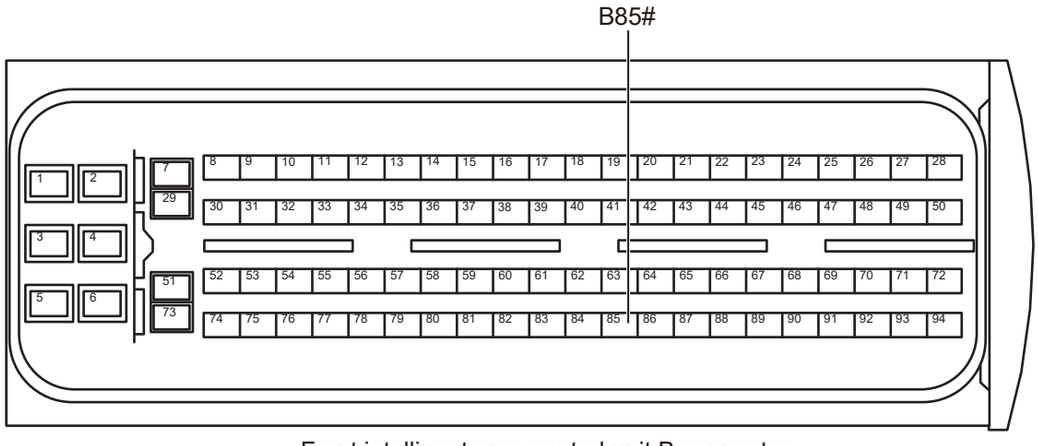
DTC No.	DTC detection condition	Faulty area
U026087	(a) Electronic cooling fan node lost.	• Front intelligent area control unit • Wire harness and connector • Cooling fan
U136186	(a) Electronic cooling fan communication fault.	• Front intelligent area control unit • Wire harness and connector • Cooling fan

Circuit diagram



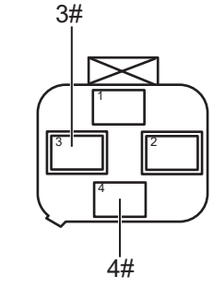
Inspection procedure

1	**Check for open in cooling fan wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Cooling fan connector

PC00670RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the cooling fan connector.

(e) According to value in the table, measure resistance.

Standard value

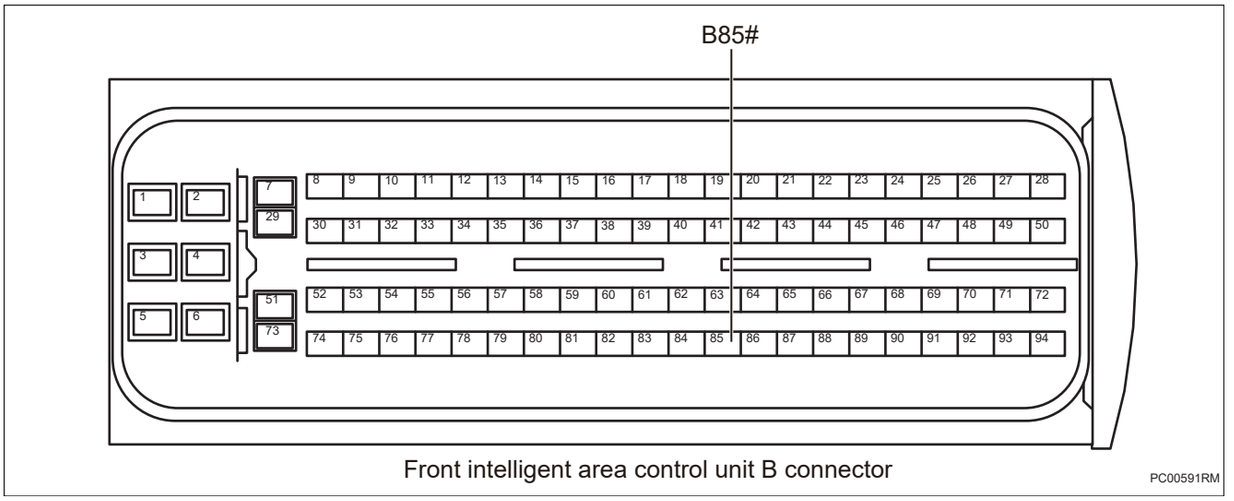
Multimeter connection	Detection condition	Specified condition
Cooling fan connector 4# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Cooling fan connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	Check for short to ground in cooling fan wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

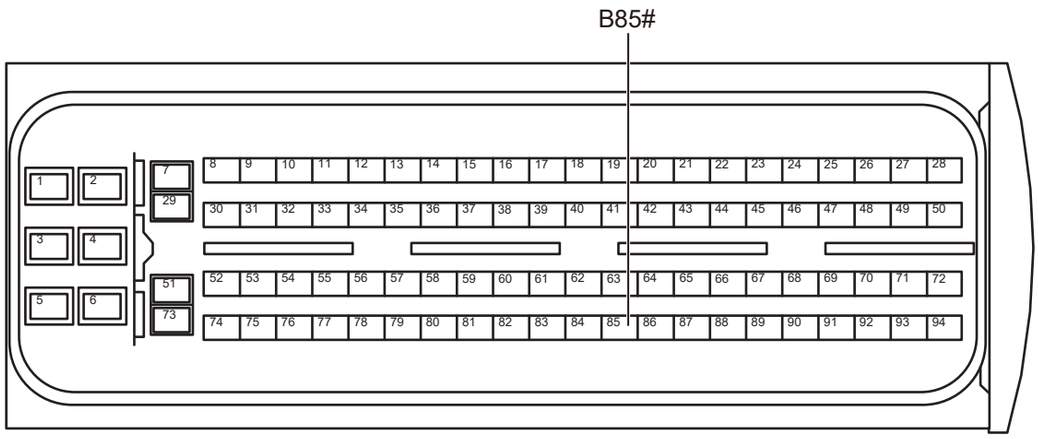
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in cooling fan wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

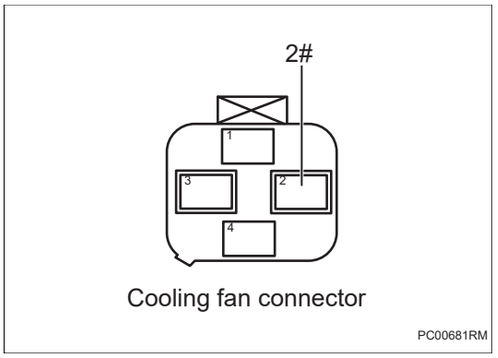
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check cooling fan power supply



Cooling fan connector

PC00681RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Cooling fan connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace cooling fan (See page RE-81)

(a) Replace the cooling fan.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

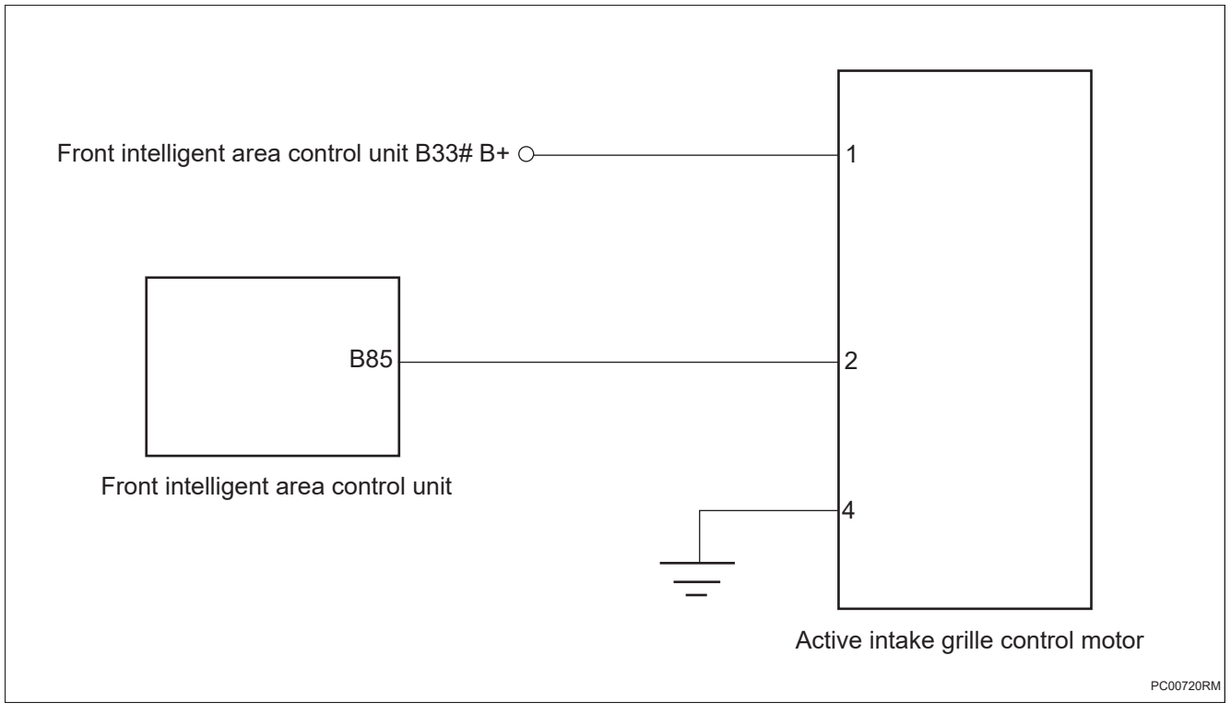
DTC	**U02F887**	**Active intake grille controller node lost**
DTC	**U131186**	**Active intake grille controller LIN communication error**

Description

When active intake grille control motor LIN communication is abnormal, the front intelligent area control unit records DTC.

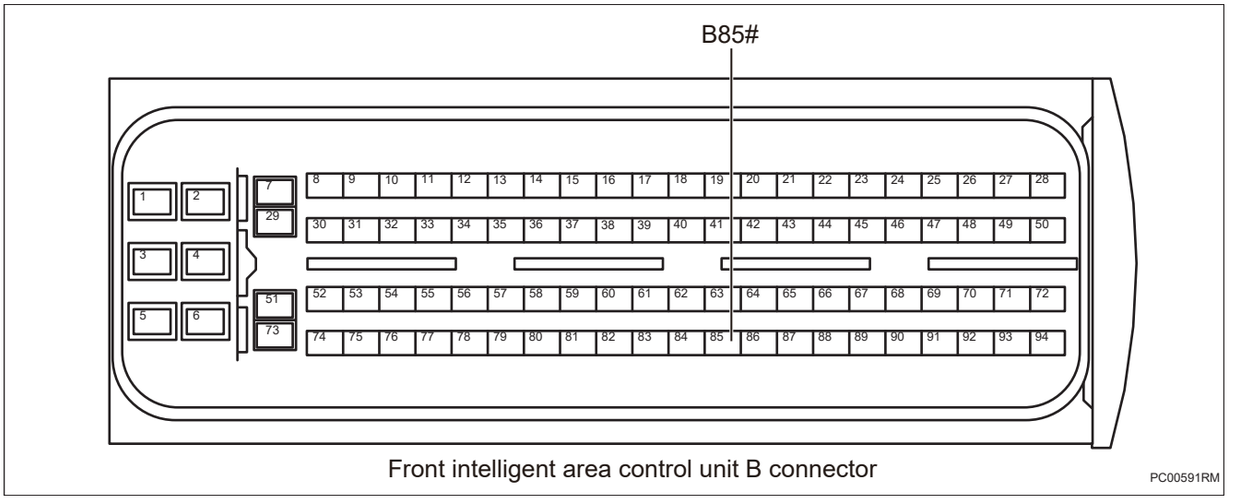
DTC No.	DTC detection condition	Faulty area
U02F887	(a) Active intake grille controller node lost.	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor
U131186	(a) Active intake grille controller LIN communication error.	• Front intelligent area control unit • Wire harness and connector • Active intake grille control motor

Circuit diagram



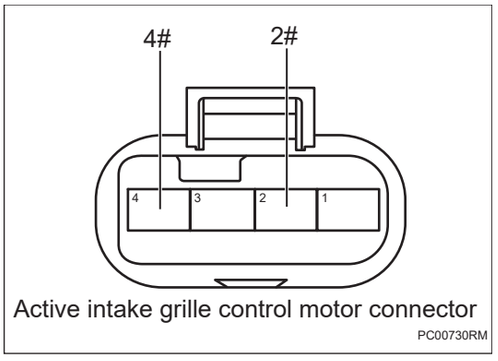
Inspection procedure

1	**Check for open in active intake grille control motor wire harness and connector**



Front intelligent area control unit B connector

PC00591RM



Active intake grille control motor connector

PC00730RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the active intake grille control motor connector.

(e) According to value in the table, measure resistance.

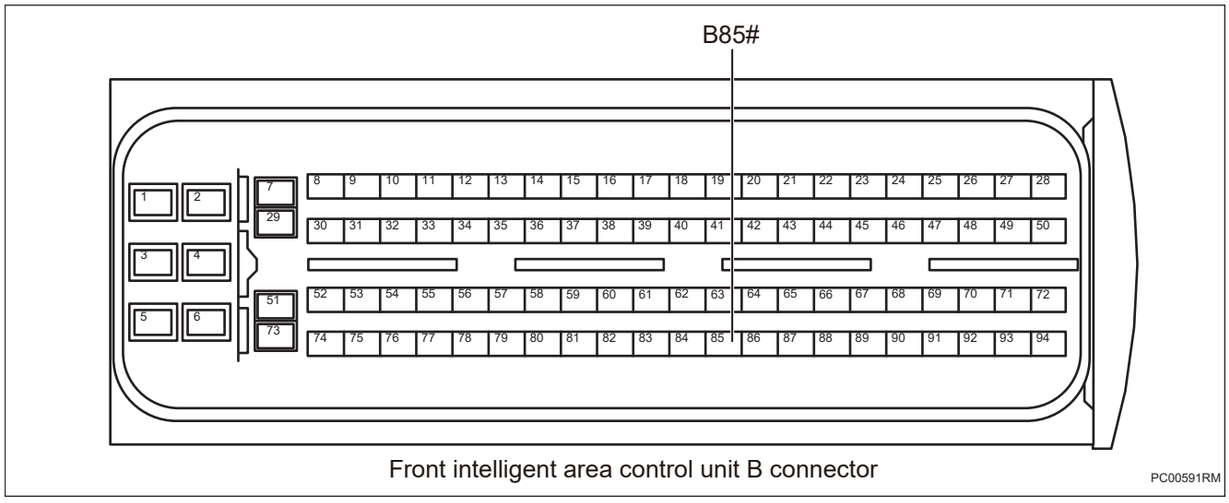
Standard value

Multimeter connection	Detection condition	Specified condition
Active intake grille control motor connector 2# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Active intake grille control motor connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in active intake grille control motor wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) According to value in the table, measure resistance.

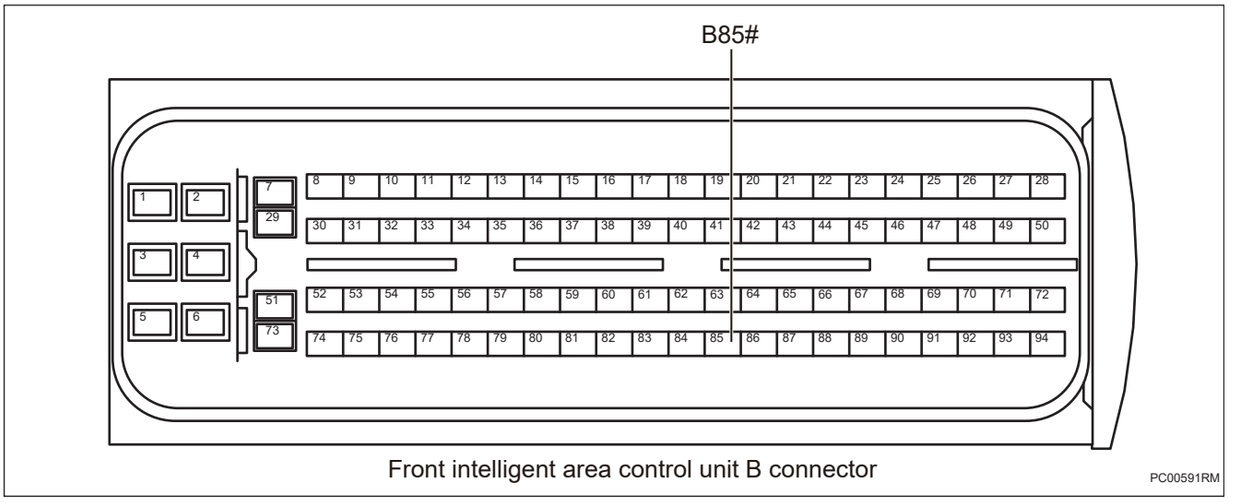
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in active intake grille control motor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

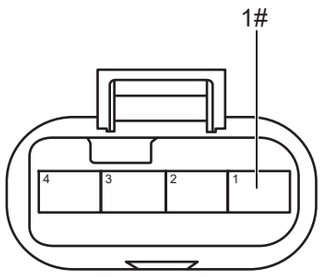
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check active intake grille control motor power supply



Active intake grille control motor connector
PC00741RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Active intake grille control motor connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace active intake grille control motor (See page RE-57)

(a) Replace the active intake grille control motor.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**U02FF87**	**Electric wiper module node lost**
DTC	**U130886**	**Electric wiper module LIN communication error**

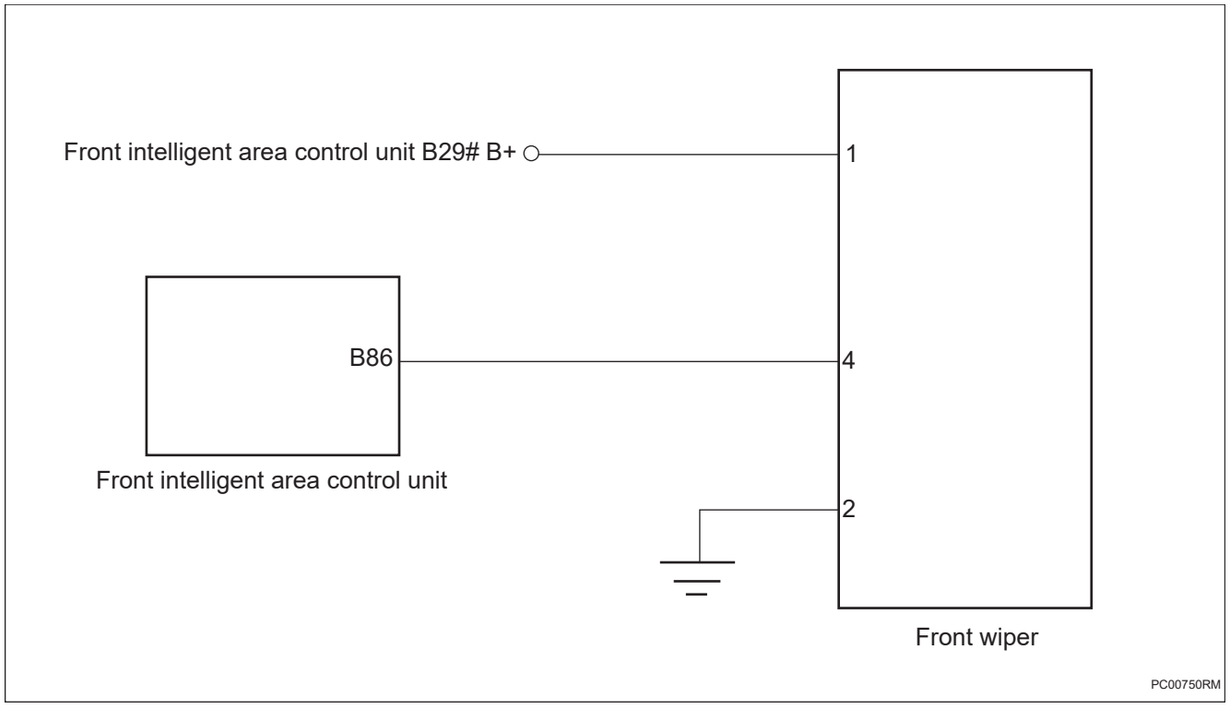
ZD

Description

When front wiper LIN communication is abnormal, the front intelligent area control unit records DTC.

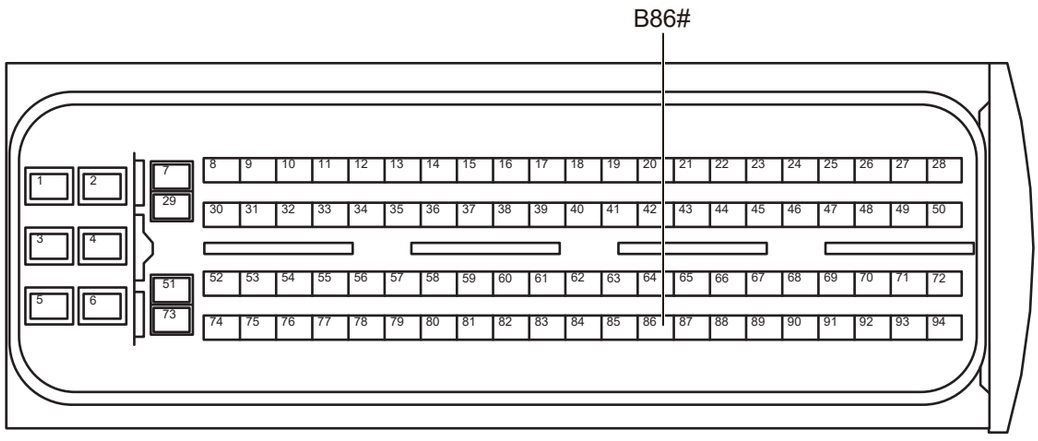
DTC No.	DTC detection condition	Faulty area
U02FF87	(a) Electric wiper node lost.	• Front intelligent area control unit • Wire harness and connector • Front wiper
U130886	(a) Electric wiper feedback fault.	• Front intelligent area control unit • Wire harness and connector • Front wiper

Circuit diagram



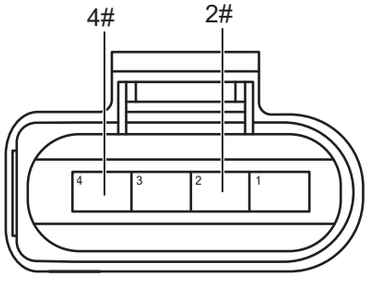
Inspection procedure

1	**Check for open in front wiper wire harness and connector**



Front intelligent area control unit B connector

PC03121RM



Front wiper connector

PC00760RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front wiper connector.

(e) According to value in the table, measure resistance.

Standard value

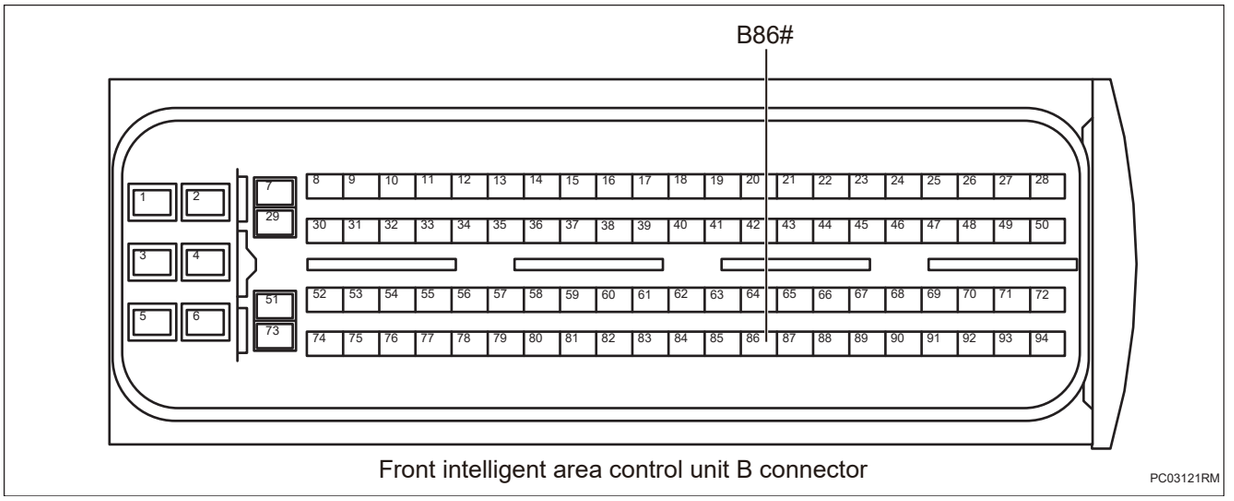
Multimeter connection	Detection condition	Specified condition
Front wiper connector 4# - front intelligent area control unit connector B86#	Always connected	Less than 1 Ω
Front wiper connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	Check for short to ground in front wiper wire harness and connector



Front intelligent area control unit B connector

PC03121RM

ZD

(a) According to value in the table, measure resistance.

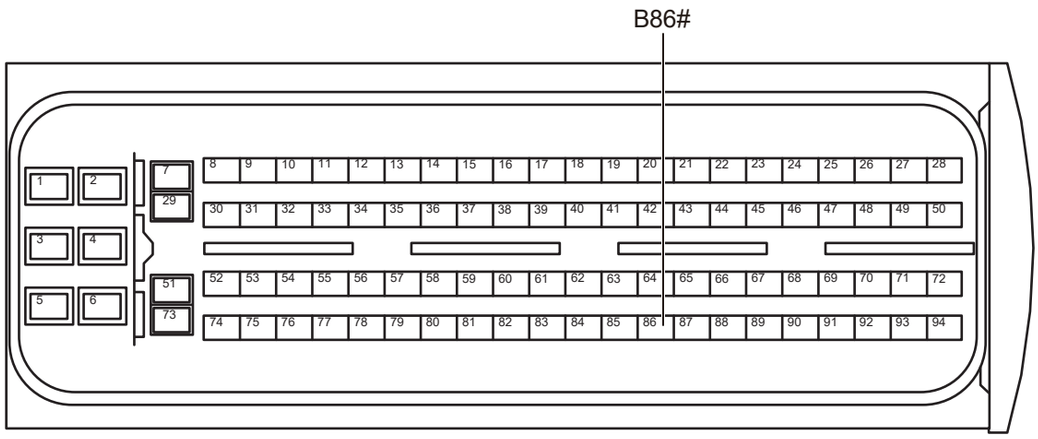
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in front wiper wire harness and connector



Front intelligent area control unit B connector

PC03121RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

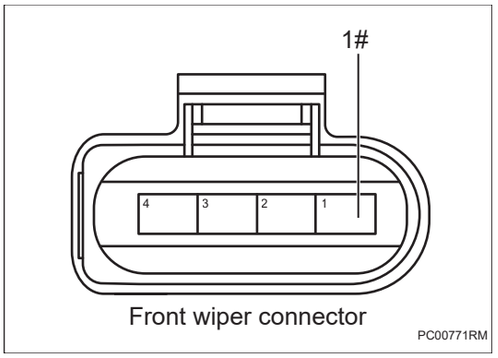
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check front wiper power supply



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Front wiper connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace front wiper (See page WS-62)

(a) Replace the front wiper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**B205019**	**VDC electronic fuse overload**
DTC	**B205011**	**Short to ground in VDC electronic fuse**
DTC	**B20501A**	**VDC electronic fuse MOS saturation shutdown**
DTC	**B20501B**	**VDC electronic fuse unable to enter sleep**
DTC	**B20501C**	**VDC electronic fuse MOS stuck**
DTC	**B20501D**	**VDC electronic fuse overtemperature**
DTC	**B20501E**	**VDC electronic fuse SPI communication fault**

Description

When electronic fuse related fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B205019	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 Overload	5	Event-based	10 ms	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
B205011	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 SCG	5	Event-based	10 ms	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
B20501A	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 Moset Saturate	5	Event-based	10 ms	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
B20501B	• Diagnostic voltage range. (9 V	• EFUSE02 Sleep fault	5	Event-based	10 ms	• No need to check and repair, only for assist troubleshoot

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) & PDC Not in OTA Mode					
B20501C	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 under voltage	5	Event-based	10 ms	• Front intelligent area control unit
B20501D	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 Overtemp	5	Event-based	10 ms	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
B20501E	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EFUSE02 SPI error	5	Event-based	10 ms	• Front intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B205019	• VDC dose not operate or operates abnormally	Not come on
B205011	• VDC dose not operate or operates abnormally	Not come on
B20501A	• VDC dose not operate or operates abnormally	Not come on
B20501B	• VDC dose not operate or operates abnormally	Not come on
B20501C	• VDC dose not operate or operates abnormally	Not come on
B20501D	• VDC dose not operate or operates abnormally	Not come on
B20501E	• VDC dose not operate or operates abnormally	Not come on

Inspection procedure

1	**Check related controller wire harness and connector**

(a) Check if related controller wire harness and connector are damaged.

(b) Check for short or open in related controller wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace relevant controller

DTC	C205E10	EPB switch acquisition error
DTC	C205F10	EPB switch stuck
DTC	C206010	Overtemperature fault in switch identification part of EPB driver chip
DTC	C206116	EPB pre-drive chip power supply undervoltage fault
DTC	C206117	EPB pre-drive chip power supply overvoltage fault
DTC	C206210	EPB pre-drive chip internal reset fault
DTC	C206310	EPB pre-drive chip internal crystal oscillator fault
DTC	C206410	EPB pre-drive chip internal initialization configuration and self-check fault
DTC	C206510	EPB pre-drive chip internal charge pump fault
DTC	C206610	EPB pre-drive chip watchdog fault
DTC	C206710	EPB pre-drive chip overtemperature fault
DTC	C206810	EPB pre-drive chip charge pump undervoltage fault

DTC	C206919	EPB pre-drive chip detected overcurrent fault
DTC	C206A10	EPB pre-drive chip detected abnormal H-bridge high and low side MOSFET
DTC	C206B10	SPI communication failure between EPB MCU and pre-drive chip
DTC	C206C10	Communication interrupted between EPB pre-drive chip and MCU SPI
DTC	C206D10	SPI communication address check failure fault between MCU and pre-drive chip
DTC	C206E10	MCU SPI transmission failure
DTC	C206F10	Pre-drive chip detected sampling synchronization fault
DTC	C207010	EPB MCU detects pre-drive chip sampling synchronization signal detection function abnormality fault
DTC	C207110	EPB current sampling consistency fault
DTC	C207210	EPB pre-drive chip sampling stuck fault
DTC	C207310	EPB pre-drive chip ADC conversion failure fault
DTC	C207710	EPB H-bridge shutdown bridge arm voltage abnormal fault
DTC	C207810	EPB drive circuit or actuator fault
DTC	C207910	EPB detects abnormal current fault when motor is not driven
DTC	C207A10	EPB drive anti-reversion open fault
DTC	C207B10	EPB drive anti-reversion rationality fault
DTC	C207C10	SPI communication CRC check failure between EPB pre-drive chip and MCU
DTC	C207D10	EPB current sampling offset calculation not completed for a long time

DTC	C207E10	EPB pre-drive chip self-check timeout fault
DTC	C208011	EPB caliper motor overcurrent fault (software protection)
DTC	C200100	EPB-HOST response error - left
DTC	C200200	EPB - no brake disc - left
DTC	C200300	EPB - motor stuck - left
DTC	C200400	EPB - clamping force insufficient - left
DTC	C200500	EPB - unloaded current too high - left
DTC	C200600	EPB - actuator damaged - left
DTC	C200700	EPB - caliper status inconsistent or unknown - left
DTC	C200A00	Host not available - left
DTC	C200B00	EPB - excessive current fluctuation - left
DTC	C201100	EPB - invalid data storage area - left
DTC	C201400	EPB - dynamic anti-lock brake failure - left
DTC	C208111	HSB and PBC request clamping conflict failure
DTC	C208211	HSB and PBC request releasing conflict failure
DTC	C208311	HSB does not allow caliper action failure
DTC	C208411	External shutdown EPB H-bridge fault

Description

When EPB related fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C205E10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• IDL04~07 combinatio-n judgment fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C205F10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB switch remains Apply/ Release over 60 s	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206010	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB IC switch collection overtempe-rture	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206116	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB UV of driver IC powersupp-ly fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206117	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB OV of driver IC powersupp-ly fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206210	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC internal reset fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206310	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC internal OSC fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206410	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC Init configurati-on and self test fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206510	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC internal Charge pump fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206610	• Diagnostic voltage range. (9 V	• EPB driver IC Watch dog fault	5	Event-based	10 ms	• Front intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) & PDC Not in OTA Mode					• Wire harness and connector • Rear left brake caliper
C206710	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC Over temperatur-e fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206810	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC Charge pump supply under-voltage	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206919	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB driver IC detcets Overcurrent fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206A10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Mosfets fault detected by Predrive IC	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206B10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB SPI message fault from MCU to Predrive IC	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206C10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB SPI message loss from Predrive IC to MCU	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206D10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB SPI message address check fault Between MCU and Predrive IC	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206E10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB SPI message send fault from MCU to Predrive IC	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C206F10	• Diagnostic voltage range. (9 V - 16 V) &	• EPB driver IC detects a sampling synchroniz-ation fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode					• Rear left brake caliper
C207010	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB MCU check Predrive IC synchroniz-ation signal detection function abnormal fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207110	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Current sampling consistency fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207210	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB AD sampling stuck fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207310	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB ADC conversion failure	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207710	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Abnormal voltage fault of H-bridge closing bridge arm	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207810	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB caliper line error	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207910	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Undrivern motor detects abnormal current	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207A10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB RVPG line open	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207B10	• Diagnostic voltage range. (9 V - 16 V) &	• EPB RVPG plausibility Fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode					• Rear left brake caliper
C207C10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• The SPI communic-ation CRC check from the pre-drive chip to the MCU is invalid	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207D10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Current offset calculation has not been completed for a long time	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C207E10	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB Selftest timeout fault	5	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C208011	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• EPB caliper motor overcurrent	1000 ms	Periodicity	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200100	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, drive change is incorrect	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200200	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, duration of Idle stage in Apply is too long	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200300	• Diagnostic voltage range. (9 V	• During EPB operation, applying: current	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	reaches to 4 A for less than 50 ms; releasing: current is higher than 12 A for more than 150 ms or current is higher than 24 A for more than 30 ms				• Rear left brake caliper
C200400	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During clamping EPB, the target clamping force cannot be reached within 4 s after the disk is released	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200500	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, Idle current is higher than 3 A	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200600	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, the time is less than 330 ms	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200700	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) &	• One of left and right caliper is released and the other is pulled up or right caliper is in UNKNOW state or left	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode	caliper is in UNKNOW state, left and right calipers are not aligned or both in UNKNOW state				
C200A00	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• Voltage is between 8.5 V and 16.5 V, host is invalid	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C200B00	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, the disk separation point is not found within 2000 ms in the Load stage	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C201100	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	-	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C201400	• Diagnostic voltage range. (9 V - 16 V) IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	-	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C208111	• Diagnostic voltage range. (9 V	• HSB and PBC request	1	Event-based	10 ms	• Front intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) & PDC Not in OTA Mode	clamping conflict				• Wire harness and connector • Rear left brake caliper
C208211	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• HSB and PBC request releasing conflict	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C208311	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• HSB does not allow caliper action	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper
C208411	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• External shutdown EPB H bridge	1	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Rear left brake caliper

ZD

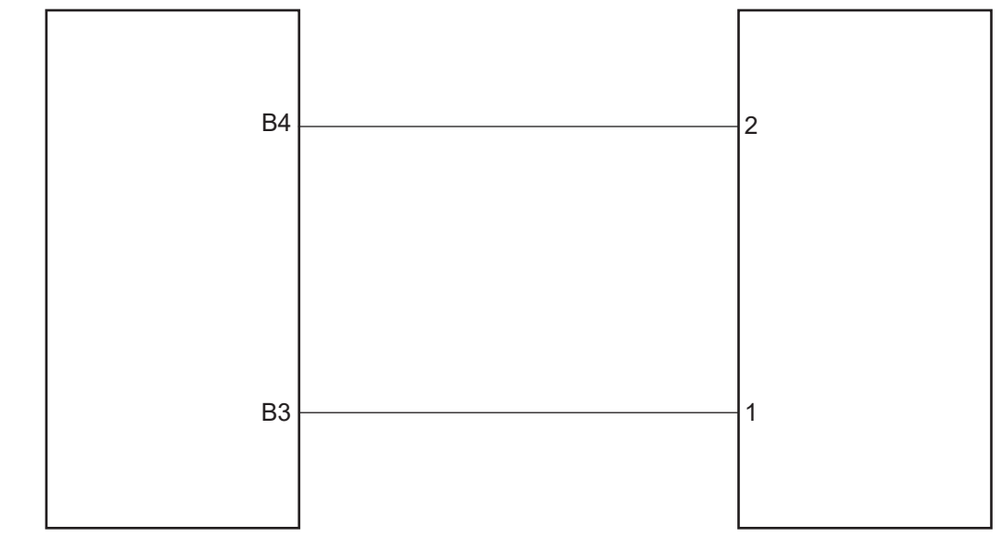
Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C205E10	• EPB dose not operate or operates abnormally	Not come on
C205F10	• EPB dose not operate or operates abnormally	Not come on
C206010	• EPB dose not operate or operates abnormally	Not come on
C206116	• EPB dose not operate or operates abnormally	Not come on
C206117	• EPB dose not operate or operates abnormally	Not come on
C206210	• EPB dose not operate or operates abnormally	Not come on
C206310	• EPB dose not operate or operates abnormally	Not come on
C206410	• EPB dose not operate or operates abnormally	Not come on
C206510	• EPB dose not operate or operates abnormally	Not come on
C206610	• EPB dose not operate or operates abnormally	Not come on
C206710	• EPB dose not operate or operates abnormally	Not come on
C206810	• EPB dose not operate or operates abnormally	Not come on

DTC No.	Fault symptom	Warning light/indicator
C206919	• EPB dose not operate or operates abnormally	Not come on
C206A10	• EPB dose not operate or operates abnormally	Not come on
C206B10	• EPB dose not operate or operates abnormally	Not come on
C206C10	• EPB dose not operate or operates abnormally	Not come on
C206D10	• EPB dose not operate or operates abnormally	Not come on
C206E10	• EPB dose not operate or operates abnormally	Not come on
C206F10	• EPB dose not operate or operates abnormally	Not come on
C207010	• EPB dose not operate or operates abnormally	Not come on
C207110	• EPB dose not operate or operates abnormally	Not come on
C207210	• EPB dose not operate or operates abnormally	Not come on
C207310	• EPB dose not operate or operates abnormally	Not come on
C207710	• EPB dose not operate or operates abnormally	Not come on
C207810	• EPB dose not operate or operates abnormally	Not come on
C207910	• EPB dose not operate or operates abnormally	Not come on
C207A10	• EPB dose not operate or operates abnormally	Not come on
C207B10	• EPB dose not operate or operates abnormally	Not come on
C207C10	• EPB dose not operate or operates abnormally	Not come on
C207D10	• EPB dose not operate or operates abnormally	Not come on
C207E10	• EPB dose not operate or operates abnormally	Not come on
C208011	• EPB dose not operate or operates abnormally	Not come on
C200100	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C200200	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on

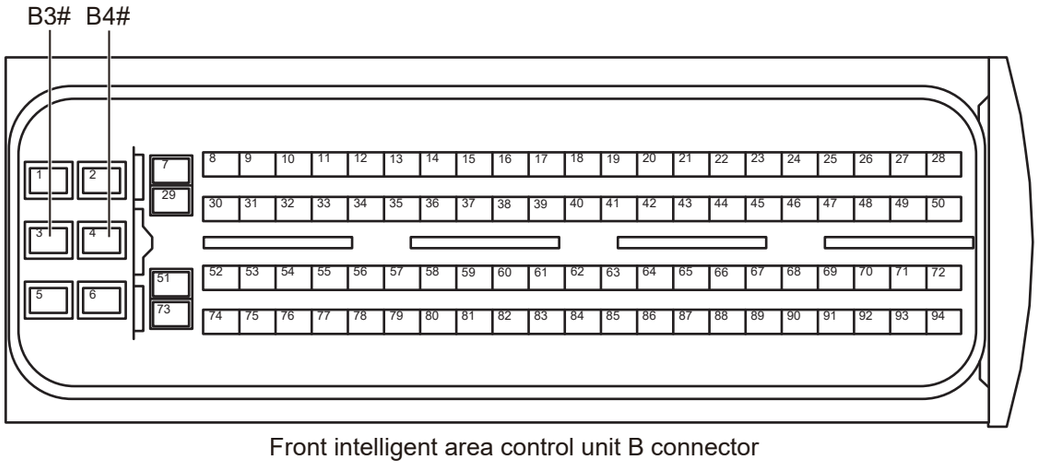
DTC No.	Fault symptom	Warning light/indicator
C200300	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C200400	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C200500	• No	Not come on
C200600	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C200700	• No	Not come on
C200A00	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C200B00	• All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	Not come on
C201100	• No	Not come on
C201400	• No	Not come on
C208111	• EPB dose not operate or operates abnormally	Not come on
C208211	• EPB dose not operate or operates abnormally	Not come on
C208311	• EPB dose not operate or operates abnormally	Not come on
C208411	• EPB dose not operate or operates abnormally	Not come on

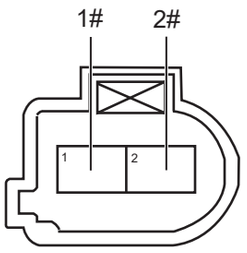
Circuit diagram



Inspection procedure

1	**Check for open in rear left brake caliper wire harness and connector**





Rear left brake caliper connector

PC01300RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the rear left brake caliper connector.

(e) According to value in the table, measure resistance.

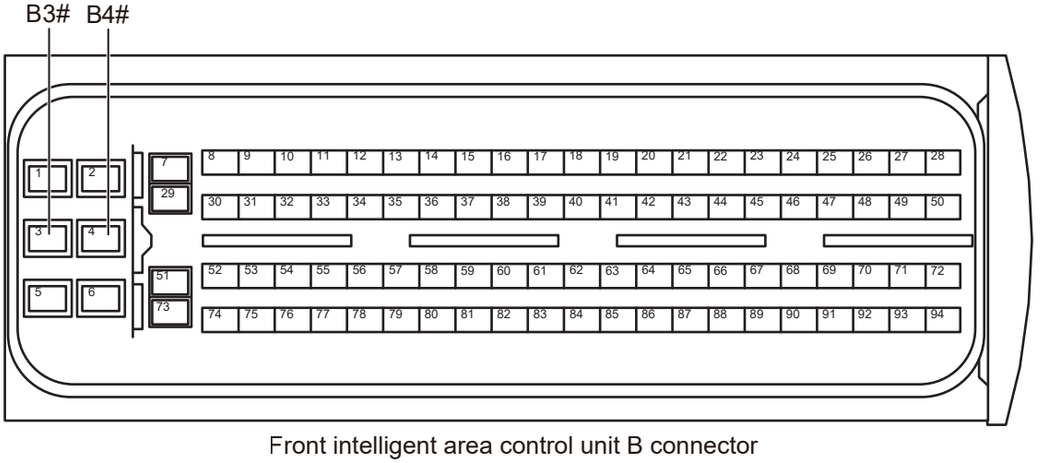
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left brake caliper connector 1# - front intelligent area control unit connector B3#	Always connected	Less than 1 Ω
Rear left brake caliper connector 2# - front intelligent area control unit connector B4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left brake caliper wire harness and connector**



Front intelligent area control unit B connector

PC01291RM

(a) According to value in the table, measure resistance.

Standard value

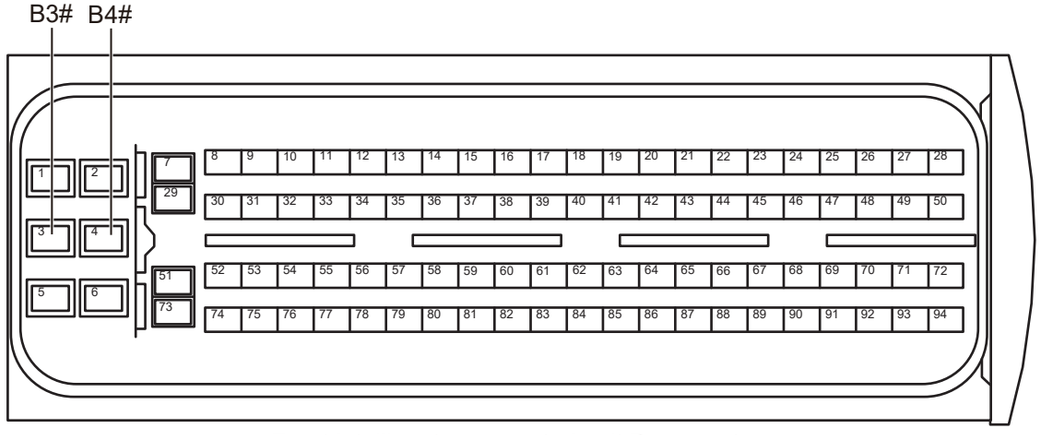
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B3# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in rear left brake caliper wire harness and connector**



Front intelligent area control unit B connector

PC01291RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace rear left brake caliper (See page DP-17)**

(a) Replace the rear left brake caliper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	**C200800**	**EPB - abnormal voltage during operation - left**
DTC	**C200C00**	**EPB - power supply voltage too low - left**
DTC	**C200D00**	**EPB - power supply voltage too high - left**

Description

When EPB power supply is abnormal, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C200800	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• During EPB operation, the voltage is too high or too low, the voltage is less than 8.5 V or more than 16.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear left brake caliper • Front intelligent area control unit
C200C00	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• The voltage drops below 8.5 V for a certain period of time; the voltage is below 8.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear left brake caliper • Front intelligent area control unit
C200D00	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• The voltage exceeds 16.5 V for a certain period of time; the voltage is above 16.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear left brake caliper • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C200800	• No	Not come on
C200C00	• All functions prohibition	Not come on
C200D00	• All functions prohibition	Not come on

Inspection procedure

1	Check low voltage battery

(a) Check if voltage of low voltage battery is normal.

NG → **Perform repair according to malfunction**

OK

2	Check rear left brake caliper wire harness and connector

(a) Check if rear left brake caliper wire harness and connector are damaged.

(b) Check for short or open in rear left brake caliper wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace rear left brake caliper (See page DP-17)

(a) Replace the rear left brake caliper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	C200900	EPB - maintenance mode - left

Description

When EPB is in service mode, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C200900	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) with ALS configurati-on& PDC Not in OTA Mode	• Enter the maintenan-ce mode, and calipers on both side are fully released to the end	1	Event-based	10 ms	• Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C200900	• Prohibition for all functions except diagnostic service	Not come on

Inspection procedure

1	**Exit maintenance mode through diagnostic service**

DTC	**C201000**	**EPB - abnormal power off - left**

Description

When EPB abnormal power off fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C201000	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• Abnormal power off signal triggering	1	Event-based	10 ms	• Vehicle power supply

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C201000	• No	Not come on

Inspection procedure

1	**Check vehicle power supply system**

DTC	**C201200**	**EPB - excessive gradient - left**

Description

When excessive road gradient is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C201200	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) with ALS configurati-on& PDC Not in OTA Mode	• The caliper is in a clamped state and the vehicle is stationary, the slope sensor detects that the slope is greater than 30%	1	Event-based	10 ms	• Repair is unnecessary

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C201200	• No	Not come on

Inspection procedure

1	**Repair is unnecessary**

DTC C201300 EPB - configuration code error - left

Description

ZD When EPB configuration code error is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C201300	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) with ALS configurati-on& PDC Not in OTA Mode	• -	1	Event-based	10 ms	• Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C201300	• No	Not come on

Inspection procedure

1	**Rewrite configuration code**

DTC C211800 Low power supply voltage (SR power grid)

DTC	C211900	Power supply overvoltage (SR power grid)
DTC	C211A00	Low power supply voltage (QM power grid)
DTC	C211B00	Power supply overvoltage (QM power grid)

Description

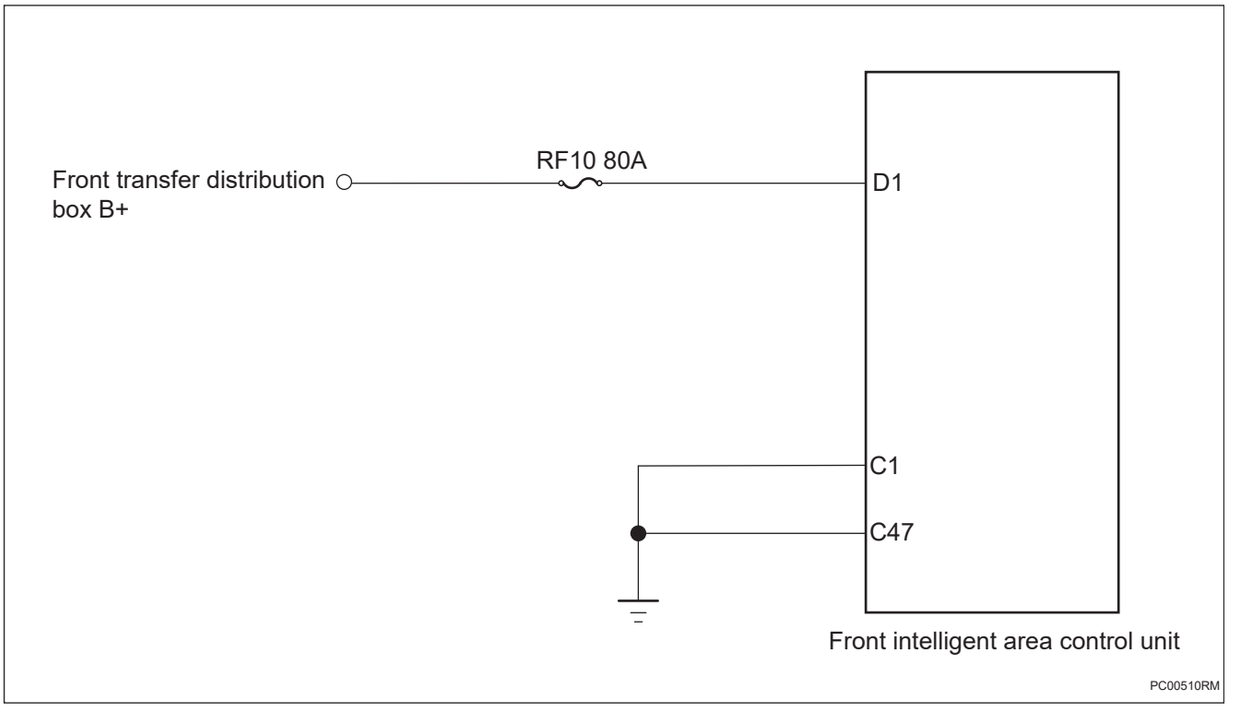
When power supply voltage (SR or QM power) of front intelligent area control unit is too high or too low, the front intelligent driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C211800	• PDC wakeup & PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system
C211900	• PDC wakeup & PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system
C211A00	• PDC wakeup & PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system
C211B00	• PDC wakeup & PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Front intelligent area control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C211800	• ECU communication function is limited, IO function is limited	Not come on
C211900	• ECU communication function is limited, IO function is limited	Not come on
C211A00	• ECU communication function is limited, IO function is limited	Not come on
C211B00	• ECU communication function is limited, IO function is limited	Not come on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 30 seconds, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

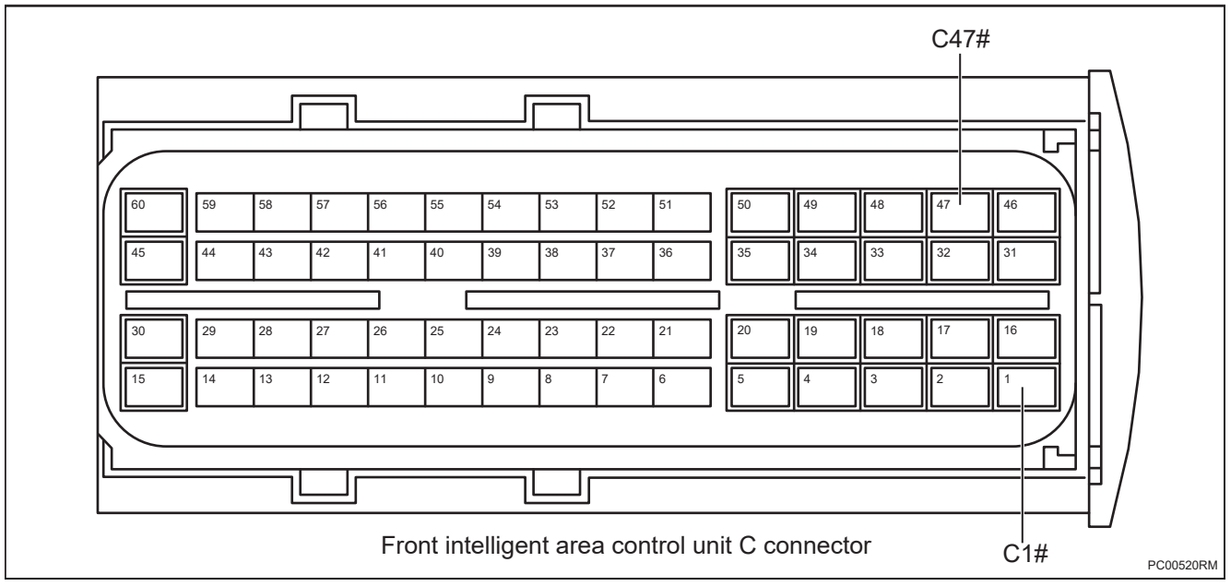
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	Battery voltage

NG → **Check and repair charging system**

OK

3	Check front intelligent area control unit ground



Front intelligent area control unit C connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) According to value in the table, measure resistance.

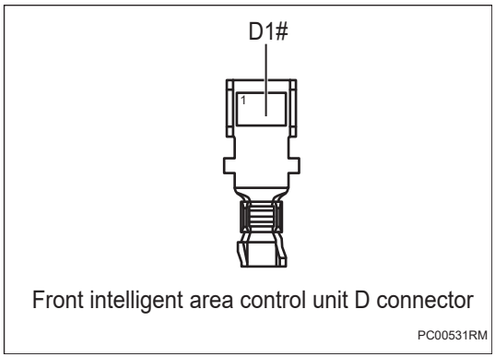
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check front intelligent area control unit power supply**



Front intelligent area control unit D connector

PC00531RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	P306B11	Short to ground fault in PT sensor/TXV power supply terminal

Description

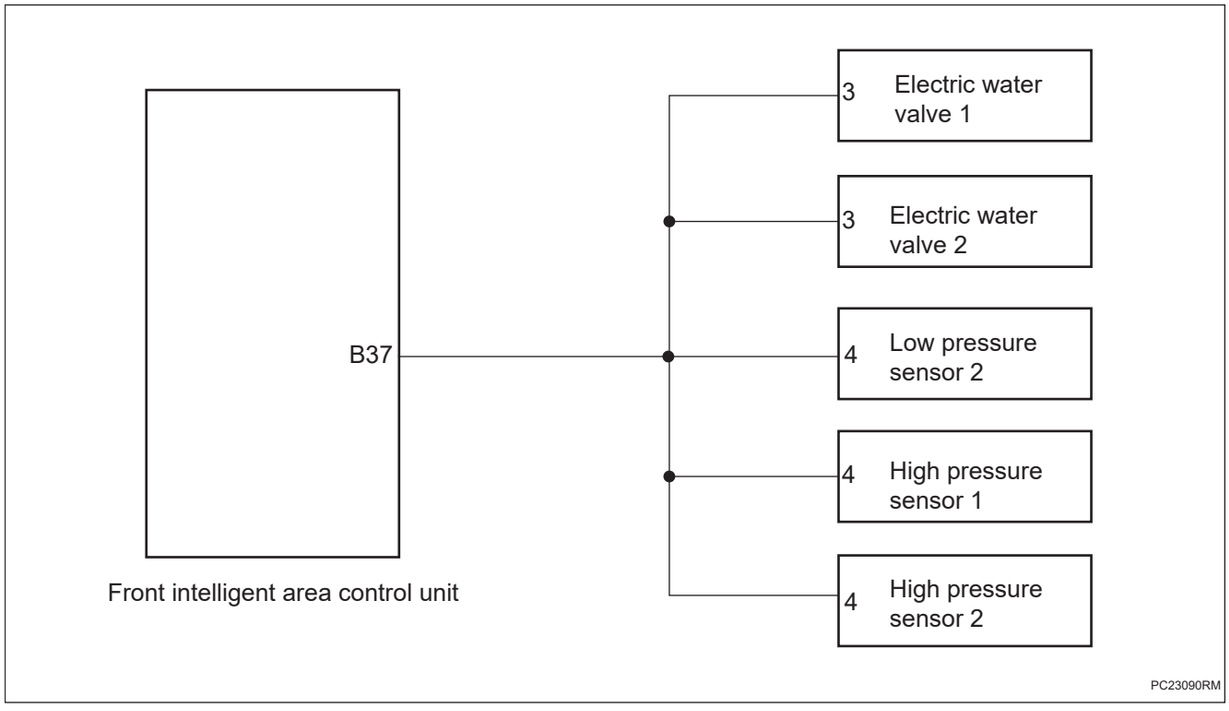
When there are short in high and low pressure sensor, electric water valve power supply circuit, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P306B11	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH20 short to GND	5	Event-based	10 ms	• Low pressure sensor • High pressure sensor • Electric water valve • Wire harness and connector • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P306B11	• PT sensor does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check high/low pressure sensor wire harness and connector**

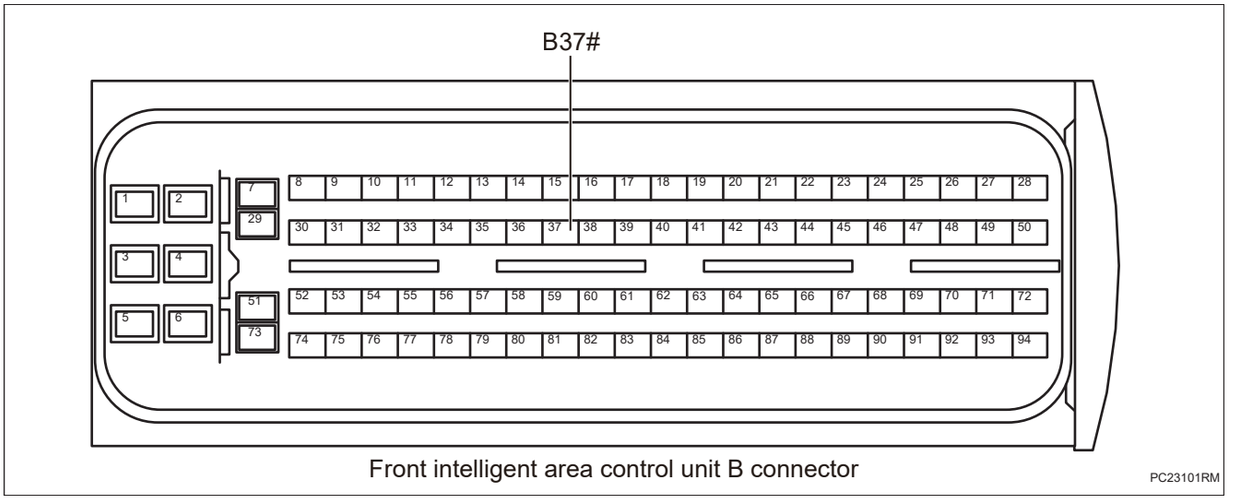
(a) Check if high/low pressure sensor wire harness and connector are damaged.

(b) Check if high/low pressure sensor wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in high/low pressure sensor wire harness and connector



Front intelligent area control unit B connector

PC23101RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the high/low pressure sensor connector.

(e) Disconnect the electric water valve connector.

(f) According to value in the table, measure resistance.

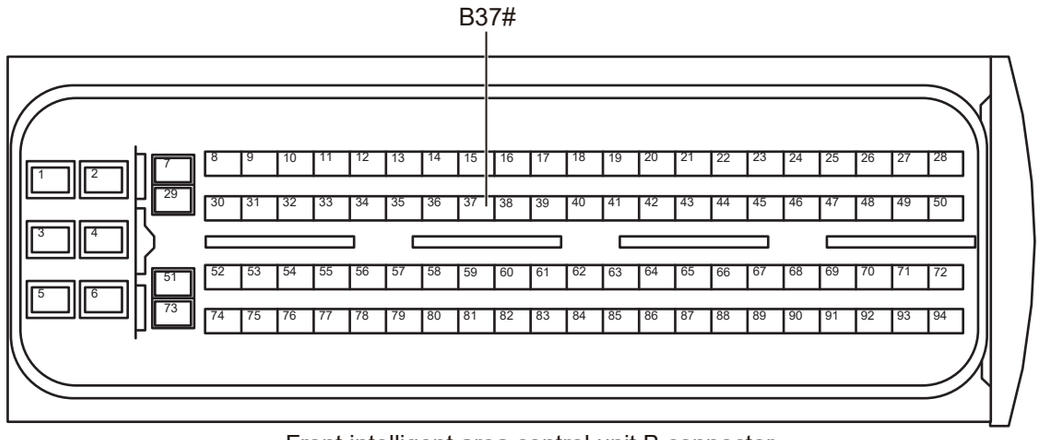
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B37# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in high/low pressure sensor wire harness and connector**



Front intelligent area control unit B connector

PC23101RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B37# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace high/low pressure sensor or electric water valve (See page RE-98)**

(a) Replace the high/low pressure sensor or electric water valve.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

ZD

Diagnosis ends

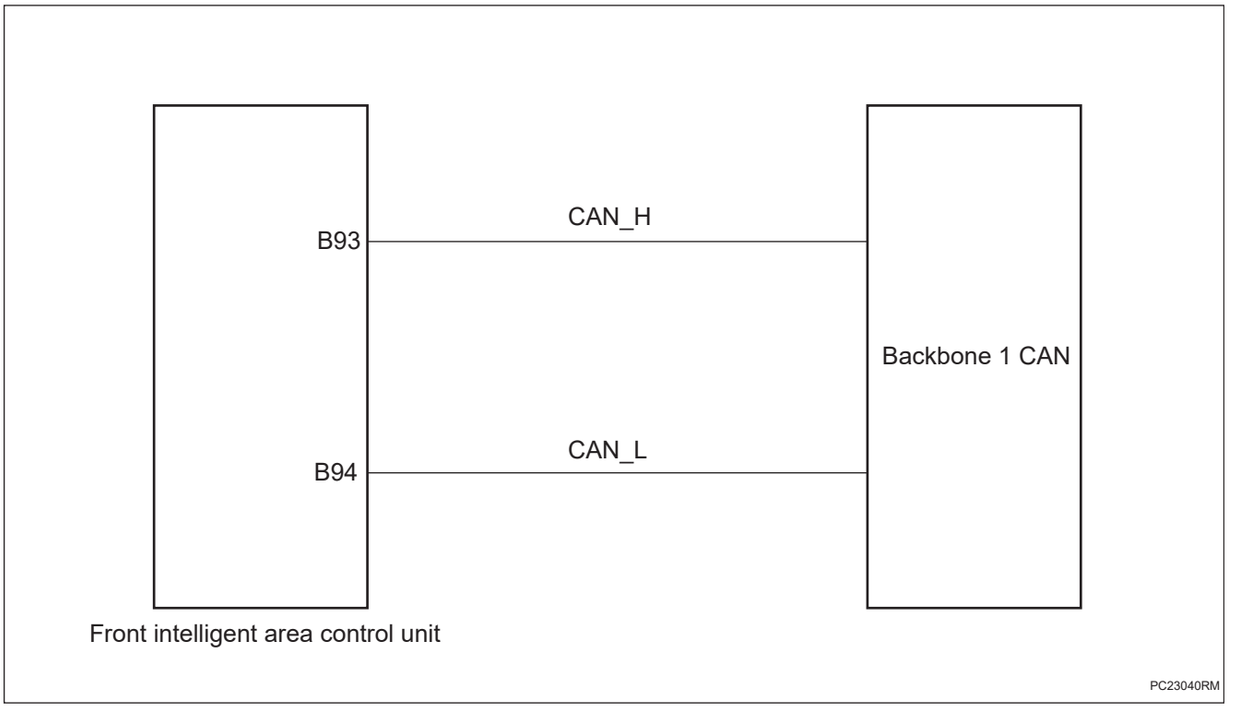
DTC	U008988	Backbone network 1 CAN bus off
DTC	U204688	Information CAN bus off
DTC	U006488	Chassis CAN bus off
DTC	U002888	Body/comfort CAN bus off
DTC	U205187	Backbone network 2 CAN bus off
DTC	U003788	Driving assist/extension CAN bus off

Description

When front intelligent area control unit detects CAN bus off fault, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U008988	(a) Backbone network 1 CAN bus off.	• CAN line and connector • Rear intelligent area control unit • Intelligent communication domain control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit • Middle intelligent area control unit
U204688	(a) Information CAN bus off.	• CAN line and connector • Front intelligent area control unit • Infotainment control unit • Power amplifier
U006488	(a) Chassis CAN bus off.	• CAN line and connector • Front intelligent area control unit • Integrated brake controller • Rear intelligent area control unit • Electric power steering control unit
U002888	(a) Body/comfort CAN bus off.	• CAN line and connector • Front intelligent area control unit • Front left combination light I • Front right combination light I
U205187	(a) Backbone network 2 CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U003788	(a) Driving assist/extension CAN bus off.	• CAN line and connector • Front intelligent area control unit • Advanced automatic driving controller • Smart camera

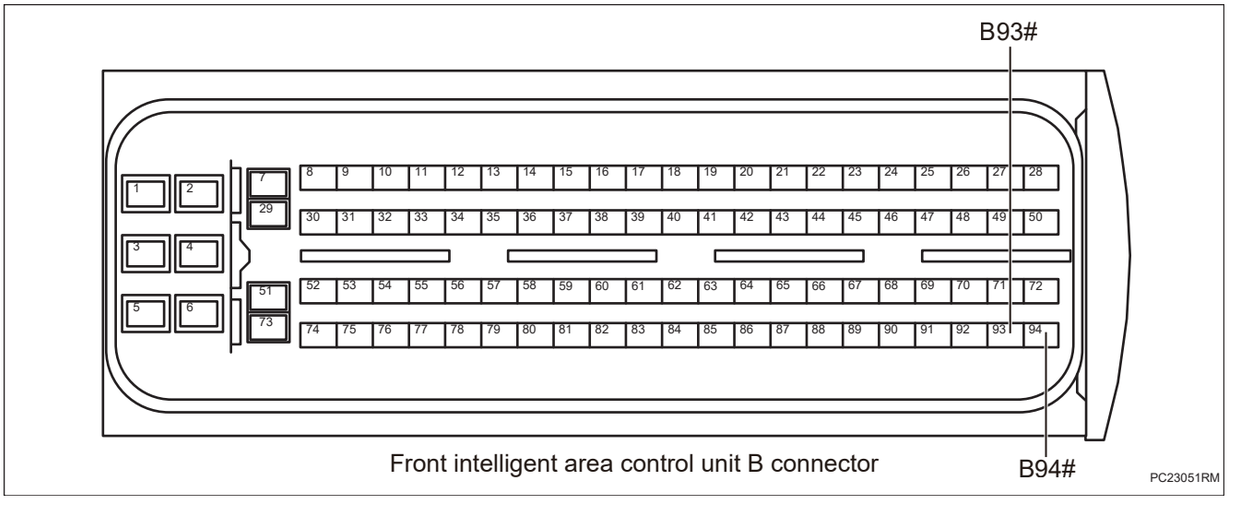
Circuit diagram



Inspection procedure

Note: Taking the U008988 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check backbone 1 CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B93# - front intelligent area control unit connector B94#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

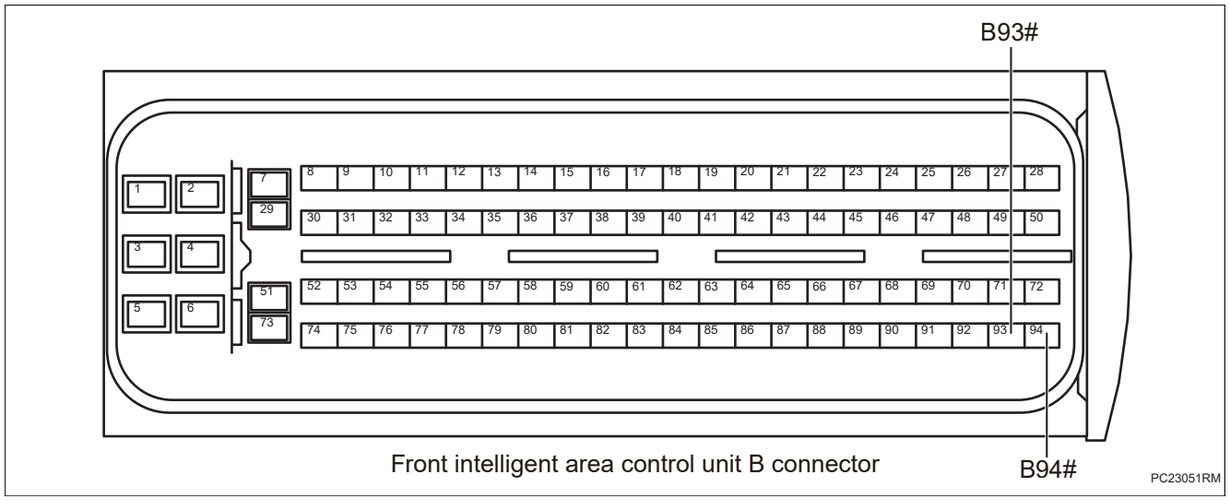
2	Check controllers on backbone 1 CAN bus

(a) Disconnect the controllers on the backbone 1 CAN bus one by one and check if the other controllers resume operating.

NG → **Perform repair according to malfunction**

OK

3	Check for short between backbone 1 CAN buses CAN-L and CAN-H



Front intelligent area control unit B connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

Standard value

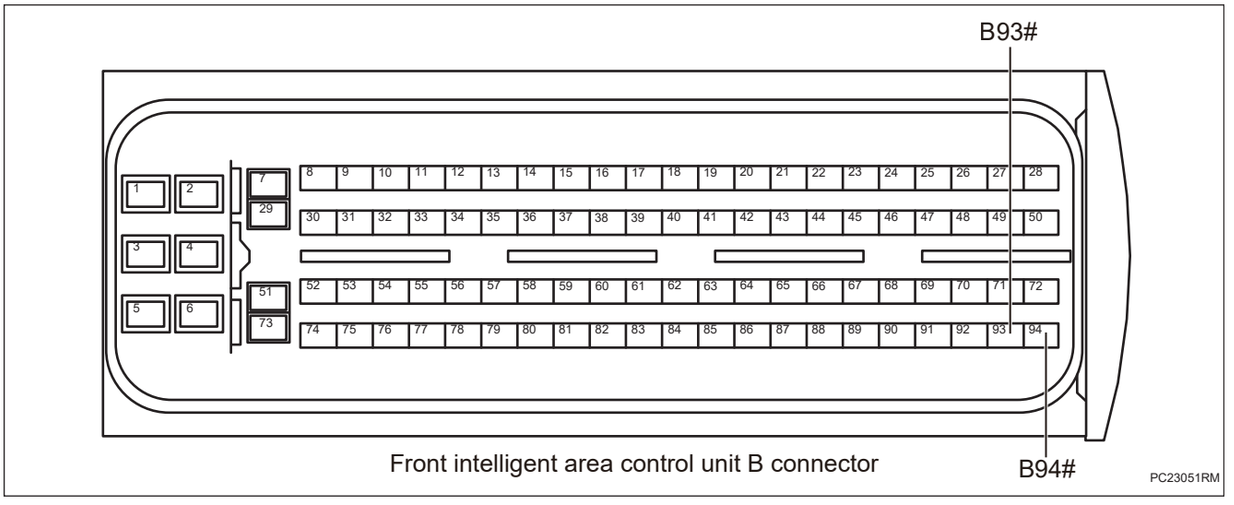
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B93# - front intelligent area control unit connector B94#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check for short to ground in backbone 1 CAN bus



Front intelligent area control unit B connector

(a) According to value in the table, measure resistance.

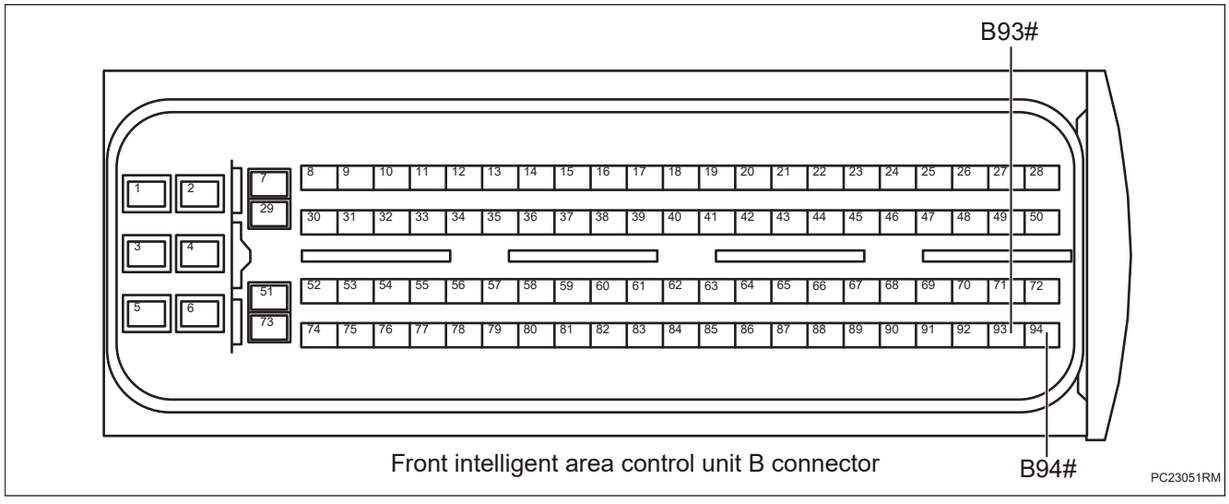
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B93# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B94# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in backbone 1 CAN bus**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B93# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B94# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

DTC	**U014C87**	**HAD/IFC node lost**
DTC	**U114787**	**PDCM node lost**
DTC	**U014887**	**PDCR node lost**
DTC	**U014B87**	**VDC397 node lost**
DTC	**U014A87**	**VDC821 node lost**
DTC	**U011B87**	**CSC node lost**
DTC	**U013187**	**Electric power steering control unit node lost**
DTC	**U012987**	**Integrated brake control unit node lost**
DTC	**U02E387**	**Front left light controller node lost**
DTC	**U01E387**	**Front right light controller node lost**

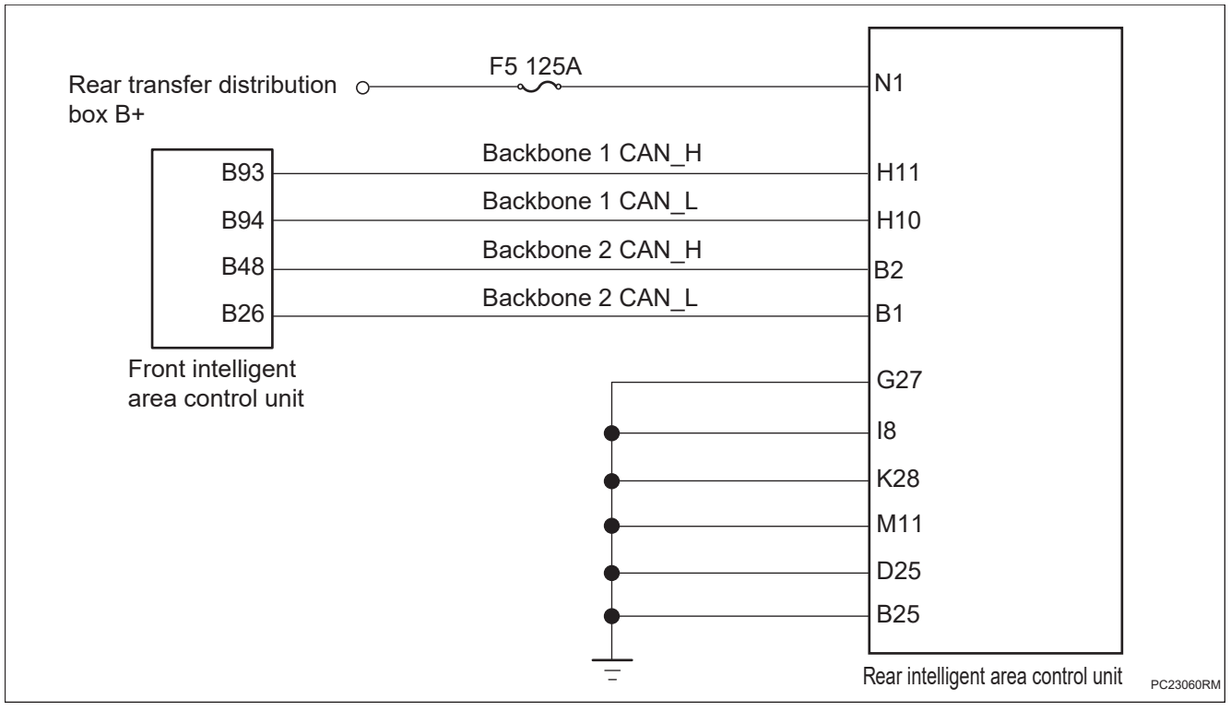
Description

When communication between front intelligent area control unit and other system is abnormal or interrupted, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014C87	(a) HAD/IFC node lost.	• Front intelligent area control unit • Advanced automatic driving controller • Wire harness and connector
U114787	(a) PDCM node lost.	• Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector
U014887	(a) PDCR node lost.	• Front intelligent area control unit • Rear intelligent area control unit • Wire harness and connector
U014B87	(a) VDC397 node lost.	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector
U014A87	(a) VDC821 node lost.	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector
U011B87	(a) CSC node lost.	• Front intelligent area control unit • Infotainment control unit • Wire harness and connector

DTC No.	DTC detection condition	Faulty area
U02E387	(a) Front left light controller node lost.	• Front intelligent area control unit • Front left combination light I • Front right combination light I • Wire harness and connector
U01E387	(a) Front right light controller node lost.	• Front intelligent area control unit • Front left combination light I • Front right combination light I • Wire harness and connector

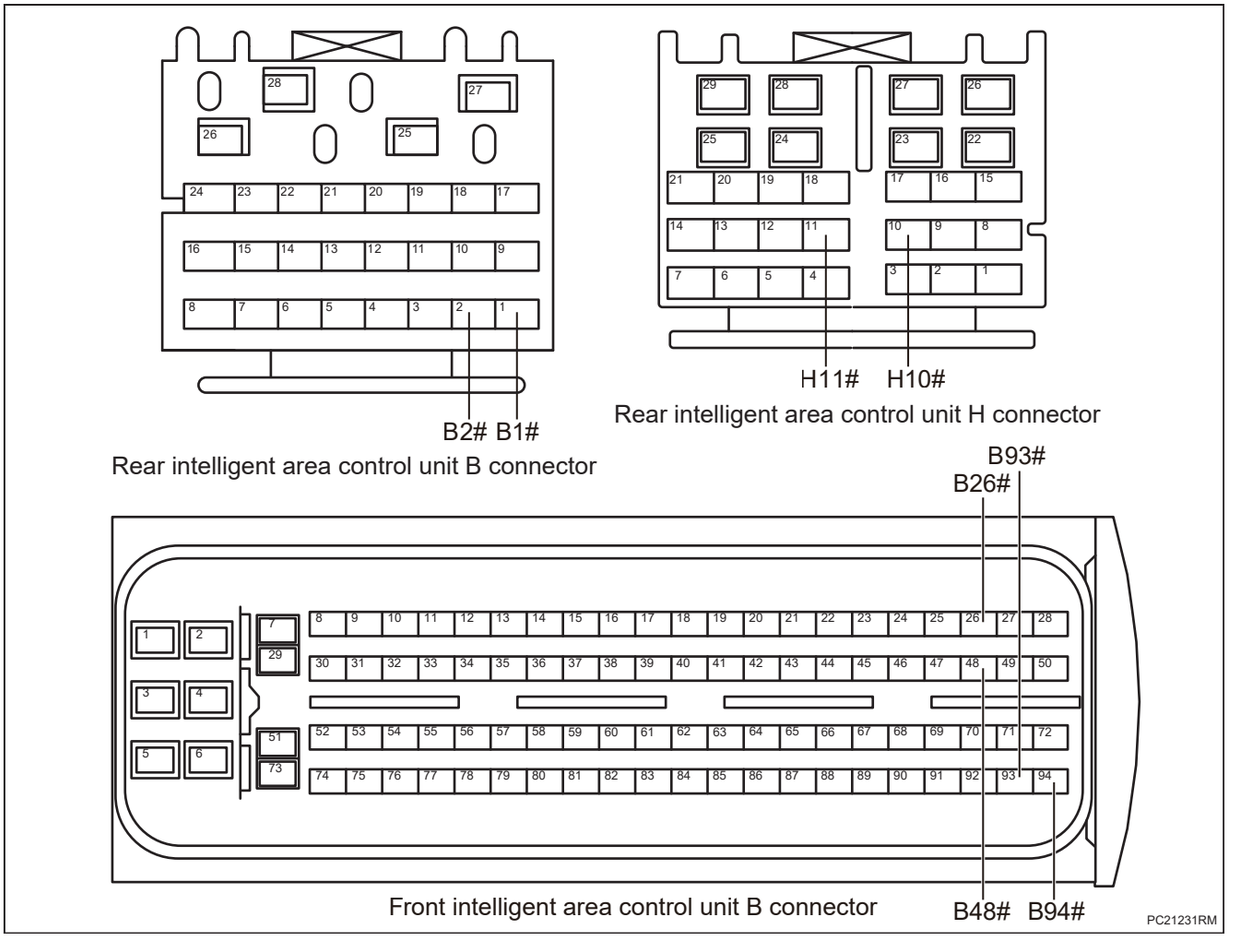
Circuit diagram



Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (front intelligent area control unit - rear intelligent area control unit)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 and 2 CAN bus.

(d) According to value in the table, measure resistance.

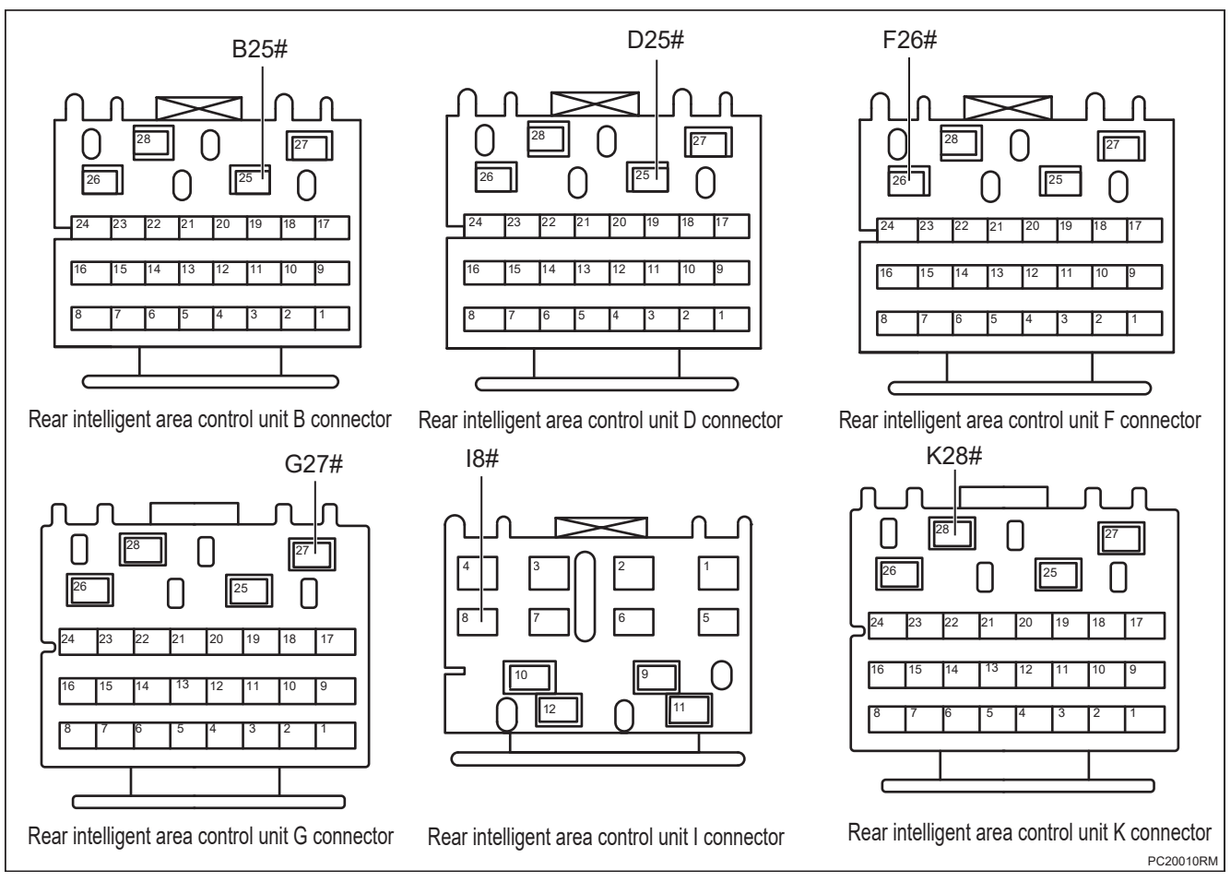
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H11# - front intelligent area control unit connector B93#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector H10# - front intelligent area control unit connector B94#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B2# - front intelligent area control unit connector B48#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B1# - front intelligent area control unit connector B26#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear intelligent area control unit ground**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G27# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector I8# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector F26# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B25# - body ground	Always connected	Less than 1 Ω

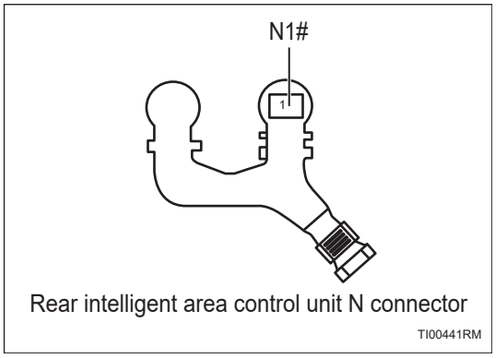
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K28# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D25# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK →

3	Check rear intelligent area control unit power supply



Rear intelligent area control unit N connector

TI00441RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

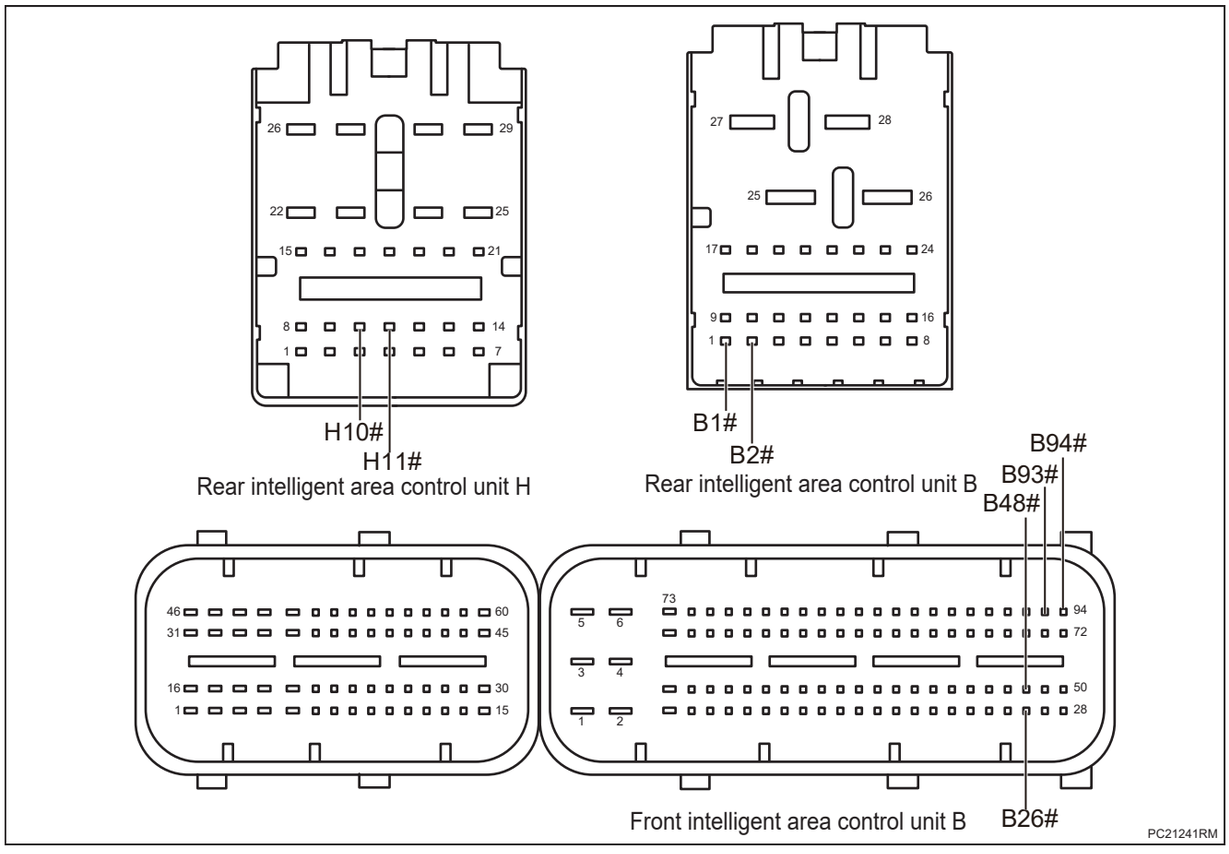
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector N1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK →

4	**Check backbone 1 and 2 CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit B26# - front intelligent area control unit B48#	Always connected	Approximately 120 Ω
Front intelligent area control unit B93# - front intelligent area control unit B94#	Always connected	Approximately 120 Ω
Rear intelligent area control unit B1# - rear intelligent area control unit B2#	Always connected	Approximately 120 Ω
Rear intelligent area control unit H10# - rear intelligent area control unit H11#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

ZD

Diagnosis ends

DTC	U14628A	PDCF backbone network Eth1 connection establishment failure

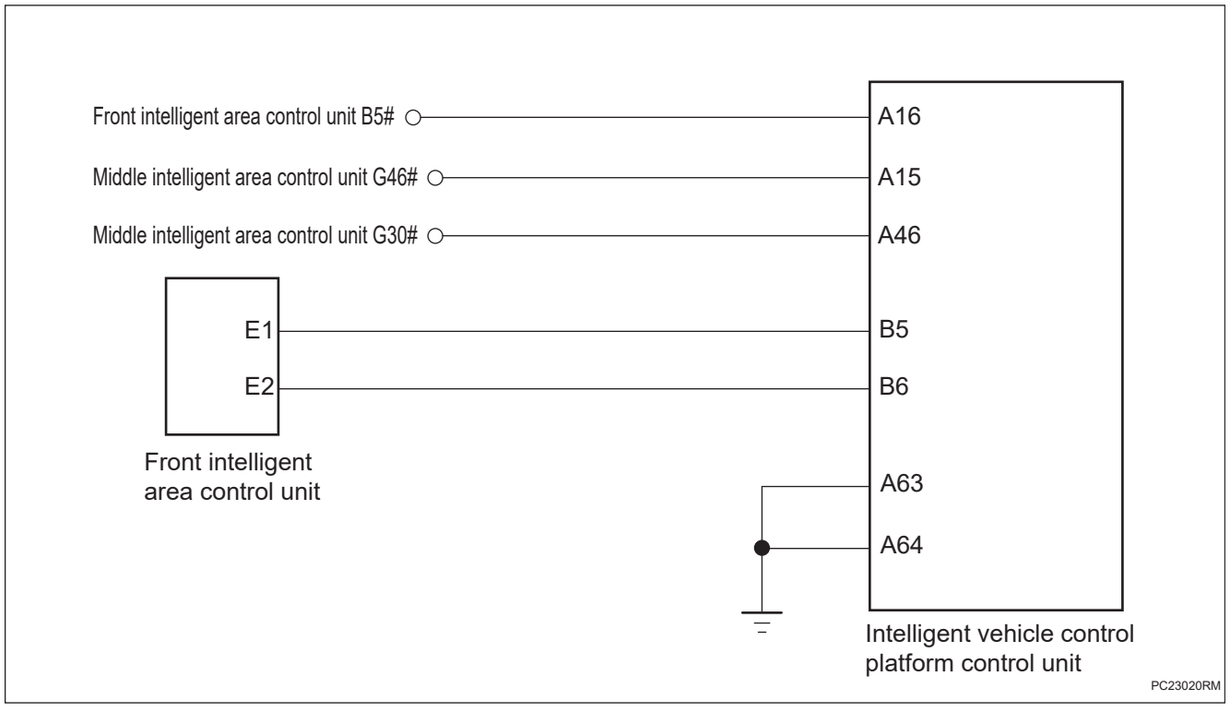
ZD

Description

When Ethernet communication between front intelligent area control unit and intelligent vehicle control platform control unit is abnormal or interrupted, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U14628A	(a) Backbone network Eth1 connection establishment failure.	• Front intelligent area control unit • Intelligent vehicle control platform control unit • Ethernet wire and connector

Circuit diagram



Inspection procedure

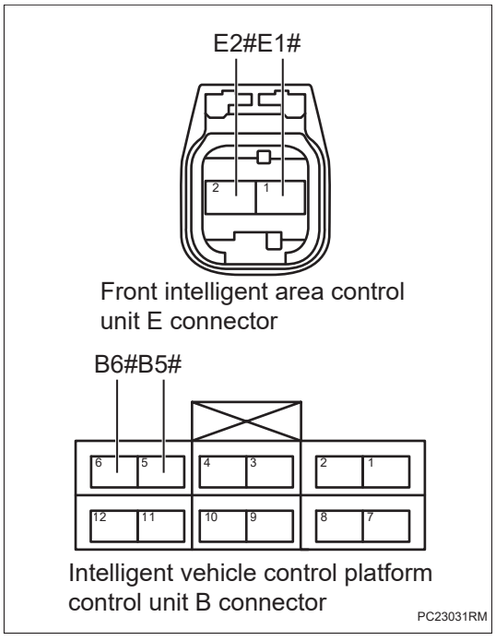
1	**Check Ethernet**

(a) Check for electrical or electromagnetic interference in Ethernet.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in Ethernet circuit (front intelligent area control unit - intelligent vehicle control platform control unit)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

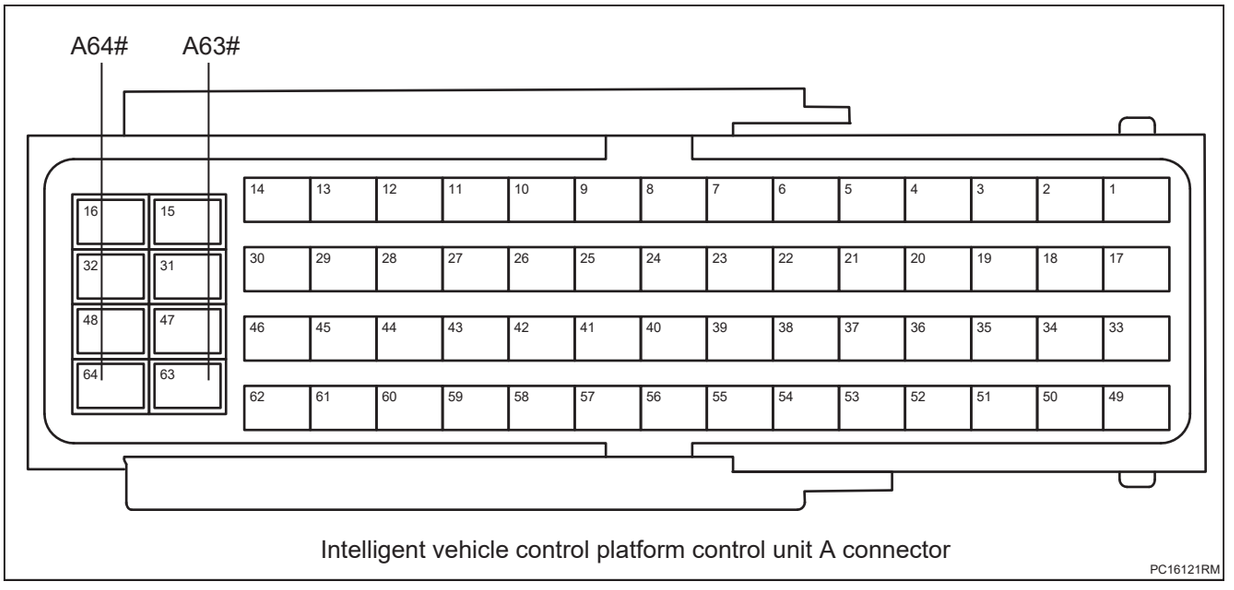
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector B5# - front intelligent area control unit connector E1#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector B6# - front intelligent area control unit connector E2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check intelligent vehicle control platform control unit ground



Intelligent vehicle control platform control unit A connector

PC16121RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

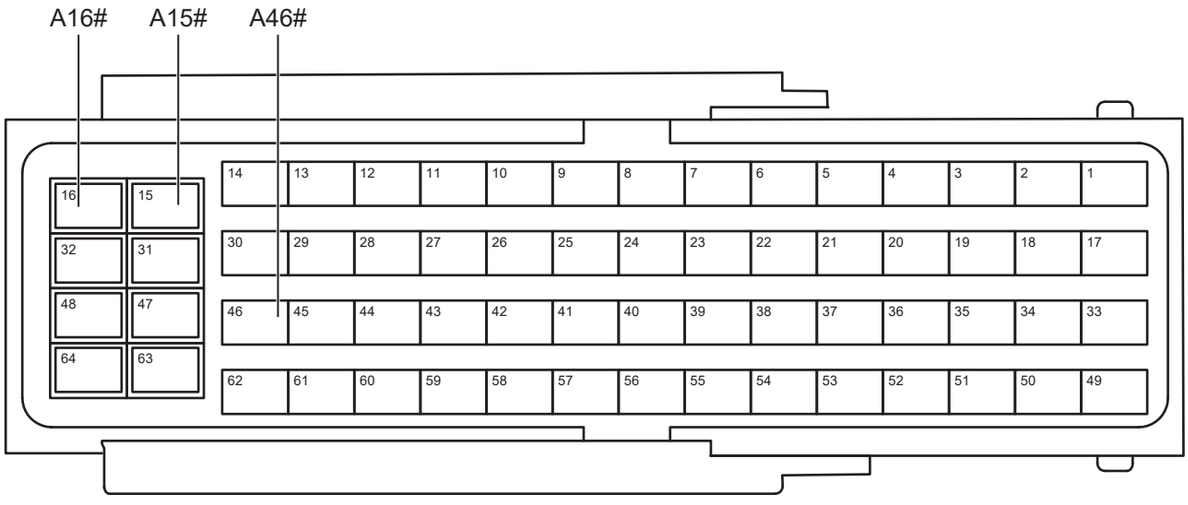
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check intelligent vehicle control platform control unit power supply**



Intelligent vehicle control platform control unit A connector

PC16131RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	Battery voltage
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	Battery voltage
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check the front, front intelligent area control unit power supply and ground and confirm whether the front, front intelligent area control unit are damaged)**

ZD

OK

5	Replace intelligent vehicle control platform control unit (See page ZC-154)

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B200900	Motor fault

Description

When there is fault in front combination light motor, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B200900	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) with ALS configurati-on& PDC Not in OTA Mode	• Motor fault signal timeout/ invalid initial value/ reported fault is detected, that is, Timeout Fail = 0x01, or CAN Invalid Initial Value is not 0, or ALS _ Motor Fault _ FR _ enum is not	3 times in a row	Event-based	5 s	• Front combination light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B200900	• During power on, it is detected that motor fault signal times out/initial value is invalid/a fault is reported	Not come on

Inspection procedure

1	**Check and repair front combination light**

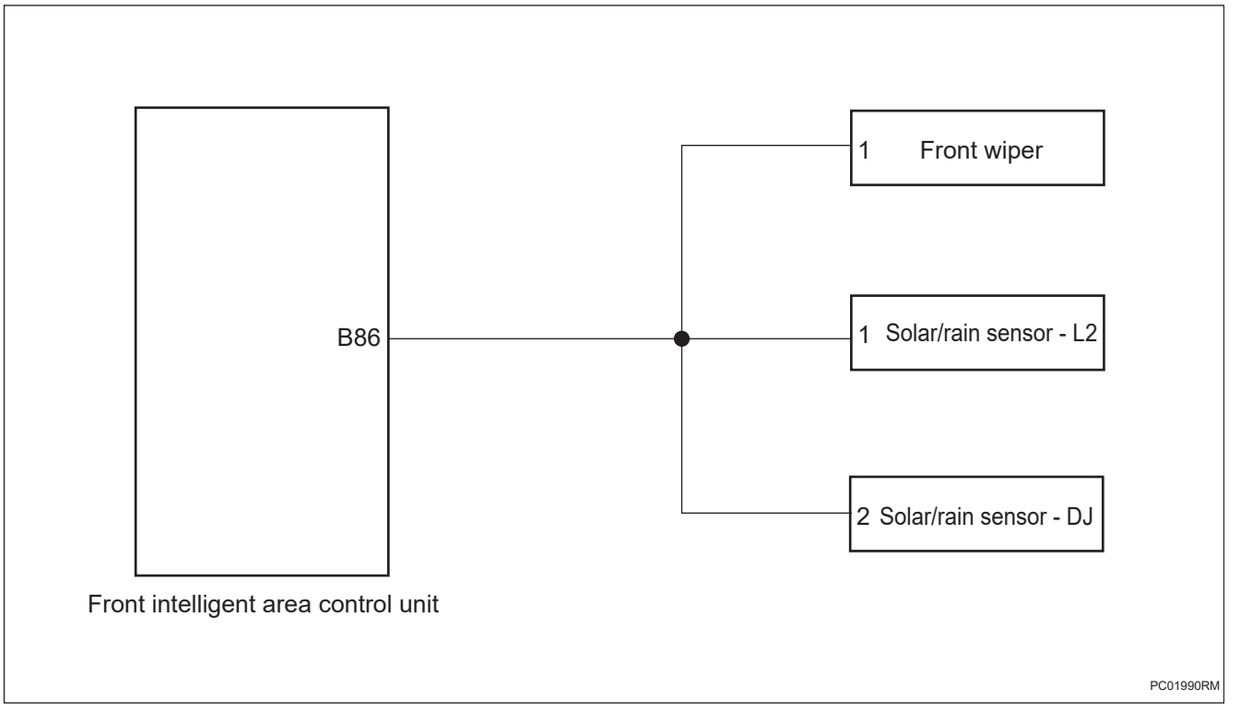
DTC U103A88 LIN4 physical bus error (TM_LIN2)

Description

When LIN4 bus has error, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U103A88	(a) LIN4 physical bus error (TM_LIN2).	• Front intelligent area control unit • Wire harness and connector • Front wiper • Solar/rain sensor-L2 • Solar/rain sensor-DJ

Circuit diagram



ZD

Inspection procedure

1	**Check if LIN4 wire harness and connector are short to each other**

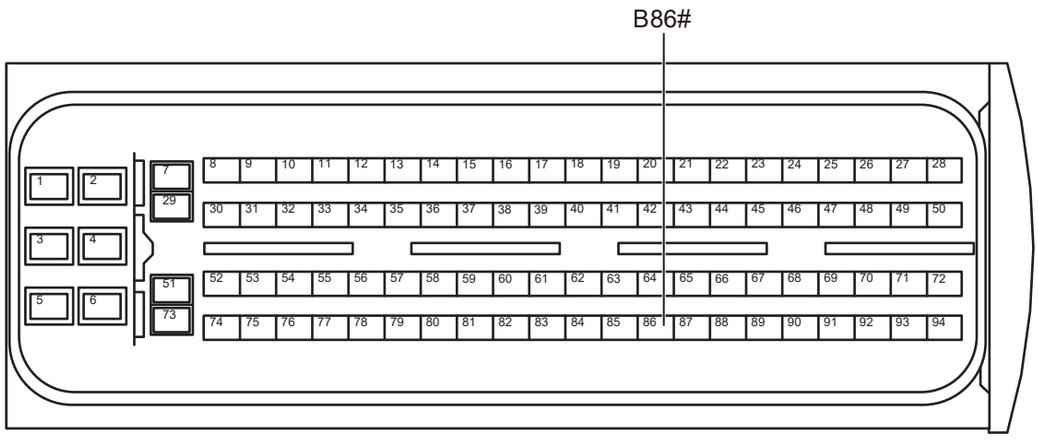
(a) Check if LIN4 wire harness and connector are short to each other.

(b) Check if LIN4 wire harness and connector are damaged.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in LIN4 wire harness and connector



Front intelligent area control unit B connector

PC00631RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect connectors of all controllers on LIN4.

(e) According to value in the table, measure resistance.

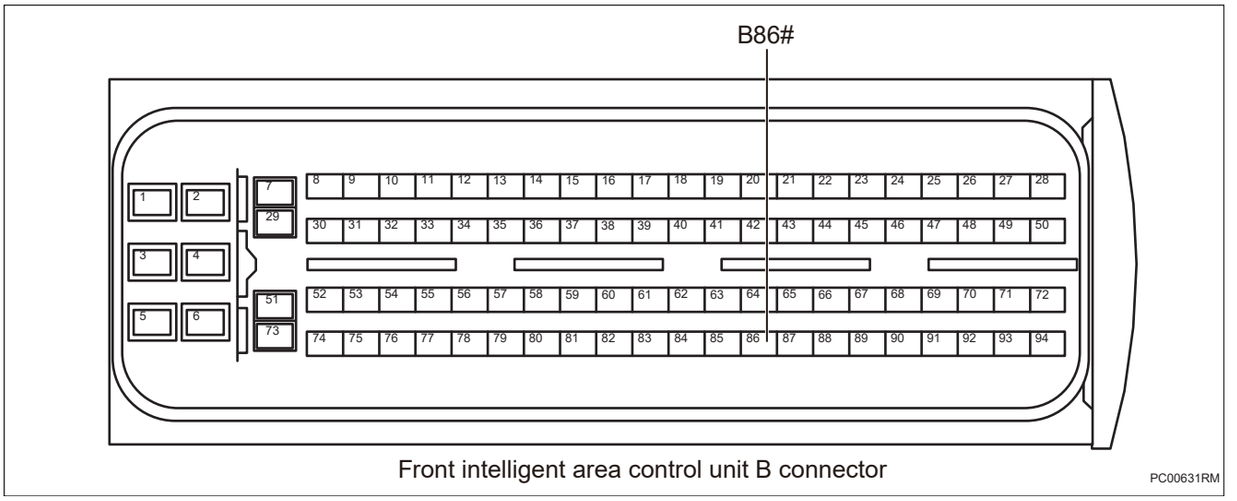
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in LIN4 wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace controllers on LIN4**

(a) Replace controllers on LIN4, and troubleshoot in turn.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B203911	Short to ground in front combination light driver 2 assembly (right) - power supply

Description

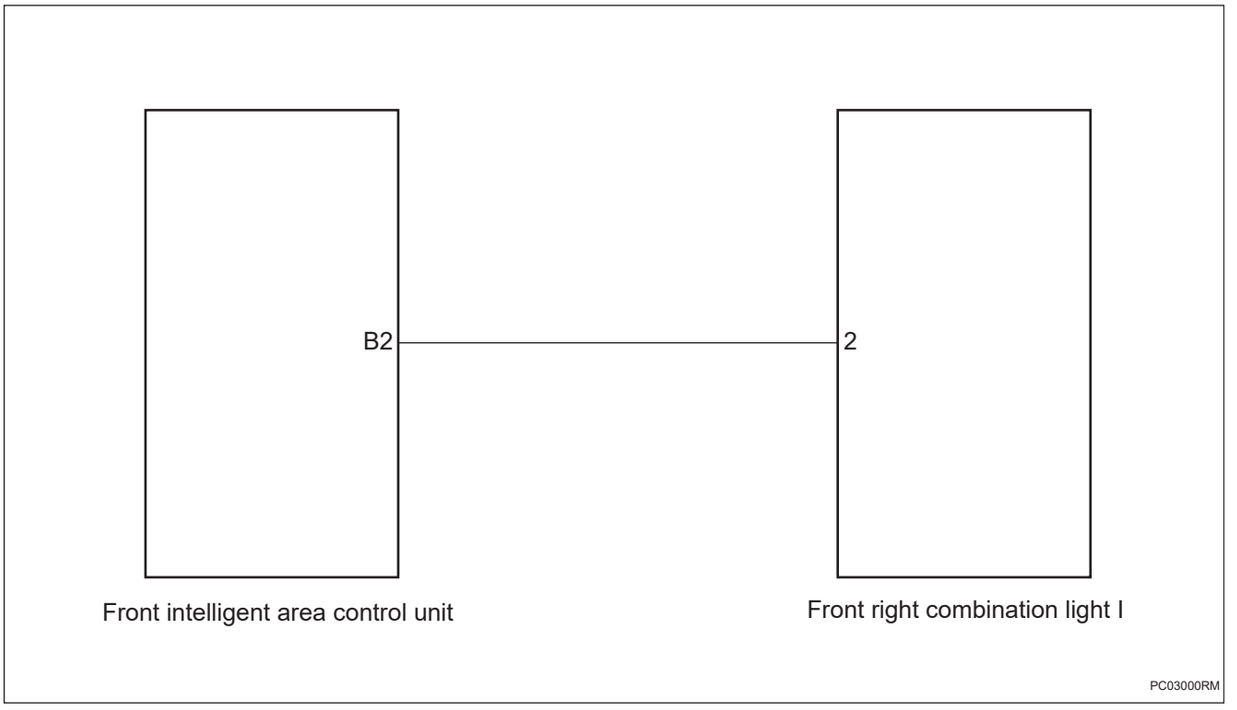
When front right combination light I power supply circuit is short, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B203911	• Diagnostic voltage range. (9 V - 16 V) & PDC Not in OTA Mode	• ODH36 short to GND	5	Event-based	10 ms	• Front right combination light I • Wire harness and connector • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B203911	• Front combination light driver 2 assembly (left) does not operate or operates abnormally	Not come on

Circuit diagram



Inspection procedure

1	**Check front right combination light I wire harness and connector**

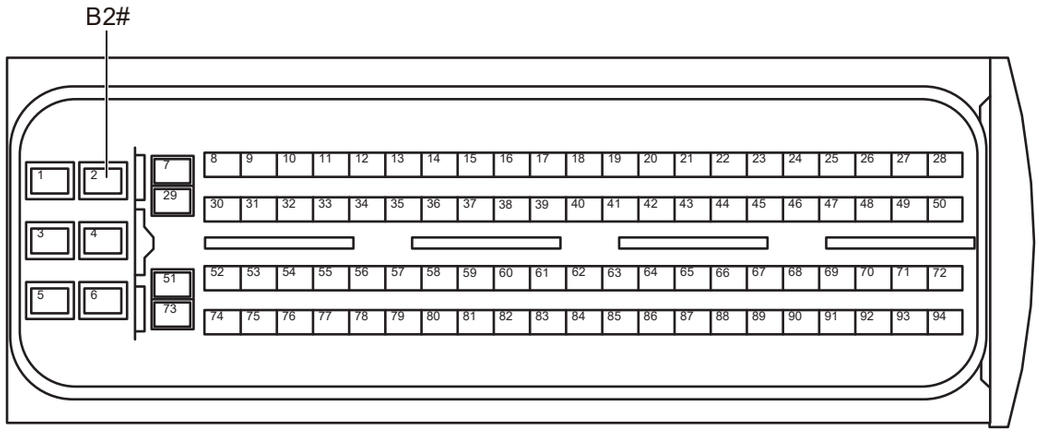
(a) Check if front right combination light I wire harness and connector are damaged.

(b) Check for short to each other in front right combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front right combination light I wire harness and connector**



Front intelligent area control unit B connector

PC03011RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the front right combination light I connector.

(e) According to value in the table, measure resistance.

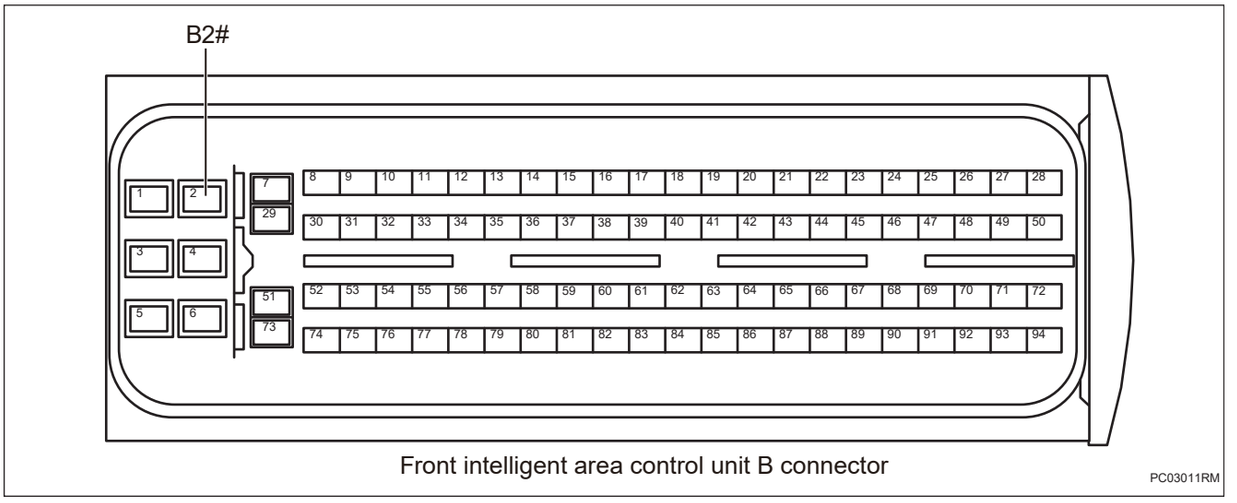
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in front right combination light I wire harness and connector



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace front right combination light I (See page ZC-18)

(a) Replace the front right combination light I.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

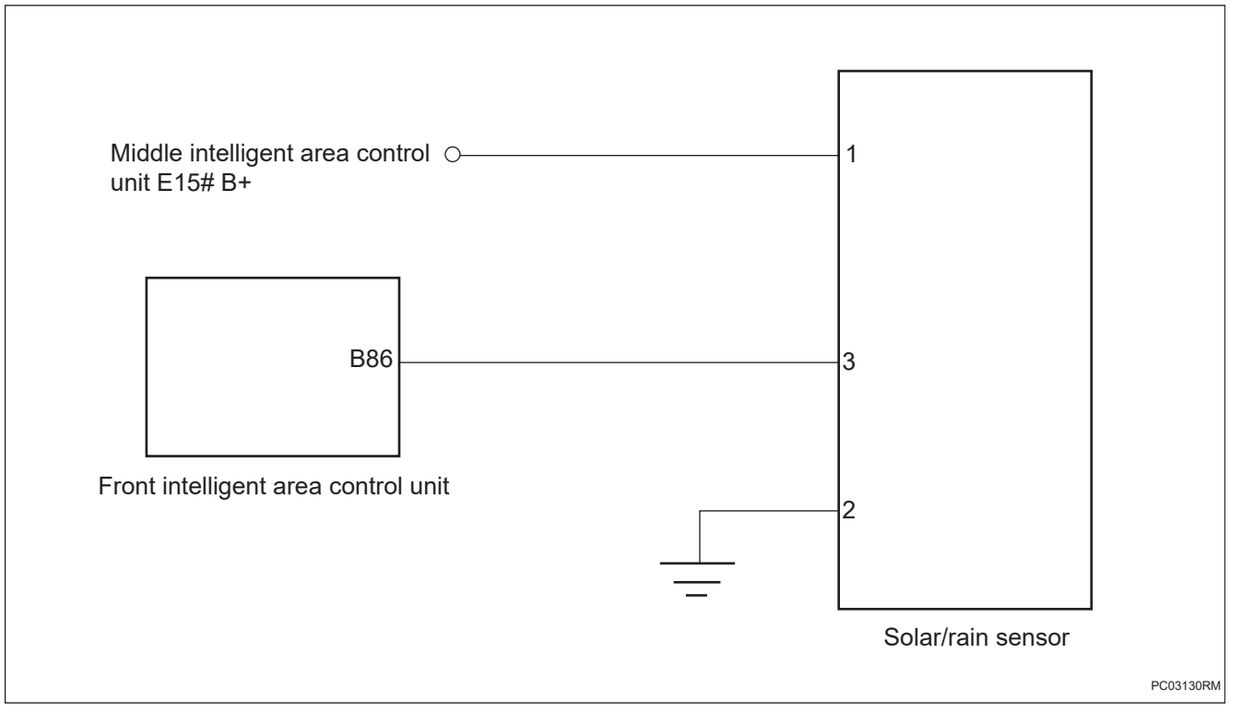
DTC	U023187	Solar/rain sensor node lost
DTC	U130086	Solar/rain sensor LIN communication error

Description

When solar/rain sensor LIN communication is abnormal, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U023187	(a) Solar/rain sensor node lost.	• Front intelligent area control unit • Wire harness and connector • Solar/rain sensor-DJ • Solar/rain sensor-L2
U130086	(a) Solar/rain sensor LIN communication error.	• Front intelligent area control unit • Wire harness and connector • Solar/rain sensor-DJ • Solar/rain sensor-L2

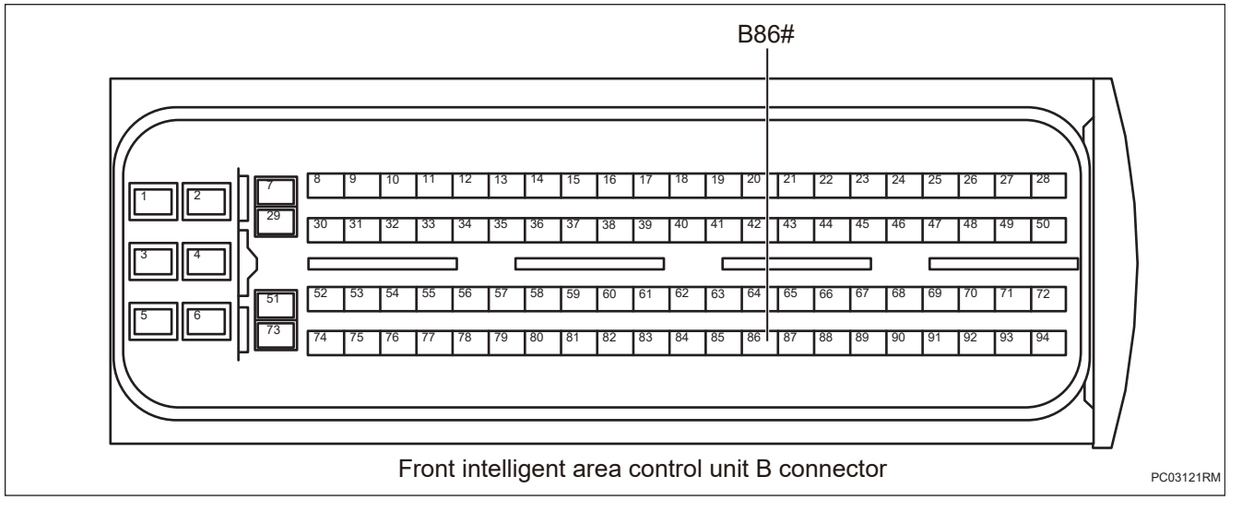
Circuit diagram

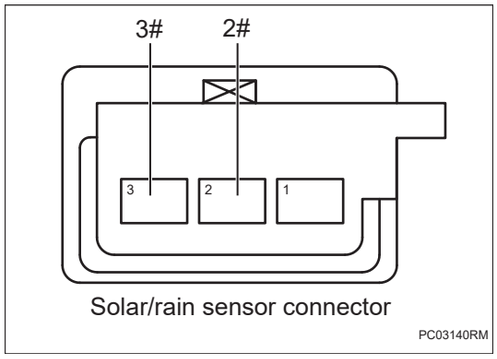


ZD

Inspection procedure

1	**Check for open in solar/rain sensor wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the solar/rain sensor connector.

(e) According to value in the table, measure resistance.

Standard value

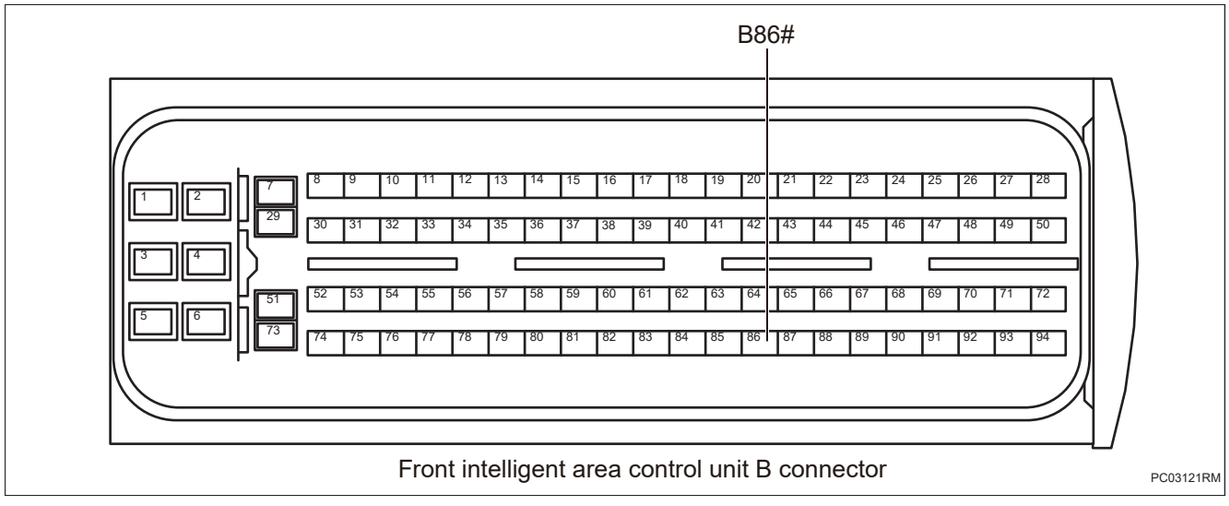
Multimeter connection	Detection condition	Specified condition
Solar/rain sensor connector 3# — Front intelligent area control unit connector B86#	Always connected	Less than 1 Ω
Solar/rain sensor connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in solar/rain sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

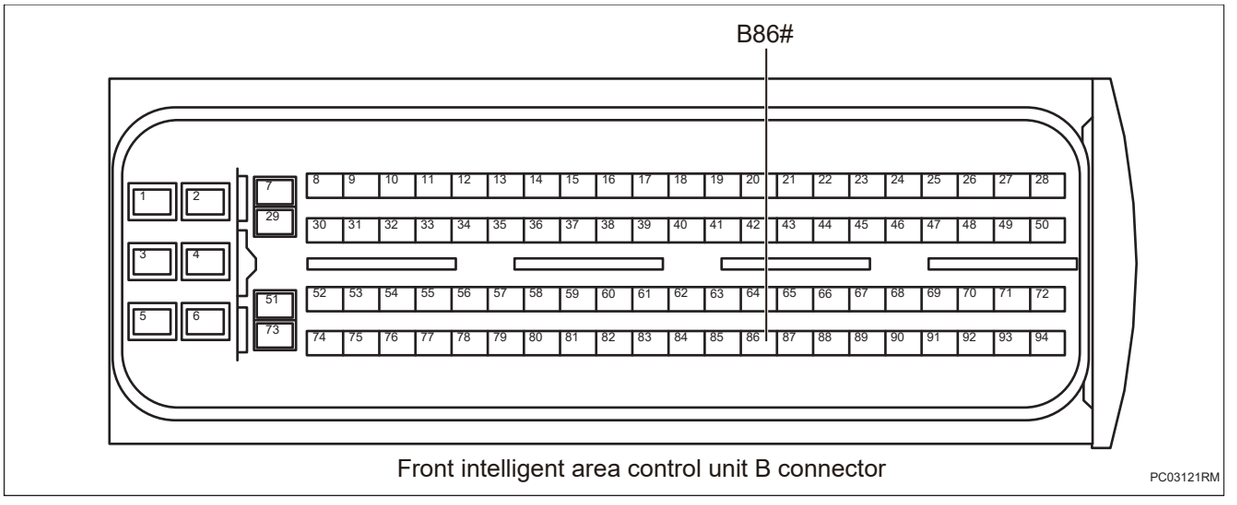
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to power supply in solar/rain sensor wire harness and connector



Front intelligent area control unit B connector

PC03121RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

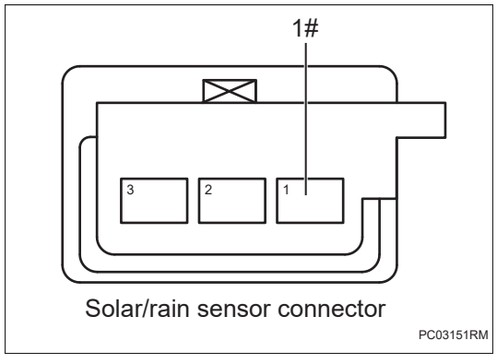
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B86# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check solar/rain sensor power supply**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Solar/rain sensor connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace solar/rain sensor (See page WS-54)**

(a) Replace the solar/rain sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

ZD

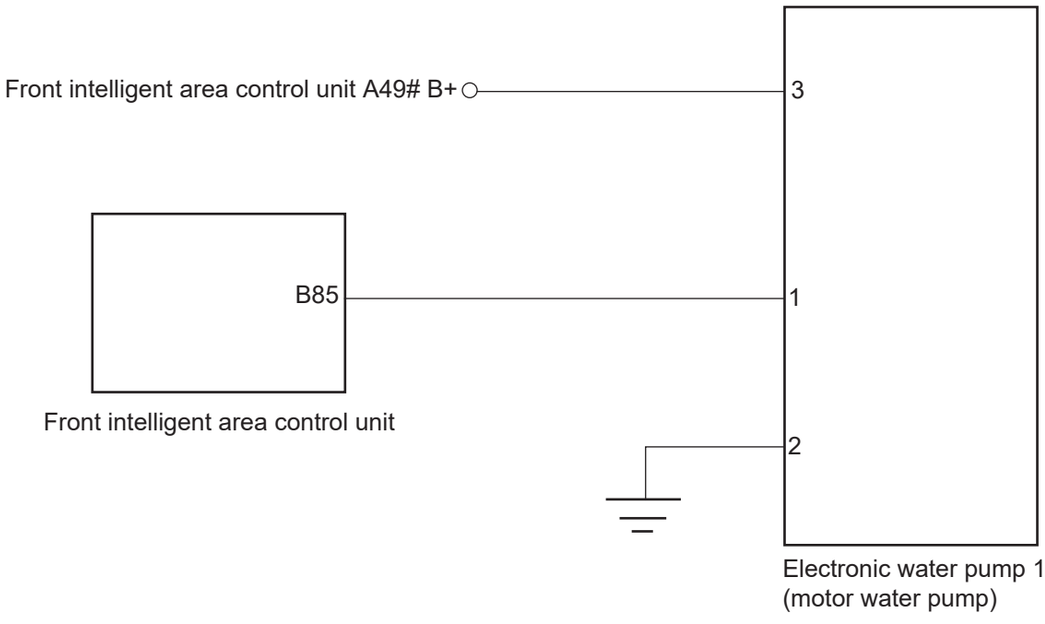
DTC	U026187	Electric cooling water pump 1 node lost
DTC	U136286	Electric cooling water pump 1 communication error

Description

When electronic water pump 1 LIN communication is abnormal, the front intelligent area control unit records DTC.

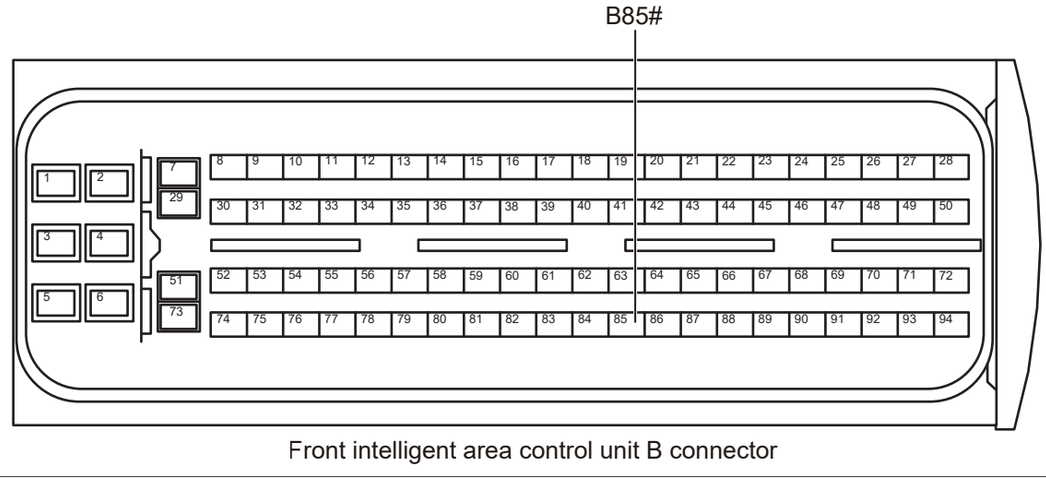
DTC No.	DTC detection condition	Faulty area
U026187	(a) Motor water pump node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)
U136286	(a) Motor water pump communication fault.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 1 (motor water pump)

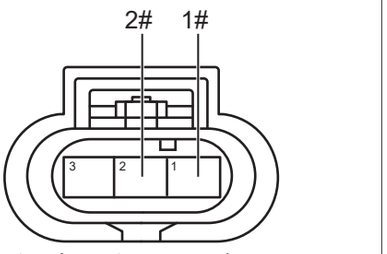
Circuit diagram



Inspection procedure

1	**Check for open in electric water pump 1 (motor water pump) wire harness and connector**





Electronic water pump 1
(motor water pump) connector PC01660RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 1 (motor water pump) connector.

(e) According to value in the table, measure resistance.

Standard value

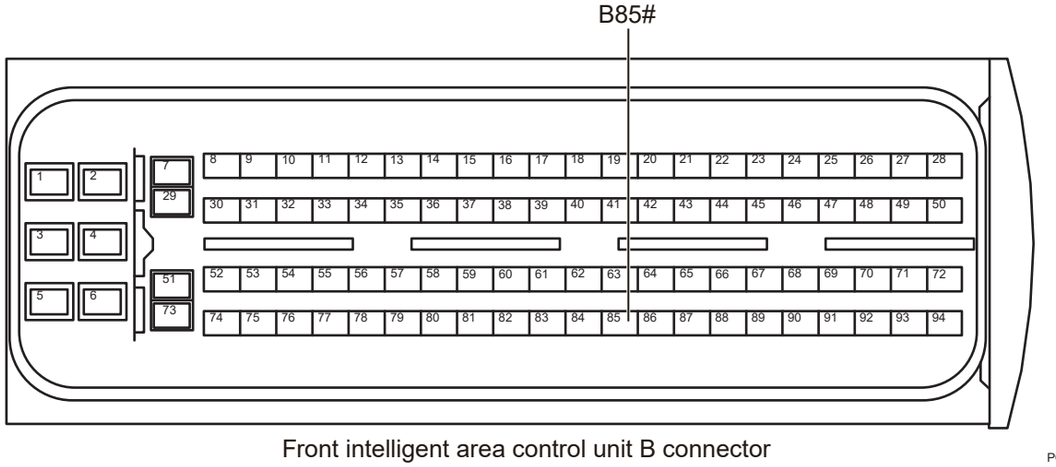
Multimeter connection	Detection condition	Specified condition
Electric water pump 1 (motor water pump) connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electric water pump 1 (motor water pump) connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electric water pump 1 (motor water pump) wire harness and connector**



Front intelligent area control unit B connector PC00591RM

(a) According to value in the table, measure resistance.

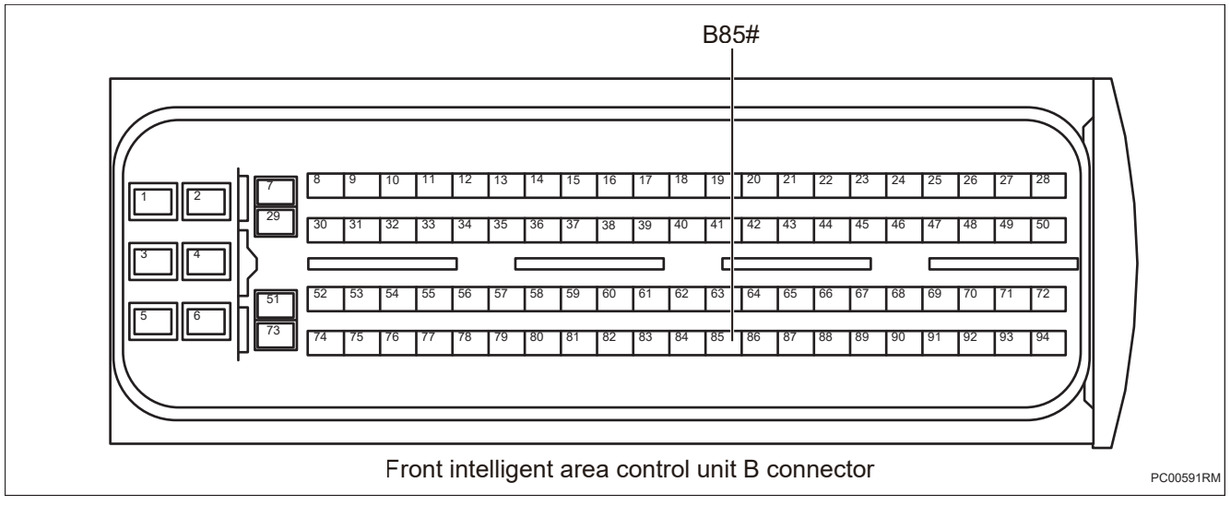
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in electric water pump 1 (motor water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

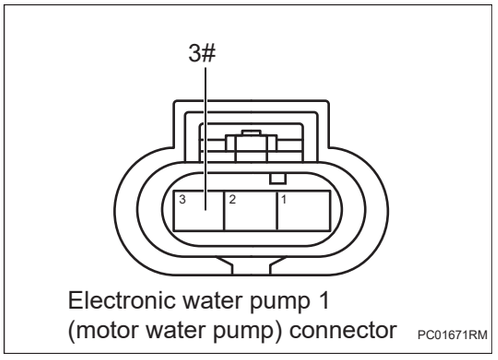
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric water pump 1 (motor water pump) power supply



Electronic water pump 1 (motor water pump) connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 1 (motor water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electric water pump 1 (motor water pump) (See page RE-98)

(a) Replace the electric water pump 1 (motor water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

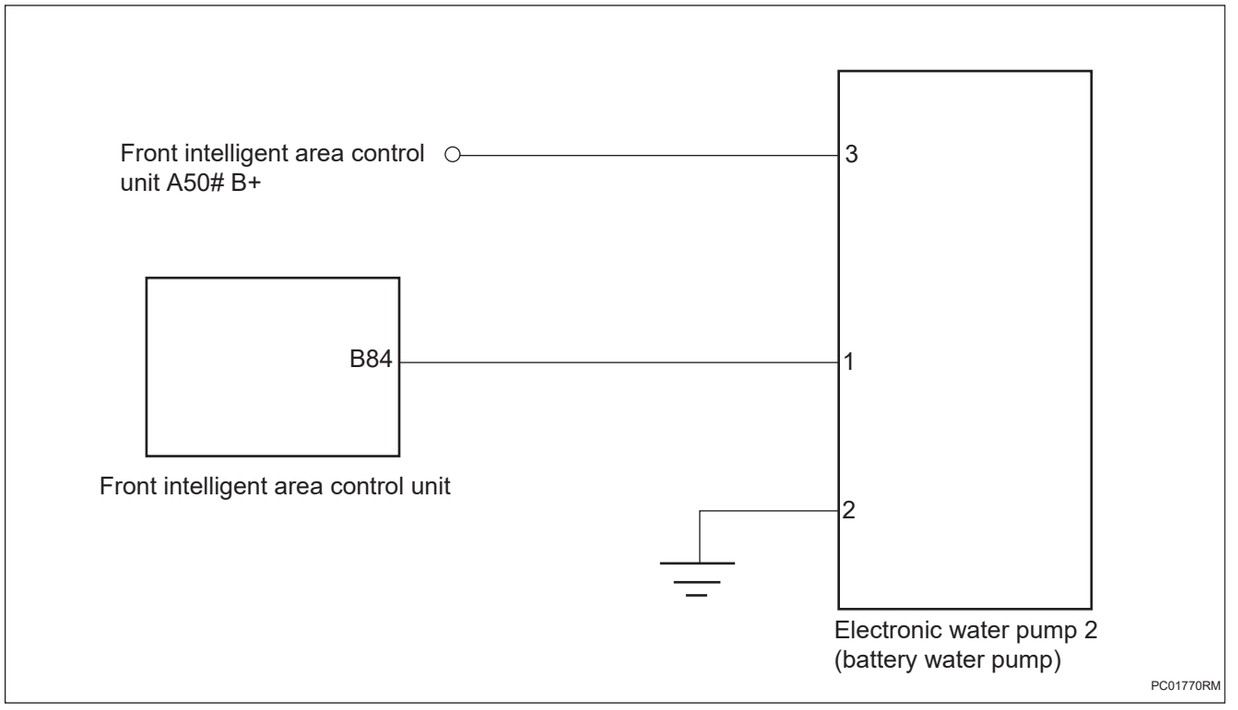
DTC	**U026287**	**Electric cooling water pump 2 node lost**
DTC	**U136386**	**Electric cooling water pump 2 communication error**

Description

When electronic water pump 2 LIN communication is abnormal, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U026287	(a) Electric cooling water pump 2 node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)
U136386	(a) Electric cooling water pump 2 communication error.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 2 (battery water pump)

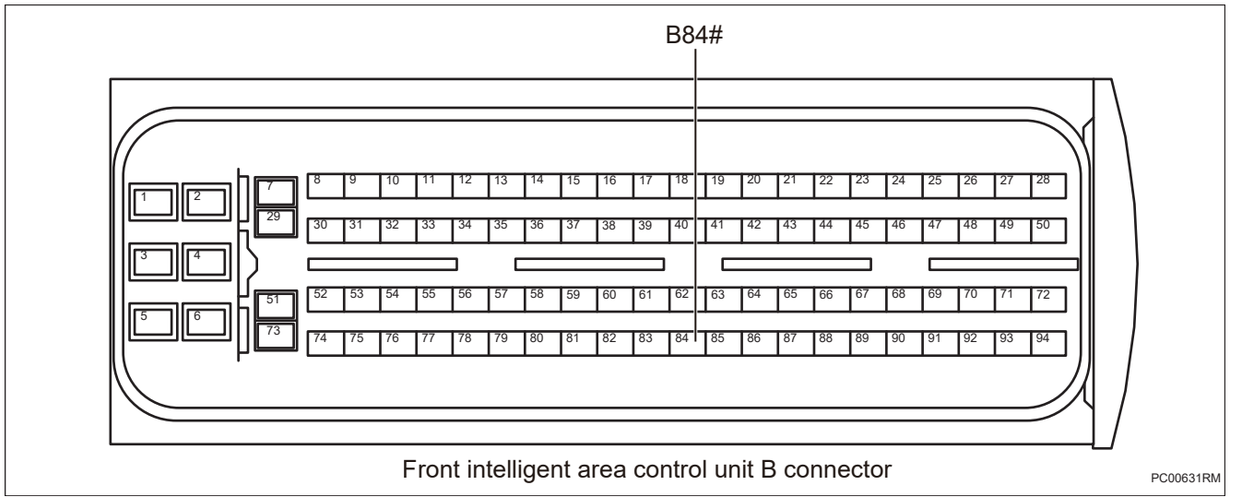
Circuit diagram

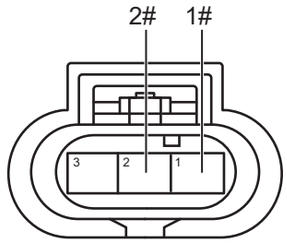


ZD

Inspection procedure

1	**Check for open in electric water pump 2 (battery water pump) wire harness and connector**





Electronic water pump 2
(battery water pump) connector PC01781RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 2 (battery water pump) connector.

(e) According to value in the table, measure resistance.

Standard value

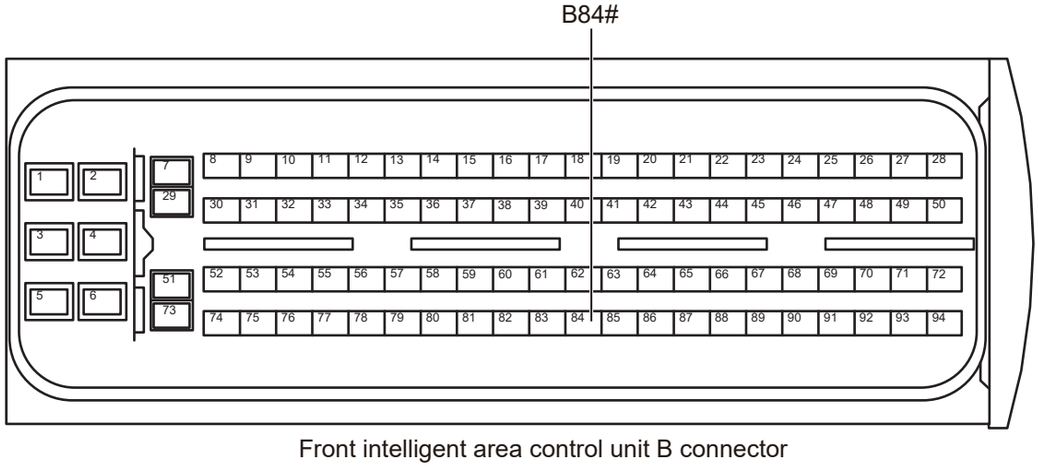
Multimeter connection	Detection condition	Specified condition
Electric water pump 2 (battery water pump) connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electric water pump 2 (battery water pump) connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electric water pump 2 (battery water pump) wire harness and connector**



Front intelligent area control unit B connector PC00631RM

(a) According to value in the table, measure resistance.

Standard value

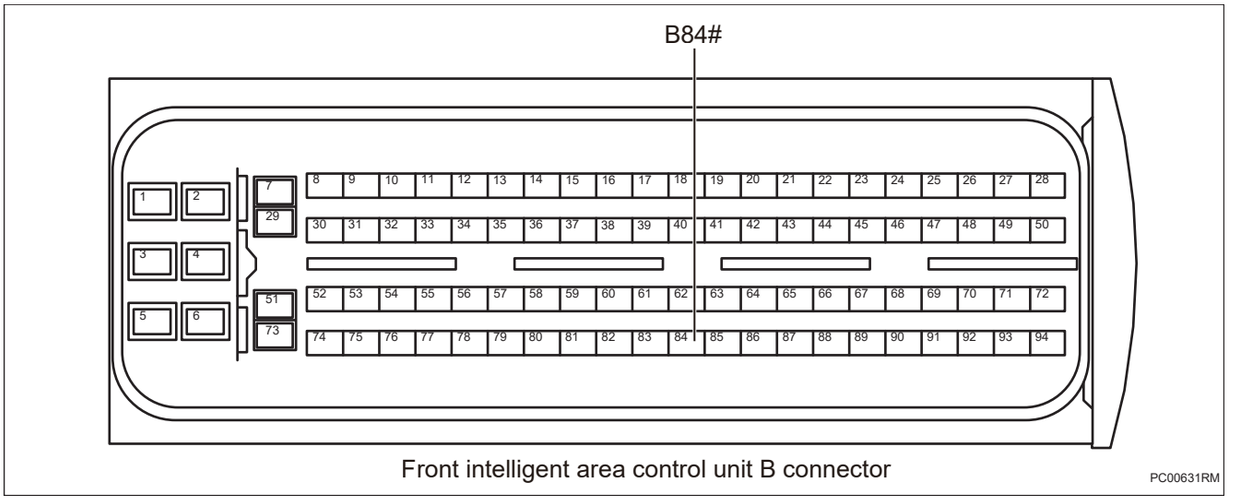
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in electric water pump 2 (battery water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

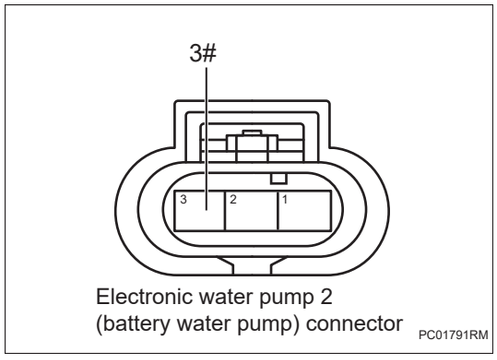
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric water pump 2 (battery water pump) power supply



Electronic water pump 2 (battery water pump) connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 2 (battery water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electric water pump 2 (battery water pump) (See page RE-98)

(a) Replace the electric water pump 2 (battery water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

ZD

OK

Diagnosis ends

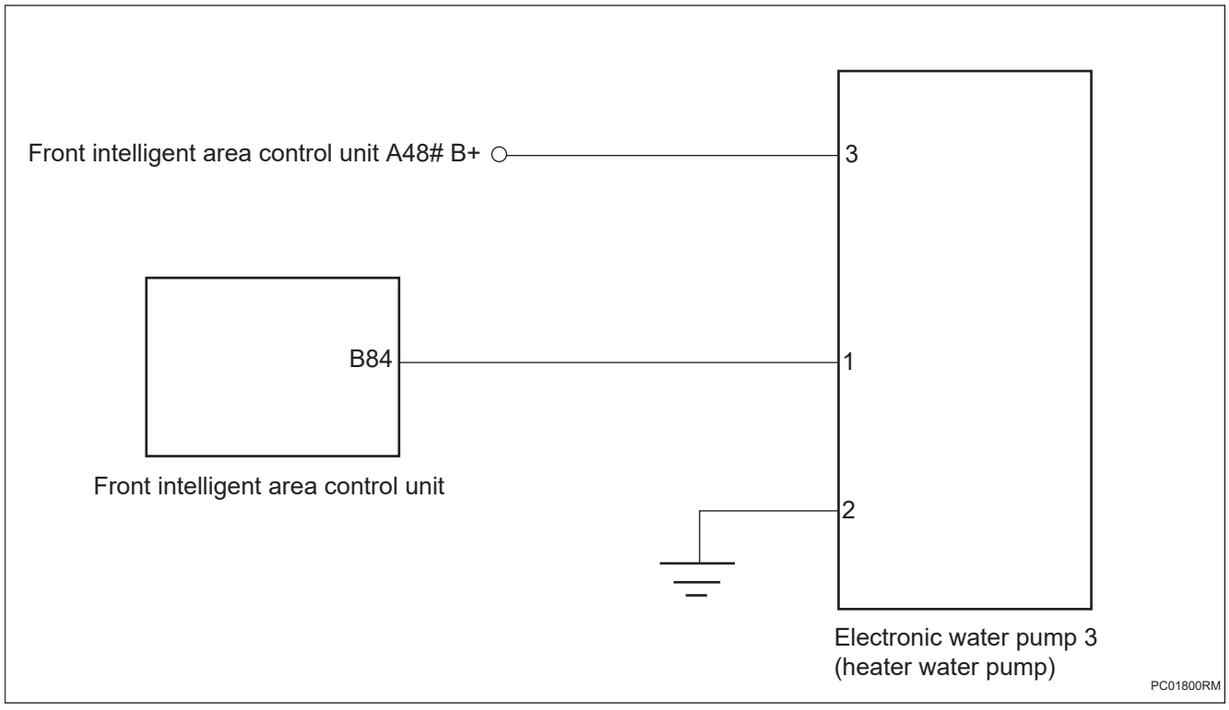
DTC	**U026387**	**Electric cooling water pump 3 node lost**
DTC	**U136486**	**Electric cooling water pump 3 communication error**

Description

When electronic water pump 3 LIN communication is abnormal, the front intelligent area control unit records DTC.

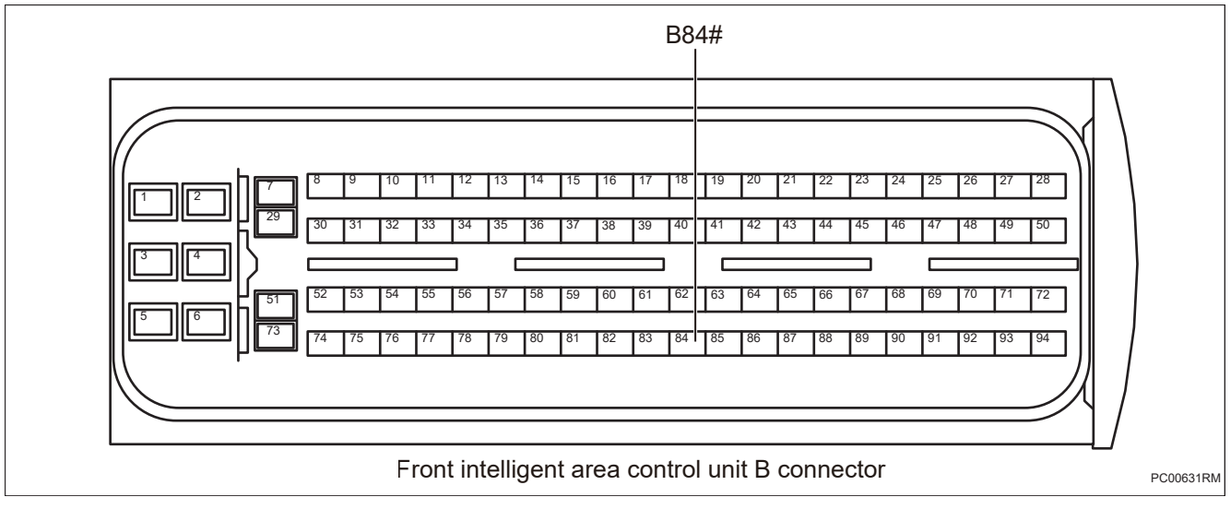
DTC No.	DTC detection condition	Faulty area
U026387	(a) Electric cooling water pump 3 node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)
U136486	(a) Electric cooling water pump 3 communication error.	• Front intelligent area control unit • Wire harness and connector • Electronic water pump 3 (heater water pump)

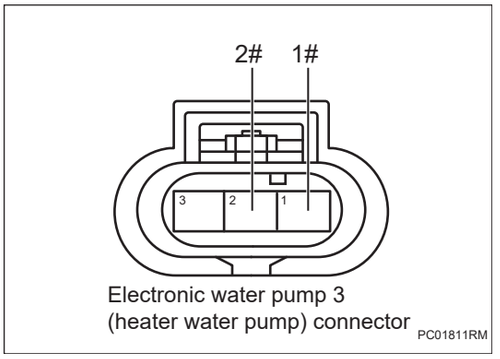
Circuit diagram



Inspection procedure

1	**Check for open in electric water pump 3 (heater water pump) wire harness and connector**





Electronic water pump 3 (heater water pump) connector
PC01811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electric water pump 3 (heater water pump) connector.

(e) According to value in the table, measure resistance.

Standard value

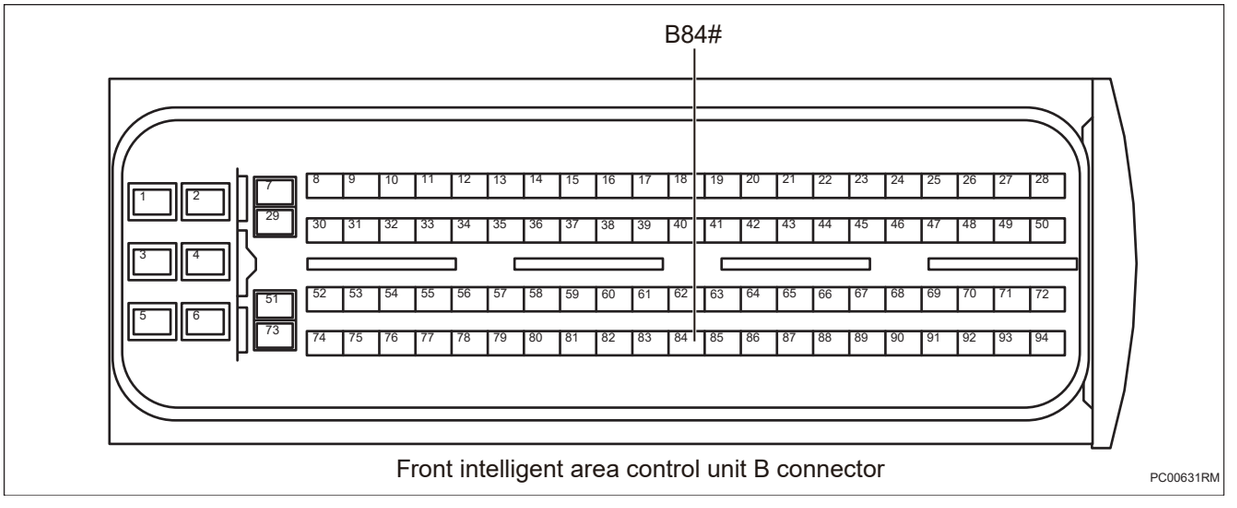
Multimeter connection	Detection condition	Specified condition
Electric water pump 3 (heater water pump) connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electric water pump 3 (heater water pump) connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electric water pump 3 (heater water pump) wire harness and connector**



Front intelligent area control unit B connector
PC00631RM

(a) According to value in the table, measure resistance.

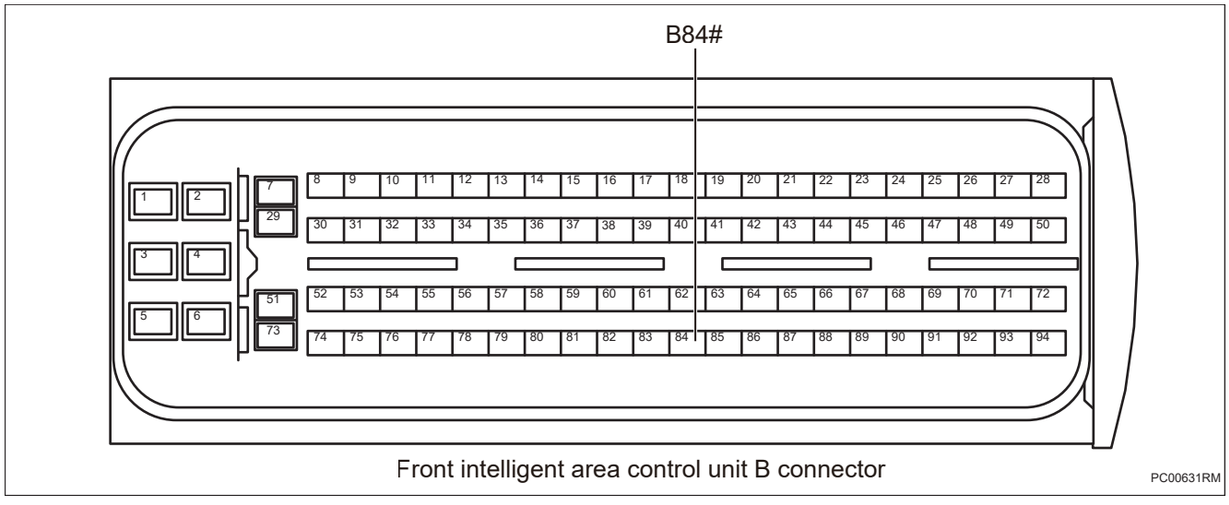
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in electric water pump 3 (heater water pump) wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

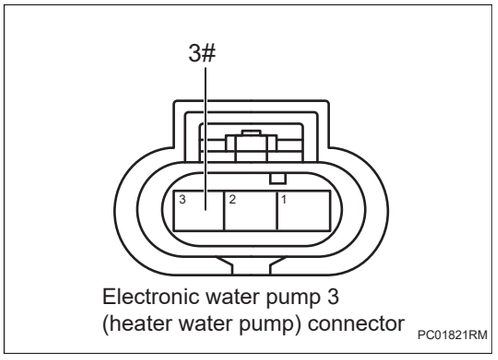
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric water pump 3 (heater water pump) power supply



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electric water pump 3 (heater water pump) connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electric water pump 3 (heater water pump) (See page RE-98)

(a) Replace the electric water pump 3 (heater water pump).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

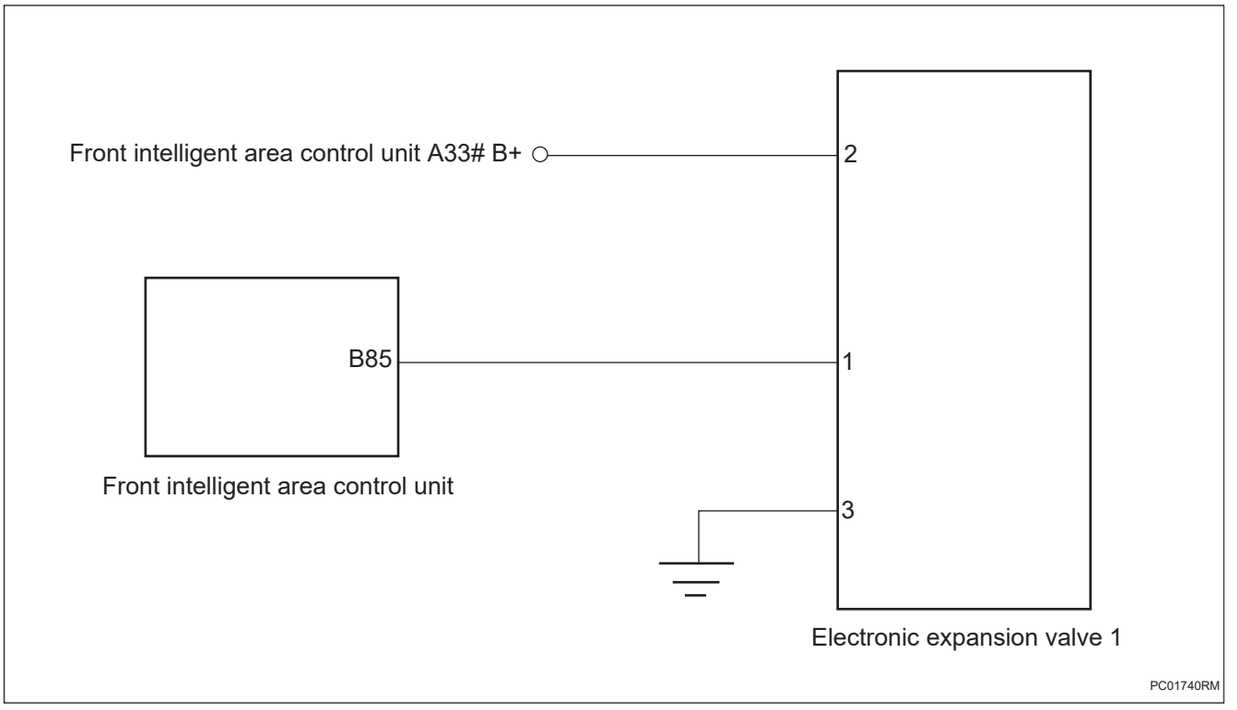
DTC	**U026887**	**Electronic expansion valve 1 node lost**
DTC	**U139186**	**Electronic expansion valve 1 LIN communication error**

Description

When electronic expansion valve 1 LIN communication is abnormal, the front intelligent area control unit records DTC.

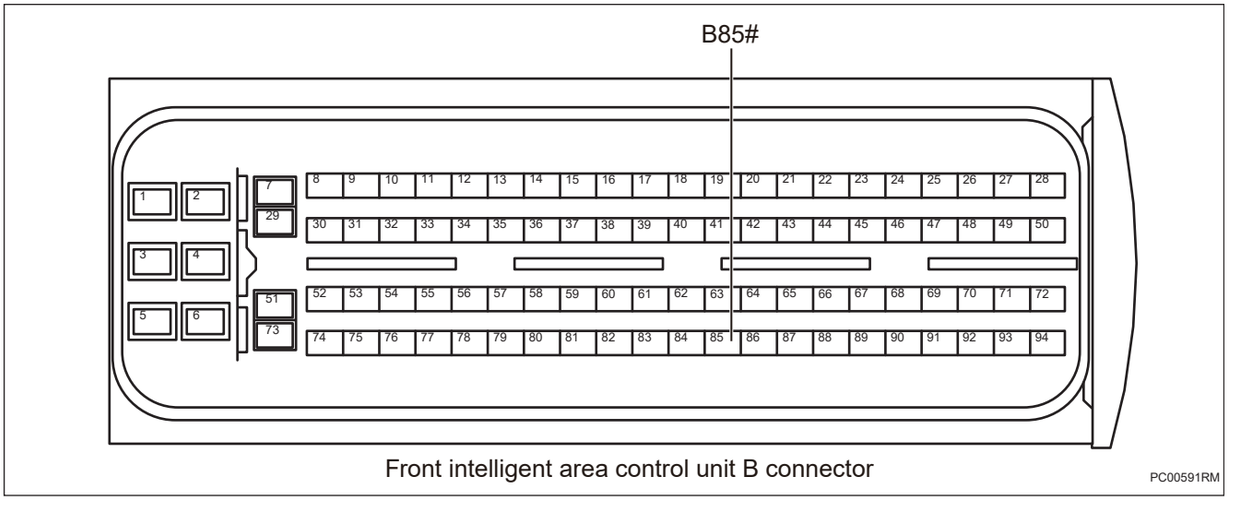
DTC No.	DTC detection condition	Faulty area
U026887	(a) Electronic expansion valve 1 node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1
U139186	(a) Electronic expansion valve 1 LIN communication error.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 1

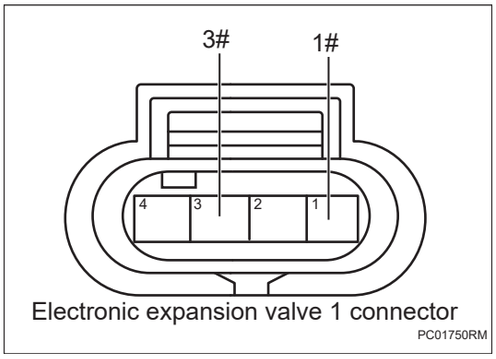
Circuit diagram



Inspection procedure

1	**Check for open in electronic expansion valve 1 wire harness and connector**





Electronic expansion valve 1 connector
PC01750RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 1 connector.

(e) According to value in the table, measure resistance.

Standard value

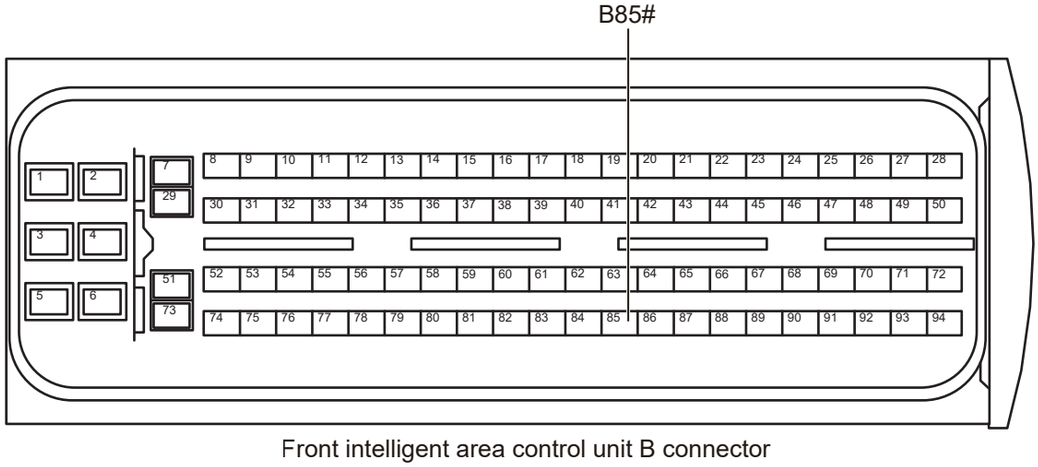
Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 1 connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electronic expansion valve 1 connector 3# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electronic expansion valve 1 wire harness and connector**



Front intelligent area control unit B connector
PC00591RM

(a) According to value in the table, measure resistance.

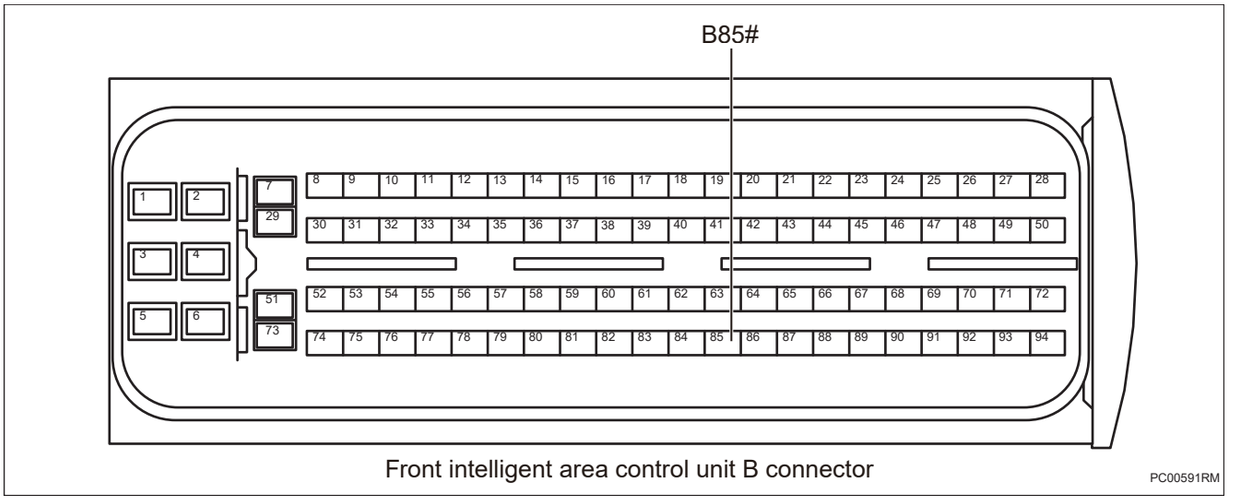
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in electronic expansion valve 1 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

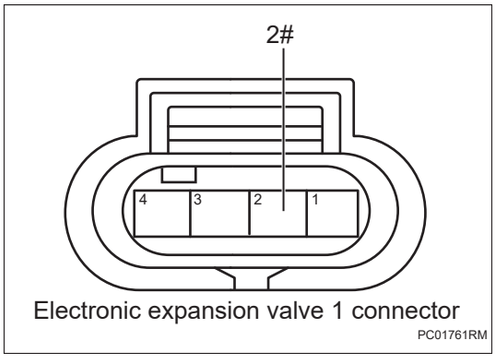
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric expansion valve 1 power supply



Electronic expansion valve 1 connector
PC01761RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electronic expansion valve 1 (See page RE-98)

(a) Replace the electronic expansion valve 1.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

ZD

OK

Diagnosis ends

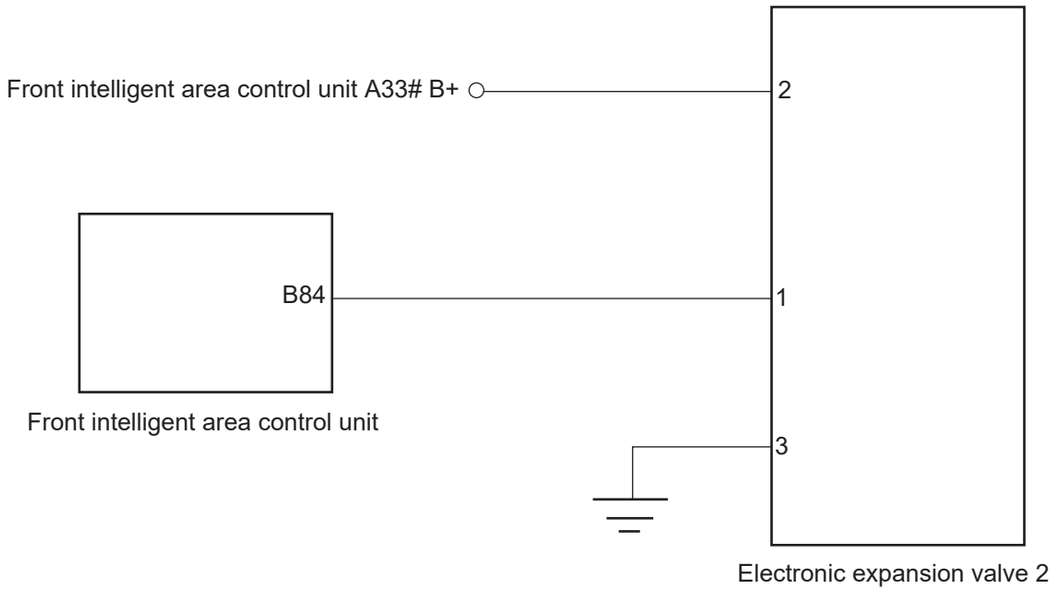
DTC	**U026987**	**Electronic expansion valve 2 node lost**
DTC	**U139286**	**Electronic expansion valve 2 LIN communication error**

Description

When electronic expansion valve 2 LIN communication is abnormal, the front intelligent area control unit records DTC.

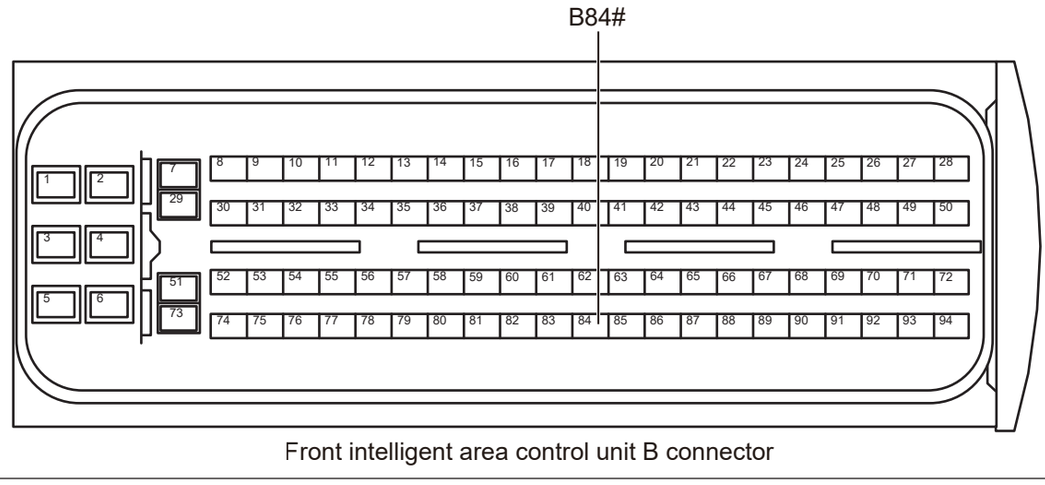
DTC No.	DTC detection condition	Faulty area
U026987	(a) Electronic expansion valve 2 node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2
U139286	(a) Electronic expansion valve 2 LIN communication error.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 2

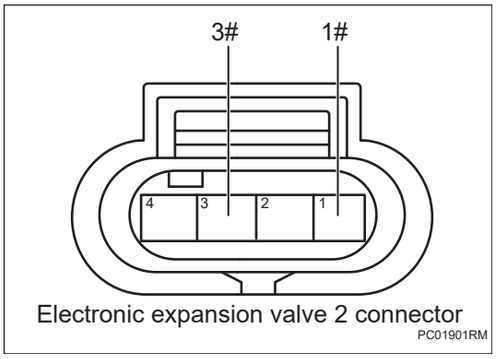
Circuit diagram



Inspection procedure

1	**Check for open in electronic expansion valve 2 wire harness and connector**





Electronic expansion valve 2 connector
PC01901RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 2 connector.

(e) According to value in the table, measure resistance.

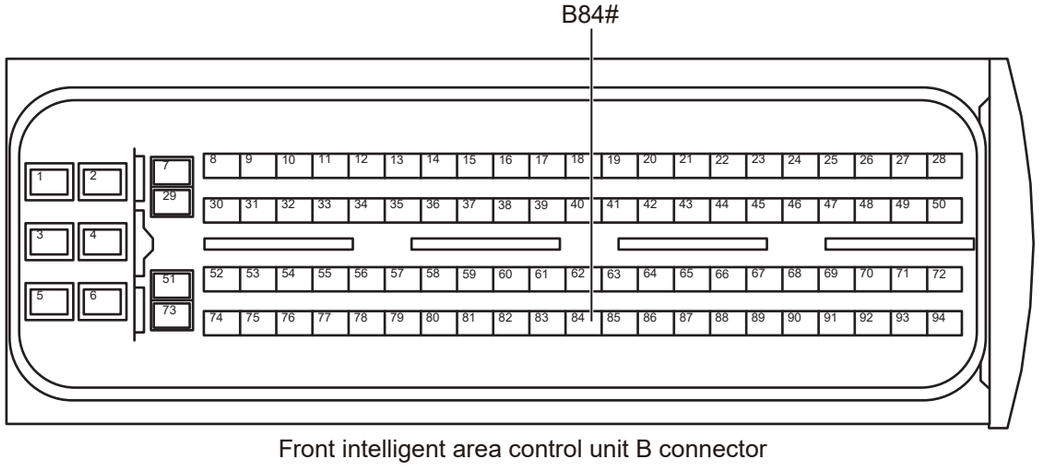
Standard value

Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 2 connector 1# - front intelligent area control unit connector B84#	Always connected	Less than 1 Ω
Electronic expansion valve 2 connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electronic expansion valve 2 wire harness and connector**



Front intelligent area control unit B connector
PC00631RM

(a) According to value in the table, measure resistance.

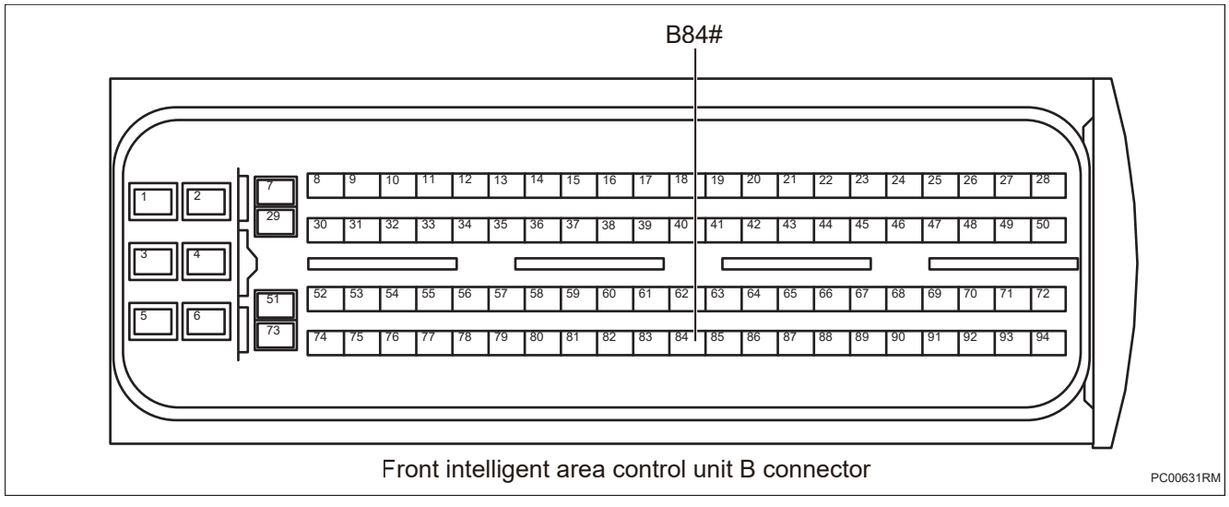
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in electronic expansion valve 2 wire harness and connector**



Front intelligent area control unit B connector

PC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

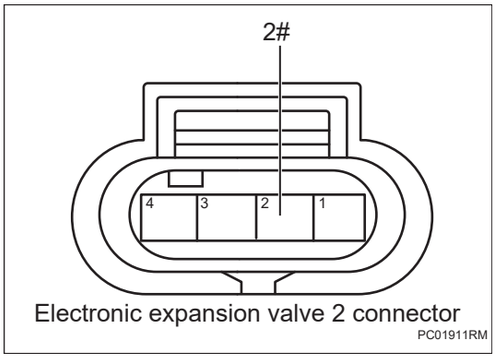
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric expansion valve 2 power supply



Electronic expansion valve 2 connector
PC01911RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the front intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 2 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electronic expansion valve 2 (See page RE-98)

(a) Replace the electronic expansion valve 2.
(b) Connect HQ-VDS diagnostic tester.
(c) Clear DTCs.
(d) Read DTCs again.

Standard:
No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

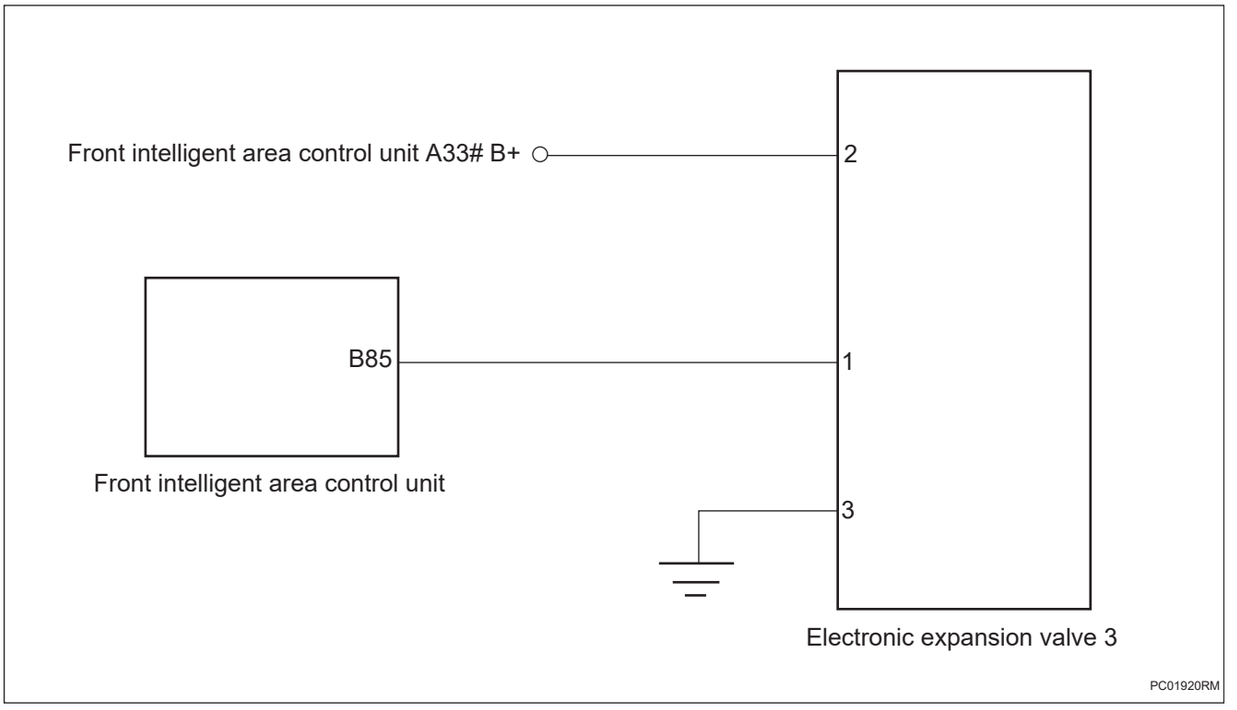
DTC	**U026A87**	**Electronic expansion valve 3 node lost**
DTC	**U139B86**	**Electronic expansion valve 3 LIN communication error**

Description

When electronic expansion valve 3 LIN communication is abnormal, the front intelligent area control unit records DTC.

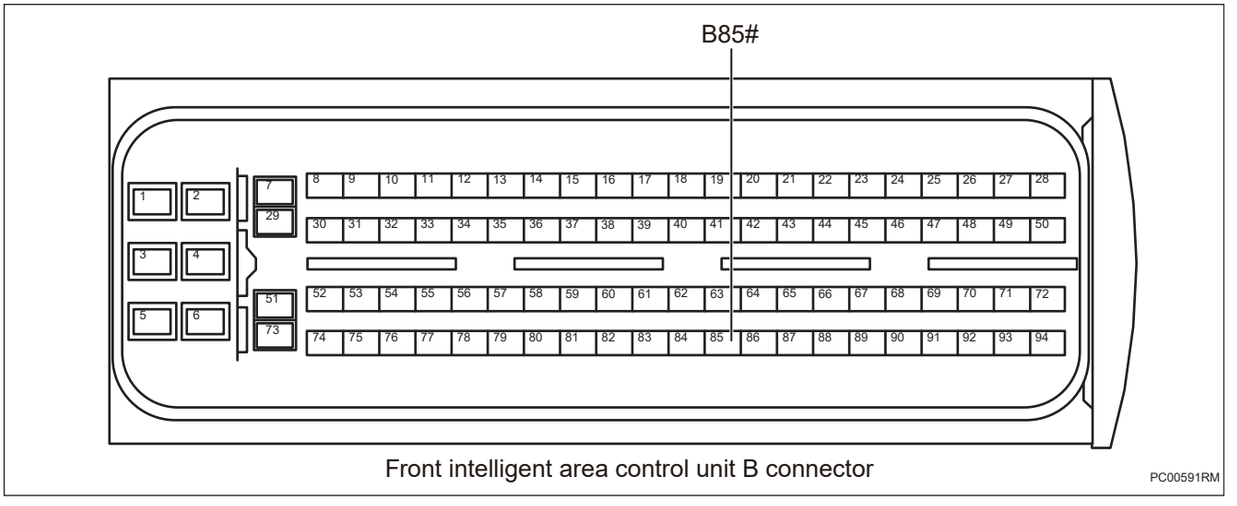
DTC No.	DTC detection condition	Faulty area
U026A87	(a) Electronic expansion valve 3 node lost.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3
U139B86	(a) Electronic expansion valve 3 LIN communication error.	• Front intelligent area control unit • Wire harness and connector • Electronic expansion valve 3

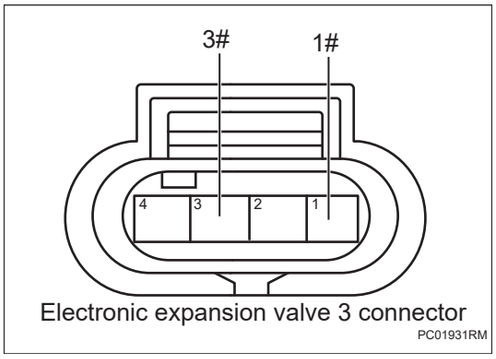
Circuit diagram



Inspection procedure

1	**Check for open in electronic expansion valve 3 wire harness and connector**





Electronic expansion valve 3 connector
PC01931RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the electronic expansion valve 3 connector.

(e) According to value in the table, measure resistance.

Standard value

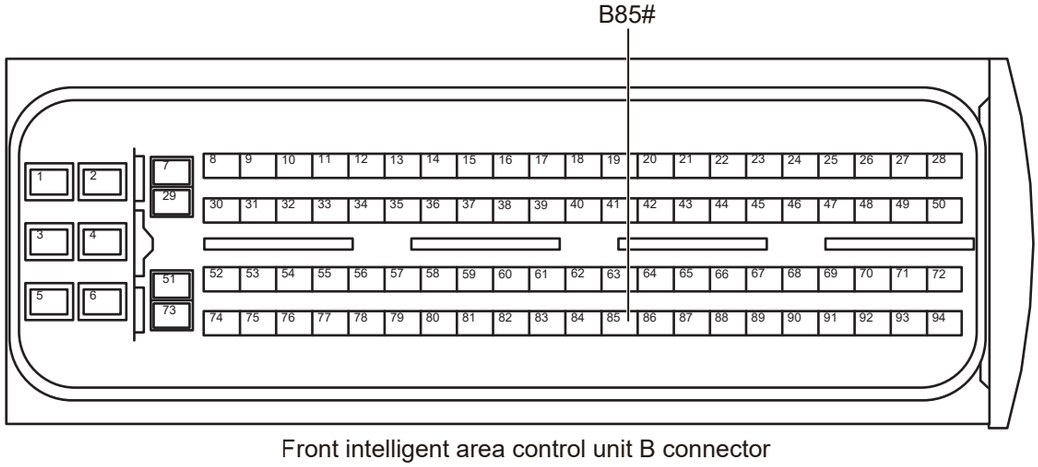
Multimeter connection	Detection condition	Specified condition
Electronic expansion valve 3 connector 1# - front intelligent area control unit connector B85#	Always connected	Less than 1 Ω
Electronic expansion valve 3 connector 3# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electronic expansion valve 3 wire harness and connector**



Front intelligent area control unit B connector
PC00591RM

(a) According to value in the table, measure resistance.

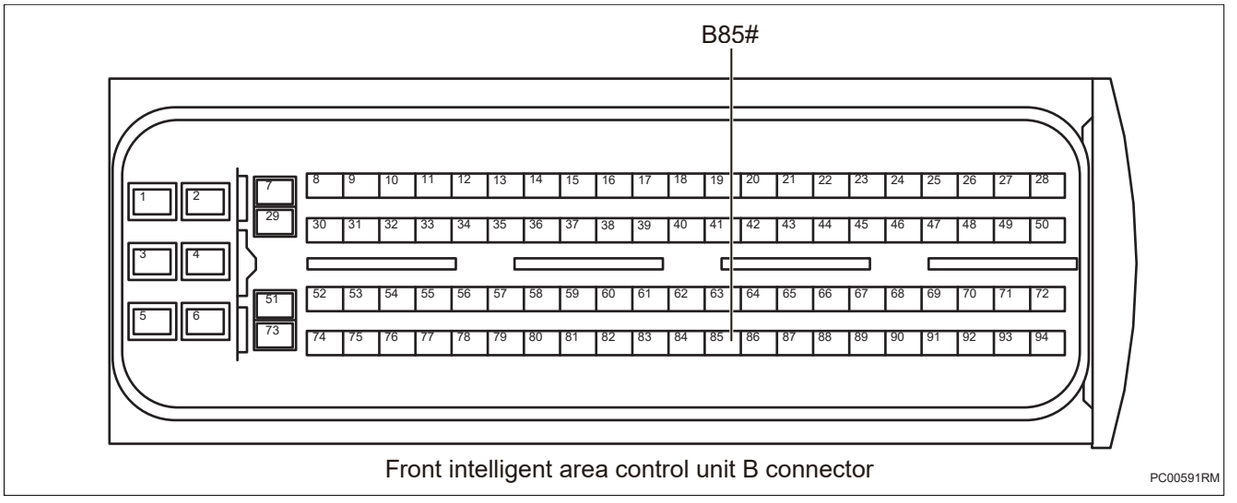
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in electronic expansion valve 3 wire harness and connector**



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

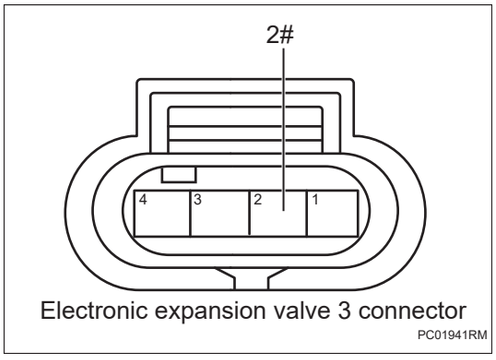
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Check electric expansion valve 3 power supply



Electronic expansion valve 3 connector
PC01941RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the front intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Electronic expansion valve 3 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace electronic expansion valve 3 (See page RE-98)

(a) Replace the electronic expansion valve 3.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front intelligent area control unit (See page ZC-128)**

ZD

OK

Diagnosis ends

DTC	U103888	LIN2 physical bus error (WMM)

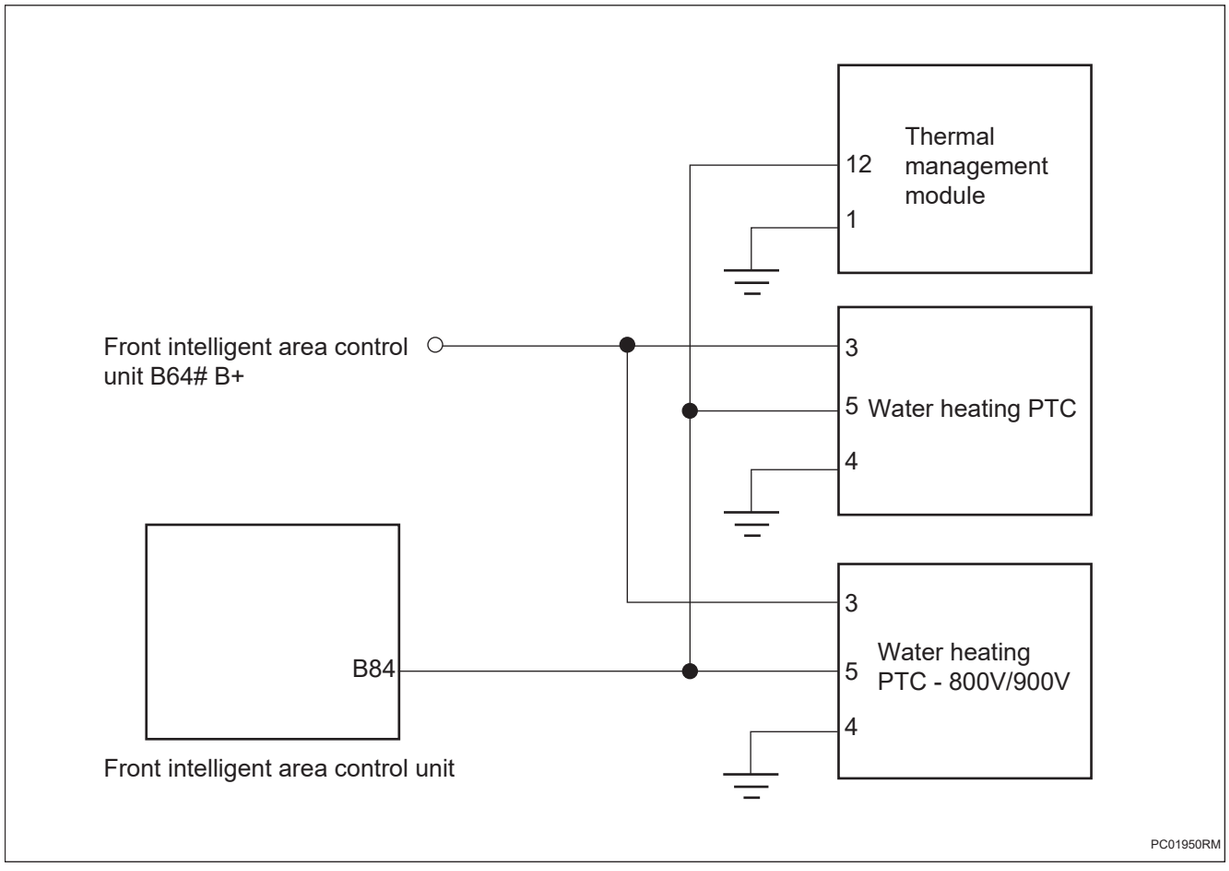
ZD

Description

When water heating PTC and thermal management module LIN bus has error, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U103888	(a) LIN2 physical bus error (SignLamp).	• Front intelligent area control unit • Wire harness and connector • Water heating PTC • Water heating PTC-800V/900V • Thermal management module

Circuit diagram



Inspection procedure

1	**Check for short to each other in water heating PTC and thermal management module wire harness and connector**

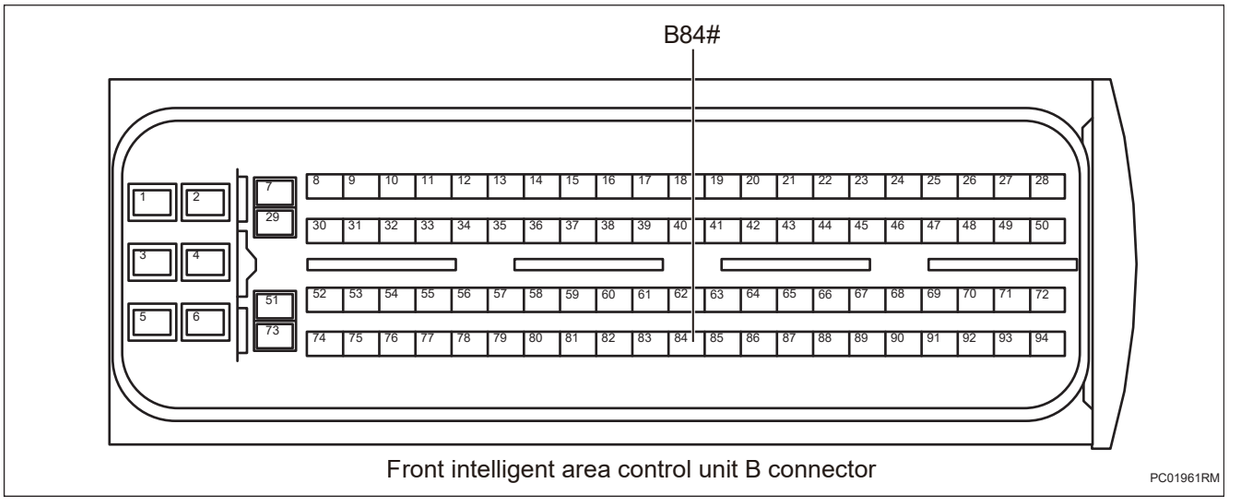
(a) Check for short to each other in water heating PTC and thermal management module wire harness and connector.

(b) Check if water heating PTC and thermal management module wire harness and connector are damaged.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in water heating PTC and thermal management module wire harness and connector**



Front intelligent area control unit B connector

PC01961RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the water heating PTC and thermal management module connector.

(e) According to value in the table, measure resistance.

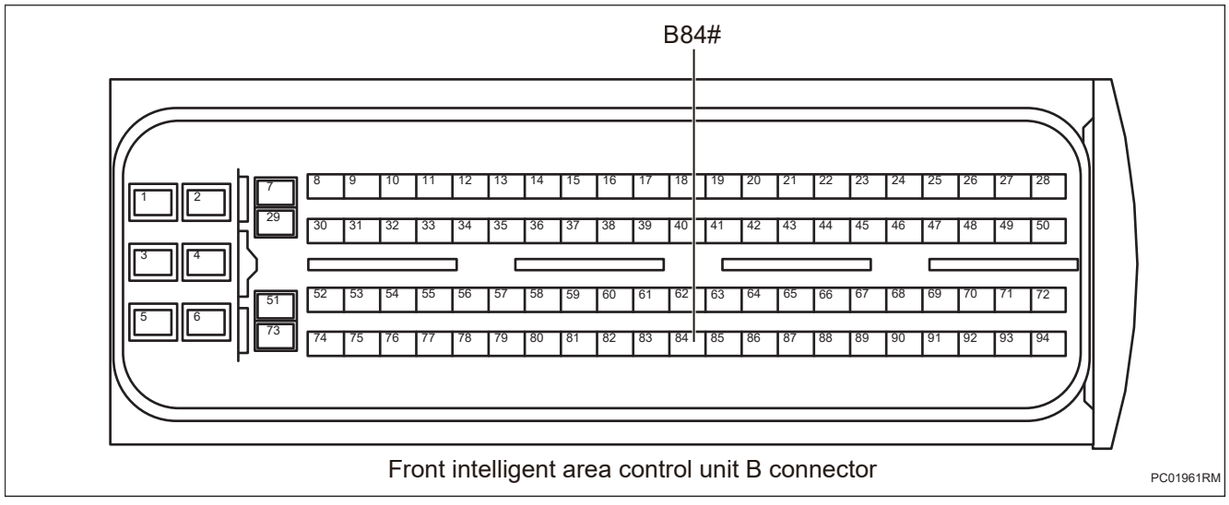
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in water heating PTC and thermal management module wire harness and connector**



Front intelligent area control unit B connector

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace water heating PTC and thermal management module (See page DL-84) (See page RE-98)**

(a) Replace the water heating PTC and thermal management module.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK →

Diagnosis ends

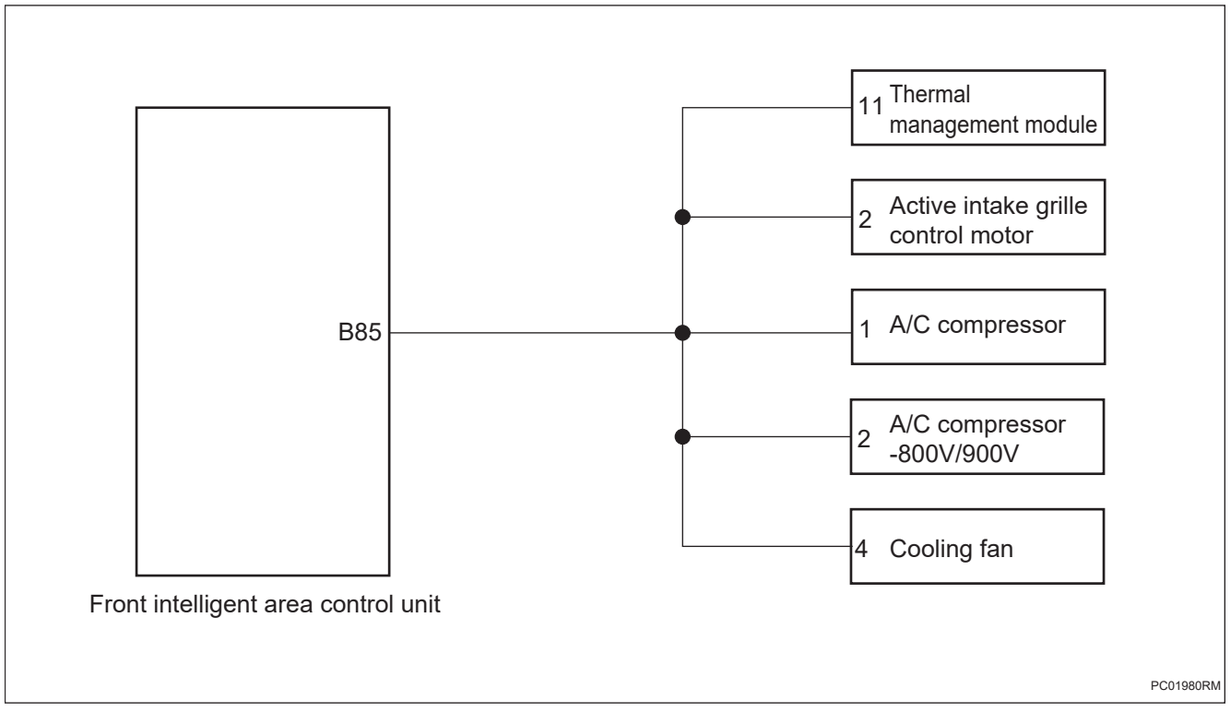
DTC	U103988	LIN3 physical bus error (TM_LIN1)

Description

When LIN3 bus has error, the front intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U103988	(a) LIN3 physical bus error (TM_LIN1).	• Front intelligent area control unit • Wire harness and connector • Thermal management module • Active intake grille control motor • A/C compressor • A/C compressor-800V/900V • Cooling fan

Circuit diagram



Inspection procedure

1	**Check if LIN3 wire harness and connector are short to each other**

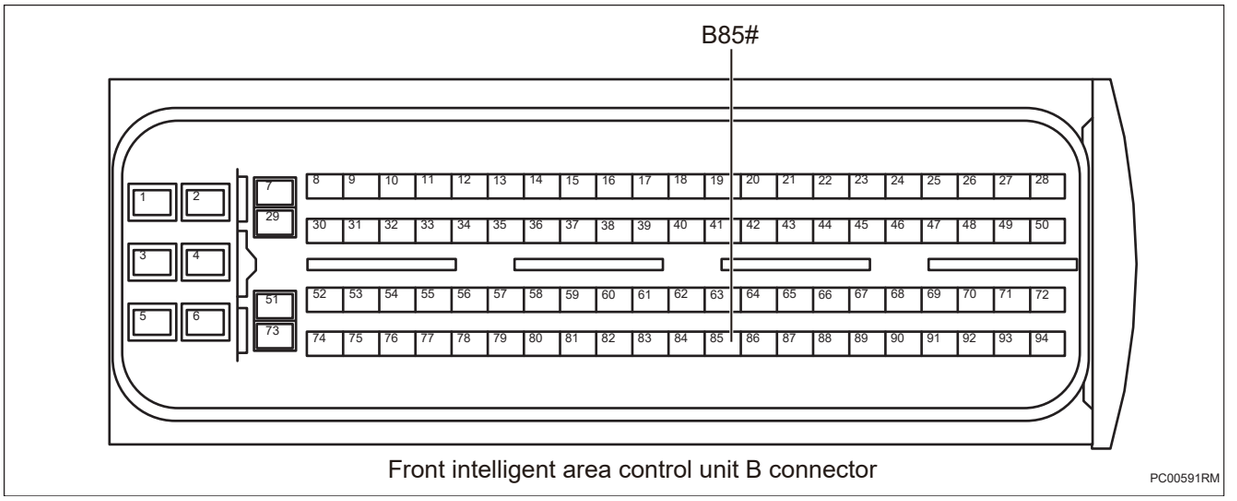
(a) Check if LIN3 wire harness and connector are short to each other.

(b) Check if LIN3 wire harness and connector are damaged.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in LIN3 wire harness and connector



Front intelligent area control unit B connector

PC00591RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect connectors of all controllers on LIN3.

(e) According to value in the table, measure resistance.

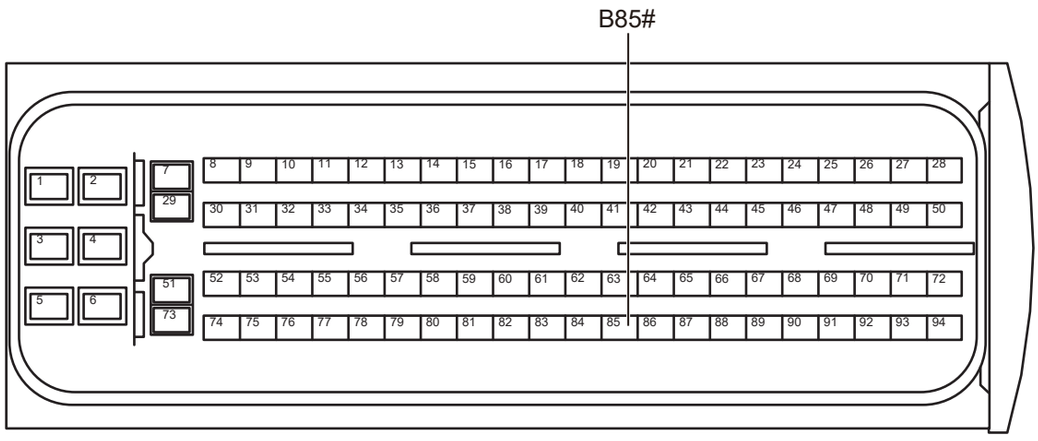
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in LIN3 wire harness and connector**



Front intelligent area control unit B connector

PC00591RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace controllers on LIN3**

(a) Replace controllers on LIN3, and troubleshoot in turn.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

ZD

Diagnosis ends

DTC	C200E00	EPB - assembly inspection not completed - left

Description

When EPB assembly incomplete fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C200E00	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) with ALS configurati-on& PDC Not in OTA Mode	• Voltage is between 8.5 V and 16.5 V	1	Event-based	10 ms	• EPB calibration

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C200E00	• No	Not come on

Inspection procedure

1	**Perform EPB calibration**

DTC	C200F00	EPB - wheel speed signal error - left

Description

When wheel speed sensor invalid fault is detected, the front intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C200F00	• Diagnostic voltage range. (9 V - 16 V) & IGN ON • (VDC _ Power Mode = Standby || Driving) & PDC Not in OTA Mode	• The speeds of all four wheels are incorrect values for a period of time, and all four wheels fail for a certain period of time	1	Event-based	10 ms	• Wheel speed sensor

Fault symptom

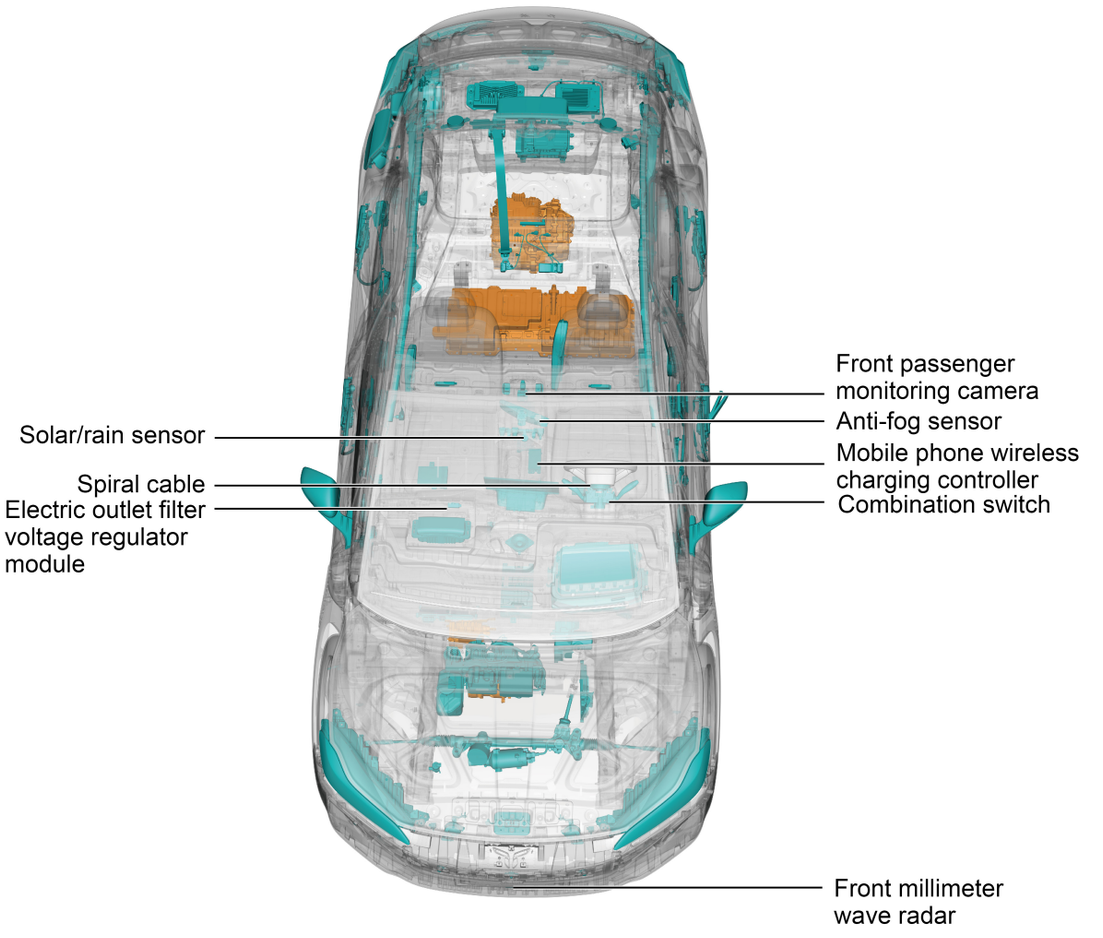
DTC No.	Fault symptom	Warning light/indicator
C200F00	• No	Not come on

Inspection procedure

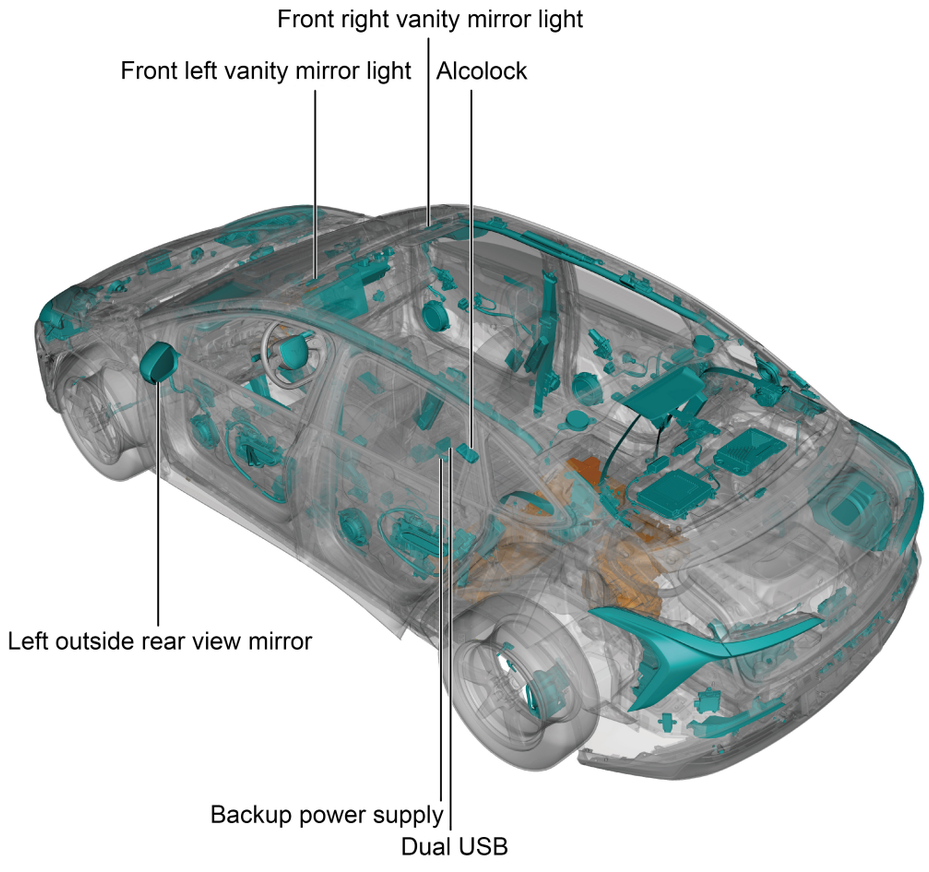
1	**Check wheel speed sensor**

Middle intelligent area control unit

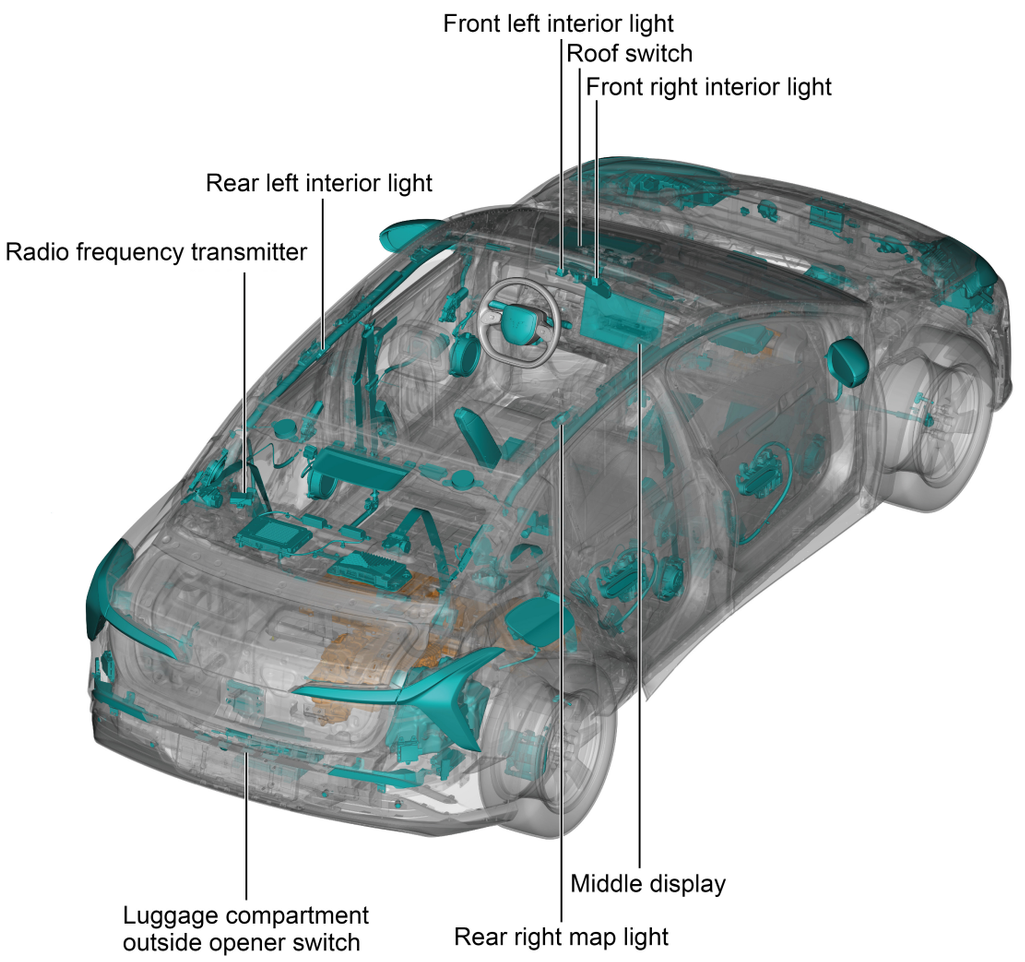
Part position



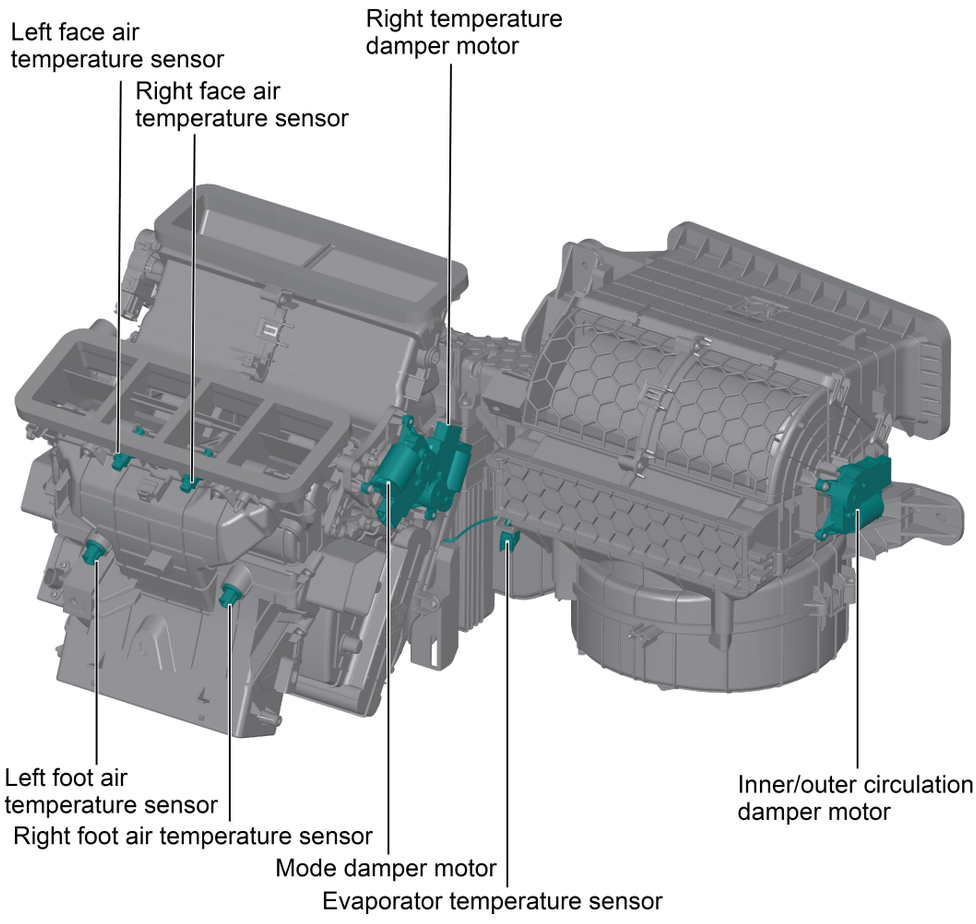
Part position



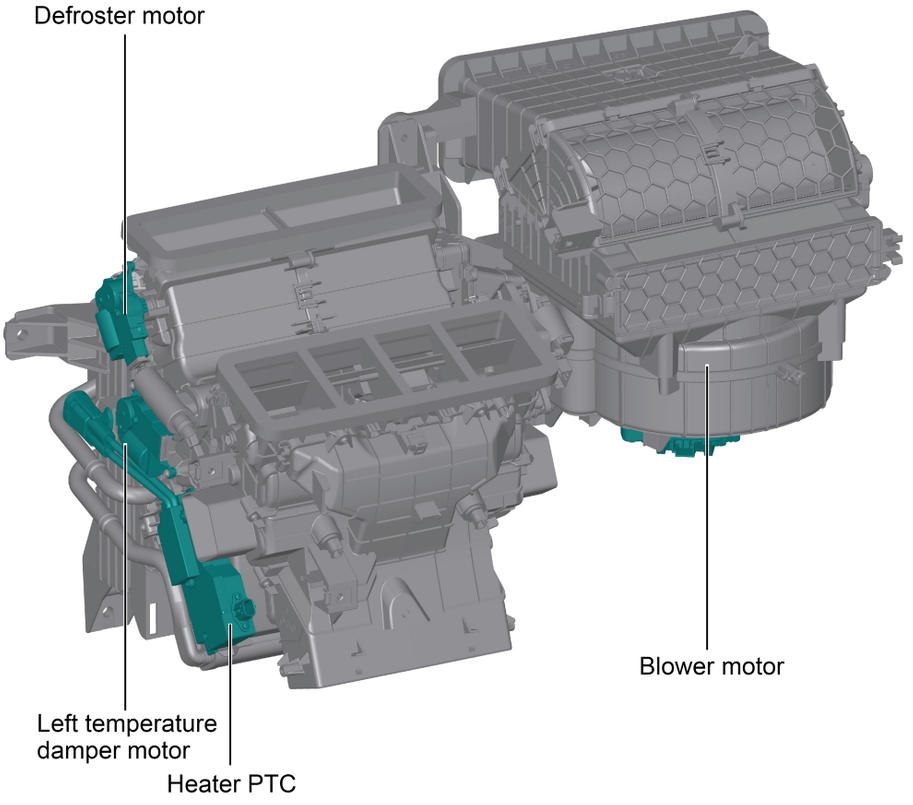
Part position



Part position



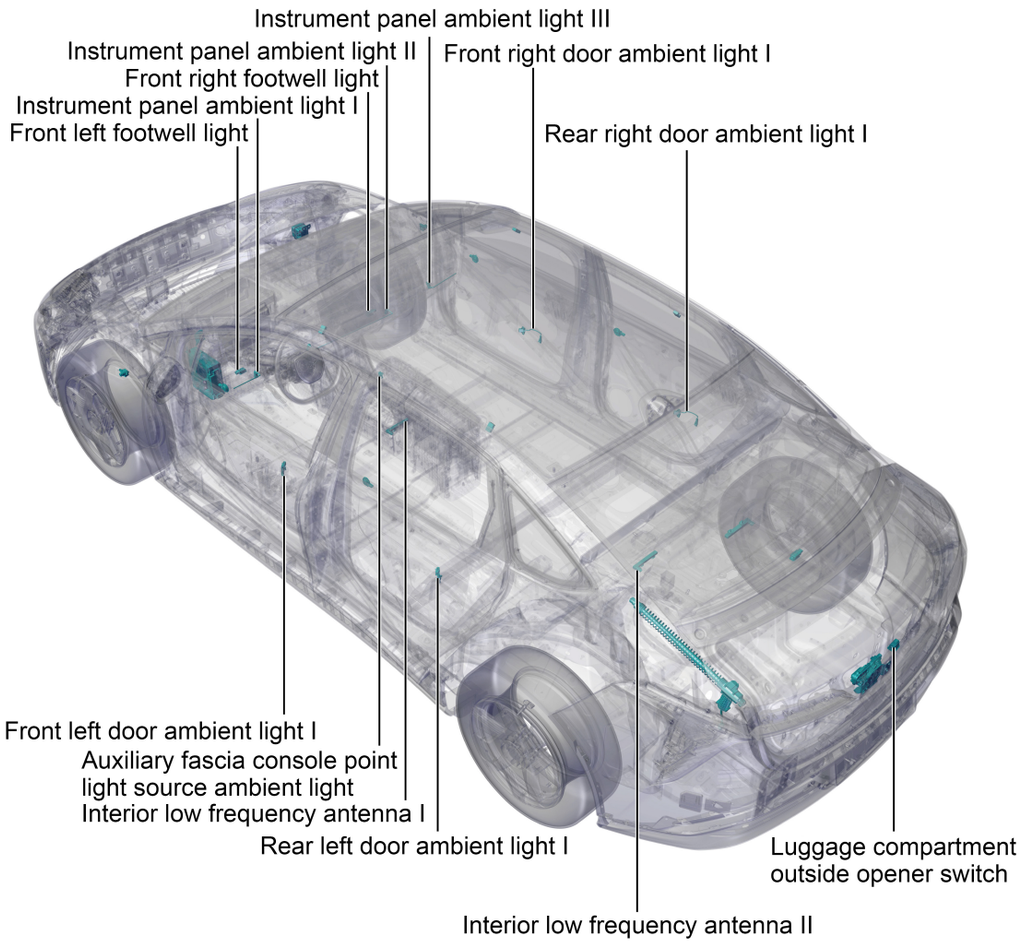
Part position



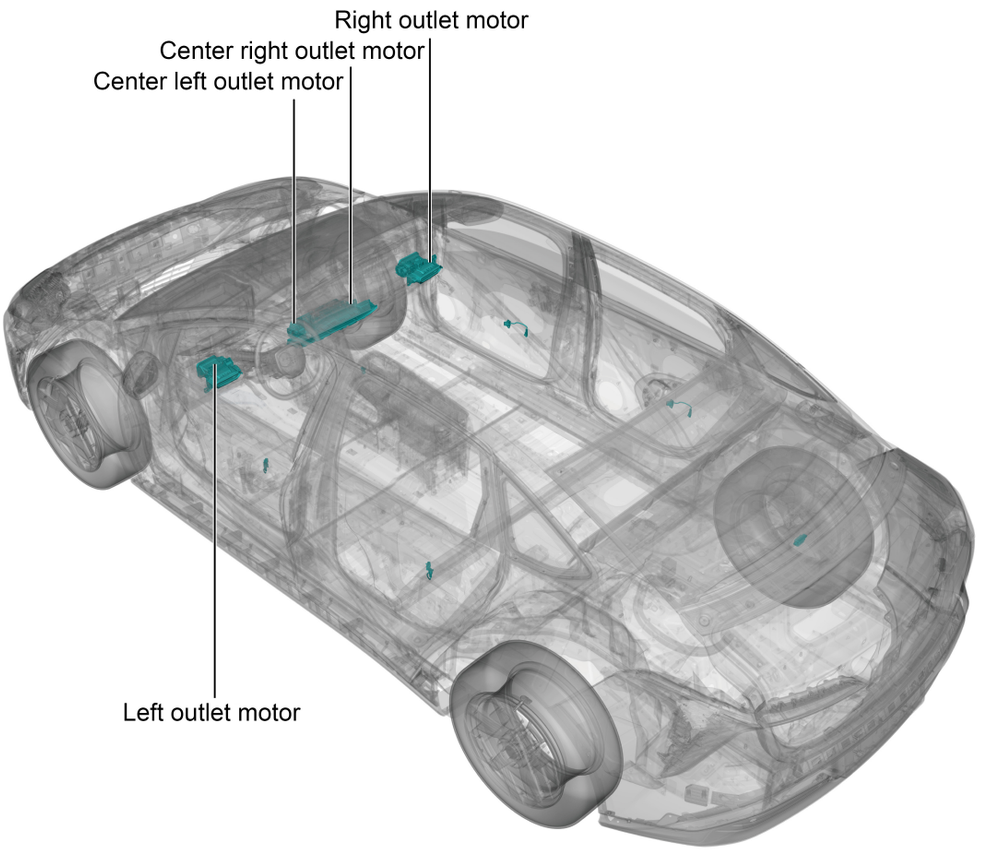
PC10140RM

ZD

Part position

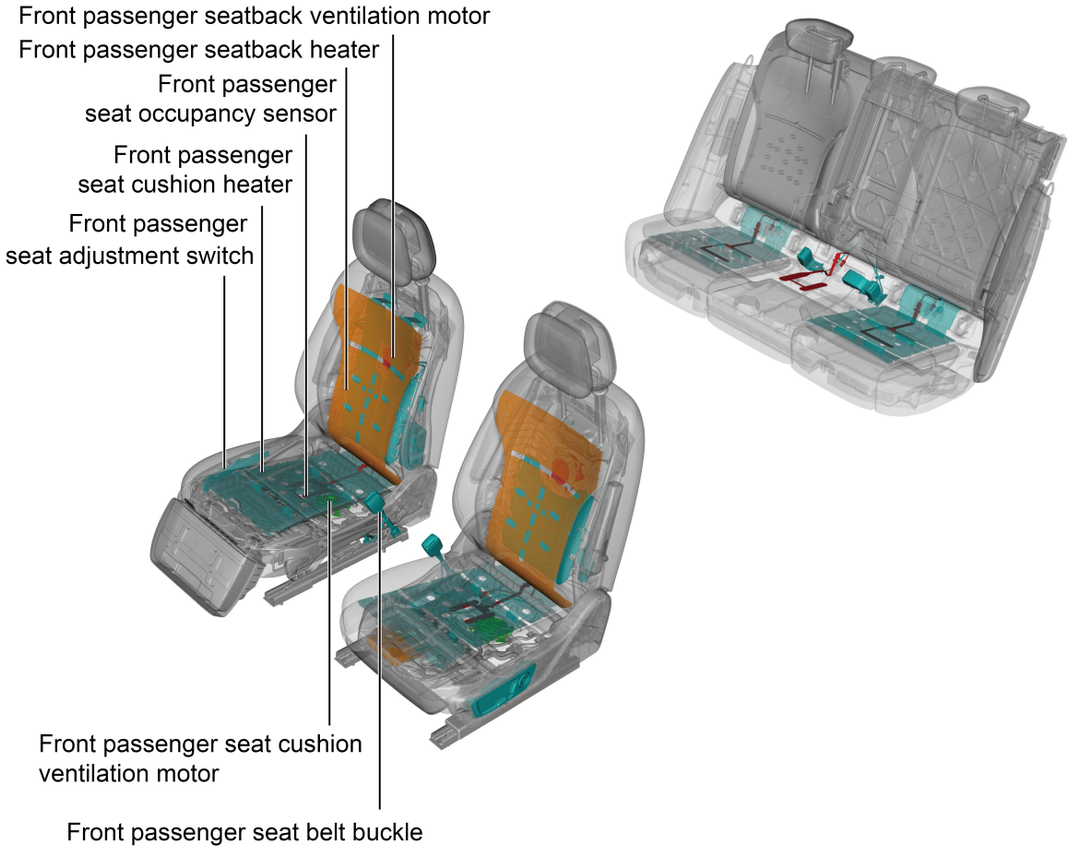


Part position

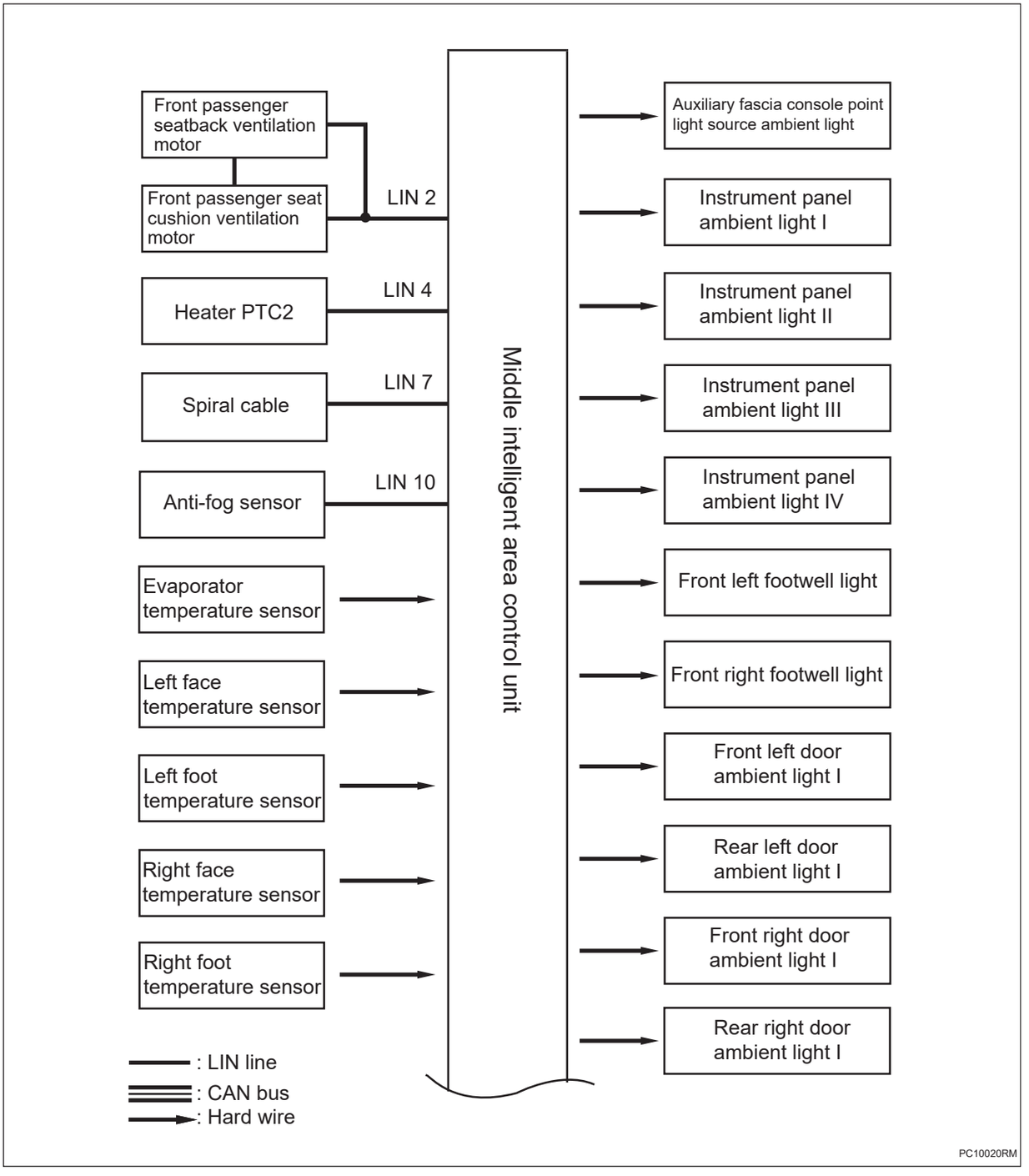


PC10160RM

Part position

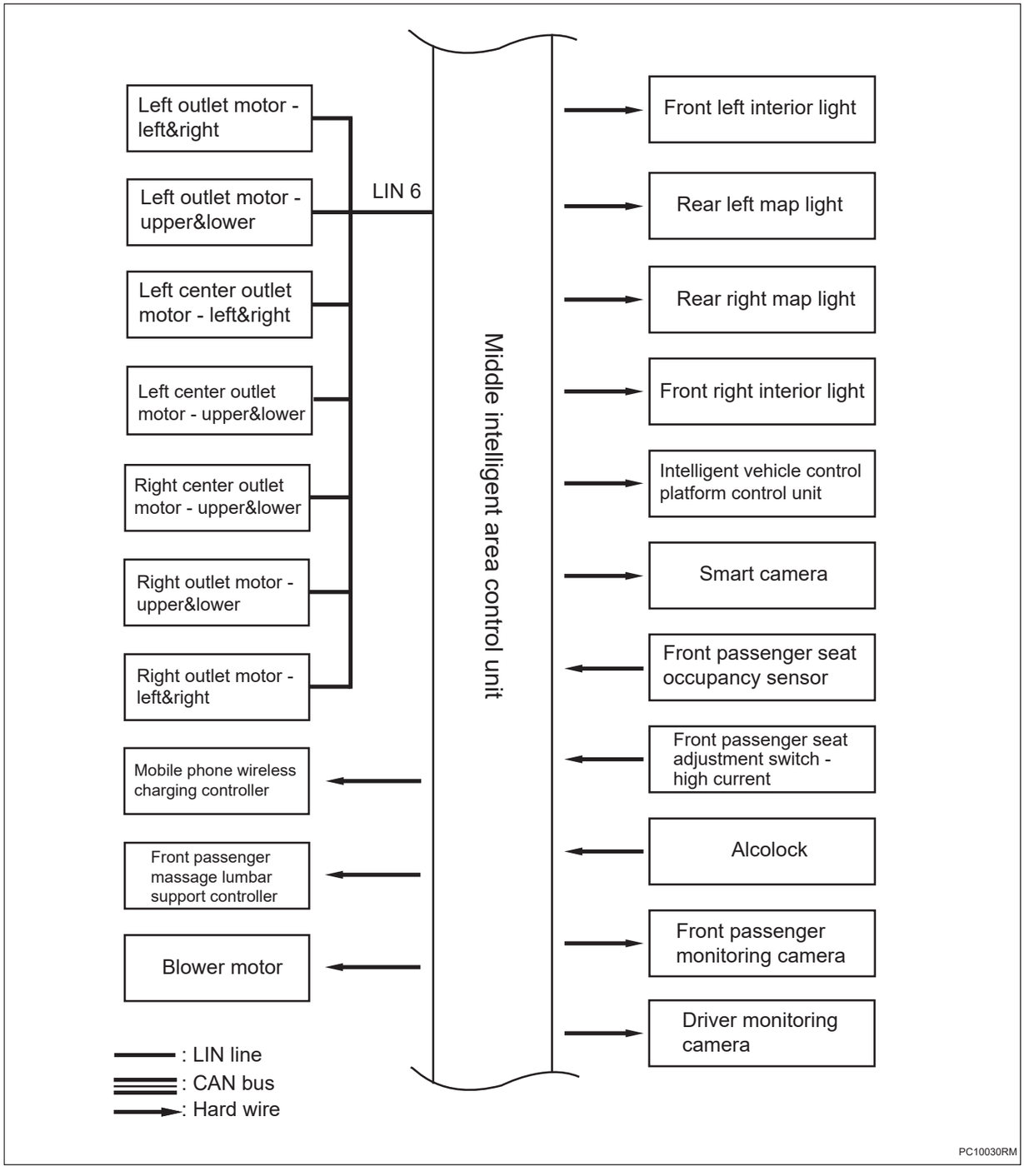


System diagram



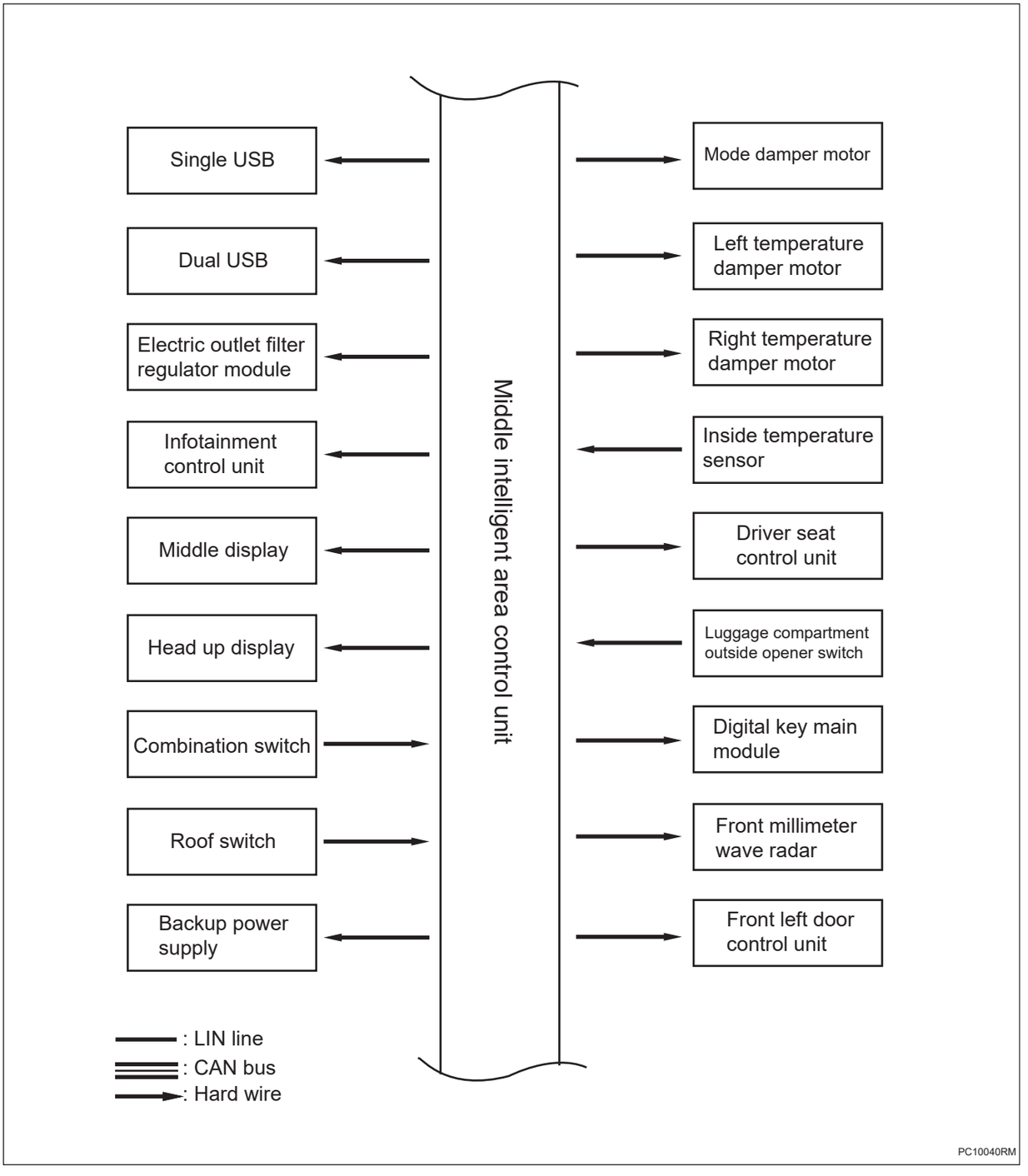
ZD

System diagram



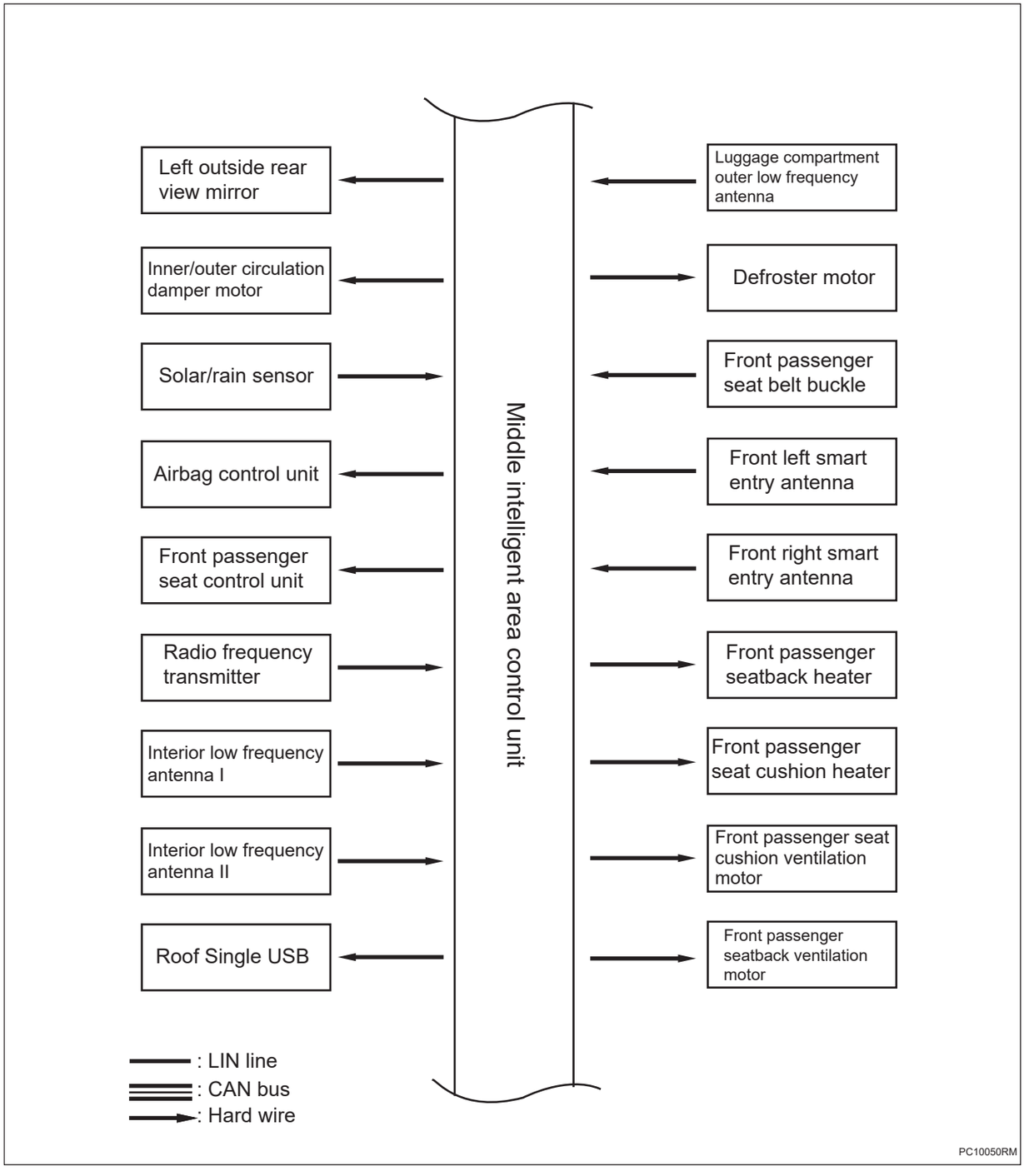
ZD

System diagram

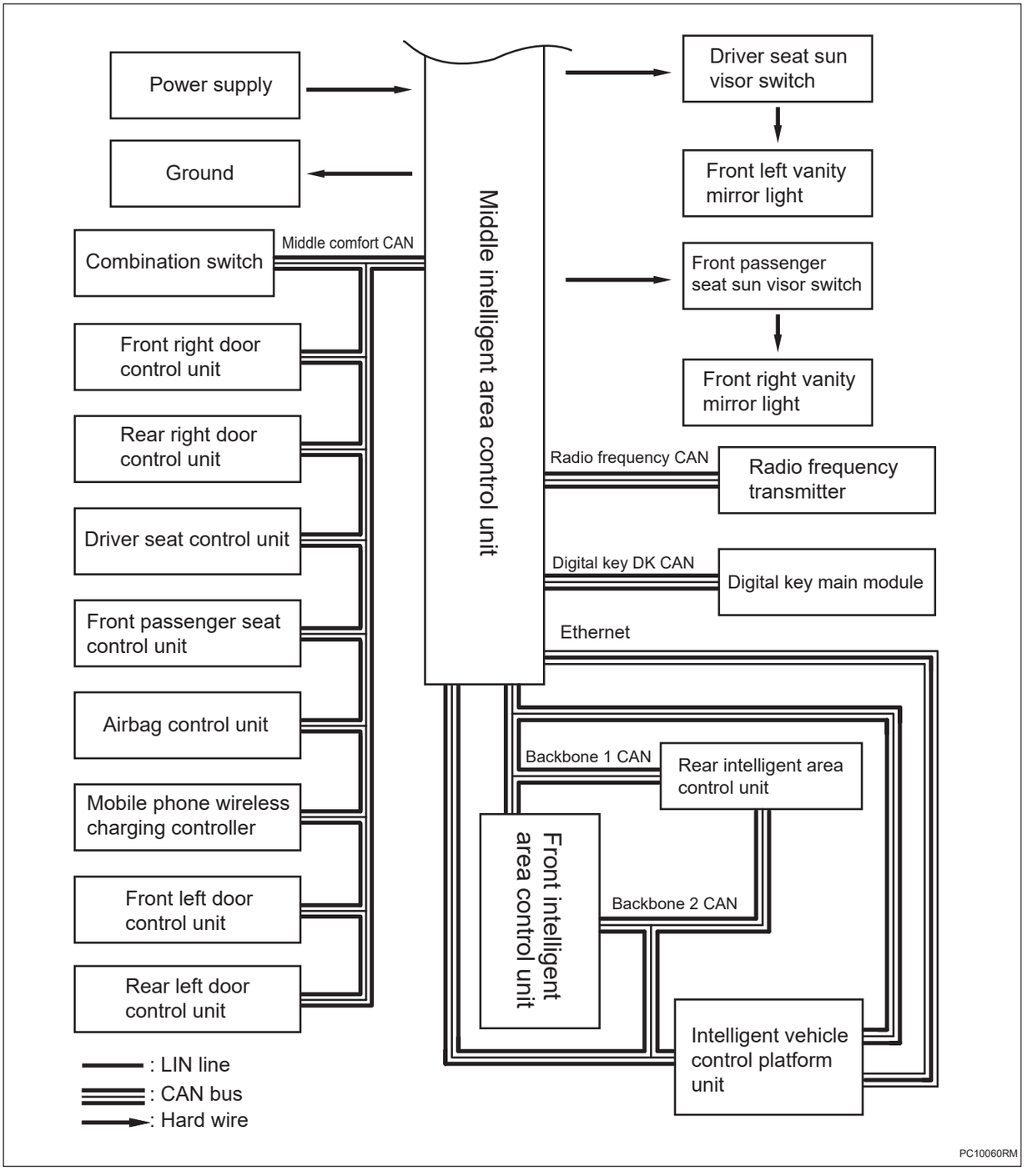


ZD

System diagram



System diagram



System description

1. System description

(a) Intelligent area controller assembly (PDC) is the various sensor/actuator acquisition and driving center and area data center of the physical area of the vehicle, undertaking the physical interface of the vehicle, such as the power distribution and input/output control of the area, etc., and transforming the service of the vehicle basic data.

2. Intelligent power distribution management

(a) PDC integrated power distribution module can realize different ECU demanded power distribution according to functional scenarios. According to scenario requirements, the power is only supplied to specified ECUs in a certain time sequence and can be woken up by network segments. After the function is complete, the network segment sleeps in time and the power distribution is cut off, so that energy consumption is minimized. For example, when power battery is charged, the power is only supplied to ECU (BMS, PDC-I, CSC , etc.) according to identified charging scenarios. After charging is finished, the network segment sleeps and the power is cut off.

Data parameter

Luggage compartment outside opener switch

Item	Max	OK	Minimum
Operating voltage (V)	15	12	9
Operating current (A)	10	0.1	0

Roof switch

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.05	0.035	0.02

Rear left map light

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.13	0.12	0.11

Rear right map light

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.13	0.12	0.11

Mode damper motor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.1	-

Left temperature damper motor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.1	-

Right temperature damper motor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.1	-

Inner/outer circulation damper motor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.1	-

Defroster motor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.1	-

Blower motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	25	22	1

Evaporator temperature sensor

Item	Max	OK	Minimum
Operating voltage (V)	-	5	-
Operating current (A)	⩽ 0.0008	⩽ 0.0008	⩽ 0.0008

Radio frequency transmitter

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.1	-	0.04

Front left vanity mirror light

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	0.085	0.063	0.026

Front right vanity mirror light

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	0.085	0.063	0.026

Inside temperature sensor

Item	Max	OK	Minimum
Operating voltage (V)	5.1	5	4.9
Operating current (A)	47	1	-

Front passenger seat occupancy sensor

Item	Max	OK	Minimum
Operating voltage (V)	19	-	0
Operating current (A)	0.02	-	0

Solar/rain sensor

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.03	0.017	0.014

Combination switch

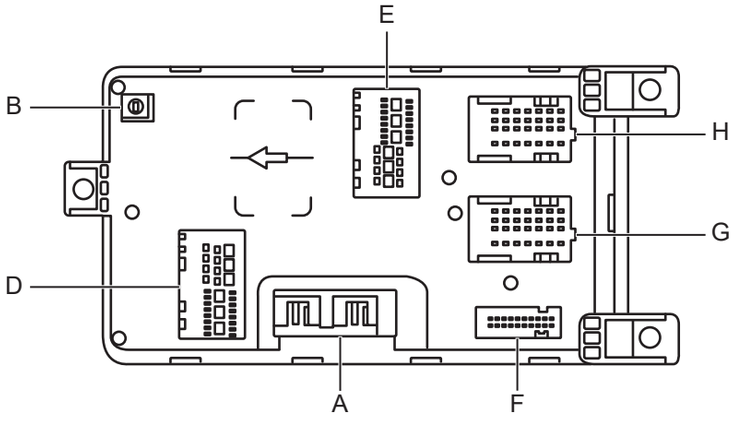
Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.5	0.24	0.1

Spiral cable (heating)

Item	Max	OK	Minimum
Operating voltage (V)	-	-	-
Operating current (A)	10	8	-

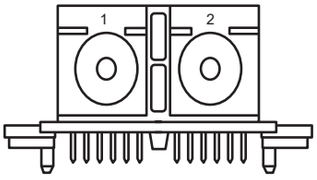
ECU terminal

Middle intelligent area control unit

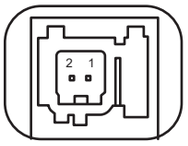


Middle intelligent area control unit

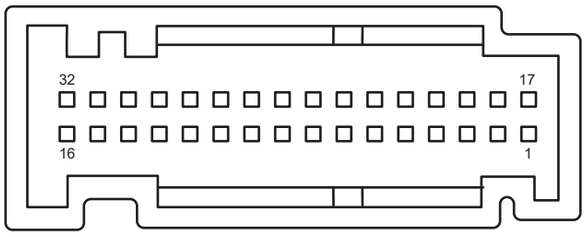
PC10200RM



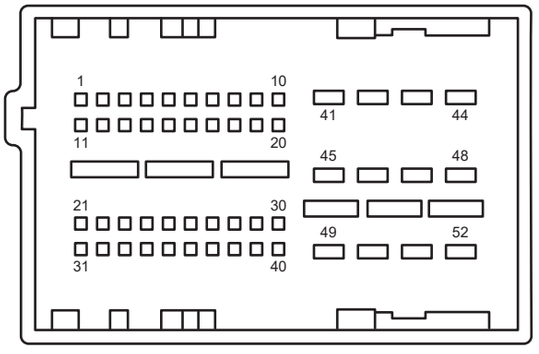
Middle intelligent area control unit - A



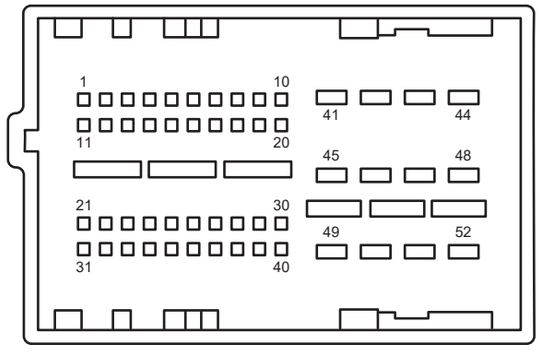
Middle intelligent area control unit - B



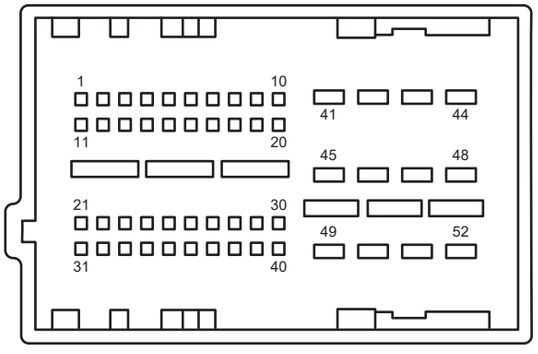
Middle intelligent area control unit - F



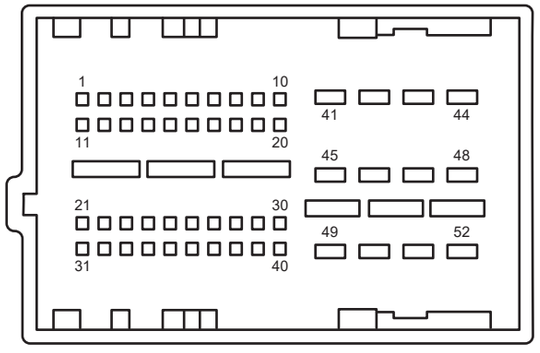
Middle intelligent area control unit - D



Middle intelligent area control unit - G



Middle intelligent area control unit - E



Middle intelligent area control unit - H

PC10010RM

Middle intelligent area control unit - A	
Pin number	**Definition**
1	B grid/non-safety power
2	-

Middle intelligent area control unit - B	
Pin number	**Definition**
1	ETH_T1_1_P (100Base) (VDC)
2	ETH_T1_1_N (100Base) (VDC)

Middle intelligent area control unit - D			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	27	-
2	CAN2H	28	-
3	CAN5L (VDC/PDCF/PDCR, backbone network CAN2)	29	LIN4 (APTC)
4	-	30	-
5	-	31	-
6	CAN1H (VDC/ICC/PDC R/PDC F) backbone network 1	32	-
7	-	33	-
8	-	34	-
9	-	35	Tracker 5V-03/inner circulation motor, defroster motor, mode motor, left temperature motor, right temperature motor power supply
10	-	36	Digital key main module/NFC/driver seat intelligent terminal B+
11	-	37	Color-changeable sunroof -/inner circulation motor drive
12	CAN2L	38	-
13	CAN5H (VDC/PDCF/PDCR, backbone network CAN2)	39	DK wake-up line
14	-	40	Color-changeable sunroof +/inner circulation motor drive
15	-	41	-
16	CAN1L (VDC/ICC/PDC R/PDC F) backbone network 1	42	GND
17	-	43	Driver heating power supply
18	-	44	-
19	Outside luggage compartment switch signal	45	Driver seat ventilation massage power supply
20	LIN2 (SeatCushion Ventilate_FR/ Seatbackrest Ventilate_FR)	46	-
21	-	47	-
22	-	48	-
23	Front millimeter wave radar	49	-
24	GND (ground)	50	Front left door intelligent terminal (B+)

Middle intelligent area control unit - D			
Pin number	**Definition**	**Pin number**	**Definition**
25	-	51	-
26	-	52	Driver seat control module power supply - motor power supply

Middle intelligent area control unit - E			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	27	Interior antenna 1-
2	-	28	-
3	Color-changeable sunroof -/defroster motor drive	29	CAN4H(RFR)
4	Color-changeable sunroof +/defroster motor drive	30	CAN3H (DK_M)
5	-	31	Interior antenna 2+
6	-	32	Interior antenna 2-
7	LIN6 (OutletMotor1-8)	33	-
8	ADS sensor power supply	34	Smart entry antenna - right-
9	Airbag controller power distribution	35	Smart entry antenna - left+
10	-	36	-
11	Alcohol interlock output	37	Interior antenna 1+
12	-	38	-
13	-	39	CAN4L(RFR)
14	-	40	CAN3L (DK_M)
15	RFR power supply/solar rain sensor power distribution/front passenger seat intelligent terminal (B+)	41	Instrument cluster/door handle/auxiliary fascia console/footwell light power supply
16	-	42	Power supply for front passenger seat ventilation and massage
17	-	43	Front right door intelligent terminal (B+)
18	LIN10 (ADS)	44	-
19	-	45	Front passenger seat belt buckle
20	-	46	GND (ground)
21	Exterior antenna 1-	47	-
22	Exterior antenna 1+	48	Front passenger heating power supply
23	-	49	-
24	Smart entry antenna - right+	50	-
25	Smart entry antenna - left-	51	Front passenger seat control module power supply - motor power supply
26	-	52	-

Middle intelligent area control unit - F			
Pin number	**Definition**	**Pin number**	**Definition**
1	Wireless charging disabled signal	17	-
2	-	18	-
3	-	19	-
4	-	20	-
5	-	21	-
6	-	22	GND (sensor ground)
7	Front evaporator temperature sensor input	23	Second row left face temperature sensor / inner circulation motor feedback
8	First row left face temperature sensor / air outlet temperature sensor 1	24	Map light status collecting
9	First row left foot temperature sensor / air outlet temperature sensor 2	25	Second row left foot temperature sensor / defroster motor feedback
10	First row right face temperature sensor / air outlet temperature sensor 3	26	Second row right face temperature sensor / mode motor feedback
11	First row right foot temperature sensor / air outlet temperature sensor 4	27	Second row right foot temperature sensor / left temperature motor feedback
12	-	28	-
13	-	29	-
14	-	30	-
15	-	31	Color-changeable sunroof temperature sensor collection 2/right temperature motor feedback
16	-	32	Front passenger seat heater temperature sensor

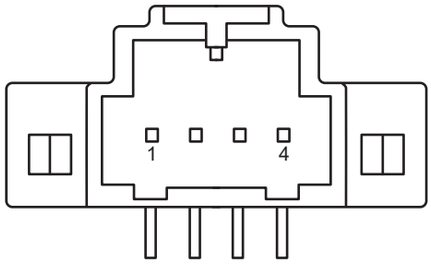
Middle intelligent area control unit - G			
Pin number	**Definition**	**Pin number**	**Definition**
1	Front and rear map light control	27	-
2	-	28	-
3	-	29	-
4	-	30	IG enable signal
5	-	31	Front blower PWM control input
6	-	32	USB A power supply
7	-	33	-
8	-	34	-
9	Front passenger occupancy sensor	35	-
10	APTC power supply	36	-
11	-	37	-
12	Alcohol interlock wake-up signal	38	Alcohol interlock standby/driving
13	-	39	-

Middle intelligent area control unit - G			
Pin number	**Definition**	**Pin number**	**Definition**
14	-	40	Driver status monitoring camera infrared fill light power distribution/front passenger status monitoring camera infrared fill light power distribution
15	-	41	Single USB power supply
16	-	42	12-5V USB output HUB
17	-	43	GND
18	-	44	Front HVAC blower (brushless)
19	Front interior light power supply, BatterySaver vanity mirror power supply, rear map light	45	-
20	-	46	VDC power distribution 1
21	-	47	-
22	-	48	Electric sunroof power distribution/front passenger seatback motor power supply
23	-	49	-
24	-	50	-
25	-	51	Power supply for front passenger seat horizontal and vertical motors
26	-	52	OBD (B+)

On-board middle intelligent area control unit - H			
Pin number	**Definition**	**Pin number**	**Definition**
1	Reserved speaker regulator motor 3+ (up)/right temperature motor driver	27	-
2	-	28	-
3	Combination switch power supply/ alcohol interlock KL30 power supply (B +)	29	Speaker regulator motor 1- (down)/ mode motor driver
4	-	30	Speaker regulator motor 2- (down)/left temperature motor driver
5	Center display power supply	31	-
6	IFC power supply	32	-
7	Hazard warning switch indicator power	33	-
8	LIN7 (MFS)	34	Reserved speaker regulator motor 3- (down)/right temperature motor driver
9	-	35	-
10	Hazard warning switch backlight power + roof switch SOS backlight	36	Blower PWM feedback
11	-	37	-
12	Hazard warning switch signal	38	Speaker regulator motor 1+ (up)/mode motor driver

On-board middle intelligent area control unit - H			
Pin number	**Definition**	**Pin number**	**Definition**
13	Steering wheel control panel power supply	39	-
14	-	40	Speaker regulator motor 2+ (up)/left temperature motor driver
15	-	41	Front mobile phone wireless charging
16	-	42	Steering wheel heaer
17	-	43	Backup power supply 1
18	-	44	CSC power supply (B+)
19	Alcohol interlock input	45	Head up display power supply/AR-head up display
20	-	46	Air outlet motor voltage regulator module power supply
21	-	47	-
22	-	48	-
23	Horn switch signal	49	-
24	-	50	-
25	Steering wheel heating NTC input	51	-
26	Front inside temperature sensor signal	52	-

Radio frequency transmitter



Radio frequency transmitter

PC30010RM

Radio frequency transmitter			
Pin number	**Definition**	**Pin number**	**Definition**
1	CANFD_L	3	GND
2	CANFD_H	4	B+

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C230046	Power supply voltage low	(See page ZD-483)
C230047	Power supply voltage excessive	(See page ZD-483)
C231800	Low power supply voltage (SR power grid)	(See page ZD-488)
C231900	Power supply overvoltage (SR power grid)	(See page ZD-488)
C231A00	Low power supply voltage (QM power grid)	(See page ZD-488)
C231B00	Power supply overvoltage (QM power grid)	(See page ZD-488)
B220F10	Horn switch stuck	(See page ZD-492)
B221D13	Open in interior antenna 1	(See page ZD-508)
B221D11	Short to ground in interior antenna 1	(See page ZD-508)
B221D12	Short to power supply in interior antenna 1	(See page ZD-508)
B221E13	Open in interior antenna 2	(See page ZD-508)
B221E11	Short to ground in interior antenna 2	(See page ZD-508)
B221E12	Short to power supply in interior antenna 2	(See page ZD-508)
B222013	Open in exterior antenna 1	(See page ZD-508)
B222011	Short to ground in exterior antenna 1	(See page ZD-508)
B222012	Short to power supply in exterior antenna 1	(See page ZD-508)
B222113	Open in left smart entry antenna	(See page ZD-508)
B222111	Short to ground in left smart entry antenna	(See page ZD-508)
B222112	Short to power supply in left smart entry antenna	(See page ZD-508)
B222213	Open in right smart entry antenna	(See page ZD-508)
B222211	Short to ground in right smart entry antenna	(See page ZD-508)
B222212	Short to power supply in right smart entry antenna	(See page ZD-508)
B222A11	Short to ground in front right millimeter wave radar ADS sensor power supply	(See page ZD-547)
B222D11	Short to ground in front millimeter wave radar power supply	(See page ZD-550)
B222E11	Short to ground in multiple light source ambient light power supply	(See page ZD-552)
B222F11	Short to ground in front passenger seat ventilation massage power supply	(See page ZD-556)
B223B11	Short to ground in front mobile phone wireless charger	(See page ZD-569)
B223E11	Short to ground in front passenger seat control module power supply	(See page ZD-571)
B223F11	Short to ground in front passenger heating power supply	(See page ZD-574)
B223F13	Open in front passenger heater	(See page ZD-574)

DTC	Detection Items	See page
B224F11	Short to ground in front/rear map light control	(See page ZD-596)
B224F12	Short to power supply in front/rear map light control	(See page ZD-596)
B220100	ICC authentication failure	(See page ZD-630)
B220200	PDC authentication failure	(See page ZD-631)
B220300	TPMS ID invalid	(See page ZD-632)
B220400	Front TPMS low pressure alarm threshold invalid	(See page ZD-632)
B220500	TPMS temperature alarm threshold invalid	(See page ZD-632)
B220600	TPMS temperature alarm threshold invalid	(See page ZD-632)
B220700	Front left TPMS invalid	(See page ZD-634)
B220800	Front left TPMS undervoltage	(See page ZD-634)
B220900	Front right TPMS invalid	(See page ZD-634)
B220A00	Front right TPMS undervoltage	(See page ZD-634)
B220B00	Rear left TPMS invalid	(See page ZD-634)
B220C00	Rear left TPMS undervoltage	(See page ZD-634)
B220D00	Rear right TPMS invalid	(See page ZD-634)
B220E00	Rear right TPMS undervoltage	(See page ZD-634)
B221010	Hazard warning light switch stuck	(See page ZD-497)
B225211	Short to ground in hazard warning switch backlight power	(See page ZD-497)
B225212	Short to power supply in hazard warning switch backlight power	(See page ZD-497)
B225311	Short to ground in hazard warning switch indicator power	(See page ZD-497)
B225312	Short to power supply in hazard warning switch indicator power	(See page ZD-497)
B221210	Outside luggage compartment switch signal stuck	(See page ZD-503)
B222411	Short to ground in front interior light power supply, BatterySaver vanity mirror power supply, rear map light, low configuration footwell light	(See page ZD-532)
B222511	Short to ground in head up display power supply	(See page ZD-535)
B222711	Short to ground in center display power supply	(See page ZD-537)
B222811	Short to ground in driver status monitoring camera power supply	(See page ZD-540)
B222911	Short to ground in IG power supply	(See page ZD-543)
B222912	Short to power supply in IG power supply	(See page ZD-543)
B223111	Short to ground in driver seat ventilation massage power supply	(See page ZD-558)

DTC	Detection Items	See page
B223611	Front passenger seatback motor power supply	(See page ZD-561)
B223811	Short to ground in 12-5V USB output HUB	(See page ZD-564)
B223911	Short to ground in backup power supply 1	(See page ZD-566)
B224011	Short to ground in driver seat control module power supply	(See page ZD-578)
B224211	Short to ground in driver heating power supply	(See page ZD-580)
B224311	Short to ground in VDC power distribution 1	(See page ZD-583)
B224519	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse overload	(See page ZD-585)
B224511	Short to ground in combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse	(See page ZD-585)
B22451A	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse MOS saturation shutdown	(See page ZD-585)
B22451B	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse unable to enter sleep	(See page ZD-585)
B22451C	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse undervoltage	(See page ZD-585)
B22451D	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse overtemperature	(See page ZD-585)
B22451E	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse SPI communication fault	(See page ZD-585)
B224619	Front left door intelligent terminal electronic fuse overload	(See page ZD-585)
B224611	Short to ground in front left door intelligent terminal electronic fuse	(See page ZD-585)
B22461A	Front left door intelligent terminal electronic fuse MOS saturation shutdown	(See page ZD-585)
B22461B	Front left door intelligent terminal electronic fuse unable to enter sleep	(See page ZD-585)
B22461C	Front left door intelligent terminal electronic fuse undervoltage	(See page ZD-585)

DTC	Detection Items	See page
B22461D	Front left door intelligent terminal electronic fuse overtemperature	(See page ZD-585)
B22461E	Front left door intelligent terminal electronic fuse SPI communication fault	(See page ZD-585)
B224719	Front right door intelligent terminal electronic fuse overload	(See page ZD-585)
B224711	Short to ground in front right door intelligent terminal electronic fuse	(See page ZD-585)
B22471A	Front right door intelligent terminal electronic fuse MOS saturation shutdown	(See page ZD-585)
B22471B	Front right door intelligent terminal electronic fuse unable to enter sleep	(See page ZD-585)
B22471C	Front right door intelligent terminal electronic fuse undervoltage	(See page ZD-585)
B22471D	Front right door intelligent terminal electronic fuse overtemperature	(See page ZD-585)
B22471E	Front right door intelligent terminal electronic fuse SPI communication fault	(See page ZD-585)
B224919	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse overload	(See page ZD-585)
B224911	Short to ground in digital key main module/ NFC/driver seat intelligent terminal B+ electronic fuse	(See page ZD-585)
B22491A	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse MOS saturation shutdown	(See page ZD-585)
B22491B	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse unable to enter sleep	(See page ZD-585)
B22491C	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse undervoltage	(See page ZD-585)
B22491D	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse overtemperature	(See page ZD-585)
B22491E	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse SPI communication fault	(See page ZD-585)
B224B19	OBD electronic fuse overload	(See page ZD-585)
B224B11	Short to ground in OBD electronic fuse	(See page ZD-585)
B224B1A	OBD electronic fuse MOS saturation shutdown	(See page ZD-585)
B224B1B	OBD electronic fuse unable to enter sleep	(See page ZD-585)
B224B1C	OBD electronic fuse undervoltage	(See page ZD-585)
B224B1D	OBD electronic fuse overtemperature	(See page ZD-585)
B224B1E	OBD electronic fuse SPI communication fault	(See page ZD-585)

DTC	Detection Items	See page
B224C19	Cockpit domain controller electronic fuse overload	(See page ZD-585)
B224C11	Short to ground in cockpit domain controller electronic fuse	(See page ZD-585)
B224C1A	Cockpit domain controller electronic fuse MOS saturation shutdown	(See page ZD-585)
B224C1B	Cockpit domain controller electronic fuse unable to enter sleep	(See page ZD-585)
B224C1C	Cockpit domain controller electronic fuse undervoltage	(See page ZD-585)
B224C1D	Cockpit domain controller electronic fuse overtemperature	(See page ZD-585)
B224C1E	Cockpit domain controller electronic fuse serial peripheral device interface communication fault	(See page ZD-585)
B225611	Short to ground in wireless charging disabled signal	(See page ZD-600)
B227712	Short to power supply in DK wake-up line	(See page ZD-603)
B227812	Short to power supply in alcolock	(See page ZD-605)
C220D11	Short to ground in front passenger seat heater temperature sensor acquisition	(See page ZD-608)
C220E11	Short to power supply/open in front passenger seat heater temperature sensor acquisition	(See page ZD-608)
C220F11	Short to ground in right temperature motor recovery	(See page ZD-613)
C221011	Short to power supply/open in right temperature motor recovery	(See page ZD-613)
P30A011	Short to ground in steering wheel heating NTC input	(See page ZD-516)
P30B511	Short to power supply/open in steering wheel heating NTC input	(See page ZD-516)
P30BE11	Steering wheel heating NTC reasonability range fault	(See page ZD-516)
C220A11	Steering wheel NTC abnormal fault	(See page ZD-516)
P30B111	Short to ground in steering wheel heater	(See page ZD-516)
P30B112	Short to power supply in steering wheel heater	(See page ZD-516)
P30B113	Open in steering wheel heater	(See page ZD-516)
P30A111	Short to ground in front inside temperature sensor signal	(See page ZD-523)
P30A211	Short to ground in front evaporator temperature sensor input	(See page ZD-525)
P30A311	Short to ground in first row left face temperature sensor	(See page ZD-525)
P30A411	Short to ground in first row left foot temperature sensor	(See page ZD-525)

DTC	Detection Items	See page
P30A511	Short to ground in first row right face temperature sensor	(See page ZD-525)
P30A611	Short to ground in first row right foot temperature sensor	(See page ZD-525)
P30B411	Short to power supply/open in front evaporator temperature sensor input	(See page ZD-525)
P30B611	Short to power supply/open in first row left face temperature sensor	(See page ZD-525)
P30B711	Short to power supply/open in first row left foot temperature sensor	(See page ZD-525)
P30B811	Short to power supply/open in first row right face temperature sensor	(See page ZD-525)
P30B911	Short to power supply/open in first row right foot temperature sensor	(See page ZD-525)
P30AB11	Short to ground in air outlet motor voltage regulator module power supply	(See page ZD-617)
P30AC11	Short to ground in airbag power supply	(See page ZD-620)
P30B011	Front passenger seat horizontal - vertical motor power supply	(See page ZD-623)
P30B211	Short to ground in front HVAC blower (brushless)	(See page ZD-625)
P30B312	Short to power supply in front blower PWM control	(See page ZD-628)
B223D11	Short to ground in cigarette lighter drive	(See page ZD-640)
B226C11	Short to ground in A/C box assembly right temperature motor	(See page ZD-646)
B226C12	Short to power supply in A/C box assembly right temperature motor	(See page ZD-646)
B226C13	Open in A/C box assembly right temperature motor	(See page ZD-646)
B222311	Short to ground in air cleaner power supply, second row A/C switch power supply, intelligent fragrance controller power supply, air quality sensor - power distribution	(See page ZD-637)
B222312	Short to power supply in air cleaner power supply, second row A/C switch power supply, intelligent fragrance controller power supply, air quality sensor - power distribution	(See page ZD-637)
B225411	Short to ground in USB output HUB LED indicator	(See page ZD-643)
B227011	Short to ground in hands off monitor power supply, steering wheel control panel power supply	(See page ZD-654)
P30A711	Short to ground in second row left face temperature sensor	(See page ZD-658)
B226D11	Short to ground in A/C box assembly inner circulation motor	(See page ZD-658)

DTC	Detection Items	See page
B226D12	Short to power supply in A/C box assembly inner circulation motor	(See page ZD-658)
B226D13	Open in A/C box assembly inner circulation motor	(See page ZD-658)
P30BA11	Short to power supply/open in second row left face temperature sensor	(See page ZD-658)
P30A811	Short to ground in second row left foot temperature sensor	(See page ZD-665)
B226E11	Short to ground in A/C box assembly defroster motor	(See page ZD-665)
B226E12	Short to power supply in A/C box assembly defroster motor	(See page ZD-665)
B226E13	Open in A/C box assembly defroster motor	(See page ZD-665)
P30BB11	Short to power supply/open in second row left foot temperature sensor	(See page ZD-665)
P30A911	Short to ground in second row right face temperature sensor	(See page ZD-674)
B226A11	Short to ground in A/C box assembly mode motor	(See page ZD-674)
B226A12	Short to power supply in A/C box assembly mode motor	(See page ZD-674)
B226A13	Open in A/C box assembly mode motor	(See page ZD-674)
P30BC11	Short to power supply/open in second row right face temperature sensor	(See page ZD-674)
P30AA11	Short to ground in second row right foot temperature sensor	(See page ZD-683)
B226B11	Short to ground in A/C box assembly left temperature motor	(See page ZD-683)
B226B12	Short to power supply in A/C box assembly left temperature motor	(See page ZD-683)
B226B13	Open in A/C box assembly left temperature motor	(See page ZD-683)
P30BD11	Short to power supply/open in second row right foot temperature sensor	(See page ZD-683)
P30AD11	Short to ground in instrument panel switch power supply, auxiliary fascia console switch power supply, DP switch (instrument panel headlight switch)	(See page ZD-692)
U102E88	PDCM LIN2 physical bus error	(See page ZD-695)
U218687	Seat cushion motor node lost	(See page ZD-695)
U218787	Seatback motor node lost	(See page ZD-695)
P30889A	Front right seatback ventilation motor error	(See page ZD-695)
P30889B	Front right seatback ventilation motor code pin error	(See page ZD-695)
P30889C	Front right seatback ventilation motor undervoltage error	(See page ZD-695)

DTC	Detection Items	See page
P30899A	Front right seatback ventilation motor overvoltage error	(See page ZD-695)
P30899B	Front right seatback ventilation motor overtemperature error	(See page ZD-695)
P30899C	Front right seat cushion ventilation motor error	(See page ZD-695)
P308A9A	Front right seat cushion ventilation motor code pin error	(See page ZD-695)
P308A9B	Front right seat cushion ventilation motor undervoltage error	(See page ZD-695)
P308A9C	Front right seat cushion ventilation motor overvoltage error	(See page ZD-695)
P308B9A	Front right seat cushion ventilation motor overtemperature error	(See page ZD-695)
P308B9B	Front right seat cushion ventilation motor fault	(See page ZD-695)
P308B9C	Front right seatback ventilation motor fault	(See page ZD-695)
U103088	PDCM LIN4 physical bus error	(See page ZD-704)
P308097	AirPTC overvoltage error	(See page ZD-704)
P308096	AirPTC undervoltage error	(See page ZD-704)
P30809A	AirPTC overtemperature error	(See page ZD-704)
P308191	Short/open in AirPTC temperature sensor	(See page ZD-704)
P308293	Open in AirPTC Mosfet/PTC	(See page ZD-704)
P308299	AirPTC overcurrent error	(See page ZD-704)
P308291	Short in AirPTC Mosfet/PTC	(See page ZD-704)
U21D186	AirPTC communication error	(See page ZD-704)
U21D286	APTC response error	(See page ZD-704)
U218D87	Heater positive temperature coefficient heater node lost	(See page ZD-704)
U103288	PDCM LIN6 physical bus error	(See page ZD-710)
U218E87	A/C outlet left air outlet left/right motor node lost	(See page ZD-710)
U218F87	A/C outlet left air outlet upper/lower motor node lost	(See page ZD-710)
U219087	A/C outlet left center air outlet left/right motor node lost	(See page ZD-710)
U219187	A/C outlet left center air outlet upper/lower motor node lost	(See page ZD-710)
U219287	A/C outlet right center air outlet left/right motor node lost	(See page ZD-710)
U219387	A/C outlet right center air outlet upper/lower motor node lost	(See page ZD-710)
U219487	A/C outlet right air outlet left/right motor node lost	(See page ZD-710)

DTC	Detection Items	See page
U219587	A/C outlet right air outlet upper/lower motor node lost	(See page ZD-710)
U21E586	A/C outlet left air outlet left/right motor communication fault	(See page ZD-710)
U21E686	A/C outlet left air outlet upper/lower motor communication fault	(See page ZD-710)
U21E786	A/C outlet left center air outlet left/right motor communication fault	(See page ZD-710)
U21E886	A/C outlet left center air outlet upper/lower motor communication fault	(See page ZD-710)
U21E986	A/C outlet right center air outlet left/right motor communication fault	(See page ZD-710)
U21EA86	A/C outlet right center air outlet upper/lower motor communication fault	(See page ZD-710)
U21EB86	A/C outlet right air outlet left/right motor communication fault	(See page ZD-710)
U21EC86	A/C outlet right air outlet upper/lower motor communication fault	(See page ZD-710)
P308E9A	A/C outlet left air outlet left/right motor overtemperature fault	(See page ZD-710)
P308E9B	A/C outlet left air outlet left/right motor electrical fault	(See page ZD-710)
P308E96	A/C outlet left air outlet left/right motor undervoltage fault	(See page ZD-710)
P308E97	A/C outlet left air outlet left/right motor overvoltage fault	(See page ZD-710)
P308E93	Open in A/C outlet left air outlet left/right motor	(See page ZD-710)
P308E91	Short in A/C outlet left air outlet left/right motor	(See page ZD-710)
P308F9A	A/C outlet left air outlet upper/lower motor overtemperature fault	(See page ZD-710)
P308F9B	A/C outlet left air outlet upper/lower motor electrical fault	(See page ZD-710)
P308F96	A/C outlet left air outlet upper/lower motor undervoltage fault	(See page ZD-710)
P308F97	A/C outlet left air outlet upper/lower motor overvoltage fault	(See page ZD-710)
P308F93	Open in A/C outlet left air outlet upper/lower motor	(See page ZD-710)
P308F91	Short in A/C outlet left air outlet upper/lower motor	(See page ZD-710)
P30909A	A/C outlet left center air outlet left/right motor overtemperature fault	(See page ZD-710)
P30909B	A/C outlet left center air outlet left/right motor electrical fault	(See page ZD-710)
P309096	A/C outlet left center air outlet left/right motor undervoltage fault	(See page ZD-710)

DTC	Detection Items	See page
P309097	A/C outlet left center air outlet left/right motor overvoltage fault	(See page ZD-710)
P309093	Open in A/C outlet left center air outlet left/ right motor	(See page ZD-710)
P309091	Short in A/C outlet left center air outlet left/ right motor	(See page ZD-710)
P30919A	A/C outlet left center air outlet upper/lower motor overtemperature fault	(See page ZD-710)
P30919B	A/C outlet left center air outlet upper/lower motor electrical fault	(See page ZD-710)
P309196	A/C outlet left center air outlet upper/lower motor undervoltage fault	(See page ZD-710)
P309197	A/C outlet left center air outlet upper/lower motor overvoltage fault	(See page ZD-710)
P309193	Open in A/C outlet left center air outlet upper/lower motor	(See page ZD-710)
P309191	Short in A/C outlet left center air outlet upper/lower motor	(See page ZD-710)
P30929A	A/C outlet right center air outlet left/right motor overtemperature fault	(See page ZD-710)
P30929B	A/C outlet right center air outlet left/right motor electrical fault	(See page ZD-710)
P309296	A/C outlet right center air outlet left/right motor undervoltage fault	(See page ZD-710)
P309297	A/C outlet right center air outlet left/right motor overvoltage fault	(See page ZD-710)
P309293	Open in A/C outlet right center air outlet left/ right motor	(See page ZD-710)
P309291	Short in A/C outlet right center air outlet left/ right motor	(See page ZD-710)
P30939A	A/C outlet right center air outlet upper/lower motor overtemperature fault	(See page ZD-710)
P30939B	A/C outlet right center air outlet upper/lower motor electrical fault	(See page ZD-710)
P309396	A/C outlet right center air outlet upper/lower motor undervoltage fault	(See page ZD-710)
P309397	A/C outlet right center air outlet upper/lower motor overvoltage fault	(See page ZD-710)
P309393	Open in A/C outlet right center air outlet upper/lower motor	(See page ZD-710)
P309391	Short in A/C outlet right center air outlet upper/lower motor	(See page ZD-710)
P30949A	A/C outlet right air outlet left/right motor overtemperature fault	(See page ZD-710)
P30949B	A/C outlet right air outlet left/right motor electrical fault	(See page ZD-710)
P309496	A/C outlet right air outlet left/right motor undervoltage fault	(See page ZD-710)

DTC	Detection Items	See page
P309497	A/C outlet right air outlet left/right motor overvoltage fault	(See page ZD-710)
P309493	Open in A/C outlet right air outlet left/right motor	(See page ZD-710)
P309491	Short in A/C outlet right air outlet left/right motor	(See page ZD-710)
P30959A	A/C outlet right air outlet upper/lower motor overtemperature fault	(See page ZD-710)
P30959B	A/C outlet right air outlet upper/lower motor electrical fault	(See page ZD-710)
P309596	A/C outlet right air outlet upper/lower motor undervoltage fault	(See page ZD-710)
P309597	A/C outlet right air outlet upper/lower motor overvoltage fault	(See page ZD-710)
P309593	Open in A/C outlet right air outlet upper/ lower motor	(See page ZD-710)
P309591	Short in A/C outlet right air outlet upper/ lower motor	(See page ZD-710)
U103388	PDCM LIN7 physical bus error	(See page ZD-726)
U02FA87	Multi-function steering wheel switch node lost	(See page ZD-726)
U21E286	Multi-function steering wheel LIN node communication fault	(See page ZD-726)
B220397	Multi-function steering wheel LIN node overvoltage fault	(See page ZD-726)
B220396	Multi-function steering wheel LIN node undervoltage fault	(See page ZD-726)
B22039A	Multi-function steering wheel LIN node left switch stuck fault	(See page ZD-726)
B22039B	Multi-function steering wheel LIN node right switch stuck fault	(See page ZD-726)
B22039C	Multi-function steering wheel LIN node internal fault	(See page ZD-726)
B22039F	Multi-function steering wheel LIN node acceleration switch fault	(See page ZD-726)
U103688	PDCM LIN10 physical bus error	(See page ZD-733)
U02AB87	Anti-fog sensor node lost	(See page ZD-733)
U21DD86	Anti-fog sensor feedback fault	(See page ZD-733)
U21DF86	Anti-fog sensor feedback sensor fault	(See page ZD-733)
U002888	Comfort CAN bus off	(See page ZD-739)
U008188	Digital key CAN bus off	(See page ZD-750)
U008988	Backbone network 1 CAN bus off	(See page ZD-756)
U009288	Backbone network 2 CAN bus off	(See page ZD-761)
U14648A	Backbone network Eth1 connection establishment failure	(See page ZD-773)
U014687	Front area controller node lost	(See page ZD-766)

DTC	Detection Items	See page
U014887	Rear area controller node lost	(See page ZD-766)
U014B87	Central computing unit VDC397 node lost	(See page ZD-766)
U014A87	Central computing unit VDC821 node lost	(See page ZD-766)
U02DB87	Digital key controller node lost	(See page ZD-766)
U011C87	Combination switch node lost	(See page ZD-766)
U020887	Front Left seat controller node lost	(See page ZD-766)
U021187	Front right seat controller node lost	(See page ZD-766)
U015187	Airbag control unit node lost	(See page ZD-766)
U024887	Wireless charging unit node lost	(See page ZD-766)
U019987	Driver door module node lost	(See page ZD-766)
U020087	Front passenger door module node lost	(See page ZD-766)
U020187	Rear left door module node lost	(See page ZD-766)
U020287	Rear right door module node lost	(See page ZD-766)
U216187	Radio frequency transceiver node lost	(See page ZD-766)
U014A97	VDC821 node lost (backbone network 2)	(See page ZD-766)
U008088	RFR CAN bus Off	(See page ZD-766)
B226F11	Short to ground in USB A power supply	(See page ZD-777)

Radio frequency transmitter

DTC	Detection Items	See page
B17E016	Battery voltage too low	(See page ZD-780)
B17E017	Battery voltage too high	(See page ZD-780)

DTC	**C230046**	**Power supply voltage low**
DTC	**C230047**	**Power supply voltage excessive**

Description

When power supply voltage of middle intelligent area control unit is too high or too low, the middle intelligent area control unit records DTC.

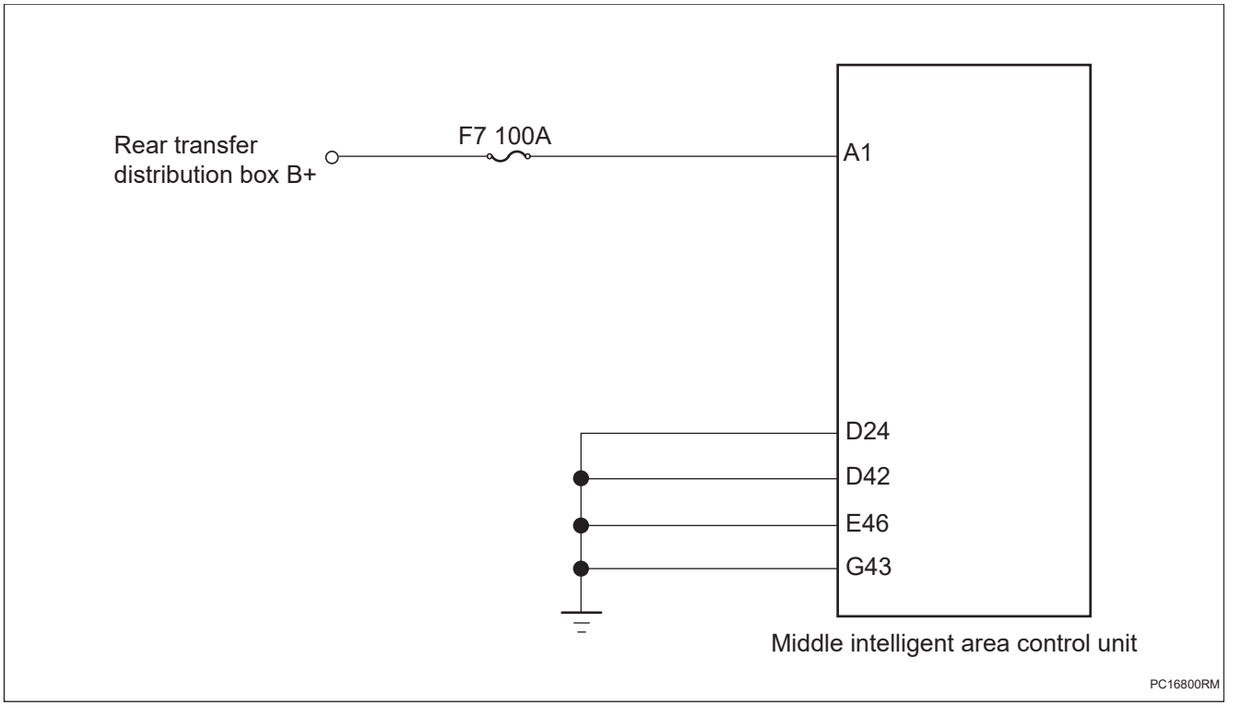
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C230046	• PDC wakeup • PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system
C230047	• PDC wakeup • PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C230046	ECU communication function is limited, IO function is limited	-
C230047	ECU communication function is limited, IO function is limited	-

Circuit diagram



Inspection procedure

1	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

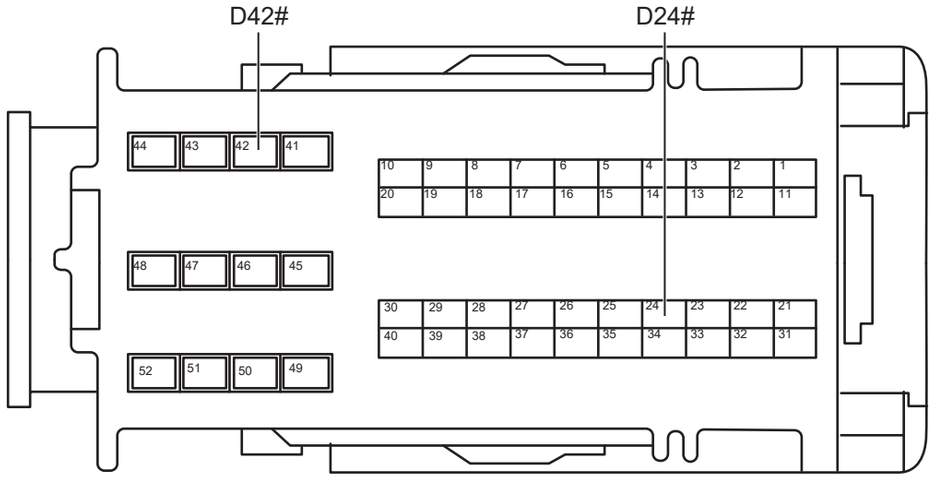
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

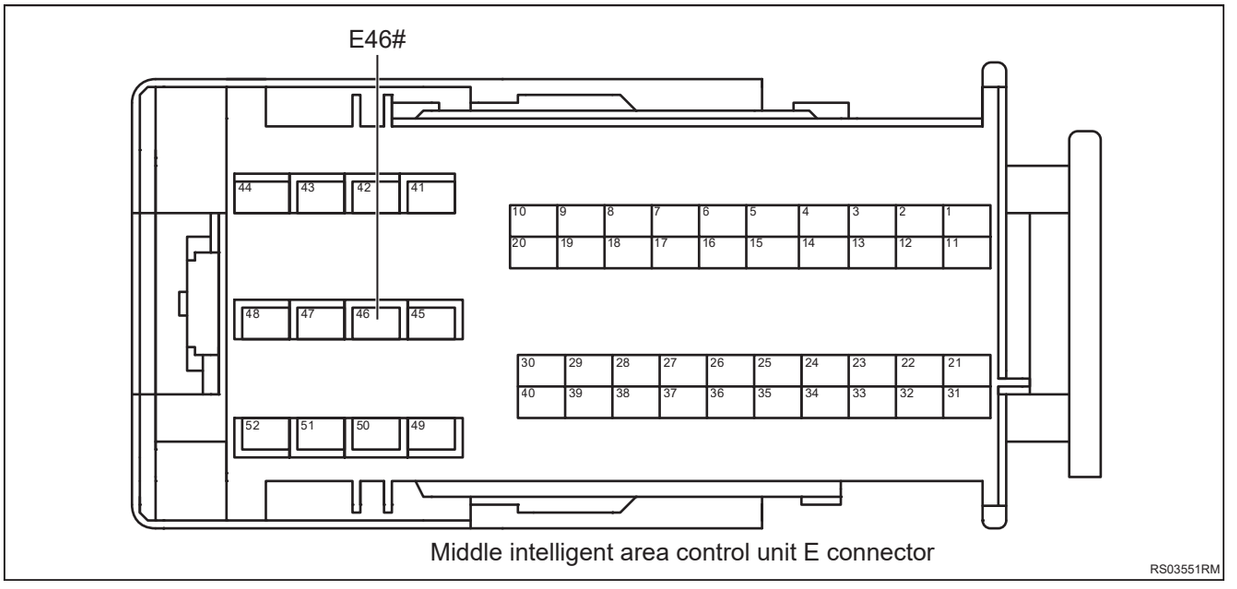
OK

2	Check middle intelligent area control unit ground

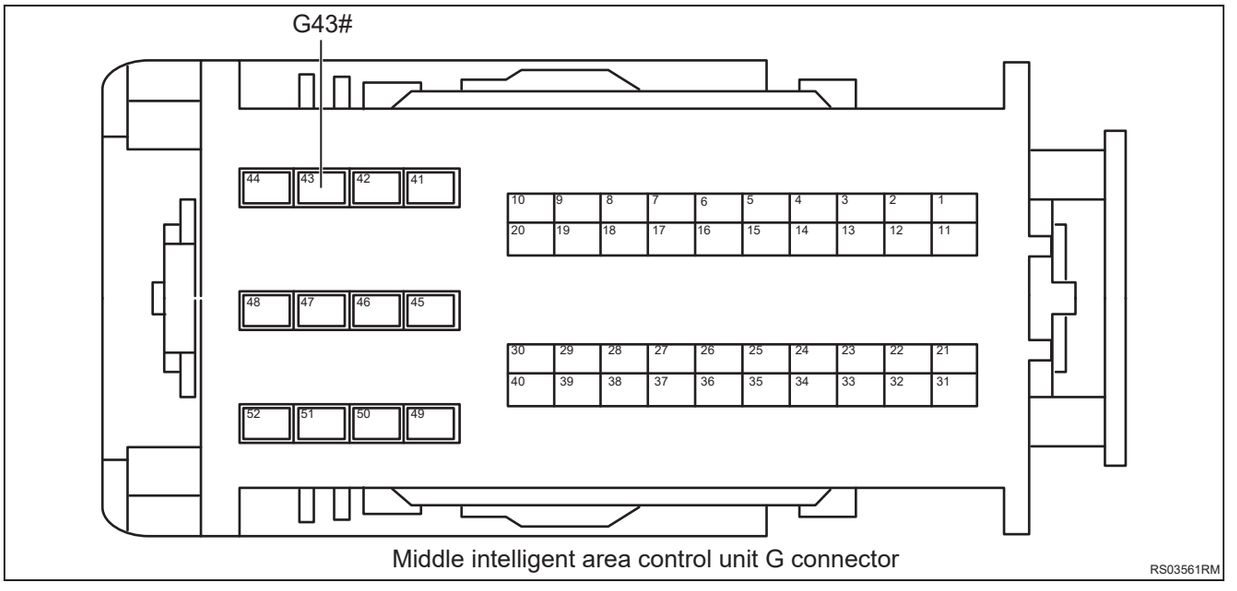


Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector



Middle intelligent area control unit G connector

(a) According to value in the table, measure resistance.

Standard value

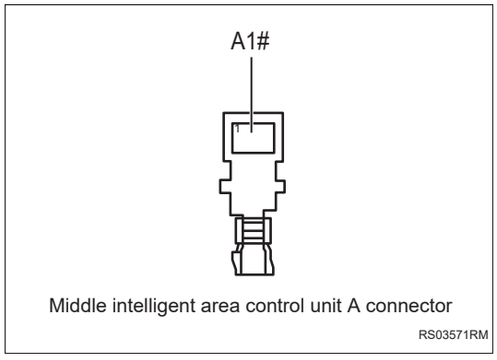
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace middle intelligent area control unit (See page ZC-132)

DTC	C231800	Low power supply voltage (SR power grid)
DTC	C231900	Power supply overvoltage (SR power grid)
DTC	C231A00	Low power supply voltage (QM power grid)
DTC	C231B00	Power supply overvoltage (QM power grid)

Description

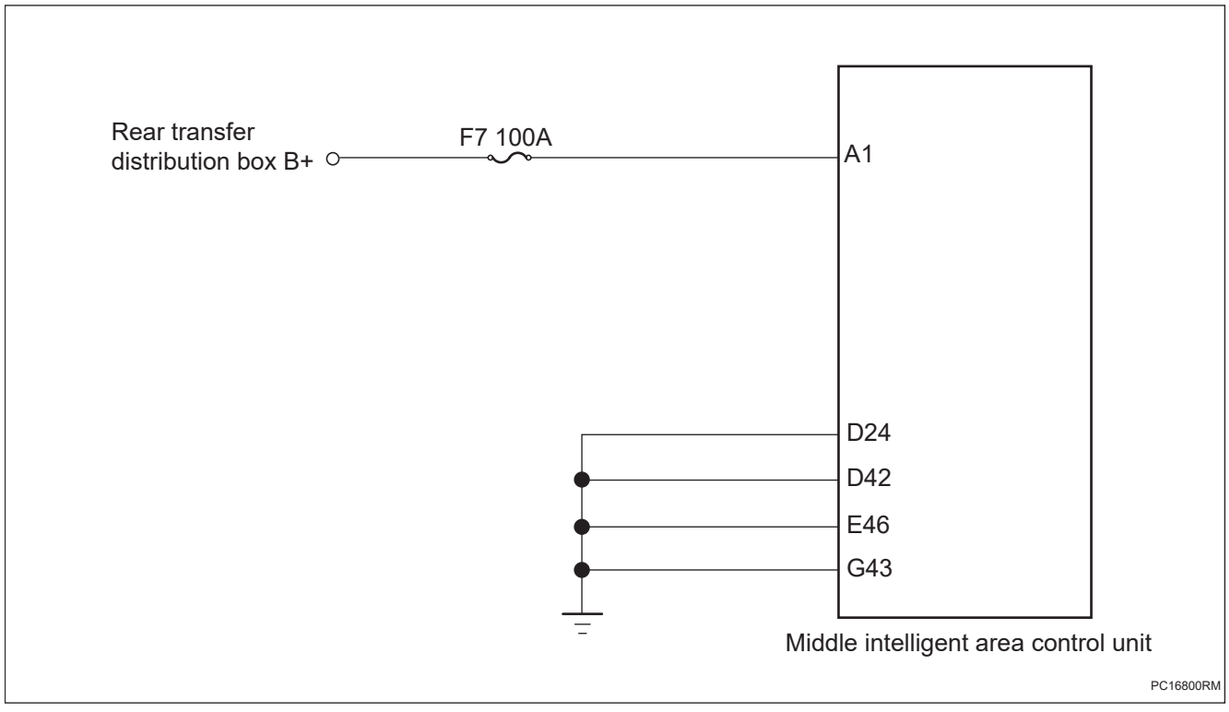
When power supply voltage of middle intelligent area control unit internal is abnormal, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C231800	• PDC wakeup • PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system
C231900	• PDC wakeup • PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system
C231A00	• PDC wakeup • PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system
C231B00	• PDC wakeup • PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	200	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C231800	ECU communication function is limited, IO function is limited	-
C231900	ECU communication function is limited, IO function is limited	-
C231A00	ECU communication function is limited, IO function is limited	-
C231B00	ECU communication function is limited, IO function is limited	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

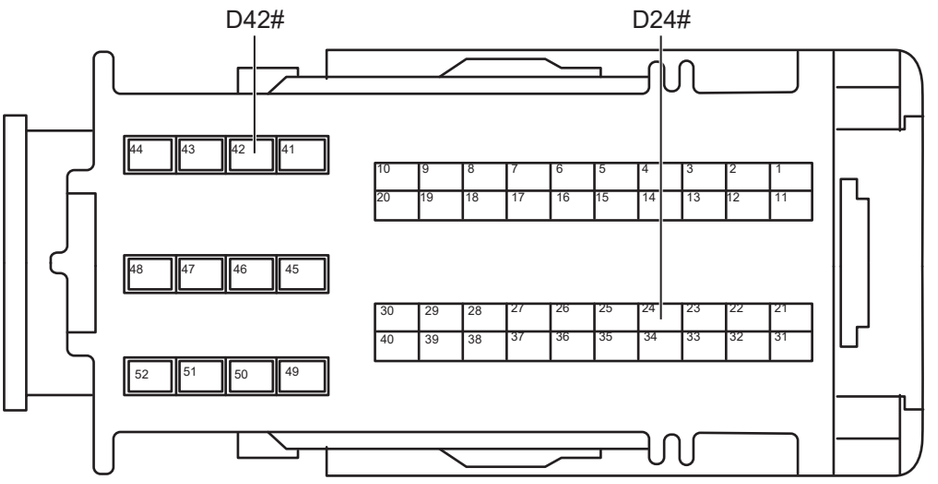
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

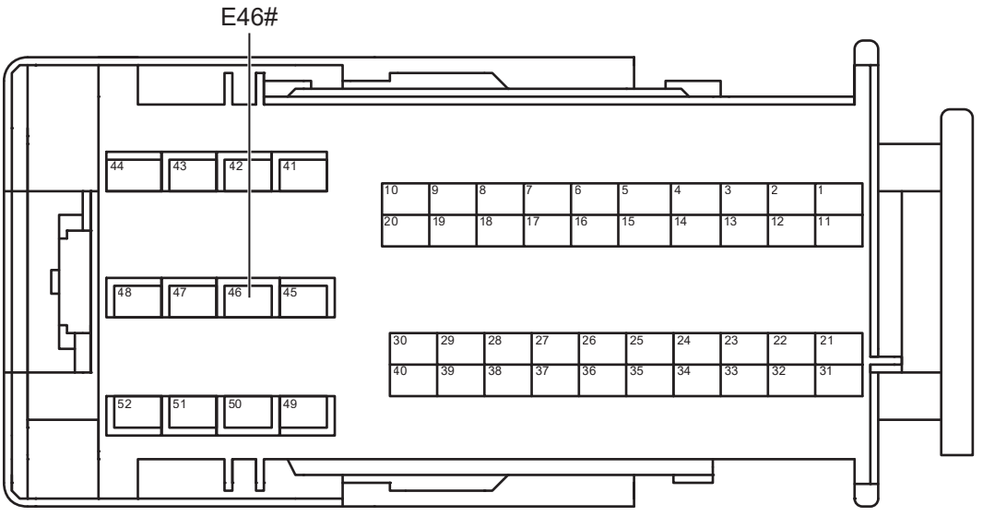
OK

2	**Check middle intelligent area control unit ground**



Middle intelligent area control unit D connector

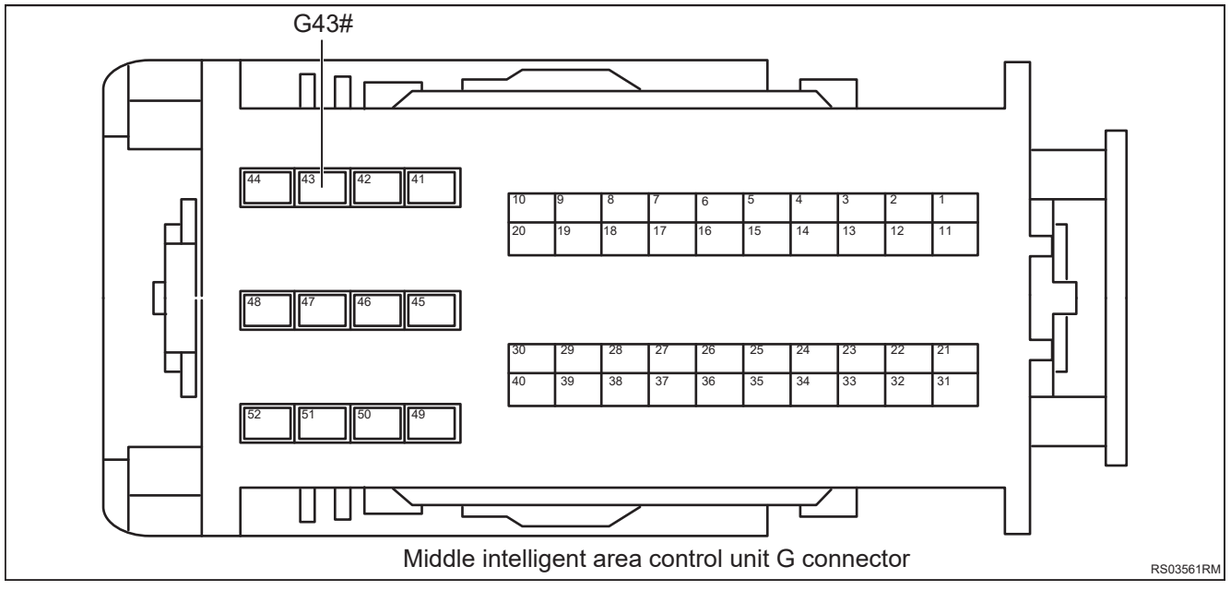
RS03541RM



Middle intelligent area control unit E connector

RS03551RM

ZD



Middle intelligent area control unit G connector

ZD

(a) According to value in the table, measure resistance.

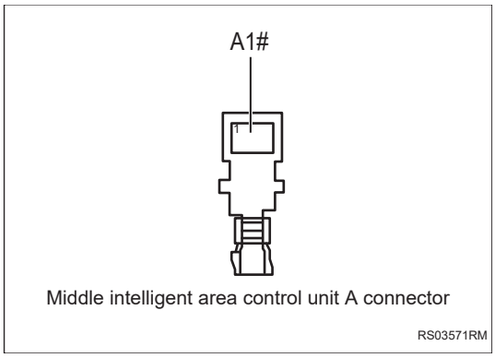
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check middle intelligent area control unit power supply



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

Replace middle intelligent area control unit (See page ZC-132)

DTC	B220F10	Horn switch stuck

Description

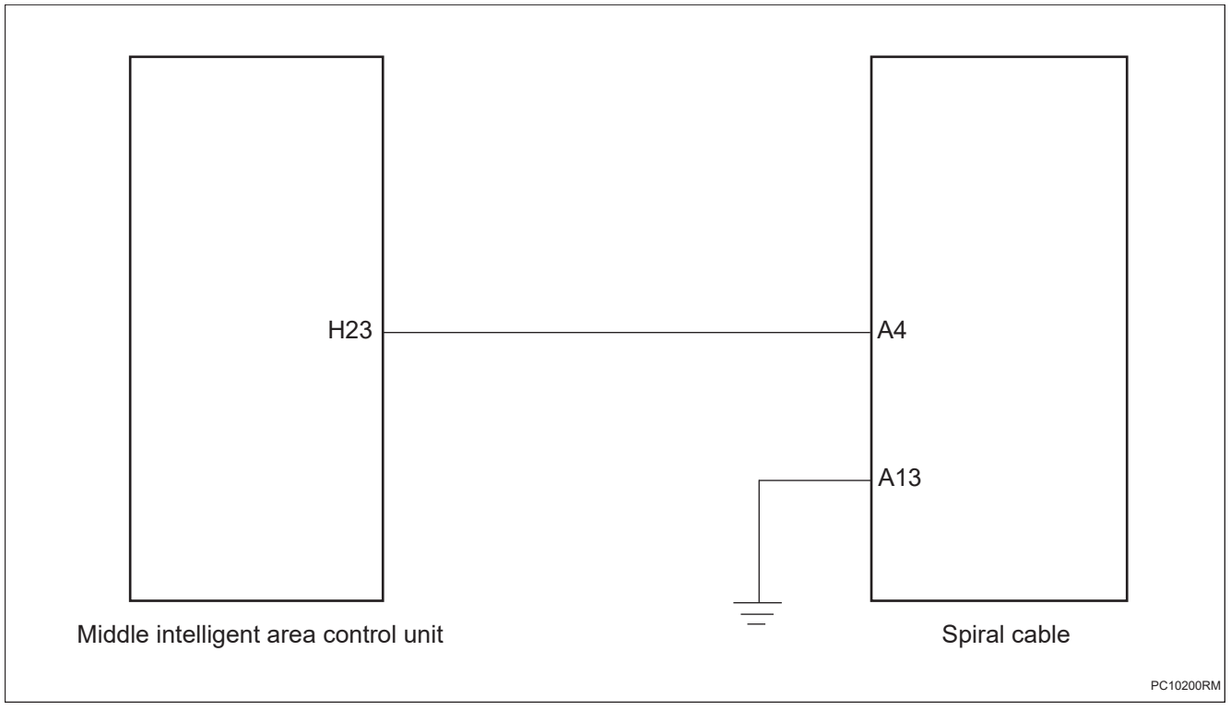
When steering wheel horn switch is stuck, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B220F10	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IDL01 active for defined time (30 s if no define)	Defined	-	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B220F10	Horn switch remains effective	-

Circuit diagram



Inspection procedure

1	**Check horn switch**

(a) Check for foreign matters in horn switch.

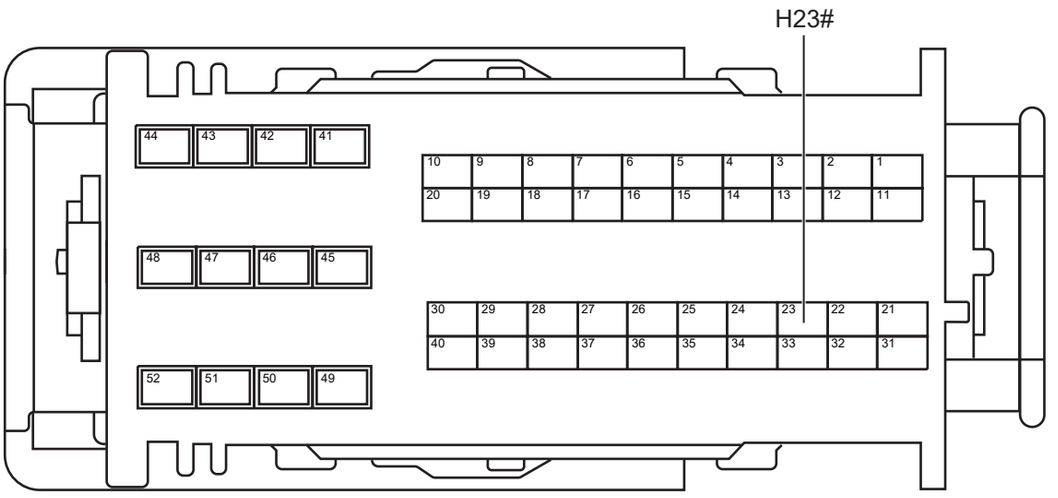
(b) Check if horn switch is damaged or deformed.

(c) Operate horn switch to check for sticking.

NG → **Perform repair according to malfunction**

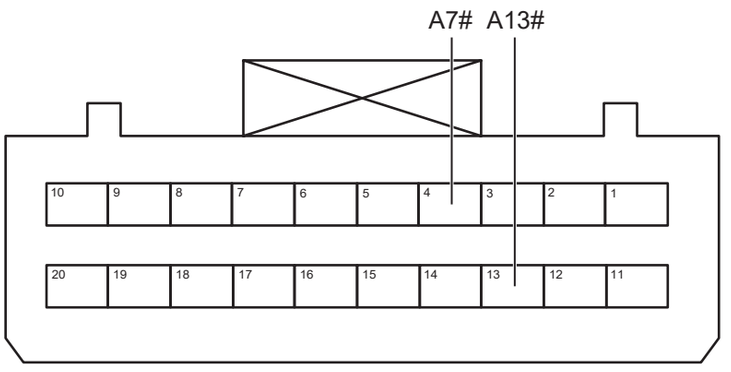
OK

2	**Check for open in spiral cable wire harness and connector**



Middle intelligent area control unit H connector

PC10211RM



Spiral cable A connector

PC10220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the spiral cable connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

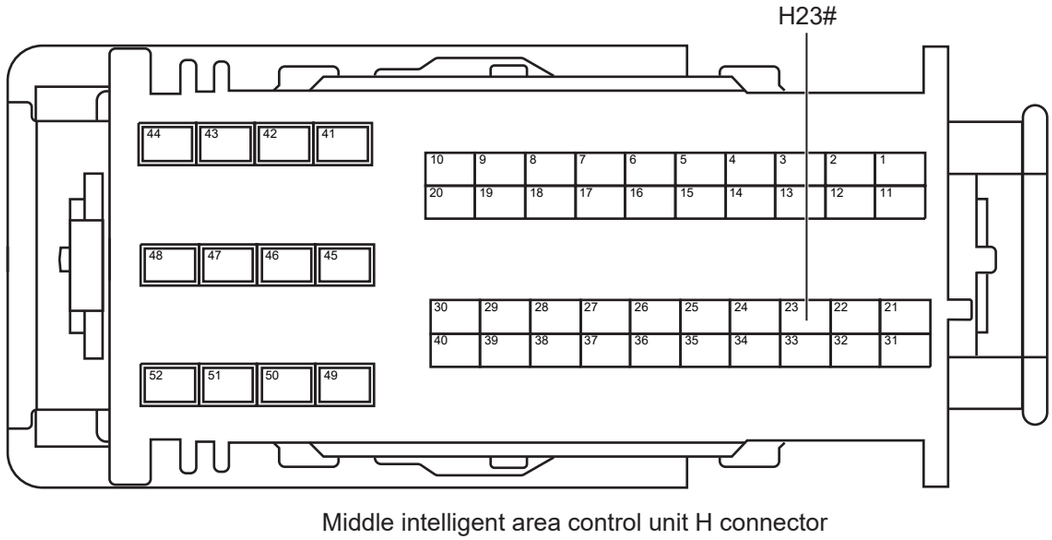
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H23# - spiral cable connector A4#	Always connected	Less than 1 Ω
Spiral cable connector A13# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in spiral cable wire harness and connector**



Middle intelligent area control unit H connector

PC10211RM

(a) According to value in the table, measure resistance.

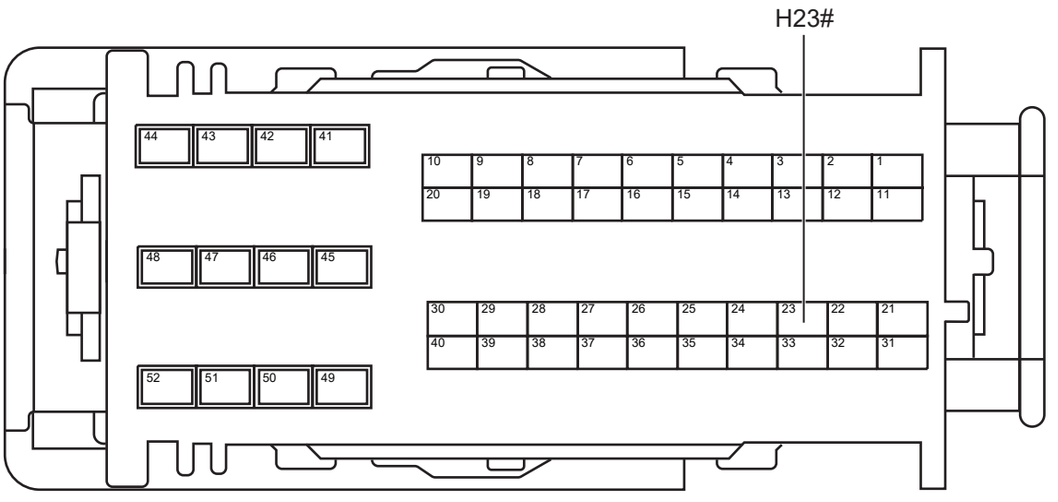
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H23# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in spiral cable wire harness and connector



Middle intelligent area control unit H connector

PC10211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H23# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace spiral cable (See page ZC-120)**

(a) Replace the spiral cable.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B221010**	**Hazard warning light switch stuck**
DTC	**B225211**	**Short to ground in hazard warning switch backlight power**
DTC	**B225212**	**Short to power supply in hazard warning switch backlight power**
DTC	**B225311**	**Short to ground in hazard warning switch indicator power**

DTC	B225312	Short to power supply in hazard warning switch indicator power

Description

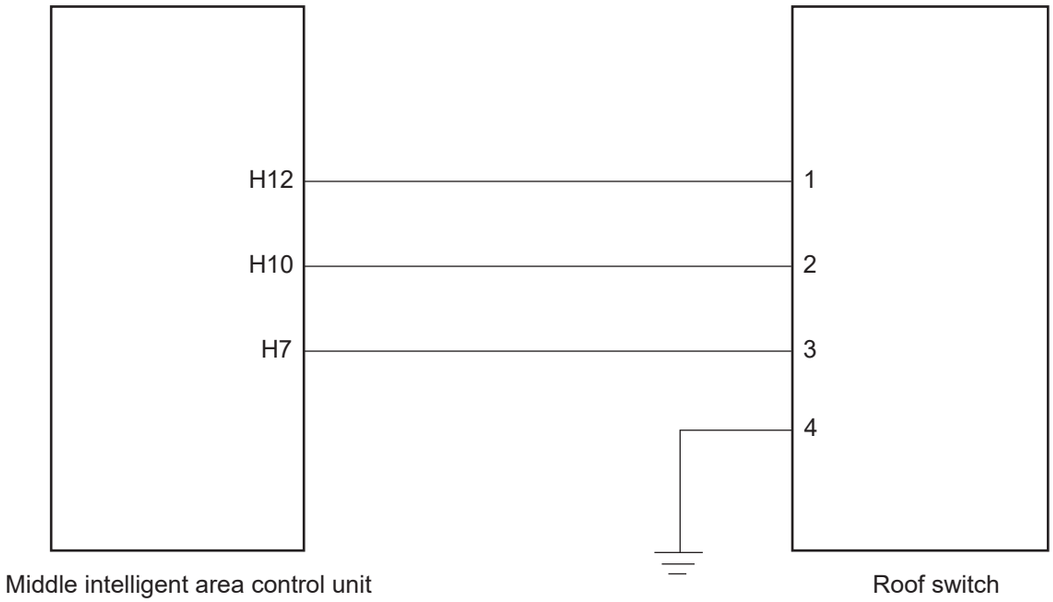
When roof switch is stuck or there is short in roof switch circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B221010	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IDL02 active for defined time (30 s if no define)	Defined	-	10 ms	• Middle intelligent area control unit • Roof switch • Wire harness and connector
B225211	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH03 short to GND	5	Event-based	10 ms	• Middle intelligent area control unit • Roof switch • Wire harness and connector
B225212	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH03 short to BAT	5	Event-based	10 ms	• Middle intelligent area control unit • Roof switch • Wire harness and connector
B225311	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH04 short to GND	5	Event-based	10 ms	• Middle intelligent area control unit • Roof switch • Wire harness and connector
B225312	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH04 short to BAT	5	Event-based	10 ms	• Middle intelligent area control unit • Roof switch • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B221010	-	-
B225211	-	-
B225212	-	-
B225311	-	-
B225312	-	-

Circuit diagram



Inspection procedure

1	**Check roof switch**

(a) Check for foreign matters in roof switch.

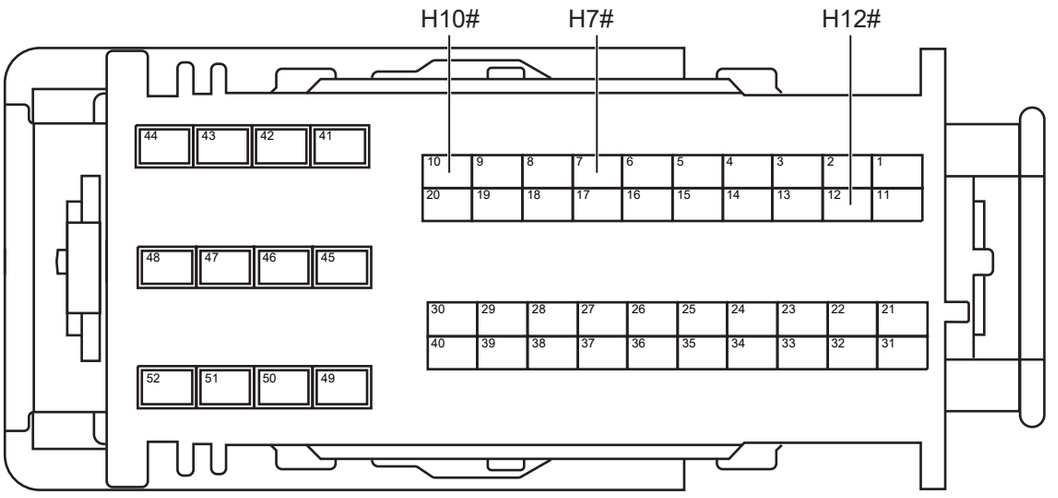
(b) Check if roof switch is damaged or deformed.

(c) Operate roof switch to check for sticking.

NG → **Perform repair according to malfunction**

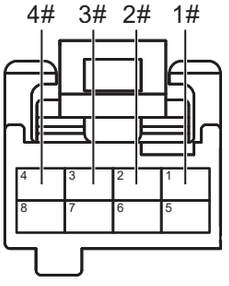
OK

2	**Check for open in roof switch wire harness and connector**



Middle intelligent area control unit H connector

PC17011RM



Roof switch connector

PC17021RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the roof switch connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

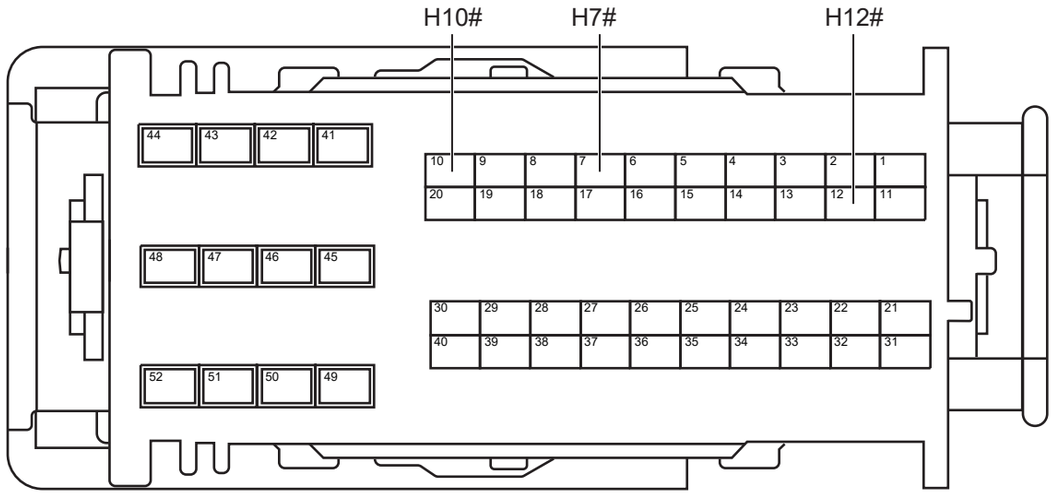
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H12# - roof switch connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H10# - roof switch connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H7# - roof switch connector 3#	Always connected	Less than 1 Ω
Roof switch connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in roof switch wire harness and connector**



Middle intelligent area control unit H connector

PC17011RM

(a) According to value in the table, measure resistance.

Standard value

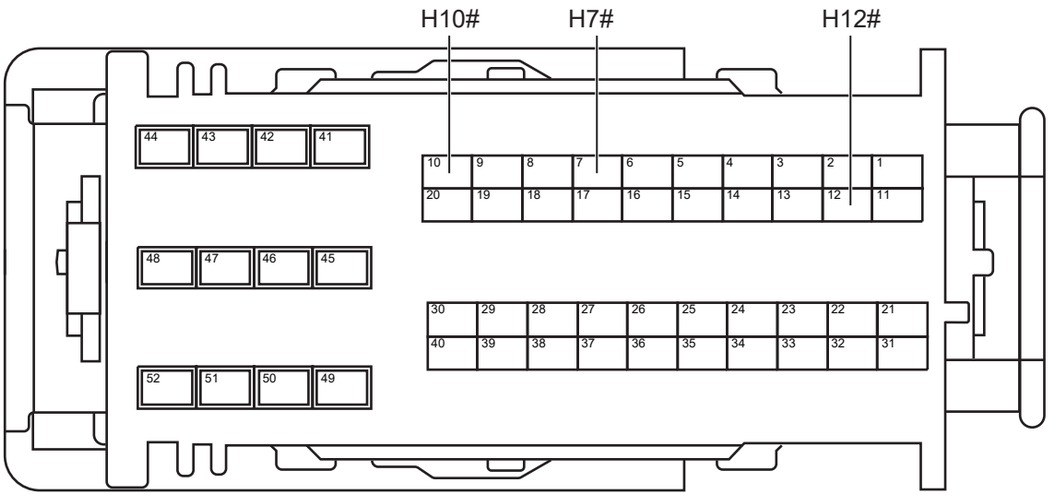
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H12# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H10# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in roof switch wire harness and connector**



Middle intelligent area control unit H connector

PC17011RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H7# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace roof switch (See page ZC-5)**

(a) Replace the roof switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B221210**	**Outside luggage compartment switch signal stuck**

Description

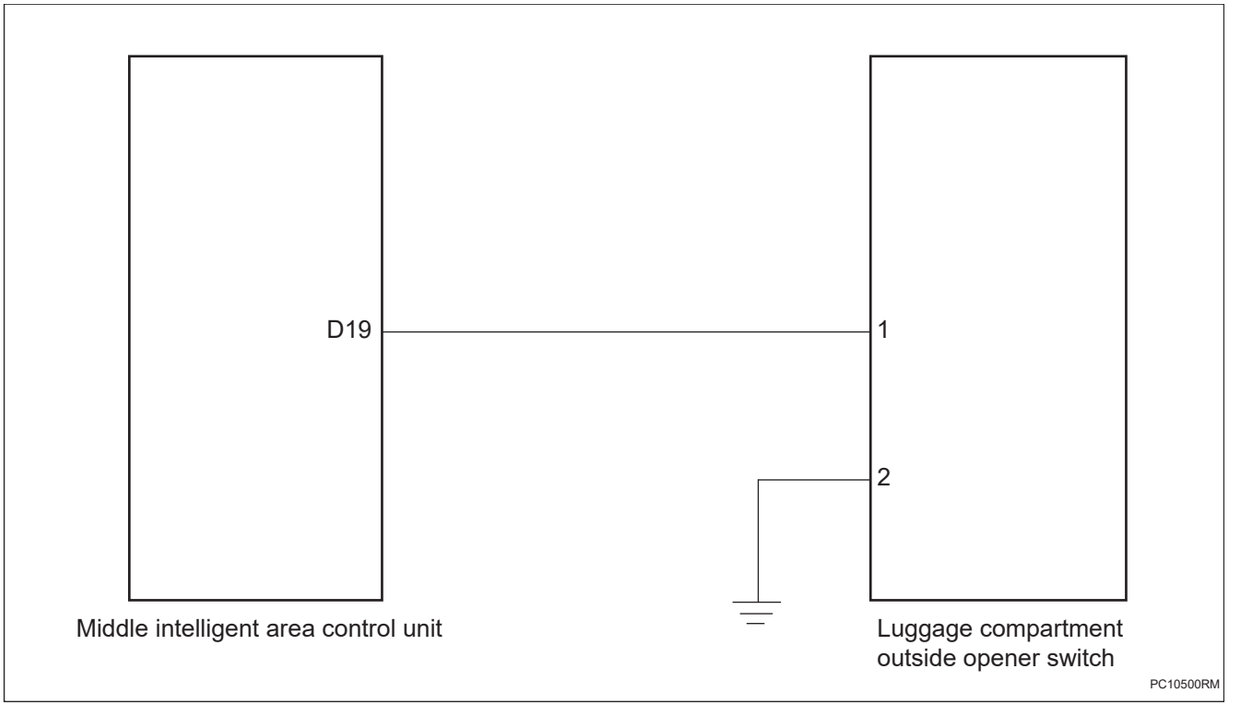
When luggage compartment outside opener switch is stuck, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B221210	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IDL15 active for defined time (30 s if no define)	Defined	-	10 ms	• Luggage compartment outside opener switch • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B221210	Outside luggage compartment switch signal is always valid	-

Circuit diagram



Inspection procedure

1	**Check luggage compartment outside opener switch**

(a) Check for foreign matters in luggage compartment outside opener switch.

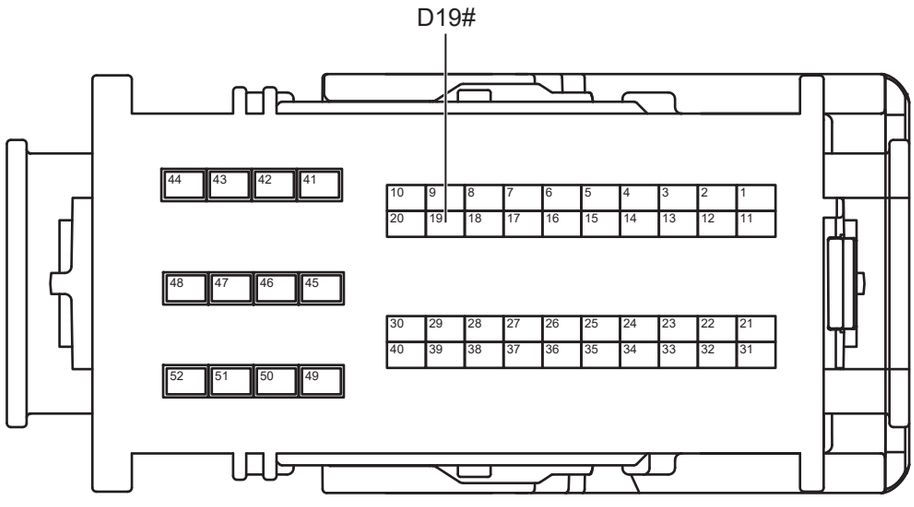
(b) Check luggage compartment outside opener switch for damage and deformation.

(c) Operate luggage compartment outside opener switch to check for sticking.

NG → **Perform repair according to malfunction**

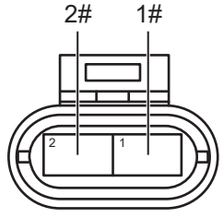
OK

2	**Check for open in luggage compartment outside opener switch wire harness and connector**



Middle intelligent area control unit D connector

PC10511RM



Luggage compartment outside opener switch connector

PC10520RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the luggage compartment outside opener switch connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

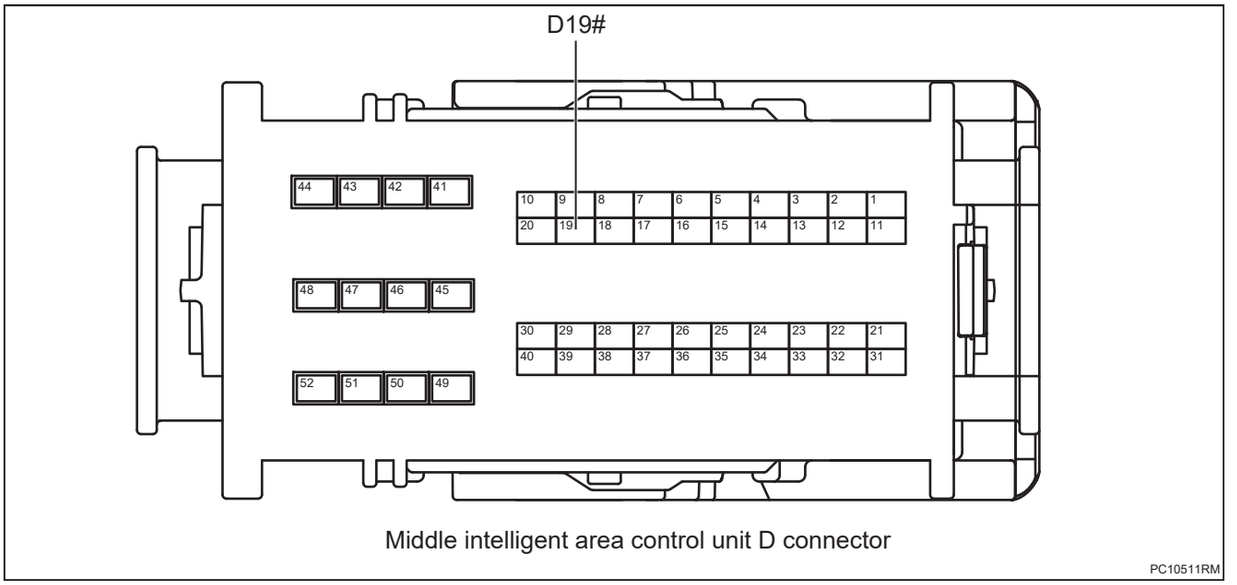
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D19# - luggage compartment outside opener switch connector 1#	Always connected	Less than 1 Ω
Luggage compartment outside opener switch connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in luggage compartment outside opener switch wire harness and connector**



Middle intelligent area control unit D connector

(a) According to value in the table, measure resistance.

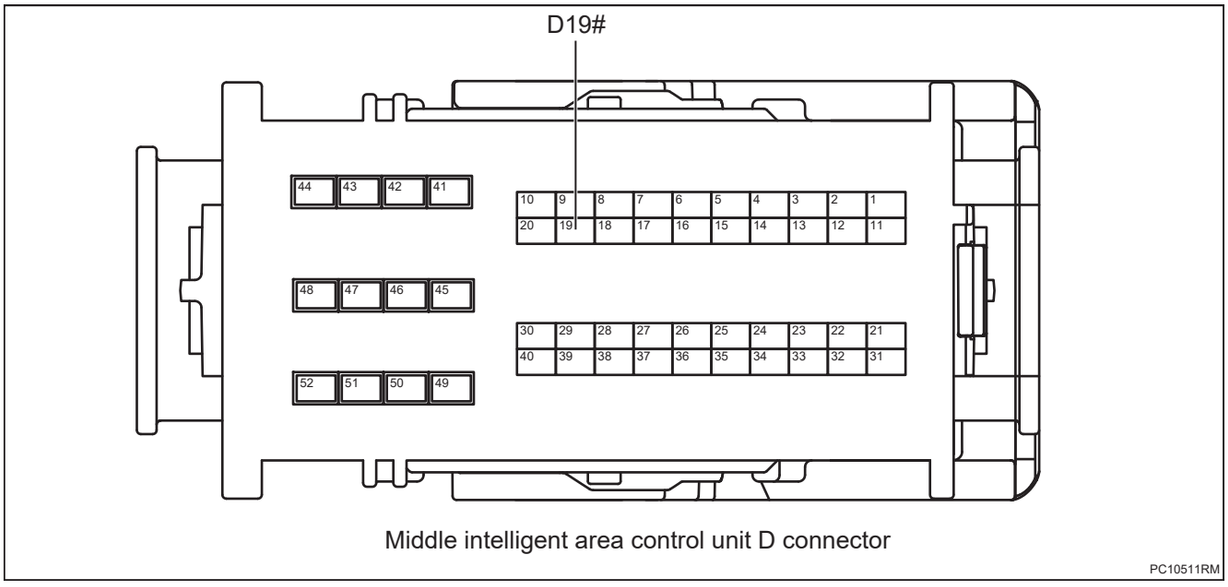
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in luggage compartment outside opener switch wire harness and connector**



Middle intelligent area control unit D connector

PC10511RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D19# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace luggage compartment outside opener switch (See page ZC-3)**

(a) Replace the luggage compartment outside opener switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

ZD

Diagnosis ends

DTC	B221D13	Open in interior antenna 1
DTC	B221D11	Short to ground in interior antenna 1
DTC	B221D12	Short to power supply in interior antenna 1
DTC	B221E13	Open in interior antenna 2
DTC	B221E11	Short to ground in interior antenna 2
DTC	B221E12	Short to power supply in interior antenna 2
DTC	B222013	Open in exterior antenna 1
DTC	B222011	Short to ground in exterior antenna 1
DTC	B222012	Short to power supply in exterior antenna 1
DTC	B222113	Open in left smart entry antenna
DTC	B222111	Short to ground in left smart entry antenna
DTC	B222112	Short to power supply in left smart entry antenna

DTC	**B222213**	**Open in right smart entry antenna**
DTC	**B222211**	**Short to ground in right smart entry antenna**
DTC	**B222212**	**Short to power supply in right smart entry antenna**

Description

When antenna circuit is short or open, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B221D13	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Open in interior antenna 1 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna I
B221D11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to ground in interior antenna 1 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna I
B221D12	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to power supply in interior antenna 1 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna I
B221E13	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Open in interior antenna 2 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna II
B221E11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to ground in interior antenna 2 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna II
B221E12	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to power supply in interior antenna 2 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Interior low frequency antenna II
B222013	• Diagnostic voltage	Open in exterior	1	Event-based	10 ms	• Middle intelligent area control unit

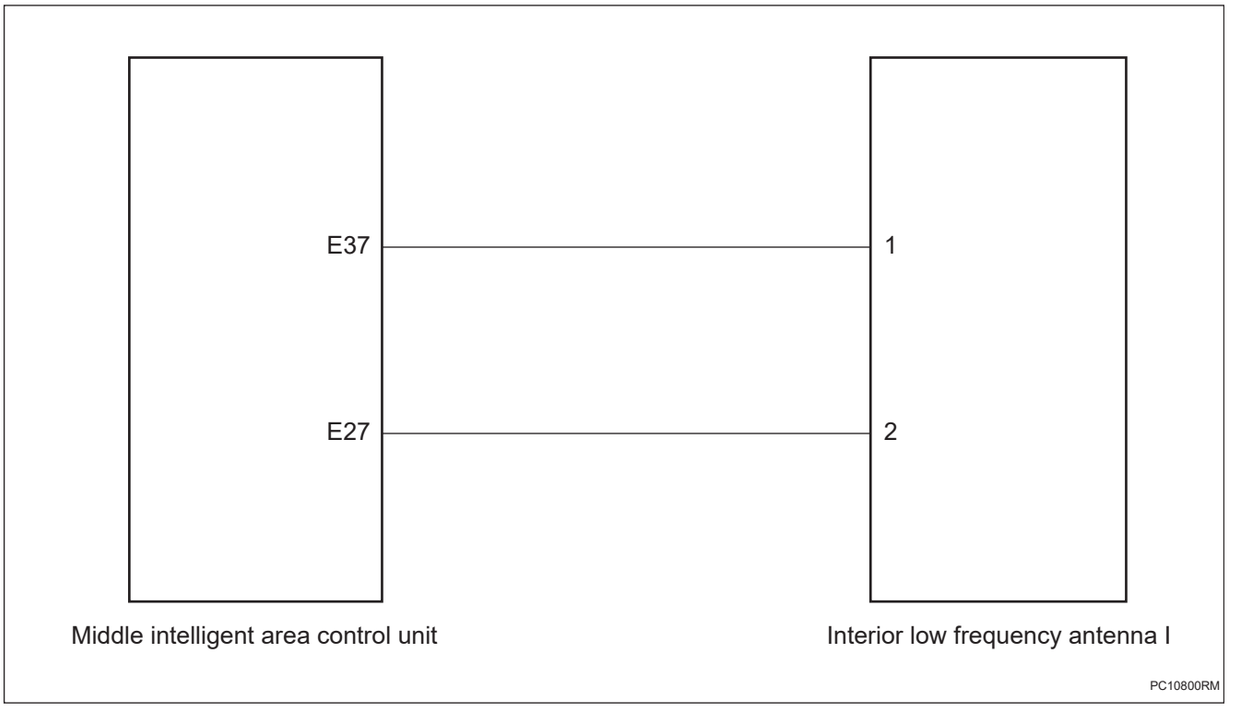
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	range. (9 V - 16 V) • PDC not in OTA mode	antenna 1 is set				• Wire harness and connector • Luggage compartment outer low frequency antenna
B222011	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to ground in exterior antenna 1 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Luggage compartment outer low frequency antenna
B222012	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Short to power supply in exterior antenna 1 is set	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Luggage compartment outer low frequency antenna
B222113	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset open in left smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front left smart entry antenna
B222111	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset short to ground in left smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front left smart entry antenna
B222112	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset short to power supply in left smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front left smart entry antenna
B222213	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset open in right smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front right smart entry antenna

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222211	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset short to ground in right smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front right smart entry antenna
B222212	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	Reset short to power supply in right smart antenna	1	Event-based	10 ms	• Middle intelligent area control unit • Wire harness and connector • Front right smart entry antenna

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B221D13	The vehicle cannot be powered on occasionally and the key cannot be found	-
B221D11	The vehicle cannot be powered on occasionally and the key cannot be found	-
B221D12	The vehicle cannot be powered on occasionally and the key cannot be found	-
B221E13	The vehicle cannot be powered on occasionally and the key cannot be found	-
B221E11	The vehicle cannot be powered on occasionally and the key cannot be found	-
B221E12	The vehicle cannot be powered on occasionally and the key cannot be found	-
B222013	The vehicle cannot be unlocked and the key cannot be found	-
B222011	The vehicle cannot be unlocked and the key cannot be found	-
B222012	The vehicle cannot be unlocked and the key cannot be found	-
B222113	The vehicle cannot be unlocked and the key cannot be found	-
B222111	The vehicle cannot be unlocked and the key cannot be found	-
B222112	The vehicle cannot be unlocked and the key cannot be found	-
B222213	The vehicle cannot be unlocked and the key cannot be found	-
B222211	The vehicle cannot be unlocked and the key cannot be found	-
B222212	The vehicle cannot be unlocked and the key cannot be found	-

Circuit diagram

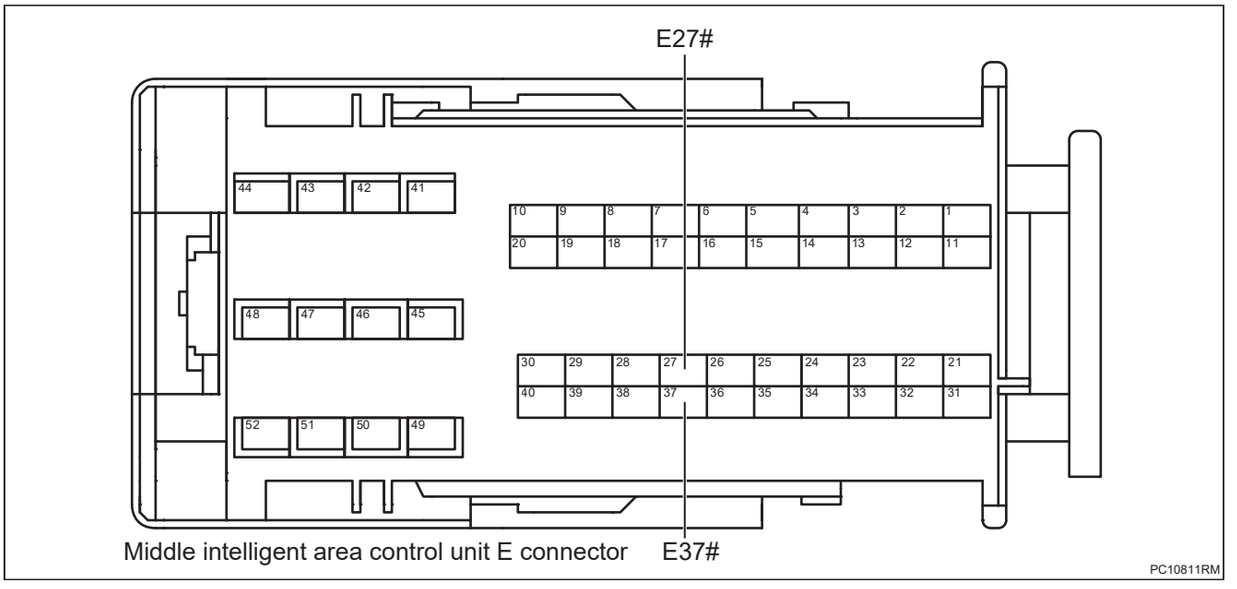


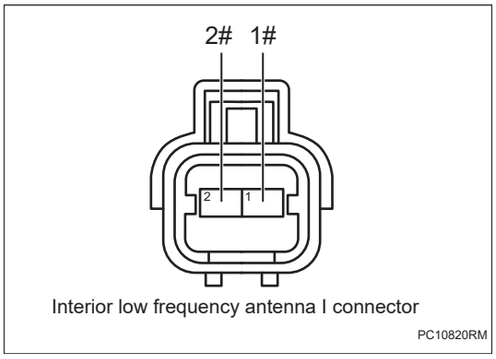
ZD

Inspection procedure

Note: Taking the interior low frequency antenna I fault as an example, and fault analysis steps for other antennas are similar.

1	**Check for open in interior low frequency antenna I wire harness and connector**





Interior low frequency antenna I connector

PC10820RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the interior low frequency antenna I connector.

(e) According to value in the table, measure resistance.

Standard value

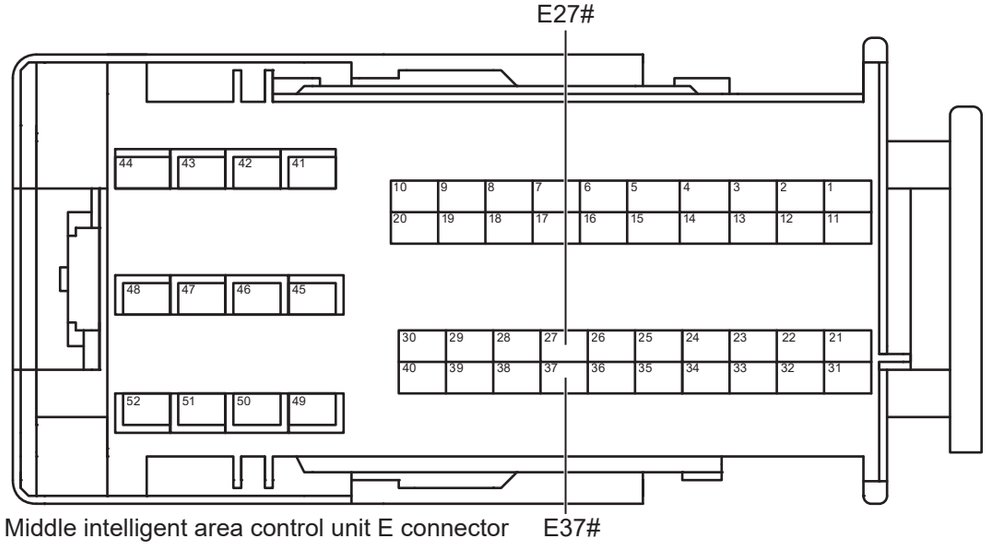
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E37# - interior low frequency antenna I connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E27# - interior low frequency antenna I connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in interior low frequency antenna I wire harness and connector**



Middle intelligent area control unit E connector

PC10811RM

(a) According to value in the table, measure resistance.

Standard value

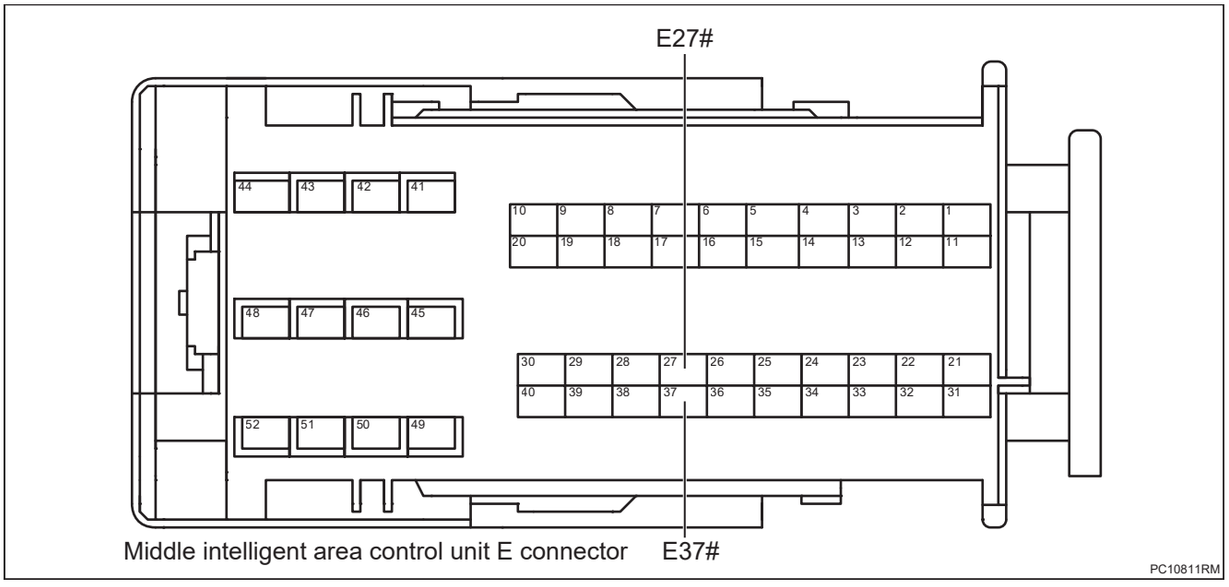
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E37# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector E27# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in interior low frequency antenna I wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E37# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector E27# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace interior low frequency antenna I (See page ZC-46)**

(a) Replace the interior low frequency antenna I.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30A011	Short to ground in steering wheel heating NTC input
DTC	P30B511	Short to power supply/open in steering wheel heating NTC input
DTC	P30BE11	Steering wheel heating NTC reasonability range fault
DTC	C220A11	Steering wheel NTC abnormal fault
DTC	P30B111	Short to ground in steering wheel heater
DTC	P30B112	Short to power supply in steering wheel heater
DTC	P30B113	Open in steering wheel heater

Description

When steering wheel heating function is abnormal, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30-A011	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	IAN01 short to GND	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit
P30-B511	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	IAN01 short to BAT or Open	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit
P30B-E11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	IAN01 reasonability range fault	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit
C220-A11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	Steering wheel temperature rise abnormality or temperature control abnormality	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit
P30-B111	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH01 short to GND	5	Event-based	10 ms	• Spiral cable • Wire harness and connector

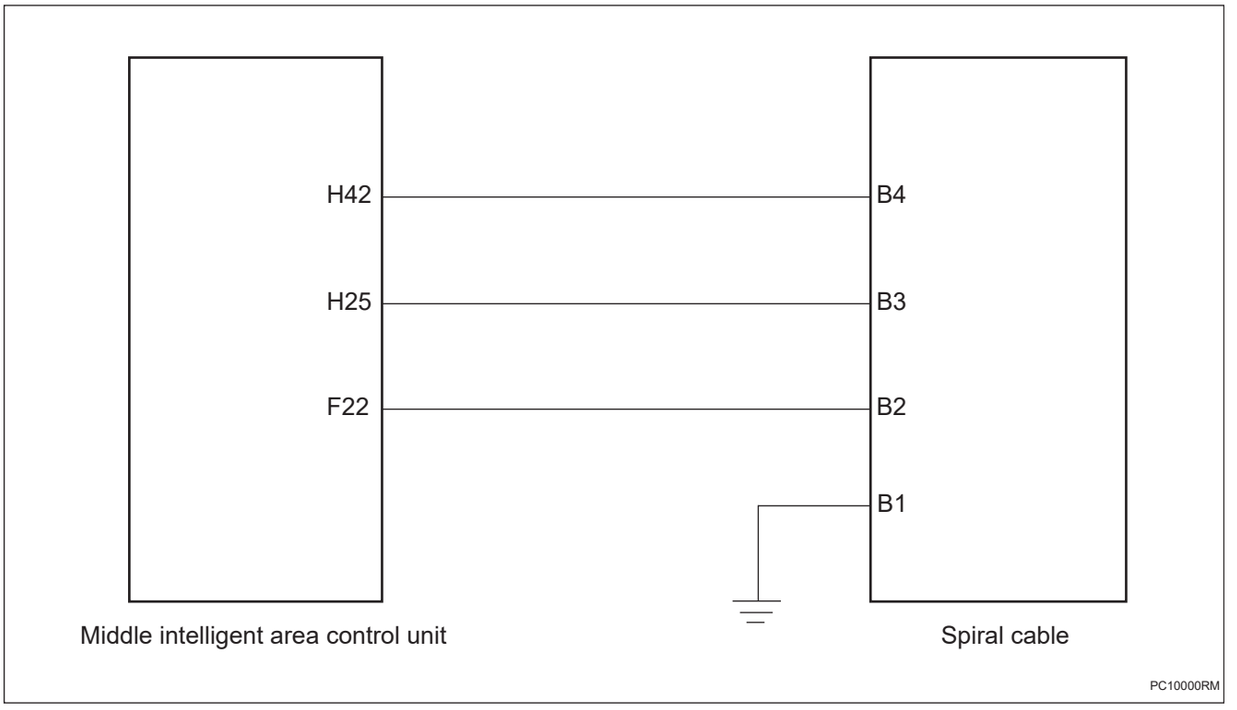
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• gCFG_u8SteerHeatEna=0x1					• Middle intelligent area control unit
P30-B112	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	OPH01 short to BAT	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit
P30-B113	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode • gCFG_u8SteerHeatEna=0x1	OPH01 open circuit	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

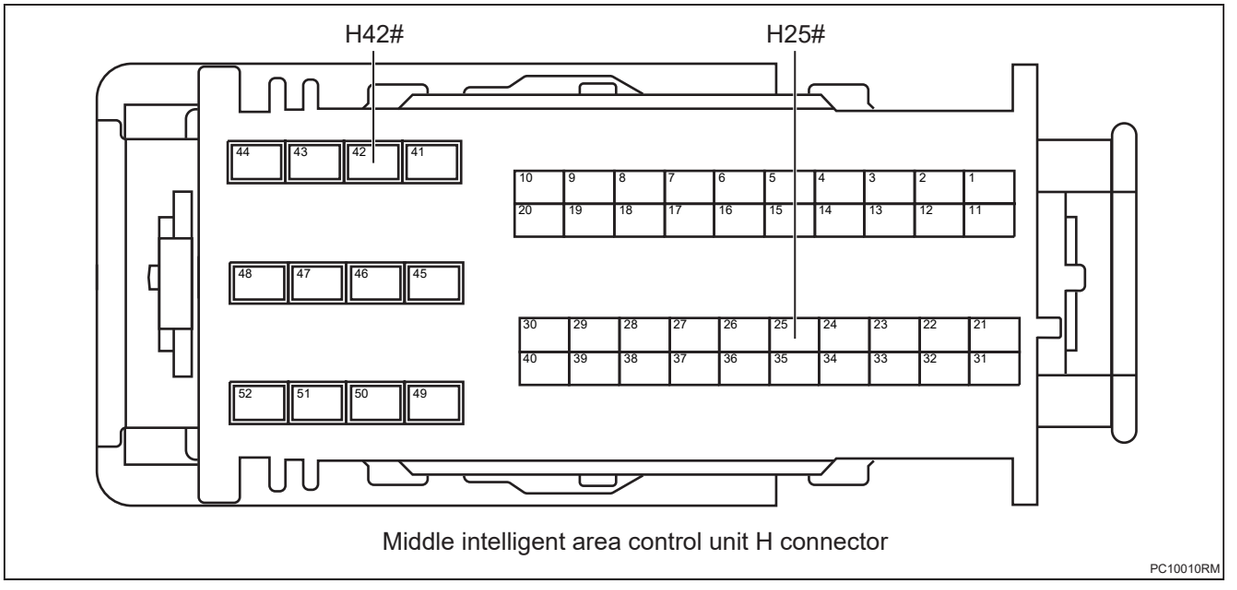
DTC No.	Fault symptom	Warning light/indicator
P30A011	Temperature collected by steering wheel heating NTC is unreasonable	-
P30B511	Temperature collected by steering wheel heating NTC is unreasonable	-
P30BE11	Temperature collected by steering wheel heating NTC is unreasonable	-
C220A11	Temperature collected by steering wheel heating NTC is unreasonable	-
P30B111	Steering wheel heating dose not operate or operates abnormally	-
P30B112	Steering wheel heating dose not operate or operates abnormally	-
P30B113	Steering wheel heating dose not operate or operates abnormally	-

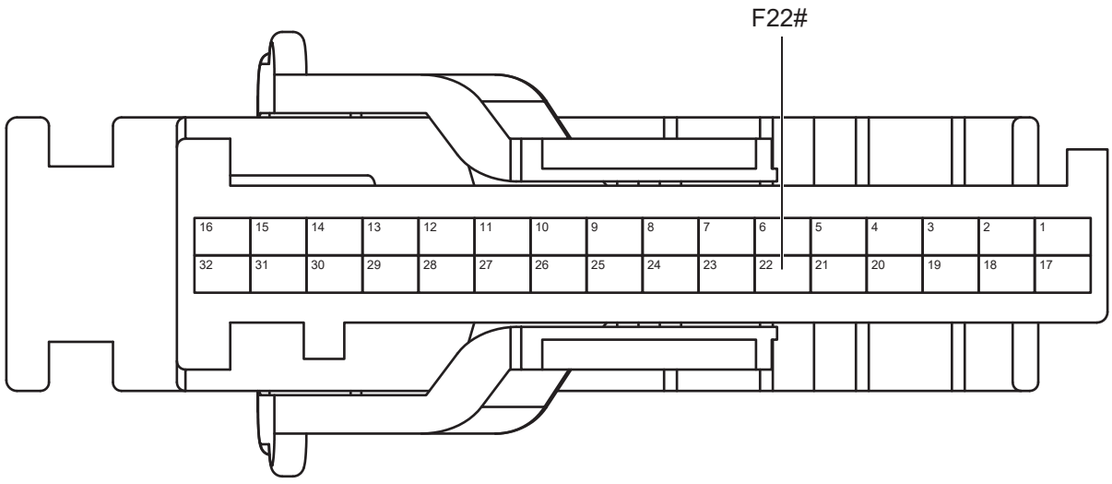
Circuit diagram



Inspection procedure

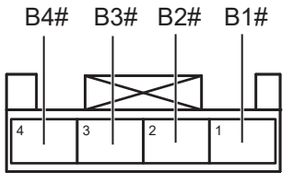
1	**Check for open in spiral cable wire harness and connector**





Middle intelligent area control unit F connector

PC10011RM



Spiral cable B connector

PC10020RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the spiral cable connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

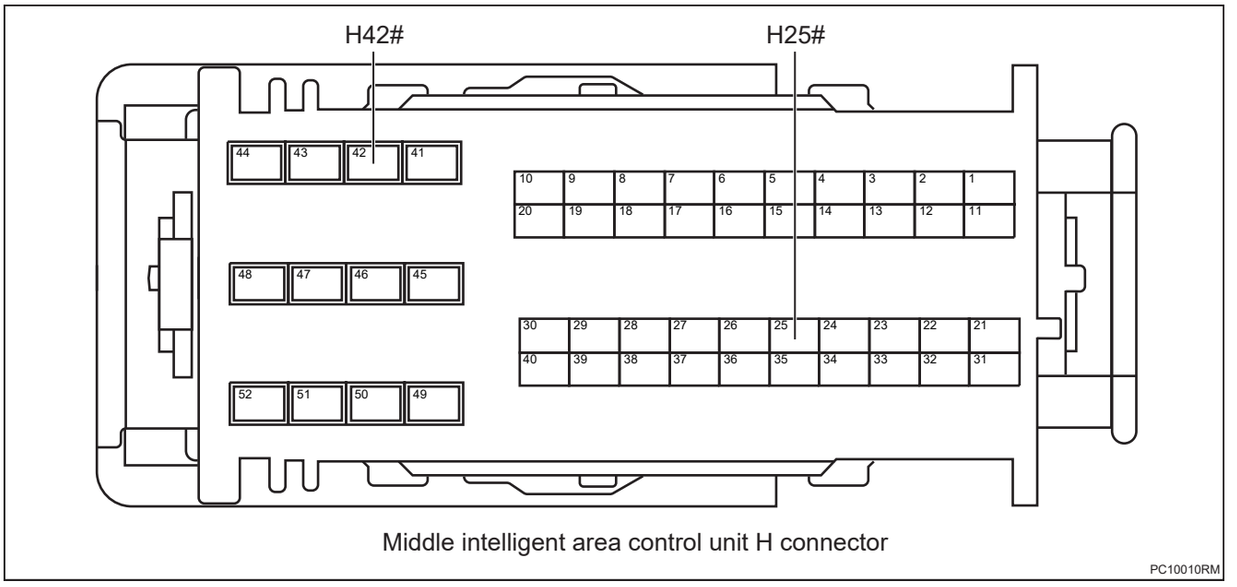
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H42# - spiral cable connector B4#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H25# - spiral cable connector B3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - spiral cable connector B2#	Always connected	Less than 1 Ω
Spiral cable connector B1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

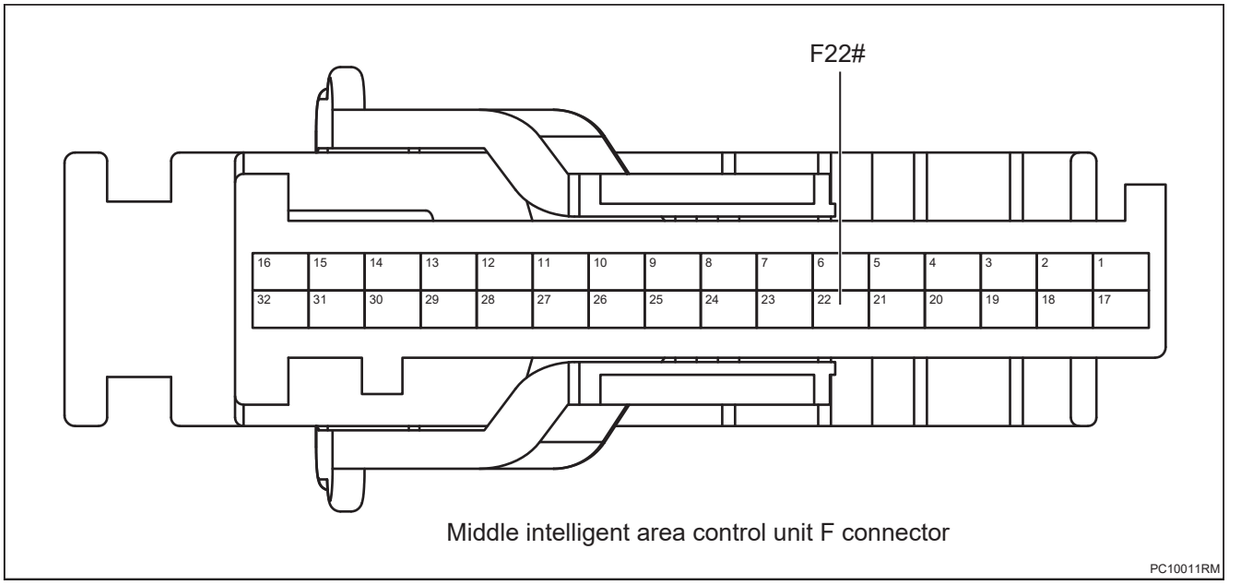
OK

2	**Check for short to ground in spiral cable wire harness and connector**



Middle intelligent area control unit H connector

PC10010RM



Middle intelligent area control unit F connector

PC10011RM

(a) According to value in the table, measure resistance.

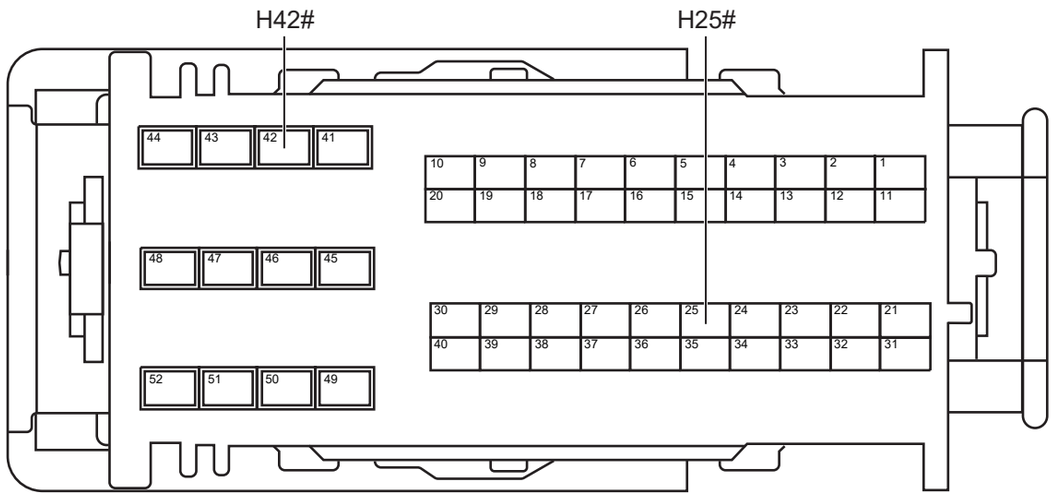
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H42# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H25# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

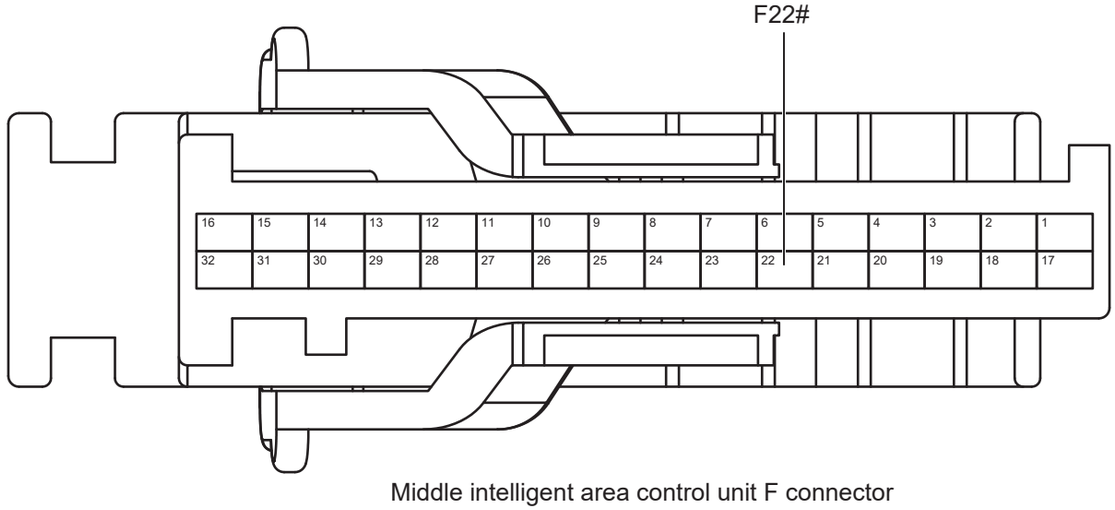
OK

3	**Check for short to power supply in spiral cable wire harness and connector**



Middle intelligent area control unit H connector

PC10010RM



Middle intelligent area control unit F connector

PC10011RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H42# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H25# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace spiral cable (See page ZC-120)**

(a) Replace the spiral cable.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30A111	Short to ground in front inside temperature sensor signal

Description

When inside temperature sensor signal circuit is short to ground, the middle intelligent area control unit records DTC.

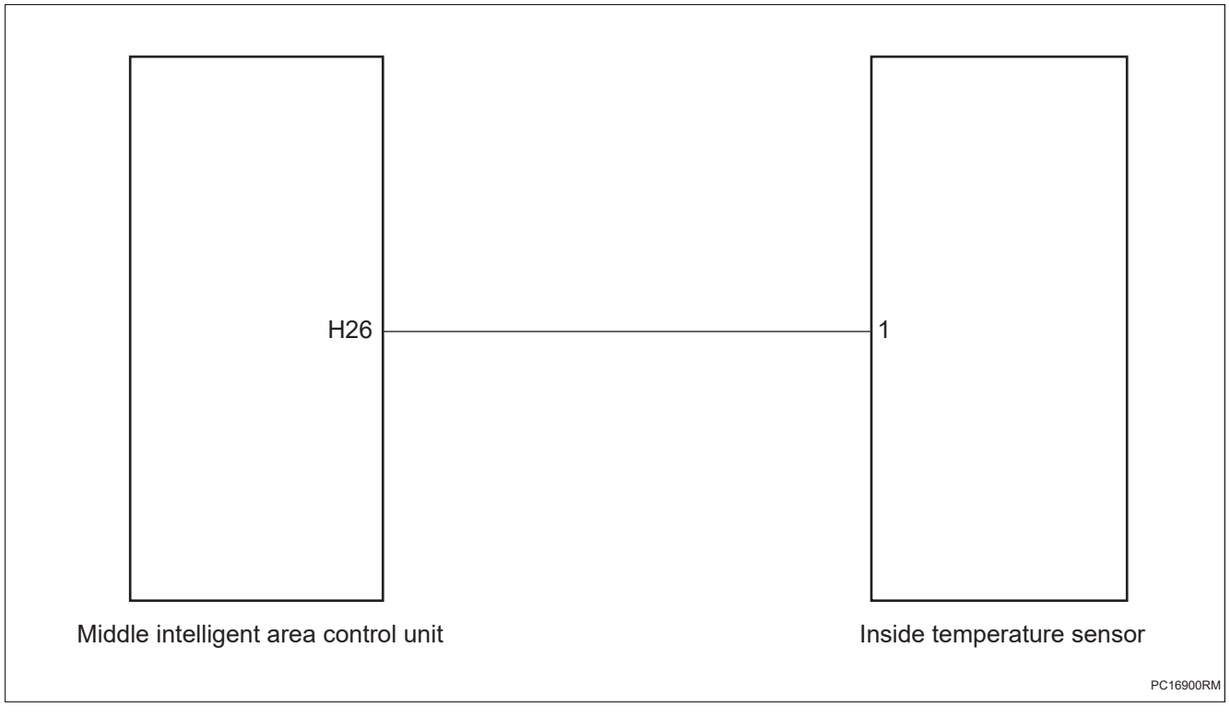
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A111	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN02 short to GND	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

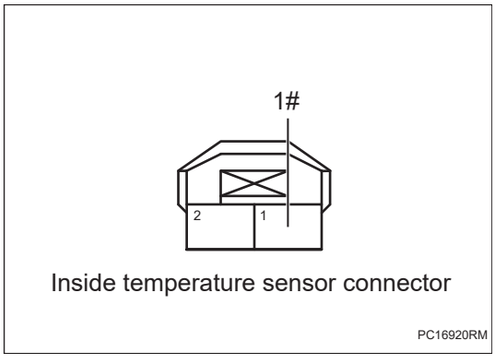
DTC No.	Fault symptom	Warning light/indicator
P30A111	-	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in inside temperature sensor wire harness and connector**



Inside temperature sensor connector

PC16920RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the inside temperature sensor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Inside temperature sensor connector 1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace inside temperature sensor (See page RE-17)**

(a) Replace the inside temperature sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**P30A211**	**Short to ground in front evaporator temperature sensor input**
DTC	**P30A311**	**Short to ground in first row left face temperature sensor**
DTC	**P30A411**	**Short to ground in first row left foot temperature sensor**
DTC	**P30A511**	**Short to ground in first row right face temperature sensor**
DTC	**P30A611**	**Short to ground in first row right foot temperature sensor**
DTC	**P30B411**	**Short to power supply/open in front evaporator temperature sensor input**
DTC	**P30B611**	**Short to power supply/open in first row left face temperature sensor**
DTC	**P30B711**	**Short to power supply/open in first row left foot temperature sensor**
DTC	**P30B811**	**Short to power supply/open in first row right face temperature sensor**
DTC	**P30B911**	**Short to power supply/open in first row right foot temperature sensor**

Description

When front evaporator temperature sensor and face, foot temperature sensor circuit are short or open, the middle intelligent area control unit records DTC.

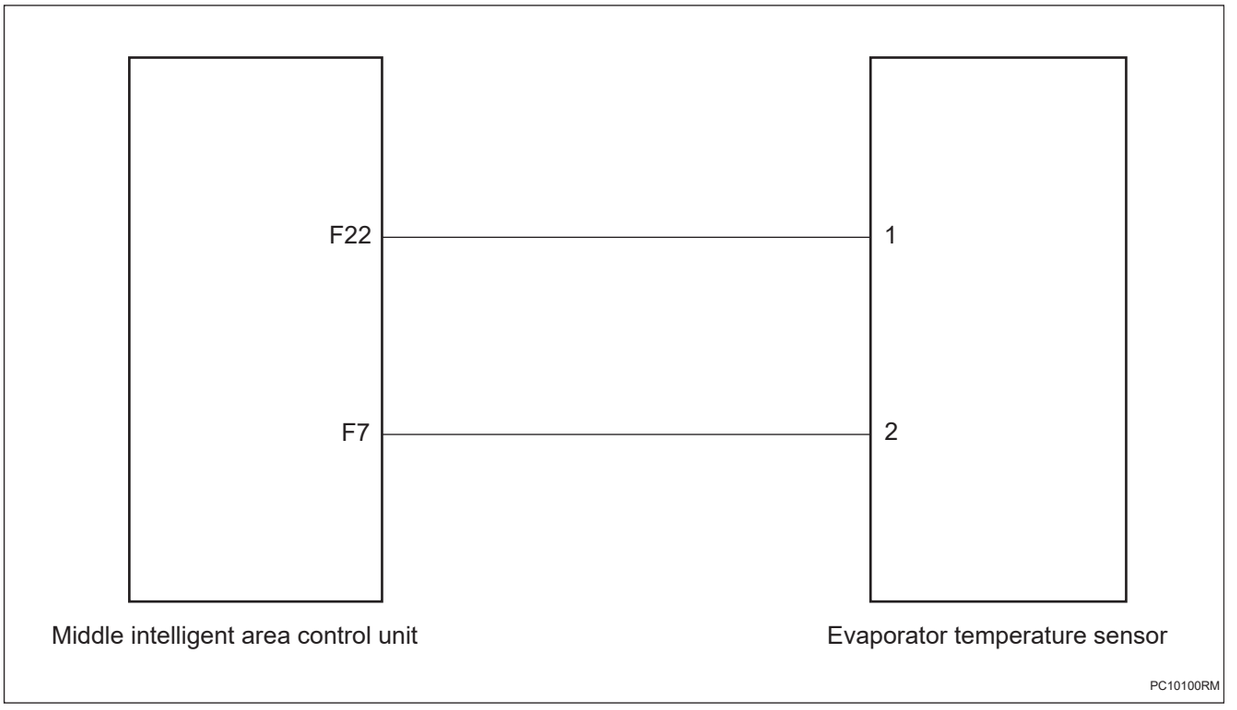
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A211	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN03 short to GND	5	Event-based	10 ms	• Evaporator temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30A311	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN04 short to GND	5	Event-based	10 ms	• Left face air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30A411	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN05 short to GND	5	Event-based	10 ms	• Left foot air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30A511	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN06 short to GND	5	Event-based	10 ms	• Right face air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30A611	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN07 short to GND	5	Event-based	10 ms	• Right foot air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30B411	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN03 short to BAT or Open	5	Event-based	10 ms	• Evaporator temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30B611	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN04 short to BAT or Open	5	Event-based	10 ms	• Left face air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30B711	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN05 short to BAT or Open	5	Event-based	10 ms	• Left foot air temperature sensor • Wire harness and connector • Middle intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30B811	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN06 short to BAT or Open	5	Event-based	10 ms	• Right face air temperature sensor • Wire harness and connector • Middle intelligent area control unit
P30B911	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN07 short to BAT or Open	5	Event-based	10 ms	• Right foot air temperature sensor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P30A211	The temperature collected by front evaporator temperature sensor is unreasonable	-
P30A311	Temperature collected by first row left face temperature sensor is unreasonable	-
P30A411	-	-
P30A511	Temperature collected by first row right face temperature sensor is unreasonable	-
P30A611	-	-
P30B411	The temperature collected by front evaporator temperature sensor is unreasonable	-
P30B611	Temperature collected by first row left face temperature sensor is unreasonable	-
P30B711	-	-
P30B811	Temperature collected by first row right face temperature sensor is unreasonable	-
P30B911	-	-

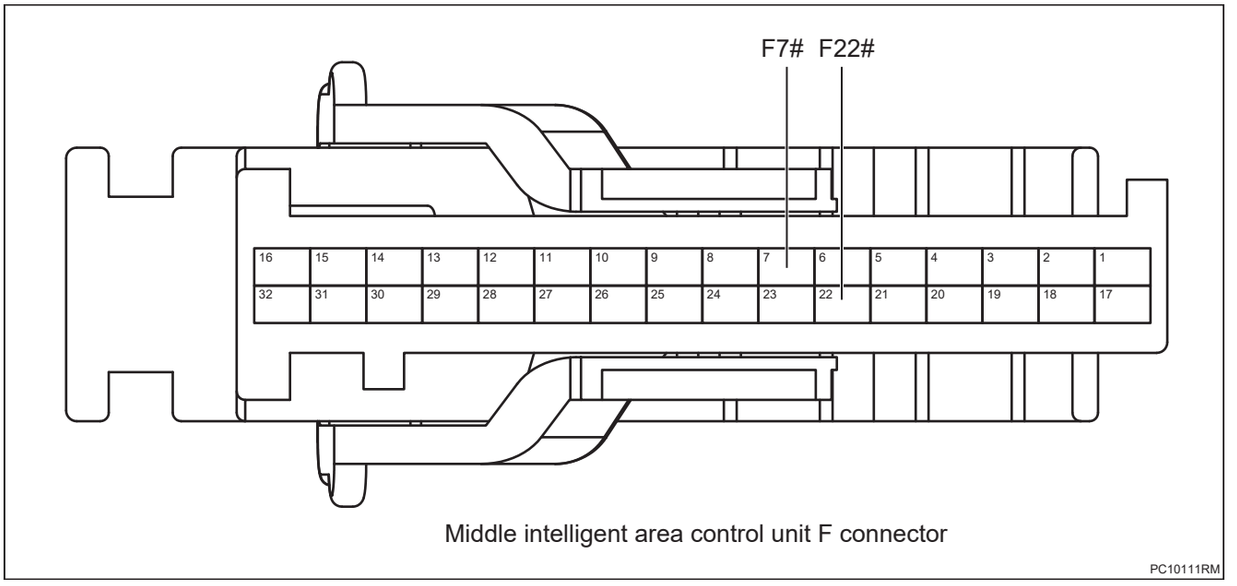
Circuit diagram

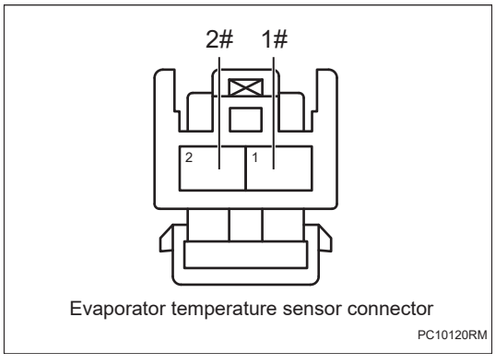


Inspection procedure

Note: Taking the evaporator temperature sensor fault as an example, and DTC analysis steps for other components are similar.

1	**Check for open in evaporator temperature sensor wire harness and connector**





Evaporator temperature sensor connector

PC10120RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the evaporator temperature sensor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

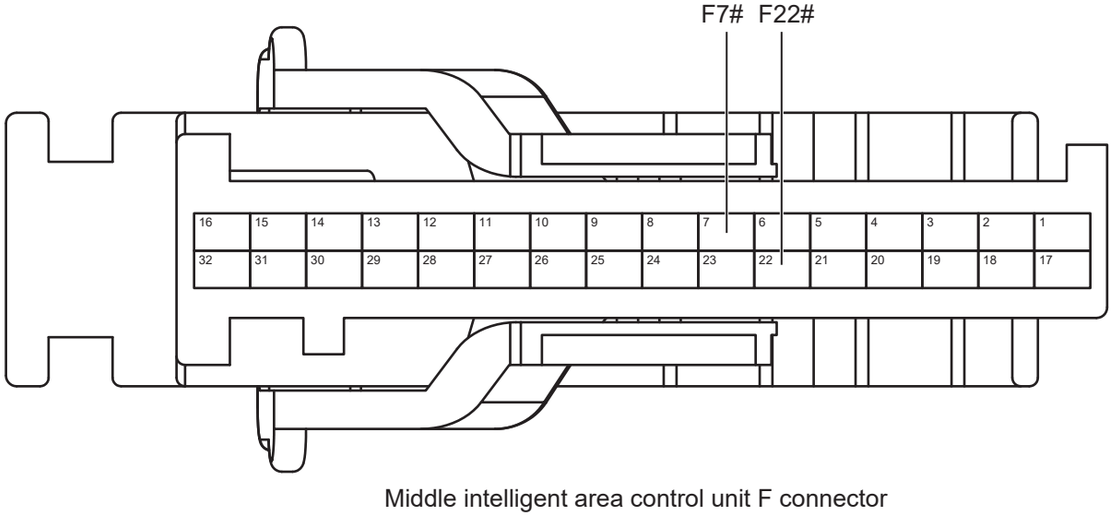
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F22# - evaporator temperature sensor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F7# - evaporator temperature sensor connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in evaporator temperature sensor wire harness and connector**



Middle intelligent area control unit F connector

PC10111RM

(a) According to value in the table, measure resistance.

Standard value

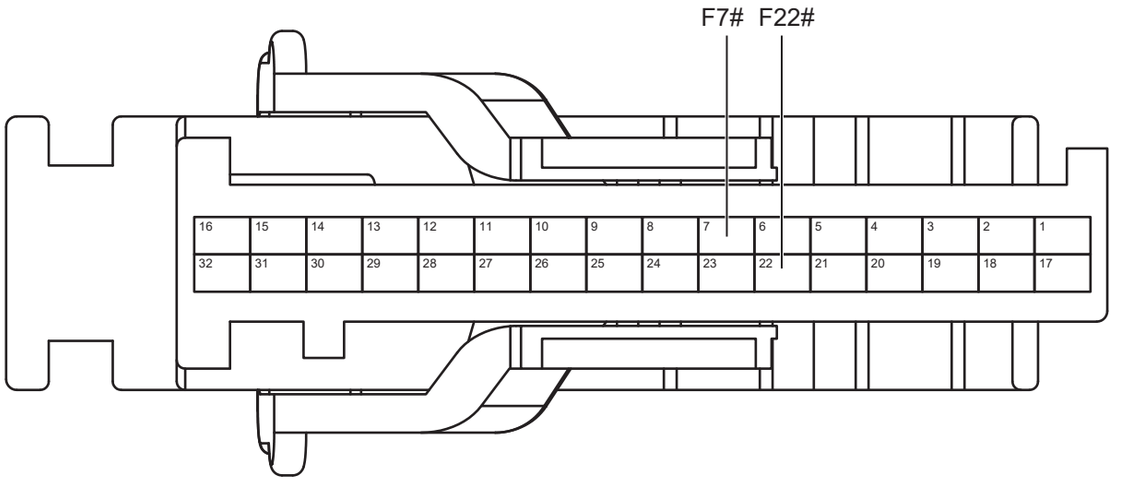
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in evaporator temperature sensor wire harness and connector**



Middle intelligent area control unit F connector

PC10111RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F7# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace evaporator temperature sensor (See page RE-19)**

(a) Replace the evaporator temperature sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222411	**Short to ground in front interior light power supply, BatterySaver vanity mirror power supply, rear map light, low configuration footwell light**

Description

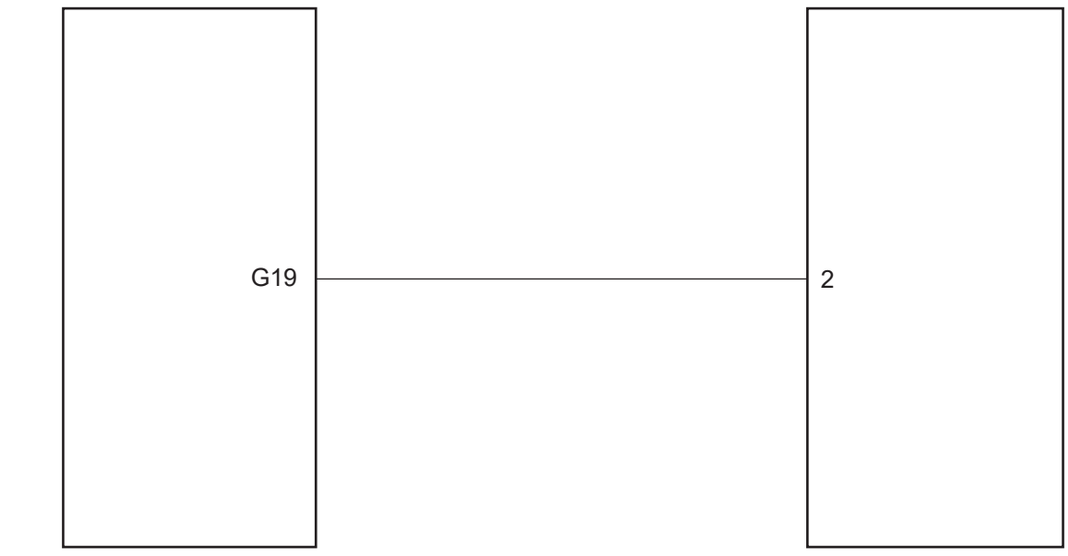
When interior map light power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222411	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH51 short to GND	5	Event-based	10 ms	• Front left interior light • Front right interior light • Rear left map light • Rear right map light • Driver seat sun visor switch • Front left vanity mirror light • Front passenger seat sun visor switch • Front right vanity mirror light • Wire harness and connector • Middle intelligent area control unit

Fault symptom

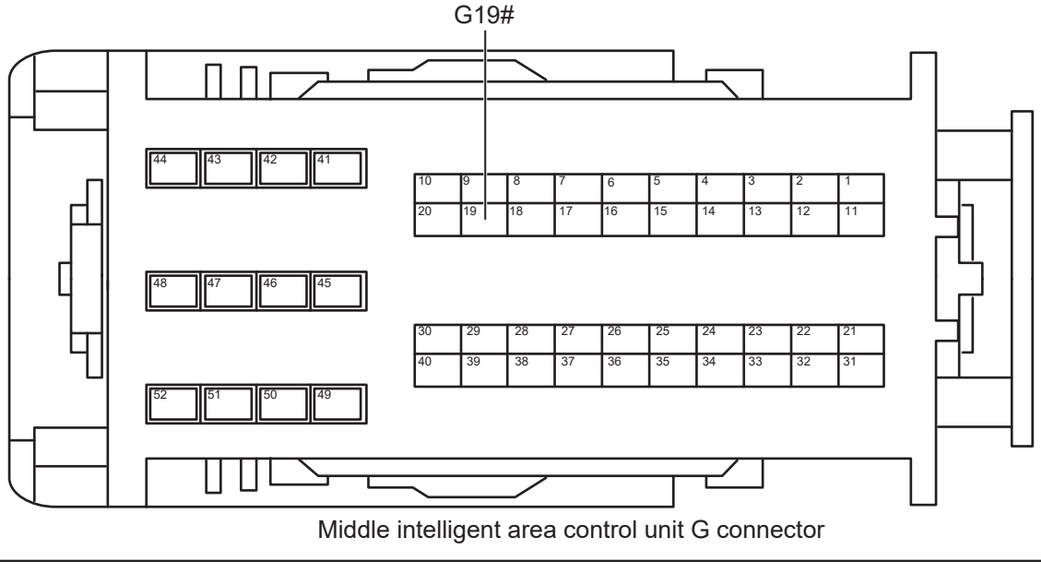
DTC No.	Fault symptom	Warning light/indicator
B222411	Front interior light does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the interior light connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Replace front left interior light/front right interior light/rear left interior light/rear right interior light/front left vanity mirror light/front right vanity mirror light (See page ZC-36) (See page ZC-22)**

(a) Replace the front left interior light/front right interior light/rear left interior light/rear right interior light/front left vanity mirror light/front right vanity mirror light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222511	Short to ground in head up display power supply

Description

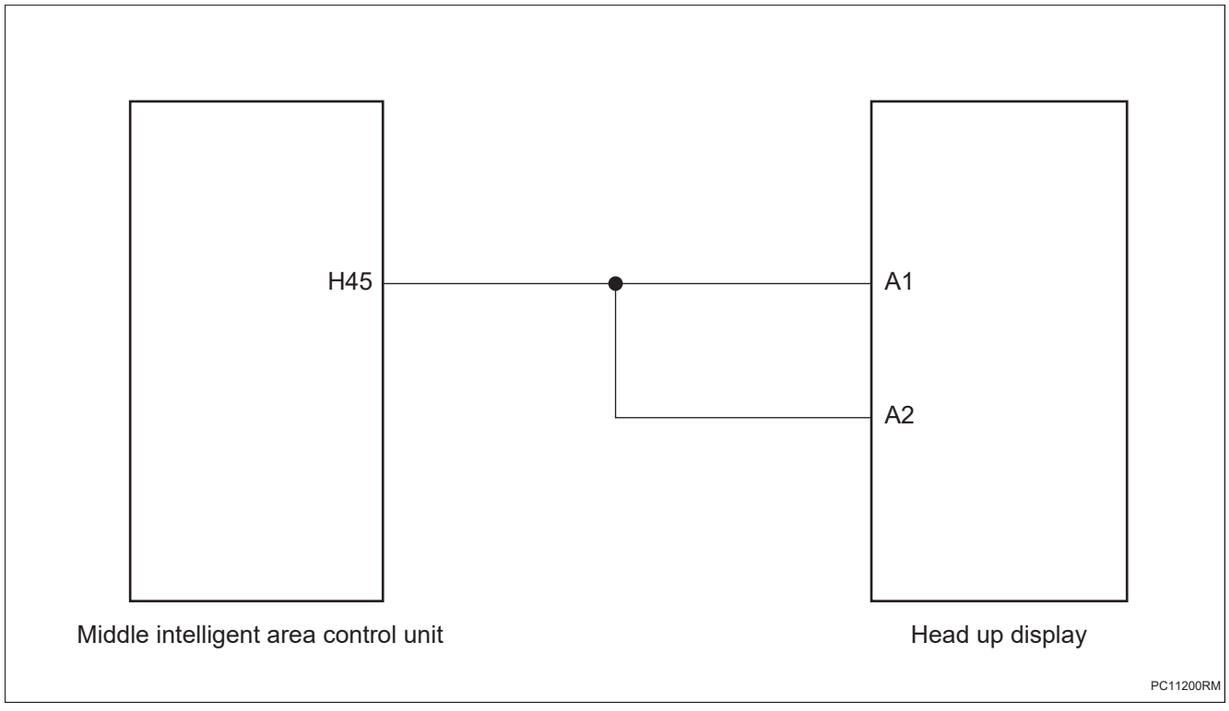
When head up display power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222511	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH09 short to GND	5	Event-based	10 ms	• Head up display • Wire harness and connector • Middle intelligent area control unit

Fault symptom

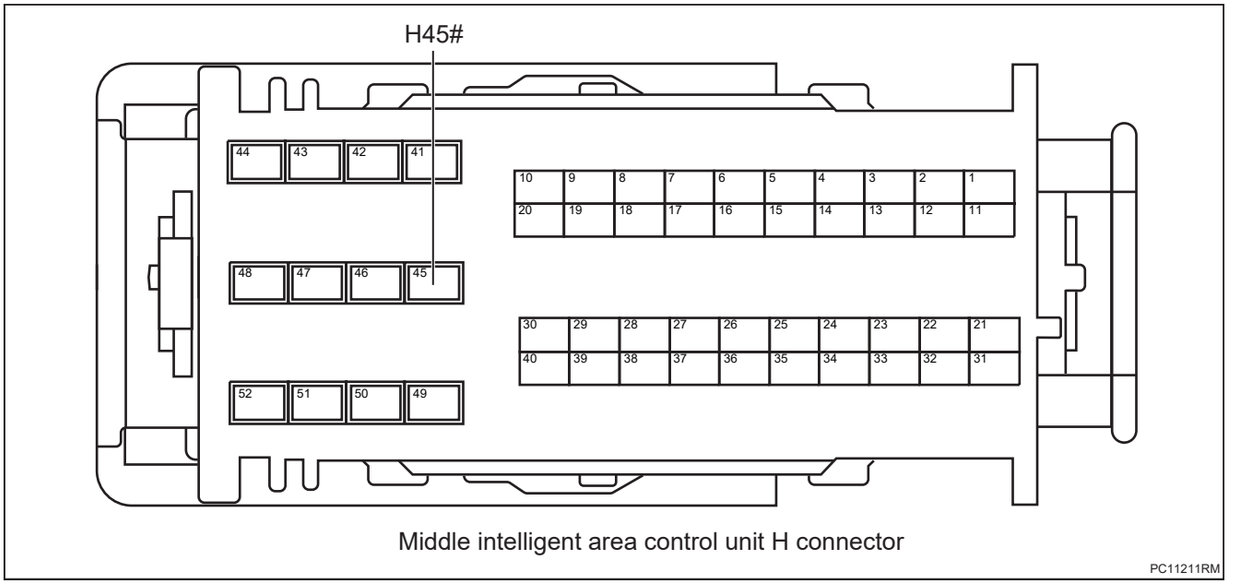
DTC No.	Fault symptom	Warning light/indicator
B222511	Head up display does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the head up display connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H45# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace head up display (See page ZC-114)**

(a) Replace the head up display.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222711	Short to ground in center display power supply

Description

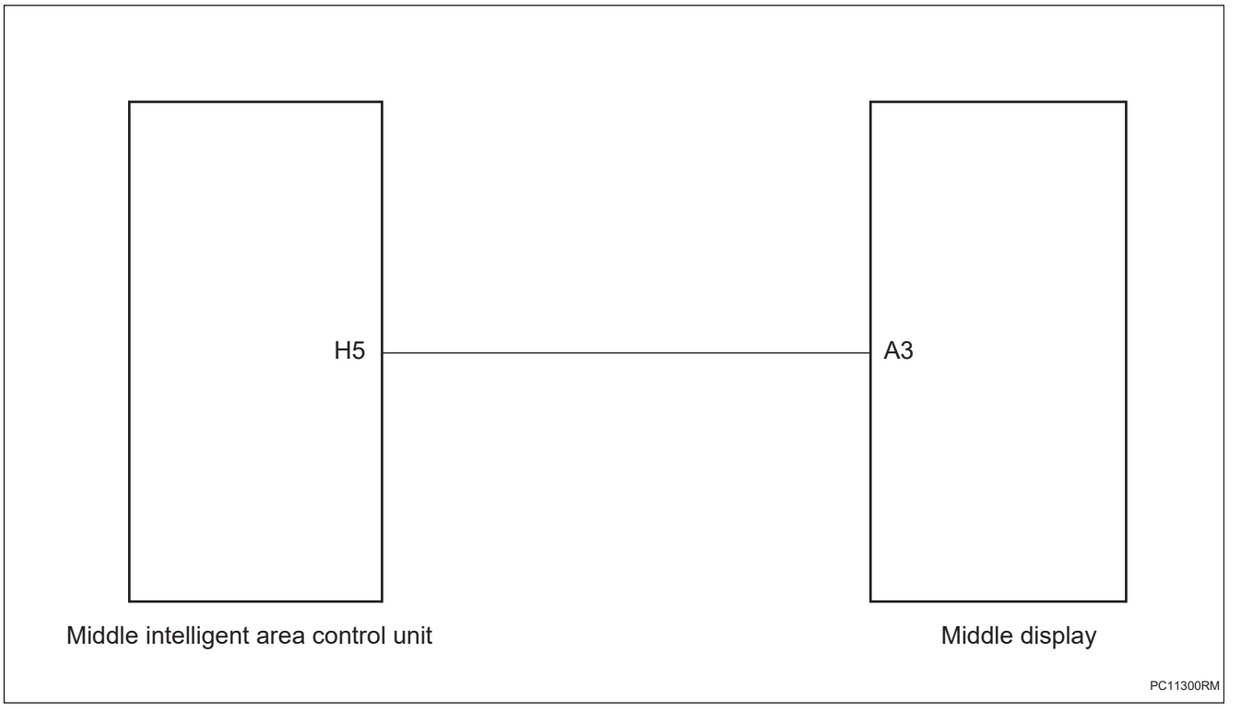
When center display power supply circuit is short, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222711	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH11 short to GND	5	Event-based	10 ms	• Middle display • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B222711	Center display does not operate or operates abnormally	-

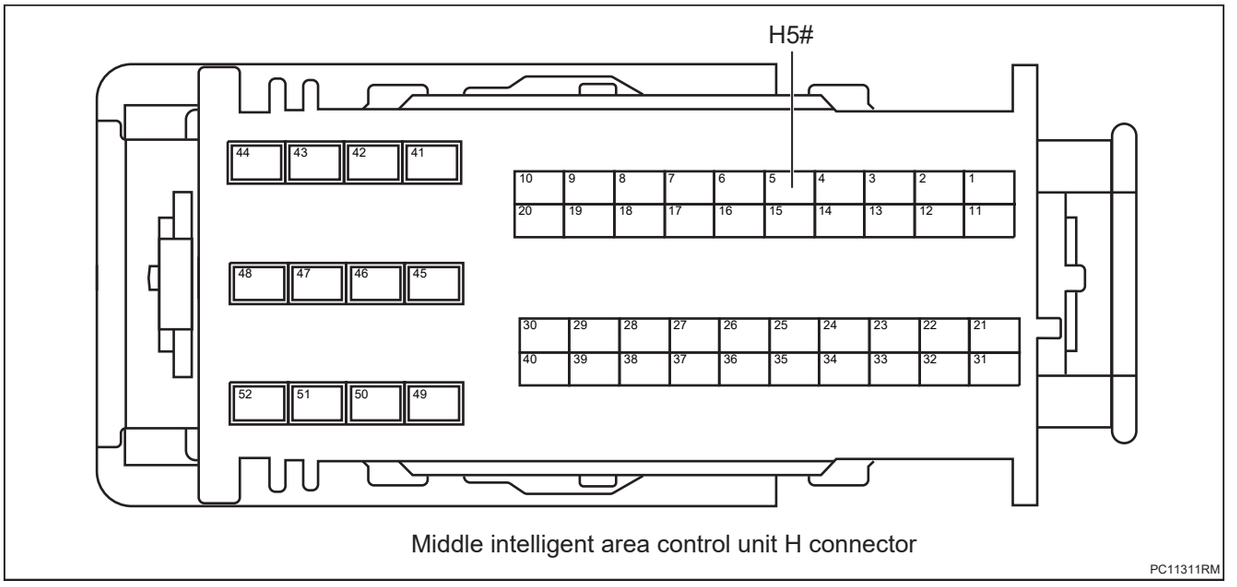
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle display wire harness connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace middle display (See page ZC-85)

(a) Replace the middle display.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222811	Short to ground in driver status monitoring camera power supply

Description

When there is short to ground in front passenger monitoring camera, driver monitoring camera power supply circuit, the middle intelligent area control unit records DTC.

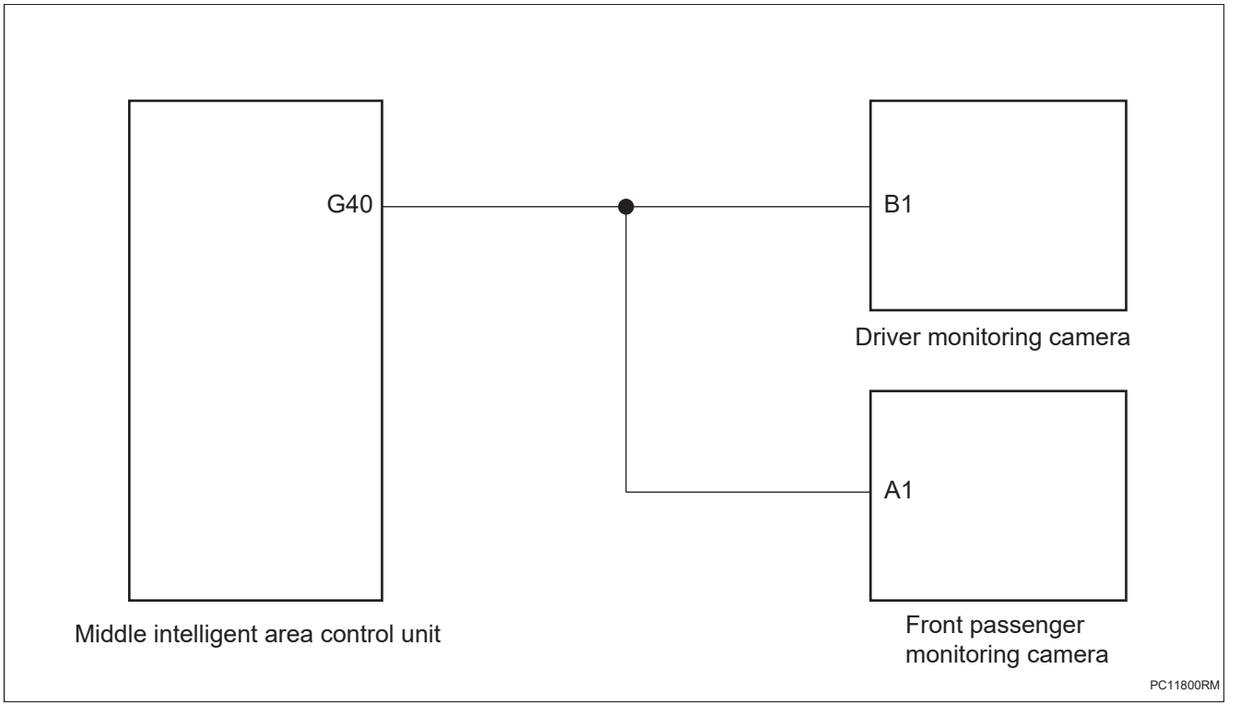
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222811	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH64 short to GND	5	Event-based	10 ms	• Front passenger monitoring camera • Driver monitoring camera • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

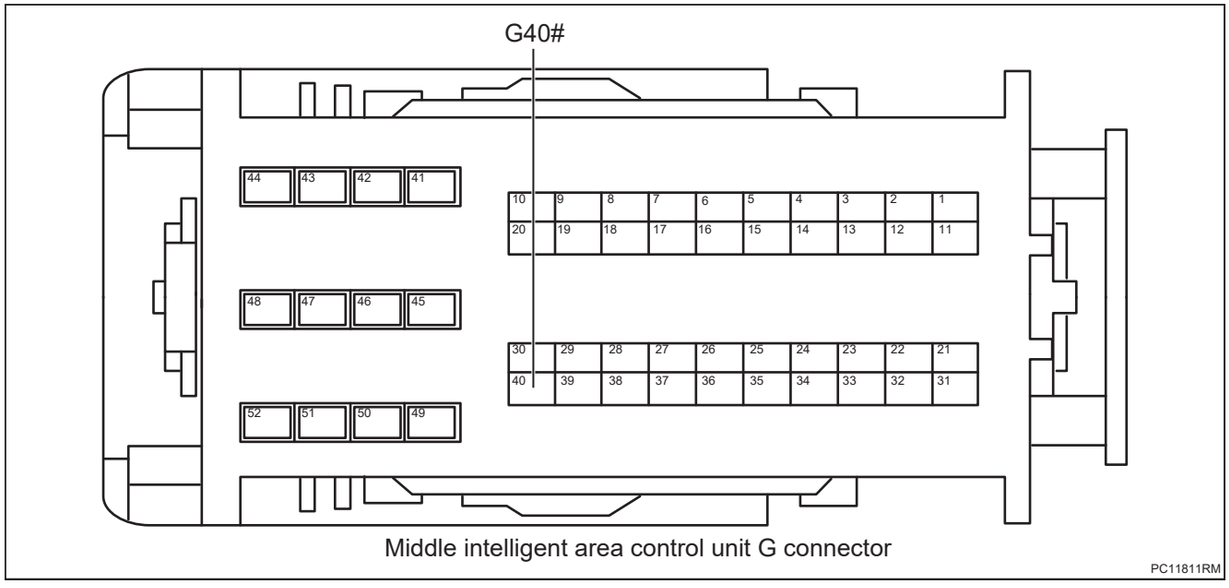
DTC No.	Fault symptom	Warning light/indicator
B222811	Driver status monitoring camera does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver monitoring camera connector.

(d) Disconnect the front passenger monitoring camera connector.

(e) Disconnect the middle intelligent area control unit connector.

(f) According to value in the table, measure resistance.

Standard value

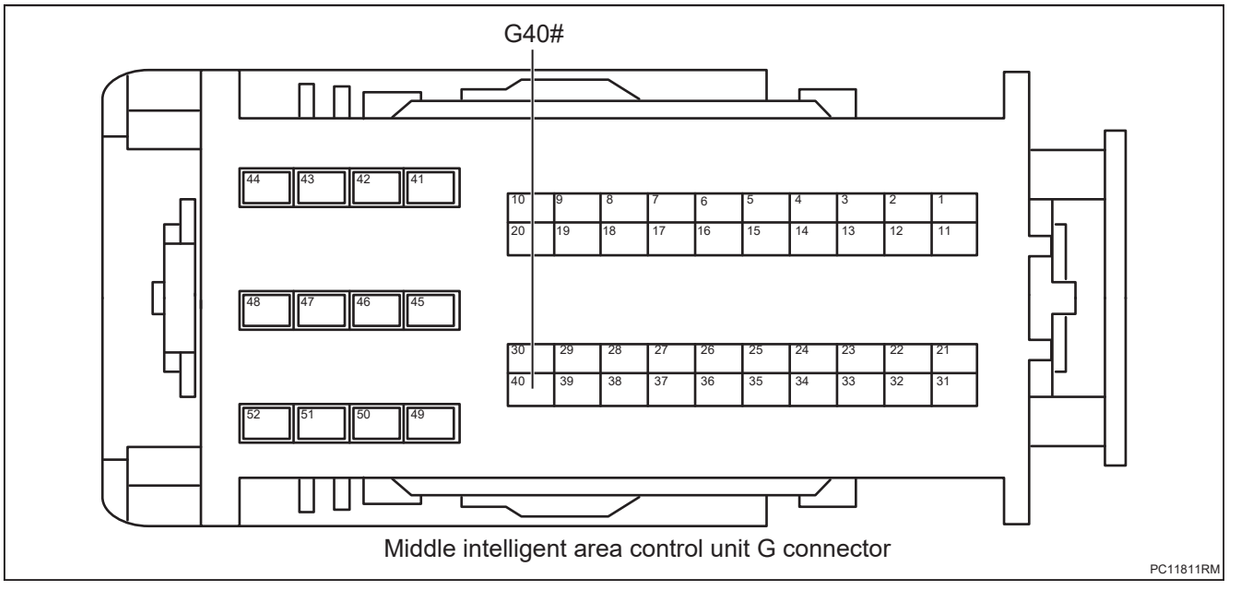
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G40# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G40# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace driver monitoring camera/front passenger monitoring camera (See page ZC-137) (See page ZC-144)**

(a) Replace the driver monitoring camera/front passenger monitoring camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B222911**	**Short to ground in IG power supply**
DTC	**B222912**	**Short to power supply in IG power supply**

Description

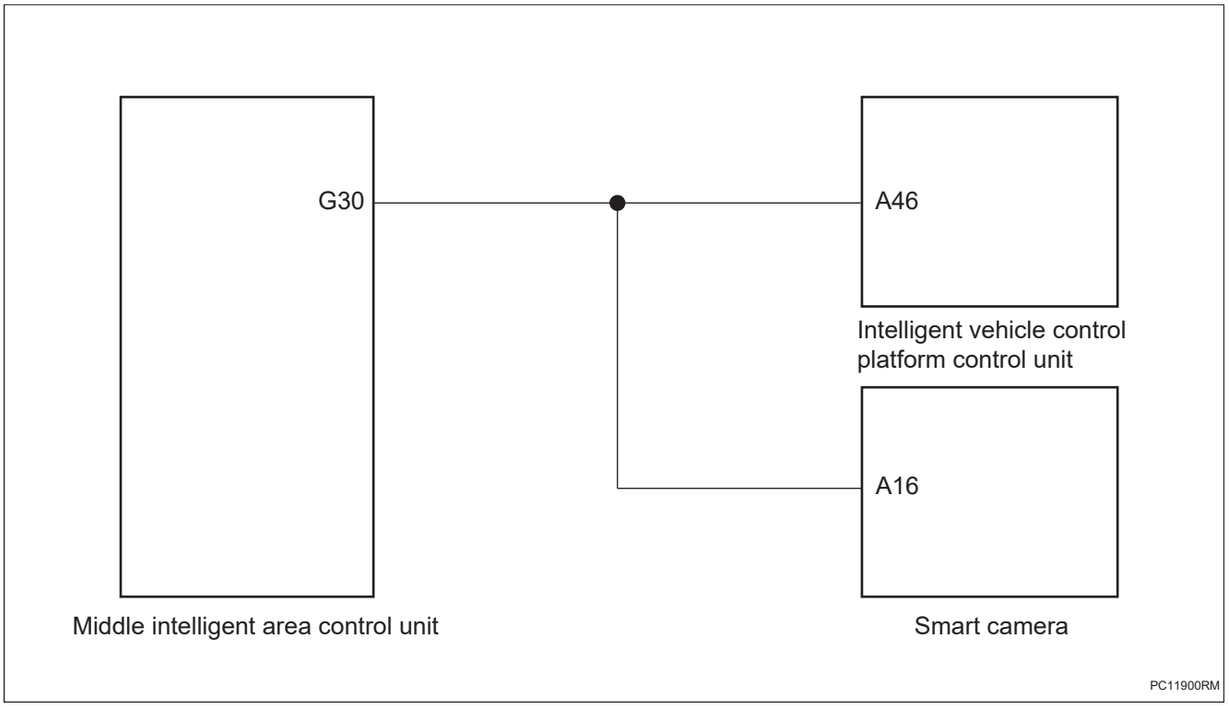
When intelligent vehicle control platform control unit and smart camera IG power supply circuit is short, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222911	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH59 short to GND	5	Event-based	10 ms	• Intelligent vehicle control platform control unit • Smart camera • Wire harness and connector • Middle intelligent area control unit
B222912	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH59 short to BAT	5	Event-based	10 ms	• Intelligent vehicle control platform control unit • Smart camera • Wire harness and connector • Middle intelligent area control unit

Fault symptom

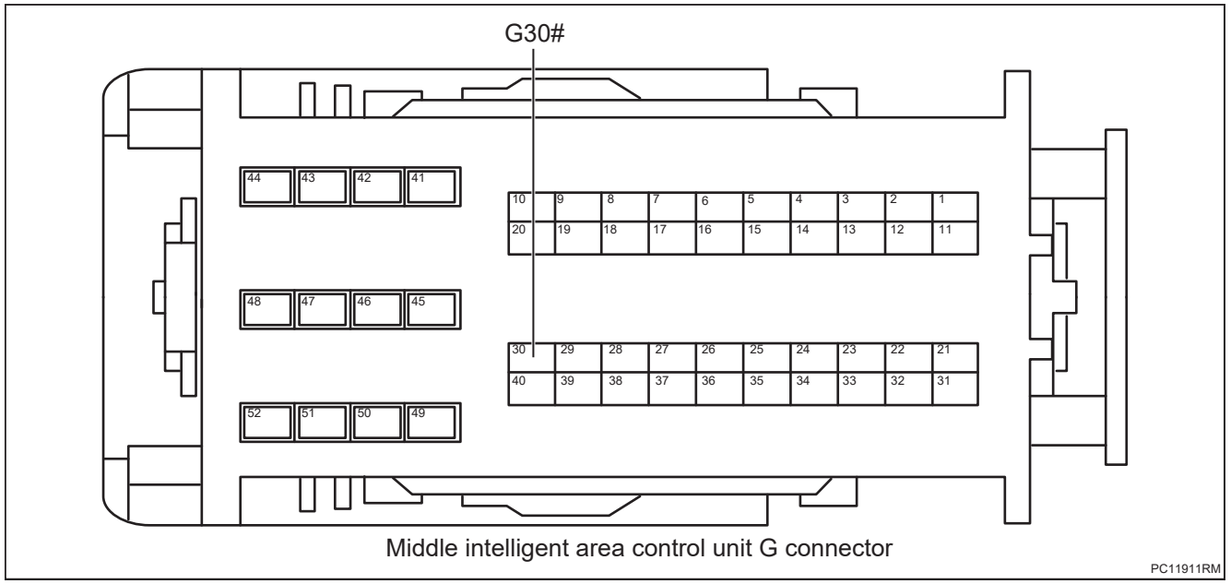
DTC No.	Fault symptom	Warning light/indicator
B222911	IG power supply dose not operate or operates abnormally	-
B222912	IG power supply dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Disconnect the smart camera connector.

(e) Disconnect the middle intelligent area control unit connector.

(f) According to value in the table, measure resistance.

Standard value

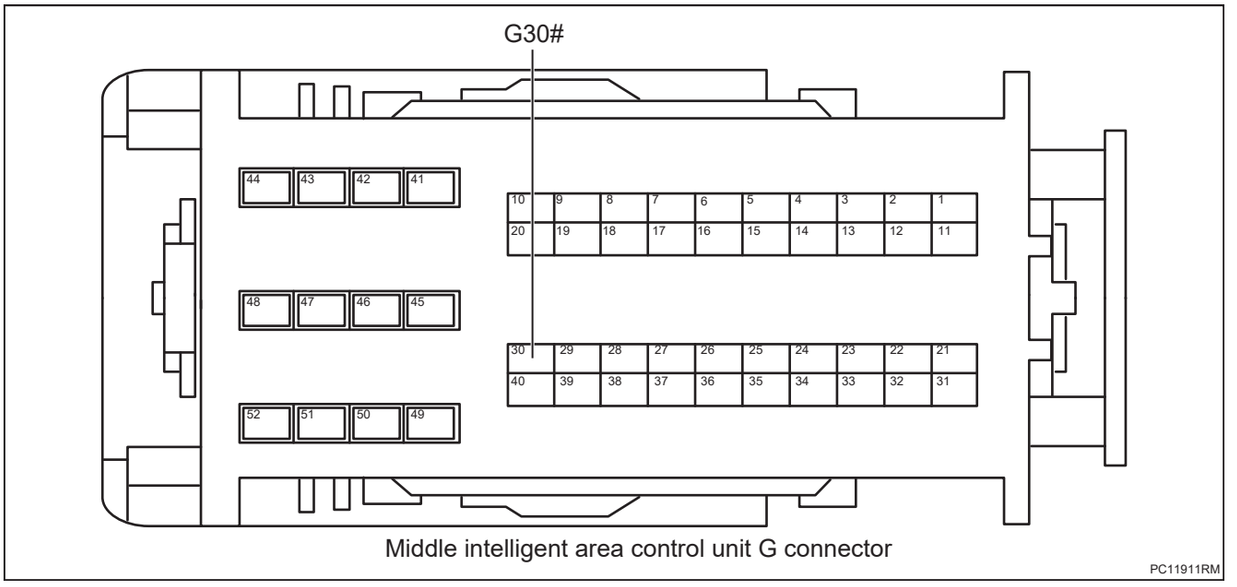
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace intelligent vehicle control platform control unit/smart camera (See page ZC-154) (See page ZC-139)**

(a) Replace the intelligent vehicle control platform control unit/smart camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222A11	Short to ground in front right millimeter wave radar ADS sensor power supply

Description

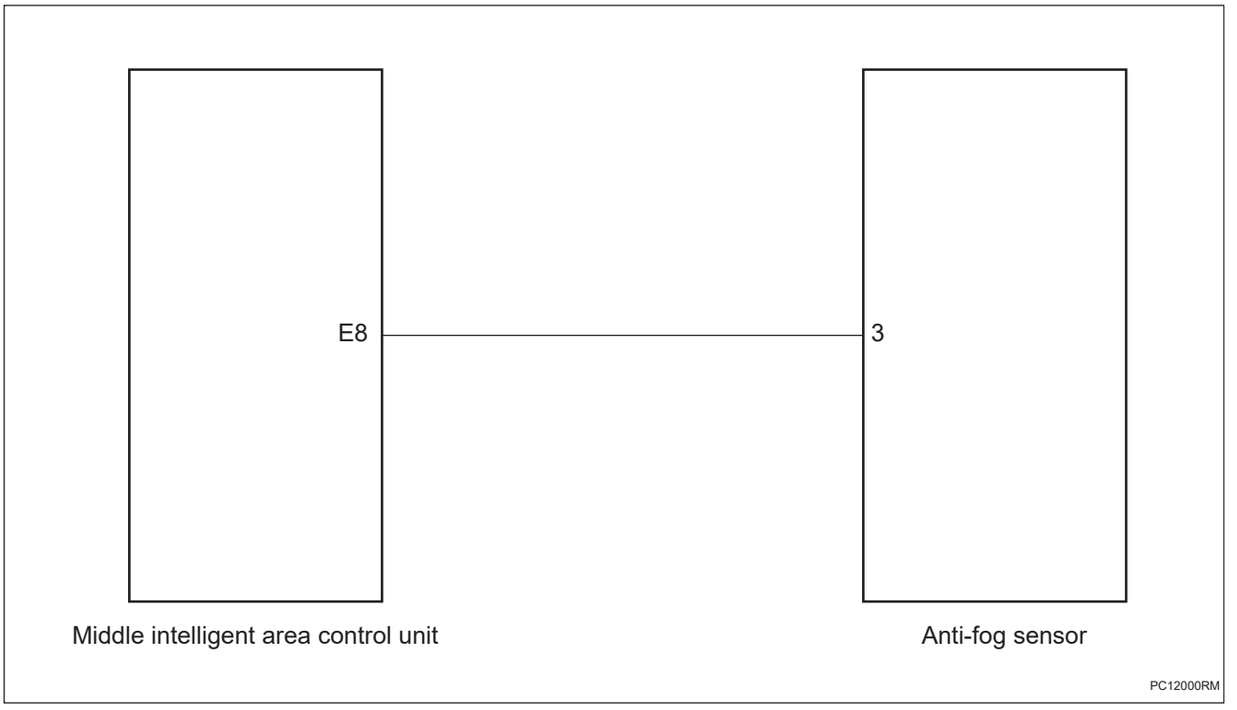
When there is short to ground in anti-fog sensor power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222A11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH14 short to GND	5	Event-based	10 ms	• Anti-fog sensor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B222A11	ADS dose not operate or operates abnormally	-

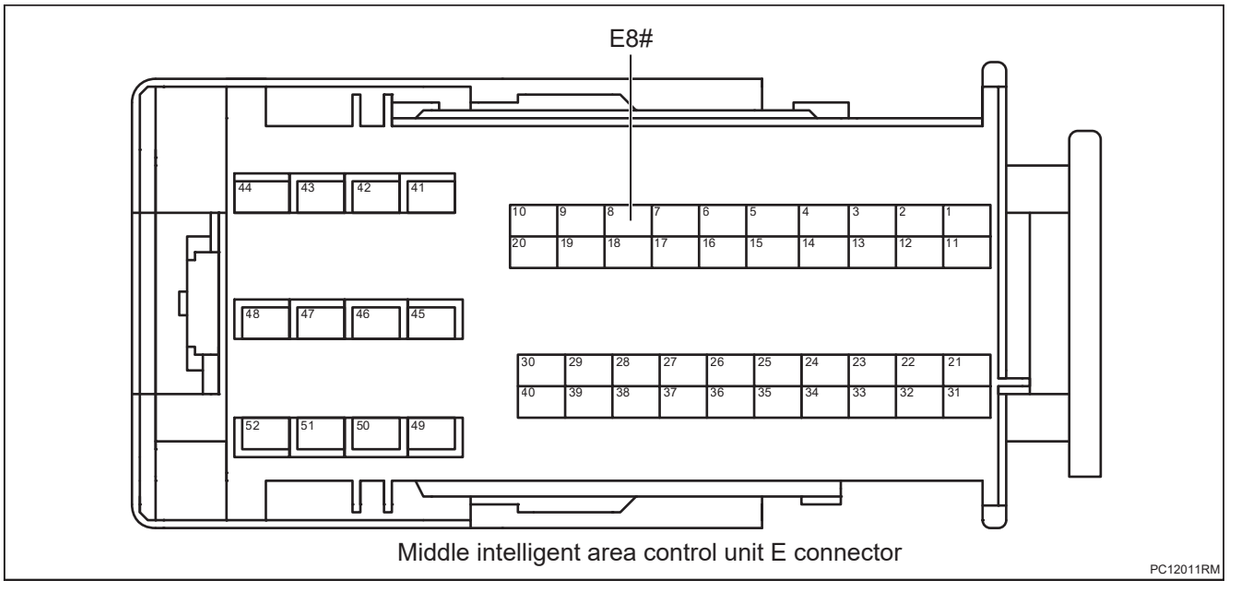
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the anti-fog sensor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace anti-fog sensor (See page RE-11)**

(a) Replace the anti-fog sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222D11	Short to ground in front millimeter wave radar power supply

Description

When front millimeter wave radar power supply circuit is short to ground, the middle intelligent area control unit records DTC.

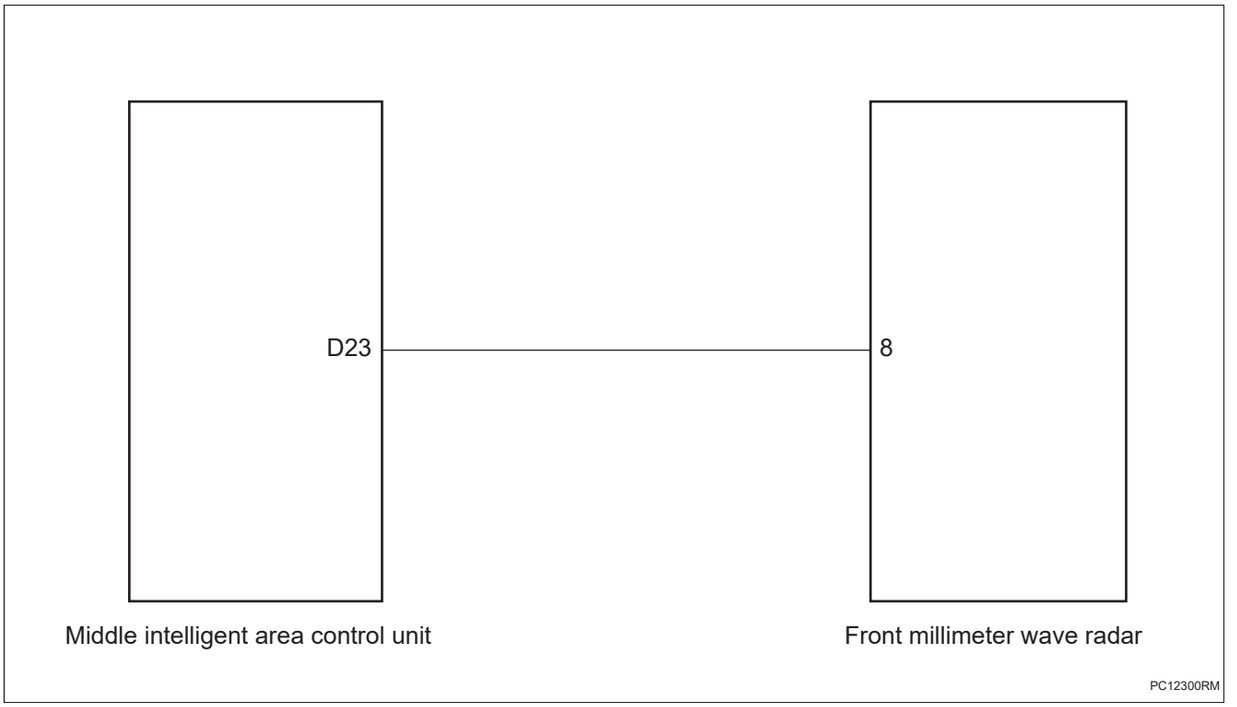
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222D11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH18 short to GND	5	Event-based	10 ms	• Front millimeter wave radar • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

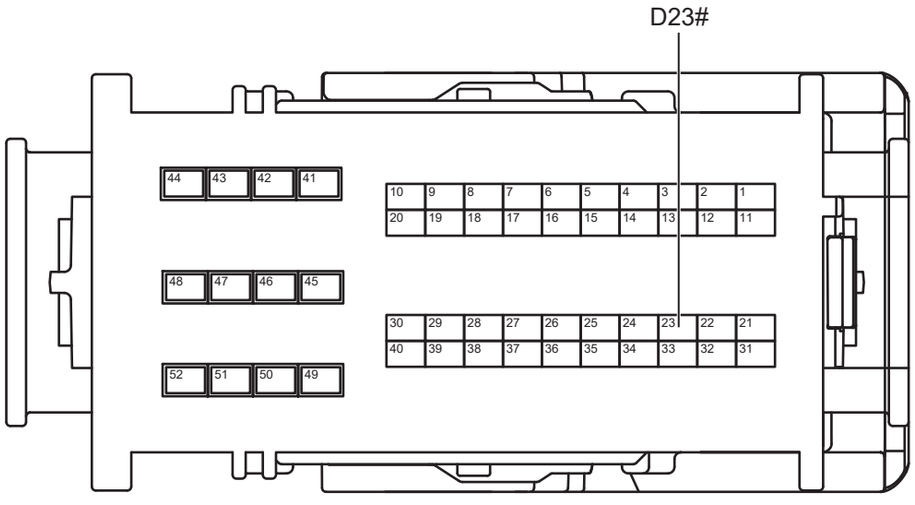
DTC No.	Fault symptom	Warning light/indicator
B222D11	Front millimeter wave radar does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit D connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front millimeter wave radar connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D23# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front millimeter wave radar (See page ZC-110)**

(a) Replace the front millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

ZD

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

ZD

OK

Diagnosis ends

DTC	B222E11	Short to ground in multiple light source ambient light power supply

Description

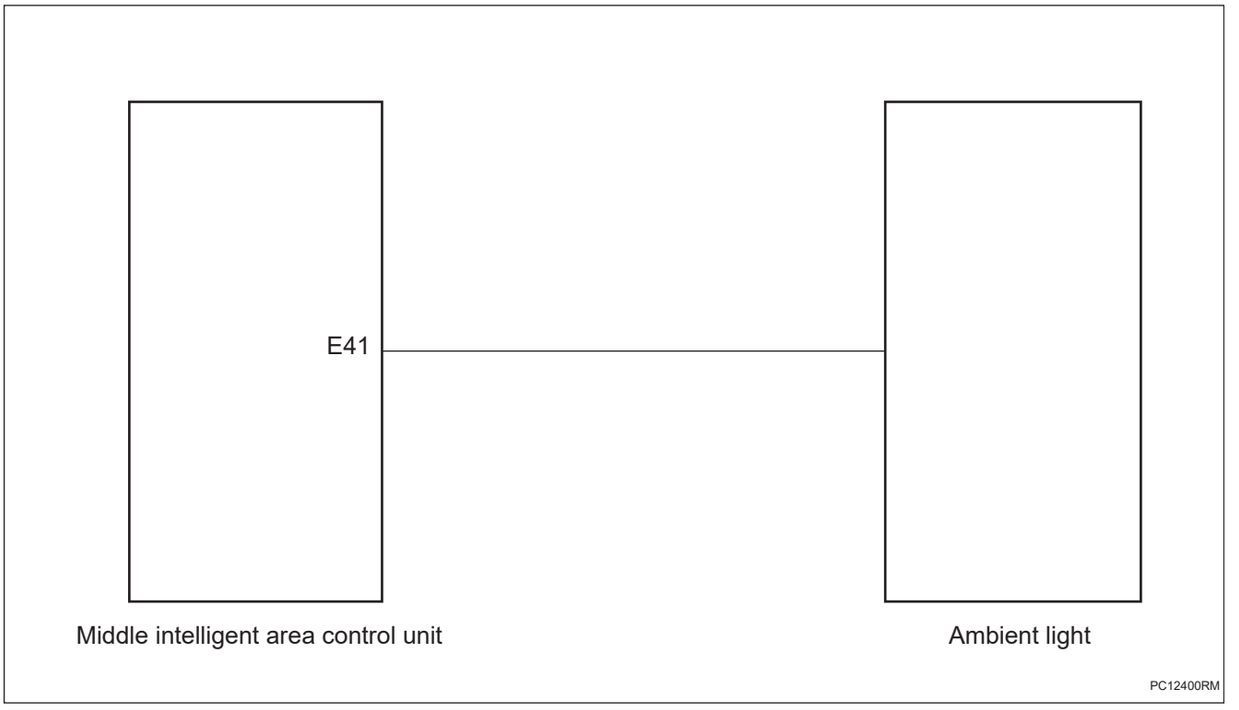
When footwell light, ambient light power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222E11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH61 short to GND	5	Event-based	10 ms	• Instrument panel ambient light Ⅰ • Instrument panel ambient light II • Instrument panel ambient light III • Instrument panel ambient light IV • Front left footwell light • Front right footwell light • Front left door ambient light Ⅰ • Rear left door ambient light Ⅰ • Front right door ambient light I • Rear right door ambient light I • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B222E11	Multiple light source ambient light dose not operate or operates abnormally	-

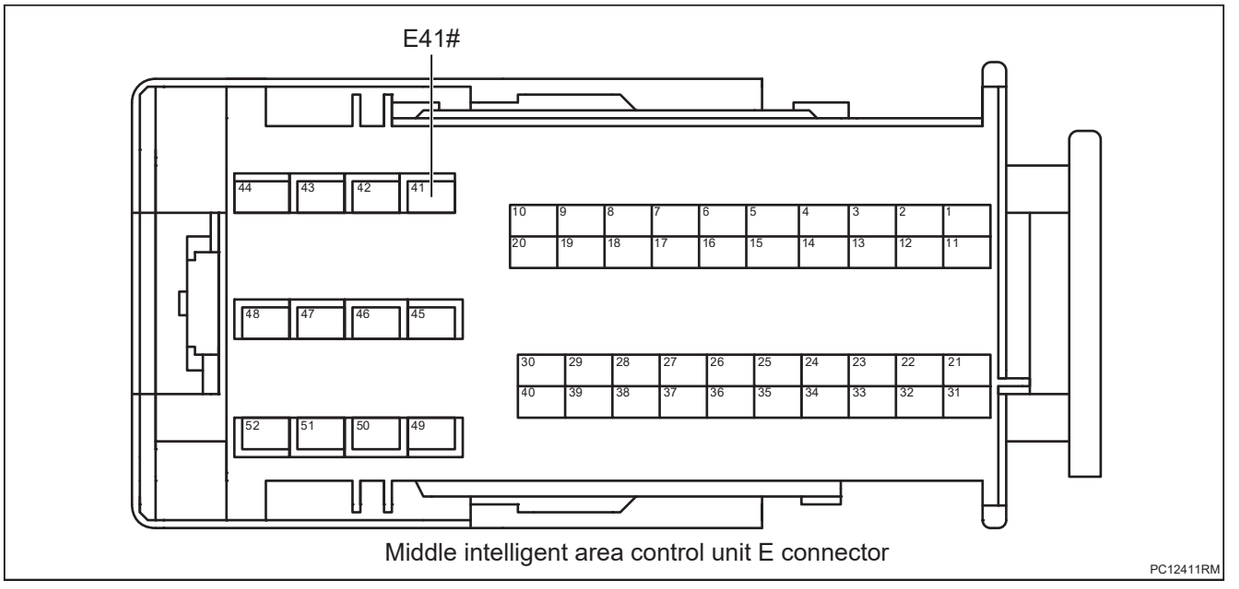
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the ambient light connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E41# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace ambient light (See page ZC-32)**

(a) Replace the ambient light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B222F11	Short to ground in front passenger seat ventilation massage power supply

Description

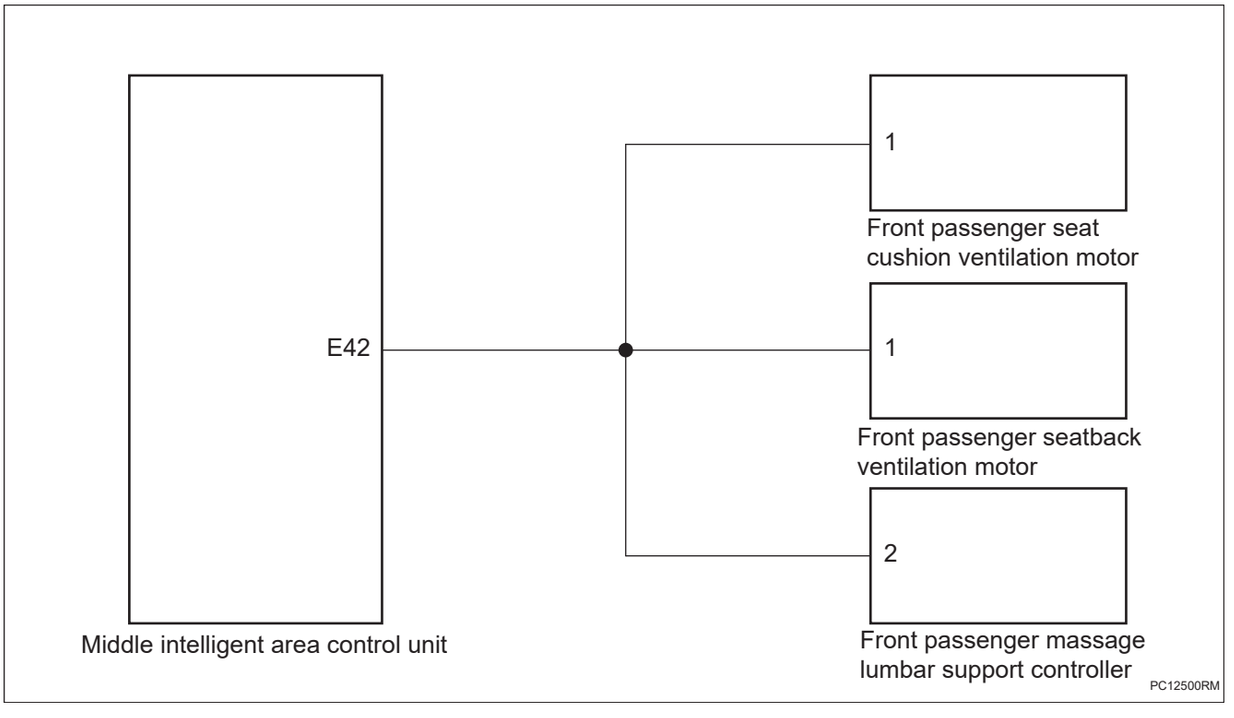
When there is short to ground in front passenger seat ventilation motor, massage lumbar support controller power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222F11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH12 short to GND	5	Event-based	10 ms	• Front passenger seat cushion ventilation motor • Front passenger seatback ventilation motor • Front passenger massage lumbar support controller • Wire harness and connector • Middle intelligent area control unit

Fault symptom

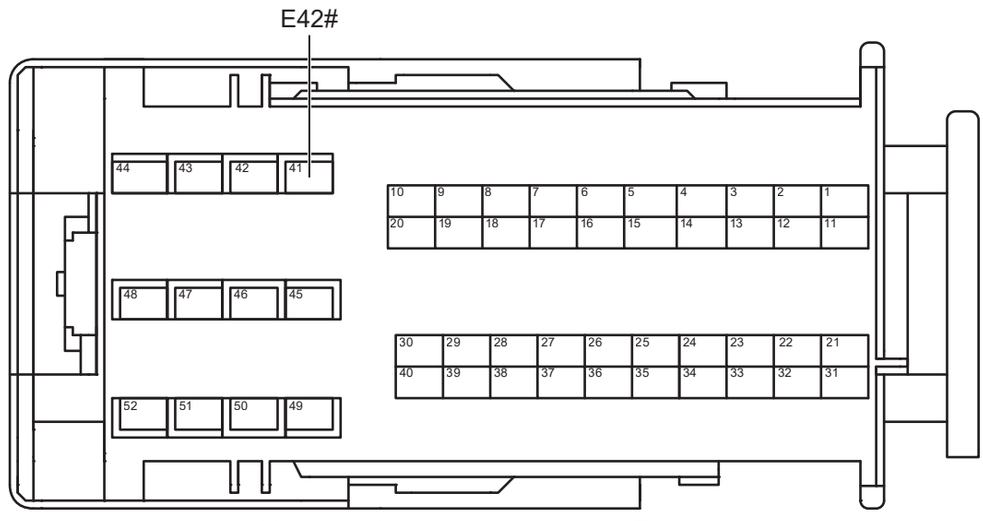
DTC No.	Fault symptom	Warning light/indicator
B222F11	Front passenger seat ventilation massage does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit E connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat cushion ventilation motor connector.

(d) Disconnect the front passenger seatback ventilation motor connector.

(e) Disconnect the front passenger massage lumbar support controller connector.

(f) Disconnect the middle intelligent area control unit connector.

(g) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E42# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front passenger seat cushion ventilation motor/front passenger seatback ventilation motor/front passenger massage lumbar support controller (See page NS-67)**

(a) Replace the front passenger seat cushion ventilation motor/front passenger seatback ventilation motor/front passenger massage lumbar support controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B223111**	**Short to ground in driver seat ventilation massage power supply**

Description

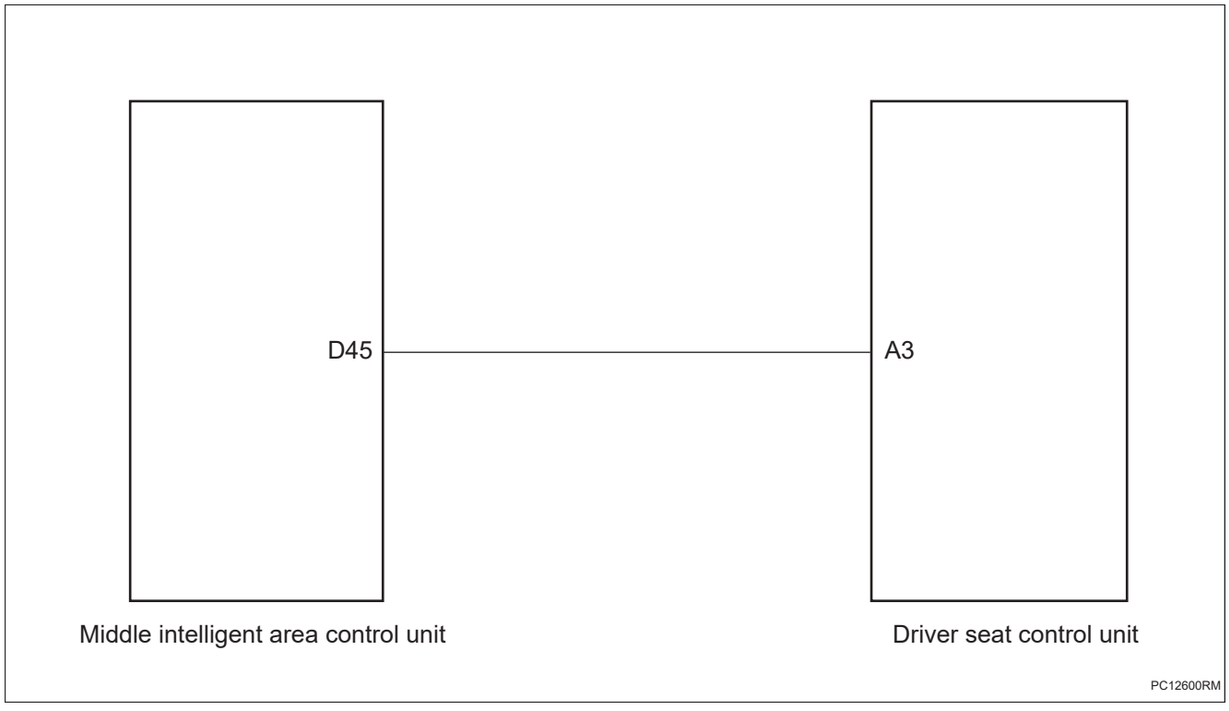
When driver seat control unit (driver seat ventilation massage) power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223111	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH15 short to GND	5	Event-based	10 ms	• Driver seat control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

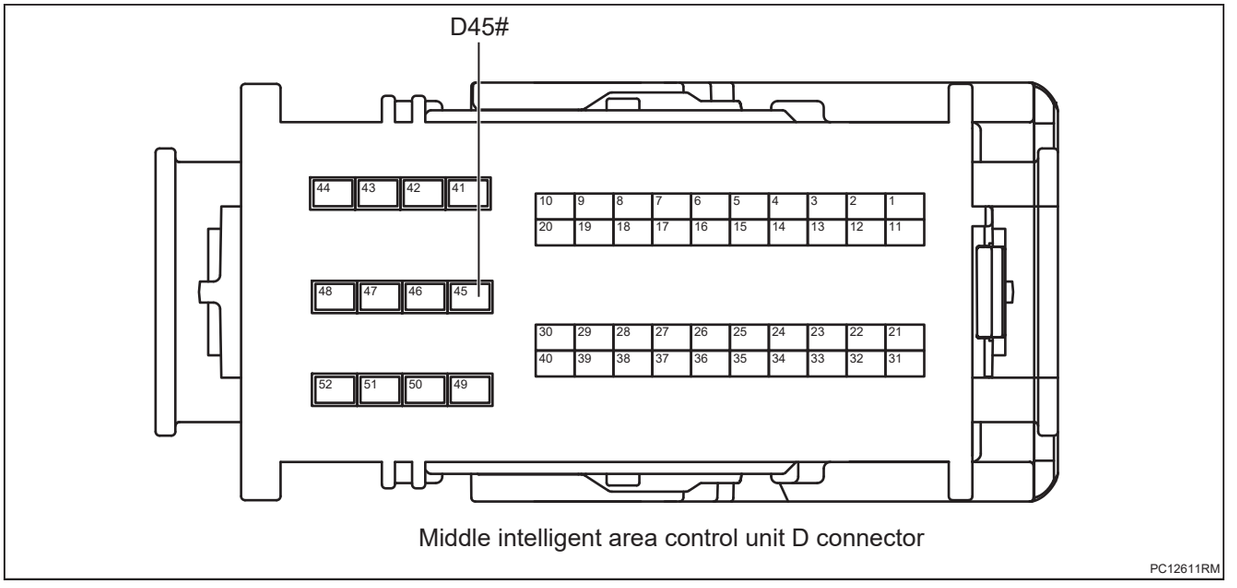
DTC No.	Fault symptom	Warning light/indicator
B223111	Driver seat ventilation massage does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit D connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D45# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace driver seat control unit (See page NS-90)**

(a) Replace the driver seat control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B223611	Front passenger seatback motor power supply

Description

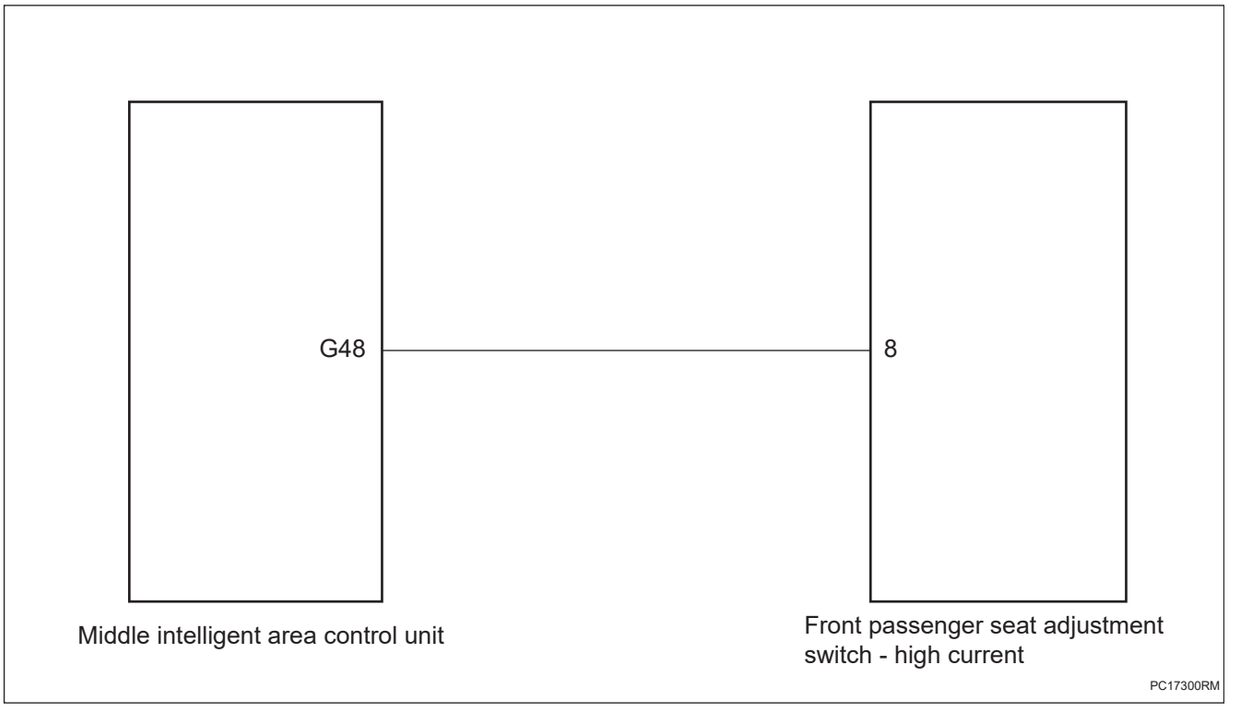
When there is short to ground in front passenger seat adjustment switch (high current) power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223611	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH21 short to GND	5	Event-based	10 ms	• Front passenger seat adjustment switch - high current • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B223611	Front passenger seat adjustment abnormal	-

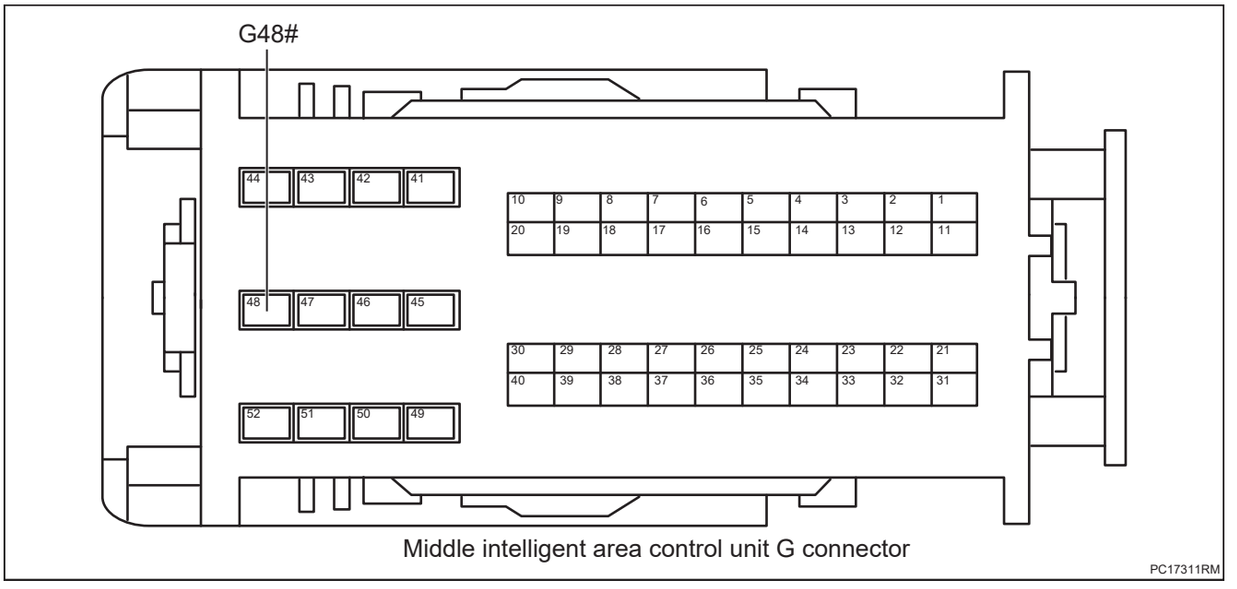
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat adjustment switch (high current) connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G48# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front passenger seat adjustment switch - high current (See page NS-67)**

(a) Replace the front passenger seat adjustment switch - high current.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B223811	Short to ground in 12-5V USB output HUB

Description

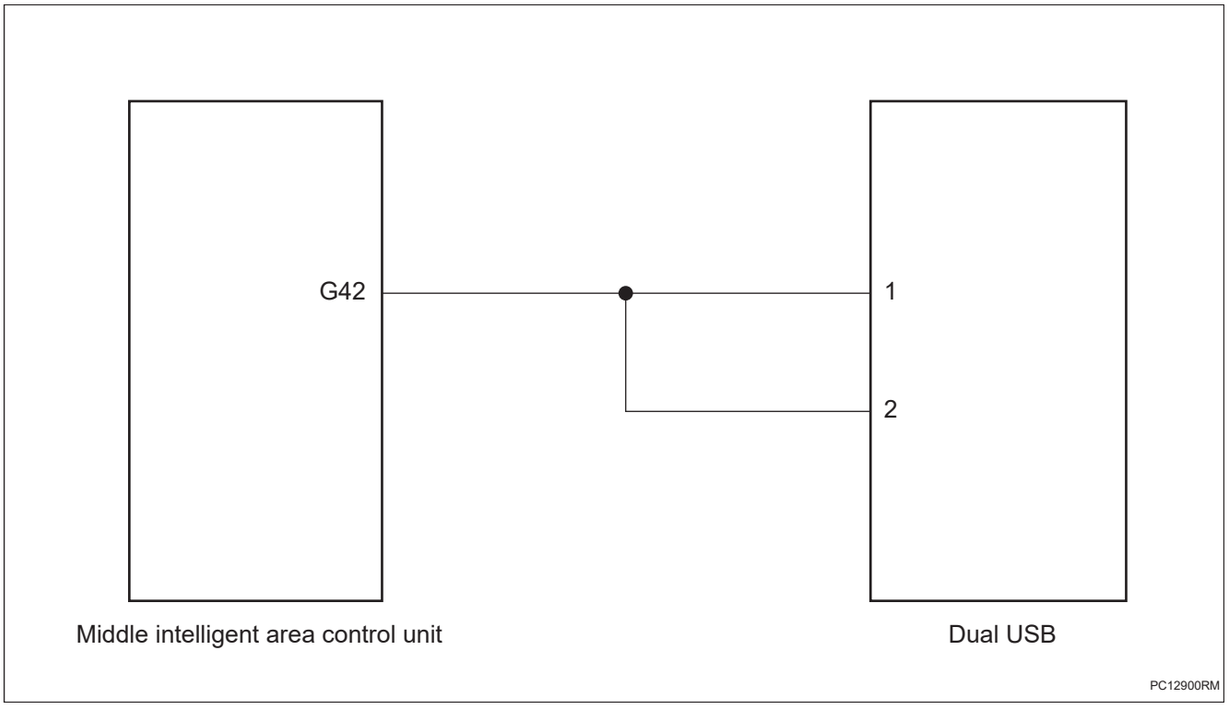
When dual USB power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223811	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH25 short to GND	5	Event-based	10 ms	• Dual USB • Wire harness and connector • Middle intelligent area control unit

Fault symptom

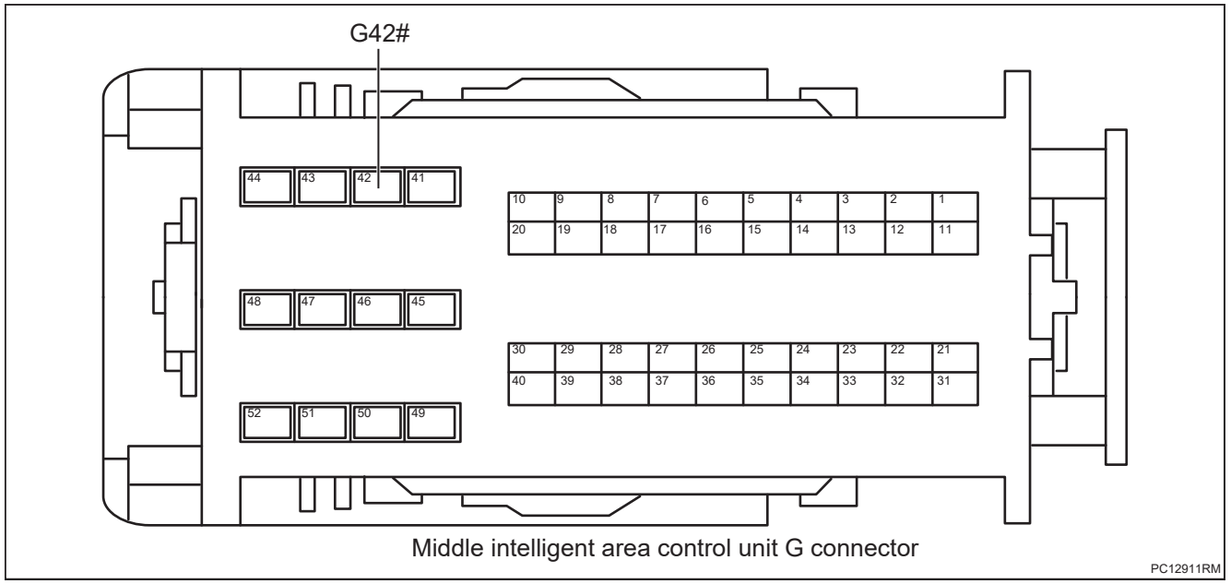
DTC No.	Fault symptom	Warning light/indicator
B223811	12-5V USB output HUB dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the dual USB connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G42# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace dual USB (See page ZC-9)**

(a) Replace the dual USB.

(b) Connect HQ-VDS diagnostic tester.

ZD

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

ZD

OK

Diagnosis ends

DTC	B223911	Short to ground in backup power supply 1

Description

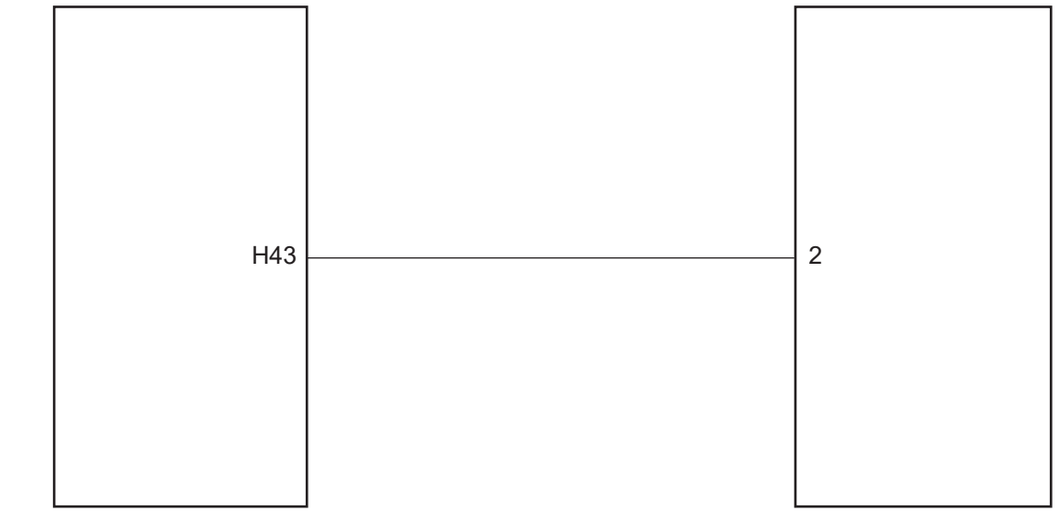
When there is short to ground in backup power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223911	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH26 short to GND	5	Event-based	10 ms	• Backup power supply • Wire harness and connector • Middle intelligent area control unit

Fault symptom

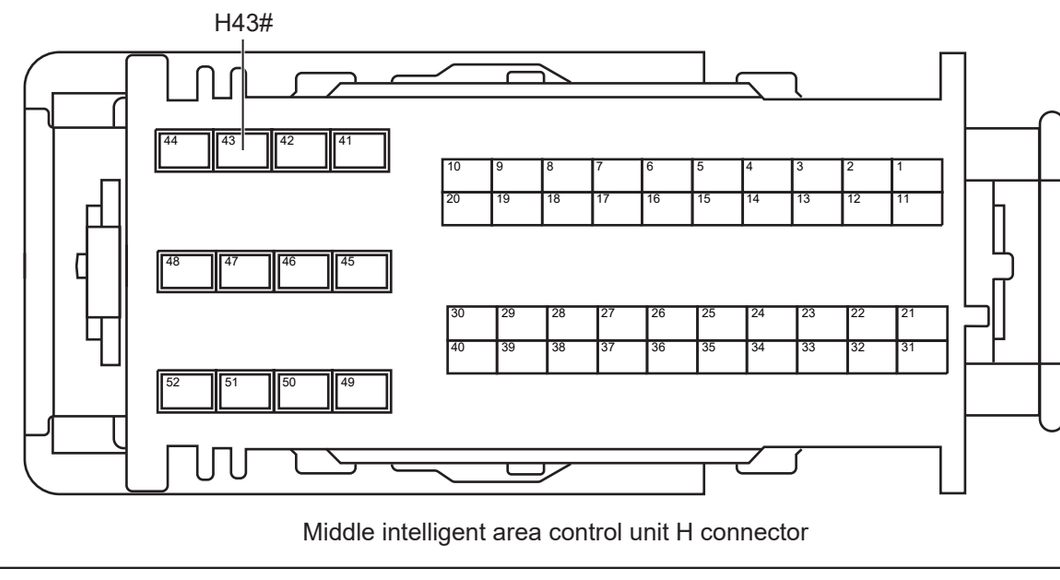
DTC No.	Fault symptom	Warning light/indicator
B223911	Backup power supply 1 does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the backup power supply connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H43# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	Replace backup power supply (See page ZC-13)

(a) Replace the backup power supply.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B223B11	Short to ground in front mobile phone wireless charger

Description

When mobile phone wireless charging controller power supply circuit is short to ground, the middle intelligent area control unit records DTC.

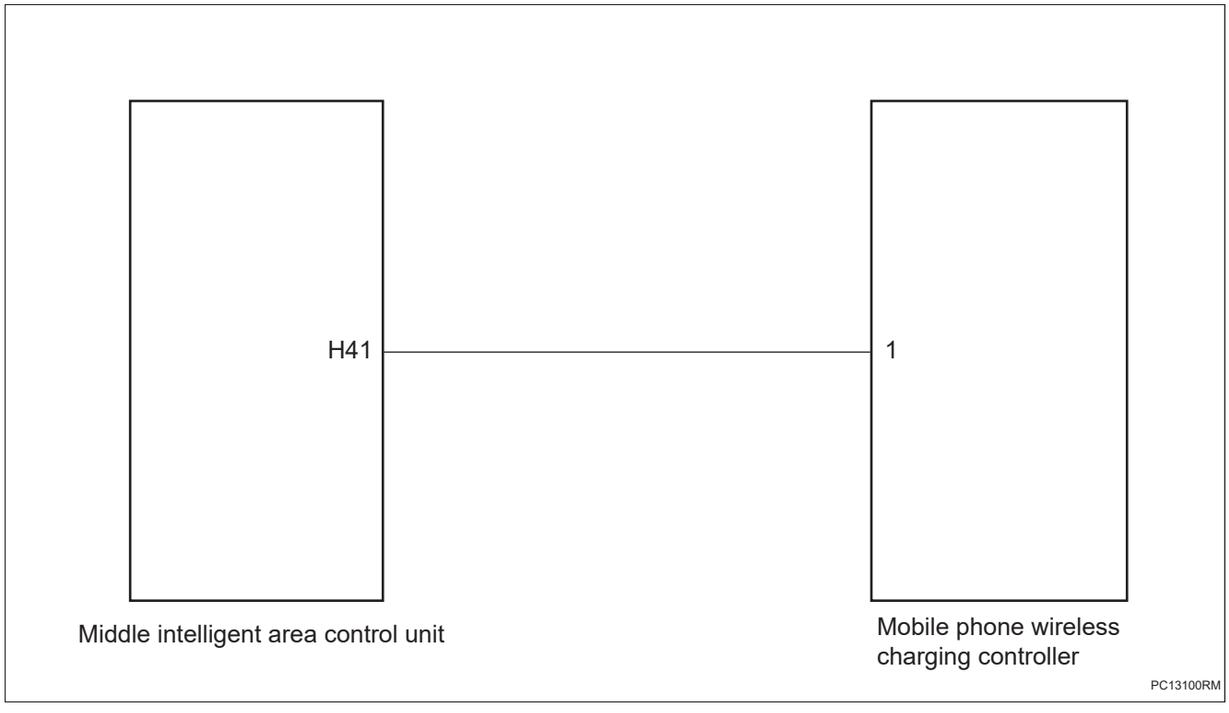
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223B11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH05 short to GND	5	Event-based	10 ms	• Mobile phone wireless charging controller • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

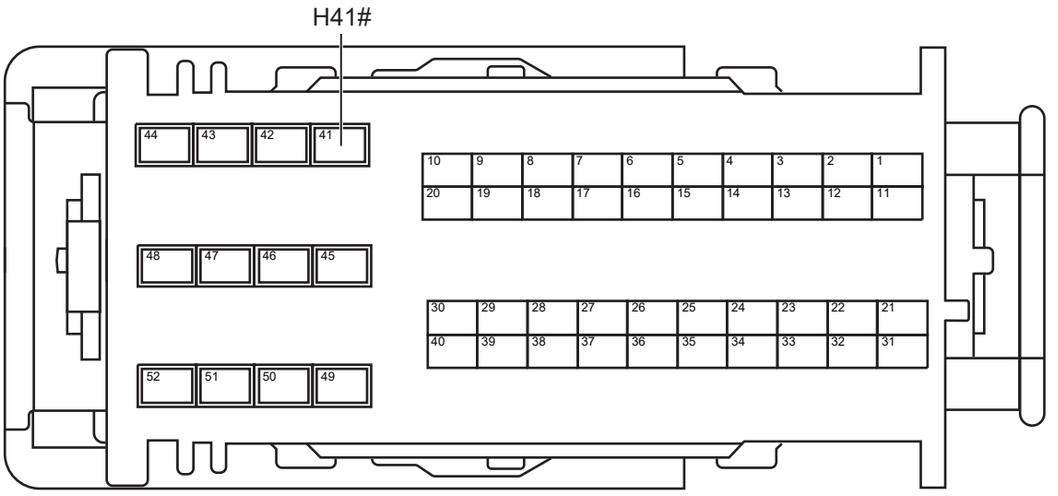
DTC No.	Fault symptom	Warning light/indicator
B223B11	Front mobile phone wireless charging does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

PC13111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mobile phone wireless charging controller connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H41# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace mobile phone wireless charging controller (See page ZC-156)

(a) Replace the mobile phone wireless charging controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B223E11	Short to ground in front passenger seat control module power supply

Description

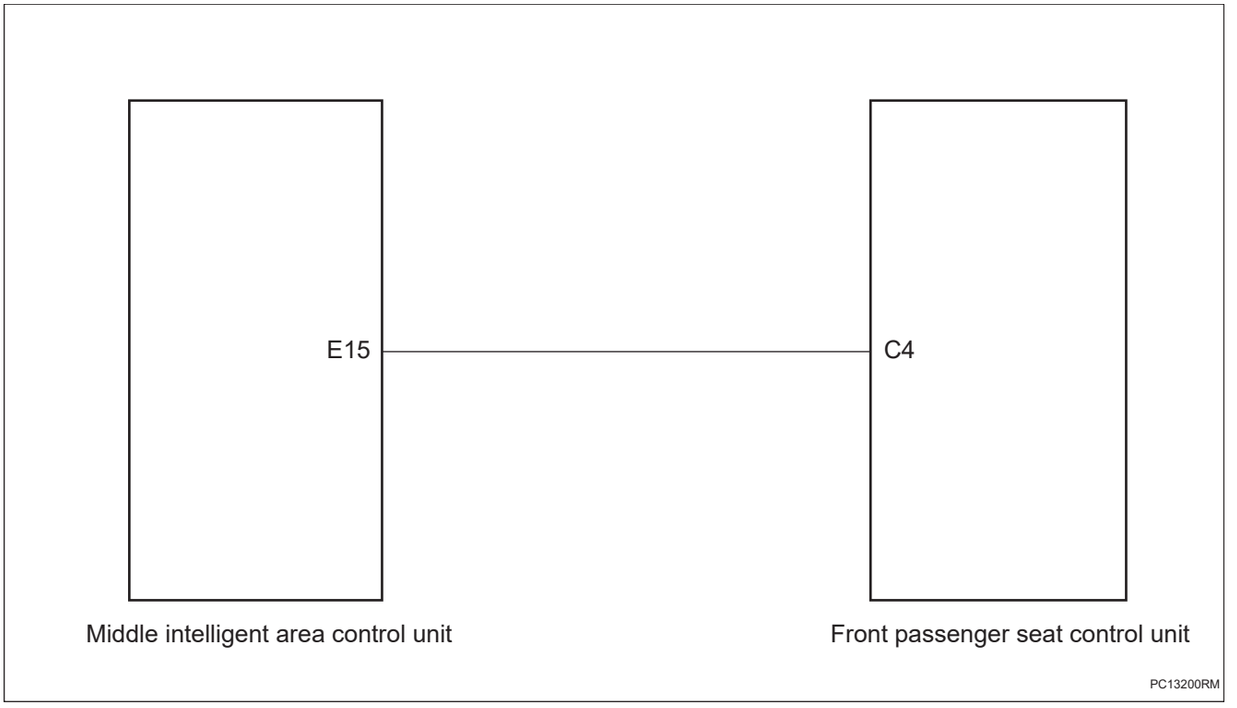
When there is short to ground in front passenger seat control unit power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223E11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH28 short to GND	5	Event-based	10 ms	• Front passenger seat control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

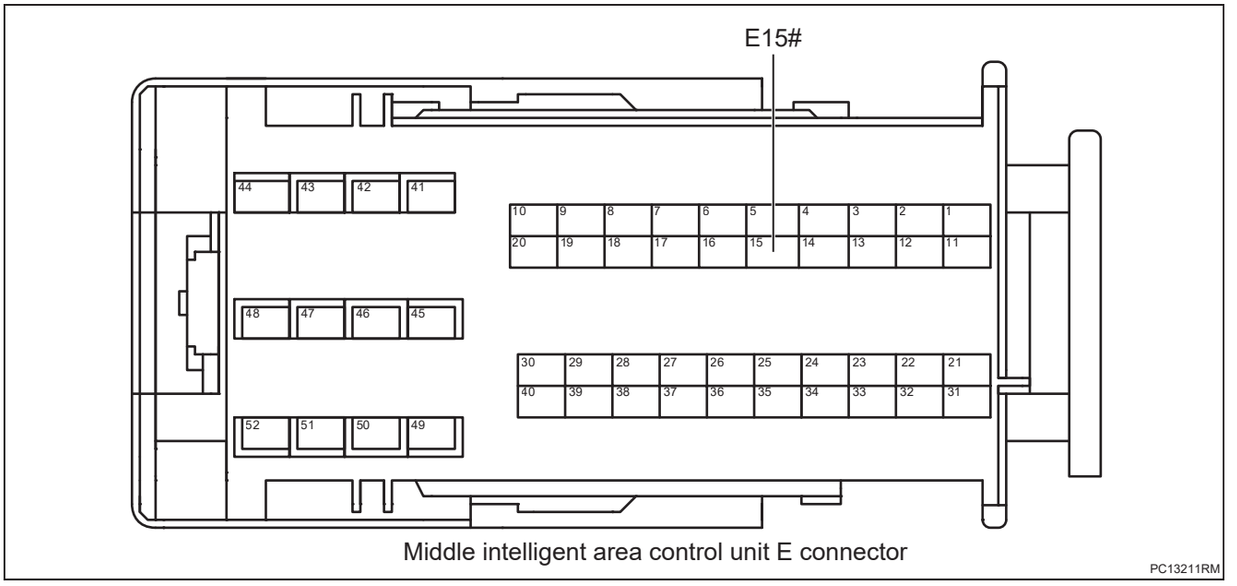
DTC No.	Fault symptom	Warning light/indicator
B223E11	Front passenger seat control module does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front passenger seat control unit (See page NS-90)**

(a) Replace the front passenger seat control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B223F11**	**Short to ground in front passenger heating power supply**
DTC	**B223F13**	**Open in front passenger heater**

Description

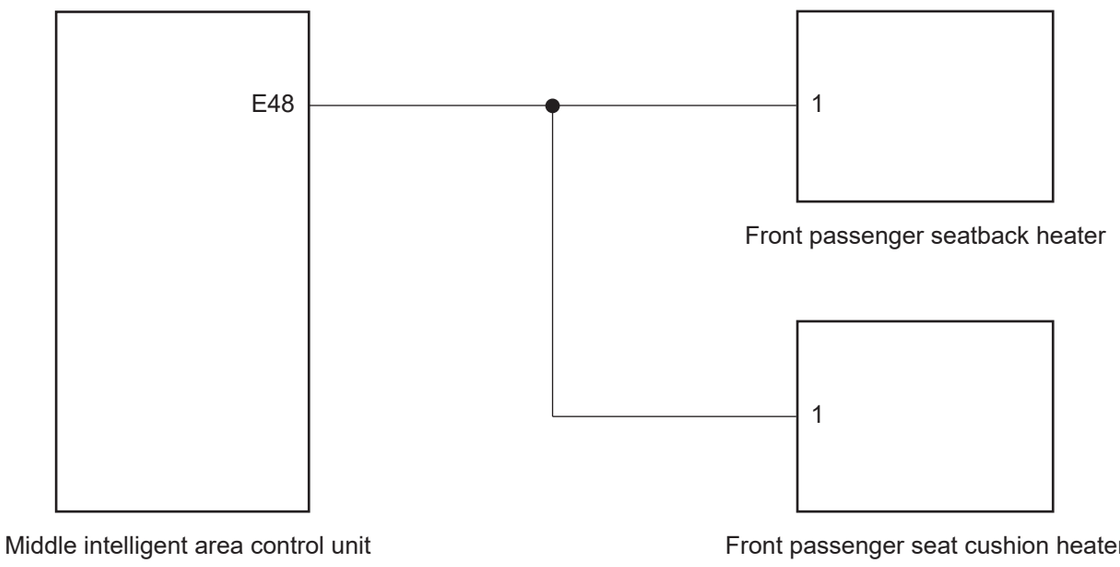
When there is open or short in front passenger seatback, seat cushion heating power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223F11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH29 short to GND	5	Event-based	10 ms	• Front passenger seatback heater • Front passenger seat cushion heater • Wire harness and connector • Middle intelligent area control unit
B223F13	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH29 open circuit	5	Event-based	10 ms	• Front passenger seatback heater • Front passenger seat cushion heater • Wire harness and connector • Middle intelligent area control unit

Fault symptom

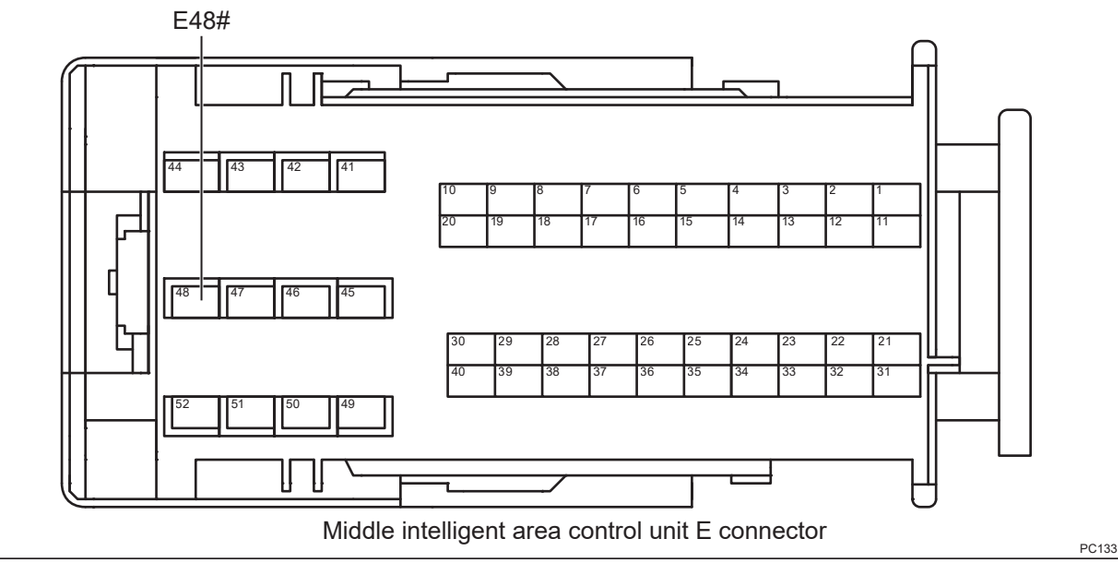
DTC No.	Fault symptom	Warning light/indicator
B223F11	Front passenger heating power supply does not operate or operates abnormally	-
B223F13	-	-

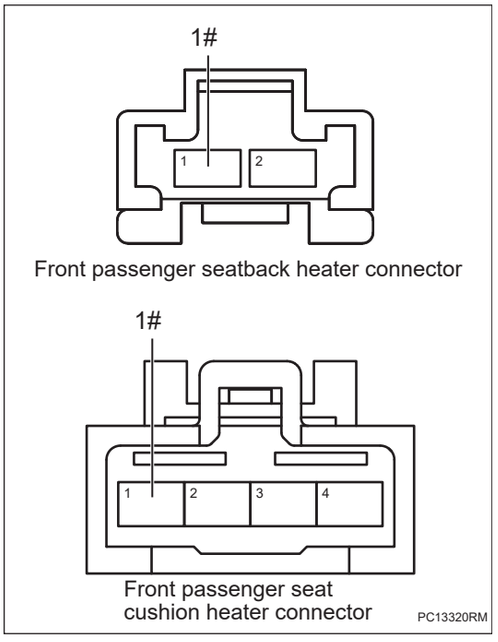
Circuit diagram



Inspection procedure

1	**Check for open in middle intelligent area control unit wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seatback heater connector.

(d) Disconnect the front passenger seat cushion heater connector.

(e) Disconnect the middle intelligent area control unit connector.

(f) According to value in the table, measure resistance.

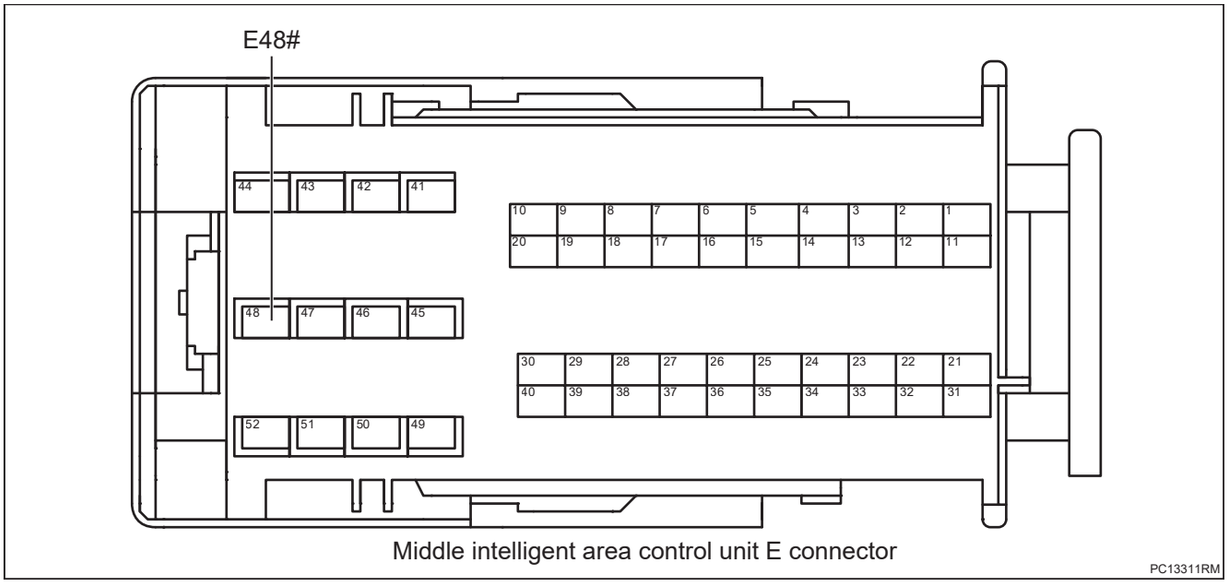
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - front passenger seatback heater connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E48# - front passenger seat cushion heater connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace front passenger seatback/seat cushion heater (See page NS-67)**

(a) Replace the front passenger seatback/seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B224011	Short to ground in driver seat control module power supply

Description

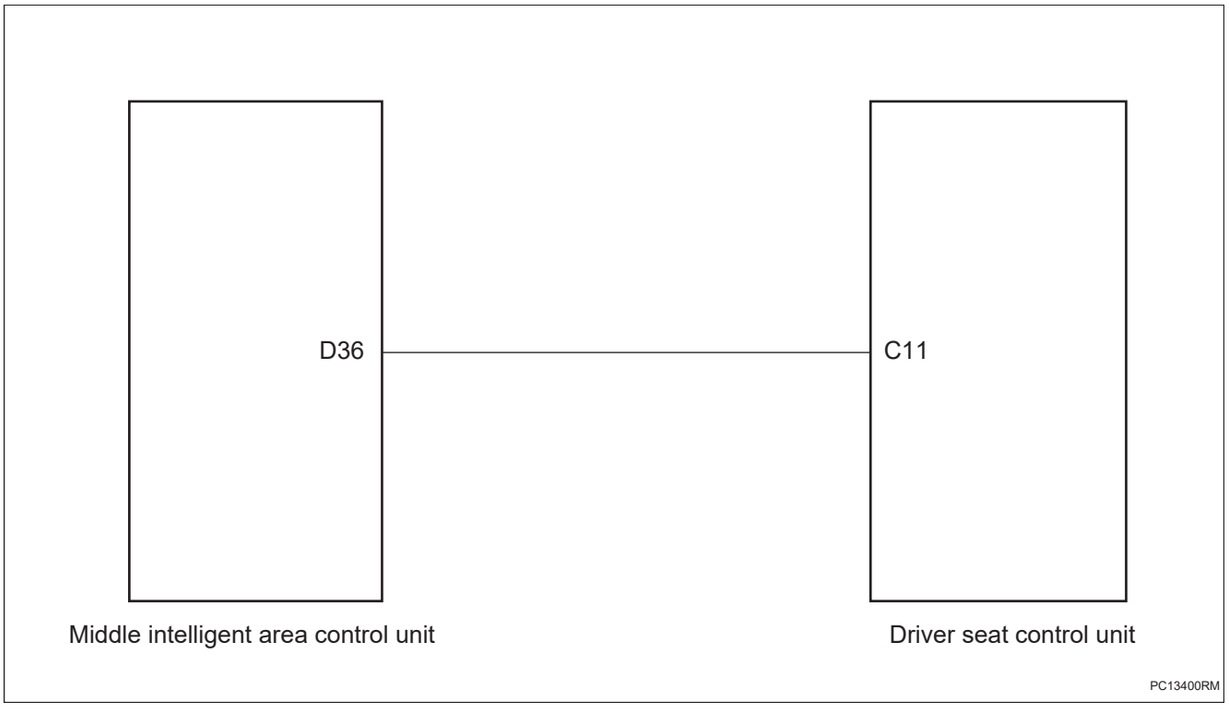
When driver seat control unit power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B224011	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH30 short to GND	5	Event-based	10 ms	• Driver seat control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

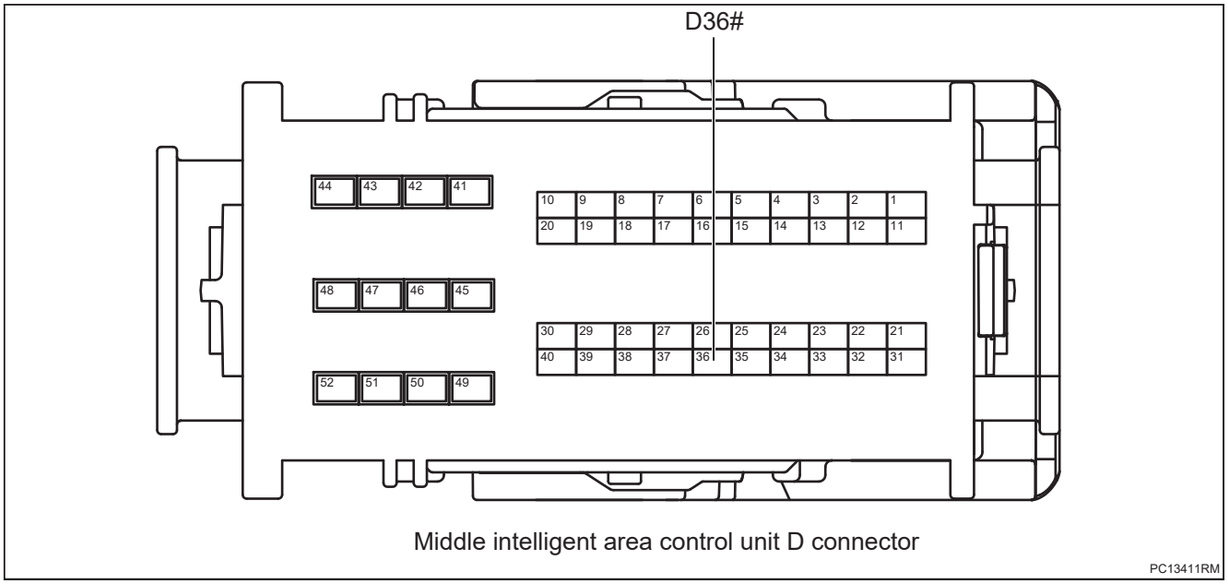
DTC No.	Fault symptom	Warning light/indicator
B224011	Driver seat control does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit D connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D36# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace driver seat control unit (See page NS-90)**

(a) Replace the driver seat control unit.

(b) Connect HQ-VDS diagnostic tester.

ZD

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

ZD

OK

Diagnosis ends

DTC	B224211	Short to ground in driver heating power supply

Description

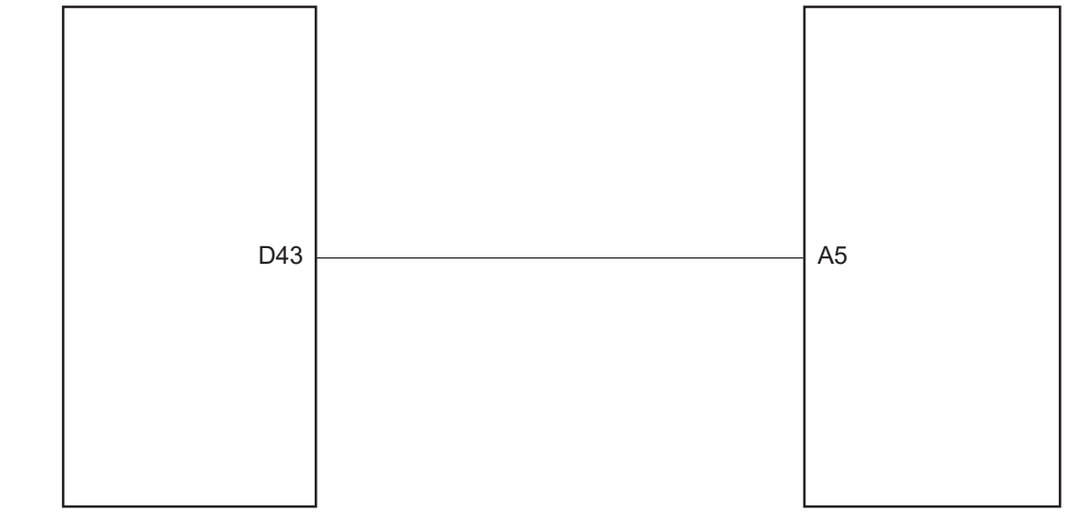
When driver seat heater power supply circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B224211	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH32 short to GND	5	Event-based	10 ms	• Driver seat control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

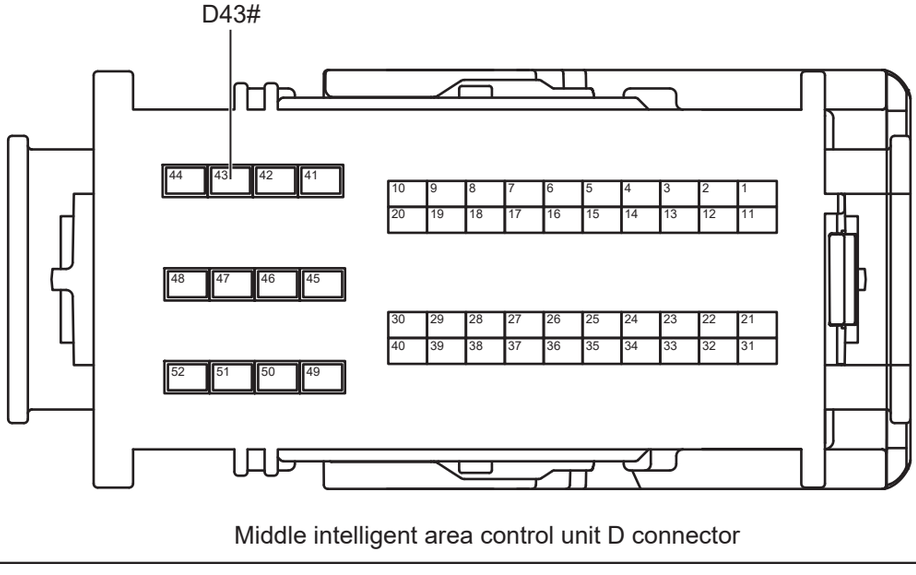
DTC No.	Fault symptom	Warning light/indicator
B224211	Driver seat heater does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D43# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Replace driver seat control unit (See page NS-90)**

(a) Replace the driver seat control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B224311	Short to ground in VDC power distribution 1

Description

When intelligent vehicle control platform control unit power supply circuit is short to ground, the middle intelligent area control unit records DTC.

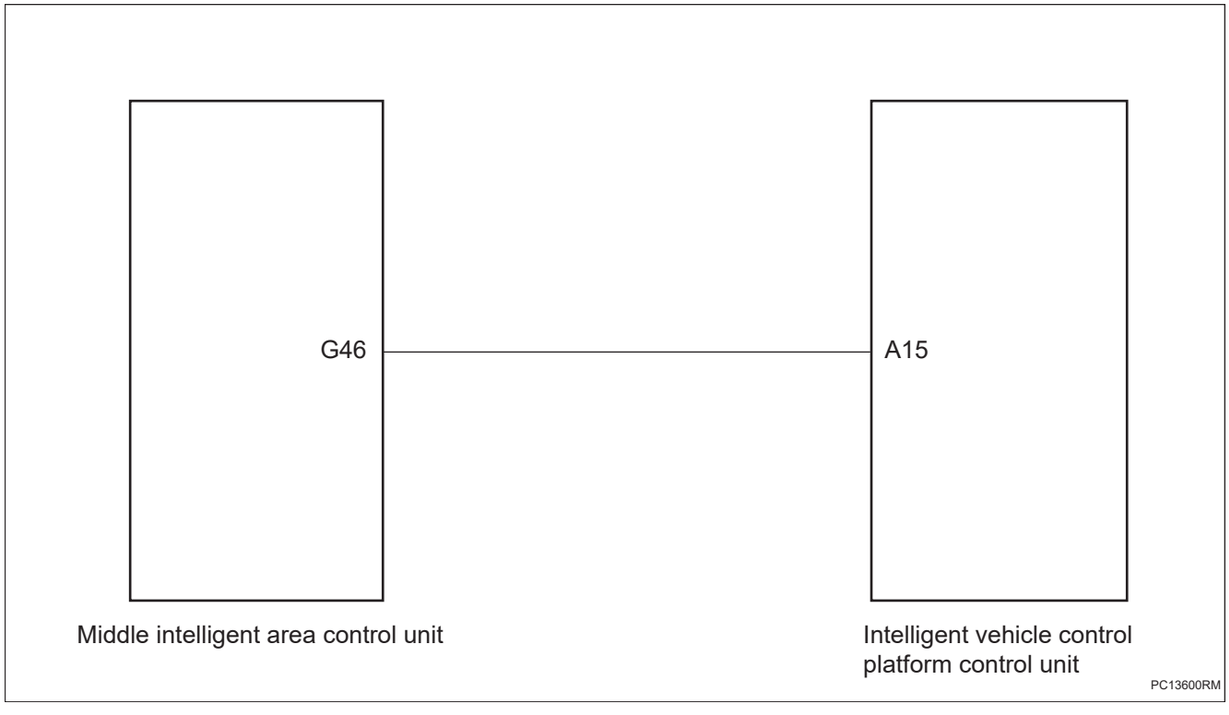
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B224311	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH65 short to GND	5	Event-based	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

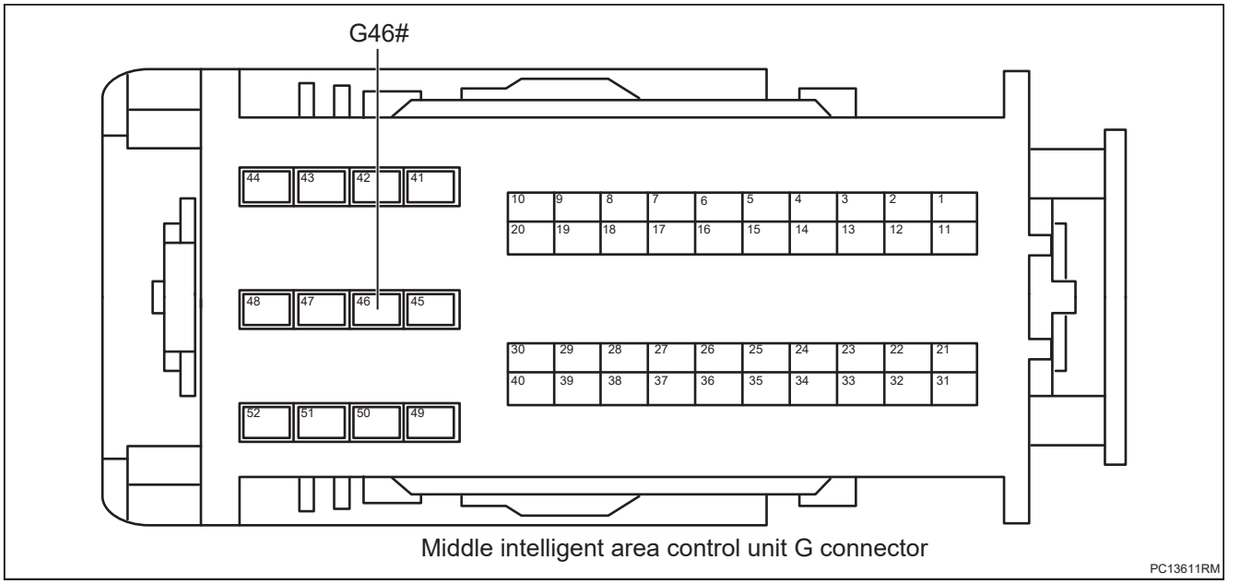
DTC No.	Fault symptom	Warning light/indicator
B224311	VDC dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G46# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace intelligent vehicle control platform control unit (See page ZC-154)

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B224519**	**Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse overload**
DTC	**B224511**	**Short to ground in combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse**

DTC	B22451A	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse MOS saturation shutdown
DTC	B22451B	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse unable to enter sleep
DTC	B22451C	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse undervoltage
DTC	B22451D	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse overtemperature
DTC	B22451E	Combination switch power supply, interior millimeter wave radar power supply, brake switch power supply 1-OUT, front control panel (with hazard warning switch) electronic fuse SPI communication fault
DTC	B224619	Front left door intelligent terminal electronic fuse overload
DTC	B224611	Short to ground in front left door intelligent terminal electronic fuse
DTC	B22461A	Front left door intelligent terminal electronic fuse MOS saturation shutdown
DTC	B22461B	Front left door intelligent terminal electronic fuse unable to enter sleep
DTC	B22461C	Front left door intelligent terminal electronic fuse undervoltage

DTC	B22461D	Front left door intelligent terminal electronic fuse overtemperature
DTC	B22461E	Front left door intelligent terminal electronic fuse SPI communication fault
DTC	B224719	Front right door intelligent terminal electronic fuse overload
DTC	B224711	Short to ground in front right door intelligent terminal electronic fuse
DTC	B22471A	Front right door intelligent terminal electronic fuse MOS saturation shutdown
DTC	B22471B	Front right door intelligent terminal electronic fuse unable to enter sleep
DTC	B22471C	Front right door intelligent terminal electronic fuse undervoltage
DTC	B22471D	Front right door intelligent terminal electronic fuse overtemperature
DTC	B22471E	Front right door intelligent terminal electronic fuse SPI communication fault
DTC	B224919	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse overload
DTC	B224911	Short to ground in digital key main module/ NFC/driver seat intelligent terminal B+ electronic fuse
DTC	B22491A	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse MOS saturation shutdown
DTC	B22491B	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse unable to enter sleep
DTC	B22491C	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse undervoltage

DTC	B22491D	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse overtemperature
DTC	B22491E	Digital key main module/NFC/driver seat intelligent terminal B+ electronic fuse SPI communication fault
DTC	B224B19	OBD electronic fuse overload
DTC	B224B11	Short to ground in OBD electronic fuse
DTC	B224B1A	OBD electronic fuse MOS saturation shutdown
DTC	B224B1B	OBD electronic fuse unable to enter sleep
DTC	B224B1C	OBD electronic fuse undervoltage
DTC	B224B1D	OBD electronic fuse overtemperature
DTC	B224B1E	OBD electronic fuse SPI communication fault
DTC	B224C19	Cockpit domain controller electronic fuse overload
DTC	B224C11	Short to ground in cockpit domain controller electronic fuse
DTC	B224C1A	Cockpit domain controller electronic fuse MOS saturation shutdown
DTC	B224C1B	Cockpit domain controller electronic fuse unable to enter sleep
DTC	B224C1C	Cockpit domain controller electronic fuse undervoltage
DTC	B224C1D	Cockpit domain controller electronic fuse overtemperature

DTC	B224C1E	Cockpit domain controller electronic fuse serial peripheral device interface communication fault

Description

When there is short in electronic fuse circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B224519	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 Overload	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B224511	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 SCG	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B22451A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 Moset Saturate	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B22451B	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 Sleep fault	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B22451C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 under voltage	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B22451D	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 Overtemp	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B22451E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE01 SPI error	5	Event-based	10 ms	• Combination switch • Wire harness and connector • Middle intelligent area control unit
B224619	• Diagnostic voltage	EFUSE03 Overload	5	Event-based	10 ms	• Front left door control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	range. (9 V - 16 V) • PDC not in OTA mode					• Wire harness and connector • Middle intelligent area control unit
B224611	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 SCG	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B22461A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 Moset Saturate	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B22461B	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 Sleep fault	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B22461C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 under voltage	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B22461D	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 Overtemp	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B22461E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE03 SPI error	5	Event-based	10 ms	• Front left door control unit • Wire harness and connector • Middle intelligent area control unit
B224719	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 Overload	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B224711	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 SCG	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B22471A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 Moset Saturate	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B22471B	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 Sleep fault	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B22471C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 under voltage	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B22471D	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 Overtemp	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B22471E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE04 SPI error	5	Event-based	10 ms	• Front right door control unit • Wire harness and connector • Middle intelligent area control unit
B224919	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 Overload	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B224911	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 SCG	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B22491A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 Moset Saturate	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B22491B	• Diagnostic voltage range. (9 V - 16 V)	EFUSE06 Sleep fault	5	Event-based	10 ms	• Digital key main module • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• PDC not in OTA mode					• Middle intelligent area control unit
B22491C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 under voltage	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B22491D	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 Overtemp	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B22491E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE06 SPI error	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit
B224B19	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 Overload	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224B11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 SCG	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224B1A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 Moset Saturate	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224B1B	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 Sleep fault	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224B1C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 under voltage	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224B1D	• Diagnostic voltage range. (9 V - 16 V)	EFUSE08 Overtemp	5	Event-based	10 ms	• Standard OBD • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• PDC not in OTA mode					• Middle intelligent area control unit
B224B1E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE08 SPI error	5	Event-based	10 ms	• Standard OBD • Wire harness and connector • Middle intelligent area control unit
B224C19	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 Overload	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 SCG	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C1A	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 Moset Saturate	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C1B	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 Sleep fault	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C1C	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 under voltage	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C1D	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 Overtemp	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit
B224C1E	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	EFUSE10 SPI error	5	Event-based	10 ms	• Infotainment control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B224519	Combination switch does not operate or operates abnormally	-
B224511	Combination switch does not operate or operates abnormally	-
B22451A	Combination switch does not operate or operates abnormally	-
B22451B	Combination switch does not operate or operates abnormally	-
B22451C	-	-
B22451D	Combination switch does not operate or operates abnormally	-
B22451E	Combination switch does not operate or operates abnormally	-
B224619	Front left door intelligent terminal does not operate or operates abnormally	-
B224611	Front left door intelligent terminal does not operate or operates abnormally	-
B22461A	Front left door intelligent terminal does not operate or operates abnormally	-
B22461B	Front left door intelligent terminal does not operate or operates abnormally	-
B22461C	-	-
B22461D	Front left door intelligent terminal does not operate or operates abnormally	-
B22461E	Front left door intelligent terminal does not operate or operates abnormally	-
B224719	Front right door intelligent terminal does not operate or operates abnormally	-
B224711	Front right door intelligent terminal does not operate or operates abnormally	-
B22471A	Front right door intelligent terminal does not operate or operates abnormally	-
B22471B	Front right door intelligent terminal does not operate or operates abnormally	-
B22471C	-	-
B22471D	Front right door intelligent terminal does not operate or operates abnormally	-
B22471E	Front right door intelligent terminal does not operate or operates abnormally	-
B224919	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-
B224911	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-

DTC No.	Fault symptom	Warning light/indicator
B22491A	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-
B22491B	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-
B22491C	-	-
B22491D	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-
B22491E	Digital key function is abnormal, NFC card swiping cannot lock or unlock, the App fails to connect to the vehicle via Bluetooth	-
B224B19	RBU dose not operate or operates abnormally	-
B224B11	RBU dose not operate or operates abnormally	-
B224B1A	RBU dose not operate or operates abnormally	-
B224B1B	RBU dose not operate or operates abnormally	-
B224B1C	-	-
B224B1D	RBU dose not operate or operates abnormally	-
B224B1E	RBU dose not operate or operates abnormally	-
B224C19	CSC dose not operate or operates abnormally	-
B224C11	CSC dose not operate or operates abnormally	-
B224C1A	CSC dose not operate or operates abnormally	-
B224C1B	CSC dose not operate or operates abnormally	-
B224C1C	-	-
B224C1D	CSC dose not operate or operates abnormally	-
B224C1E	CSC dose not operate or operates abnormally	-

Inspection procedure

1	**Check related controller wire harness and connector**

(a) Check if related controller wire harness and connector are damaged.

(b) Check for short or open in related controller wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace relevant controller

(a) Replace the relevant controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B224F11**	**Short to ground in front/rear map light control**
DTC	**B224F12**	**Short to power supply in front/rear map light control**

Description

When interior map light control circuit is short, the middle intelligent area control unit records DTC.

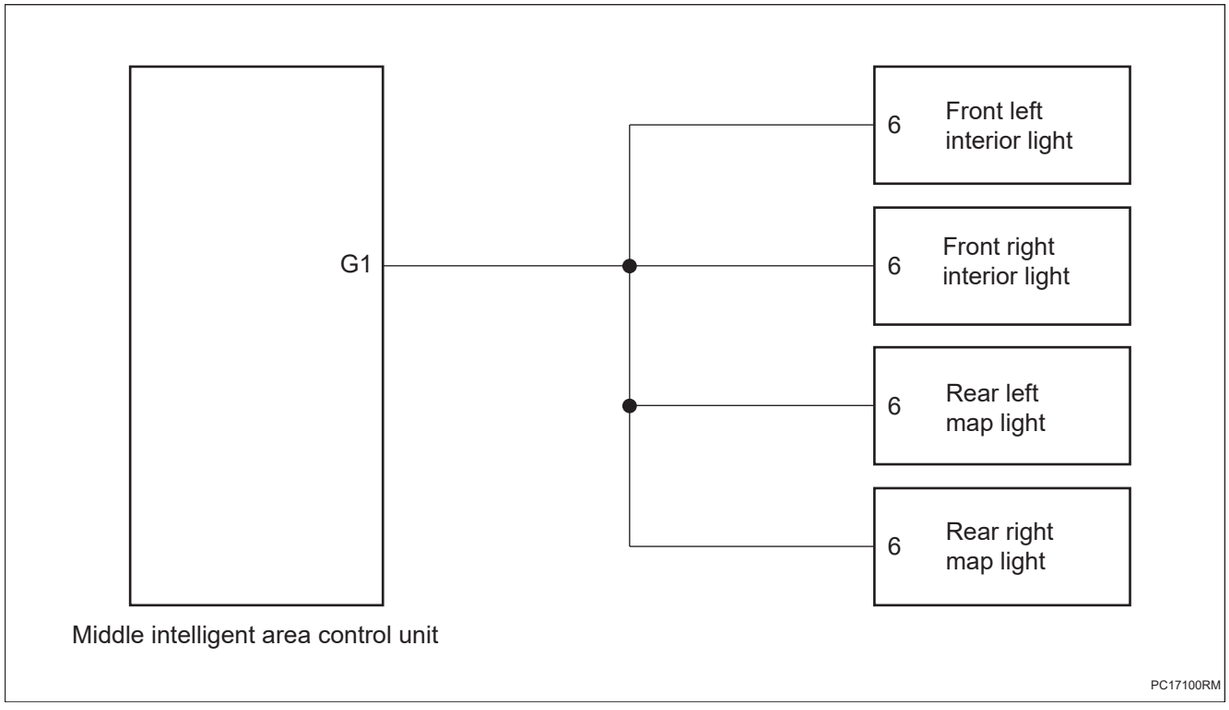
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B224F11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH02 short to GND	5	Event-based	10 ms	• Front left interior light • Front right interior light • Rear left map light • Rear right map light • Wire harness and connector • Middle intelligent area control unit
B224F12	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH02 short to BAT	5	Event-based	10 ms	• Front left interior light • Front right interior light • Rear left map light • Rear right map light • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

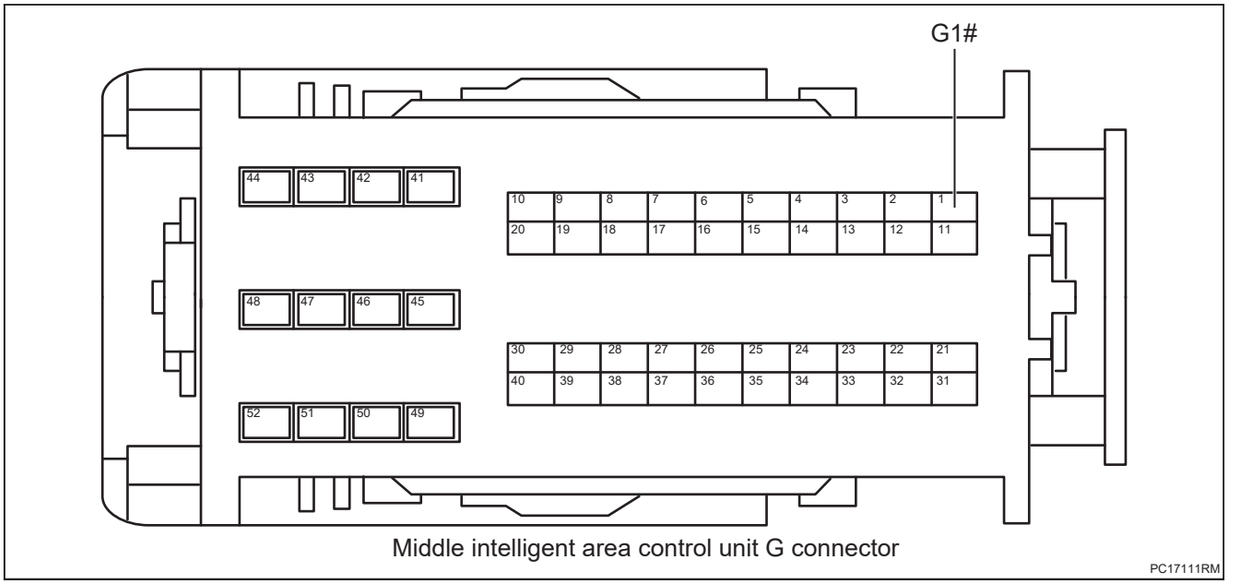
DTC No.	Fault symptom	Warning light/indicator
B224F11	Backlight signal 1 does not operate or operates abnormally	-
B224F12	Backlight signal 2 does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left interior light connector.

(d) Disconnect the front right interior light connector.

(e) Disconnect the rear left map light connector.

(f) Disconnect the rear right map light connector.

(g) Disconnect the middle intelligent area control unit connector.

(h) According to value in the table, measure resistance.

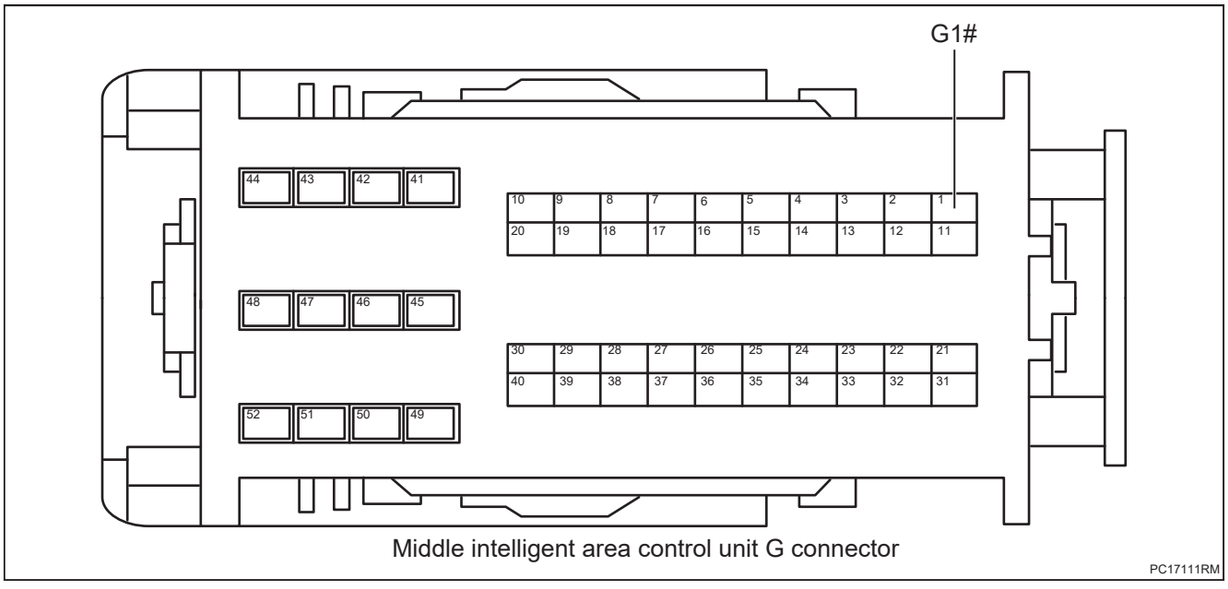
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G1# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace front left interior light/front right interior light/rear left map light/rear right map light (See page ZC-36)**

(a) Replace the front left interior light/front right interior light/rear left map light/rear right map light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B225611	Short to ground in wireless charging disabled signal

Description

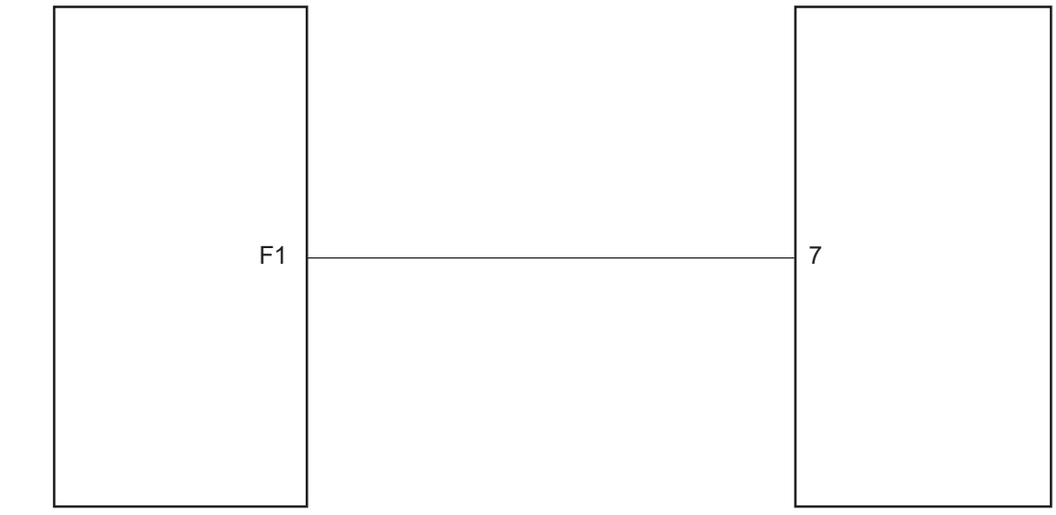
When mobile phone wireless charging controller circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B225611	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH37 short to GND	5	Event-based	10 ms	• Mobile phone wireless charging controller • Wire harness and connector • Middle intelligent area control unit

Fault symptom

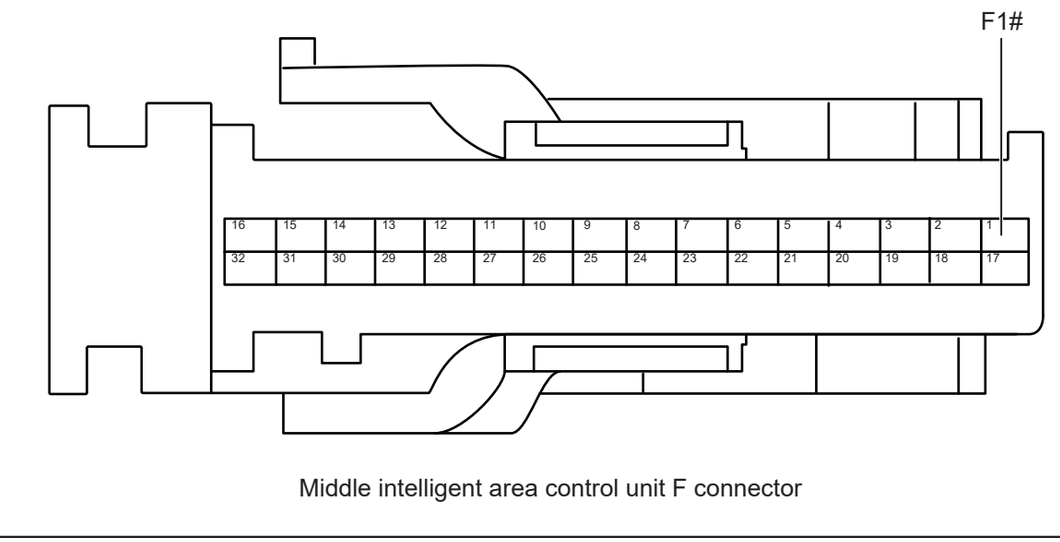
DTC No.	Fault symptom	Warning light/indicator
B225611	Wireless charging disabling does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mobile phone wireless charging controller connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	Replace mobile phone wireless charging controller (See page ZC-156)

(a) Replace the mobile phone wireless charging controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B227712	Short to power supply in DK wake-up line

Description

When digital key main module circuit wake up circuit is short to power supply, the middle intelligent area control unit records DTC.

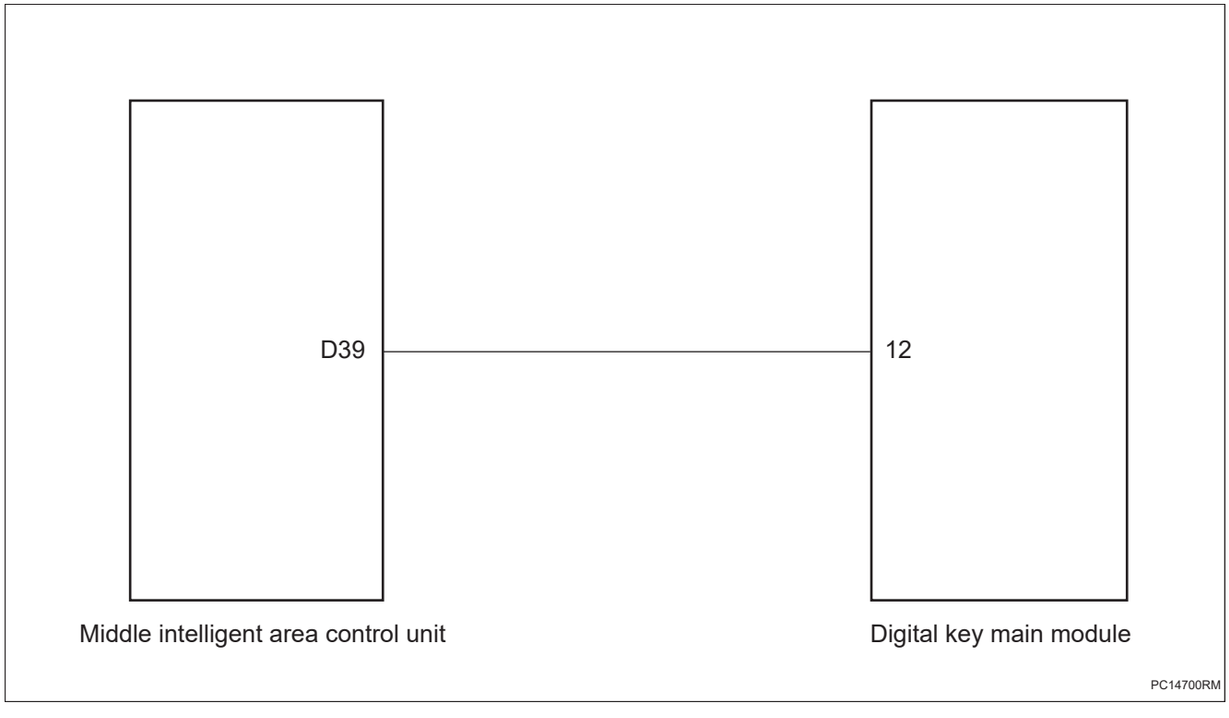
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B227712	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPL03 short to BAT	5	Event-based	10 ms	• Digital key main module • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

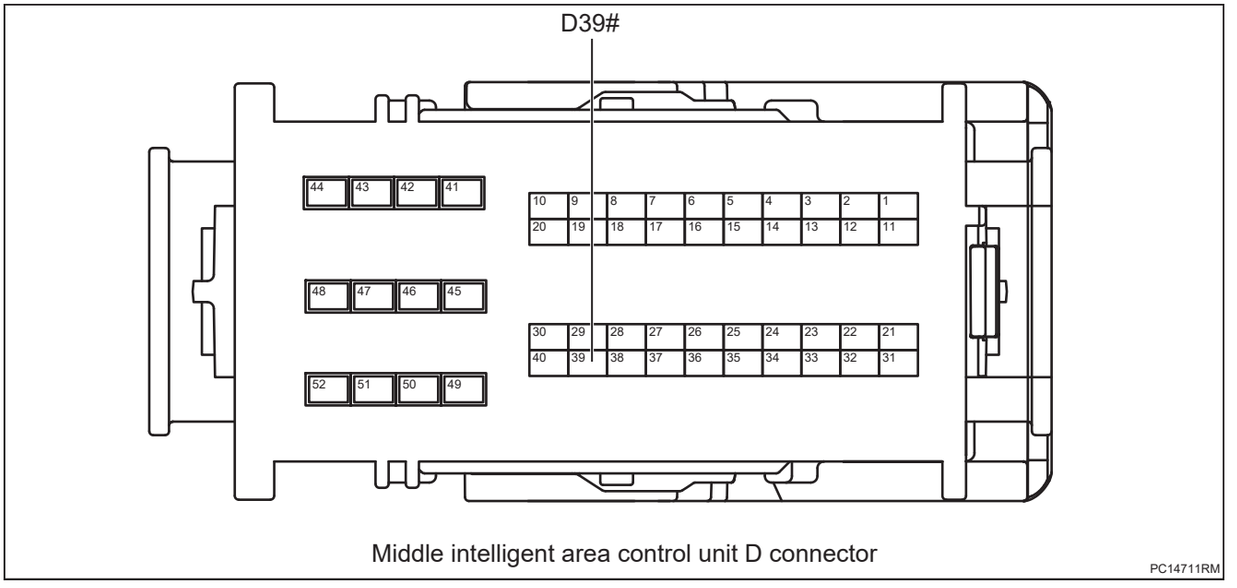
DTC No.	Fault symptom	Warning light/indicator
B227712	-	-

Circuit diagram



Inspection procedure

1	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit D connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) Connect the negative battery terminal.

(f) Turn ignition switch to "ON".

(g) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D39# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace digital key main module (See page ZC-102)

(a) Replace the digital key main module.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC B227812 Short to power supply in alcolock

Description

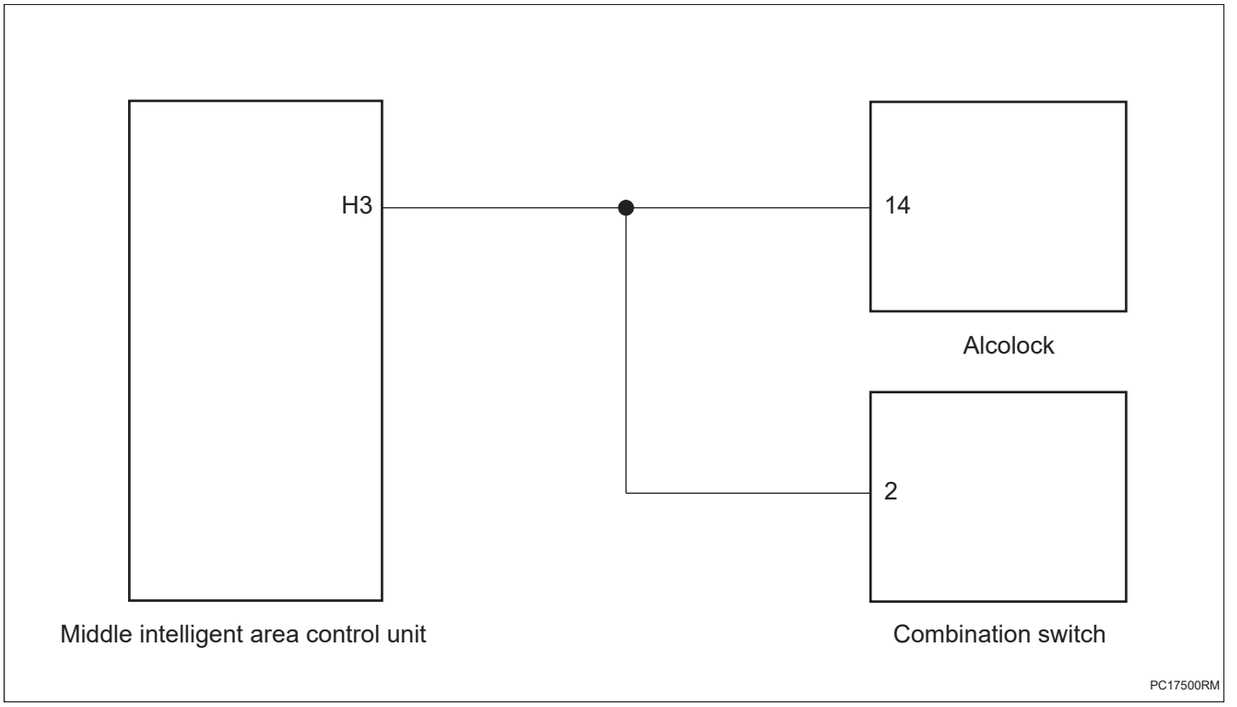
When combination switch, alcolock power supply circuit is short, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B227812	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODL04 short to BAT	5	Event-based	10 ms	• Alcolock • Combination switch • Wire harness and connector • Middle intelligent area control unit

Fault symptom

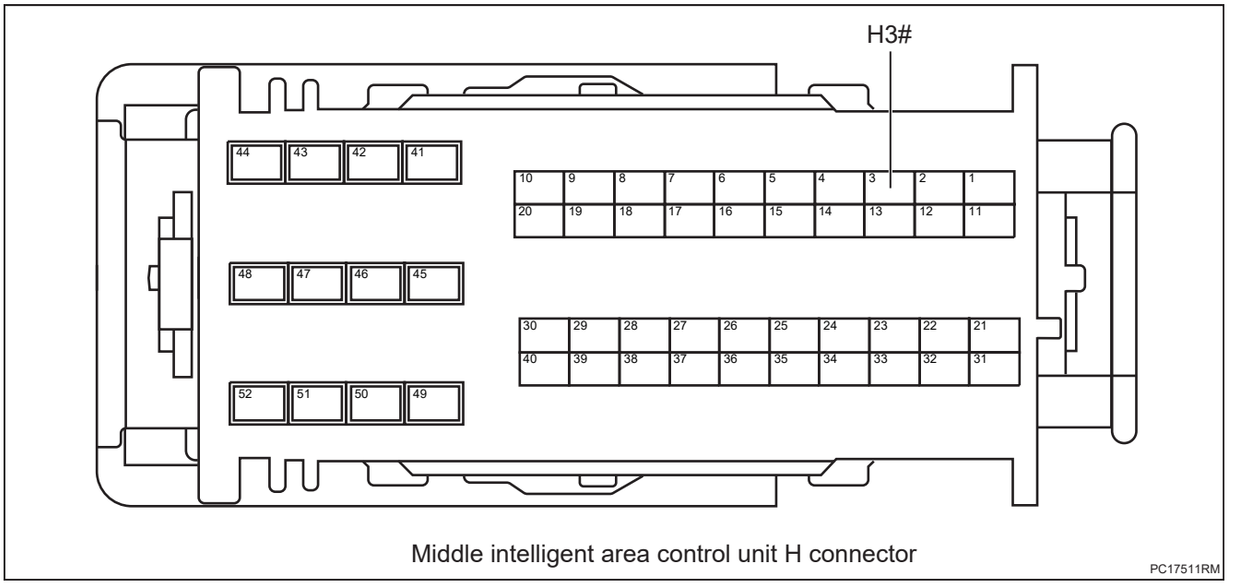
DTC No.	Fault symptom	Warning light/indicator
B227812	Alcolock does not operate	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the alcolock connector.

(d) Disconnect the combination switch connector.

(e) Disconnect the middle intelligent area control unit connector.

(f) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace alcolock/combination switch (See page ZC-122)**

(a) Replace the alcolock/combination switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**C220D11**	**Short to ground in front passenger seat heater temperature sensor acquisition**
DTC	**C220E11**	**Short to power supply/open in front passenger seat heater temperature sensor acquisition**

Description

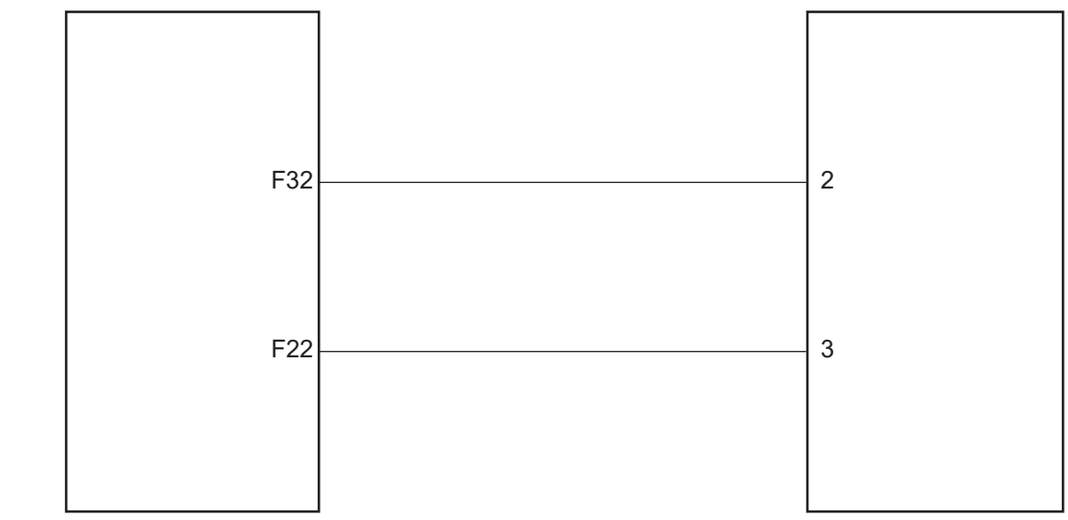
When there is short or open in front passenger seat cushion heater temperature sensor circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C220D11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN18 short to GND	5	Event-based	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Middle intelligent area control unit
C220E11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN18 short to BAT or Open	5	Event-based	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Middle intelligent area control unit

Fault symptom

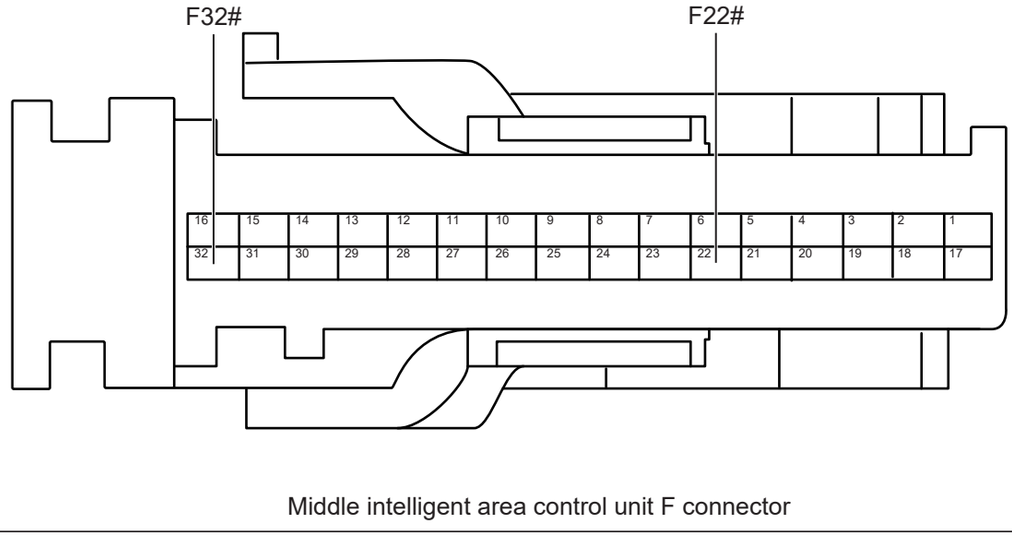
DTC No.	Fault symptom	Warning light/indicator
C220D11	No collection from front passenger seat heater temperature sensor	-
C220E11	No collection from front passenger seat heater temperature sensor	-

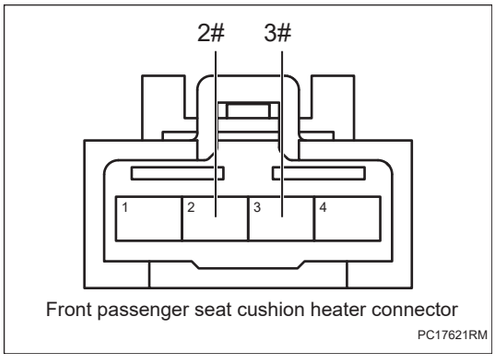
Circuit diagram



Inspection procedure

1	**Check for open in front passenger seat cushion heater wire harness and connector**





Front passenger seat cushion heater connector
PC17621RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat cushion heater connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

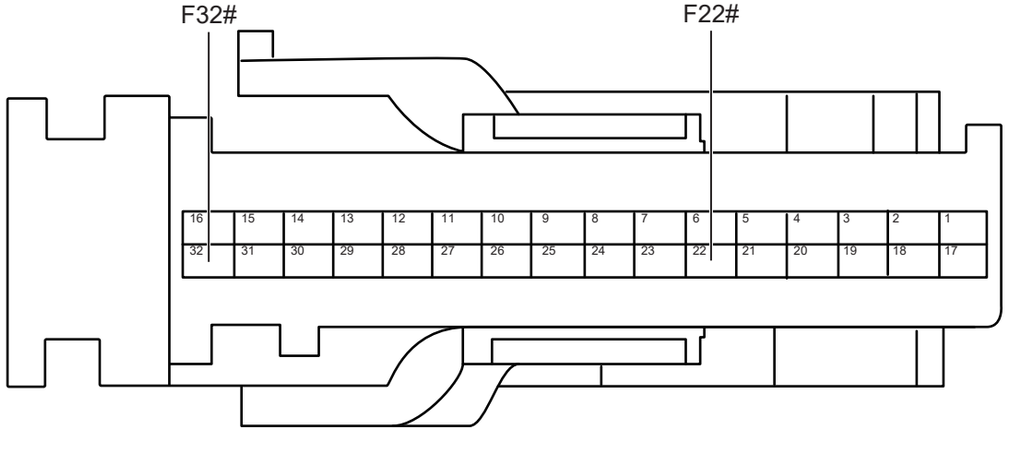
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F32# - front passenger seat cushion heater connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - front passenger seat cushion heater connector 3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seat cushion heater wire harness and connector**



Middle intelligent area control unit F connector
PC17611RM

(a) According to value in the table, measure resistance.

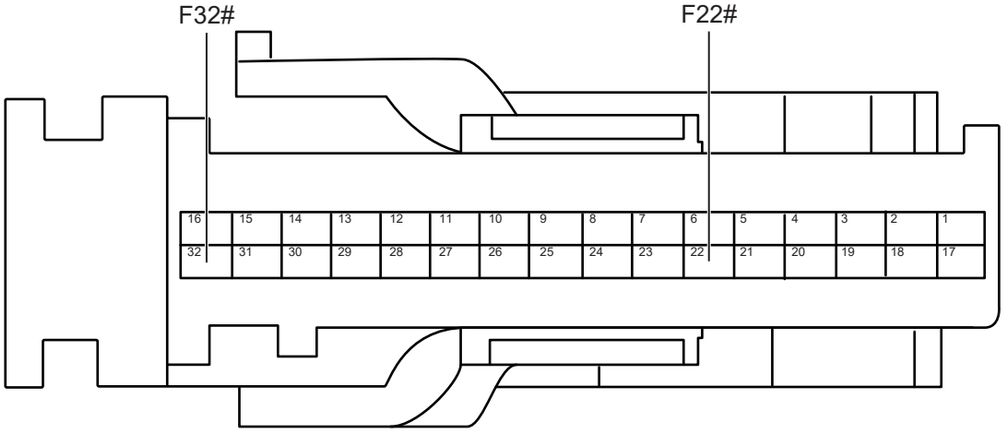
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F32# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in front passenger seat cushion heater wire harness and connector**



Middle intelligent area control unit F connector

PC17611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F32# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace front passenger seat cushion heater (See page NS-67)**

(a) Replace the front passenger seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**C220F11**	**Short to ground in right temperature motor recovery**
DTC	**C221011**	**Short to power supply/open in right temperature motor recovery**

Description

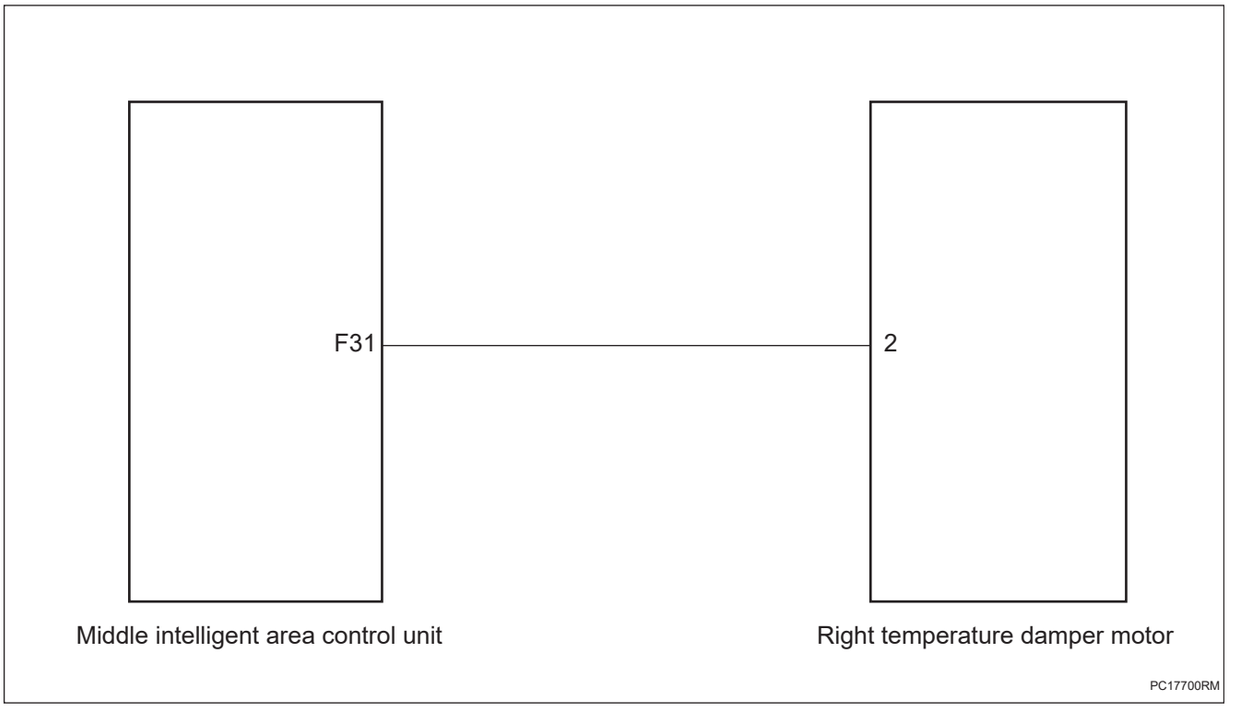
When right temperature damper motor temperature sensor circuit is short or open, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C220F11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN17 short to GND	5	Event-based	10 ms	• Right temperature damper motor • Wire harness and connector • Middle intelligent area control unit
C221011	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	IAN17 short to BAT or Open	5	Event-based	10 ms	• Right temperature damper motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

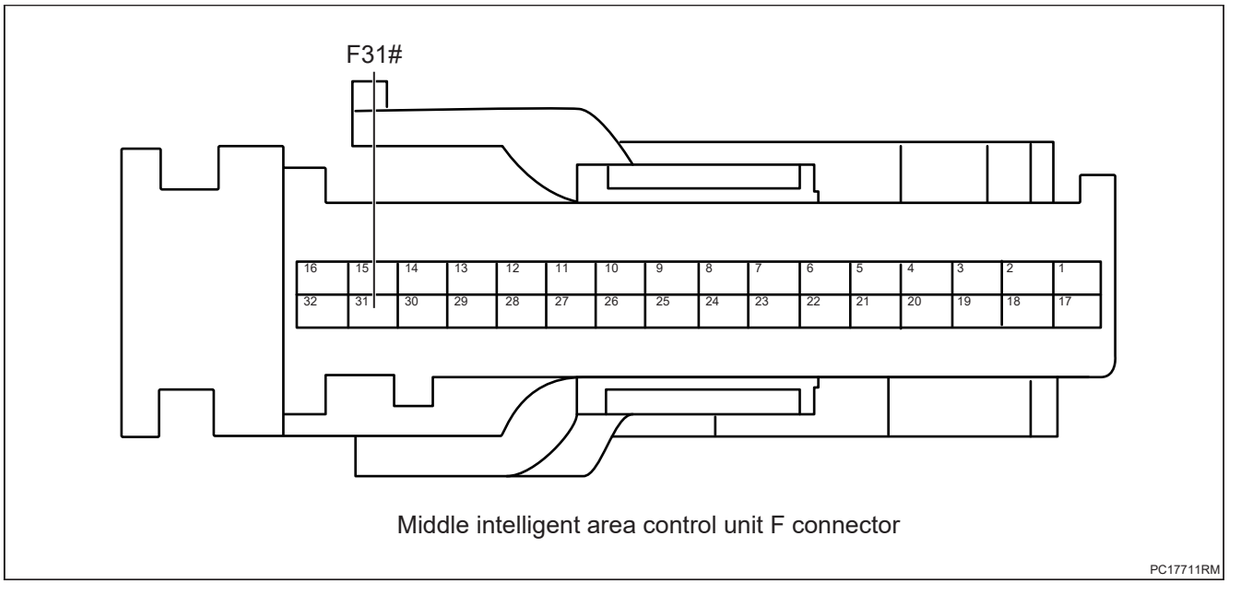
DTC No.	Fault symptom	Warning light/indicator
C220F11	Right temperature motor cannot be recovered	-
C221011	Right temperature motor cannot be recovered	-

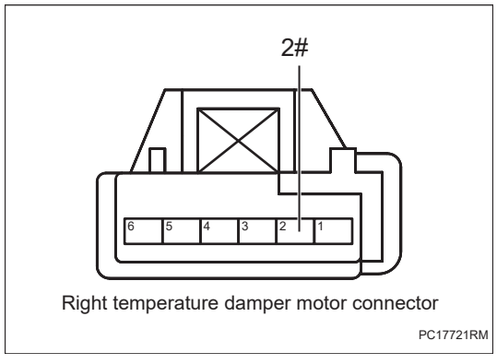
Circuit diagram



Inspection procedure

1	**Check for open in right temperature damper motor wire harness and connector**





Right temperature damper motor connector

PC17721RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the right temperature damper motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

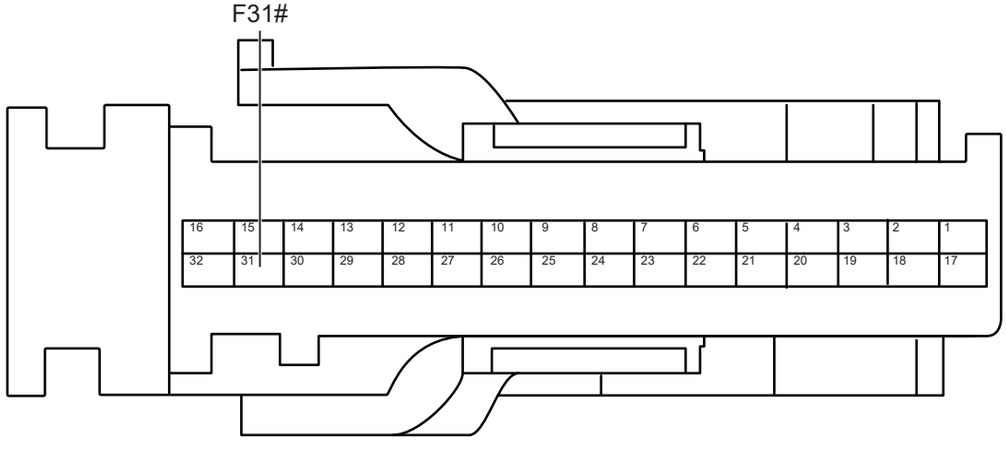
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - right temperature damper motor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in right temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

PC17711RM

(a) According to value in the table, measure resistance.

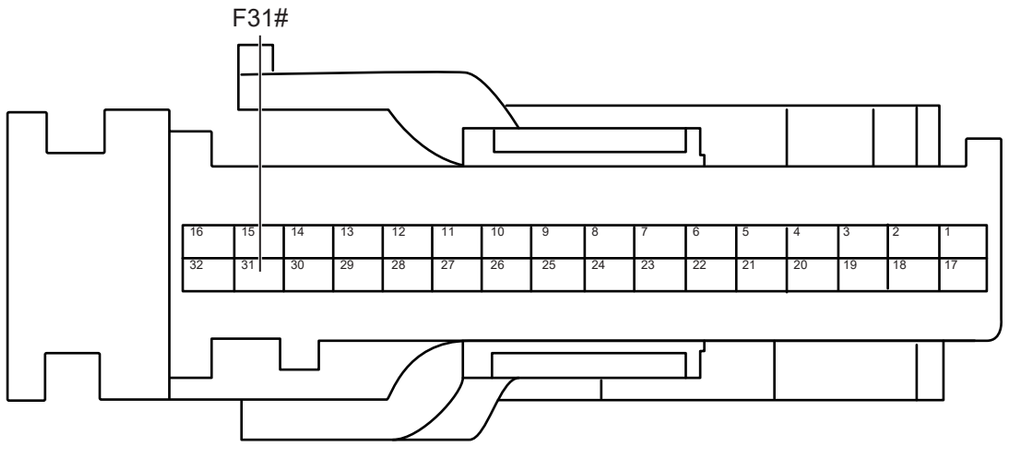
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in right temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → Check and repair or replace wire harness and connector

OK

4	Replace right temperature damper motor (See page RE-19)

(a) Replace the right temperature damper motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace middle intelligent area control unit (See page ZC-132)

OK

Diagnosis ends

DTC	P30AB11	Short to ground in air outlet motor voltage regulator module power supply

Description

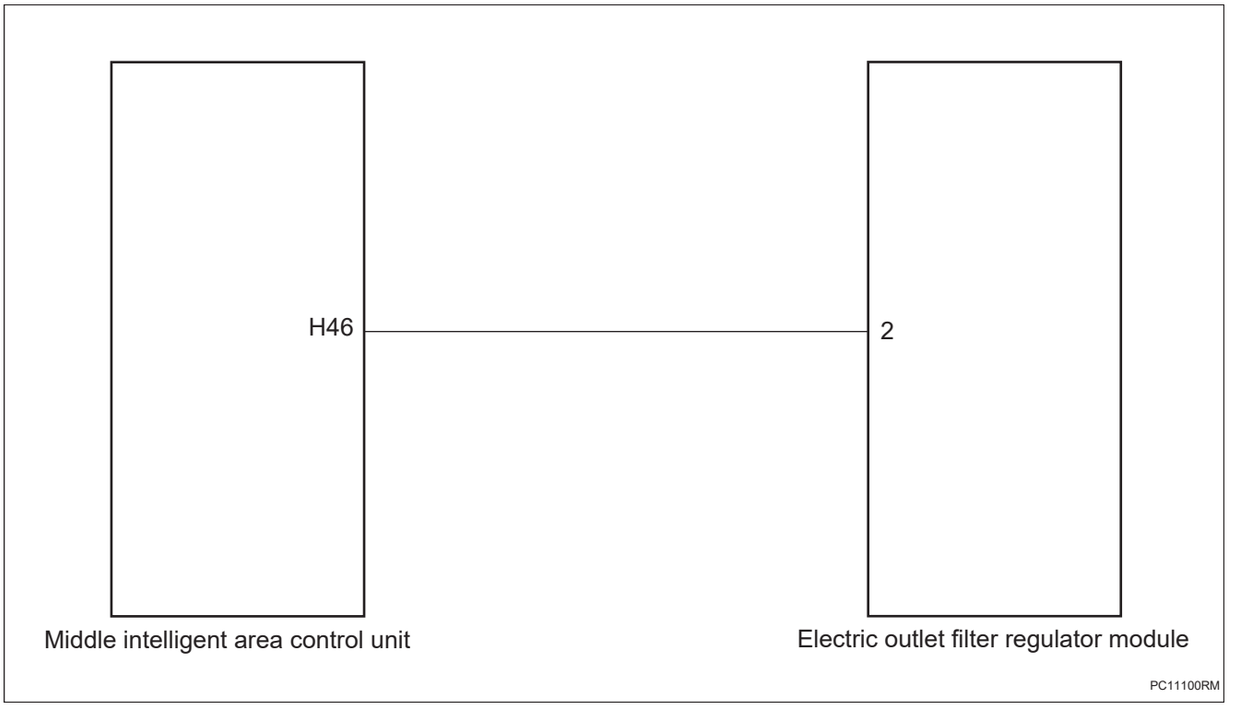
When there is short to ground in electric outlet filter voltage regulator module power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30AB11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH06 short to GND	5	Event-based	10 ms	• Electric outlet filter voltage regulator module • Wire harness and connector • Middle intelligent area control unit

Fault symptom

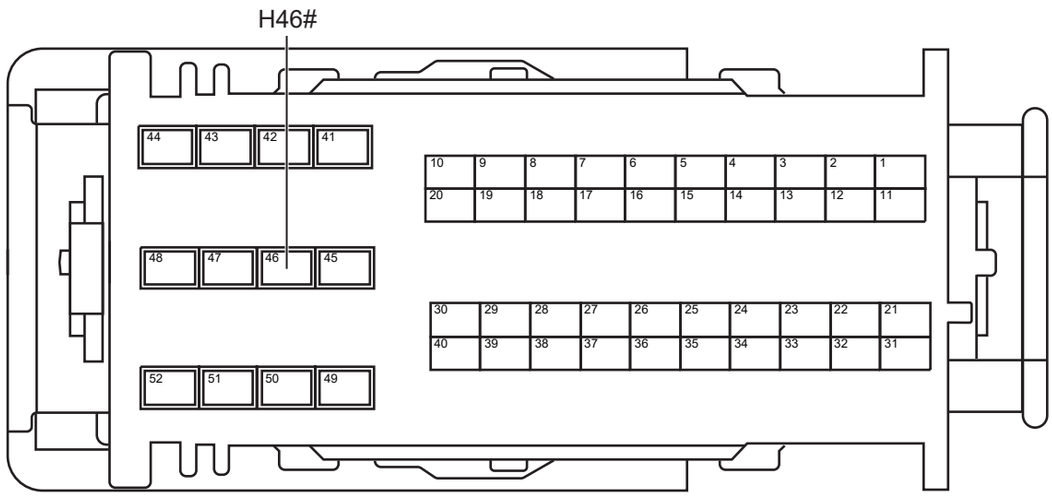
DTC No.	Fault symptom	Warning light/indicator
P30AB11	Air outlet motor does not operate or its operation is abnormal	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

PC11111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric outlet filter voltage regulator module connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H46# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Replace electric outlet filtering and voltage regulator module (See page RE-44)**

(a) Replace electric outlet filtering and voltage regulator module.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC P30AC11 Short to ground in airbag power supply

Description

When there is short to ground in airbag control unit power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30AC11	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH16 short to GND	5	Event-based	10 ms	• Airbag control unit • Wire harness and connector • Middle intelligent area control unit

Fault symptom

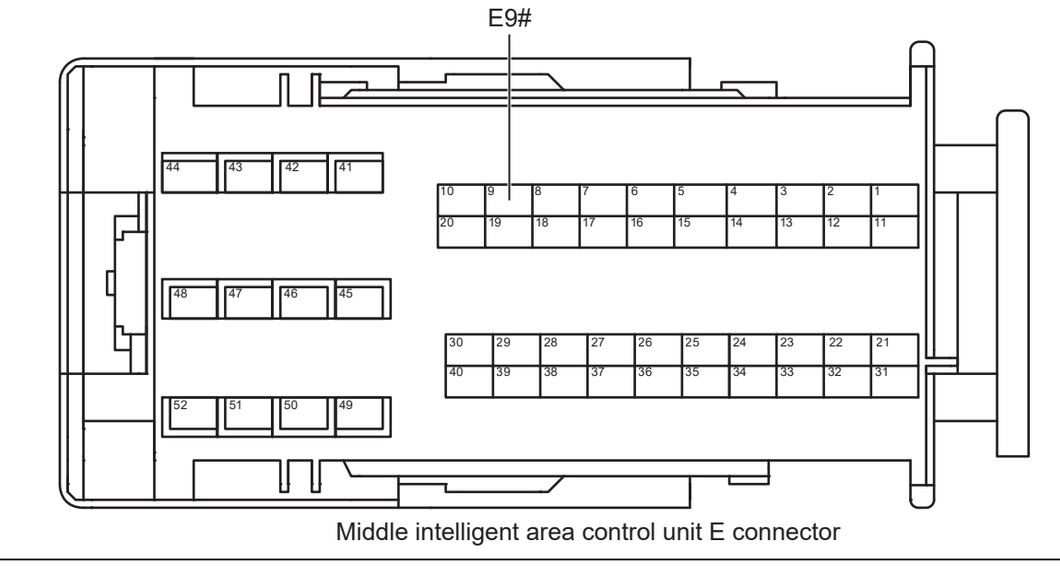
DTC No.	Fault symptom	Warning light/indicator
P30AC11	Airbag does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E9# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace airbag control unit (See page ZC-74)

(a) Replace the airbag control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30B011	Front passenger seat horizontal - vertical motor power supply

Description

When there is short to ground in front passenger seat adjustment switch (high current) power supply circuit, the middle intelligent area control unit records DTC.

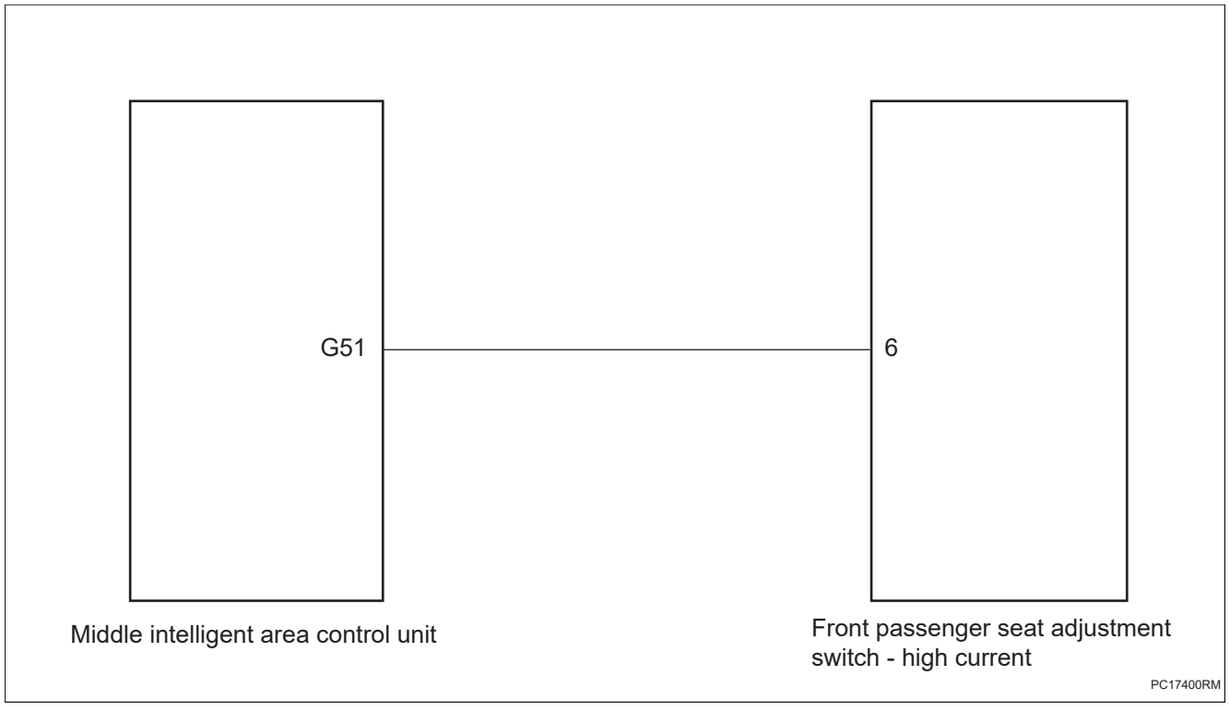
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30B011	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPH12 short to GND	5	Event-based	10 ms	• Front passenger seat adjustment switch - high current • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

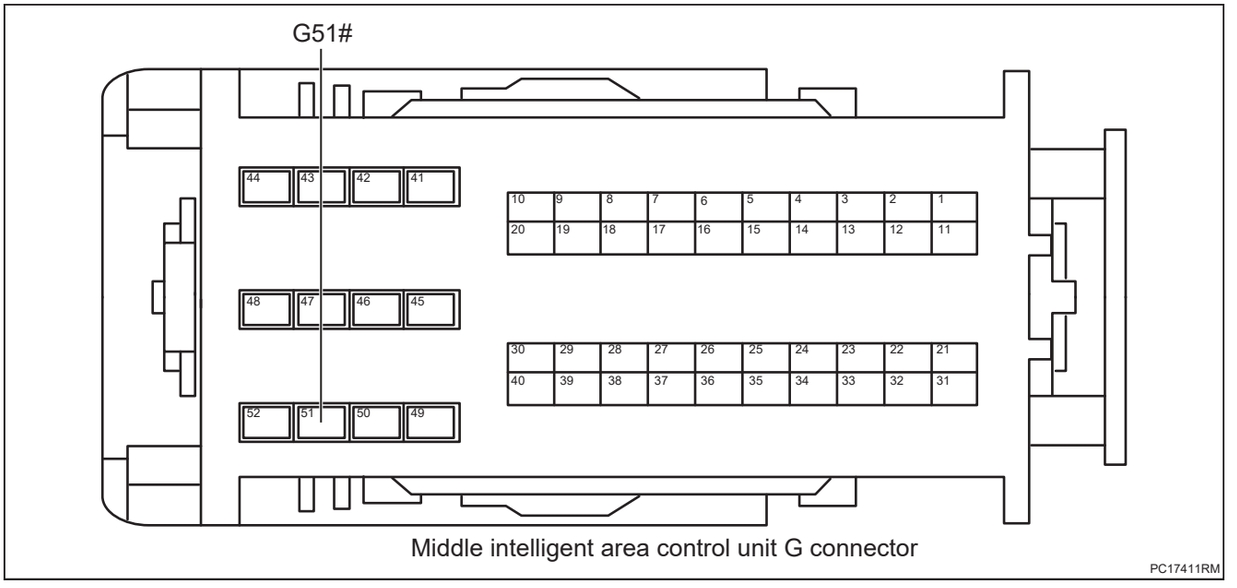
DTC No.	Fault symptom	Warning light/indicator
P30B011	-	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat adjustment switch (high current) connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G51# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front passenger seat adjustment switch - high current (See page NS-67)**

(a) Replace the front passenger seat adjustment switch - high current.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30B211	Short to ground in front HVAC blower (brushless)

Description

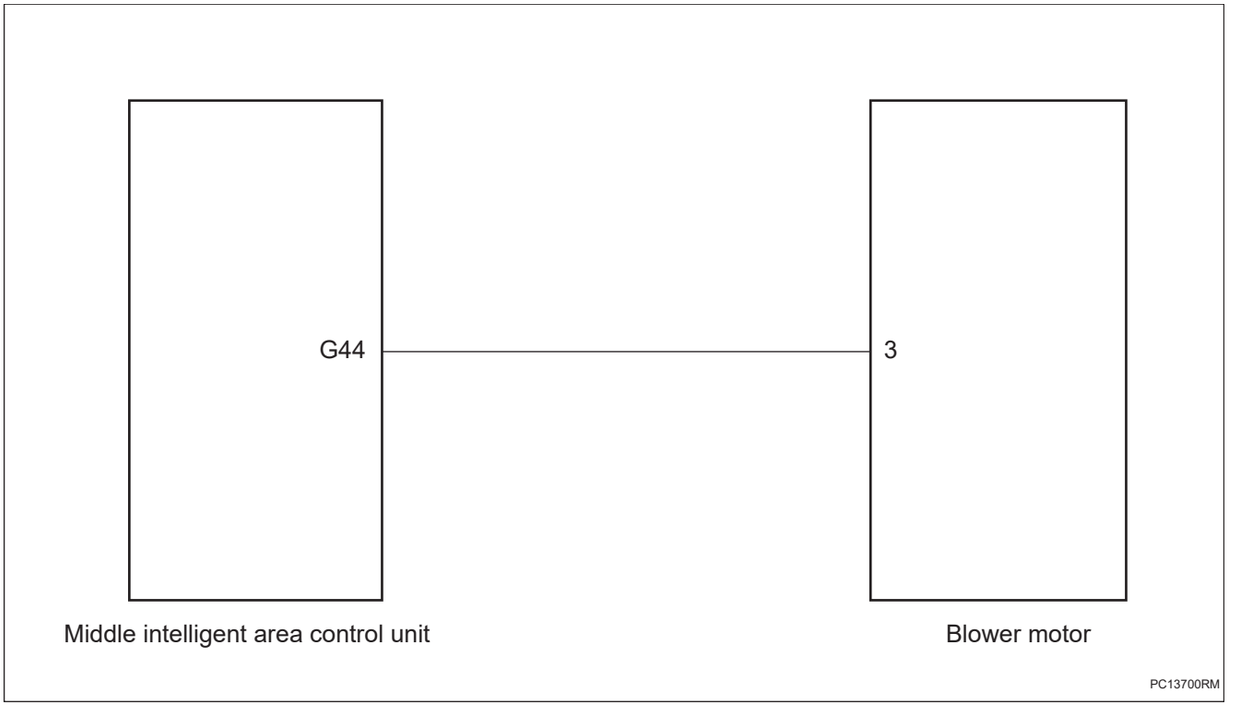
When there is short to ground in blower motor power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30B211	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	ODH24 short to GND	5	Event-based	10 ms	• Blower motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

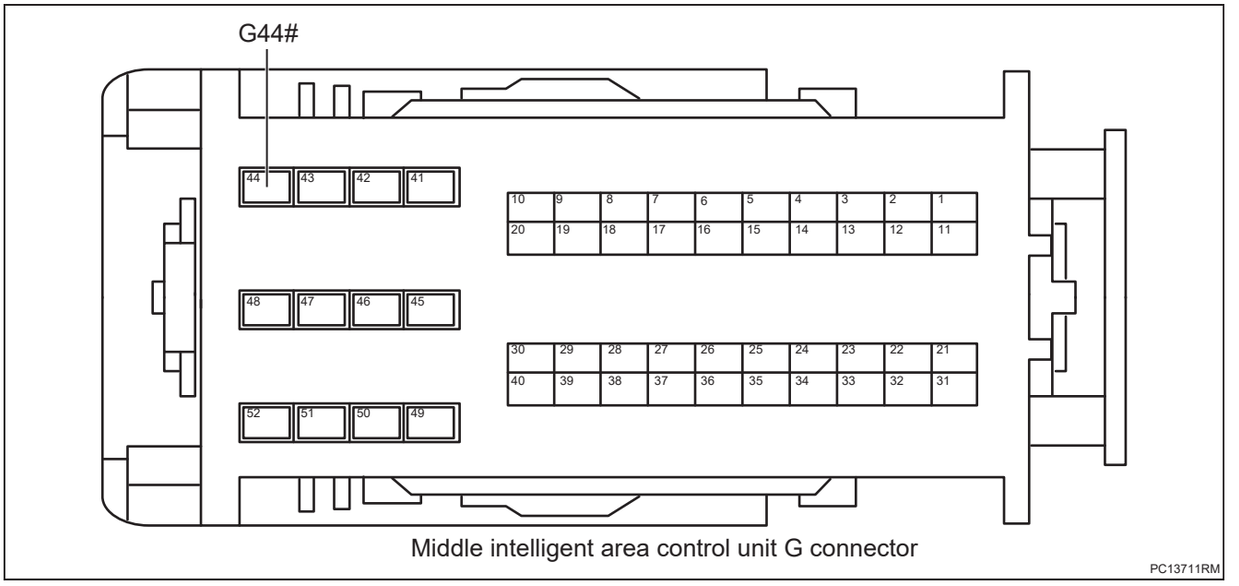
DTC No.	Fault symptom	Warning light/indicator
P30B211	Front HVAC blower does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the blower motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G44# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace blower motor (See page RE-19)**

(a) Replace the blower motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30B312	Short to power supply in front blower PWM control

Description

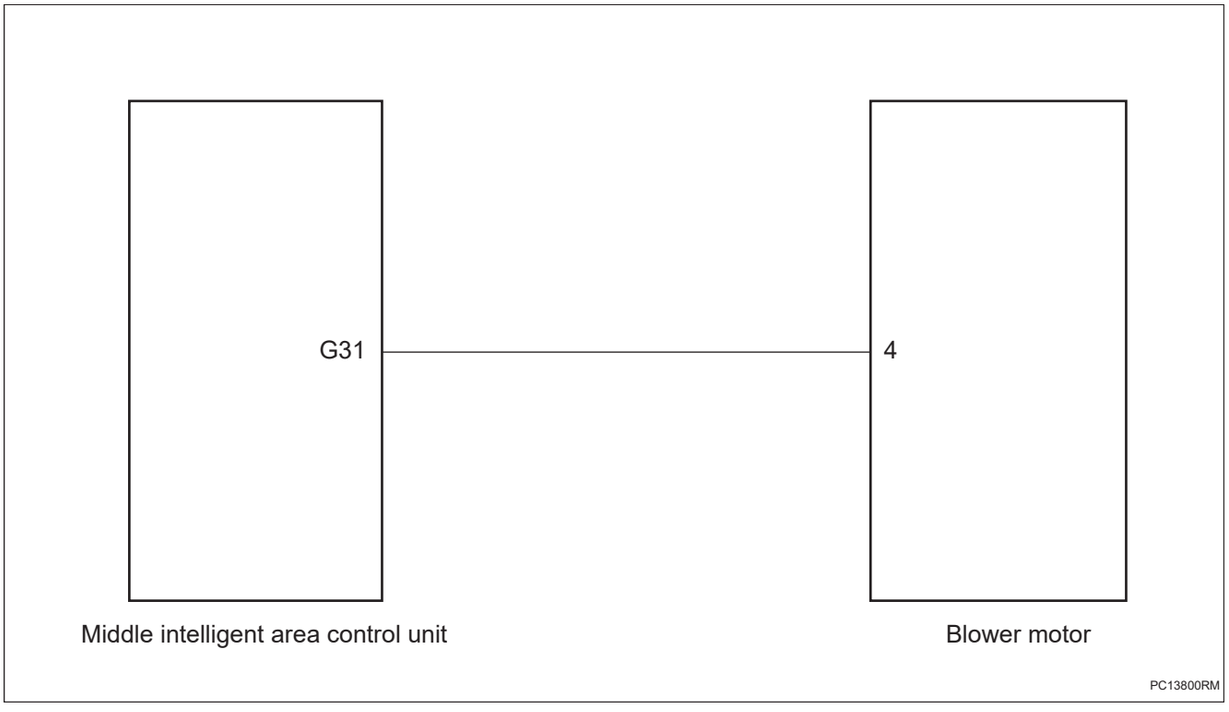
When there is short to power supply in blower motor control circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30B312	• Diagnostic voltage range. (9 V - 16 V) • PDC not in OTA mode	OPL01 short to BAT	5	Event-based	10 ms	• Blower motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

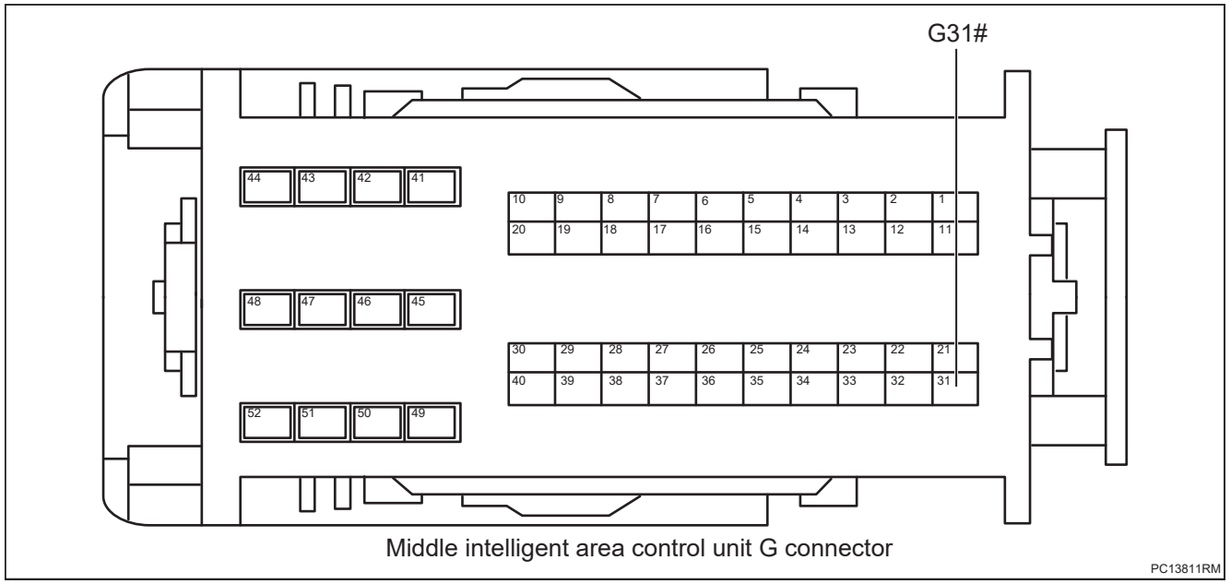
DTC No.	Fault symptom	Warning light/indicator
P30B312	Front blower does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the blower motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) Connect the negative battery terminal.

(f) Turn ignition switch to "ON".

(g) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G31# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	Replace blower motor (See page RE-19)

(a) Replace the blower motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC B220100 ICC authentication failure

Description

When authentication between middle intelligent area control unit and intelligent communication domain control unit is abnormal, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B220100	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	5 s	Periodic type	10 ms	• Middle intelligent area control unit • Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B220100	-	-

Inspection procedure

1	**Check for any DTCs output for middle intelligent area control unit**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

Replace intelligent communication domain control unit (See page ZC-116)

DTC B220200 PDC authentication failure

Description

When authentication between middle intelligent area control unit and front and rear intelligent area control units is abnormal, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B220200	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	5 s	Periodic type	10 ms	• Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B220200	-	-

Inspection procedure

1	**Check for any DTCs output for middle intelligent area control unit**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

Replace front/rear intelligent area control unit (See page ZC-128) (See page ZC-135)

DTC	B220300	TPMS ID invalid
DTC	B220400	Front TPMS low pressure alarm threshold invalid
DTC	B220500	TPMS temperature alarm threshold invalid
DTC	B220600	TPMS temperature alarm threshold invalid

Description

When the tire pressure monitoring system is abnormal, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B220300	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Middle intelligent area control unit
B220400	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Middle intelligent area control unit
B220500	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Middle intelligent area control unit
B220600	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Middle intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B220300	-	-
B220400	-	-
B220500	-	-
B220600	-	-

Inspection procedure

1	Match tire pressure monitoring system

(a) Adjust the tire pressure.

(b) Connect HQ-VDS diagnostic tester.

(c) Rematch the tire pressure monitoring system.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

ZD

DTC	**B220700**	**Front left TPMS invalid**
DTC	**B220800**	**Front left TPMS undervoltage**
DTC	**B220900**	**Front right TPMS invalid**
DTC	**B220A00**	**Front right TPMS undervoltage**
DTC	**B220B00**	**Rear left TPMS invalid**
DTC	**B220C00**	**Rear left TPMS undervoltage**
DTC	**B220D00**	**Rear right TPMS invalid**
DTC	**B220E00**	**Rear right TPMS undervoltage**

Description

When the tire pressure monitoring system is abnormal or sensor voltage is too low, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B220700	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Radio frequency transmitter • Middle intelligent area control unit
B220800	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Middle intelligent area control unit
B220900	• Diagnostic voltage range. (9 V - 16 V)	-	10 s	Periodic type	10 ms	• Tire pressure sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode					• Radio frequency transmitter • Middle intelligent area control unit
B220A00	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Middle intelligent area control unit
B220B00	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Radio frequency transmitter • Middle intelligent area control unit
B220C00	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Middle intelligent area control unit
B220D00	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Radio frequency transmitter • Middle intelligent area control unit
B220E00	• Diagnostic voltage range. (9 V - 16 V) • IGN ON (VDC_PowerMode= Standby||Driving) Not in OTA Mode	-	10 s	Periodic type	10 ms	• Tire pressure sensor • Middle intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B220700	-	-
B220800	-	-
B220900	-	-
B220A00	-	-
B220B00	-	-
B220C00	-	-
B220D00	-	-
B220E00	-	-

Inspection procedure

1	**Check tire pressure**

(a) Check if tire pressure is normal.

(b) Check if tire pressure has been calibrated correctly.

(c) Check if tire type is correct.

NG → **Perform repair according to malfunction**

OK

2	**Check radio frequency transmitter**

(a) Check for open or short in radio frequency transmitter wire harness and connector.

(b) Check if radio frequency transmitter is damaged.

NG → **Perform repair according to malfunction**

OK

3	**Replace tire pressure sensor (See page DP-121)**

(a) Replace the tire pressure sensor.

(b) Recalibrate the tire pressure.

(c) Connect HQ-VDS diagnostic tester.

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B222311**	**Short to ground in air cleaner power supply, second row A/C switch power supply, intelligent fragrance controller power supply, air quality sensor - power distribution**
DTC	**B222312**	**Short to power supply in air cleaner power supply, second row A/C switch power supply, intelligent fragrance controller power supply, air quality sensor - power distribution**

Description

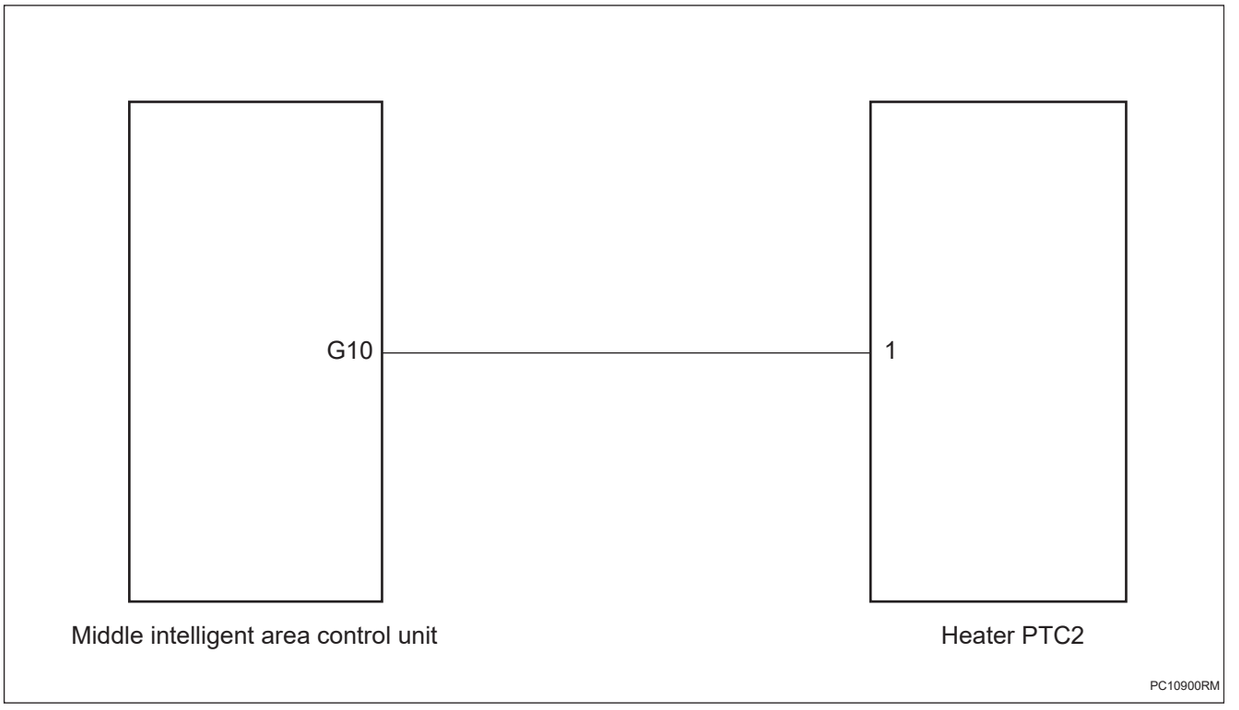
When there is short in heater PTC2 power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B222311	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH02 short to GND	5	Event-based	10 ms	• Heater PTC2 • Wire harness and connector • Middle intelligent area control unit
B222312	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH02 short to BAT	5	Event-based	10 ms	• Heater PTC2 • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B222311	Air cleaner does not operate or operates abnormally	-
B222312	Air cleaner does not operate or operates abnormally	-

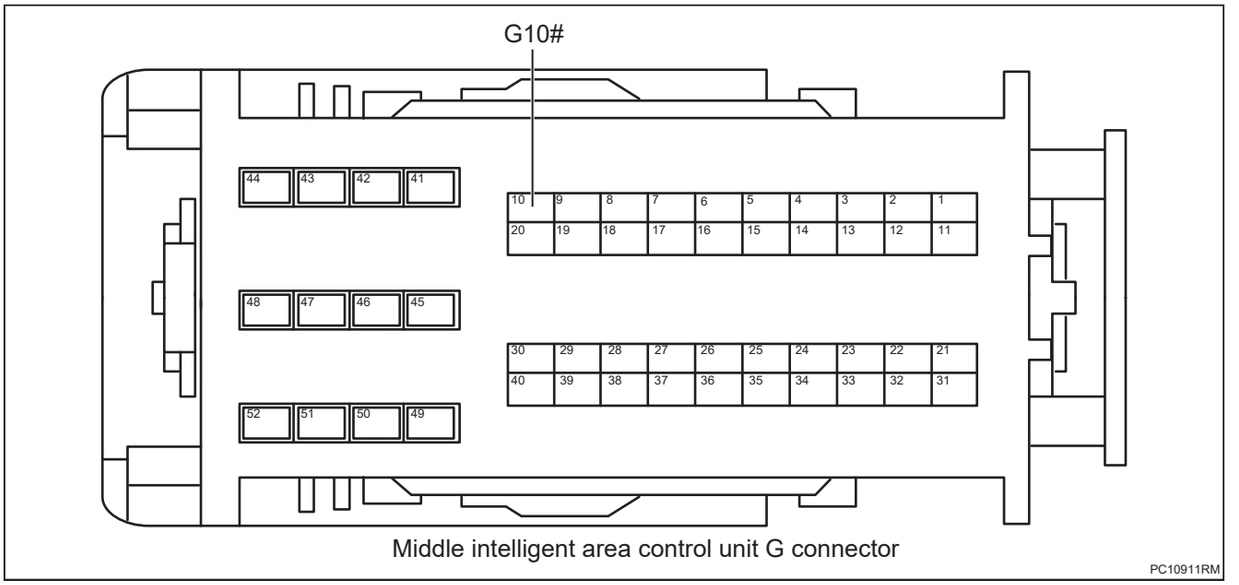
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the heater PTC2 connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

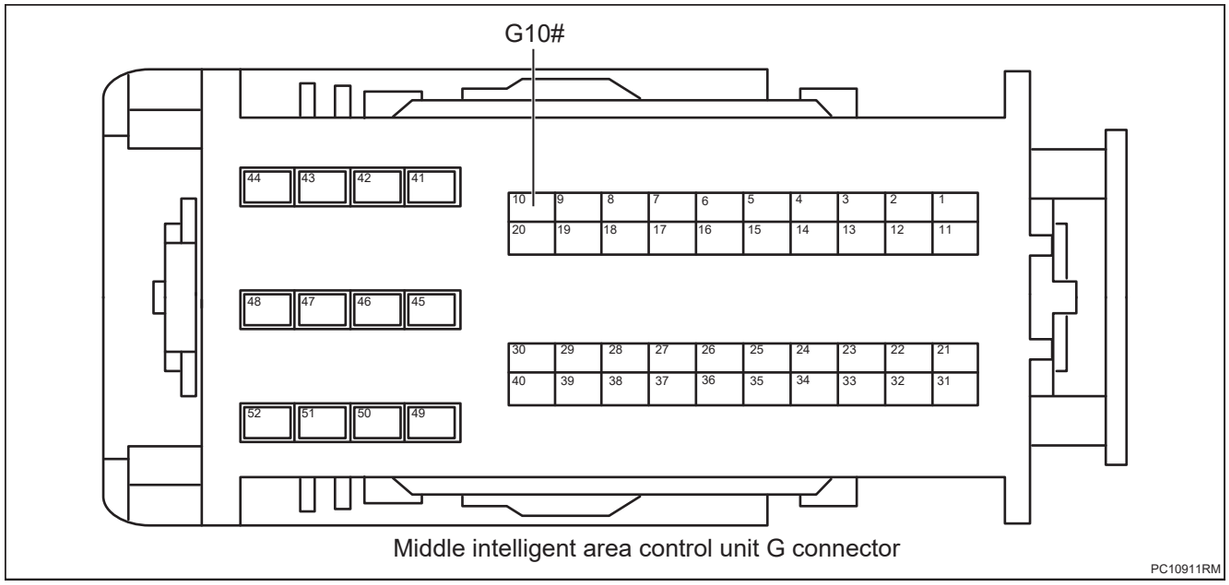
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

PC10911RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G10# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace heater PTC2 (See page RE-19)

(a) Replace the heater PTC2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B223D11	Short to ground in cigarette lighter drive

Description

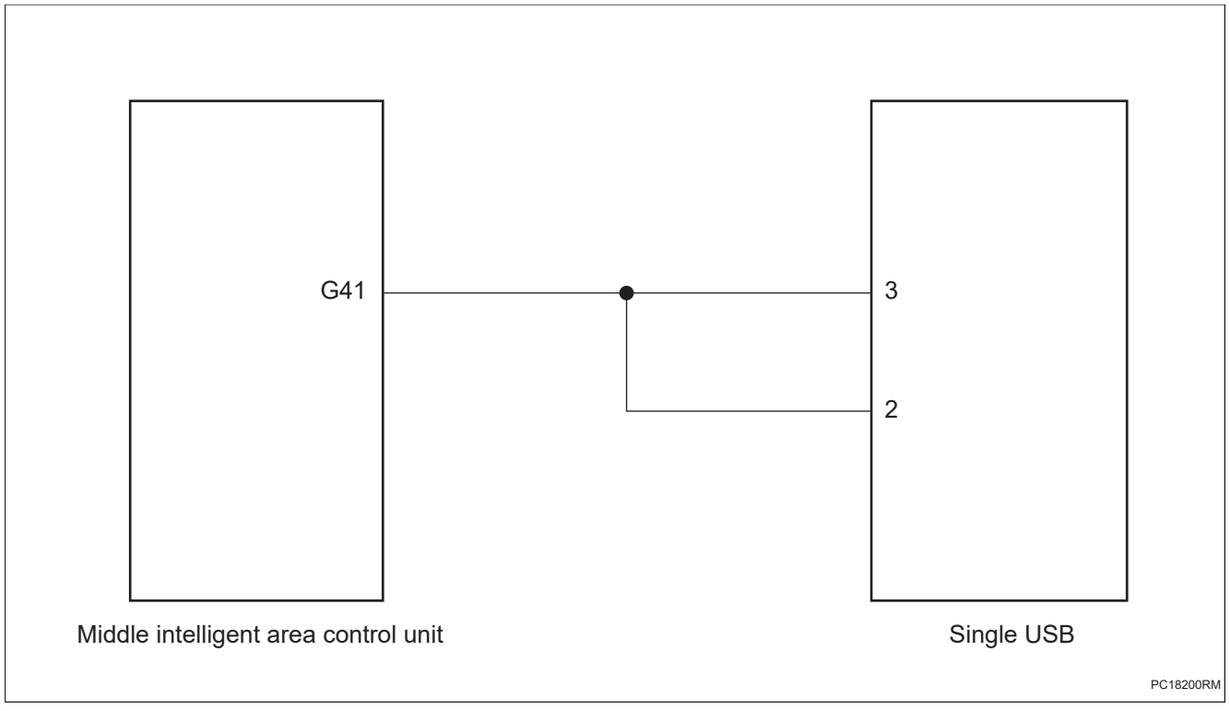
When there is short to ground in single USB power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B223D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH27 short to GND	5	Event-based	10 ms	• Single USB • Wire harness and connector • Middle intelligent area control unit

Fault symptom

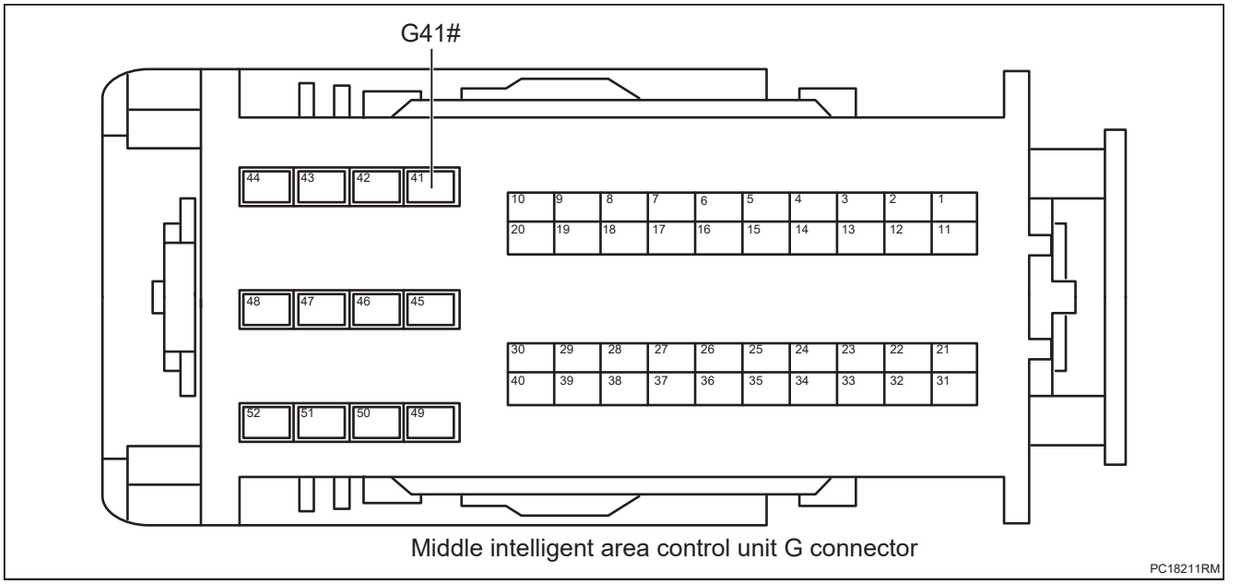
DTC No.	Fault symptom	Warning light/indicator
B223D11	Cigarette lighter driver dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the single USB connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G41# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace single USB (See page ZC-11)**

(a) Replace the single USB.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B225411	Short to ground in USB output HUB LED indicator

Description

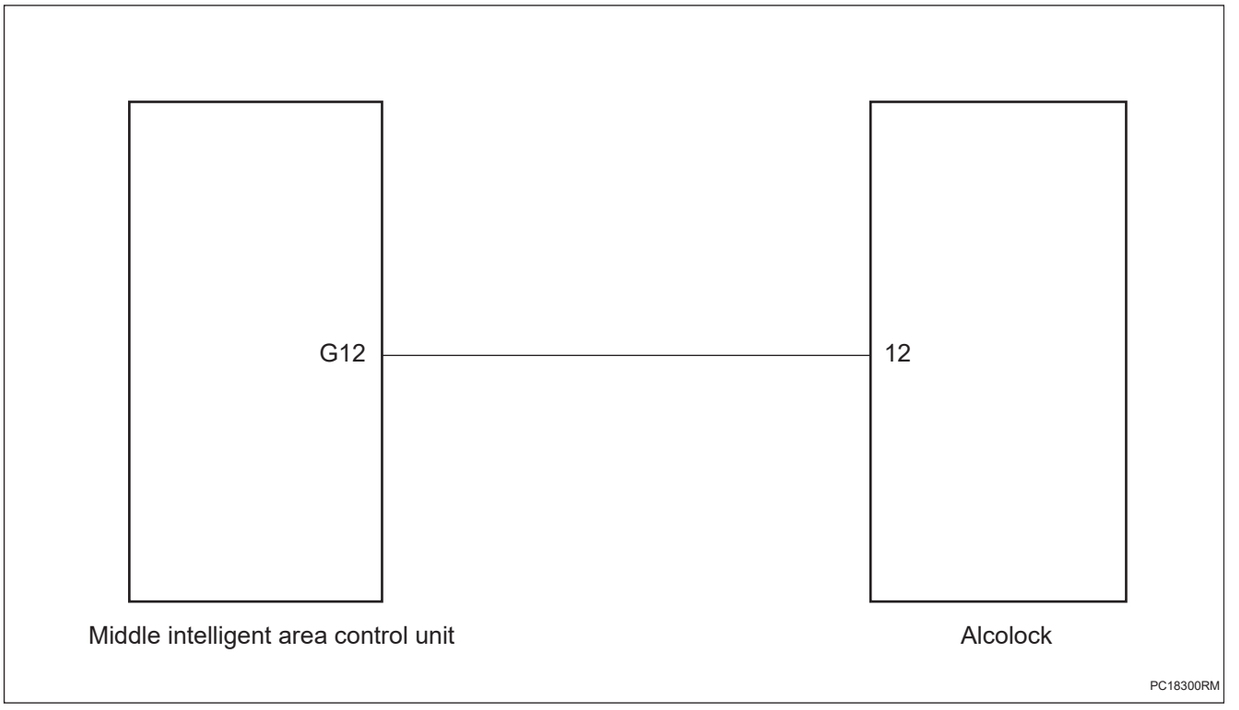
When alcolock circuit is short to ground, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B225411	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OPH05 short to GND	5	Event-based	10 ms	• Alcolock • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B225411	-	-

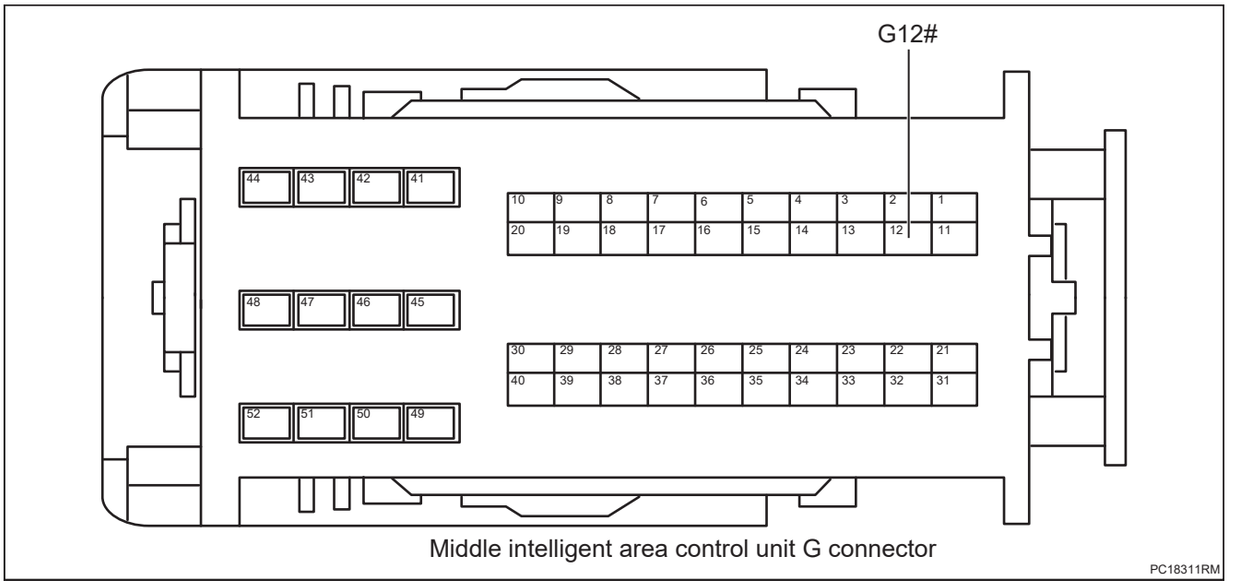
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the alcolock connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace alcolock

(a) Replace the alcolock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**B226C11**	**Short to ground in A/C box assembly right temperature motor**
DTC	**B226C12**	**Short to power supply in A/C box assembly right temperature motor**
DTC	**B226C13**	**Open in A/C box assembly right temperature motor**

Description

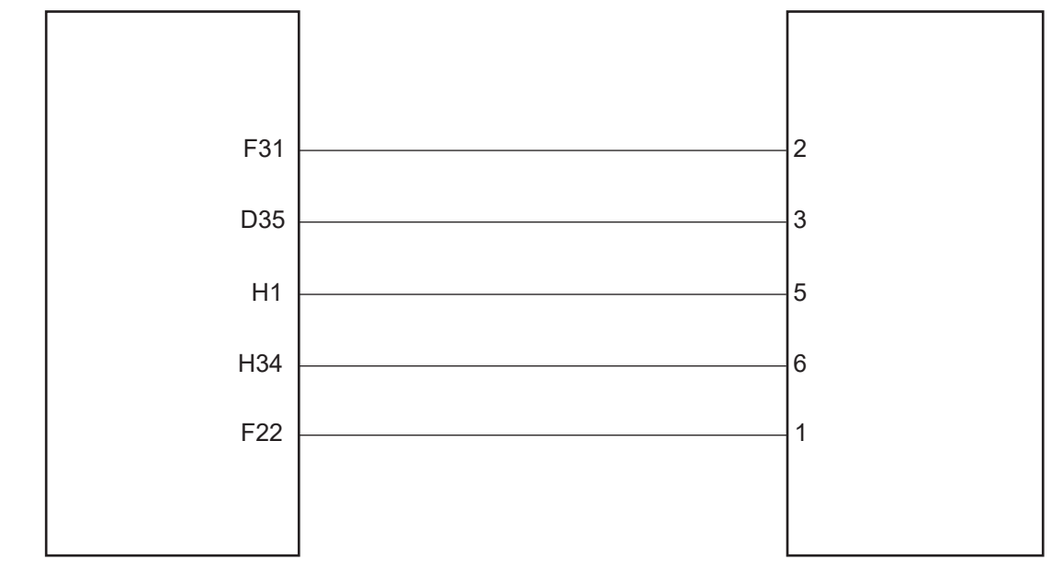
When right temperature damper motor operates abnormally or fails, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B226C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 short to GND	5	Event-based	10 ms	• Right temperature damper motor • Wire harness and connector • Middle intelligent area control unit
B226C12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 short to BAT	5	Event-based	10 ms	• Right temperature damper motor • Wire harness and connector • Middle intelligent area control unit
B226C13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 short to open circuit	5	Event-based	10 ms	• Right temperature damper motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

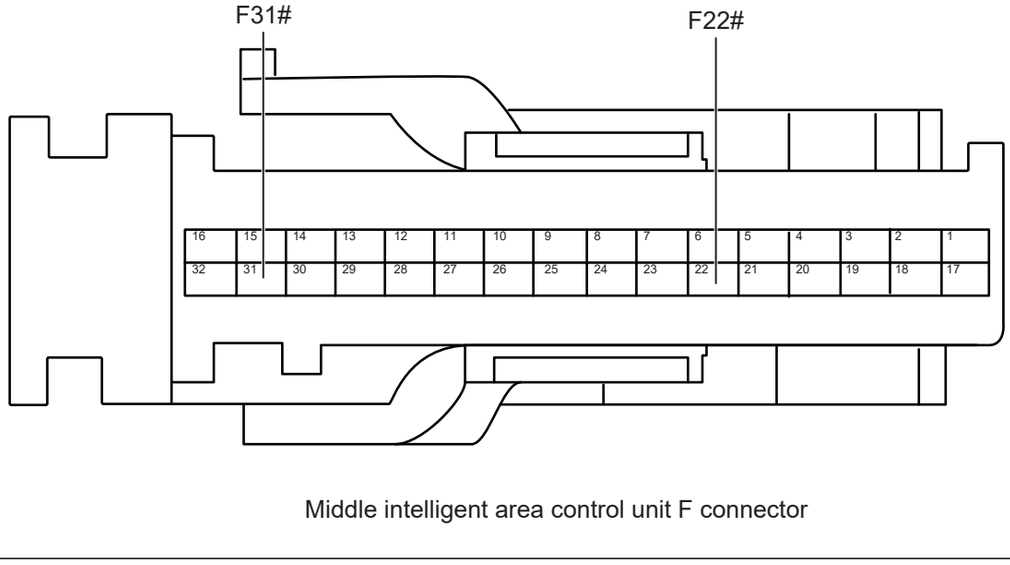
DTC No.	Fault symptom	Warning light/indicator
B226C11	-	-
B226C12	-	-
B226C13	-	-

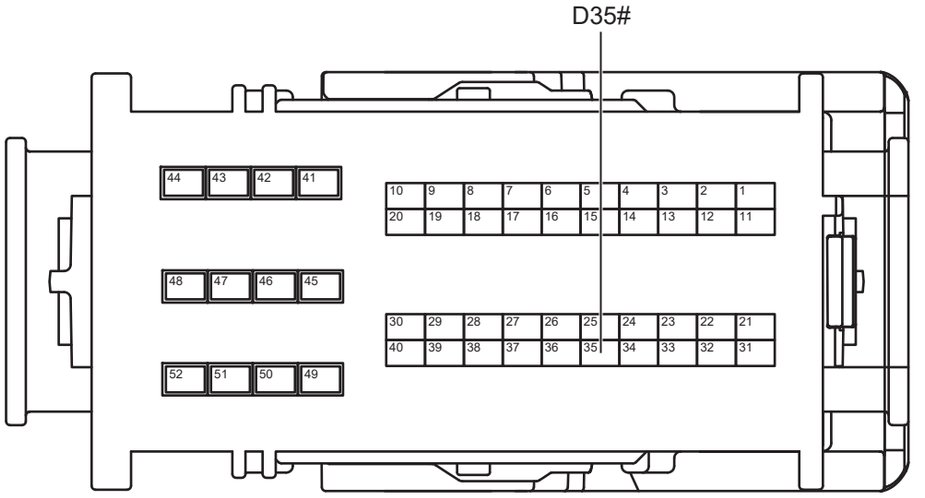
Circuit diagram



Inspection procedure

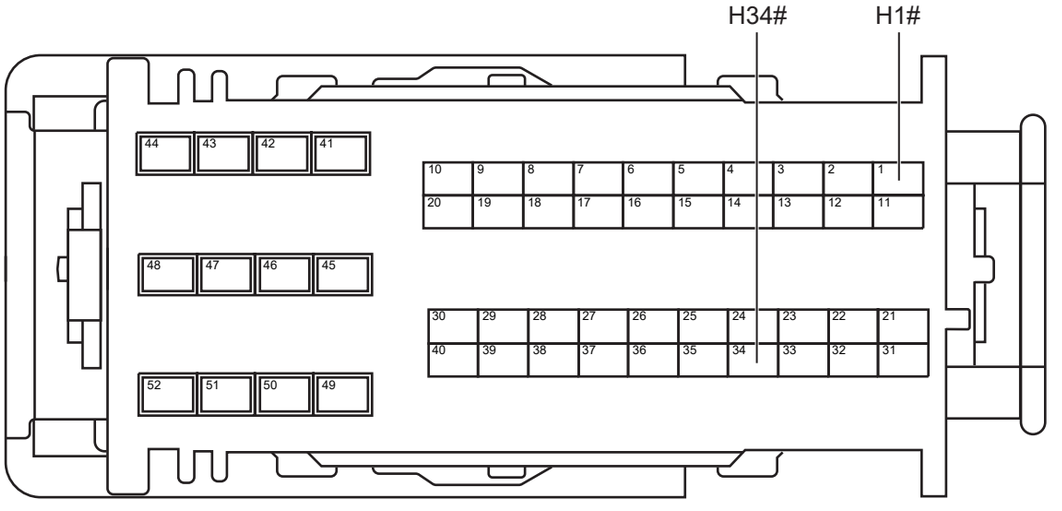
1	**Check for open in right temperature damper motor wire harness and connector**





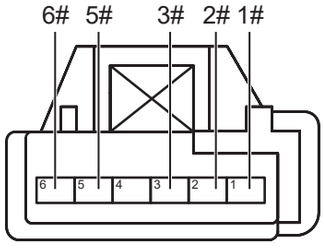
Middle intelligent area control unit D connector

PC17911RM



Middle intelligent area control unit H connector

PC18421RM



Right temperature damper motor connector

PC18430RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the right temperature damper motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

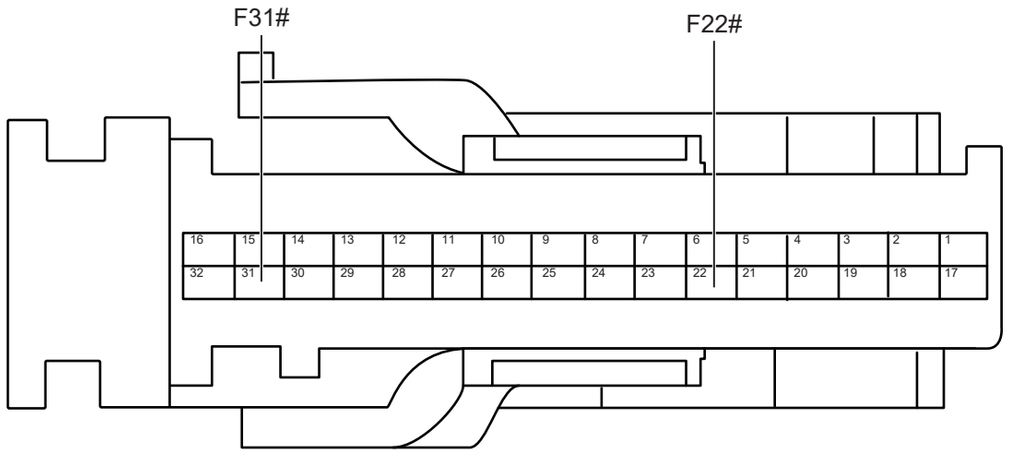
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - right temperature damper motor connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - right temperature damper motor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D35# - right temperature damper motor connector 3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H1# - right temperature damper motor connector 5#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H34# - right temperature damper motor connector 6#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

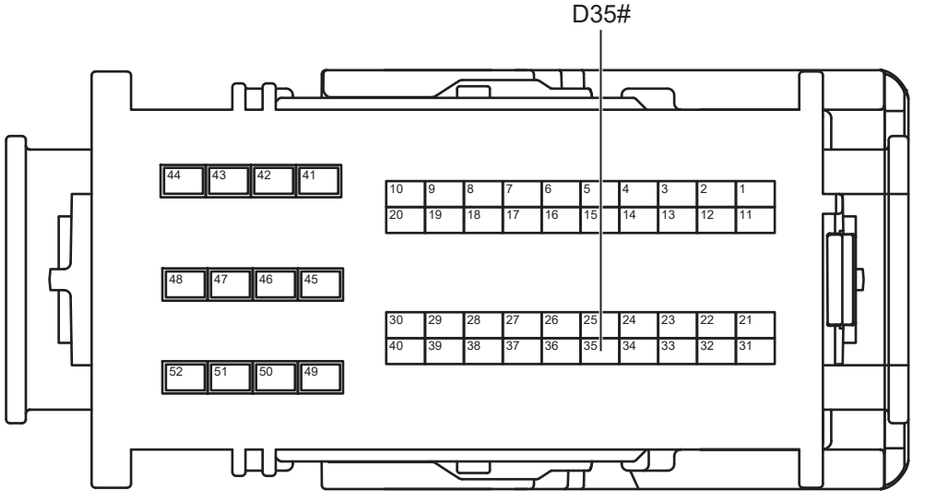
OK

2	**Check for short to ground in right temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

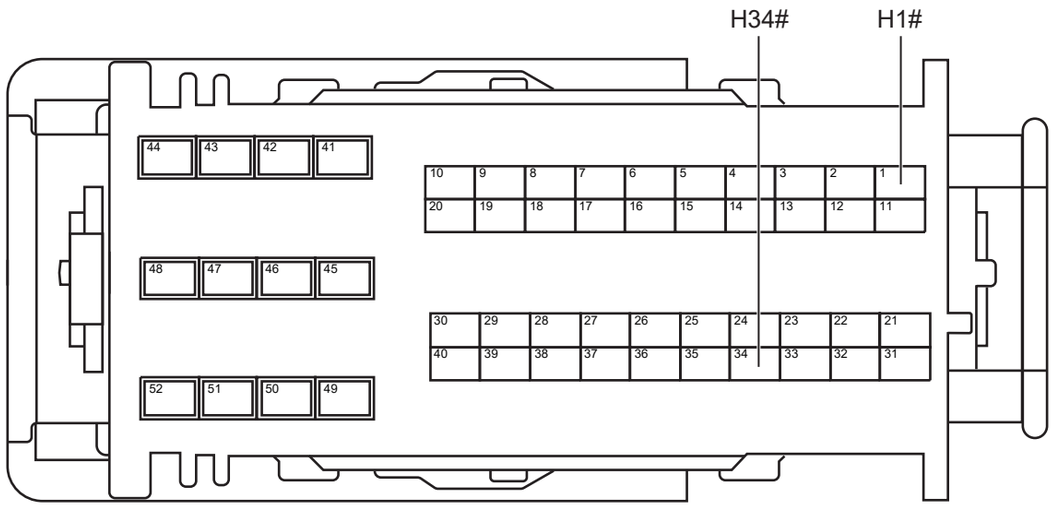
PC18401RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit H connector

PC18421RM

(a) According to value in the table, measure resistance.

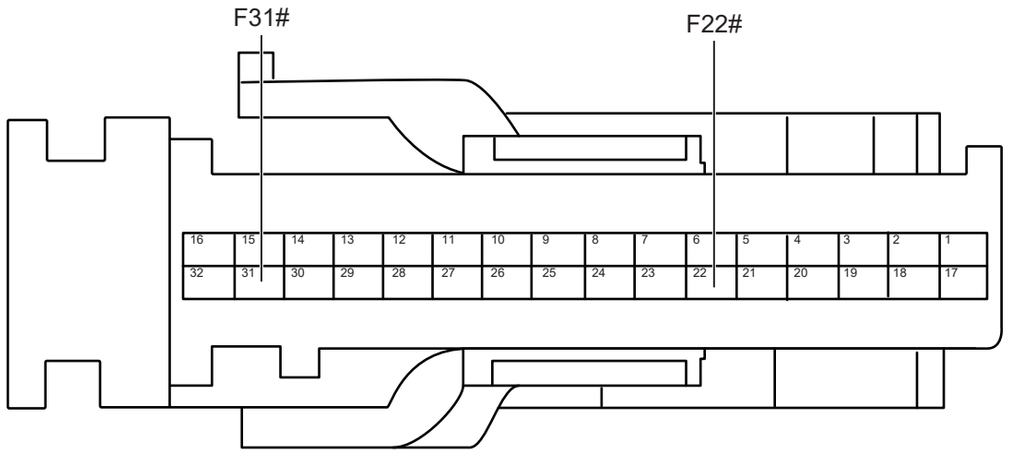
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D35# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H1# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H34# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

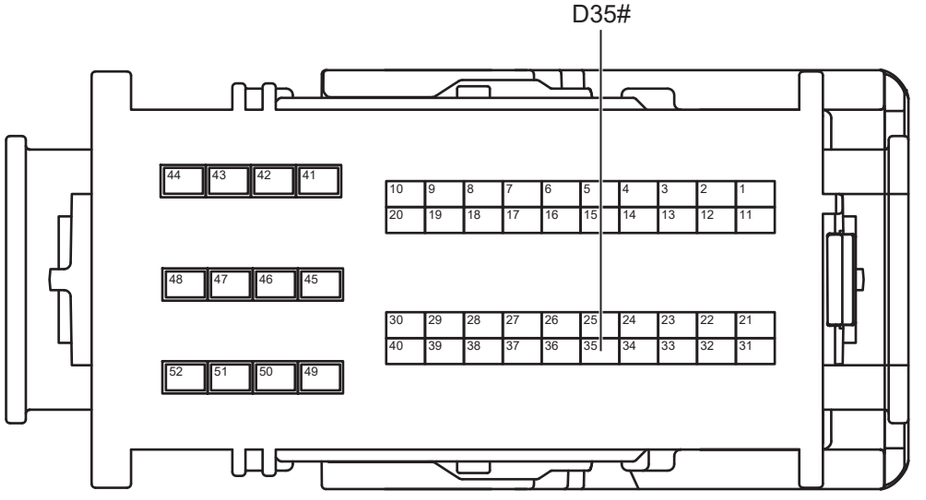
OK

3	**Check for short to power supply in right temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

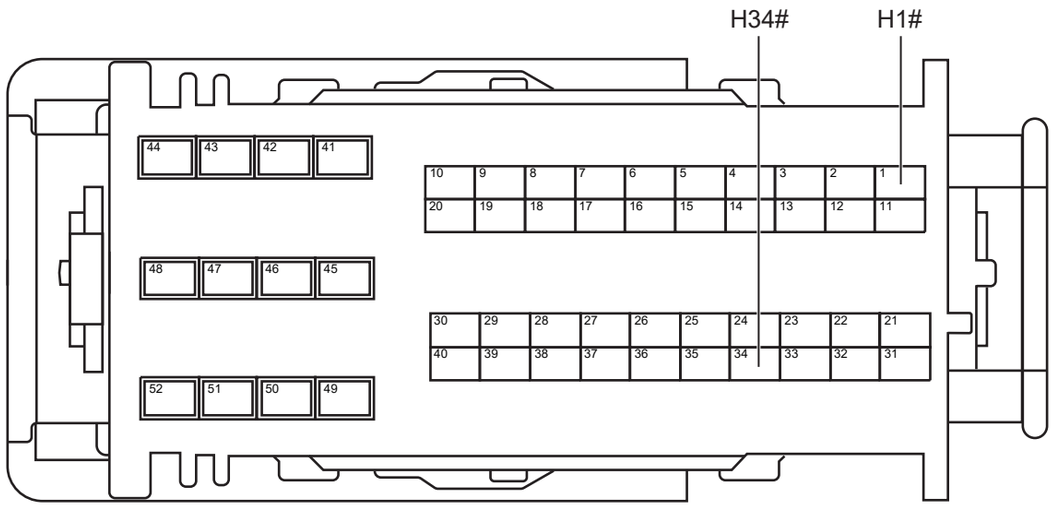
PC18401RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit H connector

PC18421RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F31# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D35# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H34# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace right temperature damper motor (See page RE-19)

(a) Replace the right temperature damper motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B227011	Short to ground in hands off monitor power supply, steering wheel control panel power supply

Description

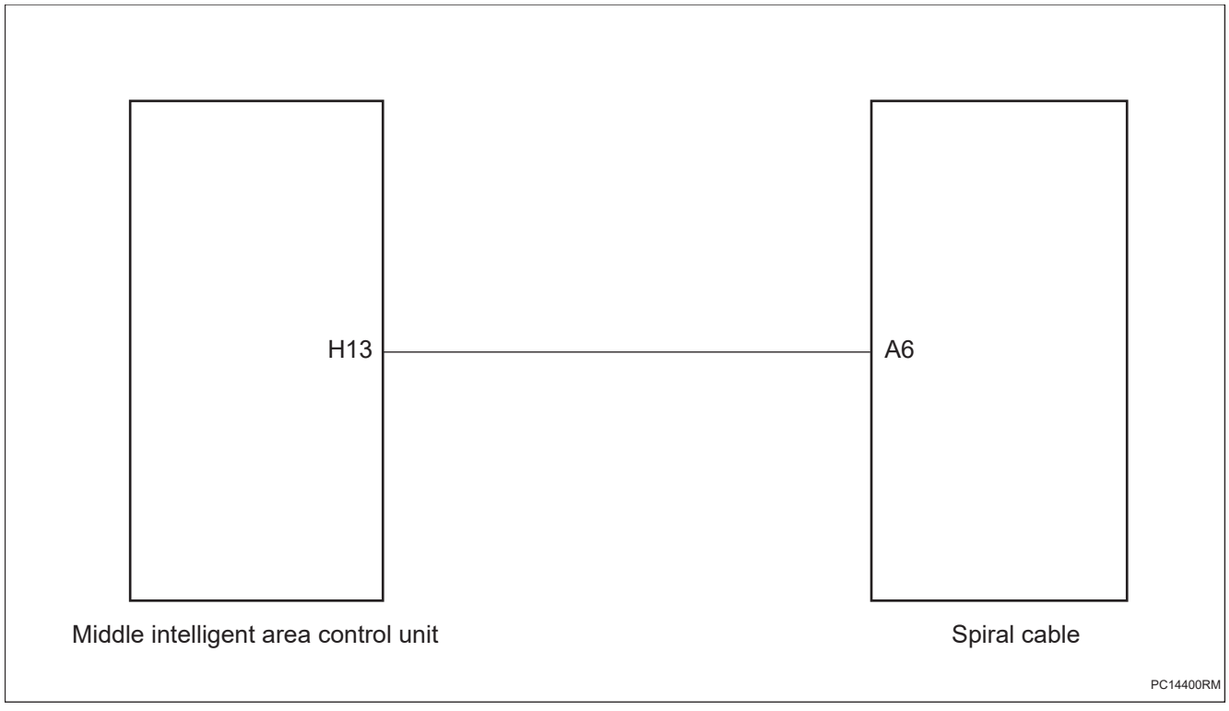
When spiral cable power supply circuit is short, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B227011	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH40 short to GND	5	Event-based	10 ms	• Spiral cable • Wire harness and connector • Middle intelligent area control unit

Fault symptom

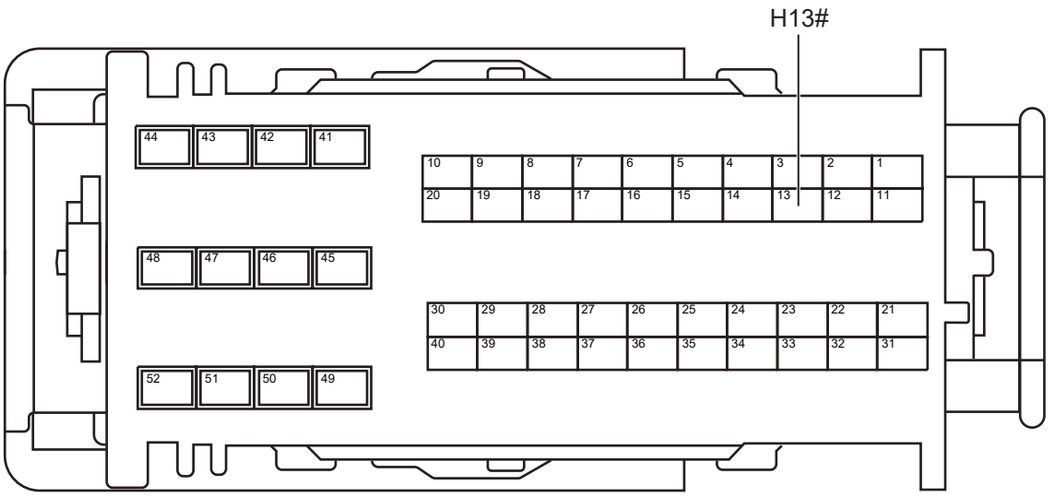
DTC No.	Fault symptom	Warning light/indicator
B227011	Hands-off monitor does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

PC14411RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the spiral cable connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

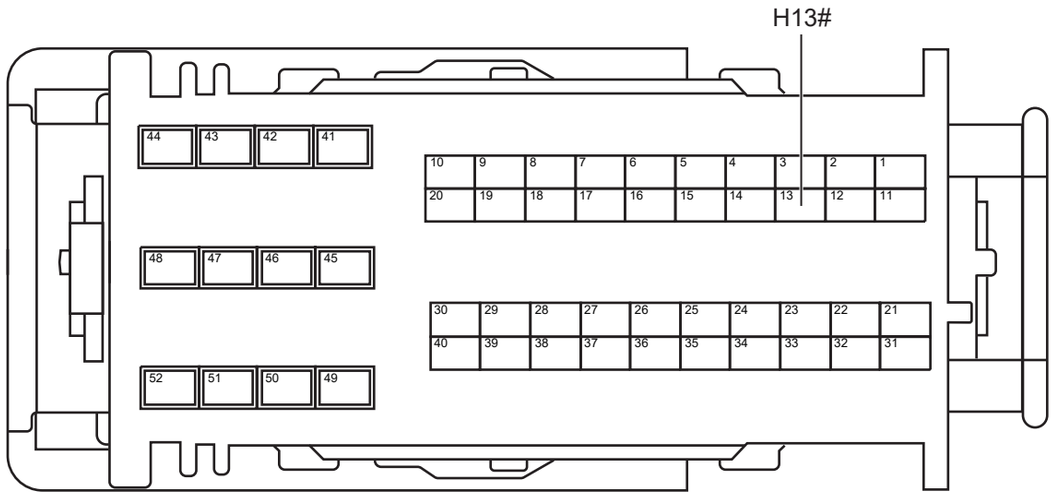
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H13# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

PC14411RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H13# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace spiral cable (See page ZC-120)**

(a) Replace the spiral cable.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK →

ZD

Diagnosis ends

DTC	**P30A711**	**Short to ground in second row left face temperature sensor**
DTC	**B226D11**	**Short to ground in A/C box assembly inner circulation motor**
DTC	**B226D12**	**Short to power supply in A/C box assembly inner circulation motor**
DTC	**B226D13**	**Open in A/C box assembly inner circulation motor**
DTC	**P30BA11**	**Short to power supply/open in second row left face temperature sensor**

Description

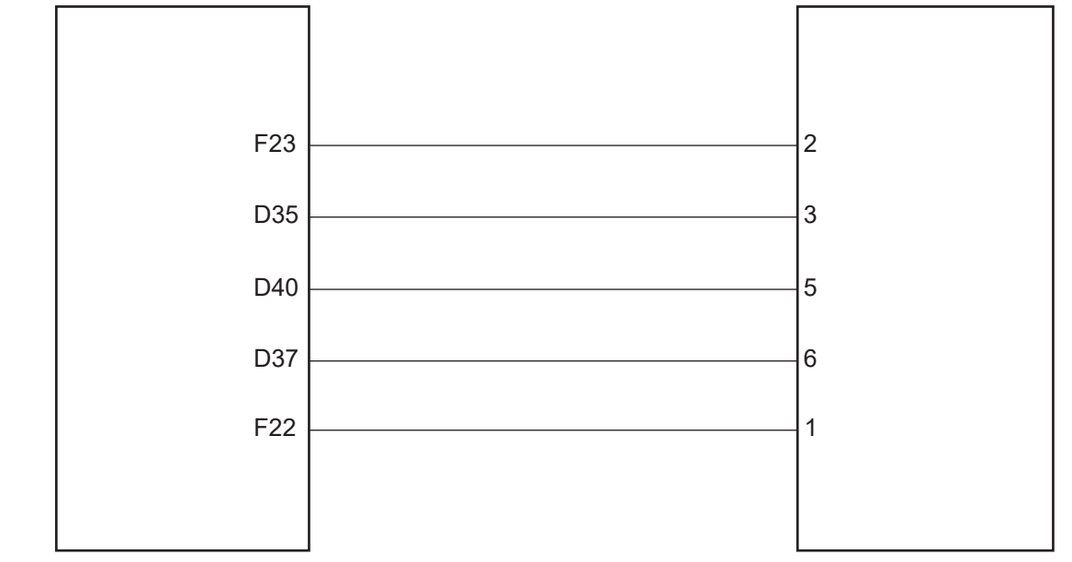
When inner/outer circulation damper motor operates abnormally or fails, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A711	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN08 short to GND	5	Event-based	10 ms	• Inner/outer circulation damper motor • Wire harness and connector • Middle intelligent area control unit
B226D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB15/ OHB16 short to GND	5	Event-based	10 ms	• Inner/outer circulation damper motor • Wire harness and connector • Middle intelligent area control unit
B226D12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB15/ OHB16 short to BAT	5	Event-based	10 ms	• Inner/outer circulation damper motor • Wire harness and connector • Middle intelligent area control unit
B226D13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB15/ OHB16 short to open circuit	5	Event-based	10 ms	• Inner/outer circulation damper motor • Wire harness and connector • Middle intelligent area control unit
P30BA11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN08 short to BAT or Open	5	Event-based	10 ms	• Inner/outer circulation damper motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P30A711	Temperature collected by second row left face temperature sensor is unreasonable	-
B226D11	-	-
B226D12	-	-
B226D13	-	-
P30BA11	Temperature collected by second row right face temperature sensor is unreasonable	-

Circuit diagram

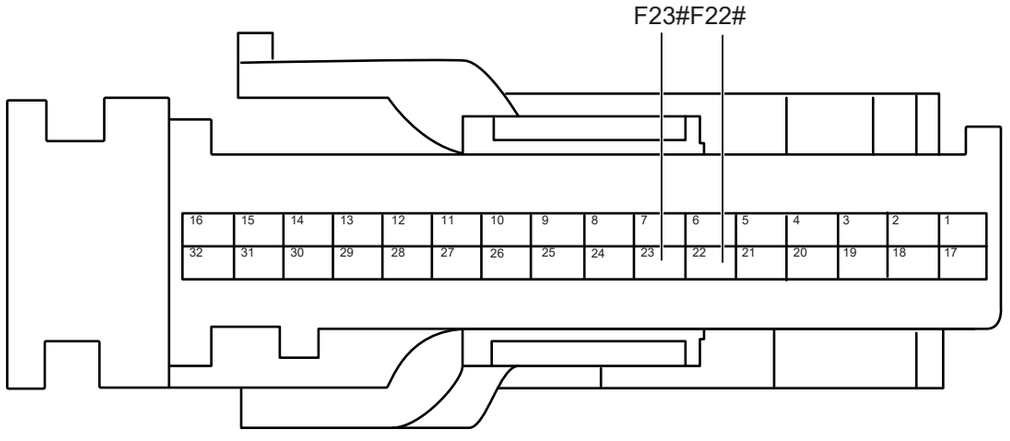


PC17800RM

ZD

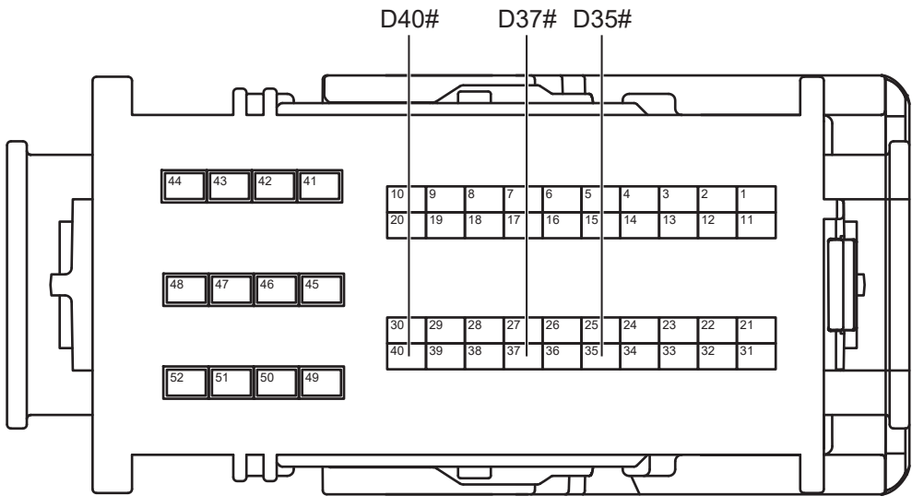
Inspection procedure

1	**Check for open in inner/outer circulation damper motor wire harness and connector**



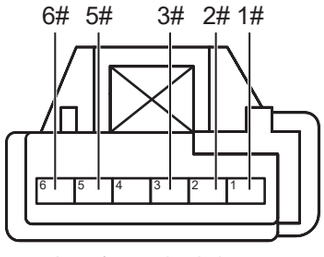
Middle intelligent area control unit F connector

PC17801RM



Middle intelligent area control unit D connector

PC17811RM



Inner/outer circulation damper motor connector

PC17820RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the inner/outer circulation damper motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

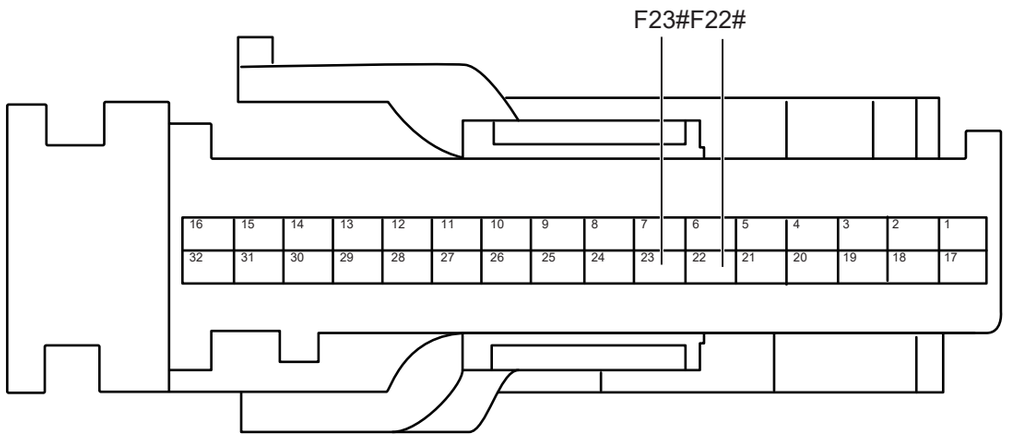
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F23# - inner/outer circulation damper motor connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - inner/outer circulation damper motor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D35# - inner/outer circulation damper motor connector 3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D40# - inner/outer circulation damper motor connector 5#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D37# - inner/outer circulation damper motor connector 6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

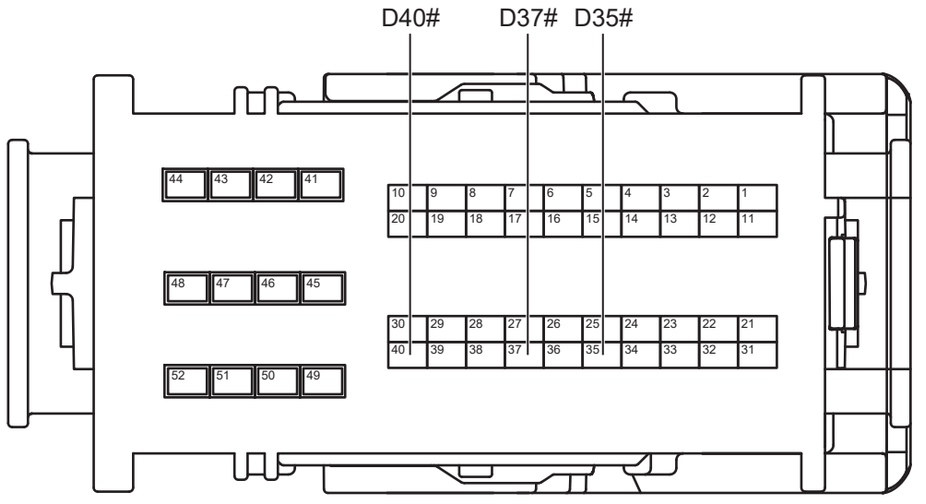
OK

2	**Check for short to ground in inner/outer circulation damper motor wire harness and connector**



Middle intelligent area control unit F connector

PC17801RM



Middle intelligent area control unit D connector

PC17811RM

(a) According to value in the table, measure resistance.

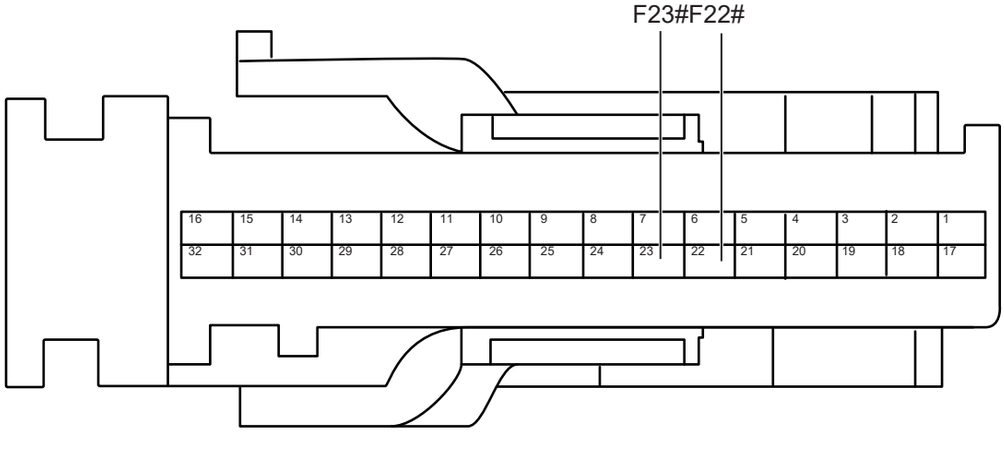
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F23# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D35# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D40# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D37# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

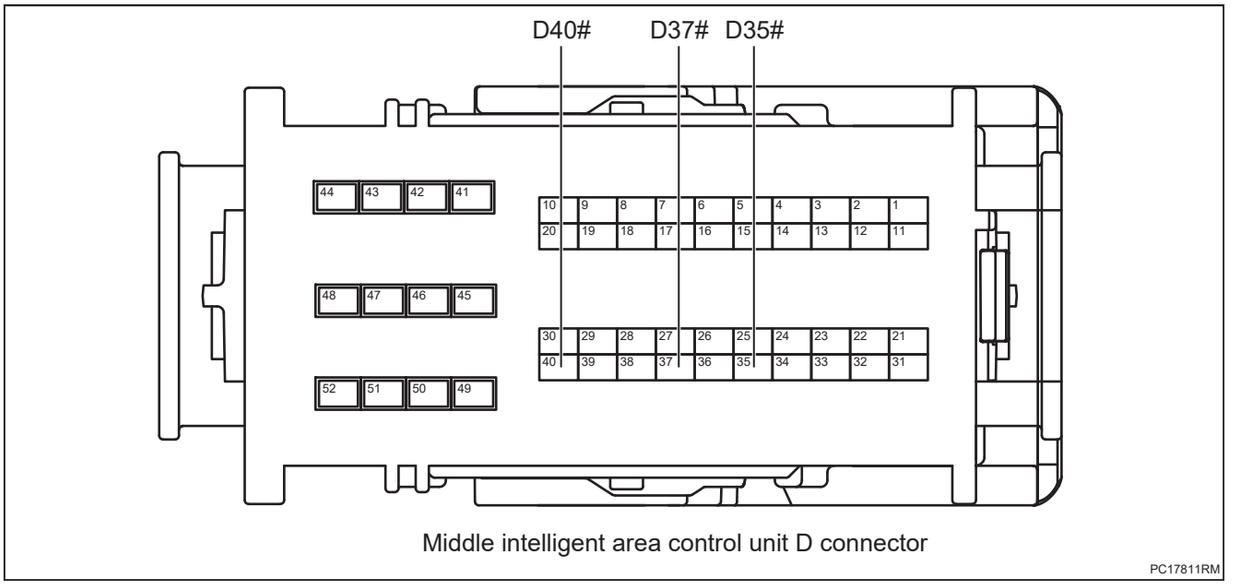
OK

3	**Check for short to power supply in inner/outer circulation damper motor wire harness and connector**



Middle intelligent area control unit F connector

PC17801RM



Middle intelligent area control unit D connector

PC17811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F23# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D35# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D40# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D37# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace inner/outer circulation damper motor (See page RE-19)

(a) Replace the inner/outer circulation damper motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30A811	Short to ground in second row left foot temperature sensor
DTC	B226E11	Short to ground in A/C box assembly defroster motor
DTC	B226E12	Short to power supply in A/C box assembly defroster motor
DTC	B226E13	Open in A/C box assembly defroster motor

DTC	P30BB11	Short to power supply/open in second row left foot temperature sensor

Description

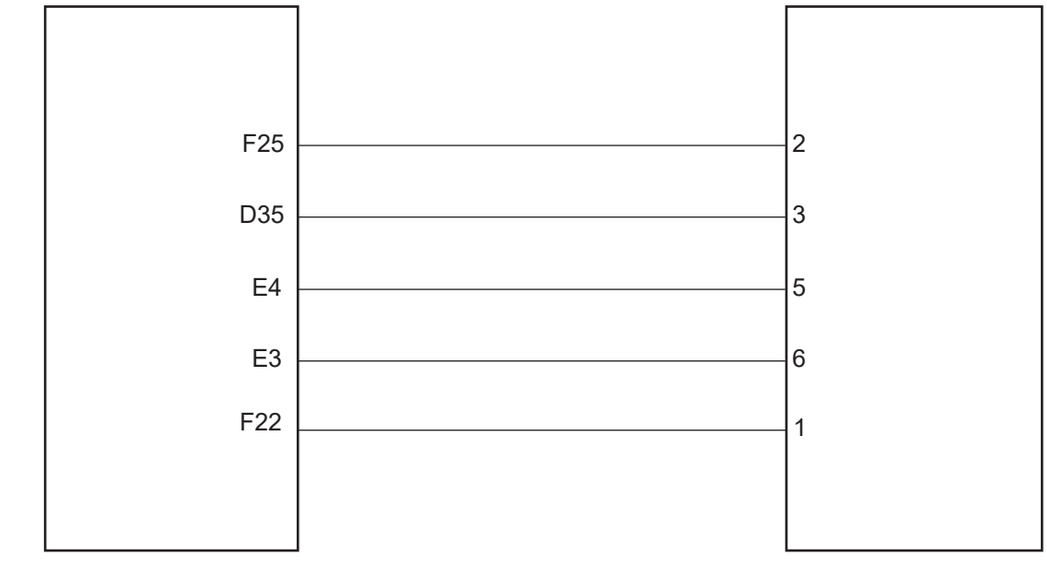
When defroster motor operates abnormally or is faulty, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN09 short to GND	5	Event-based	10 ms	• Defroster motor • Wire harness and connector • Middle intelligent area control unit
B226E11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 short to GND	5	Event-based	10 ms	• Defroster motor • Wire harness and connector • Middle intelligent area control unit
B226E12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 short to BAT	5	Event-based	10 ms	• Defroster motor • Wire harness and connector • Middle intelligent area control unit
B226E13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 short to open circuit	5	Event-based	10 ms	• Defroster motor • Wire harness and connector • Middle intelligent area control unit
P30BB11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN09 short to BAT or Open	5	Event-based	10 ms	• Defroster motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

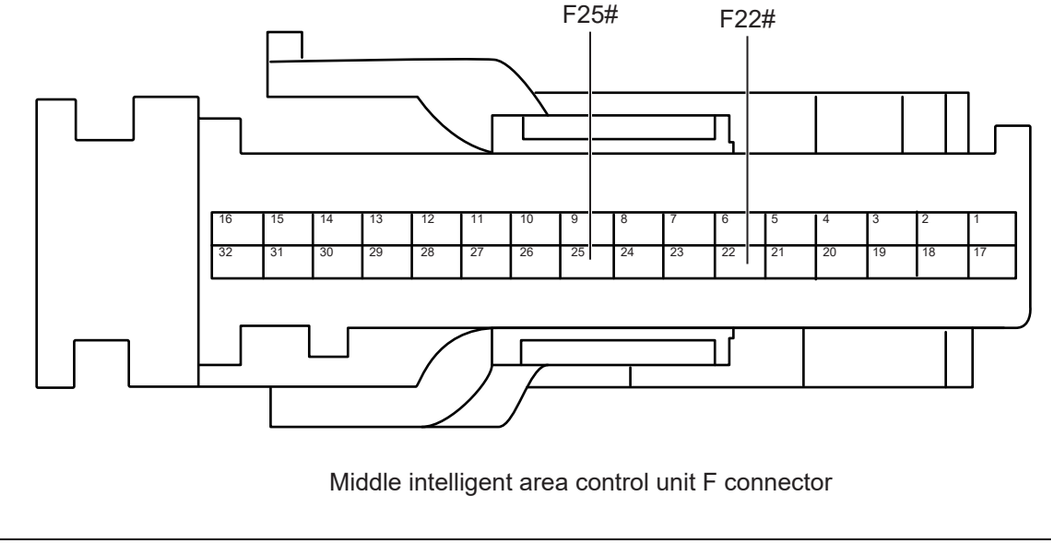
DTC No.	Fault symptom	Warning light/indicator
P30A811	-	-
B226E11	-	-
B226E12	-	-
B226E13	-	-
P30BB11	-	-

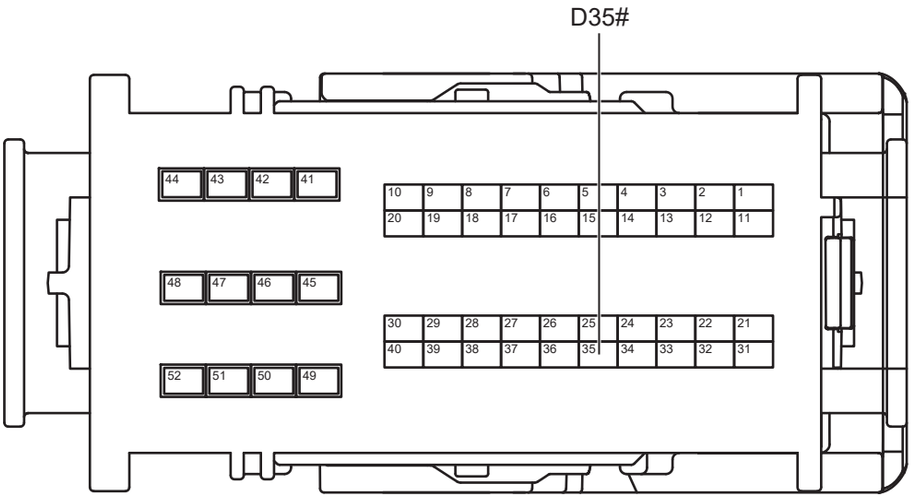
Circuit diagram



Inspection procedure

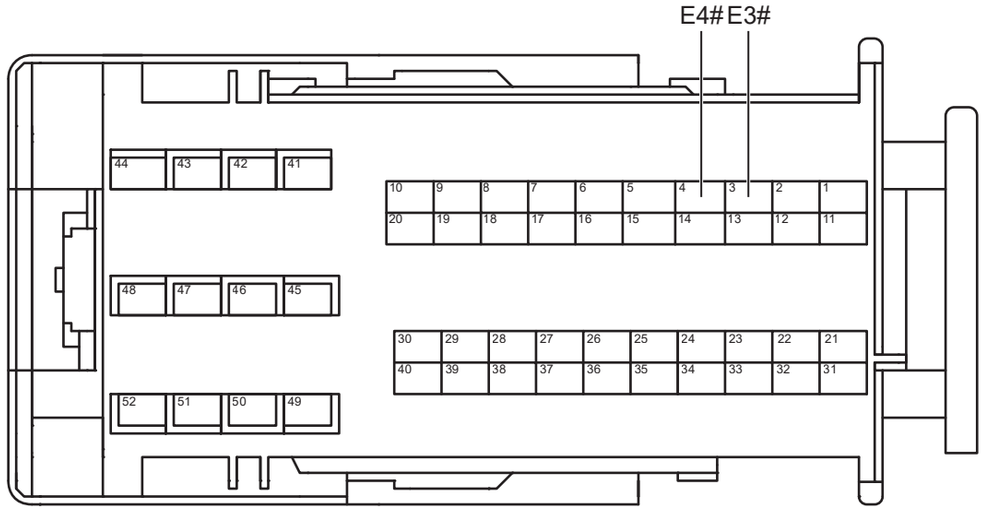
1	**Check for open in defroster motor wire harness and connector**





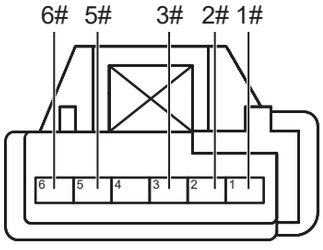
Middle intelligent area control unit D connector

PC17911RM



Middle intelligent area control unit E connector

PC17921RM



Defroster motor connector

PC17930RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the defroster motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

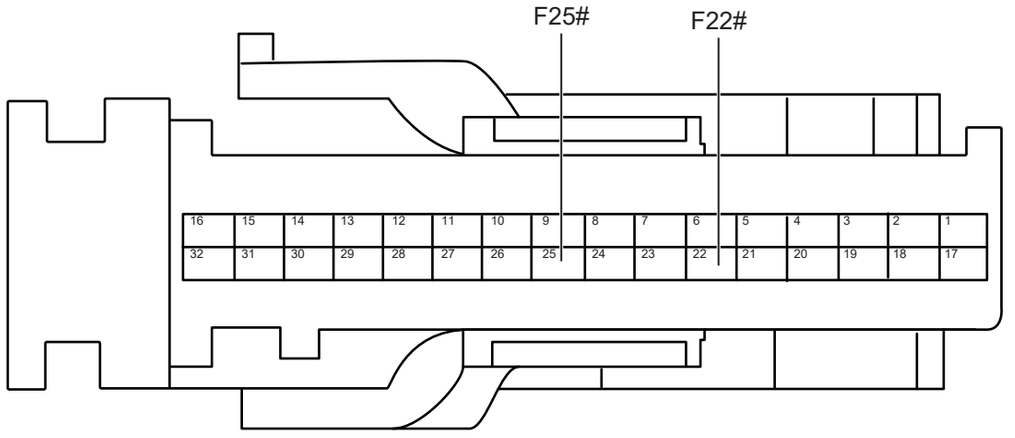
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F25# - defroster motor connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - defroster motor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D35# - defroster motor connector 3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E4# - defroster motor connector 5#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E3# - defroster motor connector 6#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

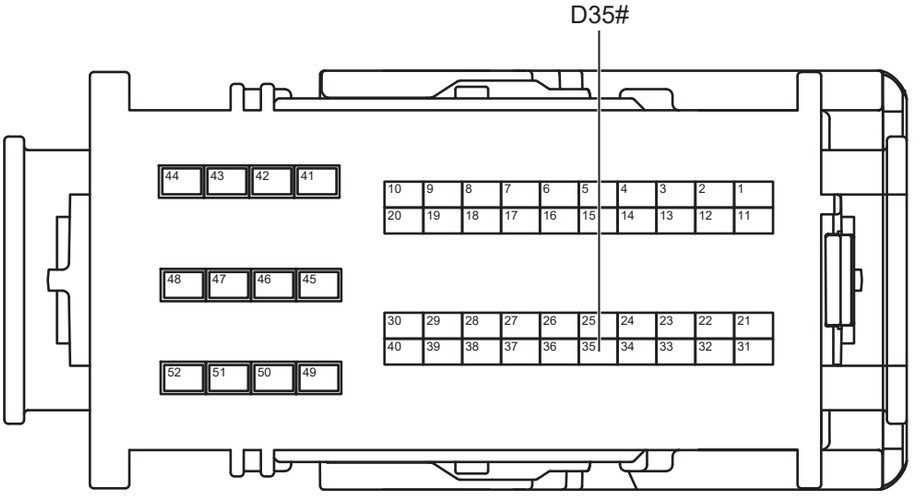
OK

2	**Check for short to ground in defroster motor wire harness and connector**



Middle intelligent area control unit F connector

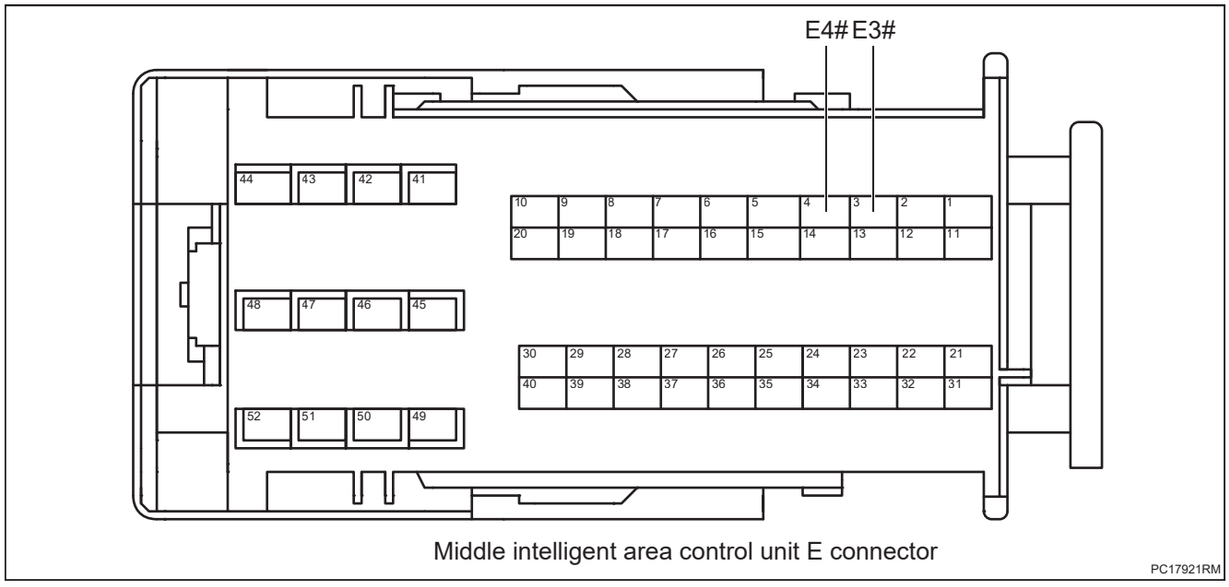
PC17901RM



Middle intelligent area control unit D connector

PC17911RM

ZD



(a) According to value in the table, measure resistance.

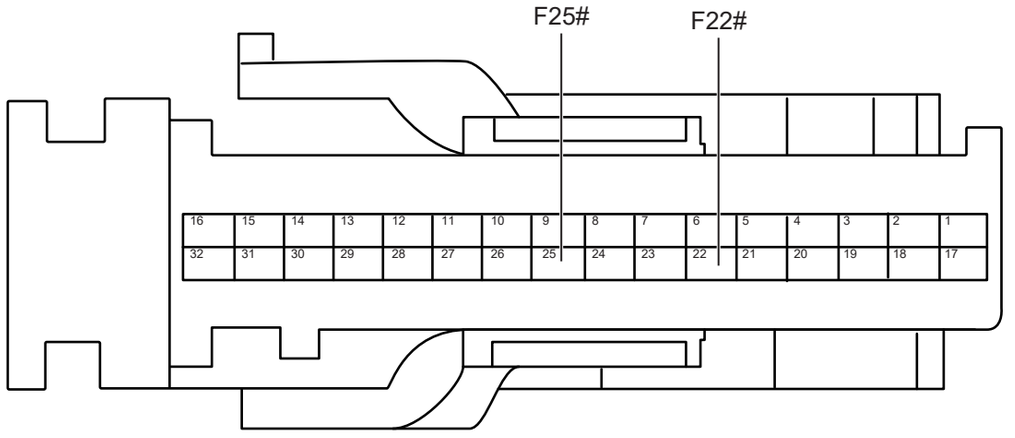
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F25# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D35# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector E4# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector E3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

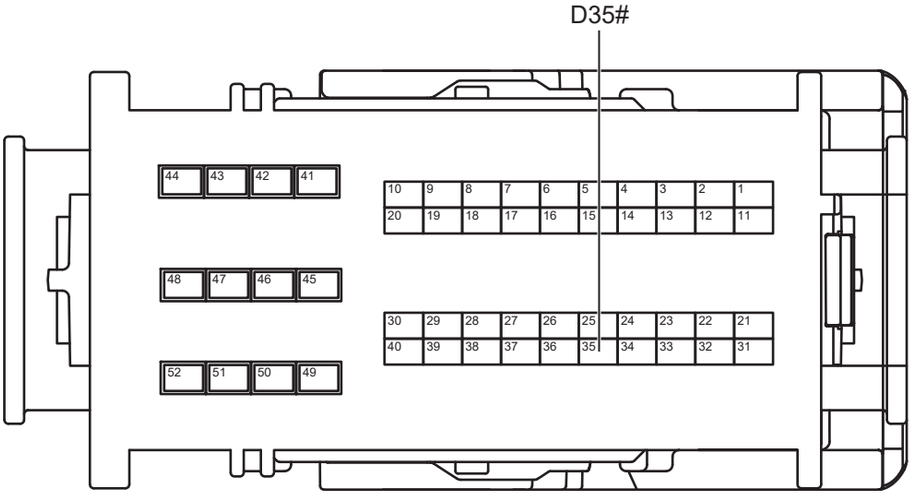
OK

3	**Check for short to power supply in defroster motor wire harness and connector**



Middle intelligent area control unit F connector

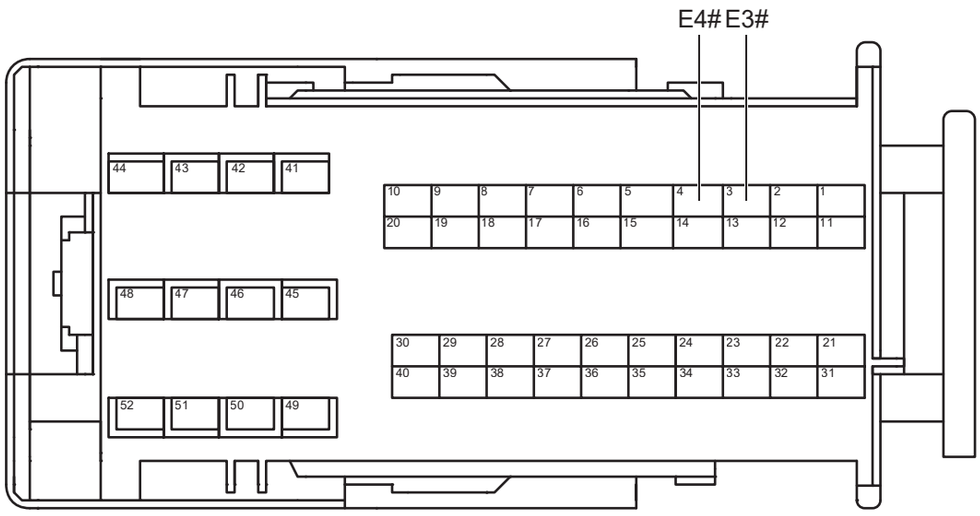
PC17901RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit E connector

PC17921RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F25# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D35# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector E4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector E3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace defroster motor (See page RE-19)

(a) Replace the defroster motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30A911	Short to ground in second row right face temperature sensor
DTC	B226A11	Short to ground in A/C box assembly mode motor
DTC	B226A12	Short to power supply in A/C box assembly mode motor
DTC	B226A13	Open in A/C box assembly mode motor

DTC	P30BC11	Short to power supply/open in second row right face temperature sensor

Description

When mode damper motor operates abnormally or fails, the middle intelligent area control unit records DTC.

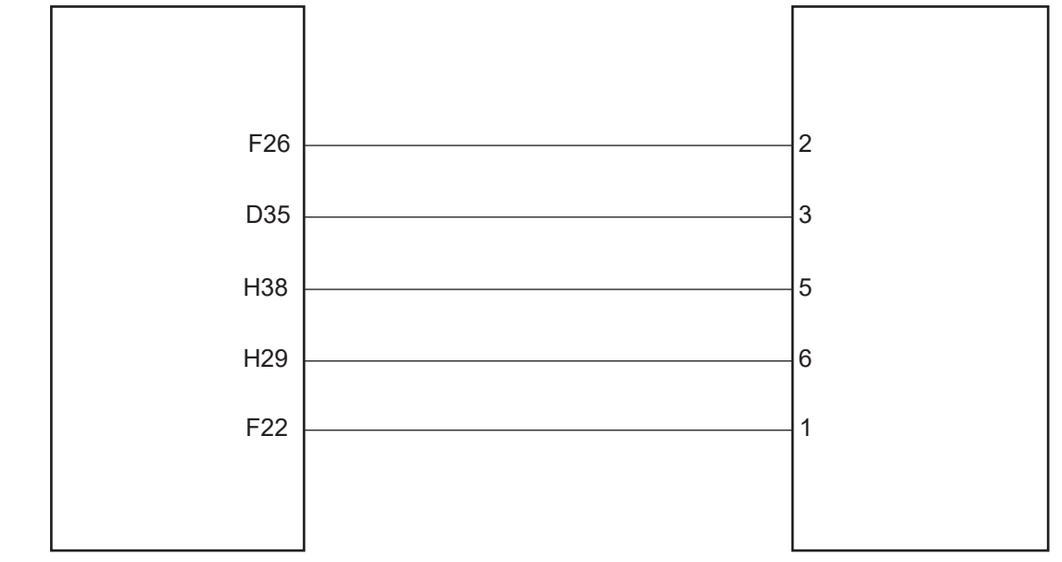
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN10 short to GND	5	Event-based	10 ms	• Mode damper motor • Wire harness and connector • Middle intelligent area control unit
B226A11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB09/ OHB10 short to GND	5	Event-based	10 ms	• Mode damper motor • Wire harness and connector • Middle intelligent area control unit
B226A12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB09/ OHB10 short to BA	5	Event-based	10 ms	• Mode damper motor • Wire harness and connector • Middle intelligent area control unit
B226A13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB09/ OHB10 short to open circuit	5	Event-based	10 ms	• Mode damper motor • Wire harness and connector • Middle intelligent area control unit
P30B-C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN10 short to BAT or Open	5	Event-based	10 ms	• Mode damper motor • Wire harness and connector • Middle intelligent area control unit

ZD

Fault symptom

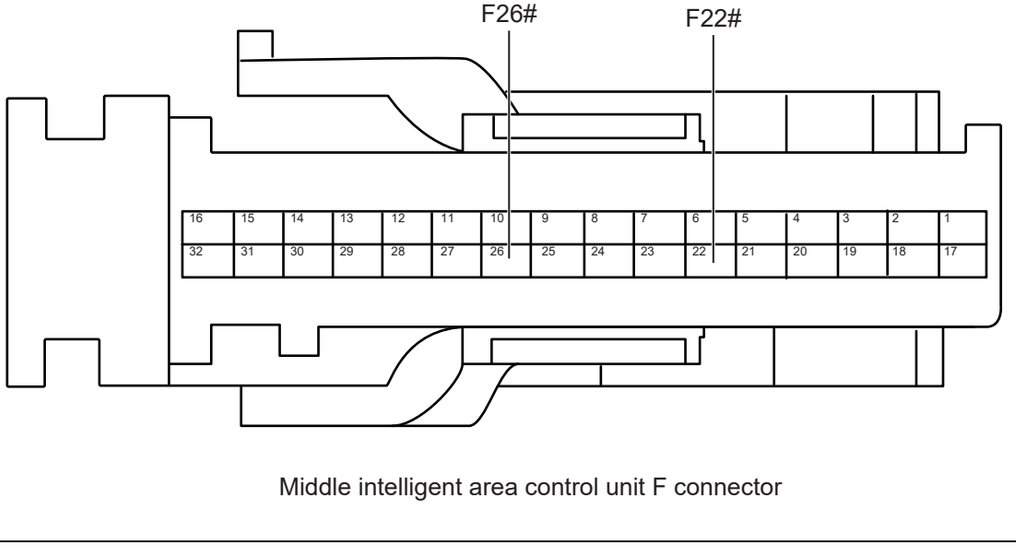
DTC No.	Fault symptom	Warning light/indicator
P30A911	-	-
B226A11	-	-
B226A12	-	-
B226A13	-	-
P30BC11	-	-

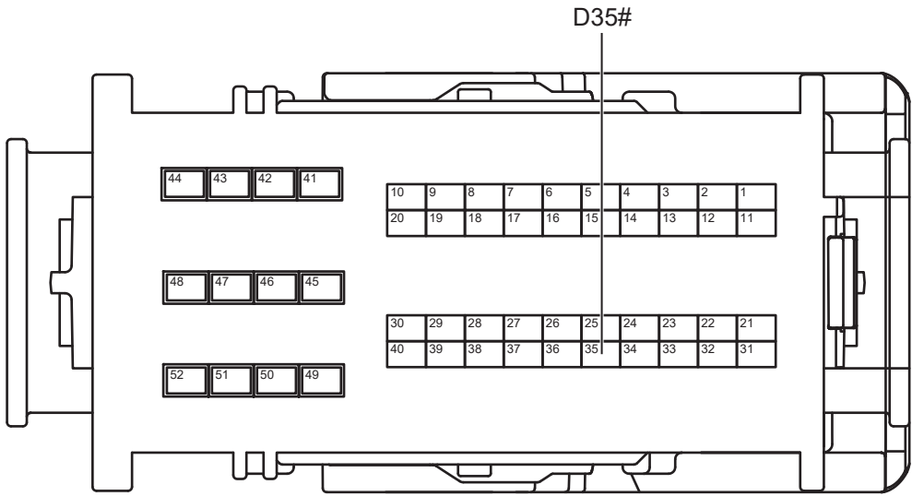
Circuit diagram



Inspection procedure

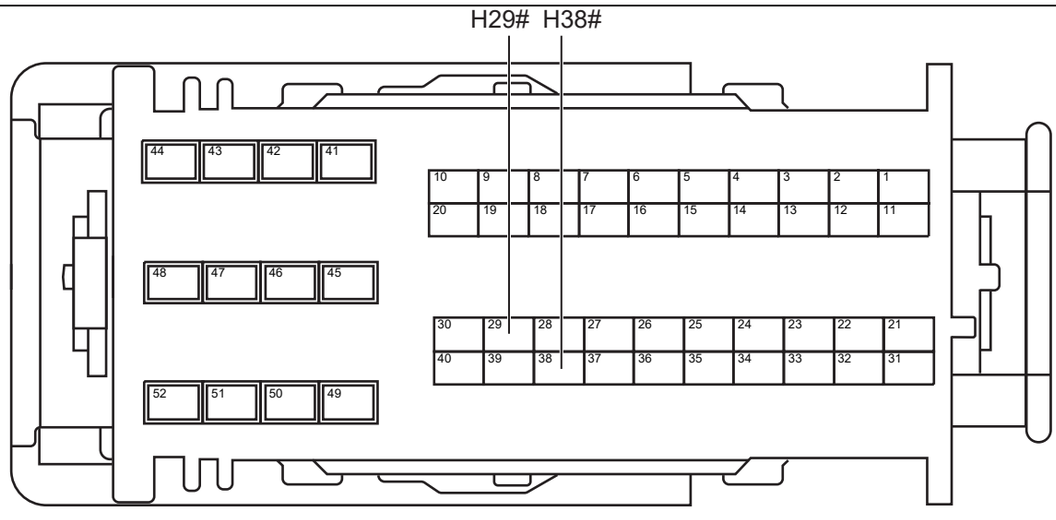
1	**Check for open in mode damper motor wire harness and connector**





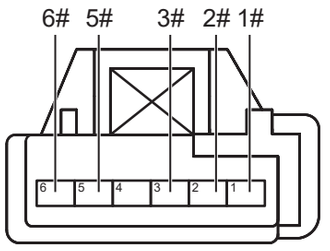
Middle intelligent area control unit D connector

PC17911RM



Middle intelligent area control unit H connector

PC18021RM



Mode damper motor connector

PC18030RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mode damper motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

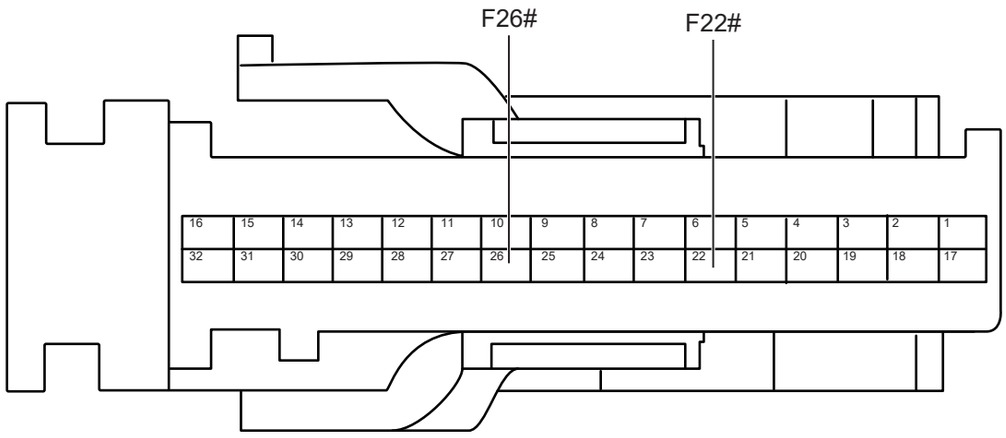
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F26# - mode damper motor connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - mode damper motor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D35# - mode damper motor connector 3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H38# - mode damper motor connector 5#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H29# - mode damper motor connector 6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

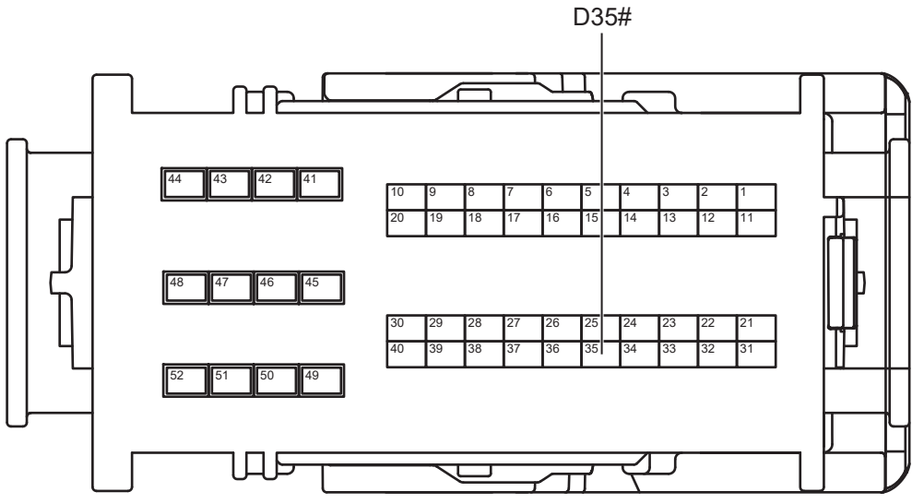
ZD

2	**Check for short to ground in mode damper motor wire harness and connector**



Middle intelligent area control unit F connector

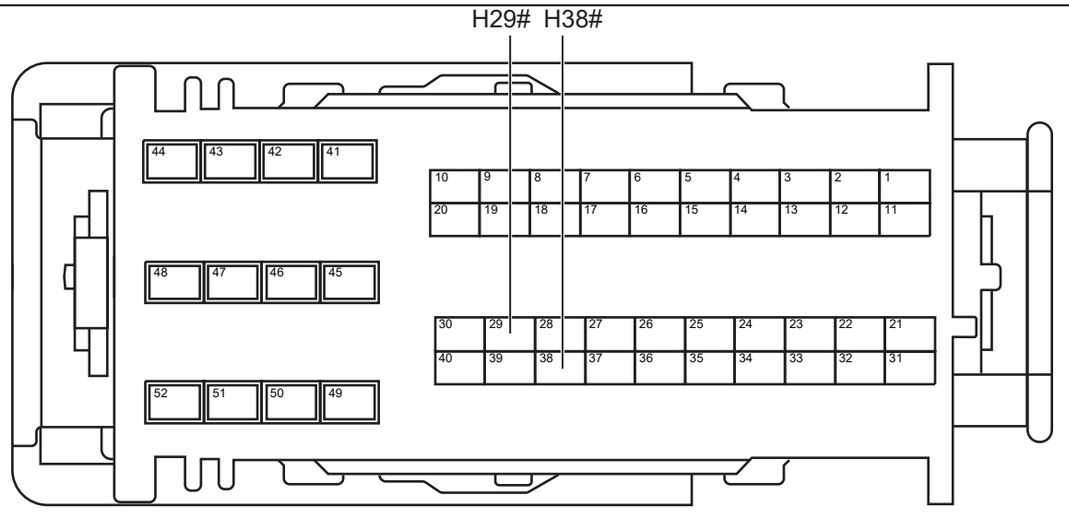
PC18001RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit H connector

PC18021RM

ZD

(a) According to value in the table, measure resistance.

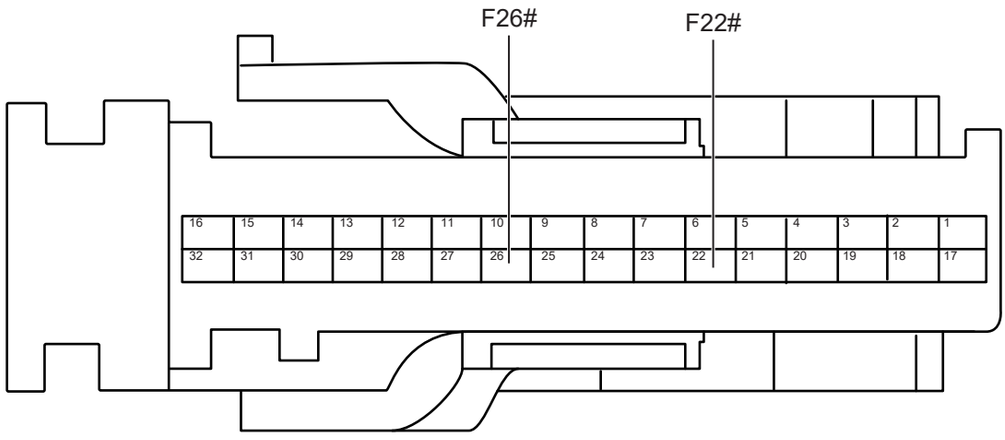
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F26# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D35# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H38# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H29# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

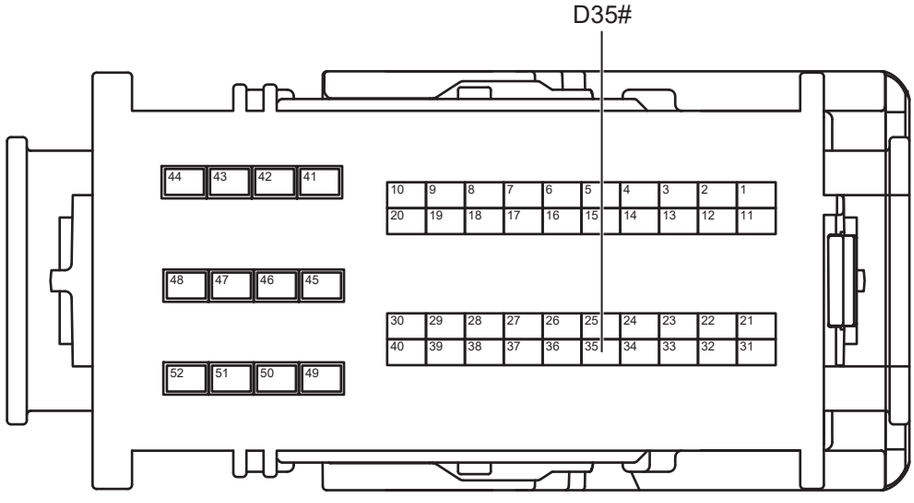
OK

3	**Check for short to power supply in mode damper motor wire harness and connector**



Middle intelligent area control unit F connector

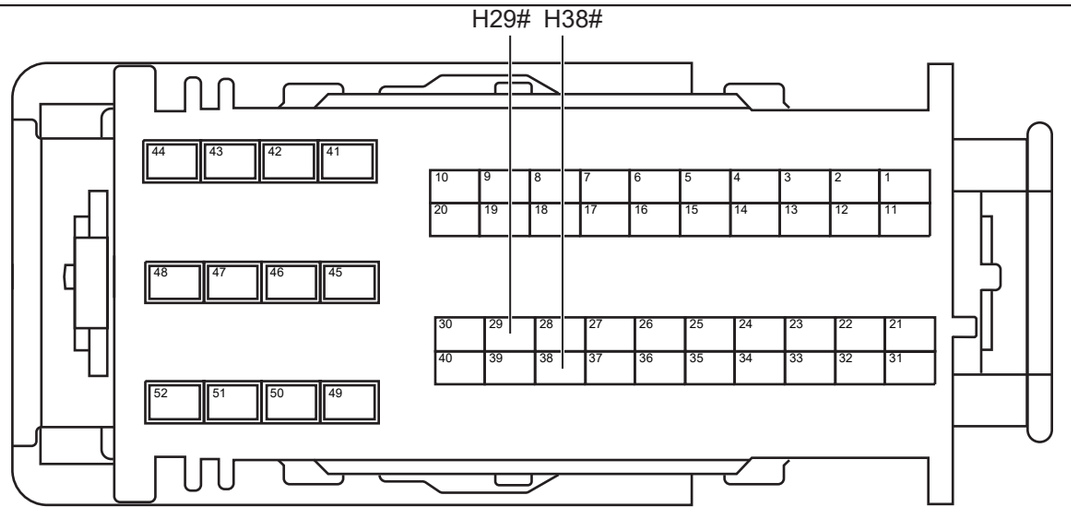
PC18001RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit H connector

PC18021RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D35# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H38# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H29# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace mode damper motor (See page RE-19)

(a) Replace the mode damper motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30AA11	Short to ground in second row right foot temperature sensor
DTC	B226B11	Short to ground in A/C box assembly left temperature motor
DTC	B226B12	Short to power supply in A/C box assembly left temperature motor
DTC	B226B13	Open in A/C box assembly left temperature motor

DTC	P30BD11	Short to power supply/open in second row right foot temperature sensor

Description

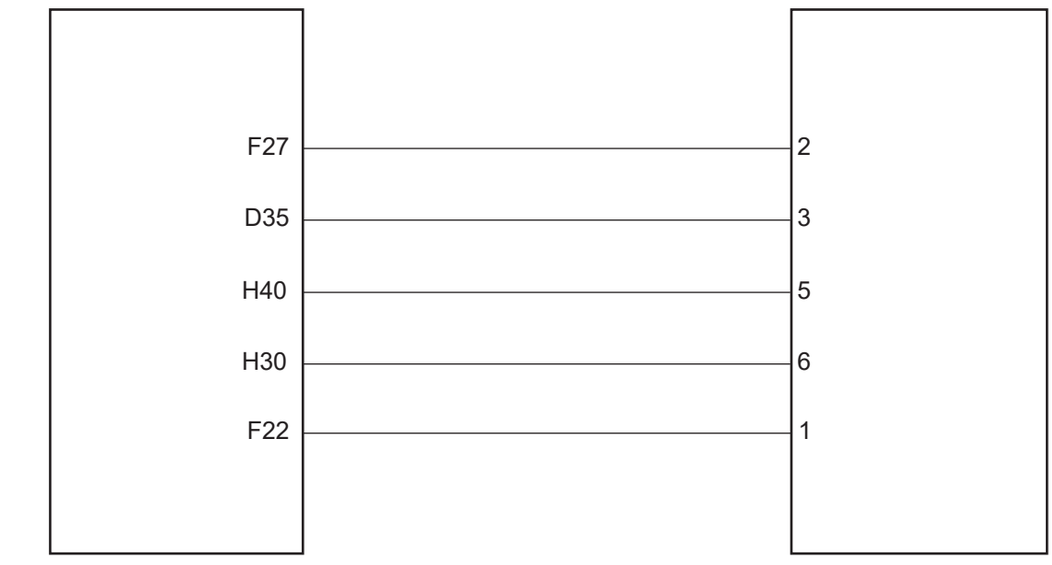
When left temperature damper motor operates abnormally or fails, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30AA11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN11 short to GND	5	Event-based	10 ms	• Left temperature damper motor • Wire harness and connector • Middle intelligent area control unit
B226B11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB11/ OHB12 short to GND	5	Event-based	10 ms	• Left temperature damper motor • Wire harness and connector • Middle intelligent area control unit
B226B12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB11/ OHB12 short to BAT	5	Event-based	10 ms	• Left temperature damper motor • Wire harness and connector • Middle intelligent area control unit
B226B13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB11/ OHB12 short to open circuit	5	Event-based	10 ms	• Left temperature damper motor • Wire harness and connector • Middle intelligent area control unit
P30B-D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN11 short to BAT or Open	5	Event-based	10 ms	• Left temperature damper motor • Wire harness and connector • Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P30AA11	-	-
B226B11	-	-
B226B12	-	-
B226B13	-	-
P30BD11	-	-

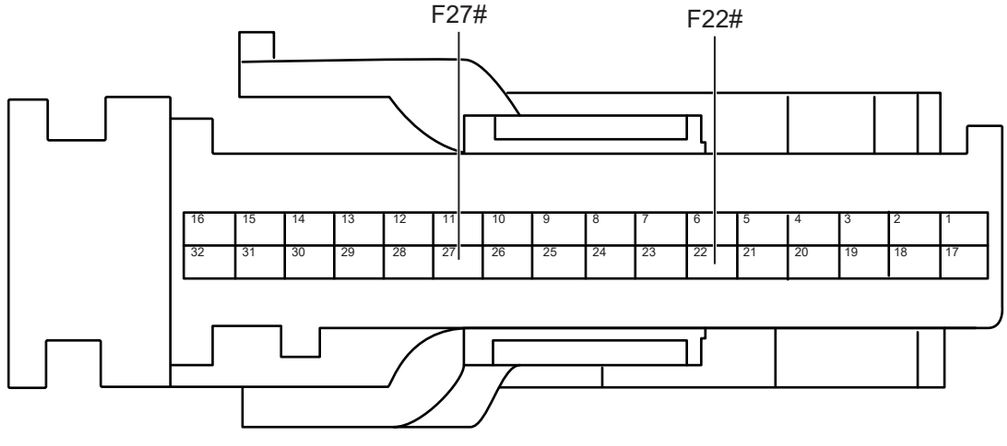
Circuit diagram



PC18100RM

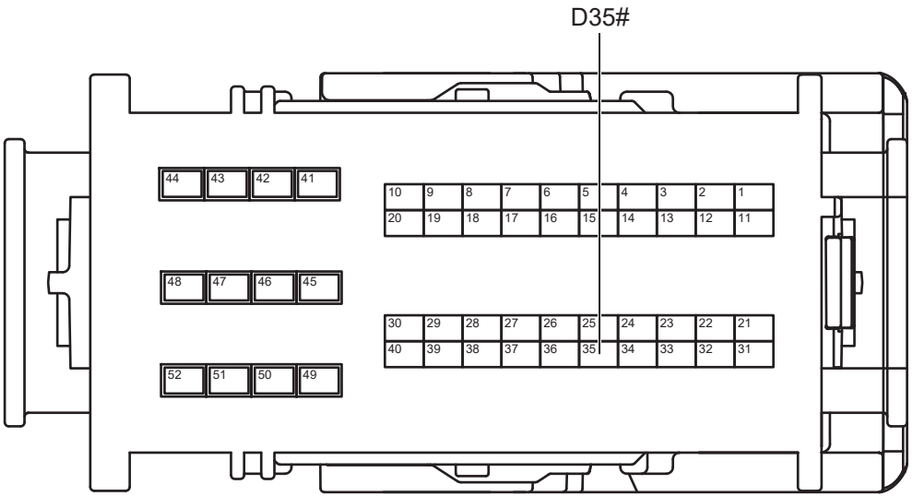
Inspection procedure

1	**Check for open in left temperature damper motor wire harness and connector**



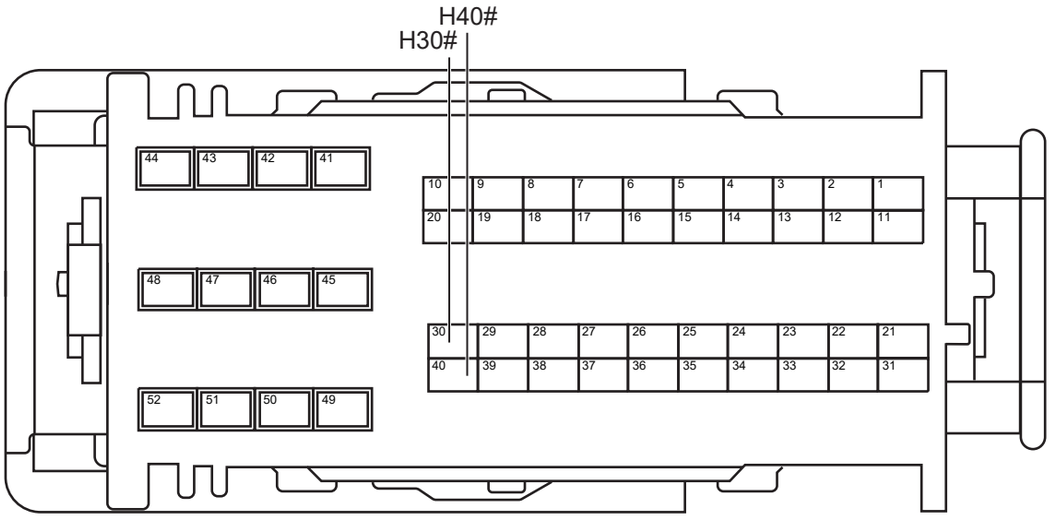
Middle intelligent area control unit F connector

PC18101RM



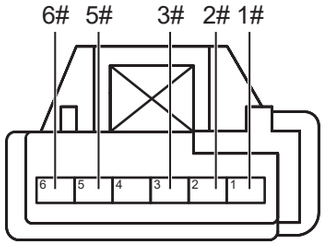
Middle intelligent area control unit D connector

PC17911RM



Middle intelligent area control unit H connector

PC18121RM



Left temperature damper motor connector

PC18130RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the left temperature damper motor connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

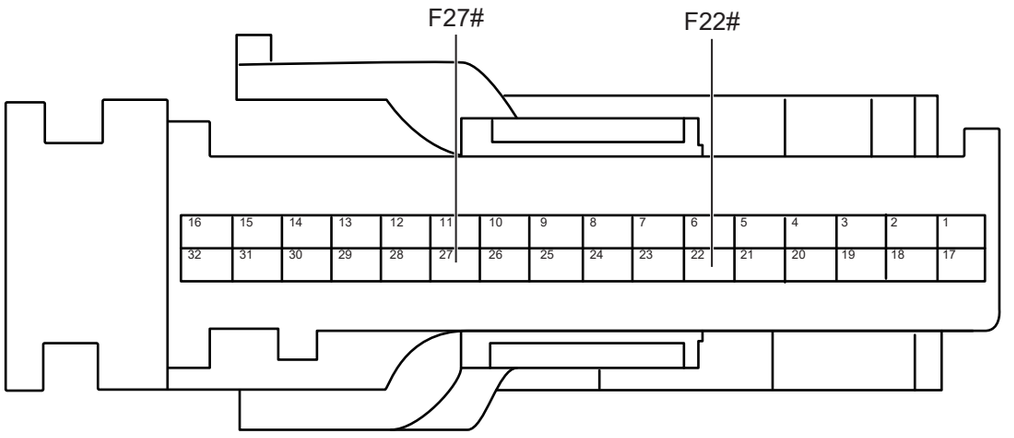
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F27# - left temperature damper motor connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - left temperature damper motor connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D35# - left temperature damper motor connector 3#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H40# - left temperature damper motor connector 5#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector H30# - left temperature damper motor connector 6#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

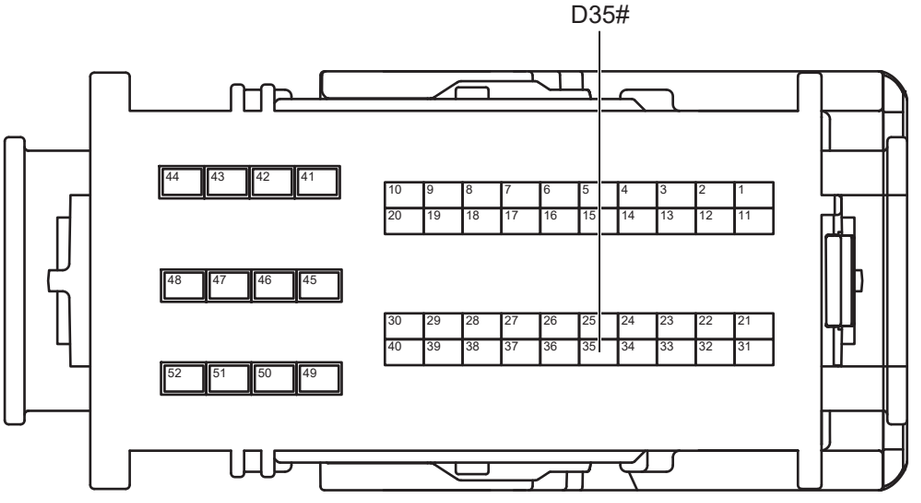
OK

2	**Check for short to ground in left temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

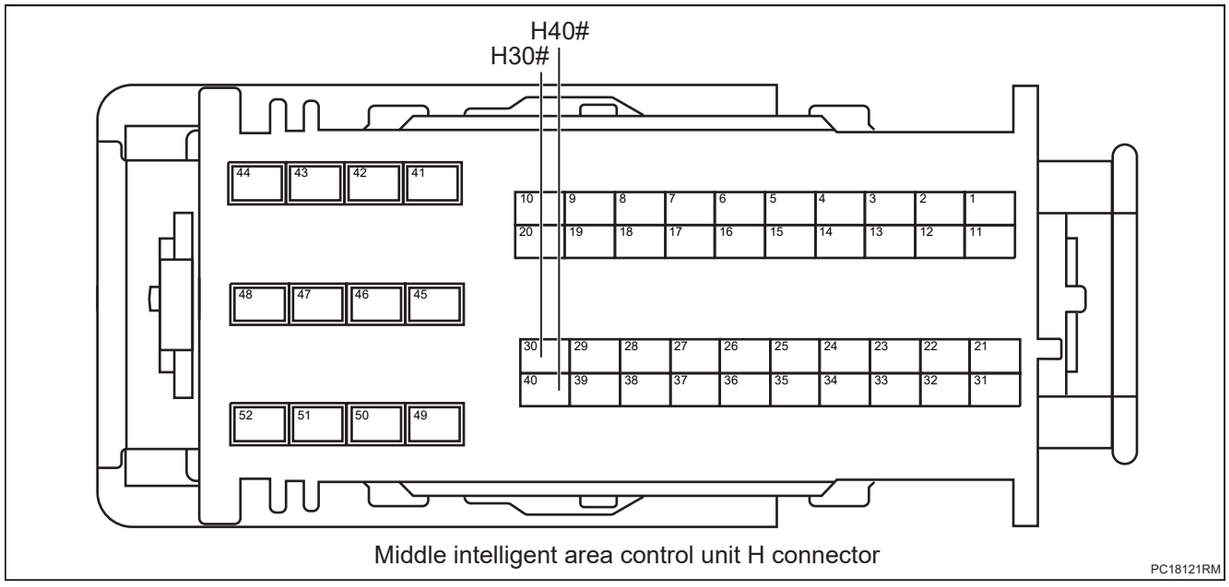
PC18101RM



Middle intelligent area control unit D connector

PC17911RM

ZD



Middle intelligent area control unit H connector

(a) According to value in the table, measure resistance.

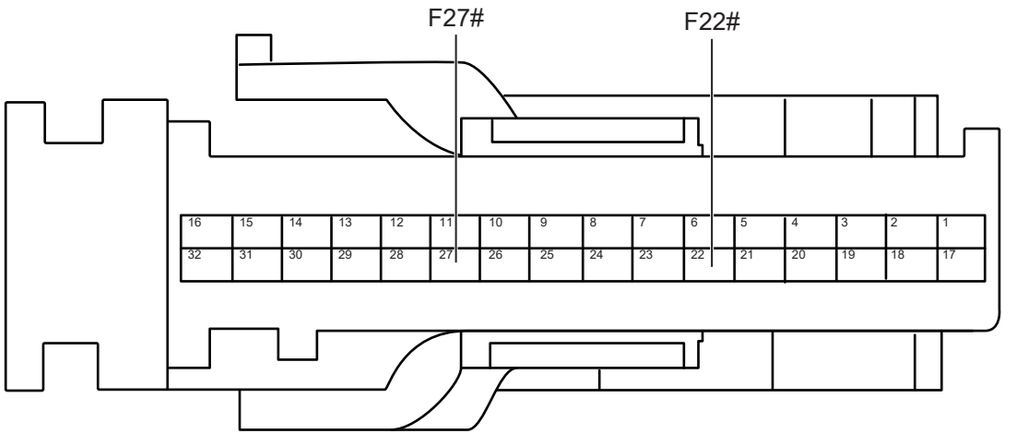
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F27# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D35# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H40# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector H30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

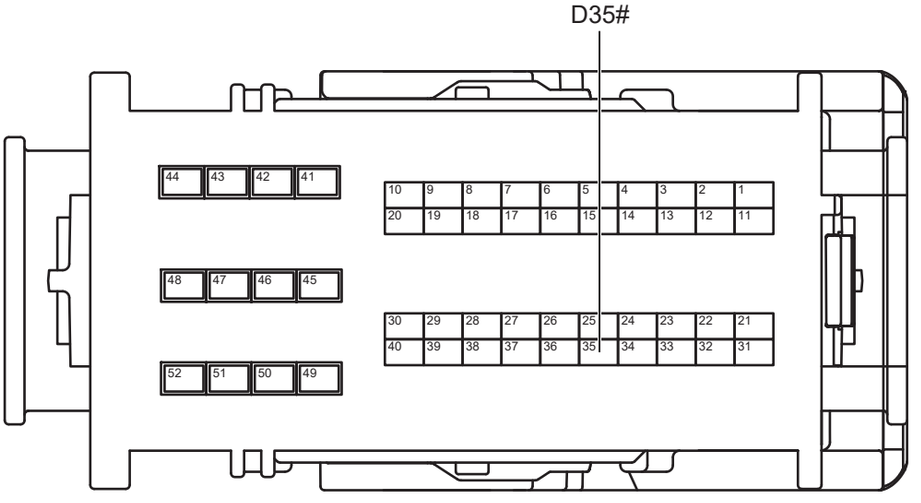
OK

3	**Check for short to power supply in left temperature damper motor wire harness and connector**



Middle intelligent area control unit F connector

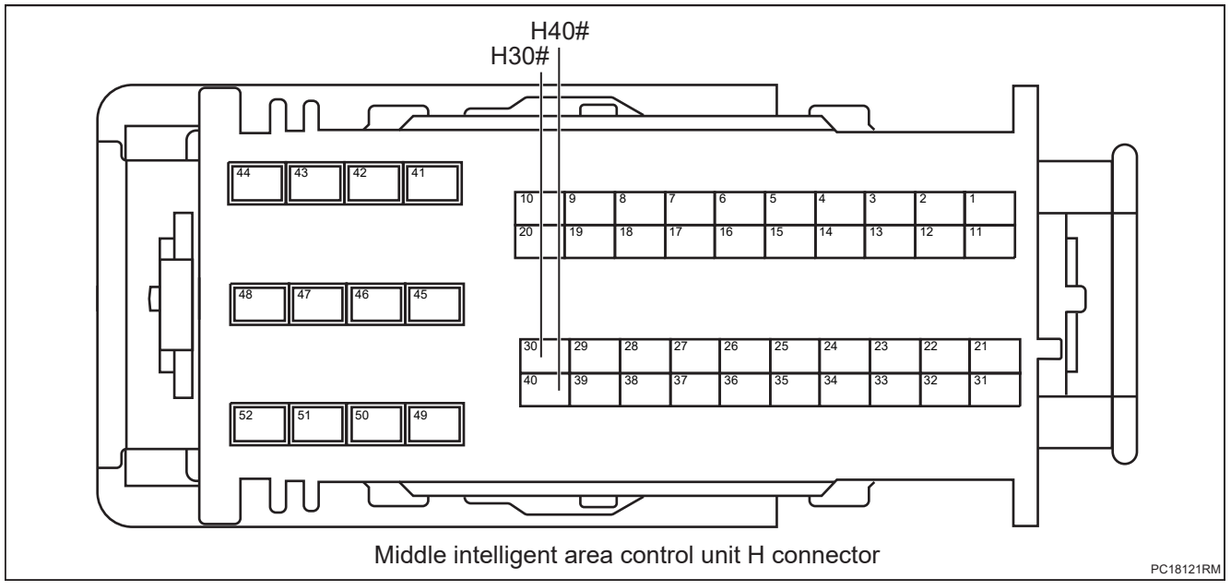
PC18101RM



Middle intelligent area control unit D connector

PC17911RM

ZD



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector F27# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector F22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D35# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H40# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector H30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace left temperature damper motor (See page RE-19)

(a) Replace the left temperature damper motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	P30AD11	Short to ground in instrument panel switch power supply, auxiliary fascia console switch power supply, DP switch (instrument panel headlight switch)

Description

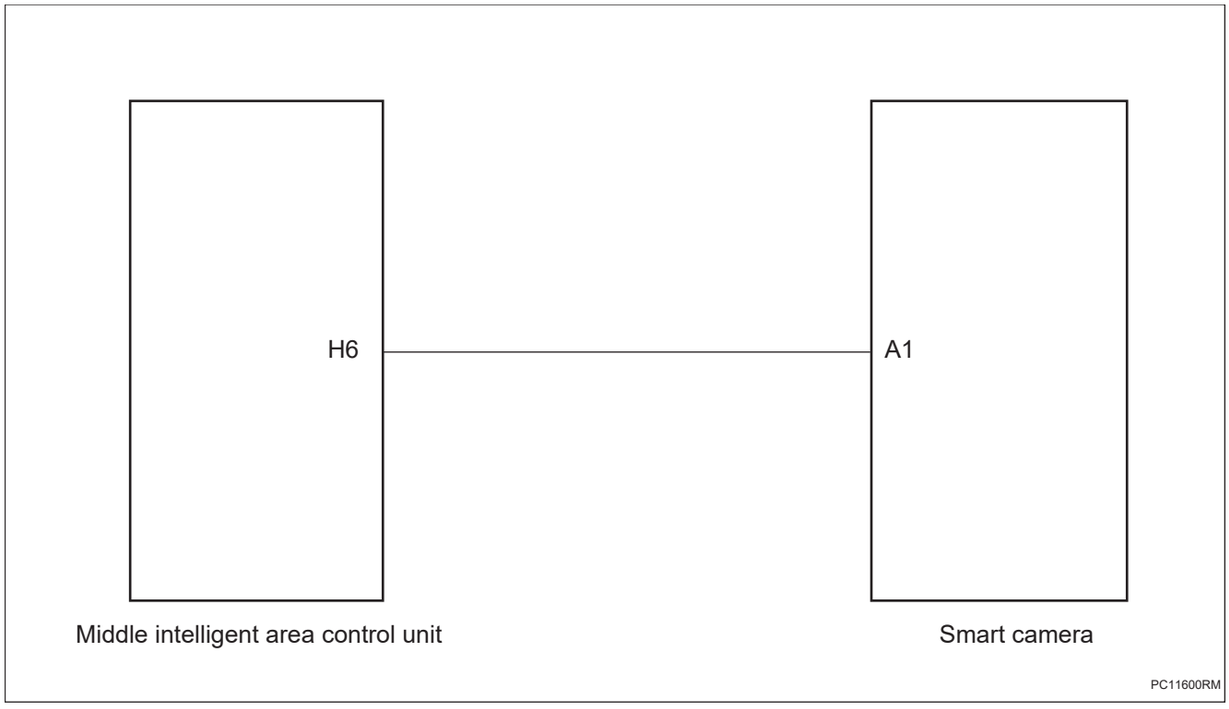
When smart camera power supply circuit is short, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P30A-D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH10 short to GND	5	Event-based	10 ms	• Smart camera • Wire harness and connector • Middle intelligent area control unit

Fault symptom

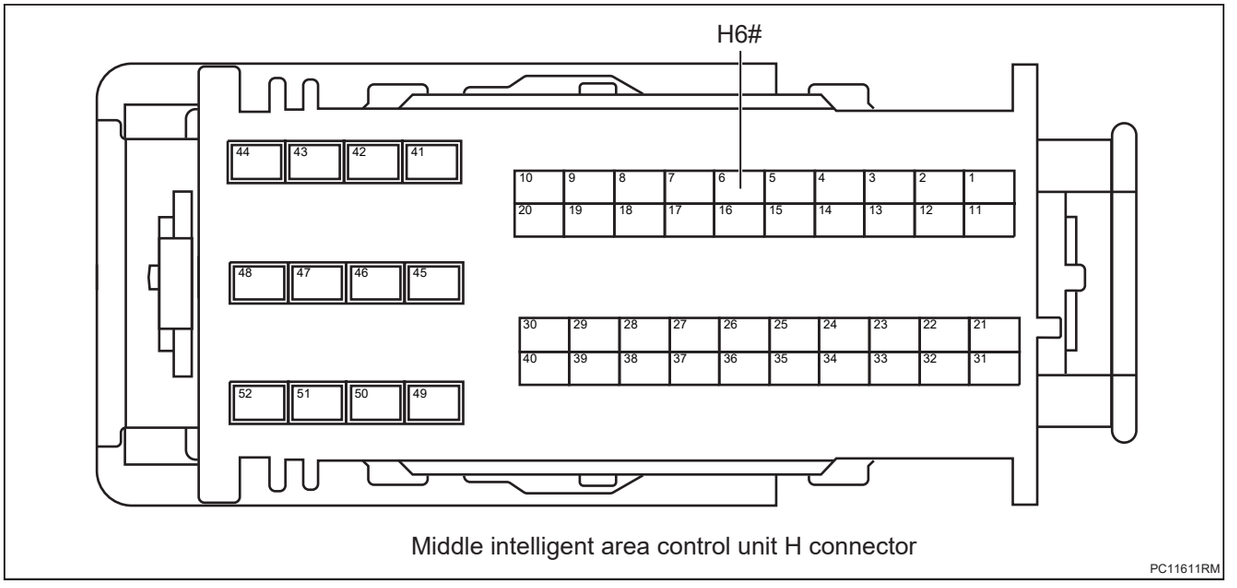
DTC No.	Fault symptom	Warning light/indicator
P30AD11	Anion generator does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit H connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace smart camera (See page ZC-139)**

(a) Replace the smart camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	U102E88	PDCM LIN2 physical bus error
DTC	U218687	Seat cushion motor node lost
DTC	U218787	Seatback motor node lost
DTC	P30889A	Front right seatback ventilation motor error
DTC	P30889B	Front right seatback ventilation motor code pin error
DTC	P30889C	Front right seatback ventilation motor undervoltage error
DTC	P30899A	Front right seatback ventilation motor overvoltage error
DTC	P30899B	Front right seatback ventilation motor overtemperature error

DTC	**P30899C**	**Front right seat cushion ventilation motor error**
DTC	**P308A9A**	**Front right seat cushion ventilation motor code pin error**
DTC	**P308A9B**	**Front right seat cushion ventilation motor undervoltage error**
DTC	**P308A9C**	**Front right seat cushion ventilation motor overvoltage error**
DTC	**P308B9A**	**Front right seat cushion ventilation motor overtemperature error**
DTC	**P308B9B**	**Front right seat cushion ventilation motor fault**
DTC	**P308B9C**	**Front right seatback ventilation motor fault**

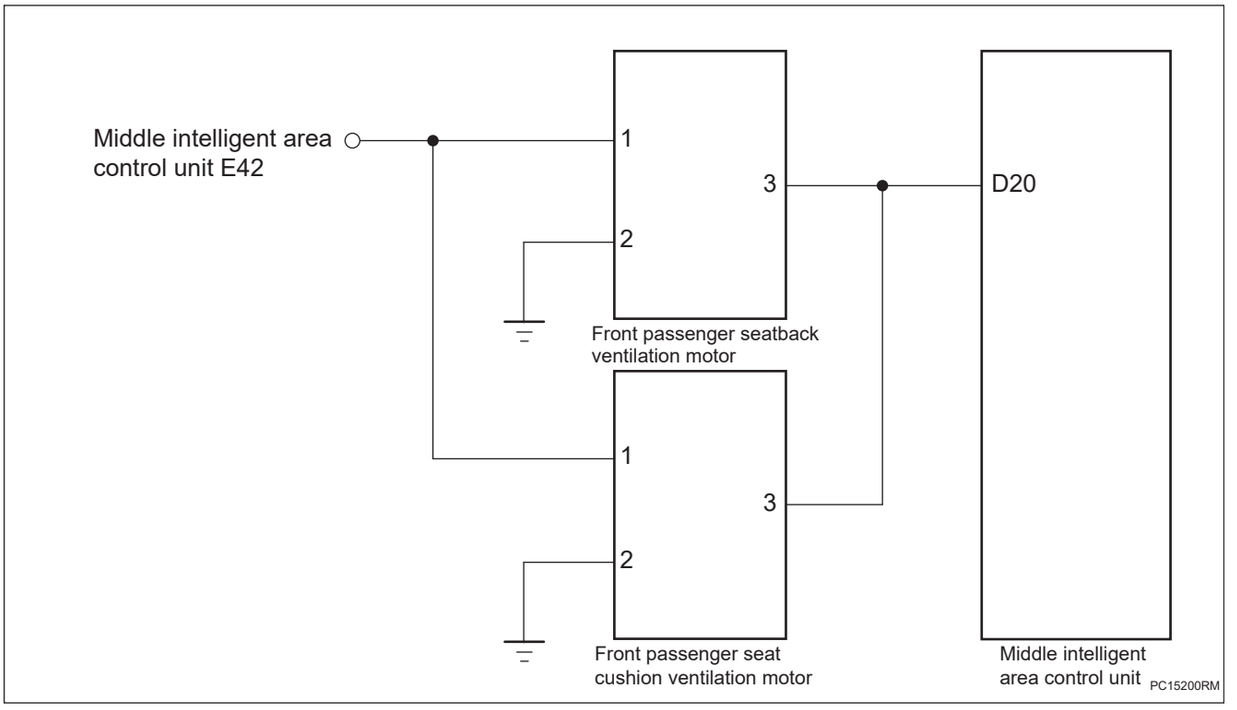
Description

When LIN2 communication between front passenger seat cushion, seatback ventilation motor and middle intelligent area control unit is faulty, the middle intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U102E88	(a) PDCM LIN2 physical bus error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor • Front passenger seatback ventilation motor
U218687	(a) Seat cushion motor node lost.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
U218787	(a) Seatback motor node lost.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor
P30889A	(a) Front right seatback ventilation motor error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor
P30889B	(a) Front right seatback ventilation motor code pin error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor

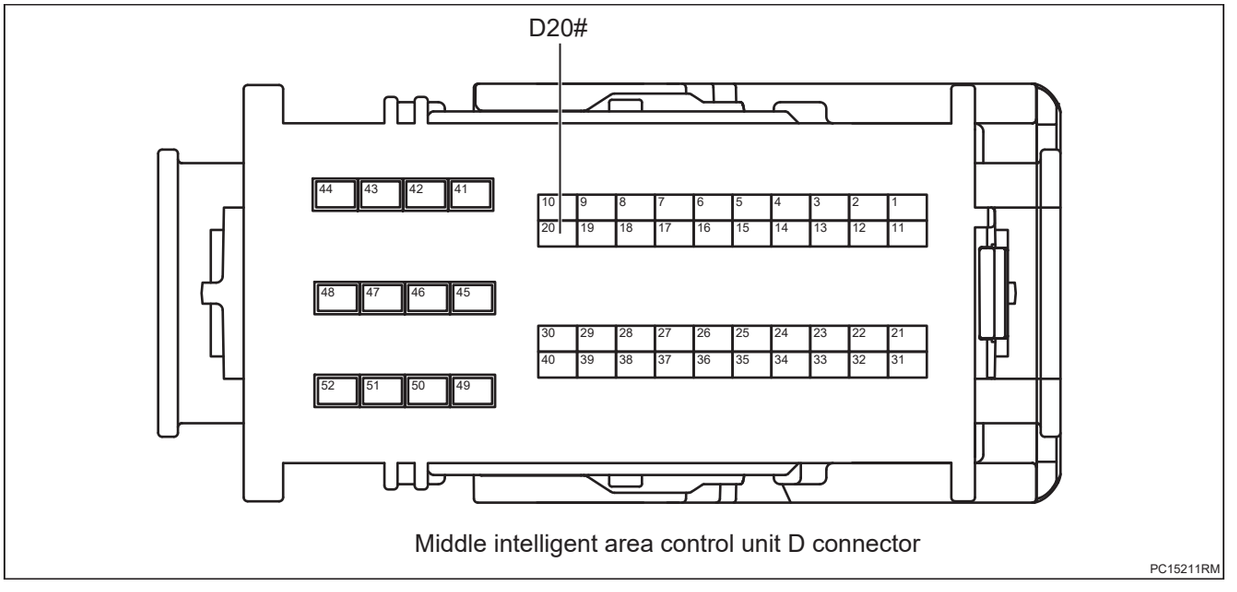
DTC No.	DTC detection condition	Faulty area
P30889C	(a) Front right seatback ventilation motor undervoltage error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor
P30899A	(a) Front right seatback ventilation motor overvoltage error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor
P30899B	(a) Front right seatback ventilation motor overtemperature error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor
P30899C	(a) Front right seat cushion ventilation motor error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308A9A	(a) Front right seat cushion ventilation motor code pin error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308A9B	(a) Front right seat cushion ventilation motor undervoltage error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308A9C	(a) Front right seat cushion ventilation motor overvoltage error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308B9A	(a) Front right seat cushion ventilation motor overtemperature error.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308B9B	(a) Front right seat cushion ventilation motor fault.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seat cushion ventilation motor
P308B9C	(a) Front right seatback ventilation motor fault.	• Middle intelligent area control unit • Wire harness and connector • Front passenger seatback ventilation motor

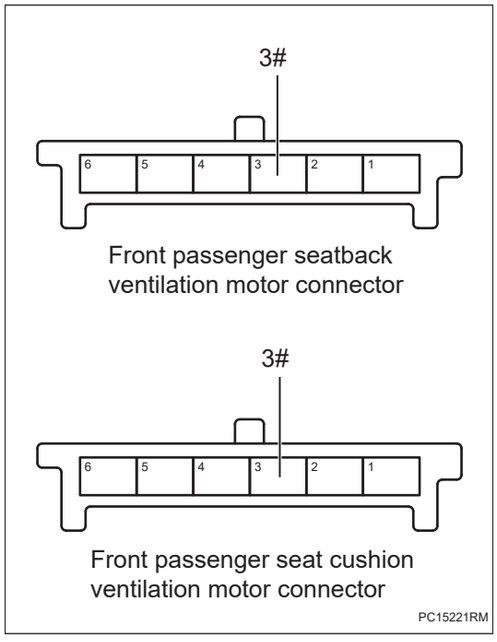
Circuit diagram



Inspection procedure

1	**Check for open in middle intelligent area control unit LIN line (front passenger seatback/seat cushion ventilation motor - middle intelligent area control unit)**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the front passenger seatback ventilation motor connector.

(e) Disconnect the front passenger seat cushion ventilation motor connector.

(f) According to value in the table, measure resistance.

Standard value

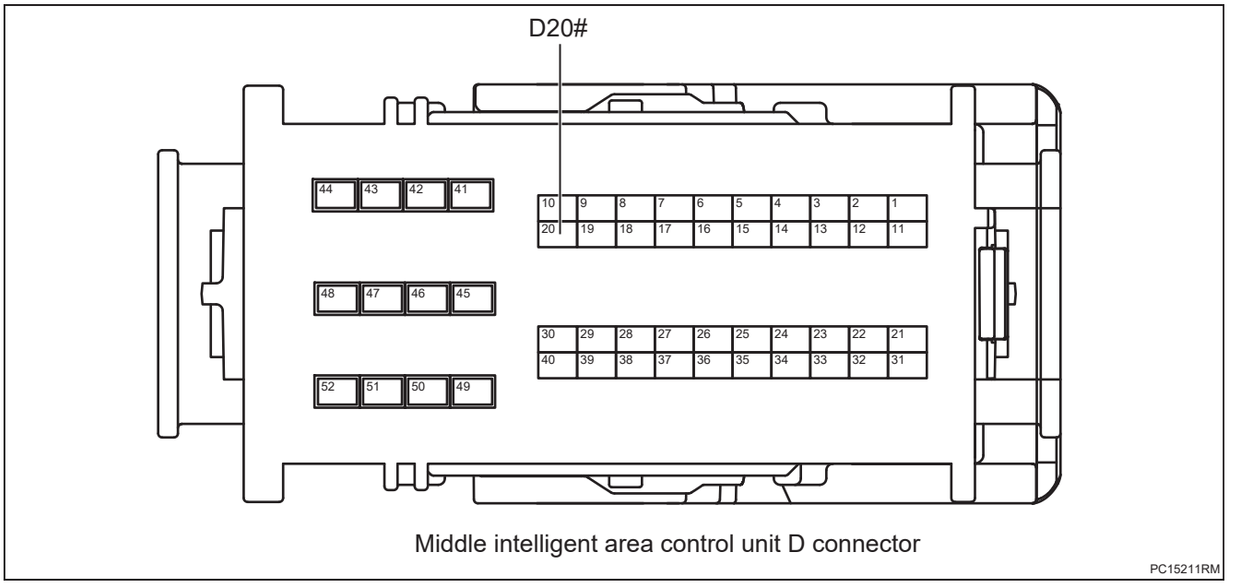
Multimeter connection	Detection condition	Specified condition
Front passenger seatback ventilation motor connector 3# - middle intelligent area control unit connector D20#	Always connected	Less than 1 Ω
Front passenger seat cushion ventilation motor connector 3# - middle intelligent area control unit connector D20#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in middle intelligent area control unit LIN line (front passenger seatback/seat cushion ventilation motor - middle intelligent area control unit)**



Middle intelligent area control unit D connector

PC15211RM

(a) According to value in the table, measure resistance.

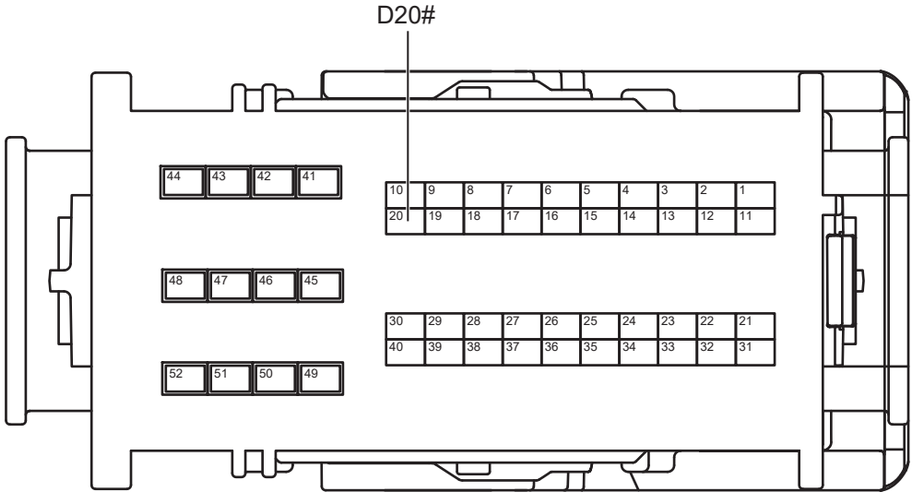
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in middle intelligent area control unit LIN line (front passenger seatback/seat cushion ventilation motor - middle intelligent area control unit)**



Middle intelligent area control unit D connector

PC15211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

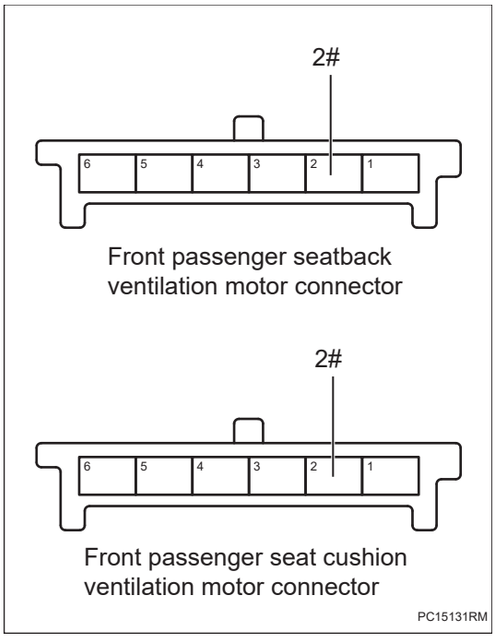
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check front passenger seatback/seat cushion ventilation motor ground



(a) According to value in the table, measure resistance.

Standard value

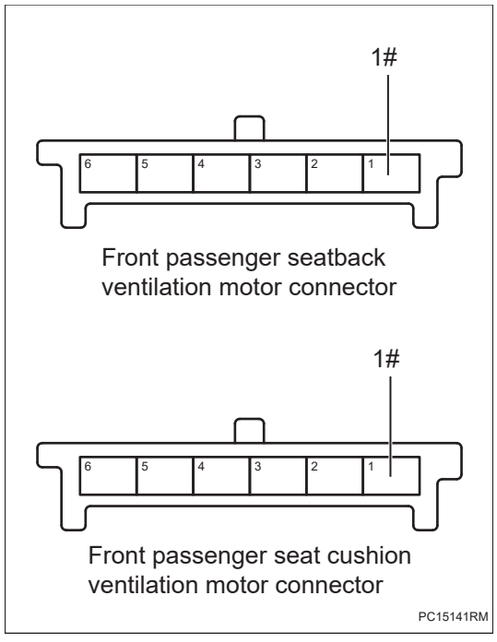
Multimeter connection	Detection condition	Specified condition
Front passenger seatback ventilation motor connector 2# - body ground	Always connected	Less than 1 Ω
Front passenger seat cushion ventilation motor connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check front passenger seatback/seat cushion ventilation motor power supply**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the middle intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seatback ventilation motor connector 3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Front passenger seat cushion ventilation motor connector 3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

6	**Replace front passenger seatback/seat cushion ventilation motor (See page NS-67)**

(a) Replace the front passenger seatback/seat cushion ventilation motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

ZD

Diagnosis ends

DTC	U103088	PDCM LIN4 physical bus error
DTC	P308097	AirPTC overvoltage error
DTC	P308096	AirPTC undervoltage error
DTC	P30809A	AirPTC overtemperature error
DTC	P308191	Short/open in AirPTC temperature sensor
DTC	P308293	Open in AirPTC Mosfet/PTC
DTC	P308299	AirPTC overcurrent error
DTC	P308291	Short in AirPTC Mosfet/PTC
DTC	U21D186	AirPTC communication error
DTC	U21D286	APTC response error

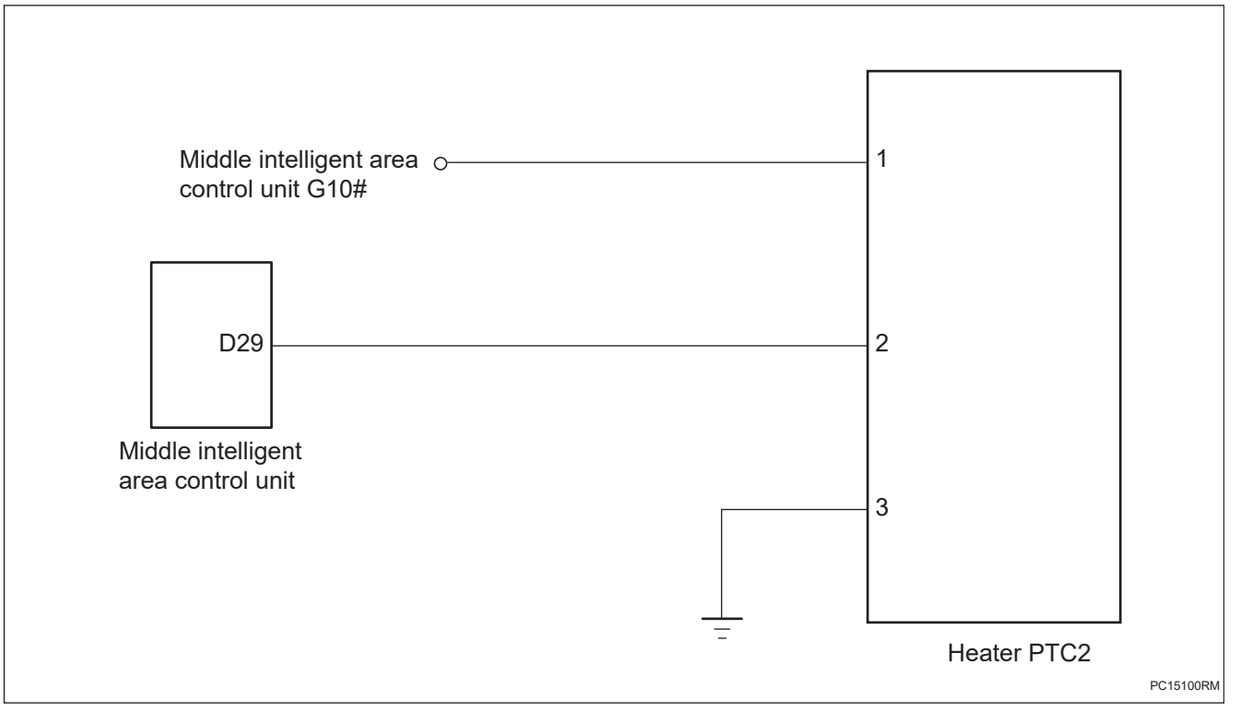
DTC	U218D87	Heater positive temperature coefficient heater node lost

Description

When LIN4 communication between heater PTC2 and middle intelligent area control unit is faulty, the middle intelligent area control unit records DTC.

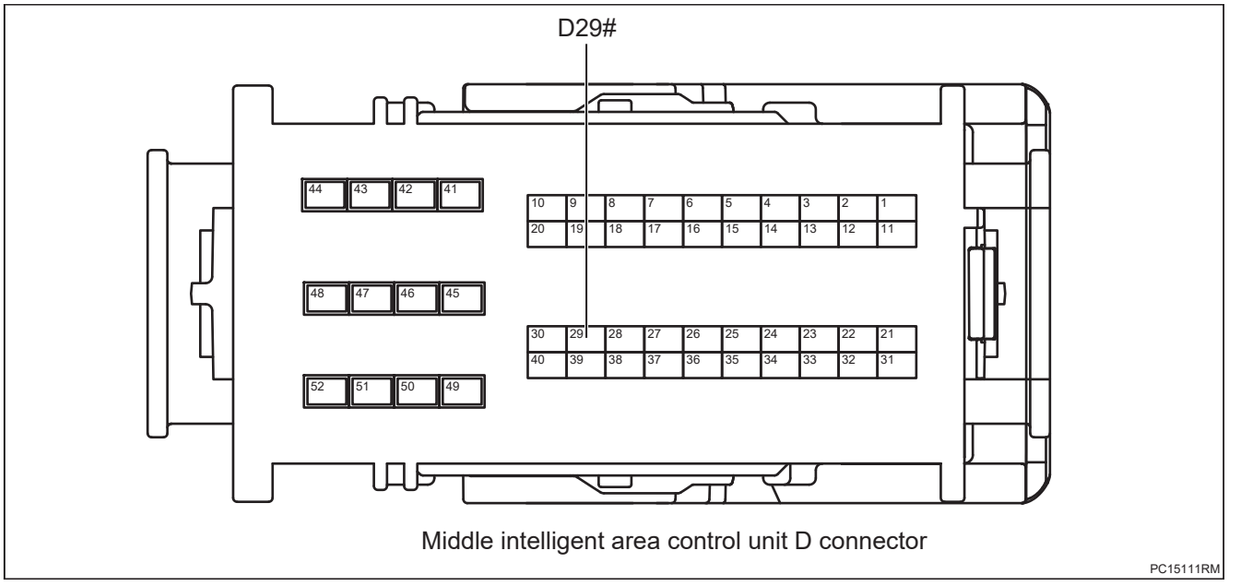
DTC No.	DTC detection condition	Faulty area
U103088	(a) PDCM LIN4 physical bus error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308097	(a) AirPTC overvoltage error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308096	(a) AirPTC undervoltage error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P30809A	(a) AirPTC overtemperature error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308191	(a) Short/open in AirPTC temperature sensor.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308293	(a) Open in AirPTC Mosfet/PTC.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308299	(a) AirPTC overcurrent error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
P308291	(a) Short in AirPTC Mosfet/PTC.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
U21D186	(a) AirPTC communication error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
U21D286	(a) APTC response error.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector
U218D87	(a) Heater positive temperature coefficient heater node lost.	• Heater PTC2 • Middle intelligent area control unit • Wire harness and connector

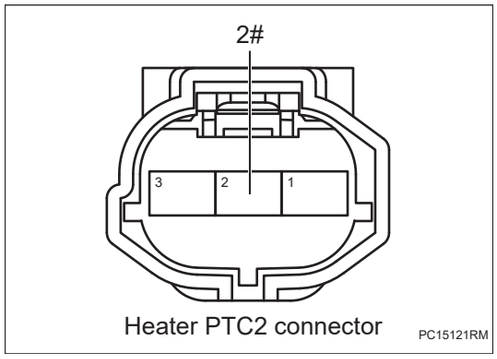
Circuit diagram



Inspection procedure

1	**Check for open in middle intelligent area control unit LIN line (heater PTC2 - middle intelligent area control unit)**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the heater PTC2 connector.

(e) According to value in the table, measure resistance.

Standard value

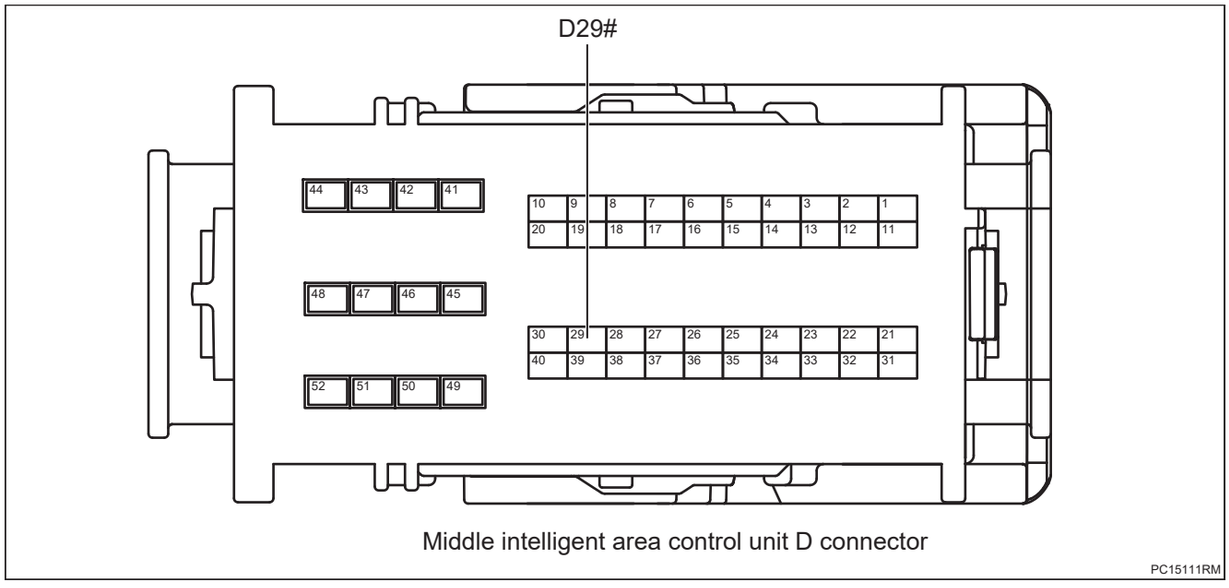
Multimeter connection	Detection condition	Specified condition
Heater PTC2 connector 2# - middle intelligent area control unit connector D29#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in middle intelligent area control unit LIN line (heater PTC2 - middle intelligent area control unit)**



(a) According to value in the table, measure resistance.

Standard value

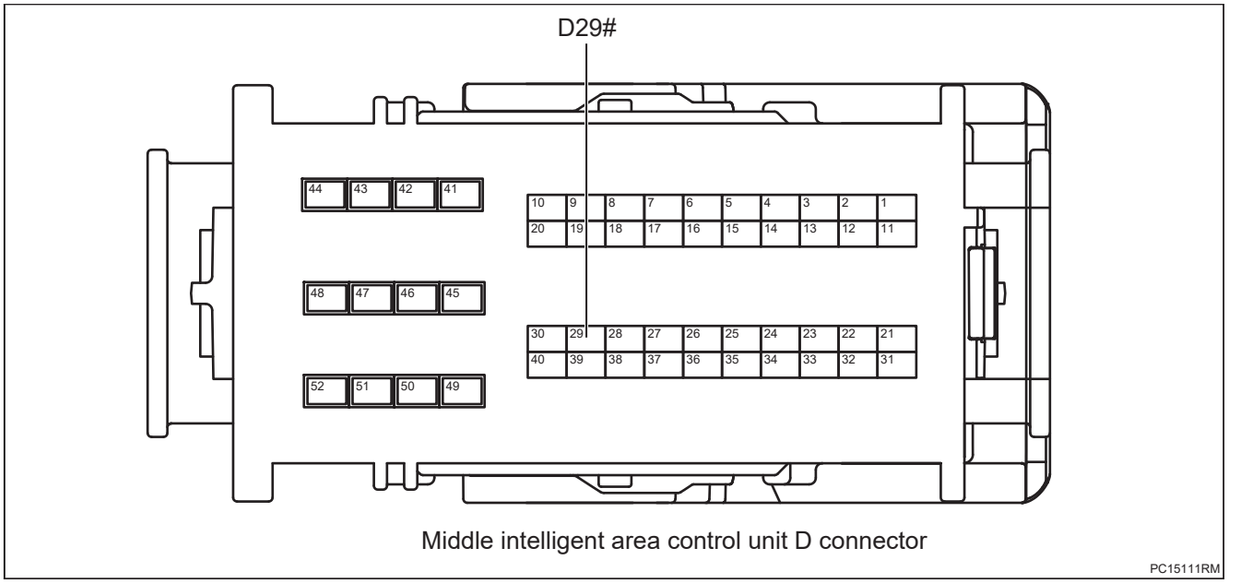
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D29# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in middle intelligent area control unit LIN line (heater PTC2 - middle intelligent area control unit)**



Middle intelligent area control unit D connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

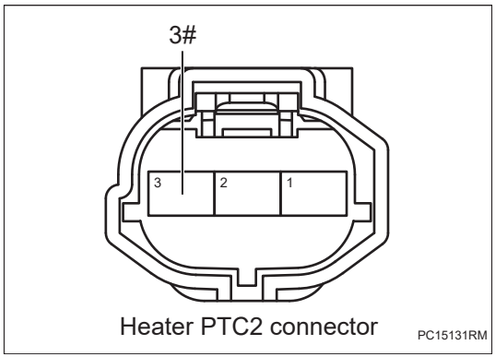
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D29# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check heater PTC2 ground**



Heater PTC2 connector PC15131RM

(a) According to value in the table, measure resistance.

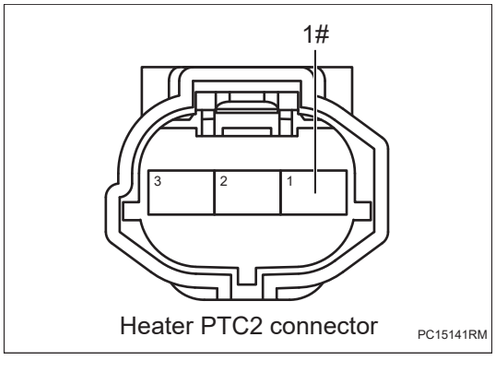
Standard value

Multimeter connection	Detection condition	Specified condition
Heater PTC2 connector 3#- - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check heater PTC2 power supply**



Heater PTC2 connector PC15141RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the middle intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Heater PTC2 connector 1#- - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

ZD

6	**Replace heater PTC2 (See page RE-19)**

(a) Replace the heater PTC2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	U103288	PDCM LIN6 physical bus error

DTC	U218E87	A/C outlet left air outlet left/right motor node lost
DTC	U218F87	A/C outlet left air outlet upper/lower motor node lost
DTC	U219087	A/C outlet left center air outlet left/right motor node lost
DTC	U219187	A/C outlet left center air outlet upper/lower motor node lost
DTC	U219287	A/C outlet right center air outlet left/right motor node lost
DTC	U219387	A/C outlet right center air outlet upper/lower motor node lost
DTC	U219487	A/C outlet right air outlet left/right motor node lost
DTC	U219587	A/C outlet right air outlet upper/lower motor node lost
DTC	U21E586	A/C outlet left air outlet left/right motor communication fault
DTC	U21E686	A/C outlet left air outlet upper/lower motor communication fault
DTC	U21E786	A/C outlet left center air outlet left/right motor communication fault
DTC	U21E886	A/C outlet left center air outlet upper/lower motor communication fault
DTC	U21E986	A/C outlet right center air outlet left/right motor communication fault
DTC	U21EA86	A/C outlet right center air outlet upper/lower motor communication fault
DTC	U21EB86	A/C outlet right air outlet left/right motor communication fault
DTC	U21EC86	A/C outlet right air outlet upper/lower motor communication fault

DTC	P308E9A	A/C outlet left air outlet left/right motor overtemperature fault
DTC	P308E9B	A/C outlet left air outlet left/right motor electrical fault
DTC	P308E96	A/C outlet left air outlet left/right motor undervoltage fault
DTC	P308E97	A/C outlet left air outlet left/right motor overvoltage fault
DTC	P308E93	Open in A/C outlet left air outlet left/right motor
DTC	P308E91	Short in A/C outlet left air outlet left/right motor
DTC	P308F9A	A/C outlet left air outlet upper/lower motor overtemperature fault
DTC	P308F9B	A/C outlet left air outlet upper/lower motor electrical fault
DTC	P308F96	A/C outlet left air outlet upper/lower motor undervoltage fault
DTC	P308F97	A/C outlet left air outlet upper/lower motor overvoltage fault
DTC	P308F93	Open in A/C outlet left air outlet upper/lower motor
DTC	P308F91	Short in A/C outlet left air outlet upper/lower motor
DTC	P30909A	A/C outlet left center air outlet left/right motor overtemperature fault
DTC	P30909B	A/C outlet left center air outlet left/right motor electrical fault
DTC	P309096	A/C outlet left center air outlet left/right motor undervoltage fault
DTC	P309097	A/C outlet left center air outlet left/right motor overvoltage fault

DTC	P309093	Open in A/C outlet left center air outlet left/ right motor
DTC	P309091	Short in A/C outlet left center air outlet left/ right motor
DTC	P30919A	A/C outlet left center air outlet upper/lower motor overtemperature fault
DTC	P30919B	A/C outlet left center air outlet upper/lower motor electrical fault
DTC	P309196	A/C outlet left center air outlet upper/lower motor undervoltage fault
DTC	P309197	A/C outlet left center air outlet upper/lower motor overvoltage fault
DTC	P309193	Open in A/C outlet left center air outlet upper/lower motor
DTC	P309191	Short in A/C outlet left center air outlet upper/lower motor
DTC	P30929A	A/C outlet right center air outlet left/right motor overtemperature fault
DTC	P30929B	A/C outlet right center air outlet left/right motor electrical fault
DTC	P309296	A/C outlet right center air outlet left/right motor undervoltage fault
DTC	P309297	A/C outlet right center air outlet left/right motor overvoltage fault
DTC	P309293	Open in A/C outlet right center air outlet left/ right motor
DTC	P309291	Short in A/C outlet right center air outlet left/ right motor
DTC	P30939A	A/C outlet right center air outlet upper/lower motor overtemperature fault
DTC	P30939B	A/C outlet right center air outlet upper/lower motor electrical fault

DTC	P309396	A/C outlet right center air outlet upper/lower motor undervoltage fault
DTC	P309397	A/C outlet right center air outlet upper/lower motor overvoltage fault
DTC	P309393	Open in A/C outlet right center air outlet upper/lower motor
DTC	P309391	Short in A/C outlet right center air outlet upper/lower motor
DTC	P30949A	A/C outlet right air outlet left/right motor overtemperature fault
DTC	P30949B	A/C outlet right air outlet left/right motor electrical fault
DTC	P309496	A/C outlet right air outlet left/right motor undervoltage fault
DTC	P309497	A/C outlet right air outlet left/right motor overvoltage fault
DTC	P309493	Open in A/C outlet right air outlet left/right motor
DTC	P309491	Short in A/C outlet right air outlet left/right motor
DTC	P30959A	A/C outlet right air outlet upper/lower motor overtemperature fault
DTC	P30959B	A/C outlet right air outlet upper/lower motor electrical fault
DTC	P309596	A/C outlet right air outlet upper/lower motor undervoltage fault
DTC	P309597	A/C outlet right air outlet upper/lower motor overvoltage fault
DTC	P309593	Open in A/C outlet right air outlet upper/ lower motor

DTC	P309591	Short in A/C outlet right air outlet upper/ lower motor

Description

When LIN6 communication between air outlet motor and middle intelligent area control unit is faulty, the middle intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U103288	(a) PDCM LIN6 physical bus error.	• Left outlet motor - left/right • Left outlet motor - up/down • Center left outlet motor - left/right • Center left outlet motor - up/down • Center right outlet motor - up/down • Center right outlet motor - left/right • Right outlet motor - up/down • Right outlet motor - left/right • Electric outlet filter voltage regulator module • Middle intelligent area control unit • Wire harness and connector
U218E87	(a) A/C outlet left air outlet left/right motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U218F87	(a) A/C outlet left air outlet upper/lower motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219087	(a) A/C outlet left center air outlet left/right motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219187	(a) A/C outlet left center air outlet upper/ lower motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219287	(a) A/C outlet right center air outlet left/right motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219387	(a) A/C outlet right center air outlet upper/ lower motor node lost.	• Electric outlet filter voltage regulator module

DTC No.	DTC detection condition	Faulty area
		• Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219487	(a) A/C outlet right air outlet left/right motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U219587	(a) A/C outlet right air outlet upper/lower motor node lost.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21E586	(a) A/C outlet left air outlet left/right motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21E686	(a) A/C outlet left air outlet upper/lower motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21E786	(a) A/C outlet left center air outlet left/right motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21E886	(a) A/C outlet left center air outlet upper/ lower motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21E986	(a) A/C outlet right center air outlet left/right motor communication fault.	• Electric outlet filter voltage regulator module • Middle intelligent area control unit • Wire harness and connector
U21EA86	(a) A/C outlet right center air outlet upper/ lower motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
U21EB86	(a) A/C outlet right air outlet left/right motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector

DTC No.	DTC detection condition	Faulty area
U21EC86	(a) A/C outlet right air outlet upper/lower motor communication fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E9A	(a) A/C outlet left air outlet left/right motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E9B	(a) A/C outlet left air outlet left/right motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E96	(a) A/C outlet left air outlet left/right motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E97	(a) A/C outlet left air outlet left/right motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E93	(a) Open in A/C outlet left air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308E91	(a) Short in A/C outlet left air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308F9A	(a) A/C outlet left air outlet upper/lower motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308F9B	(a) A/C outlet left air outlet upper/lower motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308F96	(a) A/C outlet left air outlet upper/lower motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor

DTC No.	DTC detection condition	Faulty area
		• Middle intelligent area control unit • Wire harness and connector
P308F97	(a) A/C outlet left air outlet upper/lower motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308F93	(a) Open in A/C outlet left air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P308F91	(a) Short in A/C outlet left air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30909A	(a) A/C outlet left center air outlet left/right motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30909B	(a) A/C outlet left center air outlet left/right motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309096	(a) A/C outlet left center air outlet left/right motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309097	(a) A/C outlet left center air outlet left/right motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309093	(a) Open in A/C outlet left center air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309091	(a) Short in A/C outlet left center air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector

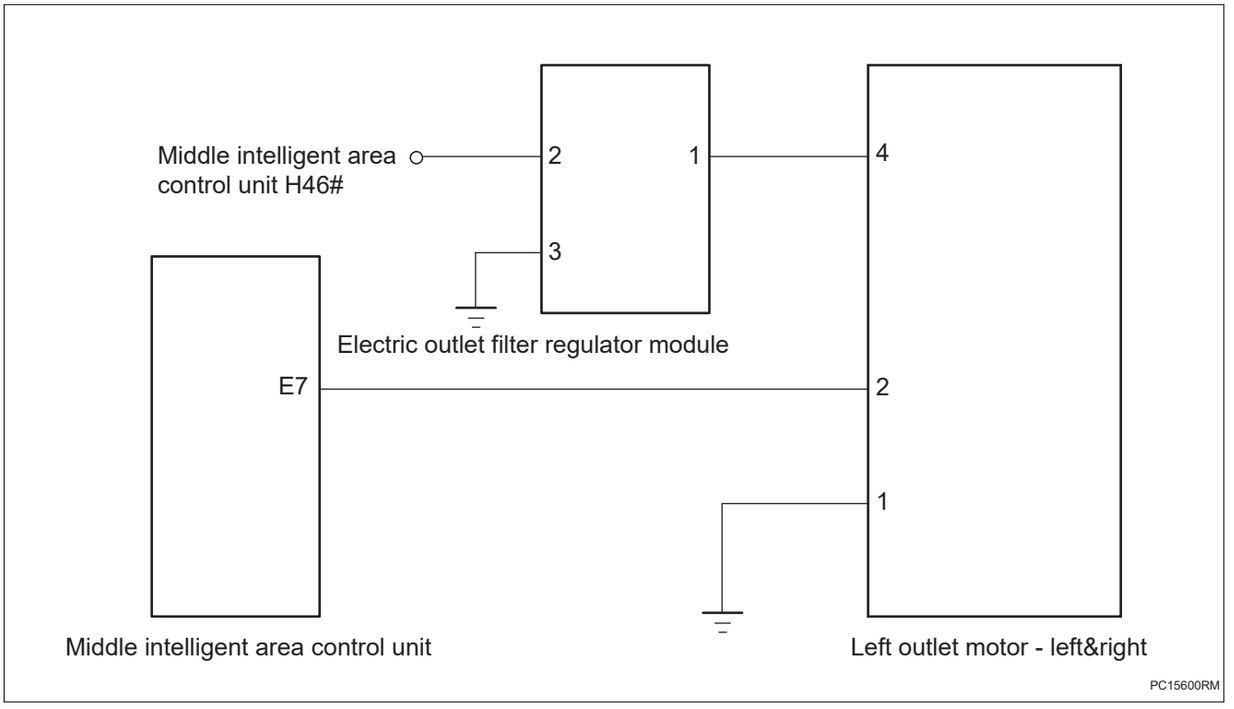
DTC No.	DTC detection condition	Faulty area
P30919A	(a) A/C outlet left center air outlet upper/ lower motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30919B	(a) A/C outlet left center air outlet upper/ lower motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309196	(a) A/C outlet left center air outlet upper/ lower motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309197	(a) A/C outlet left center air outlet upper/ lower motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309193	(a) Open in A/C outlet left center air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309191	(a) Short in A/C outlet left center air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30929A	(a) A/C outlet right center air outlet left/right motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30929B	(a) A/C outlet right center air outlet left/right motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309296	(a) A/C outlet right center air outlet left/right motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309297	(a) A/C outlet right center air outlet left/right motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor

DTC No.	DTC detection condition	Faulty area
		• Middle intelligent area control unit • Wire harness and connector
P309293	(a) Open in A/C outlet right center air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309291	(a) Short in A/C outlet right center air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30939A	(a) A/C outlet right center air outlet upper/lower motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30939B	(a) A/C outlet right center air outlet upper/lower motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309396	(a) A/C outlet right center air outlet upper/lower motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309397	(a) A/C outlet right center air outlet upper/lower motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309393	(a) Open in A/C outlet right center air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309391	(a) Short in A/C outlet right center air outlet upper/lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30949A	(a) A/C outlet right air outlet left/right motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector

DTC No.	DTC detection condition	Faulty area
P30949B	(a) A/C outlet right air outlet left/right motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309496	(a) A/C outlet right air outlet left/right motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309497	(a) A/C outlet right air outlet left/right motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309493	(a) Open in A/C outlet right air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309491	(a) Short in A/C outlet right air outlet left/right motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30959A	(a) A/C outlet right air outlet upper/lower motor overtemperature fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P30959B	(a) A/C outlet right air outlet upper/lower motor electrical fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309596	(a) A/C outlet right air outlet upper/lower motor undervoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309597	(a) A/C outlet right air outlet upper/lower motor overvoltage fault.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector

DTC No.	DTC detection condition	Faulty area
P309593	(a) Open in A/C outlet right air outlet upper/ lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector
P309591	(a) Short in A/C outlet right air outlet upper/ lower motor.	• Electric outlet filter voltage regulator module • Air outlet motor • Middle intelligent area control unit • Wire harness and connector

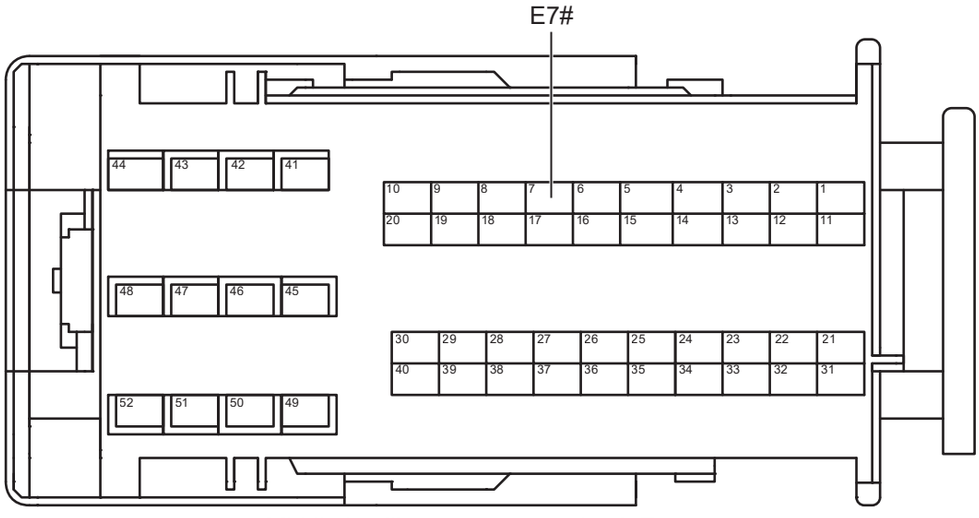
Circuit diagram



Inspection procedure

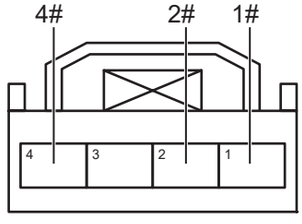
Note: Taking the left outlet motor - left/right fault as an example, and DTC analysis steps for other components are similar.

1	**Check for open in left outlet motor (left and right) wire harness and connector**

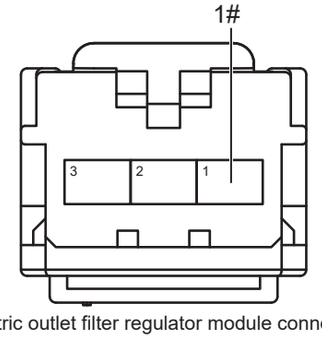


Middle intelligent area control unit E connector

PC15611RM



Left outlet motor - left&right connector



Electric outlet filter regulator module connector

PC15620RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the electric outlet filter voltage regulator module connector.

(e) Disconnect the left outlet motor - left and right connector.

(f) According to value in the table, measure resistance.

Standard value

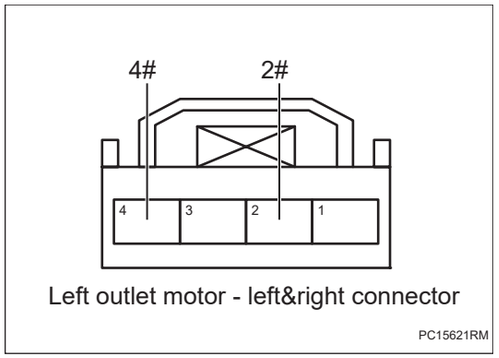
Multimeter connection	Detection condition	Specified condition
Left outlet motor - left and right connector 2# - middle intelligent area control unit connector E7#	Always connected	Less than 1 Ω
Left outlet motor - left and right connector 4# - electric outlet filter voltage regulator module connector 1#	Always connected	Less than 1 Ω
Left outlet motor - left and right connector 1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to ground in left outlet motor (left and right) wire harness and connector**



Left outlet motor - left&right connector

PC15621RM

(a) According to value in the table, measure resistance.

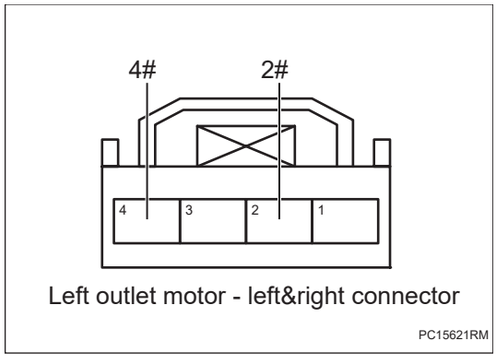
Standard value

Multimeter connection	Detection condition	Specified condition
Left outlet motor - left and right connector 4# - body ground	Always connected	10 KΩ or more
Left outlet motor - left and right connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in left outlet motor (left and right) wire harness and connector**



Left outlet motor - left&right connector

PC15621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

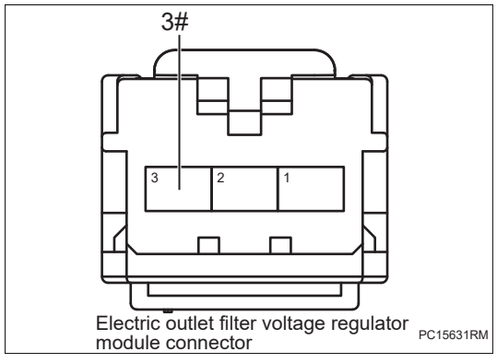
Standard value

Multimeter connection	Detection condition	Specified condition
Left outlet motor - left and right connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Left outlet motor - left and right connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric outlet filter voltage regulator module ground**



(a) According to value in the table, measure resistance.

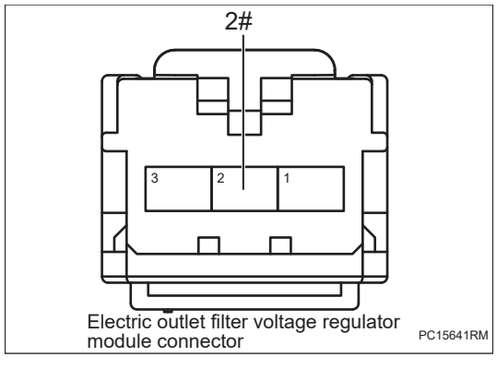
Standard value

Multimeter connection	Detection condition	Specified condition
Electric outlet filter voltage regulator module connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check electric outlet filter voltage regulator module power supply**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the middle intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric outlet filter voltage regulator module connector 2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

6	**Replace left air outlet motor - left/right (See page RE-41)**

ZD

(a) Replace the left air outlet motor - left/right.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric outlet filter voltage regulator module (See page RE-44)**

OK

Replace middle intelligent area control unit (See page ZC-132)

DTC	**U103388**	**PDCM LIN7 physical bus error**
DTC	**U02FA87**	**Multi-function steering wheel switch node lost**

DTC	**U21E286**	**Multi-function steering wheel LIN node communication fault**
DTC	**B220397**	**Multi-function steering wheel LIN node overvoltage fault**
DTC	**B220396**	**Multi-function steering wheel LIN node undervoltage fault**
DTC	**B22039A**	**Multi-function steering wheel LIN node left switch stuck fault**
DTC	**B22039B**	**Multi-function steering wheel LIN node right switch stuck fault**
DTC	**B22039C**	**Multi-function steering wheel LIN node internal fault**
DTC	**B22039F**	**Multi-function steering wheel LIN node acceleration switch fault**

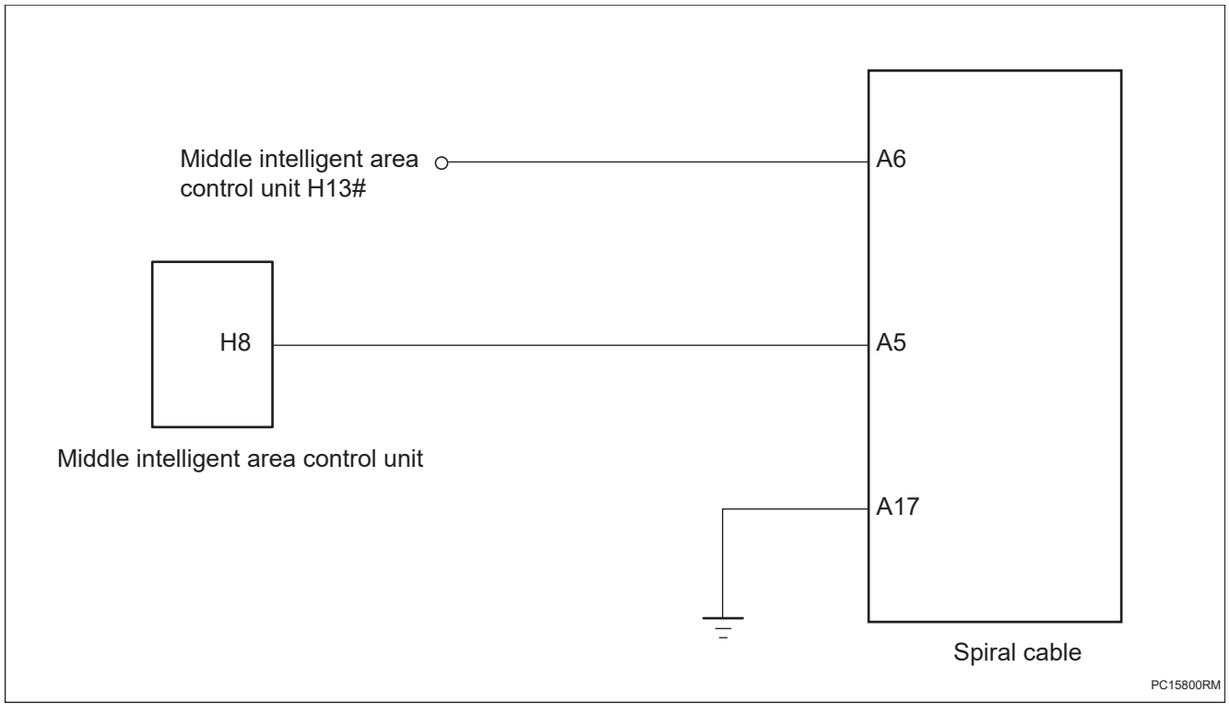
Description

When LIN7 communication between spiral cable and middle intelligent area control unit is faulty, the middle intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U103388	(a) PDCM LIN7 physical bus error.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
U02FA87	(a) Multi-function steering wheel switch node lost.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
U21E286	(a) Multi-function steering wheel LIN node communication fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
B220397	(a) Multi-function steering wheel LIN node overvoltage fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
B220396	(a) Multi-function steering wheel LIN node undervoltage fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
B22039A	(a) Multi-function steering wheel LIN node left switch stuck fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
B22039B	(a) Multi-function steering wheel LIN node right switch stuck fault.	• Spiral cable • Middle intelligent area control unit

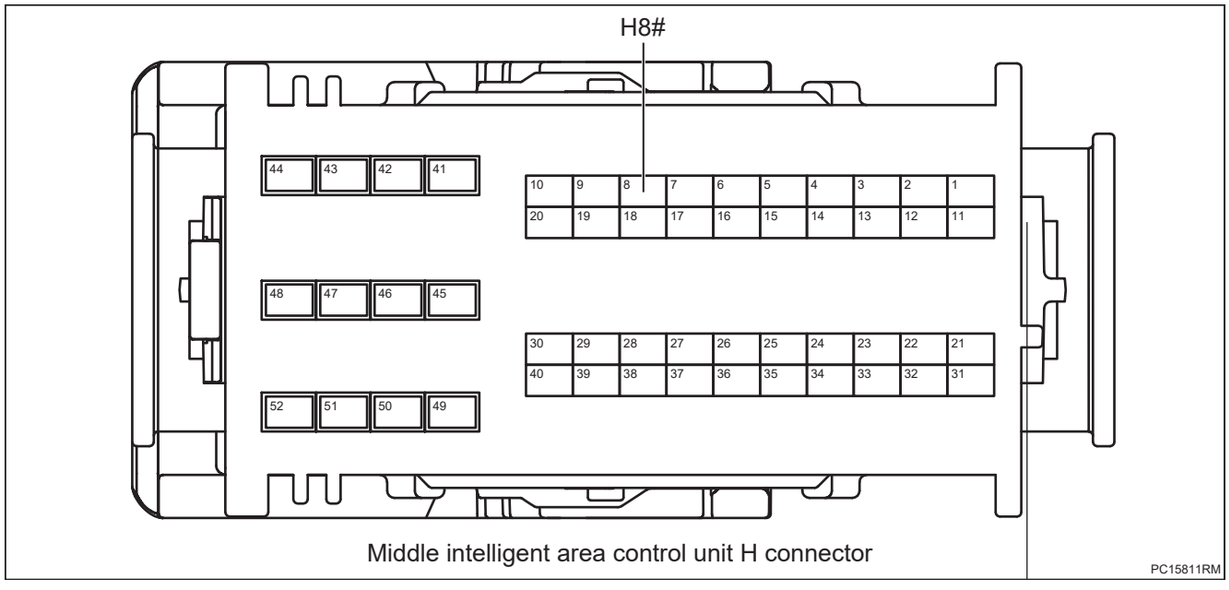
DTC No.	DTC detection condition	Faulty area
		• Wire harness and connector
B22039C	(a) Multi-function steering wheel LIN node internal fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector
B22039F	(a) Multi-function steering wheel LIN node acceleration switch fault.	• Spiral cable • Middle intelligent area control unit • Wire harness and connector

Circuit diagram

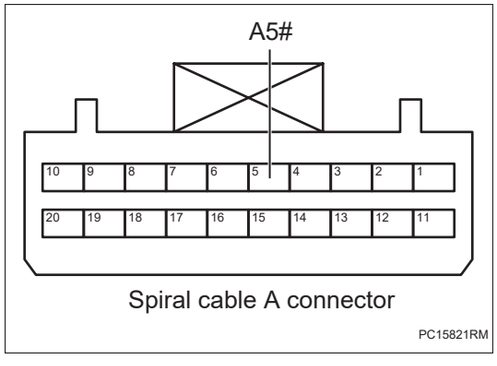


Inspection procedure

1	**Check for open in middle intelligent area control unit LIN line (spiral cable - middle intelligent area control unit)**



Middle intelligent area control unit H connector



Spiral cable A connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the spiral cable connector.

(e) According to value in the table, measure resistance.

Standard value

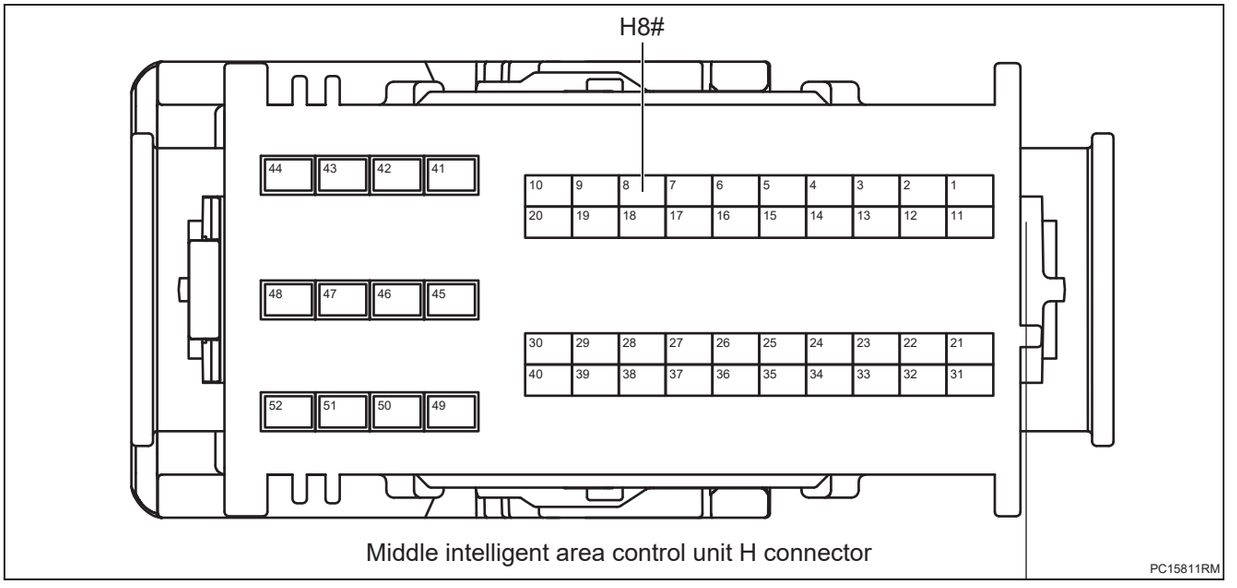
Multimeter connection	Detection condition	Specified condition
Spiral cable connector A5# - middle intelligent area control unit connector H8#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to ground in middle intelligent area control unit LIN line (spiral cable - middle intelligent area control unit)**



Middle intelligent area control unit H connector

(a) According to value in the table, measure resistance.

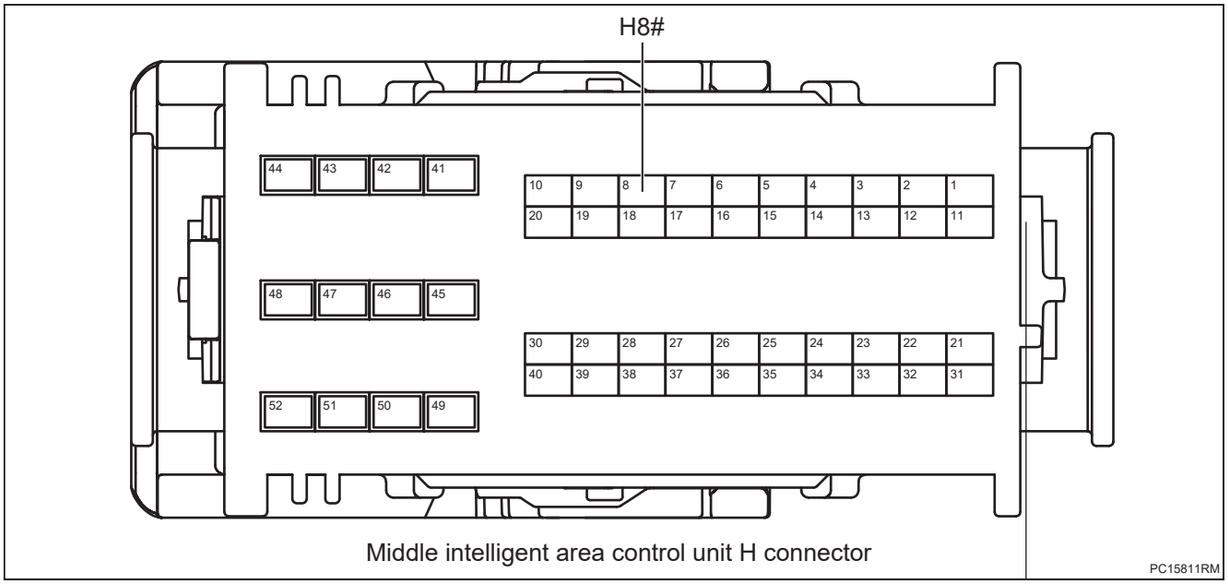
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in middle intelligent area control unit LIN line (spiral cable - middle intelligent area control unit)**



Middle intelligent area control unit H connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

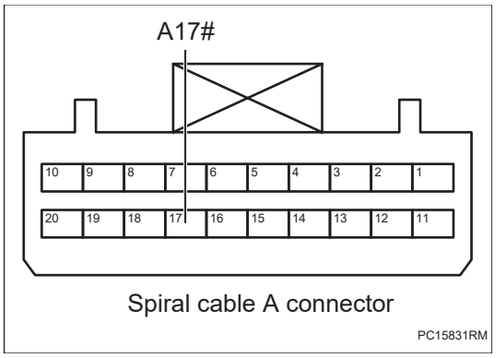
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector H8# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check spiral cable ground



(a) According to value in the table, measure resistance.

Standard value

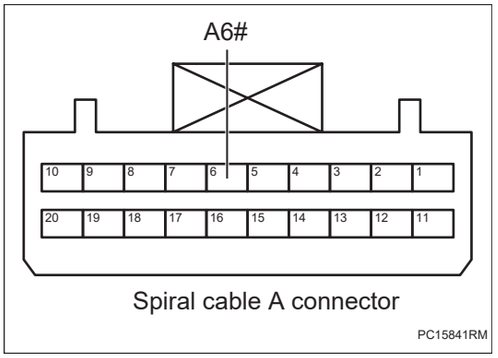
Multimeter connection	Detection condition	Specified condition
Spiral cable connector A17# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Check spiral cable power supply



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the middle intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Spiral cable connector A6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

6	Replace spiral cable (See page ZC-120)

(a) Replace the spiral cable.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace middle intelligent area control unit (See page ZC-132)

OK

Diagnosis ends

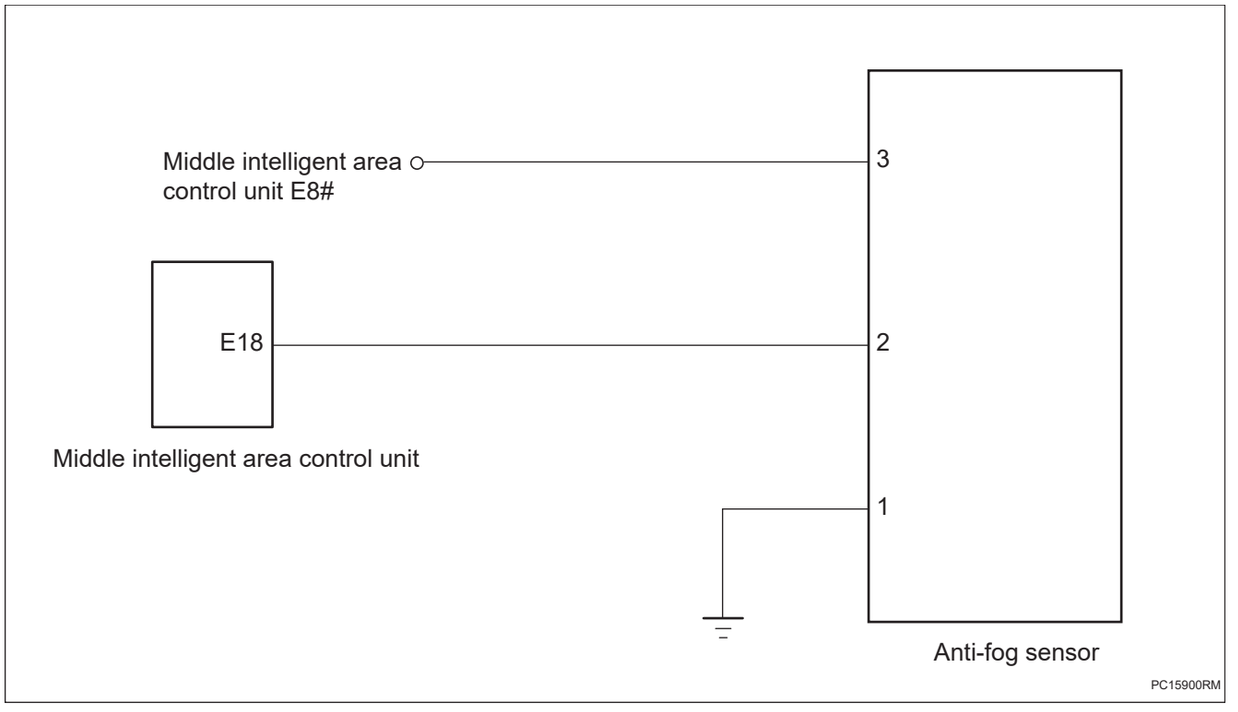
DTC	U103688	PDCM LIN10 physical bus error
DTC	U02AB87	Anti-fog sensor node lost
DTC	U21DD86	Anti-fog sensor feedback fault
DTC	U21DF86	Anti-fog sensor feedback sensor fault

Description

When LIN10 communication between anti-fog sensor and middle intelligent area control unit is faulty, the middle intelligent area control unit records DTC.

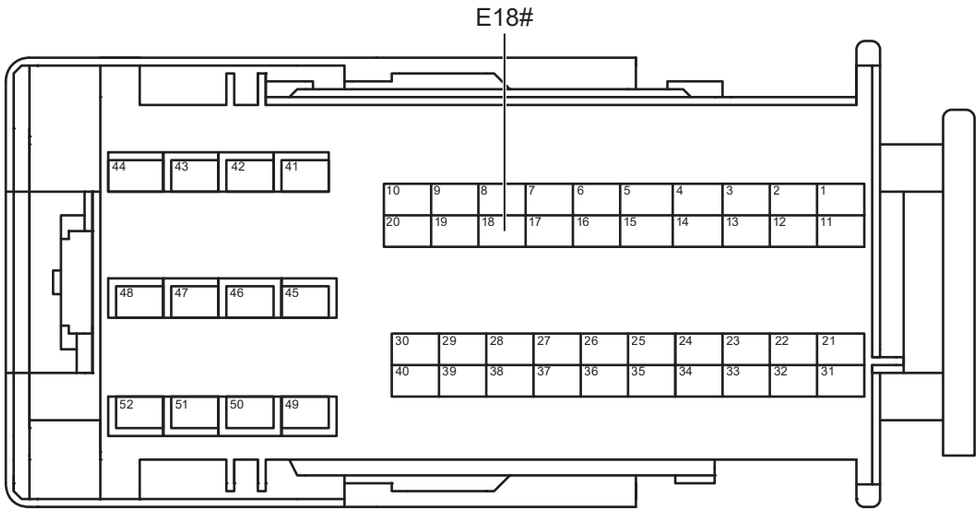
DTC No.	DTC detection condition	Faulty area
U103688	(a) PDCM LIN10 physical bus error.	• Anti-fog sensor • Middle intelligent area control unit • Wire harness and connector
U02AB87	(a) Anti-fog sensor node lost.	• Anti-fog sensor • Middle intelligent area control unit • Wire harness and connector
U21DD86	(a) Anti-fog sensor feedback fault.	• Anti-fog sensor • Middle intelligent area control unit • Wire harness and connector
U21DF86	(a) Anti-fog sensor feedback sensor fault.	• Anti-fog sensor • Middle intelligent area control unit • Wire harness and connector

Circuit diagram



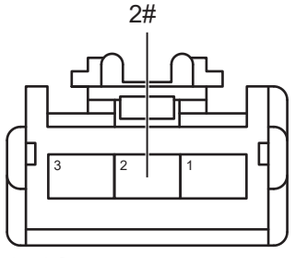
Inspection procedure

1	**Check for open in middle intelligent area control unit LIN line (anti-fog sensor - middle intelligent area control unit)**



Middle intelligent area control unit E connector

PC15911RM



Anti-fog sensor connector

PC15920RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the anti-fog sensor connector.

(e) According to value in the table, measure resistance.

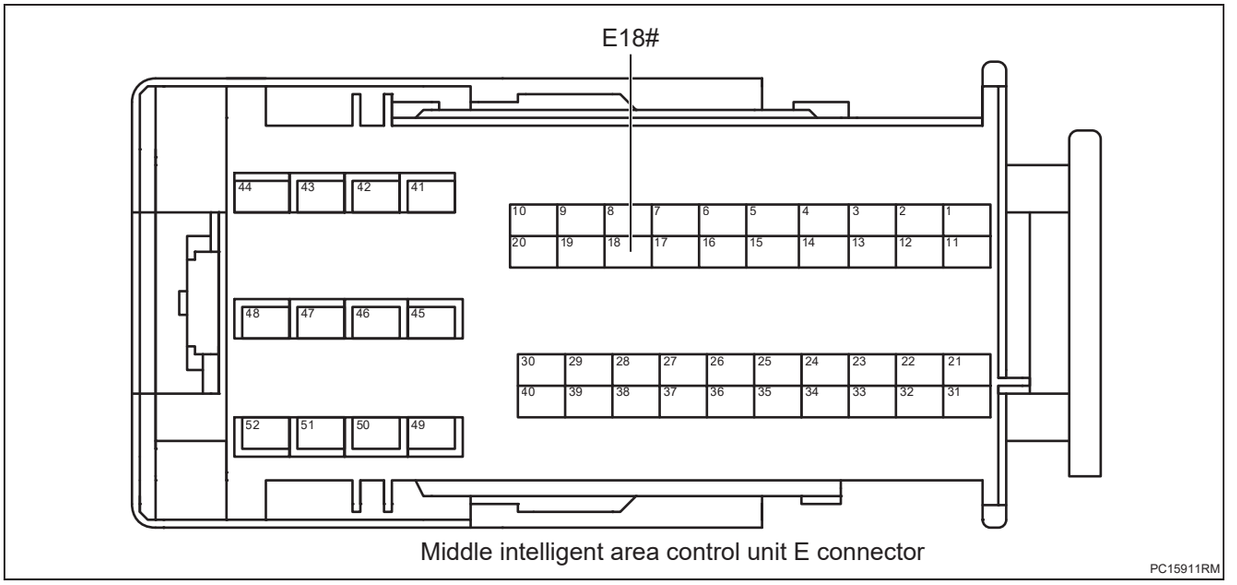
Standard value

Multimeter connection	Detection condition	Specified condition
Anti-fog sensor connector 2# - middle intelligent area control unit connector E18#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in middle intelligent area control unit LIN line (anti-fog sensor - middle intelligent area control unit)**



Middle intelligent area control unit E connector

(a) According to value in the table, measure resistance.

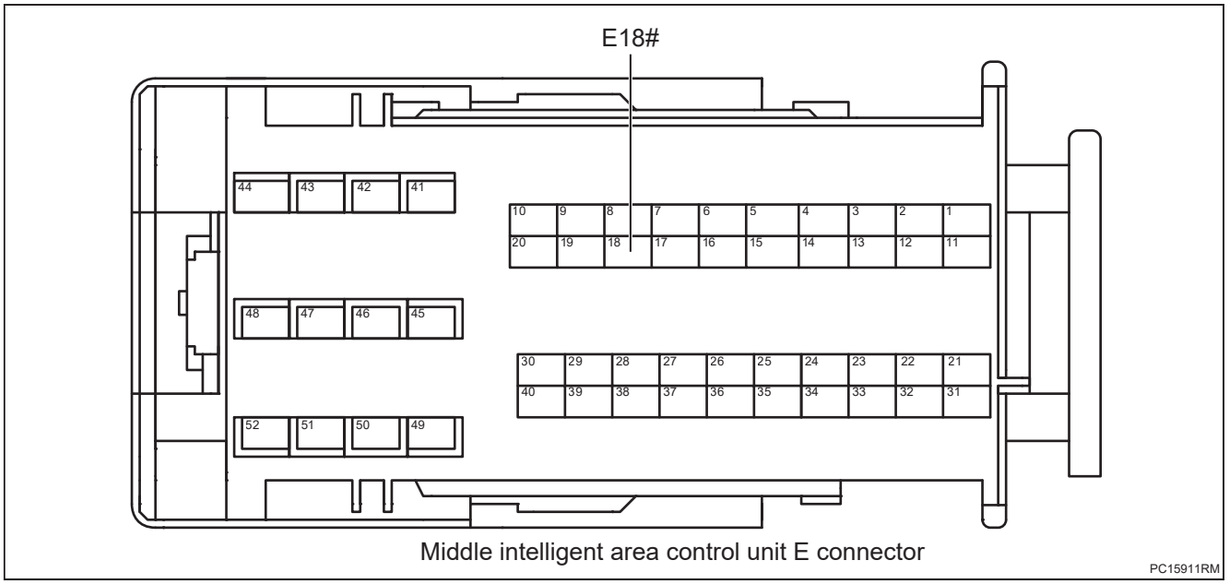
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E18# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in middle intelligent area control unit LIN line (anti-fog sensor - middle intelligent area control unit)**



Middle intelligent area control unit E connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

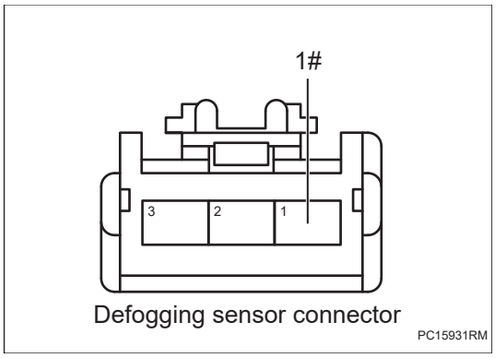
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E18# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check anti-fog sensor ground



Defogging sensor connector
PC15931RM

(a) According to value in the table, measure resistance.

Standard value

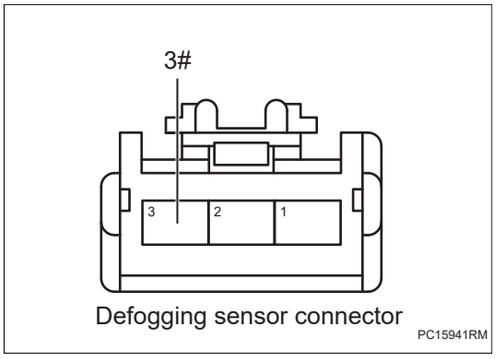
Multimeter connection	Detection condition	Specified condition
Anti-fog sensor connector 1# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Check anti-fog sensor power supply



Defogging sensor connector
PC15941RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Connect the middle intelligent area control unit connector.
(d) Connect the negative battery terminal.
(e) Turn ignition switch to "ON".
(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Anti-fog sensor connector 3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

6	**Replace anti-fog sensor (See page RE-11)**

(a) Replace the anti-fog sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

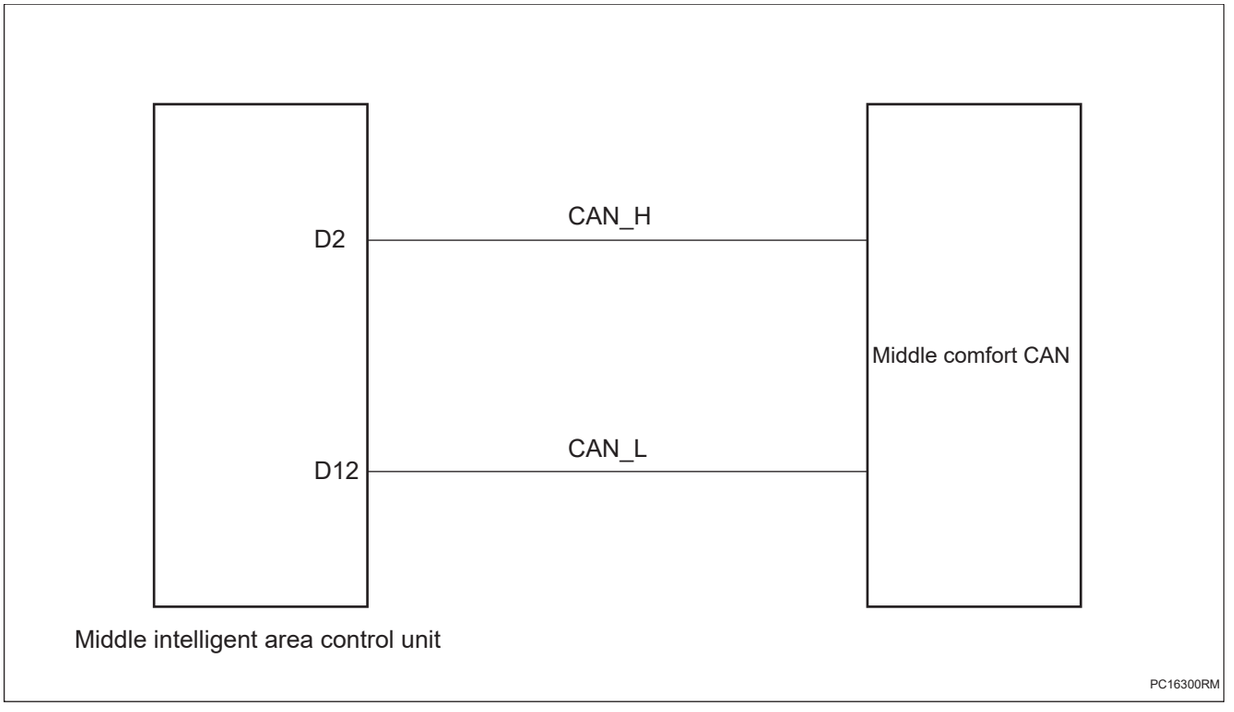
DTC	U002888	Comfort CAN bus off

Description

When middle intelligent area control unit detects middle comfort CAN bus off fault, the middle intelligent area control unit records DTC.

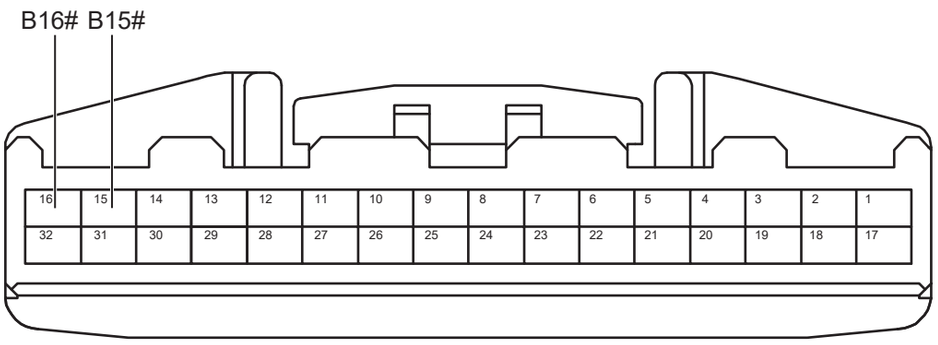
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

Circuit diagram



Inspection procedure

1	**Check middle comfort CAN bus terminal resistance**



Front left door control unit B

ED01611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - front left door control unit connector B15#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controller on middle comfort CAN bus**

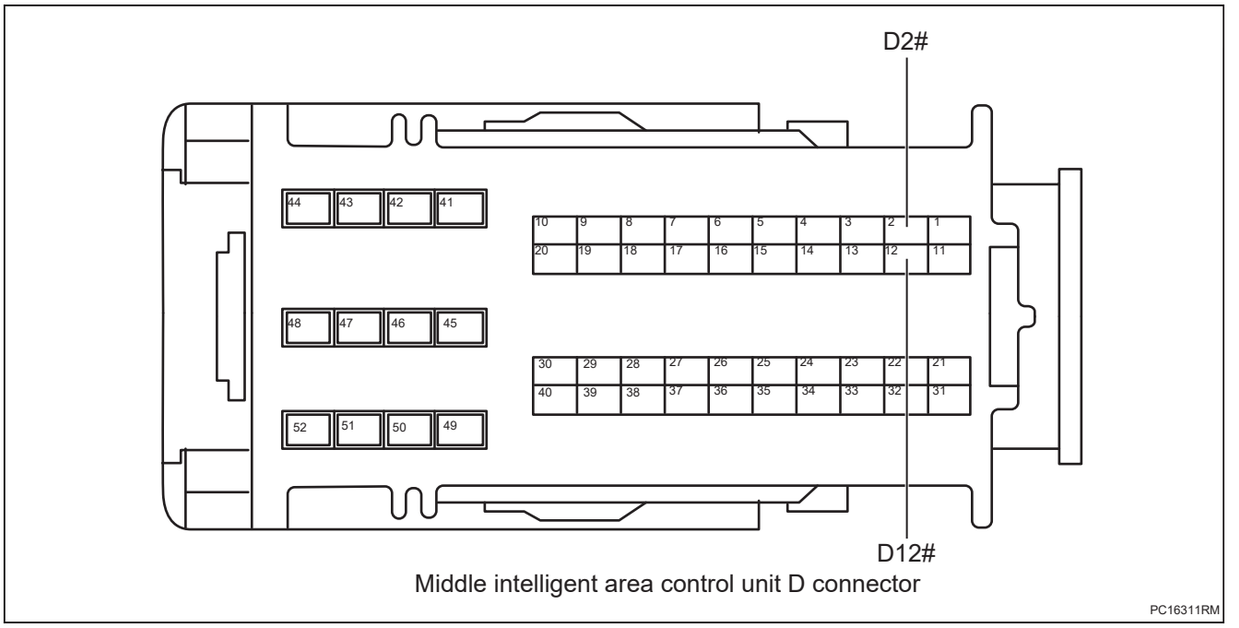
(a) Disconnect the controllers on the middle comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

ZD

OK

3	**Check for short between middle comfort CAN bus CAN-L and CAN-H**



Middle intelligent area control unit D connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on middle comfort CAN bus.

(d) According to value in the table, measure resistance.

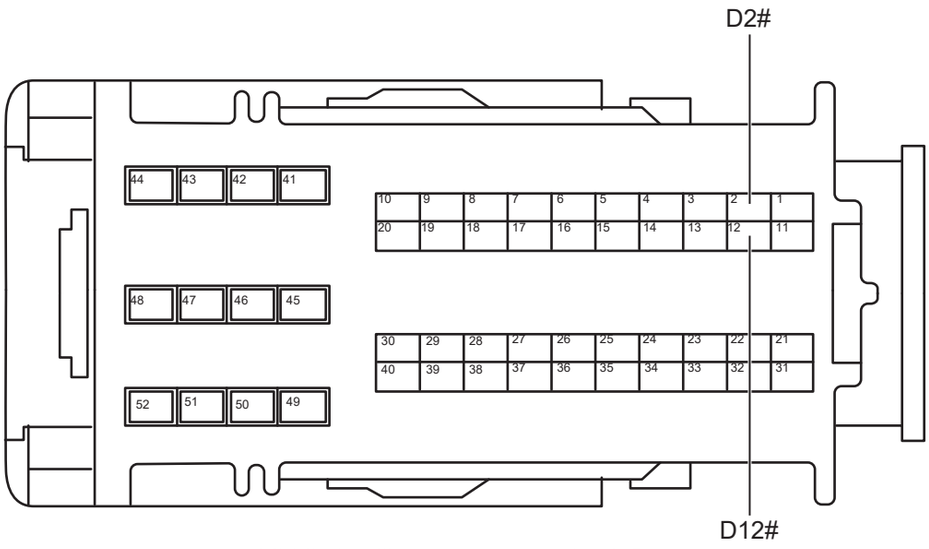
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D2# - middle intelligent area control unit connector D12#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in middle comfort CAN bus**



Middle intelligent area control unit D connector

PC16311RM

(a) According to value in the table, measure resistance.

Standard value

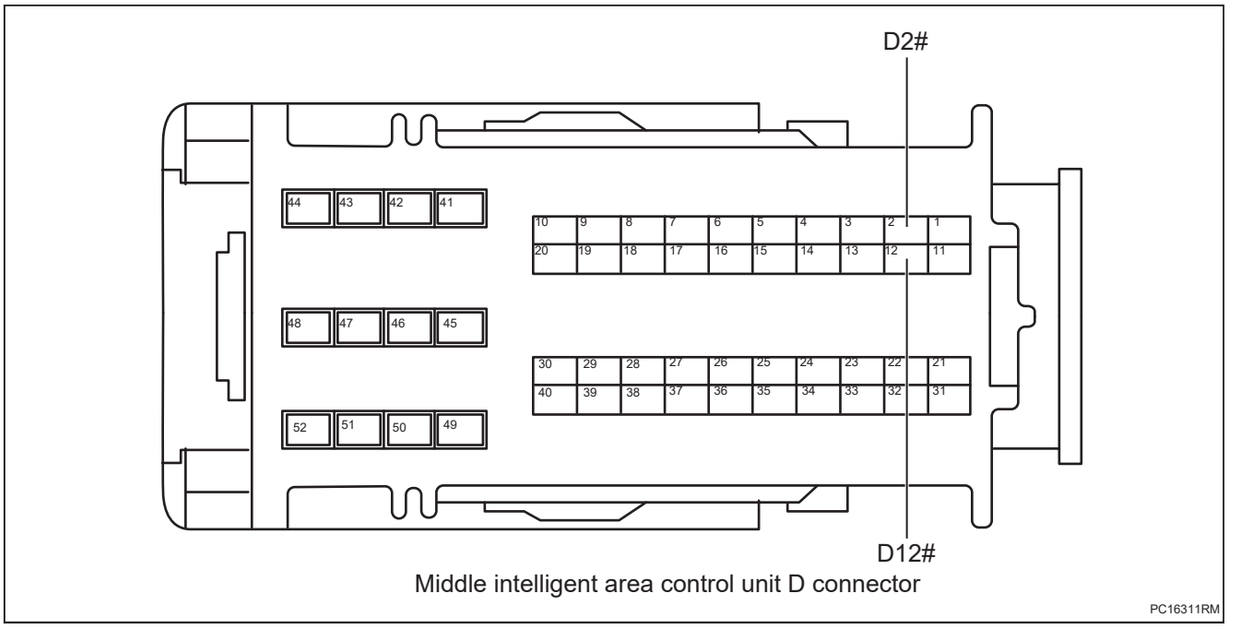
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D2# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	Check for short to power supply in middle comfort CAN bus



Middle intelligent area control unit D connector

PC16311RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

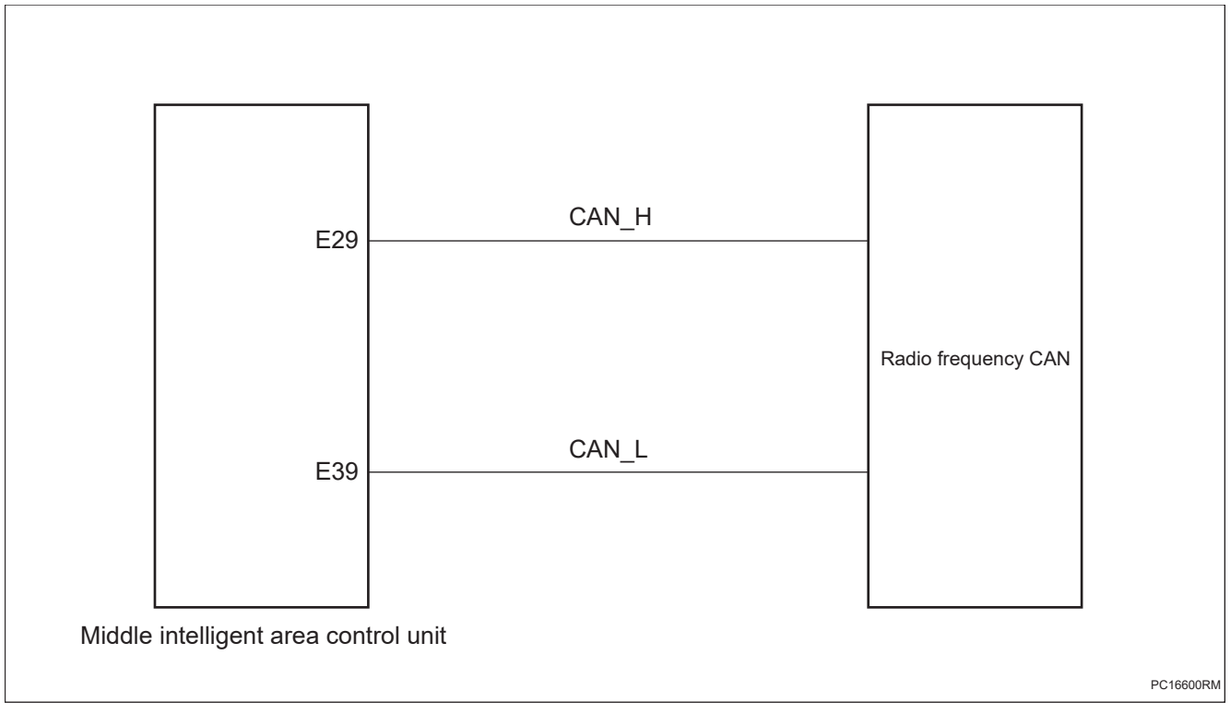
DTC	U008088	RFR CAN bus off

Description

When middle intelligent area control unit detects radio frequency CAN bus off fault, the middle intelligent area control unit records DTC.

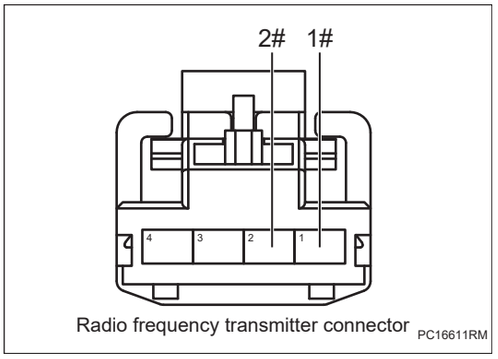
DTC No.	DTC detection condition	Faulty area
U008088	(a) RFR CAN bus off.	• CAN line and connector • Radio frequency transmitter • Middle intelligent area control unit

Circuit diagram



Inspection procedure

1	**Check middle intelligent area control unit terminal resistance**



Radio frequency transmitter connector PC16611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the radio frequency transmitter connector.

(d) Measure terminal resistance according to the values in the table below.

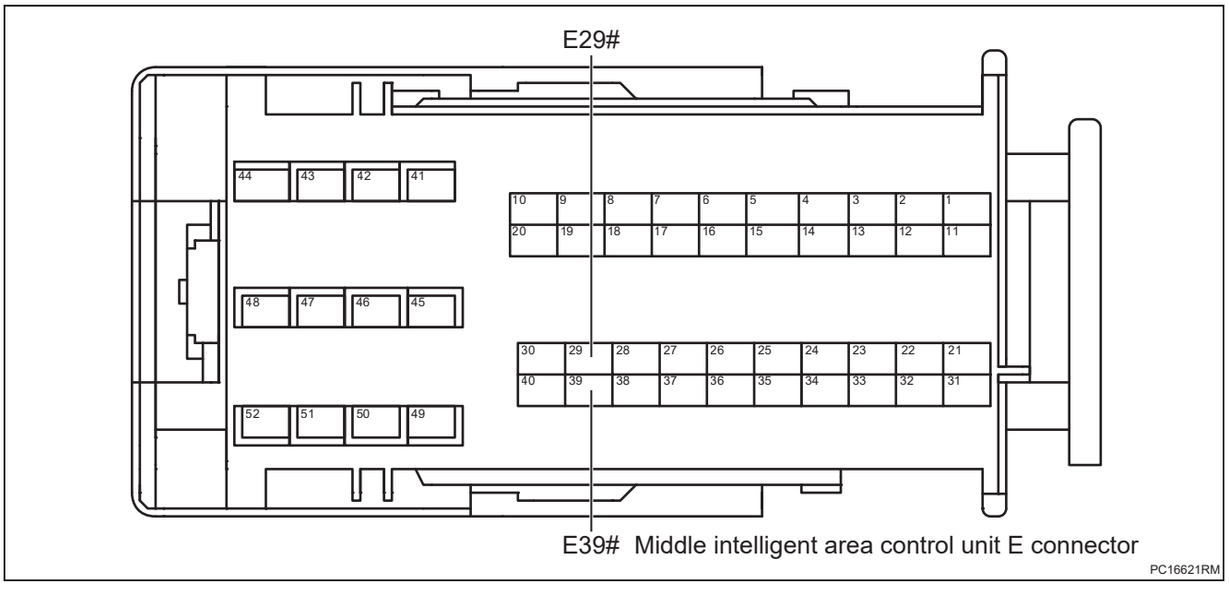
Standard value

Multimeter connection	Detection condition	Specified condition
Radio frequency transmitter connector 2# - radio frequency transmitter connector 1#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check radio frequency transmitter terminal resistance**



(a) Connect the radio frequency transmitter connector.

(b) Disconnect the middle intelligent area control unit connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E29# - middle intelligent area control unit connector E39#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

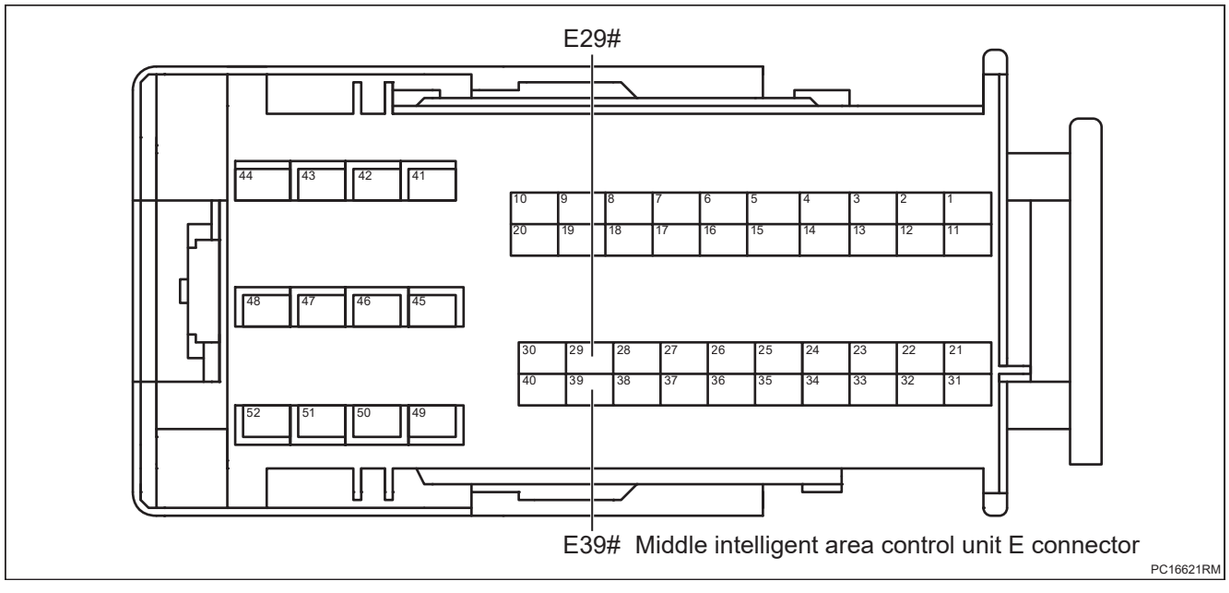
3	Check controllers on radio frequency CAN bus

(a) Disconnect the controllers on the radio frequency CAN bus one by one and check if the other controllers resume operating.

NG → **Perform repair according to malfunction**

OK

4	Check for short between radio frequency CAN buses CAN-L and CAN-H



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on radio frequency CAN bus.

(d) According to value in the table, measure resistance.

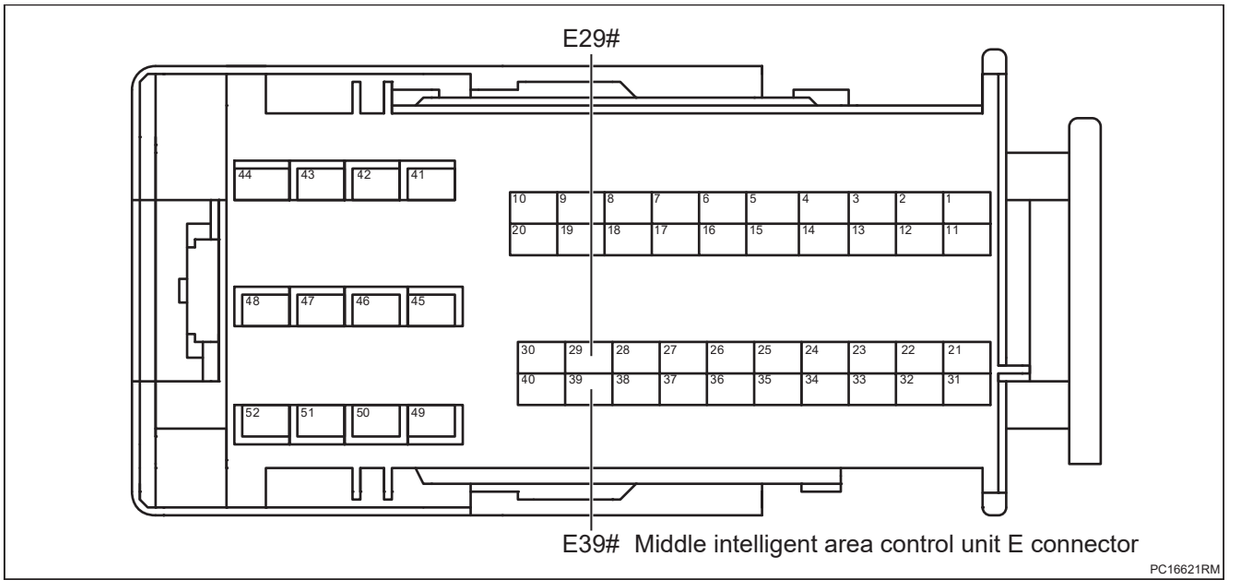
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E29# - middle intelligent area control unit connector E39#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in radio frequency CAN bus**



(a) According to value in the table, measure resistance.

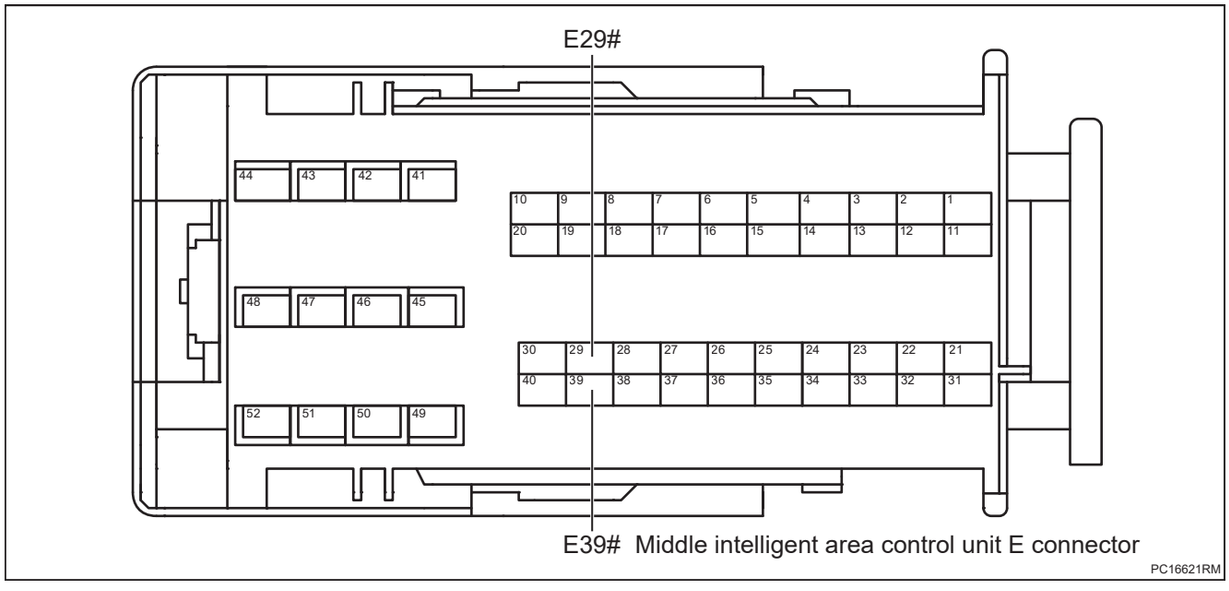
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E29# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector E39# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in radio frequency CAN bus**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E29# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector E39# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

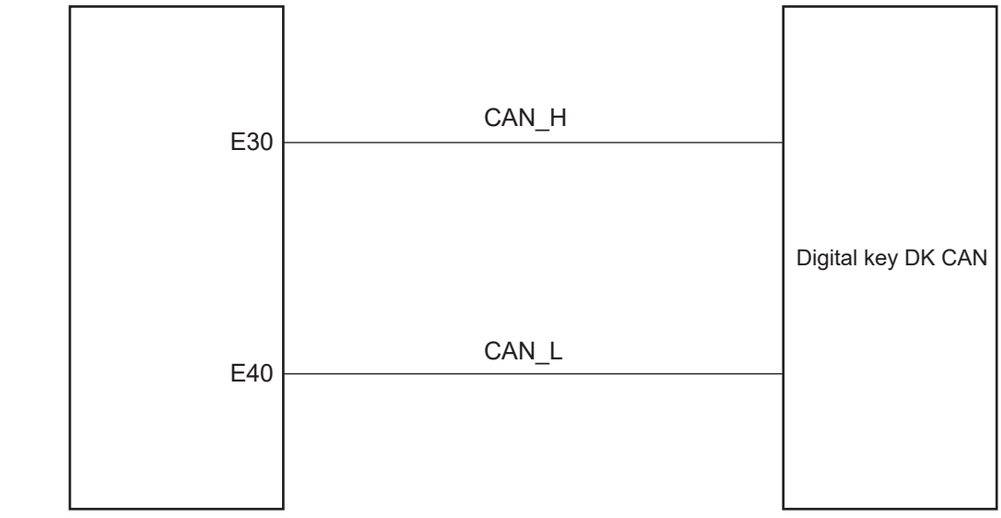
DTC	U008188	Digital key CAN bus off

Description

When middle intelligent area control unit detects digital key DK CAN bus off fault, the middle intelligent area control unit records DTC.

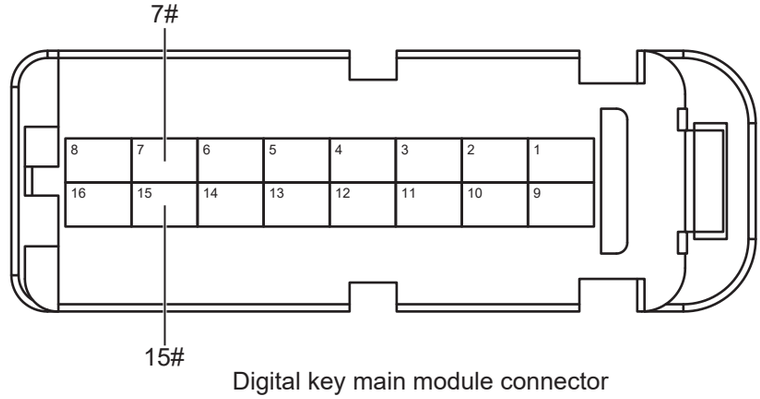
DTC No.	DTC detection condition	Faulty area
U008188	(a) Digital key CAN bus off.	• CAN line and connector • Digital key main module • Middle intelligent area control unit

Circuit diagram



Inspection procedure

1	**Check middle intelligent area control unit terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

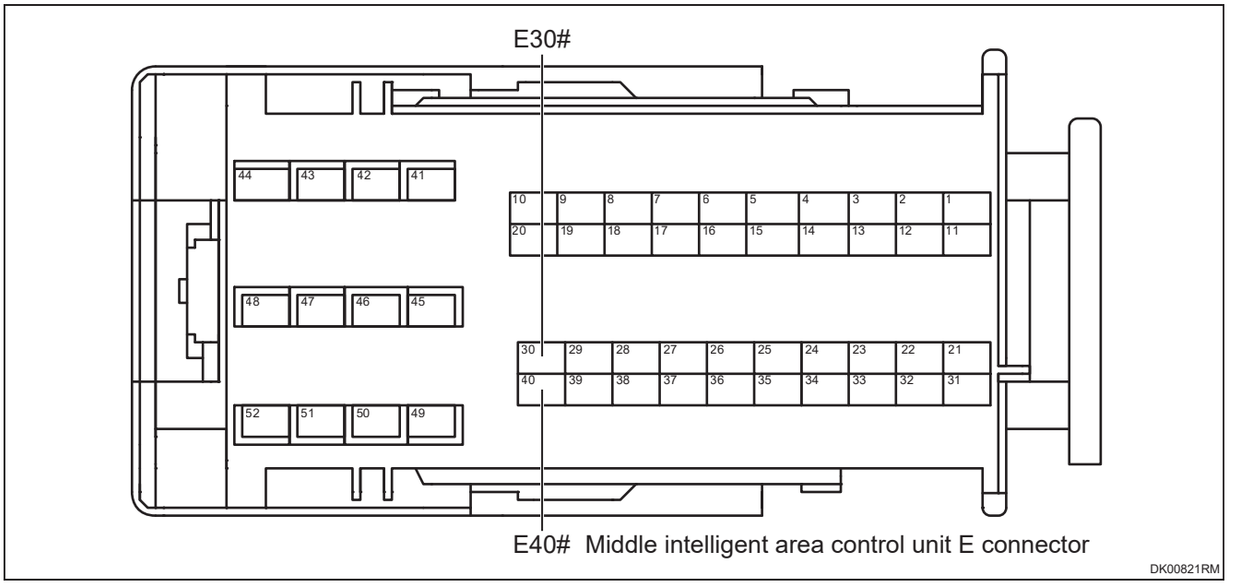
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - digital key main module connector 15#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

ZD

2	Check digital key main module terminal resistance



(a) Connect the digital key main module connector.

(b) Disconnect the middle intelligent area control unit connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E30# - middle intelligent area control unit connector E40#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

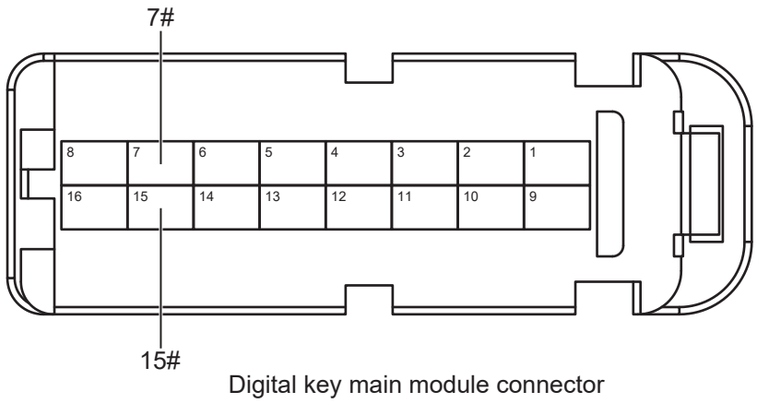
3	**Check controllers on digital key DK CAN bus**

(a) Disconnect controllers on digital key DK CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

OK

4	**Check for short between digital key DK CAN bus CAN-L and CAN-H**



Digital key main module connector

DK00811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key DK CAN bus.

(d) According to value in the table, measure resistance.

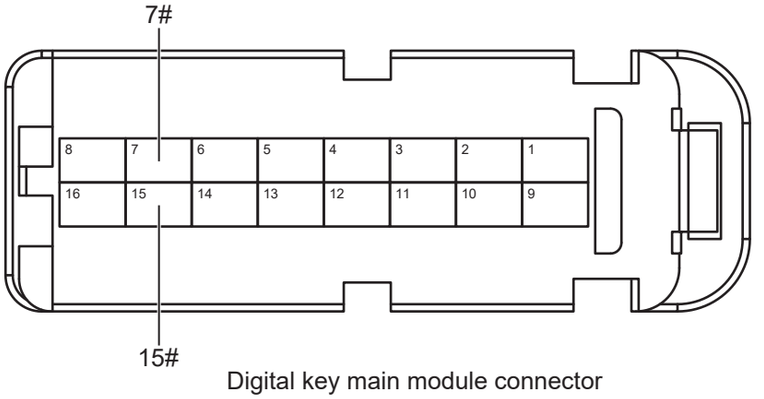
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - digital key main module connector 15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	Check for short to ground in digital key DK CAN bus



Digital key main module connector

DK00811RM

(a) According to value in the table, measure resistance.

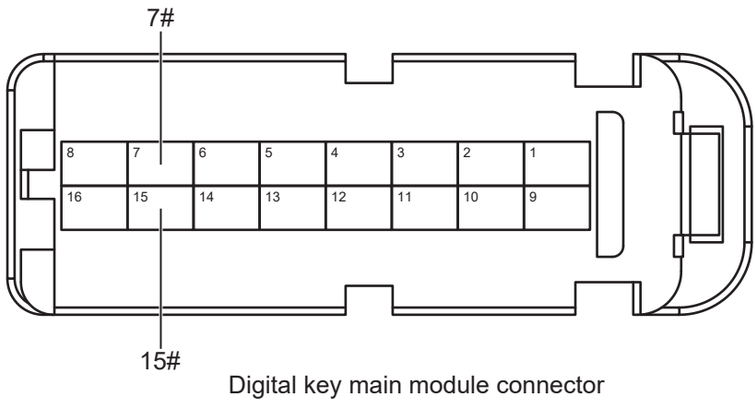
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - body ground	Always connected	10 KΩ or more
Digital key main module connector 15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in digital key DK CAN bus**



Digital key main module connector

DK00811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Digital key main module connector 15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

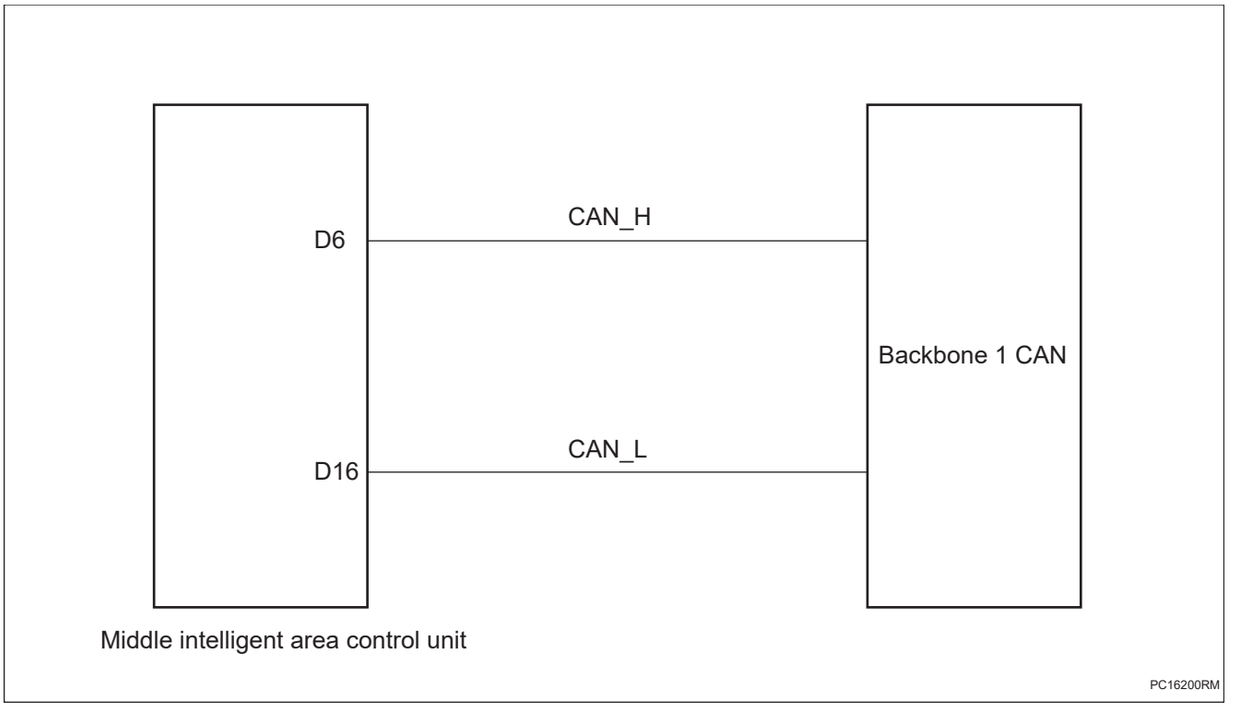
DTC	U008988	Backbone network 1 CAN bus off

Description

When middle intelligent area control unit detects backbone 1 CAN bus off fault, the middle intelligent area control unit records DTC.

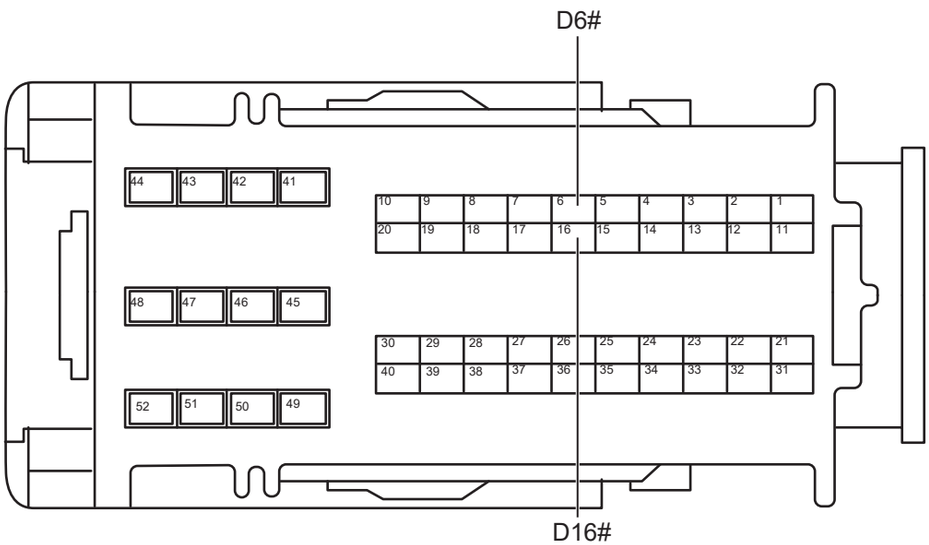
DTC No.	DTC detection condition	Faulty area
U008988	(a) Backbone network 1CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Intelligent communication domain control unit

Circuit diagram



Inspection procedure

1	**Check backbone 1 CAN bus terminal resistance**



Middle intelligent area control unit D connector

PC16211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D6# - middle intelligent area control unit connector D16#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controllers on backbone 1 CAN bus**

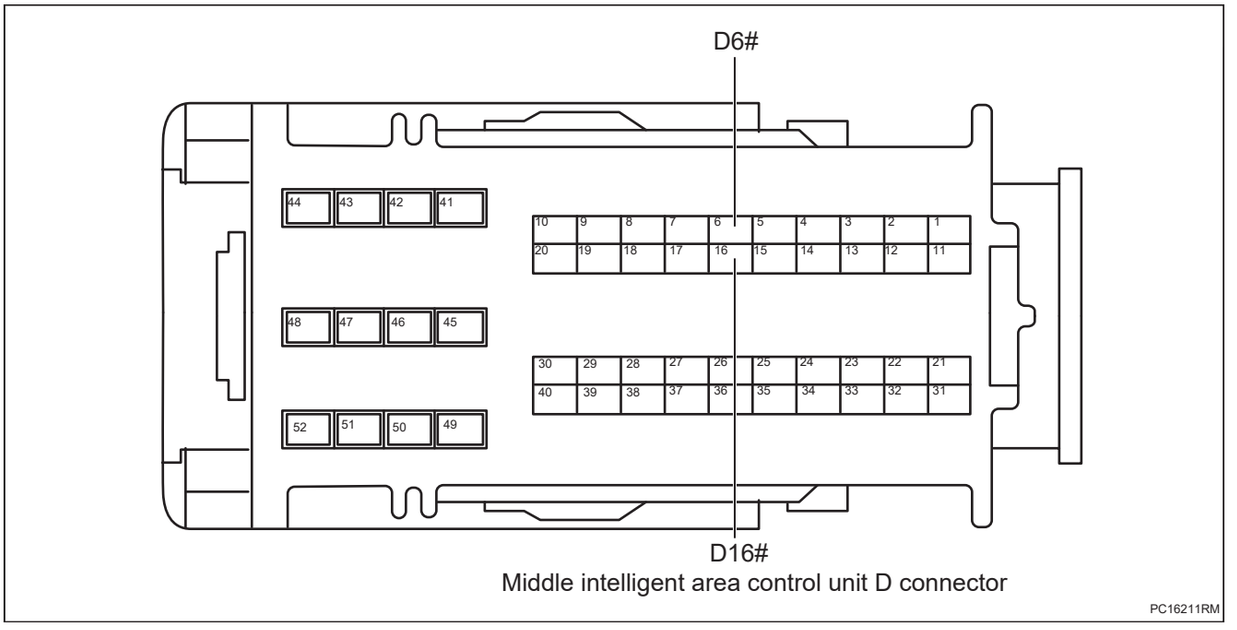
(a) Disconnect the controllers on the backbone 1 CAN bus one by one and check if the other controllers resume operating.

ZD

NG → **Perform repair according to malfunction**

OK

3	**Check for short between backbone 1 CAN buses CAN-L and CAN-H**



Middle intelligent area control unit D connector

PC16211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

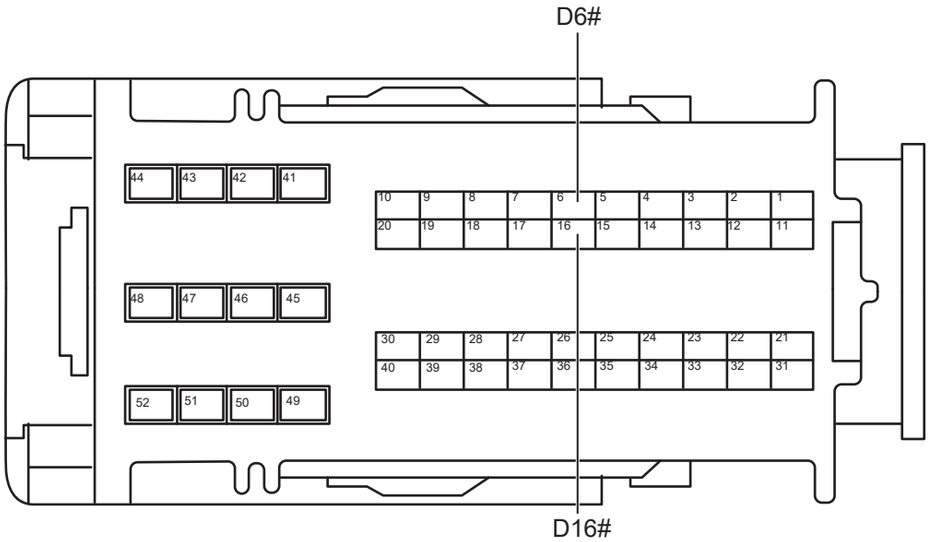
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D6# - middle intelligent area control unit connector D16#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in backbone 1 CAN bus**



Middle intelligent area control unit D connector

PC16211RM

(a) According to value in the table, measure resistance.

Standard value

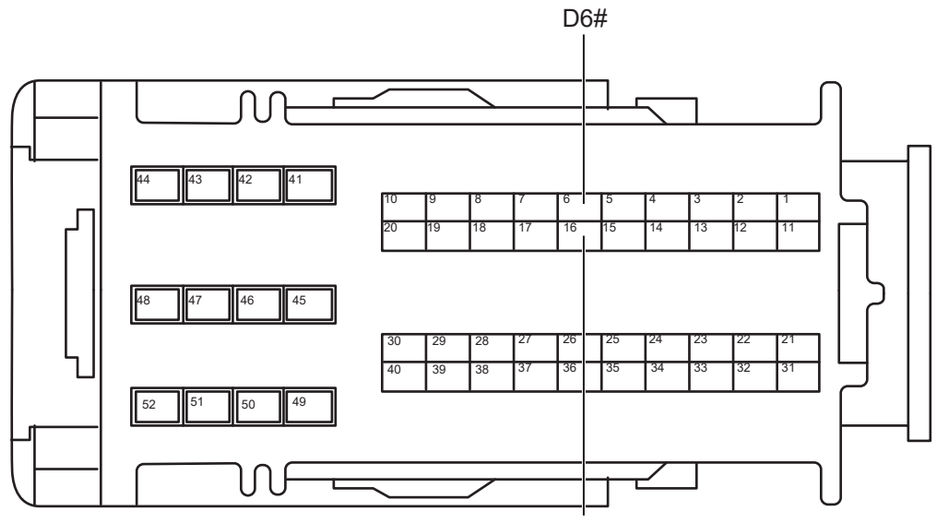
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D6# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D16# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in backbone 1 CAN bus**



Middle intelligent area control unit D connector

PC16211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D16# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

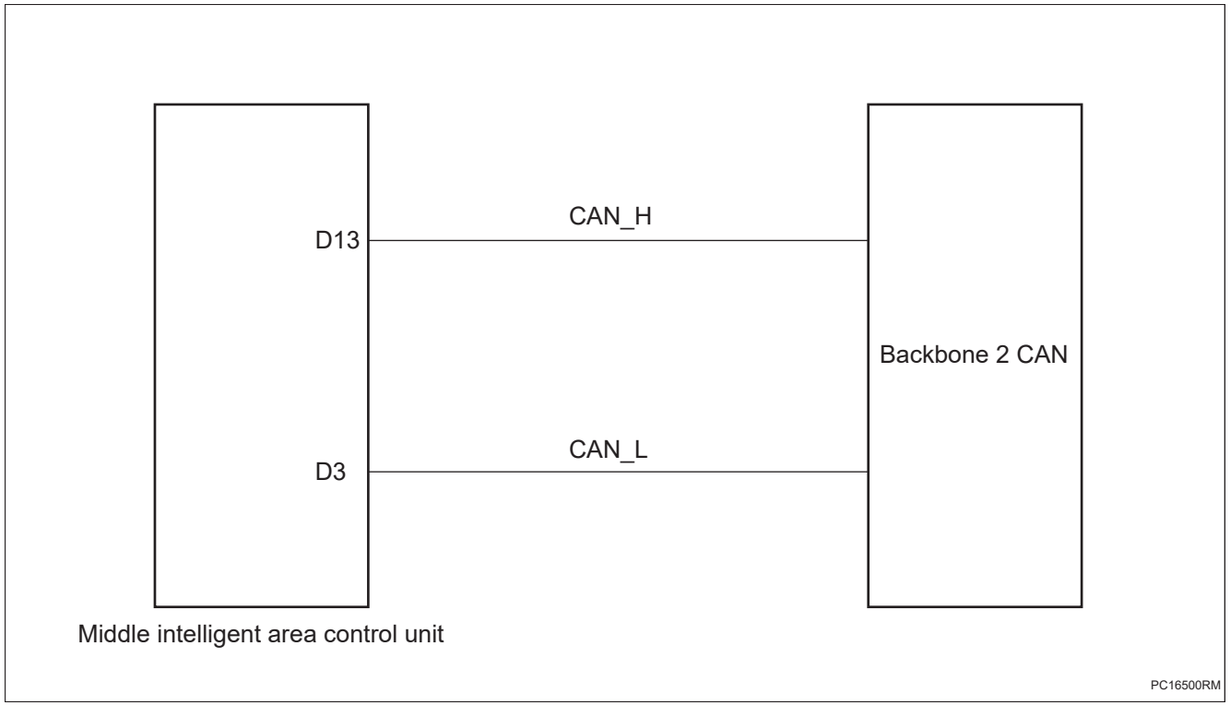
DTC	U009288	Backbone network 2 CAN bus off

Description

When middle intelligent area control unit detects backbone 2 CAN bus off fault, the middle intelligent area control unit records DTC.

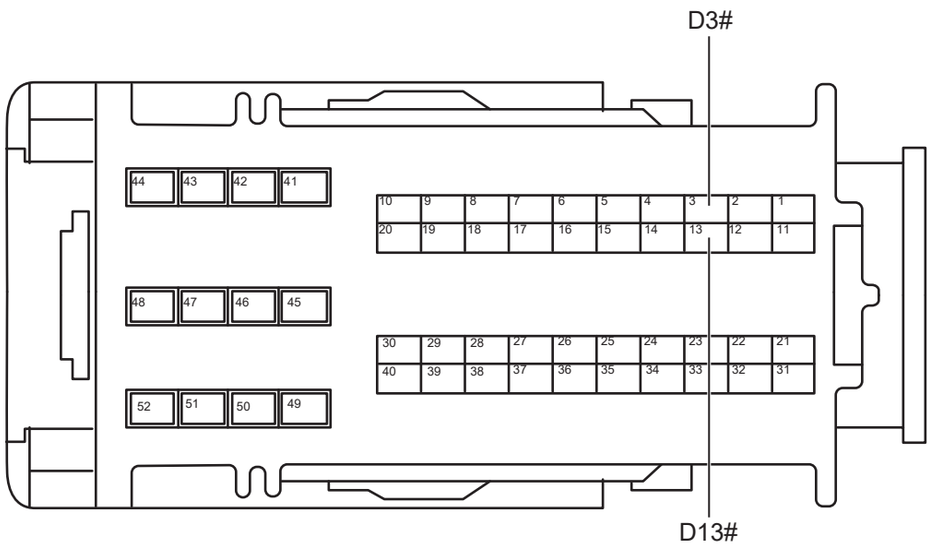
DTC No.	DTC detection condition	Faulty area
U009288	(a) Backbone network 2 CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

Circuit diagram



Inspection procedure

1	**Check backbone 2 CAN bus terminal resistance**



Middle intelligent area control unit D connector

PC16511RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D13# - middle intelligent area control unit connector D3#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

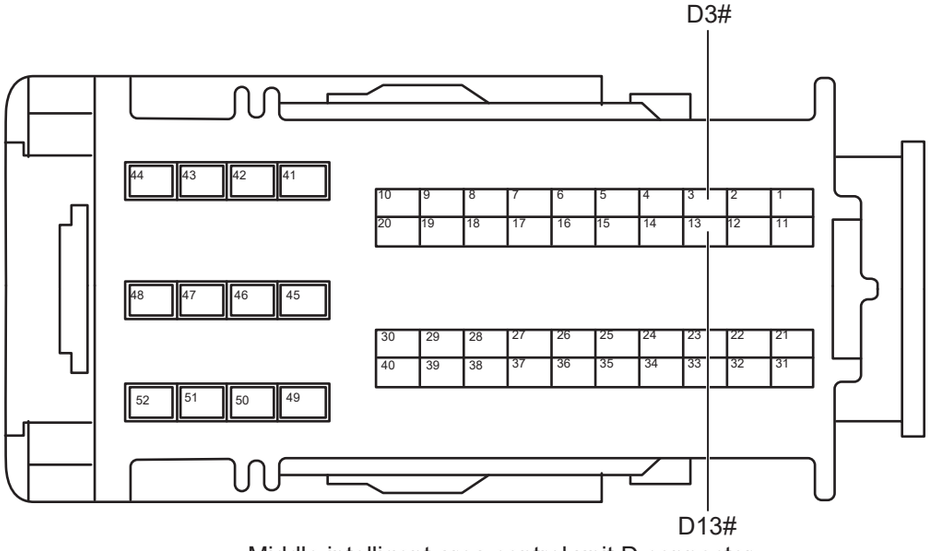
2	**Check controllers on backbone 2 CAN bus**

(a) Disconnect the controllers on the backbone 2 CAN bus one by one and check if the other controllers resume operating.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between backbone 2 CAN buses CAN-L and CAN-H**



Middle intelligent area control unit D connector

PC16511RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 2 CAN bus.

(d) According to value in the table, measure resistance.

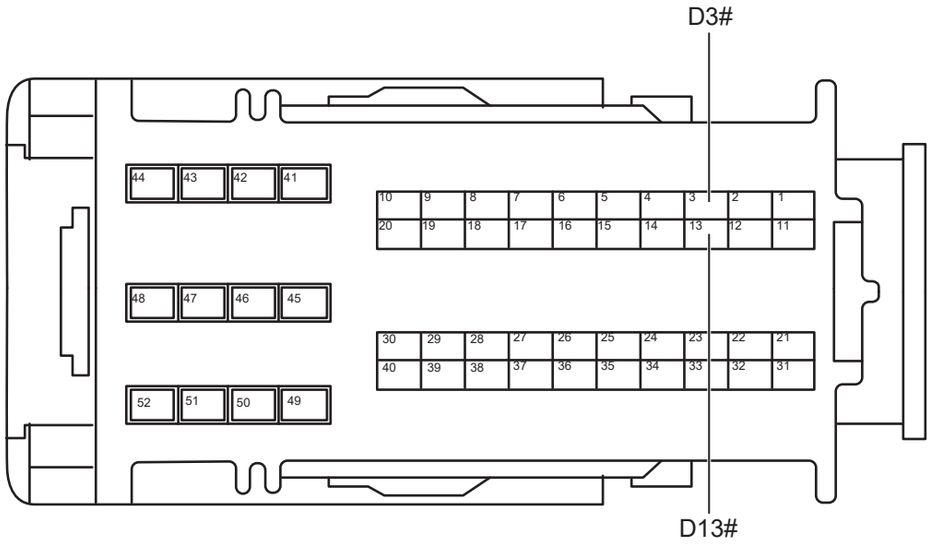
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D13# - middle intelligent area control unit connector D3#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in backbone 2 CAN bus**



Middle intelligent area control unit D connector

PC16511RM

ZD

(a) According to value in the table, measure resistance.

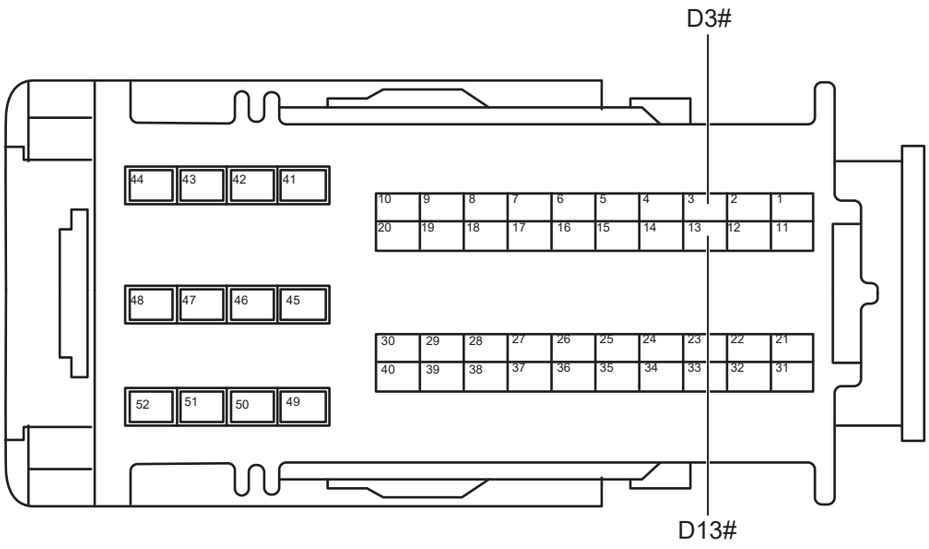
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D13# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector D3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in backbone 2 CAN bus**



Middle intelligent area control unit D connector

PC16511RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Middle intelligent area control unit connector D3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

DTC	U014687	Front area controller node lost
DTC	U014887	Rear area controller node lost
DTC	U014B87	Central computing unit VDC397 node lost
DTC	U014A87	Central computing unit VDC821 node lost
DTC	U02DB87	Digital key controller node lost
DTC	U011C87	Combination switch node lost
DTC	U020887	Front Left seat controller node lost
DTC	U021187	Front right seat controller node lost
DTC	U015187	Airbag control unit node lost
DTC	U024887	Wireless charging unit node lost
DTC	U019987	Driver door module node lost
DTC	U020087	Front passenger door module node lost
DTC	U020187	Rear left door module node lost
DTC	U020287	Rear right door module node lost
DTC	U216187	Radio frequency transceiver node lost
DTC	U014A97	VDC821 node lost (backbone network 2)

Description

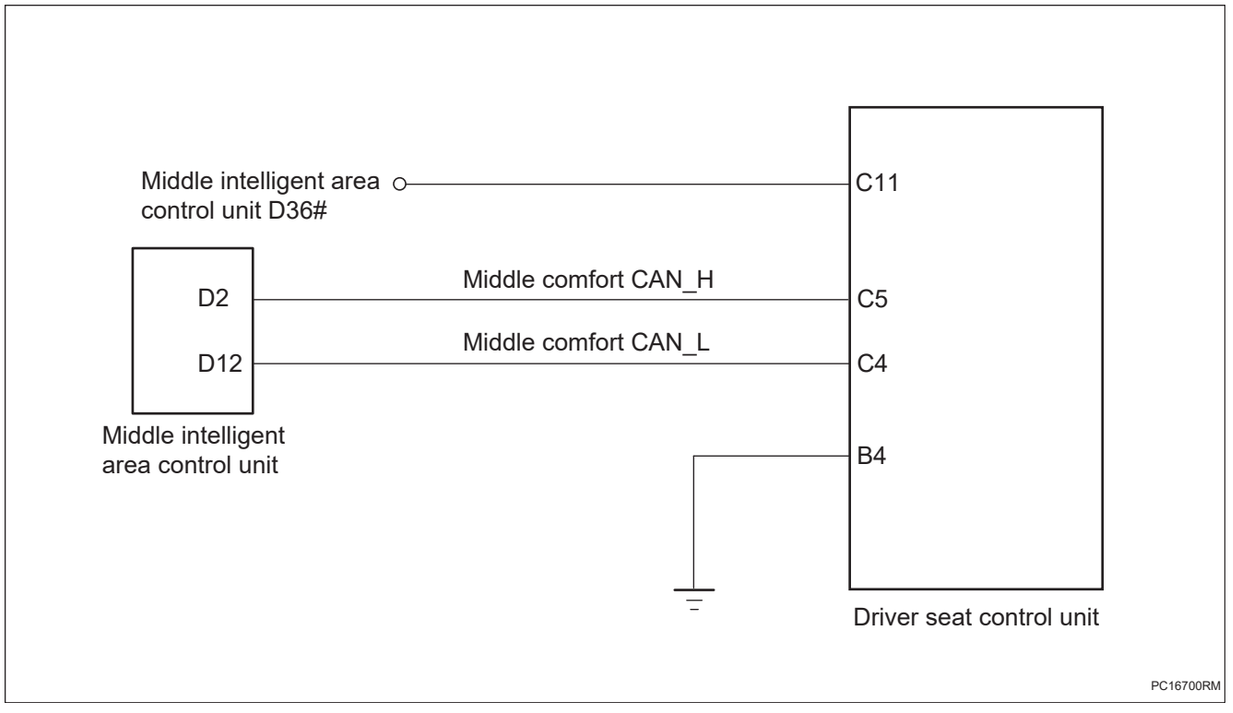
When communication between middle intelligent area control unit and other system is abnormal or interrupted, the middle intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) Front area controller node lost.	• Middle intelligent area control unit • Front intelligent area control unit • Rear intelligent area control unit • Wire harness and connector
U014887	(a) Rear area controller node lost.	• Middle intelligent area control unit • Front intelligent area control unit • Rear intelligent area control unit • Wire harness and connector
U014B87	(a) Central computing unit VDC397 node lost.	• Middle intelligent area control unit • Front intelligent area control unit • Rear intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit • Wire harness and connector
U014A87	(a) Central computing unit VDC821 node lost.	• Middle intelligent area control unit • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
U014A97	(a) VDC821 node lost (backbone network 2).	• Middle intelligent area control unit • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Wire harness and connector
U02DB87	(a) Digital key controller node lost.	• Middle intelligent area control unit • Digital key main module • Combination switch • Wire harness and connector
U024887	(a) Wireless charging module node lost.	• Middle intelligent area control unit • Mobile phone wireless charging controller • Wire harness and connector
U020887	(a) Front left seat controller node lost.	• Middle intelligent area control unit • Driver seat control unit • Combination switch • Wire harness and connector
U021187	(a) Front right seat controller node lost.	• Middle intelligent area control unit • Front passenger seat control unit • Combination switch • Wire harness and connector
U019987	(a) Driver door module node lost.	• Middle intelligent area control unit • Front left door control unit • Combination switch • Wire harness and connector
U020087	(a) Front passenger door module node lost.	• Middle intelligent area control unit • Front right door control unit • Combination switch • Wire harness and connector
U020187	(a) Rear left door module node lost.	• Middle intelligent area control unit • Combination switch • Rear left door control unit • Wire harness and connector
U020287	(a) Rear right door module node lost.	• Middle intelligent area control unit • Combination switch • Rear right door control unit • Wire harness and connector

DTC No.	DTC detection condition	Faulty area
U011C87	(a) Combination switch node lost.	• Middle intelligent area control unit • Combination switch • Wire harness and connector
U015187	(a) Airbag control unit node lost.	• Middle intelligent area control unit • Combination switch • Airbag control unit • Wire harness and connector
U216187	(a) Radio frequency transceiver node lost.	• Middle intelligent area control unit • Radio frequency transmitter • Wire harness and connector

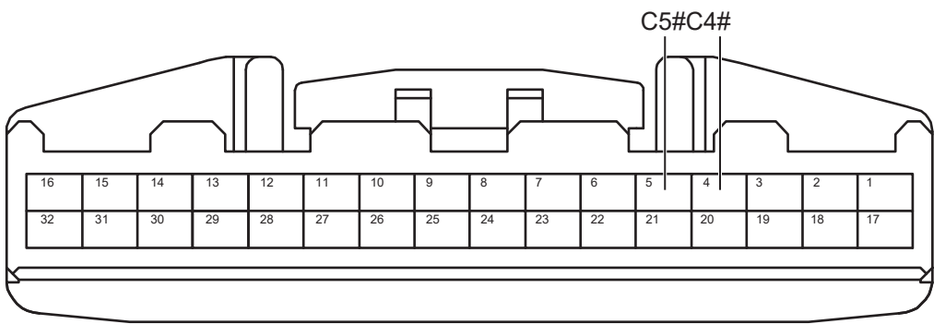
Circuit diagram



Inspection procedure

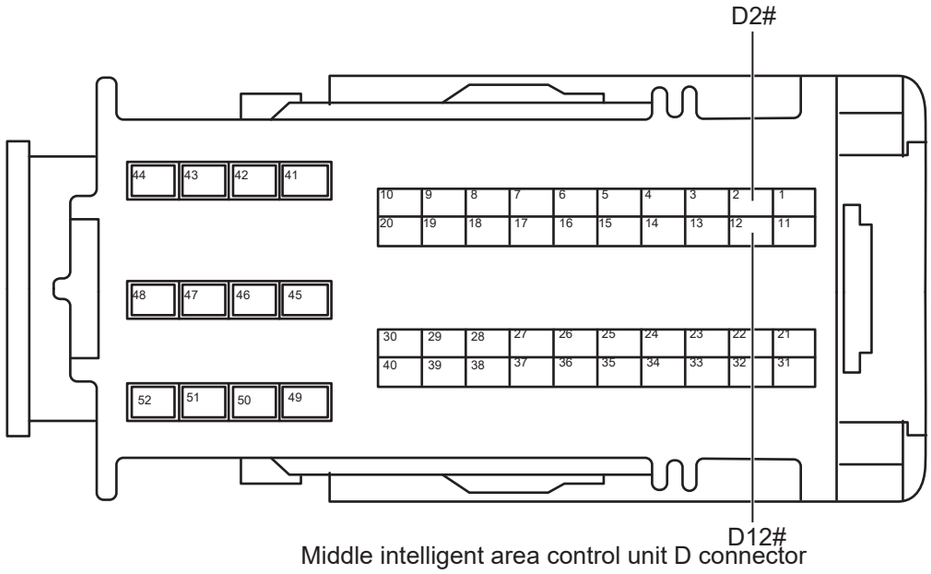
Note: Taking the U020887 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (driver seat control unit - middle intelligent area control unit)**



Driver seat control unit C connector

SE01511RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on middle comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

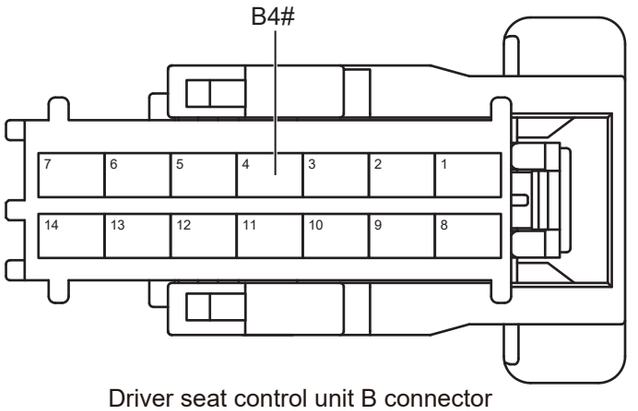
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Driver seat control unit connector C4# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Check driver seat control unit ground**



Driver seat control unit B connector

SE00510RM

(a) According to value in the table, measure resistance.

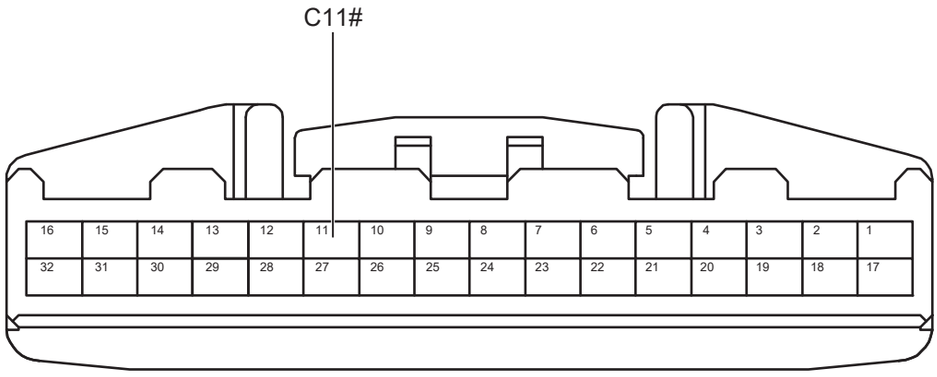
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check driver seat control unit power supply**



Driver seat control unit C connector

SE00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

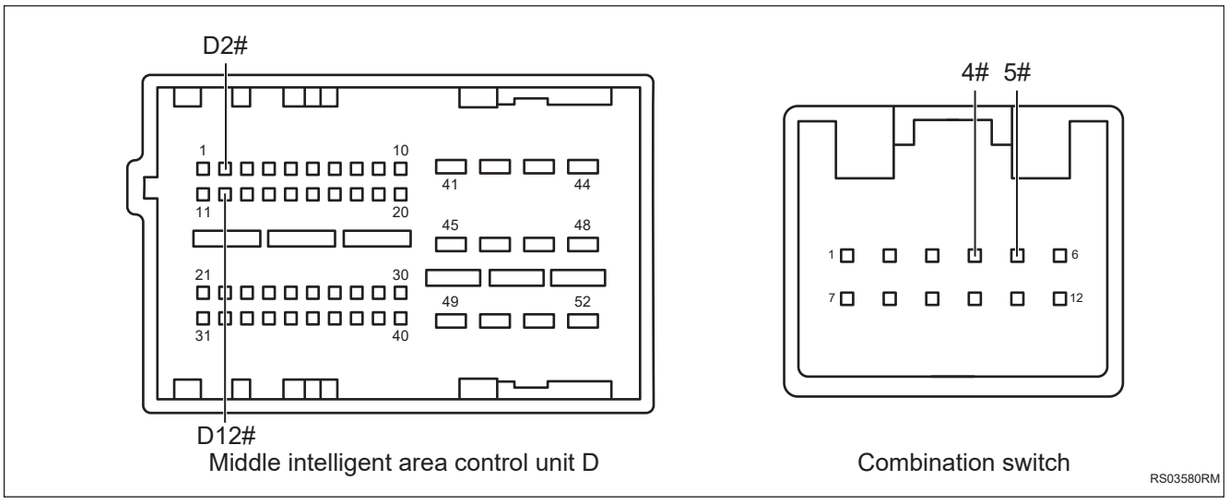
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C11# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check middle comfort CAN bus terminal resistance



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	Replace driver seat control unit (See page NS-90)

(a) Replace the driver seat control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

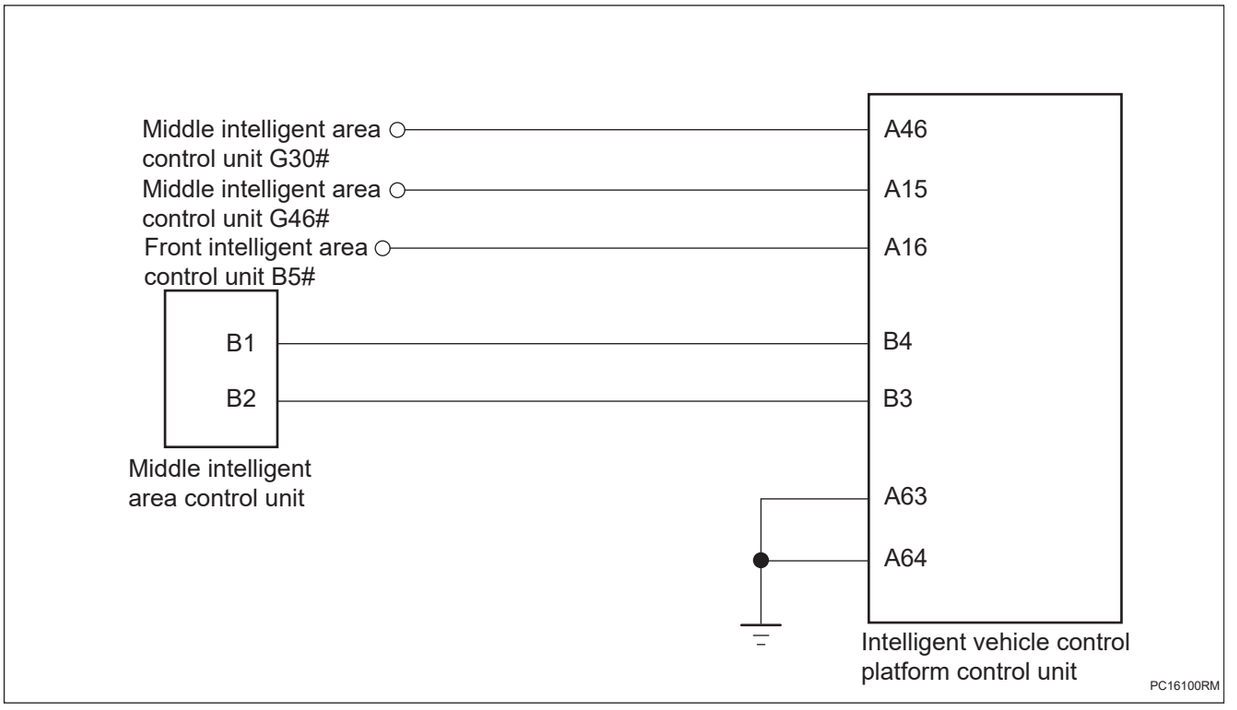
DTC	U14648A	Backbone network Eth1 connection establishment failure

Description

When Ethernet communication between middle intelligent area control unit and intelligent vehicle control platform control unit is abnormal or interrupted, the middle intelligent area control unit records DTC.

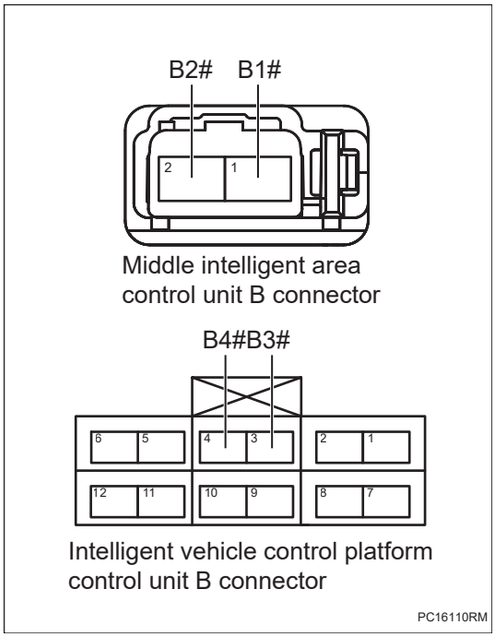
DTC No.	DTC detection condition	Faulty area
U14648A	(a) Backbone network Eth1 connection establishment failure.	• Middle intelligent area control unit • Intelligent vehicle control platform control unit • Ethernet wire and connector

Circuit diagram



Inspection procedure

1	**Check for open in Ethernet wire (middle intelligent area control unit - intelligent vehicle control platform control unit)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

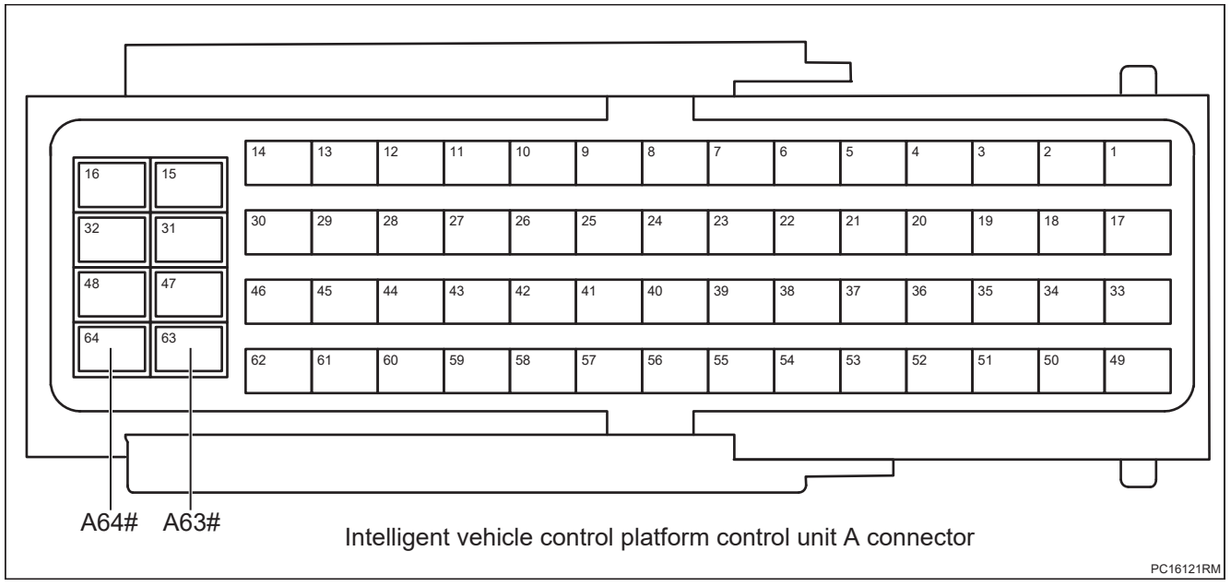
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector B4# - middle intelligent area control unit connector B1#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector B3# - middle intelligent area control unit connector B2#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

Standard value

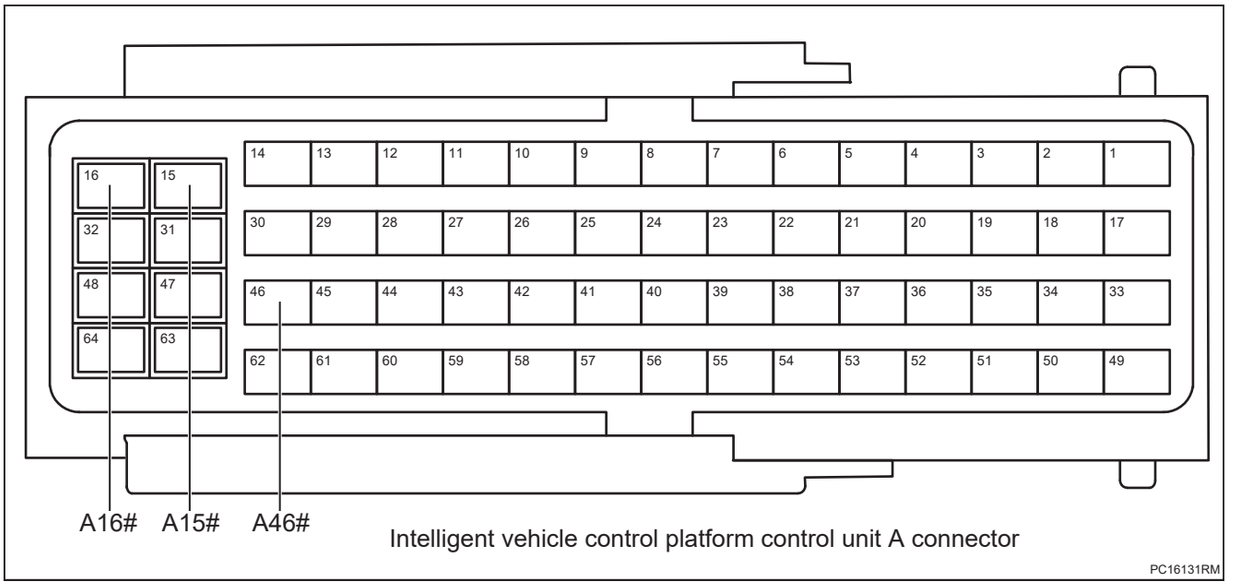
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check intelligent vehicle control platform control unit power supply



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check the power supply and ground of front and middle intelligent area control units and confirm if the front and middle intelligent area control units are damaged)**

OK

4	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	B226F11	Short to ground in USB A power supply

Description

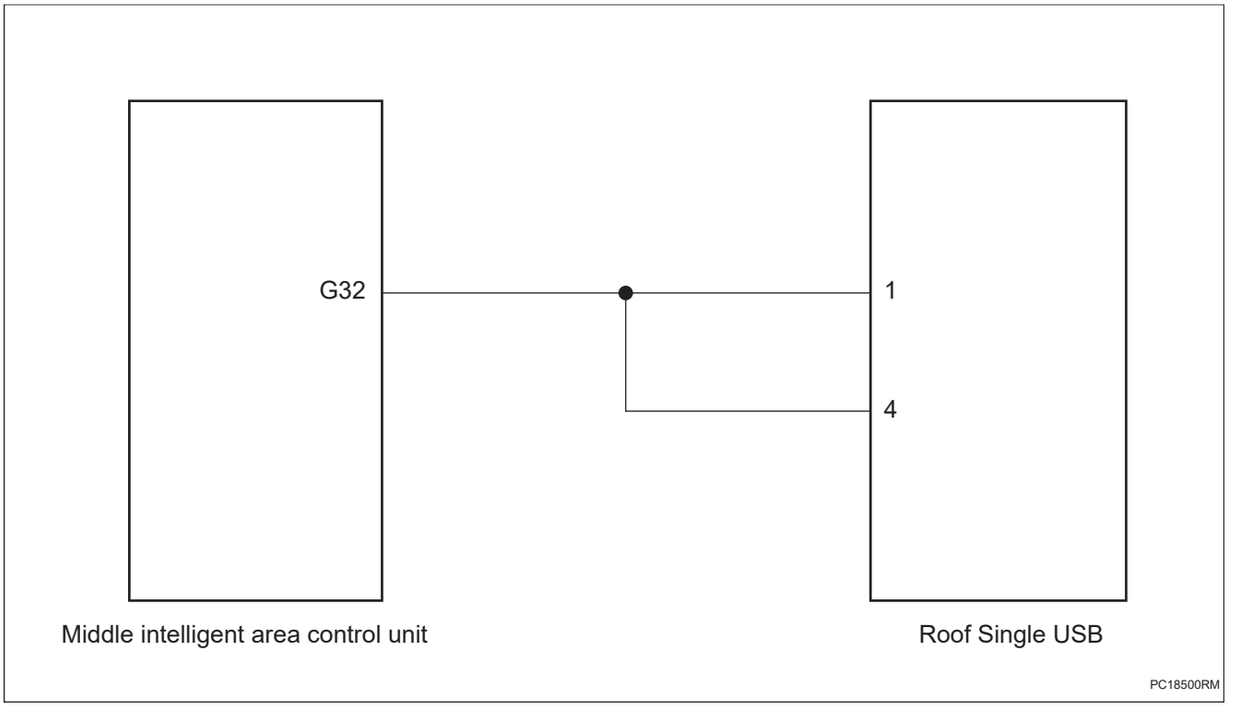
When there is short to ground in roof single USB power supply circuit, the middle intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B226F11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH07 short to GND	5	Event-based	10 ms	• Roof single USB • Wire harness and connector • Middle intelligent area control unit

Fault symptom

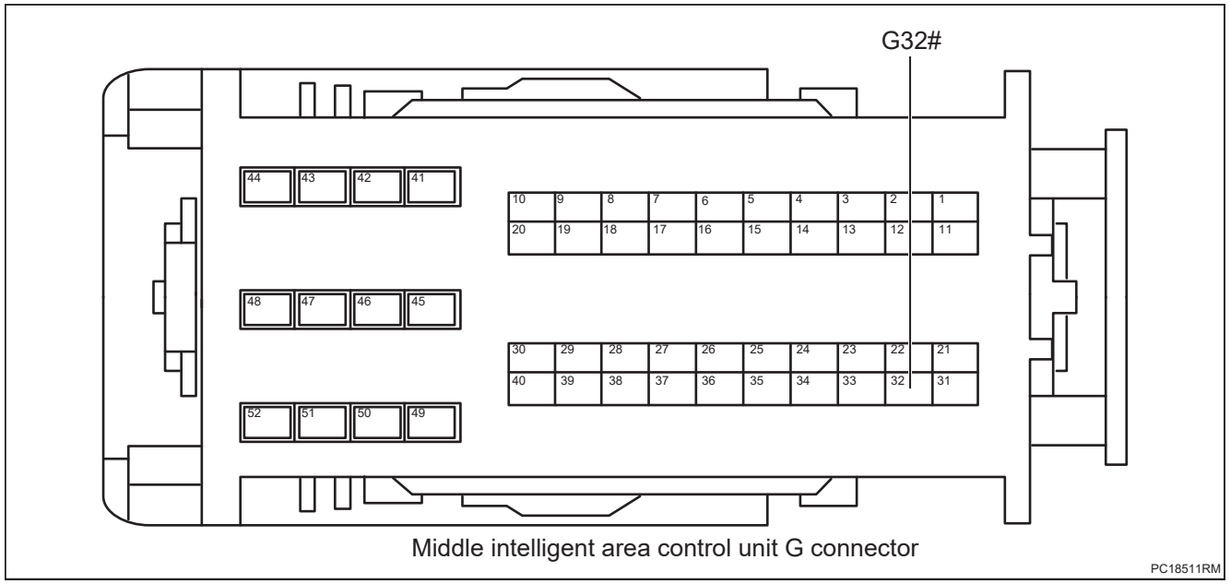
DTC No.	Fault symptom	Warning light/indicator
B226F11	DLP controller dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in middle intelligent area control unit wire harness and connector**



Middle intelligent area control unit G connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the roof single USB connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G32# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace roof single USB (See page ZC-5)**

(a) Replace the roof single USB.

(b) Connect HQ-VDS diagnostic tester.

ZD

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

ZD

OK

Diagnosis ends

DTC	**B17E016**	**Battery voltage too low**
DTC	**B17E017**	**Battery voltage too high**

Description

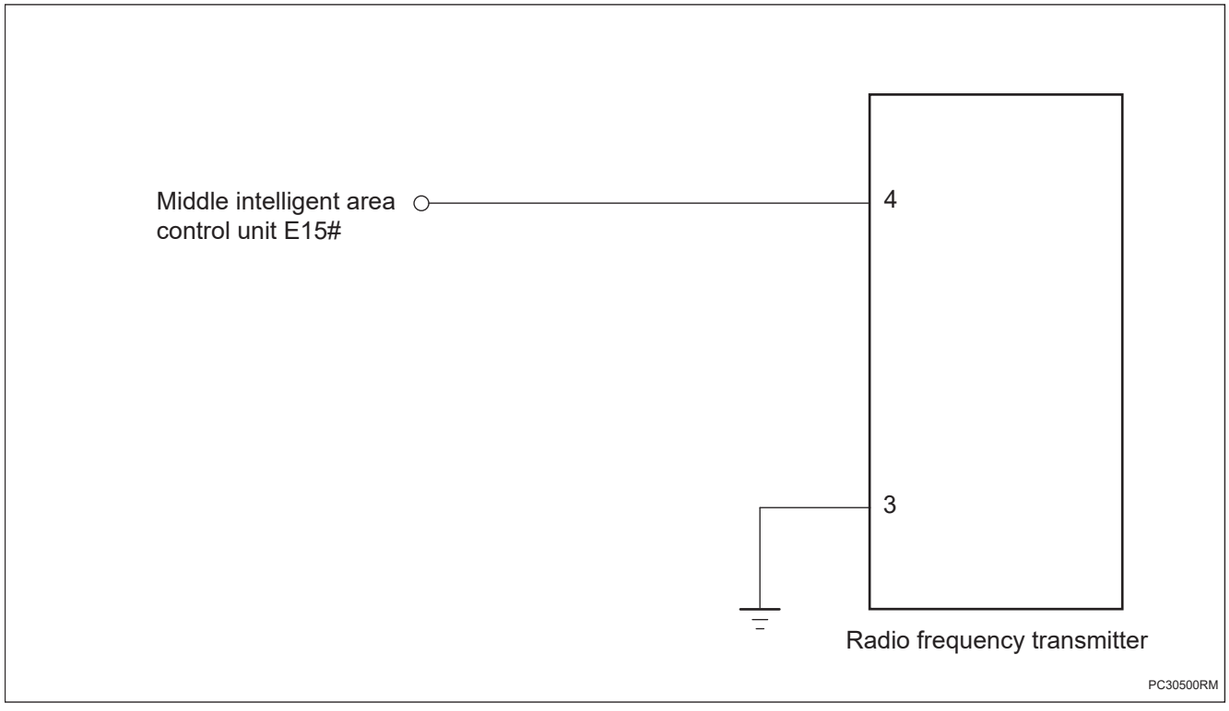
When the input voltage of radio frequency transmitter is too high or too low, the radio frequency transmitter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B17E016	• Non-diagnostic mode	Battery voltage is lower than 7 V	10000 ms	Periodic type	100 ms	• Radio frequency transmitter • Wire harness and connector • Battery/charging system
B17E017	• Non-diagnostic mode	Battery voltage is higher than 16.5 V	10000 ms	Periodic type	100 ms	• Radio frequency transmitter • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B17E016	Function failure	Not come on
B17E017	Function failure	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

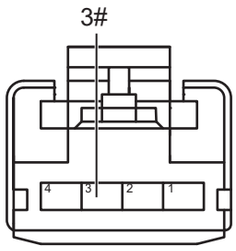
Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

2	Check radio frequency transmitter ground



Radio frequency transmitter connector
PC30510RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Disconnect the radio frequency transmitter connector.
(d) According to value in the table, measure resistance.

Standard value

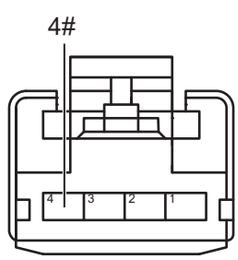
Multimeter connection	Detection condition	Specified condition
Radio frequency transmitter connector 3# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

3	Check radio frequency transmitter power supply



Radio frequency transmitter connector
PC30521RM

(a) Connect the negative battery terminal.
(b) Turn ignition switch to "ON".
(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Radio frequency transmitter connector 4# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

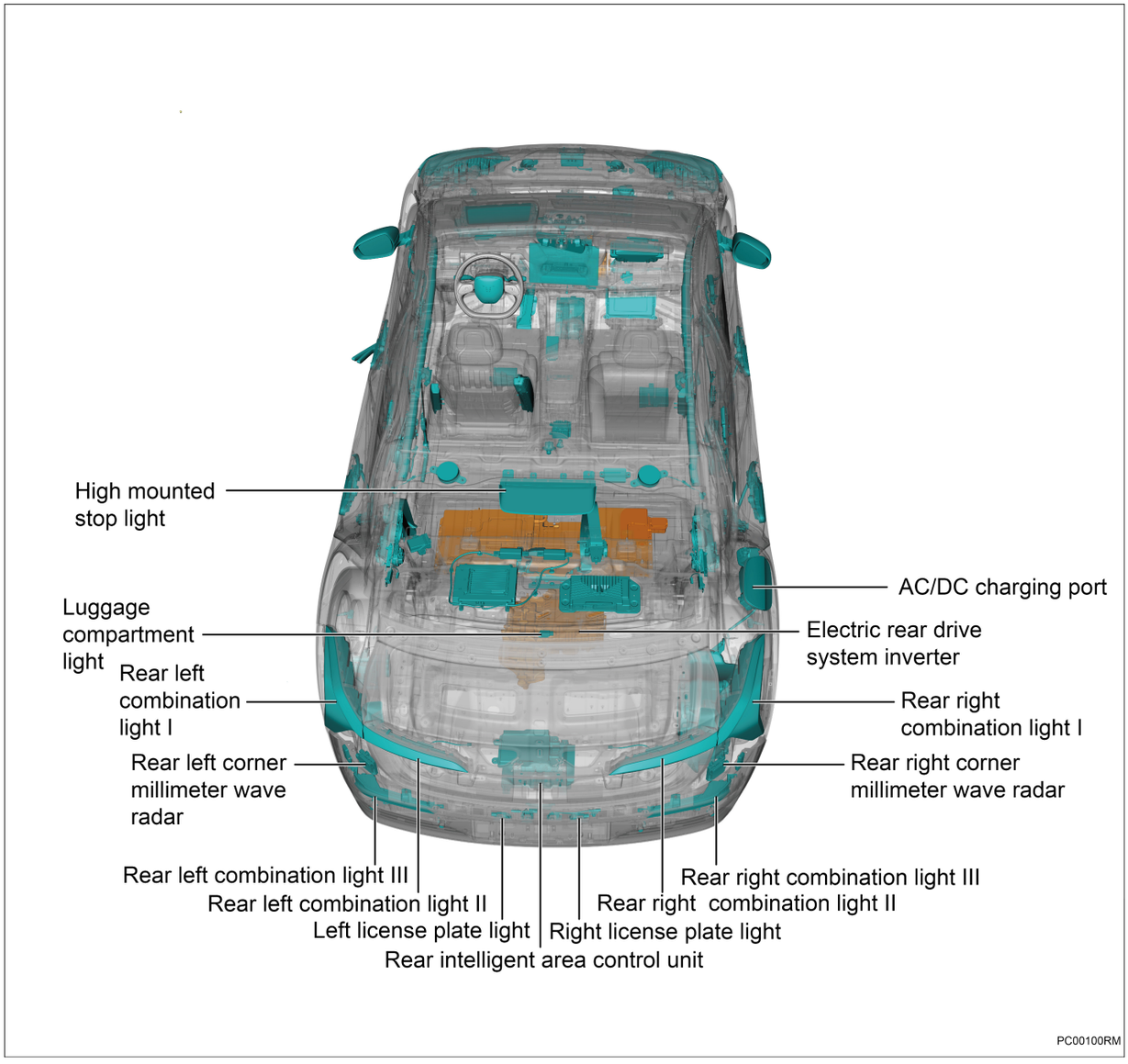
NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace radio frequency transmitter (See page ZC-51)

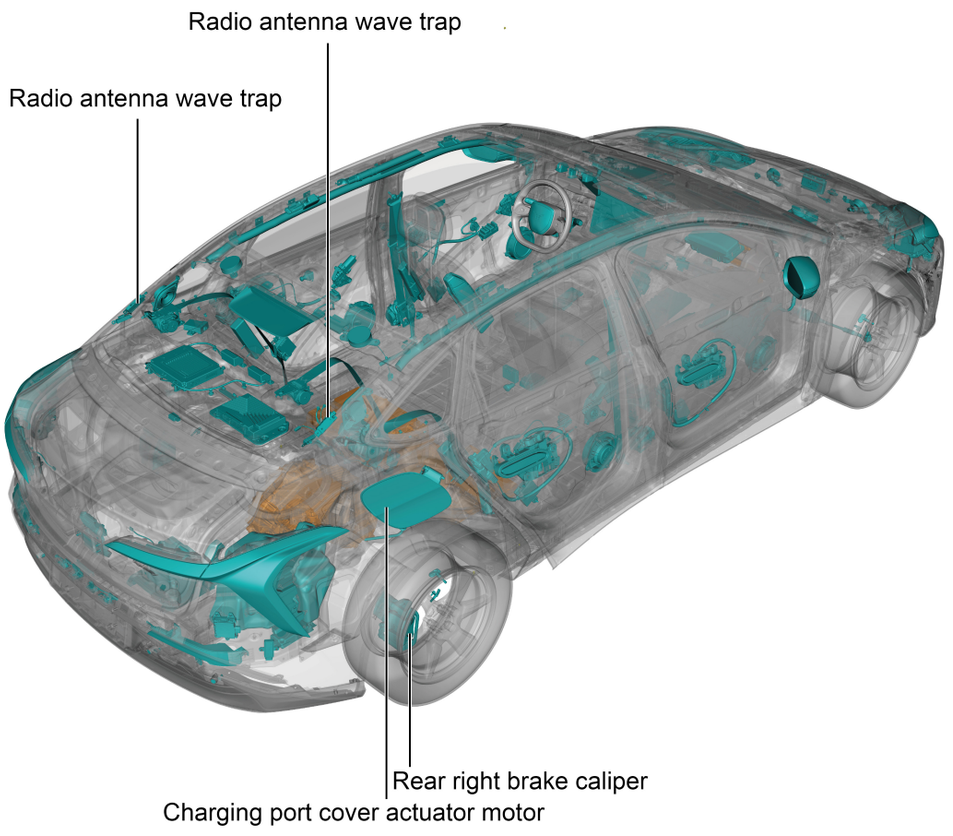
Rear intelligent area control unit

Part position



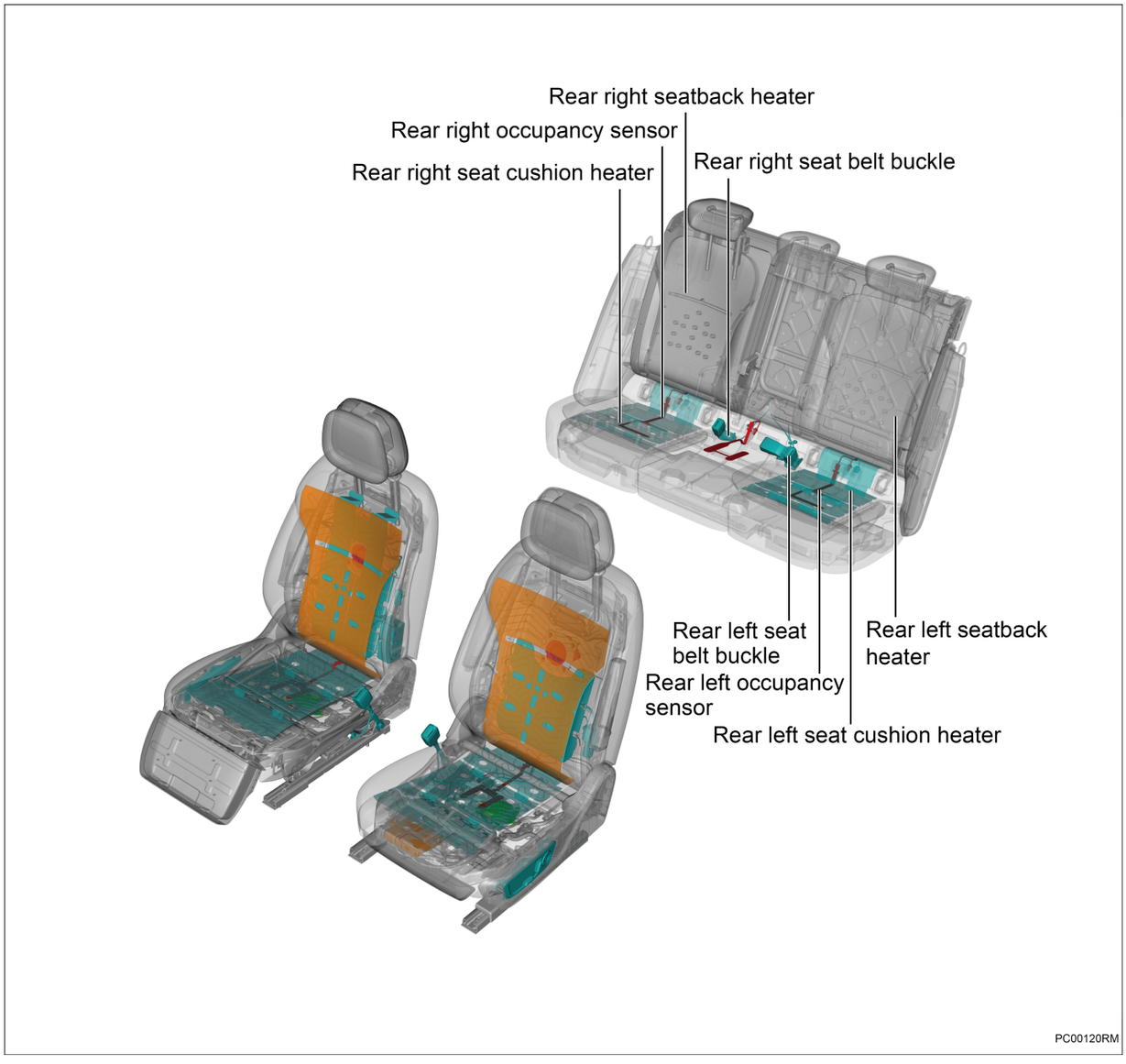
ZD

Part position

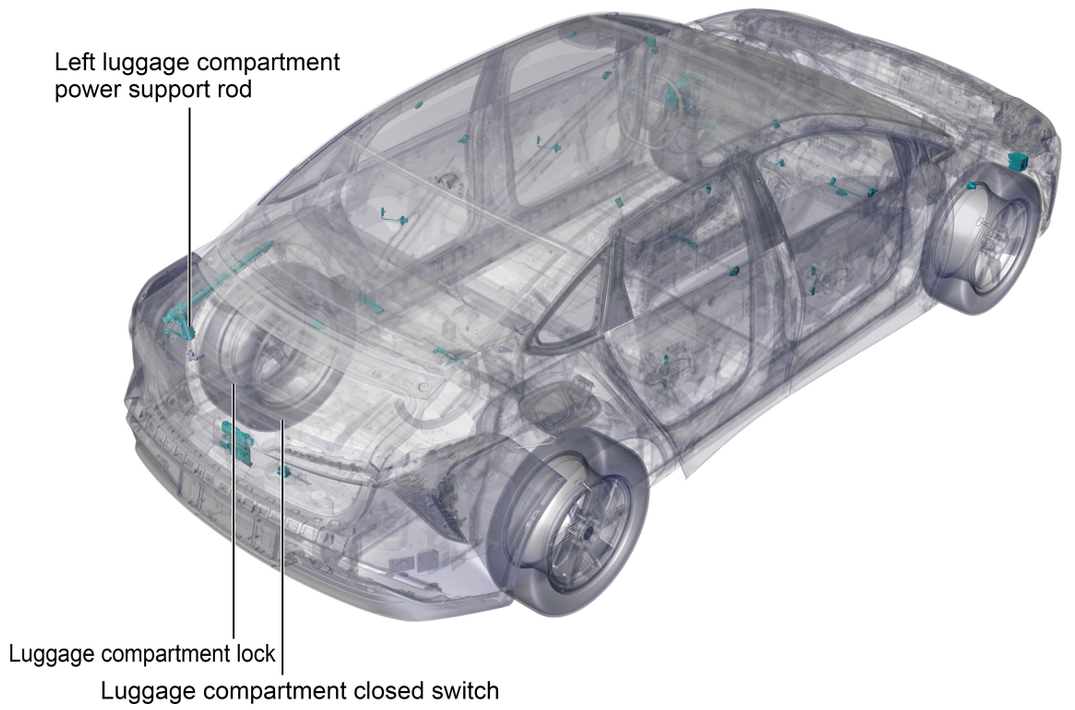


PC00110RM

Part position

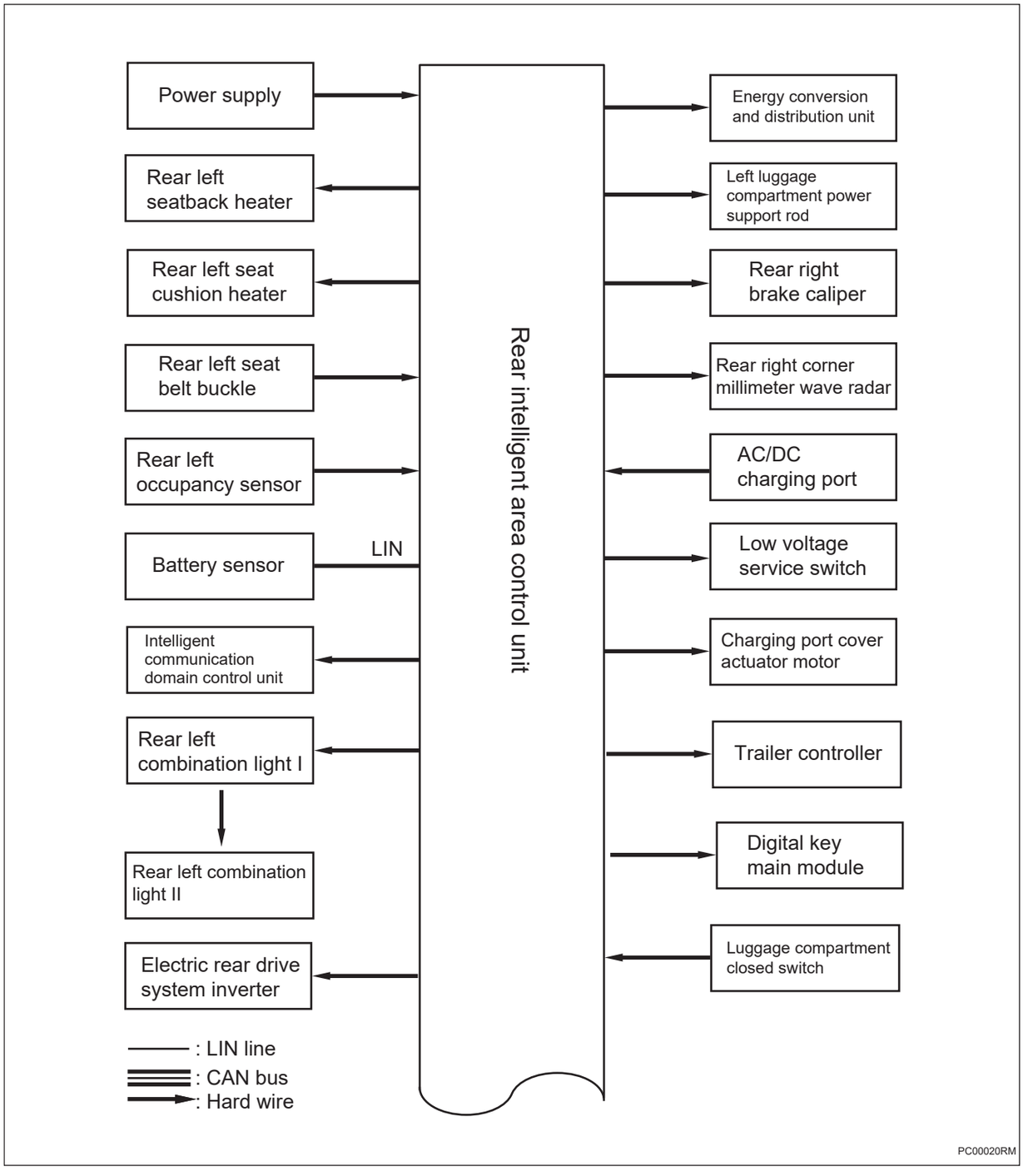


Part position

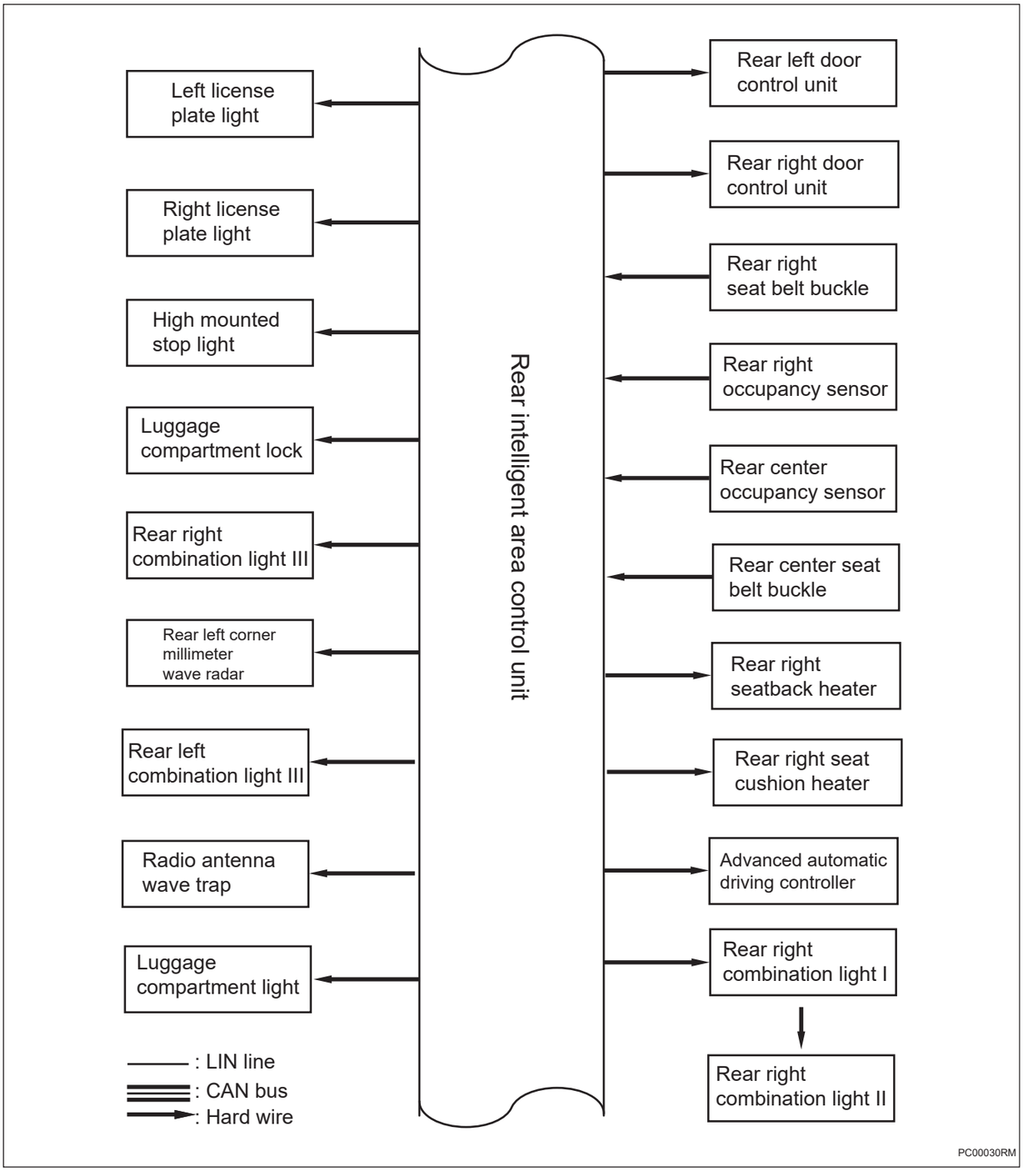


PC00130RM

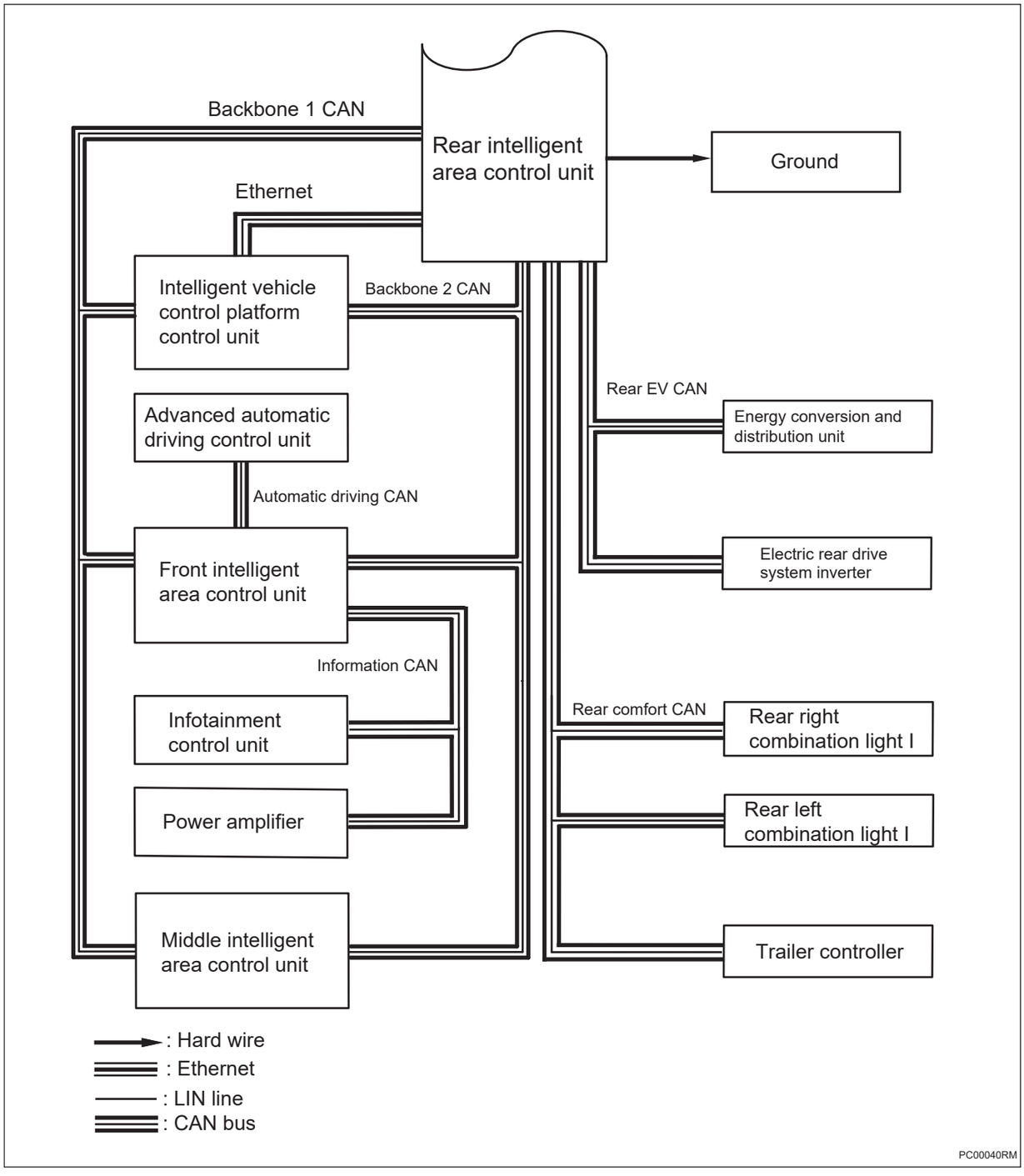
System diagram



System diagram



System diagram



System description

1. System description

(a) Intelligent area controller assembly (PDC) is the various sensor/actuator acquisition and driving center and area data center of the physical area of the vehicle, undertaking the physical interface of the vehicle, such as the power distribution and input/output control of the area, etc., and transforming the service of the vehicle basic data.

2. Intelligent power distribution management

(a) PDC integrated power distribution module can realize different ECU demanded power distribution according to functional scenarios. According to scenario requirements, the power is only supplied to specified ECUs in a certain time sequence and can be woken up by network segments. After the function is complete, the network segment sleeps in time and the power distribution is cut off, so that energy consumption is minimized. For example, when power battery is charged, the power is only supplied to ECU (BMS, PDC-I, CSC , etc.) according to identified charging scenarios. After charging is finished, the network segment sleeps and the power is cut off.

Data parameter

Charging port cover actuator motor

Item	Maximum	Normal	Minimum
Operating voltage (V)	15	12	9
Operating current (A)	2	0.6	-

Rear left combination light I

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	6	3.2	0.1

Rear left combination light II

Item	Maximum	Normal	Minimum
Operating voltage (V)	9.2	9.2	9.2
Operating current (A)	0.7	0.65	0.6

Rear left combination light III

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	6
Operating current (A)	0.5	0.2	0.18

Rear right combination light I

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	6	3.2	0.1

Rear right combination light II

Item	Maximum	Normal	Minimum
Operating voltage (V)	9.2	9.2	9.2
Operating current (A)	0.7	0.65	0.6

Rear right combination light III

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	6
Operating current (A)	0.5	0.2	0.18

Luggage compartment lock - low configuration

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	7.5	4.5	1.2

Luggage compartment lock - high configuration

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	10	5	4

Left license plate light

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.06	0.04	0.03

Right license plate light

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.06	0.04	0.03

Rear right brake caliper

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	12	6	-

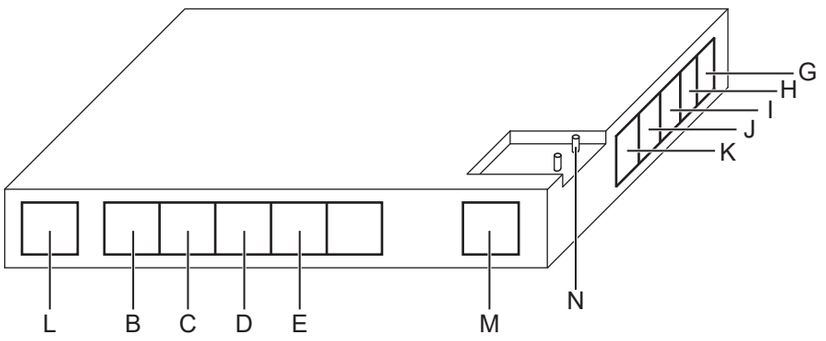
Occupancy sensor

Item	Maximum	Normal	Minimum
Operating voltage (V)	19	-	0
Operating current (A)	0.02	-	0

High mounted stop light

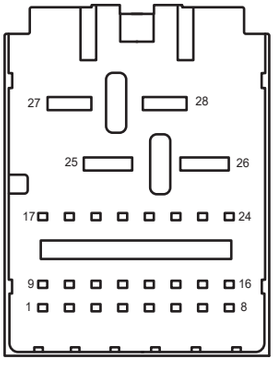
Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.32	0.25	0.12

ECU terminal

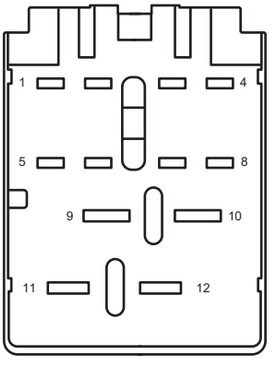


Rear intelligent area control unit

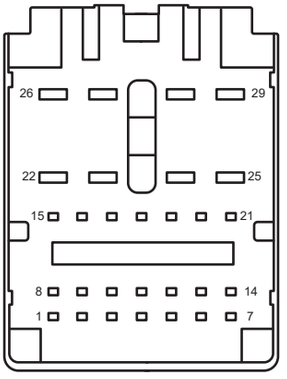
PC25000RM



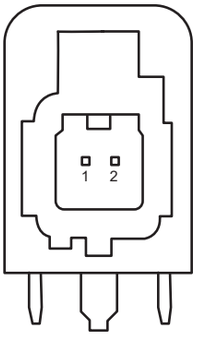
Rear intelligent area control unit B/D/E/G/K



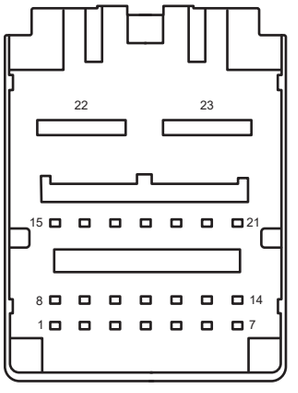
Rear intelligent area control unit C/I



Rear intelligent area control unit H/J



Rear intelligent area control unit L



Rear intelligent area control unit M

PC00010RM

Rear intelligent area control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	CAN_L (VDC, PDCF, PDCM, backbone network CAN2)	15	GND (analog sensor)
2	CAN_H (VDC, PDCF, PDCM, backbone network CAN2)	16	-
3	-	17	-

Rear intelligent area control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
4	-	18	-
5	-	19	-
6	-	20	-
7	-	21	-
8	-	22	-
9	-	23	-
10	-	24	-
11	Rear right corner millimeter wave radar	25	GND (ground)
12	-	26	Right EPB electronic caliper- (releasing direction)
13	-	27	-
14	-	28	Right EPB electronic caliper+ (clamping direction)

Rear intelligent area control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	7	-
2	-	8	-
3	Rear right combination light - power + logic power	9	-
4	-	10	-
5	-	11	-
6	-	12	Rear right door intelligent terminal (B+)

Rear intelligent area control unit D			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	15	Second row middle seat occupancy sensor/rear HVAC intake temperature sensor
2	-	16	-
3	-	17	CAN L (LAMP_RR/LAMP_RL/TICU/ EVCC)
4	-	18	CAN H (LAMP_RR/LAMP_RL/TICU/ EVCC)
5	-	19	-
6	-	20	-
7	-	21	-
8	GND (analog sensor)	22	-
9	-	23	-
10	-	24	-
11	Rear right seat belt buckle	25	GND

Rear intelligent area control unit D			
Pin number	**Definition**	**Pin number**	**Definition**
12	Rear right seat heater sensor +/Rear right row face temperature sensor	26	-
13	Rear right seat occupancy sensor/rear left row foot temperature sensor	27	Rear right seat heater power supply
14	Second row middle seat belt buckle	28	-

Rear intelligent area control unit E			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	15	AC charging port - L1 temperature monitoring positive
2	-	16	AC charging port - CC signal (Chinese standard) AC charging port - PP signal (European standard)
3	-	17	Super charging socket CC2/DC charging CC2
4	AC charging port - electronic lock - (lock)	18	DC charging socket - negative temperature monitoring
5	AC charging port - electronic lock + (unlock)	19	DC charging socket - positive temperature monitoring
6	Charging port cover motor- (lock)	20	-
7	Charging port cover motor+ (unlock)	21	-
8	-	22	AC charging port - lock lever position monitoring (pin2)
9	-	23	-
10	-	24	-
11	-	25	-
12	AC charging port - N port temperature monitoring positive	26	-
13	-	27	-
14	-	28	-

Rear intelligent area control unit G			
Pin number	**Definition**	**Pin number**	**Definition**
1	Protection	15	-
2	-	16	-
3	-	17	-
4	-	18	-
5	-	19	-
6	-	20	-
7	-	21	-
8	Protection	22	-
9	-	23	-

Rear intelligent area control unit G			
Pin number	**Definition**	**Pin number**	**Definition**
10	-	24	-
11	-	25	Rear left seat heater - power
12	-	26	-
13	-	27	GND
14	-	28	Protection

Rear intelligent area control unit H			
Pin number	**Definition**	**Pin number**	**Definition**
1	CAN4_L (PDCF, IBC, EPS)	16	-
2	CAN4_H (PDCF, IBC, EPS)	17	-
3	-	18	-
4	-	19	Rear left seat occupancy sensor
5	-	20	LIN (including EBS2)
6	CAN2_L (MCU_R, PCDU, BMS, VDC)	21	Rear left seat heater - sensor+
7	CAN2_H (MCU_R, PCDU, BMS, VDC)	22	Rear left seat belt clip
8	-	23	-
9	-	24	-
10	CAN1 L (backbone network 1)	25	-
11	CAN1 H (backbone network 1)	26	-
12	-	27	-
13	-	28	-
14	-	29	ICC power distribution (B+)
15	-	—	-

Rear intelligent area control unit I			
Pin number	**Definition**	**Pin number**	**Definition**
1	Rear left combination light - power + logic power	7	Battery management system + low voltage service switch 1 (B+)
2	-	8	GND (ground)
3	Battery management system + low voltage service switch 2 (B+)	9	-
4	Energy conversion and distribution unit, including DCDC, OBC, PDU - distribution/charging controller (EVCC) - distribution (B+)	10	Back door left drive motor - (down)
5	Rear motor control unit - distribution/ TOD controller distribution	11	-
6	-	12	Back door left drive motor + (up)

Rear intelligent area control unit J			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	16	-
2	Luggage compartment closed request switch in luggage compartment	17	-
3	Back door left drive motor - left support rod Hall B signal	18	-
4	Back door left drive motor - left support rod Hall A signal	19	Back door lock - lock tab switch signal (half latch)
5	-	20	-
6	-	21	Back door lock - pawl switch signal (full latch), back door lock status (low configuration)
7	Back-up light*2	22	Back door lock - center switch signal (reset)
8	-	23	Back door lock - motor drive
9	-	24	-
10	-	25	-
11	-	26	Back door lock - release
12	License plate light drive*2	27	Back door lock - cinch
13	High mounted stop light	28	-
14	IG signal (trailer mode controller + rear motor control unit + battery management system + charging controller (EVCC) + ICC + digital key main module)	29	-
15	Back door left drive motor - hall 1&2 sensor power supply	—	-

Rear intelligent area control unit K			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	15	-
2	-	16	-
3	-	17	-
4	-	18	-
5	-	19	-
6	-	20	-
7	Luggage compartment light left outlet/ luggage compartment inner close or lock switch backlight/luggage compartment open and close switch backlight	21	-
8	Rear left corner millimeter wave radar	22	-
9	-	23	-
10	-	24	Rear fog light*2
11	-	25	Rear windshield heater

Rear intelligent area control unit K			
Pin number	**Definition**	**Pin number**	**Definition**
12	-	26	Rear left door intelligent terminal (B+)
13	-	27	-
14	-	28	GND

Rear intelligent area control unit L			
Pin number	**Definition**	**Pin number**	**Definition**
1	ETH_T1_1_P (100M)	2	ETH_T1_1_N(100M)

Rear intelligent area control unit M			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	13	-
2	-	14	-
3	-	15	-
4	Protection	16	-
5	-	17	-
6	-	18	Protection
7	-	19	-
8	-	20	-
9	-	21	-
10	Protection	22	DJI/me (pecu, adcu) -B+
11	GND (ground) - select this circuit only with L2.9	23	-
12	Protection	—	-

Rear intelligent area control unit N	
Pin number	**Definition**
1	B grid/non-safety power

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C250046	Power supply voltage low	(See page ZD-808)
C250047	Power supply voltage excessive	(See page ZD-808)
C251800	Low power supply voltage (SR power grid)	(See page ZD-808)
C251900	Power supply overvoltage (SR power grid)	(See page ZD-808)
C251A00	Low power supply voltage (QM power grid)	(See page ZD-808)
C251B00	Power supply overvoltage (QM power grid)	(See page ZD-808)
B240B90	E2E check error (ADV_2 on CAN1)	(See page ZD-819)
B241190	E2E check error (VDC_1 on CAN1)	(See page ZD-819)

DTC	Detection Items	See page
C242290	E2E check error (HAD_3 on CAN1)	(See page ZD-819)
B240C90	E2E check error (HCU_2_10 on CAN1)	(See page ZD-814)
B240D90	E2E check error (HCU_2_12 on CAN1)	(See page ZD-814)
B240E90	E2E check error (HCU_2_2 on CAN1)	(See page ZD-814)
B240F90	E2E check error (HCU_2_4 on CAN1)	(See page ZD-814)
B241090	E2E check error (HCU_2_7 on CAN1)	(See page ZD-814)
B241A11	Short to ground in rear fog light*2	(See page ZD-856)
B241A12	Short to power supply in rear fog light*2	(See page ZD-856)
B241B11	Short to ground in rear right combination light - power + logic power	(See page ZD-859)
B241B12	Short to power supply in rear right combination light - power + logic power	(See page ZD-859)
B241C11	Short to ground in rear right seatback + seat cushion fan ventilation - power	(See page ZD-862)
B241C12	Short to power supply in rear right seatback + seat cushion fan ventilation - power	(See page ZD-862)
B241D11	Short to ground in back-up light*2	(See page ZD-865)
B241D12	Short to power supply in back-up light*2	(See page ZD-865)
B242E11	Short to ground in back door drive motor - hall 1&2 sensor power supply	(See page ZD-873)
B242E12	Short to power supply in back door drive motor - hall 1&2 sensor power supply	(See page ZD-873)
B243C11	Short to ground in rear left seat heater - power	(See page ZD-884)
B243C12	Short to power supply in rear left seat heater - power	(See page ZD-884)
B243C13	Open in rear left seat heater - power	(See page ZD-884)
B243D11	Short to ground in rear right seat heater - power	(See page ZD-889)
B243D12	Short to power supply in rear right seat heater - power	(See page ZD-889)
B243D13	Open in rear right seat heater - power	(See page ZD-889)
B243F11	Short to ground in rear right door intelligent terminal	(See page ZD-894)
B243F12	Short to power supply in rear right door intelligent terminal	(See page ZD-894)
B245E11	Short to ground in rear left seat heater - sensor+	(See page ZD-916)
P312511	Short to power supply/open in rear left seat heater - sensor+	(See page ZD-916)
B245F11	Short to ground in rear right seat heater - sensor+	(See page ZD-894)
P312611	Short to power supply/open in rear right seat heater - sensor+	(See page ZD-894)

DTC	Detection Items	See page
B240093	EBS open fault	(See page ZD-831)
B240190	EBS current sampling fault	(See page ZD-831)
B240290	EBS voltage sampling fault	(See page ZD-831)
B240390	EBS temperature sampling fault	(See page ZD-831)
B240490	EBS calibration data error	(See page ZD-831)
B240590	EBS fault diagnosis	(See page ZD-831)
B240890	E2E check error (EPBMasterReqToS on CAN4)	(See page ZD-813)
B240990	E2E check error (EPBMasterReqToS on CAN6)	(See page ZD-813)
C242490	E2E check error (EPBMaster_1 on CAN1)	(See page ZD-813)
B241310	Luggage compartment inner closed request switch stuck fault	(See page ZD-837)
B242311	Short to ground in luggage compartment inner closed or lock switch backlight	(See page ZD-837)
B242312	Short to power supply in luggage compartment inner closed or lock switch backlight	(See page ZD-837)
B241411	Short to ground in rear left combination light - power + logic power	(See page ZD-842)
B241412	Short to power supply in rear left combination light - power + logic power	(See page ZD-842)
B241711	Short to ground in IG signal (trailer mode controller + rear motor control unit + battery management system + charging controller (EVCC))	(See page ZD-845)
B241712	Short to power supply in IG signal (trailer mode controller + rear motor control unit + battery management system + charging controller (EVCC))	(See page ZD-845)
B241811	Short to ground in license plate light drive*2	(See page ZD-850)
B241812	Short to power supply in license plate light drive*2	(See page ZD-850)
B241911	Short to ground in high mounted brake light	(See page ZD-853)
B241912	Short to power supply in high mounted brake light	(See page ZD-853)
B242011	Short to ground in luggage compartment light	(See page ZD-868)
B242012	Short to power supply in luggage compartment light	(See page ZD-868)
B242511	DC charging indicator - distribution (short to ground in slow charging)	(See page ZD-871)
B242512	Short to power supply in DC charging indicator - distribution (slow charging)	(See page ZD-871)
B242611	Short to ground in DC charging indicator - distribution (fast charging)	(See page ZD-871)

DTC	Detection Items	See page
B242612	Short to power supply in DC charging indicator - distribution (fast charging)	(See page ZD-871)
B243311	Short to ground in rear left corner millimeter wave radar	(See page ZD-877)
B243312	Short to power supply in rear left corner millimeter wave radar	(See page ZD-877)
B243411	Short to ground in rear right corner millimeter wave radar	(See page ZD-881)
B243412	Short to power supply in rear right corner millimeter wave radar	(See page ZD-881)
B244011	Short to ground in rear left door intelligent terminal	(See page ZD-897)
B244012	Short to power supply in rear left door intelligent terminal	(See page ZD-897)
B244211	Short to ground in rear windshield heating	(See page ZD-900)
B244212	Short to power supply in rear windshield heating	(See page ZD-900)
B244213	Open in rear windshield heating	(See page ZD-900)
B244311	Short to ground in 220 V power supply inverter - power distribution/second row wireless charging/12 V luggage compartment backup power supply	(See page ZD-905)
B244312	220 V power supply inverter - power distribution/second row wireless charging/ 12 V luggage compartment backup power supply	(See page ZD-905)
B244519	Battery management system electronic fuse overload	(See page ZD-906)
B244511	Short to ground in battery management system electronic fuse	(See page ZD-906)
B24451A	Battery management system electronic fuse MOS saturation shutdown	(See page ZD-906)
B24451B	Battery management system electronic fuse unable to enter sleep	(See page ZD-906)
B24451C	Battery management system electronic fuse undervoltage	(See page ZD-906)
B24451D	Battery management system electronic fuse overtemperature	(See page ZD-906)
B24451E	Battery management system electronic fuse SPI communication fault	(See page ZD-906)
B244619	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse overload	(See page ZD-906)
B244611	Short to ground in energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse	(See page ZD-906)
B24461A	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse MOS saturation shutdown	(See page ZD-906)

DTC	Detection Items	See page
B24461B	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse unable to enter sleep	(See page ZD-906)
B24461C	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse undervoltage	(See page ZD-906)
B24461D	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse overtemperature	(See page ZD-906)
B24461E	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse SPI communication fault	(See page ZD-906)
B244719	Rear right door intelligent terminal electronic fuse overload	(See page ZD-906)
B244711	Short to ground in rear right door intelligent terminal electronic fuse	(See page ZD-906)
B24471A	Rear right door intelligent terminal electronic fuse MOS saturation shutdown	(See page ZD-906)
B24471B	Rear right door intelligent terminal electronic fuse unable to enter sleep	(See page ZD-906)
B24471C	Rear right door intelligent terminal electronic fuse undervoltage	(See page ZD-906)
B24471D	Rear right door intelligent terminal electronic fuse overtemperature	(See page ZD-906)
B24471E	Rear right door intelligent terminal electronic fuse SPI communication fault	(See page ZD-906)
B244819	HAD electronic fuse overload	(See page ZD-906)
B244811	Short to ground in HAD electronic fuse	(See page ZD-906)
B24481A	HAD electronic fuse MOS saturation shutdown	(See page ZD-906)
B24481B	HAD electronic fuse unable to enter sleep	(See page ZD-906)
B24481C	HAD electronic fuse undervoltage	(See page ZD-906)
B24481D	HAD electronic fuse overtemperature	(See page ZD-906)
B24481E	HAD electronic fuse SPI communication fault	(See page ZD-906)
B244919	Intelligent communication terminal electronic fuse overload	(See page ZD-906)
B244911	Short to ground in intelligent communication terminal electronic fuse	(See page ZD-906)
B24491A	Intelligent communication terminal electronic fuse MOS saturation shutdown	(See page ZD-906)
B24491B	Intelligent communication terminal electronic fuse unable to enter sleep	(See page ZD-906)
B24491C	Intelligent communication terminal electronic fuse undervoltage	(See page ZD-906)
B24491D	Intelligent communication terminal electronic fuse overtemperature	(See page ZD-906)

DTC	Detection Items	See page
B24491E	Intelligent communication terminal electronic fuse SPI communication fault	(See page ZD-906)
B244A19	Rear left door intelligent terminal electronic fuse overload	(See page ZD-906)
B244A11	Short to ground in rear left door intelligent terminal electronic fuse	(See page ZD-906)
B244A1A	Rear left door intelligent terminal electronic fuse MOS saturation shutdown	(See page ZD-906)
B244A1B	Rear left door intelligent terminal electronic fuse unable to enter sleep	(See page ZD-906)
B244A1C	Rear left door intelligent terminal electronic fuse undervoltage	(See page ZD-906)
B244A1D	Rear left door intelligent terminal electronic fuse overtemperature	(See page ZD-906)
B244A1E	Rear left door intelligent terminal electronic fuse SPI communication fault	(See page ZD-906)
B245011	Short to ground in charging port cover electronic lock motor	(See page ZD-925)
B245012	Short to power supply in charging port cover electronic lock motor	(See page ZD-925)
B245013	Open in charging port cover electronic lock motor	(See page ZD-925)
B245111	Short to ground in back door lock	(See page ZD-929)
B245112	Short to power supply in back door lock	(See page ZD-929)
B245113	Open in back door lock	(See page ZD-929)
B245C11	Short to ground in back door lock motor drive	(See page ZD-929)
B245C12	Short to power supply in back door lock motor drive	(See page ZD-929)
B245C13	Open in back door lock motor drive	(See page ZD-929)
B245211	Short to ground in back door left drive motor	(See page ZD-935)
B245212	Short to power supply in back door left drive motor	(See page ZD-935)
B245213	Open in back door left drive motor	(See page ZD-935)
B245811	Short to ground in AC charging port - electronic lock	(See page ZD-940)
B245812	Short to power supply in AC charging port - electronic lock	(See page ZD-940)
B245813	Open in AC charging port - electronic lock	(See page ZD-940)
B246111	AC charging port - electronic lock overcurrent fault	(See page ZD-940)
B246211	AC charging port - electronic lock fault	(See page ZD-940)
B246311	DC charging socket - auxiliary power supply overvoltage	(See page ZD-945)
B246411	DC charging socket - auxiliary power supply undervoltage	(See page ZD-945)

DTC	Detection Items	See page
B246511	OHB31 tailgate low configuration electronic lock fault	(See page ZD-947)
B246611	Tailgate high configuration electronic lock fault	(See page ZD-947)
B246711	Left tailgate support rod fault	(See page ZD-949)
B246911	Left tailgate support rod Hall fault	(See page ZD-950)
C240D00	EPB - assembly detection incomplete - right	(See page ZD-957)
C240E00	EPB - wheel speed signal error - right	(See page ZD-958)
C240F00	EPB - abnormal power off - right	(See page ZD-959)
C242B16	EPB pre-drive chip power supply undervoltage fault	(See page ZD-961)
C242B17	EPB pre-drive chip power supply overvoltage fault	(See page ZD-961)
C242C10	EPB pre-drive chip internal reset fault	(See page ZD-961)
C242D10	EPB pre-drive chip internal crystal oscillator fault	(See page ZD-961)
C242E10	EPB pre-drive chip internal initialization configuration and self-check fault	(See page ZD-961)
C242F10	EPB pre-drive chip internal charge pump fault	(See page ZD-961)
C243010	EPB pre-drive chip watchdog fault	(See page ZD-961)
C243110	EPB pre-drive chip overtemperature fault	(See page ZD-961)
C243210	EPB pre-drive chip charge pump undervoltage fault	(See page ZD-961)
C243310	EPB pre-drive chip detected overcurrent fault	(See page ZD-961)
C243410	EPB pre-drive chip detected abnormal H-bridge high and low side MOSFET	(See page ZD-961)
C243510	SPI communication failure between EPB MCU and pre-drive chip	(See page ZD-961)
C243610	Communication interrupted between EPB pre-drive chip and MCU SPI	(See page ZD-961)
C243710	SPI communication address check failure fault between MCU and pre-drive chip	(See page ZD-961)
C243810	MCU SPI transmission failure	(See page ZD-961)
C243910	Pre-drive chip detected sampling synchronization fault	(See page ZD-961)
C243A10	EPB MCU detects pre-drive chip sampling synchronization signal detection function abnormality fault	(See page ZD-961)
C243B10	EPB current sampling consistency fault	(See page ZD-961)
C243C10	EPB pre-drive chip sampling stuck fault	(See page ZD-961)
C243D10	EPB pre-drive chip ADC conversion failure fault	(See page ZD-961)
C243E10	EPB caliper motor circuit fault (open)	(See page ZD-961)

DTC	Detection Items	See page
C243F10	EPB caliper motor circuit fault (short to ground)	(See page ZD-961)
C244010	EPB caliper motor circuit fault (short to power supply)	(See page ZD-961)
C244110	EPB H-bridge shutdown bridge arm voltage abnormal fault	(See page ZD-961)
C244210	EPB drive circuit or actuator fault	(See page ZD-961)
C244310	EPB detects abnormal current fault when motor is not driven	(See page ZD-961)
C244410	EPB drive anti-reversion open fault	(See page ZD-961)
C244510	EPB drive anti-reversion rationality fault	(See page ZD-961)
C244610	SPI communication CRC check failure between EPB pre-drive chip and MCU	(See page ZD-961)
C244710	EPB current sampling offset calculation not completed for a long time	(See page ZD-961)
C244810	EPB pre-drive chip self-check timeout fault	(See page ZD-961)
C247511	EPB caliper motor overcurrent fault (software protection)	(See page ZD-961)
C240000	EPB-HOST response error - right	(See page ZD-961)
C240100	EPB - no brake disc - right	(See page ZD-961)
C240200	EPB - motor stuck - right	(See page ZD-961)
C240300	EPB - insufficient clamping force - right	(See page ZD-961)
C240400	EPB - unloaded current too high - right	(See page ZD-961)
C240500	EPB - actuator damaged - right	(See page ZD-961)
C240600	EPB - caliper status inconsistent or unknown - right	(See page ZD-961)
C240900	Host not available - right	(See page ZD-961)
C240A00	EPB - current fluctuation too high - right	(See page ZD-961)
C241000	EPB - invalid data storage area - right	(See page ZD-961)
C241300	EPB - dynamic anti-lock brake failure - right	(See page ZD-961)
C251C00	PHY mode fault	(See page ZD-830)
C240700	EPB - abnormal voltage during operation - right	(See page ZD-954)
C240B00	EPB - power supply voltage too low - right	(See page ZD-954)
C240C00	EPB - power supply voltage too high - right	(See page ZD-954)
C240800	EPB - service mode - right	(See page ZD-957)
C241100	EPB - excessive slope - right	(See page ZD-960)
C241200	EPB - configuration code error - right	(See page ZD-961)
C242390	E2E check error (ABS_1 on CAN1)	(See page ZD-820)
C242590	E2E check error (EPS1_SAS_1 on CAN1)	(See page ZD-821)
C242690	E2E check error (PDCM_YRS on CAN1)	(See page ZD-816)

DTC	Detection Items	See page
C242790	E2E check error (EGSM_1 on CAN1)	(See page ZD-822)
C242890	E2E check error (ABS_1 on CAN4)	(See page ZD-817)
C242990	E2E check error (ESC_2_1 on CAN4)	(See page ZD-817)
C242A90	E2E check error (IBC_1 on CAN4)	(See page ZD-817)
C247611	DC charging socket - reasonable judgment of positive temperature	(See page ZD-974)
C247711	DC charging socket - reasonable judgment of negative temperature	(See page ZD-974)
C247811	AC charging port - reasonable judgment of L1 port temperature	(See page ZD-974)
C247911	AC charging port - reasonable judgment of L2 port temperature	(See page ZD-974)
P312211	AC charging port - reasonable judgment of L3 port temperature	(See page ZD-974)
P312311	AC charging port - reasonable judgment of N port temperature	(See page ZD-974)
C250100	MCU overtemperature	(See page ZD-823)
C250200	Internal watchdog triggered reset	(See page ZD-825)
C250300	External watchdog triggered reset	(See page ZD-825)
C250400	NVM checksum error	(See page ZD-825)
C250500	ROM error	(See page ZD-825)
C250819	PMIC chip QVR power supply overload fault	(See page ZD-825)
C250817	PMIC chip QVR power supply overvoltage fault	(See page ZD-825)
C250816	PMIC chip QVR power supply undervoltage fault	(See page ZD-825)
C250811	Short to ground fault in PMIC chip QVR power supply	(See page ZD-825)
C250919	PMIC chip QC0 power supply overload fault	(See page ZD-825)
C250917	PMIC chip QC0 power supply overvoltage fault	(See page ZD-825)
C250916	PMIC chip QC0 power supply undervoltage fault	(See page ZD-825)
C250911	Short to ground fault in PMIC chip QC0 power supply	(See page ZD-825)
C250A17	PMIC chip QT1 power supply overvoltage fault	(See page ZD-825)
C250A16	PMIC chip QT1 power supply undervoltage fault	(See page ZD-825)
C250A11	Short to ground fault in PMIC chip QT1 power supply	(See page ZD-825)
C250B17	PMIC chip QT2 power supply overvoltage fault	(See page ZD-825)
C250B16	PMIC chip QT2 power supply undervoltage fault	(See page ZD-825)

DTC	Detection Items	See page
C250B11	Short to ground fault in PMIC chip QT2 power supply	(See page ZD-825)
C251400	Errorpin release failed	(See page ZD-825)
C251500	Low errorpin during operation	(See page ZD-825)
C251600	Low errorpin caused by external watchdog during operation	(See page ZD-825)
C251700	Shutdown path check fault	(See page ZD-825)
C251300	MCU hardware fault	(See page ZD-829)
P310A11	Short to ground in AC charging port CC signal	(See page ZD-981)
P310B11	Short to ground in DC charging port CC2 signal	(See page ZD-981)
P310C11	Short to ground in rear motor control unit - distribution/TOD controller distribution	(See page ZD-985)
P310C12	Short to power supply in rear motor control unit - distribution/TOD controller distribution	(See page ZD-985)
P310E11	Short to ground in charging controller (EVCC) - power distribution/48 V battery control unit	(See page ZD-988)
P310E12	Short to power supply in charging controller (EVCC) - power distribution/48 V battery control unit	(See page ZD-988)
P312E11	Second row left seat heating NTC temperature rise/temperature control abnormal	(See page ZD-997)
P312F11	Second row right seat heating NTC temperature rise/temperature control abnormal	(See page ZD-1002)
P311811	Short to ground in DC charging socket - positive temperature monitoring	(See page ZD-990)
P311911	Short to ground in DC charging socket - negative temperature monitoring	(See page ZD-990)
P311A11	Short to ground in AC charging port - L1 port temperature monitoring positive	(See page ZD-990)
P311B11	Short to ground in AC charging port - L2 port temperature monitoring positive	(See page ZD-990)
P311C11	Short to ground in AC charging port - L3 port temperature monitoring positive	(See page ZD-990)
P311D11	Short to ground in AC charging port - N port temperature monitoring positive	(See page ZD-990)
P312711	Short to power supply/open in DC charging socket - positive temperature monitoring	(See page ZD-990)
P312811	Short to power supply/open in DC charging socket - negative temperature monitoring	(See page ZD-990)
P312911	Short to power supply/open in AC charging port - L1 port temperature monitoring positive	(See page ZD-990)

DTC	Detection Items	See page
P312C11	Short to power supply/open in AC charging port - N port temperature monitoring positive	(See page ZD-990)
U014D87	Intelligent parking node lost	(See page ZD-1015)
U02BC87	VDCTDA4 node lost	(See page ZD-1015)
U014A97	VDC821 node lost (backbone network 2)	(See page ZD-1015)
U014B97	VDC397 node lost (backbone network 2)	(See page ZD-1015)
U02DE87	Power amplifier node lost	(See page ZD-1015)
U014797	Middle PDC/left PDC node lost (backbone network 2)	(See page ZD-1015)
U02BD87	Lithium battery management system node lost	(See page ZD-1015)
U02A587	Trailer controller node lost	(See page ZD-1015)
U02E287	Rear left light node lost	(See page ZD-1015)
U01E287	Rear left light node lost	(See page ZD-1015)
U029287	Motor control unit 2 node lost	(See page ZD-1015)
U02BE87	Energy conversion and distribution unit node lost	(See page ZD-1015)
U029A87	Battery management system node lost	(See page ZD-1015)
U015387	VDC397R node lost	(See page ZD-1015)
U014B87	VDC397 node lost	(See page ZD-1015)
U014A87	VDC821 node lost	(See page ZD-1015)
U014C87	Smart driving domain controller node lost	(See page ZD-1015)
U014687	Front area controller node lost	(See page ZD-1015)
U226B87	Intelligent communication terminal controller node lost	(See page ZD-1015)
U014F87	Cockpit domain controller node lost	(See page ZD-1015)
U014787	Center area controller node lost	(See page ZD-1015)
U02A487	EVCC communication controller unit node lost	(See page ZD-1015)
U014697	Front PDC node lost (backbone network 2)	(See page ZD-1015)
U008988	Backbone network 1 CAN bus off	(See page ZD-1011)
U000188	Rear EV CAN bus off	(See page ZD-1011)
U002888	Body/comfort CAN bus off	(See page ZD-1011)
U225287	Chassis CAN bus off	(See page ZD-1011)
U009288	Backbone network 2 CAN bus off	(See page ZD-1011)
U011187	Battery sensor 2 node lost	(See page ZD-1007)
U130486	Battery sensor 2 LIN communication error	(See page ZD-1007)
U100A88	LIN1 physical bus error	(See page ZD-1007)
U224287	Insufficient SQI	(See page ZD-1024)

DTC	Detection Items	See page
U224387	Ethernet CRC error	(See page ZD-1024)
U146E8A	Backbone network Eth1 connection establishment failure	(See page ZD-1024)

DTC	**C250046**	**Power supply voltage low**
DTC	**C250047**	**Power supply voltage excessive**
DTC	**C251800**	**Low power supply voltage (SR power grid)**
DTC	**C251900**	**Power supply overvoltage (SR power grid)**
DTC	**C251A00**	**Low power supply voltage (QM power grid)**
DTC	**C251B00**	**Power supply overvoltage (QM power grid)**

Description

When power supply voltage of rear intelligent area control unit is too high or too low, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C250046	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	50	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging system
C250047	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	50	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging system
C251800	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	50	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging system
C251900	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is higher than the	50	Event-based	10 ms	• Rear intelligent area control unit

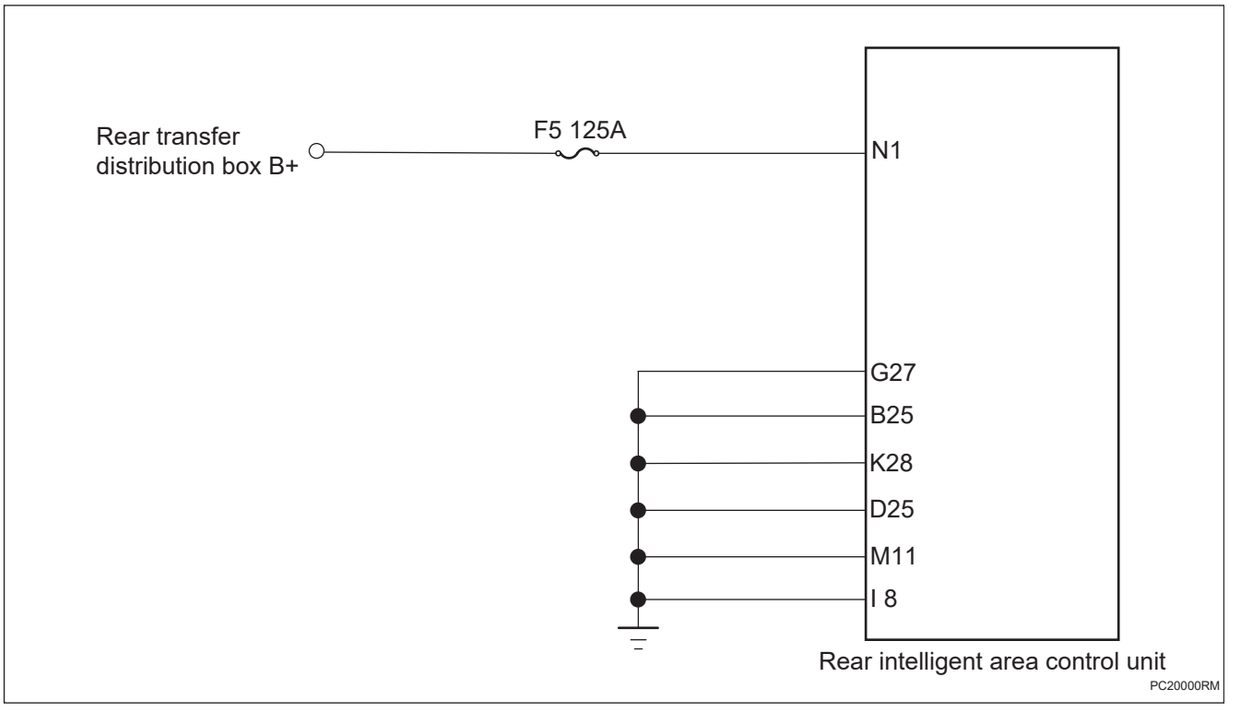
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		defined value (16.5 V)				• Wire harness and connector • Charging system
C251A00	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is lower than the defined value (8.5 V)	50	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging system
C251B00	• PDC wakeup/ PDC not in OTA mode	Collecting voltage is higher than the defined value (16.5 V)	50	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C250046	ECU communication function is limited, IO function is limited	-
C250047	ECU communication function is limited, IO function is limited	-
C251800	ECU communication function is limited, IO function is limited	-
C251900	ECU communication function is limited, IO function is limited	-
C251A00	ECU communication function is limited, IO function is limited	-
C251B00	ECU communication function is limited, IO function is limited	-

Circuit diagram



Inspection procedure

1	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check rear intelligent area control unit fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the rear intelligent area control unit fuse.

(d) According to value in the table, measure resistance.

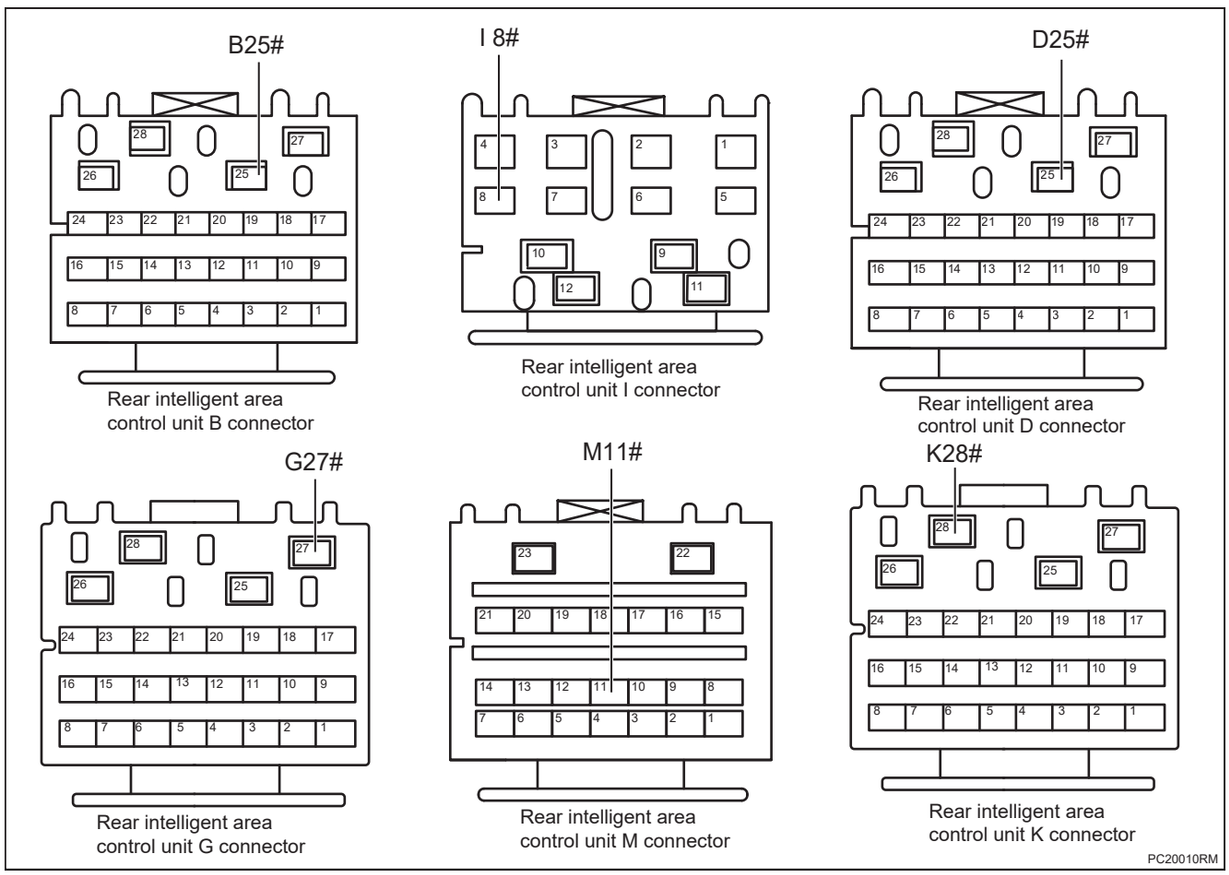
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	Check rear intelligent area control unit ground



(a) Disconnect the rear intelligent area control unit connector.

(b) According to value in the table, measure resistance.

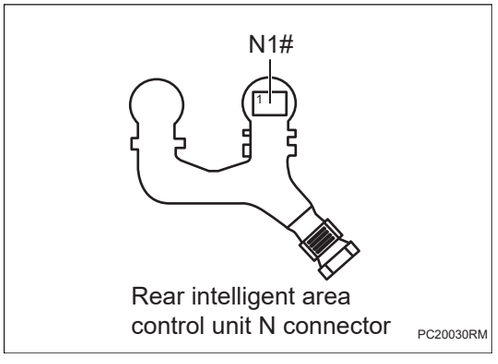
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G27# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B25# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector K28# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D25# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector M11# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector I8# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	Check rear intelligent area control unit power supply



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector N1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear intelligent area control unit (See page ZC-135)

DTC	**B240890**	**E2E check error (EPBMasterReqToS on CAN4)**
DTC	**B240990**	**E2E check error (EPBMasterReqToS on CAN6)**
DTC	**C242490**	**E2E check error (EPBMaster_1 on CAN1)**

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B240890	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for EPB Master ReqToS	Subject to the enterprise standard	-	10 ms	• Front intelligent area control unit
B240990	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for EPB Master ReqToS	Subject to the enterprise standard	-	10 ms	• Front intelligent area control unit
C242490	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for EPB Master_1	Subject to the enterprise standard	-	10 ms	• Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B240890	EPB dose not operate or operates abnormally	-
B240990	EPB dose not operate or operates abnormally	-
C242490	EPB dose not operate or operates abnormally	-

Inspection procedure

1	**Clear DTCs**

ZD

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	B240C90	E2E check error (HCU_2_10 on CAN1)
DTC	B240D90	E2E check error (HCU_2_12 on CAN1)
DTC	B240E90	E2E check error (HCU_2_2 on CAN1)
DTC	B240F90	E2E check error (HCU_2_4 on CAN1)

DTC	B241090	E2E check error (HCU_2_7 on CAN1)

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B240-C90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HCU_2_10	Subject to the enterprise standard	-	10 ms	• Intelligent vehicle control platform control unit
B240-D90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HCU_2_12	Subject to the enterprise standard	-	10 ms	• Intelligent vehicle control platform control unit
B240E90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HCU_2_2	Subject to the enterprise standard	-	10 ms	• Intelligent vehicle control platform control unit
B240F90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HCU_2_4	Subject to the enterprise standard	-	10 ms	• Intelligent vehicle control platform control unit
B241090	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HCU_2_7	Subject to the enterprise standard	-	10 ms	• Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B240C90	Power related function fault	-
B240D90	Power related function fault	-
B240E90	Power related function fault	-
B240F90	Power related function fault	-
B241090	Power related function fault	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

ZD **Diagnosis ends**

DTC	C242690	E2E check error (PDCM_YRS on CAN1)

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242690	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for PDCM_YRS	Subject to the enterprise standard	-	10 ms	• Middle intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242690	-	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Diagnosis ends

DTC	**C242890**	**E2E check error (ABS_1 on CAN4)**
DTC	**C242990**	**E2E check error (ESC_2_1 on CAN4)**
DTC	**C242A90**	**E2E check error (IBC_1 on CAN4)**

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242890	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for ABS_1	Subject to the enterprise standard	-	10 ms	• Integrated brake controller
C242990	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for ESC_2_1	Subject to the enterprise standard	-	10 ms	• Integrated brake controller
C242-A90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode= Standby||Driving)/PDC Not in OTA Mode	E2E checksum or livecounter error for IBC_1	Subject to the enterprise standard	-	10 ms	• Integrated brake controller

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242890	-	-
C242990	-	-
C242A90	-	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

Diagnosis ends

DTC	**B240B90**	**E2E check error (ADV_2 on CAN1)**
DTC	**B241190**	**E2E check error (VDC_1 on CAN1)**
DTC	**C242290**	**E2E check error (HAD_3 on CAN1)**

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B240B90	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby || Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for ADV_2	Subject to the enterprise standard	-	10 ms	• Advanced automatic driving controller • Front intelligent area control unit
B241190	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for VDC_1	Subject to the enterprise standard	-	10 ms	• Advanced automatic driving controller • Front intelligent area control unit
C242290	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby|| Driving)/ PDC Not in OTA Mode	E2E checksum or livecounter error for HAD_3	Subject to the enterprise standard	-	10 ms	• Advanced automatic driving controller • Front intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B240B90	Intelligent driving related function fault	-
B241190	Intelligent driving related function fault	-
C242290	Intelligent driving related function fault	-

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Replace front intelligent area control unit (See page ZC-128)

ZD

DTC	C242390	E2E check error (ABS_1 on CAN1)

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242390	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby || Driving) /PDC Not in OTA Mode	E2E checksum or livecounter error for ABS_1	Subject to the enterprise standard	-	10 ms	• Integrated brake controller • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242390	-	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	C242590	E2E check error (EPS1_SAS_1 on CAN1)

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242590	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby || Driving) /PDC Not in OTA Mode	E2E checksum or livecounter error for EPS1_SAS_1	Subject to the enterprise standard	-	10 ms	• Electric power steering control unit • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242590	-	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Replace front intelligent area control unit (See page ZC-128)

ZD

DTC	C242790	E2E check error (EGSM_1 on CAN1)

Description

When E2E check fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242790	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_PowerMode = Standby || Driving) /PDC Not in OTA Mode	E2E checksum or livecounter error for EGSM_1	Subject to the enterprise standard	-	10 ms	• Combination switch • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242790	-	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace combination switch (See page ZC-122)**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	C250100	MCU overtemperature

Description

When MCU internal temperature sensor reports overtemperature fault, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C250100	• PDC wakeup/ PDC not in OTA mode	MCU internal temperature sensor reports an overtemperature fault flag set	1	Event-based	10 ms	• Ambient temperature • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C250100	ECU communication function is limited, IO function is limited	-

Inspection procedure

1	**Electric rear drive system inverter cools down**

(a) Lower the electric rear drive system inverter to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Replace electric rear drive system inverter (See page DL-3)**

(a) Replace the electric rear drive system inverter.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	C250200	Internal watchdog triggered reset
DTC	C250300	External watchdog triggered reset
DTC	C250400	NVM checksum error
DTC	C250500	ROM error
DTC	C250819	PMIC chip QVR power supply overload fault
DTC	C250817	PMIC chip QVR power supply overvoltage fault
DTC	C250816	PMIC chip QVR power supply undervoltage fault
DTC	C250811	Short to ground fault in PMIC chip QVR power supply
DTC	C250919	PMIC chip QC0 power supply overload fault
DTC	C250917	PMIC chip QC0 power supply overvoltage fault
DTC	C250916	PMIC chip QC0 power supply undervoltage fault
DTC	C250911	Short to ground fault in PMIC chip QC0 power supply
DTC	C250A17	PMIC chip QT1 power supply overvoltage fault
DTC	C250A16	PMIC chip QT1 power supply undervoltage fault
DTC	C250A11	Short to ground fault in PMIC chip QT1 power supply
DTC	C250B17	PMIC chip QT2 power supply overvoltage fault
DTC	C250B16	PMIC chip QT2 power supply undervoltage fault
DTC	C250B11	Short to ground fault in PMIC chip QT2 power supply
DTC	C251400	Errorpin release failed

DTC	C251500	Low errorpin during operation
DTC	C251600	Low errorpin caused by external watchdog during operation
DTC	C251700	Shutdown path check fault

Description

When an internal fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C250200	• PDC wakeup/ PDC not in OTA mode	Internal watchdog triggered reset	1	Event-based	10 ms	• Rear intelligent area control unit
C250300	• PDC wakeup/ PDC not in OTA mode	External watchdog triggered reset	1	Event-based	10 ms	• Rear intelligent area control unit
C250400	• PDC wakeup/ PDC not in OTA mode	NVM checksum error	1	Event-based	10 ms	• Rear intelligent area control unit
C250500	• PDC wakeup/ PDC not in OTA mode	ROM error	1	Event-based	10 ms	• Rear intelligent area control unit
C250819	• PDC wakeup/ PDC not in OTA mode	OTWRNSF. VREF=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250817	• PDC wakeup/ PDC not in OTA mode	MONSF1. VREFOV=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250816	• PDC wakeup/ PDC not in OTA mode	MONSF0=1 /OTWRNSF=1 /MONSF2=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250811	• PDC wakeup/ PDC not in OTA mode	MONSF0. VREFSG=1 /OTWRNSF . VREF=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250919	• PDC wakeup/ PDC not in OTA mode	OTWRNSF. COM=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250917	• PDC wakeup/ PDC not in OTA mode	MONSF1. COMOV=1	1	Event-based	10 ms	• Rear intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C250916	• PDC wakeup/ PDC not in OTA mode	MONSF0 . COMSG=1 /MONSF2 . COMFUV=1 /OTWRNSF . COM=0	1	Event-based	10 ms	• Rear intelligent area control unit
C250911	• PDC wakeup/ PDC not in OTA mode	MONSF0. COM=1/ OTFAIL. COM=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250A17	• PDC wakeup/ PDC not in OTA mode	MONSF1. TRK1OV=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250A16	• PDC wakeup/ PDC not in OTA mode	MONSF0. TRK1SG=1/ MONSF2. TRK1UV=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250A11	• PDC wakeup/ PDC not in OTA mode	MONSF0. TRK1SG=1 /OTFAIL. UC/ OTFAIL. PREG=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250B17	• PDC wakeup/ PDC not in OTA mode	MONSF1. TRK2OV=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250B16	• PDC wakeup/ PDC not in OTA mode	MONSF0. TRK2SG=1/ MONSF2. TRK2UV=1	1	Event-based	10 ms	• Rear intelligent area control unit
C250B11	• PDC wakeup/ PDC not in OTA mode	MONSF0. TRK2SG=1 /OTFAIL.UC /OTFAIL. PREG=1	1	Event-based	10 ms	• Rear intelligent area control unit
C251400	• PDC wakeup/ PDC not in OTA mode	Release errorpin failed	1	Event-based	10 ms	• Rear intelligent area control unit
C251500	• PDC wakeup/ PDC not in OTA mode	Errorpin Low during running	1	Event-based	10 ms	• Rear intelligent area control unit
C251600	• PDC wakeup/ PDC not in OTA mode	Errorpin Low due to external watchdog during running	1	Event-based	10 ms	• Rear intelligent area control unit
C251700	• PDC wakeup/ PDC not in OTA mode	Shut-off path fault	1	Event-based	10 ms	• Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C250200	ECU communication function is limited, IO function is limited	-
C250300	ECU communication function is limited, IO function is limited	-
C250400	ECU communication function is limited, IO function is limited	-
C250500	ECU communication function is limited, IO function is limited	-
C250819	ECU communication function is limited, IO function is limited	-
C250817	ECU communication function is limited, IO function is limited	-
C250816	ECU communication function is limited, IO function is limited	-
C250811	ECU communication function is limited, IO function is limited	-
C250919	ECU communication function is limited, IO function is limited	-
C250917	ECU communication function is limited, IO function is limited	-
C250916	ECU communication function is limited, IO function is limited	-
C250911	ECU communication function is limited, IO function is limited	-
C250A17	ECU communication function is limited, IO function is limited	-
C250A16	ECU communication function is limited, IO function is limited	-
C250A11	ECU communication function is limited, IO function is limited	-
C250B17	ECU communication function is limited, IO function is limited	-
C250B16	ECU communication function is limited, IO function is limited	-
C250B11	ECU communication function is limited, IO function is limited	-
C251400	ECU communication function is limited, IO function is limited	-
C251500	ECU communication function is limited, IO function is limited	-
C251600	ECU communication function is limited, IO function is limited	-
C251700	ECU communication function is limited, IO function is limited	-

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC C251300 MCU hardware fault

Description

When an internal fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C251300	• PDC wakeup/ PDC not in OTA mode	Hardware fault occured	1	Event-based	10 ms	• Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C251300	ECU communication function is limited, IO function is limited	-

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC C251C00 PHY mode fault

Description

When an internal fault occurs in rear intelligent area control unit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C251C00	• PDC wakeup/ PDC not in OTA mode	PHY mode is not in Normal mode	1	Event-based	10 ms	• Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C251C00	Ethernet communication stopped	-

Inspection procedure

1	Clear DTCs

(a) Rear intelligent area control unit is powered on again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B240093	EBS open fault
DTC	B240190	EBS current sampling fault
DTC	B240290	EBS voltage sampling fault
DTC	B240390	EBS temperature sampling fault
DTC	B240490	EBS calibration data error
DTC	B240590	EBS fault diagnosis

Description

When the battery sensor circuit is short, open or internal fault occurs, the rear intelligent area control unit records DTC.

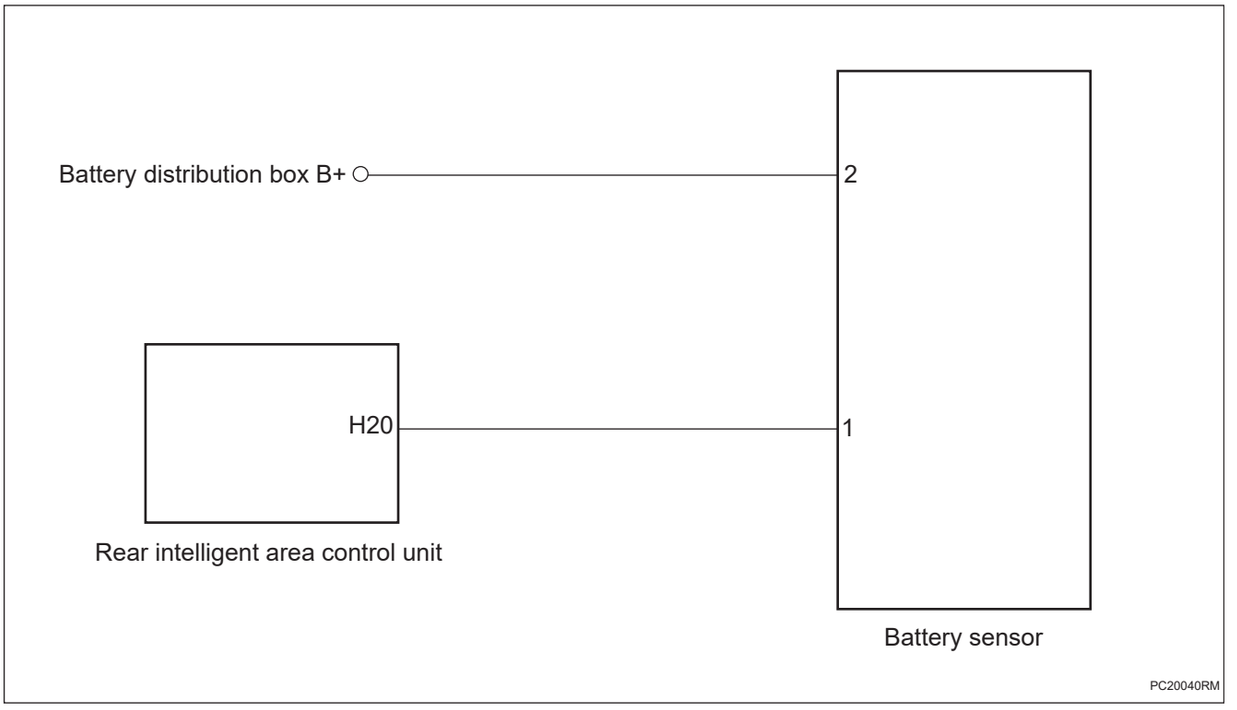
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B240093	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	#EBS_ Frame1# Status_ Current#0x01 Error open circuit | or #EBS_ Frame1# Status_ Voltage#0x01 Error open circuit	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
B240190	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	#EBS_ Frame1# Status_ Current# 0x02 HW defect or 0x03LIN saturation	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
B240290	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	#EBS_Frame 1#Status_ Voltage#0x02 HW defect or 0x03LIN saturation	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
B240390	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	#EBS_ Frame1# Status_ Temp# 0x02 HW defect or 0x03LIN saturation	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B240490	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	#EBS_Frame 1# ERROR_ Calib# 0x01 Error	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
B240590	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving) /PDC Not in OTA Mode	ERROR_ IDENT =0x1	1	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Battery sensor

Fault symptom

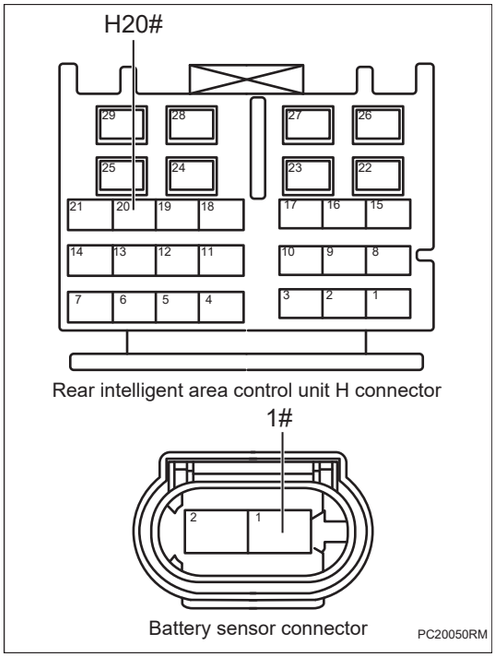
DTC No.	Fault symptom	Warning light/indicator
B240093	Open in EBS sensor	-
B240190	EBS sensor current sampling fault	-
B240290	EBS sensor current sampling fault	-
B240390	EBS temperature sampling error	-
B240490	EBS calibration error	-
B240590	EBS fault diagnosis	-

Circuit diagram



Inspection procedure

1	**Check for open in battery sensor wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the battery sensor connector.

(e) According to value in the table, measure resistance.

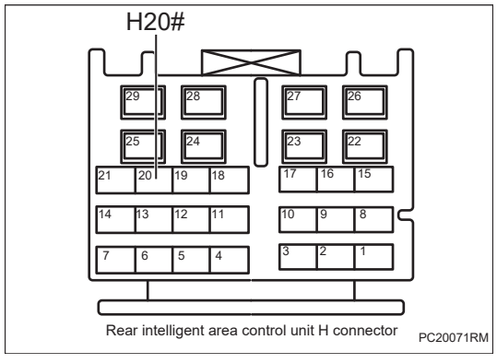
Standard value

Multimeter connection	Detection condition	Specified condition
Battery sensor connector 1# - rear intelligent area control unit connector H20#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in battery sensor wire harness and connector**



(a) According to value in the table, measure resistance.

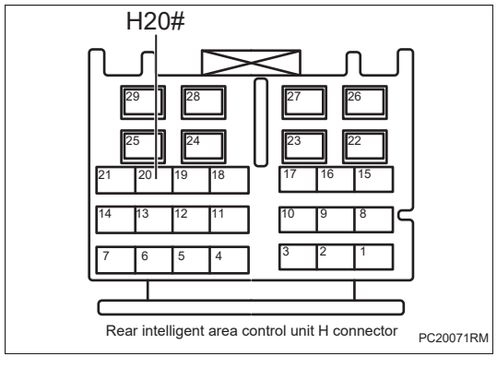
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in battery sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

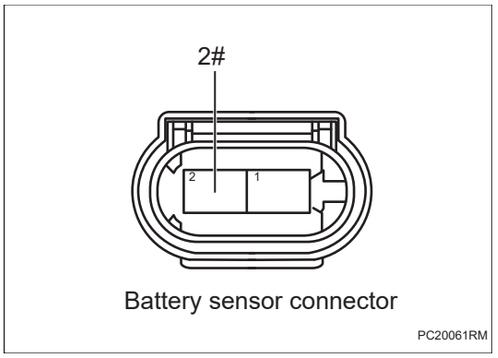
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check battery sensor power supply



Battery sensor connector

PC20061RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the rear intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Battery sensor connector 2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace battery sensor (See page DL-21)

(a) Replace the battery sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B241310**	**Luggage compartment inner closed request switch stuck fault**
DTC	**B242311**	**Short to ground in luggage compartment inner closed or lock switch backlight**
DTC	**B242312**	**Short to power supply in luggage compartment inner closed or lock switch backlight**

Description

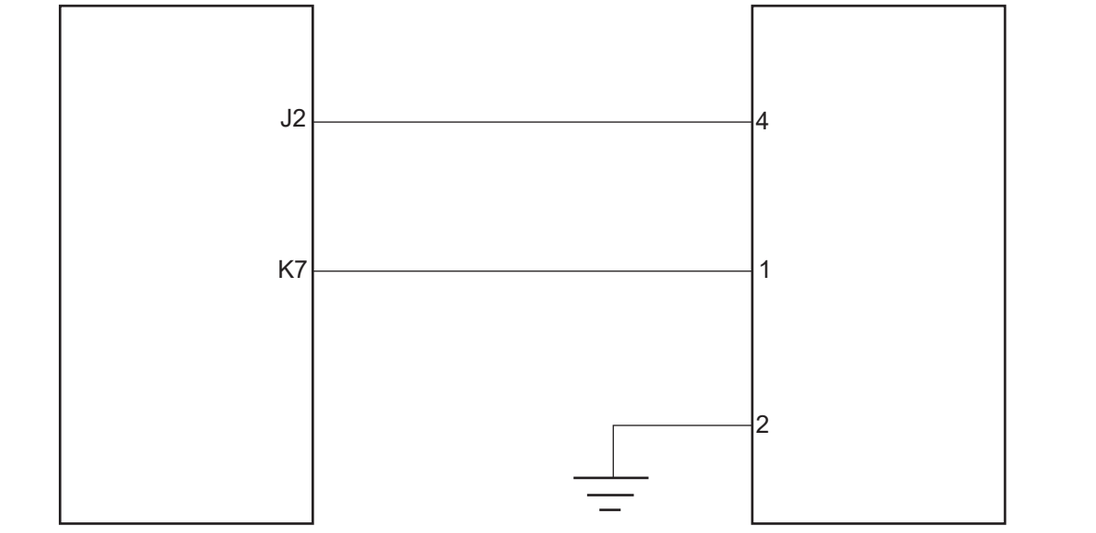
When the luggage compartment closed switch is stuck or short in backlight, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241310	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	IDL03 active for defined time (1 minute if no define)	Defined	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment closed switch
B242311	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH05 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment closed switch
B242312	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH05 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment closed switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B241310	Closed request switch in luggage compartment remains valid	-
B242311	Luggage compartment inner close or lock switch backlight does not operate or operates abnormally	-
B242312	Luggage compartment inner close or lock switch backlight does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check luggage compartment closed switch**

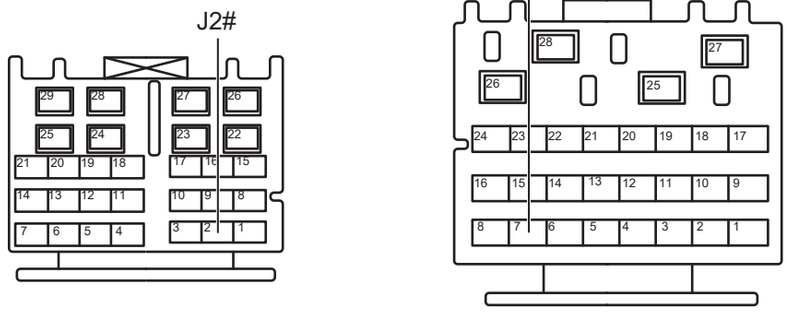
(a) Check for foreign matters in luggage compartment closed switch.

(b) Check luggage compartment closed switch for sticking.

NG → **Perform repair according to malfunction**

OK

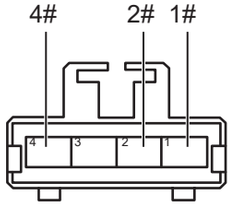
2	**Check for open in luggage compartment closed switch wire harness and connector**



Rear intelligent area control unit J connector

Rear intelligent area control unit K connector

PC20120RM



Luggage compartment closed switch connector

PC20130RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the luggage compartment closed switch connector.

(e) According to value in the table, measure resistance.

Standard value

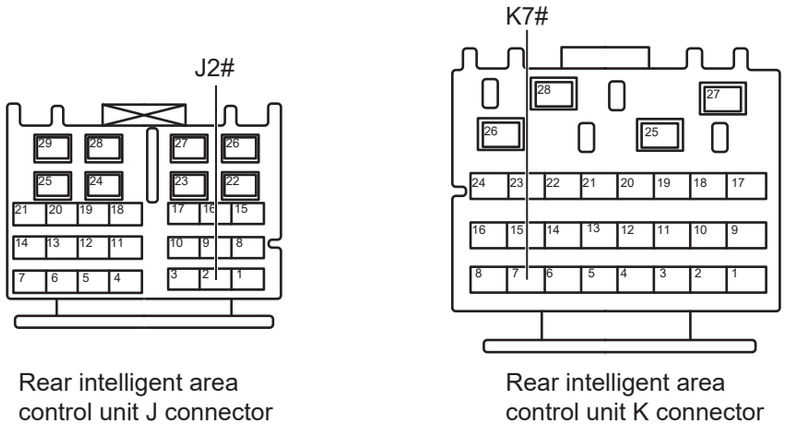
Multimeter connection	Detection condition	Specified condition
Luggage compartment closed switch connector 4# - rear intelligent area control unit connector J2#	Always connected	Less than 1 Ω
Luggage compartment closed switch connector 1# - rear intelligent area control unit connector K7#	Always connected	Less than 1 Ω
Luggage compartment closed switch connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in luggage compartment closed switch wire harness and connector**



Rear intelligent area control unit J connector

Rear intelligent area control unit K connector

PC20120RM

ZD

(a) According to value in the table, measure resistance.

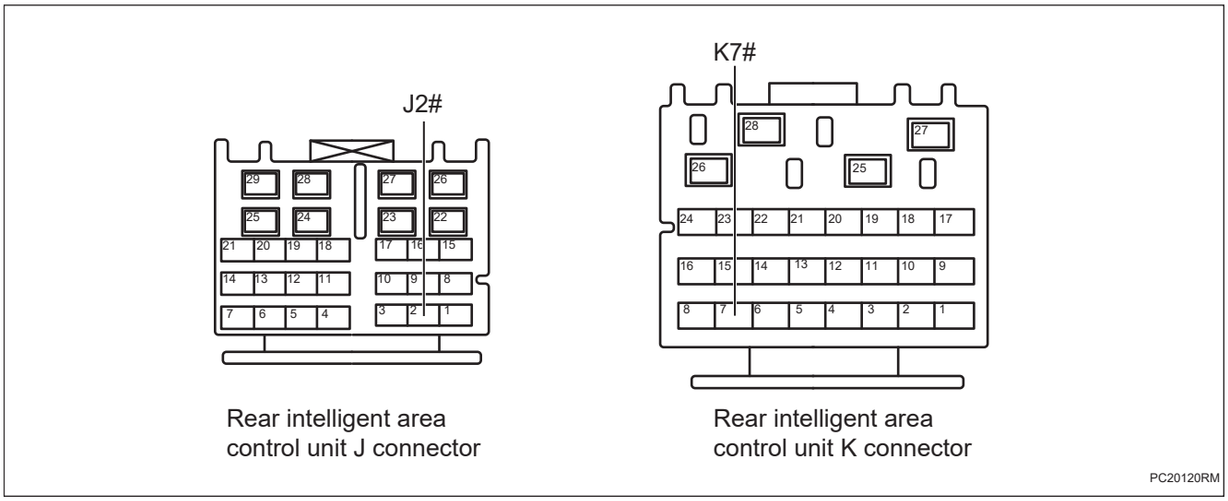
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K7# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in luggage compartment closed switch wire harness and connector**



ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace luggage compartment closed switch (See page ZC-1)**

(a) Replace the luggage compartment closed switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B241411**	**Short to ground in rear left combination light - power + logic power**
DTC	**B241412**	**Short to power supply in rear left combination light - power + logic power**

Description

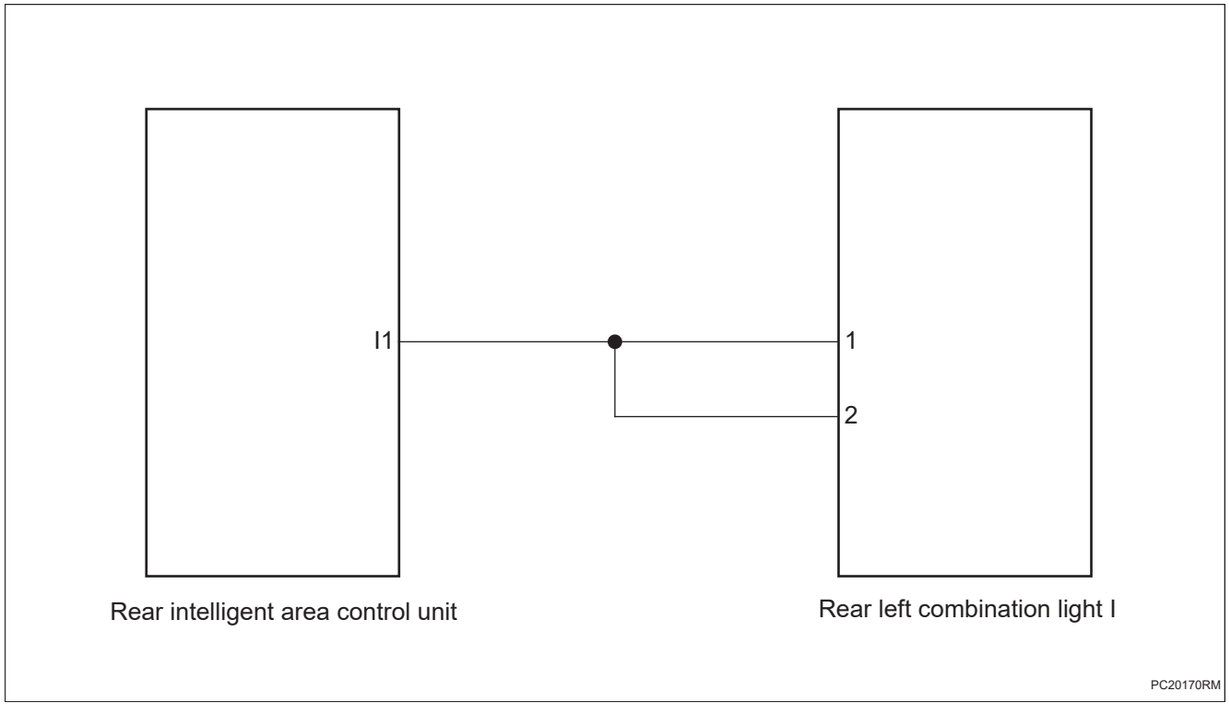
When the rear left combination light I power supply circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241411	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH01 short to GND	5	Event-based	10 ms	• Rear left combination light I • Wire harness and connector • Rear intelligent area control unit
B241412	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH01 short to BAT	5	Event-based	10 ms	• Rear left combination light I • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B241411	Rear left combination light does not operate or operates abnormally	-
B241412	Rear left combination light does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check rear left combination light I wire harness and connector**

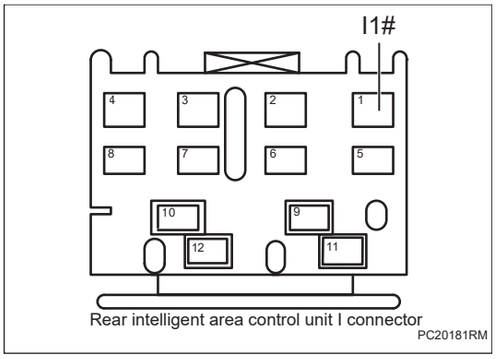
(a) Check if rear left combination light I wire harness and connector are damaged.

(b) Check if rear left combination light I wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in rear left combination light l wire harness and connector



Rear intelligent area control unit I connector
PC20181RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left combination light l connector.

(e) According to value in the table, measure resistance.

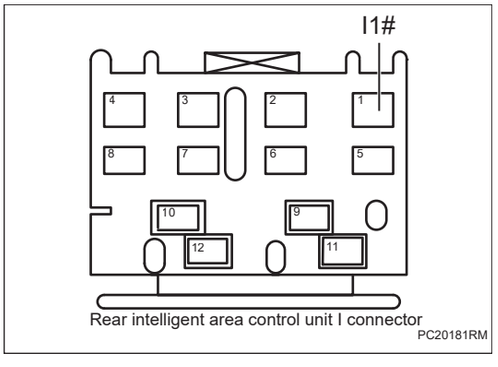
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in rear left combination light l wire harness and connector



Rear intelligent area control unit I connector
PC20181RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I1# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace rear left combination light I (See page ZC-24)

(a) Replace rear left combination light I.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B241711**	**Short to ground in IG signal (trailer mode controller + rear motor control unit + battery management system + charging controller (EVCC))**
DTC	**B241712**	**Short to power supply in IG signal (trailer mode controller + rear motor control unit + battery management system + charging controller (EVCC))**

Description

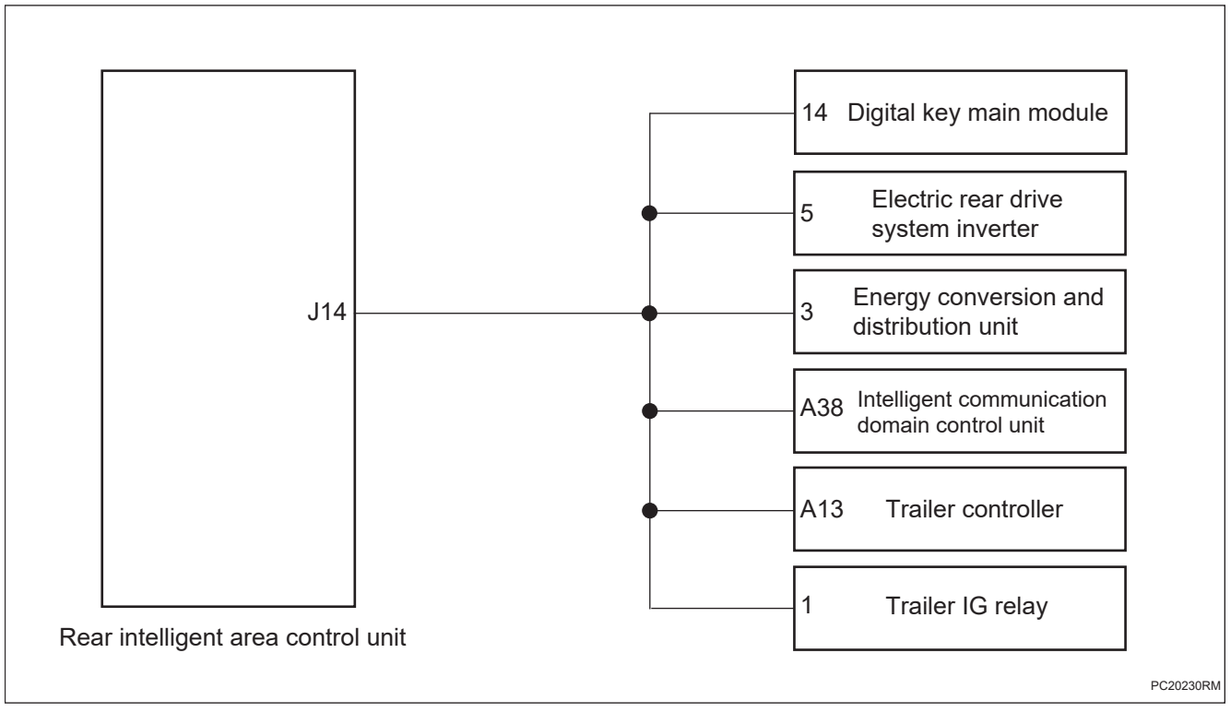
When there is short in IG hard wire signal circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241711	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH05 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Trailer IG relay • Trailer controller • Intelligent communication domain control unit • Energy conversion and distribution unit • Electric rear drive system inverter • Digital key main module
B241712	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH05 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Trailer IG relay • Trailer controller • Intelligent communication domain control unit • Energy conversion and distribution unit • Electric rear drive system inverter • Digital key main module

Fault symptom

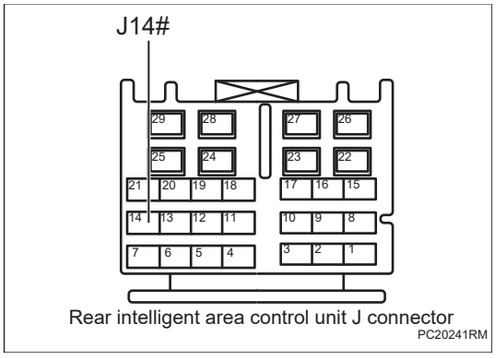
DTC No.	Fault symptom	Warning light/indicator
B241711	IG signal dose not operate or operates abnormally	-
B241712	IG signal dose not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear intelligent area control unit wire harness and connector**



Rear intelligent area control unit J connector
PC20241RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the trailer IG relay.

(e) Disconnect the trailer controller connector.

(f) Disconnect the intelligent communication domain control unit connector.

(g) Disconnect the energy conversion and distribution unit connector.

(h) Disconnect the electric rear drive system inverter connector.

(i) Disconnect the digital key main module connector.

(j) According to value in the table, measure resistance.

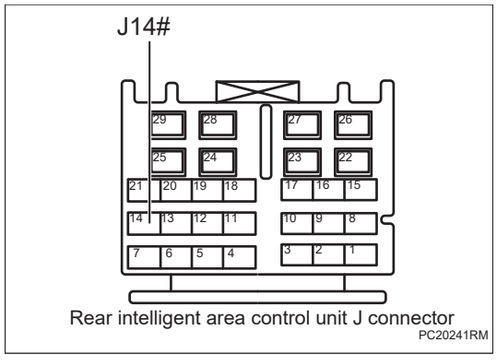
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to power supply in rear intelligent area control unit wire harness and connector



Rear intelligent area control unit J connector
PC20241RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J14# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace rear intelligent area control unit (See page ZC-135)

(a) Replace the rear intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric rear drive system inverter/energy conversion and distribution unit/digital key main module/ intelligent communication domain control unit/trailer controller/trailer IG relay**

OK

Diagnosis ends

DTC	**B241811**	**Short to ground in license plate light drive*2**
DTC	**B241812**	**Short to power supply in license plate light drive*2**

Description

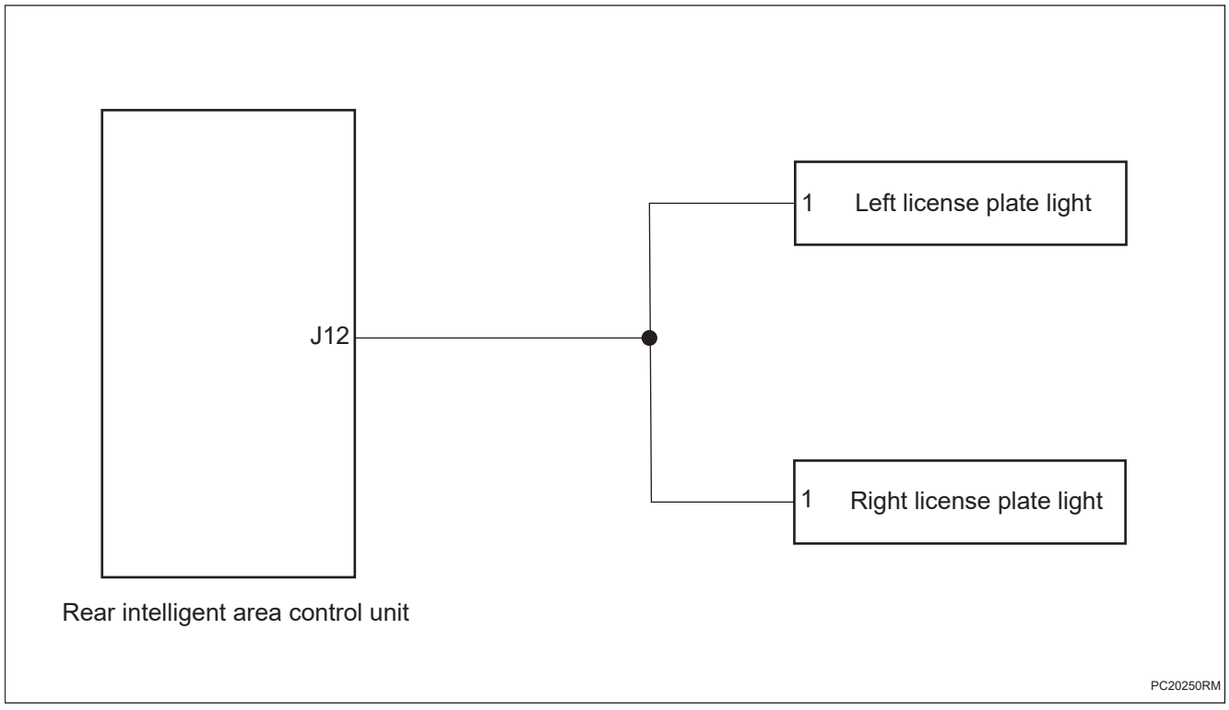
When the license plate light drive circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241811	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH18 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left license plate light • Right license plate light
B241812	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH18 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left license plate light • Right license plate light

Fault symptom

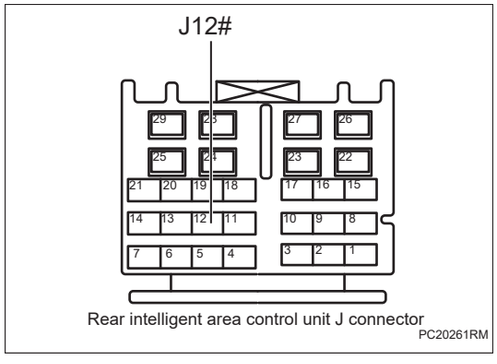
DTC No.	Fault symptom	Warning light/indicator
B241811	License plate light drive does not operate or operates abnormally	-
B241812	License plate light drive does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in license plate light wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the license plate light connector.

(e) According to value in the table, measure resistance.

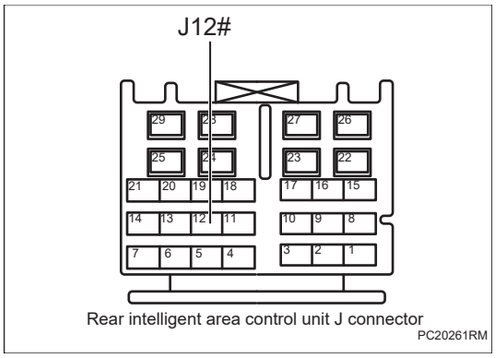
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to power supply in license plate light wire harness and connector



Rear intelligent area control unit J connector
PC20261RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J12# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace left/right license plate light (See page ZC-34)

(a) Replace the left/right license plate light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B241911**	**Short to ground in high mounted brake light**
DTC	**B241912**	**Short to power supply in high mounted brake light**

Description

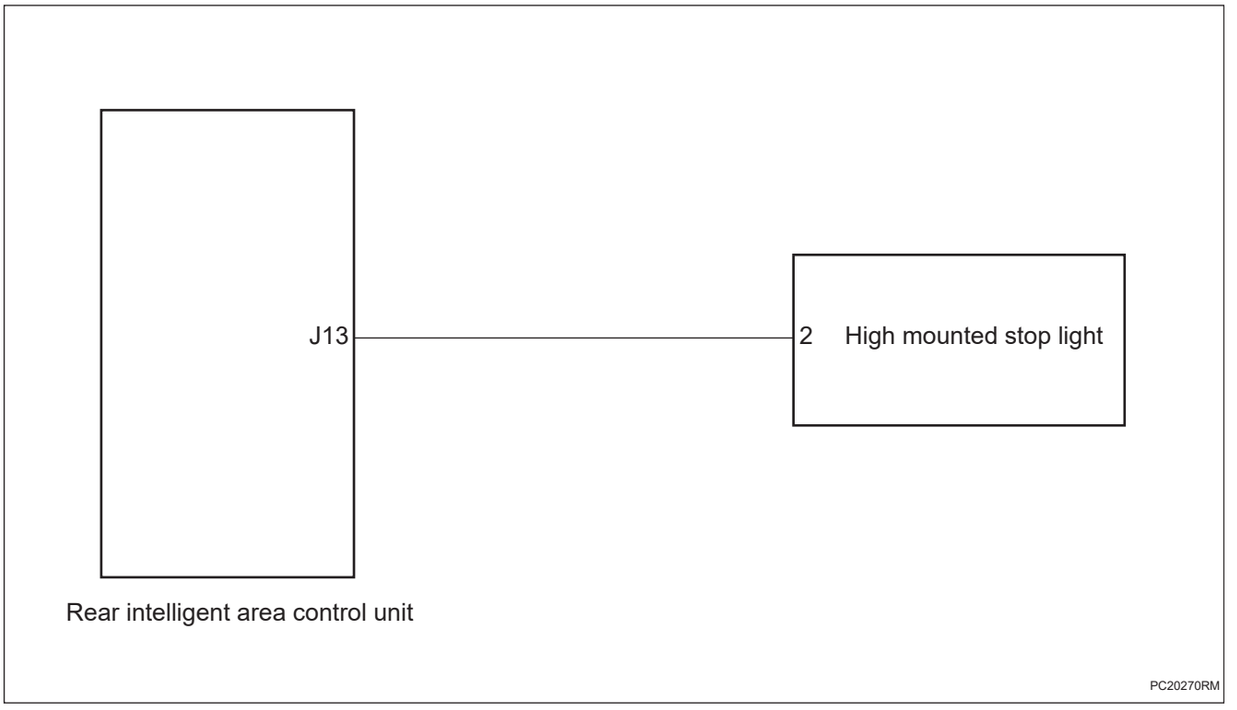
When there is short in high mounted stop light drive circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241911	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH17 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • High mounted stop light
B241912	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH17 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • High mounted stop light

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B241911	High mounted stop light does not operate or operates abnormally	-
B241912	High mounted stop light does not operate or operates abnormally	-

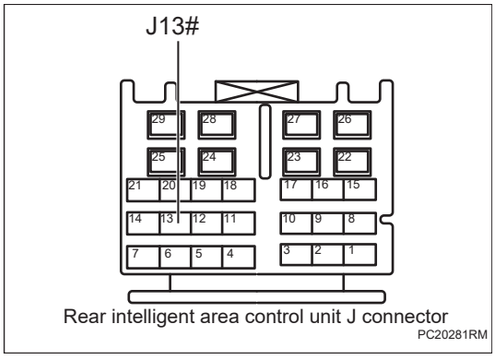
Circuit diagram



ZD

Inspection procedure

1	Check for short to ground in high mounted stop light wire harness and connector



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the high mounted stop light connector.

(e) According to value in the table, measure resistance.

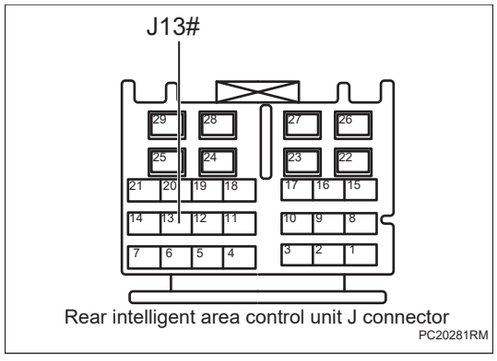
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J13# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to power supply in high mounted stop light wire harness and connector



Rear intelligent area control unit J connector
PC20281RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J13# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace high mounted stop light (See page ZC-38)

(a) Replace the high mounted stop light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B241A11	Short to ground in rear fog light*2
DTC	B241A12	Short to power supply in rear fog light*2

Description

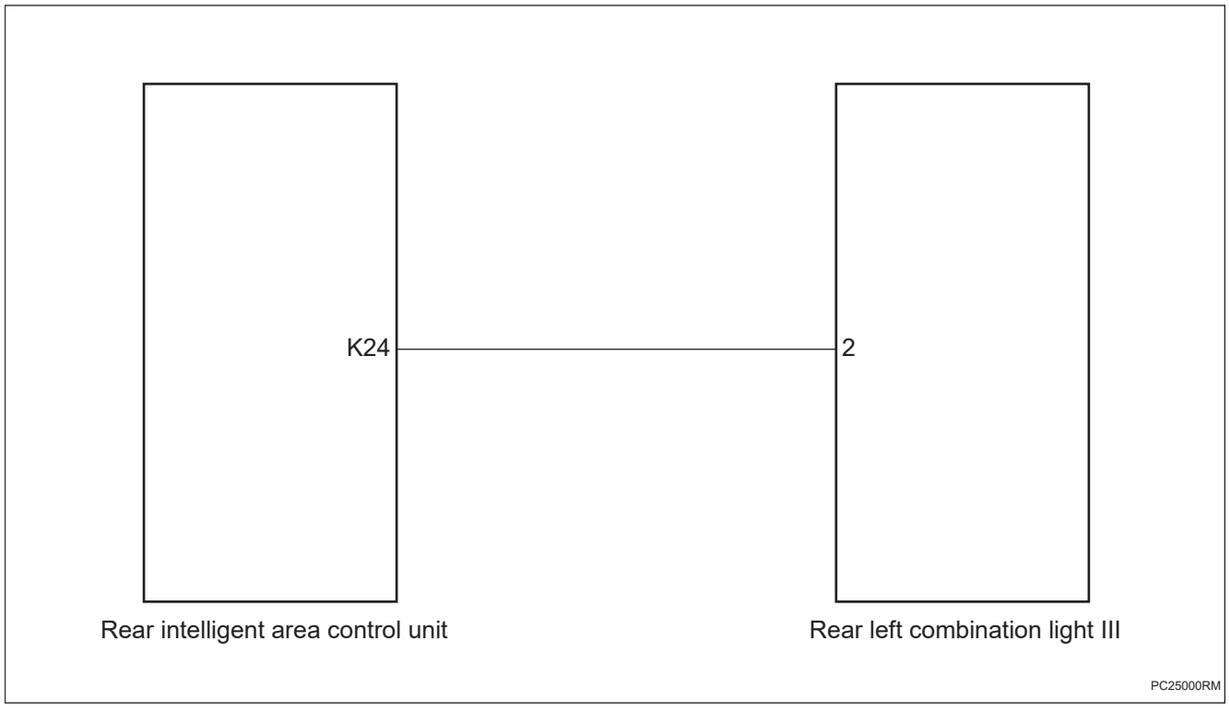
When there is short in rear fog light circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241A11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH01 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left combination light III
B241A12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH01 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left combination light III

Fault symptom

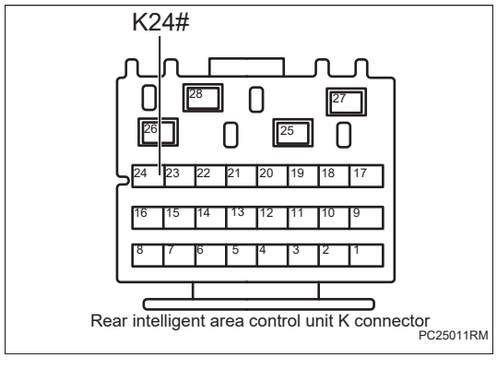
DTC No.	Fault symptom	Warning light/indicator
B241A11	Rear fog light does not operate or operates abnormally	-
B241A12	Rear fog light does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear left combination light III wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left combination light III connector.

(e) According to value in the table, measure resistance.

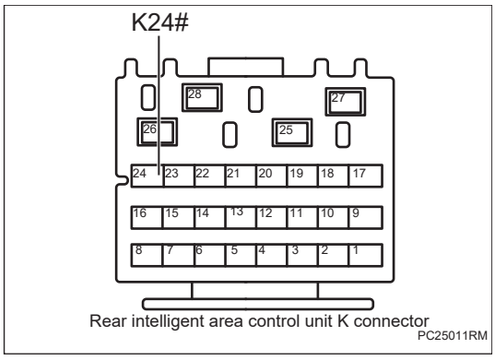
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K24# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to power supply in rear left combination light III wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K24# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	Replace rear left combination light III (See page ZC-30)

(a) Replace the rear left combination light III.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

ZD

Diagnosis ends

DTC	**B241B11**	**Short to ground in rear right combination light - power + logic power**
DTC	**B241B12**	**Short to power supply in rear right combination light - power + logic power**

Description

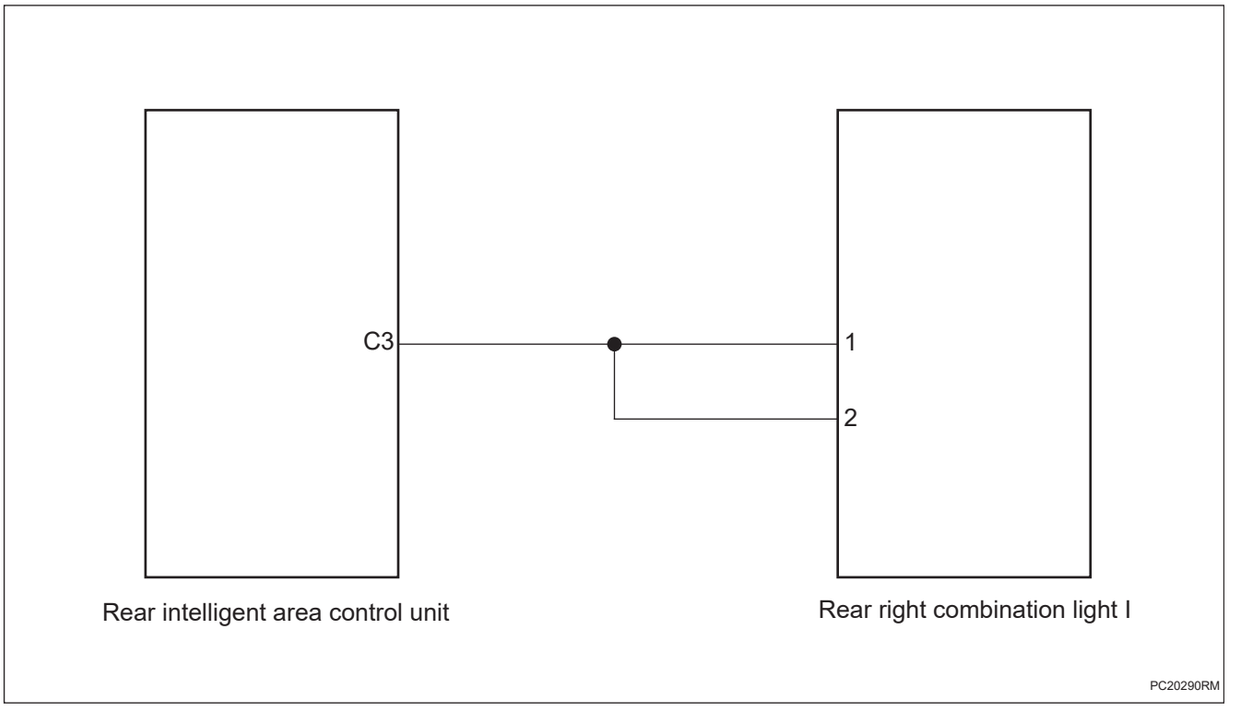
When the rear right combination light I power supply circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241B11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH08 short to GND	5	Event-based	10 ms	• Rear right combination light I • Wire harness and connector • Rear intelligent area control unit
B241B12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH08 short to BAT	5	Event-based	10 ms	• Rear right combination light I • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B241B11	Short in rear right combination light wire harness or equipment damaged	-
B241B12	Short in rear right combination light wire harness or equipment damaged	-

Circuit diagram



Inspection procedure

1	**Check rear right combination light I wire harness and connector**

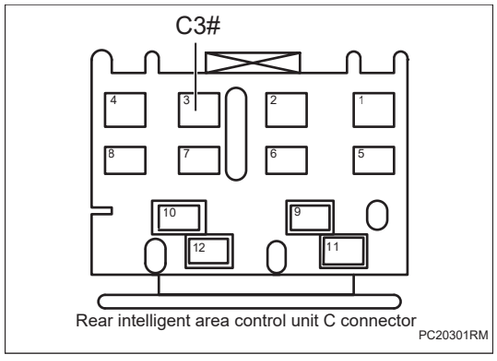
(a) Check if rear right combination light I wire harness and connector are damaged.

(b) Check if rear right combination light I wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in rear right combination light I wire harness and connector



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right combination light I connector.

(e) According to value in the table, measure resistance.

Standard value

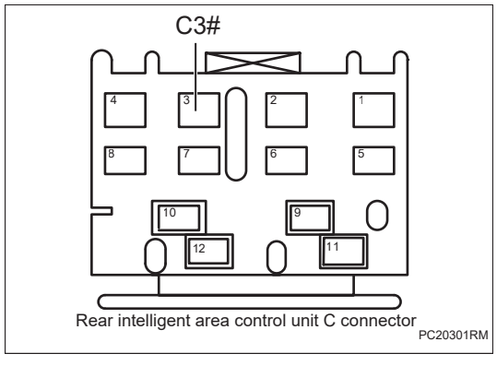
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector C3# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in rear right combination light I wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector C3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace rear right combination light I (See page ZC-24)

(a) Replace the rear right combination light I.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B241C11	Short to ground in rear right seatback + seat cushion fan ventilation - power
DTC	B241C12	Short to power supply in rear right seatback + seat cushion fan ventilation - power

Description

When the rear right seat cushion, seatback heater power supply circuit is short, the rear intelligent area control unit records DTC.

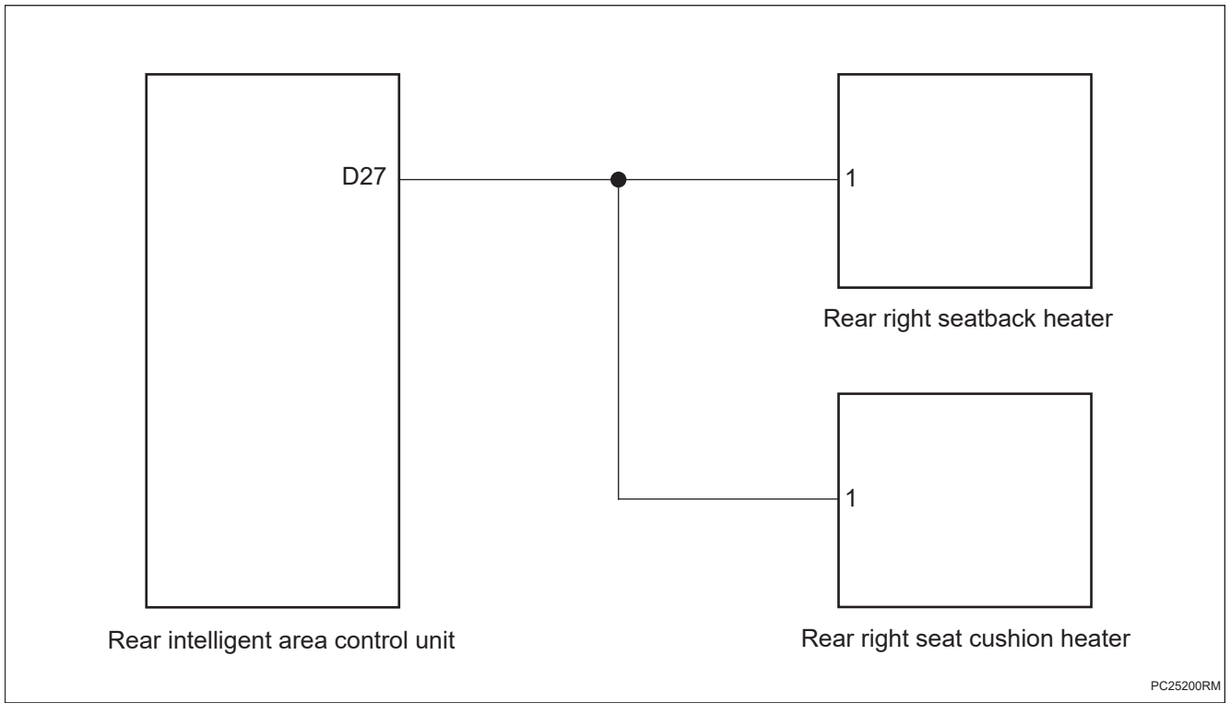
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241C11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH04 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seat cushion heater • Rear right seatback heater
B241C12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH04 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seat cushion heater • Rear right seatback heater

ZD

Fault symptom

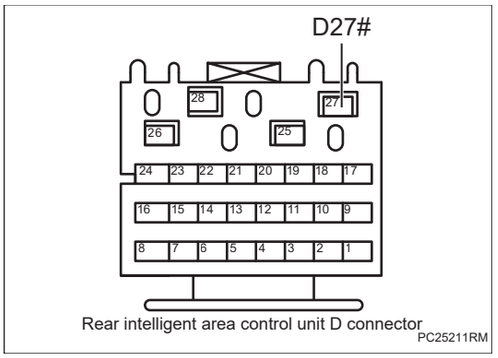
DTC No.	Fault symptom	Warning light/indicator
B241C11	Rear right seat ventilation does not operate or operates abnormally	-
B241C12	Rear right seat ventilation does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear right seat cushion/seatback heater wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right seat cushion heater connector.

(e) According to value in the table, measure resistance.

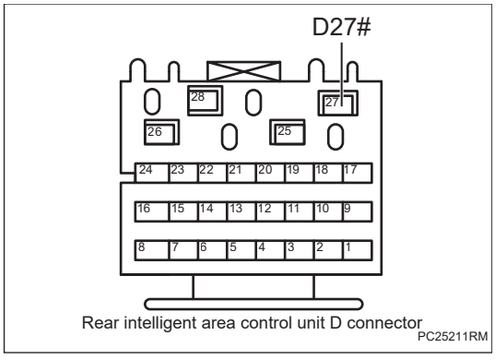
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D27# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear right seat cushion/seatback heater wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D27# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear right seat cushion/seatback heater (See page NS-92)**

(a) Replace the rear right seat cushion/seatback heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B241D11**	**Short to ground in back-up light*2**
DTC	**B241D12**	**Short to power supply in back-up light*2**

Description

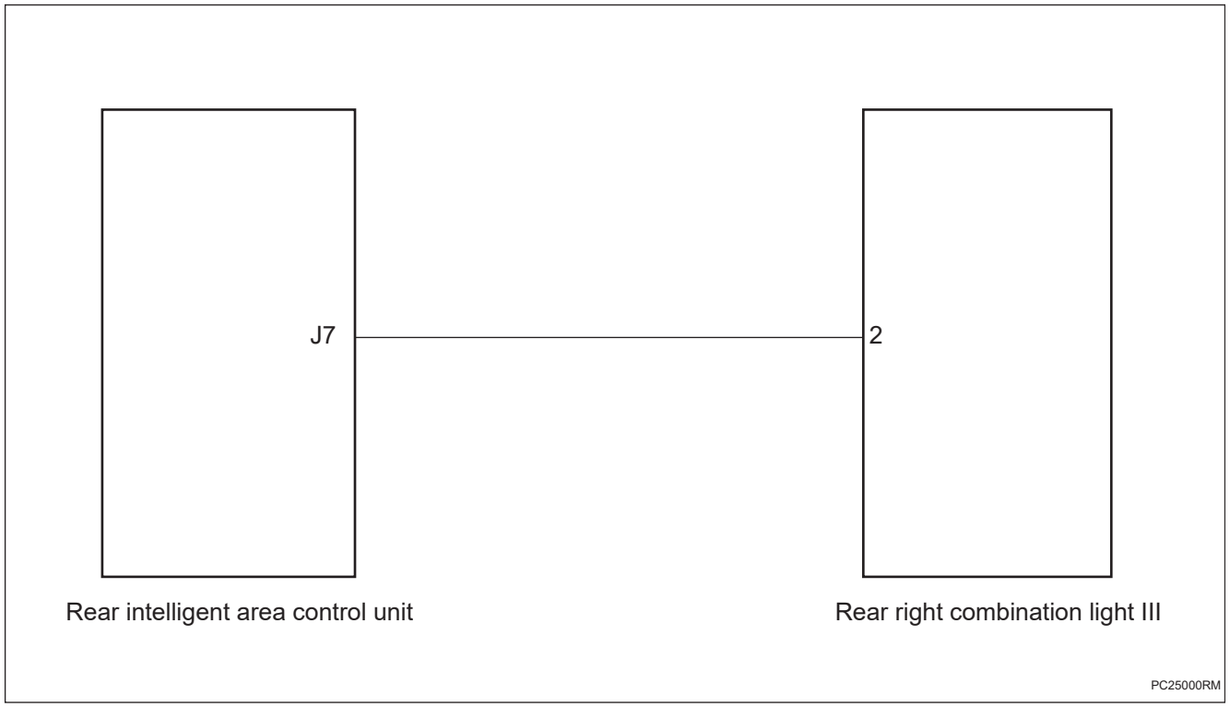
When there is short in back-up light circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B241D11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH07 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right combination light III
B241D12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH07 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right combination light III

Fault symptom

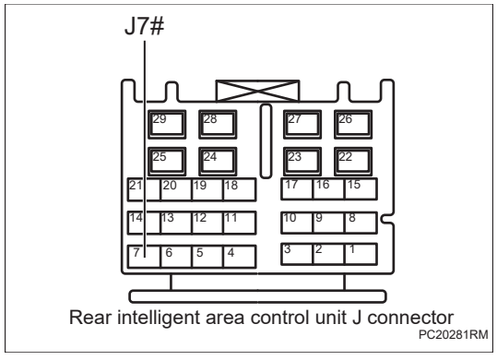
DTC No.	Fault symptom	Warning light/indicator
B241D11	Back-up light does not operate or operates abnormally.	-
B241D12	Back-up light does not operate or operates abnormally.	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear right combination light III wire harness and connector**



Rear intelligent area control unit J connector
PC20281RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right combination light III connector.

(e) According to value in the table, measure resistance.

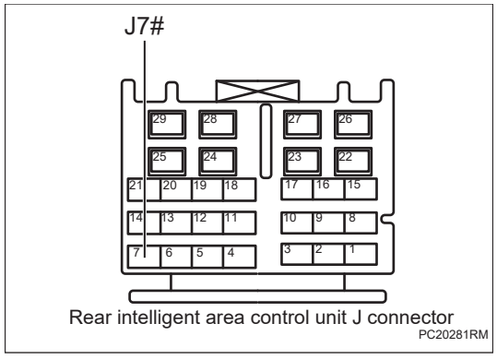
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear right combination light III wire harness and connector**



Rear intelligent area control unit J connector
PC20281RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J7# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Replace rear right combination light III (See page ZC-30)

(a) Replace the rear right combination light III.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

ZD

DTC	B242011	Short to ground in luggage compartment light
DTC	B242012	Short to power supply in luggage compartment light

Description

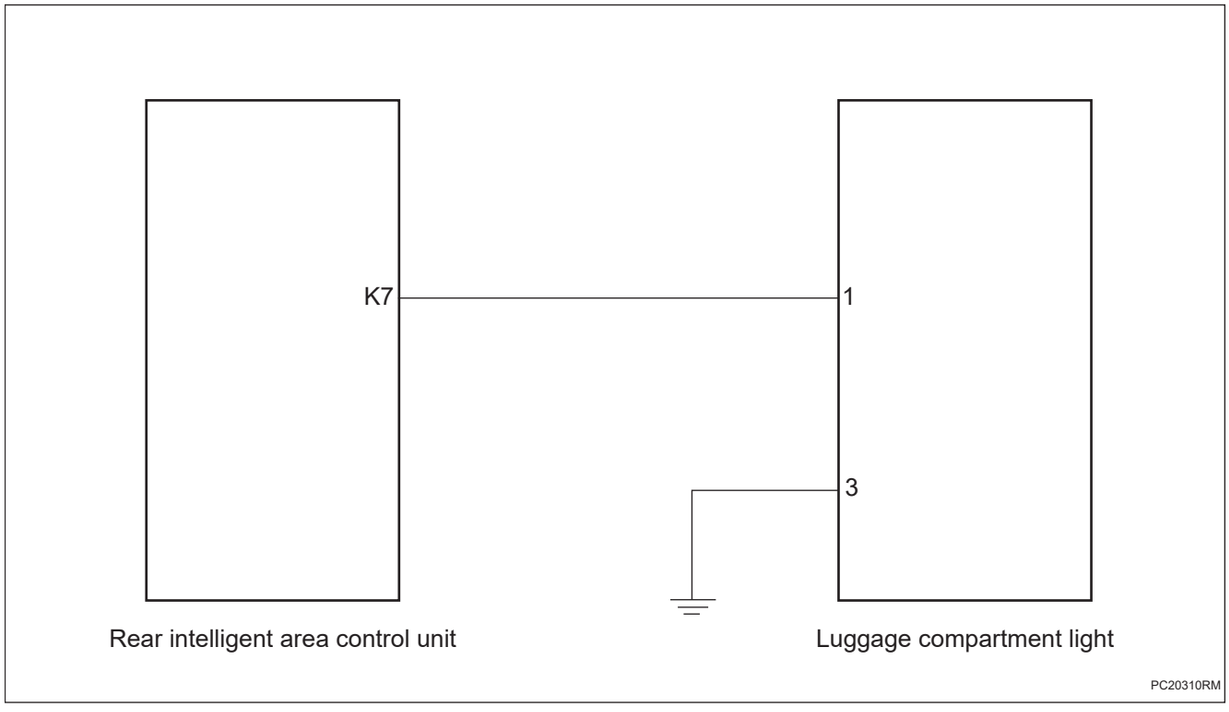
When the luggage compartment light is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B242011	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH51 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment light
B242012	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH51 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment light

Fault symptom

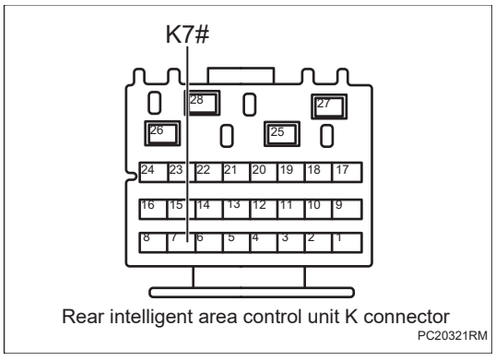
DTC No.	Fault symptom	Warning light/indicator
B242011	Luggage compartment light does not operate or operates abnormally	-
B242012	Luggage compartment light does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in luggage compartment light wire harness and connector**



Rear intelligent area control unit K connector
PC20321RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the luggage compartment light connector.

(e) According to value in the table, measure resistance.

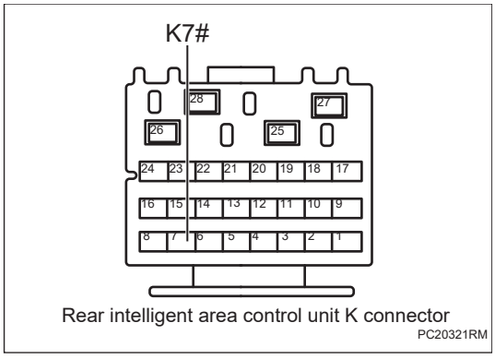
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in luggage compartment light wire harness and connector**



Rear intelligent area control unit K connector
PC20321RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K7# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	Replacement of luggage compartment light

(a) Replace the luggage compartment light.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B242511	DC charging indicator - distribution (short to ground in slow charging)
DTC	B242512	Short to power supply in DC charging indicator - distribution (slow charging)
DTC	B242611	Short to ground in DC charging indicator - distribution (fast charging)

DTC	B242612	Short to power supply in DC charging indicator - distribution (fast charging)

Description

When DC charging indicator dose not operate or operates abnormally, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B242511	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH50 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B242512	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH50 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B242611	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH16 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B242612	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH16 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B242511	DC charging indicator does not operate or operates abnormally	-
B242512	DC charging indicator does not operate or operates abnormally	-
B242611	DC charging indicator does not operate or operates abnormally	-
B242612	DC charging indicator does not operate or operates abnormally	-

Inspection procedure

1	Check AC/DC charging port wire harness and connector

(a) Check if AC/DC charging port wire harness and connector are damaged.

(b) Check if AC/DC charging port wire harness and connector are open or short.

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B242E11	Short to ground in back door drive motor - hall 1&2 sensor power supply

DTC	B242E12	Short to power supply in back door drive motor - hall 1&2 sensor power supply

Description

When the left luggage compartment power support rod power supply circuit is short, the rear intelligent area control unit records DTC.

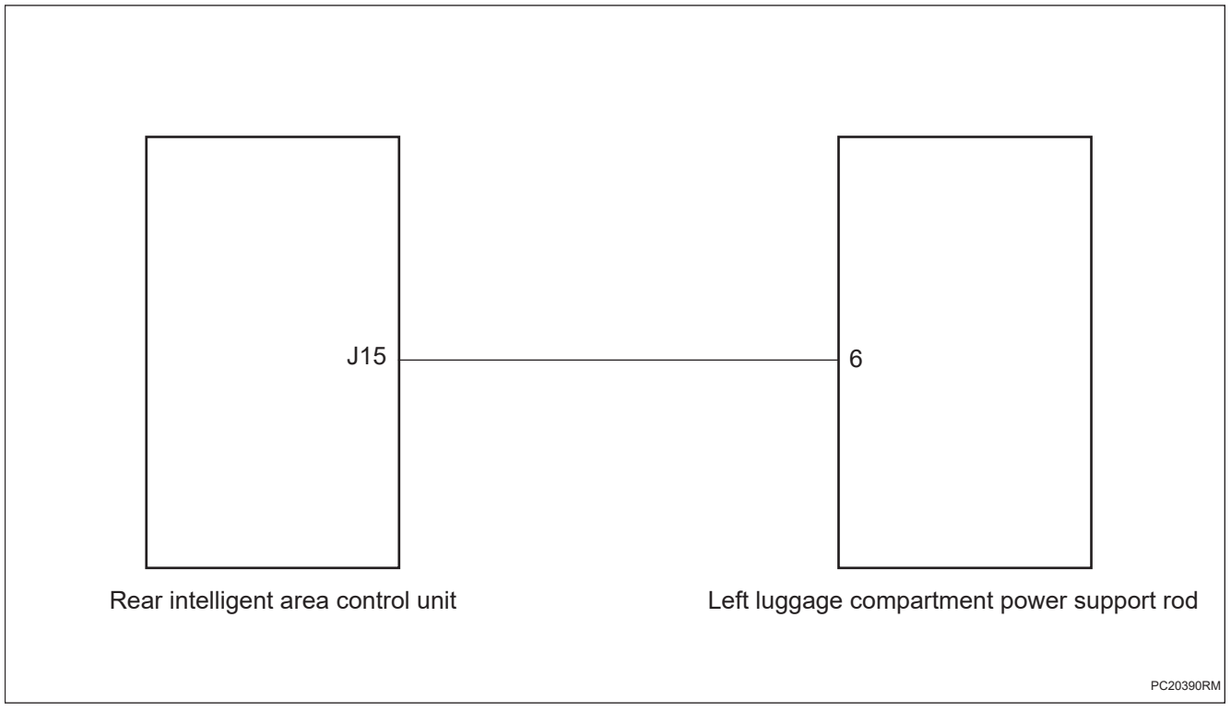
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B242E11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH52 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod
B242E12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH52 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B242E11	Back door support rod motor does not operate or operates abnormally	-
B242E12	Back door support rod motor does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check left luggage compartment power support rod wire harness and connector**

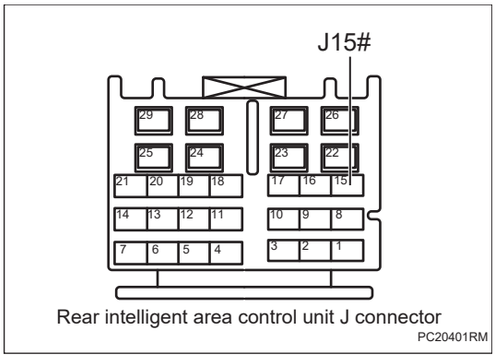
(a) Check if left luggage compartment power support rod wire harness and connector are damaged.

(b) Check if left luggage compartment power support rod wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in left luggage compartment power support rod wire harness and connector



Rear intelligent area control unit J connector
PC20401RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the left luggage compartment power support rod connector.

(e) According to value in the table, measure resistance.

Standard value

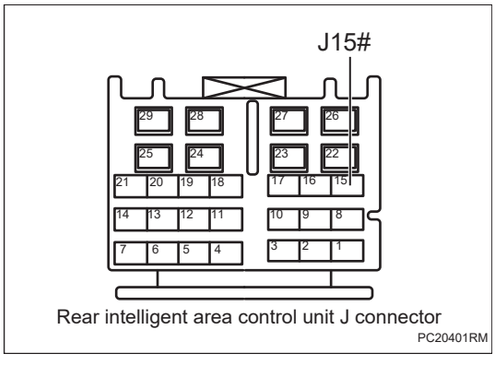
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J15# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in left luggage compartment power support rod wire harness and connector



Rear intelligent area control unit J connector
PC20401RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace left luggage compartment power support rod (See page CS-35)

(a) Replace the left luggage compartment power support rod.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B243311**	**Short to ground in rear left corner millimeter wave radar**
DTC	**B243312**	**Short to power supply in rear left corner millimeter wave radar**

Description

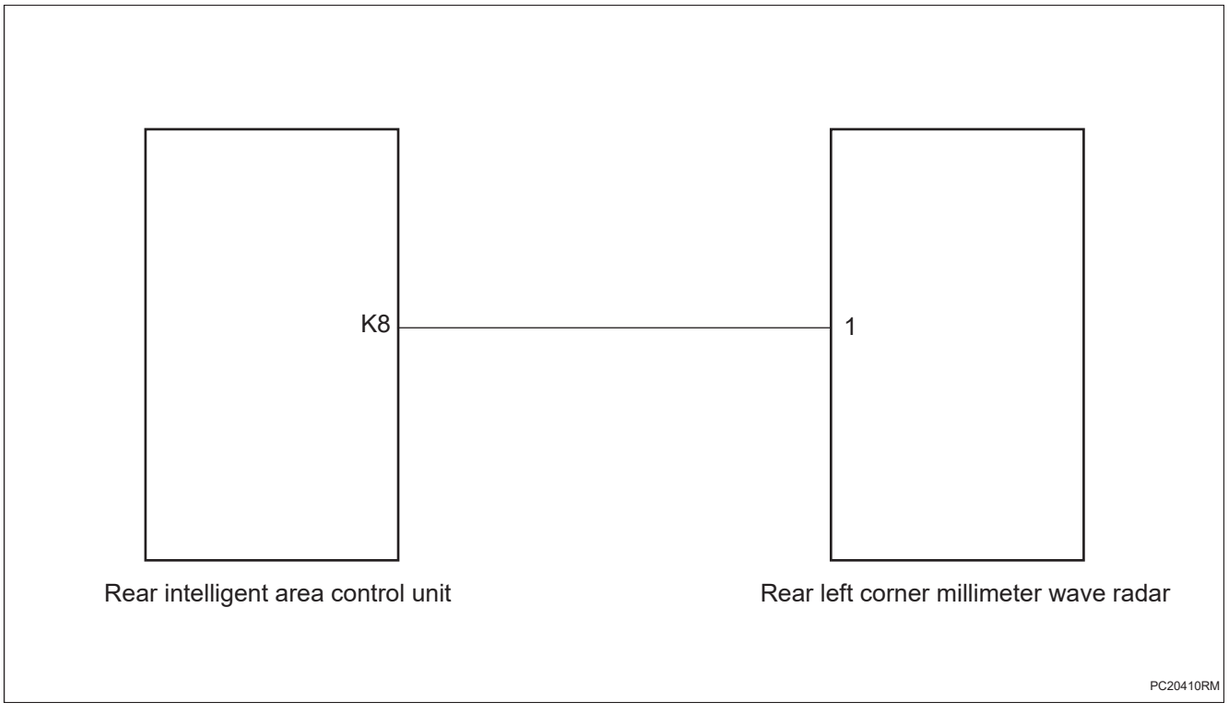
When the rear left corner millimeter wave radar power supply circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B243311	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH28 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left corner millimeter wave radar
B243312	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH28 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B243311	Rear left millimeter wave radar does not operate or operates abnormally	-
B243312	Rear left millimeter wave radar does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check rear left corner millimeter wave radar wire harness and connector**

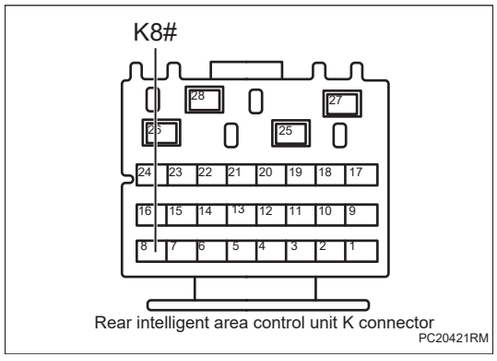
(a) Check rear left corner millimeter wave radar wire harness and connector for damage.

(b) Check for short to each other in rear left corner millimeter wave radar wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left corner millimeter wave radar wire harness and connector**



Rear intelligent area control unit K connector
PC20421RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left corner millimeter wave radar connector.

(e) According to value in the table, measure resistance.

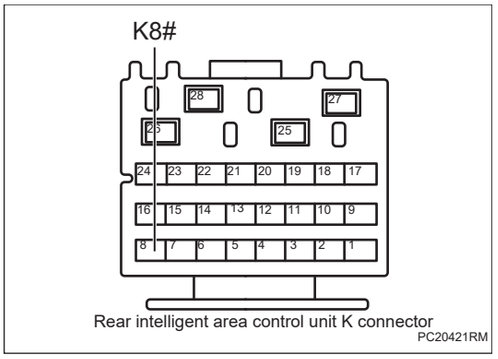
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in rear left corner millimeter wave radar wire harness and connector



Rear intelligent area control unit K connector
PC20421RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K8# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace rear left corner millimeter wave radar (See page ZC-112)

(a) Replace the rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B243411**	**Short to ground in rear right corner millimeter wave radar**
DTC	**B243412**	**Short to power supply in rear right corner millimeter wave radar**

Description

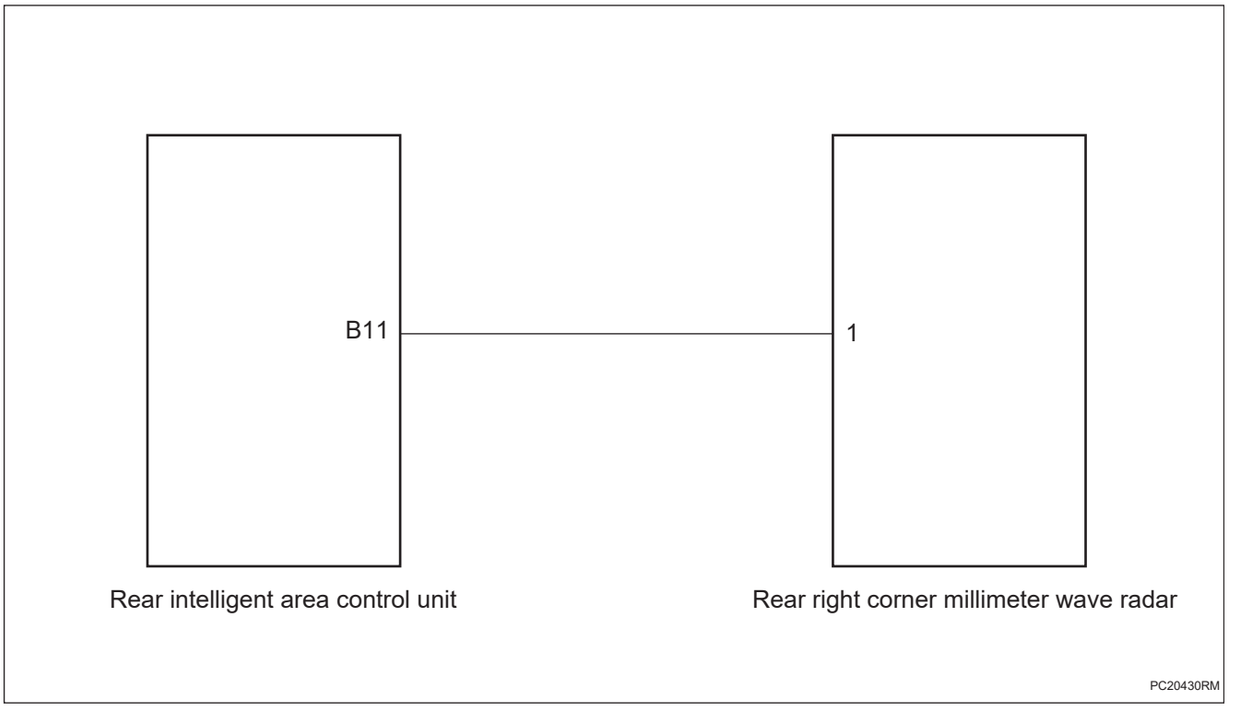
When the rear right corner millimeter wave radar power supply circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B243411	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH23 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right corner millimeter wave radar
B243412	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH23 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B243411	Rear right millimeter wave radar does not operate or operates abnormally	-
B243412	Rear right millimeter wave radar does not operate or operates abnormally	-

Circuit diagram



ZD

Inspection procedure

1	**Check rear right corner millimeter wave radar wire harness and connector**

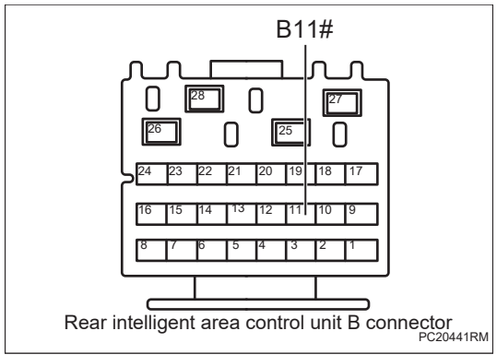
(a) Check rear right corner millimeter wave radar wire harness and connector for damage.

(b) Check for short to each other in rear right corner millimeter wave radar wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear right corner millimeter wave radar wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right corner millimeter wave radar connector.

(e) According to value in the table, measure resistance.

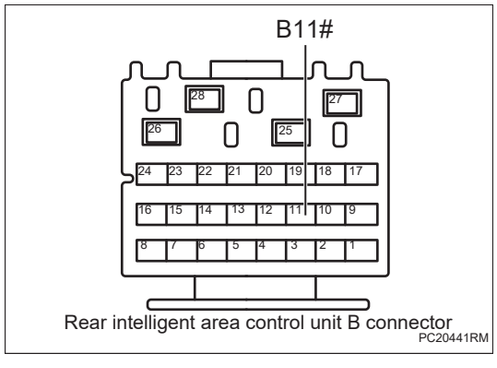
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B11# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in rear right corner millimeter wave radar wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Replace rear right corner millimeter wave radar (See page ZC-112)

(a) Replace the rear right corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B243C11	Short to ground in rear left seat heater - power
DTC	B243C12	Short to power supply in rear left seat heater - power
DTC	B243C13	Open in rear left seat heater - power

Description

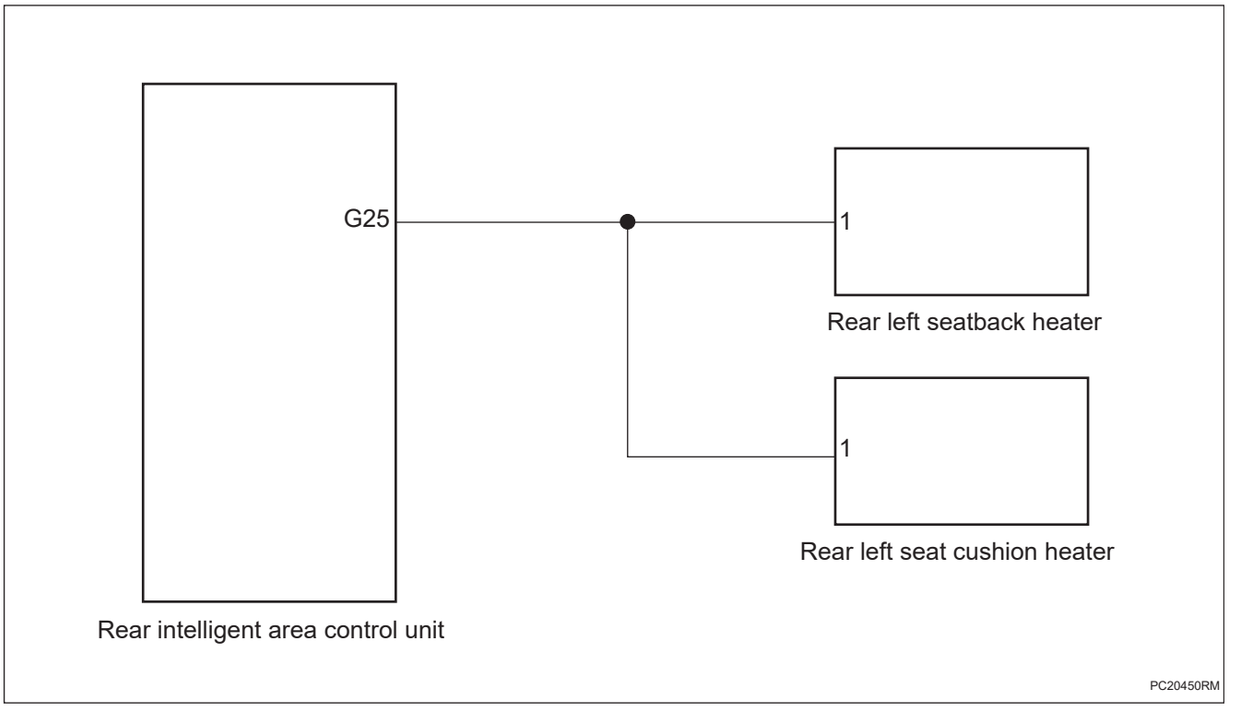
When the rear left seatback/seat cushion heater power supply is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B243C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode /gCFG_ u8Sec SeatHeat Ena=0x1	OPH08 short to GND	20	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seatback heater • Rear left seat cushion heater
B243C12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeat Ena=0x1	OPH08 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seatback heater • Rear left seat cushion heater
B243C13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode /gCFG_ u8Sec SeatHeat Ena=0x1	OPH8 open circuit	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seatback heater • Rear left seat cushion heater

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B243C11	Rear left seat heater does not operate or operates abnormally	-
B243C12	Rear left seat heater does not operate or operates abnormally	-
B243C13	Rear left seat heater does not operate or operates abnormally	-

Circuit diagram



ZD

Inspection procedure

1	**Check rear left seatback/seat cushion heater wire harness and connector**

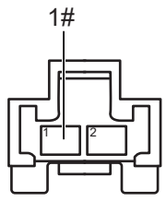
(a) Check if rear left seatback/seat cushion heater wire harness and connector are damaged.

(b) Check if rear left seatback/seat cushion heater wire harness and connector are short to each other.

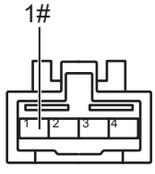
NG → **Check and repair or replace wire harness and connector**

OK

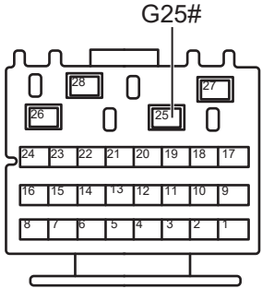
2	Check for open in rear left seatback/seat cushion heater wire harness and connector



Rear left seatback heater connector



Rear left seat cushion heater connector



Rear intelligent area control unit G connector

PC20470RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left seatback/seat cushion heater connector.

(e) According to value in the table, measure resistance.

Standard value

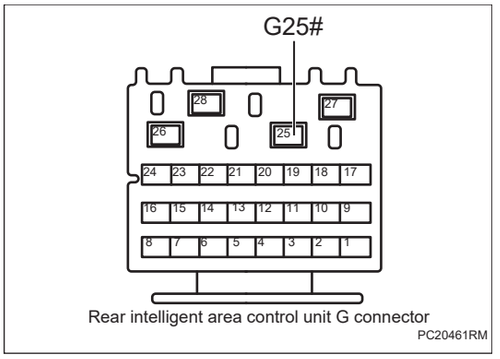
Multimeter connection	Detection condition	Specified condition
Rear left seatback heater connector 1# - rear intelligent area control unit connector G25#	Always connected	Less than 1 Ω
Rear left seat cushion heater connector 1# - rear intelligent area control unit connector G25#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in rear left seatback/seat cushion heater wire harness and connector



Rear intelligent area control unit G connector
PC20461RM

(a) According to value in the table, measure resistance.

Standard value

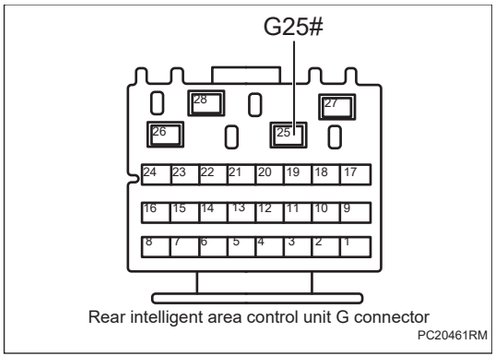
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G25# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear left seatback/seat cushion heater wire harness and connector



Rear intelligent area control unit G connector
PC20461RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G25# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left seatback/seat cushion heater (See page NS-92)**

(a) Replace the rear left seatback/seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK →

Diagnosis ends

DTC	**B243D11**	**Short to ground in rear right seat heater - power**
DTC	**B243D12**	**Short to power supply in rear right seat heater - power**
DTC	**B243D13**	**Open in rear right seat heater - power**

Description

When the rear right seatback/seat cushion heater power supply is short or open, the rear intelligent area control unit records DTC.

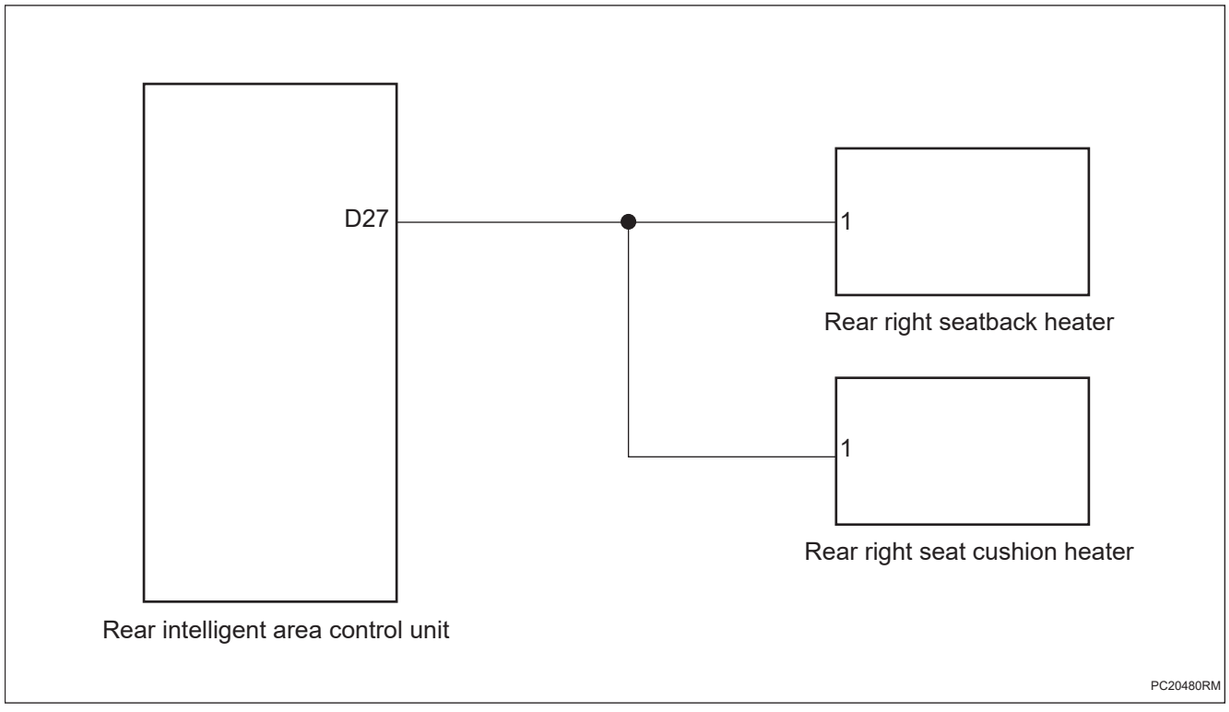
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B243D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeat Ena=0x1	OPH09 short to GND	20	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seatback heater • Rear right seat cushion heater
B243D12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeat Ena=0x1	OPH09 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seatback heater • Rear right seat cushion heater
B243D13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeat Ena=0x1	OPH09 open circuit	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seatback heater • Rear right seat cushion heater

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B243D11	Rear right seat heater does not operate or operates abnormally	-
B243D12	Rear right seat heater does not operate or operates abnormally	-
B243D13	Rear right seat heater does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check rear right seatback/seat cushion heater wire harness and connector**

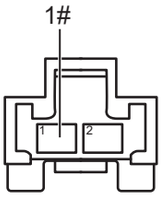
(a) Check if rear right seatback/seat cushion heater wire harness and connector are damaged.

(b) Check if rear right seatback/seat cushion heater wire harness and connector are short to each other.

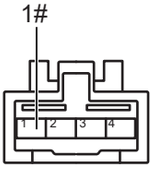
NG → **Check and repair or replace wire harness and connector**

OK

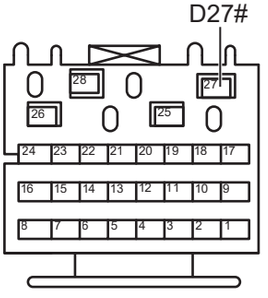
2	**Check for open in rear right seatback/seat cushion heater wire harness and connector**



Rear right seatback heater connector



Rear right seat cushion heater connector



Rear intelligent area control unit D connector

PC20491RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right seatback/seat cushion heater connector.

(e) According to value in the table, measure resistance.

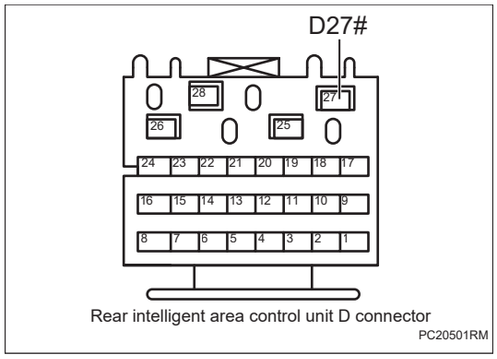
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right seatback heater connector 1# - rear intelligent area control unit connector D27#	Always connected	Less than 1 Ω
Rear right seat cushion heater connector 1# - rear intelligent area control unit connector D27#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in rear right seatback/seat cushion heater wire harness and connector



Rear intelligent area control unit D connector
PC20501RM

(a) According to value in the table, measure resistance.

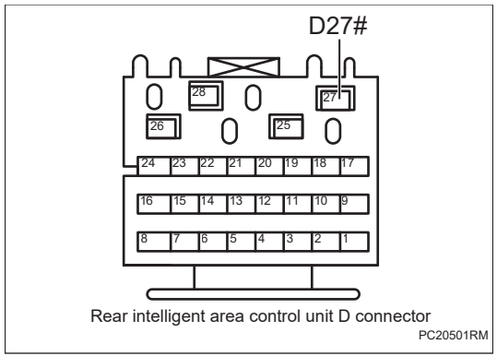
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D27# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear right seatback/seat cushion heater wire harness and connector



Rear intelligent area control unit D connector
PC20501RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D27# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace rear right seatback/seat cushion heater (See page NS-92)**

(a) Replace the rear right seatback/seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B243F11**	**Short to ground in rear right door intelligent terminal**
DTC	**B243F12**	**Short to power supply in rear right door intelligent terminal**

Description

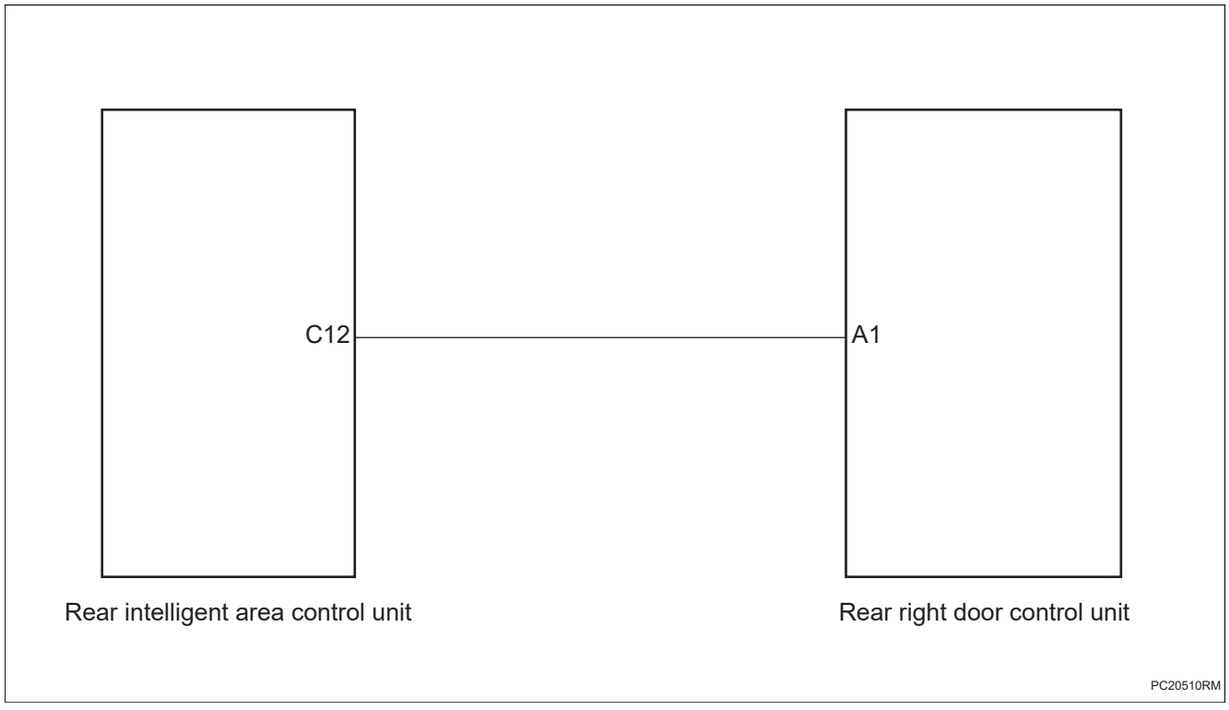
When rear right door control unit circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B243F11	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH34 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right door control unit
B243F12	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH34 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right door control unit

Fault symptom

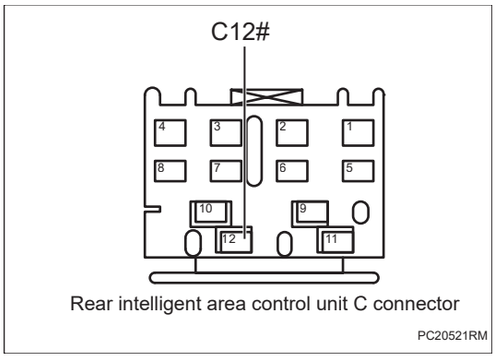
DTC No.	Fault symptom	Warning light/indicator
B243F11	Rear right door intelligent terminal does not operate or operates abnormally	-
B243F12	Rear right door intelligent terminal does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear right door control unit wire harness and connector**



Rear intelligent area control unit C connector

PC20521RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right door control unit connector.

(e) According to value in the table, measure resistance.

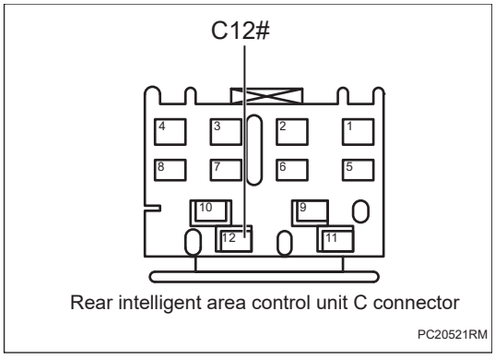
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector C12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear right door control unit wire harness and connector**



Rear intelligent area control unit C connector

PC20521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector C12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Replace rear right door control unit (See page CS-12)**

(a) Replace the rear right door control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B244011**	**Short to ground in rear left door intelligent terminal**
DTC	**B244012**	**Short to power supply in rear left door intelligent terminal**

Description

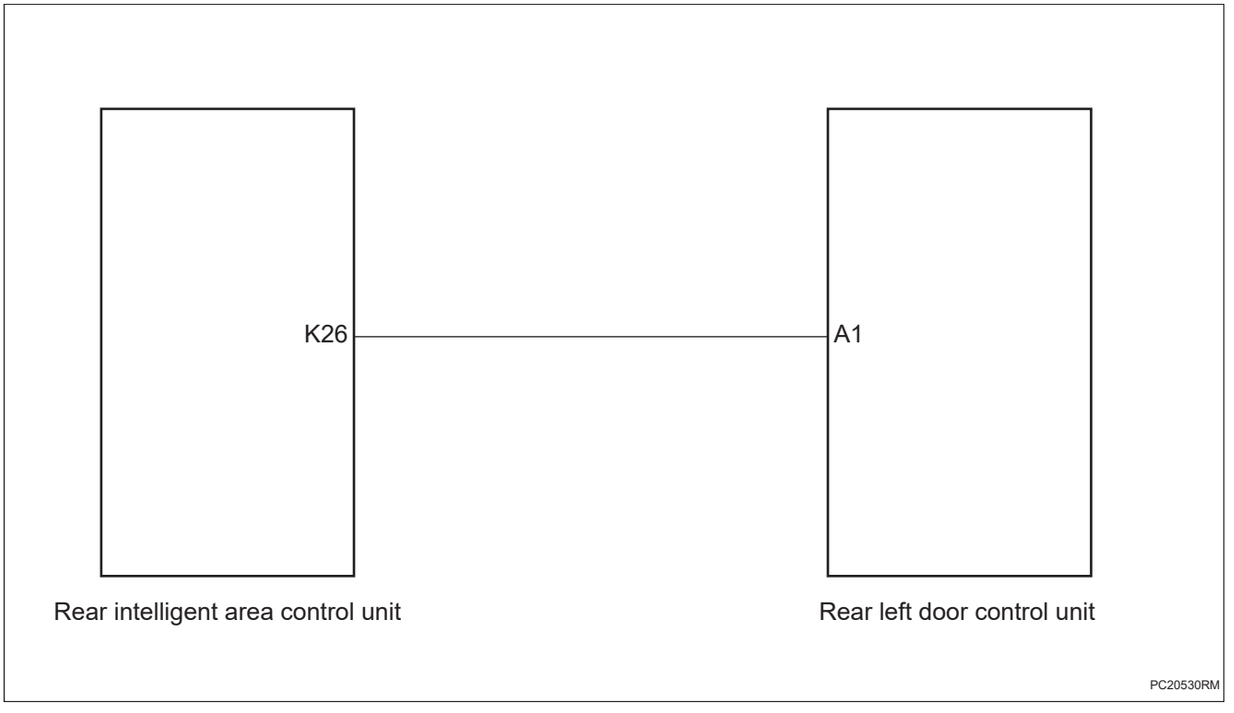
When rear left door control unit circuit is short, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B244011	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH35 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left door control unit
B244012	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH35 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left door control unit

Fault symptom

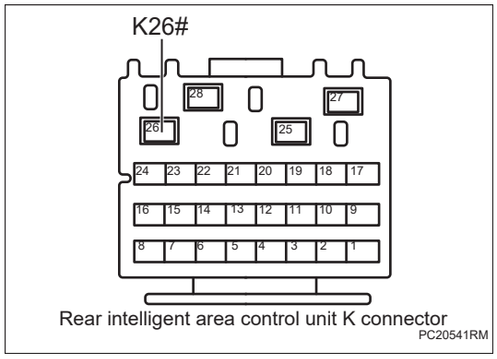
DTC No.	Fault symptom	Warning light/indicator
B244011	Rear left door intelligent terminal does not operate or operates abnormally	-
B244012	Rear left door intelligent terminal does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	Check for short to ground in rear left door control unit wire harness and connector



Rear intelligent area control unit K connector
PC20541RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left door control unit connector.

(e) According to value in the table, measure resistance.

Standard value

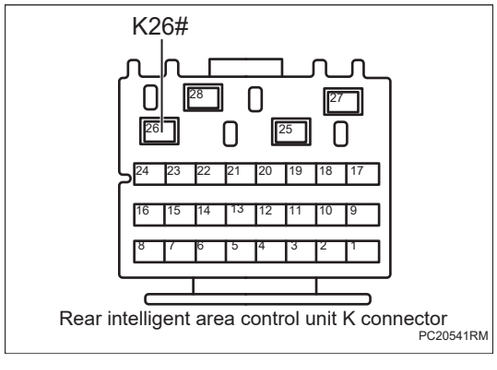
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K26# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to power supply in rear left door control unit wire harness and connector



Rear intelligent area control unit K connector
PC20541RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K26# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear left door control unit (See page CS-12)**

(a) Replace the rear left door control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B244211**	**Short to ground in rear windshield heating**
DTC	**B244212**	**Short to power supply in rear windshield heating**
DTC	**B244213**	**Open in rear windshield heating**

Description

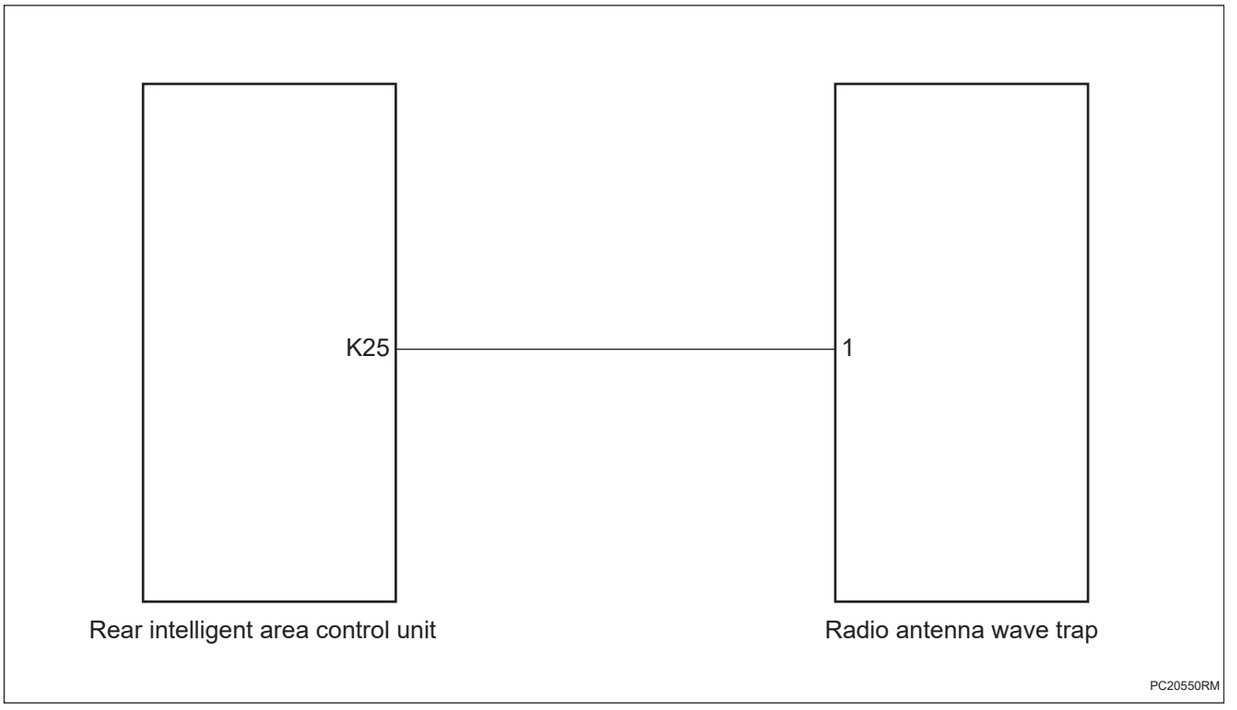
When the radio antenna wave trap (rear windshield heater) is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B244211	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH13 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Radio antenna wave trap (rear windshield heater)
B244212	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH13 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Radio antenna wave trap (rear windshield heater)
B244213	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	OPH13 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Radio antenna wave trap (rear windshield heater)

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B244211	Rear windshield heater does not operate or operates abnormally	-
B244212	Rear windshield heater does not operate or operates abnormally	-
B244213	Rear windshield heater does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

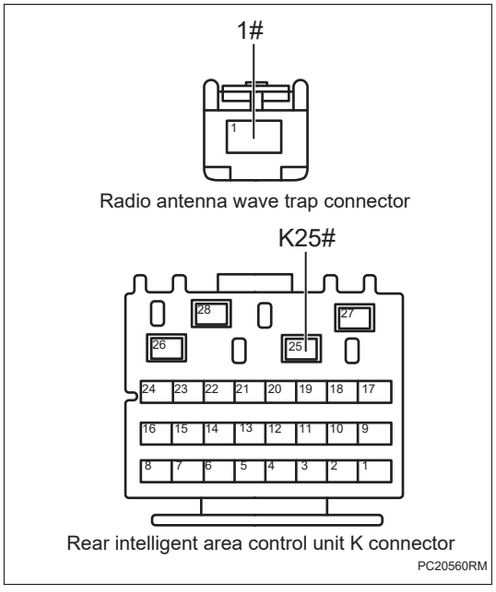
1	**Check radio antenna wave trap**

(a) Check if radio antenna wave trap is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in radio antenna wave trap wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the radio antenna wave trap connector.

(e) According to value in the table, measure resistance.

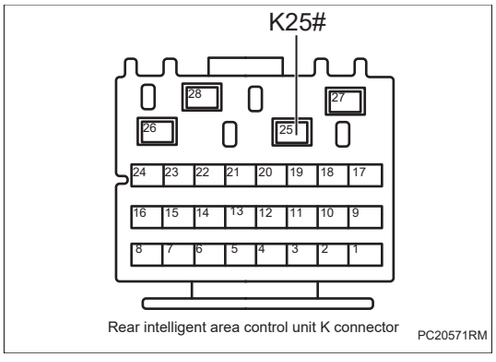
Standard value

Multimeter connection	Detection condition	Specified condition
Radio antenna wave trap connector 1# - rear intelligent area control unit connector K25#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in radio antenna wave trap wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

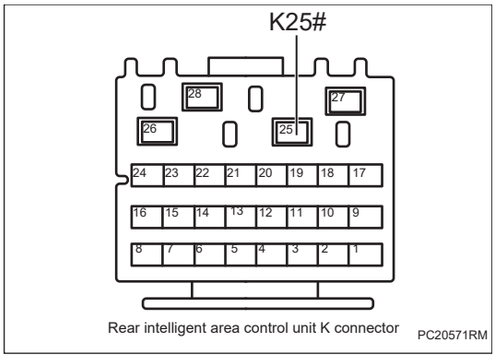
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K25# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to power supply in radio antenna wave trap wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector K25# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace radio antenna wave trap (See page ZC-100)

(a) Replace the radio antenna wave trap.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B244311**	**Short to ground in 220 V power supply inverter - power distribution/second row wireless charging/12 V luggage compartment backup power supply**
DTC	**B244312**	**220 V power supply inverter - power distribution/second row wireless charging/12 V luggage compartment backup power supply**

Description

When backup power supply operates abnormally, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B244311	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH39 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Backup power supply
B244312	• Diagnostic voltage range. (9 V - 16 V)/ PDC Not in OTA Mode	ODH39 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Backup power supply

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B244311	220 V power supply inverter dose not operate or operates abnormally	-
B244312	220 V power supply inverter dose not operate or operates abnormally	-

Inspection procedure

1	**Check backup power supply wire harness and connector**

(a) Check if backup power supply wire harness and connector are damaged.

(b) Check for short or open in backup power supply wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace backup power supply (See page ZC-9)

(a) Replace the backup power supply.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B244519	Battery management system electronic fuse overload
DTC	B244511	Short to ground in battery management system electronic fuse
DTC	B24451A	Battery management system electronic fuse MOS saturation shutdown
DTC	B24451B	Battery management system electronic fuse unable to enter sleep

DTC	B24451C	Battery management system electronic fuse undervoltage
DTC	B24451D	Battery management system electronic fuse overtemperature
DTC	B24451E	Battery management system electronic fuse SPI communication fault
DTC	B244619	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse overload
DTC	B244611	Short to ground in energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse
DTC	B24461A	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse MOS saturation shutdown
DTC	B24461B	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse unable to enter sleep
DTC	B24461C	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse undervoltage
DTC	B24461D	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse overtemperature
DTC	B24461E	Energy conversion and distribution unit, including DCDC, OBC, PDU - power distribution electronic fuse SPI communication fault
DTC	B244719	Rear right door intelligent terminal electronic fuse overload
DTC	B244711	Short to ground in rear right door intelligent terminal electronic fuse

DTC	B24471A	Rear right door intelligent terminal electronic fuse MOS saturation shutdown
DTC	B24471B	Rear right door intelligent terminal electronic fuse unable to enter sleep
DTC	B24471C	Rear right door intelligent terminal electronic fuse undervoltage
DTC	B24471D	Rear right door intelligent terminal electronic fuse overtemperature
DTC	B24471E	Rear right door intelligent terminal electronic fuse SPI communication fault
DTC	B244819	HAD electronic fuse overload
DTC	B244811	Short to ground in HAD electronic fuse
DTC	B24481A	HAD electronic fuse MOS saturation shutdown
DTC	B24481B	HAD electronic fuse unable to enter sleep
DTC	B24481C	HAD electronic fuse undervoltage
DTC	B24481D	HAD electronic fuse overtemperature
DTC	B24481E	HAD electronic fuse SPI communication fault
DTC	B244919	Intelligent communication terminal electronic fuse overload
DTC	B244911	Short to ground in intelligent communication terminal electronic fuse
DTC	B24491A	Intelligent communication terminal electronic fuse MOS saturation shutdown
DTC	B24491B	Intelligent communication terminal electronic fuse unable to enter sleep
DTC	B24491C	Intelligent communication terminal electronic fuse undervoltage
DTC	B24491D	Intelligent communication terminal electronic fuse overtemperature

DTC	**B24491E**	**Intelligent communication terminal electronic fuse SPI communication fault**
DTC	**B244A19**	**Rear left door intelligent terminal electronic fuse overload**
DTC	**B244A11**	**Short to ground in rear left door intelligent terminal electronic fuse**
DTC	**B244A1A**	**Rear left door intelligent terminal electronic fuse MOS saturation shutdown**
DTC	**B244A1B**	**Rear left door intelligent terminal electronic fuse unable to enter sleep**
DTC	**B244A1C**	**Rear left door intelligent terminal electronic fuse undervoltage**
DTC	**B244A1D**	**Rear left door intelligent terminal electronic fuse overtemperature**
DTC	**B244A1E**	**Rear left door intelligent terminal electronic fuse SPI communication fault**

Description

When electronic fuse related faults are detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B244519	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 Overload	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B244511	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 SCG	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24451A	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 Moset Saturate	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B24451B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 Sleep fault	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24451C	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 under voltage	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24451D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 Overtemp	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24451E	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE02 SPI error	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B244619	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 Overload	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B244611	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 SCG	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24461A	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 Moset Saturate	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24461B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 Sleep fault	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24461C	• Diagnostic voltage range. (9 V	EFUSE04 under voltage	50	Event-based	10 ms	• Energy conversion and distribution unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) / PDC Not in OTA Mode					• Rear intelligent area control unit • Wire harness and connector
B24461D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 Overtemp	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B24461E	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE04 SPI error	50	Event-based	10 ms	• Energy conversion and distribution unit • Rear intelligent area control unit • Wire harness and connector
B244719	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 Overload	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B244711	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 SCG	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B24471A	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 Moset Saturate	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B24471B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 Sleep fault	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B24471C	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 under voltage	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B24471D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE06 Overtemp	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit • Wire harness and connector
B24471E	• Diagnostic voltage range. (9 V - 16 V) /	EFUSE06 SPI error	50	Event-based	10 ms	• Rear right door control unit • Rear intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode					• Wire harness and connector
B244819	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 Overload	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B244811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 SCG	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B24481A	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 Moset Saturate	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B24481B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 Sleep fault	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B24481C	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 under voltage	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B24481D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 Overtemp	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B24481E	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE07 SPI error	50	Event-based	10 ms	• Advanced automatic driving controller • Rear intelligent area control unit • Wire harness and connector
B244919	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 Overload	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B244911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 SCG	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B24491A	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 Moset Saturate	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B24491B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 Sleep fault	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B24491C	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 under voltage	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B24491D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 Overtemp	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B24491E	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE09 SPI error	50	Event-based	10 ms	• Intelligent communication domain control unit • Rear intelligent area control unit • Wire harness and connector
B244A19	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 Overload	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector
B244A11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 SCG	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector
B244A1A	• Diagnostic voltage range. (9 V - 16 V) /	EFUSE10 Moset Saturate	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode					• Wire harness and connector
B244A1B	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 Sleep fault	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector
B244A1C	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 under voltage	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector
B244A1D	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 Overtemp	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector
B244A1E	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EFUSE10 SPI error	50	Event-based	10 ms	• Rear left door control unit • Rear intelligent area control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B244519	Battery management system not operating or malfunctioning	-
B244511	Battery management system not operating or malfunctioning	-
B24451A	Battery management system not operating or malfunctioning	-
B24451B	Battery management system not operating or malfunctioning	-
B24451C	Battery management system not operating or malfunctioning	-
B24451D	Battery management system not operating or malfunctioning	-
B24451E	Battery management system not operating or malfunctioning	-
B244619	Energy conversion and distribution unit does not operate or operates abnormally	-
B244611	Energy conversion and distribution unit does not operate or operates abnormally	-
B24461A	Energy conversion and distribution unit does not operate or operates abnormally	-
B24461B	Energy conversion and distribution unit does not operate or operates abnormally	-

DTC No.	Fault symptom	Warning light/indicator
B24461C	Energy conversion and distribution unit does not operate or operates abnormally	-
B24461D	Energy conversion and distribution unit does not operate or operates abnormally	-
B24461E	Energy conversion and distribution unit does not operate or operates abnormally	-
B244719	Rear right door intelligent terminal does not operate or operates abnormally	-
B244711	Rear right door intelligent terminal does not operate or operates abnormally	-
B24471A	Rear right door intelligent terminal does not operate or operates abnormally	-
B24471B	Rear right door intelligent terminal does not operate or operates abnormally	-
B24471C	Rear right door intelligent terminal does not operate or operates abnormally	-
B24471D	Rear right door intelligent terminal does not operate or operates abnormally	-
B24471E	Rear right door intelligent terminal does not operate or operates abnormally	-
B244819	HAD dose not operate or operates abnormally	-
B244811	HAD dose not operate or operates abnormally	-
B24481A	HAD dose not operate or operates abnormally	-
B24481B	HAD dose not operate or operates abnormally	-
B24481C	HAD dose not operate or operates abnormally	-
B24481D	HAD dose not operate or operates abnormally	-
B24481E	HAD dose not operate or operates abnormally	-
B244919	Intelligent communication terminal does not operate or operates abnormally	-
B244911	Intelligent communication terminal does not operate or operates abnormally	-
B24491A	Intelligent communication terminal does not operate or operates abnormally	-
B24491B	Intelligent communication terminal does not operate or operates abnormally	-
B24491C	Intelligent communication terminal does not operate or operates abnormally	-
B24491D	Intelligent communication terminal does not operate or operates abnormally	-

DTC No.	Fault symptom	Warning light/indicator
B24491E	Intelligent communication terminal does not operate or operates abnormally	-
B244A19	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A11	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A1A	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A1B	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A1C	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A1D	Rear left door intelligent terminal does not operate or operates abnormally	-
B244A1E	Rear left door intelligent terminal does not operate or operates abnormally	-

Inspection procedure

1	**Check related controller wire harness and connector**

(a) Check if related controller wire harness and connector are damaged.

(b) Check for short or open in related controller wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace relevant controller

DTC	B245E11	Short to ground in rear left seat heater - sensor+

DTC	P312511	Short to power supply/open in rear left seat heater - sensor+

Description

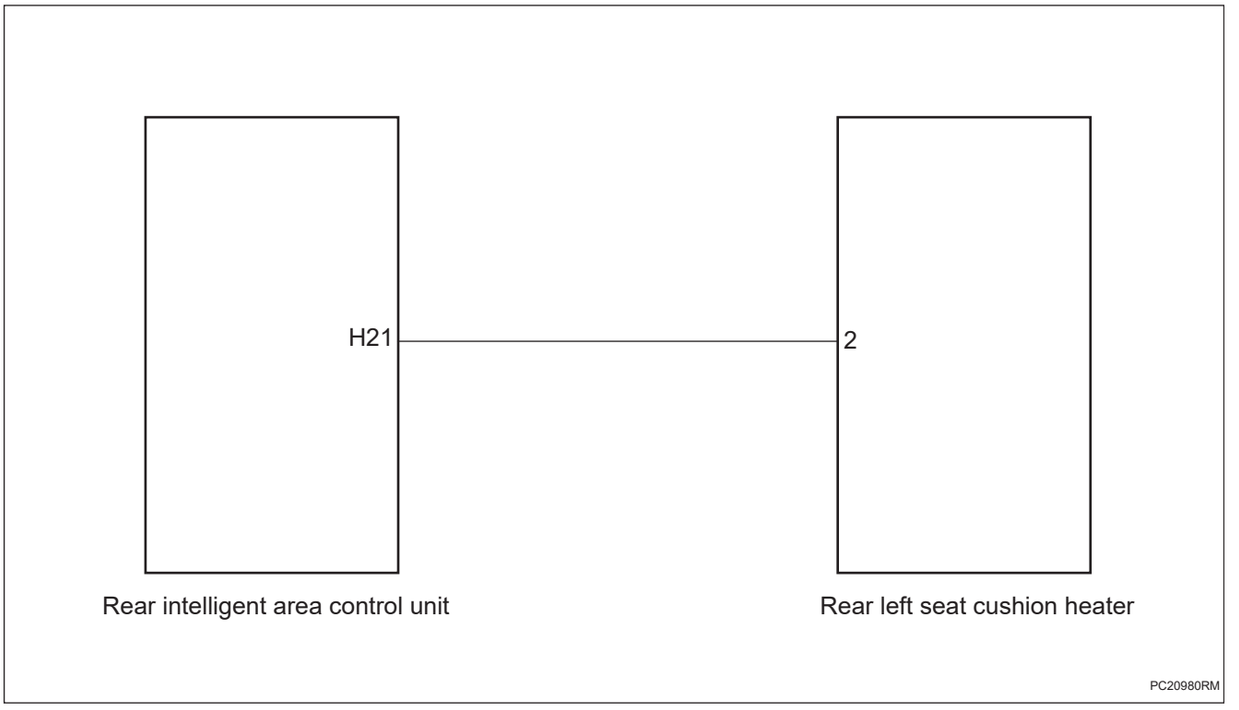
When the rear left seat cushion heater sensor is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245E11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeatE-na =0x1	Short to ground in IAN28	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seat cushion heater
P312511	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Sec SeatHeatE-na =0x1	Short to power supply/open in IAN28	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seat cushion heater

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245E11	Rear left seat heater - sensor unreasonable	-
P312511	Rear left seat heater - sensor signal unreasonable	-

Circuit diagram



ZD

Inspection procedure

1	**Check rear left seat cushion heater wire harness and connector**

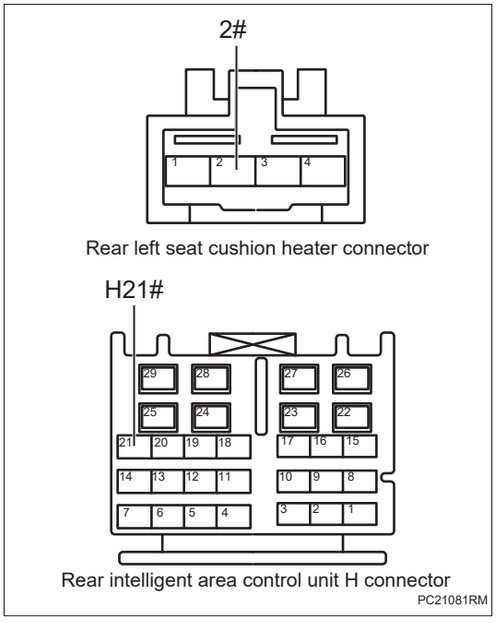
(a) Check if rear left seat cushion heater wire harness and connector are damaged.

(b) Check if rear left seat cushion heater wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in rear left seat cushion heater wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left seat cushion heater connector.

(e) According to value in the table, measure resistance.

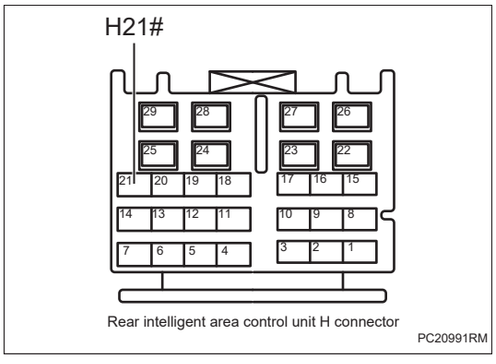
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H21# - rear left seat cushion heater connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left seat cushion heater wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

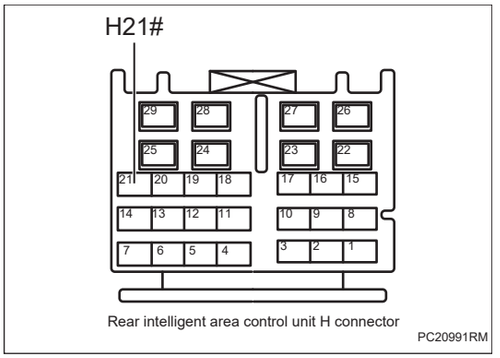
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in rear left seat cushion heater wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left seat cushion heater (See page NS-92)**

(a) Replace the rear left seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B245F11**	**Short to ground in rear right seat heater - sensor+**
DTC	**P312611**	**Short to power supply/open in rear right seat heater - sensor+**

Description

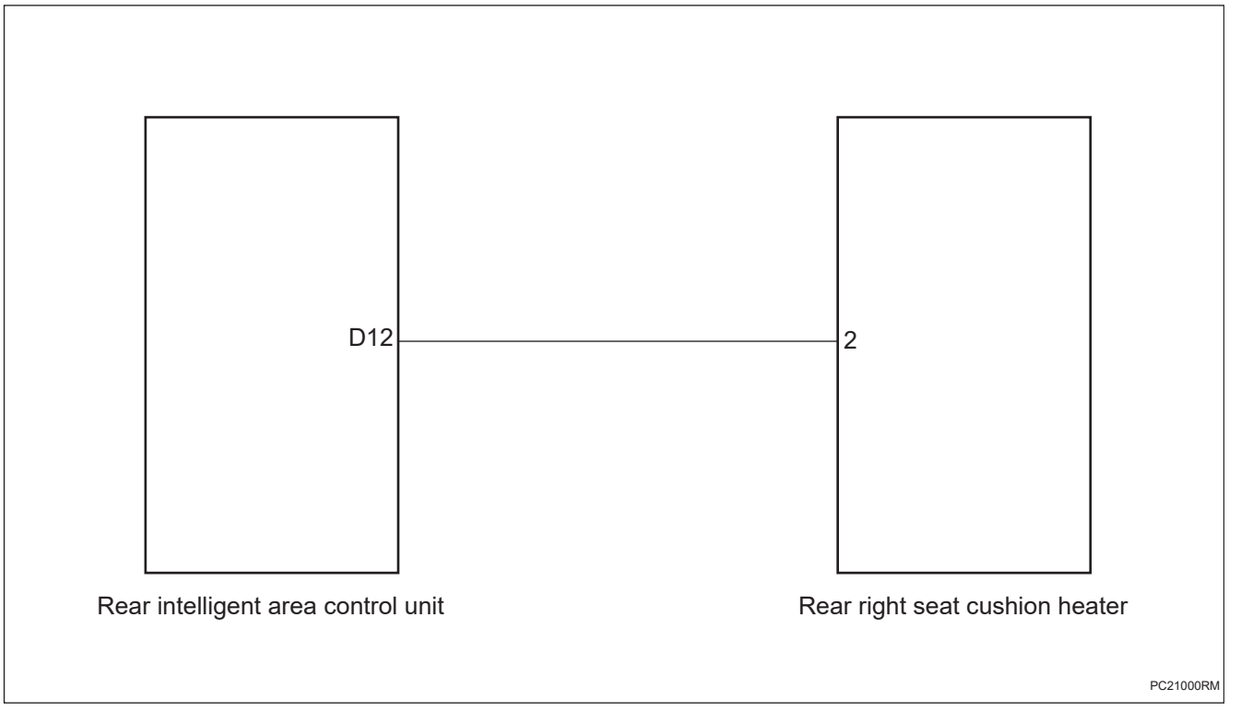
When the rear right seat cushion heater circuit is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245F11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG _u8 Sec SeatHeat Ena = 0x1	Short to ground in IAN29	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seat cushion heater
P312611	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_u 8Sec SeatHeat Ena =0x1	Short to power supply/open in IAN29	200	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seat cushion heater

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245F11	Rear right seat heater - sensor unreasonable	-
P312611	Rear right seat heater - sensor signal unreasonable	-

Circuit diagram



Inspection procedure

1	**Check rear right seat cushion heater wire harness and connector**

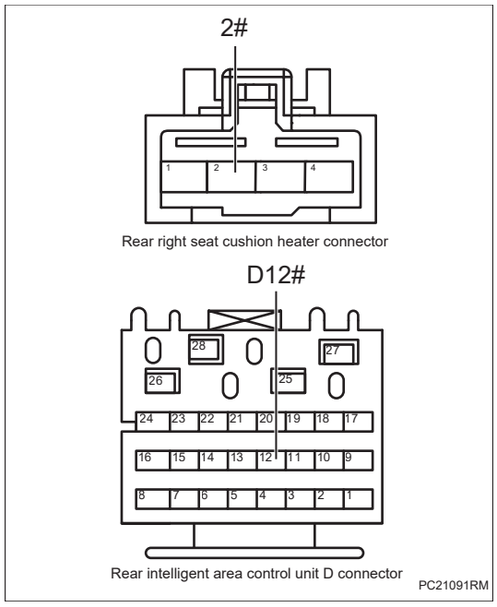
(a) Check if rear right seat cushion heater wire harness and connector are damaged.

(b) Check if rear right seat cushion heater wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in rear right seat cushion heater wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right seat cushion heater connector.

(e) According to value in the table, measure resistance.

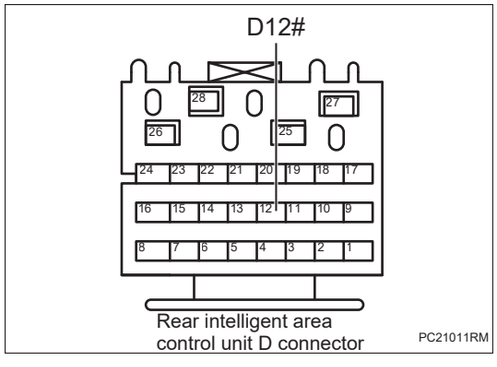
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D12# - rear right seat cushion heater connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear right seat cushion heater wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

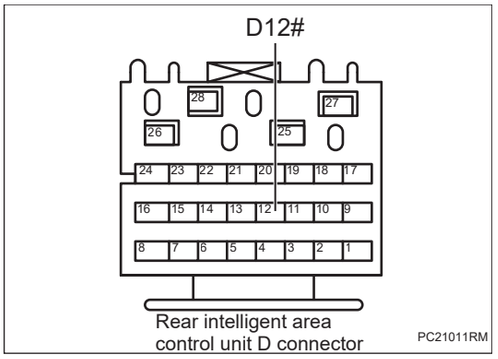
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to power supply in rear right seat cushion heater wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D12# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace rear right seat cushion heater (See page NS-92)

(a) Replace the rear right seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B245011**	**Short to ground in charging port cover electronic lock motor**
DTC	**B245012**	**Short to power supply in charging port cover electronic lock motor**
DTC	**B245013**	**Open in charging port cover electronic lock motor**

Description

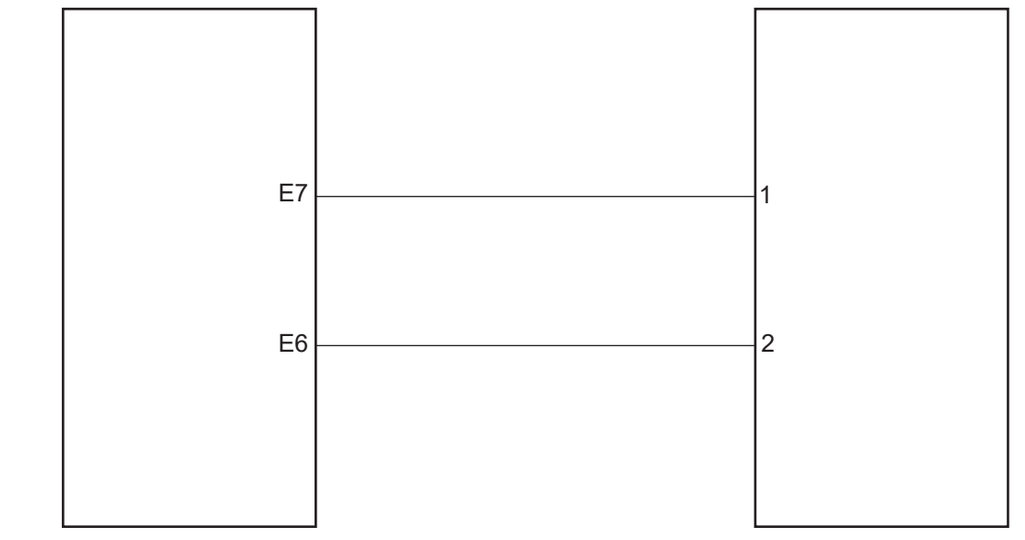
When there is short or open in charging port cover actuator motor, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245011	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Elec ChrgPort Typ =0x1	OHB09/ OHB10 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging port cover actuator motor
B245012	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Elec ChrgPort Typ =0x1	OHB09/ OHB10 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging port cover actuator motor
B245013	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode/ gCFG_ u8Elec ChrgPort Typ =0x1	OHB09/ OHB10 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging port cover actuator motor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245011	Charging port cover electronic lock motor does not operate or its operation is abnormal	-
B245012	Charging port cover electronic lock motor does not operate or its operation is abnormal	-
B245013	Charging port cover electronic lock motor does not operate or its operation is abnormal	-

Circuit diagram



Inspection procedure

1	**Check charging port cover actuator motor**

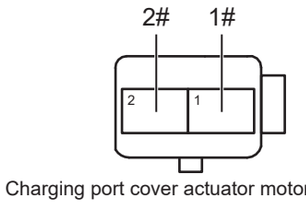
(a) Check charging port cover actuator motor for foreign matters.

(b) Check charging port cover actuator motor for sticking.

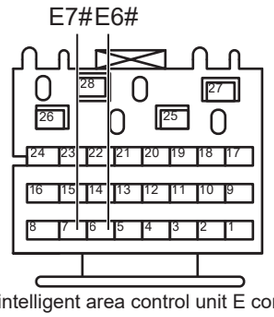
NG → **Perform repair according to malfunction**

OK

2	**Check for open in charging port cover actuator motor wire harness and connector**



Charging port cover actuator motor connector



Rear intelligent area control unit E connector

PC20611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the charging port cover actuator motor connector.

(e) According to value in the table, measure resistance.

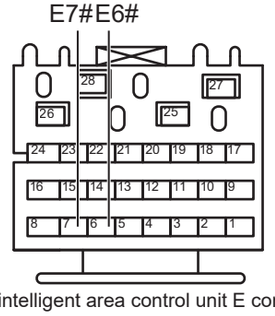
Standard value

Multimeter connection	Detection condition	Specified condition
Charging port cover actuator motor connector 2# - rear intelligent area control unit connector E7#	Always connected	Less than 1 Ω
Charging port cover actuator motor connector 1# - rear intelligent area control unit connector E8#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in charging port cover actuator motor wire harness and connector**



Rear intelligent area control unit E connector

PC20621RM

(a) According to value in the table, measure resistance.

Standard value

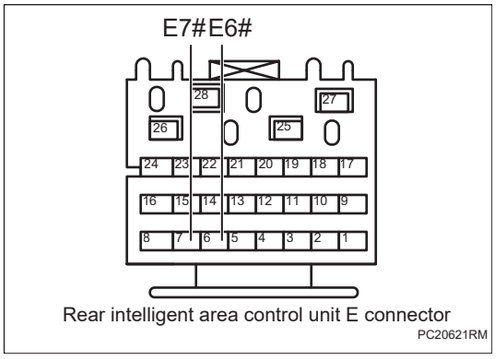
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E7# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in charging port cover actuator motor wire harness and connector**



Rear intelligent area control unit E connector
PC20621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E6# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace charging port cover actuator motor (See page WS-52)**

(a) Replace the charging port cover actuator motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG	**Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B245111**	**Short to ground in back door lock**
DTC	**B245112**	**Short to power supply in back door lock**
DTC	**B245113**	**Open in back door lock**
DTC	**B245C11**	**Short to ground in back door lock motor drive**
DTC	**B245C12**	**Short to power supply in back door lock motor drive**
DTC	**B245C13**	**Open in back door lock motor drive**

Description

When the luggage compartment lock is short or open, the rear intelligent area control unit records DTC.

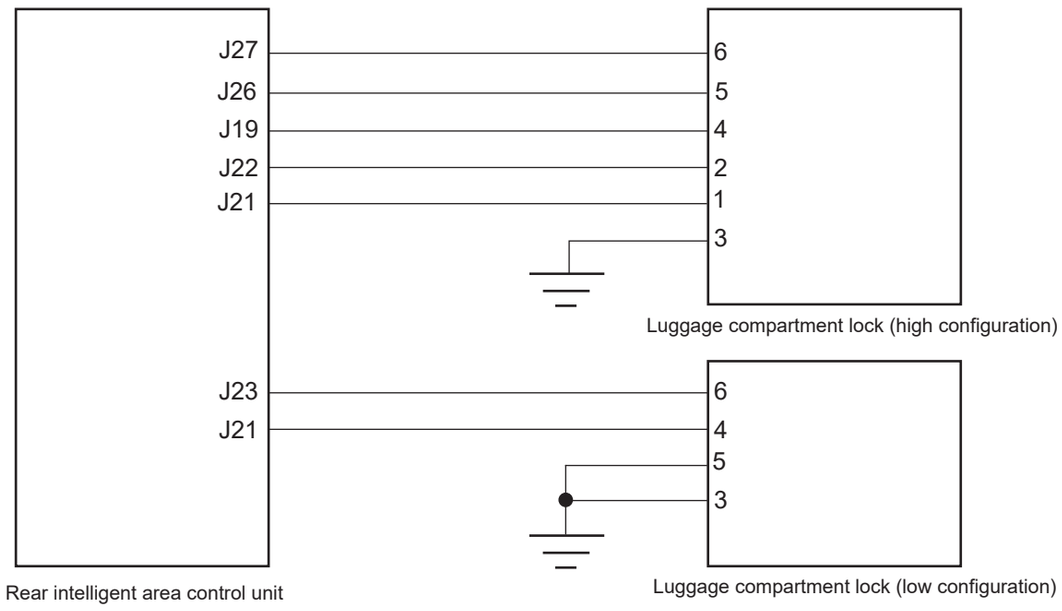
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245111	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock
B245112	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245113	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB17/ OHB18 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock
B245C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB31 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock
B245C12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB31 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock
B245C13	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB31 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Luggage compartment lock

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245111	Back door lock motor does not operate or operates abnormally	-
B245112	Back door lock motor does not operate or operates abnormally	-
B245113	Back door lock motor does not operate or operates abnormally	-
B245C11	Back door lock motor does not operate or operates abnormally	-
B245C12	Back door lock motor does not operate or operates abnormally	-
B245C13	Back door lock motor does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check luggage compartment lock**

(a) Check for foreign matters in luggage compartment lock.

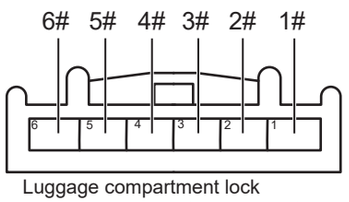
(b) Check luggage compartment lock for sticking.

NG → **Perform repair according to malfunction**

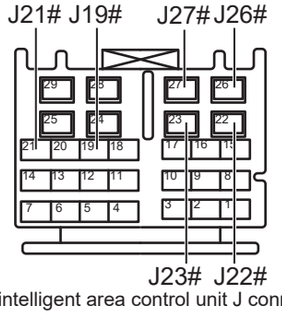
OK

ZD

2	Check for open in luggage compartment lock wire harness and connector



Luggage compartment lock
(high/low configuration) connector



Rear intelligent area control unit J connector

PC20640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the luggage compartment lock connector.

(e) According to value in the table, measure resistance.

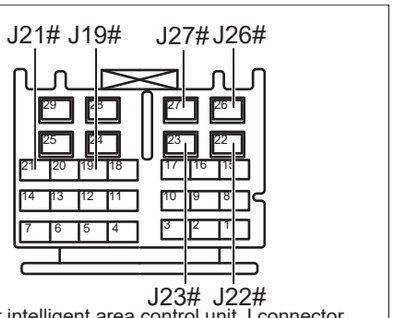
Standard value

Multimeter connection	Detection condition	Specified condition
Luggage compartment lock (high configuration) connector 6# - rear intelligent area control unit connector J27#	Always connected	Less than 1 Ω
Luggage compartment lock (high configuration) connector 5# - rear intelligent area control unit connector J26#	Always connected	Less than 1 Ω
Luggage compartment lock (high configuration) connector 4# - rear intelligent area control unit connector J19#	Always connected	Less than 1 Ω
Luggage compartment lock (high configuration) connector 2# - rear intelligent area control unit connector J22#	Always connected	Less than 1 Ω
Luggage compartment lock (high configuration) connector 1# - rear intelligent area control unit connector J21#	Always connected	Less than 1 Ω
Luggage compartment lock (high configuration) connector 3# - body ground	Always connected	Less than 1 Ω
Luggage compartment lock (low configuration) connector 6# - rear intelligent area control unit connector J23#	Always connected	Less than 1 Ω
Luggage compartment lock (low configuration) connector 4# - rear intelligent area control unit connector J21#	Always connected	Less than 1 Ω
Luggage compartment lock (low configuration) connector 5# - body ground	Always connected	Less than 1 Ω
Luggage compartment lock (low configuration) connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in luggage compartment lock wire harness and connector**



Rear intelligent area control unit J connector
PC20651RM

(a) According to value in the table, measure resistance.

Standard value

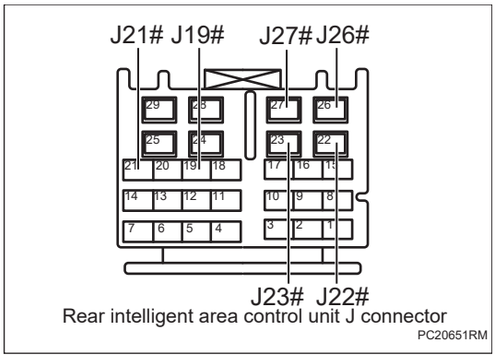
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J27# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J26# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J19# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J22# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J21# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J23# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in luggage compartment lock wire harness and connector**



Rear intelligent area control unit J connector
PC20651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J27# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J21# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J23# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace luggage compartment lock (See page CS-56)**

(a) Replace the luggage compartment lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B245211**	**Short to ground in back door left drive motor**
DTC	**B245212**	**Short to power supply in back door left drive motor**
DTC	**B245213**	**Open in back door left drive motor**

Description

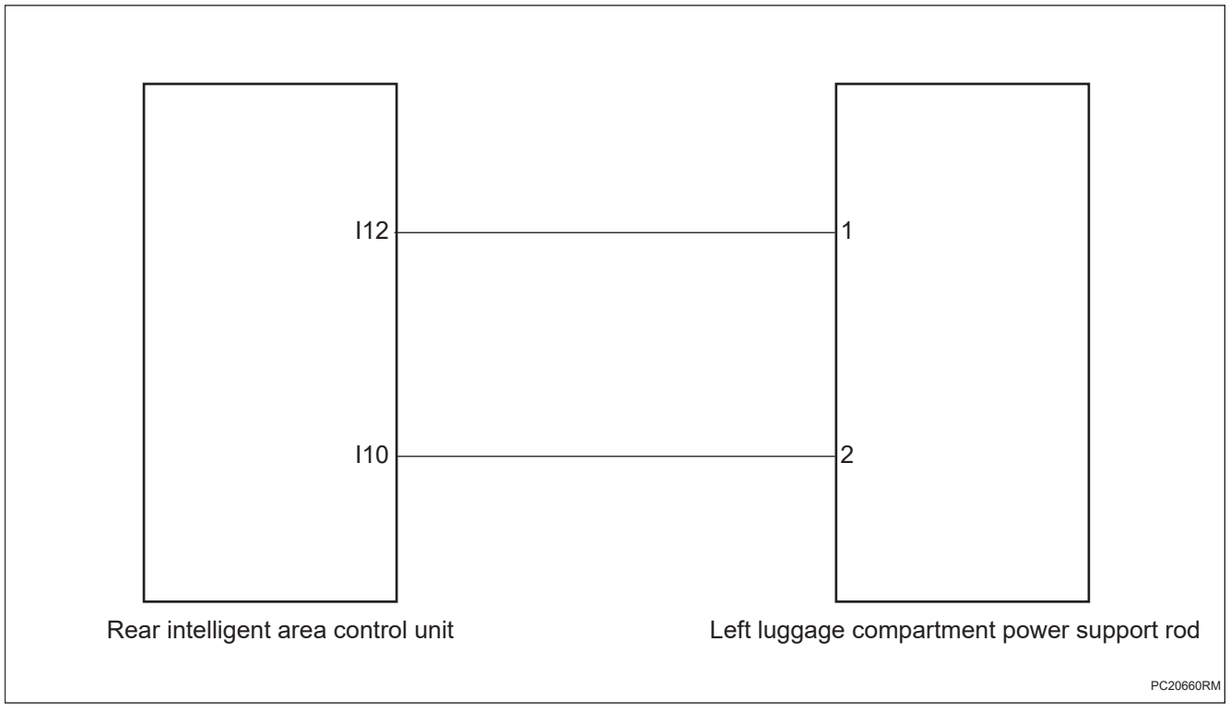
When the left luggage compartment power support rod is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245211	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod
B245212	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod
B245213	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB13/ OHB14 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245211	Back door lock does not operate or operates abnormally	-
B245212	Back door lock does not operate or operates abnormally	-
B245213	Back door lock does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check left luggage compartment power support rod**

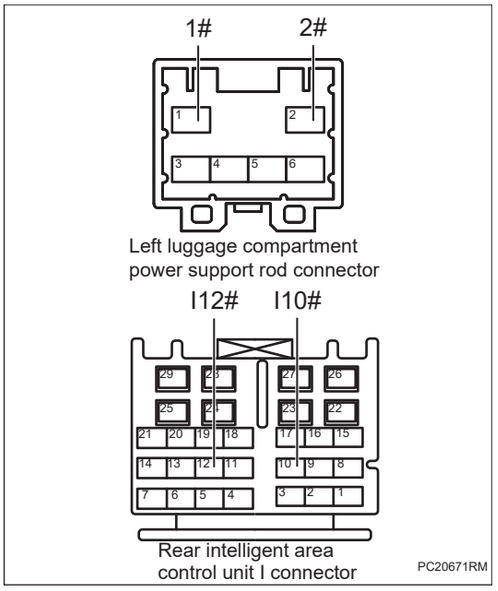
(a) Check left luggage compartment power support rod for foreign matters.

(b) Check if left luggage compartment power support rod is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in left luggage compartment power support rod wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the left luggage compartment power support rod connector.

(e) According to value in the table, measure resistance.

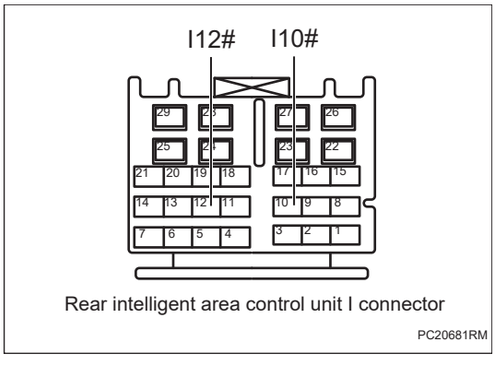
Standard value

Multimeter connection	Detection condition	Specified condition
Left luggage compartment power support rod connector 1# - rear intelligent area control unit connector I12#	Always connected	Less than 1 Ω
Left luggage compartment power support rod connector 2# - rear intelligent area control unit connector I10#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in left luggage compartment power support rod wire harness and connector**



(a) According to value in the table, measure resistance.

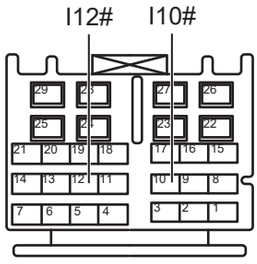
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I10# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector I12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in left luggage compartment power support rod wire harness and connector



Rear intelligent area control unit I connector

PC20681RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector I12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace left luggage compartment power support rod (See page CS-35)

(a) Replace the left luggage compartment power support rod.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

ZD

DTC	**B245811**	**Short to ground in AC charging port - electronic lock**
DTC	**B245812**	**Short to power supply in AC charging port - electronic lock**
DTC	**B245813**	**Open in AC charging port - electronic lock**
DTC	**B246111**	**AC charging port - electronic lock overcurrent fault**
DTC	**B246211**	**AC charging port - electronic lock fault**

Description

When the AC charging port electronic lock is short or open, the rear intelligent area control unit records DTC.

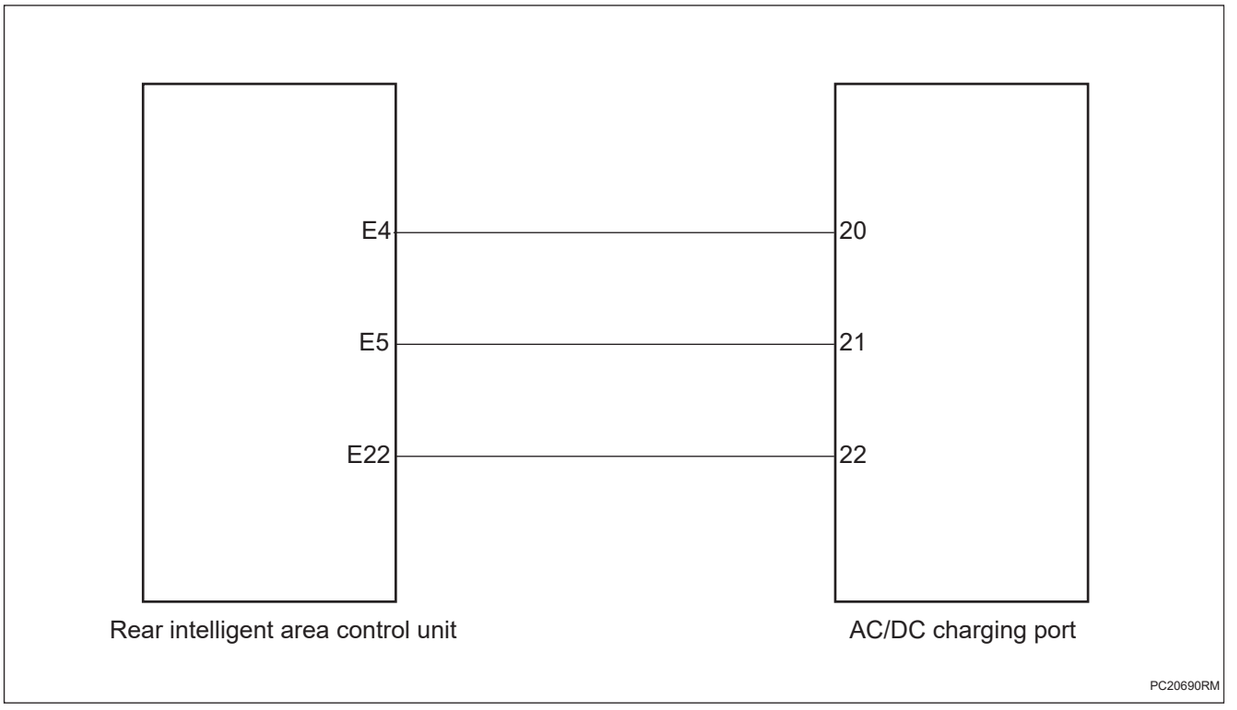
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB25/ OHB26 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B245812	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB25/ OHB26 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B245813	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB25/ OHB26 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B246111	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB25/ OHB26 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
B246211	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	OHB25/ OHB26 open circuit	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B245811	AC charging port - electronic lock does not operate or operates abnormally	-
B245812	AC charging port - electronic lock does not operate or operates abnormally	-
B245813	AC charging port - electronic lock does not operate or operates abnormally	-
B246111	AC charging port - electronic lock does not operate or operates abnormally	-
B246211	AC charging port - electronic lock does not operate or operates abnormally	-

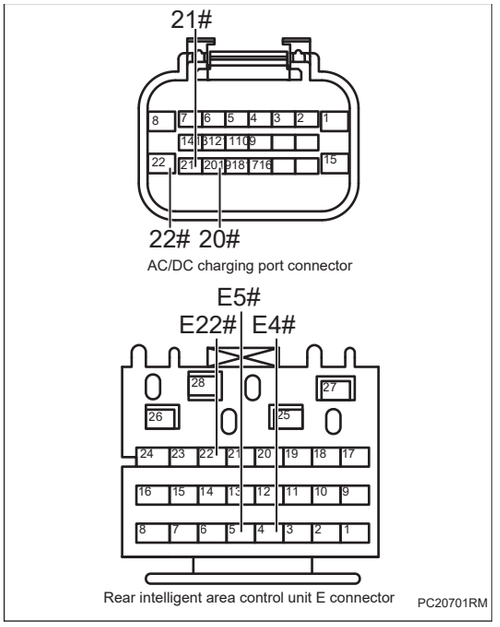
Circuit diagram



ZD

Inspection procedure

1	**Check for open in AC/DC charging port wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the AC/DC charging port connectors.

(e) According to value in the table, measure resistance.

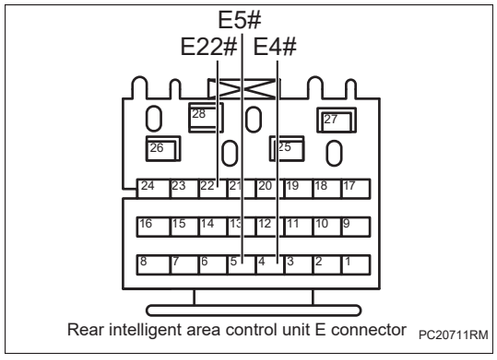
Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 22# - rear intelligent area control unit connector E22#	Always connected	Less than 1 Ω
AC/DC charging port connector 20# - rear intelligent area control unit connector E4#	Always connected	Less than 1 Ω
AC/DC charging port connector 21# - rear intelligent area control unit connector E5#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in AC/DC charging port wire harness and connector



Rear intelligent area control unit E connector PC20711RM

(a) According to value in the table, measure resistance.

Standard value

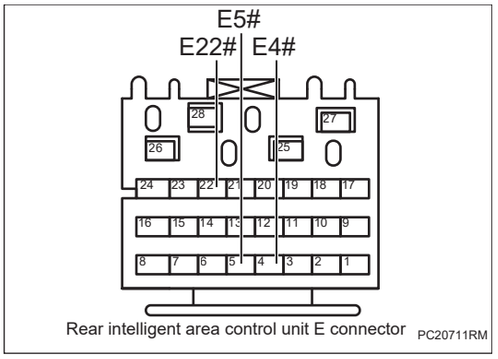
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E4# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E5# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check for short to power supply in AC/DC charging port wire harness and connector



Rear intelligent area control unit E connector PC20711RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B246311**	**DC charging socket - auxiliary power supply overvoltage**
DTC	**B246411**	**DC charging socket - auxiliary power supply undervoltage**

Description

When the DC charging socket auxiliary power supply voltage is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B246311	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN10 overvoltage fault in connection status	5	Event-based	10 ms	• Wire harness and connector • AC/DC charging port
B246411	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN10 overvoltage fault in connection status	5	Event-based	10 ms	• Wire harness and connector • AC/DC charging port

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B246311	DC charging socket - auxiliary power supply does not operate or operates abnormally	-
B246411	DC charging socket - auxiliary power supply does not operate or operates abnormally	-

Inspection procedure

1	Check AC/DC charging port wire harness and connector

(a) Check if AC/DC charging port wire harness and connector are damaged.

(b) Check if AC/DC charging port wire harness and connector are open or short.

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**B246511**	**OHB31 tailgate low configuration electronic lock fault**
DTC	**B246611**	**Tailgate high configuration electronic lock fault**

Description

When the luggage compartment lock is faulty, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B246511	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	After the electronic lock drives to unlock or lock, if the corresponding position feedback status is not detected within 500 ms, it will drive again. A fault will be set after 3 consecutive abnormal conditions	5	Event-based	10 ms	• Wire harness and connector • Luggage compartment lock • Rear intelligent area control unit
B246611	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	After the electronic lock drives to unlock or lock, if the corresponding position feedback status is not detected within 500 ms, it will drive again. A fault will be set after 3 consecutive abnormal conditions	5	Event-based	10 ms	• Wire harness and connector • Luggage compartment lock • Rear intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B246511	Tailgate low configuration electronic lock does not operate or operates abnormally	-
B246611	Tailgate high configuration electronic lock does not operate or operates abnormally	-

Inspection procedure

1	**Check luggage compartment lock wire harness and connector**

(a) Check if luggage compartment lock wire harness and connector are damaged.

(b) Check if luggage compartment lock wire harness and connector are short or open.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace luggage compartment lock (See page CS-56)**

(a) Replace the luggage compartment lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B246711	Left tailgate support rod fault

Description

When the left luggage compartment power support rod is faulty, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B246711	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	After the left electronic support rod is driven, the corresponding Hall position feedback status is not detected within 500 ms, drive it again, and reset it if it is abnormal for 3 consecutive times	5	Event-based	10 ms	• Wire harness and connector • Left luggage compartment power support rod • Rear intelligent area control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B246711	Left back door support rod does not operate or operates abnormally	-

Inspection procedure

1	Check left luggage compartment power support rod wire harness and connector

(a) Check if left luggage compartment power support rod wire harness and connector are damaged.

(b) Check if left luggage compartment power support rod wire harness and connector are short or open.

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace left luggage compartment power support rod (See page CS-35)

(a) Replace the left luggage compartment power support rod.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	B246911	Left tailgate support rod Hall fault

Description

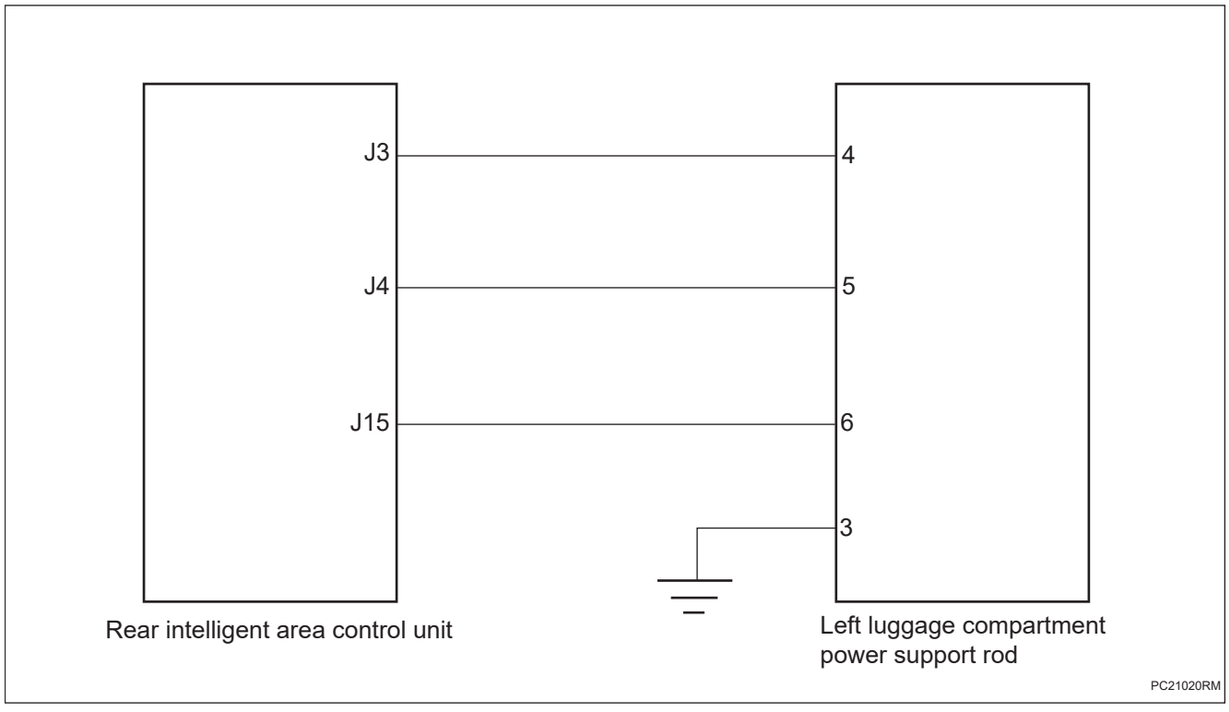
When the left luggage compartment power support rod Hall sensor signal is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B246911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Left Hall sensor fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Left luggage compartment power support rod

Fault symptom

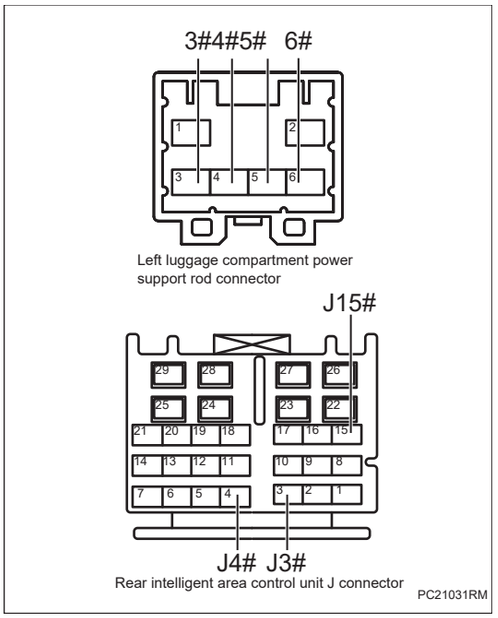
DTC No.	Fault symptom	Warning light/indicator
B246911	Left back door support rod does not operate or operates abnormally	-

Circuit diagram



Inspection procedure

1	**Check for open in left luggage compartment power support rod wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the left luggage compartment power support rod connector.

(e) According to value in the table, measure resistance.

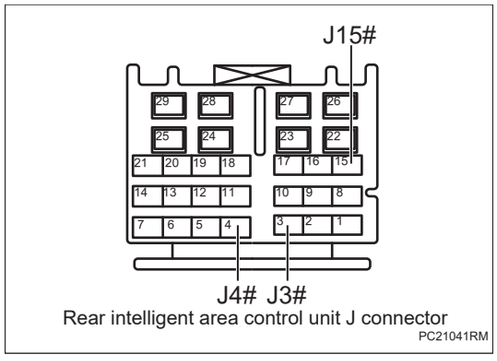
Standard value

Multimeter connection	Detection condition	Specified condition
Left luggage compartment power support rod connector 4# - rear intelligent area control unit connector J3#	Always connected	Less than 1 Ω
Left luggage compartment power support rod connector 5# - rear intelligent area control unit connector J4#	Always connected	Less than 1 Ω
Left luggage compartment power support rod connector 6# - rear intelligent area control unit connector J15#	Always connected	Less than 1 Ω
Left luggage compartment power support rod connector 3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in left luggage compartment power support rod wire harness and connector**



Rear intelligent area control unit J connector
PC21041RM

(a) According to value in the table, measure resistance.

Standard value

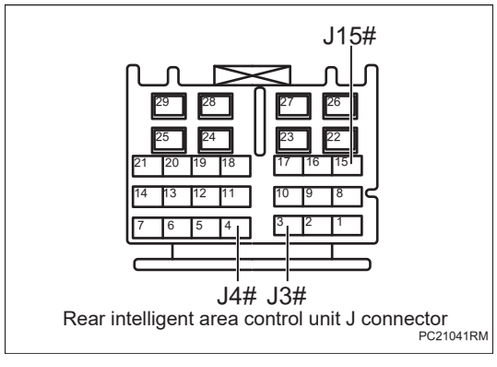
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J3# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J4# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector J15# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in left luggage compartment power support rod wire harness and connector**



Rear intelligent area control unit J connector
PC21041RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector J3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector J15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace left luggage compartment power support rod (See page CS-35)**

(a) Replace the left luggage compartment power support rod.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**C240700**	**EPB - abnormal voltage during operation - right**
DTC	**C240B00**	**EPB - power supply voltage too low - right**

DTC	C240C00	EPB - power supply voltage too high - right

Description

When EPB power supply is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C240700	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode =Standby || Driving)/ PDC Not in OTA Mode	During EPB operation, the voltage is too high or too low, the voltage is less than 8.5 V or more than 16.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear right brake caliper • Rear intelligent area control unit
C240B00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode =Standby || Driving)/ PDC Not in OTA Mode	The voltage drops below 8.5 V for a certain period of time; the voltage is below 8.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear right brake caliper • Rear intelligent area control unit
C240C00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode =Standby || Driving)/ PDC Not in OTA Mode	The voltage exceeds 16.5 V for a certain period of time; the voltage is above 16.5 V	1	Event-based	10 ms	• Low voltage battery • Wire harness and connector • Rear right brake caliper • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C240700	-	-
C240B00	All EPB-related functions prohibition	-
C240C00	All EPB-related functions prohibition	-

Inspection procedure

1	Check low voltage battery

(a) Check if voltage of low voltage battery is normal.

NG → **Perform repair according to malfunction**

OK

2	**Check rear right brake caliper wire harness and connector**

(a) Check if rear right brake caliper wire harness and connector are damaged.

(b) Check if rear right brake caliper wire harness and connector are short or open.

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear right brake caliper (See page DP-17)**

(a) Replace the rear right brake caliper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	C240800	EPB - service mode - right

Description

When EPB is in service mode, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C240800	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode =Standby || Driving)/ PDC Not in OTA Mode	Enter the maintenance mode, and calipers on both side are fully released to the end	1	Event-based	10 ms	• Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C240800	All EPB-related functions prohibition	-

Inspection procedure

1	Exit maintenance mode through diagnostic service

DTC	C240D00	EPB - assembly detection incomplete - right

Description

When EPB assembly detection incomplete fault is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C240D00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving)/ PDC Not in OTA Mode	Voltage is between 8.5 V and 16.5 V	1	Event-based	10 ms	• EPB calibration

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C240D00	-	-

Inspection procedure

1	**Perform EPB calibration**

DTC C240E00 EPB - wheel speed signal error - right

Description

When wheel speed sensor fault is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C240E00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving)/ PDC Not in OTA Mode	The speeds of all four wheels are incorrect values for a period of time, and all four wheels fail for a certain period of time	1	Event-based	10 ms	• Wheel speed sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C240E00	-	-

Inspection procedure

1	**Check wheel speed sensor**

DTC C240F00 EPB - abnormal power off - right

Description

When the vehicle abnormal power off is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C240F00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving)/ PDC Not in OTA Mode	Abnormal power off signal triggering	1	Event-based	10 ms	• Vehicle power supply

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C240F00	-	-

Inspection procedure

1	**Check vehicle power supply**

DTC	**C241100**	**EPB - excessive slope - right**

Description

When excessive road slope is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C241100	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode = Standby || Driving)/ PDC Not in OTA Mode	The caliper is in a clamped state and the vehicle is stationary, the slope sensor detects that the slope is greater than 30%	1	Event-based	10 ms	• Repair is unnecessary

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C241100	-	-

Inspection procedure

1	**Repair is unnecessary**

DTC C241200 EPB - configuration code error - right

Description

When EPB configuration code error is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C241200	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ Power Mode =Standby || Driving)/ PDC Not in OTA Mode	-	1	Event-based	10 ms	• Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C241200	-	-

Inspection procedure

1	**Rewrite configuration code**

DTC C242B16 EPB pre-drive chip power supply undervoltage fault

DTC	C242B17	EPB pre-drive chip power supply overvoltage fault
DTC	C242C10	EPB pre-drive chip internal reset fault
DTC	C242D10	EPB pre-drive chip internal crystal oscillator fault
DTC	C242E10	EPB pre-drive chip internal initialization configuration and self-check fault
DTC	C242F10	EPB pre-drive chip internal charge pump fault
DTC	C243010	EPB pre-drive chip watchdog fault
DTC	C243110	EPB pre-drive chip overtemperature fault
DTC	C243210	EPB pre-drive chip charge pump undervoltage fault
DTC	C243310	EPB pre-drive chip detected overcurrent fault
DTC	C243410	EPB pre-drive chip detected abnormal H-bridge high and low side MOSFET
DTC	C243510	SPI communication failure between EPB MCU and pre-drive chip
DTC	C243610	Communication interrupted between EPB pre-drive chip and MCU SPI
DTC	C243710	SPI communication address check failure fault between MCU and pre-drive chip
DTC	C243810	MCU SPI transmission failure
DTC	C243910	Pre-drive chip detected sampling synchronization fault
DTC	C243A10	EPB MCU detects pre-drive chip sampling synchronization signal detection function abnormality fault
DTC	C243B10	EPB current sampling consistency fault
DTC	C243C10	EPB pre-drive chip sampling stuck fault

DTC	C243D10	EPB pre-drive chip ADC conversion failure fault
DTC	C243E10	EPB caliper motor circuit fault (open)
DTC	C243F10	EPB caliper motor circuit fault (short to ground)
DTC	C244010	EPB caliper motor circuit fault (short to power supply)
DTC	C244110	EPB H-bridge shutdown bridge arm voltage abnormal fault
DTC	C244210	EPB drive circuit or actuator fault
DTC	C244310	EPB detects abnormal current fault when motor is not driven
DTC	C244410	EPB drive anti-reversion open fault
DTC	C244510	EPB drive anti-reversion rationality fault
DTC	C244610	SPI communication CRC check failure between EPB pre-drive chip and MCU
DTC	C244710	EPB current sampling offset calculation not completed for a long time
DTC	C244810	EPB pre-drive chip self-check timeout fault
DTC	C247511	EPB caliper motor overcurrent fault (software protection)
DTC	C240000	EPB-HOST response error - right
DTC	C240100	EPB - no brake disc - right
DTC	C240200	EPB - motor stuck - right
DTC	C240300	EPB - insufficient clamping force - right
DTC	C240400	EPB - unloaded current too high - right
DTC	C240500	EPB - actuator damaged - right
DTC	C240600	EPB - caliper status inconsistent or unknown - right

DTC	**C240900**	**Host not available - right**
DTC	**C240A00**	**EPB - current fluctuation too high - right**
DTC	**C241000**	**EPB - invalid data storage area - right**
DTC	**C241300**	**EPB - dynamic anti-lock brake failure - right**

Description

When EPB related fault is detected, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C242B16	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB UV of driver IC powersupply fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C242B17	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB OV of driver IC powersupply fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C242C10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC internal reset fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C242D10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC internal OSC fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C242E10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC Init configuration and self test fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C242F10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC internal Charge pump fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243010	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC Watch dog fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C243110	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC Over temperature fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243210	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC Charge pump supply under-voltage	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243310	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC detcets Overcurrent fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243410	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB Mosfets fault detected by Predrive IC	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243510	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB SPI message fault from MCU to Predrive IC	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243610	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB SPI message loss from Predrive IC to MCU	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243710	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB SPI message address check fault Between MCU and Predrive IC	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243810	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB SPI message send fault from MCU to Predrive IC	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243910	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB driver IC detects a sampling synchronizatio-n fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243A10	• Diagnostic voltage range. (9 V	EPB MCU check Predrive IC	5	Event-based	10 ms	• Rear intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	- 16 V) / PDC Not in OTA Mode	synchronizatio-n signal detection function abnormal fault				• Wire harness and connector • Rear right brake caliper
C243B10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB Current sampling consistency fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243C10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB AD sampling stuck fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243D10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB ADC conversion failure	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243E10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB caliper line open	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C243F10	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB caliper line short to ground	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244010	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB caliper line shour to battery	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244110	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB Abnormal voltage fault of H-bridge closing bridge arm	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244210	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB caliper line error	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244310	• Diagnostic voltage range. (9 V - 16 V) /	EPB Undrivern motor detects abnormal current	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PDC Not in OTA Mode					• Rear right brake caliper
C244410	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB RVPG line open	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244510	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB RVPG plausibility Fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244610	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	The SPI communication CRC check from the pre-drive chip to the MCU is invalid	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244710	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Diagnostic voltage range. (9 V - 16 V)	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C244810	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Diagnostic voltage range. (9 V - 16 V)	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C247511	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	EPB caliper motor overcurrent	1000 ms	Periodic type	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240000	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	During EPB operation, drive change is incorrect	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240100	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e=	During EPB operation, duration of Idle stage in Apply is too long	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	Standby|| Driving)/ PDC Not in OTA Mode					
C240200	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	During EPB operation, applying: current reaches to 4 A for less than 50 ms; releasing: current is higher than 12 A for more than 150 ms or current is higher than 24 A for more than 30 ms	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240300	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	During clamping EPB, the target clamping force cannot be reached within 4 s after the disk is released	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240400	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	During EPB operation, Idle current is higher than 3 A	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240500	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMode= Standby|| Driving)/ PDC Not in OTA Mode	During EPB operation, the time is less than 330 ms	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240600	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_	One of left and right caliper is released and the other is pulled up or right caliper is in UNKNOW	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper

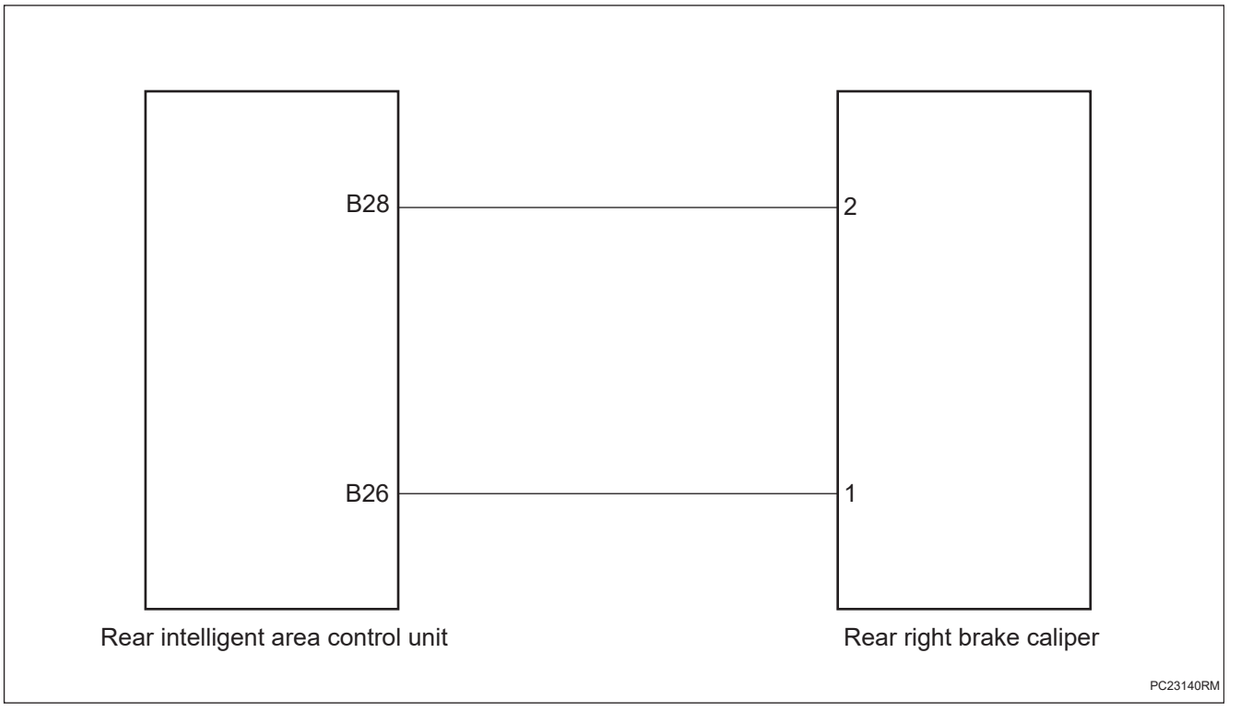
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	state or left caliper is in UNKNOW state, left and right calipers are not aligned or both in UNKNOW state				
C240900	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	Voltage is between 8.5 V and 16.5 V, host is invalid	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C240A00	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	During EPB operation, the disk separation point is not found within 2000 ms in the Load stage	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C241000	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	-	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper
C241300	• Diagnostic voltage range. (9 V - 16 V) / IGN ON (VDC_ PowerMod-e= Standby|| Driving)/ PDC Not in OTA Mode	-	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right brake caliper

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C242B16	EPB dose not operate or operates abnormally	-
C242B17	EPB dose not operate or operates abnormally	-
C242C10	EPB dose not operate or operates abnormally	-
C242D10	EPB dose not operate or operates abnormally	-
C242E10	EPB dose not operate or operates abnormally	-
C242F10	EPB dose not operate or operates abnormally	-
C243010	EPB dose not operate or operates abnormally	-
C243110	EPB dose not operate or operates abnormally	-
C243210	EPB dose not operate or operates abnormally	-
C243310	EPB dose not operate or operates abnormally	-
C243410	EPB dose not operate or operates abnormally	-
C243510	EPB dose not operate or operates abnormally	-
C243610	EPB dose not operate or operates abnormally	-
C243710	EPB dose not operate or operates abnormally	-
C243810	EPB dose not operate or operates abnormally	-
C243910	EPB dose not operate or operates abnormally	-
C243A10	EPB dose not operate or operates abnormally	-
C243B10	EPB dose not operate or operates abnormally	-
C243C10	EPB dose not operate or operates abnormally	-
C243D10	EPB dose not operate or operates abnormally	-
C243E10	EPB dose not operate or operates abnormally	-
C243F10	EPB dose not operate or operates abnormally	-
C244010	EPB dose not operate or operates abnormally	-

DTC No.	Fault symptom	Warning light/indicator
C244110	EPB dose not operate or operates abnormally	-
C244210	EPB dose not operate or operates abnormally	-
C244310	EPB dose not operate or operates abnormally	-
C244410	EPB dose not operate or operates abnormally	-
C244510	EPB dose not operate or operates abnormally	-
C244610	EPB dose not operate or operates abnormally	-
C244710	EPB dose not operate or operates abnormally	-
C244810	EPB dose not operate or operates abnormally	-
C247511	EPB dose not operate or operates abnormally	-
C240000	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240100	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240200	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240300	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240400	-	-
C240500	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240600	-	-
C240900	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C240A00	All functions of left caliper are disabled during current cycle, and all functions will be restored in the next cycle.	-
C241000	-	-
C241300	-	-

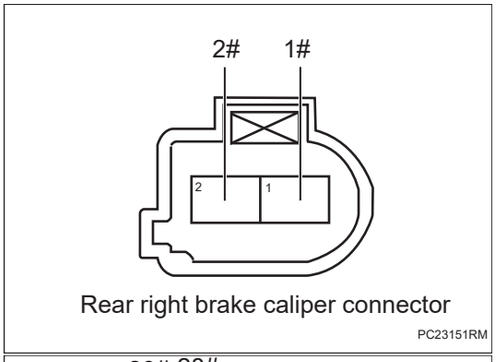
Circuit diagram

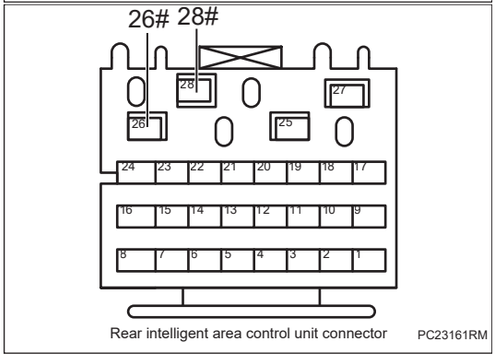


ZD

Inspection procedure

1	**Check for open in rear right brake caliper wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right brake caliper connector.

(e) According to value in the table, measure resistance.

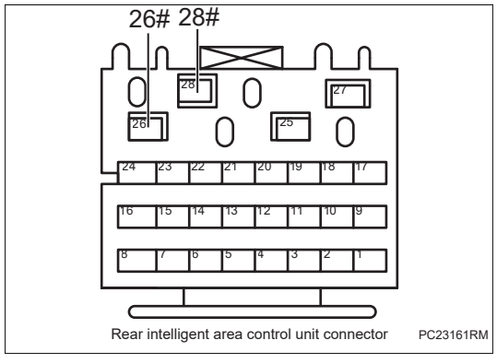
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right brake caliper connector 1# - rear intelligent area control unit connector B26#	Always connected	Less than 1 Ω
Rear right brake caliper connector 2# - rear intelligent area control unit connector B28#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear right brake caliper wire harness and connector**



(a) According to value in the table, measure resistance.

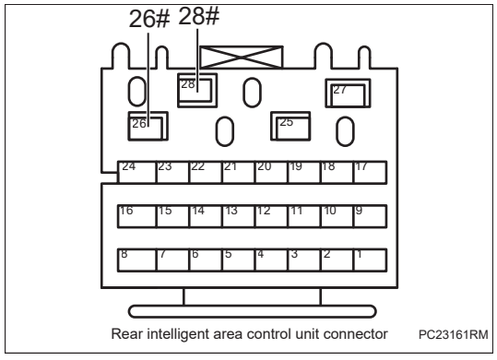
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B26# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector B28# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in rear right brake caliper wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector B28# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace rear right brake caliper (See page DP-17)**

(a) Replace the rear right brake caliper.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**C247611**	**DC charging socket - reasonable judgment of positive temperature**
DTC	**C247711**	**DC charging socket - reasonable judgment of negative temperature**
DTC	**C247811**	**AC charging port - reasonable judgment of L1 port temperature**

DTC	**C247911**	**AC charging port - reasonable judgment of L2 port temperature**
DTC	**P312211**	**AC charging port - reasonable judgment of L3 port temperature**
DTC	**P312311**	**AC charging port - reasonable judgment of N port temperature**

Description

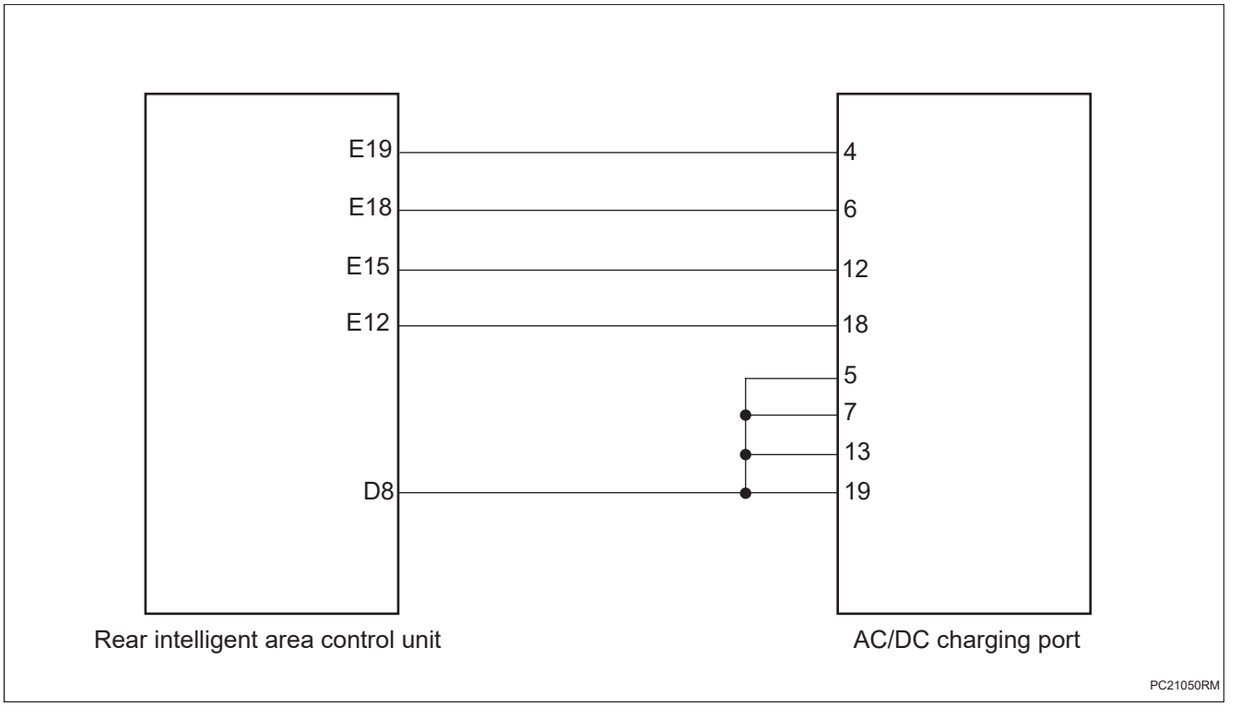
When AC/DC charging port temperature sensor signal is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C247611	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN08 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
C247711	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN09 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
C247811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN13 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
C247911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN14 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P312211	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN15 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P312311	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN16 reasonability range fault	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C247611	DC charging socket - positive temperature signal unreasonable	-
C247711	DC charging socket - positive temperature signal unreasonable	-
C247811	AC charging port - L1 port temperature monitoring signal unreasonable	-
C247911	AC charging port - L2 port temperature monitoring signal unreasonable	-
P312211	AC charging port - L3 port temperature monitoring signal unreasonable	-
P312311	AC charging port - N port temperature monitoring signal unreasonable	-

Circuit diagram



Inspection procedure

1	**Check AC/DC charging port wire harness and connector**

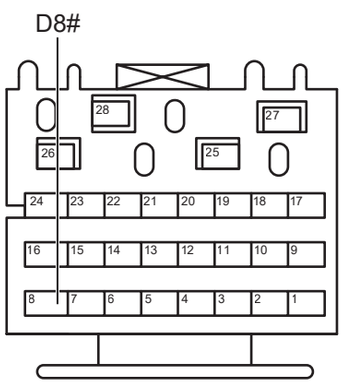
(a) Check if AC/DC charging port wire harness and connector are damaged.

(b) Check if AC/DC charging port wire harness and connector are short to each other.

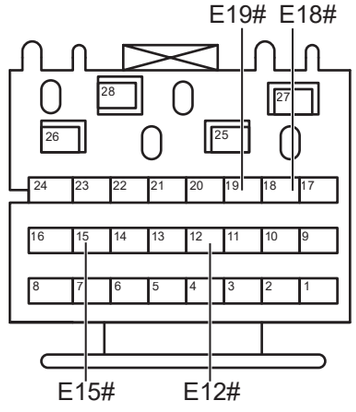
NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in AC/DC charging port wire harness and connector**



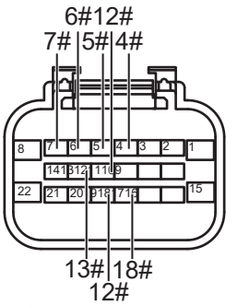
Rear intelligent area control unit D connector



Rear intelligent area control unit E connector

PC21061RM

ZD



AC/DC charging port connector

PC21071RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the AC/DC charging port connectors.

(e) According to value in the table, measure resistance.

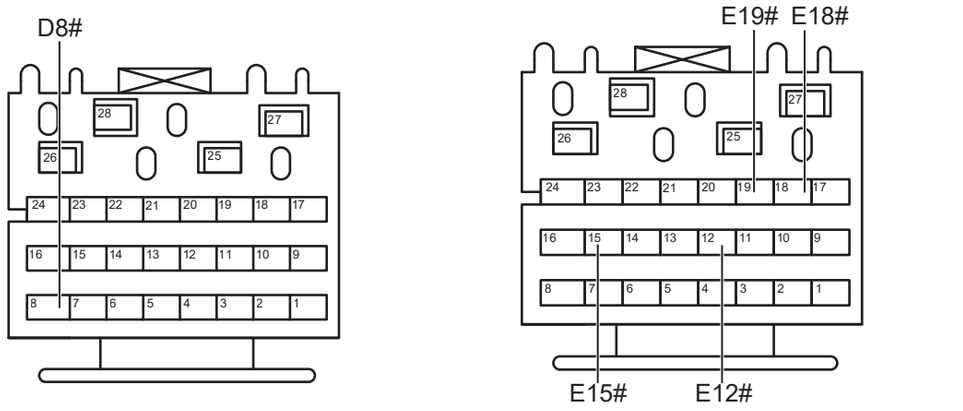
Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 4# - rear intelligent area control unit connector E19#	Always connected	Less than 1 Ω
AC/DC charging port connector 6# - rear intelligent area control unit connector E18#	Always connected	Less than 1 Ω
AC/DC charging port connector 12# - rear intelligent area control unit connector E15#	Always connected	Less than 1 Ω
AC/DC charging port connector 18# - rear intelligent area control unit connector E12#	Always connected	Less than 1 Ω
AC/DC charging port connector 5# - rear intelligent area control unit connector D8#	Always connected	Less than 1 Ω
AC/DC charging port connector 7# - rear intelligent area control unit connector D8#	Always connected	Less than 1 Ω
AC/DC charging port connector 13# - rear intelligent area control unit connector D8#	Always connected	Less than 1 Ω
AC/DC charging port connector 19# - rear intelligent area control unit connector D8#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in AC/DC charging port wire harness and connector**



Rear intelligent area control unit D connector

Rear intelligent area control unit E connector

PC21061RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the AC/DC charging port connectors.

(e) According to value in the table, measure resistance.

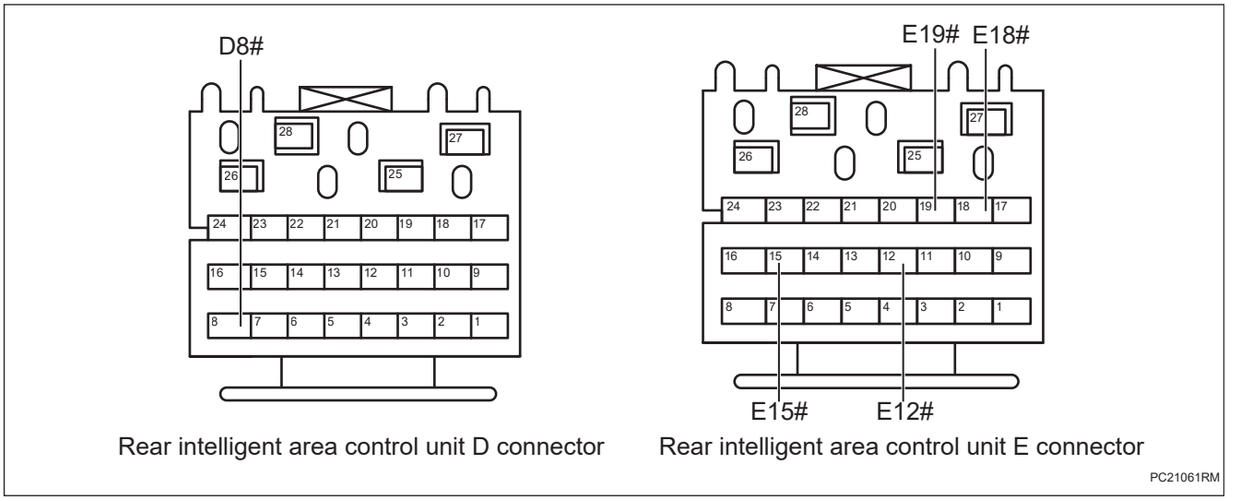
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E19# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E18# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E15# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E12# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector D8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in AC/DC charging port wire harness and connector**



Rear intelligent area control unit D connector

Rear intelligent area control unit E connector

PC21061RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E18# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E15# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector D8# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

ZD

DTC	P310A11	Short to ground in AC charging port CC signal
DTC	P310B11	Short to ground in DC charging port CC2 signal

Description

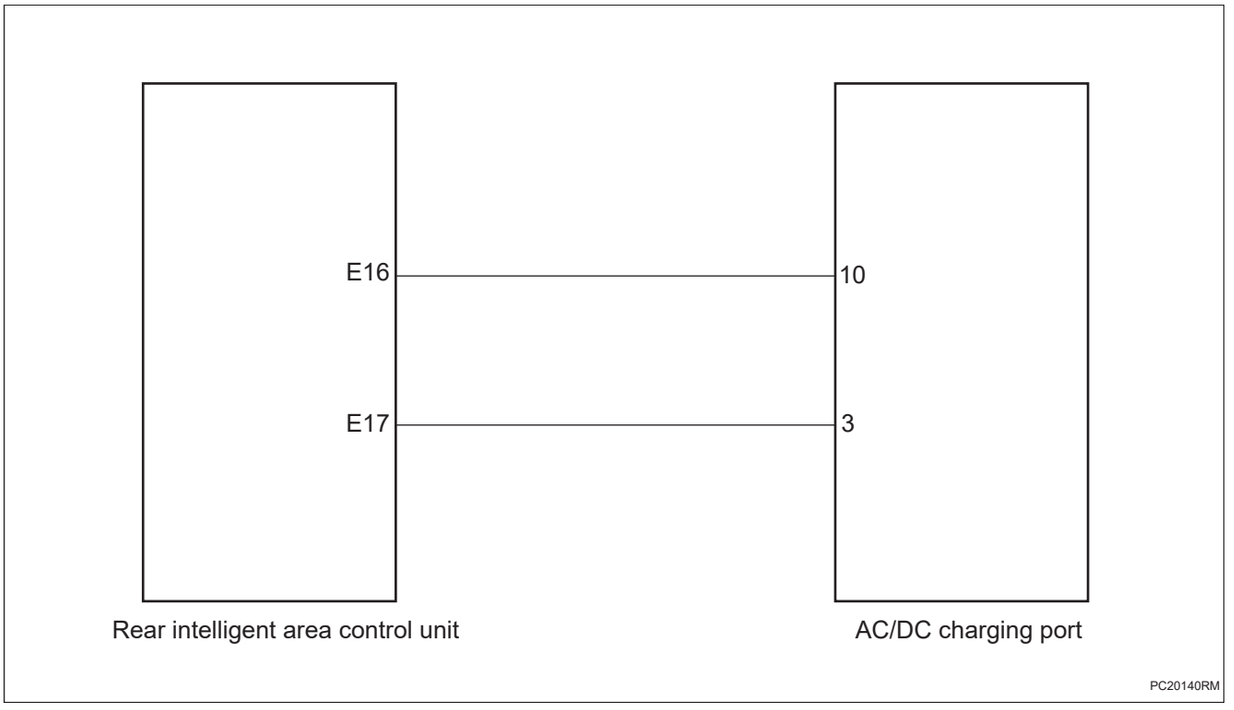
When short to ground is detected in AC/DC charging port CC signal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P310A11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN12 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P310B11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	IAN18 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

Fault symptom

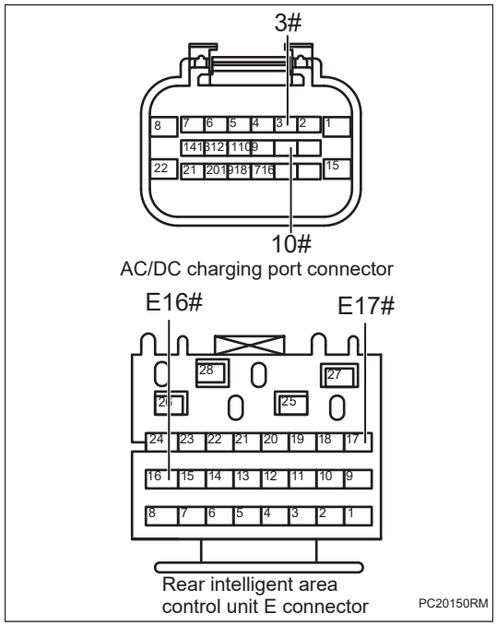
DTC No.	Fault symptom	Warning light/indicator
P310A11	AC charging port CC signal unreasonable	-
P310B11	DC charging port CC2 signal unreasonable	-

Circuit diagram



Inspection procedure

1	**Check for open in AC/DC charging port wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the AC/DC charging port connectors.

(e) According to value in the table, measure resistance.

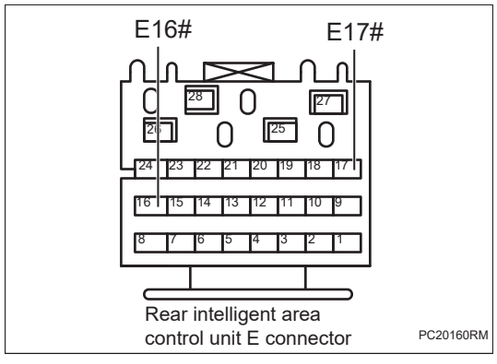
Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 10# - rear intelligent area control unit connector E16#	Always connected	Less than 1 Ω
AC/DC charging port connector 3# - rear intelligent area control unit connector E17#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in AC/DC charging port wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

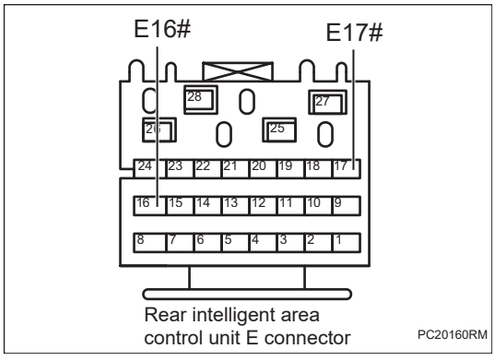
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E17# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E16# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Check for short to power supply in AC/DC charging port wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E17# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E16# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**P310C11**	**Short to ground in rear motor control unit - distribution/TOD controller distribution**
DTC	**P310C12**	**Short to power supply in rear motor control unit - distribution/TOD controller distribution**

Description

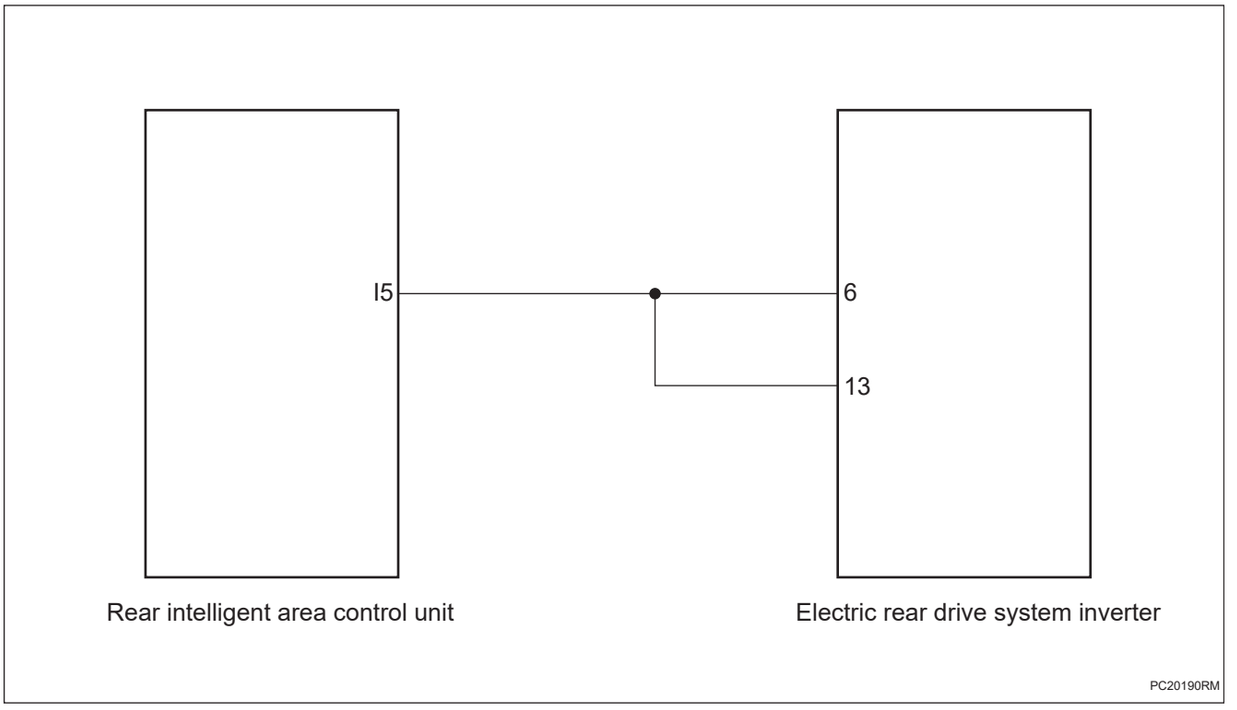
When there is short in electric rear drive system inverter power supply circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P310C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH29 short to GND	5	Event-based	10 ms	• Electric rear drive system inverter • Wire harness and connector • Rear intelligent area control unit
P310C12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH29 short to BAT	5	Event-based	10 ms	• Electric rear drive system inverter • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P310C11	Rear motor control unit does not operate or operates abnormally	-
P310C12	Rear motor control unit does not operate or operates abnormally	-

Circuit diagram



ZD

Inspection procedure

1	**Check electric rear drive system inverter wire harness and connector**

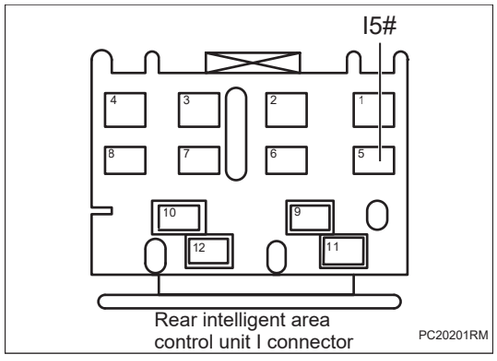
(a) Check if electric rear drive system inverter wire harness and connector are damaged.

(b) Check if electric rear drive system inverter wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in electric rear drive system inverter wire harness and connector



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the electric rear drive system inverter connector.

(e) According to value in the table, measure resistance.

Standard value

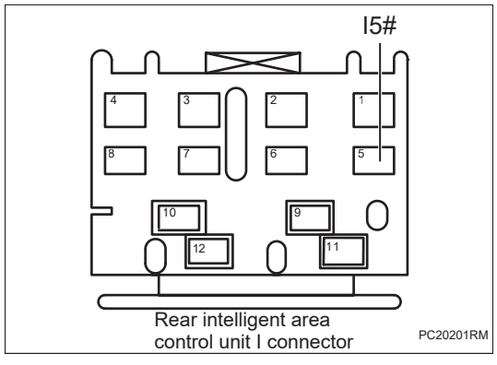
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I5# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to power supply in electric rear drive system inverter wire harness and connector



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector I5# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace electric rear drive system inverter (See page DL-3)**

(a) Replace the electric rear drive system inverter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**P310E11**	**Short to ground in charging controller (EVCC) - power distribution/48 V battery control unit**
DTC	**P310E12**	**Short to power supply in charging controller (EVCC) - power distribution/48 V battery control unit**

Description

When there is short in charging controller power supply circuit, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P310E11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH30 short to GND	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging controller
P310E12	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	ODH30 short to BAT	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Charging controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P310E11	Charging controller (EVCC) does not operate or its operation is abnormal	-
P310E12	Charging controller (EVCC) does not operate or its operation is abnormal	-

ZD

Inspection procedure

1	**Check charging controller wire harness and connector**

(a) Check if charging controller wire harness and connector are damaged.

(b) Check for short in charging controller wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace charging controller**

(a) Replace the charging controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK →

ZD

Diagnosis ends

DTC	P311811	Short to ground in DC charging socket - positive temperature monitoring
DTC	P311911	Short to ground in DC charging socket - negative temperature monitoring
DTC	P311A11	Short to ground in AC charging port - L1 port temperature monitoring positive
DTC	P311B11	Short to ground in AC charging port - L2 port temperature monitoring positive
DTC	P311C11	Short to ground in AC charging port - L3 port temperature monitoring positive
DTC	P311D11	Short to ground in AC charging port - N port temperature monitoring positive
DTC	P312711	Short to power supply/open in DC charging socket - positive temperature monitoring
DTC	P312811	Short to power supply/open in DC charging socket - negative temperature monitoring

DTC	**P312911**	**Short to power supply/open in AC charging port - L1 port temperature monitoring positive**
DTC	**P312C11**	**Short to power supply/open in AC charging port - N port temperature monitoring positive**

Description

When AC/DC charging port temperature sensor circuit is short or open, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P311811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN08	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P311911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN09	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P311A11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN13	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P311B11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN14	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P311C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN15	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P311D11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to ground in IAN16	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P312711	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to power supply/open in IAN08	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

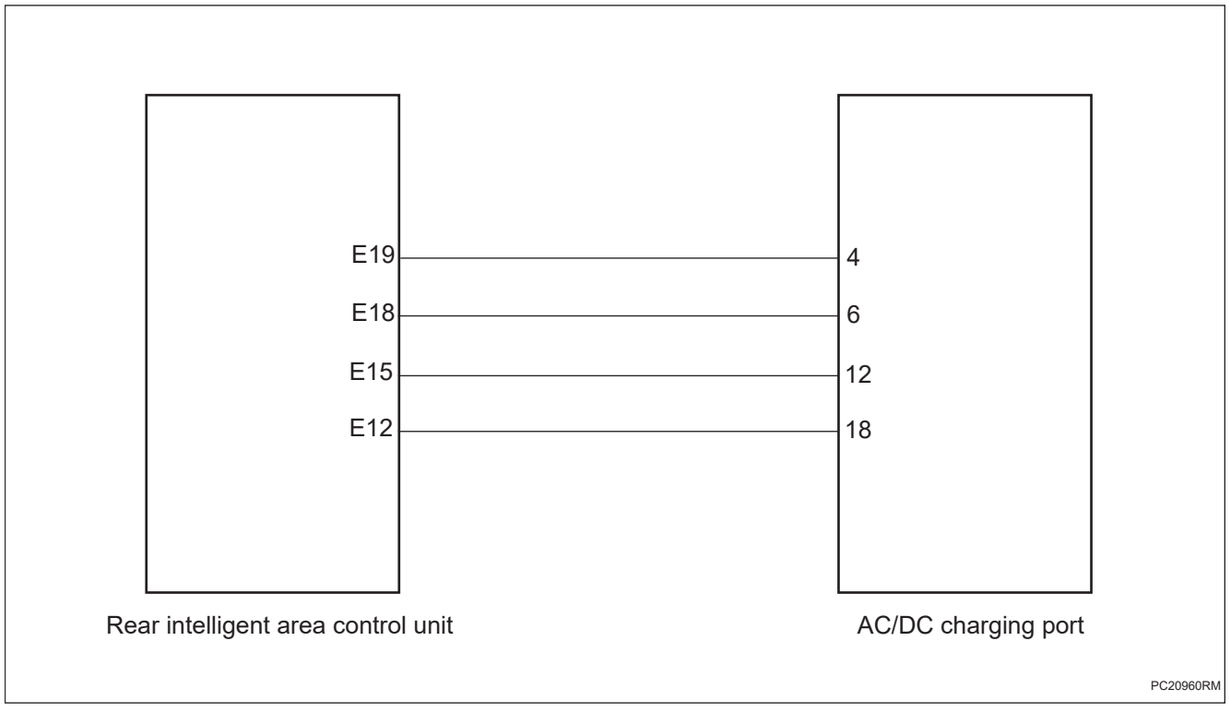
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P312811	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to power supply/open in IAN09	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P312911	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to power supply/open in IAN13	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port
P312C11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode	Short to power supply/open in IAN16	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • AC/DC charging port

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P311811	DC charging socket - positive temperature monitoring signal unreasonable	-
P311911	DC charging socket - positive temperature monitoring signal unreasonable	-
P311A11	AC charging port - L1 port temperature monitoring signal unreasonable	-
P311B11	AC charging port - L2 port temperature monitoring signal unreasonable	-
P311C11	AC charging port - L3 port temperature monitoring signal unreasonable	-
P311D11	AC charging port - N port temperature monitoring signal unreasonable	-
P312711	DC charging socket - positive temperature signal unreasonable	-
P312811	DC charging socket - positive temperature signal unreasonable	-
P312911	AC charging port - L1 port temperature monitoring signal unreasonable	-
P312C11	AC charging port - N port temperature monitoring signal unreasonable	-

Circuit diagram



Inspection procedure

1	**Check AC/DC charging port wire harness and connector**

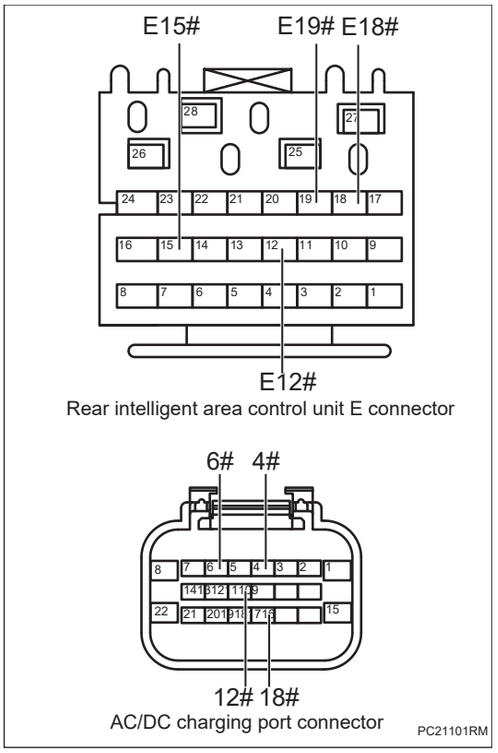
(a) Check if AC/DC charging port wire harness and connector are damaged.

(b) Check if AC/DC charging port wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in AC/DC charging port wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the AC/DC charging port connectors.

(e) According to value in the table, measure resistance.

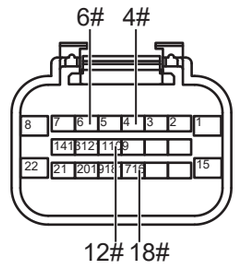
Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 4# - rear intelligent area control unit connector E19#	Always connected	Less than 1 Ω
AC/DC charging port connector 6# - rear intelligent area control unit connector E18#	Always connected	Less than 1 Ω
AC/DC charging port connector 12# - rear intelligent area control unit connector E15#	Always connected	Less than 1 Ω
AC/DC charging port connector 18# - rear intelligent area control unit connector E12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to ground in AC/DC charging port wire harness and connector



AC/DC charging port connector

PC20971RM

(a) According to value in the table, measure resistance.

Standard value

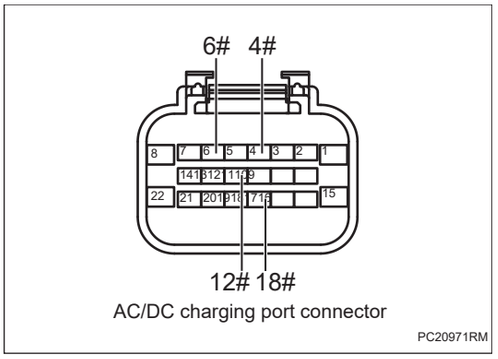
Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 4# - body ground	Always connected	10 KΩ or more
AC/DC charging port connector 6# - body ground	Always connected	10 KΩ or more
AC/DC charging port connector 12# - body ground	Always connected	10 KΩ or more
AC/DC charging port connector 18# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in AC/DC charging port wire harness and connector



AC/DC charging port connector

PC20971RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
AC/DC charging port connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
AC/DC charging port connector 12# - body ground	Turn ignition switch to "ON"	Less than 1 V
AC/DC charging port connector 18# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	P312E11	Second row left seat heating NTC temperature rise/temperature control abnormal

Description

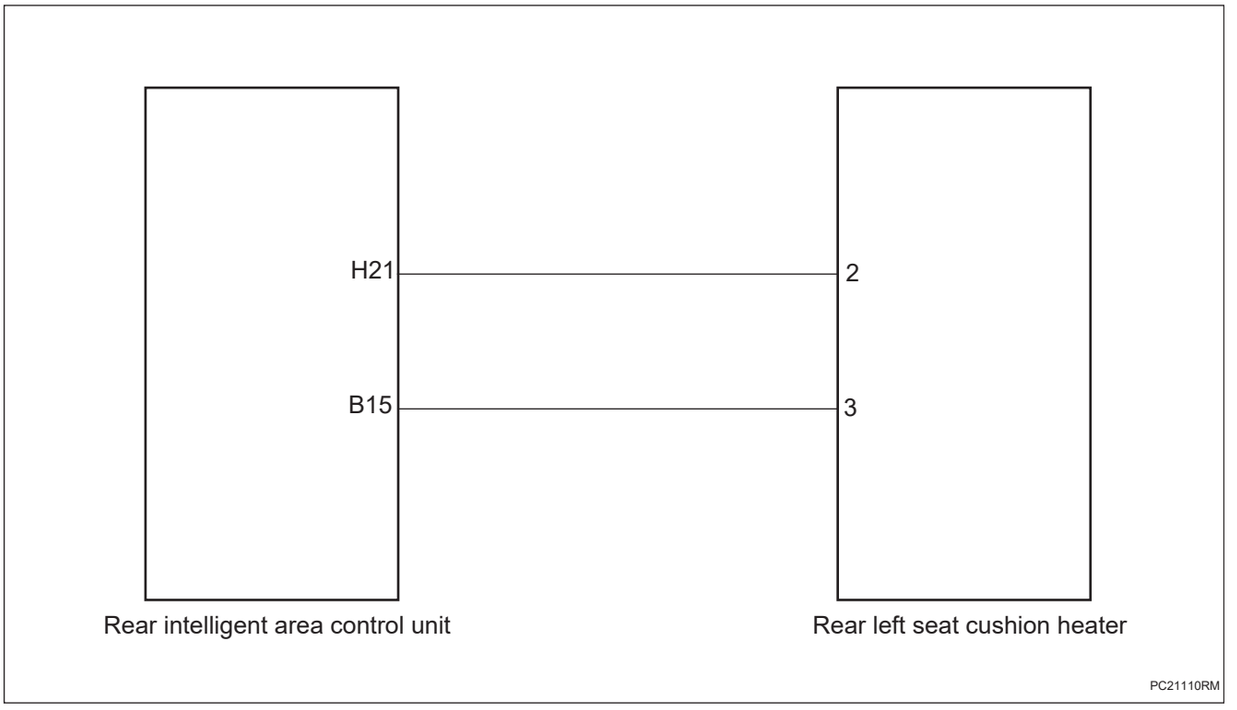
When the rear left seat cushion heater temperature sensor is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P312E11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode// gCFG_ u8Sec SeatHeat Ena=0x1	OPH08+IAN28 temperature control abnormal	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear left seat cushion heater

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P312E11	Second row left seat heating NTC signal is unreasonable	-

Circuit diagram



Inspection procedure

1	**Check rear left seat cushion heater wire harness and connector**

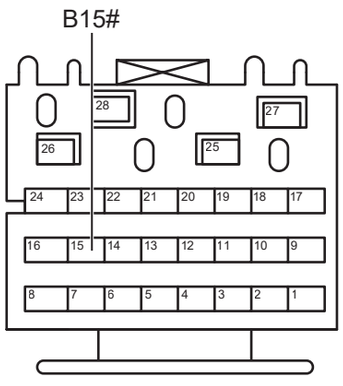
(a) Check if rear left seat cushion heater wire harness and connector are damaged.

(b) Check if rear left seat cushion heater wire harness and connector are short to each other.

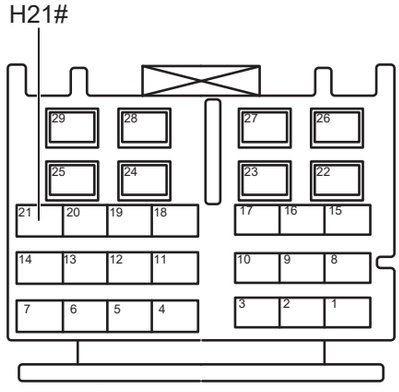
NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in rear left seat cushion heater wire harness and connector**

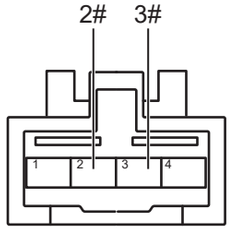


Rear intelligent area control unit B connector



Rear intelligent area control unit H connector

PC21121RM



Rear left seat cushion heater connector

PC21131RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left seat cushion heater connector.

(e) According to value in the table, measure resistance.

Standard value

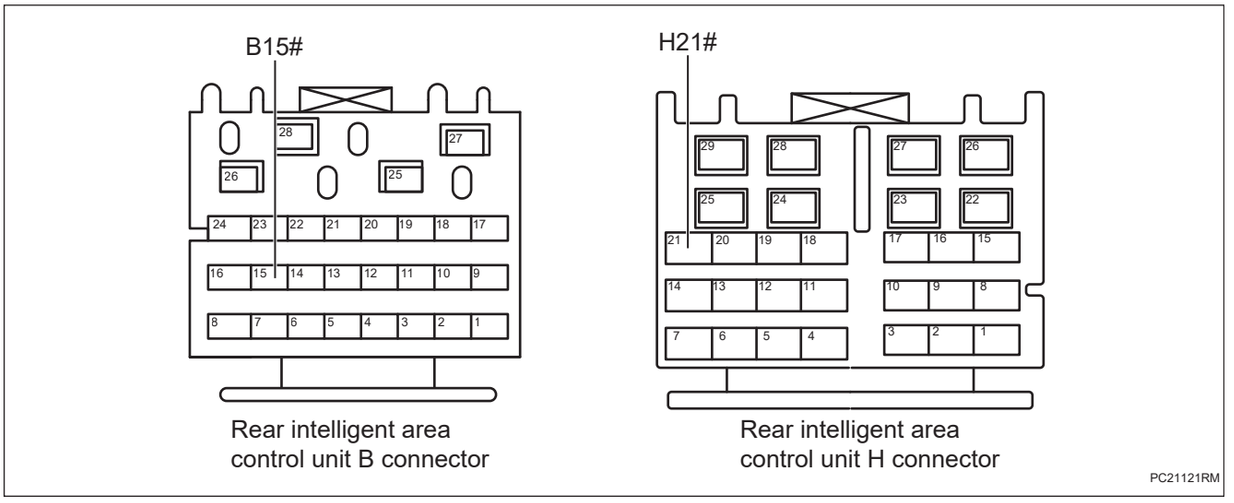
Multimeter connection	Detection condition	Specified condition
Rear left seat cushion heater connector 2# - rear intelligent area control unit connector H21#	Always connected	Less than 1 Ω
Rear left seat cushion heater connector 3# - rear intelligent area control unit connector B15#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in rear left seat cushion heater wire harness and connector**



ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear left seat cushion heater connector.

(e) According to value in the table, measure resistance.

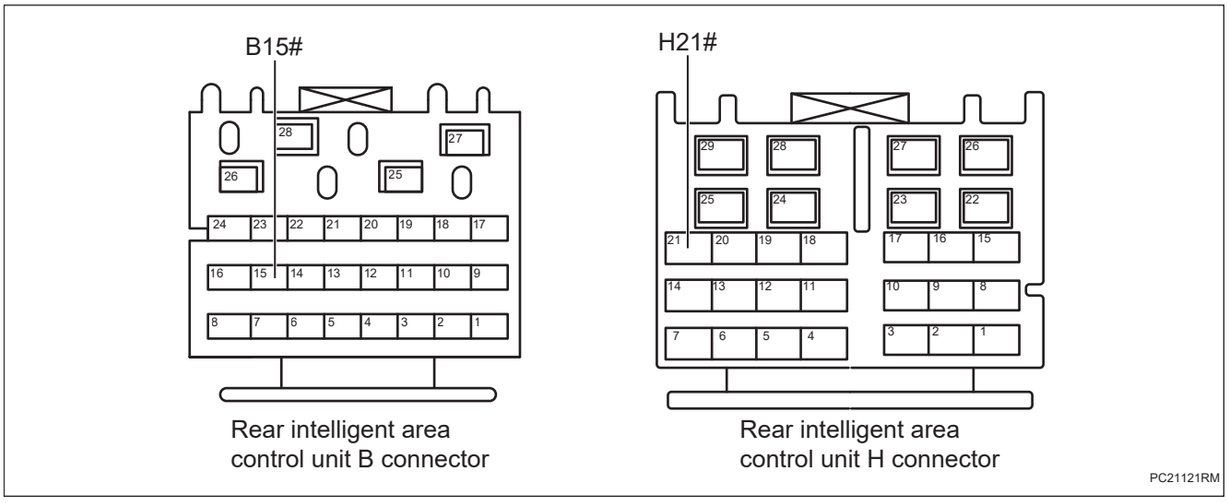
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B15# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector H21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left seat cushion heater wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector H21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left seat cushion heater (See page NS-92)**

(a) Replace the rear left seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	P312F11	Second row right seat heating NTC temperature rise/temperature control abnormal

Description

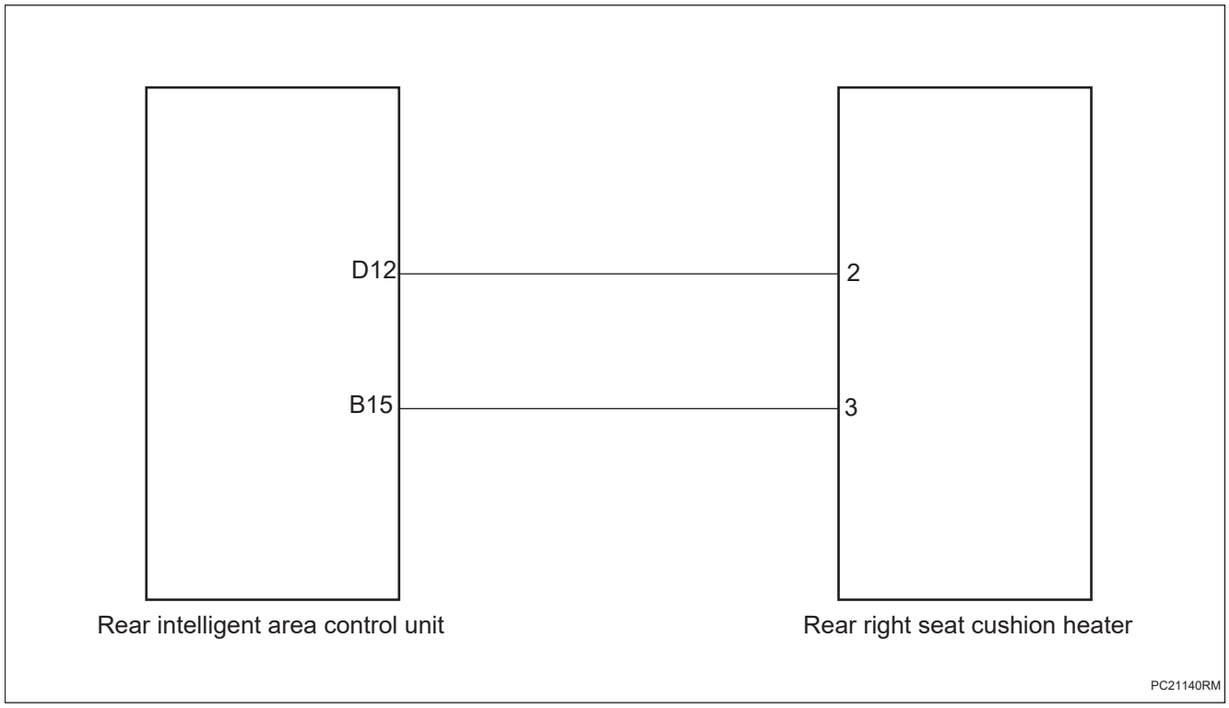
When the rear right seat cushion heater temperature sensor is abnormal, the rear intelligent area control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P312F11	• Diagnostic voltage range. (9 V - 16 V) / PDC Not in OTA Mode// gCFG_ u8Sec SeatHeat Ena=0x1	OPH09+IAN29 temperature control abnormal	5	Event-based	10 ms	• Rear intelligent area control unit • Wire harness and connector • Rear right seat cushion heater

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P312F11	Second row right seat heating NTC signal is unreasonable	-

Circuit diagram



Inspection procedure

1	**Check rear right seat cushion heater wire harness and connector**

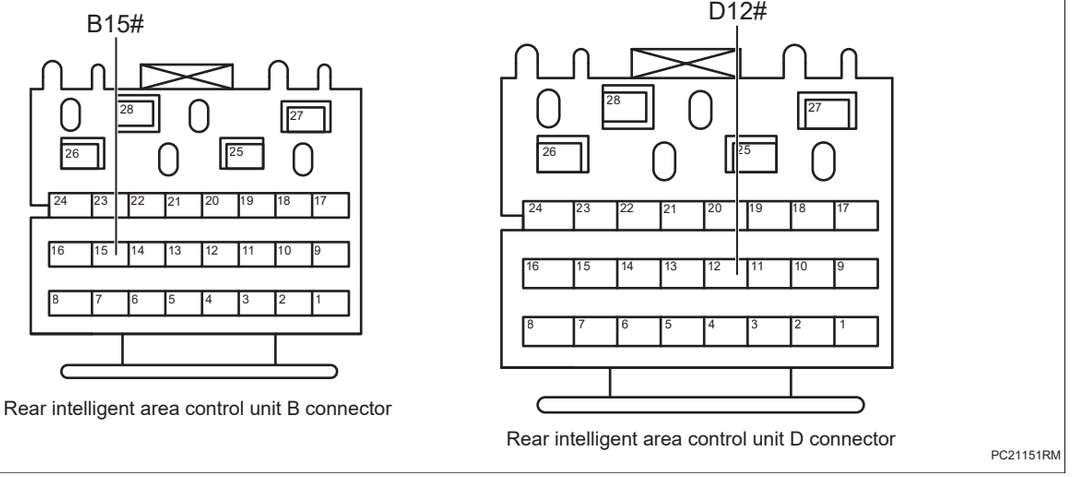
(a) Check if rear right seat cushion heater wire harness and connector are damaged.

(b) Check if rear right seat cushion heater wire harness and connector are short to each other.

NG → **Check and repair or replace wire harness and connector**

OK

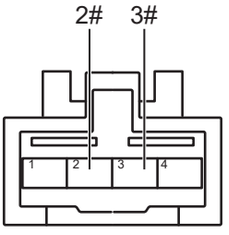
2	**Check for open in rear right seat cushion heater wire harness and connector**



Rear intelligent area control unit B connector

Rear intelligent area control unit D connector

PC21151RM



Rear right seat cushion heater connector

PC21161RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right seat cushion heater connector.

(e) According to value in the table, measure resistance.

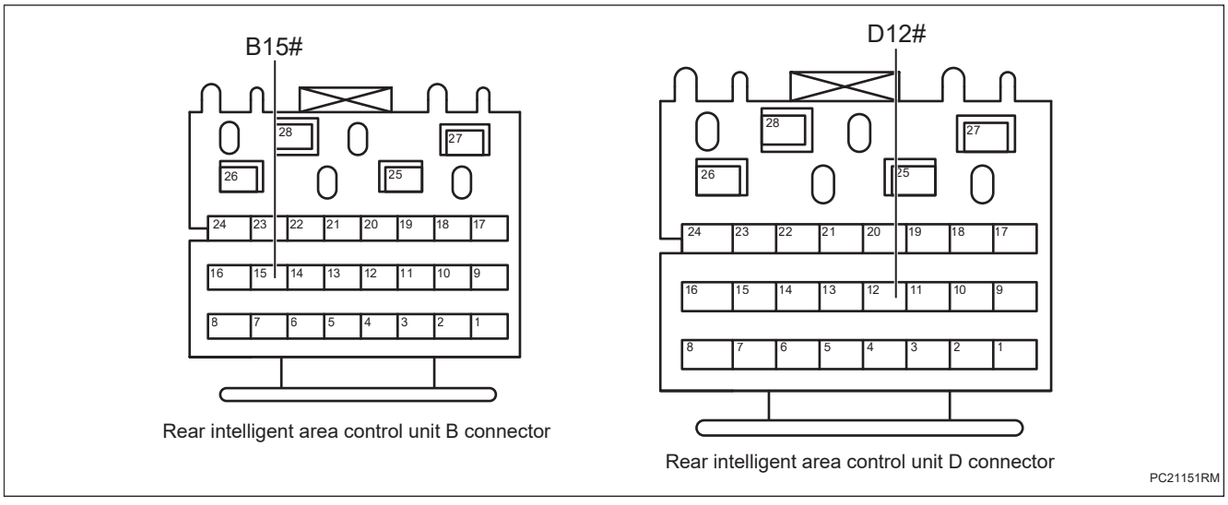
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right seat cushion heater connector 2# - rear intelligent area control unit connector D12#	Always connected	Less than 1 Ω
Rear right seat cushion heater connector 3# - rear intelligent area control unit connector B15#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear right seat cushion heater wire harness and connector**



Rear intelligent area control unit B connector

Rear intelligent area control unit D connector

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the rear right seat cushion heater connector.

(e) According to value in the table, measure resistance.

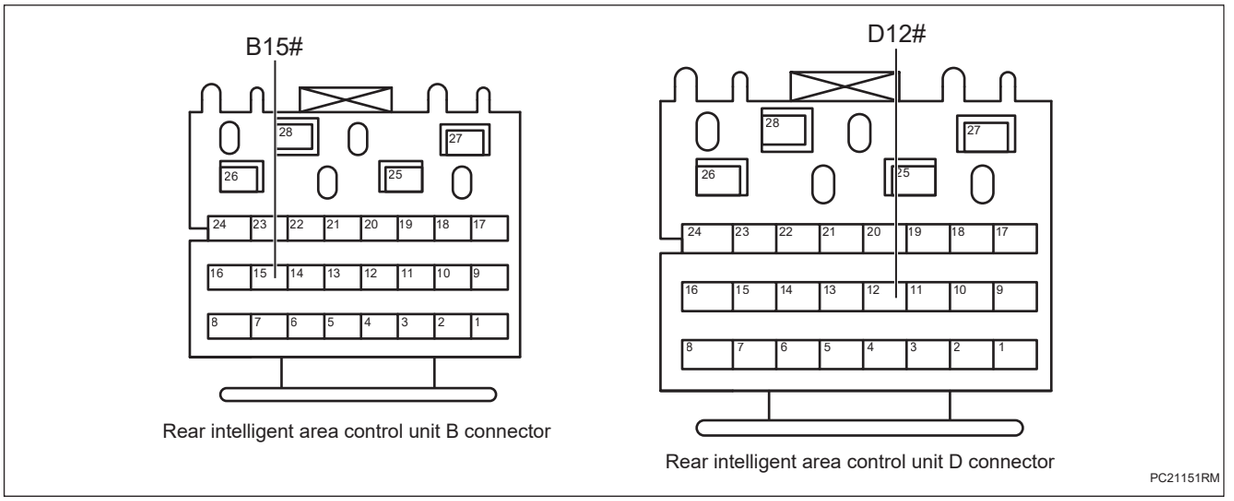
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B15# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector D12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right seat cushion heater wire harness and connector**



Rear intelligent area control unit B connector

Rear intelligent area control unit D connector

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector D12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear right seat cushion heater (See page NS-92)**

(a) Replace the rear right seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

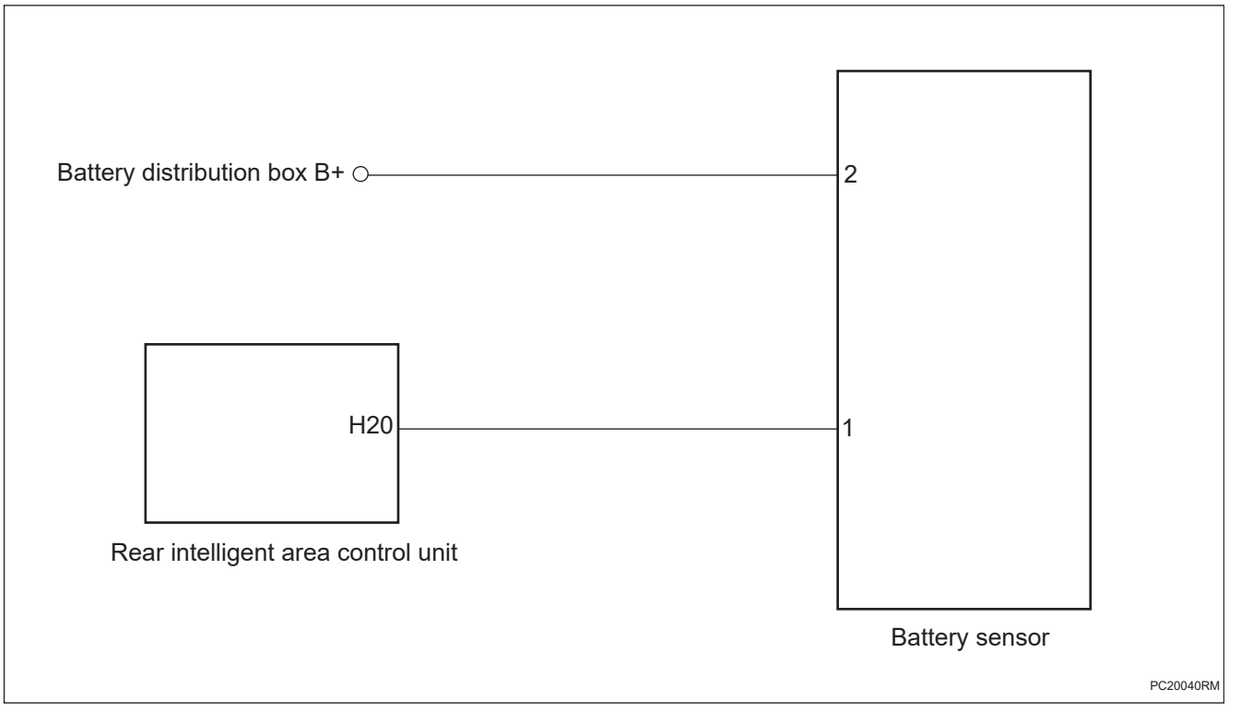
DTC	**U011187**	**Battery sensor 2 node lost**
DTC	**U130486**	**Battery sensor 2 LIN communication error**
DTC	**U100A88**	**LIN1 physical bus error**

Description

When the battery sensor LIN communication is abnormal, the rear intelligent area control unit records DTC.

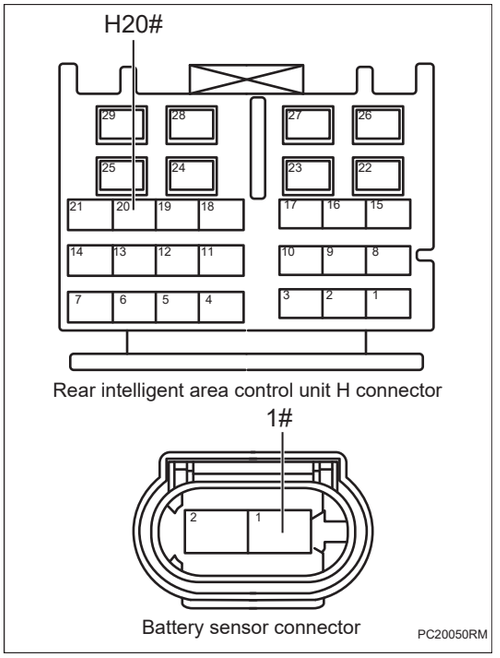
DTC No.	DTC detection condition	Faulty area
U011187	(a) Battery sensor 2 node lost.	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
U130486	(a) Battery sensor 2 LIN communication error.	• Rear intelligent area control unit • Wire harness and connector • Battery sensor
U100A88	(a) LIN1 physical bus error.	• Rear intelligent area control unit • Wire harness and connector • Battery sensor

Circuit diagram



Inspection procedure

1	**Check for open in battery sensor wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the battery sensor connector.

(e) According to value in the table, measure resistance.

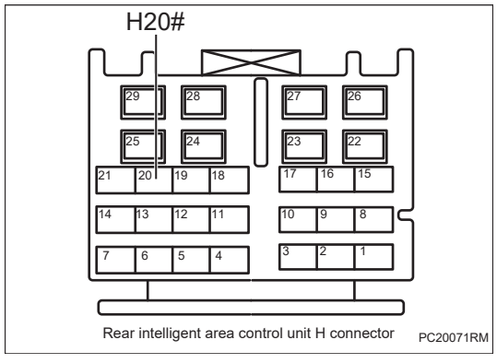
Standard value

Multimeter connection	Detection condition	Specified condition
Battery sensor connector 1# - rear intelligent area control unit connector H20#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in battery sensor wire harness and connector**



(a) According to value in the table, measure resistance.

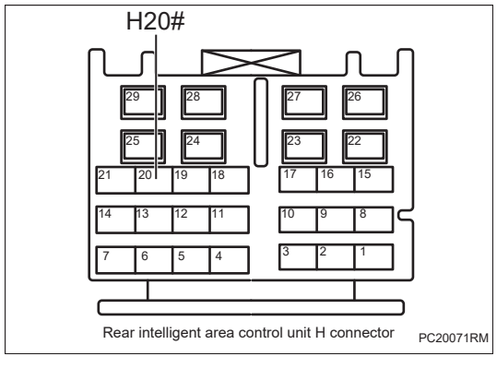
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in battery sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

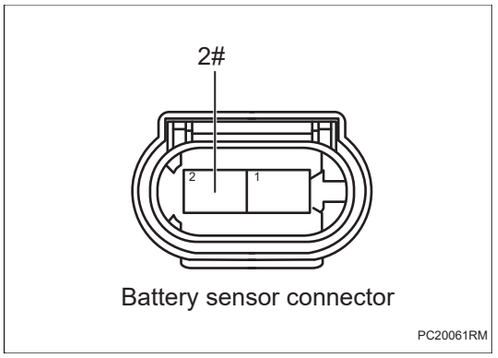
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check battery sensor power supply



Battery sensor connector

PC20061RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the rear intelligent area control unit connector.

(d) Connect the negative battery terminal.

(e) Turn ignition switch to "ON".

(f) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified conditio-n
Battery sensor connector 2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace battery sensor (See page DL-21)

(a) Replace the battery sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	**U008988**	**Backbone network 1 CAN bus off**
DTC	**U000188**	**Rear EV CAN bus off**
DTC	**U002888**	**Body/comfort CAN bus off**
DTC	**U225287**	**Chassis CAN bus off**
DTC	**U009288**	**Backbone network 2 CAN bus off**

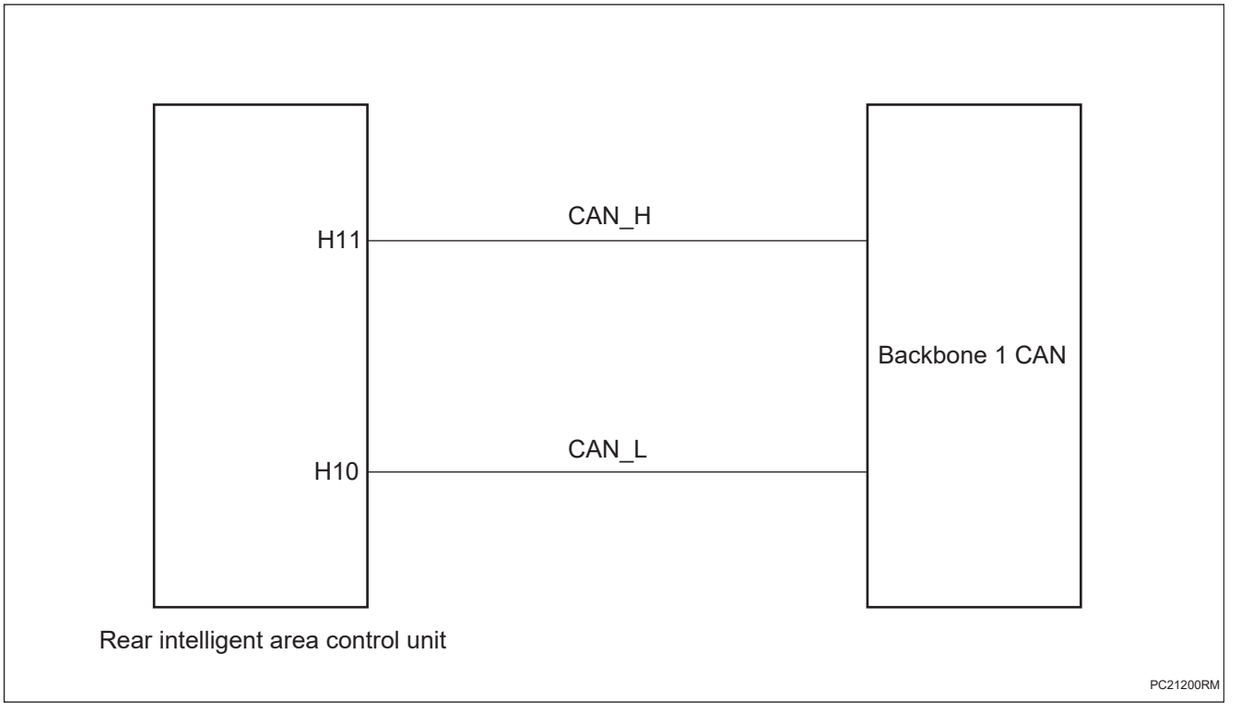
Description

When rear intelligent area control unit detects CAN bus off fault, the rear intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U008988	(a) Backbone network 1CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Intelligent communication domain control unit
U000188	(a) Rear EV CAN bus off fault.	• CAN line and connector • Rear intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U002888	(a) Body/comfort CAN bus off.	• CAN line and connector • Rear intelligent area control unit • Rear left combination light I • Rear right combination light I • Trailer controller

DTC No.	DTC detection condition	Faulty area
U225287	(a) Chassis CAN bus off.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller • Electric power steering control unit
U009288	(a) Backbone network 2 CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

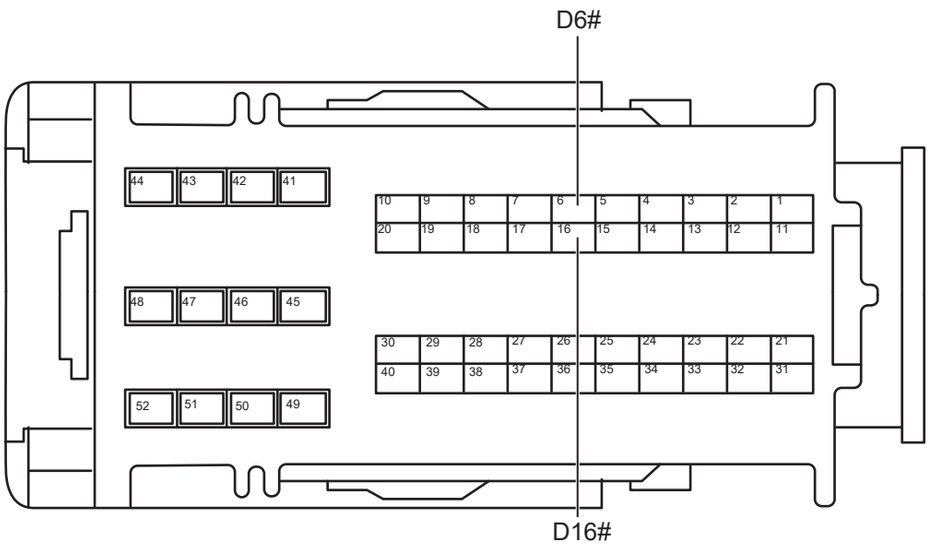
Circuit diagram



Inspection procedure

Note: Taking the U008988 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check backbone 1 CAN bus terminal resistance**



Middle intelligent area control unit D connector

PC16211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector D6# - middle intelligent area control unit connector D16#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controllers on backbone 1 CAN bus**

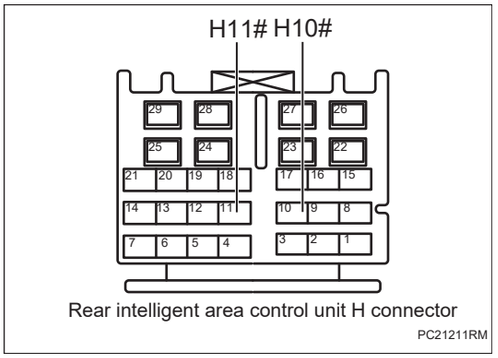
(a) Disconnect the controllers on the backbone 1 CAN bus one by one and check if the other controllers resume operating.

ZD

NG → **Perform repair according to malfunction**

OK

3	Check for short between backbone 1 CAN buses CAN-L and CAN-H



Rear intelligent area control unit H connector
PC21211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

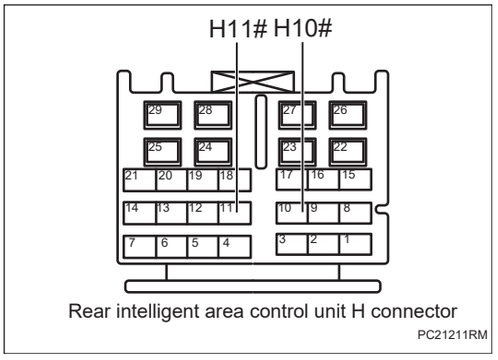
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H11# - rear intelligent area control unit connector H10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in backbone 1 CAN bus



Rear intelligent area control unit H connector
PC21211RM

(a) According to value in the table, measure resistance.

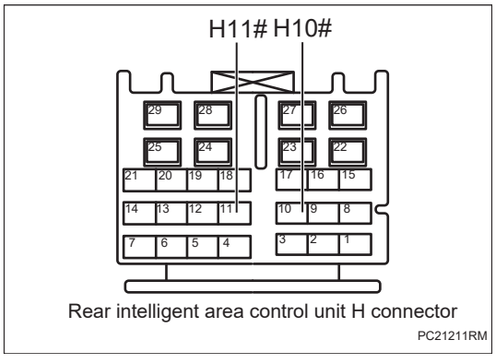
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H11# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector H10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	Check for short to power supply in backbone 1 CAN bus



Rear intelligent area control unit H connector
PC21211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector H10# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	U014D87	Intelligent parking node lost
DTC	U02BC87	VDCTDA4 node lost
DTC	U014A97	VDC821 node lost (backbone network 2)
DTC	U014B97	VDC397 node lost (backbone network 2)
DTC	U02DE87	Power amplifier node lost

DTC	U014797	Middle PDC/left PDC node lost (backbone network 2)
DTC	U02BD87	Lithium battery management system node lost
DTC	U02A587	Trailer controller node lost
DTC	U02E287	Rear left light node lost
DTC	U01E287	Rear left light node lost
DTC	U029287	Motor control unit 2 node lost
DTC	U02BE87	Energy conversion and distribution unit node lost
DTC	U029A87	Battery management system node lost
DTC	U015387	VDC397R node lost
DTC	U014B87	VDC397 node lost
DTC	U014A87	VDC821 node lost
DTC	U014C87	Smart driving domain controller node lost
DTC	U014687	Front area controller node lost
DTC	U226B87	Intelligent communication terminal controller node lost
DTC	U014F87	Cockpit domain controller node lost
DTC	U014787	Center area controller node lost
DTC	U02A487	EVCC communication controller unit node lost
DTC	U014697	Front PDC node lost (backbone network 2)

Description

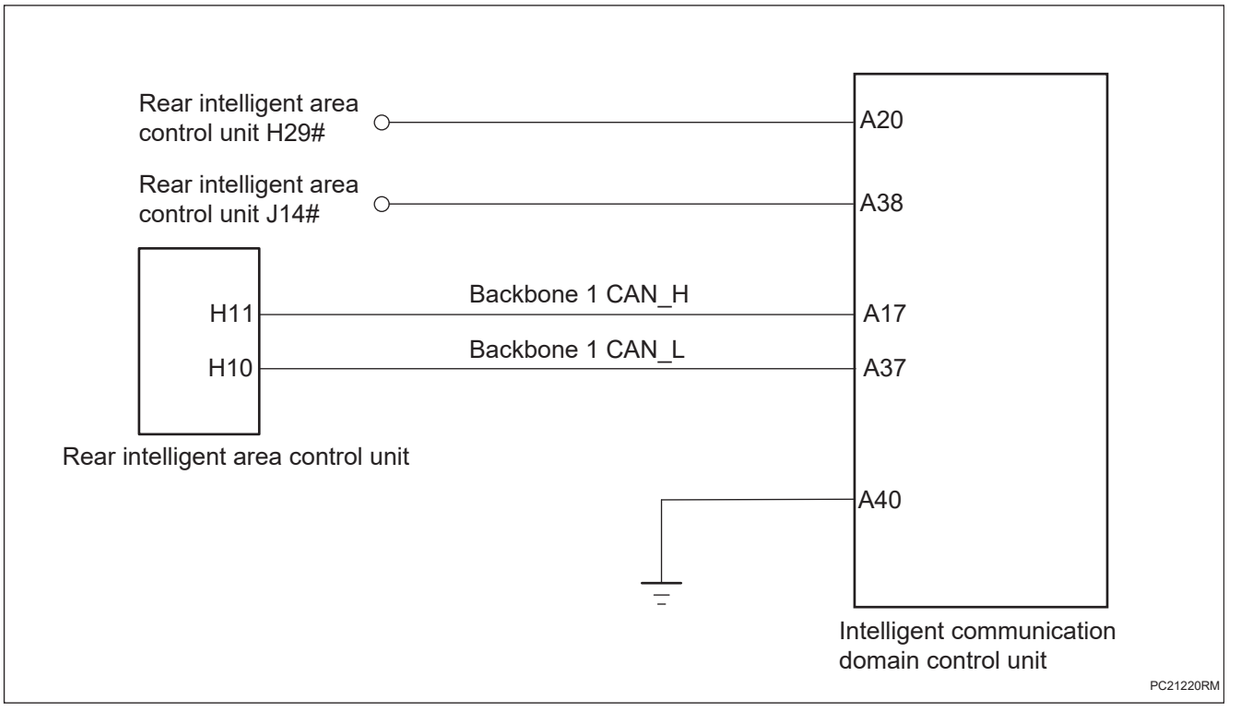
When communication between rear intelligent area control unit and other system is abnormal or interrupted, the rear intelligent area control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014D87	(a) Intelligent parking node lost.	• Wire harness and connector • Rear intelligent area control unit • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U02BC87	(a) VDC TDA4 node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014A97	(a) VDC 821 node lost (backbone network 2).	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014B97	(a) VDC 397 node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U02DE87	(a) Power amplifier node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Power amplifier
U014797	(a) Middle PDC/left PDC node lost (backbone network 2).	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Middle intelligent area control unit
U02BD87	(a) Lithium battery management system node lost.	• Rear intelligent area control unit • Electric rear drive system inverter • Energy conversion and distribution unit • Wire harness and connector
U02A587	(a) Trailer controller node lost.	• Wire harness and connector • Rear intelligent area control unit • Rear left combination light I • Rear right combination light I • Trailer controller
U02E287	(a) Rear left light node lost.	• Wire harness and connector • Rear intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Rear left combination light I • Rear right combination light I
U01E287	(a) Rear left light node lost.	• Wire harness and connector • Rear intelligent area control unit • Rear left combination light I • Rear right combination light I
U029287	(a) Motor control unit 2 node lost.	• Wire harness and connector • Rear intelligent area control unit • Energy conversion and distribution unit • Electric rear drive system inverter
U02BE87	(a) Energy conversion and distribution unit node lost.	• Wire harness and connector • Rear intelligent area control unit • Energy conversion and distribution unit • Electric rear drive system inverter
U029A87	(a) Battery management system node lost.	• Wire harness and connector • Rear intelligent area control unit • Energy conversion and distribution unit • Electric rear drive system inverter
U015387	(a) VDC 397R node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014B87	(a) VDC 397 node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014A87	(a) VDC 821 node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014C87	(a) Smart driving domain controller node lost.	• Wire harness and connector • Rear intelligent area control unit • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U014687	(a) Front area controller node lost.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Rear intelligent area control unit • Front intelligent area control unit • Electric power steering control unit
U226B87	(a) Intelligent communication terminal controller node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Intelligent communication domain control unit
U014F87	(a) Cabin domain controller node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Infotainment control unit
U014787	(a) Center area controller node lost.	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Middle intelligent area control unit
U02A487	(a) EVCC communication controller unit node lost.	• Wire harness and connector • Rear intelligent area control unit • Rear left combination light I • Rear right combination light I • Charging controller
U014697	(a) Front PDC node lost (backbone network 2).	• Wire harness and connector • Rear intelligent area control unit • Front intelligent area control unit • Electric power steering control unit

Circuit diagram

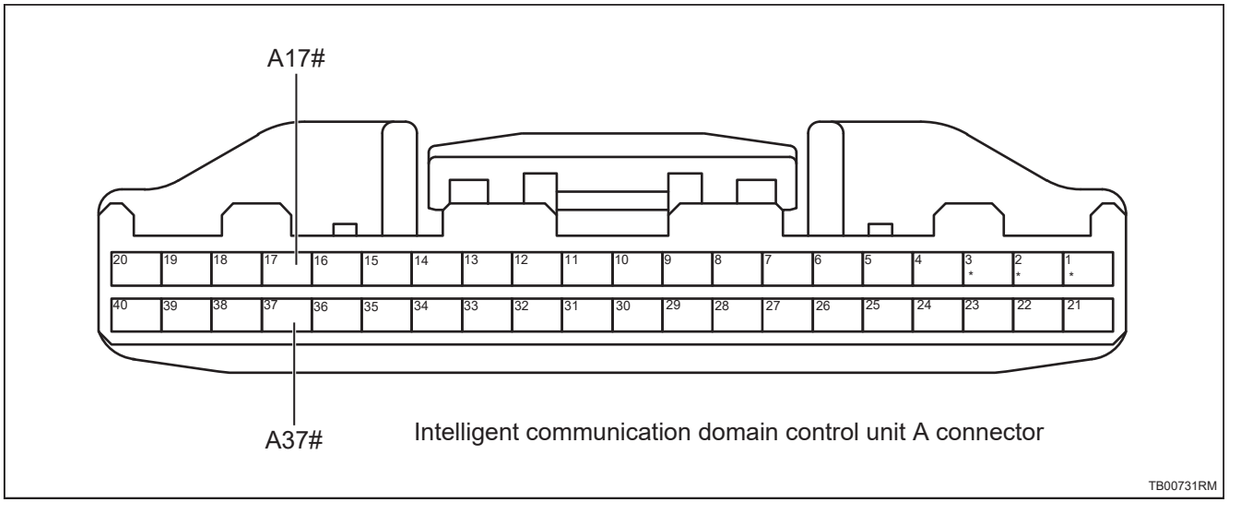


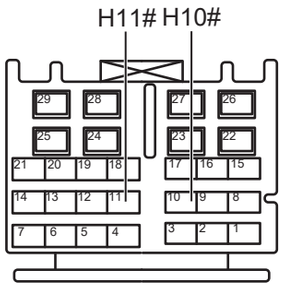
ZD

Inspection procedure

Note: Taking the U226B87 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in backbone 1 CAN bus (intelligent communication domain control unit - rear intelligent area control unit)**





Rear intelligent area control unit H connector

PC21211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

Standard value

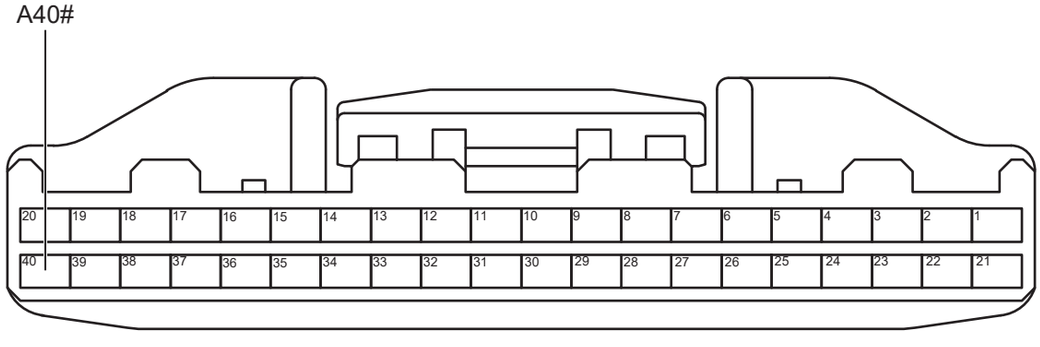
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H11# - intelligent communication domain control unit connector A17#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector H10# - intelligent communication domain control unit connector A37#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check intelligent communication domain control unit ground**



Intelligent communication domain control unit A connector

TB00510RM

(a) According to value in the table, measure resistance.

Standard value

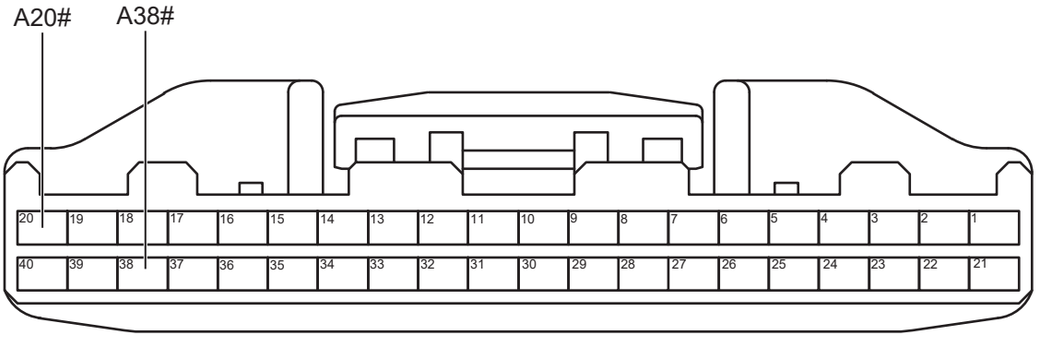
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A40# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check intelligent communication domain control unit power supply



Intelligent communication domain control unit A connector

TB00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

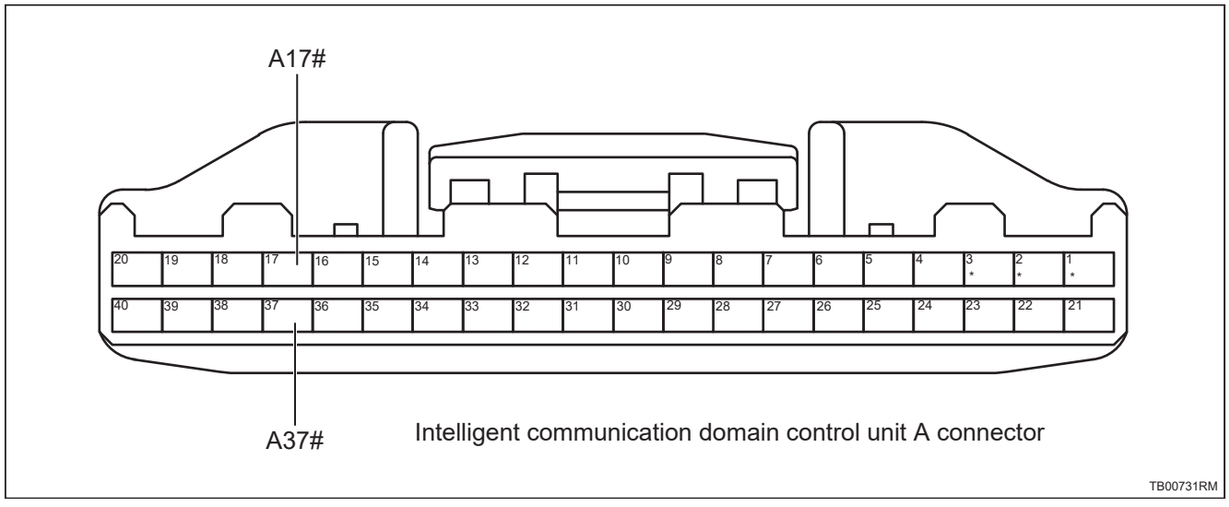
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A20# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent communication domain control unit connector A38# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

4	**Check backbone 1 CAN bus terminal resistance**



(a) Connect the front intelligent area control unit connector.

(b) Connect the rear intelligent area control unit connector.

(c) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A17# - intelligent communication domain control unit connector A37#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

Diagnosis ends

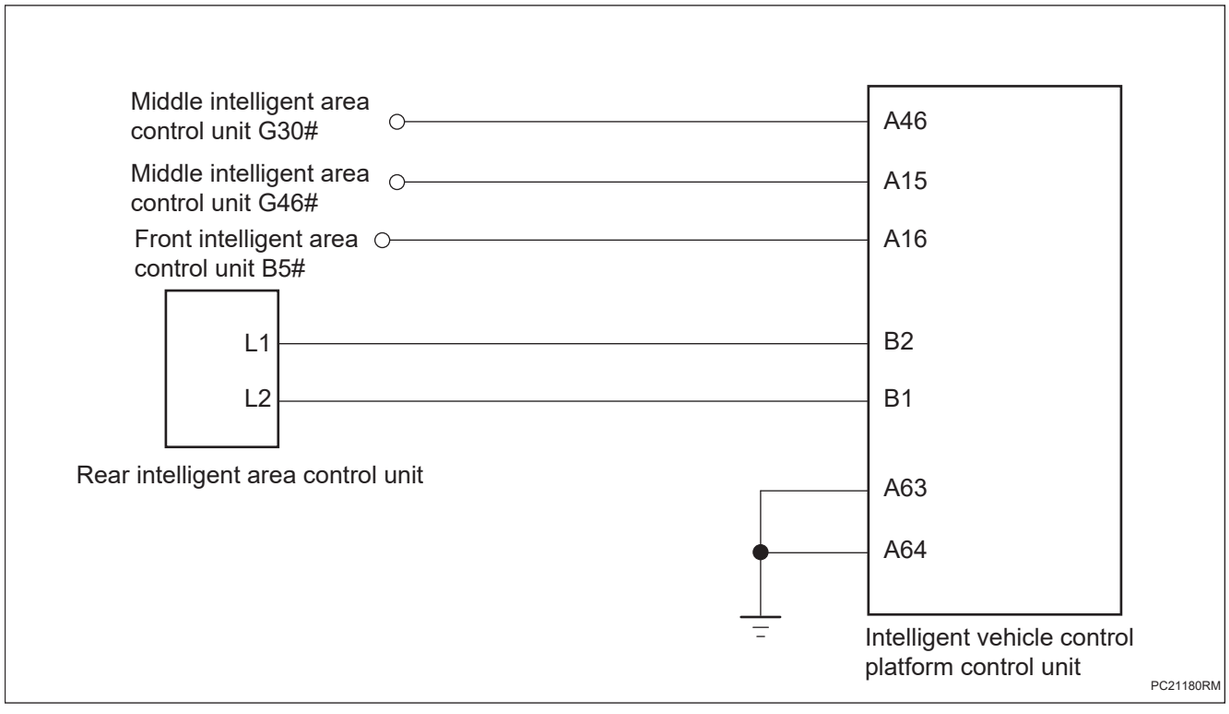
DTC	**U224287**	**Insufficient SQI**
DTC	**U224387**	**Ethernet CRC error**
DTC	**U146E8A**	**Backbone network Eth1 connection establishment failure**

Description

When Ethernet communication between rear intelligent area control unit and intelligent vehicle control platform control unit is abnormal or interrupted, the rear intelligent area control unit records DTC.

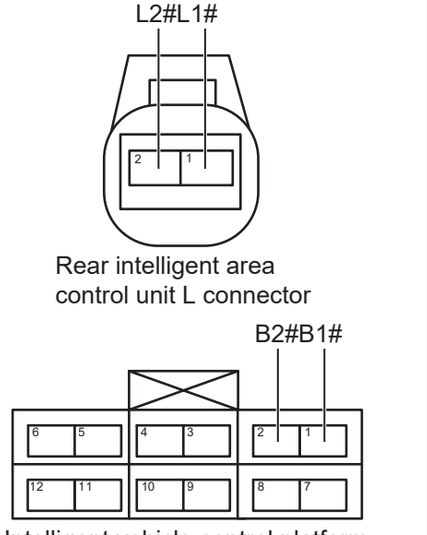
DTC No.	DTC detection condition	Faulty area
U224287	(a) Insufficient SQI.	• Rear intelligent area control unit • Intelligent vehicle control platform control unit • Ethernet wire and connector
U224387	(a) Ethernet CRC error.	• Rear intelligent area control unit • Intelligent vehicle control platform control unit • Ethernet wire and connector
U146E8A	(a) Backbone network Eth1 connection establishment failure.	• Rear intelligent area control unit • Intelligent vehicle control platform control unit • Ethernet wire and connector

Circuit diagram



Inspection procedure

1	**Check for open in Ethernet wire (rear intelligent area control unit - intelligent vehicle control platform control unit)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

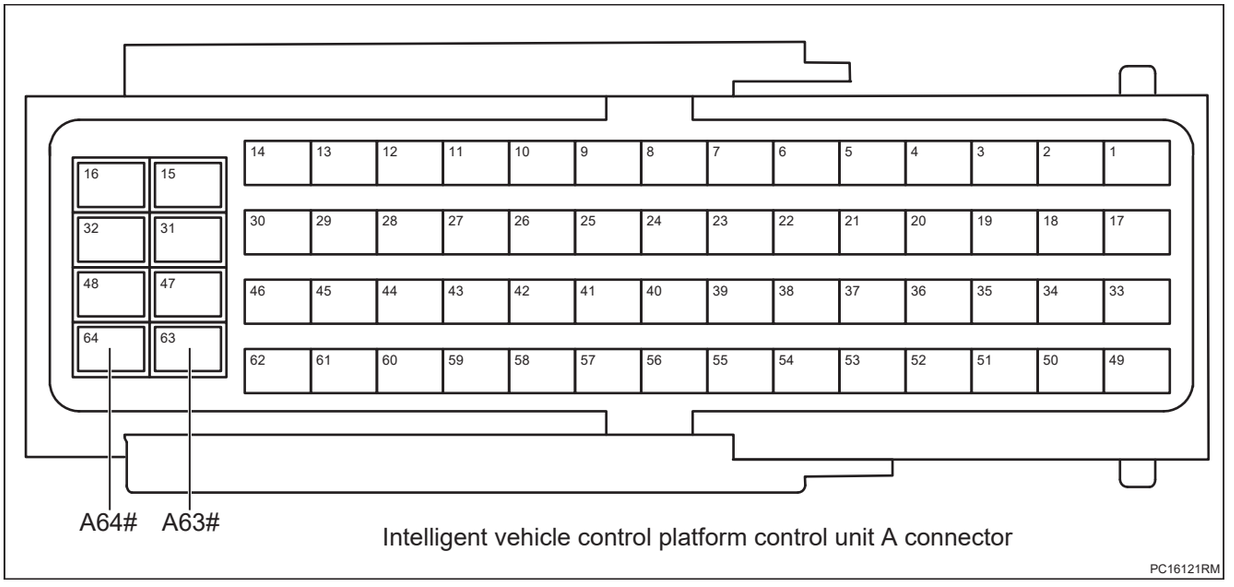
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector B2# - rear intelligent area control unit connector L1#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector B1# - rear intelligent area control unit connector L2#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

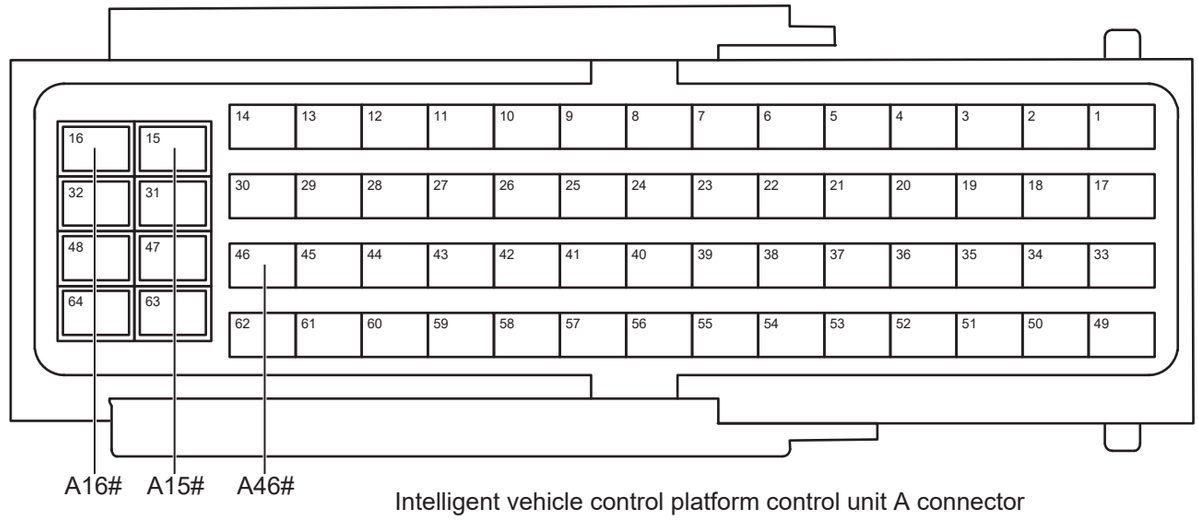
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check intelligent vehicle control platform control unit power supply**



Intelligent vehicle control platform control unit A connector

PC16131RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check the power supply and ground of front and middle intelligent area control units and confirm if the front and middle intelligent area control units are damaged)**

ZD

OK

4	Replace intelligent vehicle control platform control unit (See page ZC-154)

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

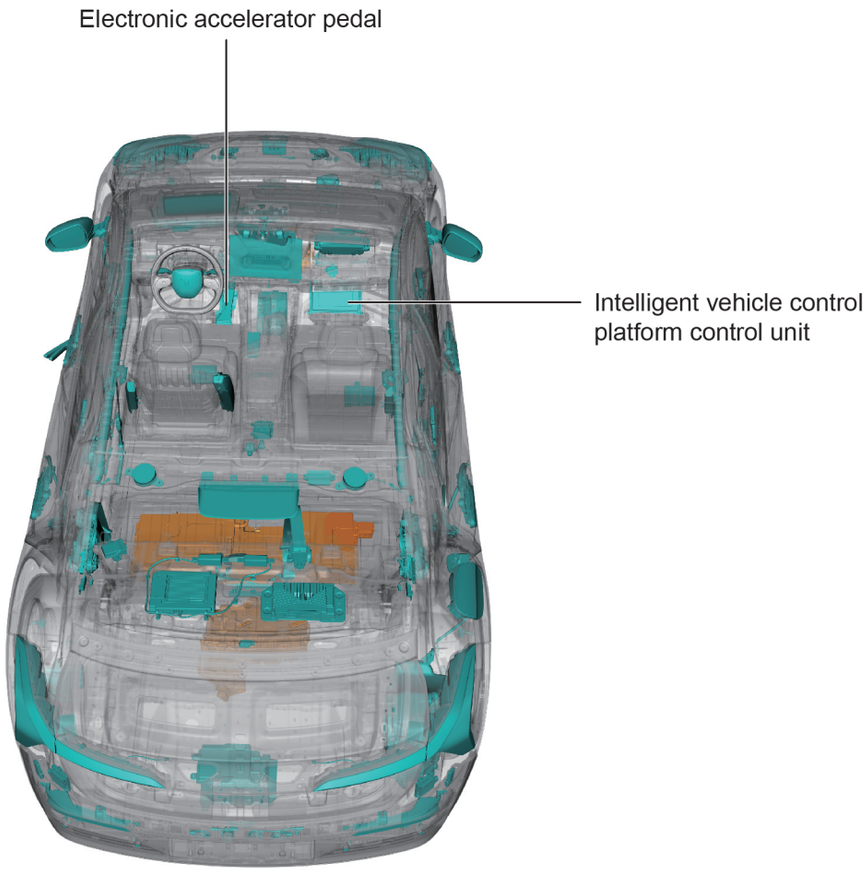
OK

Diagnosis ends

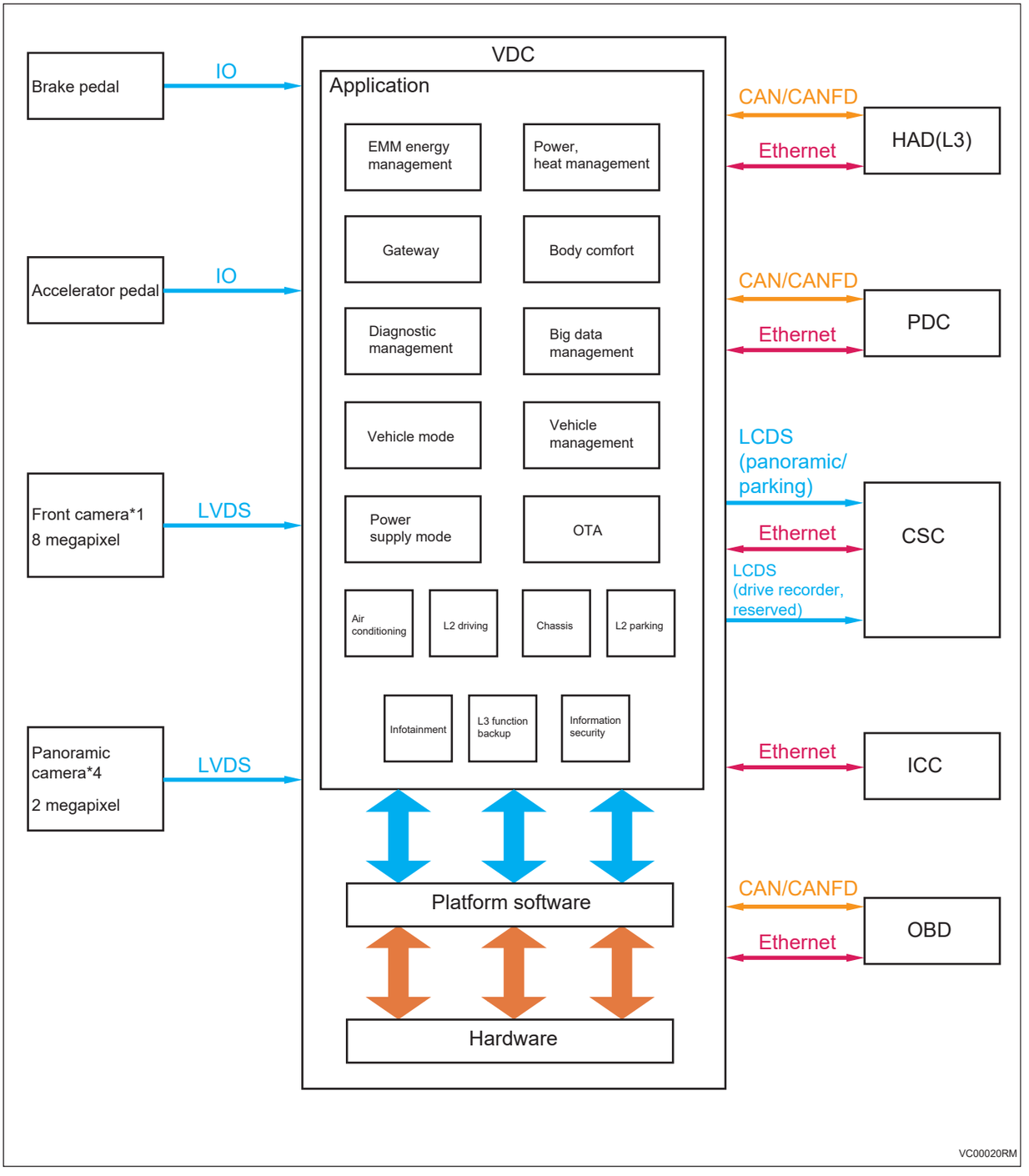
Intelligent vehicle control platform control system

Intelligent vehicle control platform control unit

Part position



System diagram



System description

1. System description

(a) The overall solution of FEEA3.0 adopts the topology form of central computing platform and area control, and is equipped with a vehicle-cloud integrated vehicle-level SOA software architecture. Three central computing platforms are planned for the vehicle, that is, smart driving platform HAD, smart control platform VDC, and Zhilian platform CSC.

(b) As an intelligent control platform, VDC mainly realizes vehicle control (body comfort, air conditioning, infotainment, chassis, power & EV & thermal management), vehicle functions and management (OTA, big data, power supply mode, vehicle mode, log management, API management, service management, gateway, SOA service, extension and other functions), L2 driving/parking, L3 intelligent driving backup and other functions. VDC is divided into Base and Plus versions based on different functional integrations, which are implemented through different hardware circuit configurations.

(c) VDC-Base: Corresponding to high configuration models with advanced automatic driving (with HAD intelligent driving platform), it has advanced automatic driving backup and L2 driving function.

(d) VDC-Plus: Corresponding to low configuration models without advanced automatic driving (without HAD), compared with VDC-Base, it does not require advanced automatic driving backup, but additionally includes all functions of L2 driving assistance and parking.

2. System composition

(a) The drive recorder camera is merged with the front camera, and there are two options for VDC to transmit the video: Ethernet and LVDS. When Ethernet sends the drive recorder video, it requires compression and adding time-stamped layer, which needs to be decompressed by CSC, and integrate the function of drive recorder by CSC, and the hardware of LVDS interface will be reserved, the decision of whether or not to retain it will be made according to the actual effect.

(b) There are two schemes for panoramic & parking video output: Ethernet and LVDS. The LVDS scheme is preferred. The transmitted video needs to be compressed, CSC needs to be decompressed, and the Ethernet scheme is reserved. Later, whether it can be converted to Ethernet transmission will be determined based on the actual effect.

(c) VDC can access the Internet through VBOX data transmission and interact with TSP server to achieve big data service, OTA, remote diagnosis and other functions.

Data parameter

Intelligent vehicle control platform control unit

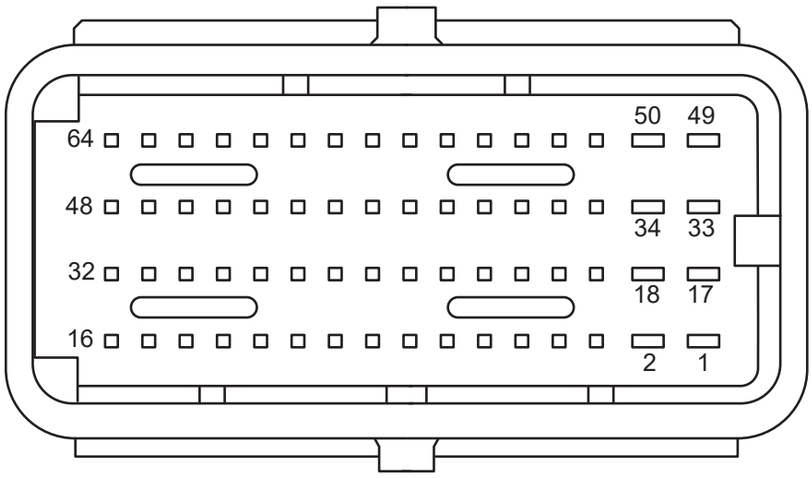
Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	10	7	—

Electronic accelerator pedal

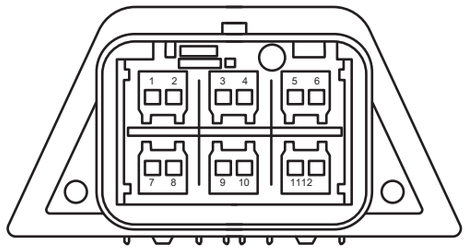
Item	Maximum	Normal	Minimum
Operating voltage (V)	—	5	—
Operating current (A)	—	0.2	—

ECU terminal

Intelligent vehicle control platform control unit



Intelligent vehicle control platform control unit - A



Intelligent vehicle control platform control unit - B

VC00010RM

Intelligent vehicle control platform control unit - A			
Pin number	**Definition**	**Pin number**	**Definition**
1	CAN2_H (backbone network 2)	33	—
2	CAN2_L (backbone network 2)	34	—
3	CAN1_H (backbone network 1)	35	—
4	CAN1_L (backbone network 1)	36	Collision signal input
5	CAN3_H OBD (calibration)	37	—
6	CAN3_L OBD (calibration)	38	Accelerator pedal_voltage 1
7	—	39	Accelerator pedal_signal output 1
8	—	40	Accelerator pedal_ground 1
9	—	41	Accelerator pedal_voltage 2
10	—	42	Accelerator pedal_signal output 2
11	CAN6_H OBD	43	Accelerator pedal_ground 2
12	CAN6_L OBD	44	—
13	—	45	—
14	Activeline	46	KL15

Intelligent vehicle control platform control unit - A			
Pin number	**Definition**	**Pin number**	**Definition**
15	VBAT_1	47	—
16	VBAT_2	48	—
17	—	49	—
18	—	50	—
19	—	51	—
20	—	52	SW_ETH5_MDIP OBD calibration
21	CAN9_H rear EV/chassis	53	SW_ETH5_MDIN OBD calibration
22	CAN9_L rear EV/chassis	54	—
23	—	55	—
24	—	56	—
25	—	57	—
26	—	58	TX_TXP 100Base-TX
27	—	59	TX_TXN 100Base-TX
28	—	60	TX_RXP 100Base-TX
29	—	61	TX_RXN 100Base-TX
30	—	62	—
31	—	63	GND
32	—	64	GND

Intelligent vehicle control platform control unit - B			
Pin number	**Definition**	**Pin number**	**Definition**
1	MDIN PDC_R-ETH 100M	7	MDIN HAD-ETH 1000M
2	MDIP PDC_R-ETH 100M	8	MDIP HAD-ETH 1000M
3	MDIN PDC_C-ETH 100M	9	MDIN CSC-ETH 1000M
4	MDIP PDC_C-ETH 100M	10	MDIP CSC-ETH 1000M
5	MDIN PDC_F-TEH 100M	11	MDIN ICC-ETH 1000M
6	MDIP PDC_F-ETH 100M	12	MDIP ICC-ETH 1000M

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
P213800	Accelerator pedal difference fault	(See page ZD-1125)
P1B1100	Brake failure	(See page ZD-1103)
P1B1200	IBC brake pedal status fault	(See page ZD-1103)
P1B1400	IBC brake travel failure	(See page ZD-1103)
P1B2729	RegenerationTorqueRequest signal invalid	(See page ZD-1103)
P1B2829	ESC_TorqueReq_VMC_1 signal invalid	(See page ZD-1103)
P1B2A29	AvailableSt_MSR signal unreliable	(See page ZD-1103)

DTC	Detection Items	See page
P1B0200	Function safety level 2 fault	(See page ZD-1097)
P1B0300	Function safety level 3 fault	(See page ZD-1097)
P1B057E	Disconnecting device failing to engage	(See page ZD-1097)
P1B057F	Disconnecting device failing to separate	(See page ZD-1097)
P1B2329	TorqueReductionFast_TCS_FrontWhe signal invalid	(See page ZD-1106)
P1B2429	TorqueReductionFast_TCS_RearWheel signal invalid	(See page ZD-1106)
P1B2529	TorqueIncrease_MSR_FrontWheel signal invalid	(See page ZD-1106)
P1B2629	TorqueIncrease_MSR_RearWheel signal invalid	(See page ZD-1106)
P1B2D29	Typical signal related to rear MCU torque invalid	(See page ZD-1106)
P1B2929	BMS_BatteryPackSOC signal invalid	(See page ZD-1109)
P1B2E29	Any typical signal related to BMS power invalid	(See page ZD-1109)
P1B2F29	Simultaneous failure for MCU speed and ABS vehicle speed	(See page ZD-1089)
P1B2B00	Pre-charging timeout fault	(See page ZD-1087)
P1B0F11	Short to ground in charging gun AC charging hardware connection signal	(See page ZD-1051)
P1B1011	Short to ground in charging gun DC charging hardware connection signal	(See page ZD-1051)
P1B1B4B	Motor system coolant temperature high	(See page ZD-1053)
P1B1C4B	Battery system water temperature high	(See page ZD-1063)
P1B1D01	VDC power supply voltage too low	(See page ZD-1073)
P1B1D16	VDC power supply voltage low	(See page ZD-1073)
P1B1D17	VDC power supply voltage high	(See page ZD-1073)
P1B1D1C	VDC power supply voltage too high	(See page ZD-1073)
P1B391D	TC397 power management chip (PMIC) power supply abnormal	(See page ZD-1073)
P1B7C00	Battery charging system fault	(See page ZD-1073)
P1B1E17	Accelerator pedal 1 sensor power supply voltage out of upper limit	(See page ZD-1079)
P1B1E16	Accelerator pedal 1 sensor power supply voltage out of lower limit	(See page ZD-1079)
P1B1F17	Accelerator pedal 1 sensor signal voltage out of upper limit	(See page ZD-1079)
P1B1F16	Accelerator pedal 1 sensor signal voltage out of lower limit	(See page ZD-1079)
P1B2017	Accelerator pedal 2 sensor power supply voltage out of upper limit	(See page ZD-1079)

DTC	Detection Items	See page
P1B2016	Accelerator pedal 2 sensor power supply voltage out of lower limit	(See page ZD-1079)
P1B2117	Accelerator pedal 2 sensor signal voltage out of upper limit	(See page ZD-1079)
P1B2116	Accelerator pedal 2 sensor signal voltage out of lower limit	(See page ZD-1079)
P1B2200	Interlock error	(See page ZD-1092)
P1B3A42	TC397 random accessor (NvM) memory abnormal	(See page ZD-1092)
P1B3B00	TC397 chip resource abnormal	(See page ZD-1092)
P1B4700	Chip internal safety related module/IP function safety monitoring fault	(See page ZD-1092)
P1B4800	Chip peripheral module related function safety monitoring fault	(See page ZD-1092)
P1B4900	Watchdog input or function safety software scheduling related fault	(See page ZD-1092)
P1B7D00	Function safety monitoring fault of abnormal chip shutdown path inspection	(See page ZD-1092)
P1B7E00	Function safety monitoring fault of abnormal chip ErrorPin release	(See page ZD-1092)
P1B7F00	Abnormal low function safety monitoring fault during chip ErrorPin operation	(See page ZD-1092)
P1B3000	Simultaneous fault for all AC charging port temperature sensors	(See page ZD-1112)
P1B314B	Any AC charging socket temperature sensor overtemperature	(See page ZD-1112)
P1B324B	Simultaneous fault for all DC charging port temperature sensors	(See page ZD-1112)
P1B334B	Any DC charging socket temperature sensor overtemperature	(See page ZD-1112)
P1B3400	Thermal management system malfunction light prompt	(See page ZD-1118)
P1B384B	TC397 temperature out of limit	(See page ZD-1102)
P1B4600	Function safety accelerator pedal fault	(See page ZD-1120)
B170000	A/C system refrigerant pressure too low	(See page ZD-1044)
B170100	Insufficient refrigerant at pressure rising	(See page ZD-1044)
B175D71	Air outlet motor 1 stuck	(See page ZD-1042)
B175E71	Air outlet motor 2 stuck	(See page ZD-1042)
B175F71	Air outlet motor 3 stuck	(See page ZD-1042)
B176071	Air outlet motor 4 stuck	(See page ZD-1042)
B176171	Air outlet motor 5 stuck	(See page ZD-1049)
B176271	Air outlet motor 6 stuck	(See page ZD-1049)
B176371	Air outlet motor 7 stuck	(See page ZD-1049)

DTC	Detection Items	See page
B176471	Air outlet motor 8 stuck	(See page ZD-1049)
B174B88	DRA821 CAN6 Busoff	(See page ZD-1038)
B175800	ICC authentication failure	(See page ZD-1047)
B175900	PDC authentication failure	(See page ZD-1048)
B173201	VDC power supply voltage too low	(See page ZD-1073)
B173317	VDC power supply voltage low	(See page ZD-1073)
B173316	VDC power supply voltage high	(See page ZD-1073)
B17331C	VDC power supply voltage too high	(See page ZD-1073)
B17351C	DRA821 PMIC (power management chip) power supply abnormal	(See page ZD-1073)
B173542	DRA821 NvM memory abnormal	(See page ZD-1092)
B173600	DRA821 CPU Usage overload	(See page ZD-1092)
B173700	DRA821 DDR overloaded	(See page ZD-1092)
B174000	DRA821 sleep abnormal	(See page ZD-1092)
B174186	DRA821 IPC communication abnormal	(See page ZD-1092)
B174D00	Chip internal safety related module/IP function safety monitoring fault	(See page ZD-1092)
B174E00	Chip peripheral module related function safety monitoring fault	(See page ZD-1092)
B174F00	Watchdog input or function safety software scheduling related fault	(See page ZD-1092)
B17344B	DRA821 temperature out of limit	(See page ZD-1102)
B150900	DRA821 CPU Usage overload	(See page ZD-1092)
B150A00	DRA821 DDR overloaded	(See page ZD-1092)
B150E00	DRA821 EMMC operating abnormal	(See page ZD-1092)
B150F86	DRA821 IPC communication abnormal	(See page ZD-1092)
B15074B	DRA821 temperature out of limit	(See page ZD-1102)
B152000	VDC in OBD certified factory mode	(See page ZD-1043)
U1A00AA	No valid certificate for VDC	(See page ZD-1131)
U008988	Backbone network 1 CAN bus off	(See page ZD-1145)
U114687	Front PDC message missing	(See page ZD-1132)
U014787	PDCM node lost	(See page ZD-1132)
U014887	PDCR node lost	(See page ZD-1132)
U014A87	VDC821 node lost	(See page ZD-1132)
U114687	PDCF message missing	(See page ZD-1132)
U041782	PDCF message content fault	(See page ZD-1132)
U041783	PDCF message content fault	(See page ZD-1132)
U112987	IBC message missing	(See page ZD-1132)

DTC	Detection Items	See page
U041882	IBC message content fault	(See page ZD-1132)
U041883	IBC message content fault	(See page ZD-1132)
U113187	Electric power steering control unit message missing	(See page ZD-1132)
U042082	Electric power steering control unit message content fault	(See page ZD-1132)
U042083	Electric power steering control unit message content fault	(See page ZD-1132)
U110387	Electronic shifter message missing	(See page ZD-1132)
U040482	Electronic shifter message content fault	(See page ZD-1132)
U040483	Electronic shifter message content fault	(See page ZD-1132)
U115187	Airbag control unit message missing	(See page ZD-1132)
U045282	Airbag controller message content fault	(See page ZD-1132)
U045283	Airbag controller message content fault	(See page ZD-1132)
U114787	PDCM message missing	(See page ZD-1132)
U042282	PDCM message content fault	(See page ZD-1132)
U042283	PDCM message content fault	(See page ZD-1132)
U009288	Backbone network 2 CAN bus off	(See page ZD-1145)
U014697	Backbone network 2 bus PDCF node lost	(See page ZD-1132)
U014A97	Backbone network 2 bus VDC821 node lost	(See page ZD-1132)
U114697	Backbone network 2 bus PDCF message missing	(See page ZD-1132)
U124287	HAD/IFC message missing	(See page ZD-1132)
U054982	HAD/IFC message content fault	(See page ZD-1132)
U054983	HAD/IFC message content fault	(See page ZD-1132)
U005588	Rear EV CAN bus off	(See page ZD-1145)
U0148A7	PDCR node lost	(See page ZD-1132)
U129A87	Battery management system message missing	(See page ZD-1132)
U129287	Motor control unit 2 message missing	(See page ZD-1132)
U129887	PCDU message missing	(See page ZD-1132)
U059B82	Battery management system message content fault	(See page ZD-1132)
U059B83	Battery management system message content fault	(See page ZD-1132)
U059982	PCDU message content fault	(See page ZD-1132)
U059983	PCDU message content fault	(See page ZD-1132)
U059382	Motor control unit 2 message content fault	(See page ZD-1132)
U059383	Motor control unit 2 message content fault	(See page ZD-1132)

DTC	B174B88	DRA821 CAN6 Busoff (CAN communication's error recovery mechanism)

Description

When intelligent communication domain control unit detects an off fault in diagnostic CAN bus, the intelligent communication domain control unit records DTC.

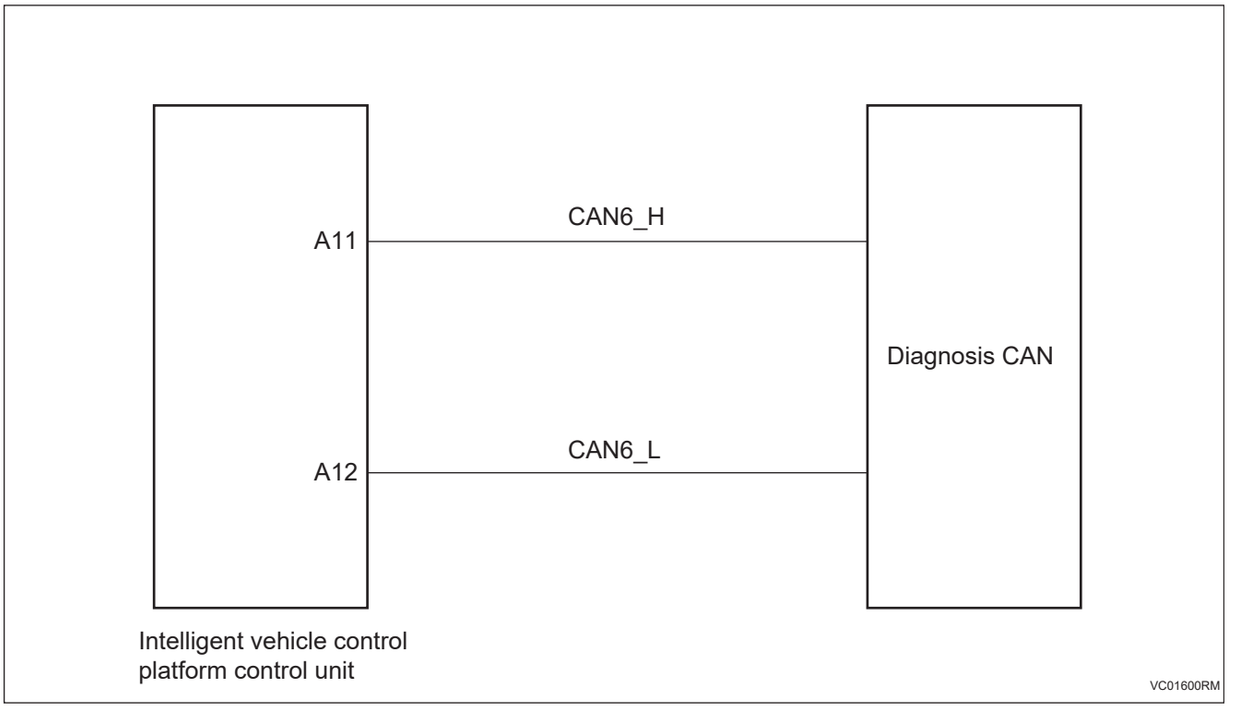
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B174B88	• VDC operates normally	DRA821 CAN6 (OBD) Busoff	3 times	Event-based	—	• CAN line and connector • Diagnostic interface • Intelligent vehicle control platform unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B174B88	• DRA821 CAN6 communication is abnormal	Not come on

Circuit diagram



Inspection procedure

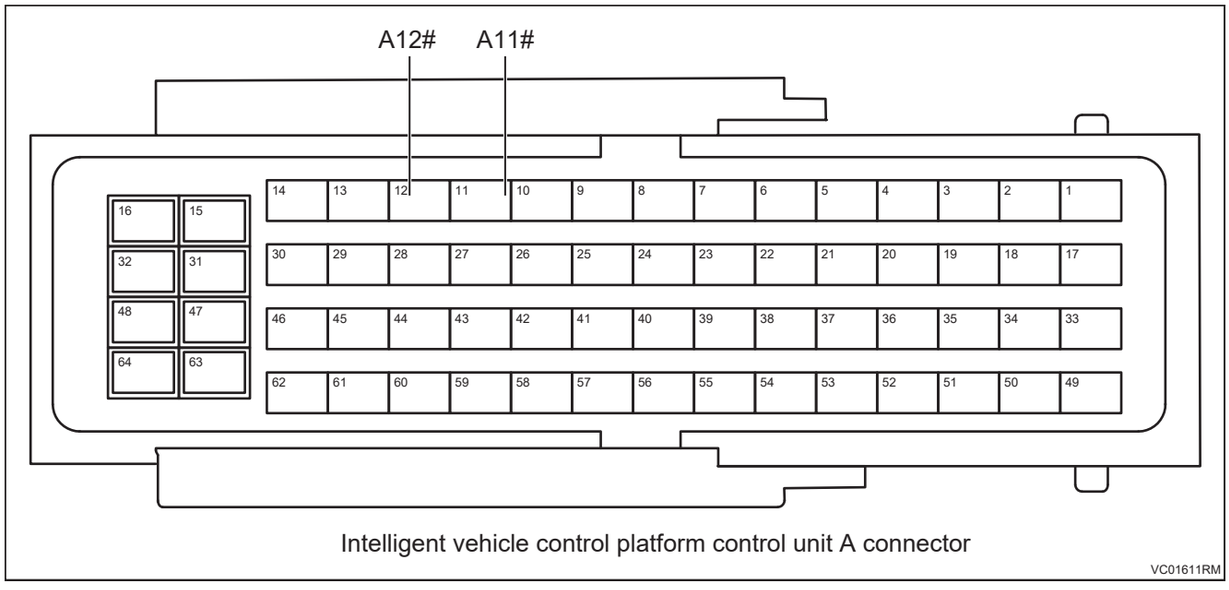
Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check controller on diagnosis CAN bus**

(a) Disconnect the controllers on diagnosis CAN bus in sequence and check if other controllers resume operation.

NG → **Perform repair according to malfunction**

2	**Check for short between diagnosis CAN bus CAN-L and CAN-H**



Intelligent vehicle control platform control unit A connector

VC01611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on diagnostic CAN bus.

(d) According to value in the table, measure resistance.

Standard value

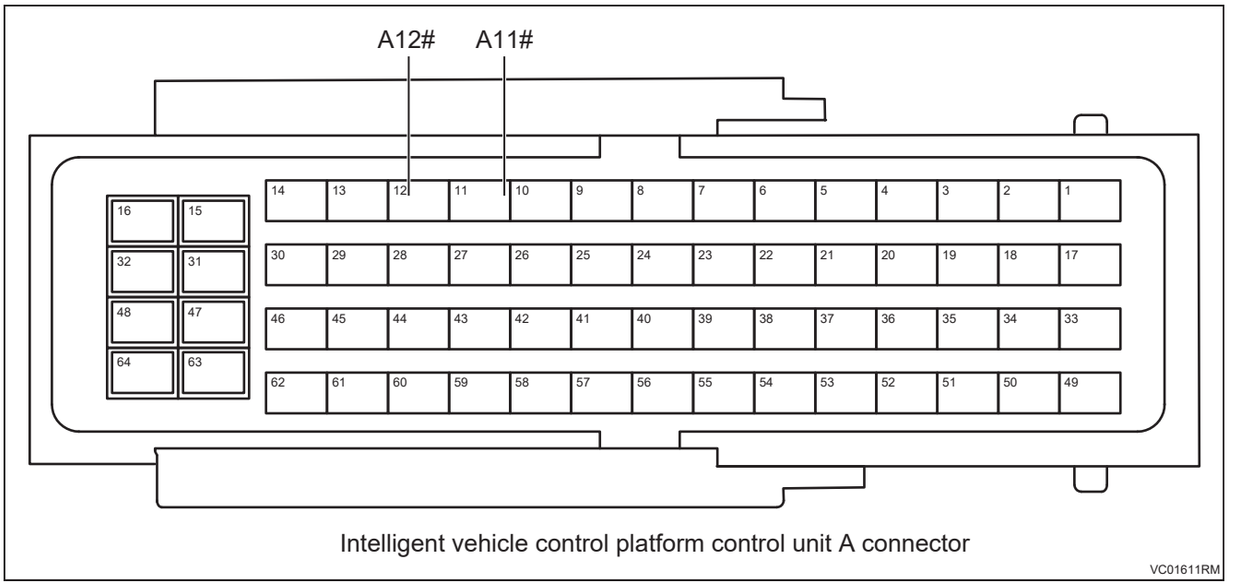
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A11# - intelligent vehicle control platform control unit connector A12#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in diagnostic CAN bus**



Intelligent vehicle control platform control unit A connector

VC01611RM

(a) According to value in the table, measure resistance.

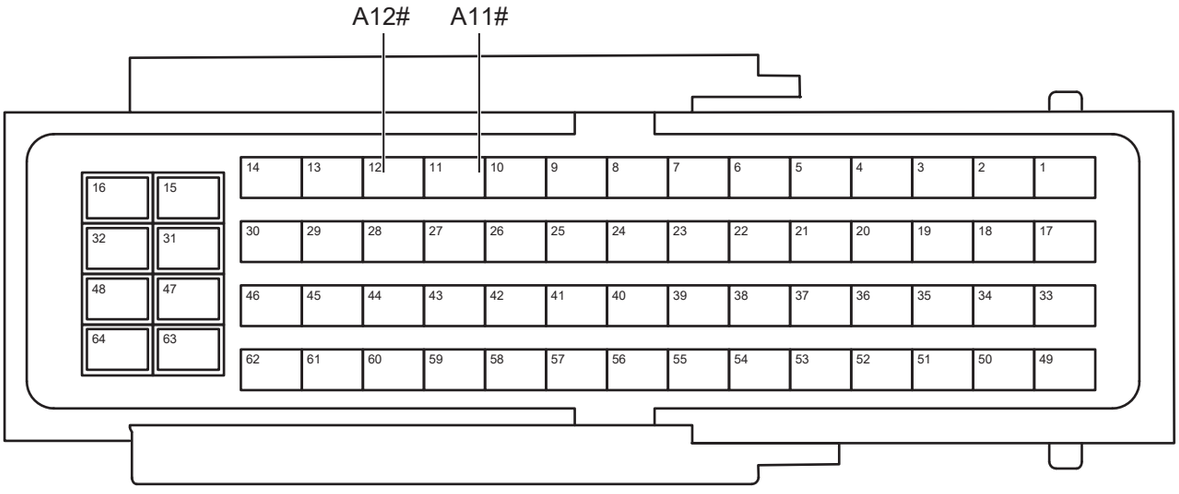
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A11# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in diagnostic CAN bus**



Intelligent vehicle control platform control unit A connector

VC01611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

DTC	**B175D71**	**Air outlet motor 1 stuck**
DTC	**B175E71**	**Air outlet motor 2 stuck**
DTC	**B175F71**	**Air outlet motor 3 stuck**
DTC	**B176071**	**Air outlet motor 4 stuck**

Description

When air outlet motor operates abnormally, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B175D71	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	• 3 times	Event-based	200 ms	• Air outlet motor I
B175E71	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	• 3 times	Event-based	200 ms	• Air outlet motor II
B175F71	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	• 3 times	Event-based	200 ms	• Air outlet motor III
B176071	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	• 3 times	Event-based	200 ms	• Air outlet motor IV

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B175D71	• Air outlet motor operation is abnormal	Not come on
B175E71	• Air outlet motor operation is abnormal	Not come on
B175F71	• Air outlet motor operation is abnormal	Not come on
B176071	• Air outlet motor operation is abnormal	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check A/C outlet

(a) Check if there is foreign matter at A/C outlet.

(b) Check if A/C outlet is stuck or damaged.

NG → **Perform repair according to malfunction**

OK

Replace air outlet motor Ⅰ/Ⅱ/Ⅲ/Ⅳ (See page RE-41)

DTC	B152000	VDC in OBD certified factory mode

Description

When intelligent vehicle control platform control unit is in factory mode, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152000		The OBD authentication mode value is detected as factory mode during ECU power-on/after clearing DTC/ after mode switching	1 time	Event-based	Not involved	• Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B152000	The interior sensitive diagnostic service can be accessed through diagnostic tester that is not authorized by FAW	—

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Release factory mode of intelligent vehicle control platform control unit**

(a) Release the factory mode of intelligent vehicle control platform control unit.

(b) Restart the intelligent vehicle control platform control unit.

(c) Connect HQ-VDS diagnostic tester.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	B170000	A/C system refrigerant pressure too low

DTC	B170100	Insufficient refrigerant at pressure rising

Description

When A/C function fails, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B170000	• High voltage applied • External temperature >= -1.5° C (DTC is not recorded when the external temperature sensor fails.)	• High pressure value is not higher than the threshold value calculated by outside air temperature sensor • 0.102 MPaG ~ 0.176 MPaG	4 s	Periodic type	200 ms	• Pressure sensor • Wire harness and connector • A/C line
B170100	• High voltage applied • External temperature >= -1.5° C (DTC is not recorded when the external temperature sensor fails.) • Heat pump cycle status = heating box or waste heat heating box • Compressor speed > 500 rpm	• High pressure value is lower than the threshold value calculated by outside air temperature sensor • 0.13 MPaG ~ 0.48 MPaG	30 s	Periodic type	200 ms	• Pressure sensor • Wire harness and connector • A/C line

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B170000	A/C cooling + heat pump function failure	Not come on
B170100	A/C cooling + heat pump function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check A/C system pressure

(a) Check A/C line for leakage or blockage.

(b) Check if A/C system pressure is normal.

NG → **Perform repair according to malfunction**

OK

2	Check A/C refrigerant

(a) Check if refrigerant capacity is normal.

NG → **Perform repair according to malfunction**

OK

3	Check pressure sensor wire harness and connector

(a) Check if pressure sensor connector is connected firmly.

(b) Check if pressure sensor wire harness and connector are broken and aged.

(c) Check for short or open in pressure sensor wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace pressure sensor (See page DP-121)

DTC	B175800	ICC authentication failure

Description

When authentication between intelligent vehicle control platform control unit and intelligent communication domain control unit is abnormal, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B175800	• VDC operates normally		1 time	Event-based		• Intelligent communication domain control unit • Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B175800	• ICC anti-theft verification fails	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check for any DTCs output for intelligent vehicle control platform control unit

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

Replace intelligent communication domain control unit (See page ZC-116)

DTC	B175900	PDC authentication failure

Description

When authentication between intelligent vehicle control platform control unit and front/middle/rear intelligent area control unit is abnormal, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B175900	• VDC operates normally		1 time	Event-based		• Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B175900	• VDC and PDC anti-theft verification fails, instrument cluster alarms	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check for any DTCs output for intelligent vehicle control platform control unit

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

Replace the front/center/rear intelligent area control unit (See page ZC-128) (See page ZC-132) (See page ZC-135)

DTC	**B176171**	**Air outlet motor 5 stuck**
DTC	**B176271**	**Air outlet motor 6 stuck**
DTC	**B176371**	**Air outlet motor 7 stuck**
DTC	**B176471**	**Air outlet motor 8 stuck**

Description

When internal fault occurs in intelligent vehicle control platform control unit, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B176171	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	3 times	Event-based	200 ms	• Intelligent vehicle control platform control unit
B176271	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	3 times	Event-based	200 ms	• Intelligent vehicle control platform control unit
B176371	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	3 times	Event-based	200 ms	• Intelligent vehicle control platform control unit
B176471	• Vehicle is powered on	The electric air outlet is stuck during operation and cannot be restored even if initialization is performed.	3 times	Event-based	200 ms	• Intelligent vehicle control platform control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B176171	• Air outlet motor operation is abnormal	Not come on
B176271	• Air outlet motor operation is abnormal	Not come on
B176371	• Air outlet motor operation is abnormal	Not come on
B176471	• Air outlet motor operation is abnormal	Not come on

Inspection procedure

1	**Check rear intelligent area control unit DTC**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Check for DTCs in rear intelligent area control unit.

NG → **Perform repair according to DTC**

OK

2	**Intelligent vehicle control platform control unit performs automatic configuration module program**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Intelligent vehicle control platform control unit performs automatic configuration module program.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	**P1B0F11**	**Short to ground in charging gun AC charging hardware connection signal**
DTC	**P1B1011**	**Short to ground in charging gun DC charging hardware connection signal**

Description

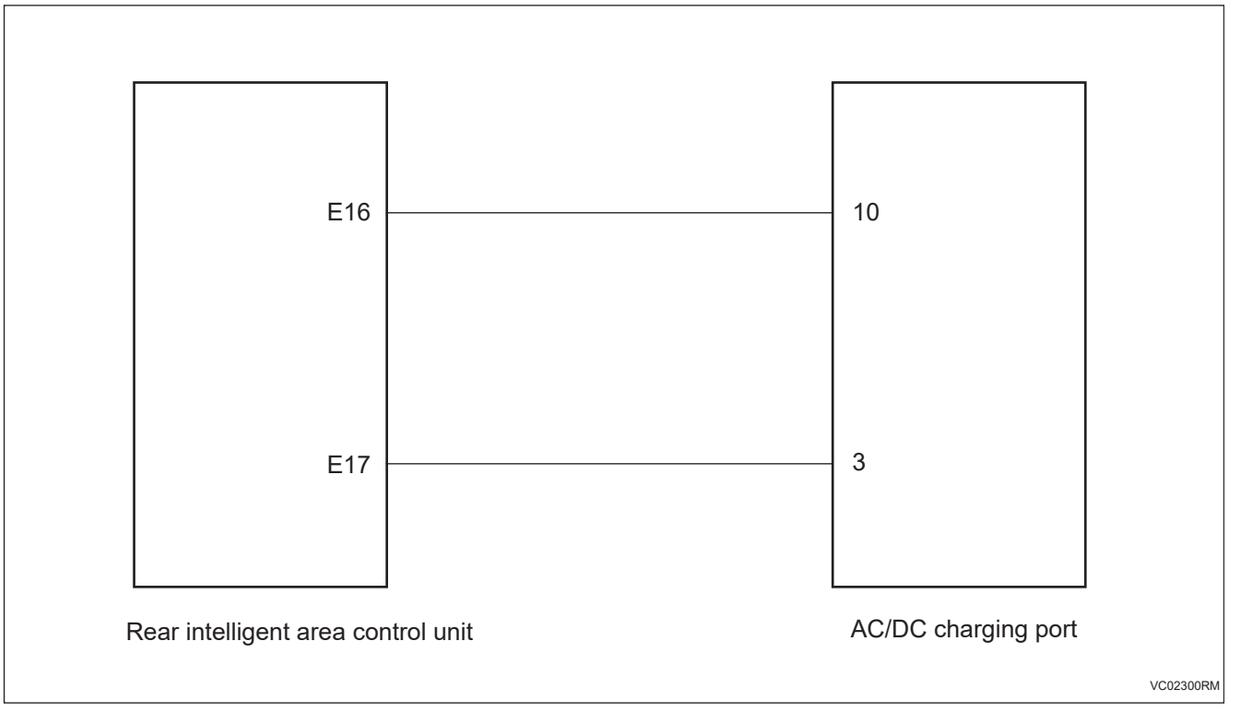
When AC/DC charging port signal circuit is short to ground, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B0F11		The signal voltage value is less than 0.1 V, and the output port of low end drive is closed	3 s	Continuous type	5 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit
P1B1011		The signal voltage value is less than 0.1 V, and the output port of low end drive is closed	3 s	Continuous type	5 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B0F11	• Unable to perform AC charging/ discharging	Not come on
P1B1011	• Unable to perform DC charging	Not come on

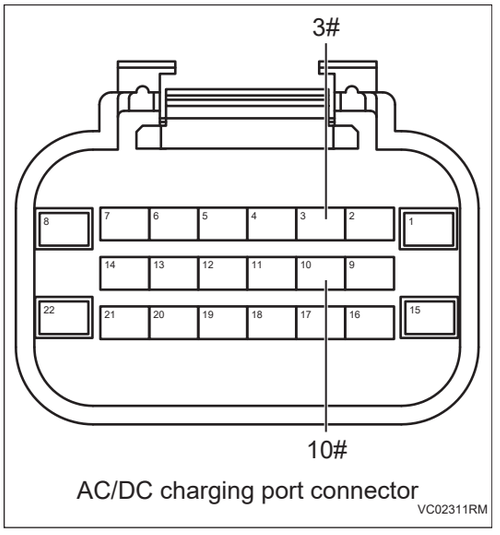
Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check for short to ground in AC/DC charging port wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the AC/DC charging port connectors.

(d) Disconnect the rear intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port connector 10# - body ground	Always connected	10 KΩ or more
AC/DC charging port connector 3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace AC/DC charging port (See page WS-52)**

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	P1B1B4B	Motor system coolant temperature high

Description

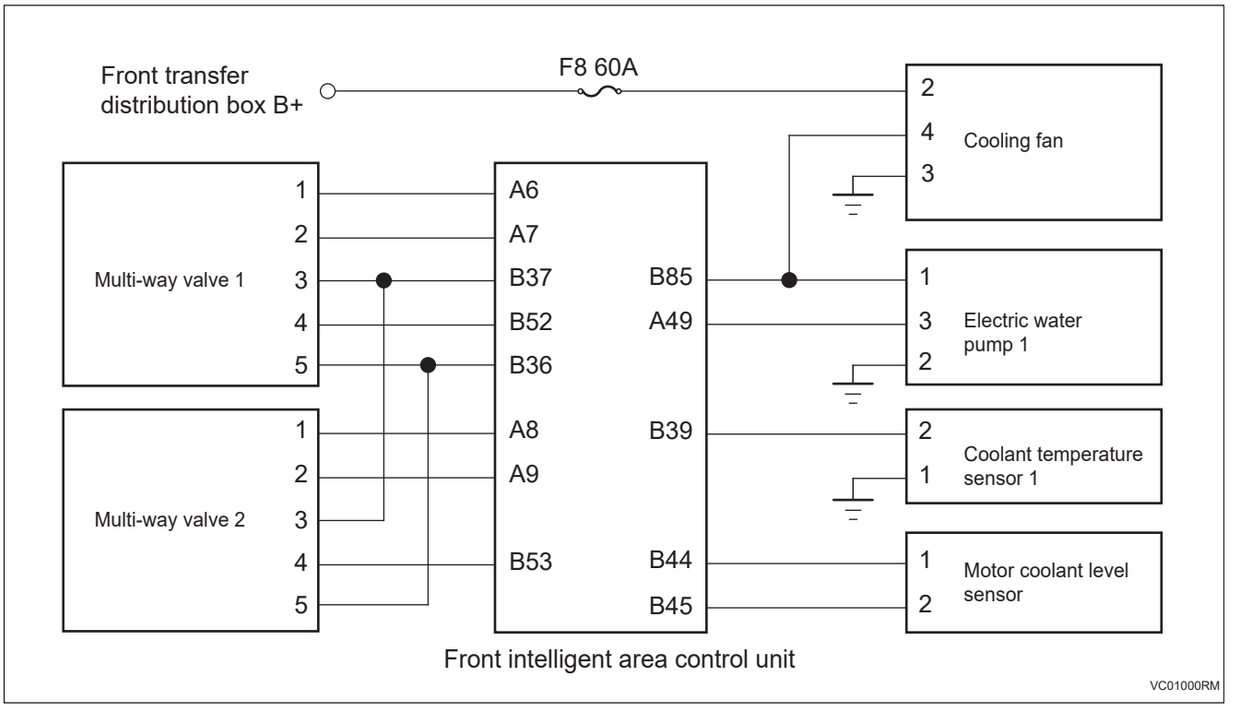
When water temperature of motor system is too high, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B1B4B	• Power supply is in IGON	70° C	20 s	Continuous type	10 ms	• Coolant • Cooling line • Cooling fan • Radiator • Thermal management module • Electric water pump 1 • Coolant temperature sensor 1 • Multi-way valve 1 • Multi-way valve 2 • Motor coolant level sensor • Wire harness and connector • Electric front drive system inverter • Electric rear drive system inverter • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B1B4B	Instrument cluster alarm	Not come on

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check coolant

(a) Check if coolant level is normal.

(b) Check coolant for deterioration.

NG → **Perform repair according to malfunction**

OK

2	Check coolant line

(a) Check coolant line for leakage or blockage.

(b) Check if coolant line connection is correct.

NG → **Perform repair according to malfunction**

OK

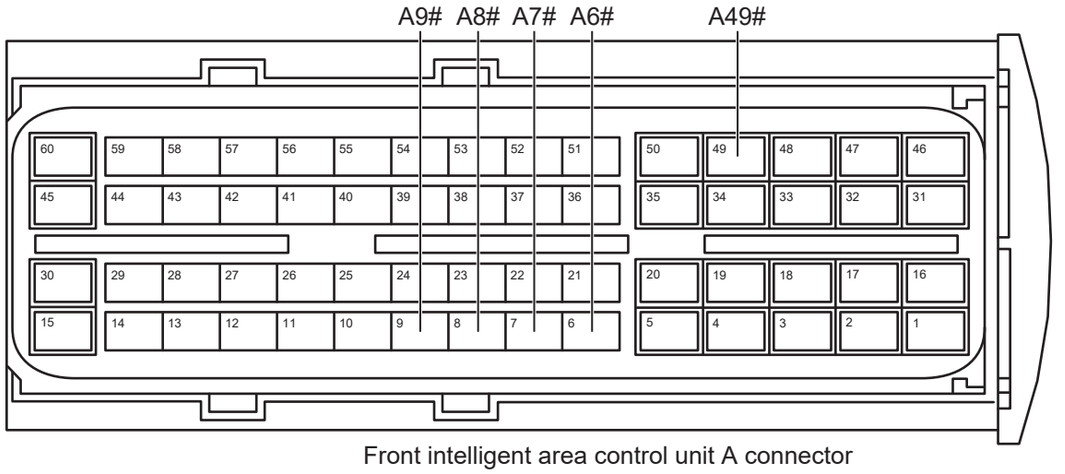
3	Check radiator

(a) Check if radiator function is normal.

NG → **Perform repair according to malfunction**

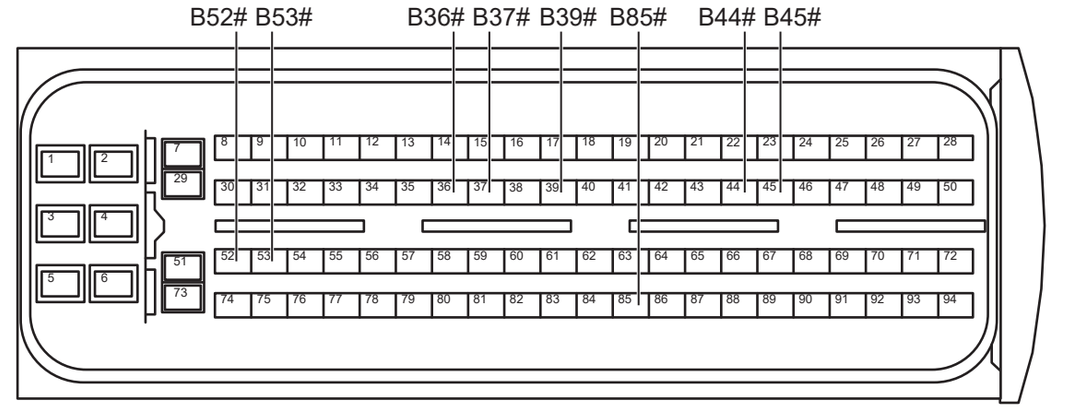
OK

4	**Check for open in front intelligent area control unit wire harness and connector**



Front intelligent area control unit A connector

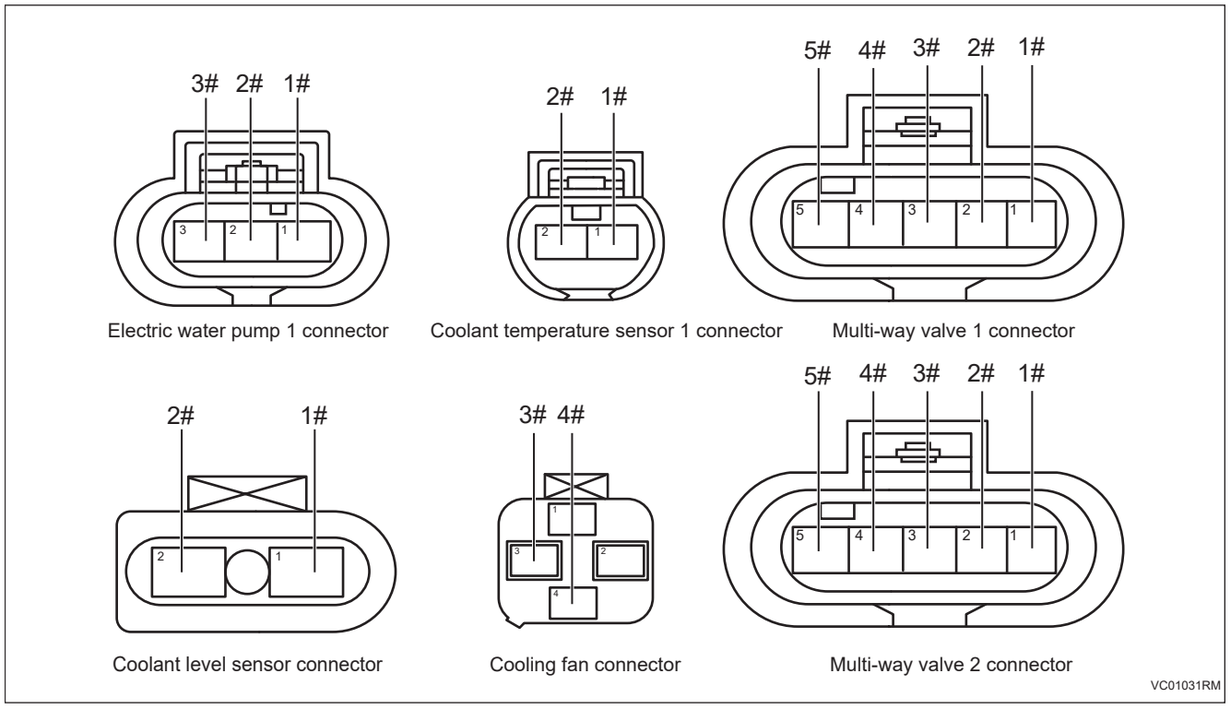
VC01011RM



Front intelligent area control unit B connector

VC01021RM

ZD



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the multi-way valve 1 connector.

(e) Disconnect the multi-way valve 2 connector.

(f) Disconnect the cooling fan connector.

(g) Disconnect the electric water pump 1 connector.

(h) Disconnect the coolant temperature sensor 1 connector.

(i) Disconnect the coolant level sensor connector.

(j) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - multi-way valve 1 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A7# - multi-way valve 1 connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B37# - multi-way valve 1 connector 3#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B52# - multi-way valve 1 connector 4#	Always connected	Less than 1 Ω

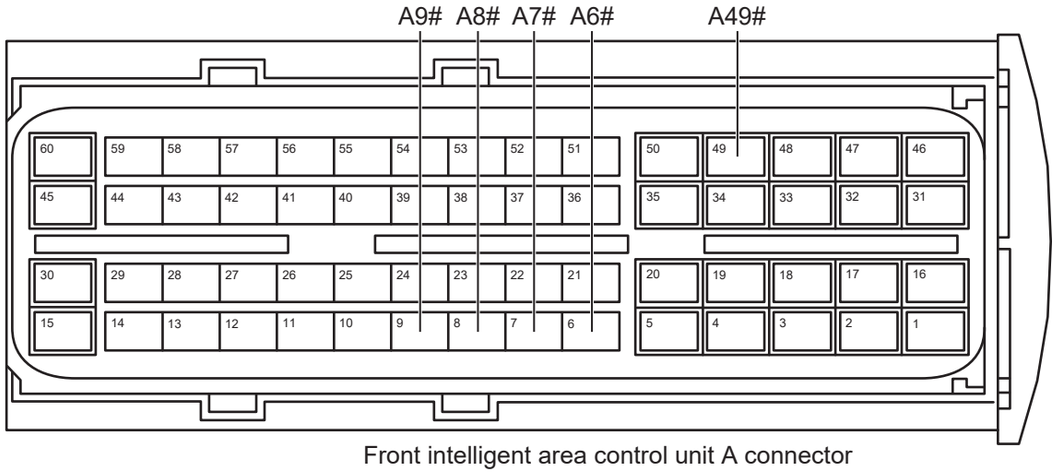
ZD

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - multi-way valve 1 connector 5#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A8# - multi-way valve 2 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A9# - multi-way valve 2 connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B37# - multi-way valve 2 connector 3#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B53# - multi-way valve 2 connector 4#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B36# - multi-way valve 2 connector 5#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B85# - cooling fan connector 4#	Always connected	Less than 1 Ω
Cooling fan connector 3# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B85# - electric water pump 1 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A49# - electric water pump 1 connector 3#	Always connected	Less than 1 Ω
Electric water pump 1 connector 2# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B39# - coolant temperature sensor 1 connector 2#	Always connected	Less than 1 Ω
Coolant temperature sensor 1 connector 1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B44# - coolant level sensor connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B45# - coolant level sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

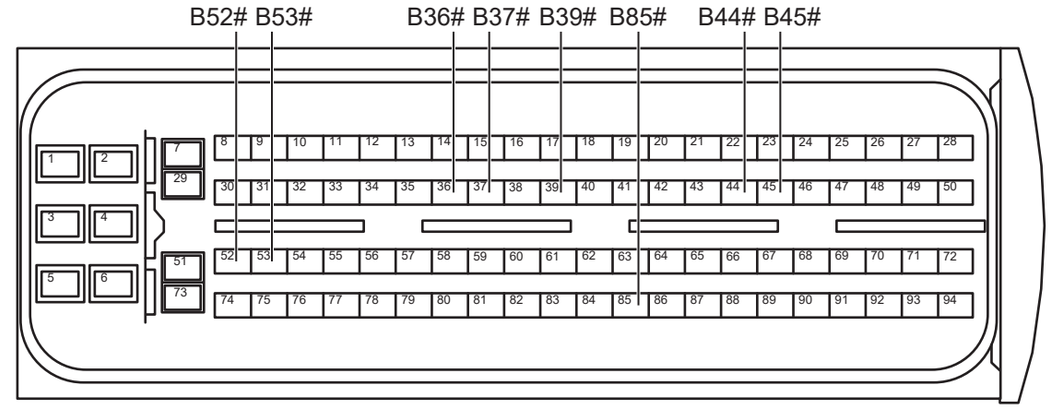
OK

5	**Check for short to ground in front intelligent area control unit wire harness and connector**



Front intelligent area control unit A connector

VC01011RM



Front intelligent area control unit B connector

VC01021RM

(a) According to value in the table, measure resistance.

Standard value

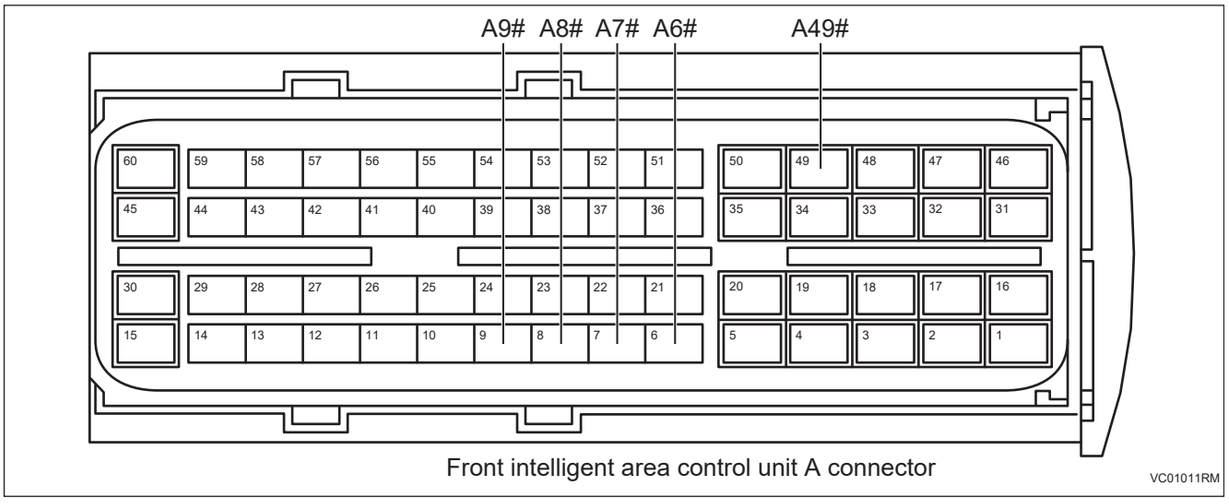
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A7# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B37# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B52# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B36# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A8# - body ground	Always connected	10 KΩ or more

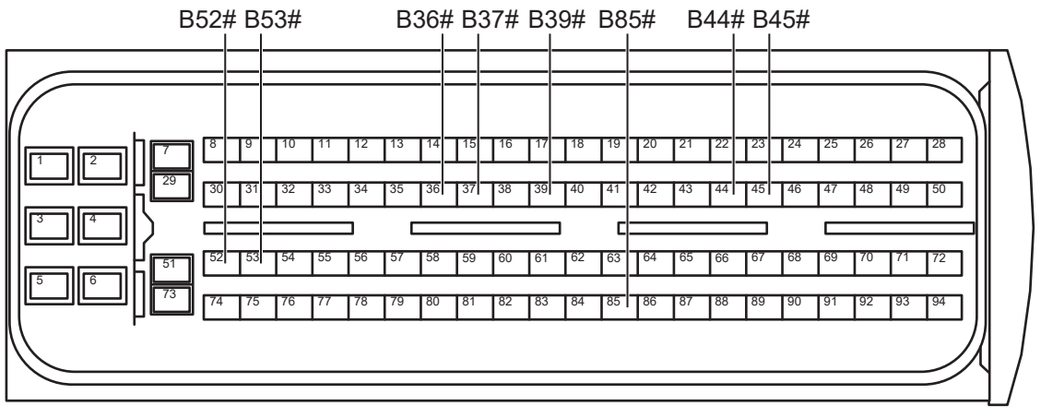
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A9# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B53# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B85# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A49# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B39# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B44# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B45# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in front intelligent area control unit wire harness and connector**





Front intelligent area control unit B connector

VC01021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

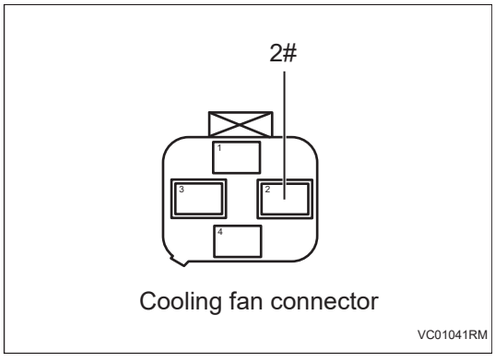
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B37# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B52# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B36# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A8# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B53# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B85# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A49# - body ground	Turn ignition switch to "ON"	Less than 1 V

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B39# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B44# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B45# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check cooling fan power supply**



Cooling fan connector

VC01041RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Cooling fan connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

8	**Replace multi-way valve 1/2, cooling fan, electric water pump 1, coolant temperature sensor 1 and motor coolant level sensor (See page RE-98)**

(a) Replace multi-way valve 1/2, cooling fan, electric water pump 1, coolant temperature sensor 1 and motor coolant level sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	P1B1C4B	Battery system water temperature high

Description

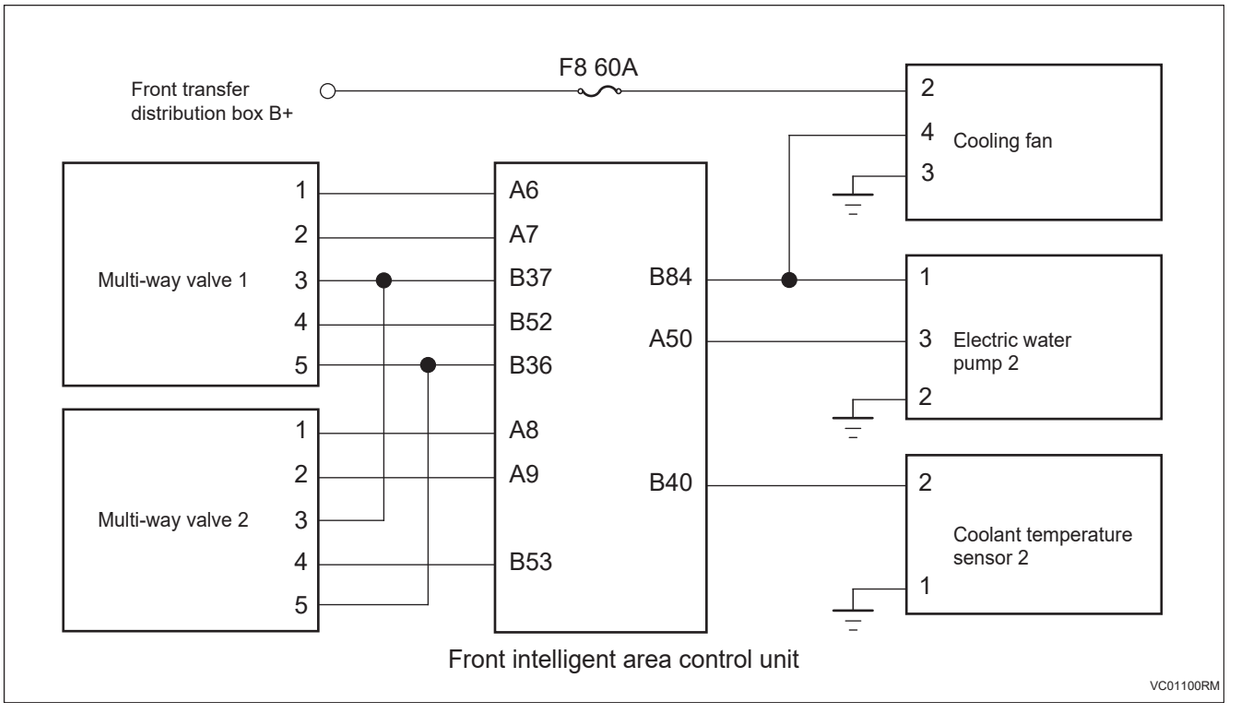
When water temperature of power battery system is too high, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B1C4B	• Power supply is in IGON	60° C	20 s	Continuous type	10 ms	• Coolant • Cooling line • Cooling fan • Radiator • Thermal management module • Electric water pump 2 • Coolant temperature sensor 2 • Multi-way valve 1 • Multi-way valve 2 • Wire harness and connector • Power battery control unit • Front intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B1C4B	• Instrument cluster alarm • HVCH enable prohibition	Not come on

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check coolant

(a) Check if coolant level is normal.

(b) Check coolant for deterioration.

NG → **Perform repair according to malfunction**

OK

2	Check coolant line

(a) Check coolant line for leakage or blockage.

(b) Check if coolant line connection is correct.

NG → **Perform repair according to malfunction**

OK

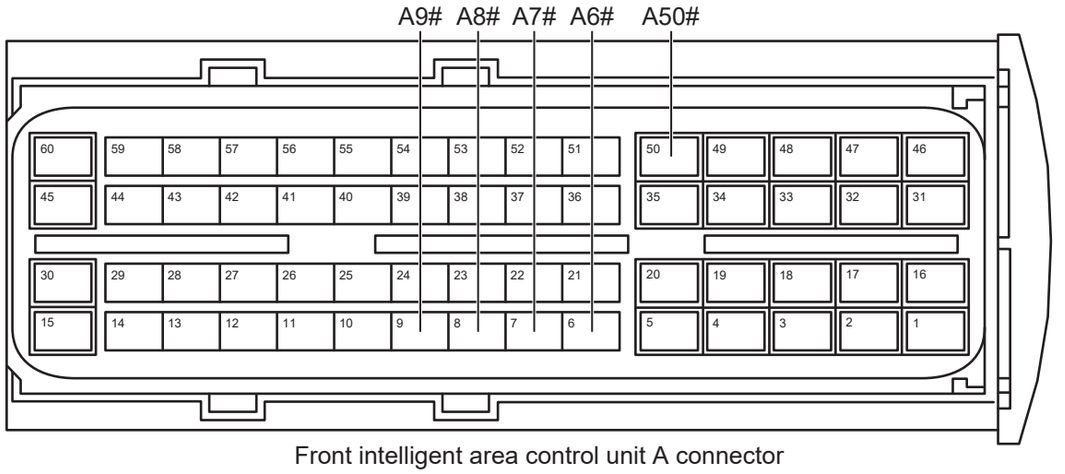
3	Check radiator

(a) Check if radiator function is normal.

NG → **Perform repair according to malfunction**

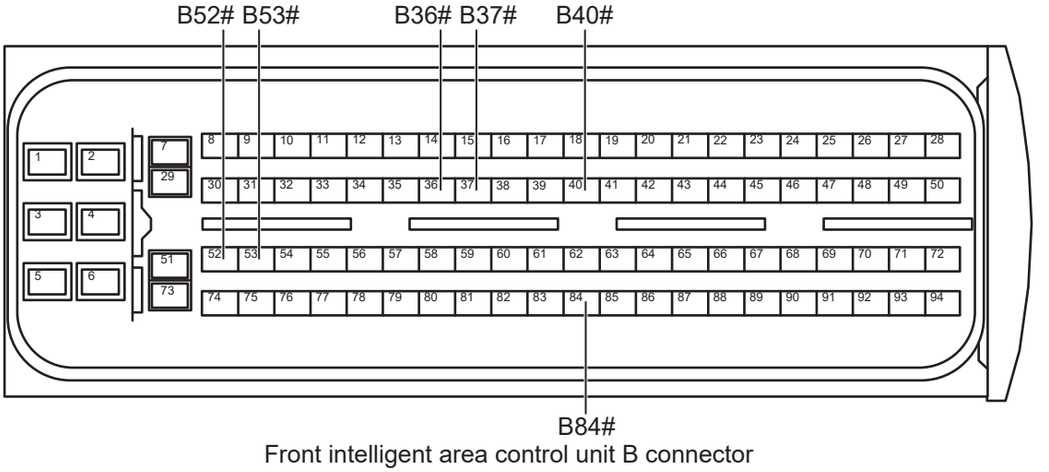
OK

4	**Check for open in front intelligent area control unit wire harness and connector**



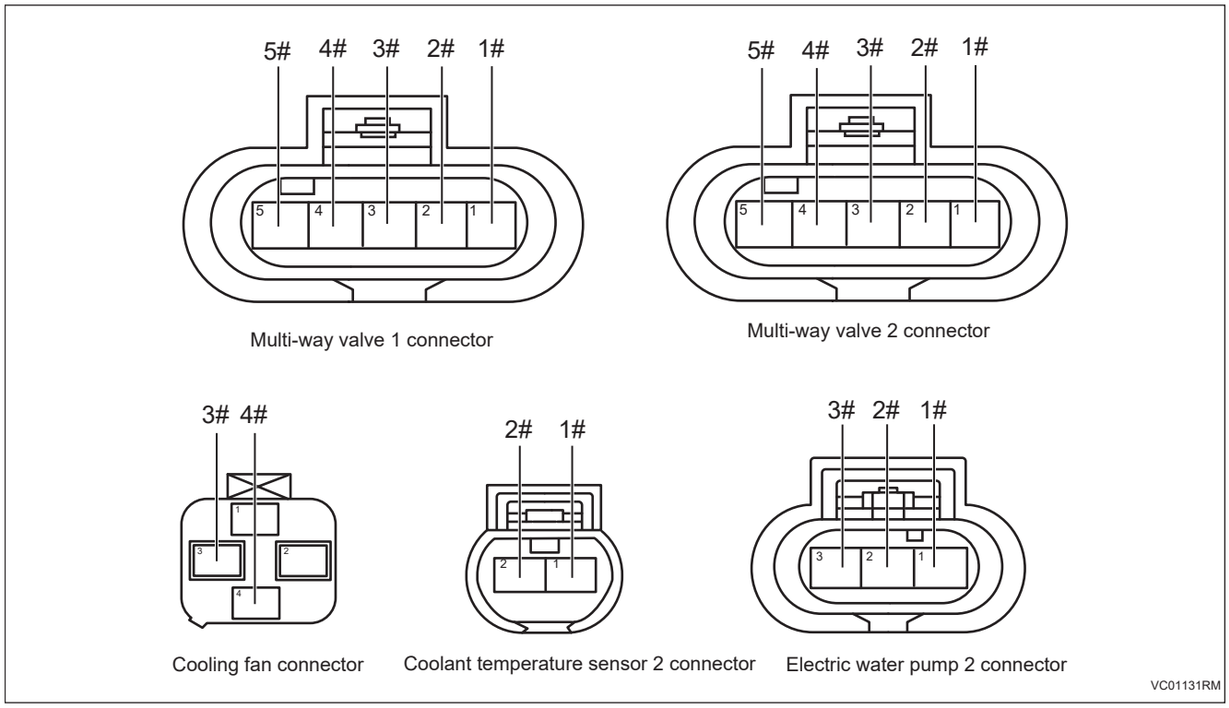
Front intelligent area control unit A connector

VC01111RM



Front intelligent area control unit B connector

VC01121RM



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Disconnect the multi-way valve 1 connector.

(e) Disconnect the multi-way valve 2 connector.

(f) Disconnect the cooling fan connector.

(g) Disconnect the electric water pump 2 connector.

(h) Disconnect the coolant temperature sensor 2 connector.

(i) Disconnect the coolant level sensor connector.

(j) According to value in the table, measure resistance.

Standard value

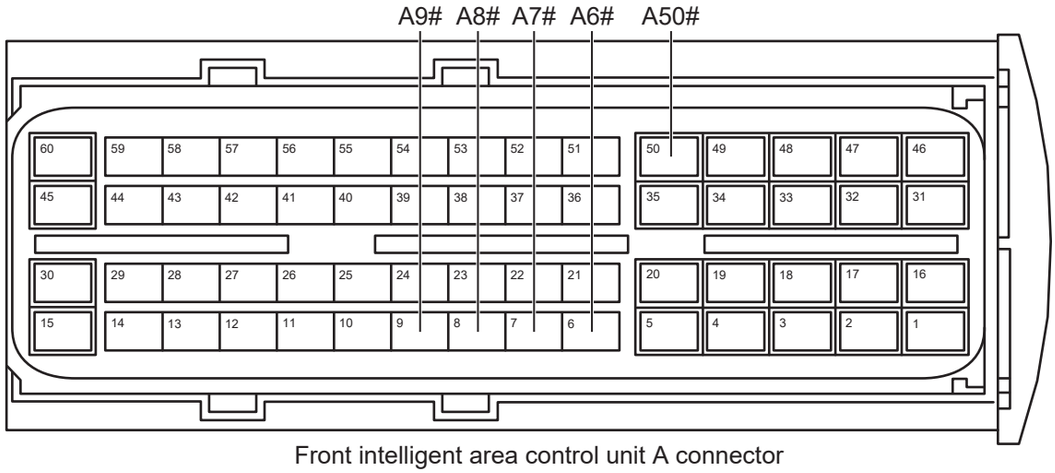
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - multi-way valve 1 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A7# - multi-way valve 1 connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B37# - multi-way valve 1 connector 3#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B52# - multi-way valve 1 connector 4#	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B36# - multi-way valve 1 connector 5#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A8# - multi-way valve 2 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A9# - multi-way valve 2 connector 2#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B37# - multi-way valve 2 connector 3#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B53# - multi-way valve 2 connector 4#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B36# - multi-way valve 2 connector 5#	Always connected	Less than 1 Ω
Front intelligent area control unit connector B85# - cooling fan connector 4#	Always connected	Less than 1 Ω
Cooling fan connector 3# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B84# - electric water pump 2 connector 1#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A50# - electric water pump 2 connector 3#	Always connected	Less than 1 Ω
Electric water pump 2 connector 2# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B40# - coolant temperature sensor 2 connector 2#	Always connected	Less than 1 Ω
Coolant temperature sensor 2 connector 1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

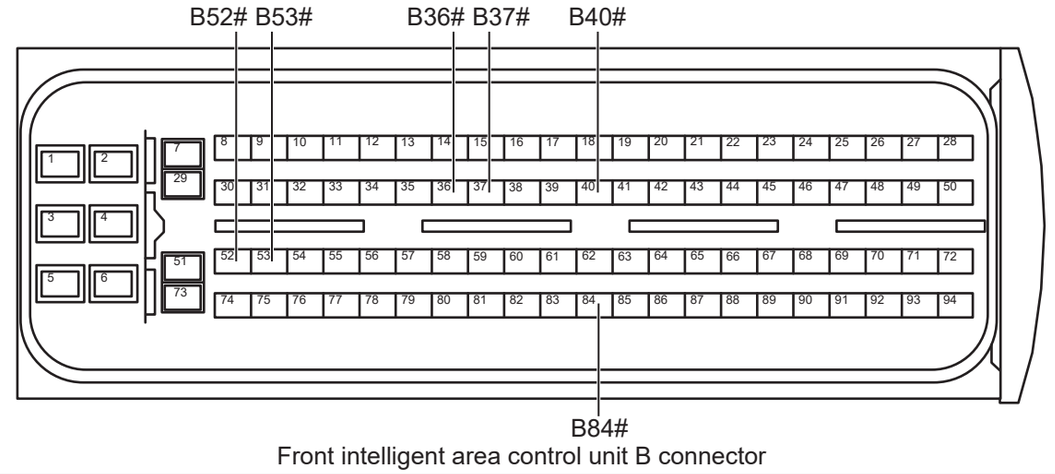
OK →

5	**Check for short to ground in front intelligent area control unit wire harness and connector**



Front intelligent area control unit A connector

VC01111RM



Front intelligent area control unit B connector

VC01121RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A7# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B37# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B52# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B36# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A8# - body ground	Always connected	10 KΩ or more

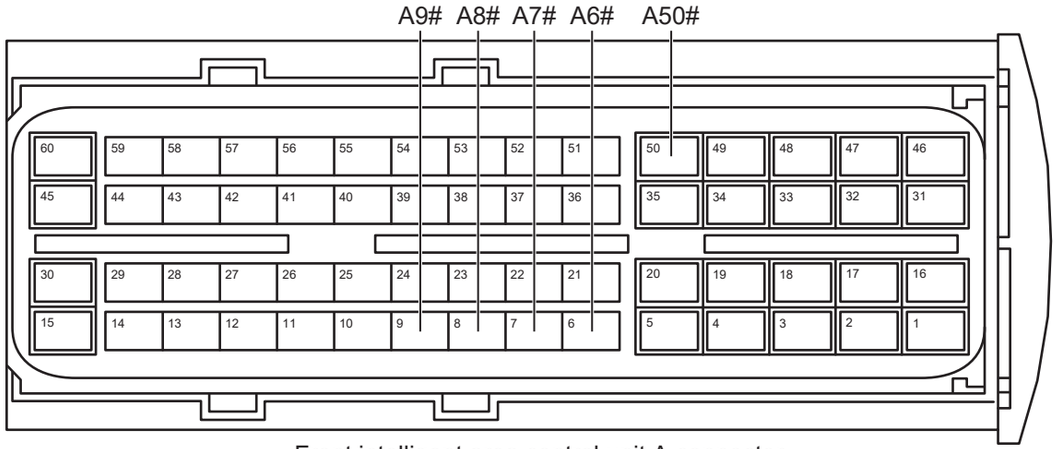
ZD

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A9# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B53# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B84# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector A50# - body ground	Always connected	10 KΩ or more
Front intelligent area control unit connector B40# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

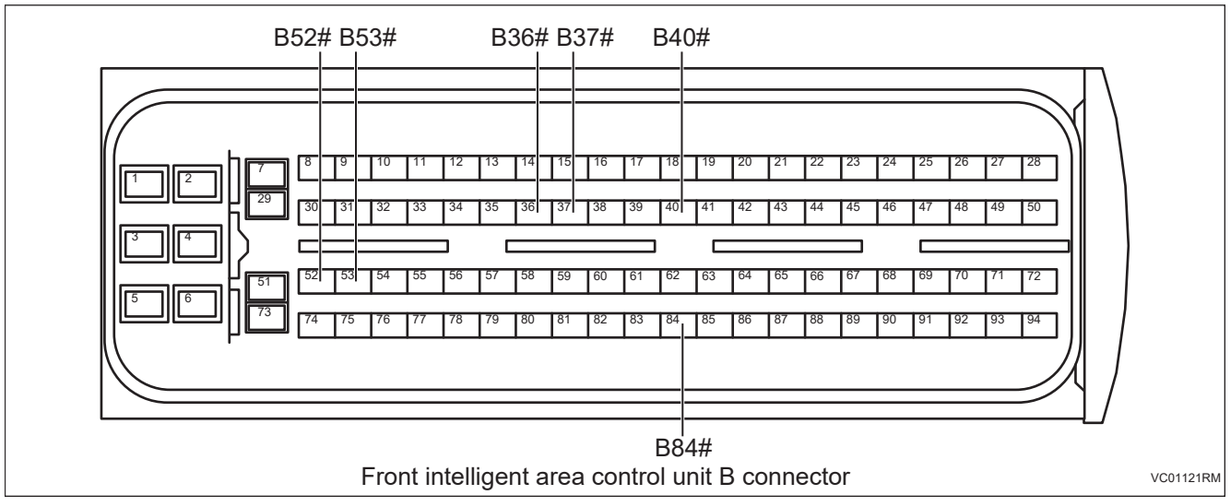
OK

6	**Check for short to power supply in front intelligent area control unit wire harness and connector**



Front intelligent area control unit A connector

VC01111RM



Front intelligent area control unit B connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B37# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B52# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B36# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A8# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector A9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B53# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B84# - body ground	Turn ignition switch to "ON"	Less than 1 V

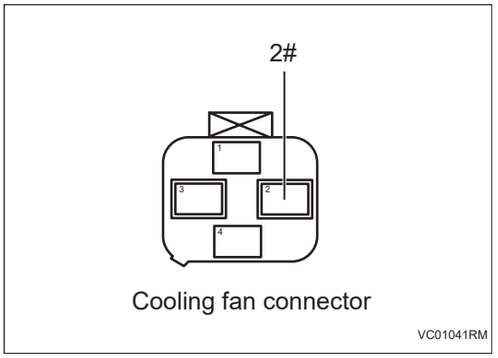
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A50# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front intelligent area control unit connector B40# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

7	**Check cooling fan power supply**



Cooling fan connector

VC01041RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Cooling fan connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

8	**Replace multi-way valve 1/2, cooling fan, electric water pump 2 and coolant temperature sensor 2 (See page RE-98)**

(a) Replace multi-way valve 1/2, cooling fan, electric water pump 2 and coolant temperature sensor 2.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front intelligent area control unit (See page ZC-128)**

OK

Diagnosis ends

DTC	P1B1D01	VDC power supply voltage too low
DTC	P1B1D16	VDC power supply voltage low
DTC	P1B1D17	VDC power supply voltage high
DTC	P1B1D1C	VDC power supply voltage too high
DTC	P1B391D	TC397 power management chip (PMIC) power supply abnormal
DTC	B173201	VDC power supply voltage too low
DTC	B173317	VDC power supply voltage low
DTC	B173316	VDC power supply voltage high
DTC	B17331C	VDC power supply voltage too high
DTC	B17351C	DRA821 PMIC (power management chip) power supply abnormal

DTC	P1B7C00	Battery charging system fault

Description

When intelligent vehicle control platform control unit power supply voltage is out of normal operation range, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B1D01	• VDC operates normally • Detection begins at 1.5 seconds after power on	• cyclic	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
P1B1D16	• VDC operates normally • Detection begins at 1.5 seconds after power on	• VDC power supply voltage lower than 9 V	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
P1B1D17	• VDC operates normally • Detection begins at 1.5 seconds after power on	• VDC power supply voltage higher than 18 V	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
P1B1D1C	• VDC operates normally • Detection begins at 1.5 seconds after power on	• VDC power supply voltage higher than 26 V	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
P1B391D	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	TC397 PMIC power supply voltage higher than 3.6 V / lower than 3 V	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system

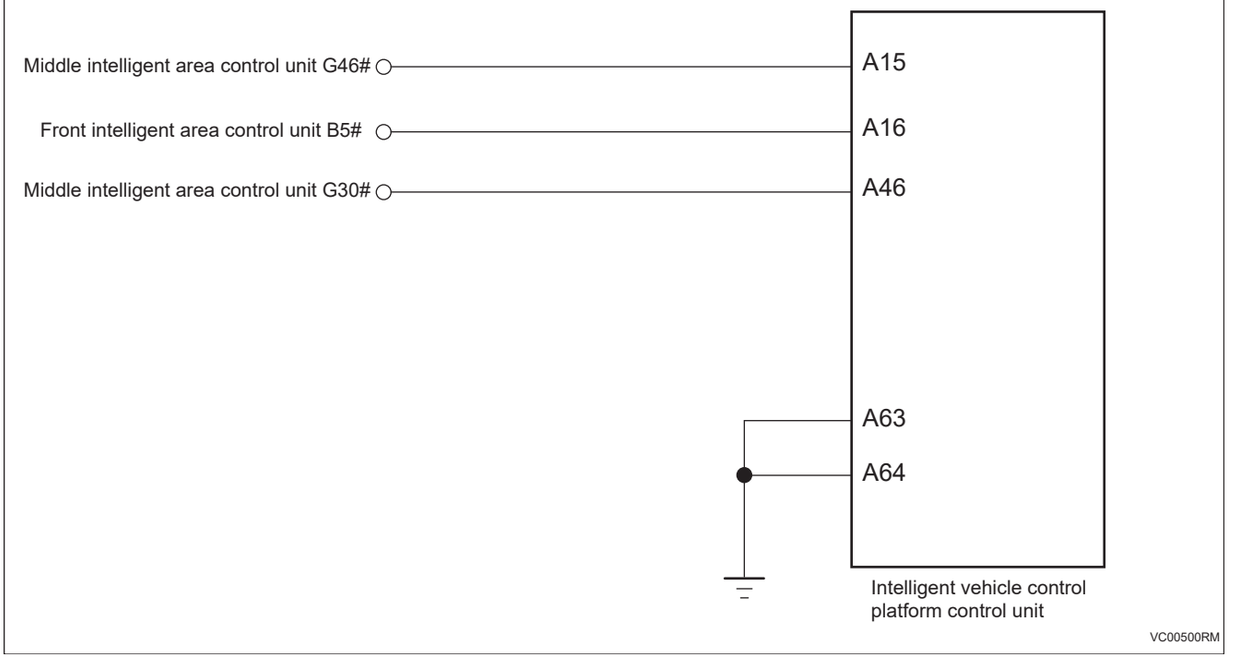
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B173201	• VDC operates normally • Detection begins at 1.5 seconds after power on	VDC power supply voltage lower than 6 V	50 ms	Periodic type	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
B173317	• VDC operates normally • Detection begins at 1.5 seconds after power on	VDC power supply voltage lower than 9 V	50 ms	Periodic type	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
B173316	• VDC operates normally • Detection begins at 1.5 seconds after power on	VDC power supply voltage higher than 18 V	50 ms	Periodic type	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
B17331C	• VDC operates normally • Detection begins at 1.5 seconds after power on	VDC power supply voltage higher than 26 V	50 ms	Periodic type	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
B17351C	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 PMIC power supply voltage higher than 3.6 V / lower than 3 V	50 ms	Periodic type	10 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Charging system
P1B7C00						• Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B1D01		Not come on
P1B1D16		Not come on
P1B1D17		Not come on
P1B1D1C		Not come on
P1B391D	• TC397 function is abnormal	Not come on
B173201	• No function	Not come on
B173317	• Only keep start-related functions Class A	Not come on
B173316	• Necessary function for normal starting, FSC A 60s	Not come on
B17331C	• No function	Not come on
B17351C	• DRA821 function is abnormal	Not come on
P1B7C00	• DCDC does not output	Not come on

ZD

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

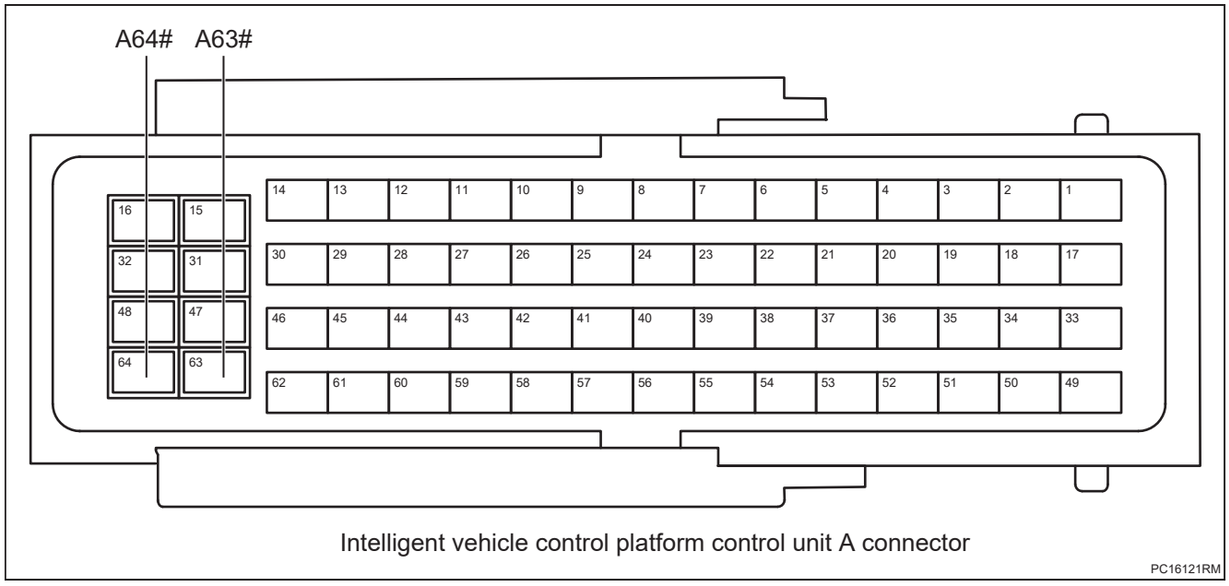
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check intelligent vehicle control platform control unit ground



Intelligent vehicle control platform control unit A connector

PC16121RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

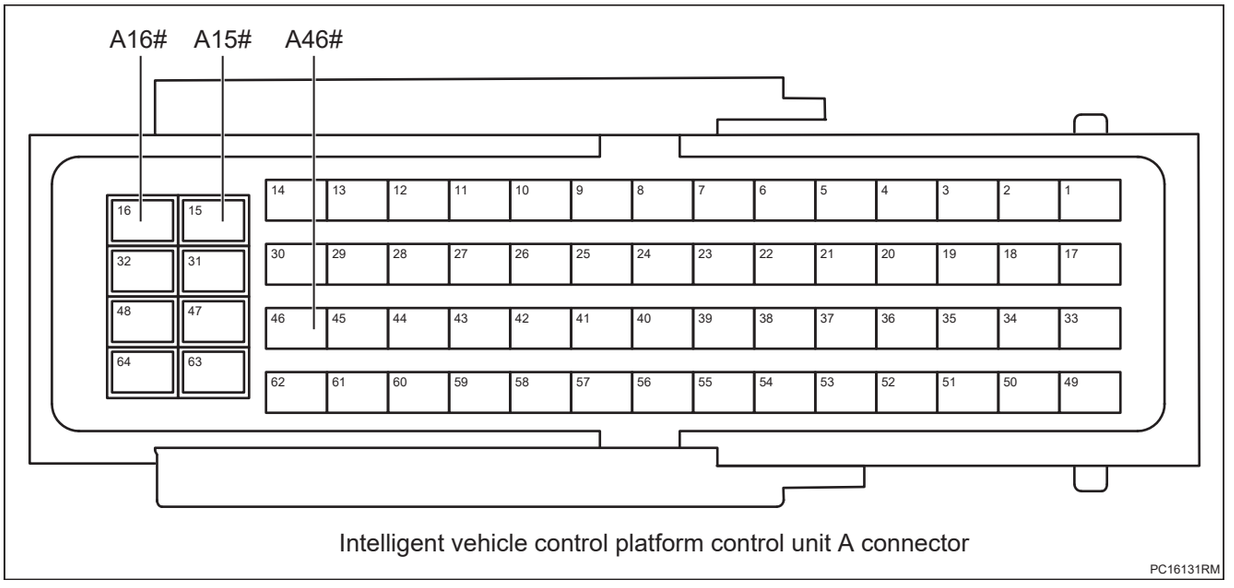
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check intelligent vehicle control platform control unit power supply**



Intelligent vehicle control platform control unit A connector

PC16131RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	Battery voltage
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	Battery voltage
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	Battery voltage

NG

Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check the power supply and ground of front and middle intelligent area control units and confirm if the front and middle intelligent area control units are damaged)

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

DTC	P1B1E17	Accelerator pedal 1 sensor power supply voltage out of upper limit
DTC	P1B1E16	Accelerator pedal 1 sensor power supply voltage out of lower limit
DTC	P1B1F17	Accelerator pedal 1 sensor signal voltage out of upper limit
DTC	P1B1F16	Accelerator pedal 1 sensor signal voltage out of lower limit
DTC	P1B2017	Accelerator pedal 2 sensor power supply voltage out of upper limit
DTC	P1B2016	Accelerator pedal 2 sensor power supply voltage out of lower limit
DTC	P1B2117	Accelerator pedal 2 sensor signal voltage out of upper limit

DTC	P1B2116	Accelerator pedal 2 sensor signal voltage out of lower limit

Description

When power supply or signal voltage of electronic accelerator pedal sensors 1 and 2 is out of range, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B1E17	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 1 power supply voltage is higher than 5.5 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B1E16	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 1 power supply voltage is lower than 4.5 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B1F17	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 1 signal voltage is higher than 4.82 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B1F16	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds	Accelerator pedal 1 signal voltage is lower than 0.66 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit

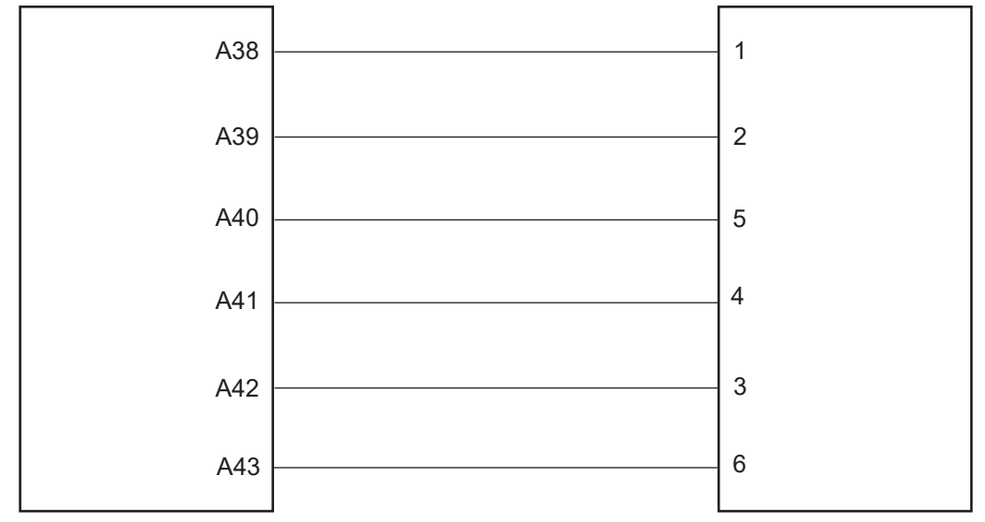
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	after power on					
P1B2017	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 2 power supply voltage is higher than 5.5 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B2016	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 2 power supply voltage is lower than 4.5 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B2117	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 2 signal voltage is higher than 2.41 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit
P1B2116	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Accelerator pedal 2 signal voltage is lower than 0.33 V	50 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B1E17	• Accelerator pedal function abnormal	Not come on
P1B1E16	• Accelerator pedal function abnormal	Not come on

DTC No.	Fault symptom	Warning light/indicator
P1B1F17	• Accelerator pedal function abnormal	Not come on
P1B1F16	• Accelerator pedal function abnormal	Not come on
P1B2017	• Accelerator pedal function abnormal	Not come on
P1B2016	• Accelerator pedal function abnormal	Not come on
P1B2117	• Accelerator pedal function abnormal	Not come on
P1B2116	• Accelerator pedal function abnormal	Not come on

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Confirm and clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Record and clear DTCs.

(d) Perform driving test again under the conditions described by the user.

(e) Check if DTC occurs again.

Result

Result	Proceed to
DTCs occur again	OK
DTCs do not occur again	NG

NG → **Check connector and clean connector**

OK

2	Check for short to each other in electronic accelerator pedal wire harness and connector

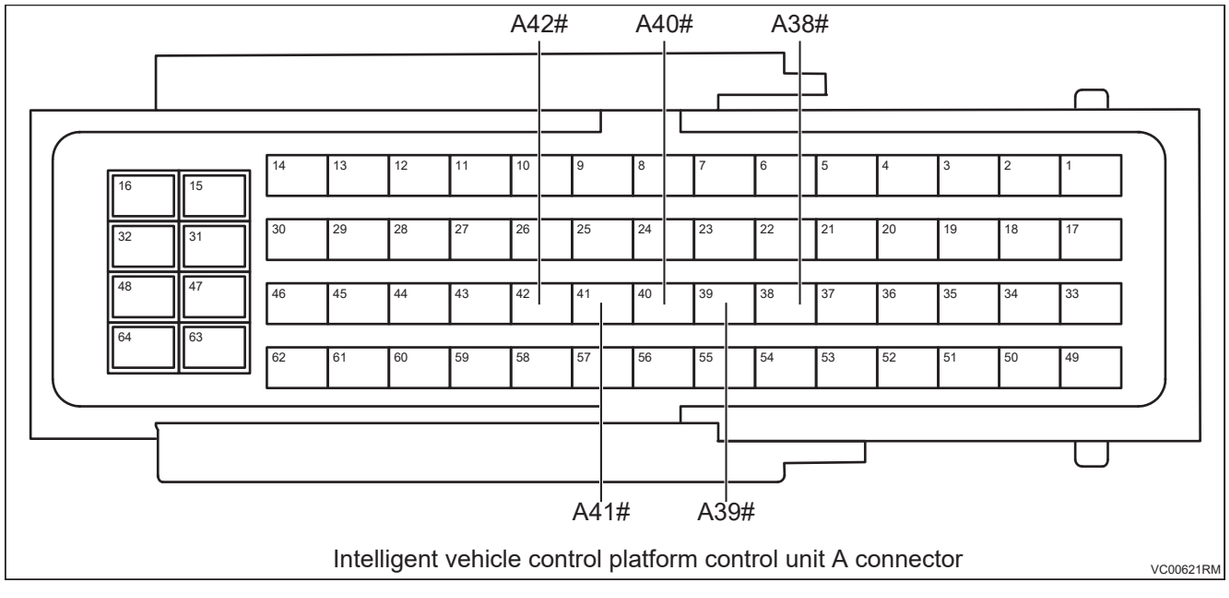
(a) Check if electronic accelerator pedal wire harness and connector are aging and damaged.

(b) Check for short to each other in electronic accelerator pedal wire harness and connector

NG → **Check and repair or replace wire harness and connector**

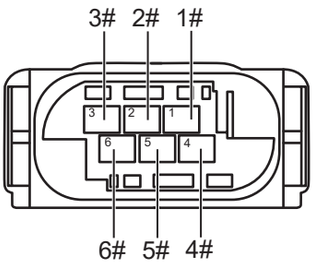
OK

3	Check for open in electronic accelerator pedal wire harness and connector



Intelligent vehicle control platform control unit A connector

VC00621RM



Electronic accelerator pedal connector
VC00631RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

Standard value

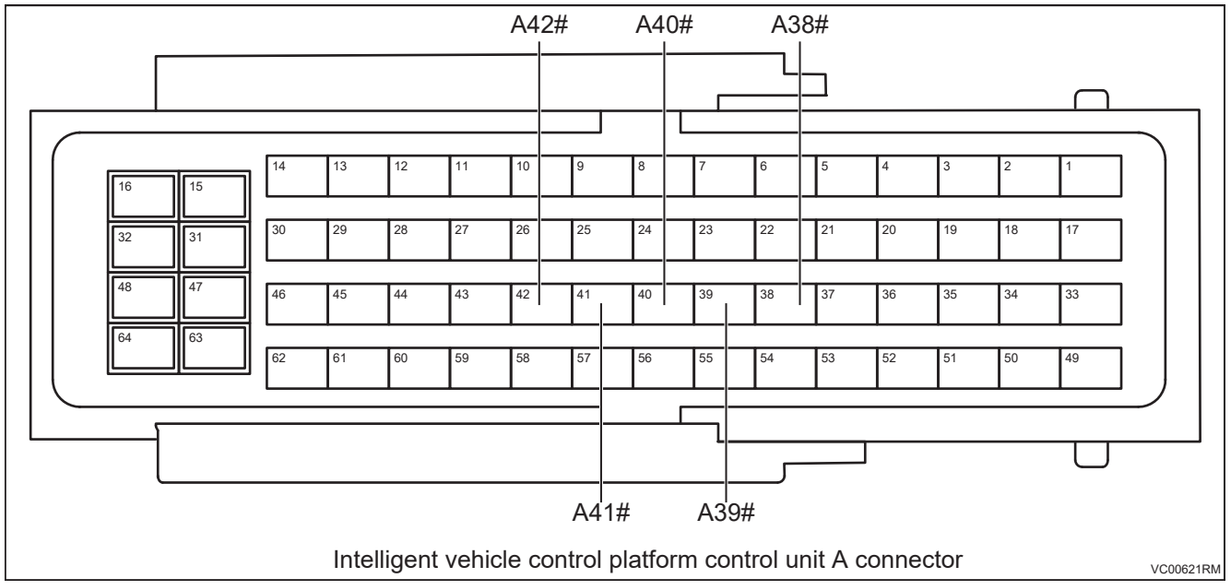
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - electronic accelerator pedal connector 1#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A39# - electronic accelerator pedal connector 2#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A40# - electronic accelerator pedal connector 5#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A41# - electronic accelerator pedal connector 4#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A42# - electronic accelerator pedal connector 3#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A43# - electronic accelerator pedal connector 6#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00621RM

(a) According to value in the table, measure resistance.

Standard value

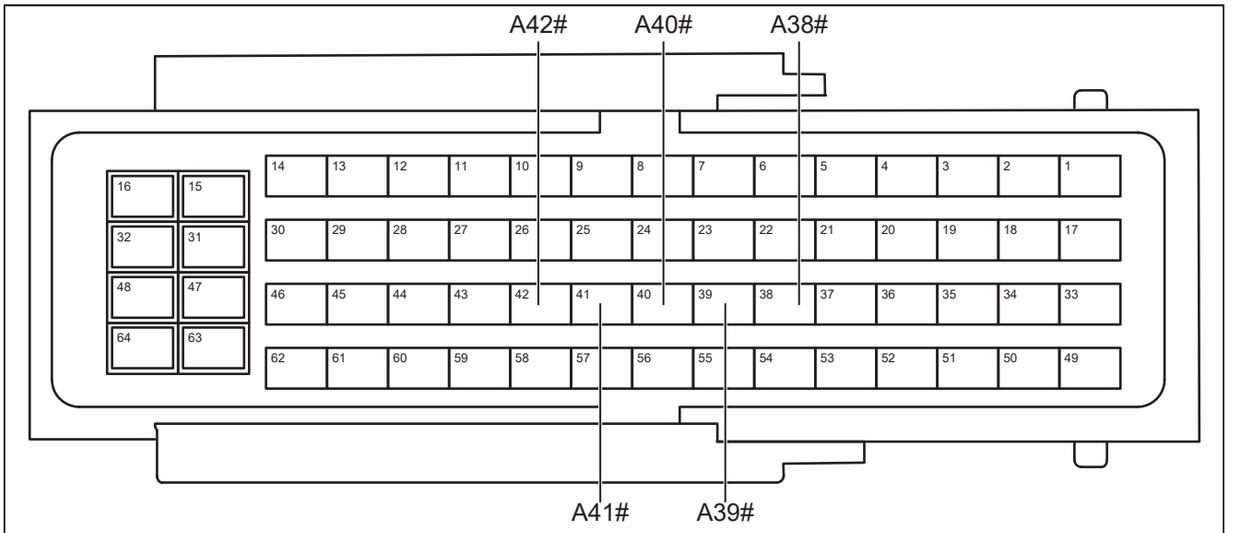
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A39# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A40# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A41# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A42# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A43# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A39# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A40# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A41# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A42# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A43# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

6	**Replace electronic accelerator pedal (See page ZC-7)**

(a) Replace electronic accelerator pedal.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	P1B2B00	Pre-charging timeout fault

Description

When precharging timeout fault occurs in intelligent vehicle control platform control unit, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B2B00	• Power supply is in IGON	The relay is recognized as not closed 1500 ms after the relay closing command is issued	1500 ms	Continuous type	10 ms	• Power battery control unit • Intelligent vehicle control platform control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B2B00	• Unable to power on with high voltage	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check power battery control unit for any DTCs output

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

2	Check power battery control unit wire harness and connector

(a) Check if power battery control unit connector is connected securely.

(b) Check power battery control unit wire harness and connector for breakage or aging.

(c) Check for short or open in power battery control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

ZD

DTC	P1B2F29	Simultaneous failure for MCU speed and ABS vehicle speed

Description

When MCU vehicle speed and ABS vehicle speed fail at the same time, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B2F29	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B2F29	• Power system fault light • The vehicle cannot be driven	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

ZD

2	Check integrated brake controller for any DTCs output

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

3	Check integrated brake controller wire harness and connector

(a) Check if integrated brake controller connector is connected securely.

(b) Check integrated brake controller wire harness and connector for breakage or aging.

(c) Check for short or open in integrated brake controller wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check rear electric drive system inverter for any DTCs output.**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

5	**Check electric rear drive system inverter wire harness and connector**

(a) Check if rear electric drive system inverter connector is connected securely.

(b) Check rear electric drive system inverter wire harness and connector for breakage or aging.

(c) Check for short or open in rear electric drive system inverter wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check intelligent vehicle control platform control unit wire harness and connector**

(a) Check if intelligent vehicle control platform control unit connector is connected securely.

(b) Check intelligent vehicle control platform control unit wire harness and connector for breakage or aging.

(c) Check for short or open in intelligent vehicle control platform control unit wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

ZD

DTC	P1B2200	Interlock error
DTC	P1B3A42	TC397 NvM memory abnormal
DTC	P1B3B00	TC397 chip resource abnormal
DTC	B173542	DRA821 NvM memory abnormal
DTC	B173600	DRA821 CPU Usage overload
DTC	B173700	DRA821 DDR overloaded
DTC	B174000	DRA821 sleep abnormal
DTC	B174186	DRA821 IPC communication abnormal
DTC	B174D00	Chip internal safety related module/IP function safety monitoring fault
DTC	B174E00	Chip peripheral module related function safety monitoring fault
DTC	B174F00	Watchdog input or function safety software scheduling related fault
DTC	B150900	DRA821 CPU Usage overload
DTC	B150A00	DRA821 DDR overloaded
DTC	B150E00	DRA821 EMMC operating abnormal
DTC	B150F86	DRA821 IPC communication abnormal

DTC	**P1B4700**	**Chip internal safety related module/IP function safety monitoring fault**
DTC	**P1B4800**	**Chip peripheral module related function safety monitoring fault**
DTC	**P1B4900**	**Watchdog input or function safety software scheduling related fault**
DTC	**P1B7D00**	**Function safety monitoring fault of abnormal chip shutdown path inspection**
DTC	**P1B7E00**	**Function safety monitoring fault of abnormal chip ErrorPin release**
DTC	**P1B7F00**	**Abnormal low function safety monitoring fault during chip ErrorPin operation**

Description

When internal fault is detected in intelligent vehicle control platform control unit, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B2200	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	Refer to FDD high voltage interlock requirement specification for details	50 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit
P1B3A42	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	TC397 NvM drive is abnormal 1 time	1 time	event	/	• Intelligent vehicle control platform control unit
P1B3B00	• Voltage is between 6 V and 26 V	TC397 CPU Usage exceeds 95%	60 s	cyclic	2 s	• Intelligent vehicle control platform control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• VDC operates normally • Detection begins at 1.5 seconds after power on					
B173542	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 NvM drive is abnormal 1 time	1 time	Event-based	—	• Intelligent vehicle control platform control unit
B173600	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 CPU Usage exceeds 95%	60 s	Periodic type	2 s	• Intelligent vehicle control platform control unit
B173700	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 DDR overloaded	60 s	Periodic type	2 s	• Intelligent vehicle control platform control unit
B174000	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 cannot sleep for more than 30 min	2 s	Periodic type	100 ms	• Intelligent vehicle control platform control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B174186	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 IPC communication is abnormal 1 time	1 time	Event-based	—	• Intelligent vehicle control platform control unit
B174D00	• VDC operates normally	N.A.	< 200 ms	Periodicity	10 ms	• Intelligent vehicle control platform control unit
B174E00	• VDC operates normally	N.A.	< 200 ms	Periodicity	10 ms	• Intelligent vehicle control platform control unit
B174F00	• VDC operates normally	N.A.	< 200 ms	Periodicity	10 ms	• Intelligent vehicle control platform control unit
B150900	• VDC system monitoring module operates normally	DRA821 CPU Usage exceeds 95%	60 s	Periodicity	2 s	• Intelligent vehicle control platform control unit
B150A00	• VDC system monitoring module operates normally	DRA821 DDR overloaded	60 s	Periodicity	2 s	• Intelligent vehicle control platform control unit
B150E00	• VDC diagnosis operates normally	DRA821 operates/lives abnormally for more than 60 s	1 time	Event-based	—	• Intelligent vehicle control platform control unit
B150F86	• VDC diagnosis operates normally	DRA821 IPC communication is abnormal 1 time	1 time	Event-based	—	• Intelligent vehicle control platform control unit
P1B4700	• VDC operates normally	N.A.	< 200 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit
P1B4800	• VDC operates normally	N.A.	< 200 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit
P1B4900	• VDC operates normally	N.A.	< 200 ms	cyclic	10 ms	• Intelligent vehicle control platform control unit
P1B7D00	• VDC operates normally	N.A.	< 200 ms	event	One time for each driving cycle	• Intelligent vehicle control platform control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B7E00	• VDC operates normally	N.A.	< 200 ms	event	One time for each driving cycle	• Intelligent vehicle control platform control unit
P1B7F00	• VDC operates normally	N.A.	< 200 ms	event	One time for each driving cycle	• Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B2200	• High voltage interlock state abnormal	Not come on
P1B3A42	• TC397 storage function is abnormal	Not come on
P1B3B00	• TC397 has no function	Not come on
B173542	• DRA821 storage function is abnormal	Not come on
B173600	• DRA821 has no function	Not come on
B173700	• DRA821 has no function	Not come on
B174000	• DRA821 cannot sleep	Not come on
B174186	• DRA821 IPC communication is abnormal or can not communicate	Not come on
B174D00	• Chip operating abnormal	Not come on
B174E00	• Chip operating abnormal	Not come on
B174F00	• Chip operating abnormal	Not come on
B150900	• DRA821 has no function	Not come on
B150A00	• DRA821 has no function	Not come on
B150E00	• DRA821 EMMC operating abnormal	Not come on
B150F86	• DRA821 IPC communication is abnormal or can not communicate	Not come on
P1B4700	• Chip operating abnormal	Not come on
P1B4800	• Chip operating abnormal	Not come on
P1B4900	• Chip operating abnormal	Not come on
P1B7D00	• Chip operating abnormal	Not come on
P1B7E00	• Chip operating abnormal	Not come on
P1B7F00	• Chip operating abnormal	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

DTC	**P1B0200**	**Function safety level 2 fault**
DTC	**P1B0300**	**Function safety level 3 fault**
DTC	**P1B057E**	**Disconnecting device failing to engage**
DTC	**P1B057F**	**Disconnecting device failing to separate**

Description

When disconnection device is faulty, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B0200	• Vehicle power mode is in IGON and there is no fault causing the torque monitoring function to be disabled in the vehicle.	• Total driver demand torque > torque monitoring upper limit value 200 ms or < torque monitoring lower limit value 200 ms • Torque requireme-nt of single shaft is less than MSR requested torque for 200 ms or is more than TCS requested torque for more than 200 ms (front motor is not in speed mode)	200 ms	Continuous type	5 ms	• Battery/charging system • Wire harness and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
P1B0300	• Vehicle power mode is in	• The actual torque converted	400 ms	Continuous type	5 ms	• Battery/charging system • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	IGON and there is no fault causing the torque monitoring function to be disabled in the vehicle.	from acceleratio-n is greater than the torque monitoring upper limit value and the drive power of vehicle is greater than 6 kw for 400 ms or less than the torque monitoring lower limit value for 400 ms • Monitoring motor is in abnormal operation status for 400 ms				• Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
P1B057E	• Power supply is in IGON	• The power system mode is in 4WD status. The speed difference between input side and output side of the disconnect-ion device is ⩾ 150 rpm and lasts for 0.1 s	5 ms	Continuous type	5 ms	• Battery/charging system • Wire harness and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B057F	• Power supply is in IGON	• The power system is in 2WD status. The front motor speed is ⩾ 500 rpm and lasts for 0.1 s; • The power system is in a separated state. The front motor sends oscillating torque. The EDD state is not separated and lasts for 10 s	5 ms	Continuous type	5 ms	• Battery/charging system • Wire harness and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B0200	• The power system fault light turns on	Comes on
P1B0300	• The power system fault light turns on • Vehicle cannot be driven	Comes on
P1B057E	• Disconnecting device failing to engage	Comes on
P1B057F	• Disconnecting device failing to separate	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	**Check front intelligent area control unit wire harness and connector**

(a) Check if front intelligent area control unit connector is connected securely.

(b) Check front intelligent area control unit wire harness and connector for breakage or aging.

(c) Check for short or open in front intelligent area control unit wire harness and connector.

NG → **Perform repair according to malfunction**

OK

3	**Check middle intelligent area control unit wire harness and connector**

(a) Check if middle intelligent area control unit connector is connected securely.

(b) Check middle intelligent area control unit wire harness and connector for breakage or aging.

(c) Check for short or open in middle intelligent area control unit wire harness and connector.

NG → **Perform repair according to malfunction**

OK

4	**Check rear intelligent area control unit wire harness and connector**

(a) Check if rear intelligent area control unit connector is connected securely.

(b) Check rear intelligent area control unit wire harness and connector for breakage or aging.

(c) Check for short or open in rear intelligent area control unit wire harness and connector.

NG → **Perform repair according to malfunction**

OK

5	**Check intelligent vehicle control platform control unit wire harness and connector**

(a) Check if intelligent vehicle control platform control unit connector is connected securely.

(b) Check intelligent vehicle control platform control unit wire harness and connector for breakage or aging.

(c) Check for short or open in intelligent vehicle control platform control unit wire harness and connector.

NG → **Perform repair according to malfunction**

OK

6	**Replace front/middle/rear intelligent area control unit (See page ZC-128) (See page ZC-132) (See page ZC-135)**

(a) Replace the front/middle/rear intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:
No DTC outputs.

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	**P1B384B**	**TC397 temperature out of limit**
DTC	**B17344B**	**DRA821 temperature out of limit**
DTC	**B15074B**	**DRA821 temperature out of limit**

Description

When temperature of intelligent vehicle control platform control unit is too high, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B384B	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	TC397 junction temperature exceeds 125° C (hardware recommended)	2 s	cyclic	100 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Ambient temperature
B17344B	• Voltage is between 6 V and 26 V • VDC operates normally • Detection begins at 1.5 seconds after power on	DRA821 junction temperature exceeds 115° C (hardware recommended)	2 s	Periodic type	100 ms	• Intelligent vehicle control platform control unit • Wire harness and connector • Ambient temperature
B15074B	• VDC diagnosis operates normally	DRA821 junction temperature exceeds 115° C (hardware recommended)	5 s	Periodic type	1 s	• Intelligent vehicle control platform control unit • Wire harness and connector • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B384B	TC397 has no function	—
B17344B	DRA821 has no function	—
B15074B	DRA821 has no function	—

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Lower temperature of Intelligent vehicle control platform control unit**

(a) Lower the intelligent vehicle control platform control unit to normal operating temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	**P1B1100**	**Brake failure**
DTC	**P1B1200**	**IBC brake pedal status fault**
DTC	**P1B1400**	**IBC brake travel failure**
DTC	**P1B2729**	**RegenerationTorqueRequest signal invalid**
DTC	**P1B2829**	**ESC_TorqueReq_VMC_1 signal invalid**

DTC	P1B2A29	AvailableSt_MSR signal unreliable

Description

When integrated brake controller is faulty, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B1100	• Refer to CAN specification for details	Brake pedal status error or IBC communication fault	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector
P1B1200	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector
P1B1400	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2729	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2829	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2A29	• After ready	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Integrated brake controller • Intelligent vehicle control platform control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B1100	• Intelligent driving prohibition • Automatic parking prohibition	Not come on
P1B1200	• Corresponding function may become ineffective	Not come on
P1B1400	• Corresponding function may become ineffective	Not come on
P1B2729	• No brake energy recovery	Not come on

DTC No.	Fault symptom	Warning light/indicator
P1B2829	• Intelligent driving prohibition • Automatic parking prohibition	Not come on
P1B2A29	• Corresponding function may become ineffective	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check integrated brake controller for any DTCs output

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

3	Check integrated brake controller wire harness and connector

(a) Check if integrated brake controller connector is connected securely.

(b) Check integrated brake controller wire harness and connector for breakage or aging.

(c) Check for short or open in integrated brake controller wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check intelligent vehicle control platform control unit wire harness and connector

(a) Check if intelligent vehicle control platform control unit connector is connected securely.

(b) Check intelligent vehicle control platform control unit wire harness and connector for breakage or aging.

(c) Check for short or open in intelligent vehicle control platform control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

DTC	P1B2329	TorqueReductionFast_TCS_FrontWhe signal invalid

DTC	**P1B2429**	**TorqueReductionFast_TCS_RearWheel signal invalid**
DTC	**P1B2529**	**TorqueIncrease_MSR_FrontWheel signal invalid**
DTC	**P1B2629**	**TorqueIncrease_MSR_RearWheel signal invalid**
DTC	**P1B2D29**	**Typical signal related to rear MCU torque invalid**

Description

When front or rear electric drive system inverter is faulty, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B2329	• Refer to CAN specification for details	• Depending on CAN protocol	5 ms	Continuous type	5 ms	• Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2429	• Refer to CAN specification for details	• Depending on CAN protocol	5 ms	Continuous type	5 ms	• Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2529	• Refer to CAN specification for details	• Depending on CAN protocol	5 ms	Continuous type	5 ms	• Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2629	• Refer to CAN specification for details	• Depending on CAN protocol	5 ms	Continuous type	5 ms	• Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2D29	• Refer to CAN specification for details	• Depending on CAN protocol	5 ms	Continuous type	5 ms	• Electric rear drive system inverter • Intelligent vehicle control platform control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B2329	• Front axle TCS prohibition	Not come on
P1B2429	• Front axle TCS prohibition	Not come on
P1B2529	• Front axle TCS prohibition	Not come on
P1B2629	• Front axle TCS prohibition	Not come on
P1B2D29	• Corresponding function may become ineffective	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

ZD

1	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check front or rear electric drive system inverter for any DTCs output

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

3	**Check front or rear electric drive system inverter wire harness and connector**

(a) Check if front or rear electric drive system inverter connector is connected securely.

(b) Check front or rear electric drive system inverter wire harness and connector for breakage or aging.

(c) Check for short or open in front or rear electric drive system inverter wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check intelligent vehicle control platform control unit wire harness and connector**

(a) Check if intelligent vehicle control platform control unit connector is connected securely.

(b) Check intelligent vehicle control platform control unit wire harness and connector for breakage or aging.

(c) Check for short or open in intelligent vehicle control platform control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

DTC	P1B2929	BMS_BatteryPackSOC signal invalid

DTC	P1B2E29	Any typical signal related to BMS power invalid

Description

When power battery control unit is faulty, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B2929	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Power battery control unit • Intelligent vehicle control platform control unit • Wire harness and connector
P1B2E29	• Refer to CAN specification for details	Depending on CAN protocol	5 ms	Continuous type	5 ms	• Power battery control unit • Intelligent vehicle control platform control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B2929	• Corresponding function may become ineffective	Not come on
P1B2E29	• Corresponding function may become ineffective	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG	Check and repair charging system

OK

2	**Check power battery control unit for any DTCs output**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

3	**Check power battery control unit wire harness and connector**

(a) Check if power battery control unit connector is connected securely.

(b) Check power battery control unit wire harness and connector for breakage or aging.

(c) Check for short or open in power battery control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check intelligent vehicle control platform control unit wire harness and connector**

(a) Check if intelligent vehicle control platform control unit connector is connected securely.

(b) Check intelligent vehicle control platform control unit wire harness and connector for breakage or aging.

(c) Check for short or open in intelligent vehicle control platform control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

ZD

DTC	P1B3000	Simultaneous fault for all AC charging port temperature sensors
DTC	P1B314B	Any AC charging socket temperature sensor overtemperature
DTC	P1B324B	Simultaneous fault for all DC charging port temperature sensors
DTC	P1B334B	Any DC charging socket temperature sensor overtemperature

Description

When AC/DC charging port temperature sensor is faulty, the intelligent vehicle control platform control unit records DTC.

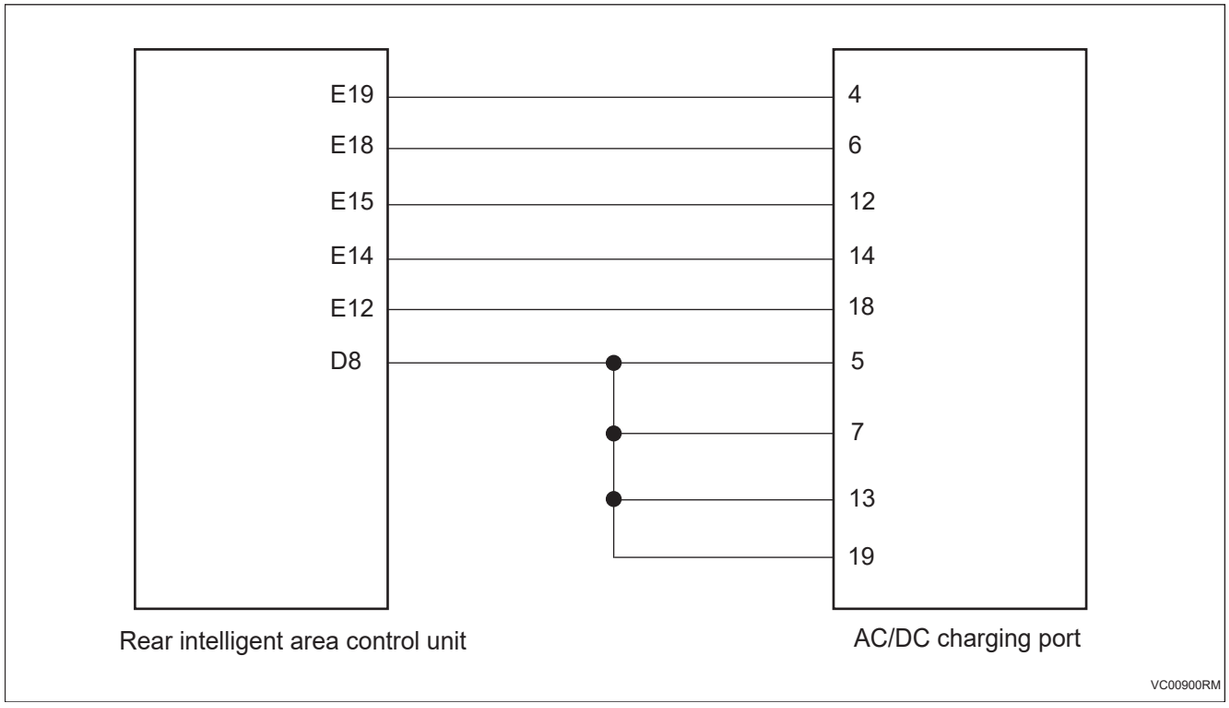
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B3000	• Detection begins at 1.5 seconds after power on			cyclic	100 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit
P1B314B	• Detection begins at 1.5 seconds after power on	> 90° C	• 5 ms	cyclic	100 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B324B	• Detection begins at 1.5 seconds after power on			cyclic	100 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit
P1B334B	• Detection begins at 1.5 seconds after power on	> 90° C	• 5 ms	cyclic	100 ms	• AC/DC charging port • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B3000	• Unable to perform AC charging/ discharging	Not come on
P1B314B	• Unable to perform AC charging/ discharging	Not come on
P1B324B	• Unable to perform DC charging	Not come on
P1B334B	• Unable to perform DC charging	Not come on

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check for short to each other in AC/DC charging port wire harness and connector**

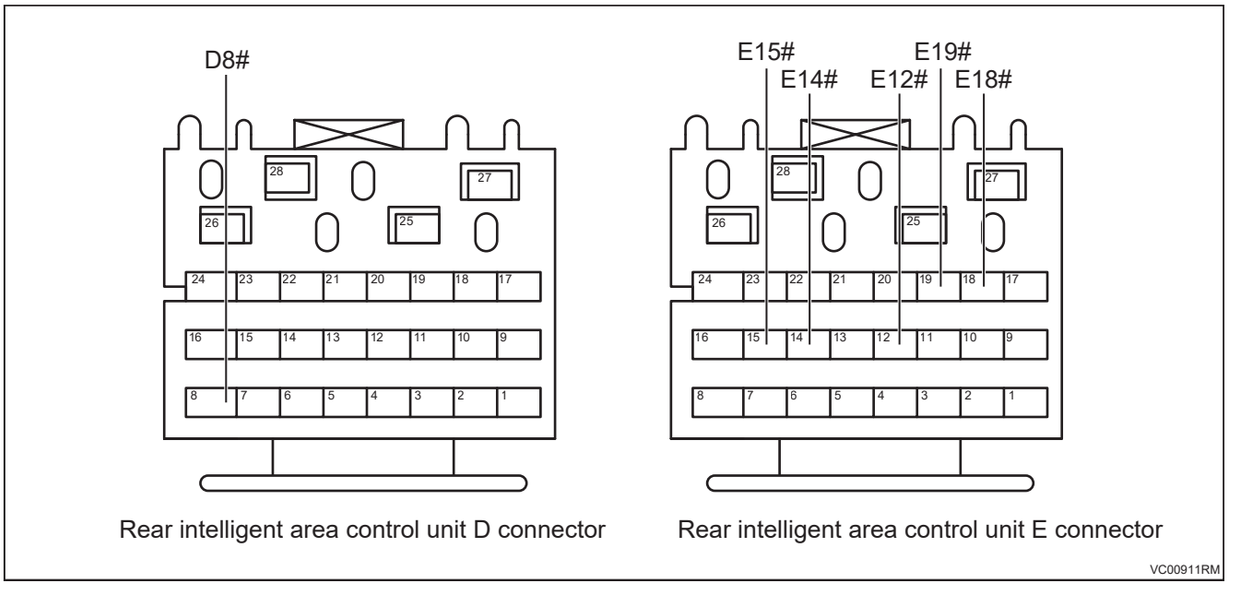
(a) Check AC/DC charging port wire harness and connector for aging or damage.

(b) Check for short to each other in AC/DC charging port wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

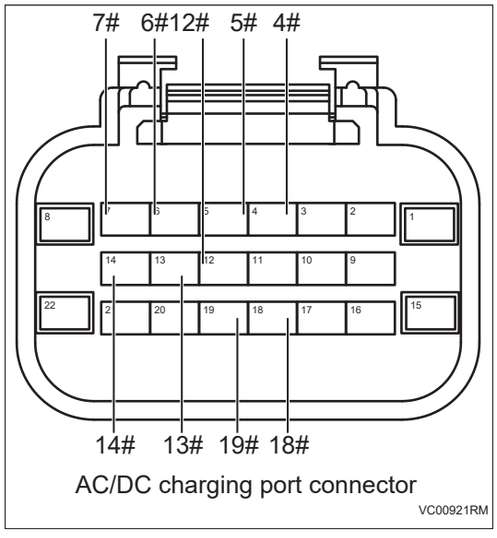
2	**Check for open in AC/DC charging port wire harness and connector**



Rear intelligent area control unit D connector

Rear intelligent area control unit E connector

VC00911RM



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) According to value in the table, measure resistance.

Standard value

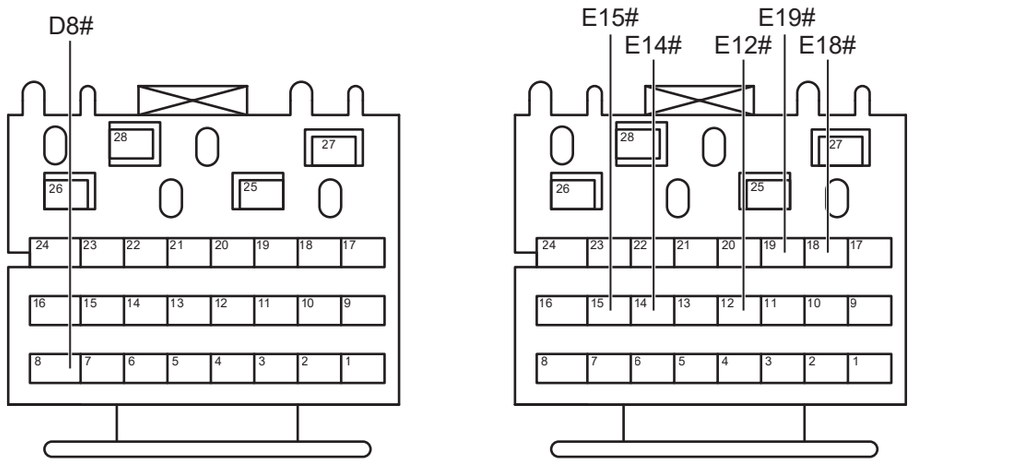
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E19# - AC/DC charging port connector 4#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector E18# - AC/DC charging port connector 6#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector E15# - AC/DC charging port connector 12#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector E14# - AC/DC charging port connector 14#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector E12# - AC/DC charging port connector 18#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D8# - AC/DC charging port connector 5#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D8# - AC/DC charging port connector 7#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D8# - AC/DC charging port connector 13#	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D8# - AC/DC charging port connector 19#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in AC/DC charging port wire harness and connector**



Rear intelligent area control unit D connector

Rear intelligent area control unit E connector

VC00911RM

(a) According to value in the table, measure resistance.

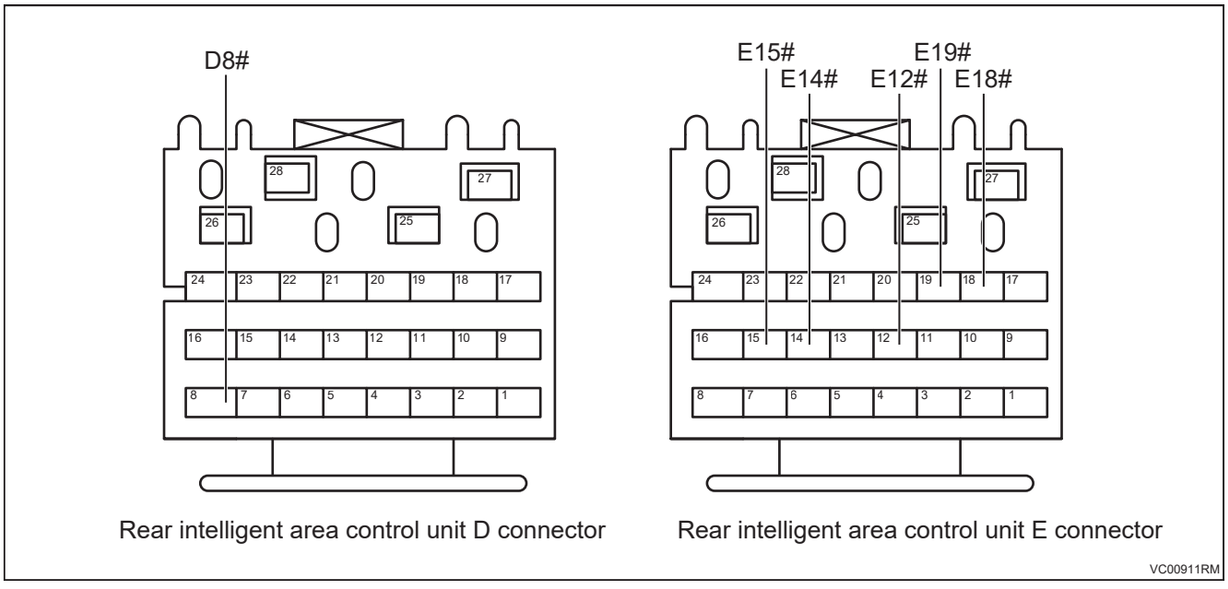
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E19# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E18# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E15# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E14# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector E12# - body ground	Always connected	10 KΩ or more
Rear intelligent area control unit connector D8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in AC/DC charging port wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector E19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E18# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E15# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E14# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector E12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear intelligent area control unit connector D8# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	Replace AC/DC charging port (See page WS-52)

(a) Replace the AC/DC charging port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear intelligent area control unit (See page ZC-135)**

OK

Diagnosis ends

DTC	P1B3400	Thermal management system malfunction light prompt

Description

When thermal management system is faulty, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B3400	• All instrument cluster prompt items required for thermal managem-ent has output VTMerror=1 • High voltage applied	10 min	Refer to thermal management specification for details	cyclic	100 ms	• Front intelligent area control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B3400	Thermal management fault light	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check front intelligent area control unit for any DTC output related to thermal management system**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Perform repair according to DTC**

OK

2	**Check front intelligent area control unit wire harness and connector**

(a) Check if front intelligent area control unit connector is connected securely.

(b) Check front intelligent area control unit wire harness and connector for breakage or aging.

(c) Check for short or open in front intelligent area control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front intelligent area control unit (See page ZC-128)

DTC	P1B4600	Function safety accelerator pedal fault

Description

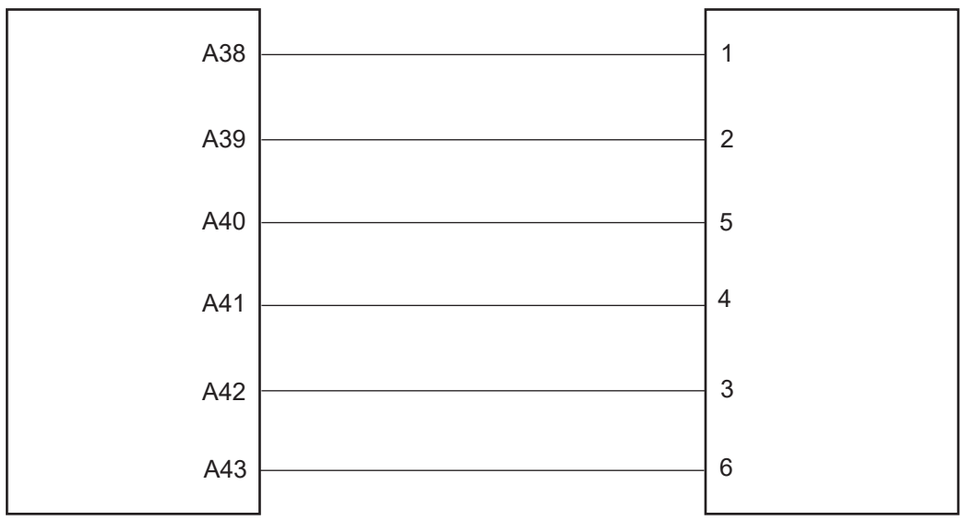
When functional safety fault is detected in electronic accelerator pedal, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1B4600	• Power on, the accelerator pedal function fault (including sensor power supply and sensor range, etc.) is not reported	N.A.	< 200 ms	cyclic	10 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1B4600	• Accelerator pedal function abnormal	Not come on

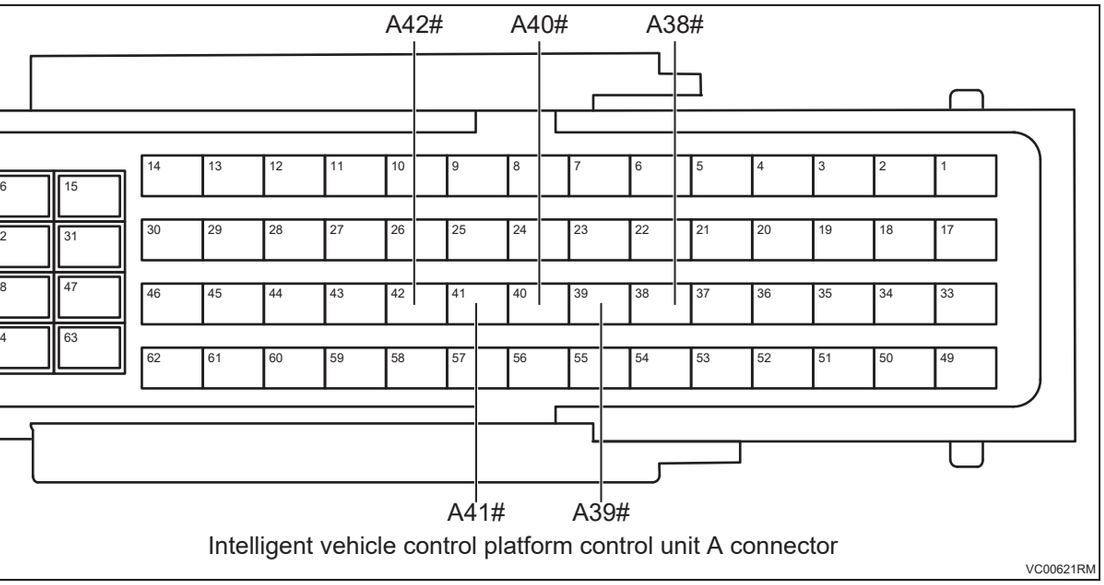
Circuit diagram

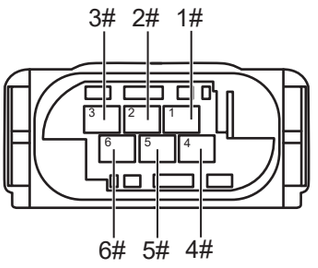


Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check for open in electronic accelerator pedal wire harness and connector**





Electronic accelerator pedal connector
VC00631RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electronic accelerator pedal connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

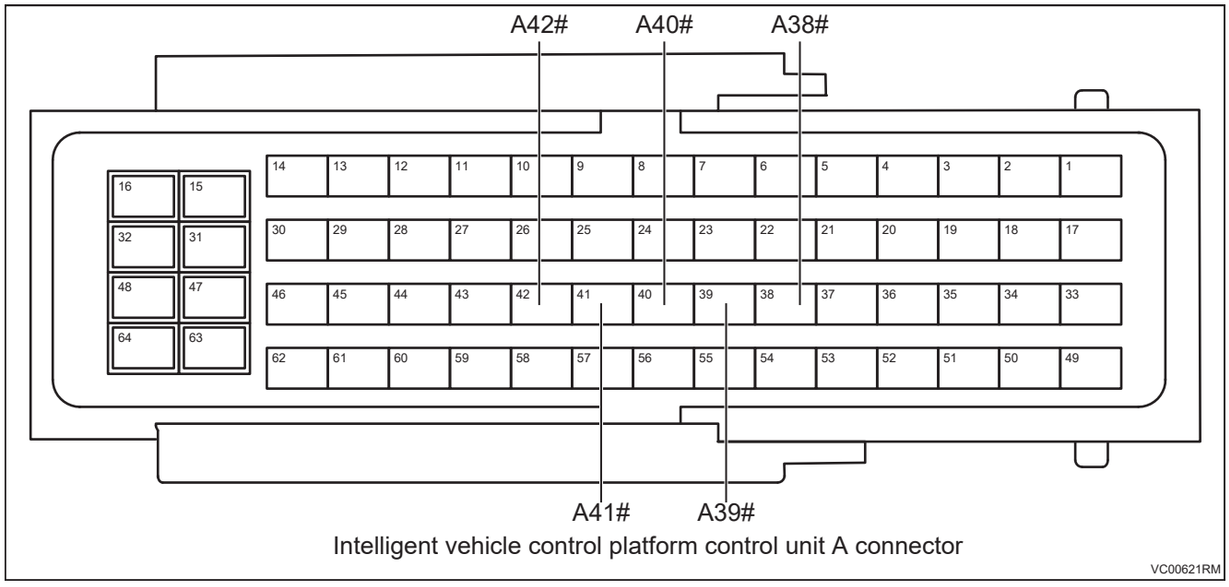
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - electronic accelerator pedal connector 1#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A39# - electronic accelerator pedal connector 2#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A40# - electronic accelerator pedal connector 5#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A41# - electronic accelerator pedal connector 4#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A42# - electronic accelerator pedal connector 3#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A43# - electronic accelerator pedal connector 6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00621RM

(a) According to value in the table, measure resistance.

Standard value

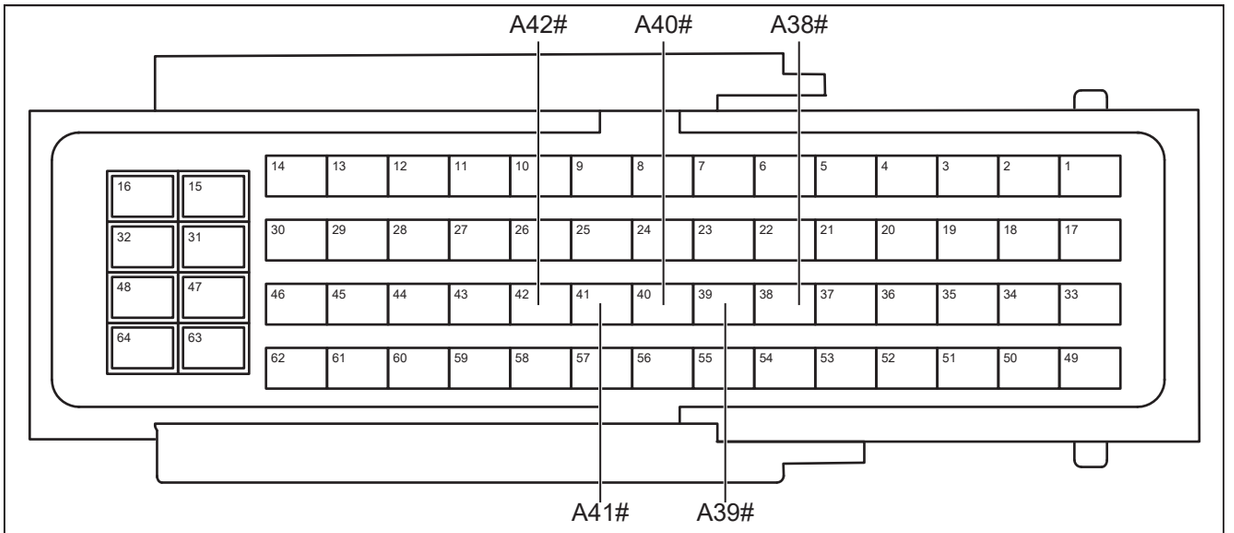
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A39# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A40# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A41# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A42# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A43# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A38# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A39# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A40# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A41# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A42# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A43# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

4	**Replace electronic accelerator pedal (See page ZC-7)**

(a) Replace electronic accelerator pedal.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	P213800	Accelerator pedal difference fault

Description

When difference fault is detected in electronic accelerator pedal, the intelligent vehicle control platform control unit records DTC.

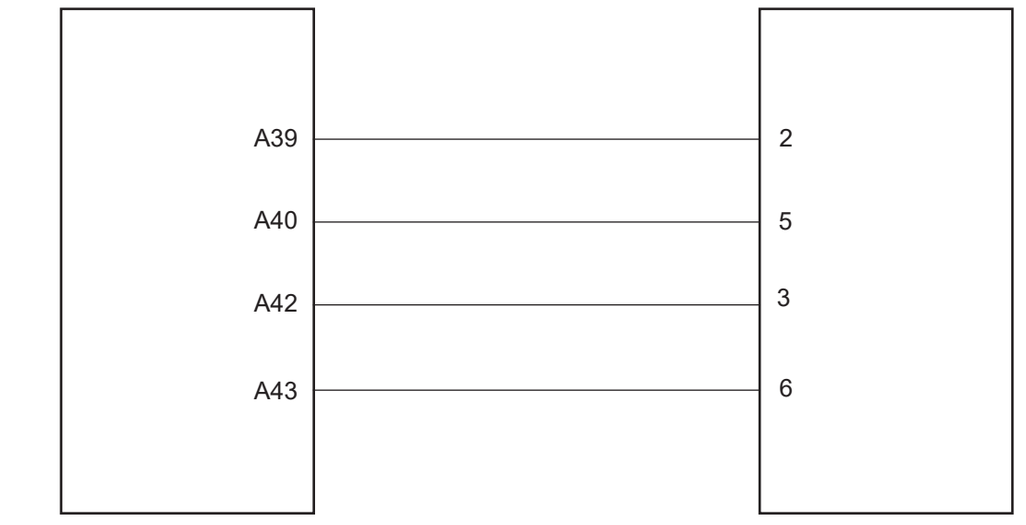
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P213800	• Power supply is in IGON	The accelerator opening difference between accelerator pedal signal 1 and signal 2 is greater than 9.97%	160 ms (Note: All identification or monitoring times refer to application layer time only, within 10% error, same below)	Continuous type	5 ms	• Electronic accelerator pedal • Wire harness and connector • Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P213800	• The power system fault light turns on • Intelligent driving prohibition • Automatic parking prohibition	Comes on

ZD

Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check for short to each other in electronic accelerator pedal wire harness and connector**

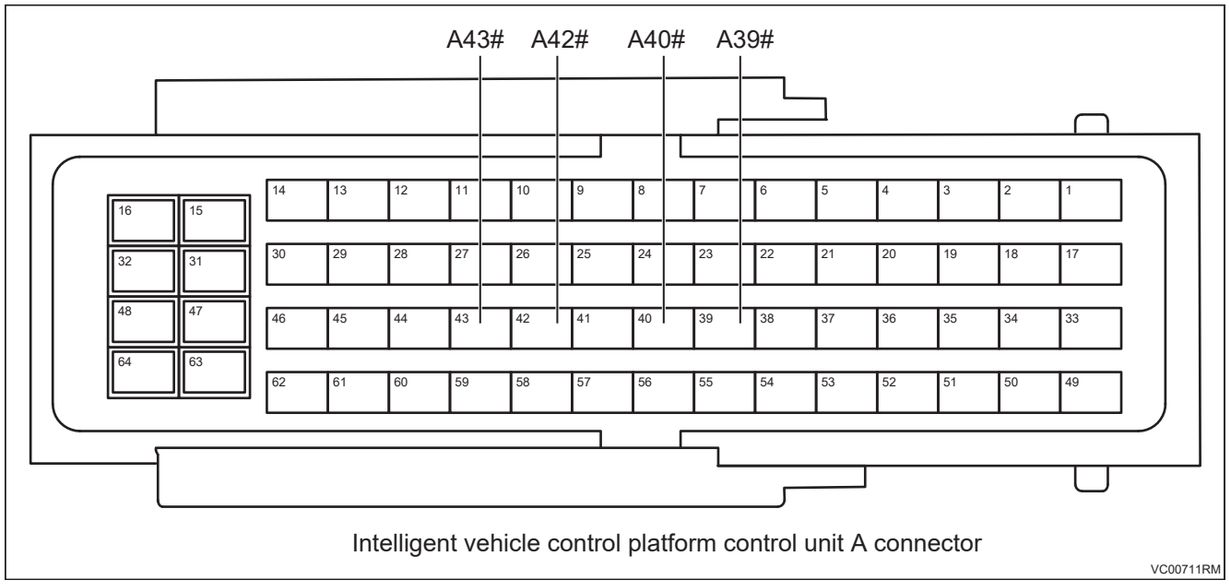
(a) Check if electronic accelerator pedal wire harness and connector are aging and damaged.

(b) Check for short to each other in electronic accelerator pedal wire harness and connector

NG → **Check and repair or replace wire harness and connector**

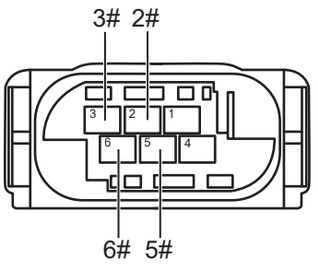
OK

2	**Check for open in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00711RM



Electronic accelerator pedal connector
VC00641RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electronic accelerator pedal connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

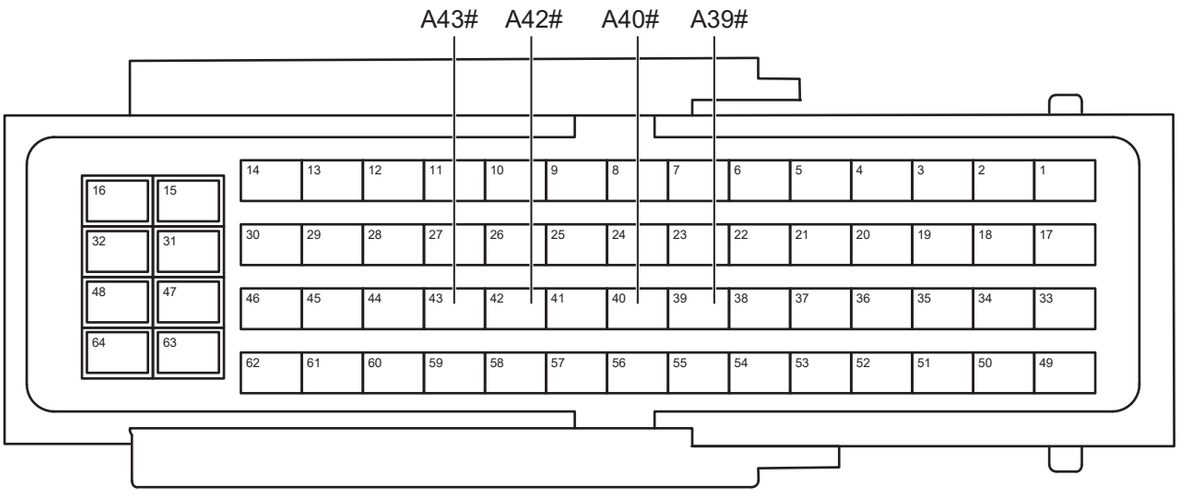
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A39# - electronic accelerator pedal connector 2#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A40# - electronic accelerator pedal connector 5#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A42# - electronic accelerator pedal connector 3#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A43# - electronic accelerator pedal connector 6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00711RM

(a) According to value in the table, measure resistance.

Standard value

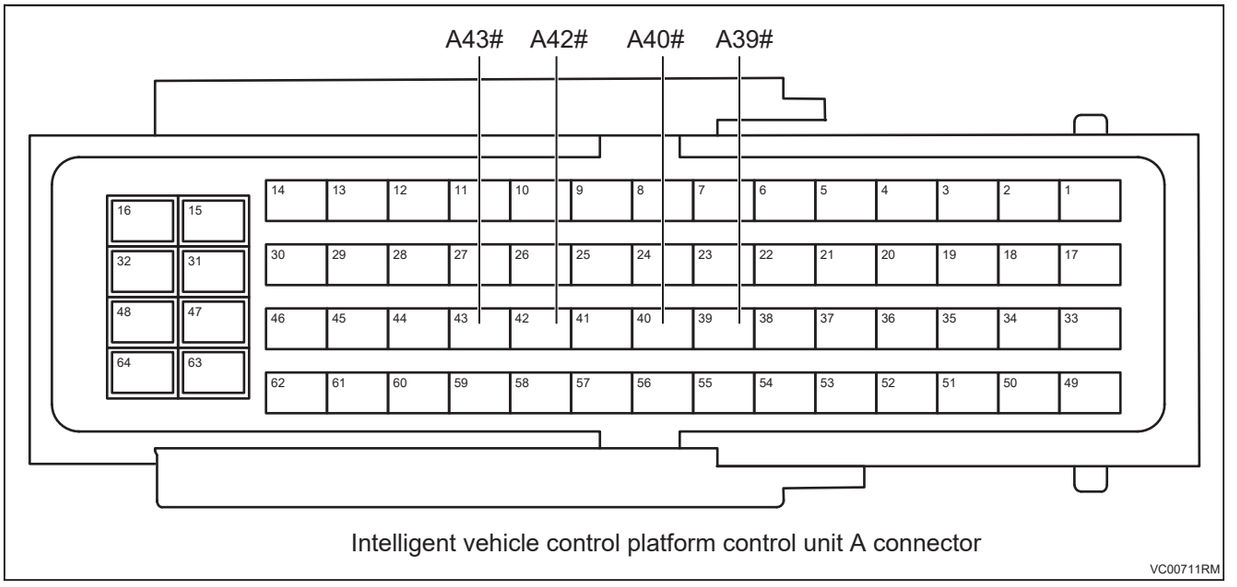
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A39# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A40# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A42# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A43# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in electronic accelerator pedal wire harness and connector**



Intelligent vehicle control platform control unit A connector

VC00711RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A39# - body ground	Ignition switch "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A40# - body ground	Ignition switch "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A42# - body ground	Ignition switch "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A43# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace electronic accelerator pedal (See page ZC-7)**

(a) Replace electronic accelerator pedal.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	U1A00AA	No valid certificate for VDC

Description

When intelligent vehicle control platform control unit has no a valid certificate, the intelligent vehicle control platform control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U1A00AA	• No valid certificates recognized when checking certificates	No valid certificates recognized during online and offline certificate application and power on process	1 time	Event-based	Not involved	• Intelligent vehicle control platform control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
U1A00AA	• No valid certificates recognized during online and offline certificate application and power on process	—

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Apply for certificate for intelligent vehicle control platform control unit**

(a) Restart the intelligent vehicle control platform control unit.

(b) Apply for a valid certificate for intelligent vehicle control platform control unit.

(c) Connect HQ-VDS diagnostic tester.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

DTC	U114687	Front PDC message missing
DTC	U014787	PDCM node lost

DTC	U014887	PDCR node lost
DTC	U014A87	VDC821 node lost
DTC	U114687	PDCF message missing
DTC	U041782	PDCF message content fault
DTC	U041783	PDCF message content fault
DTC	U112987	IBC message missing
DTC	U041882	IBC message content fault
DTC	U041883	IBC message content fault
DTC	U113187	Electric power steering control unit message missing
DTC	U042082	Electric power steering control unit message content fault
DTC	U042083	Electric power steering control unit message content fault
DTC	U110387	Electronic shifter message missing
DTC	U040482	Electronic shifter message content fault
DTC	U040483	Electronic shifter message content fault
DTC	U115187	Airbag control unit message missing
DTC	U045282	Airbag controller message content fault
DTC	U045283	Airbag controller message content fault
DTC	U114787	PDCM message missing
DTC	U042282	PDCM message content fault
DTC	U042283	PDCM message content fault
DTC	U014697	Backbone network 2 bus PDCF node lost
DTC	U014A97	Backbone network 2 bus VDC821 node lost
DTC	U114697	Backbone network 2 bus PDCF message missing

DTC	**U124287**	**HAD/IFC message missing**
DTC	**U054982**	**HAD/IFC message content fault**
DTC	**U054983**	**HAD/IFC message content fault**
DTC	**U0148A7**	**PDCR node lost**
DTC	**U129A87**	**Battery management system message missing**
DTC	**U129287**	**Motor control unit 2 message missing**
DTC	**U129887**	**PCDU message missing**
DTC	**U059B82**	**Battery management system message content fault**
DTC	**U059B83**	**Battery management system message content fault**
DTC	**U059982**	**PCDU message content fault**
DTC	**U059983**	**PCDU message content fault**
DTC	**U059382**	**Motor control unit 2 message content fault**
DTC	**U059383**	**Motor control unit 2 message content fault**

Description

When communication between intelligent vehicle control platform control unit and other system is abnormal or interrupted, the intelligent vehicle control platform control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U114687	(a) Front PDC message missing.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U014787	(a) PDCM node lost.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit
U014887	(a) PDCR node lost.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit
U014A87	(a) VDC821 node lost.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U114687	(a) PDCF message missing.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U041782	(a) PDCF message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U041783	(a) PDCF message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U112987	(a) IBC message missing.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Integrated brake controller
U041882	(a) IBC message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Integrated brake controller
U041883	(a) IBC message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Integrated brake controller
U113187	(a) Electric power steering control unit message missing.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Electric power steering control unit

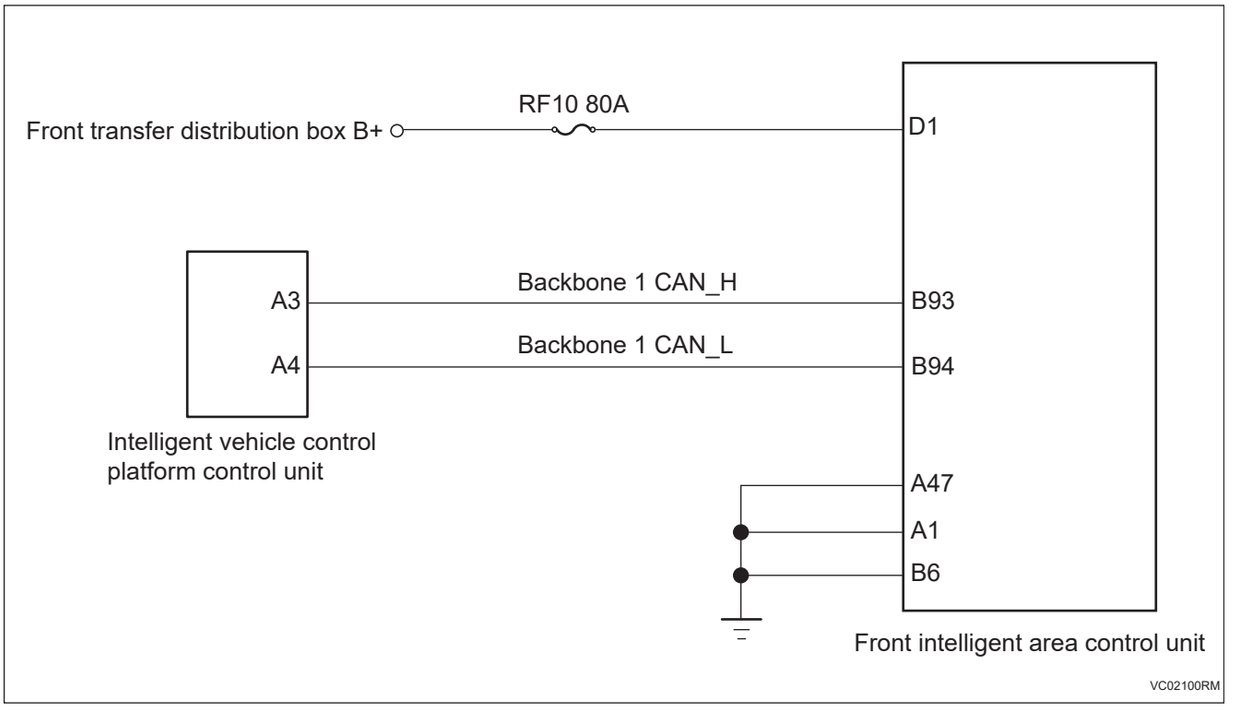
DTC No.	DTC detection condition	Faulty area
U042082	(a) Electric power steering control unit message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Electric power steering control unit
U042083	(a) Electric power steering control unit message content fault.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Electric power steering control unit
U110387	(a) Electronic shifter message missing.	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Combination switch
U040482	(a) Electronic shifter message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Combination switch
U040483	(a) Electronic shifter message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Combination switch
U115187	(a) Airbag control unit message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Airbag control unit
U045282	(a) Airbag controller message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Airbag control unit

DTC No.	DTC detection condition	Faulty area
U045283	(a) Airbag controller message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Airbag control unit
U114787	(a) PDCM message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit
U042282	(a) PDCM message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit
U042283	(a) PDCM message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Middle intelligent area control unit
U014697	(a) Backbone network 2 bus PDCF node lost	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U014A97	(a) Backbone network 2 bus VDC821 node lost	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U114697	(a) Backbone network 2 bus PDCF message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U124287	(a) HAD/IFC message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Smart camera • Advanced automatic driving controller

DTC No.	DTC detection condition	Faulty area
U054982	(a) HAD/IFC message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Smart camera • Advanced automatic driving controller
U054983	(a) HAD/IFC message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Smart camera • Advanced automatic driving controller
U0148A7	(a) PDCR node lost	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U129A87	(a) Battery management system message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U129287	(a) Motor control unit 2 message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U129887	(a) PCDU message missing	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059B82	(a) Battery management system message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059B83	(a) Battery management system message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059982	(a) PCDU message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059983	(a) PCDU message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059382	(a) Motor control unit 2 message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059383	(a) Motor control unit 2 message content fault	• CAN line and connector • Front intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit

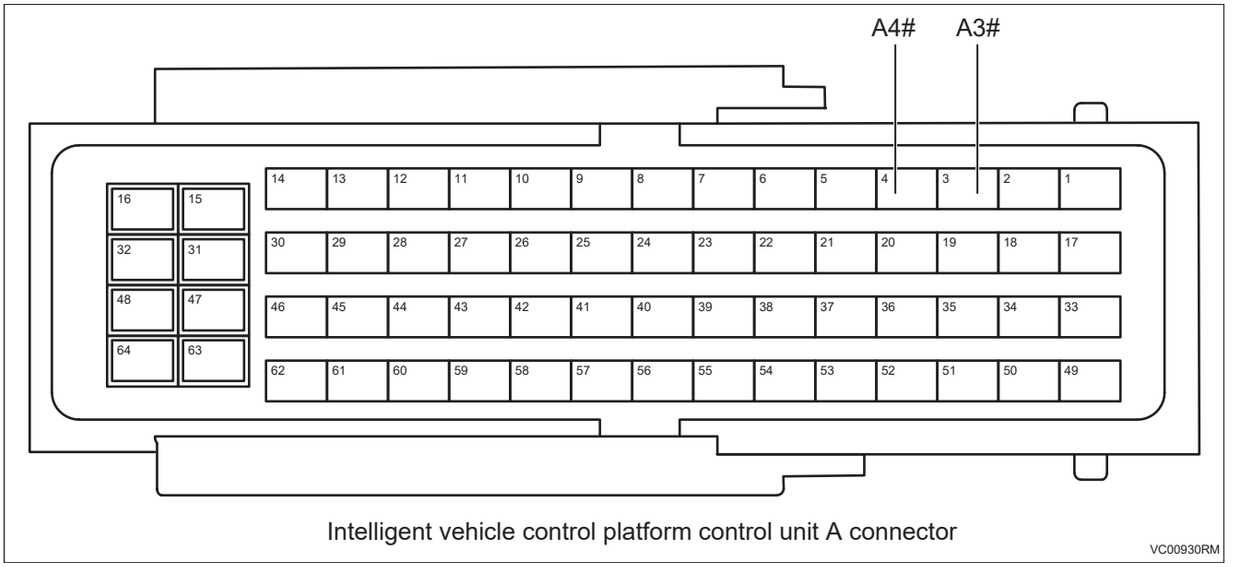
Circuit diagram

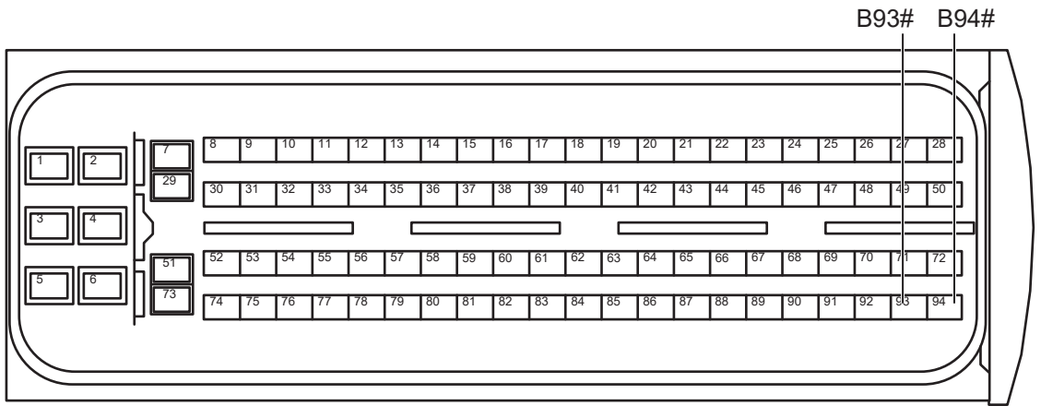


Inspection procedure

Note: Taking the U014C87 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in backbone 1 CAN bus (front intelligent area control unit - intelligent vehicle control platform control unit)**





Front intelligent area control unit B connector

VC00940RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

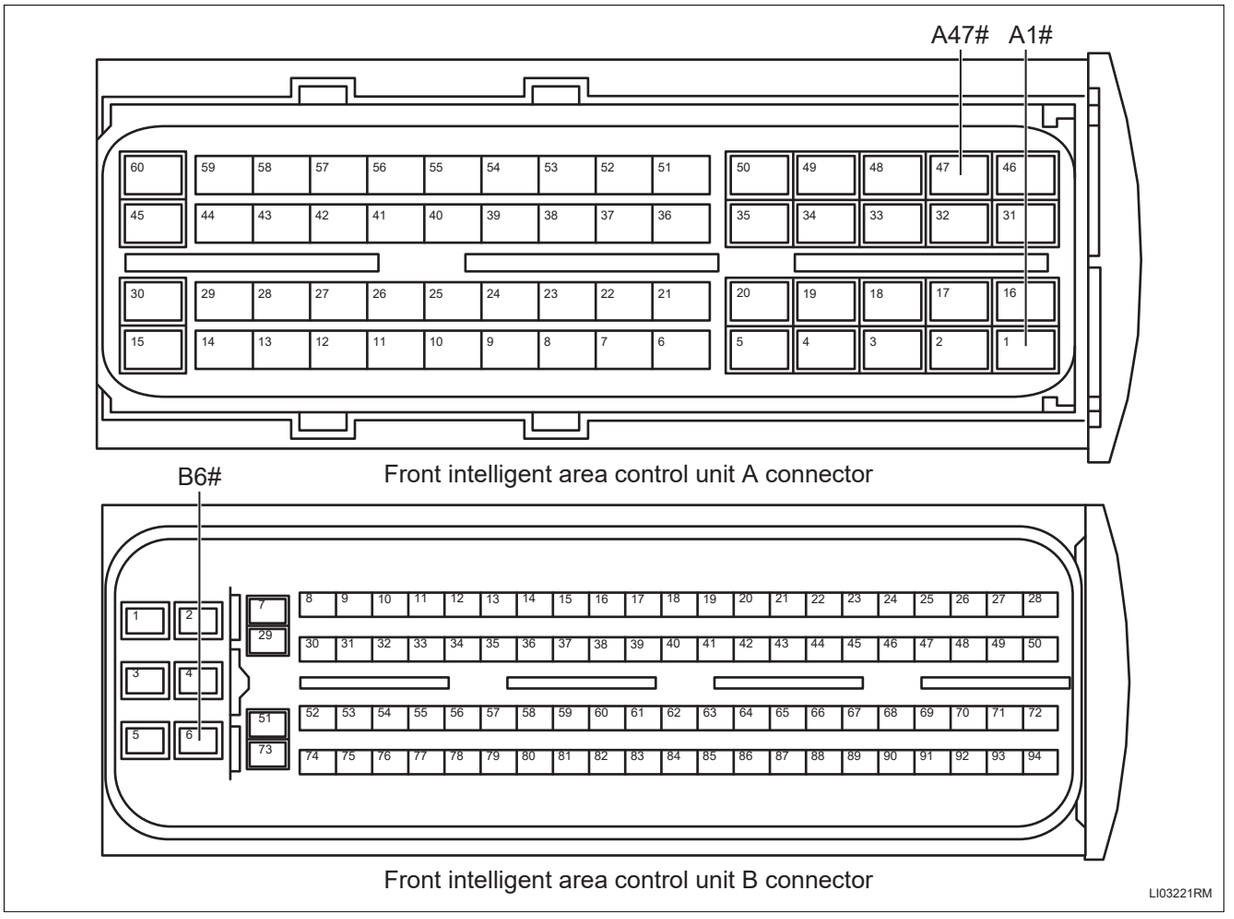
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A17# - intelligent vehicle control platform control unit connector A62#	Always connected	Less than 1 Ω
Front intelligent area control unit connector A18# - intelligent vehicle control platform control unit connector A61#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check front intelligent area control unit ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) According to value in the table, measure resistance.

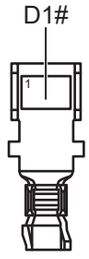
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector A47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness or connector**

OK

3 Check front intelligent area control unit power supply



Front intelligent area control unit D connector

PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

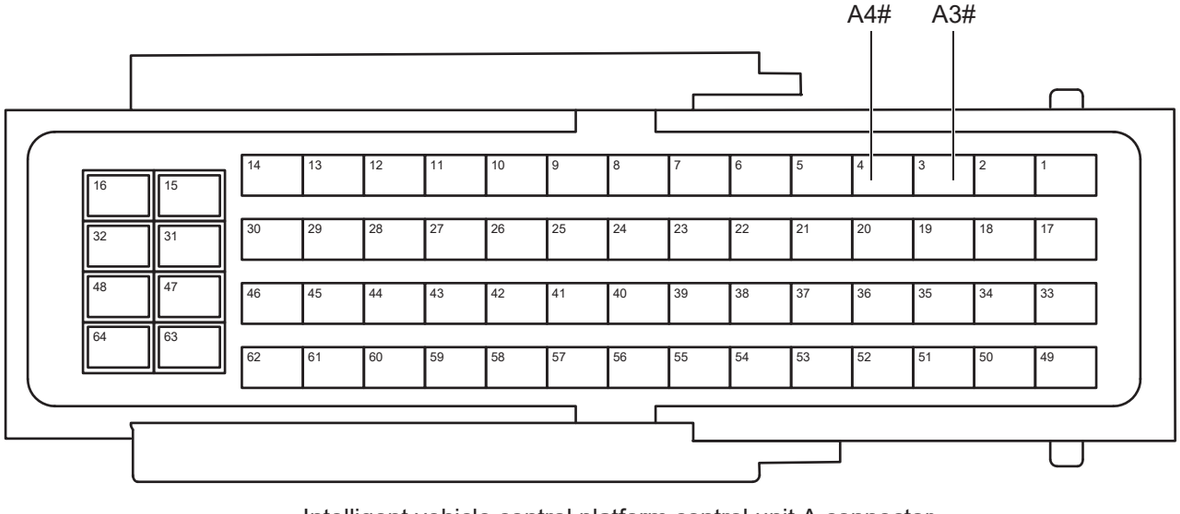
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

4 Check backbone 1 CAN bus terminal resistance



Intelligent vehicle control platform control unit A connector

VC00930RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A3# - intelligent vehicle control platform control unit connector A4#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

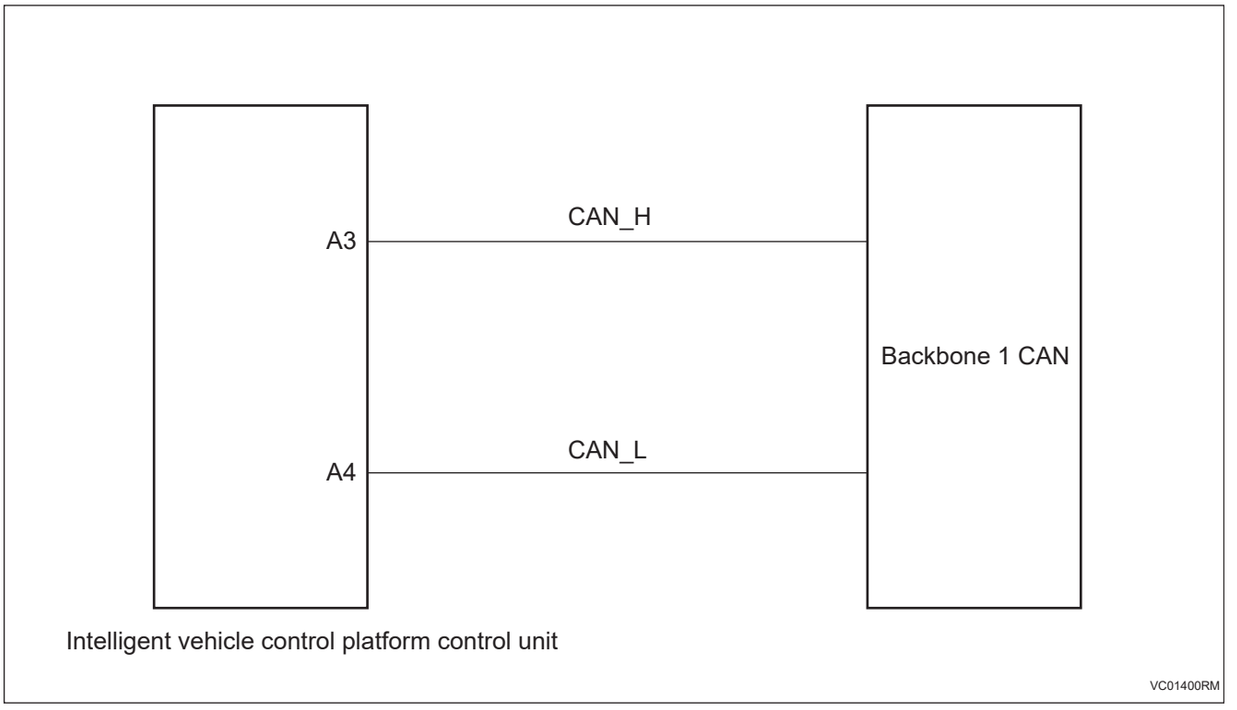
DTC	**U008988**	**Backbone network 1 CAN bus off**
DTC	**U009288**	**Backbone network 2 CAN bus off**
DTC	**U005588**	**Rear EV CAN bus off**

Description

When intelligent vehicle control platform control unit detects an off fault in backbone 1 CAN bus, the intelligent vehicle control platform control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U008988	(a) Backbone network 1CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Intelligent communication domain control unit
U009288	(a) Backbone network 2CAN bus off.	• CAN line and connector • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit
U005588	(a) Rear EV CAN bus off fault.	• CAN line and connector • Energy conversion and distribution unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Electric rear drive system inverter

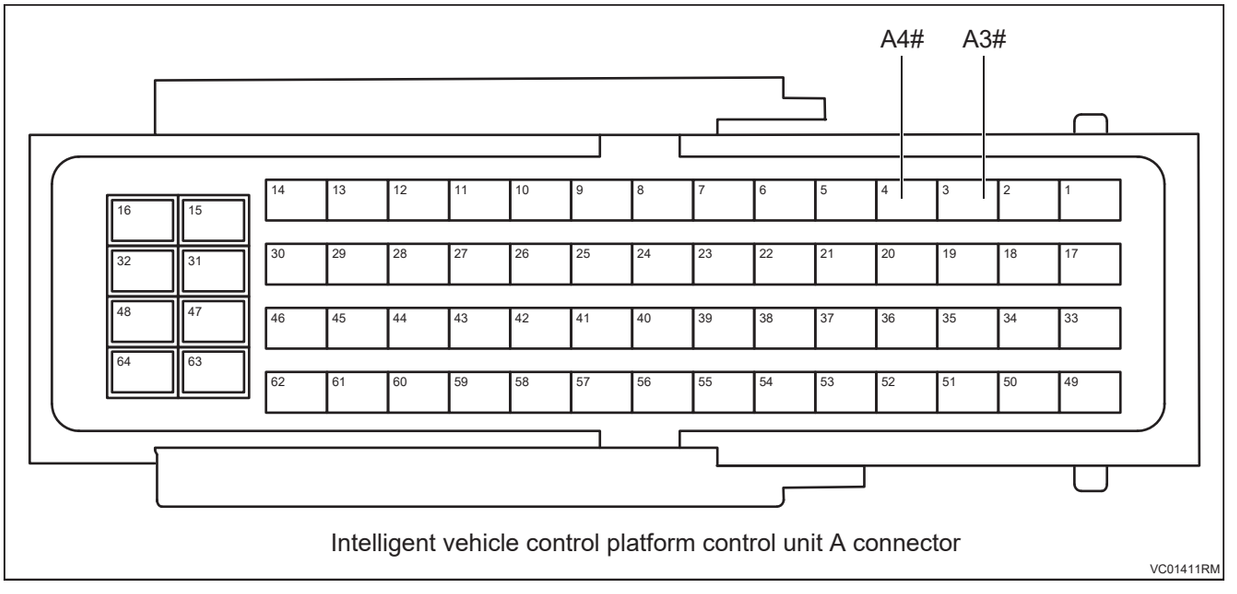
Circuit diagram



Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames). Taking the backbone 1 CAN bus fault as an example, and DTC analysis steps for backbone 2 CAN bus off and rear EV CAN bus off are similar.

1	**Check backbone 1 CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A3# - intelligent vehicle control platform control unit connector A4#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

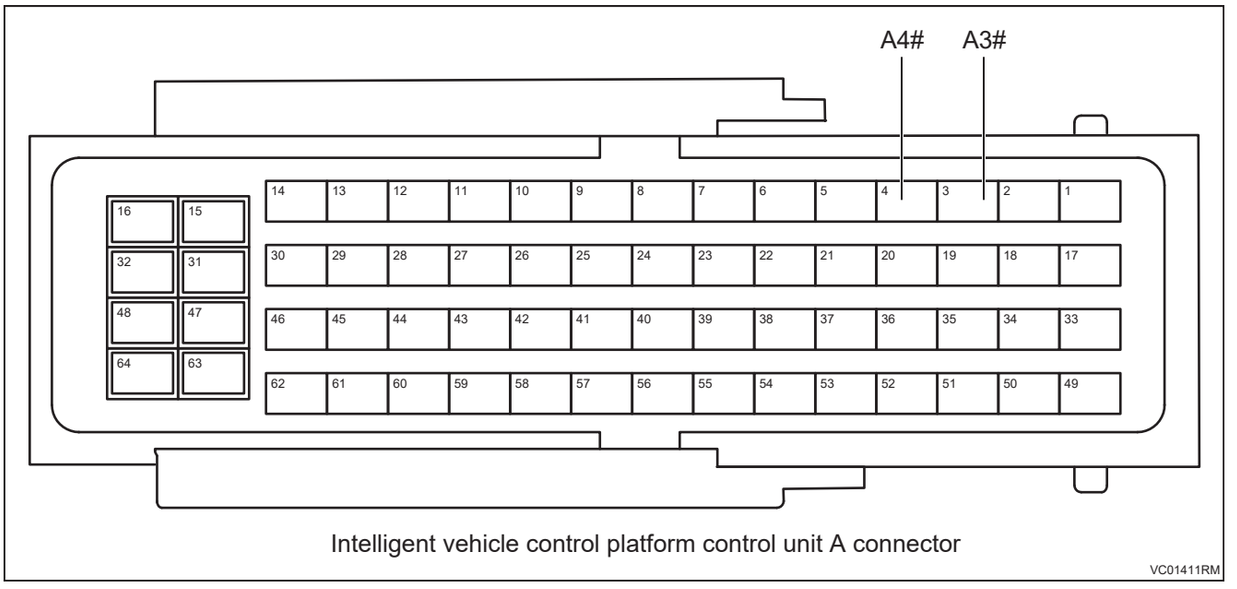
2	**Check controllers on backbone 1 CAN bus**

(a) Disconnect the controllers on the backbone 1 CAN bus one by one and check if the other controllers resume operating.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between backbone 1 CAN buses CAN-L and CAN-H**



Intelligent vehicle control platform control unit A connector

VC01411RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

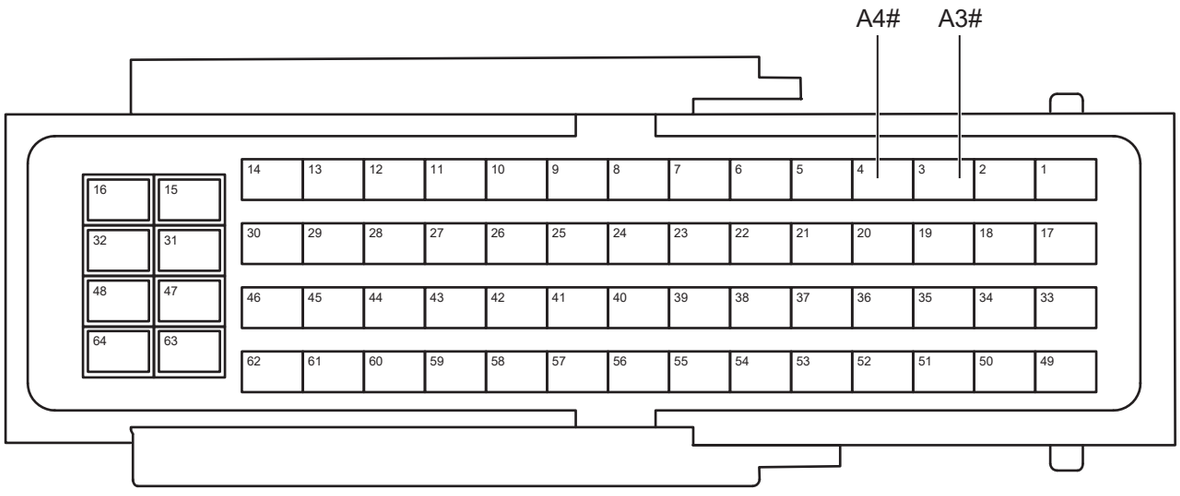
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A3# - intelligent vehicle control platform control unit connector A4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in backbone 1 CAN bus**



Intelligent vehicle control platform control unit A connector

VC01411RM

(a) According to value in the table, measure resistance.

Standard value

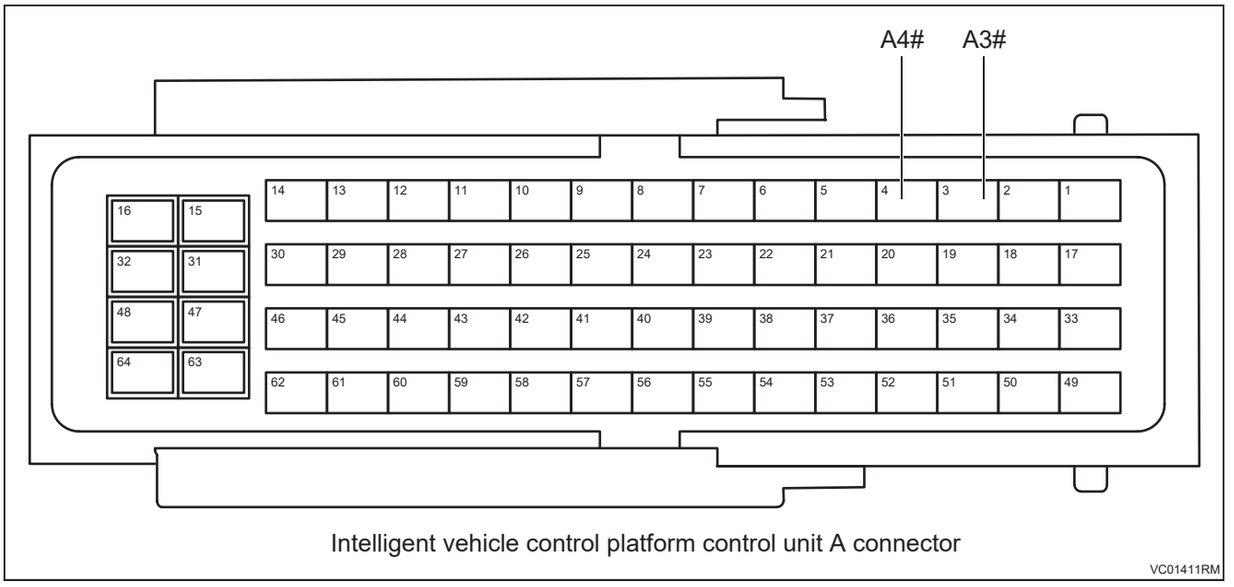
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A3# - body ground	Always connected	10 KΩ or more
Intelligent vehicle control platform control unit connector A4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in backbone 1 CAN bus**



Intelligent vehicle control platform control unit A connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent vehicle control platform control unit connector A4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

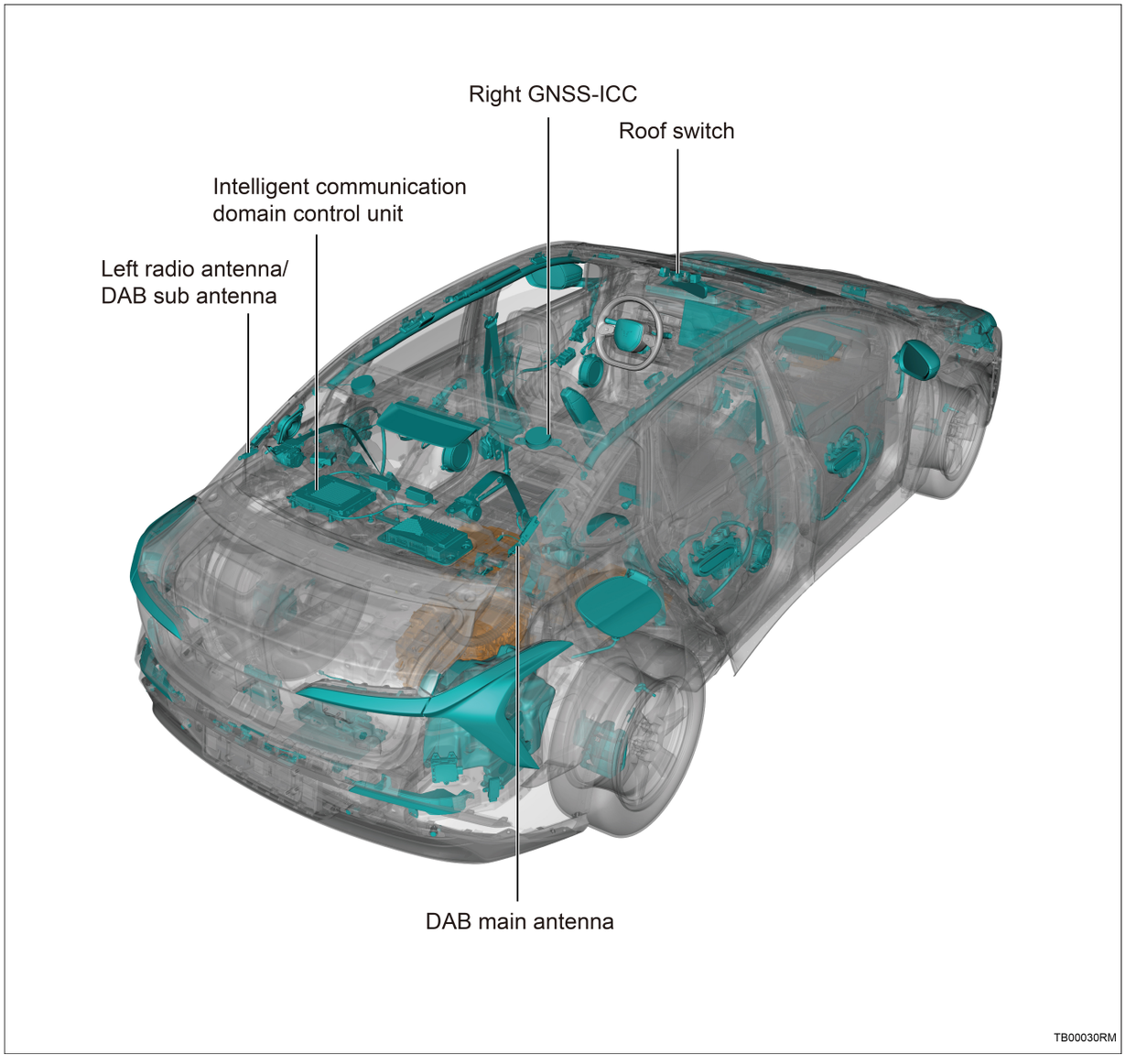
OK

Diagnosis ends

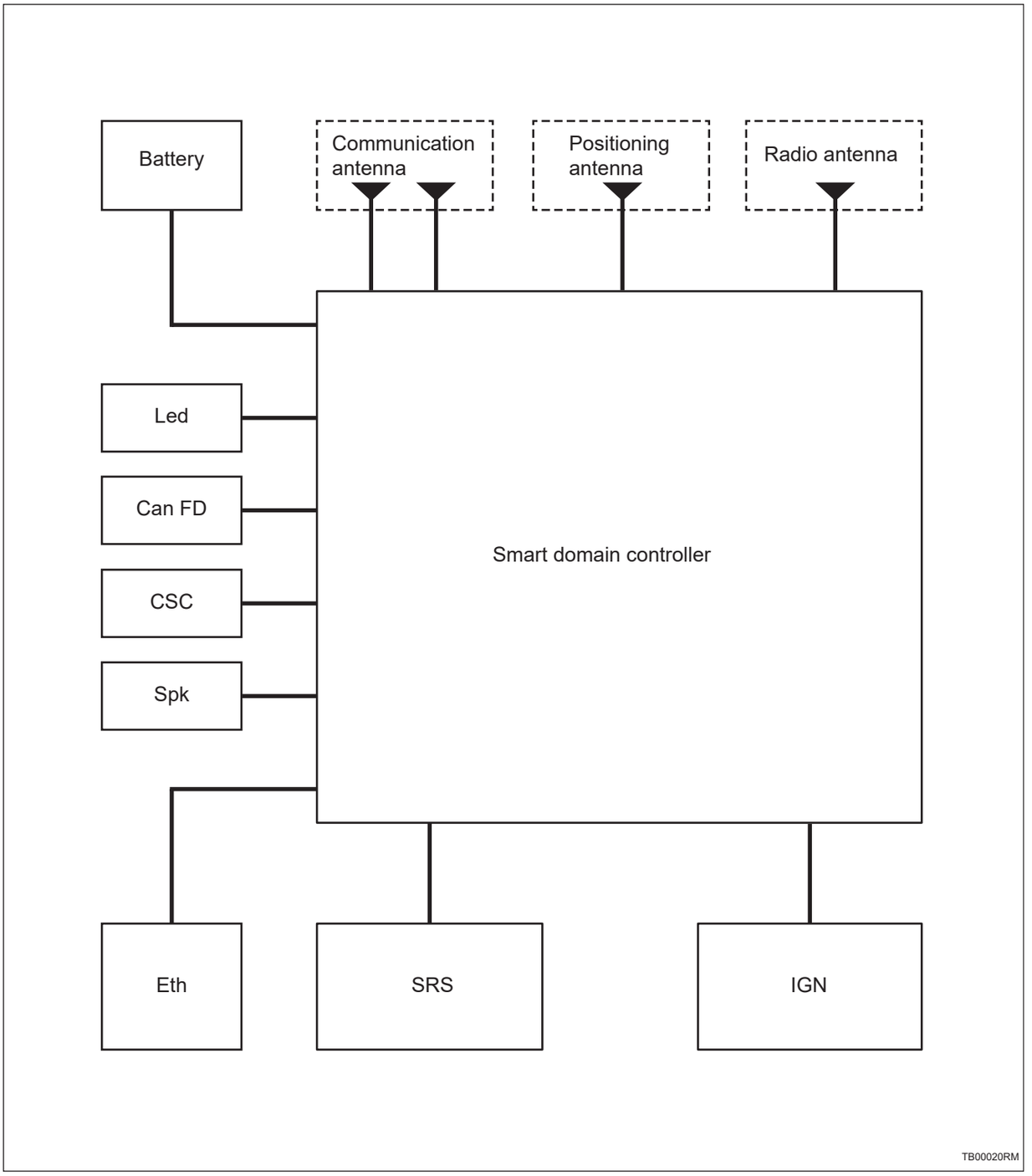
Intelligent communication domain control system

Intelligent communication domain control unit

Part position



System diagram



ZD

Function description

1. Intelligent communication domain control unit function overview

(a) Data communication function.

(b) Connection/authentication function.

(c) Sleep awakening.

(d) Vehicle condition query function.

(e) Remote vehicle control function.

(f) Safety guarantee function.

(g) Vehicle maintenance reminder function.

(h) Vehicle inspection, namely, network/local/remote diagnosis and writing functions.

(i) Online entertainment, network security, and position locating functions.

(j) Driving assist functions such as collision and blind spot warning and emergency brake.

Data parameter

Intelligent communication domain control unit

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	5	2	-

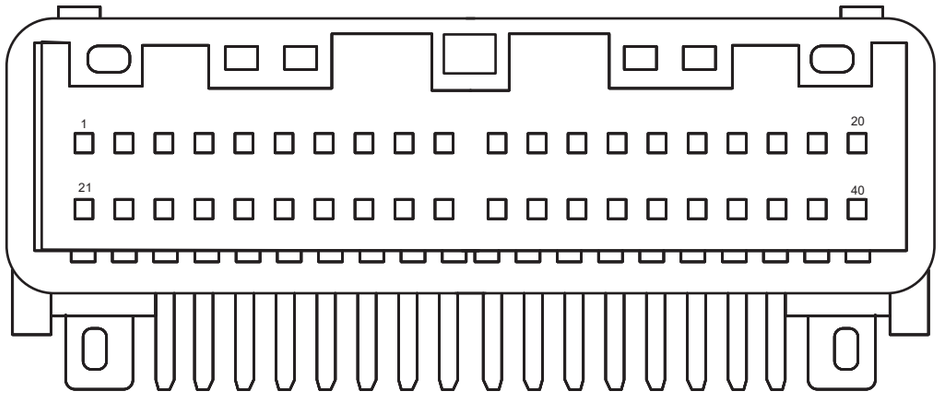
ECALL microphone

Item	Maximum	Normal	Minimum
Operating voltage (V)	7.2	8	8.8
Operating current (A)	0.009	0.0065	0.003

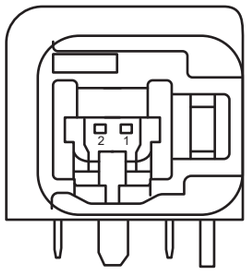
Emergency call speaker

Item	Maximum	Normal	Minimum
Operating voltage (V)	4.47	4	-
Operating current (A)	1.117	1	-

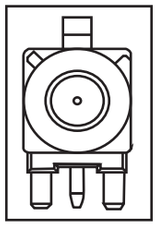
ECU terminal



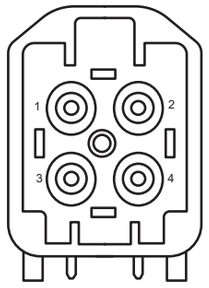
Intelligent communication domain control unit A



Intelligent communication domain control unit B



Intelligent communication domain control unit C



Intelligent communication domain control unit E

TB00010RM

Intelligent communication domain control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	-
3	-	23	B_SPK- (speaker output negative)
4	B_SPK+ (speaker output positive)	24	-
5	-	25	T-AUDIO- analog audio output to head unit negative
6	T-AUDIO+ analog audio output to head unit positive	26	Analog audio output shield ground
7	-	27	-
8	-	28	-
9	-	29	-
10	-	30	-
11	External Ecall trigger button input	31	ECALL button ground wire
12	-	32	-
13	-	33	Operation indicator LED1 power supply
14	ECALL_MIC_P	34	ECALL_MIC_N
15	-	35	-
16	-	36	-

Intelligent communication domain control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
17	HS_CAN1_H	37	HS_CAN1_L
18	-	38	IGN_ON/OFF
19	Airbag input signal	39	-
20	BATT	40	GND

Intelligent communication domain control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	Ethernet data negative	2	Ethernet data positive

Intelligent communication domain control unit C	
Pin number	**Definition**
1	External GNSS input

Intelligent communication domain control unit E			
Pin number	**Definition**	**Pin number**	**Definition**
1	Tuner sub antenna input	3	Tuner main antenna input
2	DAB sub antenna input	4	DAB main antenna input

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B14A016	Circuit voltage too low	(See page ZD-1156)
B14A017	Circuit voltage too high	(See page ZD-1156)
B14A100	Backup battery diagnosis	(See page ZD-1160)
B14A201	E-call LED fault	(See page ZD-1161)
B14A271	ECALL button stuck	(See page ZD-1161)
B14A300	Built-in SIM1 card fault	(See page ZD-1167)
B14A400	Built-in SIM2 card fault	(See page ZD-1167)
B14A500	SRS signal fault	(See page ZD-1169)
B14A608	Tuner communication fault	(See page ZD-1173)
B14A708	DAB communication fault	(See page ZD-1173)
B14A800	Codec module fault	(See page ZD-1173)
B14A900	AMP module fault	(See page ZD-1173)
B14AA00	MIC fault	(See page ZD-1177)
B14AC08	Gsensor communication fault	(See page ZD-1182)
B14C600	GNSS module 2 fault (Nad GNSS module)	(See page ZD-1182)
B14B300	Tuner antenna 1 fault	(See page ZD-1183)
B14B500	GNSS antenna fault	(See page ZD-1188)

DTC	Detection Items	See page
B14B600	5G antenna 1 fault	(See page ZD-1192)
B14B700	5G antenna 2 fault	(See page ZD-1192)
B14B800	5G antenna 3 fault	(See page ZD-1192)
B14B900	5G antenna 4 fault	(See page ZD-1192)
B14BA00	4G antenna 1 fault	(See page ZD-1195)
B14BB00	4G antenna 2 fault	(See page ZD-1195)
B14BC00	DAB antenna 1 fault	(See page ZD-1198)
B14BD00	DAB antenna 2 fault	(See page ZD-1198)
B14BE00	USB communication between module and SOC	(See page ZD-1203)
B14C800	EOL switching eSIM physical card failure	(See page ZD-1203)
B14C900	eSIM switching back failure	(See page ZD-1203)
B14C400	GNSS module 1 fault	(See page ZD-1205)
B14CB00	EOL switching to physical card 1 failure	(See page ZD-1207)
B14CC00	SIM2 switching back failure	(See page ZD-1208)
B14CE00	SIM1 switching back failure	(See page ZD-1208)
B14CD00	EOL switching to physical card 2 failure	(See page ZD-1210)
U146E8A	ICC backbone network Eth1 connection establishment failure	(See page ZD-1211)
U008988	Backbone network 1 CAN bus off	(See page ZD-1215)

DTC	**B14A016**	**Circuit voltage too low**
DTC	**B14A017**	**Circuit voltage too high**

Description

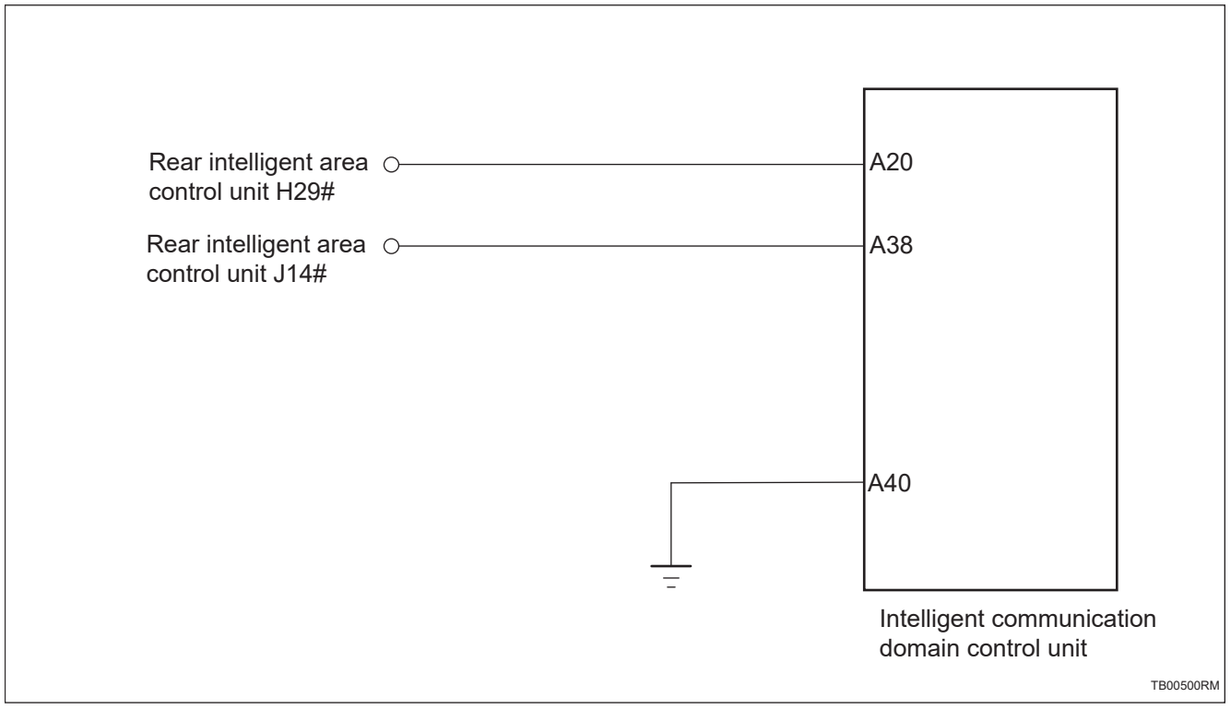
When power supply voltage of intelligent communication domain control unit is too high or too low, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A016	• IGN is ON and TBOX is in normal operating status	Battery voltage ⩽ 9 V	40 times (2 s)	Periodic type	20 Hz	• Intelligent communication domain control unit • Wire harness and connector • Charging system
B14A017	• IGN is ON and TBOX is in normal operating status	Battery voltage ⩾ 16 V	8 times (400 ms)	Periodic type	20 Hz	• Intelligent communication domain control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A016	TBOX function is abnormal	-
B14A017	TBOX function is abnormal	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

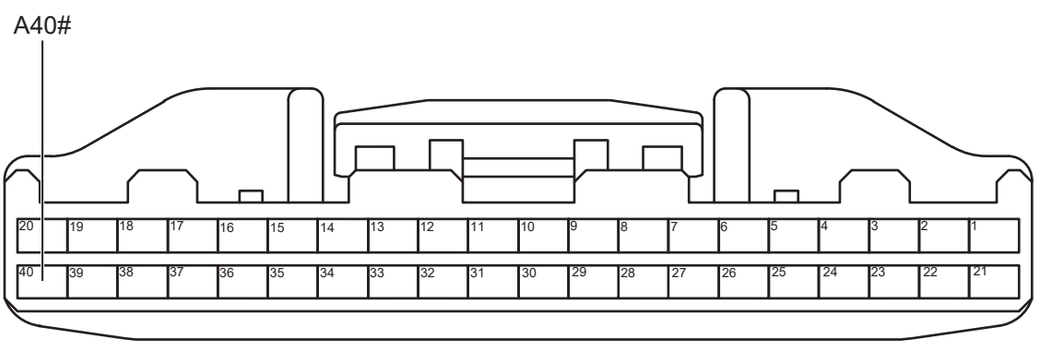
Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

2	Check intelligent communication domain control unit ground



Intelligent communication domain control unit A connector

TB00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) According to value in the table, measure resistance.

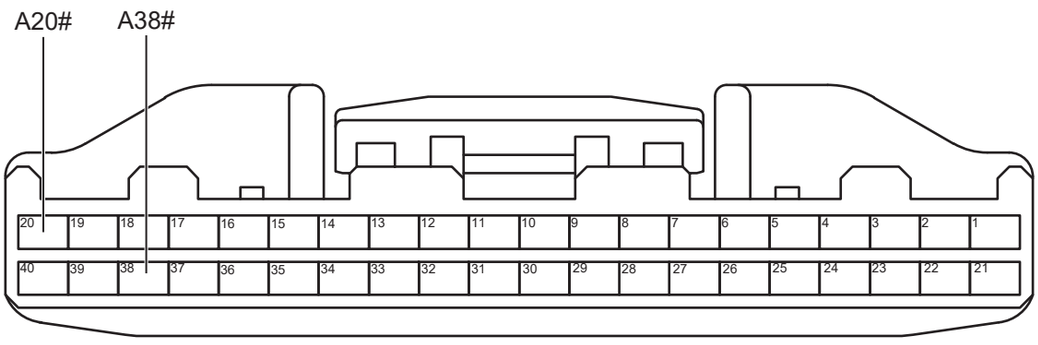
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A40# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check intelligent communication domain control unit power supply**



Intelligent communication domain control unit A connector

TB00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A20# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent communication domain control unit connector A38# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

ZD

Replace intelligent communication domain control unit (See page ZC-116)

DTC	B14A100	Backup battery diagnosis

Description

ZD

When backup battery voltage is abnormal, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times/monitoring type/monitoring rate	Faulty area
B14A100	• IGN is ON and TBOX is in normal operating status	Abnormal internal resistance of backup battery	After reaching monitoring threshold, DTC will be reported within 60 seconds (as the backup battery does not support real-time monitoring)	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A100	Backup battery is unable to supply power	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14A201**	**E-call LED fault**
DTC	**B14A271**	**ECALL button stuck**

Description

When roof switch (E-CALL button) is faulty or LED is damaged, the intelligent communication domain control unit records DTC.

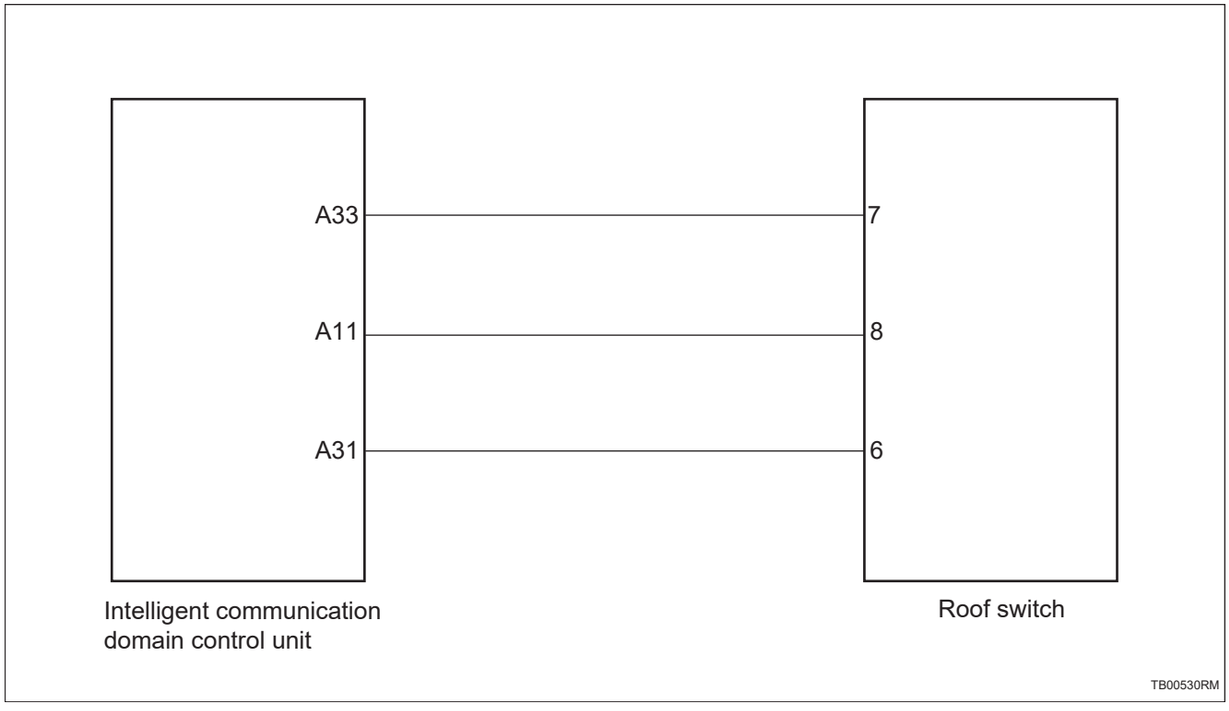
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A201	• IGN is ON and TBOX is in normal operating status	• 5G: The current open and short circuit states are determined by the AD value. (Voltage between GN_FB and GND—— MCU Pin128) Normal: Voltage range: 0.6 ~ 1.45 V Open circuit: Voltage range: More than 1.45 V Short circuit: Voltage range: Less than 0.2 V • 4G: The current open and short circuit states are determined by the AD value. (Voltage between GN_FB and GND—— MCU Pin82) Normal: Voltage range: 0.6 ~ 1.45 V Open circuit: Voltage range: More than 1.45 V Short circuit: Voltage range: Less than 0.2 V	10 times (1 s)	Periodic type	10 Hz	• Roof switch • Intelligent communication domain control unit • Wire harness and connector
B14A271	• IGN is ON and TBOX is in normal	• Press and hold the button for 60 s, check	120 times (60 s)	Periodic type	2 Hz	• Roof switch • Intelligent communication domain control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	operating status	that ECALL button level input status is LOW				• Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A201	E-call LED cannot display properly	Not come on
B14A271	E-CALL LED light turns off	Comes on

Circuit diagram



Inspection procedure

1	**Check roof switch button**

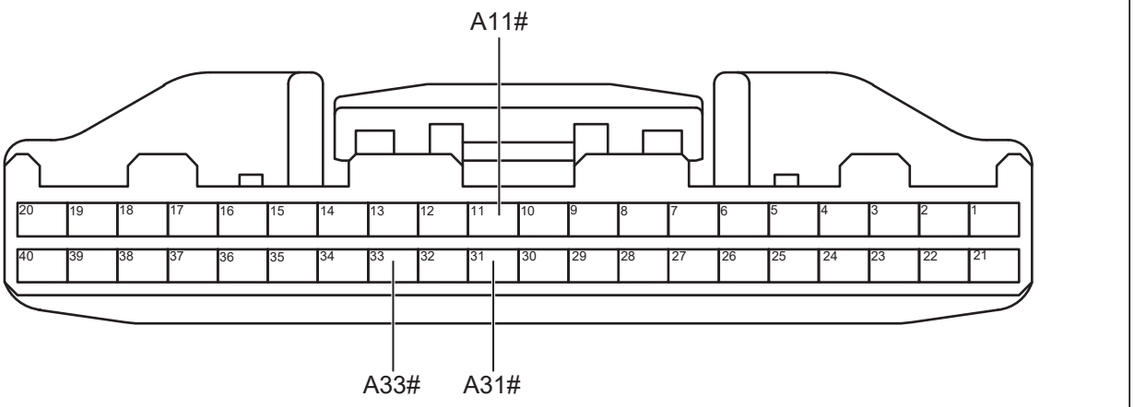
(a) Check for foreign matters in roof switch button.

(b) Check if roof switch button is stuck.

NG → **Perform repair according to malfunction**

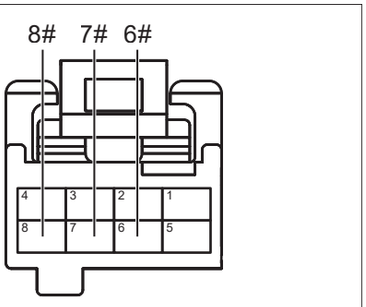
OK

2	Check for open in roof switch wire harness and connector



Intelligent communication domain control unit A connector

TB00541RM



Roof switch connector

TB00550RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the roof switch connector.

(e) According to value in the table, measure resistance.

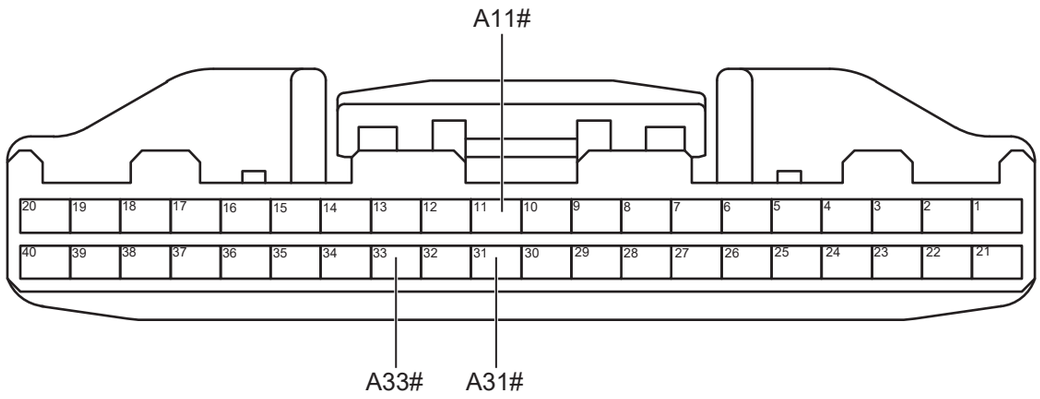
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A33# - roof switch connector 7#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector A11# - roof switch connector 8#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector A31# - roof switch connector 6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in roof switch wire harness and connector**



Intelligent communication domain control unit A connector

TB00541RM

(a) According to value in the table, measure resistance.

Standard value

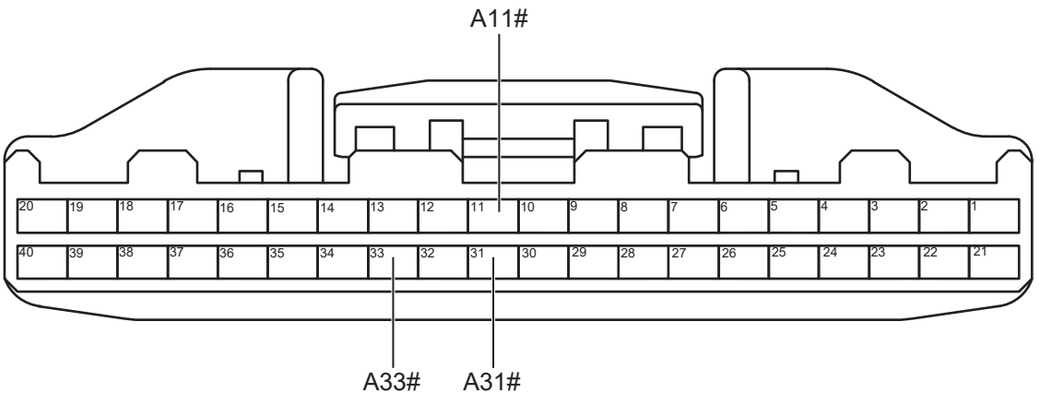
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A11# - body ground	Always connected	10 KΩ or more
Intelligent communication domain control unit connector A31# - body ground	Always connected	10 KΩ or more
Intelligent communication domain control unit connector A33# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	Check for short to power supply in roof switch wire harness and connector



Intelligent communication domain control unit A connector

TB00541RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent communication domain control unit connector A31# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent communication domain control unit connector A33# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace roof switch (See page ZC-5)

(a) Replace the roof switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14A300**	**Built-in SIM1 card fault**
DTC	**B14A400**	**Built-in SIM2 card fault**

Description

When built-in SIM card is faulty, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A300	• IGN is ON and TBOX is in normal operating status	• Return the SIM card abnormally by calling the high-pass interface	1 time	Event-based	When an interrupted SIM card fault occurs, perform one monitoring	• Intelligent communication domain control unit
B14A400	• IGN is ON and TBOX is in normal operating status	• Return the SIM card abnormally by calling the high-pass interface	1 time	Event-based	When an interrupted SIM card fault occurs, perform one monitoring	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A300	• Unable to use the normal network application • Unable to make a call and no 4G or 5G network	Comes on
B14A400	• Unable to use the normal network application • Unable to make a call and no 4G or 5G network	Comes on

Inspection procedure

1	**Clear DTCs**

ZD

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14A500	SRS signal fault

Description

When Crash hard wire signal is abnormal, the intelligent communication domain control unit records DTC.

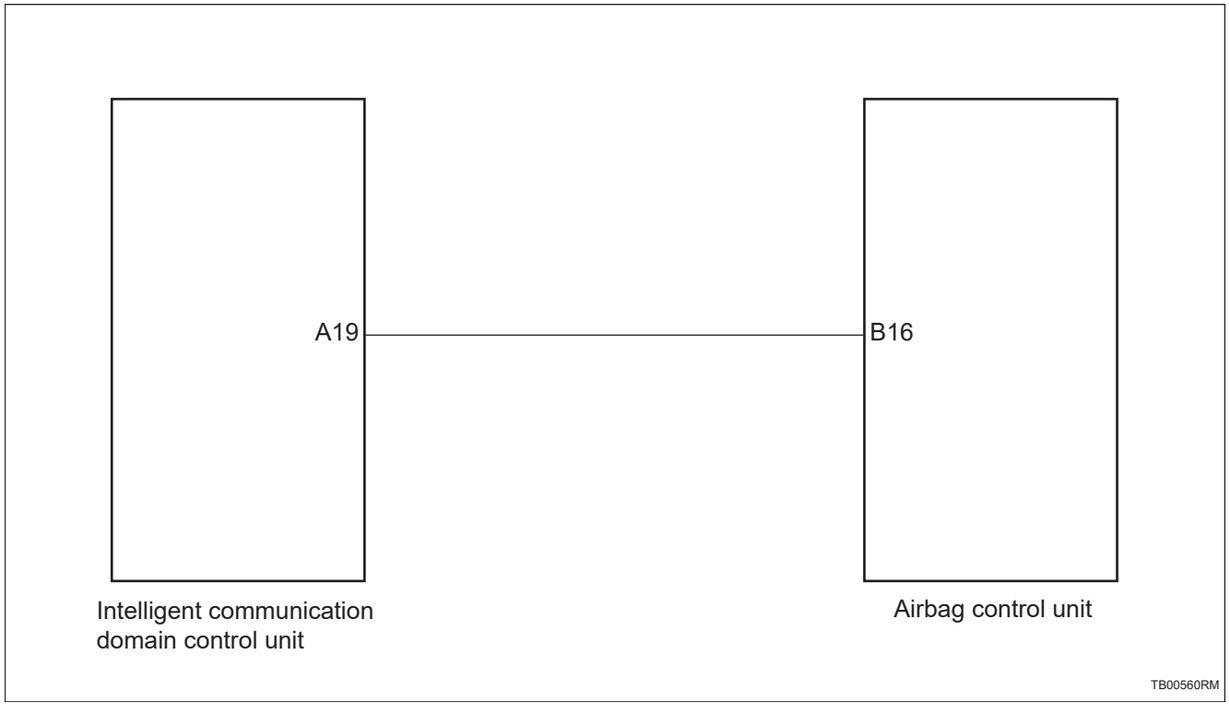
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A500	• IGN is ON and TBOX is in normal operating status	• Crash waveform is abnormal for 7 s (PWM ratio is not one-fifth or four-fifths)	28 times (7 s)	Periodic type	4 Hz	• Airbag control unit • Intelligent communication domain control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A500	Abnormal frequency or duty radio of PWM, unable to trigger ECALL	Comes on

Circuit diagram



Inspection procedure

1	Check airbag system

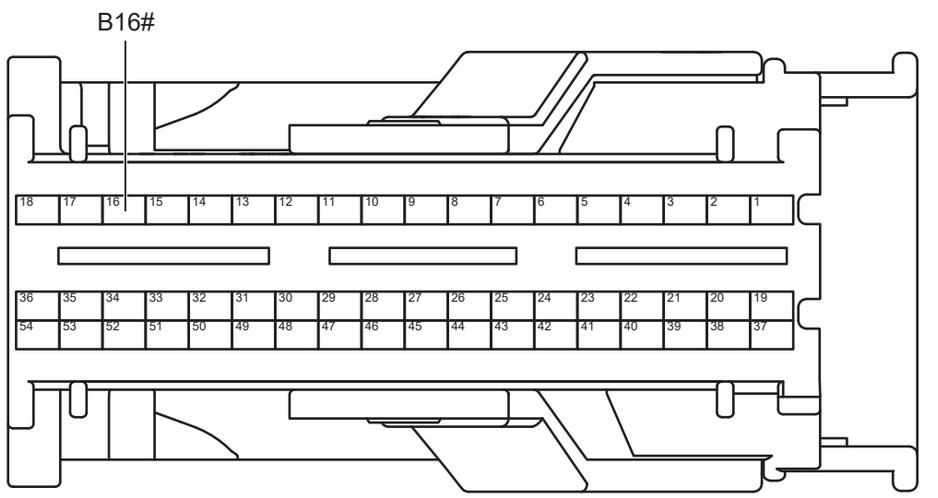
(a) Check if airbag system is normal.

(b) Check if the vehicle is involved in a collision.

NG → **Perform repair according to malfunction**

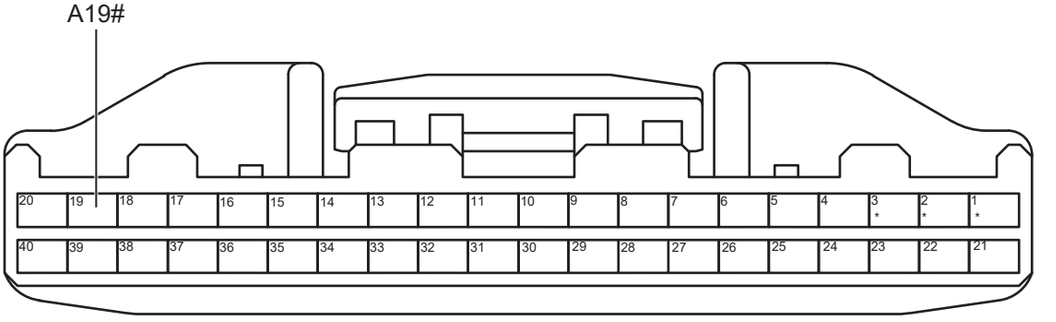
OK

2	**Check for open in intelligent communication domain control unit wire harness and connector**



Airbag control unit B connector

TB00571RM



Intelligent communication domain control unit A connector

TB00581RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the airbag control unit connector.

(e) According to value in the table, measure resistance.

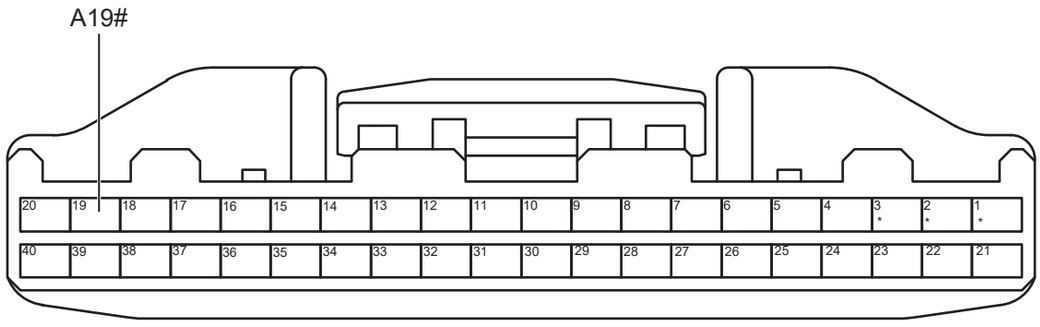
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A19# - airbag control unit connector B16#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in intelligent communication domain control unit wire harness and connector**



Intelligent communication domain control unit A connector

TB00581RM

(a) According to value in the table, measure resistance.

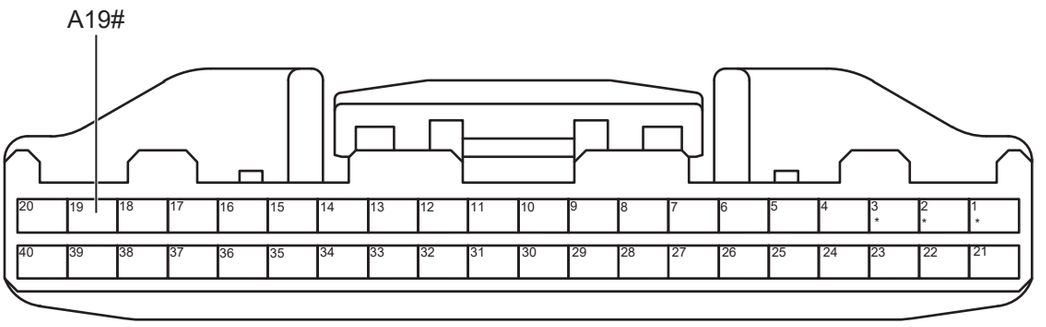
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in intelligent communication domain control unit wire harness and connector**



Intelligent communication domain control unit A connector

TB00581RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A19# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace airbag control unit (See page ZC-74)**

(a) Replace the airbag control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14A608**	**Tuner communication fault**
DTC	**B14A708**	**DAB communication fault**
DTC	**B14A800**	**Codec module fault**

Description

When an internal fault occurs in intelligent communication domain control unit, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A608	• IGN is ON and TBOX is in normal operating status	• Tuner chip fault is continuously detected for 3 times • Communication fault for 3 consecutive times	3 times (3 s)	Periodic type	1 Hz	• Intelligent communication domain control unit
B14A708	• IGN is ON and TBOX is in normal operating status	• DAB chip fault is continuously detected for 3 times • Communication fault for 3 consecutive times	3 times (3 s)	Periodic type	1 Hz	• Intelligent communication domain control unit
B14A800	• IGN is ON and TBOX is in normal operating status	• Read codec error status memory returned an abnormal codec status	5 times (5 s)	Periodic type	1 Hz	• Intelligent communication domain control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A608	• I2C communication fault, Tuner can play back normally but radio can not be scanned • Tuner chip is faulty and radio cannot play	-
B14A708	• SPI communication fault, DAB can play normally but cannot scan the radio • Radio cannot be played due to DAB chip fault	-
B14A800	• The phone call is successfully connected, but there is no sound (two scenarios: one is that there is no sound on one's own end, and the other is that the other party cannot hear the sound)	-

Inspection procedure

1	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC B14A900 AMP module fault

Description

When an internal fault occurs in intelligent communication domain control unit, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14A900	• IGN is ON and TBOX is in normal operating status	• The status of the error indication pin (FAULT) of the AMP is read as Low	5 times (5 s)	Periodic type	1 Hz	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14A900	• No sound when making a call by ECALL/BCALL	-

Inspection procedure

1	**Check emergency call system speaker wire harness and connector**

(a) Check for short in emergency call system speaker wire harness and connector.

(b) Check for open in emergency call system speaker wire harness and connector.

NG → **Perform repair according to malfunction**

OK

2	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14AA00	MIC fault

Description

When ECALL microphone is faulty, the intelligent communication domain control unit records DTC.

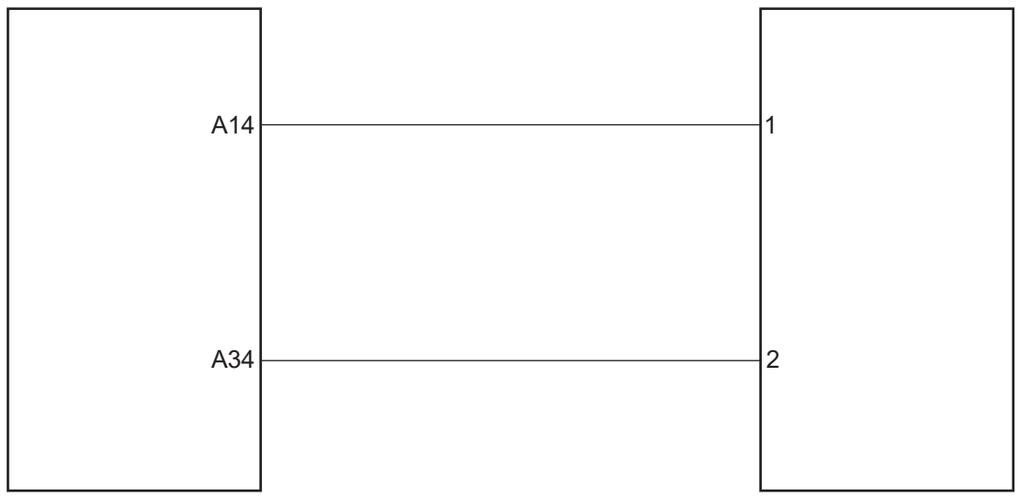
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14AA00	• IGN is ON and TBOX is in normal operating status	• 5G: The current open and short circuit states are determined by the AD value. (Detect for MIC_ POWER_ DET ——MCU Pin38) Normal: Voltage range 0.2 ~ 2.2 V Open circuit: Voltage range 0 ~ 0.2 V Short circuit: Voltage range > 2.2 V • 4G: Determine the current open and short status by AD value. (Detect for MIC_ _DET ——MCU Pin43) Normal: Voltage range 0.2 ~ 2.2 V Open circuit: Voltage range 0 ~ 0.2 V Short circuit: Voltage range > 2.2 V	100 times (10 min)	Periodic type	1/6 Hz	• ECALL microphone • Intelligent communication domain control unit • Wire harness and connector

ZD

Fault symptom

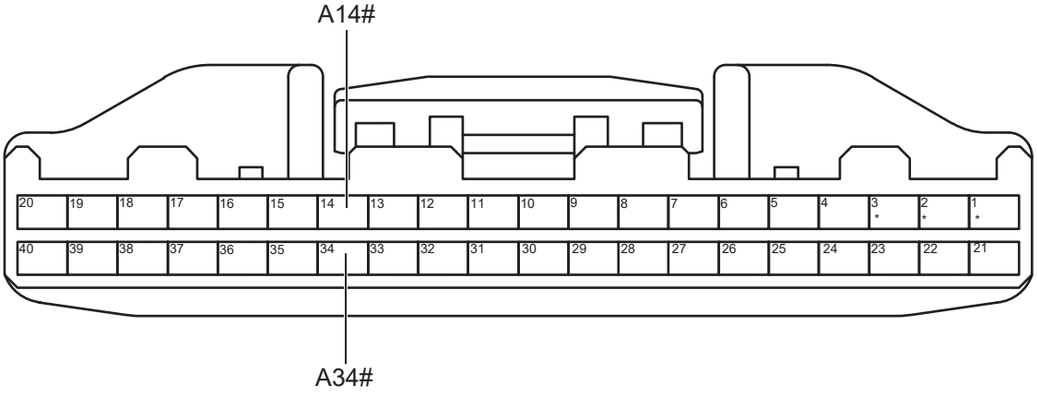
DTC No.	Fault symptom	Warning light/indicator
B14AA00	The other party cannot hear the sound when making a call by ECALL/BCALL	Comes on

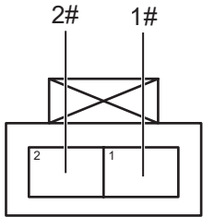
Circuit diagram



Inspection procedure

1	**Check for open in ECALL microphone wire harness and connector**





ECALL microphone connector

TB00610RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the ECALL microphone connector.

(e) According to value in the table, measure resistance.

Standard value

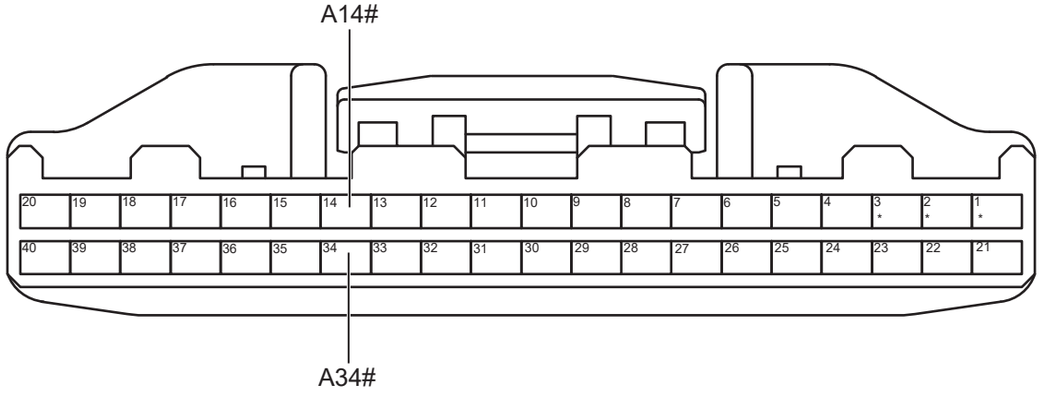
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A14# - ECALL microphone connector 1#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector A34# - ECALL microphone connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in ECALL microphone wire harness and connector**



Intelligent communication domain control unit A connector

TB00601RM

(a) According to value in the table, measure resistance.

Standard value

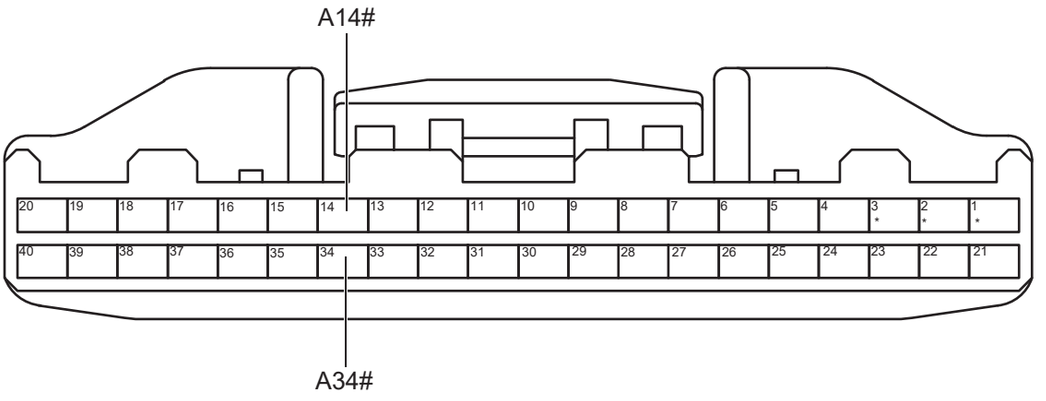
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A14# - body ground	Always connected	10 KΩ or more
Intelligent communication domain control unit connector A34# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in ECALL microphone wire harness and connector**



Intelligent communication domain control unit A connector

TB00601RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A14# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent communication domain control unit connector A34# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace ECALL microphone**

(a) Replace the ECALL microphone.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14AC08	Gsensor communication fault
DTC	B14C600	GNSS module 2 fault (Nad GNSS module)

Description

When an internal fault occurs in intelligent communication domain control unit, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14AC08	• IGN is ON and TBOX is in normal operating status	• Communication fault for 5 seconds	25 times (5 s)	Periodic type	5 Hz	• Intelligent communication domain control unit
B14C600	• IGN is ON and TBOX is in normal operating status	• If the module fails to read GNSS data for 5 consecutive seconds, the current DTC is stored	1 time (3 s)	Periodic type	1/3 Hz	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14AC08	Movement alarm function invalid	-
B14C600	Unable to locate	Comes on

Inspection procedure

1	Clear DTCs

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14B300	Tuner antenna 1 fault

Description

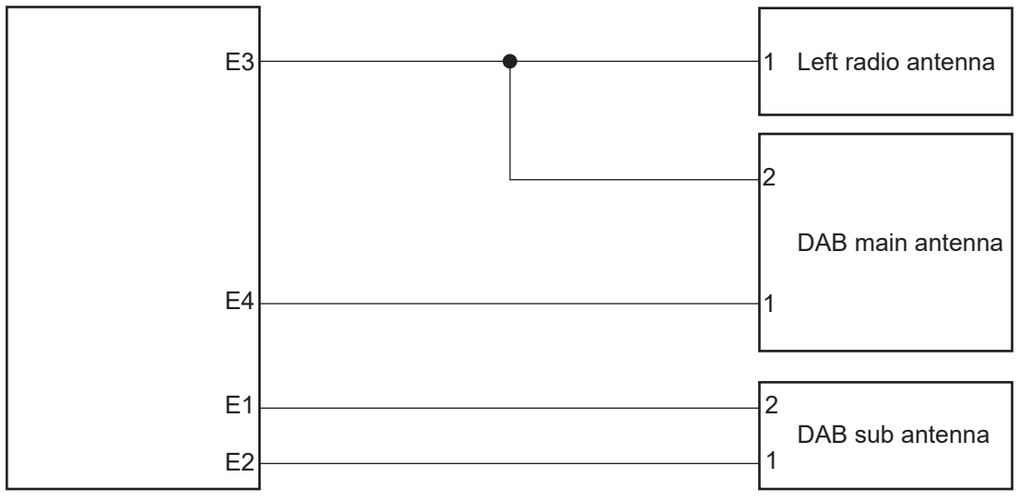
When a fault occurs in radio antenna, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14B300	• IGN is ON and TBOX is in normal operating status	• 5G: The current open and short circuit states are determined by the AD value. (Detect for Tuner _ ANT2UP_ MAIN_ SENSE ——MCU Pin61) Normal: Voltage range 0.3 ~ 2.4 V Open circuit: Voltage range 0 ~ 0.0.3V Short circuit: Voltage range 2.4 ~ 2.65 V • 4G: The current open and short circuit states are determined by the AD value. (Detect for Tuner_ ANT2UP_ MAIN_ SENSE ——MCU Pin45) Normal: Voltage range 0.3 ~ 2.4 V Open circuit: Voltage range 0 ~ 0.3 V Short circuit: Voltage range 2.4 ~ 2.65 V	5 times (0.5 s)	Periodic type	10 Hz	• Left radio antenna • DAB main antenna • DAB sub antenna • Antenna filter (positive) assembly • Intelligent communication domain control unit • Wire harness and connector

Fault symptom

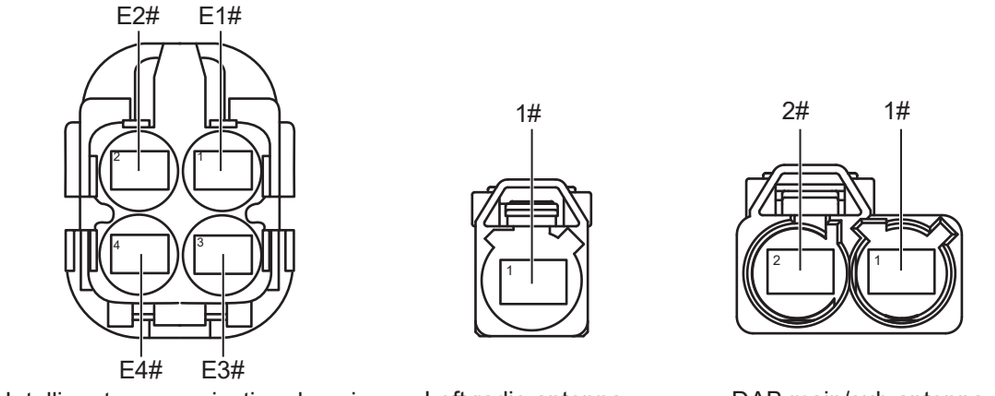
DTC No.	Fault symptom	Warning light/indicator
B14B300	The radio station has a lot of noise	-

Circuit diagram



Inspection procedure

1	**Check for open in radio antenna wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the left radio antenna connector.

(e) Disconnect the DAB main antenna connector.

(f) Disconnect the DAB sub antenna connector.

(g) According to value in the table, measure resistance.

Standard value

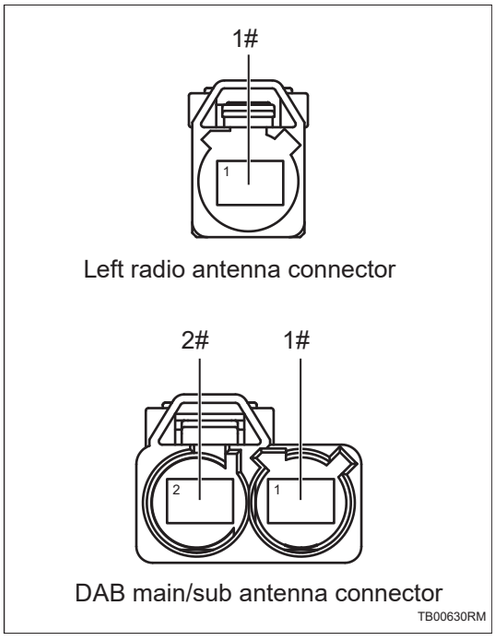
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector E3# - left radio antenna connector 1#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E3# - DAB main antenna connector 2#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E4# - DAB main antenna connector 1#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E1# - DAB sub antenna connector 2#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E2# - DAB sub antenna connector 1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in radio antenna wire harness and connector**



(a) According to value in the table, measure resistance.

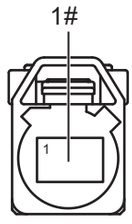
Standard value

Multimeter connection	Detection condition	Specified condition
Left radio antenna connector 1# - body ground	Always connected	10 KΩ or more
DAB main antenna connector 1# - body ground	Always connected	10 KΩ or more
DAB main antenna connector 2# - body ground	Always connected	10 KΩ or more
DAB sub antenna connector 1# - body ground	Always connected	10 KΩ or more
DAB sub antenna connector 2# - body ground	Always connected	10 KΩ or more

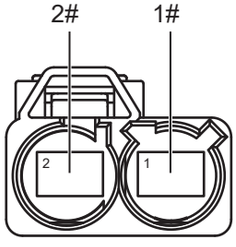
NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in radio antenna wire harness and connector**



Left radio antenna connector



DAB main/sub antenna connector

TB00630RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Left radio antenna connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB main antenna connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB main antenna connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB sub antenna connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB sub antenna connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace left radio antenna and DAB main/sub antenna (See page ZC-98)**

(a) Replace the left radio antenna and DAB main/sub antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

ZD

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace antenna filter (positive) assembly/antenna filter (negative) assembly**

ZD

OK

Replace intelligent communication domain control unit (See page ZC-116)

DTC	B14B500	GNSS antenna fault

Description

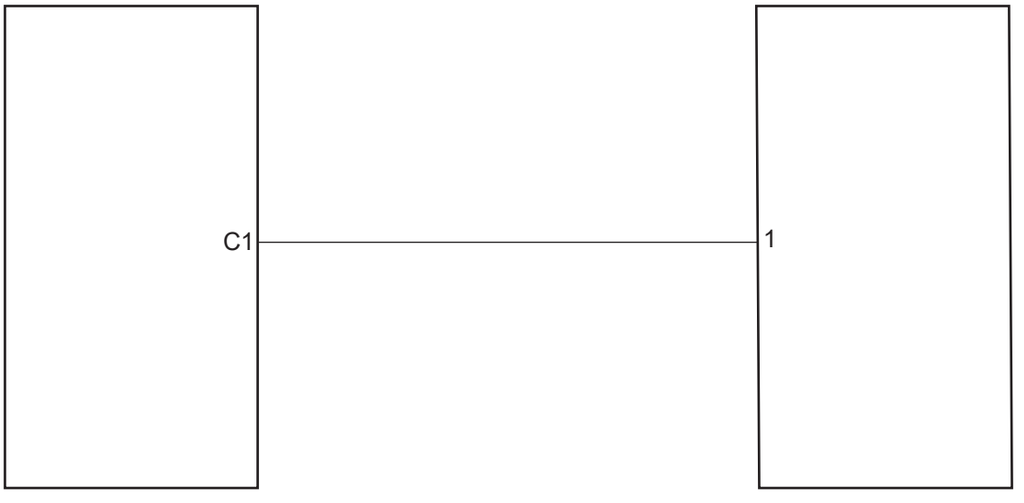
When right GNSS-ICC is short or open, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14B500	• IGN is ON and TBOX is in normal operating status	• 5G: The current open and short circuit states are determined by the AD value. (Detect for GNSS_STAT——MCU Pin106) Normal: Voltage range 0.17 ~ 2.4 V Open circuit: Voltage range 0 ~ 0.17 V Short circuit: Voltage range 2.4 ~ 2.65 V • 4G: The current open and short circuit states are determined by the AD value. (Detect for GPS2uP_ANT_CONNEC-T_DET——MCU Pin40) Normal: Voltage range 0.17 ~ 2.4 V Open circuit: Voltage range 0 ~ 0.17 V Short circuit: Voltage range 2.4 ~ 2.65 V	5 times (0.5 s)	Periodic type	10 Hz	• Right GNSS-ICC • Intelligent communication domain control unit • Wire harness and connector

Fault symptom

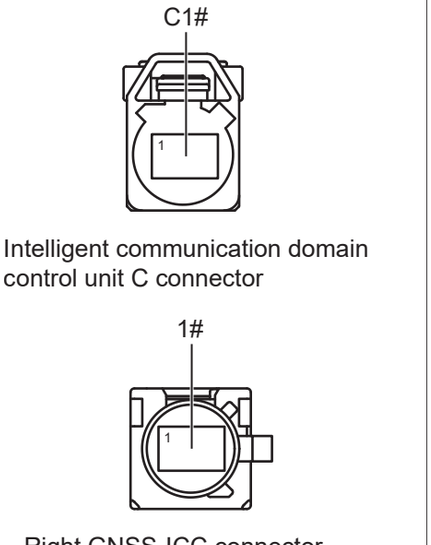
DTC No.	Fault symptom	Warning light/indicator
B14B500	The navigation map fails to provide location	-

Circuit diagram



Inspection procedure

1	**Check for open in right GNSS-ICC wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the right GNSS-ICC connector.

(e) According to value in the table, measure resistance.

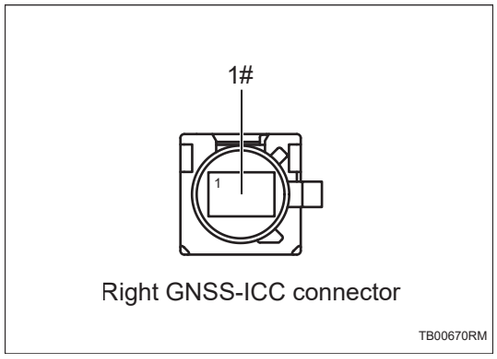
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector C1# - right GNSS-ICC connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in right GNSS-ICC wire harness and connector**



(a) According to value in the table, measure resistance.

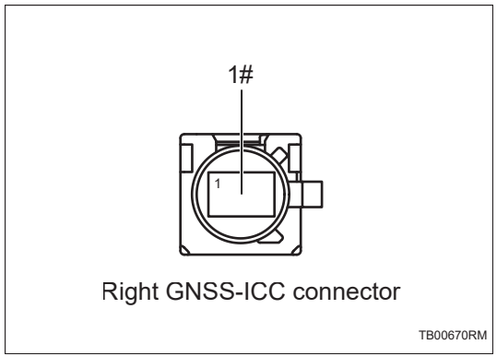
Standard value

Multimeter connection	Detection condition	Specified condition
Right GNSS-ICC connector 1# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in right GNSS-ICC wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Right GNSS-ICC connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Replace right GNSS-ICC (See page ZC-40)**

(a) Replace the right GNSS-ICC.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14B600**	**5G antenna 1 fault**
DTC	**B14B700**	**5G antenna 2 fault**
DTC	**B14B800**	**5G antenna 3 fault**
DTC	**B14B900**	**5G antenna 4 fault**

Description

When a fault occurs in communication antenna assembly I, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14B600	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 5G_ RF_ MAIN_ ANT_DET——NAD Pin247) Normal: Voltage range 0.81 ~ 1.33 V Open circuit: Voltage range 1.71 ~ 1.89 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly l • Wire harness and connector • Intelligent communication domain control unit
B14B700	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 5G_ ANT_DIV_ DET——MCU Pin110) Normal: Voltage range 1.4894 ~ 2.152 V Open circuit: Voltage range 3.135 ~ 3.465 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly l • Wire harness and connector • Intelligent communication domain control unit
B14B800	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 5G_ ANT_ MIMO3_ DET—— MCU Pin112) Normal: Voltage range 1.4894 ~ 2.152 V Open circuit: Voltage range 3.135 ~ 3.465 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly l • Wire harness and connector • Intelligent communication domain control unit
B14B900	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 5G_ ANT_MIMO4_ DET—— MCU Pin114) Normal: Voltage range 1.4894 ~ 2.152 V Open circuit: Voltage range 3.135 ~ 3.465 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly l • Wire harness and connector • Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14B600	Weak signal, slow signal	Comes on
B14B700	Weak signal, slow signal	Comes on
B14B800	Weak signal, slow signal	Comes on
B14B900	Weak signal, slow signal	Comes on

Inspection procedure

1	**Check communication antenna assembly I antenna wire harness and connector**

(a) Check communication antenna assembly I antenna connector for damage or looseness.

(b) Check for short in communication antenna assembly I antenna wire harness and connector.

(c) Check for open in communication antenna assembly I antenna wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Replace communication antenna assembly I antenna**

(a) Replace the communication antenna assembly I antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14BA00**	**4G antenna 1 fault**
DTC	**B14BB00**	**4G antenna 2 fault**

Description

When a fault occurs in communication antenna assembly I, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14BA00	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 4G_ RF_ MAIN_ ANT_DET——NAD Pin175) Normal: Voltage range 0.81 ~ 1.33 V Open circuit: Voltage range 1.71 ~ 1.89 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly I • Wire harness and connector • Intelligent communication domain control unit
B14BB00	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (Detect for 4G_ ANT_ DIV_DET——NAD Pin172) Normal: Voltage range 0.81 ~ 1.33 V Open circuit: Voltage range 1.71 ~ 1.89 V Short circuit: Voltage range 0 ~ 0.7 V	5 times (0.5 s)	Periodic type	10 Hz	• Communication antenna assembly I • Wire harness and connector • Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14BA00	Weak signal, slow signal	Comes on
B14BB00	Weak signal, slow signal	Comes on

Inspection procedure

1	**Check communication antenna assembly I antenna wire harness and connector**

(a) Check communication antenna assembly I antenna connector for damage or looseness.

(b) Check for short in communication antenna assembly I antenna wire harness and connector.

(c) Check for open in communication antenna assembly I antenna wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace communication antenna assembly I antenna**

(a) Replace the communication antenna assembly I antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14BC00	DAB antenna 1 fault
DTC	B14BD00	DAB antenna 2 fault

Description

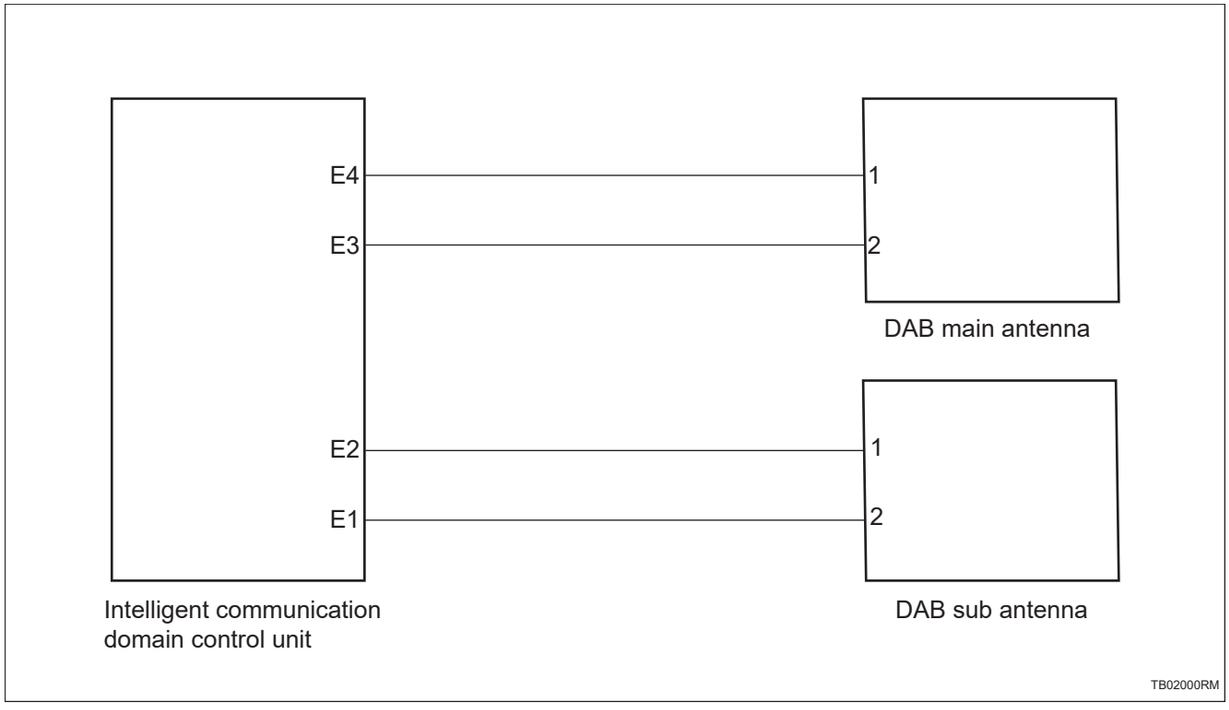
When DAB antenna is faulty, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14BC00	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (MCU Pin59) Normal: Voltage range 0.1 ~ 2.0 V Open circuit: Voltage range < 0.1 V Short circuit: Voltage range > 2 V	5 times (0.5 s)	Periodic type	10 Hz	• DAB main antenna • Wire harness and connector • Intelligent communication domain control unit
B14BD00	• IGN is ON and TBOX is in normal operating status	• The current open and short circuit states are determined by the AD value. (MCU Pin131) Normal: Voltage range 0.1 ~ 2.0 V Open circuit: Voltage range < 0.1 V Short circuit: Voltage range > 2 V	5 times (0.5 s)	Periodic type	10 Hz	• DAB sub antenna • Wire harness and connector • Intelligent communication domain control unit

Fault symptom

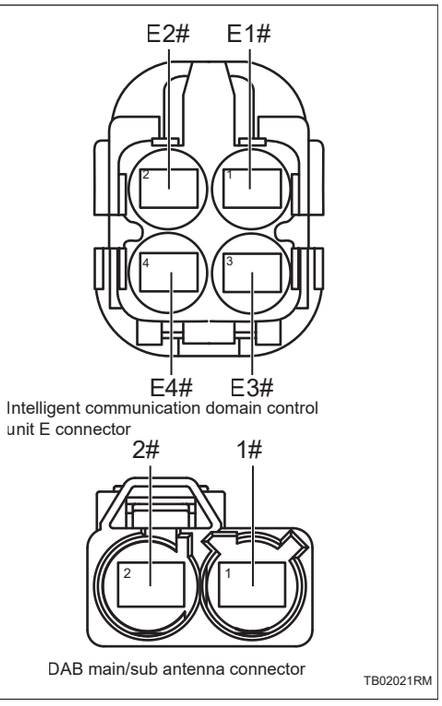
DTC No.	Fault symptom	Warning light/indicator
B14BC00	• SPI communication fault, DAB can play normally but cannot scan the radio • Radio cannot be played due to DAB chip fault	-
B14BD00	• SPI communication fault, DAB can play normally but cannot scan the radio • Radio cannot be played due to DAB chip fault	-

Circuit diagram



Inspection procedure

1	**Check for open in DAB antenna wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the DAB antenna connector.

(e) According to value in the table, measure resistance.

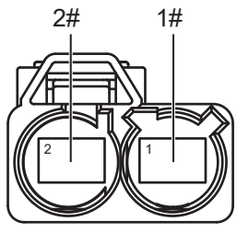
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector E4# - DAB main antenna connector 1#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E3# - DAB main antenna connector 2#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E2# - DAB sub antenna connector 1#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector E1# - DAB sub antenna connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in DAB antenna wire harness and connector**



DAB main/sub antenna connector

TB02010RM

(a) According to value in the table, measure resistance.

Standard value

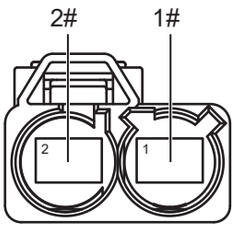
Multimeter connection	Detection condition	Specified condition
DAB main antenna connector 1# - body ground	Always connected	10 KΩ or more
DAB main antenna connector 2# - body ground	Always connected	10 KΩ or more
DAB sub antenna connector 1# - body ground	Always connected	10 KΩ or more
DAB sub antenna connector 2# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in DAB antenna wire harness and connector**



DAB main/sub antenna connector

TB02010RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
DAB main antenna connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB main antenna connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB sub antenna connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
DAB sub antenna connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace DAB main/sub antenna (See page ZC-98)**

(a) Replace the DAB main/sub antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14BE00**	**USB communication between module and SOC**
DTC	**B14C800**	**EOL switching eSIM physical card failure**
DTC	**B14C900**	**eSIM switching back failure**

Description

When intelligent communication domain control unit operates abnormally, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14BE00	• Voltage is between 9 V and 16 V • IGN signal is ON	• USB communication between module and SOC cannot be detected	3 times (15 s)	Event-based	0.2 Hz	• Intelligent communication domain control unit
B14C800	• Voltage is between 9 V and 16 V • IGN signal is ON	• EOL switching to eSIM card fails to complete 3-way APN dialing within the specified time	1 time	Event-based	When EOL switching to eSIM physical card fails	• Intelligent communication domain control unit
B14C900	• Voltage is between 9 V and 16 V • IGN signal is ON	• Failed to complete the switching back and complete 3-way APN dialling within the specified time	1 time	Event-based	When eSIM switching back fails	• Intelligent communication domain control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14BE00	USB communication between module and SOC is impossible	-
B14C800	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-
B14C900	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-

Inspection procedure

1	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK →

Diagnosis ends

DTC B14C400 GNSS module 1 fault

Description

When an internal fault occurs in intelligent communication domain control unit, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C400	• IGN is ON and TBOX is in normal operating status	• Communication fault for 5 seconds	25 times (5 s)	Periodic type	5 Hz	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C400	Unable to locate	Comes on

Inspection procedure

1	**Check right GNSS wire harness and connector**

(a) Check for short in right GNSS wire harness and connector.

(b) Check for open in right GNSS wire harness and connector.

NG → **Perform repair according to malfunction**

OK

2	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14CB00	EOL switching to physical card 1 failure

Description

When EOL fails to switch to physical card 1, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14CB00	• Voltage is between 9 V and 16 V • IGN signal is ON	• EOL switching to SIM card 1 fails to complete 3-way APN dialing within the specified time	1 time	Event-based	When EOL switching to physical card 2 fails	• Intelligent communication domain control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14CB00	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-

Inspection procedure

1	Clear DTCs

(a) Restart T-BOX through IVI engineering mode.

(b) Contact the operator to confirm the status of the card.

(c) Confirm that the card is in a normal state, and then operate EOL again to switch to physical card 1.

(d) Wait for more than 120 seconds.

(e) Connect HQ-VDS diagnostic tester.

(f) Turn ignition switch to "ON".

(g) Clear DTCs.

(h) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	**B14CC00**	**SIM2 switching back failure**
DTC	**B14CE00**	**SIM1 switching back failure**

Description

When SIM2, SIM2 fail to switch back, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14CC00	• Voltage is between 9 V and 16 V • IGN signal is ON	• Failed to complete the switching back and complete 3-way APN dialling within the specified time	1 time	Event-based	When SIM2 switching back fails	• Intelligent communication domain control unit
B14CE00	• Voltage is between 9 V and 16 V • IGN signal is ON	• Failed to complete the switching back and complete 3-way APN dialling within the specified time	1 time	Event-based	When SIM1 switching back fails	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14CC00	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-
B14CE00	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-

Inspection procedure

1	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Contact the operator to confirm the status of the card.

(c) Confirm that the card is in a normal state, and then perform the card-switching operation again.

(d) Wait for more than 120 seconds.

(e) Connect HQ-VDS diagnostic tester.

(f) Turn ignition switch to "ON".

(g) Clear DTCs.

(h) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

DTC	B14CD00	EOL switching to physical card 2 failure

Description

When EOL fails to switch to physical card 2, the intelligent communication domain control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14CD00	• Voltage is between 9 V and 16 V • IGN signal is ON	• EOL switching to SIM card 2 fails to complete 3-way APN dialing within the specified time	1 time	Event-based	When EOL switching to physical card 2 fails	• Intelligent communication domain control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14CD00	Unable to use the normal network application Unable to make a call and no 4G or 5G network	-

Inspection procedure

1	Clear DTCs

(a) Restart T-BOX through IVI engineering mode.

(b) Contact the operator to confirm the status of the card.

(c) Confirm that the card is in a normal state, and then operate EOL again to switch to physical card 2.

(d) Wait for more than 120 seconds.

(e) Connect HQ-VDS diagnostic tester.

(f) Turn ignition switch to "ON".

(g) Clear DTCs.

(h) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

Diagnosis ends

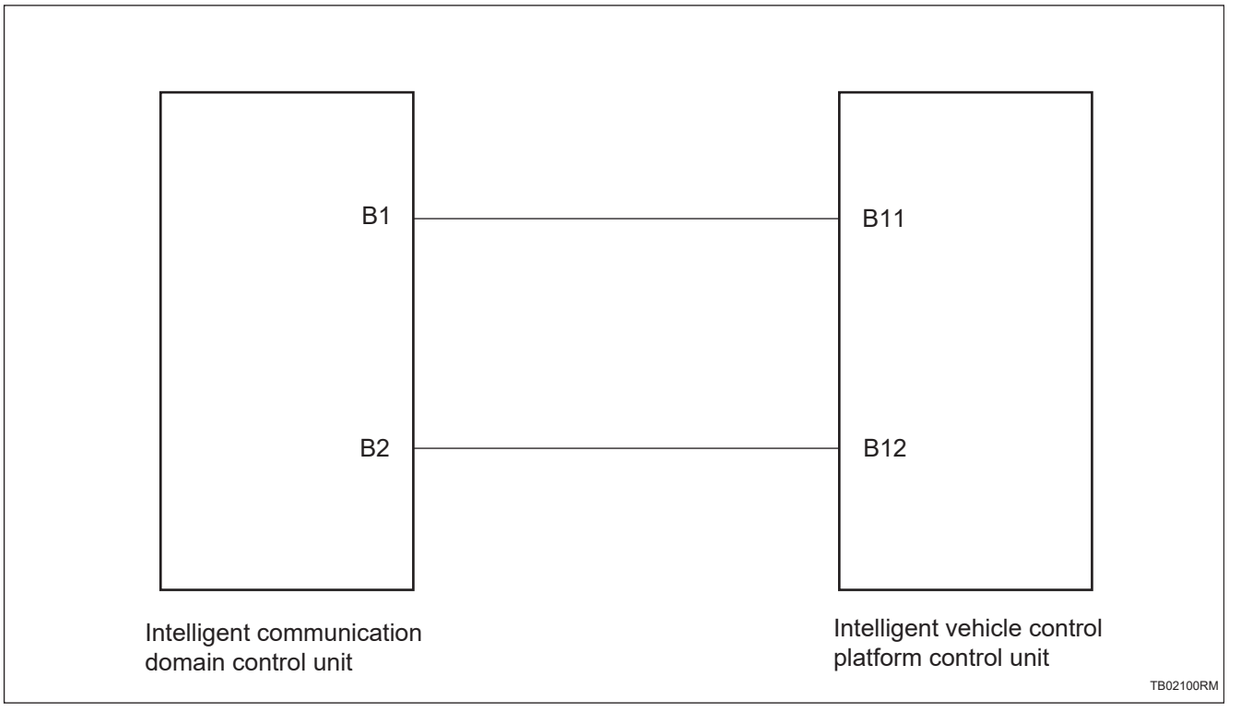
DTC	U146E8A	ICC backbone network Eth1 connection establishment failure

Description

When an fault occurs in intelligent communication domain control unit Ethernet, the intelligent communication domain control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U146E8A	(a) ICC backbone network Eth1 connection establishment failure.	• Intelligent communication domain control unit • Wire harness and connector • Intelligent vehicle control platform control unit

Circuit diagram



ZD

Inspection procedure

1	**Clear DTCs**

(a) Restart T-BOX through IVI engineering mode.

(b) Wait for more than 120 seconds.

(c) Connect HQ-VDS diagnostic tester.

(d) Turn ignition switch to "ON".

(e) Clear DTCs.

(f) Read DTCs again.

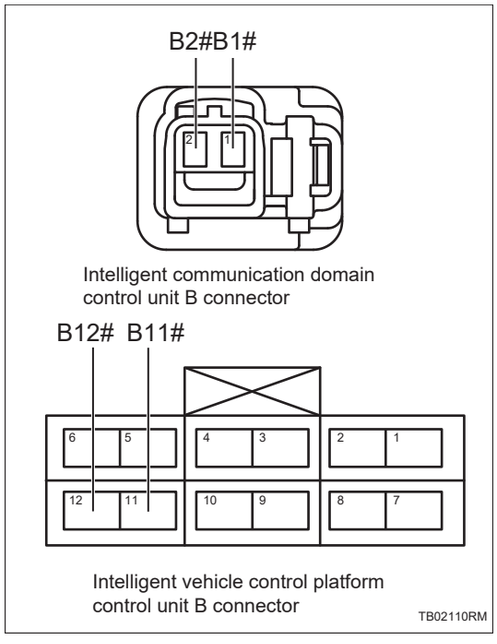
Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit (See page ZC-116)**

OK

2	**Check for open in intelligent communication domain control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

Standard value

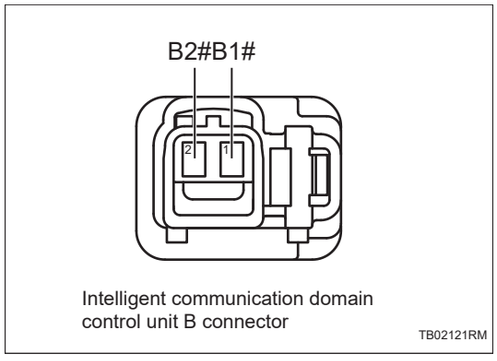
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector B1# - intelligent vehicle control platform control unit connector B11#	Always connected	Less than 1 Ω
Intelligent communication domain control unit connector B2# - intelligent vehicle control platform control unit connector B12#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in intelligent communication domain control unit wire harness and connector**



(a) According to value in the table, measure resistance.

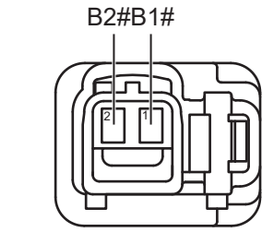
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector B1# - body ground	Always connected	10 KΩ or more
Intelligent communication domain control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in intelligent communication domain control unit wire harness and connector**



Intelligent communication domain control unit B connector

TB02121RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector B1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent communication domain control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace intelligent communication domain control unit**

(a) Replace the intelligent communication domain control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit**

OK

Diagnosis ends

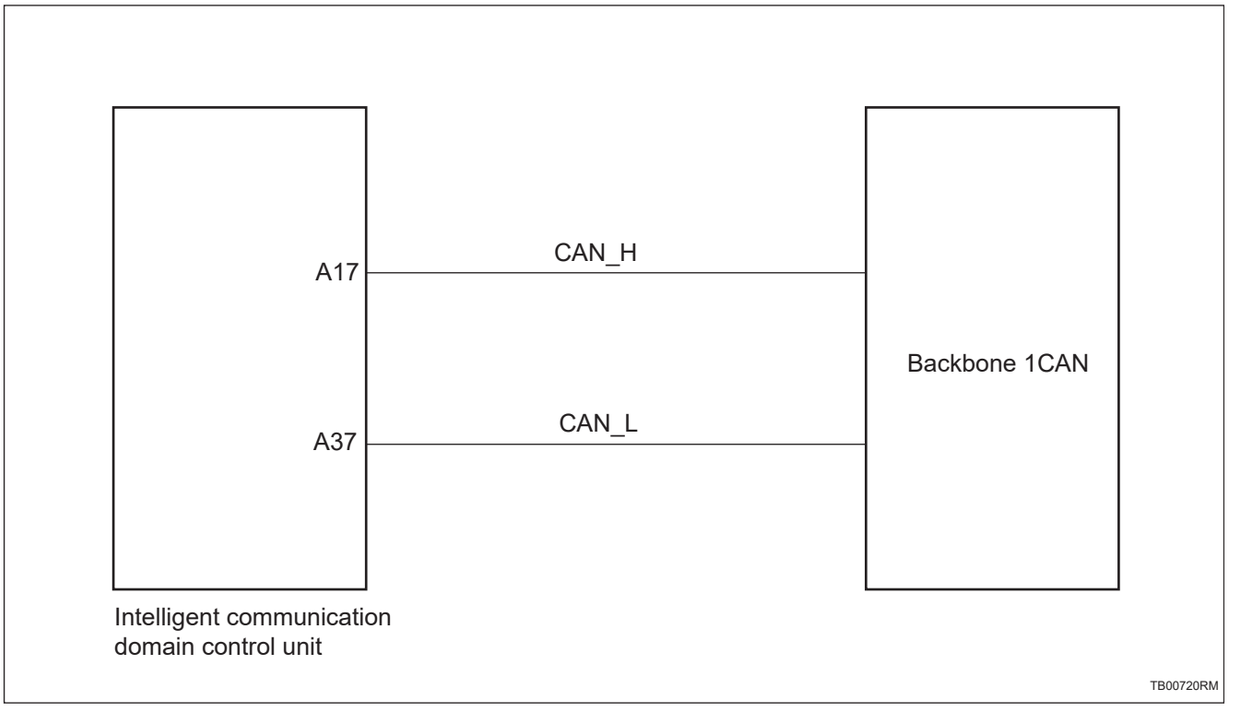
DTC	U008988	Backbone network 1 CAN bus off

Description

When intelligent communication domain control unit detects an off fault in backbone 1 CAN bus, the intelligent communication domain control unit records DTC.

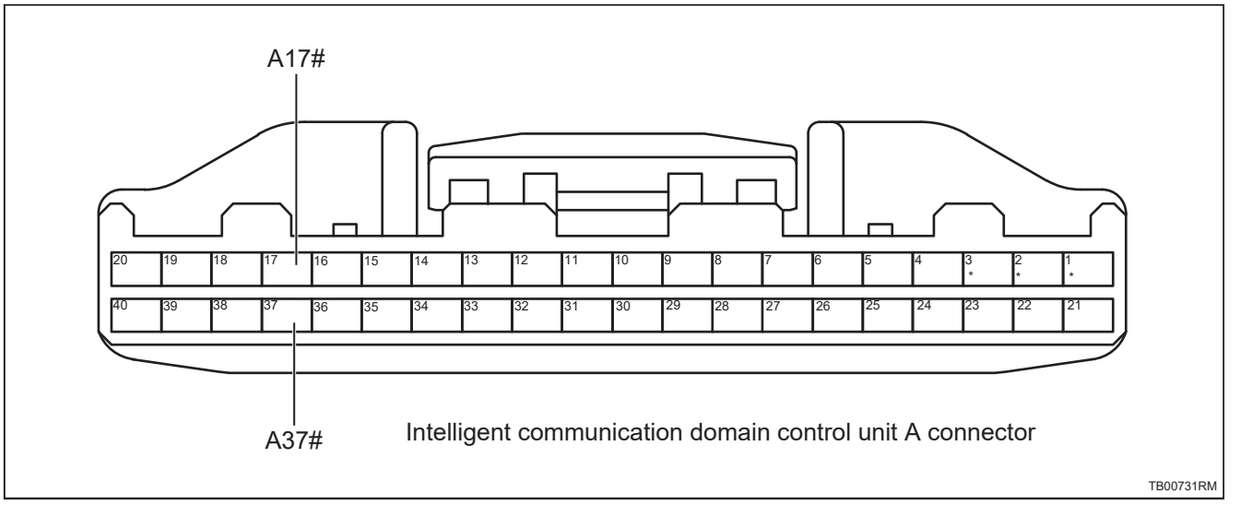
DTC No.	DTC detection condition	Faulty area
U008988	(a) Backbone network 1 CAN bus off.	• CAN line and connector • Intelligent communication domain control unit • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit • Intelligent vehicle control platform control unit

Circuit diagram



Inspection procedure

1	**Check backbone 1 CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A17# - intelligent communications domain control unit connector A37#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

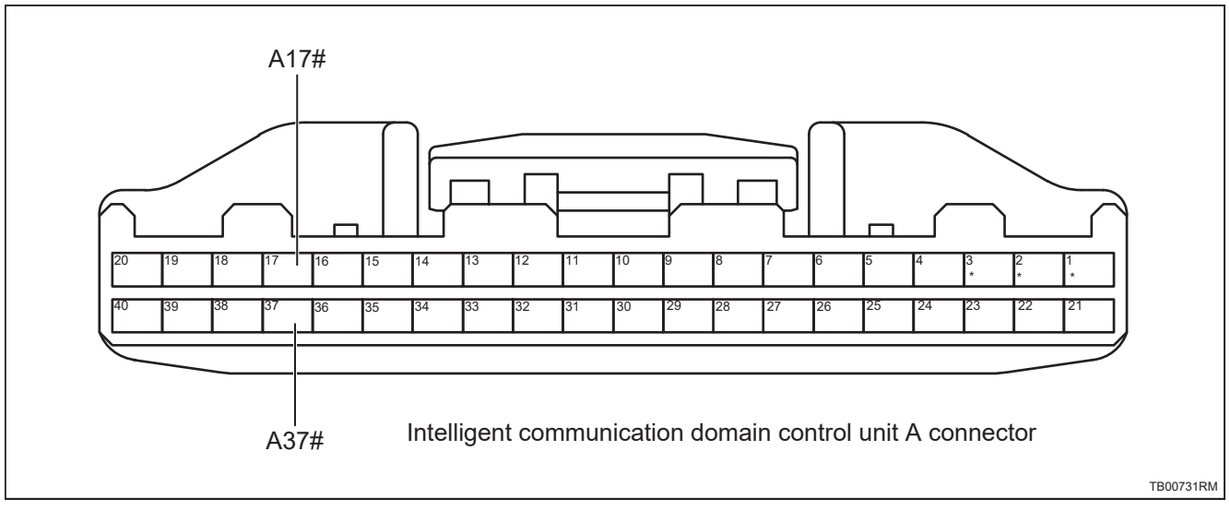
2	Check controllers on backbone 1 CAN bus

(a) Disconnect the controllers on the backbone 1 CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	Check for short between backbone 1 CAN bus CAN-L and CAN-H



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

Standard value

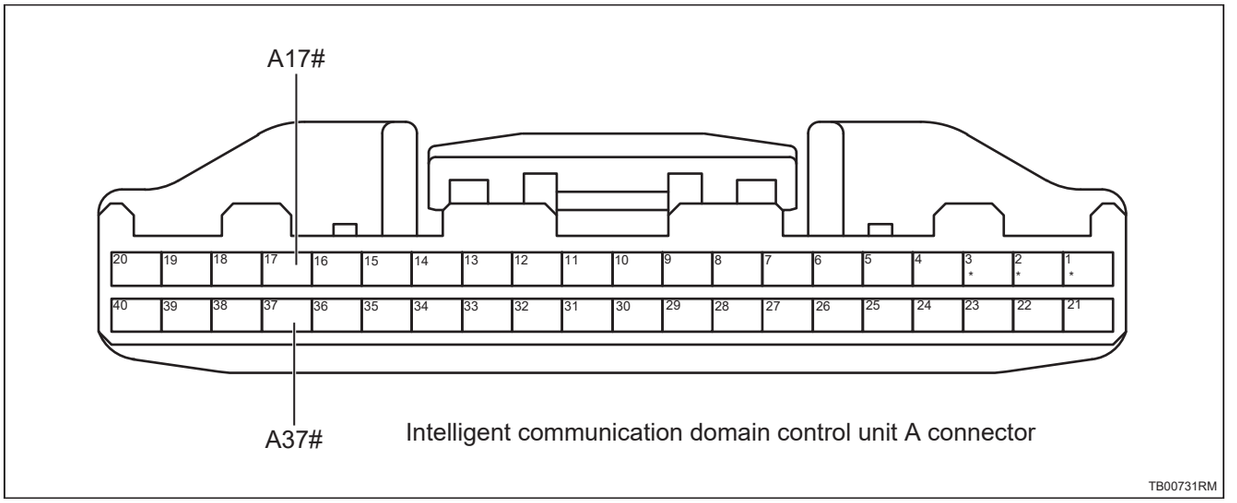
Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A17# - intelligent communications domain control unit connector A37#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check for short to ground in backbone 1 CAN bus



(a) According to value in the table, measure resistance.

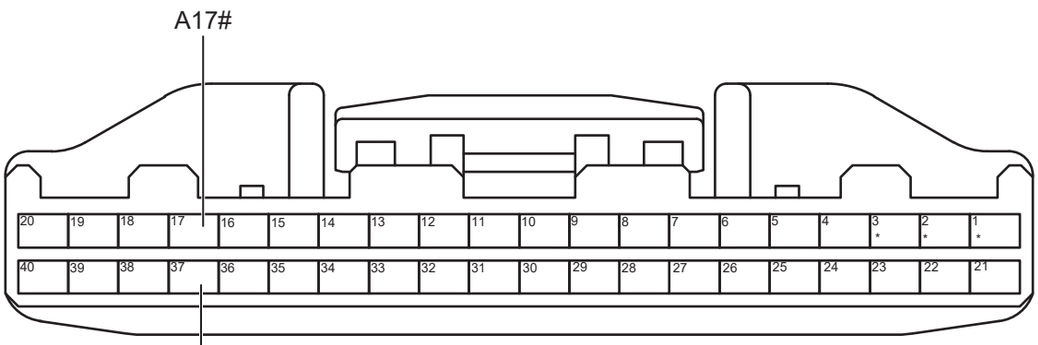
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A17# - body ground	Always connected	10 KΩ or more
Intelligent communication domain control unit connector A37# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in backbone 1 CAN bus**



Intelligent communication domain control unit A connector

TB00731RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent communication domain control unit connector A17# - body ground	Turn ignition switch to "ON"	Less than 1 V
Intelligent communication domain control unit connector A37# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

Power motor control system

Electric rear drive system inverter

Precautions

1. Operation precautions for electric vehicle

(a) The damaged high voltage wire harness should be replaced in time.

(b) High voltage electrical connection parts such as high voltage wire harness must be dry during assembly, and the metal part of electrical connection must be bright.

(c) People wearing electronic/medical life and health support devices (such as pacemakers) should not approach electric vehicles.

(d) The measuring instruments used must be approved and within the validity period.

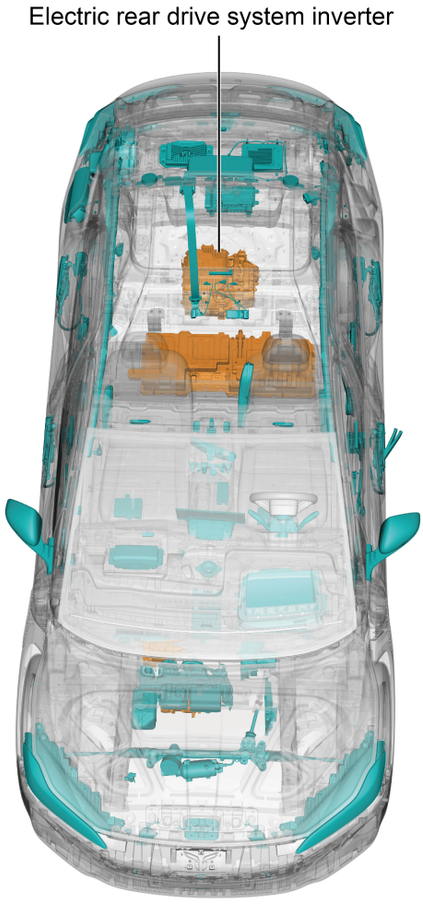
(e) After insulation failure, do not contact with high voltage components, and the housing can conduct electricity.

(f) When removing the high voltage system, electrician special tools should be used.

(g) When operating inside the power battery, tools with insulation protection should be used.

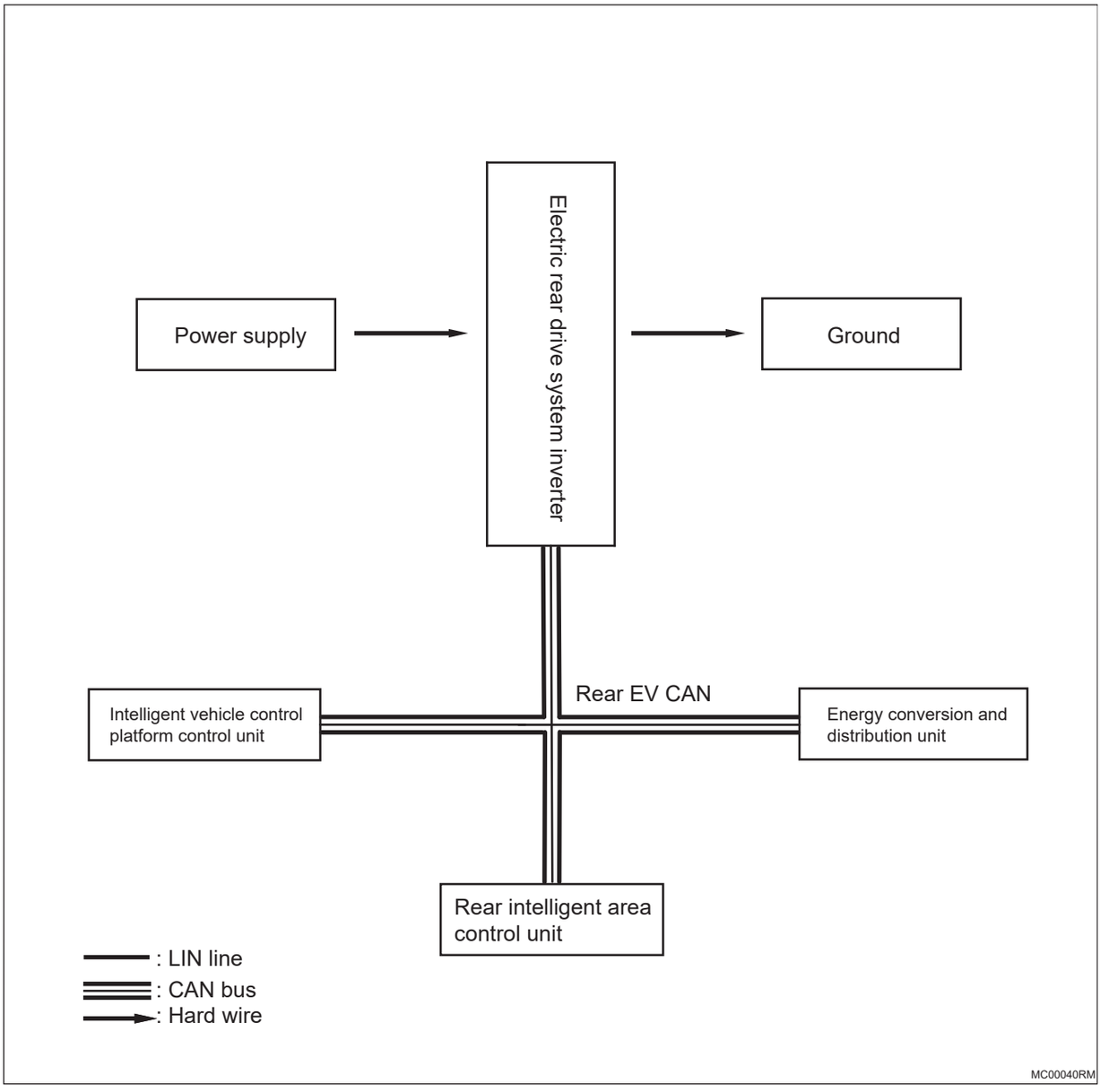
(h) When checking and repairing high voltage systems or components with water inflow, special care should be taken (high voltage components with snow melting salts are particularly dangerous).

Part position



MC00050RM

System diagram



ZD

System description

1. Technical characteristics

(a) Use permanent magnet synchronous power motor and coaxial reducer.

2. Function description

(a) The high voltage DC power supply is converted into three phase AC power with adjustable voltage amplitude and frequency through DC/AC (inverter), which drives the permanent magnet synchronous motor to run. The motor control unit communicates with the vehicle controller via CAN bus and obtains the current torque command, operating mode and rotation direction from the vehicle controller, and according to the current and motor position signal obtained by feedback, the motor driver is controlled to generate the required three phase AC, so as to drive the motor operation.

3. Function description

(a) Torque control function: According to the torque demand command, the inverter takes the motor mechanical torque output value as the control target, and implements voltage or current control on the motor assembly to meet the control function of the vehicle torque demand. In addition, the system has anti-vibration control function, that is, active torque anti-vibration function can be adopted in the software to avoid vibration of the drive train.

(b) Active discharging function: The inverter quickly discharges the power stored in the internal DC bus capacitor to ensure the high voltage safety of the system.

(c) Torque capacity estimation function: Based on current voltage, current, temperature and other informations, the maximum output torque in real-time is estimated.

(d) Derating output function: Based on the current temperature, voltage, speed and other informations, the motor torque and power output are limited in order to protect the motor assembly.

(e) Diagnostic function: Inverter has sensor diagnosis, motor diagnosis, CAN communication diagnosis, hardware safety shutdown and other diagnostic functions.

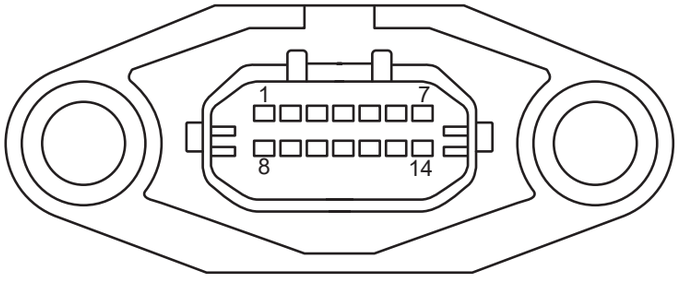
(f) Fault tolerant control function: Some parts of the motor or inverter have a functional failure, but they can still run at reduced power without affecting the safety of the motor assembly to support the motor control function of limp home for vehicle (due to motor assembly fault).

Data parameter

Electric rear drive system inverter

Item	Max	OK	Minimum
Operating voltage (V)	16	-	9
Operating current (A)	5	-	-

ECU terminal



Electric rear drive system inverter

MC00030RM

Electric rear drive system inverter			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	8	-
2	Debug CAN L	9	Debug CAN H
3	Vehicle CAN H	10	Vehicle CAN L

Electric rear drive system inverter			
Pin number	**Definition**	**Pin number**	**Definition**
4	Interlock input	11	Interlock output
5	IG	12	-
6	Power supply	13	Power supply
7	Ground	14	Ground

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
P1D0E19	Motor output software overcurrent flag bit	(See page ZD-1239)
P1D0F19	Motor output hardware overcurrent flag bit	(See page ZD-1239)
P1D1000	Three phase current check error status flag	(See page ZD-1239)
P1D1C00	Abnormal diagnosis memory data (EEPROM)	(See page ZD-1254)
P1D1D00	Abnormal resolver compensation memory data (EEPROM)	(See page ZD-1254)
P1D2600	Internal EEPROM read abnormal	(See page ZD-1254)
P1D2F00	Drive plate power supply abnormal flag bit	(See page ZD-1264)
P1D3000	Control plate communication 5 V power supply abnormal flag bit	(See page ZD-1264)
P1D0101	Abnormal digital 5 V power supply	(See page ZD-1225)
P1D0201	Position sensor power supply voltage abnormal	(See page ZD-1225)
P1D0301	Abnormal current sensor 5 V power supply	(See page ZD-1225)
P1D0401	Drive plate 5 V power supply voltage abnormal flag bit	(See page ZD-1225)
P1D0501	Abnormal AD reference voltage (abnormal motor temperature sensor voltage)	(See page ZD-1225)
P1D0600	Phase current zero error flag	(See page ZD-1225)
P1D144B	Junction temperature estimation overtemperature	(See page ZD-1251)
P1D0701	Bus voltage abnormal flag bit	(See page ZD-1231)
P1D0817	Bus voltage hardware abnormal flag bit	(See page ZD-1231)
P1D0901	Bus voltage characteristic abnormal flag bit	(See page ZD-1234)
P1D0916	Bus voltage undervoltage flag bit	(See page ZD-1235)
P1D0917	Bus voltage overvoltage flag bit	(See page ZD-1237)
P1D1100	IGBT temperature derating flag bit	(See page ZD-1244)
P1D114B	IGBT overtemperature flag bit	(See page ZD-1244)
P1D1200	Motor temperature derating flag bit	(See page ZD-1247)
P1D124B	Motor overtemperature flag bit	(See page ZD-1247)
P1D1300	Drive plate overtemperature alarm	(See page ZD-1249)

DTC	Detection Items	See page
P1D134B	Drive plate overtemperature	(See page ZD-1249)
P1D1500	Resolver signal collection abnormal	(See page ZD-1252)
P1D2200	Abnormal torque monitoring	(See page ZD-1255)
P1D2400	Motor stator temperature sensor disconnection flag bit	(See page ZD-1256)
P1D2500	IGBT temperature sensor wire harness disconnection flag bit	(See page ZD-1256)
P1D2700	Cyclic communication abnormal flag bit	(See page ZD-1258)
P1D2800	Continuous communication abnormal flag bit	(See page ZD-1258)
P1D2900	Inverter upper bridge arm fault flag bit	(See page ZD-1259)
P1D2A00	Inverter lower bridge arm fault flag bit	(See page ZD-1259)
P1D5616	Electric rear drive system inverter input end serious undervoltage	(See page ZD-1268)
P1D5617	Electric rear drive system inverter input end serious overvoltage	(See page ZD-1268)
U300316	Electric rear drive system inverter input end undervoltage	(See page ZD-1272)
U300317	Electric rear drive system inverter input end overvoltage	(See page ZD-1272)
U005588	Rear EV CAN bus off	(See page ZD-1276)
U029387	VDC397 node lost	(See page ZD-1282)
U029A87	Battery management system node lost	(See page ZD-1282)
U014687	PDCR node lost	(See page ZD-1282)
U059482	VDC397 message content fault	(See page ZD-1282)
U059483	VDC397 message content fault	(See page ZD-1282)

DTC	**P1D0101**	**Abnormal digital 5 V power supply**
DTC	**P1D0201**	**Position sensor power supply voltage abnormal**
DTC	**P1D0301**	**Abnormal current sensor 5 V power supply**
DTC	**P1D0401**	**Drive plate 5 V power supply voltage abnormal flag bit**

DTC	**P1D0501**	**Abnormal AD reference voltage (abnormal motor temperature sensor voltage)**
DTC	**P1D0600**	**Phase current zero error flag**

Description

When electric rear drive system inverter low voltage power supply voltage is out of normal operating range, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0101	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+4.9) V • └ Input voltage > (+5.1) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D0201	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Input voltage < (+13) V • Input voltage > (+17) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D0301	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+4.9) V • └ Input voltage > (+5.1) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D0401	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+4.9) V • └ Input voltage > (+5.1) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter

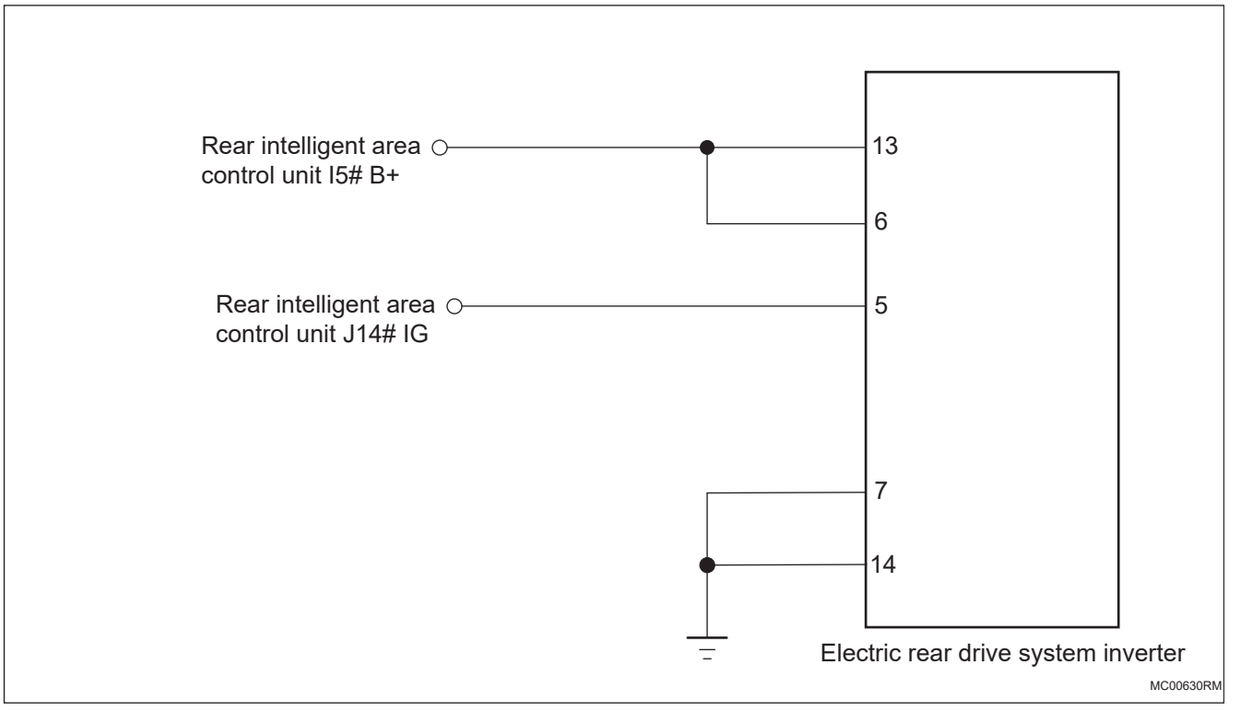
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0501	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+4.9) V • └ Input voltage > (+5.1) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D0600	• AND┬ MCU low voltage (12 V) power supply ⩾ 7.7 V • ├ 4.9 V ⩽ current sensor 5 V power supply ⩽ 5.1 V • ├ Current sensor offset correction process is completed • ├ Inverter switch is disconnect-ed • ├ Operating time of this diagnostic function ⩽ 300 ms • └ Absolute value of motor mechanical speed ⩽ 50 rpm	• Absolute value of any U, V, W phase current > 16 A	200 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0101	Motor shutdown	Comes on
P1D0201	Motor shutdown	Comes on
P1D0301	Motor shutdown	Comes on
P1D0401	Motor shutdown	Comes on
P1D0501	Motor shutdown	Comes on
P1D0600	Motor shutdown	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

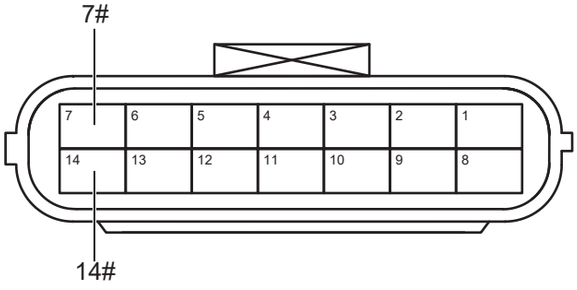
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	Check electric rear drive system inverter ground



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

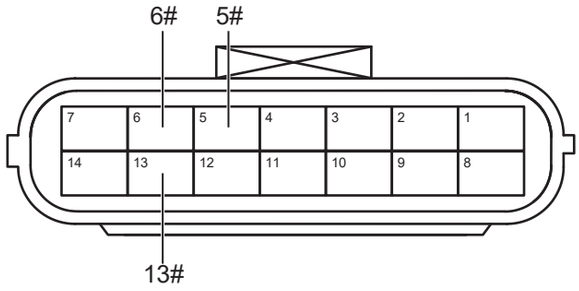
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	**P1D0701**	**Bus voltage abnormal flag bit**
DTC	**P1D0817**	**Bus voltage hardware abnormal flag bit**

Description

When electric rear drive system inverter detects abnormal bus voltage, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0701	AND: • 12 V power supply ⩾ 7.7 V • Inverter is in connected mode • No software overvoltage fault • No hardware overvoltage fault • No software undervolta-ge fault	Inverter input voltage ⩽ 40 V. Inverter input voltage ⩾ 850 V	200 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Power battery control unit • High voltage wire harness and connector
P1D0817	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	Over-voltage signal form Drive Circuit is ON. Inverter input voltage > (+530) V	Immediately hardware shut down	Periodic type	Immediately	• Electric rear drive system inverter • Power battery control unit • High voltage wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0701	Motor shutdown	Comes on
P1D0817	Motor shutdown	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → Diagnosis ends

NG

2	Check high voltage wire harness and connector

(a) Check if high voltage wire harness and connector are connected securely.

(b) Check if high voltage wire harness and connector are damaged.

(c) Check for short or open in high voltage wire harness and connector.

NG → Check and repair or replace high voltage wire harness and connector

OK

3	Read inverter bus voltage

(a) Use diagnostic tester to read the inverter bus voltage.

Standard:

Inverter bus voltage: 212 ~ 487 V.

NG → Check and repair power battery system

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D0901	Bus voltage characteristic abnormal flag bit

Description

When electric rear drive system inverter detects abnormal voltage characteristics of bus, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0901	AND: • 12 V power supply ⩾ 7.7 V • Inverter is in connected mode • No BUSOFF fault • No BMS message-related faults (TimeOut, LiveCounter, CheckSum)	|Inverter input voltage - BMS sensor feedback voltage| > 60 V	1000 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Power battery control unit • High voltage wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0901	Motor warning	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	Check high voltage wire harness and connector

(a) Check if high voltage wire harness and connector are connected securely.

(b) Check if high voltage wire harness and connector are damaged.

(c) Check for short or open in high voltage wire harness and connector.

NG → **Check and repair or replace high voltage wire harness and connector**

OK

3	Read data stream

(a) Read data stream, check if the inverter bus voltage is consistent with the high voltage battery voltage.

NG → **Check and repair high voltage battery system**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D0916	Bus voltage undervoltage flag bit

Description

When electric rear drive system inverter detects bus voltage undervoltage, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0916	AND: • 12 V power supply ⩾ 7.7 V • Inverter is in connected mode	Inverter input voltage < (180) V	15 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Power battery control unit • High voltage wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0916	Motor shutdown	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 2 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	Check high voltage wire harness and connector

(a) Check if high voltage wire harness and connector are connected securely.

(b) Check if high voltage wire harness and connector are damaged.

(c) Check for short or open in high voltage wire harness and connector.

NG → Check and repair or replace high voltage wire harness and connector

OK

3	Read inverter bus voltage

(a) Use diagnostic tester to read the inverter bus voltage.

Standard:

Inverter bus voltage: 212 ~ 487 V.

NG → Check and repair high voltage battery system

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D0917	Bus voltage overvoltage flag bit

Description

When electric rear drive system inverter detects bus voltage overvoltage, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0917	AND: • 12 V power supply ⩾ 7.7 V • Inverter is in connected mode	Inverter input voltage > (510 V)	15 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Power battery control unit • High voltage wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0917	Motor shutdown	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check high voltage wire harness and connector**

(a) Check if high voltage wire harness and connector are connected securely.

(b) Check if high voltage wire harness and connector are damaged.

(c) Check for short or open in high voltage wire harness and connector.

NG → **Check and repair or replace high voltage wire harness and connector**

OK

3	**Read inverter bus voltage**

(a) Use diagnostic tester to read the inverter bus voltage.

Standard:

Inverter bus voltage: 212 ~ 487 V.

NG → **Check and repair high voltage battery system**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D0E19	Motor output software overcurrent flag bit
DTC	P1D0F19	Motor output hardware overcurrent flag bit
DTC	P1D1000	Three phase current check error status flag

Description

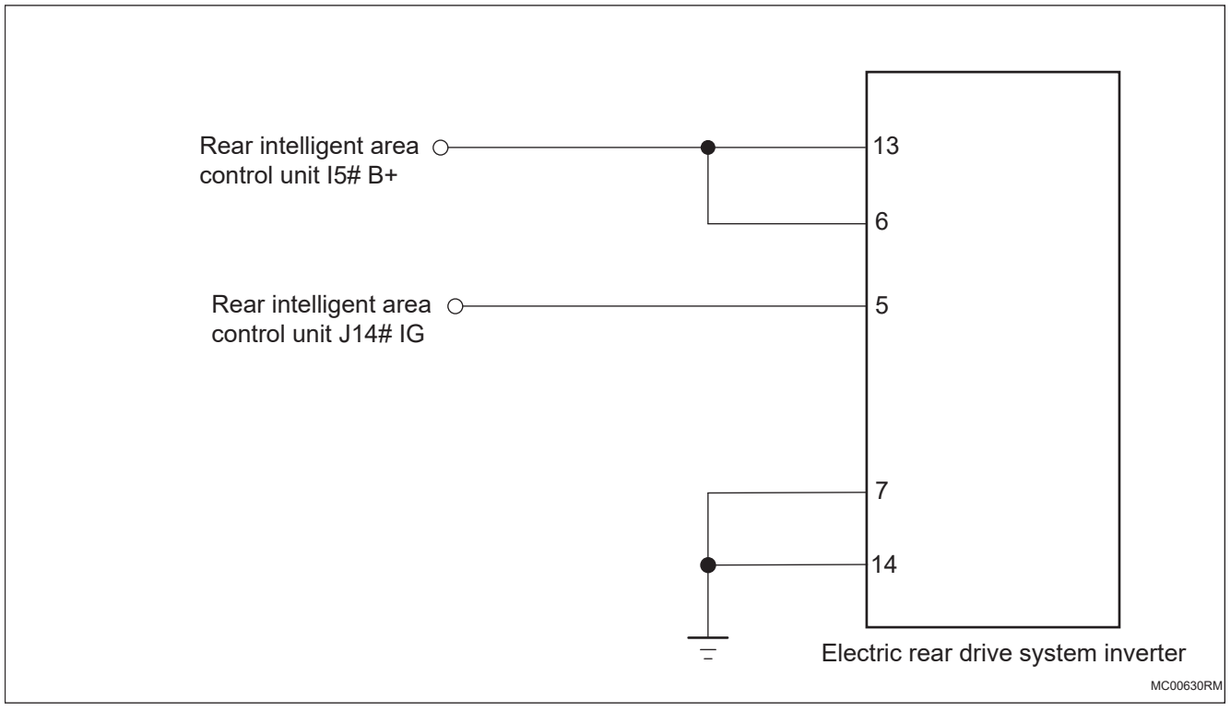
When electric rear drive system inverter detects output current fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D0E19	AND: • ┬ MCU low voltage (12 V) power supply ⩾ 7.7 V • └ 4.9 V ⩽ current sensor 5 V power supply ⩽ 5.1 V	Current amplitude (DQ coordinate system) > 1100 A	10 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system
P1D0F19	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	UVW absolute value of any phase current > 1020 A	Immediately hardware shut down	Event-based	Immediately	• Electric rear drive system inverter • Wire harness and connector • Charging system
P1D1000	AND: • 12 V power supply ⩾ 7.7 V • ├ Current sensor power supply is normal • └ Switch is not disconnec-ted	|Sum of three phase current| > 100 A	20 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D0E19	Motor shutdown	Comes on
P1D0F19	Motor shutdown	Comes on
P1D1000	Motor shutdown	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

Standard value

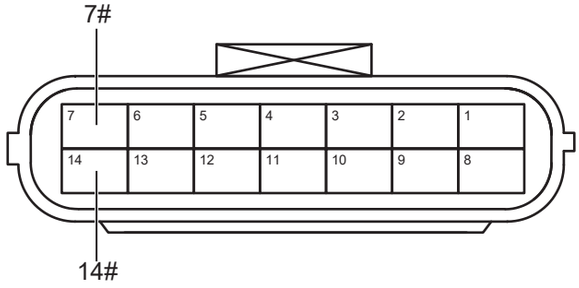
Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

3	Check electric rear drive system inverter ground



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

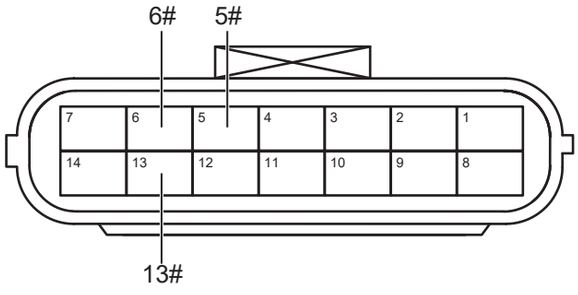
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D1100	IGBT temperature derating flag bit
DTC	P1D114B	IGBT overtemperature flag bit

Description

When electric rear drive system inverter detects that IGBT temperature exceeds the specified value or signal is abnormal, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D1100	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• IGBT temperature derating factor < 0.7, and the torque requested by the HCU exceeds the maximum allowable torque after derating -20 N • m • IGBT temperature derating factor < 0.5	100 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Cooling system • Brake system
P1D114B	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• IGBT temperature above 99° C • IGBT temperature > 99° C	20 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Cooling system • Brake system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D1100	Motor derating	Comes on
P1D114B	Motor shutdown	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Wait for 5 minutes.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check cooling system**

(a) Read data stream, the normal standard for IGBT temperature is less than 95° C.

(b) Check if cooling water pump operates normally.

(c) Check cooling system for leakage.

(d) Check cooling system for blockage.

(e) Check if coolant level is normal.

(f) Check coolant for deterioration.

NG → **Check and repair cooling system**

OK

3	**Check brake system**

(a) If the vehicle does not respond to the accelerator pedal and the vehicle indicator is on, check the vehicle brake system for problems. (For example, shift the gear to N and push the vehicle manually to check if it can run normally.)

NG → **Check and repair brake system**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D1200	Motor temperature derating flag bit
DTC	P1D124B	Motor overtemperature flag bit

Description

When electric rear drive system inverter detects that motor temperature exceeds the specified value or signal is abnormal, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D1200	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Motor temperature derating factor < 0.7, and the torque requested by the HCU exceeds the maximum allowable torque after derating -20 N • m • Motor temperature derating factor < 0.5	400 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Brake system • Cooling system
P1D124B	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• PMSM winding temperature above 160° C. • Motor temperature > 160° C	400 ms	Periodic type	1 [ms]	• Electric rear drive system inverter • Brake system • Cooling system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D1200	Motor derating	Comes on
P1D124B	Motor shutdown	Comes on

Inspection procedure

1	Clear DTCs

(a) Wait for 30 minutes.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

ZD

2	Check cooling system

(a) Read data stream and the normal standard of motor temperature: < 125° C.

(b) Check if the coolant is sufficient and if the cooling water pump operates normally.

NG → **Perform repair according to malfunction**

OK

3	Check brake system

(a) If the vehicle does not respond to the accelerator pedal and the vehicle indicator is on, check the vehicle brake system for problems. (For example, shift the gear to N and push the vehicle manually to check if it can run normally.)

NG → **Check and repair brake system**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D1300	Drive plate overtemperature alarm
DTC	P1D134B	Drive plate overtemperature

Description

When electric rear drive system inverter detects that drive board temperature is too high, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D1300	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Drive plate temperature > 180° C	200 ms	Periodic type	10 [ms]	• Electric rear drive system inverter • Cooling system • Brake system
P1D134B	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Drive plate temperature > 200° C	20 ms	Periodic type	10 [ms]	• Electric rear drive system inverter • Cooling system • Brake system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D1300	Motor shutdown	Comes on
P1D134B	Motor shutdown	Comes on

Inspection procedure

1	Clear DTCs

(a) Wait for 30 minutes.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → Diagnosis ends

NG

2	Check cooling system

(a) Check if cooling water pump operates normally.
(b) Check cooling system for leakage.
(c) Check cooling system for blockage.
(d) Check if coolant level is normal.
(e) Check coolant for deterioration.

NG → Check and repair cooling system

OK

3	Check brake system

(a) If the vehicle does not respond to the accelerator pedal and the vehicle indicator is on, check the vehicle brake system for problems. (For example, shift the gear to N and push the vehicle manually to check if it can run normally.)

NG → Check and repair brake system

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D144B	Junction temperature estimation overtemperature

Description

When electric rear drive system inverter detects power module overheating fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D144B	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	Estimated temperature for junction temperature > 170° C	200 ms	Periodic type	10 [ms]	• Electric rear drive system inverter • Cooling system • Brake system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D144B	Motor shutdown	Comes on

Inspection procedure

1	Clear DTCs

(a) Wait for 30 minutes.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	Check cooling system

(a) Read data stream, the normal standard for temperature: < 155° C.

(b) Check if cooling water pump operates normally.

(c) Check cooling system for leakage.

(d) Check cooling system for blockage.

(e) Check if coolant level is normal.

(f) Check coolant for deterioration.

NG → **Check and repair cooling system**

ZD

OK

3	Check brake system

(a) If the vehicle does not respond to the accelerator pedal and the vehicle indicator is on, check the vehicle brake system for problems. (For example, shift the gear to N and push the vehicle manually to check if it can run normally.)

NG → **Check and repair brake system**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D1500	Resolver signal collection abnormal

Description

When electric rear drive system inverter detects abnormal resolver signal collection, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D1500	• 12 V Battery Voltage above 7.7 V • Resolver power supply normal	Hard wire fault signal reset	100 [ms]	Periodic type	100 [ms]	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D1500	Motor shutdown	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Read data stream**

(a) Read data stream, motor speed normal standard: ⩽ 100 rpm.

(b) Check if motor speed is normal.

NG → **Replace electric rear drive system inverter (See page DL-3)**

DTC	**P1D1C00**	**Abnormal diagnosis memory data (EEPROM)**
DTC	**P1D1D00**	**Abnormal resolver compensation memory data (EEPROM)**
DTC	**P1D2600**	**Internal EEPROM read abnormal**

Description

When electric rear drive system inverter detects internal fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D1C00	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Diagnosis memory area abnormal	MCU init	Event-based	init	• Electric rear drive system inverter
P1D1D00	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Resolver initial position angle memory area abnormal	MCU init	Event-based	init	• Electric rear drive system inverter
P1D2600	• Low voltage power supply > 7.7 V	• Internal EEPROM reading fault	MCU init	Event-based	init	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D1C00	Motor shutdown	Comes on
P1D1D00	Motor shutdown	Comes on
P1D2600	Motor operates normally	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace electric rear drive system inverter (See page DL-3)**

OK

Diagnosis ends

DTC P1D2200 Abnormal torque monitoring

Description

When electric rear drive system inverter detects abnormal torque monitoring fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D2200	• Low voltage power supply > 7.7 V • Inverter is in normal control mode	> (80 N • m)| Torque command value - torque estimation value|> (80 N • m)	100 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D2200	Motor shutdown	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check motor resolver initial angle**

(a) Read data stream, check if motor resolver initial angle is consistent with the pasted initial angle of motor housing.

NG → **Rewrite initial angle**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	P1D2400	Motor stator temperature sensor disconnection flag bit

DTC	P1D2500	IGBT temperature sensor wire harness disconnection flag bit

Description

When electric rear drive system inverter detects motor stator temperature sensor or IGBT temperature sensor disconnection fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D2400	AND: • Low voltage power supply > 7.7 V	• Motor temperature ⩽ -40° C	2 [min]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D2500	AND: • Low voltage power supply > 7.7 V	• IGBT temperature < -39° C	2 min	Periodic type	1 [ms]	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D2400	Motor warning	Comes on
P1D2500	Motor warning	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) When the vehicle is stationary, power off for 5 minutes, and then wait for 5 minutes after power-on again.

(e) Read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	Diagnosis ends

NG

2	**Check motor and inverter temperature**

(a) Read data stream, check motor and inverter temperature, which should be close to the ambient temperature.

NG → **Replace electric rear drive system inverter (See page DL-3)**

ZD

DTC	P1D2700	Cyclic communication abnormal flag bit
DTC	P1D2800	Continuous communication abnormal flag bit

Description

When electric rear drive system inverter detects cyclic or continuous communication abnormal fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D2700	• MCU is in torque control mode or speed control mode	• HCU related network fault, BMS related network fault 10 times, busoff occurs and recovers 10 times	2[min]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector
P1D2800	• MCU is in torque control mode or speed control mode	• HCU related network fault, BMS related network fault, busoff lasting for 2 minutes	2[min]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D2700	Motor operates normally	Comes on
P1D2800	Motor operates normally	Comes on

Inspection procedure

1	**Read DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Read DTCs and check if DTCs in table below occur.

U005588	Rear EV CAN bus off
U029387	VDC397 node lost
U059482	VDC397 message content fault
U059483	VDC397 message content fault

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Based on present DTCs, check if the corresponding controller also has a corresponding DTC, check and repair according to DTC**

OK

Check and repair electric rear drive system inverter and low voltage wire harness

DTC	P1D2900	Inverter upper bridge arm fault flag bit

DTC	P1D2A00	Inverter lower bridge arm fault flag bit

Description

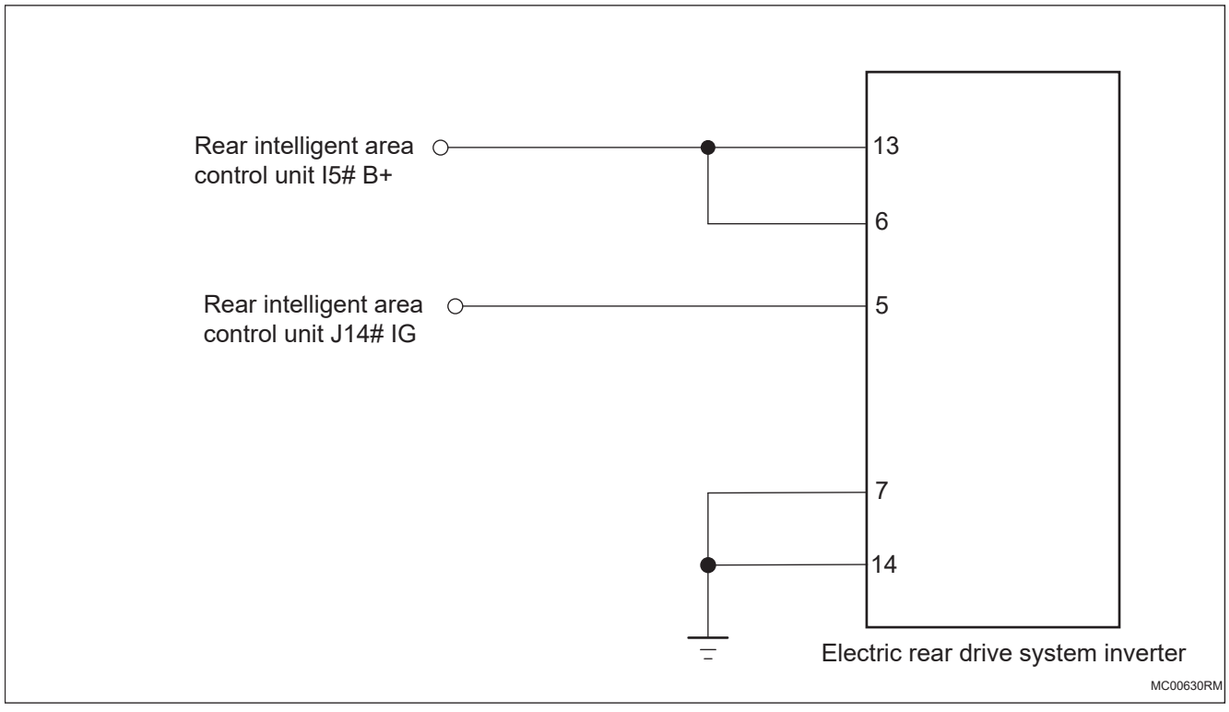
When electric rear drive system inverter detects inverter upper and lower bridge arm fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D2900	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Drive plate reports IGBT upper bridge fault signal	Immediately hardware shut down	Event-based	Immediately	• Electric rear drive system inverter
P1D2A00	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• Drive plate reports IGBT lower bridge fault signal	Immediately hardware shut down	Event-based	Immediately	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D2900	Motor shutdown	Comes on
P1D2A00	Motor shutdown	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

Standard value

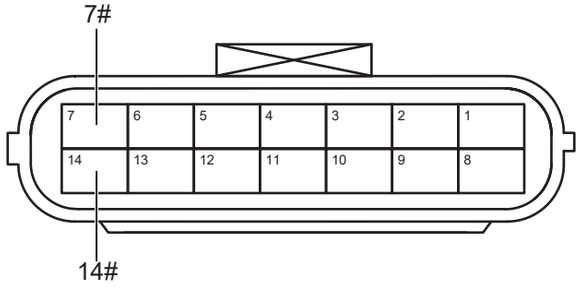
Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

3	Check electric rear drive system inverter ground



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

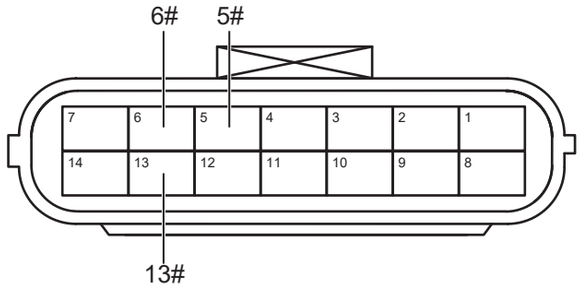
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK →

Replace electric rear drive system inverter (See page DL-3)

DTC	**P1D2F00**	**Drive plate power supply abnormal flag bit**
DTC	**P1D3000**	**Control plate communication 5 V power supply abnormal flag bit**

Description

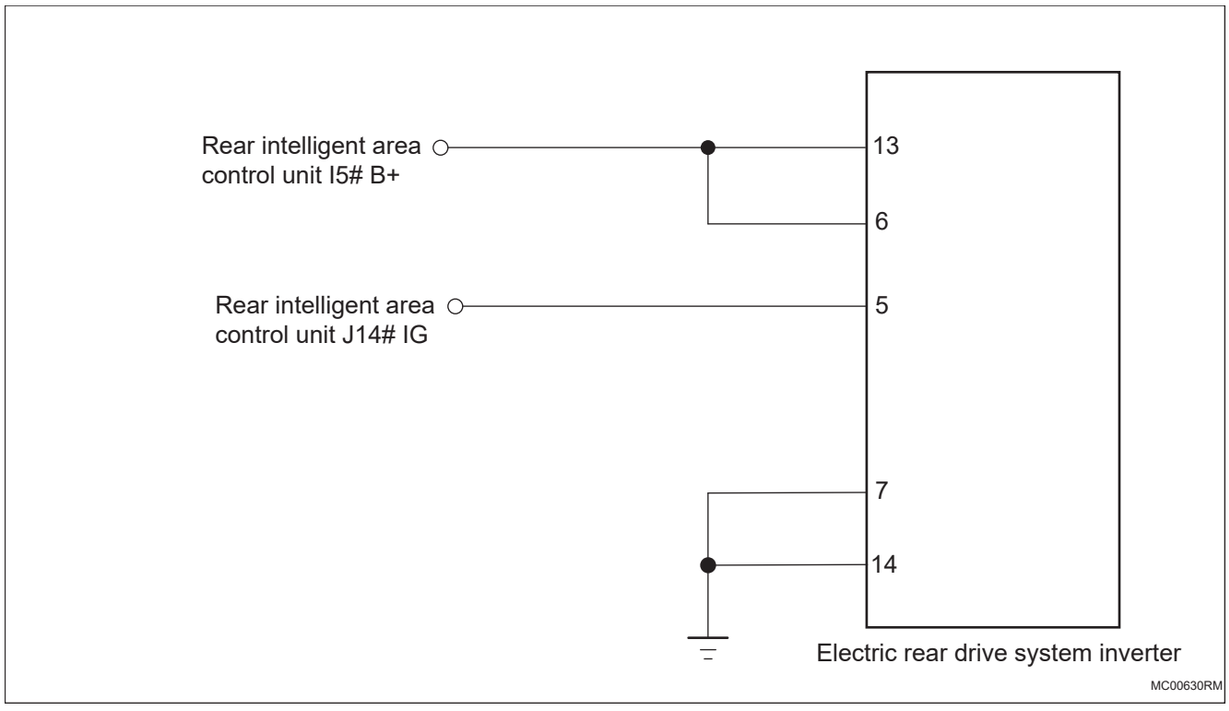
When electric rear drive system inverter detects drive board and control panel abnormal voltage fault, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D2F00	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+13) V └ input voltage > (+17) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter
P1D3000	• Vehicle power on • (12 V) power supply ⩾ 7.7 V 12 V Battery Voltage above 7.7 V	• OR ┬ input voltage < (+4.9) V └ input voltage > (+5.1) V	120 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D2F00	Motor shutdown	Comes on
P1D3000	Motor operates normally	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

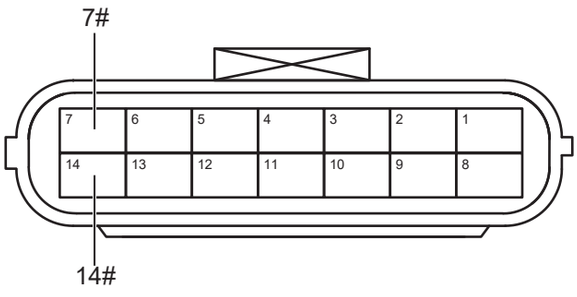
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check electric rear drive system inverter ground**



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

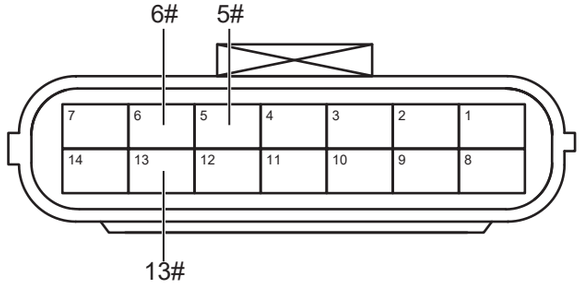
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	**P1D5616**	**Electric rear drive system inverter input end serious undervoltage**
DTC	**P1D5617**	**Electric rear drive system inverter input end serious overvoltage**

Description

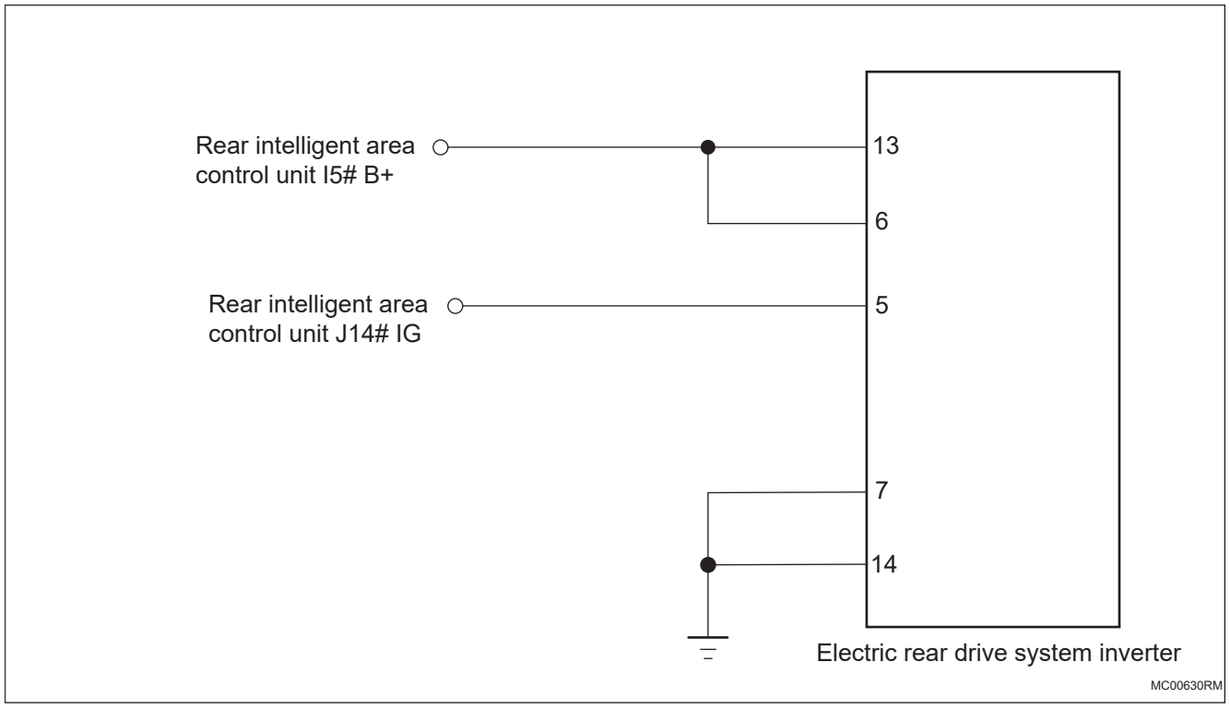
When electric rear drive system inverter low voltage power supply voltage is seriously high or low, the electric front drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D5616	-	Low voltage power supply < 7.7 V	510 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system
P1D5617	-	Low voltage power supply > 18.0 V	200 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D5616	Motor shutdown	Comes on
P1D5617	Motor shutdown	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

ZD

2	Check battery voltage (low voltage battery)

(a) Start the vehicle, measure battery voltage.

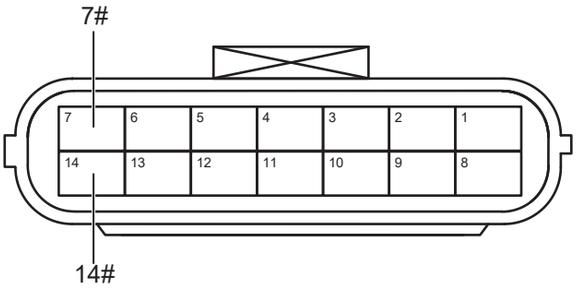
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	Check electric rear drive system inverter ground



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

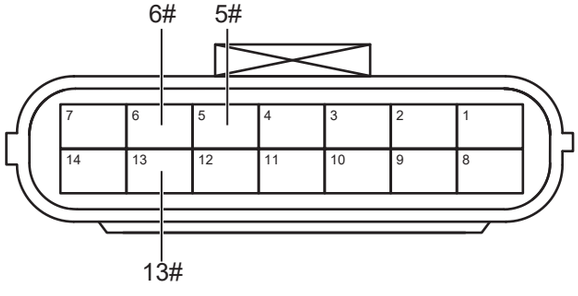
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace electric rear drive system inverter (See page DL-3)

DTC	**U300316**	**Electric rear drive system inverter input end undervoltage**
DTC	**U300317**	**Electric rear drive system inverter input end overvoltage**

Description

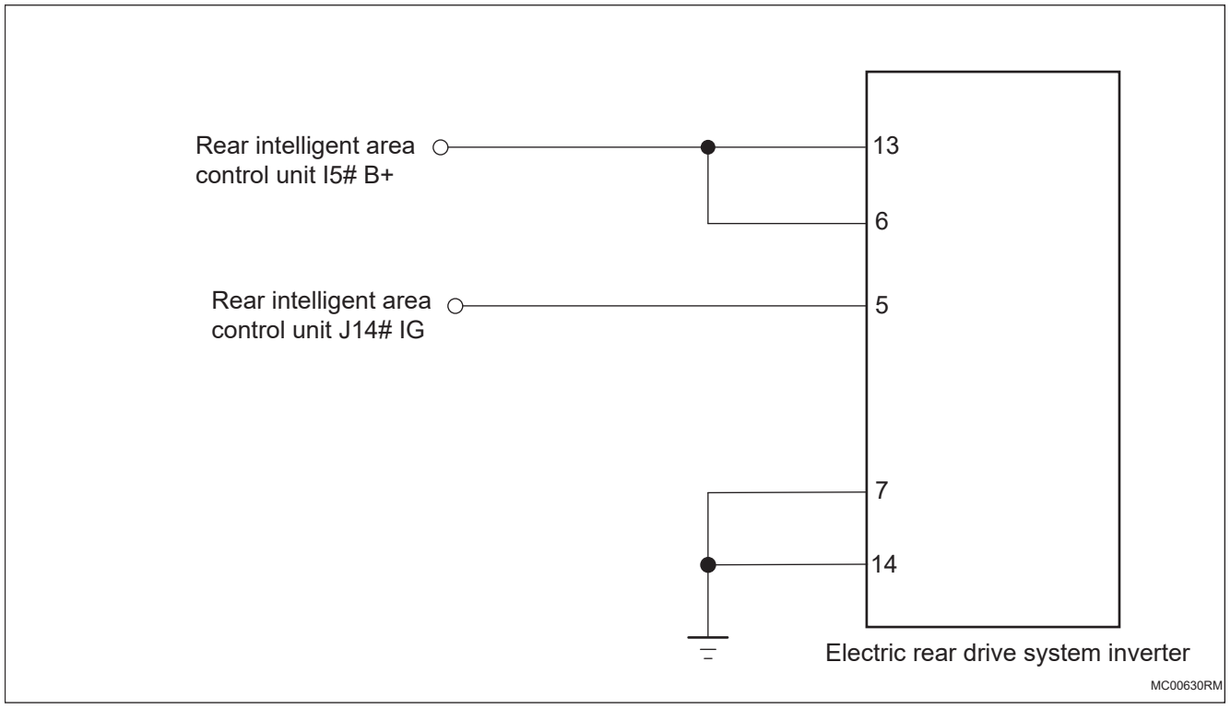
When electric rear drive system inverter low voltage power supply voltage is too high or too low, the electric rear drive system inverter records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U300316	-	Low voltage power supply < 6.5 V	2000 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system
U300317	-	Low voltage power supply > 17 V	1000 [ms]	Periodic type	1 [ms]	• Electric rear drive system inverter • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
U300316	Motor shutdown	Comes on
U300317	Motor shutdown	Comes on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 5 minutes, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

ZD

2	Check battery voltage (low voltage battery)

(a) Start the vehicle, measure battery voltage.

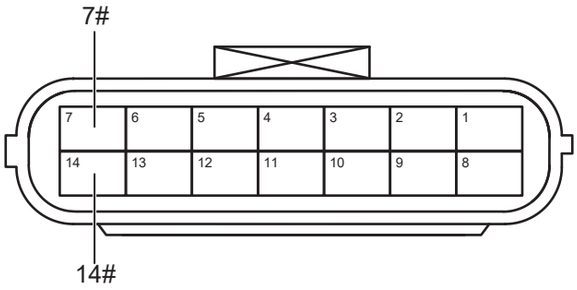
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	Check electric rear drive system inverter ground



Electric rear drive system inverter connector

MC00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the electric rear drive system inverter connector (low voltage).

(d) According to value in the table, measure resistance.

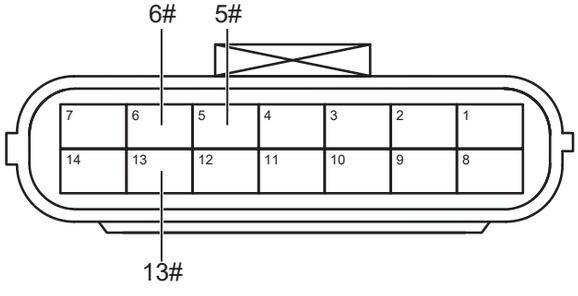
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 7# - body ground	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 14# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric rear drive system inverter power supply**



Electric rear drive system inverter connector

MC00651RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Electric rear drive system inverter connector 13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 6# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric rear drive system inverter connector 5# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace electric rear drive system inverter (See page DL-3)

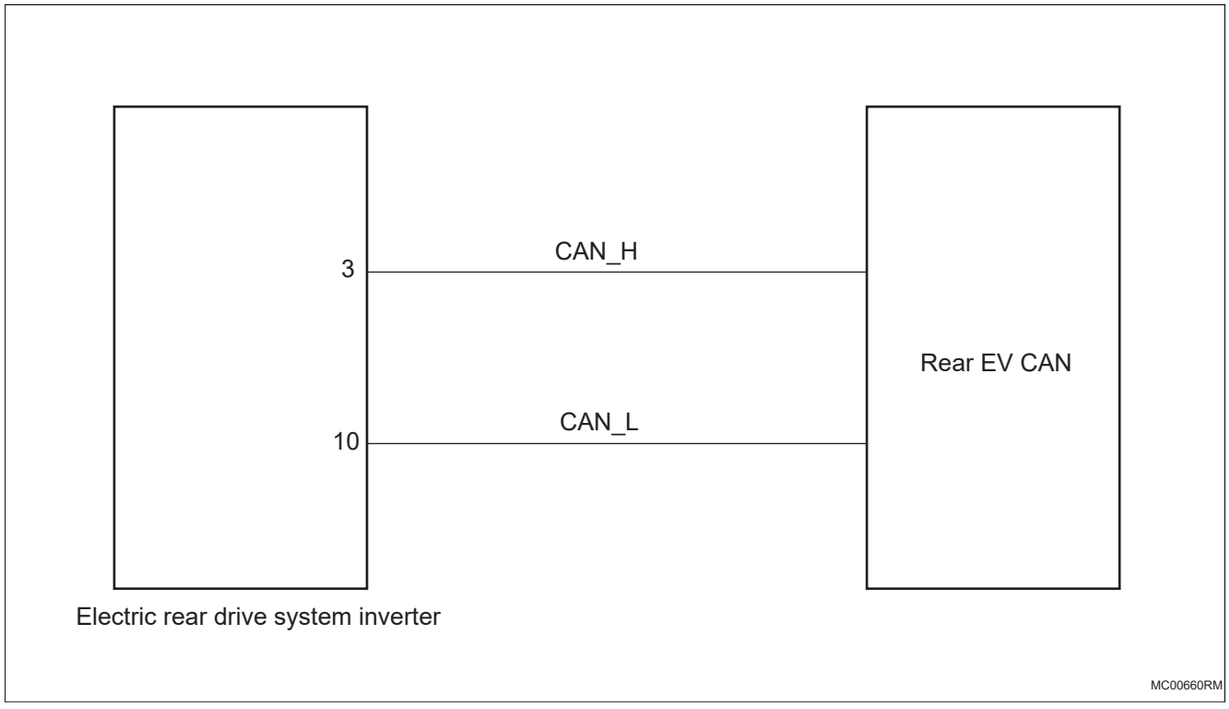
DTC	U005588	Rear EV CAN bus off

Description

When electric rear drive system inverter detects rear EV CAN bus off fault, the electric rear drive system inverter records DTC.

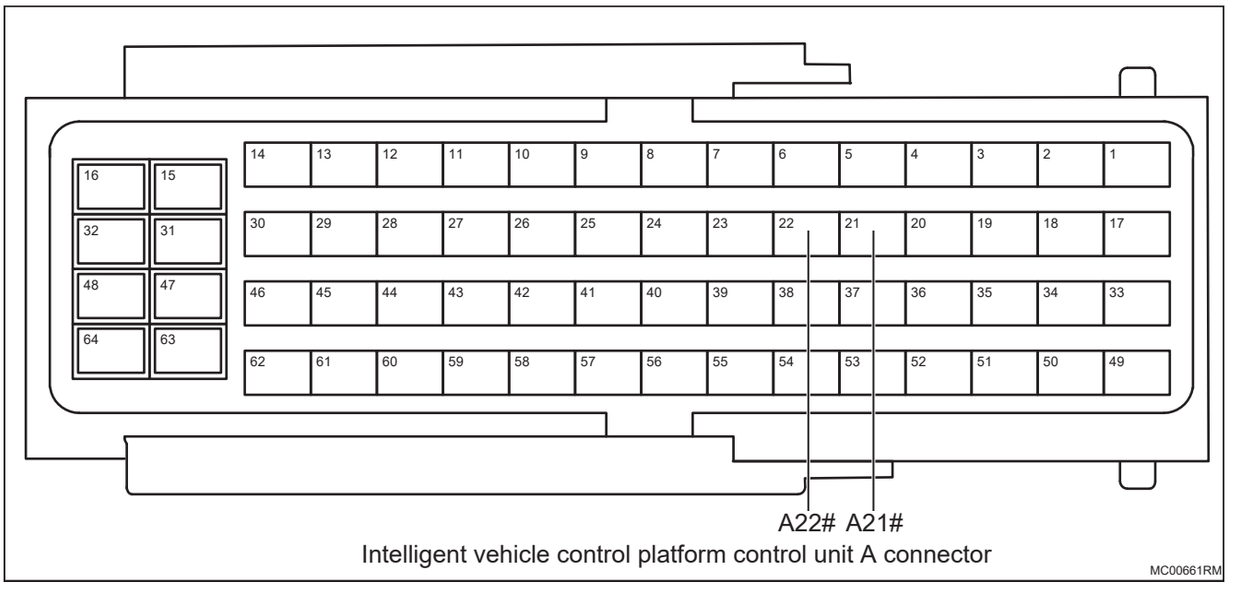
DTC No.	DTC detection condition	Faulty area
U005588	(a) Rear EV CAN bus off.	• CAN line and connector • Rear intelligent area control unit • Electric rear drive system inverter • Intelligent vehicle control platform control unit • Energy conversion and distribution unit

Circuit diagram



Inspection procedure

1	**Check rear EV CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A21# - intelligent vehicle control platform control unit connector A22#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

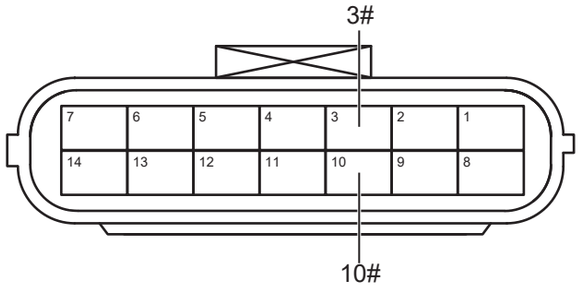
2	**Check controllers on rear EV CAN bus**

(a) Disconnect controllers on rear EV CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear EV CAN bus CAN-L and CAN-H**



Electric rear drive system inverter connector

MC00671RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

Standard value

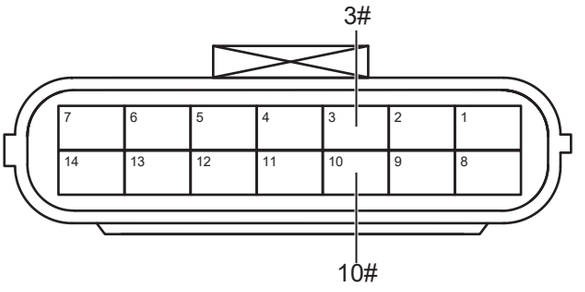
Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 3# - electric rear drive system inverter connector 10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in rear EV CAN bus**



Electric rear drive system inverter connector

MC00671RM

ZD

(a) According to value in the table, measure resistance.

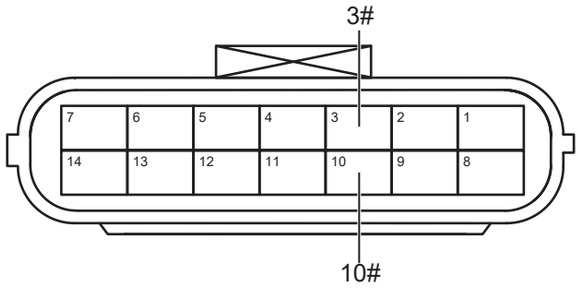
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 10# - body ground	Always connected	10 KΩ or more
Electric rear drive system inverter connector 3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear EV CAN bus**



Electric rear drive system inverter connector

MC00671RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric rear drive system inverter connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

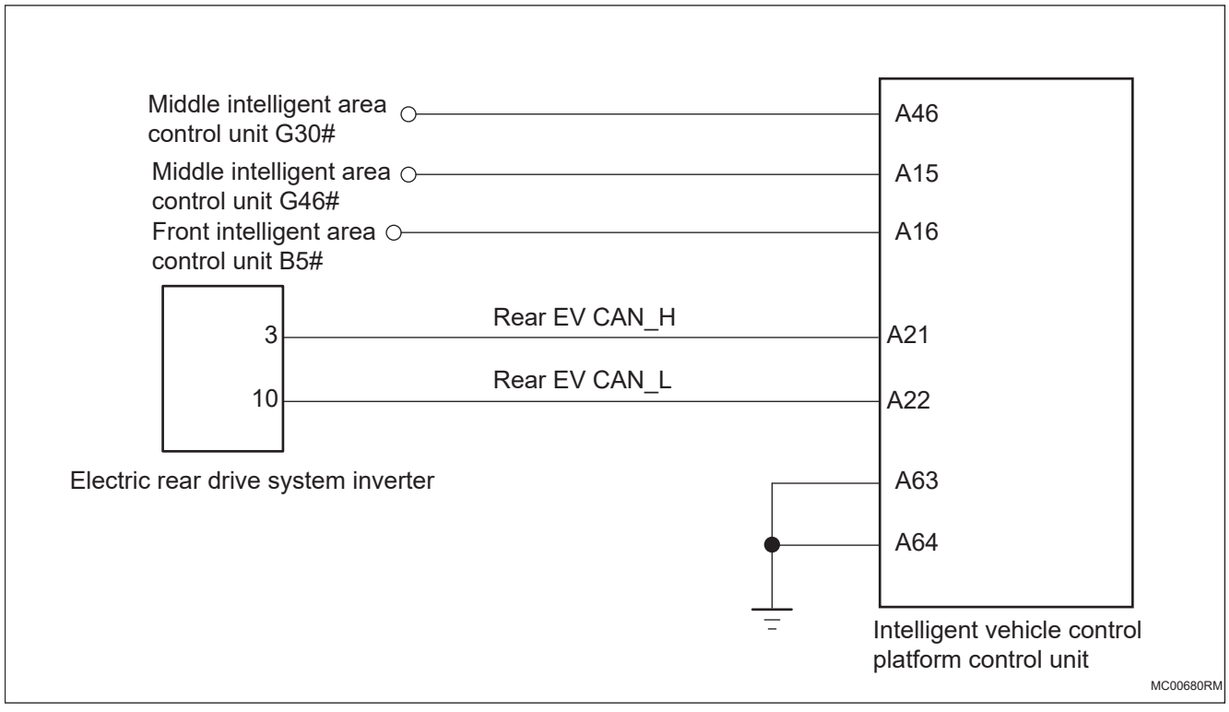
DTC	**U029387**	**VDC397 node lost**
DTC	**U029A87**	**Battery management system node lost**
DTC	**U014687**	**PDCR node lost**
DTC	**U059482**	**VDC397 message content fault**
DTC	**U059483**	**VDC397 message content fault**

Description

When communication between electric rear drive system inverter and other systems is abnormal or interrupted, the electric rear drive system inverter records DTC.

DTC No.	DTC detection condition	Faulty area
U029387	(a) VDC397 node lost.	• Wire harness and connector • Electric rear drive system inverter • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U029A87	(a) Battery management system node lost.	• Wire harness and connector • Electric rear drive system inverter • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U014687	(a) PDCR node lost.	• Wire harness and connector • Electric rear drive system inverter • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059482	(a) VDC397 message content fault.	• Wire harness and connector • Electric rear drive system inverter • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit
U059483	(a) VDC397 message content fault.	• Wire harness and connector • Electric rear drive system inverter • Rear intelligent area control unit • Intelligent vehicle control platform control unit • Energy conversion and distribution unit

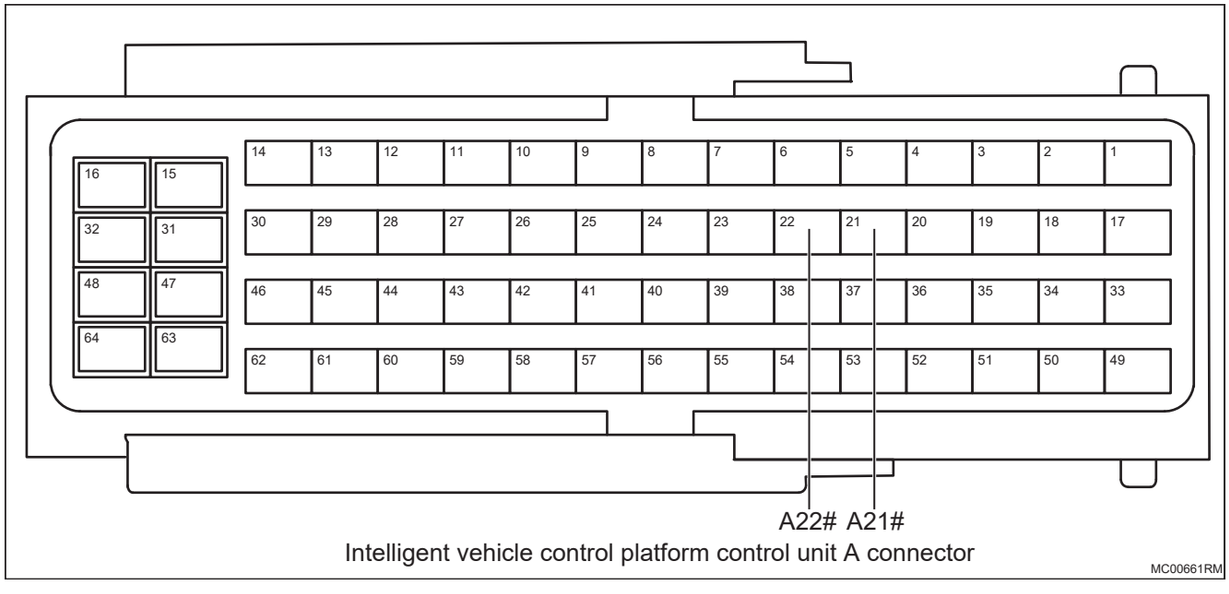
Circuit diagram

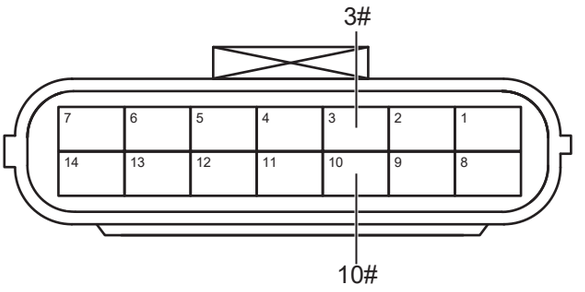


Inspection procedure

Note: Taking the U029387 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear EV CAN bus (electric rear drive system inverter - intelligent vehicle control platform control unit)**





Electric rear drive system inverter connector

MC00671RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

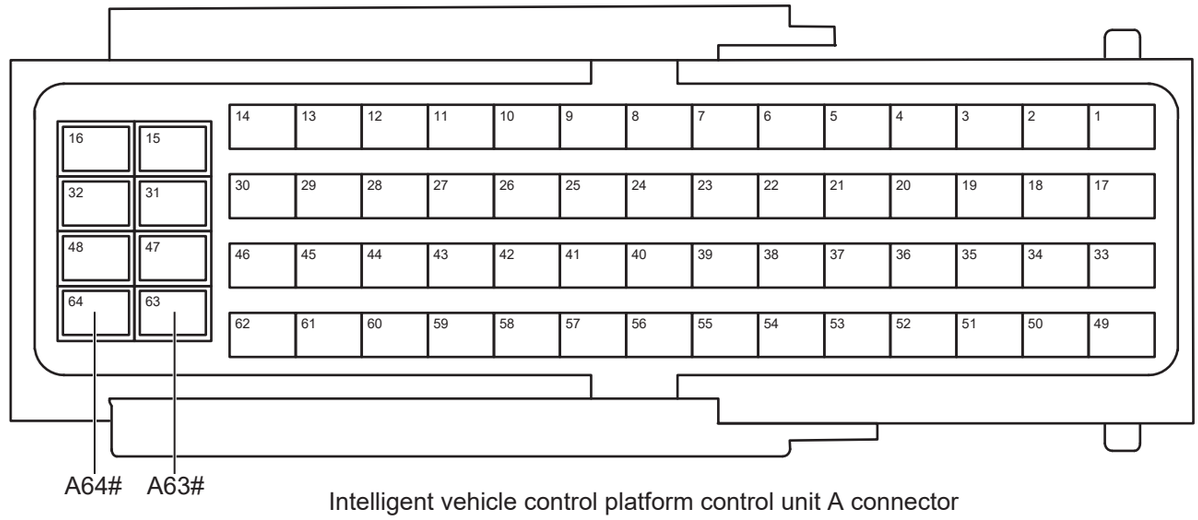
Standard value

Multimeter connection	Detection condition	Specified condition
Electric rear drive system inverter connector 3# - intelligent vehicle control platform control unit connector A21#	Always connected	Less than 1 Ω
Electric rear drive system inverter connector 10# - intelligent vehicle control platform control unit connector A22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



Intelligent vehicle control platform control unit A connector

PC16121RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) According to value in the table, measure resistance.

Standard value

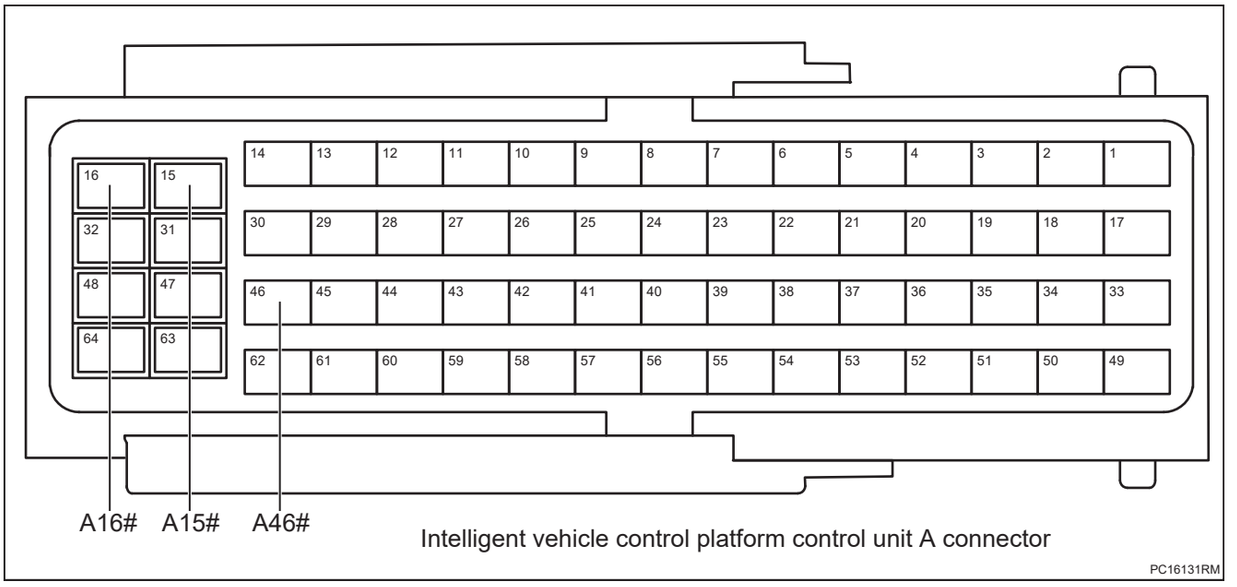
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check intelligent vehicle control platform control unit power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

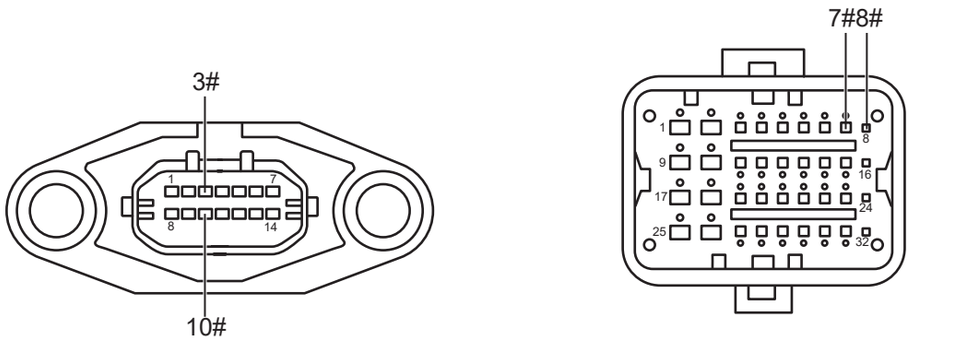
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check the power supply and ground of front and middle intelligent area control units and confirm if the front and middle intelligent area control units are damaged)**

OK

4	**Check rear EV CAN bus terminal resistance**



Electric rear drive system inverter

Energy conversion and distribution unit

MC00701RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear electric drive system inverter connector 3# - rear electric drive system inverter connector 10#	Always connected	Approximately 120 Ω
Energy conversion and distribution unit 7# - energy conversion and distribution unit 8#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

ZD

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric rear drive system inverter (See page DL-3)**

OK

Diagnosis ends

Power battery control system

Power battery control unit (PB62)

System description

1. Function overview

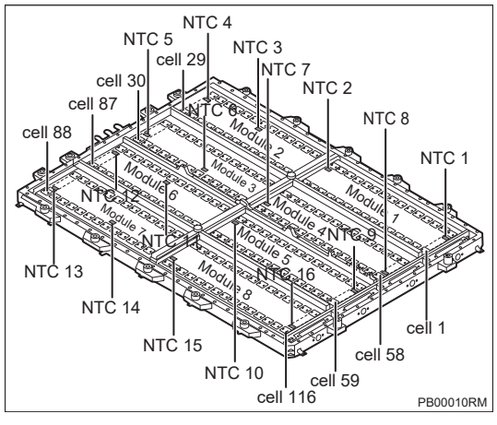
(a) It consists of battery control unit assembly (BMS main control), battery slave control unit assembly (BMS slave control), which is located inside battery pack.

(b) Main functions of battery control unit assembly include charging/discharging management, contractor control, power control, SOC estimation, SOH estimation, insulation detection and vehicle communication etc.

(c) The main functions of the battery slave control unit assembly include battery voltage sampling, module temperature sampling, and battery equalizing etc.

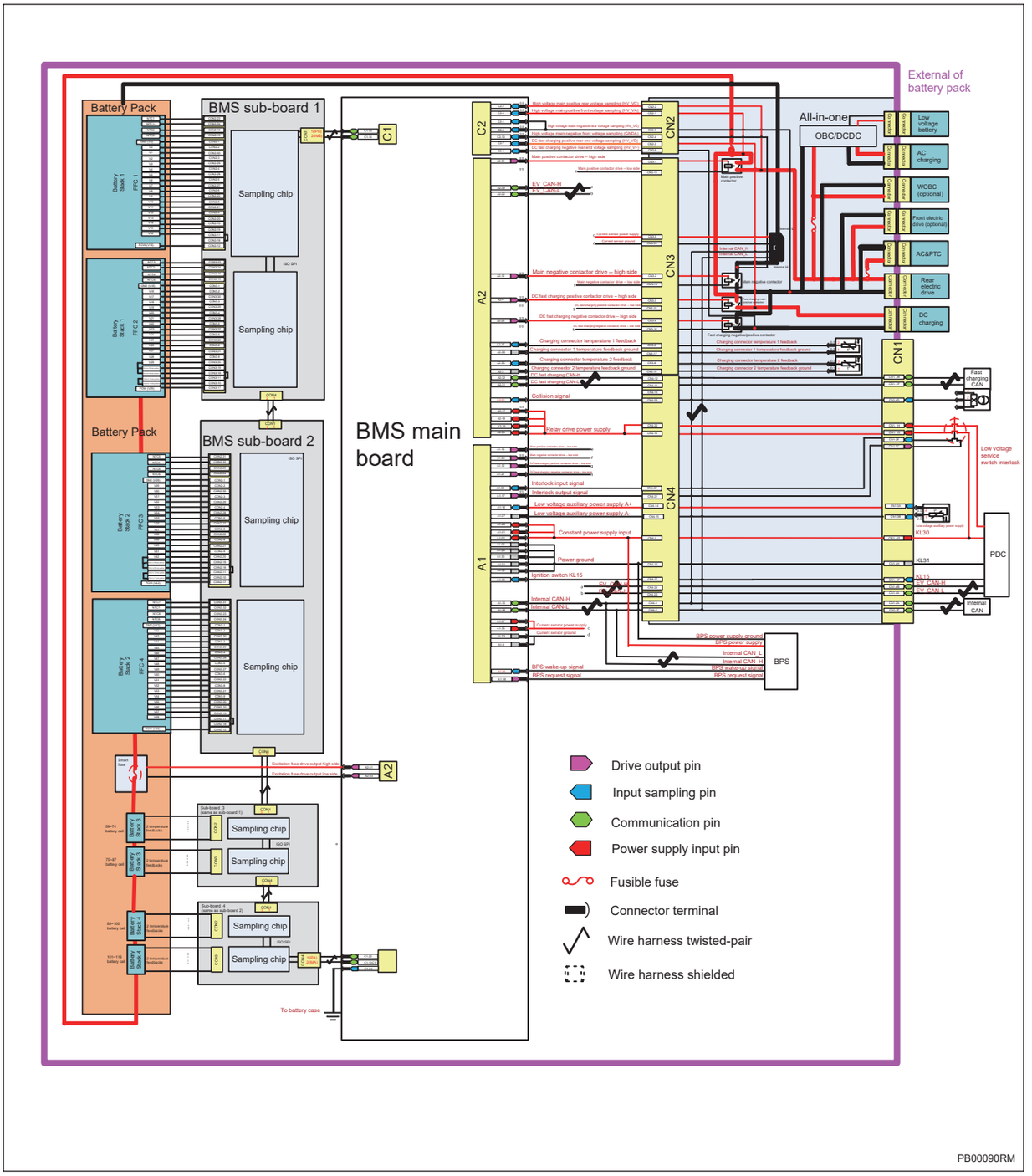
2. Internal structure of battery pack

(a) Layout diagram of battery cell and module NTC in battery pack

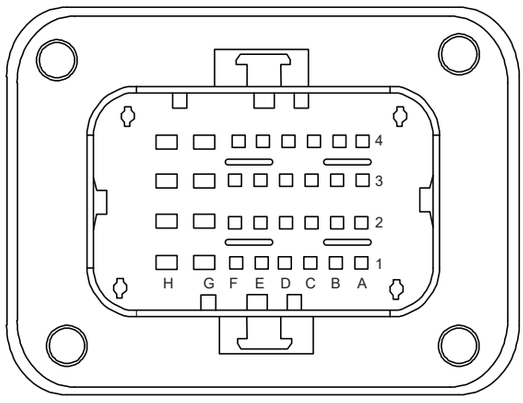


ZD

Internal schematic diagram of BMS



ECU terminal



Power battery pack terminal low voltage

PB00110RM

ZD

Low voltage communication			
Pin number	**Definition**	**Pin number**	**Definition**
1A	-	3A	DC charging auxiliary power supply (A+)
1B	-	3B	DC charging auxiliary power supply (A-)
1C	-	3C	-
1D	-	3D	-
1E	-	3E	-
1F	Battery inside communication CAN_L	3F	-
1G	Contactor power supply	3G	-
1H	Contactor redundant power supply	3H	-
2A	Battery inside communication CAN_H	4A	EV_CAN_L(EV_CANL)
2B	DC charging CAN_H	4B	EV_CAN_H(EV_CANH)
2C	Low voltage service switch interlock output	4C	-
2D	-	4D	Collision hard wire signal input
2E	Low voltage service switch interlock input	4E	-
2F	DC charging CAN_L	4F	Vehicle KL15 power
2G	-	4G	Vehicle KL30 power input
2H	-	4H	Vehicle KL31 power output

Pin definition between battery pack BMS slave control and module FPC

Sub-board 1			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
1	GND1	1	GND2
2	V0	2	V16
3	V2	3	V18
4	V4	4	V20
5	V6	5	V22
6	V8	6	V24
7	—	7	—
8	V10	8	V26
9	V12	9	V28
10	V14	10	Short 11
11	V16	11	Short 10
12	POWER	12	POWER2
13	—	13	—
14	—	14	—
15	NTC2-	15	NTC4-
16	NTC2+	16	NTC4+
17	—	17	—
18	—	18	Short 20
19	V15	19	Short 20
20	V13	20	V29
21	V11	21	V27
22	V9	22	V25
23	NTC1+	23	NTC3+
24	NTC1-	24	NTC3-
25	—	25	—
26	—	26	—
27	V7	27	V23
28	V5	28	V21
29	V3	29	V19
30	V1	30	V17
31	—	31	—
32	—	32	—

Sub-board 2			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
1	GND3	1	GND4
2	V29	2	V42

Sub-board 2			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
3	V31	3	V44
4	V33	4	V46
5	V35	5	V48
6	V37	6	V50
7	—	7	—
8	V39	8	V52
9	V41	9	V54
10	Short 11	10	V56
11	Short 10	11	V58
12	OWER3	12	POWER4
13	—	13	—
14	—	14	—
15	NTC6-	15	—
16	NTC6+	16	—
17	—	17	—
18	Short 20	18	—
19	Short 20	19	V57
20	V42	20	V55
21	V40	21	V53
22	V38	22	V51
23	—	23	NTC8+
24	—	24	NTC8-
25	—	25	—
26	—	26	—
27	V36	27	V49
28	V34	28	V47
29	V32	29	V45
30	V30	30	V43
31	NTC5+	31	NTC7+
32	NTC5-	32	NTC7-

Sub-board 3			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
1	GND5	1	GND6
2	V58	2	V74
3	V60	3	V76
4	V62	4	V78
5	V64	5	V80

Sub-board 3			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
6	V66	6	V82
7	—	7	—
8	V68	8	V84
9	V70	9	V86
10	V82	10	Short 11
11	V74	11	Short 10
12	POWER5	12	—
13	—	13	—
14	—	14	—
15	NTC10-	15	NTC12-
16	NTC10+	16	NTC12+
17	—	17	POWER6
18	—	18	Short 20
19	V73	19	Short 20
20	V71	20	V87
21	V69	21	V85
22	V67	22	V83
23	NTC9+	23	NTC11+
24	NTC9-	24	NTC11-
25	—	25	—
26	—	26	—
27	V65	27	V81
28	V63	28	V79
29	V61	29	V77
30	V59	30	V75
31	—	31	—
32	—	32	—

Sub-board 4			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
1	GND7	1	GND8
2	V87	2	V100
3	V89	3	V102
4	V91	4	V104
5	V93	5	V106
6	—	6	—
7	V95	7	V108
8	V97	8	V110

Sub-board 4			
CN2 pin number	**FPC1 (sampling wire harness) definition**	**CN3 pin number**	**FPC2 (sampling wire harness) definition**
9	V99	9	V112
10	Short 11	10	V114
11	Short 10	11	V116
12	—	12	—
13	—	13	—
14	—	14	POWER8
15	—	15	—
16	—	16	—
17	POWER7	17	—
18	Short 20	18	—
19	Short 20	19	V115
20	V100	20	V113
21	V98	21	V111
22	V96	22	V109
23	NTC14+	23	NTC16+
24	NTC14-	24	NTC16-
25	—	25	—
26	—	26	—
27	V94	27	V107
28	V92	28	V105
29	V90	29	V103
30	V88	30	V101
31	NTC13+	31	NTC15+
32	NTC13-	32	NTC15-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
P1D8A18	Battery pack feedback charge current out of limit fault	(See page ZD-1367)
P1DCC00	Battery pack feedback charge current out of limit alarm	(See page ZD-1367)
P1D8C1A	Vehicle insulation slight alarm	(See page ZD-1369)
P1D8D1A	Vehicle insulation serious fault	(See page ZD-1369)
P1D82F0	Battery total voltage seriously too low fault	(See page ZD-1357)
P1D964C	Charging connector overtemperature fault	(See page ZD-1315)
P1D8016	Cell voltage too low fault	(See page ZD-1355)
P1D8116	Cell voltage too low alarm	(See page ZD-1355)
P1D8117	Cell voltage too high alarm	(See page ZD-1356)

DTC	Detection Items	See page
P1D8400	Cell SOC deviation alarm	(See page ZD-1361)
P1D8500	Cell SOC deviation fault	(See page ZD-1362)
P1D8698	Battery module temperature too high	(See page ZD-1364)
P1D8798	Battery module overtemperature alarm	(See page ZD-1365)
P1D8800	Battery module temperature too low fault	(See page ZD-1366)
P1D9116	BMS power supply (KL30) voltage too low fault	(See page ZD-1300)
P1D91F0	BMS power supply (KL30) voltage too low fault	(See page ZD-1300)
P1D91F1	BMS power supply (KL30) voltage too low fault (instrument cluster indicates battery management system input end undervoltage)	(See page ZD-1300)
P1D9117	BMS power supply (KL30) voltage too high fault (instrument cluster indicates battery management system input end overvoltage)	(See page ZD-1303)
P1D9312	Short (short to ground) in charging connector temperature sensor 1	(See page ZD-1305)
P1D9313	Open in charging connector temperature sensor 1	(See page ZD-1307)
P1D9612	Short in charging connector temperature sensor 2	(See page ZD-1310)
P1D9613	Open in charging connector temperature sensor 2	(See page ZD-1312)
P1DA188	Charging CAN busoff fault	(See page ZD-1317)
P1DAA01	Feedback current too high fault	(See page ZD-1371)
P1DAC00	DC charging timeout fault	(See page ZD-1318)
P1DAD00	Cell voltage seriously too low fault	(See page ZD-1372)
P1D81F2	Cell voltage seriously too low fault 2	(See page ZD-1372)
P1DAE00	Battery module temperature seriously too high fault	(See page ZD-1373)
P1DB000	Shunt overtemperature or abnormal temperature increasing or PRA overtemperature	(See page ZD-1321)
P1DB100	Shunt overtemperature or abnormal temperature increasing or serious PRA overtemperature	(See page ZD-1321)
P1DB300	Equalizing circuit open fault	(See page ZD-1323)
P1D8B74	Equalizer switch closes unexpectedly due to equalizer short fault	(See page ZD-1323)
P1DB600	Contactor power supply too high fault	(See page ZD-1324)
P1DB885	Battery module temperature difference too large fault	(See page ZD-1375)
P1DB900	SOC jump fault	(See page ZD-1377)
P1DBA00	Insulation hardware fault (insulation detection module failure)	(See page ZD-1326)

DTC	Detection Items	See page
P1DBC00	Battery thermal runaway alarm	(See page ZD-1327)
P1DBF00	Vehicle insulation serious fault (gun insertion mode)	(See page ZD-1378)
P1DC9F0	Driving risk due to excessive resistance	(See page ZD-1334)
P1DC9F1	Driving failure due to too low resistance	(See page ZD-1334)
P1DC017	Cell voltage seriously too high fault	(See page ZD-1379)
P1D8017	Cell voltage too high fault	(See page ZD-1379)
P1DC117	Battery total voltage seriously too high fault	(See page ZD-1381)
P1D8217	Battery total voltage too high fault	(See page ZD-1381)
P1DC900	Smart fuse drive self-check fault (Unable to deploy due to internal abnormality of driver chip)	(See page ZD-1328)
P1DC901	Smart fuse drive chip communication abnormal	(See page ZD-1328)
P1DC912	Short in smart fuse drive circuit	(See page ZD-1330)
P1DC913	Open in smart fuse drive circuit	(See page ZD-1333)
P1DCD00	Battery pack SOC seriously too low fault	(See page ZD-1385)
P1DCE00	Battery pack SOH too low alarm	(See page ZD-1385)
P1DCE23	Battery pack SOH too low fault	(See page ZD-1385)
P1DCEF0	SOH seriously too low fault	(See page ZD-1386)
P1DD200	Shunt system error	(See page ZD-1336)
P1DDF1D	Charge current too high alarm	(See page ZD-1386)
P1DDFF0	Charge current too high fault	(See page ZD-1386)
P1DDFF1	Charging mode - current pulse charge current too high alarm	(See page ZD-1386)
P1DDFF2	Charging mode - pulse charge current too high fault	(See page ZD-1386)
P1DDFF3	Charging mode - pulse charge current too high fault cumulative count out of limit flag	(See page ZD-1389)
P1DDFF4	Current out of limit fault	(See page ZD-1390)
P1DE3F0	Shunt message error severity level 2	(See page ZD-1338)
P1DE7F0	Insulation status unreliable	(See page ZD-1488)
P1DE300	Shunt message error severity level 1	(See page ZD-1337)
P1DE600	Open in contactor power supply circuit	(See page ZD-1341)
P1DB500	Contactor power supply too low fault	(See page ZD-1341)
P1DE700	Battery isolation alarm	(See page ZD-1391)
P1DF411	Crash PWM signal abnormal fault (abnormal duty ratio)	(See page ZD-1344)
P1F2A00	Open in low voltage service switch interlock (service switch disconnection)	(See page ZD-1347)

DTC	Detection Items	See page
P1F2C00	Short to power supply in low voltage service switch interlock	(See page ZD-1350)
P1F2E00	BMS 12 V power supply output too low (current sensor power supply)	(See page ZD-1353)
P1F2F00	BMS 12 V power supply output too high (current sensor power supply)	(See page ZD-1354)
P1D9D12	Open in battery cell voltage sampling wire harness	(See page ZD-1430)
P1D9044	E2P data reading error (data, check)	(See page ZD-1399)
P1DEF00	RTC function fault (crystal oscillator, I2C abnormal)	(See page ZD-1399)
P1D9411	Main positive contactor coil short to ground fault (high side, low side)	(See page ZD-1401)
P1D9412	Main positive contactor coil short to power supply fault (high side, low side)	(See page ZD-1403)
P1D9413	Main positive contactor coil open fault (high side, low side)	(See page ZD-1405)
P1D9511	Main negative contactor coil short to ground fault (high side, low side)	(See page ZD-1408)
P1D9512	Main negative contactor coil short to power supply fault (high side, low side)	(See page ZD-1411)
P1D9513	Main negative contactor coil open fault (high side, low side)	(See page ZD-1413)
P1D9711	Charging positive contactor coil short to ground fault (high side, low side)	(See page ZD-1415)
P1D9712	Charging positive contactor coil short to power supply fault (high side, low side)	(See page ZD-1417)
P1D9713	Charging positive contactor coil open fault (high side, low side)	(See page ZD-1419)
P1D9811	Charging negative contactor coil short to ground fault (high side, low side)	(See page ZD-1421)
P1D9812	Charging negative contactor coil short to power supply fault (high side, low side)	(See page ZD-1423)
P1D9813	Charging negative contactor coil open fault (high side, low side)	(See page ZD-1425)
P1D9911	Main positive contactor contact stuck fault	(See page ZD-1427)
P1D9A11	Main negative contactor contact stuck fault	(See page ZD-1427)
P1D9B11	Charging positive contactor contact stuck fault	(See page ZD-1427)
P1D9C11	Charging negative contactor contact stuck fault	(See page ZD-1427)
P1D9912	Main positive contactor contact open fault	(See page ZD-1428)
P1D9A12	Main negative contactor contact open fault	(See page ZD-1428)
P1D9B12	Charging positive contactor contact open fault	(See page ZD-1428)
P1DA288	Internal CAN	(See page ZD-1432)

DTC	Detection Items	See page
P1DA300	Collision fault - CAN signal	(See page ZD-1434)
P1DA400	Collision fault - hard wire signal	(See page ZD-1434)
P1DA598	Sub-board PCB temperature too high fault	(See page ZD-1436)
P1DBD00	Battery module temperature sampling circuit fault	(See page ZD-1438)
P1DD300	CMC daisy chain open fault	(See page ZD-1440)
P1DD3F0	CMC daisy chain one point open fault	(See page ZD-1440)
P1DE9F0	IG OFF busoff	(See page ZD-1461)
P1DDDF0	Total voltage positive (HV+) sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1442)
P1DDDF1	Main positive contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1445)
P1DDDF2	Charging positive contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1448)
P1DDDF4	Main negative contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1451)
P1DDDF5	Charging negative contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1454)
P1DE000	Open in battery assembly	(See page ZD-1457)
P1DE400	BMS main control initialization timeout fault	(See page ZD-1458)
P1DE800	Pre-charging check failure	(See page ZD-1459)
P1DFB4B	SBC overtemperature fault	(See page ZD-1463)
P1DFC4B	MCU overtemperature fault	(See page ZD-1463)
P1F234B	AFE overtemperature fault	(See page ZD-1465)
P1F4104	Pressure sensor internal fault	(See page ZD-1470)
P1F4000	Pressure out of measurement range	(See page ZD-1470)
P1F4200	BPS Wake_up function fault	(See page ZD-1472)
P1F4211	Short to ground in pressure sensor drive (request)	(See page ZD-1473)
P1F4212	Short to power supply in pressure sensor drive (request)	(See page ZD-1475)
P1DDBF0	Discharging current out of limit alarm	(See page ZD-1394)
P1D81F3	Discharging current out of limit fault	(See page ZD-1394)
P1D82F1	Discharging current serious out of limit fault	(See page ZD-1395)
P1D82F2	Collision fault - frontal collision fault	(See page ZD-1434)
P1D8A00	Battery pack feedback charge current out of limit fault	(See page ZD-1393)
P1D88F1	Charging connector temperature sensor 1 and 2 simultaneous fault	(See page ZD-1396)

DTC	Detection Items	See page
P1F2900	High voltage sampling (2950) communication fault	(See page ZD-1463)
U005588	Rear EV CAN bus off	(See page ZD-1477)
U129887	On-board charger node lost	(See page ZD-1481)
U114B87	VDC397 message missing	(See page ZD-1481)
U114A87	VDC821 message missing	(See page ZD-1481)
U044B82	VDC397 message content fault	(See page ZD-1481)
U044B83	VDC397 message content fault	(See page ZD-1481)
U129287	Motor control unit 2 message missing	(See page ZD-1481)
U114687	Front area control unit message missing	(See page ZD-1481)
U115187	Airbag control unit message missing	(See page ZD-1481)
U045282	Airbag control unit message content fault	(See page ZD-1481)
U045283	Airbag control unit message content fault	(See page ZD-1481)
U059982	On-board charger message content fault	(See page ZD-1481)
U059983	On-board charger message content fault	(See page ZD-1481)

DTC	**P1D9116**	**BMS power supply (KL30) voltage too low fault**
DTC	**P1D91F0**	**BMS power supply (KL30) voltage too low fault**
DTC	**P1D91F1**	**BMS power supply (KL30) voltage too low fault (instrument cluster indicates battery management system input end undervoltage)**

Description

When BMS detects too low BMS power supply, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9116	• KL30 voltage is higher than 6 V	Power supply voltage < 9 V	500 ms	Periodic type	10 ms	• 12 V battery • Inside the power battery • Rear intelligent area control unit
P1D91F0	• KL30 voltage is higher than 6 V	Power supply voltage < 6 V	500 ms	Periodic type	10 ms	• 12 V battery • Inside the power battery • Rear intelligent area control unit
P1D91F1	• KL30 voltage is higher than 6 V	Power supply voltage < 5.5 V	2000 ms	Periodic type	10 ms	• 12 V battery • Inside the power battery • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9116	-	Not come on
P1D91F0	-	Not come on
P1D91F1	• The vehicle fails to activate high voltage system • Battery discharging function limited • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery voltage (low voltage battery)

(a) Clear DTCs, wait for 30 seconds and read DTCs.

(b) If DTCs still exist, start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check rear intelligent area control unit**

(a) Check the rear intelligent area control unit for damage.

(b) Check for short or open in rear intelligent area control unit wire harness and connector.

NG → **Check and repair or replace rear intelligent area control unit and wire harness**

ZD

NG

3	**Check wire harness and connector (vehicle end)**

(a) Disconnect the connection between battery pack low voltage connector and vehicle.

(b) According to value in the table, measure voltage.

Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Connector CN1-4G# - connector CN1-4H#	Always connected	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check wire harness and connector (battery pack internal wire harness)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-1# - connector (inside battery pack) CN1-4G#	Always connected	Continuity
Connector (inside battery pack) CN4-10# - connector (inside battery pack) CN1-4H#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9117	BMS power supply (KL30) voltage too high fault (instrument cluster indicates battery management system input end overvoltage)

Description

When BMS detects too high BMS power supply (KL30) voltage, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9117	• KL30 voltage is higher than 6 V	Power supply voltage is higher than (1) 16.5 V (2) 17.5 V (3) 18.5 V	(1) 2000 ms (2) 600 ms (3) 400 ms	Periodic type	10 ms	• Low voltage battery • Inside the power battery • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9117	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check battery voltage (low voltage battery)**

(a) Clear DTCs, wait for 30 seconds and read DTCs.

(b) If DTCs still exist, start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check rear intelligent area control unit**

(a) Check the rear intelligent area control unit for damage.

(b) Check for short or open in rear intelligent area control unit wire harness and connector.

NG → **Check and repair or replace rear intelligent area control unit and wire harness**

OK

Replace BMS main control (See page DL-61)

ZD

DTC	P1D9312	Short (short to ground) in charging connector temperature sensor 1

Description

When BMS detects short to ground in charging connector temperature sensor 1, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9312	• KL30 voltage is higher than 6 V	pINP_VAR_ChgCnt TempSen1 Fault_BL == 0x03	5 s	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • BMS main control

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9312	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (energy conversion and distribution unit)

(a) Check if the energy conversion and distribution unit is connected firmly.

(b) Check if the energy conversion and distribution unit is damaged.

(c) Check if the energy conversion and distribution unit terminals are in good condition.

NG → **Check and repair or replace wire harness and connector**

NG

2	Check wire harness and connector (sensor - energy conversion and distribution unit)

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the energy conversion and distribution unit connector.

(c) Check resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-5# - connector (inside battery pack) CN3-17#	At room temperature	About 10 kΩ
Connector (inside battery pack) CN3-5# - energy conversion and distribution unit metal housing	Always connected	No continuity
Connector (inside battery pack) CN3-17# - energy conversion and distribution unit metal housing	Always connected	No continuity

ZD

NG → **If the wire harness is normal, replace the energy conversion and distribution unit (See page DL-62)**

OK

3	Clear DTCs

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	Check wire harness and connector (battery pack internal wire harness)

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-37# - connector (inside battery pack) CN3-5#	Always connected	Continuity
Connector (inside battery pack) A2-36# - connector (inside battery pack) CN3-17#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9313	Open in charging connector temperature sensor 1

Description

When BMS detects open in charging connector temperature sensor 1, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9313	• KL30 voltage is higher than 6 V	pINP_VAR_ChgCnt TempSen1 Fault_BL == 0x05	5 s	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9313	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (energy conversion and distribution unit)**

(a) Check if the energy conversion and distribution unit is connected firmly.

(b) Check if the energy conversion and distribution unit is damaged.

(c) Check if the energy conversion and distribution unit terminals are in good condition.

ZD

NG → **Check and repair or replace wire harness and connector**

NG

2	**Check wire harness and connector (sensor - energy conversion and distribution unit)**

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the energy conversion and distribution unit connector.

(c) Check resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-5# - connector (inside battery pack) CN3-17#	At room temperature	About 10 kΩ

NG → **If the wire harness is normal, replace the energy conversion and distribution unit (See page DL-62)**

OK

3	**Clear DTCs**

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	**Check wire harness and connector (battery pack internal wire harness)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-37# - connector (inside battery pack) CN3-5#	Always connected	Continuity
Connector (inside battery pack) A2-36# - connector (inside battery pack) CN3-17#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9612	Short in charging connector temperature sensor 2

Description

When BMS detects short to ground in charging connector temperature sensor 2, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9612	• KL30 voltage is higher than 6 V	pINP_VAR_ ChgCnt TempSen2 Fault_BL == 0x03	5 s	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9612	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (energy conversion and distribution unit)

(a) Check if the energy conversion and distribution unit is connected firmly.

(b) Check if the energy conversion and distribution unit is damaged.

(c) Check if the energy conversion and distribution unit terminals are in good condition.

NG → **Check and repair or replace wire harness and connector**

NG

2	Check wire harness and connector (sensor - energy conversion and distribution unit)

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the energy conversion and distribution unit connector.

(c) Check resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-6# - connector (inside battery pack) CN3-18#	At room temperature	About 10 kΩ
Connector (inside battery pack) CN3-6# - energy conversion and distribution unit metal housing	Always connected	No continuity
Connector (inside battery pack) CN3-18# - energy conversion and distribution unit metal housing	Always connected	No continuity

NG → **If the wire harness is normal, replace the energy conversion and distribution unit (See page DL-62)**

OK

3	Clear DTCs

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	Check wire harness and connector (battery pack internal wire harness)

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-35# - connector (inside battery pack) CN3-6#	Always connected	Continuity
Connector (inside battery pack) A2-3# - connector (inside battery pack) CN3-18#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

ZD

OK

Replace BMS main control (See page DL-61)

DTC	P1D9613	Open in charging connector temperature sensor 2

Description

When BMS detects open in charging connector temperature sensor 2, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9613	• KL30 voltage is higher than 6 V	pINP_VAR_ChgCntTempSen2Fault_BL == 0x05	5 s	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9613	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (energy conversion and distribution unit)**

(a) Check if the energy conversion and distribution unit is connected firmly.

(b) Check if the energy conversion and distribution unit is damaged.

(c) Check if the energy conversion and distribution unit terminals are in good condition.

NG → **Check and repair or replace wire harness and connector**

NG

2	**Check wire harness and connector (sensor - energy conversion and distribution unit)**

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the energy conversion and distribution unit connector.

(c) Check resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-6# - connector (inside battery pack) CN3-18#	At room temperature	About 10 kΩ

NG → **If the wire harness is normal, replace the energy conversion and distribution unit (See page DL-62)**

OK

3	**Clear DTCs**

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	**Check wire harness and connector (battery pack internal wire harness)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-35# - connector (inside battery pack) CN3-6#	Always connected	Continuity
Connector (inside battery pack) A2-3# - connector (inside battery pack) CN3-18#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1D964C	Charging connector overtemperature fault

Description

When BMS detects charging connector overtemperature fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D964C	• KL30 voltage is higher than 6 V	⩾ 120° C	5 s	Periodic type	10 ms	• Inside the energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D964C	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check high voltage charging connector under service port

(a) Turn off the vehicle high voltage power and low voltage power, disconnect the service switch.

(b) Check the appearance of high voltage charging connector and high voltage cable nearby for damage.

NG → **Replace high voltage charging connector**

OK

2	Check charging connector upper cover torque

(a) Check if the charging connector upper cover torque is correct.

Standard torque: 6.5 ~ 7.5 N • m

NG → **Tighten connector upper cover with correct torque**

OK

3	**Check connector internal appearance**

(a) Open the charging connector upper cover and observe if the connector internal appearance is damaged.

(b) Check internal structure of connector for serious damage or deformation due to heat.

NG → **Replace high voltage charging connector**

OK

4	**Check connector internal fixing torque**

(a) Check torque of 3 standard parts inside connector is correct.

Standard torque of cooper bar bolt: 11.5 ~ 12.5 N • m

Standard torque of other bolts: 6.5 ~ 7.5 N • m

NG → **Tighten connector standard parts with correct torque**

OK

5	**Clear DTCs**

(a) Clear DTCs.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

6	Check multiple-in-one end charging connector

(a) Remove the fixing standard parts inside the charging connector and observe the appearance of the multiple-in-one end connector to check if the internal structure is damaged or deformed due to heat.

NG → **Perform repair according to malfunction**

ZD

OK

Further troubleshoot the interior of all-in-one

DTC	P1DA188	Charging CAN busoff fault

Description

When BMS detects charging CAN busoff fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DA188	• KL30 voltage is higher than 6 V	pINP_VAR_DCCAN Busoff_BL == 1	1 s	Periodic type	10 ms	• Charging pile

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DA188	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**This DTC is only for prompting, and repair is unnecessary**

DTC	P1DAC00	DC charging timeout fault

Description

When BMS detects DC charging timeout fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DAC00	• KL30 voltage is higher than 6 V	Reported with charging timeout according to GB	Charging timeout threshold according to GB	Periodic type	10 ms	• Charging pile • Low voltage wire harness between charging pile and power battery • Energy conversion and distribution unit • Power battery internal wire harness • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DAC00	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Reconnect charging gun after clearing DTCs.

(b) If current DTCs can still be read, replace the quick charging pile to charge.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check DC charging port terminal resistance

(a) Check the DC charging port terminal resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
AC/DC charging port 1# - AC/DC charging port 2#	Always connected	Approximately 120 Ω

NG → **Replace AC/DC charging port (See page WS-52)**

OK

3	Check wire harness and connector (DC charging port - power battery)

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (vehicle end) CN1-2B# - AC/DC charging port connector 1#	Always connected	Continuity
Connector (vehicle end) CN1-2F# - AC/DC charging port connector 2#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check wire harness and connector (inside battery pack)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN1-2B# - connector (inside battery pack) CN1-2F#	Always connected	Approximately 120 Ω
Connector (inside battery pack) CN1-2B# - connector (inside battery pack) CN1-4H#	Always connected	Approximately 1 MΩ
Connector (inside battery pack) CN1-2F# - connector (inside battery pack) CN1-4H#	Always connected	Approximately 1 MΩ

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check BMS main control terminal resistance**

(a) Check the BMS main control terminal resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
BMS main control A2-32# - BMS main control A2-31#	Always connected	Approximately 120 Ω

NG → **Replace BMS main control (See page DL-61)**

OK

6	**Check wire harness and connector (inside battery pack)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-32# - connector (inside battery pack) CN4-12#	Always connected	Continuity
Connector (inside battery pack) A2-31# - connector (inside battery pack) CN4-11#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	**P1DB000**	**Shunt overtemperature or abnormal temperature increasing or PRA overtemperature**
DTC	**P1DB100**	**Shunt overtemperature or abnormal temperature increasing or serious PRA overtemperature**

Description

When BMS detects abnormal shunt temperature, BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DB000	• KL30 voltage is higher than 6 V	IVTTemp > 125° C	5 s	Periodic type	10 ms	• Inside the power battery • Energy conversion and distribution unit
P1DB100	• KL30 voltage is higher than 6 V	IVTTemp > 125° C	5 s	Periodic type	10 ms	• Inside the power battery • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DB000	• Battery feedback function failure	Comes on
P1DB100	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

ZD

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs after 60 minutes with vehicle stopped.

(b) Power off and wait for 10 minutes, then power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DB300	Equalizing circuit open fault
DTC	P1D8B74	Equalizer switch closes unexpectedly due to equalizer short fault

Description

When BMS detects short or open in equalizer circuit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DB300	• KL30 voltage is higher than 6 V	pINP_VAR_Bal Circut Fault_UB==0x03	5 s	Periodic type	10 ms	• Inside the power battery: Module, wire harness and BMS main control
P1D8B74	• KL30 voltage is higher than 6 V	pINP_VAR_Bal Circut Fault_UB==0x05	5 s	Periodic type	10 ms	• Inside the power battery: Module, wire harness and BMS main control

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DB300	-	Comes on
P1D8B74	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Read data stream and sub-board status signal with diagnostic tester, and troubleshoot the corresponding power battery module FPC and BMS slave control according to the sub-board status signal**

OK

Diagnosis ends

DTC	P1DB600	Contactor power supply too high fault

Description

When BMS detects too high contactor power supply, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DB600	• KL30 voltage is higher than 6 V	pINP_VAR_HDrvVol_SL > 16 V	2 s	Periodic type	10 ms	• 12 V battery • Inside the power battery • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DB600	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check the 12 V battery voltage

(a) Check if 12 V battery voltage is normal.

NG → **Perform repair according to malfunction**

OK

3	Check rear intelligent area control unit power supply to BMS main control

(a) Check if the rear intelligent area control unit power supply to BMS main control is normal.

NG → **Check and repair rear intelligent area control unit and wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	P1DBA00	Insulation hardware fault (insulation detection module failure)

Description

When BMS detects insulation hardware fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DBA00	• KL30 voltage is higher than 6 V	pINP_VAR_InsltDiagResult_UB == 1; pINP_VAR_InsltDiagResult_UB set to 1 condition: pINP_VAR_HvdSFVlinkOor_UB == 100000: V6 out of range error pINP_VAR_HvdSFGpoCmp_UB == 100: GPO3 Readback error	3 insulation detection cycles	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DBA00	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DBC00	Battery thermal runaway alarm

Description

When BMS detects battery thermal runaway alarm fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DBC00	• KL30 voltage is higher than 6 V	-	-	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DBC00	• The vehicle immediately loses power	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Replace power battery (See page DL-37)**

DTC	**P1DC900**	**Smart fuse drive self-check fault (Unable to deploy due to internal abnormality of driver chip)**
DTC	**P1DC901**	**Smart fuse drive chip communication abnormal**

Description

When BMS detects intelligent fuse drive chip fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC900	• KL30 voltage is higher than 6 V	(pINP_ VAR_ yrofuse Flt_ UW! =0) / / (pINP_ VAR_ PyrofuseFlt _Uw!=0x04) Smart fuse drive fault (0x00 – no fault 0x01 – VRCM check - High Side 0x02 – VRCM check - Low Side 0x04- -Leakage test - High Side 0x08- -Leakage test - Low Side 0x10- -Short between loops 0x20 – Squib resistance range 0x40 – Squib resistance measurement (Initialize to measure resistance) 0x80- -High Side FET diagnostic 0x100- -Low Side FET diagnostic)	2 s	Periodic type	10 ms	• Inside the power battery • BMS main control
P1DC901	• KL30 voltage is higher than 6 V	pINP_VAR_ Pyrofuse SPIFlt_UW!=0	2 s	Periodic type	10 ms	• Inside the power battery • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC900	• Battery feedback function limited • Battery charging function failure	Comes on
P1DC901	• Battery feedback function limited • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC P1DC912 Short in smart fuse drive circuit

Description

When BMS detects short in intelligent fuse drive circuit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC912	• KL30 voltage is higher than 6 V	pINP_VAR_PyrofuseFlt_UW= =0x04 initialization to measure resistance value	2 s	Periodic type	10 ms	• Wire harness between BMS main control and smart fuse • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC912	• Battery feedback function limited • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector (inside battery pack)

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-40#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-1#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-2#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-5#	Always connected	Continuity

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-29#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-30#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-31#	Always connected	Continuity
Connector (inside battery pack) A2-1# - connector (inside battery pack) A1-32#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-40#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-1#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-2#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-5#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-29#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-30#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-31#	Always connected	Continuity
Connector (inside battery pack) A2-40# - connector (inside battery pack) A1-32#	Always connected	Continuity

ZD

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1DC913	Open in smart fuse drive circuit

Description

When BMS detects open in intelligent fuse drive circuit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC913	• KL30 voltage is higher than 6 V	pINP_VAR_PyrofuseFlt_UW= =0x04 initialization to measure resistance value	2 s	Periodic type	10 ms	• Wire harness between BMS main control and smart fuse • BMS main control

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC913	• Battery feedback function limited • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector (inside battery pack)

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (internal of battery pack) A2-1# - intelligent fuse external trigger interface	Always connected	Continuity
Connector (internal of battery pack) A2-4# - intelligent fuse external trigger interface	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

ZD

OK

Replace BMS main control (See page DL-61)

DTC	**P1DC9F0**	**Driving risk due to excessive resistance**
DTC	**P1DC9F1**	**Driving failure due to too low resistance**

Description

When BMS detects abnormal intelligent fuse resistance, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC9F0	• KL30 voltage is higher than 6 V	pINP_VAR_Pyrofuse Resis Value_SL > 2.5 Ω	2 s	Periodic type	10 ms	• Wire harness between BMS main control and smart fuse • BMS main control
P1DC9F1	• KL30 voltage is higher than 6 V	pINP_VAR_Pyrofuse Resis Value_SL < 1.57 Ω	2 s	Periodic type	1 ms	• Wire harness between BMS main control and smart fuse • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC9F0	-	Comes on
P1DC9F1	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness and connector (inside battery pack)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (internal of battery pack) A2-1# - intelligent fuse external trigger interface	Always connected	Continuity
Connector (internal of battery pack) A2-40# - intelligent fuse external trigger interface	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1DD200	Shunt system error

ZD

Description

When BMS detects shunt system error, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DD200	• KL30 voltage is higher than 6 V	IVT System Error=1	500 ms	Periodic type	10 ms	• Inside the power battery • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DD200	• Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DE300	Shunt message error severity level 1

Description

When BMS detects shunt message error severity level 1 fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE300	• KL30 voltage is higher than 6 V	IVT MsgErr Flag=1@ high voltage connection	500 ms	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE300	• Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**This DTC is only for prompting, and repair is unnecessary**

DTC	**P1DE3F0**	**Shunt message error severity level 2**

Description

When BMS detects shunt message error severity level 2 fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE3F0	• KL30 voltage is higher than 6 V	IVT MsgErr Flag=1@ high voltage disconnection	500 ms	Periodic type	10 ms	• Inside the power battery • Energy conversion and distribution unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE3F0	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness and connector (inside battery pack)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-3# - connector (inside battery pack) A1-10#	Always connected	Continuity
Connector (inside battery pack) CN4-2# - connector (inside battery pack) A1-28#	Always connected	Continuity

NG → **Replace wire harness and connector**

NG

3	**Check BMS main control**

(a) Check BMS main control.

Standard value

Multimeter connection	Detection condition	Specified condition
BMS main control A1-10# - BMS main control A1-28#	Always connected	Approximately 120 Ω
BMS main control A1-10# - BMS main control A1-5#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-29#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-30#	Always connected	No continuity

Multimeter connection	Detection condition	Specified condition
BMS main control A1-10# - BMS main control A1-31#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-32#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-5#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-29#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-30#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-31#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-32#	Always connected	No continuity

NG → **Replace BMS main control (See page DL-37)**

NG

4	**Check energy conversion and distribution unit**

(a) Check the energy conversion and distribution unit.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit CN4-3# - energy conversion and distribution unit CN4-2#	Always connected	Approximately 120 Ω
Energy conversion and distribution unit CN4-2# - energy conversion and distribution unit CN4-10#	Always connected	No continuity
Energy conversion and distribution unit CN4-3# - energy conversion and distribution unit CN4-10#	Always connected	No continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

DTC	**P1DE600**	**Open in contactor power supply circuit**
DTC	**P1DB500**	**Contactor power supply too low fault**

Description

When BMS detects open in contactor power supply circuit or too low voltage, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE600	• KL30 voltage is higher than 6 V	pINP_VAR_ HDrvVol_SL < 5.5 V	2 s	Periodic type	10 ms	• 12 V battery • Power battery • Wire harness and connector • Energy conversion and distribution unit • Rear intelligent area control unit
P1DB500	• KL30 voltage is higher than 6 V	pINP_VAR_ HDrvVol_SL < 8.5 V	2 s	Periodic type	10 ms	• 12 V battery • Power battery • Wire harness and connector • Energy conversion and distribution unit • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE600	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1DB500	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Check for following DTCs.

P1F2A00	Open in low voltage service switch interlock (service switch disconnection)

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

2	**Clear DTCs**

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

OK

3	**Check the 12 V battery voltage**

(a) Check if 12 V battery voltage is normal.

NG → Perform repair according to malfunction

OK

4	Check rear intelligent area control unit power supply to BMS main control

(a) Check if the rear intelligent area control unit power supply to BMS main control is normal.

NG → Check and repair rear intelligent area control unit and wire harness

NG

5	Check wire harness and connector (vehicle end)

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the connection between battery pack low voltage connector and vehicle.

(c) Check if voltage is normal.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (vehicle end) CN1-1H# - connector (vehicle end) CN1-4H#	Always connected	9 V ~ 16 V
Connector (vehicle end) CN1-1G# - connector (vehicle end) CN1-4H#	Always connected	9 V ~ 16 V

NG → Check and repair or replace wire harness and connector

OK

6	Check wire harness and connector (battery pack internal wire harness)

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-20# - connector (inside battery pack) CN1-1H#	Always connected	Continuity
Connector (inside battery pack) CN4-19# - connector (inside battery pack) CN1-1G#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Replace BMS main control (See page DL-61)

DTC	P1DF411	Crash PWM signal abnormal fault (abnormal duty ratio)

Description

When BMS detects abnormal collision PWM signal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DF411	• KL30 voltage is higher than 6 V	Abnormal duty ratio (0 ⩽ duty ratio < 10%, 30% < duty ratio < 70%, 90% < duty ratio ⩽ 100%), ACU message reception error at the same time	5 s	Periodic type	10 ms	• Airbag control unit • Energy conversion and distribution unit • Wire harness and connector • BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DF411	• Battery discharging function restricted	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Power on and read DTCs again.

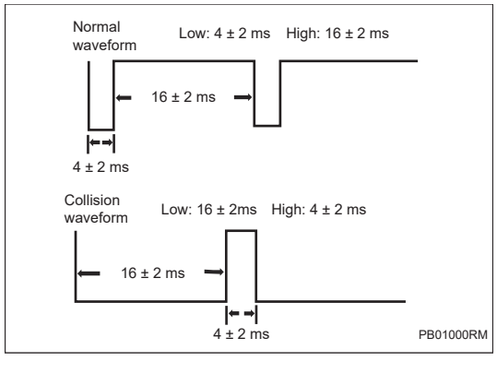
Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery pack low voltage wire harness and connector (vehicle end)



(a) Measure vehicle wire harness end connector CN1-4D for crash PWM waveform.

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check wire harness and connector (inside battery pack)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-25# - connector (inside battery pack) CN4-10#	Always connected	No continuity
Connector (inside battery pack) CN4-25# - connector (inside battery pack) CN4-1#	Always connected	No continuity
Connector (inside battery pack) CN4-25# - connector (inside battery pack) CN1-4D#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit**

OK

4	**Check wire harness and connector (energy conversion and distribution unit - BMS)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-40#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-1#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-2#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-5#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-29#	Always connected	No continuity

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-30#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-31#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) A1-32#	Always connected	No continuity
Connector (inside battery pack) A2-21# - connector (inside battery pack) CN4-25#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1F2A00	Open in low voltage service switch interlock (service switch disconnection)

Description

When BMS detects open in low voltage service switch interlock, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F2A00	• KL30 voltage is higher than 6 V	pINP_VAR_InterLock Fault_UB = 0x01	2 s	Periodic type	10 ms	• Inside vehicle or power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F2A00	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check low voltage service switch

(a) Check if low voltage service switch is damaged.

(b) Check if low voltage service switch is turned on.

NG → **Perform repair according to malfunction**

OK

2	Clear DTCs

(a) Clear DTCs.

(b) Wait for 10 minutes after being powered off.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

3	Check wire harness and connector (vehicle end)

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the connection between battery pack low voltage connector and vehicle.

(c) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (vehicle end) CN1-2C# - connector (vehicle end) CN1-2E#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

4	Check wire harness and connector (battery pack internal wire harness)

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A1-17# - connector (inside battery pack) CN4-21#	Always connected	Continuity
Connector (inside battery pack) A1-36# - connector (inside battery pack) CN4-22#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

5	Check energy conversion and distribution unit

(a) Check for continuity in the energy conversion and distribution unit.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-21# - connector (inside battery pack) CN1-2C#	Always connected	Continuity
Connector (inside battery pack) CN4-22# - connector (inside battery pack) CN1-2E#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Replace BMS main control (See page DL-61)

DTC	P1F2C00	Short to power supply in low voltage service switch interlock

Description

When BMS detects short to power supply in low voltage service switch interlock, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F2C00	• KL30 voltage is higher than 6 V	pINP_VAR_InterLock Fault_UB = 0x04	2 s	Periodic type	10 ms	• Inside vehicle or power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F2C00	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check low voltage service switch

(a) Check if low voltage service switch is damaged.

(b) Check if low voltage service switch is turned on.

NG → **Perform repair according to malfunction**

OK

2	Clear DTCs

(a) Clear DTCs.

(b) Wait for 10 minutes after being powered off.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

3	Check wire harness and connector (vehicle end)

(a) The vehicle is powered off and enters sleep mode.

(b) Disconnect the connection between battery pack low voltage connector and vehicle.

(c) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (vehicle end) CN1-2C# - connector (vehicle end) CN1-4G#	Always connected	No continuity
Connector (vehicle end) CN1-2C# - connector (vehicle end) CN1-4H#	Always connected	No continuity
Connector (vehicle end) CN1-2E# - connector (vehicle end) CN1-4G#	Always connected	No continuity
Connector (vehicle end) CN1-2E# - connector (vehicle end) CN1-4H#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check wire harness and connector (battery pack internal wire harness)**

(a) Check the wire harness for continuity.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN4-22# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) CN4-22# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) CN4-21# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) CN4-21# - connector (inside battery pack) CN1-4H#	Always connected	No continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	**P1F2E00**	**BMS 12 V power supply output too low (current sensor power supply)**

Description

When BMS detects too low BMS 12 V power supply output, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F2E00	• KL30 voltage is higher than 6 V	pINP_VAR_12V PowerOut_SL < 5.5 V	2 s	Periodic type	10 ms	• 12 V battery • Power battery • Energy conversion and distribution unit • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F2E00	• Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Check for following DTCs.

P1D9116	BMS power supply (KL30) voltage too low fault
P1D91F0	BMS power supply (KL30) voltage too low fault
P1D91F1	BMS power supply (KL30) voltage too low fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

ZD

NG → **Perform repair according to DTC**

OK

Replace BMS main control (See page DL-61)

DTC P1F2F00 BMS 12 V power supply output too high (current sensor power supply)

Description

When BMS detects too high BMS 12 V power supply output, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F2F00	• KL30 voltage is higher than 6 V	pINP_VAR_12V PowerOut_SL > 18 V	2 s	Periodic type	10 ms	• 12 V battery • Power battery • Energy conversion and distribution unit • Wire harness and connector • Rear intelligent area control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F2F00	• Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Check for following DTCs.

P1D9117	BMS power supply (KL30) voltage too high fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

Replace BMS main control (See page DL-61)

DTC	P1D8016	Cell voltage too low fault
DTC	P1D8116	Cell voltage too low alarm

Description

When BMS detects cell voltage too low fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8016	• KL30 voltage is higher than 6 V	• Vmin ⩽ 1.7 V (stage 1) • Vmin ⩽ 1.7 V (stage 2)	2 s	Periodic type	10 ms	• Inside the power battery
P1D8116	• KL30 voltage is higher than 6 V	• Vmin < 2.5 V (stage 1) • Vmin < 2.1 V (stage 2)	4 s	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8016	• Battery AC discharging function failure	Not come on
P1D8116	• Battery AC discharging function failure	Not come on

ZD

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Query occurrence number of historical fault. Locate the faulty battery cell according to "the lowest value sampling point of cell voltage" in the fault snapshot.

(c) Power on again, clear DTCs and charge the vehicle.

DTC P1D8117 Cell voltage too high alarm

Description

When BMS detects cell voltage too high alarm fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8117	• KL30 voltage is higher than 6 V	Vmax ⩾ 3.81 V	1 s	Periodic type	10 ms	• Repair is unnecessary

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8117	• Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**This DTC is only for prompting, and repair is unnecessary**

DTC P1D82F0 Battery total voltage seriously too low fault

Description

When BMS detects battery too low total voltage, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D82F0	• KL30 voltage is higher than 6 V	Total battery voltage ⩽ limit value for too high cell voltage * 116 - 5V Total battery voltage ⩽ 169 V (T > 10° C) Total voltage ⩽ 169 V (T ⩽ 10° C)	2 s	Periodic type	13 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D82F0	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

ZD

(a) Check for following DTCs.

P1DAD00	Cell voltage seriously too low fault
P1D8016	Cell voltage too low fault
P1D8116	Cell voltage too low alarm

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Repair as cell voltage too low fault**

OK

2	**Read DTCs**

(a) Check for following DTCs.

P1DA300	Collision fault - CAN signal
P1DA400	Collision fault - hard wire signal
P1DBC00	Battery thermal runaway alarm
P1DDFF4	Current out of limit fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Troubleshooting by collision fault, battery thermal runaway fault and current out of limit fault**

OK

3	**Check smart fuse**

(a) Remove the battery pack.

(b) Open the service port to check for continuity of smart fuse.

NG → **Replace smart fuse**

OK

4	**Measure total power battery voltage**

(a) Measure voltage between positive and negative poles of battery pack.

(b) Check if total voltage is less than threshold.

NG → **Troubleshoot the connection between battery pack fuse and copper bar**

OK

5	**Check wire harness and connector (CN2 - C2)**

(a) Check if wire harness and connector are connected properly.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
C2 connector 4# - CN2 connector 1#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D8400	Cell SOC deviation alarm

Description

When BMS detects cell SOC deviation alarm fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8400	• KL30 voltage is higher than 6 V	Maximum value of cell SOC difference is more than 15%, time at IG OFF is more than 60 minutes	Perform initialization judgment once for 300 ms	Periodic type	10 ms	• Power battery

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8400	• Battery discharging function limited • Battery feedback function limited • AC discharging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery cell self-discharging rate

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 1 hour.

(b) Feed back the fault information (fault symptom, time, location etc.) and vehicle information (vehicle mileage, VIN code etc.) to the manufacturer, and the manufacturer will analyze to determine if the battery cell self-discharging rate is abnormal through big data.

NG → **Replace battery pack (See page DL-37)**

OK

Locate the faulty battery cell according to "the lowest value sampling point of cell voltage" in the fault snapshot and return to the battery manufacturer to actively recharge the battery pack.

DTC	P1D8500	Cell SOC deviation fault

Description

When BMS detects cell SOC deviation fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8500	• KL30 voltage is higher than 6 V	Maximum value of cell SOC difference is more than 20%, time at IG OFF is more than 60 minutes	Perform initialization judgment once for 300 ms	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8500	• Battery discharging function limited • Battery feedback function limited • AC discharging function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery cell self-discharging rate

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 1 hour.

(b) Feed back the fault information (fault symptom, time, location etc.) and vehicle information (vehicle mileage, VIN code etc.) to the manufacturer, and the manufacturer will analyze to determine if the battery cell self-discharging rate is abnormal through big data.

Result

Result	Proceed to
Battery cell self-discharging rate is abnormal	NG
Battery cell self-discharging rate is normal	OK

NG → **Replace battery pack (See page DL-37)**

OK

2	Read DTCs

(a) Query occurrence number of historical fault.

Result

Result	Proceed to
Within 3 times (excluding 3 times)	NG
3 times or more	OK

NG → **Locate the faulty battery cell according to "the highest value sampling point of cell voltage" in the fault snapshot and return the battery pack to the battery manufacturer to actively recharge the battery pack.**

ZD

OK

3	Troubleshoot battery cell voltage sampling FPC

(a) Check if battery cell voltage sampling FPC is damaged.

(b) Check for short or open in battery cell voltage sampling FPC.

NG → **Check and repair or replace the battery cell voltage sampling FPC.**

OK

Replace battery pack (See page DL-37)

DTC	P1D8698	Battery module temperature too high

Description

When BMS detects battery module overtemperature fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8698	• KL30 voltage is higher than 6 V	Tmax > 55° C	4 s	Periodic type	10 ms	• Vehicle cooling system or inside power battery • Battery module • Cooling plate

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8698	• Battery discharging function limited • AC discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check vehicle environment (Fault caused by vehicle parking and sun exposure)

(a) Keep vehicle stationary for more than 10 hours at room temperature.

(b) Power on again, and clear DTCs.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check thermal management system**

(a) Check if A/C system operates normally.

(b) Check if battery cooling water pump operates normally.

(c) Check if PTC starts abnormally.

(d) Check if the expansion tank level is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check power battery**

(a) Check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

NG → **Replace battery pack (See page DL-37)**

OK

Locate the faulty battery cell and remind the user to avoid violent driving by continuously monitoring the usage of faulty battery cell through background data.

DTC	P1D8798	Battery module overtemperature alarm

Description

When BMS detects battery module too high alarm fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8798	• KL30 voltage is higher than 6 V	Tmax > 53° C	4 s	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8798	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Repair is unnecessary**

DTC P1D8800 Battery module temperature too low fault

Description

When BMS detects too low module temperature, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8800	• KL30 voltage is higher than 6 V	Tmin < -30° C	4 s	Periodic type	10 ms	• Vehicle cooling system or inside power battery • Battery module • Cooling plate

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8800	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Keep vehicle stationary for more than 10 hours at room temperature.

(b) Power on again, and clear DTCs.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

OK

2	**Read cell voltage and module temperature of battery pack**

(a) Read the cell voltage and module temperature of the battery pack to locate the faulty module.

(b) Troubleshoot connecting FPC between module and BMS slave control for damage or short circuit.

NG → **Perform repair according to malfunction**

DTC	P1D8A18	Battery pack feedback charge current out of limit fault

DTC	P1DCC00	Battery pack feedback charge current out of limit alarm

Description

When BMS detects a fault related to battery pack feedback charging current out of limit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8A18	• KL30 voltage is higher than 6 V	⩽ 1.15 * Permissible feedback charging current value * SOH-2A (Cell parameter table: 7 - Battery assembly peak power MAP (BOL/EOL) divided by current voltage)	2 s	Periodic type	10 ms	• Inside the power battery • High voltage electrical system
P1DCC00	• KL30 voltage is higher than 6 V	⩽ 1.05 * Permissible feedback charging current value * SOH-2A (Cell parameter table: 7 - Battery assembly peak power MAP (BOL/EOL) divided by current voltage)	2 s	Periodic type	10 ms	• Inside the power battery • High voltage electrical system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8A18	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1DCC00	• Battery feedback function limited	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Troubleshoot motor or intelligent vehicle control platform control unit**

OK

Diagnosis ends

DTC	P1D8C1A	Vehicle insulation slight alarm
DTC	P1D8D1A	Vehicle insulation serious fault

Description

When BMS detects vehicle insulation related fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8C1A	• KL30 voltage is higher than 6 V	Insulation resistance < 296 kΩ	3 cycles	Periodic type	10 ms	• Vehicle high voltage system • Inside the power battery
P1D8D1A	• KL30 voltage is higher than 6 V	Insulation resistance < 60 kΩ	3 cycles	Periodic type	10 ms	• Vehicle high voltage system • Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8C1A	-	Not come on
P1D8D1A	• Battery feedback function limited • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

ZD

(a) Clear DTCs.

(b) After vehicle is powered off for 10 minutes and then powered on for 1 minute, read the current BMS DTC and insulation resistance.

(c) Keep Start status for 5 minutes and read current BMS DTC.

Result

Result	Proceed to
DTC exists and insulation resistance is lower than 300 kΩ before the Start	NG
No DTC before the Start, and DTC occurs after the Start	OK

NG → **Check and repair the power battery internal insulation problem (troubleshooting method is same as that of 1DE700)**

OK

Check vehicle insulation fault except the battery

DTC	P1DAA01	Feedback current too high fault

Description

When BMS detects too large feedback current, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DAA01	• KL30 voltage is higher than 6 V	I ⩽ 1.1 * Permissible feedback current value * SOH-2A (Cell parameter table: 7 - Battery assembly peak power MAP (BOL/EOL) divided by current voltage)	2 s	Periodic type	10 ms	• Inside the power battery • High voltage electrical system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DAA01	• Battery feedback function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Troubleshoot motor or intelligent vehicle control platform control unit**

OK

Diagnosis ends

DTC	**P1DAD00**	**Cell voltage seriously too low fault**
DTC	**P1D81F2**	**Cell voltage seriously too low fault 2**

Description

When BMS detects seriously low cell voltage, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DAD00	• KL30 voltage is higher than 6 V	• Vmin ⩽ 1.5 V (stage 1) • Vmin ⩽ 1.5 V (stage 2)	2 s	Periodic type	10 ms	• Inside the power battery
P1D81F2	• KL30 voltage is higher than 6 V	• Vmin ⩽ 1.5 V (stage 1) • Vmin ⩽ 1.5 V (stage 2)	2 s	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DAD00	• The vehicle fails to activate high voltage system	Comes on
P1D81F2	• The vehicle fails to activate high voltage system	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).Such DTCs are analyzed in two cases: Use step 1 for current fault detection; Use step 2 for history fault detection.

1	**Charge power battery**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Charge to SOC ⩾ 20%.

2	**Clear DTCs**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Query occurrence number of historical fault. Locate the faulty battery cell according to "the lowest value sampling point of cell voltage" in the fault snapshot.

(c) Power on again, clear DTCs and charge the vehicle.

DTC	P1DAE00	Battery module temperature seriously too high fault

Description

When BMS detects seriously high battery module temperature, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DAE00	• KL30 voltage is higher than 6 V	Tmax > 60° C	4 s	Periodic type	10 ms	• Vehicle cooling system or inside power battery • Battery module • Sampling FPC • Cooling plate

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DAE00	• The vehicle immediately loses power	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check vehicle environment (Fault caused by vehicle parking and sun exposure)**

(a) Keep vehicle stationary for more than 10 hours at room temperature.

(b) Power on again, and clear DTCs.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

OK

ZD

2	**Check thermal management system**

(a) Check if A/C system operates normally.

(b) Check if battery cooling water pump operates normally.

(c) Check if PTC starts abnormally.

(d) Check if the expansion tank level is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check power battery**

(a) Check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

NG → **Replace battery pack (See page DL-37)**

OK

4	**Check temperature of sampling point at time of failure**

(a) Check if temperature of sampling points is higher than 60° C.

Result

Result	Proceed to
The temperature at one sampling point is higher than 60° C and the temperature at other sampling points is not higher than 53° C	NG
Other conditions	OK

NG → **Troubleshoot the battery cell temperature sampling FPC. If there is no battery cell temperature sampling fault, replace battery pack (See page DL-37)**

OK

Locate the faulty battery cell and remind the user to avoid violent driving by continuously monitoring the usage of faulty battery cell through background data.

DTC	P1DB885	Battery module temperature difference too large fault

Description

When BMS detects battery module temperature difference too large fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DB885	• KL30 voltage is higher than 6 V	Cumulative 3 driving cycles: $\Delta T \geqslant 30$° C	10 s	Periodic type	10 ms	• Vehicle cooling system or inside power battery • Battery module • Cooling plate • Sampling FPC

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DB885	• Battery discharging function limited • AC discharging prohibition • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check thermal management system

ZD

(a) Check if battery cooling water pump operates normally.

(b) Check if the expansion tank level is normal.

NG → **Perform repair according to malfunction**

OK

2	Check power battery

(a) Check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

NG → **Replace battery pack (See page DL-37)**

OK

3	Check battery cell temperature sampling FPC

(a) Check if battery cell temperature sampling FPC is damaged.

NG → **Replace battery cell temperature sampling FPC**

OK

Replace battery pack (after replacing, power on again, clear DTCs, and check for normal operation) (See page DL-37)

DTC	P1DB900	SOC jump fault

Description

When BMS detects battery pack SOC jump fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DB900	• KL30 voltage is higher than 6 V	SOC jump value > 20%	-	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DB900	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**The vehicle can be driven and charged, only as a warning fault**

DTC	**P1DBF00**	**Vehicle insulation serious fault (gun insertion mode)**

Description

ZD When BMS detects vehicle insulation serious fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DBF00	• KL30 voltage is higher than 6 V	Insulation resistance < 60 kΩ	3 cycles	Periodic type	10 ms	• Vehicle high voltage system • Inside the power battery • Charging pile

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DBF00	• Battery feedback function limited • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Disconnect charging gun, clear DTCs.

(b) Wait for 10 minutes after stalling and start, and read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **DTC is recorded due to charging pile insulation fault while charging**

NG

2	**Read DTCs**

(a) Check for following DTCs.

P1D8C1A	Vehicle insulation slight alarm
P1D8D1A	Vehicle insulation serious fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

Diagnosis ends

DTC	P1DC017	Cell voltage seriously too high fault
DTC	P1D8017	Cell voltage too high fault

Description

When BMS detects cell voltage too high fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC017	• KL30 voltage is higher than 6 V	Vmax ⩾ 4.1 V	1 s	Periodic type	10 ms	• Inside the power battery
P1D8017	• KL30 voltage is higher than 6 V	Vmax ⩾ 3.87 V	2 s	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC017	• The vehicle immediately loses power	Comes on
P1D8017	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Power on again, and clear DTCs.

(c) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Troubleshoot faulty battery cell voltage sampling FPC**

(a) Locate the faulty battery cell according to "the highest value sampling point of cell voltage" in the fault snapshot.

(b) Troubleshoot if the faulty battery cell voltage sampling FPC is faulty.

NG → **Perform repair according to malfunction**

OK

Replace battery pack (See page DL-37)

DTC	P1DC117	Battery total voltage seriously too high fault
DTC	P1D8217	Battery total voltage too high fault

Description

When BMS detects cell voltage too high fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DC117	• KL30 voltage is higher than 6 V	Total battery voltage ⩾ limit value for seriously high cell voltage * 116 + 5 V (480.6 V)	1 s	Periodic type	11 ms	• Inside the power battery
P1D8217	• KL30 voltage is higher than 6 V	Total battery voltage ⩾ limit value for too high cell voltage * 116 + 5 V (453.92 V)	2 s	Periodic type	12 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DC117	• The vehicle immediately loses power	Not come on
P1D8217	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).Such DTCs are analyzed in two cases: If the diagnostic tester displays "current fault and history fault", use step 1 for detection; If the diagnostic tester displays "history fault", use step 2 for detection.

ZD

1	Read DTCs

(a) If the diagnostic tester displays "current fault and history fault", check for DTCs in table below.

P1D8117	Cell voltage too high alarm
P1D8017	Cell voltage too high fault
P1DC017	Cell voltage seriously too high fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

Replace BMS main control (See page DL-61)

2	Read DTCs

(a) If the diagnostic tester displays "historical fault", check for "Cell voltage too high fault”.

Result

Result	Proceed to
"Cell voltage too high fault" occurs	NG
"Cell voltage too high fault" does not occur	OK

NG → **Perform repair according to DTC**

OK

3	Check if BMS main control total voltage sampling accuracy is normal

ZD

(a) Read the "average cell voltage value" and "total battery pack voltage value".

(b) Multiply the reading of "average cell voltage value" by 116, and compare the resulting voltage value with the reading of "total battery pack voltage value".

Standard:

The difference between them should be no more than 4 V.

NG → **Replace BMS main control (See page DL-61)**

OK

Clear DTCs

DTC	P1DCD00	Battery pack SOC seriously too low fault

Description

When BMS detects seriously low battery pack SOC, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DCD00	• KL30 voltage is higher than 6 V	Vehicle Speed = 0 / / (T ⩾ 10° C, Vmin ⩽ 2.8 V / / I ⩽ 10 A; T < 10° C, Vmin ⩽ 2.4 V / / I ⩽ 3 A) / / I > 0 (current is in the discharge state)	1200 s	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DCD00	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, stall the vehicle and wait for 10 minutes before starting.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Charge the vehicle**

OK

Diagnosis ends

DTC	P1DCE00	Battery pack SOH too low alarm

Description

When BMS battery pack SOH occurs too low alarm, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DCE00	• KL30 voltage is higher than 6 V	SOH ⩽ 65%	Power on and off for 3 consecutive times	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DCE00	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Repair is unnecessary

DTC	P1DCE23	Battery pack SOH too low fault

Description

When BMS battery pack SOH is too low, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DCE23	• KL30 voltage is higher than 6 V	SOH ⩽ 3%	Power on and off for 3 consecutive times	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DCE23	-	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**If repair is necessary, remind the user that the power battery has reached the disposal limit and needs to be replaced in time**

DTC	**P1DCEF0**	**SOH seriously too low fault**

Description

When BMS SOH is seriously low, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DCEF0	• KL30 voltage is higher than 6 V	Drive 1000 km after SOH ⩽ 3%	Power on and off for 3 consecutive times	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DCEF0	-	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Replace battery pack (See page DL-37)**

DTC	**P1DDF1D**	**Charge current too high alarm**
DTC	**P1DDFF0**	**Charge current too high fault**

DTC	**P1DDFF1**	**Charging mode - current pulse charge current too high alarm**
DTC	**P1DDFF2**	**Charging mode - pulse charge current too high fault**

Description

When BMS detects too high charging current or pulse charging current, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDF1D	• KL30 voltage is higher than 6 V	Charging ammeter limit value * 1.05 * SOH-2A	2 s	Periodic type	10 ms	• Charging pile
P1DDFF0	• KL30 voltage is higher than 6 V	Charging ammeter limit value * 1.1 * SOH-2A	10 s	Periodic type	10 ms	• Charging pile
P1DDFF1	• KL30 voltage is higher than 6 V	① MAX (1.1 * 5s peak feedback current, 0.95 * charging ammeter limit) * SOH -2A (Cell parameter table: 8 - Battery assembly peak current MAP (BOL/EOL))	300 ms	Periodic type	10 ms	• Charging pile
P1DDFF2	• KL30 voltage is higher than 6 V	② 1.1 * 5s peak feedback current * SOH-2A (Cell parameter table: 8 - Battery assembly peak current MAP (BOL/EOL))	1 s	Periodic type	10 ms	• Charging pile

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDF1D	-	Not come on
P1DDFF0	• Battery charging function failure	Not come on
P1DDFF1	-	Not come on
P1DDFF2	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Reconnect charging gun after clearing DTCs.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Replace quick charging pile to charge**

(a) Replace the quick charging pile to charge.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DDFF3	Charging mode - pulse charge current too high fault cumulative count out of limit flag

Description

When BMS detects that pulse charging too high current cumulative number is out of limit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDFF3	• KL30 voltage is higher than 6 V	② Cumulative number of faults ⩾ 50	-	Periodic type	10 ms	• Power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDFF3	• Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read DTCs.

(b) Query if the occurrence number of historical faults exceeds 50.

Result

Result	Proceed to
The occurrence number of historical faults exceeds 50	NG
The occurrence number of historical faults does not exceed 50	OK

NG → **Replace battery pack**

OK

No maintenance is required, clear DTCs using UDS. Power on again, and clear DTCs

DTC	P1DDFF4	Current out of limit fault

Description

When BMS detects that the current is out of limit, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDFF4	• KL30 voltage is higher than 6 V	• I > 2000 A • 1600 < I ⩽ 2000 A • 1400 < I ⩽ 1600 A	• 50 ms (application layer receives the message receiving flag from firmware to ensure that valid messages are received in 5 cycles) • 1 s • 10 s	Periodic type	10 ms	• Inside the power battery • Whole high voltage system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDFF4	• The vehicle immediately loses power	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery external high voltage circuit

(a) Check if power battery external high voltage wire harness is damaged.

(b) Check for short in power battery external high voltage circuit.

NG → **Check and repair battery external high voltage system**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DE700	Battery isolation alarm

Description

When BMS detects battery insulation alarm fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE700	• KL30 voltage is higher than 6 V	Insulation resistance < 1000 kΩ (TBD)	3 cycles	Periodic type	10 ms	• Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE700	• The vehicle immediately loses power	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check breather valve

(a) Check breather valve for damage.

NG → **Replace power battery (See page DL-37)**

NG

3	**Measure the insulation resistance between high voltage positive and negative terminals**

(a) Open battery total positive assembly cover plate and battery total negative assembly cover plate.

(b) Using a insulation meter, measure the insulation resistance between high voltage positive and negative terminals and battery housing respectively.

Standard value

Multimeter connection	Detection condition	Specified condition
High voltage positive - battery housing	Always connected	Infinity
High voltage negative - battery housing	Always connected	Infinity

NG

If the resistance is too small, further troubleshoot the battery module: After removing energy conversion and distribution unit, use the insulation meter to measure the insulation values of the copper bars at both sides connected to intelligent fuse respectively. Repeat the copper bar disconnection operation on the side with insulation resistance problem, gradually narrow down the faulty points in sections and finally locate it.

OK

Replace BMS main control (See page DL-61)

DTC	P1D8A00	Battery pack feedback charge current seriously out of limit fault

Description

When there is a serious out of limit fault in battery pack feedback charging current, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D8A00	• KL30 voltage is higher than 6 V	• I ⩽ 1.15 * Permissible feedback charge current value * SOH-2A (Cell parameter table: 7 - Battery assembly peak power MAP (BOL&EO-L) divided by current voltage)	2 s	Periodic type	10 ms	• Inside the power battery • High voltage electrical system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D8A00		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Troubleshoot motor or intelligent vehicle control platform control unit**

OK

Diagnosis ends

DTC	P1D81F3	Discharging current out of limit fault

Description

When BMS detects that discharging current is not less than 925 A, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D81F3	• High voltage connection and KL30 voltage is higher than 6 V	I ⩾ 925 A	2 s	Periodic type	10 ms	• Inside the power battery • Whole high voltage system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D81F3		Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery external high voltage circuit

(a) Check if power battery external high voltage wire harness is damaged.

(b) Check for short in power battery external high voltage circuit.

NG → **Check and repair battery external high voltage system**

OK

Replace energy conversion and distribution unit (See page DL-62)

ZD

DTC	P1D82F1	Discharging current serious out of limit fault

Description

When discharging current is not less than 970 A, BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D82F1	• High voltage connection and KL30 voltage is higher than 6 V	I ⩾ 970 A	2 s	Periodic type	10 ms	• Inside the power battery • Whole high voltage system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D82F1		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery external high voltage circuit

(a) Check if power battery external high voltage wire harness is damaged.

(b) Check for short in power battery external high voltage circuit.

NG → **Check and repair battery external high voltage system**

OK

Replace energy conversion and distribution unit (See page DL-62)

ZD

DTC	P1D88F1	Charging connector temperature sensor 1 and 2 simultaneous fault

Description

When charging connector temperature sensors 1 and 2 fail at the same time, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D88F1	• High voltage connection and power supply is higher than 6 V	P1D8A18 fault is triggered totally 3 times in this power-on cycle	-	Event-based	-	• Inside the energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D88F1		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check high voltage charging connector under service port

(a) Turn off the vehicle high voltage power and low voltage power, disconnect the service switch.

(b) Check the appearance of high voltage charging connector and high voltage cable nearby for damage.

NG → **Replace high voltage charging connector**

OK

2	**Check the appearance of high voltage charging connector and high voltage cable nearby**

(a) Check the appearance of high voltage charging connector and high voltage cable nearby for serious damage.

NG → **Replace wire harness**

OK

3	**Check charging connector upper cover torque**

(a) Check if the charging connector upper cover torque is correct.

Standard torque: 6.5 ~ 7.5 N • m

NG → **Tighten connector upper cover with correct torque**

OK

4	**Check connector internal appearance**

(a) Open the charging connector upper cover and observe if the connector internal appearance is damaged.

(b) Check internal structure of connector for serious damage or deformation due to heat.

NG → **Replace wire harness**

OK

5	**Check connector internal fixing torque**

(a) Check torque of 3 standard parts inside connector is correct.

Standard torque of cooper bar bolt: 11.5 ~ 12.5 N • m

Standard torque of other bolts: 6.5 ~ 7.5 N • m

NG → **Tighten connector standard parts with correct torque**

OK

6	**Clear DTCs**

(a) Clear DTCs.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

7	**Check energy conversion and distribution unit end charging connector**

(a) Remove the fixing standard parts inside the charging connector and observe the appearance of the energy conversion and distribution unit end connector to check if the internal structure is damaged or deformed due to heat.

NG → **Perform repair according to malfunction**

OK

Further check the interior of energy conversion and distribution unit

DTC	**P1D9044**	**E2P data reading error (data, check)**
DTC	**P1DEF00**	**RTC function fault (crystal oscillator, I2C abnormal)**

Description

When BMS detects data reading error or RTC function fault, BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9044	• KL30 voltage is higher than 6 V	• pINP_ VAR_ROM Cal Crc Invalid_BL == 1	1 s	Periodic type	10 ms	• BMS main control
P1DEF00	• KL30 voltage is higher than 6 V	• pINP_ VAR_ RtcFlt_UB ! = 0 • (0x01 – Oscillator stop • Detection function 0x02 – IIC communic-ation timeout (no reply in 3 cycles, timeout determine-d) • 0x04 - -KL30 power off (judged by KL30 power off of SBC)	1 s	Periodic type	10 ms	• BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9044	• The vehicle fails to activate high voltage system • Battery discharging function limited • AC discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1DEF00	• RTC function fault	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

ZD

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1D9411	Main positive contactor coil short to ground fault (high side, low side)

Description

When BMS detects short to ground in main positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9411	• KL30 voltage is higher than 6 V	pINP_VAR_PosChkDiag_UB == 40	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main positive contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9411	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A1-15# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) A1-15# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A2-30# - connector (inside battery pack) CN1-4H#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-13# - connector (inside battery pack) CN1-4H#	Always connected	Continuity
Connector (inside battery pack) CN3-13# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-1# - connector (inside battery pack) CN1-4H#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D9412	Main positive contactor coil short to power supply fault (high side, low side)

Description

When BMS detects short to power supply in main positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9412	• KL30 voltage is higher than 6 V	pINP_VAR_PosChkDiag_UB == 1, 2, 4 20	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main positive contactor • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9412	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A1-15# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) A1-15# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A2-30# - connector (inside battery pack) CN1-4G#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-13# - connector (inside battery pack) CN1-4G#	Always connected	Continuity
Connector (inside battery pack) CN3-13# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-1# - connector (inside battery pack) CN1-4G#	Always connected	Continuity

NG → **Check and repair or replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D9413	Main positive contactor coil open fault (high side, low side)

Description

When BMS detects open in main positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9413	• KL30 voltage is higher than 6 V	• pINP_VAR_PosChkDiag_UB == 8 10 • Main positive coil diagnostic fault: Fault diagnosed, the corresponding fault position is 1, otherwise it will be reset to 0 • 0x00: No fault • 0x01:OFF State Short to power supply in relay coil • 0x02:OFF State Short to power supply in relay coil low side • Open/short to ground in relay coil high side • 0x04:OFF State Short to power supply in relay coil high side • Open/short to ground in relay coil low side • 0x08:OFF State Open in relay coil • 0x10:ON State Open in relay coil • Or short to power supply in relay coil high side • 0x20:ON State Short to power	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main positive contactor • Energy conversion and distribution unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		supply in relay coil low side • 0x40:ON State Short to ground in relay coil high side				

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9413	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (BMS main control - contactor)

(a) If multiple contactor coil open circuit faults are reported at the same time, first check if the low voltage wire harness between BMS main control and contactor is connected firmly or damaged.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check wire harness and connector (BMS main control - contactor)

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-30# - connector (inside battery pack) CN3-1#	Always connected	Continuity
Connector (inside battery pack) A1-15# - connector (inside battery pack) CN3-13#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check energy conversion and distribution unit**

(a) Check if the energy conversion and distribution unit is damaged.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit CN3-1# - energy conversion and distribution unit CN3-13#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9511	Main negative contactor coil short to ground fault (high side, low side)

Description

When BMS detects short to ground in main negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9511	• KL30 voltage is higher than 6 V	pINP_VAR_NegChkDiag_UB == 40	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main negative contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9511	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-12# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) A2-12# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A1-24# - connector (inside battery pack) CN1-4H#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-14# - connector (inside battery pack) CN1-4H#	Always connected	Continuity
Connector (inside battery pack) CN3-14# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-2# - connector (inside battery pack) CN1-4H#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D9512	Main negative contactor coil short to power supply fault (high side, low side)

Description

When BMS detects short to power supply in main negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9512	• KL30 voltage is higher than 6 V	pINP_VAR_NegChkDiag_UB == 1, 2, 4 20	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main negative contactor • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9512	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-12# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) A2-12# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A1-24# - connector (inside battery pack) CN1-4G#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-14# - connector (inside battery pack) CN1-4G#	Always connected	Continuity
Connector (inside battery pack) CN3-14# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-2# - connector (inside battery pack) CN1-4G#	Always connected	Continuity

NG → **Check and repair or replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1D9513**	**Main negative contactor coil open fault (high side, low side)**

Description

When BMS detects open in main negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9513	• KL30 voltage is higher than 6 V	pINP_VAR_ NegChkDiag_ UB == 8 10	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or main negative contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9513	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (BMS main control - contactor)**

(a) If multiple contactor coil open circuit faults are reported at the same time, first check if the low voltage wire harness between BMS main control and contactor is connected firmly or damaged.

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (BMS main control - contactor)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-12# - connector (inside battery pack) CN3-2#	Always connected	Continuity
Connector (inside battery pack) A1-24# - connector (inside battery pack) CN3-14#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check energy conversion and distribution unit**

(a) Check if the energy conversion and distribution unit is damaged.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit CN3-2# - energy conversion and distribution unit CN3-14#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9711	Charging positive contactor coil short to ground fault (high side, low side)

Description

When BMS detects short to ground in charging positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9711	• KL30 voltage is higher than 6 V	pINP_VAR_ ChgPosChkDiag_UB == 40	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging positive contactor • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9711	• Compressor stop	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A-9# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) A-9# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A-12# - connector (inside battery pack) CN1-4H#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-15# - connector (inside battery pack) CN1-4H#	Always connected	Continuity
Connector (inside battery pack) CN3-15# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-3# - connector (inside battery pack) CN1-4H#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D9712	Charging positive contactor coil short to power supply fault (high side, low side)

Description

When BMS detects short to power supply in charging positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9712	• KL30 voltage is higher than 6 V	pINP_VAR_ChgPosChkDiag_UB == 1, 2, 4 20	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging positive contactor • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9712	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-9# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) A2-9# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A2-12# - connector (inside battery pack) CN1-4G#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-15# - connector (inside battery pack) CN1-4G#	Always connected	Continuity
Connector (inside battery pack) CN3-15# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-3# - connector (inside battery pack) CN1-4G#	Always connected	Continuity

NG → **Check and repair or replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1D9713**	**Charging positive contactor coil open fault (high side, low side)**

Description

When BMS detects open in charging positive contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9713	• KL30 voltage is higher than 6 V	pINP_VAR_ ChgPosChkDi-ag_UB == 8 10	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging positive contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9713	• Battery DC charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (BMS main control - contactor)**

(a) If multiple contactor coil open circuit faults are reported at the same time, first check if the low voltage wire harness between BMS main control and contactor is connected firmly or damaged.

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (BMS main control - contactor)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-9# - connector (inside battery pack) CN3-3#	Always connected	Continuity
Connector (inside battery pack) A2-12# - connector (inside battery pack) CN3-15#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check energy conversion and distribution unit**

(a) Check if the energy conversion and distribution unit is damaged.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit CN3-3# - energy conversion and distribution unit CN3-15#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9811	Charging negative contactor coil short to ground fault (high side, low side)

Description

When BMS detects short to ground in charging negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9811	• KL30 voltage is higher than 6 V	pINP_VAR_ ChgNegChkDiag == 40	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging negative contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9811	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-26# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) A2-26# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A1-12# - connector (inside battery pack) CN1-4H#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-16# - connector (inside battery pack) CN1-4H#	Always connected	Continuity
Connector (inside battery pack) CN3-16# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-4# - connector (inside battery pack) CN1-4H#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D9812	Charging negative contactor coil short to power supply fault (high side, low side)

Description

When BMS detects short to power supply in charging negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9812	• KL30 voltage is higher than 6 V	pINP_VAR_ChgNegChkDiag_UB == 1, 2, 4 20	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging negative contactor • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9812	• Battery DC charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for short in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-26# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) A2-26# - battery metal housing	Always connected	No continuity
Connector (inside battery pack) A1-12# - connector (inside battery pack) CN1-4G#	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

(b) Check for short in wire harness.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN3-16# - connector (inside battery pack) CN1-4G#	Always connected	Continuity
Connector (inside battery pack) CN3-16# - battery metal housing	Always connected	Continuity
Connector (inside battery pack) CN3-4# - connector (inside battery pack) CN1-4G#	Always connected	Continuity

NG → **Check and repair or replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

3	**Replace BMS main control (See page DL-61)**

(a) Replace the BMS main control.

(b) Clear DTCs and read DTCs again.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1D9813**	**Charging negative contactor coil open fault (high side, low side)**

Description

When BMS detects open in charging negative contactor coil, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9813	• KL30 voltage is higher than 6 V	pINP_VAR_ ChgNegChkDiag_UB == 8 10	500 ms	Periodic type	10 ms	• Power battery internal BMS main control • Low voltage wire harness between power battery internal BMS main control and contactor or charging negative contactor • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9813	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (BMS main control - contactor)**

(a) If multiple contactor coil open circuit faults are reported at the same time, first check if the low voltage wire harness between BMS main control and contactor is connected firmly or damaged.

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check wire harness and connector (BMS main control - contactor)**

(a) Check for short or open in wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A2-26# - connector (inside battery pack) CN3-4#	Always connected	Continuity
Connector (inside battery pack) A1-12# - connector (inside battery pack) CN3-16#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check energy conversion and distribution unit**

(a) Check if the energy conversion and distribution unit is damaged.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit CN3-4# - energy conversion and distribution unit CN3-16#	Always connected	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	**P1D9911**	**Main positive contactor contact stuck fault**
DTC	**P1D9A11**	**Main negative contactor contact stuck fault**
DTC	**P1D9B11**	**Charging positive contactor contact stuck fault**
DTC	**P1D9C11**	**Charging negative contactor contact stuck fault**

Description

When BMS detects contactor contact stuck fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9911	• KL30 voltage is higher than 6 V	|V main positive rear end voltage - V main positive front end voltage| ⩽ 10 V	500 ms	Periodic type	10 ms	• Charging negative contactor
P1D9A11	• KL30 voltage is higher than 6 V	0.259 V > main negative rear end voltage > -0.254 V	500 ms	Periodic type	10 ms	• Charging negative contactor
P1D9B11	• KL30 voltage is higher than 6 V	|V charging positive rear end voltage - V main positive front end voltage| ⩽ 10 V	500 ms	Periodic type	10 ms	• Charging negative contactor
P1D9C11	• KL30 voltage is higher than 6 V	0.259 V > charging negative rear end voltage > -0.254 V	500 ms	Periodic type	10 ms	• Charging negative contactor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9911	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1D9A11	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1D9B11	• Battery DC charging function failure	Comes on
P1D9C11	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check relay**

(a) Confirm if relay is stuck with conductive band of multimeter according to high voltage principle.

(b) After confirming it is stuck, drive the relay with diagnostic tester again to disconnect. Use conductive band of multimeter to confirm if relay operates as driven, and confirm if it is stuck again.

NG → **Troubleshoot other high voltage components other than the power battery and replace energy conversion and distribution unit**

DTC	P1D9912	Main positive contactor contact open fault

DTC	P1D9A12	Main negative contactor contact open fault
DTC	P1D9B12	Charging positive contactor contact open fault

Description

When BMS detects open in contactor contact, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9912	• KL30 voltage is higher than 6 V	|mcu2 voltage - V battery internal voltage| > 100 V&&|V main positive rear end voltage - V main positive front end voltage| > 10 V	500 ms	Periodic type	10 ms	• Charging positive contactor
P1D9A12	• KL30 voltage is higher than 6 V	|mcu2 voltage - V battery internal voltage| > 100 V&&|V main positive rear end voltage - V main positive front end voltage| ⩽ 10 V	500 ms	Periodic type	10 ms	• Charging positive contactor
P1D9B12	• KL30 voltage is higher than 6 V	|Charging port link voltage - V battery inside voltage| > 100 V&&|V charging positive rear end voltage - V main positive front end voltage| > 10 V	500 ms	Periodic type	10 ms	• Charging positive contactor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9912	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1D9A12	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
P1D9B12	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check relay**

(a) Drive the relay to disconnect, confirm if relay is disconnected with conductive band of multimeter according to high voltage principle.

NG → **Troubleshoot other high voltage components other than the power battery and replace energy conversion and distribution unit (See page DL-62)**

DTC	P1D9D12	Open in battery cell voltage sampling wire harness

Description

When BMS detects cell voltage sampling wire fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1D9D12	• KL30 voltage is higher than 6 V	pINP_VAR_VolCntChk_BL = 1	1s BSW given filter time	Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control
	• KL30 voltage is higher than 6 V			Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control
	• KL30 voltage is higher than 6 V			Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D9D12	• Battery feedback function failure • Battery charging function failure	Comes on
	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
	• Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check cell voltage sampling wire harness**

(a) Locate faulty cell according to sub-board state information read with diagnostic tester.

(b) Troubleshoot for open in connection between cell and FPC, FPC and module connector, module connector and BMS slave control connector.

NG → **Replace cell voltage sampling wire harness**

ZD

OK

Replace BMS slave control (See page DL-37)

DTC	P1DA288	Internal CAN bus off fault

Description

When BMS detects battery internal CAN communication fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DA288	• KL30 voltage is higher than 6 V	pINP_VAR_PrivateCANB-usoff_BL == 1	1 s	Periodic type	10 ms	• Power battery internal wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DA288	• Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector (vehicle end wire harness - power battery)**

(a) Check for short or open in wire harness.

(b) Check if wire harness is damaged.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check resistance**

(a) Check if resistance value is normal.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN1-2A# - connector (inside battery pack) CN1-1F#	Always connected	Approximately 120 Ω
Connector (inside battery pack) CN1-2A# - connector (inside battery pack) CN1-4G#	Always connected	More than 1 kΩ
Connector (inside battery pack) CN1-2A# - connector (inside battery pack) CN1-4H#	Always connected	More than 1 kΩ
Connector (inside battery pack) CN1-2A# - metal housing	Always connected	More than 1 kΩ
Connector (inside battery pack) CN1-1F# - connector (inside battery pack) CN1-4G#	Always connected	More than 1 kΩ
Connector (inside battery pack) CN1-1F# - connector (inside battery pack) CN1-4H#	Always connected	More than 1 kΩ
Connector (inside battery pack) CN1-1F# - metal housing	Always connected	More than 1 kΩ

NG → **Perform repair according to malfunction**

OK

3	**Check wire harness and connector (inside battery pack)**

(a) Check battery internal wire harness for crimping or wear.

(b) Check if power battery current sensor communicates abnormally.

(c) Check if power battery voltage sensor communicates abnormally.

NG → **Perform repair according to malfunction**

OK

Replace BMS main control (See page DL-61)

DTC	**P1DA300**	**Collision fault - CAN signal**
DTC	**P1DA400**	**Collision fault - hard wire signal**
DTC	**P1D82F2**	**Collision fault - frontal collision fault**

Description

When BMS detects collision fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DA300	• KL30 voltage is higher than 6 V	CAN Crash Signal =1	—	Periodic type	10 ms	• Inside the power battery • Airbag
P1DA400	• KL30 voltage is higher than 6 V	10% ≤ duty ratio ≤ 30%	480 ms	Periodic type	10 ms	• Inside the power battery • Airbag
P1D82F2	• 1.5 s after IG ON	CAN Crash_ Frount Signal =1	—	Event-based	—	• Inside the power battery • Airbag

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DA300	• The vehicle immediately loses power	Comes on
P1DA400	• The vehicle immediately loses power	Comes on
P1D82F2		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Confirm if vehicle has involved in a collision

(a) Confirm if vehicle has involved in a collision.

Result

Result	Proceed to
There has been a collision	NG
There has been no collision	OK

NG → **If the connector is disconnected or there is visible damage to the battery during the crash, the battery must be further repaired**

OK

2	Clear DTCs

(a) Clear DTCs.

(b) The vehicle is powered off for 10 minutes.

(c) Power on again and read BMS current DTCs.

Standard:
No DTC outputs.

NG → **Check and repair airbag system**

OK

Diagnosis ends

DTC	P1DA598	Sub-board PCB temperature too high fault

Description

When BMS detects too high sub-board PCB temperature, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DA598	• KL30 voltage is higher than 6 V	pINP_Arry_AfeSFGpioBt-Oor_UB[36]! = 0	2 s	Periodic type	10 ms	• Power battery: BMS slave control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DA598	• Battery feedback function failure • Battery charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Check for following DTCs.

P1D8B74	Equalizer switch closes unexpectedly due to equalizer short fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

2	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Standard:
No DTC outputs.

NG → **Read data stream with diagnostic tester, read DID0730 equalizer circuit temperature, and locate the faulty slave control and replace it**

OK

Diagnosis ends

DTC	P1DDBF0	Discharging current out of limit alarm

Description

When BMS detects that discharging current is not less than 880 A, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDBF0	• High voltage connection and KL30 voltage is higher than 6 V	I ⩾ 880 A	2 s	Periodic type	10 ms	• Inside the power battery • Whole high voltage system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1D81F3	The vehicle discharging power is limited to 50%	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check battery external high voltage circuit**

(a) Check if power battery external high voltage wire harness is damaged.

(b) Check for short in power battery external high voltage circuit.

NG → **Check and repair battery external high voltage system**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DBD00	Battery module temperature sampling circuit fault

Description

When BMS detects module temperature sampling fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DBD00	• KL30 voltage is higher than 6 V	pINP_Arry_ ModuleTemp-Fault_UB = 1	1s BSW given filter time	Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control
	• KL30 voltage is higher than 6 V			Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control
	• KL30 voltage is higher than 6 V			Periodic type	10 ms	• Power battery module, wire harness, BMS slave control and BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DBD00	• Battery feedback function failure • Battery charging function failure	Comes on
	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on
	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery module temperature sampling wire harness

(a) Locate faulty cell according to sub-board state information read with diagnostic tester.

(b) Troubleshoot for open in connection between NTC temperature sensor and FPC, FPC and module connector, module connector and BMS slave control connector.

NG → **Replace battery module temperature sampling wire harness (See page DL-37)**

OK

Replace BMS slave control (See page DL-37)

DTC	**P1DD300**	**CMC daisy chain open fault**
DTC	**P1DD3F0**	**CMC daisy chain one point open fault**

Description

When BMS detects open in CMC daisy chain, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DD300	• KL30 voltage is higher than 6 V, initialization stage	CMC Chain Break Flag = 1	300 ms	Periodic type	10 ms	• Power battery internal wire harness
P1DD300	• KL30 voltage is higher than 6 V, high voltage connected for driving, status lasts for 1 s	CMC Chain Break Flag = 1	1s BSW given filter time	Periodic type	10 ms	• Power battery internal wire harness
P1DD300	• KL30 voltage is higher than 6 V, high voltage connected for driving, status lasts for 1 min	CMC Chain Break Flag = 1	1s BSW given filter time	Periodic type	10 ms	• Power battery internal wire harness

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DD300	• KL30 voltage is higher than 6 V, high voltage disconnect-ed| charging, status lasts for 1 s	CMC Chain Break Flag = 1	1s BSW given filter time	Periodic type	10 ms	• Power battery internal wire harness
P1DD3F0	• PDC wakeup & PDC not in OTA mode	MONSF1 . UCOV=1	10 s	Periodic type	10 ms	• Power battery internal wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DD300		Not come on
	• Battery feedback function failure • Battery charging function failure	Comes on
	• Battery feedback function failure • Battery charging function failure • Battery discharging function limited to limp mode	Comes on
	• Battery feedback function failure • Battery charging function failure • Battery discharging function failure	Comes on
P1DD3F0		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs and wait for 10 minutes after being powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle power battery external high voltage connector**

(a) Disconnect the high voltage connector between vehicle and battery, read DTCs again. If no fault, troubleshoot the vehicle power battery external high voltage connector.

NG → **Check vehicle power battery external high voltage connector**

OK

Confirm the chain broken components and replace (judging method based on location of chain broken position)

DTC	P1DDDF0	Total voltage positive (HV+) sampling wire harness abnormal (judge if out of sampling range)

Description

When BMS detects that reported sampling is abnormal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDDF0	• KL30 voltage is higher than 6 V	pINP_VAR_ Vbat Pos Flag_BL == 0 (If the following conditions are met, it is considered as valid: • pINP_ VAR_Hvd SF E2E Pro_BL no fault • pINP_ VAR_Hvd SF Vbat Oor_BL no fault • pINP_ VAR_Hvd SF Vbat Red_BL no fault (accuracy detection) If one of the above is not met, it is invalid.	1 s	Periodic type	10 ms	• Energy conversion and distribution unit • BMS main control • Wire harness

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDDF0	• Battery discharging function limited • AC discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

ZD

2	**Check wire harness and connector (inside battery pack)**

(a) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) C2-4# - connector (inside battery pack) CN2-1#	Always connected	Continuity
Connector (inside battery pack) C2-10# - connector (inside battery pack) CN2-4#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace and troubleshoot the energy conversion and distribution unit (See page DL-62)**

(a) Replace and troubleshoot the energy conversion and distribution unit.

(b) Power on again and read DTCs, confirm if DTC still exists.

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	**P1DDDF1**	**Main positive contactor rear sampling wire harness abnormal (judge if out of sampling range)**

Description

When BMS detects that reported sampling is abnormal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDDF1	• KL30 voltage is higher than 6 V	pINP_VAR_ Vload Pos Flag_BL == 0 (If the following conditions are met, it is considered as valid: • pINP_ VAR_HvdSFE2E Pro_BL no fault • pINP_ VAR_ HvdSF Vlink Oor_ UB no fault (V1 fault) • pINP_ VAR_HvdSF Vlink Red_UW no fault (V1 fault) • pINP_ VAR_HvdSF Vlink Owd_UB no fault (V1 fault) If one of the above is not met, it is invalid.	1 s	Periodic type	10 ms	• Energy conversion and distribution unit • BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDDF1	• Battery discharging function limited • AC discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness and connector (inside battery pack)**

(a) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) C2-2# - connector (inside battery pack) CN2-2#	Always connected	Continuity
Connector (inside battery pack) C2-10# - connector (inside battery pack) CN2-4#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace and troubleshoot the energy conversion and distribution unit (See page DL-62)**

(a) Replace and troubleshoot the energy conversion and distribution unit.

(b) Power on again and read DTCs, confirm if DTC still exists.

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	**P1DDDF2**	**Charging positive contactor rear sampling wire harness abnormal (judge if out of sampling range)**

Description

When BMS detects that main negative contactor rear end sampling wire is abnormal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDDF2	• KL30 voltage is higher than 6 V	pINP_VAR_ Vchg Pos Flag_BL == 0 (If the following conditions are met, it is considered as valid: • pINP_ VAR_Hvd SFE2E Pro_BL no fault • pINP_ VAR_Hvd SF Vlink Oor_UB no fault (V2 fault) • pINP_ VAR_Hvd SFV link Red_UW no fault (V2 fault) • pINP_ VAR_Hvd SF Vlink Owd_UB no fault (V2 fault) If one of the above is not met, it is invalid.	1 s	Periodic type	10 ms	• Energy conversion and distribution unit • BMS main control • Wire harness

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDDF2	• Battery DC charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

ZD

2	**Check wire harness and connector (inside battery pack)**

(a) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) C2-7# - connector (inside battery pack) CN2-3#	Always connected	Continuity
Connector (inside battery pack) C2-10# - connector (inside battery pack) CN2-4#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace and troubleshoot the energy conversion and distribution unit (See page DL-62)**

(a) Replace and troubleshoot the energy conversion and distribution unit.

(b) Power on again and read DTCs, confirm if DTC still exists.

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	**P1DDDF4**	**Main negative contactor rear sampling wire harness abnormal (judge if out of sampling range)**

Description

When BMS detects that main negative contactor rear end sampling wire is abnormal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDDF4	• KL30 voltage is higher than 7 V	pINP_VAR_Vload Neg Flag_BL == 0 (If the following conditions are met, it is considered as valid: • pINP_VAR_Hvd SFE2E Pro_BL no fault • pINP_VAR_Hvd SF Vlink Oor_UB no fault (V3 fault) • pINP_VAR_Hvd SF Vlink Red_UW no fault (V3 fault) • pINP_VAR_Hvd SF Vlink Owd_UB no fault (V3 fault) • pINP_VAR_Hvd SF Vref125 Oor_BL no fault (refer to voltage diagnosis) If one of the above is not met, it is invalid.	1 s	Periodic type	10 ms	• Energy conversion and distribution unit • BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDDF4	• Battery discharging function limited • AC discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness and connector (inside battery pack)**

(a) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) C2-3# - connector (inside battery pack) CN2-5#	Always connected	Continuity
Connector (inside battery pack) C2-10# - connector (inside battery pack) CN2-4#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace and troubleshoot the energy conversion and distribution unit (See page DL-62)**

(a) Replace and troubleshoot the energy conversion and distribution unit.

(b) Power on again and read DTCs, confirm if DTC still exists.

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DDDF5	Charging negative contactor rear sampling wire harness abnormal (judge if out of sampling range)

Description

When BMS detects that the charging negative contactor rear end sampling wire is abnormal, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DDDF5	• KL30 voltage is higher than 7 V	pINP_VAR_Vchg Neg Flag_BL == 0 (If the following conditions are met, it is considered as valid: • pINP_VAR_Hvd SFE2E Pro_BL no fault • pINP_VAR_Hvd SF Vlink Oor_UB no fault (V4 fault) • pINP_VAR_Hvd SF Vlink Red_UW no fault (V4 fault) • pINP_VAR_Hvd SF Vlink Owd_UB no fault (V4 fault) • pINP_VAR_Hvd SF Vref125 Oor_BL no fault (refer to voltage diagnosis) If one of the above is not met, it is invalid.	1 s	Periodic type	10 ms	• Energy conversion and distribution unit • BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DDDF5	• Battery DC charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

ZD

2	**Check wire harness and connector (inside battery pack)**

(a) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) C2-1# - connector (inside battery pack) CN2-5#	Always connected	Continuity
Connector (inside battery pack) C2-3# - connector (inside battery pack) CN2-5#	Always connected	Continuity
Connector (inside battery pack) C2-10# - connector (inside battery pack) CN2-4#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace and troubleshoot the energy conversion and distribution unit (See page DL-62)**

(a) Replace and troubleshoot the energy conversion and distribution unit.

(b) Power on again and read DTCs, confirm if DTC still exists.

NG	**Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	**P1DE000**	**Open in battery assembly**

Description

When BMS detects open in battery assembly, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE000	• KL30 voltage is higher than 6 V	|Pack voltage - Sum(CellVol)| > 30 V (Adjustment by functional safety)	500 ms	Periodic type	10 ms	• Inside the power battery • Sampling wire harness • Copper bar connection • BMS slave control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE000	• Battery discharging function failure • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Check for following DTCs.

P1D9D12	Open in battery cell voltage sampling wire harness
P1DB200	Cell voltage sampling fault (leakage current)
P1DD300	CMC daisy chain open fault

Result

Result	Proceed to
DTCs in table above occur	NG
DTCs in table above does not occur	OK

NG → **Perform repair according to DTC**

OK

2	**Check total voltage of power battery**

(a) Use a multimeter to measure the voltage between total battery positive and total battery negative, check if the voltage is lower than 300 V.

NG → **Troubleshoot power battery internal copper bar connection**

DTC	P1DE400	BCU initialization timeout fault

Description

When BMS detects the initialization timeout, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE400	• KL30 voltage is higher than 6 V	The initialization is not completed	5 s	Periodic type	10 ms	• BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE400		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**If the above fault occurs, it does not affect the use of vehicle. The initialization detection is completed and the fault recovers, it is only used as alarm fault**

DTC P1DE800 Pre-charging check failure

Description

When BMS detects pre-charge check failure, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE800	• KL30 voltage is higher than 6 V	When the vehicle main positive and main negative commands are set to 1 at the same time, the following conditions are not met within 500 ms • The sum of cell voltage is more than 200 V • Main positive rear end > cell voltage sum +20 V or main positive rear end < cell voltage sum -20 V	500 ms	Periodic type	10 ms	• Vehicle high voltage system • Inside the power battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE800	• The vehicle fails to activate high voltage system • Battery discharging function limited • Battery feedback function failure • Battery charging function failure	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs and wait for 10 minutes.

(b) Charging again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check vehicle high voltage system

(a) Check if vehicle high voltage system is faulty.

NG → **Perform repair according to malfunction**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DE9F0	IG OFF busoff

Description

When BMS detects that EVCAN bus has BusOFF fault in vehicle IG OFF state, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE9F0	• KL30 voltage is higher than 6 V	• IG OFF && (BUSOFF fault|HCU_1_6 message abnormal)	5 s	Periodic type	10 ms	• BMS main control • Vehicle CAN network related wire harness • Power battery BMS main control and low voltage wire harness connected to vehicle

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE9F0	• The vehicle immediately loses power • Battery discharging function limited • Battery feedback function failure • Battery charging function failure • AC discharging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle CAN wire harness**

(a) Check if vehicle CAN wire harness is normal.

(b) Check for short between EV CAN high end and low end.

(c) Check for short to body ground or power supply respectively.

NG → **Check and repair or replace wire harness and connector**

NG

ZD

3	**Check resistance**

(a) Check if resistance is normal.

Standard value

Multimeter connection	Detection condition	Specified condition
Battery terminal CN1-4B# - battery terminal CN1-4A#	Always connected	120 Ω

NG → **Check and repair or replace wire harness and connector**

NG

4	**Check wire harness and connector (inside battery pack)**

(a) Check for short in wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) CN1-4B# - connector (inside battery pack) CN1-4G#	Always connected	10 KΩ or more
Connector (inside battery pack) CN1-4B# - connector (inside battery pack) CN1-4H#	Always connected	10 KΩ or more
Connector (inside battery pack) CN1-4A# - connector (inside battery pack) CN1-4G#	Always connected	10 KΩ or more
Connector (inside battery pack) CN1-4A# - connector (inside battery pack) CN1-4H#	Always connected	10 KΩ or more

NG → **Disconnect BMS main control connector and corresponding mating part and recheck. If it is still abnormal, replace power battery internal wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	**P1DFB4B**	**SBC overtemperature fault**
DTC	**P1DFC4B**	**MCU overtemperature fault**
DTC	**P1F2900**	**High voltage sampling (2950) communication fault**

Description

When BMS detects SBC, MCU, high voltage sampling communication are faulty, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DFB4B	• KL30 voltage is higher than 6 V	• pINTG _ VAR _ SBC Over Temp Fault _ BLSBC overtemperature fault • 0: no error, 1: Overtemperature • If T >= 130° C, an overtemperature fault will be reported.	• 5 s	Periodic type	10 ms	• BMS main control
P1DFC4B	• KL30 voltage is higher than 6 V	• pINTG _ VAR _ MCU Over Temp Fault _ BLMCU overtemperature fault • If T >= 130° C, an overtemperature fault will be reported. • Diagnostic filtering: IO/AD diagnostics - diagnostic filtering logic for cycle detection	• 5 s	Periodic type	10 ms	• BMS main control
P1F2900	• Real-time & power supply > 6 V	pINP_VAR_ Hvd SFE2E Pro_BL == 1 • Diagnostic logic: "IC - diagnostic filtering logic for cycle detection" • After initialization is completed, perform periodic detection	• 5 s	Periodic type	10 ms	• BMS main control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DFB4B	• Battery feedback function failure • Battery charging function failure	Comes on
P1DFC4B	• Battery feedback function failure • Battery charging function failure	Comes on
P1F2900	—	Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC P1F234B AFE overtemperature fault

Description

When BMS detects AFE overtemperature fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F234B	• KL30 voltage is higher than 6 V	• pINP_VAR_AfeSF Die Temp Oor Err_BL == 1	2 s	Periodic type	10 ms	• Power battery: BMS slave control

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F234B	• Compressor stop	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Clear DTCs, and wait for 11 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Use diagnostic tester to read data stream, read DID 072E\072F AFE chip temperature, locate the faulty slave control and replace it (See page DL-37)**

OK

Diagnosis ends

DTC	P1F4102	Voltage sensor message reception error

Description

When BMS detects pressure sensor message reception error, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F4102	• KL30 voltage is higher than 6 V	BPSMsgErrFlag=1	300 ms	Periodic type	10 ms	• BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F4102	• Compressor stop	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control connector and corresponding mating part.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (internal of battery pack) A1-10# - pressure sensor connector 5#	Always connected	Continuity
Connector (internal of battery pack) A1-28# - pressure sensor connector 6#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Check BMS main control terminal resistance

(a) Check the BMS main control terminal resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
BMS main control A1-10# - BMS main control A1-28#	Always connected	Approximately 120 Ω

NG → **Replace BMS main control (See page DL-37)**

OK

4	Check for short in BMS main control

(a) Check for short in BMS main control.

Standard value

Multimeter connection	Detection condition	Specified condition
BMS main control A1-10# - BMS main control A1-05#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-29#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-30#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-31#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-32#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-01#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-02#	Always connected	No continuity
BMS main control A1-10# - BMS main control A1-40#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-05#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-29#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-30#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-31#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-32#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-01#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-02#	Always connected	No continuity
BMS main control A1-28# - BMS main control A1-40#	Always connected	No continuity

NG → **Replace BMS main control (See page DL-61)**

OK

5	**Check for short in pressure sensor**

(a) Check for short in pressure sensor.

Standard value

Multimeter connection	Detection condition	Specified condition
Pressure sensor 5# - pressure sensor 2#	Always connected	No continuity
Pressure sensor 5# - pressure sensor 1#	Always connected	No continuity
Pressure sensor 6# - pressure sensor 2#	Always connected	No continuity
Pressure sensor 6# - pressure sensor 1#	Always connected	No continuity

NG → **Replace pressure sensor (See page DL-55)**

ZD

DTC	P1F4104	Pressure sensor internal fault
DTC	P1F4000	Pressure out of measurement range

Description

When BMS detects pressure sensor internal fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F4104	• KL30 voltage is higher than 6 V	Pressure sensor internal fault mark = 1	300 ms	Periodic type	10 ms	• Pressure sensor
P1F4000	• KL30 voltage is higher than 6 V	Pressure sensor measurement range fault mark = 1	300 ms	Periodic type	10 ms	• Pressure sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F4104		Comes on
P1F4000		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace battery pressure sensor (See page DL-55)**

OK

Diagnosis ends

DTC	P1F4200	BPS Wake_up function fault

Description

When BMS detects pressure sensor wake-up function fault, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F4200	• KL30 voltage is higher than 6 V	pINP_VAR_BspWkFlt_UB==1	1 s	Periodic type	10 ms	• Pressure sensor • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F4200	• Compressor stop	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (internal of battery pack) A1-26# - pressure sensor connector 3#	Always connected	Continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace pressure sensor (See page DL-55)

DTC	P1F4211	Short to ground in pressure sensor drive (request)

Description

When BMS detects short to ground in pressure sensor drive, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F4211	• KL30 voltage is higher than 6 V	pINP_VAR_BPSChkHDiag_UB == 0x04	1 s	Periodic type	10 ms	• BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F4211		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness and connector (inside battery pack)**

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A1-18# - connector (inside battery pack) CN1-4H#	Always connected	No continuity
Connector (inside battery pack) A1-18# - battery metal housing	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check wire harness and connector (inside battery pack)**

(a) Disconnect pressure sensor terminal connector and corresponding terminal connector.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Pressure sensor connector 4# - connector (internal of battery pack) CN1-4H#	Always connected	No continuity
Pressure sensor connector 4# - battery metal housing	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

DTC	P1F4212	Short to power supply in pressure sensor drive (request)

Description

When BMS detects short to power supply in pressure sensor drive, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1F4212	• KL30 voltage is higher than 6 V	pINP_VAR_BPSChkHDiag_UB == 0x02	1 s	Periodic type	10 ms	• BMS main control • Wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1F4212		Comes on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTCs, and wait for 10 minutes after vehicle is powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector (inside battery pack)

(a) Disconnect BMS main control end connector X1 and corresponding terminal connector.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector (inside battery pack) A1-18# - connector (inside battery pack) CN1-4G#	Always connected	No continuity
Connector (inside battery pack) A1-18# - battery metal housing	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check wire harness and connector (inside battery pack)**

(a) Disconnect pressure sensor terminal connector and corresponding terminal connector.

(b) Check for continuity between wire harness and connector.

Standard value

Multimeter connection	Detection condition	Specified condition
Pressure sensor connector 4# - connector (internal of battery pack) CN1-4G#	Always connected	No continuity
Pressure sensor connector 4# - battery metal housing	Always connected	No continuity

NG → **Check and repair or replace wire harness and connector**

OK

Replace BMS main control (See page DL-61)

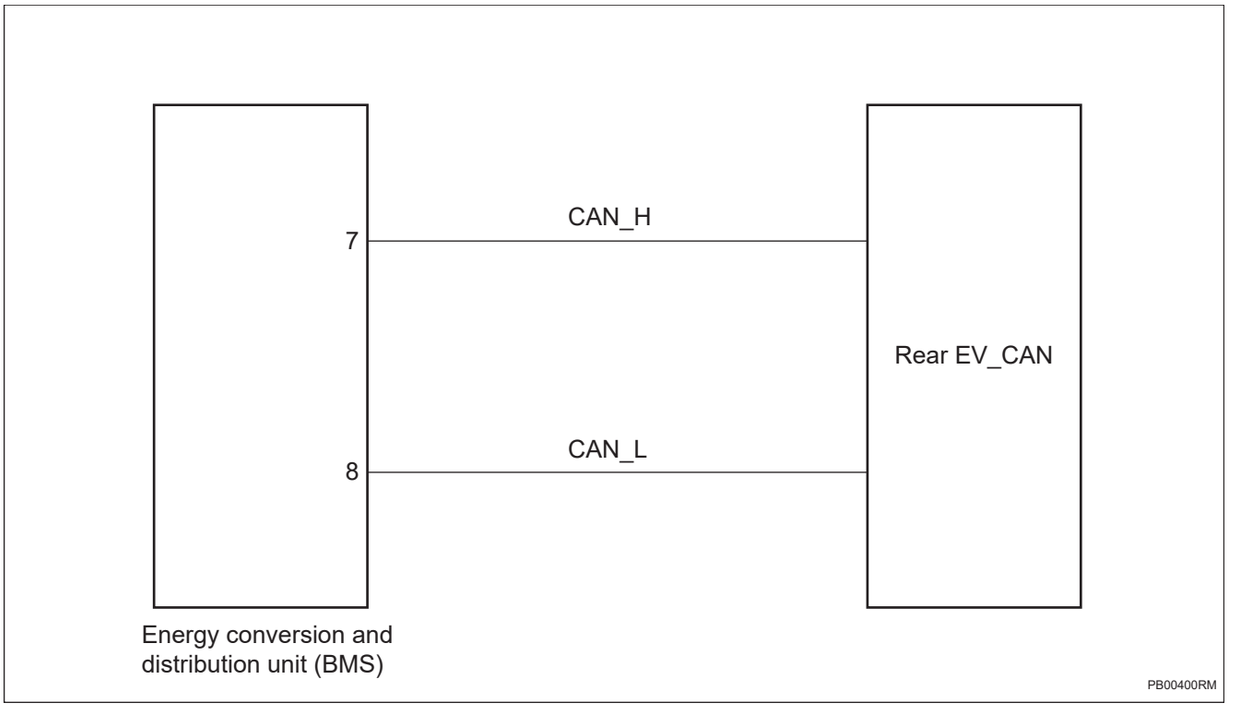
DTC	U005588	Rear EV CAN bus off

Description

When energy conversion and distribution unit (BMS) detects rear EV CAN bus off fault, the energy conversion and distribution unit (BMS) records DTCs.

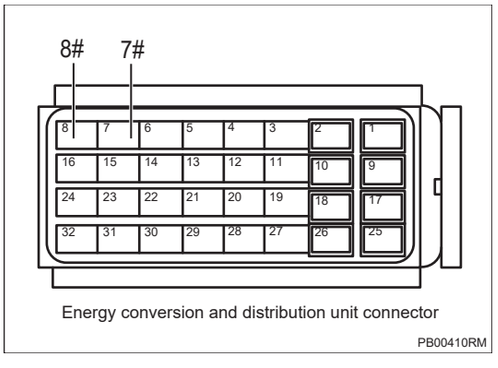
DTC No.	DTC detection condition	Faulty area
U005588	(a) Rear EV CAN bus off.	• CAN line and connector • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter • Energy conversion and distribution unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit

Circuit diagram



Inspection procedure

1	**Check rear EV CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the trailer controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) connector 7# - energy conversion and distribution unit (BMS) connector 8#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

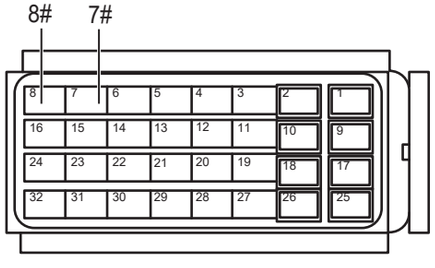
2	**Check controllers on rear EV CAN bus**

(a) Disconnect controllers on rear EV CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear EV CAN bus CAN-L and CAN-H**



Energy conversion and distribution unit connector

PB00410RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

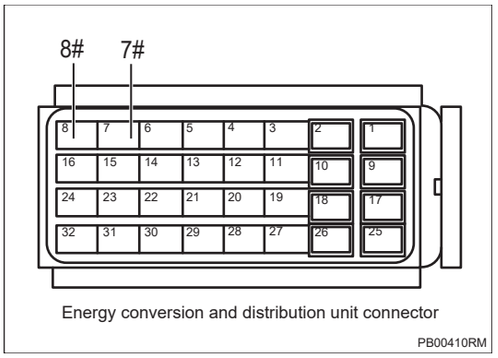
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) connector 7# - energy conversion and distribution unit (BMS) connector 8#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in rear EV CAN bus**



Energy conversion and distribution unit connector

PB00410RM

(a) According to value in the table, measure resistance.

Standard value

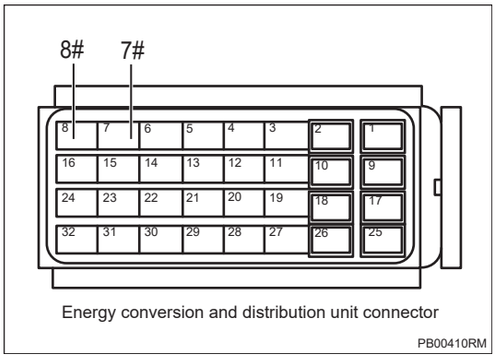
Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) connector 8# - body ground	Always connected	10 KΩ or more
Energy conversion and distribution unit (BMS) connector 7# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear EV CAN bus**



Energy conversion and distribution unit connector

PB00410RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) connector 8# - body ground	Turn ignition switch to "ON"	Less than 1 V
Energy conversion and distribution unit (BMS) connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	**U129887**	**On-board charger node lost**
DTC	**U114B87**	**VDC397 message missing**
DTC	**U114A87**	**VDC821 message missing**
DTC	**U044B82**	**VDC397 message content fault**
DTC	**U044B83**	**VDC397 message content fault**
DTC	**U129287**	**Motor control unit 2 message missing**
DTC	**U114687**	**Front area control unit message missing**
DTC	**U115187**	**Airbag control unit message missing**
DTC	**U045282**	**Airbag control unit message content fault**
DTC	**U045283**	**Airbag control unit message content fault**
DTC	**U059982**	**On-board charger message content fault**
DTC	**U059983**	**On-board charger message content fault**

Description

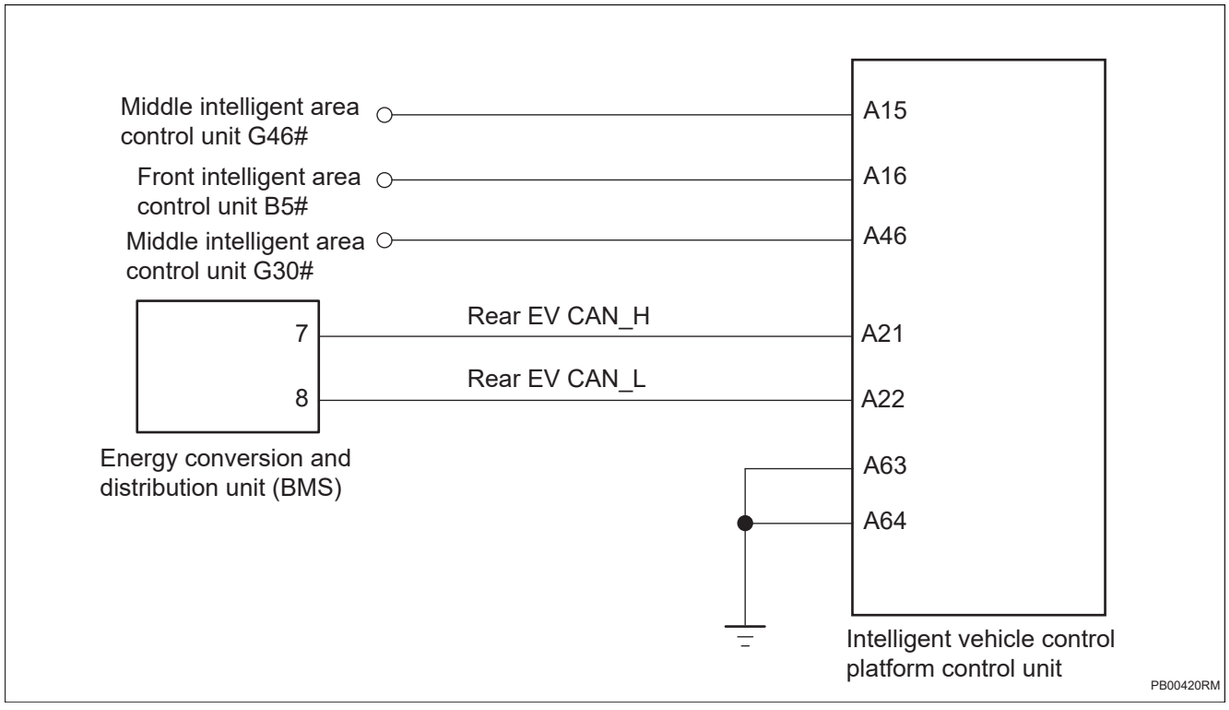
When communication between trailer controller and other system is abnormal or interrupted, the trailer controller records DTC.

DTC No.	DTC detection condition	Faulty area
U129887	(a) On-board charger node lost.	• Wire harness and connector • Charging controller • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U114B87	(a) VDC397 message missing.	• Wire harness and connector • Intelligent vehicle control platform control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U114A87	(a) VDC821 message missing.	• Wire harness and connector • Intelligent vehicle control platform control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U044B82	(a) VDC397 message content fault.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U044B83	(a) VDC397 message content fault.	• Wire harness and connector • Intelligent vehicle control platform control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U129287	(a) Motor control unit 2 message missing.	• Wire harness and connector • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U114687	(a) Front area control unit message missing.	• Wire harness and connector • Front intelligent area control unit • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U115187	(a) Airbag control unit message missing.	• Wire harness and connector • Airbag control unit • Middle intelligent area control unit • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U045282	(a) Airbag control unit message content fault.	• Wire harness and connector • Airbag control unit • Middle intelligent area control unit • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U045283	(a) Airbag control unit message content fault.	• Wire harness and connector • Airbag control unit • Middle intelligent area control unit • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter

DTC No.	DTC detection condition	Faulty area
U059982	(a) On-board charger message content fault.	• Wire harness and connector • Charging controller • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter
U059983	(a) On-board charger message content fault.	• Wire harness and connector • Charging controller • Rear intelligent area control unit • Energy conversion and distribution unit (BMS) • Electric rear drive system inverter

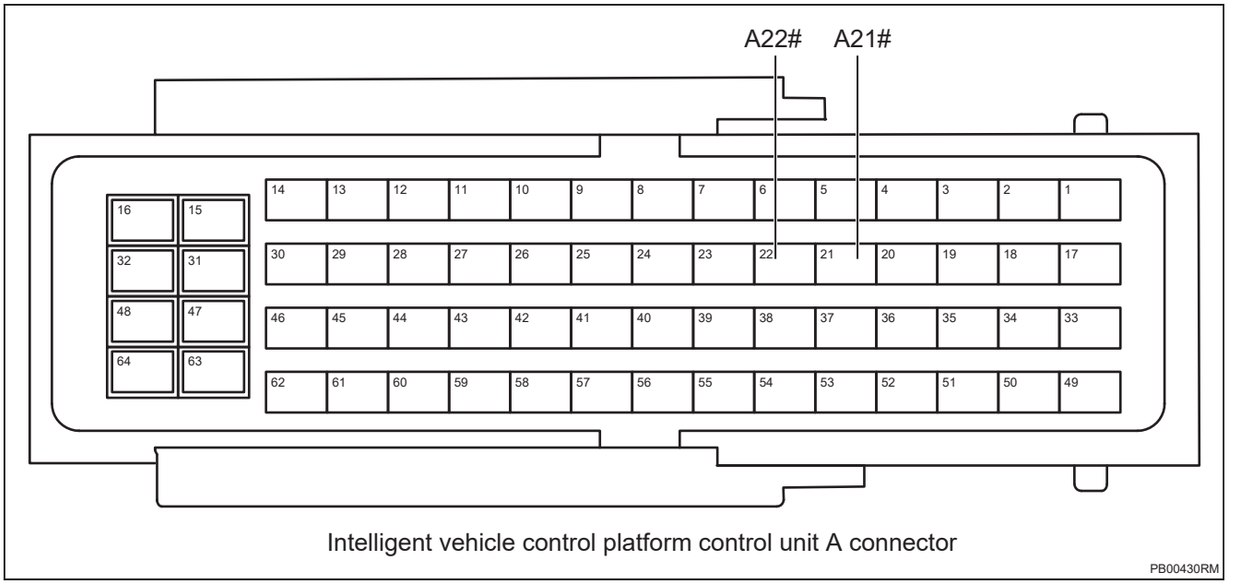
Circuit diagram



Inspection procedure

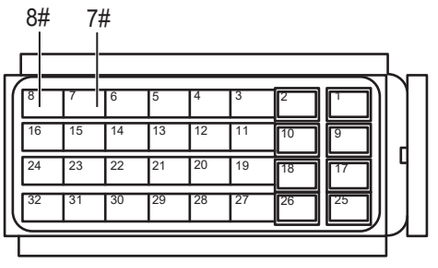
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear EV CAN bus (energy conversion and distribution unit (BMS) - intelligent vehicle control platform control unit)**



Intelligent vehicle control platform control unit A connector

PB00430RM



Energy conversion and distribution unit connector

PB00410RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

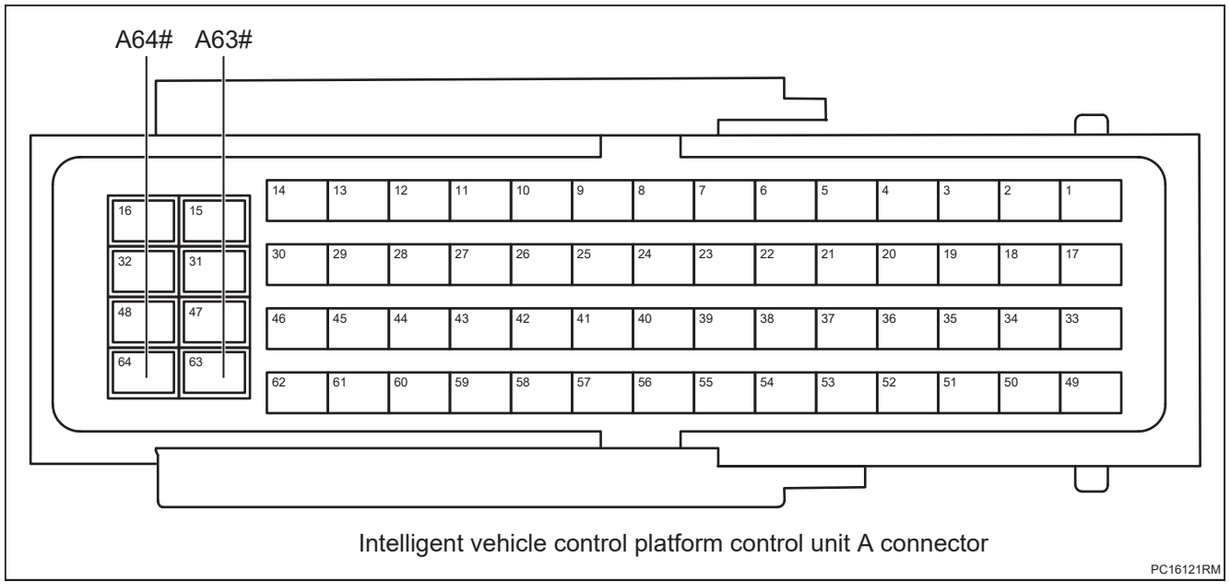
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) connector 7# - intelligent vehicle control platform control unit connector A21#	Always connected	Less than 1 Ω
Energy conversion and distribution unit (BMS) connector 8# - intelligent vehicle control platform control unit connector A22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



Intelligent vehicle control platform control unit A connector

PC16121RM

(a) According to value in the table, measure resistance.

Standard value

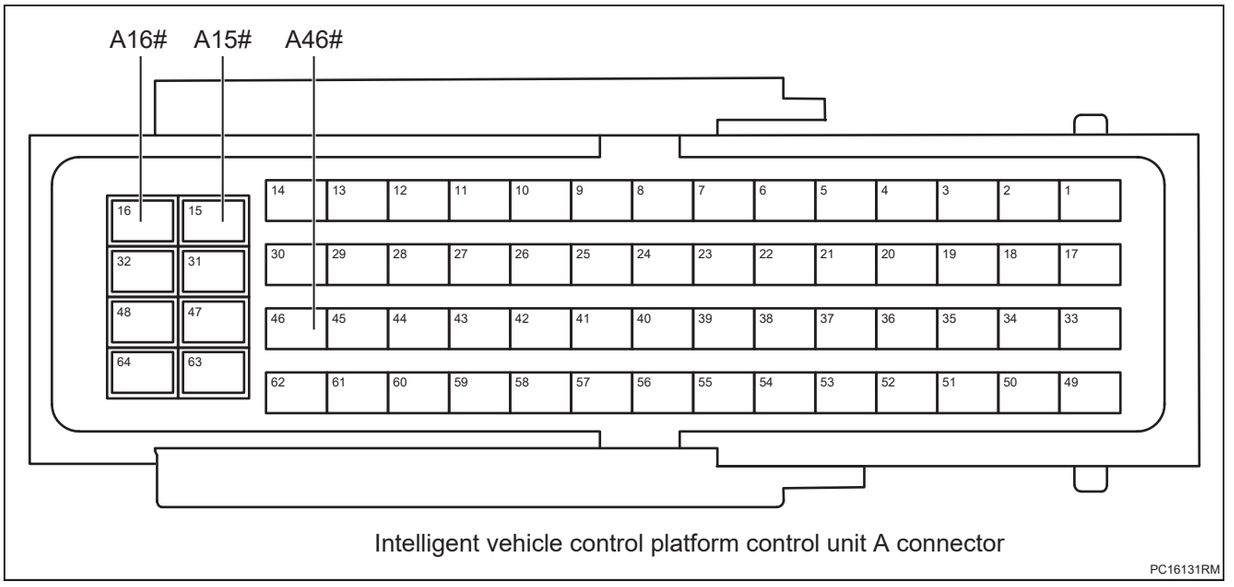
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check intelligent vehicle control platform control unit power supply**



Intelligent vehicle control platform control unit A connector

PC16131RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

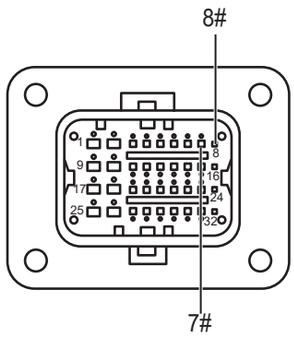
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A46# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

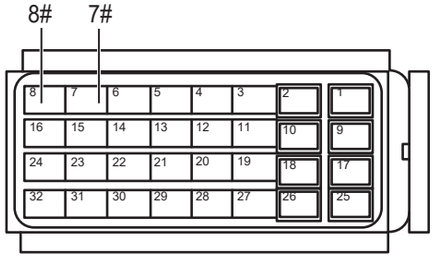
OK

4	**Check rear EV CAN bus terminal resistance**



Battery control unit

PU00261RM



Energy conversion and distribution unit connector

PB00410RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit (BMS) 7# - energy conversion and distribution unit (BMS) 8#	Always connected	120 Ω
Energy conversion and distribution unit (BMS) connector 7# - energy conversion and distribution unit (BMS) connector 8#	Always connected	120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (BMS) (See page DL-61)**

OK

Diagnosis ends

DTC	P1DE7F0	Insulation status unreliable

Description

When BMS detects unreliable insulation status, the BMS records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1DE7F0	• KL30 voltage is higher than 6 V	(a) Insulation resistance is invalid	5 min	Periodic type	10 ms	• Charging pile

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1DE7F0	• Battery DC charging function failure	Not come on

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Reconnect charging gun after clearing DTCs.

(b) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Replace quick charging pile to charge**

OK

Diagnosis ends

Power battery control system

Power battery control unit (PB85)

System description

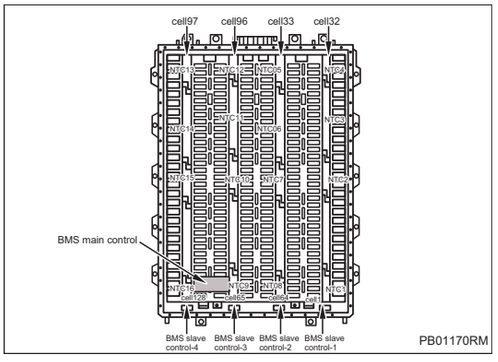
1. Function overview

(a) The battery management system consists of the battery control unit assembly (BMS master control) and the battery slave control unit assembly (BMS slave control), which are placed inside the battery pack. The main functions of the battery control unit assembly include charge and discharge management, contactor control, power control, SOC estimation, SOH estimation, insulation detection, and vehicle communication.

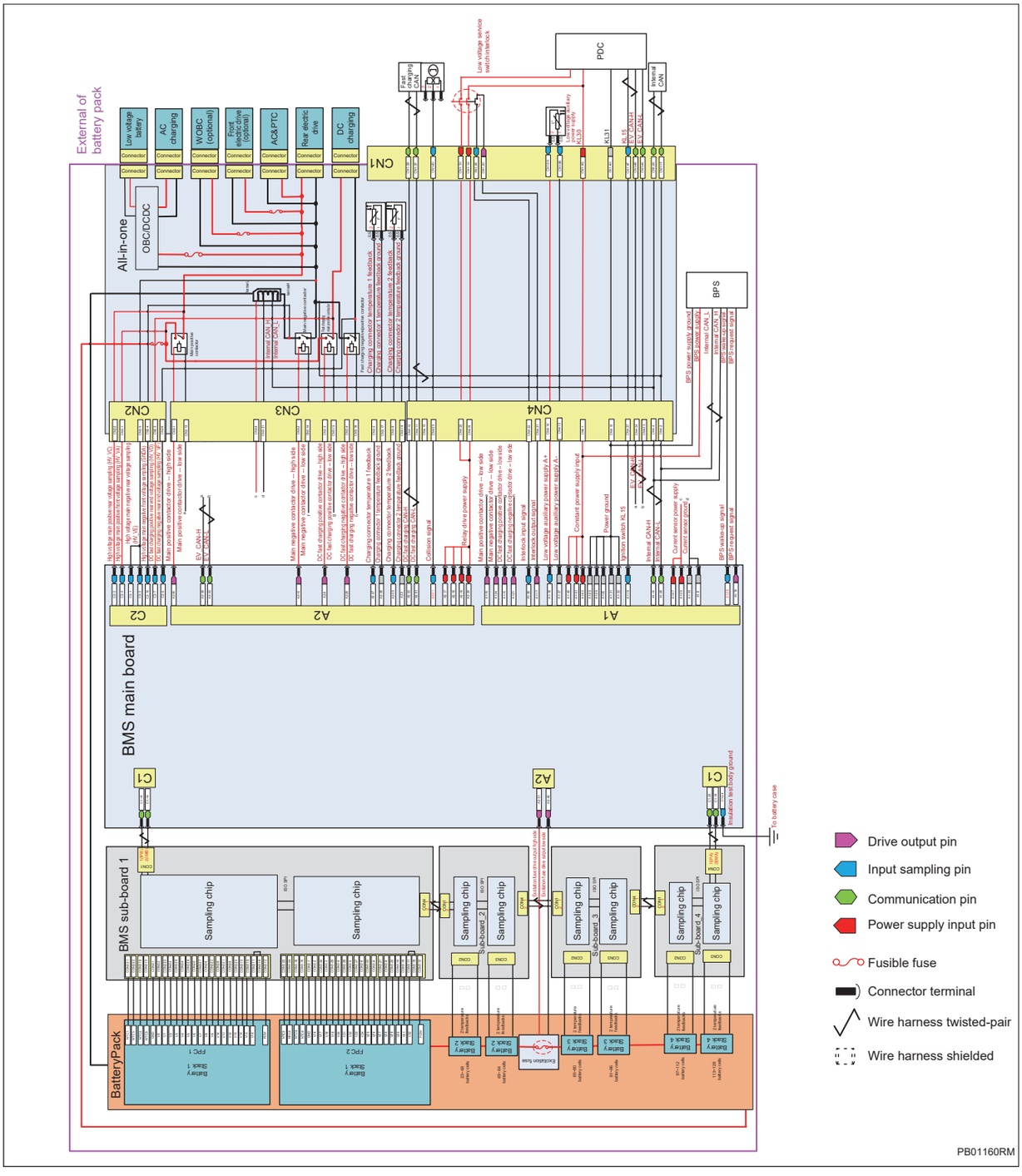
(b) The main functions of the battery slave control unit assembly include battery voltage sampling, module temperature sampling, and battery equalizing etc.

2. Internal structure of battery pack

(a) Layout diagram of battery cell and module NTC in battery pack

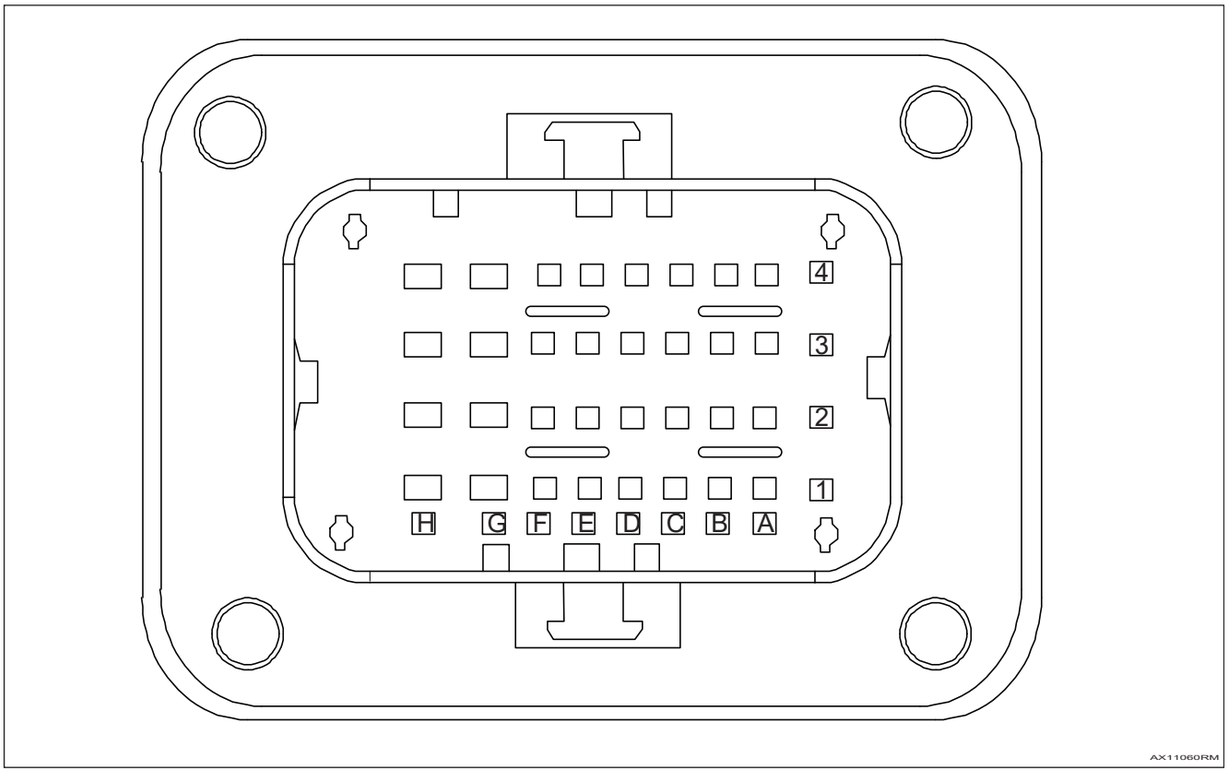


Internal schematic diagram of BMS



ZD

ECU terminal



Low voltage communication			
Pin number	**Definition**	**Pin number**	**Definition**
1A	—	3A	DC charging auxiliary power supply (A+)
1B	—	3B	DC charging auxiliary power supply (A-)
1C	—	3C	—
1D	—	3D	—

Low voltage communication			
Pin number	**Definition**	**Pin number**	**Definition**
1E	—	3E	—
1F	Battery inside communication CAN_L	3F	—
1G	Contactor power supply	3G	—
1H	Contactor redundant power supply	3H	—
2A	Battery inside communication CAN_H	4A	EV_CAN_L(EV_CANL)
2B	DC charging CAN_H	4B	EV_CAN_H(EV_CANH)
2C	Low voltage service switch interlock output	4C	—
2D	—	4D	Collision hard wire signal input
2E	Low voltage service switch interlock input	4E	—
2F	DC charging CAN_L	4F	Vehicle KL15 power
2G	—	4G	Vehicle KL30 power input
2H	—	4H	Vehicle KL31 power output

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
P1DC017	Cell voltage seriously too high fault	(See page ZD-1554)
P1D8017	Cell voltage too high fault	(See page ZD-1507)
P1D8117	Cell voltage too high alarm	(See page ZD-1508)
P1DAD00	Cell voltage seriously too low fault 1	(See page ZD-1538)
P1D81F2	Cell voltage seriously too low fault 2	(See page ZD-1538)
P1D8016	Cell voltage too low fault	(See page ZD-1506)
P1D8116	Cell voltage too low alarm	(See page ZD-1506)
P1DC117	Battery total voltage seriously too high fault	(See page ZD-1555)
P1D8217	Battery total voltage too high fault	(See page ZD-1555)
P1D82F0	Battery total voltage seriously too low fault	(See page ZD-1501)
P1DAE00	Battery module temperature seriously too high fault	(See page ZD-1539)
P1D8698	Battery module temperature too high	(See page ZD-1512)
P1D8800	Battery module temperature too low fault	(See page ZD-1515)
P1DB885	Battery module temperature difference too large fault	(See page ZD-1546)
P1D8A18	Battery pack feedback charge current out of limit fault	(See page ZD-1498)
P1DCC00	Battery pack feedback charge current out of limit alarm	(See page ZD-1561)
P1DDF1D	Charge current too high alarm	(See page ZD-1566)

DTC	Detection Items	See page
P1DDFF0	Charge current too high fault	(See page ZD-1568)
P1DDFF1	Charging mode - current pulse charge current too high alarm	(See page ZD-1569)
P1DDFF2	Charging mode - pulse charge current too high fault	(See page ZD-1570)
P1DDFF3	Charging mode - pulse charge current too high fault cumulative count out of limit flag	(See page ZD-1572)
P1DDFF4	Current out of limit fault	(See page ZD-1573)
P1DCD00	Battery pack SOC seriously too low fault	(See page ZD-1562)
P1DB900	SOC jump fault	(See page ZD-1549)
P1D8400	Cell SOC deviation alarm	(See page ZD-1508)
P1D8500	Cell SOC deviation fault	(See page ZD-1510)
P1DCE00	Battery pack SOH too low alarm	(See page ZD-1563)
P1DCE23	Battery pack SOH too low fault	(See page ZD-1563)
P1DCEF0	SOH seriously too low fault	(See page ZD-1563)
P1DAA01	Feedback current too high fault	(See page ZD-1534)
P1DE700	Battery isolation alarm	(See page ZD-1580)
P1DE7F0	Insulation status unreliable	(See page ZD-1576)
P1D8C1A	Vehicle insulation slight alarm	(See page ZD-1498)
P1D8D1A	Vehicle insulation serious fault	(See page ZD-1498)
P1DBF00	Vehicle insulation serious fault (gun insertion mode)	(See page ZD-1552)
P1DBA00	Insulation hardware fault (insulation detection module failure)	(See page ZD-1549)
P1F2A00	Open in low voltage service switch interlock (service switch disconnection)	(See page ZD-1584)
P1F2C00	Short to power supply in low voltage service switch interlock	(See page ZD-1586)
P1D9117	BMS power supply (KL30) voltage too high fault (instrument cluster indicates battery management system input end overvoltage)	(See page ZD-1519)
P1D9116	BMS power supply (KL30) voltage too low fault	(See page ZD-1516)
P1D91F0	BMS power supply (KL30) voltage too low fault	(See page ZD-1516)
P1D91F1	BMS power supply (KL30) voltage too low fault (instrument cluster indicates battery management system input end undervoltage)	(See page ZD-1516)
P1DE600	Open in contactor power supply circuit	(See page ZD-1577)
P1DB500	Contactor power supply too low fault	(See page ZD-1577)
P1DB600	Contactor power supply too high fault	(See page ZD-1545)
P1D9313	Open in charging connector temperature sensor 1	(See page ZD-1522)

DTC	Detection Items	See page
P1D9312	Short (short to ground) in charging connector temperature sensor 1	(See page ZD-1520)
P1D9613	Open in charging connector temperature sensor 2	(See page ZD-1527)
P1D9612	Short in charging connector temperature sensor 2	(See page ZD-1525)
P1D964C	Charging connector overtemperature fault	(See page ZD-1504)
P1DA300	Collision fault - CAN signal	(See page ZD-1532)
P1DA400	Collision fault - hard wire signal	(See page ZD-1532)
P1DF411	Crash PWM signal abnormal fault (abnormal duty ratio)	(See page ZD-1582)
P1DB000	Shunt overtemperature or abnormal temperature increasing or PRA overtemperature	(See page ZD-1543)
P1DB100	Shunt overtemperature or abnormal temperature increasing or serious PRA overtemperature	(See page ZD-1543)
P1DE300	Shunt message error severity level 1	(See page ZD-1577)
P1DE3F0	Shunt message error severity level 2	(See page ZD-1573)
P1DD200	Shunt system error	(See page ZD-1564)
P1DBC00	Battery thermal runaway alarm	(See page ZD-1550)
P1DC900	Smart fuse drive self-check fault (Unable to deploy due to internal abnormality of driver chip)	(See page ZD-1557)
P1DC901	Smart fuse drive chip communication abnormal	(See page ZD-1557)
P1DC913	Open in smart fuse drive circuit	(See page ZD-1559)
P1DC912	Short in smart fuse drive circuit	(See page ZD-1558)
P1DC9F0	Driving risk due to excessive resistance	(See page ZD-1553)
P1DC9F1	Driving failure due to too low resistance	(See page ZD-1553)
P1DB300	Equalizing circuit open fault	(See page ZD-1544)
P1D8B74	Equalizer switch closes unexpectedly due to equalizer short fault	(See page ZD-1544)
P1DAC00	DC charging timeout fault	(See page ZD-1535)
P1DA188	Charging CAN busoff fault	(See page ZD-1529)
P1DA288	Battery internal CAN communication busoff	(See page ZD-1530)
U005588	Rear EV CAN bus off	(See page ZD-1589)
U129887	On-board charger node lost	(See page ZD-1589)
U044B82	VDC397 message content fault	(See page ZD-1589)
U044B83	VDC397 message content fault	(See page ZD-1589)
U114B87	VDC397 message missing	(See page ZD-1589)
U114A87	VDC821 message missing	(See page ZD-1589)

DTC	Detection Items	See page
U129287	Motor control unit 2 message missing	(See page ZD-1589)
U114687	Front area control unit message missing	(See page ZD-1589)
U115187	Airbag control unit message missing	(See page ZD-1589)
U045282	Airbag control unit message content fault	(See page ZD-1589)
U045283	Airbag control unit message content fault	(See page ZD-1589)
U059982	On-board charger message content fault	(See page ZD-1589)
U059983	On-board charger message content fault	(See page ZD-1589)
P1D9D12	Open in battery cell voltage sampling wire harness	(See page ZD-1500)
P1DBD00	Battery module temperature sampling circuit fault	(See page ZD-1550)
P1DD300	CMC daisy chain open fault	(See page ZD-1565)
P1DD3F0	CMC daisy chain one point open fault	(See page ZD-1565)
P1DA598	Sub-board PCB temperature too high fault	(See page ZD-1533)
P1F234B	AFE overtemperature fault	(See page ZD-1588)
P1D82F1	Discharging current serious out of limit fault	(See page ZD-1593)
P1DE000	Open in battery assembly	(See page ZD-1635)
P1DDBF0	Discharging current out of limit alarm	(See page ZD-1624)
P1D82F2	Collision fault - frontal collision fault	(See page ZD-1594)
P1D9044	E2P data reading error (data, check)	(See page ZD-1598)
P1DEF00	RTC function fault (crystal oscillator, I2C abnormal)	(See page ZD-1598)
P1F4104	Pressure sensor internal fault	(See page ZD-1645)
P1F4000	Pressure out of measurement range	(See page ZD-1645)
P1DE400	BMS main control initialization timeout fault	(See page ZD-1639)
P1DE800	Pre-charging check failure	(See page ZD-1639)
P1D9912	Main positive contactor contact open fault	(See page ZD-1622)
P1D9A12	Main negative contactor contact open fault	(See page ZD-1622)
P1D9B12	Charging positive contactor contact open fault	(See page ZD-1622)
P1D9911	Main positive contactor contact stuck fault	(See page ZD-1620)
P1D9A11	Main negative contactor contact stuck fault	(See page ZD-1620)
P1D9B11	Charging positive contactor contact stuck fault	(See page ZD-1620)
P1D9C11	Charging negative contactor contact stuck fault	(See page ZD-1620)
P1D9712	Charging positive contactor coil short to power supply fault (high side, low side)	(See page ZD-1611)
P1D9711	Charging positive contactor coil short to ground fault (high side, low side)	(See page ZD-1610)

DTC	Detection Items	See page
P1D9713	Charging positive contactor coil open fault (high side, low side)	(See page ZD-1613)
P1D9512	Main negative contactor coil short to power supply fault (high side, low side)	(See page ZD-1606)
P1D9513	Main negative contactor coil open fault (high side, low side)	(See page ZD-1608)
P1D9412	Main positive contactor coil short to power supply fault (high side, low side)	(See page ZD-1601)
P1D9411	Main positive contactor coil short to ground fault (high side, low side)	(See page ZD-1599)
P1D9413	Main positive contactor coil open fault (high side, low side)	(See page ZD-1603)
P1D9511	Main negative contactor coil short to ground fault (high side, low side)	(See page ZD-1605)
P1D81F3	Discharging current out of limit fault	(See page ZD-1593)
P1DDDF2	Charging positive contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1629)
P1DDDF1	Main positive contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1627)
P1DDDF4	Main negative contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1631)
P1DDDF5	Charging negative contactor rear sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1633)
P1DDDF0	Total voltage positive (HV+) sampling wire harness abnormal (judge if out of sampling range)	(See page ZD-1625)
P1DE9F0	IG OFF busoff	(See page ZD-1636)
P1F4102	Voltage sensor message reception error	(See page ZD-1642)
P1DFB4B	SBC overtemperature fault	(See page ZD-1641)
P1DFC4B	MCU overtemperature fault	(See page ZD-1641)
P1F2900	High voltage sampling (2950) communication fault	(See page ZD-1641)
P1D9812	Charging negative contactor coil short to power supply fault (high side, low side)	(See page ZD-1617)
P1D9811	Charging negative contactor coil short to ground fault (high side, low side)	(See page ZD-1615)
P1D9813	Charging negative contactor coil open fault (high side, low side)	(See page ZD-1618)
P1D8A00	Battery pack feedback charge current out of limit fault	(See page ZD-1591)
P1D88F1	Charging connector temperature sensor 1 and 2 simultaneous fault	(See page ZD-1596)

DTC	P1D8A18	Battery pack feedback charge current out of limit fault

Description

When battery control unit detects that battery pack feedback charging current is out of limit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8A18	(a) Battery pack feedback charging current out of limit fault.	• High voltage electrical system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Troubleshoot motor or VDC**

OK

Diagnosis ends

DTC	P1D8C1A	Vehicle insulation slight alarm

DTC	P1D8D1A	Vehicle insulation serious fault

Description

When battery control unit detects vehicle insulation slight alarm fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8C1A	(a) Vehicle insulation slight alarm.	• Vehicle high voltage system • Inside the power battery • Energy conversion and distribution unit
P1D8D1A	(a) Vehicle insulation serious fault.	• Vehicle high voltage system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) The vehicle is powered off for 10 minutes.

(c) After power on for 1 minute.

(d) Read current DTCs and insulation resistance value.

(e) Start for 5 minutes and read current DTCs.

Result

Result	Proceed to
DTC exists and insulation resistance is lower than 300 kΩ before the Start	NG
No DTC before the Start, and DTC occurs after the Start	OK

NG → **Troubleshoot power battery internal insulation problem; Troubleshooting method is same as that of P1DE700**

OK

Check vehicle insulation problem except the battery

DTC	P1D9D12	Open in battery cell voltage sampling wire harness

Description

When battery control unit detects open in battery cell voltage sampling wire, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9D12	(a) Open in DC battery cell voltage sampling wire harness.	• Power battery module • Wire harness • BMS main control • BMS slave control

ZD

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Locate faulty cell according to sub-board state information read with diagnostic tester

(a) Remove power battery from vehicle, troubleshoot for open in connection between cell and FPC, FPC and module connector, module connector and BMS slave control connector.

Result:

Result	Proceed to
Open in connection	NG
Not open in connection	OK

NG → **Replace wire harness**

OK

Replace BMS slave control (See page DL-37)

DTC	P1D82F0	Battery total voltage seriously too low fault

Description

When battery control unit detects seriously low battery total voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D82F0	(a) Battery total voltage seriously too low fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) If it occurs with cell voltage too low fault (P1DAD00, P1D8016, P1D8116) at the same time, repair it according to the cell voltage too low fault.

(b) If it occurs with collision fault (P1DA300, P1DA400), battery thermal runaway fault (P1DBC00) and current out of limit fault (P1DDFF4) at the same time, troubleshoot it according to collision fault, battery thermal runaway fault and current out of limit fault.

(c) If this fault occurs independently, remove the battery pack from vehicle, open the service port to check for continuity of smart fuse.

Result

Result	Proceed to
No continuity	NG
Continuity	OK

NG → **Replace smart fuse**

ZD

OK

2	Measure total battery voltage

(a) Measure total battery voltage according to measurement method of total power battery voltage.

Result:

Result	Proceed to
Less than fault threshold	NG
Within normal range	OK

NG → **It is necessary to unpack to troubleshoot the connection between battery pack fuse and copper bar**

OK

3	Check wire harness in battery pack

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the wire harness in battery pack.

(d) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
C2-4# - CN2-1#	Always connected	Less than 1 Ω

NG → **Replace wire harness**

OK

4	**Replace BMS main control (See page DL-61)**

(a) Replace BMS main control, restore battery pack and read total battery voltage with diagnostic tester.

Result:

Result	Proceed to
Total voltage is still less than fault threshold	NG
Total voltage is within normal range	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Return original BMS main control to factory

DTC	P1D964C	Charging connector overtemperature fault

Description

When battery control unit detects charging connector overtemperature, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D964C	(a) Charging connector overtemperature fault.	• Inside the energy conversion and distribution unit

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness

(a) Turn off the vehicle high voltage power and low voltage power, disconnect the service switch, and check the high voltage charging connector under the service port under the seat.

(b) Check the appearance of high voltage charging connector and high voltage cable nearby for serious damage.

Result:

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Replace wire harness**

OK

2	Check high voltage charging connector

(a) Check high voltage charging connector upper cover torque and record it.

(b) Open the high voltage charging connector and observe if the connector internal structure is seriously damaged or deformed due to heating.

Result:

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Replace wire harness**

OK

3	Check internal torque of high voltage charging connector

(a) Check torques of 3 standard parts in the connector.

Result:

Result	Proceed to
Non-standard torque	NG
Standard torque	OK

NG → **Structure for restoring torque and related disassembly**

OK

4	Read DTCs

(a) Read and clear DTCs.

(b) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1D8016	Cell voltage too low fault
DTC	P1D8116	Cell voltage too low fault

ZD

Description

When battery control unit detects cell voltage too low fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8016	(a) Cell voltage too low fault.	• Power battery
P1D8116	(a) Cell voltage too low fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Locate the faulty battery cell according to "the lowest value sampling point of cell voltage" in the fault snapshot and feed back to the manufacturer.

(c) Power on again, and clear DTCs.

(d) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → Charge the vehicle.

OK

Diagnosis ends

DTC	**P1D8017**	**Cell voltage too high fault**

Description

When battery control unit detects cell voltage too high fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8017	(a) Cell voltage too high fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Locate the faulty battery cell according to "the highest value sampling point of cell voltage" in the fault snapshot and feed back to the manufacturer.

(c) Power on again, and clear DTCs.

(d) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Remove the battery pack from vehicle, unpack and troubleshoot the faulty battery cell voltage sampling FPC. If there is no battery cell voltage sampling fault, replace the battery pack.**

OK

Diagnosis ends

ZD

DTC	P1D8117	Cell voltage too high alarm

Description

When battery control unit detects cell voltage too high alarm fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8117	(a) Cell voltage too high alarm.	• Power battery

Inspection procedure

Note: This DTC is only for prompting, and repair is unnecessary.

DTC	P1D8400	Cell SOC deviation alarm

Description

When battery control unit detects cell SOC deviation alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8400	(a) Cell SOC deviation alarm.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check battery cell self-discharging rate**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 1 hour.

(b) Feed back the fault information (fault symptom, time, location etc.) and vehicle information (vehicle mileage, VIN code etc.) to the manufacturer, and the manufacturer will analyze to determine if the battery cell self-discharging rate is abnormal through big data.

Result:

Result	Proceed to
Battery cell self-discharging rate is abnormal	NG
Battery cell self-discharging rate is normal	OK

NG → **Replace battery pack**

OK

2	**Check fault snapshot**

(a) Locate the faulty battery cell according to "the lowest value sampling point of cell voltage" in the fault snapshot.

Result:

Result	Proceed to
Battery cell is abnormal	NG
Battery cell is normal	OK

NG → **Return to the battery manufacturer to actively recharge the battery pack**

OK

Diagnosis ends

DTC	P1D8500	Cell SOC deviation fault

Description

When battery control unit detects cell SOC deviation fault, the battery control unit records DTC.

ZD

DTC No.	DTC detection condition	Faulty area
P1D8500	(a) Cell SOC deviation fault	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery cell self-discharging rate

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 1 hour.

(b) Feed back the fault information (fault symptom, time, location etc.) and vehicle information (vehicle mileage, VIN code etc.) to the manufacturer, and the manufacturer will analyze to determine if the battery cell self-discharging rate is abnormal through big data.

Result:

Result	Proceed to
Self-discharging rate is abnormal	NG
Self-discharging rate is normal	OK

NG → **Replace battery pack (See page DL-37)**

OK

2	**Query occurrence number of historical fault**

(a) Query occurrence number of historical fault.

Result

Result	Proceed to
Within 3 times (excluding 3 times)	NG
3 times or more	OK

NG → **Locate the faulty battery cell according to "the highest value sampling point of cell voltage" in the fault snapshot and return to the battery manufacturer to actively recharge the battery pack**

OK

3	**Check battery cell voltage**

(a) Remove the battery pack, and troubleshoot battery cell voltage sampling FPC.

Result:

Result	Proceed to
Battery cell voltage sampling FPC is abnormal	NG
Battery cell voltage sampling FPC is normal	OK

NG → **Replace battery pack (See page DL-37)**

OK

Diagnosis ends

DTC	P1D8698	Battery module temperature too high

Description

When battery control unit detects battery module overtemperature fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8698	(a) Battery module temperature too high.	• Vehicle cooling system • Inside the power battery: Battery module, sampling FPC, cooling plate

Inspection procedure

ZD

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check external environment

(a) Check if the vehicle has been exposed to sun.

Result

Result	Proceed to
Fault caused by vehicle parking and sun exposure	NG
Fault not caused by sun exposure	OK

NG → **Keep vehicle stationary for more than 10 hours at room temperature. Power on again, and clear DTCs**

OK

2	Check A/C system

(a) Check if A/C system operates normally.

Result

Result	Proceed to
Air conditioning system operates abnormally	NG
Air conditioning system operates normally	OK

NG → **Go to air conditioning system**

OK

3	**Check battery cooling water pump**

(a) Check if battery cooling water pump operates normally.

Result

Result	Proceed to
Battery cooling water pump operates abnormally	NG
Battery cooling water pump operates normally	OK

NG → **Repair circuit or replace battery cooling water pump**

OK

4	**Check PTC**

(a) Check if PTC starts abnormally.

Result

Result	Proceed to
Start abnormally	NG
Start normally	OK

NG → **Repair circuit or replace PTC**

OK

5	**Check expansion tank**

(a) Check the expansion tank for lack of fluid.

Result

Result	Proceed to
Expansion tank is lack of fluid	NG
Expansion tank is not lack of fluid	OK

NG → **Add coolant**

OK

ZD

6	Troubleshoot battery pack

(a) Lift the vehicle, and check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

Result

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Replace battery pack (See page DL-37)**

OK

Locate the faulty battery cell according to "the highest temperature of cell" in the fault snapshot and remind the user to avoid violent driving by continuously monitoring the usage of faulty battery cell through background data.

DTC	P1D8800	Battery module temperature too low fault

Description

When battery control unit detects battery module undertemperature fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8800	(a) Battery module temperature too low fault.	• Vehicle cooling system • Inside the power battery: Battery module, sampling FPC, cooling plate

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check external environment

(a) Check if outside temperature is too low.

Result:

Result	Proceed to
Too low	NG
Not too low	OK

NG → **Keep vehicle stationary for more than 10 hours at room temperature. Power on again, and clear DTCs**

OK

2	Check battery pack

(a) Locate the faulty module according to the method of reading the cell voltage and module temperature of the battery pack.

(b) Troubleshoot connecting FPC between module and BMS slave control for damage or short circuit.

Result:

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Repair circuit or replace battery pack (See page DL-37)**

OK →

ZD

Diagnosis ends

DTC	**P1D9116**	**BMS power supply (KL30) voltage too low fault**
DTC	**P1D91F0**	**BMS power supply (KL30) voltage too low fault**
DTC	**P1D91F1**	**BMS power supply (KL30) voltage too low fault (instrument cluster indicates battery management system input end undervoltage)**

Description

When battery control unit detects abnormal power supply voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9116	(a) BMS power supply (KL30) voltage too low fault.	• 12 V battery • Vehicle PDCR • Inside the power battery
P1D91F0	(a) BMS power supply (KL30) voltage too low fault.	• 12 V battery • Vehicle PDCR • Inside the power battery
P1D91F1	(a) BMS power supply (KL30) voltage too low fault (instrument cluster indicates battery management system input end undervoltage).	• 12 V battery • Vehicle PDCR • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check the 12 V battery voltage

(a) Check if 12 V battery voltage is less than fault threshold.

Result:

Result	Proceed to
Less than fault threshold	NG
Not less than fault threshold	OK

NG → **Repair or replace battery**

OK

3	**Check power supply output of PDCR to BMS main control**

(a) Check if power supply output of PDCR to BMS main control is less than fault threshold.

Result:

Result	Proceed to
Less than fault threshold	NG
Not less than fault threshold	OK

NG → **Troubleshoot PDCR**

OK

4	**Check wire harness**

(a) Disconnect the connection between battery pack low voltage connector and vehicle.

(b) Measure if vehicle wire harness end connector voltage is less than fault threshold.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-4G# - CN1-4H#	Always	Less than 9 V

NG → **Troubleshoot vehicle wire harness**

OK

5	**Check battery pack internal wire harness**

(a) Remove the power battery from vehicle.

(b) Measure the battery pack internal wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-1# - CN1-4G#	Always	Continuity
CN4-10# - CN1-4H#	Always	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9117	BMS power supply (KL30) voltage too high fault (instrument cluster indicates battery management system input end overvoltage)

Description

When battery control unit detects too high power supply voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9117	(a) BMS power supply (KL30) voltage too high fault (instrument cluster indicates battery management system input end overvoltage).	• 12 V battery • Vehicle PDCR • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Wait for 30 seconds and read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Check 12 V battery and PDCR**

OK

ZD **Replace BMS main control (See page DL-61)**

DTC	P1D9312	Short (short to ground) in charging connector temperature sensor 1

Description

When battery control unit detects short in charging connector temperature sensor 1, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9312	(a) Short (short to ground) in charging connector temperature sensor 1.	• Energy conversion and distribution unit • Low voltage wire harness connected between energy conversion and distribution unit and battery • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check sensor and energy conversion and distribution unit wire harness

(a) Disconnect the energy conversion and distribution unit connector CN3.

(b) Check if connector Pin is in good condition.

(c) Measure the pin resistance value through CN3 male terminal.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-5# - CN3-17#	Always	About 10 kΩ at room temperature
CN3-5# - body ground#	Always	No continuity
CN3-17# - body ground#	Always	No continuity

NG → **Repair or replace wire harness**

OK

2	Check if connector is inserted firmly

(a) Check if DC charging 6pin connector of energy conversion and distribution unit is inserted firmly.

Result

Result	Proceed to
Not inserted firmly	NG
Inserted firmly	OK

NG → **Reinstall connector**

OK

3	Replace energy conversion and distribution unit (See page DL-62)

(a) Replace the energy conversion and distribution unit.

(b) Clear DTCs, and wait for 30s.

(c) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	**Check internal wire harness**

(a) Check for continuity between A2 pin of BMS terminal and CN3 pin of energy conversion and distribution unit respectively.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-37# - CN3-5#	Always	No continuity
A2-36# - CN3-17#	Always	No continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9313	Open in charging connector temperature sensor 1

Description

When battery control unit detects open in charging connector temperature sensor 1, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9313	(a) Open in charging connector temperature sensor 1.	• Energy conversion and distribution unit • Low voltage wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check sensor and energy conversion and distribution unit wire harness**

(a) Disconnect the energy conversion and distribution unit connector CN3.

(b) Check if connector Pin is in good condition.

(c) Measure the pin resistance value through CN3 male terminal.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-5# - CN3-17#	Always	About 10 kΩ at room temperature

NG → **Repair or replace wire harness**

OK

2	**Check if connector is inserted firmly**

(a) Check if DC charging 6pin connector of energy conversion and distribution unit is inserted firmly.

Result

Result	Proceed to
Not inserted firmly	NG
Inserted firmly	OK

NG → **Reinstall connector**

OK

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Clear DTCs, and wait for 30s.

ZD

(c) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	Check internal wire harness

(a) Check for continuity between A2 pin of BMS terminal and CN3 pin of energy conversion and distribution unit respectively.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-37# - CN3-5#	Always	No continuity
A2-36# - CN3-17#	Always	No continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	P1D9612	Short in charging connector temperature sensor 2

Description

When battery control unit detects short in charging connector temperature sensor 2, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9612	(a) Short in charging connector temperature sensor 2.	• Energy conversion and distribution unit • Low voltage wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check sensor and energy conversion and distribution unit wire harness

(a) Disconnect the energy conversion and distribution unit connector CN3.

(b) Check if connector Pin is in good condition.

(c) Measure the pin resistance value through CN3 male terminal.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-6# - CN3-18#	Always	About 10 kΩ at room temperature

NG → **Repair or replace wire harness**

OK

2	Check if connector is inserted firmly

(a) Check if DC charging 6pin connector of energy conversion and distribution unit is inserted firmly.

Result:

Result	Proceed to
Not inserted firmly	NG
Inserted firmly	OK

NG → **Reinstall connector**

OK

ZD

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Clear DTCs, and wait for 30s.

(c) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	**Check internal wire harness**

(a) Check for continuity between A2 pin of BMS terminal and CN3 pin of energy conversion and distribution unit respectively.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-35# - CN3-6#	Always	No continuity
A2-3# - CN3-18#	Always	No continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	**P1D9613**	**Open in charging connector temperature sensor 2**

Description

When battery control unit detects open in charging connector temperature sensor 2, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9613	(a) Open in charging connector temperature sensor 2.	• Energy conversion and distribution unit • Low voltage wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check sensor and energy conversion and distribution unit wire harness**

(a) Disconnect the energy conversion and distribution unit connector CN3.

(b) Check if connector Pin is in good condition.

(c) Measure the pin resistance value through CN3 male terminal.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-6# - CN3-18#	Always	About 10 kΩ at room temperature
CN3-6# - body ground#	Always	No continuity
CN3-18# - body ground#	Always	No continuity

NG → **Repair or replace wire harness**

OK

2	**Check if connector is inserted firmly**

(a) Check if DC charging 6pin connector of energy conversion and distribution unit is inserted firmly.

Result:

Result	Proceed to
Not inserted firmly	NG
Inserted firmly	OK

NG → **Reinstall connector**

OK

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Clear DTCs, and wait for 30s.

(c) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	Check internal wire harness

Standard value

Multimeter connection	Detection condition	Specified condition
A2-35# - CN3-6#	Always	No continuity
A2-3# - CN3-18#	Always	No continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	P1DA188	Charging CAN busoff fault

Description

When battery control unit detects charging CAN - busoff fault, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1DA188	(a) Charging CAN-busoff fault.	• Charging pile • Low voltage wire harness between charging pile and power battery • Energy conversion and distribution unit • Power battery internal wire harness • BMS main control

Inspection procedure

Note: This DTC is only for prompting, and repair is unnecessary.

DTC	P1DA288	Battery internal CAN communication busoff

Description

When battery control unit detects DC charging timeout fault, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1DA288	(a) Battery internal CAN communication busoff.	• Charging pile • Low voltage wire harness between charging pile and power battery • Energy conversion and distribution unit • Power battery internal wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check connection of power battery low voltage connector

(a) Check if the power battery low voltage connector is properly connected.

Result:

Result	Proceed to
Connected abnormally	NG
Connected normally	OK

NG → **Reconnect power battery low voltage connector**

OK

2	Check resistance between power battery connector pins

(a) Check the resistance between power battery connector pins.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-2A# - CN1-1F#	Always	120 Ω
CN1-2A# - body ground#	Always	1 kΩ

Multimeter connection	Detection condition	Specified condition
CN1-2A# - CN1-4G#	Always	1 kΩ
CN1-2A# - CN1-4H#	Always	1 kΩ
CN1-1F# - body ground#	Always	1 kΩ
CN1-1F# - CN1-4G#	Always	1 kΩ
CN1-1F# - CN1-4H#	Always	1 kΩ

NG → **Replace wire harness**

OK

3 **Check battery internal wire harness**

(a) Check battery internal wire harness for crimping or wear.

Result:

Result	Proceed to
Crimped or worn	NG
Not crimped or worn	OK

NG → **Replace battery internal wire harness**

OK

4 **Check power battery current sensor**

(a) Check if power battery current sensor communicates abnormally.

Result:

Result	Proceed to
Abnormal communication	NG
Normal communication	OK

NG → **Replace power battery current sensor**

OK

Replace BMS main control (See page DL-61)

ZD

DTC	**P1DA300**	**Collision fault - CAN signal**
DTC	**P1DA400**	**Collision fault - hard wire signal**

Description

When battery control unit detects collision fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DA300	(a) Collision fault - CAN signal.	• Wire harness and connector • Airbag • Inside the power battery
P1DA400	(a) Collision fault - hard wire signal.	• Wire harness and connector • Airbag • Inside the power battery

Inspection procedure

For specific analysis steps regarding communication DTCs, please refer to the intelligent vehicle control platform control system.

DTC	P1DA598	Sub-board PCB temperature too high fault

Description

When battery control unit detects too high sub-board PCB temperature, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DA598	(a) Sub-board PCB temperature too high fault.	• Power battery • BMS slave control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

(d) If P1D8B74 equalizer short fault exists, troubleshooting method is the same as P1D8B74.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Read data stream

(a) Read data stream with diagnostic tester, read DID0730 equalizer circuit temperature, and locate the problem.

Result:

Result	Proceed to
Circuit temperature is abnormal	NG
Circuit temperature is normal	OK

OK → **Diagnosis ends**

NG

ZD **Replace BMS slave control (See page DL-61)**

DTC	P1DAA01	Feedback current too high fault

Description

When battery control unit detects too high feedback current, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DAA01	(a) Feedback current too high fault.	• High voltage electrical system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Clear DTCs.

(b) Wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Please troubleshoot motor or intelligent vehicle control platform control unit**

OK

Diagnosis ends

DTC	P1DAC00	DC charging timeout fault

Description

When battery control unit detects DC charging timeout fault, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1DAC00	(a) DC charging timeout fault.	• Charging pile • Low voltage wire harness between charging pile and power battery • Energy conversion and distribution unit • Power battery internal wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

ZD

2	**Replace quick charging pile to charge**

(a) Replace the quick charging pile to charge.

(b) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

3	**Check DC charging port resistance, vehicle wire harness between DC charging port and power battery**

(a) Measure continuity between BMS main control resistance and wire harness

Standard value

Multimeter connection	Detection condition	Specified condition
CAN-H# - CAN-L#	Always	120 Ω
CN1-2B# - CAN-H#	Always	No continuity
CN1-2F# - CAN-L#	Always	No continuity

NG → **Replace vehicle wire harness**

OK

4	**Check power battery internal wire harness**

(a) Check the resistance of power battery connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-2B# - CN1-2F#	Always	120 Ω
CN1-2B# - CN1-4H#	Always	1 MΩ
CN1-2F# - CN1-4H#	Always	1 MΩ

NG → **Replace power battery internal wire harness**

OK

5	**Check BMS main control**

(a) Check the BMS main control resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-31# - A2-32#	Always	120 Ω

NG → **Replace BMS main control**

OK

6	**Check BMS main control and energy conversion and distribution unit wire harness**

(a) Check for continuity between BMS main control and energy conversion and distribution unit wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-31# - CN4-11#	Always	Continuity
A2-32# - CN4-12#	Always	Continuity

NG → **Replace wire harness**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DAD00	Cell voltage seriously too low fault 1
DTC	P1D81F2	Cell voltage seriously too low fault 2

Description

When battery control unit detects seriously low cell voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DAD00	(a) Cell voltage seriously too low fault 1.	• Power battery
P1D81F2	(a) Cell voltage seriously too low fault 2.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Current fault: Remove the battery pack, and charge to SOC ⩾ 20%.

(c) Historical fault: Query occurrence number of historical fault. Locate the faulty battery cell according to "the

lowest value sampling point of cell voltage" in the fault snapshot, and remind the user to avoid violent driving.

(d) Power on again, and clear DTCs.

(e) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

NG → **Report fault information (fault symptom, time, location, etc.) and vehicle information (vehicle mileage, VIN code, etc.) to the manufacturer**

OK

Diagnosis ends

DTC	P1DAE00	Battery module temperature seriously too high fault

Description

When battery control unit detects battery module temperature seriously high, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DAE00	(a) Battery module temperature seriously too high fault.	• Vehicle cooling system • Inside the power battery: Battery module, sampling FPC, cooling plate

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check external environment

(a) Check if the vehicle has been exposed to sun.

Result

Result	Proceed to
Fault caused by vehicle parking and sun exposure	NG
Fault not caused by sun exposure	OK

NG → **Keep vehicle stationary for more than 10 hours at room temperature. Power on again, and clear DTCs**

ZD

OK

2	Check A/C system

(a) Check if A/C system operates normally.

Result:

Result	Proceed to
Air conditioning system operates abnormally	NG
Air conditioning system operates normally	OK

NG → **Go to air conditioning system**

OK

3	Check battery cooling water pump

(a) Check if battery cooling water pump operates normally.

Result:

Result	Proceed to
Battery cooling water pump operates abnormally	NG
Battery cooling water pump operates normally	OK

NG → **Repair circuit or replace battery cooling water pump**

OK

4	**Check PTC**

(a) Check if PTC starts abnormally.

Result:

Result	Proceed to
Start abnormally	NG
Start normally	OK

NG → **Repair circuit or replace PTC**

OK

5	**Check expansion tank**

(a) Check the expansion tank for lack of fluid.

Result:

Result	Proceed to
Lack of fluid	NG
Not lack of fluid	OK

NG → **Add coolant**

OK

6	**Troubleshoot battery pack**

(a) Lift the vehicle, and check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

Result:

Result	Proceed to
Scratched/deformed	NG
Not scratched/deformed	OK

NG → **Check the inside of battery pack**

OK

7	**Confirm temperature at time of failure**

(a) If the temperature at one sampling point is higher than 60° C and the temperature at other sampling points is not higher than 53° C, remove the battery pack and troubleshoot if the battery cell temperature sampling FPC is faulty.

Result:

Result	Proceed to
Battery cell temperature sampling FPC is faulty	NG
Battery cell temperature sampling FPC is not faulty	OK

NG → **Locate the faulty battery cell according to "the highest temperature of cell" in the fault snapshot and remind the user to avoid violent driving by continuously monitoring the usage of faulty battery cell through background data.**

OK

Replace battery pack (See page DL-37)

DTC	**P1DB000**	**Shunt overtemperature or abnormal temperature increasing or PRA overtemperature**
DTC	**P1DB100**	**Shunt overtemperature or abnormal temperature increasing or serious PRA overtemperature**

Description

When battery control unit detects shunt fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DB000	(a) Shunt overtemperature or abnormal temperature increasing or PRA overtemperature.	• Energy conversion and distribution unit • Inside the power battery
P1DB100	(a) Shunt overtemperature or abnormal temperature rise or severe PRA overtemperature fault.	• Energy conversion and distribution unit • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Clear DTCs after 60 minutes with vehicle stopped.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1DB300**	**Equalizing circuit open fault**
DTC	**P1D8B74**	**Equalizer switch closes unexpectedly due to equalizer short fault**

Description

When battery control unit detects open or short in equalizer circuit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DB300	(a) Equalizing circuit open fault	• Module • Inside the power battery • BMS main control
P1D8B74	(a) Equalizer switch closes unexpectedly due to equalizer short fault.	• Module • Inside the power battery • BMS main control

ZD

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Read data stream DID 0732-0739 and sub-board status signal with diagnostic tester, and troubleshoot the corresponding power battery module FPC and BMS slave control according to the sub-board status signal**

OK

Diagnosis ends

DTC	P1DB600	Contactor power supply too high fault

Description

When battery control unit detects too high contactor power supply, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DB600	(a) Contactor power supply too high fault.	• 12 V battery • Vehicle PDCR • Energy conversion and distribution unit • Power battery • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	Check the 12 V battery

(a) Check the 12 V battery.

Result

Result	Proceed to
Battery is abnormal	NG
Battery is normal	OK

NG → **Repair or replace battery**

OK

ZD

3	Check power supply output of PDCR to BMS main control

(a) Check if power supply output of PDCR to BMS main control is more than fault threshold.

Result

Result	Proceed to
More than fault threshold	NG
Not more than fault threshold	OK

NG → **Troubleshoot PDCR**

OK

Replace BMS main control (See page DL-61)

DTC	P1DB885	Battery module temperature difference too large fault

Description

When battery control unit detects that battery module temperature difference is too large, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DB885	(a) Battery module temperature difference too large fault.	• Vehicle cooling system • Inside the power battery: Battery module, sampling FPC, cooling plate

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery cooling water pump

(a) Check if battery cooling water pump operates normally.

Result:

Result	Proceed to
Battery cooling water pump operates abnormally	NG
Battery cooling water pump operates normally	OK

NG → **Repair circuit or replace battery cooling water pump**

OK

2	Check expansion tank

(a) Check the expansion tank for lack of fluid.

Result:

Result	Proceed to
Lack of fluid	NG
Not lack of fluid	OK

NG → **Add coolant**

OK

3	**Troubleshoot battery pack**

(a) Lift the vehicle, and check if the bottom of battery is scratched/deformed.

(b) Remove the battery bottom protector, and check if water-cooled plate is scratched/deformed.

Result:

Result	Proceed to
Scratched/deformed	NG
Not scratched/deformed	OK

NG → **Check the inside of battery pack**

OK

4	**Troubleshoot battery cell temperature sampling**

(a) Remove the battery pack, and troubleshoot battery cell temperature sampling FPC.

Result:

Result	Proceed to
Battery cell temperature sampling FPC is abnormal	NG
Battery cell temperature sampling FPC is normal	OK

NG → **Replace battery pack (See page DL-37)**

OK

Diagnosis ends

DTC	P1DB900	SOC jump fault

Description

When battery control unit detects a SOC jump fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DB900	(a) SOC jump fault.	• Power battery

Inspection procedure

Note: If the above faults occur, the vehicle can be driven and charged, only as a warning fault.

DTC	P1DBA00	Insulation hardware fault (insulation detection module failure)

Description

When battery control unit detects insulation hardware fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DBA00	(a) Insulation hardware fault (insulation detection module failure).	• Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

ZD

DTC	P1DBC00	Battery thermal runaway alarm

Description

When battery control unit detects battery thermal runaway alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DBC00	(a) Battery thermal runaway alarm.	• Inside the power battery

Inspection procedure

Note: Replace the power battery.

DTC	P1DBD00	Battery module temperature sampling circuit fault

Description

When battery control unit detects battery module temperature sampling circuit fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DBD00	(a) Battery module temperature sampling circuit fault.	• Power battery module • Wire harness • BMS main control • BMS slave control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Locate faulty cell according to sub-board state information read with diagnostic tester**

(a) Remove power battery from vehicle, troubleshoot for open in connection between NTC temperature sensor and FPC, FPC and module connector, module connector and BMS slave control connector.

Result:

Result	Proceed to
Open in connection	NG
Not open in connection	OK

NG → **Replace wire harness**

OK

Replace BMS slave control (See page DL-37)

ZD

DTC	P1DBF00	Vehicle insulation serious fault (gun insertion mode)

Description

When battery control unit detects vehicle insulation serious fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DBF00	(a) Vehicle insulation serious fault (gun insertion mode).	• Vehicle high voltage system • Inside the power battery • Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Disconnect charging gun, read and clear DTCs.

(b) Wait for 10 minutes after stalling and then start.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

If DTC is P1D8C1A or P1D8D1A, troubleshoot according to P1D8C1A

DTC	**P1DC9F0**	**Driving risk due to excessive resistance**
DTC	**P1DC9F1**	**Driving failure due to too low resistance**

Description

When battery control unit detects abnormal resistance, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC9F0	(a) Driving risk due to excessive resistance	• Smart fuse • Wire harness between BMS main control and smart fuse
P1DC9F1	(a) Driving failure due to too low resistance	• Smart fuse • Wire harness between BMS main control and smart fuse

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check battery pack internal wire harness**

(a) Measure for continuity between BMS main control connector wire harnesses A2-01 and A2-40 and external triggering interface of smart fuse.

Result:

Result	Proceed to
Continuity	NG
No continuity	OK

ZD

NG → **Replace wire harness**

OK

Replace smart fuse (See page DL-57)

DTC	P1DC017	Cell voltage seriously too high fault

Description

When battery control unit detects seriously high cell voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC017	(a) Cell voltage seriously too high fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) After the system is powered off, the vehicle enters sleep mode, and keep vehicle stationary for 0.5 hour.

(b) Feed back the fault information (fault symptom, time, location etc.), vehicle information (vehicle mileage, VIN code etc.) and location of the faulty battery cell that have been located according to "the highest value sampling point of cell voltage" in the fault snapshot to the manufacturer.

(c) Power on again, and clear DTCs.

(d) Read DTCs again.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

ZD

NG → **Remove the battery pack from vehicle, unpack and troubleshoot the faulty battery cell voltage sampling FPC. If there is no battery cell voltage sampling fault, replace the battery pack.**

OK

Diagnosis ends

DTC	P1DC117	Battery total voltage seriously too high fault
DTC	P1D8217	Battery total voltage too high fault

Description

When battery control unit detects abnormal battery total voltage, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC117	(a) Battery total voltage seriously too high fault	• Power battery
P1D8217	(a) Battery total voltage too high fault	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Diagnostic tester displays "current fault and history fault": If it occurs with cell voltage too high fault (DTCs P1DC017, P1D8017, P1D8117) at the same time, repair it according to the cell voltage fault; If it occurs separately, replace BMS main control.

(b) Diagnostic tester displays "history fault": If it occurs with cell voltage too high fault at the same time, repair it according to the cell voltage too high fault; If it occurs separately, first check if the total voltage sampling accuracy of BMS main control is normal, then read the "cell voltage average value", multiply by 128, and compare the resulting value with the "total battery pack voltage".

Result

Result	Proceed to
Difference is more than 4 V	NG
Within 4 V	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	**P1DC900**	**Smart fuse drive self-check fault (Unable to deploy due to internal abnormality of driver chip)**
DTC	**P1DC901**	**Smart fuse drive chip communication abnormal**

Description

When battery control unit detects intelligent fuse fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC900	(a) Smart fuse drive self-check fault (Unable to deploy due to internal abnormality of driver chip).	• BMS main control • Inside the power battery
P1DC901	(a) Smart fuse drive chip communication abnormal.	• BMS main control • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DC912	Short in smart fuse drive circuit

Description

When battery control unit detects short in intelligent fuse drive circuit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC912	(a) Short in smart fuse drive circuit.	• BMS main control • Wire harness between BMS main control and smart fuse

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery pack internal wire harness

(a) Remove the power battery from vehicle. Check the battery pack internal wire harness according to electrical schematic diagram.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-1# - A1-1#	Always	Continuity
A2-1# - A1-2#	Always	Continuity

Multimeter connection	Detection condition	Specified condition
A2-1# - A1-5#	Always	Continuity
A2-1# - A1-29#	Always	Continuity
A2-1# - A1-30#	Always	Continuity
A2-1# - A1-31#	Always	Continuity
A2-1# - A1-32#	Always	Continuity
A2-1# - A1-40#	Always	Continuity
A2-40# - A1-1#	Always	Continuity
A2-40# - A1-2#	Always	Continuity
A2-40# - A1-5#	Always	Continuity
A2-40# - A1-29#	Always	Continuity
A2-40# - A1-30#	Always	Continuity
A2-40# - A1-31#	Always	Continuity
A2-40# - A1-32#	Always	Continuity
A2-40# - A1-40#	Always	Continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC P1DC913 Open in smart fuse drive circuit

Description

When battery control unit detects open in intelligent fuse drive circuit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DC913	(a) Open in smart fuse drive circuit.	• BMS main control • Wire harness between BMS main control and smart fuse

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check battery pack internal wire harness**

(a) Measure for continuity between BMS main control connector wire harnesses A2-1 and A2-40 and external triggering interface of smart fuse.

Result:

Result	Proceed to
Continuity	NG
No continuity	OK

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	P1DCC00	Battery pack feedback charge current out of limit alarm

Description

When battery control unit detects battery pack feedback charging current out of limit alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DCC00	(a) Battery pack feedback charge current out of limit alarm.	• High voltage electrical system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and store DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Troubleshoot motor or VDC**

OK

Diagnosis ends

DTC	P1DCD00	Battery pack SOC seriously too low fault

Description

When battery control unit detects seriously low battery pack SOC, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DCD00	(a) Battery pack SOC seriously too low fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

ZD

1	Read DTCs

(a) Read and clear DTCs.

(b) Stall the vehicle and wait for 10 minutes before starting.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Charge the vehicle**

OK

Diagnosis ends

DTC	P1DCE00	Battery pack SOH too low alarm

Description

When battery control unit detects battery pack SOH too low alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DCE00	(a) Battery pack SOH too low alarm.	• Power battery

Inspection procedure

Note: If the above faults occur, the vehicle can be used, so repair is unnecessary.

DTC	P1DCE23	Battery pack SOH too low fault

Description

When battery control unit detects too low battery pack SOH, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DCE23	(a) Battery pack SOH too low fault.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**If repair is necessary, remind the user that the power battery has reached the disposal limit and needs to be replaced in time**

DTC	P1DCEF0	SOH seriously too low fault

Description

When battery control unit detects seriously low SOH, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DCEF0	(a) SOH seriously too low fault.	• Power battery

Inspection procedure

Note: Replace the battery pack.

DTC	P1DD200	Shunt system error

Description

When battery control unit detects shunt system error, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DD200	(a) Shunt system error.	• Energy conversion and distribution unit • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Update energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1DD300**	**CMC daisy chain open fault**
DTC	**P1DD3F0**	**CMC daisy chain one point open fault**

Description

When battery control unit detects CMC daisy chain fault, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1DD300	(a) CMC daisy chain open fault.	• Power battery • Wire harness • BMS main control • BMS slave control
P1DD3F0	(a) CMC daisy chain one point open fault.	• Power battery • Wire harness • BMS main control • BMS slave control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Disconnect high voltage connection between vehicle and battery**

(a) Disconnect high voltage connection between vehicle and battery, and read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Troubleshoot vehicle power battery external high voltage connector**

NG

Replace broken chain parts

DTC	P1DDF1D	Charge current too high alarm

Description

When battery control unit detects charging current too high alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDF1D	(a) Charging current too high alarm.	• Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

2	**Charge and read DTCs again**

(a) Read and clear DTCs.

(b) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DDFF0	Charge current too high fault

Description

When battery control unit detects charging current too high fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDFF0	(a) Charging current too high fault.	• Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

ZD

1	Read DTCs

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

2	Charge and read DTCs again

(a) Read and clear DTCs.

(b) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1DDFF1**	**Charging mode - current pulse charge current too high alarm**

Description

When battery control unit detects charging mode - current pulse charging current too high alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDFF1	(a) Charging mode - current pulse charging current too high alarm.	• Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

2	**Charge and read DTCs again**

(a) Read and clear DTCs.

(b) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DDFF2	Charging mode - pulse charge current too high fault

Description

When battery control unit detects too high charging mode - pulse charging current, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDFF2	(a) Charging mode - pulse charging current too high fault.	• Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

2	**Charge and read DTCs again**

(a) Read and clear DTCs.

(b) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1DDFF3	Charging mode - pulse charge current too high fault cumulative count out of limit flag

Description

When battery control unit detects that the cumulative number of charging mode - pulse charging current too high fault is out of limit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDFF3	(a) Charging mode - pulse charge current too high fault cumulative count out of limit flag.	• Power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Query if the occurrence number of historical faults are 50 or more, if so, report fault information (fault symptom, time, location, etc.) and vehicle information (vehicle mileage, VIN code, etc.) to the manufacturer.

(b) The manufacturer provides feedback on repairs according to fault information and vehicle information.

(c) UDS clears DTCs, power on again, and clear DTCs.

(d) Check if it operates normally.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace battery pack (See page DL-37)**

OK

Diagnosis ends

DTC	P1DDFF4	Current out of limit fault

Description

When battery control unit detects that current is out of limit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDFF4	(a) Current out of limit fault.	• High voltage system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check external high voltage circuit

(a) Check for short in battery external high voltage circuit.

Result:

Result	Proceed to
Short circuit	NG
No short circuit	OK

NG → **Repair circuit or replace high voltage wire harness**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DE3F0	Shunt message error severity level 2

Description

When battery control unit detects shunt message error severity level 2 fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE3F0	(a) Shunt message error severity level 2.	• Inside the power battery • Energy conversion and distribution unit

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check battery pack internal wire harness**

(a) Check the battery pack internal wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-3# - A1-10#	Always	Continuity
CN4-2# - A1-28#	Always	Continuity

NG → **Replace wire harness**

OK

3	Check for open in BMS main control resistance and wire harness

(a) Measure for open in BMS main control resistance and wire harness

Standard value

Multimeter connection	Detection condition	Specified condition
A1-10# - A1-28#	Always	120 Ω
A1-10# - A1-05#	Always	No continuity
A1-10# - A1-29#	Always	No continuity
A1-10# - A1-30#	Always	No continuity
A1-10# - A1-31#	Always	No continuity
A1-10# - A1-32#	Always	No continuity
A1-28# - A1-05#	Always	No continuity
A1-28# - A1-29#	Always	No continuity
A1-28# - A1-30#	Always	No continuity
A1-28# - A1-31#	Always	No continuity
A1-28# - A1-32#	Always	No continuity

NG → **Replace BMS main control (See page DL-61)**

OK

4	Check for open in energy conversion and distribution unit resistance and wire harness

(a) Check for open in energy conversion and distribution unit resistance and wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-3# - CN4-2#	Always	120 Ω
CN4-3# - CN4-10#	Always	No continuity
CN4-2# - CN4-10#	Always	No continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

ZD

DTC	P1DE7F0	Insulation status unreliable

Description

When battery control unit detects unreliable insulation status, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE7F0	(a) Insulation status unreliable.	• Charging pile

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Reinsert the charging gun to charge.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace quick charging pile to charge**

OK

Diagnosis ends

DTC	P1DE300	Shunt message error severity level 1

Description

When battery control unit detects shunt message error severity level 1 fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE300	(a) Shunt message error severity level 1.	• Inside the power battery • Energy conversion and distribution unit

Inspection procedure

Note: This DTC is only for prompting, and repair is unnecessary.

DTC	P1DE600	Open in contactor power supply circuit
DTC	P1DB500	Contactor power supply too low fault

Description

When battery control unit detects contactor power supply circuit fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE600	(a) Open in contactor power supply circuit.	• 12 V battery • Vehicle PDCR • Energy conversion and distribution unit • Power battery • BMS main control
P1DB500	(a) Contactor power supply too low fault.	• 12 V battery • Vehicle PDCR • Energy conversion and distribution unit • Power battery • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Clear DTCs, and wait for 30s.

(b) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check the 12 V battery voltage**

(a) Check if 12 V battery voltage is less than fault threshold.

Result:

Result	Proceed to
Battery voltage is abnormal	NG
Battery voltage is normal	OK

NG → **Repair or replace battery**

OK

3	**Check power supply output of PDCR to BMS main control**

(a) Check if power supply output of PDCR to BMS main control is less than fault threshold.

Result:

Result	Proceed to
Main control power supply output is abnormal	NG
Main control power supply output is normal	OK

NG → **Troubleshoot PDCR**

OK

4	**Check wire harness**

(a) Disconnect the connection between battery pack low voltage connector and vehicle.

(b) Measure if vehicle wire harness end connector voltage is less than fault threshold.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-1H# - CN1-4H#	Always	Less than 5.5 V
CN1-1G# - CN1-4H#	Always	Less than 5.5 V

NG → **Troubleshoot vehicle wire harness**

OK

5	**Check battery pack internal wire harness**

(a) Remove the power battery from vehicle.

(b) Measure the battery pack internal wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-20# - CN1-1H#	Always	No continuity
CN4-19# - CN1-1G#	Always	No continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Replace BMS main control (See page DL-61)

DTC	P1DE700	Battery isolation alarm

Description

When battery control unit detects battery insulation alarm fault, the battery control unit records DTC.

ZD

DTC No.	DTC detection condition	Faulty area
P1DE700	(a) Battery insulation alarm.	• Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and store DTCs.

(b) Power off and wait for 10 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Remove the power battery from vehicle, and check the breather valve for damage. If it is damaged, replace the power battery**

OK

2	Check insulation resistance of battery housing

(a) Open battery total positive assembly cover plate and battery total negative assembly cover plate.

(b) Measure the insulation resistance between high voltage positive and negative terminals and battery housing respectively with insulation meter, and it should be infinite.

Result:

Result	Proceed to
Insulation resistance is abnormal	NG
Insulation resistance is normal	OK

NG → **Replace BMS main control (See page DL-61)**

OK

3	Check battery module

(a) Remove the energy conversion and distribution unit.

(b) Measure insulation value of copper bars connecting to both ends of the smart fuse with insulation meter. Repeat the copper bar disconnection operation on the side with insulation resistance problem, gradually narrow down the problem points in sections and eventually locate the problem.

Result:

Result	Proceed to
Insulation resistance is abnormal	NG
Insulation resistance is normal	OK

NG → **Repair or replace faulty cooper bars**

OK

Diagnosis ends

DTC	P1DF411	Crash PWM signal abnormal fault (abnormal duty ratio)

Description

When battery control unit detects abnormal collision PWM signal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DF411	(a) Crash PWM signal abnormal fault (abnormal duty ratio).	• Airbag • Energy conversion and distribution unit • BMS main control • EV-CAN

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read and clear DTCs.

(b) Power off and wait for 10 minutes, then power on again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness

(a) Disconnect the connection between battery pack low voltage connector and vehicle.

(b) Measure vehicle wire harness end connector CN1-4D for crash PWM waveform.

Result:

Result	Proceed to
Crash PWM waveform occurs	NG
No crash PWM waveform occurs	OK

NG → **Check vehicle wire harness**

OK

3	**Check battery pack internal wire harness**

(a) Measure for short or open in the battery pack internal wire harness.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-25# - CN4-10#	Always	No continuity
CN4-25# - CN4-1#	Always	No continuity
CN4-25# - CN1-4D#	Always	Continuity

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

4	**Check wire harness between energy conversion and distribution unit and BMS**

(a) Measure for open in wire harness between energy conversion and distribution unit and BMS.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-25# - A2-21#	Always	Continuity

NG → **Replace wire harness between BMS in battery pack and energy conversion and distribution unit**

OK

Replace BMS main control (See page DL-61)

ZD

DTC	P1F2A00	Open in low voltage service switch interlock (service switch disconnection)

Description

When battery control unit detects open in low voltage service switch interlock, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1F2A00	(a) Open in low voltage service switch interlock (service switch disconnectioned).	• Inside vehicle or power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check low voltage service switch

(a) Check if low voltage service switch is closed.

Result:

Result	Proceed to
Not closed	NG
Closed	OK

NG → Close low voltage service switch

OK

2	**Read DTCs**

(a) Clear DTCs, and wait for 10 minutes after being powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

3	**Check wire harness**

(a) After the vehicle is powered off and enters sleep mode, disconnect the connection between battery pack low voltage connector and vehicle.

(b) Measure the vehicle wire harness end connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-2C# - CN1-2E#	Always	No continuity

NG → **Repair wire harness**

NG

4	**Check battery pack internal wire harness**

(a) Remove the power battery from vehicle. Check the battery pack internal wire harness according to electrical schematic diagram.

Standard value

Multimeter connection	Detection condition	Specified condition
A1-17# - CN4-21#	Always	No continuity
A1-36# - CN4-22#	Always	No continuity
CN4-21# - CN1-2C#	Always	No continuity
CN4-22# - CN1-2E#	Always	No continuity

OK → **Replace energy conversion and distribution unit (See page DL-62)**

NG

Replace BMS main control (See page DL-61)

DTC	P1F2C00	Short to power supply in low voltage service switch interlock

Description

When battery control unit detects short to power supply in low voltage service switch interlock, the battery control unit records DTCs.

DTC No.	DTC detection condition	Faulty area
P1F2C00	(a) Short to power supply in low voltage service switch interlock.	• Inside vehicle or power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check low voltage service switch

(a) Check if low voltage service switch is closed.

Result:

Result	Proceed to
Not closed	NG
Closed	OK

NG → **Close low voltage service switch**

OK

2	Read DTCs

(a) Clear DTCs, and wait for 10 minutes after being powered off.

(b) Power on again and read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

3	Check wire harness

(a) After the vehicle is powered off and enters sleep mode, disconnect the connection between battery pack low voltage connector and vehicle.

(b) Measure the vehicle wire harness end connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-2C# - CN1-4G#	Always	Continuity
CN1-2C# - CN1-4H#	Always	Continuity
CN1-2E# - CN1-4G#	Always	Continuity
CN1-2E# - CN1-4H#	Always	Continuity

NG → **Repair wire harness**

NG

4	**Check battery pack internal wire harness**

(a) Remove the power battery from vehicle. Check the battery pack internal wire harness according to electrical schematic diagram.

Standard value

Multimeter connection	Detection condition	Specified condition
CN4-22# - CN1-4G#	Always	Continuity
CN4-22# - CN1-4H#	Always	Continuity
CN4-21# - CN1-4G#	Always	Continuity
CN4-21# - CN1-4H#	Always	Continuity

OK → **Replace energy conversion and distribution unit (See page DL-62)**

NG

Replace BMS main control (See page DL-61)

DTC	P1F234B	AFE overtemperature fault

Description

When battery control unit detects AFE overtemperature fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1F234B	(a) AFE overtemperature fault.	• Power battery • BMS slave control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Read and clear DTCs.

(b) Wait for 11 minutes, then power on and power off again.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Read data stream with diagnostic tester, read DID 072E\072F Equalizer AFE chip temperature, and locate the faulty slave control and replace it**

OK

Diagnosis ends

DTC	**U005588**	**Rear EV CAN bus off**
DTC	**U129887**	**On-board charger node lost**
DTC	**U044B82**	**VDC397 message content fault**
DTC	**U044B83**	**VDC397 message content fault**
DTC	**U114B87**	**VDC397 message missing**
DTC	**U114A87**	**VDC821 message missing**

DTC	**U129287**	**Motor control unit 2 message missing**
DTC	**U114687**	**Front area control unit message missing**
DTC	**U115187**	**Airbag control unit message missing**
DTC	**U045282**	**Airbag control unit message content fault**
DTC	**U045283**	**Airbag control unit message content fault**
DTC	**U059982**	**On-board charger message content fault**
DTC	**U059983**	**On-board charger message content fault**

ZD Description

When communication between battery control unit and other controllers is abnormal or interrupted, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U005588	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U129887	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U044B82	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U044B83	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U114B87	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U114A87	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U129287	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U114687	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U115187	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U045282	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U045283	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U059982	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller
U059983	(a) Communication abnormal or interrupted.	• Wire harness and connector • Relevant controller

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).For specific analysis steps regarding communication DTCs, please refer to the intelligent vehicle control platform control system.

DTC	P1D8A00	Battery pack feedback charge current out of limit fault

Description

When battery control unit detects that battery pack feedback charging current is out of limit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D8A00	(a) P1D8A18 fault is triggered totally 3 times in this power-on cycle.	• High voltage electrical system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Clear DTCs and leave the vehicle in place for 10 minutes.

(b) Power on again and read DTCs.

(c) Read if DTC is P1D8A00 with a diagnostic tester.

Result:

Result	Proceed to
DTC is not P1D8A00	NG
DTC is P1D8A00	OK

NG → **Perform repair according to malfunction**

OK

2	**Check motor**

(a) Check the motor.

Result:

Result	Proceed to
Motor is abnormal	NG
Motor is normal	OK

NG → **Replace faulty part**

ZD

OK

3	**Check VDC**

(a) Check the VDC.

Result:

Result	Proceed to
VDC is abnormal	NG
VDC is normal	OK

NG → **Replace faulty part**

OK

Diagnosis ends

DTC	P1D81F3	Discharging current out of limit fault

Description

When battery control unit detects that discharging current is out of limit, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D81F3	(a) I ⩾ 1530 A.	• Power battery • Whole high voltage system

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

ZD

1	Check battery external high voltage circuit

(a) Check for short in battery external high voltage circuit.

Result:

Result	Proceed to
Short circuit does not exist	NG
Short circuit exists	OK

OK → **Repair faulty parts**

NG

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D82F1	Discharging current serious out of limit fault

Description

When battery control unit detects a discharging current serious out of limit fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D82F1	(a) I ⩾ 1600 A.	• Whole high voltage system • Power battery assembly

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check for short in battery external high voltage circuit

(a) Check for short in high voltage circuit.

Result:

Result	Proceed to
High voltage circuit is short	NG
High voltage circuit is not short	OK

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC P1D82F2 Collision fault - frontal collision fault

Description

When battery control unit detects collision fault/frontal collision fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D82F2	(a) Collision.	• Airbag • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check if vehicle is involved in a collision**

(a) Check if the vehicle is involved in a collision.

Result:

Result	Proceed to
There has been a collision	OK
There has been no collision	NG

OK → **Contact airbag professionals for troubleshooting**

NG

2	**Clear DTCs**

(a) Clear DTCs, power on again after power-off for 10 minutes.

(b) Read if DTC still exists with a diagnostic tester.

Result:

Result	Proceed to
DTC still exists	NG
DTC does not exist	OK

OK → **Diagnosis ends**

NG

Further repair the power battery, check if the connector is disconnected or there is visible damage to the battery

DTC	P1D88F1	Charging connector temperature sensor 1 and 2 simultaneous fault

Description

When battery control unit detects that charging connector temperature sensors 1 and 2 fail at the same time, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D88F1	(a) 2 temperature sensors fail simultaneously.	• Inside the energy conversion and distribution unit • Low voltage wire harness connected between energy conversion and distribution unit and battery BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check sensor and energy conversion and distribution unit wire harness

(a) Disconnect the energy conversion and distribution unit connector CN3.

(b) Check if connector Pin is in good condition.

(c) Measure the pin resistance value through CN3 male terminal.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-5# - CN3-17#	Always	About 10 kΩ at room temperature
CN3-5# - body ground#	Always	No continuity
CN3-17# - body ground#	Always	No continuity
CN3-6# - CN3-18#	Always	About 10 kΩ at room temperature
CN3-6# - body ground#	Always	No continuity
CN3-18# - body ground#	Always	No continuity

NG → **Repair or replace wire harness**

OK

2	**Check if connector is inserted firmly**

(a) Check if DC charging 6pin connector of energy conversion and distribution unit is inserted firmly.

Result:

Result	Proceed to
Not inserted firmly	NG
Inserted firmly	OK

NG → **Reinstall connector**

OK

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Clear DTCs, and wait for 30s.

(c) Read DTCs.

Result

Result	Proceed to
DTCs occur again	NG
DTCs do not occur again	OK

OK → **Diagnosis ends**

NG

4	**Check internal wire harness**

(a) Check for continuity between A2 pin of BMS terminal and CN3 pin of energy conversion and distribution unit respectively.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-35# - CN3-6#	Always	No continuity
A2-3# - CN3-18#	Always	No continuity
A2-37# - CN3-5#	Always	No continuity
A2-36# - CN3-17#	Always	No continuity

NG → **Replace wire harness**

OK

Replace BMS main control (See page DL-61)

DTC	**P1D9044**	**E2P data reading error (data, check)**
DTC	**P1DEF00**	**RTC function fault (crystal oscillator, I2C abnormal)**

Description

When battery control unit detects a loss of data and function fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9044	(a) Power-on read data abnormal (data lost)	• BMS main control
P1DEF00	(a) RTC function fault (crystal oscillator, I2C abnormal).	• BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

Replace BMS main control (See page DL-61)

DTC	P1D9411	Main positive contactor coil short to ground fault (high side, low side)

Description

When battery control unit detects short to ground in main positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9411	(a) Main positive contactor drive coil circuit short to ground fault.	• BMS main control • Wire harness • Main positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness**

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A1-15# - CN1-4H#	Always connected	Continuity
A2-30# - CN1-4H#	Always connected	Continuity
A1-15# - ground#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	**Check energy conversion and distribution unit wire harness**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-13 - CN1-4H#	Always connected	No continuity
CN3-1# - CN1-4H#	Always connected	No continuity
CN3-13# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9412	Main positive contactor coil short to power supply fault (high side, low side)

Description

When battery control unit detects short to power supply in main positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9412	(a) Main positive contactor drive coil circuit short to power supply fault.	• BMS main control • Wire harness • Main positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A1-15# - CN1-4G#	Always connected	Continuity
A2-30# - CN1-4G#	Always connected	Continuity
A1-15# - ground#	Always connected	Continuity

ZD

OK → **Replace BMS main control (See page DL-61)**

NG

2	**Check energy conversion and distribution unit wire harness**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-13 - CN1-4G#	Always connected	No continuity
CN3-1# - CN1-4G#	Always connected	No continuity
CN3-13# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	**P1D9413**	**Main positive contactor coil open fault (high side, low side)**

Description

When battery control unit detects open in main positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9413	(a) Main positive contactor drive coil circuit open fault.	• BMS main control • Wire harness • Main positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness and connector**

(a) If multiple contactor coil open circuit faults are reported at the same time, perform inspection.

(b) Check battery pack swapping connector and vehicle end wire harness.

(c) Check if connector between vehicle end wire harness and vehicle end charging relay distribution box is loose.

OK → **Check and repair or replace wire harness and connector**

NG

2	**Check wire harness**

(a) Check for continuity of low voltage wire harness between BMS main control and contactor.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-30# - CN3-1#	Always connected	Continuity
A1-15# - CN3-13#	Always connected	Continuity

OK → **Repair wire harness**

NG

3	**Check energy conversion and distribution unit wire harness**

(a) Check for continuity between energy conversion and distribution unit pin CN3-1 and pin CN3-13.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-1# - CN3-13#	Always connected	Continuity

NG → **Replace BMS main control (See page DL-61)**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9511	Main negative contactor coil short to ground fault (high side, low side)

Description

When battery control unit detects short to ground in main negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9511	(a) Main negative contactor drive coil circuit short to ground fault.	• BMS main control • Wire harness • Main negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-12# - CN1-4H#	Always connected	Continuity
A1-24# - CN1-4H#	Always connected	Continuity
A2-12# - ground#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	Check energy conversion and distribution unit wire harness

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-14 - CN1-4H#	Always connected	No continuity
CN3-2# - CN1-4H#	Always connected	No continuity
CN3-14# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK →

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9512	Main negative contactor coil short to power supply fault (high side, low side)

Description

When battery control unit detects short to power supply in main negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9512	(a) Main negative contactor drive coil circuit short to power supply fault.	• BMS main control • Wire harness • Main negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness**

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-12# - CN1-4G#	Always connected	Continuity
A1-24# - CN1-4G#	Always connected	Continuity
A2-12# - ground#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	**Check energy conversion and distribution unit wire harness**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-14 - CN1-4G#	Always connected	No continuity
CN3-2# - CN1-4G#	Always connected	No continuity
CN3-14# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9513	Main negative contactor coil open fault (high side, low side)

Description

When battery control unit detects open in main negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9513	(a) Main negative contactor drive coil circuit open fault.	• BMS main control • Wire harness • Main negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector

(a) If multiple contactor coil open circuit faults are reported at the same time, perform inspection.

(b) Check battery pack swapping connector and vehicle end wire harness.

(c) Check if connector between vehicle end wire harness and vehicle end charging relay distribution box is loose.

OK → **Check and repair or replace wire harness and connector**

NG

2	Check wire harness

(a) Disconnect the swapping connector.

(b) Check for continuity of low voltage wire harness between BMS main control and contactor.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-12# - CN3-2#	Always connected	Continuity
A1-24# - CN3-14#	Always connected	Continuity

OK → **Repair wire harness**

NG

3	Check energy conversion and distribution unit wire harness

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-2# - CN3-14#	Always connected	Continuity

NG → **Replace BMS main control (See page DL-61)**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9711	Charging positive contactor coil short to ground fault (high side, low side)

Description

When battery control unit detects short to ground in charging positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9711	(a) Charging positive contactor drive coil circuit short to ground fault.	• BMS main control • Wire harness • Charging positive contactor

ZD

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-9# - CN1-4H#	Always connected	Continuity
A2-9# - battery metal housing	Always connected	Continuity
A1-12# - CN1-4H#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	Check energy conversion and distribution unit wire harness

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-15# - CN1-4H#	Always connected	No continuity
CN3-3# - CN1-4H#	Always connected	No continuity
CN3-15# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9712	Charging positive contactor coil short to power supply fault (high side, low side)

Description

When battery control unit detects short to power supply in charging positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9712	(a) Charging positive contactor drive coil circuit short to power supply fault.	• BMS main control • Wire harness • Charging positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Check wire harness**

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-9# - CN1-4G#	Always connected	Continuity
A2-9# - battery metal housing	Always connected	Continuity
A1-12# - CN1-4G#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	**Check energy conversion and distribution unit wire harness**

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-15# - CN1-4G#	Always connected	No continuity
CN3-3# - CN1-4G#	Always connected	No continuity
CN3-15# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9713	Charging positive contactor coil open fault (high side, low side)

Description

When battery control unit detects open in charging positive contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9713	(a) Charging positive contactor drive coil circuit open fault.	• BMS main control • Wire harness • Charging positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector

(a) If multiple contactor coil open circuit faults are reported at the same time, perform inspection.

(b) Check battery pack swapping connector and vehicle end wire harness.

(c) Check if connector between vehicle end wire harness and vehicle end charging relay distribution box is loose.

Result:

Result	Proceed to
There is looseness	NG
There is no looseness	OK

OK → **Check and repair or replace wire harness and connector**

NG

ZD

2	Check wire harness

(a) Check for continuity in low voltage wire harness between BMS main control and contactor.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-9# - CN3-3#	Always connected	Continuity
A1-12# - CN3-15#	Always connected	Continuity

OK → **Repair wire harness**

NG

3	Check energy conversion and distribution unit wire harness

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-3# - CN3-15#	Always connected	Continuity

NG → **Replace BMS main control (See page DL-61)**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9811	Charging negative contactor coil short to ground fault (high side, low side)

Description

When battery control unit detects short to ground in charging negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9811	(a) Charging negative contactor drive coil circuit short to ground fault.	• BMS main control • Wire harness • Charging negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check BMS main control wire harness

(a) Disconnect BMS main control terminal connectors A1, A2 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-26# - CN1-4H#	Always connected	Continuity
A1-21# - CN1-4H#	Always connected	No continuity
A2-26# - ground#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	Check energy conversion and distribution unit wire harness

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-16# - CN1-4H#	Always connected	No continuity
CN3-16# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9812	Charging negative contactor coil short to power supply fault (high side, low side)

Description

When battery control unit detects short to power supply in charging negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9812	(a) Charging negative contactor drive coil circuit short to power supply fault.	• BMS main control • Wire harness • Charging negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check BMS main control wire harness

(a) Disconnect the swapping connector.

Standard value

Multimeter connection	Detection condition	Specified condition
A1-21# - CN1-4G#	Always connected	Continuity
A2-26# - CN1-4G#	Always connected	Continuity
A1-21# - ground#	Always connected	Continuity
A2-26# - ground#	Always connected	Continuity

OK → **Replace BMS main control (See page DL-61)**

NG

2	Check energy conversion and distribution unit wire harness

(a) Disconnect energy conversion and distribution unit end connector CN3 and corresponding terminal connector.

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-16# - CN1-4G#	Always connected	No continuity
CN3-4# - CN1-4G#	Always connected	No continuity
CN3-16# - ground#	Always connected	No continuity

NG → **Replace low voltage wire harness between power battery internal BMS main control and contactor.**

OK →

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1D9813	Charging negative contactor coil open fault (high side, low side)

Description

When battery control unit detects open in charging negative contactor coil, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9813	(a) Charging negative contactor drive coil circuit open fault.	• BMS main control • Wire harness • Charging negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check wire harness and connector

(a) If multiple contactor coil open circuit faults are reported at the same time, perform inspection.

(b) Check battery pack swapping connector and vehicle end wire harness.

(c) Check if connector between vehicle end wire harness and vehicle end charging relay distribution box is loose.

OK → **Check and repair or replace wire harness and connector**

NG

2	Check wire harness

(a) Disconnect the swapping connector.

(b) Check for continuity of low voltage wire harness between BMS main control and contactor.

Standard value

Multimeter connection	Detection condition	Specified condition
A2-26# - CN3-4#	Always connected	Continuity
A1-21# - CN3-16#	Always connected	Continuity

OK → **Repair wire harness**

NG

3	**Check energy conversion and distribution unit wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
CN3-4# - CN3-16#	Always connected	Continuity

ZD

NG → **Replace BMS main control (See page DL-61)**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	**P1D9911**	**Main positive contactor contact stuck fault**
DTC	**P1D9A11**	**Main negative contactor contact stuck fault**
DTC	**P1D9B11**	**Charging positive contactor contact stuck fault**
DTC	**P1D9C11**	**Charging negative contactor contact stuck fault**

Description

When battery control unit detects main positive contactor contact stuck fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9911	(a) Main positive contactor contact stuck.	• Main positive contactor
P1D9A11	(a) Main negative contactor contact stuck.	• Main negative contactor

DTC No.	DTC detection condition	Faulty area
P1D9B11	(a) Charging positive contactor contact stuck fault.	• Charging positive contactor
P1D9C11	(a) Charging negative contactor contact stuck fault.	• Charging negative contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Clear DTCs.

(b) Leave the vehicle in place for 10 minutes.

(c) Power on and off again.

(d) Use the diagnostic tester to read if DTCs are P1D9911, P1D9A11, P1D9B11, P1D9C11.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

2	**Check relay**

(a) Check if the relay is stuck.

(b) After confirm that it is stuck, use the diagnostic tester to drive the relay off again.

(c) Using conductive band of multimeter, confirm if relay operates according to the drive and confirm it is stuck again.

Result:

Result	Proceed to
Stuck	NG
Not stuck	OK

NG → **Repair faulty parts**

OK

3	**Check other high voltage components except power battery**

(a) Check other high voltage components except power battery.

Result:

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Repair faulty parts and replace the energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	P1D9912	Main positive contactor contact open fault
DTC	P1D9A12	Main negative contactor contact open fault
DTC	P1D9B12	Charging positive contactor contact open fault

Description

When battery control unit detects open in main positive or main negative contactor contacts, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1D9912	(a) Main positive contactor contact open fault.	• Main positive contactor
P1D9A12	(a) Main negative contactor contact open fault.	• Main negative contactor
P1D9B12	(a) Charging positive contactor contact open fault.	• Charging positive contactor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Clear DTCs.

(b) Leave the vehicle in place for 10 minutes.

(c) Power on and off again.

(d) Use the diagnostic tester to read if DTCs are P1D9912, P1D9A12, P1D9B12.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Perform repair according to malfunction**

OK

2	**Check drive relay**

(a) Confirm if relay is off again with conductive band of multimeter according to high voltage principle.

Result:

Result	Proceed to
Disconnected	NG
Not disconnected	OK

NG → **Repair faulty parts**

OK

3	Check other high voltage components except power battery

(a) Check other high voltage components except power battery.

Result:

Result	Proceed to
Damaged	NG
Not damaged	OK

NG → **Repair faulty parts and replace the energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	P1DDBF0	Discharging current out of limit alarm

Description

When battery control unit detects discharging current out of limit alarm, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDBF0	(a) I ⩾ 1460 A.	• Power battery • Whole high voltage system

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Check battery external high voltage circuit

(a) Check for short in battery external high voltage circuit.

Result:

Result	Proceed to
Short circuit	NG
No short circuit	OK

OK → **Repair faulty parts**

NG

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1DDDF0	Total voltage positive (HV+) sampling wire harness abnormal (judge if out of sampling range)

Description

When battery control unit detects that total voltage positive (HV+) sampling wire is abnormal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDDF0	(a) Report the abnormal sampling.	• Energy conversion and distribution unit • Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

ZD

2	**Check wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
C2-4# - CN2-1#	Always connected	Continuity
C2-10# - CN2-4#	Always connected	Continuity

OK → **Replace faulty part and wire harness**

NG

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Power on again.

(c) Read if DTC is P1DDDF0 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

ZD

DTC	**P1DDDF1**	**Main positive contactor rear sampling wire harness abnormal (judge if out of sampling range)**

Description

When battery control unit detects that main positive contactor rear end sampling wire is abnormal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDDF1	(a) Report the abnormal sampling.	• Energy conversion and distribution unit • Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
C2-2# - CN2-2#	Always connected	Continuity
C2-10# - CN2-4#	Always connected	Continuity

OK → **Repair faulty part and wire harness**

NG

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Power on again.

(c) Read if DTC is P1DDDF1 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DDDF2	Charging positive contactor rear sampling wire harness abnormal (judge if out of sampling range)

Description

When battery control unit detects that charging positive contactor rear end sampling wire is abnormal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDDF2	(a) Report the abnormal sampling.	• Energy conversion and distribution unit • Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
C2-7# - CN2-3#	Always connected	Continuity
C2-10# - CN2-4#	Always connected	Continuity

ZD

OK → **Replace faulty part and wire harness**

NG

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Power on again.

(c) Read if DTC is P1DDDF2 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DDDF4	Main negative contactor rear sampling wire harness abnormal (judge if out of sampling range)

Description

When battery control unit detects that main negative contactor rear end sampling wire is abnormal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDDF4	(a) Report the abnormal sampling.	• Energy conversion and distribution unit • Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
C2-1# - CN2-5#	Always connected	Continuity
C2-3# - CN2-5#	Always connected	Continuity
C2-10# - CN2-4#	Always connected	Continuity

OK → **Replace faulty part and wire harness**

NG

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace energy conversion and distribution unit

(b) Power on again.

(c) Read if DTC is P1DDDF4 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DDDF5	Charging negative contactor rear sampling wire harness abnormal (judge if out of sampling range)

Description

When battery control unit detects charging negative contactor rear end sampling wire is abnormal, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DDDF5	(a) Report the abnormal sampling.	• Energy conversion and distribution unit • Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

2	**Check wire harness**

Standard value

Multimeter connection	Detection condition	Specified condition
C2-1# - CN2-5#	Always connected	Continuity
C2-3# - CN2-5#	Always connected	Continuity
C2-10# - CN2-4#	Always connected	Continuity

OK → **Replace faulty part and wire harness**

NG

3	**Replace energy conversion and distribution unit (See page DL-62)**

(a) Replace the energy conversion and distribution unit.

(b) Power on again.

(c) Read if DTC is P1DDDF5 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace BMS main control (See page DL-61)**

OK

Diagnosis ends

DTC	P1DE000	Open in battery assembly

Description

When battery control unit detects open in battery assembly, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE000	(a) With high voltage disconnected, |Pack voltage-Sum(CellVol)| > 30 V is detected.	• Inside the power battery • Sampling wire harness • Copper bar connection • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Read DTCs

(a) Read DTC, if P1D9D12, P1DB200, P1DD300 are not found, clear DTC.

(b) Wait for 10 minuets, power on the vehicle again.

(c) Read if DTC is P1DE800 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Perform repair according to malfunction**

OK

2	Check the voltage between total battery positive and total battery negative

(a) Check total battery positive assembly cover plate and total battery negative assembly cover plate, the voltage between total battery positive and total battery negative is lower than 300 V.

Result:

Result	Proceed to
Voltage is not lower than 300 V	NG
Voltage is lower than 300 V	OK

OK → **Repair faulty parts**

NG

ZD

3	**Check copper bar**

(a) Check power battery internal copper bar connection.

Result:

Result	Proceed to
Abnormal copper bar connection	NG
Normal copper bar connection	OK

NG → **Repair faulty parts**

OK

Diagnosis ends

DTC	P1DE9F0	IG OFF busoff

Description

When battery control unit detects IG OFF busoff fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE9F0	(a) In non-OTA mode, EVCAN bus has BUSOFF fault in vehicle IG OFF state.	• Vehicle CAN network related wire harness • Power battery BMS main control • Low voltage wire harness connected to vehicle

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTCs.

(b) Leave the vehicle in place for 10 minutes.

(c) Power on and off again.

(d) Use the diagnostic tester to read this DTC.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Perform repair according to malfunction**

NG

2	**Check vehicle CAN wire harness**

(a) Check if vehicle CAN wire harness is normal.

(b) Check for short between EV CAN high end and low end.

(c) Check for short between EV CAN high and body ground.

(d) Check for short between EV CAN high and power supply.

(e) Check for short between EV CAN low and body ground.

(f) Check for short between EV CAN low and power supply.

Result:

Result	Proceed to
Short circuit	NG
No short circuit	OK

OK → **Repair wire harness**

NG

ZD

3	Check wire harness

(a) Measure if the resistance between No.CN1-4B pin and No.CN1-4A pin of battery terminal is 120 Ω.

Standard value

Multimeter connection	Detection condition	Specified condition
CN1-4B# - CN1-4G#	Always connected	Continuity
CN1-4B# - CN1-4H#	Always connected	Continuity
CN1-4A# - CN1-4G#	Always connected	Continuity
CN1-4A# - CN1-4H#	Always connected	Continuity

OK → **For reconnection and corresponding end, recheck or replace power battery internal wire harness**

NG

Replace BMS main control (See page DL-61)

DTC	P1DE400	BMS main control initialization timeout fault

Description

When battery control unit detects BMS main control initialization timeout, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE400	(a) The initialization detection is not completed within 5 seconds.	• BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**It does not affect the use of vehicle. The initialization detection is completed and the fault recovers, it is only used as alarm fault.**

OK

Diagnosis ends

DTC	P1DE800	Pre-charging check failure

Description

When battery control unit detects pre-charge check failure, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DE800	When the vehicle main positive and main negative commands are set to 1 at the same time, the following conditions are not met within 500 ms: (1) Cell voltage sum > 200 V (2) Voltage of main positive rear end > voltage of main positive front end (accumulated sum of cell voltage) ± 20 V.	• Vehicle high voltage system • Inside the power battery

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Read DTCs**

(a) Leave the vehicle in place for 10 minutes.

(b) Read if DTC is P1DE800 with a diagnostic tester.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Perform repair according to malfunction**

OK

2	**Check vehicle high voltage system**

(a) Check if vehicle high voltage system is normal.

Result:

Result	Proceed to
High voltage system is abnormal	NG
High voltage system is normal	OK

NG → **Repair faulty parts**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	**P1DFB4B**	**SBC overtemperature fault**
DTC	**P1DFC4B**	**MCU overtemperature fault**
DTC	**P1F2900**	**High voltage sampling (2950) communication fault**

Description

When battery control unit detects abnormal SBC temperature, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1DFB4B	(a) SBC temperature T >= 130° C.	• BMS main control
P1DFC4B	(a) MCU temperature T >= 130° C.	• BMS main control
P1F2900	(a) Abnormal communication between 2950 and MCU SPI.	• BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Power on and off again**

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

Replace BMS main control (See page DL-61)

DTC	P1F4102	Voltage sensor message reception error

Description

When battery control unit detects pressure sensor message reception error, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1F4102	(a) Pressure sensor has no message.	• Wire harness • BMS main control

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	Clear DTCs

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

NG

2	Check wire harness

(a) Check for continuity between BMS main control female terminal wire harness A1-10 and No.5 pin of pressure sensor terminal.

(b) Check for continuity between BMS main control female terminal wire harness A1-28 and No.6 pin of pressure sensor terminal.

Result:

Result	Proceed to
Wire harness is abnormal	NG
Wire harness is normal	OK

OK → **Repair faulty part and replace wire harness**

NG

3	**Check wire harness**

(a) Check if the resistance between BMS main control male terminals A1-10 and A1-28 is 120 Ω.

Standard value

Multimeter connection	Detection condition	Specified condition
A1-40# - A1-10#	Always connected	No continuity
A1-01# - A1-10#	Always connected	No continuity
A1-02# - A1-10#	Always connected	No continuity
A1-05# - A1-10#	Always connected	No continuity
A1-29# - A1-10#	Always connected	No continuity
A1-30# - A1-10#	Always connected	No continuity
A1-31# - A1-10#	Always connected	No continuity
A1-32# - A1-10#	Always connected	No continuity
A1-40# - A1-28#	Always connected	No continuity
A1-01# - A1-28#	Always connected	No continuity
A1-02# - A1-28#	Always connected	No continuity

Multimeter connection	Detection condition	Specified condition
A1-05# - A1-28#	Always connected	No continuity
A1-29# - A1-28#	Always connected	No continuity
A1-30# - A1-28#	Always connected	No continuity
A1-31# - A1-28#	Always connected	No continuity
A1-32# - A1-10#	Always connected	No continuity

OK → **Replace BMS main control**

NG

4	Check pressure sensor

(a) Check that pins 5, 6 and pins 2, 1 of pressure sensor are not short respectively.

Result:

Result	Proceed to
Short circuit	NG
No short circuit	OK

NG → **Replace pressure sensor (See page DL-55)**

OK

Diagnosis ends

DTC	**P1F4104**	**Pressure sensor internal fault**
DTC	**P1F4000**	**Pressure out of measurement range**

Description

When battery control unit detects pressure sensor internal fault, the battery control unit records DTC.

DTC No.	DTC detection condition	Faulty area
P1F4104	(a) Pressure sensor itself fault.	• Pressure sensor
P1F4000	(a) Pressure sensor itself fault.	• Pressure sensor

Inspection procedure

Note: After DTCs are read successfully, store all DTCs and the corresponding fault snapshots (freeze frames).

1	**Clear DTCs**

(a) Clear DTC, wait for 10 minutes, power on and power off again, and read if this DTC can still be read with diagnostic tester.

Result

Result	Proceed to
This DTC still can be read	NG
This DTC cannot be read	OK

OK → **Diagnosis ends**

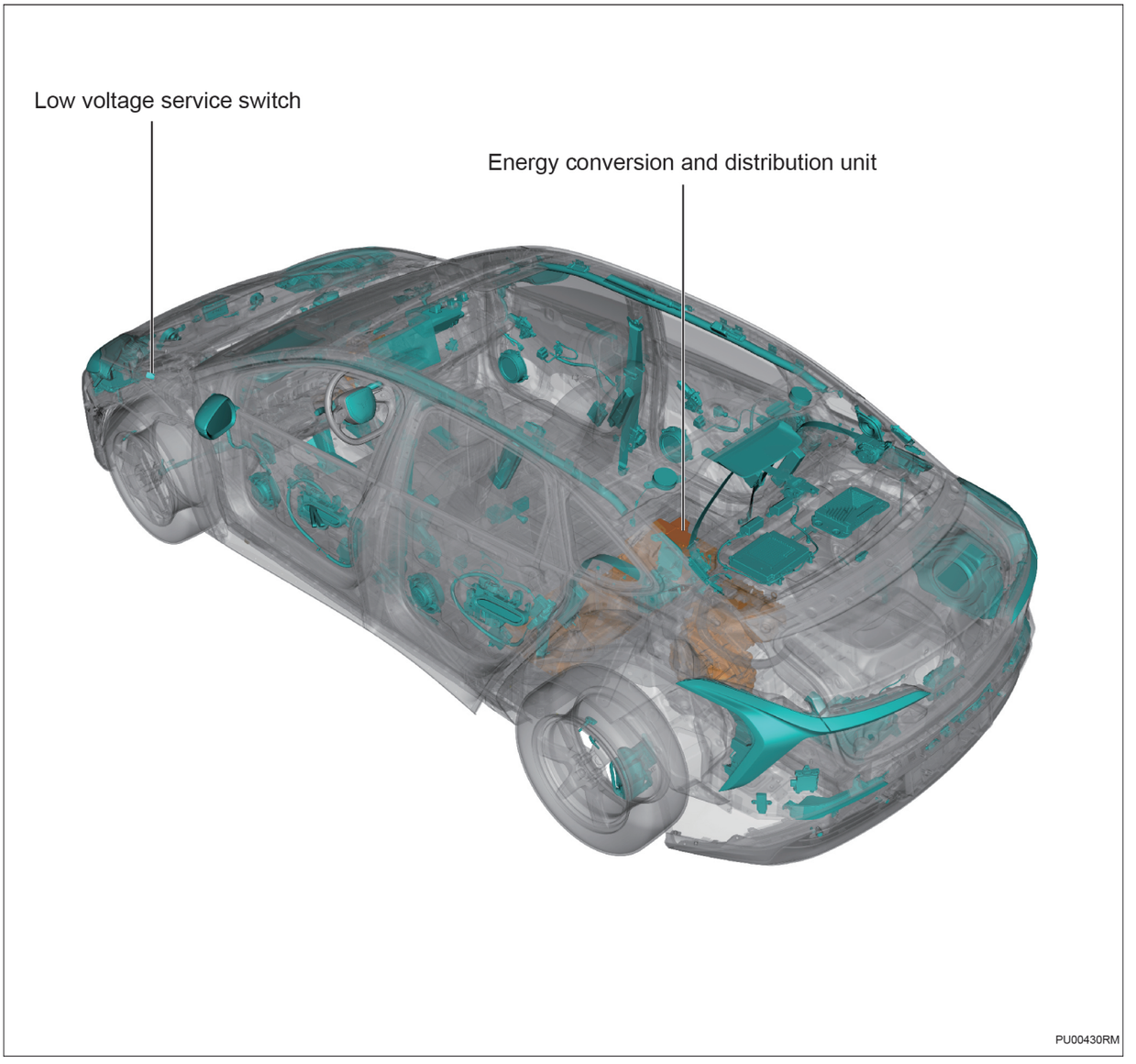
NG

Replace battery pressure sensor (See page DL-55)

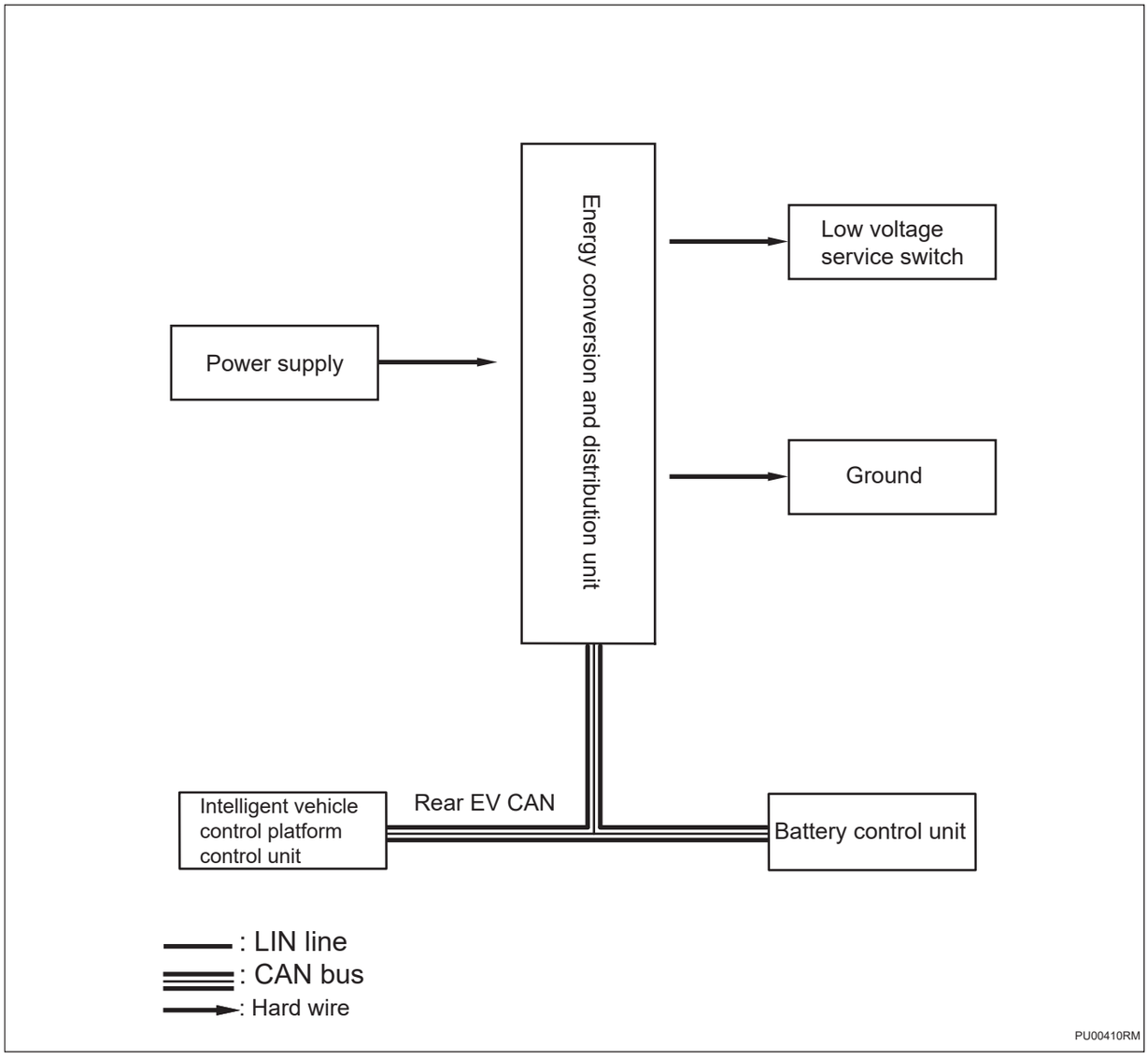
Energy conversion and distribution control system

Energy conversion and distribution unit

Part position



System diagram



System description

1. Function overview

(a) Energy conversion and distribution unit integrates with high voltage distribution box, charger, DCDC and other functions as a unit.

(b) AC and DC conversion function can be achieved.

(c) Voltage conversion between different voltage platforms can be achieved.

Data parameter

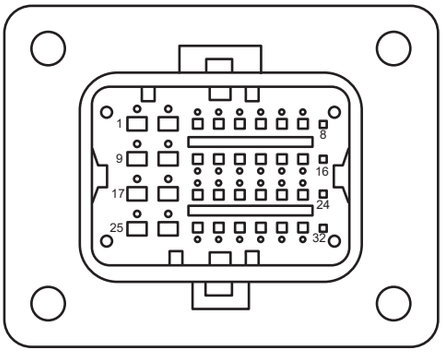
Energy conversion and distribution unit

Item	Max	OK	Minimum
Operating voltage (V)	16	—	9
Operating current (A)	—	3	—

DCDC output voltage

Item	Max	OK	Minimum
Operating voltage (V)	16	14.5	9
Operating current (A)	208	—	—

ECU terminal



Energy conversion and distribution unit

PU00400RM

Energy conversion and distribution unit			
Pin number	**Definition**	**Pin number**	**Definition**
1	Vehicle KL31 power (BMS_KL31)	17	—
2	Vehicle KL30 power (BMS_KL30)	18	—
3	BMS: Vehicle KL15 power (BMS_ KL15)	19	DC charging CAN_L (ChargeCANL)
4	—	20	High voltage interlock input 1 (Interlock in1)
5	BMS: Collision hard wire signal (Crash signal)	21	—
6	—	22	High voltage interlock output 1 (Interlock out1)
7	BMS: EV_CAN_H (EV_CANH)	23	DC charging CAN_H (ChargeCANH)
8	BMS: EV_CAN_L (EV_CANL)	24	Battery internal communication CAN_H (BatteryCANH)
9	—	25	Contactor redundant power supply
10	—	26	Contactor power supply (Relay Power)
11	—	27	Battery internal communication CAN_L (BatteryCANL)

Energy conversion and distribution unit			
Pin number	**Definition**	**Pin number**	**Definition**
12	—	28	CP
13	—	29	OBC/DCDC: EV_CAN_H (EV_CANH)
14	—	30	OBC/DCDC: EV_CAN_L (EV_CANL)
15	DC charging auxiliary power supply (A-)	31	OBC/DCDC: GND
16	DC charging auxiliary power supply (A+)	32	OBC/DCDC: 12 V+

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
P1E0087	OBC key message communication fault	(See page ZD-1679)
P1E0288	ICANBusoff fault	(See page ZD-1679)
P1E0329	CP fault	(See page ZD-1679)
P1E0417	KL30 operating overvoltage	(See page ZD-1681)
P1E0516	KL30 operating undervoltage	(See page ZD-1681)
P1E0622	Coolant temperature too high fault	(See page ZD-1685)
P1E0721	Coolant temperature too low fault	(See page ZD-1685)
P1E0812	Short to VCC in inlet coolant temperature sampling	(See page ZD-1689)
P1E0911	Short to GND in inlet coolant temperature sampling	(See page ZD-1689)
P1E0A92	Insulation fault	(See page ZD-1652)
P1E0F87	OBC_A_MCUE2E fault	(See page ZD-1654)
P1E1036	HVAC frequency too high	(See page ZD-1691)
P1E1137	HVAC frequency too low	(See page ZD-1691)
P1E1217	HVAC voltage too high	(See page ZD-1691)
P1E1316	HVAC voltage too low	(See page ZD-1691)
P1E1412	Short to VCC in HVAC voltage sampling circuit	(See page ZD-1694)
P1E1511	Short to GND in HVAC voltage sampling circuit	(See page ZD-1694)
P1E1619	HIAC overcurrent fault	(See page ZD-1696)
P1E1712	Short to VCC in HVAC current sampling circuit	(See page ZD-1694)
P1E1811	Short to GND in HVAC current sampling circuit	(See page ZD-1694)
P1E1919	HIAC hardware overcurrent	(See page ZD-1696)
P1E1A19	HIAC TZ overcurrent	(See page ZD-1696)
P1E1B19	HIAC negative direction TZ overcurrent	(See page ZD-1696)

DTC	Detection Items	See page
P1E1C17	HVDC side overvoltage	(See page ZD-1656)
P1E1D16	HVDC side undervoltage	(See page ZD-1656)
P1E1E17	HVDCTZ overvoltage	(See page ZD-1748)
P1E1F19	HIDC output TZ overcurrent	(See page ZD-1658)
P1E2019	HIDC output overcurrent	(See page ZD-1658)
P1E6022	PFC (charging for primary side, discharging for secondary side) MOSFET temperature too high	(See page ZD-1737)
P1E6121	PFC (charging for primary side, discharging for secondary side) MOSFET temperature too low	(See page ZD-1737)
P1E6211	Short to GND in PFC MOSFET temperature sampling circuit	(See page ZD-1737)
P1E6312	Short to VCC in PFC MOSFET temperature sampling circuit	(See page ZD-1737)
P1E2222	Short to VCC in LLC diode (charging for primary side, discharging for secondary side) temperature sampling circuit	(See page ZD-1698)
P1E2321	Short to GND in LLC (charging for secondary side, discharging for primary side) diode temperature sampling circuit	(See page ZD-1698)
P1E2422	LLC (charging for secondary side, discharging for primary side) diode temperature too high	(See page ZD-1701)
P1E2521	LLC (charging for secondary side, discharging for primary side) diode temperature too low	(See page ZD-1701)
P1E2622	LLC (charging for primary side, discharging for secondary side) MOSFET temperature too high	(See page ZD-1701)
P1E2721	LLC (charging for primary side, discharging for secondary side) MOSFET temperature too low	(See page ZD-1701)
P1E2811	Short to GND in LLC (charging for primary side, discharging for secondary side) MOSFET temperature sampling circuit	(See page ZD-1698)
P1E2912	Short to VCC in LLC (charging for primary side, discharging for secondary side) MOSFET temperature sampling circuit	(See page ZD-1698)
P1E2B17	Vbus voltage overvoltage fault	(See page ZD-1660)
P1E2C12	Short to VCC in Vbus voltage sampling circuit	(See page ZD-1660)
P1E641C	OBC sampling offset error	(See page ZD-1687)
P1E2E19	HIDC overcurrent	(See page ZD-1662)
P1E2F19	HVDC side current hardware overcurrent	(See page ZD-1664)
P1E3017	HVDC side overvoltage	(See page ZD-1704)
P1E3116	HVDC input undervoltage	(See page ZD-1704)

DTC	Detection Items	See page
P1E3217	HVDC side hardware overvoltage	(See page ZD-1704)
P1E3419	LIDC output current hardware overcurrent	(See page ZD-1706)
P1E3592	Static switch failed	(See page ZD-1708)
P1E3616	Vbat undervoltage fault	(See page ZD-1709)
P1E3717	Vbattt overvoltage	(See page ZD-1709)
P1E3817	LVDC side hardware overvoltage	(See page ZD-1712)
P1E3916	LVDC side voltage hardware undervoltage	(See page ZD-1712)
P1E3A22	HVDC side MOS temperature too high	(See page ZD-1665)
P1E3B21	HVDC side MOS temperature too low	(See page ZD-1665)
P1E3C12	Short to VCC in HVDC side MOS temperature sampling circuit	(See page ZD-1668)
P1E3D11	Short to GND in HVDC side MOS temperature sampling circuit	(See page ZD-1668)
P1E3E22	LVDC side MOSFET temperature too high	(See page ZD-1669)
P1E3F21	LVDC side MOSFET temperature too low	(See page ZD-1669)
P1E4012	Short to VCC in LVDC side temperature sampling circuit	(See page ZD-1714)
P1E4111	Short to GND in LVDC side temperature sampling circuit	(See page ZD-1714)
P1E4219	Pre-charging current hardware overcurrent	(See page ZD-1716)
P1E4313	Open in high voltage side capacitor	(See page ZD-1718)
P1E4549	Drive shutdown path fault	(See page ZD-1720)
P1E4812	DCDC HVDC current detection A1, short to power supply	(See page ZD-1722)
P1E4911	DCDC LVDC side current detection A2, short to ground	(See page ZD-1723)
P1E4A12	DCDC LVDC side current detection A2, short to power supply	(See page ZD-1723)
P1E4D1D	OBC primary/secondary side current detection zero drift too large	(See page ZD-1672)
P1E4F12	Short to VCC in DCDC MOSFET NTC sampling circuit	(See page ZD-1673)
P1E5011	Short to GND in DCDC MOSFET NTC sampling circuit	(See page ZD-1673)
P1E5112	HVDC terminal voltage ADV3, short to power supply	(See page ZD-1725)
P1E5247	OBC watchdog fault	(See page ZD-1727)
P1E5349	Drive shutdown path fault	(See page ZD-1729)
P1E5448	OBC program flow monitoring fault	(See page ZD-1730)
P1E5612	HVDC terminal output current AD A4, short to power supply	(See page ZD-1732)
P1E5843	MCU power-on self-check fault	(See page ZD-1734)

DTC	Detection Items	See page
P1E5948	MCU program flow monitoring fault	(See page ZD-1735)
P1E5A1C	Difference between two HVDC voltage sampling values too large	(See page ZD-1675)
P1E5C12	Short to VCC in outlet temperature sampling	(See page ZD-1677)
P1E5D11	Short to GND in outlet temperature sampling	(See page ZD-1677)
P1E6517	Internal auxiliary power supply voltage overvoltage fault	(See page ZD-1740)
P1E6616	Internal auxiliary power supply voltage undervoltage fault	(See page ZD-1740)
P1E6714	High voltage interlock disconnected	(See page ZD-1742)
P1E6815	Short to power supply in high voltage interlock	(See page ZD-1742)
P1E6911	Short to ground fault	(See page ZD-1742)
U005588	Rear EV CAN bus off	(See page ZD-1756)
U029A87	Battery management system node lost	(See page ZD-1750)
U014B87	VDC397 node lost	(See page ZD-1750)
U044B82	VDC397 message content fault	(See page ZD-1750)
U044B83	VDC397 message content fault	(See page ZD-1750)
U059B82	Battery management system message content fault	(See page ZD-1750)
U059B83	Battery management system message content fault	(See page ZD-1750)

ZD

DTC P1E0A92 Insulation fault

Description

When insulation fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0A92	• The received HCU_ Discharge Permission signal is Permission	• Insulation resistance is less than 200 kΩ	100	Periodic type	1 ms	• Wire harness and connector • Energy conversion and distribution unit • High voltage terminal

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0A92	• OBC discharging stops	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check high voltage terminal connection**

(a) Check if high voltage terminal connection is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

ZD

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	P1E0F87	OBC_A_MCU E2E fault

Description

When a fault is detected in the OBC receiving MCU E2E messages, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0F87	• Network diagnosis ON • NM mode is Network mode • ICAN non Bus off	• 10 times	20 ms	Periodic type	NA	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0F87	• MCU E2E message received by OBC fault	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

ZD

DTC	**P1E1C17**	**HVDC side overvoltage**
DTC	**P1E1D16**	**HVDC side undervoltage**

Description

When HVDC fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1C17	• After waking up PCDU	• HVDC voltage is higher than 503 (±1%) V	100 times	Periodic type	10 ms	• Battery • HCU control command • Wire harness and connector • Energy conversion and distribution unit
P1E1D16	• After waking up PCDU	• HVDC voltage is lower than 206 (±1%) V	100 times	Periodic type	10 ms	• Battery • HCU control command • Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1C17	• OBC does not operate	Not come on
P1E1D16	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check high voltage load**

(a) Check for short in high voltage load.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

ZD

Diagnosis ends

DTC	P1E1F19	HIDC output TZ overcurrent
DTC	P1E2019	HIDC output overcurrent

Description

When HVAC short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1F19	• After waking up PCDU	• Output current is more than 40 A (±3%)	10 times	Periodic type	—	• Wire harness and connector • Energy conversion and distribution unit • Battery
P1E2019	• After waking up PCDU	• Output current is more than 29 A (±3%)	2 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Battery

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1F19	• OBC does not operate	Not come on
P1E2019	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

ZD

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

ZD

DTC	**P1E2B17**	**Vbus voltage overvoltage fault**
DTC	**P1E2C12**	**Short to VCC in Vbus voltage sampling circuit**

Description

When a fault is detected in Vbus, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2B17	• After waking up PCDU	• Battery is higher than 465 V	Trigger 10 times continuously	Event-based	/	• Energy conversion and distribution unit
P1E2C12	• After waking up PCDU	• AD > 4000	10 times	Event-based	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E2B17	• OBC does not operate	Not come on
P1E2C12	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E2E19	HIAC overcurrent fault

Description

When HIDC overcurrent fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2E19	• The buck command sent by HCU is received (when BUCK command is not received, it indicates that the prerequisites for fault occurrence are not met, and the fault state will be automatically exited)	• Input current is more than 22 A±3%	100 times	Periodic type	1 ms	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E2E19	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	Diagnosis ends

OK

2	Check high voltage load

(a) Check for short in high voltage load.

NG → Perform repair according to malfunction

OK

ZD

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → Perform repair according to malfunction

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E2F19	HVDC side current hardware overcurrent

Description

When sampling circuit damage or input / output terminal short circuit is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2F19	• The buck command sent by HCU is received	• Input current is more than 30 A±3%	Trigger 10 times continuously	Event-based	/	• Wire harness and connector • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E2F19	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check high voltage load

(a) Check for short in high voltage load.

NG → Perform repair according to malfunction

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → Perform repair according to malfunction

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E3A22	HVDC side MOS temperature too high

DTC	P1E3B21	HVDC side MOS temperature too low

Description

When HVDC side switch tube temperature fault occurs, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3A22	• The buck command or precharging command sent by HCU is received	HVDC side MOS temperature is higher than 130° C±3° C	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant
P1E3B21	• The buck command or precharging command sent by HCU is received	HVDC side MOS temperature is lower than -45° C±3° C	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3A22	• DCDC stops working	Not come on
P1E3B21	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Check connections and characteristics of CANH and CANL.

(e) Clear DTCs.

(f) Restart vehicle, read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	Diagnosis ends

NG

2	Check vehicle coolant

(a) Check if vehicle coolant is normal.

(b) Check if vehicle coolant flow control is normal.

NG → **Perform repair according to malfunction**

NG

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E3C12**	**Short to VCC in HVDC side MOS temperature sampling circuit**
DTC	**P1E3D11**	**Short to GND in HVDC side MOS temperature sampling circuit**

Description

When there is short in HVDC side switch tube temperature sampling circuit, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3C12	• The buck command or precharging command sent by HCU is received	Lower than -55° C (±3° C)	100	Event-based	10 ms	• Energy conversion and distribution unit
P1E3D11	• The buck command or precharging command sent by HCU is received	Higher than 200° C (±3° C)	100	Event-based	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3C12	• DCDC stops working	Not come on
P1E3D11	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → Diagnosis ends

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → Perform repair according to malfunction

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E3E22	LVDC side MOSFET temperature too high

DTC	P1E3F21	LVDC side MOSFET temperature too low

Description

When HVDC side switch tube temperature fault occurs, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3E22	• The buck command or precharging command sent by HCU is received	LVDC side MOS temperature is higher than 120° C±3° C	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant
P1E3F21	• The buck command or precharging command sent by HCU is received	LVDC side MOS temperature is lower than -45° C±3° C	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3E22	• DCDC stops working	Not come on
P1E3F21	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Check connections and characteristics of CANH and CANL.

(e) Clear DTCs.

(f) Restart vehicle, read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle coolant**

(a) Check if vehicle coolant is normal.

(b) Check if vehicle coolant flow control is normal.

NG → **Perform repair according to malfunction**

NG

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E4D1D	OBC primary/secondary side current detection zero drift too large

Description

When excessive difference between the primary-side and secondary-side current of DCDC fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4D1D	• DCDC primary/ secondary side current detection zero drift too large	• When DCDC is in standby (check if A1, A2 have zero drift), and when |A1| is more than 2 A or |A2| is more than 10 A for 100 ms	10 times	Periodic type	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4D1D	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E4F12	Short to VCC in DCDC MOSFET NTC sampling circuit

DTC	P1E5011	Short to GND in DCDC MOSFET NTC sampling circuit

Description

When DCDC MOSFET NTC sampling circuit short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4F12	• DCDC wake-up	• Lower than -55° C (±3° C)	10 times	Periodic type	10 ms	• Energy conversion and distribution unit
P1E5011	• DCDC wake-up	• Higher than 200° C (±3° C)	10 times	Periodic type	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4F12	• DCDC stops working	Not come on
P1E5011	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E5A1C	Difference between two HVDC voltage sampling values too large

Description

When a fault of excessive difference between the two HVDC voltage sampling is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5A1C	• PCDU wake-up	• Difference between two HVDC voltage is higher than or equal to 40 V	40	Periodic type	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5A1C	OBC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	P1E5C12	Short to VCC in outlet temperature sampling
DTC	P1E5D11	Short to GND in outlet temperature sampling

Description

When there is short in outlet temperature sampling circuit, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5C12	• PCDU wake-up	Lower than -55° C (±5° C)	50	Periodic type	20 ms	• Energy conversion and distribution unit • Wire harness and connector • Temperature sensor
P1E5D11	• PCDU wake-up	Higher than 150° C (±5° C)	50	Periodic type	20 ms	• Energy conversion and distribution unit • Wire harness and connector • Temperature sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5C12	• Short to VCC in outlet temperature sampling	Not come on
P1E5D11	• Short to VCC in outlet temperature sampling	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E0087**	**OBC key message communication fault**
DTC	**P1E0288**	**ICAN Busoff fault**
DTC	**P1E0329**	**CP fault**

Description

When communication fault occurs, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0087	• Network diagnosis ON • NM mode is Network mode • ICAN non Bus off	NA	Key message is missed for 10 consecutive times or E2E fault lasts 10 times	Event-based	NA	• Wire harness and connector • Energy conversion and distribution unit
P1E0288	• Network diagnosis ON • NM mode is Network mode	NA	ICAN occurs Busoff 3 times	Event-based	NA	• Wire harness and connector • Energy conversion and distribution unit
P1E0329	• MCU has been waken-up	Refer to Attachment 1	50 times	Periodic type	20 ms	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0087	• Unable to receive OBC message	Not come on
P1E0288	• ICAN bus off	Not come on
P1E0329	• CP invalid	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Check connections and characteristics of CANH and CANL.

(e) Clear DTCs.

(f) Restart vehicle, read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Check if CAN bus is connected abnormally or interfered**

OK

2	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E0417	KL30 operating overvoltage
DTC	P1E0516	KL30 operating undervoltage

Description

When the low-voltage power supply voltage of the energy conversion and distribution unit is too high or too low, the energy conversion and distribution unit records DTC.

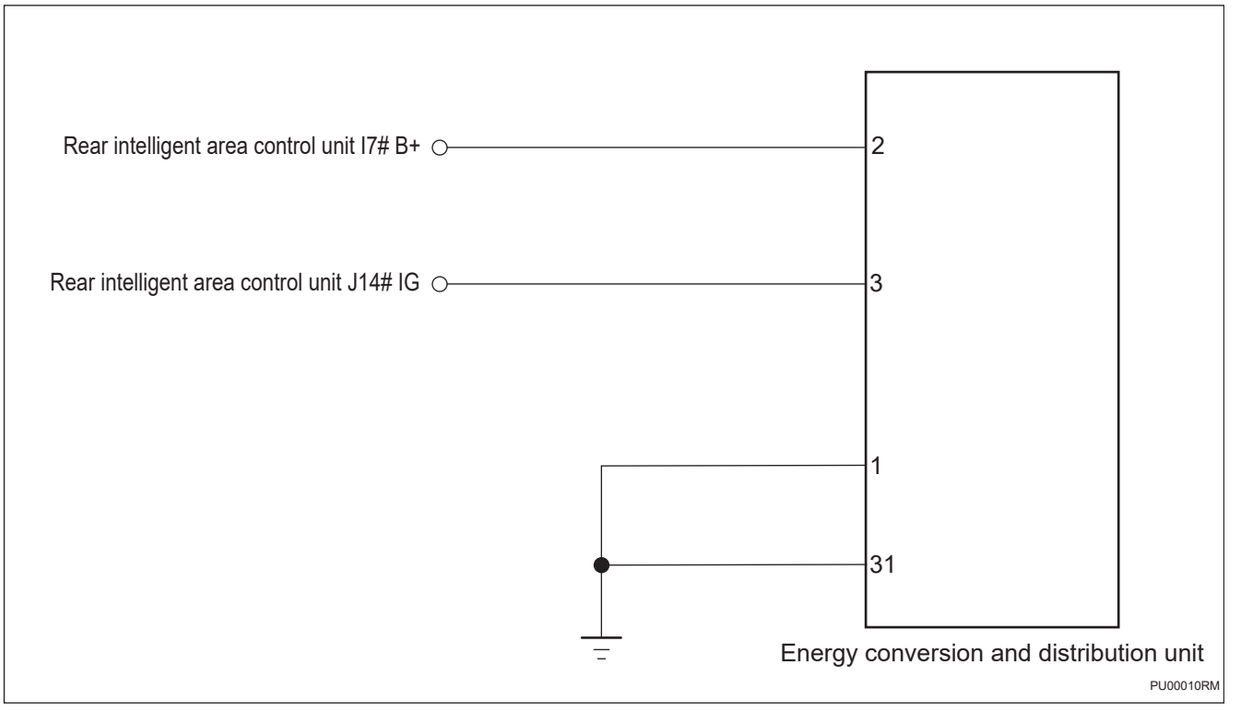
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0417	• MCU has been waken-up	• KL30 > 16.5 (± 0.2) V	200 times	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • Battery/charging system
P1E0516	• MCU has been waken-up	KL30 < 8 (± 0.2) V	200 times	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • Battery/charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0417	• ECU operating voltage overvoltage	Not come on
P1E0516	• ECU operating voltage undervoltage	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Power off, wait for 30 seconds, and read DTCs after power-on again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check battery voltage (low voltage battery)**

(a) Start the vehicle, measure battery voltage.

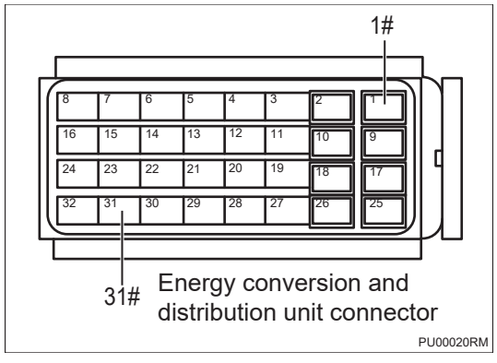
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	Check ground of energy conversion and distribution unit



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the energy conversion and distribution unit connector.

(d) According to value in the table, measure resistance.

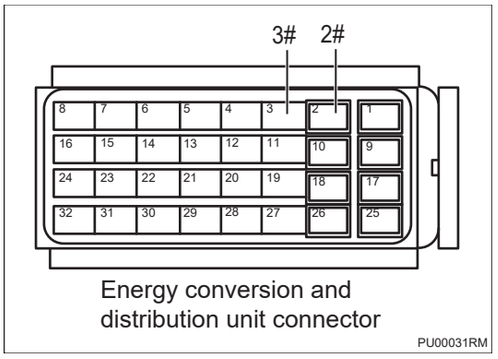
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 1# - body ground	Always connected	Less than 1 Ω
Energy conversion and distribution unit connector 31# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check power supply of energy conversion and distribution unit**



Energy conversion and distribution unit connector

PU00031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage
Energy conversion and distribution unit connector 3# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

5	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

Replace energy conversion and distribution unit (See page DL-62)

DTC	P1E0622	Coolant temperature too high fault
DTC	P1E0721	Coolant temperature too low fault

Description

When communication fault occurs, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0622	• The received charging mode command is Current / Voltage Mode • The received HCU_ Discharge Permission signal is Permission • The buck command or precharging command sent by HCU is received	Water temperature > 85° C (±3° C)	50	Periodic type	20 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant
P1E0721	• The received charging mode command is Current / Voltage Mode • The received HCU_ Discharge Permission signal is Permission • The buck command or precharging command sent by HCU is received	Water temperature < -45 (±3)° C	50	Periodic type	20 ms	• Wire harness and connector • Energy conversion and distribution unit • Coolant

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0622	• The water temperature exceeds the upper limit of 85° C (±3° C)	Not come on
P1E0721	• The water temperature exceeds the lower limit of -45° C (±3° C)	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Check connections and characteristics of CANH and CANL.

(e) Clear DTCs.

(f) Restart vehicle, read DTCs.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle coolant**

(a) Check if vehicle coolant is normal.

(b) Check if vehicle coolant flow control is normal.

NG → **Perform repair according to malfunction**

NG

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E641C	OBC sampling offset error

Description

When OBC short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E641C	• After waking up PCDU	• HVAC&HI-DC sampling offset > 1.7 V or < 1.6 V	Power-on self-check once	Event-based	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E641C	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E0812**	**Short to VCC in inlet coolant temperature sampling**
DTC	**P1E0911**	**Short to GND in inlet coolant temperature sampling**

Description

When water inlet temperature sampling fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E0812	• After waking up PCDU	• AD > 4000	50	Periodic type	20	• Wire harness and connector • Energy conversion and distribution unit • Temperature sensor
P1E0911	• After waking up PCDU	AD < 100	50	Periodic type	20	• Wire harness and connector • Energy conversion and distribution unit • Temperature sensor

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E0812	• The water temperature exceeds the upper limit of 250 (± 3)° C	Not come on
P1E0911	• The water temperature exceeds the lower limit of -70 (± 3)° C	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E1036**	**HVAC frequency too high**
DTC	**P1E1137**	**HVAC frequency too low**
DTC	**P1E1217**	**HVAC voltage too high**
DTC	**P1E1316**	**HVAC voltage too low**

Description

When HVAC fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1036	• The received charging mode command is Current / Voltage Mode	• AC input frequency is higher than 65 (±0.1) Hz	250 times	Periodic type	10 ms	• AC voltage • Charging pile • Wire harness and connector • Energy conversion and distribution unit
P1E1137	• The received charging mode command is Current / Voltage Mode	• AC input frequency is lower than 45 (±0.1) Hz	250 times	Periodic type	10 ms	• AC voltage • Charging pile • Wire harness and connector • Energy conversion and distribution unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1217	• The received charging mode command is Current / Voltage Mode	• AC input voltage is higher than 270 (±3%) V	100 times	Periodic type	10 ms	• AC voltage • Charging pile • Wire harness and connector • Energy conversion and distribution unit
P1E1316	• The received charging mode command is Current / Voltage Mode	• AC input voltage is lower than 75 (±3%) V	100 times	Periodic type	10 ms	• AC voltage • Charging pile • Wire harness and connector • Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1036	• OBC does not operate	Not come on
P1E1137	• OBC does not operate	Not come on
P1E1217	• OBC does not operate	Not come on
P1E1316	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check AC voltage**

(a) Check if AC voltage is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E1412**	**Short to VCC in HVAC voltage sampling circuit**
DTC	**P1E1511**	**Short to GND in HVAC voltage sampling circuit**
DTC	**P1E1712**	**Short to VCC in HVAC current sampling circuit**
DTC	**P1E1811**	**Short to GND in HVAC current sampling circuit**

Description

ZD When HVAC short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1412	• After waking up PCDU	• AD > 4000	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit
P1E1511	• After waking up PCDU	• AD < 100	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit
P1E1712	• After waking up PCDU	• AD > 4000	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit
P1E1811	• After waking up PCDU	• AD < 100	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1412	• OBC does not operate	Not come on
P1E1511	• OBC does not operate	Not come on
P1E1712	• OBC does not operate	Not come on
P1E1811	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E1619**	**HIAC overcurrent fault**
DTC	**P1E1919**	**HIAC hardware overcurrent**
DTC	**P1E1A19**	**HIAC TZ overcurrent**
DTC	**P1E1B19**	**HIAC negative direction TZ overcurrent**

Description

When HVAC fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1619	• The received HCU _ Discharge Permission signal is Permission	• Higher than 3.9 kw for 100 ms	200	Periodic type	10 ms	• External load under external discharge conditions • Wire harness and connector • Energy conversion and distribution unit
P1E1919	• After waking up PCDU	• AC side current is more than 75 A (±3%)	Trigger 10 times continuously	Event-based	/	• Charging pile • Wire harness and connector • Energy conversion and distribution unit
P1E1A19	• After waking up PCDU	• AC side current is more than 75 A (±3%)	Trigger 10 times continuously	Event-based	/	• Charging pile • Wire harness and connector • Energy conversion and distribution unit
P1E1B19	• After waking up PCDU	• AC side current negative direction current is less than -74 A	Trigger 10 times continuously	Event-based	/	• Charging pile • Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1619	• OBC does not operate	Not come on
P1E1919	• OBC does not operate	Not come on
P1E1A19	• OBC does not operate	Not come on
P1E1B19	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check high voltage load**

(a) Check for short in high voltage load.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

ZD

Diagnosis ends

DTC	**P1E2222**	**Short to VCC in LLC diode (charging for primary side, discharging for secondary side) temperature sampling circuit**
DTC	**P1E2321**	**Short to GND in LLC (charging for secondary side, discharging for primary side) diode temperature sampling circuit**
DTC	**P1E2811**	**Short to GND in LLC (charging for primary side, discharging for secondary side) MOSFET temperature sampling circuit**
DTC	**P1E2912**	**Short to VCC in LLC (charging for primary side, discharging for secondary side) MOSFET temperature sampling circuit**

Description

When LLC short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2222	• After waking up PCDU	• Lower than -50° C (±3° C)	10 times	Event-based	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E2321	• After waking up PCDU	• Higher than 180° C (±3° C)	10 times	Event-based	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E2811	• After waking up PCDU	• Higher than 180° C (±3° C)	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E2912	• After waking up PCDU	• Lower than -50° C (±3° C)	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E2222	• OBC does not operate	Not come on
P1E2321	• OBC does not operate	Not come on
P1E2811	• OBC does not operate	Not come on
P1E2912	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → Diagnosis ends

OK

2	Check cooling system

(a) Check if cooling system is normal.

NG → Perform repair according to malfunction

ZD

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → Perform repair according to malfunction

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	**P1E2422**	**LLC (charging for secondary side, discharging for primary side) diode temperature too high**
DTC	**P1E2521**	**LLC (charging for secondary side, discharging for primary side) diode temperature too low**
DTC	**P1E2622**	**LLC (charging for primary side, discharging for secondary side) MOSFET temperature too high**
DTC	**P1E2721**	**LLC (charging for primary side, discharging for secondary side) MOSFET temperature too low**

Description

When an abnormal temperature fault is detected in the LLC, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2422	• After waking up PCDU	• LLC (charging for secondary side, discharging for primary side) diode pipe temperature is higher than 100° C (±3° C)	100 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E2521	• After waking up PCDU	• LLC (charging for secondary side, discharging for primary side) diode pipe temperature is lower than -45° C (±3° C)	100 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E2622	• After waking up PCDU	• LLC (charging for primary side, discharging for secondary side) MOSFET temperature is higher than 100° C (±3° C)	100 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E2721	• After waking up PCDU	• LLC (charging for primary side, discharging for secondary side) MOSFET temperature is lower than -45° C (±3° C)	100 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E2422	• OBC stops working	Not come on
P1E2521	• OBC stops working	Not come on
P1E2622	• OBC stops working	Not come on
P1E2721	• OBC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	**Diagnosis ends**

OK

2	**Check cooling system**

(a) Check if cooling system is normal.

NG	**Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG	**Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG	**Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E3017**	**HVDC side overvoltage**
DTC	**P1E3116**	**HVDC input undervoltage**
DTC	**P1E3217**	**HVDC side hardware overvoltage**

Description

When an abnormal HVDC voltage is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3017	• The buck command or precharging command sent by HCU is received	• HVDC voltage is lower than 205 V±1% or lower than 100 V ±1% within 400 ms	20 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit
P1E3116	• The buck command sent by HCU is received	• HVDC input voltage is lower than 205 V±1%	20 times/40 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Battery
P1E3217	• The buck command or precharging command sent by HCU is received	• Voltage is higher than 550 V ± 1%	Trigger 10 times continuously	Event-based	/	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3017	• DCDC stops working	Not come on
P1E3116	• DCDC stops working	Not come on
P1E3217	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check high voltage battery load

(a) Check if high voltage battery load is abnormal.

NG → **Perform repair according to malfunction**

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

ZD

DTC	**P1E3419**	**LIDC output current hardware overcurrent**

Description

When LIDC output current hardware overcurrent is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3419	• The buck command sent by HCU is received	• LVDC output current is more than 250 A±2%	Trigger 10 times continuously	Event-based	/	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3419	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	Diagnosis ends

OK

2	Check high voltage load

(a) Check for short in high voltage load.

NG	Perform repair according to malfunction

ZD

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG	Perform repair according to malfunction

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG	Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E3592	Static switch failed

Description

When voltage difference between two terminals of static switch is too large, the energy conversion and distribution unit records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3592	• The buck command or precharging command sent by HCU is received	DCDC _LVDC _MEAS. DCDC _LVDC _Current * 0.0025+0.5	200 times	Event-based	1 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3592	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK	Diagnosis ends

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E3616	Vbat undervoltage fault

DTC	P1E3717	Vbattt overvoltage

Description

When Vbat voltage is abnormal, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3616	• The buck command or precharging command sent by HCU is received	Voltage is lower than 7.5 V	200 times	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • Low voltage battery
P1E3717	• The buck command or precharging command sent by HCU is received	Voltage is higher than 17.5 V±1%	40 times	Periodic type	10 ms	• Energy conversion and distribution unit • Wire harness and connector • Control command

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3616	• DCDC stops working	Not come on
P1E3717	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	Check battery voltage (low voltage battery)

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	**P1E3817**	**LVDC side hardware overvoltage**
DTC	**P1E3916**	**LVDC side voltage hardware undervoltage**

Description

When LVDC voltage is abnormal, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E3817	• The buck command or precharging command sent by HCU is received	Output voltage is higher than 20.9 V±1%	Trigger 10 times continuously	Event-based	/	• Energy conversion and distribution unit • Wire harness and connector
P1E3916	• The buck command or precharging command sent by HCU is received	LVDC side voltage is lower than 7.24 V±1%	Trigger 10 times continuously	Event-based	/	• Energy conversion and distribution unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E3817	• DCDC stops working	Not come on
P1E3916	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2 Check battery voltage (low voltage battery)

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3 Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	**P1E4012**	**Short to VCC in LVDC side temperature sampling circuit**
DTC	**P1E4111**	**Short to GND in LVDC side temperature sampling circuit**

Description

When there is short in low voltage side temperature sampling circuit, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4012	• The buck command or precharging command sent by HCU is received	Lower than -55° C (±3° C)	10 times	Event-based	10 ms	• Energy conversion and distribution unit
P1E4111	• The buck command or precharging command sent by HCU is received	Higher than 200° C (±3° C)	10 times	Event-based	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4012	• DCDC stops working	Not come on
P1E4111	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E4219	Pre-charging current hardware overcurrent

Description

When HVDC side short fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4219	• The precharging command sent by HCU is received	• Precharge low voltage side current is less than -80 A	Trigger 10 times continuously	Event-based	\	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4219	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check high voltage load**

(a) Check for short in high voltage load.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

ZD

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

ZD

OK

Diagnosis ends

DTC	P1E4313	Open in high voltage side capacitor

Description

When high voltage side capacitor open circuit fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4313	• The precharging command sent by HCU is received	• Precharge voltage rising slope is greater than 10 V/ms	5 times	Event-based	1 ms	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4313	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check high voltage terminal connection**

(a) Check if high voltage terminal connection is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E4549	Drive shutdown path fault

Description

When the drive shutdown route fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4549	• Power-off sleep	• ADC _DCDC _ILVDC > 10 A	10 times	Event-based	—	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4549	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E4812	DCDC HVDC current detection A1, short to power supply

Description

When HVDC current detection A1 short to power supply fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4812	• DCDC wake-up	• AD > 4000	10 times	Periodic type	10 ms	• Energy conversion and distribution unit • CA25G-0.35-B wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4812	• DCDC stops working	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E4911**	**DCDC LVDC side current detection A2, short to ground**
DTC	**P1E4A12**	**DCDC LVDC side current detection A2, short to power supply**

Description

When short fault is detected in DCDC LVDC side current detection A2, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E4911	• DCDC wake-up	• AD < 100	10 times	Periodic type	10 ms	• Energy conversion and distribution unit • CA26G-0.35-O/BR wire harness
P1E4A12	• DCDC wake-up	• AD > 4000	10 times	Periodic type	10 ms	• Energy conversion and distribution unit • CA26G-0.36-O/BR wire harness

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E4911	• DCDC stops working	Not come on
P1E4A12	• DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → Perform repair according to malfunction

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E5112	HVDC terminal voltage AD V3, short to power supply

Description

When HVDC terminal voltage AD V3 fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5112	• DCDC wake-up	• AD > 4000	10 times	Periodic type	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5112	• OBC&DCDC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E5247**	**OBC watchdog fault**

Description

When OBC watchdog fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5247	• DCDC wake-up	• The MCU detects that duty cycle of the DSP watchdog input signal is less than 30%,or more than 70%, or that the cycle is less than 30 ms or more than 50 ms	More than or equal to 3 times	Periodic type	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5247	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

ZD

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E5349	Drive shutdown path fault

Description

When the drive shutdown route fault is detected, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5349	• DCDC wake-up	• When PCDU is powered off and enters pre-sleep state, AD_LLC_AD_LLC_HVDC_I > 2 A	10 times	Periodic type	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5349	• OBC does not operate	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E5448	OBC program flow monitoring fault

Description

When an OBC program flow monitoring fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5448	• OBC wake-up	• NA	3 times	Periodic type	100 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5448	• OBC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

ZD

Diagnosis ends

DTC	P1E5612	HVDC terminal output current AD A4, short to power supply

Description

When HVDC terminal output current AD V4 short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5612	• OBC wake-up	• AD > 4000	2 times	Periodic type	10 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5612	• OBC stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E5843	MCU power-on self-check fault

Description

When MCU power-on self-check fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5843	• MCU wake-up	• MCU_ 2.5V_ Sample exceeds 2.5 V±6%	1 times	Event-based	10 ms	• Energy conversion and distribution unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5843	• MCU reset/stop	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E5948	MCU program flow monitoring fault

Description

When MCU program flow monitoring fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E5948	• MCU wake-up	• NA	10 times	Periodic type	100 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E5948	MCU stops working	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

3	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → Replace energy conversion and distribution unit (See page DL-62)

OK

Diagnosis ends

DTC	P1E6022	PFC (charging for primary side, discharging for secondary side) MOSFET temperature too high
DTC	P1E6121	PFC (charging for primary side, discharging for secondary side) MOSFET temperature too low
DTC	P1E6211	Short to GND in PFC MOSFET temperature sampling circuit
DTC	P1E6312	Short to VCC in PFC MOSFET temperature sampling circuit

Description

When HVAC short fault is detected, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E6022	• After waking up PCDU	• PFC (charging for primary side, discharging for secondary side) MOSFET temperature is higher than 110° C (±3° C)	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E6121	• After waking up PCDU	• PFC (charging for primary side, discharging for secondary side) MOSFET temperature is lower than -45° C±3° C	100	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E6211	• After waking up PCDU	• Higher than 180° C (±3° C)	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system
P1E6312	• After waking up PCDU	• Lower than -50° C (±3° C)	10 times	Periodic type	10 ms	• Wire harness and connector • Energy conversion and distribution unit • Cooling system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E6022	• OBC does not operate	Not come on
P1E6121	• OBC does not operate	Not come on
P1E6211	• OBC does not operate	Not come on
P1E6312	• OBC does not operate	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check cooling system

(a) Check if cooling system is normal.

NG → **Perform repair according to malfunction**

OK

3	Check CAN bus

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	Clear DTCs again

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

ZD

DTC	**P1E6517**	**Internal auxiliary power supply voltage overvoltage fault**
DTC	**P1E6616**	**Internal auxiliary power supply voltage undervoltage fault**

Description

When internal auxiliary power supply voltage is abnormal, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E6517	• PCDU wake-up	Internal auxiliary power supply voltage > 23 V	5 times	Periodic type	20 ms	• Energy conversion and distribution unit
P1E6616	• PCDU wake-up	Internal auxiliary power supply voltage < 17 V	5 times	Periodic type	20 ms	• Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E6517	• Internal auxiliary power supply voltage overvoltage fault	Not come on
P1E6616	• Internal auxiliary power supply voltage undervoltage fault	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

NG

2	**Check low voltage battery of vehicle**

(a) Check if low voltage battery of vehicle is normal.

NG → **Check and repair low voltage battery**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**P1E6714**	**High voltage interlock disconnected**
DTC	**P1E6815**	**Short to power supply in high voltage interlock**
DTC	**P1E6911**	**Short to ground fault**

Description

When there is short to ground or open in high voltage interlock, the energy conversion and distribution unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E6714	• PCDU wake-up	• Duty ratio of readback PWM pin INTLOCK _ UP _ 1 is more than 60%; OR • Duty ratio of readback pin INTLOCK _ UP _ 1 is less than 40%; OR • Duty ratio of readback pin INTLOCK _ UP _ 2 is more than 60%; OR • Duty ratio of readback pin INTLOCK _ UP _ 2 is less than 40%; • Frequency of readback pin INTLOCK _ UP _ 1 is more than 1200 hz; OR • Frequency of readback pin INTLOCK _ UP _ 1 is less than 800 hz; OR • Frequency of readback pin INTLOCK _ UP _ 2 is more than 1200 hz; OR • Frequency of readback pin INTLOCK _ UP _ 2 is less than 800 hz	100 times	Periodic type	10 ms	• Low voltage service switch
P1E6815	• PCDU wake-up	• Level value of readback pin	100 times	Periodic type	10 ms	• Low voltage service switch

ZD

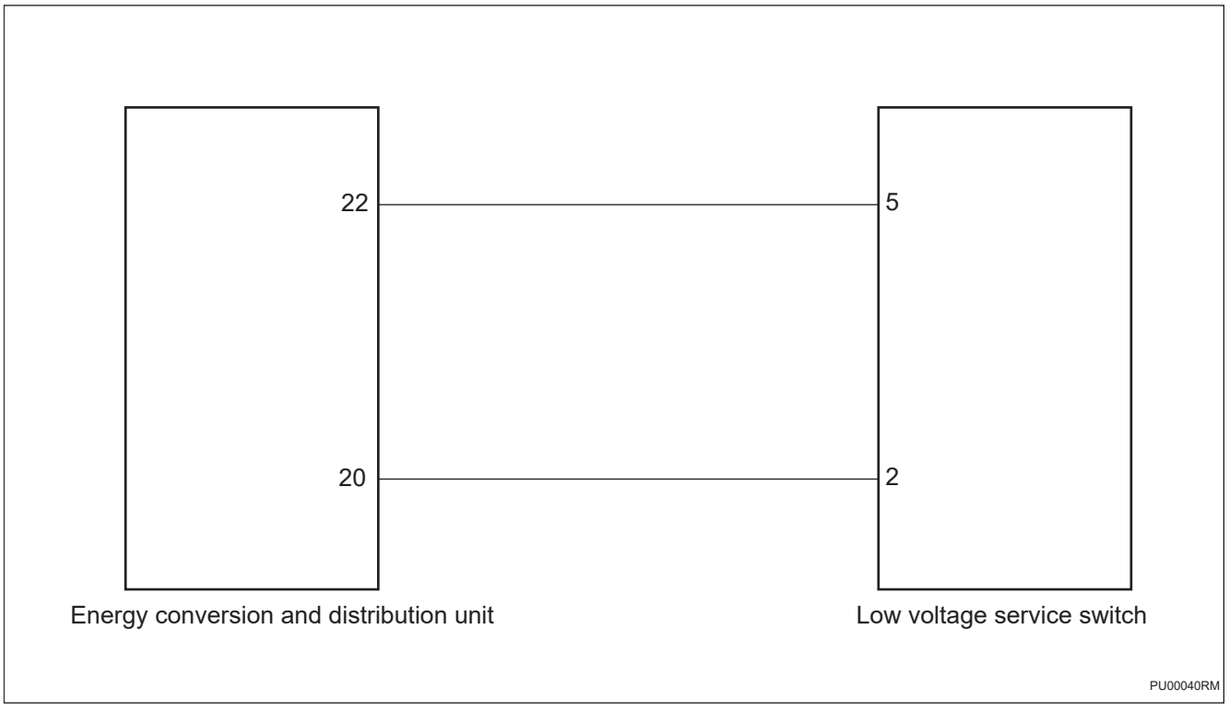
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		INTLOCK _ UP _ 1 is 0; OR • Level value of readback pin INTLOCK _ UP _ 2 is 0				
P1E6911	• PCDU wake-up	• Level value of readback pin INTLOCK _ UP _ 1 is 1; AND • Level value of readback pin INTLOCK _ UP _ 2 is 1; AND • Level value of readback pin HVIL _ Detection is 1	100 times	Periodic type	10 ms	• Low voltage service switch

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E6714	• Short to ground or open in high voltage interlock	Not come on
P1E6815	• Short to VCC in high voltage interlock	Not come on
P1E6911	• Short to ground in high voltage interlock	Not come on

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

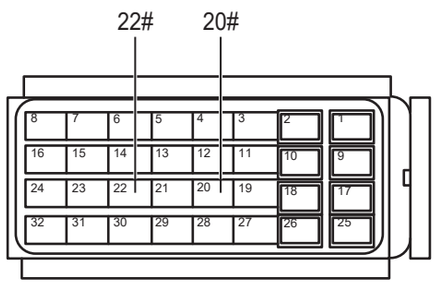
(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

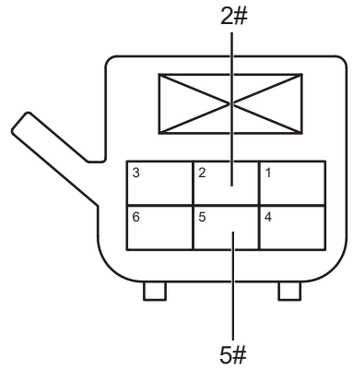
OK

2	**Check for open in high voltage interlock wire harness and connector**



Energy conversion and distribution unit connector

PU00061RM



Low voltage service switch connector

PU00060RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the energy conversion and distribution unit connector.

(d) Disconnect the low voltage service switch connector.

(e) According to value in the table, measure resistance.

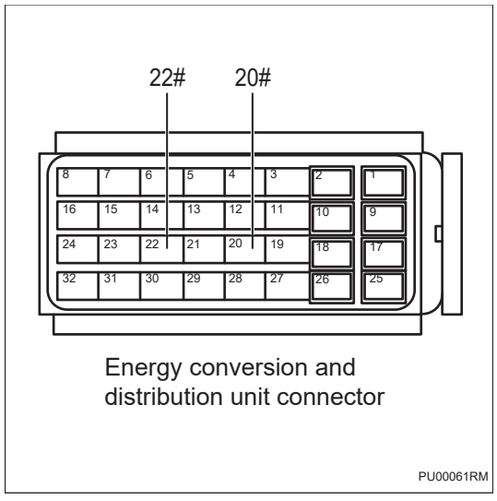
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 20# - low voltage service switch connector 2#	Always connected	Less than 1 Ω
Energy conversion and distribution unit connector 22# - low voltage service switch connector 5#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to ground in high voltage interlock wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

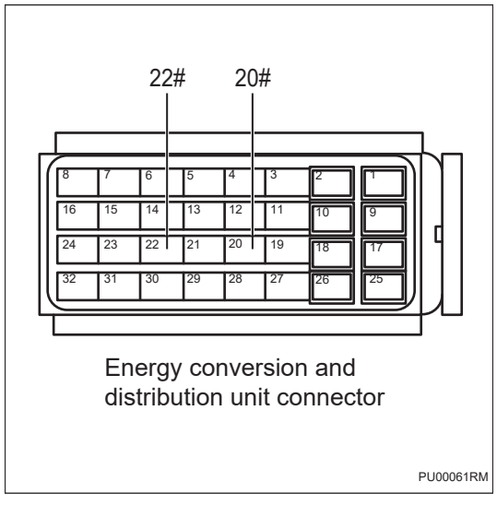
Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 20# - body ground	Always connected	10 KΩ or more
Energy conversion and distribution unit connector 22# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in low voltage service switch wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 20# - body ground	Ignition switch "ON"	Less than 1 V
Energy conversion and distribution unit connector 22# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

6	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	P1E1E17	HVDC TZ overvoltage

Description

When HVDC side voltage is detected to be higher than 550 V, the energy conversion and distribution unit records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P1E1E17	• After waking up PCDU	• HVDC side voltage is higher than 550 V (±1%) V	Trigger 10 times continuously	Event-based	/	• Wire harness and connector • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
P1E1E17	• OBC does not operate	Not come on

Inspection procedure

1	Clear DTCs

(a) Leave the vehicle as is and high voltage power is off.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Restart vehicle, read DTCs.

(f) Check if other controllers report this fault.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

OK → **Diagnosis ends**

OK

2	Check high voltage battery load

(a) Check if high voltage battery load is abnormal.

NG → **Perform repair according to malfunction**

OK

3	**Check CAN bus**

(a) Check if CAN bus is connected correctly.

(b) Check for short or open in CAN bus.

(c) Check if CAN bus is subjected to electromagnetic interference.

NG → **Perform repair according to malfunction**

OK

4	**Clear DTCs again**

(a) Clear DTCs.

(b) Restart vehicle, read DTCs.

(c) Check if fault is eliminated.

NG → **Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

DTC	**U029A87**	**Battery management system node lost**
DTC	**U014B87**	**VDC397 node lost**
DTC	**U044B82**	**VDC397 message content fault**
DTC	**U044B83**	**VDC397 message content fault**
DTC	**U059B82**	**Battery management system message content fault**

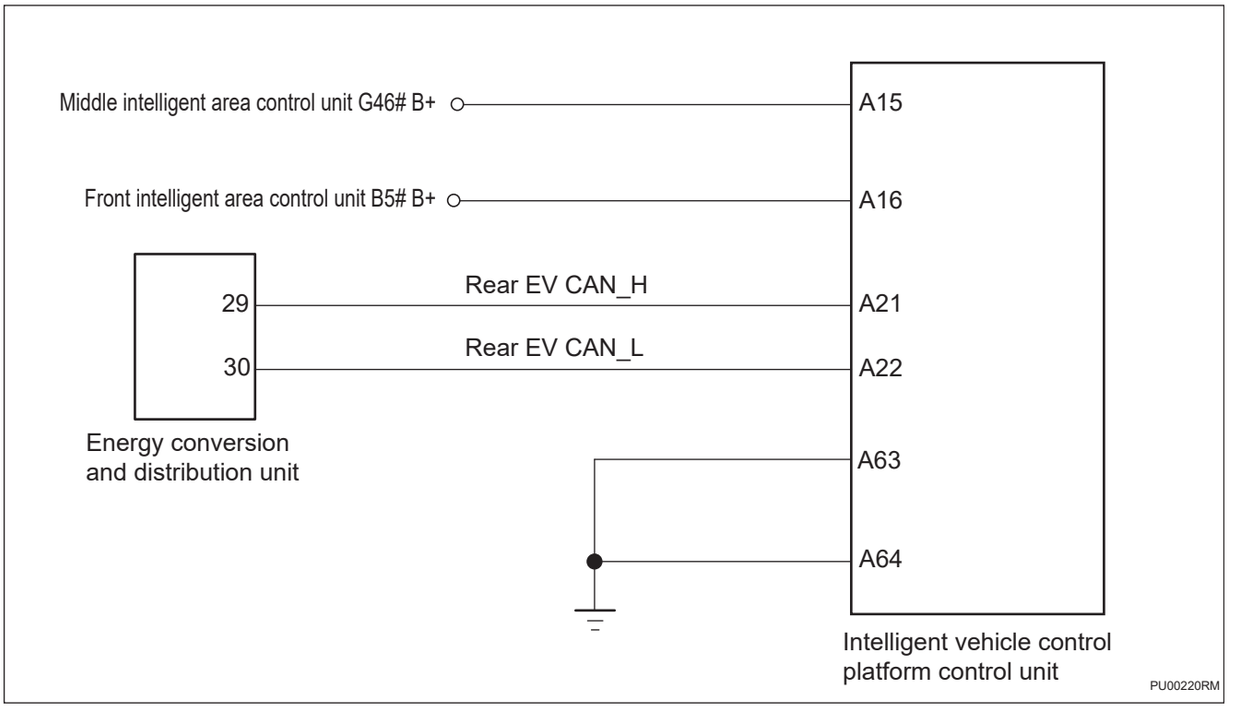
DTC	U059B83	Battery management system message content fault

Description

When communication between energy conversion and distribution unit and other system is abnormal or interrupted, the energy conversion and distribution records DTCs.

DTC No.	DTC detection condition	Faulty area
U029A87	(a) Battery management system node lost.	• Wire harness and connector • Rear intelligent area control unit • Energy conversion and distribution unit • Battery control unit
U014B87	(a) VDC397 node lost.	• Wire harness and connector • Electric rear drive system inverter • Energy conversion and distribution unit • Battery control unit • Intelligent vehicle control platform control unit
U044B82	(a) VDC397 message content fault.	• Wire harness and connector • Electric rear drive system inverter • Energy conversion and distribution unit • Battery control unit • Intelligent vehicle control platform control unit
U044B83	(a) VDC397 message content fault.	• Wire harness and connector • Electric rear drive system inverter • Energy conversion and distribution unit • Battery control unit • Intelligent vehicle control platform control unit
U059B82	(a) Battery management system message content fault.	• Wire harness and connector • Electric rear drive system inverter • Energy conversion and distribution unit • Battery control unit
U059B83	(a) Battery management system message content fault.	• Wire harness and connector • Electric rear drive system inverter • Energy conversion and distribution unit • Battery control unit

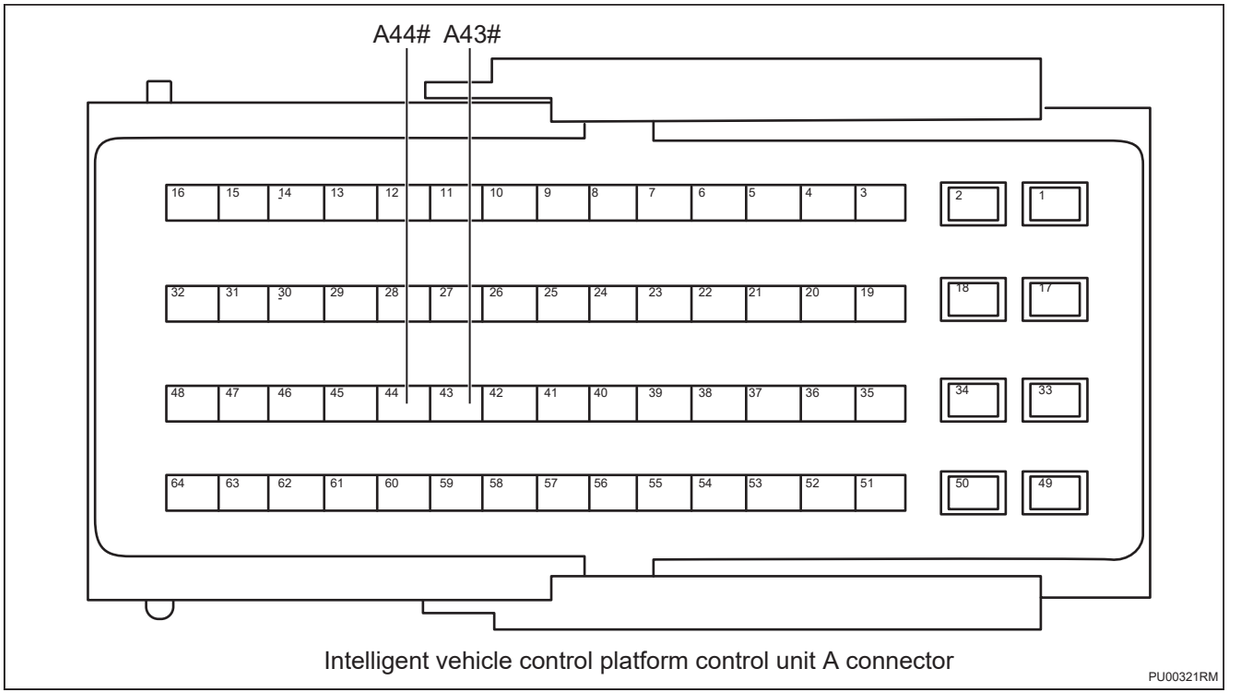
Circuit diagram

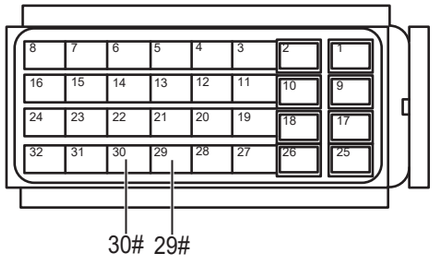


Inspection procedure

Note: Taking the U014B87 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check open in rear EV CAN bus (energy conversion and distribution unit - intelligent vehicle control platform control unit)**





Energy conversion and distribution unit connector

PU00211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

Standard value

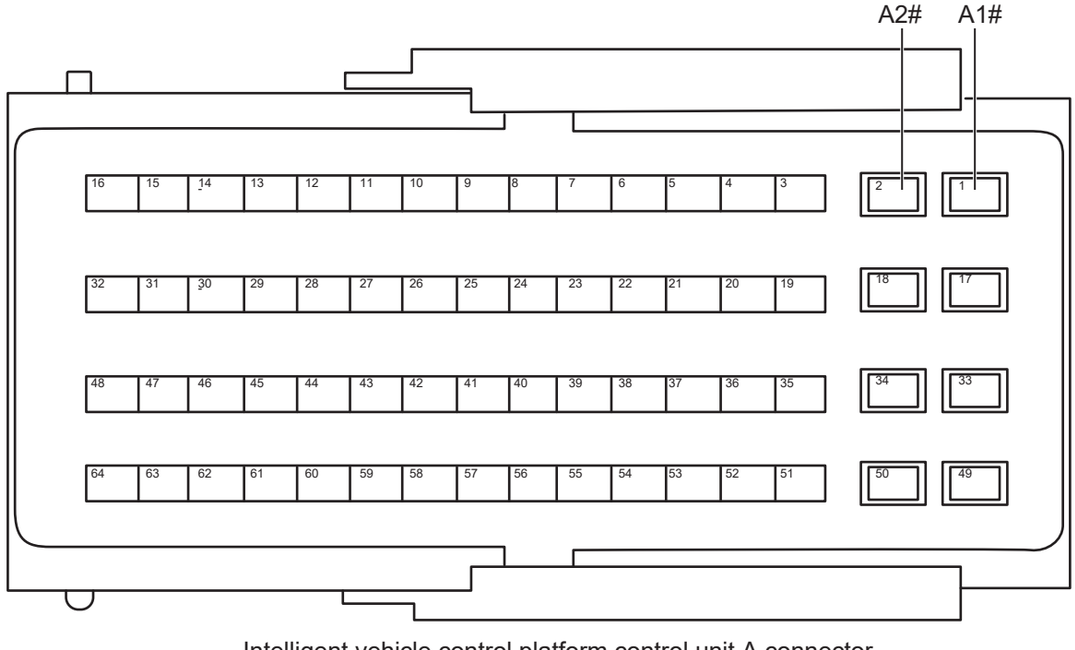
Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 29# - intelligent vehicle control platform control unit connector A44#	Always connected	Less than 1 Ω
Energy conversion and distribution unit connector 30# - intelligent vehicle control platform control unit connector A43#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



Intelligent vehicle control platform control unit A connector

PU00241RM

(a) According to value in the table, measure resistance.

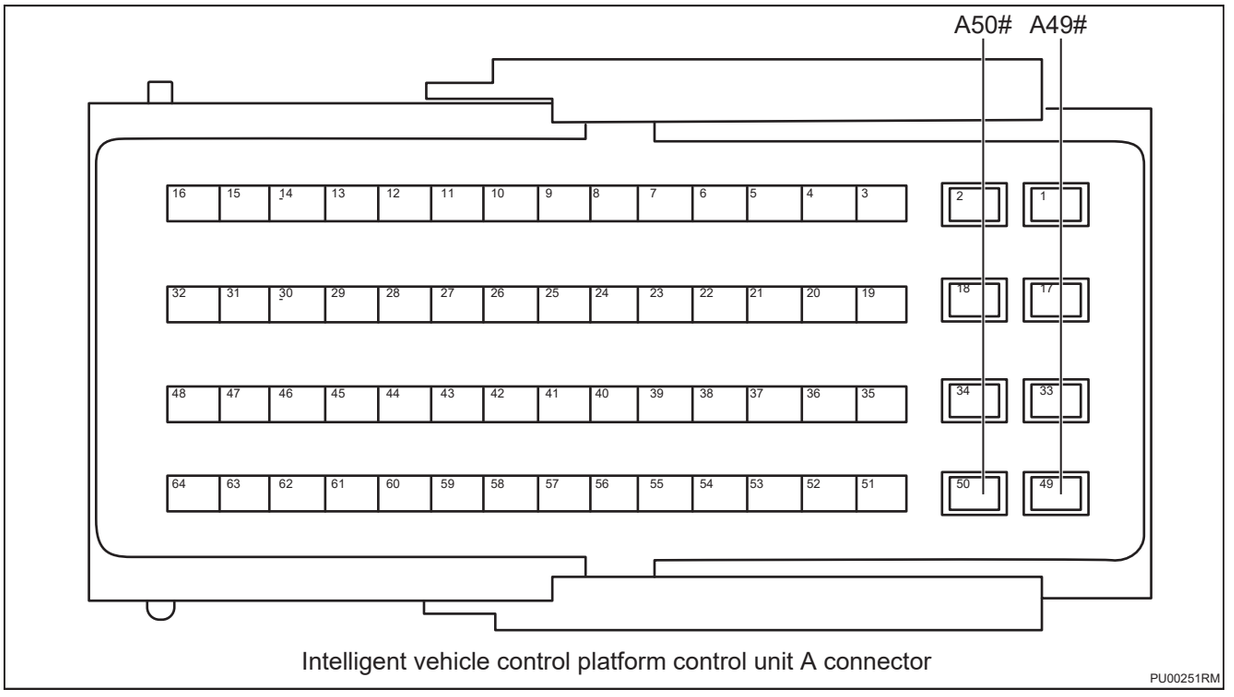
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Intelligent vehicle control platform control unit connector A1# - body ground	Always connect-ed	Less than 1 Ω
Intelligent vehicle control platform control unit connector A2# - body ground	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check intelligent vehicle control platform control unit power supply**



Intelligent vehicle control platform control unit A connector

PU00251RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

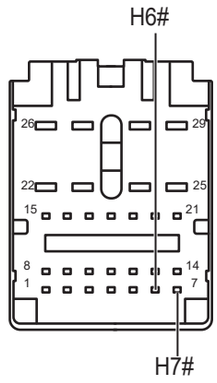
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A49# - body ground	Turn ignition switch to "ON"	Battery voltage
Intelligent vehicle control platform control unit connector A50# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

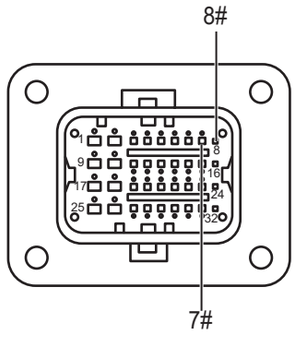
ZD

OK

4	Check rear EV CAN bus terminal resistance



Rear intelligent area control unit H



Battery control unit

PU00261RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Battery control unit 7# - Battery control unit 8#	Always connected	Approximately 120 Ω
Rear intelligent area control unit H7# - rear intelligent area control unit H6#	Always connected	Approximately 120 Ω

NG	**Check and repair or replace battery control unit/rear intelligent area control unit**

OK

5	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace energy conversion and distribution unit (See page DL-62)**

OK

Diagnosis ends

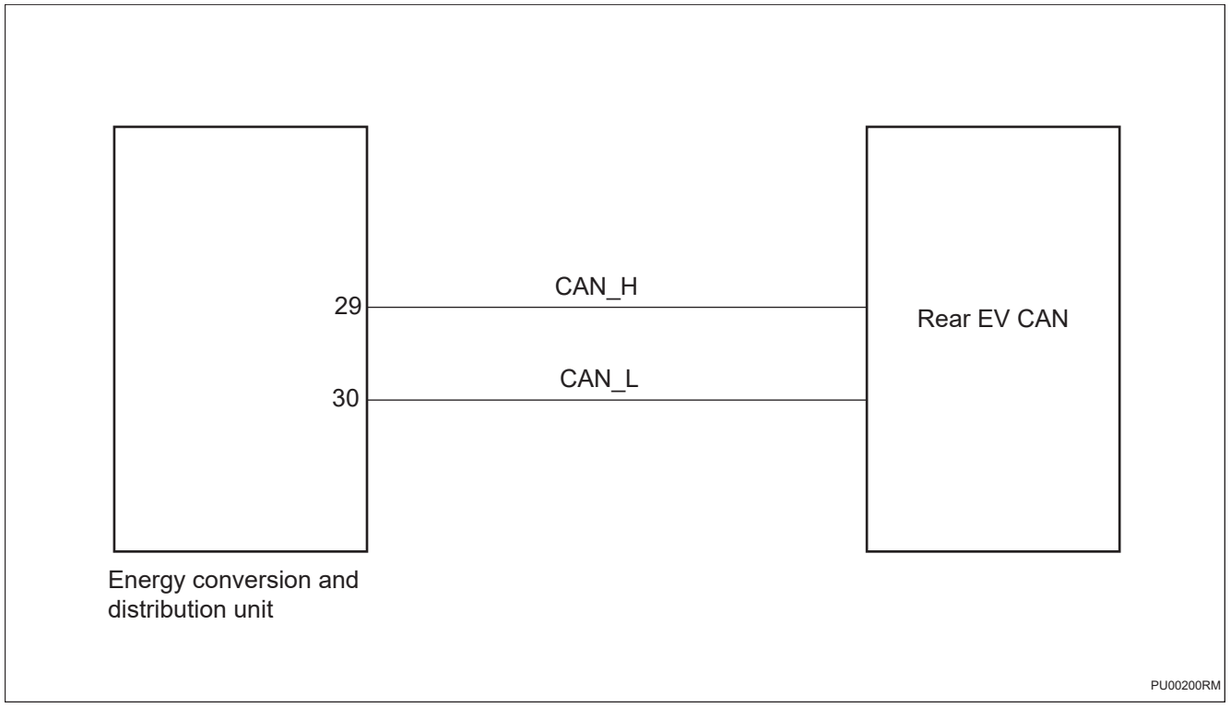
DTC	U005588	Rear EV CAN bus off

Description

When energy conversion and distribution unit detects rear EV CAN bus off fault, the energy conversion and distribution unit records DTCs.

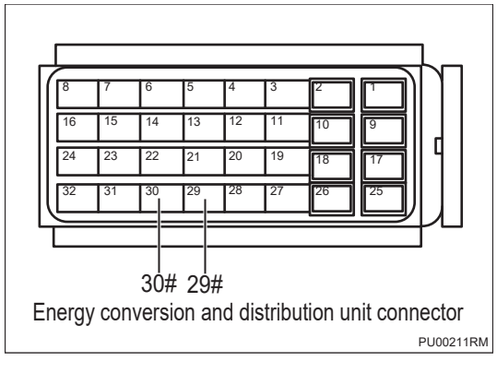
DTC No.	DTC detection condition	Faulty area
U005588	(a) Rear EV CAN bus off.	• CAN line and connector • Energy conversion and distribution unit • Rear intelligent area control unit • Electric rear drive system inverter • Battery control unit • Intelligent vehicle control platform control unit

Circuit diagram



Inspection procedure

1	Check terminal resistance of rear EV CAN bus



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the energy conversion and distribution unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 29# - energy conversion and distribution unit connector 30#	Always connected	120 Ω

NG → **Perform repair according to malfunction**

OK

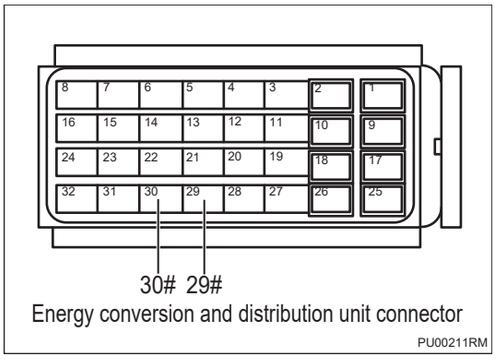
2	**Check the controller on rear EV CAN bus**

(a) Disconnect the controller on rear EV CAN bus, check if other controller resumes the normal operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear EV CAN bus CAN-L and CAN-H**



Energy conversion and distribution unit connector

PU00211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear EV CAN bus.

(d) According to value in the table, measure resistance.

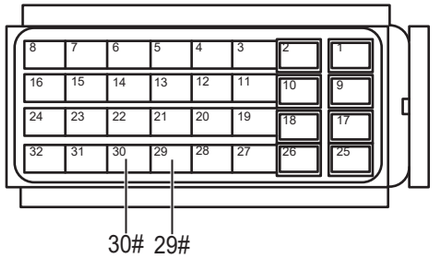
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 29# - energy conversion and distribution unit connector 30#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in rear EV CAN bus**



Energy conversion and distribution unit connector

PU00211RM

(a) According to value in the table, measure resistance.

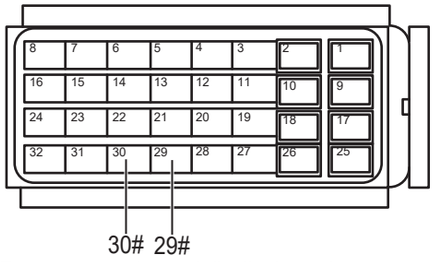
Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 29# - body ground	Always connected	10 KΩ or more
Energy conversion and distribution unit connector 30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear EV CAN bus**



Energy conversion and distribution unit connector

PU00211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Energy conversion and distribution unit connector 29# - body ground	Turn ignition switch to "ON"	Less than 1 V
Energy conversion and distribution unit connector 30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

Brake control

Integrated brake controller

Precautions

1. Operation precautions

(a) IPB system must be repaired by professional technicians who have trained and mastered maintenance skills and only use original parts for replacement.

(b) Unless specified in inspection procedure, be sure to remove and install IPB electronic control unit and sensor when ignition switch is in OFF position and negative battery terminal is disconnected.

(c) When handling IPB, it is necessary to hold it with both hands. Never carry by grasping the mounting plate, and never carry by grasping easily damaged parts such as the motor, reservoir, push rod, and ECU port, etc.

2. IBC diagnosis and manual bleeding process

(a) Connect the diagnostic tester, select the diagnostic tester "IBC inflation/bleeding" function, and perform operation according to the prompts of the diagnostic tester.

(b) Connect the brake fluid pressurization device to the remote reservoir to provide an external pressure of 2 bar. Fill the brake fluid into the brake system through remote reservoir port, paying attention to the filling speed to prevent the brake fluid from overflowing into the front compartment and polluting other spare parts.

(c) Depress the pedal at a certain pace and perform basic brake bleeding of all wheels from rear left, front left, front right and rear right. After bleeding each wheel, tighten the bleeder screw.

(d) Turn off power supply of the filling and exhaust pressurization device.

(e) The diagnostic tester "IBC inflation/bleeding" function automatically performs IBC leakage and air detection, and evaluates the results.

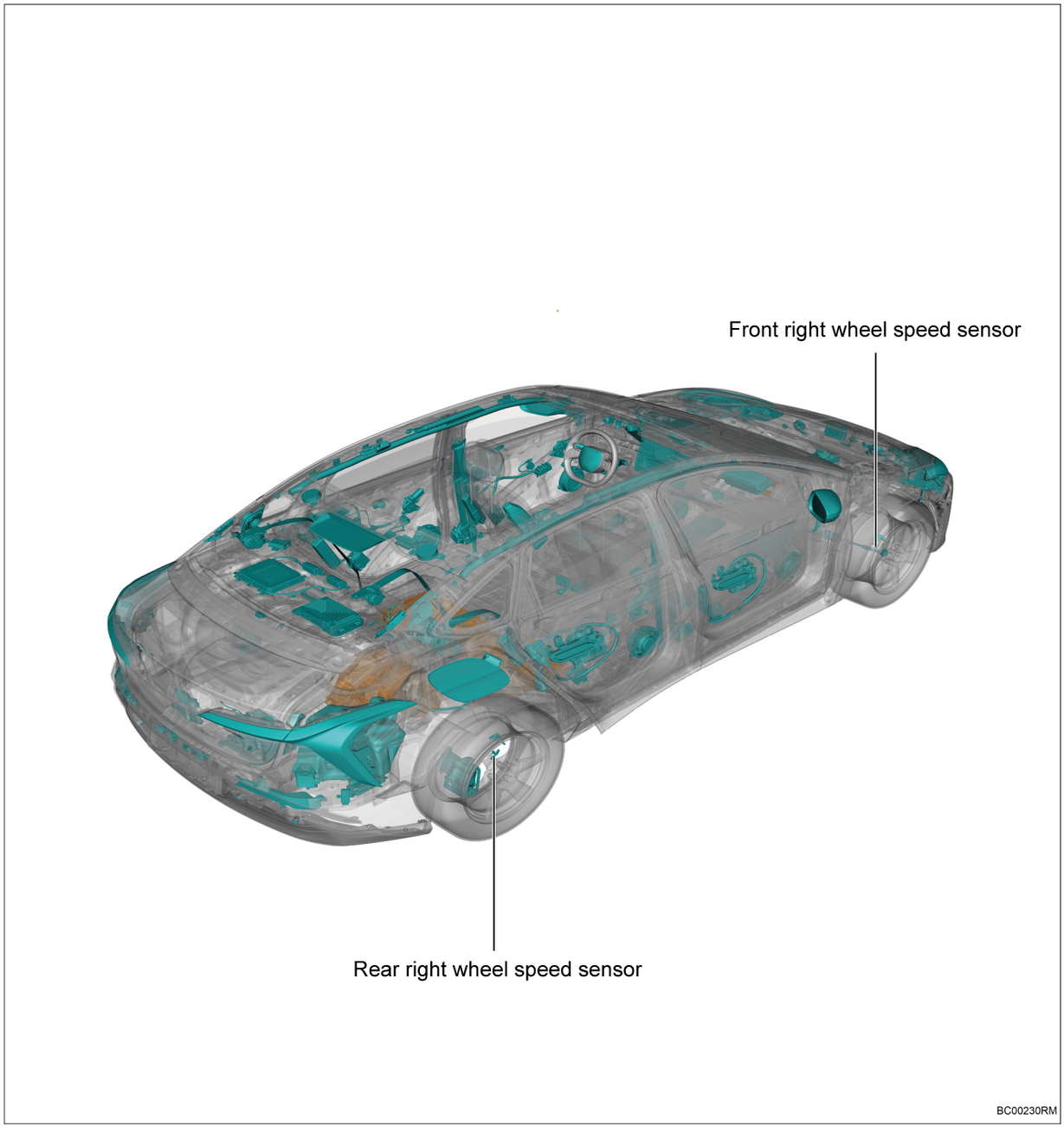
(f) After the exhaust is completed, remove the external brake fluid pressurization device.

(g) Re-ignition, check if all warning lights are turned off.

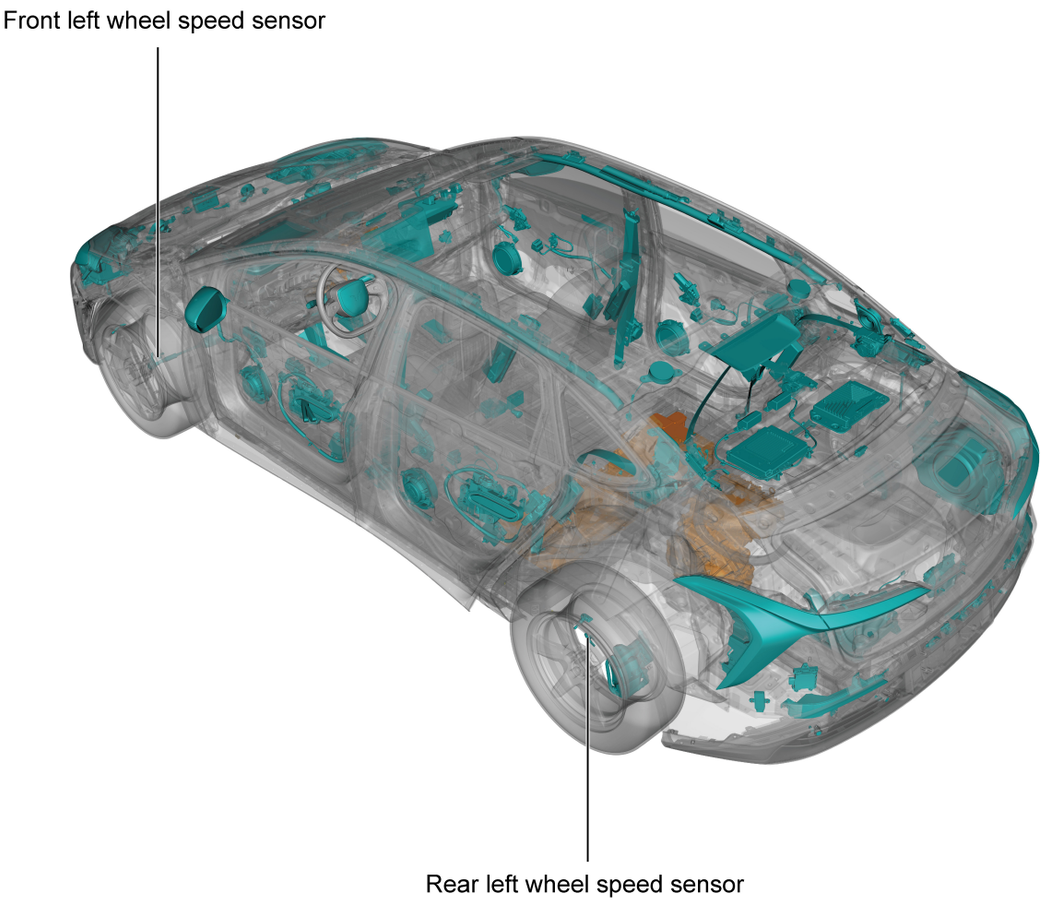
Note:

When using the gravity filling method to fill brake fluid, the brake fluid level must always be maintained not lower than Min line. If the liquid level is lower than the remote reservoir outlet, while filling the brake fluid, it is necessary to repeatedly shake the reservoir connecting hose up and down to ensure that the brake fluid can smoothly flow into the reservoir and exhaust residual air.

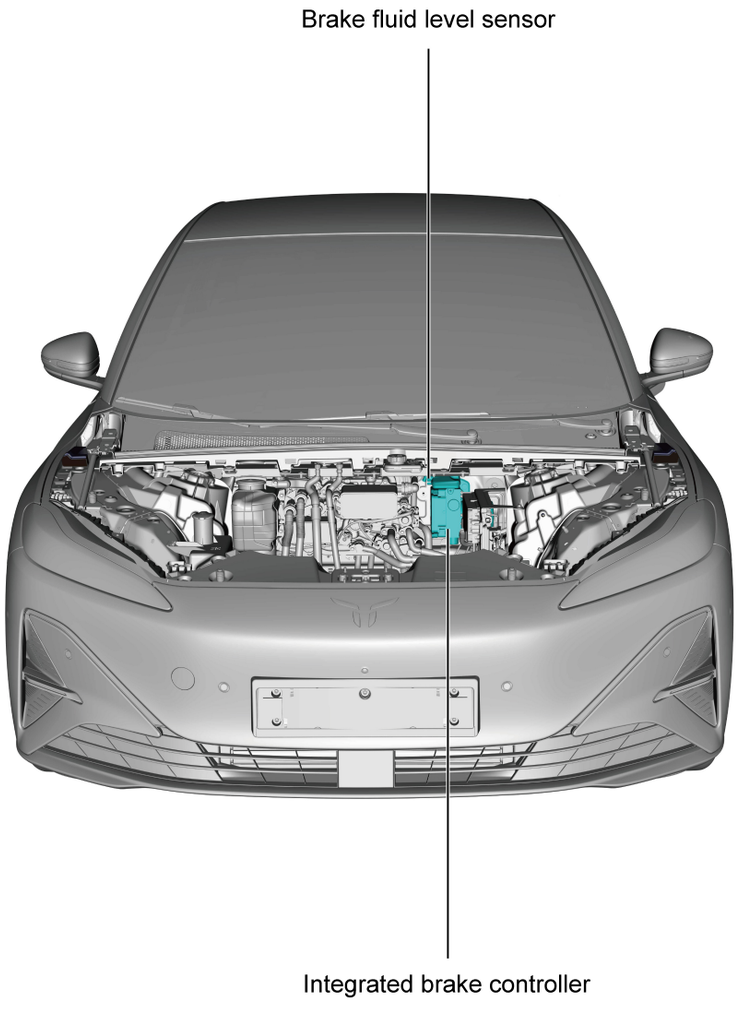
Part position



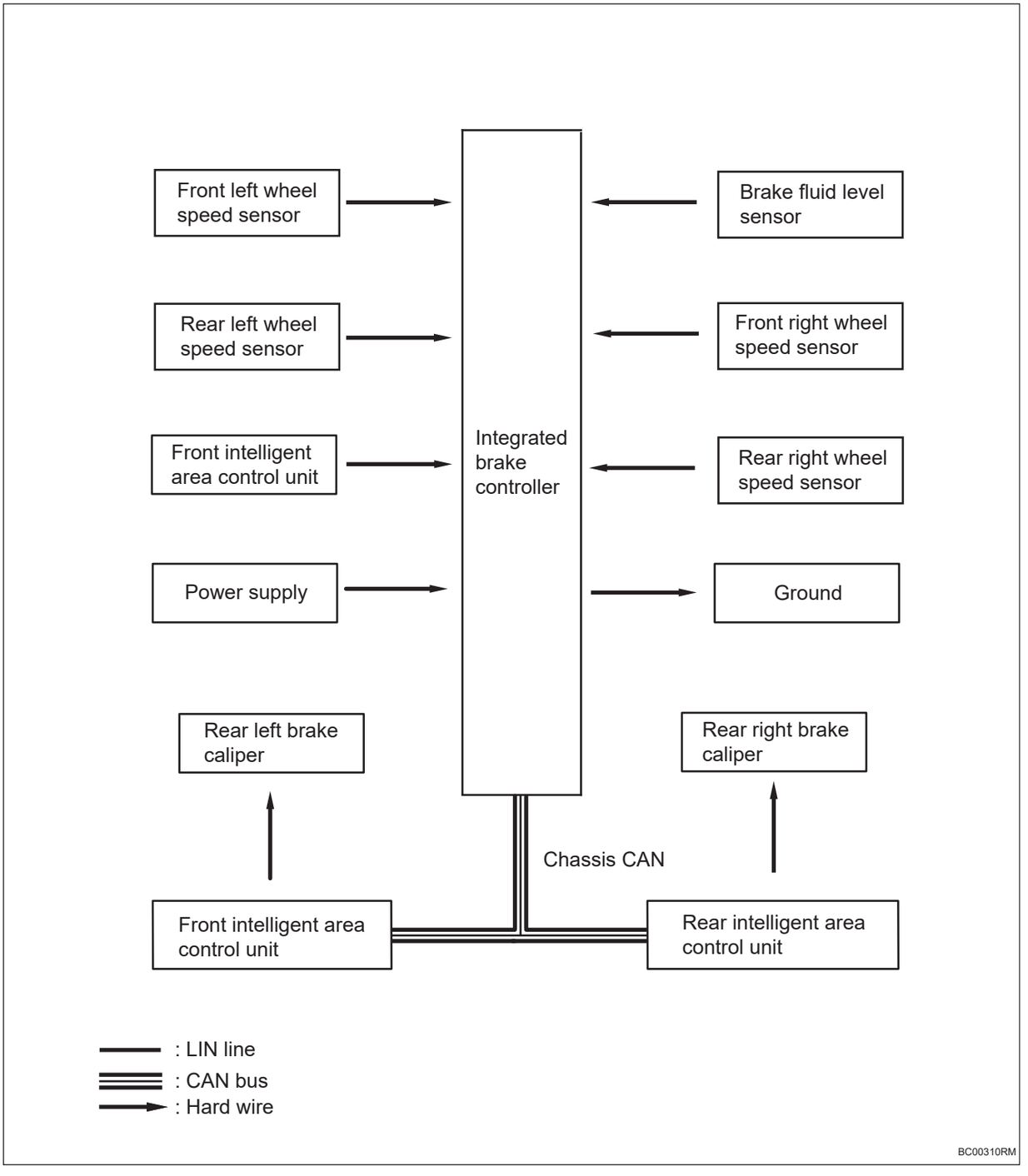
Part position



Part position



System diagram



Function description

1. System overview

(a) Integrated brake controller assembly (IPB) consists of small reservoir with liquid level sensor, mounting plate, push rod, control unit and hydraulic unit.

(b) IPB system composition: The IPB system consists of the IPB product body and related components: IPB assembly with electronic control unit, wheel speed sensor, steering wheel angle sensor, yaw rate sensor.

(c) IPB is in decoupled state under normal operating mode, and the brake pedal sensing is simulated by PFS (pedal simulator), and brake pressure of brake wheel cylinder is built up by piston.

(d) If IPB pedal sensing is degraded to mechanical backup mode (non-decoupled), TMC (series master cylinder) brake circuit is directly connected to the brake wheel cylinder; At this time, the braking deceleration is directly controlled by the driver.

2. System abbreviation

Abbreviation	Definition
EBD	Electronic brake force distribution
ABS	Anti-brake system
TCS	Traction control system
VDC	Vehicle Dynamic Control System
EBD	Electronic brake force distribution
BBF	Brake booster function
ESP	Body Electronic Stability System
IPB	Integrated intelligent brake system
PFS	Pedal simulator
TMC	Series master cylinder

Fault pre-handling

1. Faulty vehicle handling process

(a) The following information should be gathered once the vehicle is in the repair store:

(1) How it operated before and after the fault.

(2) Check if there is any text prompt or malfunction light comes on during the fault.

(3) What is the frequency of the fault occurrence and whether it recovers after re-ignition.

(b) Create diagnosis and analyze diagnostic results:

(1) Connect the diagnostic tester.

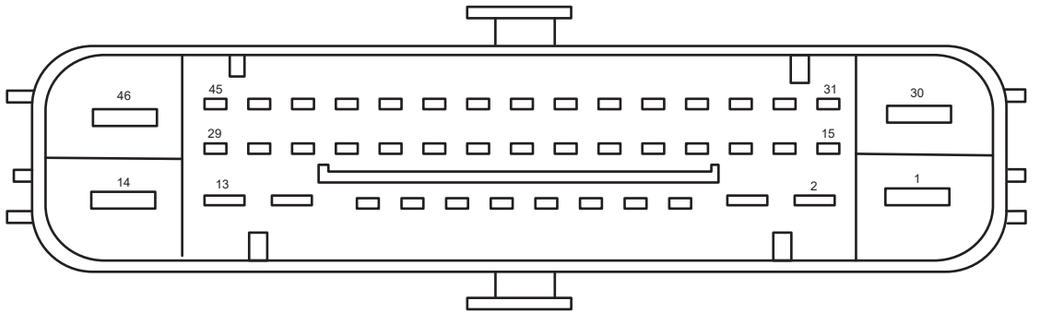
(2) The vehicle power-on self-test ends.

(3) Create communication, read and store DTC.

(4) Analyze whether DTC is the current fault or the history fault.

(5) Check the solutions according to DTC.

ECU terminal



Integrated brake controller

BC00300RM

ZD

Integrated brake controller			
Pin number	**Definition**	**Pin number**	**Definition**
1	PGND	24	-
2	-	25	-
3	-	26	WSS-FR (ground)
4	-	27	-
5	CAN_H	28	-
6	-	29	-
7	WSS-FL (ground)	30	PGND
8	-	31	-
9	-	32	-
10	-	33	-
11	-	34	-
12	-	35	-
13	-	36	KL15
14	KL30_1	37	WSS-RR (ground)
15	-	38	Fluid
16	-	39	WSP-RL (power)
17	-	40	-
18	-	41	-
19	CAN_L	42	WSP-FR (power)
20	WSP-RR (power)	43	-
21	WSP-FL (power)	44	-
22	-	45	-
23	WSS-RL (ground)	46	KL30_2

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C00A900	Front left wheel sensor initialization test failed	(See page ZD-1793)
C00A100	Short to power supply in front left wheel sensor	(See page ZD-1793)
C00A000	Front left wheel sensor short to GND	(See page ZD-1793)
C003208	Front left wheel speed sensor direction error	(See page ZD-1793)
C003200	Front left wheel sensor short to GND	(See page ZD-1793)
C003108	Front left wheel speed sensor signal abnormal	(See page ZD-1793)
C00B900	Front left wheel speed test fault	(See page ZD-1793)
C00AA00	Front right wheel sensor initialization test failed	(See page ZD-1801)
C00A300	Short to power supply in front right wheel sensor	(See page ZD-1801)
C00A200	Front right wheel sensor short to GND	(See page ZD-1801)
C003508	Front right wheel speed sensor direction error	(See page ZD-1801)
C003500	Front right wheel sensor short to GND	(See page ZD-1801)
C003408	Front right wheel sensor direction/signal error	(See page ZD-1801)
C00BA00	Front right wheel speed test fault	(See page ZD-1801)
C00AB00	Rear left wheel sensor initialization test failed	(See page ZD-1809)
C00A500	Short to power supply in rear left wheel sensor	(See page ZD-1809)
C00A400	Rear left wheel sensor short to GND	(See page ZD-1809)
C003808	Rear left wheel speed sensor direction error	(See page ZD-1809)
C003800	Rear left wheel sensor short to GND	(See page ZD-1809)
C003708	Rear left wheel speed sensor signal missing	(See page ZD-1809)
C00BB00	Rear left wheel speed test fault	(See page ZD-1809)
C00AC00	Rear right wheel sensor initialization test failed	(See page ZD-1817)
C00A700	Short to power supply in rear right wheel sensor	(See page ZD-1817)
C00A600	Rear right wheel sensor short to GND	(See page ZD-1817)
C003B08	Rear right wheel sensor direction error	(See page ZD-1817)
C003B00	Rear right wheel sensor short to GND	(See page ZD-1817)
C003A08	Rear right wheel speed sensor signal error	(See page ZD-1817)
C00BC00	Rear right wheel speed test fault	(See page ZD-1817)
C2A1700	Air in hydraulic brake circuit	(See page ZD-1869)
C05B000	Brake pipeline hydraulic circuit leakage	(See page ZD-1851)

DTC	Detection Items	See page
C055F92	BSCM/EBBC hydraulic function problem	(See page ZD-1851)
C006B06	Unreliable ABS control	(See page ZD-1781)
C007200	Brake temperature too high	(See page ZD-1781)
C007204	Brake disc temperature too high	(See page ZD-1781)
C0072FB	Pressure too high during hydraulic valve dynamic test	(See page ZD-1781)
C006BFC	Unreliable ABS control	(See page ZD-1781)
C055E00	Brake pipeline leakage	(See page ZD-1832)
C055FFB	Hydraulic valve mechanical fault related to IPB system	(See page ZD-1838)
C059700	IPB installation not completed	(See page ZD-1838)
C007208	Valve fault: Overheat protection, signal invalid, hardware fault	(See page ZD-1788)
C0072FC	Valve fault: Overheat protection, signal invalid, hardware fault	(See page ZD-1788)
C104D04	AVH button pressed for long time	(See page ZD-1856)
C104D04	Brake booster motor operating error	(See page ZD-1857)
C0595FC	Brushless motor initialization timeout	(See page ZD-1842)
C058900	Position sensor fault	(See page ZD-1842)
C058800	Position sensor fault	(See page ZD-1842)
C058AFC	Brake booster motor "A" position sensor	(See page ZD-1842)
C059000	Brake booster motor phase current too high	(See page ZD-1842)
C0590FC	Brake booster motor phase current too high	(See page ZD-1842)
C059100	Brake booster motor phase current too low	(See page ZD-1842)
C0591FC	Brake booster motor phase current too low	(See page ZD-1842)
C059200	Brake booster motor "B" phase current too high	(See page ZD-1842)
C0592FC	Brake booster motor "B" phase current too high	(See page ZD-1842)
C059300	Brake booster motor "B" phase current too low	(See page ZD-1842)
C0593FC	Brake booster motor "B" phase current too low	(See page ZD-1842)
C059400	Brake booster motor "A" fault	(See page ZD-1842)
C059592	Brushless motor drive chip not in operating mode	(See page ZD-1842)
C1099FC	Multiple wheel speed sensors error	(See page ZD-1859)
C109908	Wheel speed sensor direction error	(See page ZD-1859)
C109904	Abnormal multiple wheel speed sensor signals	(See page ZD-1859)
C004900	Fluid level sensor fault	(See page ZD-1772)

DTC	Detection Items	See page
C006108	Lateral acceleration sensor signal compensation error	(See page ZD-1777)
C006208	Longitudinal acceleration sensor signal error	(See page ZD-1777)
C006308	Yaw rate sensor signal error	(See page ZD-1779)
C054300	Pressure sensor fault: circuit voltage too high	(See page ZD-1825)
C054200	Pressure sensor fault: circuit voltage too low	(See page ZD-1825)
C053F00	Plunger internal pressure too low	(See page ZD-1825)
C053D00	Pressure sensor fault	(See page ZD-1825)
C007500	Lips ID transmission timeout	(See page ZD-1825)
C056C00	Pressure sensor internal fault	(See page ZD-1825)
C004510	Pressure sensor circuit fault	(See page ZD-1825)
C0044FC	Pressure sensor internal fault	(See page ZD-1825)
C121208	Variant error	(See page ZD-1867)
C200004	Roller mode misuse	(See page ZD-1868)
P25C700	Internal hardware error	(See page ZD-1879)
P25C600	Internal hardware error	(See page ZD-1879)
C057A00	Brake booster temperature sensor "B" circuit voltage too low	(See page ZD-1879)
C057900	Brake booster temperature sensor "B" circuit voltage too low	(See page ZD-1879)
C054100	Pressure sensor fault	(See page ZD-1879)
C059900	RPS calibration software version incompatible	(See page ZD-1879)
P06B800	Lips ID value read failure	(See page ZD-1879)
P06B8FC	RPS NVM value read failure	(See page ZD-1879)
P057B00	Brake pedal position sensor circuit internal fault	(See page ZD-1879)
P057C00	Brake pedal position sensor circuit voltage too low	(See page ZD-1879)
P057D00	Brake pedal position sensor circuit voltage too high	(See page ZD-1879)
P057E00	Brake pedal position sensor circuit intermittent fault	(See page ZD-1879)
P05DD00	Brake pedal position sensor circuit voltage too low	(See page ZD-1879)
P05DE00	Brake pedal position sensor circuit voltage too high	(See page ZD-1879)
P05DF00	Brake pedal position sensor circuit intermittent fault	(See page ZD-1879)
P05E009	Brake pedal displacement sensor measured value error	(See page ZD-1879)

DTC	Detection Items	See page
C057E00	Brake pedal position sensor circuit intermittent fault	(See page ZD-1879)
C05C24B	Booster motor temperature too high	(See page ZD-1879)
C05C300	Brake booster motor "A" power supply circuit	(See page ZD-1879)
C061900	Stroke sensor 1st path correction value error	(See page ZD-1879)
C1000FC	APBMI software/hardware error	(See page ZD-1879)
C102001	ECU internal hardware, controller error	(See page ZD-1879)
P05FF09	BSM related error, brake pedal too hard/too soft	(See page ZD-1879)
P05FF03	Master cylinder pressure of driver stepping on brake pedal greater than expected	(See page ZD-1879)
C100004	ECU internal fault	(See page ZD-1879)
P05CB00	Vehicle hardware mismatch	(See page ZD-1879)
C100104	Network timeout caused by hardware fault	(See page ZD-1879)
C100047	uC memory or bus abnormal	(See page ZD-1879)
P056024	UBB power supply lost	(See page ZD-1872)
P056023	UBVR power supply lost	(See page ZD-1872)
C190004	Power supply voltage greater than voltage threshold	(See page ZD-1872)
C190104	Low voltage causes number of consecutive ECU restart out of limit	(See page ZD-1872)
C1901FC	Power supply voltage too low	(See page ZD-1872)
U006488	Chassis CAN bus off	(See page ZD-1893)
U115187	Airbag control unit message missing	(See page ZD-1898)
U129387	Vehicle controller message missing	(See page ZD-1898)
U116487	A/C controller message missing	(See page ZD-1898)
U115587	Instrument cluster control unit message missing	(See page ZD-1898)
U124587	Infotainment head unit message missing	(See page ZD-1898)
U014887	Rear PDC message missing	(See page ZD-1898)
U114687	Front PDC message missing	(See page ZD-1898)
U013187	Electric power steering node lost	(See page ZD-1898)
U020887	Front seat control module message missing	(See page ZD-1898)
U119987	Front left door module message missing	(See page ZD-1898)
U114B87	VDC message missing	(See page ZD-1898)
U014C87	HAD node lost	(See page ZD-1898)
U113887	Driving mode message missing	(See page ZD-1898)
U112887	Electronic parking brake message missing	(See page ZD-1898)
U044B84	VDC message content error	(See page ZD-1898)

DTC	Detection Items	See page
U044B86	VDC message content error	(See page ZD-1898)
U054482	HAD message content error	(See page ZD-1898)
U054483	HAD message content error	(See page ZD-1898)
U054484	HAD message content error	(See page ZD-1898)
U054486	HAD message content error	(See page ZD-1898)
U042484	A/C controller message content error	(See page ZD-1898)
U042486	A/C controller message content error	(See page ZD-1898)
U050984	Front seat controller message content error	(See page ZD-1898)
U050986	Front seat controller message content error	(See page ZD-1898)
U049A84	Front left door module message content fault	(See page ZD-1898)
U042082	Electric power steering control unit message content fault	(See page ZD-1898)
U042083	Electric power steering control unit message content fault	(See page ZD-1898)
U042084	Electric power steering control unit message content fault	(See page ZD-1898)
U042086	Electric power steering control unit message content fault	(See page ZD-1898)
C046008	SAS signal invalid	(See page ZD-1898)
U045282	Airbag control unit message content error	(See page ZD-1898)
U045283	Airbag control unit message content error	(See page ZD-1898)
U045284	Airbag control unit message content error	(See page ZD-1898)
U045286	Airbag control unit message content error	(See page ZD-1898)
U059482	Vehicle controller message content fault	(See page ZD-1898)
U059483	Vehicle controller message content fault	(See page ZD-1898)
U059484	Vehicle controller message content fault	(See page ZD-1898)
U059486	Vehicle controller message content fault	(See page ZD-1898)
U0594F6	Vehicle controller message content fault	(See page ZD-1898)
C108C08	Reverse signal cannot change	(See page ZD-1898)
U043984	Driving mode message content fault	(See page ZD-1898)
U043986	Driving mode message content fault	(See page ZD-1898)
U054684	Infotainment head unit message content fault	(See page ZD-1898)
U054686	Infotainment head unit message content fault	(See page ZD-1898)
U042384	Instrument cluster control unit message content fault	(See page ZD-1898)
U042386	Instrument cluster control unit message content fault	(See page ZD-1898)
U041782	Electronic parking brake message content fault	(See page ZD-1898)

DTC	Detection Items	See page
U041783	Electronic parking brake message content fault	(See page ZD-1898)
U041784	Electronic parking brake message content fault	(See page ZD-1898)
U041786	Electronic parking brake message content fault	(See page ZD-1898)
U044784	Front PDC message content fault	(See page ZD-1898)
U044884	Rear PDC message content fault	(See page ZD-1898)

DTC C004900 Fluid level sensor fault

Description

When brake fluid level sensor is faulty, the integrated brake controller records DTC.

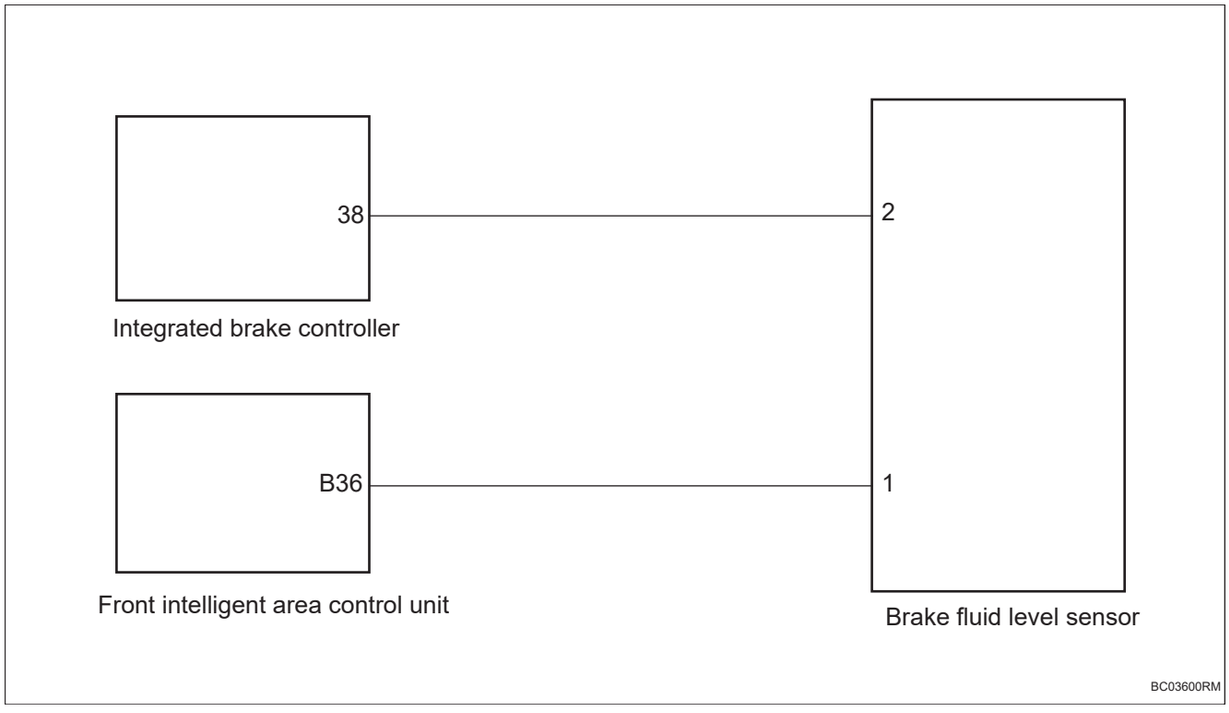
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C004900	When the hydraulic system is downgraded and active refill, the monitor is turned on	Based on the difference between the current PV curve and the calibrated PV curve of the plunger circuit, the air content in plunger after fluid replenishment can be calculated. When air content exceeds a certain threshold, a fault will be reported	-	-	-	• Brake fluid level sensor • Wire harness and connector • Integrated brake controller

Fault symptom

DTC No.	Fault symptom	Warning light
C004900	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:OFF; ABS: ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
	System performance (EBD: ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: OFF; ESP:ON)	

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

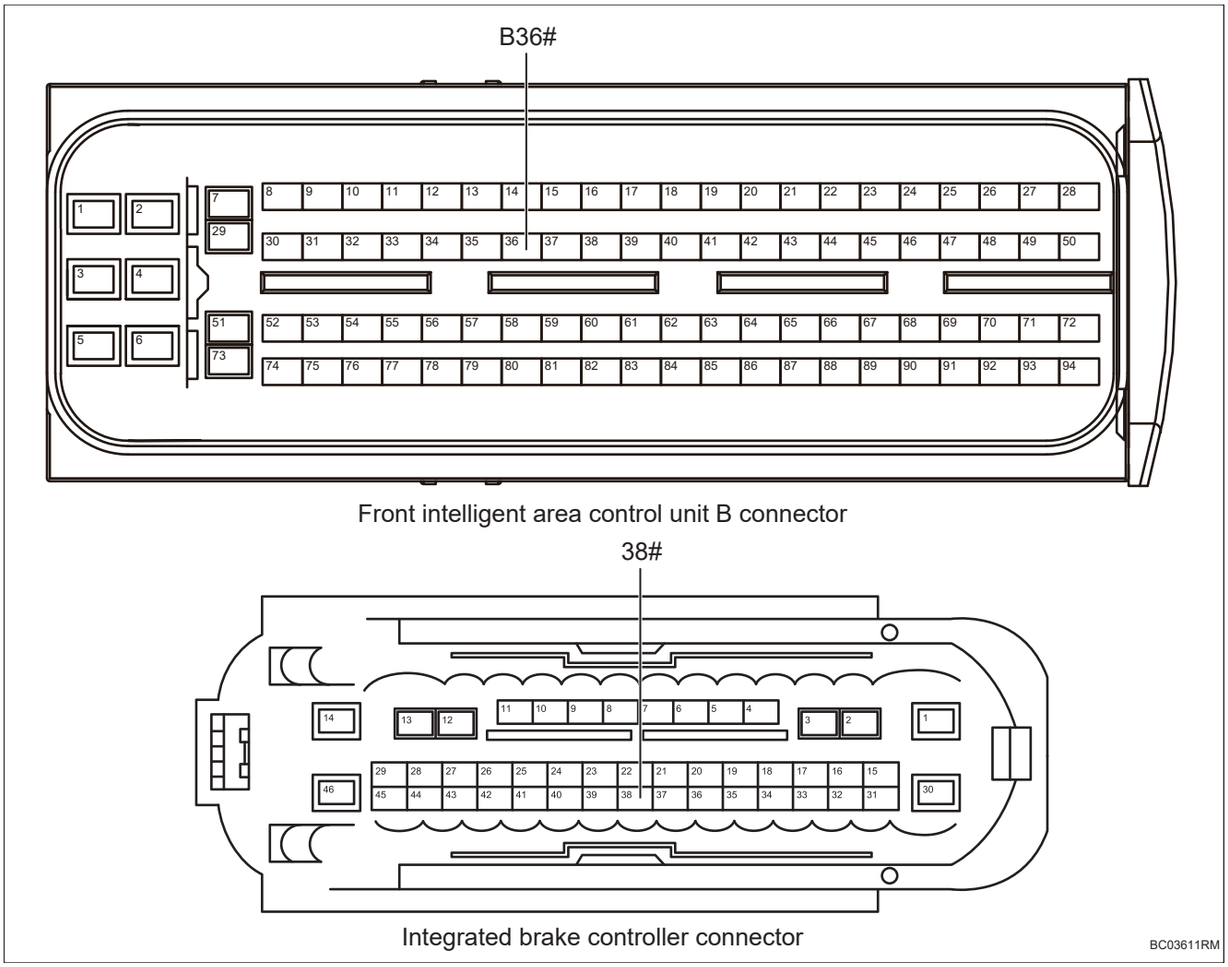
2	**Check brake fluid level**

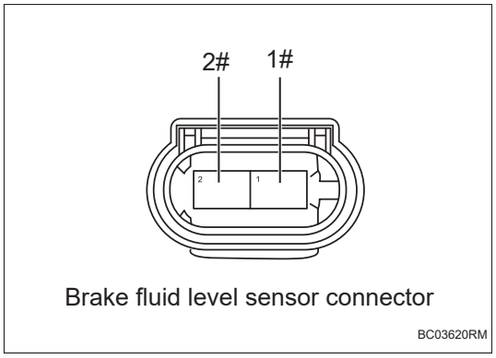
(a) Check if brake fluid level is normal.

NG → **Perform repair according to malfunction**

OK

3	**Check for open in brake fluid level sensor wire harness and connector**





(a) Disconnect the brake fluid level sensor connector.

(b) According to value in the table, measure resistance.

Standard value

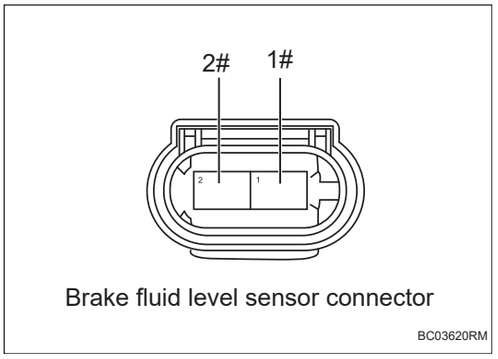
Multimeter connection	Detection condition	Specified condition
Brake fluid level sensor connector 2# - integrated brake controller connector 38#	Always connected	Less than 1 Ω
Brake fluid level sensor connector 1# - front intelligent area control unit connector B36#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness or connector**

ZD

OK

4	**Check for short to ground in brake fluid level sensor wire harness and connector**



Brake fluid level sensor connector

BC03620RM

(a) According to value in the table, measure resistance.

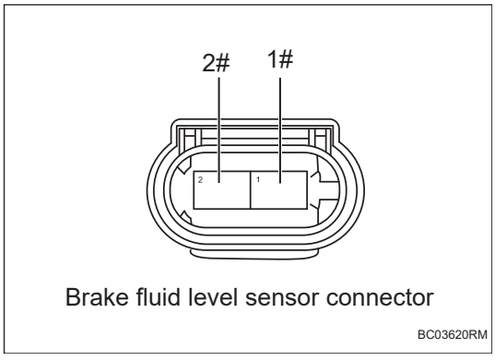
Standard value

Multimeter connection	Detection condition	Specified condition
Brake fluid level sensor connector 1# - body ground	Always connected	10 KΩ or more
Brake fluid level sensor connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness or connector**

OK

5	**Check for short to power supply in brake fluid level sensor wire harness and connector**



Brake fluid level sensor connector

BC03620RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Brake fluid level sensor connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Brake fluid level sensor connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness or connector**

ZD

OK

6	Replace brake fluid level sensor (See page DP-33)

(a) Replace the brake fluid level sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → Replace integrated brake controller (See page DP-33)

OK

Diagnosis ends

DTC	C006108	Lateral acceleration sensor signal compensation error
DTC	C006208	Longitudinal acceleration sensor signal error

Description

When acceleration sensor signals are detected, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C006108	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller (internal sensor)
C006208	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller (internal sensor)

Fault symptom

DTC No.	Fault symptom	Warning light
C006108	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C006208	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

ZD

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → Diagnosis ends

NG

2	Check airbag system DTC

(a) Check for yaw rate sensor related DTCs in airbag system.

(b) Check for CAN communication related DTCs in airbag system.

Result:

Result	Proceed to
Existence	NG
Not exist	OK

NG → Perform repair according to malfunction

OK

Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault recurs.) (See page DP-33)

ZD

DTC	C006308	Yaw rate sensor signal error

Description

When yaw rate sensor signal is incorrect, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C006308	U = 12 V, ignition on	-	-	-	-	• Airbag system • CAN line and connector • Integrated brake controller

Fault symptom

DTC No.	Fault symptom	Warning light
C006308	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: OFF; ABS:ON; ESP:ON)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check airbag system DTC

(a) Check for yaw rate sensor related DTCs in airbag system.

(b) Check for CAN communication related DTCs in airbag system.

Result:

Result	Proceed to
Existence	NG
Not exist	OK

NG → **Perform repair according to malfunction**

OK

Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault recurs.) (See page DP-33)

DTC	C006B06	Unreliable ABS control
DTC	C007200	Brake temperature too high

DTC	**C007204**	**Brake disc temperature too high**
DTC	**C0072FB**	**Pressure too high during hydraulic valve dynamic test**
DTC	**C006BFC**	**Unreliable ABS control**

Description

When long brake time or high temperature is detected, the integrated brake controller records DTC.

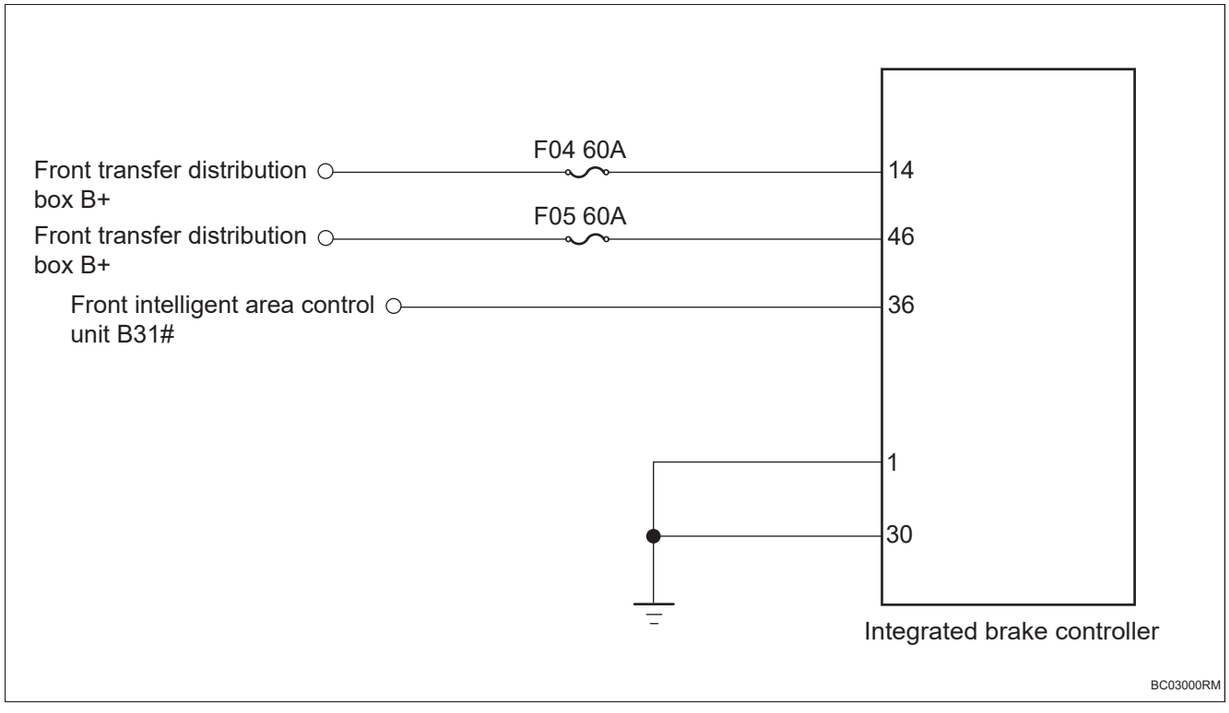
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C006B06	Monitor is turned on when ABS is triggered	-	-	-	-	• Brake system pipeline • Integrated brake controller
C007200	The voltage is within the normal operating range, turn ignition switch to ON.	-	-	-	-	• Brake system pipeline • Integrated brake controller
C007204	U = 12 V, ignition on	-	-	-	-	• Brake system pipeline • Integrated brake controller
C0072FB	During DHP test, Master Cylinder pressure is too high	-	-	-	-	• Brake system pipeline • Integrated brake controller
C006BFC	Monitor when there is no low voltage error reported	-	-	-	-	• Brake system pipeline • Integrated brake controller

Fault symptom

DTC No.	Fault symptom	Warning light
C006B06	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:OFF; EBD:OFF; ABS: OFF; ESP:OFF)	Not come on
C007200	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:OFF; EBD:OFF; ABS: OFF; ESP:OFF)	Not come on
C007204	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:OFF; EBD:OFF; ABS: OFF; ESP:OFF)	Not come on

DTC No.	Fault symptom	Warning light
C0072FB	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:OFF; EBD:OFF; ABS: OFF; ESP:OFF)	Not come on
C006BFC	System performance (EBD: OFF; ABS: OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check wire harness and connector

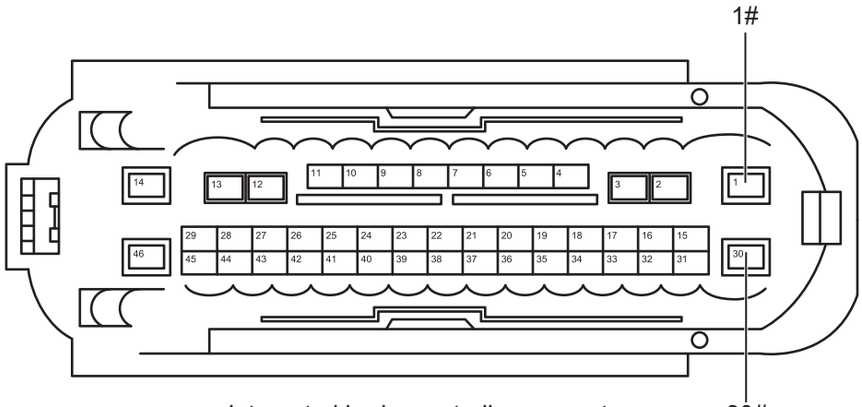
(a) Check if wire harness and connector are connected properly.

(b) Check if wire harness and connector are aging and damaged.

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check integrated brake controller ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) According to value in the table, measure resistance.

Standard value

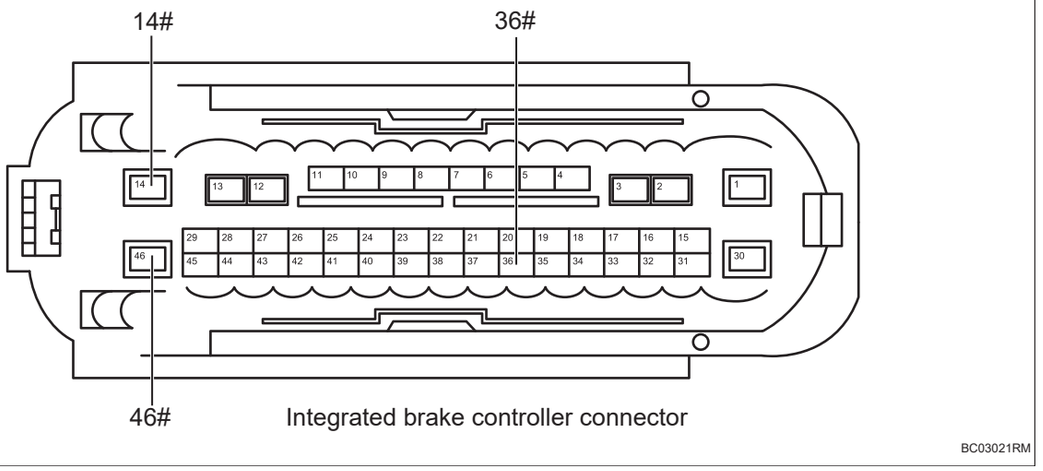
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check integrated brake controller power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	Battery voltage
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	Battery voltage
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector, fuse (if there is no problem with wire harness and connector, check the power supply and ground of front intelligent area control unit and confirm if the front intelligent area control unit is damaged)**

OK

5	**Read DTCs**

(a) Turn ignition switch to ON again after powering off.

(b) Brake hold for more than 30 s is not necessary.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

6	**Read DTCs again**

(a) The vehicle is powered off and wait for 5 minutes.

(b) Turn ignition switch to ON again, and drive the vehicle at a speed above 30 kph for at least 30 seconds.

(c) Stop vehicle and turn off the engine (shift to P gear, do not apply parking brake).

(d) Wait at least 100 seconds, during which no operation is allowed (do not open or close the door, and do not turn on any device functions to avoid disturbing ECU sleep.)

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

Diagnosis ends

DTC	**C007208**	**Valve fault: Overheat protection, signal invalid, hardware fault**
DTC	**C0072FC**	**Valve fault: Overheat protection, signal invalid, hardware fault**

Description

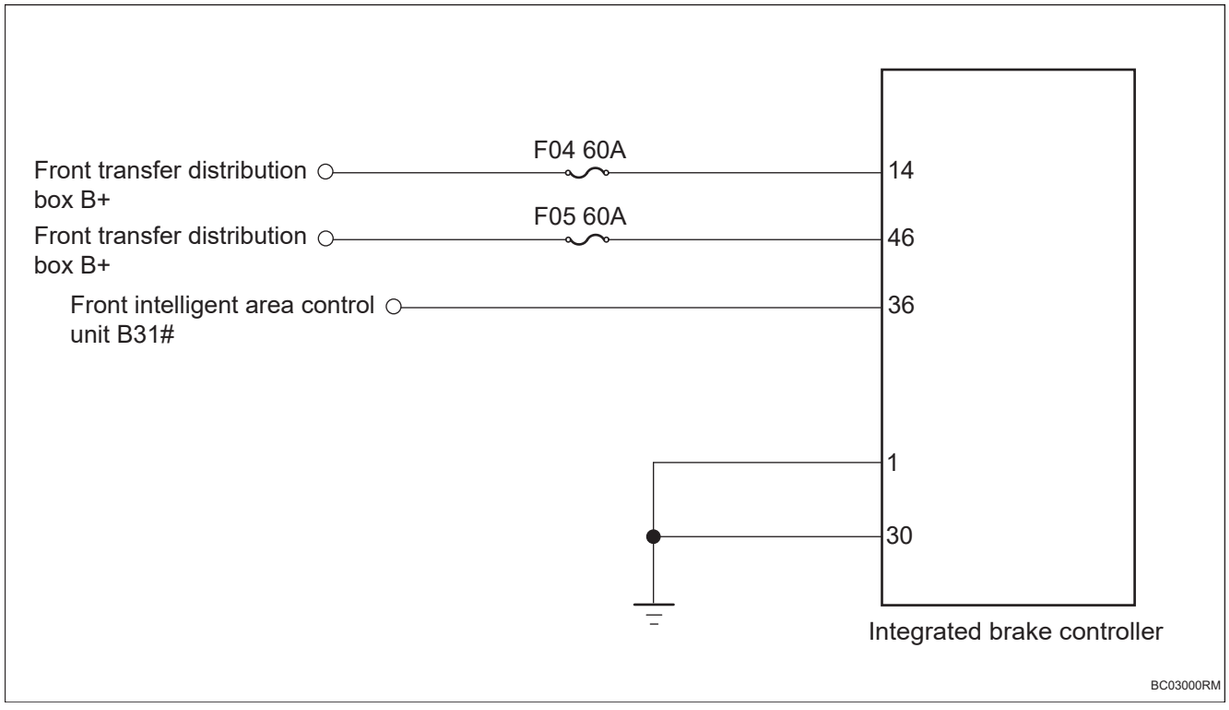
When integrated brake controller internal solenoid valve is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C007208	IGN is ON	Backup security switch is unable to shut down VRG	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0072FC	IGN is ON	The following three conditions exist simultaneously: The vehicle speed is higher than 15 kph; The power supply voltage of UB_VR is between 9.75 V and 18 V; And there is no request for braking	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light
C007208	System performance (EBD: OFF; ABS: OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	Comes on
C0072FC	System performance (EBD: OFF; ABS: OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check integrated brake controller fuse RF3/RF4**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the integrated brake controller fuse RF3/RF4.

(d) According to value in the table, measure resistance.

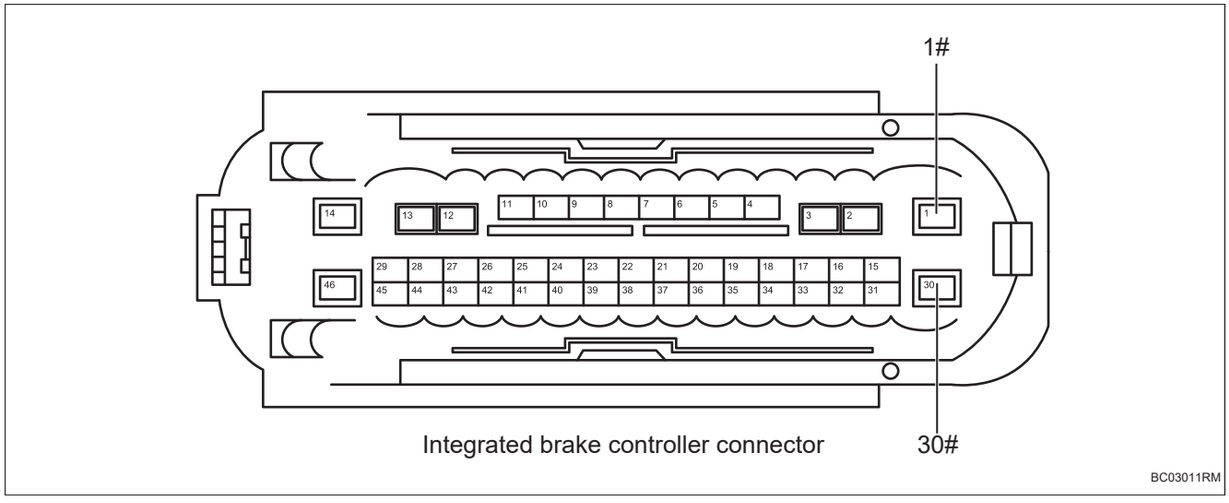
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	**Check integrated brake controller ground**



(a) Disconnect the integrated brake controller connector.

(b) According to value in the table, measure resistance.

Standard value

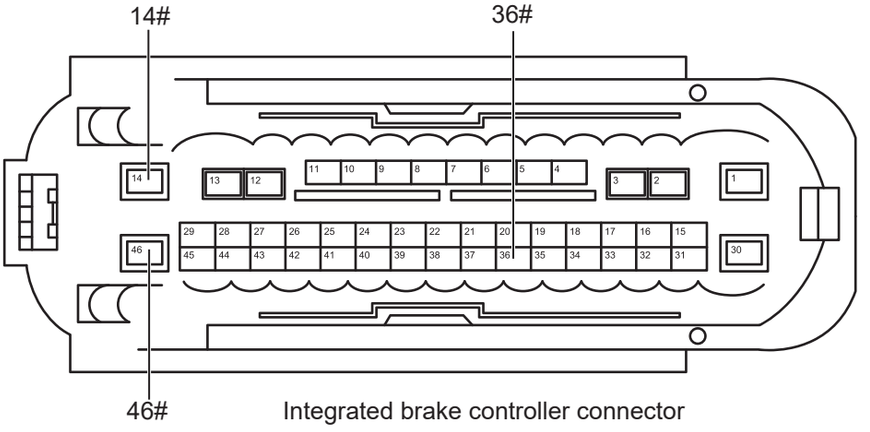
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check integrated brake controller power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK →

Replace integrated brake controller (See page DP-33)

DTC	**C00A900**	**Front left wheel sensor initialization test failed**
DTC	**C00A100**	**Short to power supply in front left wheel sensor**
DTC	**C00A000**	**Front left wheel sensor short to GND**
DTC	**C003208**	**Front left wheel speed sensor direction error**
DTC	**C003200**	**Front left wheel sensor short to GND**

DTC	**C003108**	**Front left wheel speed sensor signal abnormal**
DTC	**C00B900**	**Front left wheel speed test fault**

Description

When integrated brake controller detects that front left wheel speed sensor is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C00A900	Power-on initialization	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor
C00A100	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor
C00A000	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor
C003208	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor
C003200	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
						• Front left wheel speed sensor
C003108	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor
C00B900	Power supply status is normal IGN is ON	During power-on initialization, HW WSS self-check is triggered. If any error is found in the line of the sensor, an error is reported	-	Non-continuous type	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front left wheel speed sensor

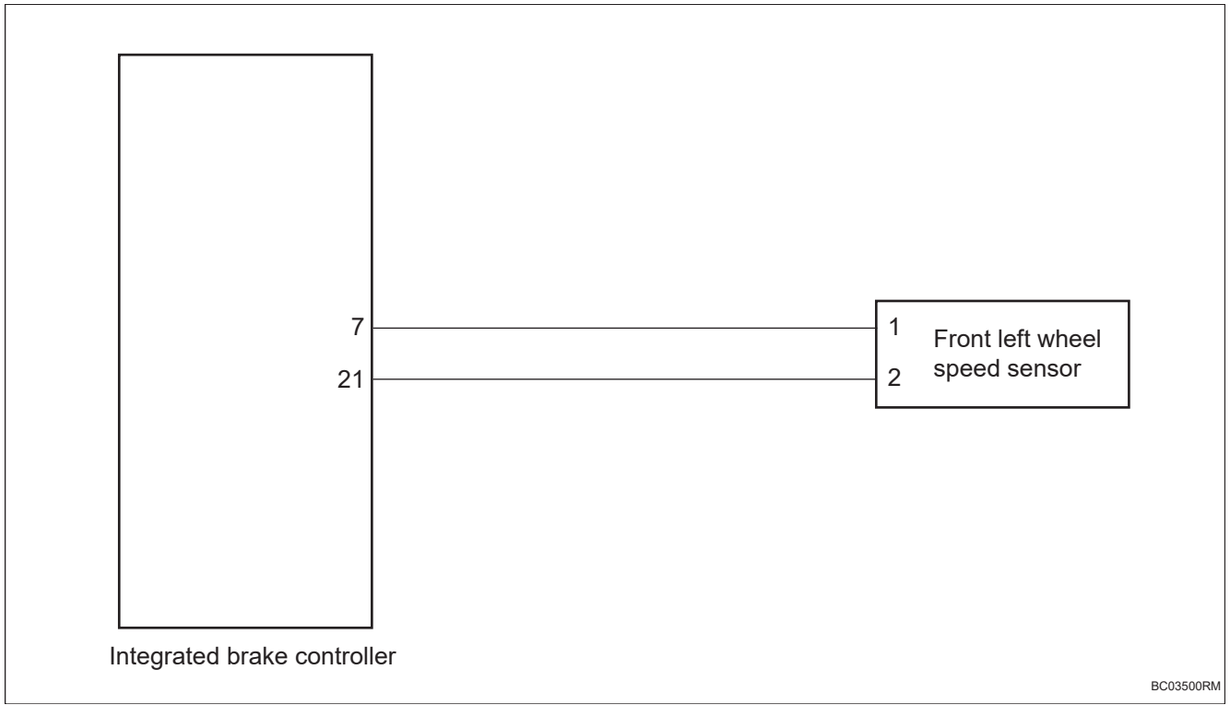
ZD

Fault symptom

DTC No.	Fault symptom	Warning light
C00A900	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A100	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A000	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C003208	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C003200	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C003108	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00B900	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle tire**

(a) Check if the tire size is as specified.

NG → **Perform repair according to malfunction**

OK

3	**Check front left wheel speed sensor signal gear ring**

(a) Check if the clearance between front left wheel speed sensor and gear ring is correct.

NG → **Perform repair according to malfunction**

OK

4	**Check front left wheel speed sensor**

(a) Check front left wheel speed sensor for proper installation.

(b) Check if front left wheel speed sensor is interfered by external magnetic field.

NG → **Perform repair according to malfunction**

OK

5	**Check for short to each other in front left wheel speed sensor wire harness and connector**

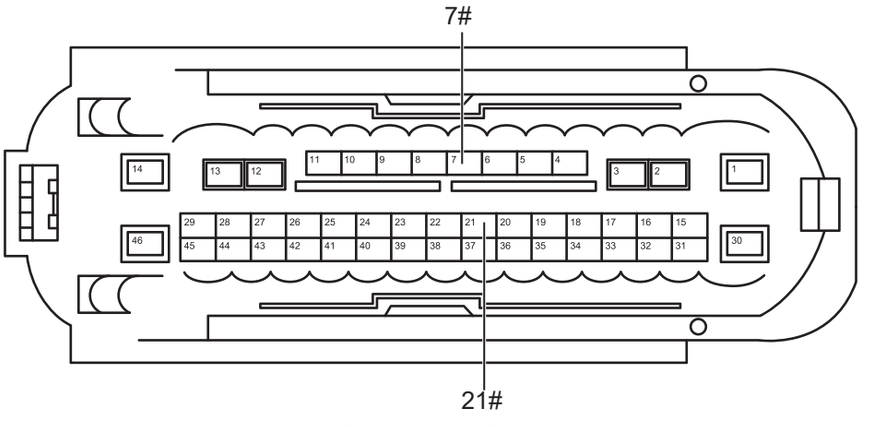
(a) Check if there is a reverse connection between front left wheel speed sensor signal wire and power supply wire.

(b) Check for short to each other in front left wheel speed sensor wire harness.

NG → **Perform troubleshooting**

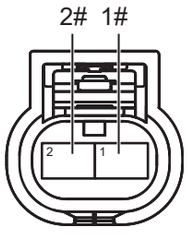
OK

6	**Check for open in front left wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03521RM



Front left wheel speed sensor connector

BC03511RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Disconnect the front left wheel speed sensor connector.

(e) According to value in the table, measure resistance.

Standard value

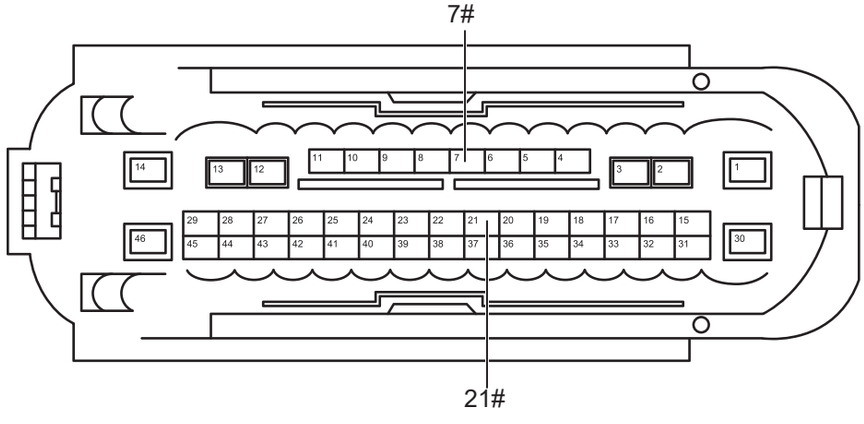
Multimeter connection	Detection condition	Specified condition
Front left wheel speed sensor connector 1# - integrated brake controller connector 7#	Always connected	Less than 1 Ω
Front left wheel speed sensor connector 2# - integrated brake controller connector 21#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03521RM

(a) According to value in the table, measure resistance.

Standard value

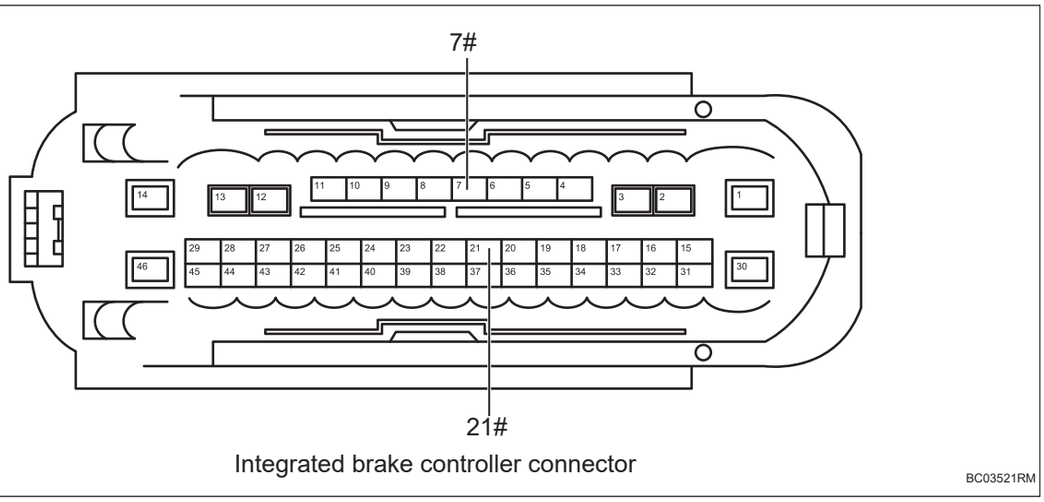
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 7# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	Check for short to power supply in wheel speed sensor wire harness and connector



Integrated brake controller connector

BC03521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK ↓

9	**Replace front left wheel speed sensor (See page DP-6)**

(a) Replace the front left wheel speed sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault occurs again.) (See page DP-33)**

OK ↓

Diagnosis ends

ZD

DTC	C00AA00	Front right wheel sensor initialization test failed
DTC	C00A300	Short to power supply in front right wheel sensor
DTC	C00A200	Front right wheel sensor short to GND
DTC	C003508	Front right wheel speed sensor direction error

DTC	**C003500**	**Front right wheel sensor short to GND**
DTC	**C003408**	**Front right wheel sensor direction/signal error**
DTC	**C00BA00**	**Front right wheel speed test fault**

Description

When integrated brake controller detects that front right wheel speed sensor is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C00AA00	Power-on initialization	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C00A300	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C00A200	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C003508	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C003500	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
						• Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C003408	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor
C00BA00	Power supply status is normal IGN is ON	During power-on initialization, HW WSS self-check is triggered. If any error is found in the line of the sensor, an error is reported	-	Non-continuous type	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Front right wheel speed sensor

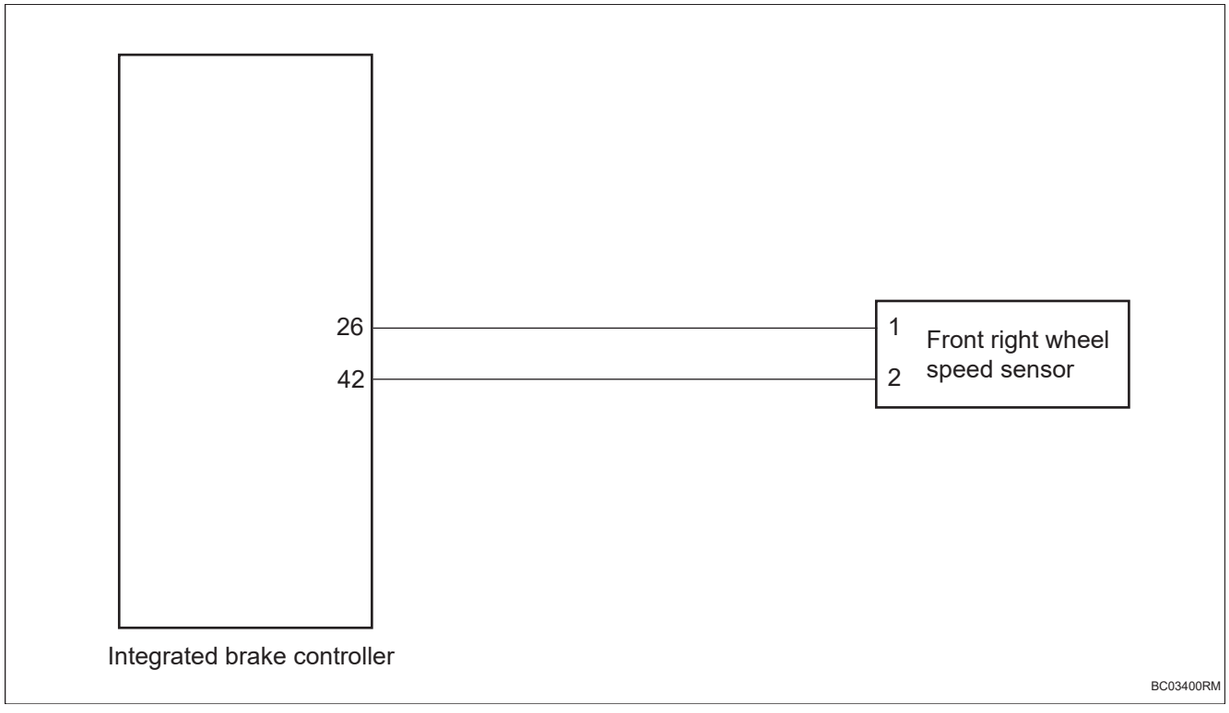
ZD

Fault symptom

DTC No.	Fault symptom	Warning light
C00AA00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A300	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A200	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C003508	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C003500	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C003408	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00BA00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle tire**

(a) Check if the tire size is as specified.

NG → **Perform repair according to malfunction**

OK

3	**Check front right wheel speed sensor signal gear ring**

(a) Check if the clearance between front right wheel speed sensor and gear ring is correct.

NG → **Perform repair according to malfunction**

OK

4	**Check front right wheel speed sensor**

(a) Check front right wheel speed sensor for proper installation.

(b) Check if front right wheel speed sensor is interfered by external magnetic field.

NG → **Perform repair according to malfunction**

OK

5	**Check for short to each other in front right wheel speed sensor wire harness and connector**

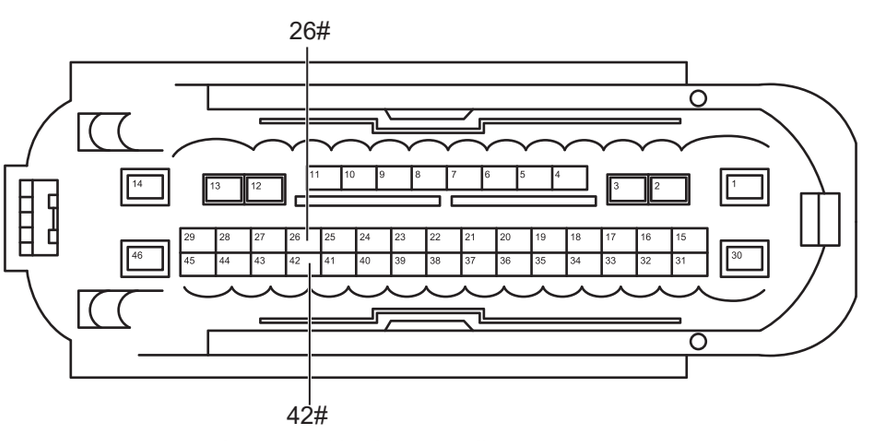
(a) Check if there is a reverse connection between front right wheel speed sensor signal wire and power supply wire.

(b) Check for short to each other in front right wheel speed sensor wire harness.

NG → **Perform troubleshooting**

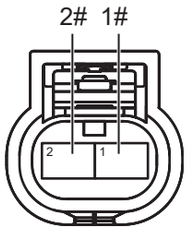
OK

6	**Check for open in front right wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03421RM



Front right wheel speed sensor connector

BC03411RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Disconnect the front right wheel speed sensor connector.

(e) According to value in the table, measure resistance.

Standard value

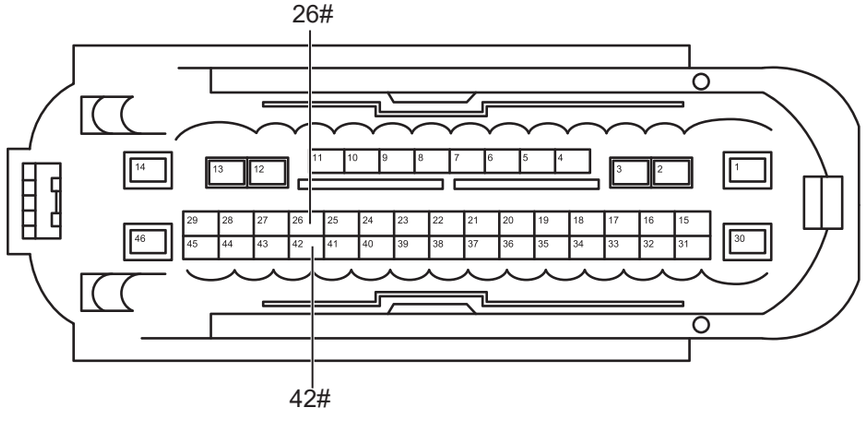
Multimeter connection	Detection condition	Specified condition
Front right wheel speed sensor connector 1# - integrated brake controller connector 26#	Always connected	Less than 1 Ω
Front right wheel speed sensor connector 2# - integrated brake controller connector 42#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03421RM

(a) According to value in the table, measure resistance.

Standard value

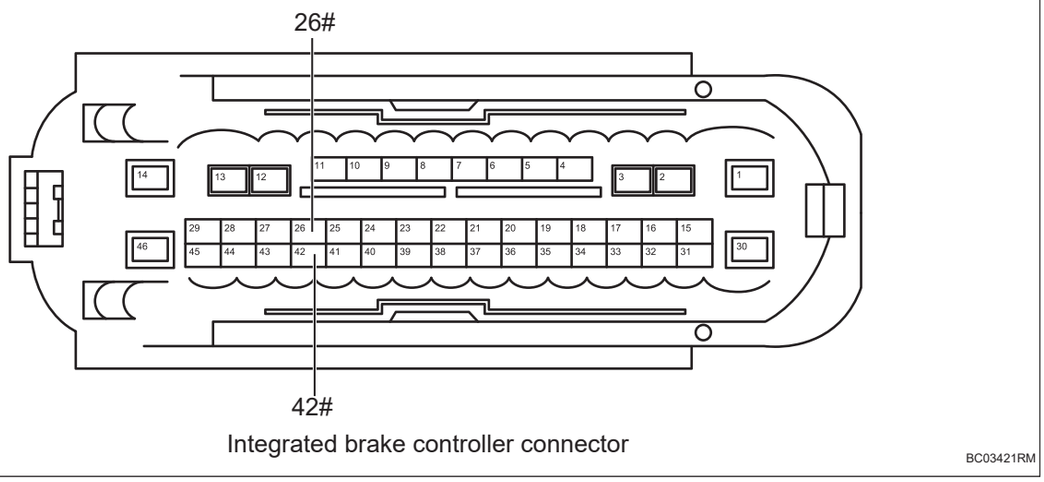
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 26# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 42# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	Check for short to power supply in wheel speed sensor wire harness and connector



Integrated brake controller connector

BC03421RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 42# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → Check and repair or replace wire harness and connector

OK

9	Replace front right wheel speed sensor (See page DP-6)

(a) Replace the front right wheel speed sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault occurs again.) (See page DP-33)

OK

Diagnosis ends

DTC	C00AB00	Rear left wheel sensor initialization test failed
DTC	C00A500	Short to power supply in rear left wheel sensor
DTC	C00A400	Rear left wheel sensor short to GND
DTC	C003808	Rear left wheel speed sensor direction error

DTC	C003800	Rear left wheel sensor short to GND
DTC	C003708	Rear left wheel speed sensor signal missing
DTC	C00BB00	Rear left wheel speed test fault

Description

When integrated brake controller detects that rear left wheel speed sensor is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C00AB00	Power-on initialization	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor
C00A500	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor
C00A400	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor
C003808	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor
C003800	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
						• Rear left wheel speed sensor
C003708	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor
C00BB00	Power supply status is normal IGN is ON	During power-on initialization, HW WSS self-check is triggered. If any error is found in the line of the sensor, an error is reported	-	Non-continuous type	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear left wheel speed sensor

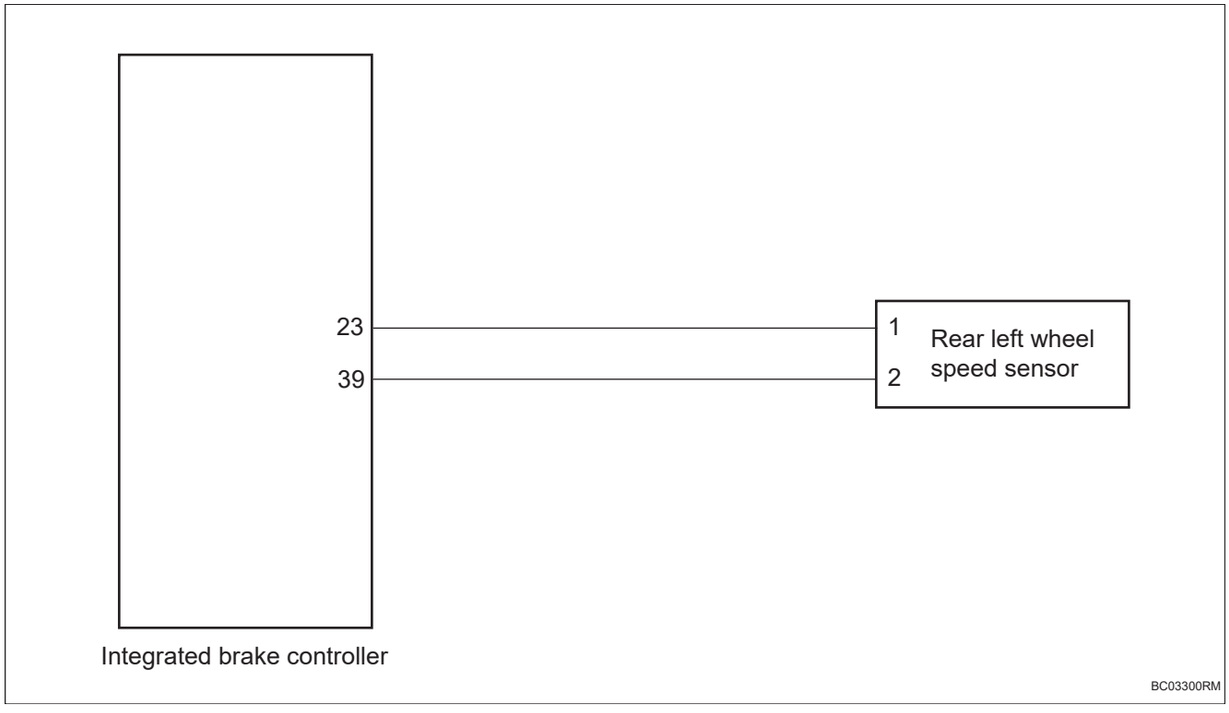
ZD

Fault symptom

DTC No.	Fault symptom	Warning light
C00AB00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A500	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A400	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C003808	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C003800	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C003708	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00BB00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle tire**

(a) Check if the tire size is as specified.

NG → **Perform repair according to malfunction**

OK

3	**Check rear left wheel speed sensor signal gear ring**

(a) Check if the clearance between rear left wheel speed sensor and gear ring is correct.

NG → **Perform repair according to malfunction**

OK

4	**Check rear left wheel speed sensor**

(a) Check rear left wheel speed sensor for proper installation.

(b) Check if rear left wheel speed sensor is interfered by external magnetic field.

NG → **Perform repair according to malfunction**

OK

5	**Check for short to each other in rear left wheel speed sensor wire harness and connector**

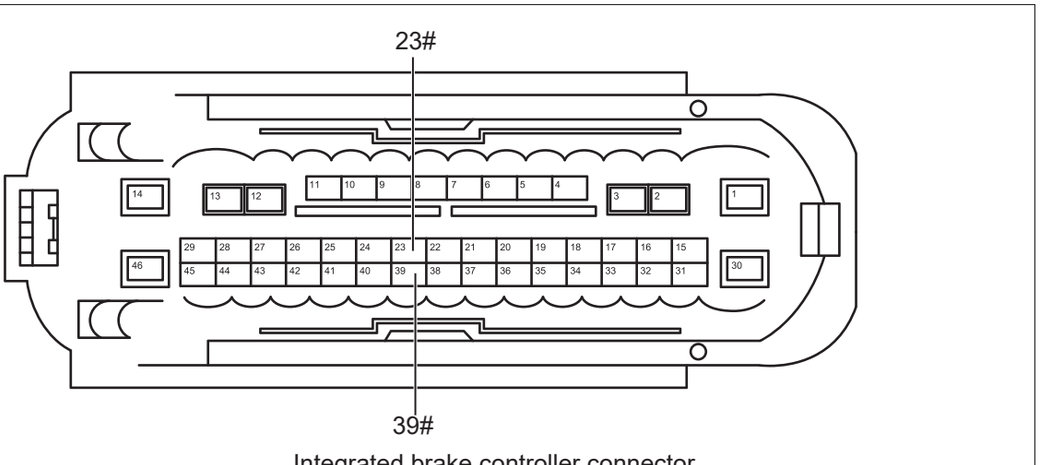
(a) Check if there is a reverse connection between rear left wheel speed sensor signal wire and power supply wire.

(b) Check for short to each other in rear left wheel speed sensor wire harness.

NG → **Perform troubleshooting**

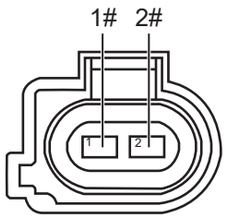
OK

6	**Check for open in rear left wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03321RM



Rear left wheel speed sensor connector

BC03311RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Disconnect the rear left wheel speed sensor connector.

(e) According to value in the table, measure resistance.

Standard value

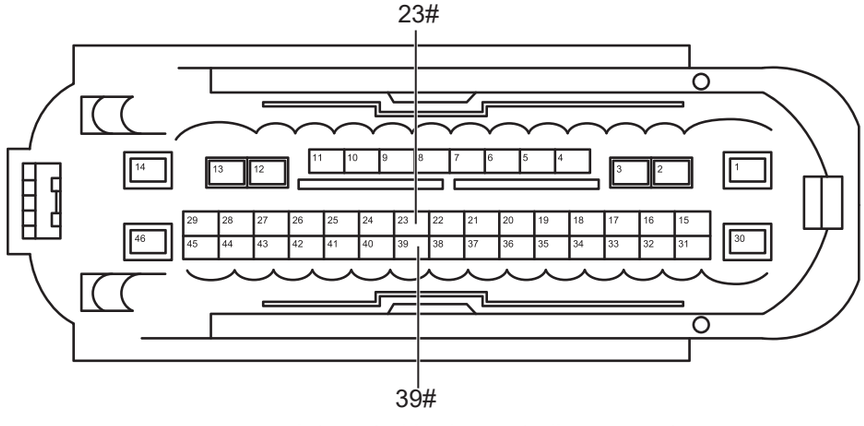
Multimeter connection	Detection condition	Specified condition
Rear left wheel speed sensor connector 1# - integrated brake controller connector 23#	Always connected	Less than 1 Ω
Rear left wheel speed sensor connector 2# - integrated brake controller connector 39#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03321RM

(a) According to value in the table, measure resistance.

Standard value

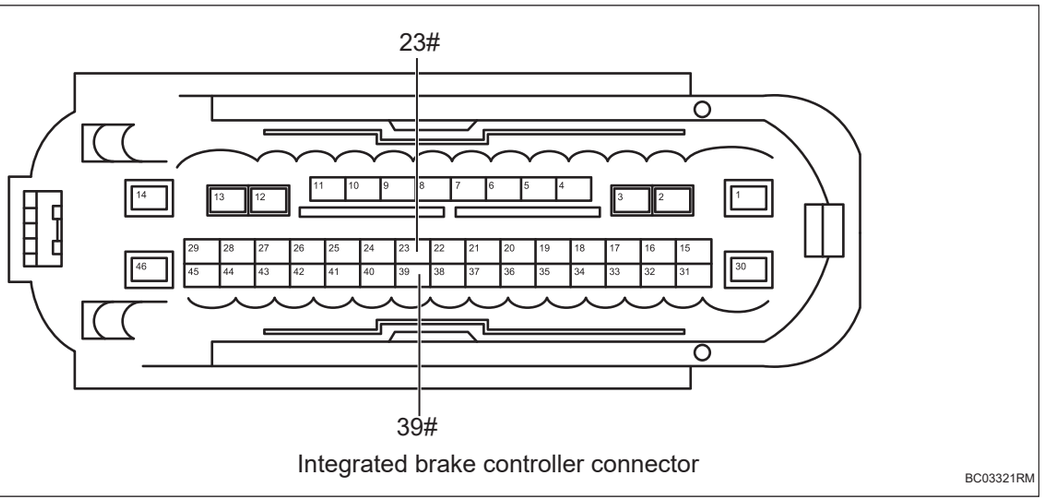
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 23# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 39# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	Check for short to power supply in wheel speed sensor wire harness and connector



Integrated brake controller connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 23# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 39# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK ↓

9	Replace rear left wheel speed sensor (See page DP-6)

(a) Replace the rear left wheel speed sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault occurs again.) (See page DP-33)**

OK ↓

Diagnosis ends

ZD

DTC	C00AC00	Rear right wheel sensor initialization test fault
DTC	C00A700	Short to power supply in rear right wheel sensor
DTC	C00A600	Rear right wheel sensor short to GND
DTC	C003B08	Rear right wheel sensor direction error

DTC	**C003B00**	**Rear right wheel sensor short to GND**
DTC	**C003A08**	**Rear right wheel speed sensor signal error**
DTC	**C00BC00**	**Rear right wheel speed test fault**

Description

When integrated brake controller detects that rear right wheel speed sensor is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C00AC00	Power-on initialization	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor
C00A700	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor
C00A600	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor
C003B08	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor
C003B00	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
						• Rear right wheel speed sensor
C003A08	Initialization is completed, and the vehicle speed is maintained above 5 kph for 10 s	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor
C00BC00	Power supply status is normal: IGN is in ON	During power-on initialization, HW WSS self-check is triggered. If any error is found in the line of the sensor, an error is reported	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Rear right wheel speed sensor

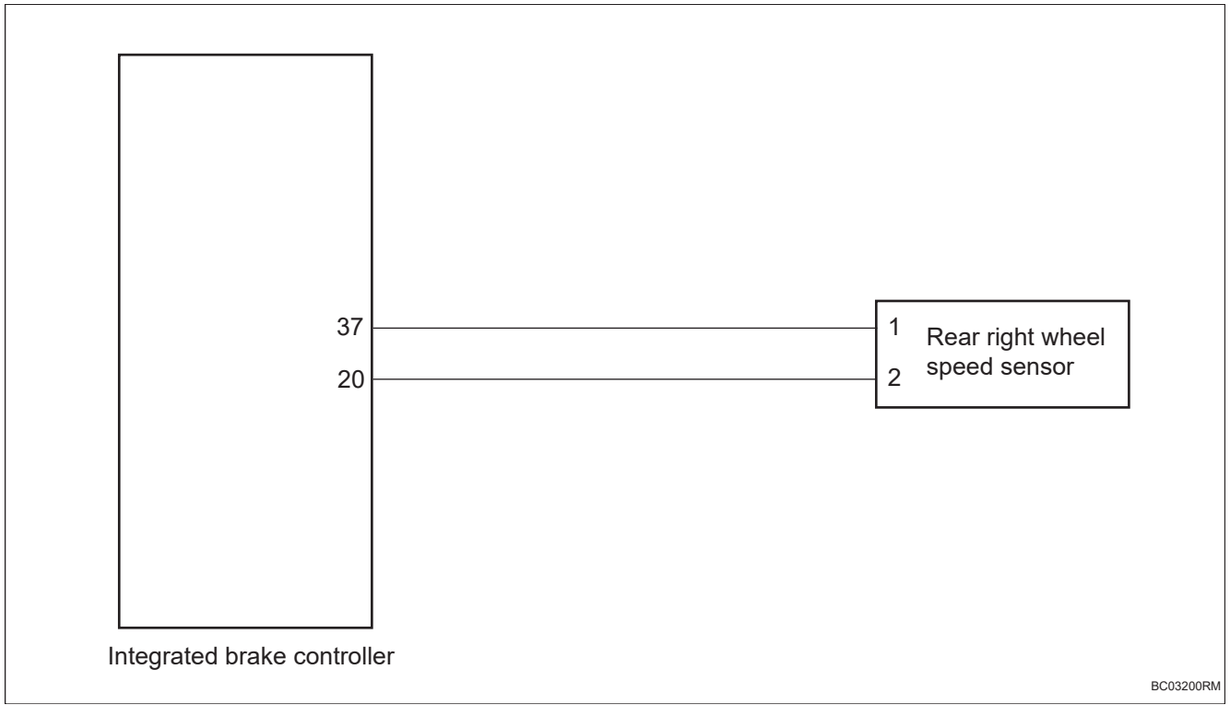
ZD

Fault symptom

DTC No.	Fault symptom	Warning light
C00AC00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A700	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00A600	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C003B08	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C003B00	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C003A08	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on
C00BC00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check vehicle tire**

(a) Check if the tire size is as specified.

NG → **Perform repair according to malfunction**

OK

3	**Check rear right wheel speed sensor signal gear ring**

(a) Check if the clearance between rear right wheel speed sensor and gear ring is correct.

NG → **Perform repair according to malfunction**

OK

4	**Check rear right wheel speed sensor**

(a) Check rear right wheel speed sensor for proper installation.

(b) Check if rear right wheel speed sensor is interfered by external magnetic field.

NG → **Perform repair according to malfunction**

OK

5	**Check for short to each other in rear right wheel speed sensor wire harness and connector**

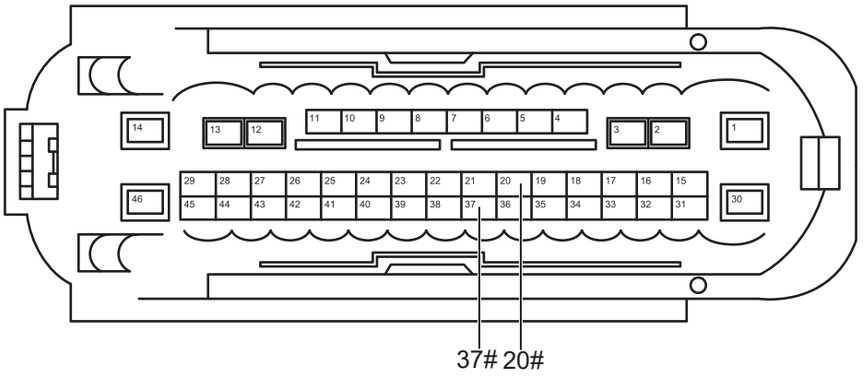
(a) Check if there is a reverse connection between rear right wheel speed sensor signal wire and power supply wire.

(b) Check for short to each other in rear right wheel speed sensor wire harness.

NG → **Perform troubleshooting**

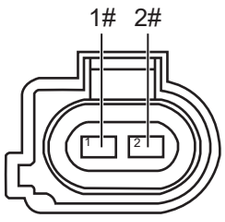
OK

6	**Check for open in rear right wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03221RM



Rear right wheel speed sensor connector

BC03211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Disconnect the rear right wheel speed sensor connector.

(e) According to value in the table, measure resistance.

Standard value

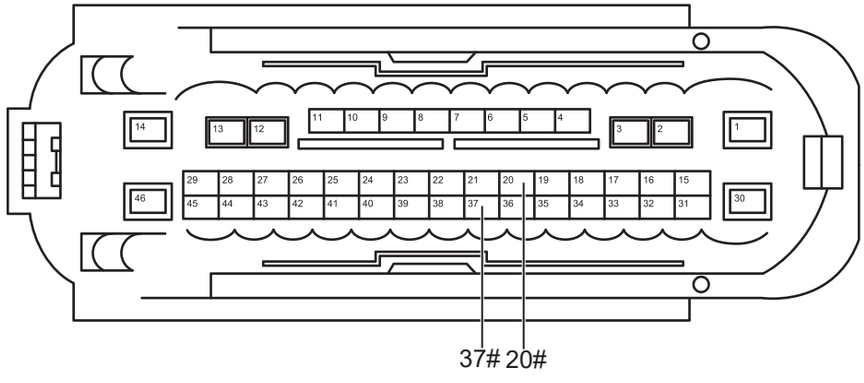
Multimeter connection	Detection condition	Specified condition
Rear right wheel speed sensor connector 1# - integrated brake controller connector 37#	Always connected	Less than 1 Ω
Rear right wheel speed sensor connector 2# - integrated brake controller connector 20#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03221RM

(a) According to value in the table, measure resistance.

Standard value

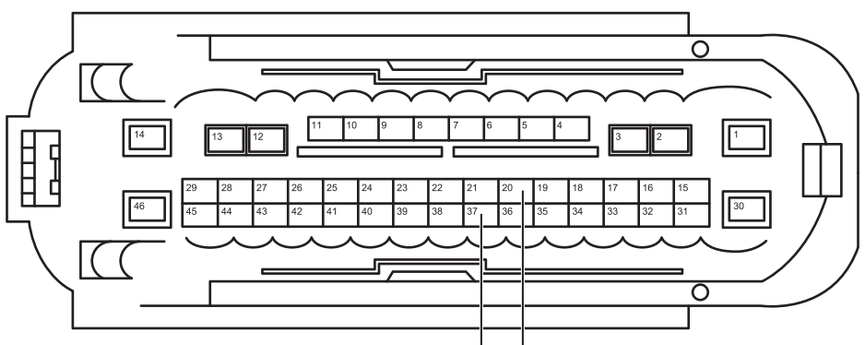
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 37# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	Check for short to power supply in wheel speed sensor wire harness and connector



Integrated brake controller connector

BC03221RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 37# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	Replace rear right wheel speed sensor (See page DP-6)

(a) Replace the rear right wheel speed sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault occurs again.) (See page DP-33)**

OK

Diagnosis ends

ZD

DTC	C054300	Pressure sensor fault: circuit voltage too high
DTC	C054200	Pressure sensor fault: circuit voltage too low
DTC	C053F00	Plunger internal pressure too low
DTC	C053D00	Pressure sensor fault
DTC	C007500	Lips ID transmission timeout

DTC	C056C00	Pressure sensor internal fault
DTC	C004510	Pressure sensor circuit fault
DTC	C0044FC	Pressure sensor internal fault

Description

When integrated brake controller internal pressure sensor is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C054300	IGN is ON	When no correct data frame is received for a period of time and the signal line level is high, a fault is reported.	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C054200	IGN is ON	When no correct data frame is received for a period of time and the signal line level is low, a fault is reported.	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C053F00	Periodic monitoring	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C053D00	After releasing the brake pedal	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C007500	IGN is ON	fast channel value of pressure sensor is 4088	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C056C00	IGN is ON	The status bit in SENT protocol or the data in fast channel 2 does not comply with the protocol specifications	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C004510	IGN is ON	When no correct data frame is received for a period of time and the signal line level is high, a fault is reported. When no correct data frame is received for a period of time and the signal line level is low, a fault is reported.	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0044FC	IGN is ON	The status bit in SENT protocol or the data in fast channel 2 does not comply with the protocol specifications	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

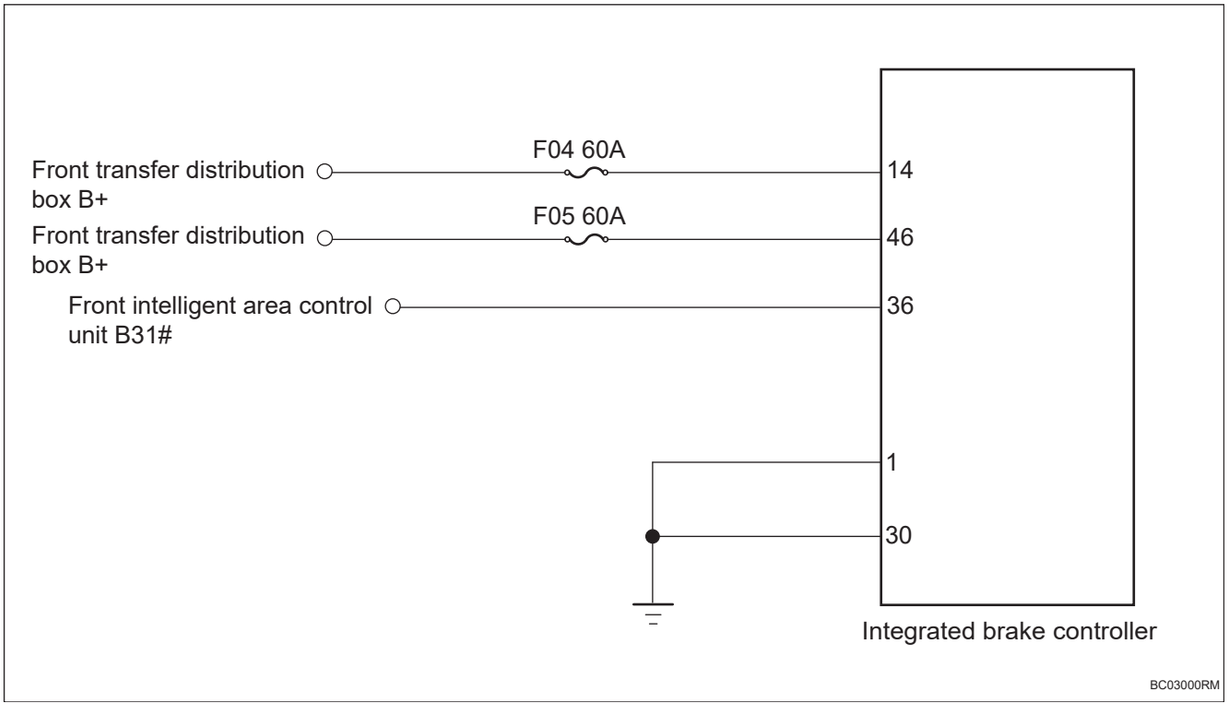
ZD

Fault symptom

DTC No.	Fault symptom	Warning light
C054300	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C054200	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C053F00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C053D00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C007500	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C056C00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF)	Comes on

DTC No.	Fault symptom	Warning light
	Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	
C004510	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C0044FC	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check integrated brake controller fuse RF3/RF4**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the integrated brake controller fuse RF3/RF4.

(d) According to value in the table, measure resistance.

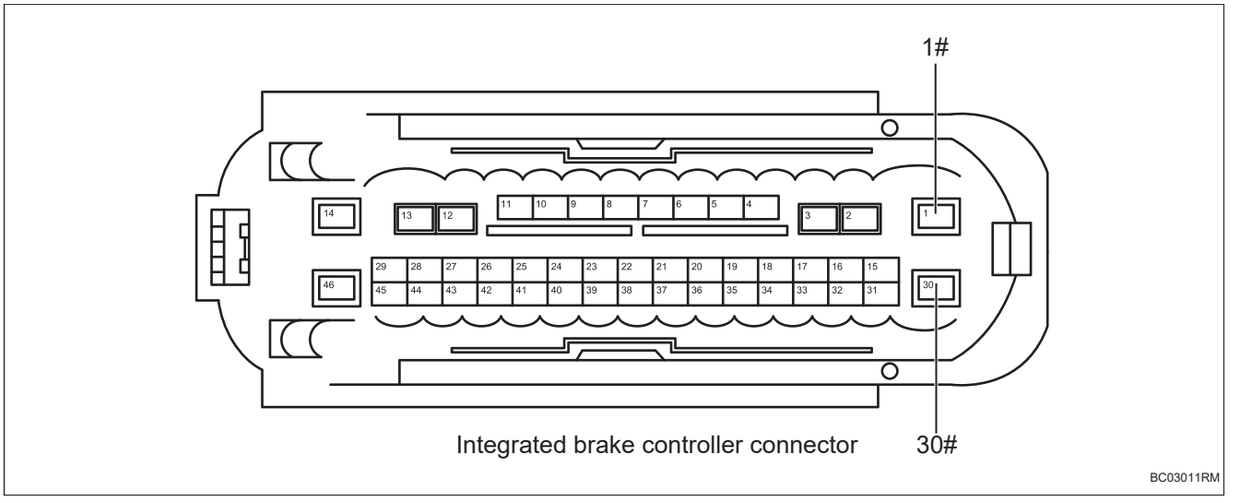
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	**Check integrated brake controller ground**



(a) Disconnect the integrated brake controller connector.

(b) According to value in the table, measure resistance.

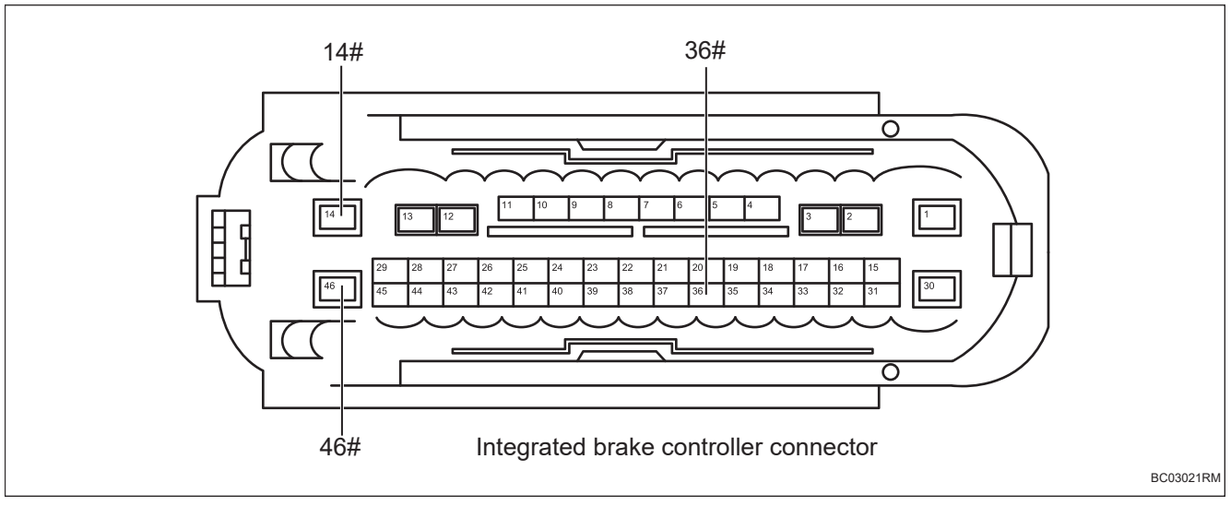
Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check integrated brake controller power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK →

Replace integrated brake controller (See page DP-33)

DTC	C055E00	Brake pipeline leakage

Description

When the deviation between actual vehicle pressure and set pressure is out of the set range, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C055E00	When IPB is in single pipe mode, and perform monitor when plunger is operating	The difference between the target elasticity modulus and the actual elasticity modulus of the brake pipeline in the software is more than the threshold value for more than 0.5 second The difference between the fluid volume calculated based on the plunger position and the fluid volume calculated based on the pipeline pressure is greater than the error reporting threshold Calculate the change rate in the difference between the fluid volume calculated based on the plunger position and the fluid volume calculated based on the pipeline pressure. When the change rate is greater than the threshold value, an error is reported	-	-	-	• Brake system pipeline • Integrated brake controller (internal pressure sensor)
	With IPB in alternating pressure building of circuits 1, 2, perform monitoring when plunger is operating	The difference between the target elasticity modulus and the actual elasticity modulus of the brake pipeline in the software is more than the threshold	-	-	-	

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		value for more than 0.5 second Calculate the change rate in the difference between the fluid volume calculated based on the plunger position and the fluid volume calculated based on the pipeline pressure. When the change rate in pipeline 2 is greater than that in pipeline 1 and the difference is greater than the threshold value, an error is reported Compare the liquid volume values calculated based on the push rod formation between circuit 1 and circuit 2. When the liquid volume of circuit 2 is greater than that of circuit 1 and the difference exceeds the door limit value, an error will be reported				
	With IPB in normal mode, perform monitoring when plunger is operating	The difference between the target elasticity modulus and the actual elasticity modulus of the brake pipeline in the software is more than the threshold value for more than 0.5 second	-	-	-	

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		The difference between the fluid volume calculated based on the plunger position and the fluid volume calculated based on the pipeline pressure is greater than the error reporting threshold Calculate the change rate in the difference between the fluid volume calculated based on the plunger position and the fluid volume calculated based on the pipeline pressure. When the change rate is greater than the threshold value, an error is reported				

Fault symptom

DTC No.	Fault symptom	Warning light
C055E00	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	Comes on
	System performance (EBD: ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: OFF; ESP:ON)	Comes on
	System performance (EBD: ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: OFF; ESP:ON)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check for CAN related fault**

(a) Check for CAN communication related DTCs.

(b) Check for fault in CAN bus hardware and software.

NG → **Perform repair according to malfunction**

OK

3	**Check for air in brake pipe**

(a) Check for air in brake pipe system.

NG → **The brake system performs off-line air bleeding operation (ensure that there is no residual air in the brake pipe and integrated brake controller)**

OK

4	**Read DTCs**

(a) Keep stationary for 15 seconds after turning ignition switch to ON again, during which no brake related operation is allowed.

(b) The vehicle is powered off and wait for 5 minutes.

(c) Power on again and fully release the brake pedal, and wait for 15 seconds. Do not perform any brake related operations during this period (depress the brake pedal, turn on APB, apply parking brake, etc.).

(d) Fully depress brake pedal (build up a pressure of about 78 bar) and hold for at least 120 seconds (do not release the pedal if there is any IPB operating sound during this period).

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

Diagnosis ends

DTC	**C055FFB**	**Hydraulic valve mechanical fault related to IPB system**
DTC	**C059700**	**IPB installation not completed**

Description

When the deviation between actual vehicle pressure and set pressure is out of the set range, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C055FFB	New ignition cycle and keep releasing the brake pedal for at least 30 s	Active testing performs active pressure relief in the plunger circuit. Loss of pressure build-up capability is detected. Errors will only be reported during power-on again phase	-	-	-	• Brake system pipeline • Integrated brake controller (internal pressure sensor)
	Depress brake pedal, master cylinder pressure > 3 bar	Within a period of time (> 3 s) after depressing the brake pedal, the calculated brake fluid leakage rate is > 500 mm`3/s	-	-	-	
	During replenishing	When the push rod flow exceeds the push rod flow at the start of	-	-	-	

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		RPL, a fault is reported.				
	Power on and maintain for at least 30 seconds, no braking operations are allowed during this period. (For example, inability to depress the brake pedal, apply parking brake or electronic parking brake, auxiliary braking function, etc.)	Active testing performs active pressure relief in the plunger circuit. Reduced pressure build-up capability is detected. Errors will only be reported during power-on again phase	-	-	-	
	Power on, the vehicle is stationary after driving for a period of time. Enter postrun after power off until postrun is completely finished	The active test of system detects that the hydraulic valve related to IPB is stuck	-	-	-	
C059700	When ECU starts or diagnoses	-	-	-	-	• Brake system pipeline • Integrated brake controller (internal pressure sensor)

Fault symptom

DTC No.	Fault symptom	Warning light
C055FFB	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:OFF; ABS: ON; ESP:ON)	Comes on
	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:ON; EBD:ON; ABS: OFF; ESP:OFF)	
	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	
	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:ON; EBD:OFF; ABS: OFF; ESP:OFF)	

DTC No.	Fault symptom	Warning light
	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:ON; EBD:OFF; ABS: OFF; ESP:OFF)	
C059700	System performance (EBD: OFF; ABS: OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check for CAN related fault**

(a) Check for CAN communication related DTCs.

(b) Check for fault in CAN bus hardware and software.

NG → **Perform repair according to malfunction**

OK

3	**Check for air in brake pipe**

(a) Check for air in brake pipe system.

NG → **The brake system performs off-line air bleeding operation (ensure that there is no residual air in the brake pipe and integrated brake controller)**

OK

4	**Read DTCs**

(a) Depress brake pedal after turning ignition switch to ON again.

(b) The vehicle is powered off and wait for 5 minutes.

(c) Power on again and then wait for 30 seconds. Do not perform any brake related operations during this period. (Depress the brake pedal, turn on APB, apply parking brake, etc.).

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

ZD

Diagnosis ends

DTC	C0595FC	Brushless motor initialization timeout
DTC	C058900	Position sensor fault
DTC	C058800	Position sensor fault
DTC	C058AFC	Brake booster motor "A" position sensor
DTC	C059000	Brake booster motor phase current too high
DTC	C0590FC	Brake booster motor phase current too high
DTC	C059100	Brake booster motor phase current too low
DTC	C0591FC	Brake booster motor phase current too low
DTC	C059200	Brake booster motor "B" phase current too high
DTC	C0592FC	Brake booster motor "B" phase current too high
DTC	C059300	Brake booster motor "B" phase current too low

DTC	**C0593FC**	**Brake booster motor "B" phase current too low**
DTC	**C059400**	**Brake booster motor "A" fault**
DTC	**C059592**	**Brushless motor drive chip not in operating mode**

Description

When integrated brake controller pump motor operates abnormally, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C0595FC	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C058900	IGN is ON	-	2500 us	-	500 us	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C058800	IGN is ON	-	2500 us	-	500 us	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C058AFC	Periodic monitoring	The square of vector length of RPS sensor is higher than the error threshold (114%*114%) The square of vector length of RPS sensor is lower than the error threshold (83% *83%) The square of the vector length of the RPS sensor filtered by the high-pass filter shows a jump (+/-6%)	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C059000	IGN is ON	The phase current is more than 37 A when motor is in idle mode	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0590FC	-	Phase current > 100 A during motor operation	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C059100	IGN is ON	Phase current < -37 A when the motor is in idle mode	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0591FC	-	Phase current < -100 A during motor drive	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C059200	IGN is ON	The phase current is more than 37 A when motor is in idle mode	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0592FC	-	Phase current > 100 A during motor operation	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C059300	IGN is ON	Phase current < -37 A when the motor is in idle mode	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C0593FC	-	Phase current < -100 A during motor drive	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

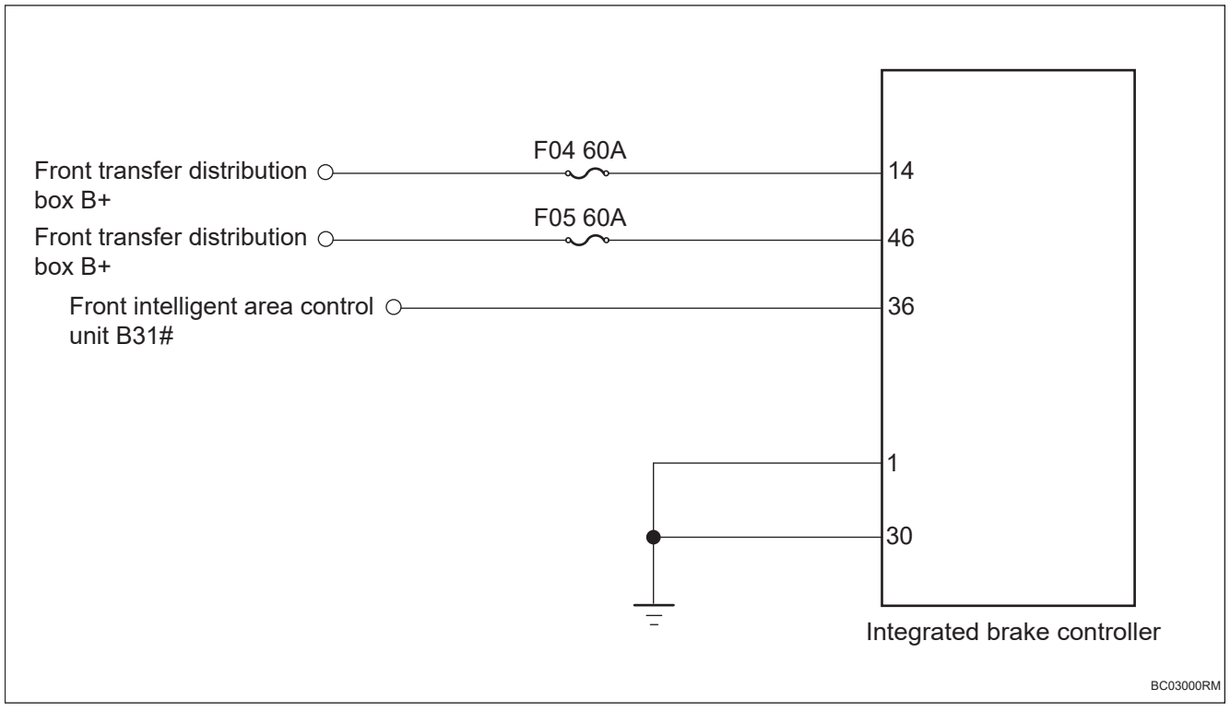
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C059400	Periodic monitoring	The square of vector length of RPS sensor is higher than the error threshold (114%*114%) The square of vector length of RPS sensor is lower than the error threshold (83% *83%) The square of the vector length of the RPS sensor filtered by the high-pass filter shows a jump (+/-6%)	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system
C059592	IGN is ON	UBB > 34.5 V, or UBB < 6.4 V, monitor once every 5 ms, and report an error after 100 ms	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light
C0595FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on
C058900	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C058800	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C058AFC	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C059000	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C0590FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on
C059100	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C0591FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on
C059200	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C0592FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on
C059300	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C0593FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on
C059400	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on
C059592	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF: ON; ABS:ON; ESP:ON)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

ZD

NG

2	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check integrated brake controller fuse RF3/RF4**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the integrated brake controller fuse RF3/RF4.

(d) According to value in the table, measure resistance.

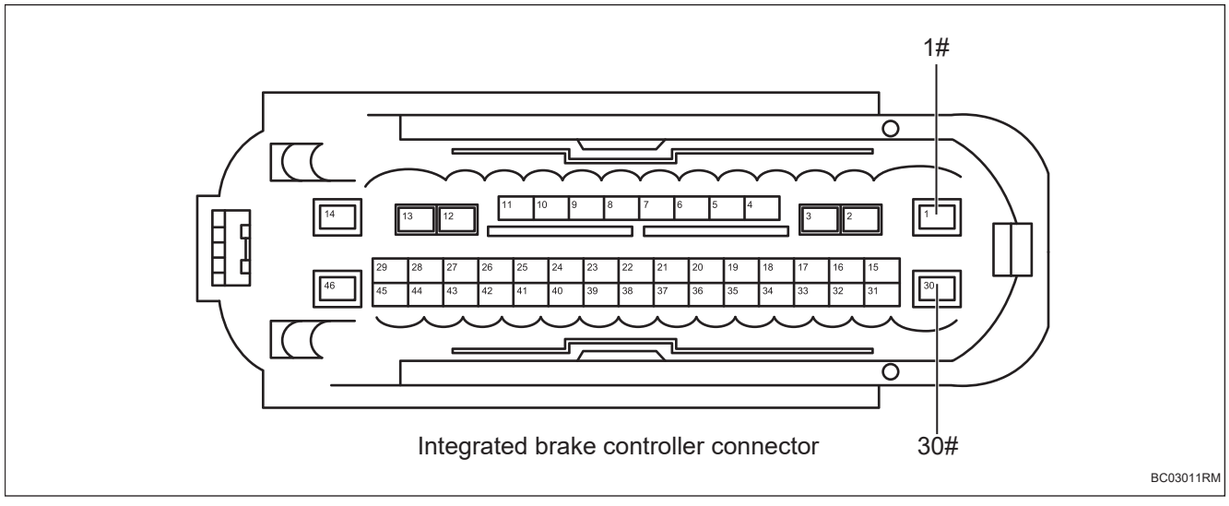
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	Check integrated brake controller ground



(a) Disconnect the integrated brake controller connector.

(b) According to value in the table, measure resistance.

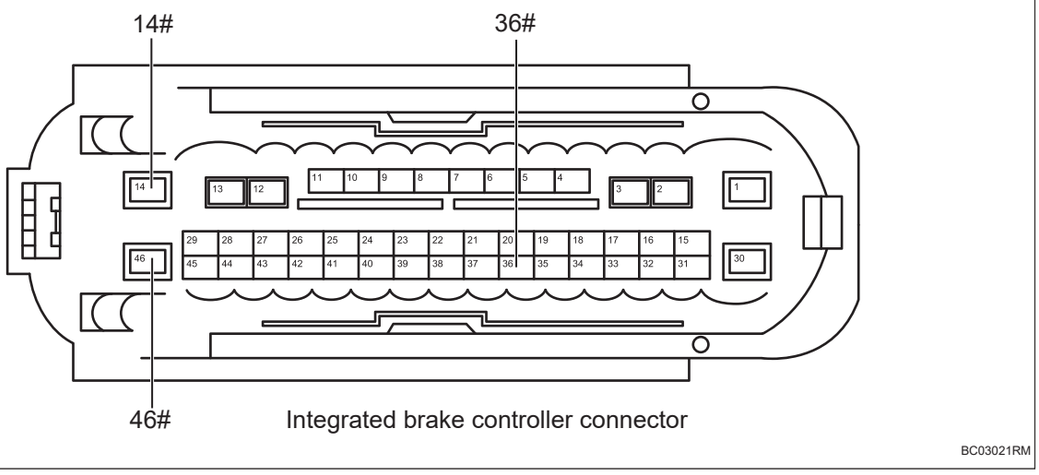
Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check integrated brake controller power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK

Replace integrated brake controller (See page DP-33)

DTC	**C05B000**	**Brake pipeline hydraulic circuit leakage**
DTC	**C055F92**	**BSCM/EBBC hydraulic function problem**

Description

When the deviation between actual vehicle pressure and set pressure is out of the set range, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C05B000	Report error during postrun	Perform active testing during postrun, LEM evaluates the pressure situation. In the test, the piston pushes forward to provide a certain pressure, and then stops. If the pressure continues to drop, the leakage amount can be calculated. If the leakage amount and air content are too large, an error will be reported	-	-	-	• Brake system pipeline • Integrated brake controller (internal pressure sensor)

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	Error reported at the end of braking, several braking may be required	When the driver or VAF function depresses the brake pedal, if the system shows that the amount of liquid consumed to build pressure or maintain a certain pressure is increasing, the amount of leakage can be calculated. If the leakage amount is too large, an error will be reported. It usually takes 2 to 10 times of braking to detect leakage	-	-	-	
C055F92	Each ignition cycle is monitored when the system is not degraded	During the pressure build-up process, the actual pressure in plunger is lower than the target pressure (the difference is more than 30 bar)	-	-	-	• Brake system pipeline • Integrated brake controller (internal pressure sensor)
	Each ignition cycle is monitored when the system is not degraded	During the pressure build-up process, the actual pressure in plunger is lower than the target pressure (the difference is more than 30 bar)	-	-	-	

Fault symptom

DTC No.	Fault symptom	Warning light
C05B000	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:ON; EBD:OFF; ABS: OFF; ESP:OFF)	Comes on
C055F92	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:OFF; ABS: ON; ESP:ON)	Comes on
	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF: ON; ABS:OFF; ESP:OFF)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

ZD

2	**Check for CAN related fault**

(a) Check for CAN communication related DTCs.

(b) Check for fault in CAN bus hardware and software.

NG → **Perform repair according to malfunction**

OK

3	**Check for air in brake pipe**

(a) Check for air in brake pipe system.

NG → **The brake system performs off-line air bleeding operation (ensure that there is no residual air in the brake pipe and integrated brake controller)**

OK

4	**Read DTCs**

(a) Depress brake pedal after turning ignition switch to ON again.

(b) The vehicle is powered off and wait for 5 minutes.

(c) Power on again and then wait for 30 seconds. Do not perform any brake related operations during this

period (depress the brake pedal, turn on APB, apply parking brake, etc.).

(d) Depresses the accelerator pedal, and drive the vehicle at a speed above 15 kph for at least 30 seconds.

(e) Stop vehicle normally and turn off the engine.

(f) Wait for 20 seconds, and do not perform any brake related operations during this period (depress the brake pedal, turn on APB, apply parking brake, etc.).

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

5	Read DTCs again

(a) The vehicle is powered off and wait for 5 minutes.

(b) Power on again.

(c) Drive the vehicle at a speed above 30 kph for at least 30 seconds.

(d) Stop vehicle normally and turn off the engine.

(e) Wait at least 100 seconds, during which no operation is allowed (do not open or close the door, and do not turn on any device functions to avoid disturbing ECU sleep.)

(f) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK

Diagnosis ends

ZD

DTC	C104D04	AVH button pressed for long time

Description

When AVH button is faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C104D04	Battery 12 V, ignition ON and power ON	After power-on, press AVH button continuously for more than 30 seconds	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light
C104D04	System performance (EBD: ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (BBF:OFF; EBD:OFF; ABS: OFF; ESP:OFF)	Comes on

Inspection procedure

1	Check AVH button switch

(a) Check for foreign matters in AVH button.

(b) Check AVH button for damage and deformation.

(c) Operate switch to check for sticking.

NG → **Perform repair according to malfunction**

OK

Replace AVH button

DTC	**C104D04**	**Brake booster motor operating error**

Description

When the brake booster motor operation error is detected, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C104D04	Pressure-building capability of plunger has lost completely	-	-	-	-	• Brake system pipeline • Integrated brake controller

Fault symptom

DTC No.	Fault symptom	Warning light
C104D04	System performance (EBD: ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (BBF:ON; EBD:ON; ABS: ON; ESP:ON)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check for air in brake pipe**

(a) Check for air in brake pipe system.

NG → **The brake system performs off-line air bleeding operation (ensure that there is no residual air in the brake pipe and integrated brake controller)**

OK

3	**Check brake fluid level**

(a) Check for leakage fault in brake pipe system.

(b) Check if brake fluid level is normal.

NG → **Perform repair according to malfunction**

OK

Replace integrated brake controller (See page DP-33)

DTC	**C1099FC**	**Multiple wheel speed sensors error**
DTC	**C109908**	**Wheel speed sensor direction error**
DTC	**C109904**	**Abnormal multiple wheel speed sensor signals**

Description

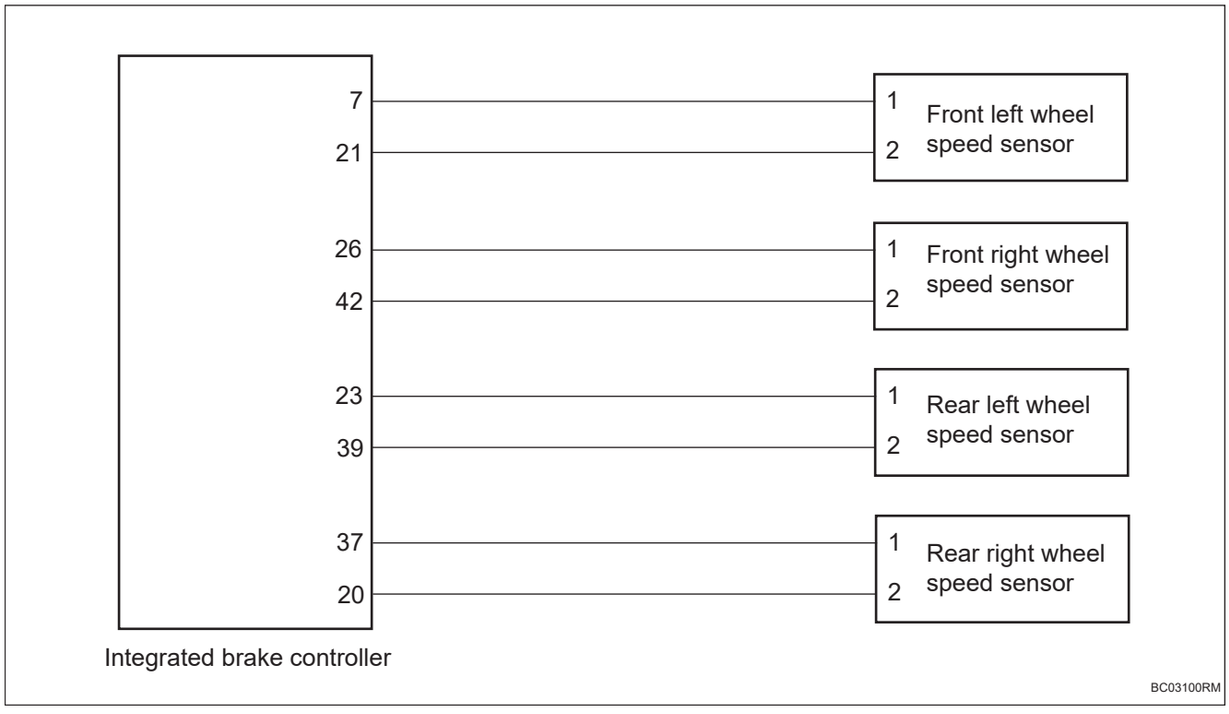
When integrated brake controller detects that multiple wheel speed sensors are faulty, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C1099FC	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Wheel speed sensor
C109908	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Wheel speed sensor
C109904	U = 12 V, ignition on	-	-	-	-	• Integrated brake controller • Wire harness and connector • Wheel speed sensor signal gear ring • Tire • Wheel speed sensor

Fault symptom

DTC No.	Fault symptom	Warning light
C1099FC	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C109908	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C109904	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:ON; ESP:ON	

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

ZD

NG

2	Check vehicle tire

(a) Check if the tire size is as specified.

NG → **Perform repair according to malfunction**

OK

3	Check wheel speed sensor signal gear ring

(a) Check if the clearance between wheel speed sensor and gear ring is correct.

NG → **Perform repair according to malfunction**

OK

4	Check wheel speed sensor

(a) Check wheel speed sensor for proper installation.

(b) Check if wheel speed sensor is interfered by external magnetic field.

NG → **Perform repair according to malfunction**

OK

5	**Check for short to each other in wheel speed sensor wire harness and connector**

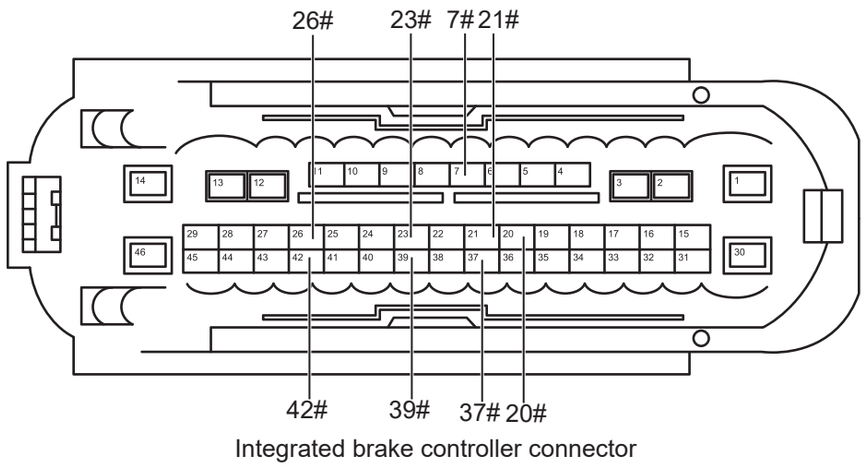
(a) Check if there is a reverse connection between wheel speed sensor signal wire and power wire.

(b) Check for short to each other in wheel speed sensor wire harness.

NG → **Perform troubleshooting**

OK

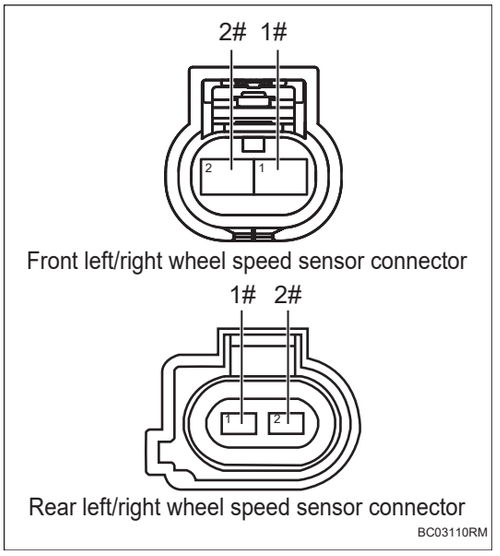
6	**Check for open in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03121RM

ZD



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Disconnect 4 wheel speed sensor connectors.

(e) According to value in the table, measure resistance.

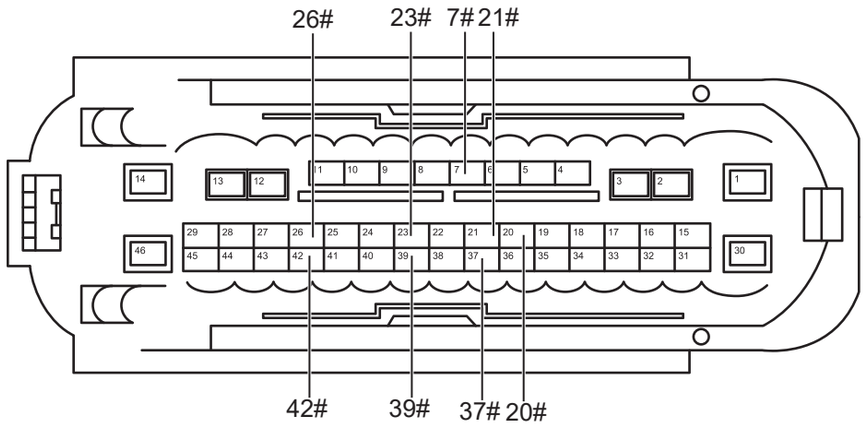
Standard value

Multimeter connection	Detection condition	Specified condition
Front left wheel speed sensor connector 1# - integrated brake controller connector 7#	Always connected	Less than 1 Ω
Front left wheel speed sensor connector 2# - integrated brake controller connector 21#	Always connected	Less than 1 Ω
Front right wheel speed sensor connector 1# - integrated brake controller connector 26#	Always connected	Less than 1 Ω
Front right wheel speed sensor connector 2# - integrated brake controller connector 42#	Always connected	Less than 1 Ω
Rear left wheel speed sensor connector 1# - integrated brake controller connector 23#	Always connected	Less than 1 Ω
Rear left wheel speed sensor connector 2# - integrated brake controller connector 39#	Always connected	Less than 1 Ω
Rear right wheel speed sensor connector 1# - integrated brake controller connector 37#	Always connected	Less than 1 Ω
Rear right wheel speed sensor connector 2# - integrated brake controller connector 20#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03121RM

(a) According to value in the table, measure resistance.

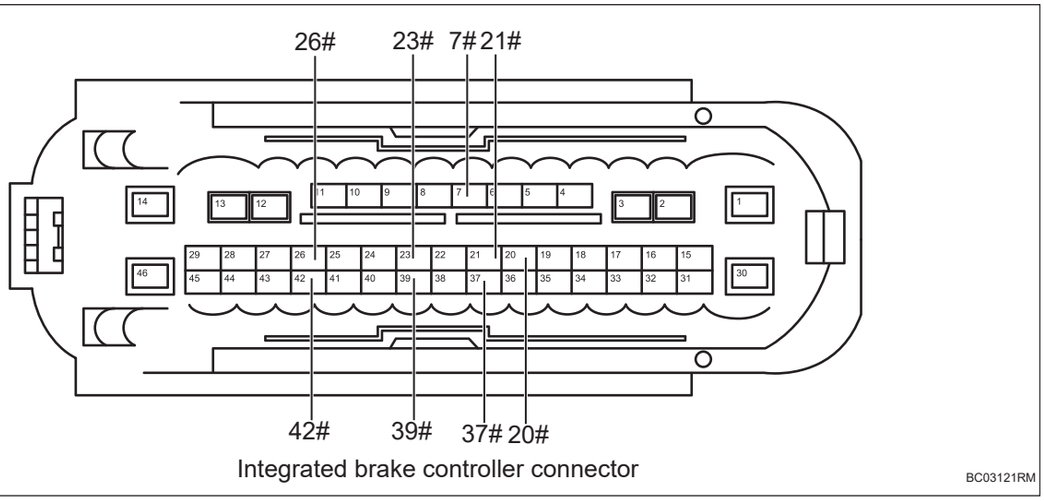
Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 7# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 21# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 26# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 42# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 23# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 39# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 37# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 20# - body ground	Always connected	10 KΩ or more

NG	**Check and repair or replace wire harness and connector**

OK

8	**Check for short to power supply in wheel speed sensor wire harness and connector**



Integrated brake controller connector

BC03121RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 21# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 26# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 42# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 23# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 39# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 37# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Replace wheel speed sensor (See page DP-6) (See page DP-9)**

(a) Replace wheel speed sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace integrated brake controller (after replacement, accelerate the vehicle to 15 km/h and then stop vehicle. Perform diagnosis again, and confirm if the fault occurs again.) (See page DP-33)**

OK

Diagnosis ends

ZD

DTC	C121208	Variant error

Description

When configuration information is not written or does not match, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C121208	IGN is ON	—	—	—	—	• Configuration information is not written or does not match

Fault symptom

DTC No.	Fault symptom	Warning light
C121208	System performance (EBD: ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:ON)	Comes on

Inspection procedure

1	**Write correct configuration information with diagnostic tester**

DTC C200004 Roller mode misuse

Description

When roller mode trigger is detected, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C200004	The vehicle enters roller mode	-	160 ms	-	5 ms	• Roller mode flag set

Fault symptom

DTC No.	Fault symptom	Warning light
C200004	System performance (EBD:ON; ABS:ON; TCS:ONVDC:ON) Warning lamps (EBD/BBF: OFF; ABS:OFF; ESP:OFF)	Not come on

Inspection procedure

1	**After power on and off again, roller mode will be exit automatically**

DTC C2A1700 Air in hydraulic brake circuit

Description

When the deviation between actual vehicle pressure and set pressure is out of the set range, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C2A1700	Each ignition cycle is monitored when the system is not degraded	Based on the difference between the current PV curve and the calibrated PV curve of the hydraulic brake circuit, the air content can be calculated. When air content exceeds a certain threshold, a fault will be reported	It is necessary to depress the pedal several times to report error	-	-	• Integrated brake controller • Brake system pipeline

Fault symptom

DTC No.	Fault symptom	Warning light
C2A1700	System performance (EBD:ON; ABS:ON; TCS:ONVDC:ON) Warning lamps (BBF:ON; BBF: ON; EBD: OFF; ABS:OFF; ESP:OFF)	Comes on

Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	**Check for CAN related fault**

(a) Check for CAN communication related DTCs.

(b) Check for fault in CAN bus hardware and software.

NG → **Perform repair according to malfunction**

OK

3	**Check for air in brake pipe**

(a) Check for air in brake pipe system.

NG → **The brake system performs off-line air bleeding operation (ensure that there is no residual air in the brake pipe and integrated brake controller)**

OK

4	**Read DTCs**

(a) The vehicle is powered off and wait for 5 minutes.

(b) Turn ignition switch to ON again, and drive the vehicle at a speed above 15 kph for at least 30 seconds.

(c) Stop vehicle normally and turn off the engine.

(d) Wait for 2 minutes, during which no operation is allowed. (Do not open or close the door, and do not turn on any device to avoid disturbing ECU sleep)

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

5	**Read DTCs again**

(a) The vehicle is powered off and wait for 5 minutes.

(b) Turn ignition switch to ON again and perform the following operations in stationary condition: Starting from 0 bar, slowly depress the brake pedal

(establishing a pressure of approximately 10 bar per second) until the pressure reaches 40 bar; Hold pressure for 10 s; Slowly release the pedal (release approximately 10 bar of pressure per second). Wait for 2 minutes, during which no operation is allowed. (Do not open or close the door, and do not turn on any device to avoid disturbing ECU sleep)

(c) Perform step 5 five times.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace integrated brake controller (See page DP-33)**

OK →

Diagnosis ends

DTC	P056024	UBB power supply lost
DTC	P056023	UBVR power supply lost
DTC	C190004	Power supply voltage greater than voltage threshold
DTC	C190104	Low voltage causes number of consecutive ECU restart out of limit

DTC	C1901FC	Power supply voltage too low

Description

When integrated brake controller input voltage is too high or too low, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P056024	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P056023	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C190004	IGN is ON	Power supply voltage is higher than voltage threshold (20 V)	200 ms	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C190104	At ECU startup	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C1901FC	IGN is ON	During motor initialization test, UBMotor power supply voltage is less than 5 V	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
	IGN is ON	During motor initialization test, only UBVR is powered, and its voltage is less than 8 V	-	-	-	
	IGN is ON	Power supply voltage is lower than 8.0 V	200 ms	-	-	
	IGN is ON	Power supply voltage is lower than 5.5 V	-	-	-	

ZD

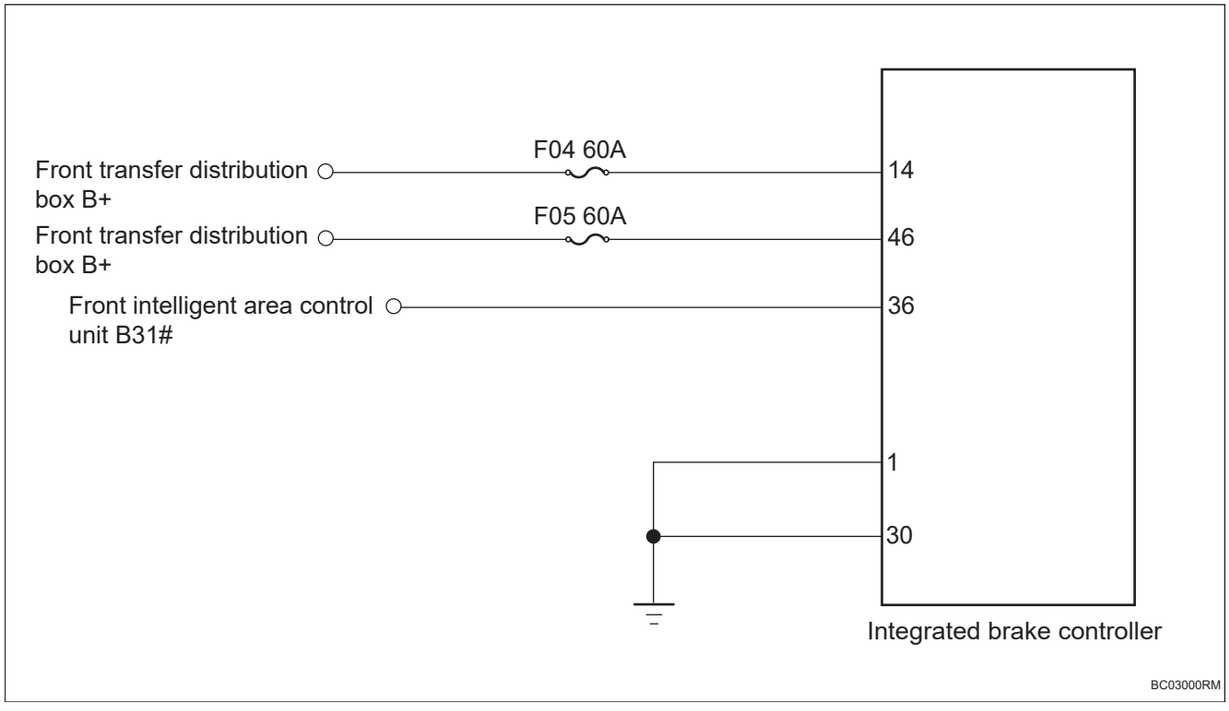
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	IGN is ON	Voltage is lower than 8.7 V	-	-	-	
	IGN is ON	Voltage is lower than 6.9 V	200 ms	-	-	
	IGN is ON	Voltage is lower than 6.2 V and vehicle speed is valid and more than 3 Km/h.	200 ms	-	-	

Fault symptom

DTC No.	Fault symptom	Warning light
P056024	System performance (EBD:ON, ABS:ON, TCS:OFF, VDC:OFF, BBF: ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:ON)	Comes on
P056023	System performance (EBD:ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:ON)	Comes on
C190004	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Not come on
C190104	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C1901FC	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	
	System performance (EBD:ON; ABS:ON; TCS:ONF; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	
	System performance (EBD:ON; ABS:ON; TCS:ONF; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	
	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF)	

DTC No.	Fault symptom	Warning light
	Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	
	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	
	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check integrated brake controller fuse RF3/RF4**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the integrated brake controller fuse RF3/RF4.

(d) According to value in the table, measure resistance.

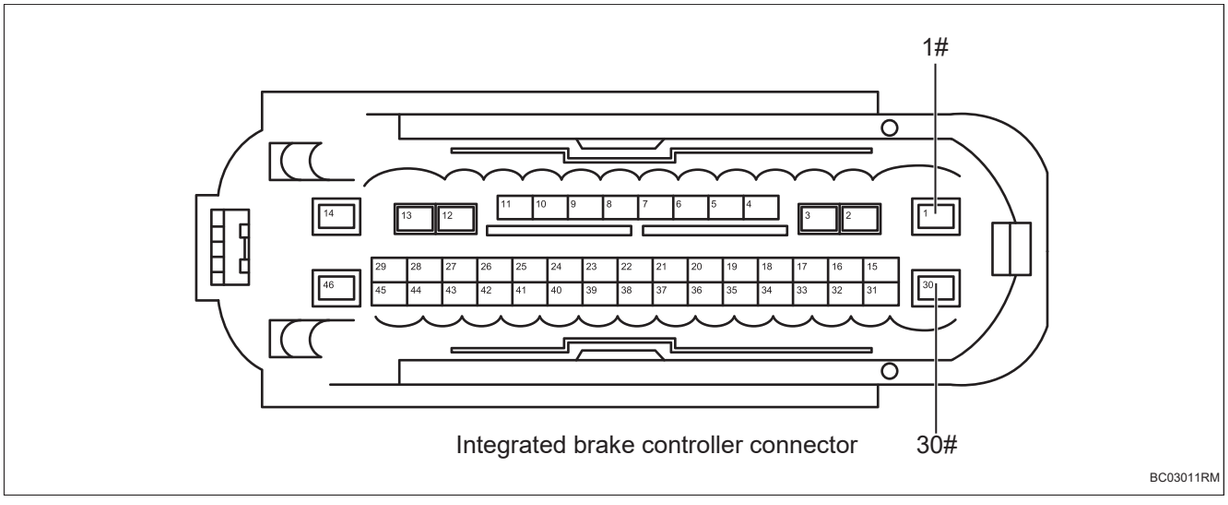
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	**Check integrated brake controller ground**



(a) Disconnect the integrated brake controller connector.

(b) According to value in the table, measure resistance.

Standard value

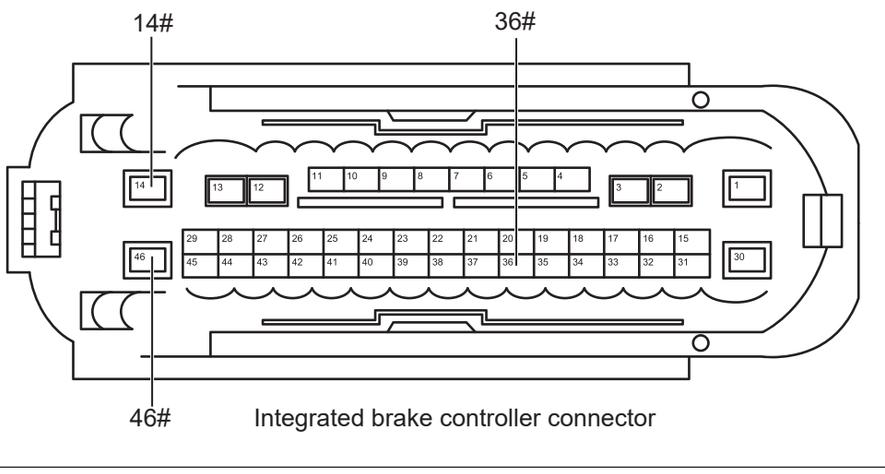
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check integrated brake controller power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK →

Replace integrated brake controller (See page DP-33)

DTC	**P25C700**	**Internal hardware error**
DTC	**P25C600**	**Internal hardware error**
DTC	**C057A00**	**Brake booster temperature sensor "B" circuit voltage too low**
DTC	**C057900**	**Brake booster temperature sensor "B" circuit voltage too low**
DTC	**C054100**	**Pressure sensor fault**

DTC	C059900	RPS calibration software version incompatible
DTC	P06B800	Lips ID value read failure
DTC	P06B8FC	RPS NVM value read failure
DTC	P057B00	Brake pedal position sensor circuit internal fault
DTC	P057C00	Brake pedal position sensor circuit voltage too low
DTC	P057D00	Brake pedal position sensor circuit voltage too high
DTC	P057E00	Brake pedal position sensor circuit intermittent fault
DTC	P05DD00	Brake pedal position sensor circuit voltage too low
DTC	P05DE00	Brake pedal position sensor circuit voltage too high
DTC	P05DF00	Brake pedal position sensor circuit intermittent fault
DTC	P05E009	Brake pedal displacement sensor measured value error
DTC	C057E00	Brake pedal position sensor circuit intermittent fault
DTC	C05C24B	Booster motor temperature too high
DTC	C05C300	Brake booster motor "A" power supply circuit
DTC	C061900	Stroke sensor 1st path correction value error
DTC	C1000FC	APBMI software/hardware error
DTC	C102001	ECU internal hardware, controller error
DTC	P05FF09	BSM related error, brake pedal too hard/too soft

DTC	**P05FF03**	**Master cylinder pressure of driver stepping on brake pedal greater than expected**
DTC	**C100004**	**ECU internal fault**
DTC	**P05CB00**	**Vehicle hardware mismatch**
DTC	**C100104**	**Network timeout caused by hardware fault**
DTC	**C100047**	**uC memory or bus abnormal**

Description

When integrated brake controller input voltage is too high or too low, the integrated brake controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P25C700	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P25C600	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C057A00	IGN is ON	ADC value of BLM temperature sensor 2 is more than 3900	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C057900	IGN is ON	ADC value of BLM temperature sensor 2 is less than 40	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C054100	Vehicle is accelerating Accelerator pedal is not depressed The IPB system is not actively building pressure Vehicle speed is more than	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	specific threshold					
	IGN is ON	-	-	-	-	
	IGN is ON	The pressure signal is greater than 280 bar	-	-	-	
C059900	System startup	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P06B800	When the ECU is powered on, read the value in the EEPROM	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P06B8FC	Monitoring during system startup initialization	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P057B00	IGN is ON	The SENT signal value of the position sensor exceeds the normal range, or the protocol information is incorrect, or the data transmission time is too long	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P057C00	IGN is ON	Real-time monitoring after ECU power-on initialization is completed	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P057D00	IGN is ON	Real-time monitoring after ECU power-on initialization is completed	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P057E00	IGN is ON	Linear position sensor, channel 1, SENT protocol fault	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P05DD00	IGN is ON	No signal edge is received and the level remains low	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P05DE00	IGN is ON	No signal edge is received and the level remains high	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P05DF00	IGN is ON	Linear position sensor, channel 2, duty ratio or cycle out of range	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P05E009	Monitoring is turned on under driving	> 1 mm, the deeper depressed for 120-360s, the shorter the time to report errors	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
	-	On the basis of the error reported by FW_Bsm_ PtsNotZeroSt-age1, and the brake pedal stroke is > 5 mm for 1 s	-	-	-	
	-	The difference between two displacement signals is greater than 1.5 mm for 0.12 second	-	-	-	
C057E00	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C05C24B	(Coil, ECU or motor) temperature too high	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
	(Coil, ECU or motor) temperature too high	-	-	-	-	
	-	-	-	-	-	

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C05C300	IGN is ON	Activating EN_B6, BMS, BMS_RVP (or BRS) Motor operation request UB6 < 3.2175 V UBMotor > UB6 and UBMotor - UB6 > 1.04 V If the ratio between UBB and UB6 is less than 75% or more than 125%, a fault will be set	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C061900	U = 12 V, ignition on	With offset less than 0, if offset is less than -1.5 mm for 200 ms, error will be reported With offset more than 0, if offset is more than 1.1 mm for 200 ms, error will be reported	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C1000FC	-	APB ASIC internal voltage monitoring control. If overvoltage, undervoltage or ground loss is detected in the APB Asic, the fault counter will increase. Continuously activated during 5 ms operation. Monitoring threshold is 30 ms	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C102001	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
P05FF09	Turn on monitoring in full system state	When the master cylinder pressure corresponding to the pedal travel exceeds the system fault-reporting threshold and lasts for 200 ms	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
	Turn on monitoring in full system state	When the master cylinder pressure corresponding to the pedal travel is lower than the system fault-reporting threshold and lasts for 200 ms	-	-	-	
P05FF03	Turn on monitoring in full system state	When the master cylinder pressure corresponding to the pedal travel exceeds the system fault-reporting threshold and lasts for 200 ms. The fault-reporting logic is the same as FW_Bsm_HardPedalChar, but the recovery occurs in the next ignition cycle	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C100004	-	If the core voltage exceeds the range (overvoltage/undervoltage), the core voltage monitor will send a reset signal. Once the core voltage is within range again, a fault will be reported	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
P05CB00	-	-	-	-	-	• Integrated brake controller

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
						• Wire harness and connector • Fuse • Battery/charging system
C100104	. Power supply status is normal IGN is ON	-	-	Non-continuous type	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system
C100047	IGN is ON	-	-	-	-	• Integrated brake controller • Wire harness and connector • Fuse • Battery/charging system

ZD

Fault symptom

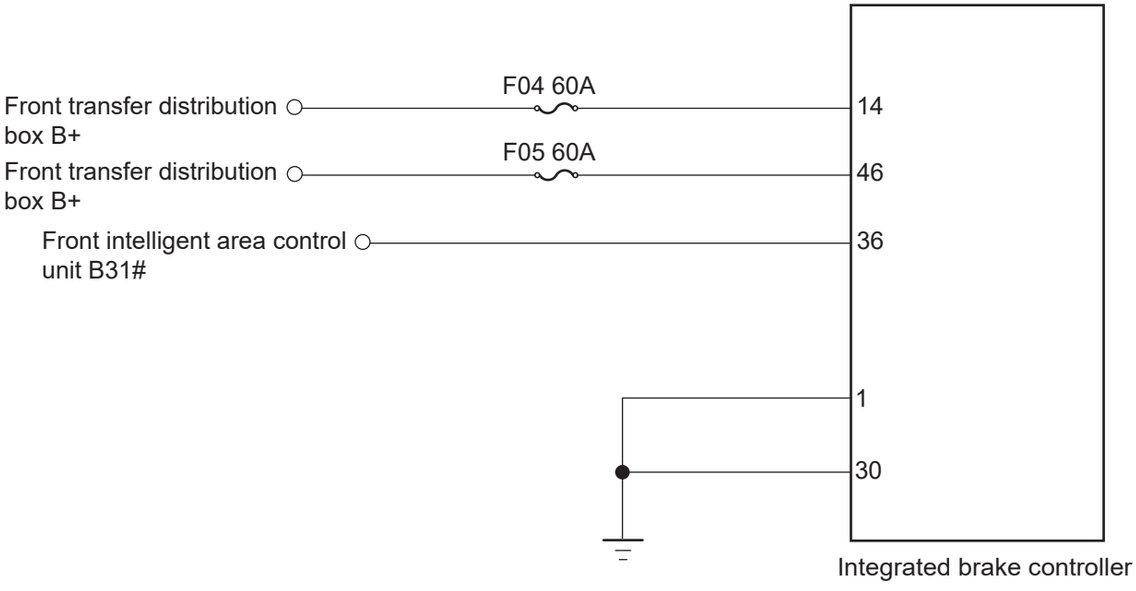
DTC No.	Fault symptom	Warning light
P25C700	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
P25C600	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
C057A00	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
C057900	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
C054100	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Comes on
	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C059900	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF)	Comes on

DTC No.	Fault symptom	Warning light
	Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	
P06B800	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P06B8FC	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF; BBF:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P057B00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P057C00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P057D00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P057E00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05DD00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05DE00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05DF00	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05E009	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C057E00	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
C05C24B	System performance (EBD:ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:ON)	Comes on
	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance and warning lamps depends on the behaviour of RPL_ PressureBuildupNotPossible	-
C05C300	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C061900	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C1000FC	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
C102001	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05FF09	System performance (EBD:ON; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
P05FF03	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:ON; ABS:OFF; ESP:OFF)	Comes on
C100004	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on
P05CB00	System performance (EBD:OFF; ABS:OFF; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:ON; ABS:ON; ESP:ON)	Comes on

DTC No.	Fault symptom	Warning light
C100104	System performance (EBD:ON; ABS:ON; TCS:OFF; VDC:OFF) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:ON)	Comes on
C100047	System performance (EBD:ON; ABS:ON; TCS:ON; VDC:ON) Warning lamps (EBD/BBF:OFF; ABS:OFF; ESP:OFF)	Comes on

Circuit diagram



Inspection procedure

1	**Perform preliminary inspection**

(a) Confirm if the malfunction light comes on when the malfunction occurs.

(b) Confirm the malfunction frequency and if it is accidental.

(c) Confirm the operating condition, vehicle speed, accelerator/brake pedal status, etc. when the malfunction occurs.

(d) Check if the vehicle has been involved in accident or repaired.

(e) Check if the vehicle power supply system is normal (such as if the battery terminal is normal, if IPB fuse is damaged).

(f) Check IPB for signs of bumping or impacts.

(g) Check IPB for proper installation, brake fluid reservoir and pipe for leakage, and check the grounding status.

(h) Check the connection status of IPB connector, if there is corrosion, poor connection or water ingress, etc.

(i) Check and repair according to the problems detected.

(j) Connect HQ-VDS diagnostic tester.

(k) Turn ignition switch to "ON".

(l) Read and store DTCs.

(m) Clear DTCs, power on and off again.

(n) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

OK → **Diagnosis ends**

NG

2	Check battery voltage

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check integrated brake controller fuse RF3/RF4**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the integrated brake controller fuse RF3/RF4.

(d) According to value in the table, measure resistance.

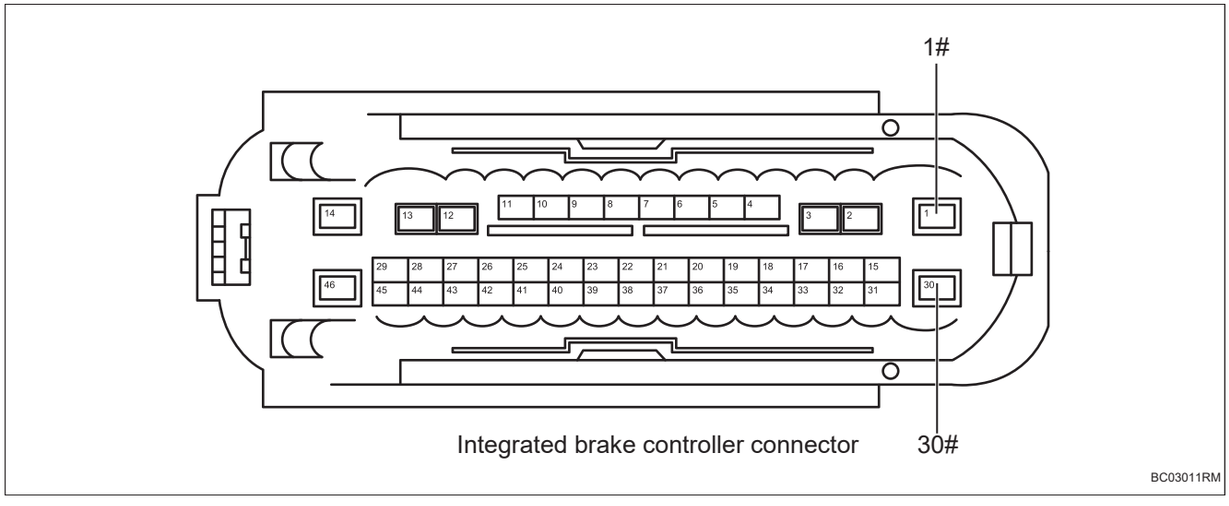
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	**Check integrated brake controller ground**



(a) Disconnect the integrated brake controller connector.

(b) According to value in the table, measure resistance.

Standard value

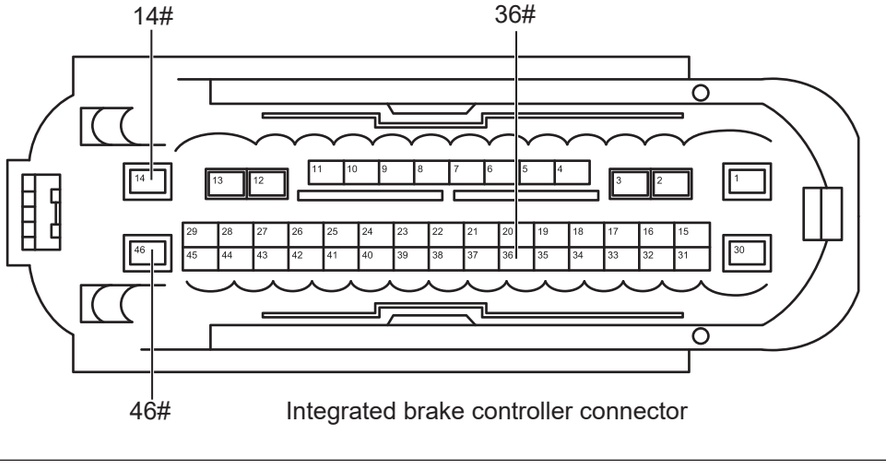
Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 1# - body ground	Always connected	Less than 1 Ω
Integrated brake controller connector 30# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check integrated brake controller power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Integrated brake controller connector 14# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 46# - body ground	Turn ignition switch to "ON"	9 ~ 16 V
Integrated brake controller connector 36# - body ground	Turn ignition switch to "ON"	9 ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK →

Replace integrated brake controller (See page DP-33)

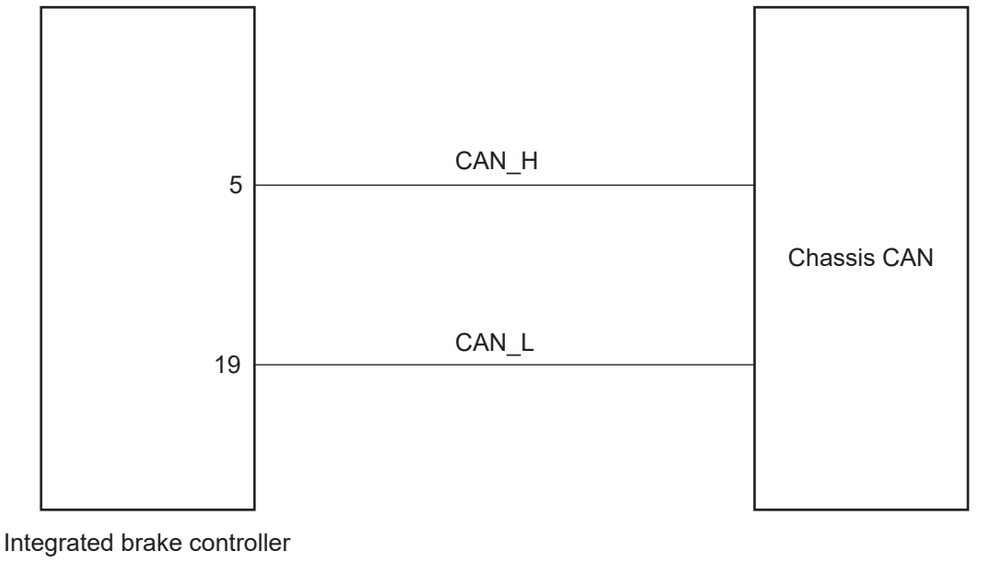
DTC	U006488	Chassis CAN bus off

Description

When integrated brake controller detects chassis CAN bus off fault, the integrated brake controller records DTC.

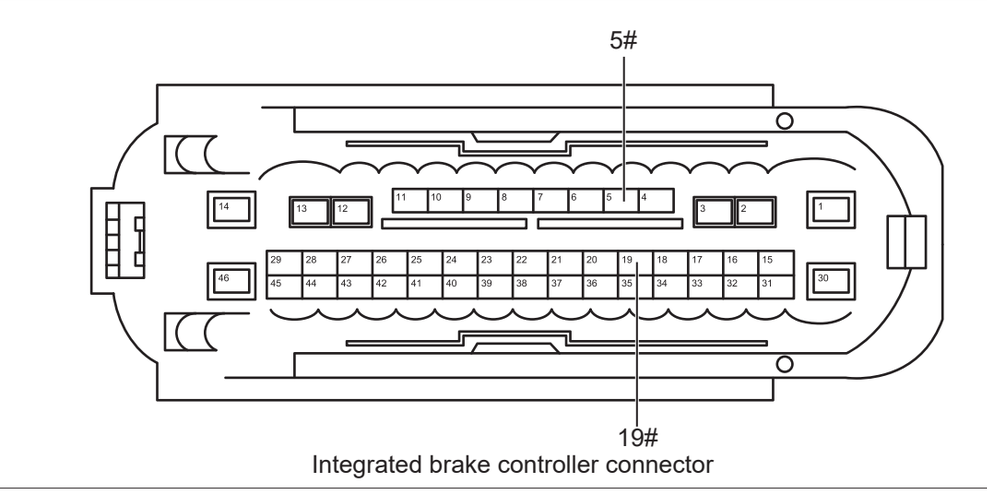
DTC No.	DTC detection condition	Faulty area
U006488	(a) Chassis CAN bus off.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller

Circuit diagram



Inspection procedure

1	**Check chassis CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the integrated brake controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 5# - integrated brake controller connector 19#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

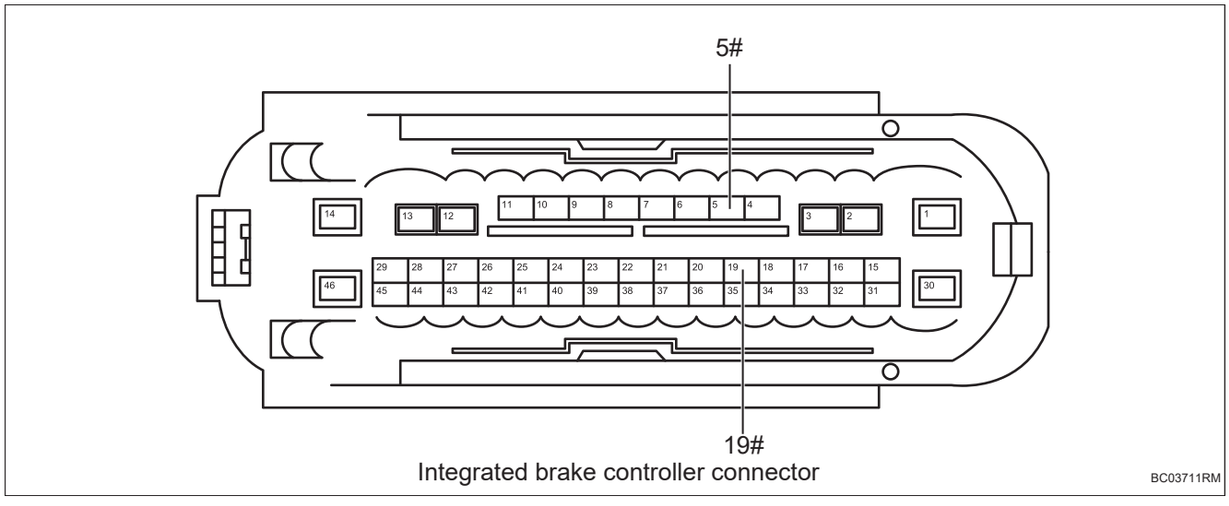
2	Check controllers on chassis CAN bus

(a) Disconnect the controllers on chassis CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	Check for short between chassis CAN bus CAN-L and CAN-H



Integrated brake controller connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

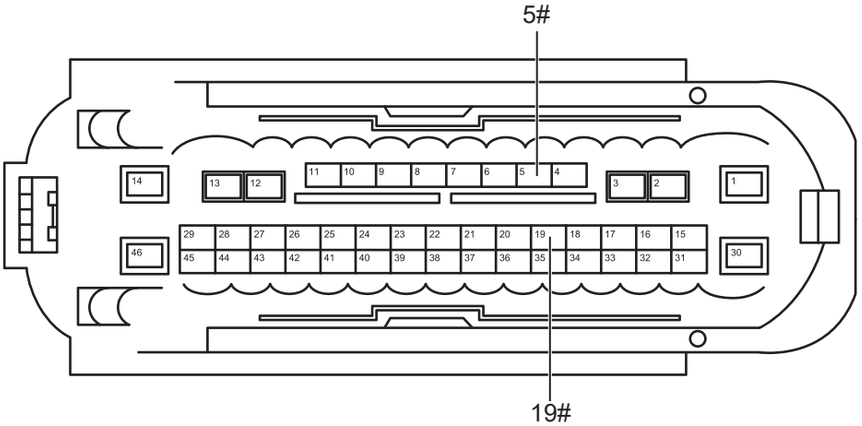
Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 5# - integrated brake controller connector 19#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in chassis CAN bus



Integrated brake controller connector

(a) According to value in the table, measure resistance.

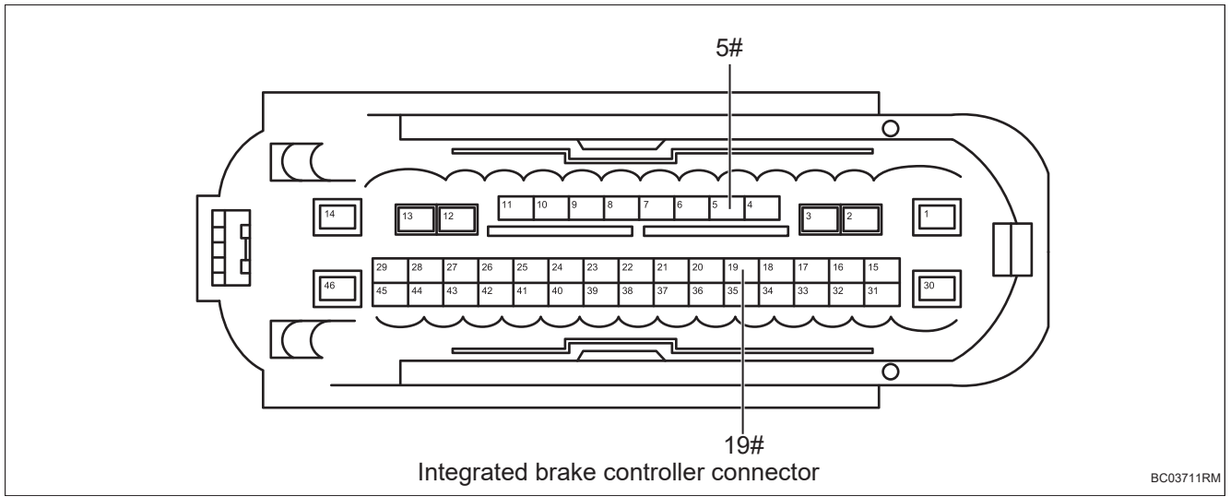
Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 5# - body ground	Always connected	10 KΩ or more
Integrated brake controller connector 19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in chassis CAN bus**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Integrated brake controller connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Integrated brake controller connector 19# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

DTC	U115187	Airbag control unit message missing
DTC	U129387	Vehicle controller message missing
DTC	U116487	A/C controller message missing
DTC	U115587	Instrument cluster control unit message missing
DTC	U124587	Infotainment head unit message missing
DTC	U014887	Rear PDC message missing
DTC	U114687	Front PDC message missing
DTC	U013187	Electric power steering node lost
DTC	U020887	Front seat control module message missing
DTC	U119987	Front left door module message missing
DTC	U114B87	VDC message missing
DTC	U014C87	HAD node lost
DTC	U113887	Driving mode message missing
DTC	U112887	Electronic parking brake message missing
DTC	U044B84	VDC message content error
DTC	U044B86	VDC message content error
DTC	U054482	HAD message content error
DTC	U054483	HAD message content error
DTC	U054484	HAD message content error
DTC	U054486	HAD message content error
DTC	U042484	A/C controller message content error
DTC	U042486	A/C controller message content error
DTC	U050984	Front seat controller message content error
DTC	U050986	Front seat controller message content error
DTC	U049A84	Front left door module message content fault

DTC	U042082	Electric power steering control unit message content fault
DTC	U042083	Electric power steering control unit message content fault
DTC	U042084	Electric power steering control unit message content fault
DTC	U042086	Electric power steering control unit message content fault
DTC	C046008	SAS signal invalid
DTC	U045282	Airbag control unit message content error
DTC	U045283	Airbag control unit message content error
DTC	U045284	Airbag control unit message content error
DTC	U045286	Airbag control unit message content error
DTC	U059482	Vehicle controller message content fault
DTC	U059483	Vehicle controller message content fault
DTC	U059484	Vehicle controller message content fault
DTC	U059486	Vehicle controller message content fault
DTC	U0594F6	Vehicle controller message content fault
DTC	C108C08	Reverse signal cannot change
DTC	U043984	Driving mode message content fault
DTC	U043986	Driving mode message content fault
DTC	U054684	Infotainment head unit message content fault
DTC	U054686	Infotainment head unit message content fault
DTC	U042384	Instrument cluster control unit message content fault
DTC	U042386	Instrument cluster control unit message content fault

DTC	**U041782**	**Electronic parking brake message content fault**
DTC	**U041783**	**Electronic parking brake message content fault**
DTC	**U041784**	**Electronic parking brake message content fault**
DTC	**U041786**	**Electronic parking brake message content fault**
DTC	**U044784**	**Front PDC message content fault**
DTC	**U044884**	**Rear PDC message content fault**

Description

When communication between integrated brake controller and other system is abnormal or interrupted, the integrated brake controller records DTC.

DTC No.	DTC detection condition	Faulty area
U115187	(a) Airbag control unit message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Middle intelligent area control unit • Airbag control unit • Combination switch
U129387	(a) Vehicle controller message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U116487	(a) A/C controller message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U115587	(a) Instrument cluster control unit message missing.	• CAN line and connector • Infotainment control unit • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U124587	(a) Infotainment head unit message missing.	• CAN line and connector • Infotainment control unit • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit • Integrated brake controller
U014887	(a) Rear PDC message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller
U114687	(a) Front PDC message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U013187	(a) Electric power steering node lost.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U020887	(a) Front seat control module message missing.	• CAN line and connector • Driver seat control unit • Electric power steering control unit • Front intelligent area control unit • Middle intelligent area control unit • Integrated brake controller • Combination switch
U119987	(a) Front left door module message missing.	• CAN line and connector • Front left door control unit • Electric power steering control unit • Front intelligent area control unit • Middle intelligent area control unit • Integrated brake controller • Combination switch
U114B87	(a) VDC message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U014C87	(a) HAD node lost.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Advanced automatic driving controller
U113887	(a) Driving mode message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit
U112887	(a) Electronic parking brake message missing.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U044B84	(a) VDC message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U044B86	(a) VDC message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U054482	(a) HAD message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Advanced automatic driving controller
U054483	(a) HAD message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Advanced automatic driving controller
U054484	(a) HAD message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Advanced automatic driving controller
U054486	(a) HAD message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Advanced automatic driving controller
U042484	(a) A/C controller message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042486	(a) A/C controller message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit

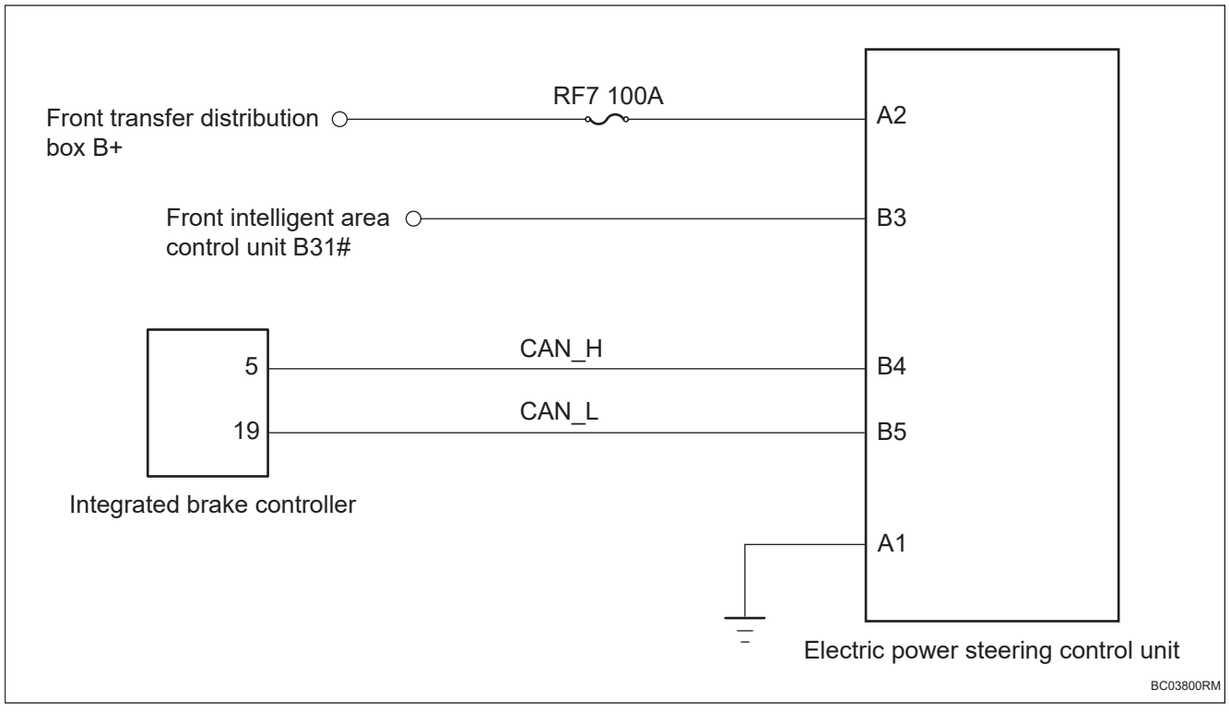
DTC No.	DTC detection condition	Faulty area
		• Integrated brake controller
U050984	(a) Front seat controller message content error.	• CAN line and connector • Driver seat control unit • Electric power steering control unit • Front intelligent area control unit • Middle intelligent area control unit • Integrated brake controller • Combination switch
U050986	(a) Front seat controller message content error.	• CAN line and connector • Driver seat control unit • Electric power steering control unit • Front intelligent area control unit • Middle intelligent area control unit • Integrated brake controller • Combination switch
U049A84	(a) Front left door module message content fault.	• CAN line and connector • Front left door control unit • Electric power steering control unit • Front intelligent area control unit • Middle intelligent area control unit • Integrated brake controller • Combination switch
U042082	(a) Electric power steering control unit message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042083	(a) Electric power steering control unit message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042084	(a) Electric power steering control unit message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042086	(a) Electric power steering control unit message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042086	(a) SAS signal invalid.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U045282	(a) Airbag control unit message content error.	• CAN line and connector • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit • Integrated brake controller • Middle intelligent area control unit • Airbag control unit • Combination switch
U045283	(a) Airbag control unit message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Middle intelligent area control unit • Airbag control unit • Combination switch
U045284	(a) Airbag control unit message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Middle intelligent area control unit • Airbag control unit • Combination switch
U045286	(a) Airbag control unit message content error.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Middle intelligent area control unit • Airbag control unit • Combination switch
U059482	(a) Vehicle controller message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U059483	(a) Vehicle controller message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U059484	(a) Vehicle controller message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U059486	(a) Vehicle controller message content fault.	• CAN line and connector • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U0594F6	(a) Vehicle controller message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
C108C08	(a) Reverse signal cannot be changed.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U043984	(a) Driving mode message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U043986	(a) Driving mode message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller • Intelligent vehicle control platform control unit
U054684	(a) Infotainment head unit message content fault.	• CAN line and connector • Infotainment control unit • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U054686	(a) Infotainment head unit message content fault.	• CAN line and connector • Infotainment control unit • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042384	(a) Instrument cluster control unit message content fault.	• CAN line and connector • Infotainment control unit • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U042386	(a) Instrument cluster control unit message content fault.	• CAN line and connector • Infotainment control unit • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit • Integrated brake controller
U041782	(a) Electronic parking brake message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U041783	(a) Electronic parking brake message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U041784	(a) Electronic parking brake message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U041786	(a) Electronic parking brake message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U044784	(a) Front PDC message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Integrated brake controller
U044884	(a) Rear PDC message content fault.	• CAN line and connector • Electric power steering control unit • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller

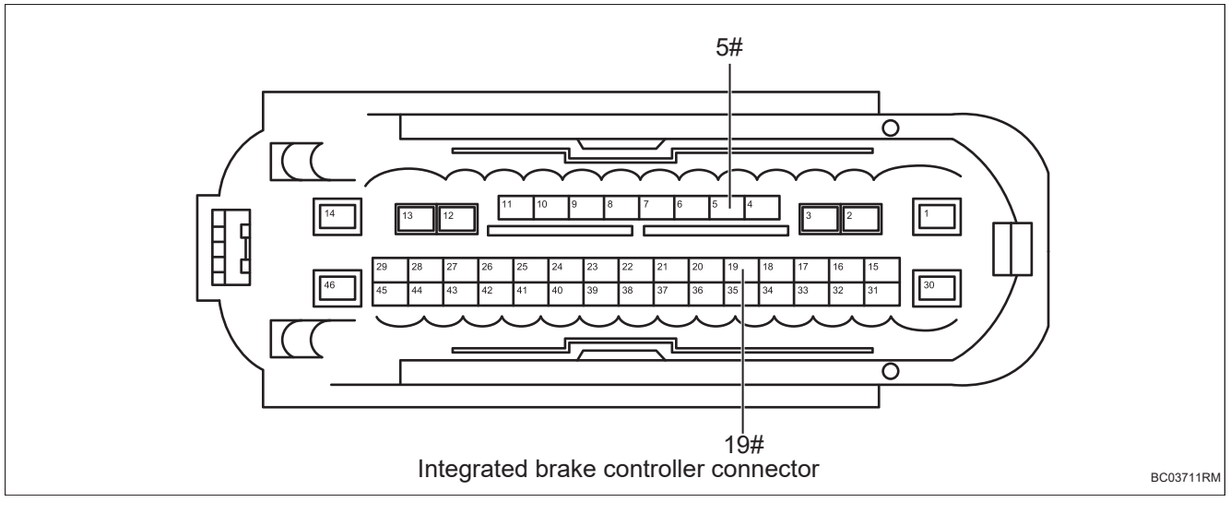
Circuit diagram

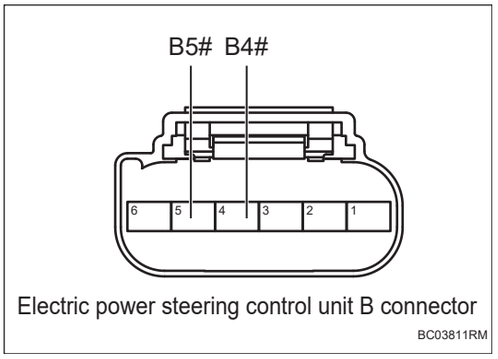


Inspection procedure

Note: Taking the U013187 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in chassis CAN bus (electric power steering control unit - integrated brake controller)**





Electric power steering control unit B connector
BC03811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

Standard value

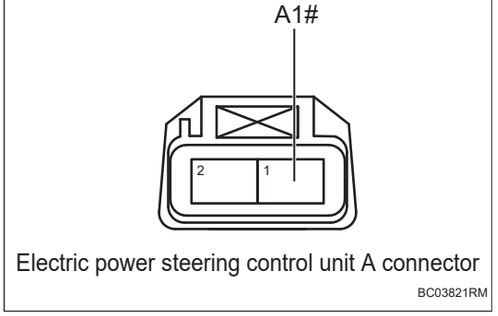
Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B4# - integrated brake controller connector 5#	Always connected	Less than 1 Ω
Electric power steering control unit connector B5# - integrated brake controller connector 19#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check electric power steering control unit ground**



Electric power steering control unit A connector
BC03821RM

(a) According to value in the table, measure resistance.

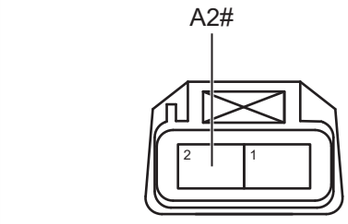
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

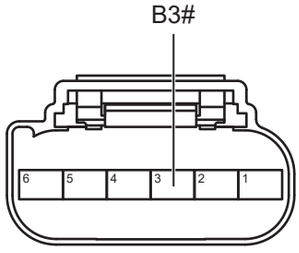
NG → **Check and repair or replace wire harness and connector**

OK

3	**Check electric power steering control unit power supply**



Electric power steering control unit A connector



Electric power steering control unit B connector

BC03831RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

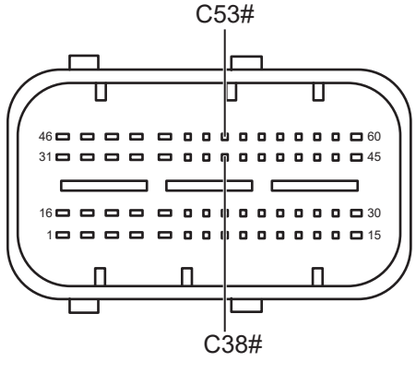
Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A2# - body ground	Turn ignition switch to "ON"	Battery voltage
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

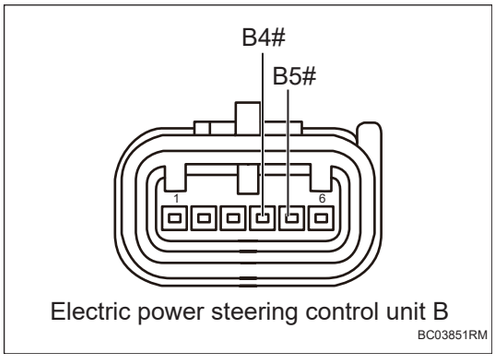
OK

4	**Check chassis CAN bus terminal resistance**



Front intelligent area control unit C

BC03841RM



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit B4# - electric power steering control unit B5#	Always connected	Approximately 120 Ω
Front intelligent area control unit C38# - front intelligent area control unit C53#	Always connected	Approximately 120 Ω

ZD

NG → **Perform repair according to malfunction**

OK

5	**Replace electric power steering control unit (See page DP-52)**

(a) Replace the electric power steering control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:
No DTC outputs.

NG → **Replace integrated brake controller (See page DP-33)**

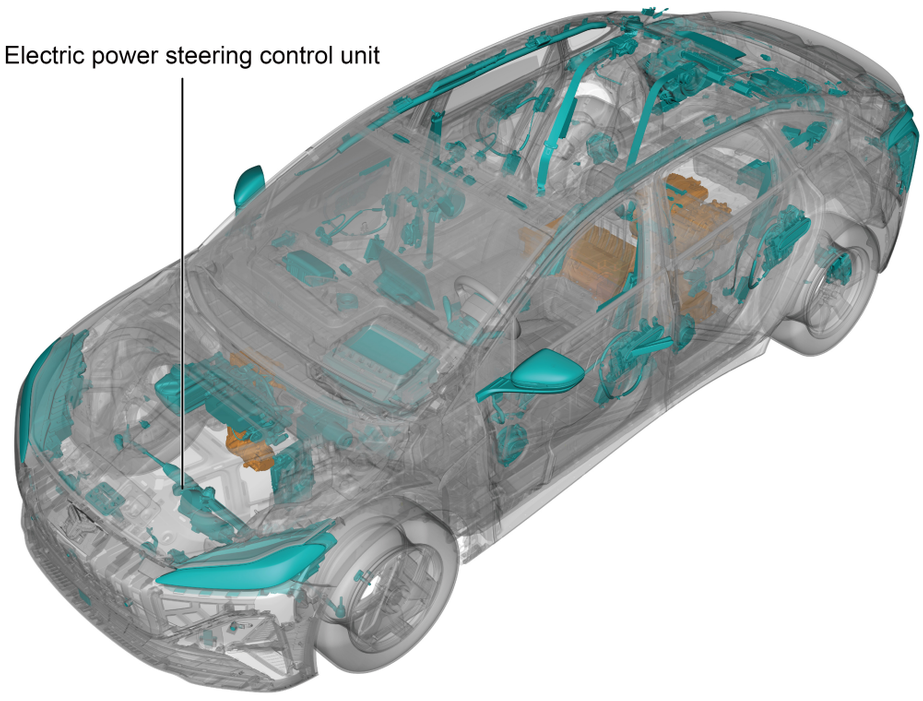
OK

Diagnosis ends

Power steering system-A

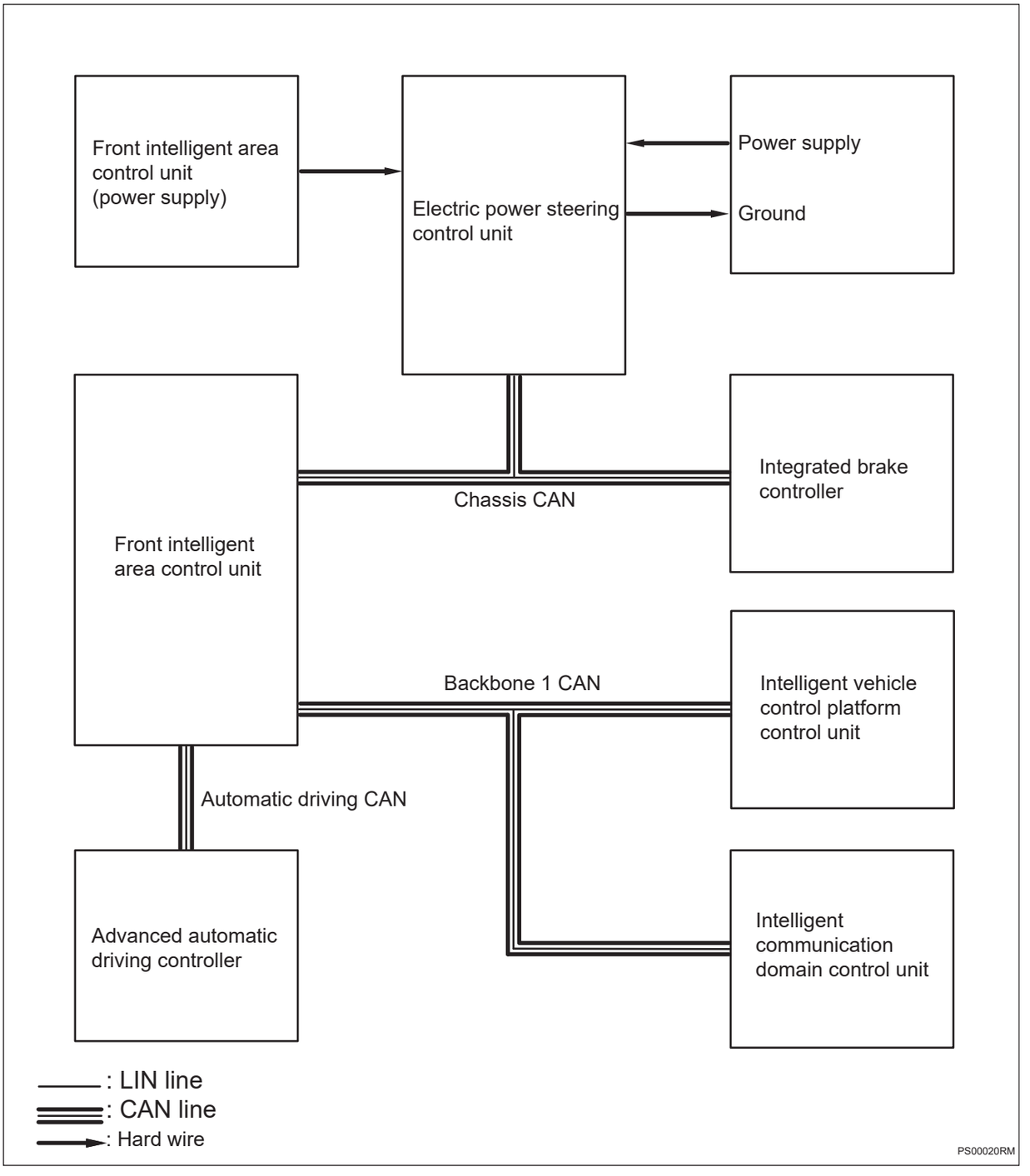
Electric power steering control unit

Part position



PS00030RM

System diagram



Function overview

1. Steering assist control:

(a) When power supply, ignition signal, vehicle speed signal, and high voltage electrical signal are in normal operation state. After the user operates the steering wheel, angle and torque sensor sends recognized angle and torque signal to ECU. ECU processes and calculates the received signal to control the motor to provide the required steering torque. At the same time,

it supports emergency power-off assistance keeping, idle start and stop, external assistance request, stall delay assistance and output fault state.

2. Comfort steering:

(a) When the steering assist control is in normal operating condition, the EPS system enhances steering comfort through damping compensation and inertia compensation functions, improves steering maneuverability through active return-to-center, and reduces noise through soft-stop protection.

3. Steering assist with speed:

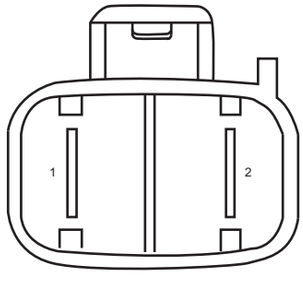
(a) When the steering assist control is in normal operating condition, the assistance provided by the EPS system decreases as the vehicle speed increases, ensuring that the steering effort required from the driver also increases with the vehicle speed.

Data parameter

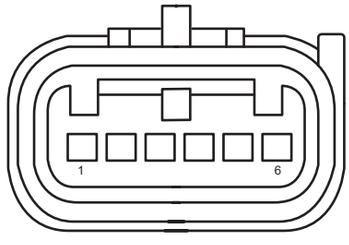
Electric power steering control unit

Item	Max	OK	Minimum
Operating voltage (V)	-	12.5	-
Operating current (A)	95	-	0.3

ECU terminal



Electric power steering control unit A



Electric power steering control unit B

PS00010RM

Electric power steering control unit A	
Pin number	**Definition**
1	GND
2	B+

Electric power steering control unit B	
Pin number	**Definition**
1	-
2	-

Electric power steering control unit B	
Pin number	**Definition**
3	Ignition
4	CAN_H
5	CAN_L
6	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
U300317	EPS controller input end overvoltage	(See page ZD-1915)
U300316	EPS controller input end undervoltage	(See page ZD-1915)
C190B01	Operation reset	(See page ZD-1934)
C19021C	Motor position sensor supply voltage fault	(See page ZD-1921)
C190504	Temperature sensor fault	(See page ZD-1921)
C190C62	Motor position sensor fault	(See page ZD-1921)
C190D16	Open in motor phase	(See page ZD-1921)
C190E96	Short in motor phase	(See page ZD-1921)
C190F62	Motor current difference	(See page ZD-1921)
C191019	Motor overcurrent	(See page ZD-1921)
C191128	Motor current sensor fault	(See page ZD-1921)
C19074B	Overheating protection	(See page ZD-1930)
C190021	Ignition signal fault	(See page ZD-1919)
C190101	Torque sensor supply voltage fault	(See page ZD-1919)
C190301	Angle sensor - electrical fault	(See page ZD-1925)
C190454	Angle sensor - uncalibrated	(See page ZD-1926)
C190602	Torque sensor signal fault	(See page ZD-1928)
C190804	ECU hardware fault	(See page ZD-1931)
C190904	Data flash memory fault	(See page ZD-1931)
C190A01	ECU fail-safe relay fault	(See page ZD-1931)
U006488	Chassis CAN bus off	(See page ZD-1937)
U012987	IBC node lost	(See page ZD-1941)
U041582	IBC message content fault	(See page ZD-1941)
U041583	IBC message content fault	(See page ZD-1941)
U041586	IBC message content fault	(See page ZD-1941)
U014687	PDCF node lost	(See page ZD-1941)
U059482	VDC397 message content fault	(See page ZD-1941)
U059483	VDC397 message content fault	(See page ZD-1941)

DTC	Detection Items	See page
U059486	VDC397 message content fault	(See page ZD-1941)
U054482	Automatic parking message content fault	(See page ZD-1941)
U054483	Automatic parking message content fault	(See page ZD-1941)
U054486	Automatic parking message content fault	(See page ZD-1941)
U045282	ACU message content fault	(See page ZD-1941)
U045283	ACU message content fault	(See page ZD-1941)
U045286	ACU message content fault	(See page ZD-1941)
U114687	VDC message missing	(See page ZD-1941)
U129387	Vehicle controller message missing	(See page ZD-1941)
U115187	Airbag control unit message missing	(See page ZD-1941)
U124387	Automatic parking message missing	(See page ZD-1941)
U113887	Driving mode message missing	(See page ZD-1941)
U119887	T-BOX message missing	(See page ZD-1941)
U114A87	VDC_config message missing	(See page ZD-1941)
U043382	VDC_1 message content fault	(See page ZD-1941)
U043383	VDC_1 message content fault	(See page ZD-1941)
U043386	VDC_1 message content fault	(See page ZD-1941)

DTC	**U300317**	**EPS controller input end overvoltage**
DTC	**U300316**	**EPS controller input end undervoltage**

Description

When electric power steering control unit power supply voltage is out of normal operation range, the electric power steering control unit records DTC.

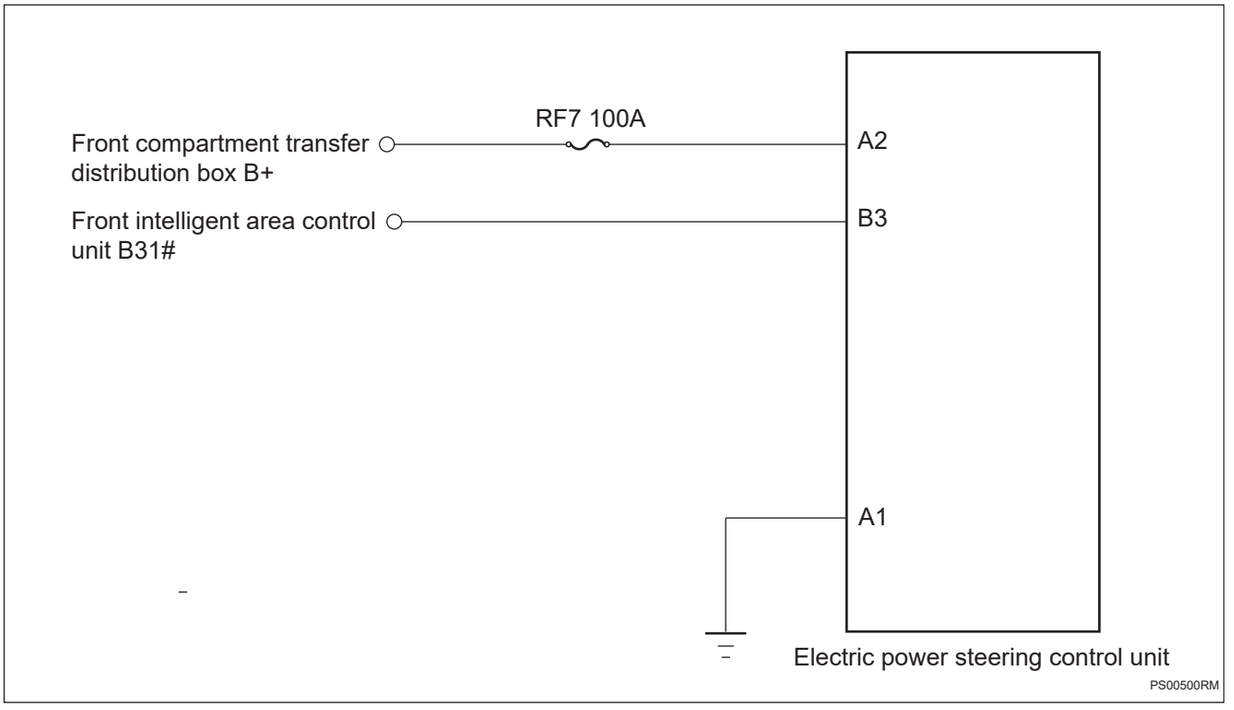
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U300317	• DTC setting is enable. • IGN is ON	VBAT >= 18 V	500 ms	Periodic type	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system
U300316	• DTC setting is enable. • IGN is ON	VBAT < 10 V	500 ms	Periodic type	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
U300317	When electric power steering control unit power supply voltage is out of normal operation range	Comes on
U300316	When electric power steering control unit power supply voltage is out of normal operation range	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check electric power steering control unit fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove electric power steering control unit fuse.

(d) According to value in the table, measure resistance.

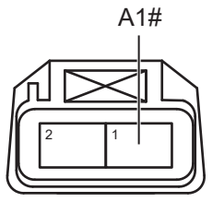
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	**Check electric power steering control unit ground**



Electric power steering control unit A connector

PS00510RM

(a) Disconnect electric power steering control unit connector.

(b) According to value in the table, measure resistance.

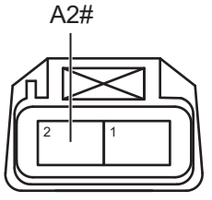
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

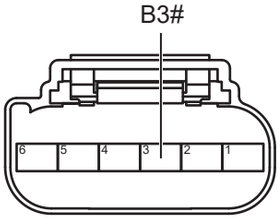
NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric power steering control unit power supply**



Electric power steering control unit A connector



Electric power steering control unit B connector

PS00520RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)

OK

Replace electric power steering control unit (See page DP-52)

DTC	**C190021**	**Ignition signal fault**
DTC	**C190101**	**Torque sensor supply voltage fault**

Description

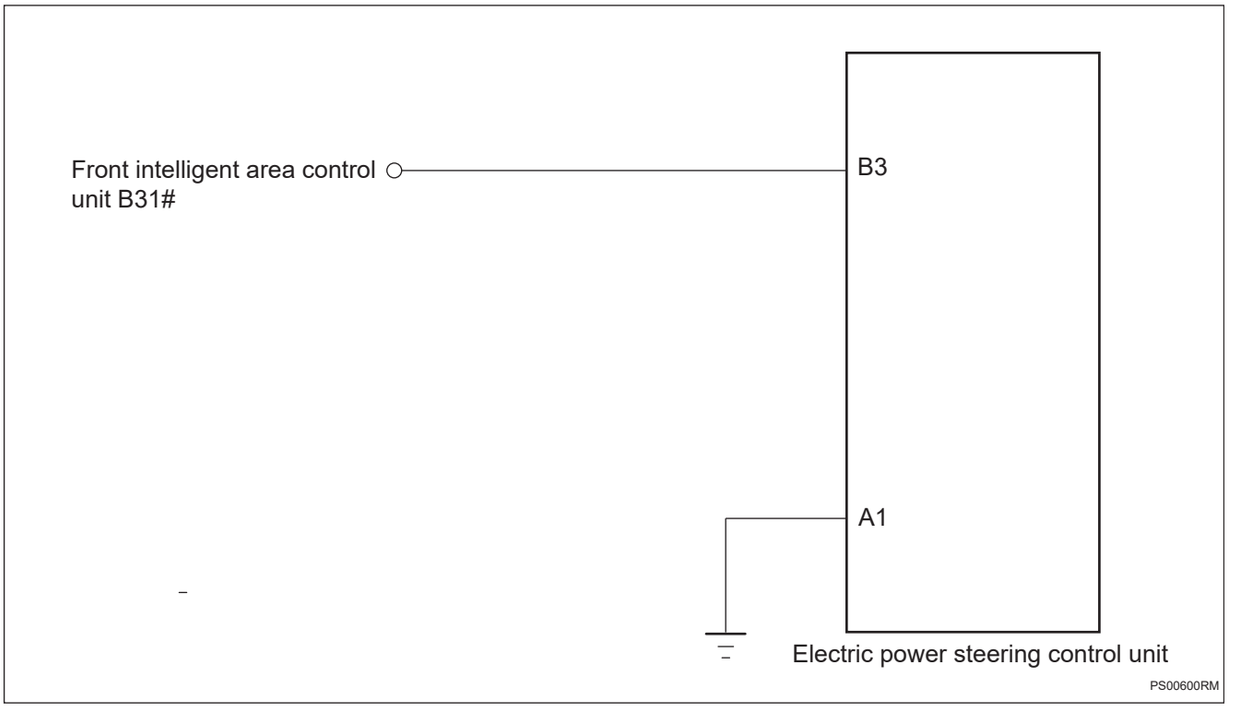
When electric power steering control unit ignition signal or torque sensor power supply voltage is faulty, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190021	• DTC setting is enable. • IGN is ON	Ignition supply < 7 V	10000 ms	Periodic type	10 ms	• Electric power steering control unit • Wire harness and connector
C190101	• DTC setting is enable. • IGN is ON	SENT supply voltage > 5.5 V or < 4.5 V	24 ms	Periodic type	2 ms	• Electric power steering control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C190021	Normal auxiliary function (motor on and relay on)	Comes on
C190101	No assistance, relay disconnected	Comes on

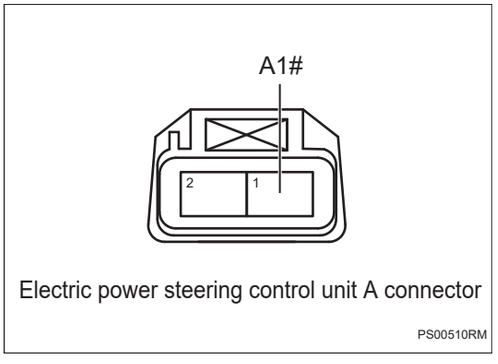
Circuit diagram



ZD

Inspection procedure

1	**Check electric power steering control unit ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect electric power steering control unit connector.

(d) According to value in the table, measure resistance.

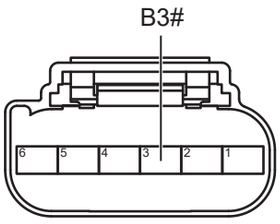
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check electric power steering control unit power supply**



Electric power steering control unit B connector

PS00621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK

Replace electric power steering control unit (See page DP-52)

DTC	**C19021C**	**Motor position sensor supply voltage fault**
DTC	**C190504**	**Temperature sensor fault**
DTC	**C190C62**	**Motor position sensor fault**
DTC	**C190D16**	**Open in motor phase**
DTC	**C190E96**	**Short in motor phase**
DTC	**C190F62**	**Motor current difference**

DTC	C191019	Motor overcurrent
DTC	C191128	Motor current sensor fault

Description

When steering gear motor or control unit fault occurs, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C19021C	• DTC setting is enable. • IGN is ON	Motor Position Supply Voltage > 5.5 V or < 4.5 V	24 ms	Periodic type	2 ms	• Electric power steering control unit • Wire harness and connector
C190504	• DTC setting is enable. • IGN is ON	ECU Temperature sensing value > 150° C or < -50° C for 3sec	3 sec	Periodic type	3 ms	• Electric power steering control unit • Wire harness and connector
C190C62	• DTC setting is enable. • IGN is ON	• T < -40° C, T > 125° C (motor position sensor temperature range error) • 165 deg < | SPI1-SPI2| < 195 deg is not satisfied • Motor position signal absent	• 24 ms • 24 ms • 24 ms	Periodic type	1 ms	• Electric power steering control unit • Wire harness and connector
C190D16	• DTC setting is enable. • IGN is ON	|I phase| (measured each phase current) < 2.5 A and |Iqref| (target current) > 30 A	50 ms	Periodic type	5 ms	• Electric power steering control unit • Wire harness and connector
C190E96	• DTC setting is enable. • IGN is ON	Motor line short is detected by Gate Driver failure information	32 ms	Periodic type	2 ms	• Electric power steering control unit • Wire harness and connector
C190F62	• DTC setting is enable. • IGN is ON	|(Iq(measured current) - Iqref (target current)| > 30 A	50 ms	Periodic type	5 ms	• Electric power steering control unit • Wire harness and connector

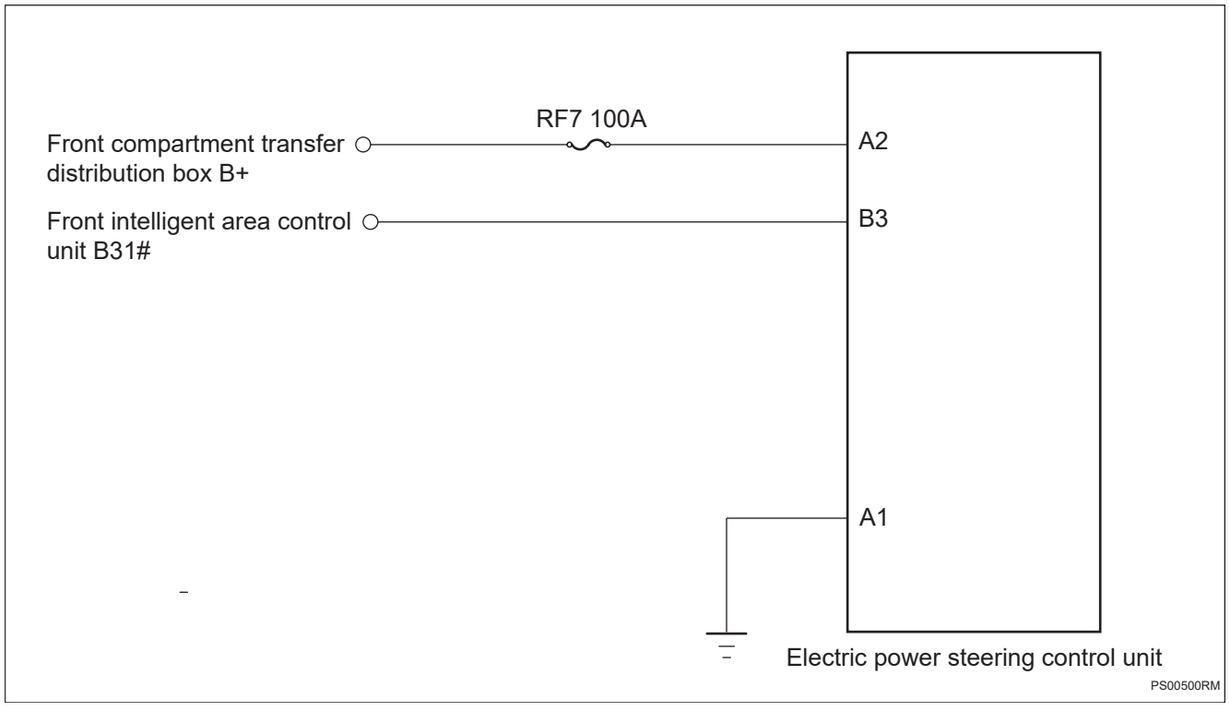
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C191019	• DTC setting is enable. • IGN is ON	|Iq| (measured current) > 175 A	50 ms	Periodic type	5 ms	• Electric power steering control unit • Wire harness and connector
C191128	• DTC setting is enable. • IGN is ON	Current sensing absolute value is over than ±12 A when system initializing	50 ms	Periodic type	5 ms	• Electric power steering control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C19021C	No assistance	Comes on
C190504	Full assistance	Comes on
C190C62	No assistance	Comes on
C190D16	No assistance	Comes on
C190E96	No assistance	Comes on
C190F62	No assistance	Comes on
C191019	No assistance	Comes on
C191128	No assistance	Comes on

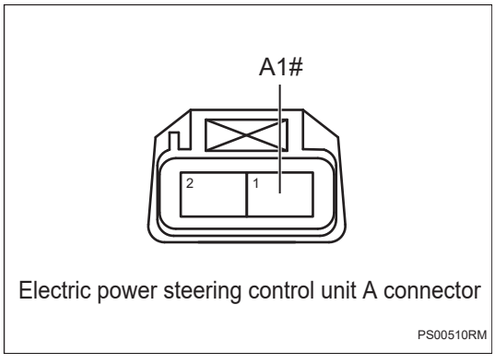
ZD

Circuit diagram



Inspection procedure

1	**Check electric power steering control unit ground**



Electric power steering control unit A connector

PS00510RM

(a) Disconnect electric power steering control unit connector.

(b) According to value in the table, measure resistance.

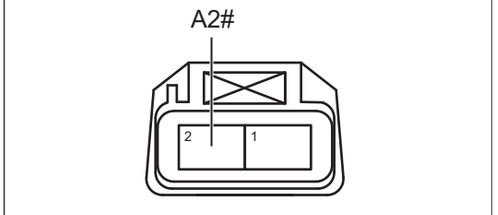
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

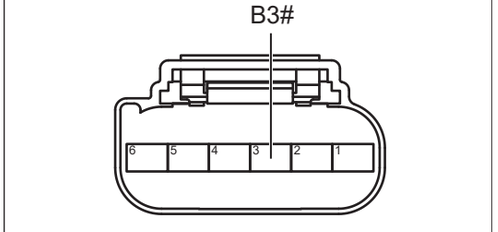
NG → **Check and repair or replace wire harness and connector**

OK

2	**Check electric power steering control unit power supply**



Electric power steering control unit A connector



Electric power steering control unit B connector

PS00520RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)

OK

Replace electric power steering control unit (See page DP-52)

DTC	C190301	Angle sensor - electrical fault

Description

When steering angle sensor signal is faulty, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190301	• DTC setting is enable. • IGN is ON	• PWM duty range < 10% or > 90% • PWM period > normal range (4 ~ 6 ms) • PWM and SENT relative angle differential ± 27 degree • PWM supply voltage > 5.5 V or < 4.55 V	• 500 ms • 500 ms • 500 ms • 500 ms	Periodic type	1 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C190301	Full assistance	Comes on

Inspection procedure

1	**Check electric power steering control unit wire harness and connector**

(a) Check if electric power steering control unit wire harness and connector are connected correctly.

(b) Check for short or open in electric power steering control unit wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace electric power steering control unit (See page DP-52)

DTC	C190454	Angle sensor - uncalibrated

Description

When steering angle sensor is not calibrated, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190454	• DTC setting is enable. • IGN is ON	• Steering angle sensor is not calibrated • When difference between absolute angle from SAS and Offset detected "straight driving condition" is bigger than 50 deg	Immediately	Periodic type	1 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C190454	Full assistance	Comes on

Inspection procedure

1	**Check wheel alignment data**

(a) Check if wheel alignment data is normal.

NG → **Perform repair according to malfunction**

OK

2	**Calibrate steering angle sensor**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Recalibrate steering angle sensor.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

ZD

Diagnosis ends

DTC	C190602	Torque sensor signal fault

Description

When torque sensor signal error is detected, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190602	• DTC setting is enable. • IGN is ON	• SENT 1 or SENT2 Tick time is < 1.344 us or > 2.015 us or Nibble Value exceed 0~15 • The specified number of edges on SENT 1 or SENT2 signal mismatche-d • SENT 1 or SENT2 checksum mismatch • SENT 1 or SENT2 invalid (0 or 4095) • |(The diff. Value SENT1 signal) - (The diff. Value SENT2 signal)| > 1.0 deg • SENT1, 2 signal timeout	• 24 ms • 24 ms • 24 ms • 24 ms • 24 ms	Periodic type	1 ms	• Electric power steering control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C190602	No assistance	Comes on

Inspection procedure

1	Check electric power steering control unit

(a) Check if electric power steering control unit wire harness and connector are tightened.

(b) Check for short or open in electric power steering control unit wire harness and connector.

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

ZD

DTC	C19074B	Overheating protection

Description

When the electric power steering control unit detects that system temperature is too high, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C19074B	• DTC setting is enable. • IGN is ON	Detected when meets conditions below 121 A of Peak current 100 rpm for 139 sec. (In case of temperature is less than 40° C) or 81 sec. (40 ~ 80° C) or 52 sec. (81 ~ 110° C)	Immediately	Periodic type	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C19074B	Current reduced based on temperature and heating coefficient	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Turn off the vehicle and keep vehicle stationary until it reaches room temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	C190804	ECU hardware fault
DTC	C190904	Data flash memory fault
DTC	C190A01	ECU fail-safe relay fault

Description

When electric power steering control unit is faulty, the electric power steering control unit records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190804	• DTC setting is enable. • IGN is ON	• Detected failure information by Gate Driver • MCU Hardware Failures handled by SMU (Safety Managem-ent Unit) Peripheral ; e.g lock step error, access protection violation, Flash ECC, RAM ECC, DFLASH ECC etc • Motor is rotated 40 wheel to one direction • Torque sensor offset is not calibrated • Current sensor offset is not calibrated • Dynamics SWC correlaction error	• 32 ms • Immediately • Immediately • Immediately • Immediately • 24 ms	Periodic type	• 1 ms • 2 ms • Every time • 4 ms • 4 ms • 2 ms	• Electric power steering control unit
C190904	• DTC setting is enable. • IGN is ON	• Every time read/write access is performed, if there MPU (Memory Protection Unit) error a trap/ exception is raised; stuck in the endless while loop. Types of Failures: privilege instruction check, read/write execution,	• Immediately	Periodic type	Every time read/ write access	• Electric power steering control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		peripheral access, null address and global register write protection				
C190A01	• DTC setting is enable. • IGN is ON	• ECU fail-safe RELAY Short (When Power SW Drv Off + Monitoring ON) • ECU fail-safe RELAY Open (When Power SW Drv ON + Monitoring OFF)	• 80 ms • 80 ms	Periodic type	2 ms	• Electric power steering control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C190804	• No assistance • Full assistance	Comes on
C190904	• Full assistance	Comes on
C190A01	• No assistance	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

ZD

DTC	C190B01	Operation reset

Description

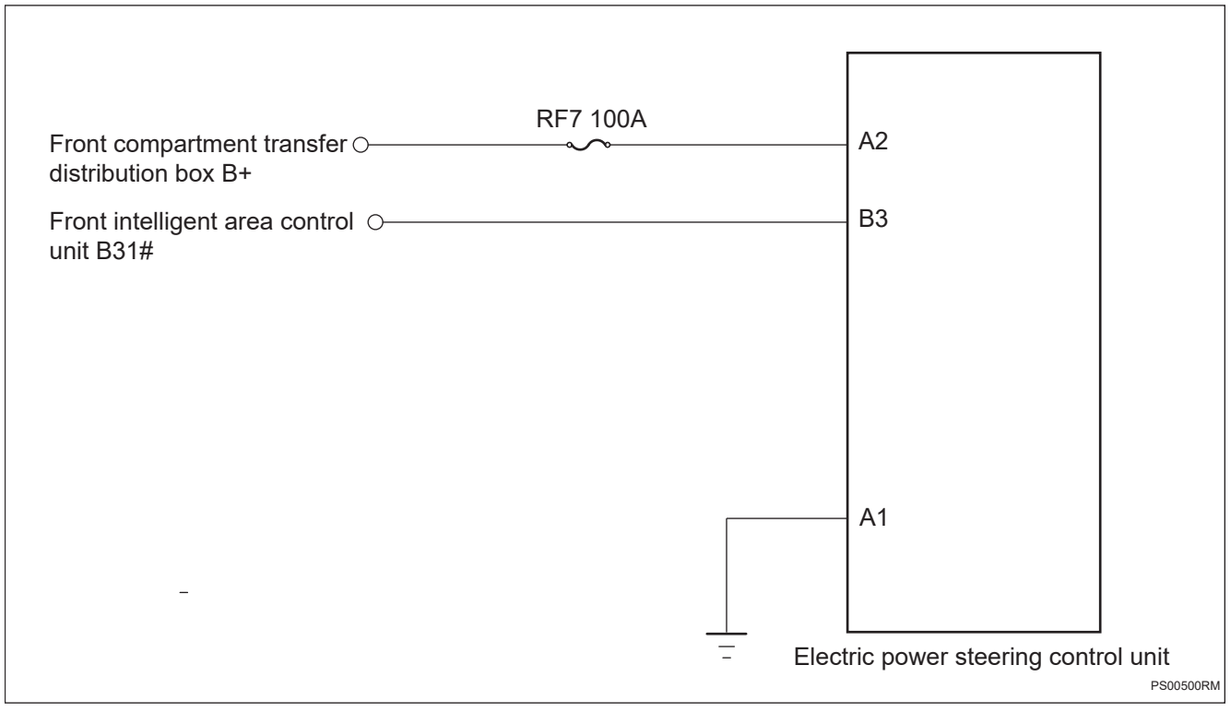
When electric power steering control unit has operation reset fault, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C190B01	• DTC setting is enable. • IGN is ON	Abnormal ECU shutdown of Consecutive 50 times during assist on	Immediately	Periodic type	When EPS waking up	• Electric power steering control unit • Wire harness and connector

Fault symptom

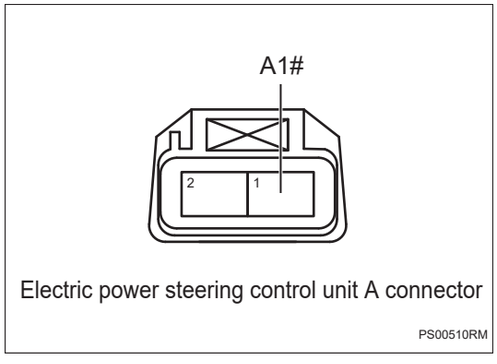
DTC No.	Fault symptom	Warning light/indicator
C190B01	Full assistance	Comes on

Circuit diagram



Inspection procedure

1	**Check electric power steering control unit ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect electric power steering control unit connector.

(d) According to value in the table, measure resistance.

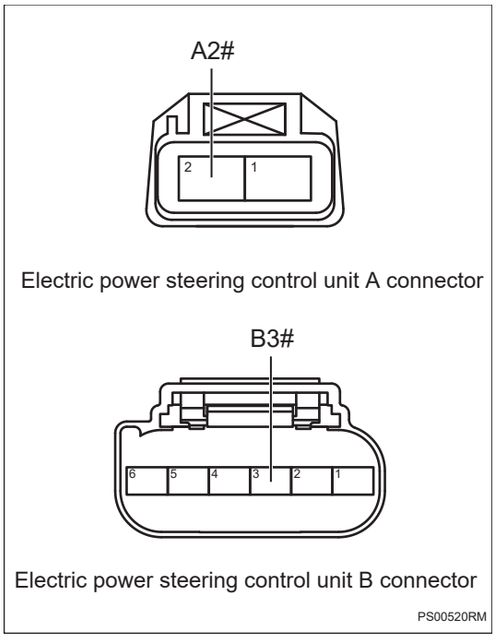
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check electric power steering control unit power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK

3	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) After the vehicle is powered down and wakes up from sleep.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

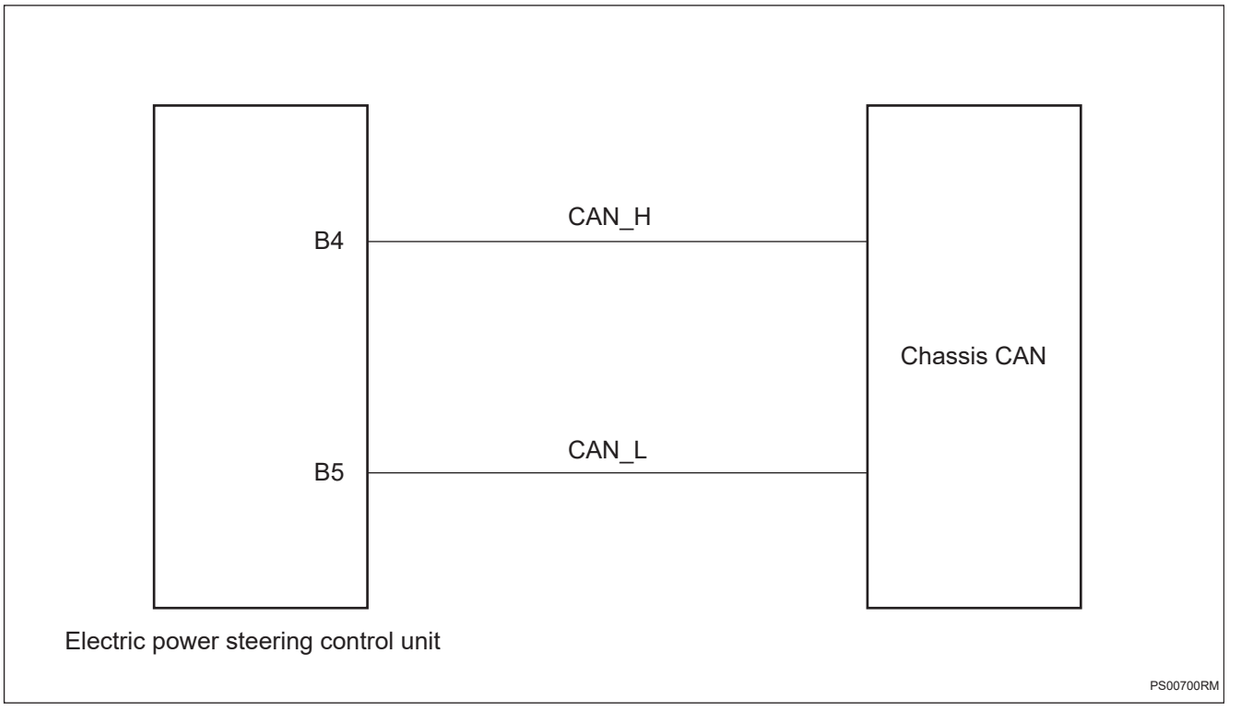
DTC	U006488	Chassis CAN bus off

Description

When the electric power steering control unit detects chassis CAN bus off fault, the electric power steering control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U006488	(a) Chassis CAN bus off.	• Wire harness and connector • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller • Electric power steering control unit

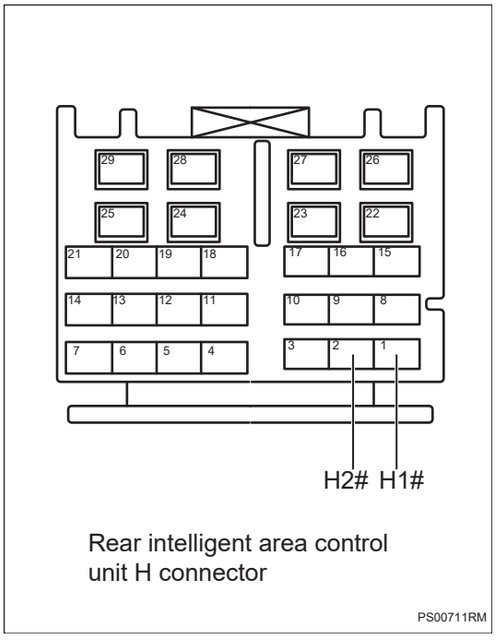
Circuit diagram



ZD

Inspection procedure

1	**Check chassis CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H1# - rear intelligent area control unit connector H2#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	Check controllers on chassis CAN bus

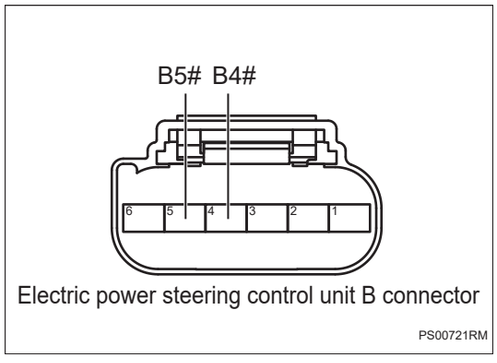
(a) Disconnect the controllers on chassis CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

ZD

3	Check for short between chassis CAN bus CAN-L and CAN-H



Electric power steering control unit B connector

PS00721RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

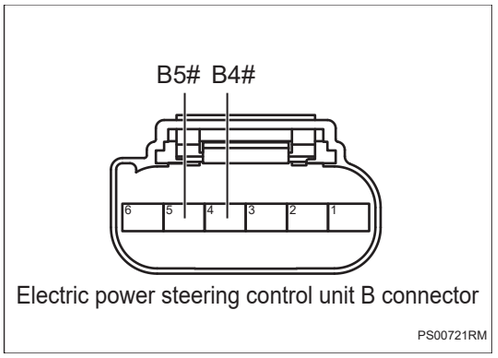
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - electric power steering control unit connector B4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in chassis CAN bus**



Electric power steering control unit B connector

PS00721RM

(a) According to value in the table, measure resistance.

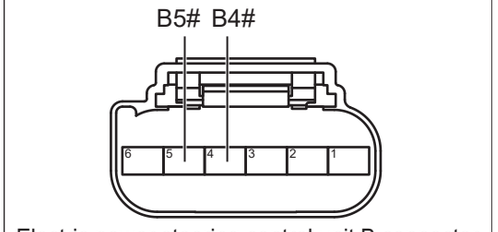
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - body ground	Always connected	10 KΩ or more
Electric power steering control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in chassis CAN bus**



Electric power steering control unit B connector

PS00721RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric power steering control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	U012987	IBC node lost
DTC	U041582	IBC message content fault
DTC	U041583	IBC message content fault
DTC	U041586	IBC message content fault
DTC	U014687	PDCF node lost
DTC	U059482	VDC397 message content fault
DTC	U059483	VDC397 message content fault
DTC	U059486	VDC397 message content fault
DTC	U054482	Automatic parking message content fault
DTC	U054483	Automatic parking message content fault
DTC	U054486	Automatic parking message content fault
DTC	U045282	ACU message content fault
DTC	U045283	ACU message content fault
DTC	U045286	ACU message content fault
DTC	U114687	VDC message missing
DTC	U129387	Vehicle controller message missing
DTC	U115187	Airbag control unit message missing
DTC	U124387	Automatic parking message missing
DTC	U113887	Driving mode message missing
DTC	U119887	T-BOX message missing
DTC	U114A87	VDC_config message missing
DTC	U043382	VDC_1 message content fault
DTC	U043383	VDC_1 message content fault

DTC	U043386	VDC_1 message content fault

Description

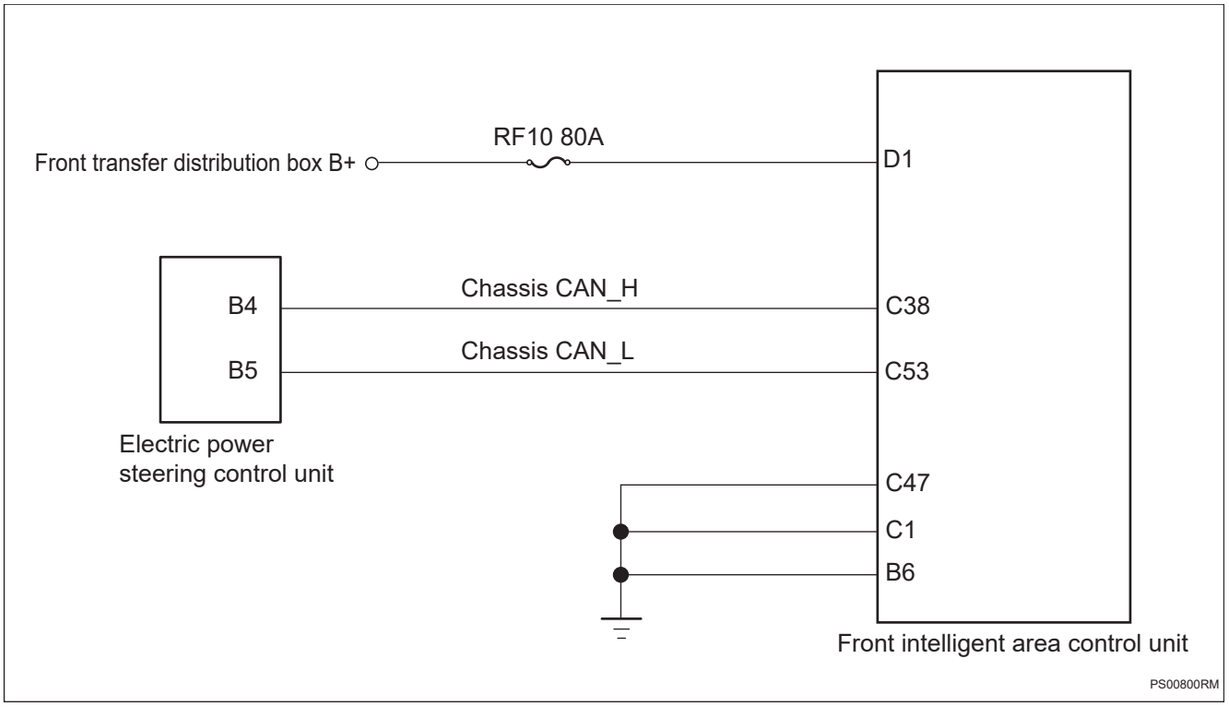
When communication between electric power steering control unit and other system is abnormal or interrupted, the electric power steering control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U012987	(a) IBC node lost.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U041582	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U041583	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U041586	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U014687	(a) Gateway node lost.	• Wire harness and connector • Electric power steering control unit • Front intelligent area control unit
U059482	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U059483	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U059486	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U054482	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit

DTC No.	DTC detection condition	Faulty area
U054483	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U054486	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U045282	(a) ACU message content fault.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U045283	(a) ACU message content fault.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U045286	(a) ACU message content fault.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U114687	(a) VDC message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Electric power steering control unit • Front intelligent area control unit
U115187	(a) Airbag control unit message missing.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U124387	(a) Automatic parking message missing.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U113887	(a) Driving mode message missing.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U119887	(a) T-BOX message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent communication domain control unit

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit
U114A87	(a) VDC_config message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U043382	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U043383	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U043386	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit

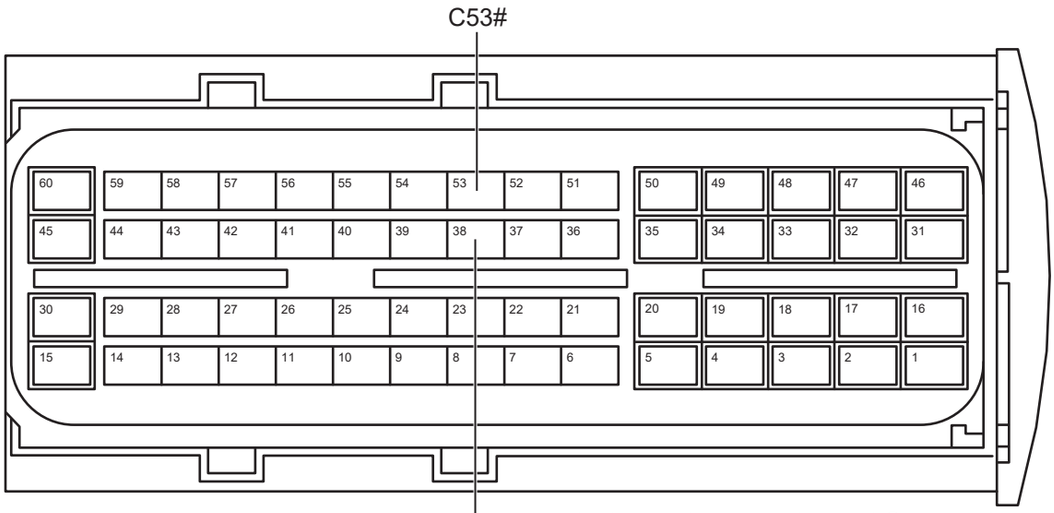
Circuit diagram



Inspection procedure

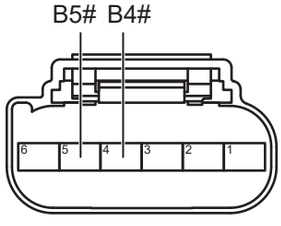
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in chassis CAN bus (electric power steering control unit - front intelligent area control unit)**



Front intelligent area control unit C connector

PS00811RM



Electric power steering control unit B connector

PS00721RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

Standard value

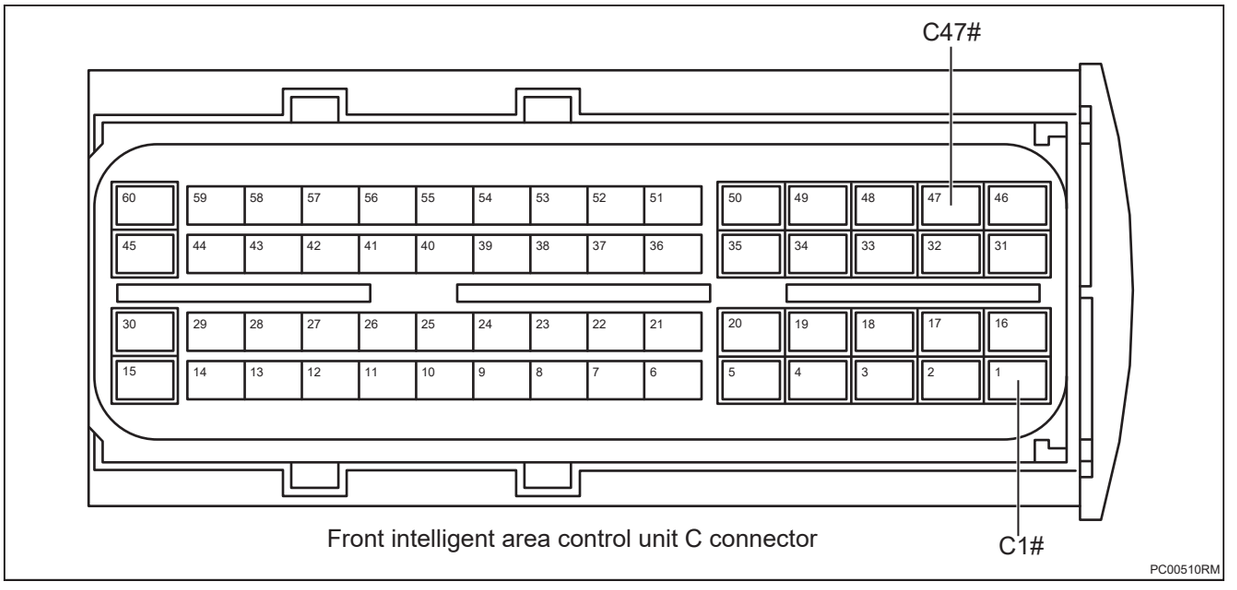
Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B4# - front intelligent area control unit connector C38#	Always connected	Less than 1 Ω
Electric power steering control unit connector B5# - front intelligent area control unit connector C53#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

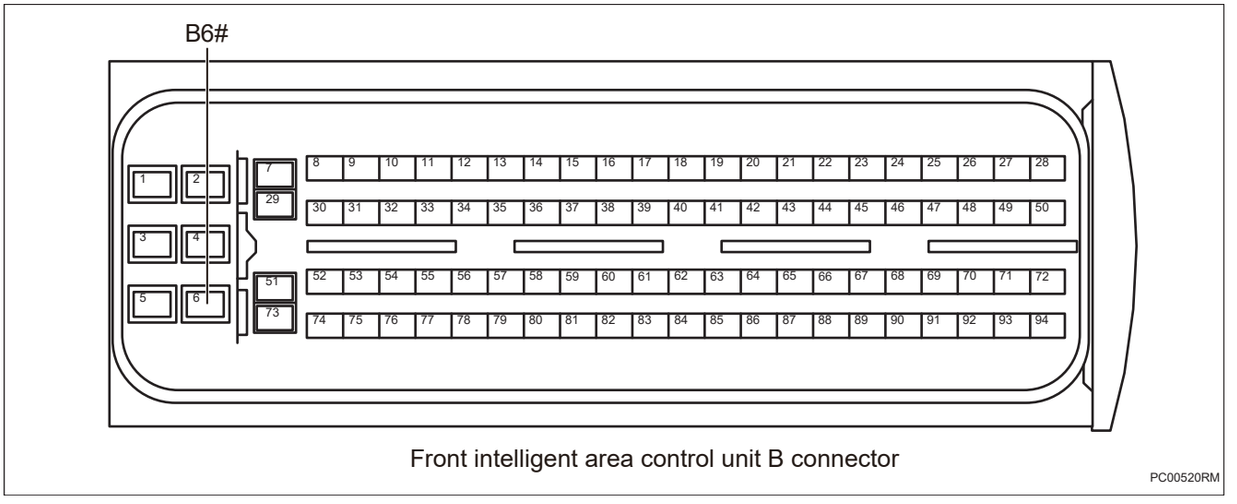
ZD

2	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

PC00510RM



Front intelligent area control unit B connector

PC00520RM

(a) According to value in the table, measure resistance.

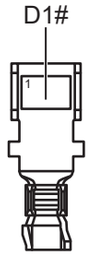
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front intelligent area control unit power supply**



Front intelligent area control unit D connector

PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

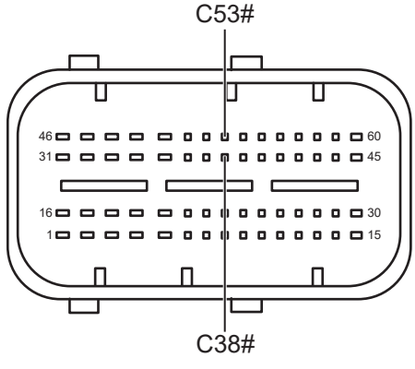
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

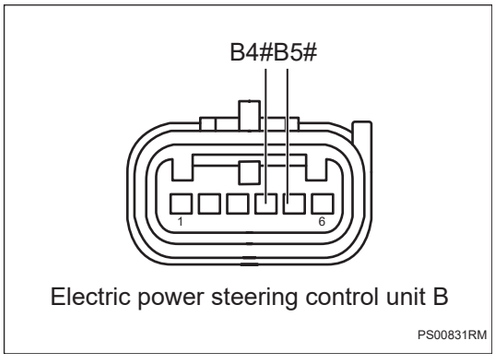
4	**Check chassis CAN bus terminal resistance**



Front intelligent area control unit C

PS00821RM

ZD



Electric power steering control unit B

PS00831RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit B5# - electric power steering control unit B4#	Always connected	Approximately 120 Ω
Front intelligent area control unit C38# - front intelligent area control unit C53#	Always connected	Approximately 120 Ω

ZD

NG → **Perform repair according to malfunction**

OK

5	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

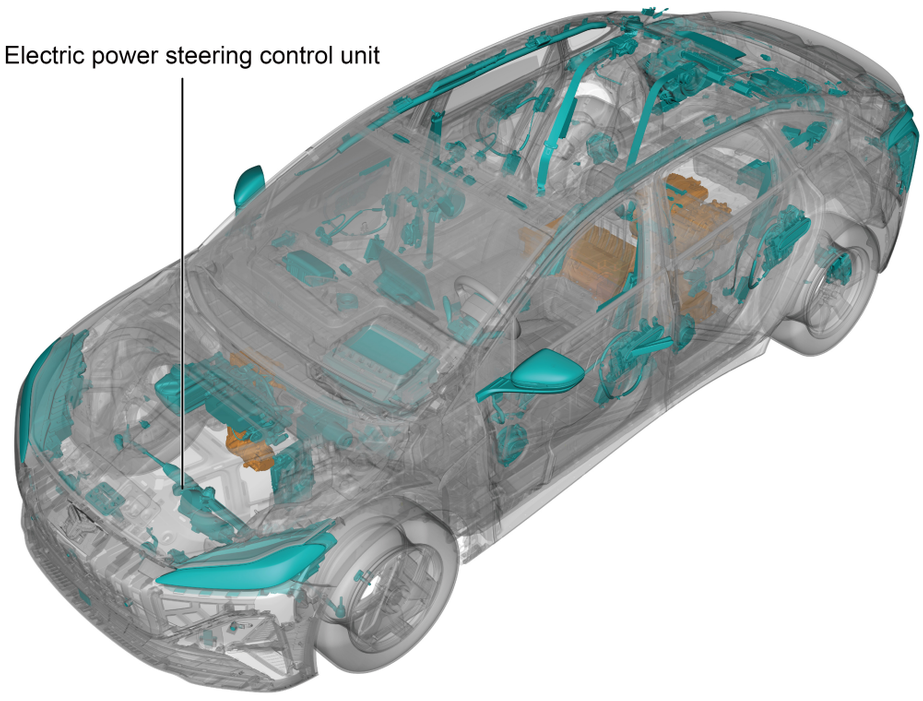
OK

Diagnosis ends

Power steering system-B

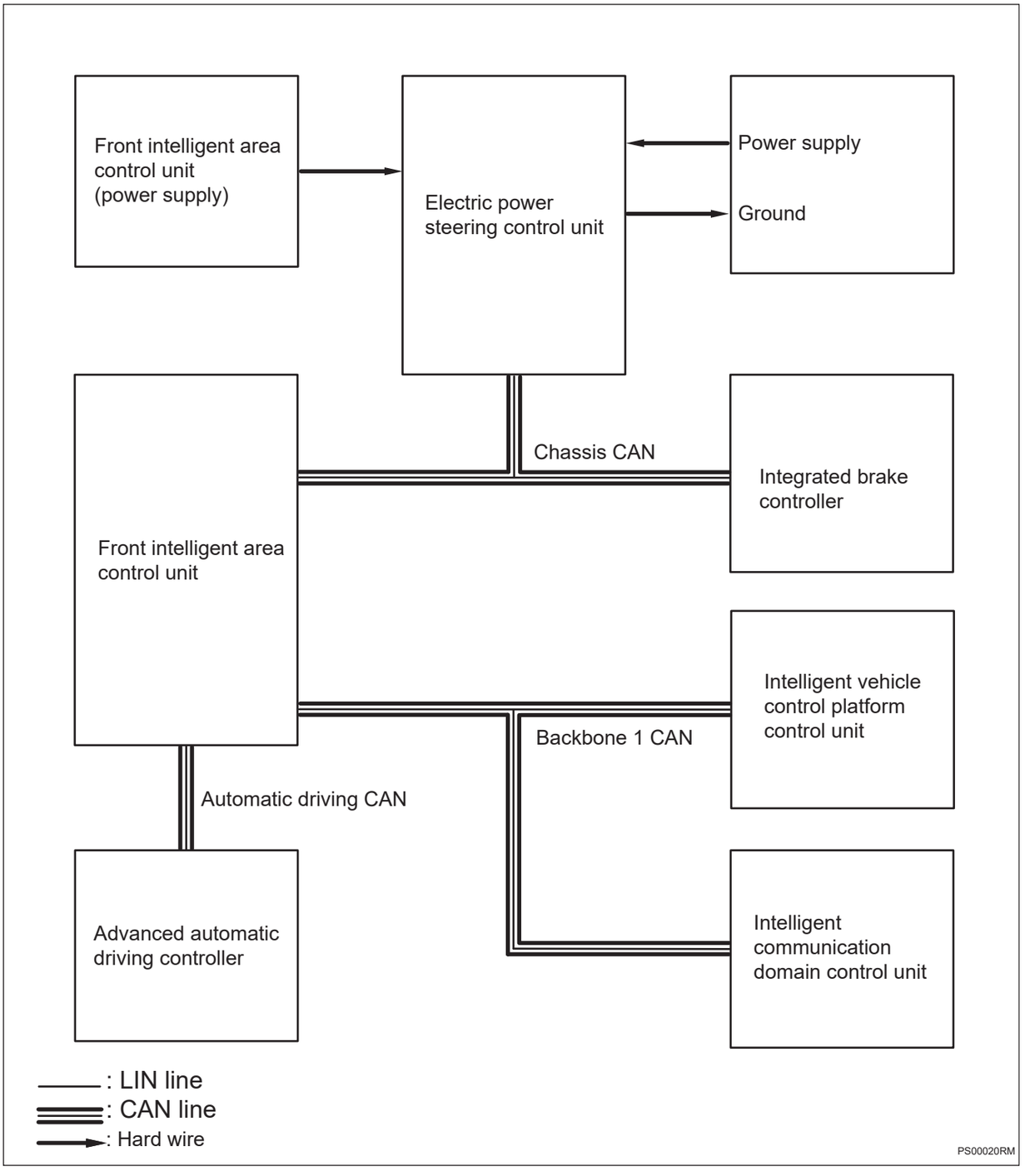
Electric power steering control unit

Part position



PS00030RM

System diagram



Function overview

1. Steering assist control:

(a) When power supply, ignition signal, vehicle speed signal, and high voltage electrical signal are in normal operation state. After the user operates the steering wheel, angle and torque sensor sends recognized angle and torque signal to

ECU. ECU processes and calculates the received signal to control the motor to provide the required steering torque. At the same time, it supports emergency power-off assistance keeping, idle start and stop, external assistance request, stall delay assistance and output fault state.

2. **Comfort steering:**

   (a) When the steering assist control is in normal operating condition, the EPS system enhances steering comfort through damping compensation and inertia compensation functions, improves steering maneuverability through active return-to-center, and reduces noise through soft-stop protection.

3. **Steering assist with speed:**

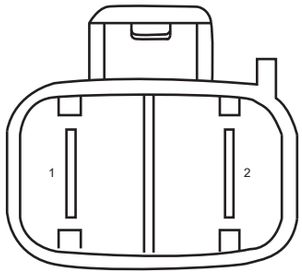
   (a) When the steering assist control is in normal operating condition, the assistance provided by the EPS system decreases as the vehicle speed increases, ensuring that the steering effort required from the driver also increases with the vehicle speed.

Data parameter

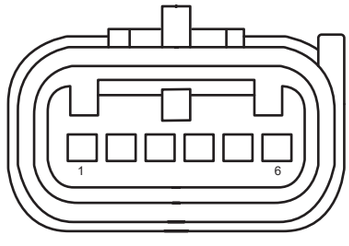
Electric power steering control unit

Item	Max	OK	Minimum
Operating voltage (V)	-	12.5	-
Operating current (A)	95	-	0.3

ECU terminal



Electric power steering control unit A



Electric power steering control unit B

PS00010RM

Electric power steering control unit A	
Pin number	**Definition**
1	GND
2	B+

Electric power steering control unit B	
Pin number	**Definition**
1	-
2	-
3	Ignition
4	CAN_H
5	CAN_L
6	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C160017	EPS controller input end overvoltage	(See page ZD-1953)
C160022	Power supply voltage abnormally high	(See page ZD-1953)
C160116	EPS controller input end undervoltage	(See page ZD-1953)
C160121	Power supply voltage abnormally low	(See page ZD-1953)
C160E41	EPS overcurrent fault	(See page ZD-1965)
C161014	EPS overload	(See page ZD-1965)
C160F64	Abnormal motor shutdown path	(See page ZD-1966)
C161148	MCU internal fault	(See page ZD-1966)
C161100	MCU internal potential fault	(See page ZD-1966)
C16034B	ECU overtemperature	(See page ZD-1959)
C160300	ECU temperature abnormal	(See page ZD-1959)
C160213	ECU internal circuit error	(See page ZD-1957)
C160404	Power supply chip fault	(See page ZD-1960)
C160411	Power supply chip potential fault	(See page ZD-1960)
C160504	Pre-drive fault	(See page ZD-1960)
C160511	Pre-drive hidden type fault	(See page ZD-1960)
C160654	Neutral position not calibrated	(See page ZD-1962)
C160754	Three phase current sum exceeding threshold	(See page ZD-1963)
C16081C	Power supply voltage fault	(See page ZD-1963)
C160926	Signal check fault	(See page ZD-1963)
C160A1C	Power supply voltage fault	(See page ZD-1963)
C160B85	TAS torque signal fault	(See page ZD-1963)

DTC	Detection Items	See page
C160C48	TAS angle signal fault	(See page ZD-1963)
C160D42	Watchdog input fault	(See page ZD-1963)
U006488	Chassis CAN bus off	(See page ZD-1968)
U012987	IBC node lost	(See page ZD-1971)
U041582	IBC message content fault	(See page ZD-1971)
U041583	IBC message content fault	(See page ZD-1971)
U041586	IBC message content fault	(See page ZD-1971)
U014687	PDCF node lost	(See page ZD-1971)
U059482	VDC397 message content fault	(See page ZD-1971)
U059483	VDC397 message content fault	(See page ZD-1971)
U059486	VDC397 message content fault	(See page ZD-1971)
U054482	Automatic parking message content fault	(See page ZD-1971)
U054483	Automatic parking message content fault	(See page ZD-1971)
U054486	Automatic parking message content fault	(See page ZD-1971)
U045282	ACU message content fault	(See page ZD-1971)
U045283	ACU message content fault	(See page ZD-1971)
U045286	ACU message content fault	(See page ZD-1971)
U114687	VDC message missing	(See page ZD-1971)
U129387	Vehicle controller message missing	(See page ZD-1971)
U115187	Airbag control unit message missing	(See page ZD-1971)
U124387	Automatic parking message missing	(See page ZD-1971)
U113887	Driving mode message missing	(See page ZD-1971)
U119887	T-BOX message missing	(See page ZD-1971)
U114A87	VDC_config message missing	(See page ZD-1971)
U043382	VDC_1 message content fault	(See page ZD-1971)
U043383	VDC_1 message content fault	(See page ZD-1971)
U043386	VDC_1 message content fault	(See page ZD-1971)

DTC	**C160017**	**EPS controller input end overvoltage**
DTC	**C160022**	**Power supply voltage abnormally high**

DTC	C160116	EPS controller input end undervoltage
DTC	C160121	Power supply voltage abnormally low

Description

When electric power steering control unit power supply voltage is out of normal operation range, the electric power steering control unit records DTC.

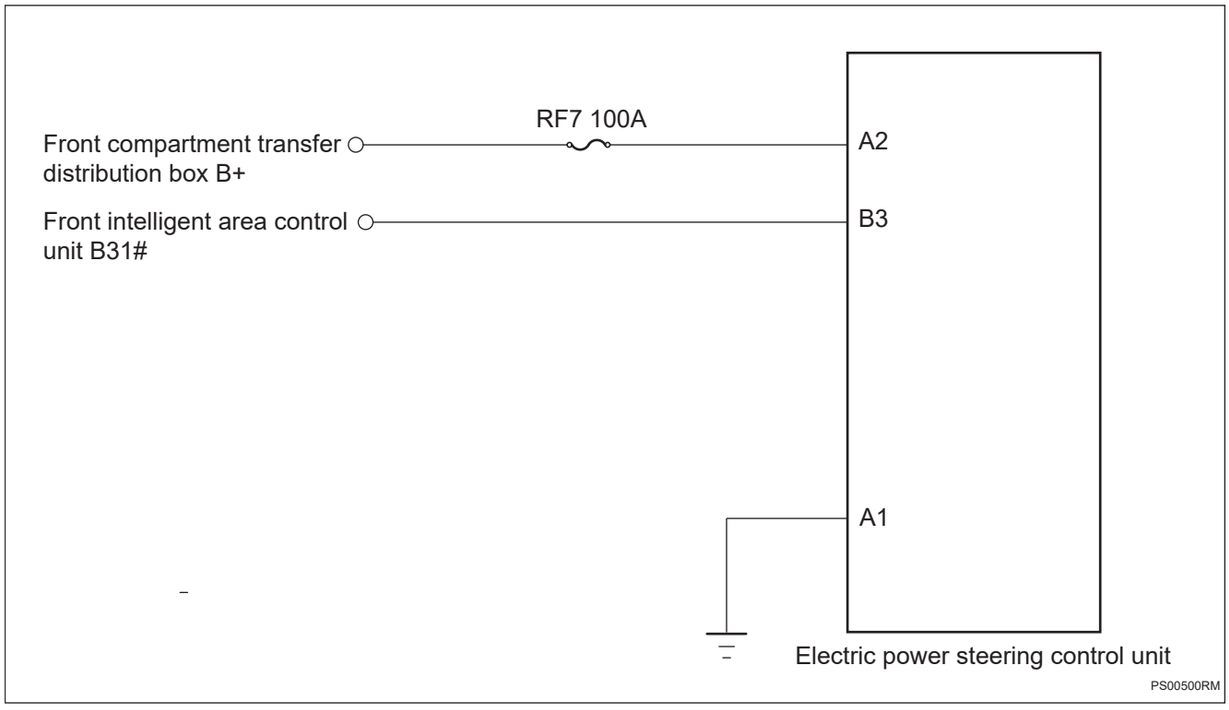
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160017	• Voltage is between 9 V and 18 V • IGN signal is ON • Engine is in running state	Voltg = (18 V, 24 V)	500 ms	cyclic	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system
C160022	• Voltage is between 9 V and 18 V • IGN signal is ON • Engine is in running state	Voltg > 24 V	500 ms	cyclic	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system
C160116	• Voltage is between 9 V and 18 V • IGN signal is ON • Engine is in running state	Voltg = (7 V, 9 V)	500 ms	cyclic	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system
C160121	• Voltage is between 9 V and 18 V • IGN signal is ON • Engine is in running state	Voltg < 7 V	500 ms	cyclic	10 ms	• Electric power steering control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160017	• Power degradation • EPS turns on the malfunction light	Comes on
C160022	• Power degradation • EPS turns on the malfunction light	Comes on

DTC No.	Fault symptom	Warning light/indicator
C160116	• Power degradation • EPS turns on the malfunction light	Comes on
C160121	• Power degradation • EPS turns on the malfunction light	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check electric power steering control unit fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove electric power steering control unit fuse.

(d) According to value in the table, measure resistance.

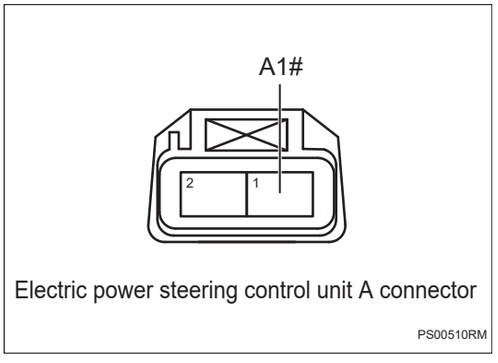
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	**Check electric power steering control unit ground**



Electric power steering control unit A connector

PS00510RM

(a) Disconnect electric power steering control unit connector.

(b) According to value in the table, measure resistance.

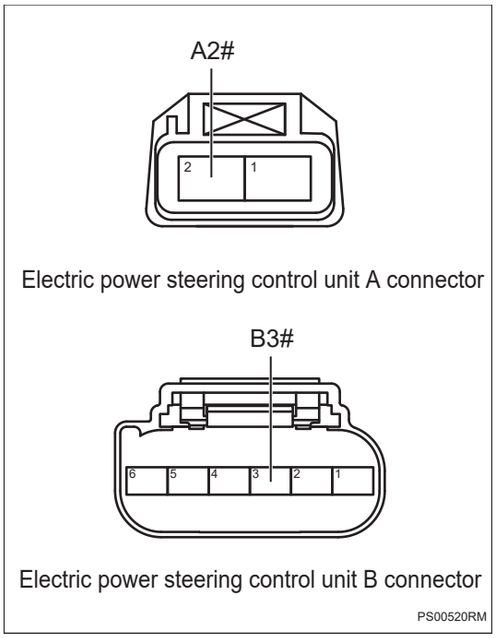
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check electric power steering control unit power supply**



(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Electric power steering control unit connector B3# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK

Replace electric power steering control unit (See page DP-52)

DTC	C160213	ECU internal circuit error

Description

When the internal circuit of electric power steering control unit is faulty, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160213	• Voltage is between 9 V and 18 V • IGN signal is ON	ECU internal circuit fault	500 ms	cyclic	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160213	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	C16034B	ECU overtemperature
DTC	C160300	ECU temperature abnormal

Description

When the electric power steering control unit detects that system temperature is too high, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C16034B	• Voltage is between 9 V and 18 V • IGN signal is ON	MOS temperature (115° C, 145° C)	10 times	cyclic	10 ms	• Electric power steering control unit
C160300	• Voltage is between 9 V and 18 V • IGN signal is ON	MOS temperature > 145° C, MCU temperature > 120° C	10 times	cyclic	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C16034B	• Power degradation • EPS turns on the malfunction light	Comes on
C160300	• Power off • EPS turns on the malfunction light	Comes on

Inspection procedure

1	Vehicle cooling

(a) Cool down the vehicle at room temperature for 1 hour.

Result:

Result	Proceed to
Power cannot be restored	NG
Power restoration	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	**C160404**	**Power supply chip fault**
DTC	**C160411**	**Power supply chip potential fault**
DTC	**C160504**	**Pre-drive fault**
DTC	**C160511**	**Pre-drive hidden type fault**

Description

When the internal chip of electric power steering control unit is faulty, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160404	• Voltage is between 9 V and 18 V • IGN signal is ON	Read fault memory	10 times	cyclic	10 ms	• Electric power steering control unit
C160411	• Voltage is between 9 V and 18 V • IGN signal is ON	Read fault memory	Once in a driving cycle	initial	ECU initial	• Electric power steering control unit
C160504	• Voltage is between 9 V and 18 V • IGN signal is ON	Read fault memory	10 times	cyclic	10 ms	• Electric power steering control unit
C160511	• Voltage is between 9 V and 18 V • IGN signal is ON	Read fault memory	Once in a driving cycle	initial	ECU initial	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160404	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160411	• Not affect assistance • EPS malfunction light on instrument cluster remains on	Comes on
C160504	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160511	• Not affect assistance • EPS malfunction light on instrument cluster remains on	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	C160654	Neutral position not calibrated

Description

When electric power steering control unit does not calibrate neutral position, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160654	• Voltage is between 9 V and 18 V • IGN signal is ON	No neutral position calibration has been performed	10 times	cyclic	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160654	• Steering assist is normal • EPS malfunction light on instrument cluster remains on	Comes on

Inspection procedure

1	Neutral calibration

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform neutral position calibration, and calibrate steering angle sensor.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	**C160754**	**Three phase current sum exceeding threshold**
DTC	**C16081C**	**Power supply voltage fault**
DTC	**C160926**	**Signal check fault**
DTC	**C160A1C**	**Power supply voltage fault**
DTC	**C160B85**	**TAS torque signal fault**
DTC	**C160C48**	**TAS angle signal fault**
DTC	**C160D42**	**Watchdog input fault**

Description

When an internal fault occurs in electric power steering control unit, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160754	• Voltage is between 9 V and 18 V • IGN signal is ON	Three phase current sum is more than 10 A	10 times	cyclic	100 us	• Electric power steering control unit
C16081C	• Voltage is between 9 V and 18 V • IGN signal is ON	Read SBC fault memory	10 times	cyclic	10 ms	• Electric power steering control unit
C160926	• Voltage is between 9 V and 18 V • IGN signal is ON	RPS signal value, RPS synchronizatio-n check value, RPS check mechanism	10 times	cyclic	10 ms	• Electric power steering control unit
C160A1C	• Voltage is between 9 V and 18 V • IGN signal is ON	Read SBC fault memory	10 times	cyclic	10 ms	• Electric power steering control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160B85	• Voltage is between 9 V and 18 V • IGN signal is ON	SENT protocol, SENT_counter value, synchronization check value, etc.	10 times	cyclic	10 ms	• Electric power steering control unit
C160C48	• Voltage is between 9 V and 18 V • IGN signal is ON	SENT protocol, SENT_counter value, synchronization check value, etc.	10 times	cyclic	10 ms	• Electric power steering control unit
C160D42	• Voltage is between 9 V and 18 V • IGN signal is ON	Read MCU fault memory	10 times	cyclic	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160754	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C16081C	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160926	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160A1C	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160B85	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C160C48	• Steering assist function is normal • EPS malfunction light on instrument cluster remains on	Comes on
C160D42	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	**C160E41**	**EPS overcurrent fault**
DTC	**C161014**	**EPS overload**

Description

When overcurrent or overload fault occurs in electric power steering control unit, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160E41	• Voltage is between 9 V and 18 V • IGN signal is ON	PPK current > 130 A	10 times	cyclic	10 ms	• Electric power steering control unit
C161014	• Voltage is between 9 V and 18 V • IGN signal is ON	PPK current is more than 90 A	10 times	cyclic	10 ms	• Electric power steering control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160E41	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C161014	• Power degradation • EPS turns on the malfunction light	Comes on

Inspection procedure

1	Vehicle cooling

(a) Cool down the vehicle at room temperature for 1 hour.

ZD

Result:

Result	Proceed to
Power cannot be restored	NG
Power restoration	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

DTC	C160F64	Abnormal motor shutdown path
DTC	C161148	MCU internal fault
DTC	C161100	MCU internal potential fault

Description

When the internal motor of electric power steering control unit is faulty, the electric power steering control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C160F64	• Voltage is between 9 V and 18 V • IGN signal is ON	The voltage across MOS terminals is not within the range of 0 V ±0.5 V	Once in a driving cycle	initial	ECU initial	• Electric power steering control unit
C161148	• Voltage is between 9 V and 18 V • IGN signal is ON	Read MCU fault memory	10 times	cyclic	1 ms	• Electric power steering control unit
C161100	• Voltage is between 9 V and 18 V • IGN signal is ON	Read MCU fault memory	Once in a driving cycle	initial	ECU initial	• Electric power steering control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C160F64	• Steering assist function is normal • EPS malfunction light on instrument cluster remains on	Comes on
C161148	• Power off, heavy steering operation • EPS malfunction light on instrument cluster remains on	Comes on
C161100	• Not affect assistance • EPS malfunction light on instrument cluster remains on	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

Diagnosis ends

ZD

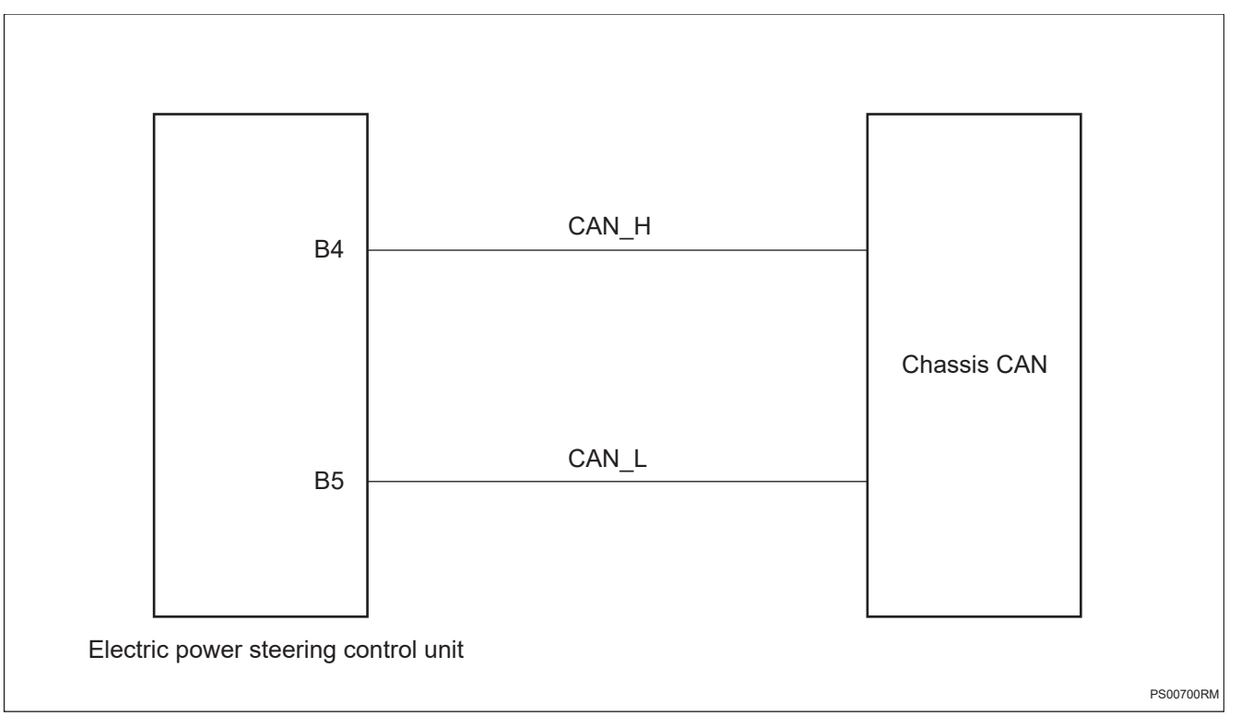
DTC	**U006488**	**Chassis CAN bus off**

Description

When the electric power steering control unit detects chassis CAN bus off fault, the electric power steering control unit records DTC.

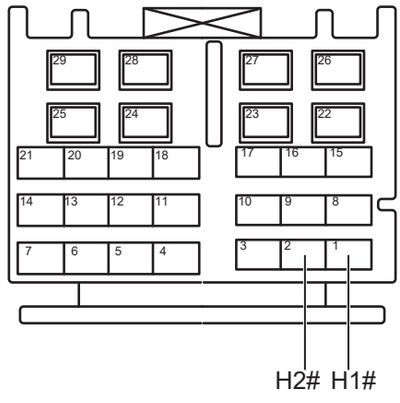
DTC No.	DTC detection condition	Faulty area
U006488	(a) Chassis CAN bus off.	• Wire harness and connector • Front intelligent area control unit • Rear intelligent area control unit • Integrated brake controller • Electric power steering control unit

Circuit diagram



Inspection procedure

1	**Check chassis CAN bus terminal resistance**



Rear intelligent area control unit H connector

PS00711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector H1# - rear intelligent area control unit connector H2#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controllers on chassis CAN bus**

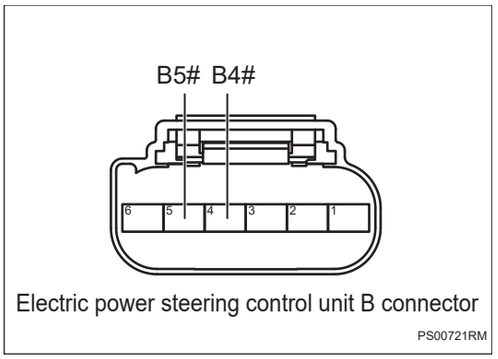
(a) Disconnect the controllers on chassis CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

ZD

3	**Check for short between chassis CAN bus CAN-L and CAN-H**



Electric power steering control unit B connector
PS00721RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

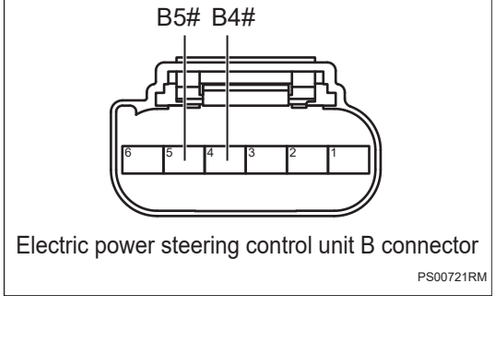
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - electric power steering control unit connector B4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in chassis CAN bus**



Electric power steering control unit B connector
PS00721RM

(a) According to value in the table, measure resistance.

Standard value

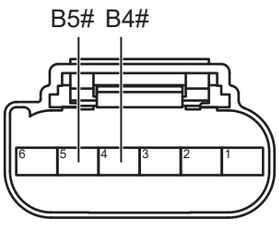
Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - body ground	Always connected	10 KΩ or more
Electric power steering control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	Check for short to power supply in chassis CAN bus



Electric power steering control unit B connector

PS00721RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Electric power steering control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

Diagnosis ends

DTC	U012987	IBC node lost
DTC	U041582	IBC message content fault
DTC	U041583	IBC message content fault
DTC	U041586	IBC message content fault
DTC	U014687	PDCF node lost
DTC	U059482	VDC397 message content fault
DTC	U059483	VDC397 message content fault
DTC	U059486	VDC397 message content fault

DTC	U054482	Automatic parking message content fault
DTC	U054483	Automatic parking message content fault
DTC	U054486	Automatic parking message content fault
DTC	U045282	ACU message content fault
DTC	U045283	ACU message content fault
DTC	U045286	ACU message content fault
DTC	U114687	VDC message missing
DTC	U129387	Vehicle controller message missing
DTC	U115187	Airbag control unit message missing
DTC	U124387	Automatic parking message missing
DTC	U113887	Driving mode message missing
DTC	U119887	T-BOX message missing
DTC	U114A87	VDC_config message missing
DTC	U043382	VDC_1 message content fault
DTC	U043383	VDC_1 message content fault
DTC	U043386	VDC_1 message content fault

Description

When communication between electric power steering control unit and other system is abnormal or interrupted, the electric power steering control unit records DTC.

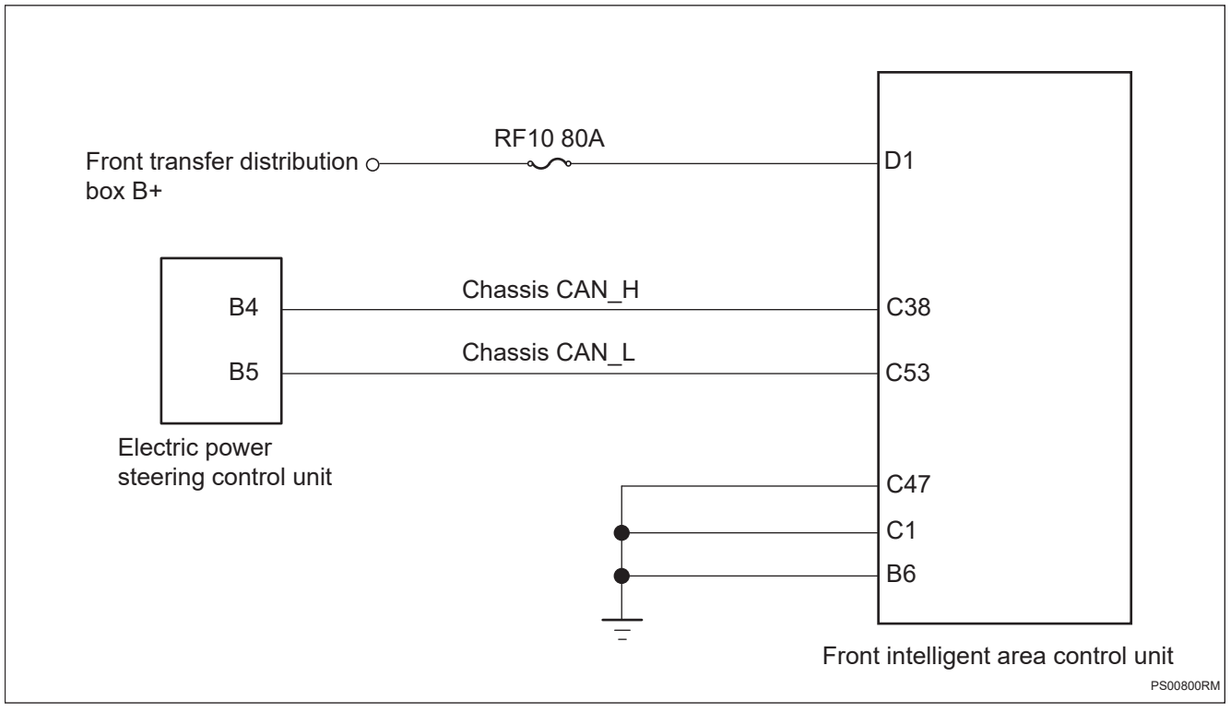
DTC No.	DTC detection condition	Faulty area
U012987	(a) IBC node lost.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U041582	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U041583	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit
U041586	(a) IBC message content fault.	• Wire harness and connector • Electric power steering control unit • Integrated brake controller • Front intelligent area control unit
U014687	(a) Gateway node lost.	• Wire harness and connector • Electric power steering control unit • Front intelligent area control unit
U059482	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U059483	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U059486	(a) Central computing platform message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U054482	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U054483	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U054486	(a) Automatic parking message content fault.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U045282	(a) ACU message content fault.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U045283	(a) ACU message content fault.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U045286	(a) ACU message content fault.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U114687	(a) VDC message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Electric power steering control unit • Front intelligent area control unit
U115187	(a) Airbag control unit message missing.	• Wire harness and connector • Electric power steering control unit • Airbag control unit • Front intelligent area control unit
U124387	(a) Automatic parking message missing.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U113887	(a) Driving mode message missing.	• Wire harness and connector • Electric power steering control unit • Advanced automatic driving controller • Front intelligent area control unit
U119887	(a) T-BOX message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent communication domain control unit • Front intelligent area control unit
U114A87	(a) VDC_config message missing.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U043382	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit

DTC No.	DTC detection condition	Faulty area
U043383	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit
U043386	(a) VDC_1 message content fault.	• Wire harness and connector • Electric power steering control unit • Intelligent vehicle control platform control unit • Front intelligent area control unit

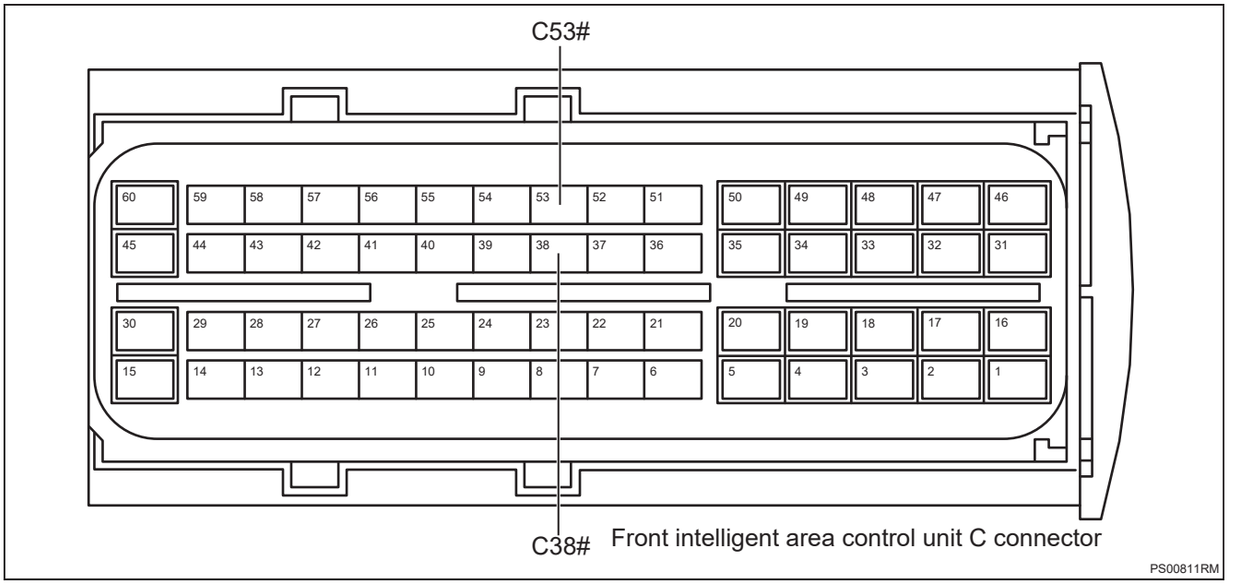
Circuit diagram

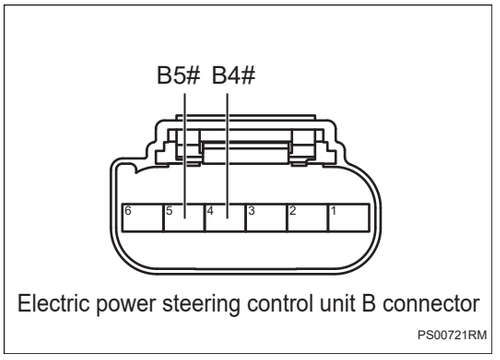


Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in chassis CAN bus (electric power steering control unit - front intelligent area control unit)**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on chassis CAN bus.

(d) According to value in the table, measure resistance.

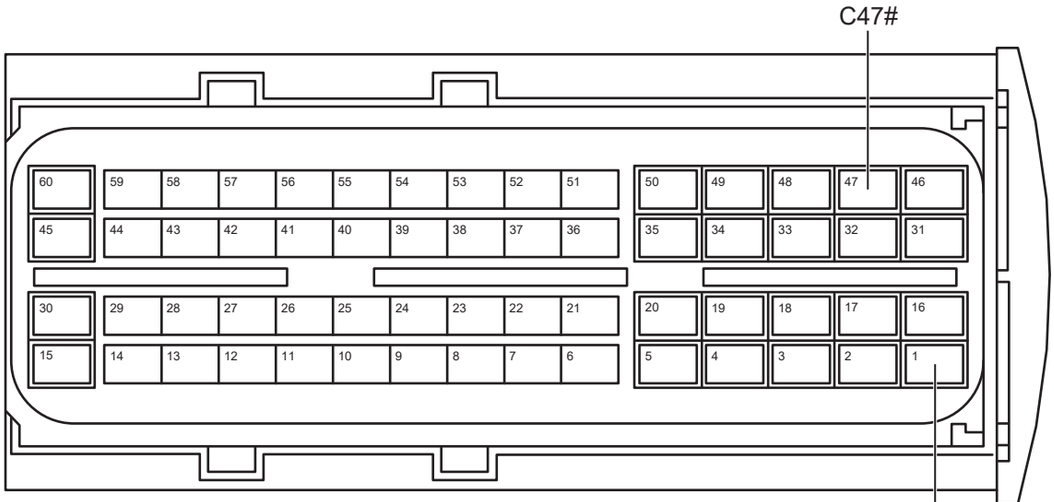
Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit connector B4# - front intelligent area control unit connector C38#	Always connected	Less than 1 Ω
Electric power steering control unit connector B5# - front intelligent area control unit connector C53#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

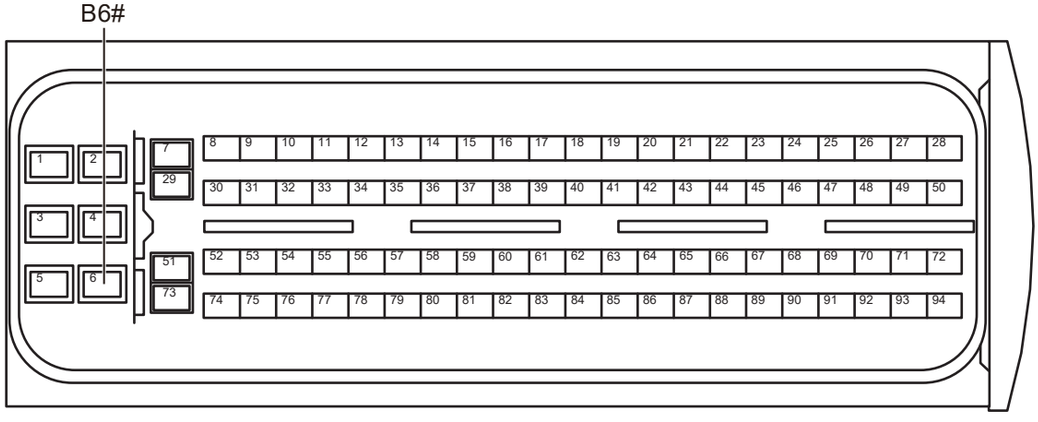
OK

2	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

PC00510RM



Front intelligent area control unit B connector

PC00520RM

(a) According to value in the table, measure resistance.

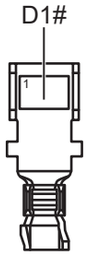
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3 Check front intelligent area control unit power supply



Front intelligent area control unit D connector

PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

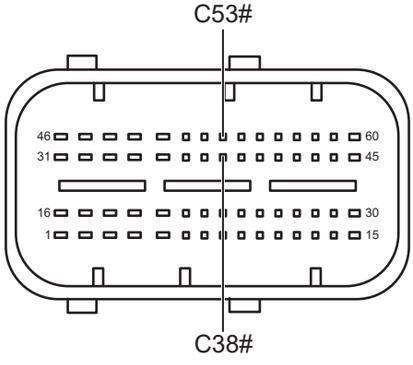
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

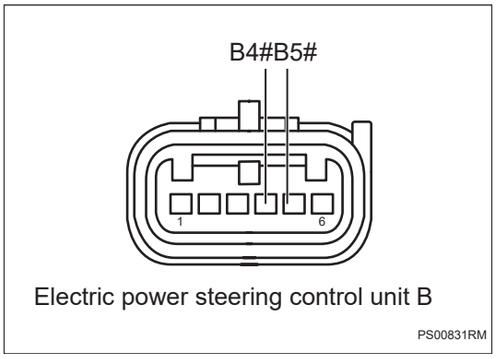
OK

4 Check chassis CAN bus terminal resistance



Front intelligent area control unit C

PS00821RM



Electric power steering control unit B

PS00831RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Electric power steering control unit B5# - electric power steering control unit B4#	Always connected	Approximately 120 Ω
Front intelligent area control unit C38# - front intelligent area control unit C53#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace electric power steering control unit (See page DP-52)**

OK

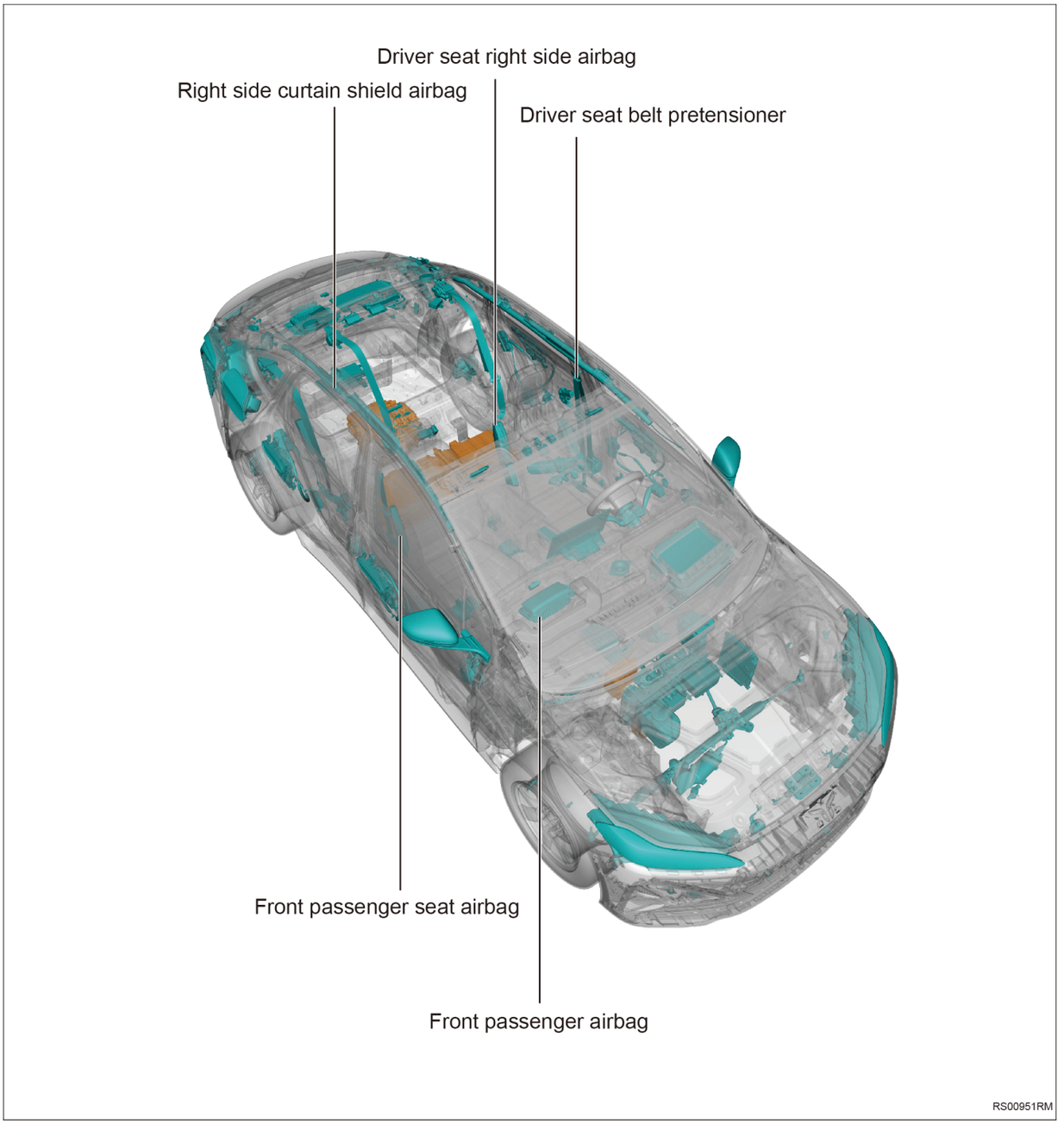
Diagnosis ends

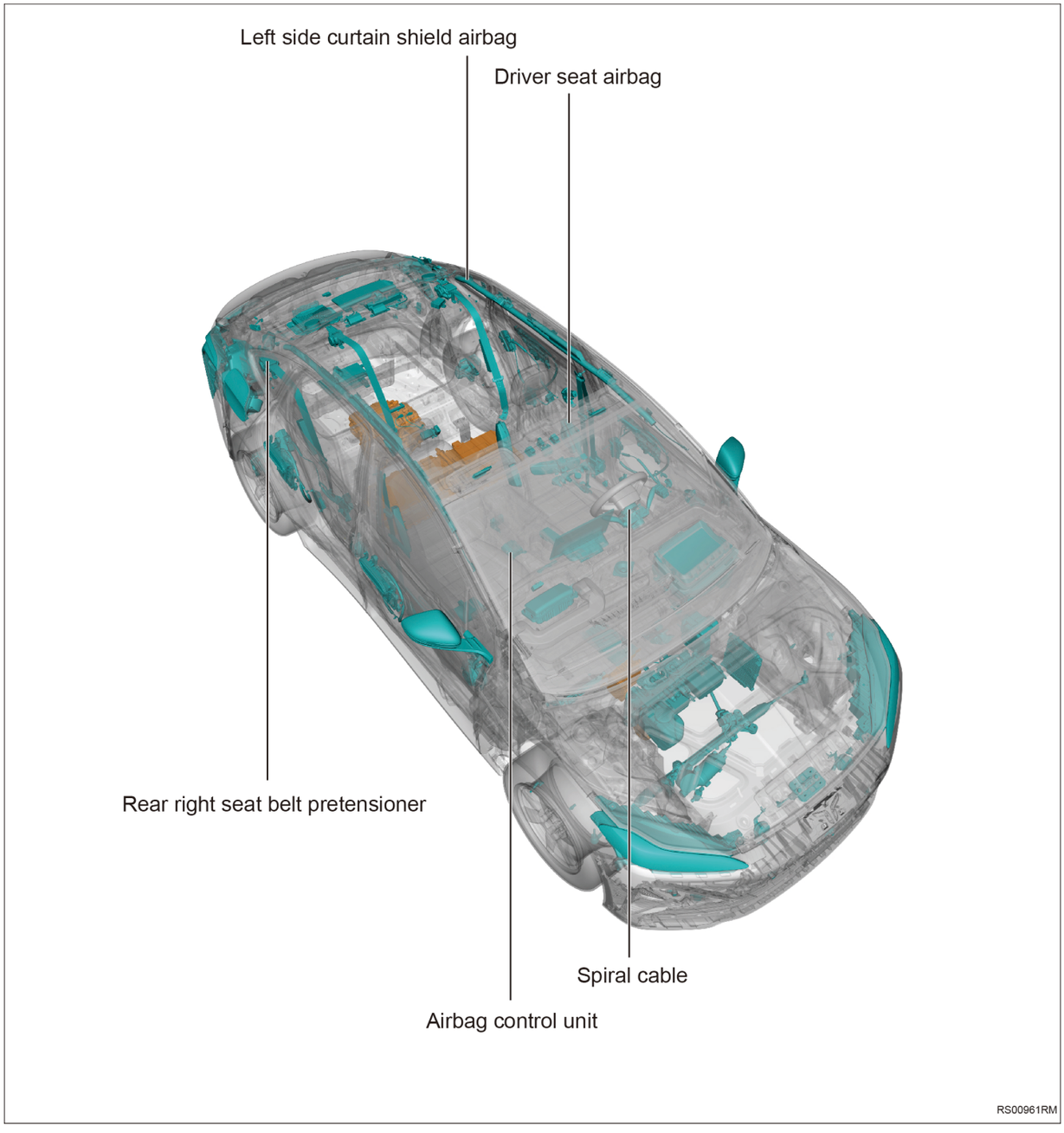
ZD

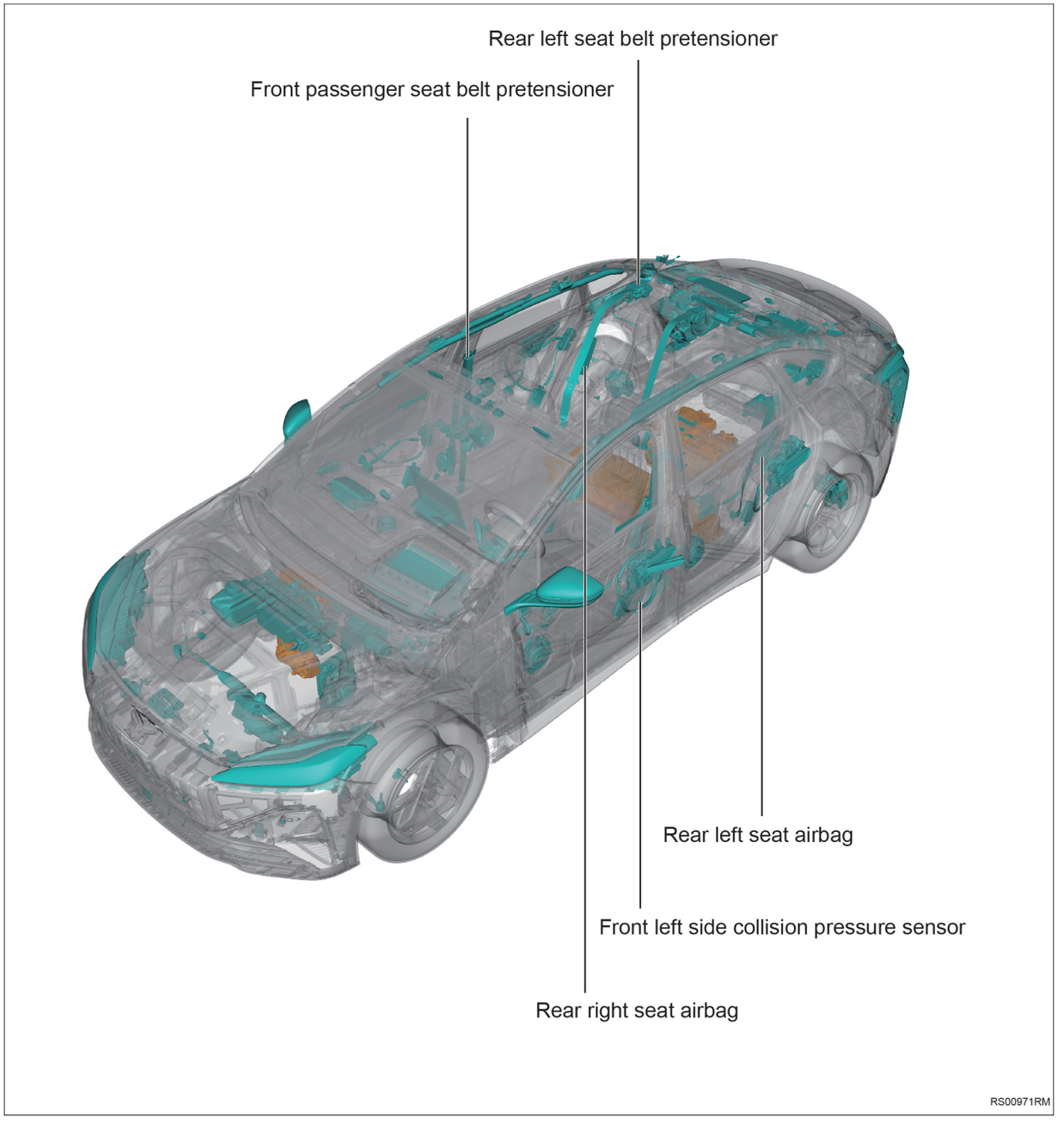
Supplemental restraint system

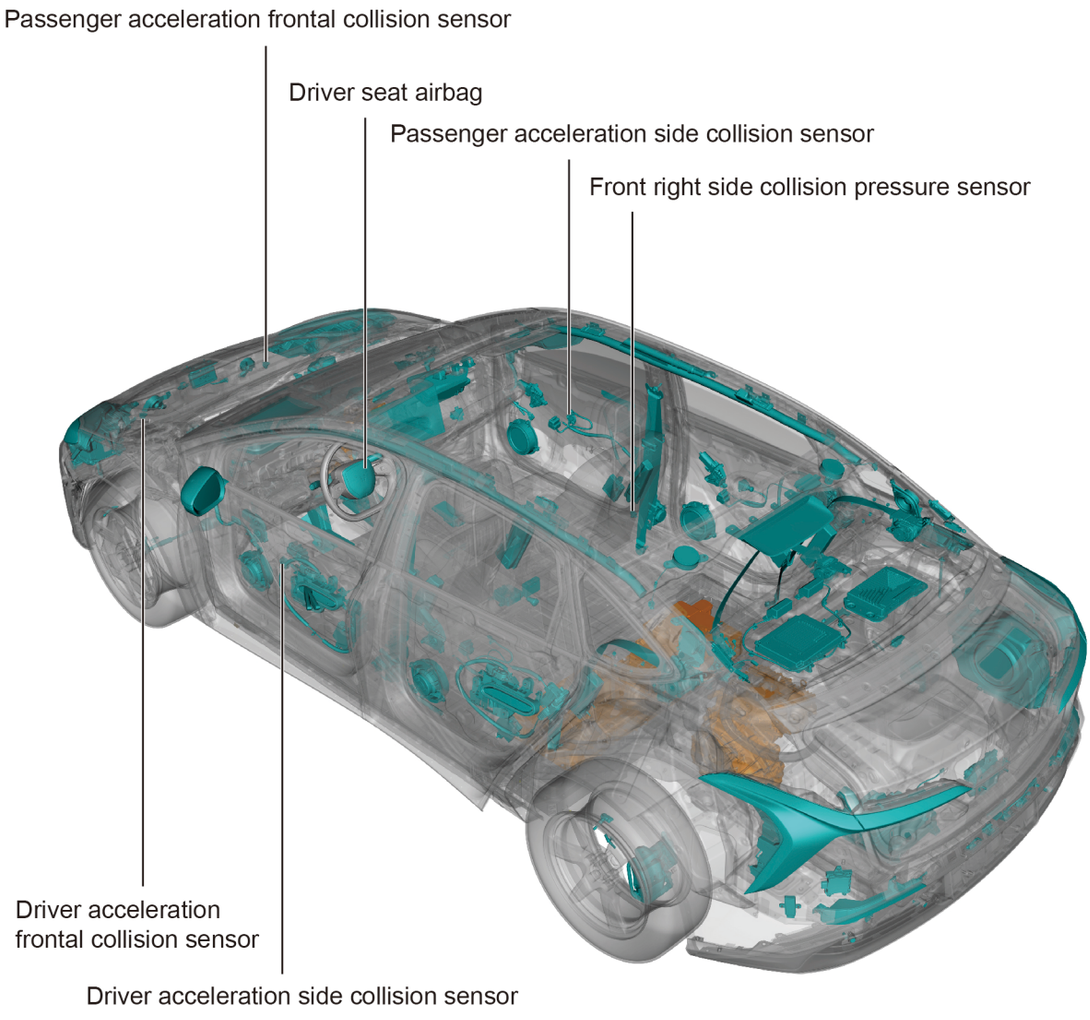
Supplemental restraint

Part position



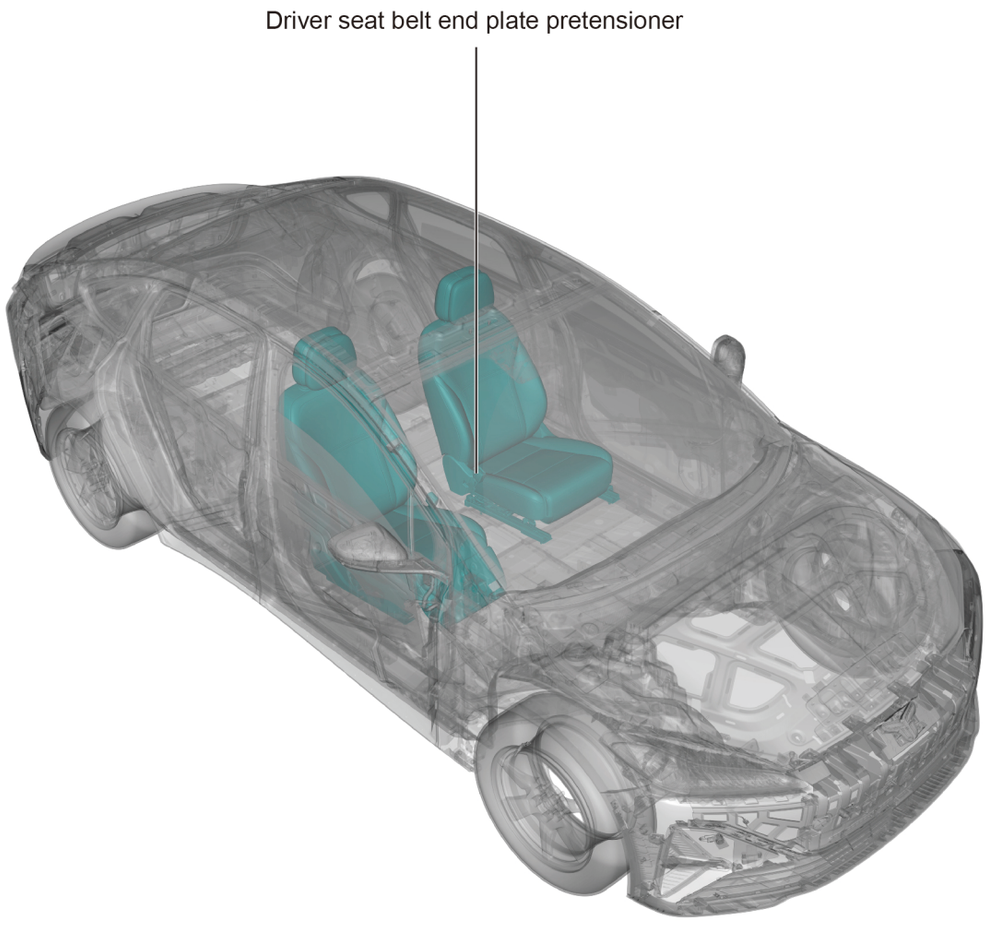

Left side curtain shield airbag
Driver seat airbag
Rear right seat belt pretensioner
Spiral cable
Airbag control unit
RS00961RM


Rear left seat belt pretensioner
Front passenger seat belt pretensioner
Rear left seat airbag
Front left side collision pressure sensor
Rear right seat airbag
RS00971RM



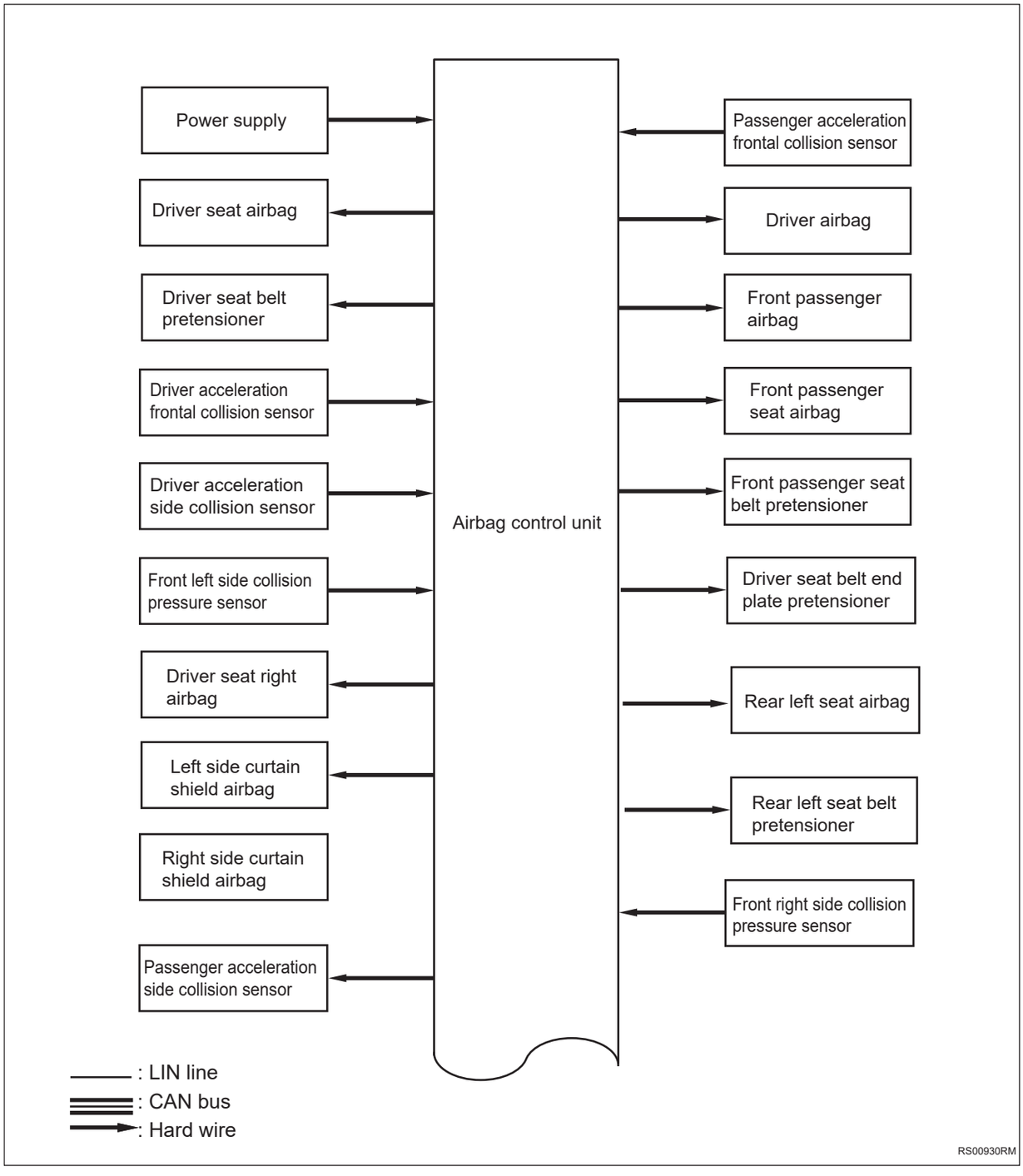
RS00981RM

ZD



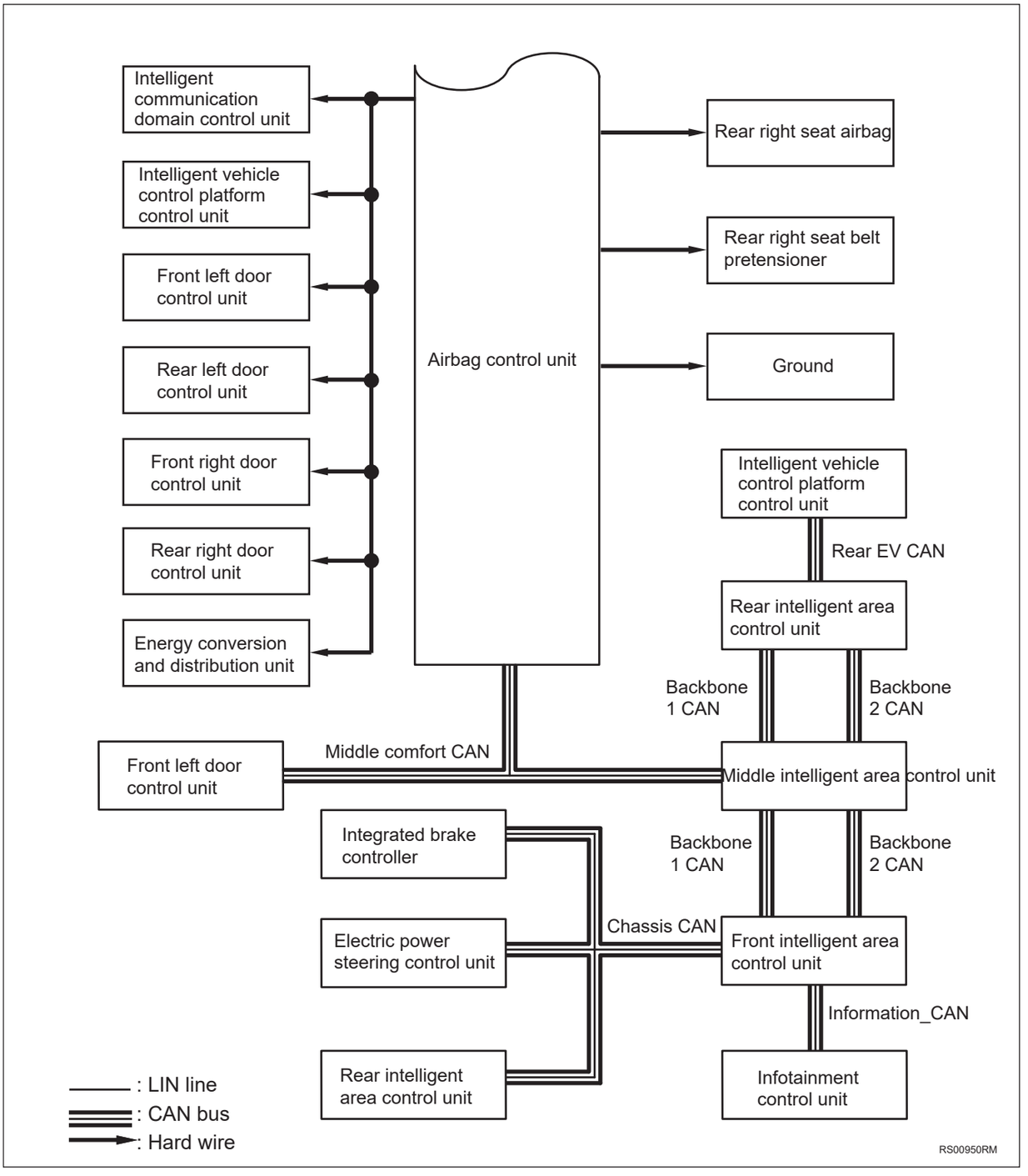
RS00991RM

System diagram



ZD

System diagram



Function description

1. Function overview

(a) Airbag deployment control, pedestrian protection control and seat belt unfastened reminder.

2. Function overview

(a) Airbag deployment: The ignition timing of collision airbag deployment needs to meet the ignition timing requirements specified in RTTF table.

(b) Seat belt unfastened reminder logic: Meets the requirements in the seat belt unfastened reminder function specification.

(c) Pedestrian protection: The ignition timing of the collision active engine hood needs to meet the ignition timing requirements of RTTF table.

3. Function success indicator

(a) Level 2 threshold requirement for seat belt unfastened: When the vehicle speed is higher than 13 kph, unfastened seat belt should trigger level 2 alarm.

(b) Level 3 threshold requirement for seat belt unfastened: When level 2 reminder is greater than 25 seconds, enter level 3 reminder.

(c) Second row seatbelt unfastened reminder off: After setting off in IVI, the second row unfastened reminder function is disabled and remains in no reminder state.

4. Function definition

(a) Airbag function fault prompt: When the airbag function has fault, the vehicle prompts the driver that the airbag function is faulty.

(b) Airbag deployment: In the event of vehicle collision, the airbag is deployed to maximize protect the safety of passengers in vehicle.

(c) Front passenger airbag OFF: The airbag function can be turned off manually according to the needs of front passenger; The customer can turn off the front passenger airbag, front passenger side airbag and front passenger side curtain shield airbag as required.

(d) Front passenger airbag ON: The airbag function can be turned on manually according to the needs of front passenger; The customer can turn on the front passenger airbag, front passenger side airbag and front passenger side curtain shield airbag as required.

(e) Seat belt level 1 reminder: When passengers in vehicle are not fastening seat belts and the vehicle is in IG ON state, and the vehicle speed is lower than 13 kph, a visual reminder signal needs to be issued.

(f) Seat belt unfastened level 2 reminder: When passengers in vehicle are not fastening seat belts and the vehicle speed reaches 13 kph, an sound reminder signal needs to be issued.

(g) Seat belt unfastened level 3 reminder: The seat belt unfastened reminder is in level 2 reminder state, and the duration exceeds 25 seconds. At this point, visual and high-frequency auditory signal need to be issued.

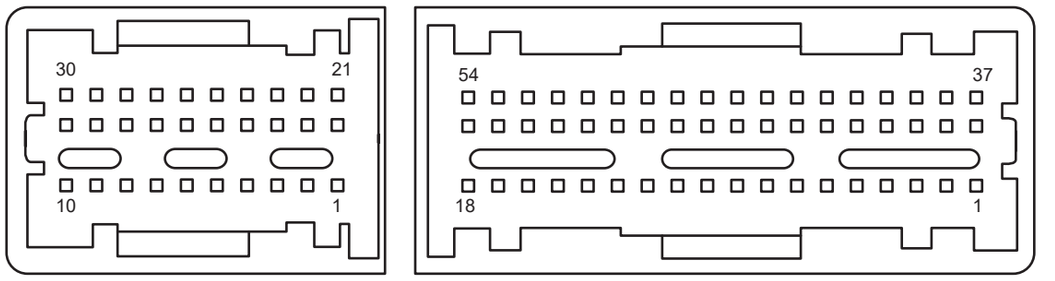
(h) Second row seatbelt unfastened reminder off: According to the driver's intension, the second-row seat belt unfastened reminder function can be disabled when not needed; if the reminder function for the second row is required, it can be enabled again.

Data parameter

Airbag control unit

Item	Max	OK	Minimum
Operating voltage (V)	16.5	13.5	8.5
Operating current (A)	—	< 0.5 A	—

ECU terminal



Airbag control unit connector A

Airbag control unit connector B

RS00920RM

ZD

Airbag control unit - A			
Pin number	**Definition**	**Pin number**	**Definition**
A1	—	A16	—
A2	—	A17	—
A3	—	A18	—
A4	—	A19	Right door pressure sensor +
A5	—	A20	Right door pressure sensor -
A6	—	A21	Rear left seat belt pretensioner +
A7	—	A22	Rear left seat belt pretensioner -
A8	—	A23	—
A9	—	A24	—
A10	—	A25	Driver seat belt secondary pretensioner +
A11	Rear right seat belt pretensioner +	A26	Driver seat belt secondary pretensioner -
A12	Rear right seat belt pretensioner -	A27	Rear right airbag -
A13	—	A28	Rear right airbag +
A14	—	A29	Rear left airbag +
A15	—	A30	Rear left airbag -

Airbag control unit - B			
Pin number	**Definition**	**Pin number**	**Definition**
B1	Front right collision sensor +	B28	Front/rear left curtain shield airbag -
B2	Front right collision sensor -	B29	Driver seat belt primary pretensioner -
B3	Front left collision sensor +	B30	Driver seat belt primary pretensioner +
B4	Front left collision sensor -	B31	—
B5	B-pillar left acceleration sensor +	B32	—
B6	B-pillar left acceleration sensor -	B33	—
B7	—	B34	—
B8	—	B35	—
B9	B-pillar right acceleration sensor +	B36	—
B10	B-pillar right acceleration sensor -	B37	—
B11	Far side airbag -	B38	—
B12	Far side airbag +	B39	—
B13	Left door pressure sensor +	B40	—
B14	Left door pressure sensor -	B41	Front left airbag +
B15	—	B42	Front left airbag -
B16	Collision output	B43	Front passenger seat airbag -
B17	CAN_L	B44	Front passenger seat airbag +
B18	CAN_H	B45	Front right airbag +
B19	—	B46	Front right airbag -
B20	—	B47	Front/rear right curtain shield airbag -
B21	—	B48	Front/rear right curtain shield airbag +
B22	—	B49	—
B23	Driver seat airbag +	B50	—
B24	Driver seat airbag -	B51	Front passenger seat belt primary pretensioner +
B25	—	B52	Front passenger seat belt primary pretensioner -
B26	—	B53	GNDB
B27	Front/rear left curtain shield airbag +	B54	BAT

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B000111	Short to ground in driver frontal airbag circuit	(See page ZD-2042)
B000112	Short to power supply in driver frontal airbag circuit	(See page ZD-2042)
B00011A	Driver frontal airbag circuit resistance below threshold	(See page ZD-2042)

DTC	Detection Items	See page
B00011B	Driver frontal airbag circuit resistance above threshold	(See page ZD-2042)
B00012B	Driver frontal airbag other circuit series fault	(See page ZD-2042)
B000156	Driver frontal airbag invalid configuration	(See page ZD-2054)
B001011	Short to ground in front passenger frontal airbag circuit	(See page ZD-2064)
B001012	Short to power supply in front passenger frontal airbag circuit	(See page ZD-2064)
B00101A	Front passenger frontal airbag circuit resistance below threshold	(See page ZD-2064)
B00101B	Front passenger frontal airbag circuit resistance above threshold	(See page ZD-2064)
B00102B	Front passenger frontal airbag other circuit series fault	(See page ZD-2064)
B001056	Front passenger frontal airbag invalid configuration	(See page ZD-2075)
B002011	Short to ground in driver side airbag circuit	(See page ZD-2085)
B002012	Short to power supply in driver side airbag circuit	(See page ZD-2085)
B00201A	Driver side airbag circuit resistance below threshold	(See page ZD-2085)
B00201B	Driver side airbag circuit resistance above threshold	(See page ZD-2085)
B00202B	Driver side airbag other circuit series fault	(See page ZD-2085)
B002056	Driver side airbag invalid configuration	(See page ZD-2096)
B002811	Short to ground in front passenger side airbag circuit	(See page ZD-2121)
B002812	Short to power supply in front passenger side airbag circuit	(See page ZD-2121)
B00281A	Front passenger side airbag circuit resistance below threshold	(See page ZD-2121)
B00281B	Front passenger side airbag circuit resistance above threshold	(See page ZD-2121)
B00282B	Front passenger side airbag other circuit series fault	(See page ZD-2121)
B002856	Front passenger side airbag invalid configuration	(See page ZD-2132)
B003011	Short to ground in second row left side airbag circuit	(See page ZD-2157)
B003012	Short to power supply in second row left side airbag circuit	(See page ZD-2157)
B00301A	Second row left side airbag circuit resistance below threshold	(See page ZD-2157)
B00301B	Second row left side airbag circuit resistance above threshold	(See page ZD-2157)
B00302B	Second row left side airbag other circuit series fault	(See page ZD-2157)

DTC	Detection Items	See page
B003056	Second row left side airbag invalid configuration	(See page ZD-2168)
B003811	Short to ground in second row right side airbag circuit	(See page ZD-2178)
B003812	Short to power supply in second row right side airbag circuit	(See page ZD-2178)
B00381A	Second row right side airbag circuit resistance below threshold	(See page ZD-2178)
B00381B	Second row right side airbag circuit resistance above threshold	(See page ZD-2178)
B00382B	Second row right side airbag other circuit series fault	(See page ZD-2178)
B003856	Second row right side airbag invalid configuration	(See page ZD-2189)
B002111	Short to ground in left curtain shield airbag circuit	(See page ZD-2107)
B002112	Short to power supply in left curtain shield airbag circuit	(See page ZD-2107)
B00211A	Left curtain shield airbag circuit resistance below threshold	(See page ZD-2107)
B00211B	Left curtain shield airbag circuit resistance above threshold	(See page ZD-2107)
B00212B	Left curtain shield airbag other circuit series fault	(See page ZD-2107)
B002156	Left curtain shield airbag invalid configuration	(See page ZD-2114)
B002911	Short to ground in right curtain shield airbag circuit	(See page ZD-2142)
B002912	Short to power supply in right curtain shield airbag circuit	(See page ZD-2142)
B00291A	Right curtain shield airbag circuit resistance below threshold	(See page ZD-2142)
B00291B	Right curtain shield airbag circuit resistance above threshold	(See page ZD-2142)
B00292B	Right curtain shield airbag other circuit series fault	(See page ZD-2142)
B002956	Right curtain shield airbag invalid configuration	(See page ZD-2150)
B007011	Short to ground in driver seat belt retractor pretensioner circuit	(See page ZD-2199)
B007012	Short to power supply in driver seat belt retractor pretensioner circuit	(See page ZD-2199)
B00701A	Driver seat belt retractor pretensioner circuit resistance below threshold	(See page ZD-2199)
B00701B	Driver seat belt retractor pretensioner circuit resistance above threshold	(See page ZD-2199)
B00702B	Driver seat belt retractor pretensioner other circuit series fault	(See page ZD-2199)
B007056	Driver seat belt retractor pretensioner invalid configuration	(See page ZD-2206)

DTC	Detection Items	See page
B007211	Short to ground in front passenger seat belt retractor pretensioner circuit	(See page ZD-2213)
B007212	Short to power supply in front passenger seat belt retractor pretensioner circuit	(See page ZD-2213)
B00721A	Front passenger seat belt retractor pretensioner circuit resistance below threshold	(See page ZD-2213)
B00721B	Front passenger seat belt retractor pretensioner circuit resistance above threshold	(See page ZD-2213)
B00722B	Front passenger seat belt retractor pretensioner other circuit series fault	(See page ZD-2213)
B007256	Front passenger seat belt retractor pretensioner invalid configuration	(See page ZD-2220)
B007911	Short to ground in driver seat belt leg pretensioner circuit	(See page ZD-2255)
B007912	Short to power supply in driver seat belt leg pretensioner circuit	(See page ZD-2255)
B00791A	Driver seat belt leg pretensioner circuit resistance below threshold	(See page ZD-2255)
B00791B	Driver seat belt leg pretensioner circuit resistance above threshold	(See page ZD-2255)
B00792B	Driver seat belt leg pretensioner other circuit series fault	(See page ZD-2255)
B007956	Driver seat belt leg pretensioner invalid configuration	(See page ZD-2262)
B007311	Short to ground in second row left seat belt pretensioner	(See page ZD-2227)
B007312	Short to power supply in second row left seat belt pretensioner circuit	(See page ZD-2227)
B00731A	Second row left seat belt pretensioner circuit resistance below threshold	(See page ZD-2227)
B00731B	Second row left seat belt pretensioner circuit resistance above threshold	(See page ZD-2227)
B00732B	Second row left seat belt pretensioner other circuit series fault	(See page ZD-2227)
B007356	Second row left seat belt pretensioner invalid configuration	(See page ZD-2234)
B007511	Short to ground in second row right seat belt pretensioner	(See page ZD-2241)
B007512	Short to power supply in second row right seat belt pretensioner circuit	(See page ZD-2241)
B00751A	Second row right seat belt pretensioner circuit resistance below threshold	(See page ZD-2241)
B00751B	Second row right seat belt pretensioner circuit resistance above threshold	(See page ZD-2241)
B00752B	Second row right seat belt pretensioner other circuit series fault	(See page ZD-2241)
B007556	Second row right seat belt pretensioner invalid configuration	(See page ZD-2248)

DTC	Detection Items	See page
B1A0411	Short to ground in front seat inner side airbag (driver)	(See page ZD-1995)
B1A0412	Short to power supply in front seat inner side airbag (driver)	(See page ZD-1995)
B1A041A	Front seat inner side airbag (driver) circuit resistance below threshold	(See page ZD-1995)
B1A041B	Front seat inner side airbag (driver) circuit resistance above threshold	(See page ZD-1995)
B1A042B	Front seat inner side airbag (driver) other circuit series fault	(See page ZD-1995)
B1A0456	Front seat inner side airbag (driver) invalid configuration	(See page ZD-2007)
B009013	Open in left earlier collision sensor	(See page ZD-2269)
B009086	Left earlier collision sensor communication error	(See page ZD-2281)
B009091	Left earlier collision sensor parameter error	(See page ZD-2281)
B009096	Left earlier collision sensor self-check failure	(See page ZD-2281)
B009011	Short to ground in left earlier collision sensor	(See page ZD-2269)
B009012	Short to power supply in left earlier collision sensor	(See page ZD-2269)
B00902B	Left earlier collision sensor series fault	(See page ZD-2269)
B009056	Left earlier collision sensor configuration error	(See page ZD-2276)
B009513	Open in right earlier collision sensor	(See page ZD-2325)
B009586	Right earlier collision sensor communication error	(See page ZD-2338)
B009591	Right earlier collision sensor parameter error	(See page ZD-2338)
B009596	Right earlier collision sensor self-check failure	(See page ZD-2338)
B009511	Short to ground in right earlier collision sensor	(See page ZD-2325)
B009512	Short to power supply in right earlier collision sensor	(See page ZD-2325)
B00952B	Right earlier collision sensor series fault	(See page ZD-2325)
B009556	Right earlier collision sensor configuration error	(See page ZD-2332)
B009613	Open in B-pillar right acceleration sensor	(See page ZD-2344)
B009686	B-pillar right acceleration sensor communication error	(See page ZD-2357)
B009691	B-pillar right acceleration sensor parameter error	(See page ZD-2357)
B009696	B-pillar right acceleration sensor self-check failure	(See page ZD-2357)
B009611	Short to ground in B-pillar right acceleration sensor	(See page ZD-2344)
B009612	Short to power supply in B-pillar right acceleration sensor	(See page ZD-2344)
B00962B	B-pillar right acceleration sensor series fault	(See page ZD-2344)

DTC	Detection Items	See page
B009656	B-pillar right acceleration sensor configuration error	(See page ZD-2351)
B009113	Open in B-pillar left acceleration sensor	(See page ZD-2287)
B009186	B-pillar left acceleration sensor communication error	(See page ZD-2300)
B009191	B-pillar left acceleration sensor parameter error	(See page ZD-2300)
B009196	B-pillar left acceleration sensor self-check failure	(See page ZD-2300)
B009111	Short to ground in B-pillar left acceleration sensor	(See page ZD-2287)
B009112	Short to power supply in B-pillar left acceleration sensor	(See page ZD-2287)
B00912B	B-pillar left acceleration sensor series fault	(See page ZD-2287)
B009156	B-pillar left acceleration sensor configuration error	(See page ZD-2294)
B009213	Open in left door pressure sensor	(See page ZD-2306)
B009286	Left door pressure sensor communication error	(See page ZD-2319)
B009291	Left door pressure sensor parameter error	(See page ZD-2319)
B009296	Left door pressure sensor self-check failure	(See page ZD-2319)
B009211	Short to ground in left door pressure sensor	(See page ZD-2306)
B009212	Short to power supply in left door pressure sensor	(See page ZD-2306)
B00922B	Left door pressure sensor series fault	(See page ZD-2306)
B009256	Left door pressure sensor configuration error	(See page ZD-2313)
B009713	Open in right door pressure sensor	(See page ZD-2363)
B009786	Right door pressure sensor communication error	(See page ZD-2376)
B009791	Right door pressure sensor parameter error	(See page ZD-2376)
B009796	Right door pressure sensor self-check failure	(See page ZD-2376)
B009711	Short to ground in right door pressure sensor	(See page ZD-2363)
B009712	Short to power supply in right door pressure sensor	(See page ZD-2363)
B00972B	Right door pressure sensor series fault	(See page ZD-2363)
B009756	Right door pressure sensor configuration error	(See page ZD-2370)
B1A1216	Power supply voltage below threshold	(See page ZD-2036)
B1A1217	Power supply voltage above threshold	(See page ZD-2036)
B1A1011	Short to ground in collision output circuit	(See page ZD-2017)
B1A1012	Short to power supply in collision output circuit	(See page ZD-2017)
B1A1056	Collision output invalid configuration	(See page ZD-2029)
B1A2900	No functions configured	(See page ZD-2041)

DTC	Detection Items	See page
B1A1F00	Offline configuration error	(See page ZD-2041)
B1A2800	CAN transceiver error	(See page ZD-2041)
B1A1600	Internal error	(See page ZD-2040)
U002888	Comfort CAN bus off	(See page ZD-2382)
U014687	Transmission control unit node lost	(See page ZD-2387)
U020887	Front Left seat controller node lost	(See page ZD-2387)
U112987	IBC message missing	(See page ZD-2387)
U113187	Electric power steering control unit message missing	(See page ZD-2387)
U114F87	CSC message missing	(See page ZD-2387)
U114A87	VDC821 message missing	(See page ZD-2387)
U114B87	VDC397 message missing	(See page ZD-2387)
U114887	Rear PDC message missing	(See page ZD-2387)
U114787	Central PDC message missing	(See page ZD-2387)
U114687	Front PDC message missing	(See page ZD-2387)
U041782	Front PDC message content fault	(See page ZD-2387)
U041783	Front PDC message content fault	(See page ZD-2387)

DTC	**B1A0411**	**Short to ground in front seat inner side airbag (driver)**
DTC	**B1A0412**	**Short to power supply in front seat inner side airbag (driver)**
DTC	**B1A041A**	**Front seat inner side airbag (driver) circuit resistance below threshold**
DTC	**B1A041B**	**Front seat inner side airbag (driver) circuit resistance above threshold**

DTC	B1A042B	Front seat inner side airbag (driver) other circuit series fault

Description

When there is short to ground, short to power supply, high or low resistance, series fault in driver seat right airbag ignition circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A0411	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Driver seat right airbag • Airbag control unit • Wire harness and connector
B1A0412	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Driver seat right airbag • Airbag control unit • Wire harness and connector
B1A041A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat right airbag • Airbag control unit • Wire harness and connector

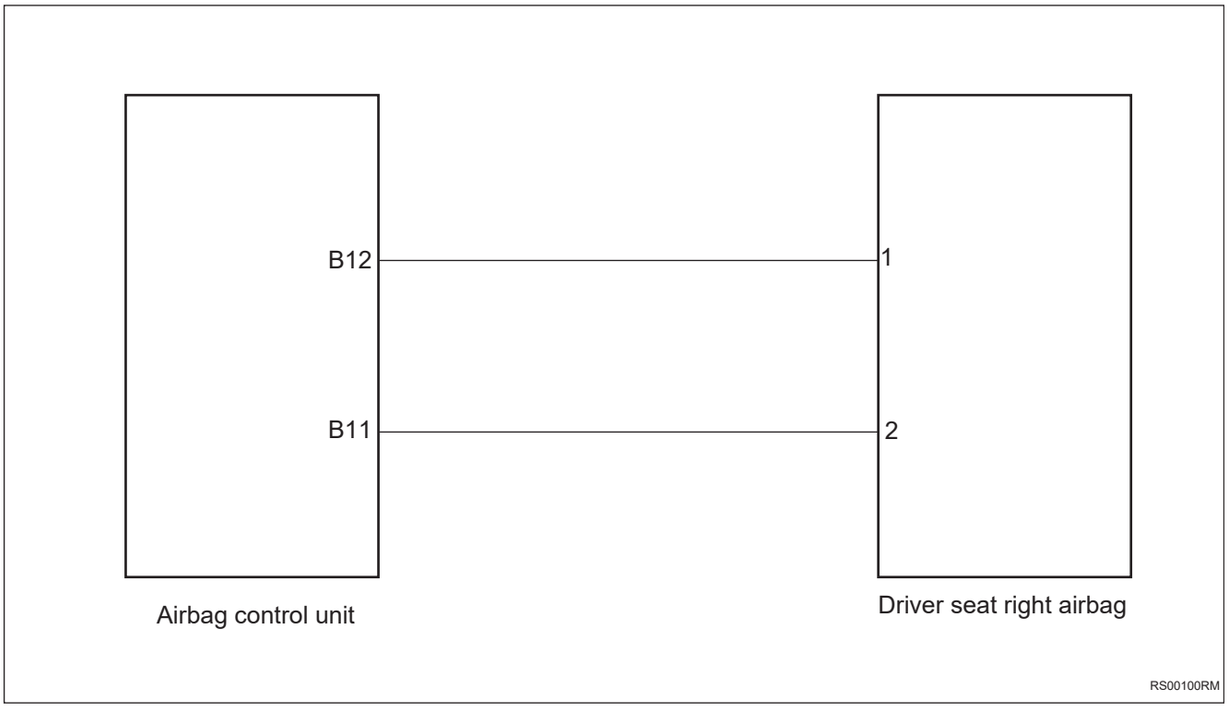
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A041B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat right airbag • Airbag control unit • Wire harness and connector
B1A042B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Driver seat right airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A0411	• Warning light comes on • Set DTC	Comes on
B1A0412	• Warning light comes on • Set DTC	Comes on
B1A041A	• Warning light comes on • Set DTC	Comes on
B1A041B	• Warning light comes on • Set DTC	Comes on
B1A042B	• Warning light comes on • Set DTC	Comes on

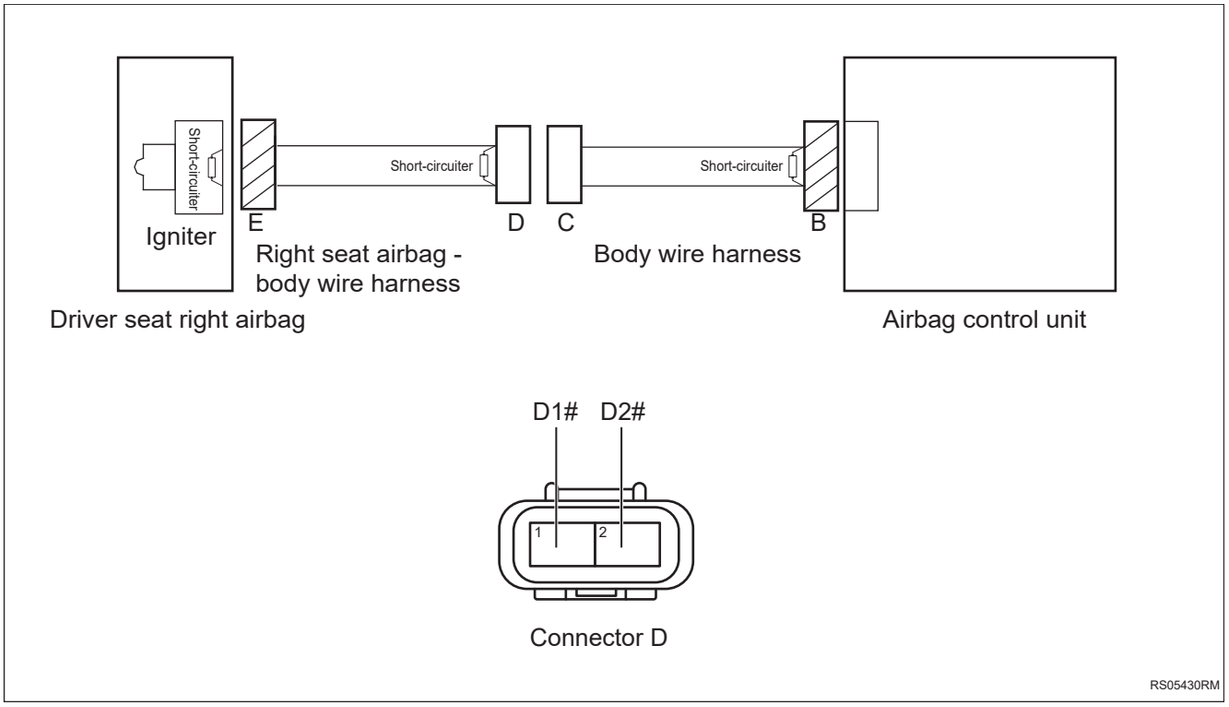
Circuit diagram



ZD

Inspection procedure

1	**Check for short to each other in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

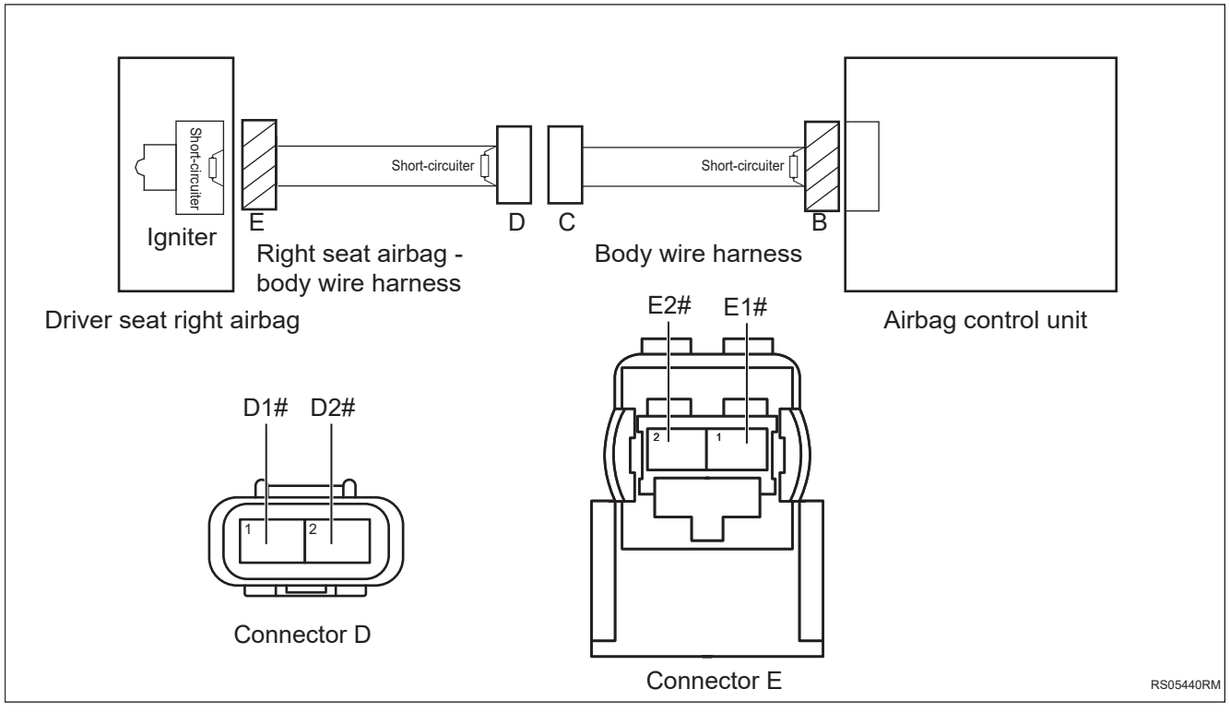
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

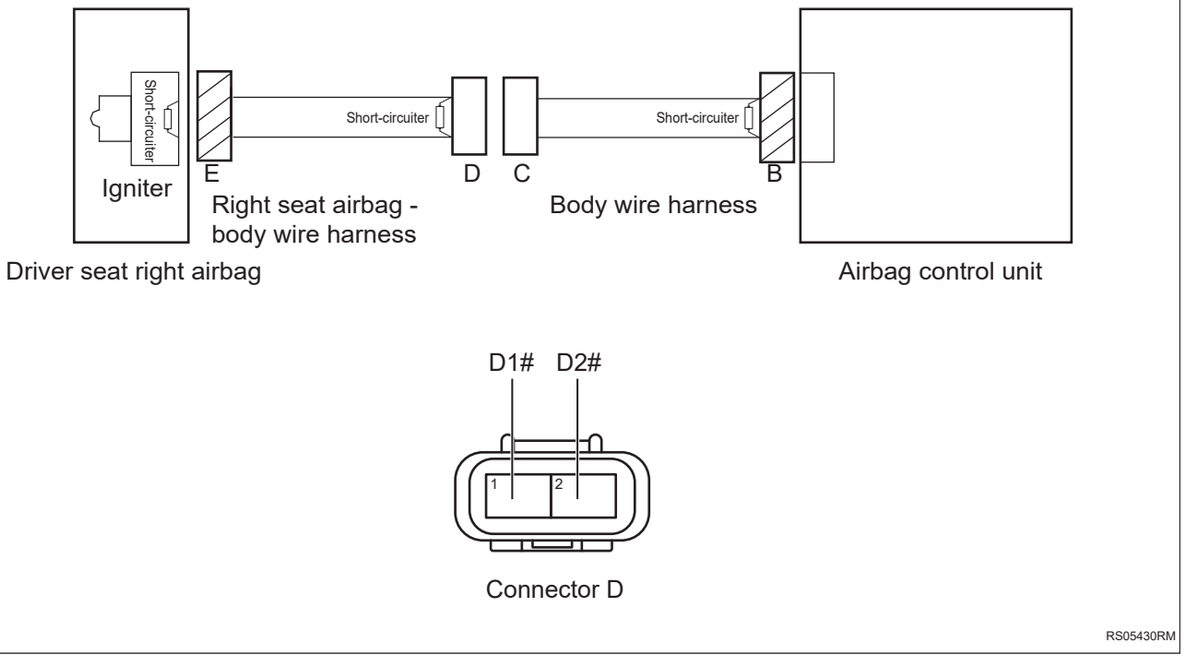
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector E1# - connector D2#	Always connect-ed	Less than 1 Ω
Connector E2# - connector D1#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

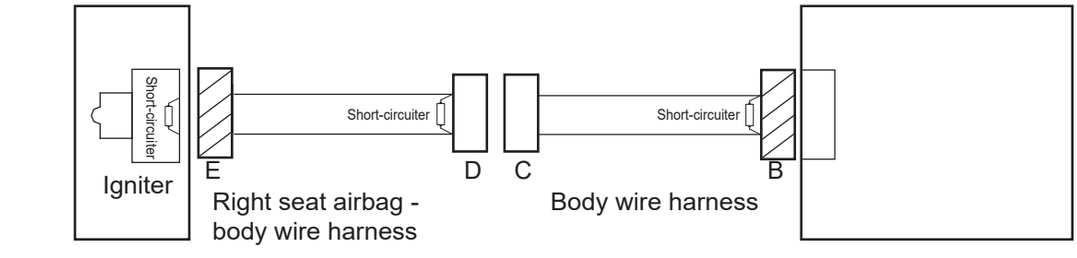
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

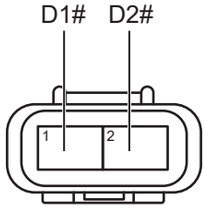
NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**





Connector D

RS05430RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

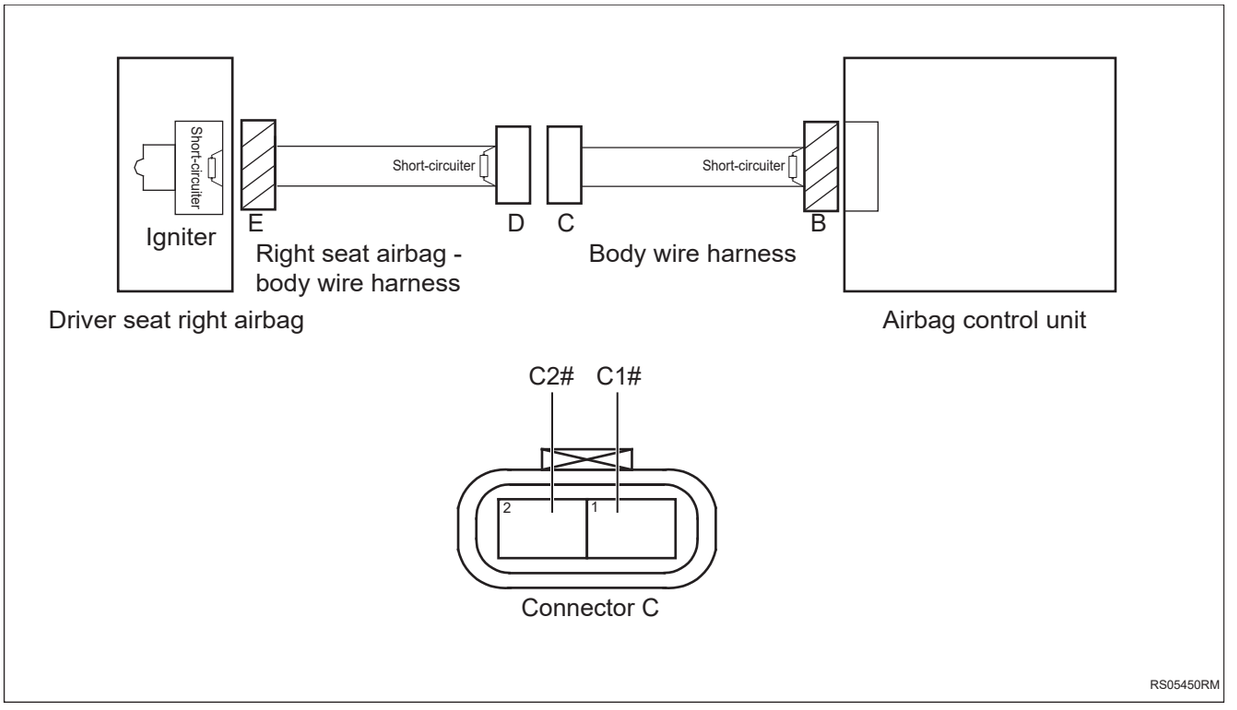
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to each other in driver seat right airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

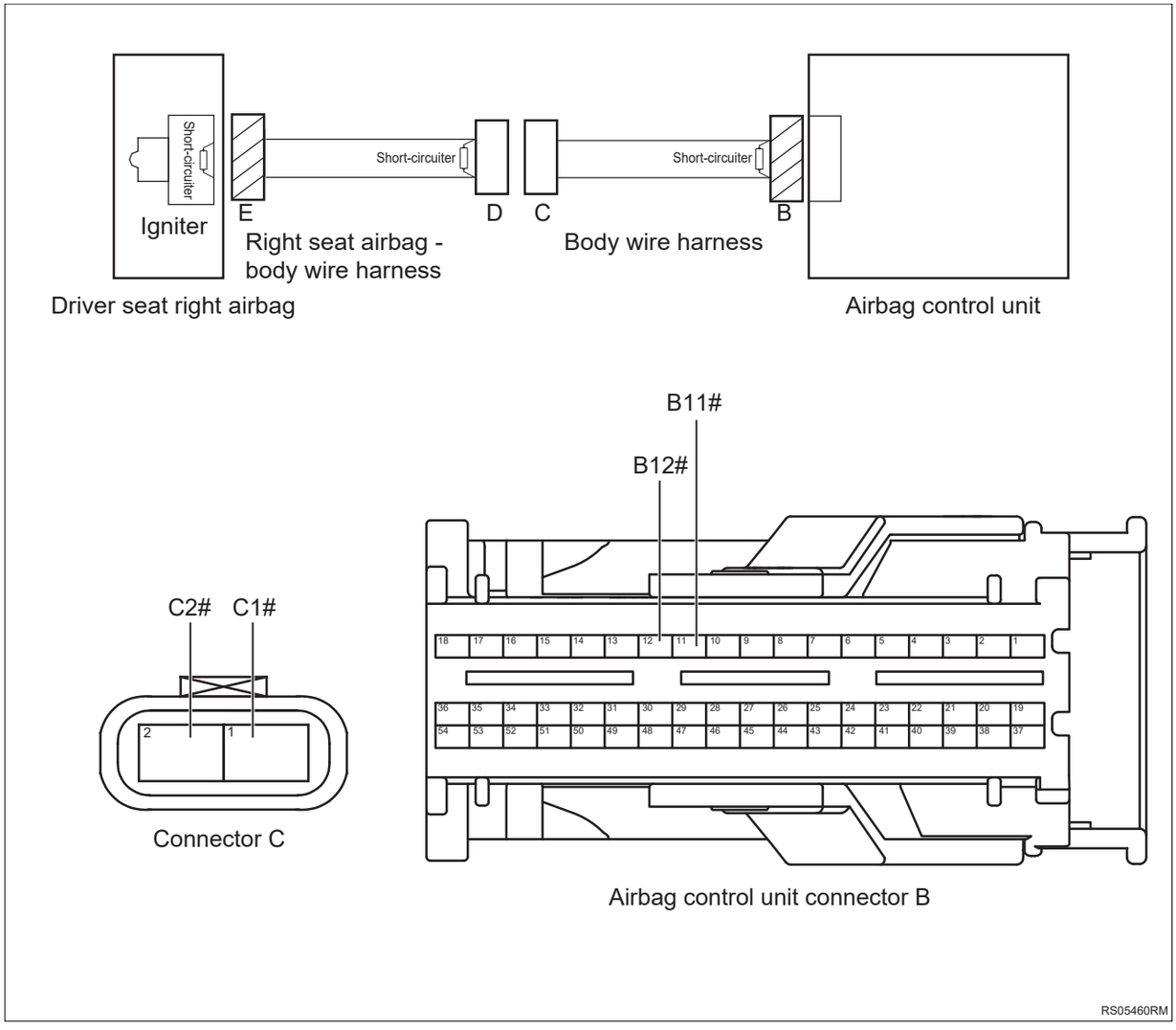
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in driver seat right airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

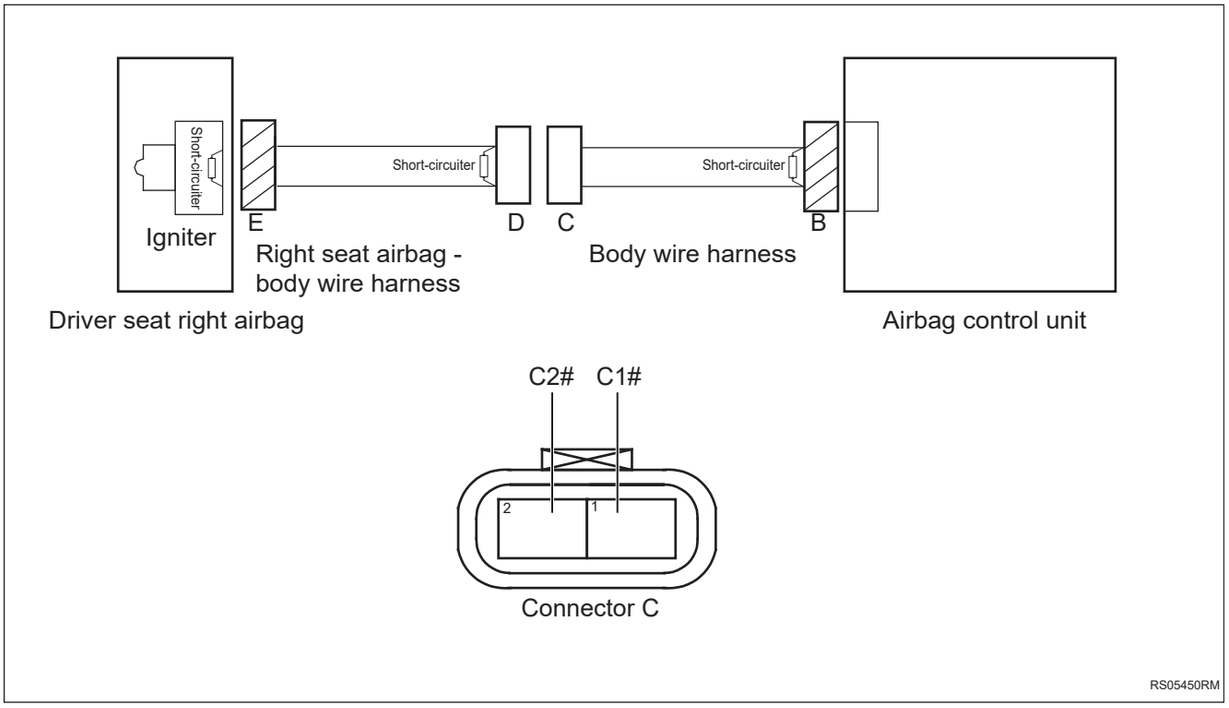
Multimeter connection	Detection condition	Specified condition
Connector C2# - airbag control unit connector B12#	Always connected	Less than 1 Ω
Connector C1# - airbag control unit connector B11#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

7	**Check for short to ground in driver seat right airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

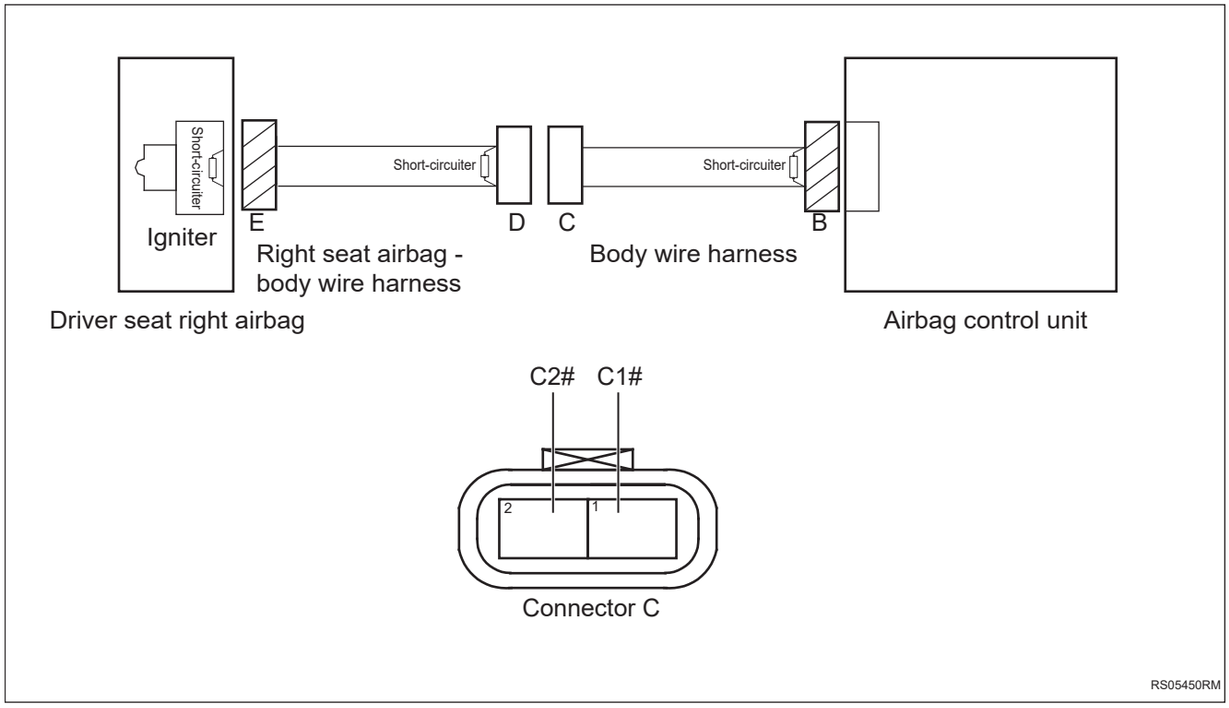
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	**Check for short to power supply in driver seat right airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

9	**Replace driver seat right airbag (See page ZC-63)**

(a) Replace the driver seat right airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B1A0456	Front seat inner side airbag (driver) invalid configuration

Description

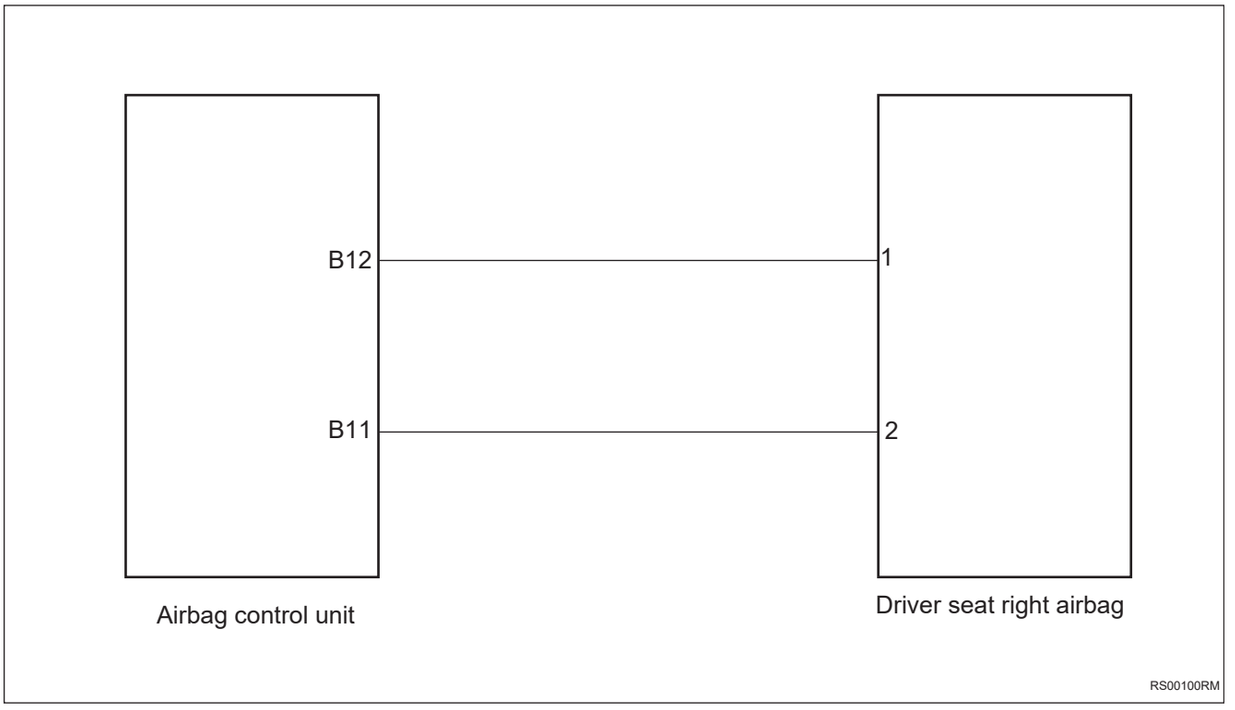
When driver seat right airbag ignition circuit has an invalid configuration, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A0456	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Driver seat right airbag • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A0456	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

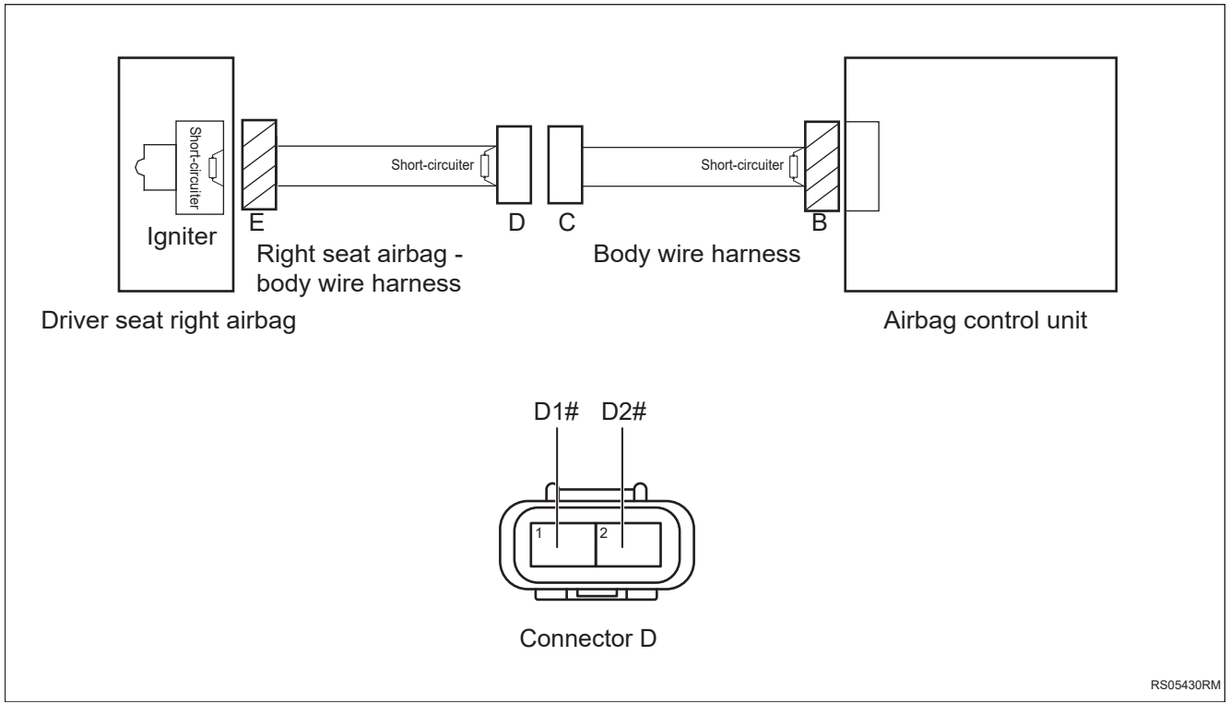
1	**Check and read configuration file of driver seat right airbag**

(a) Check and read if configuration file of driver seat right airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

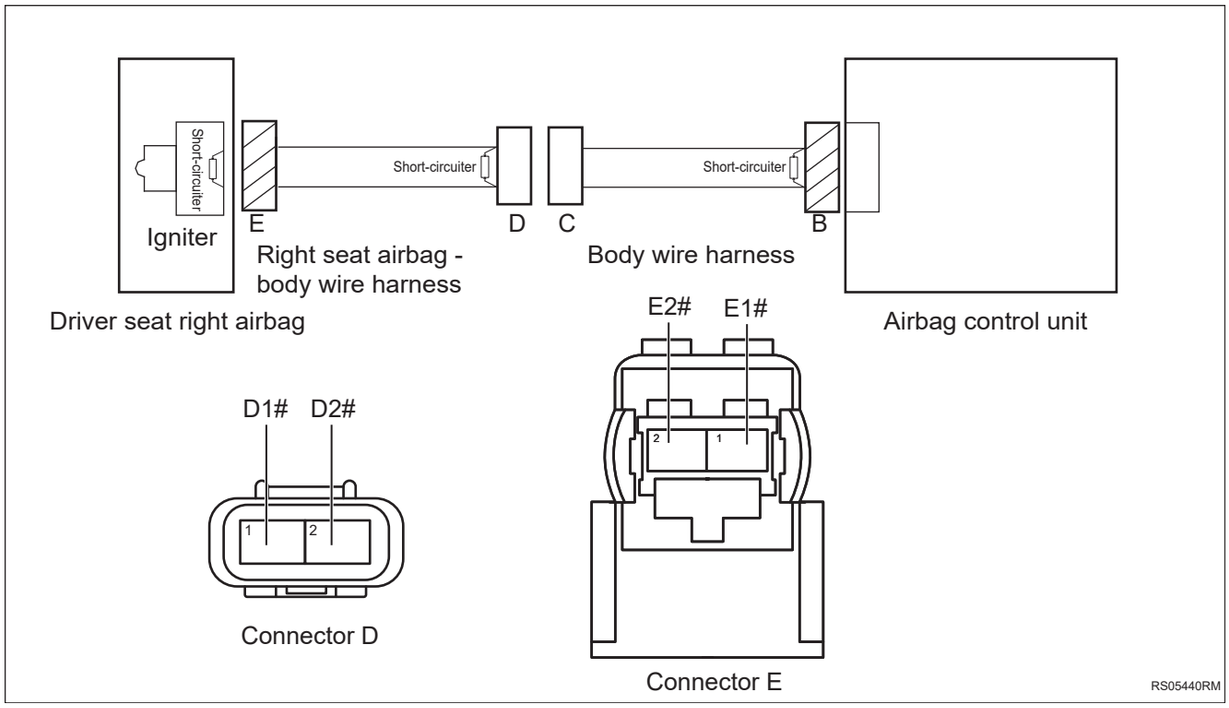
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

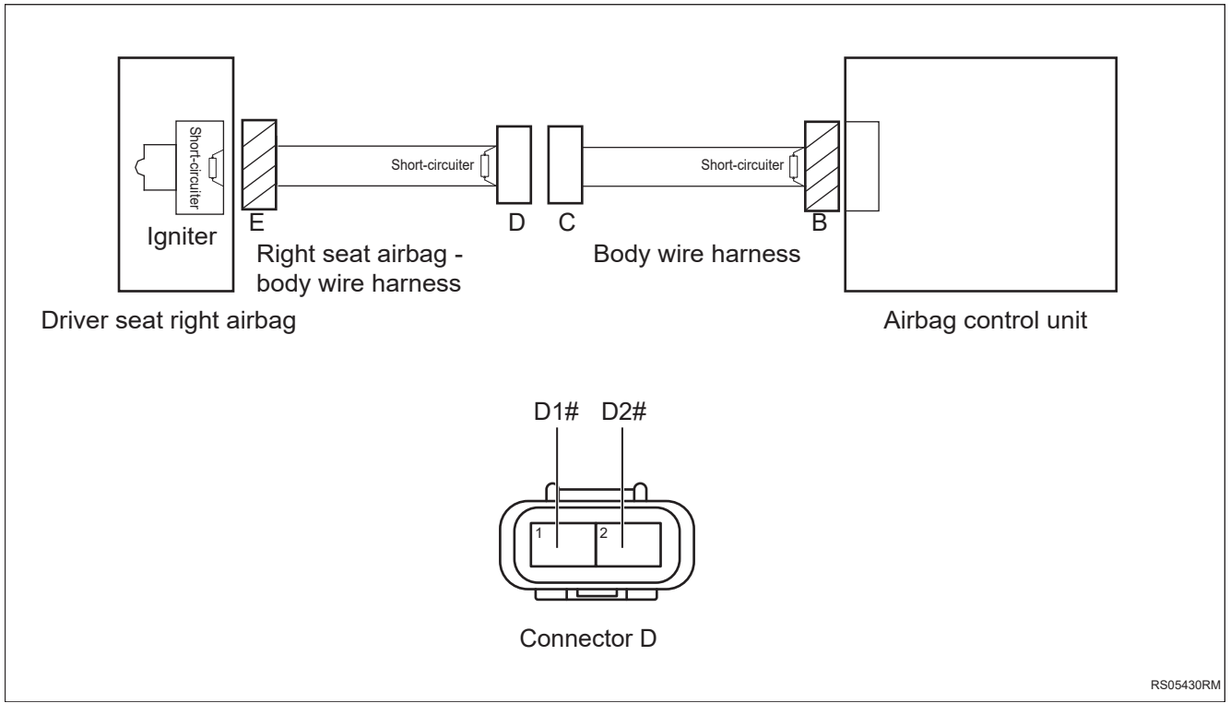
Standard value

Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D2#	Always connected	Less than 1 Ω
Connector E2# - connector D1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

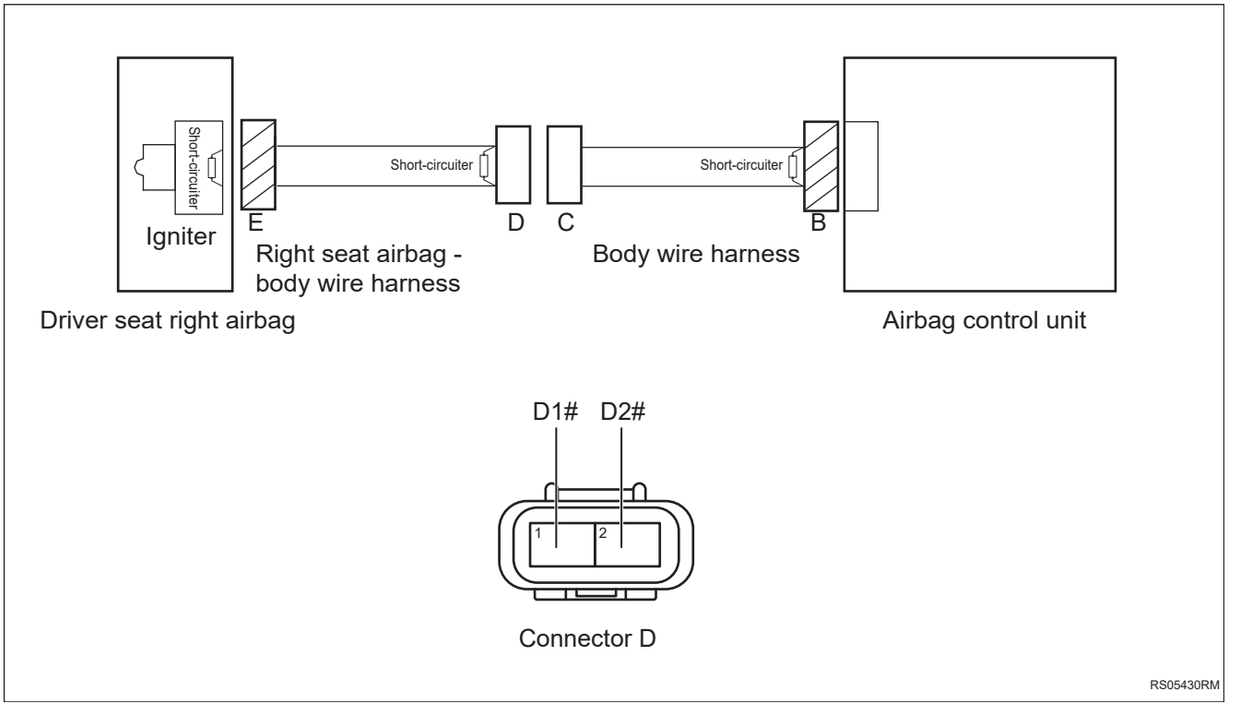
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in driver seat right airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

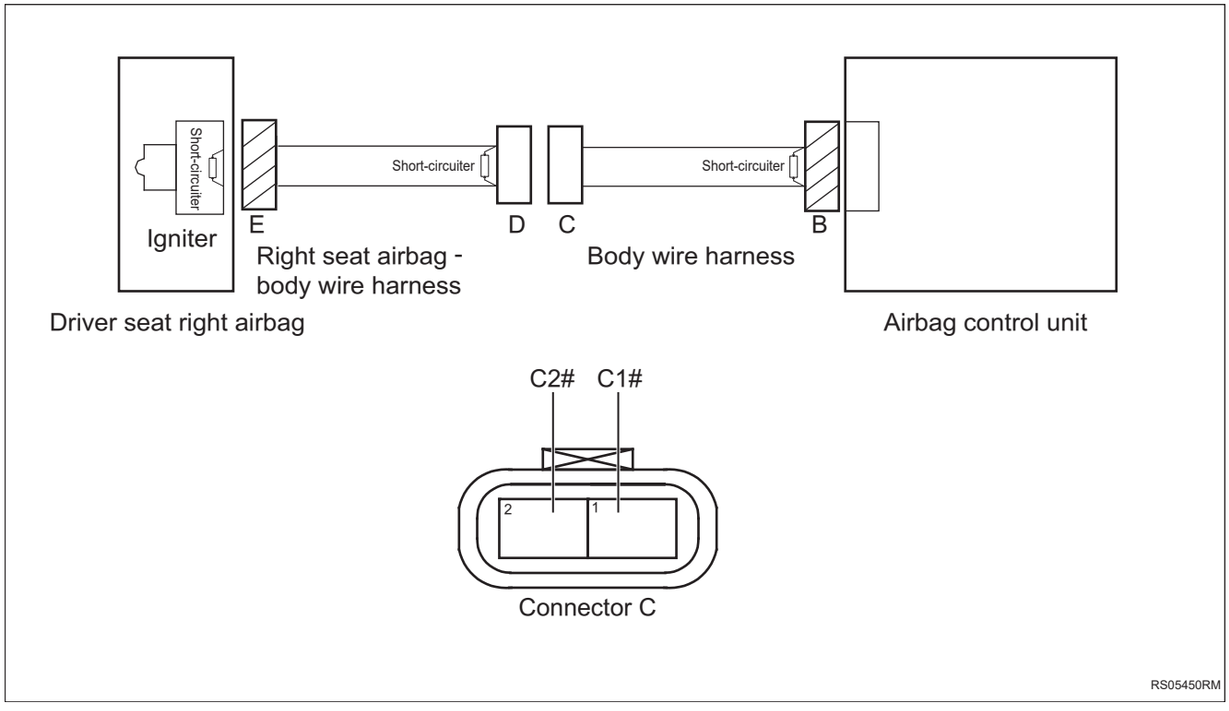
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in driver seat right airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

Standard value

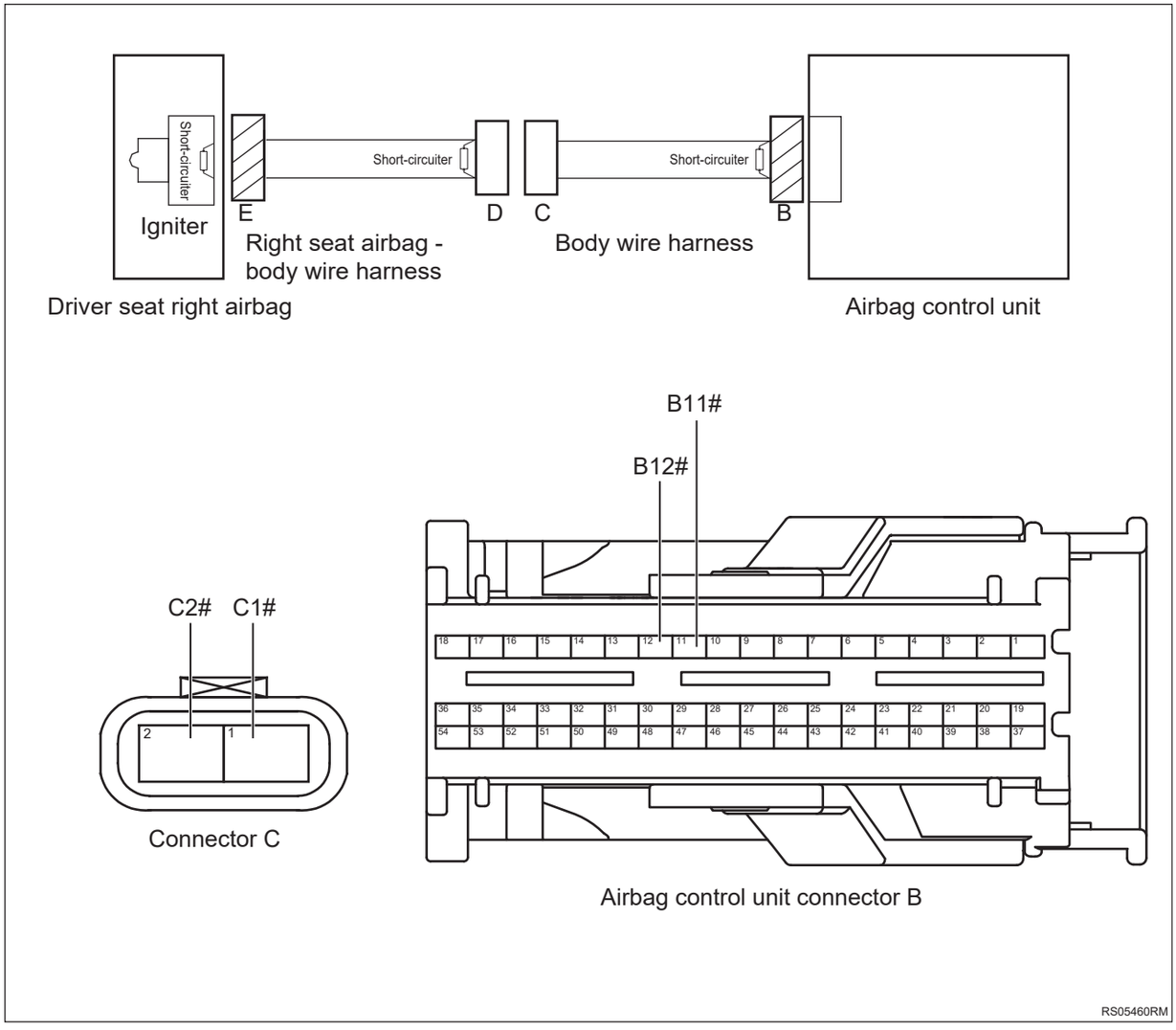
Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

7	**Check for open in driver seat right airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

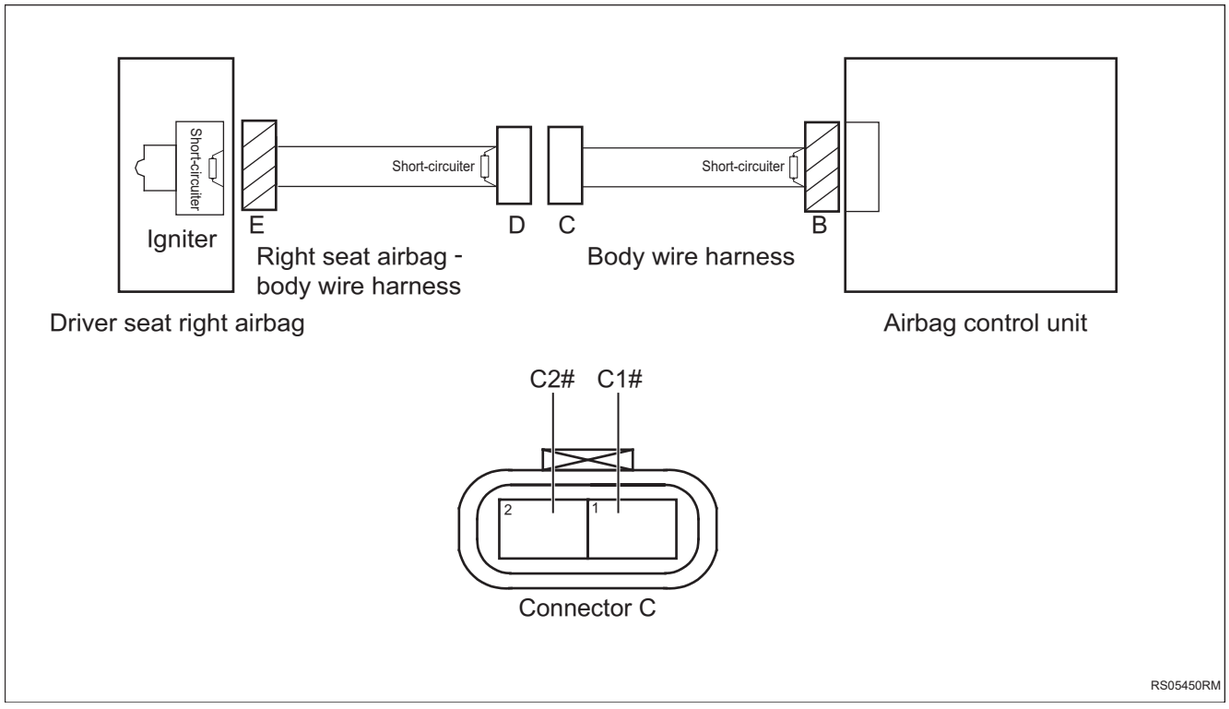
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C2# - airbag control unit connector B12#	Always connected	Less than 1 Ω
Connector C1# - airbag control unit connector B11#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in driver seat right airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

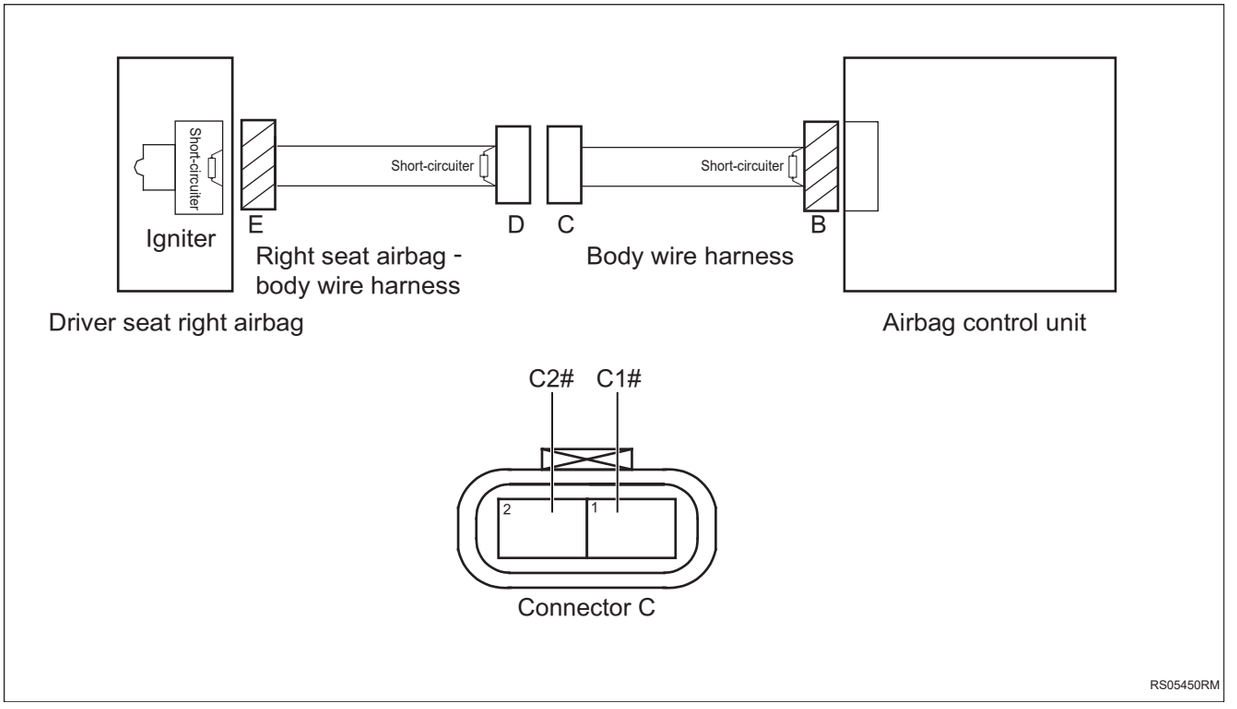
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

9	**Check for short to power supply in driver seat right airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace driver seat right airbag (See page ZC-63)**

(a) Replace the driver seat right airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B1A1011**	**Short to ground in collision output circuit**
DTC	**B1A1012**	**Short to power supply in collision output circuit**

Description

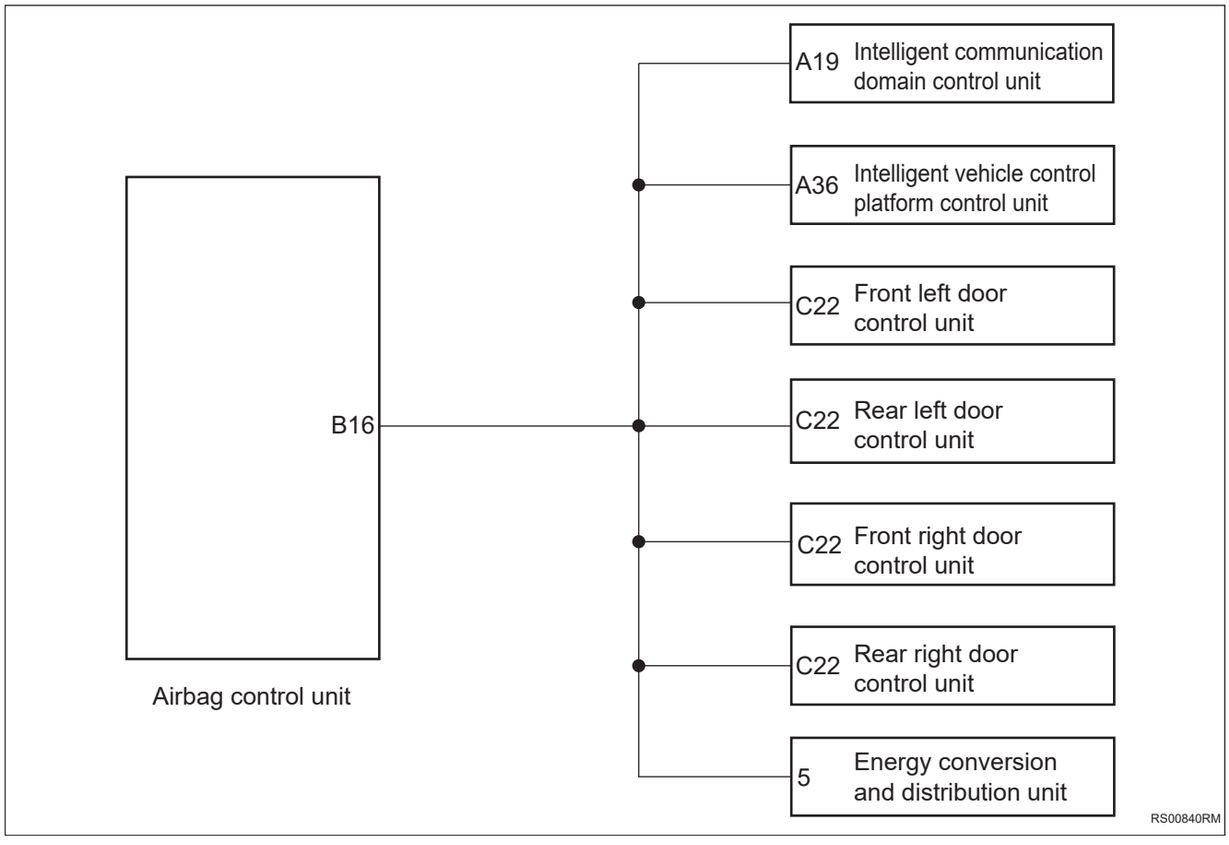
When collision output signal is abnormal, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A1011	• Power supply status is normal • IGN is ON	—	5 times	Continuous type	400 ms	• Airbag control unit • Wire harness and connector • Intelligent vehicle control platform control unit • Front left door controller • Front right door controller • Rear left door controller • Rear right door controller • Intelligent communication domain control unit • Energy conversion and distribution unit
B1A1012	• Power supply status is normal • IGN is ON	—	5 times	Continuous type	400 ms	• Airbag control unit • Wire harness and connector • Intelligent vehicle control platform control unit • Front left door controller • Front right door controller • Rear left door controller • Rear right door controller • Intelligent communication domain control unit • Energy conversion and distribution unit

Fault symptom

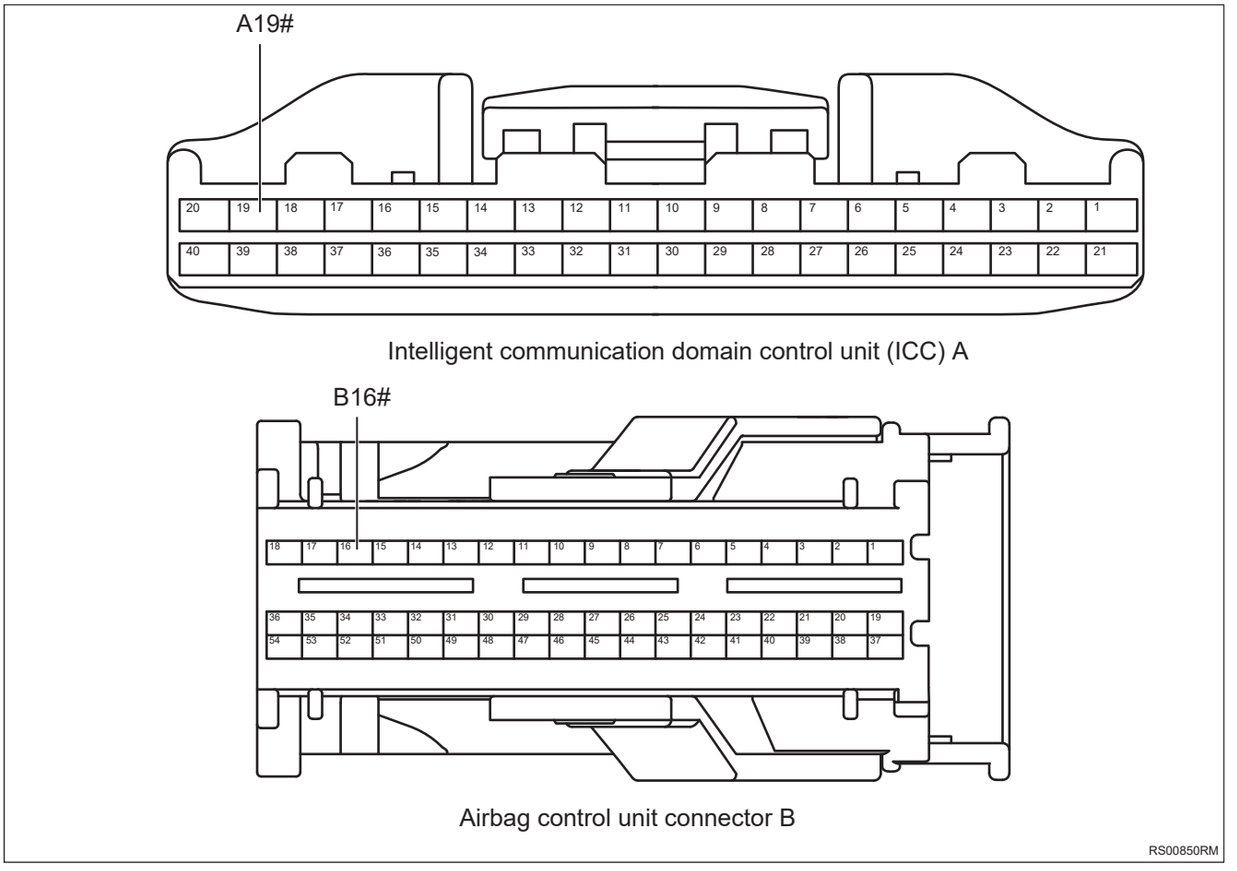
DTC No.	Fault symptom	Warning light/indicator
B1A1011	• Warning light comes on • Set DTC	Comes on
B1A1012	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for open in wire harness and connector (airbag control unit - intelligent communication domain control unit)**



(a) Turn ignition switch to "OFF"

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the airbag control unit connector.

(e) According to value in the table, measure resistance.

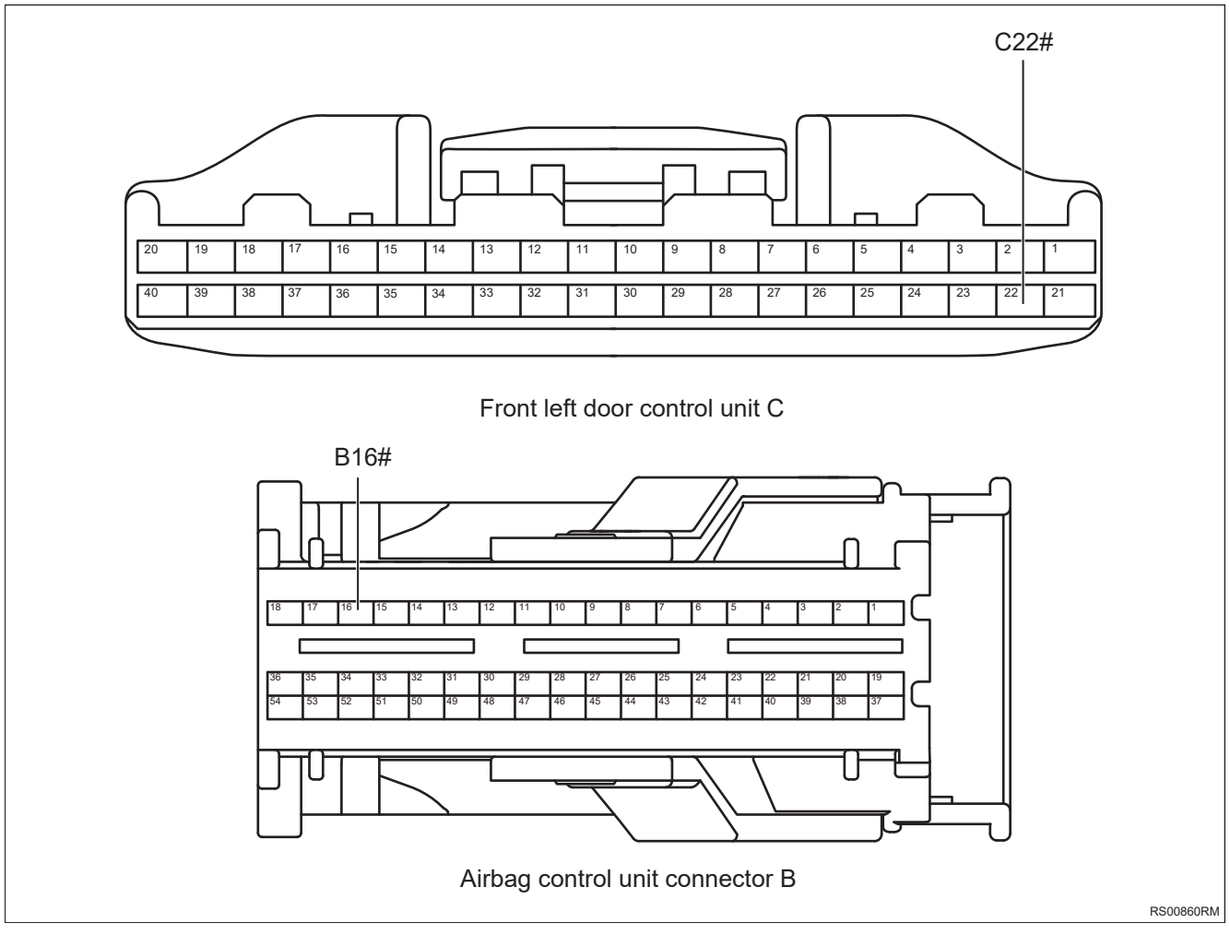
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - intelligent communication domain control unit A19#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in wire harness and connector (airbag control unit - front left door control unit)**



(a) Disconnect the front left door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

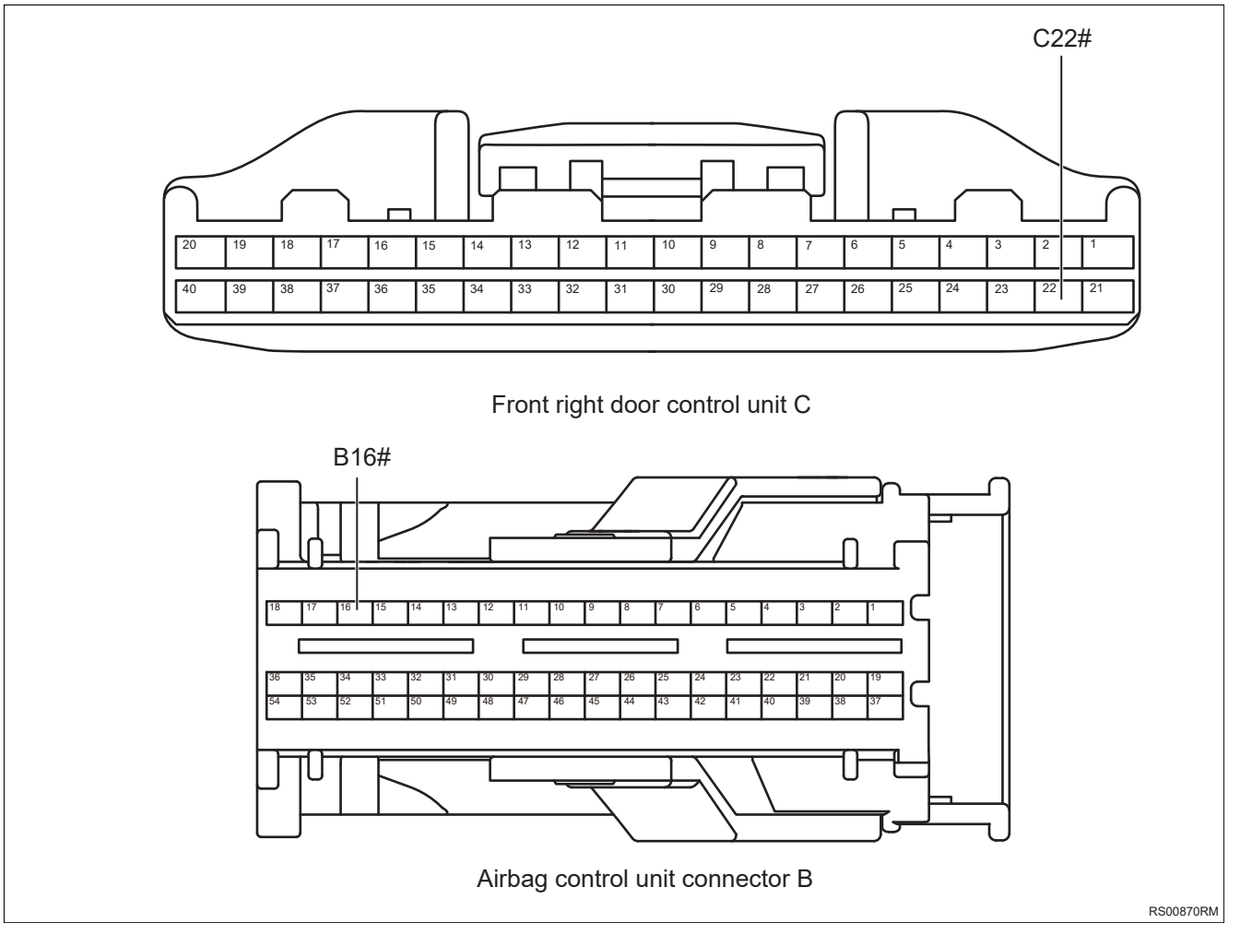
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - front left door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for open in wire harness and connector (airbag control unit - front right door control unit)**



(a) Disconnect the front right door control unit connector.

(b) According to value in the table, measure resistance.

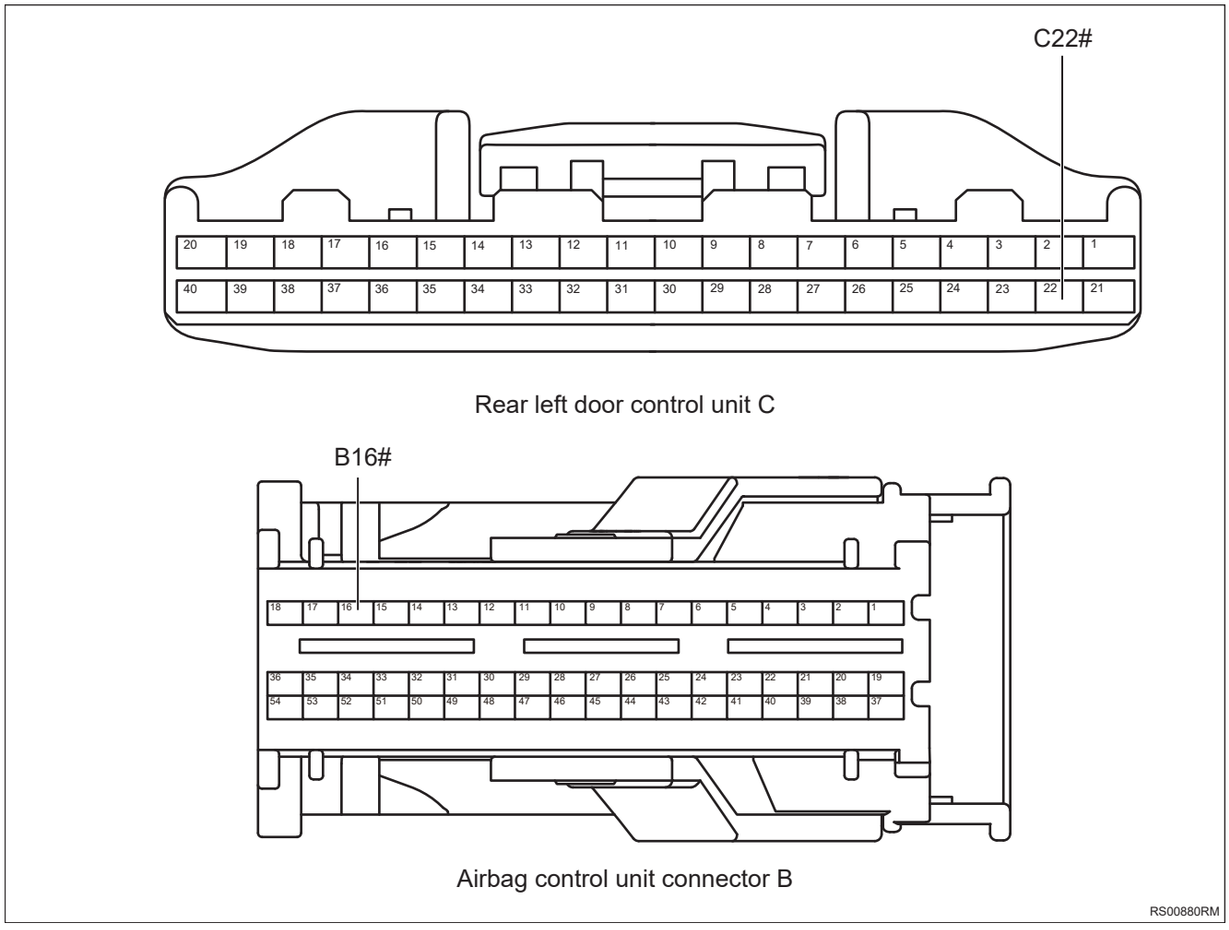
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - front right door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for open in wire harness and connector (airbag control unit - rear left door control unit)**



(a) Disconnect the rear left door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

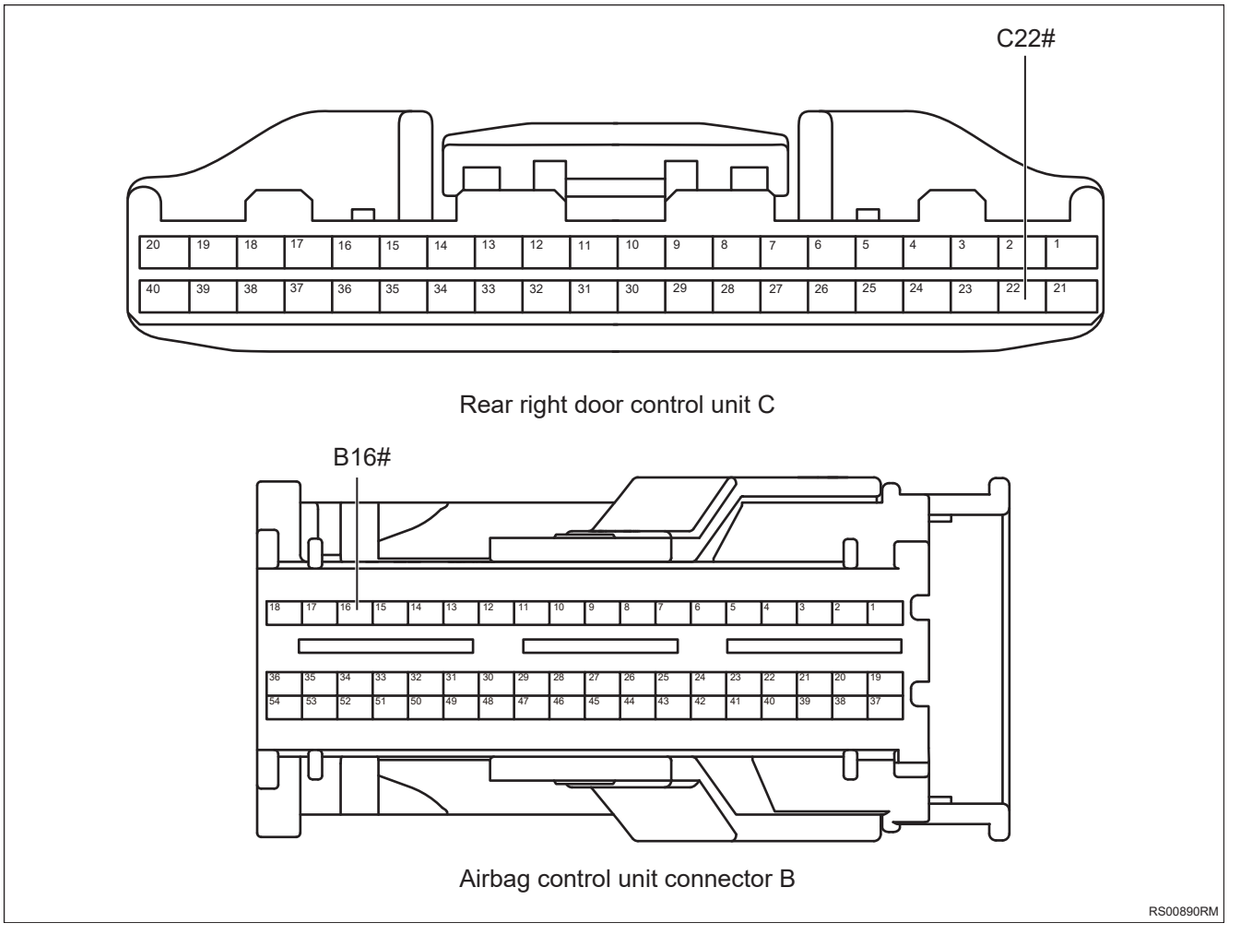
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - rear left door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for open in wire harness and connector (airbag control unit - rear right door control unit)**



(a) Disconnect the rear right door control unit connector.

(b) According to value in the table, measure resistance.

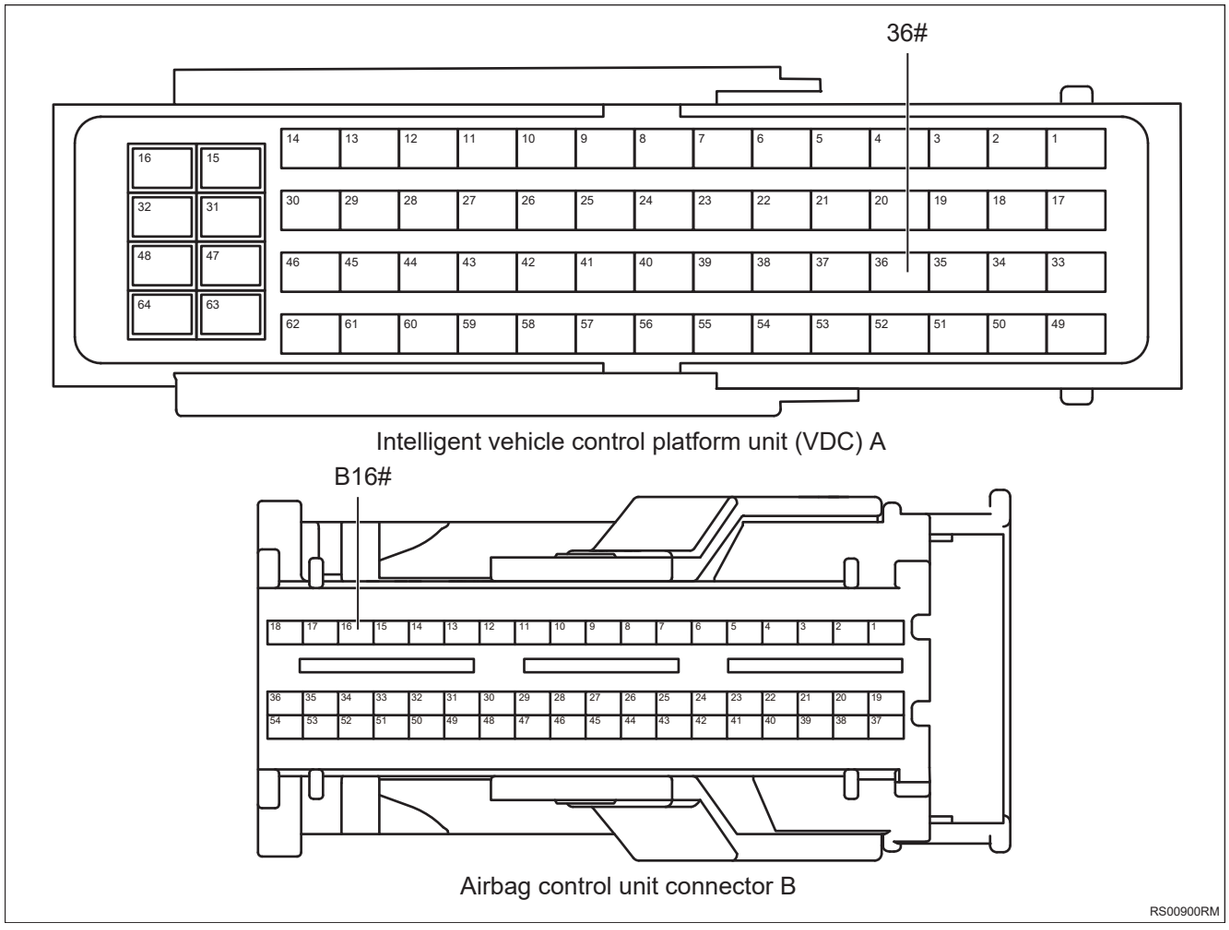
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - rear right door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in wire harness and connector (airbag control unit - intelligent vehicle control platform control unit)**



(a) Disconnect the intelligent vehicle control platform control unit connector.

(b) According to value in the table, measure resistance.

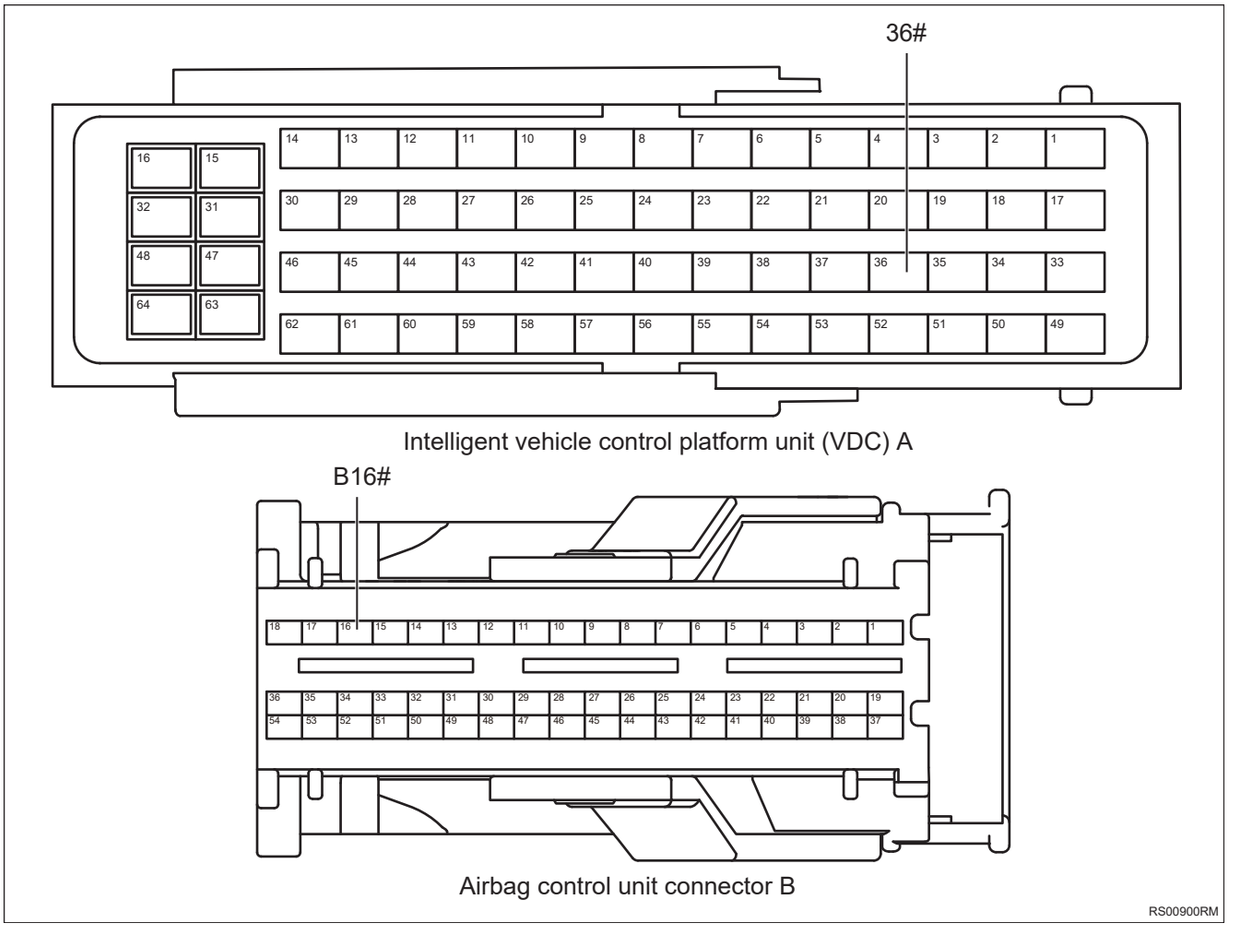
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - intelligent vehicle control platform control unit connector A36#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in wire harness and connector (airbag control unit - energy conversion and distribution unit)**



(a) Disconnect the energy conversion and distribution unit connector.

(b) According to value in the table, measure resistance.

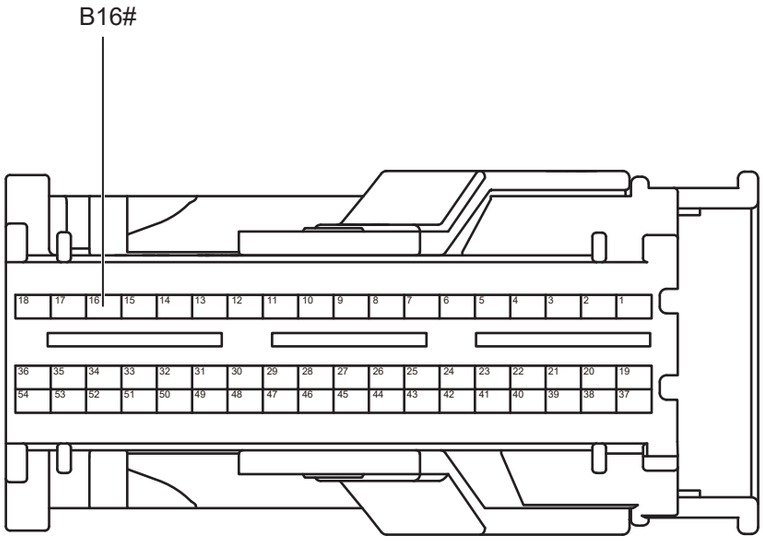
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - energy conversion and distribution unit connector 5#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	Check for short to ground in airbag control unit wire harness and connector



Airbag control unit connector B

RS00910RM

(a) According to value in the table, measure resistance.

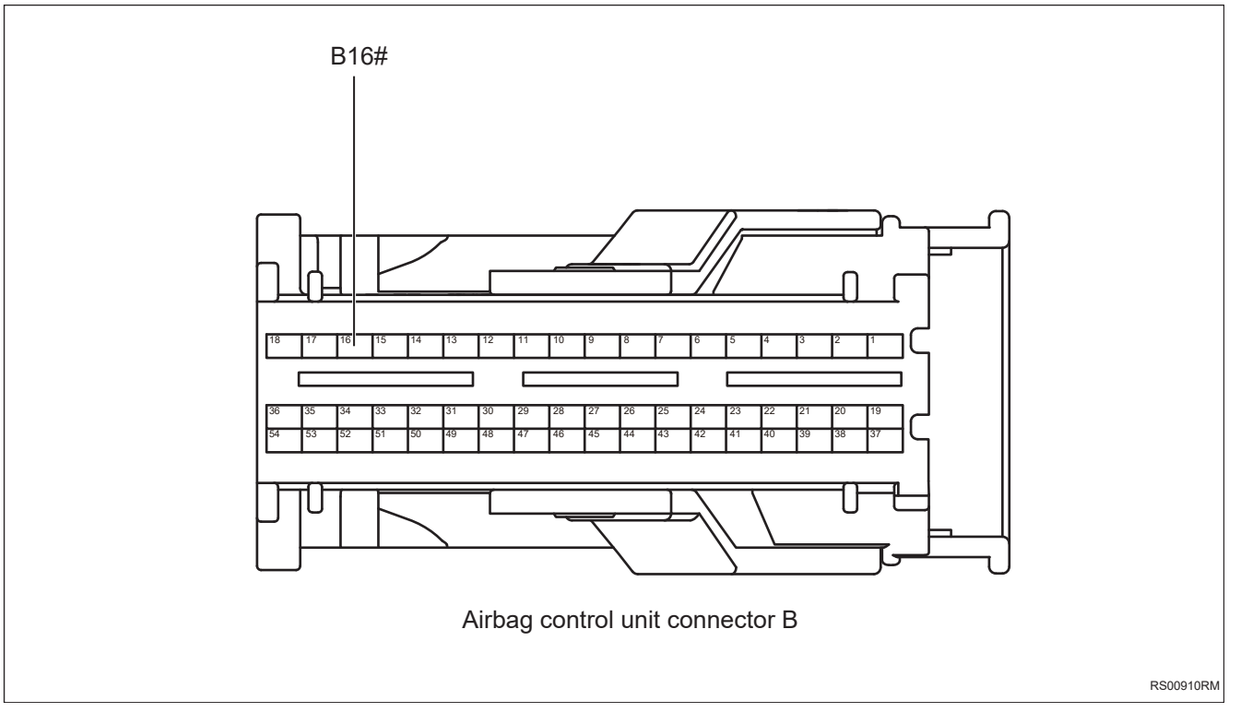
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in airbag control unit wire harness and connector**



Airbag control unit connector B

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace airbag control unit (See page ZC-74)**

(a) Replace the airbag control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit or door control unit or intelligent vehicle control platform control unit or energy conversion and distribution unit (See page ZC-116) (See page CS-12) (See page DL-37)**

OK

Diagnosis ends

DTC	B1A1056	Collision output invalid configuration

Description

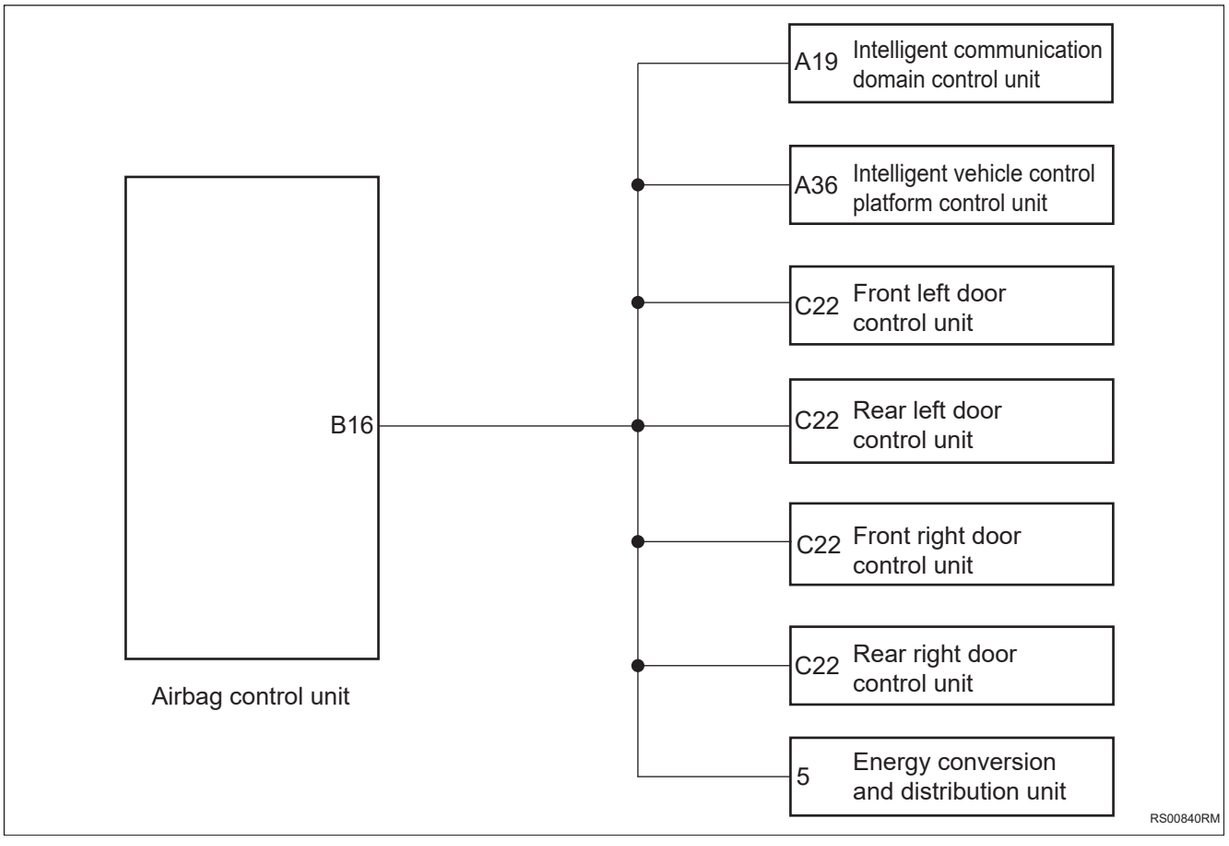
When collision output signal is abnormal, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A1056	• Power supply status is normal • IGN is ON	—	1 times	Non-continuous type	Detected only during initialization	• Airbag control unit • Wire harness and connector • Intelligent vehicle control platform control unit • Front left door controller • Front right door controller • Rear left door controller • Rear right door controller • Intelligent communication domain control unit • Energy conversion and distribution unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A1056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for open in wire harness and connector (airbag control unit - intelligent communication domain control unit)**

(a) Turn ignition switch to "OFF"

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent communication domain control unit connector.

(d) Disconnect the airbag control unit connector.

(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - intelligent communication domain control unit A19#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in wire harness and connector (airbag control unit - front left door control unit)**

(a) Disconnect the front left door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - front left door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in wire harness and connector (airbag control unit - front right door control unit)**

(a) Disconnect the front right door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - front right door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for open in wire harness and connector (airbag control unit - rear left door control unit)**

(a) Disconnect the rear left door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - rear left door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for open in wire harness and connector (airbag control unit - rear right door control unit)**

(a) Disconnect the rear right door control unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - rear right door control unit connector C22#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in wire harness and connector (airbag control unit - intelligent vehicle control platform control unit)**

(a) Disconnect the intelligent vehicle control platform control unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - intelligent vehicle control platform control unit connector A36#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in wire harness and connector (airbag control unit - energy conversion and distribution unit)**

(a) Disconnect the energy conversion and distribution unit connector.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - energy conversion and distribution unit connector 5#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in airbag control unit wire harness and connector**

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in airbag control unit wire harness and connector**

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace airbag control unit (See page ZC-74)**

(a) Replace the airbag control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent communication domain control unit or door control unit or intelligent vehicle control platform control unit (See page ZC-116) (See page CS-12) (See page DL-37)**

OK

Diagnosis ends

DTC	B1A1216	Power supply voltage below threshold
DTC	B1A1217	Power supply voltage above threshold

Description

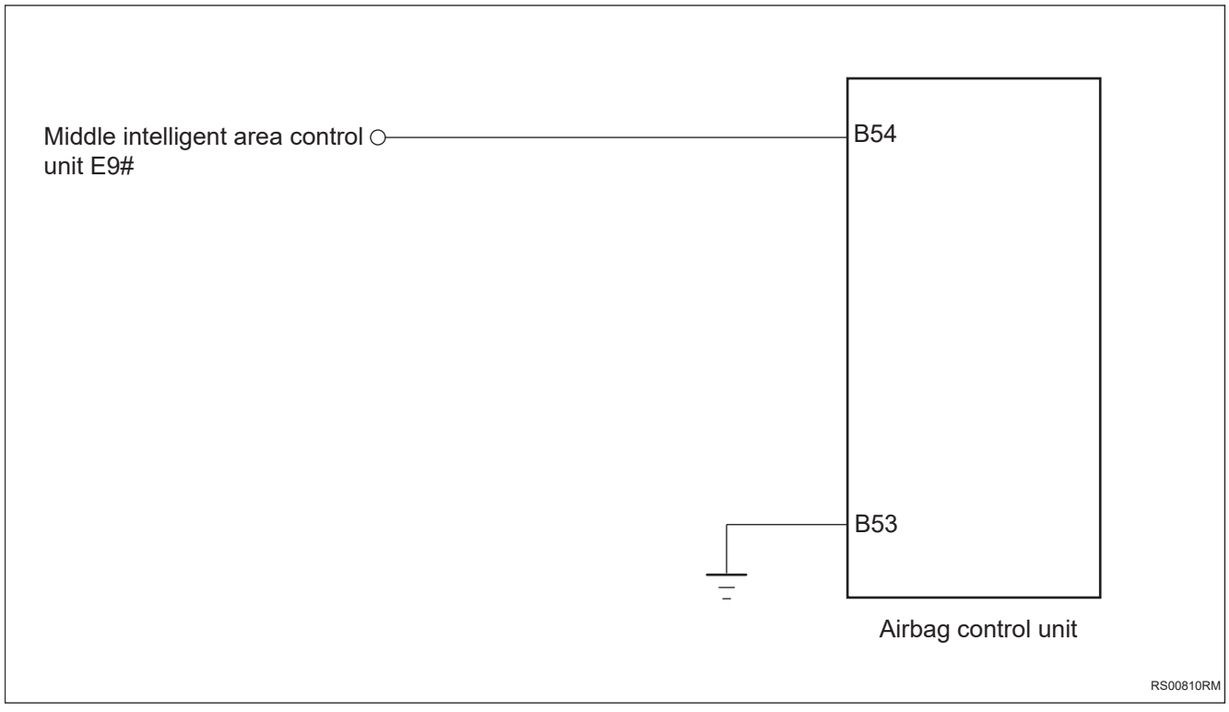
When airbag control unit power supply voltage is out of normal operating range, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A1216	• Power supply status is normal • IGN is ON	• Voltage < 7.2 V and fault is detected • Voltage < 8.5 V and fault may be detected	1200 times	Continuous type	10 ms	• Airbag control unit • Wire harness and connector • Charging system
B1A1217	• Power supply status is normal • IGN is ON	• Voltage > 19.5 V and fault is detected • Voltage > 16.5 V and fault may be detected	100 times	Continuous type	10 ms	• Airbag control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A1216	• Warning light comes on • Set DTC	Comes on
B1A1217	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start engine and measure battery voltage.

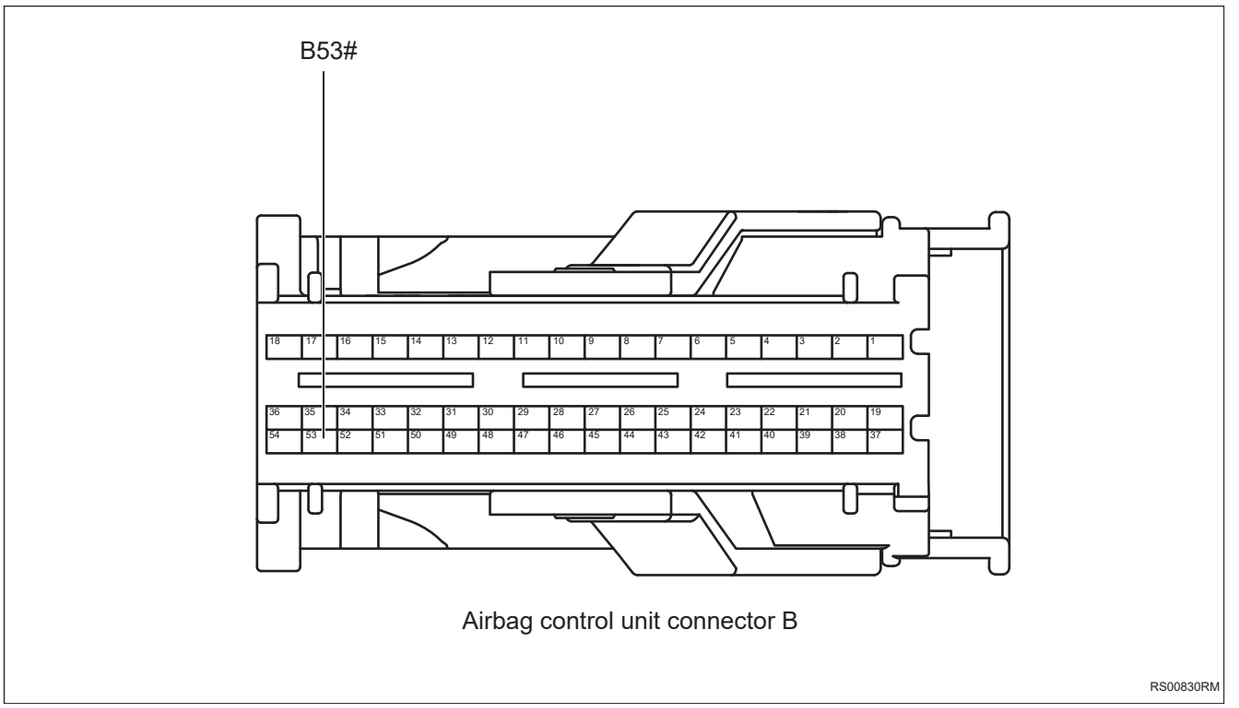
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check airbag control unit ground**



Airbag control unit connector B

(a) Disconnect the airbag control unit connector.

(b) According to value in the table, measure resistance.

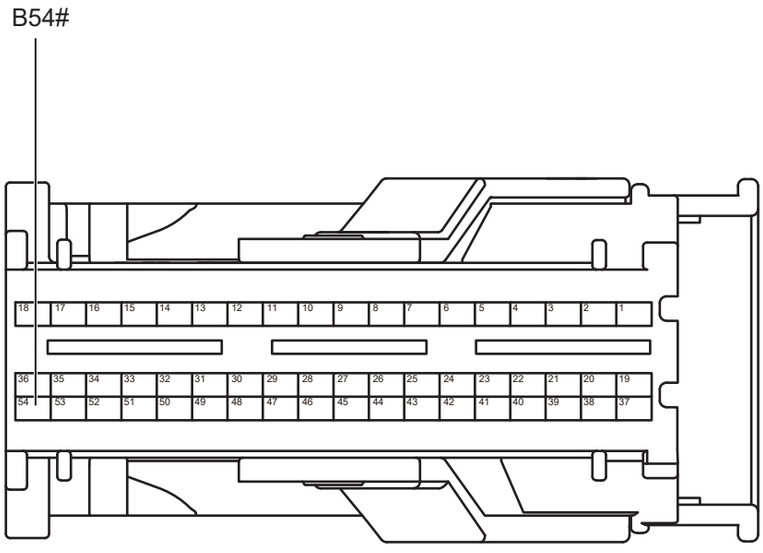
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B53# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check airbag control unit power supply**



Airbag control unit connector B

RS00820RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B54# - body ground	Turn ignition switch to "ON"	9 - 16 V

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

ZD

Replace airbag control unit (See page ZC-74)

DTC	**B1A1600**	**Internal error**

Description

When an internal fault occurs in airbag control unit, airbag control unit records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A1600	• Power supply status is normal • IGN is ON	ACU circuit is damaged	1 times	Continuous type	—	• Airbag control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A1600	• Warning light comes on • Set DTC	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B1A2900**	**No functions configured**
DTC	**B1A1F00**	**Offline configuration error**
DTC	**B1A2800**	**CAN transceiver error**

Description

When an internal fault occurs in airbag control unit, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B1A2900	• Power supply status is normal • IGN is ON	—	1 times	Continuous type	Detected only during initialization	• Airbag control unit
B1A1F00	• Power supply status is normal • IGN is ON	The software that is not matched with the configuration words and hardware is written using FBL	1 times	Continuous type	Detected only during initialization	• Airbag control unit
B1A2800	• Power supply status is normal • IGN is ON	CAN transceiver short to ground or temperature fault	1 times	Non-continuous type	—	• Airbag control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B1A2900	• Warning light comes on • Set DTC	Comes on
B1A1F00	• Warning light comes on • Set DTC	Comes on
B1A2800	• Warning light comes on • Set DTC	Comes on

Inspection procedure

1	**Clear DTCs**

ZD

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B000111**	**Short to ground in driver frontal airbag circuit**
DTC	**B000112**	**Short to power supply in driver frontal airbag circuit**

DTC	**B00011A**	**Driver frontal airbag circuit resistance below threshold**
DTC	**B00011B**	**Driver frontal airbag circuit resistance above threshold**
DTC	**B00012B**	**Driver frontal airbag other circuit series fault**

Description

When there is short to ground, short to power supply, high or low resistance, series fault in driver frontal airbag ignition circuit, the airbag control unit records DTC.

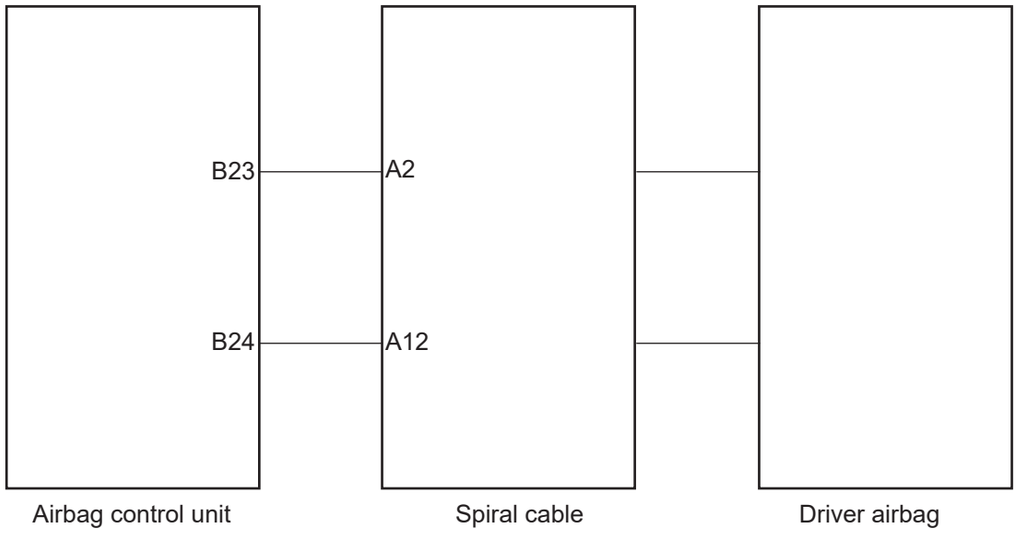
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B000111	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Periodic type	400 ms	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B000112	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B00011A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B00011B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B00012B	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	1 times	Continuous type	Detected only during initialization	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector

Fault symptom

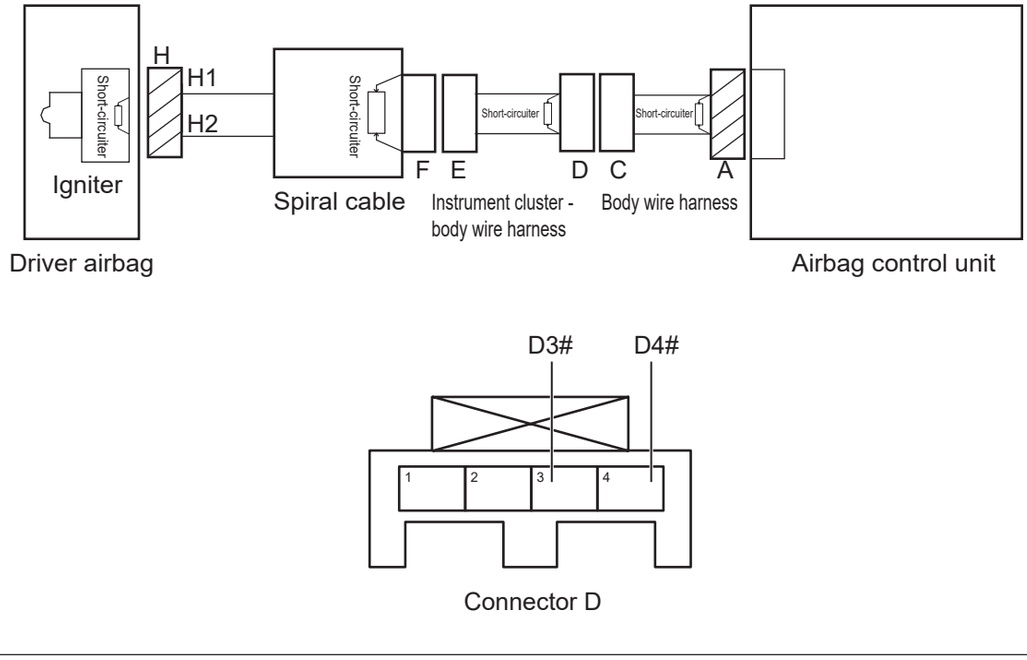
DTC No.	Fault symptom	Warning light/indicator
B000111	• Warning light comes on • Set DTC	Comes on
B000112	• Warning light comes on • Set DTC	Comes on
B00011A	• Warning light comes on • Set DTC	Comes on
B00011B	• Warning light comes on • Set DTC	Comes on
B00012B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

Standard value

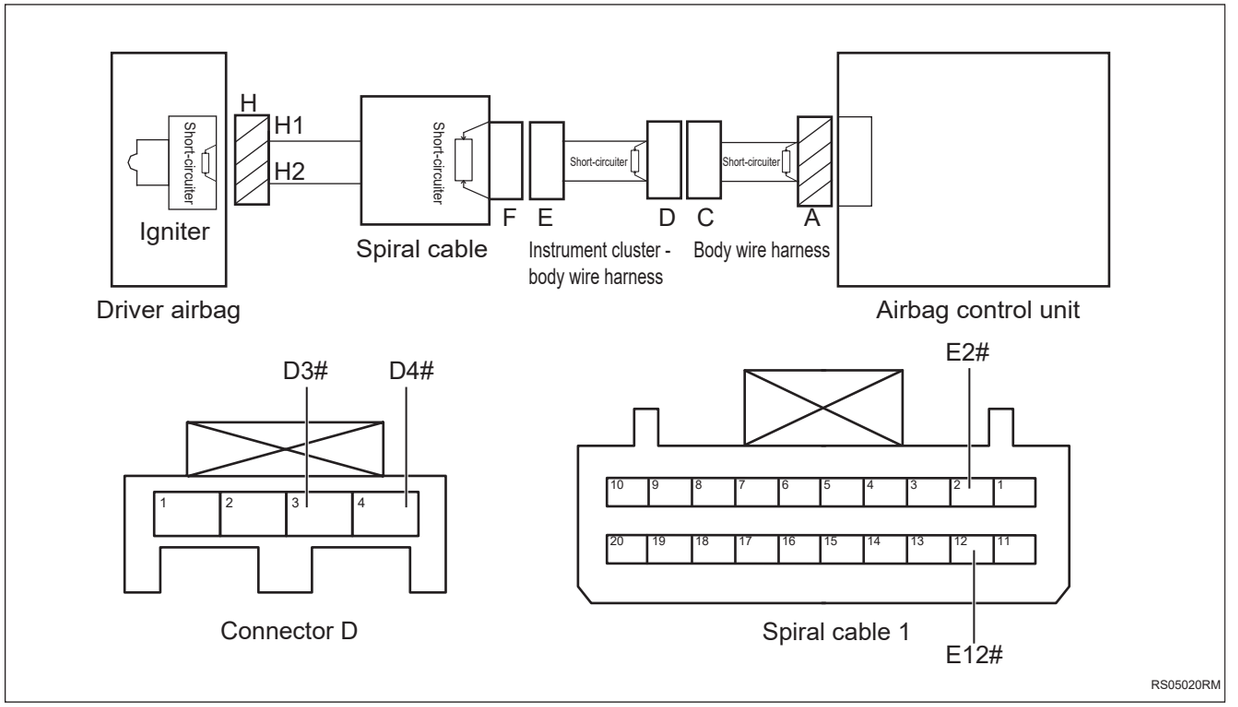
Multimeter connection	Detection condition	Specified condition
Connector D3# - connector D4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Check for open in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

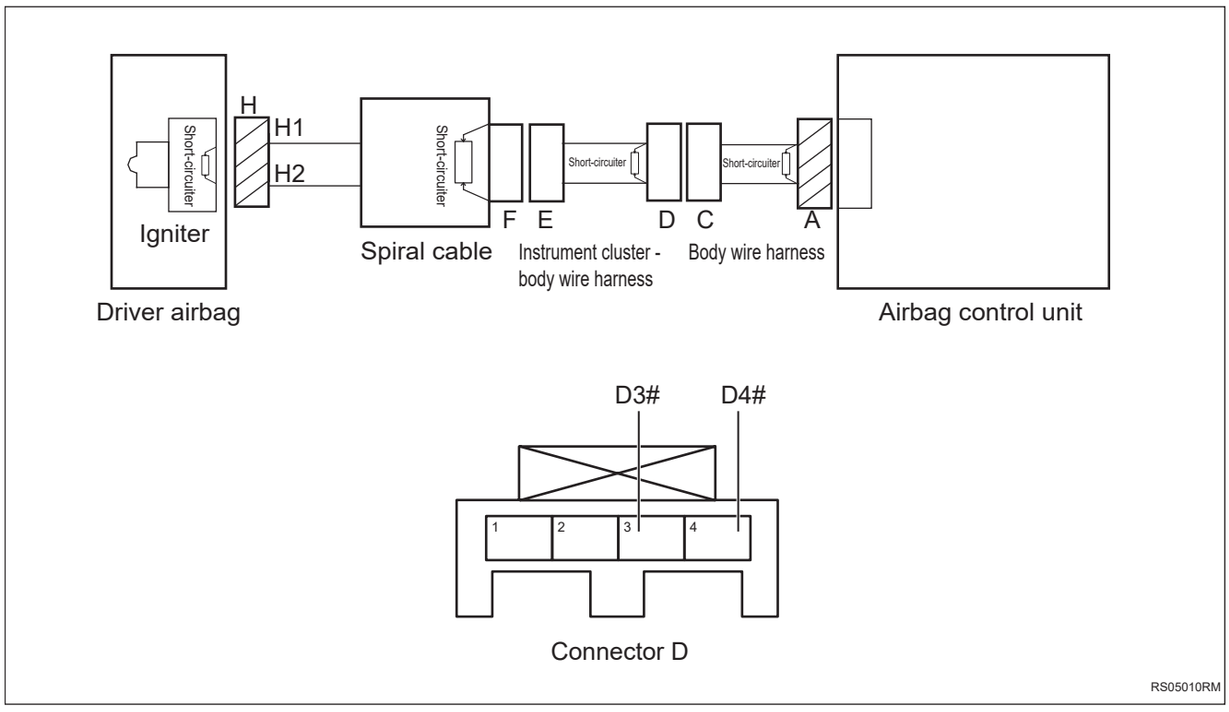
Multimeter connection	Detection condition	Specified condition
Connector E2# - connector D4#	Always connected	Less than 1 Ω
Connector E12# - connector D3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

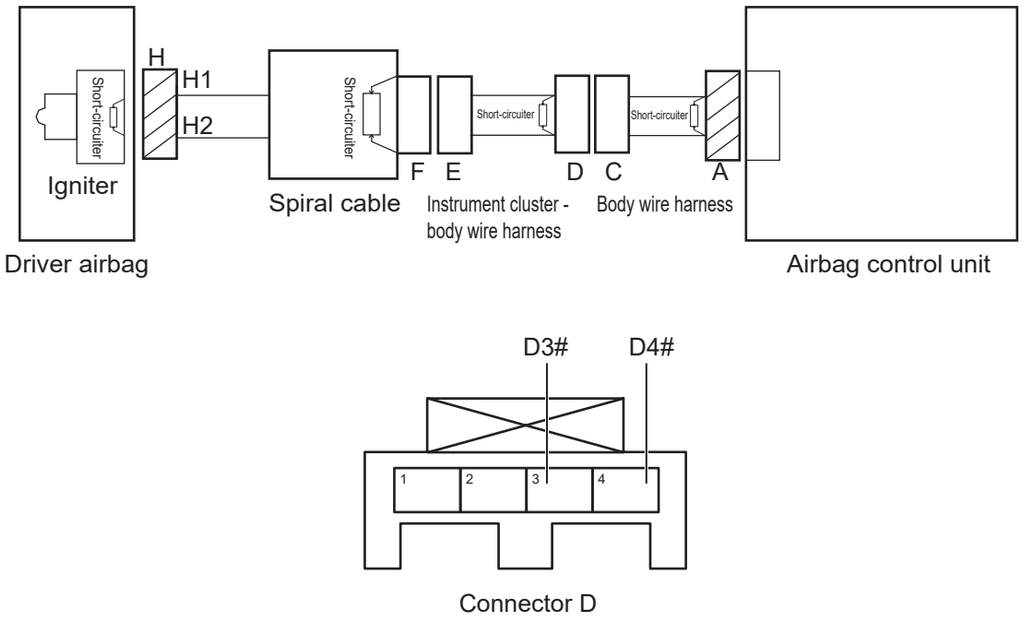
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D3# - body ground	Always connect-ed	10 KΩ or more
Connector D4# - body ground	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

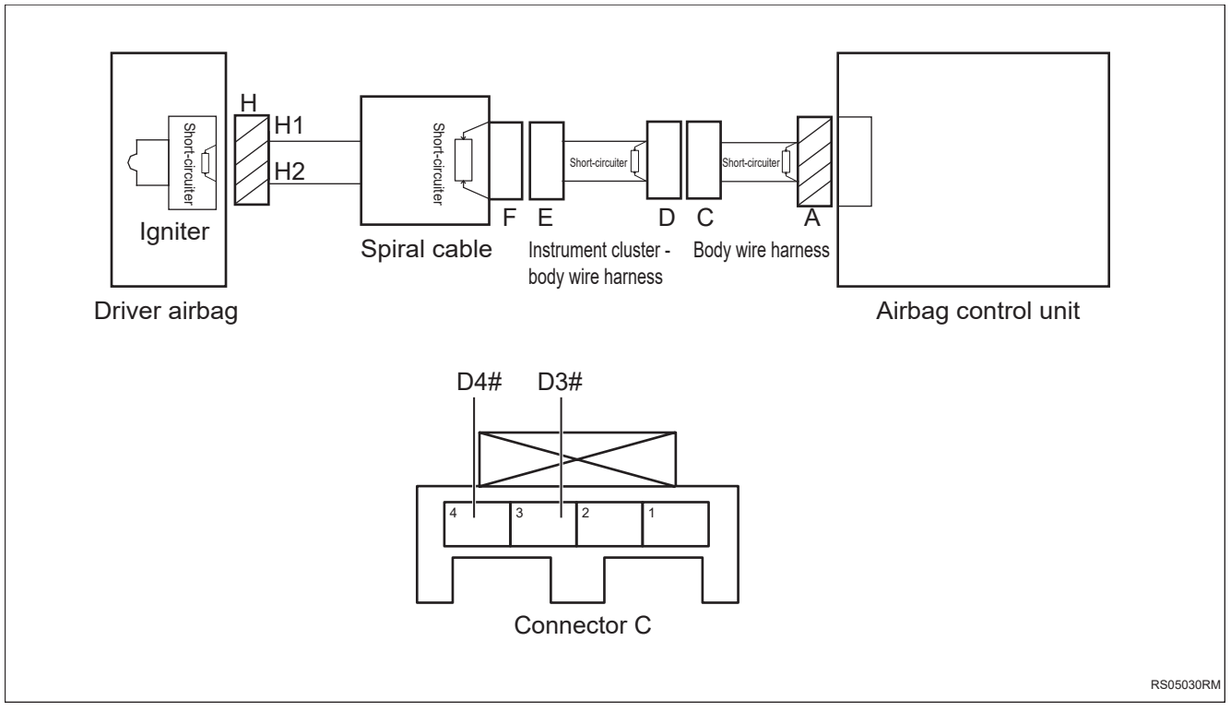
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to each other in driver airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

Standard value

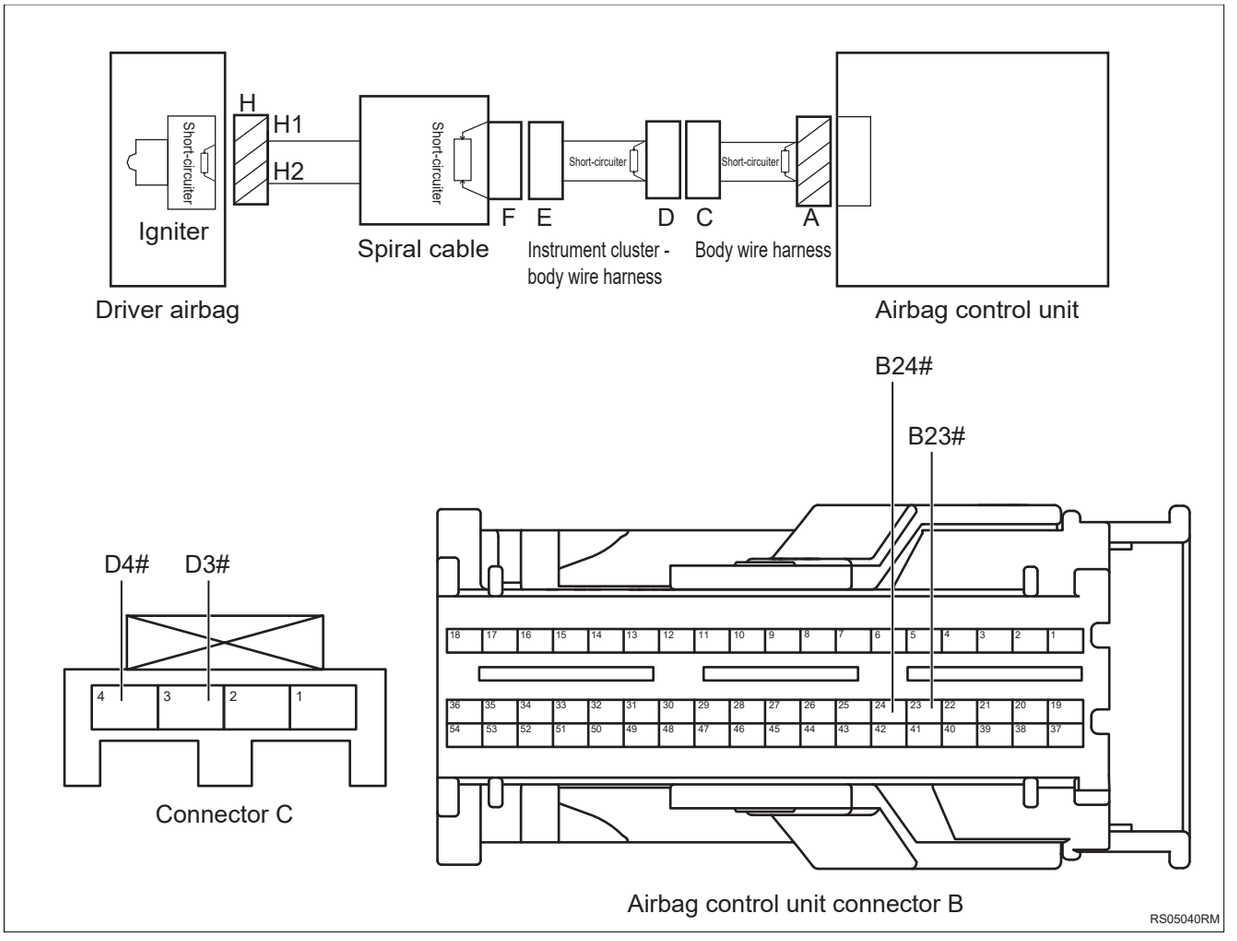
Multimeter connection	Detecti-on conditi-on	Specifi-ed conditi-on
Connector C3# - connector C4#	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	Check for open in driver airbag wire harness and connector (body wire harness)



(a) According to value in the table, measure resistance.

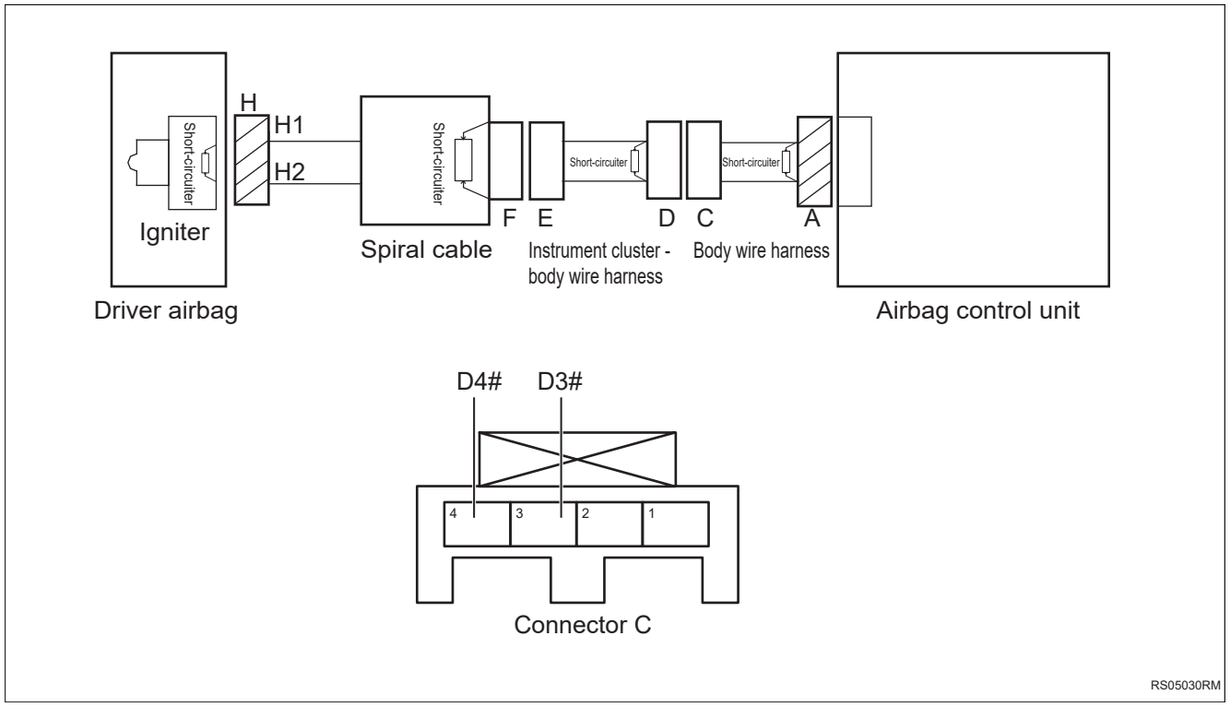
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C3# - airbag control unit connector B24#	Always connected	Less than 1 Ω
Connector C4# - airbag control unit connector B23#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in driver airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

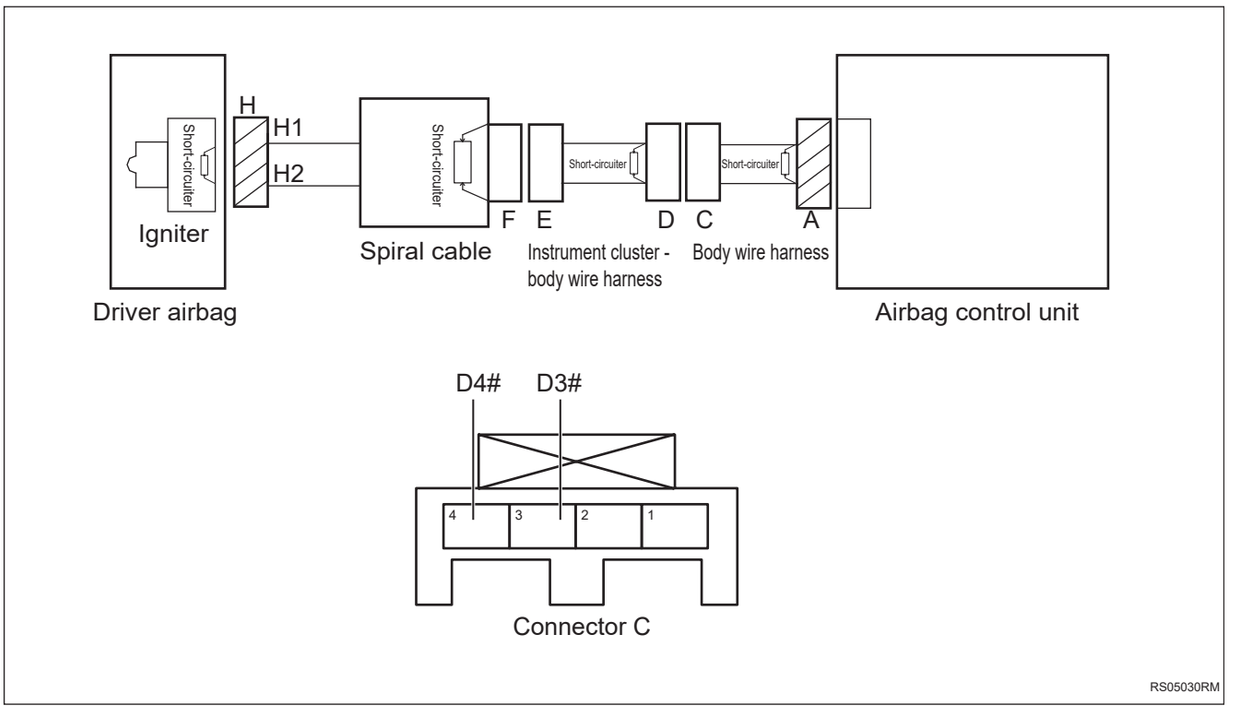
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector C3# - body ground	Always connect-ed	10 KΩ or more
Connector C4# - body ground	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	**Check for short to power supply in driver airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check spiral cable**

(a) Check for open or short in spiral cable wire harness and connector.

(b) Check if spiral cable is damaged.

NG → **Replace spiral cable (See page DP-47)**

OK

10	**Replace driver airbag (See page ZC-76)**

(a) Replace the driver airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

ZD

DTC	B000156	Driver frontal airbag invalid configuration

Description

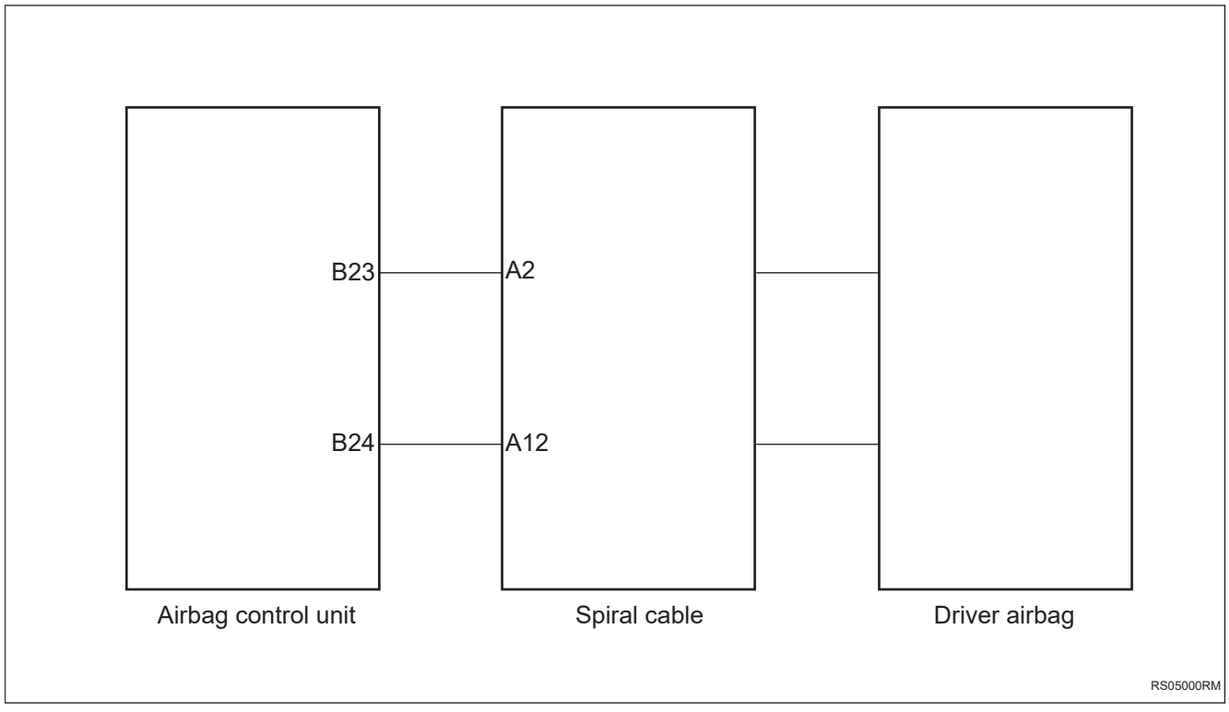
When driver frontal airbag ignition circuit has an invalid configuration, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B000156	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B000156	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

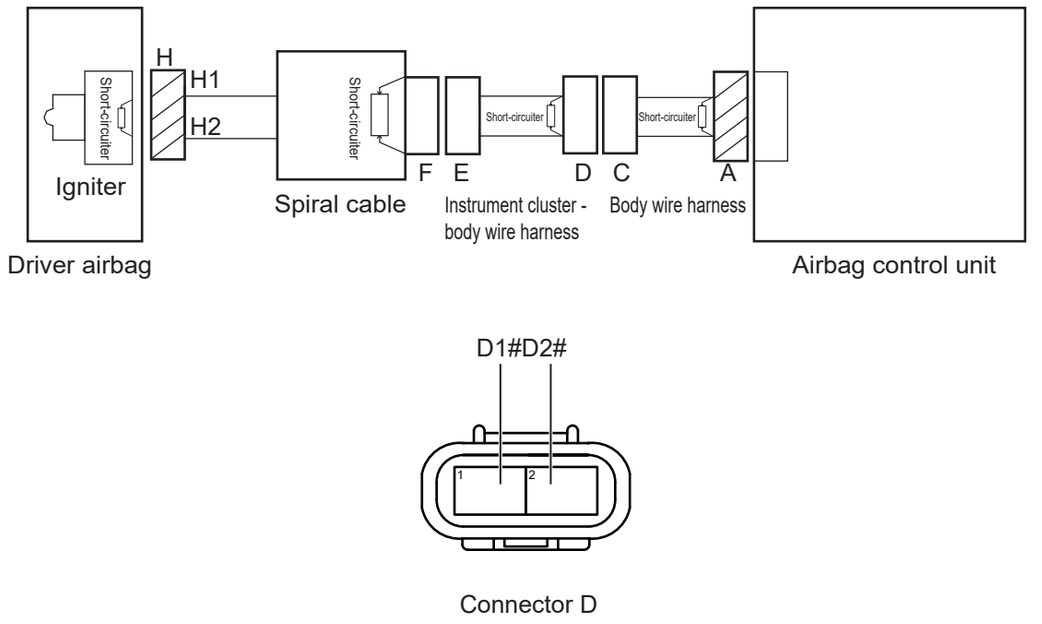
1	**Check and read configuration file of driver airbag**

(a) Check and read if configuration file of driver airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

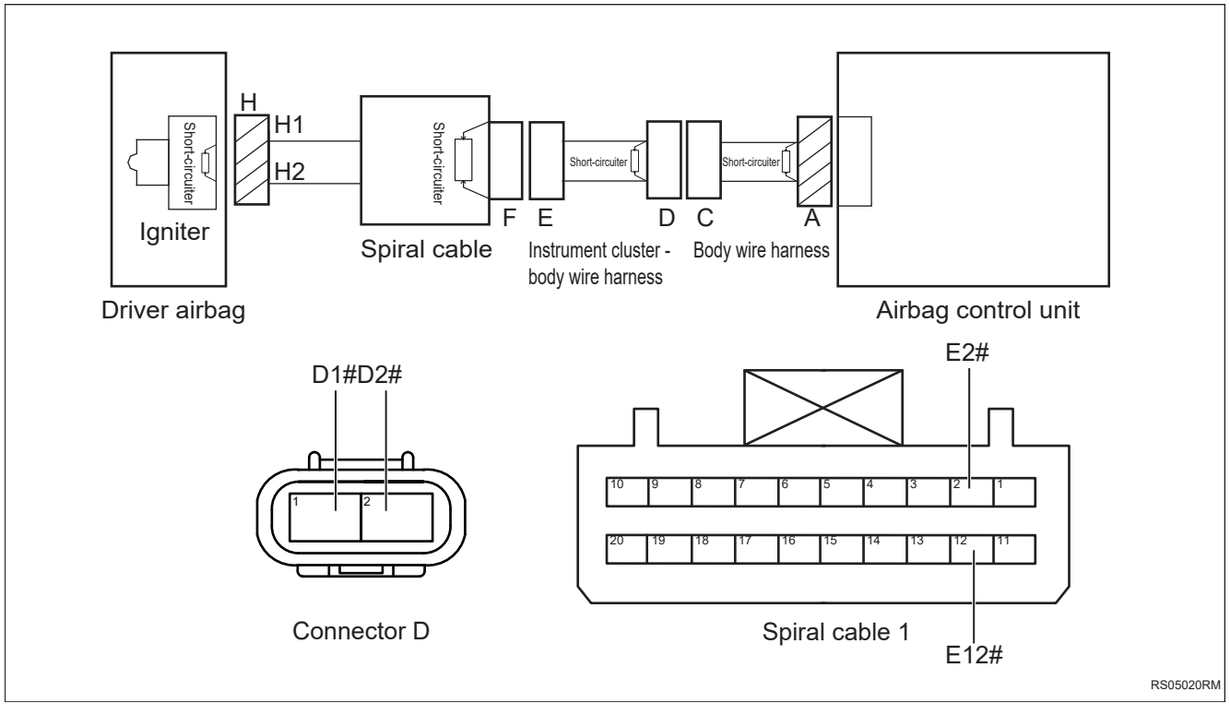
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

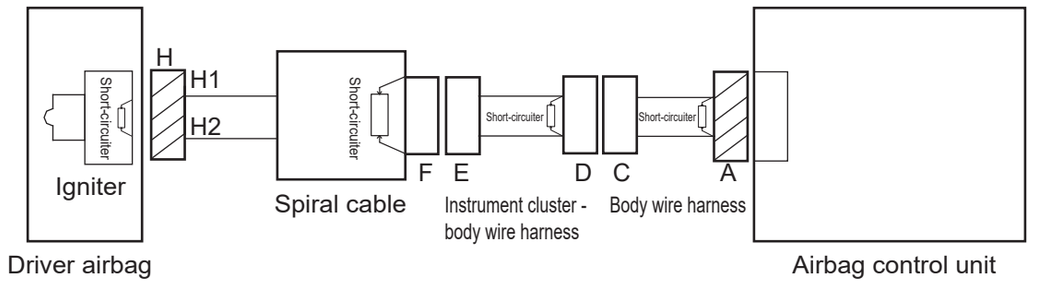
Standard value

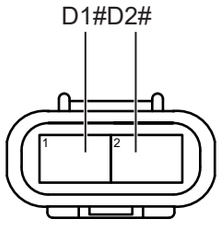
Multimeter connection	Detection condition	Specified condition
Connector E2# - connector D1#	Always connected	Less than 1 Ω
Connector E12# - connector D2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in driver airbag wire harness and connector (instrument cluster - body wire harness)**





Connector D

RS05010RM

(a) According to value in the table, measure resistance.

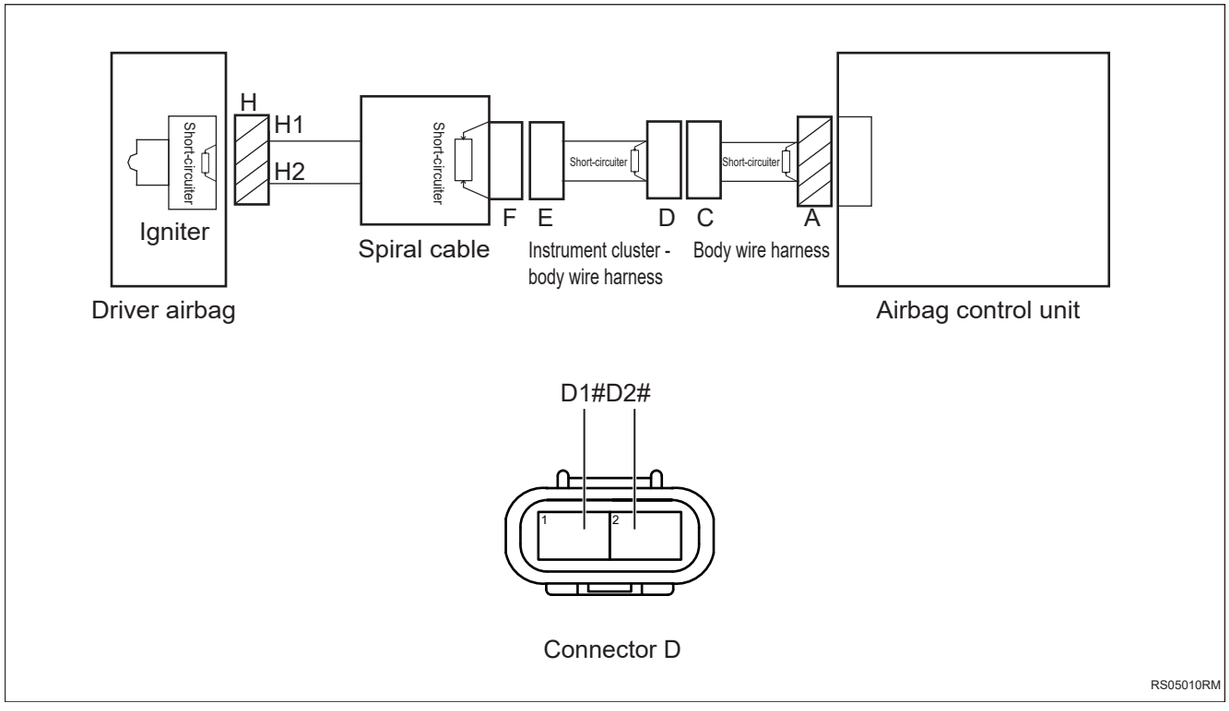
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in driver airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

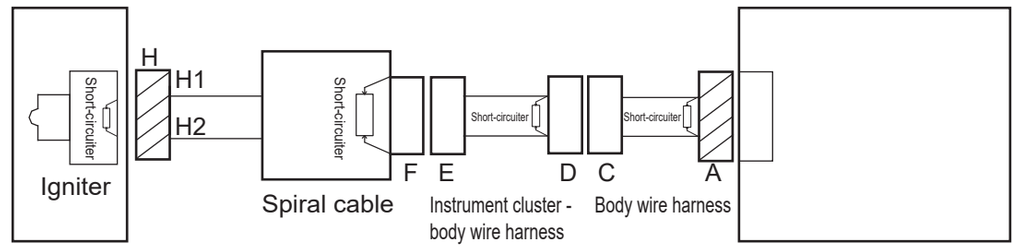
Standard value

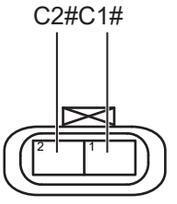
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in driver airbag wire harness and connector (body wire harness)**





RS05030RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

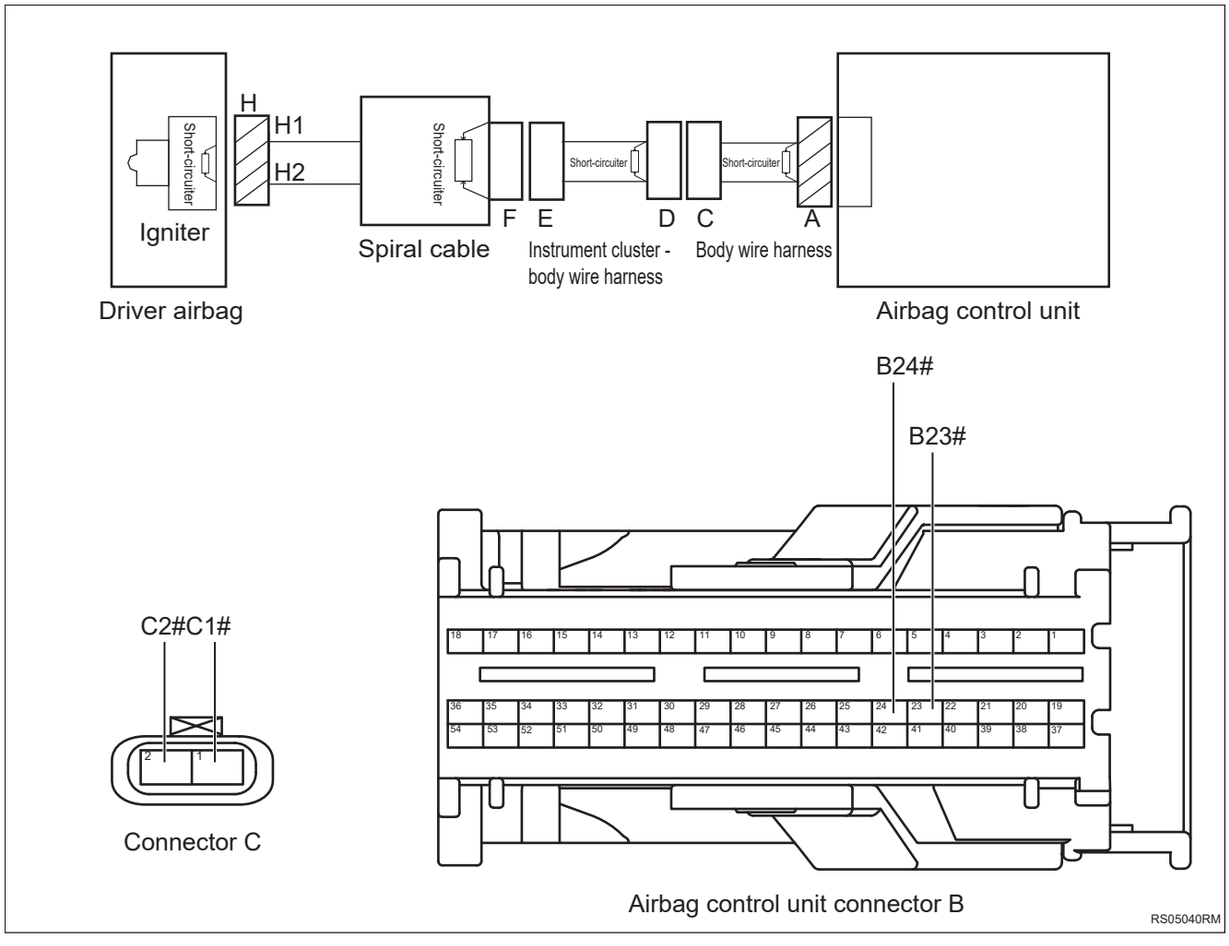
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in driver airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

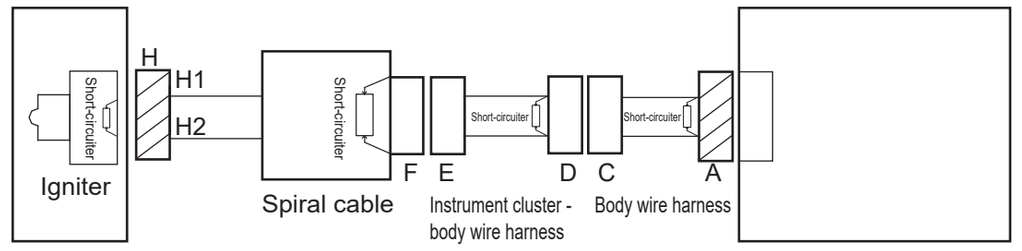
Standard value

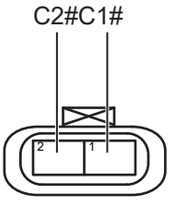
Multimeter connection	Detection condition	Specified condition
Connector C2# - airbag control unit connector B24#	Always connected	Less than 1 Ω
Connector C1# - airbag control unit connector B23#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in driver airbag wire harness and connector (body wire harness)**





RS05030RM

(a) According to value in the table, measure resistance.

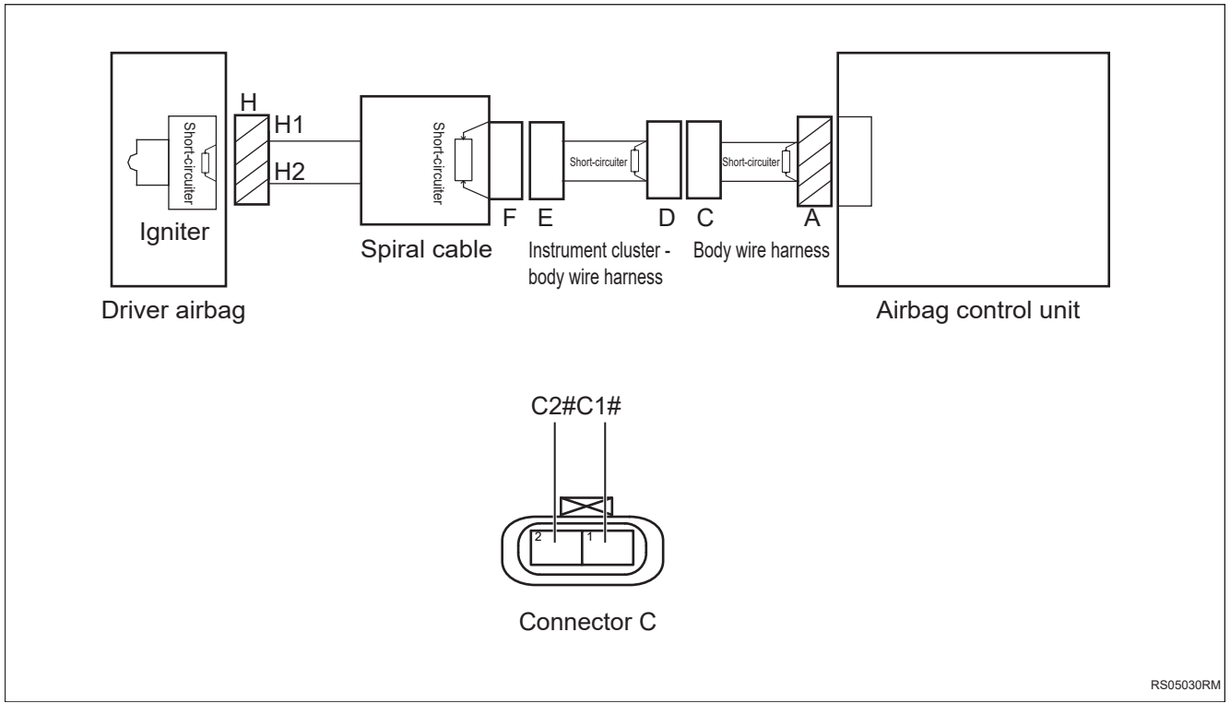
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in driver airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Check spiral cable**

(a) Check for open or short in spiral cable wire harness and connector.

(b) Check if spiral cable is damaged.

NG → **Replace spiral cable (See page DP-47)**

OK

11	**Replace driver airbag (See page ZC-76)**

(a) Replace the driver airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B001011	Short to ground in front passenger frontal airbag circuit

DTC	**B001012**	**Short to power supply in front passenger frontal airbag circuit**
DTC	**B00101A**	**Front passenger frontal airbag circuit resistance below threshold**
DTC	**B00101B**	**Front passenger frontal airbag circuit resistance above threshold**
DTC	**B00102B**	**Front passenger frontal airbag other circuit series fault**

Description

When there is short to ground, short to power supply, too high or too low resistance, series faults in front passenger airbag ignition circuit, the airbag control unit records DTC.

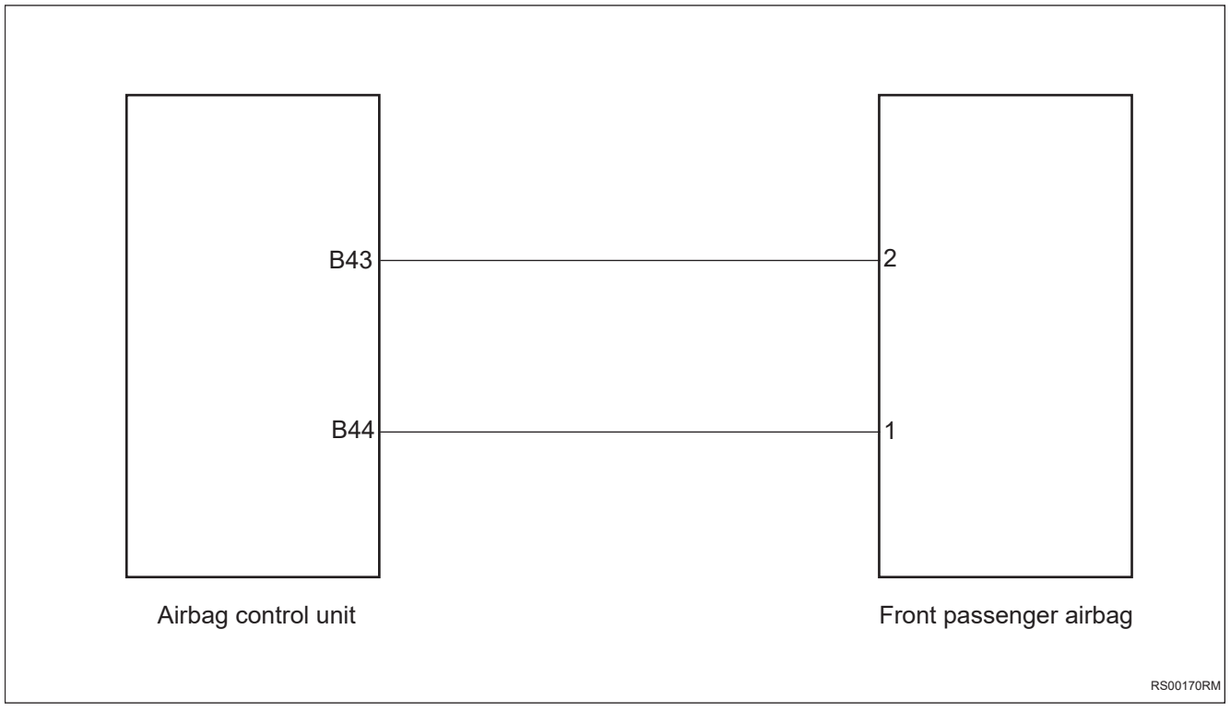
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B001011	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Front passenger airbag • Airbag control unit • Wire harness and connector
B001012	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Front passenger airbag • Airbag control unit • Wire harness and connector
B00101A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Front passenger airbag • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B00101B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Front passenger airbag • Airbag control unit • Wire harness and connector
B00102B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Front passenger airbag • Airbag control unit • Wire harness and connector

Fault symptom

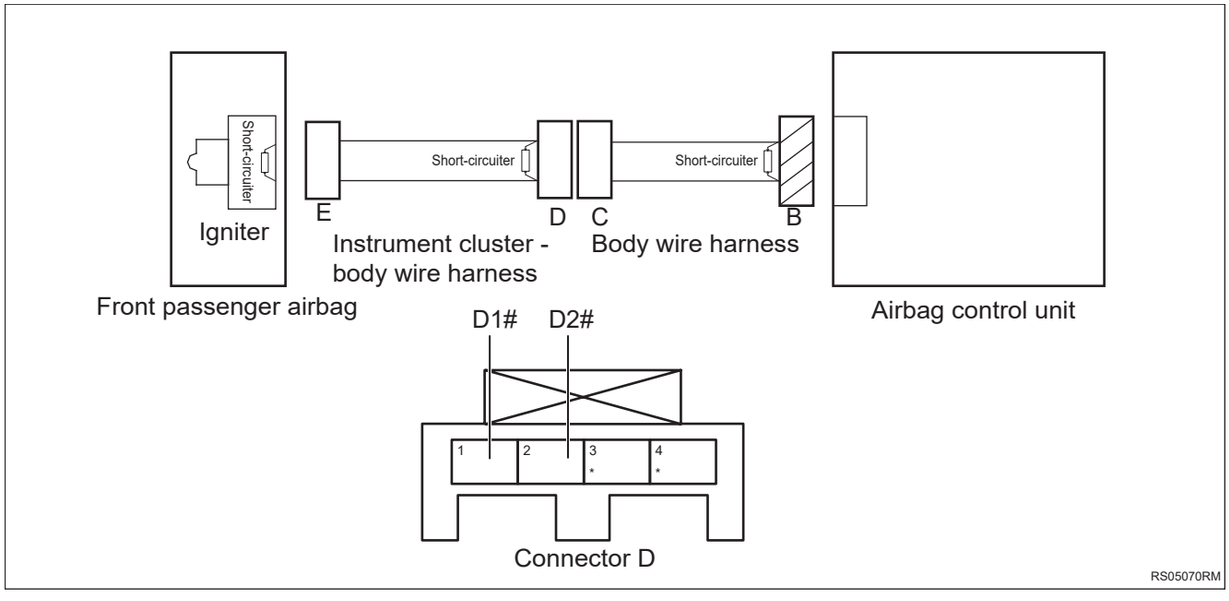
DTC No.	Fault symptom	Warning light/indicator
B001011	• Warning light comes on • Set DTC	Comes on
B001012	• Warning light comes on • Set DTC	Comes on
B00101A	• Warning light comes on • Set DTC	Comes on
B00101B	• Warning light comes on • Set DTC	Comes on
B00102B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

Standard value

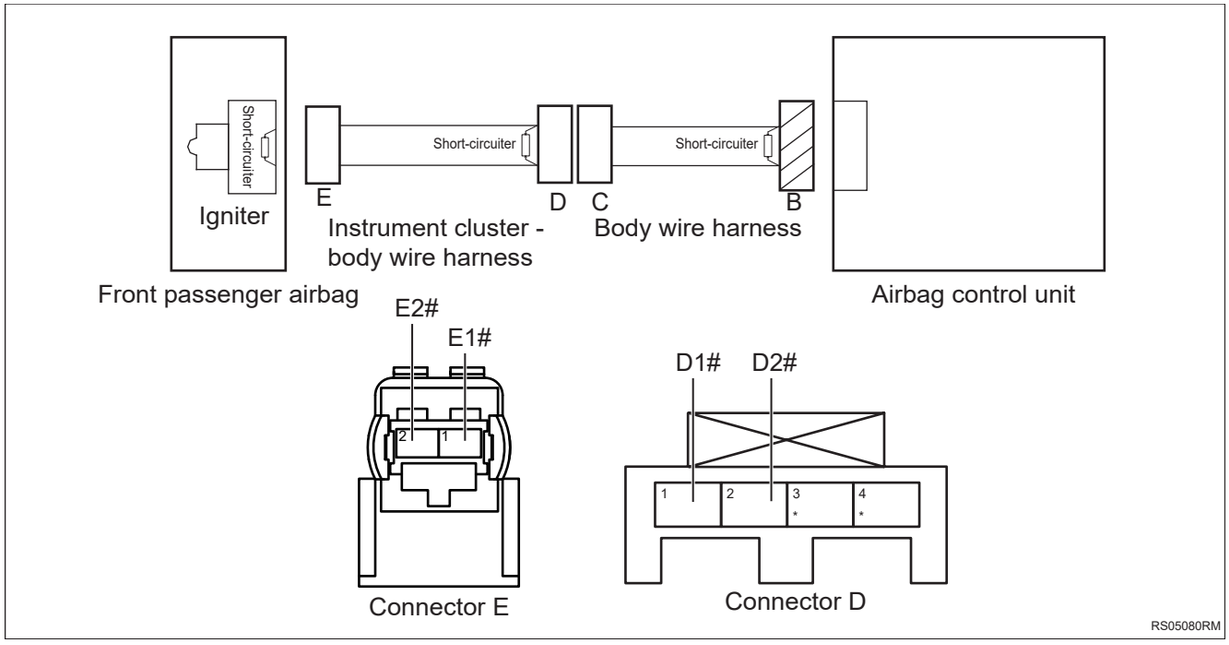
Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for open in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

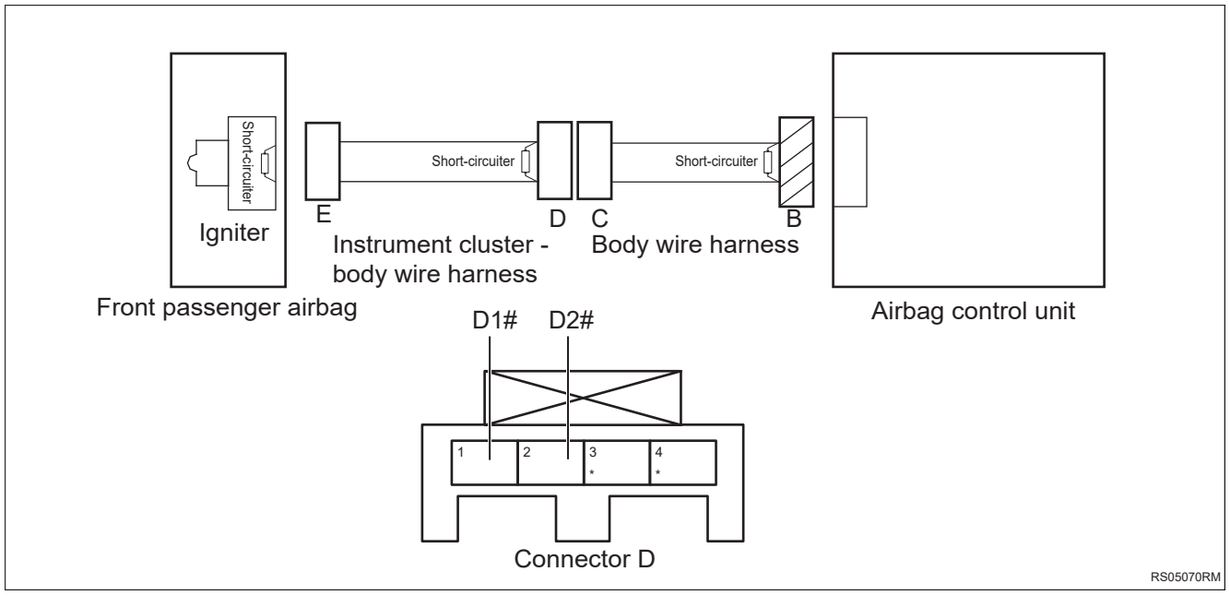
Standard value

Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D2#	Always connected	Less than 1 Ω
Connector E2# - connector D1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

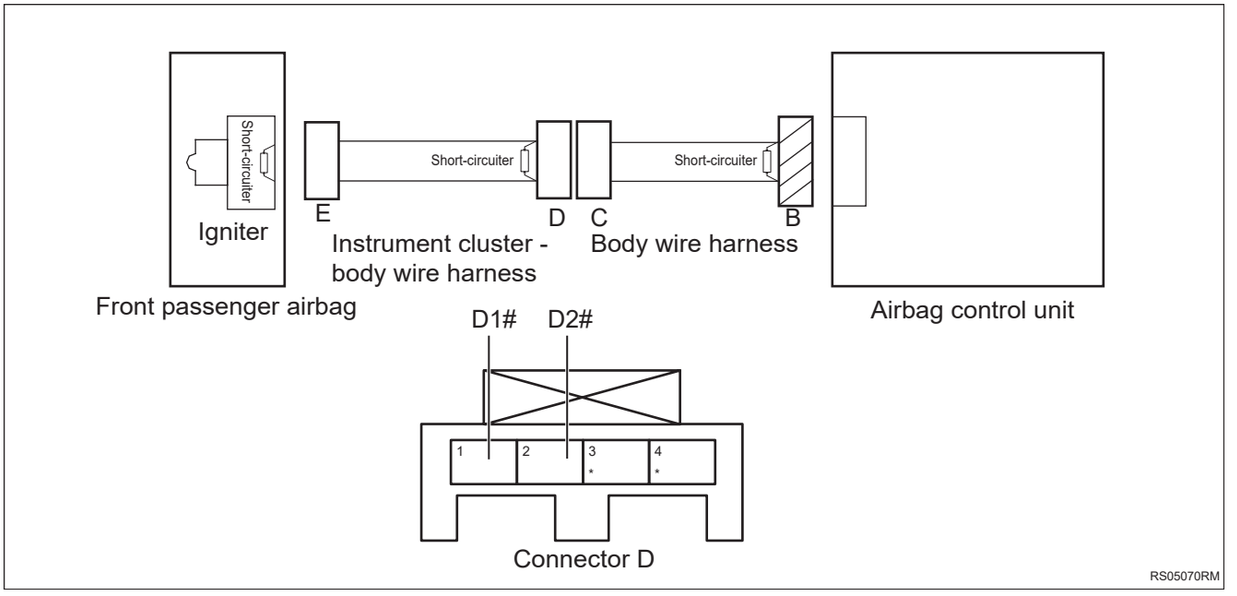
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

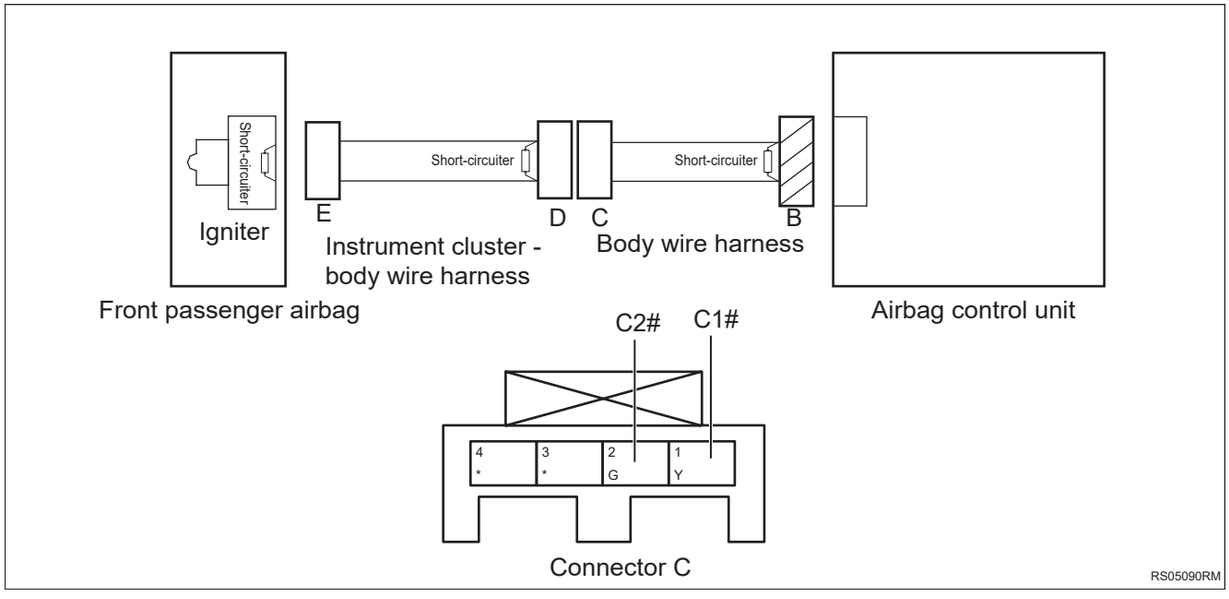
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to each other in front passenger airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

Standard value

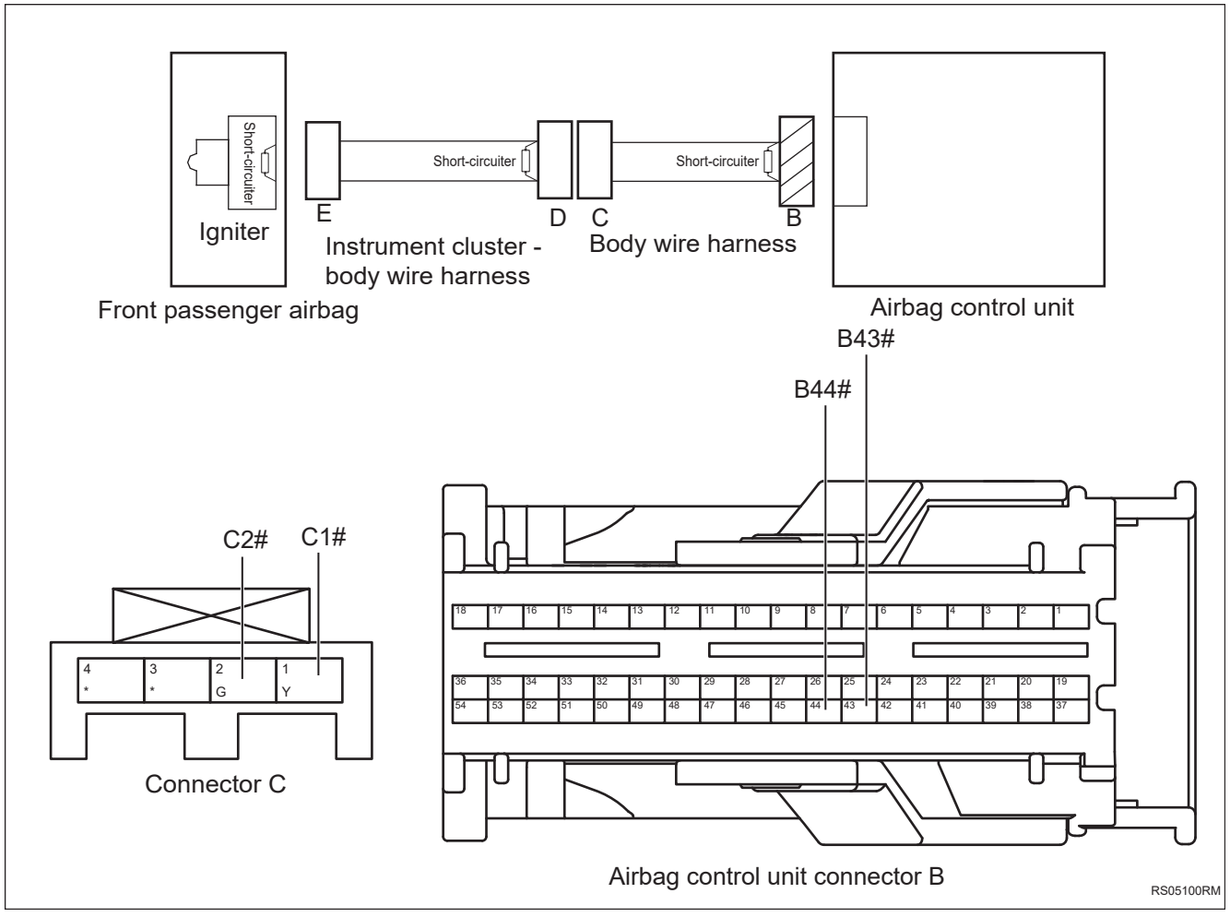
Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	**Check for open in front passenger airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

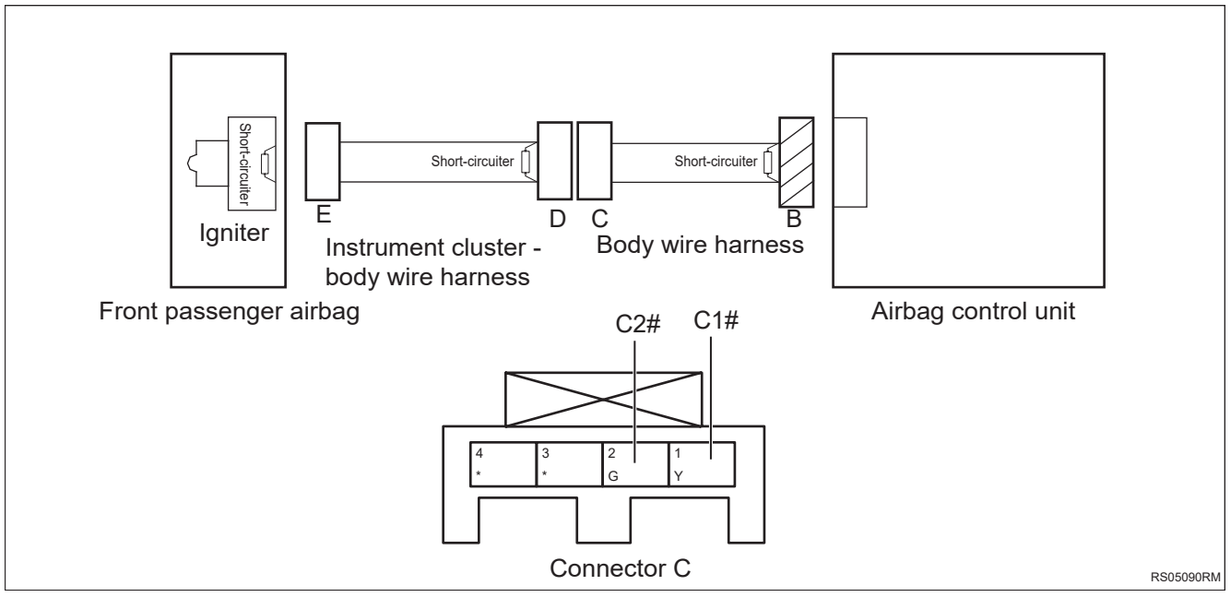
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector B43#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector B44#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in front passenger airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

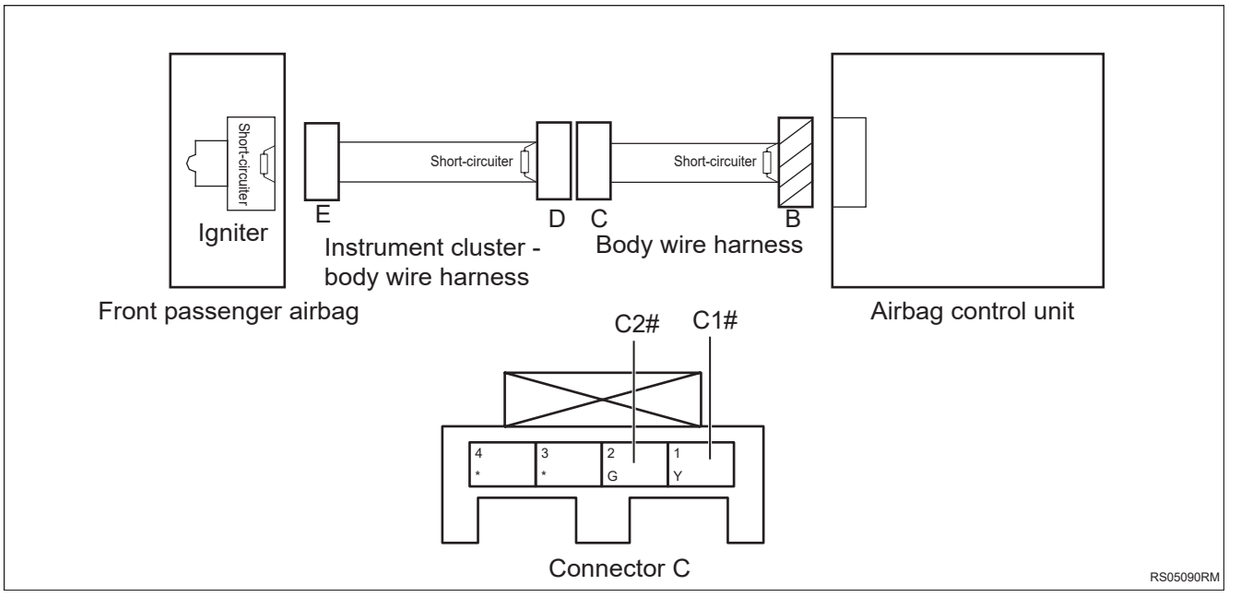
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

8	**Check for short to power supply in front passenger airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Replace front passenger airbag (See page ZC-66)**

(a) Replace the front passenger airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B001056	Front passenger frontal airbag invalid configuration

Description

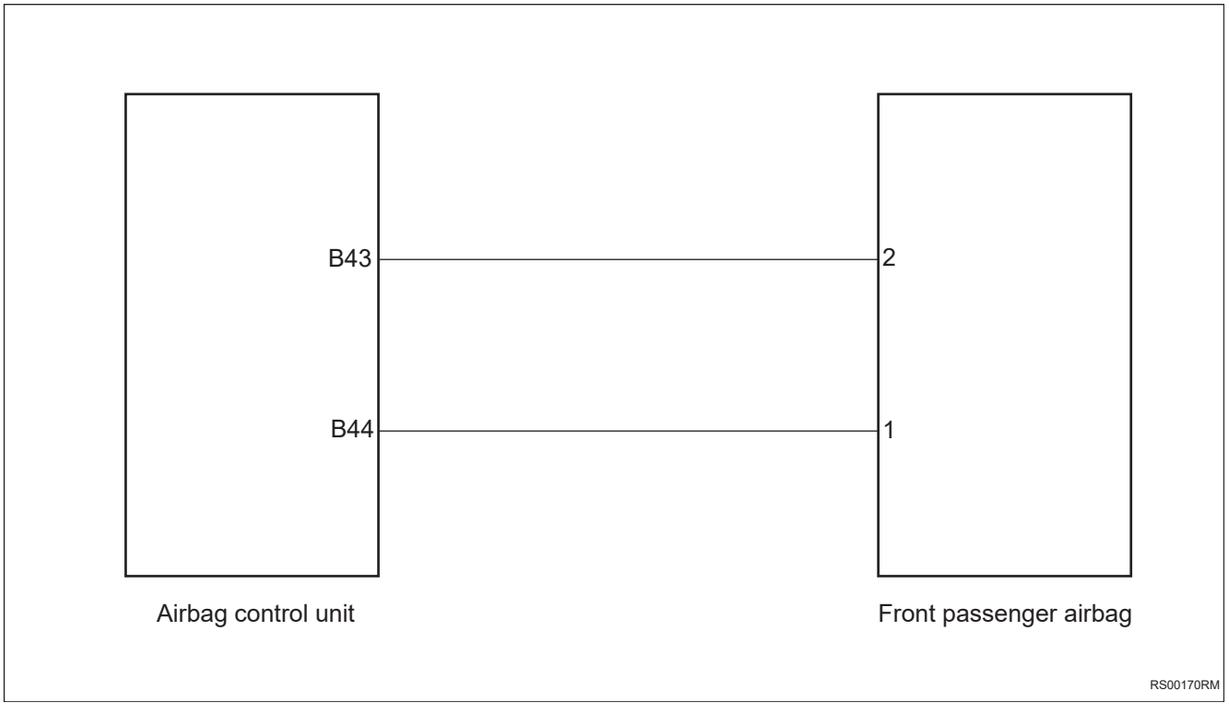
When the front passenger airbag ignition circuit has a configuration error, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B001056	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Front passenger airbag • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B001056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

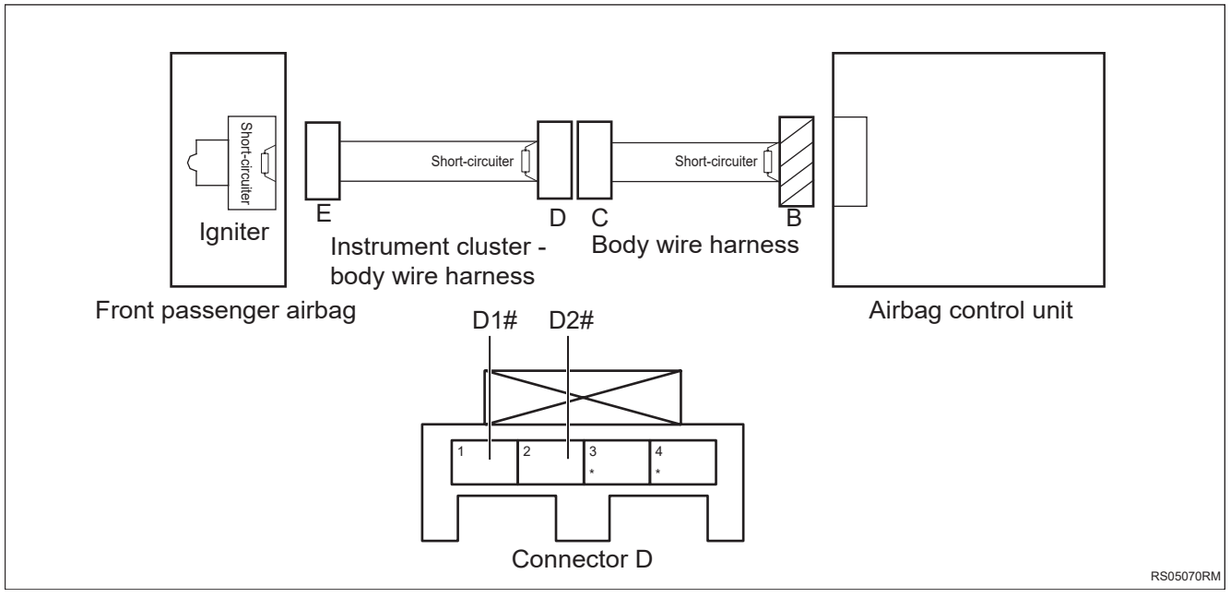
1	**Check and read configuration file of front passenger airbag**

(a) Check and read if configuration file of front passenger airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

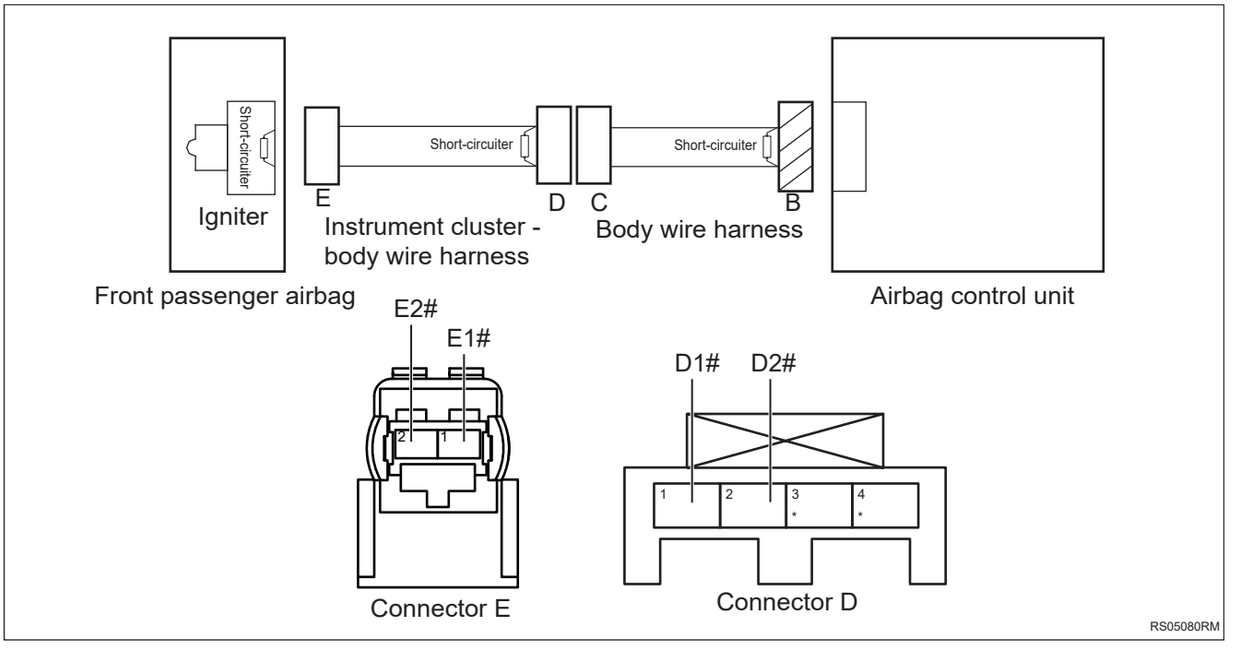
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

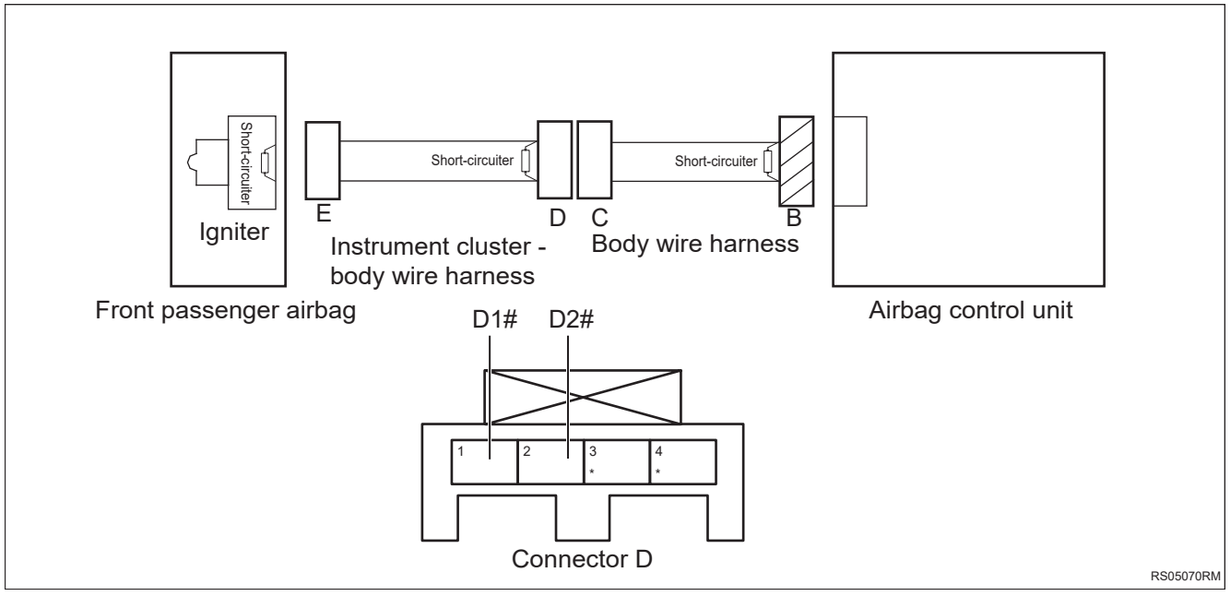
Standard value

Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D2#	Always connected	Less than 1 Ω
Connector E2# - connector D1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

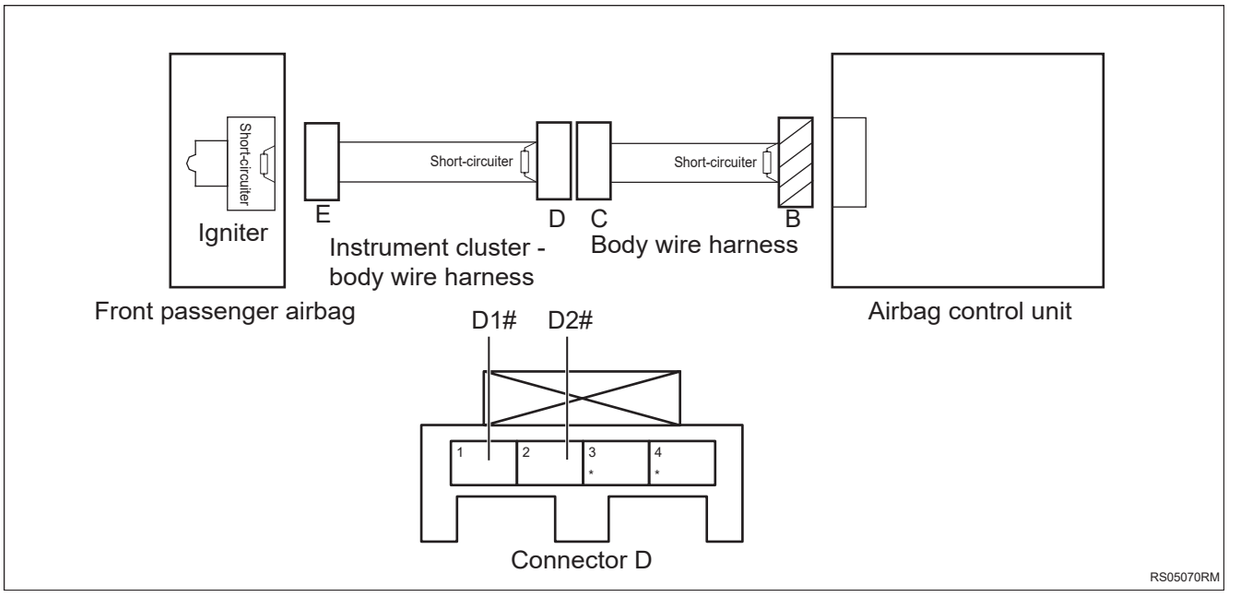
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in front passenger airbag wire harness and connector (instrument cluster - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

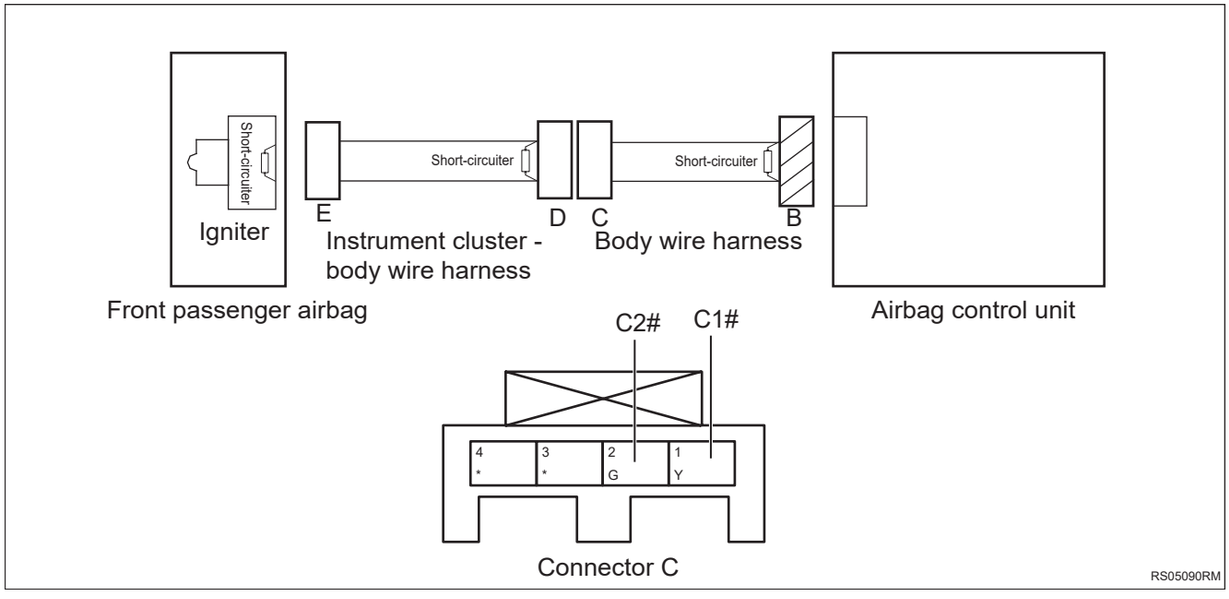
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in front passenger airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

Standard value

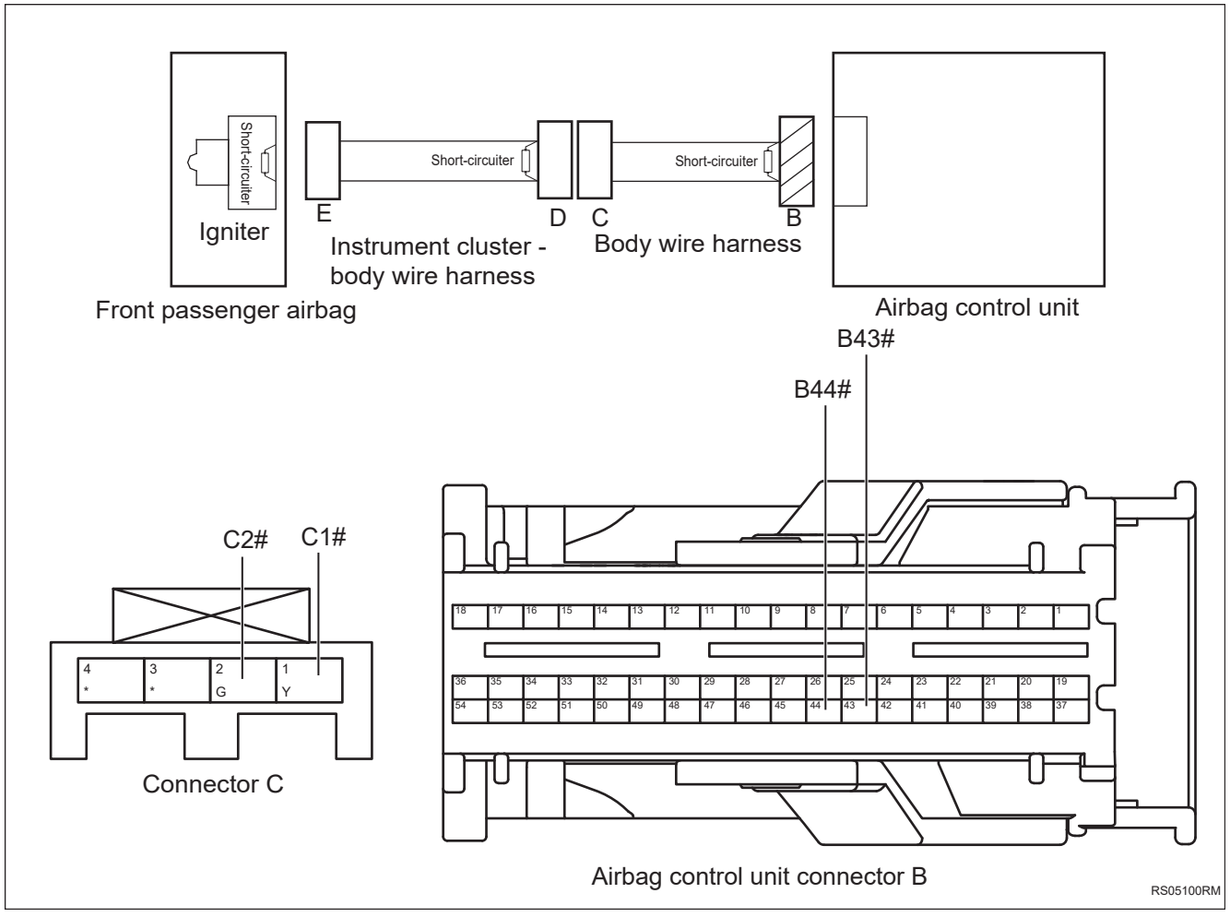
Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

7	**Check for open in front passenger airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

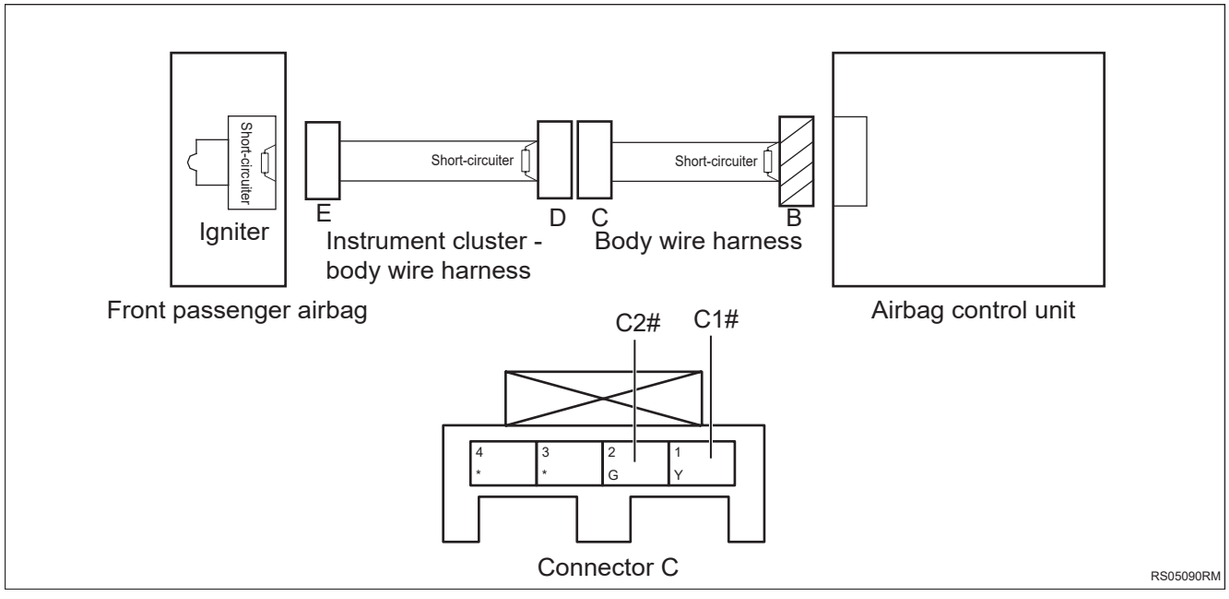
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector B43#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector B44#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	Check for short to ground in front passenger airbag wire harness and connector (body wire harness)



(a) According to value in the table, measure resistance.

Standard value

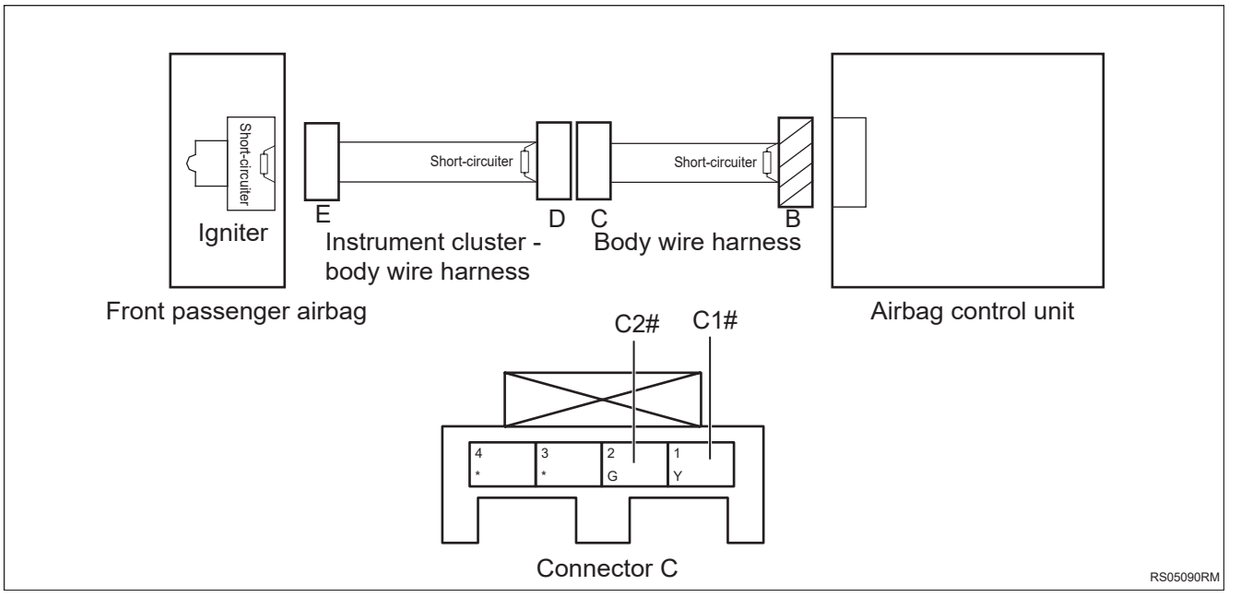
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

9	**Check for short to power supply in front passenger airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace front passenger airbag (See page ZC-66)**

(a) Replace the front passenger airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B002011**	**Short to ground in driver side airbag circuit**
DTC	**B002012**	**Short to power supply in driver side airbag circuit**
DTC	**B00201A**	**Driver side airbag circuit resistance below threshold**
DTC	**B00201B**	**Driver side airbag circuit resistance above threshold**
DTC	**B00202B**	**Driver side airbag other circuit series fault**

Description

When there is short to ground, short to power supply, high or low resistance, series fault in driver seat airbag ignition circuit, the airbag control unit records DTC.

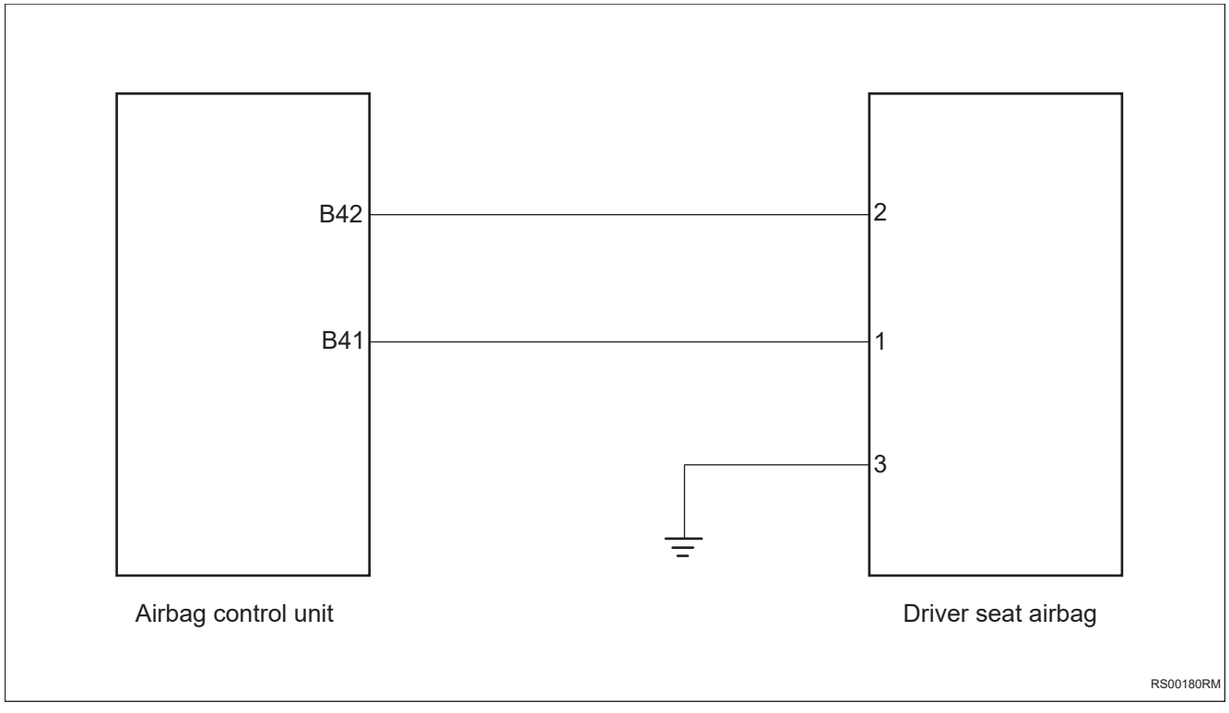
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002011	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Driver seat airbag • Airbag control unit • Wire harness and connector
B002012	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Driver seat airbag • Airbag control unit • Wire harness and connector
B00201A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat airbag • Airbag control unit • Wire harness and connector
B00201B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat airbag • Airbag control unit • Wire harness and connector
B00202B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Driver seat airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

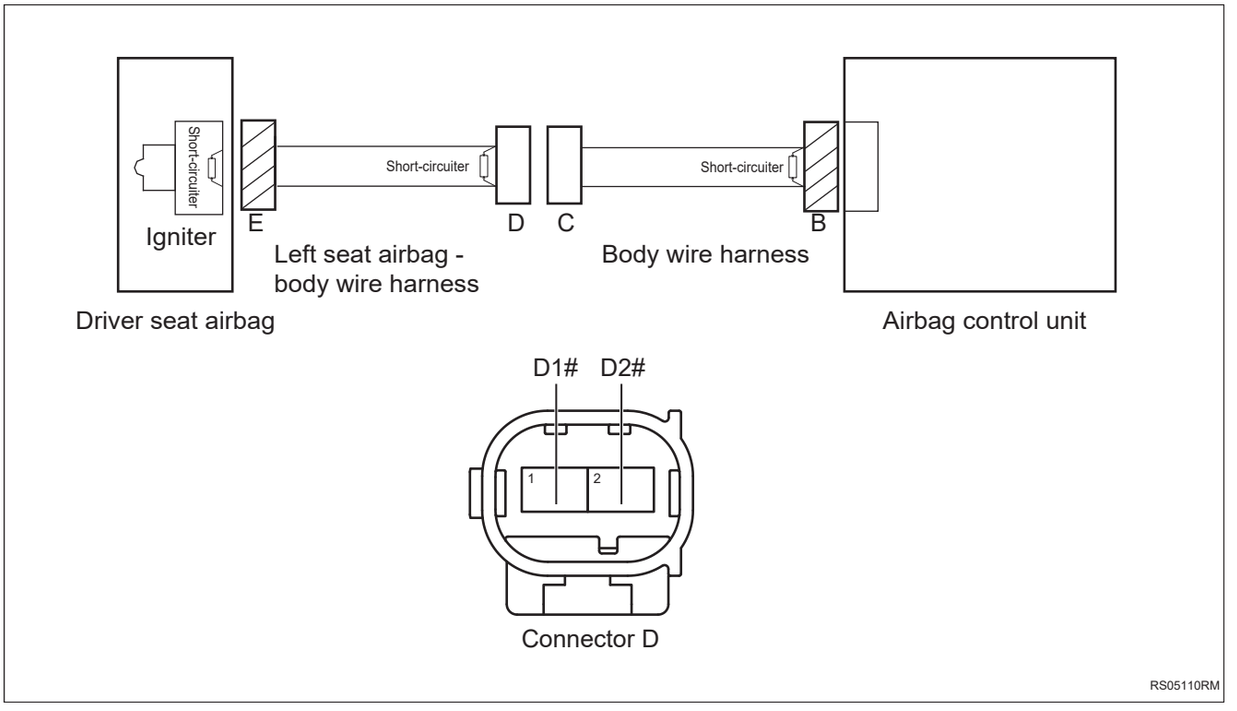
DTC No.	Fault symptom	Warning light/indicator
B002011	• Warning light comes on • Set DTC	Comes on
B002012	• Warning light comes on • Set DTC	Comes on
B00201A	• Warning light comes on • Set DTC	Comes on
B00201B	• Warning light comes on • Set DTC	Comes on
B00202B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

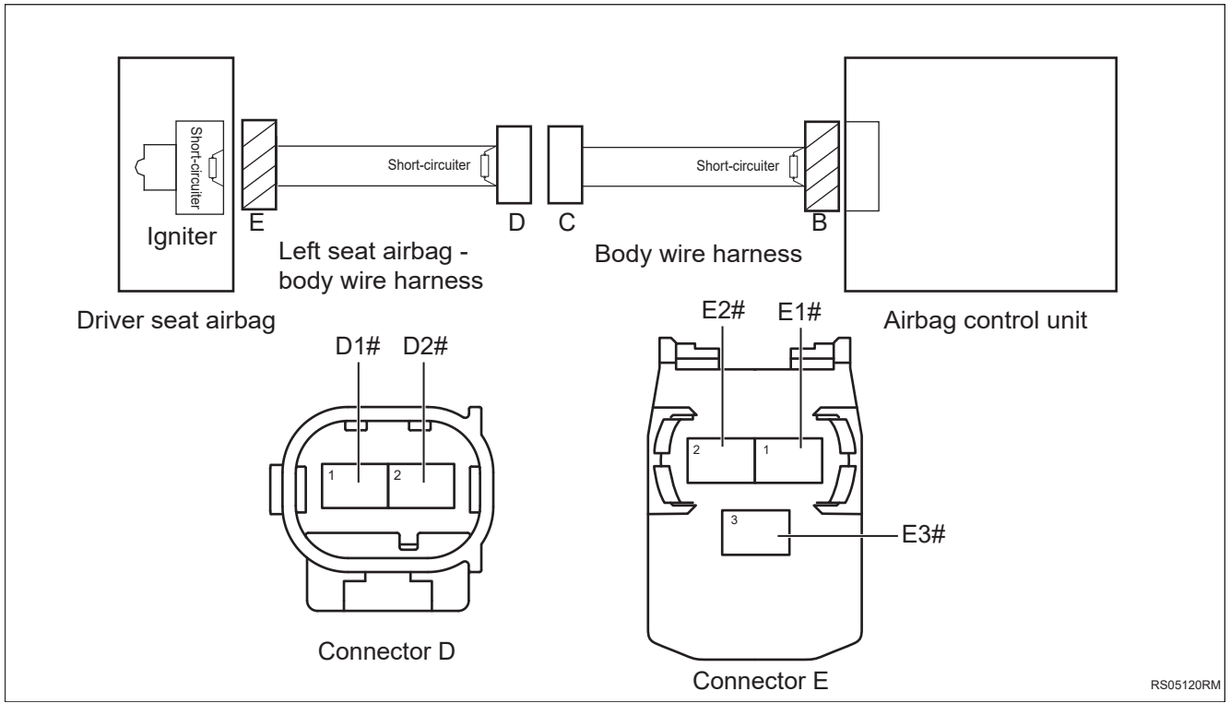
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

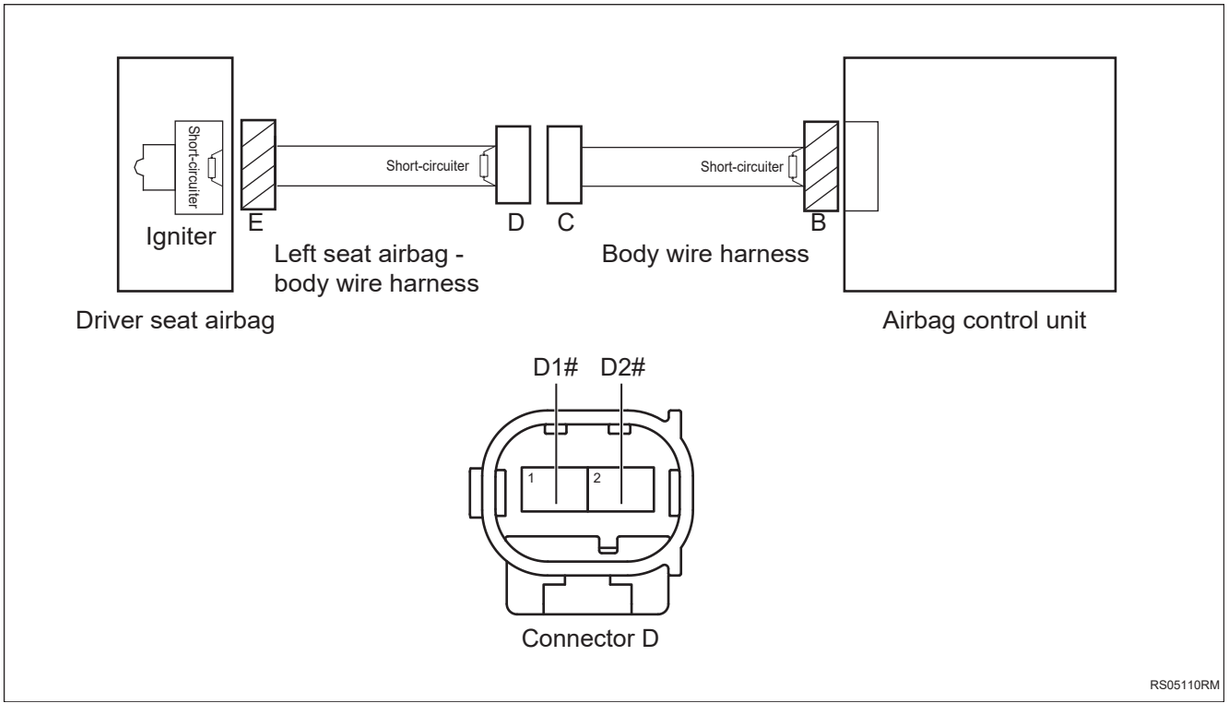
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω
Connector E3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

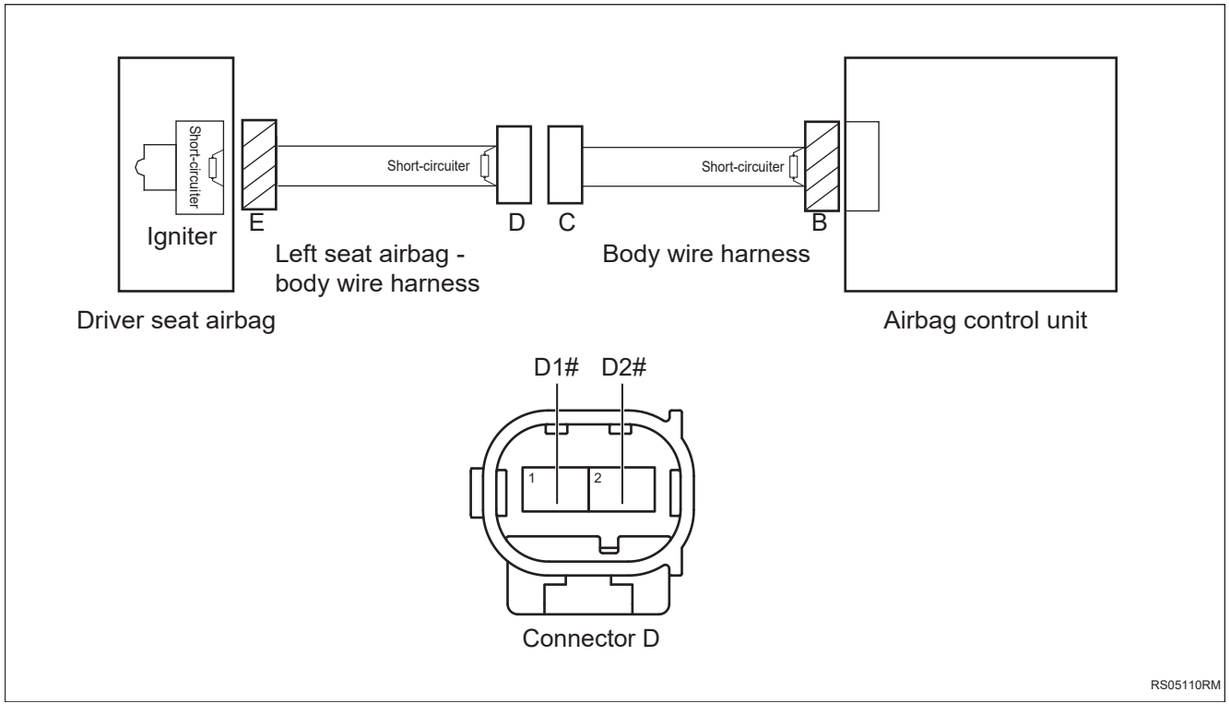
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

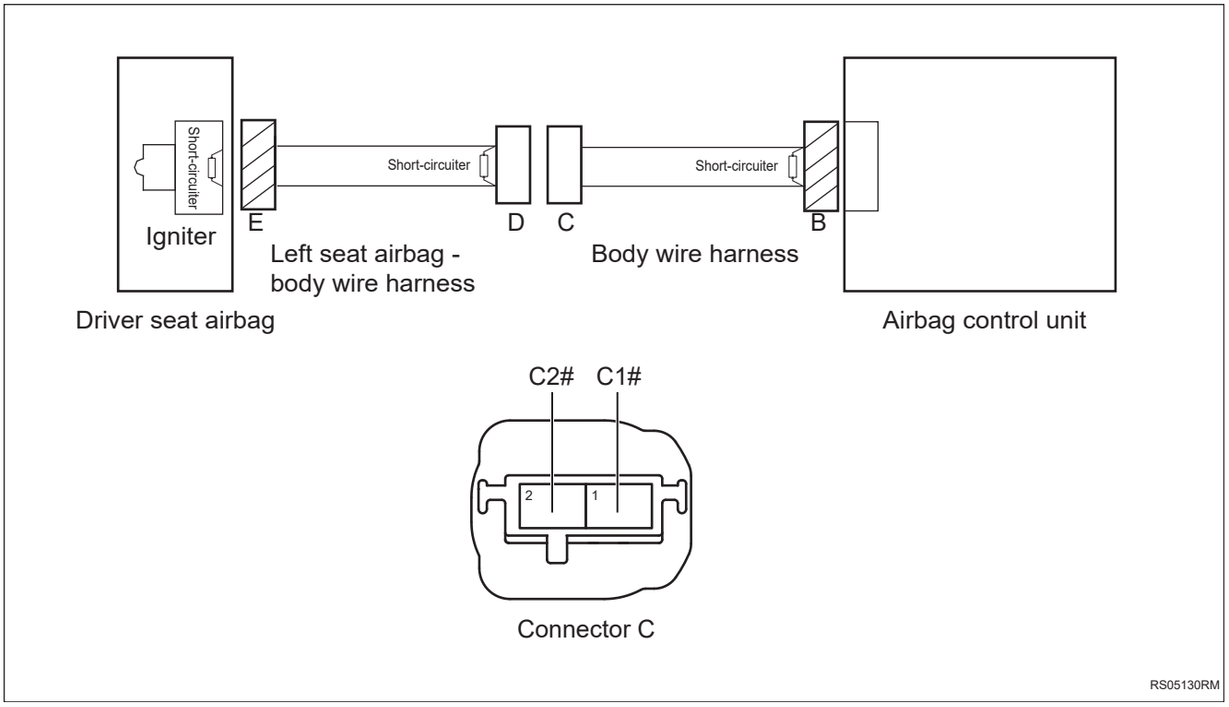
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to each other in driver seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

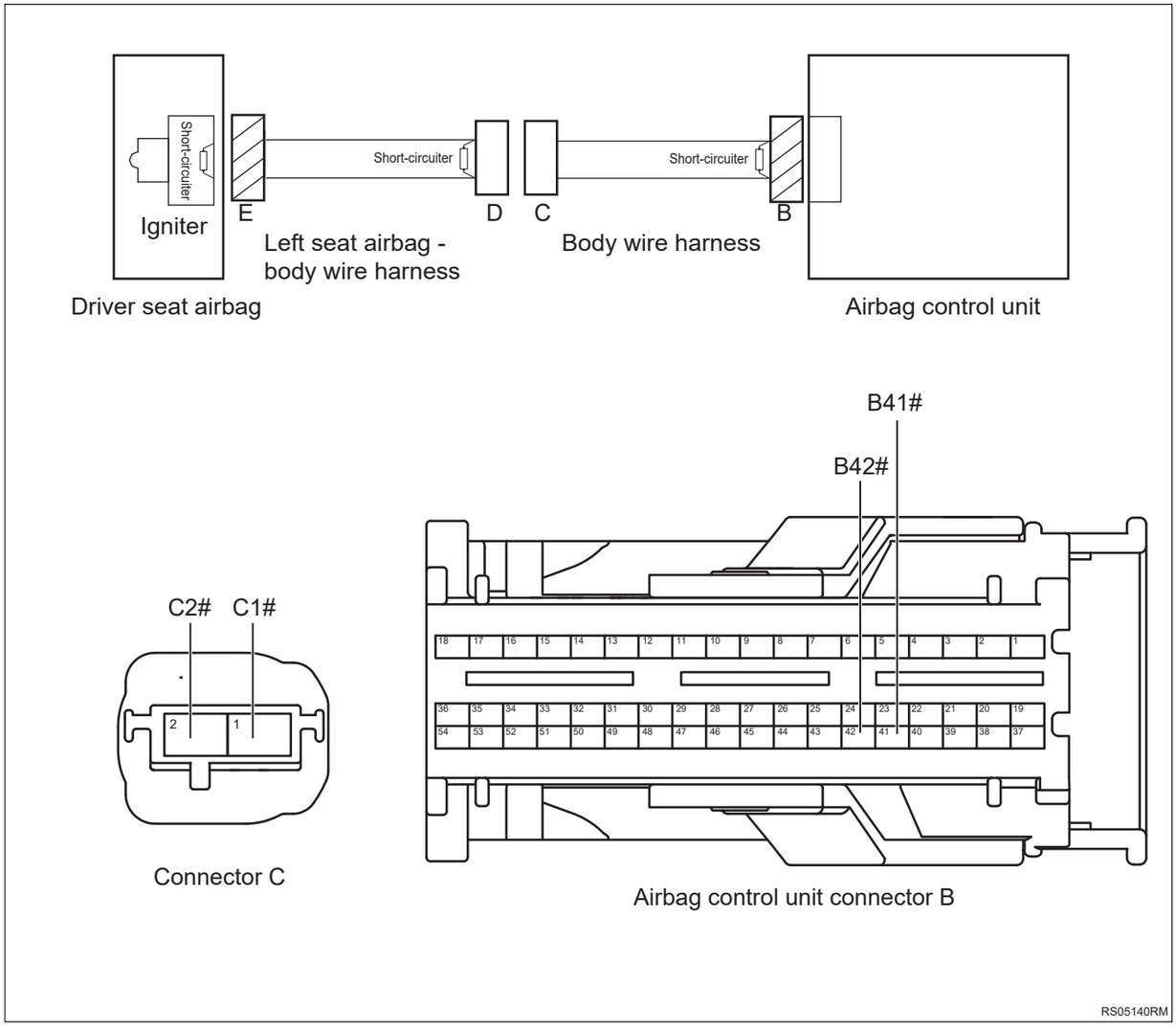
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in driver seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

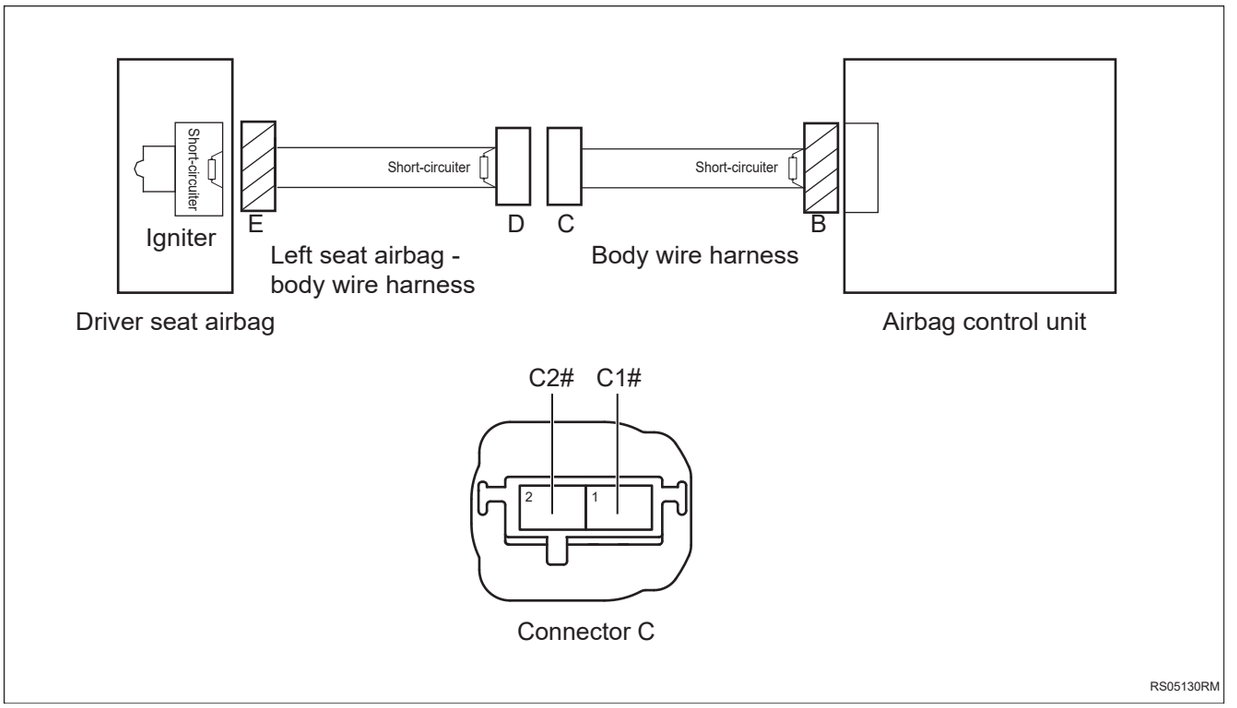
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C2# - airbag control unit connector B42#	Always connected	Less than 1 Ω
Connector C1# - airbag control unit connector B41#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in driver seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

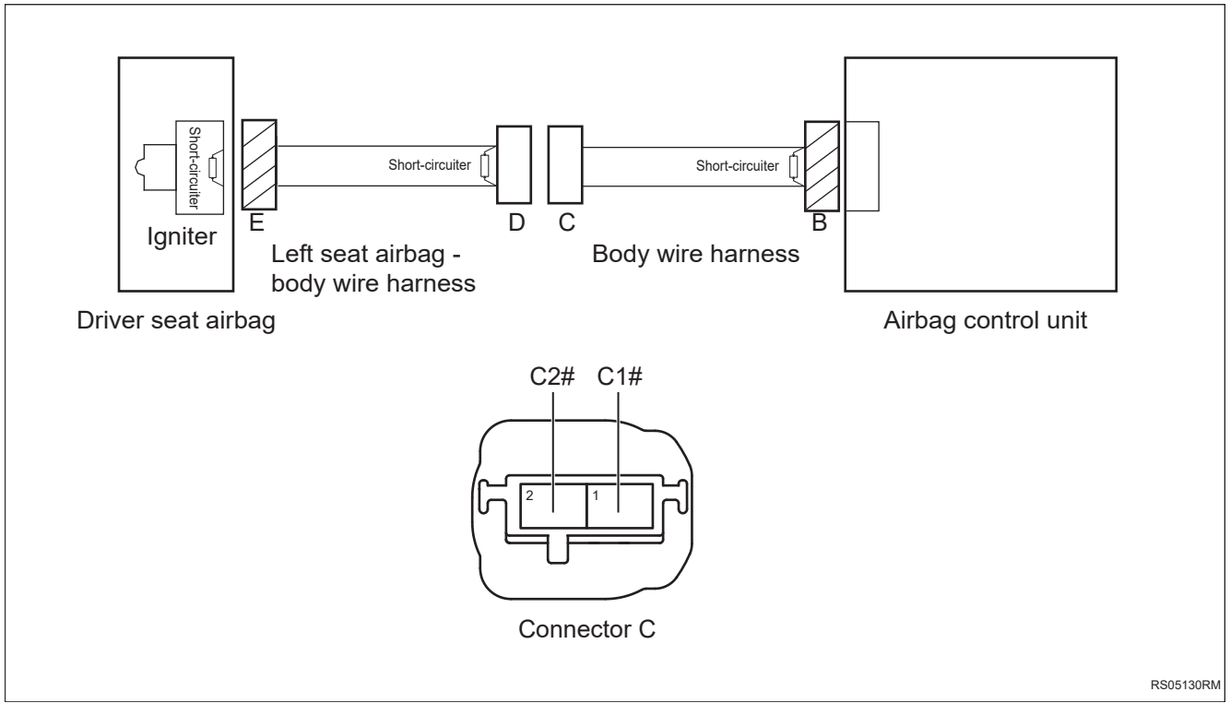
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to power supply in driver seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

9	**Replace driver seat airbag (See page ZC-63)**

(a) Replace the driver seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B002056	Driver side airbag invalid configuration

Description

When driver seat airbag ignition circuit has an invalid configuration, airbag control unit records DTC.

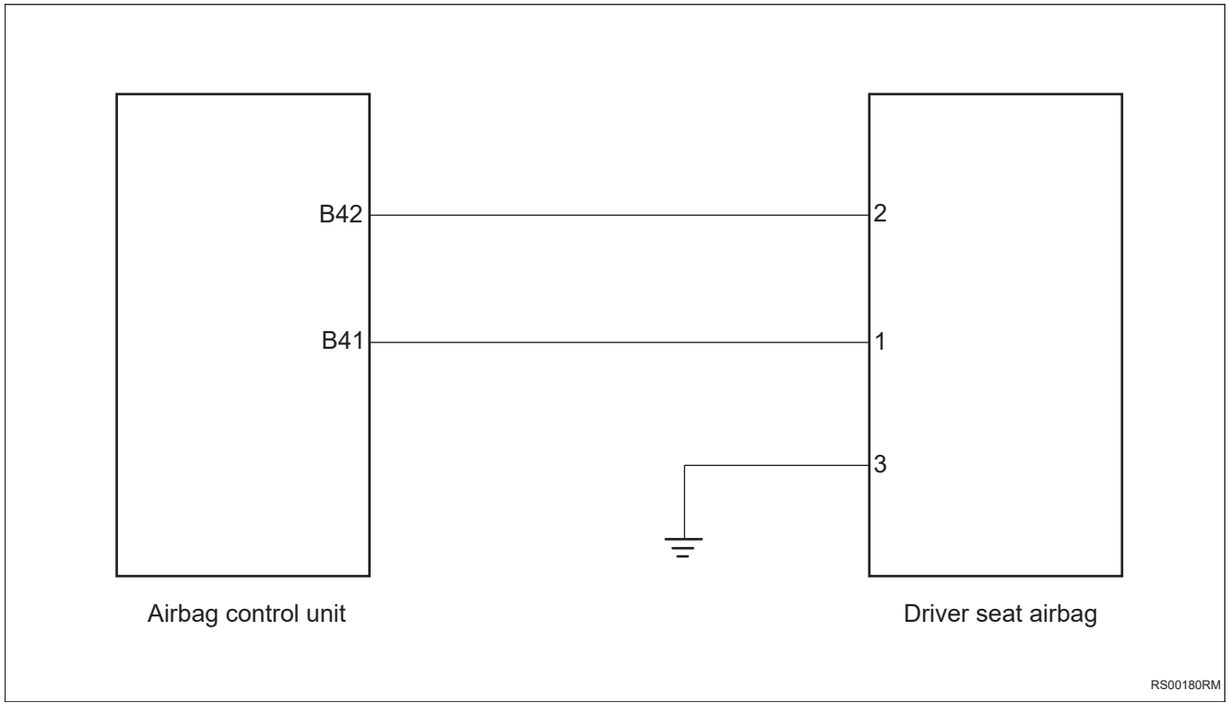
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002056	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Driver seat airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B002056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

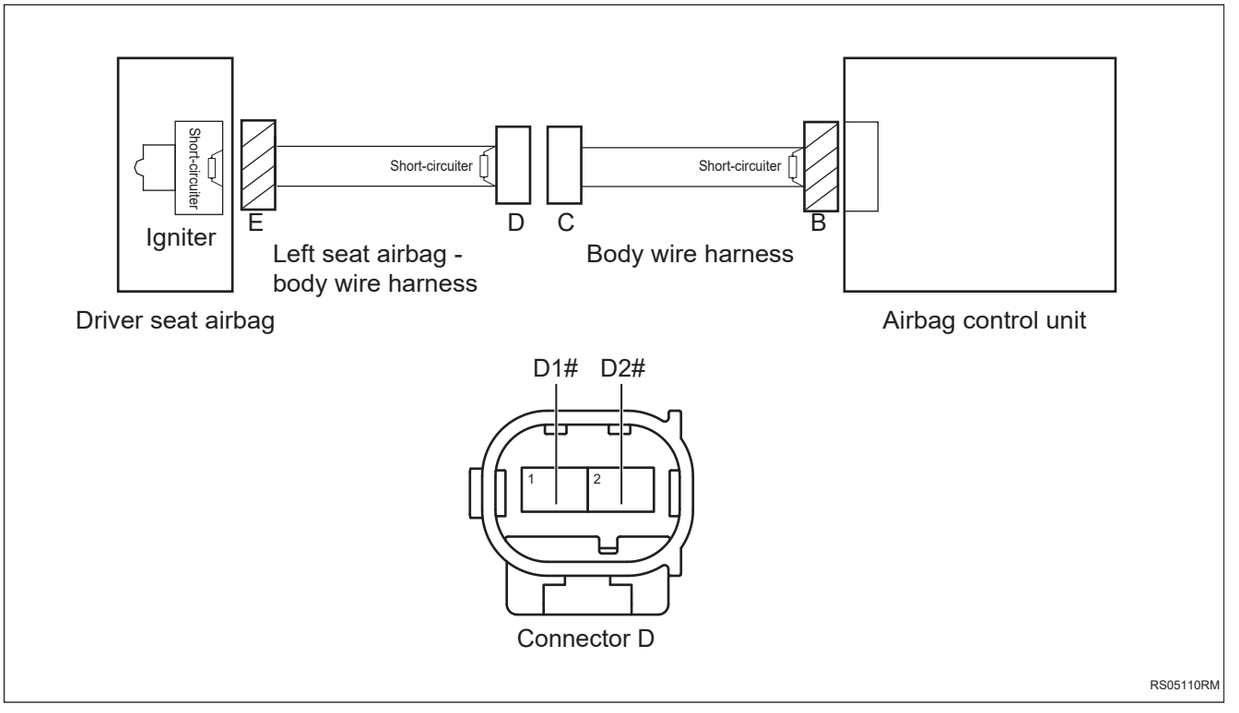
1	**Check and read configuration file of driver seat airbag**

(a) Check and read if configuration file of driver seat airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

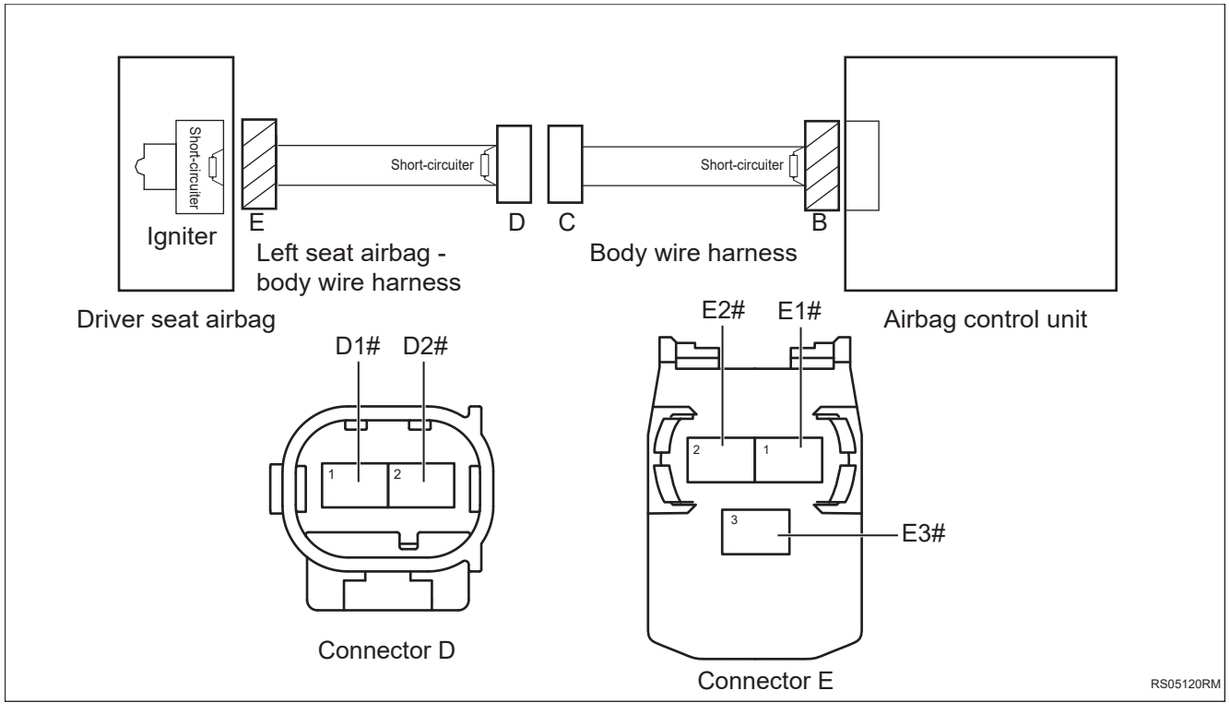
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

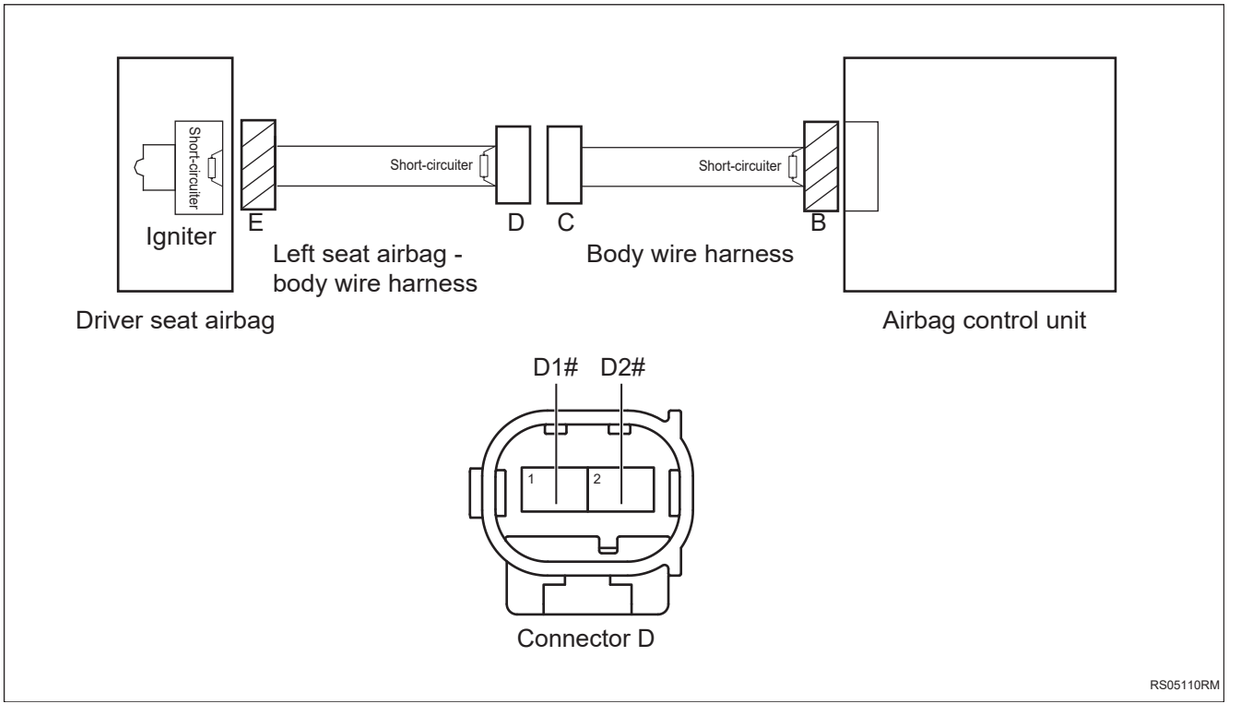
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector E1# - connector D1#	Always connect-ed	Less than 1 Ω
Connector E2# - connector D2#	Always connect-ed	Less than 1 Ω
Connector E3# - body ground	Always connect-ed	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

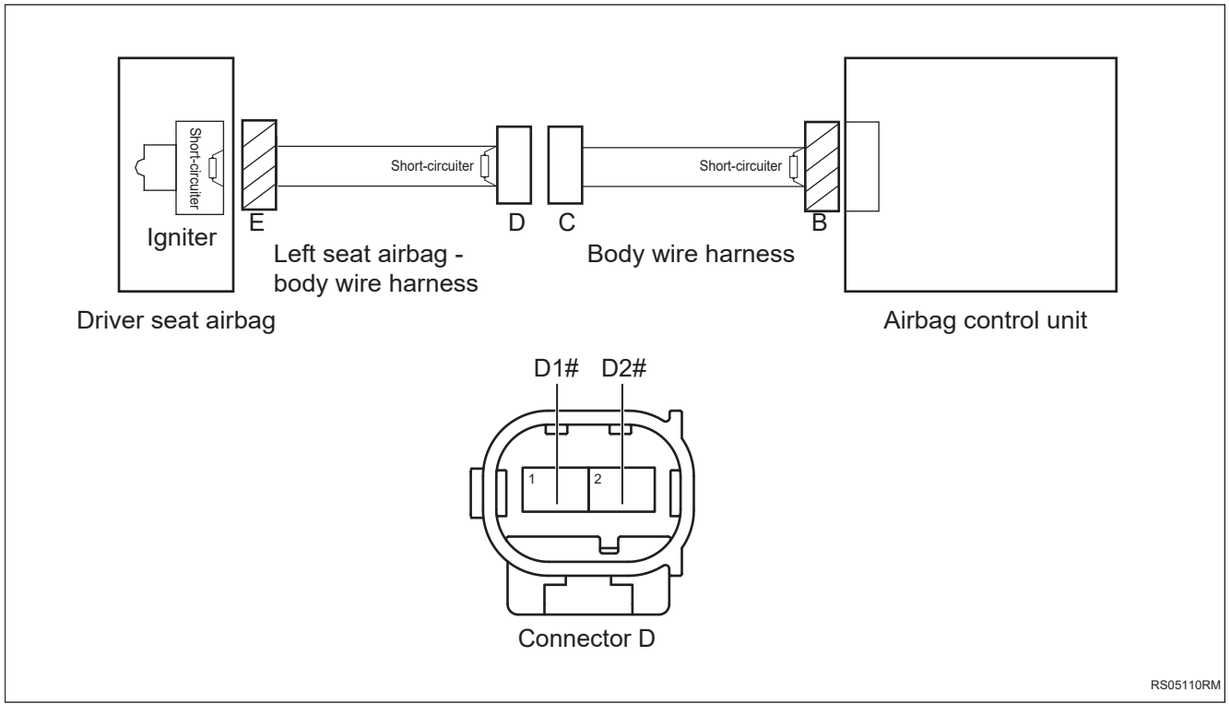
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in driver seat airbag wire harness and connector (left seat airbag - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

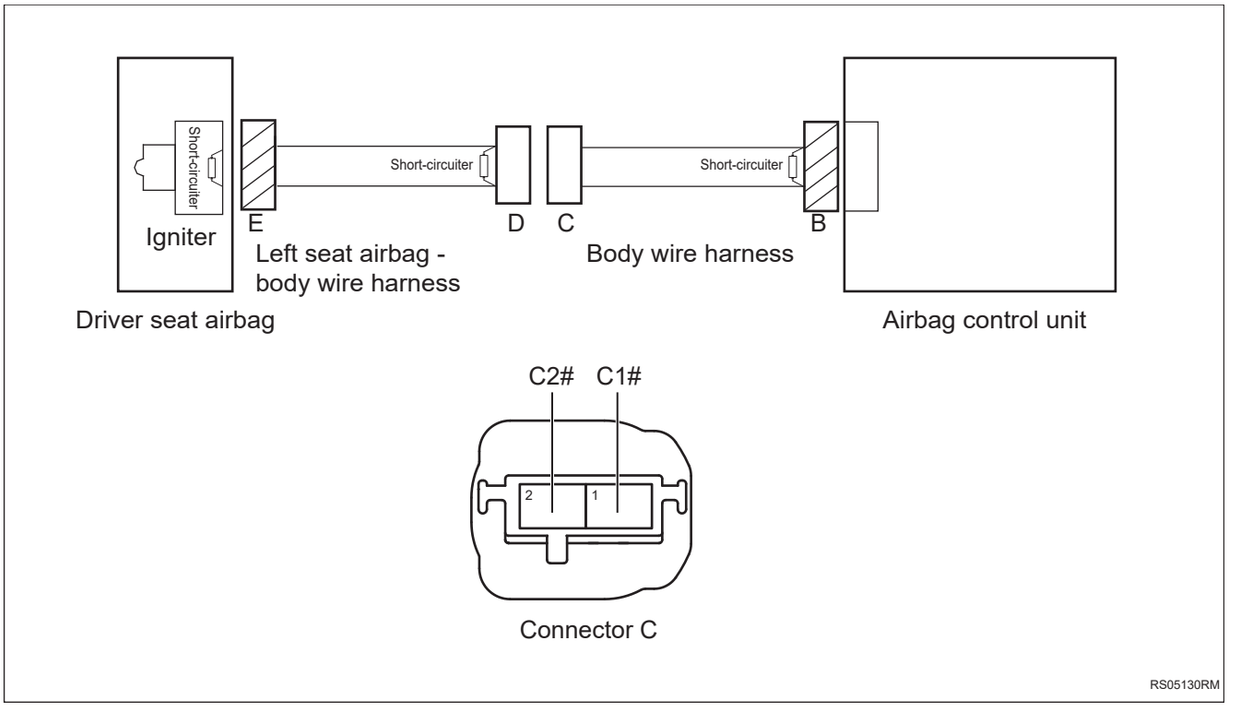
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

6	**Check for short to each other in driver seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

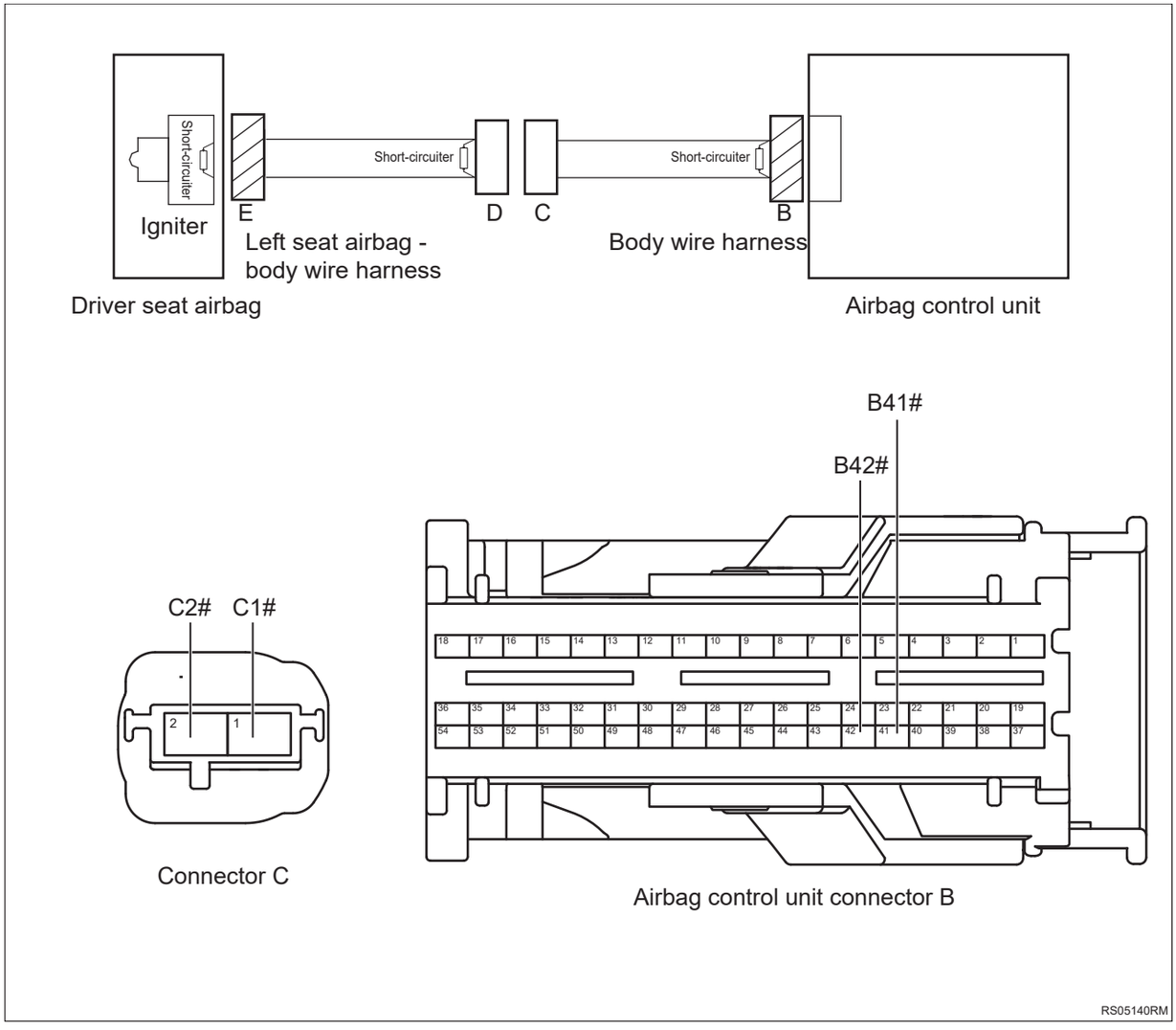
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in driver seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

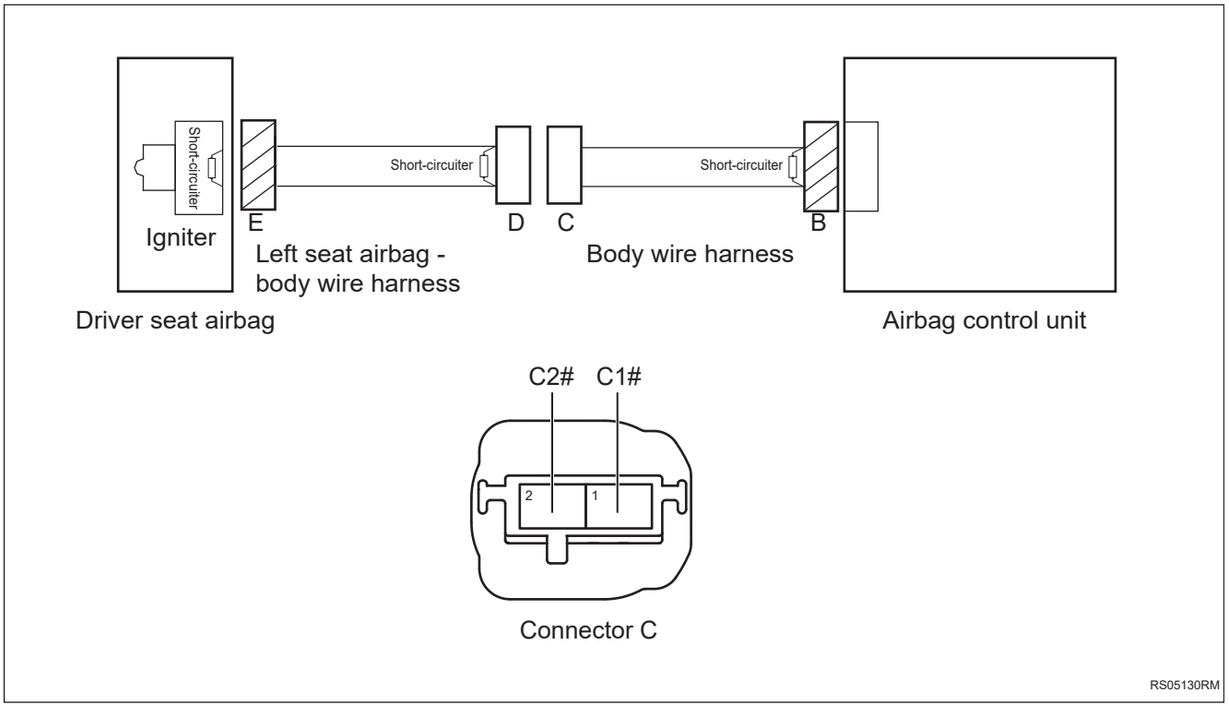
Multimeter connection	Detection condition	Specified condition
Connector C2# - airbag control unit connector B42#	Always connected	Less than 1 Ω
Connector C1# - airbag control unit connector B41#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	**Check for short to ground in driver seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

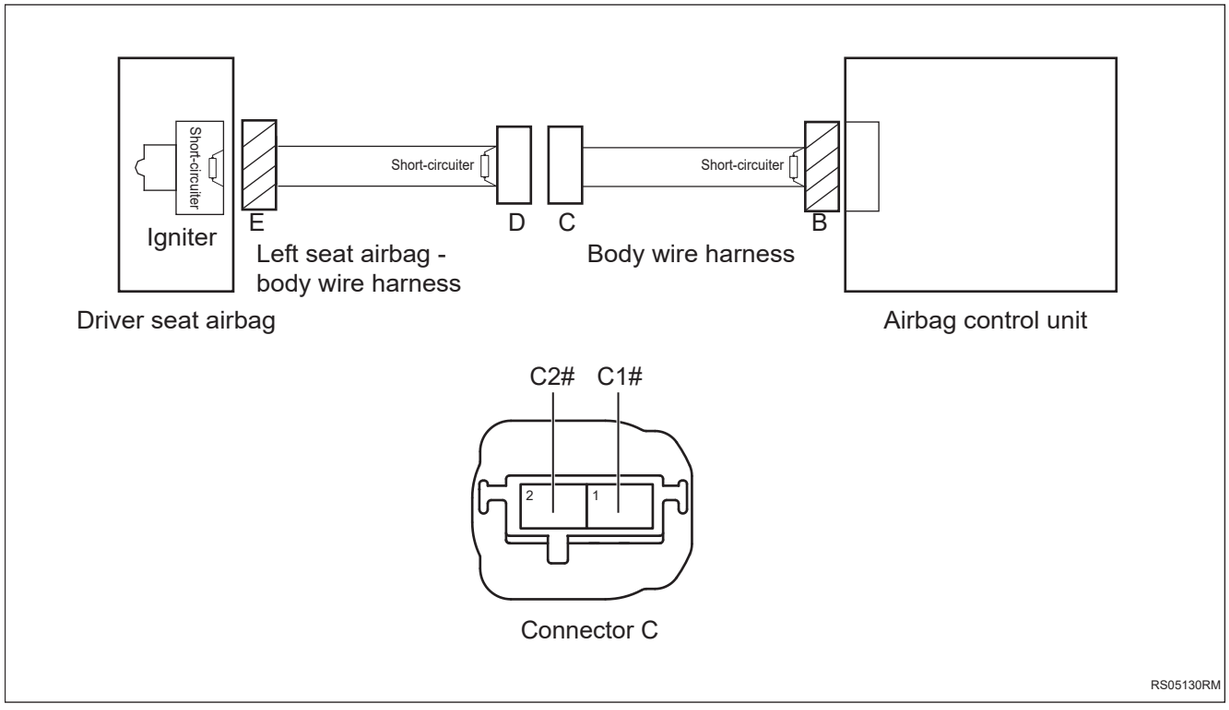
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

9	**Check for short to power supply in driver seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

10	**Replace driver seat airbag (See page ZC-63)**

(a) Replace the driver seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B002111**	**Short to ground in left curtain shield airbag circuit**
DTC	**B002112**	**Short to power supply in left curtain shield airbag circuit**
DTC	**B00211A**	**Left curtain shield airbag circuit resistance below threshold**
DTC	**B00211B**	**Left curtain shield airbag circuit resistance above threshold**
DTC	**B00212B**	**Left curtain shield airbag other circuit series fault**

Description

When there is short to ground, short to power supply, high or low resistance, series fault in left side curtain shield airbag ignition circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002111	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector
B002112	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector
B00211A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault	5 times	Continuous type	400 ms	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector

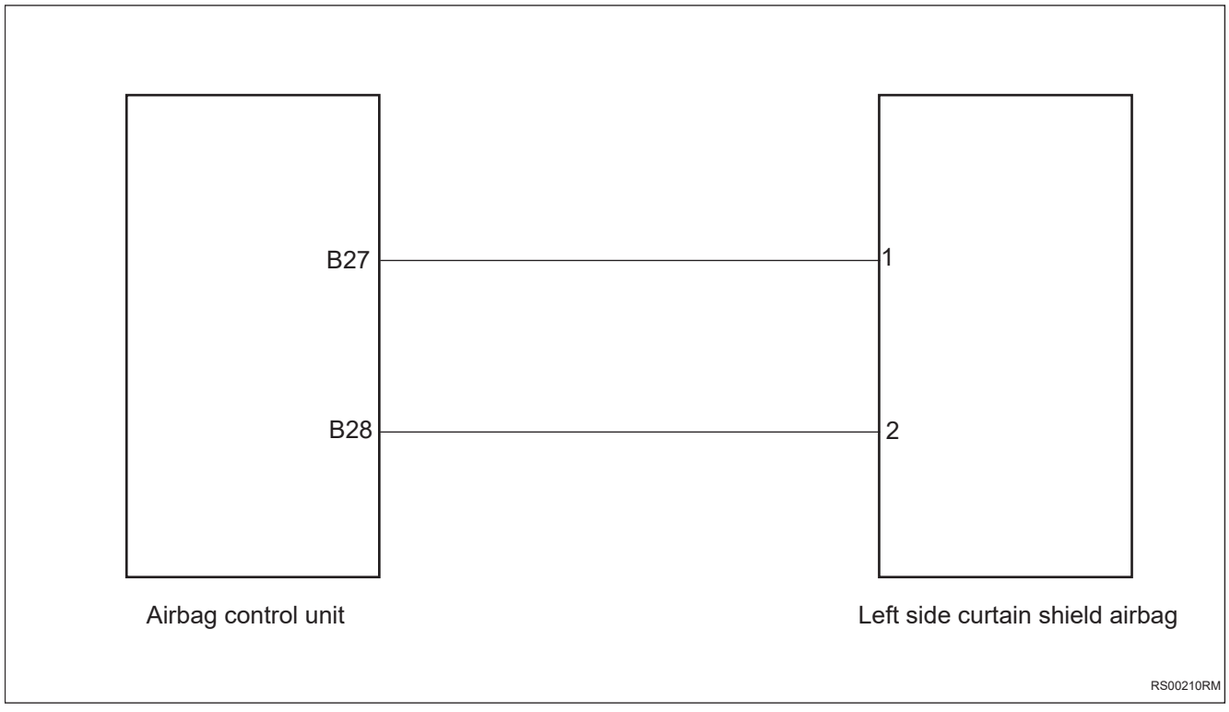
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		may be detected				
B00211B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector
B00212B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

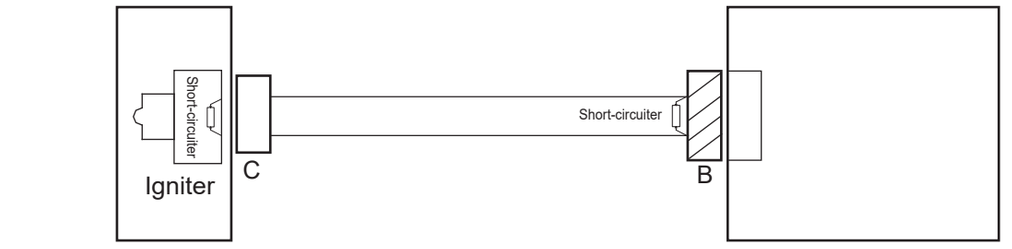
DTC No.	Fault symptom	Warning light/indicator
B002111	• Warning light comes on • Set DTC	Comes on
B002112	• Warning light comes on • Set DTC	Comes on
B00211A	• Warning light comes on • Set DTC	Comes on
B00211B	• Warning light comes on • Set DTC	Comes on
B00212B	• Warning light comes on • Set DTC	Comes on

Circuit diagram

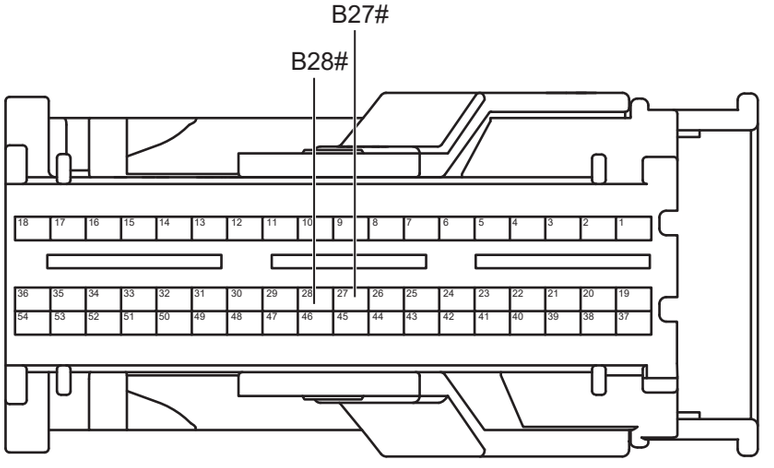


Inspection procedure

1	**Check if there is short to each other in left side curtain shield airbag wire harness and connector**



Left side curtain shield airbag — Airbag control unit



Airbag control unit connector B

RS05270RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

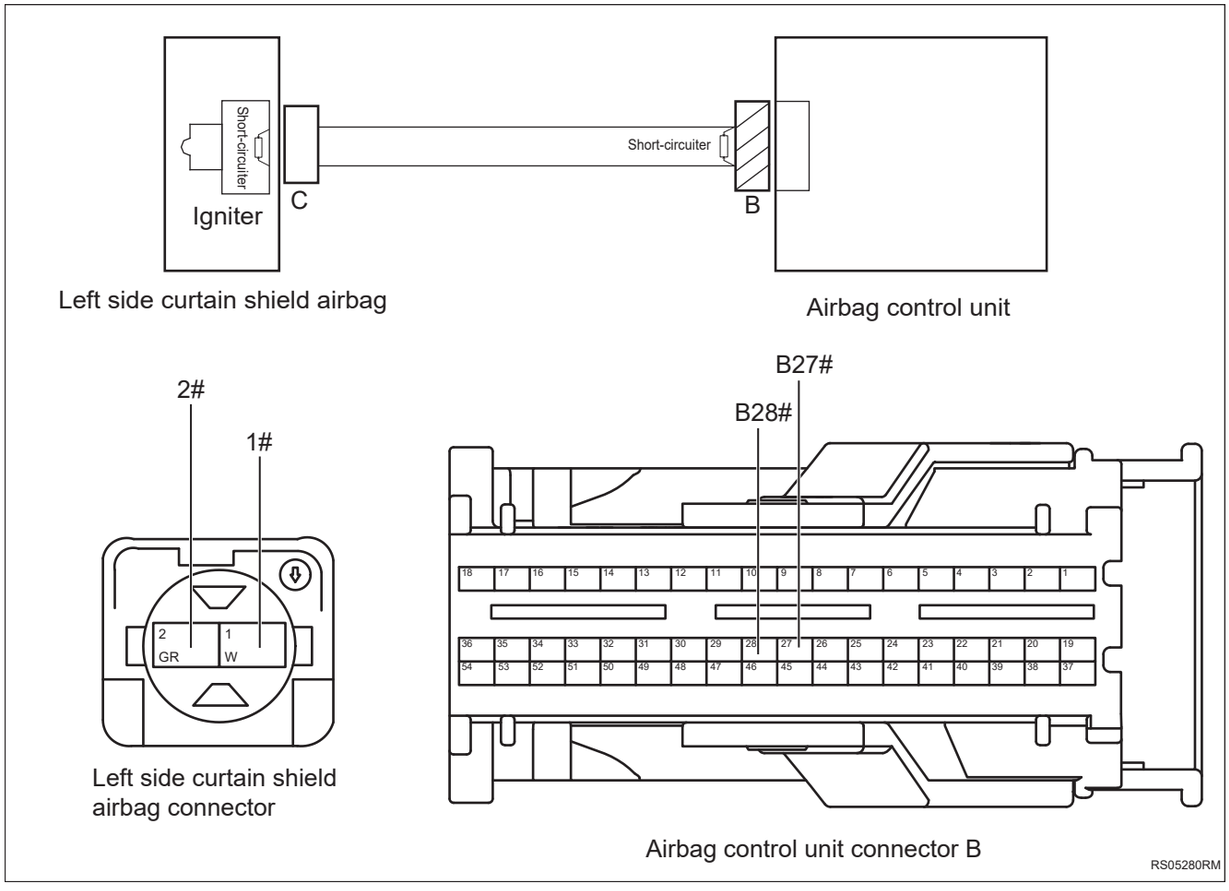
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B27# - airbag control unit connector B28#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in left side curtain shield airbag wire harness and connector**



(a) According to value in the table, measure resistance.

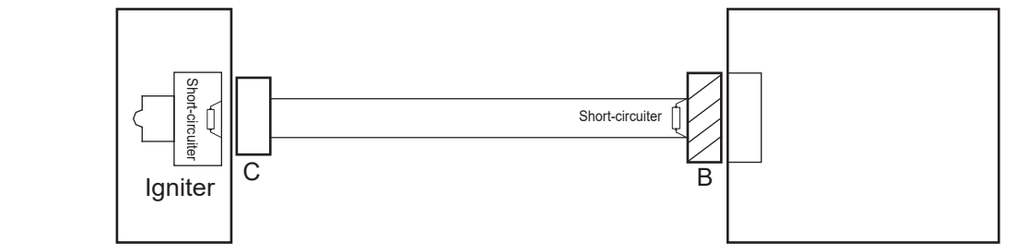
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B28# - left side curtain shield airbag connector 2#	Always connected	Less than 1 Ω
Airbag control unit connector B27# - left side curtain shield airbag connector 1#	Always connected	Less than 1 Ω

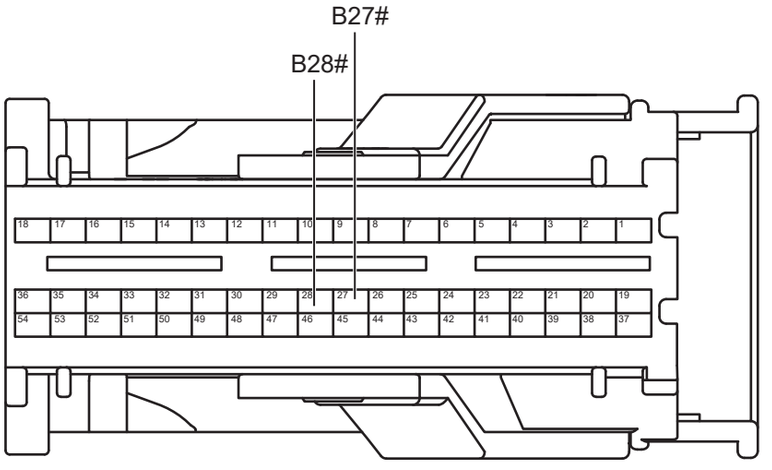
NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in left side curtain shield airbag wire harness and connector**



Left side curtain shield airbag — Airbag control unit



Airbag control unit connector B

RS05270RM

(a) According to value in the table, measure resistance.

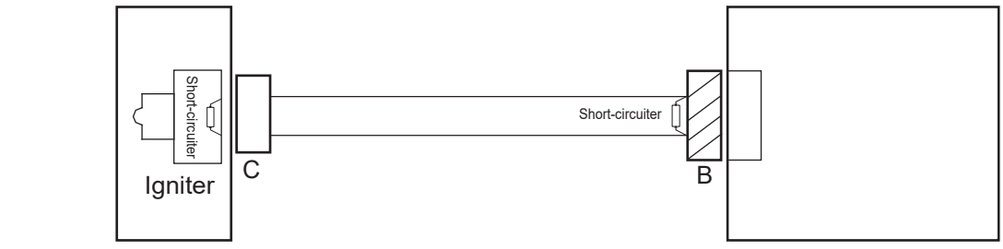
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B27# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B28# - body ground	Always connected	10 KΩ or more

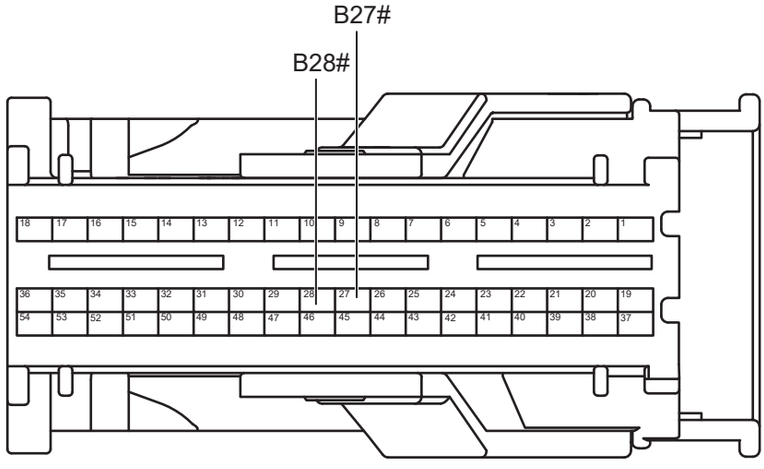
NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in left side curtain shield airbag wire harness and connector**



Left side curtain shield airbag — Airbag control unit



Airbag control unit connector B

RS05270RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B27# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B28# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace left side curtain shield airbag (See page ZC-60)**

(a) Replace the left side curtain shield airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B002156	Left curtain shield airbag invalid configuration

Description

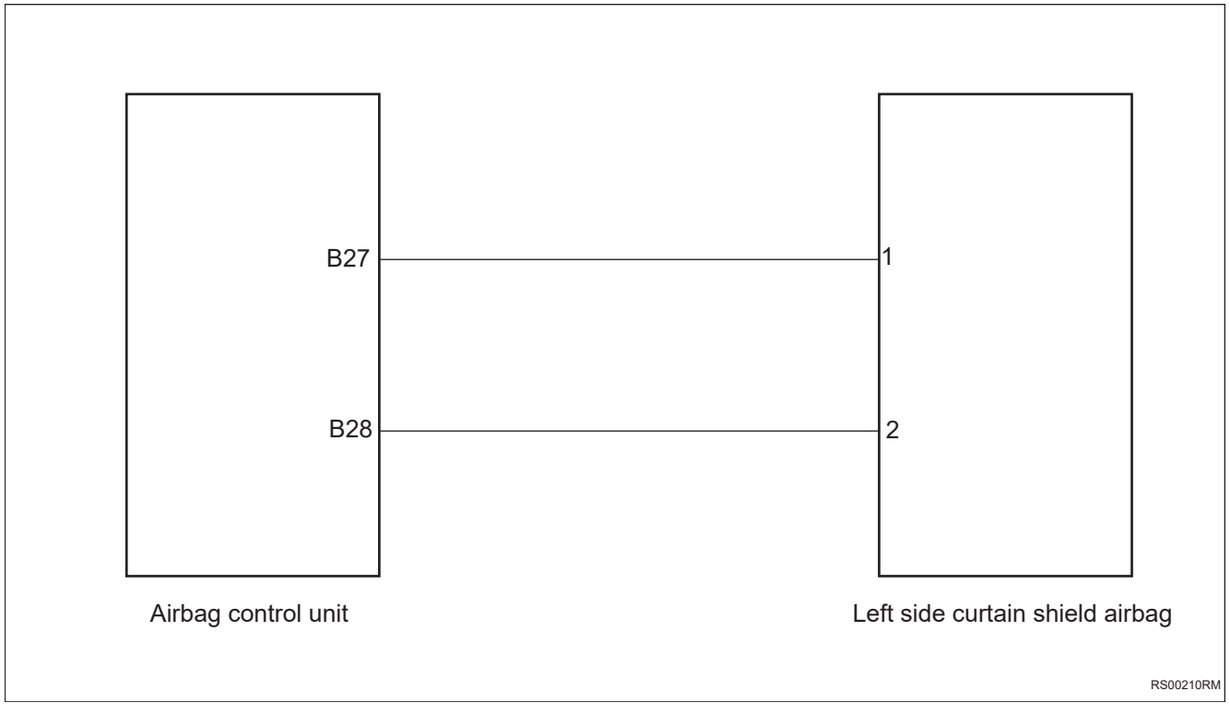
When left side curtain shield airbag ignition circuit has an invalid configuration, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002156	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Left side curtain shield airbag • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B002156	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

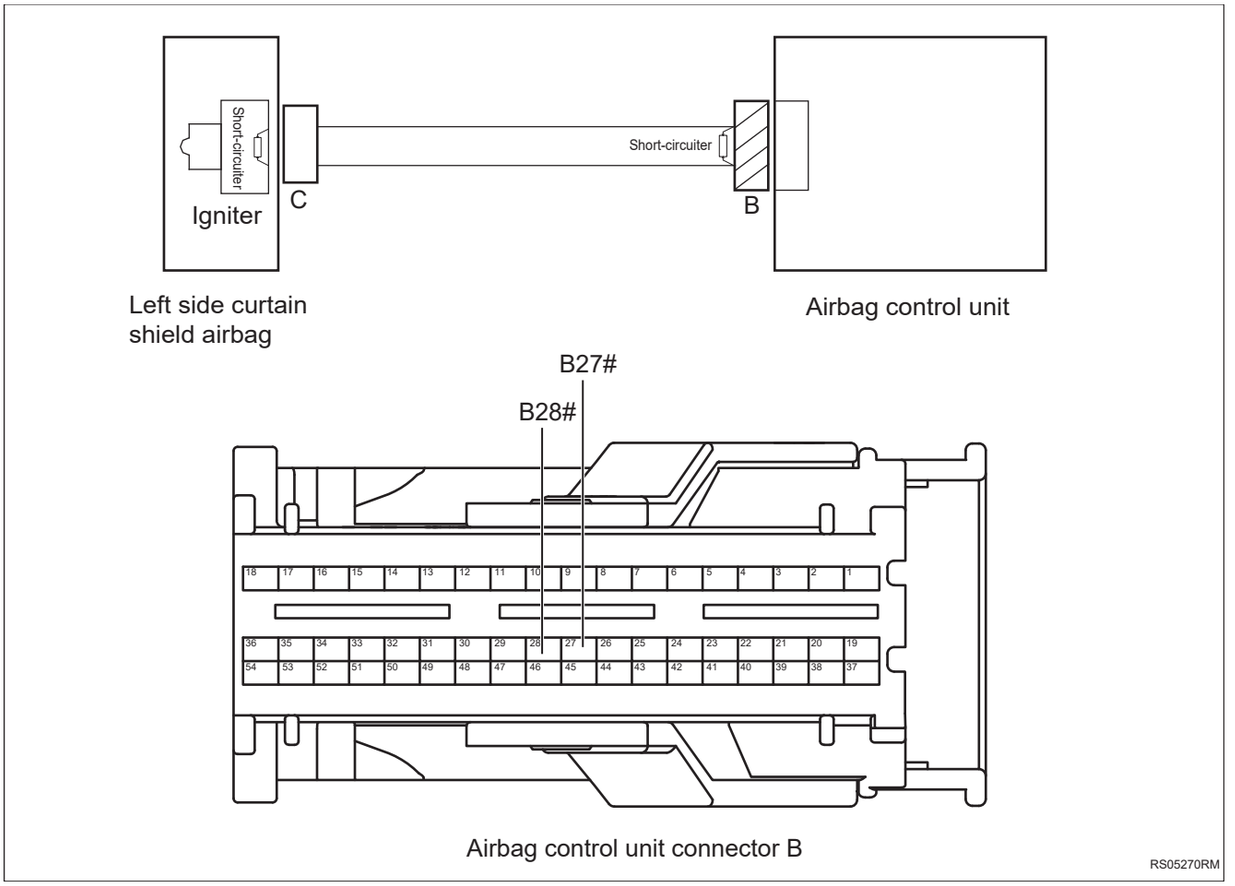
1	**Check and read configuration file of left side curtain shield airbag**

(a) Check and read if configuration file of left side curtain shield airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check if there is short to each other in left side curtain shield airbag wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

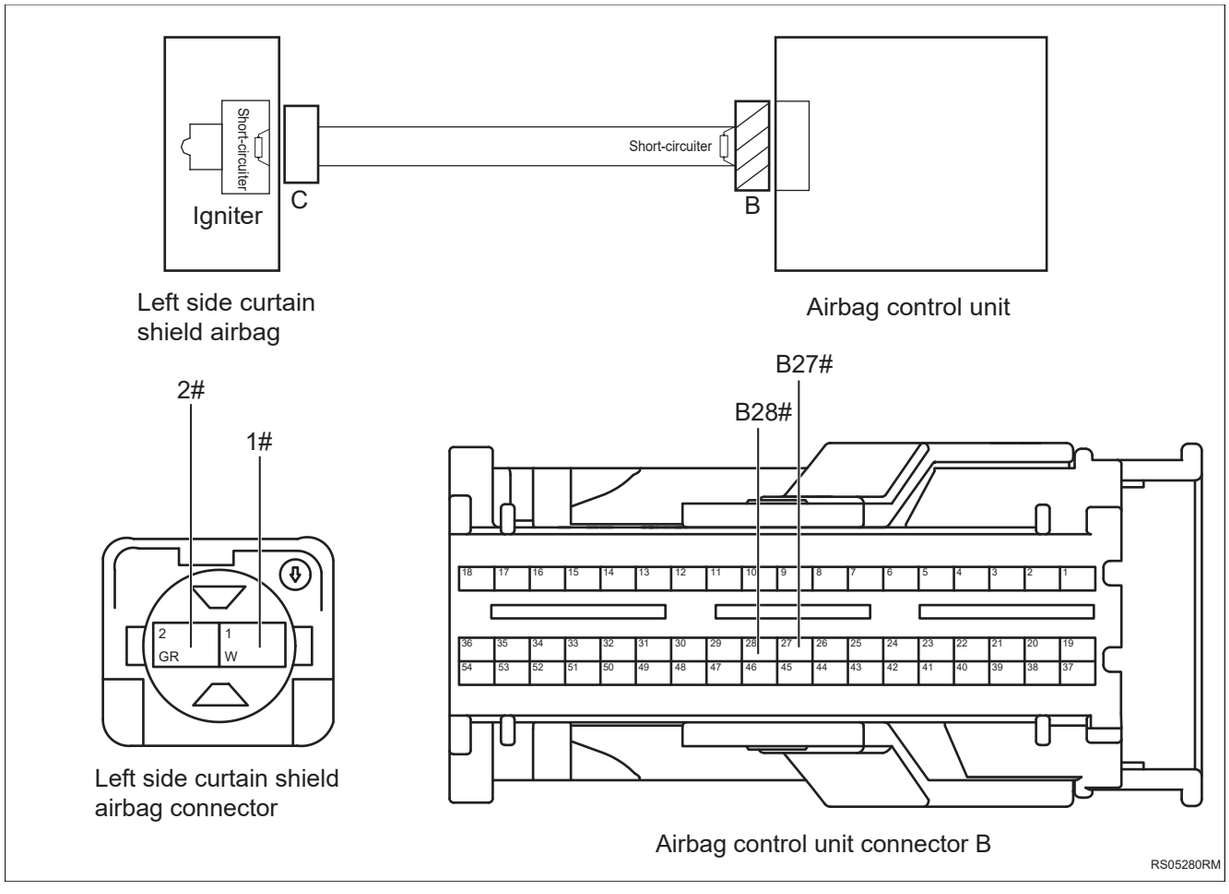
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B27# - airbag control unit connector B28#	Always connected	10 K Ω or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for open in left side curtain shield airbag wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

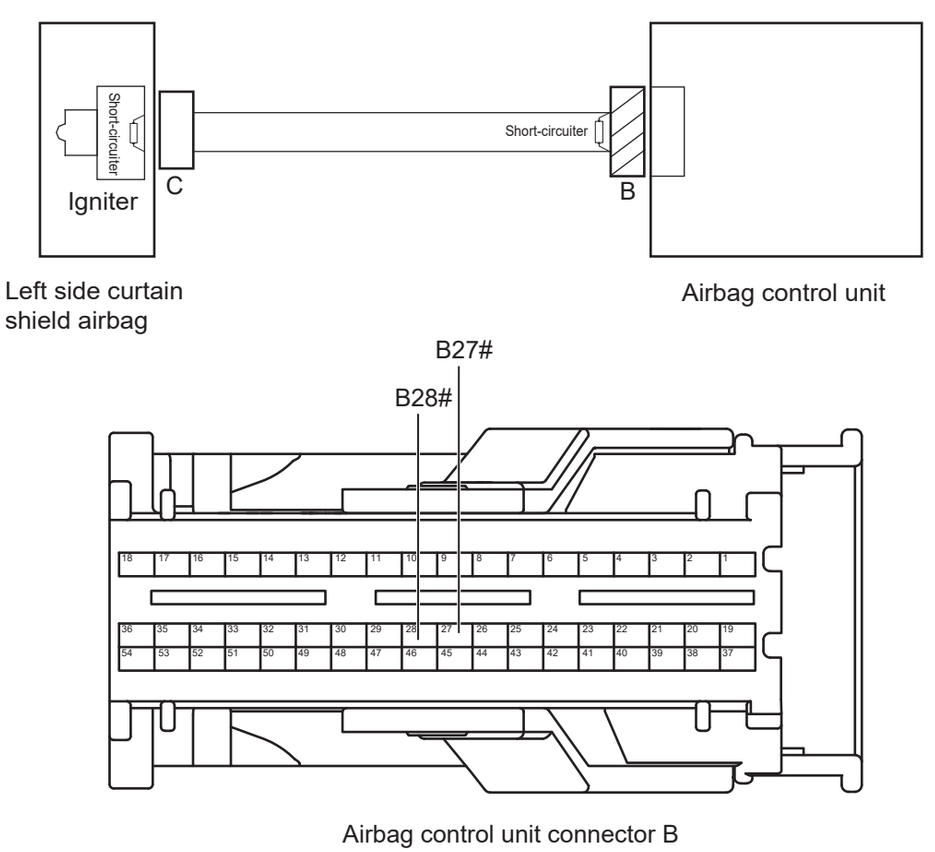
Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B28# - left side curtain shield airbag connector 2#	Always connect-ed	Less than 1 Ω
Airbag control unit connector B27# - left side curtain shield airbag connector 1#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in left side curtain shield airbag wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

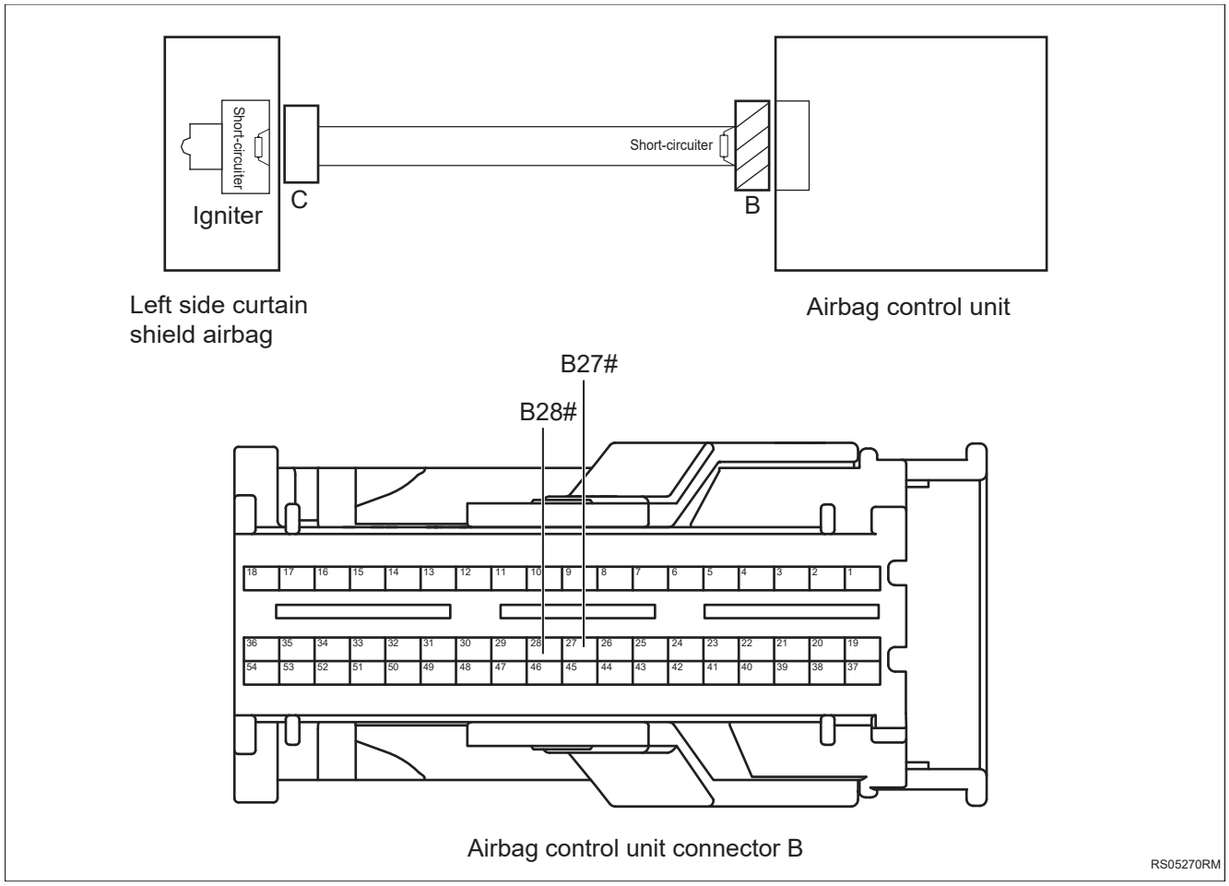
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B27# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B28# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in left side curtain shield airbag wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B27# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B28# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Replace left side curtain shield airbag (See page ZC-60)**

(a) Replace the left side curtain shield airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B002811**	**Short to ground in front passenger side airbag circuit**
DTC	**B002812**	**Short to power supply in front passenger side airbag circuit**
DTC	**B00281A**	**Front passenger side airbag circuit resistance below threshold**
DTC	**B00281B**	**Front passenger side airbag circuit resistance above threshold**
DTC	**B00282B**	**Front passenger side airbag other circuit series fault**

Description

When there is short to ground, short to power supply, too high or too low resistance, series faults in front passenger seat airbag ignition circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002811	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Front passenger seat airbag • Airbag control unit • Wire harness and connector
B002812	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Front passenger seat airbag • Airbag control unit • Wire harness and connector
B00281A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7	5 times	Continuous type	400 ms	• Front passenger seat airbag • Airbag control unit • Wire harness and connector

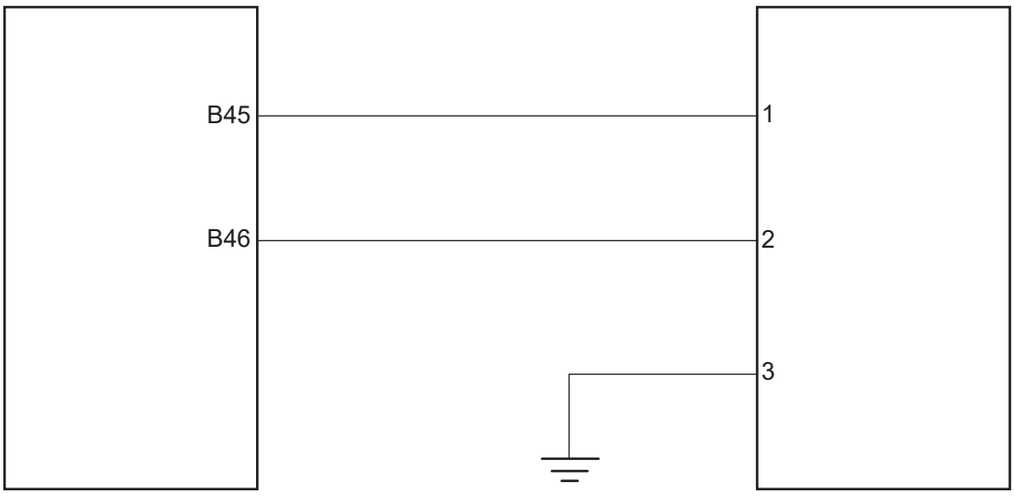
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		Ω, the fault may be detected				
B00281B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Front passenger seat airbag • Airbag control unit • Wire harness and connector
B00282B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Front passenger seat airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

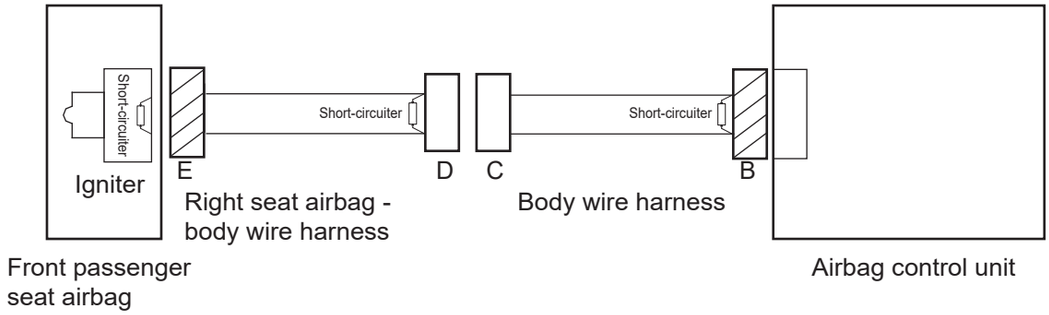
DTC No.	Fault symptom	Warning light/indicator
B002811	• Warning light comes on • Set DTC	Comes on
B002812	• Warning light comes on • Set DTC	Comes on
B00281A	• Warning light comes on • Set DTC	Comes on
B00281B	• Warning light comes on • Set DTC	Comes on
B00282B	• Warning light comes on • Set DTC	Comes on

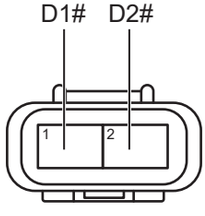
Circuit diagram



Inspection procedure

1	**Check for short to each other in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**





RS05150RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

Standard value

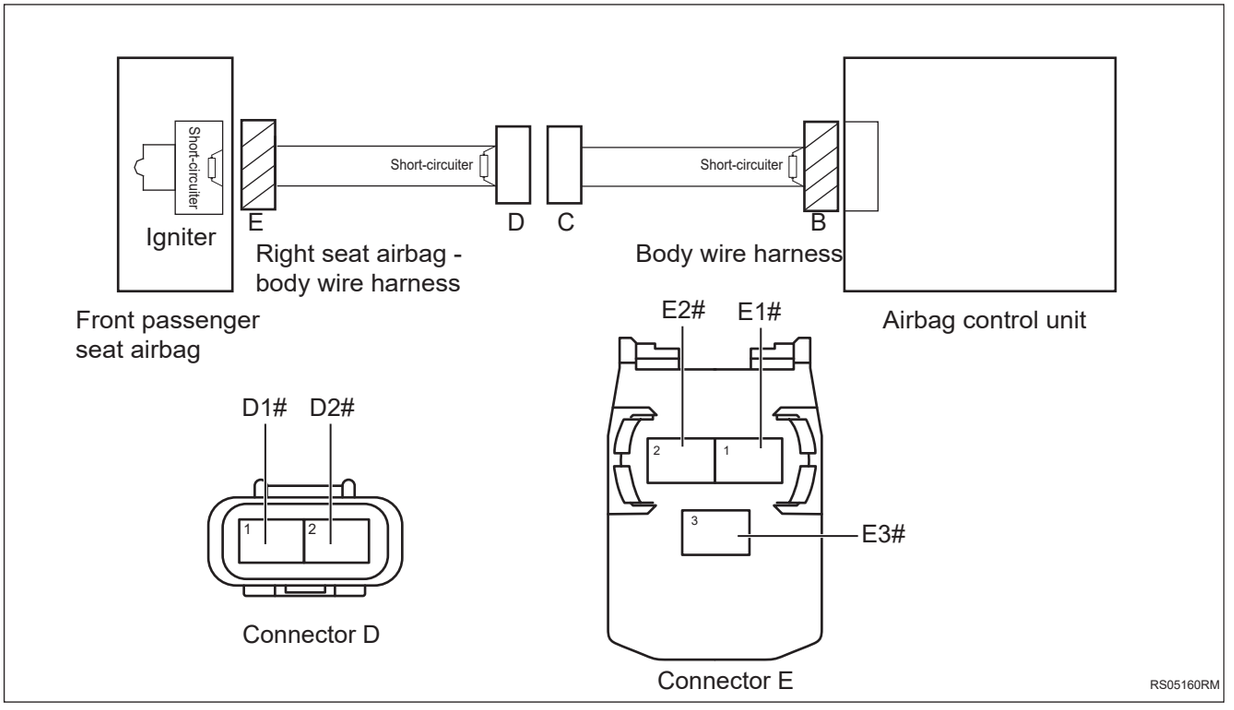
Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Check for open in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

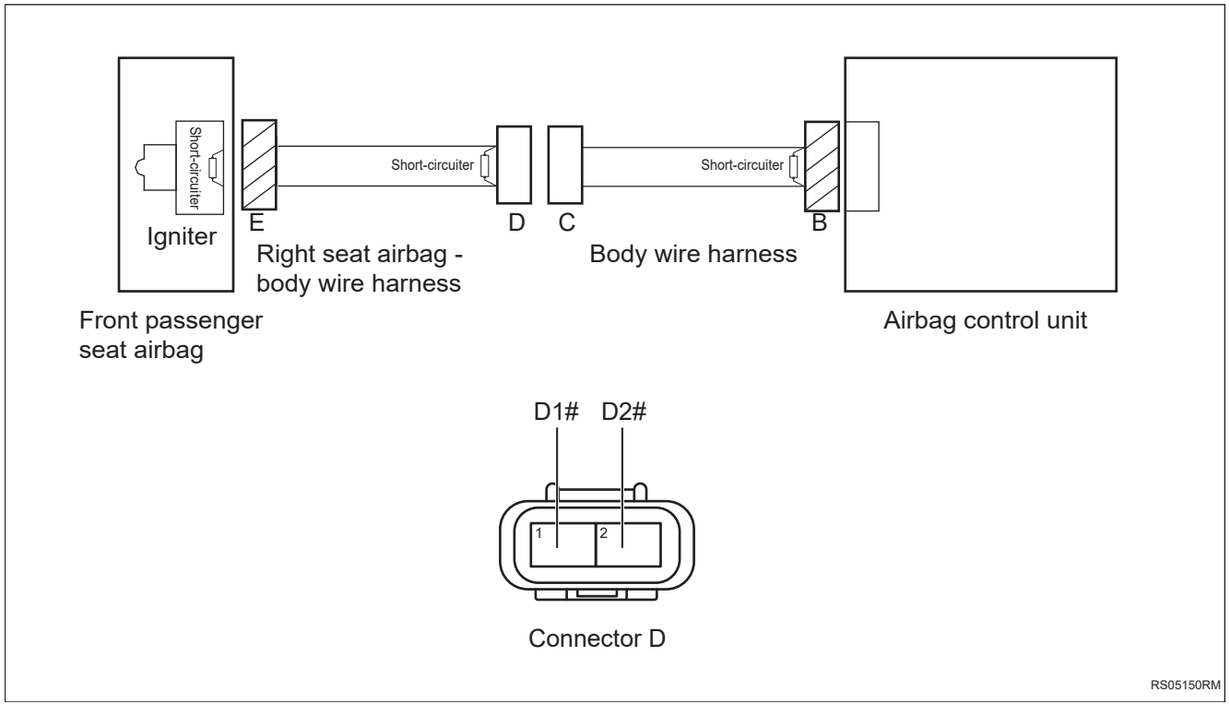
Standard value

Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω
Connector E3# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

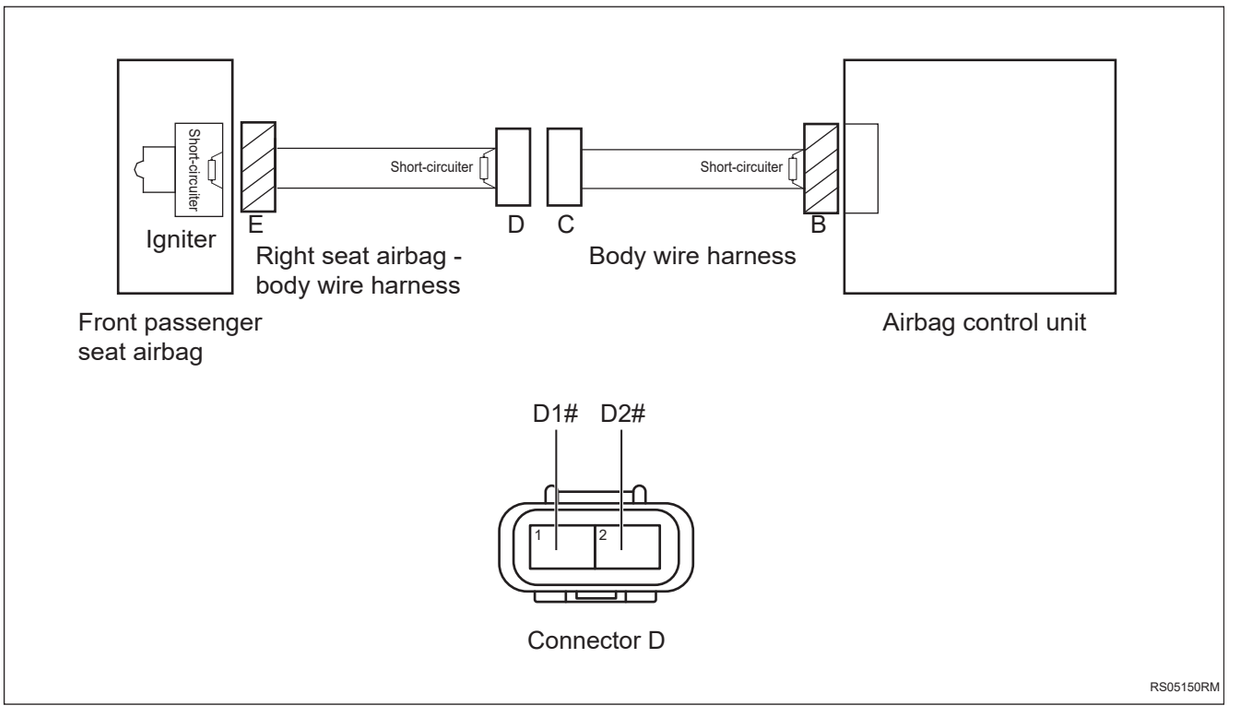
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Always connect-ed	10 KΩ or more
Connector D2# - body ground	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

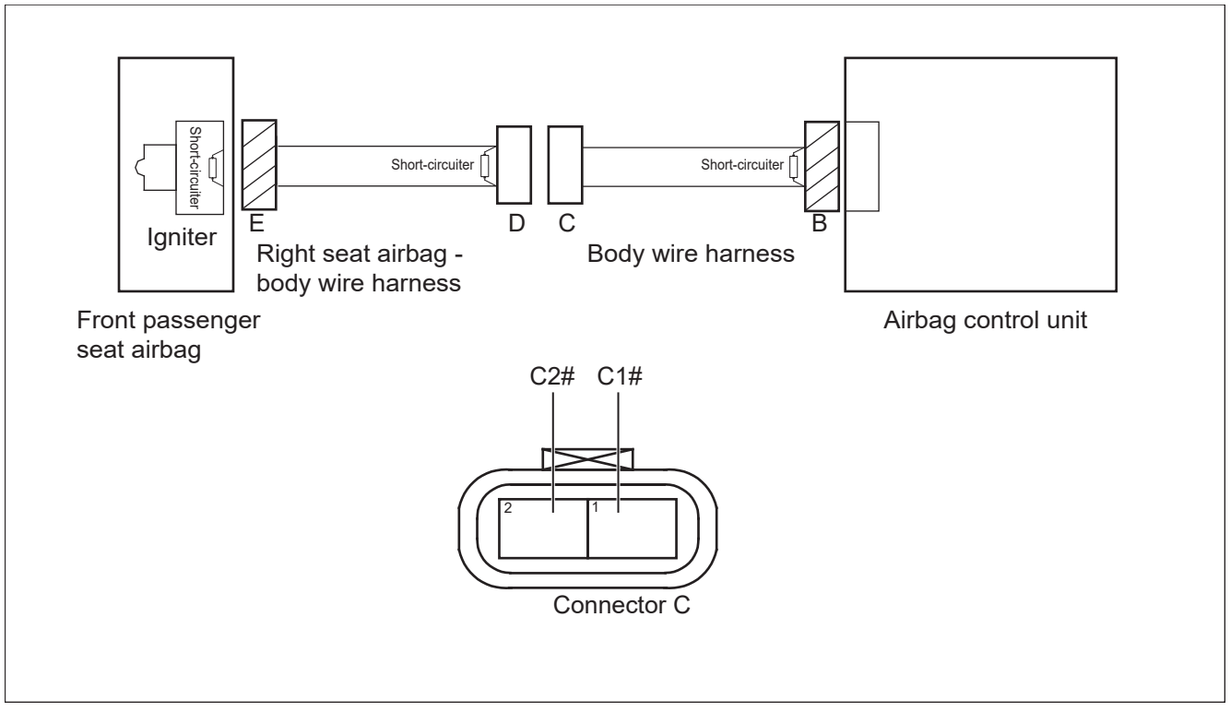
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to each other in front passenger seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

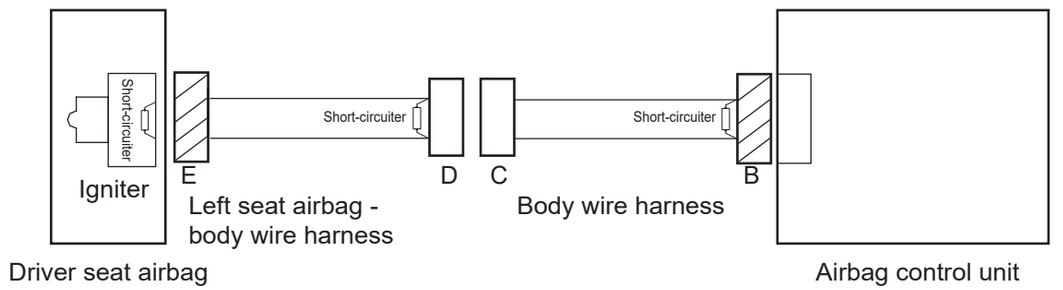
Standard value

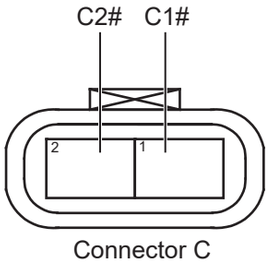
Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

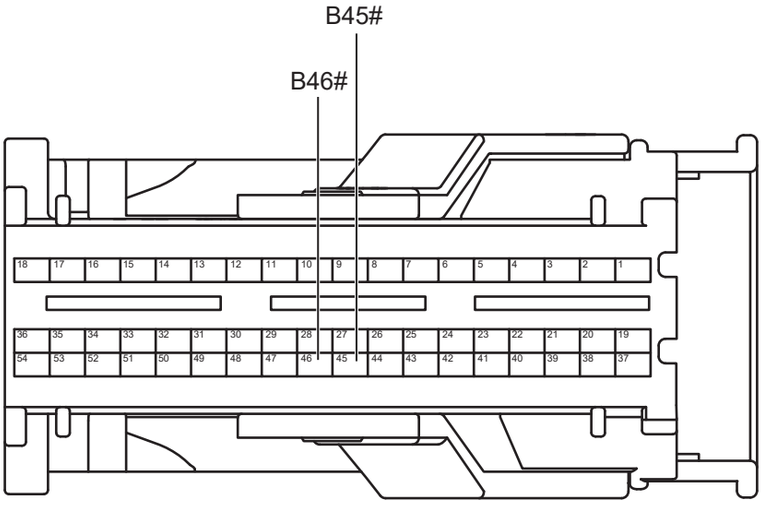
NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in front passenger seat airbag wire harness and connector (body wire harness)**







(a) According to value in the table, measure resistance.

Standard value

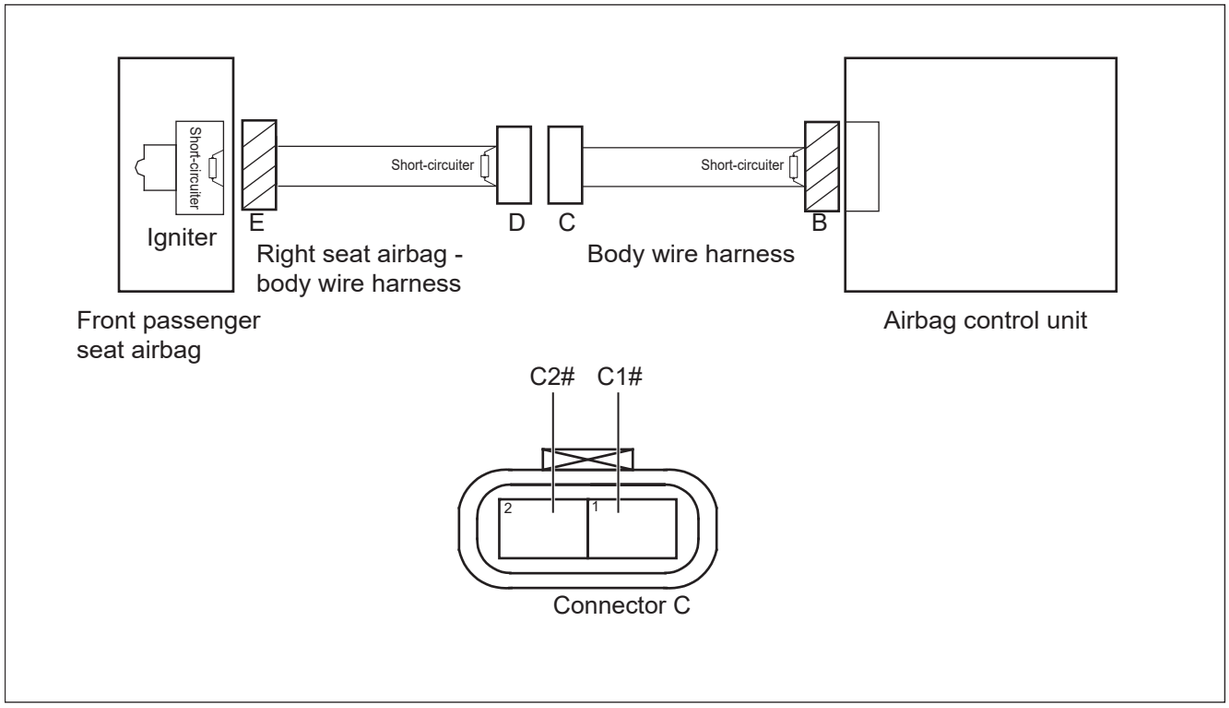
Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector B45#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector B46#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

7	**Check for short to ground in front passenger seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

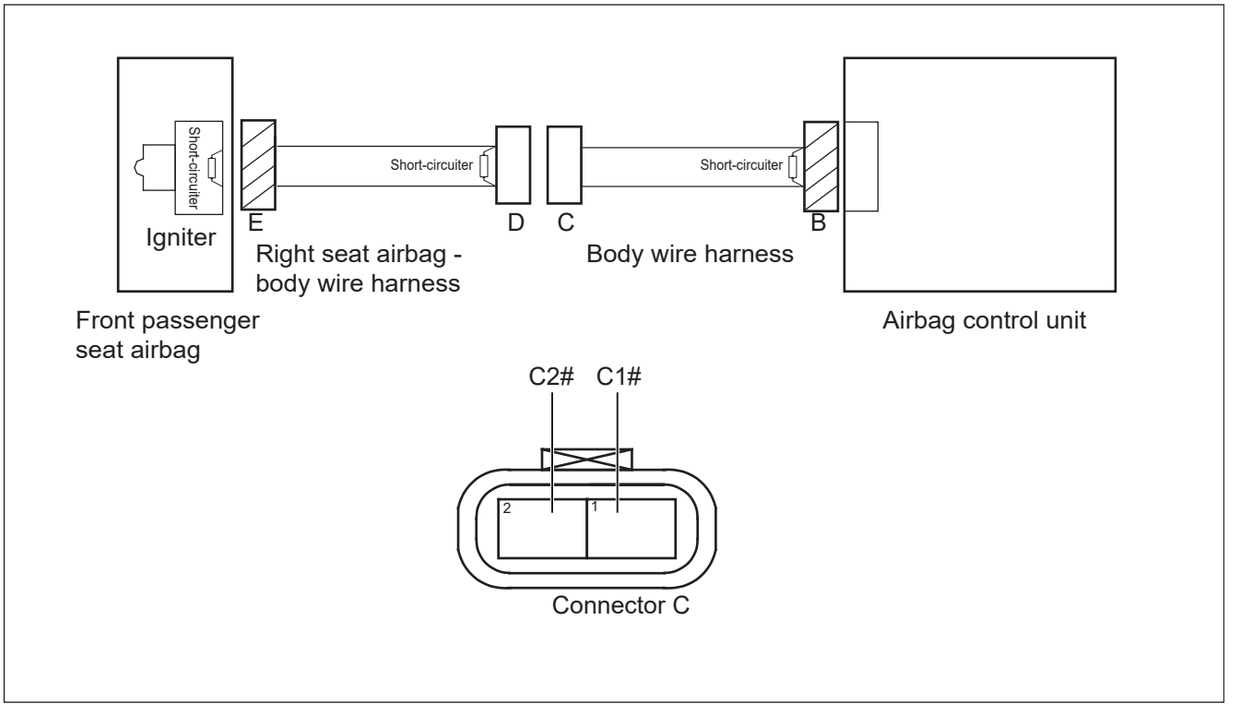
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector C1# - body ground	Always connect-ed	10 KΩ or more
Connector C2# - body ground	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	**Check for short to power supply in front passenger seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Replace front passenger seat airbag (See page ZC-63)**

(a) Replace the front passenger seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B002856	Front passenger side airbag invalid configuration

Description

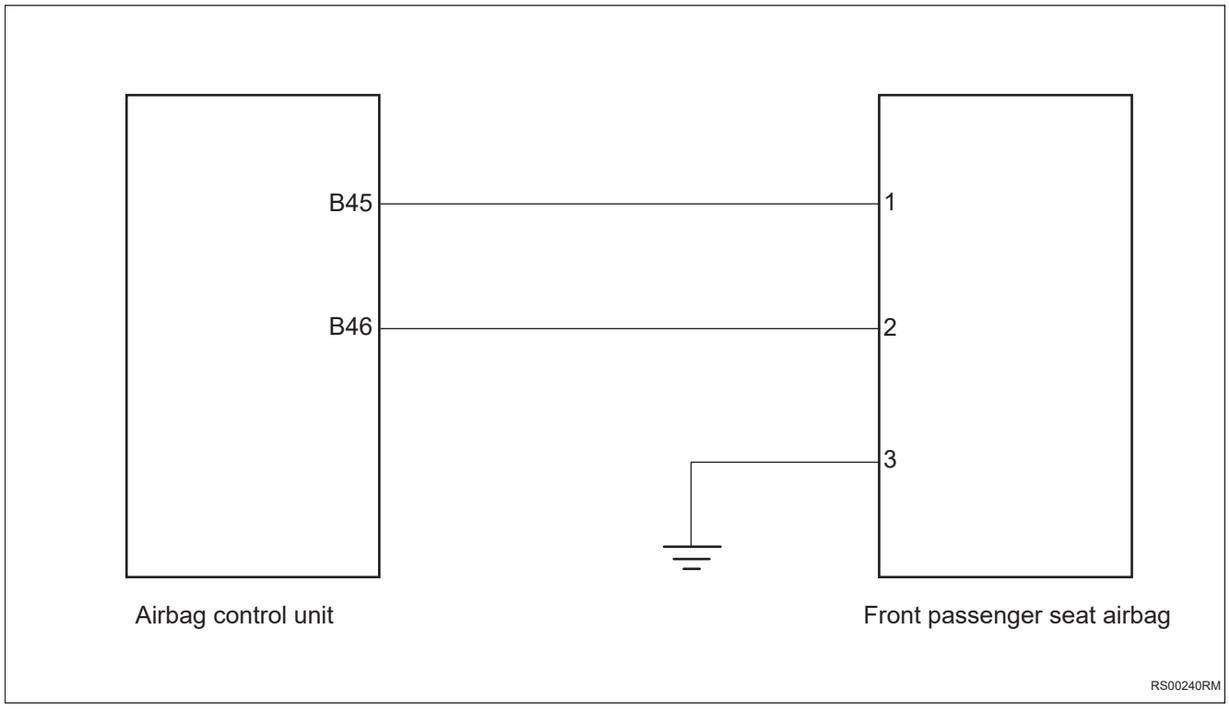
When front passenger seat airbag ignition circuit has an invalid configuration, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002856	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Front passenger seat airbag • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B002856	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

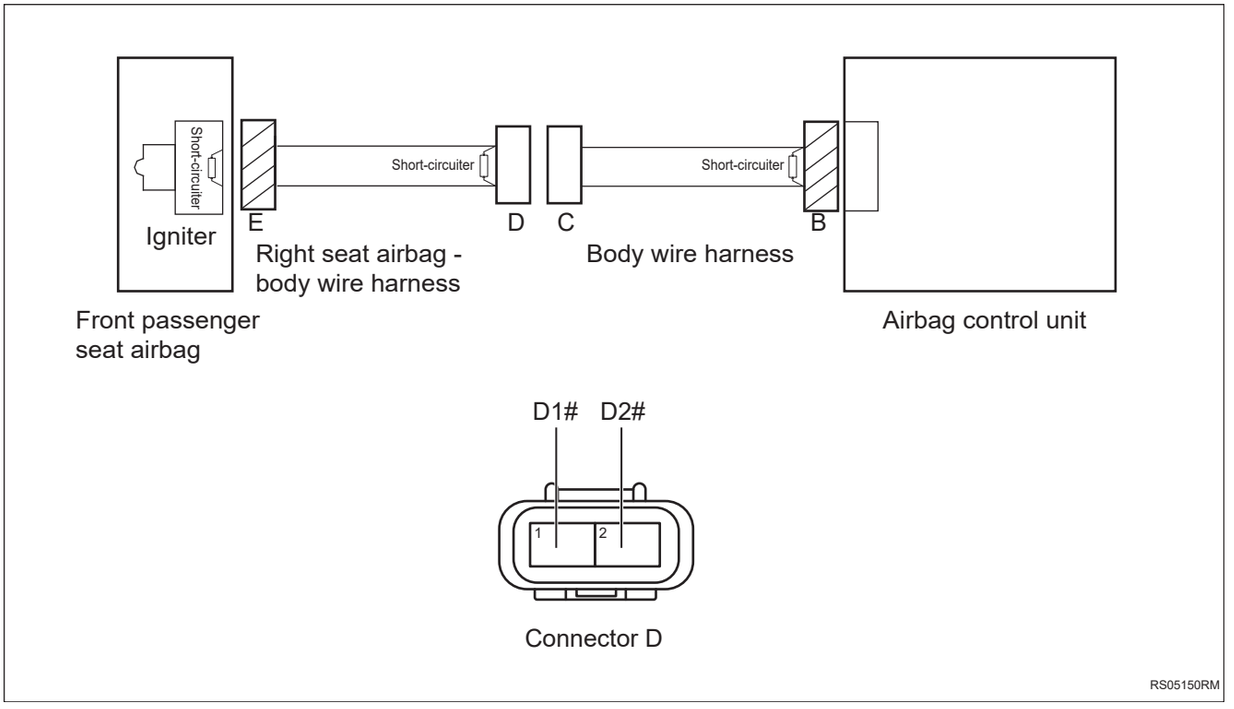
1	**Check and read configuration file of front passenger seat airbag**

(a) Check and read if configuration file of front passenger seat airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

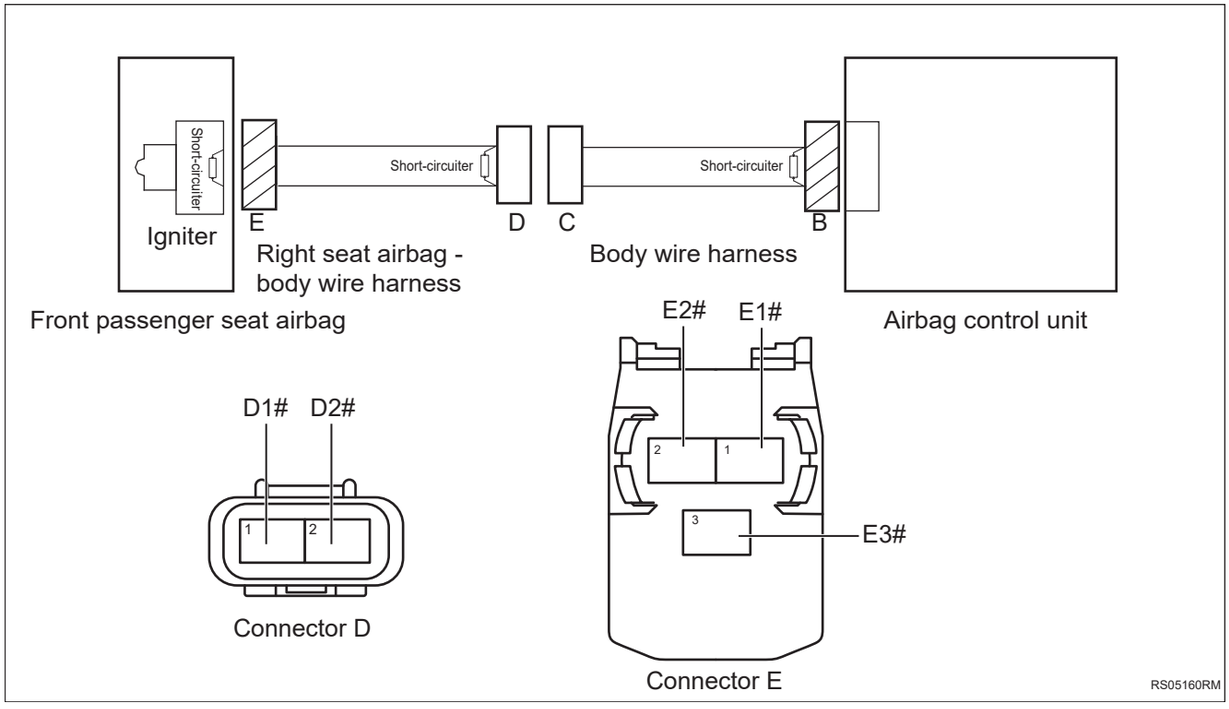
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

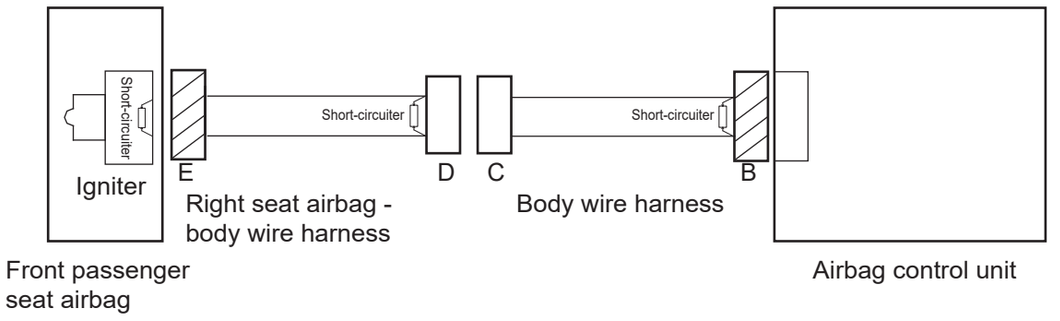
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω
Connector E3# - body ground	Always connected	Less than 1 Ω

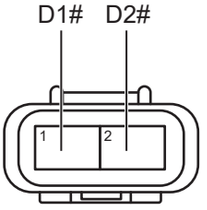
NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**





Connector D

RS05150RM

(a) According to value in the table, measure resistance.

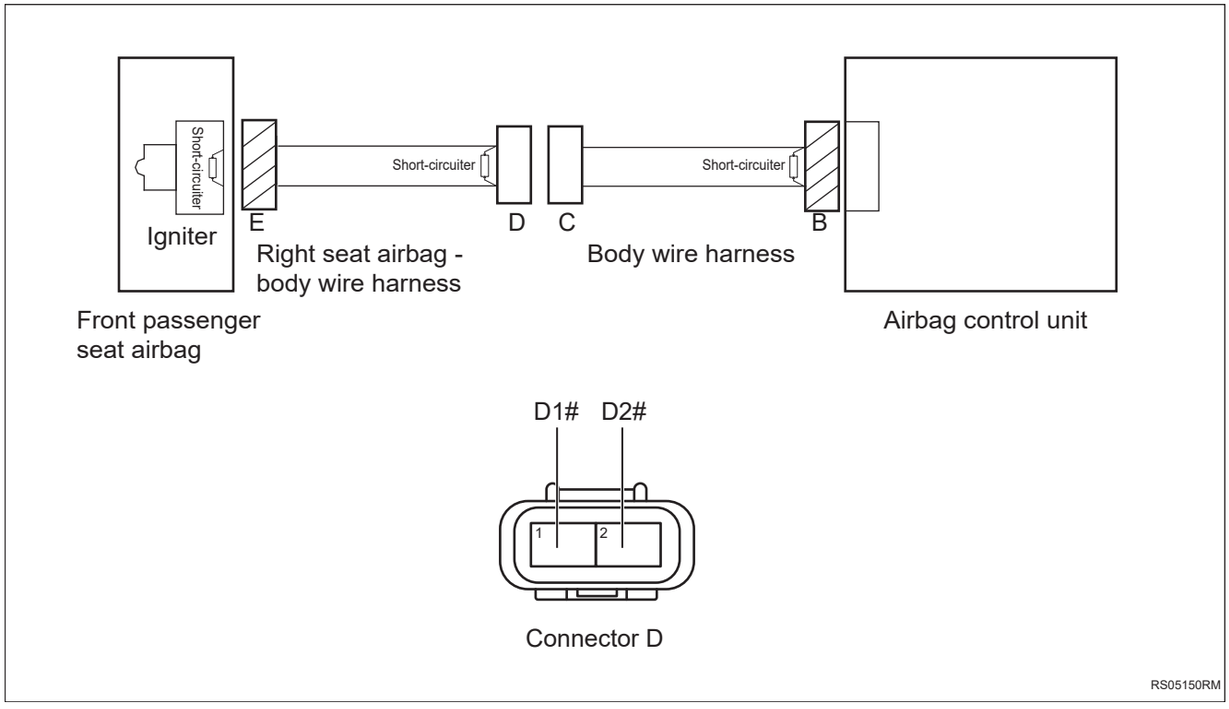
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

5	**Check for short to power supply in front passenger seat airbag wire harness and connector (right seat airbag - body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

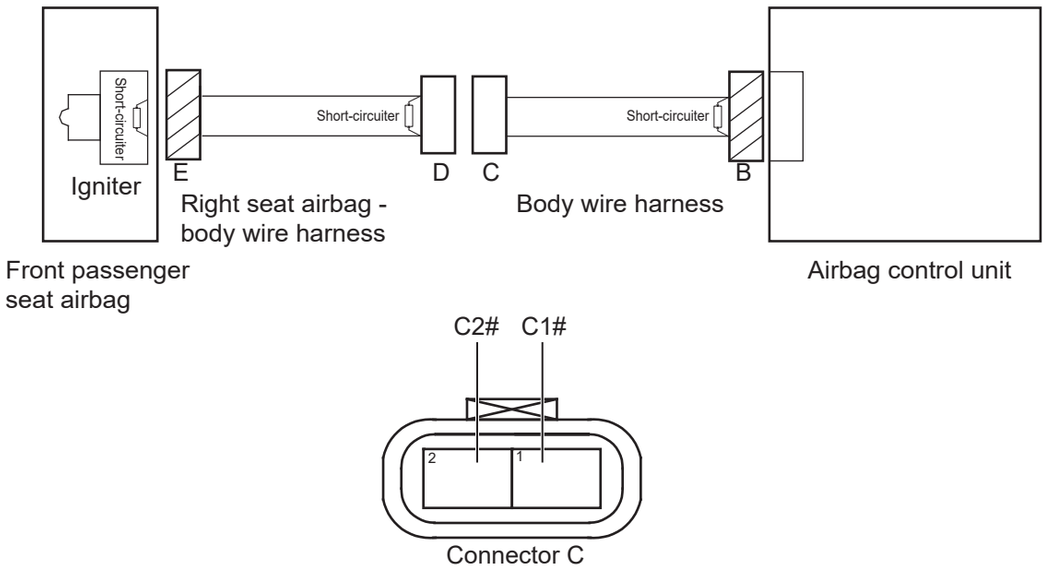
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in front passenger seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

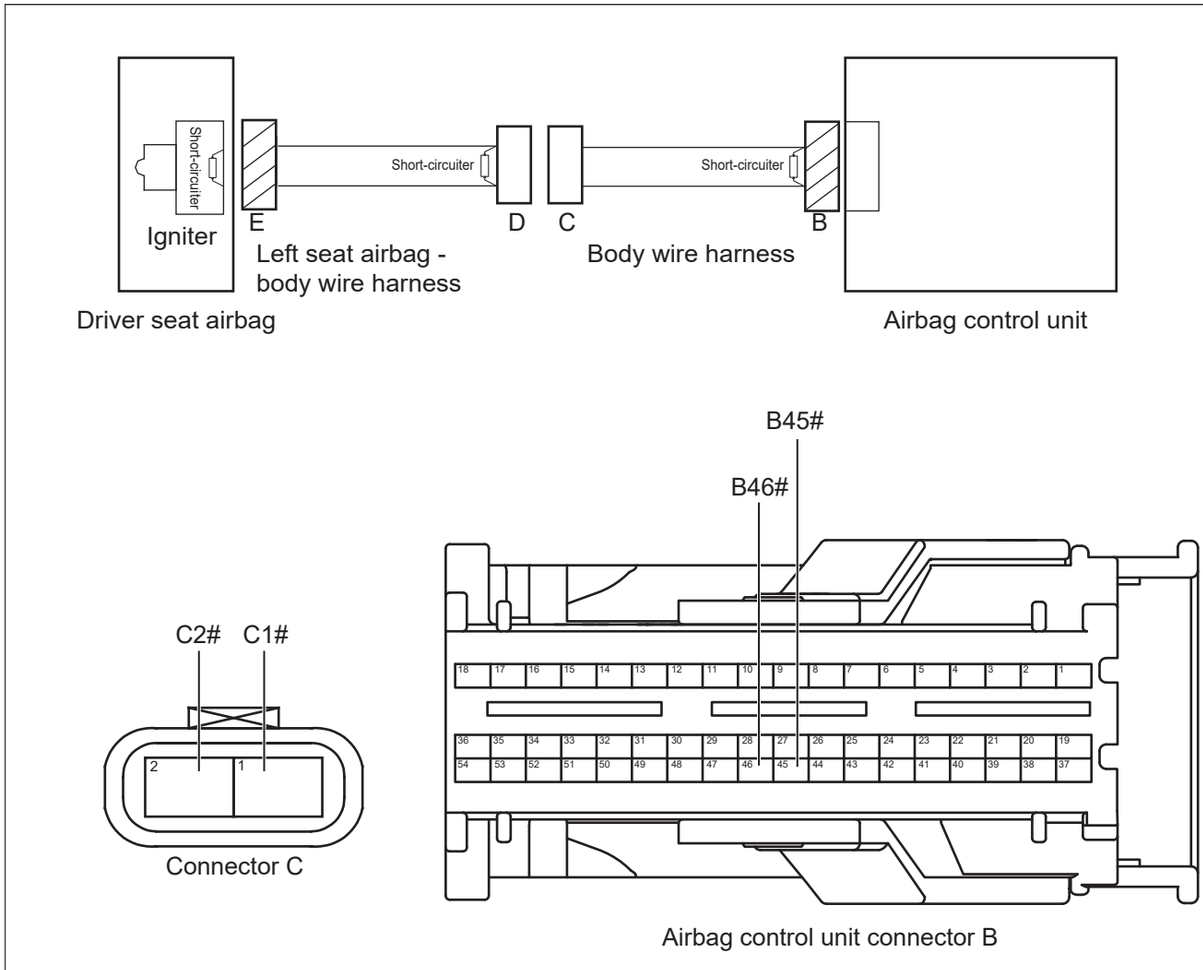
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in front passenger seat airbag wire harness and connector (body wire harness)**



ZD

(a) According to value in the table, measure resistance.

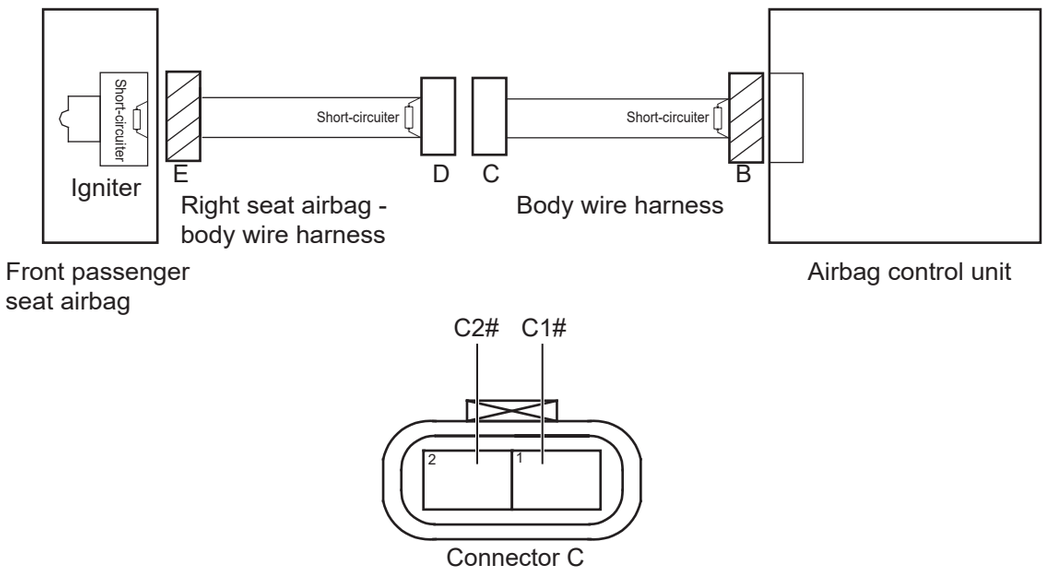
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector B45#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector B46#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in front passenger seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

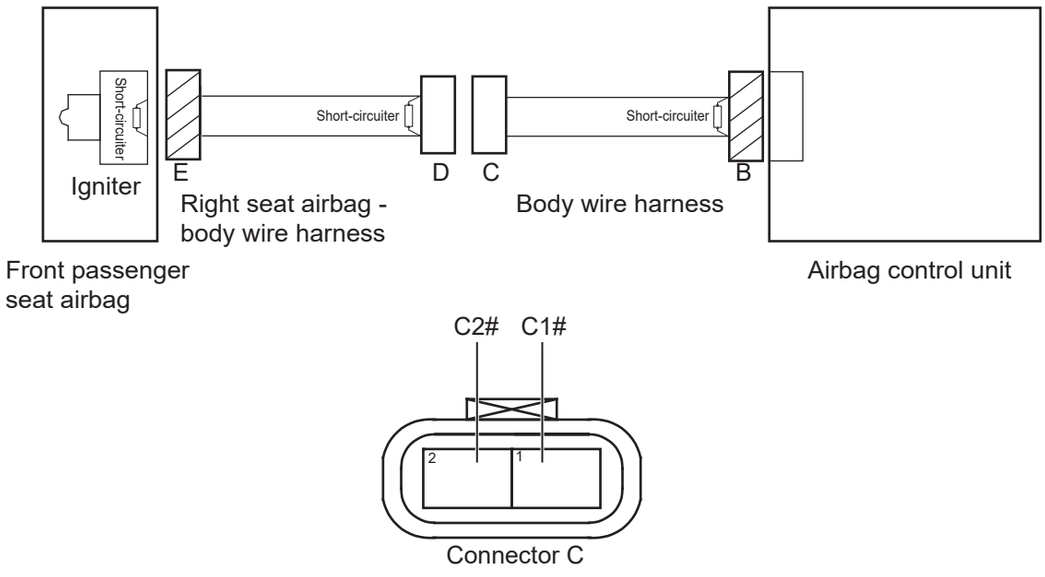
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in front passenger seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace front passenger seat airbag (See page ZC-63)**

(a) Replace the front passenger seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B002911**	**Short to ground in right curtain shield airbag circuit**
DTC	**B002912**	**Short to power supply in right curtain shield airbag circuit**
DTC	**B00291A**	**Right curtain shield airbag circuit resistance below threshold**
DTC	**B00291B**	**Right curtain shield airbag circuit resistance above threshold**

DTC	B00292B	Right curtain shield airbag other circuit series fault

Description

When there is short to ground, short to power supply, high or low resistance, series fault in right side curtain shield airbag ignition circuit, the airbag control unit records DTC.

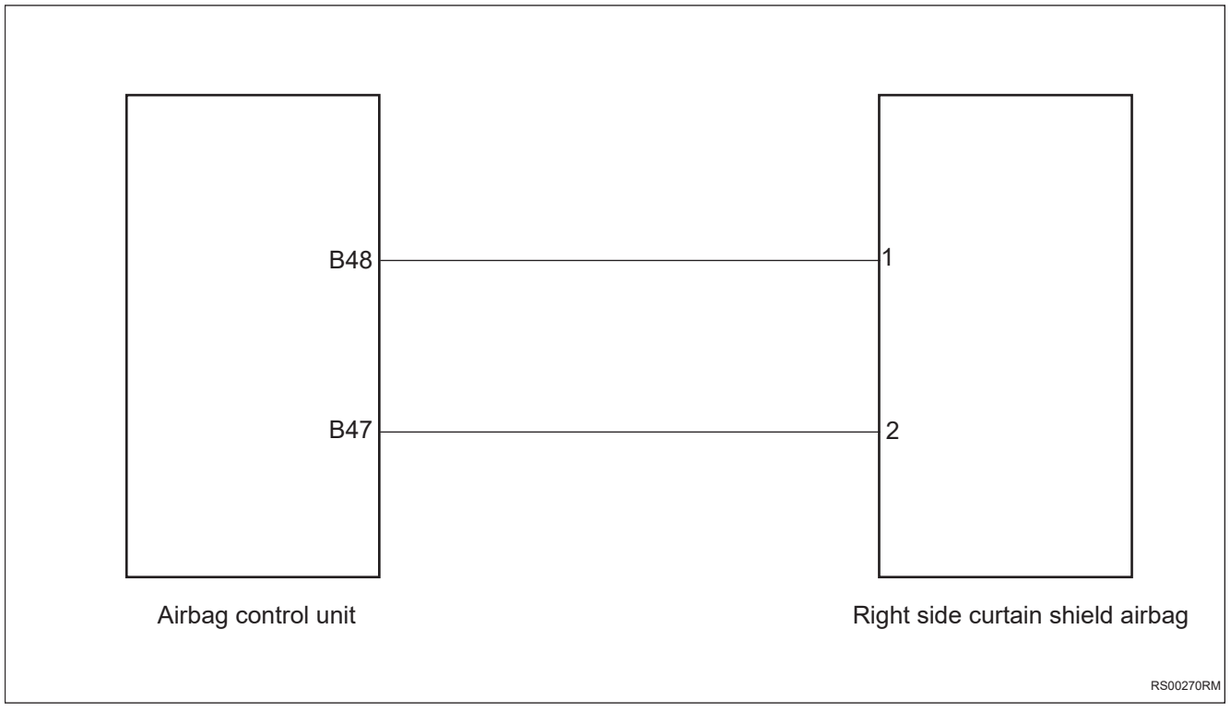
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002911	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector
B002912	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector
B00291A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B00291B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector
B00292B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	5 times	Continuous type	Detected only during initialization	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector

Fault symptom

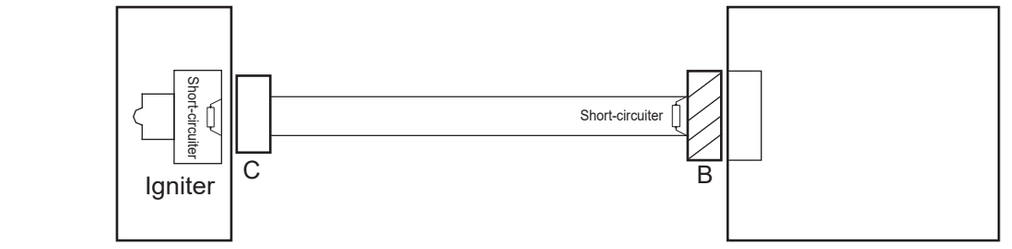
DTC No.	Fault symptom	Warning light/indicator
B002911	• Warning light comes on • Set DTC	Comes on
B002912	• Warning light comes on • Set DTC	Comes on
B00291A	• Warning light comes on • Set DTC	Comes on
B00291B	• Warning light comes on • Set DTC	Comes on
B00292B	• Warning light comes on • Set DTC	Comes on

Circuit diagram

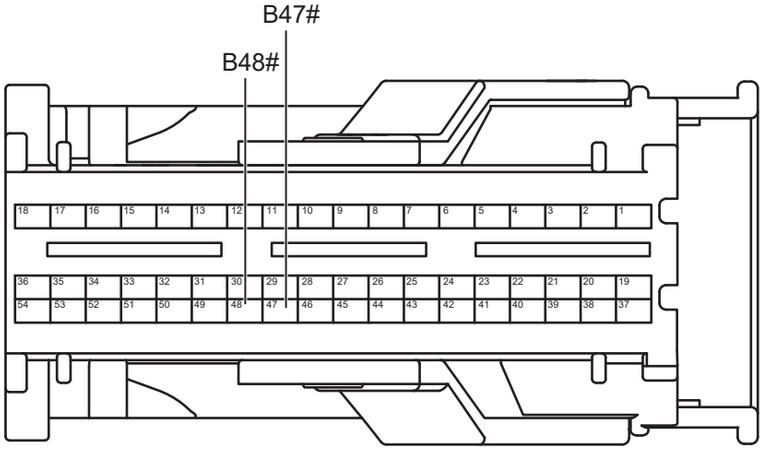


Inspection procedure

1	**Check if there is short to each other in right side curtain shield airbag wire harness and connector**



Right side curtain shield airbag — Airbag control unit



Airbag control unit connector B

RS05290RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

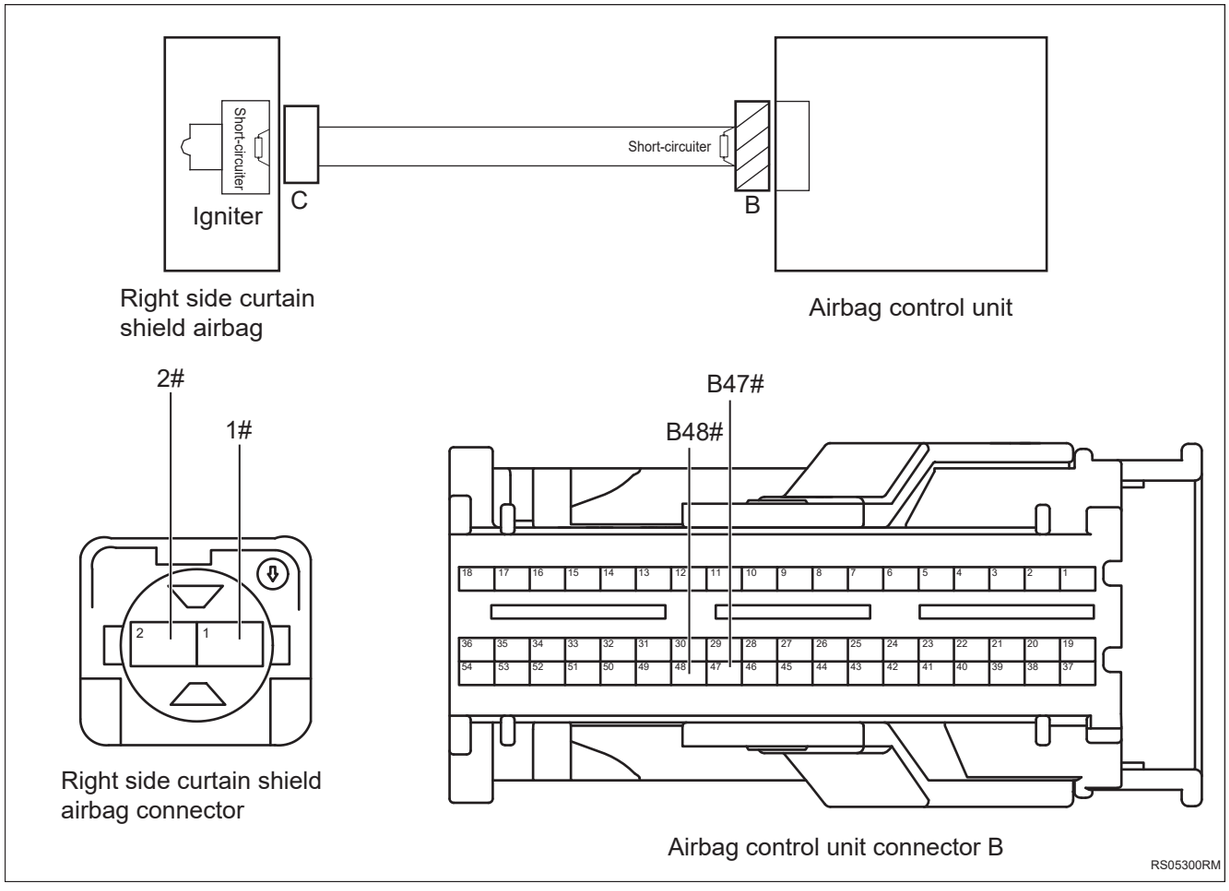
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B47# - airbag control unit connector B48#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in right side curtain shield airbag wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

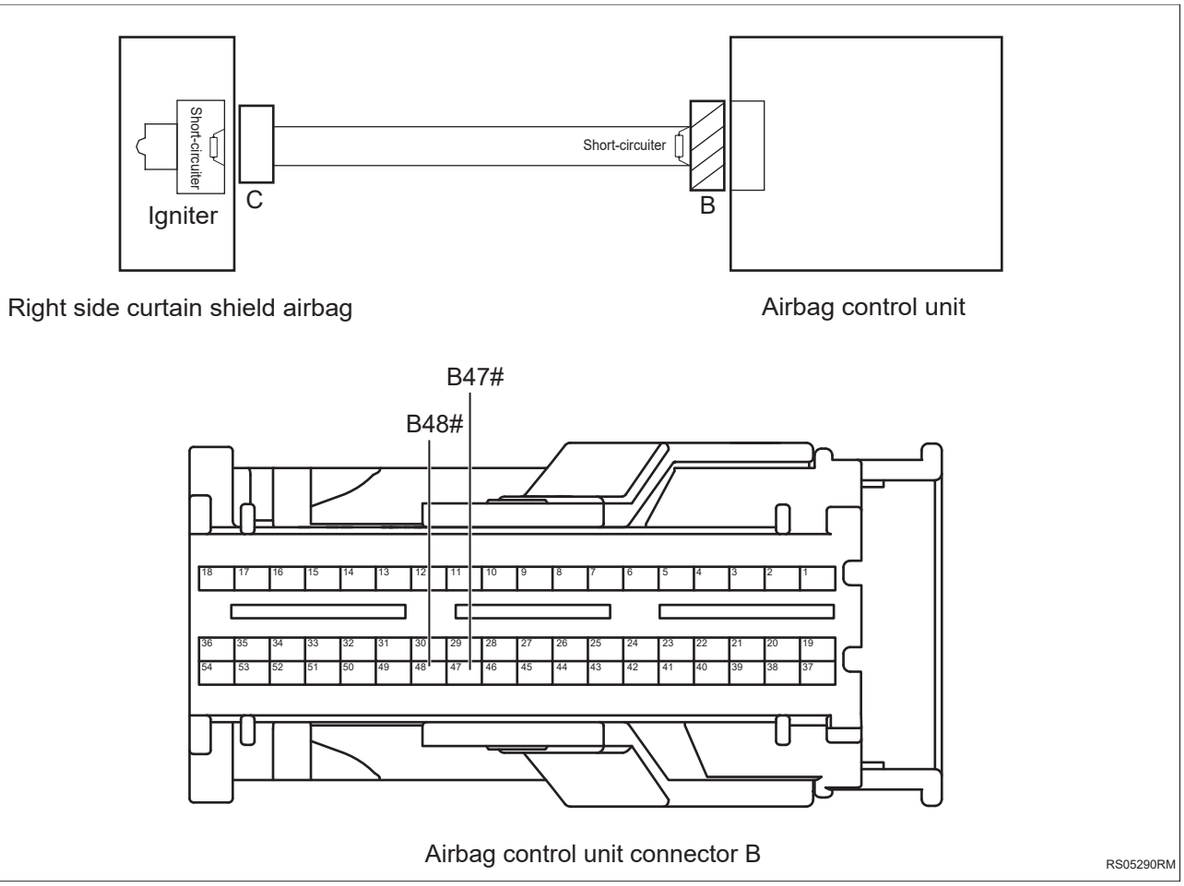
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B48# - right side curtain shield airbag connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B47# - right side curtain shield airbag connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in right side curtain shield airbag wire harness and connector**



ZD

(a) According to value in the table, measure resistance.

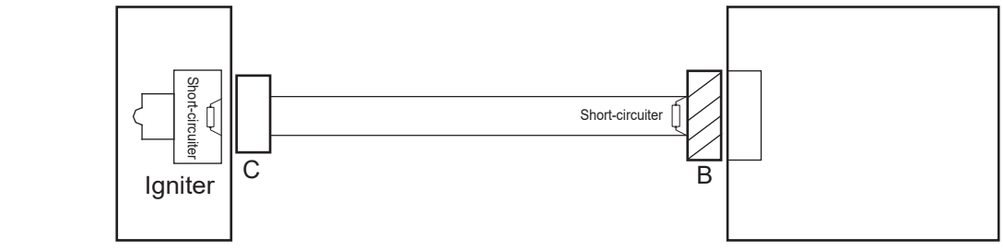
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B47# - body ground	Always connect-ed	10 KΩ or more
Airbag control unit connector B48# - body ground	Always connect-ed	10 KΩ or more

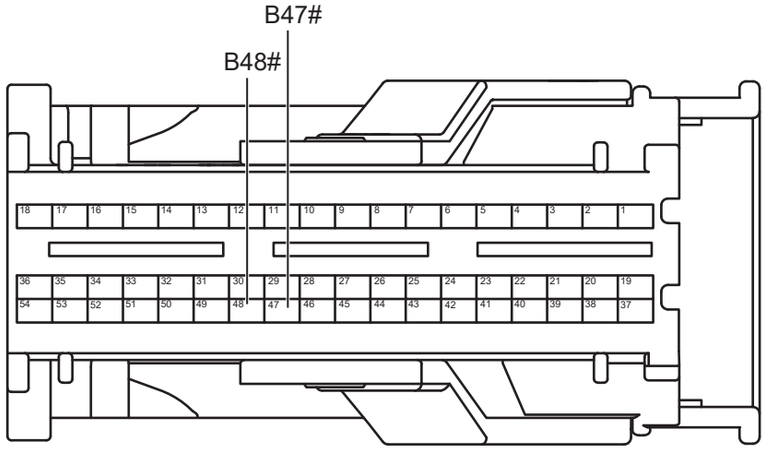
NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in right side curtain shield airbag wire harness and connector**



Right side curtain shield airbag — Airbag control unit



Airbag control unit connector B

RS05290RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B47# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B48# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace right side curtain shield airbag (See page ZC-60)**

(a) Replace the right side curtain shield airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B002956	Right curtain shield airbag invalid configuration

Description

When right side curtain shield airbag ignition circuit has an invalid configuration, airbag control unit records DTC.

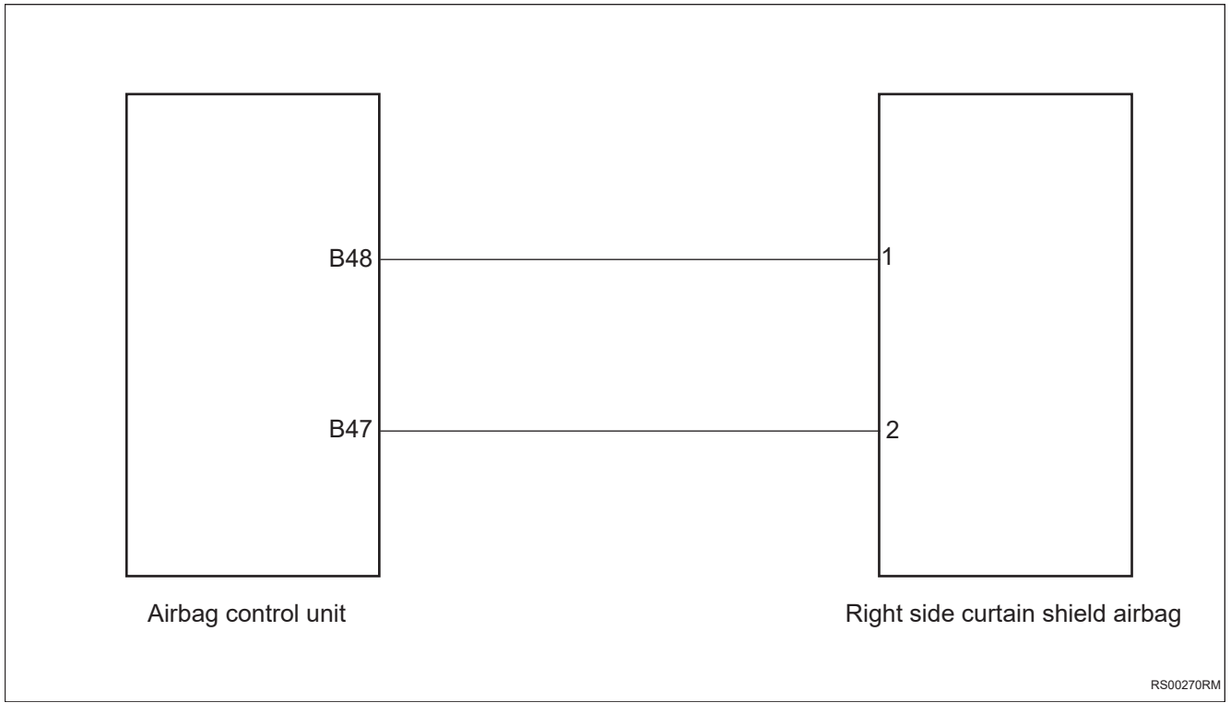
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B002956	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	5 times	Continuous type	Detected only during initialization	• Right side curtain shield airbag • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B002956	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

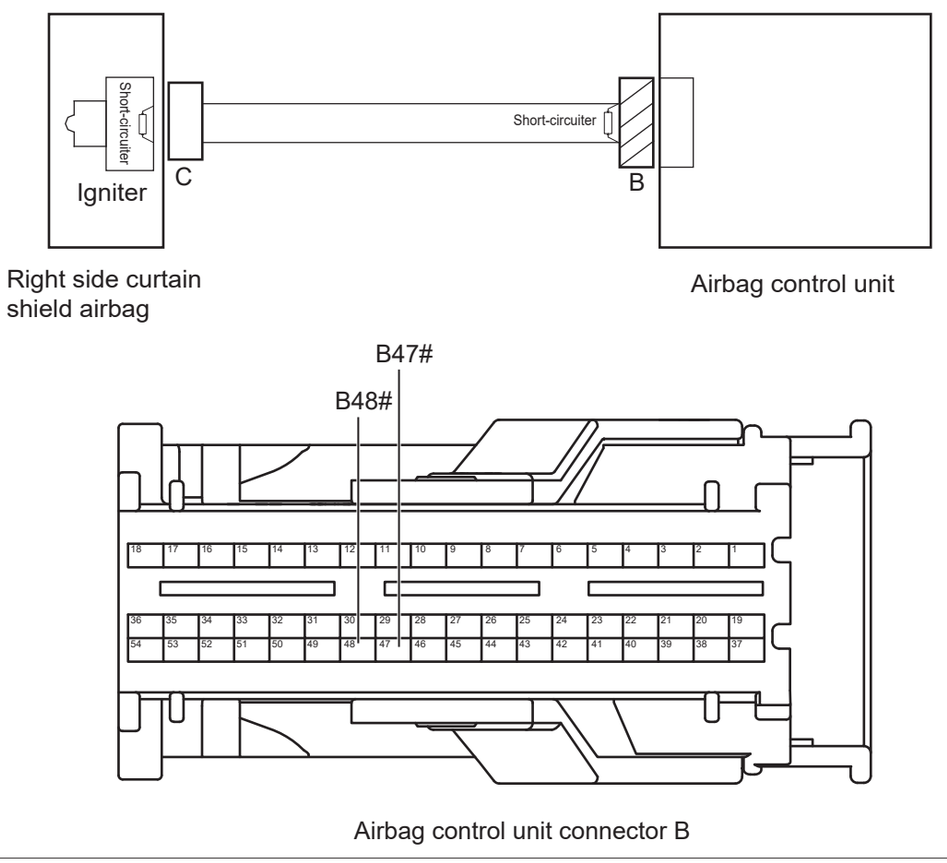
1	**Check and read configuration file of right side curtain shield airbag**

(a) Check and read if configuration file of right side curtain shield airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check if there is short to each other in right side curtain shield airbag wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

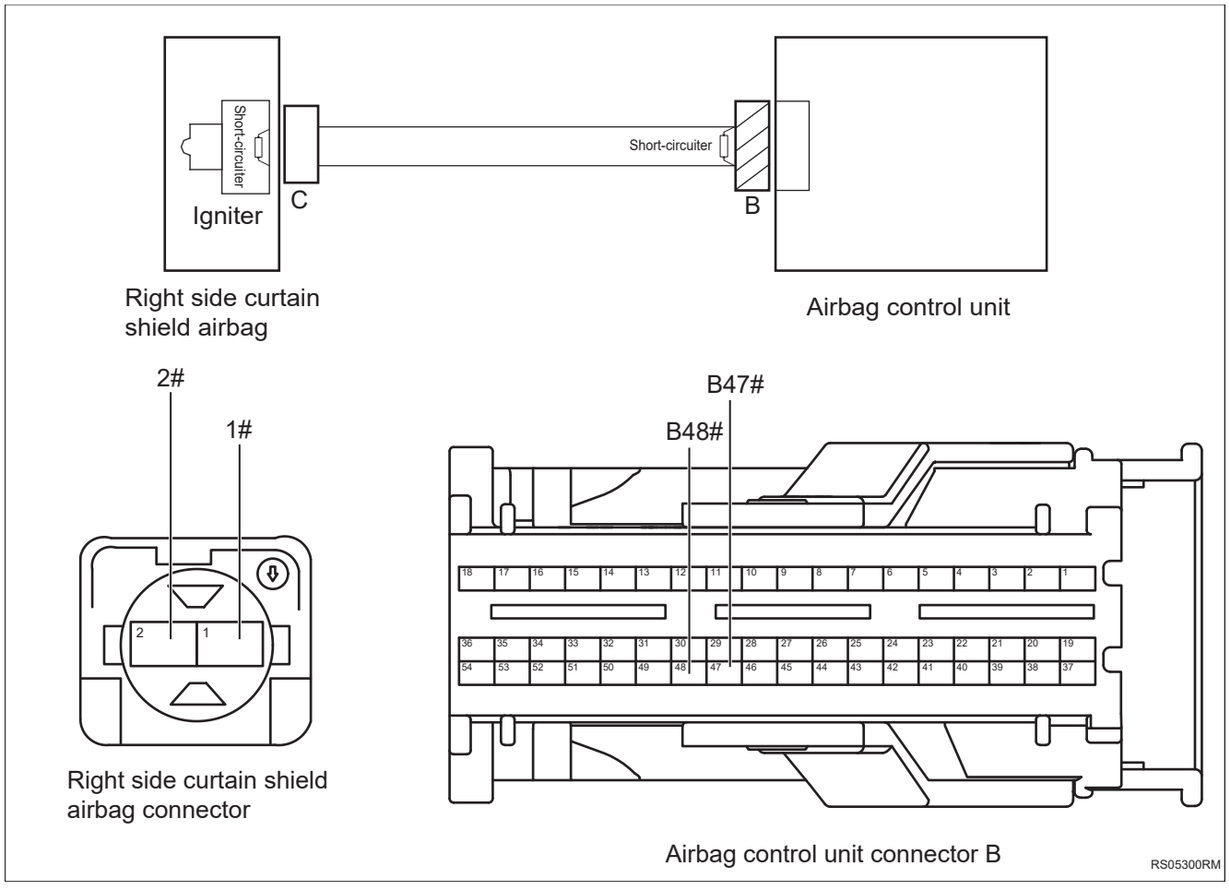
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B47# - airbag control unit connector B48#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for open in right side curtain shield airbag wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

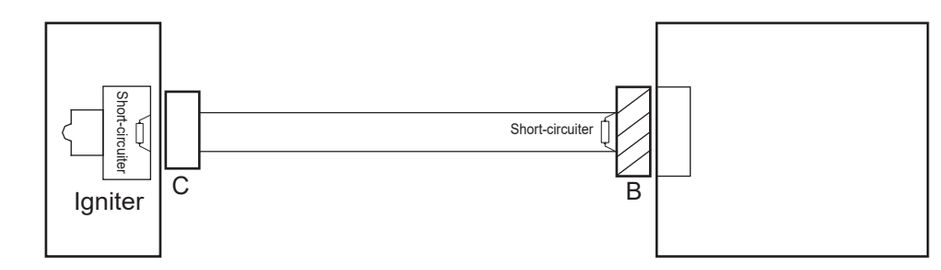
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B48# - right side curtain shield airbag connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B47# - right side curtain shield airbag connector 2#	Always connected	Less than 1 Ω

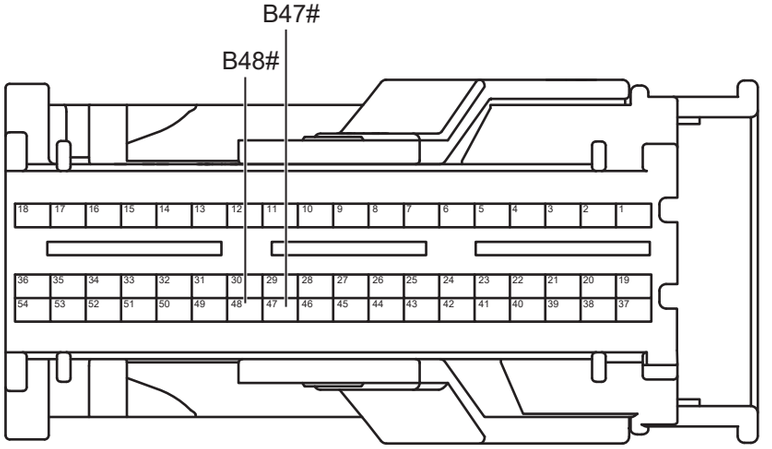
NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in right side curtain shield airbag wire harness and connector**





Airbag control unit connector B

RS05290RM

(a) According to value in the table, measure resistance.

Standard value

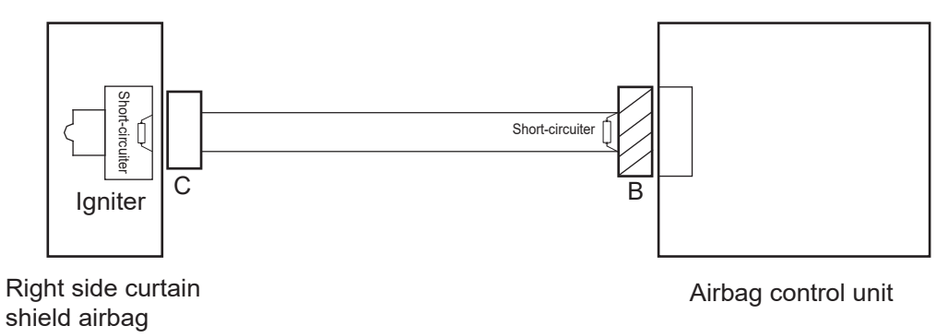
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B47# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B48# - body ground	Always connected	10 KΩ or more

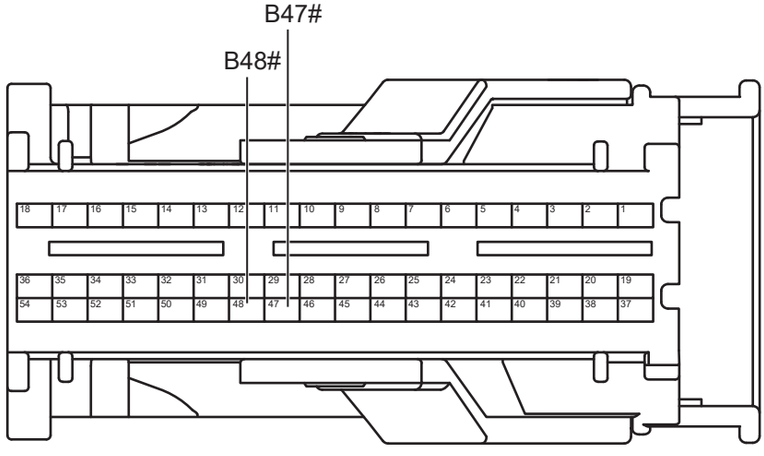
NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in right side curtain shield airbag wire harness and connector**





Airbag control unit connector B

RS05290RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B47# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B48# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Replace right side curtain shield airbag (See page ZC-60)**

(a) Replace the right side curtain shield airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B003011**	**Short to ground in second row left side airbag circuit**
DTC	**B003012**	**Short to power supply in second row left side airbag circuit**
DTC	**B00301A**	**Second row left side airbag circuit resistance below threshold**
DTC	**B00301B**	**Second row left side airbag circuit resistance above threshold**
DTC	**B00302B**	**Second row left side airbag other circuit series fault**

Description

When there is short to ground, short to power supply, high or low resistance, series fault in rear left seat airbag assembly ignition circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B003011	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	Same as the prerequisites for fault occurrence	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B003012	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	Same as the prerequisites for fault occurrence	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B00301A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7	5 times	Continuous type	400 ms	• Rear left seat airbag assembly • Airbag control unit • Wire harness and connector

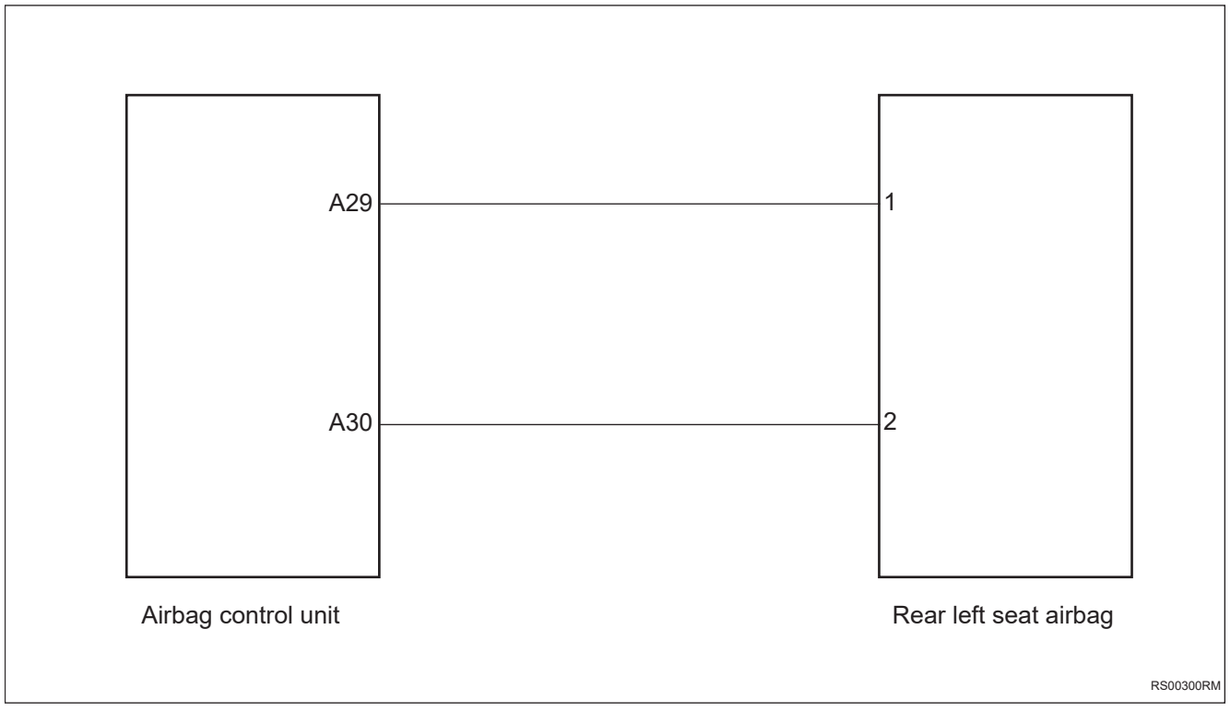
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		Ω, the fault may be detected				
B00301B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Rear left seat airbag assembly • Airbag control unit • Wire harness and connector
B00302B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Rear left seat airbag assembly • Airbag control unit • Wire harness and connector

ZD

Fault symptom

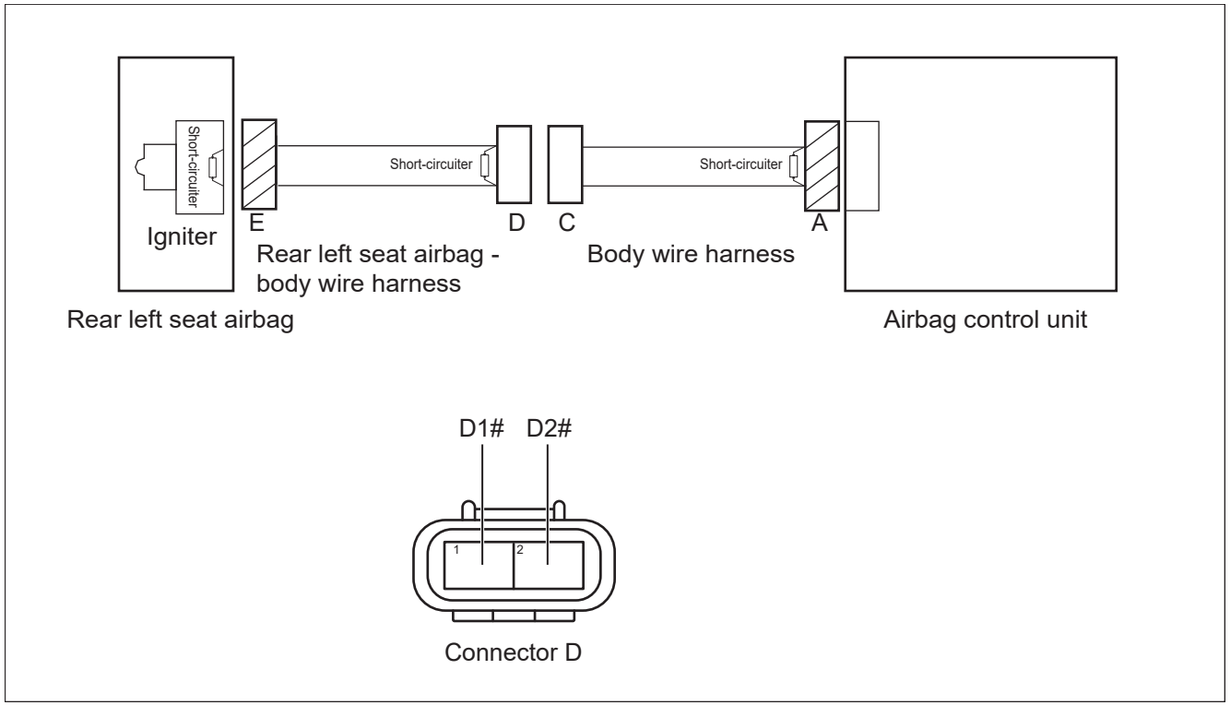
DTC No.	Fault symptom	Warning light/indicator
B003011	• Warning light comes on • Set DTC	Comes on
B003012	• Warning light comes on • Set DTC	Comes on
B00301A	• Warning light comes on • Set DTC	Comes on
B00301B	• Warning light comes on • Set DTC	Comes on
B00302B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

Standard value

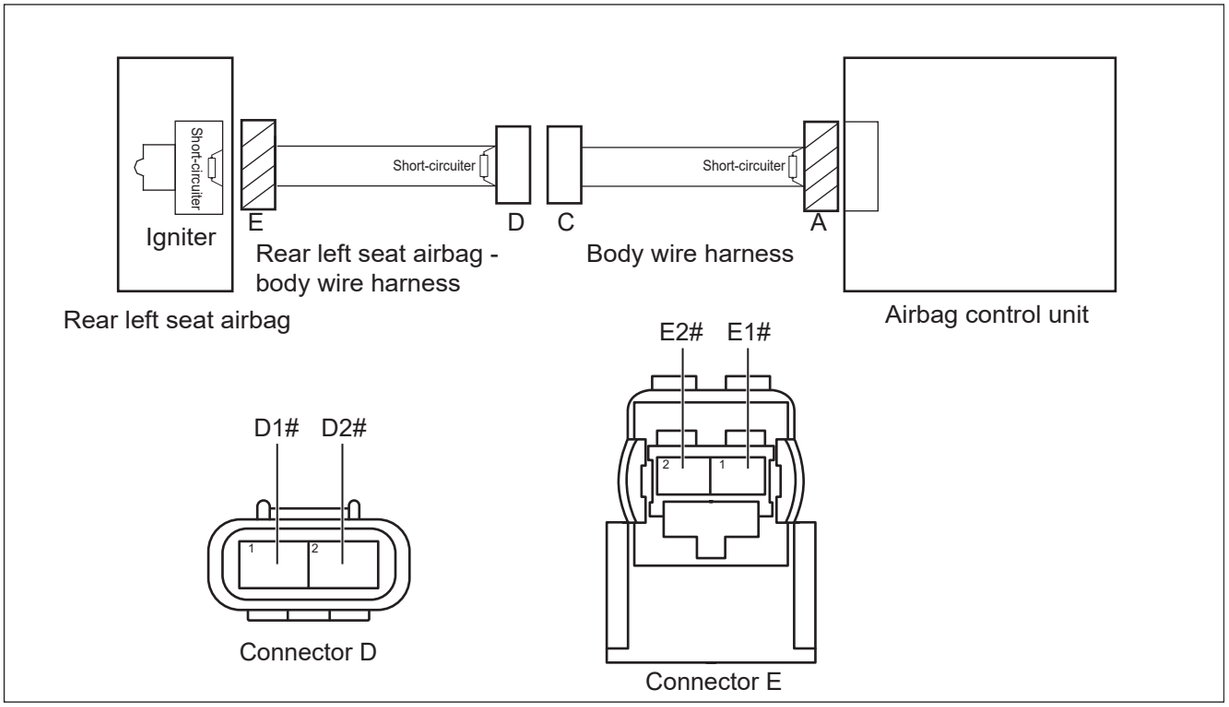
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - connector D2#	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Check for open in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

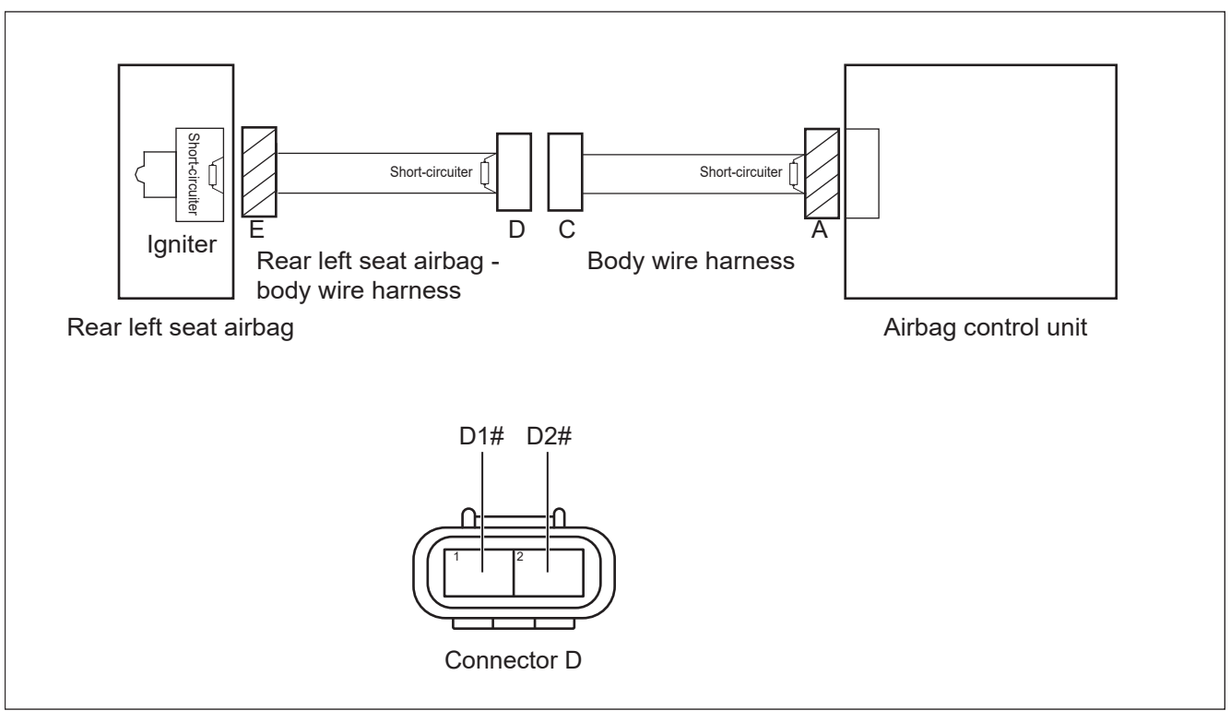
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

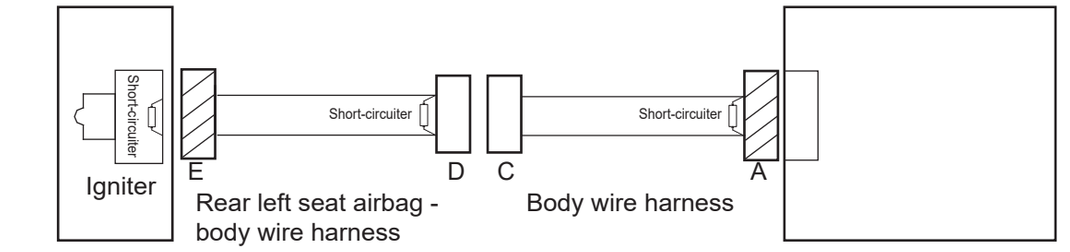
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Always connect-ed	10 KΩ or more
Connector D2# - body ground	Always connect-ed	10 KΩ or more

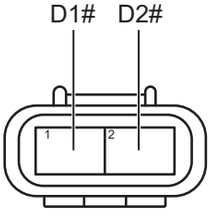
NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**





(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

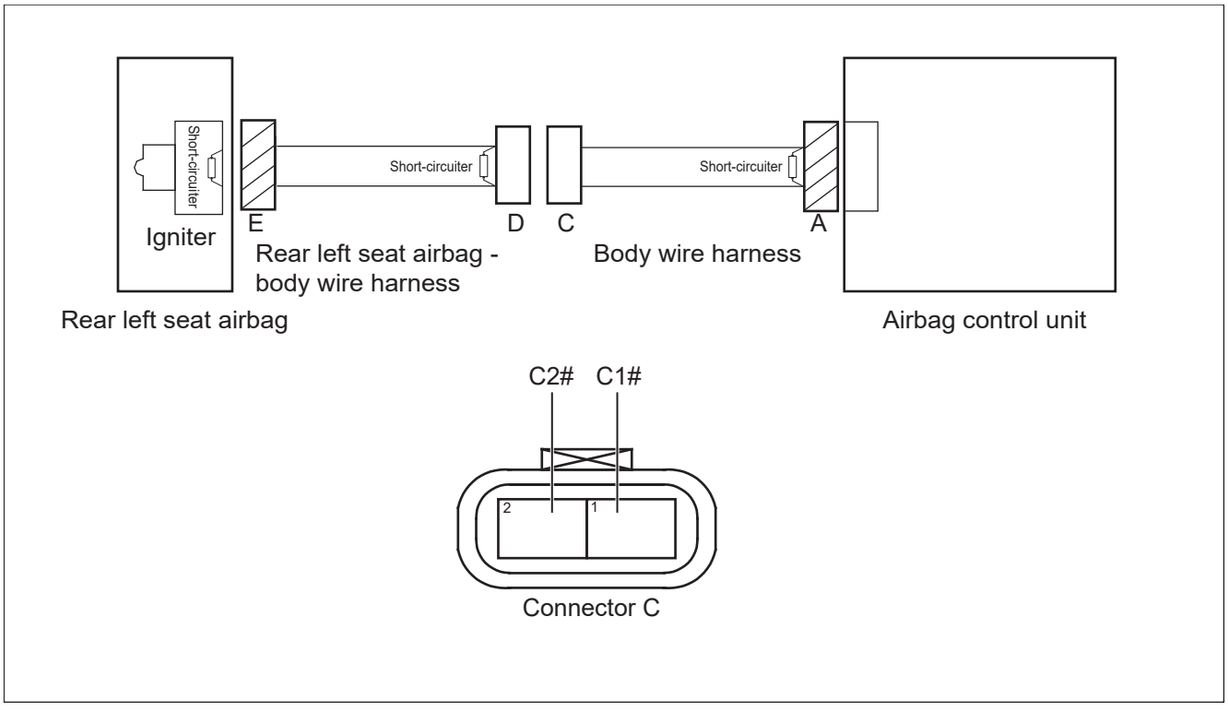
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to each other in rear left seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

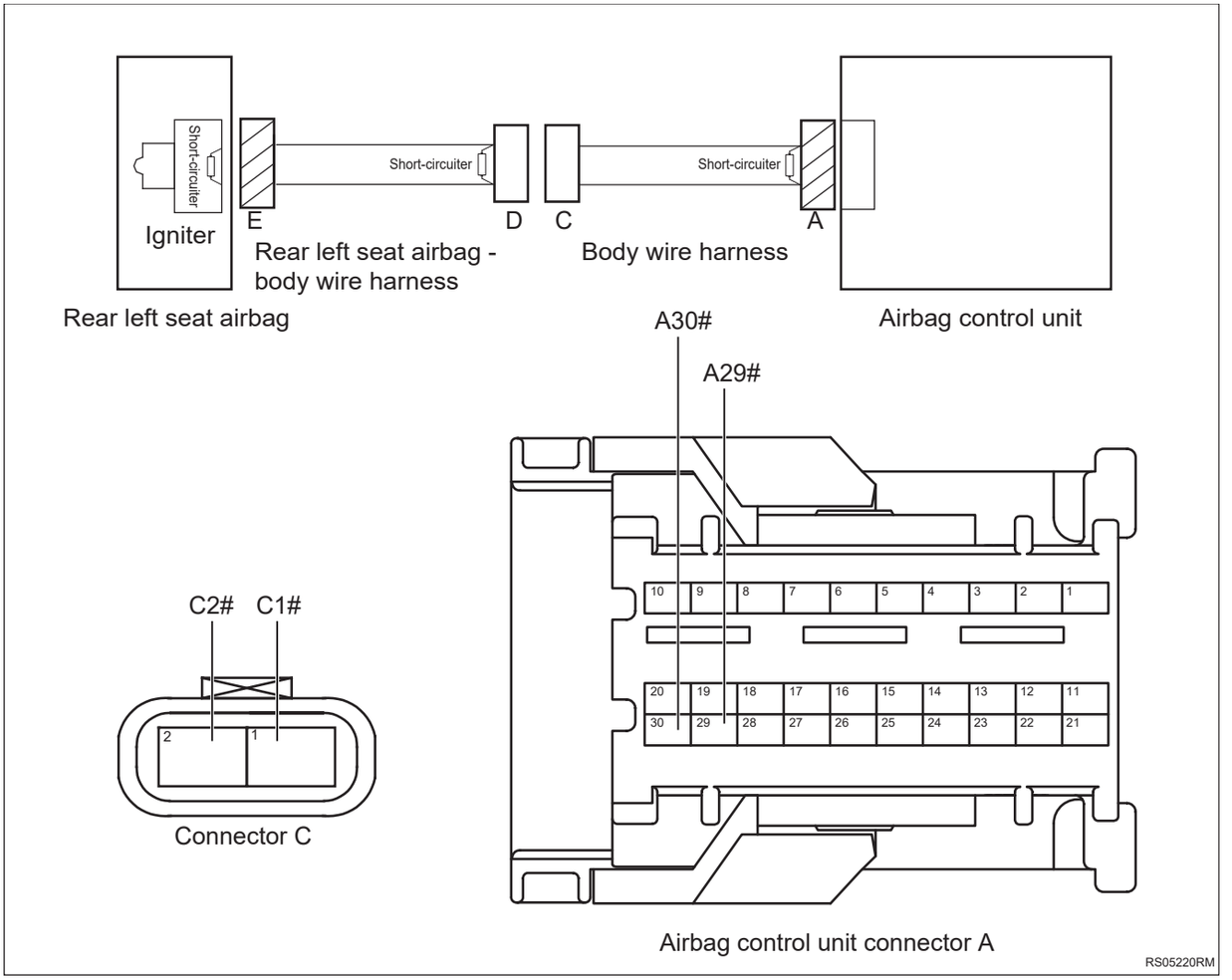
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in rear left seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

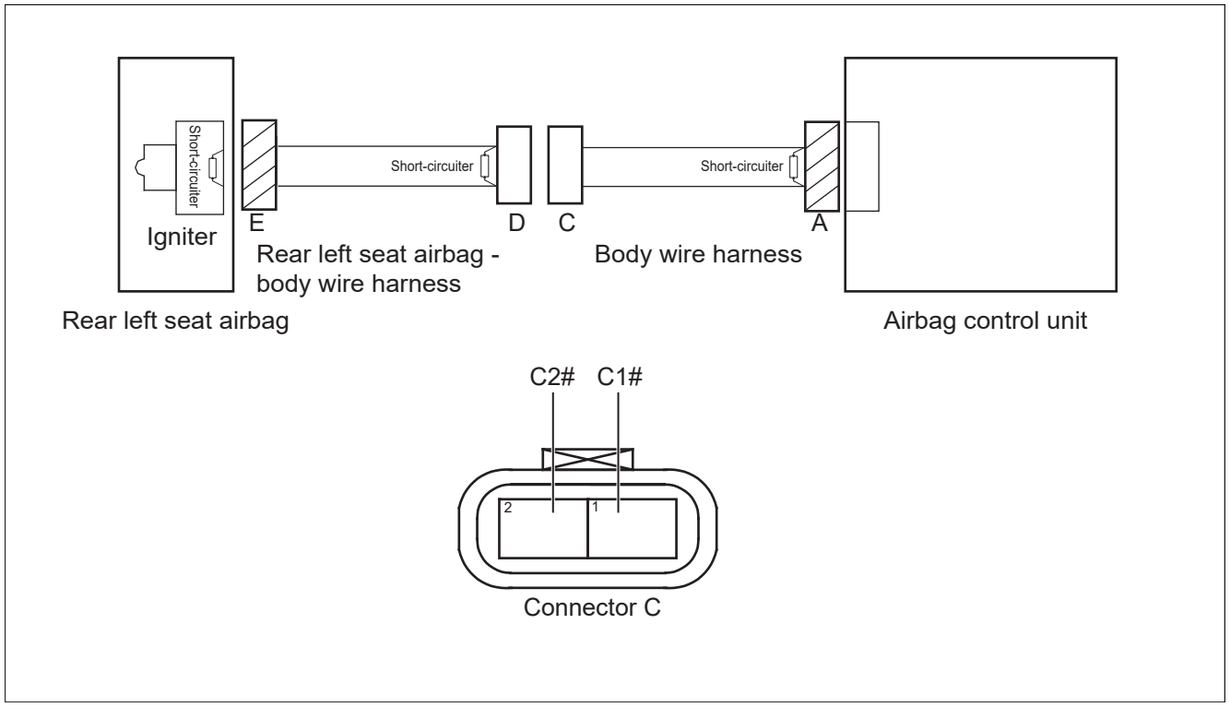
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector A29#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector A30#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in rear left seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

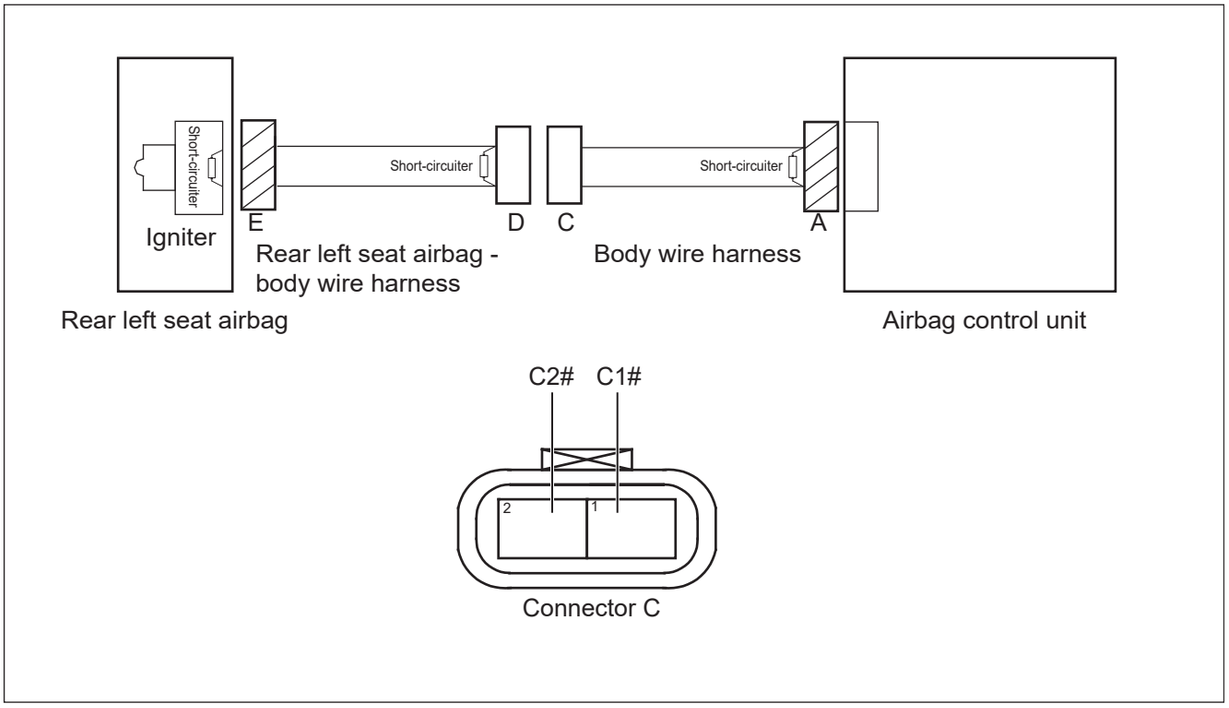
Multimeter connection	Detecti-on conditi-on	Specified condition
Connector C1# - body ground	Always connect-ed	10 KΩ or more
Connector C2# - body ground	Always connect-ed	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

8	**Check for short to power supply in rear left seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Replace rear left seat airbag (See page ZC-73)**

(a) Replace the rear left seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B003056	Second row left side airbag invalid configuration

Description

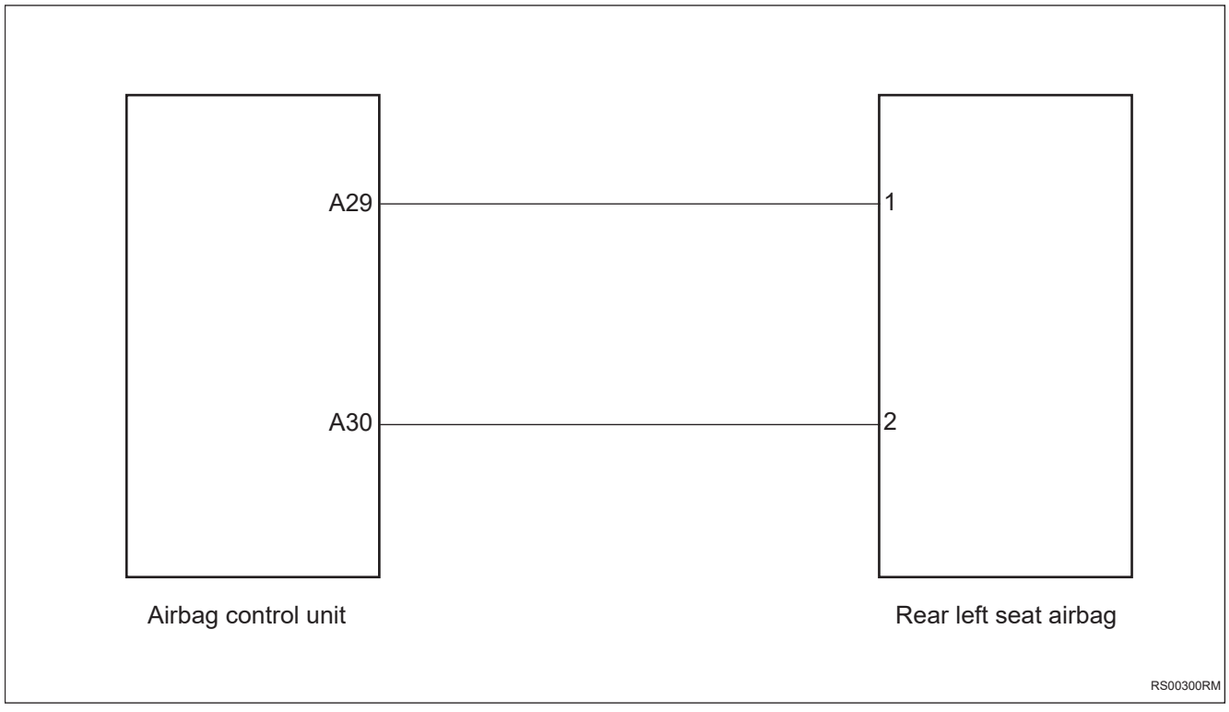
When rear left seat airbag assembly ignition circuit has an invalid configuration, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B003056	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Rear left seat airbag assembly • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B003056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

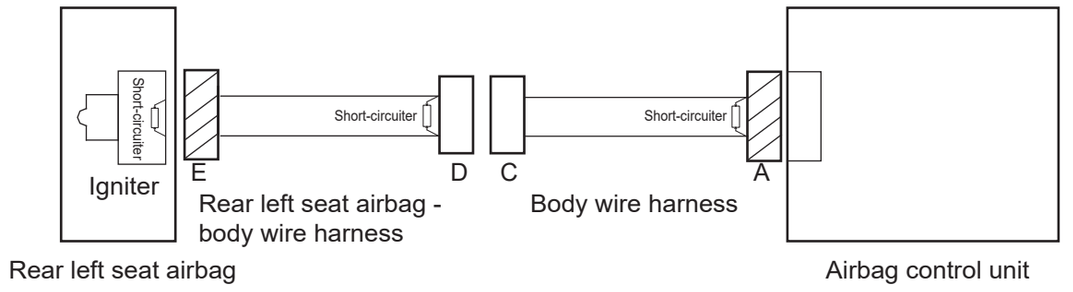
1	**Check and read configuration file of rear left seat airbag**

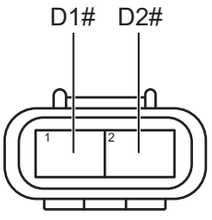
(a) Check and read if configuration file of rear left seat airbag is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**





Connector D

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

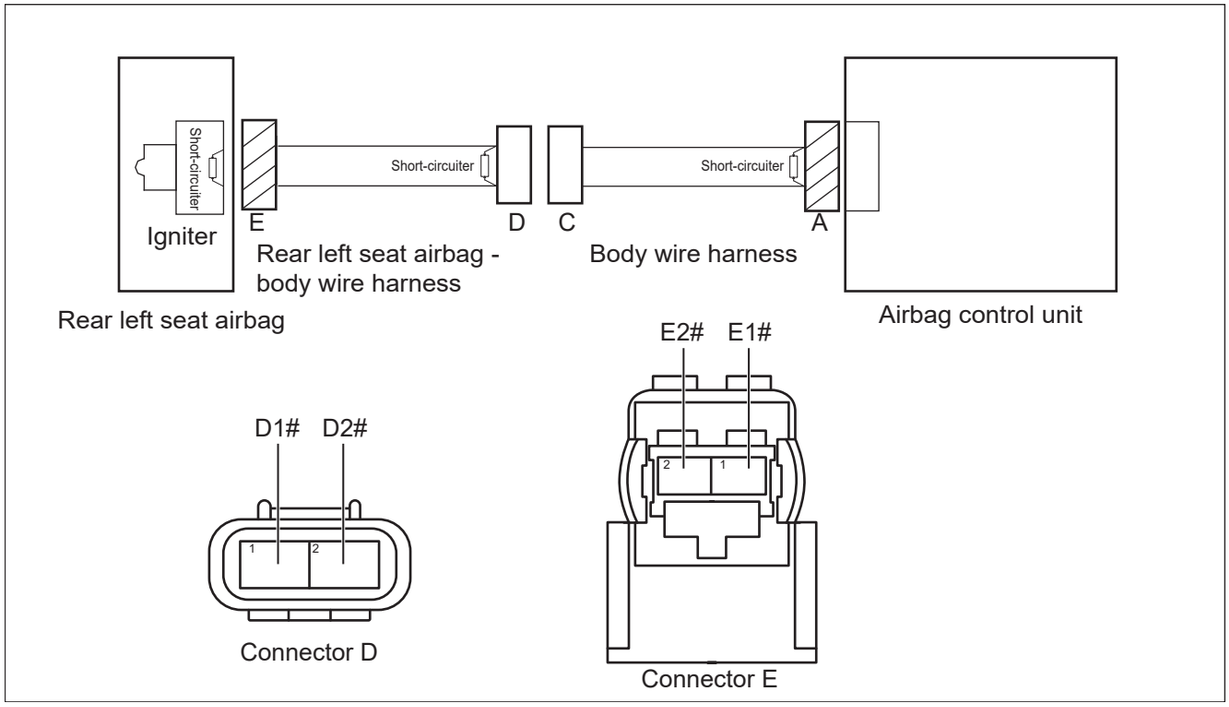
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

Standard value

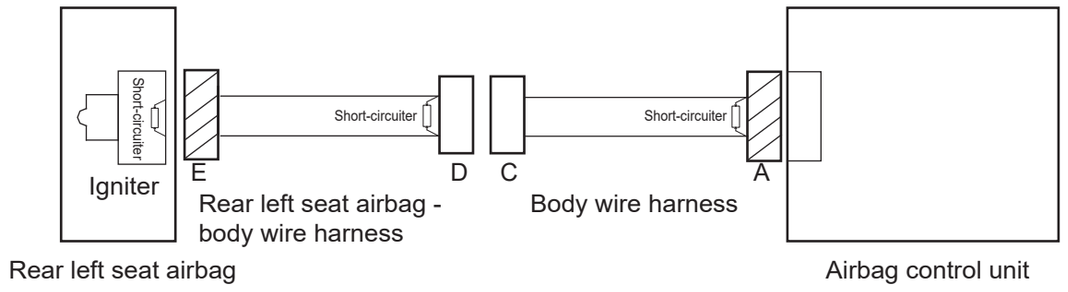
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω

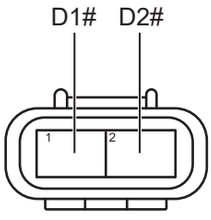
NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**





Connector D

(a) According to value in the table, measure resistance.

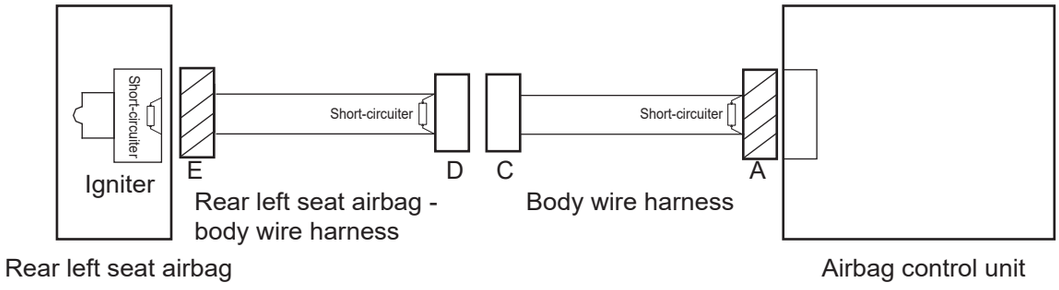
Standard value

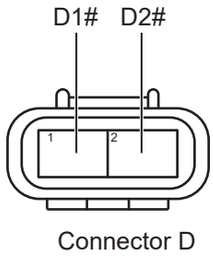
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear left seat airbag wire harness and connector (rear left seat airbag - body wire harness)**





(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

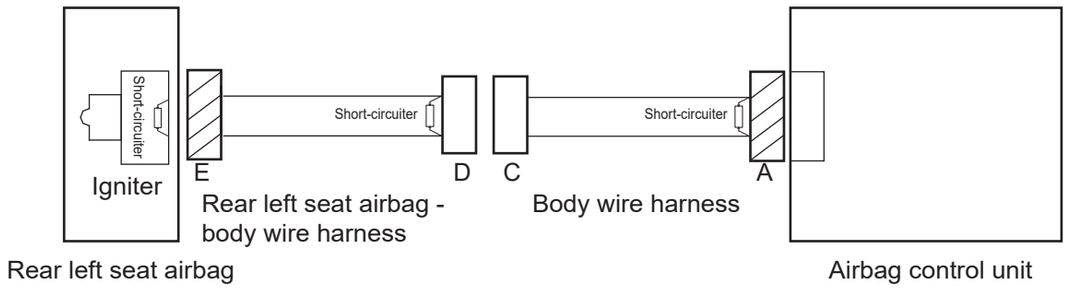
Standard value

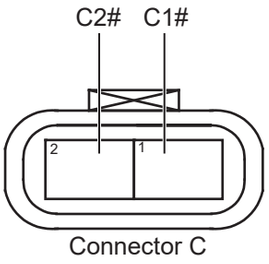
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in rear left seat airbag wire harness and connector (body wire harness)**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

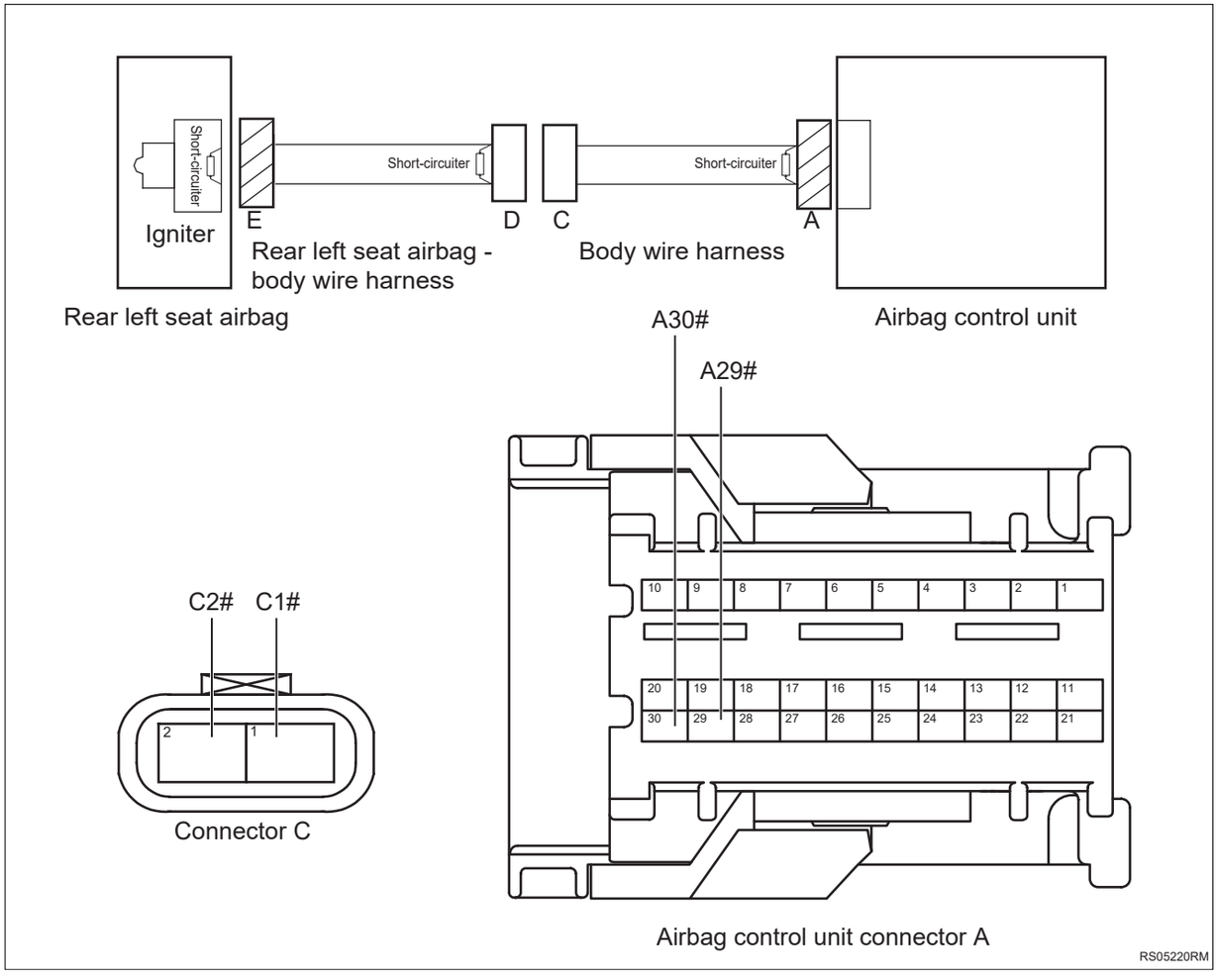
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in rear left seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

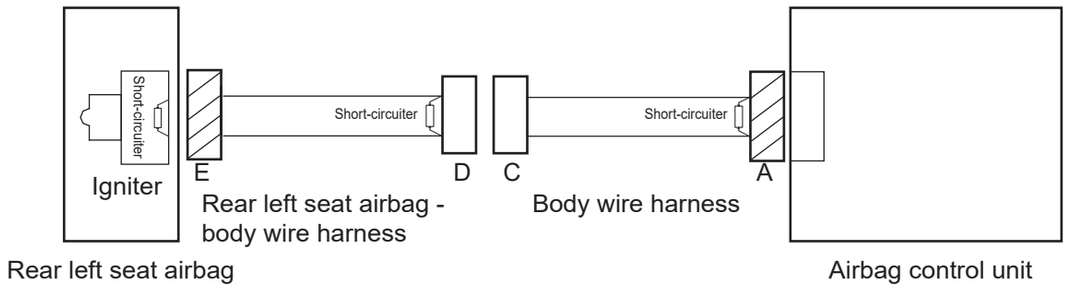
Standard value

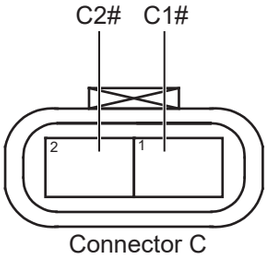
Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector A29#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector A30#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in rear left seat airbag wire harness and connector (body wire harness)**





(a) According to value in the table, measure resistance.

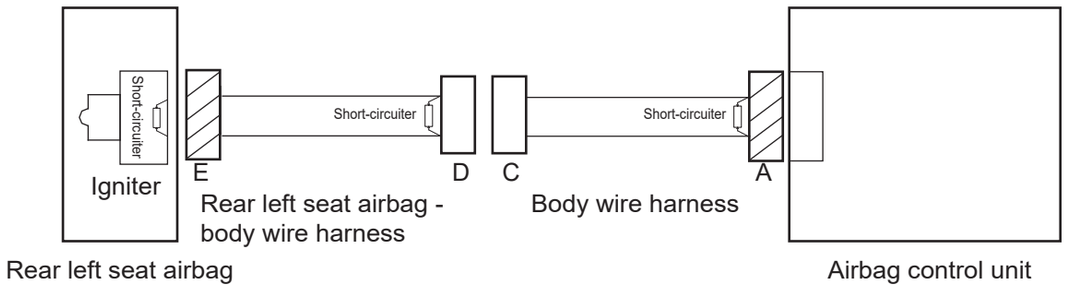
Standard value

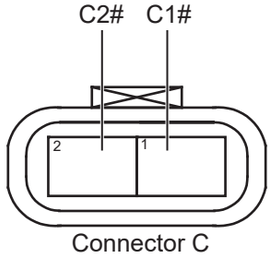
Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in rear left seat airbag wire harness and connector (body wire harness)**





(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

10	**Replace rear left seat airbag (See page ZC-73)**

(a) Replace the rear left seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B003811**	**Short to ground in second row right side airbag circuit**
DTC	**B003812**	**Short to power supply in second row right side airbag circuit**
DTC	**B00381A**	**Second row right side airbag circuit resistance below threshold**
DTC	**B00381B**	**Second row right side airbag circuit resistance above threshold**
DTC	**B00382B**	**Second row right side airbag other circuit series fault**

Description

When there is short to ground, short to power supply, high or low resistance, series fault in rear right seat airbag assembly ignition circuit, the airbag control unit records DTC.

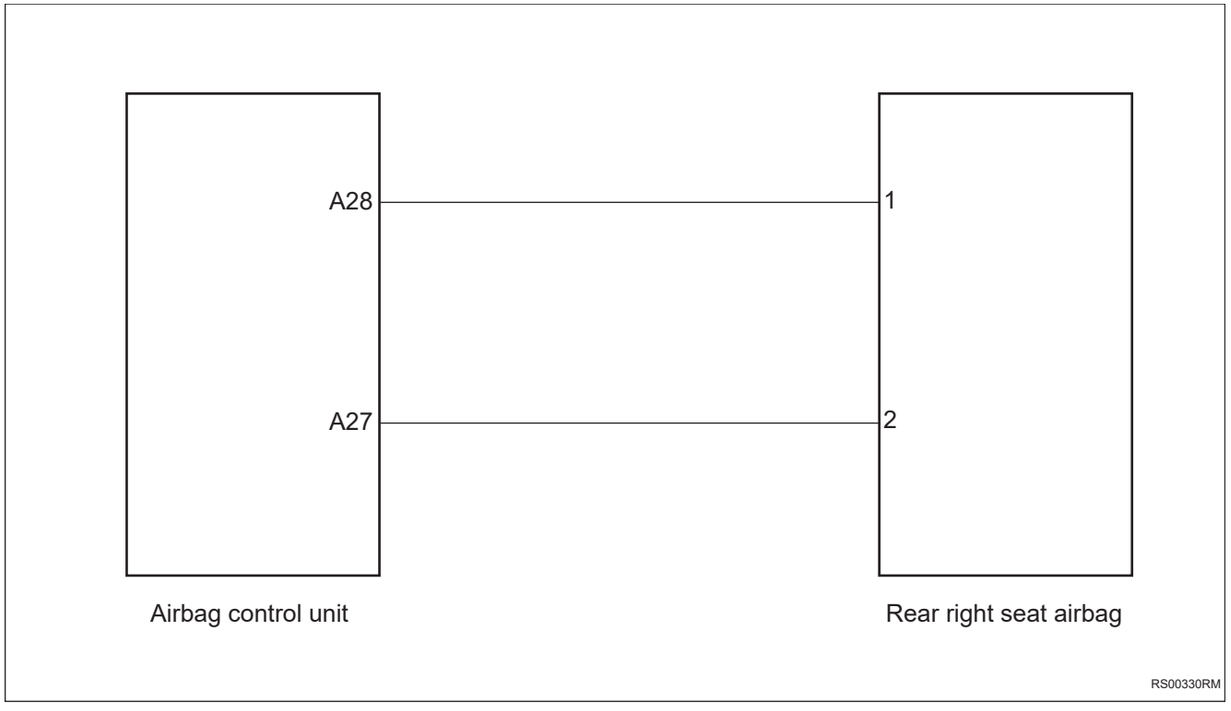
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B003811	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector
B003812	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector
B00381A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector
B00381B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector
B00382B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B003811	• Warning light comes on • Set DTC	Comes on
B003812	• Warning light comes on • Set DTC	Comes on
B00381A	• Warning light comes on • Set DTC	Comes on
B00381B	• Warning light comes on • Set DTC	Comes on
B00382B	• Warning light comes on • Set DTC	Comes on

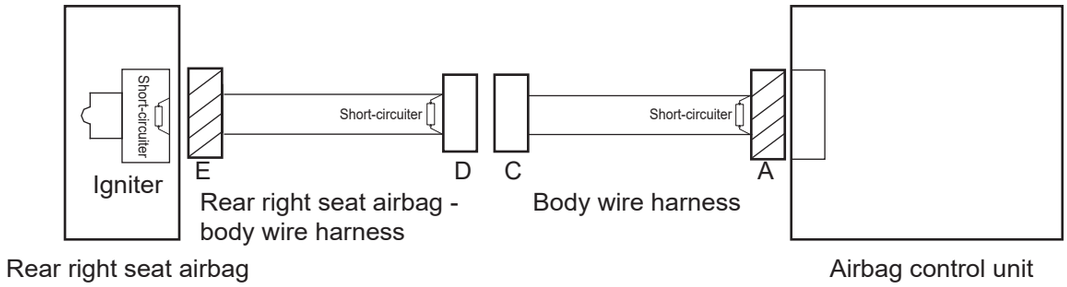
ZD

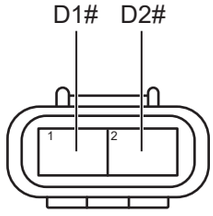
Circuit diagram



Inspection procedure

1	**Check for short to each other in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





Connector D

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

Standard value

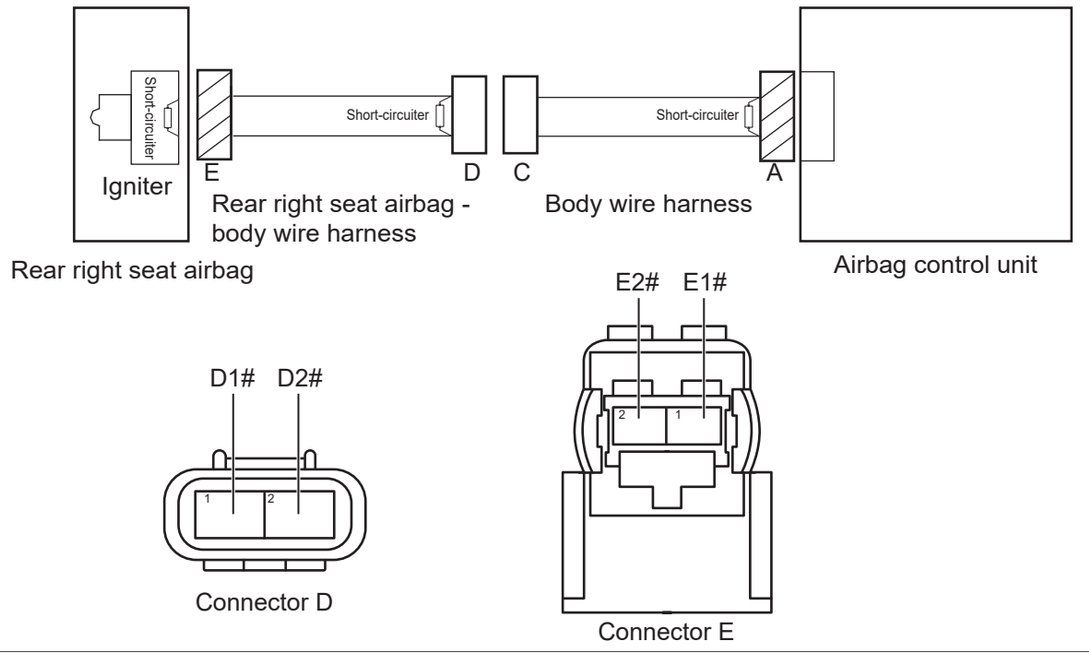
Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for open in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**



(a) According to value in the table, measure resistance.

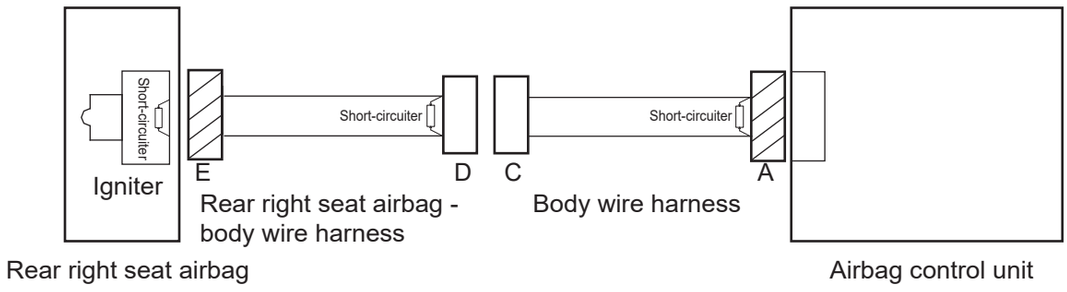
Standard value

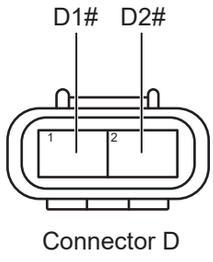
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





(a) According to value in the table, measure resistance.

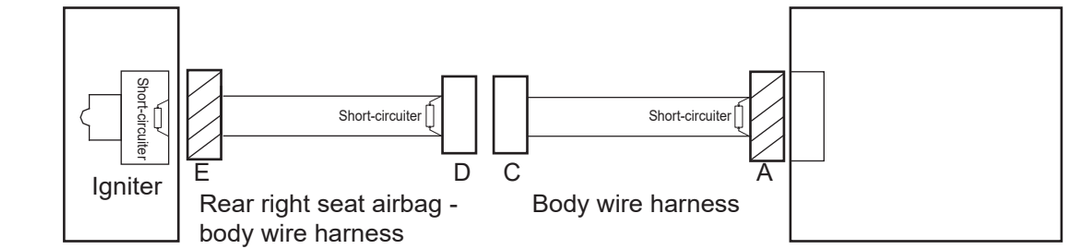
Standard value

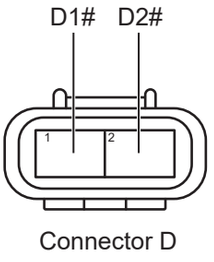
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

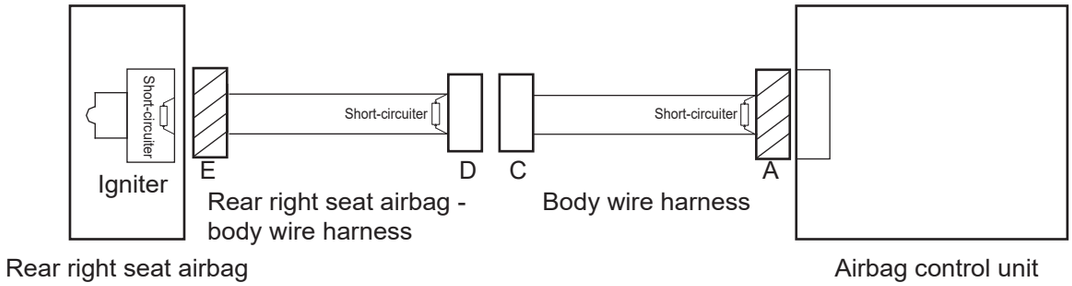
Standard value

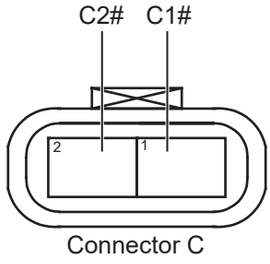
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to each other in rear right seat airbag wire harness and connector (body wire harness)**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

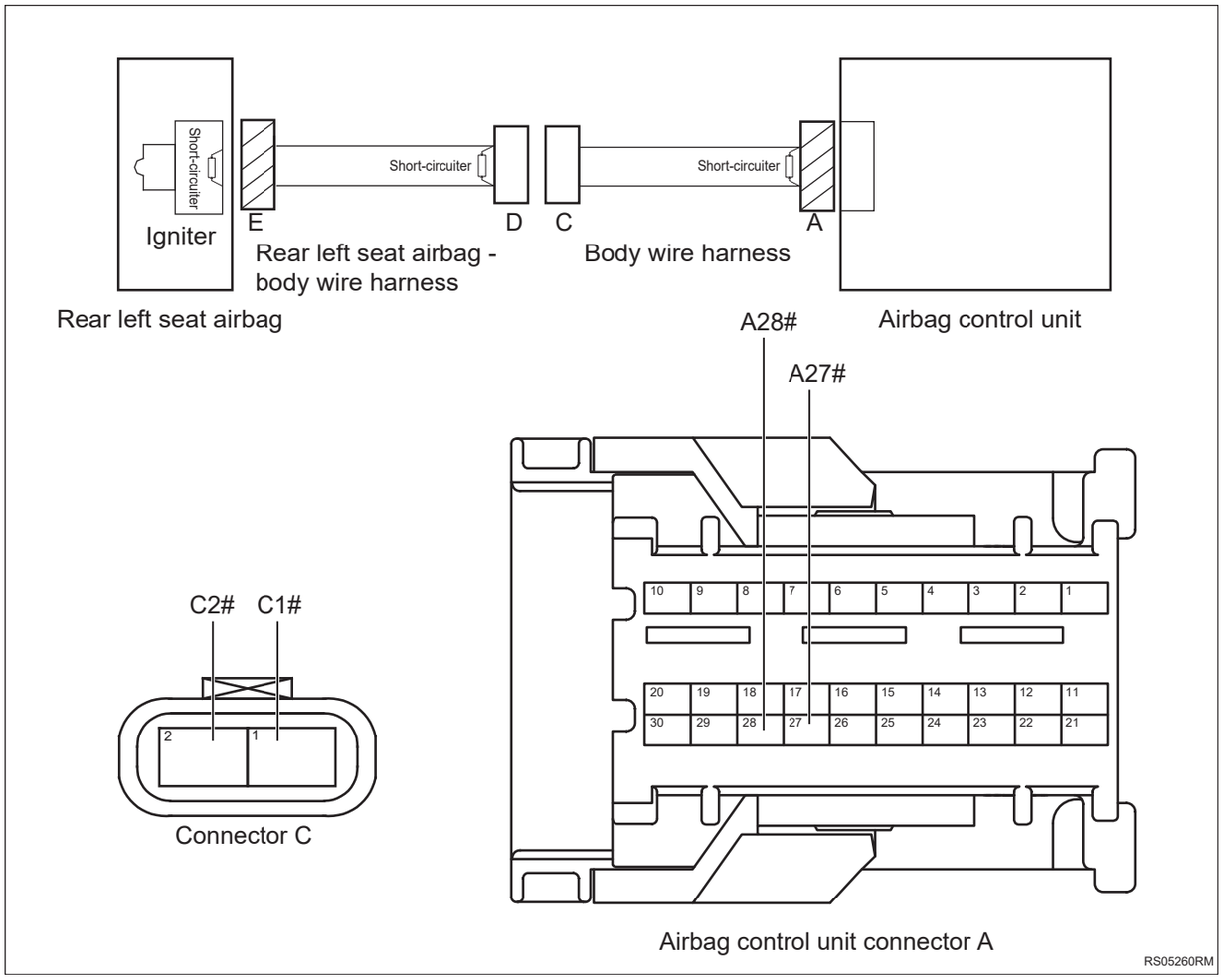
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for open in rear right seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

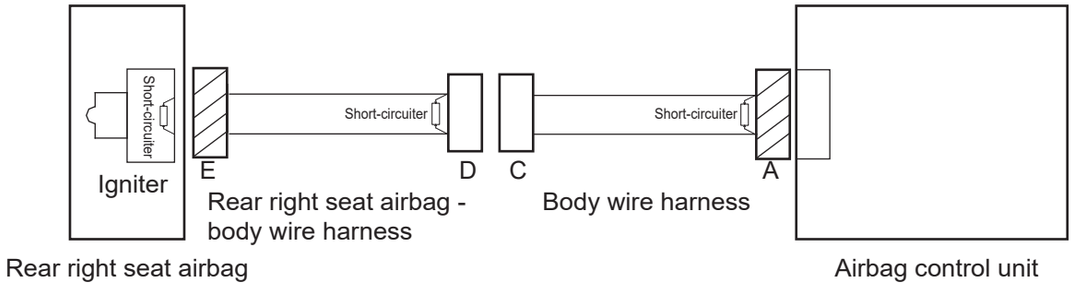
Standard value

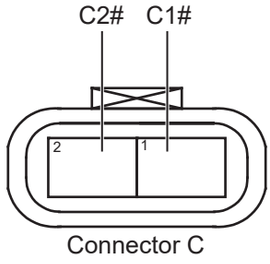
Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector A27#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector A28#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for short to ground in rear right seat airbag wire harness and connector (body wire harness)**





(a) According to value in the table, measure resistance.

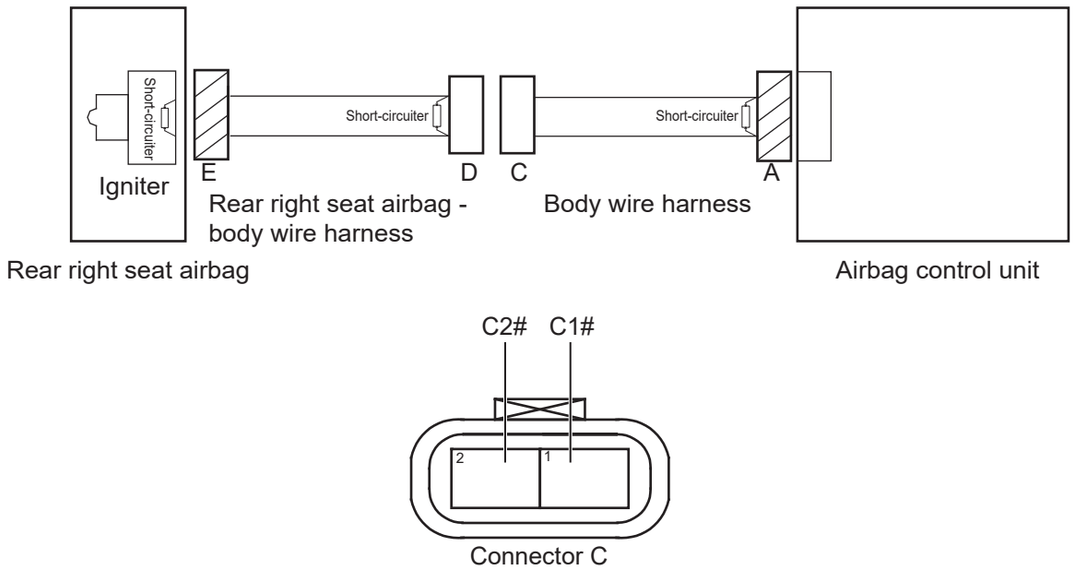
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to power supply in rear right seat airbag wire harness and connector (body wire harness)**



ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

9	**Replace rear right seat airbag (See page ZC-73)**

(a) Replace the rear right seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B003856**	**Second row right side airbag invalid configuration**

Description

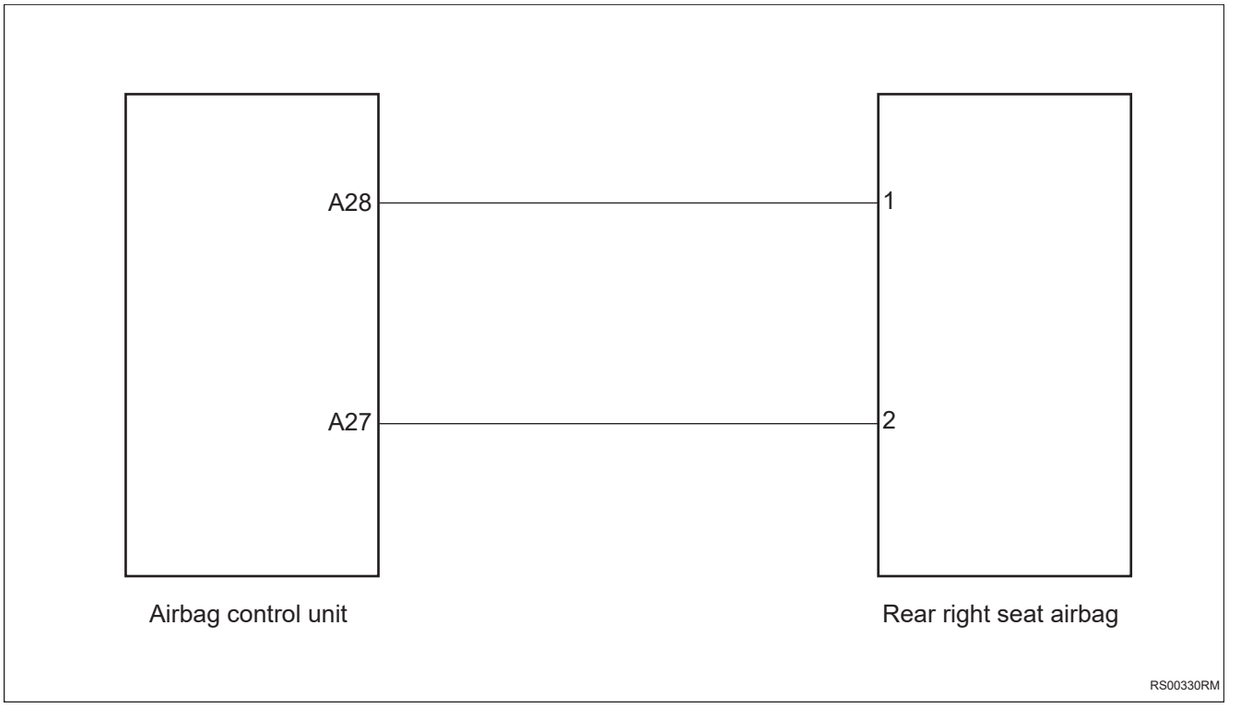
When rear right seat airbag assembly ignition circuit has an invalid configuration, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B003856	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Rear right seat airbag assembly • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B003856	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

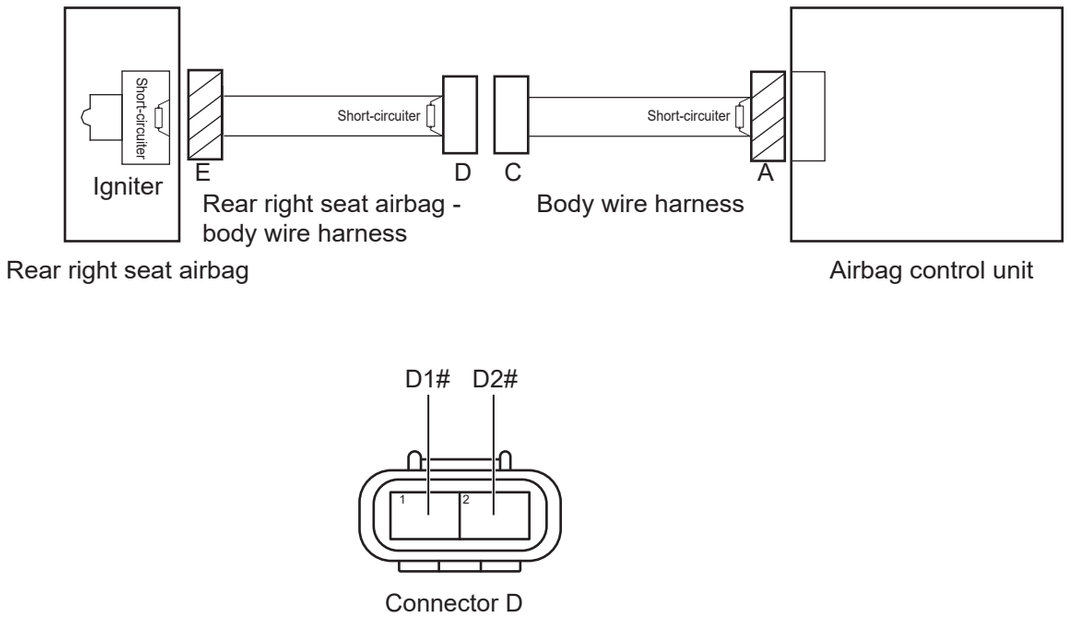
1	**Check part number of rear right seat airbag**

(a) Check if part number of rear right seat airbag is correct.

NG → **Replace airbag with the correct type**

OK

2	**Check for short to each other in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors D and E.

(d) Release the built-in short-circuiter of connector D.

(e) According to value in the table, measure resistance.

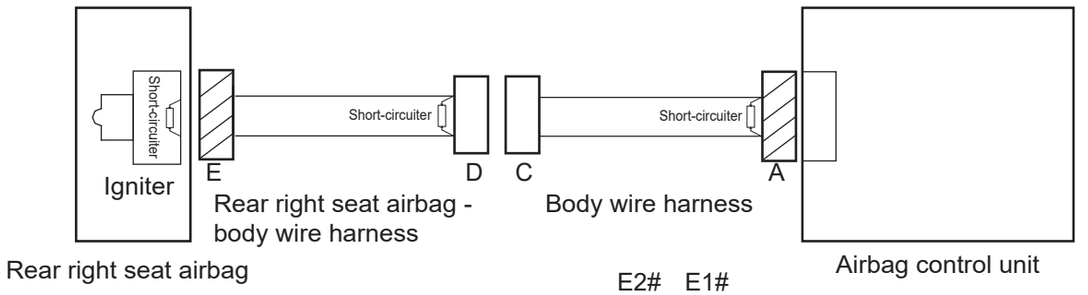
Standard value

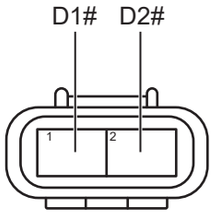
Multimeter connection	Detection condition	Specified condition
Connector D1# - connector D2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

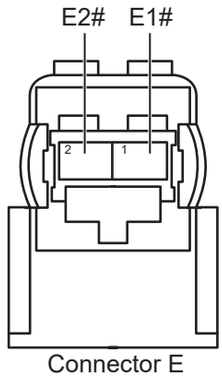
OK

3	**Check for open in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





Connector D



Connector E

(a) According to value in the table, measure resistance.

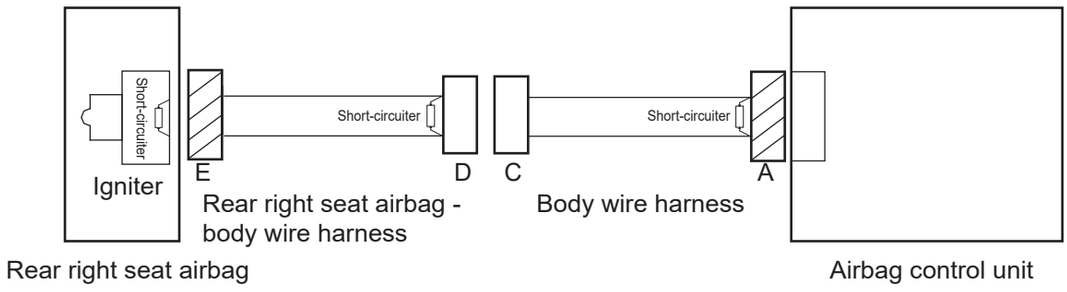
Standard value

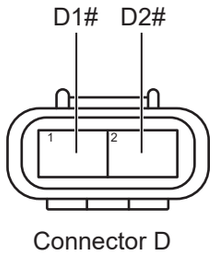
Multimeter connection	Detection condition	Specified condition
Connector E1# - connector D1#	Always connected	Less than 1 Ω
Connector E2# - connector D2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





(a) According to value in the table, measure resistance.

Standard value

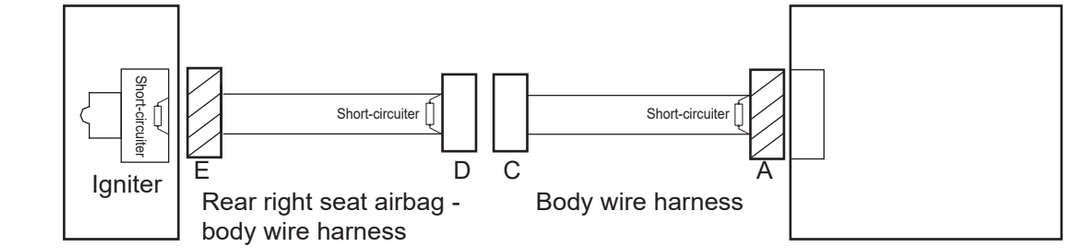
Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Always connected	10 KΩ or more
Connector D2# - body ground	Always connected	10 KΩ or more

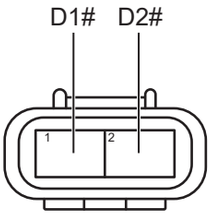
NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in rear right seat airbag wire harness and connector (rear right seat airbag - body wire harness)**





Connector D

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

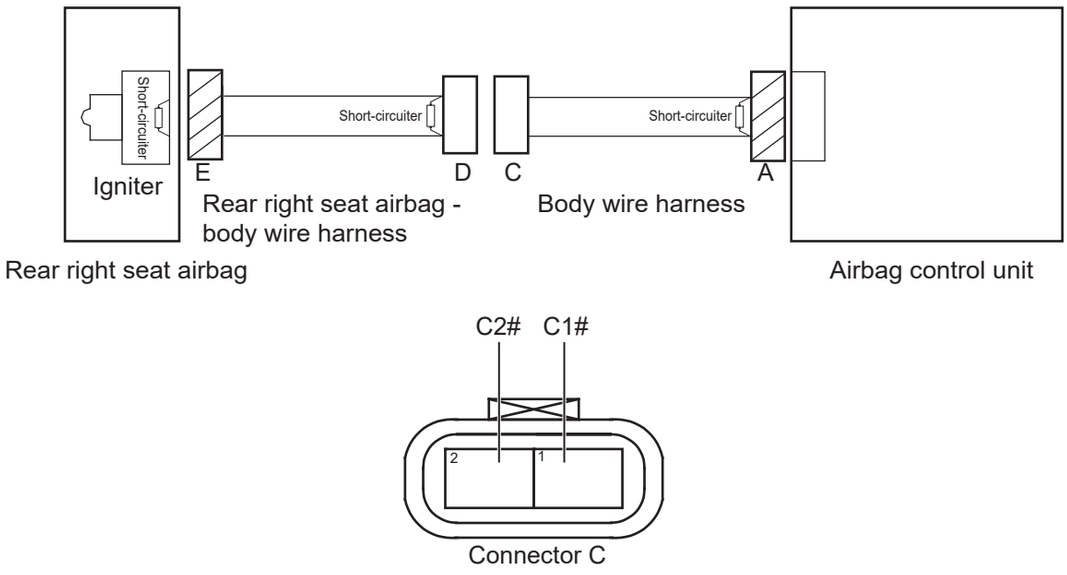
Standard value

Multimeter connection	Detection condition	Specified condition
Connector D1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector D2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to each other in rear right seat airbag wire harness and connector (body wire harness)**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

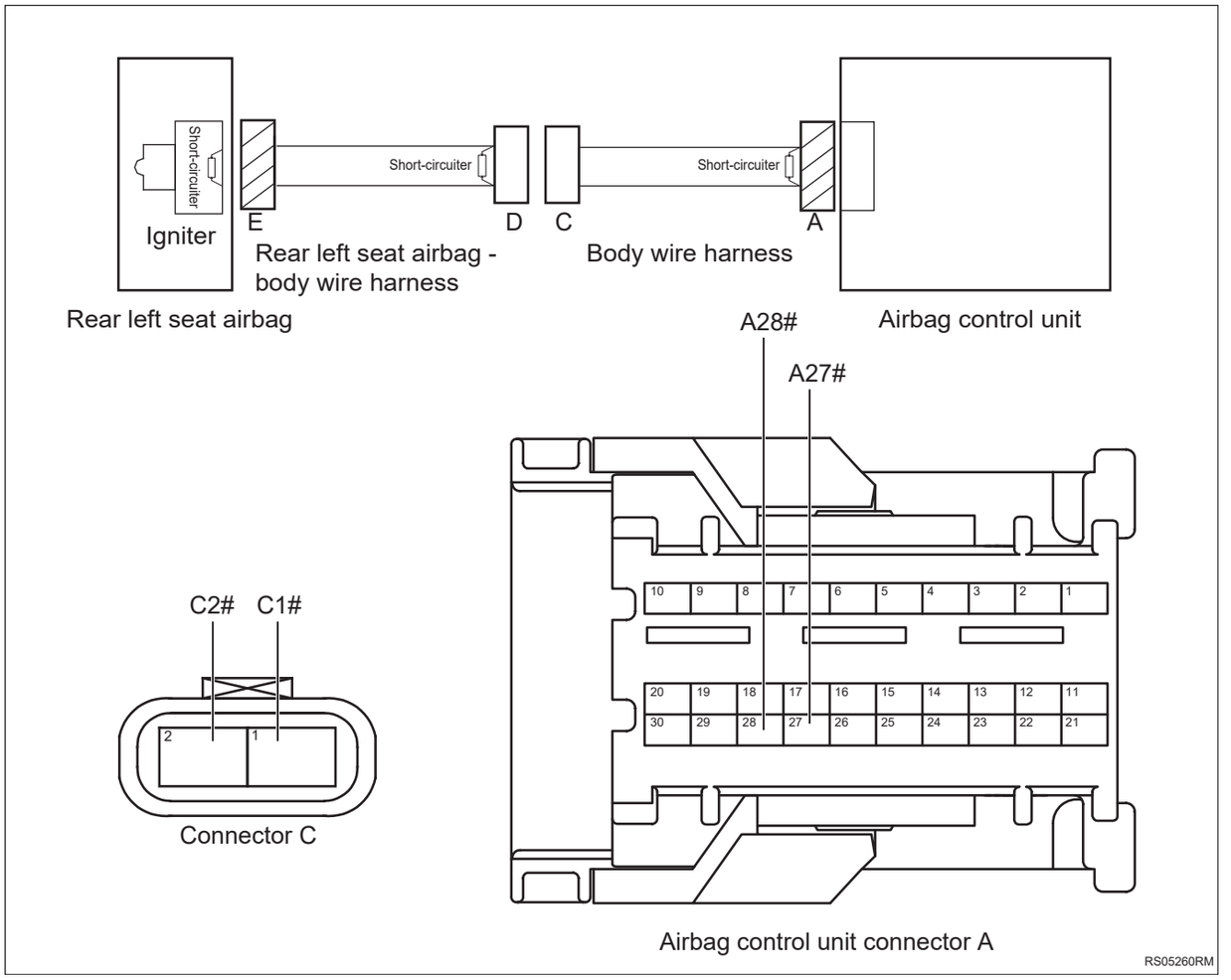
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - connector C2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

7	**Check for open in rear right seat airbag wire harness and connector (body wire harness)**



(a) According to value in the table, measure resistance.

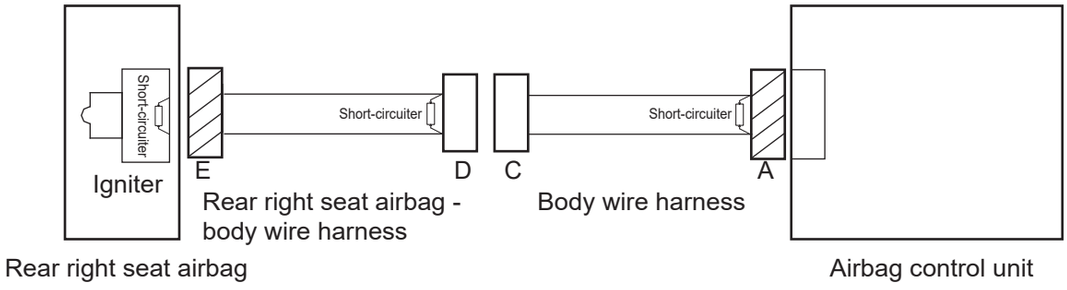
Standard value

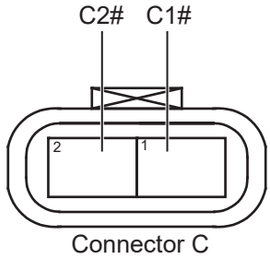
Multimeter connection	Detection condition	Specified condition
Connector C1# - airbag control unit connector A27#	Always connected	Less than 1 Ω
Connector C2# - airbag control unit connector A28#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

8	**Check for short to ground in rear right seat airbag wire harness and connector (body wire harness)**





(a) According to value in the table, measure resistance.

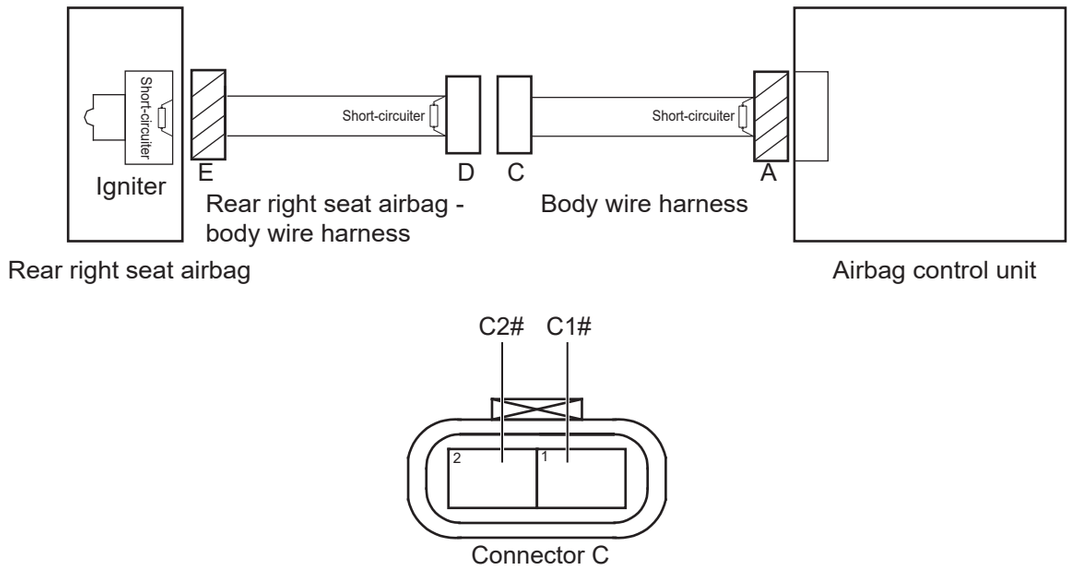
Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Always connected	10 KΩ or more
Connector C2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

9	**Check for short to power supply in rear right seat airbag wire harness and connector (body wire harness)**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Connector C1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Connector C2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

10	**Replace rear right seat airbag (See page ZC-73)**

(a) Replace the rear right seat airbag.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007011**	**Short to ground in driver seat belt retractor pretensioner circuit**
DTC	**B007012**	**Short to power supply in driver seat belt retractor pretensioner circuit**
DTC	**B00701A**	**Driver seat belt retractor pretensioner circuit resistance below threshold**
DTC	**B00701B**	**Driver seat belt retractor pretensioner circuit resistance above threshold**
DTC	**B00702B**	**Driver seat belt retractor pretensioner other circuit series fault**

Description

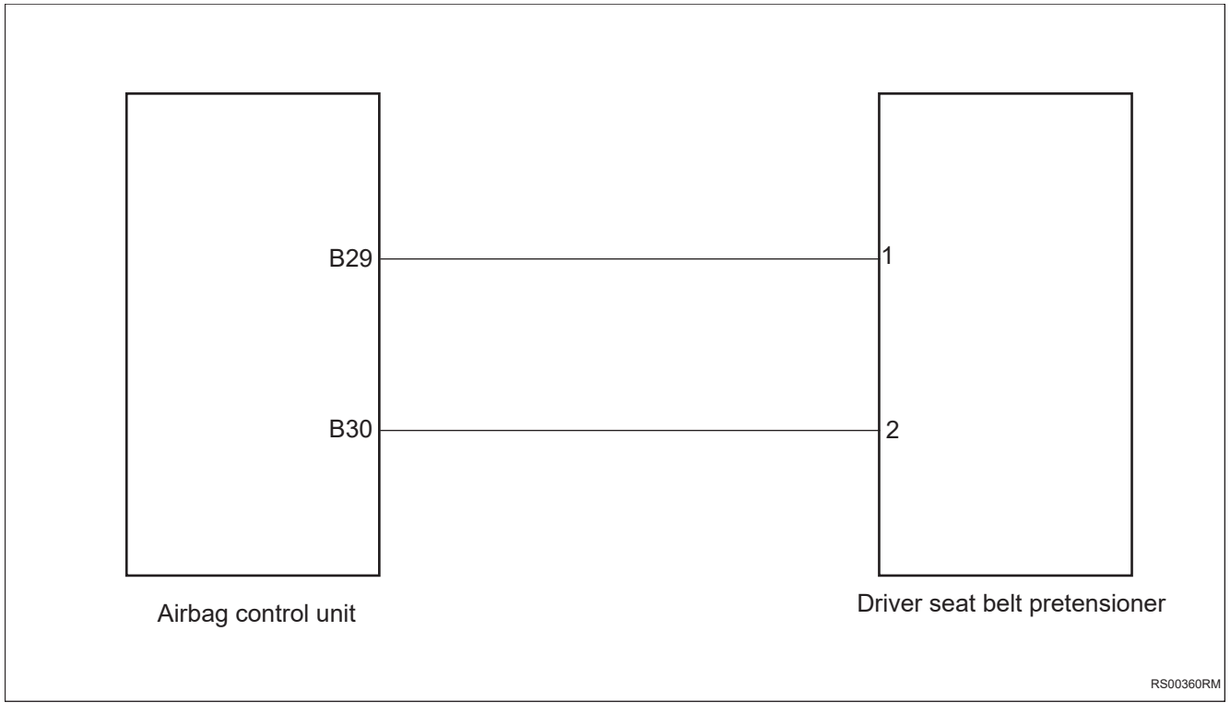
When there is short to ground, short to power supply, high or low resistance, series fault in driver seat belt pretensioner circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007011	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector
B007012	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector
B00701A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector
B00701B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector
B00702B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector

Fault symptom

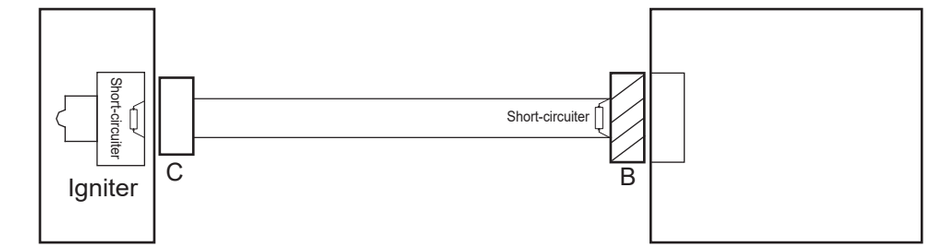
DTC No.	Fault symptom	Warning light/indicator
B007011	• Warning light comes on • Set DTC	Comes on
B007012	• Warning light comes on • Set DTC	Comes on
B00701A	• Warning light comes on • Set DTC	Comes on
B00701B	• Warning light comes on • Set DTC	Comes on
B00702B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



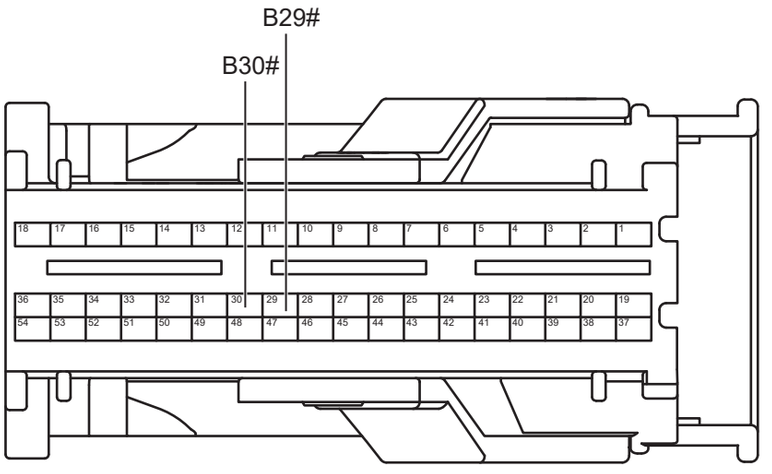
Inspection procedure

1	**Check for short to each other in driver seat belt pretensioner wire harness and connector**



Driver seat belt pretensioner

Airbag control unit



Airbag control unit connector B

RS05310RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

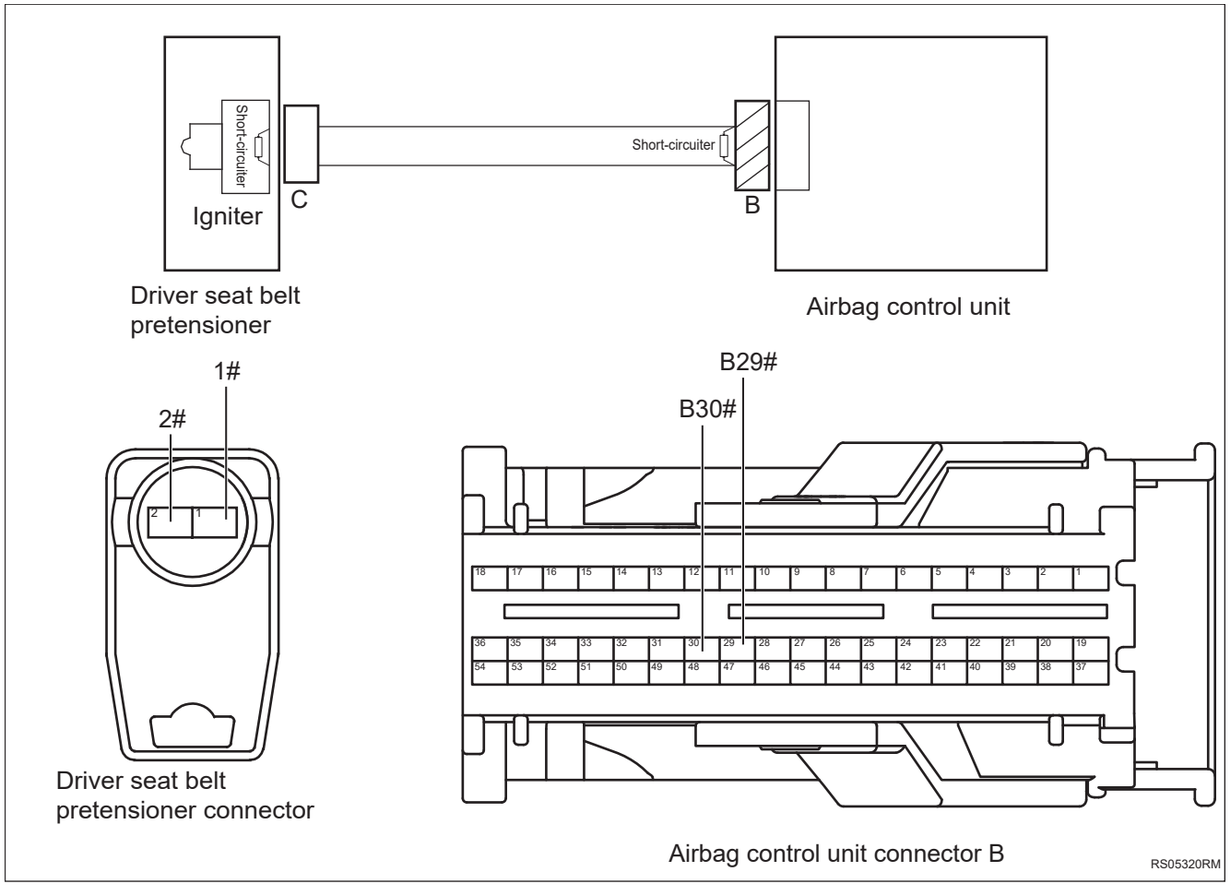
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - airbag control unit connector B30#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

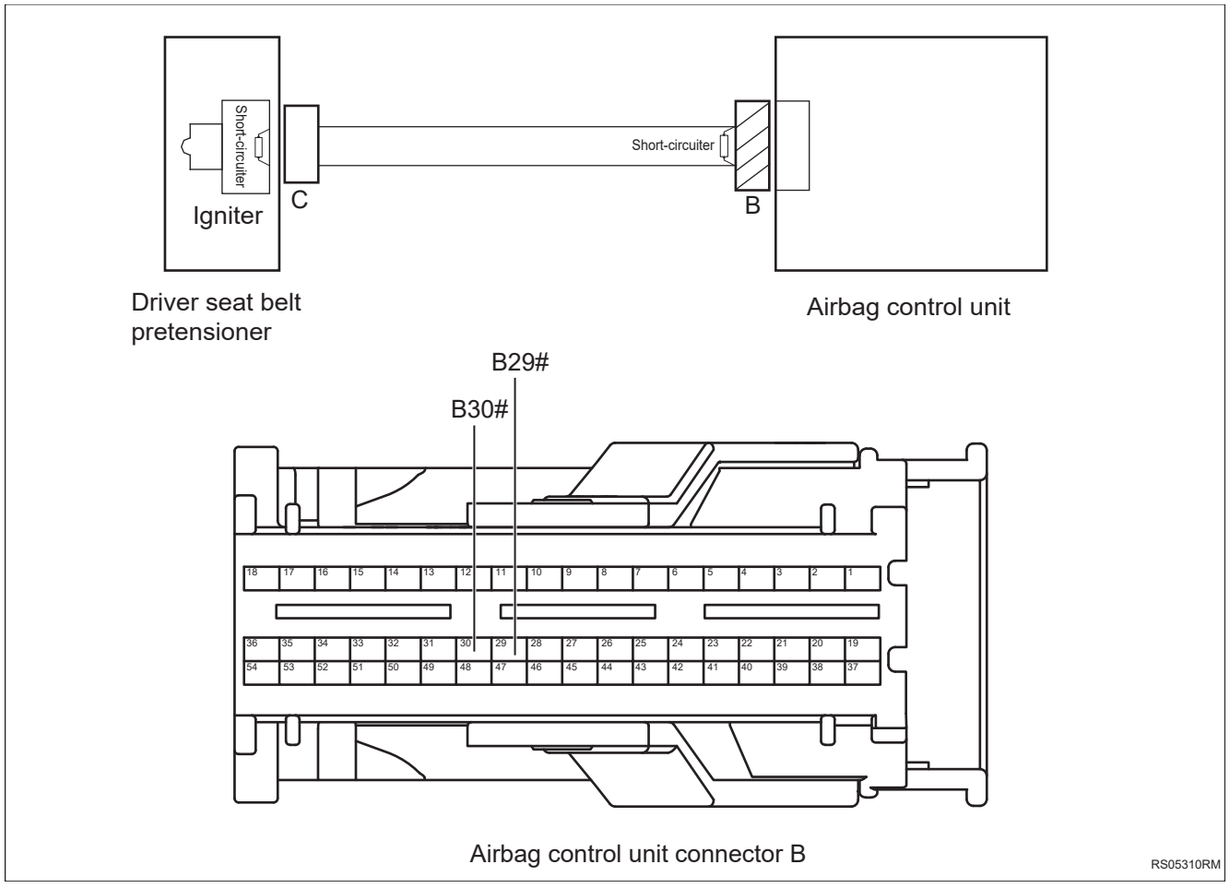
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B29# - driver seat belt pretensioner connector 1#	Always connect-ed	Less than 1 Ω
Airbag control unit connector B30# - driver seat belt pretensioner connector 2#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in driver seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

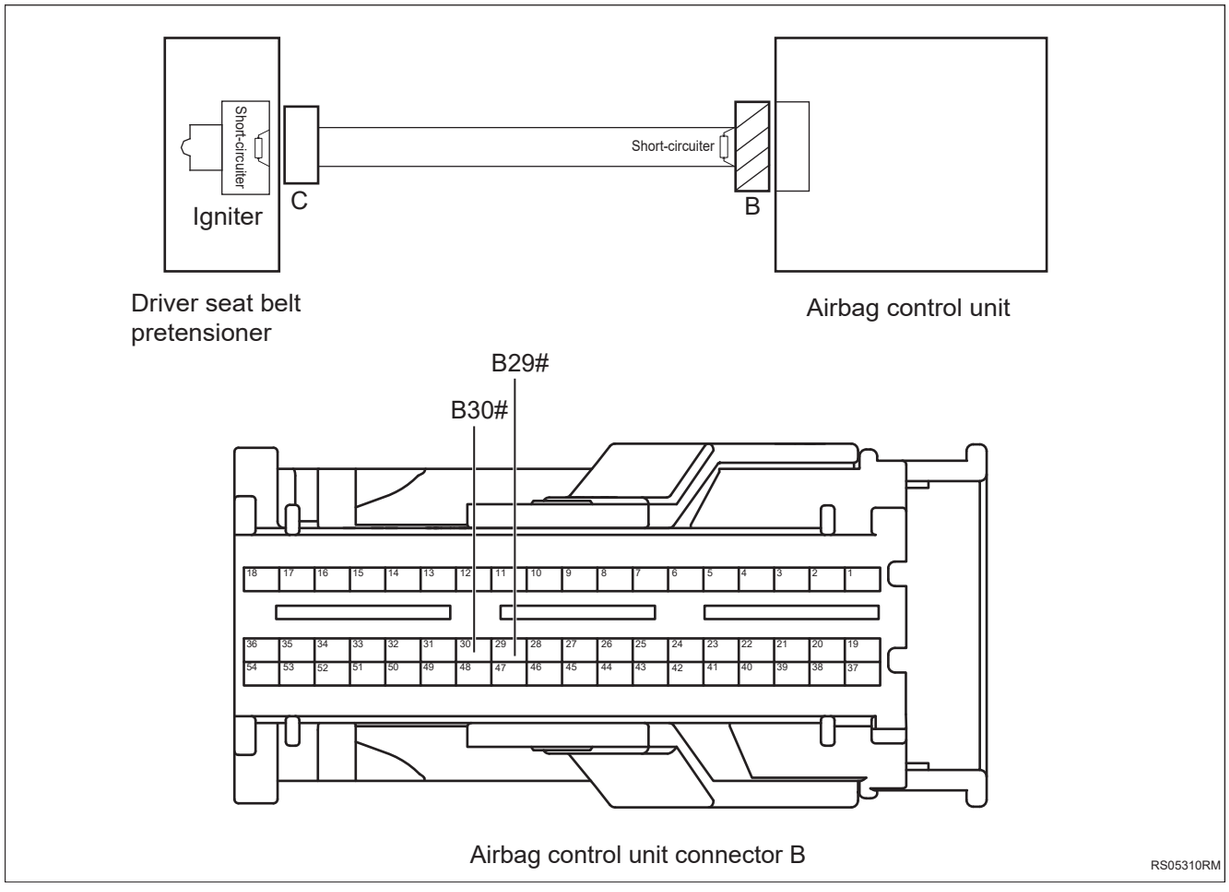
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in driver seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace driver seat belt pretensioner (See page NS-3)**

(a) Replace the driver seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B007056	Driver seat belt retractor pretensioner invalid configuration

Description

When driver seat belt pretensioner circuit has an invalid configuration, airbag control unit records DTC.

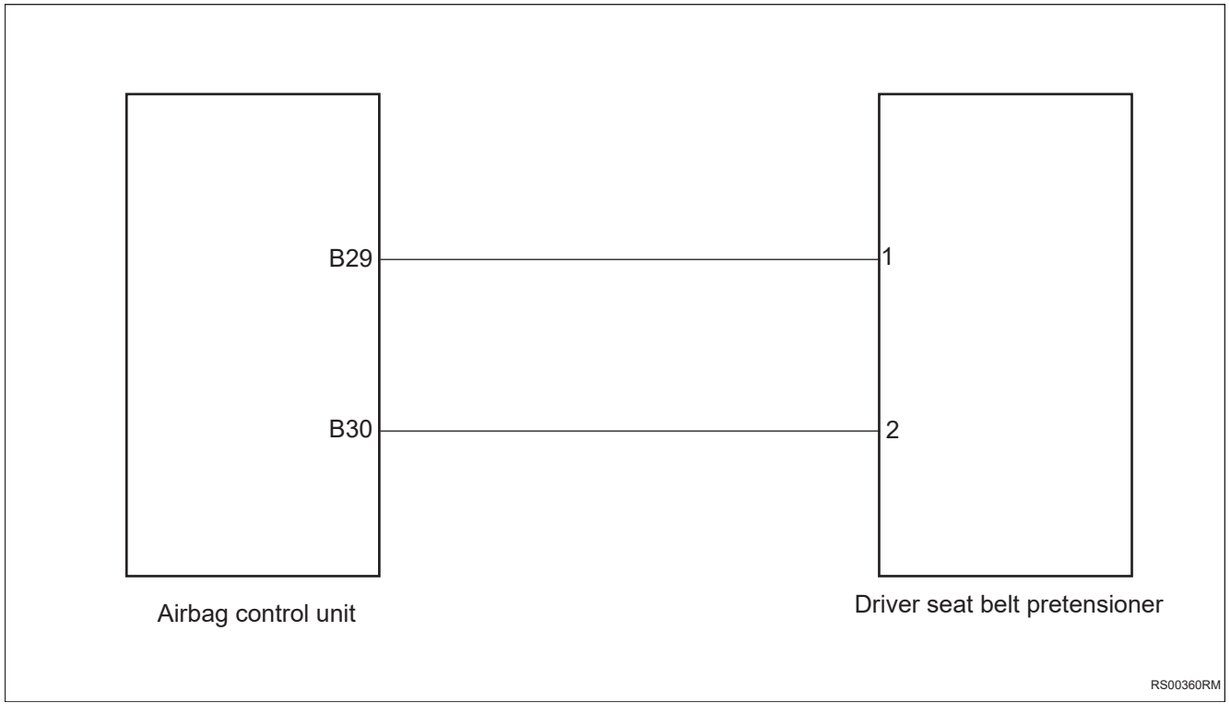
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007056	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Driver seat belt pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B007056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check and read configuration file of driver seat belt pretensioner**

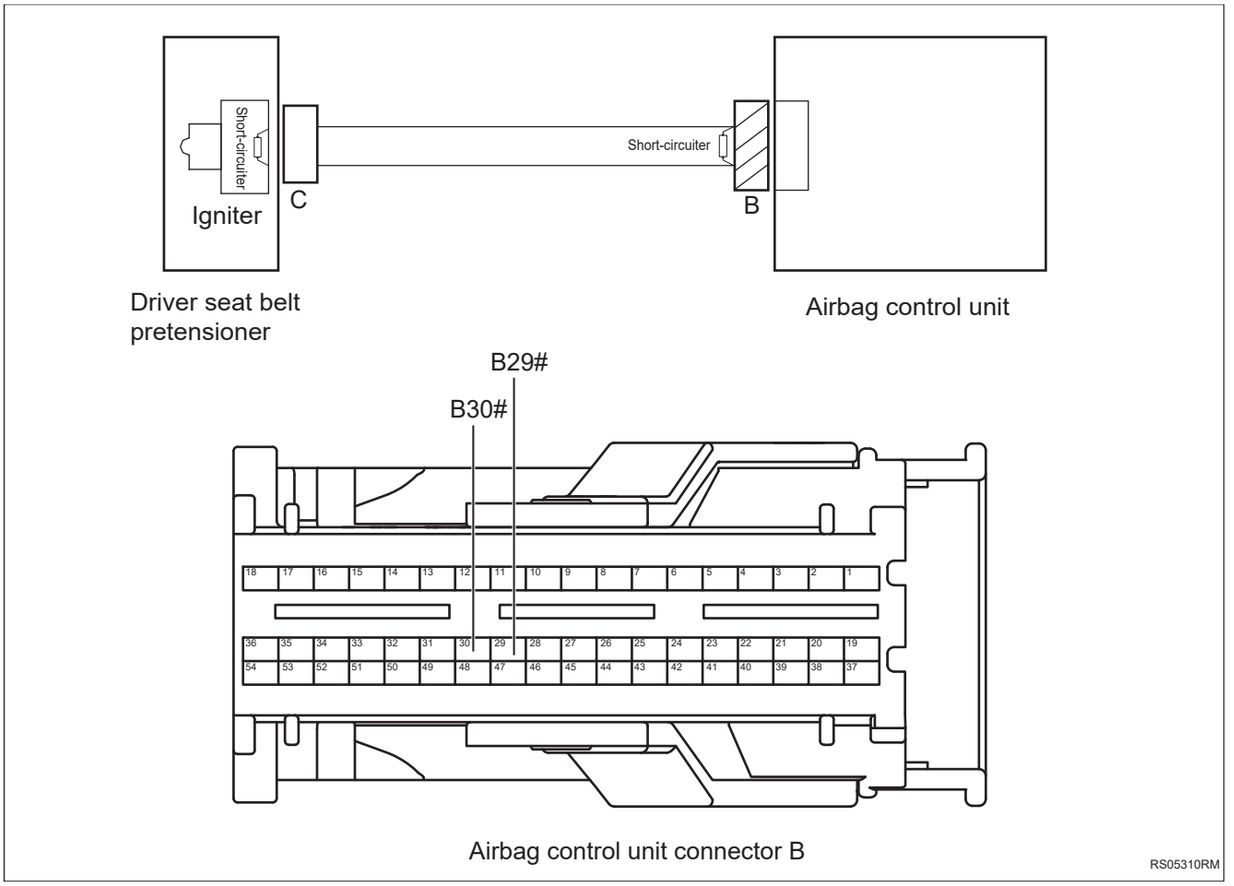
(a) Check and read if configuration file of driver seat belt pretensioner is correct.

NG → **Rewrite configuration file**

OK

ZD

2	**Check for short to each other in driver seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

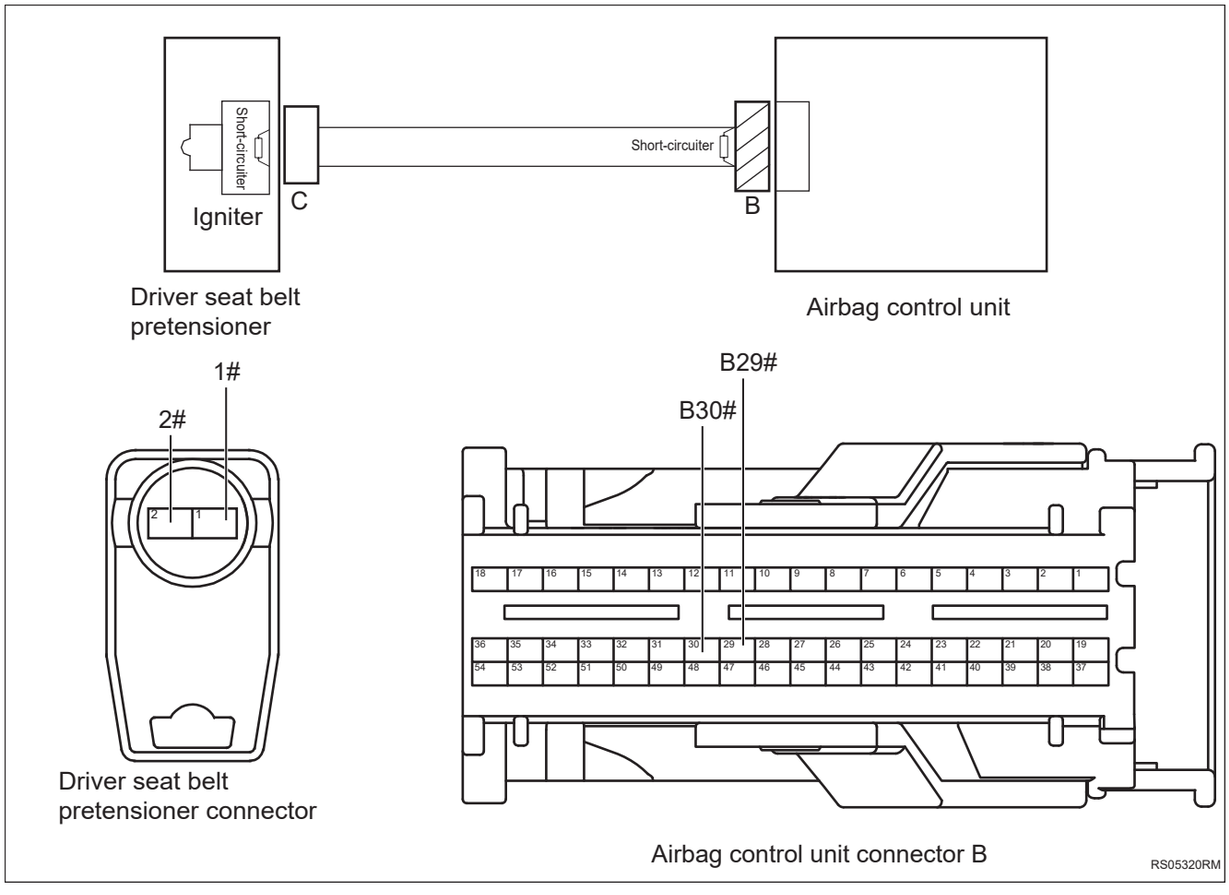
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - airbag control unit connector B30#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for open in driver seat belt pretensioner wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

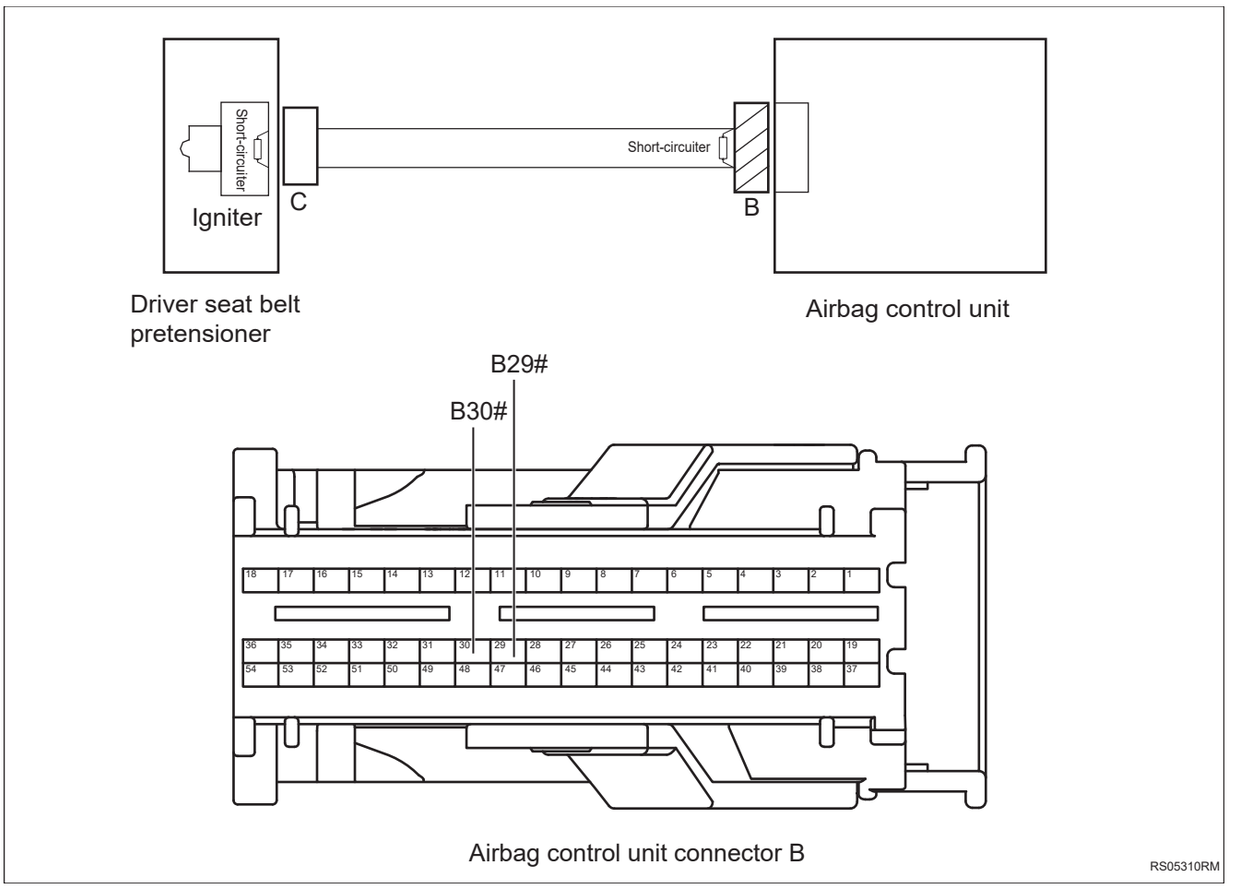
Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B29# - driver seat belt pretensioner connector 1#	Always connect-ed	Less than 1 Ω
Airbag control unit connector B30# - driver seat belt pretensioner connector 2#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in driver seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

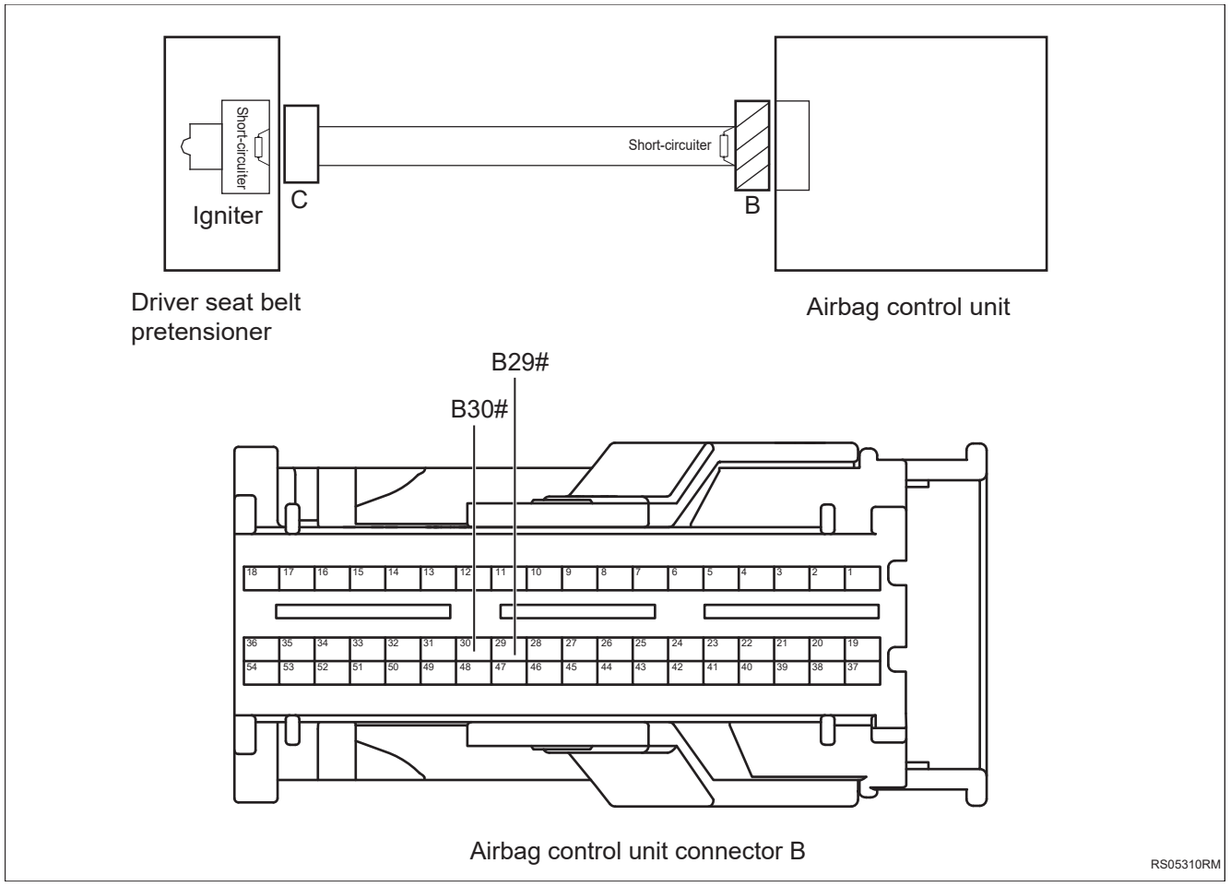
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in driver seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B29# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Replace driver seat belt pretensioner (See page NS-3)**

(a) Replace the driver seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007211**	**Short to ground in front passenger seat belt retractor pretensioner circuit**
DTC	**B007212**	**Short to power supply in front passenger seat belt retractor pretensioner circuit**
DTC	**B00721A**	**Front passenger seat belt retractor pretensioner circuit resistance below threshold**
DTC	**B00721B**	**Front passenger seat belt retractor pretensioner circuit resistance above threshold**
DTC	**B00722B**	**Front passenger seat belt retractor pretensioner other circuit series fault**

Description

When there is short to ground, short to power supply, too high or too low resistance, series faults in front passenger seat belt pretensioner circuit, the airbag control unit records DTC.

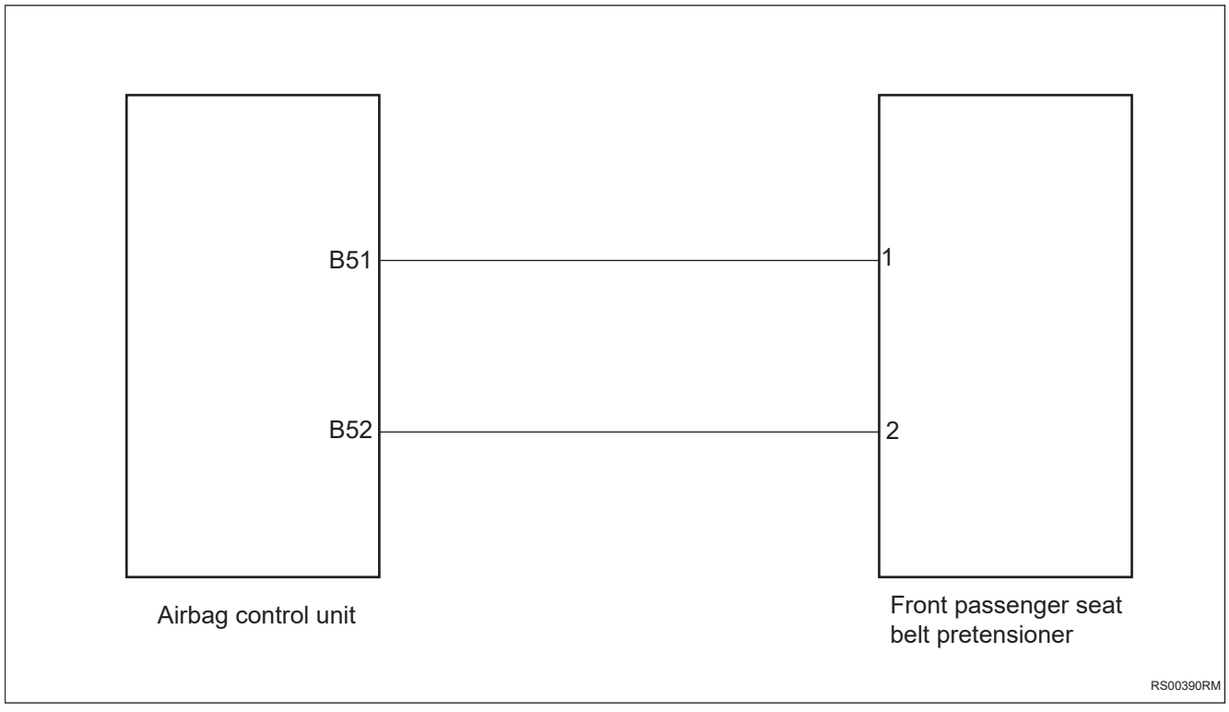
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007211	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Front passenger seat belt pretensioner • Airbag control unit • Wire harness and connector
B007212	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Front passenger seat belt pretensioner • Airbag control unit • Wire harness and connector
B00721A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the	5 times	Continuous type	Same as the prerequisites for fault occurrence	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		airbag resistance is less than 1.7 Ω, the fault may be detected				
B00721B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	Same as the prerequisites for fault occurrence	• Spiral cable • Driver airbag • Airbag control unit • Wire harness and connector
B00722B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Front passenger seat belt pretensioner • Airbag control unit • Wire harness and connector

Fault symptom

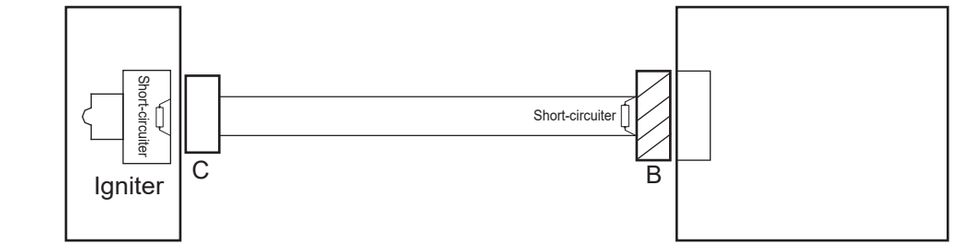
DTC No.	Fault symptom	Warning light/indicator
B007211	• Warning light comes on • Set DTC	Comes on
B007212	• Warning light comes on • Set DTC	Comes on
B00721A	• Warning light comes on • Set DTC	Comes on
B00721B	• Warning light comes on • Set DTC	Comes on
B00722B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



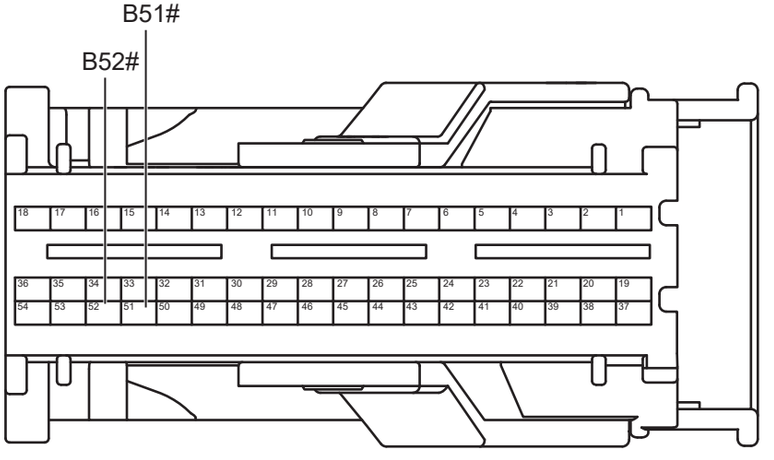
Inspection procedure

1	**Check for short to each other in front passenger seat belt pretensioner wire harness and connector**



Front passenger seat belt pretensioner

Airbag control unit



Airbag control unit connector B

RS05330RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

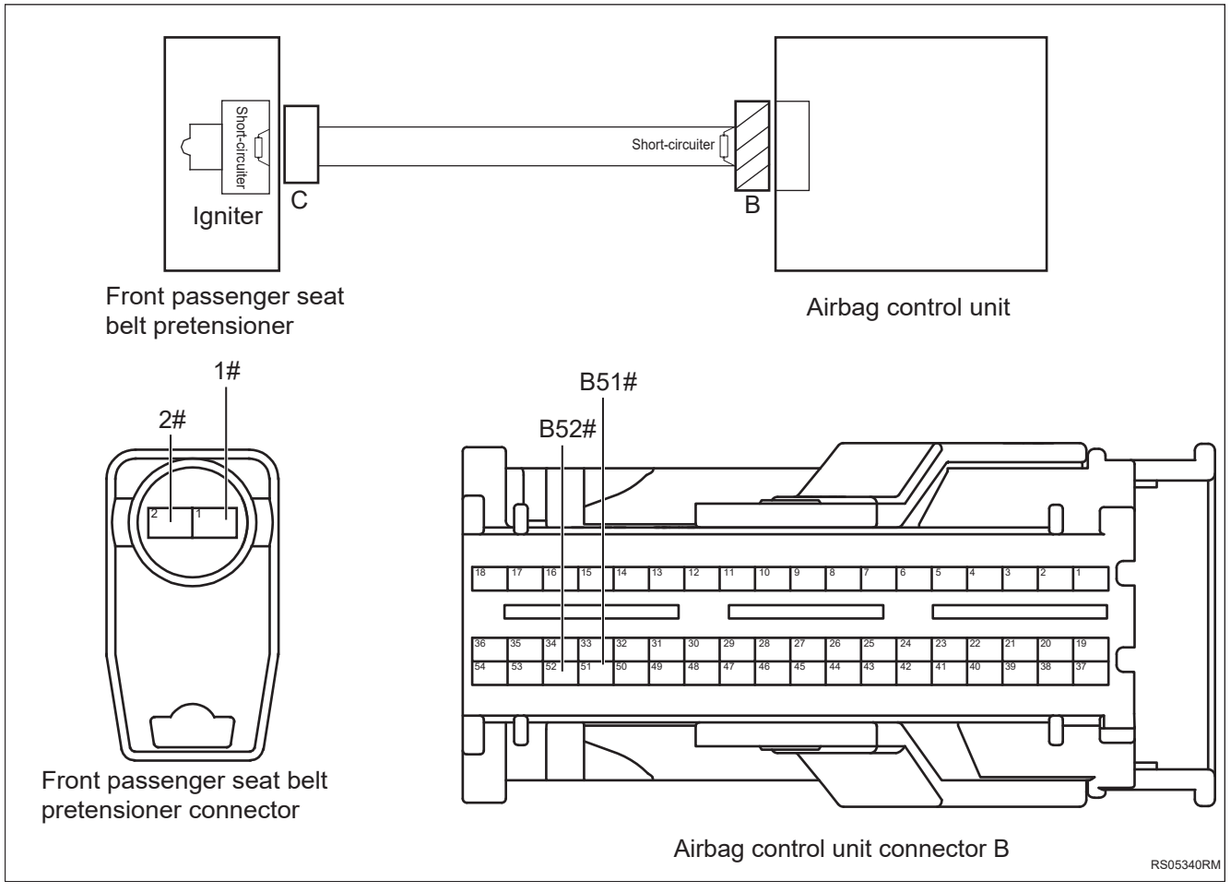
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - airbag control unit connector B52#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in front passenger seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

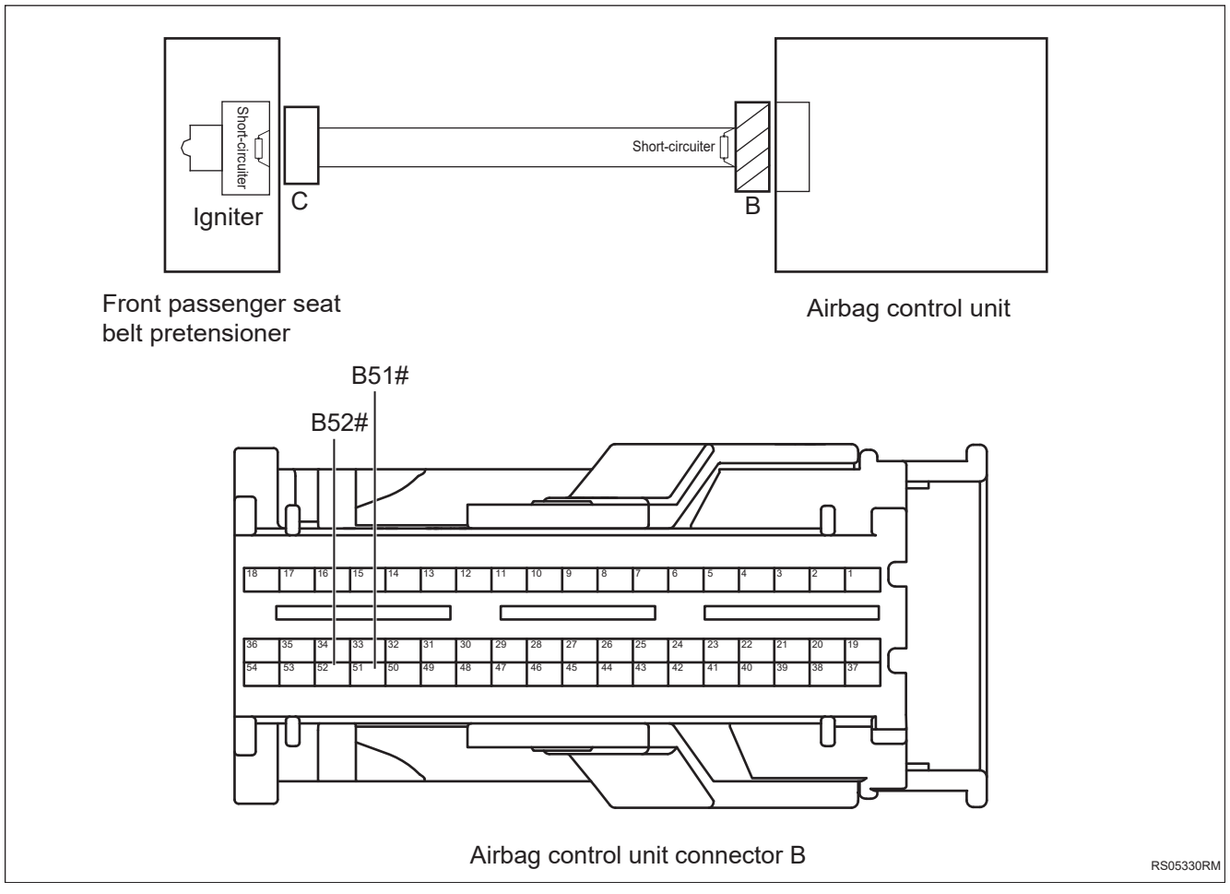
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - front passenger seat belt pretensioner connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B52# - front passenger seat belt pretensioner connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in front passenger seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

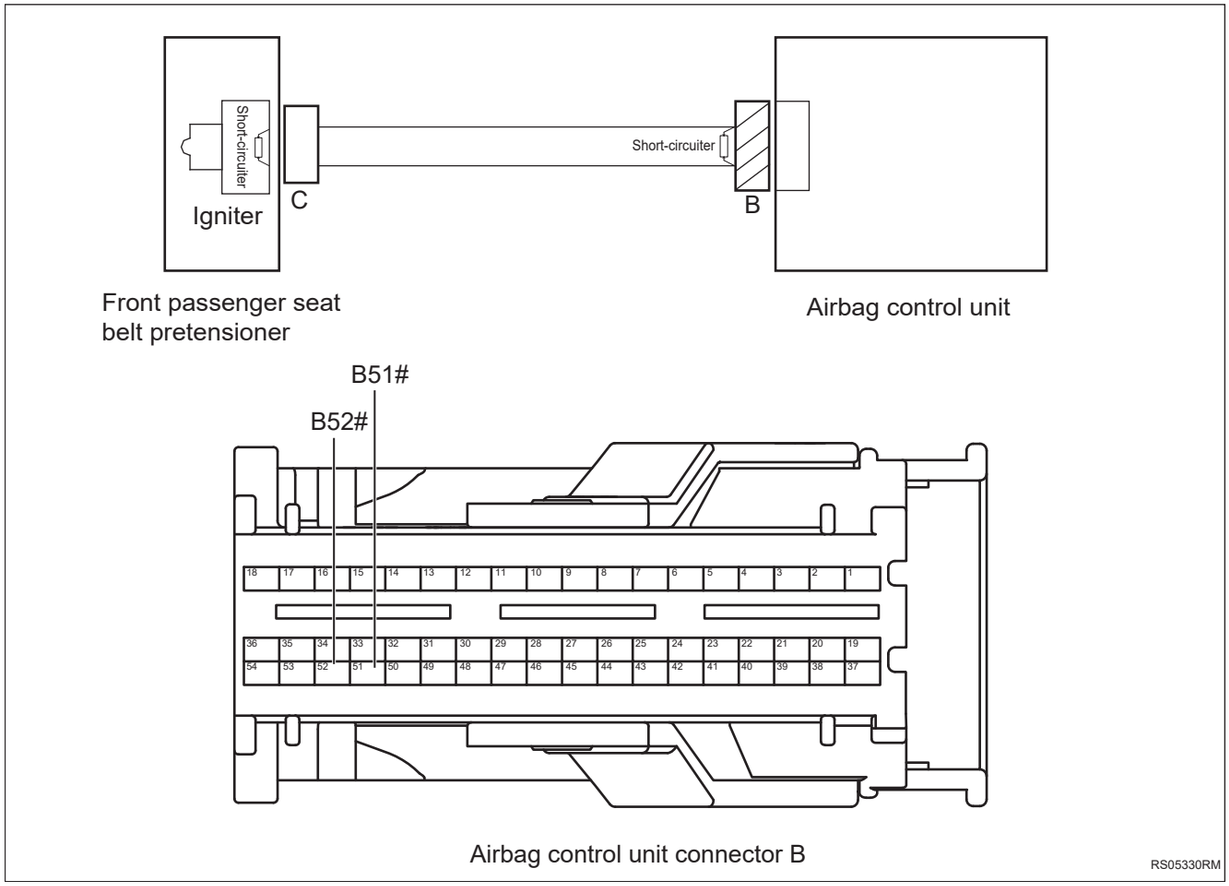
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B52# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front passenger seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B52# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front passenger seat belt pretensioner (See page NS-3)**

(a) Replace the front passenger seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B007256	Front passenger seat belt retractor pretensioner invalid configuration

Description

When front passenger seat belt pretensioner circuit has an invalid configuration, the airbag control unit records DTC.

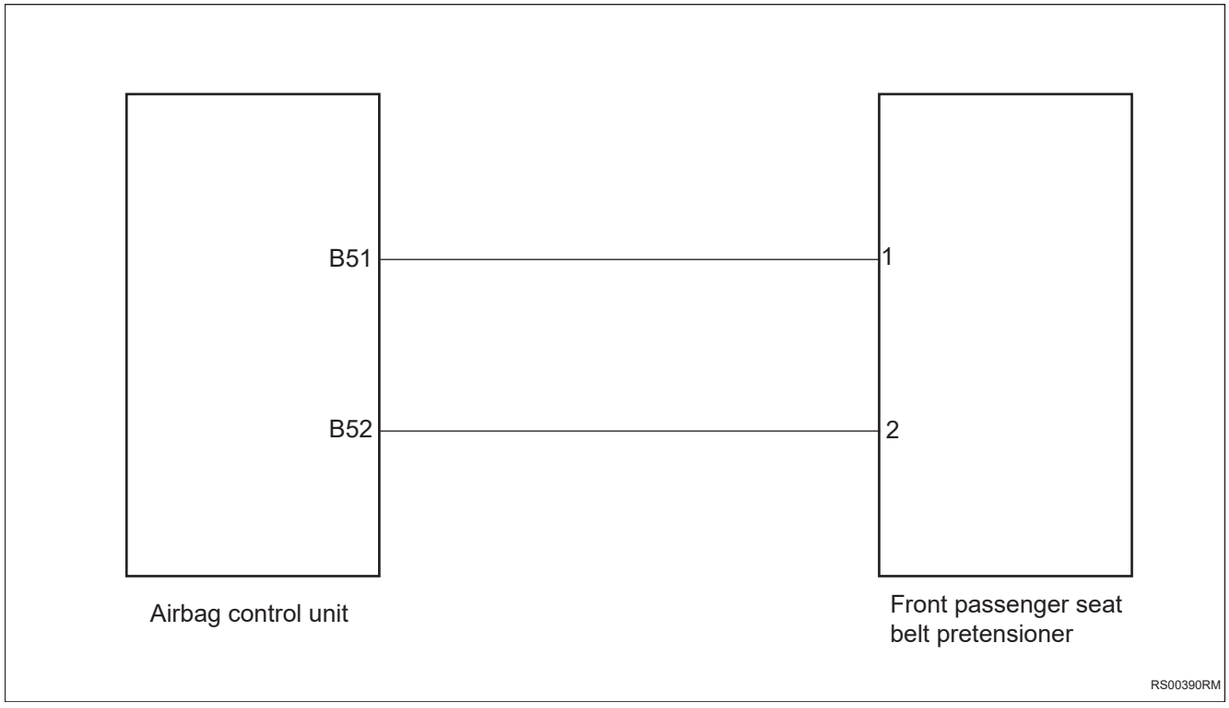
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007256	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Front passenger seat belt pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B007256	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

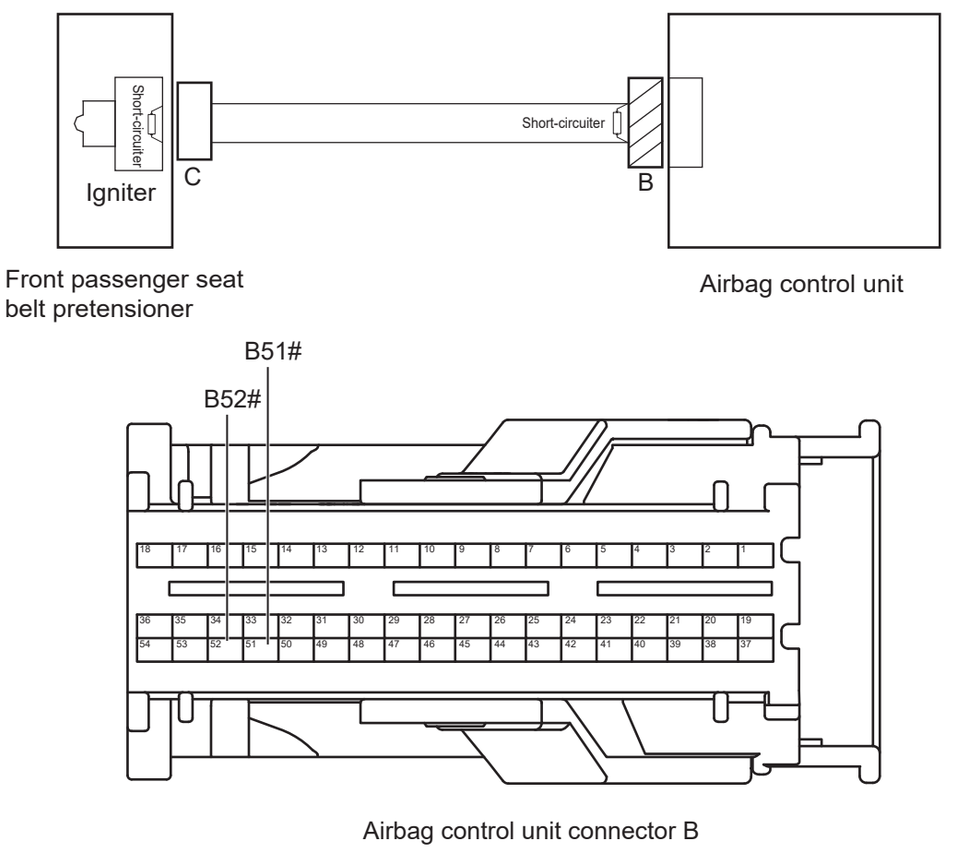
1	**Check and read configuration file of front passenger seat belt pretensioner**

(a) Check and read if configuration file of front passenger seat belt pretensioner is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in front passenger seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors B and C.

(d) Release the built-in short-circuiter of connector B.

(e) According to value in the table, measure resistance.

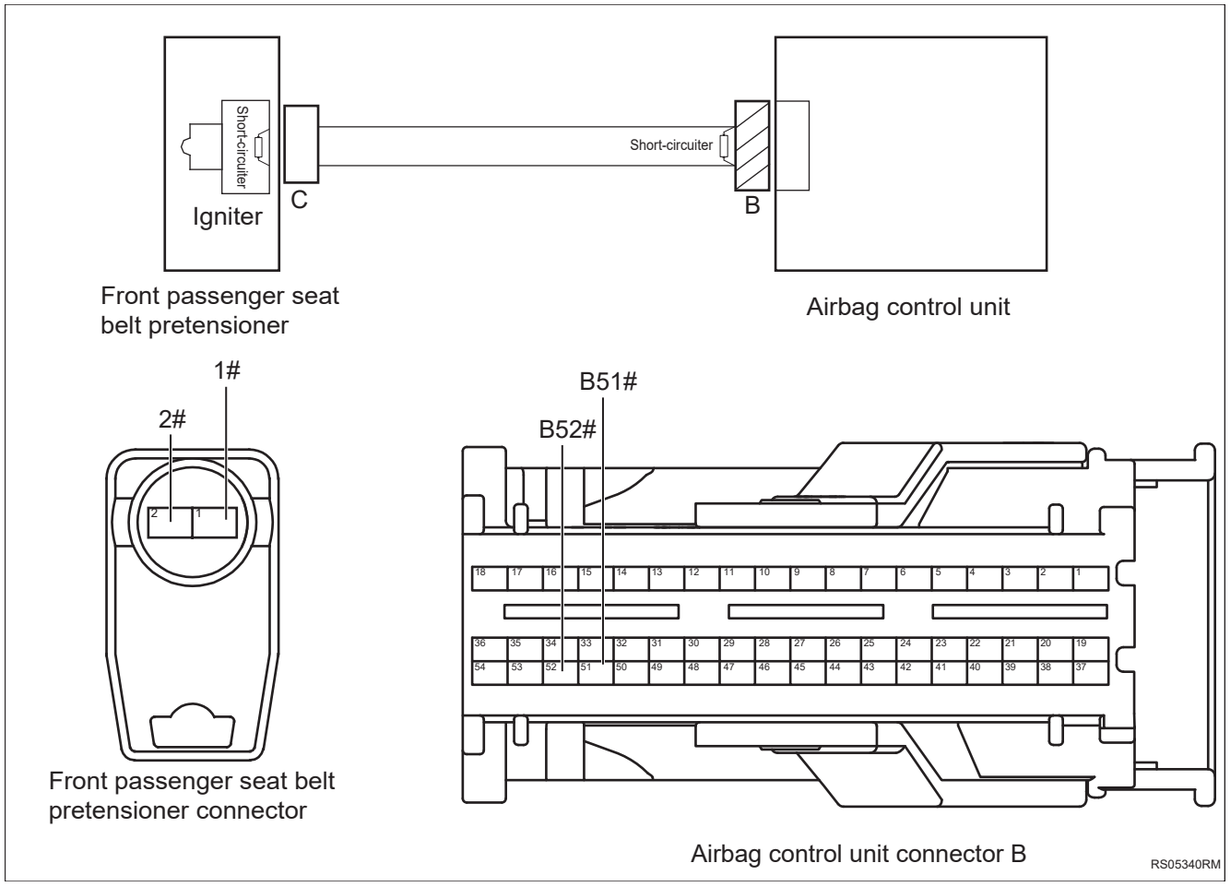
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - airbag control unit connector B52#	Always connected	10 K Ω or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in front passenger seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

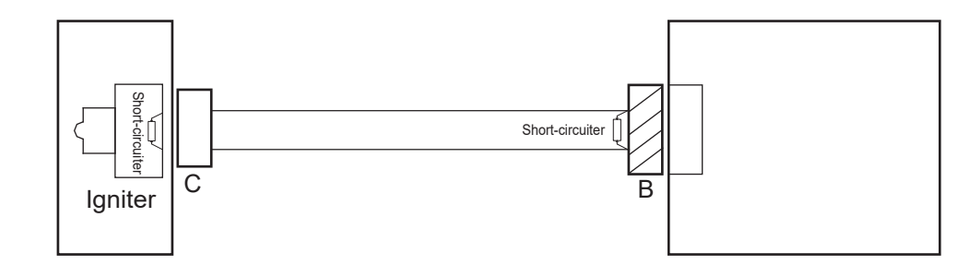
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - front passenger seat belt pretensioner connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B52# - front passenger seat belt pretensioner connector 2#	Always connected	Less than 1 Ω

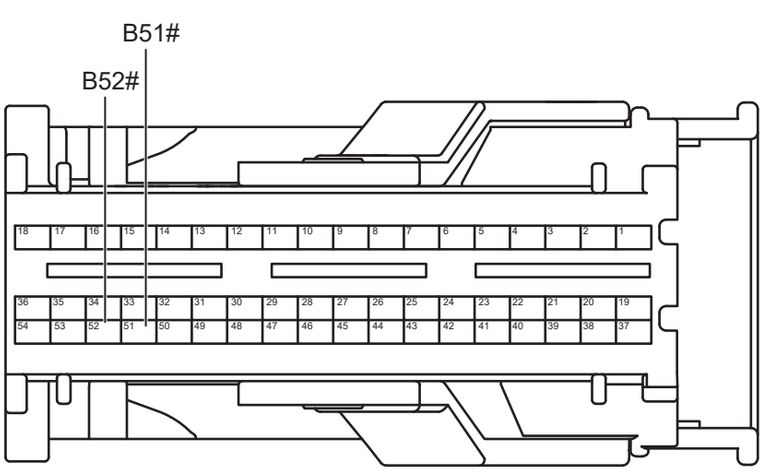
NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in front passenger seat belt pretensioner wire harness and connector**





Airbag control unit connector B

RS05330RM

(a) According to value in the table, measure resistance.

Standard value

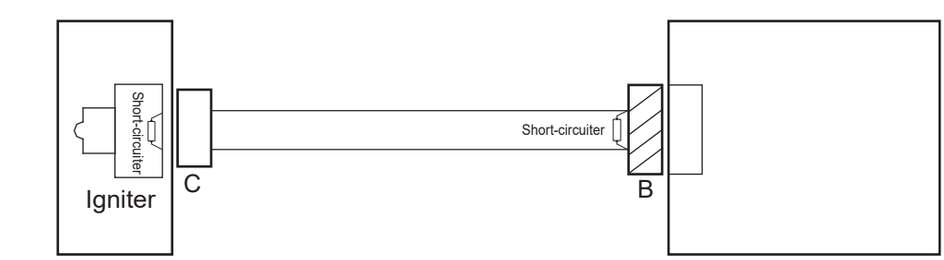
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B52# - body ground	Always connected	10 KΩ or more

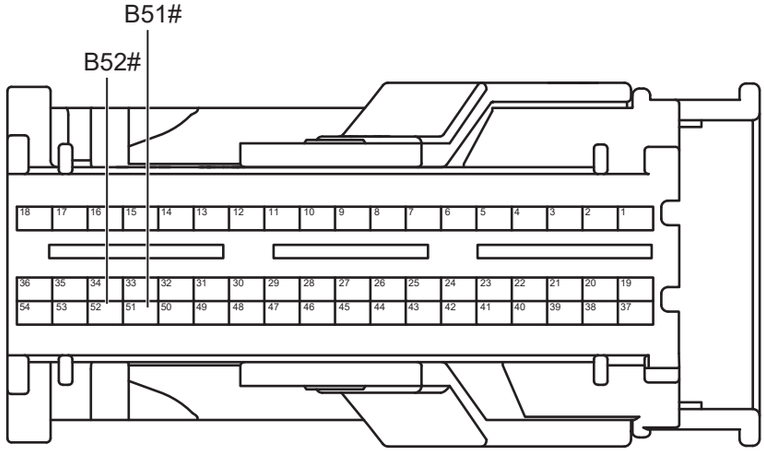
NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in front passenger seat belt pretensioner wire harness and connector**





Airbag control unit connector B

RS05330RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B51# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B52# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK ↓

6	**Replace front passenger seat belt pretensioner (See page NS-3)**

(a) Replace the front passenger seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK ↓

Diagnosis ends

DTC	**B007311**	**Short to ground in second row left seat belt pretensioner**
DTC	**B007312**	**Short to power supply in second row left seat belt pretensioner circuit**
DTC	**B00731A**	**Second row left seat belt pretensioner circuit resistance below threshold**
DTC	**B00731B**	**Second row left seat belt pretensioner circuit resistance above threshold**
DTC	**B00732B**	**Second row left seat belt pretensioner other circuit series fault**

Description

When there is short to ground, short to power supply, too high or too low resistance, series faults in rear left seat belt pretensioner circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007311	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector
B007312	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector
B00731A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault	5 times	Continuous type	400 ms	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector

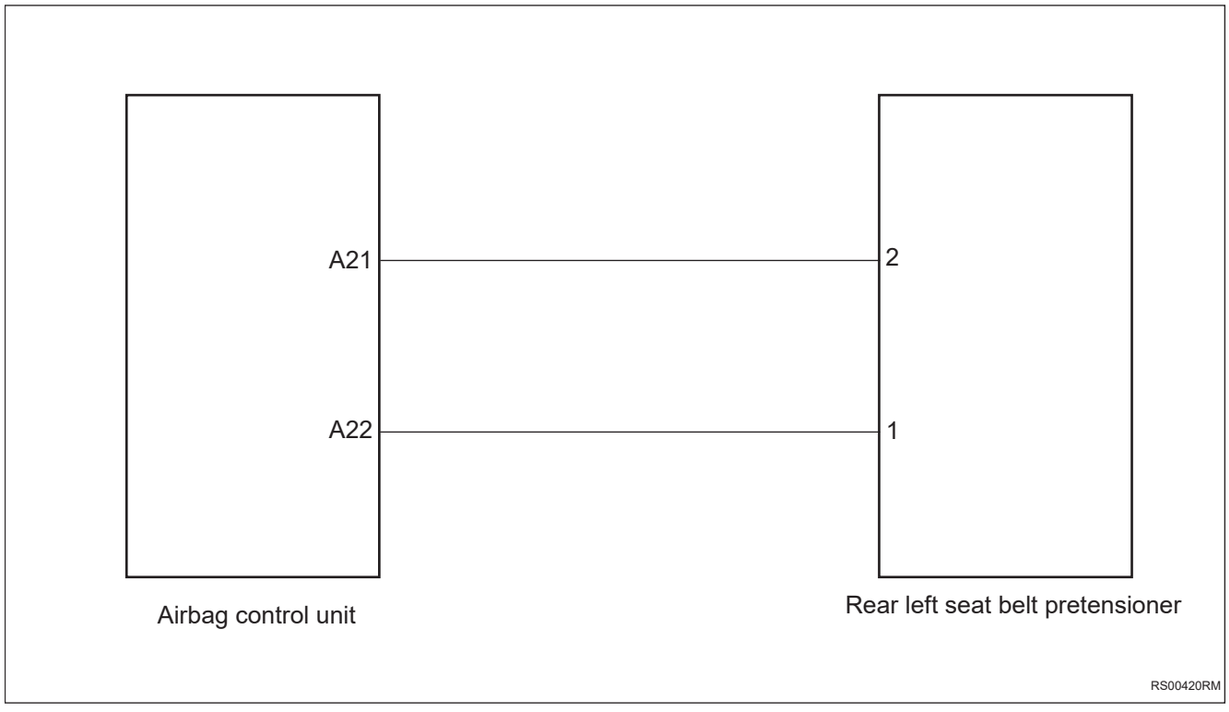
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		may be detected				
B00731B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector
B00732B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

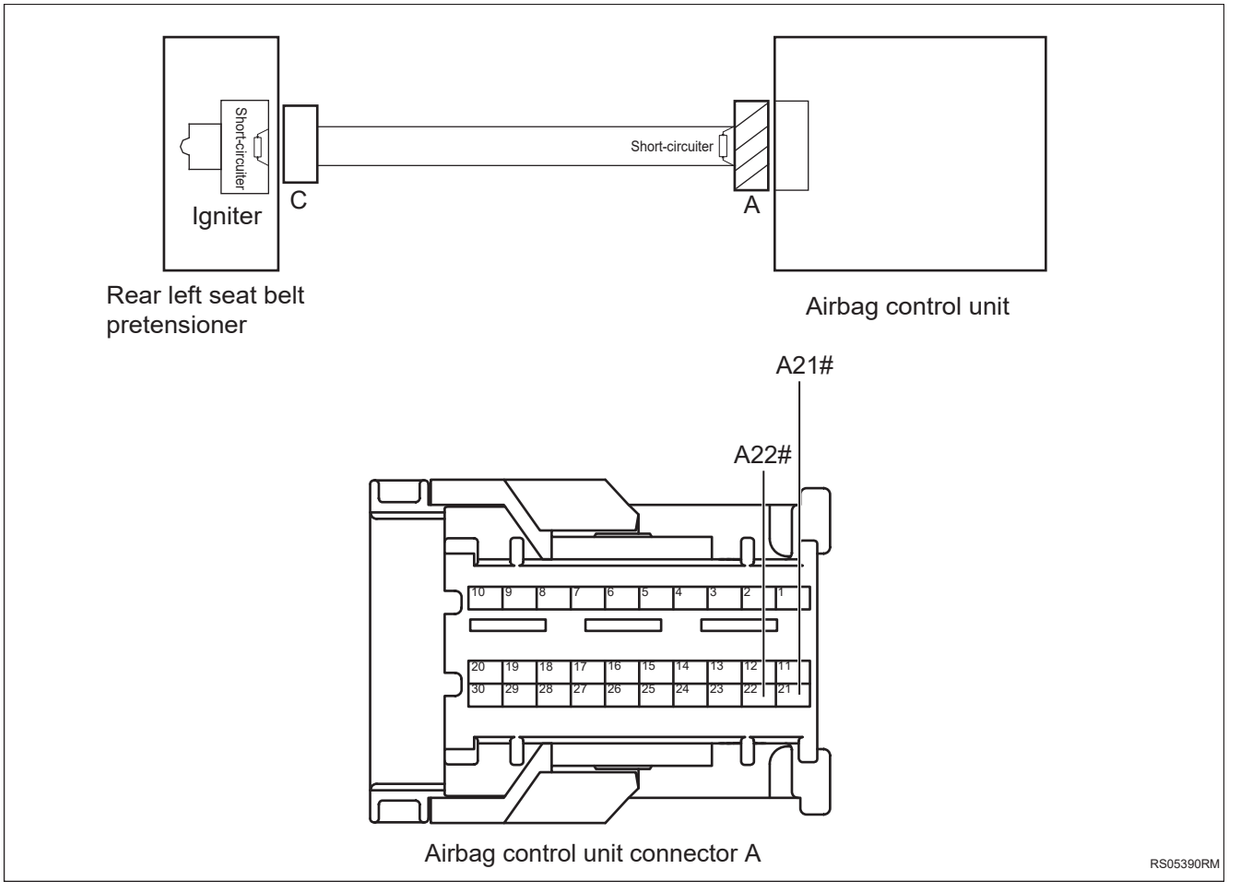
DTC No.	Fault symptom	Warning light/indicator
B007311	• Warning light comes on • Set DTC	Comes on
B007312	• Warning light comes on • Set DTC	Comes on
B00731A	• Warning light comes on • Set DTC	Comes on
B00731B	• Warning light comes on • Set DTC	Comes on
B00732B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in rear left seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

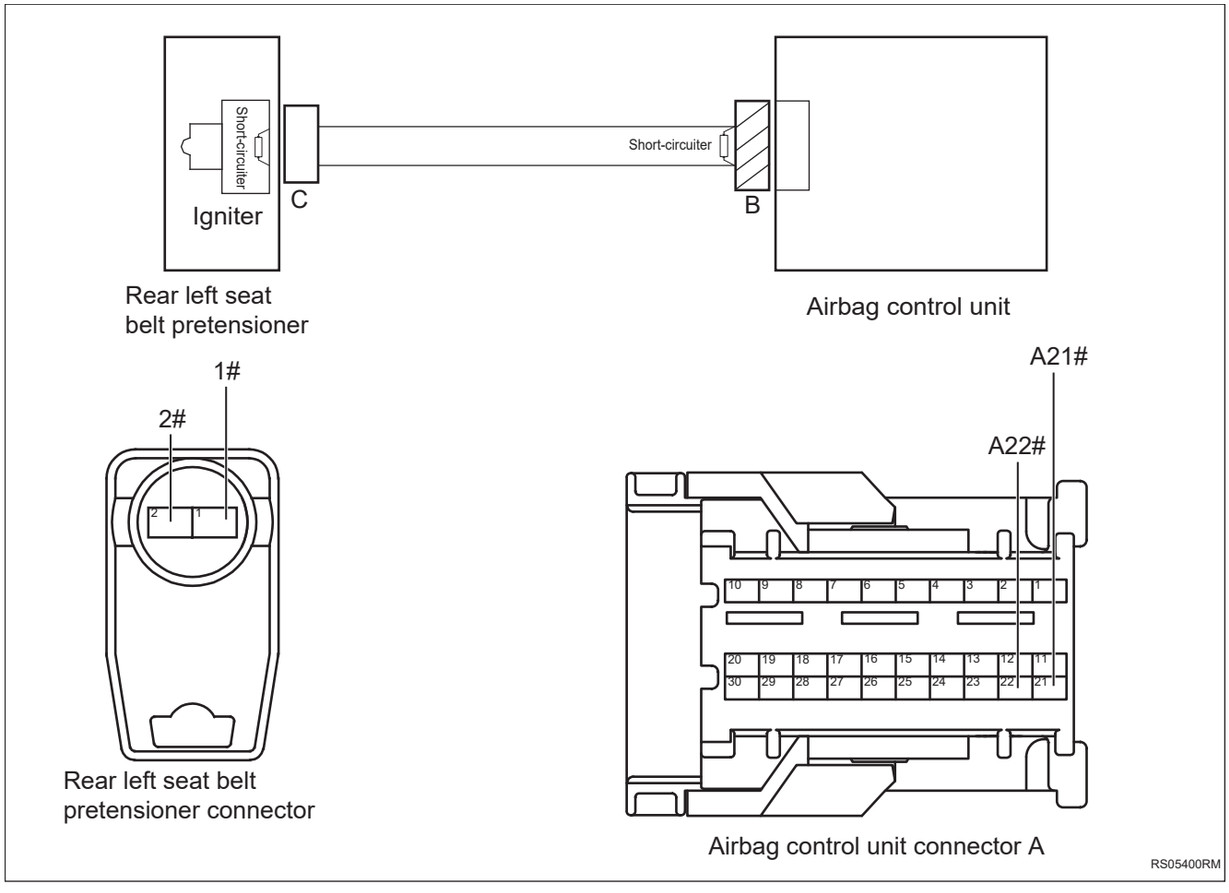
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - airbag control unit connector A22#	Always connected	10 KΩ or more

NG	**Check and repair or replace wire harness and connector**

OK

2	**Check for open in rear left seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

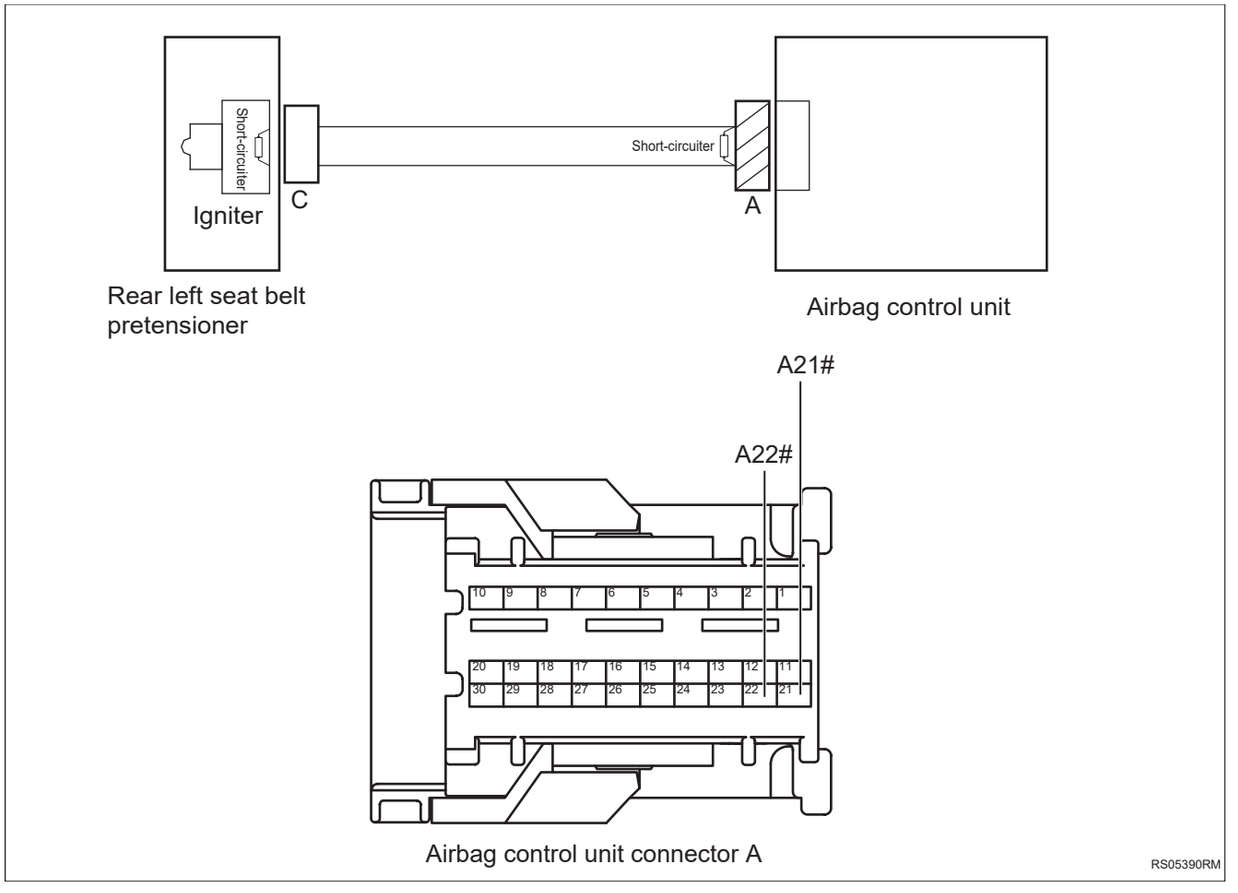
Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector A21# - rear left active seat belt connector 2#	Always connect-ed	Less than 1 Ω
Airbag control unit connector A22# - rear left active seat belt connector 1#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left seat belt pretensioner wire harness and connector**



ZD

(a) According to value in the table, measure resistance.

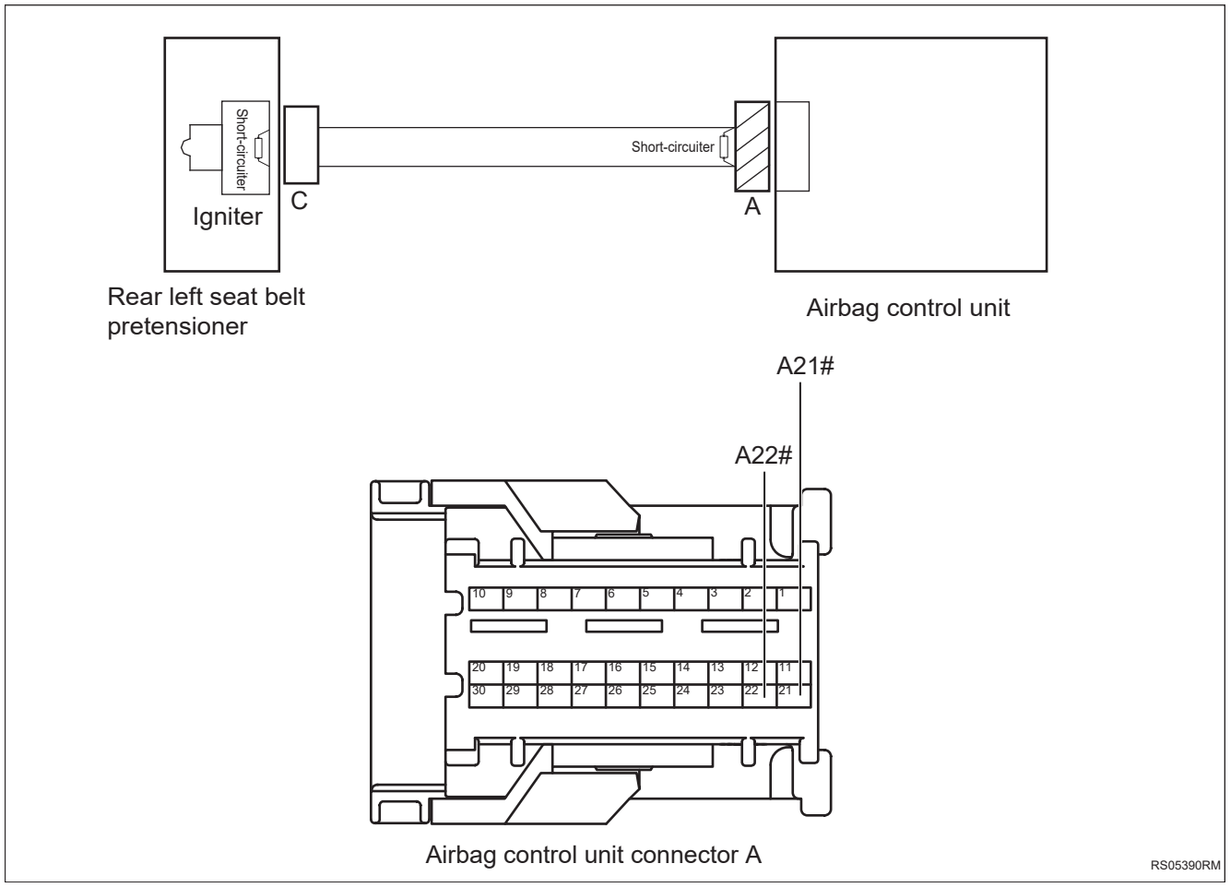
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace rear left seat belt pretensioner (See page NS-6)**

(a) Replace the rear left seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007356**	**Second row left seat belt pretensioner invalid configuration**

Description

When rear left seat belt pretensioner circuit has an invalid configuration, the airbag control unit records DTC.

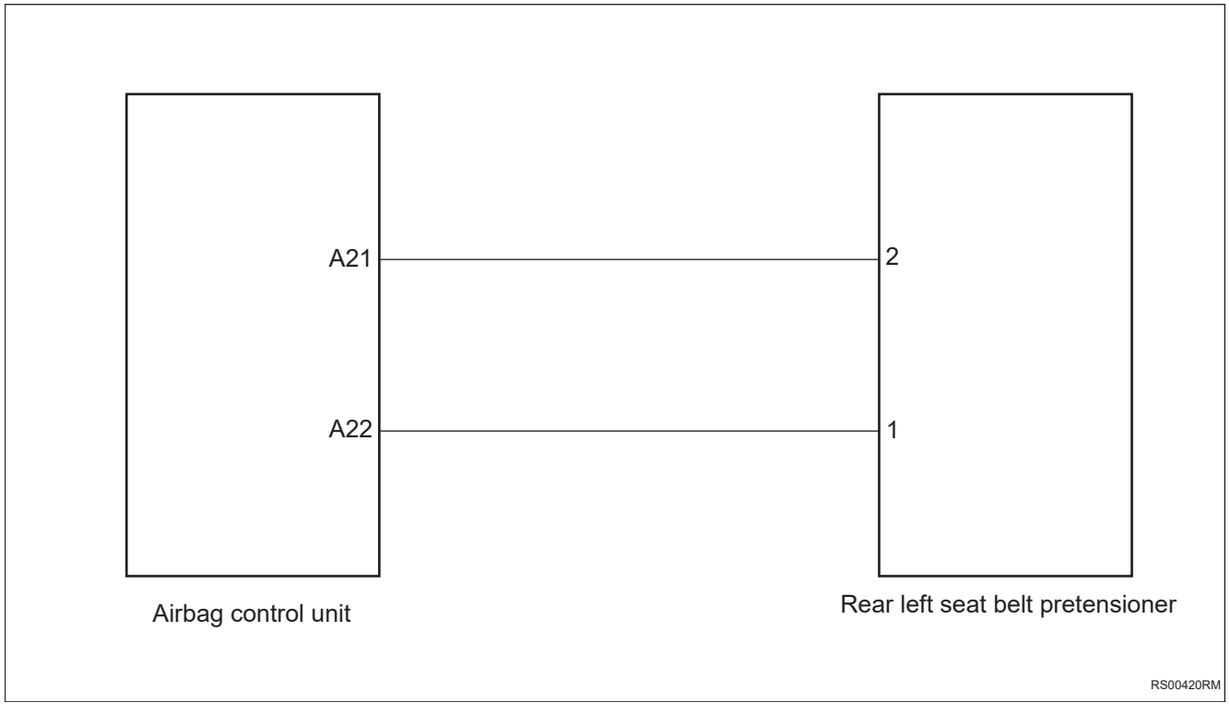
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007356	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Rear left seat belt pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B007356	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

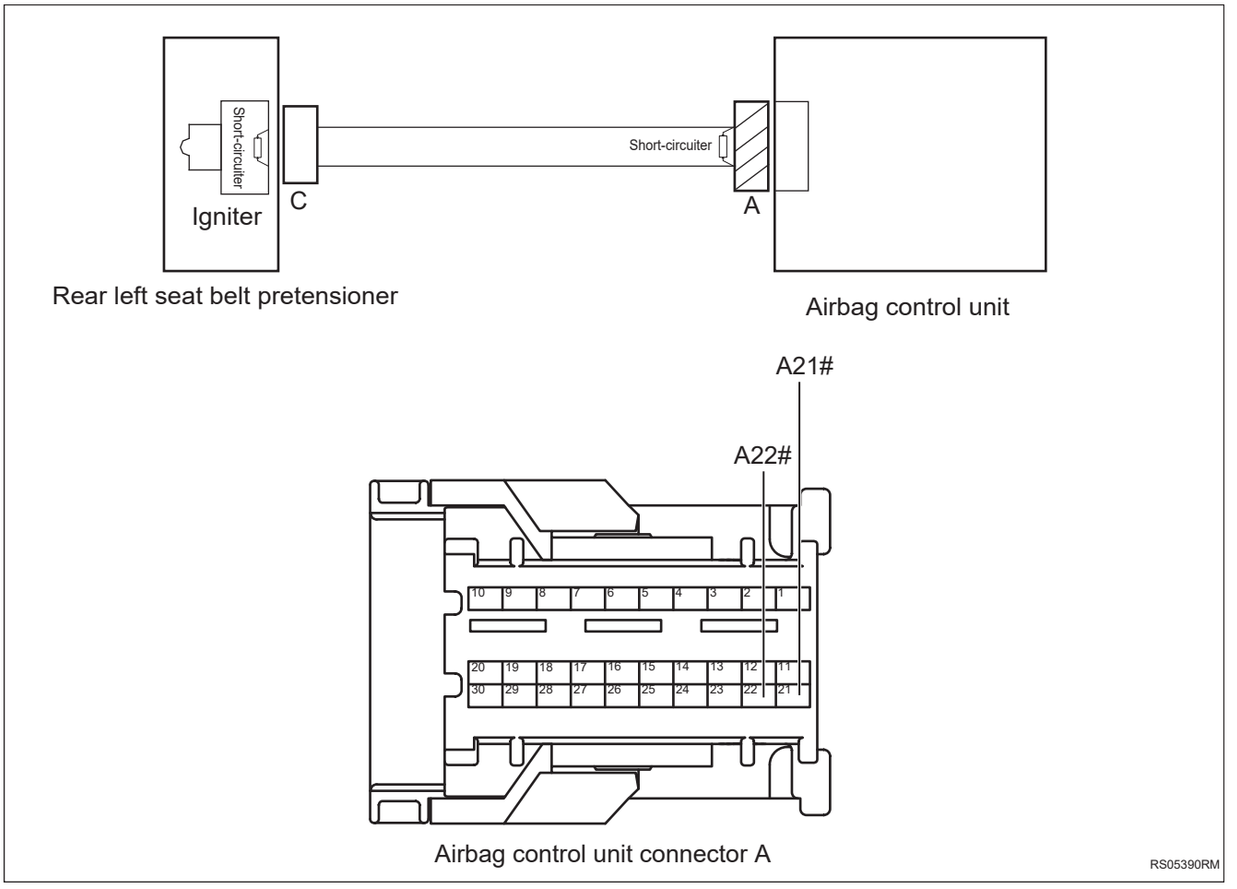
1	**Check part number of rear left seat belt pretensioner**

(a) Check if part number of rear left seat belt pretensioner is correct.

NG → **Replace seat belt with the correct type**

OK

2	**Check for short to each other in rear left seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

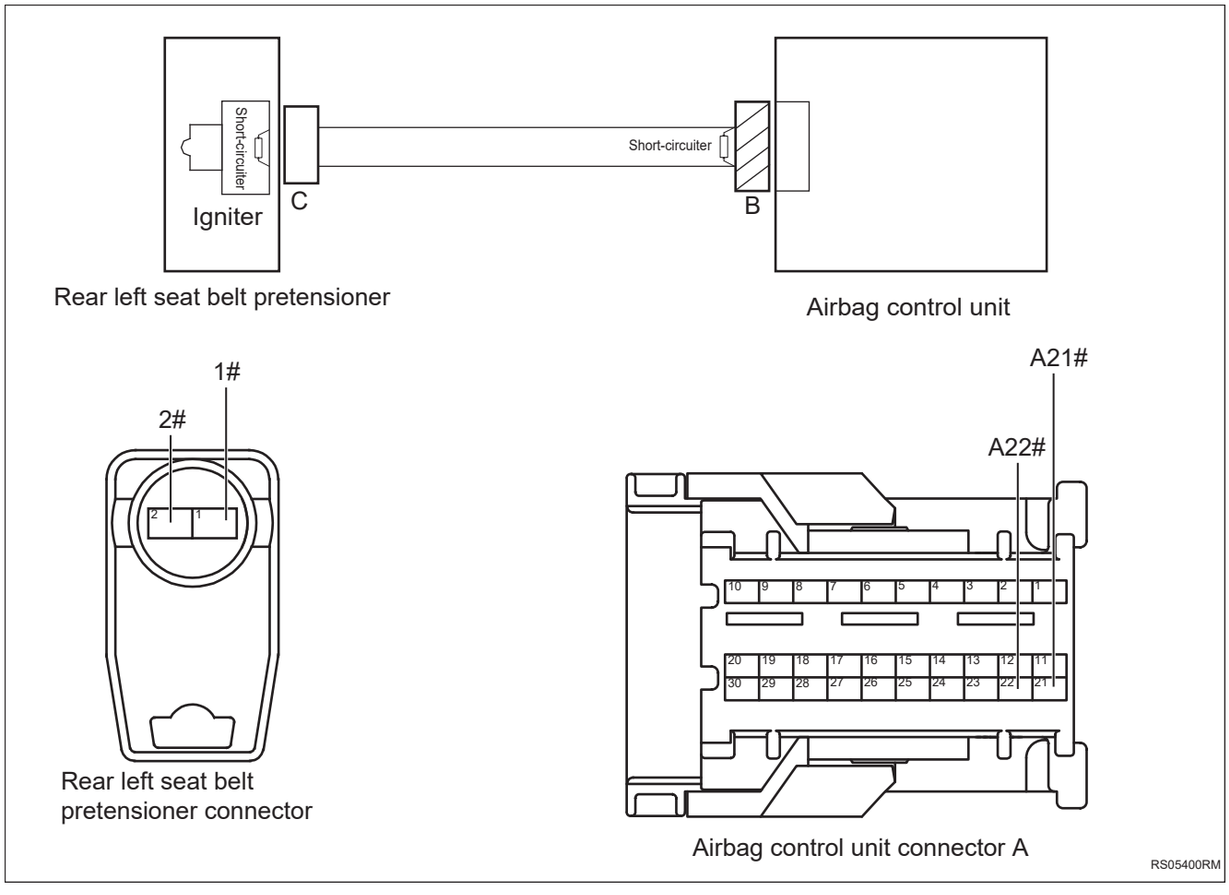
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - airbag control unit connector A22#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for open in rear left seat belt pretensioner wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

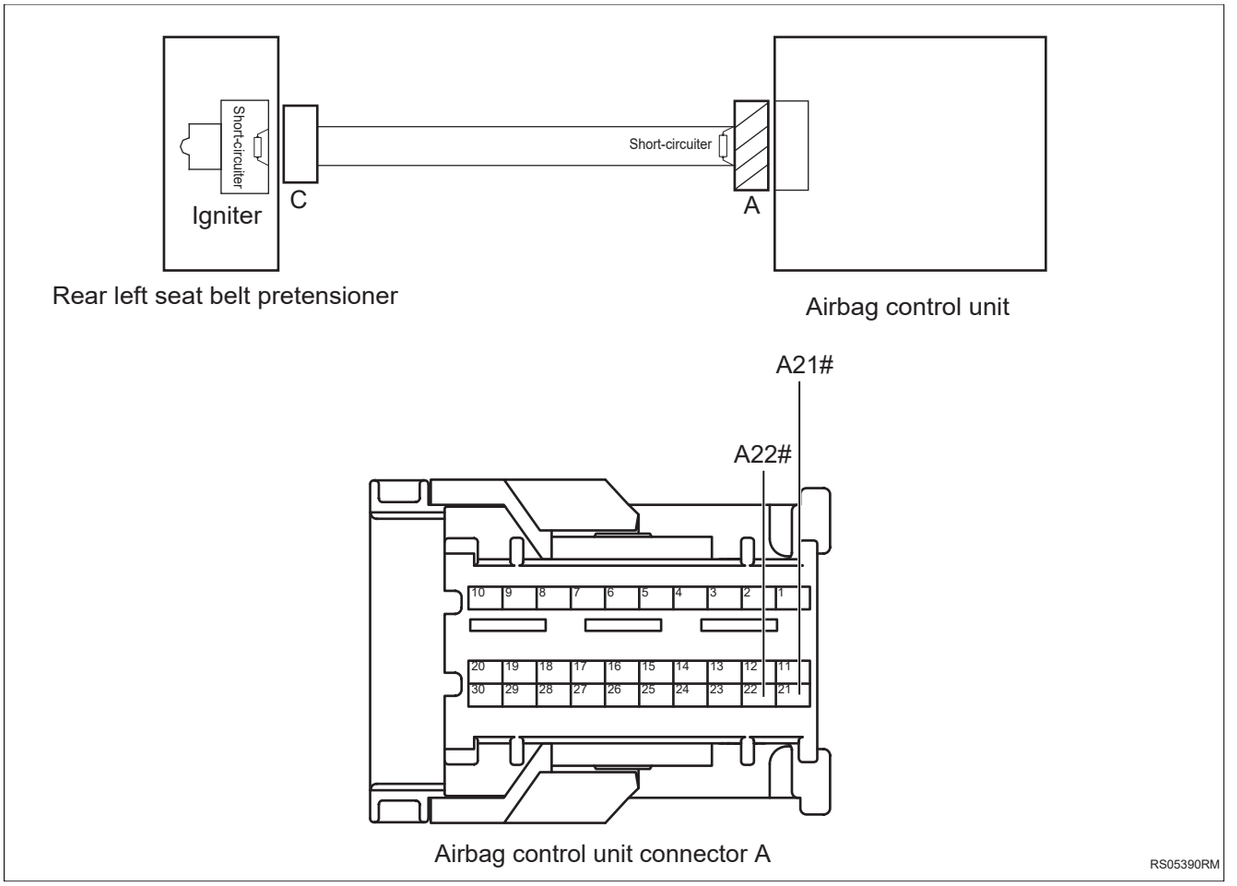
Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector A21# - rear left active seat belt connector 2#	Always connect-ed	Less than 1 Ω
Airbag control unit connector A22# - rear left active seat belt connector 1#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in rear left seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

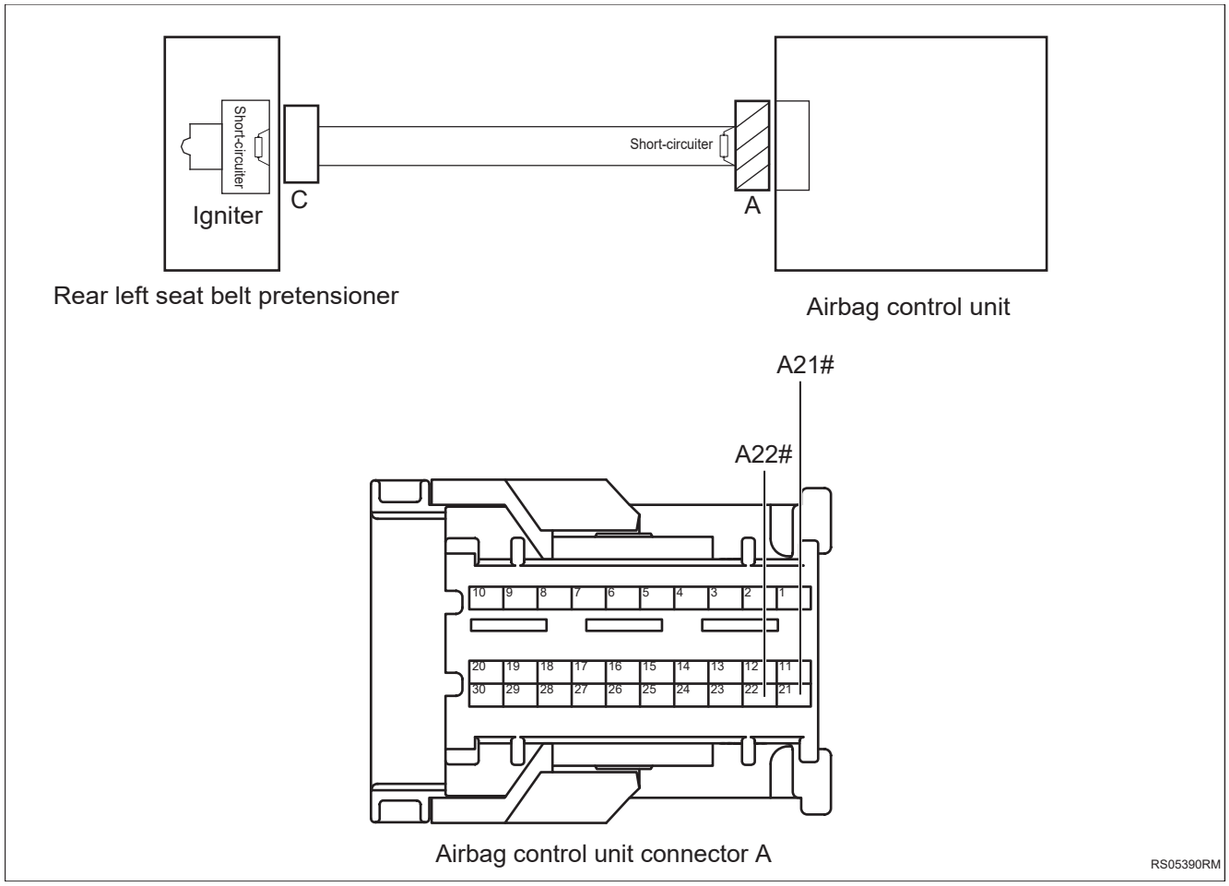
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A22# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in rear left seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A21# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A22# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Replace rear left seat belt pretensioner (See page NS-6)**

(a) Replace the rear left seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007511**	**Short to ground in second row right seat belt pretensioner**
DTC	**B007512**	**Short to power supply in second row right seat belt pretensioner circuit**
DTC	**B00751A**	**Second row right seat belt pretensioner circuit resistance below threshold**
DTC	**B00751B**	**Second row right seat belt pretensioner circuit resistance above threshold**
DTC	**B00752B**	**Second row right seat belt pretensioner other circuit series fault**

Description

When there is short to ground, short to power supply, too high or too low resistance, series faults in rear right seat belt pretensioner circuit, the airbag control unit records DTC.

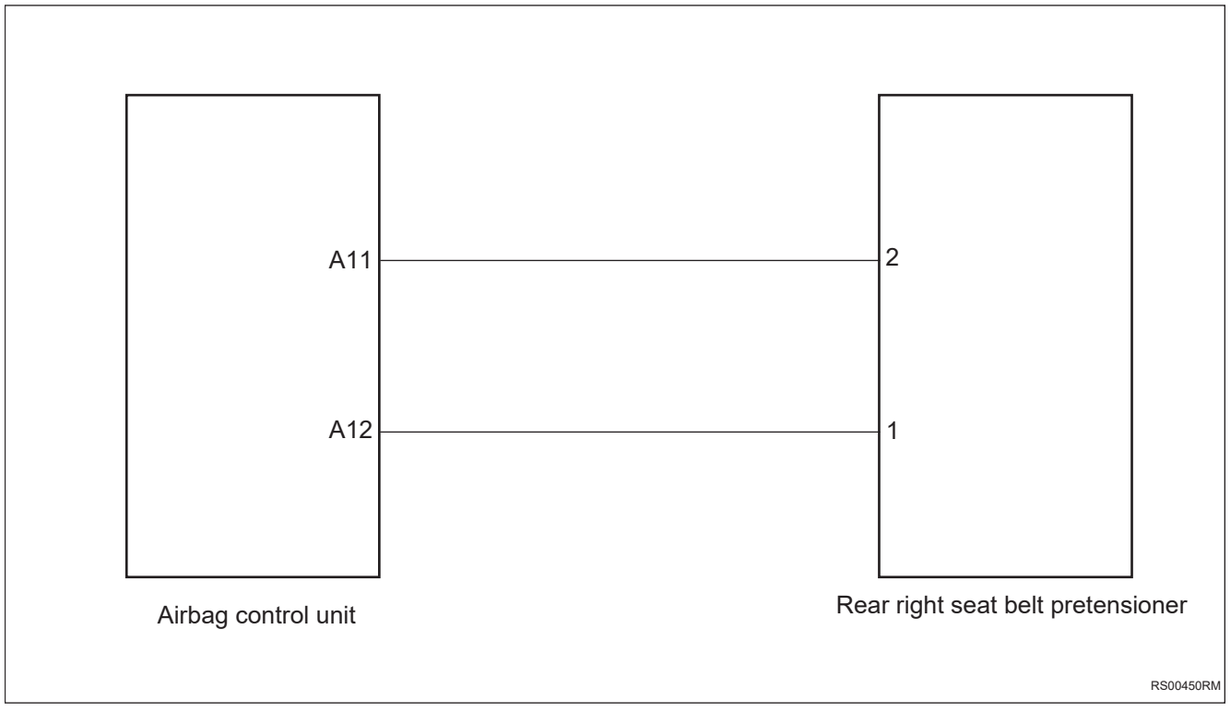
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007511	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector
B007512	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector
B00751A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault	5 times	Continuous type	400 ms	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		may be detected				
B00751B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector
B00752B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector

Fault symptom

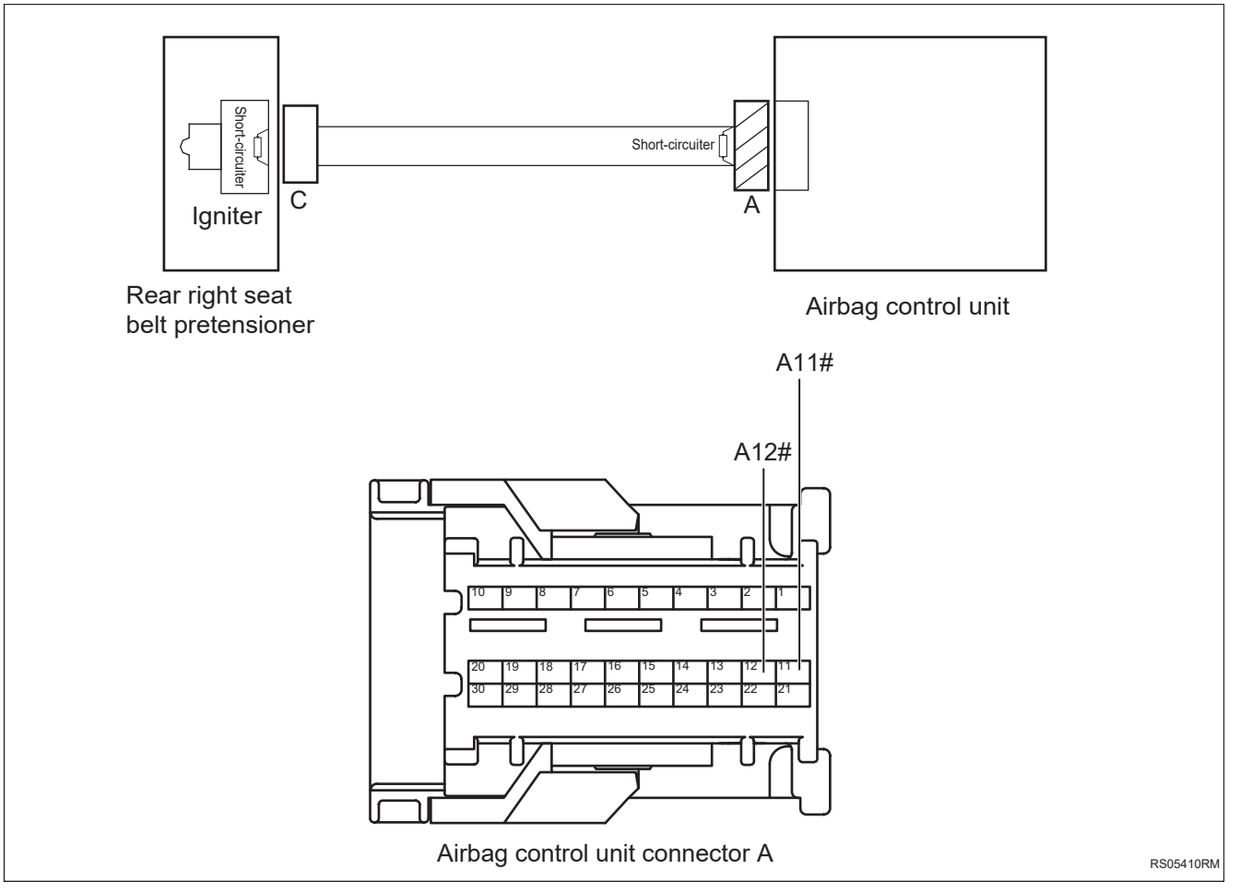
DTC No.	Fault symptom	Warning light/indicator
B007511	• Warning light comes on • Set DTC	Comes on
B007512	• Warning light comes on • Set DTC	Comes on
B00751A	• Warning light comes on • Set DTC	Comes on
B00751B	• Warning light comes on • Set DTC	Comes on
B00752B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in rear right seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

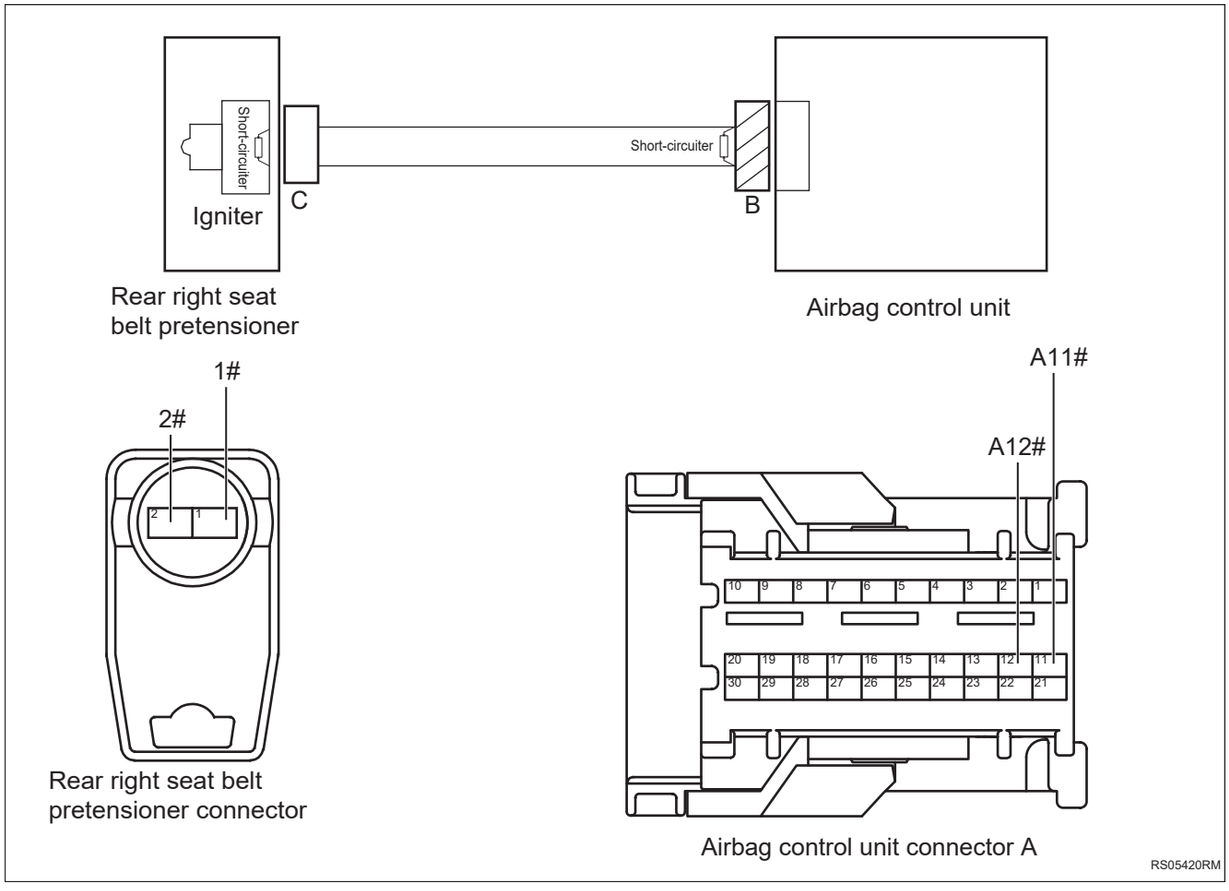
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - airbag control unit connector A12#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in rear right seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

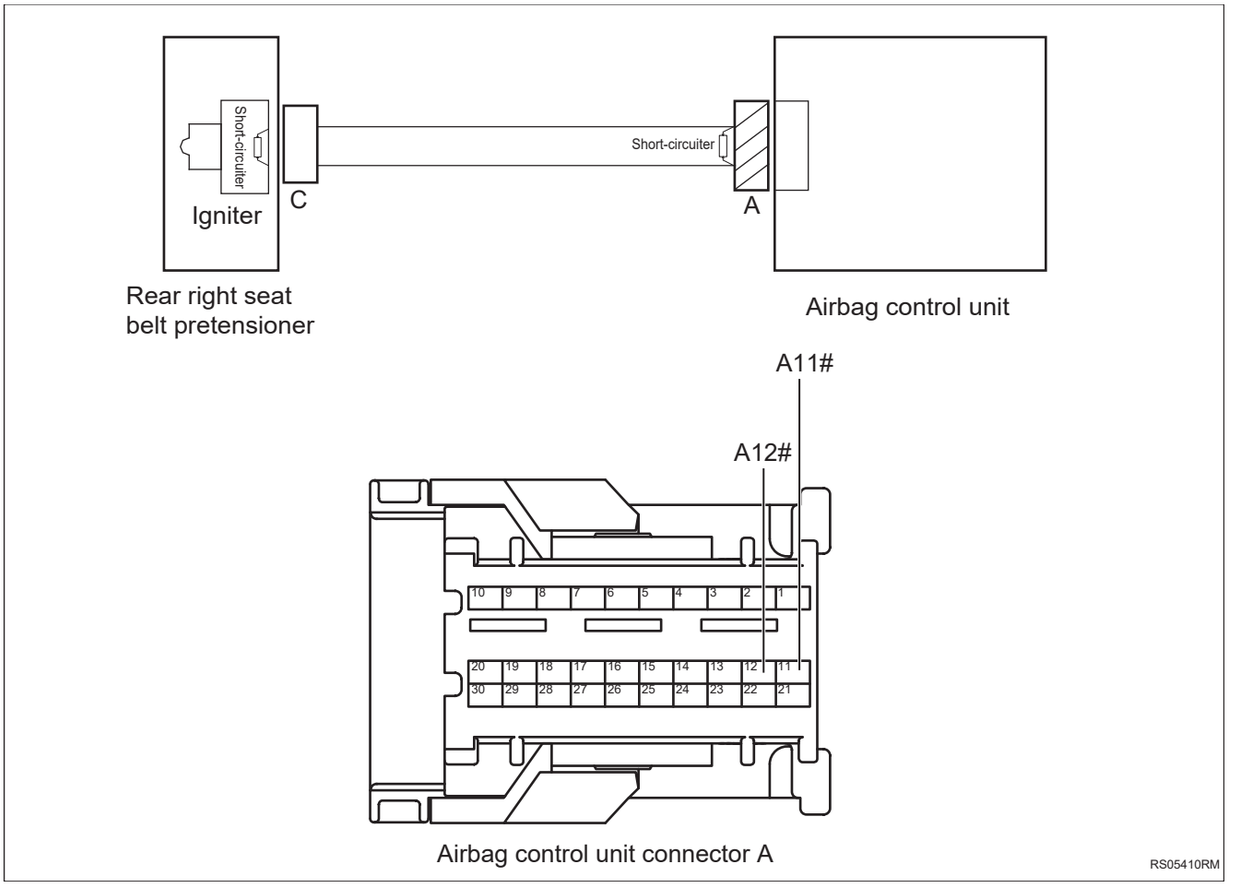
Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector A11# - rear right active seat belt connector 2#	Always connect-ed	Less than 1 Ω
Airbag control unit connector A12# - rear right active seat belt connector 1#	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in rear right seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

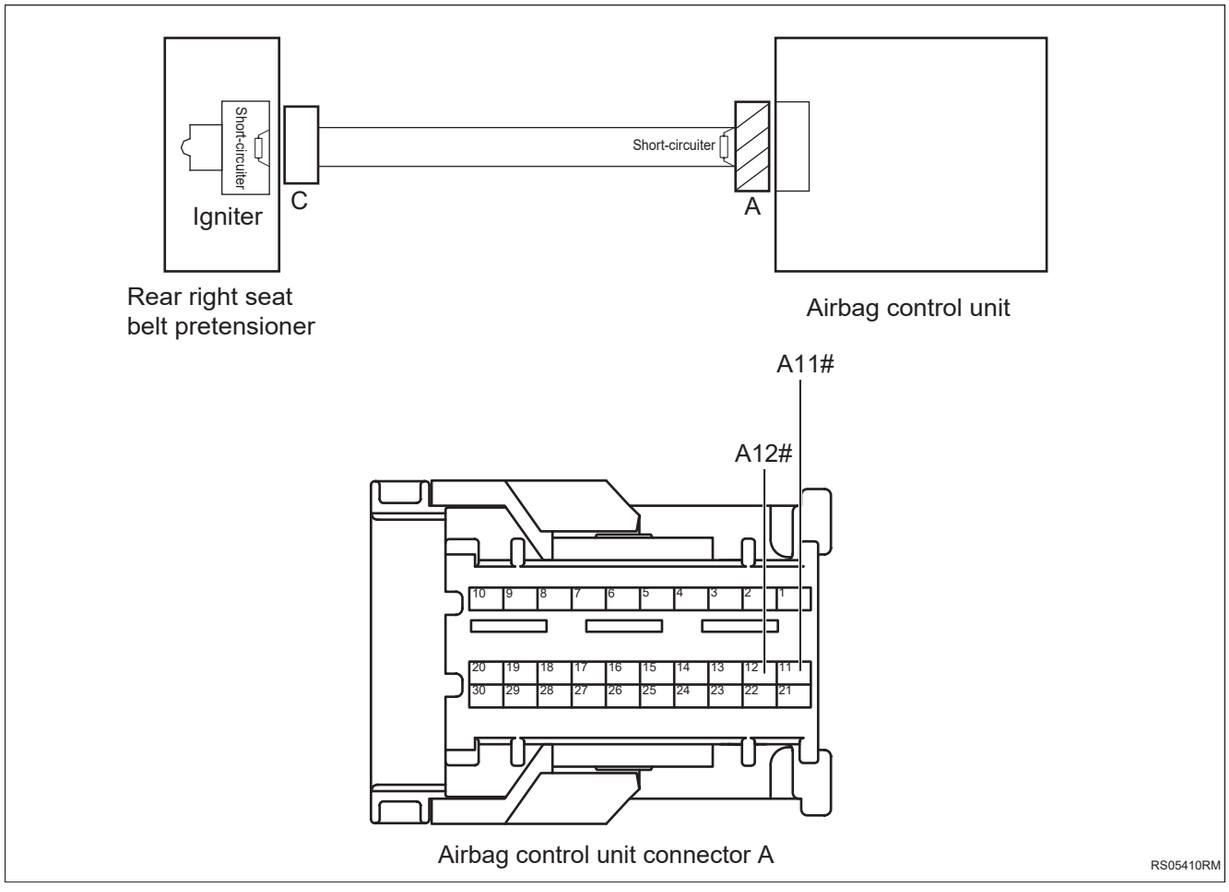
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace rear right seat belt pretensioner (See page NS-6)**

(a) Replace the rear right seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B007556	Second row right seat belt pretensioner invalid configuration

Description

When rear right seat belt pretensioner circuit has an invalid configuration, the airbag control unit records DTC.

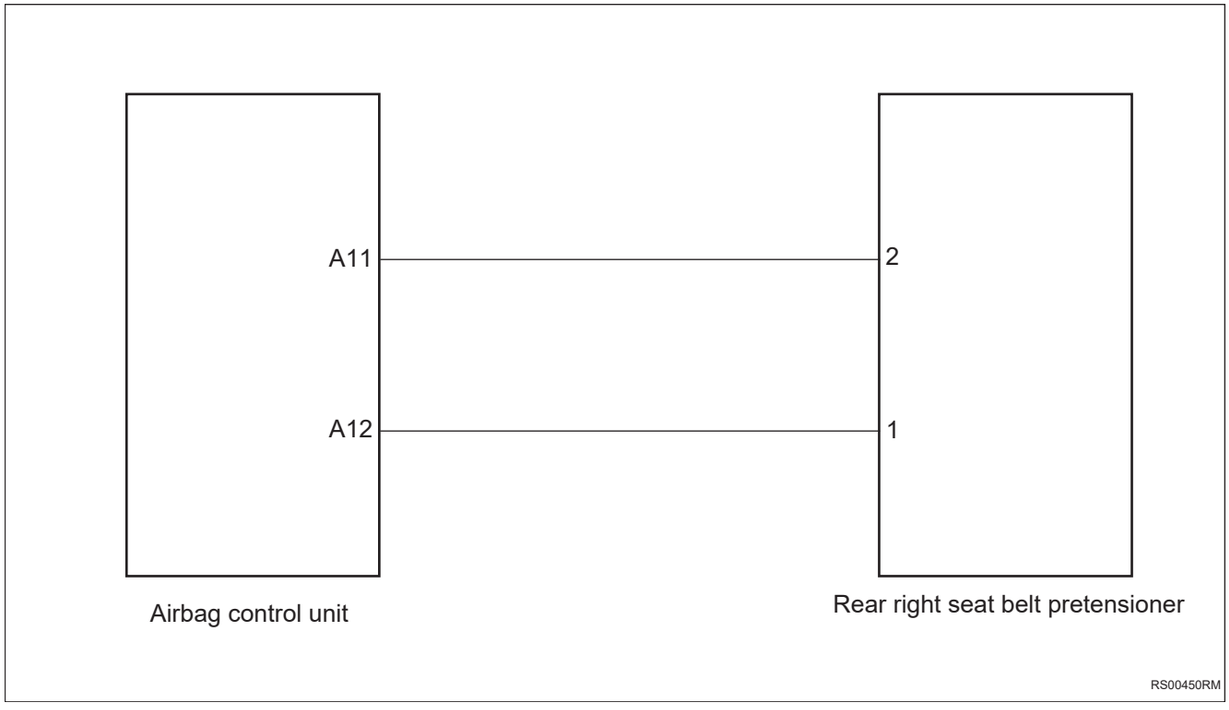
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007556	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Rear right seat belt pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B007556	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

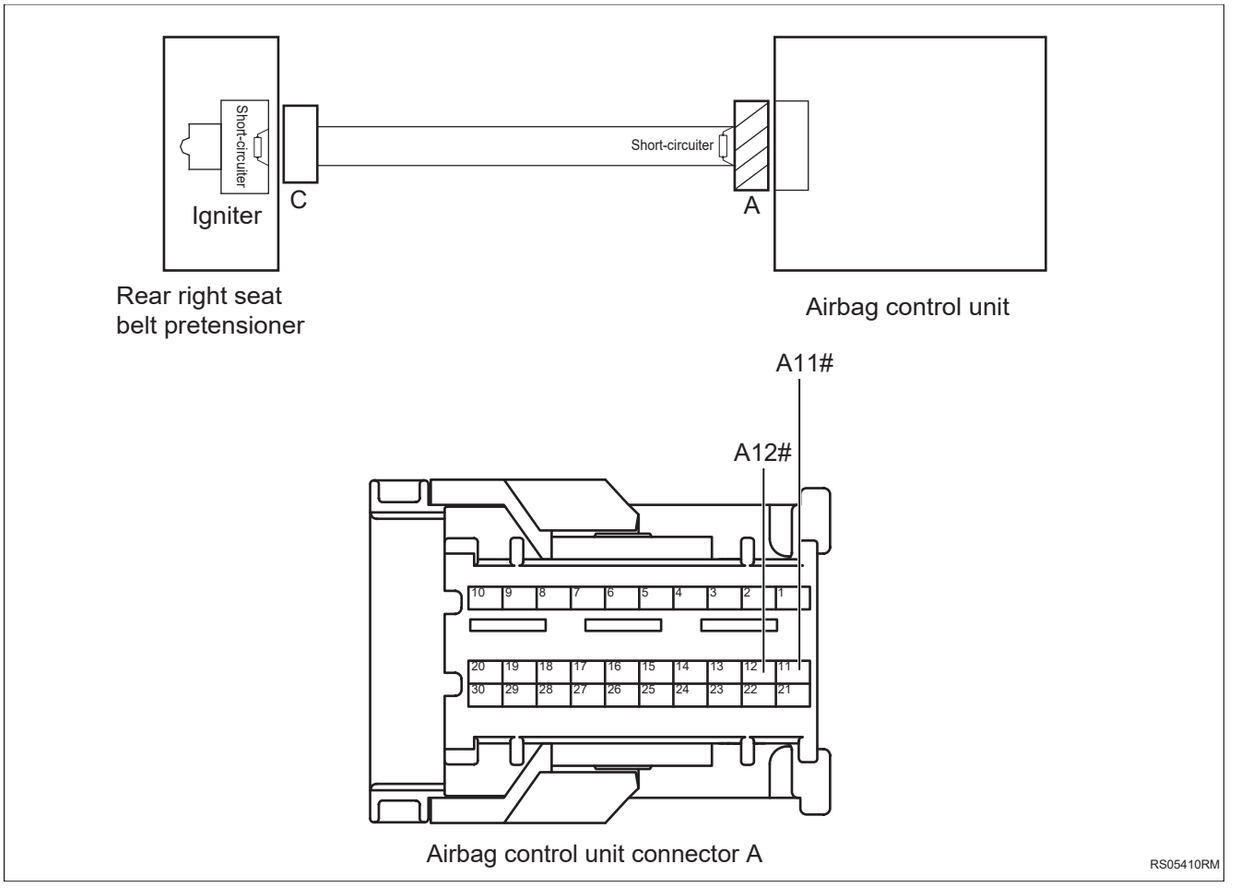
1	**Check and read configuration file of rear right seat belt pretensioner**

(a) Check and read if configuration file of rear right seat belt pretensioner is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in rear right seat belt pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

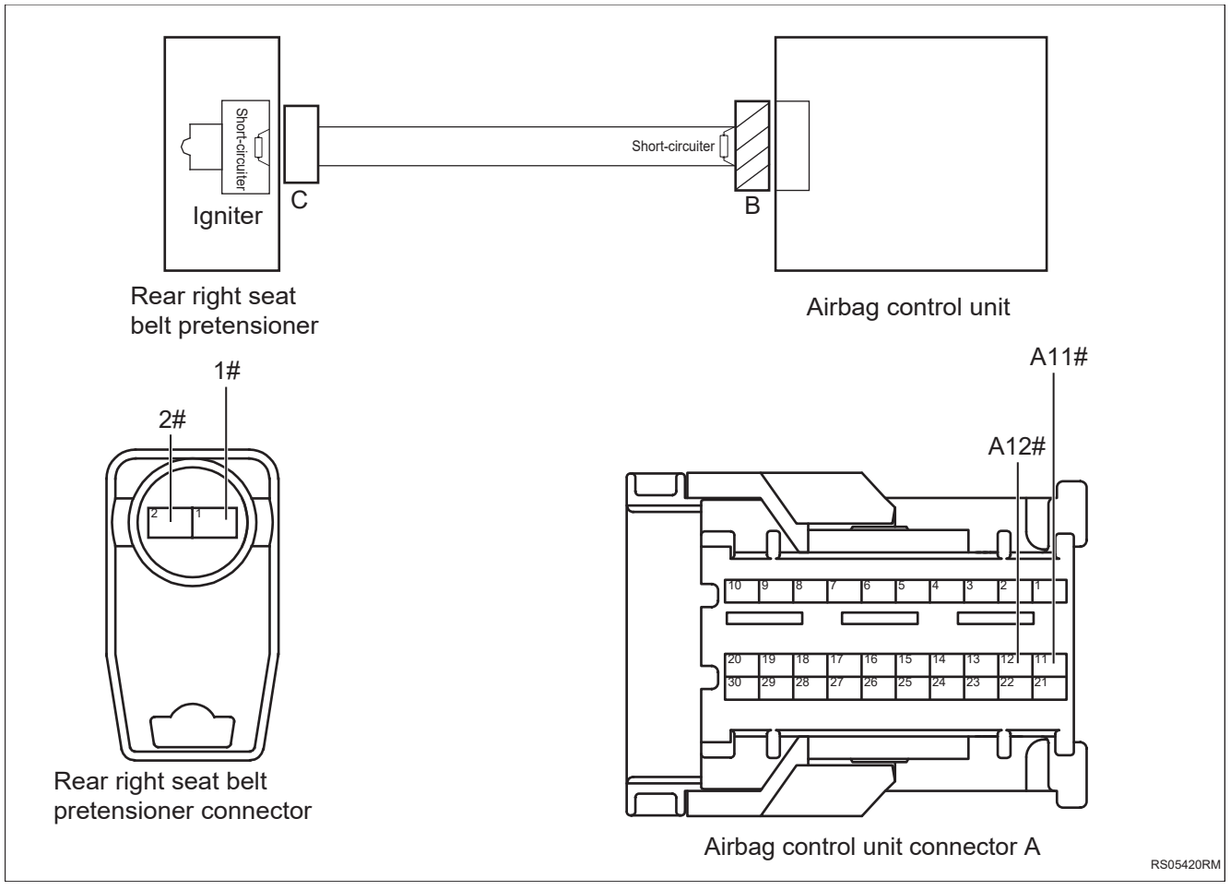
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - airbag control unit connector A12#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for open in rear right seat belt pretensioner wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

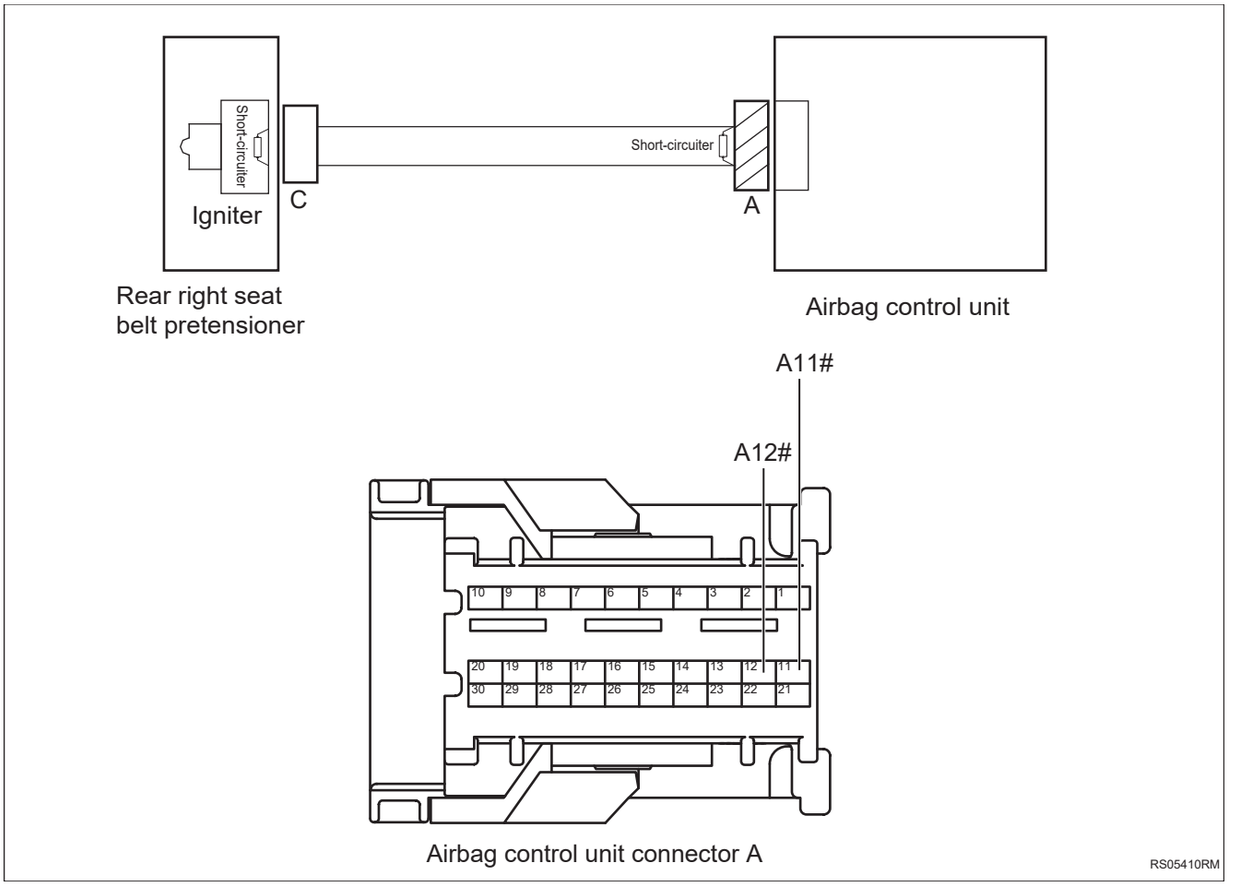
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - rear right active seat belt connector 2#	Always connected	Less than 1 Ω
Airbag control unit connector A12# - rear right active seat belt connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in rear right seat belt pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

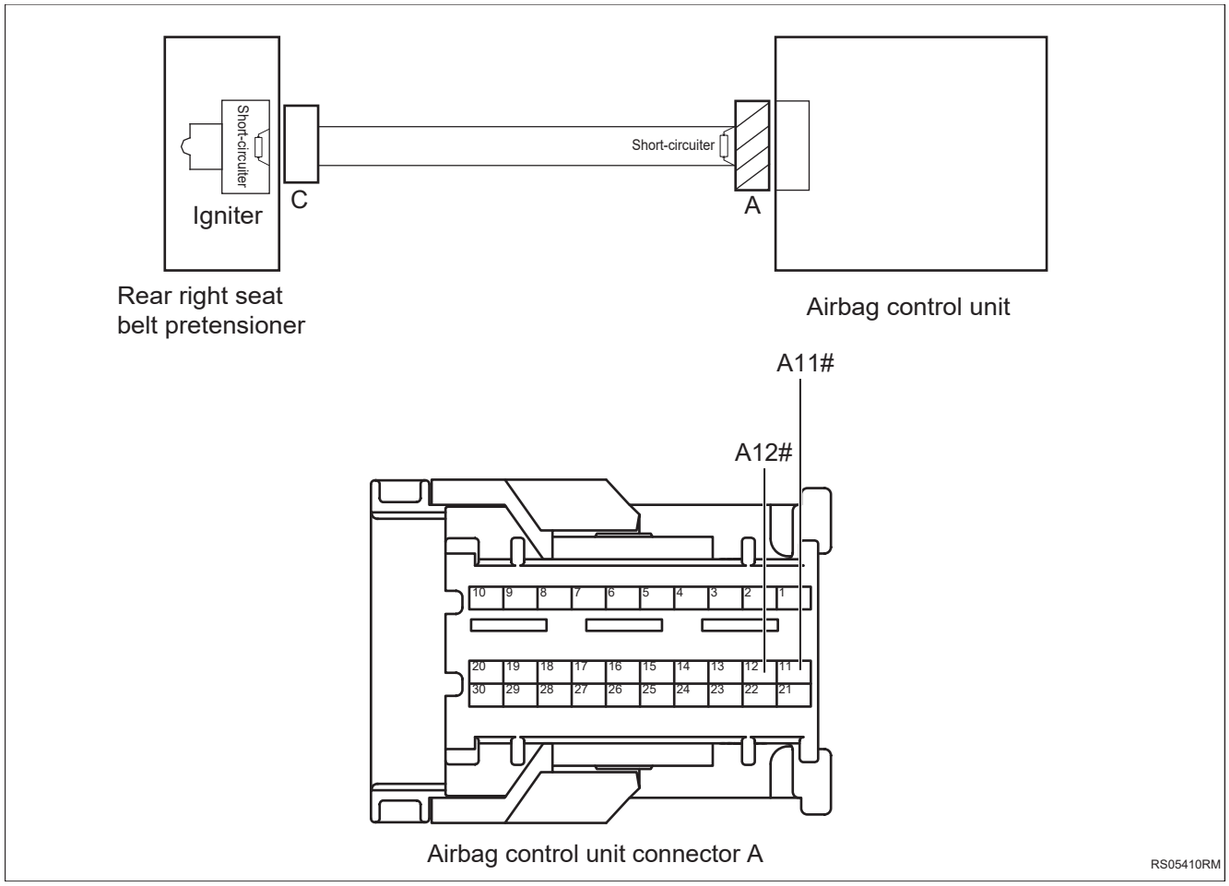
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK →

5	**Check for short to power supply in rear right seat belt pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	**Replace rear right seat belt pretensioner (See page NS-6)**

(a) Replace the rear right seat belt pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007911**	**Short to ground in driver seat belt leg pretensioner circuit**
DTC	**B007912**	**Short to power supply in driver seat belt leg pretensioner circuit**
DTC	**B00791A**	**Driver seat belt leg pretensioner circuit resistance below threshold**
DTC	**B00791B**	**Driver seat belt leg pretensioner circuit resistance above threshold**
DTC	**B00792B**	**Driver seat belt leg pretensioner other circuit series fault**

Description

When there is short in driver seat belt end plate pretensioner circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007911	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.4 kΩ, and the fault may be detected when the leakage resistance value is < 6.5 kΩ.	5 times	Continuous type	400 ms	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector
B007912	• Power supply status is normal • IGN is ON	The fault is detected when leakage resistance value is < 1.8 kΩ, and the fault may be detected when the leakage resistance value is < 9.7 kΩ.	5 times	Continuous type	400 ms	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector
B00791A	• Power supply status is normal • IGN is ON	When the airbag resistance is less than 1.1 Ω, the fault is detected. When the airbag resistance is less than 1.7 Ω, the fault	5 times	Continuous type	400 ms	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector

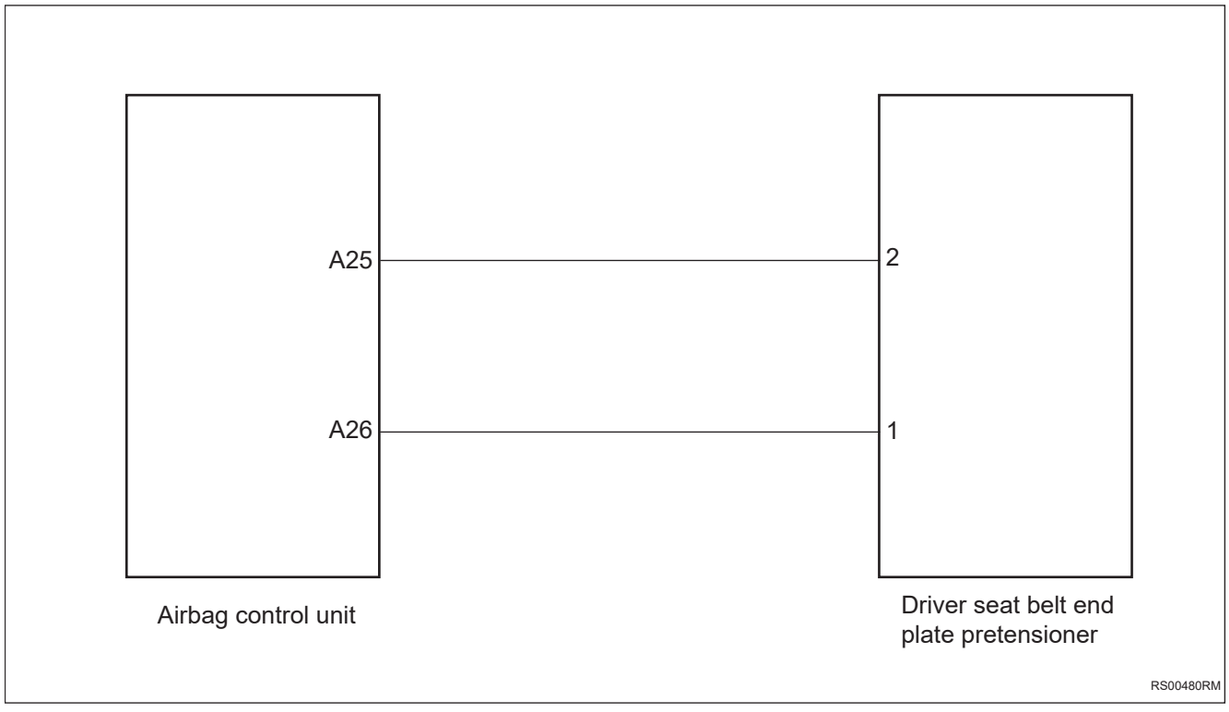
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		may be detected				
B00791B	• Power supply status is normal • IGN is ON	When the airbag resistance is greater than 5.0 Ω, the fault is detected. When the airbag resistance is greater than 3.8 Ω, the fault may be detected	5 times	Continuous type	400 ms	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector
B00792B	• Power supply status is normal • IGN is ON	Overlapping between different ignition circuit wire harnesses	1 times	Continuous type	Detected only during initialization	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

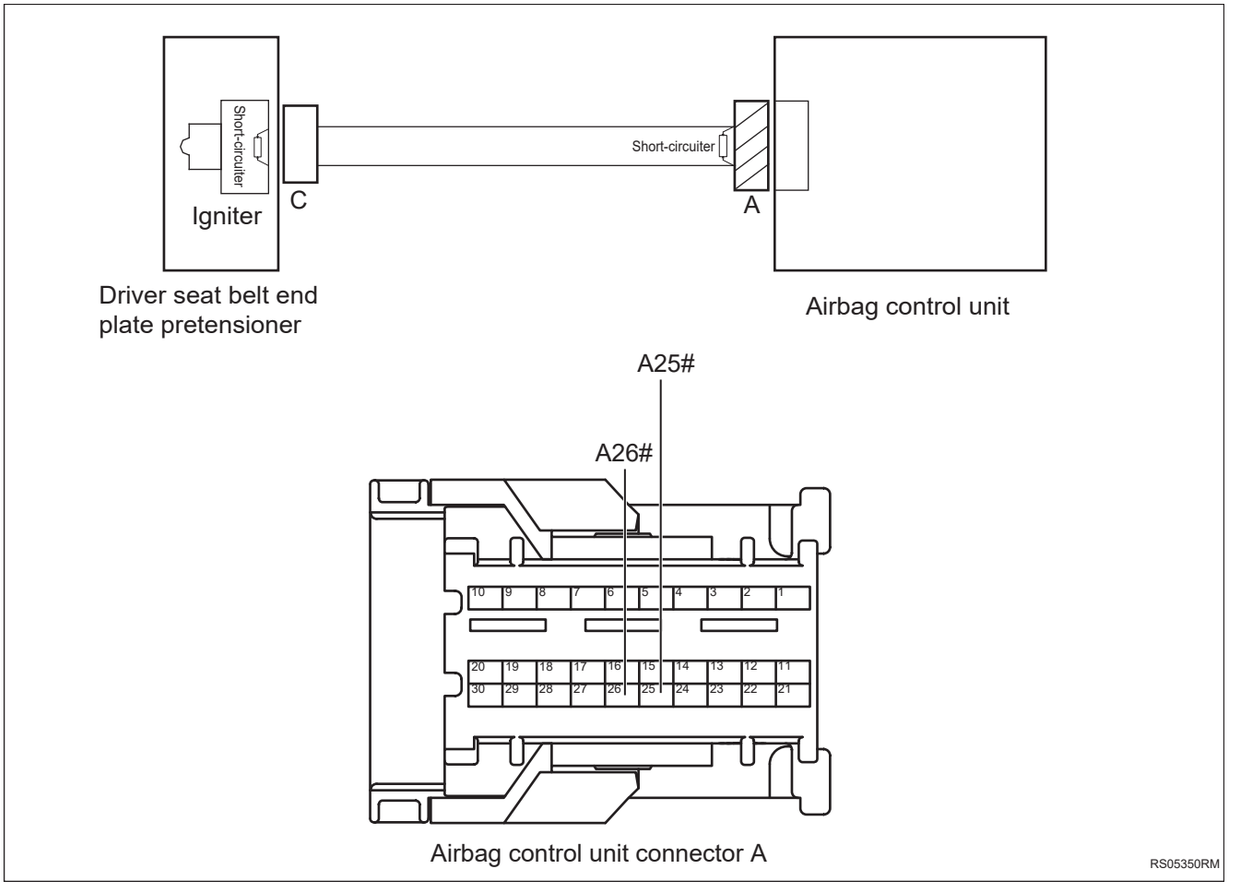
DTC No.	Fault symptom	Warning light/indicator
B007911	• Warning light comes on • Set DTC	Comes on
B007912	• Warning light comes on • Set DTC	Comes on
B00791A	• Warning light comes on • Set DTC	Comes on
B00791B	• Warning light comes on • Set DTC	Comes on
B00792B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver seat belt end plate pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

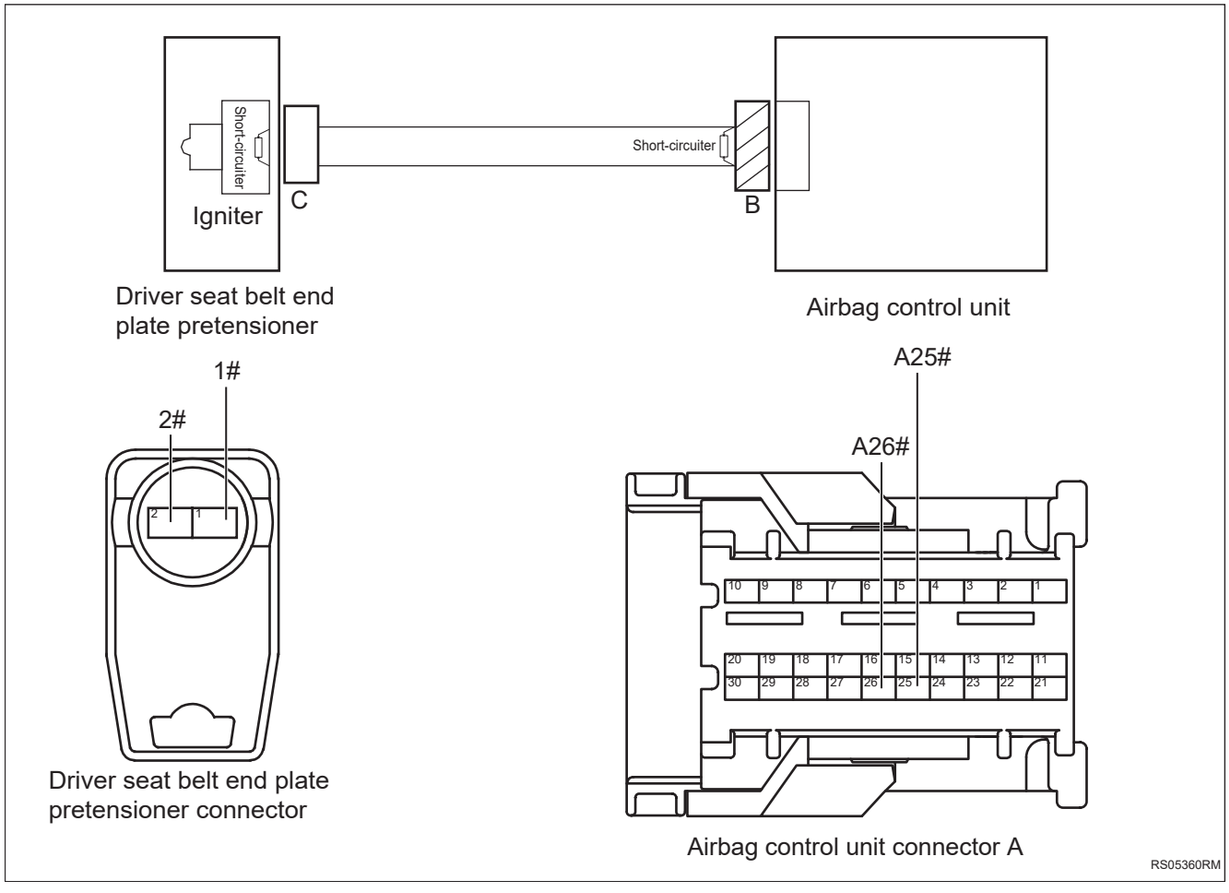
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - airbag control unit connector A26#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver seat belt end plate pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

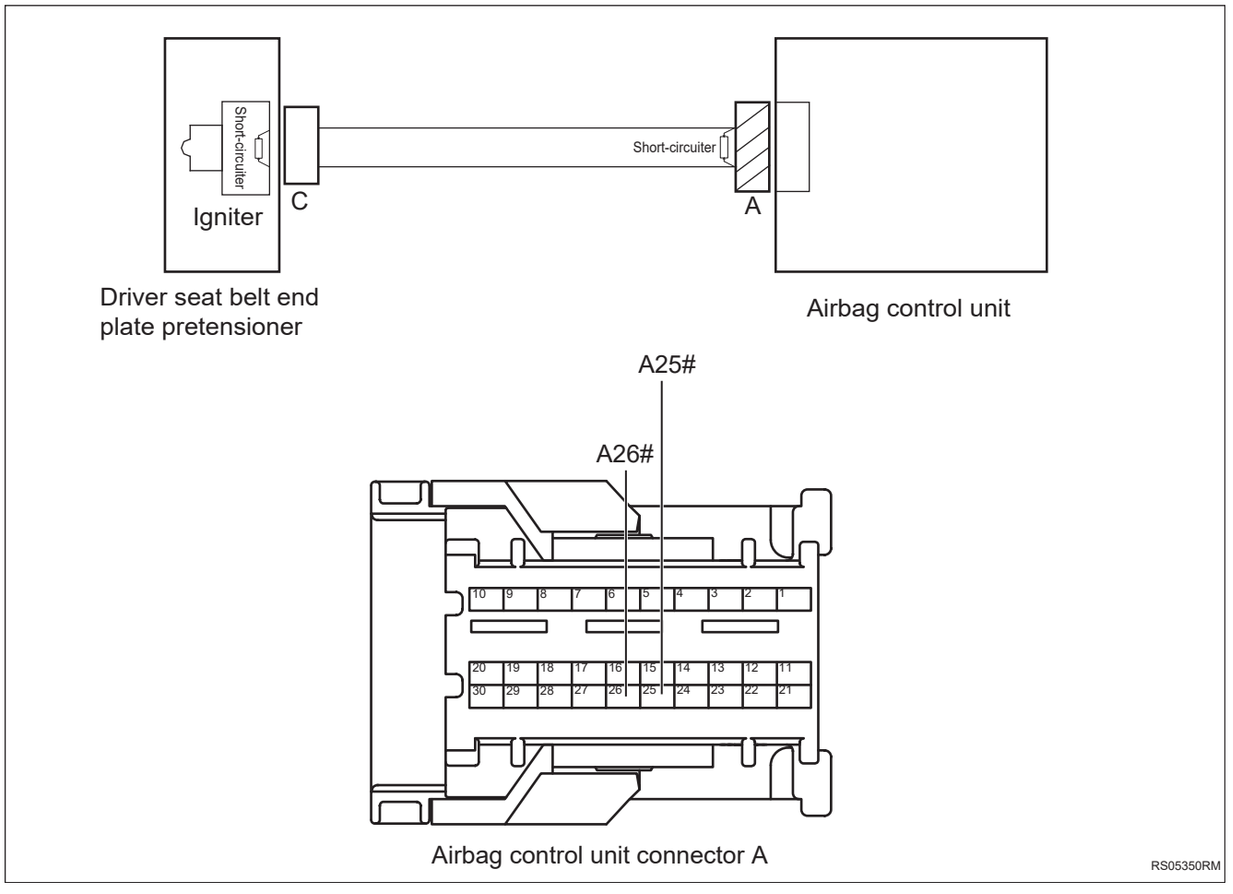
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - driver seat belt end plate pretensioner connector 2#	Always connected	Less than 1 Ω
Airbag control unit connector A26# - driver seat belt end plate pretensioner connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to ground in driver seat belt end plate pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

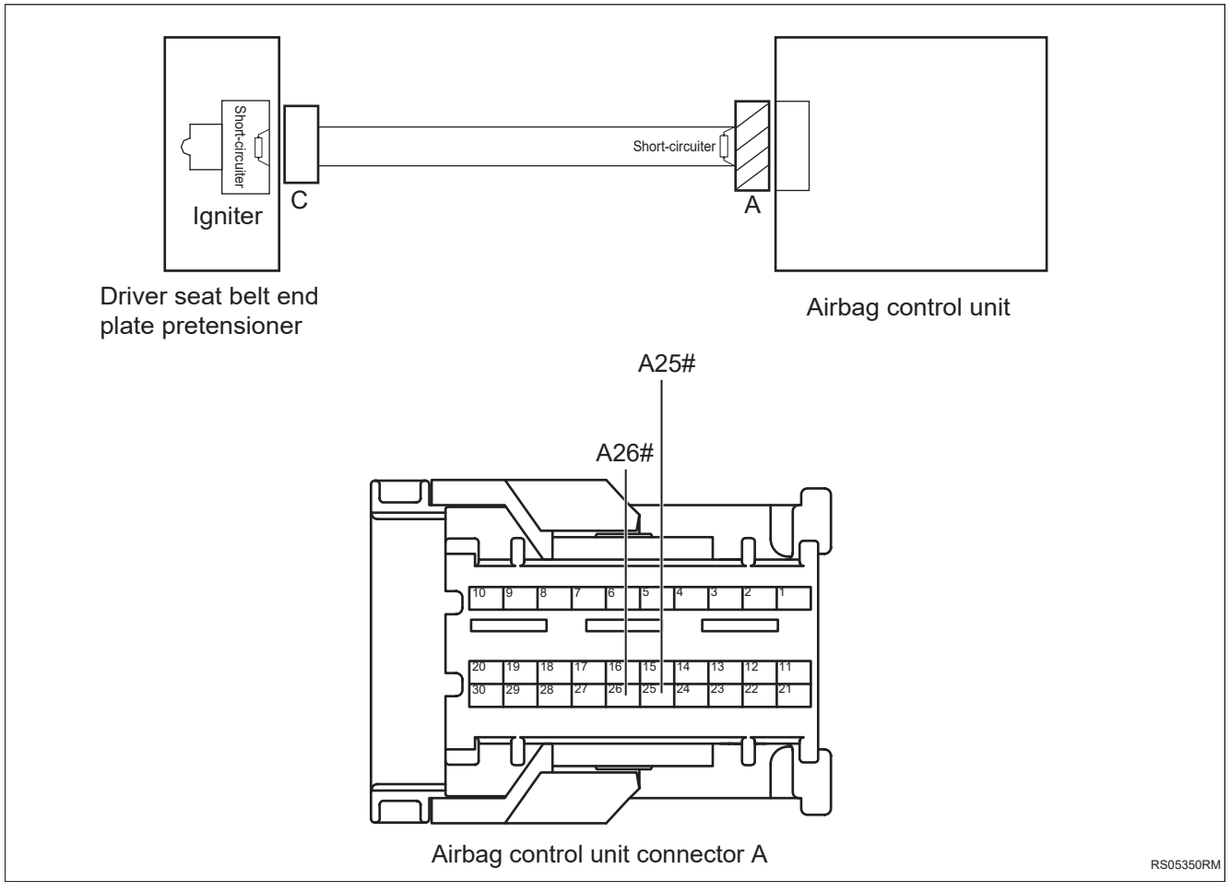
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A26# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in driver seat belt end plate pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A26# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace driver seat belt end plate pretensioner (See page NS-3)**

(a) Replace the driver seat belt end plate pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

NG	**Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B007956**	**Driver seat belt leg pretensioner invalid configuration**

Description

When driver seat belt end plate pretensioner circuit has an invalid configuration, the airbag control unit records DTC.

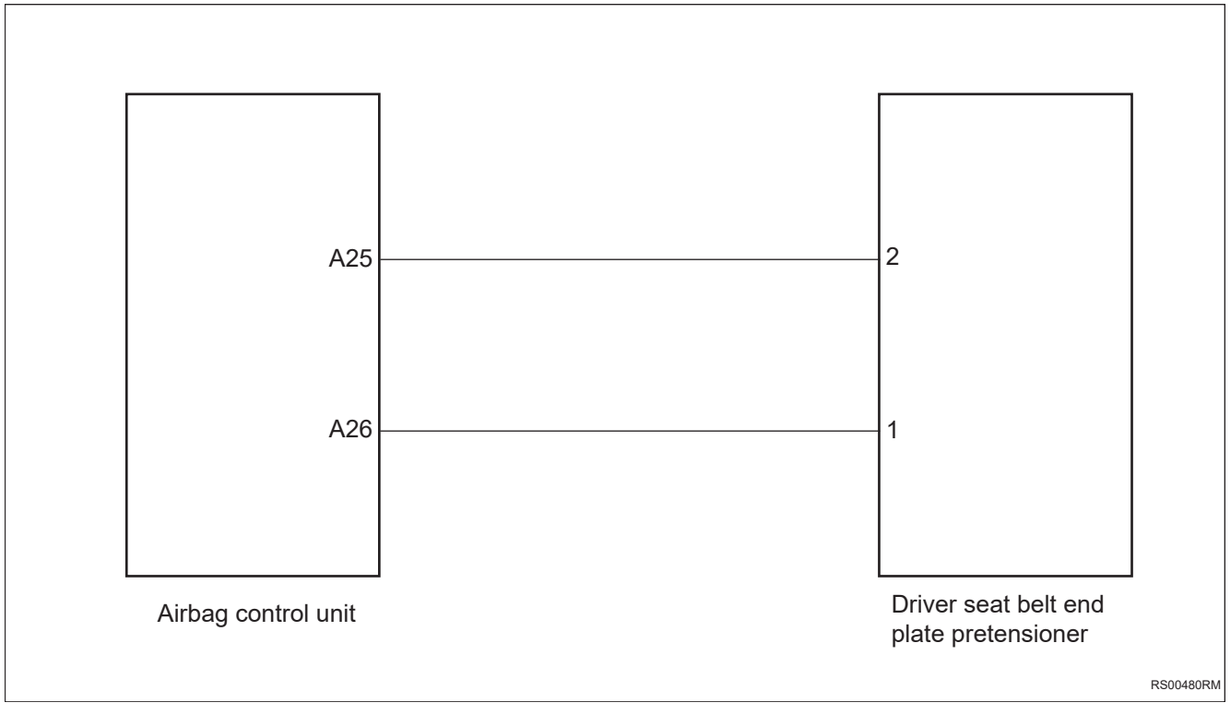
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B007956	• Power supply status is normal • IGN is ON	• Airbags that should not be configured are installed • The airbag does not exist, but there is leakage to power supply or ground in the correspon-ding pin	1 times	Continuous type	Detected only during initialization	• Driver seat belt end plate pretensioner • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B007956	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

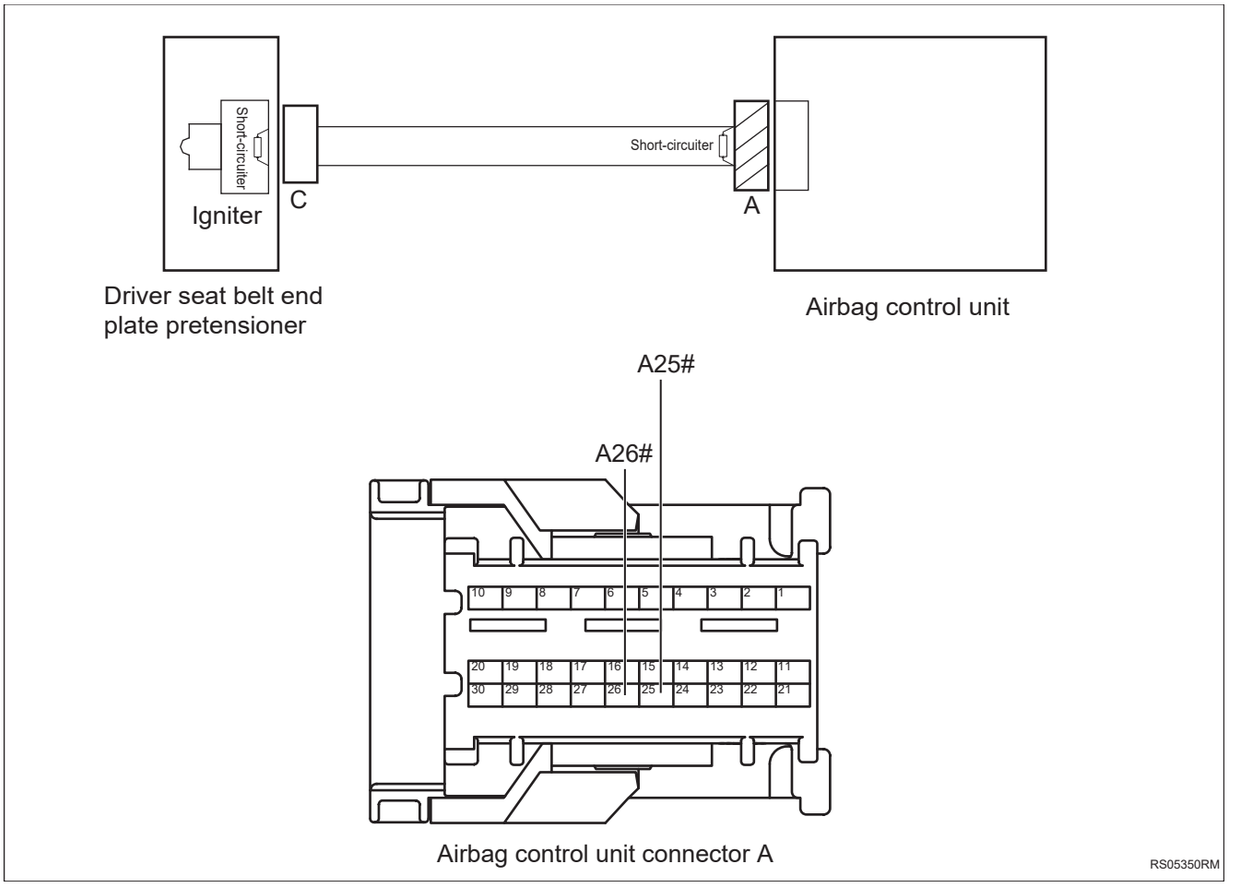
1	**Check and read configuration file of driver seat belt end plate pretensioner**

(a) Check and read if configuration file of driver seat belt end plate pretensioner is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in driver seat belt end plate pretensioner wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the connectors A and C.

(d) Release the built-in short-circuiter of connector A.

(e) According to value in the table, measure resistance.

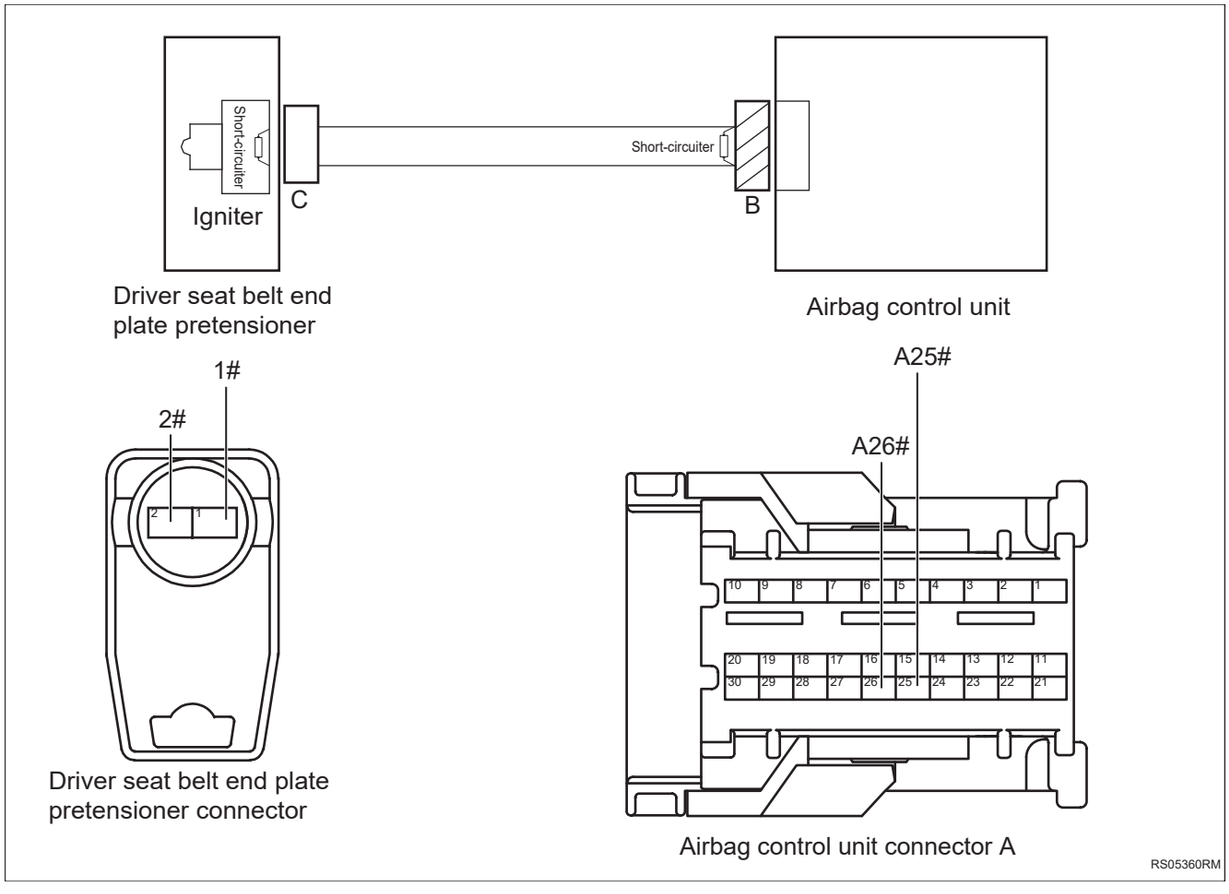
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - airbag control unit connector A26#	Always connected	10 K Ω or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in driver seat belt end plate pretensioner wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

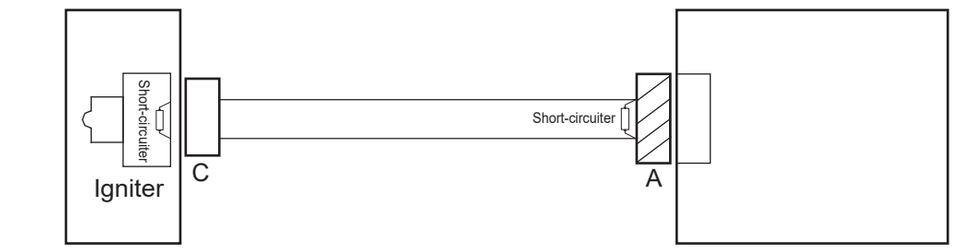
Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector A25# - driver seat belt end plate pretensioner connector 2#	Always connect-ed	Less than 1 Ω
Airbag control unit connector A26# - driver seat belt end plate pretensioner connector 1#	Always connect-ed	Less than 1 Ω

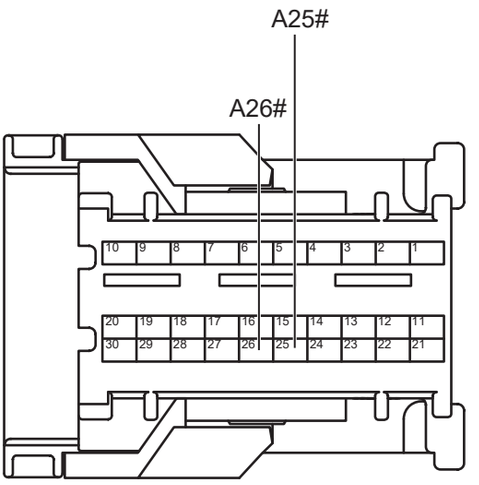
NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to ground in driver seat belt end plate pretensioner wire harness and connector**





(a) According to value in the table, measure resistance.

Standard value

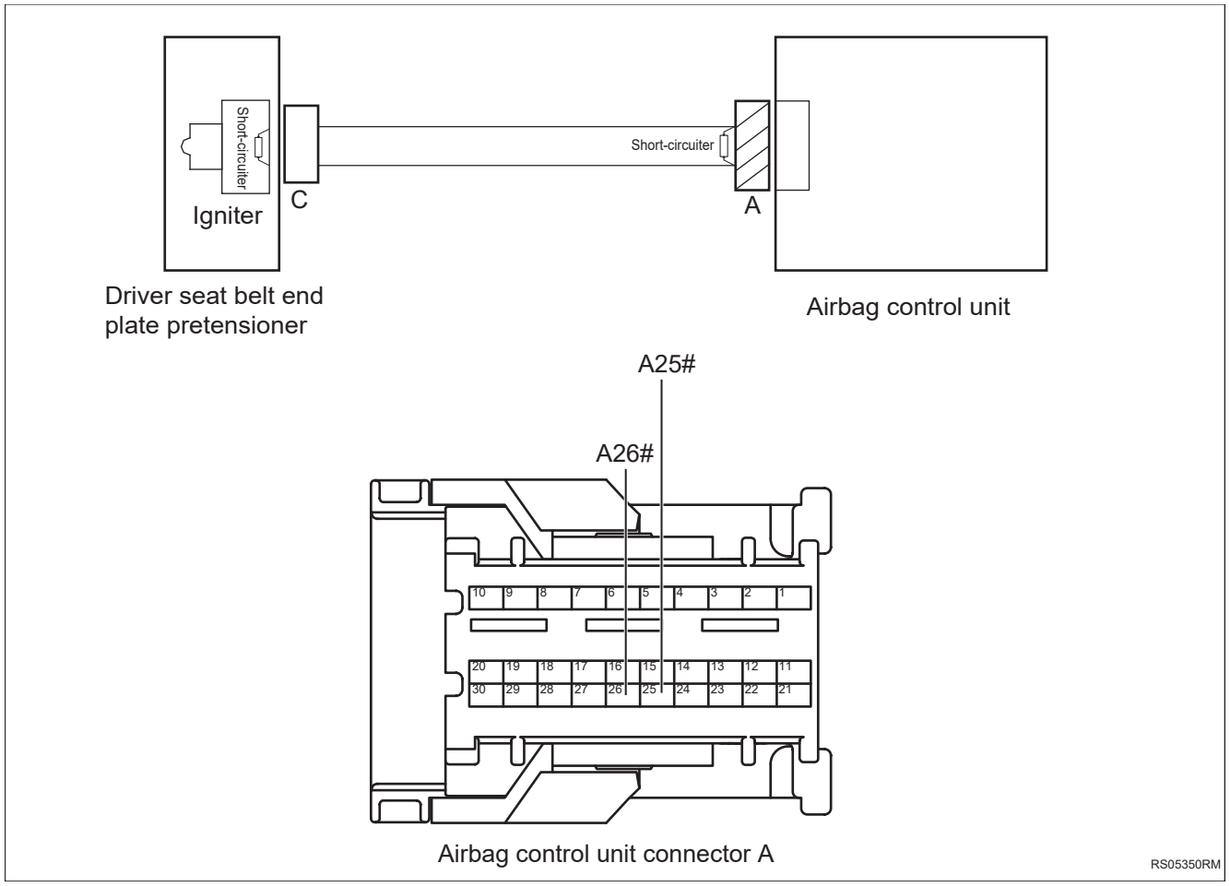
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A26# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in driver seat belt end plate pretensioner wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A25# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A26# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK ↓

6	**Replace driver seat belt end plate pretensioner (See page NS-3)**

(a) Replace the driver seat belt end plate pretensioner.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK ↓

Diagnosis ends

DTC	**B009013**	**Open in left earlier collision sensor**
DTC	**B009011**	**Short to ground in left earlier collision sensor**
DTC	**B009012**	**Short to power supply in left earlier collision sensor**
DTC	**B00902B**	**Left earlier collision sensor series fault**

Description

When driver acceleration frontal collision sensor itself is faulty, or there is short, open, series fault in circuit, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009013	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009011	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

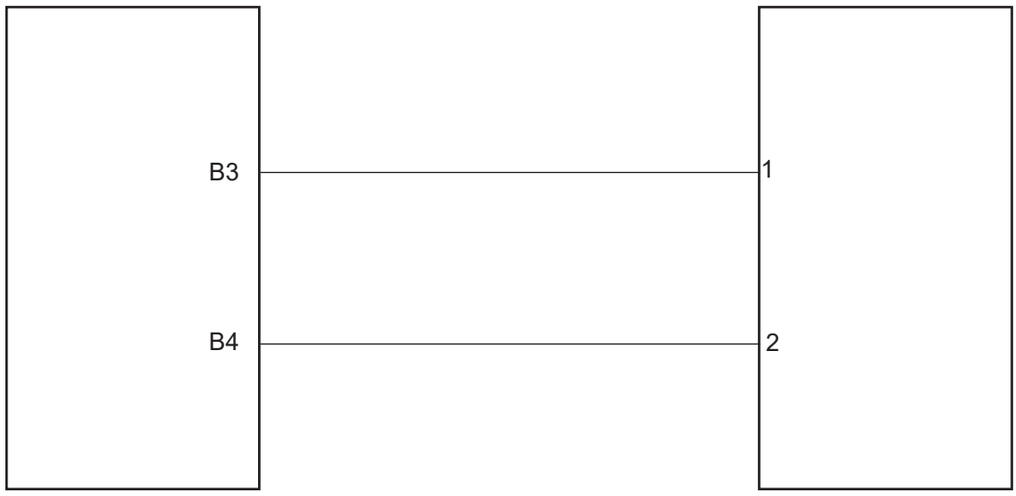
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009012	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B00902B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

ZD

Fault symptom

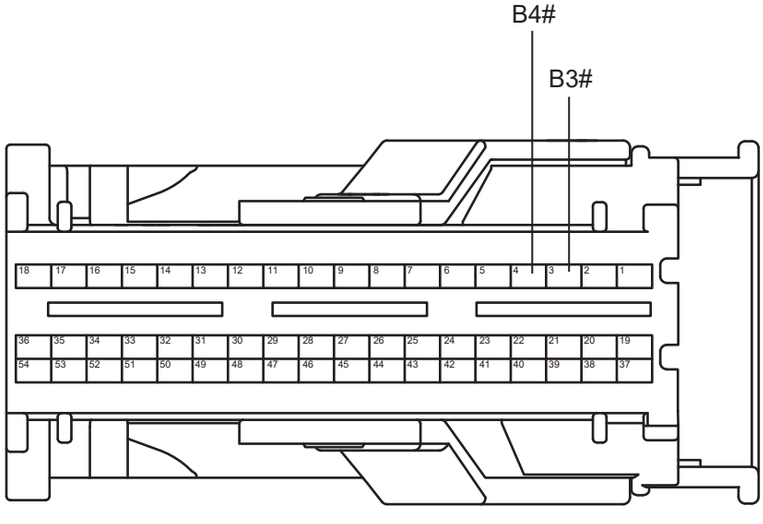
DTC No.	Fault symptom	Warning light/indicator
B009013	• Warning light comes on • Set DTC	Comes on
B009011	• Warning light comes on • Set DTC	Comes on
B009012	• Warning light comes on • Set DTC	Comes on
B00902B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver acceleration frontal collision sensor wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

Standard value

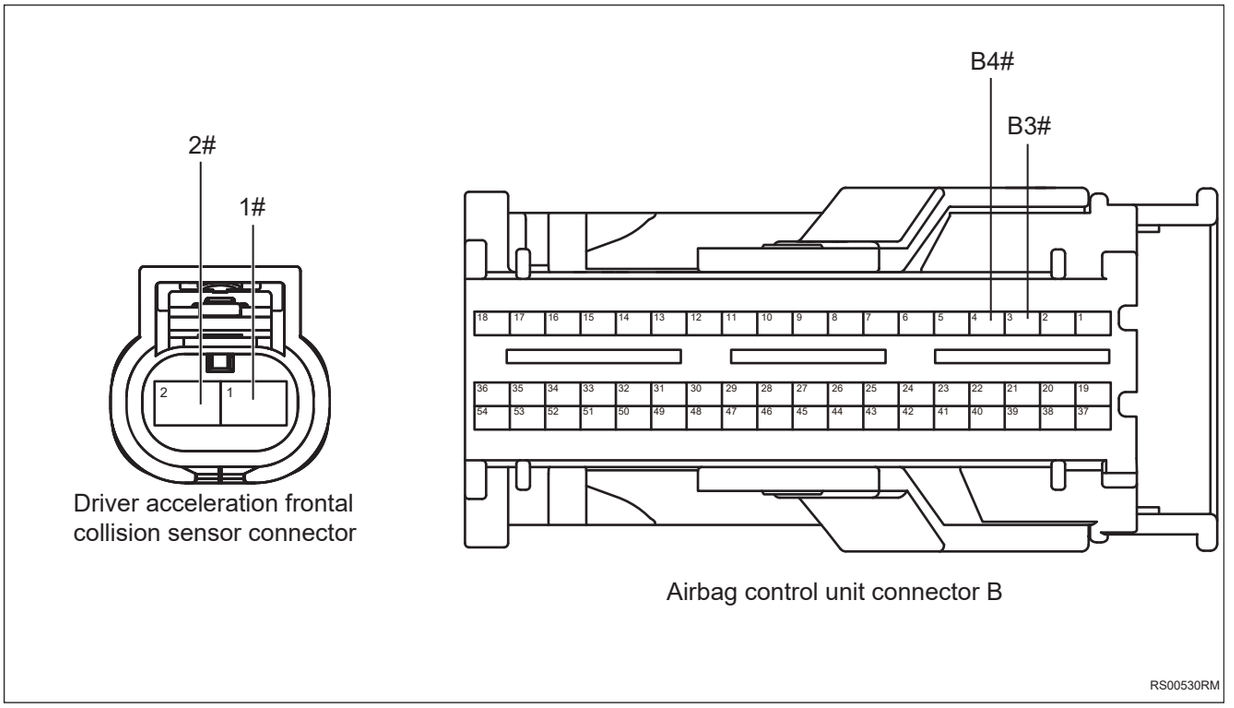
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - airbag control unit connector B4#	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver acceleration frontal collision sensor wire harness and connector**



(a) According to value in the table, measure resistance.

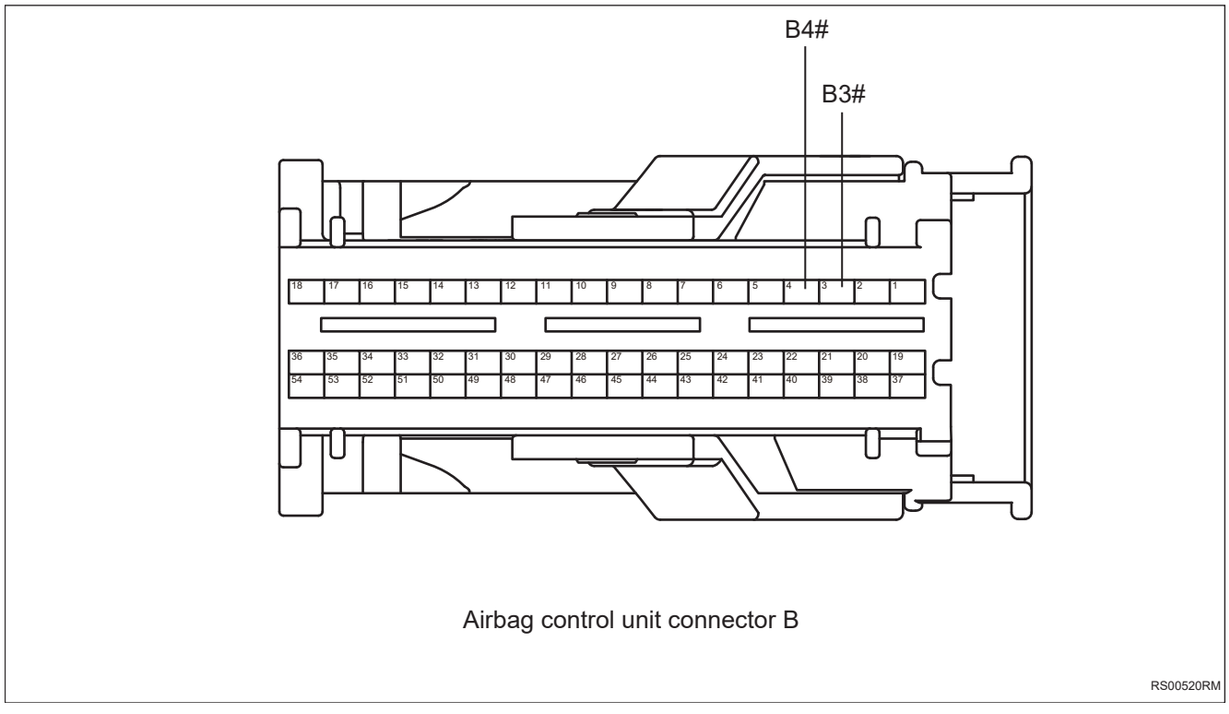
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - driver acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B4# - driver acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

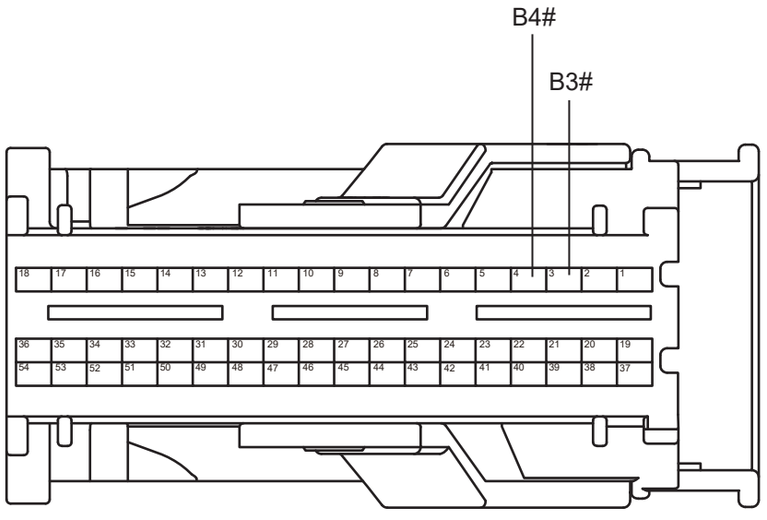
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Check for short to power supply in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00520RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace driver acceleration frontal collision sensor (See page ZC-68)**

(a) Replace the driver acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009056	Left earlier collision sensor configuration error

Description

When driver acceleration frontal collision sensor itself is faulty or has configuration error, the airbag control unit records DTC.

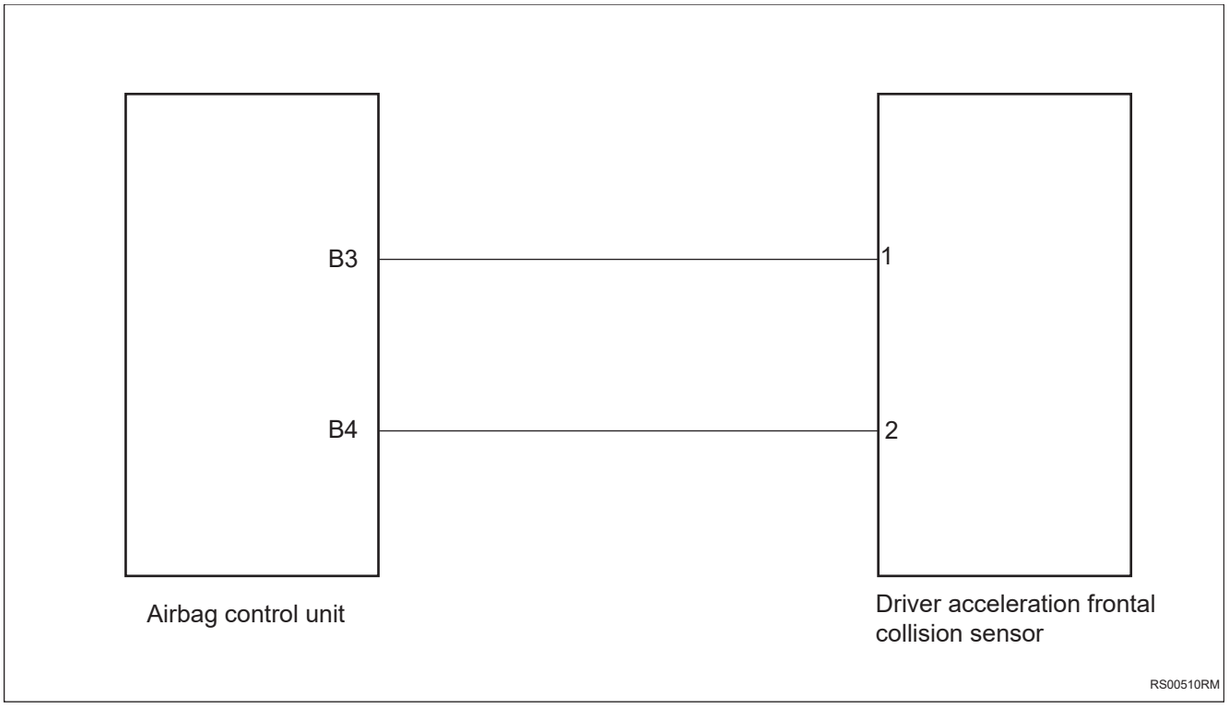
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009056	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009056	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

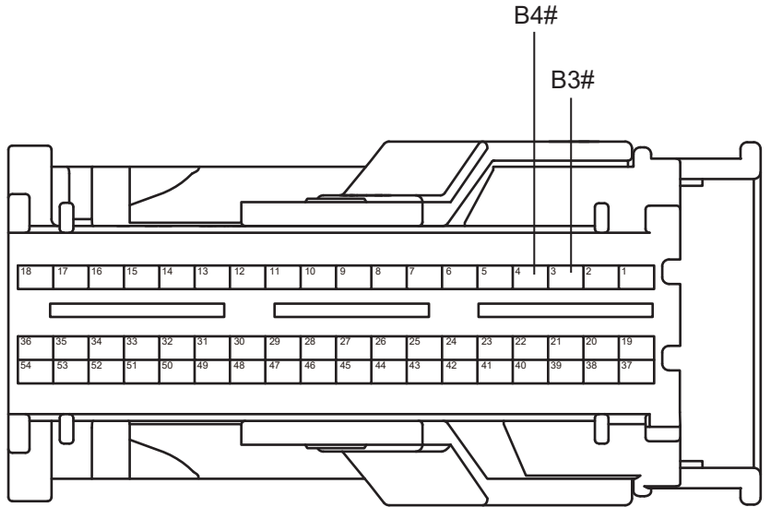
1	**Check driver acceleration frontal collision sensor part number**

(a) Check if driver acceleration frontal collision sensor part number is correct.

NG → **Replace collision sensor with correct type (See page ZC-68)**

OK

2	**Check for short to each other in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00520RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

Standard value

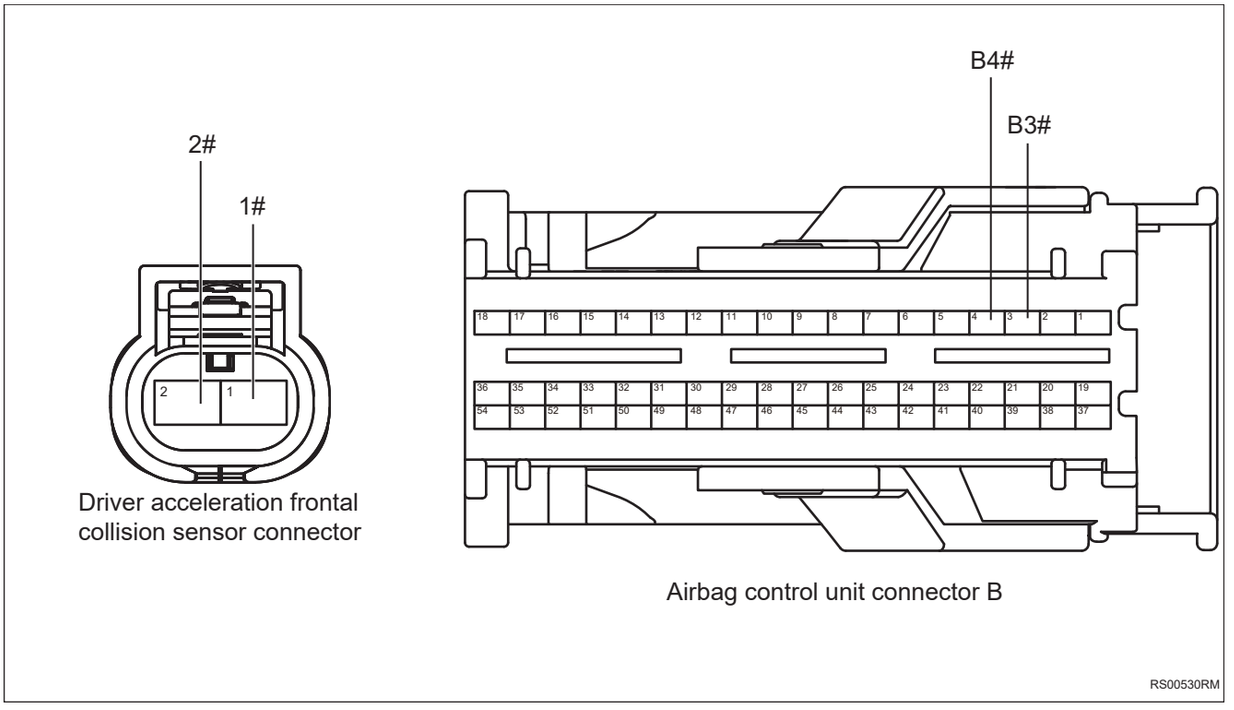
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - airbag control unit connector B4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for open in driver acceleration frontal collision sensor wire harness and connector**



(a) According to value in the table, measure resistance.

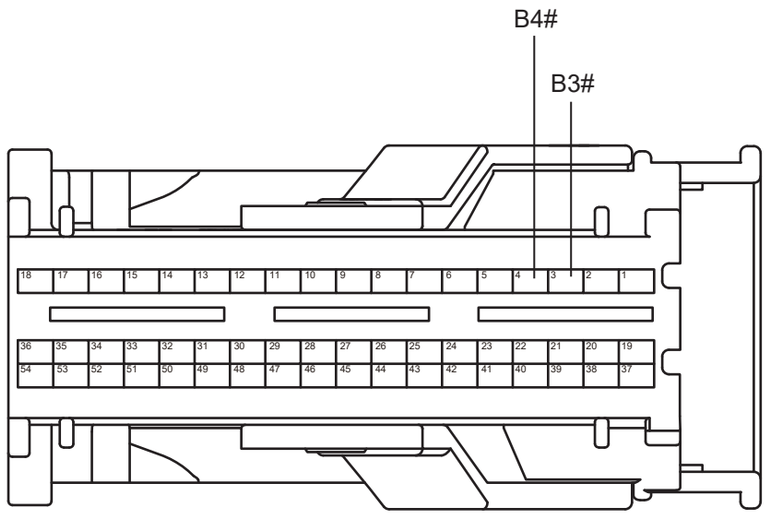
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - driver acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B4# - driver acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00520RM

(a) According to value in the table, measure resistance.

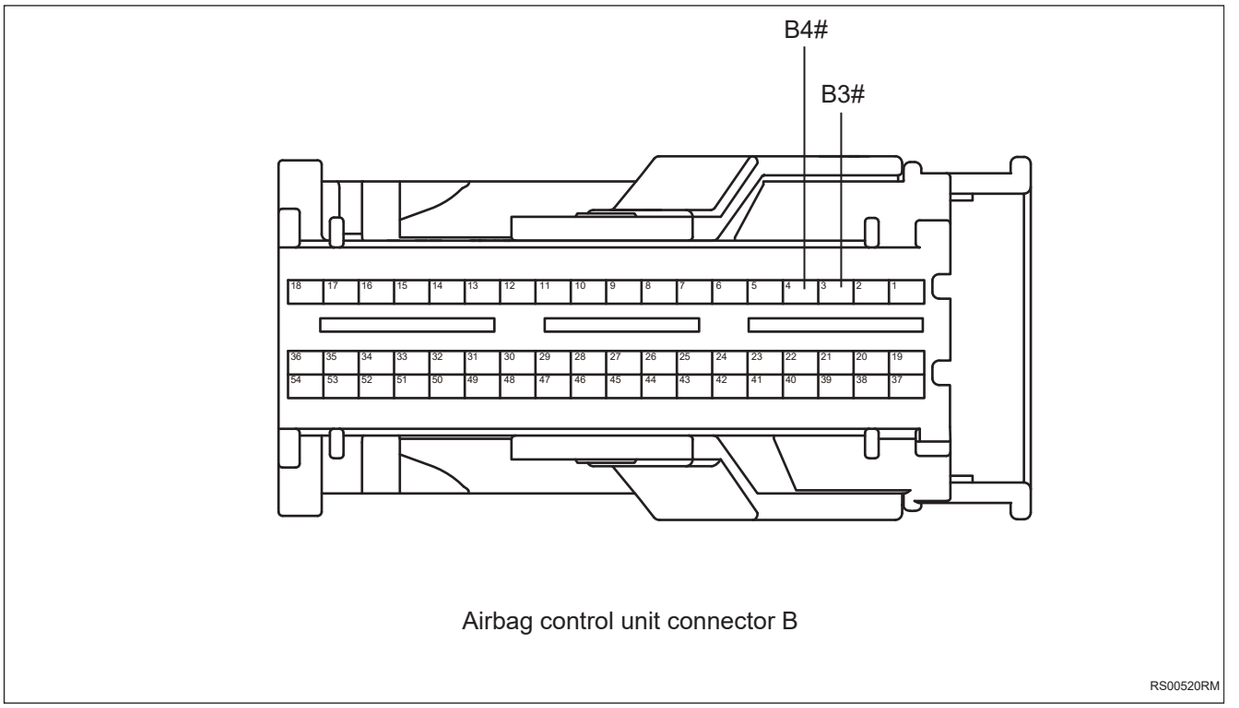
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B4# - body ground	Always connected	10 KΩ or more

NG	**Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace driver acceleration frontal collision sensor (See page ZC-68)

(a) Replace the driver acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009086**	**Left earlier collision sensor communication error**
DTC	**B009091**	**Left earlier collision sensor parameter error**
DTC	**B009096**	**Left earlier collision sensor self-check failure**

Description

When driver acceleration frontal collision sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

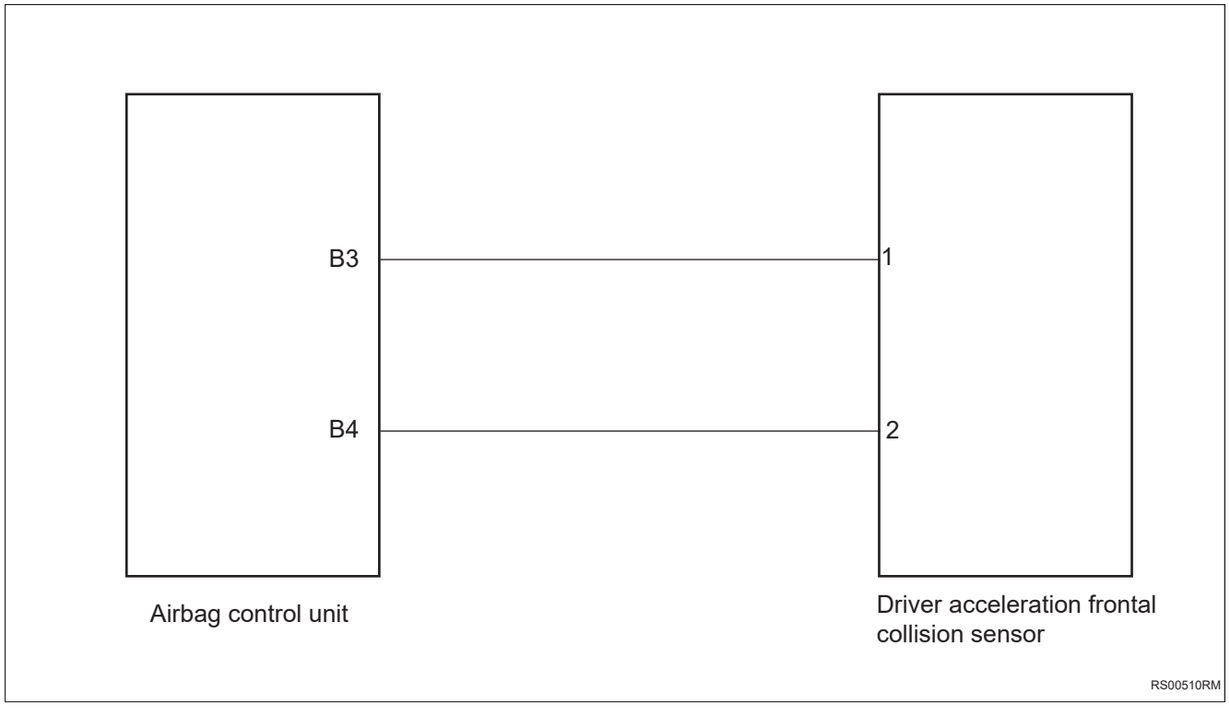
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009086	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout • Remark: The fault only diagnosis during startup phase	Non-continuous type	-	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009091	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when parameter error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite ID0~ID11 not as expect • Remark: The fault only diagnosis during startup phase	Non-continuous type	-	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009096	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when defect error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite data out of range • Remark: The fault only	Non-continuous type	-	• Driver acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
			diagnosis during startup phase			

Fault symptom

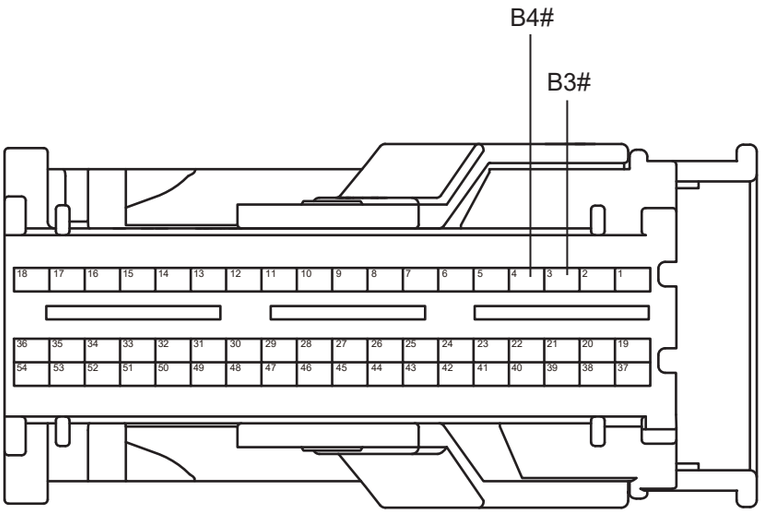
DTC No.	Fault symptom	Warning light/indicator
B009086	• Warning light comes on • Set DTC	Comes on
B009091	• Warning light comes on • Set DTC	Comes on
B009096	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00520RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

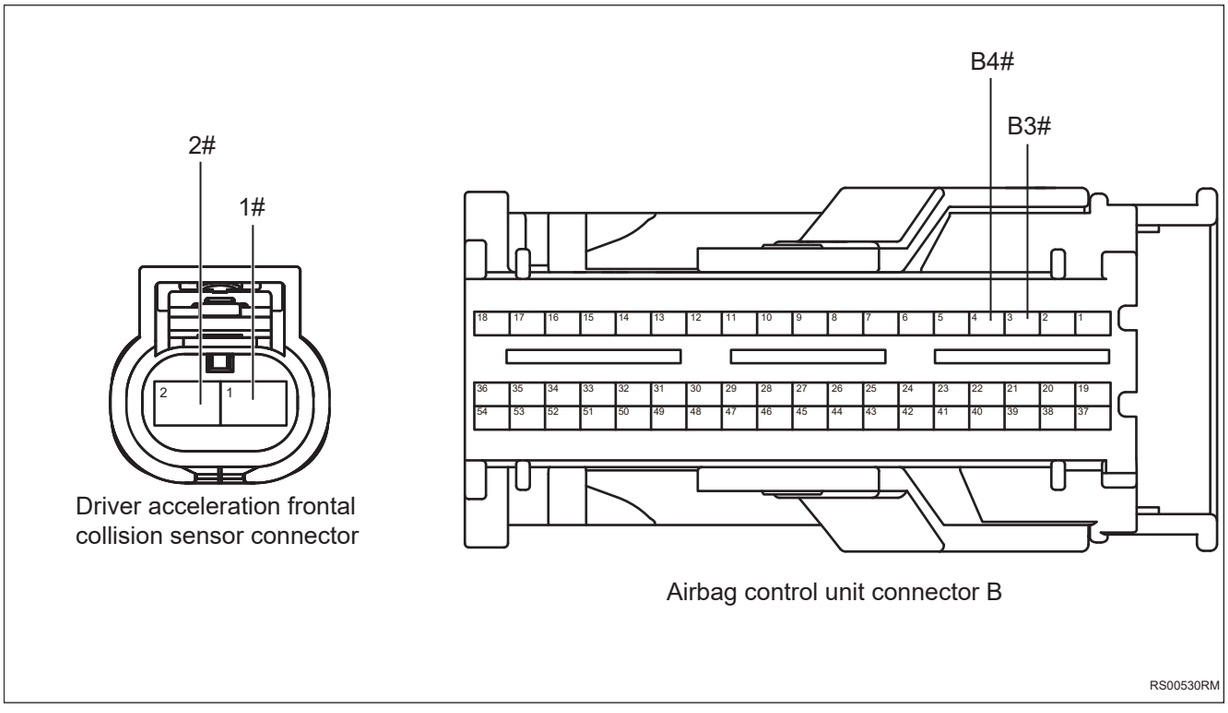
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - airbag control unit connector B4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver acceleration frontal collision sensor wire harness and connector**



Driver acceleration frontal collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

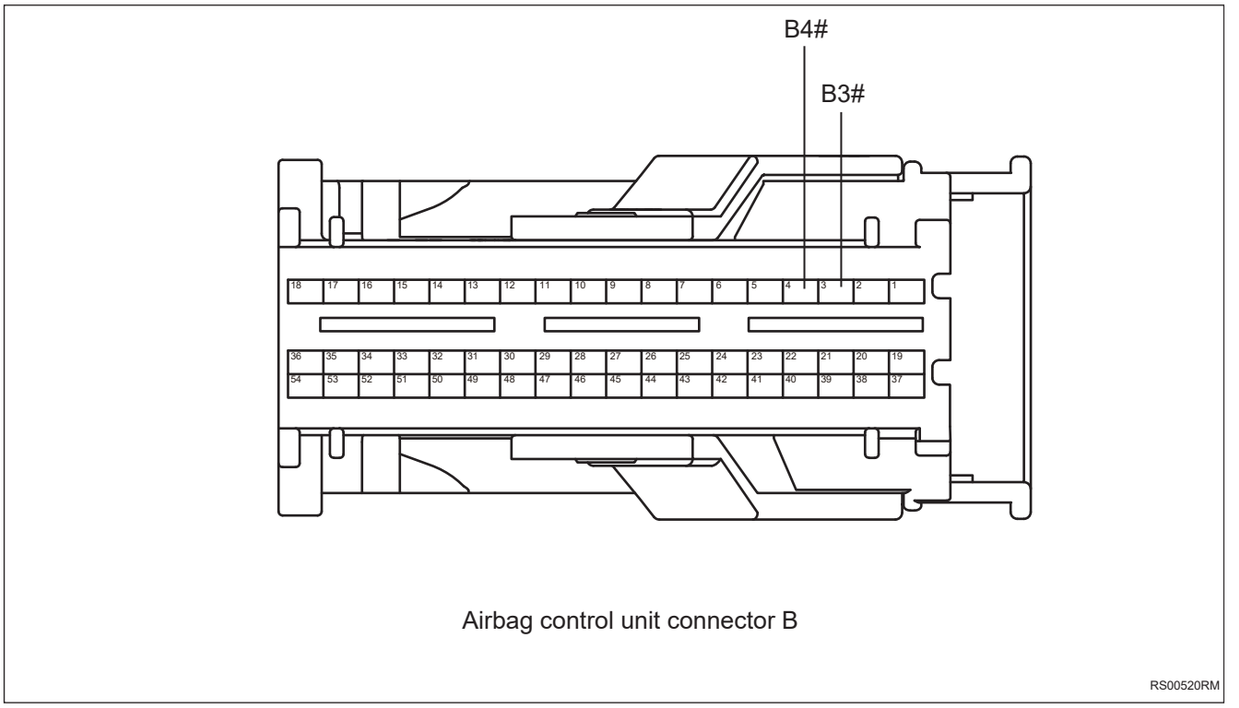
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - driver acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B4# - driver acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in driver acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B3# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver acceleration frontal collision sensor (See page ZC-68)**

(a) Replace the driver acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009113**	**Open in B-pillar left acceleration sensor**
DTC	**B009111**	**Short to ground in B-pillar left acceleration sensor**
DTC	**B009112**	**Short to power supply in B-pillar left acceleration sensor**
DTC	**B00912B**	**B-pillar left acceleration sensor series fault**

Description

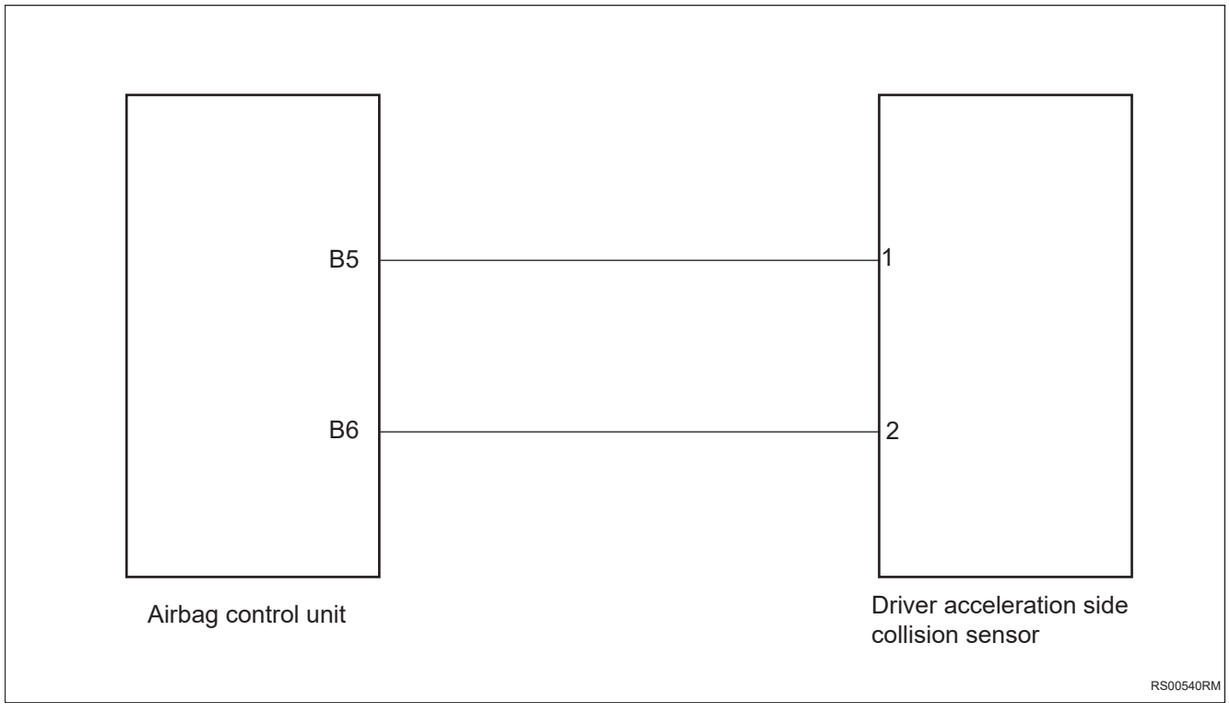
When driver acceleration side collision sensor itself is faulty, or there is short, open and series fault in circuit, airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009113	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009111	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009112	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector
B00912B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

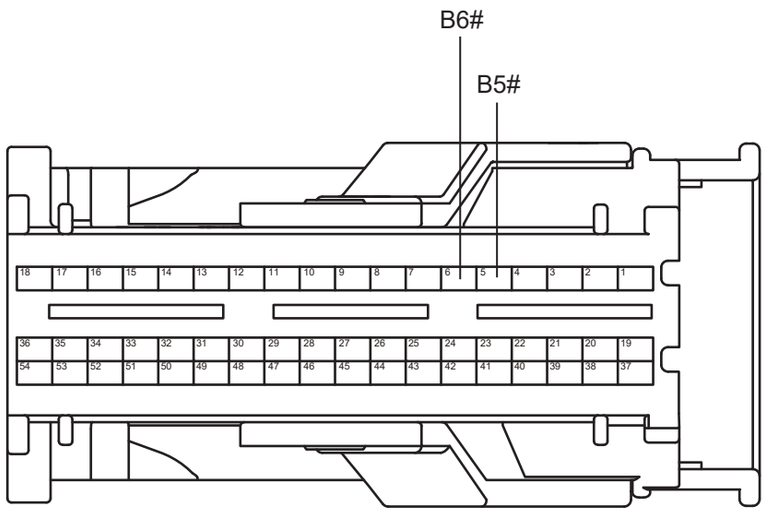
DTC No.	Fault symptom	Warning light/indicator
B009113	• Warning light comes on • Set DTC	Comes on
B009111	• Warning light comes on • Set DTC	Comes on
B009112	• Warning light comes on • Set DTC	Comes on
B00912B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

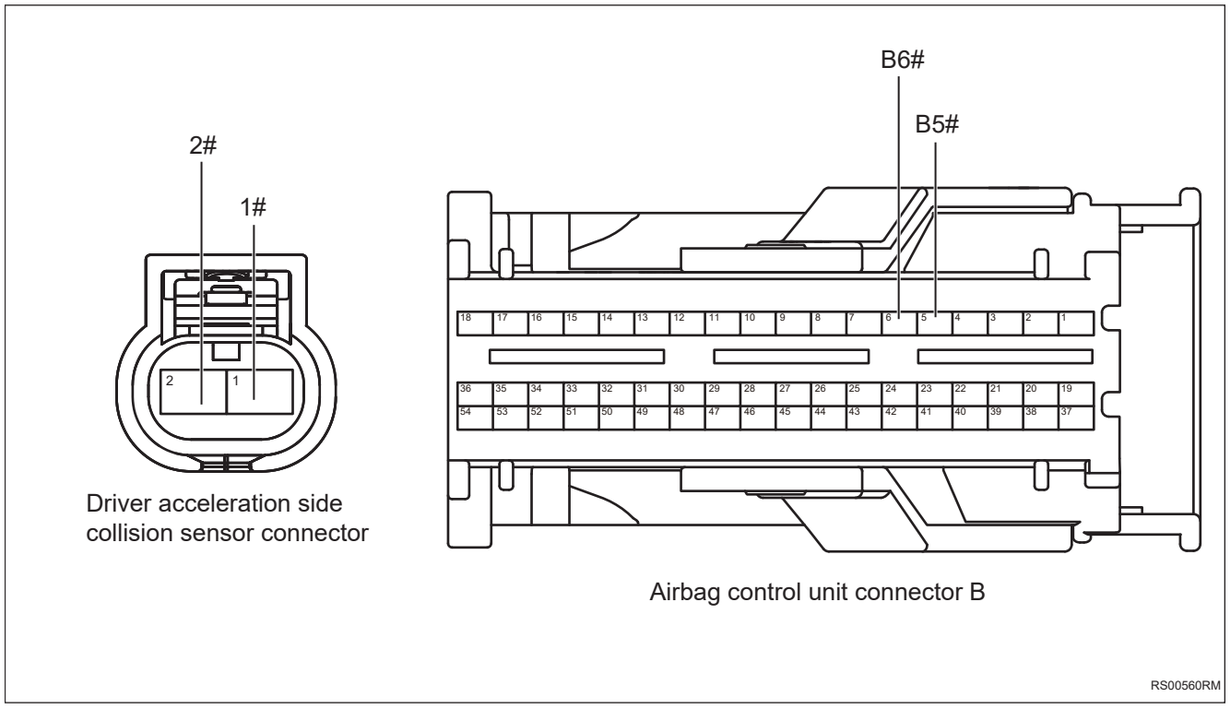
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - airbag control unit connector B6#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver acceleration side collision sensor wire harness and connector**



Driver acceleration side collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

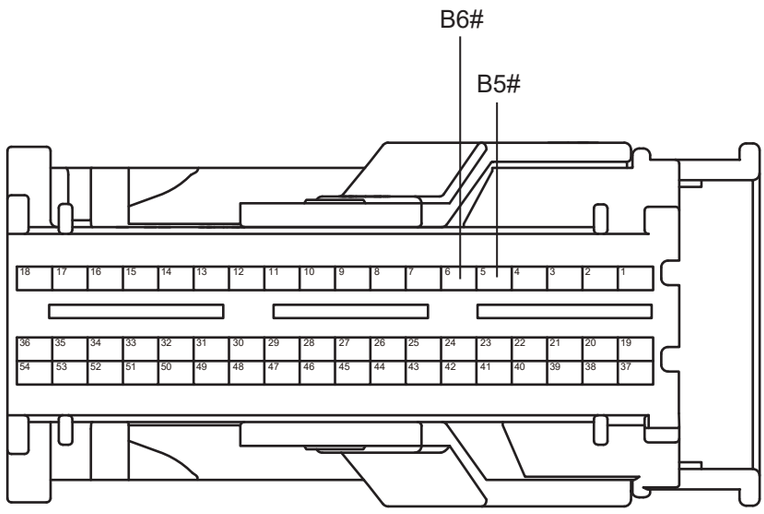
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - driver acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B6# - driver acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) According to value in the table, measure resistance.

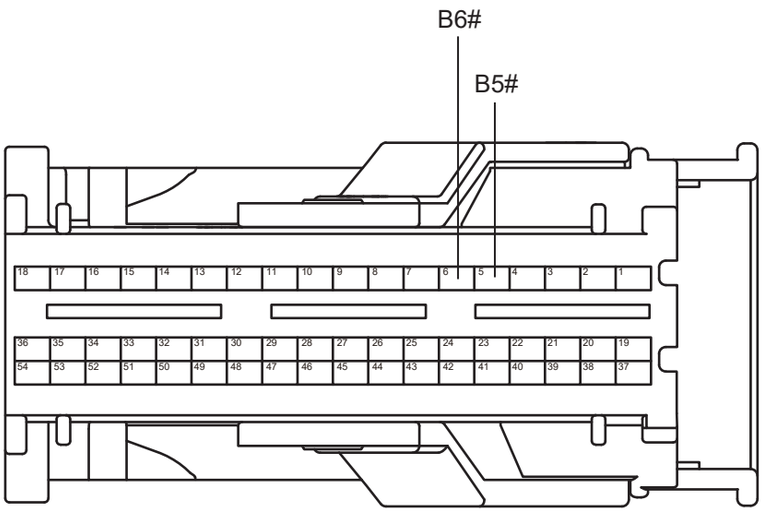
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B6# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace driver acceleration side collision sensor (See page ZC-68)**

(a) Replace the driver acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009156	B-pillar left acceleration sensor configuration error

Description

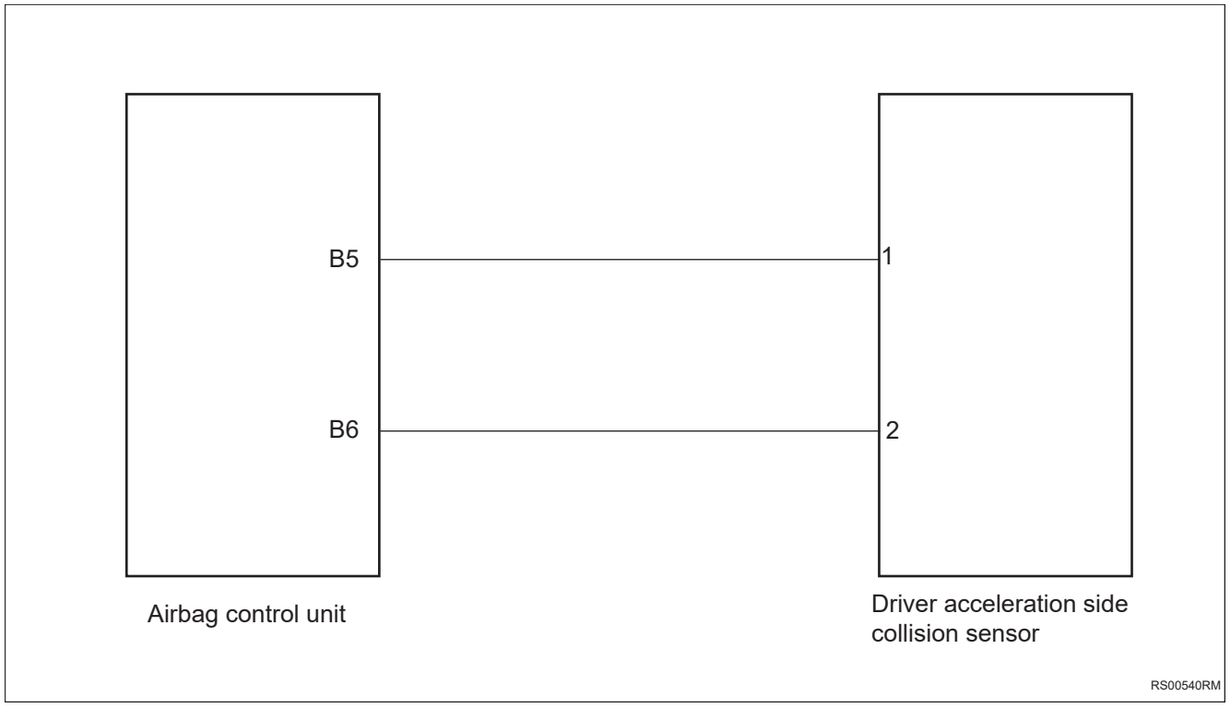
When driver acceleration side collision sensor itself is faulty or has configuration error, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009156	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009156	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

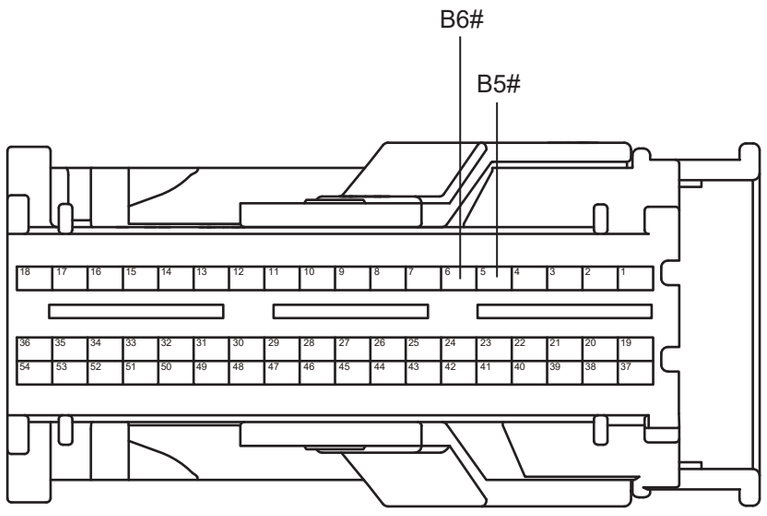
1	**Check and read configuration file of driver acceleration side collision sensor**

(a) Check and read if configuration file of driver acceleration side collision sensor is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

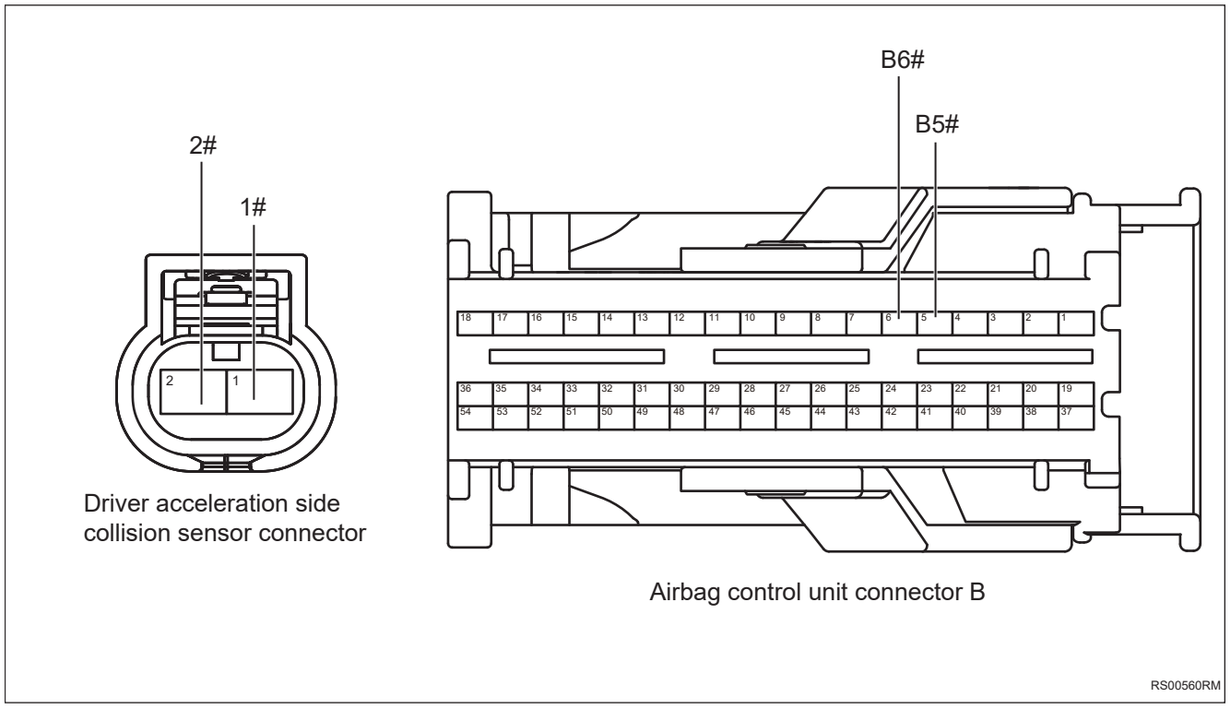
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - airbag control unit connector B6#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in driver acceleration side collision sensor wire harness and connector**



Driver acceleration side collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

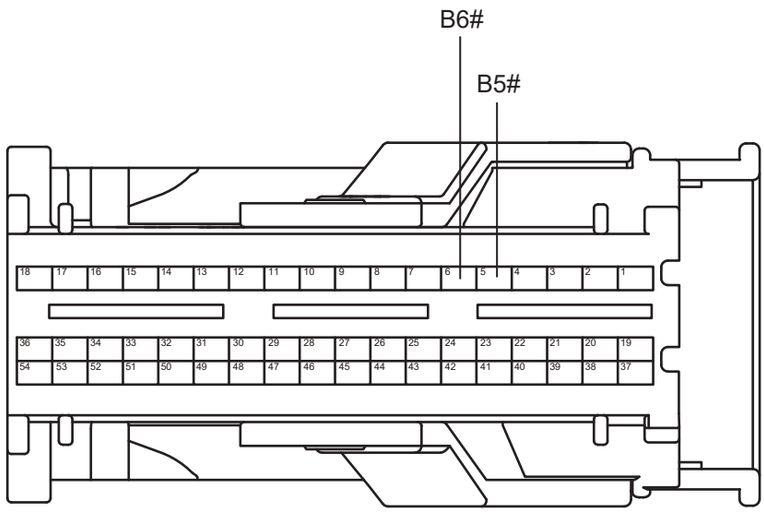
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - driver acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B6# - driver acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) According to value in the table, measure resistance.

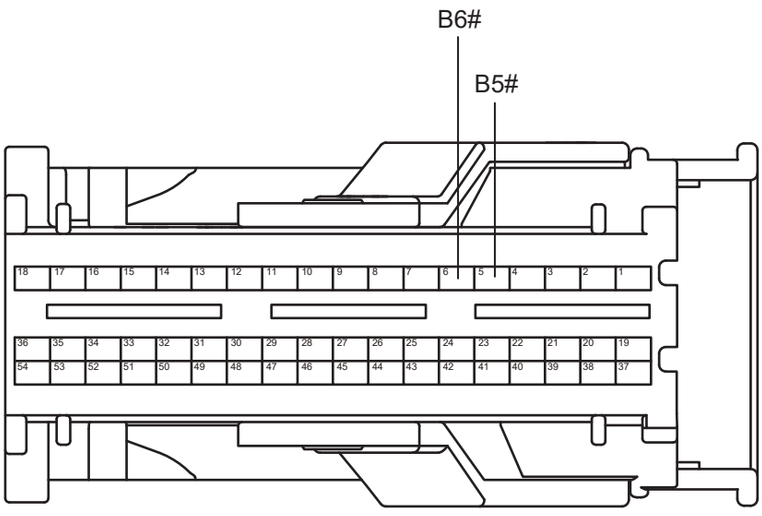
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B6# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	**Replace driver acceleration side collision sensor (See page ZC-68)**

(a) Replace the driver acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009186**	**B-pillar left acceleration sensor communication error**
DTC	**B009191**	**B-pillar left acceleration sensor parameter error**
DTC	**B009196**	**B-pillar left acceleration sensor self-check failure**

Description

When driver acceleration side collision sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

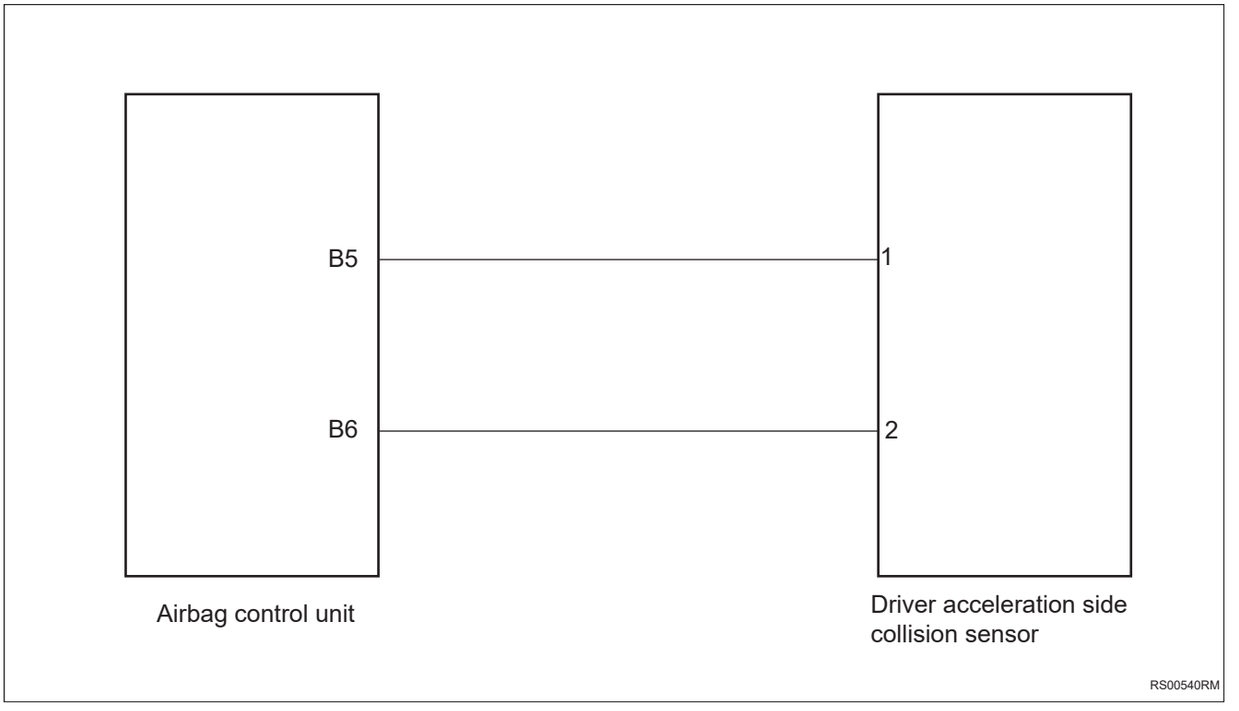
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009186	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout. • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009191	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when parameter error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite ID0~ID11 not as expect • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009196	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when defect error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite data out of range • Remark: The fault only	Non-continuous type	—	• Driver acceleration side collision sensor • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
			diagnosis during startup phase			

Fault symptom

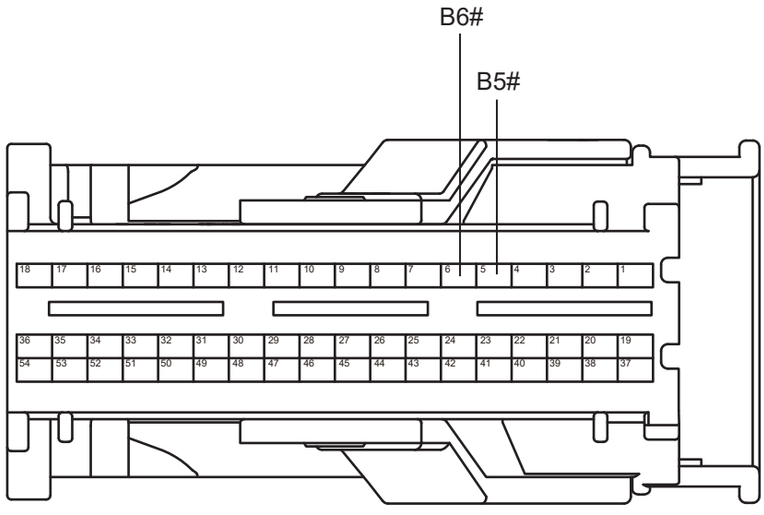
DTC No.	Fault symptom	Warning light/indicator
B009186	• Warning light comes on • Set DTC	Comes on
B009191	• Warning light comes on • Set DTC	Comes on
B009196	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the driver acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

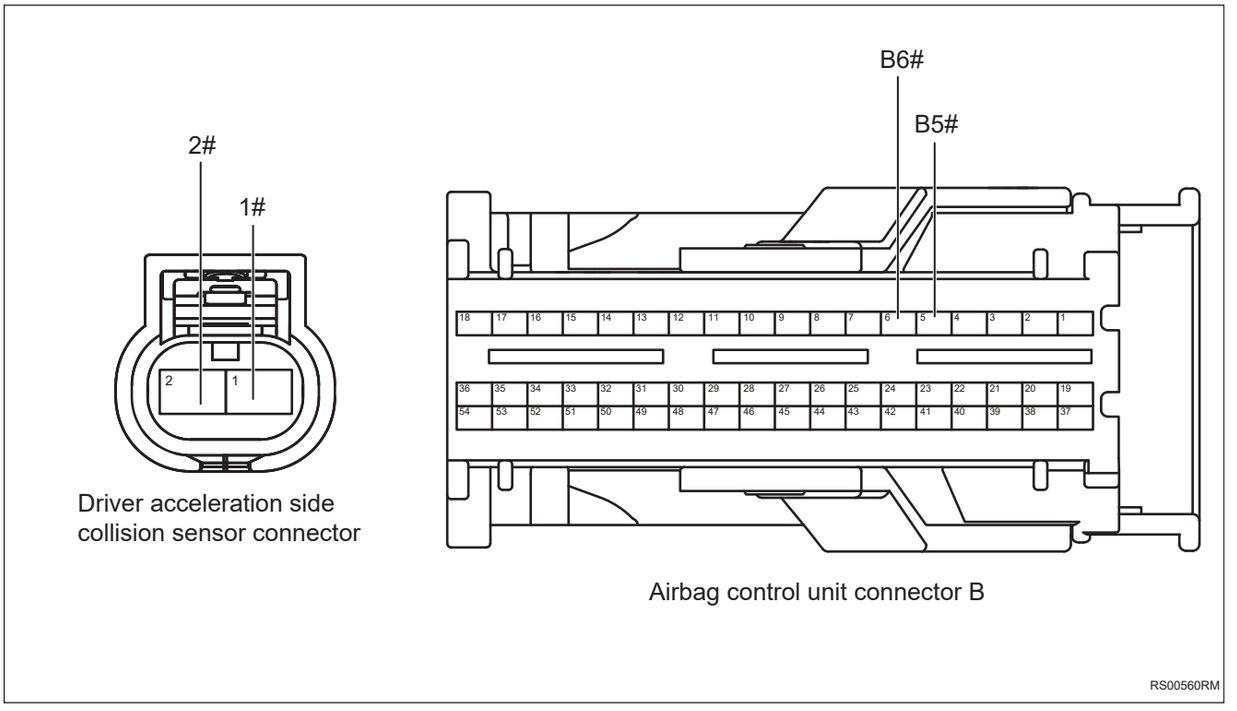
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - airbag control unit connector B6#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in driver acceleration side collision sensor wire harness and connector**



Driver acceleration side collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

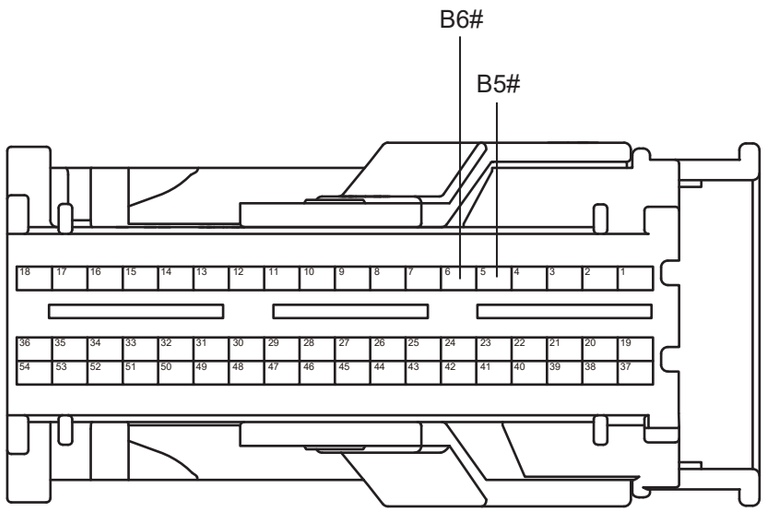
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - driver acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B6# - driver acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in driver acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00550RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B5# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver acceleration side collision sensor (See page ZC-68)**

(a) Replace the driver acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

ZD

OK

Diagnosis ends

DTC	**B009213**	**Open in left door pressure sensor**
DTC	**B009211**	**Short to ground in left door pressure sensor**
DTC	**B009212**	**Short to power supply in left door pressure sensor**
DTC	**B00922B**	**Left door pressure sensor series fault**

Description

When front left side collision pressure sensor itself is faulty, or there is short, open or series fault in circuit, the airbag control unit records DTC.

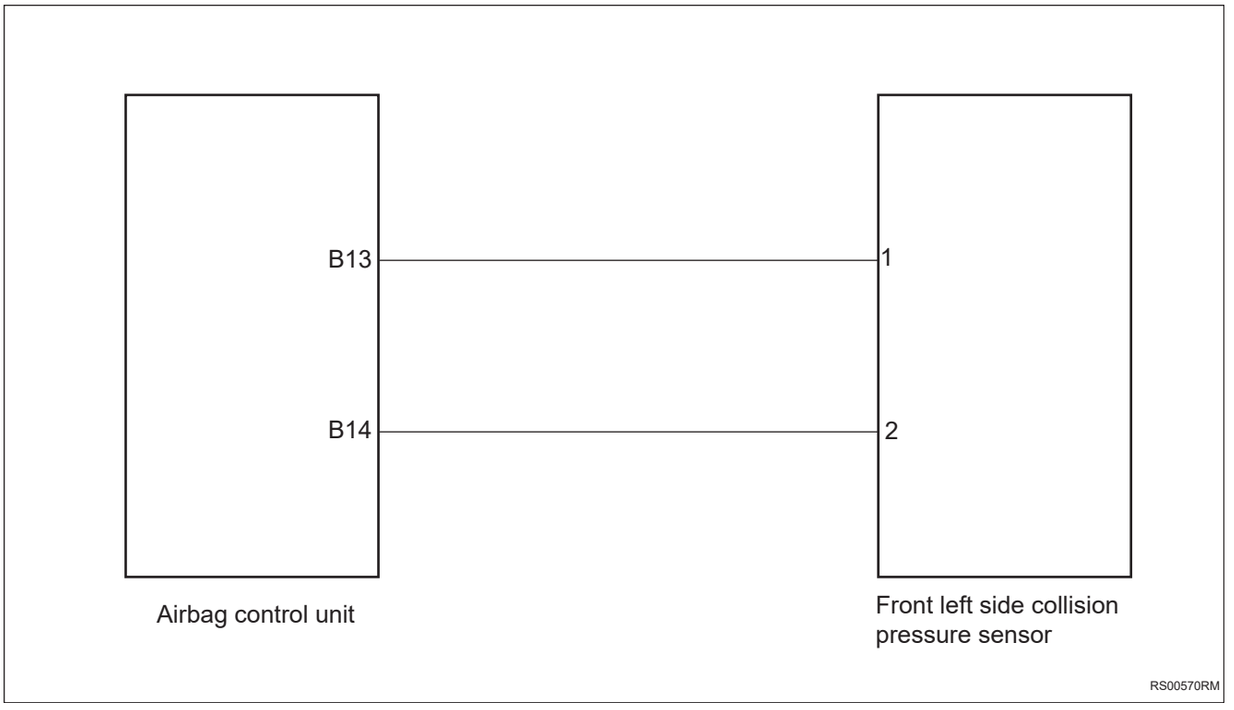
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009213	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector
B009211	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector
B009212	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector
B00922B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009213	• Warning light comes on • Set DTC	Comes on
B009211	• Warning light comes on • Set DTC	Comes on
B009212	• Warning light comes on • Set DTC	Comes on
B00922B	• Warning light comes on • Set DTC	Comes on

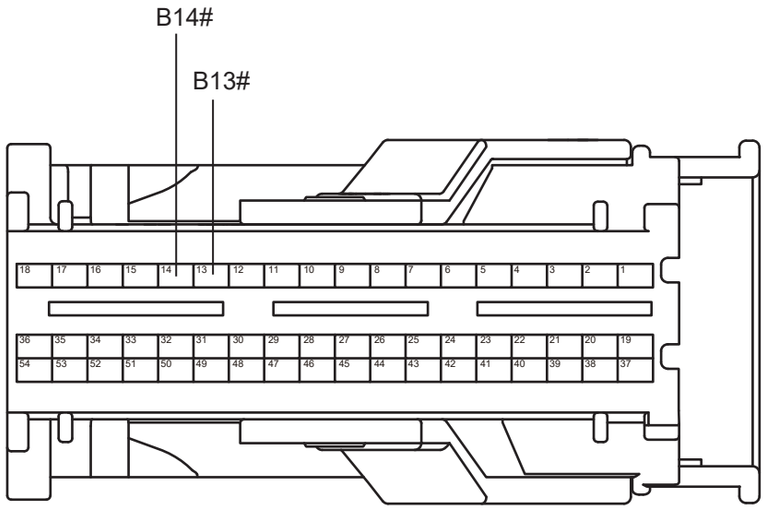
Circuit diagram

ZD



Inspection procedure

1	**Check for short to each other in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the front left side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

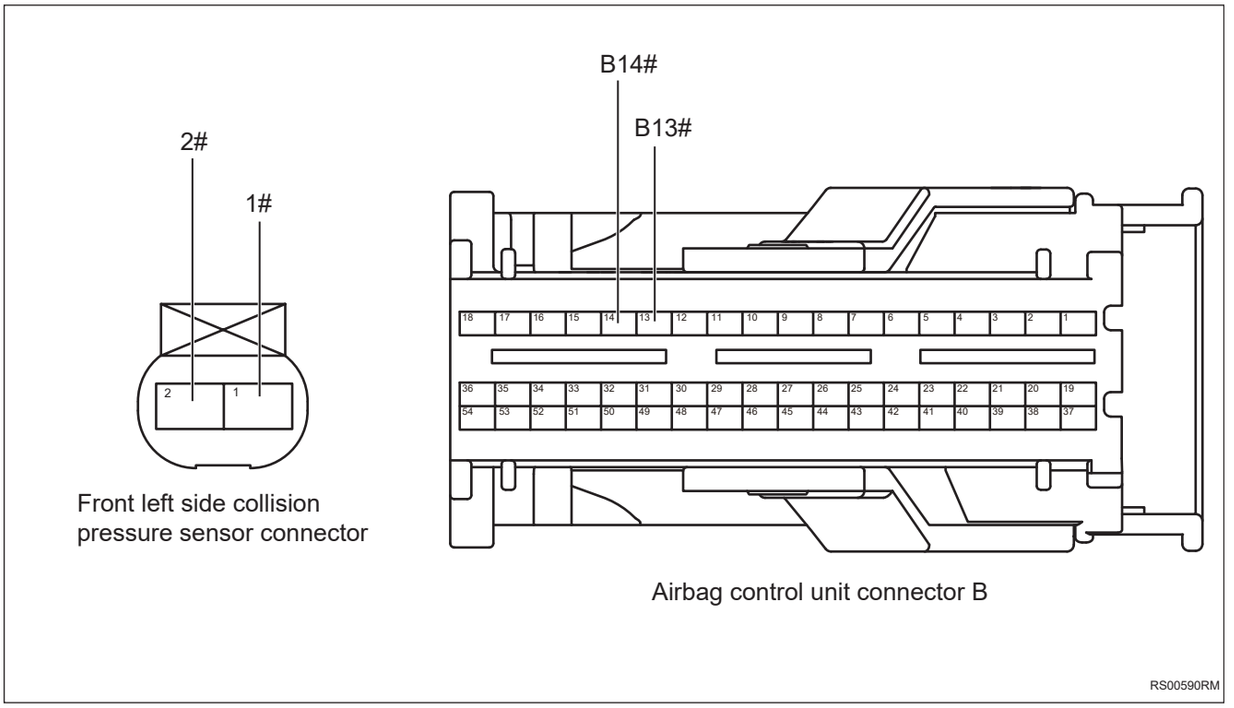
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - airbag control unit connector B14#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in front left side collision pressure sensor wire harness and connector**



Front left side collision pressure sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

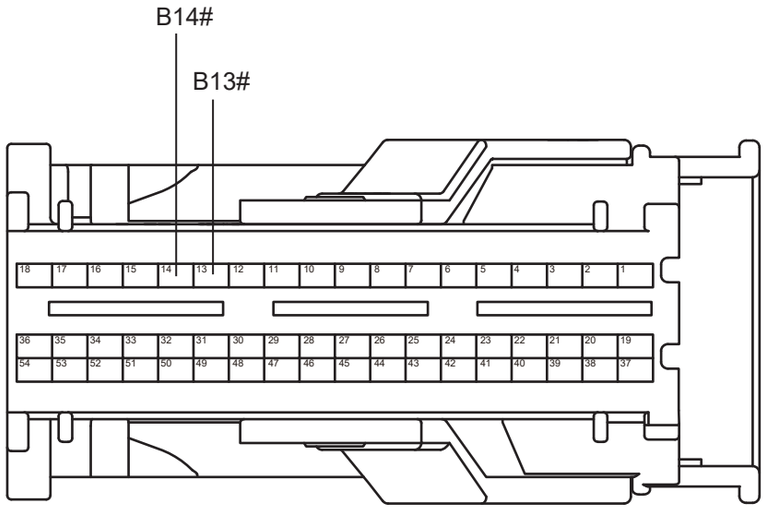
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - front left side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B14# - front left side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) According to value in the table, measure resistance.

Standard value

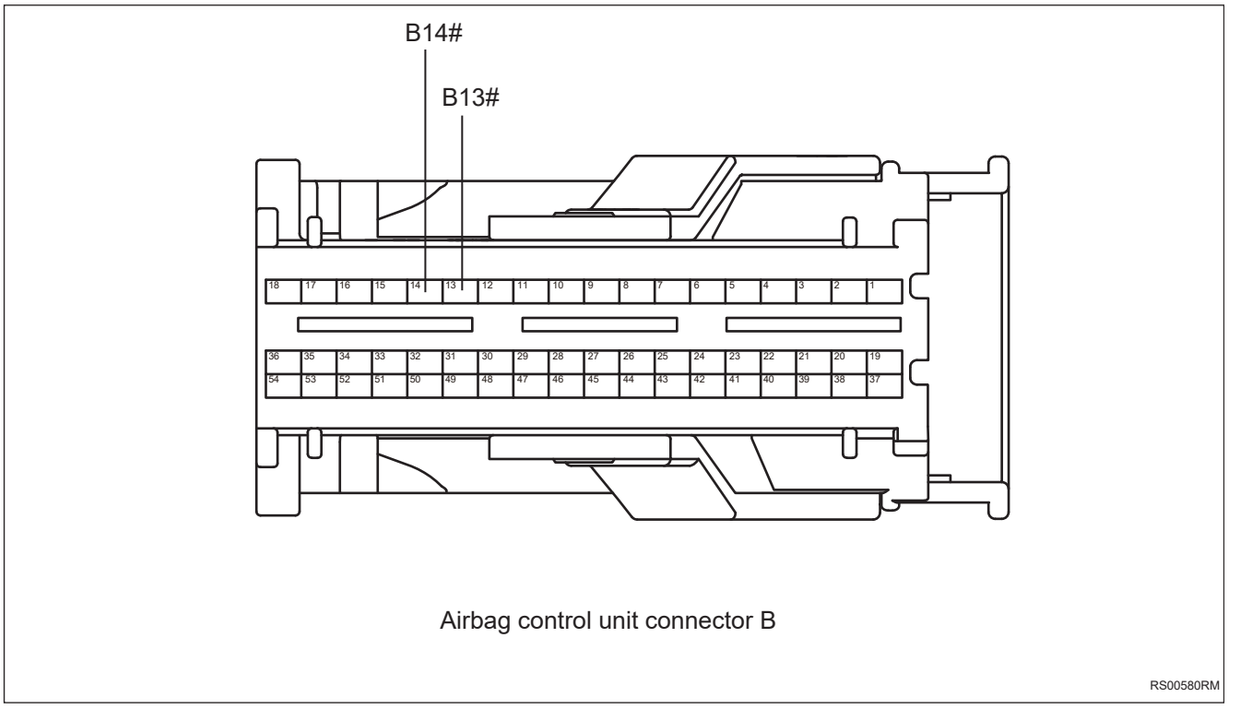
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front left side collision pressure sensor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B14# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left side collision pressure sensor (See page ZC-71)**

(a) Replace the front left side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009256	Left door pressure sensor configuration error

Description

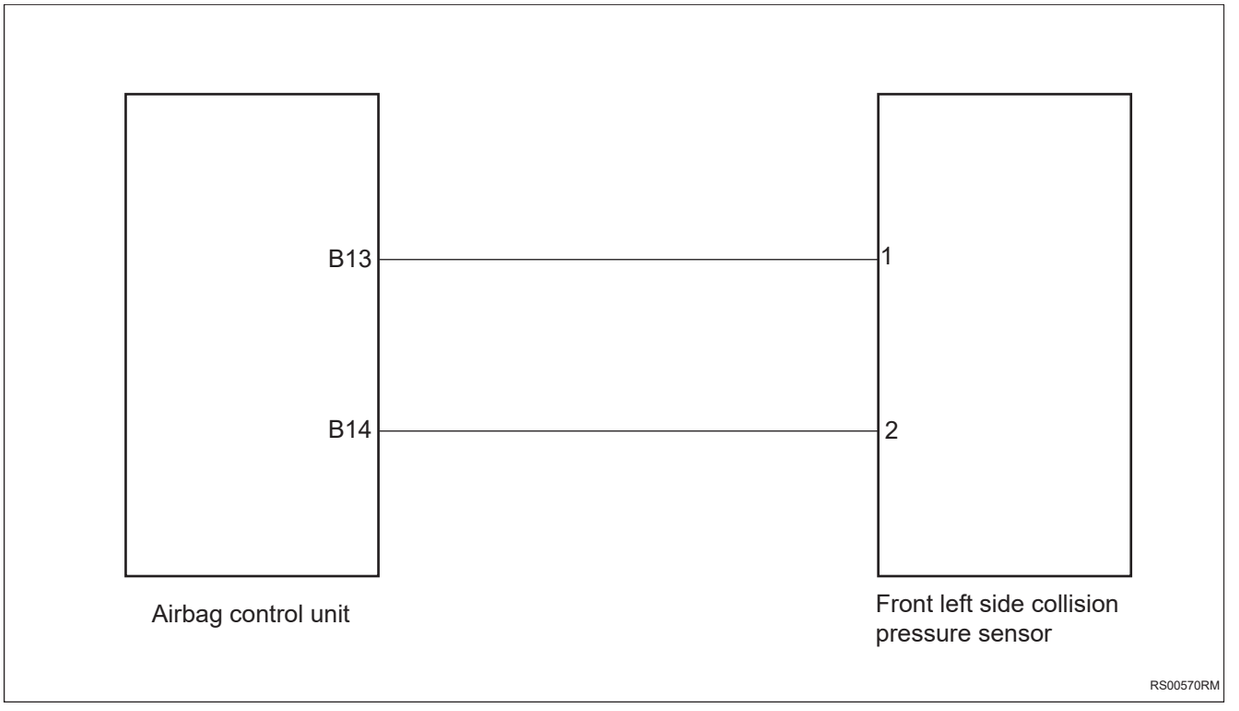
When front left side collision pressure sensor itself is faulty or has configuration error, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009256	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009256	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

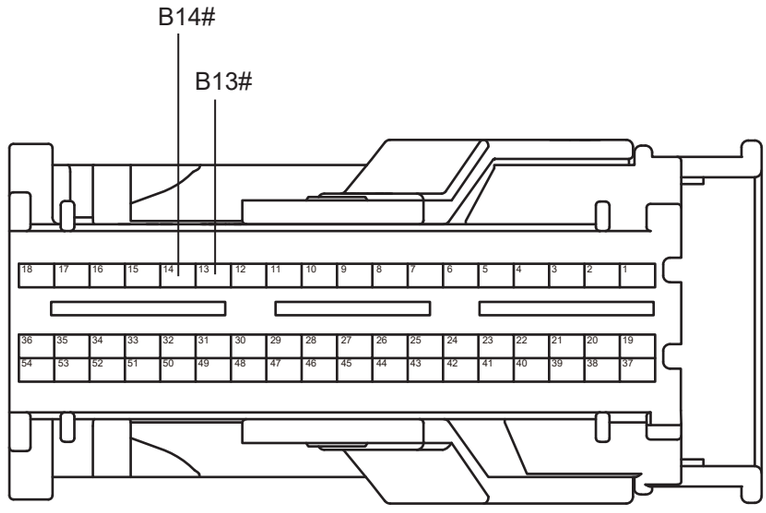
1	**Check and read configuration file of front left side collision pressure sensor**

(a) Check and read if configuration file of front left side collision pressure sensor is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the front left side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

Standard value

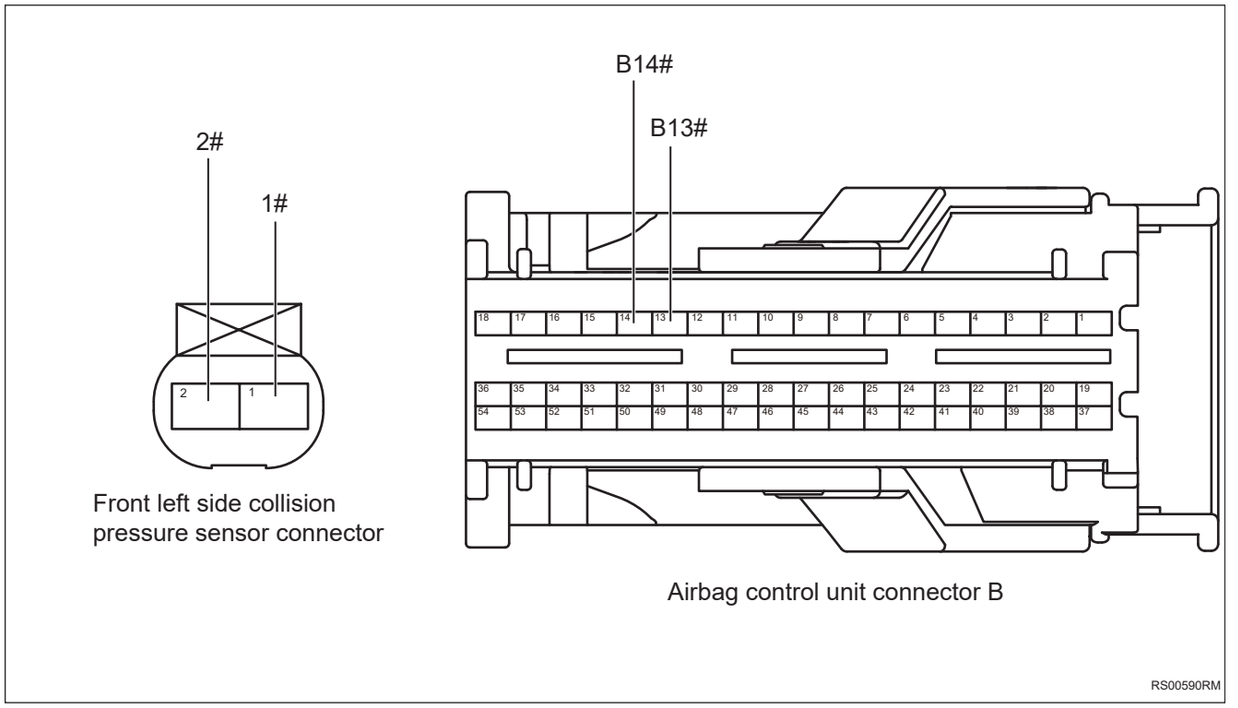
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - airbag control unit connector B14#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for open in front left side collision pressure sensor wire harness and connector**



Front left side collision pressure sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

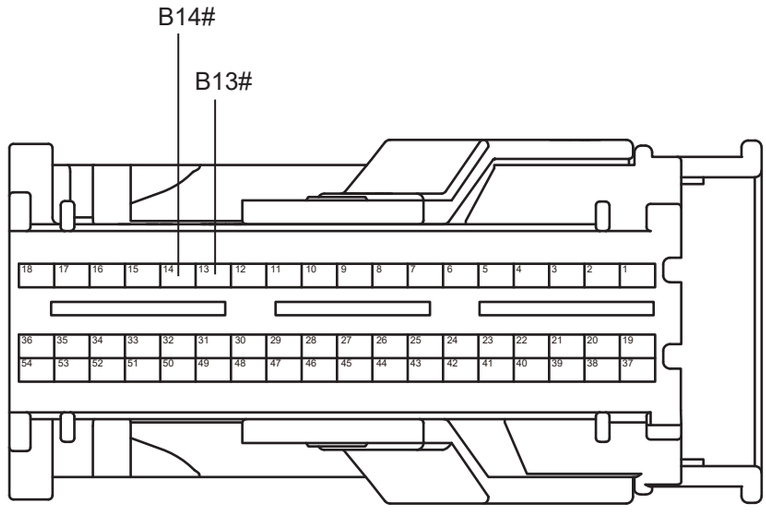
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - front left side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B14# - front left side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) According to value in the table, measure resistance.

Standard value

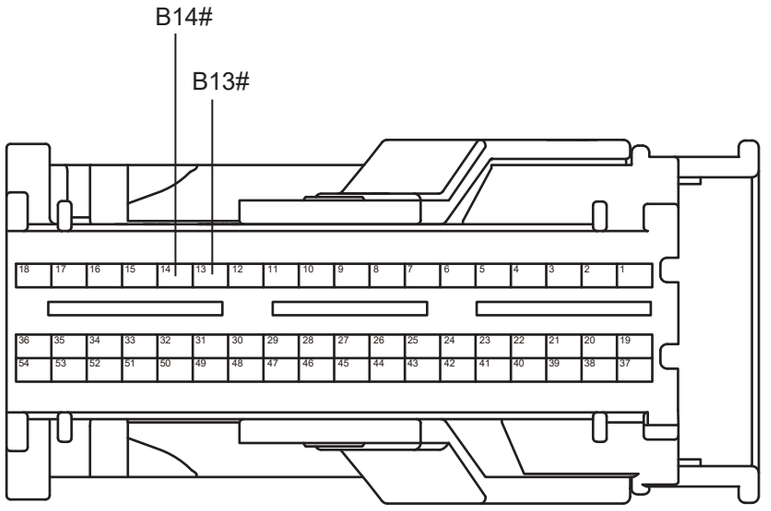
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B14# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace front left side collision pressure sensor (See page ZC-71)

(a) Replace the front left side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK →

Diagnosis ends

DTC	B009286	Left door pressure sensor communication error
DTC	B009291	Left door pressure sensor parameter error
DTC	B009296	Left door pressure sensor self-check failure

Description

When front left side collision pressure sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

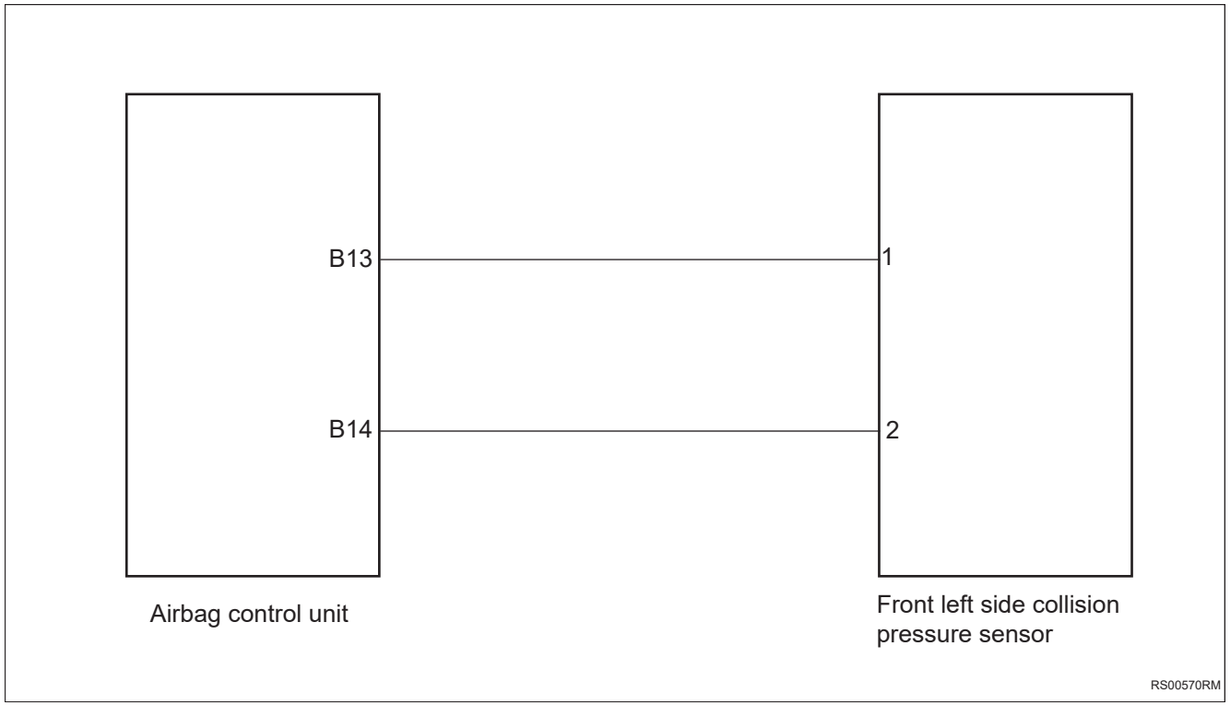
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009286	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout. • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector
B009291	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when parameter error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite ID0~ID11 not as expect • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector
B009296	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when defect error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite data out of range • Remark: The fault only	Non-continuous type	—	• Front left side collision pressure sensor • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
			diagnosis during startup phase			

Fault symptom

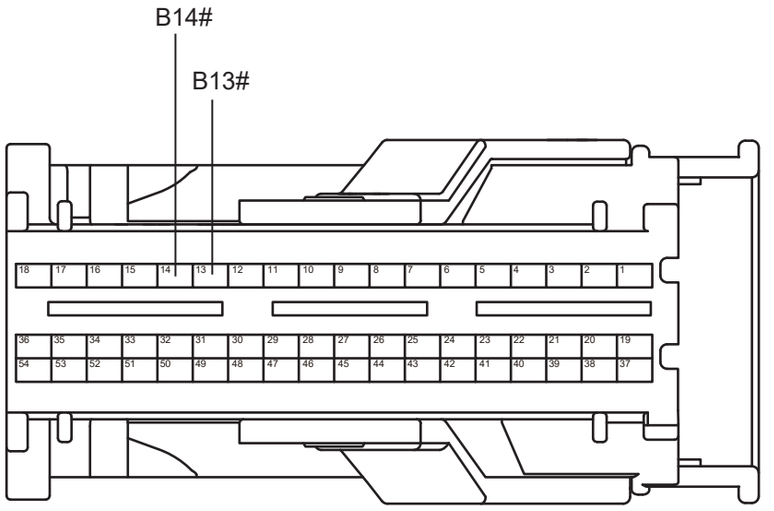
DTC No.	Fault symptom	Warning light/indicator
B009286	• Warning light comes on • Set DTC	Comes on
B009291	• Warning light comes on • Set DTC	Comes on
B009296	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

RS00580RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the front left side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

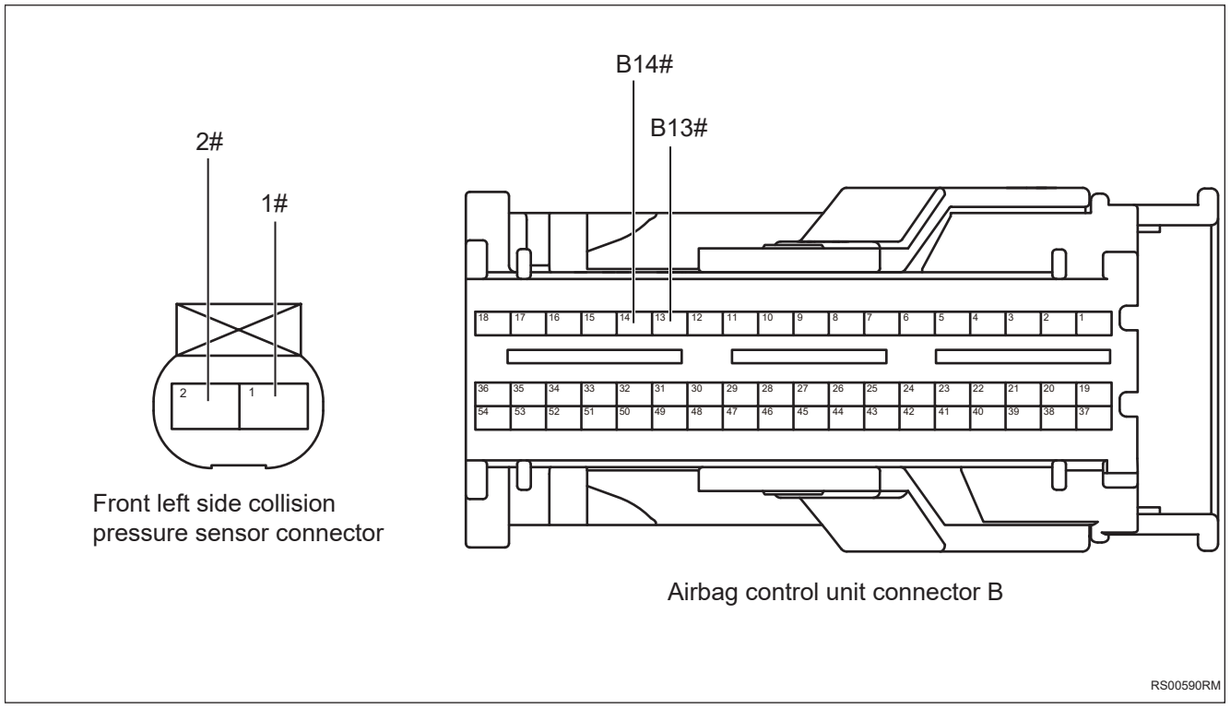
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - airbag control unit connector B14#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in front left side collision pressure sensor wire harness and connector**



Front left side collision pressure sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

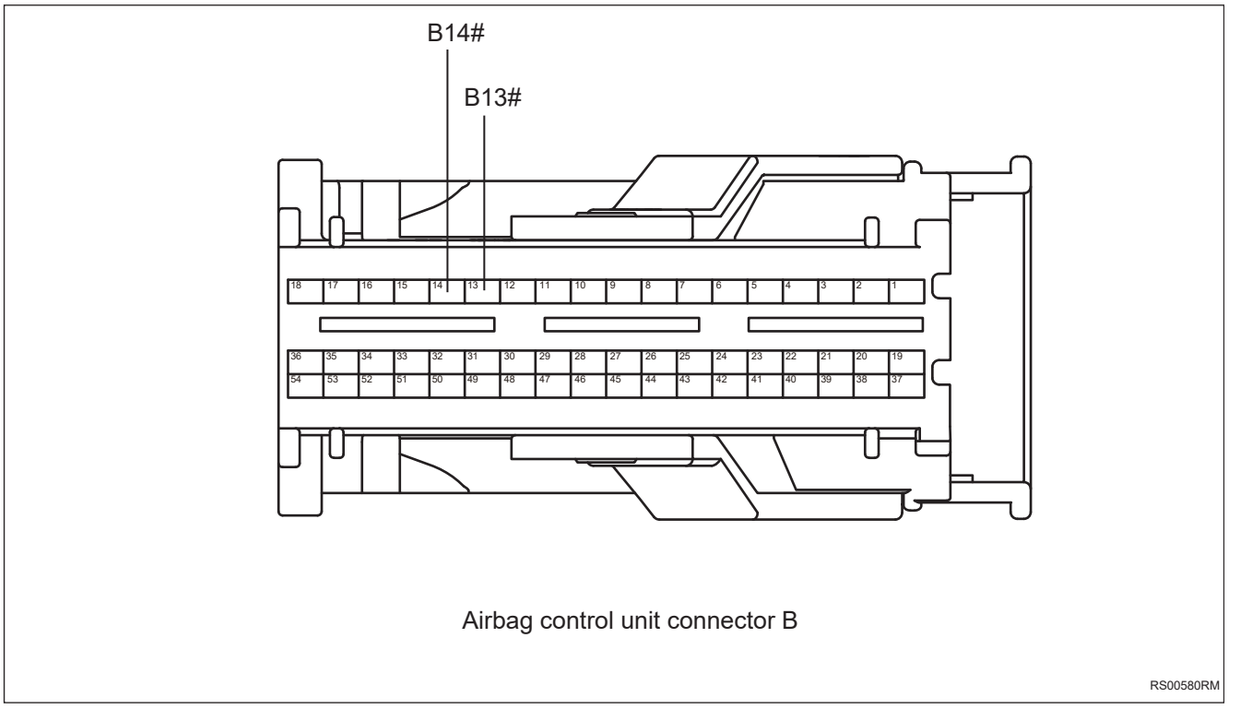
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - front left side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B14# - front left side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in front left side collision pressure sensor wire harness and connector**



Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B13# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front left side collision pressure sensor (See page ZC-71)**

(a) Replace the front left side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009513**	**Open in right earlier collision sensor**
DTC	**B009511**	**Short to ground in right earlier collision sensor**
DTC	**B009512**	**Short to power supply in right earlier collision sensor**
DTC	**B00952B**	**Right earlier collision sensor series fault**

Description

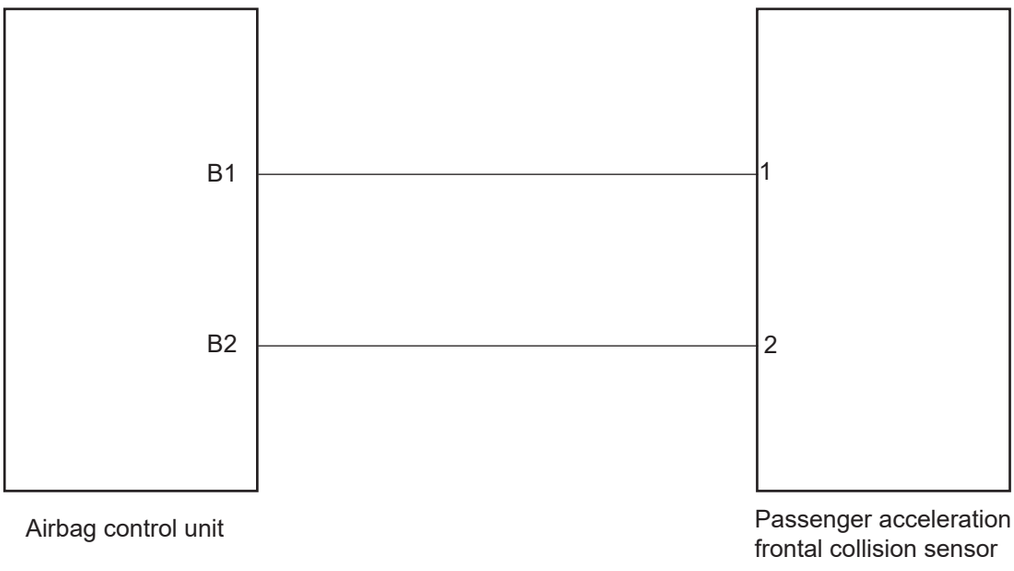
When passenger acceleration frontal collision sensor itself is faulty or there is short or open and series faults in passenger acceleration frontal collision sensor, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009513	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009511	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009512	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B00952B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

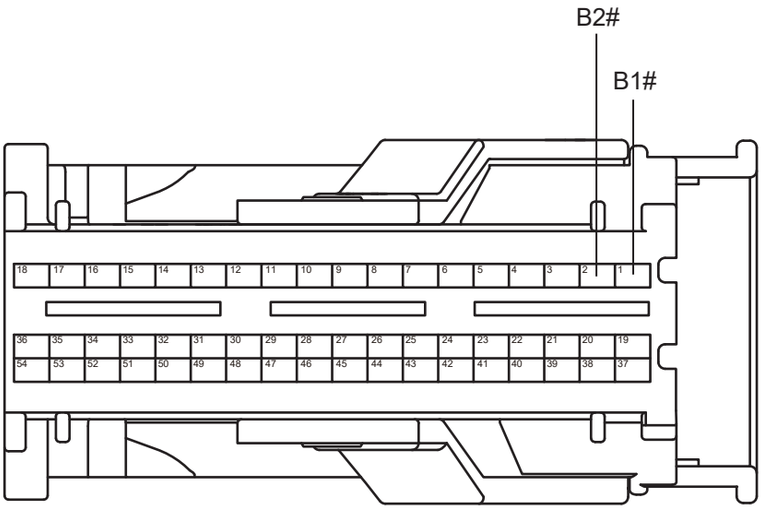
DTC No.	Fault symptom	Warning light/indicator
B009513	• Warning light comes on • Set DTC	Comes on
B009511	• Warning light comes on • Set DTC	Comes on
B009512	• Warning light comes on • Set DTC	Comes on
B00952B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

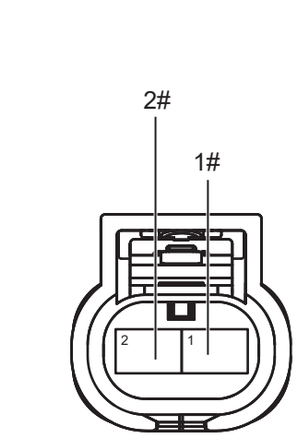
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - airbag control unit connector B2#	Always connected	10 KΩ or more

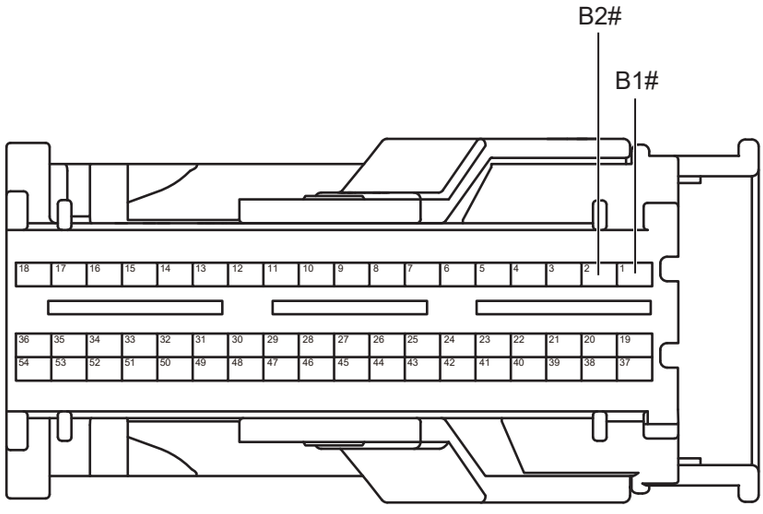
NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in passenger acceleration frontal collision sensor wire harness and connector**



Passenger acceleration frontal collision sensor connector



Airbag control unit connector B

RS00620RM

(a) According to value in the table, measure resistance.

Standard value

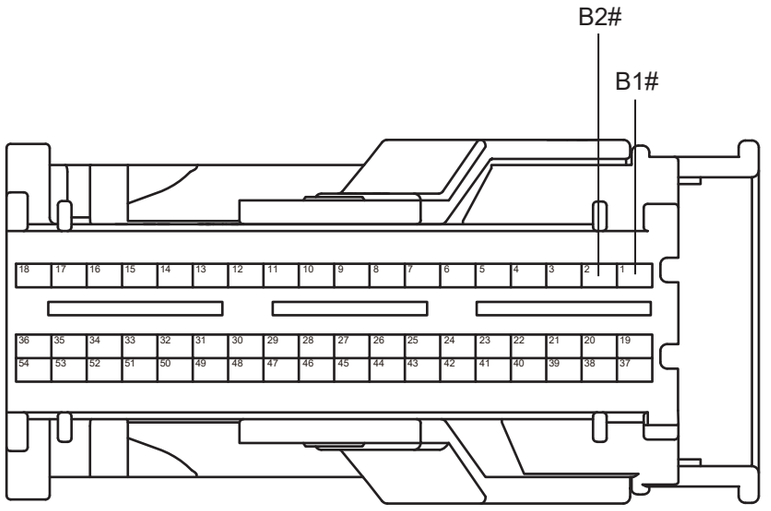
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - passenger acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B2# - passenger acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) According to value in the table, measure resistance.

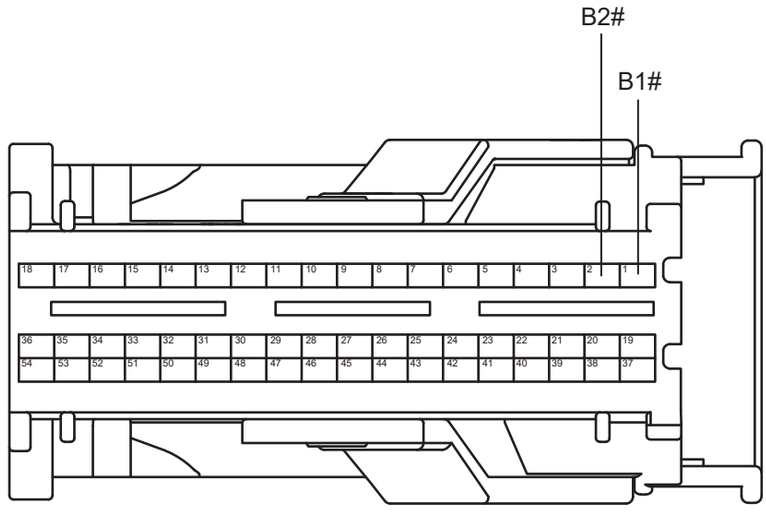
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace passenger acceleration frontal collision sensor (See page ZC-68)**

(a) Replace the passenger acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009556	Right earlier collision sensor configuration error

Description

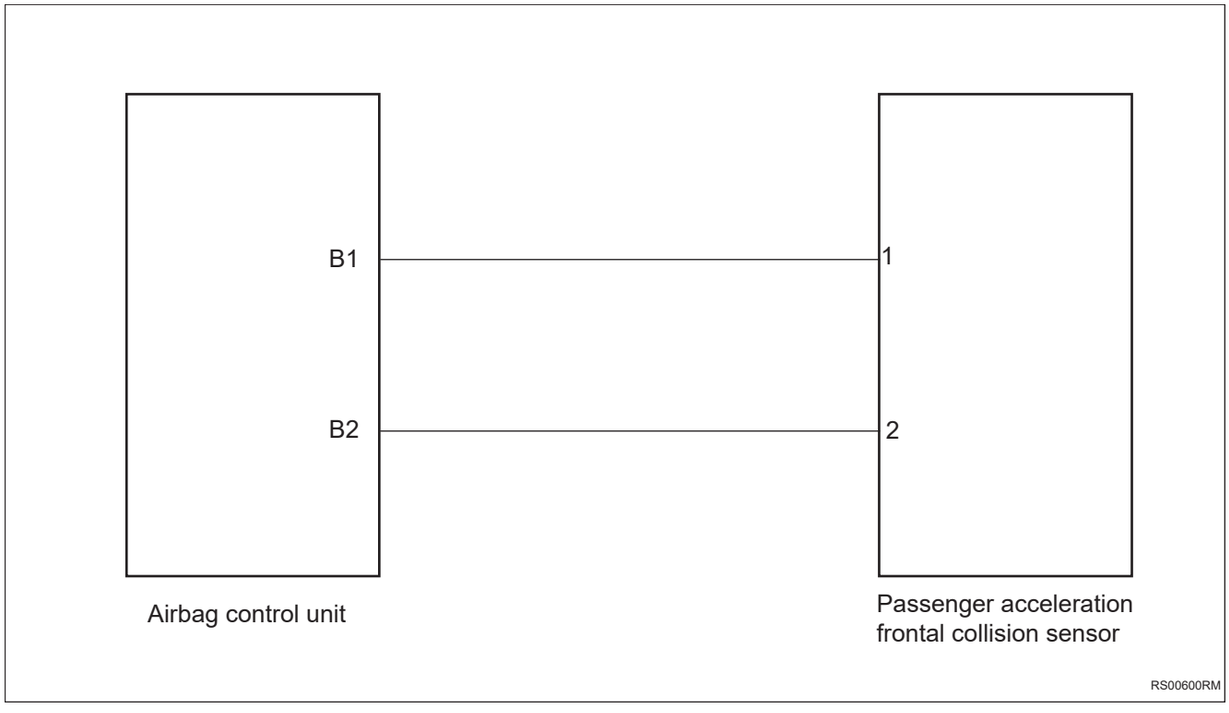
When passenger acceleration frontal collision sensor itself is faulty or configuration error occurs, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009556	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009556	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

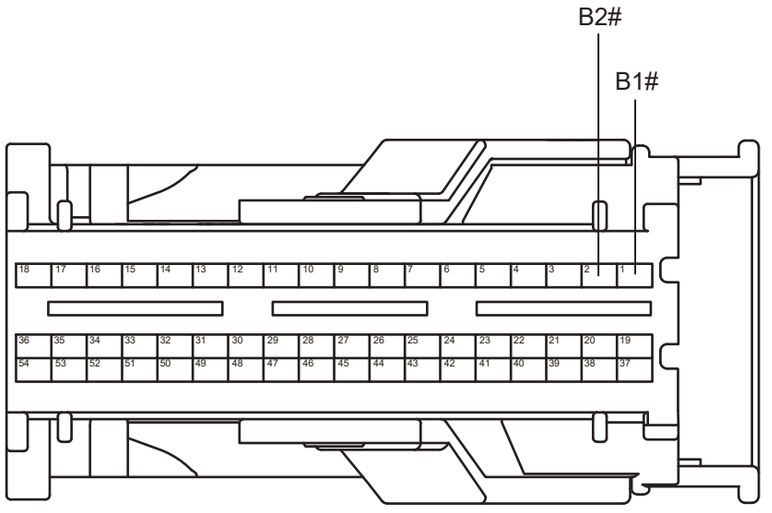
1	**Check and read configuration file of passenger acceleration frontal collision sensor**

(a) Check and read if configuration file of passenger acceleration frontal collision sensor is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

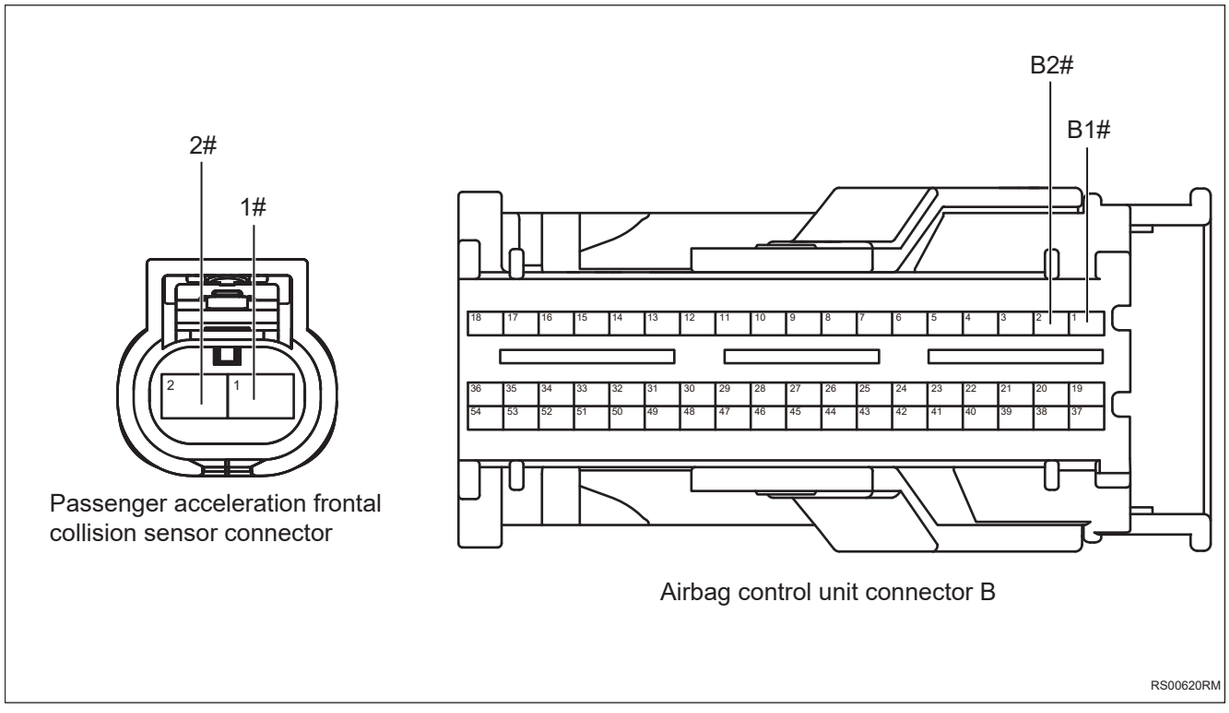
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - airbag control unit connector B2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in passenger acceleration frontal collision sensor wire harness and connector**



Passenger acceleration frontal collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

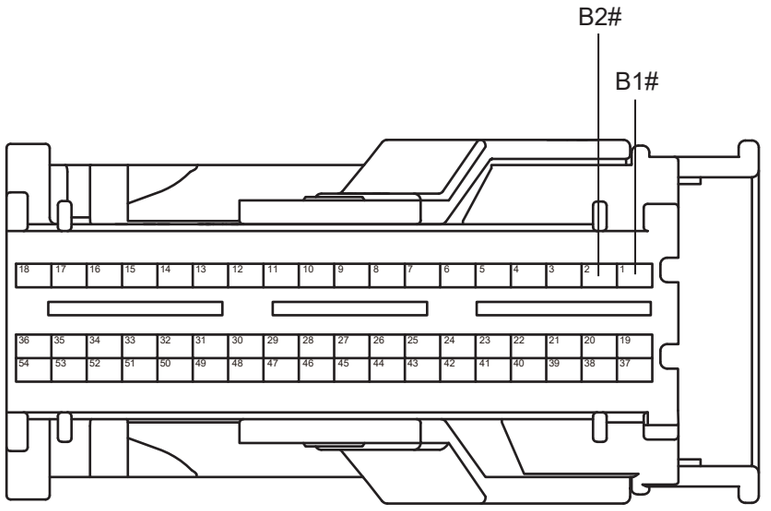
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - passenger acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B2# - passenger acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) According to value in the table, measure resistance.

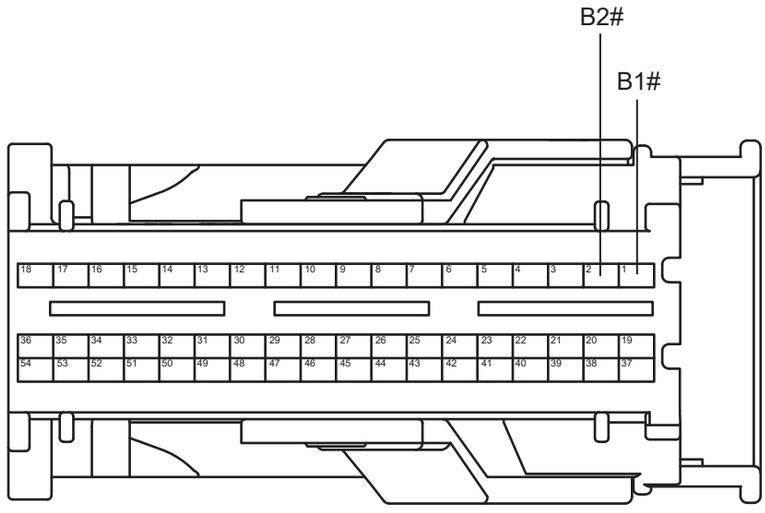
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Airbag control unit connector B1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	**Replace passenger acceleration frontal collision sensor (See page ZC-68)**

(a) Replace the passenger acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009586**	**Right earlier collision sensor communication error**
DTC	**B009591**	**Right earlier collision sensor parameter error**
DTC	**B009596**	**Right earlier collision sensor self-check failure**

Description

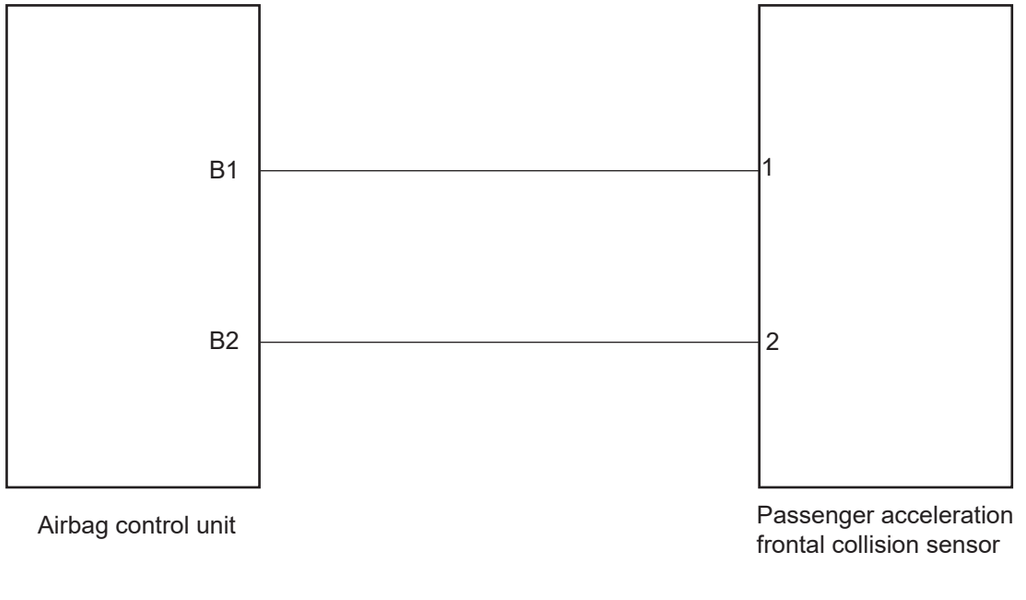
When passenger acceleration frontal collision sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009586	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout. • Remark: The fault only diagnosis during startup phase	Non-continuous type	-	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009591	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Non-continuous type	-	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector
B009596	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Non-continuous type	-	• Passenger acceleration frontal collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

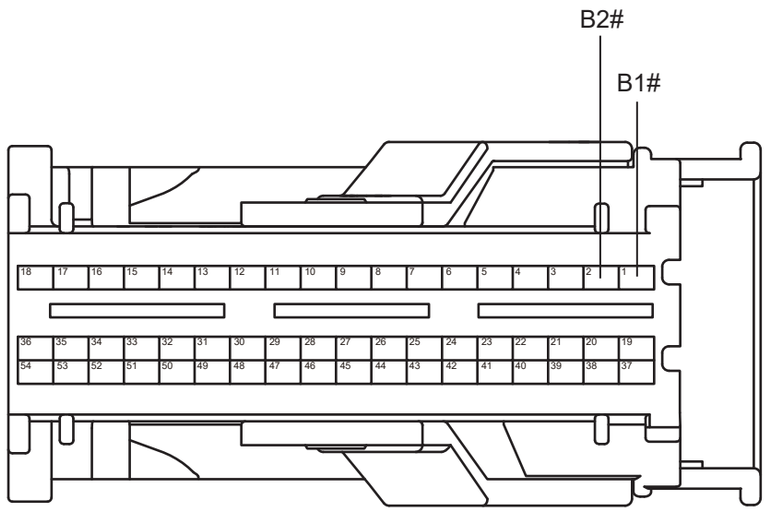
DTC No.	Fault symptom	Warning light/indicator
B009586	• Warning light comes on • Set DTC	Comes on
B009591	• Warning light comes on • Set DTC	Comes on
B009596	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

RS00610RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration frontal collision sensor connector.

(e) According to value in the table, measure resistance.

Standard value

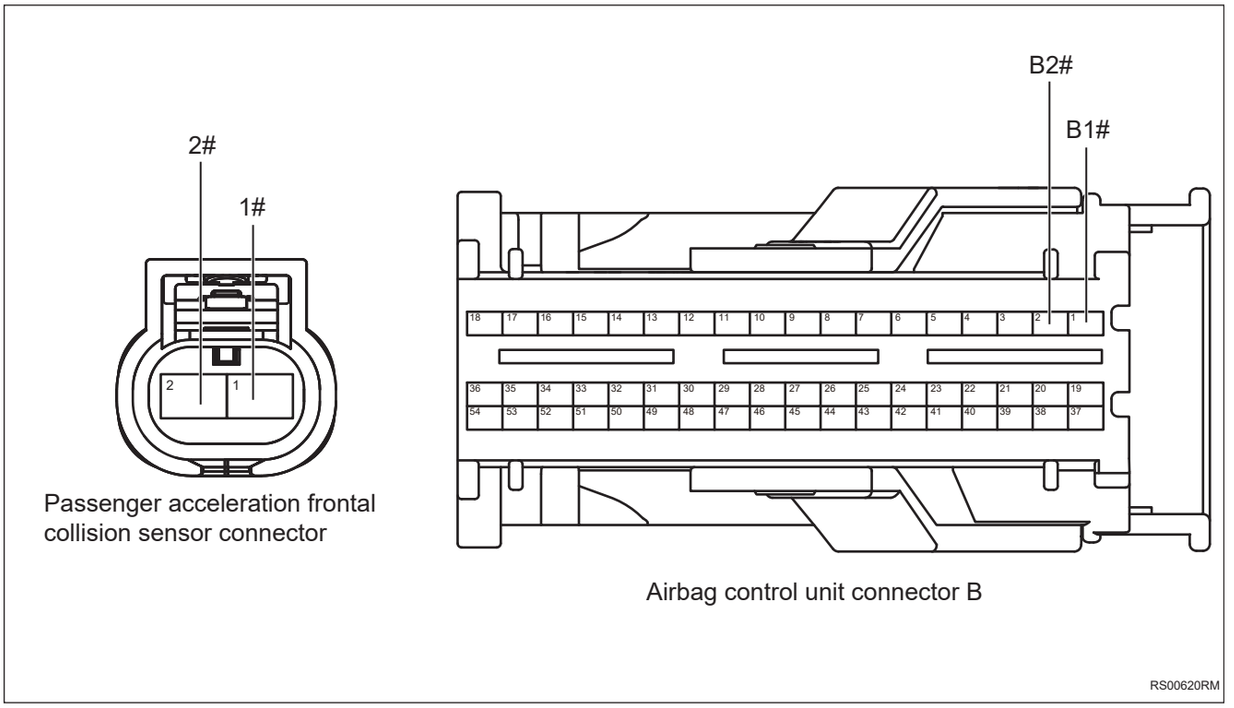
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - airbag control unit connector B2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for open in passenger acceleration frontal collision sensor wire harness and connector**



Passenger acceleration frontal collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

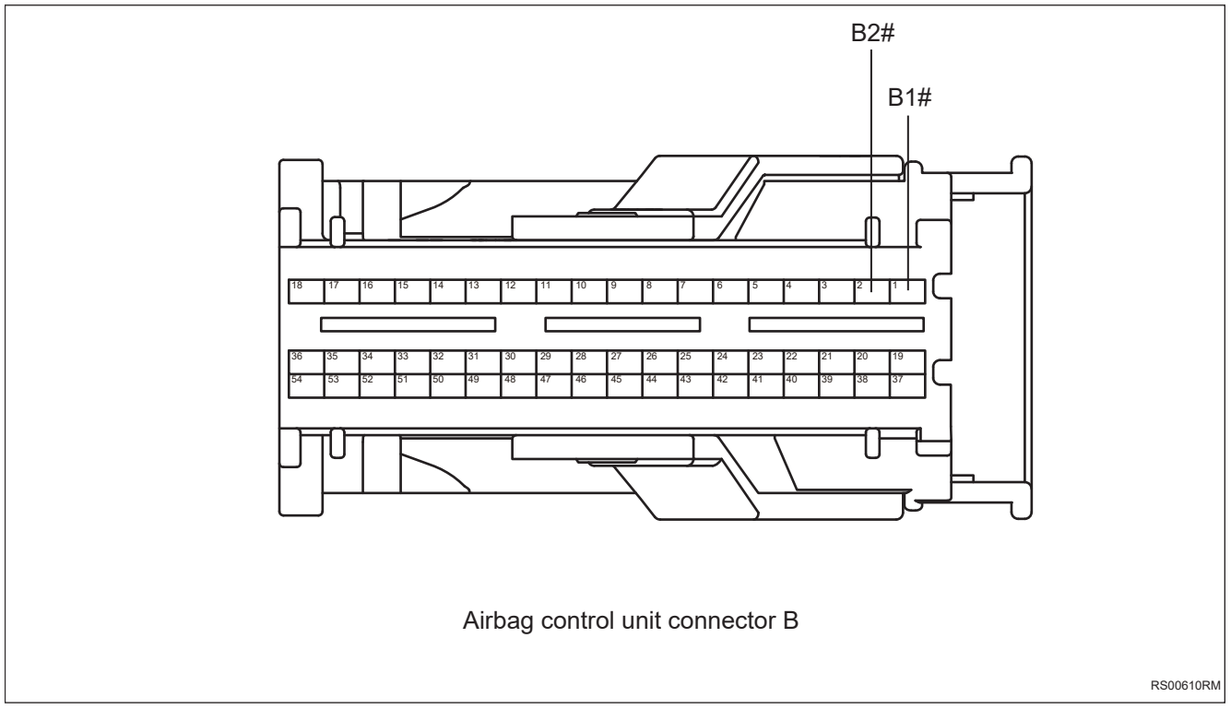
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - passenger acceleration frontal collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B2# - passenger acceleration frontal collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in passenger acceleration frontal collision sensor wire harness and connector**



Airbag control unit connector B

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B1# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace passenger acceleration frontal collision sensor (See page ZC-68)**

(a) Replace the passenger acceleration frontal collision sensor.

(b) Connect HQ-VDS diagnostic tester.

ZD

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

ZD

OK

Diagnosis ends

DTC	**B009613**	**Open in B-pillar right acceleration sensor**
DTC	**B009611**	**Short to ground in B-pillar right acceleration sensor**
DTC	**B009612**	**Short to power supply in B-pillar right acceleration sensor**
DTC	**B00962B**	**B-pillar right acceleration sensor series fault**

Description

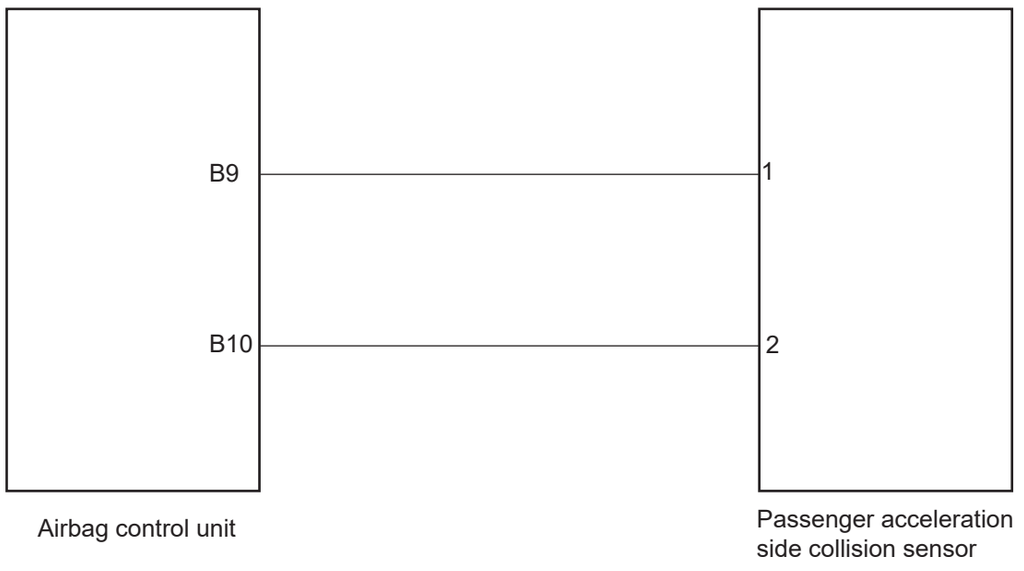
When passenger acceleration side collision sensor itself is faulty or there is short or open and series faults in passenger acceleration side collision sensor, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009613	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009611	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009612	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector
B00962B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

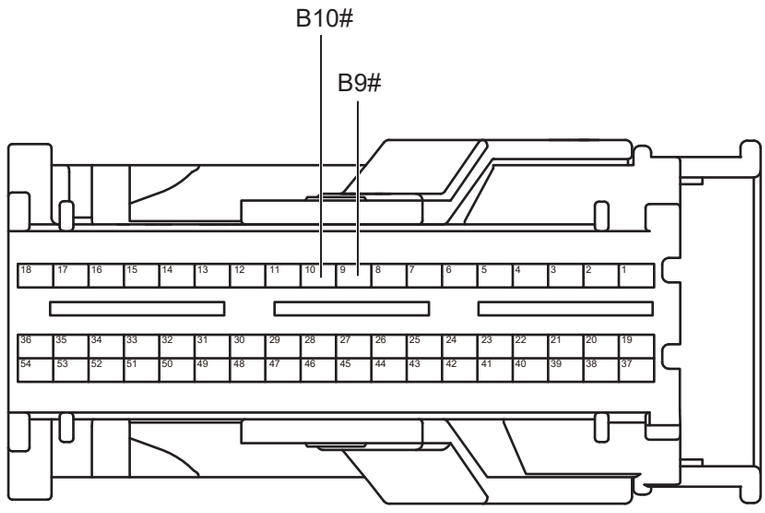
DTC No.	Fault symptom	Warning light/indicator
B009613	• Warning light comes on • Set DTC	Comes on
B009611	• Warning light comes on • Set DTC	Comes on
B009612	• Warning light comes on • Set DTC	Comes on
B00962B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

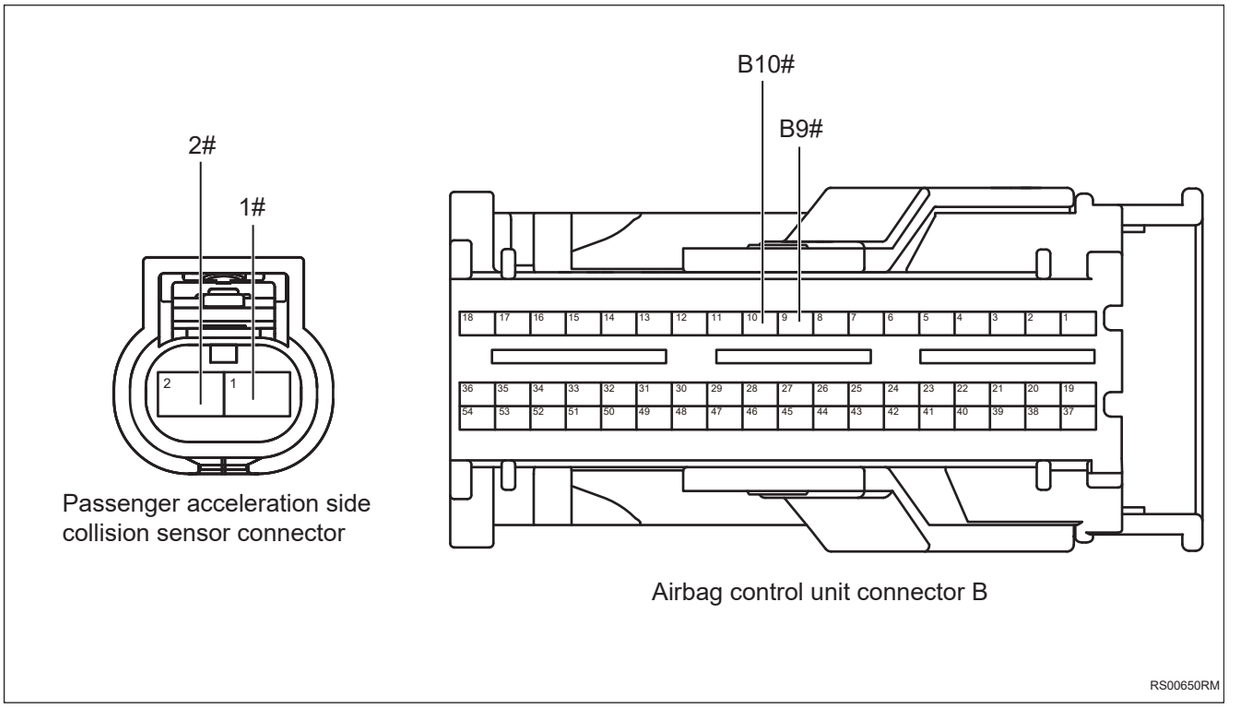
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - airbag control unit connector B10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in passenger acceleration side collision sensor wire harness and connector**



Passenger acceleration side collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

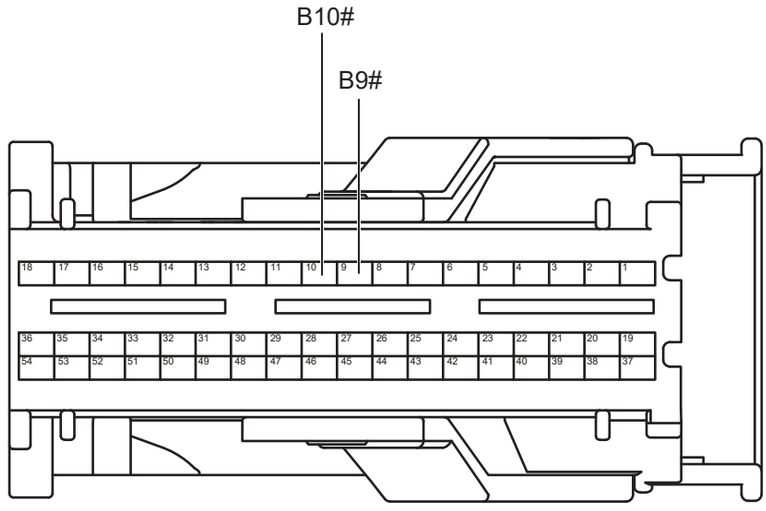
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - passenger acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B10# - passenger acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) According to value in the table, measure resistance.

Standard value

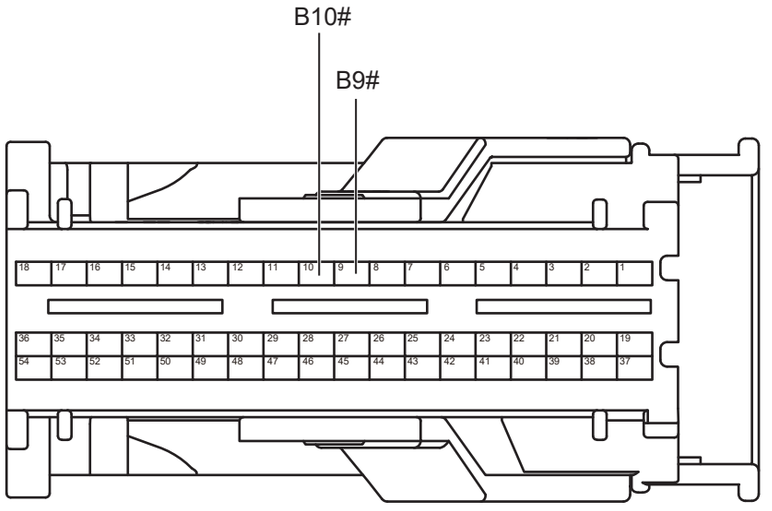
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B10# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace passenger acceleration side collision sensor (See page ZC-68)**

(a) Replace the passenger acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC B009656 B-pillar right acceleration sensor configuration error

Description

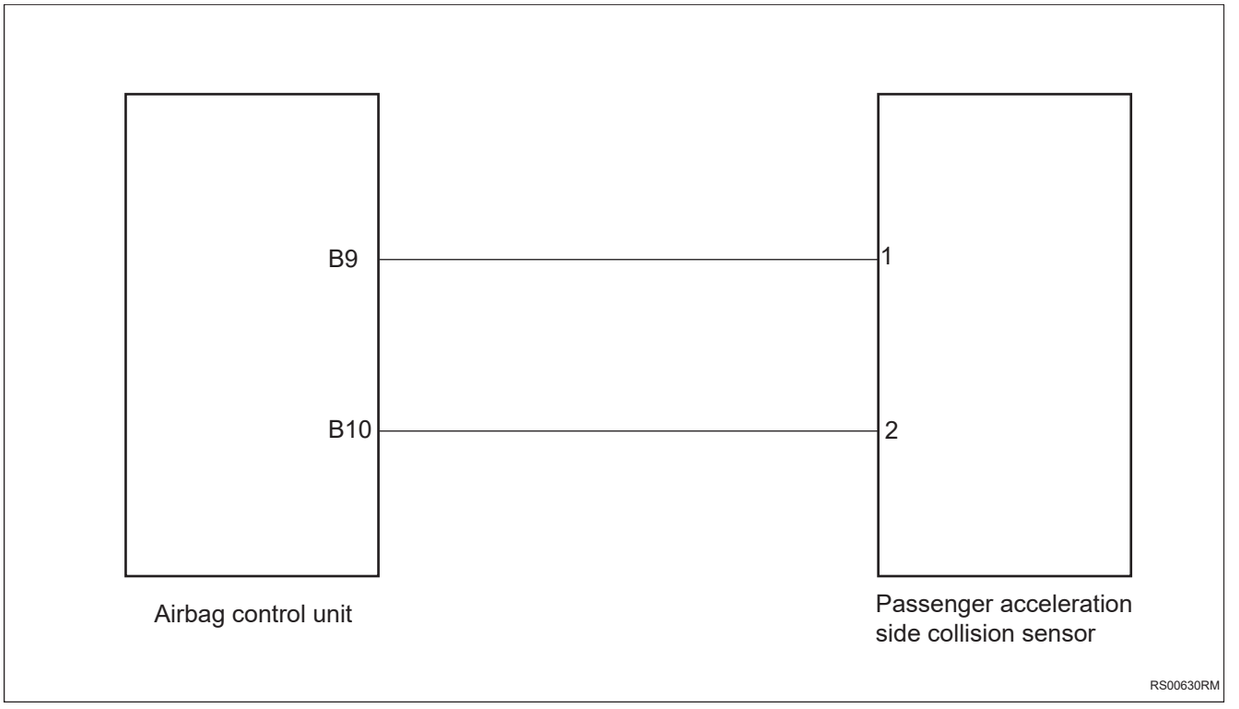
When passenger acceleration side collision sensor itself is faulty or configuration error occurs, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009656	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009656	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

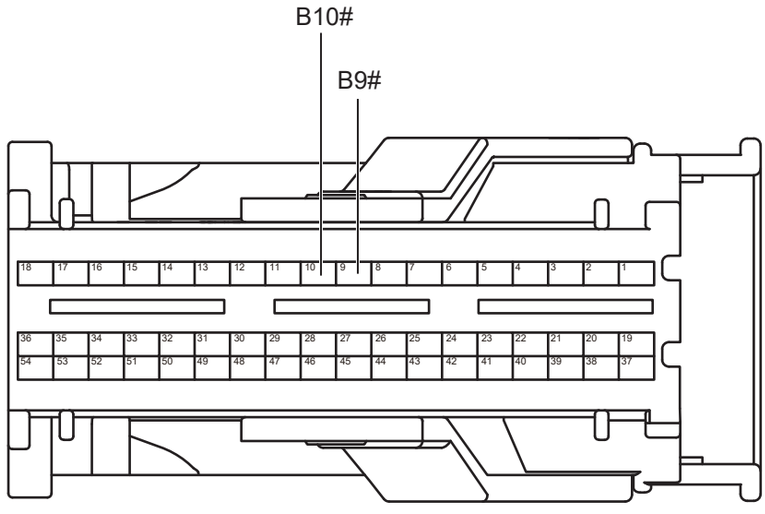
1	**Check and read configuration file of passenger acceleration side collision sensor**

(a) Check and read if configuration file of passenger acceleration side collision sensor is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

Standard value

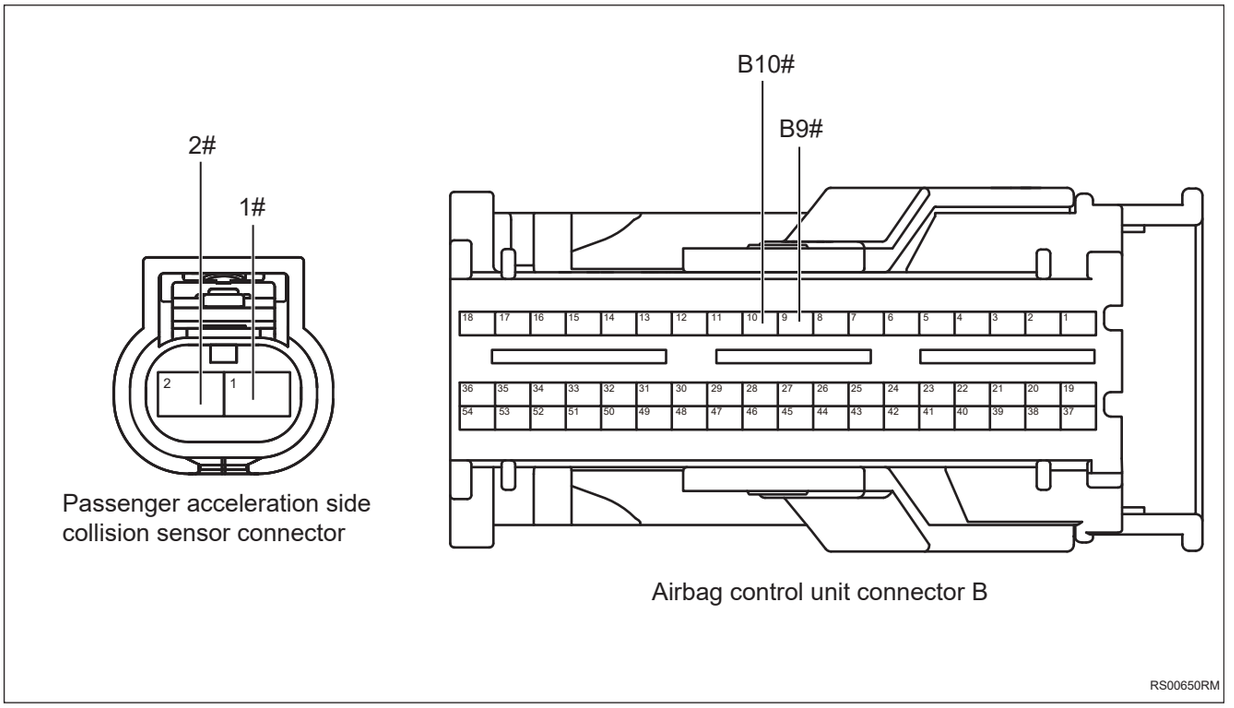
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - airbag control unit connector B10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for open in passenger acceleration side collision sensor wire harness and connector**



Passenger acceleration side collision sensor connector

Airbag control unit connector B

(a) According to value in the table, measure resistance.

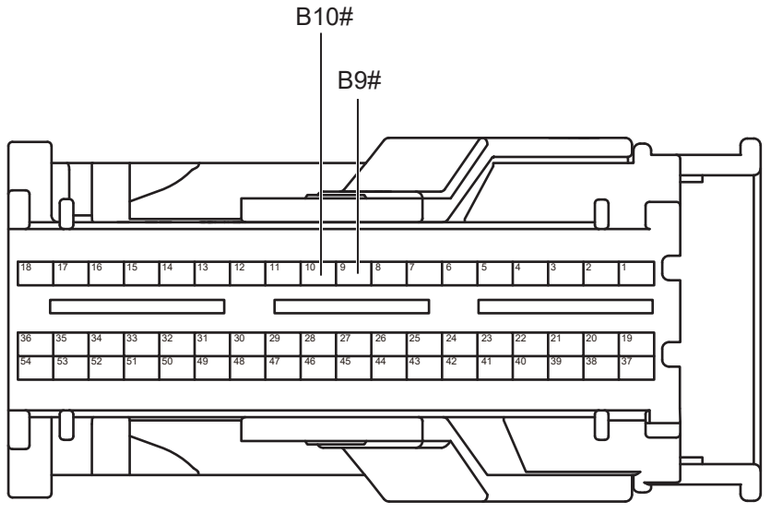
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - passenger acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B10# - passenger acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) According to value in the table, measure resistance.

Standard value

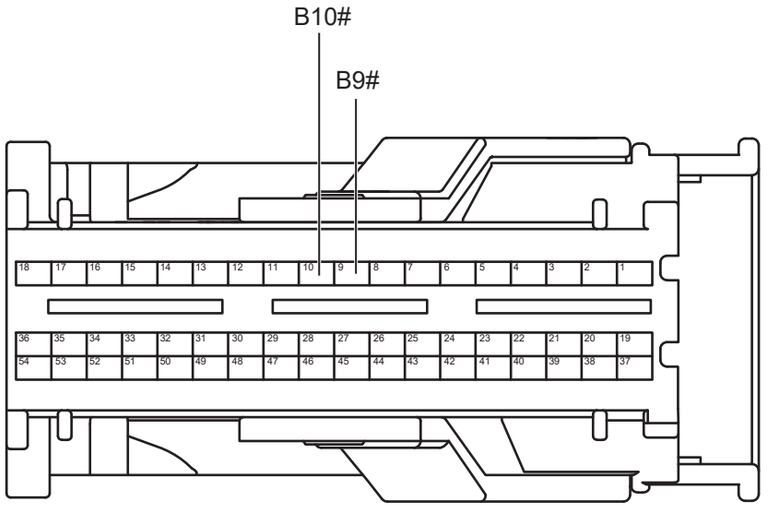
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check for short to power supply in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B10# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

6	Replace passenger acceleration side collision sensor (See page ZC-68)

(a) Replace the passenger acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009686	B-pillar right acceleration sensor communication error
DTC	B009691	B-pillar right acceleration sensor parameter error
DTC	B009696	B-pillar right acceleration sensor self-check failure

Description

When passenger acceleration side collision sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

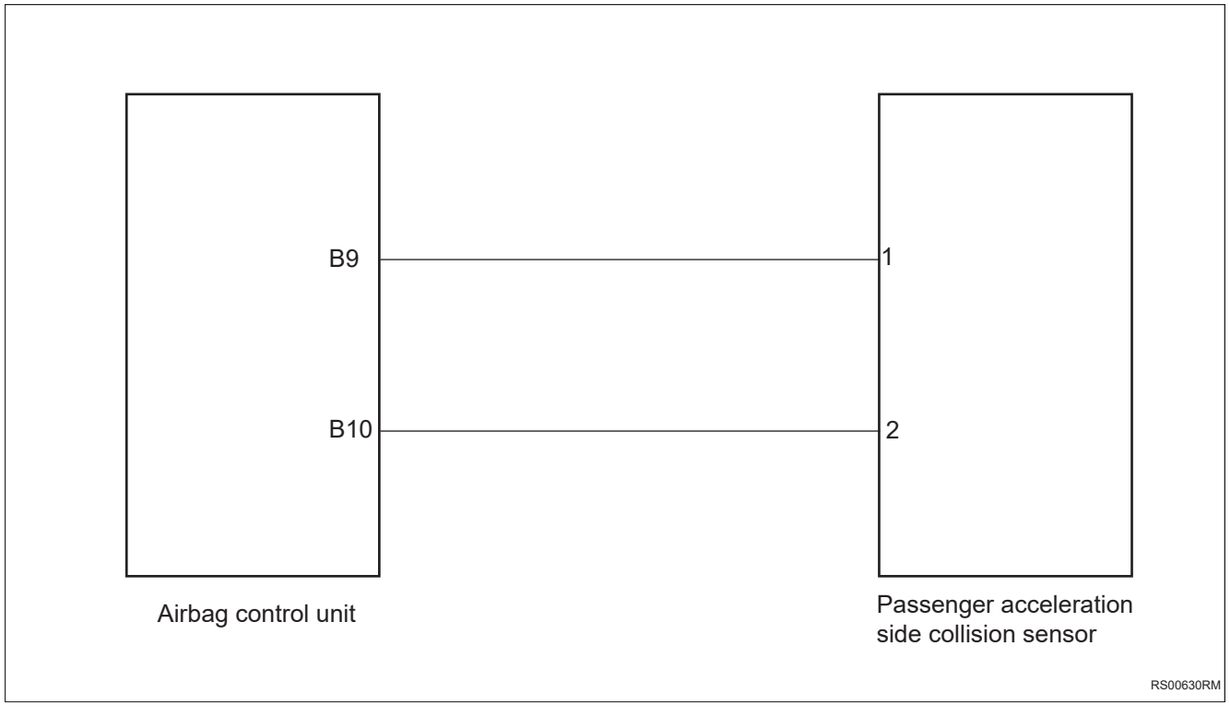
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009686	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout. • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009691	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when parameter error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite ID0~ID11 not as expect • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector
B009696	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when defect error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite data out of range • Remark: The fault only	Non-continuous type	—	• Passenger acceleration side collision sensor • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
			diagnosis during startup phase			

Fault symptom

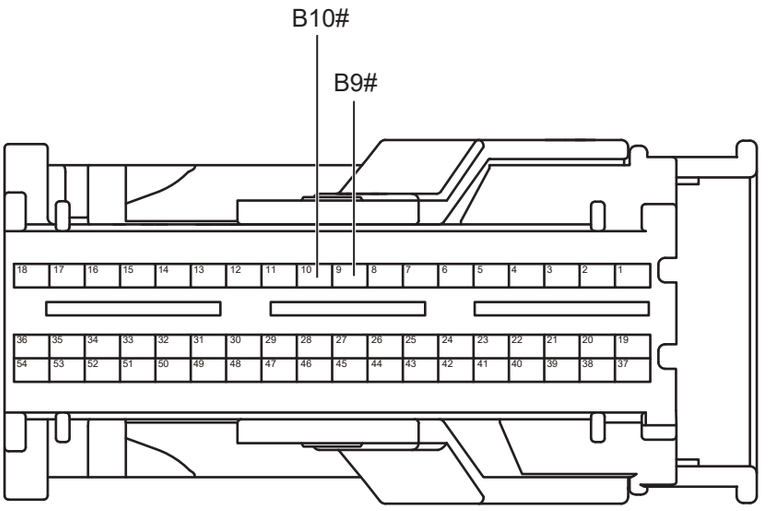
DTC No.	Fault symptom	Warning light/indicator
B009686	• Warning light comes on • Set DTC	Comes on
B009691	• Warning light comes on • Set DTC	Comes on
B009696	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit B connector.

(d) Disconnect the passenger acceleration side collision sensor connector.

(e) According to value in the table, measure resistance.

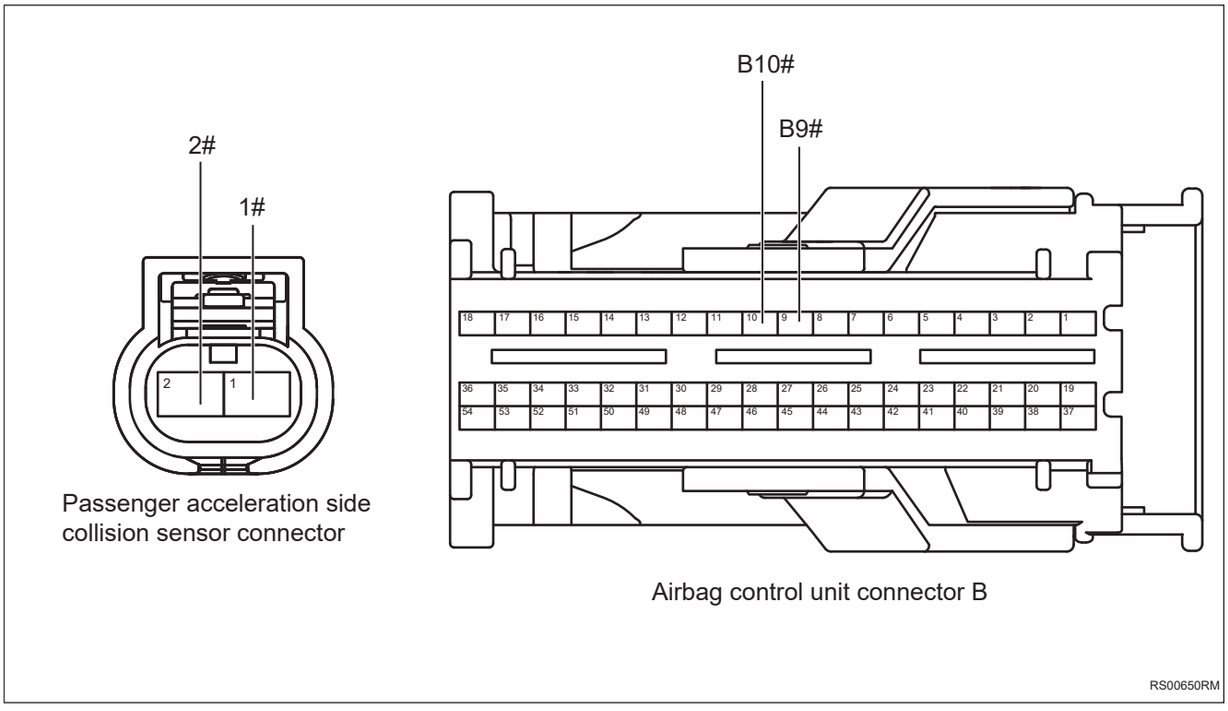
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - airbag control unit connector B10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in passenger acceleration side collision sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

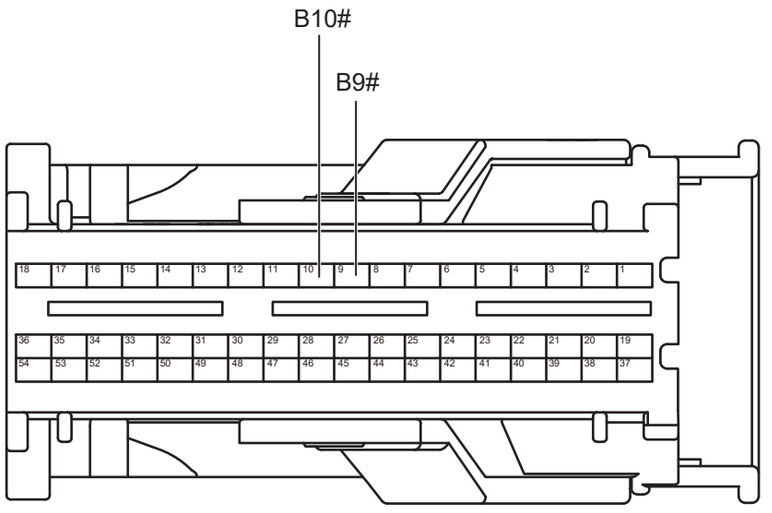
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - passenger acceleration side collision sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector B10# - passenger acceleration side collision sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in passenger acceleration side collision sensor wire harness and connector**



Airbag control unit connector B

RS00640RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B9# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

4	**Replace passenger acceleration side collision sensor (See page ZC-68)**

(a) Replace the passenger acceleration side collision sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009713**	**Open in right door pressure sensor**
DTC	**B009711**	**Short to ground in right door pressure sensor**
DTC	**B009712**	**Short to power supply in right door pressure sensor**
DTC	**B00972B**	**Right door pressure sensor series fault**

Description

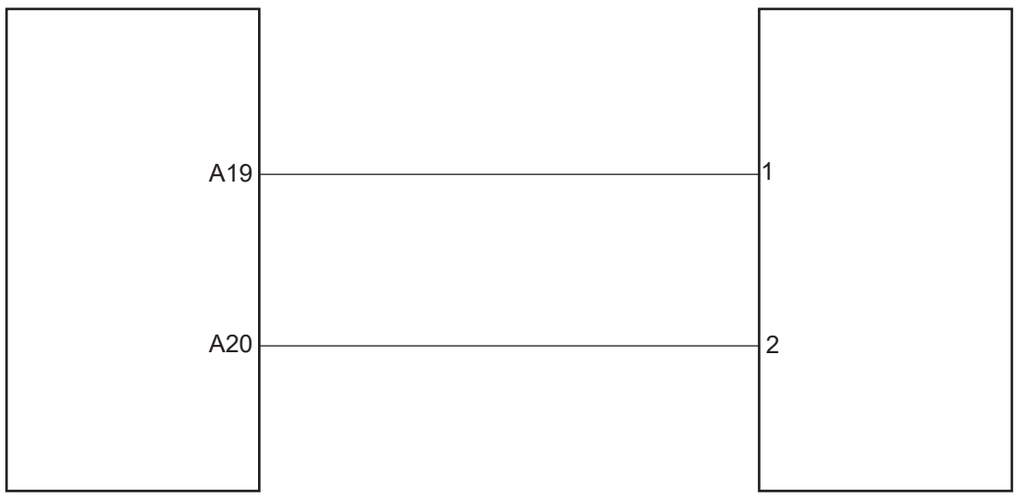
When front right side collision pressure sensor itself is faulty, or there is short, open or series fault in circuit, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009713	• Power supply status is normal • IGN is ON	External sensor not connected	• Fault qualify when open error defect 2000 ms to 2500 ms in normal phase • Fault qualify when open error defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector
B009711	• Power supply status is normal • IGN is ON	Leakage to ground in sensor pin	• Fault qualify when leak to ground error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to ground defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector
B009712	• Power supply status is normal • IGN is ON	Leakage to power supply in sensor pin	• Fault qualify when leak to battery error defect 2000 ms to 2500 ms in normal phase • Fault qualify when leak to battery defect 2500 ms to 3800 ms in startup phase	Continuous type	50 ms	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector
B00972B	• Power supply status is normal • IGN is ON	Overlapping between different sensor wiring harnesses	Fault qualify in once when cross link defect during startup phase	Non-continuous type	—	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector

Fault symptom

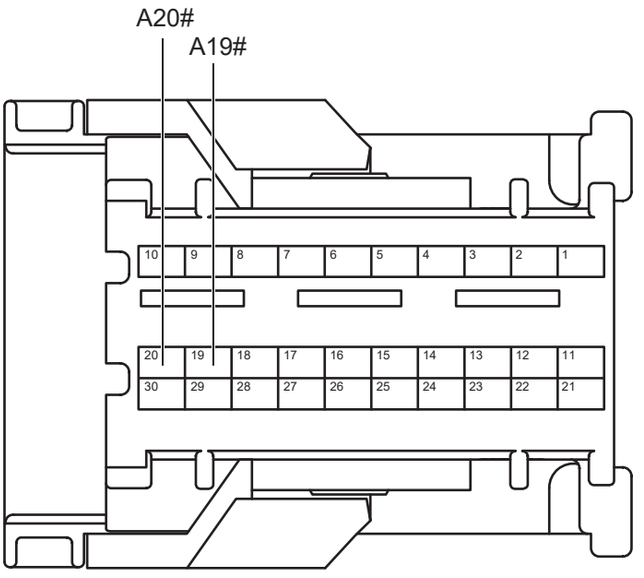
DTC No.	Fault symptom	Warning light/indicator
B009713	• Warning light comes on • Set DTC	Comes on
B009711	• Warning light comes on • Set DTC	Comes on
B009712	• Warning light comes on • Set DTC	Comes on
B00972B	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit A connector.

(d) Disconnect the front right side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

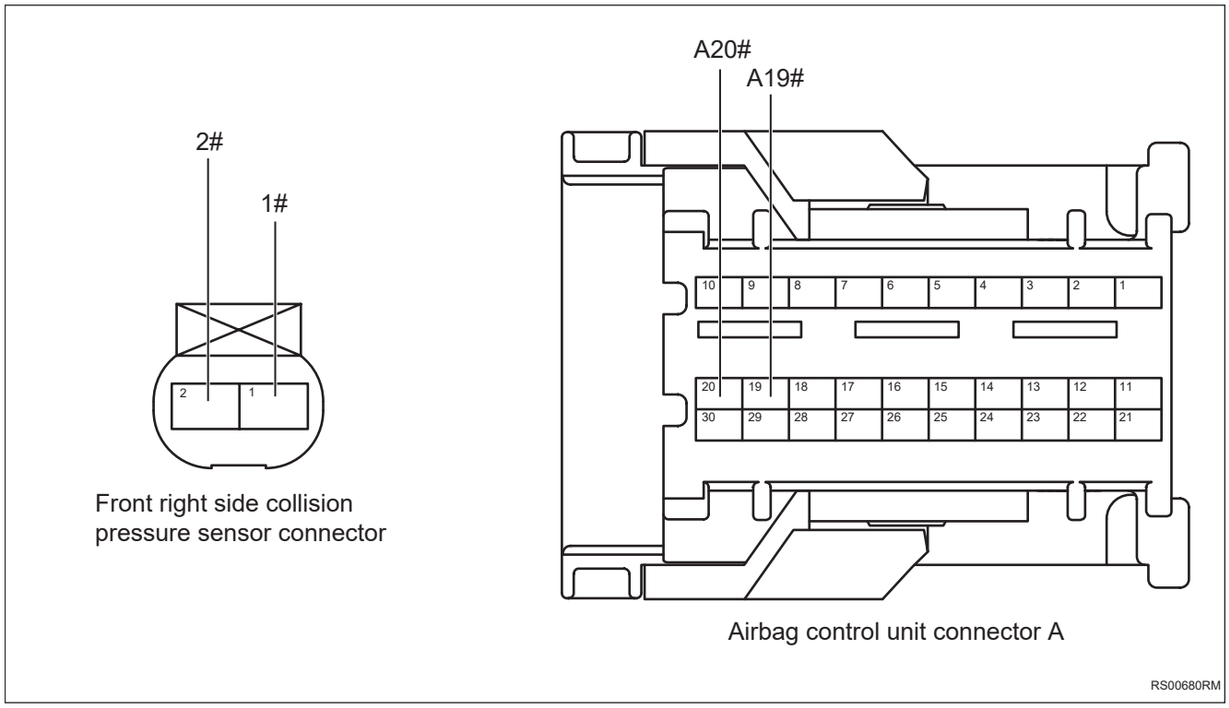
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - airbag control unit connector A20#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for open in front right side collision pressure sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

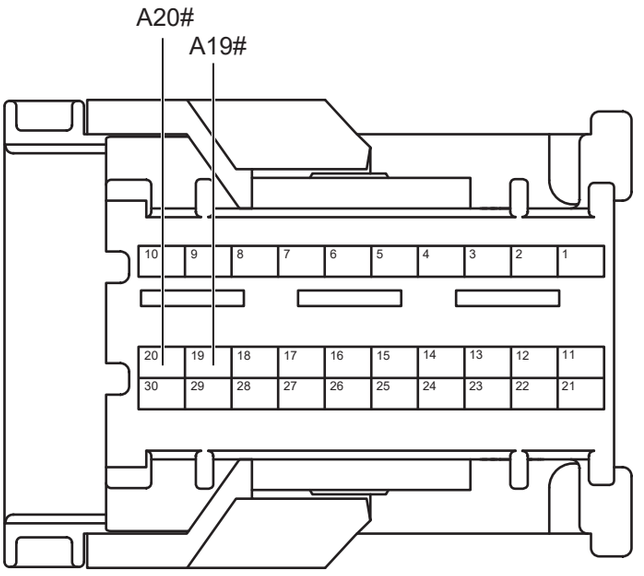
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - front right side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector A20# - front right side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) According to value in the table, measure resistance.

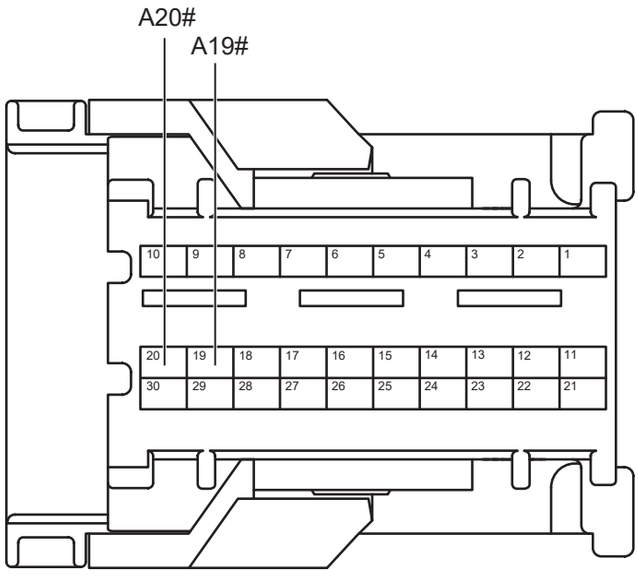
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace front right side collision pressure sensor (See page ZC-71)**

(a) Replace the front right side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	B009756	Right door pressure sensor configuration error

Description

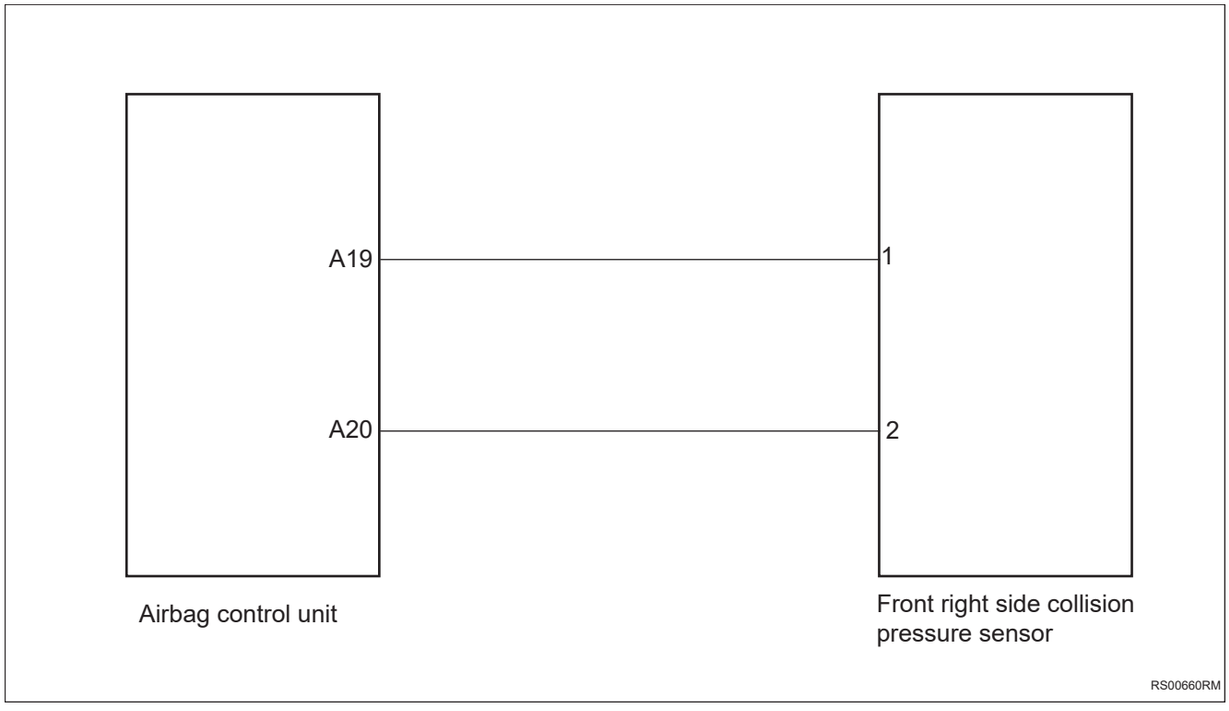
When front right side collision pressure sensor itself is faulty or has configuration error, the airbag control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009756	• Power supply status is normal • IGN is ON	Sensor communication sequence unmatched or not configured, but connected	Fault qualify in once when receive data but without configured in startup phase	Non-continuous type	—	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B009756	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

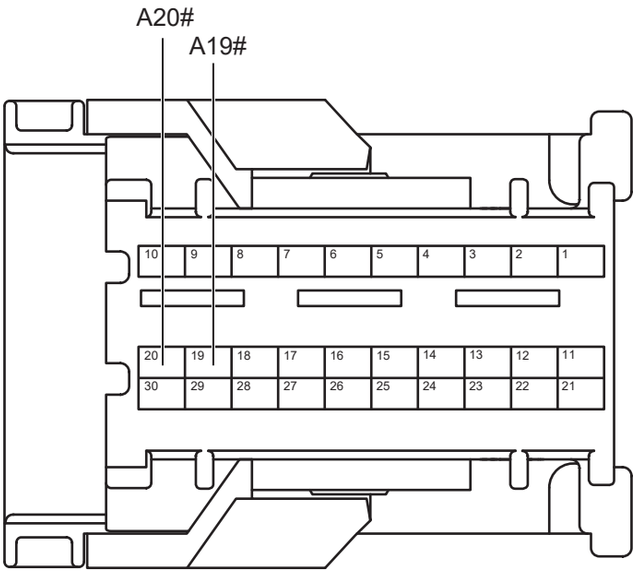
1	**Check and read configuration file of front right side collision pressure sensor**

(a) Check and read if configuration file of front right side collision pressure sensor is correct.

NG → **Rewrite configuration file**

OK

2	**Check for short to each other in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit A connector.

(d) Disconnect the front right side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

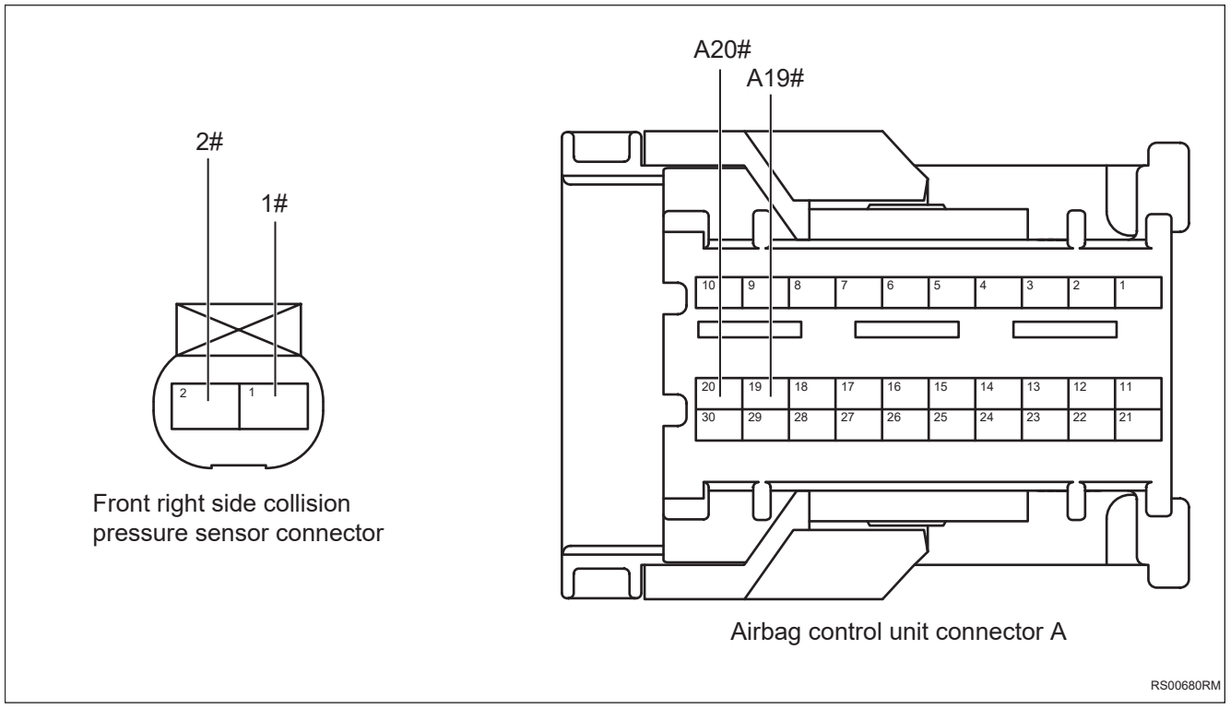
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - airbag control unit connector A20#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for open in front right side collision pressure sensor wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

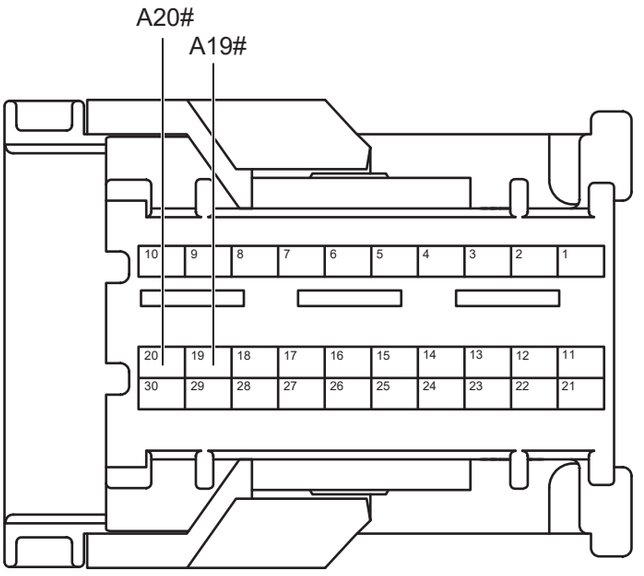
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - front right side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector A20# - front right side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) According to value in the table, measure resistance.

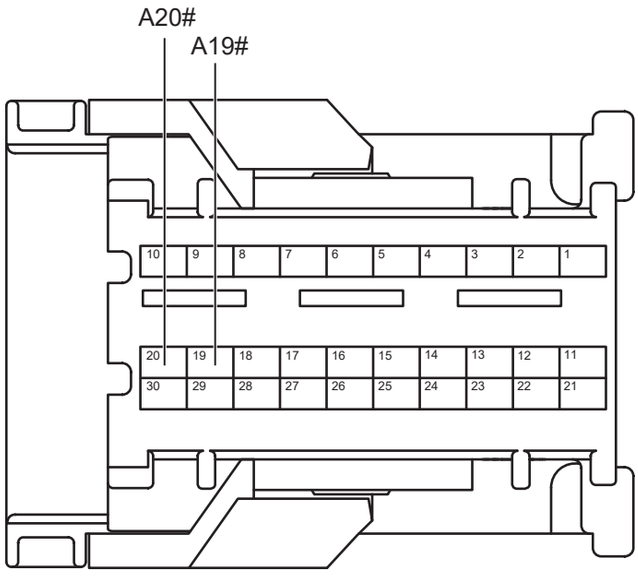
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector A20# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

6	**Replace front right side collision pressure sensor (See page ZC-71)**

(a) Replace the front right side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

OK

Diagnosis ends

DTC	**B009786**	**Right door pressure sensor communication error**
DTC	**B009791**	**Right door pressure sensor parameter error**
DTC	**B009796**	**Right door pressure sensor self-check failure**

Description

When front right side collision pressure sensor itself is faulty, communication is incorrect, parameter is incorrect or self-check fails, the airbag control unit records DTC.

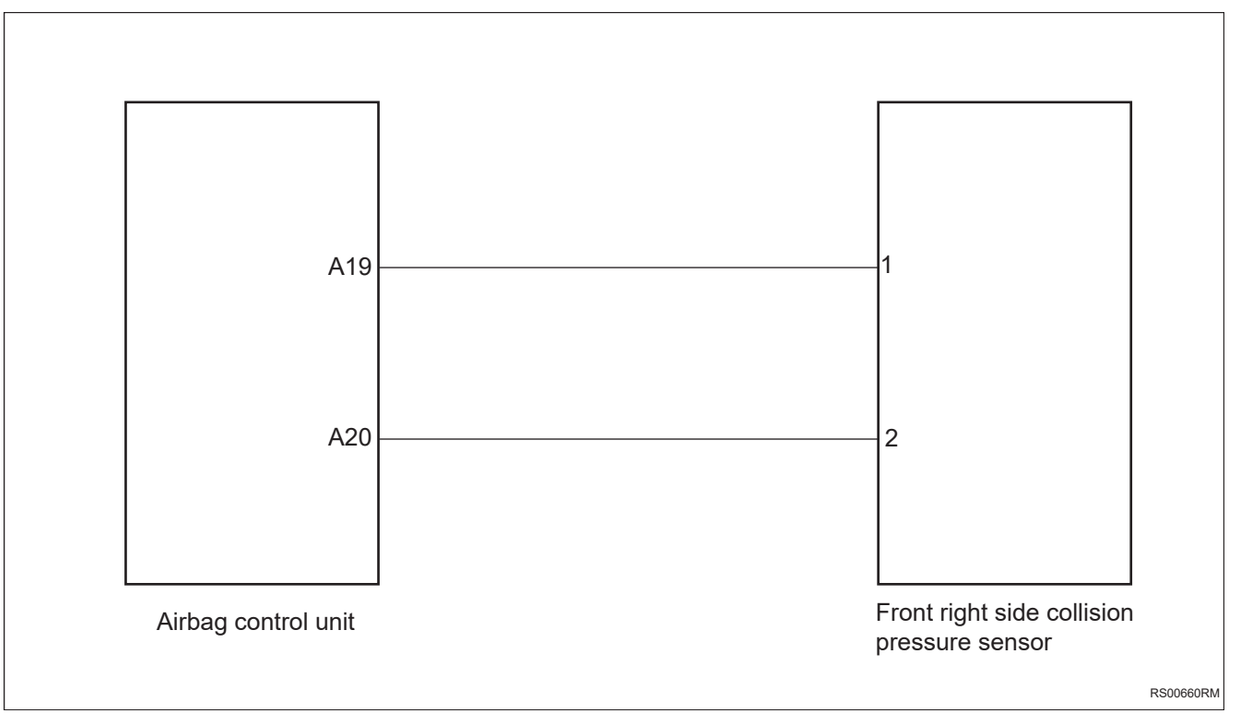
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B009786	• Power supply status is normal • IGN is ON	Any communication error can lead to this failure, such as equity failure, incorrect data frame length, etc	• Fault qualify when Communic-aton error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite 32 ID not received fully or Satellite phase timeout. • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector
B009791	• Power supply status is normal • IGN is ON	This fault will be detected when a mismatched sensor is connected	• Fault qualify when parameter error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite ID0~ID11 not as expect • Remark: The fault only diagnosis during startup phase	Non-continuous type	—	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector
B009796	• Power supply status is normal • IGN is ON	Sensor is equipped with self-check function: Once a fault is detected, sensor will report the fault	• Fault qualify when defect error defect 1800 ms to 3000 ms during startup phase • Remark: Satellite data out of range • Remark: The fault only	Non-continuous type	—	• Front right side collision pressure sensor • Airbag control unit • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
			diagnosis during startup phase			

Fault symptom

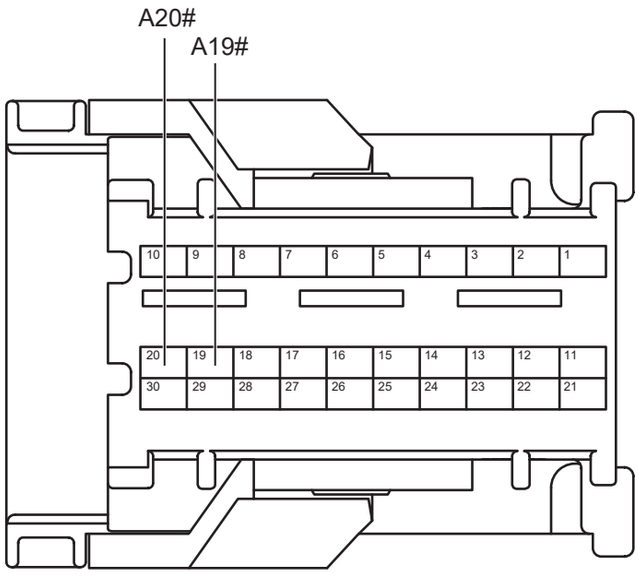
DTC No.	Fault symptom	Warning light/indicator
B009786	• Warning light comes on • Set DTC	Comes on
B009791	• Warning light comes on • Set DTC	Comes on
B009796	• Warning light comes on • Set DTC	Comes on

Circuit diagram



Inspection procedure

1	**Check for short to each other in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit A connector.

(d) Disconnect the front right side collision pressure sensor connector.

(e) According to value in the table, measure resistance.

Standard value

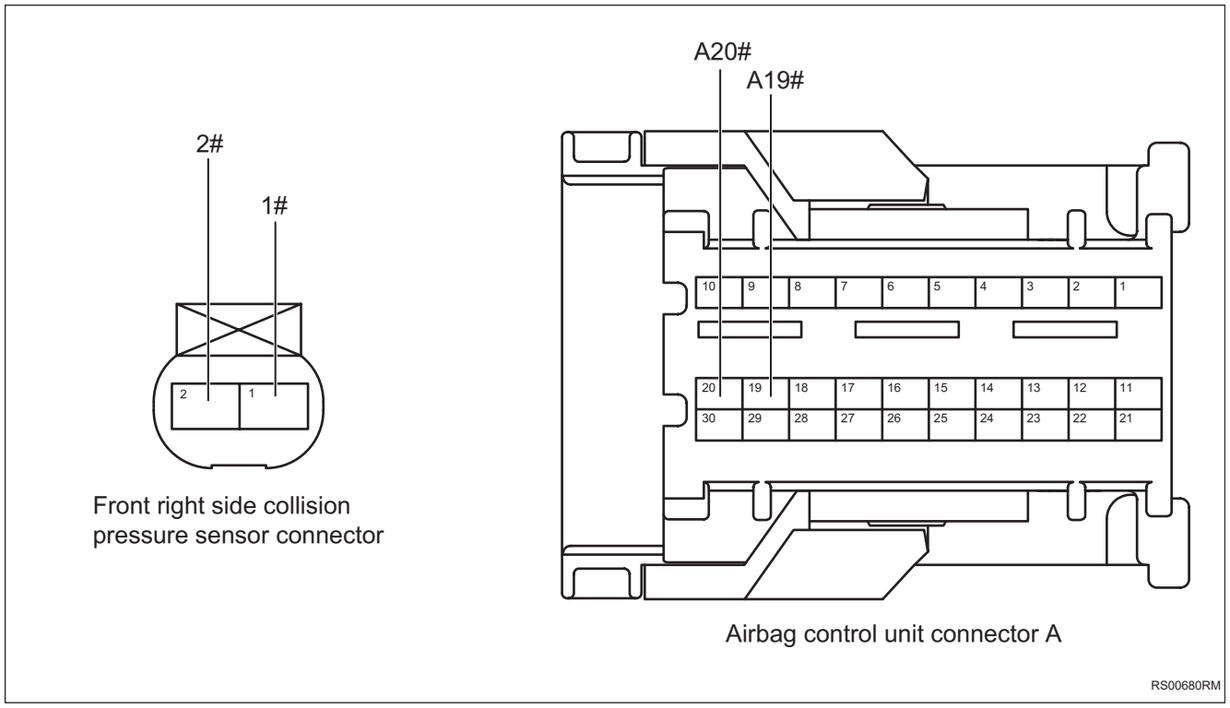
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - airbag control unit connector A20#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for open in front right side collision pressure sensor wire harness and connector**



Front right side collision pressure sensor connector

Airbag control unit connector A

(a) According to value in the table, measure resistance.

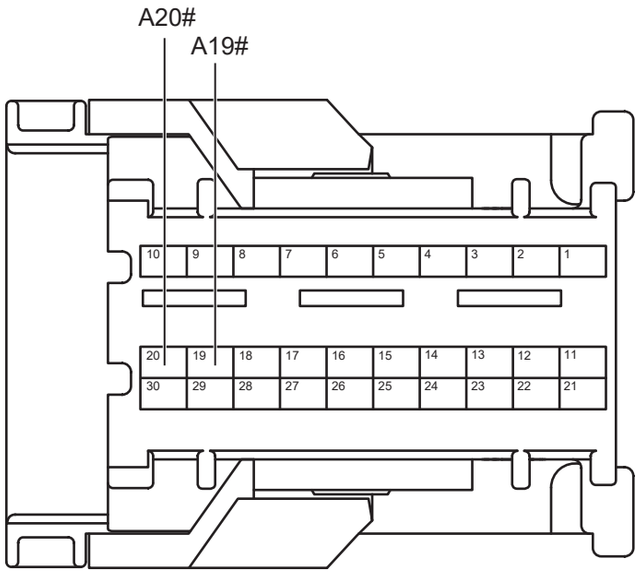
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - front right side collision pressure sensor connector 1#	Always connected	Less than 1 Ω
Airbag control unit connector A20# - front right side collision pressure sensor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front right side collision pressure sensor wire harness and connector**



Airbag control unit connector A

RS00670RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector A19# - body ground	Always connected	10 KΩ or more
Airbag control unit connector A20# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front right side collision pressure sensor (See page ZC-71)**

(a) Replace the front right side collision pressure sensor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

ZD

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

ZD

OK

Diagnosis ends

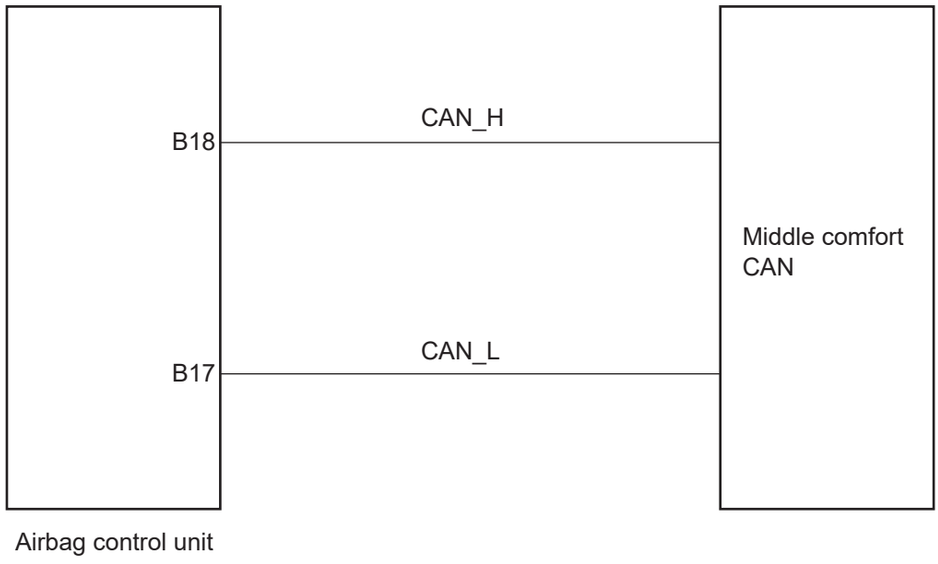
DTC	U002888	Comfort CAN bus off

Description

When airbag control unit detects middle comfort CAN bus off fault, the airbag control unit records DTC.

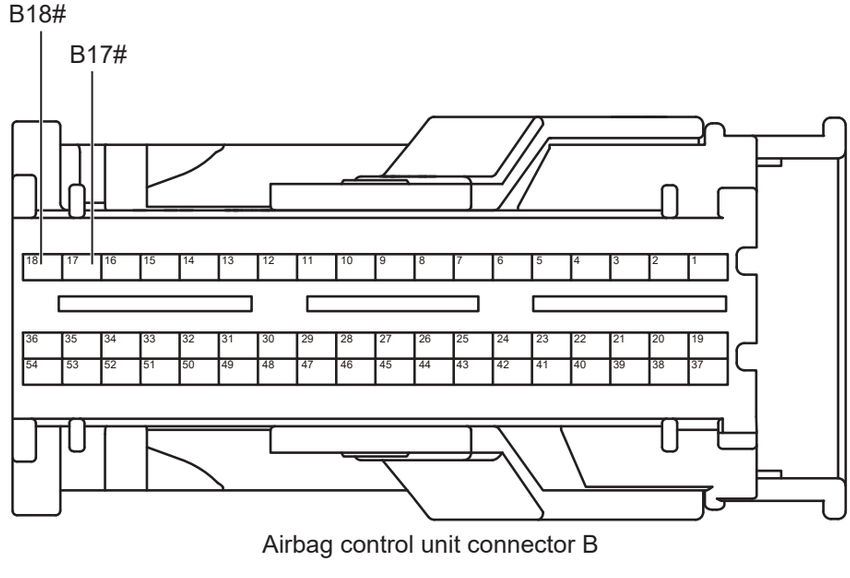
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the airbag control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B17# - airbag control unit connector B18#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

ZD

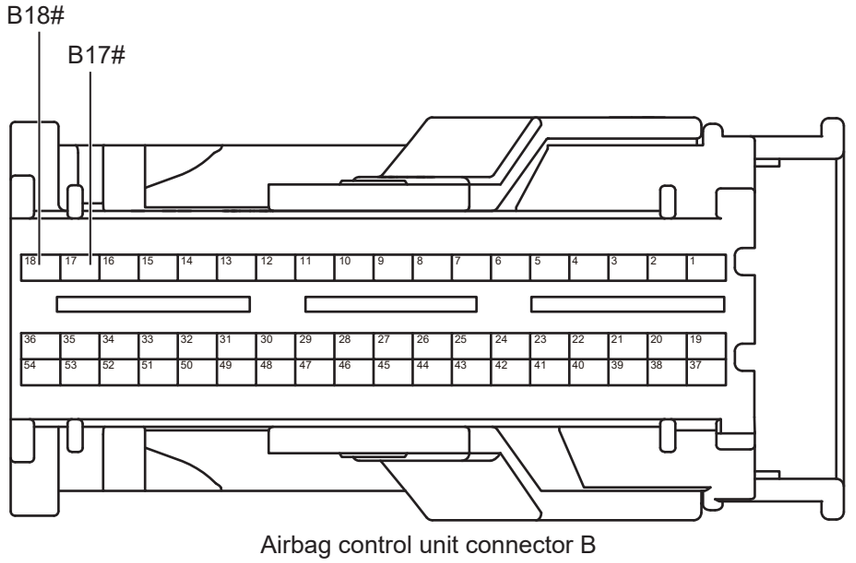
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Airbag control unit connector B

RS00940RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

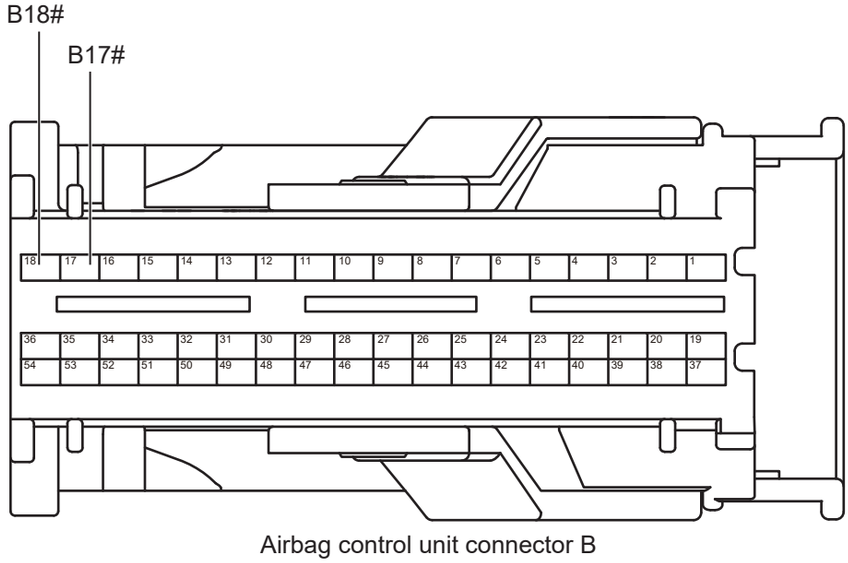
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B17# - airbag control unit connector B18#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in central comfort CAN bus**



Airbag control unit connector B

RS00940RM

(a) According to value in the table, measure resistance.

Standard value

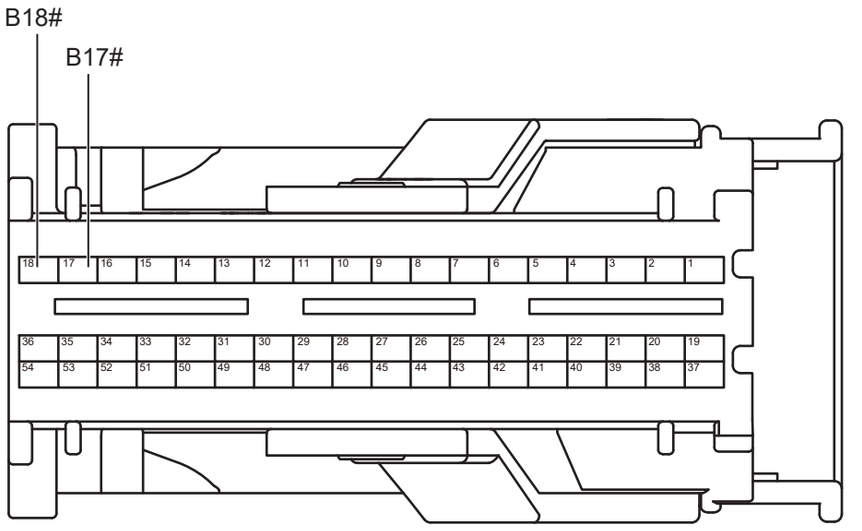
Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B17# - body ground	Always connected	10 KΩ or more
Airbag control unit connector B18# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in central comfort CAN bus**



Airbag control unit connector B

RS00940RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B17# - body ground	Turn ignition switch to "ON"	Less than 1 V
Airbag control unit connector B18# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	**U014687**	**PDCM node lost**
DTC	**U020887**	**Front Left seat controller node lost**
DTC	**U112987**	**IBC message missing**
DTC	**U113187**	**Electric power steering control unit message missing**
DTC	**U114F87**	**CSC message missing**
DTC	**U114A87**	**VDC821 message missing**
DTC	**U114B87**	**VDC397 message missing**
DTC	**U114887**	**Rear PDC message missing**
DTC	**U114787**	**Central PDC message missing**
DTC	**U114687**	**Front PDC message missing**

DTC	U041782	Front PDC message content fault
DTC	U041783	Front PDC message content fault

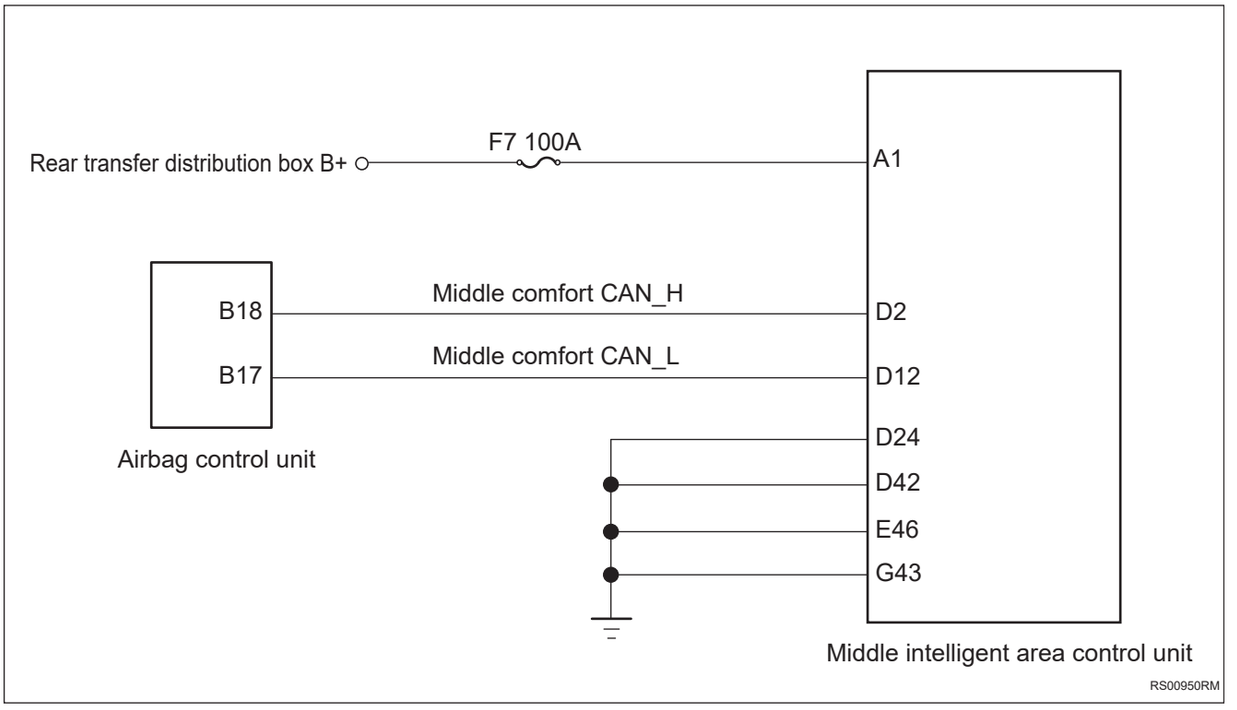
Description

When communication between airbag control unit and other system is abnormal or interrupted, the airbag control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Airbag control unit • Middle intelligent area control unit • Combination switch
U020887	(a) Front left seat controller node lost.	• Wire harness and connector • Airbag control unit • Front left door control unit • Middle intelligent area control unit • Combination switch
U112987	(a) IBC message missing.	• Wire harness and connector • Airbag control unit • Integrated brake controller • Front intelligent area control unit • Electric power steering control unit • Middle intelligent area control unit • Combination switch
U113187	(a) Electric power steering control unit message missing.	• Wire harness and connector • Airbag control unit • Front intelligent area control unit • Electric power steering control unit • Middle intelligent area control unit • Combination switch
U114F87	(a) CSC message missing.	• Wire harness and connector • Airbag control unit • Infotainment control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U114A87	(a) VDC821 message missing.	• Wire harness and connector • Airbag control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U114B87	(a) VDC397 message missing.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Airbag control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U114887	(a) Rear PDC message missing.	• Wire harness and connector • Airbag control unit • Rear intelligent area control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U114787	(a) Central PDC message missing.	• Wire harness and connector • Airbag control unit • Middle intelligent area control unit • Combination switch
U114687	(a) Front PDC message missing.	• Wire harness and connector • Airbag control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U041782	(a) Front PDC message content fault.	• Wire harness and connector • Airbag control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch
U041783	(a) Front PDC message content fault.	• Wire harness and connector • Airbag control unit • Front intelligent area control unit • Middle intelligent area control unit • Combination switch

Circuit diagram

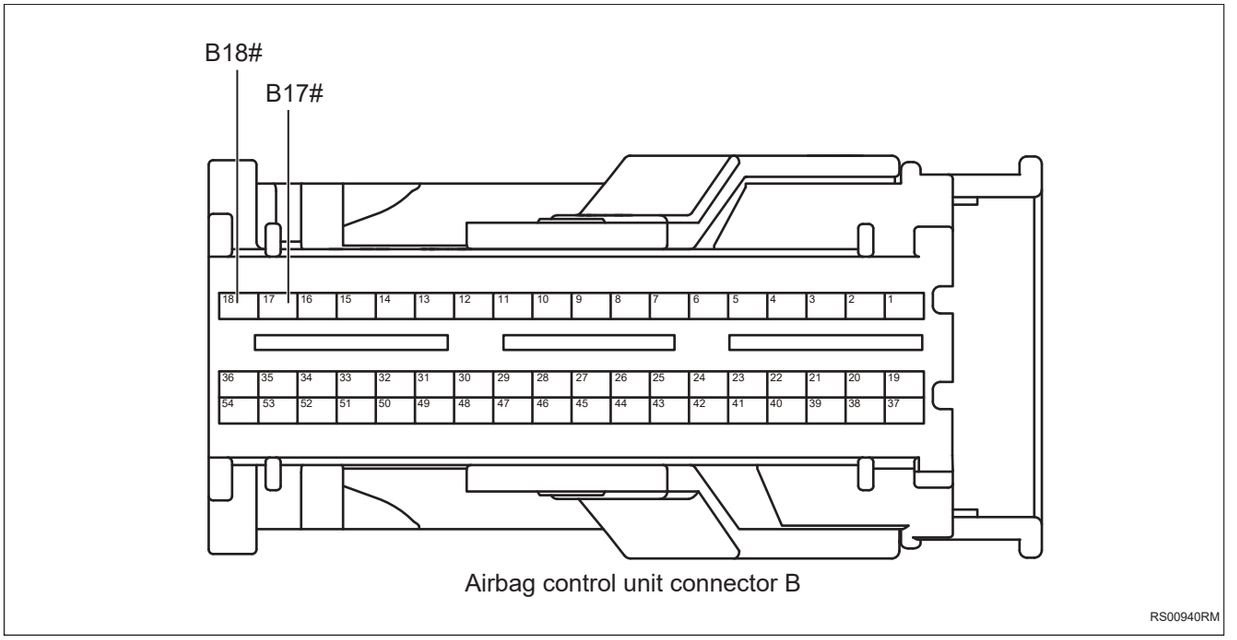


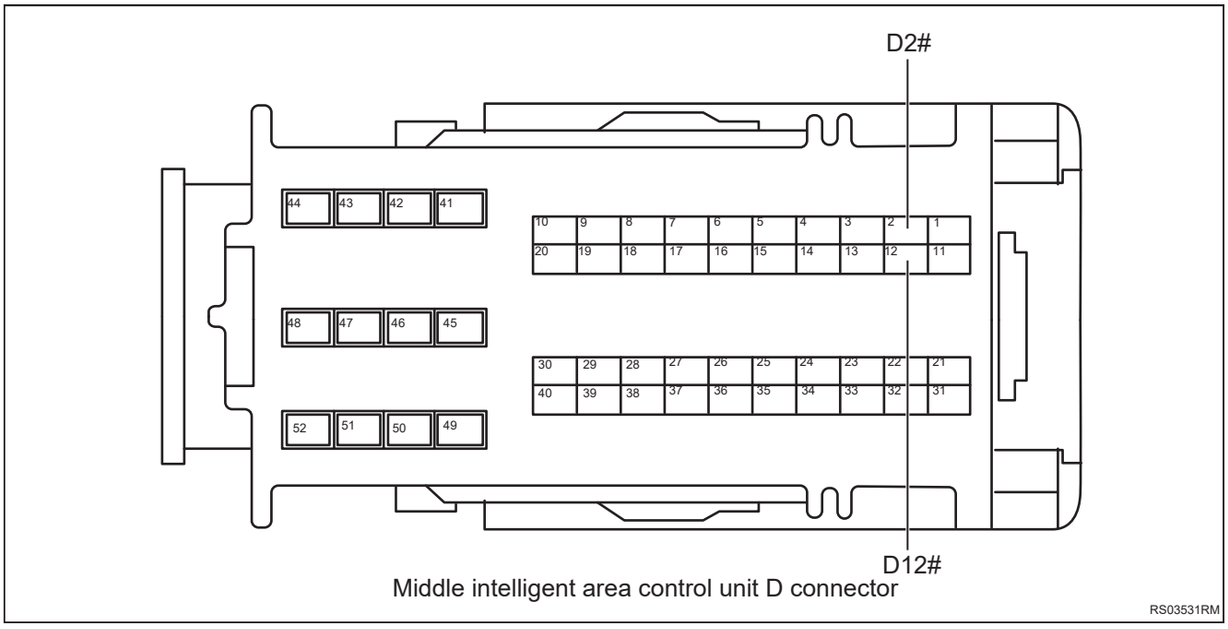
ZD

Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (airbag control unit - middle intelligent area control unit)**





Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

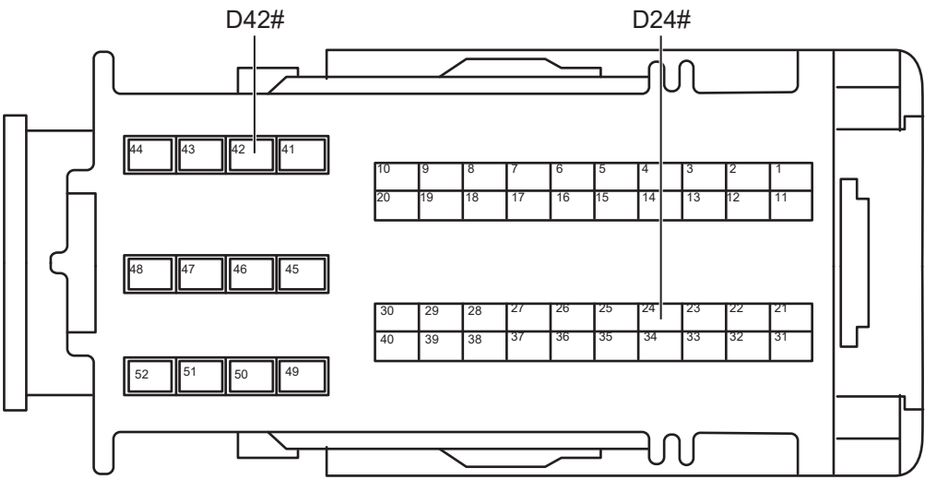
Standard value

Multimeter connection	Detection condition	Specified condition
Airbag control unit connector B18# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Airbag control unit connector B17# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

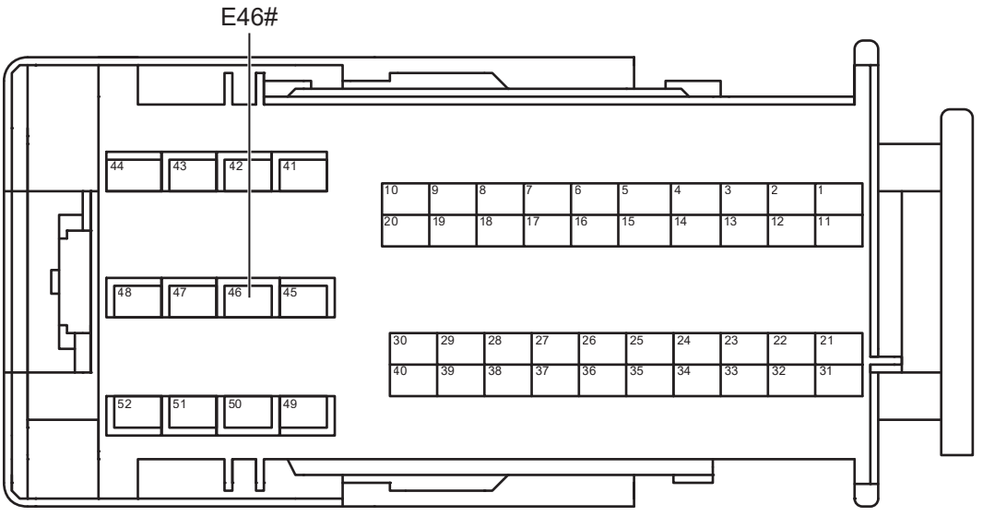
OK

2	**Check middle intelligent area control unit ground**



Middle intelligent area control unit D connector

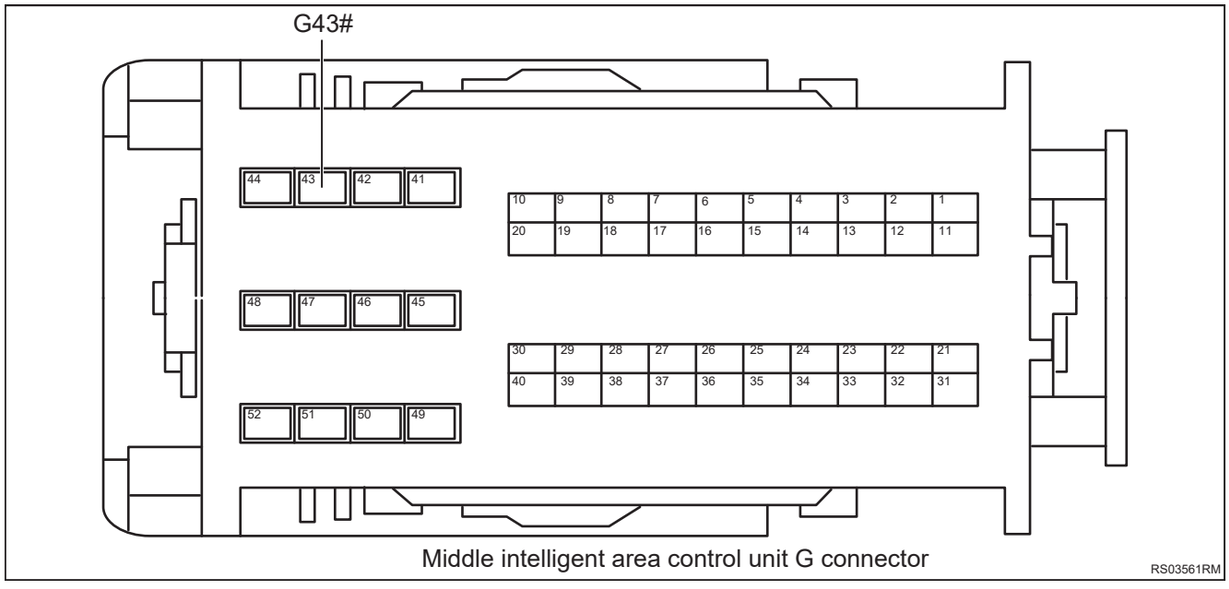
RS03541RM



Middle intelligent area control unit E connector

RS03551RM

ZD



ZD

(a) According to value in the table, measure resistance.

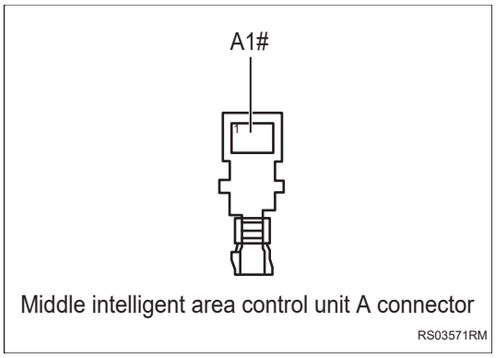
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector
RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

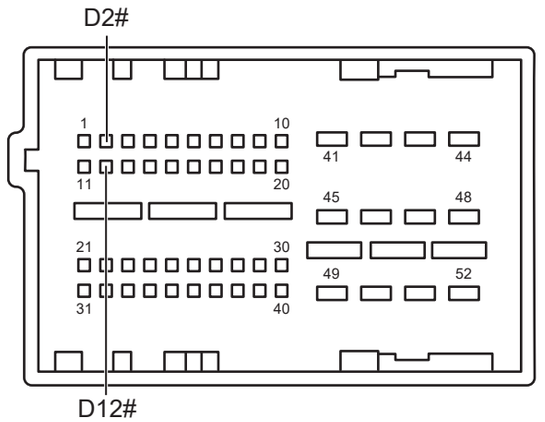
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

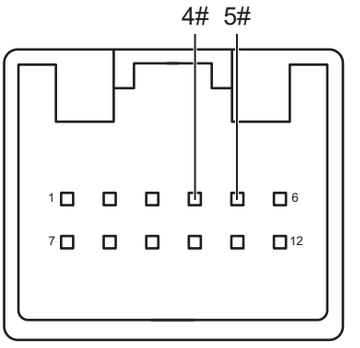
NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



Middle intelligent area control unit D



Combination switch

RS03580RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

ZD

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace airbag control unit (See page ZC-74)**

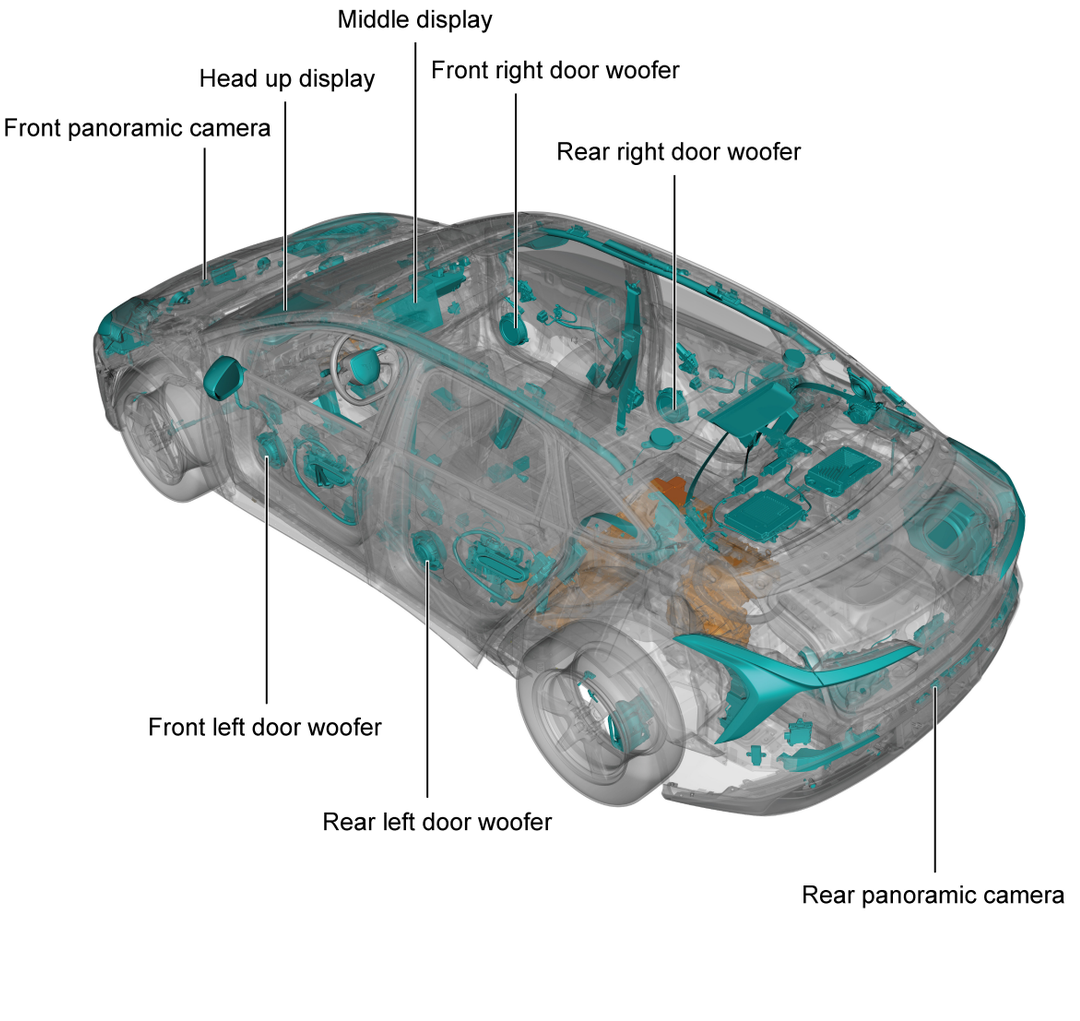
OK

Diagnosis ends

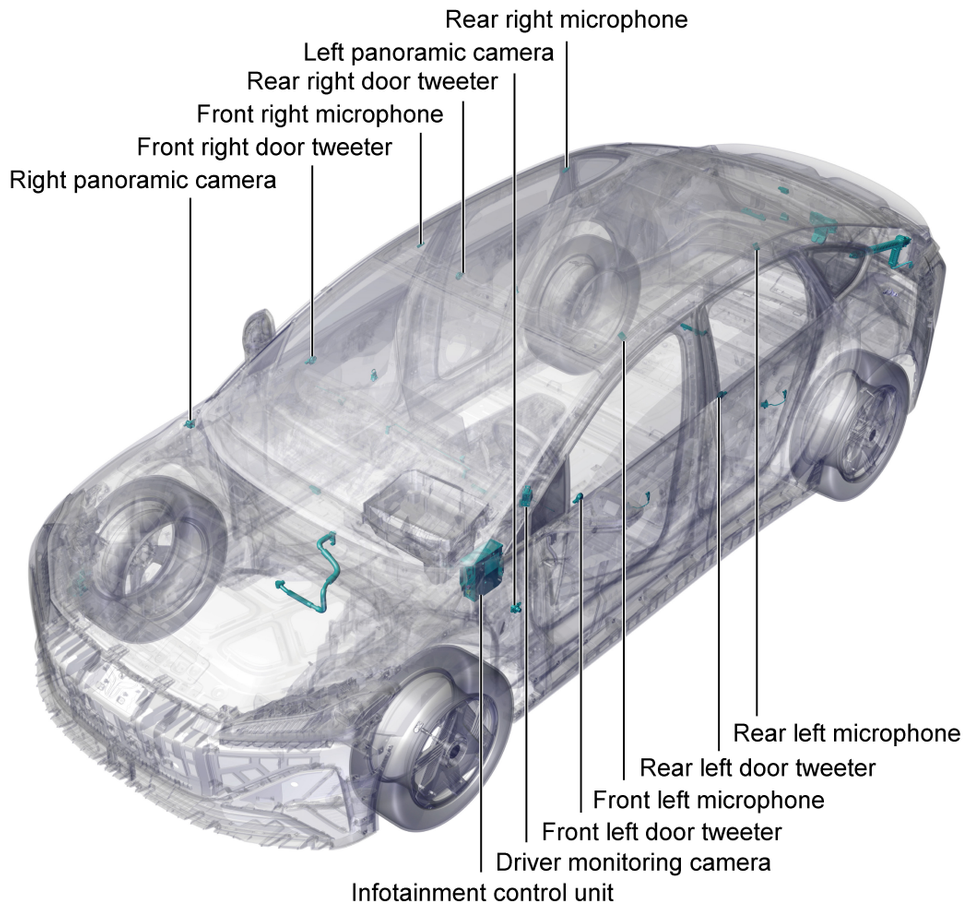
Audio entertainment system

Infotainment control unit

Part position

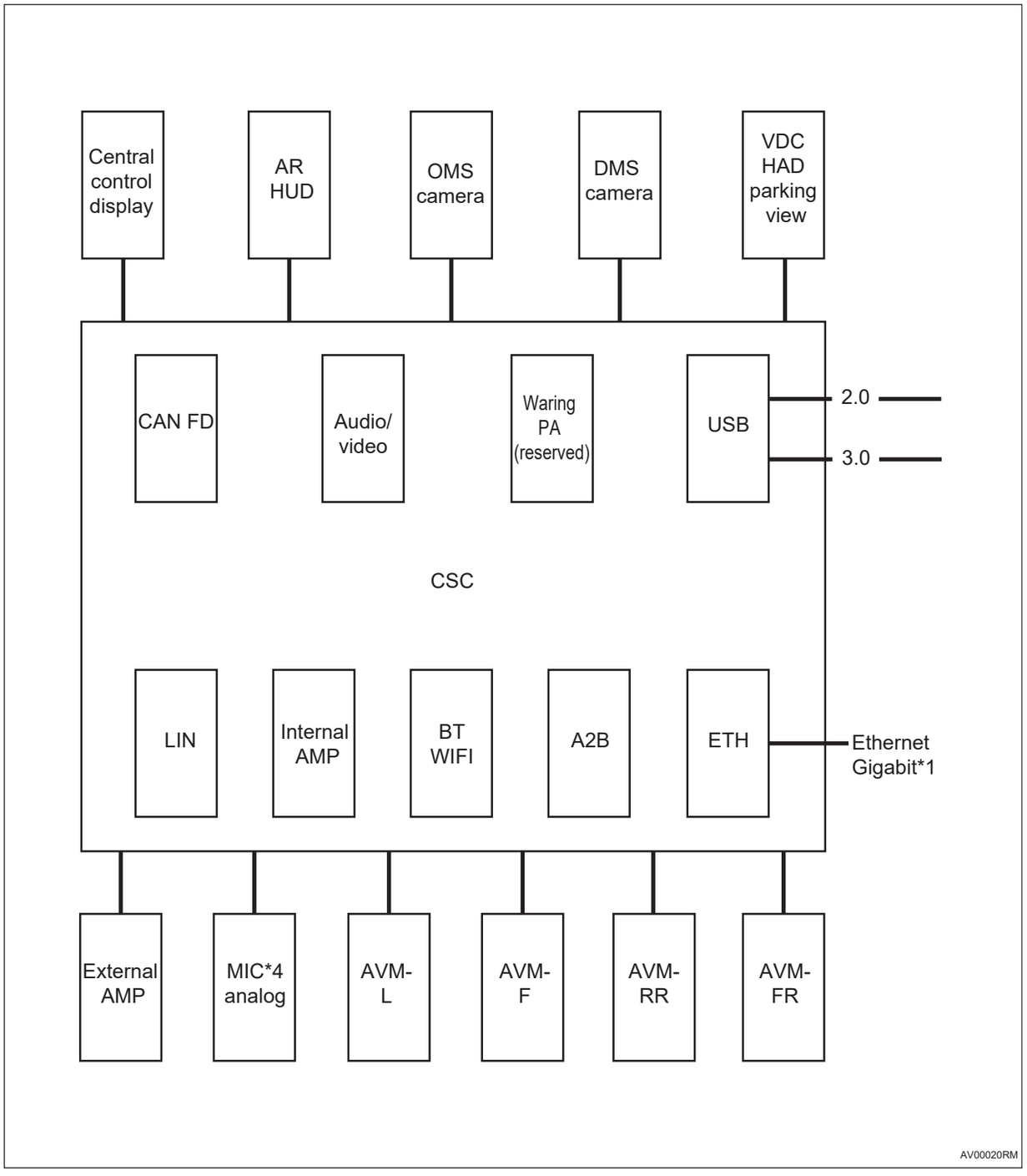


Part position



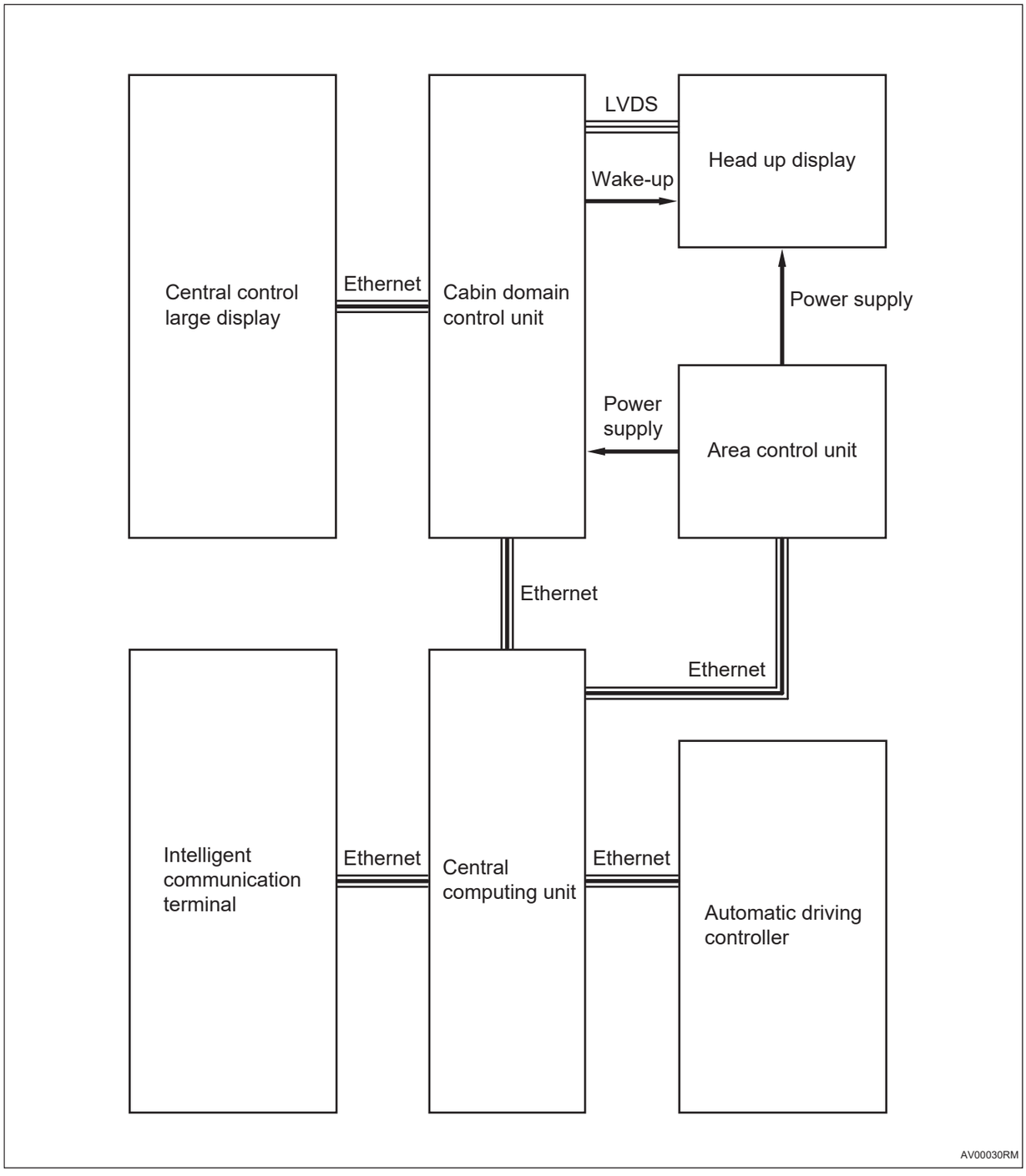
System diagram

Infotainment control unit



System diagram

Head up display



System description

1. Infotainment control unit

(a) Cabin domain controller assembly (CSC) integrates the functions of CPU, GPU, DSP, MCU, NPU and other specialized core modules, and provides external on-board special interfaces such as screen interface, camera interface, audio interface, Ethernet interface, USB interface and CAN/LIN/Ethernet interface, and supports hot-swapping function of external interfaces; it supports protocols such as Bluetooth, WIFI, MIFI and so on, and supports the authentication of functions such as USB, Bluetooth, WIFI, wired CarPlay and so on.

2. Head up display

(a) The head up display is linked to the instrument cluster and infotainment system, dynamically projecting driving assist and navigation information on the front windshield directly opposite the driver.

Data parameter

Infotainment control unit (built-in power amplifier)

Item	Max	OK	Minimum
Operating voltage (V)	18	12	6
Operating current (A)	⩽ 20	-	-

Tweeter

Item	Max	OK	Minimum
Operating voltage (V)	10	9	-
Operating current (A)	2.5	2.25	-
Operating resistance (Ω)	4		

Woofer

Item	Max	OK	Minimum
Operating voltage (V)	20	12.6	0
Operating current (A)	5	3.16	0
Operating resistance (Ω)	4+/-20%		

Pedestrian alert

Item	Max	OK	Minimum
Operating voltage (V)	8.9	8	0
Operating current (A)	1.5	1	-

Infotainment control unit (external power amplifier)

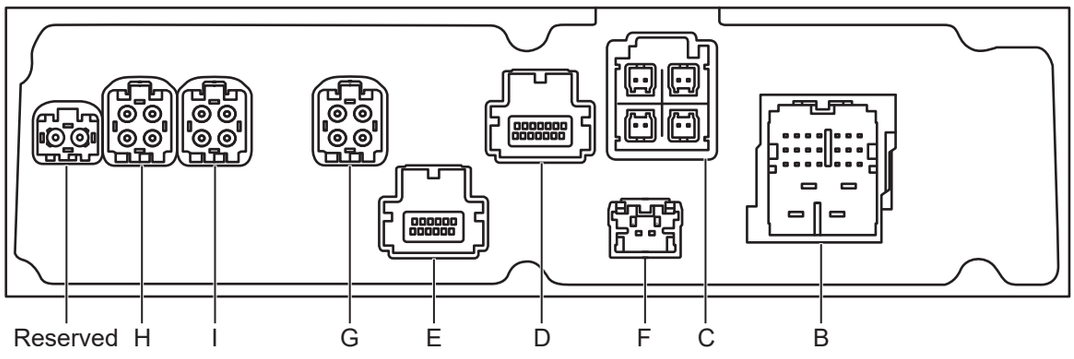
Item	Max	OK	Minimum
Operating voltage (V)	18	12	6
Operating current (A)	⩽ 16	-	-

Head up display

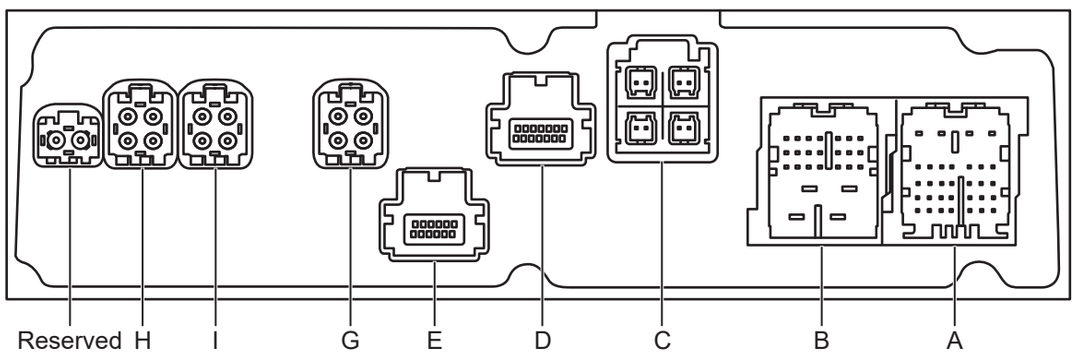
Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	3	-	-

ECU terminal

Infotainment control unit

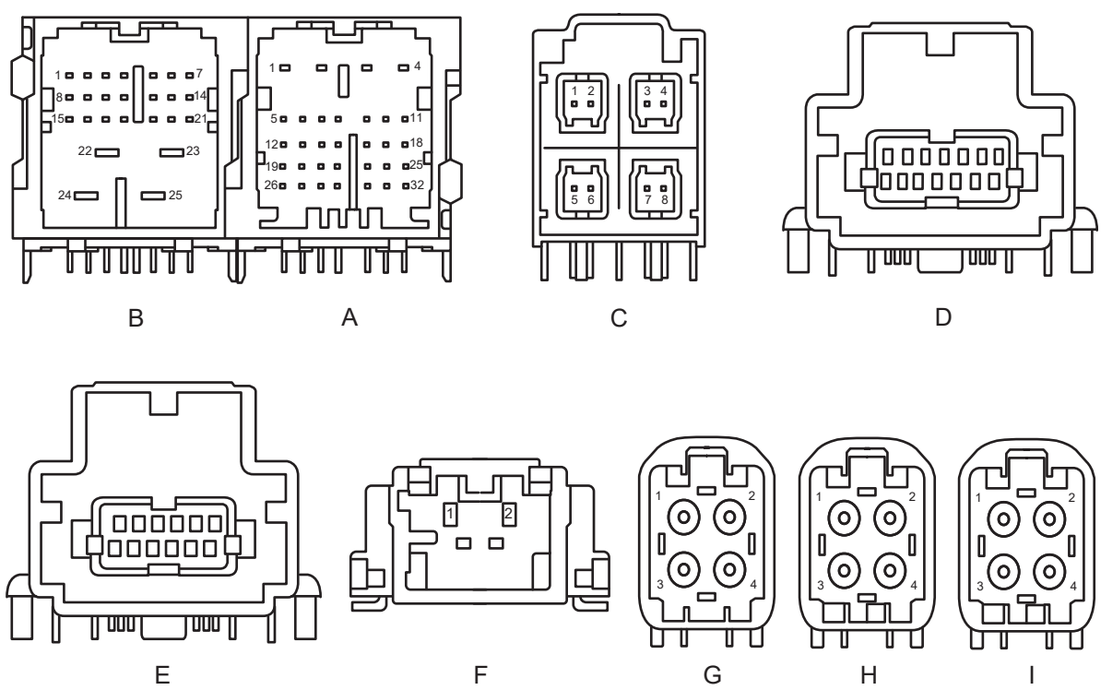


Infotainment control unit (external power amplifier)



Infotainment control unit (internal power amplifier)

AV00100RM



AV00110RM

Infotainment control unit - A			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	Built-in AMP RL (rear left) audio output "-"
2	-	18	Built-in AMP RL (rear left) audio output "+"
3	Pedestrian reminder sound -	19	-
4	Pedestrian reminder sound +	20	-
5	-	21	-
6	-	22	-
7	-	23	-
8	-	24	Built-in AMP FR (front right) audio output "-"
9	-	25	Built-in AMP FR (front right) audio output "+"
10	Built-in AMP RR (rear right) audio output "-"	26	-
11	Built-in AMP RR (rear right) audio output "+"	27	-
12	-	28	-
13	-	29	-
14	-	30	-
15	-	31	Built-in AMP FL (front left) audio output "-"
16	-	32	Built-in AMP FL (front left) audio output "+"

Infotainment control unit - B			
Pin number	**Definition**	**Pin number**	**Definition**
1	Microphone 1 signal input	14	Central control display wake-up signal
2	Microphone 2 signal input	15	CAN H
3	Microphone 3 signal input	16	CAN L
4	Microphone 4 signal input	17	-
5	TOX input shield ground	18	-
6	TBOX audio -	19	-
7	TBOX audio +	20	-
8	Microphone 1 signal ground	21	-
9	Microphone 2 signal ground	22	-
10	Microphone 3 signal ground	23	BATT power supply input
11	Microphone 4 signal ground	24	-
12	-	25	BATT power supply input ground
13	HUD wake-up signal	-	-

Infotainment control unit-C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	5	-
2	-	6	-
3	ETH1 - 1000M	7	-
4	ETH1 + 1000M	8	-

Infotainment control unit-D	
Pin number	**Definition**
1	USB-TYPE A port

Infotainment control unit - E	
Pin number	**Definition**
1	USB-TYPE C port

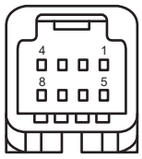
Infotainment control unit - F			
Pin number	**Definition**	**Pin number**	**Definition**
1	A2B signal +	2	A2B signal -

Infotainment control unit - G			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	3	HUD_PORTA
2	IVI_PORT1	4	-

Infotainment control unit - H			
Pin number	**Definition**	**Pin number**	**Definition**
1	Camera video signal input 1 (front)	3	Camera video signal input 2 (rear)
2	Camera video signal input 4 (right)	4	Camera video signal input 3 (left)

Infotainment control unit - I			
Pin number	**Definition**	**Pin number**	**Definition**
1	CAM1_OMS_LVDS	3	CAM2_DMS_LVDS
2	-	4	AVM video output

Head up display



Head up display A



Head up display B

AV00120RM

ZD

Head up display-A			
Pin number	**Definition**	**Pin number**	**Definition**
1	12 V	5	-
2	12 V	6	-
3	GND	7	AR_HUD WAKEUP(IN)
4	GND	8	-

Head up display-B	
Pin number	**Definition**
1	LVDS

Diagnostic Trouble Code (DTC) chart

Infotainment control unit

DTC	Detection items	See page
B140016	Infotainment controller assembly (CSC) input end undervoltage	(See page ZD-2406)
B140017	Infotainment controller assembly (CSC) input end overvoltage	(See page ZD-2406)
B140A00	USB1 interface fault	(See page ZD-2426)
B140B00	USB2 interface fault	(See page ZD-2426)
B14074B	System high temperature fault	(See page ZD-2424)
B140100	Front left microphone assembly (MIC1) fault	(See page ZD-2410)
B140200	Front right microphone assembly (MIC2) fault	(See page ZD-2410)
B140300	Rear left microphone assembly or front exterior microphone (MIC3) fault	(See page ZD-2410)
B140400	Rear right microphone assembly or rear exterior microphone (MIC4) fault	(See page ZD-2410)
B140144	Built-in power amplifier front left drive fault	(See page ZD-2438)

DTC	Detection items	See page
B140142	Built-in power amplifier front left drive fault - open	(See page ZD-2438)
B140244	Built-in power amplifier front right drive fault	(See page ZD-2442)
B140242	Built-in power amplifier front right drive fault - open	(See page ZD-2442)
B140302	HUD screen LVDS communication fault	(See page ZD-2416)
B140301	HUD screen LVDS circuit abnormal connection	(See page ZD-2416)
B140344	Built-in power amplifier rear left drive fault	(See page ZD-2447)
B140342	Built-in power amplifier rear left drive fault - open	(See page ZD-2447)
B140444	Built-in power amplifier rear right drive fault	(See page ZD-2451)
B140442	Built-in power amplifier rear right drive fault - open	(See page ZD-2451)
B140500	Power amplifier assembly A2B fault	(See page ZD-2418)
B140501	External power amplifier A2B fault - short to power supply in A2B	(See page ZD-2418)
B140502	External power amplifier A2B fault - short to ground in A2B	(See page ZD-2418)
B140503	External power amplifier A2B fault - short in A2B data lines A2B_P and A2B_N	(See page ZD-2418)
B141602	HAD camera LVDS fault	(See page ZD-2418)
B140544	Built-in power amplifier pedestrian warning device drive 1 fault	(See page ZD-2420)
B140542	Built-in power amplifier pedestrian warning device drive 1 fault - open	(See page ZD-2420)
B141002	Main display assembly LVDS communication fault	(See page ZD-2428)
B141001	Main display assembly LVDS circuit abnormal connection	(See page ZD-2428)
B141003	Central control display LVDS circuit abnormal connection - unlink	(See page ZD-2428)
B141302	AVM 4-way camera LVDS circuit abnormal connection	(See page ZD-2430)
B141301	AVM rear camera LVDS fault	(See page ZD-2430)
B141303	AVM left camera LVDS fault	(See page ZD-2430)
B141304	AVM right camera LVDS fault	(See page ZD-2430)
B141402	Driver status monitoring camera assembly (DMS) camera LVDS circuit abnormal connection	(See page ZD-2433)
B141502	Intelligent interior monitoring front camera assembly (OMS) camera LVDS circuit abnormal connection	(See page ZD-2435)
B142000	Panoramic camera not calibrated	(See page ZD-2437)
U14468A	CSC backbone network Eth1 connection establishment failure	(See page ZD-2456)

DTC	Detection items	See page
U004688	Information CAN bus off	(See page ZD-2459)
U014687	PDC node lost	(See page ZD-2463)
U014887	AMP node lost	(See page ZD-2463)

Head up display

DTC	Detection items	See page
B14C016	Head up display (HUD) input end undervoltage	(See page ZD-2468)
B14C017	Head up display (HUD) input end overvoltage	(See page ZD-2468)
B14C100	HUD motor fault	(See page ZD-2472)
B14C200	HUD limit switch fault	(See page ZD-2472)
B14C413	4.1 Board open/short fault	(See page ZD-2472)
B14C513	3.1 Board open/short fault	(See page ZD-2472)
B14C601	HUD internal 4.1TFT bar wire fault	(See page ZD-2478)
B14C701	HUD internal 3.1TFT bar wire fault	(See page ZD-2478)
B14C808	HUD internal FPGA (image processing chip) communication fault	(See page ZD-2471)
B14C998	HUD internal 4.1TFT high temperature protection fault	(See page ZD-2476)
B14CA98	HUD internal 3.1TFT high temperature protection fault	(See page ZD-2476)

DTC	**B140016**	**Infotainment controller assembly (CSC) input end undervoltage**
DTC	**B140017**	**Infotainment controller assembly (CSC) input end overvoltage**

Description

When the power supply voltage of infotainment control unit is too high or too low, the infotainment control unit records DTC.

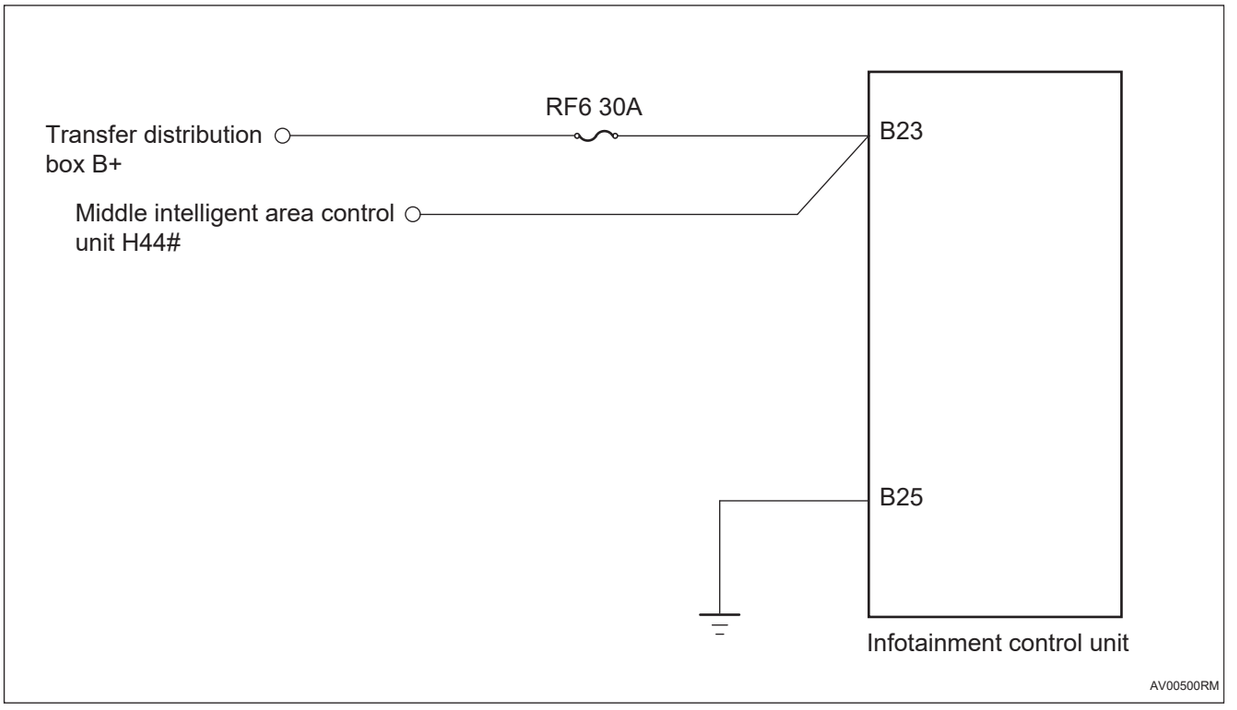
DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1400-16	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Head unit takes 10 ms as a detection cycle, if the power supply voltage (U ⩽ 5.7 ± 0.2 V) is detected for 2 s, it enters into the low voltage detection state.	Cycle (10 ms)	Head unit takes 10 ms as a detection cycle, if the power supply voltage is detected for 2 s: • Record current fault and historical fault in entertainment domain when U ⩽ 8.2 ± 0.2 V • Record current fault and historical fault in safety domain when U ⩽ 5.7 ± 0.2 V	• Infotainment control unit • Wire harness and connector • Battery/charging system
B1400-17	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Head unit takes 10 ms as a detection cycle, if the power supply voltage is detected for 2 s: U ⩾ 18.8 ± 0.2 V, enter high voltage detection state.	Cycle (10 ms)	Head unit takes 10 ms as a detection cycle, if the power supply voltage is detected for 2 s • Record current fault and historical fault in entertainment domain when U ⩾ 16.8 ± 0.2 V • Record current fault and historical fault in safety domain when U ⩾ 18.8 ± 0.2 V	• Infotainment control unit • Wire harness and connector • Battery/charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B140016	No display output, no sound output, no analog/digital input and output (except CAN communication and Ethernet communication)	Not come on
B140017	No display output, no sound output, no analog/digital input and output (except CAN communication and Ethernet communication)	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check infotainment control unit fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the infotainment control unit fuse.

(d) According to value in the table, measure resistance.

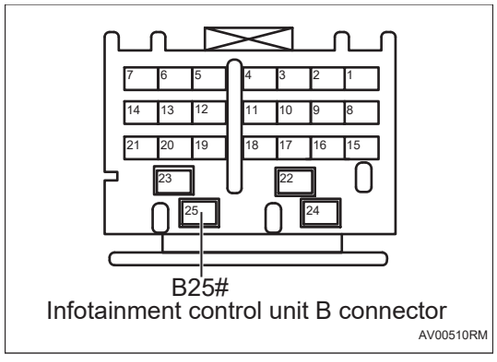
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	Check infotainment control unit ground



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) According to value in the table, measure resistance.

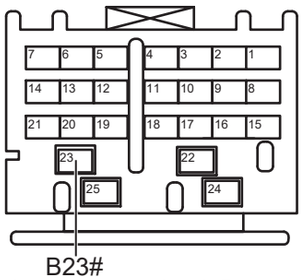
Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B25# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check infotainment control unit power supply**



B23#
Infotainment control unit B connector
AV00521RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B23# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace infotainment control unit (See page ZC-89)

DTC	**B140100**	**Front left microphone assembly (MIC1) fault**
DTC	**B140200**	**Front right microphone assembly (MIC2) fault**
DTC	**B140300**	**Rear left microphone assembly or front exterior microphone (MIC3) fault**

DTC	B140400	Rear right microphone assembly or rear exterior microphone (MIC4) fault

Description

When the microphone circuit is faulty, the infotainment control unit records DTC.

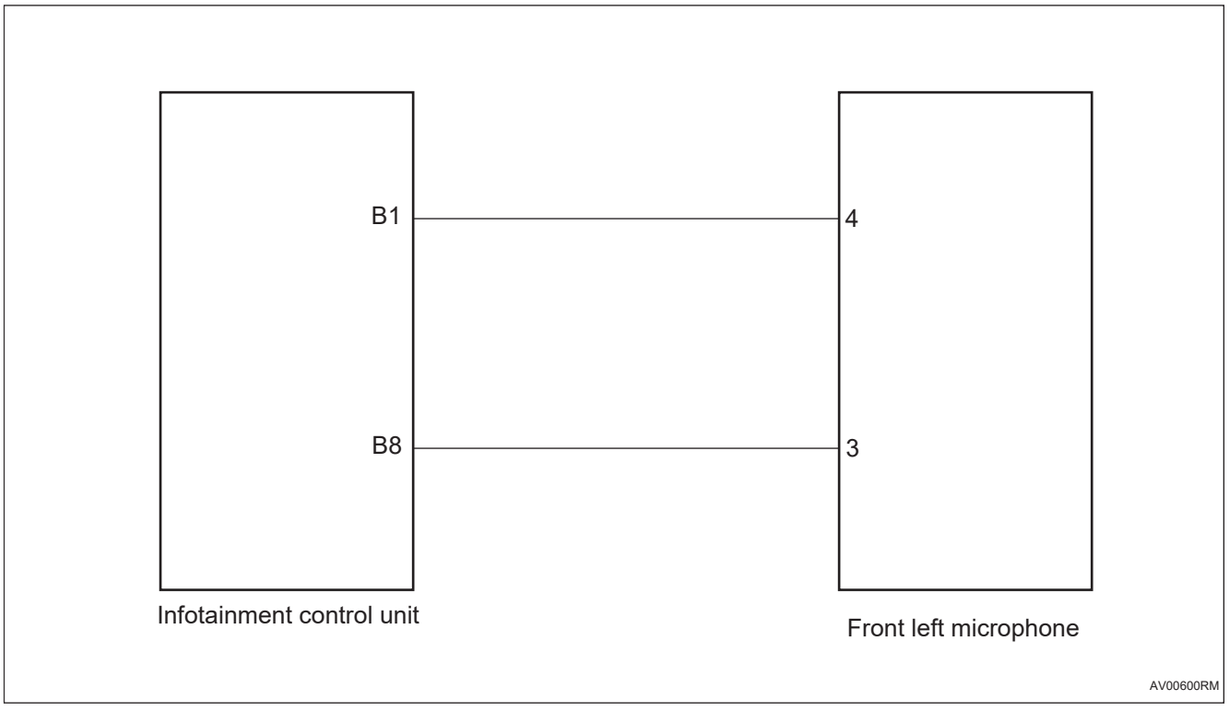
DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B14010-0	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred. The following description is the voltage range, and the following judgments need to be executed after being converted into voltage values. When the voltage is detected to be higher than 8.5 V, it is short circuit (BATT). When the voltage is detected to be lower than 1 V, it is short circuit (GND). When the voltage is detected to be between 6 V and 8 V, it is open circuit	Cycle (100 ms)	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred	• Infotainment control unit • Wire harness and connector • Front left microphone
B14020-0	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred. The following description is the voltage range, and the following judgments need to be executed after being converted into voltage values. When the voltage is detected to be higher than 8.5 V, it is short circuit (BATT). When the voltage is detected to be lower than 1 V, it is short circuit (GND). When the voltage is detected to be between 6 V and 8 V, it is open circuit	Cycle (100 ms)	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred	• Infotainment control unit • Wire harness and connector • Front right microphone
B14030-0	• Voltage is between 9 V and 16 V • Ignition switch is in ON	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred. The following description is the voltage range, and the following judgments need to be executed after being converted into voltage values. When the voltage is detected to be higher than 8.5 V, it is short circuit (BATT). When the voltage is detected to be lower than 1 V, it is short circuit (GND). When the voltage is detected to be between 6 V and 8 V, it is open circuit	Cycle (100 ms)	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred	• Infotainment control unit • Wire harness and connector • Rear left microphone

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
	position, after 500 ms				
B14040-0					
	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred. The following description is the voltage range, and the following judgments need to be executed after being converted into voltage values. When the voltage is detected to be higher than 8.5 V, it is short circuit (BATT). When the voltage is detected to be lower than 1 V, it is short circuit (GND). When the voltage is detected to be between 6 V and 8 V, it is open circuit	Cycle (100 ms)	During power on, it is detected only once. The head unit reads the corresponding AD value for 5 consecutive times with a cycle of 100 ms to determine whether a short circuit or open circuit fault has occurred	• Infotainment control unit • Wire harness and connector • Rear right microphone

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B140100	Microphone 1 has no input signal	Not come on
B140200	Microphone 2 has no input signal	Not come on
B140300	Microphone 3 has no input signal	Not come on
B140400	Microphone 4 has no input signal	Not come on

Circuit diagram



Inspection procedure

Note: Taking the front left microphone fault as an example, the fault analysis steps for other microphones are similar.

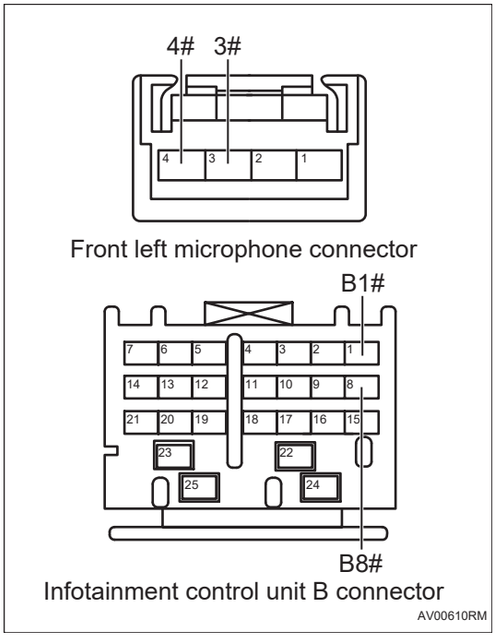
1	**Check front left microphone connector**

(a) Check front left microphone connector for looseness or damage.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in front left microphone wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the front left microphone connector.

(e) According to value in the table, measure resistance.

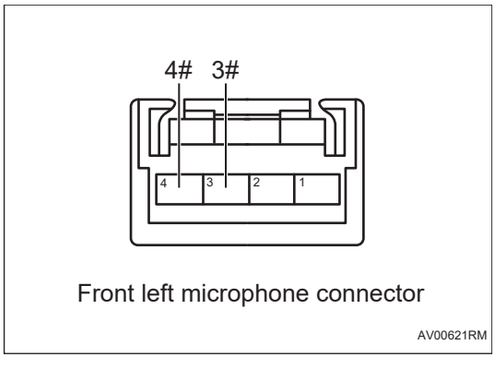
Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B1# - front left microphone connector 4#	Always connected	Less than 1 Ω
Infotainment control unit connector B8# - front left microphone connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left microphone wire harness and connector**



(a) According to value in the table, measure resistance.

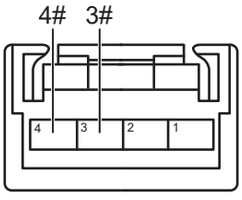
Standard value

Multimeter connection	Detection condition	Specified condition
Front left microphone connector 4# - body ground	Always connected	10 KΩ or more
Front left microphone connector 3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in front left microphone wire harness and connector



Front left microphone connector

AV00621RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left microphone connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left microphone connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace front left microphone (See page ZC-96)

(a) Replace the front left microphone.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140302**	**HUD screen LVDS communication fault**
DTC	**B140301**	**HUD screen LVDS circuit abnormal connection**

Description

When the head up display LVDS circuit is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1403-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Head unit recognizes that the ERROR pin is low, and reads the register through I2C, it identifies the open/short to power supply/ short to ground. When any abnormal condition of them is found, 3 times of 200 ms debounce processing will be performed. If the status remains stable, the abnormal state will be confirmed.	Interrupt	Head unit recognizes that the ERROR pin is low, and reads the register through I2C, it identifies the open/ short to power supply/ short to ground, and performs the anti-vibration three times for 200 ms after identifying one of the abnormalities, if the status remains stable, it records the current fault and history fault.	• Infotainment control unit • Wire harness and connector • Head up display
B1403-01	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Head unit recognizes that the ERROR pin is low, and reads the register through I2C to determine if the loop link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed	Interrupt	Head unit recognizes that the ERROR pin is low, and reads the register through I2C to determine if the loop link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status is confirmed, the current fault and historical fault will be recorded	• Infotainment control unit • Wire harness and connector • Head up display

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B140302	HUD screen abnormal display	Not come on
B140301	HUD screen abnormal display	Not come on

Inspection procedure

1	**Check head up display LVDS wire harness and connector**

(a) Check head up display LVDS wire harness connector for looseness or damage.

(b) Check for short in head up display LVDS wire harness and connector.

(c) Check for open in head up display LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace head up display (See page ZC-114)**

(a) Replace the head up display.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140500**	**Power amplifier assembly A2B fault**
DTC	**B140501**	**External power amplifier A2B fault - short to power supply in A2B**
DTC	**B140502**	**External power amplifier A2B fault - short to ground in A2B**
DTC	**B140503**	**External power amplifier A2B fault - short in A2B data lines A2B_P and A2B_N**
DTC	**B141602**	**HAD camera LVDS fault**

ZD

Description

When A2B circuit is faulty, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1405-00	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After the power mode enters Standby or Driving, the head unit recognizes the A2B interrupt signal, then the system detects A2B diagnostic memory as an error signal, and determines that it is an A2B failure state.	Interrupt	After the power mode enters Standby or Driving, the head unit uses scanning as the detection method. If it is detected that A2B diagnostic register is a incorrect signal, record the current fault and historical fault	• Power amplifier • A2B wire harness • Infotainment control unit
B1405-01	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After the power mode enters Standby or Driving, the head unit recognizes the A2B interrupt signal, then the system detects A2B diagnostic memory as an error signal, and determines that it is an A2B failure state.	Interrupt	After the power mode enters Standby or Driving, the head unit uses scanning as the detection method. If it is detected that A2B diagnostic register is a incorrect signal, record the current fault and historical fault	• Power amplifier • A2B wire harness • Infotainment control unit
B1405-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After the power mode enters Standby or Driving, the head unit recognizes the A2B interrupt signal, then the system detects A2B diagnostic memory as an error signal, and determines that it is an A2B failure state.	Interrupt	After the power mode enters Standby or Driving, the head unit uses scanning as the detection method. If it is detected that A2B diagnostic register is a incorrect signal, record the current fault and historical fault	• Power amplifier • A2B wire harness • Infotainment control unit

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1405-03	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After the power mode enters Standby or Driving, the head unit recognizes the A2B interrupt signal, then the system detects A2B diagnostic memory as an error signal, and determines that it is an A2B failure state.	Interrupt	After the power mode enters Standby or Driving, the head unit uses scanning as the detection method. If it is detected that A2B diagnostic register is a incorrect signal, record the current fault and historical fault	• Power amplifier • A2B wire harness • Infotainment control unit
B1416-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Distinguish scenarios: When data stream is being transmitted, the link status is detected once every 1 second. If change in status is detected, it is considered a fault; When the data stream is not being transmitted, the link status is detected once every 50 seconds. If change in status is detected, it is considered a fault	Period	Distinguish scenarios: When data stream is being transmitted, the link status is detected once every 1 second. If change in status is detected, it is recorded a fault; When the data stream is not being transmitted, the link status is detected once every 50 seconds. If change in status is detected, it is recorded a fault	• Power amplifier • A2B wire harness • Infotainment control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B140500	No audio output	Not come on
B140501	No audio output	Not come on
B140502	No audio output	Not come on
B140503	No audio output	Not come on
B141602	Display abnormally	Not come on

Inspection procedure

1	**Check power amplifier A2B wire harness and connector**

(a) Check power amplifier A2B wire harness connector for looseness or damage.

(b) Check for short in power amplifier A2B wire harness and connector.

(c) Check for open in power amplifier A2B wire harness and connector.

NG → **Perform repair according to malfunction**

OK

2	**Replace power amplifier (See page ZC-91)**

(a) Replace the power amplifier.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140544**	**Built-in power amplifier pedestrian warning device drive 1 fault**
DTC	**B140542**	**Built-in power amplifier pedestrian warning device drive 1 fault - open**

Description

When the built-in amplifier pedestrian warning device driver is faulty, the infotainment control unit records DTC.

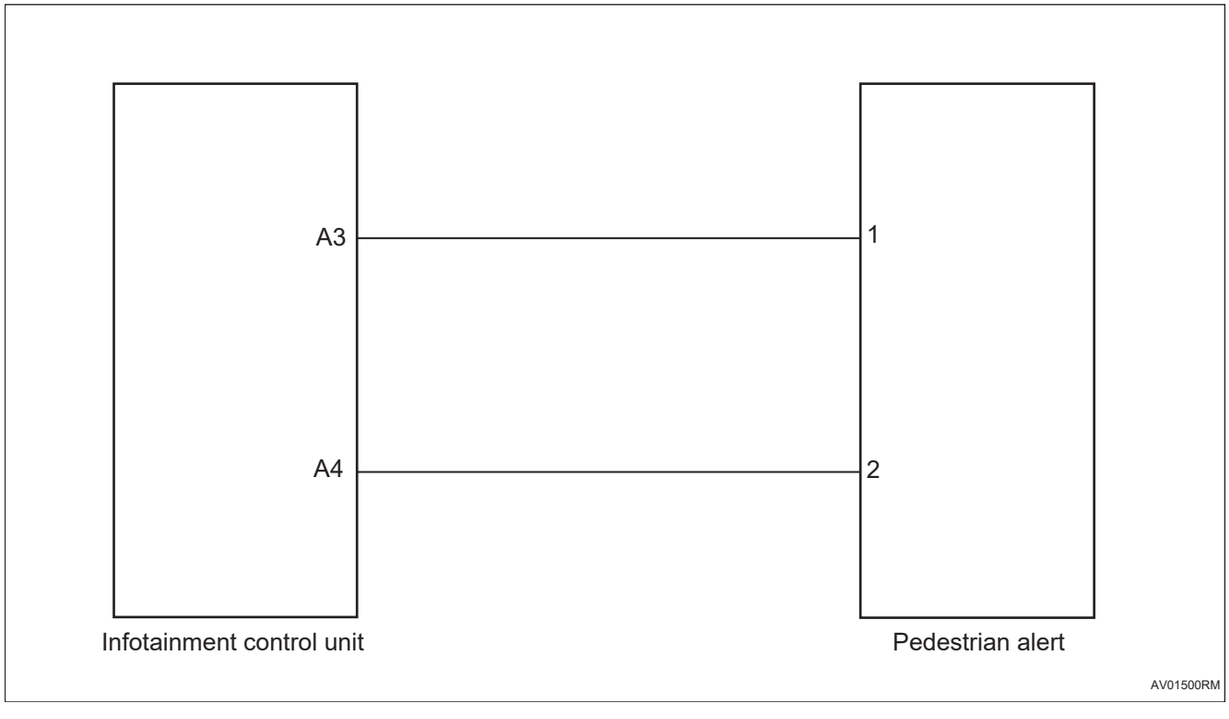
DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1405-44	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	No audio output Software processing Interrupt trigger (full diagnosis at startup)	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	• Infotainment control unit • Wire harness and connector • Pedestrian alert
B1405-42	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier pedestrian warning channel open status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier pedestrian warning channel open status	• Infotainment control unit • Wire harness and connector • Pedestrian alert

ZD

Fault symptom

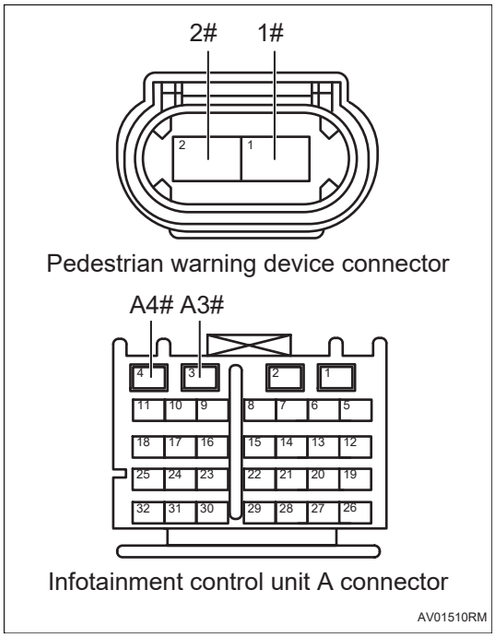
DTC No.	Fault symptom	Warning light/indicator
B140544	No audio output	Not come on
B140542	No audio output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in pedestrian warning device wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the pedestrian warning device connector.

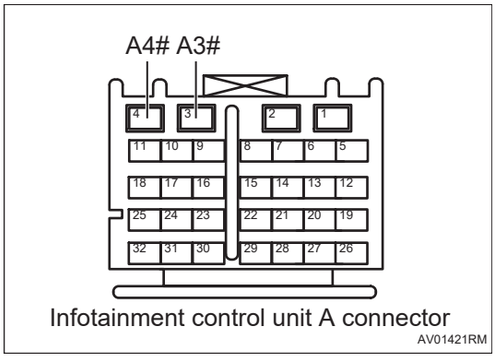
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Pedestrian warning device connector 1# - infotainment control unit connector A3#	Always connected	Less than 1 Ω
Pedestrian warning device connector 2# - infotainment control unit connector A4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in pedestrian warning device wire harness and connector**



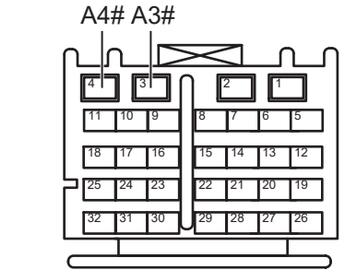
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A3# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector A4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in pedestrian warning device wire harness and connector**



Infotainment control unit A connector
AV01421RM

(a) According to value in the table, measure resistance.

Standard value

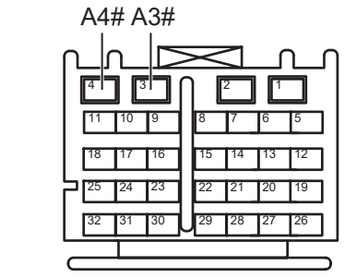
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Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A3# - infotainment control unit connector A4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in pedestrian warning device wire harness and connector**



Infotainment control unit A connector
AV01421RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A3# - body ground	Always connected	Less than 1 V
Infotainment control unit connector A4# - body ground	Always connected	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace pedestrian warning device (See page ZC-118)**

(a) Replace the pedestrian warning device.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	B14074B	System high temperature fault

Description

When the infotainment control unit temperature is too high, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1407-4B	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Head unit performs high temperature abnormal judgment based on board-to-board temperature detected by MCU: When a temperature above 92° C is detected, with a detection cycle of 500 ms, if it is detected 5 times continuously, a high temperature abnormal state is determined and DTC is recorded. When a temperature above 95° C is detected, with a detection cycle of 500 ms, if it is detected 5 times continuously, the MCU enters a high temperature abnormal state, and the SOC powers off.	Cycle (500 ms)	When the head unit determines an abnormal SOC temperature (refer to the fault determination strategy), it will perform fault diagnosis. Record current fault and history fault	• Infotainment control unit • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14074B	SOC temperature abnormal	Not come on

ZD

Inspection procedure

1	Infotainment control unit cooling

(a) Lower the infotainment control unit temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140A00**	**USB1 interface fault**
DTC	**B140B00**	**USB2 interface fault**

Description

When USB interface is faulty, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B140-A00	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	FAULT is detected, abnormal overcurrent is confirmed by debounce for 200 ms 3 times	Interrupt	FAULT is detected, low level is confirmed by debounce for 200 ms 3 times, overcurrent is determined and DTC is recorded	• Wire harness and connector • USB-TYPE A port • Infotainment control unit
B140-B00	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	FAULT is detected, abnormal overcurrent is confirmed by debounce for 200 ms 3 times	Interrupt	FAULT is detected, low level is confirmed by debounce for 200 ms 3 times, overcurrent is determined and DTC is recorded	• Wire harness and connector • USB-TYPE C • Infotainment control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B140A00	USB device cannot be connected, data cannot be transferred, power supply is cut off.	Not come on
B140B00	USB device cannot be connected, data cannot be transferred, power supply is cut off.	Not come on

Inspection procedure

1	**Check USB-TYPE interface**

(a) Check for foreign objects in USB-TYPE interface.

(b) Check if USB-TYPE interface is damaged or deformed.

NG → **Perform repair according to malfunction**

OK

2	Check USB-TYPE interface wire harness and connector

(a) Check head up display USB-TYPE wire harness connector for looseness or damage.

(b) Check for short in head up display USB-TYPE wire harness and connector.

(c) Check for open in head up display USB-TYPE wire harness and connector.

NG → Perform repair according to malfunction

ZD

OK

3	Replace USB-TYPE A port/USB-TYPE C port (See page ZC-11)

(a) Replace the USB-TYPE A port/USB-TYPE C port.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace infotainment control unit (See page ZC-89)

OK

Diagnosis ends

DTC	**B141002**	**Main display assembly LVDS communication fault**
DTC	**B141001**	**Main display assembly LVDS circuit abnormal connection**
DTC	**B141003**	**Central control display LVDS circuit abnormal connection - unlink**

Description

When the middle display LVDS circuit is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1410-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Triggers the register that read the serial chip through I2C in the form of an interrupt, and recognizes the short circuit to power supply/short to ground. When any abnormal condition of them is found, 3 times of 200 ms debounce processing will be performed. If the status remains stable, the abnormal state will be confirmed.	Interrupt	Triggers the register that read the serial chip through I2C in the form of an interrupt, and recognizes the short circuit to power supply/ short to ground, and performs the anti-vibration three times for 200 ms after identifying one of the abnormalities, if the status remains stable, it records the current fault and history fault.	• Infotainment control unit • Wire harness and connector • Middle display
B1410-01	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Triggers the register that read the serial chip through I2C in the form of an interrupt to determine if the loop link connection is abnormal. When any abnormal condition of them is found, 3 times of 200 ms debounce processing will be performed. If the status remains stable, the abnormal state will be confirmed.	Interrupt	Triggers the register that read the serial chip through I2C in the form of an interrupt to determine if the loop link connection is abnormal. When any abnormal condition of them is found, 3 times of 200 ms debounce processing will be performed. If the status remains stable, the abnormal state will be confirmed.	• Infotainment control unit • Wire harness and connector • Middle display
	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	Triggers the register that read the serial chip through I2C in the form of an interrupt to determine if the loop link connection is abnormal. When the abnormality is recognized, it will perform anti-vibration three times for 200 ms, and if the status remains stable, then the abnormality status will be confirmed.	Interrupt	Triggers the register that read the serial chip through I2C in the form of an interrupt to determine if the loop link connection is abnormal. When the abnormality is recognized, it will perform anti-vibration three times for 200 ms, and if the status remains stable, then the abnormality status will be confirmed.	• Infotainment control unit • Wire harness and connector • Middle display

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B141002	Central control display abnormal	Not come on
B141001	Central control display abnormal	Not come on
B141003	Central control display abnormal	Not come on

Inspection procedure

1	**Check middle display LVDS wire harness and connector**

(a) Check middle display LVDS wire harness connector for looseness or damage.

(b) Check for short in middle display LVDS wire harness and connector.

(c) Check for open in middle display LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace middle display (See page ZC-85)**

(a) Replace the middle display.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

ZD

Diagnosis ends

DTC	**B141302**	**AVM 4-way camera LVDS circuit abnormal connection**
DTC	**B141301**	**AVM rear camera LVDS fault**
DTC	**B141303**	**AVM left camera LVDS fault**
DTC	**B141304**	**AVM right camera LVDS fault**

Description

When the four panoramic view cameras display LVDS loop connection is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1413-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Front panoramic camera • Rear panoramic camera • Left panoramic camera • Right panoramic camera
B1413-01	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Rear panoramic camera

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1413-03	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Left panoramic camera
B1413-04	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Right panoramic camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B141302	Display abnormally	Not come on
B141301	Display abnormally	Not come on
B141303	Display abnormally	Not come on
B141304	Display abnormally	Not come on

Inspection procedure

1	**Check front panoramic camera LVDS wire harness and connector**

(a) Check front panoramic camera LVDS wire harness connector for looseness or damage.

(b) Check for short in front panoramic camera LVDS wire harness and connector.

(c) Check for open in front panoramic camera LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear panoramic camera LVDS wire harness and connector**

(a) Check rear panoramic camera LVDS wire harness connector for looseness or damage.

(b) Check for short in rear panoramic camera LVDS wire harness and connector.

(c) Check for open in rear panoramic camera LVDS wire harness and connector.

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check left panoramic camera LVDS wire harness and connector**

(a) Check left panoramic camera LVDS wire harness connector for looseness or damage.

(b) Check for short in left panoramic camera LVDS wire harness and connector.

(c) Check for open in left panoramic camera LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check right panoramic camera LVDS wire harness and connector**

(a) Check right panoramic camera LVDS wire harness connector for looseness or damage.

(b) Check for short in right panoramic camera LVDS wire harness and connector.

(c) Check for open in right panoramic camera LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK ↓

5	**Replace front/rear/left/right panoramic camera (See page ZC-146) (See page ZC-152) (See page ZC-148)**

(a) Replace the front/rear/left/right panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK ↓

Diagnosis ends

DTC	**B141402**	**Driver status monitoring camera assembly (DMS) camera LVDS circuit abnormal connection**

Description

When the driver monitoring camera LVDS loop connection is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1414-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed. * When the information safety switch is set to OFF, DTC is not recorded.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Driver monitoring camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B141402	Display abnormally	Not come on

Inspection procedure

1	Check driver monitoring camera LVDS wire harness and connector

(a) Check driver monitoring camera LVDS connector for looseness or damage.

(b) Check for short in driver monitoring camera LVDS wire harness and connector.

(c) Check for open in driver monitoring camera LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Replace driver monitoring camera (See page ZC-137)

(a) Replace the driver monitoring camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	B141502	Intelligent interior monitoring front camera assembly (OMS) camera LVDS circuit abnormal connection

Description

When the front passenger monitoring camera LVDS circuit connection is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1415-02	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the abnormal status will be confirmed. * When the information safety switch is set to OFF, DTC is not recorded.	Interrupt	The CSC head unit recognizes that the LOCK pin is low level and reads the registers via I2C to determine if the circuit link connection is abnormal. If it is abnormal, anti-vibration treatment of 200 ms will be carried out 3 times. If the status remains stable, the current fault and historical fault will be recorded.	• Infotainment control unit • Wire harness and connector • Front passenger monitoring camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B141502	Display abnormally	Not come on

Inspection procedure

1	**Check front passenger monitoring camera LVDS wire harness and connector**

(a) Check if front passenger monitoring camera LVDS wire harness connector is loose or damaged.

(b) Check for short in front passenger monitoring camera LVDS wire harness and connector.

(c) Check for open in front passenger monitoring camera LVDS wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace front passenger monitoring camera (See page ZC-144)**

(a) Replace the front passenger monitoring camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	B142000	Panoramic camera not calibrated

Description

When panoramic camera is uncalibrated, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1420-00	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	The AVM application checks the locally stored calibrated camera serial number when the camera node is turned on, and it is determined as uncalibratedt when the local calibrated camera serial number does not exist, or does not match the current access camera serial number. When the local calibration file is turned on in the AVM application, if the calibration file is lost or damaged, it is determined as uncalibrated.	Detection	The AVM application checks the locally stored calibrated camera serial number when the camera node is turned on, and DTC is recorded when the local calibrated camera serial number does not exist, or does not match the current access camera serial number. When the local calibration file is turned on in the AVM application, if the calibration file is lost or damaged, DTC is recorded.	• Infotainment control unit • Front panoramic camera • Rear panoramic camera • Left panoramic camera • Right panoramic camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B142000	AVM image splicing display abnormalities such as ghosting, misalignment,	Not come on

Inspection procedure

1	Perform calibration procedure for panoramic camera

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform the calibration procedure for panoramic camera.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

Yes → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140144**	**Built-in power amplifier front left drive fault**
DTC	**B140142**	**Built-in power amplifier front left drive fault - open**

Description

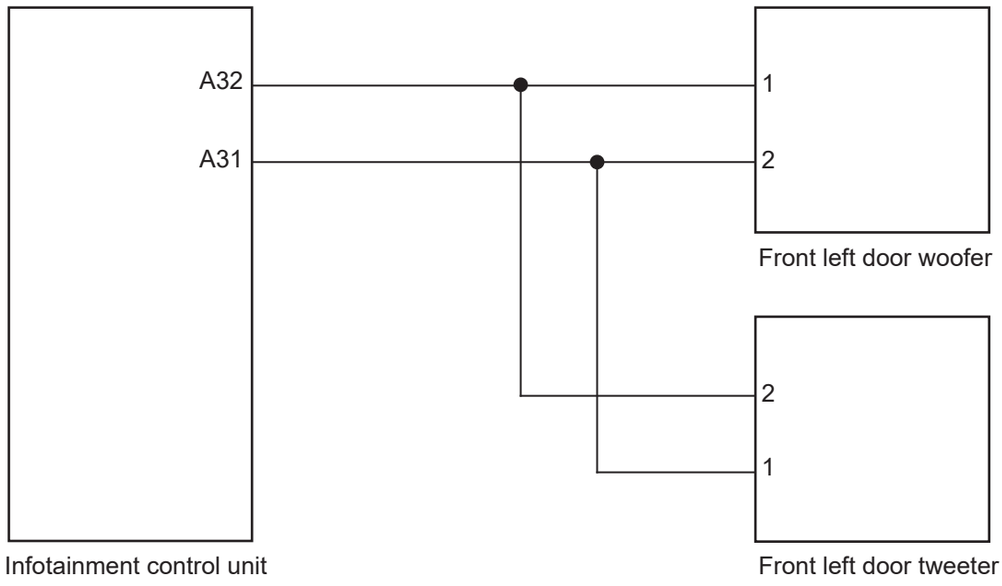
When the built-in amplifier front left drive is faulty, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Fault judgment strategy	Monitoring type	Record DTC strategy	Faulty area
B1401-44	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front left channel short to VCC/GND status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front left channel short to VCC/GND status	• Infotainment control unit • Wire harness and connector • Front left door tweeter • Front left door woofer
B1401-42	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier front left channel open status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier front left channel open status	• Infotainment control unit • Wire harness and connector • Front left door tweeter • Front left door woofer

Fault symptom

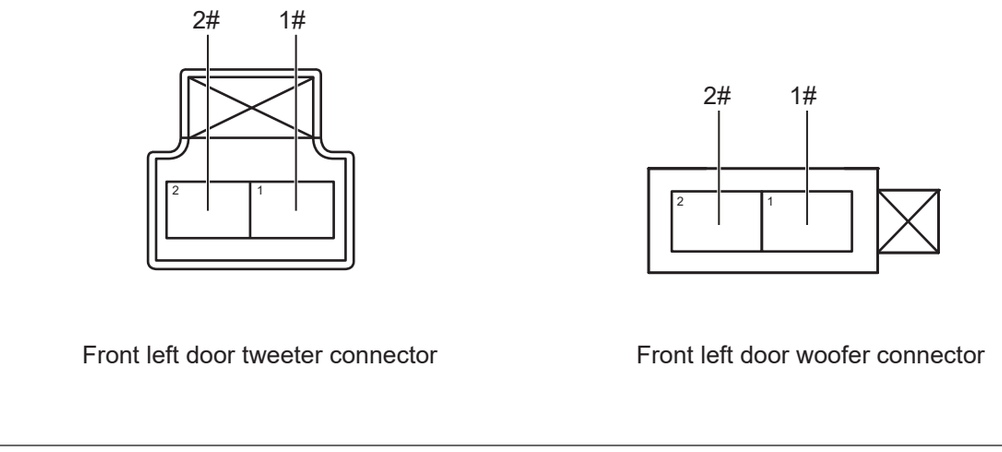
DTC No.	Fault symptom	Warning light/indicator
B140144	No audio output	Not come on
B140142	No audio output	Not come on

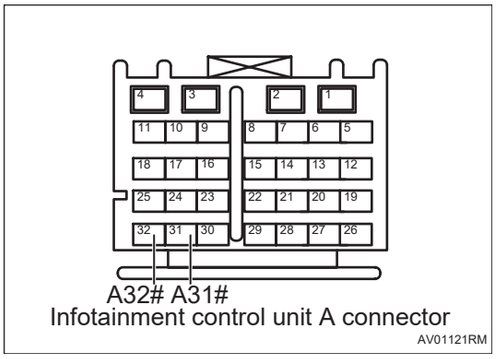
Circuit diagram



Inspection procedure

1	**Check for open in front left door speaker wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the front left door woofer connector.

(e) Disconnect the front left door tweeter connector.

(f) According to value in the table, measure resistance.

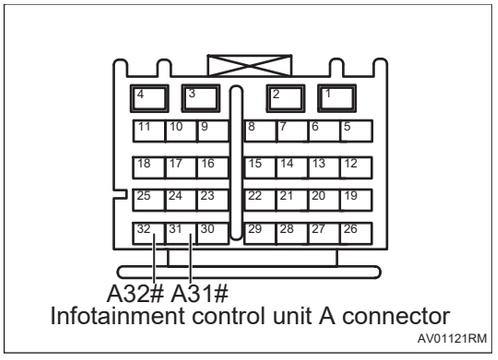
Multimeter connection	Detection condition	Specified condition
Front left door woofer connector 1# - infotainment control unit connector A32#	Always connected	Less than 1 Ω
Front left door woofer connector 2# - infotainment control unit connector A31#	Always connected	Less than 1 Ω
Front left door tweeter connector 2# - infotainment control unit connector A32#	Always connected	Less than 1 Ω
Front left door tweeter connector 1# - infotainment control unit connector A31#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2 **Check for short to ground in front left door speaker wire harness and connector**



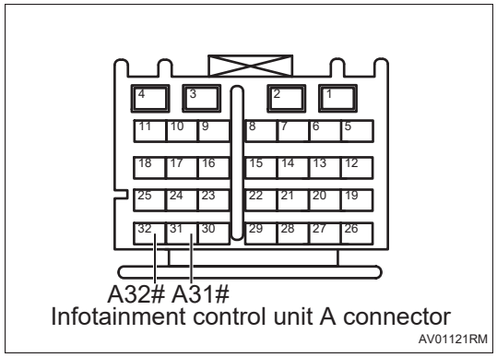
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A32# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector A31# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in front left door speaker wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

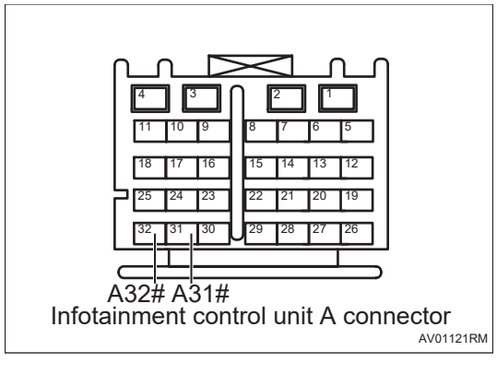
.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A32# - infotainment control unit connector A31#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door speaker wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A32# - body ground	Always connected	Less than 1 V
Infotainment control unit connector A31# - body ground	Always connected	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left door woofer/front left door tweeter (See page ZC-93)**

(a) Replace the front left door woofer/front left door tweeter.

ZD

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140244**	**Built-in power amplifier front right drive fault**
DTC	**B140242**	**Built-in power amplifier front right drive fault - open**

Description

When the built-in amplifier front right drive is faulty, the infotainment control unit records DTC.

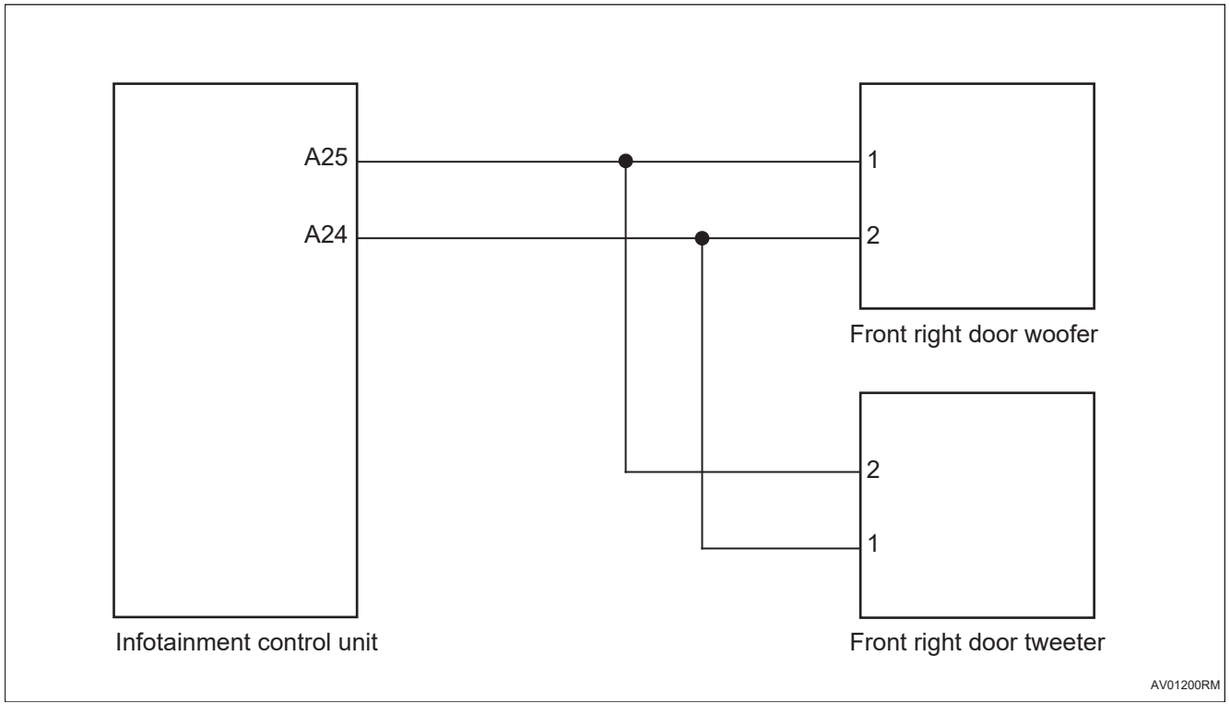
DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1402-44	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	• Infotainment control unit • Wire harness and connector • Front right door tweeter • Front right door woofer
B1402-42	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier front right channel open status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier front right channel open status	• Infotainment control unit • Wire harness and connector • Front right door tweeter • Front right door woofer

ZD

Fault symptom

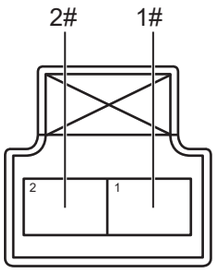
DTC No.	Fault symptom	Warning light/indicator
B140244	No audio output	Not come on
B140242	No audio output	Not come on

Circuit diagram

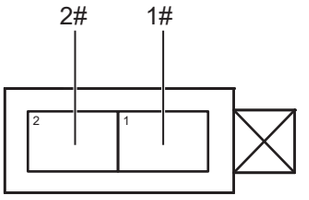


Inspection procedure

1	**Check for open in front right door speaker wire harness and connector**

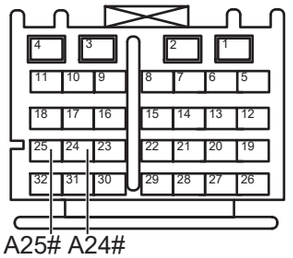


Front right door tweeter connector



Front right door woofer connector

AV01210RM



Infotainment control unit A connector

AV01221RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the front right door woofer connector.

(e) Disconnect the front right door tweeter connector.

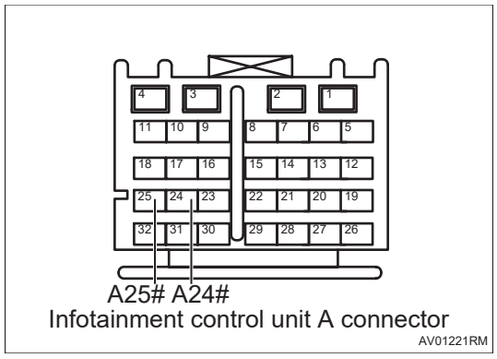
(f) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Front right door woofer connector 1# - infotainment control unit connector A25#	Always connected	Less than 1 Ω
Front right door woofer connector 2# - infotainment control unit connector A24#	Always connected	Less than 1 Ω
Front right door tweeter connector 2# - infotainment control unit connector A25#	Always connected	Less than 1 Ω
Front right door tweeter connector 1# - infotainment control unit connector A24#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front right door speaker wire harness and connector**



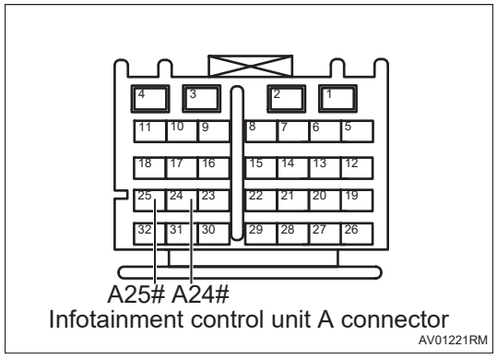
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A25# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector A24# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in front right door speaker wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

.

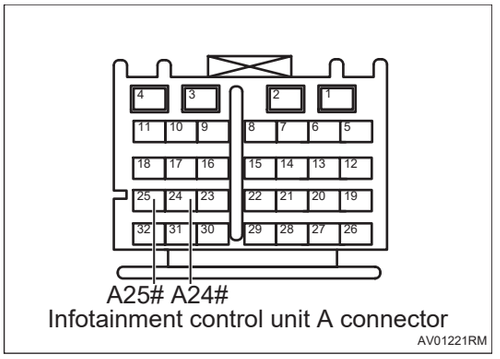
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A25# - infotainment control unit connector A24#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front right door speaker wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A25# - body ground	Always connected	Less than 1 V
Infotainment control unit connector A24# - body ground	Always connected	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front right door woofer/front right door tweeter (See page ZC-93)**

(a) Replace the front right door woofer/front right door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	B140344	Built-in power amplifier rear left drive fault
DTC	B140342	Built-in power amplifier rear left drive fault - open

Description

When the built-in amplifier rear left drive is faulty, the infotainment control unit records DTC.

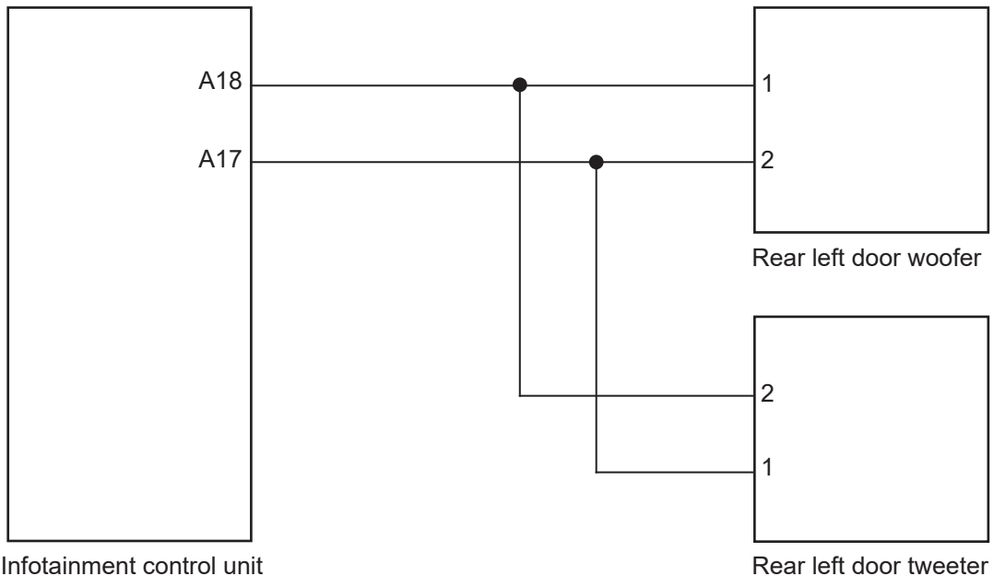
DTC No.	Prerequisites for fault	Fault judgment strategy	Detection type	Record DTC strategy	Faulty area
B1403-44	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	• Infotainment control unit • Wire harness and connector • Rear left door tweeter • Rear left door woofer
B1403-42	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier rear left channel open status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier rear left channel open status	• Infotainment control unit • Wire harness and connector • Rear left door tweeter • Rear left door woofer

ZD

Fault symptom

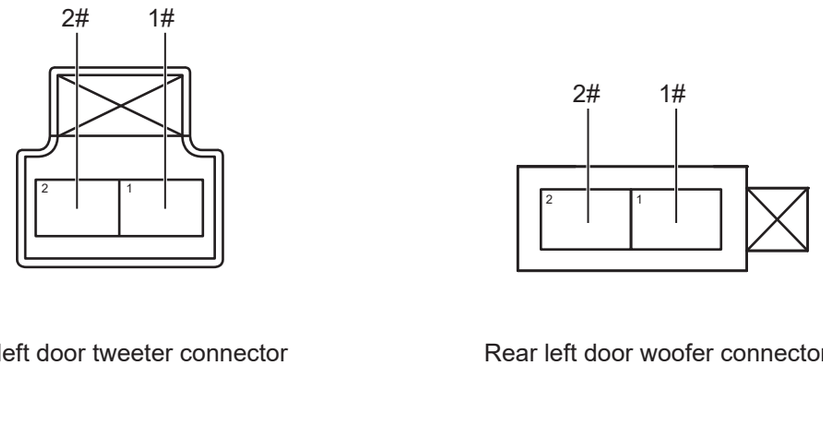
DTC No.	Fault symptom	Warning light/indicator
B140344	No audio output	Not come on
B140342	No audio output	Not come on

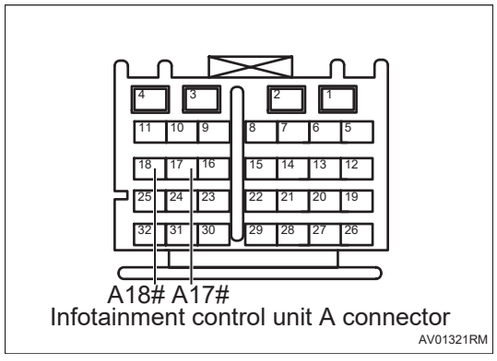
Circuit diagram



Inspection procedure

1	**Check for open in rear left door speaker wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the rear left door woofer connector.

(e) Disconnect the rear left door tweeter connector.

(f) According to value in the table, measure resistance.

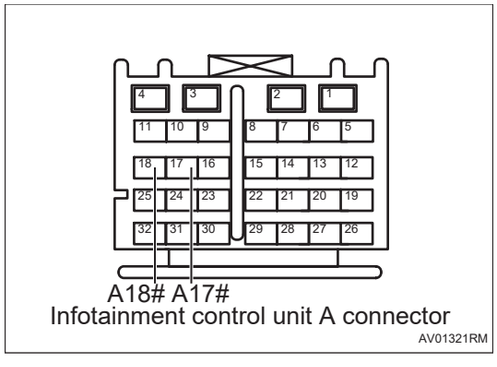
Multimeter connection	Detection condition	Specified condition
Rear left door woofer connector 1# - infotainment control unit connector A18#	Always connected	Less than 1 Ω
Rear left door woofer connector 2# - infotainment control unit connector A17#	Always connected	Less than 1 Ω
Rear left door tweeter connector 2# - infotainment control unit connector A18#	Always connected	Less than 1 Ω
Rear left door tweeter connector 1# - infotainment control unit connector A17#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left door speaker wire harness and connector**



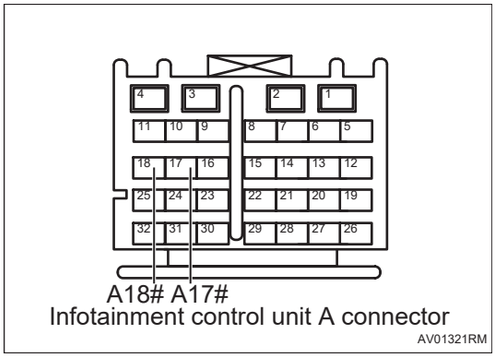
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A18# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector A17# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in rear left door speaker wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

.

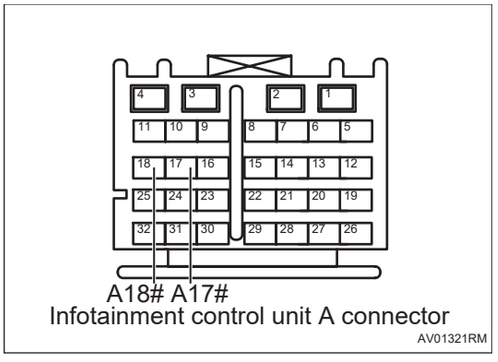
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A18# - infotainment control unit connector A17#	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left door speaker wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A18# - body ground	Always connected	Less than 1 V
Infotainment control unit connector A17# - body ground	Always connected	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left door woofer/rear left door tweeter (See page ZC-93)**

(a) Replace the rear left door woofer/rear left door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B140444**	**Built-in power amplifier rear right drive fault**
DTC	**B140442**	**Built-in power amplifier rear right drive fault - open**

Description

When the built-in amplifier rear right drive is faulty, the infotainment control unit records DTC.

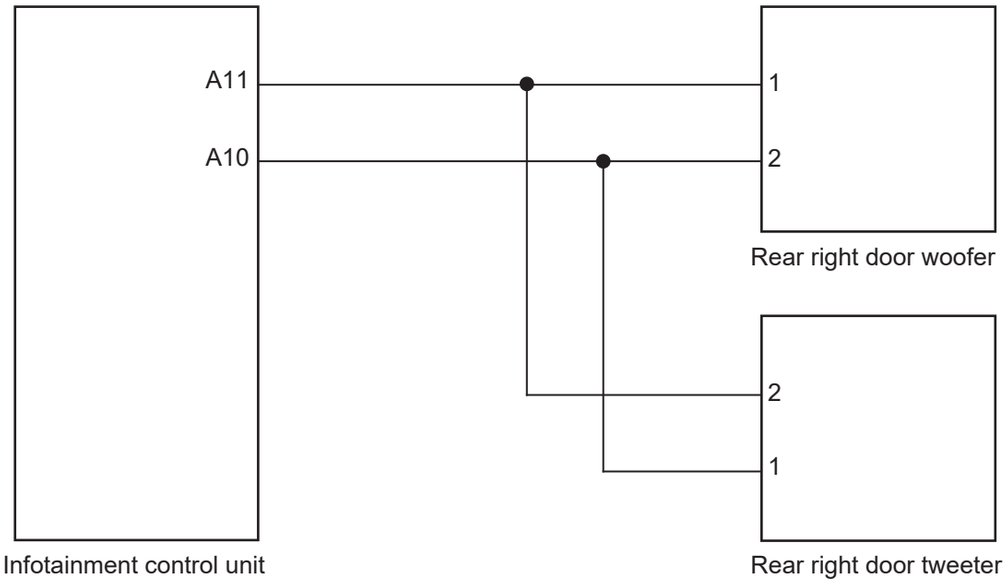
DTC No.	Prerequisites for fault	Fault judgment strategy	Monitoring type	Record DTC strategy	Faulty area
B1404-44	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is overcurrent in DB register, if it is overcurrent, report the built-in power amplifier front right channel short to VCC/GND status	• Infotainment control unit • Wire harness and connector • Rear right door tweeter • Rear right door woofer
B1404-42	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier rear right channel open status	Interrupt the triggering (power on for full diagnostics)	After triggering is interrupted, read if there is open in DB register, if it is open, report the built-in power amplifier rear right channel open status	• Infotainment control unit • Wire harness and connector • Rear right door tweeter • Rear right door woofer

ZD

Fault symptom

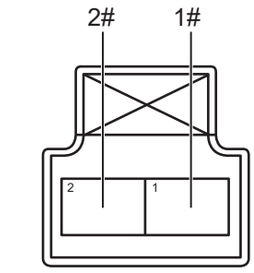
DTC No.	Fault symptom	Warning light/indicator
B140444	No audio output	Not come on
B140442	No audio output	Not come on

Circuit diagram

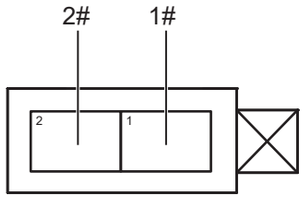


Inspection procedure

1	**Check for open in rear right door speaker wire harness and connector**

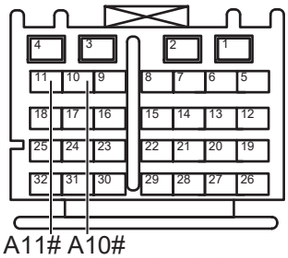


Rear right door tweeter connector



Rear right door woofer connector

AV01410RM



Infotainment control unit A connector

AV01421RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the rear right door woofer connector.

(e) Disconnect the rear right door tweeter connector.

(f) According to value in the table, measure resistance.

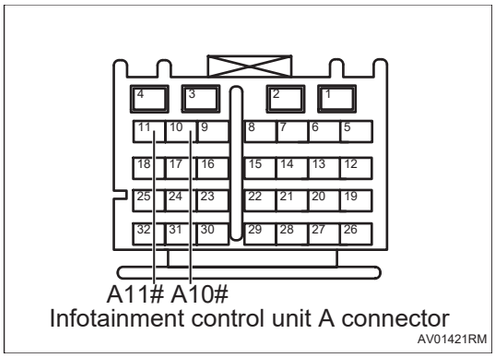
Multimeter connection	Detection condition	Specified condition
Rear right door woofer connector 1# - infotainment control unit connector A11#	Always connected	Less than 1 Ω
Rear right door woofer connector 2# - infotainment control unit connector A10#	Always connected	Less than 1 Ω
Rear right door tweeter connector 2# - infotainment control unit connector A11#	Always connected	Less than 1 Ω
Rear right door tweeter connector 1# - infotainment control unit connector A10#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to ground in rear right door speaker wire harness and connector**



(a) According to value in the table, measure resistance.

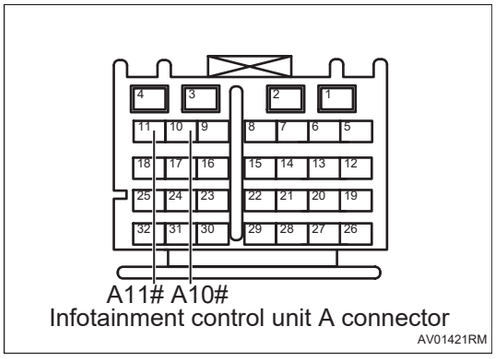
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A11# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector A10# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in rear right door speaker wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

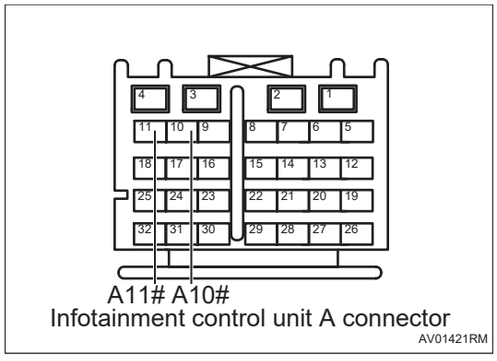
.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A11# - infotainment control unit connector A10#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right door speaker wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector A11# - body ground	Always connected	Less than 1 V
Infotainment control unit connector A10# - body ground	Always connected	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear right door woofer/rear right door tweeter (See page ZC-93)**

(a) Replace the rear right door woofer/rear right door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

ZD

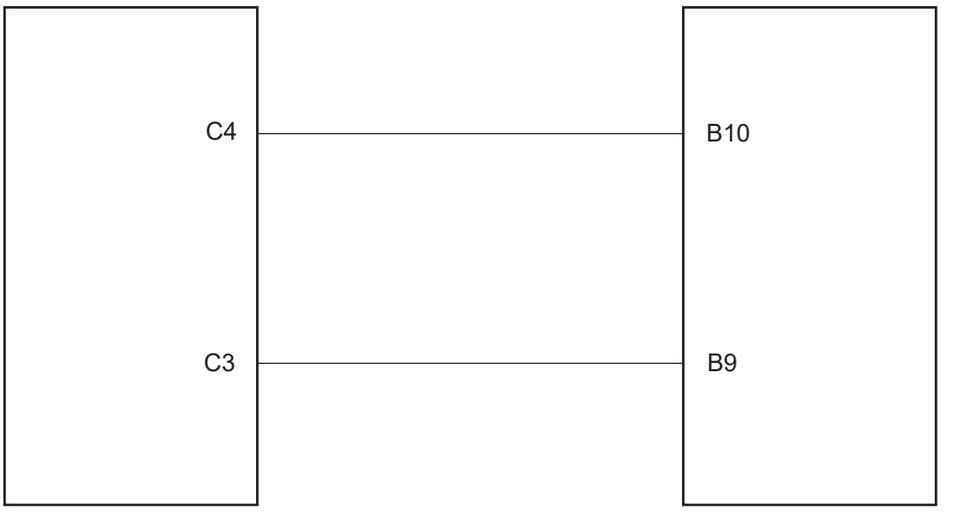
DTC	U14468A	CSC backbone network Eth1 connection establishment failure

Description

When infotainment control unit Ethernet is faulty, the infotainment control unit records DTC.

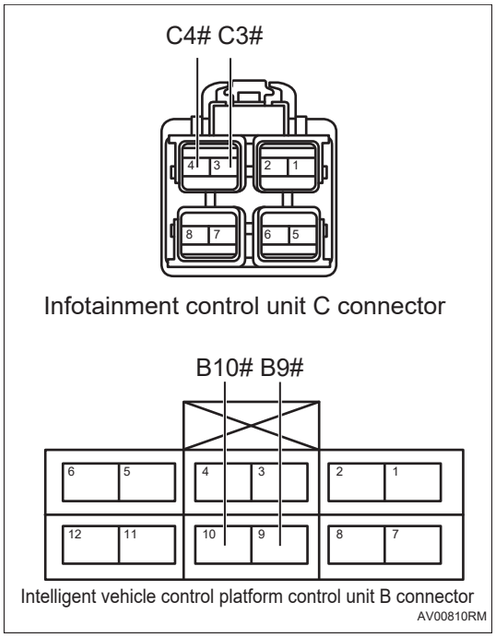
DTC No.	DTC detection condition	Faulty area
U14468A	(a) CSC backbone network Eth1 connection establishment failure.	• Infotainment control unit • Wire harness and connector • Intelligent vehicle control platform control unit

Circuit diagram



Inspection procedure

1	**Check for open in infotainment control unit wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

Standard value

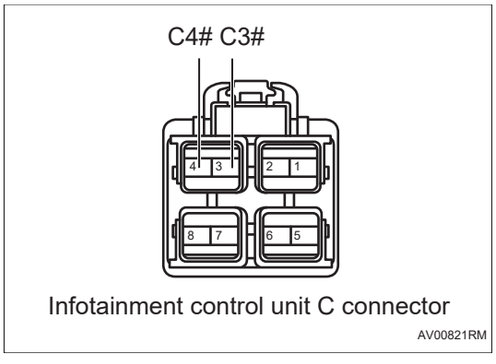
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector C4# - intelligent vehicle control platform control unit connector B10#	Always connected	Less than 1 Ω
Infotainment control unit connector C3# - intelligent vehicle control platform control unit connector B9#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in infotainment control unit wire harness and connector**



(a) According to value in the table, measure resistance.

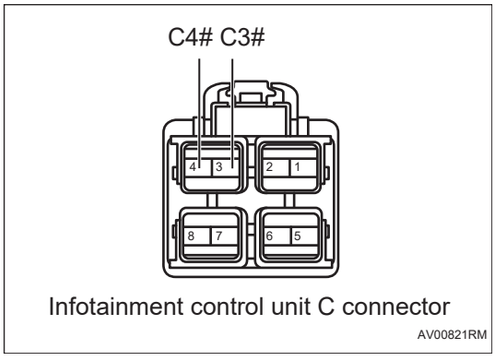
Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector C4# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector C3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in infotainment control unit wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector C4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Infotainment control unit connector C3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace infotainment control unit (See page ZC-89)**

(a) Replace the infotainment control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

ZD

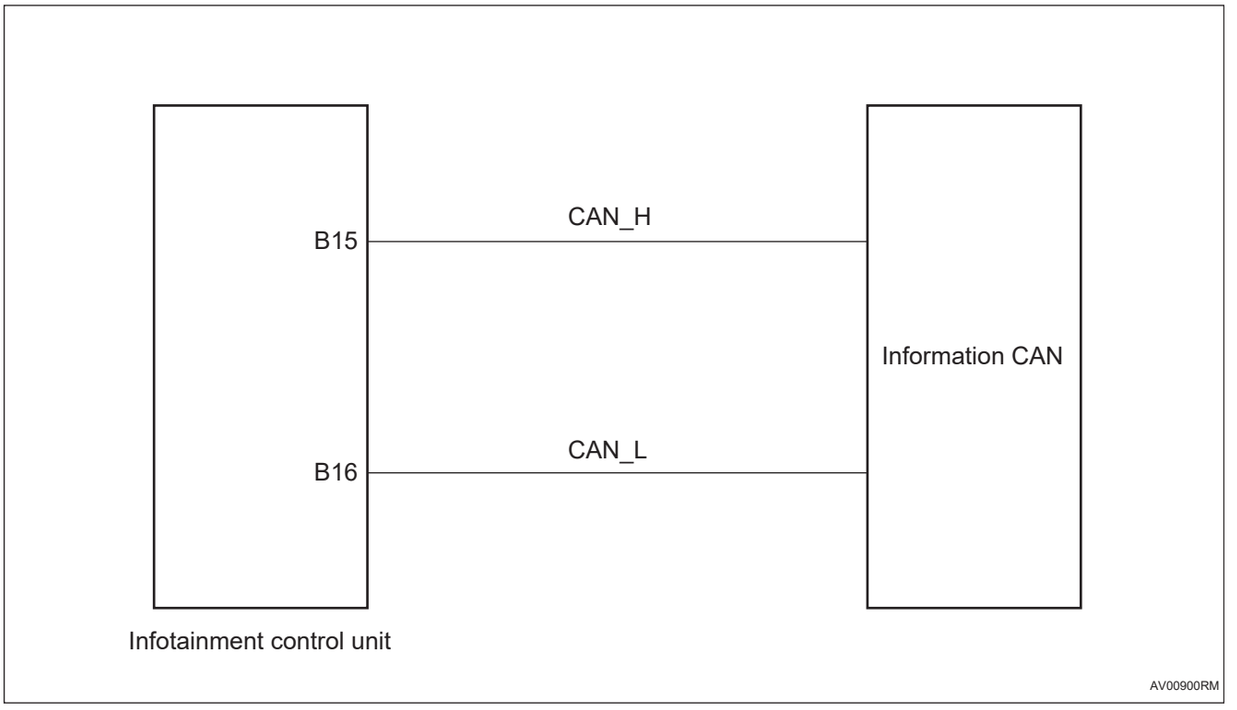
DTC	U004688	Information CAN bus off

Description

When the infotainment control unit detects information CAN bus off fault, the infotainment control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U004688	(a) Information CAN bus off.	• CAN line and connector • Front intelligent area control unit • Infotainment control unit • Power amplifier

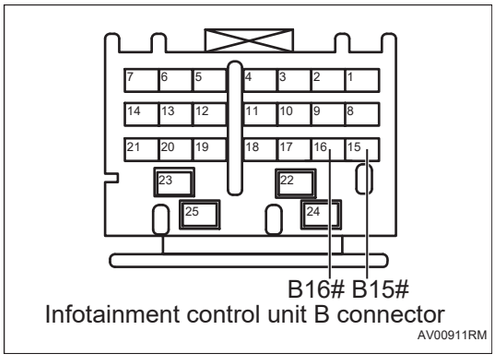
Circuit diagram



ZD

Inspection procedure

1	**Check information CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the infotainment control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B15# - infotainment control unit connector B16#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

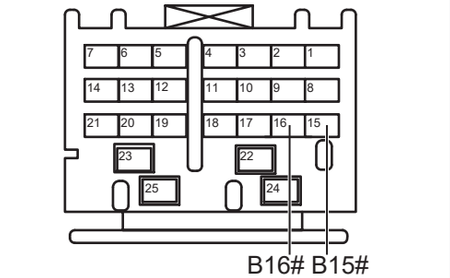
2	Check controllers on information CAN bus

(a) Disconnect the controllers on the information CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	Check for short between information CAN bus CAN-L and CAN-H



Infotainment control unit B connector
AV00911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on information CAN bus.

(d) According to value in the table, measure resistance.

Standard value

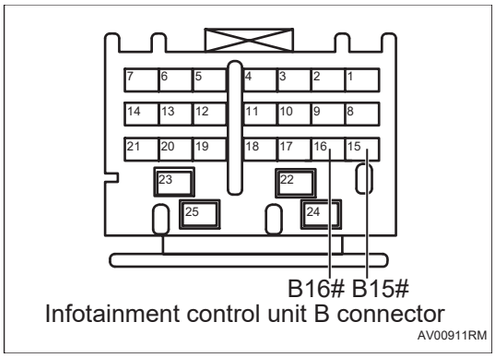
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B15# - infotainment control unit connector B16#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in information CAN bus**



(a) According to value in the table, measure resistance.

Standard value

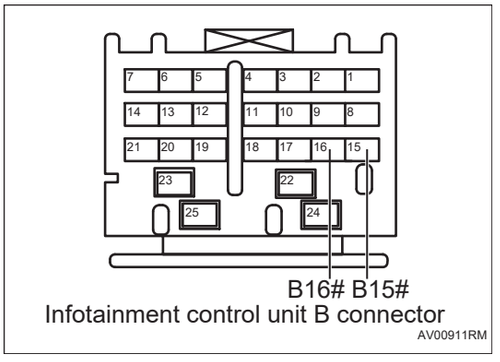
Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B15# - body ground	Always connected	10 KΩ or more
Infotainment control unit connector B16# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in information CAN bus**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V
Infotainment control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

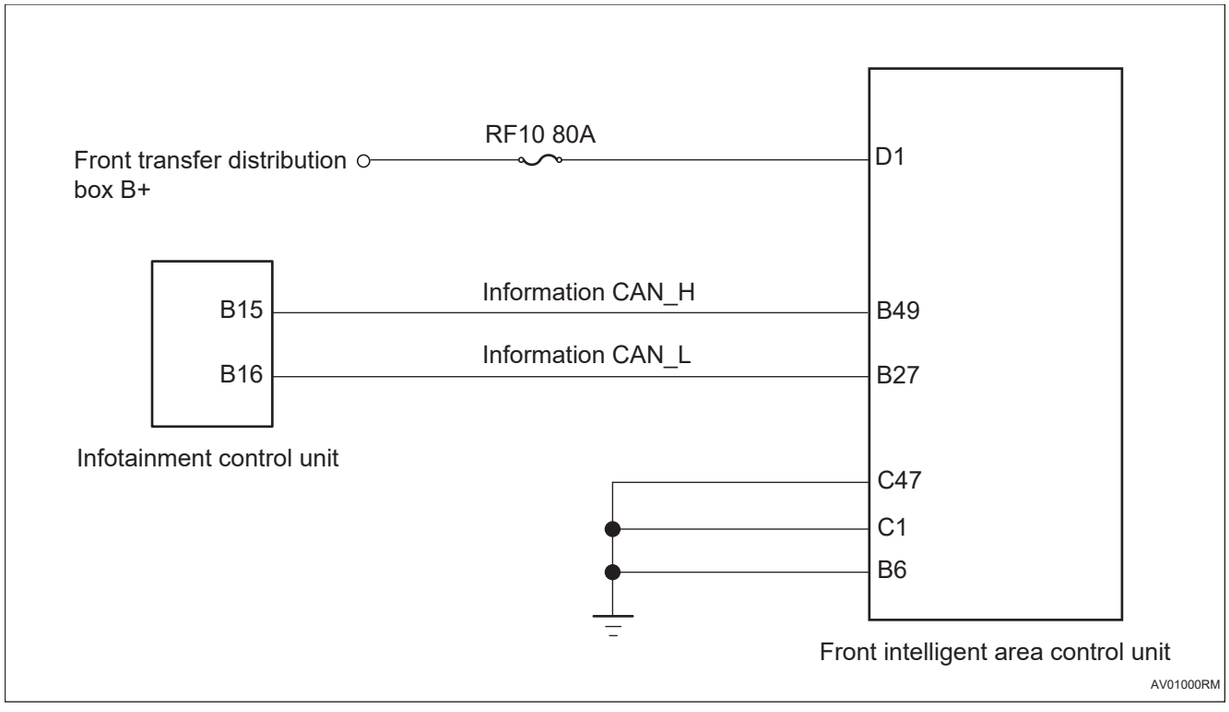
DTC	U014687	PDC node lost
DTC	U014887	AMP node lost

Description

When communication between infotainment control unit and other system is abnormal or interrupted, the infotainment control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) Front PDC node lost.	• Wire harness and connector • Infotainment control unit • Front intelligent area control unit
U014887	(a) AMP node lost.	• Wire harness and connector • Infotainment control unit • Power amplifier • Front intelligent area control unit

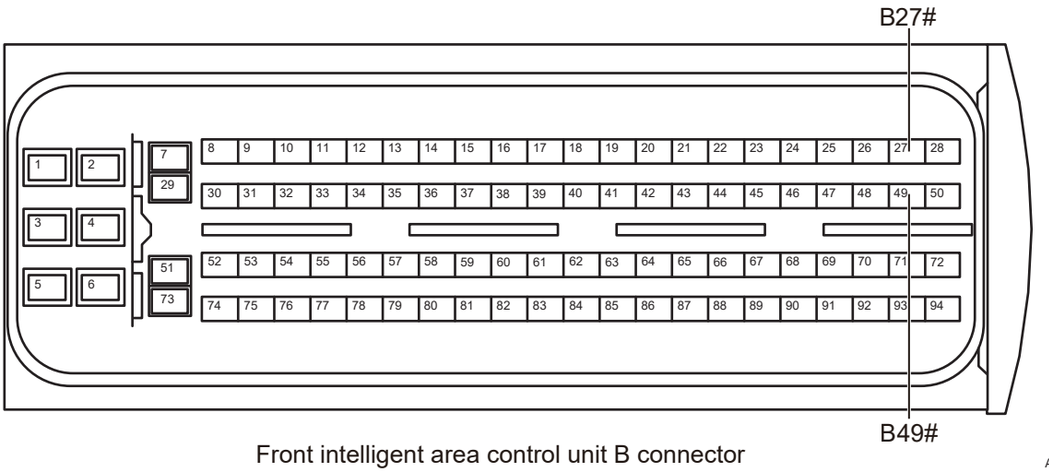
Circuit diagram



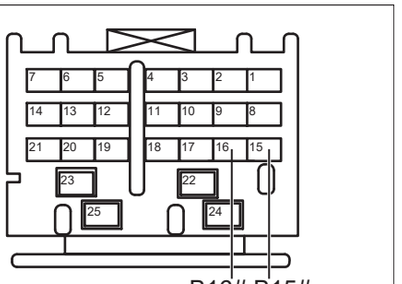
Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in information CAN bus (infotainment control unit - front intelligent area control unit)**



Front intelligent area control unit B connector
AV01011RM



Infotainment control unit B connector
AV00911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on information CAN bus.

(d) According to value in the table, measure resistance.

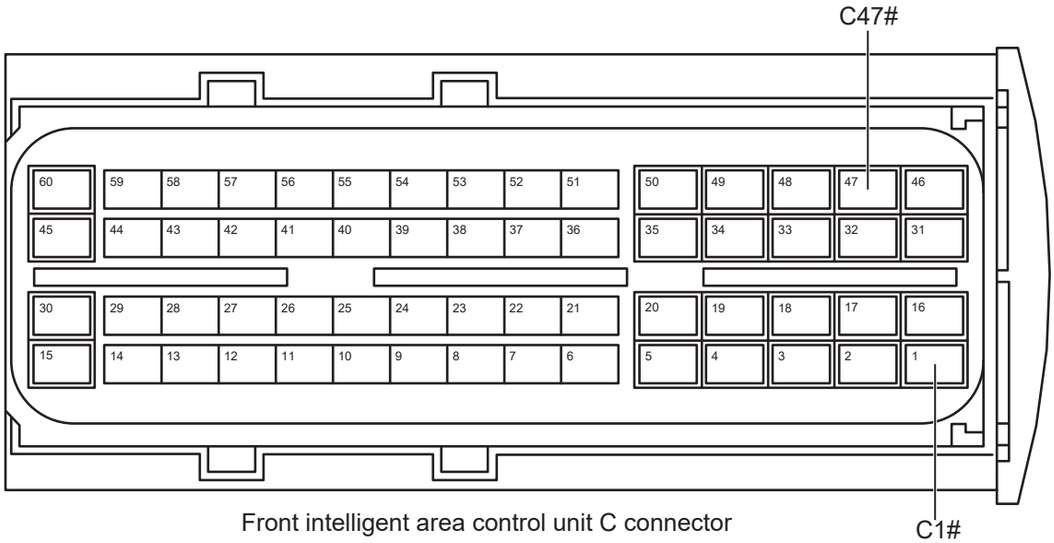
Standard value

Multimeter connection	Detection condition	Specified condition
Infotainment control unit connector B15# - front intelligent area control unit connector B49#	Always connected	Less than 1 Ω
Infotainment control unit connector B16# - front intelligent area control unit connector B27#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

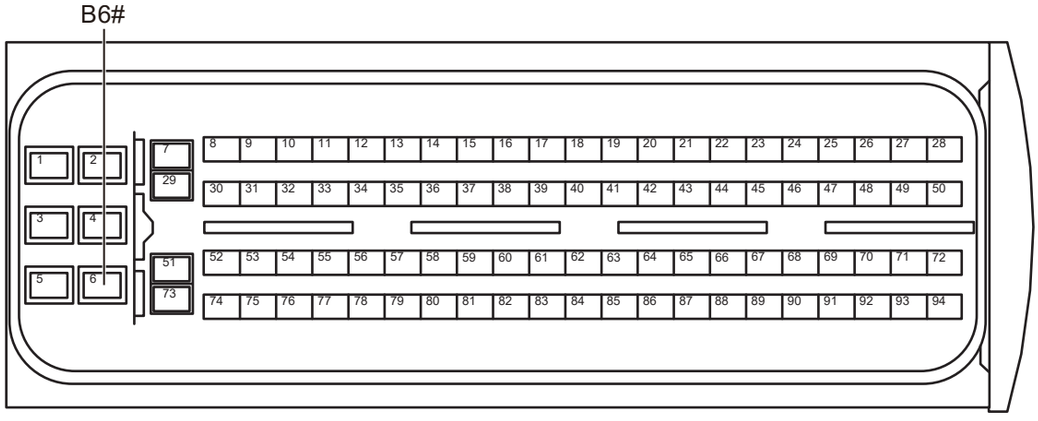
OK

2	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

PC00510RM



Front intelligent area control unit B connector

PC00520RM

(a) According to value in the table, measure resistance.

Standard value

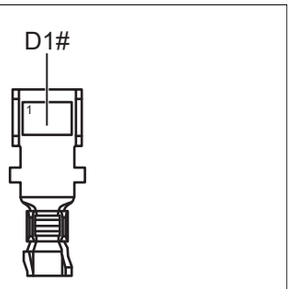
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front intelligent area control unit power supply**



Front intelligent area control unit D connector

PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

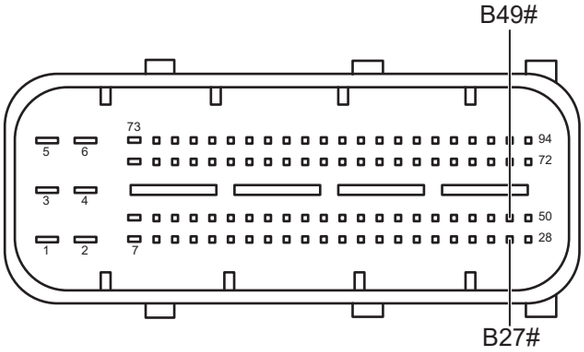
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check information CAN bus terminal resistance**



Front intelligent area control unit B

AV01020RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit B49# - front intelligent area control unit B27#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace infotainment control unit (See page ZC-89)**

OK

Diagnosis ends

DTC	**B14C016**	**Head up display (HUD) input end undervoltage**
DTC	**B14C017**	**Head up display (HUD) input end overvoltage**

Description

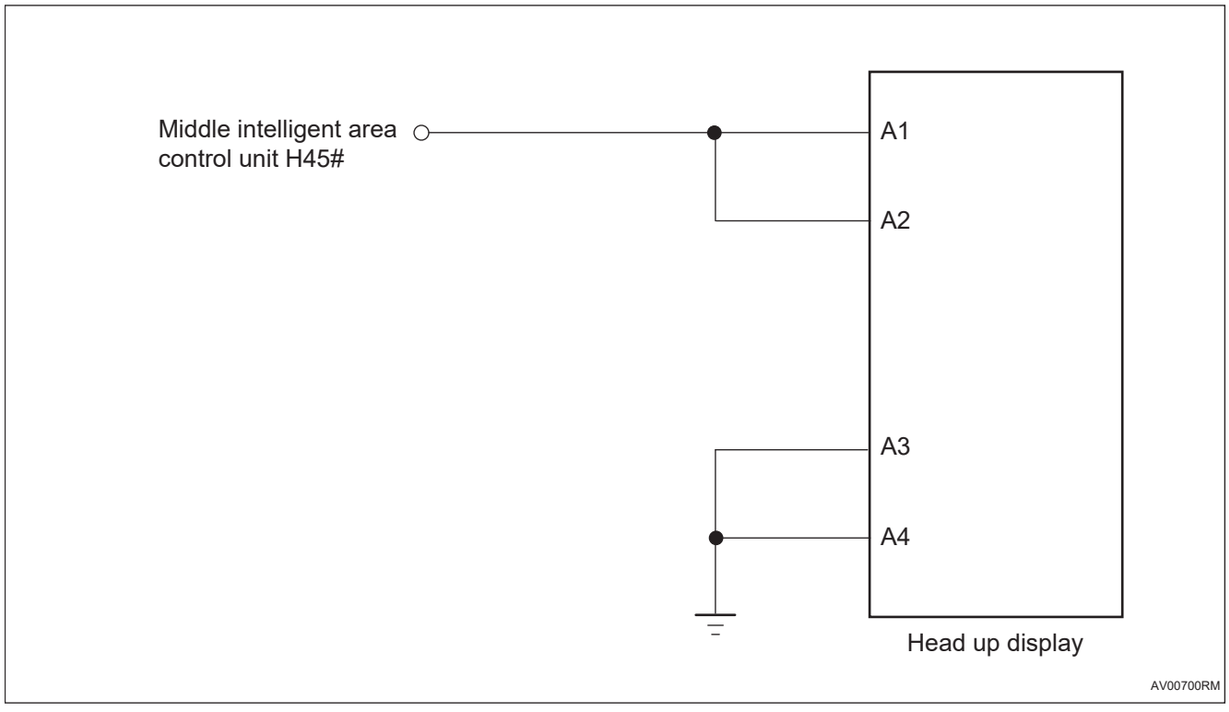
When the head up display power supply voltage is abnormal, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C016	• Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	Power supply voltage ⩽ 8.5 V	1000 ms	Periodic type	100 ms	• Battery/charging system • Wire harness and connector • Head up display
B14C017	• Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	Power supply voltage ⩾ 16.5 V	1000 ms	Periodic type	100 ms	• Battery/charging system • Wire harness and connector • Head up display

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C016	HUD function failure	Not come on
B14C017	HUD function failure	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

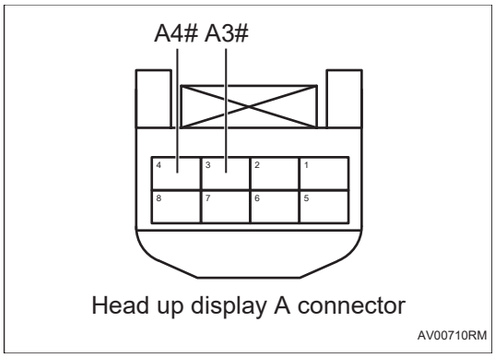
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check head up display ground**



Head up display A connector
AV00710RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Disconnect the head up display connector.
(d) According to value in the table, measure resistance.

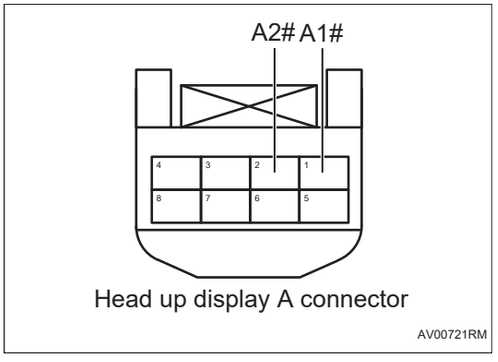
Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A3# - body ground	Always connected	Less than 1 Ω
Head up display connector A4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check head up display power supply**



Head up display A connector
AV00721RM

(a) Connect the negative battery terminal.
(b) Turn ignition switch to "ON".
(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Head up display connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)

OK

Replace head up display (See page ZC-114)

DTC	B14C808	HUD internal FPGA (image processing chip) communication fault

Description

When the head up display communication is faulty, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C808	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	No response from access heartbeat packet	5000 ms	Periodic type	100 ms	• Head up display • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C808	No display in HUD	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace head up display (See page ZC-114)**

OK

Diagnosis ends

DTC	**B14C100**	**HUD motor fault**
DTC	**B14C200**	**HUD limit switch fault**
DTC	**B14C413**	**4.1 Board open/short fault**
DTC	**B14C513**	**3.1 Board open/short fault**

Description

When the head up display internal circuit is abnormal or internal component is faulty, the infotainment control unit records DTC.

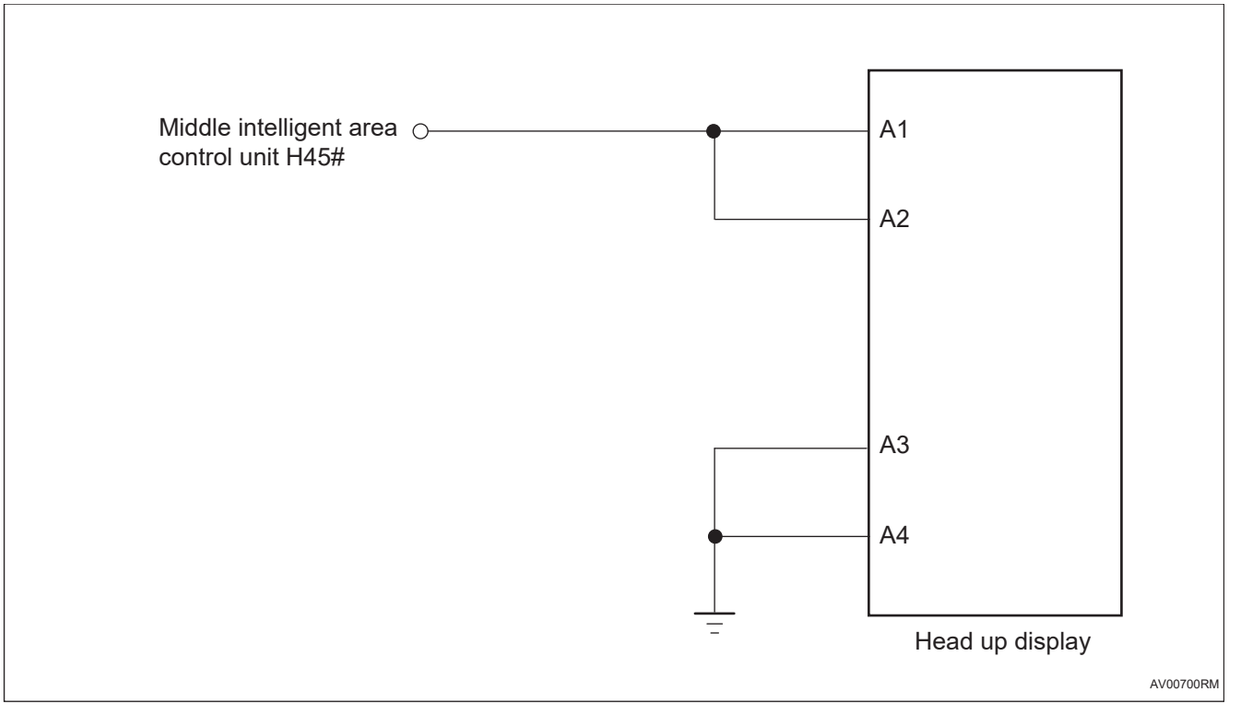
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C100	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	Step motor feedback voltage <= 1 V	5000 ms	Periodic type	100 ms	• Wire harness and connector • Head up display
B14C200	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	When the switch is closed, the feedback voltage level is high; Or when the switch is released, the feedback voltage level is low	1 time	Event-based	System startup	• Wire harness and connector • Head up display
B14C413	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	LED driver feedback error status (LED driver memory status)	5000 ms	Periodic type	100 ms	• Wire harness and connector • Head up display
B14C513	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	LED driver feedback error status (LED driver memory status)	5000 ms	Periodic type	100 ms	• Wire harness and connector • Head up display

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C100	HUD displayed height incorrect	Not come on
B14C200	No display in HUD/incorrect height	Not come on

DTC No.	Fault symptom	Warning light/indicator
B14C413	No display in HUD	Not come on
B14C513	No display in HUD	Not come on

Circuit diagram



Inspection procedure

1	**Check head up display wire harness and connector**

(a) Check head up display connector for looseness or damage.

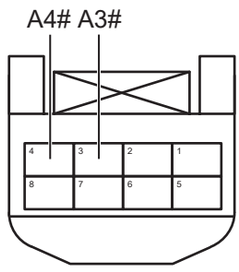
(b) Check for short in head up display wire harness and connector.

(c) Check for open in head up display wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check head up display ground**



Head up display A connector

AV00710RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the head up display connector.

(d) According to value in the table, measure resistance.

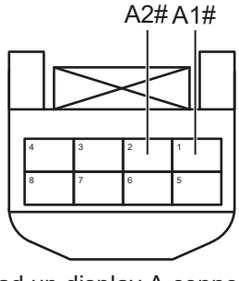
Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A3# - body ground	Always connected	Less than 1 Ω
Head up display connector A4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check head up display power supply**



Head up display A connector

AV00721RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Head up display connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace head up display (See page ZC-114)

DTC	**B14C998**	**HUD internal 4.1TFT high temperature protection fault**
DTC	**B14CA98**	**HUD internal 3.1TFT high temperature protection fault**

Description

When the head up display has high temperature protection fault, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C998	• Voltage 9 ~ 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	Temperature > 95° C	5000 ms	Periodic type	100 ms	• Head up display • Ambient temperature
B14CA98	• Voltage 9 ~ 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	Temperature > 95° C	5000 ms	Periodic type	100 ms	• Head up display • Ambient temperature

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C998	No display in HUD	Not come on
B14CA98	No display in HUD	Not come on

Inspection procedure

1	**Head up display cooling**

(a) Lower the head up display to normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace head up display (See page ZC-114)**

OK

Diagnosis ends

ZD

DTC	**B14C601**	**HUD internal 4.1TFT bar wire fault**
DTC	**B14C701**	**HUD internal 3.1TFT bar wire fault**

Description

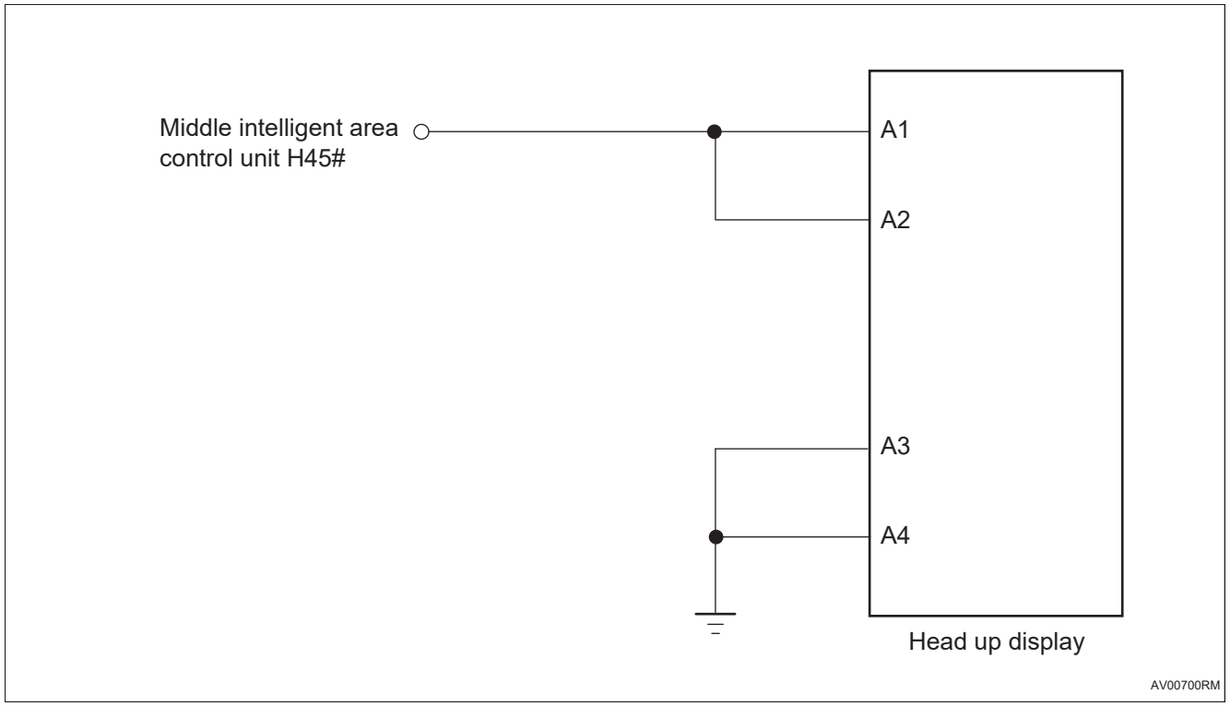
When the head up display is faulty, the infotainment control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B14C601	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	TFT signal circuit AD sampling value out of range (invalid value feedback from Temp sensor)	5000 ms	Periodic type	100 ms	• Wire harness and connector • Head up display
B14C701	• Voltage is between 9 V and 16 V • Ignition switch is in ON position, after 500 ms • Diagnostic service $85 unactivated	TFT signal circuit AD sampling value out of range (invalid value feedback from Temp sensor)	5000 ms	Periodic type	100 ms	• Wire harness and connector • Head up display

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B14C601	No display in HUD	Not come on
B14C701	No display in HUD	Not come on

Circuit diagram



Inspection procedure

1	**Check head up display wire harness and connector**

(a) Check head up display connector for looseness or damage.

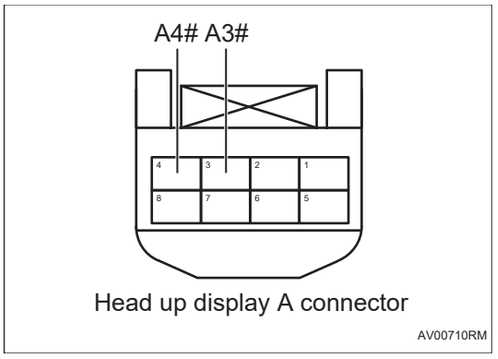
(b) Check for short in head up display wire harness and connector.

(c) Check for open in head up display wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check head up display ground**



Head up display A connector

AV00710RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the head up display connector.

(d) According to value in the table, measure resistance.

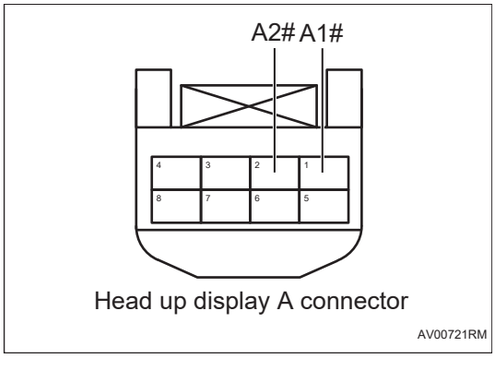
Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A3# - body ground	Always connected	Less than 1 Ω
Head up display connector A4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check head up display power supply**



Head up display A connector

AV00721RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Head up display connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Head up display connector A2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

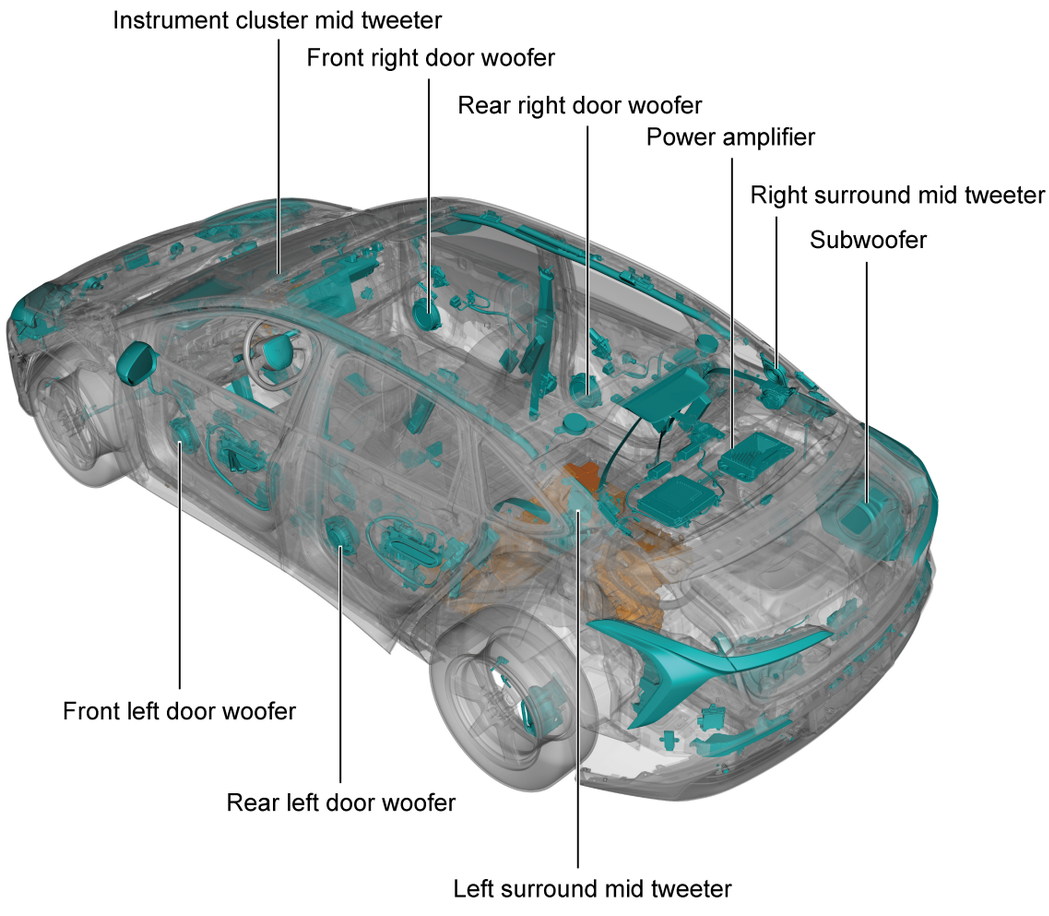
Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)

OK

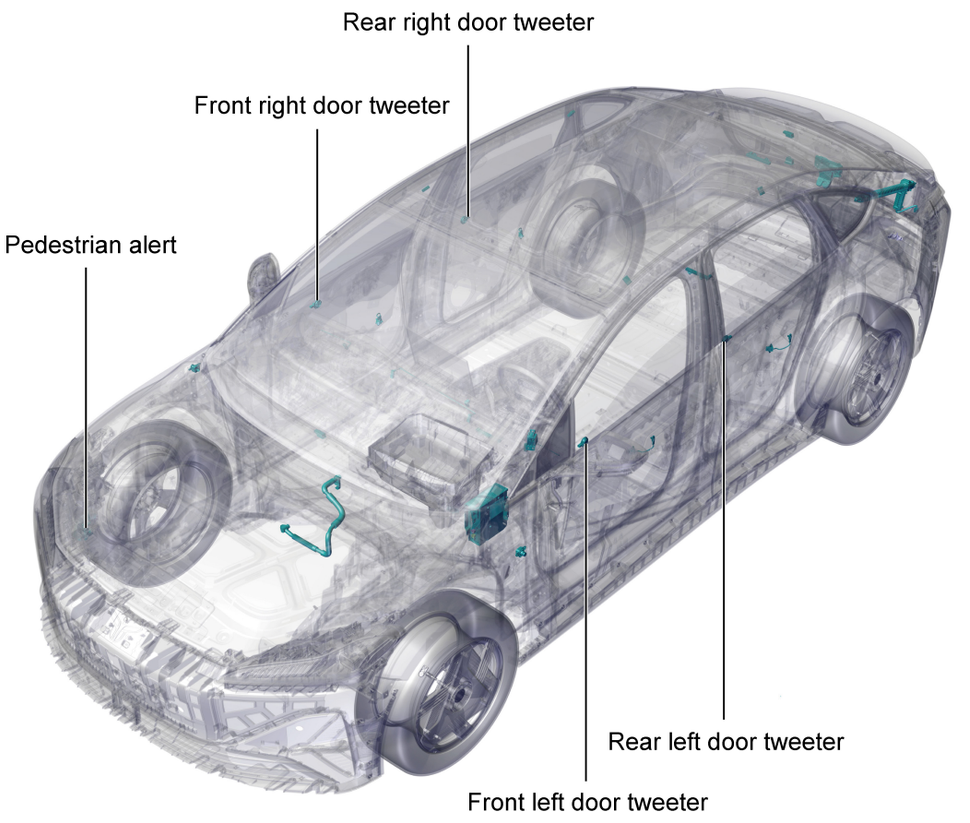
Replace head up display (See page ZC-114)

Power amplifier

Part position

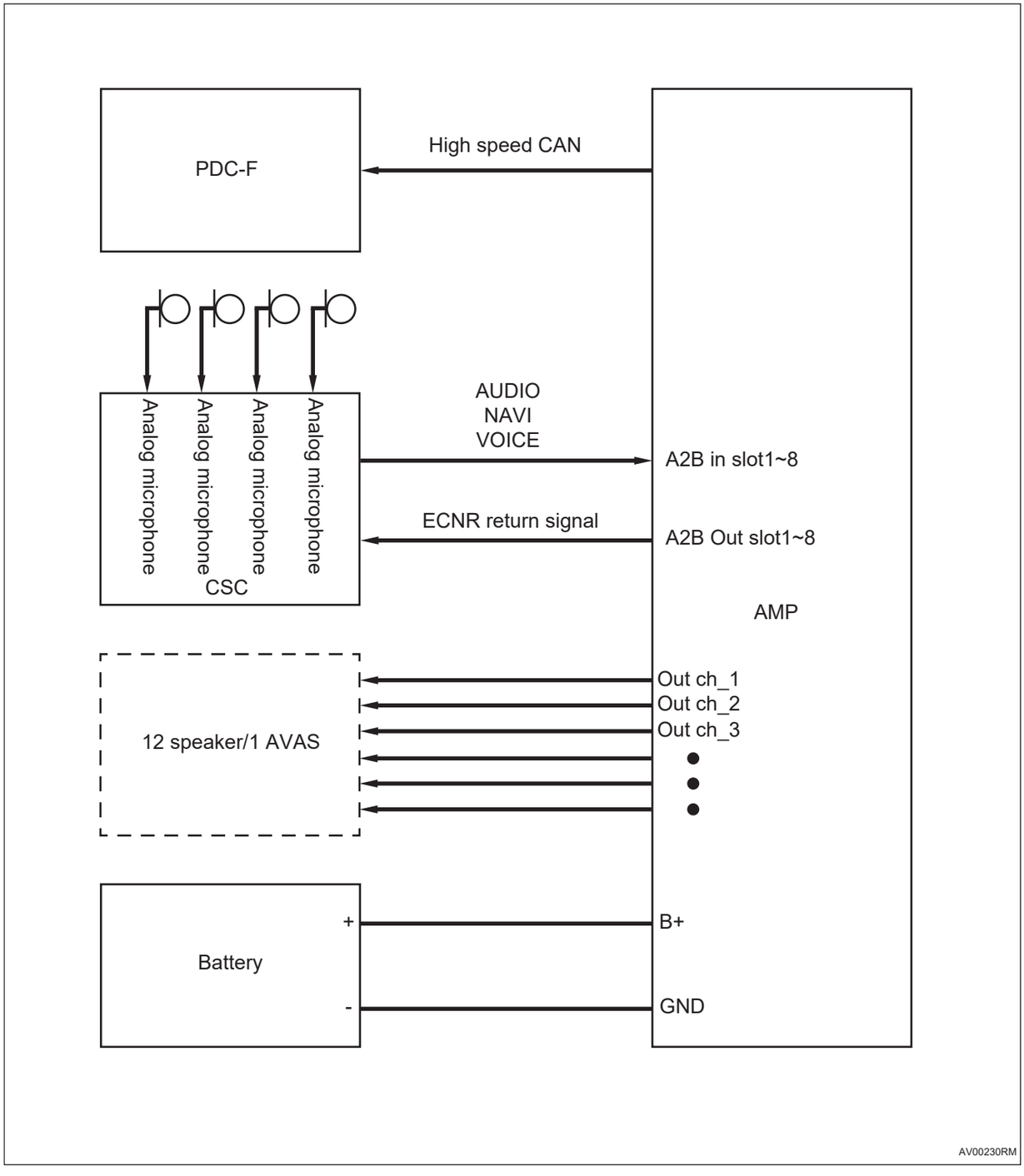


Part position



AV00260RM

System diagram



Function description

1. Audio system

(a) The audio system consists of power amplifier assembly, tweeter assembly, mid tweeter assembly, rear door speaker assembly, subwoofer assembly, and pedestrian warning speaker assembly.

Data parameter

Power amplifier

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	10	-	-

Pedestrian alert

Item	Max	OK	Minimum
Operating voltage (V)	8.9	8	0
Operating current (A)	1.5	1	-

Subwoofer

Item	Max	OK	Minimum
Operating voltage (V)	20	12.6	0
Operating current (A)	5	3.16	0

Tweeter

Item	Max	OK	Minimum
Operating voltage (V)	12	8.9	0
Operating current (A)	3	2.23	0
Operating resistance (Ω)	4+/-20%		

Woofer

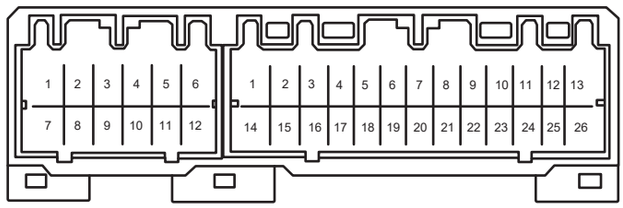
Item	Max	OK	Minimum
Operating voltage (V)	20	12.6	0
Operating current (A)	5	3.16	0
Operating resistance (Ω)	4+/-20%		

Mid tweeter

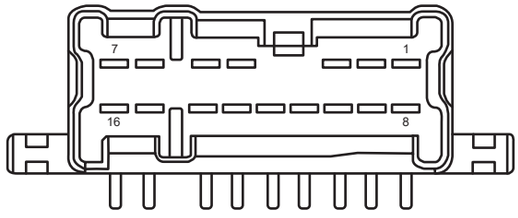
Item	Max	OK	Minimum
Operating voltage (V)	15.5	8.9	0
Operating current (A)	3.87	2.23	0
Operating resistance (Ω)	4+/-20%		

ECU terminal

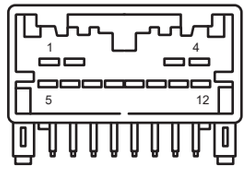
Power amplifier



Power amplifier B Power amplifier A



Power amplifier C



Power amplifier D

AV00200RM

ZD

Power amplifier - A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Right surround speaker -	14	Right surround speaker +
2	Ground	15	Ground
3	Ground	16	Ground
4	-	17	-
5	-	18	-
6	-	19	-
7	-	20	-
8	CAN L	21	-
9	CAN H	22	-
10	-	23	-
11	-	24	-
12	Power supply B+	25	Power supply B+
13	Power supply B+	26	Power supply B+

Power amplifier - B			
Pin number	**Definition**	**Pin number**	**Definition**
1	Front left tweeter -	7	Front left tweeter +
2	Rear left tweeter -	8	Rear left tweeter +
3	Rear right tweeter -	9	Rear right tweeter +
4	Front right tweeter -	10	Front right tweeter +
5	AVAS speaker -	11	AVAS speaker +
6	Left surround speaker -	12	Left surround speaker +

Power amplifier - C			
Pin number	**Definition**	**Pin number**	**Definition**
1	Center speaker -	9	-
2	-	10	Subwoofer +
3	Subwoofer -	11	-
4	-	12	Front left door woofer +
5	Rear left door woofer -	13	Front left door woofer -
6	Rear right door woofer -	14	Rear left door woofer +
7	Front right door woofer -	15	Rear right door woofer +
8	Center speaker +	16	Front right door woofer +

Power amplifier - D			
Pin number	**Definition**	**Pin number**	**Definition**
1	A2B_A port negative	7	-
2	A2B_A port positive	8	-
3	-	9	-
4	-	10	-
5	-	11	-
6	-	12	-

Diagnostic Trouble Code (DTC) chart

Power amplifier

DTC	Detection items	See page
B148017	Battery voltage too high	(See page ZD-2488)
B148016	Battery voltage too low	(See page ZD-2488)
B148A11	Short to ground in right surround	(See page ZD-2552)
B148A12	Short to power supply in right surround	(See page ZD-2552)
B148A01	Short in right surround positive and negative	(See page ZD-2552)
B148A13	Open in right surround	(See page ZD-2552)
B148B11	Short to ground in subwoofer	(See page ZD-2558)

DTC	Detection items	See page
B148B12	Short to power supply in subwoofer	(See page ZD-2558)
B148B01	Short in subwoofer positive and negative	(See page ZD-2558)
B148B13	Open in subwoofer	(See page ZD-2558)
B148E11	Short to ground in pedestrian warning speaker	(See page ZD-2564)
B148E12	Short to power supply in pedestrian warning speaker	(See page ZD-2564)
B148E10	Short in pedestrian warning speaker positive and negative	(See page ZD-2564)
B148E13	Open in pedestrian warning speaker	(See page ZD-2564)
B148011	Short to ground in front left tweeter	(See page ZD-2493)
B148012	Short to power supply in front left tweeter	(See page ZD-2493)
B148001	Short in front left tweeter positive and negative	(See page ZD-2493)
B148013	Open in front left tweeter	(See page ZD-2493)
B148111	Short to ground in front right tweeter	(See page ZD-2499)
B148112	Short to power supply in front right tweeter	(See page ZD-2499)
B148101	Short in front right tweeter positive and negative	(See page ZD-2499)
B148113	Open in front right tweeter	(See page ZD-2499)
B148211	Short to ground in rear left tweeter	(See page ZD-2505)
B148212	Short to power supply in rear left tweeter	(See page ZD-2505)
B148201	Short in rear left tweeter positive and negative	(See page ZD-2505)
B148213	Open in rear left tweeter	(See page ZD-2505)
B148311	Short to ground in rear right tweeter	(See page ZD-2510)
B148312	Short to power supply in rear right tweeter	(See page ZD-2510)
B148301	Short in rear right tweeter positive and negative	(See page ZD-2510)
B148313	Open in rear right tweeter	(See page ZD-2510)
B148411	Short to ground in front left woofer	(See page ZD-2516)
B148412	Short to power supply in front left woofer	(See page ZD-2516)
B148401	Short in front left woofer positive and negative	(See page ZD-2516)
B148413	Open in front left woofer	(See page ZD-2516)
B148511	Short to ground in front right woofer	(See page ZD-2522)
B148512	Short to power supply in front right woofer	(See page ZD-2522)
B148501	Short in front right woofer positive and negative	(See page ZD-2522)
B148513	Open in front right woofer	(See page ZD-2522)

DTC	Detection items	See page
B148611	Short to ground in rear left woofer	(See page ZD-2528)
B148612	Short to power supply in rear left woofer	(See page ZD-2528)
B148601	Short in rear left woofer positive and negative	(See page ZD-2528)
B148613	Open in rear left woofer	(See page ZD-2528)
B148711	Short to ground in rear right woofer	(See page ZD-2534)
B148712	Short to power supply in rear right woofer	(See page ZD-2534)
B148701	Short in rear right woofer positive and negative	(See page ZD-2534)
B148713	Open in rear right woofer	(See page ZD-2534)
B148811	Short to ground in instrument cluster mid tweeter	(See page ZD-2540)
B148812	Short to power supply in instrument cluster mid tweeter	(See page ZD-2540)
B148801	Short in instrument cluster mid tweeter positive and negative	(See page ZD-2540)
B148813	Open in instrument cluster mid tweeter	(See page ZD-2540)
B148911	Short to ground in left surround	(See page ZD-2546)
B148912	Short to power supply in left surround	(See page ZD-2546)
B148901	Short in left surround positive and negative	(See page ZD-2546)
B148913	Open in left surround	(See page ZD-2546)
U004688	Information CAN bus off	(See page ZD-2570)
U014687	PDCF node lost	(See page ZD-2575)
U011B87	CSC node lost	(See page ZD-2575)

DTC	**B148017**	**Battery voltage too high**
DTC	**B148016**	**Battery voltage too low**

Description

When power amplifier power supply voltage is too high or too low, the power amplifier records DTC.

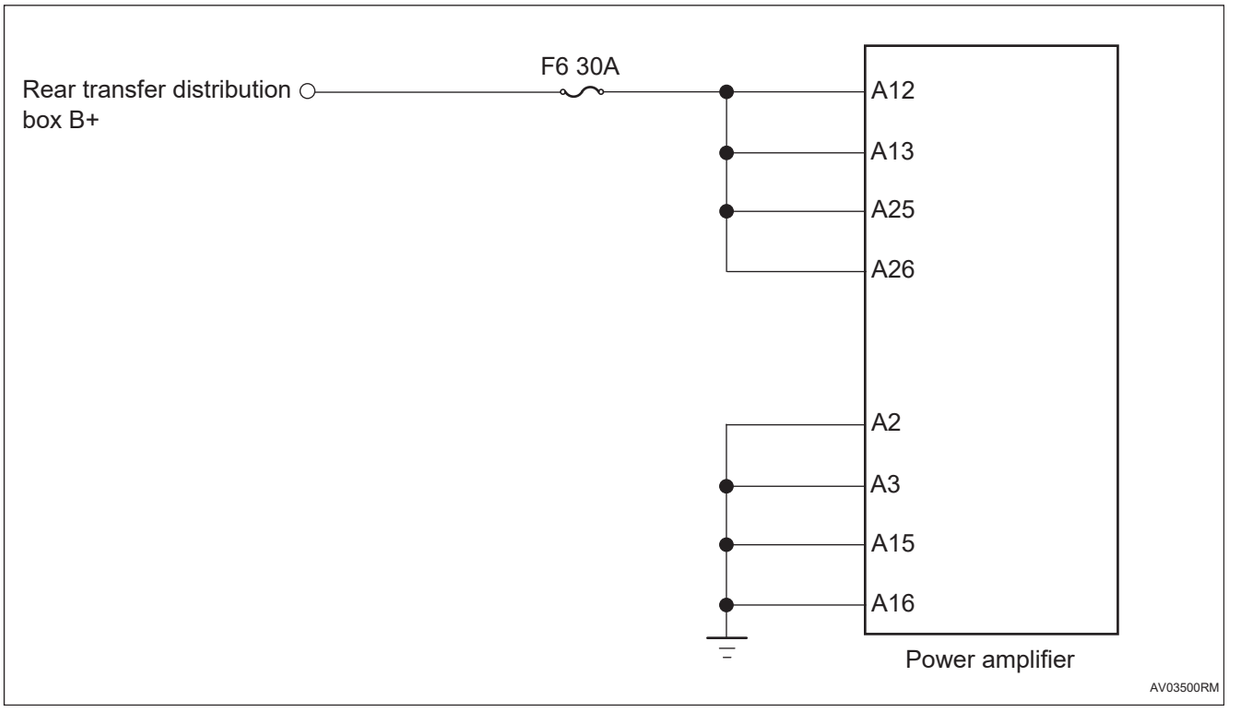
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148017	• Not in Crank, or 2 s after Crank • Non-OTA mode • Undiagnosed service is prohibited from reporting DTC	Voltage is higher than 17.5 V	1200 ms	Continuous type	4 ms	• Power amplifier • Wire harness and connector • Charging system
B148016	• Not in Crank, or 2 s after Crank • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Voltage is lower than 8.5 V	2000 ms	Continuous type	4 ms	• Power amplifier • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148017	Audio system mute	Not come on
B148016	Audio system mute	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check power amplifier fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the power amplifier fuse.

(d) According to value in the table, measure resistance.

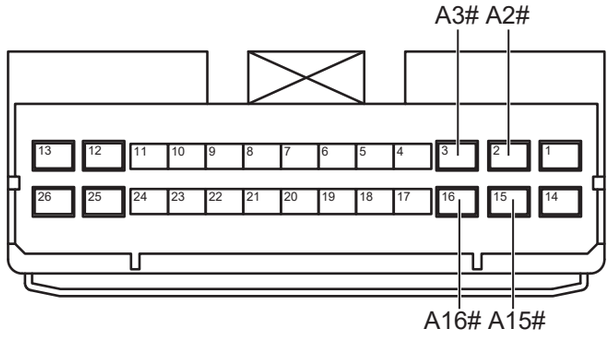
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	Check power amplifier ground



Power amplifier A connector

AV03510RM

(a) Disconnect the power amplifier connector.

(b) According to value in the table, measure resistance.

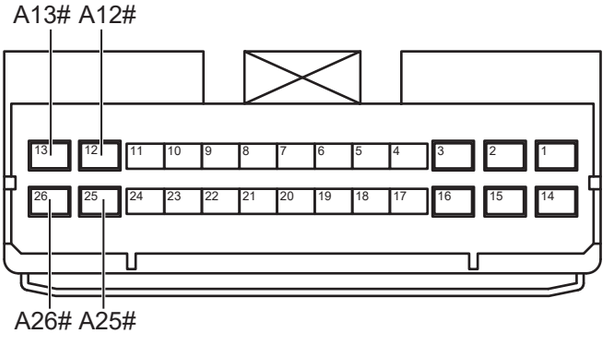
Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A2# - body ground	Always connected	Less than 1 Ω
Power amplifier connector A3# - body ground	Always connected	Less than 1 Ω
Power amplifier connector A15# - body ground	Always connected	Less than 1 Ω
Power amplifier connector A16# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check power amplifier power supply**



Power amplifier A connector

AV03521RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A12# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Power amplifier connector A13# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Power amplifier connector A25# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Power amplifier connector A26# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace power amplifier (See page ZC-91)

DTC	**B148011**	**Short to ground in front left tweeter**
DTC	**B148012**	**Short to power supply in front left tweeter**
DTC	**B148001**	**Short in front left tweeter positive and negative**
DTC	**B148013**	**Open in front left tweeter**

Description

When the front left door tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148011	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door tweeter
B148012	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door tweeter

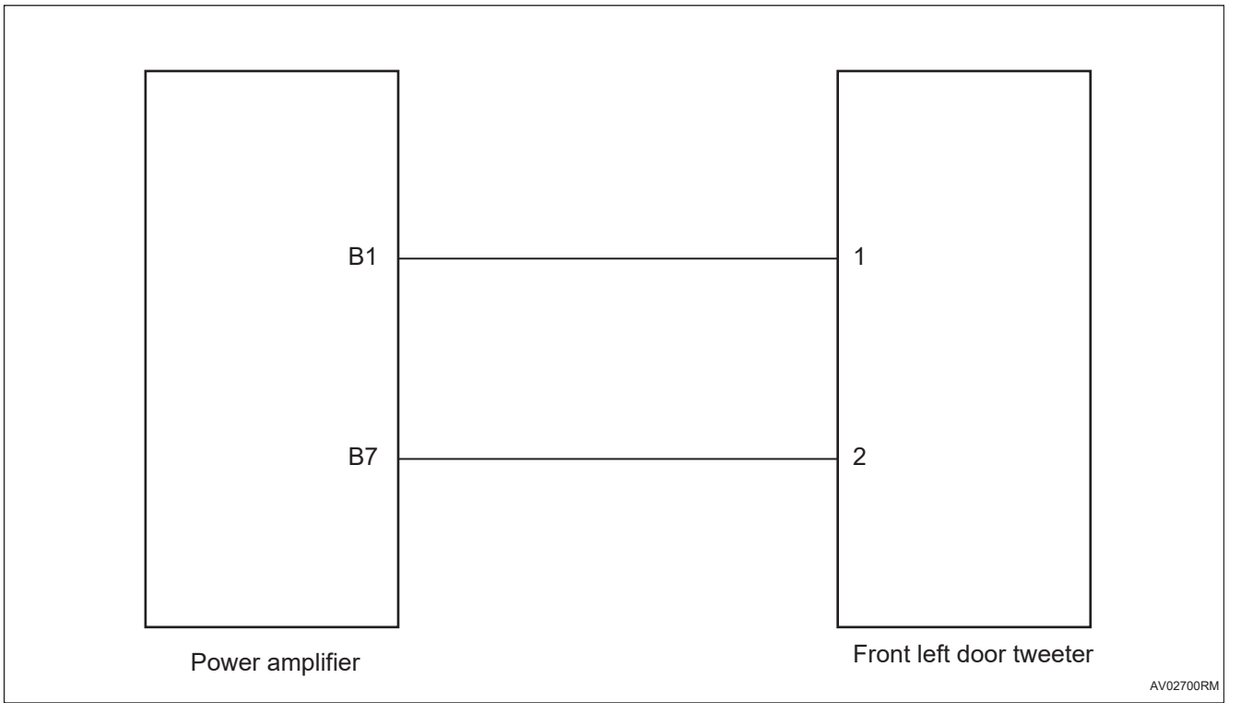
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148001	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door tweeter
B148013	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Front left door tweeter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148011	Abnormal speaker sound or no sound output	Not come on
B148012	Abnormal speaker sound or no sound output	Not come on

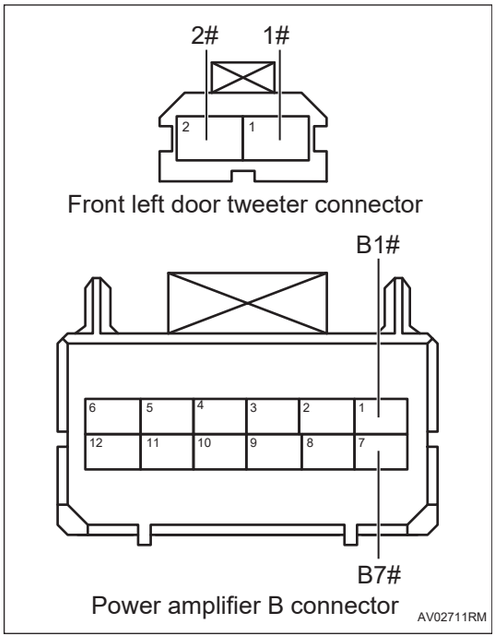
DTC No.	Fault symptom	Warning light/indicator
B148001	Abnormal speaker sound or no sound output	Not come on
B148013	Abnormal speaker sound or no sound output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in front left door tweeter wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the front left door tweeter connector.

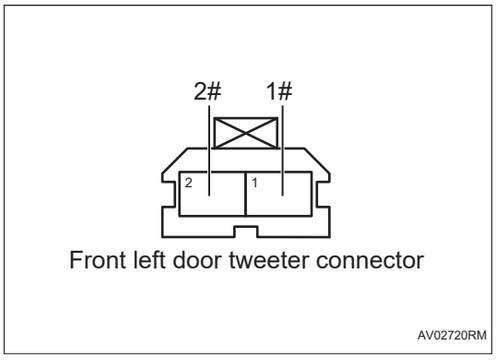
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Front left door tweeter connector 1# - power amplifier connector B1#	Always connected	Less than 1 Ω
Front left door tweeter connector 2# - power amplifier connector B7#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front left door tweeter wire harness and connector**



(a) According to value in the table, measure resistance.

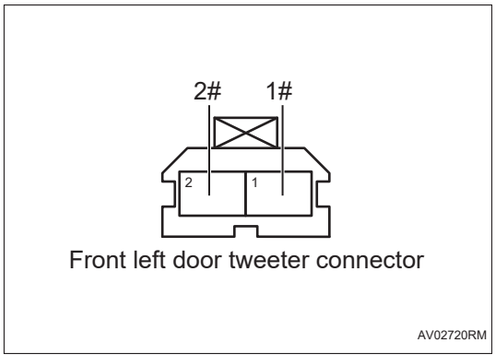
Multimeter connection	Detection condition	Specified condition
Front left door tweeter connector 1# - body ground	Always connected	10 KΩ or more
Front left door tweeter connector 2# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in front left door tweeter wire harness and connector**



(a) According to value in the table, measure resistance.

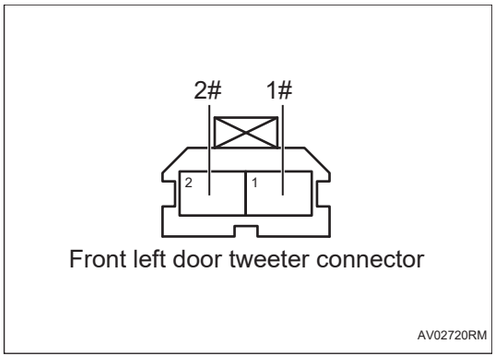
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door tweeter connector 1# - front left door tweeter connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door tweeter wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK →

5	**Replace front left door tweeter (See page ZC-93)**

(a) Replace the front left door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148111**	**Short to ground in front right tweeter**
DTC	**B148112**	**Short to power supply in front right tweeter**
DTC	**B148101**	**Short in front right tweeter positive and negative**
DTC	**B148113**	**Open in front right tweeter**

Description

When the front right door tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148111	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door tweeter
B148112	• Battery voltage is normal • Non-OTA mode	Since AMP driver circuit uses a separate power IC chip, it is judged by	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door tweeter

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Undiagnosed service $85 is prohibited from reporting DTC	reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error				
B148101	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door tweeter

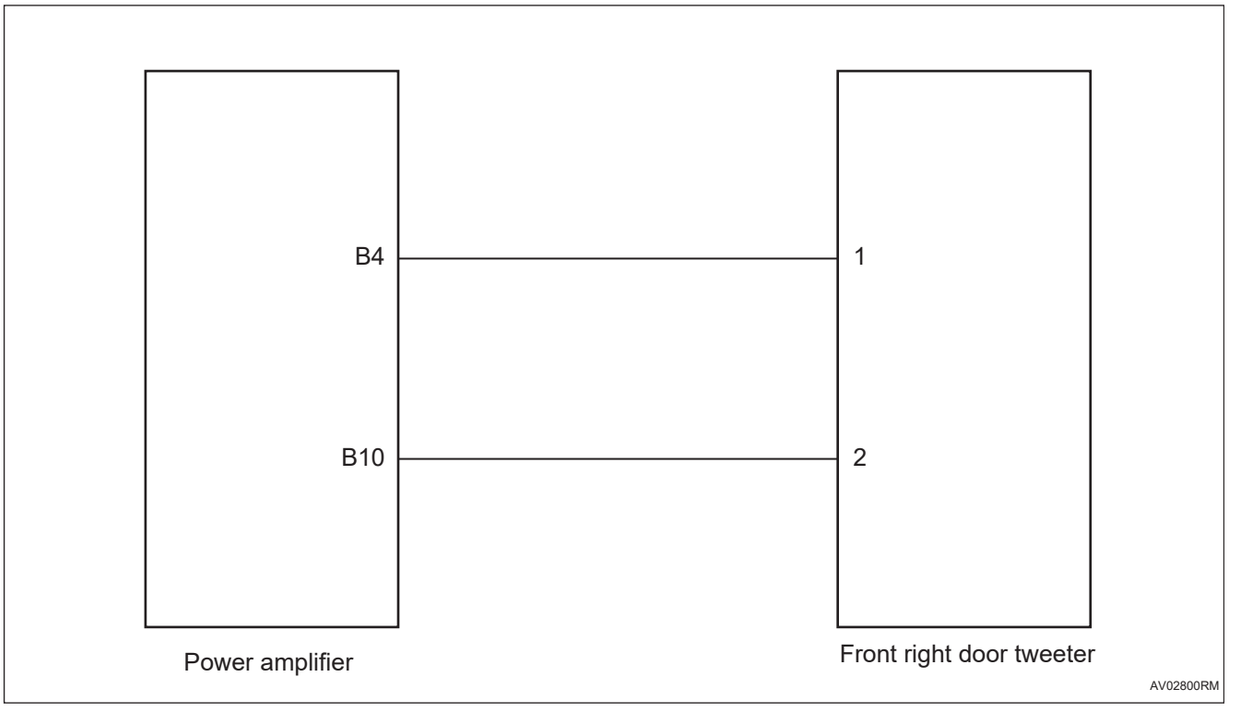
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148113	• Battery voltage is normal • Non-OTA mode • Undiagnos-ed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Front right door tweeter

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148111	Abnormal speaker sound or no sound output	Not come on
B148112	Abnormal speaker sound or no sound output	Not come on
B148101	Abnormal speaker sound or no sound output	Not come on
B148113	Abnormal speaker sound or no sound output	Not come on

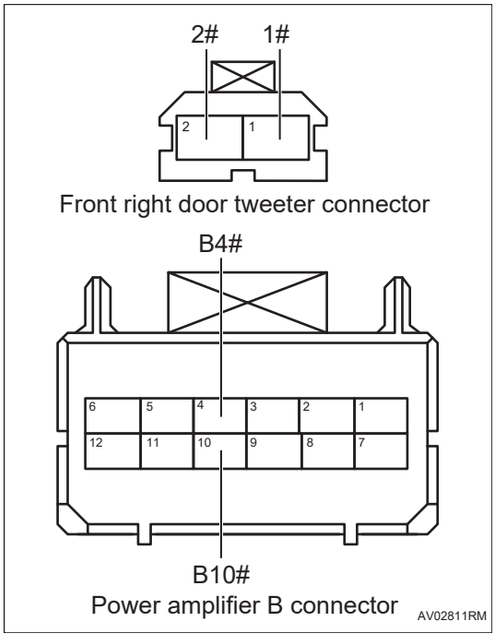
Circuit diagram



ZD

Inspection procedure

1	**Check for open in front right door tweeter wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the front right door tweeter connector.

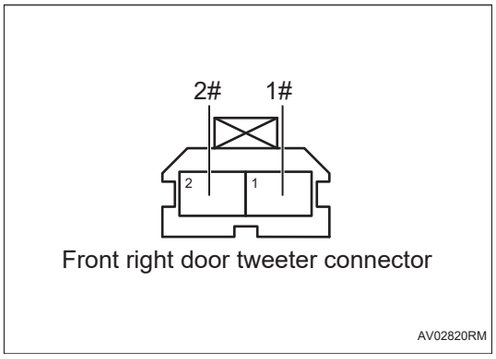
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Front right door tweeter connector 1# - power amplifier connector B4#	Always connected	Less than 1 Ω
Front right door tweeter connector 2# - power amplifier connector B10#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	Check for short to ground in front right door tweeter wire harness and connector



(a) According to value in the table, measure resistance.

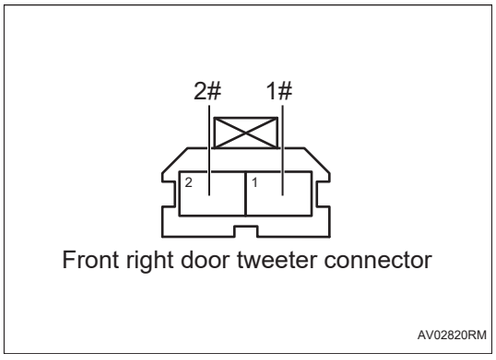
Multimeter connection	Detection condition	Specified condition
Front right door tweeter connector 1# - body ground	Always connected	10 KΩ or more
Front right door tweeter connector 2# - body ground	Always connected	10 KΩ or more

ZD

Check and repair or replace wire harness and connector

OK

3	Check for short to each other in front right door tweeter wire harness and connector



(a) According to value in the table, measure resistance.

Standard value

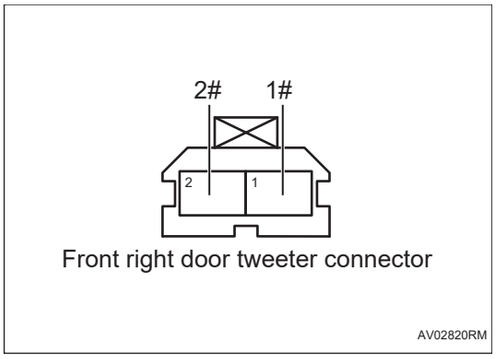
Multimeter connection	Detection condition	Specified condition
Front right door tweeter connector 1# - front right door tweeter connector 2#	Always connected	10 KΩ or more

NG

Check and repair or replace wire harness and connector

OK

4	**Check for short to power supply in front right door tweeter wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front right door tweeter (See page ZC-93)**

(a) Replace the front right door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148211**	**Short to ground in rear left tweeter**
DTC	**B148212**	**Short to power supply in rear left tweeter**
DTC	**B148201**	**Short in rear left tweeter positive and negative**
DTC	**B148213**	**Open in rear left tweeter**

Description

When rear left door tweeter circuit is short or open, the power amplifier records DTC.

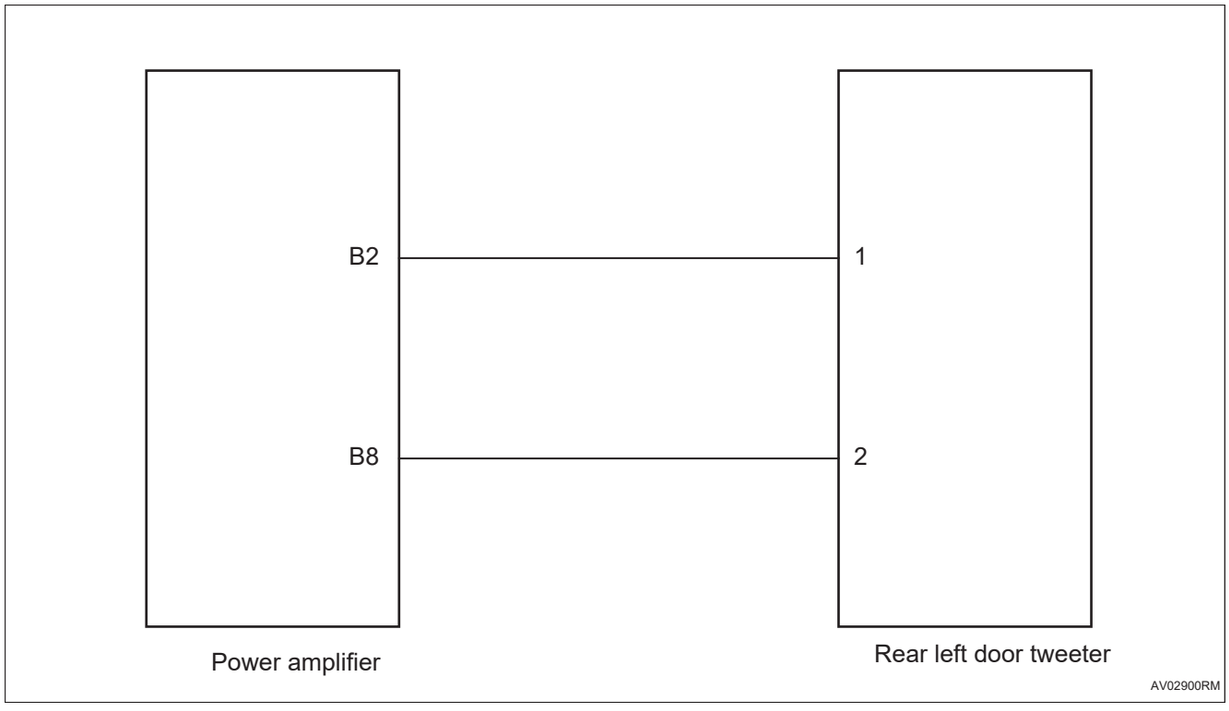
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148211	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door tweeter
B148212	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door tweeter

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	prohibited from reporting DTC	the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error				
B148201	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door tweeter
B148213	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Rear left door tweeter

Fault symptom

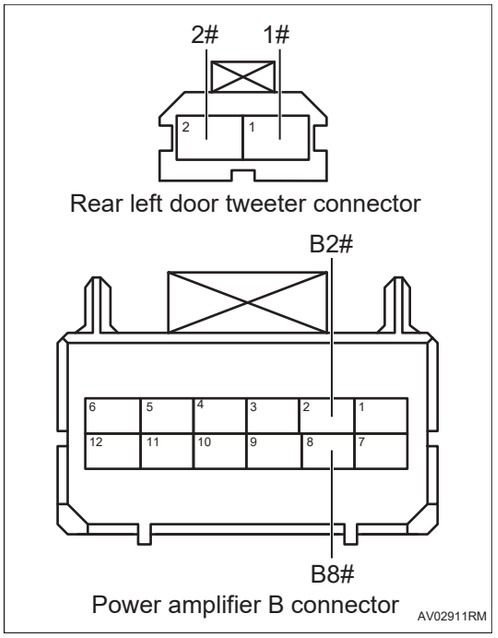
DTC No.	Fault symptom	Warning light/indicator
B148211	Abnormal speaker sound or no sound output	Not come on
B148212	Abnormal speaker sound or no sound output	Not come on
B148201	Abnormal speaker sound or no sound output	Not come on
B148213	Abnormal speaker sound or no sound output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in rear left door tweeter wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the rear left door tweeter connector.

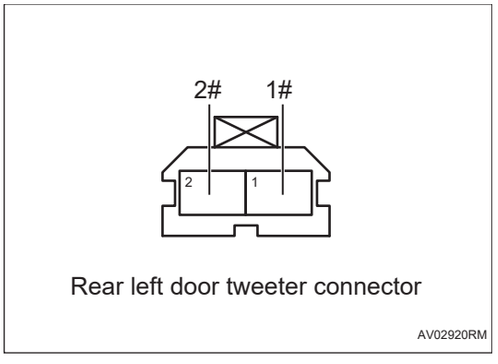
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear left door tweeter connector 1# - power amplifier connector B2#	Always connected	Less than 1 Ω
Rear left door tweeter connector 2# - power amplifier connector B8#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left door tweeter wire harness and connector**



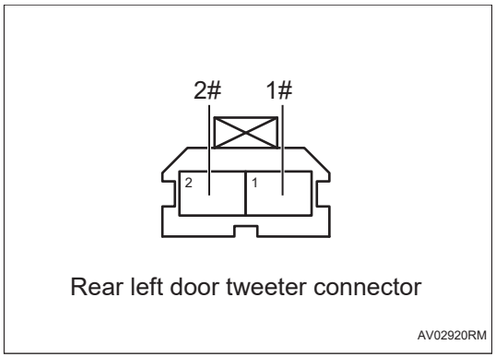
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear left door tweeter connector 1# - body ground	Always connected	10 KΩ or more
Rear left door tweeter connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	Check for short to each other in rear left door tweeter wire harness and connector



Rear left door tweeter connector

AV02920RM

(a) According to value in the table, measure resistance.

Standard value

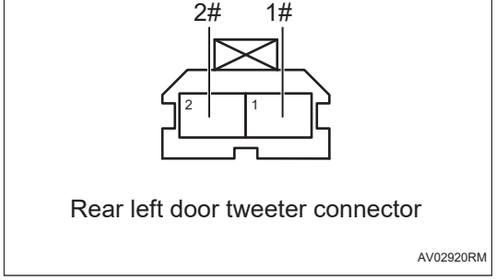
Multimeter connection	Detection condition	Specified condition
Rear left door tweeter connector 1# - rear left door tweeter connector 2#	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear left door tweeter wire harness and connector



Rear left door tweeter connector

AV02920RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left door tweeter (See page ZC-93)**

(a) Replace the rear left door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148311**	**Short to ground in rear right tweeter**
DTC	**B148312**	**Short to power supply in rear right tweeter**
DTC	**B148301**	**Short in rear right tweeter positive and negative**
DTC	**B148313**	**Open in rear right tweeter**

Description

When rear right door tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148311	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door tweeter
B148312	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door tweeter

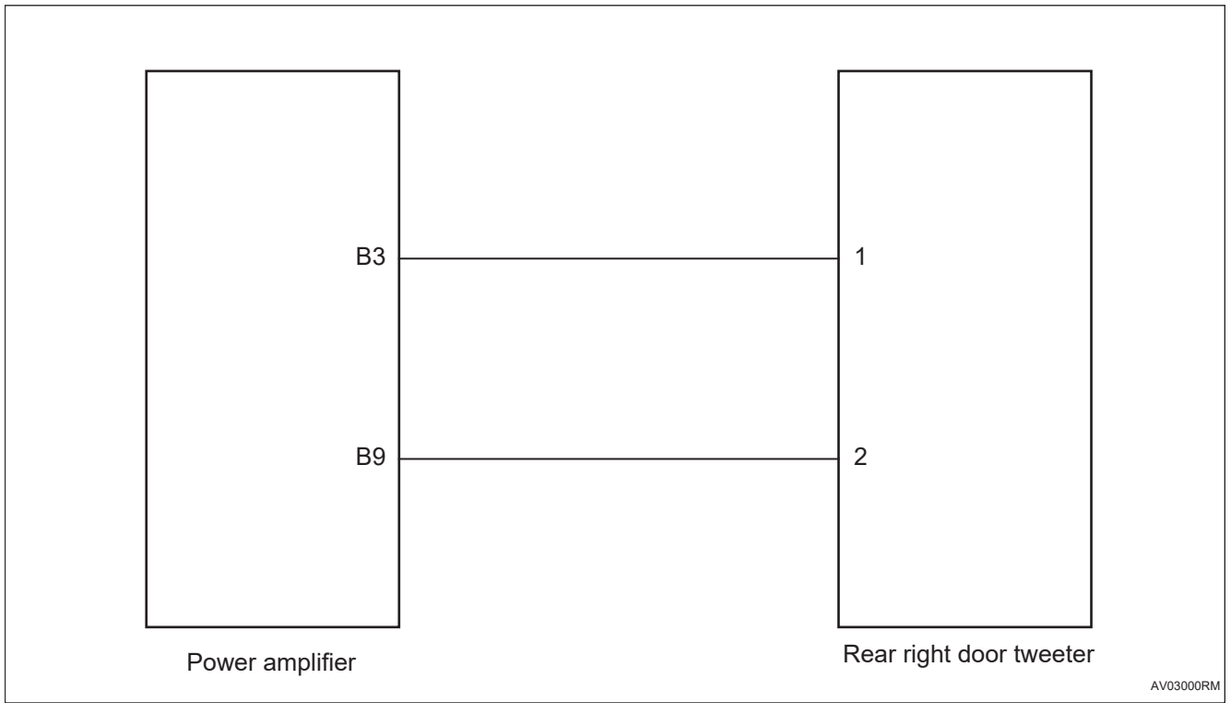
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148301	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door tweeter
B148313	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Rear right door tweeter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148311	Abnormal speaker sound or no sound output	Not come on
B148312	Abnormal speaker sound or no sound output	Not come on

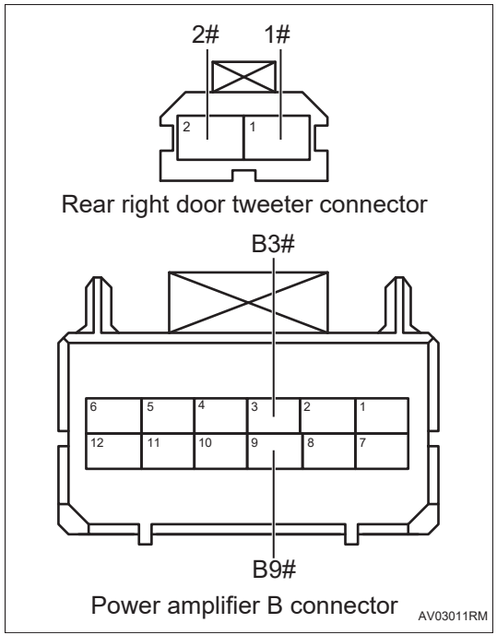
DTC No.	Fault symptom	Warning light/indicator
B148301	Abnormal speaker sound or no sound output	Not come on
B148313	Abnormal speaker sound or no sound output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in rear right door tweeter wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the rear right door tweeter connector.

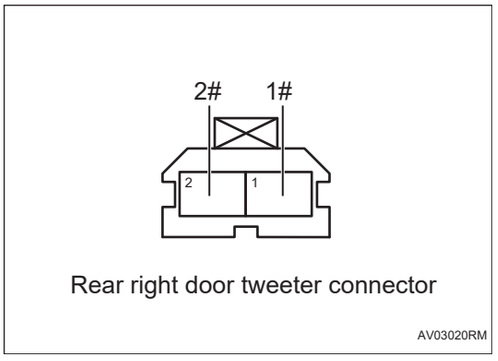
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear right door tweeter connector 1# - power amplifier connector B3#	Always connected	Less than 1 Ω
Rear right door tweeter connector 2# - power amplifier connector B9#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear right door tweeter wire harness and connector**



Rear right door tweeter connector

AV03020RM

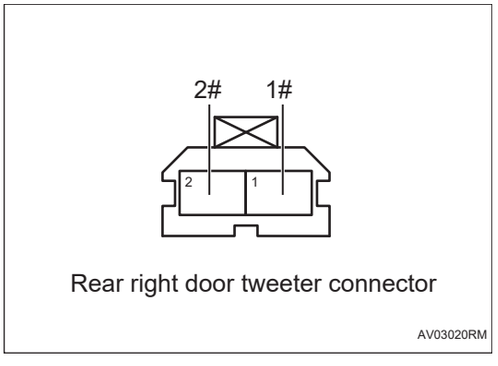
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear right door tweeter connector 1# - body ground	Always connected	10 KΩ or more
Rear right door tweeter connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in rear right door tweeter wire harness and connector**



Rear right door tweeter connector

AV03020RM

(a) According to value in the table, measure resistance.

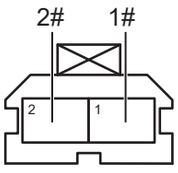
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door tweeter connector 1# - rear right door tweeter connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right door tweeter wire harness and connector**



Rear right door tweeter connector

AV03020RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear right door tweeter (See page ZC-93)**

(a) Replace the rear right door tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148411**	**Short to ground in front left woofer**
DTC	**B148412**	**Short to power supply in front left woofer**
DTC	**B148401**	**Short in front left woofer positive and negative**
DTC	**B148413**	**Open in front left woofer**

Description

When front left door woofer circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148411	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door woofer
B148412	• Battery voltage is normal • Non-OTA mode	Since AMP driver circuit uses a separate power IC chip, it is judged by	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door woofer

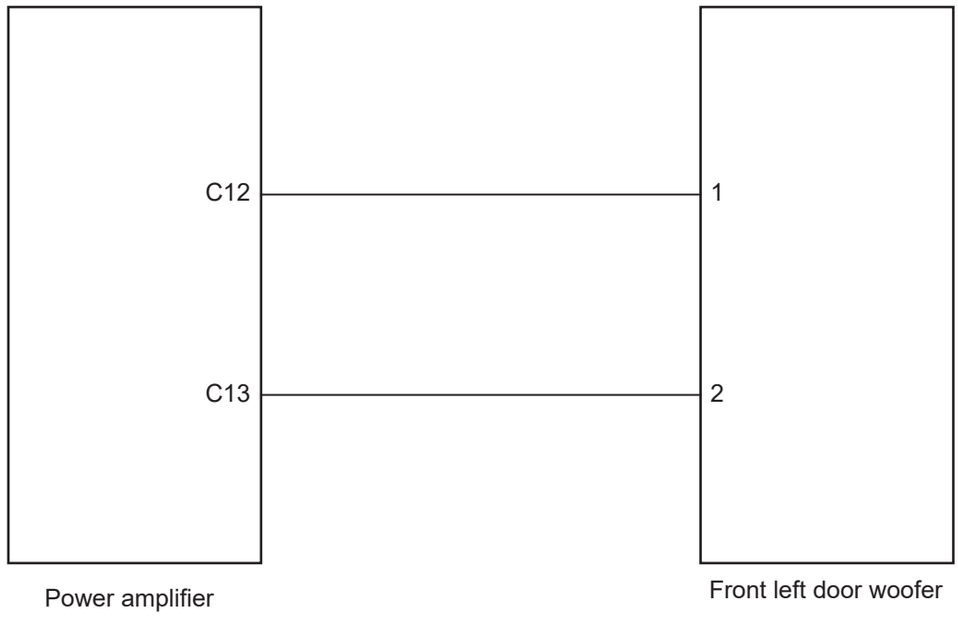
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error				
B148401	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door woofer

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148413	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front left door woofer

Fault symptom

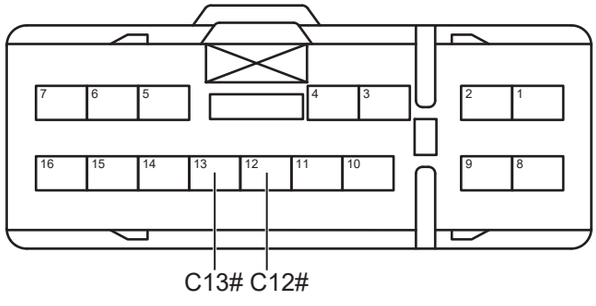
DTC No.	Fault symptom	Warning light/indicator
B148411	Abnormal speaker sound or no sound output	Not come on
B148412	Abnormal speaker sound or no sound output	Not come on
B148401	Abnormal speaker sound or no sound output	Not come on
B148413	Abnormal speaker sound or no sound output	Not come on

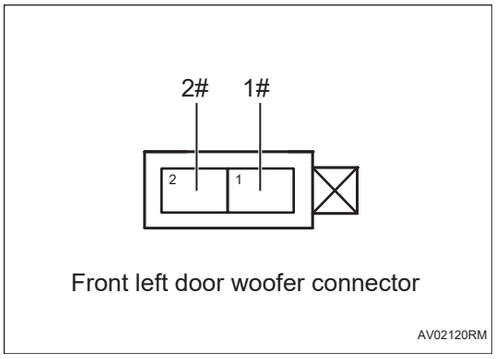
Circuit diagram



Inspection procedure

1	**Check for open in front left door woofer wire harness and connector**





Front left door woofer connector

AV02120RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the front left door woofer connector.

(e) According to value in the table, measure resistance.

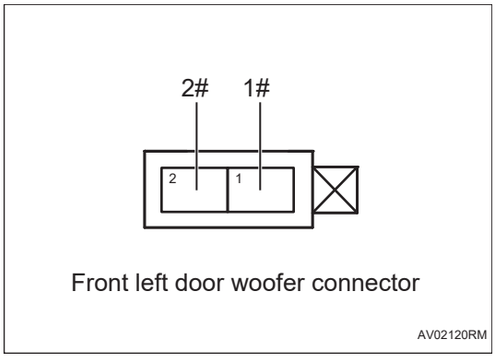
Multimeter connection	Detection condition	Specified condition
Front left door woofer connector 1# - power amplifier connector C12#	Always connected	Less than 1 Ω
Front left door woofer connector 2# - power amplifier connector C13#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front left door woofer wire harness and connector**



Front left door woofer connector

AV02120RM

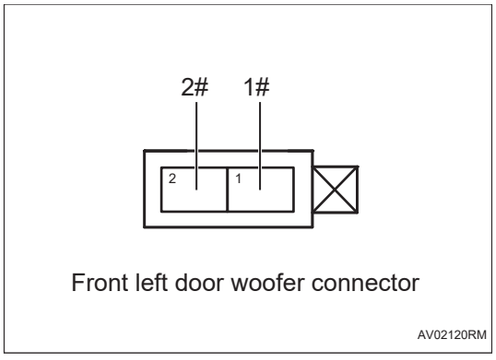
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Front left door woofer connector 1# - body ground	Always connected	10 KΩ or more
Front left door woofer connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in front left door woofer wire harness and connector**



Front left door woofer connector

AV02120RM

(a) According to value in the table, measure resistance.

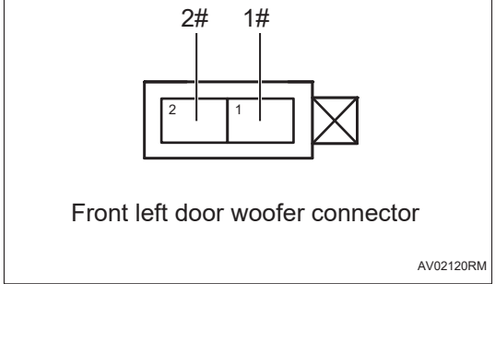
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door woofer connector 1# - front left door woofer connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door woofer wire harness and connector**



Front left door woofer connector

AV02120RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door woofer connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door woofer connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left door woofer (See page ZC-93)**

(a) Replace the front left door woofer.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148511**	**Short to ground in front right woofer**
DTC	**B148512**	**Short to power supply in front right woofer**
DTC	**B148501**	**Short in front right woofer positive and negative**
DTC	**B148513**	**Open in front right woofer**

Description

When front right door woofer circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148511	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door woofer
B148512	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door woofer

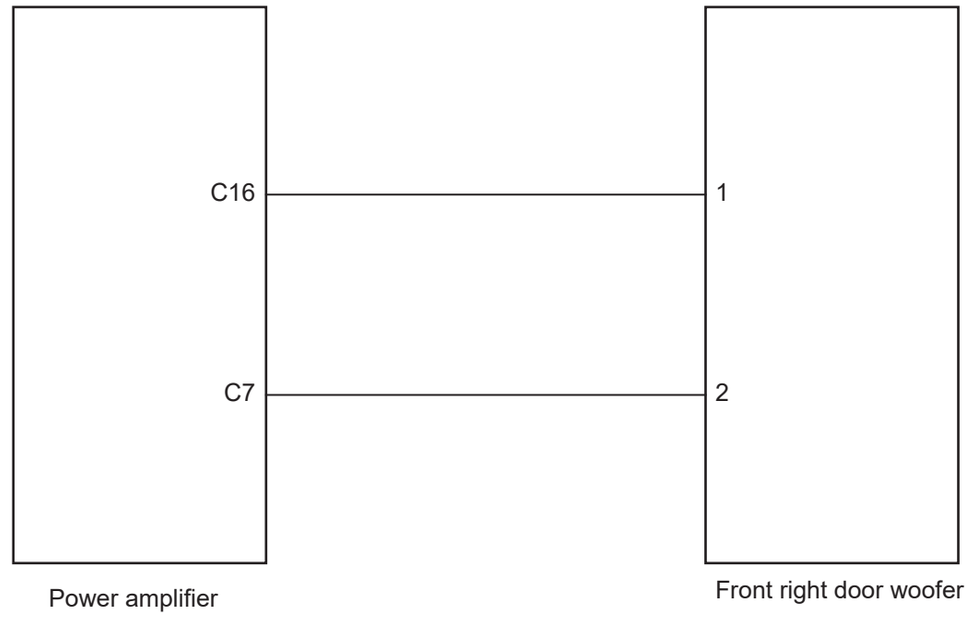
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148501	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door woofer
B148513	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Front right door woofer

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148511	Abnormal speaker sound or no sound output	Not come on
B148512	Abnormal speaker sound or no sound output	Not come on

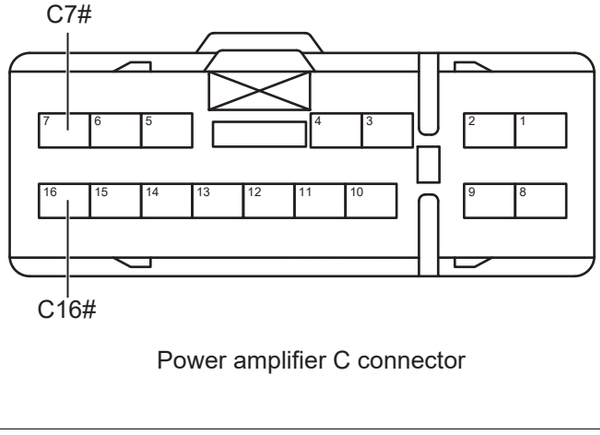
DTC No.	Fault symptom	Warning light/indicator
B148501	Abnormal speaker sound or no sound output	Not come on
B148513	Abnormal speaker sound or no sound output	Not come on

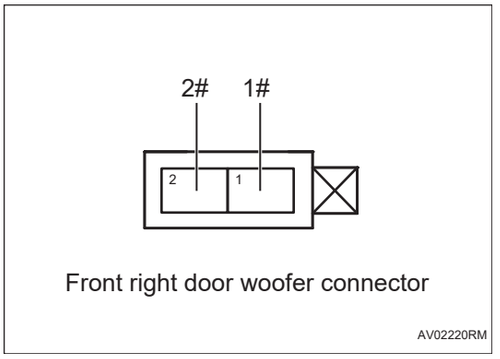
Circuit diagram



Inspection procedure

1	**Check for open in front right door woofer wire harness and connector**





Front right door woofer connector

AV02220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the front right door woofer connector.

(e) According to value in the table, measure resistance.

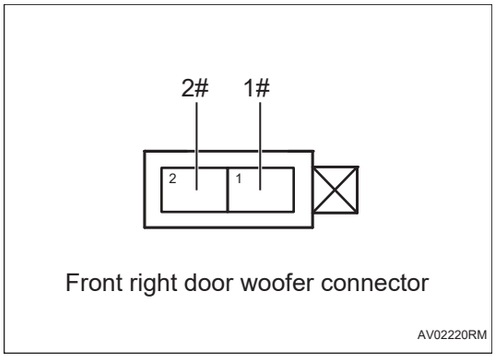
Multimeter connection	Detection condition	Specified condition
Front right door woofer connector 1# - power amplifier connector C16#	Always connected	Less than 1 Ω
Front right door woofer connector 2# - power amplifier connector C7#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front right door woofer wire harness and connector**



Front right door woofer connector

AV02220RM

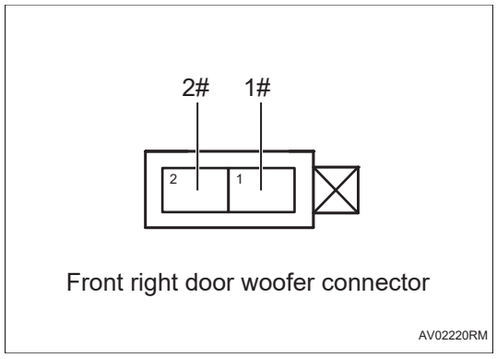
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Front right door woofer connector 1# - body ground	Always connected	10 KΩ or more
Front right door woofer connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in front right door woofer wire harness and connector**



Front right door woofer connector

AV02220RM

(a) According to value in the table, measure resistance.

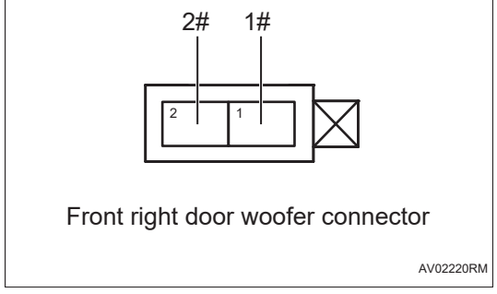
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door woofer connector 1# - front right door woofer connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front right door woofer wire harness and connector**



Front right door woofer connector

AV02220RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door woofer connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door woofer connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace front right door woofer (See page ZC-93)**

(a) Replace the front right door woofer.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148611**	**Short to ground in rear left woofer**
DTC	**B148612**	**Short to power supply in rear left woofer**
DTC	**B148601**	**Short in rear left woofer positive and negative**
DTC	**B148613**	**Open in rear left woofer**

Description

When rear left door woofer circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148611	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door woofer
B148612	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door woofer

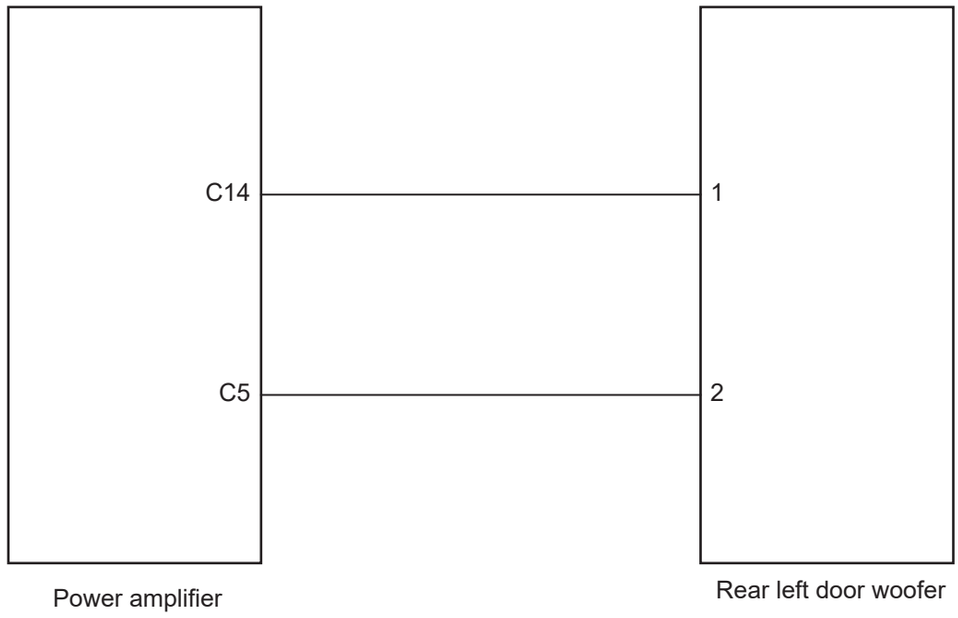
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148601	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door woofer
B148613	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear left door woofer

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148611	Abnormal speaker sound or no sound output	Not come on
B148612	Abnormal speaker sound or no sound output	Not come on

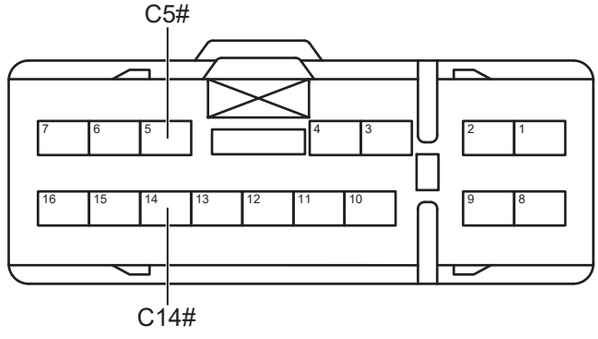
DTC No.	Fault symptom	Warning light/indicator
B148601	Abnormal speaker sound or no sound output	Not come on
B148613	Abnormal speaker sound or no sound output	Not come on

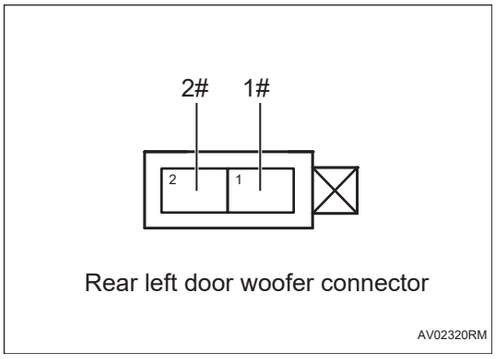
Circuit diagram



Inspection procedure

1	**Check for open in rear left door woofer wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the rear left door woofer connector.

(e) According to value in the table, measure resistance.

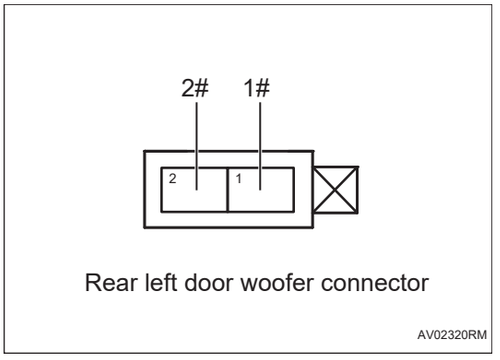
Multimeter connection	Detection condition	Specified condition
Rear left door woofer connector 1# - power amplifier connector C14#	Always connected	Less than 1 Ω
Rear left door woofer connector 2# - power amplifier connector C5#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left door woofer wire harness and connector**



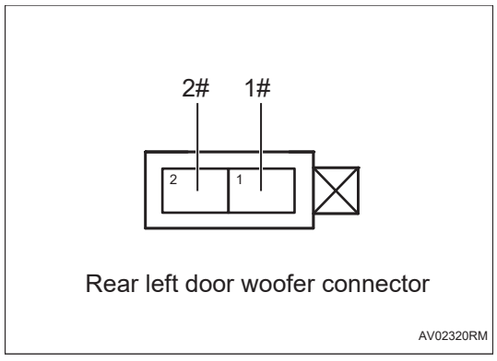
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear left door woofer connector 1# - body ground	Always connected	10 KΩ or more
Rear left door woofer connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in rear left door woofer wire harness and connector**



Rear left door woofer connector

AV02320RM

(a) According to value in the table, measure resistance.

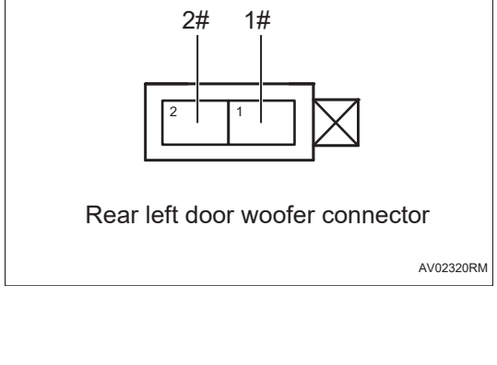
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door woofer connector 1# - rear left door woofer connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left door woofer wire harness and connector**



Rear left door woofer connector

AV02320RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door woofer connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door woofer connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace rear left door woofer (See page ZC-93)**

(a) Replace the rear left door woofer.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148711**	**Short to ground in rear right woofer**
DTC	**B148712**	**Short to power supply in rear right woofer**
DTC	**B148701**	**Short in rear right woofer positive and negative**
DTC	**B148713**	**Open in rear right woofer**

Description

When rear right door woofer circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148711	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door woofer
B148712	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door woofer

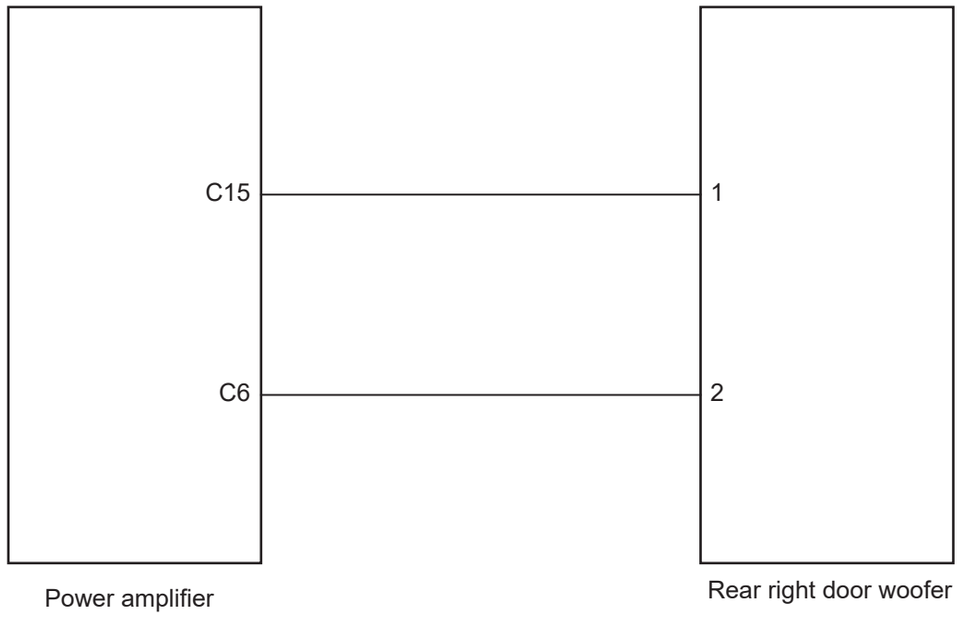
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148701	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door woofer
B148713	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Rear right door woofer

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148711	Abnormal speaker sound or no sound output	Not come on
B148712	Abnormal speaker sound or no sound output	Not come on

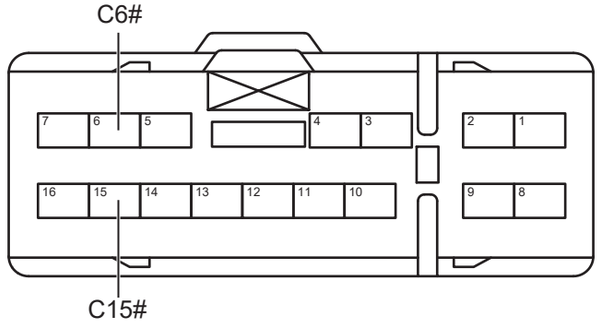
DTC No.	Fault symptom	Warning light/indicator
B148701	Abnormal speaker sound or no sound output	Not come on
B148713	Abnormal speaker sound or no sound output	Not come on

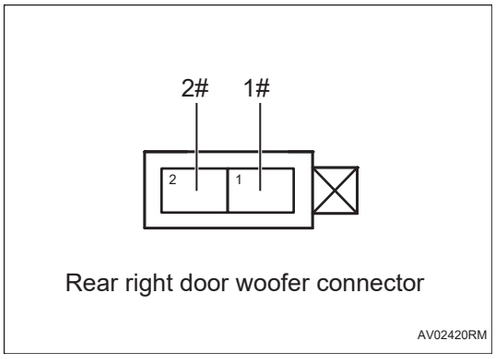
Circuit diagram



Inspection procedure

1	**Check for open in rear right door woofer wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the rear right door woofer connector.

(e) According to value in the table, measure resistance.

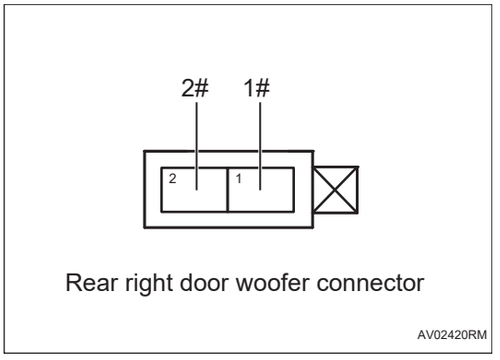
Multimeter connection	Detection condition	Specified condition
Rear right door woofer connector 1# - power amplifier connector C15#	Always connected	Less than 1 Ω
Rear right door woofer connector 2# - power amplifier connector C6#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear right door woofer wire harness and connector**



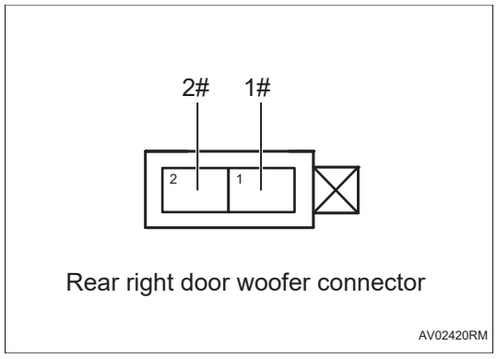
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Rear right door woofer connector 1# - body ground	Always connected	10 KΩ or more
Rear right door woofer connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in rear right door woofer wire harness and connector**



Rear right door woofer connector

AV02420RM

(a) According to value in the table, measure resistance.

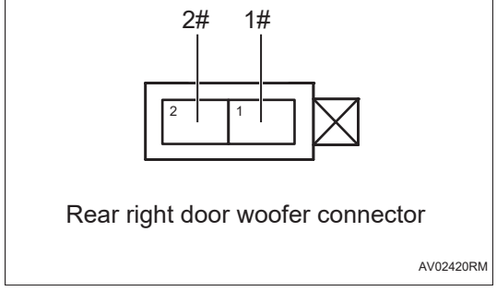
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door woofer connector 1# - rear right door woofer connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right door woofer wire harness and connector**



Rear right door woofer connector

AV02420RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door woofer connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door woofer connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace rear right door woofer (See page ZC-93)**

(a) Replace rear right door woofer.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148811**	**Short to ground in instrument cluster mid tweeter**
DTC	**B148812**	**Short to power supply in instrument cluster mid tweeter**
DTC	**B148801**	**Short in instrument cluster mid tweeter positive and negative**
DTC	**B148813**	**Open in instrument cluster mid tweeter**

Description

When the instrument cluster mid tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148811	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Instrument cluster mid tweeter
B148812	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Instrument cluster mid tweeter

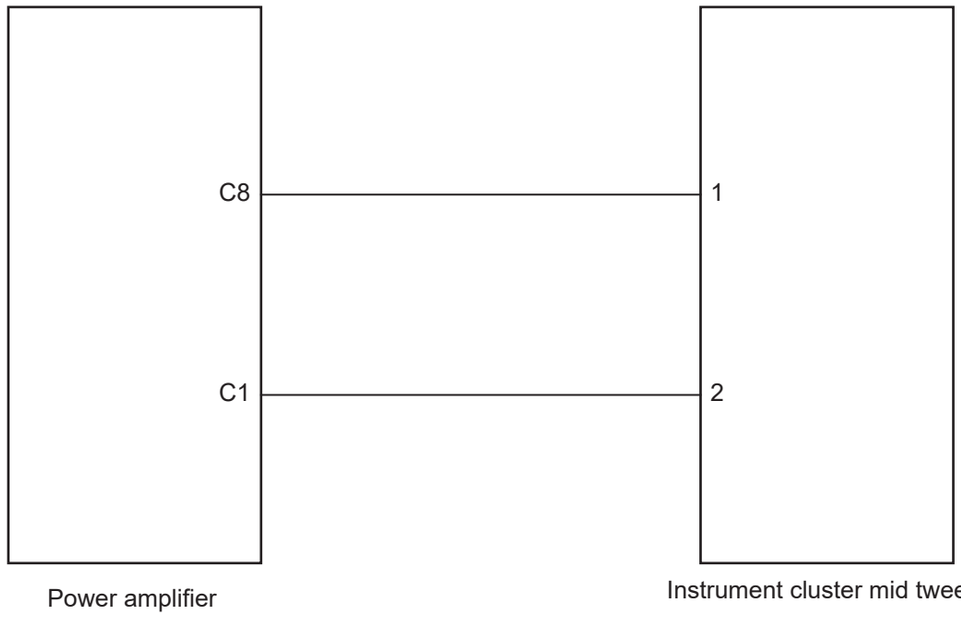
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148801	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Instrument cluster mid tweeter
B148813	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Instrument cluster mid tweeter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148811	Abnormal speaker sound or no sound output	Not come on
B148812	Abnormal speaker sound or no sound output	Not come on

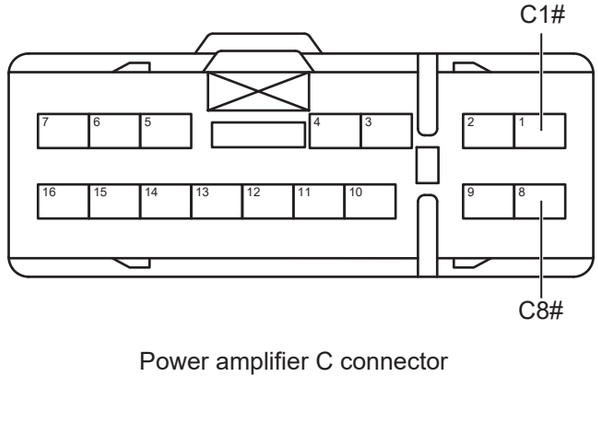
DTC No.	Fault symptom	Warning light/indicator
B148801	Abnormal speaker sound or no sound output	Not come on
B148813	Abnormal speaker sound or no sound output	Not come on

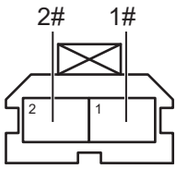
Circuit diagram



Inspection procedure

1	**Check for open in instrument cluster mid tweeter wire harness and connector**





Instrument cluster mid tweeter connector

AV02020RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the instrument cluster mid tweeter connector.

(e) According to value in the table, measure resistance.

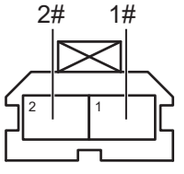
Multimeter connection	Detection condition	Specified condition
Instrument cluster mid tweeter connector 1# - power amplifier connector C8#	Always connected	Less than 1 Ω
Instrument cluster mid tweeter connector 2# - power amplifier connector C1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

2	**Check for short to ground in instrument cluster mid tweeter wire harness and connector**



Instrument cluster mid tweeter connector

AV02020RM

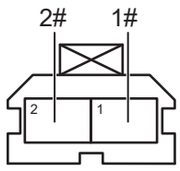
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Instrument cluster mid tweeter connector 1# - body ground	Always connected	10 KΩ or more
Instrument cluster mid tweeter connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

3	Check for short to each other in instrument cluster mid tweeter wire harness and connector



Instrument cluster mid tweeter connector

AV02020RM

(a) According to value in the table, measure resistance.

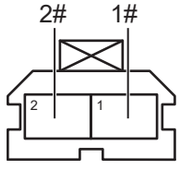
Standard value

Multimeter connection	Detection condition	Specified condition
Instrument cluster mid tweeter connector 1# - instrument cluster mid tweeter connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in instrument cluster mid tweeter wire harness and connector



Instrument cluster mid tweeter connector

AV02020RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Instrument cluster mid tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Instrument cluster mid tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace instrument cluster mid tweeter (See page ZC-82)**

(a) Replace the instrument cluster mid tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	B148911	Short to ground in left surround
DTC	B148912	Short to power supply in left surround
DTC	B148901	Short in left surround positive and negative
DTC	B148913	Open in left surround

Description

When the left surround mid tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148911	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Left surround mid tweeter
B148912	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Left surround mid tweeter

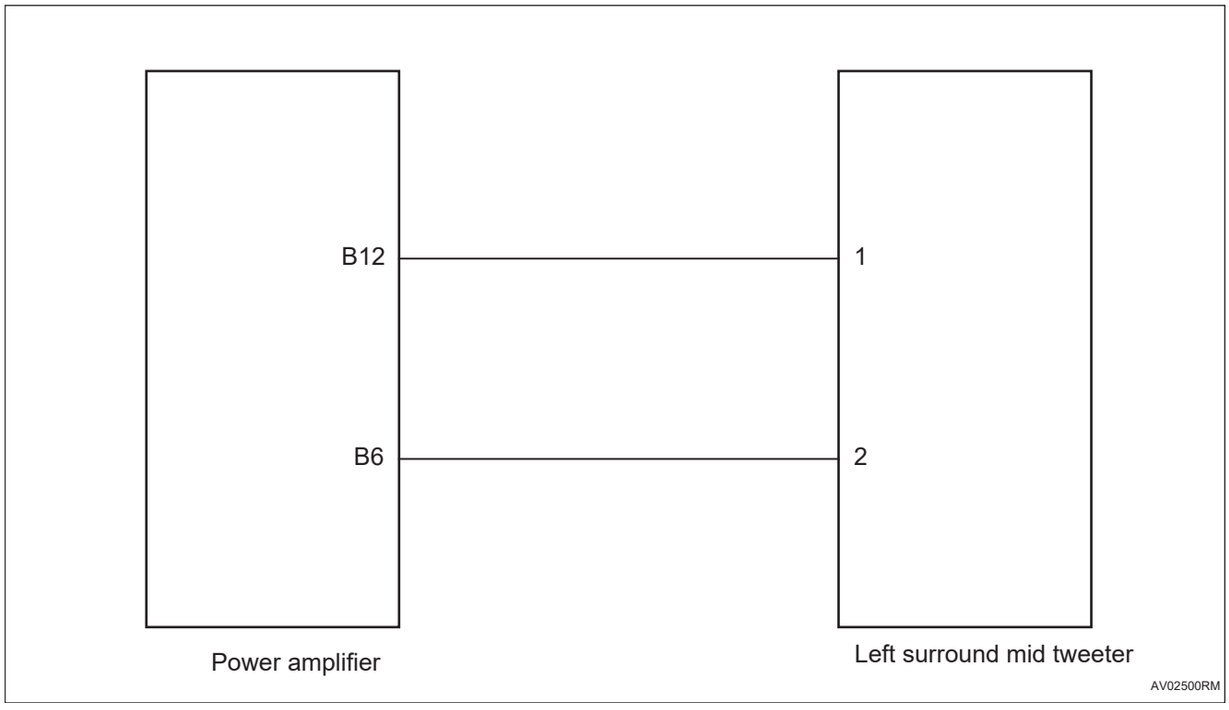
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148901	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Left surround mid tweeter
B148913	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Left surround mid tweeter

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148911	Abnormal speaker sound or no sound output	Not come on
B148912	Abnormal speaker sound or no sound output	Not come on

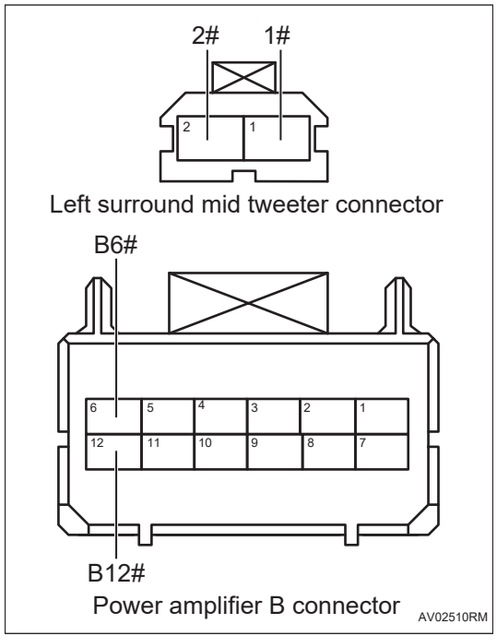
DTC No.	Fault symptom	Warning light/indicator
B148901	Abnormal speaker sound or no sound output	Not come on
B148913	Abnormal speaker sound or no sound output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in left surround mid tweeter wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the left surround mid tweeter speaker connector.

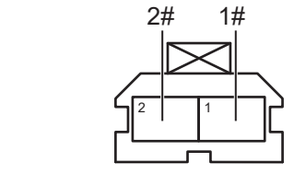
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Left surround mid tweeter connector 1# - power amplifier connector B12#	Always connected	Less than 1 Ω
Left surround mid tweeter connector 2# - power amplifier connector B6#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in left surround mid tweeter wire harness and connector**



Left surround mid tweeter connector

AV02520RM

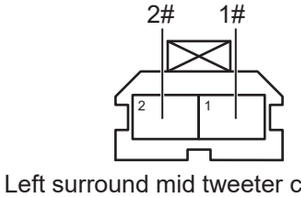
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Left surround mid tweeter connector 1# - body ground	Always connected	10 KΩ or more
Left surround mid tweeter connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in left surround mid tweeter wire harness and connector**



Left surround mid tweeter connector

AV02520RM

(a) According to value in the table, measure resistance.

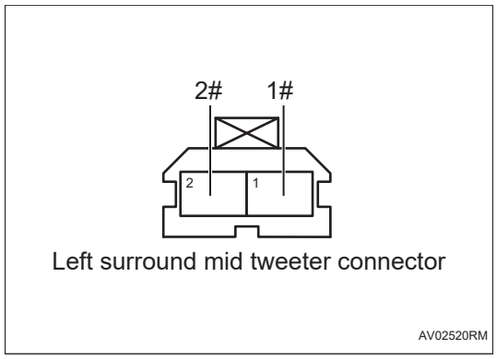
Standard value

Multimeter connection	Detection condition	Specified condition
Left surround mid tweeter connector 1# - left surround mid tweeter connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in left surround mid tweeter wire harness and connector



Left surround mid tweeter connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Left surround mid tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Left surround mid tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace left surround mid tweeter (See page ZC-82)

(a) Replace the left surround mid tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

ZD

DTC	**B148A11**	**Short to ground in right surround**
DTC	**B148A12**	**Short to power supply in right surround**
DTC	**B148A01**	**Short in right surround positive and negative**
DTC	**B148A13**	**Open in right surround**

Description

When the right surround mid tweeter circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148A11	• Battery voltage is normal • Non-OTA mode • Undiagnos-ed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Right surround mid tweeter
B148A12	• Battery voltage is normal • Non-OTA mode	Since AMP driver circuit uses a separate power IC chip, it is judged by	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Right surround mid tweeter

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error				
B148A01	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Right surround mid tweeter

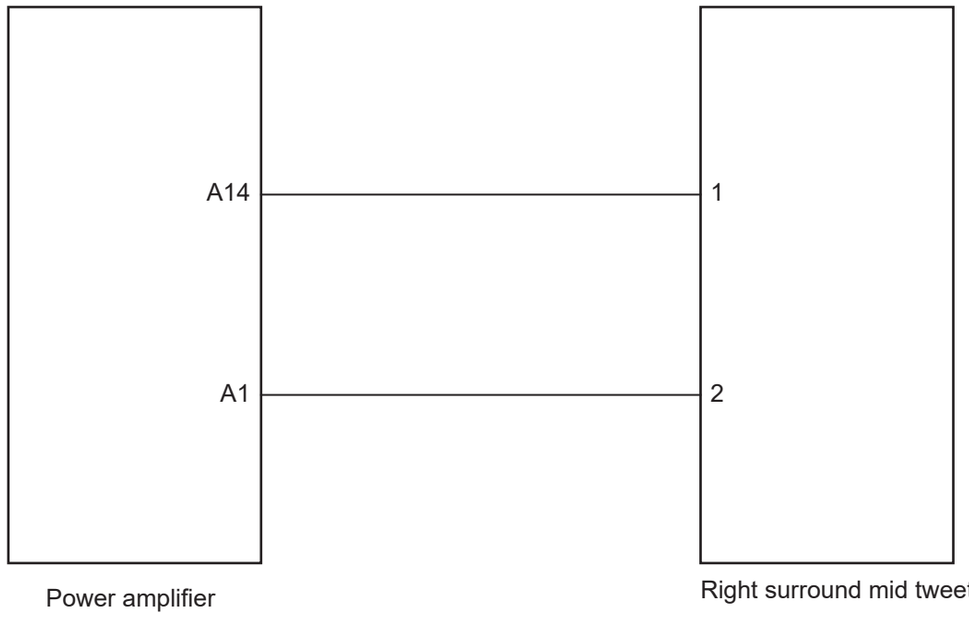
ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148A13	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Right surround mid tweeter

Fault symptom

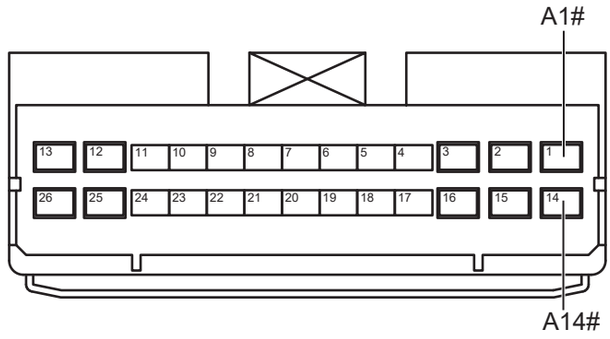
DTC No.	Fault symptom	Warning light/indicator
B148A11	Abnormal speaker sound or no sound output	Not come on
B148A12	Abnormal speaker sound or no sound output	Not come on
B148A01	Abnormal speaker sound or no sound output	Not come on
B148A13	Abnormal speaker sound or no sound output	Not come on

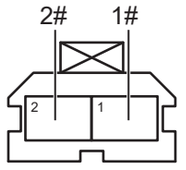
Circuit diagram



Inspection procedure

1	**Check for open in right surround mid tweeter wire harness and connector**





Right surround mid tweeter connector

AV02620RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the right surround mid tweeter speaker connector.

(e) According to value in the table, measure resistance.

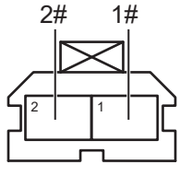
Multimeter connection	Detection condition	Specified condition
Right surround mid tweeter connector 1# - power amplifier connector A14#	Always connected	Less than 1 Ω
Right surround mid tweeter connector 2# - power amplifier connector A1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

2	**Check for short to ground in right surround mid tweeter wire harness and connector**



Right surround mid tweeter connector

AV02620RM

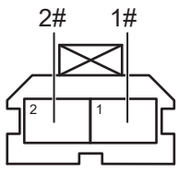
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Right surround mid tweeter connector 1# - body ground	Always connected	10 KΩ or more
Right surround mid tweeter connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK →

3	**Check for short to each other in right surround mid tweeter wire harness and connector**



Right surround mid tweeter connector

AV02620RM

(a) According to value in the table, measure resistance.

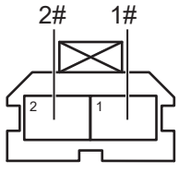
Standard value

Multimeter connection	Detection condition	Specified condition
Right surround mid tweeter connector 1# - right surround mid tweeter connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in right surround mid tweeter wire harness and connector**



Right surround mid tweeter connector

AV02620RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Right surround mid tweeter connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Right surround mid tweeter connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace right surround mid tweeter (See page ZC-82)**

(a) Replace the right surround mid tweeter.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148B11**	**Short to ground in subwoofer**
DTC	**B148B12**	**Short to power supply in subwoofer**
DTC	**B148B01**	**Short in subwoofer positive and negative**
DTC	**B148B13**	**Open in subwoofer**

Description

When there is short or open in subwoofer circuit, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148B11	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Subwoofer
B148B12	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Subwoofer

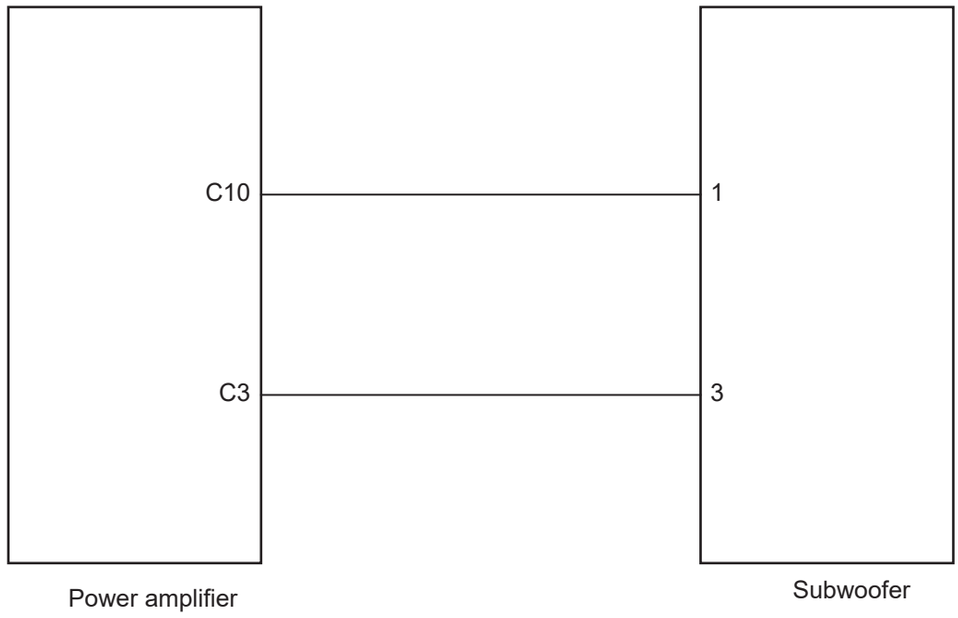
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148B01	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Subwoofer
B148B13	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as open error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Subwoofer

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148B11	Abnormal speaker sound or no sound output	Not come on
B148B12	Abnormal speaker sound or no sound output	Not come on

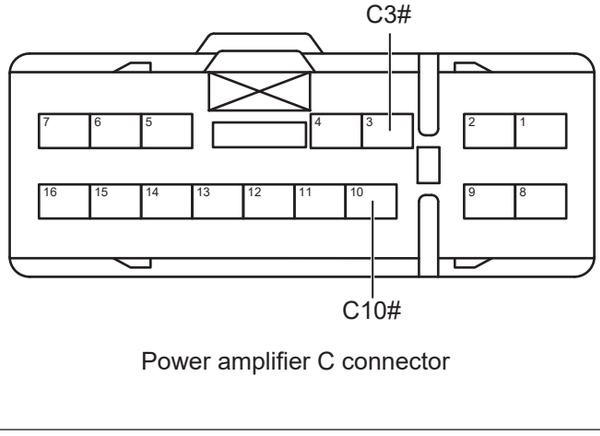
DTC No.	Fault symptom	Warning light/indicator
B148B01	Abnormal speaker sound or no sound output	Not come on
B148B13	Abnormal speaker sound or no sound output	Not come on

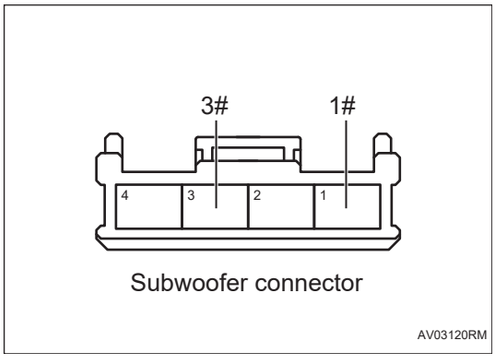
Circuit diagram



Inspection procedure

1	**Check for open in subwoofer wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the subwoofer connector.

(e) According to value in the table, measure resistance.

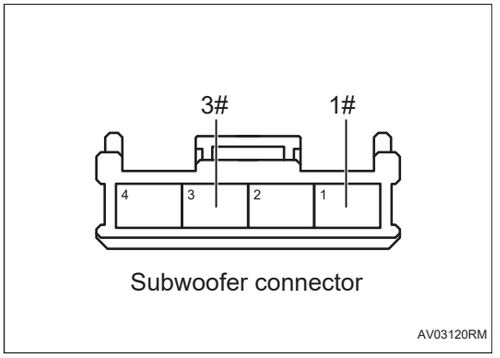
Multimeter connection	Detection condition	Specified condition
Subwoofer connector 1# - power amplifier connector C10#	Always connected	Less than 1 Ω
Subwoofer connector 3# - power amplifier connector C3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in subwoofer wire harness and connector**



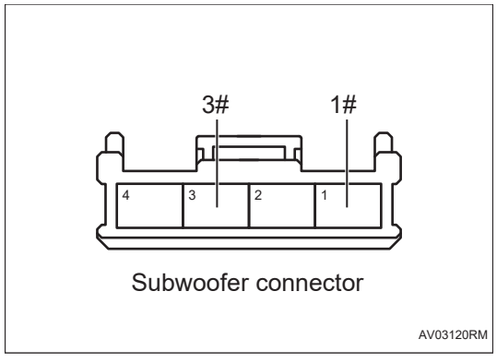
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Subwoofer connector 1# - body ground	Always connected	10 KΩ or more
Subwoofer connector 3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in subwoofer wire harness and connector**



(a) According to value in the table, measure resistance.

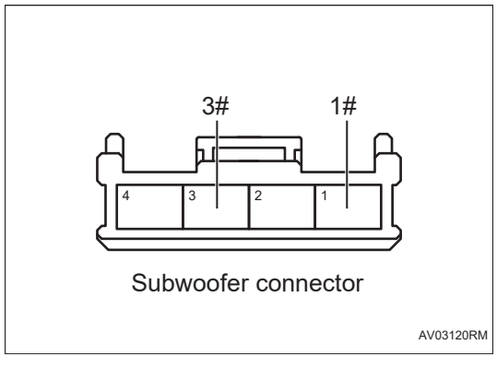
Standard value

Multimeter connection	Detection condition	Specified condition
Subwoofer connector 1# - subwoofer connector 3#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in subwoofer wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Subwoofer connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Subwoofer connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Replace subwoofer (See page ZC-87)**

(a) Replace the subwoofer.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

DTC	**B148E11**	**Short to ground in pedestrian warning speaker**
DTC	**B148E12**	**Short to power supply in pedestrian warning speaker**
DTC	**B148E10**	**Short in pedestrian warning speaker positive and negative**
DTC	**B148E13**	**Open in pedestrian warning speaker**

Description

When the pedestrian warning device circuit is short or open, the power amplifier records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148E11	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to ground error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Pedestrian alert
B148E12	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power supply voltage is 15 V	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short to power supply error	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Pedestrian alert

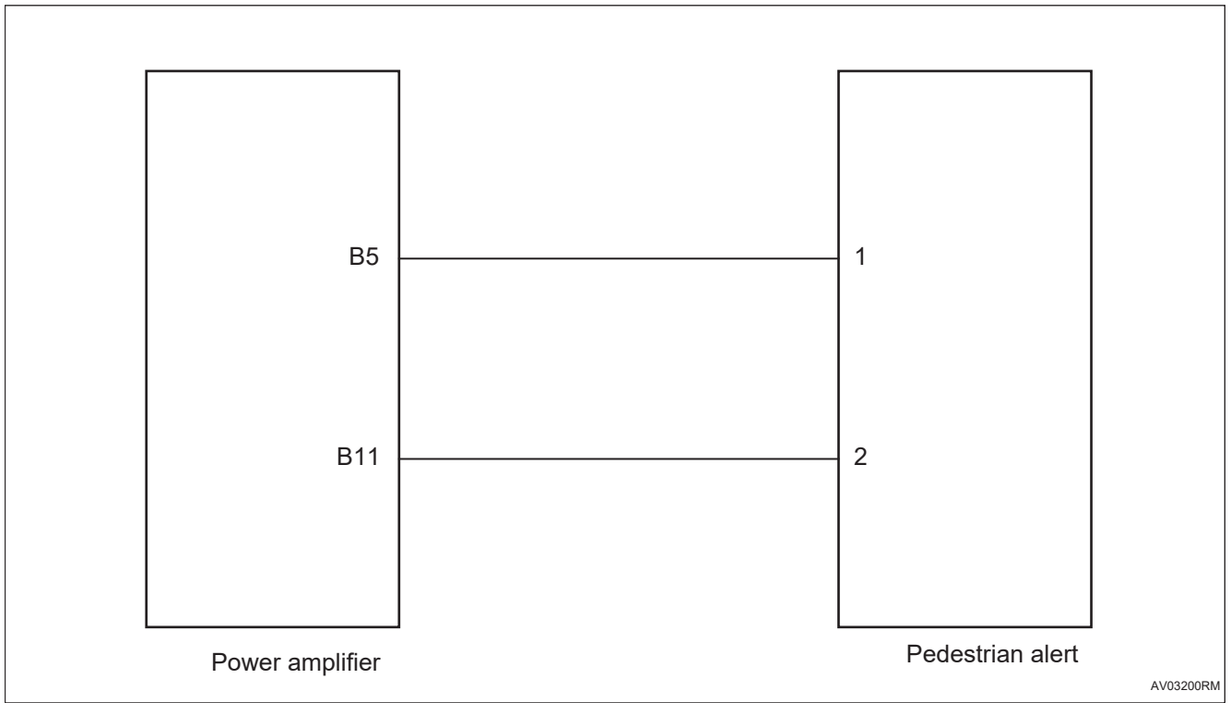
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B148E10	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by a short between positive and negative, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Read the register of power IC every 100 ms. When the status bit is detected as 1 for three consecutive times, it is determined as short error between positive and negative	300 ms	Continuous type	100 ms	• Power amplifier • Related wire harness fault • Pedestrian alert
B148E13	• Battery voltage is normal • Non-OTA mode • Undiagnosed service $85 is prohibited from reporting DTC • Power amplifier enters sleep status first, followed by an open, then power amplifier is awakened	Since AMP driver circuit uses a separate power IC chip, it is judged by reading the corresponding register bits of the power IC. Power on and read the memory of the power IC. When the state bit is detected to be 1, it is judged as an open circuit error	1 time	Non-continuous type	-	• Power amplifier • Related wire harness fault • Pedestrian alert

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B148E11	Abnormal speaker sound or no sound output	Not come on
B148E12	Abnormal speaker sound or no sound output	Not come on

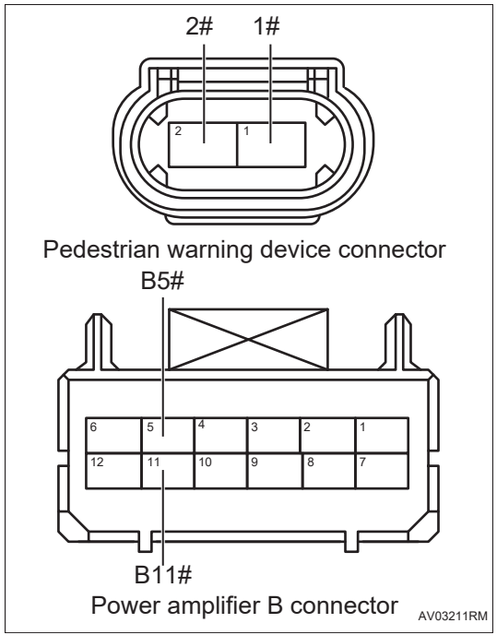
DTC No.	Fault symptom	Warning light/indicator
B148E10	Abnormal speaker sound or no sound output	Not come on
B148E13	Abnormal speaker sound or no sound output	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in pedestrian warning device wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Disconnect the pedestrian warning device connector.

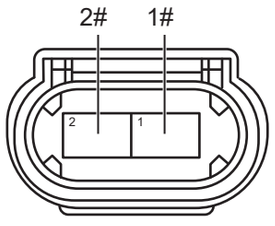
(e) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Pedestrian warning device connector 1# - power amplifier connector B5#	Always connected	Less than 1 Ω
Pedestrian warning device connector 2# - power amplifier connector B11#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in pedestrian warning device wire harness and connector**



Pedestrian warning device connector

AV03221RM

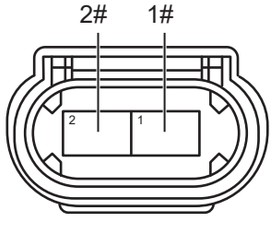
(a) According to value in the table, measure resistance.

Multimeter connection	Detection condition	Specified condition
Pedestrian warning device connector 1# - body ground	Always connected	10 KΩ or more
Pedestrian warning device connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to each other in pedestrian warning device wire harness and connector**



Pedestrian warning device connector

AV03221RM

(a) According to value in the table, measure resistance.

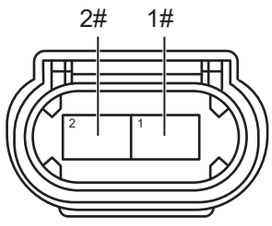
Standard value

Multimeter connection	Detection condition	Specified condition
Pedestrian warning device connector 1# - pedestrian warning device connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in pedestrian warning device wire harness and connector



Pedestrian warning device connector

AV03221RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Pedestrian warning device connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Pedestrian warning device connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	Replace pedestrian warning device (See page ZC-118)

(a) Replace the pedestrian warning device.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

OK

Diagnosis ends

ZD

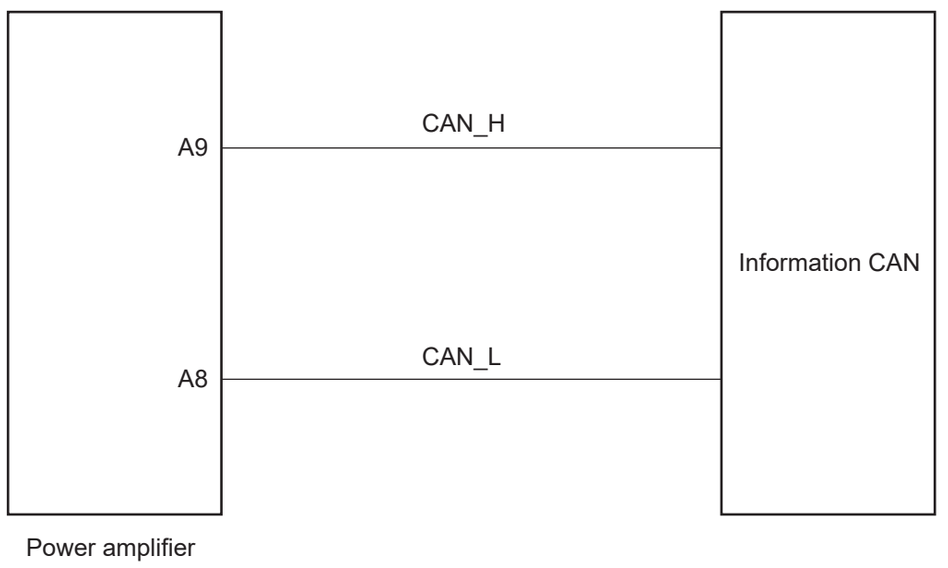
DTC	U004688	Information CAN bus off

Description

When power amplifier detects information CAN bus off fault, the power amplifier records DTC.

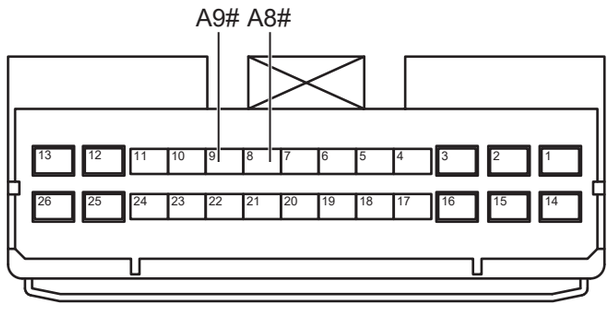
DTC No.	DTC detection condition	Faulty area
U004688	(a) Information CAN bus off.	• CAN line and connector • Front intelligent area control unit • Infotainment control unit • Power amplifier

Circuit diagram



Inspection procedure

1	**Check information CAN bus terminal resistance**



Power amplifier A connector

AV03911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the power amplifier connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A9# - power amplifier connector A8#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

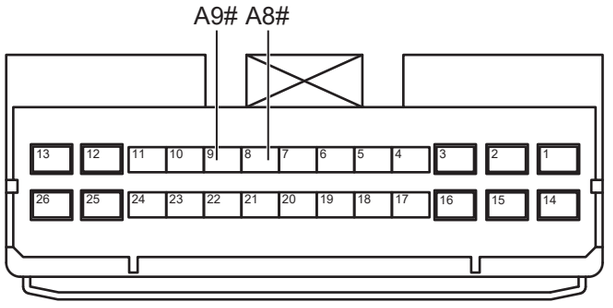
2	**Check controllers on information CAN bus**

(a) Disconnect the controllers on the information CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between information CAN bus CAN-L and CAN-H**



Power amplifier A connector

AV03911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on information CAN bus.

(d) According to value in the table, measure resistance.

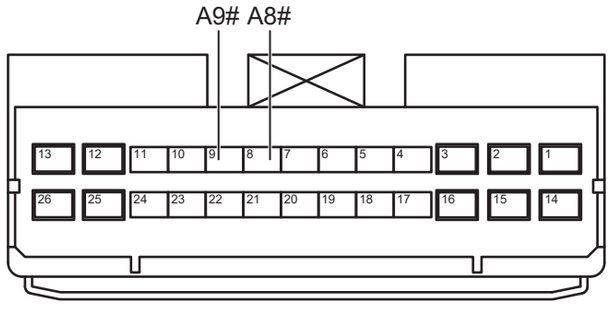
Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A9# - power amplifier connector A8#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in information CAN bus**



Power amplifier A connector

AV03911RM

(a) According to value in the table, measure resistance.

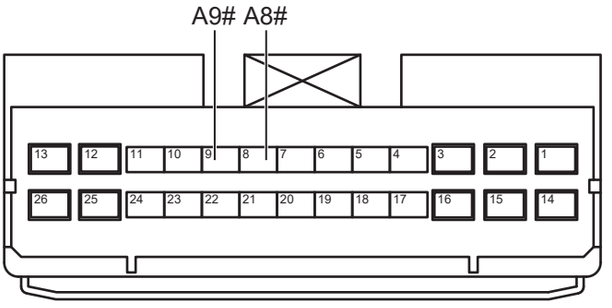
Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A9# - body ground	Always connected	10 KΩ or more
Power amplifier connector A8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in information CAN bus**



Power amplifier A connector

AV03911RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Power amplifier connector A8# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

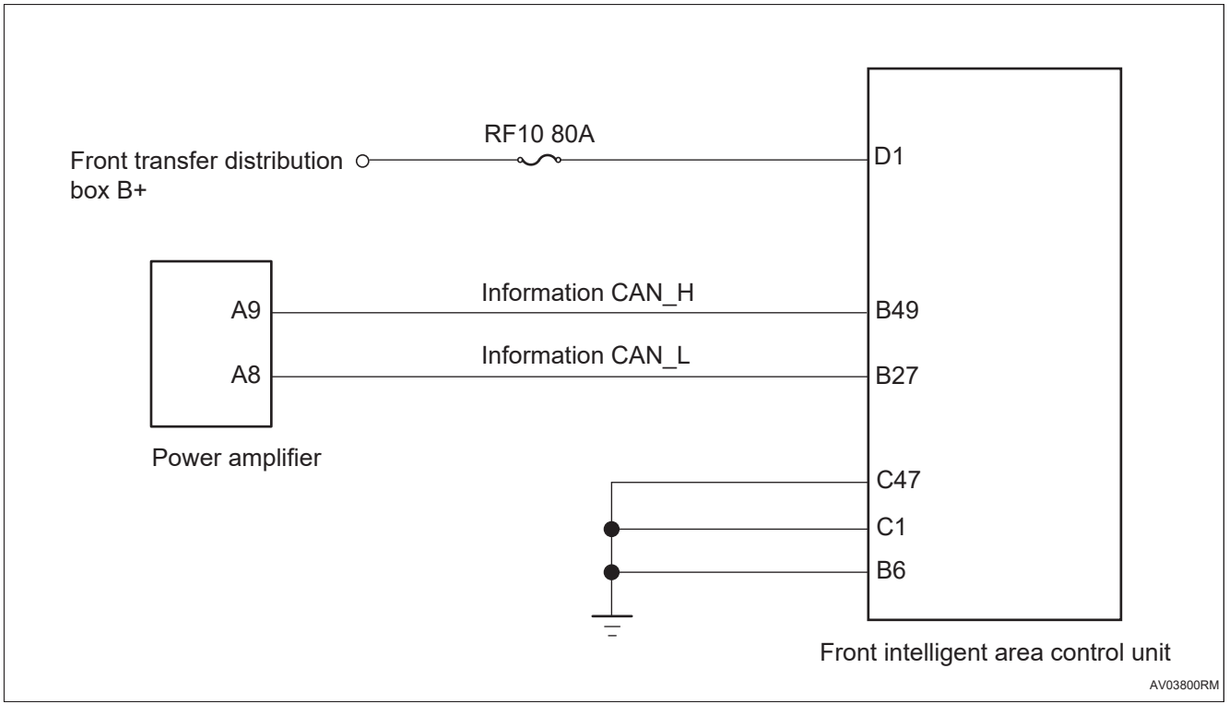
DTC	U014687	PDCF node lost
DTC	U011B87	CSC node lost

Description

When communication between power amplifier and other system is abnormal or interrupted, the power amplifier records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCF node lost.	• Wire harness and connector • Power amplifier • Front intelligent area control unit
U011B87	(a) CSC node lost.	• Wire harness and connector • Power amplifier • Infotainment control unit • Front intelligent area control unit

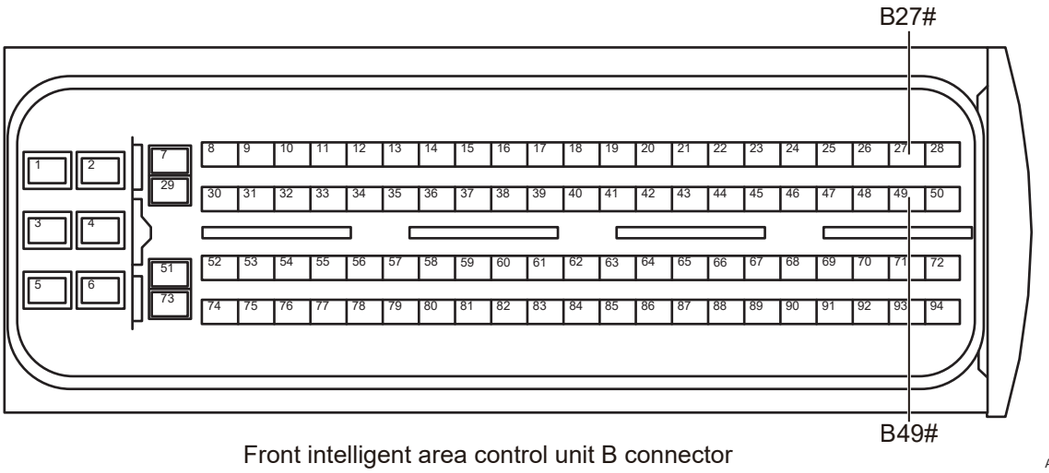
Circuit diagram



Inspection procedure

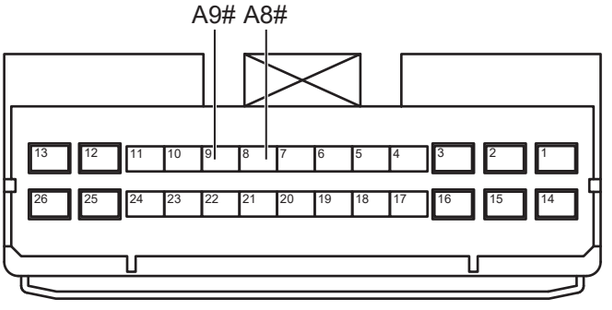
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in information CAN bus (power amplifier - front intelligent area control unit)**



Front intelligent area control unit B connector

AV01011RM



Power amplifier A connector

AV03911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on information CAN bus.

(d) According to value in the table, measure resistance.

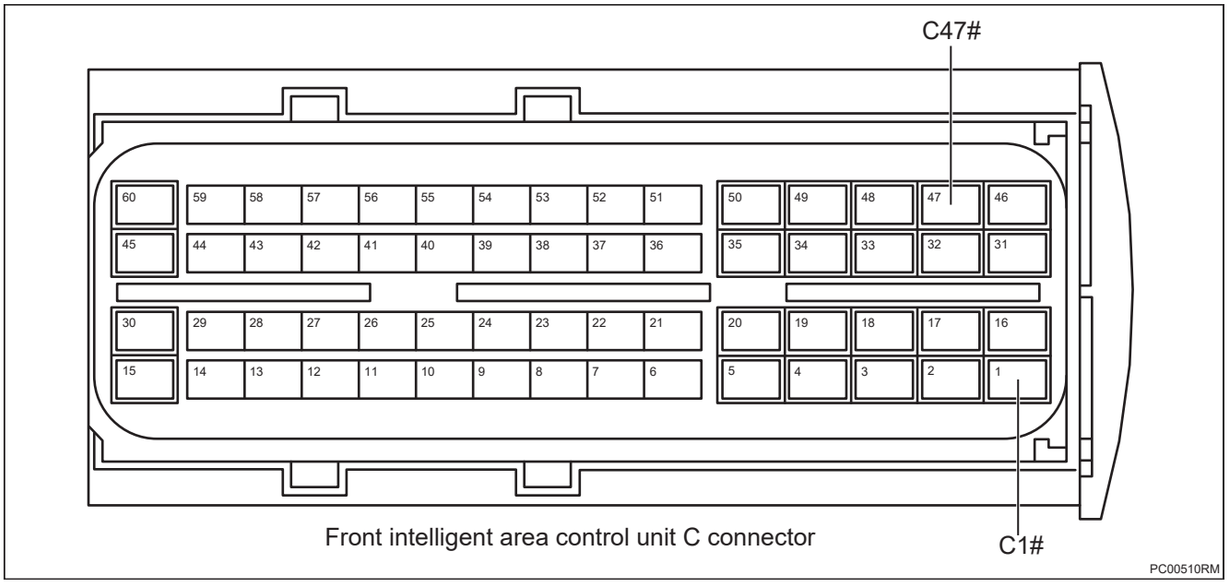
Standard value

Multimeter connection	Detection condition	Specified condition
Power amplifier connector A9# - front intelligent area control unit connector B49#	Always connected	Less than 1 Ω
Power amplifier connector A8# - front intelligent area control unit connector B27#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

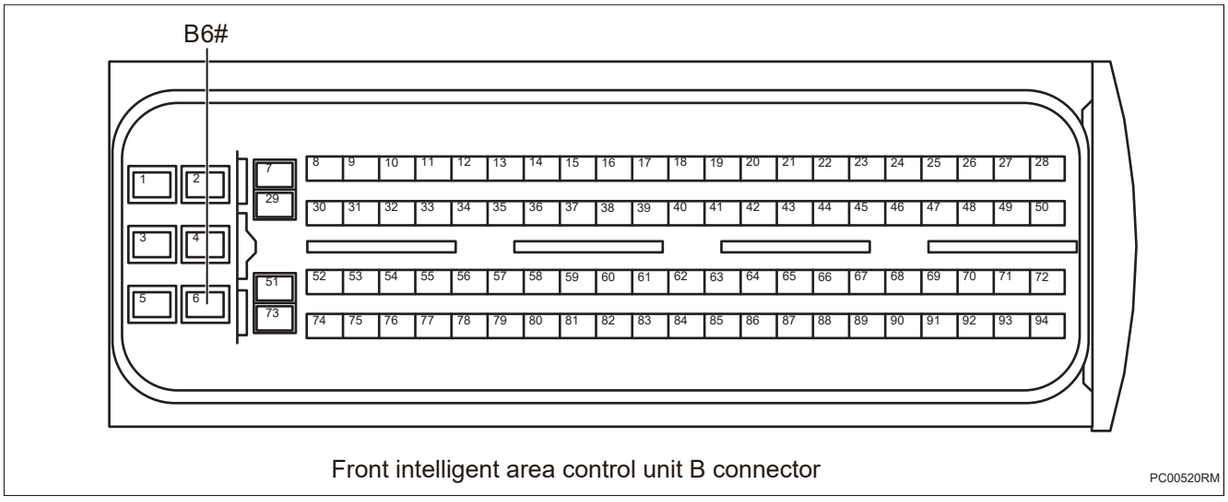
OK

2	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

PC00510RM



Front intelligent area control unit B connector

PC00520RM

(a) According to value in the table, measure resistance.

Standard value

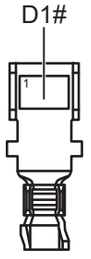
Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front intelligent area control unit power supply**



Front intelligent area control unit D connector

PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

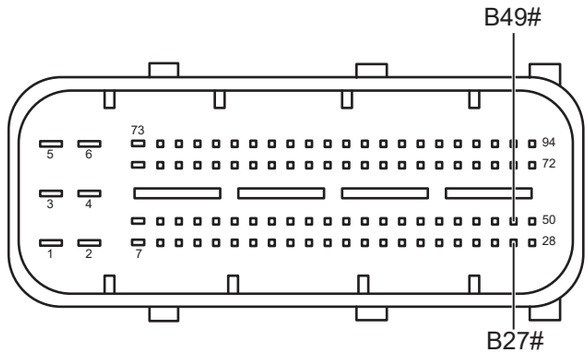
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check information CAN bus terminal resistance**



Front intelligent area control unit B

AV01020RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit B49# - front intelligent area control unit B27#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace front intelligent area control unit (See page ZC-128)**

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace power amplifier (See page ZC-91)**

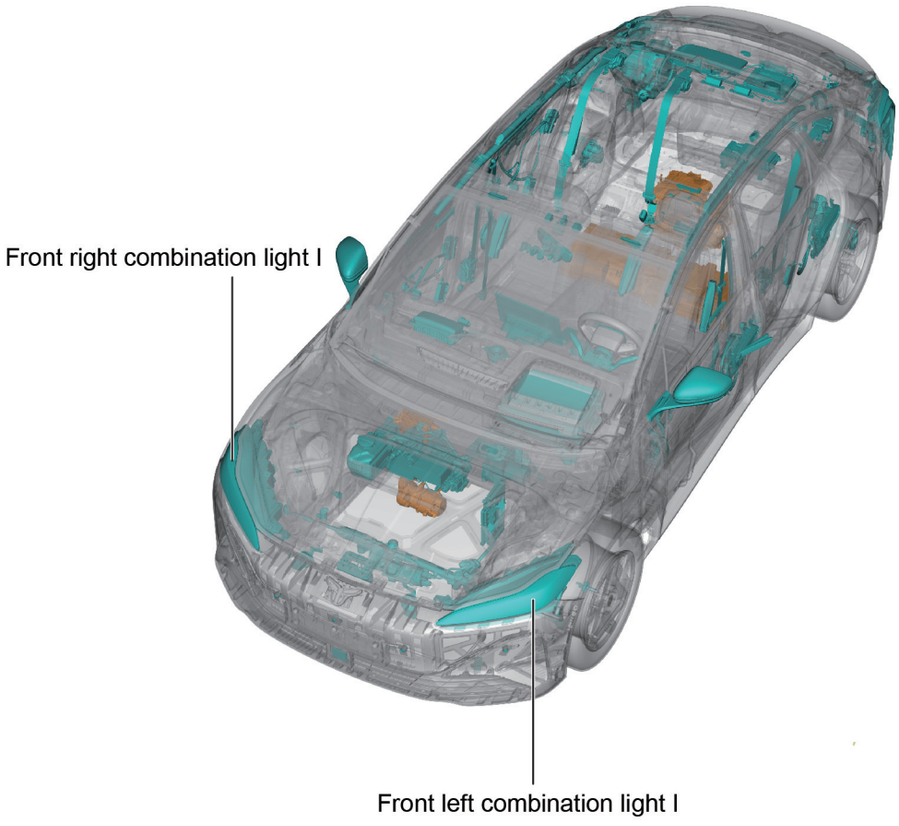
OK

Diagnosis ends

Lighting system

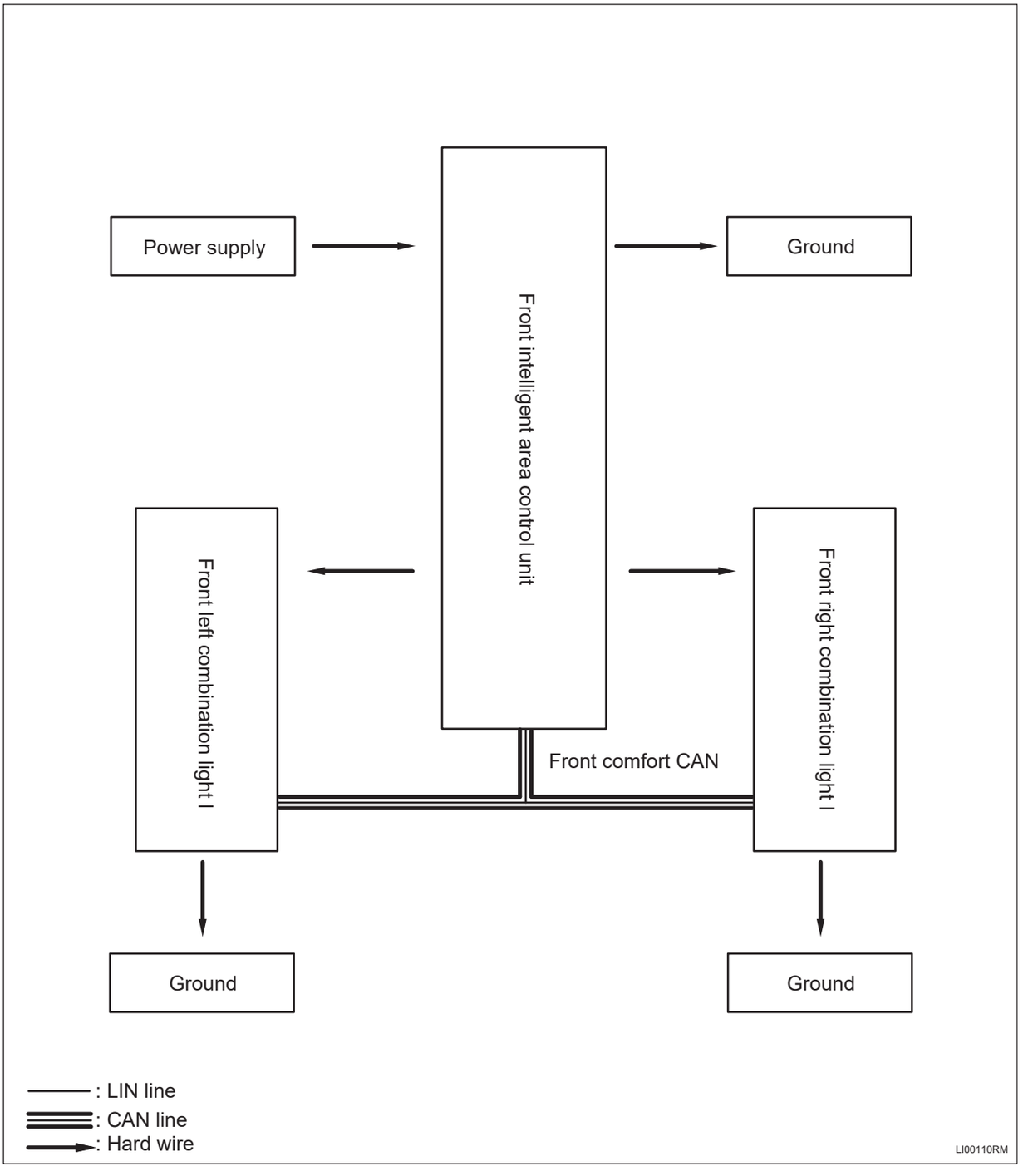
Front combination light

Part position



LI00120RM

System diagram



System description

1. Function definition

(a) Turn on low beam light: When the light is dim, the driver can turn on the low beam light according to their intention to meet the need of illuminating the closer field of view ahead and improve driving safety.

(b) Turning off low beam light: If the vehicle is in a well-lit environment, the drivers can turn off the low beam light according to their preferences to save power and energy.

(c) Low beam light fault reminder: When the low beam light fault occurs, causing the low beam light fail to function normally, the vehicle prompts the user of the low beam light fault, so as to prompt the driver to find the abnormality in time, adjust the use of the light, and repair it in time, improving driving safety.

(d) Low beam light fault reminder elimination: When the low beam light fault is repaired and the low beam light returns to the normal usable state, the vehicle eliminates the low beam light fault prompt, so that driver can obtain the low beam light status in time.

(e) Turn on high beam light: When the ambient lighting is dim, turning on the vehicle's high beam light allows user to better observe surrounding people, vehicles, roads, and obstacles, providing driver with good driving environment and improving driving safety.

(f) Turing off high beam light: If the ambient light can ensure the driving safety of vehicle without high beam light ON, the driver can turn off the high beam light.

(g) High beam light failure reminder: When high beam light is faulty and cannot being able to be used normally, the vehicle prompts the user for high beam light failure to remind the driver to find the abnormality in time, adjust the use of light, and repair in time to enhance the safety of using the vehicle.

(h) High beam light failure reminder eliminate: After the high beam light failure is repaired and restored to a normal usable state, the vehicle eliminates the high beam light failure reminder, making it easy for the driver to access the status of high beam light in time.

(i) Turn on automatic light: Users can turn on the automatic light function according to their intention, allowing the vehicle to automatically switch light according to the light intensity.

(j) Auto light adaptive adjustment: After user turns on the automatic light function, the vehicle automatically turns on the position light when it detects that the outside light intensity is weak; and automatically turns on the low beam light when the outside light intensity is extremely weak. When light becomes bright, the low beam will automatically turn off to prevent driver forgetting to turn it off, saving energy.

(k) Turning off automatic light: The users can turn off the automatic light function according to their preferences.

(l) Low beam light height initialization: When the vehicle is powered on at high voltage and the left and right headlights are not initialized, the low beam light motor performs initialization to ensure that the low beam light height is in the correct position.

(m) Manual adjustment of low beam light height - position change: With the vehicle powered on at high voltage, the vehicle changes the height of the low beam by manually adjusting the position, providing user with a good vision environment and improving driving safety.

(n) Manual adjustment of low beam light height - position memory: ALS stores the low beam light height position before the vehicle goes to sleep. After being reawakened, the low beam light height position returns to the position state at the last moment of the previous power-on cycle, realizing the position memory.

(o) Manual adjustment of low beam light height - fault feedback: When the low beam light height adjustment fault occurs, CSC displays fault signal to prompt the user.

(p) Intelligent Headlamp Control (IHC) ON/OFF: Users can choose whether to turn the IHC function on or off according to their personal preference.

(q) Intelligent Headlamp Control (IHC) enable: When the vehicle detects that the IHC enable condition is met, the IHC status will be changed from standby to enable, the IHC module will not control the high beam light to be on or off, and the vehicle will prompt the user for IHC enable.

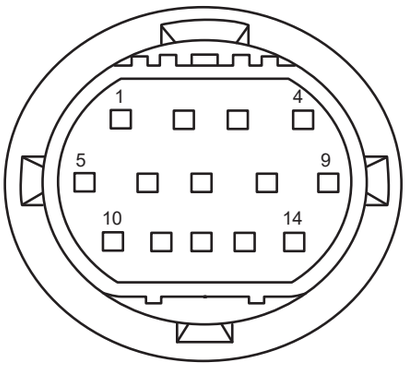
(r) Intelligent Headlamp Control (IHC) activation: When the vehicle detects that the IHC activation condition is met, the IHC status will be changed from enable to activate, and the high beam light is controlled to turn on and off based on the perception system information.

Data parameter

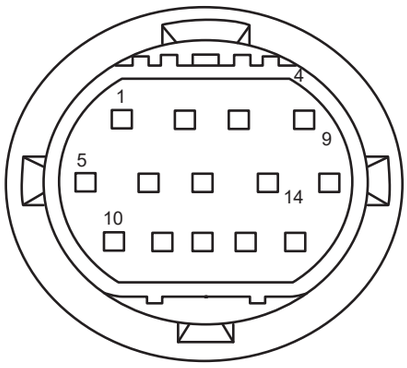
Front combination light

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	5.78	2.65	2.23

ECU terminal



Front left combination light I



Front right combination light I

LI00100RM

Front left combination light I			
Pin number	**Definition**	**Pin number**	**Definition**
1	KL31	8	-
2	KL30	9	-
3	-	10	CAN-H
4	-	11	CAN-L
5	-	12	-
6	-	13	-
7	-	14	-

Front right combination light I			
Pin number	**Definition**	**Pin number**	**Definition**
1	KL31	8	-
2	KL30	9	-
3	-	10	CAN-H
4	-	11	CAN-L
5	-	12	-

Front right combination light I			
Pin number	**Definition**	**Pin number**	**Definition**
6	-	13	-
7	-	14	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B151016	Headlight controller input terminal undervoltage	(See page ZD-2587)
B151017	Headlight controller input terminal overvoltage	(See page ZD-2587)
B151204	Headlight controller ECU internal temperature sensor fault	(See page ZD-2591)
B15124B	Headlight controller ECU overtemperature	(See page ZD-2591)
B151256	Headlight Dataset not available or incompatible with application software	(See page ZD-2594)
B151304	Headlight controller ECU internal communication fault	(See page ZD-2590)
B151414	Short or open in front low beam light temperature sensor (thermistor)	(See page ZD-2591)
B15141E	Front low beam light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2596)
B151511	Short to ground in front low beam light	(See page ZD-2596)
B151512	Short to battery in front low beam light	(See page ZD-2596)
B151513	Open in front low beam light	(See page ZD-2596)
B151614	Short or open in front high beam light temperature sensor (thermistor)	(See page ZD-2591)
B15161E	Front high beam light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2599)
B151711	Short to ground in front high beam light	(See page ZD-2599)
B151712	Short to battery in front high beam light	(See page ZD-2599)
B151713	Open in front high beam light	(See page ZD-2599)
B151814	Short or open in front turn signal light temperature sensor (thermistor)	(See page ZD-2603)
B15181E	Short or open in front turn signal light brightness sensor (programmable resistor)	(See page ZD-2603)
B151911	Short to ground in front turn signal light	(See page ZD-2603)
B151912	Short to battery in front turn signal light	(See page ZD-2603)
B151913	Open in front turn signal light	(See page ZD-2603)
B151A14	Short or open in front position light temperature sensor (thermistor)	(See page ZD-2608)

DTC	Detection Items	See page
B151A1E	Front position light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2608)
B151B11	Short to ground in front position light	(See page ZD-2608)
B151B12	Short to battery in front position light	(See page ZD-2608)
B151B13	Open in front position light	(See page ZD-2608)
B151C14	Short or open in front daytime running light temperature sensor (thermistor)	(See page ZD-2613)
B151C1E	Front daytime running light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2613)
B151D11	Short to ground in front daytime running light	(See page ZD-2613)
B151D12	Short to battery in front daytime running light	(See page ZD-2613)
B151D13	Open in front daytime running light	(See page ZD-2613)
B151E14	Short or open in front fog light temperature sensor (thermistor)	(See page ZD-2618)
B151E1E	Front fog light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2618)
B151F11	Short to ground in front fog light	(See page ZD-2618)
B151F12	Short to battery in front fog light	(See page ZD-2618)
B151F13	Open in front fog light	(See page ZD-2618)
B152014	Short or open in front corner light temperature sensor (thermistor)	(See page ZD-2622)
B15201E	Front corner light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2622)
B152111	Short to ground in front corner light	(See page ZD-2622)
B152112	Short to battery in front corner light	(See page ZD-2622)
B152113	Open in front corner light	(See page ZD-2622)
B152214	Short or open in front ADS temperature sensor (thermistor)	(See page ZD-2646)
B15221E	Front ADS brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2646)
B152311	Short to ground in front ADS	(See page ZD-2646)
B152312	Short to battery in front ADS	(See page ZD-2646)
B152313	Open in front ADS	(See page ZD-2646)
B152411	Short to ground in headlight controller fan	(See page ZD-2626)
B152412	Short to battery in headlight controller fan	(See page ZD-2626)
B152413	Open in headlight controller fan	(See page ZD-2626)
B152511	Short to ground in headlight controller fan 1	(See page ZD-2626)
B152512	Short to battery in headlight controller fan 1	(See page ZD-2626)

DTC	Detection Items	See page
B152513	Open in headlight controller fan 1	(See page ZD-2626)
B152611	Short to ground in headlight controller fan 2	(See page ZD-2626)
B152612	Short to battery in headlight controller fan 2	(See page ZD-2626)
B152613	Open in headlight controller fan 2	(See page ZD-2626)
B152711	Short to ground in headlight controller fan 3	(See page ZD-2626)
B152712	Short to battery in headlight controller fan 3	(See page ZD-2626)
B152713	Open in headlight controller fan 3	(See page ZD-2626)
B152811	Short to ground in headlight controller fan 4	(See page ZD-2626)
B152812	Short to battery in headlight controller fan 4	(See page ZD-2626)
B152813	Open in headlight controller fan 4	(See page ZD-2626)
B152911	Short to ground in headlight matrix light board 5 V power supply	(See page ZD-2633)
B152A04	Headlight controller lost communication with CC matrix light board	(See page ZD-2633)
B152B04	Headlight controller lost communication with CV1 matrix light board	(See page ZD-2633)
B152C04	Headlight controller lost communication with CV2 matrix light board	(See page ZD-2633)
B152D01	Headlight CC matrix light board chip lost	(See page ZD-2633)
B152E01	Headlight CV1 matrix light board chip lost	(See page ZD-2633)
B152F01	Headlight CV2 matrix light board chip lost	(See page ZD-2633)
U002888	Comfort CAN bus off	(See page ZD-2642)
U014687	PDCF node lost	(See page ZD-2637)

DTC	**B151016**	**Headlight controller input terminal undervoltage**
DTC	**B151017**	**Headlight controller input terminal overvoltage**

Description

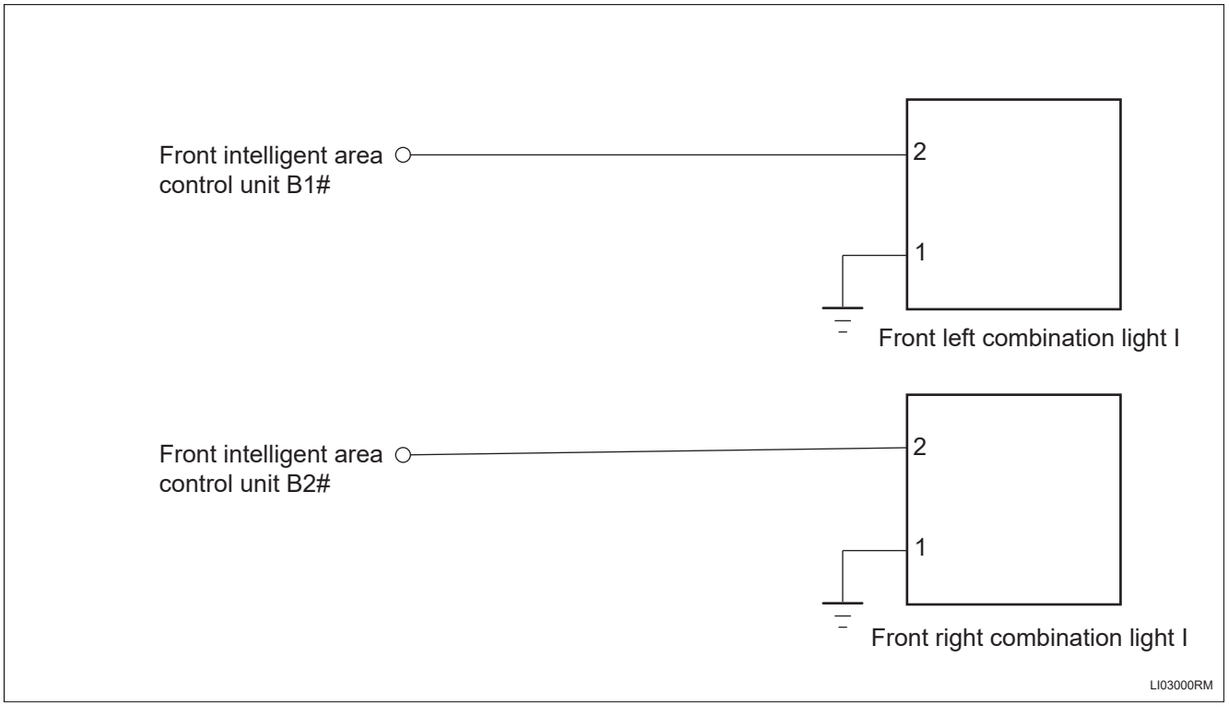
When front combination light power supply voltage is out of normal operation range, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151016	• After the IGN signal is ON for 1500 ms	• lower than 8.5 V for 15 s	15 s	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector • Charging system
B151017	• After the IGN signal is ON for 1500 ms	• Input voltage > 16.5 V for 15 s • Input voltage > 18.5 V for 400 ms	15 s/400 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151016	• Headlight function failure or degradation	Not come on
B151017	• Headlight function failure or degradation	Not come on

Circuit diagram



Inspection procedure

1	Check battery voltage

(a) Start engine and measure battery voltage.

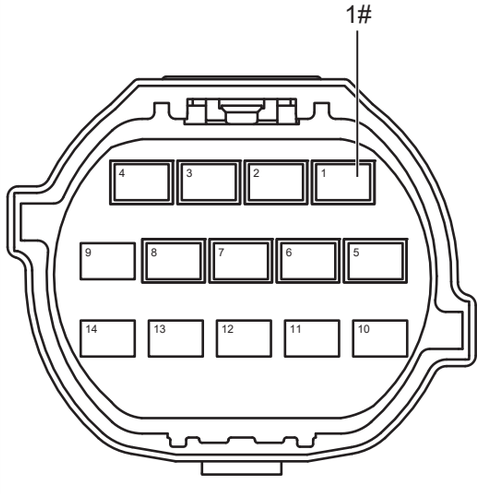
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check front combination light I ground



Front combination light I connector

LI03010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left combination light I connector.

(d) Disconnect the front right combination light I connector.

(e) According to value in the table, measure resistance.

Standard value

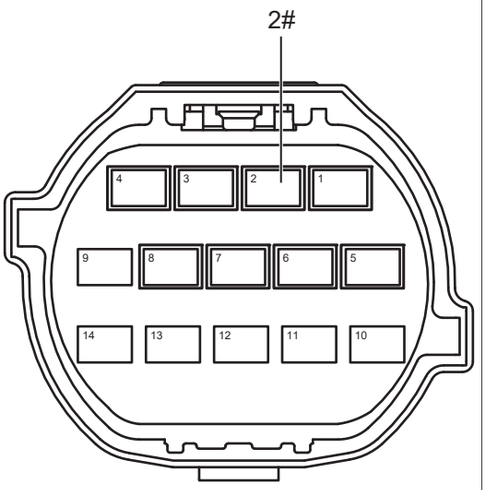
Multimeter connection	Detection condition	Specified condition
Front left combination light 1 connector 1# - body ground	Always connected	Less than 1 Ω
Front right combination light 1 connector 1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	Check front combination light I power supply



Front combination light I connector

LI03021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Front left combination light 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage
Front right combination light 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector have no problem, it is required to check front intelligent area control unit power supply and ground, confirm if the front intelligent area control unit is damaged)**

OK

Replace front combination light I (See page ZC-18)

DTC	B151304	Headlight controller ECU internal communication fault

Description

When an internal fault occurs in front combination light, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151304	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms	• Buck driver SPI failure • SPEC driver I2C failure • HSS driver SPI failure • Motor driver SPI failure	5000 ms	Periodic type	10 ms	• Front combination light

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151304	• Headlight function failure	Comes on

Inspection procedure

1	**Replace front left/right combination light I (See page ZC-18)**

DTC	**B151204**	**Headlight controller ECU internal temperature sensor fault**
DTC	**B15124B**	**Headlight controller ECU overtemperature**
DTC	**B151414**	**Short or open in front low beam light temperature sensor (thermistor)**
DTC	**B151614**	**Short or open in front high beam light temperature sensor (thermistor)**

Description

When the front combination light operating temperature is too high, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151204	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• Sampling voltage < 0.19 V, which means R < 97 Ω (SC) • Sampling voltage > 4.93 V, which means R > 351 KΩ (OL)	4000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Ambient temperature
B15124B	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• Temperature >= 118° C (starting point of ECU temperature derating)	90000 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Ambient temperature

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151414	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Ambient temperature
B151614	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151204	• Headlight function temperature derating function failure	Comes on
B15124B	• Headlight function degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B151414	• Front low beam light temperature derating function failure or degradation	Comes on
B151614	• Front high beam light temperature derating function failure or degradation	Comes on

Inspection procedure

1	**Front combination light is cooled down**

(a) Lower the front combination light temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left/right combination light l (See page ZC-18)**

OK

Diagnosis ends

DTC	B151256	Headlight Dataset not available or incompatible with application software

Description

When the hardware and software versions of the front combination light are inconsistent, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151256	—	• Dataset Checksum error • The software version number is different from the one configured in the dataset (except ZZZZ)	1	Periodic type	10 ms	• Front left combination light I • Front right combination light I

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151256	• Headlight function degradation	Comes on

Inspection procedure

1	**Front combination light performs automatic configuration module program**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Front combination light performs automatic configuration module program.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left/right combination light I (See page ZC-18)**

OK

Diagnosis ends

DTC	**B15141E**	**Front low beam light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B151511**	**Short to ground in front low beam light**
DTC	**B151512**	**Short to battery in front low beam light**
DTC	**B151513**	**Open in front low beam light**

Description

When the internal circuit of low beam light is short or open, the front combination light records DTC.

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DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15141E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; Resistance > 36 KΩ	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151511	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For non-matrix outputs, output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no	500 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Low beam light ON	differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously.				
B151512	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Low beam light OFF	Output voltage > 5 V	500 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151513	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Low beam light ON	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at the same time • For constant voltage matrix output: 1. TBD	500 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15141E	• Front low beam light brightness level selection function failure or degradation	Comes on
B151511	• Front low beam light function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B151512	• Front low beam light function failure or degradation	Comes on
B151513	• Front low beam light function failure or degradation	Comes on

Inspection procedure

1	Check left/right low beam light

(a) Check if left/right low beam light is damaged.

NG → Perform repair according to malfunction

OK

2	Check front combination light l wire harness and connector

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace front left/right combination light l (See page ZC-18)

DTC	B15161E	Front high beam light brightness sensor (programmable resistor) resistance value out of range
DTC	B151711	Short to ground in front high beam light

DTC	B151712	Short to battery in front high beam light
DTC	B151713	Open in front high beam light

Description

When the internal circuit of high beam light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15161E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151711	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal and TI CC LMM: 1. Sampling voltage < 0.19 V (SC); 2. Resistance > 30 KΩ (OL) • For TI CC LMM (100 KΩ NTC): 1. Resistance < 3.2 KΩ ;	500 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Determine the sampling range within 100 ms after power on	2. Resistance > 36 KΩ				
B151712	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • High beam light off	Output voltage > 5 V	2 s	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151713	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • High beam light on	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at the same time • For constant voltage matrix output: 1. TBD	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Fault symptom	Warning light/indicator
B15161E	• Front high beam light brightness level selection function failure or degradation	Comes on
B151711	• Front high beam light function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B151712	• Front high beam light function failure or degradation	Comes on
B151713	• Front high beam light function failure or degradation	Comes on

Inspection procedure

1	Check left/right high beam light

(a) Check if left/right high beam light is damaged.

NG → **Perform repair according to malfunction**

OK

2	Check front combination light l wire harness and connector

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light l (See page ZC-18)

DTC	B15181E	Short or open in front turn signal light brightness sensor (programmable resistor)
DTC	B151911	Short to ground in front turn signal light

DTC	**B151912**	**Short to battery in front turn signal light**
DTC	**B151913**	**Open in front turn signal light**
DTC	**B151814**	**Short or open in front turn signal light temperature sensor (thermistor)**

Description

When the internal circuit of turn signal light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15181E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	4000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151911	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM:	90000 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	1. Resistance < 3.2 KΩ ; 2. Resistance > 36 KΩ				
B151912	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Turn signal light turned on	• For non-matrix outputs, output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously.	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151913	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Turn signal light turned off	Output voltage > 5 V	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151814	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Turn signal light turned on	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		the same time • For constant voltage matrix output: 1. TBD				

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15181E	• Front turn signal light temperature derating function failure or degradation	Comes on
B151911	• Front turn signal light brightness level selection function failure or degradation	Comes on
B151912	• Front turn signal light function failure or degradation	Comes on
B151913	• Front turn signal light function failure or degradation	Comes on
B151814	• Front turn signal light function failure or degradation	Comes on

ZD

Inspection procedure

1	**Check left and right turn signal lights**

(a) Check if left and right turn signal lights are damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check front combination light l wire harness and connector**

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light I (See page ZC-18)

DTC	**B151A1E**	**Front position light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B151B11**	**Short to ground in front position light**
DTC	**B151B12**	**Short to battery in front position light**
DTC	**B151B13**	**Open in front position light**
DTC	**B151A14**	**Short or open in front position light temperature sensor (thermistor)**

ZD

Description

When the internal circuit of front position light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151A14	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	4000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151A1E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; 2. Resistance > 36 KΩ	90000 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151B11	• The voltage is between 9 V and 16	• For non-matrix outputs,	5000 ms	Event-based	10 ms	• Front left combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms • Position light ON	output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiati-on between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneo-usly.				• Front right combination light I • Wire harness and connector
B151B12	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms • Position light OFF	Output voltage > 5 V	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151B13	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Position light ON	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at the same time • For constant voltage matrix output: 1. TBD	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151A14	• Front position light temperature derating function failure or degradation	Comes on
B151A1E	• Front position light brightness level selection function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B151B11	• Front position light function failure or degradation	Comes on
B151B12	• Front position light function failure or degradation	Comes on
B151B13	• Front position light function failure or degradation	Comes on

Inspection procedure

1	**Check left/right position light**

(a) Check if left/right position light is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check front combination light l wire harness and connector**

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light l (See page ZC-18)

DTC	**B151C1E**	**Front daytime running light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B151D11**	**Short to ground in front daytime running light**
DTC	**B151D12**	**Short to battery in front daytime running light**
DTC	**B151D13**	**Open in front daytime running light**
DTC	**B151C14**	**Short or open in front daytime running light temperature sensor (thermistor)**

Description

When the internal circuit of front daytime running light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151C14	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151C1E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; 2. Resistance > 36 KΩ	5000 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151D11	• The voltage is between 9 V and 16	• For non-matrix outputs,	500 ms	Event-based	10 ms	• Front left combination light I

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Position light ON	output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously.				• Front right combination light I • Wire harness and connector
B151D12	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Position light OFF	Output voltage > 5 V	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151D13	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Position light ON	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at the same time • For constant voltage matrix output: 1. TBD	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151C14	• Front daytime running light temperature derating function failure or degradation	Comes on
B151C1E	• Front daytime running light brightness level selection function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B151D11	• Front daytime running light function failure or degradation	Comes on
B151D12	• Front daytime running light function failure or degradation	Comes on
B151D13	• Front daytime running light function failure or degradation	Comes on

Inspection procedure

1	Check left/right daytime running light

(a) Check if the left/right daytime running light is damaged.

NG → **Perform repair according to malfunction**

OK

2	Check front combination light I wire harness and connector

(a) Check for short in front combination light I wire harness and connector.

(b) Check for open in front combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light I (See page ZC-18)

DTC	**B151E1E**	**Front fog light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B151F11**	**Short to ground in front fog light**
DTC	**B151F12**	**Short to battery in front fog light**
DTC	**B151F13**	**Open in front fog light**
DTC	**B151E14**	**Short or open in front fog light temperature sensor (thermistor)**

ZD Description

When the internal circuit of front fog light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151E14	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	4000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151E1E	• The voltage is between 9 V and 16 V, or 500	• For Signal and TI CC LMM:	90000 ms	Periodic type	5 ms	• Front left combination light I

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; 2. Resistance > 36 KΩ				• Front right combination light I • Wire harness and connector
B151F11	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fog light ON	• For non-matrix outputs, output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously.	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B151F12	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fog light OFF	Output voltage > 5 V	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B151F13	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fog light ON	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		the same time • For constant voltage matrix output: 1. TBD				

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B151E14	• Front fog light temperature derating function failure or degradation	Comes on
B151E1E	• Front fog light brightness level selection function failure or degradation	Comes on
B151F11	• Front fog light function failure or degradation	Comes on
B151F12	• Front fog light function failure or degradation	Comes on
B151F13	• Front fog light function failure or degradation	Comes on

ZD

Inspection procedure

1	**Check left/right fog light**

(a) Check if left/right fog light is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check front combination light l wire harness and connector**

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light I (See page ZC-18)

ZD

DTC	**B15201E**	**Front corner light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B152111**	**Short to ground in front corner light**
DTC	**B152112**	**Short to battery in front corner light**
DTC	**B152113**	**Open in front corner light**
DTC	**B152014**	**Short or open in front corner light temperature sensor (thermistor)**

Description

When the internal circuit of front corner light is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152014	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B15201E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Determine the sampling range within 100 ms after power on	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; 2. Resistance > 36 KΩ	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152111	• The voltage is between 9 V and 16	• For non-matrix outputs,	500 ms	Event-based	10 ms	• Front left combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms • ADS light turns on	output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiati-on between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneo-usly.				• Front right combination light I • Wire harness and connector
B152112	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms • ADS light turns off	Output voltage > 5 V	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152113	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • ADS light turns on	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at the same time • For constant voltage matrix output: 1. TBD	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B152014	• Front corner light temperature derating function failure or degradation	Comes on
B15201E	• Front corner light brightness level selection function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B152111	• Front corner light function failure or degradation	Comes on
B152112	• Front corner light function failure or degradation	Comes on
B152113	• Front corner light function failure or degradation	Comes on

Inspection procedure

1	Check left/right corner light

(a) Check if left/right corner light is damaged.

NG → Perform repair according to malfunction

OK

2	Check front combination light I wire harness and connector

(a) Check for short in front combination light I wire harness and connector.

(b) Check for open in front combination light I wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace front left/right combination light I (See page ZC-18)

DTC	B152411	Short to ground in headlight controller fan
DTC	B152412	Short to battery in headlight controller fan

DTC	B152413	Open in headlight controller fan
DTC	B152511	Short to ground in headlight controller fan 1
DTC	B152512	Short to battery in headlight controller fan 1
DTC	B152513	Open in headlight controller fan 1
DTC	B152611	Short to ground in headlight controller fan 2
DTC	B152612	Short to battery in headlight controller fan 2
DTC	B152613	Open in headlight controller fan 2
DTC	B152711	Short to ground in headlight controller fan 3
DTC	B152712	Short to battery in headlight controller fan 3
DTC	B152713	Open in headlight controller fan 3
DTC	B152811	Short to ground in headlight controller fan 4
DTC	B152812	Short to battery in headlight controller fan 4
DTC	B152813	Open in headlight controller fan 4

Description

When the internal circuit of front combination light fan is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152411	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Leveling motor ON	• There are short to ground in QA1 and QA2 when current flows through A phase coil • There are short to ground in QB1 and QB2 when current flows through B phase coil	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152412	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Leveling motor OFF	• There are short to battery in QA1 and QA2 when current flows through A phase coil • There are short to battery in QB1 and QB2 when current flows through B phase coil	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152413	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Leveling motor ON	• There are open in QA1 and QA2 when current flows through A phase coil • There are open in QB1 and QB2 when current flows through B phase coil	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152511	• The voltage is between 9 V and 16	• Output current > ISC	1000 ms	Event-based	10 ms	• Front left combination light I

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	• Hint: ISC configuration in Dataset file				• Front right combination light I • Wire harness and connector
B152512	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned off	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152513	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	• Output current < IOL • Hint: IOL configuration in Dataset file	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152611	• The voltage is between 9 V and 16 V, or 500 ms after the voltage	• Output current > ISC • Hint: ISC	1000 ms	Event-based	5 ms	• Front left combination light I • Front right combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	configuration in Dataset file				• Wire harness and connector
B152612	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned off	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152613	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	• Output current < IOL • Hint: IOL configuration in Dataset file	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152711	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage	• Output current > ISC • Hint: ISC configuration in Dataset file	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on					
B152712	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned off	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152713	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	• Output current < IOL • Hint: IOL configuration in Dataset file	5000 ms	Event-based	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152811	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or	• Output current > ISC • Hint: ISC configuration in Dataset file	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on					
B152812	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned off	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152813	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • Fan is turned on	• Output current < IOL • Hint: IOL configuration in Dataset file	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B152411	• Motor adjustment function failure	Comes on
B152412	• Motor adjustment function failure	Comes on
B152413	• Motor adjustment function failure	Comes on
B152511	• Headlight brightness reduction	Comes on
B152512	• Headlight brightness reduction	Comes on

DTC No.	Fault symptom	Warning light/indicator
B152513	• Headlight brightness reduction	Comes on
B152611	• Headlight brightness reduction	Comes on
B152612	• Headlight brightness reduction	Comes on
B152613	• Headlight brightness reduction	Comes on
B152711	• Headlight brightness reduction	Comes on
B152712	• Headlight brightness reduction	Comes on
B152713	• Headlight brightness reduction	Comes on
B152811	• Headlight brightness reduction	Comes on
B152812	• Headlight brightness reduction	Comes on
B152813	• Headlight brightness reduction	Comes on

Inspection procedure

1	Check front combination light l wire harness and connector

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light l (See page ZC-18)

DTC	B152911	Short to ground in headlight matrix light board 5 V power supply
DTC	B152A04	Headlight controller lost communication with CC matrix light board

DTC	**B152B04**	**Headlight controller lost communication with CV1 matrix light board**
DTC	**B152C04**	**Headlight controller lost communication with CV2 matrix light board**
DTC	**B152D01**	**Headlight CC matrix light board chip lost**
DTC	**B152E01**	**Headlight CV1 matrix light board chip lost**
DTC	**B152F01**	**Headlight CV2 matrix light board chip lost**

Description

ZD

When the internal circuit of front combination light matrix light board is short or open, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152911	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms	Short in matrix light board power supply input terminal	500 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152A04	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After the IGN signal is ON for 1500 ms	All CC matrix chips lost	500 ms	Periodic type	5 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152B04	• The voltage is between 9 V and 16 V, or 500	All CV1 matrix chips lost	500 ms	Periodic type	10 ms	• Front left combination light I

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms					• Front right combination light I • Wire harness and connector
B152C04	—	All CV2 matrix chips lost	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152D01	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	The Matrix IC address in the matrix light board is inconsistent with the address configured for the corresponding Matrix IC in Dataset	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152E01	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	The Matrix IC address in the matrix light board is inconsistent with the address configured for the corresponding Matrix IC in Dataset	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152F01	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	The Matrix IC address in the matrix light board is inconsistent with the address configured for the corresponding Matrix IC in Dataset	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B152911	• Front CC matrix light board lost control	Comes on
B152A04	• Front CC matrix light board lost control	Comes on
B152B04	• Front CV1 matrix light board lost control	Comes on
B152C04	• Front CV2 matrix light board lost control	Comes on
B152D01	• Front CC matrix light board lost control	Comes on
B152E01	• Front CV1 matrix light board lost control	Comes on
B152F01	• Front CV2 matrix light board lost control	Comes on

Inspection procedure

1	**Check front combination light I wire harness and connector**

(a) Check for short in front combination light I wire harness and connector.

(b) Check for open in front combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace front left/right combination light I (See page ZC-18)

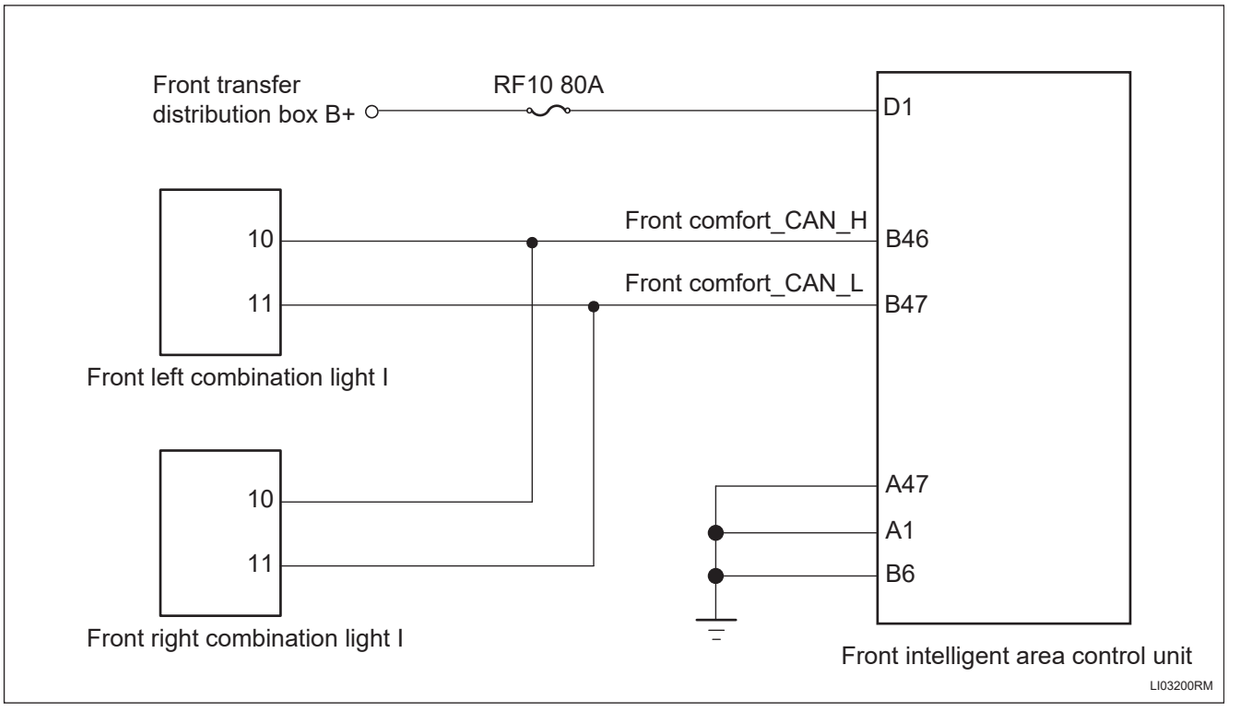
DTC	U014687	PDCF node lost

Description

When communication between front left/right combination light I and other system is abnormal or interrupted, the front left/right combination light I records DTC.

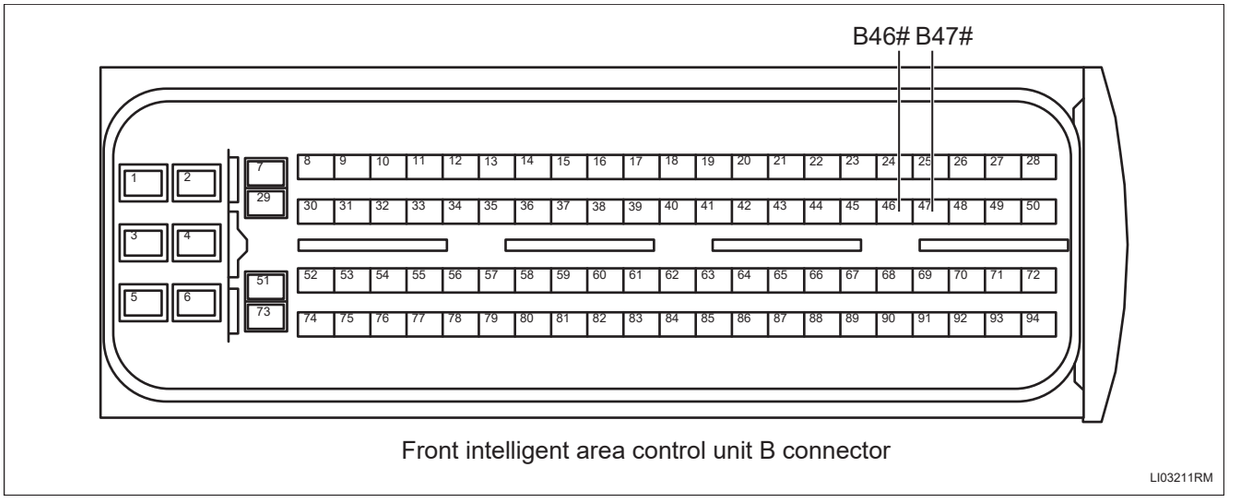
DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCF node lost.	• CAN line and connector • Front left combination light I • Front right combination light I • Front intelligent area control unit

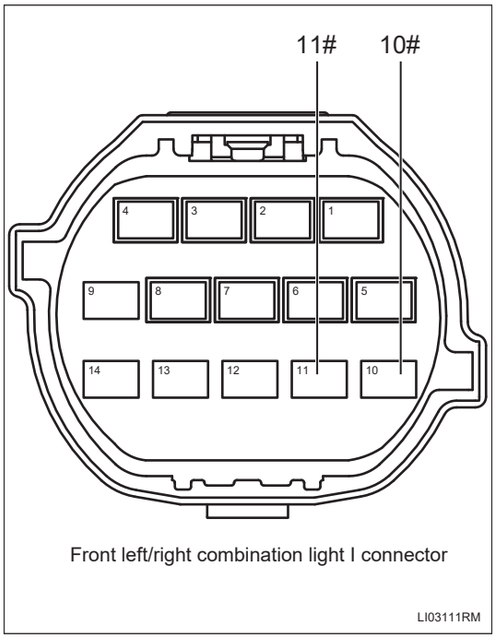
Circuit diagram



Inspection procedure

1	**Check for open in front comfort CAN bus (front left/right combination light I - front intelligent area control unit)**





Front left/right combination light I connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on front comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

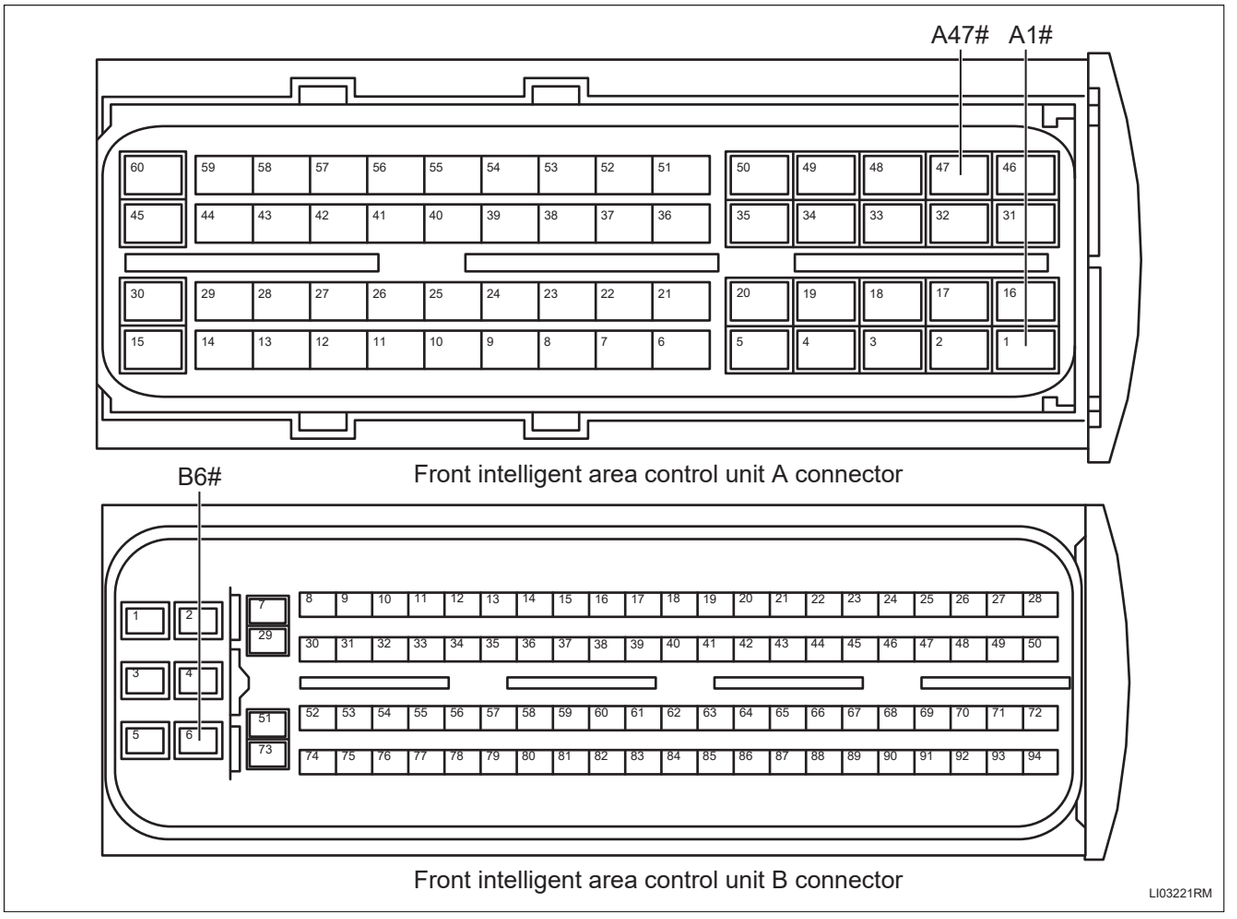
Multimeter connection	Detection condition	Specified condition
Front left combination light I connector 10# - front intelligent area control unit connector B46#	Always connected	Less than 1 Ω
Front left combination light I connector 11# - front intelligent area control unit connector B47#	Always connected	Less than 1 Ω
Front right combination light I connector 10# - front intelligent area control unit connector B46#	Always connected	Less than 1 Ω
Front right combination light I connector 11# - front intelligent area control unit connector B47#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check front intelligent area control unit ground**



(a) According to value in the table, measure resistance.

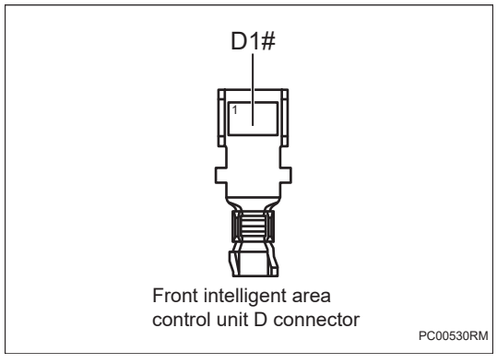
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector A1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

3	**Check front intelligent area control unit power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

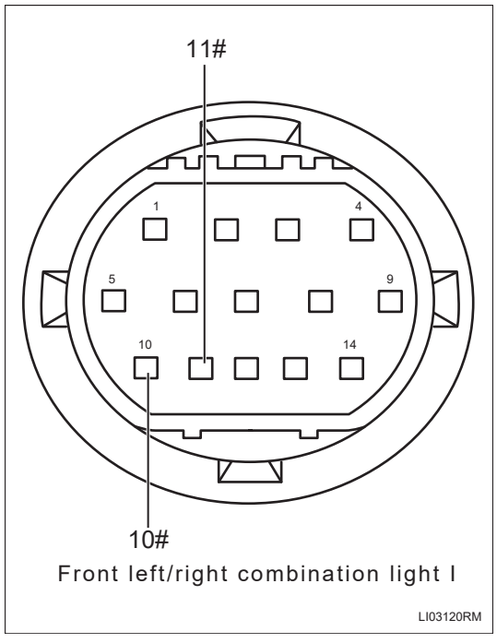
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check front comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left combination light I 10# - front left combination light I 11#	Always connected	Approximately 120 Ω
Front right combination light I 10# - front right combination light I 11#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

ZD

OK

5	Replace front intelligent area control unit

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left/right combination light I (See page ZC-18)**

OK

Diagnosis ends

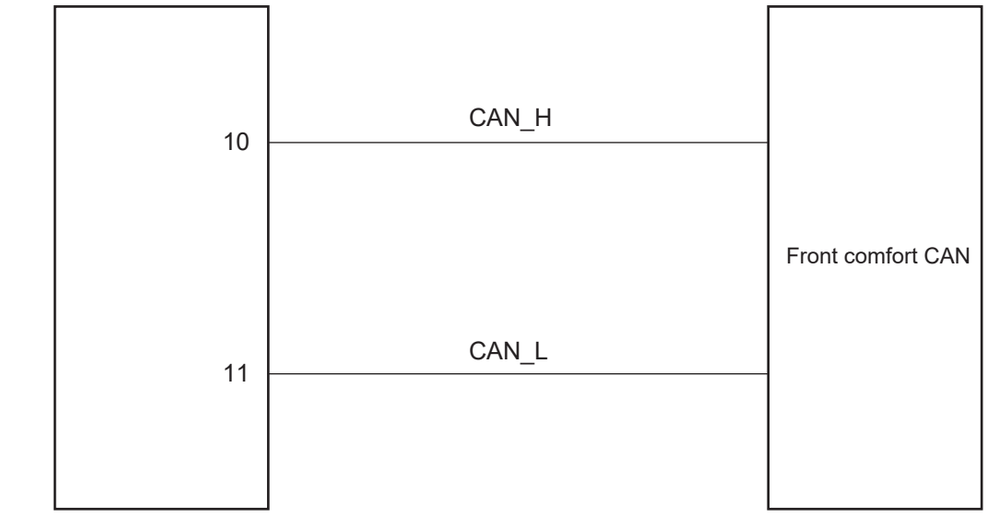
DTC	U002888	Comfort CAN bus off

Description

When the front left/right combination light I detects the front comfort CAN bus off fault, the front left/right combination light I records DTC.

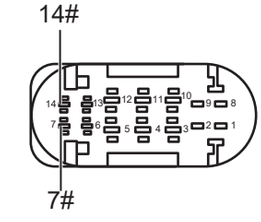
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Front left combination light I • Front right combination light I • Front intelligent area control unit

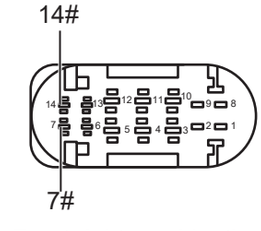
Circuit diagram



Inspection procedure

1	**Check front comfort CAN bus terminal resistance**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left/right combination light I connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left combination light I connector 10# - front left combination light I connector 11#	Always connected	Approximately 120 Ω
Front right combination light I connector 10# - front right combination light I connector 11#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

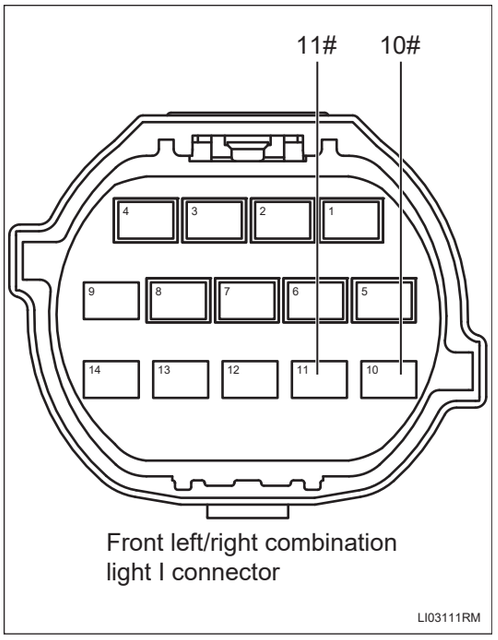
2	**Check controllers on front comfort CAN bus**

(a) Disconnect the controllers on front comfort CAN bus in sequence, and check if other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between front comfort CAN bus CAN-L and CAN-H**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on front comfort CAN bus.

(d) According to value in the table, measure resistance.

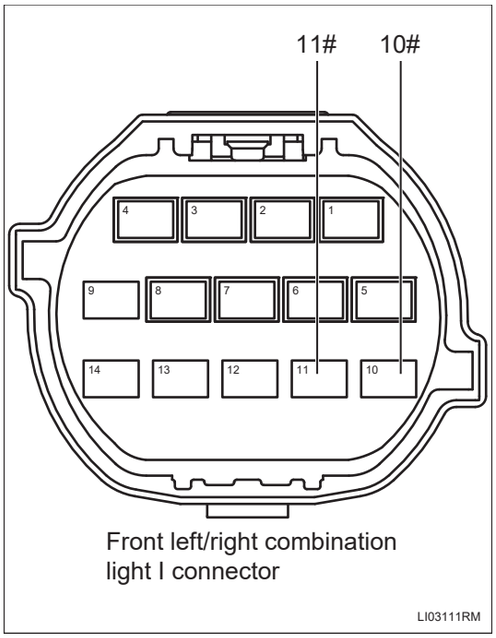
Standard value

Multimeter connection	Detection condition	Specified condition
Front left combination light I connector 10# - front left combination light I connector 11#	Always connected	10 KΩ or more
Front right combination light I connector 10# - front right combination light I connector 11#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in front comfort CAN bus



(a) According to value in the table, measure resistance.

Standard value

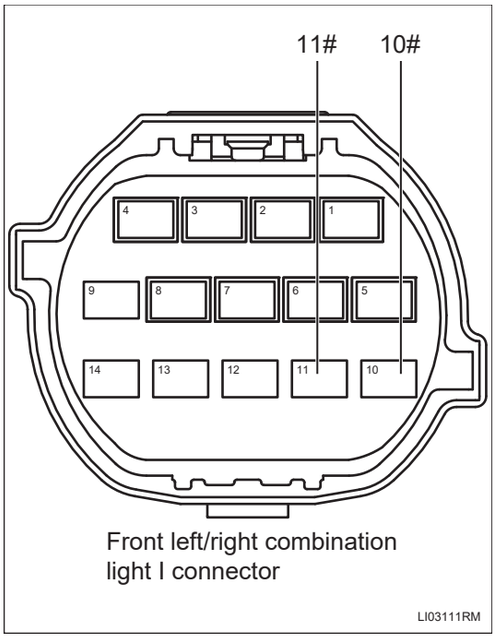
Multimeter connection	Detection condition	Specified condition
Front left combination light I connector 10# - body ground	Always connected	10 KΩ or more
Front left combination light I connector 11# - body ground	Always connected	10 KΩ or more
Front right combination light I connector 10# - body ground	Always connected	10 KΩ or more
Front right combination light I connector 11# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in front comfort CAN bus**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left combination light I connector 10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left combination light I connector 11# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right combination light I connector 10# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right combination light I connector 11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	**B152214**	**Short or open in front ADS temperature sensor (thermistor)**
DTC	**B15221E**	**Front ADS brightness sensor (programmable resistor) resistance value out of range**
DTC	**B152311**	**Short to ground in front ADS**

DTC	B152312	Short to battery in front ADS
DTC	B152313	Open in front ADS

Description

When there is short or open in ADS internal circuit, the front combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152214	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal (10 KΩ NTC): 1. Sampling voltage < 0.19 V (SC); 2. Sampling voltage > 4.93 V (OL) • For TI CC LMM (100 KΩ NTC): 1. Sampling voltage < 0.19 V (SC), OL can not be detected • For NXP CC LMM (10 KΩ NTC): 1. Resistance < 181 Ω (SC); 2. Resistance > 44 KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B15221E	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms	• For Signal and TI CC LMM: 1. Resistance < 500 Ω (SC); 2. Resistance > 30 KΩ (OL) • For NXP CC LMM: 1. Resistance < 3.2 KΩ; 2.	5000 ms	Periodic type	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	• Determine the sampling range within 100 ms after power on	Resistance > 36 KΩ				
B152311	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • ADS light turns on	• For non-matrix outputs, output voltage < 1.7 V • For matrix output, The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously.	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B152312	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • ADS light turns off	Output voltage > 5 V	500 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector
B152313	• The voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After the IGN signal is ON for 1500 ms • ADS light turns on	• For non-matrix outputs: 1. Buck register open state flag set (when Buck output voltage is close to Boost output voltage); 2. Output voltage >= (set Boost output voltage-2V) • For constant current matrix output: 1. Matrix chip short circuit and open circuit status register flag set, but short circuit and open circuit faults are not distinguished, DTCs for short to ground and open circuit will be reported at	5000 ms	Event-based	10 ms	• Front left combination light I • Front right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
		the same time • For constant voltage matrix output: 1. TBD				

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B152214	• Front ADS temperature derating function failure or degradation	Comes on
B15221E	• Front ADS brightness level selection function failure or degradation	Comes on
B152311	• Front ADS function failure or degradation	Comes on
B152312	• Front ADS function failure or degradation	Comes on
B152313	• Front ADS function failure or degradation	Comes on

Inspection procedure

1	Check front combination light l wire harness and connector

(a) Check for short in front combination light l wire harness and connector.

(b) Check for open in front combination light l wire harness and connector.

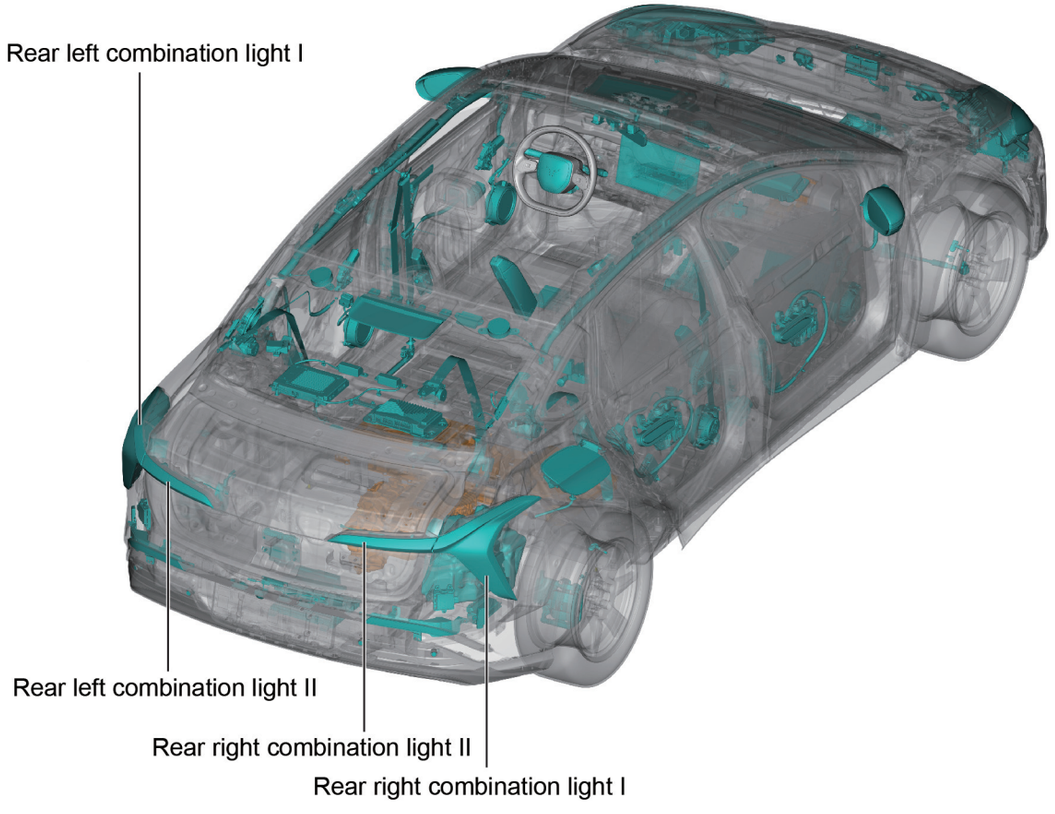
NG → **Check and repair or replace wire harness and connector**

OK

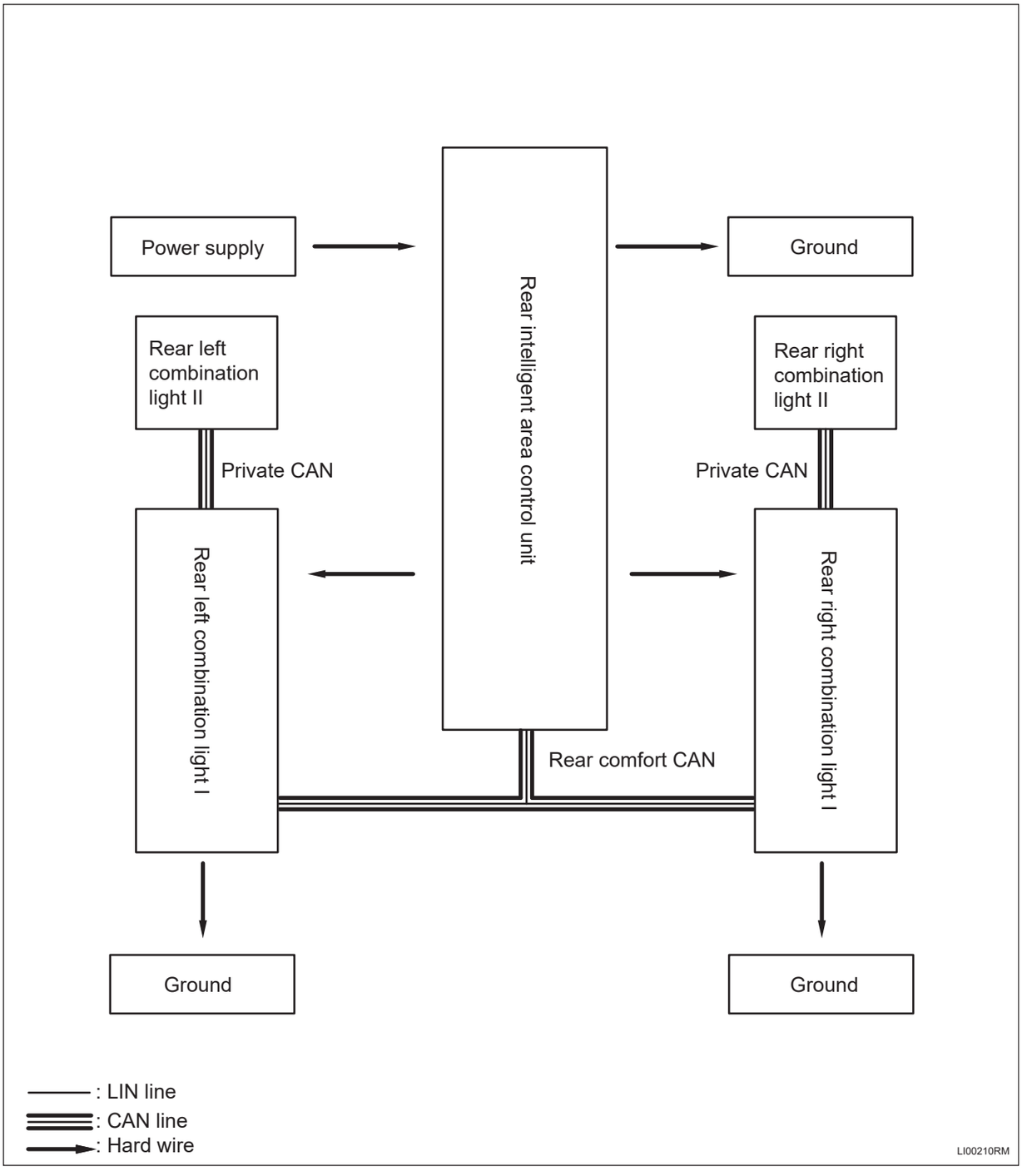
Replace front left/right combination light l (See page ZC-18)

Rear combination light

Part position



System diagram



System description

1. Rear combination light

(a) Rear combination light includes back-up light, rear fog light, rear position light, rear turn signal light and brake light.

2. System introduction

(a) Turn on rear fog light

(1) The visibility on the road where the vehicle is driving is poor. The user can turn on rear fog light through rear fog light switch to improve the visibility on the road and ensure driving safety.

(b) Turing off rear fog light

(1) With the rear fog light turned on, if the visibility in front of the vehicle recovers to a level where the user no longer requires the rear fog light, the rear fog light will be turned off.

(c) Activating back-up light

(1) When the user shifts the shift lever to R, the vehicle automatically activates the back-up light, illuminating the road behind for the driver and providing a warning to vehicles and pedestrians behind.

(d) Turning off back-up light

(1) When the user has no need to reverse, shift the shift lever to non-R and exit the back-up light.

(e) Activating back-up light

(1) When the user shifts the shift lever to R, the vehicle automatically activates the back-up light, illuminating the road behind for the driver and providing a warning to vehicles and pedestrians behind.

(f) Turning off back-up light

(1) When the user has no need to reverse, shift the shift lever to non-R and exit the back-up light.

(g) Activating brake light

(1) When the driver depresses the brake pedal or the vehicle receives the brake light ON request, the brake light of vehicle is turned on to remind the vehicle behind that this vehicle is in braking state.

(h) Turning off brake light

(1) When the driver releases the brake pedal and the vehicle is not in active brake state, the brake light of vehicle is turned off to remind the vehicle behind that this vehicle has released the brake state.

(i) Activating emergency brake signal

(1) Perform emergency braking during driving, and turn on brake light. Turn on brake light or hazard warning light to alert vehicles behind that the vehicle is under emergency braking.

(j) Turning off emergency braking signal

(1) Vehicle is under emergency braking. After finishing emergency braking operation, turn off brake light or hazard warning light.

(k) Turn on brake light fault reminder

(1) When the brake light fails to operate normally due to brake light fault, the vehicle prompts the driver that the brake light is faulty, which is convenient for the driver to adjust lighting and repair it in time.

(l) Turning off brake light fault reminder

(1) When the brake light fault is resolved and the brake light returns to normal operation, the vehicle cancels the brake light fault warning to allow the driver to promptly obtain the status of brake light.

(m) Activating daytime running light

(1) Turn on daytime running light during driving to remind other road traffic participants to pay attention to this vehicle.

(n) Turning off daytime running light

(1) The vehicle exits driving state or driver turns on low beam light. If daytime running light usage scenario is not met, daytime running light turns off.

(o) Activating turn signal light

(1) Before completing the steering/lane change operation, the driver needs to turn on the turn signal lights on the corresponding side to alert other vehicles.

(p) Turning off turn signal light

(1) After completing the steering/lane change operation, the driver should turn off the turn signal lights.

(q) Turn on turn signal light fault feedback

ZD

(1) When a turn signal light fault occurs, causing the turn signal light to malfunction, the turn signal light on the faulty side of the vehicle will blink at double the normal frequency to alert the user of the turn signal issue.

(r) Turning off turn signal light fault feedback

(1) After the turn signal light fault condition is resolved, the turn signal light fault feedback is turned off.

(s) Activating hazard warning light

(1) When the vehicle state is abnormal or user needs to stop the vehicle, the hazard warning light can be turned on manually to alert approaching vehicles behind.

(t) Turning off hazard warning light

(1) After abnormal vehicle status is resolved, the user manually turns off the hazard warning light.

(u) Turn signal light flashing when unlocking

(1) When the user performs the unlocking operation, the turn signal light flashes a corresponding number of times, which adds a sense of ceremony to the user.

(v) Locking flashing turn signal light

(1) When the user performs the unlocking operation, the turn signal light flashes a corresponding number of times, which adds a sense of ceremony to the user.

Data parameter

Rear left combination light I

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	8.5	6	0.3

Rear left combination light II

Item	Max	OK	Minimum
Operating voltage (V)	9.2	9.2	9.2
Operating current (A)	0.7	0.65	0.6

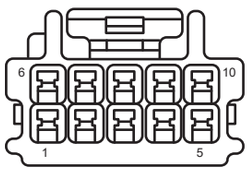
Rear right combination light I

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	6
Operating current (A)	8.5	6	0.3

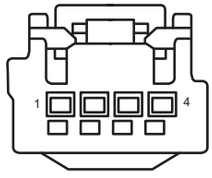
Rear right combination light II

Item	Max	OK	Minimum
Operating voltage (V)	9.2	9.2	9.2
Operating current (A)	0.7	0.65	0.6

ECU terminal



Rear left/right combination light I



Rear left/right combination light II

LI00200RM

Rear left combination light I			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply	6	CAN communication line CAN_L
2	Power supply	7	Constant voltage channel 1 output power supply
3	Power supply ground	8	Constant voltage channel 1 ground
4	Power supply ground	9	CAN2 communication line CAN_H
5	CAN communication line CAN_H	10	CAN2 communication line CAN_L

Rear left combination light II	
Pin number	**Definition**
1	Light input power supply, from the driver
2	Light input power supply ground, from the driver
3	CAN communication line CAN_H, from driver CAN2_High
4	CAN communication line CAN_L, from driver CAN2_Low

Rear right combination light I			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply	6	CAN communication line CAN_L
2	Power supply	7	Constant voltage channel 1 output power supply
3	Power supply ground	8	Constant voltage channel 1 ground
4	Power supply ground	9	CAN2 communication line CAN_H
5	CAN communication line CAN_H	10	CAN2 communication line CAN_L

Rear right combination light II			
Pin number	**Definition**	**Pin number**	**Definition**
1	Light input power supply, from the driver	6	Drive channel 1 output negative
2	Light input power supply ground, from the driver	7	GPIO GND
3	CAN communication line CAN_H, from driver CAN2_High	8	-
4	CAN communication line CAN_L, from driver CAN2_Low	9	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B153016	Rear light controller power supply voltage too low	(See page ZD-2658)
B153017	Rear light controller power supply voltage too high	(See page ZD-2658)
B153204	Rear light controller ECU internal temperature sensor fault	(See page ZD-2662)
B15324B	Rear light controller ECU overtemperature	(See page ZD-2662)
B153304	Rear light controller ECU internal communication fault	(See page ZD-2662)
B153256	Rear light Dataset not available or incompatible with application software	(See page ZD-2664)
B153E14	Short or open in rear back-up light temperature sensor (thermistor)	(See page ZD-2681)
B153E1E	Rear back-up light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2681)
B153F11	Short to ground in rear back-up light	(See page ZD-2681)
B153F12	Short to battery in rear back-up light	(See page ZD-2681)
B153F13	Open in rear back-up light	(See page ZD-2681)
B18A204	Rear light controller lost communication with CV1 matrix light board	(See page ZD-2685)

DTC	Detection Items	See page
B18A304	Rear light controller lost communication with CV2 matrix light board	(See page ZD-2685)
B18A401	Rear light CV1 matrix light board chip lost	(See page ZD-2685)
B18A501	Rear light CV2 matrix light board chip lost	(See page ZD-2685)
B153A1E	Rear fog light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2677)
B153B11	Short to ground in rear fog light	(See page ZD-2677)
B153B12	Short to battery in rear fog light	(See page ZD-2677)
B153B13	Open in rear fog light	(See page ZD-2677)
B153A14	Short or open in rear fog light temperature sensor (thermistor)	(See page ZD-2677)
B153511	Short to ground in rear position light	(See page ZD-2666)
B153512	Short to battery in rear position light	(See page ZD-2666)
B153513	Open in rear position light	(See page ZD-2666)
B153414	Short or open in rear position light temperature sensor (thermistor)	(See page ZD-2666)
B15341E	Rear position light brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2666)
B15361E	Short or open in rear brake light brightness sensor (programmable resistor)	(See page ZD-2670)
B153711	Short to ground in rear brake light	(See page ZD-2670)
B153712	Short to battery in rear brake light	(See page ZD-2670)
B153713	Open in rear brake light	(See page ZD-2670)
B153614	Short or open in rear brake light temperature sensor (thermistor)	(See page ZD-2670)
B15381E	Short or open in rear turn signal light brightness sensor (programmable resistor)	(See page ZD-2673)
B153911	Short to ground in rear turn signal light	(See page ZD-2673)
B153912	Short to battery in rear turn signal light	(See page ZD-2673)
B153913	Open in rear turn signal light	(See page ZD-2673)
B153814	Short or open in rear turn signal light temperature sensor (thermistor)	(See page ZD-2673)
B153C14	Short or open in rear ADS temperature sensor (thermistor)	(See page ZD-2699)
B153C1E	Rear ADS brightness sensor (programmable resistor) resistance value out of range	(See page ZD-2699)
B153D11	Short to ground in rear ADS	(See page ZD-2699)
B153D12	Short to battery in rear ADS	(See page ZD-2699)
B153D13	Open in rear ADS	(See page ZD-2699)
B18A011	Short to ground in rear light controller fan 1	(See page ZD-2702)

DTC	Detection Items	See page
B18A012	Short to battery in rear light controller fan 1	(See page ZD-2702)
B18A013	Open in rear light controller fan 1	(See page ZD-2702)
B18A111	Short to ground in rear light controller fan 2	(See page ZD-2702)
B18A113	Open in rear light controller fan 2	(See page ZD-2702)
B18A112	Short to battery in rear light controller fan 2	(See page ZD-2702)
B18A609	Unreliable left and right signals for rear light	(See page ZD-2688)
U002888	Comfort CAN bus off	(See page ZD-2694)
U014887	PDCR node lost	(See page ZD-2688)

DTC	**B153016**	**Rear light controller power supply voltage too low**
DTC	**B153017**	**Rear light controller power supply voltage too high**

Description

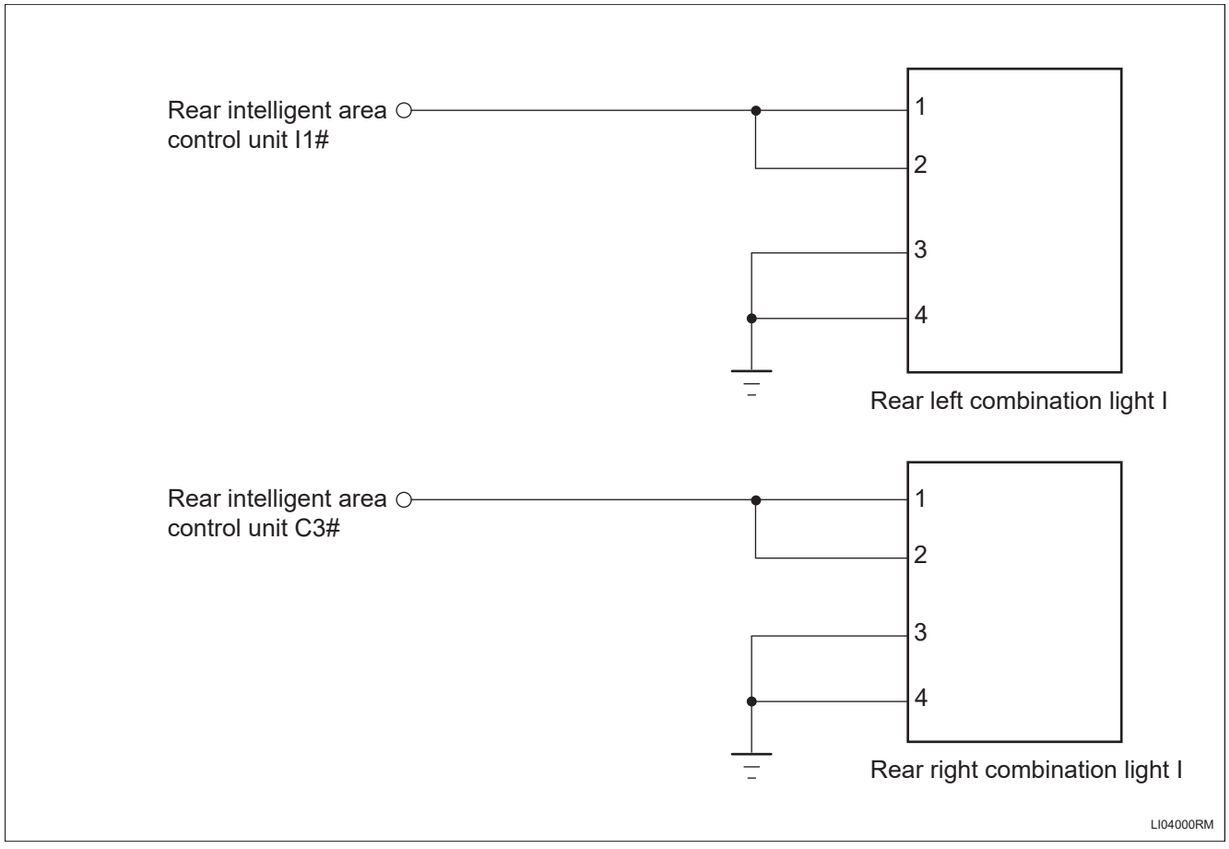
When rear combination light I power supply voltage is out of normal operating range, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153016	• After IG ON for 1500 ms • Not OTA Mode	Input voltage < 8.5 V for 15 s	15 s	Periodic type	5 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector • Charging system
B153017	• After IG ON for 1500 ms • Not OTA Mode	• Input voltage > 16.5 V for 15 s • Input voltage > 18.5 V for 400 ms	15 s/400 ms	Periodic type	5 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153016	Rear light function failure or degradation	Comes on
B153017	Rear light function failure or degradation	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage

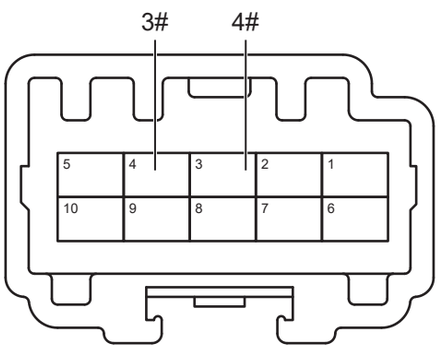
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

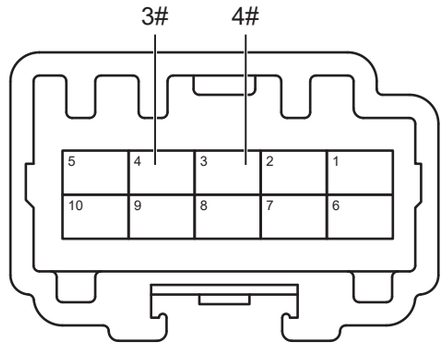
NG	**Check and repair charging system**

OK

2	**Check rear combination light I ground**



Rear left combination light I connector



Rear right combination light I connector

LI04010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left combination light I connector.

(d) Disconnect the rear right combination light I connector.

(e) According to value in the table, measure resistance.

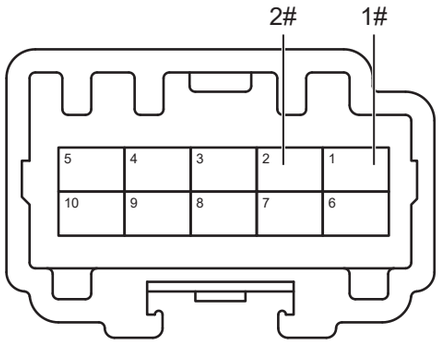
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left combination light 1 connector 3# - body ground	Always connected	Less than 1 Ω
Rear left combination light 1 connector 4# - body ground	Always connected	Less than 1 Ω
Rear right combination light 1 connector 3# - body ground	Always connected	Less than 1 Ω
Rear right combination light 1 connector 4# - body ground	Always connected	Less than 1 Ω

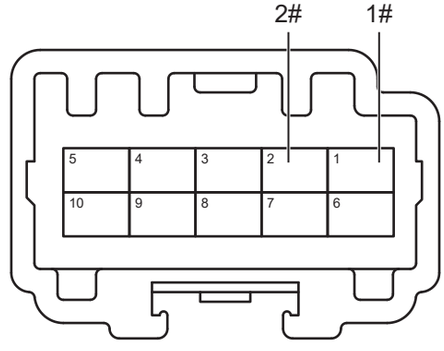
NG → **Check and repair or replace wire harness and connector**

OK

3	Check rear combination light l power supply



Rear left combination light l connector



Rear right combination light l connector

LI04021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Rear left combination light 1 connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage
Rear left combination light 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage
Rear right combination light 1 connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage
Rear right combination light 1 connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG

Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)

OK

Replace rear combination light l (See page ZC-24)

DTC	B153304	Rear light controller ECU internal communication fault

Description

When an internal fault occurs in rear combination light, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153304	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	• Buck driver SPI failure • SPEC driver I2C failure • HSS driver SPI failure • Motor driver SPI failure	500 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153304	Rear light function failure	Comes on

Inspection procedure

1	**Replace rear left/right combination light I (See page ZC-24)**

DTC	B153204	Rear light controller ECU internal temperature sensor fault

DTC	B15324B	Rear light controller ECU overtemperature

Description

When rear combination light operating temperature is too high, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153204	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	• Sampling voltage < 0.19 V, which means R < 97 Ω (SC) • Sampling voltage > 4.93 V, which means R > 351 KΩ (OL)	4000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Ambient temperature
B15324B	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	Temperature >= 105° C (starting point of ECU temperature derating)	90000 ms	Periodic type	5 ms	• Rear left combination light I • Rear right combination light I • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153204	Rear light function temperature derating function failure	Comes on
B15324B	Rear light function degradation	Comes on

Inspection procedure

1	**Rear combination light is cooled down**

(a) Lower the rear combination light temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear left/right combination light I (See page ZC-24)**

OK

Diagnosis ends

DTC	B153256	Rear light Dataset not available or incompatible with application software

Description

When hardware and software versions of the rear combination light are inconsistent, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153256	Only detect once in a single power-on cycle	• Dataset Checksum error • The software version number is different from the one configured in the dataset	1	Event-based	10 ms	• Rear left combination light I • Rear right combination light I

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153256	Rear light function degradation	Comes on

Inspection procedure

1	Rear combination light performs automatic configuration module program

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Rear combination light performs automatic configuration module program.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left/right combination light I (See page ZC-24)**

OK

Diagnosis ends

DTC	**B15341E**	**Rear position light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B153511**	**Short to ground in rear position light**
DTC	**B153512**	**Short to battery in rear position light**
DTC	**B153513**	**Open in rear position light**
DTC	**B153414**	**Short or open in rear position light temperature sensor (thermistor)**

ZD Description

When there is short or open in rear position light internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153414	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100KΩ): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperature > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B15341E	• The power supply voltage is between 9 V and 16 V, or 500 ms	For Signal and TI CC LMM: • Resistance < 500 Ω (SC)	0 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	• Resistance > 30 KΩ (OL) For NXP CC LMM: • Resistance < 3.2 KΩ • Resistance > 36 KΩ				• Wire harness and connector
B153511	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear position light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153512	• The power supply voltage is between 9	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear position light is turned on • Only detect once in a single power-on cycle • Not OTA Mode					• Wire harness and connector
B153513	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear position light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153414	Rear position light temperature derating function failure or degradation	Comes on
B15341E	Rear position light brightness level selection function failure or degradation	Comes on
B153511	Rear position light function failure or degradation	Comes on
B153512	Rear position light function failure or degradation	Comes on
B153513	Rear position light function failure or degradation	Comes on

Inspection procedure

1	**Check left/right position light**

(a) Check if left/right position light is damaged.

NG → **Perform repair according to malfunction**

OK

2	**Check rear combination light l wire harness and connector**

(a) Check for short in rear combination light l wire harness and connector.

(b) Check for open in rear combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light l (See page ZC-24)

DTC	**B15361E**	**Short or open in rear brake light brightness sensor (programmable resistor)**
DTC	**B153711**	**Short to ground in rear brake light**
DTC	**B153712**	**Short to battery in rear brake light**
DTC	**B153713**	**Open in rear brake light**
DTC	**B153614**	**Short or open in rear brake light temperature sensor (thermistor)**

Description

ZD When there is short or open in rear brake light internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153614	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervolta-ge after 500 ms • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100 KΩ NTC): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperatur-e > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light l • Rear right combination light l • Wire harness and connector
B15361E	• The power supply voltage is between 9 V and 16 V, or 500 ms after the	For Signal and TI CC LMM: • Resistance < 500 Ω (SC)	0 ms	Periodic type	10 ms	• Rear left combination light l • Rear right combination light l • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	• Resistance > 30 KΩ (OL) For NXP CC LMM: • Resistance < 3.2 KΩ • Resistance > 36 KΩ				
B153711	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear brake light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation on between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153712	• The power supply voltage is between 9 V and 16 V,	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Rear brake light is turned off • Only detect once in a single power-on cycle • Not OTA Mode					• Wire harness and connector
B153713	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Rear brake light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153614	Rear brake light temperature derating function failure or degradation	Comes on
B15361E	Rear brake light brightness level selection function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B153711	Rear brake light function failure or degradation	Comes on
B153712	Rear brake light function failure or degradation	Comes on
B153713	Rear brake light function failure or degradation	Comes on

Inspection procedure

1	Check left and right brake lights

(a) Check if left/right brake light is damaged.

NG → **Perform repair according to malfunction**

OK

2	Check rear combination light l wire harness and connector

(a) Check for short in rear combination light l wire harness and connector.

(b) Check for open in rear combination light l wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light l (See page ZC-24)

DTC	B15381E	Short or open in rear turn signal light brightness sensor (programmable resistor)

DTC	**B153911**	**Short to ground in rear turn signal light**
DTC	**B153912**	**Short to battery in rear turn signal light**
DTC	**B153913**	**Open in rear turn signal light**
DTC	**B153814**	**Short or open in rear turn signal light temperature sensor (thermistor)**

Description

When there is short or open in rear turn signal light internal circuit, the rear combination light records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153814	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100 KΩ NTC): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperatur-e > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B15381E	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an	For Signal and TI CC LMM: • Resistance < 500 Ω (SC) • Resistance > 30 KΩ (OL)	0 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	overvoltage or undervoltage condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	For NXP CC LMM: • Resistance < 3.2 KΩ • Resistance > 36 KΩ				
B153911	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Front ADS light on • Only detect once in a single power-on cycle • Not OTA Mode	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153912	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Front ADS light off • Only detect once in a single power-on cycle • Not OTA Mode					
B153913	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Front ADS light on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153814	Rear turn signal light temperature derating function failure or degradation	Comes on
B15381E	Rear turn signal light brightness level selection function failure or degradation	Comes on
B153911	Rear turn signal light function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B153912	Rear turn signal light function failure or degradation	Comes on
B153913	Rear turn signal light function failure or degradation	Comes on

Inspection procedure

1	Check rear left/right turn signal light

(a) Check if rear left/right turn signal light is damaged.

NG → Perform repair according to malfunction

OK

2	Check rear combination light I wire harness and connector

(a) Check for short in rear combination light I wire harness and connector.

(b) Check for open in rear combination light I wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace rear left/right combination light I (See page ZC-24)

DTC	B153A1E	Rear fog light brightness sensor (programmable resistor) resistance value out of range
DTC	B153B11	Short to ground in rear fog light

DTC	**B153B12**	**Short to battery in rear fog light**
DTC	**B153B13**	**Open in rear fog light**
DTC	**B153A14**	**Short or open in rear fog light temperature sensor (thermistor)**

Description

When there is short or open in rear fog light internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153A14	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervolta-ge after 500 ms • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100 KΩ NTC): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperatur-e > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153A1E	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or	For Signal and TI CC LMM: • Resistance < 500 Ω (SC) • Resistance > 30 KΩ (OL) For NXP CC LMM: • Resistance < 3.2 KΩ	0 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	undervoltage condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	• Resistance > 36 KΩ				
B153B11	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear fog light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153B12	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear fog light is turned off • Only detect once in a single power-on cycle • Not OTA Mode					
B153B13	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear fog light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153A14	Rear fog light temperature derating function failure or degradation	Comes on
B153A1E	Rear fog light brightness level selection function failure or degradation	Comes on
B153B11	Rear fog light function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B153B12	Rear fog light function failure or degradation	Comes on
B153B13	Rear fog light function failure or degradation	Comes on

Inspection procedure

1	Check rear fog light

(a) Check if rear fog light is damaged.

NG → Perform repair according to malfunction

OK

2	Check rear left combination light I wire harness and connector

(a) Check for short in rear left combination light I wire harness and connector.

(b) Check for open in rear left combination light I wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace rear left combination light I (See page ZC-24)

DTC	B153E14	Short or open in rear back-up light temperature sensor (thermistor)

DTC	**B153E1E**	**Rear back-up light brightness sensor (programmable resistor) resistance value out of range**
DTC	**B153F11**	**Short to ground in rear back-up light**
DTC	**B153F12**	**Short to battery in rear back-up light**
DTC	**B153F13**	**Open in rear back-up light**

Description

When is short or open in rear back-up light internal circuit, the rear combination light records DTC.

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153E14	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervolta-ge after 500 ms • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100 KΩ NTC): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperatur-e > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153E1E	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an	For Signal and TI CC LMM: • Resistance < 500 Ω (SC) • Resistance > 30 KΩ (OL)	0 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	overvoltage or undervoltage condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	For NXP CC LMM: • Resistance < 3.2 KΩ • Resistance > 36 KΩ				
B153F11	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear back-up light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153F12	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Rear back-up light is turned off • Only detect once in a single power-on cycle • Not OTA Mode					
B153F13	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Rear back-up light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153E14	Rear back-up light temperature derating function failure or degradation	Comes on
B153E1E	Rear back-up light brightness level selection function failure or degradation	Comes on
B153F11	Rear back-up light function failure or degradation	Comes on

DTC No.	Fault symptom	Warning light/indicator
B153F12	Rear back-up light function failure or degradation	Comes on
B153F13	Rear back-up light function failure or degradation	Comes on

Inspection procedure

1	Check left/right back-up light

(a) Check if left/right back-up light is damaged.

NG → Perform repair according to malfunction

OK

2	Check rear combination light I wire harness and connector

(a) Check for short in rear combination light I wire harness and connector.

(b) Check for open in rear combination light I wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

Replace rear left/right combination light I (See page ZC-24)

DTC	B18A204	Rear light controller lost communication with CV1 matrix light board
DTC	B18A304	Rear light controller lost communication with CV2 matrix light board

DTC	B18A401	Rear light CV1 matrix light board chip lost
DTC	B18A501	Rear light CV2 matrix light board chip lost

Description

When there is short to ground in rear combination light matrix light board internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B18A204	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Not OTA Mode	All CV1 matrix chips lost	500 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A304	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Not OTA Mode	All CV2 matrix chips lost	500 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B18A401	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	The Matrix IC address in the matrix light board is inconsistent with the address configured for the corresponding Matrix IC in Dataset	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A501	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Not OTA Mode	The Matrix IC address in the matrix light board is inconsistent with the address configured for the corresponding Matrix IC in Dataset	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B18A204	Rear CV1 matrix light board out of control	Comes on
B18A304	Rear CV2 matrix light board out of control	Comes on
B18A401	Rear CV1 matrix light board out of control	Comes on
B18A501	Rear CV2 matrix light board out of control	Comes on

Inspection procedure

1	**Check rear combination light I/II wire harness and connector**

(a) Check for short to ground in rear combination light I/II wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light I/II (See page ZC-24) (See page ZC-27)

ZD

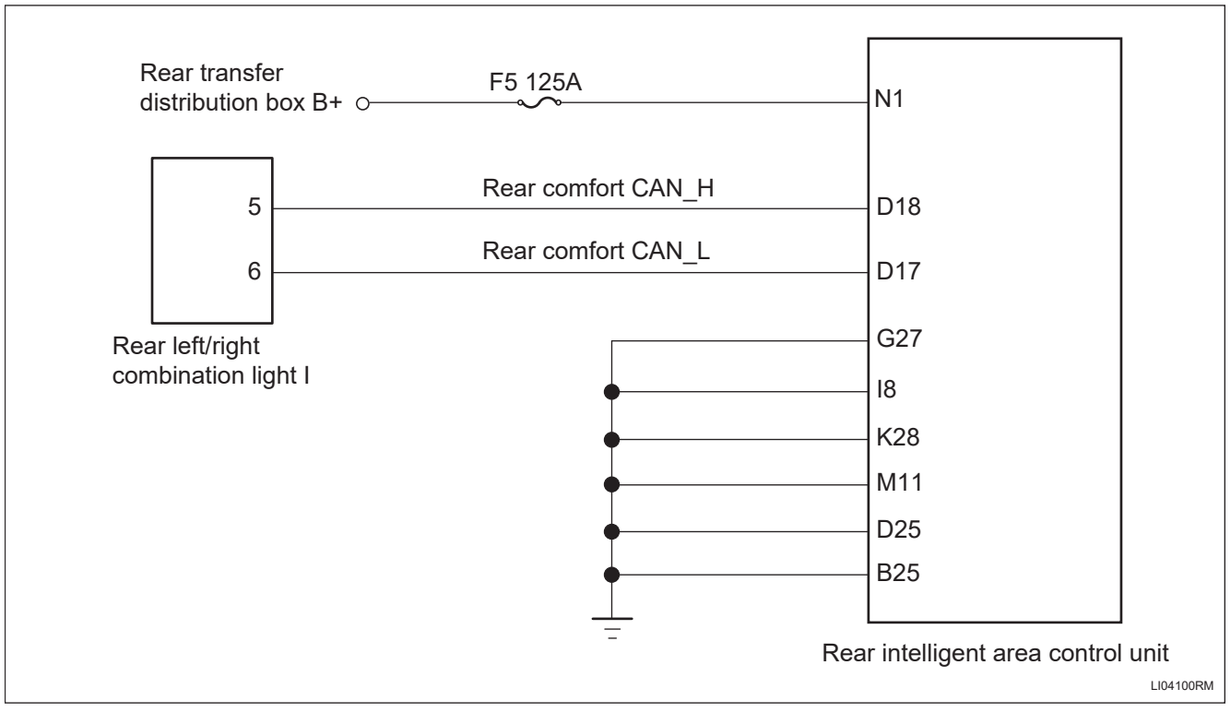
DTC	U014887	PDCR node lost

Description

When communication between rear left/right combination light I and other system is abnormal or interrupted, the rear left/right combination light I records DTC.

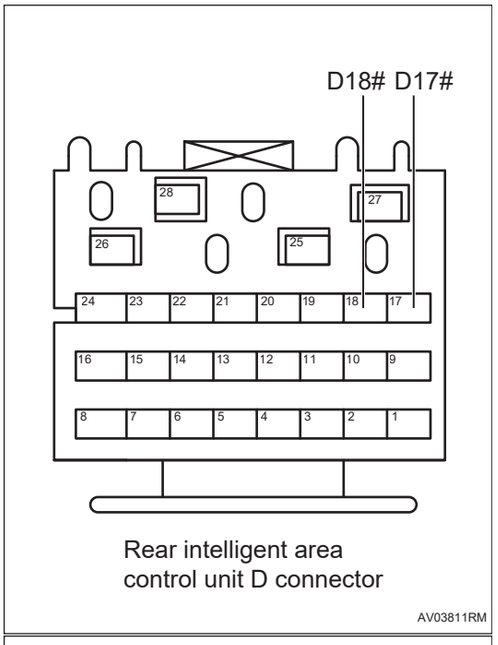
DTC No.	DTC detection condition	Faulty area
U014887	(a) PDCR node lost.	• CAN line and connector • Rear left combination light I • Rear right combination light I • Rear intelligent area control unit

Circuit diagram



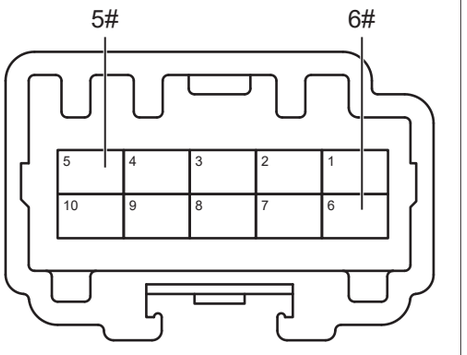
Inspection procedure

1	**Check for open in rear comfort CAN bus (rear left/right combination light I - rear intelligent area control unit)**

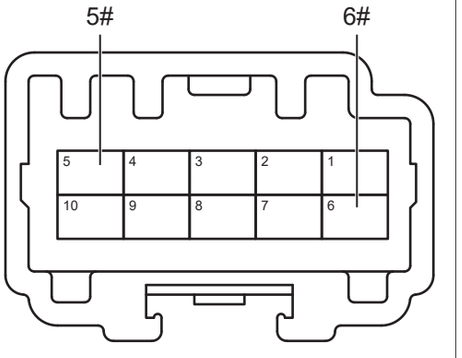


Rear intelligent area control unit D connector

AV03811RM



Rear left combination light I connector



Rear right combination light I connector

LI04111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear comfort CAN bus.

(d) According to value in the table, measure resistance.

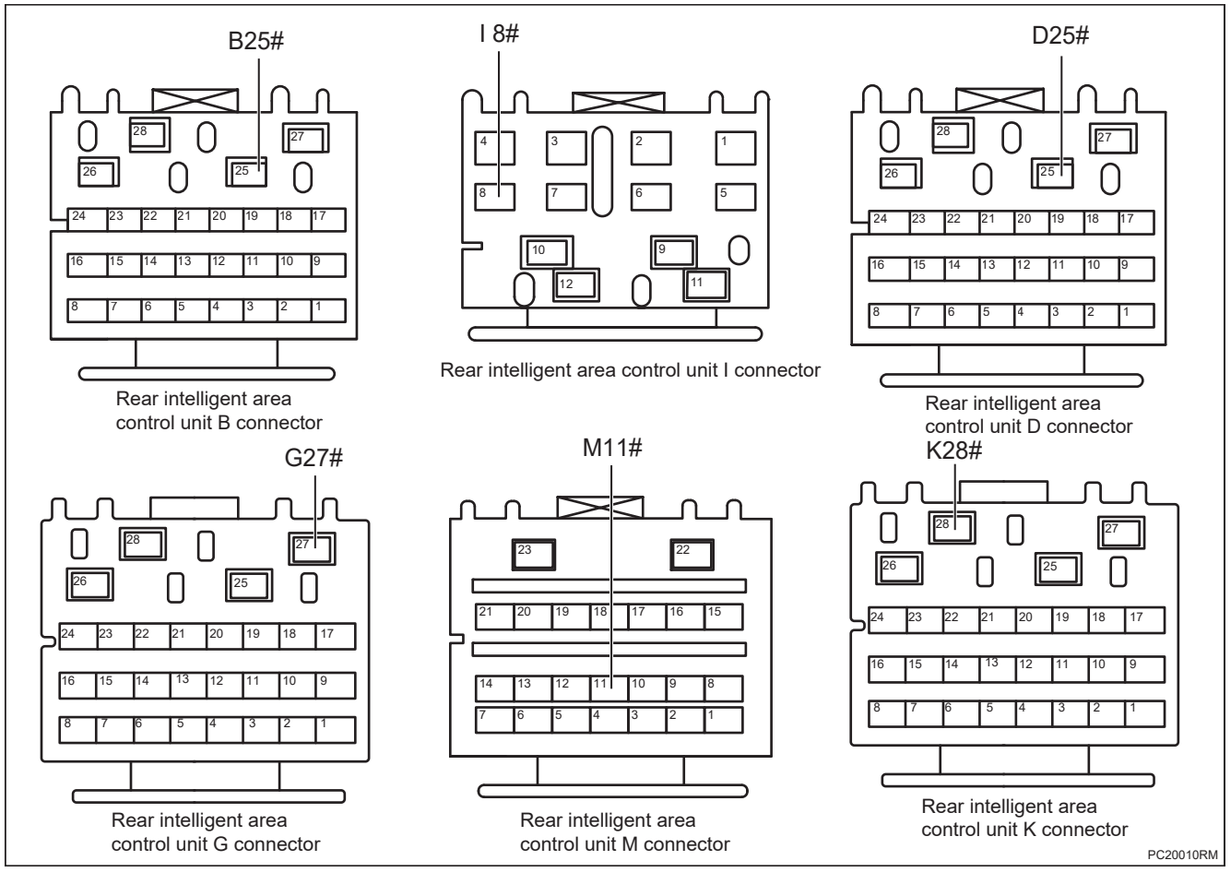
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left combination light I connector 5# - rear intelligent area control unit connector D18#	Always connected	Less than 1 Ω
Rear left combination light I connector 6# - rear intelligent area control unit connector D17#	Always connected	Less than 1 Ω
Rear right combination light I connector 5# - rear intelligent area control unit connector D18#	Always connected	Less than 1 Ω
Rear right combination light I connector 6# - rear intelligent area control unit connector D17#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear intelligent area control unit ground**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G27# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector I8# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector K28# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector M11# - body ground	Always connected	Less than 1 Ω

ZD

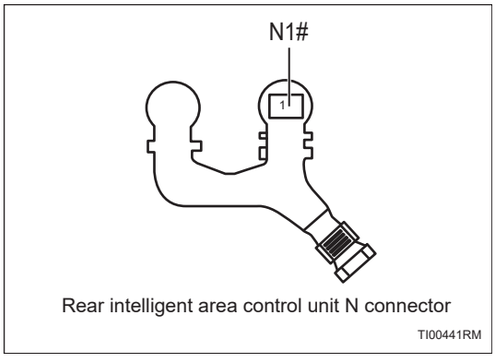
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector D25# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B25# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3 Check rear intelligent area control unit power supply



Rear intelligent area control unit N connector

TI00441RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

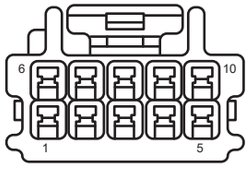
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector N1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

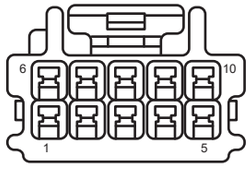
NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	Check rear comfort CAN bus terminal resistance



Rear left combination light I



Rear right combination light I

TI00451RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left combination light I 5# - rear left combination light I 6#	Always connected	Approximately 60 Ω
Rear right combination light I 5# - rear right combination light I 6#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

5	Replace rear intelligent area control unit (See page ZC-132)

(a) Replace the rear intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left/right combination light I (See page ZC-24)**

OK

ZD

Diagnosis ends

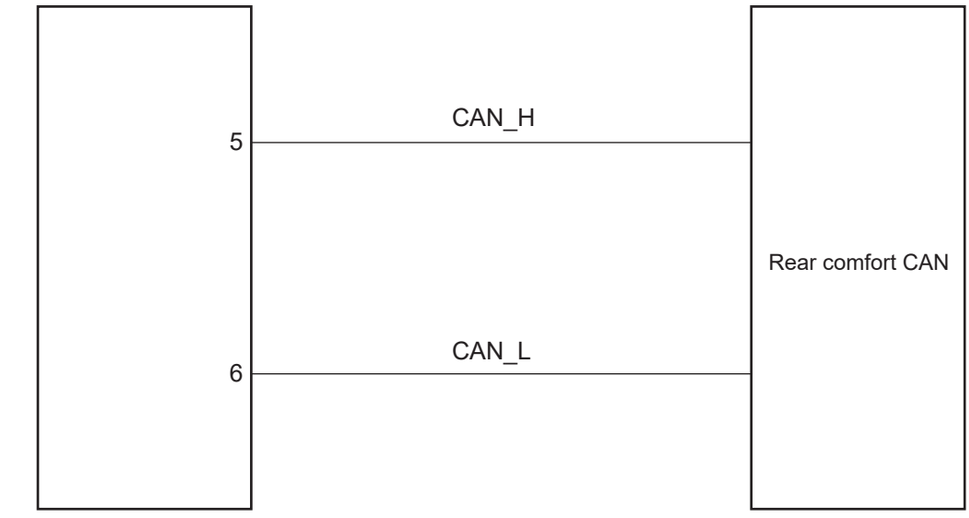
DTC	U002888	Comfort CAN bus off

Description

When rear combination light I detects rear comfort CAN bus off fault, the rear combination light I records DTC.

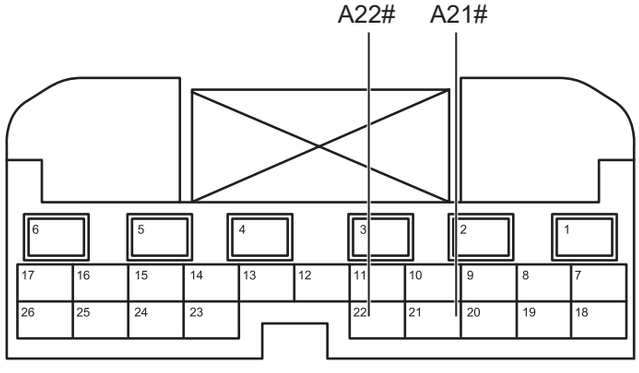
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Rear left combination light I • Rear right combination light I • Trailer controller • Rear intelligent area control unit • Charging controller

Circuit diagram



Inspection procedure

1	**Check rear comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the trailer controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A21# - trailer controller connector A22#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

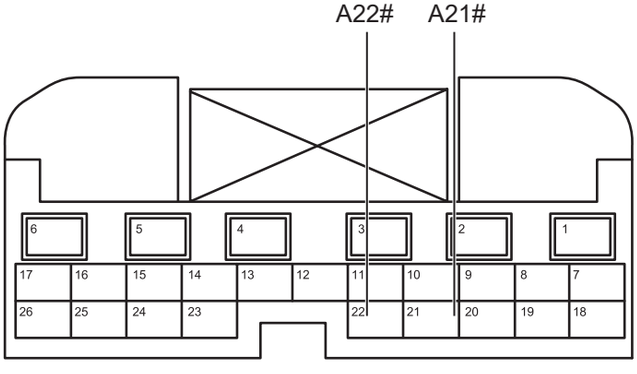
2	Check controllers on rear comfort CAN bus

(a) Disconnect the controllers on rear comfort CAN bus in sequence, and check if other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between rear comfort CAN bus CAN-L and CAN-H



Trailer identification controller A connector

TI00390RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear comfort CAN bus.

(d) According to value in the table, measure resistance.

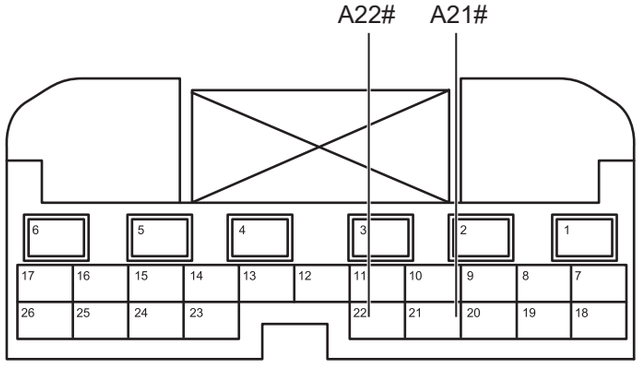
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A21# - trailer controller connector A22#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in rear comfort CAN bus



Trailer identification controller A connector

TI00390RM

(a) According to value in the table, measure resistance.

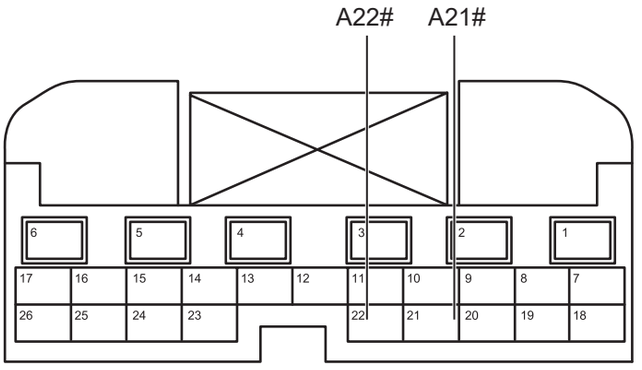
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A22# - body ground	Always connected	10 KΩ or more
Trailer controller connector A21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear comfort CAN bus**



Trailer identification controller A connector

TI00390RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Trailer controller connector A21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	**B153C14**	**Short or open in rear ADS temperature sensor (thermistor)**
DTC	**B153D11**	**Short to ground in rear ADS**
DTC	**B153D12**	**Short to battery in rear ADS**
DTC	**B153D13**	**Open in rear ADS**

Description

When there is short or open in ADS internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153C14	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervolta-ge after 500 ms • After IG ON for 1500 ms • Not OTA Mode	For Signal (10 KΩ NTC): • Sampling voltage < 0.19 V (SC) • Sampling voltage > 4.93 V (OL) For TI CC LMM (100 KΩ NTC): • Sampling voltage < 0.19 V (SC), unable to detect OL For NXP CC LMM (10 KΩ NTC): • Resistance < 181 Ω (SC) • Resistance value > 44KΩ & Junction temperatur-e > 15° C (OL)	5000 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B153D11	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage	• For non-matrix outputs: Output voltage < 1.7 V • For matrix output: The short-circuit and open-circuit	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	or undervoltage condition • After IG ON for 1500 ms • Rear ADS light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	status registers of the matrix chip are set, but there is no differentiation between short-circuit and open-circuit errors. As a result, both the short-circuit-to-ground and open-circuit DTCs will be reported simultaneously				
B153D12	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear ADS light is turned off • Only detect once in a single power-on cycle • Not OTA Mode	• Output voltage > 5 V	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153D13	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervoltage condition • After IG ON for 1500 ms • Rear ADS light is turned on • Only detect once in a single power-on cycle • Not OTA Mode	For non-matrix outputs: • Buck register open state flag set (when Buck output voltage is close to Boost output voltage) • Output voltage >= (set Boost output voltage-2 V) For constant voltage matrix output: • TBD	500 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153C14	Rear ADS light temperature derating function failure or degradation	Comes on
B153D11	Rear ADS light function failure or degradation	Comes on
B153D12	Rear ADS light function failure or degradation	Comes on
B153D13	Rear ADS light function failure or degradation	Comes on

Inspection procedure

1	**Check rear combination light I wire harness and connector**

(a) Check for short in rear combination light I wire harness and connector.

(b) Check for open in rear combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light I (See page ZC-24)

ZD

DTC	**B18A011**	**Short to ground in rear light controller fan 1**
DTC	**B18A012**	**Short to battery in rear light controller fan 1**
DTC	**B18A013**	**Open in rear light controller fan 1**
DTC	**B18A111**	**Short to ground in rear light controller fan 2**
DTC	**B18A112**	**Short to battery in rear light controller fan 2**
DTC	**B18A113**	**Open in rear light controller fan 2**

Description

When there is short or open in rear combination light fan internal circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B18A011	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned on • Not OTA Mode	• Output current > ISC • Hint: ISC configuration in Dataset file	1000 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A012	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned off • Not OTA Mode	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A013	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned on • Not OTA Mode	• Battery voltage - output voltage < IOL • Hint: IOL configuration in Dataset file	Dataset file configuration defaults for 2 s	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A111	• . Power supply voltage is between 9	• Output current > ISC	1000 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned on • Not OTA Mode	• Hint: ISC configuration in Dataset file				• Wire harness and connector
B18A112	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned off • Not OTA Mode	Battery voltage - output voltage < 3.3 V	1000 ms	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector
B18A113	• . Power supply voltage is between 9 V and 16 V or recovers from overvoltage or undervoltage after 500 ms • After IG ON for 1500 ms • Fan is turned on • Not OTA Mode	• Battery voltage - output voltage < IOL • Hint: IOL configuration in Dataset file	Dataset file configuration defaults for 2 s	Event-based	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B18A011	Rear light brightness decreased	Comes on
B18A012	Rear light brightness decreased	Comes on

DTC No.	Fault symptom	Warning light/indicator
B18A013	Rear light brightness decreased	Comes on
B18A111	Rear light brightness decreased	Comes on
B18A112	Rear light brightness decreased	Comes on
B18A113	Rear light brightness decreased	Comes on

Inspection procedure

1	Check rear combination light II wire harness and connector

(a) Check for short in rear combination light II wire harness and connector.

(b) Check for open in rear combination light II wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light II (See page ZC-24)

DTC	B153C1E	Rear ADS brightness sensor (programmable resistor) resistance value out of range

Description

When there is short or open in rear combination light brightness sensor circuit, the rear combination light records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B153C1E	• The power supply voltage is between 9 V and 16 V, or 500 ms after the voltage recovers from an overvoltage or undervolta-ge condition • After IG ON for 1500 ms • Determine the sampling range within 200 ms after power on • Only detect once in a single power-on cycle • Not OTA Mode	For Signal and TI CC LMM: • Resistance < 500 Ω (SC) • Resistance > 30 KΩ (OL) For NXP CC LMM: • Resistance < 3.2 KΩ • Resistance > 36 KΩ	0 ms	Periodic type	10 ms	• Rear left combination light I • Rear right combination light I • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B153C1E	Rear ADS light brightness level selection function failure or degradation	Comes on

Inspection procedure

1	**Check rear combination light I wire harness and connector**

(a) Check for short in rear combination light I wire harness and connector.

(b) Check for open in rear combination light I wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

Replace rear left/right combination light I

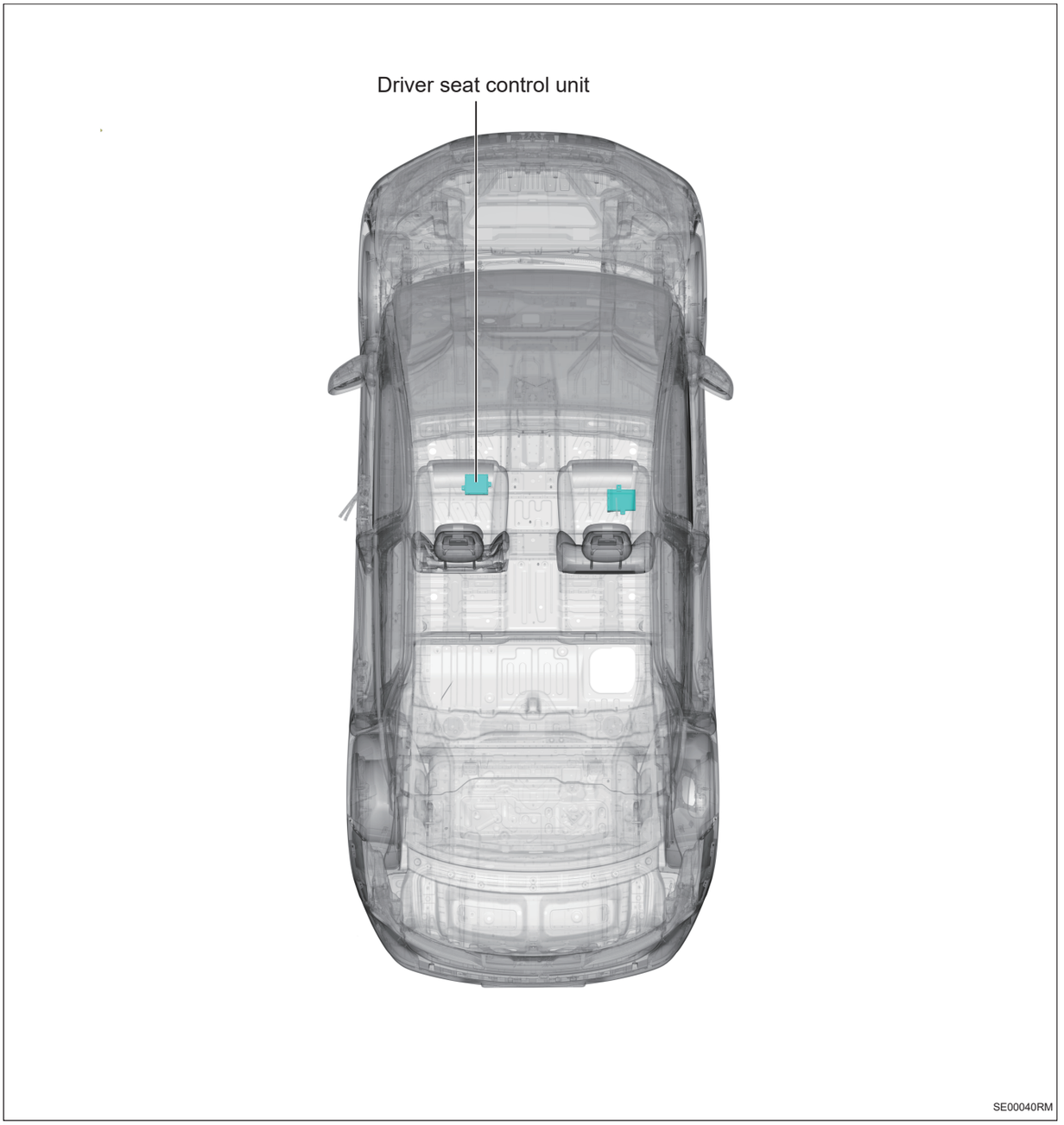
Seat system

Driver seat control unit

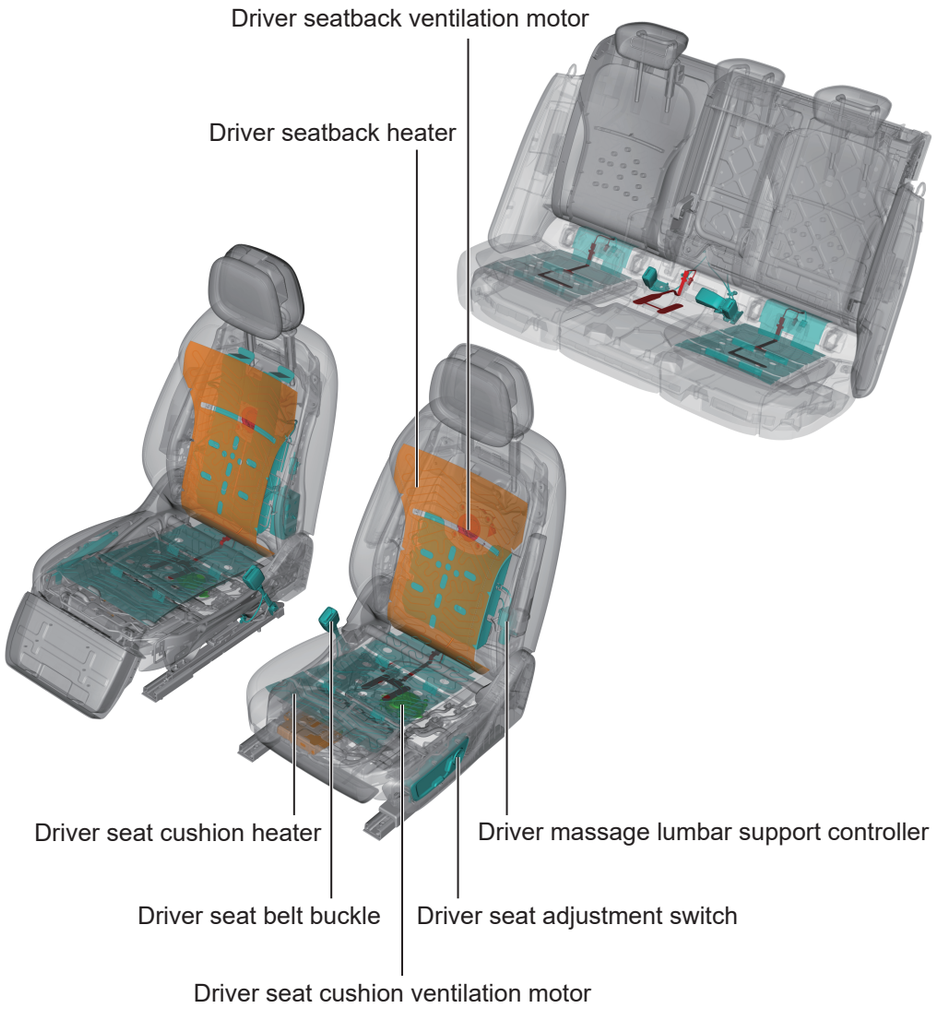
Precautions

1. **When checking seat control system, it may affect the airbag operation. Therefore, before performing servicing, be sure to read airbag precautions carefully.**

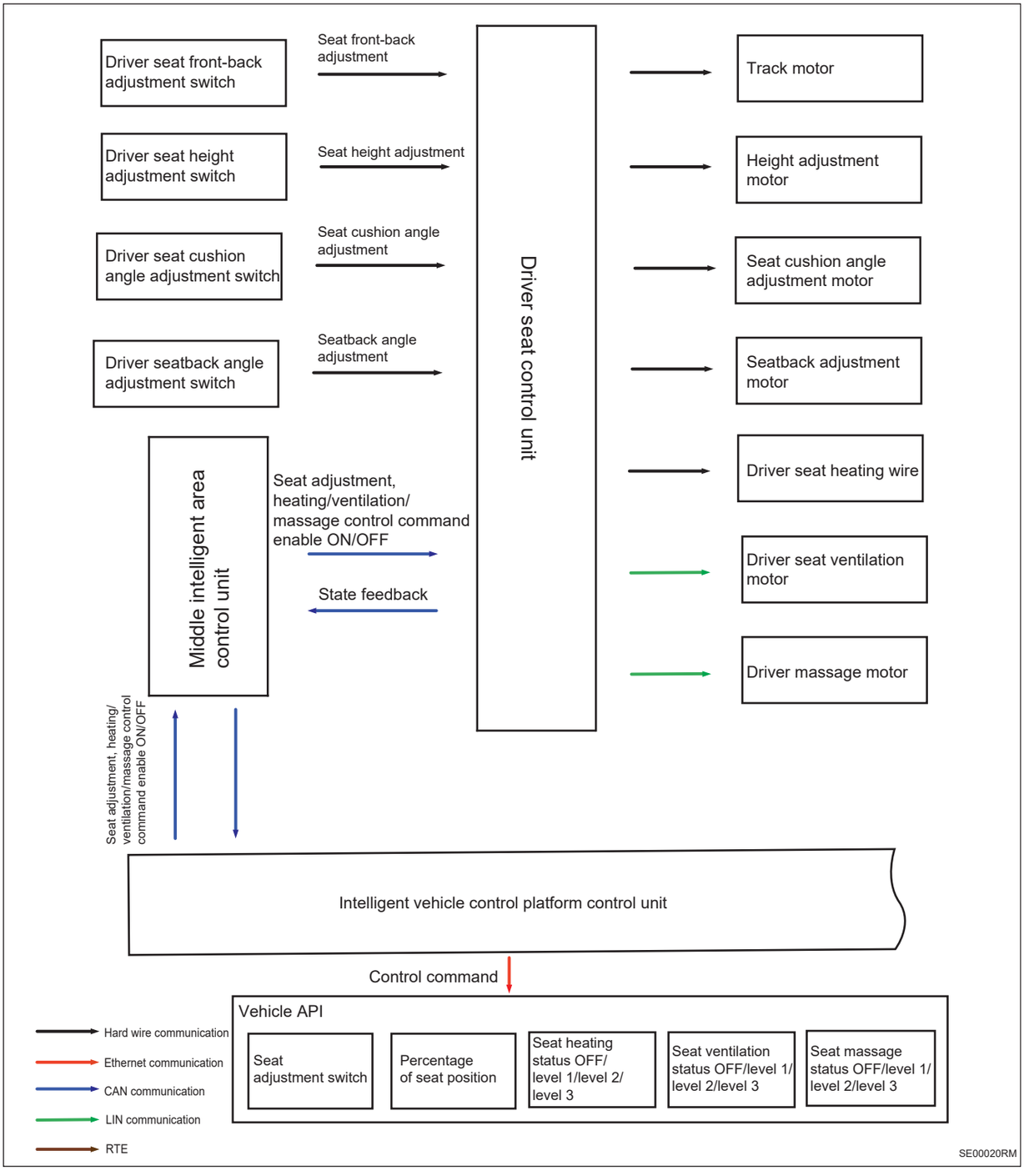
Part position

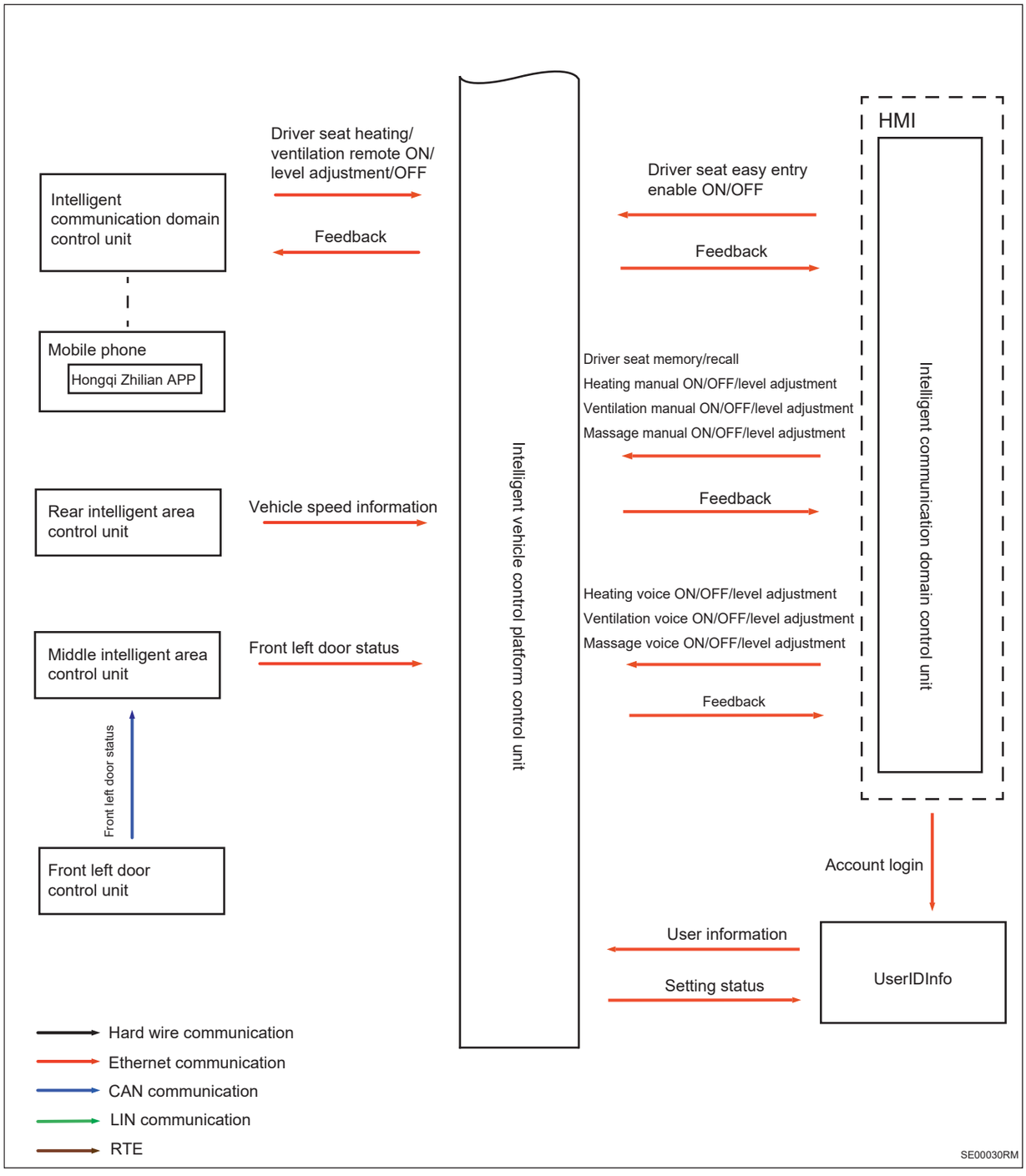


Part position



System diagram





Function description

1. **The user effectively presses the seat adjustment switch and position memory switch to adjust the seat position.**

   (a) Front-back adjustment of driver seat: The driver can adjust the seat forward or backward movement through the front-back adjustment switch of driver seat, which is convenient for the driver to get the most comfortable sitting posture and enhance the driving experience.

   (b) Height adjustment of driver seat: The driver can adjust the seat up or down through the seat height adjustment switch, which is convenient for the driver to get the most comfortable sitting posture and enhance the driving experience.

(c) Adjustment of driver seat cushion angle: The driver can increase or decrease the angle of driver seat cushion through the seat cushion angle adjustment switch, which is convenient for the driver to get the most comfortable sitting posture and enhance the driving experience.

(d) Angle adjustment of driver seatback: the driver chooses to adjust the seatback angle increase/ decrease through the driver seatback angle adjustment switch, which is convenient for the driver to get the most comfortable sitting posture and enhance the riding experience.

(e) Manual adjustment of driver seat lumbar support: The user adjusts seat lumbar support through HMI to change of the seat lumbar support position to provide the most comfortable seat lumbar support position for the user, and enhance the ride comfort.

(f) Driver seat position memory by user ID: The vehicle provides a function to bind the driver seat position and user account ID. Through user operations, the currently logged-in account and the current driver seat position are associated and memorized, so as to facilitate different users to quickly obtain their preferred seat positions by logging in their accounts, simplify user operations and improve usability and intelligent experience.

(g) Driver seat position recall by user ID: The vehicle provides a function to bind the driver seat position and user account ID. Based on the currently logged-in account of user, the memorized driver seat position information is automatically recalled to adjust the driver seat position, so as to facilitate different users to quickly obtain their preferred seat positions by logging in their accounts, simplify user operations and improve usability and intelligent experience.

(h) Front passenger position memory by user ID: The vehicle provides a function to bind the front passenger seat position and user account ID. Through user operations, the currently logged-in account and the current front passenger seat position are associated and memorized, so as to facilitate different users to quickly obtain their preferred seat positions by logging in their accounts, simplify user operations and improve usability and intelligent experience.

(i) Front passenger position recall by user ID: The vehicle provides a function to bind the front passenger seat position and user account ID. Based on the currently logged-in account of user, the memorized front passenger seat position information is automatically recalled to adjust the front passenger seat position, so as to facilitate different users to quickly obtain their preferred seat positions by logging in their accounts, simplify user operations and improve usability and intelligent experience.

(j) Driver seat position manual memory: The driver seat position memory can be achieved by operating the seat memory and recall buttons on the driver side. When the current driver seat position is memorized, users can quickly obtain their preferred driver seat positions, simplify user operations and improve usability and intelligent experience.

(k) Driver seat position manual recall: The user can recall up to three memorized driver seat positions by operating the seat memory and recall buttons on the driver side, so as to facilitate different users to quickly obtain their preferred driver seat positions, simplify user operations and improve usability and intelligent experience.

2. It supports the function of conveniently getting on and off the vehicle, when user gets off, the seat moves backward; when user gets on, the seat returns to the position before gets off.

(a) Easy Exit: When the driver exits the vehicle, the driver’s seat moves backward so that driver can exit the vehicle easily, improving convenience and intelligent experience.

(b) Easy Entry: When the driver enters the vehicle, the driver’s seat returns to the position before moving backward, improving convenience and intelligent experience.

(c) Driver seat easy entry/exit enable ON: The driver can set the driver seat easy entry/exit function enable to ON/OFF through the central control display switch to meet different users' experience needs.

(d) Driver seat easy entry/exit enable OFF: The driver can set the driver seat easy entry/exit function enable to ON/OFF through the central control display switch to meet different users' experience needs.

3. The user operates the seat heating, ventilation and massage switches to realize the corresponding functions, and the real-time level can be seen on control panel at the same time.

(a) Manual turning on driver seat heater: In cold weather, users can turn on the driver seat heater via HM to heating the part of the driver body that fits into seat to improving ride comfort and enhancing the ride experience.

(b) Remote turning on driver seat heater: In cold weather, users can turn on the driver seat heater via mobile phone APP to improving ride comfort and enhancing the ride experience

(c) Manual adjustment of driver seat heating level: Users can adjust the heating intensity of the driver seat according to their intention to get the most comfortable heating level and improve comfort.

(d) Remote adjustment of driver seat heating level: Users can adjust the heating intensity of the driver seat according to their intention via mobile phone APP to get the most comfortable heating level and improve comfort.

(e) Manual turning off driver seat heater: Users can turn off the front seat heating function on demand.

(f) Remote turning off driver seat heater: Users can turn off the driver seat heating function remotely on demand via mobile phone APP.

(g) Turning on driver seat heater via voice: In cold weather, users can turn on the driver seat heater via voice to heating the part of the driver body that fits into seat to improving ride comfort and enhancing the ride experience.

(h) Adjustment of driver seat heating level via voice: Users can adjust the heating intensity of the driver seat according to their intention to get the most comfortable heating level and improve comfort.

(i) Turning off driver seat heater via voice: Users can turn off the front seat heating function on demand.

(j) Manual turning on driver seat ventilation: In hot weather, driver can turn on the driver seat ventilation manually via switch to ventilate and cool the part of the driver body that fits into seat, enhancing ride comfort and improving the ride experience.

(k) Remote turning on driver seat ventilation: In hot weather, driver can remotely turn on the driver seat ventilation via mobile phone APP to ventilate and cool the part of the driver body that fits into seat, enhancing ride comfort and improving the ride experience.

(l) Manual adjustment of driver seat ventilation level: Users can adjust the ventilation intensity of the driver seat according to their intention to get the most comfortable ventilation level and improve comfort.

(m) Remote adjustment of driver seat ventilation level: Users can adjust the ventilation intensity of the driver seat according to their intention via mobile phone APP to get the most comfortable ventilation level and improve comfort.

(n) Manual turning off driver seat ventilation: Users can manually turn off the front seat ventilation function on demand.

(o) Remote turning off driver seat ventilation: Users can manually turn off the front seat ventilation function on demand via mobile phone APP.

(p) Turning on driver seat ventilation via voice: In hot weather, driver can turn on the driver seat ventilation via voice to ventilate and cool the part of the driver body that fits into seat, enhancing ride comfort and improving the ride experience.

(q) Adjustment of driver seat ventilation level via voice: Users can adjust the ventilation intensity of the driver seat according to their intention to get the most comfortable ventilation level and improve comfort.

(r) Turning off driver seat ventilation via voice: Users can turn off the front seat ventilation function on demand via voice.

4. Seat adaptive adjustment function

(a) Before the user drives the vehicle for the first time, the system recognizes that there is no memorized position under the logged-in account or in the case of no logged-in account, the driver seat actively adjusts the seat position automatically according to the driver personal information and information captured by the camera, saving the cumbersome operation steps of the driver;

(b) When there is already a memorized seat position under the account bound to the vehicle, but the user feels that this position is not good and wants to reuse the seat adaptive adjustment function, the user can actively retrieve this function on the central control display.

Data parameter

Driver seat control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	10	-	—

Driver seat angle adjustment motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	10	-	3

Driver seat track motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	Less than 6	4	1

Driver seat cushion heater

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	5	4
NTC sensor resistance (KΩ)	359.5644 (-40° C)	343.6326 (-40° C)	328.3739 (-40° C)

Item	Max	OK	Minimum
	101.0977 (-20° C)	97.8396 (-20° C)	94.6771 (-20° C)
	33.4771 (0° C)	32.7547 (0° C)	32.0447 (0° C)
	12.6537 (20° C)	12.5005 (20° C)	12.3479 (20° C)
	5.4018 (40° C)	5.3146 (40° C)	5.2283 (40° C)

Driver seatback heater

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	5	4

Driver seat cushion ventilation motor

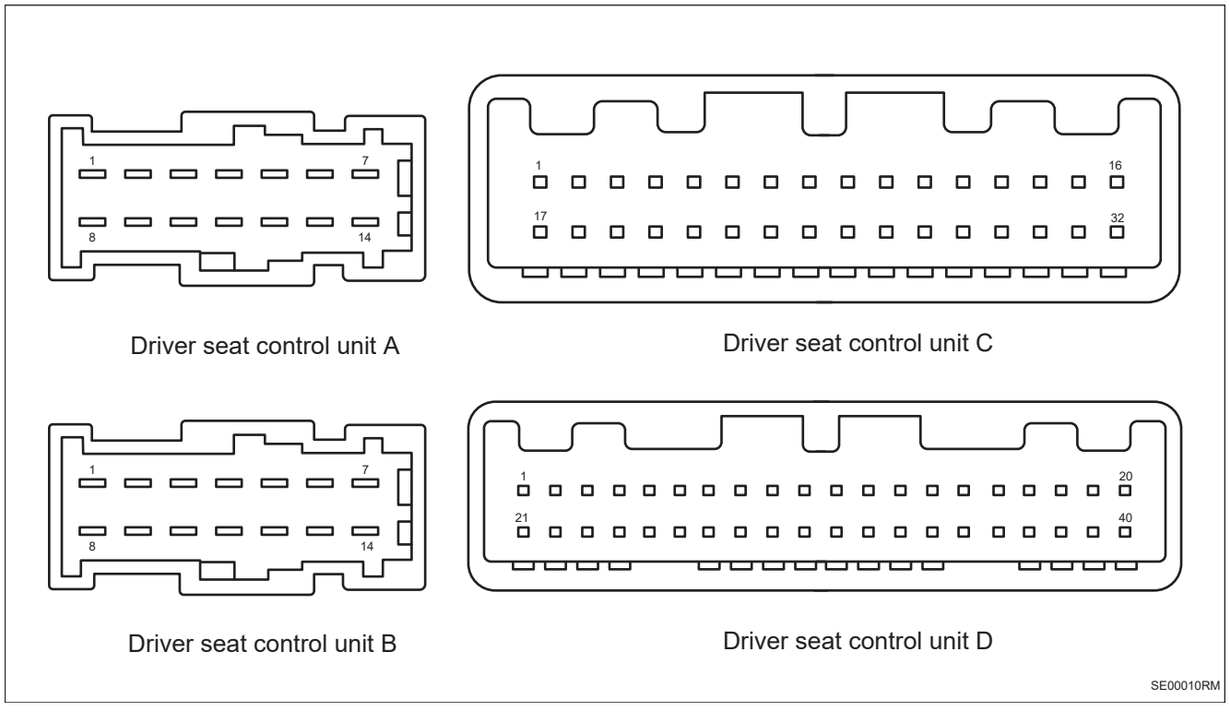
Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	1	0.67	0

Driver seatback ventilation motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	1	0.67	0

ECU terminal

Driver seat control unit



Driver seat control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	8	Ventilation power supply output
2	-	9	-
3	Massage/footwell light/ventilation/ lumbar support power supply	10	-
4	Massage/footwell light/ventilation power supply ground	11	Lumbar support power supply output
5	Seatback/seat cushion heater power supply	12	-
6	Seatback heater output	13	-
7	Seat cushion heater output	14	-

Driver seat control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	Seat adjustment common terminal output 2 (B1+, B8- seatback forward/B1 +, B9- seat height upward)	8	B8+, B1- Seatback backward adjustment output
2	-	9	B9+, B1- seat height downward adjustment output
3	-	10	-
4	Power ground	11	-
5	-	12	B12+, B14- Seat cushion angle downward adjustment output
6	Seat motor power supply ground	13	B13+, B14- seat track backward adjustment output
7	Seat motor power supply	14	Seat adjustment common terminal output 1 (B14+, B13- seat track forward/B14+, B12- seat cushion angle upward)

Driver seat control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	Seatback/seat cushion heater NTC signal
2	-	18	-
3	NTC ground	19	HALL power supply
4	CAN L	20	-
5	CAN H	21	-
6	-	22	-
7	LIN (ventilation + massage)	23	-
8	System power supply ground	24	-
9	-	25	Seatback HALL signal
10	-	26	Seat height HALL signal
11	Controller input power supply	27	Seat track HALL signal

Driver seat control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
12	-	28	-
13	-	29	-
14	-	30	-
15	-	31	-
16	-	32	-

Driver seat control unit D			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	-
3	-	23	-
4	-	24	Seat adjustment switch ground
5	Seat belt buckle switch ground	25	-
6	-	26	-
7	-	27	-
8	-	28	-
9	-	29	-
10	Seat height downward adjustment switch	30	-
11	Seat height upward adjustment switch	31	-
12	-	32	-
13	Seat belt buckle switch	33	Seat cushion angle downward adjustment switch
14	-	34	Seat cushion angle upward adjustment switch
15	-	35	Seatback backward adjustment switch
16	-	36	Seatback forward adjustment switch
17	Seat track forward adjustment switch	37	-
18	Seat track backward adjustment switch	38	-
19	-	39	-
20	-	40	-

Diagnostic Trouble Code (DTC) chart

Driver seat control unit

DTC	Detection Items	See page
B15B017	Battery voltage too high	(See page ZD-2719)
B15B016	Battery voltage too low	(See page ZD-2719)
B15B117	Massage/footwell light/ventilation lumbar support power supply voltage too high	(See page ZD-2719)

DTC	Detection Items	See page
B15B217	Seat motor power supply too high	(See page ZD-2719)
B15B317	Heater power supply voltage too high	(See page ZD-2719)
B15B116	Massage/footwell light/ventilation lumbar support power supply voltage too low	(See page ZD-2719)
B15B216	Seat motor power supply too low	(See page ZD-2719)
B15B316	Heater power supply voltage too low	(See page ZD-2719)
B15B129	Seat track motor Hall signal fault	(See page ZD-2724)
B15B229	Seat height motor Hall signal fault	(See page ZD-2729)
B15B329	Seat angle adjustment motor Hall signal fault	(See page ZD-2733)
B15B429	Seat forward tilt motor ripple signal fault	(See page ZD-2737)
B15B811	Short to ground in forward tilt motor output	(See page ZD-2737)
B15B815	Open in forward tilt motor output	(See page ZD-2737)
B15B511	Short to ground in track motor output	(See page ZD-2742)
B15B515	Open in track motor output	(See page ZD-2742)
B15B611	Short to ground in height motor output	(See page ZD-2745)
B15B615	Open in height motor output	(See page ZD-2745)
B15B711	Short to ground in angle adjustment motor output	(See page ZD-2749)
B15B715	Open in angle motor output	(See page ZD-2749)
B15B907	Seat track forward adjustment switch stuck	(See page ZD-2753)
B15BA07	Seat track backward adjustment switch stuck	(See page ZD-2753)
B15BB07	Seat height upward adjustment switch stuck	(See page ZD-2753)
B15BC07	Seat height downward adjustment switch stuck	(See page ZD-2753)
B15BD07	Seat angle adjustment motor forward adjustment switch stuck	(See page ZD-2753)
B15BE07	Seat angle adjustment motor backward adjustment switch stuck	(See page ZD-2753)
B15BF07	Seat forward tilt motor upward adjustment switch stuck	(See page ZD-2753)
B15C007	Seat forward tilt motor downward adjustment switch stuck	(See page ZD-2753)
B15C411	Short to ground in seat cushion heater output	(See page ZD-2763)
B15C415	Open in seat cushion heater output	(See page ZD-2763)
B15C511	Short to ground in seatback heater output	(See page ZD-2742)
B15C515	Open in seatback heater output	(See page ZD-2742)
B15C611	Short to ground in seat cushion heater sensor	(See page ZD-2771)
B15C615	Open in seat cushion heater sensor	(See page ZD-2771)

DTC	Detection Items	See page
B15C711	Short to ground in seatback heater sensor	(See page ZD-2771)
B15C715	Open in seatback heater sensor	(See page ZD-2771)
B15C815	Seat NTC abnormal	(See page ZD-2771)
U002888	Comfort CAN bus off	(See page ZD-2789)
U014687	PDCM node lost	(See page ZD-2783)
U102388	LIN1 physical bus error	(See page ZD-2776)
U133086	Front left seatback ventilation fan LIN communication error	(See page ZD-2776)
U133186	Front left seat cushion ventilation fan LIN communication error	(See page ZD-2776)
U134086	Front left seat massage air pump LIN communication error	(See page ZD-2776)
U024987	Front left seatback ventilation fan node lost	(See page ZD-2776)
U024A87	Front left seat cushion ventilation fan node lost	(See page ZD-2776)
U025187	Front left seat massage air pump node lost	(See page ZD-2776)
U034086	Front left seat massage air pump fault	(See page ZD-2776)
U035986	Front left seat fan fault	(See page ZD-2776)

ZD

DTC	**B15B017**	**Battery voltage too high**
DTC	**B15B016**	**Battery voltage too low**
DTC	**B15B117**	**Massage/footwell light/ventilation lumbar support power supply voltage too high**
DTC	**B15B217**	**Seat motor power supply too high**
DTC	**B15B317**	**Heater power supply voltage too high**
DTC	**B15B116**	**Massage/footwell light/ventilation lumbar support power supply voltage too low**
DTC	**B15B216**	**Seat motor power supply too low**

DTC	B15B316	Heater power supply voltage too low

Description

When the driver seat control unit, seat motor, heater and massage ventilation input voltage is too high or too low, the driver seat control unit records DTC.

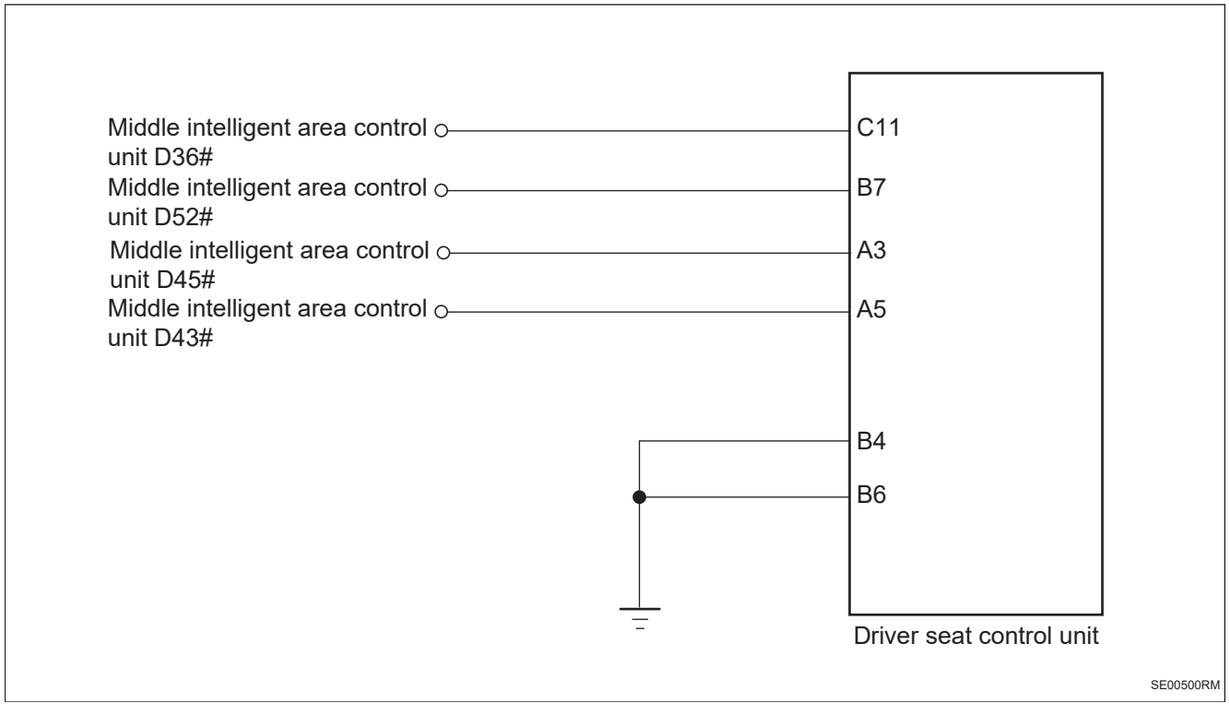
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B017	DSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B016	DSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B117	DSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B217	DSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B317	DSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B116	DSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B216	DSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system
B15B316	DSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Driver seat control unit • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15B017	All seat functions disable	Not come on
B15B016	All seat functions disable	Not come on

DTC No.	Fault symptom	Warning light/indicator
B15B117	All seat functions disable	Not come on
B15B217	All seat functions disable	Not come on
B15B317	All seat functions disable	Not come on
B15B116	All seat functions disable	Not come on
B15B216	All seat functions disable	Not come on
B15B316	All seat functions disable	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

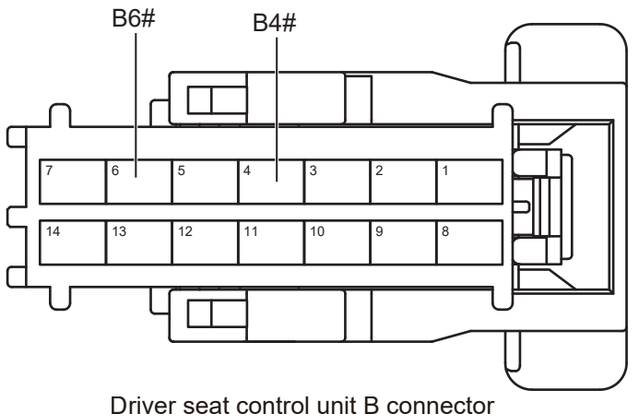
Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check driver seat control unit ground**



Driver seat control unit B connector

SE00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) According to value in the table, measure resistance.

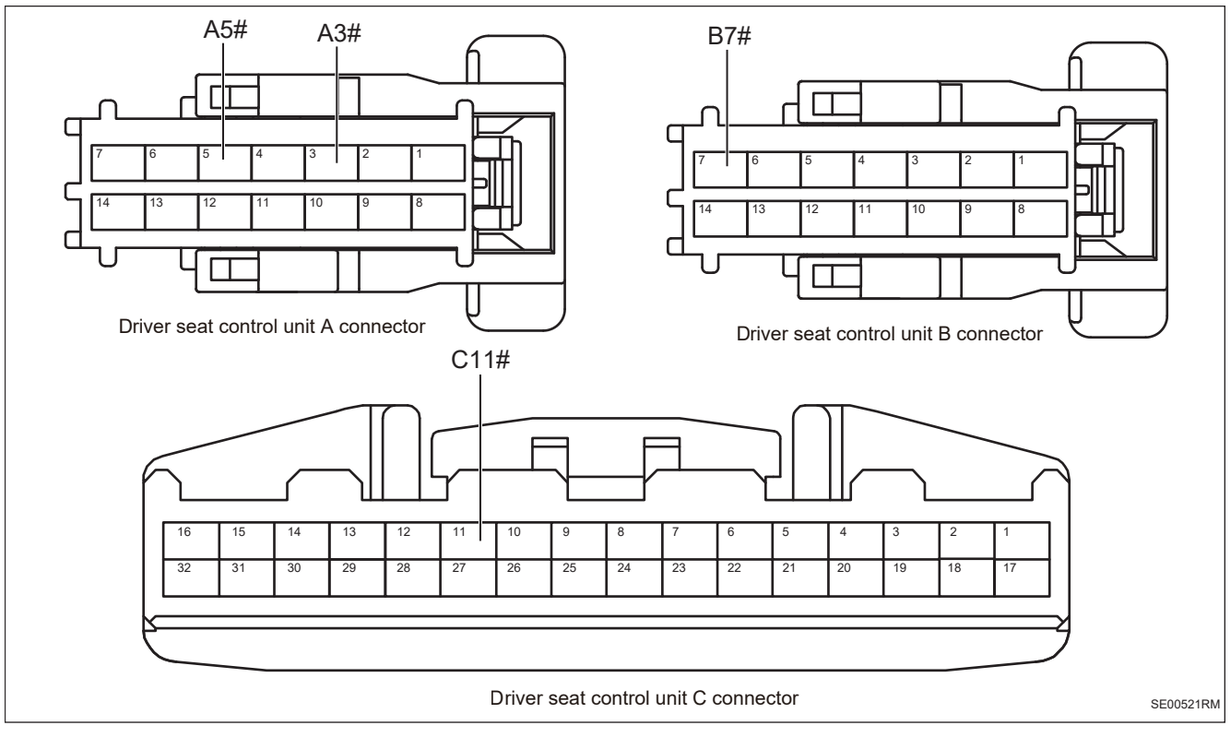
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B4# - body ground	Always connected	Less than 1 Ω
Driver seat control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check driver seat control unit power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A3# - body ground	Ignition switch "ON"	9 V ~ 16 V
Driver seat control unit connector A5# - body ground	Ignition switch "ON"	9 V ~ 16 V
Driver seat control unit connector B7# - body ground	Ignition switch "ON"	9 V ~ 16 V
Driver seat control unit connector C11# - body ground	Ignition switch "ON"	9 V ~ 16 V

ZD

NG

Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)

OK

Replace driver seat control unit (See page NS-67)

DTC	B15B129	Seat track motor Hall signal fault

Description

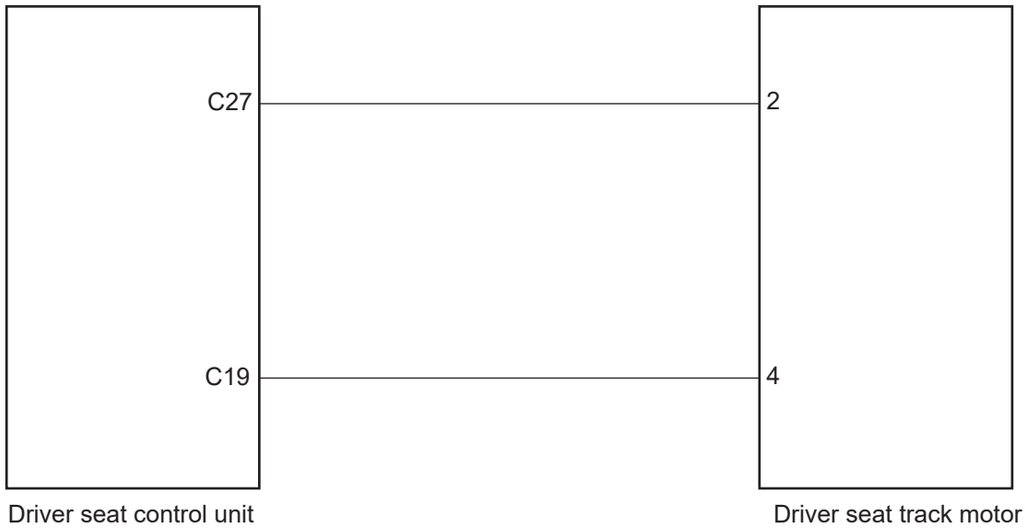
When the driver seat track motor Hall signal is faulty, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B129	KL30 voltage is normal Drive horizontal motor Motor current < 5 A	Hall signal remains in high or low level	300 ms	Periodic type	10 ms	• Driver seat track motor • Wire harness and connector • Driver seat control unit

Fault symptom

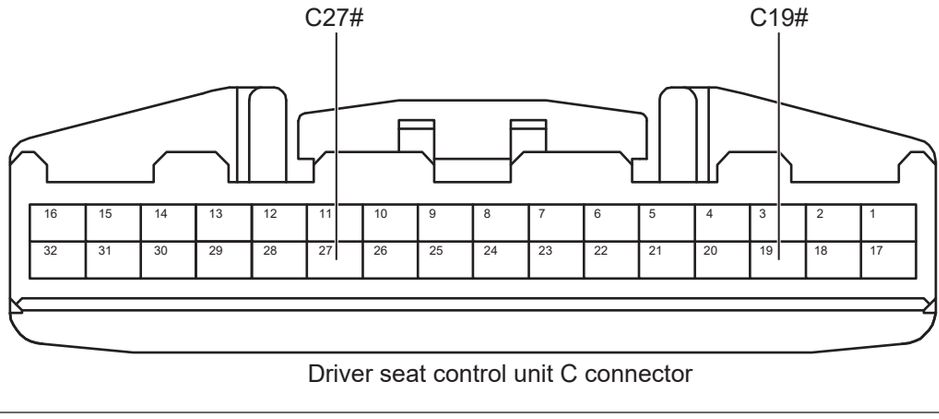
DTC No.	Fault symptom	Warning light/indicator
B15B129	Manual adjustment of horizontal motor is incontinuous	Not come on

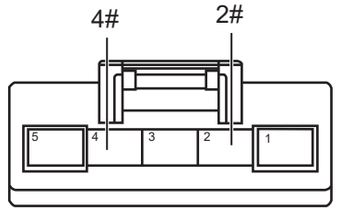
Circuit diagram



Inspection procedure

1	**Check for open in driver seat track motor wire harness and connector**





Driver seat track motor connector

SE00671RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat track motor connector.

(e) According to value in the table, measure resistance.

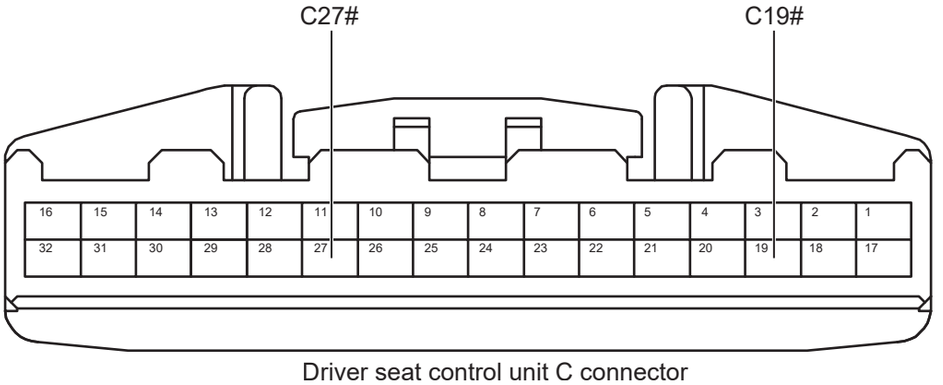
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C27# - driver seat track motor connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector C19# - driver seat track motor connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat track motor wire harness and connector**



Driver seat control unit C connector

SE00661RM

(a) According to value in the table, measure resistance.

Standard value

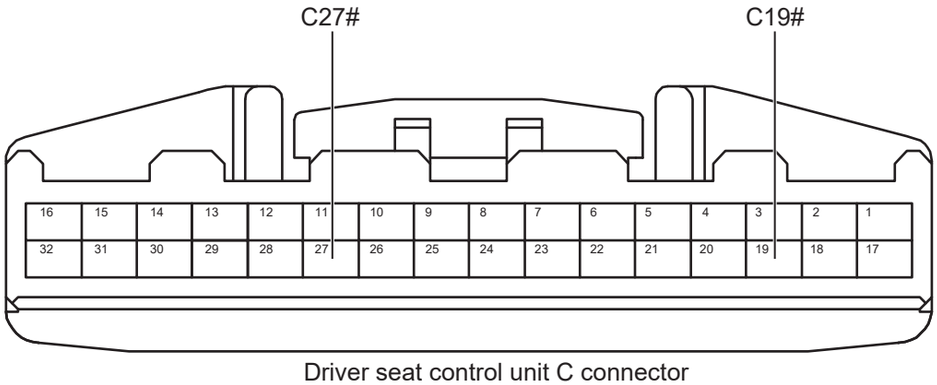
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C27# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in driver seat track motor wire harness and connector**



Driver seat control unit C connector

SE00661RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C27# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector C19# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace driver seat track motor (See page NS-67)**

(a) Replace the driver seat track motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

DTC	B15B229	Seat height motor Hall signal fault

Description

When the driver seat height adjustment motor Hall signal is faulty, the driver seat control unit records DTC.

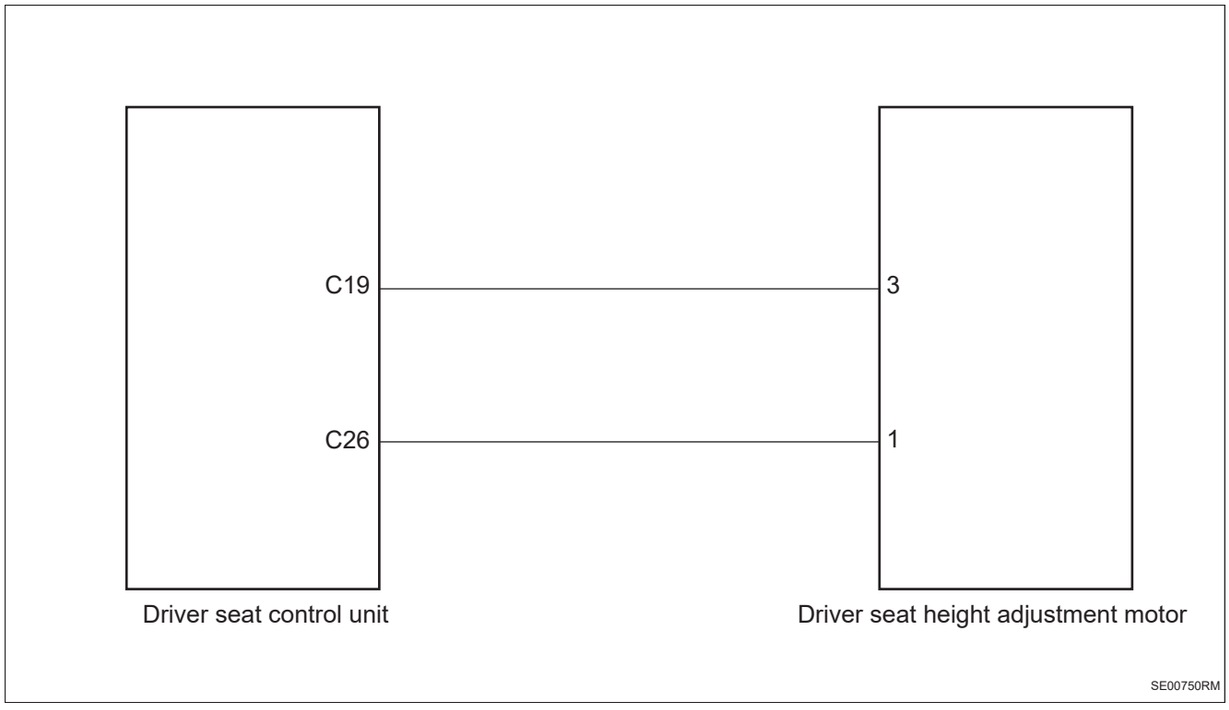
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B229	KL30 voltage is normal Drive height motor Motor current < 5 A	Hall signal remains in high or low level	300 ms	Periodic type	10 ms	• Driver seat height adjustment motor • Wire harness and connector • Driver seat control unit

ZD

Fault symptom

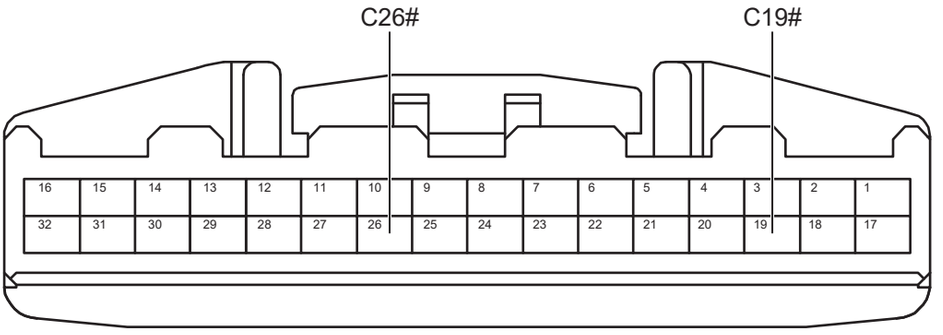
DTC No.	Fault symptom	Warning light
B15B229	Height motor manual adjustment discontinuous	Not come on

Circuit diagram



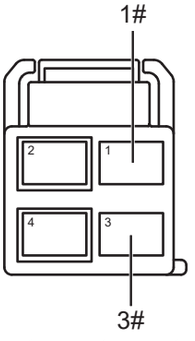
Inspection procedure

1	**Check for open in driver seat height adjustment motor wire harness and connector**



Driver seat control unit C connector

SE00761RM



Driver seat height adjustment motor connector

SE00771RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat height adjustment motor connector.

(e) According to value in the table, measure resistance.

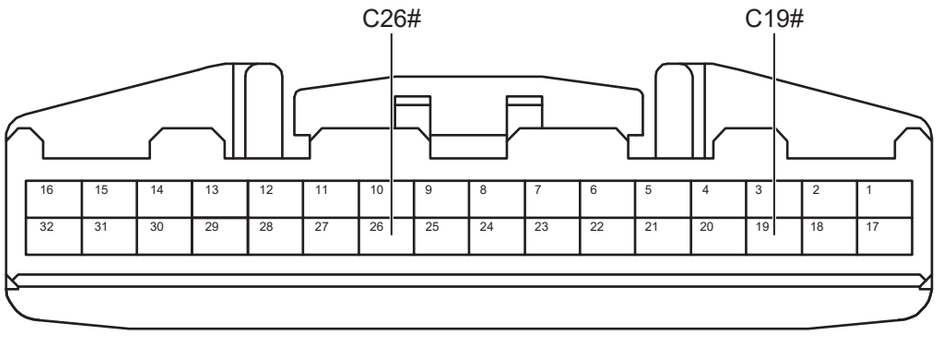
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C26# - driver seat height adjustment motor connector 1#	Always connected	Less than 1 Ω
Driver seat control unit connector C19# - driver seat height adjustment motor connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat height adjustment motor wire harness and connector**



Driver seat control unit C connector

SE00761RM

(a) According to value in the table, measure resistance.

Standard value

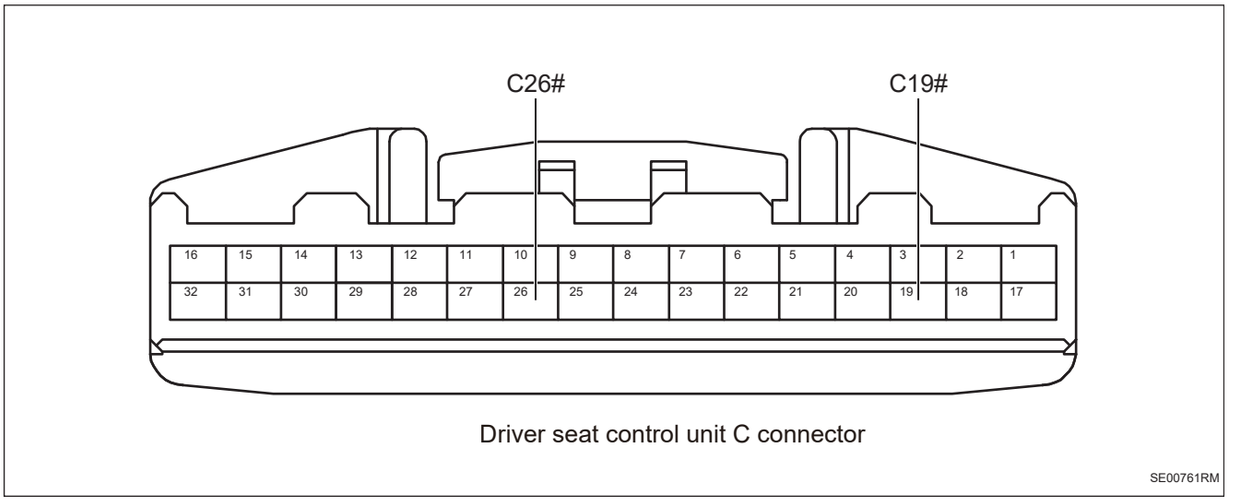
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C26# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in driver seat height adjustment motor wire harness and connector**



ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C26# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector C19# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver seat height adjustment motor (See page NS-67)**

(a) Replace the driver seat height adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

ZD

DTC	**B15B329**	**Seat angle adjustment motor Hall signal fault**
DTC	**B15B429**	**Seat forward tilt motor ripple signal fault**

Description

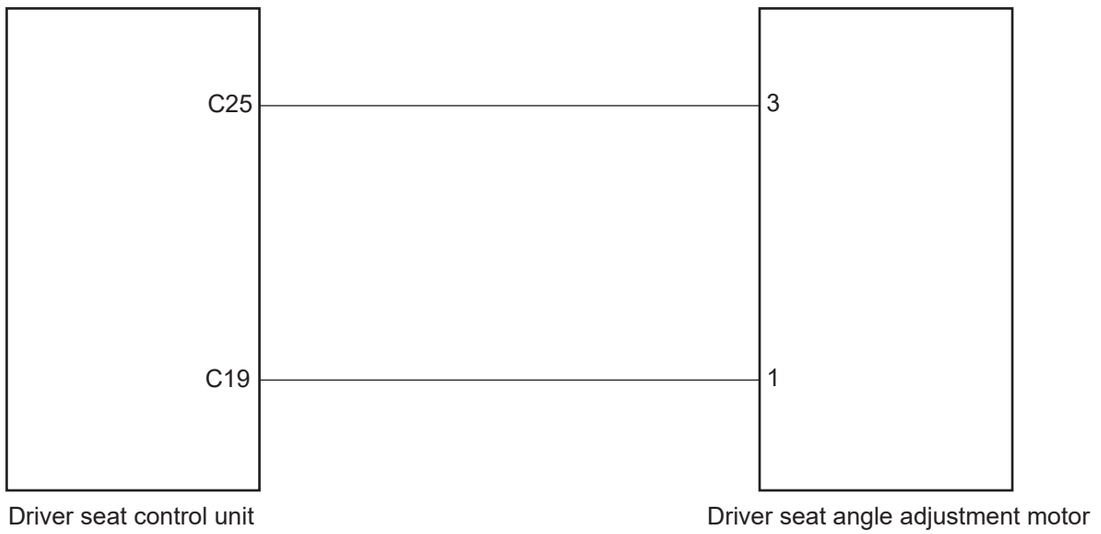
When the driver seat angle adjustment motor Hall signal is faulty, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B329	KL30 voltage is normal Drive seatback motor Motor current < 5 A	Hall signal remains in high or low level	300 ms	Periodic type	10 ms	• Driver seat angle adjustment motor • Wire harness and connector • Driver seat control unit
B15B429	KL30 voltage is normal Drive seat cushion motor Motor current < 5 A	The ripple voltage remains at 2.5 V	300 ms	Periodic type	10 ms	• Driver seat angle adjustment motor • Wire harness and connector • Driver seat control unit

Fault symptom

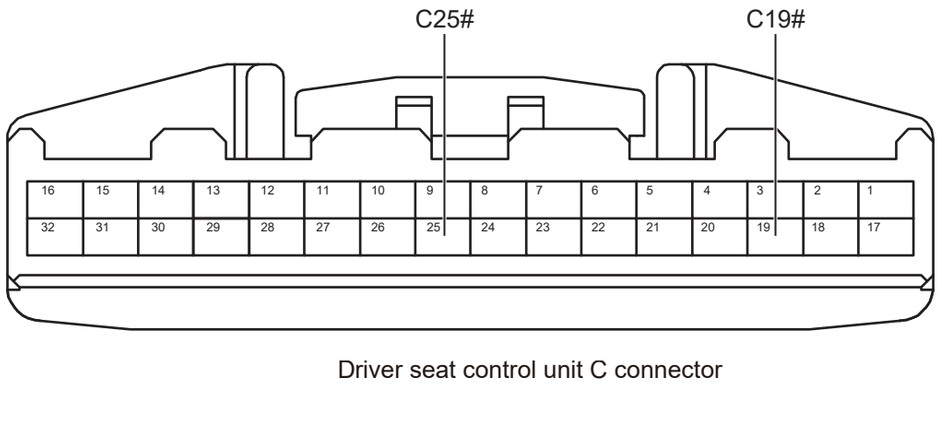
DTC No.	Fault symptom	Warning light
B15B329	Manual adjustment of seatback motor is incontinuous	Not come on
B15B429	Manual adjustment of seat cushion motor is not continuous	Not come on

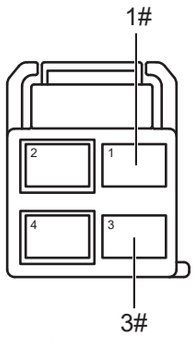
Circuit diagram



Inspection procedure

1	**Check for open in driver seat angle adjustment motor wire harness and connector**





Driver seat angle adjustment motor connector

SE00871RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat angle adjustment motor connector.

(e) According to value in the table, measure resistance.

Standard value

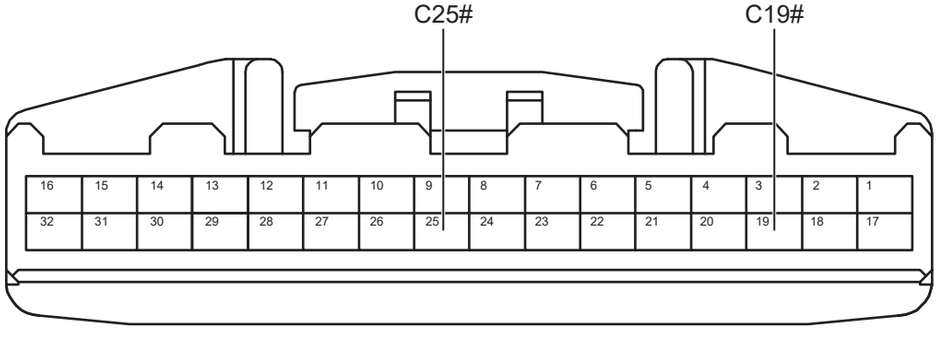
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C25# - driver seat angle adjustment motor connector 3#	Always connected	Less than 1 Ω
Driver seat control unit connector C19# - driver seat angle adjustment motor connector 1#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat angle adjustment motor wire harness and connector**



Driver seat control unit C connector

SE00861RM

(a) According to value in the table, measure resistance.

Standard value

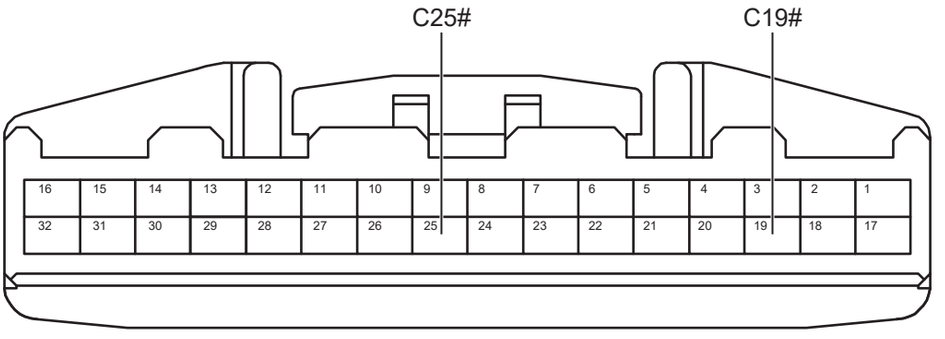
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C25# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C19# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in driver seat angle adjustment motor wire harness and connector**



Driver seat control unit C connector

SE00861RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C25# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector C19# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace driver seat angle adjustment motor (See page NS-67)**

(a) Replace the driver seat angle adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

DTC	B15B811	Short to ground in forward tilt motor output

DTC	B15B815	Open in forward tilt motor output

Description

When driver seat forward tilt motor output is short or open, the driver seat control unit records DTC.

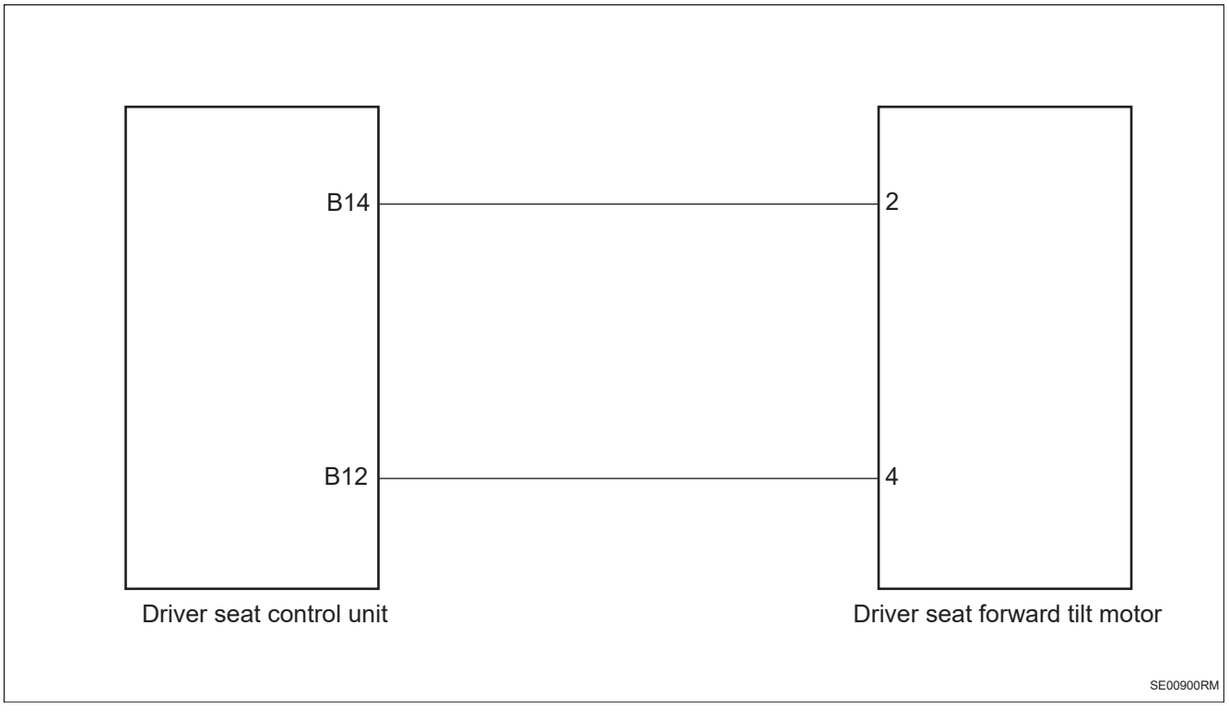
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B811	KL30 voltage is normal Drive seat cushion motor	Motor current > 20 A	0.5 s	Periodic type	10 ms	• Driver seat forward tilt motor • Wire harness and connector • Driver seat control unit
B15B815	KL30 voltage is normal Drive seat cushion motor	Motor current < 1 A	2 s	Periodic type	10 ms	• Driver seat forward tilt motor • Wire harness and connector • Driver seat control unit

ZD

Fault symptom

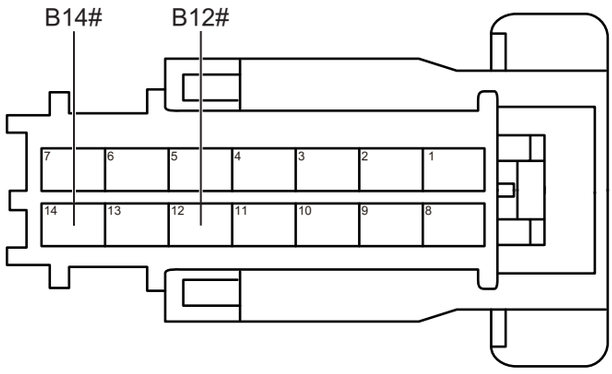
DTC No.	Fault symptom	Warning light
B15B811	Manual adjustment of seat cushion motor is not continuous	Not come on
B15B815	Manual adjustment of seat cushion motor is not continuous	Not come on

Circuit diagram



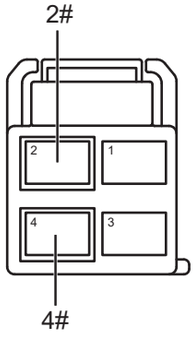
Inspection procedure

1	**Check for open in driver seat forward tilt motor wire harness and connector**



Driver seat control unit B connector

SE00911RM



Driver seat forward tilt motor connector

SE00920RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat forward tilt motor connector.

(e) According to value in the table, measure resistance.

Standard value

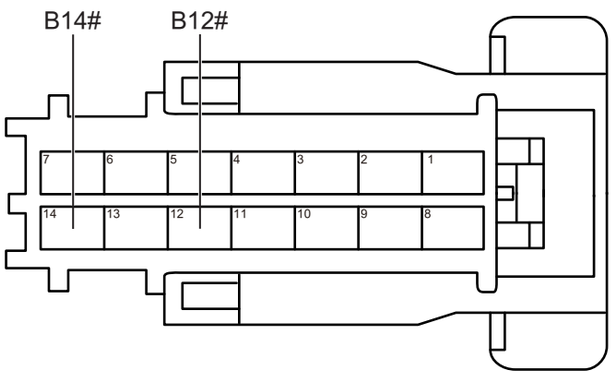
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B14# - driver seat forward tilt motor connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector B12# - driver seat forward tilt motor connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to ground in driver seat forward tilt motor wire harness and connector**



Driver seat control unit B connector

SE00911RM

(a) According to value in the table, measure resistance.

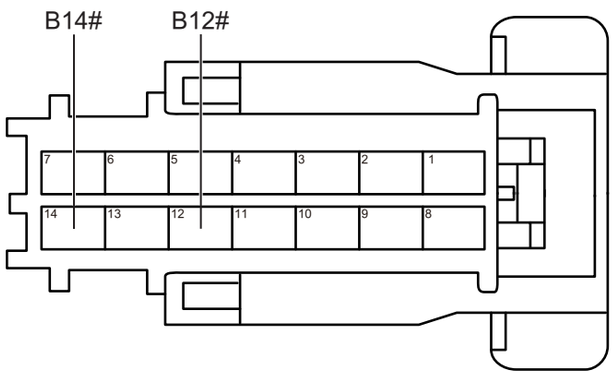
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B14# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector B12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in driver seat forward tilt motor wire harness and connector**



Driver seat control unit B connector

SE00911RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B14# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector B12# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver seat forward tilt motor (See page NS-67)**

(a) Replace the driver seat forward tilt motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

OK

ZD

Diagnosis ends

DTC	**B15B511**	**Short to ground in track motor output**
DTC	**B15B515**	**Open in track motor output**

Description

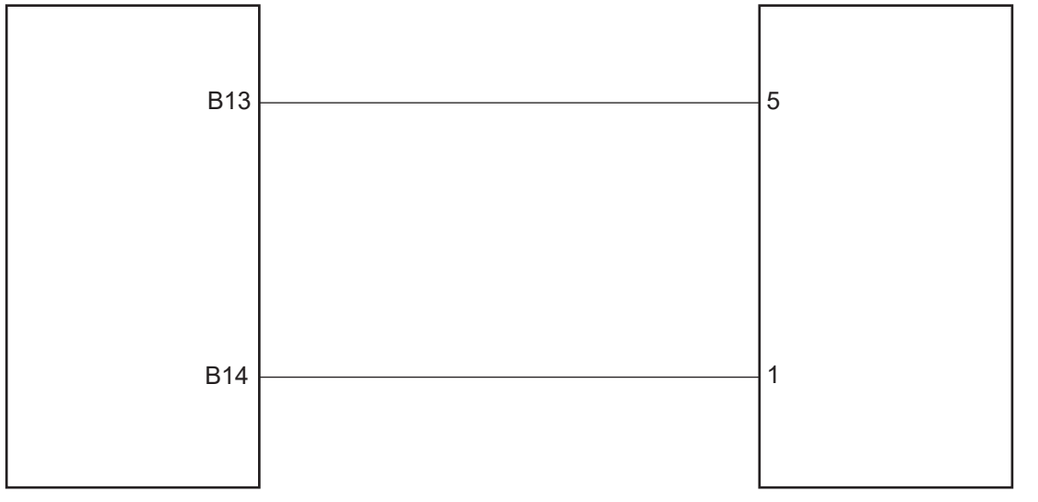
When driver seat track motor output is short or open, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B511	KL30 voltage is normal Drive horizontal motor	Motor current > 20 A	0.5 s	Periodic type	10 ms	• Driver seat track motor • Wire harness and connector • Driver seat control unit
B15B515	KL30 voltage is normal Drive horizontal motor	Motor current < 1 A	2 s	Periodic type	10 ms	• Driver seat track motor • Wire harness and connector • Driver seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light
B15B511	Manual adjustment of horizontal motor is incontinuous	Not come on
B15B515	Manual adjustment of horizontal motor is incontinuous	Not come on

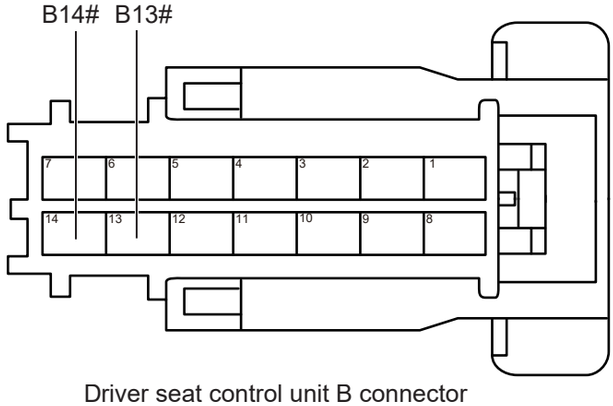
Circuit diagram



SE00600RM

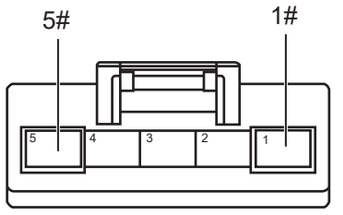
Inspection procedure

1	**Check for open in driver seat track motor wire harness and connector**



Driver seat control unit B connector

SE00610RM



Driver seat track motor connector

SE00620RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat track motor connector.

(e) According to value in the table, measure resistance.

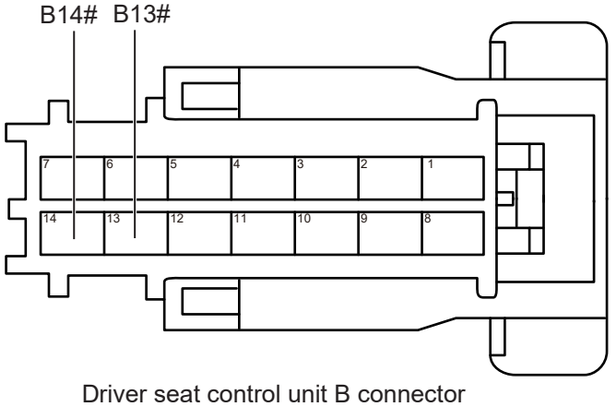
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B13# - driver seat track motor connector 5#	Always connected	Less than 1 Ω
Driver seat control unit connector B14# - driver seat track motor connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat track motor wire harness and connector**



Driver seat control unit B connector

SE00610RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B13# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector B14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Replace driver seat track motor (See page NS-67)**

(a) Replace the driver seat track motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

DTC	B15B611	Short to ground in height motor output

DTC	B15B615	Open in height motor output

Description

When driver seat height adjustment motor output is short or open, the driver seat control unit records DTC.

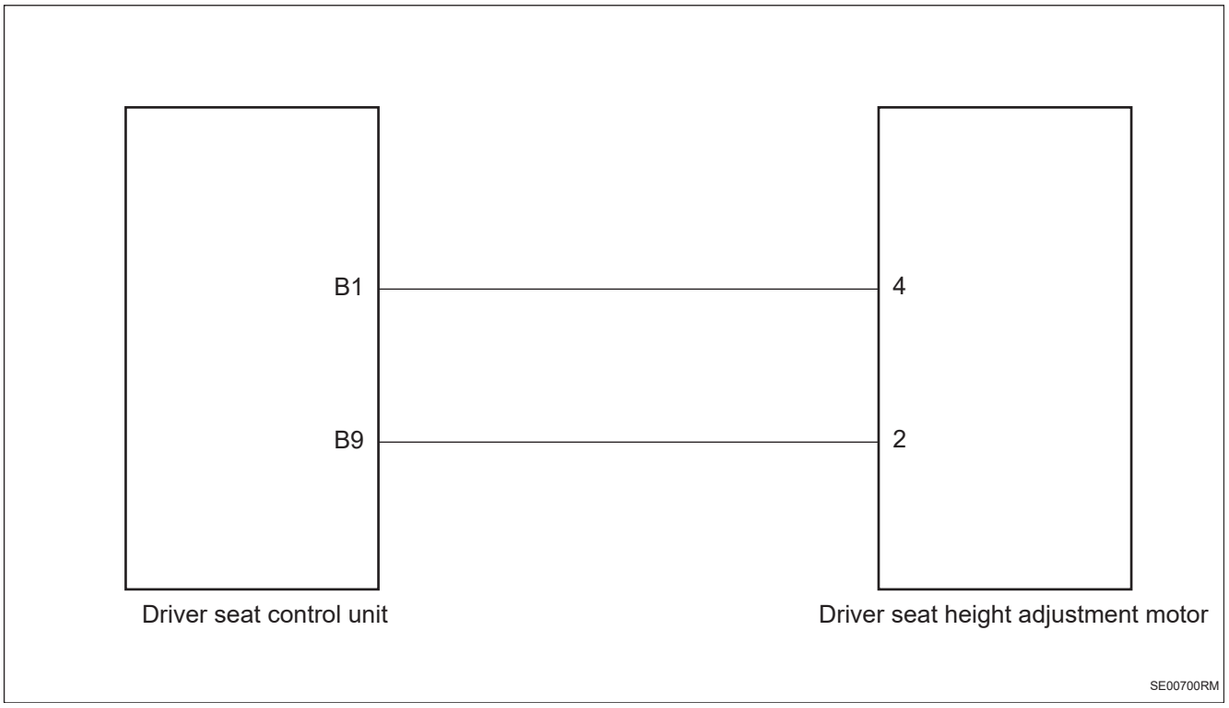
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B611	KL30 voltage is normal Drive height motor	Motor current > 20 A	0.5 s	Periodic type	10 ms	• Driver seat height adjustment motor • Wire harness and connector • Driver seat control unit
B15B615	KL30 voltage is normal Drive height motor	Motor current < 1 A	2 s	Periodic type	10 ms	• Driver seat height adjustment motor • Wire harness and connector • Driver seat control unit

ZD

Fault symptom

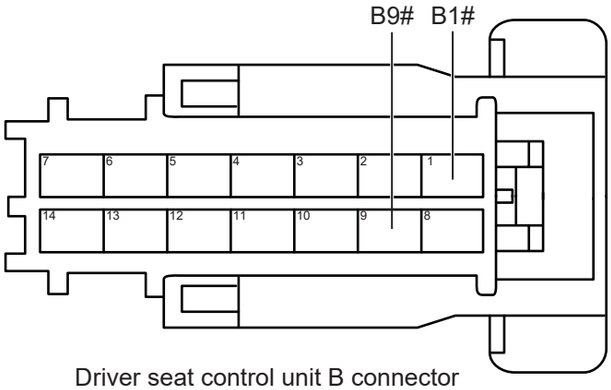
DTC No.	Fault symptom	Warning light
B15B611	Height motor manual adjustment discontinuous	Not come on
B15B615	Height motor manual adjustment discontinuous	Not come on

Circuit diagram



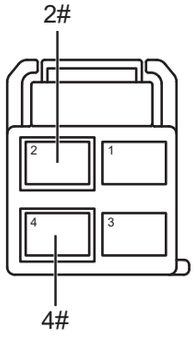
Inspection procedure

1	**Check for open in driver seat height adjustment motor wire harness and connector**



Driver seat control unit B connector

SE00711RM



Driver seat height adjustment motor connector

SE00720RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat height adjustment motor connector.

(e) According to value in the table, measure resistance.

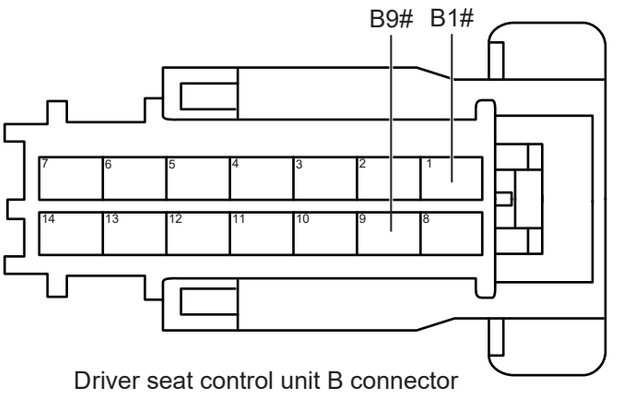
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B1# - driver seat height adjustment motor connector 4#	Always connected	Less than 1 Ω
Driver seat control unit connector B9# - driver seat height adjustment motor connector 2#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

ZD

2	**Check for short to ground in driver seat height adjustment motor wire harness and connector**



Driver seat control unit B connector

SE00711RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B1# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector B9# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace driver seat height adjustment motor (See page NS-67)**

(a) Replace the driver seat height adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

DTC	**B15B711**	**Short to ground in angle adjustment motor output**
DTC	**B15B715**	**Open in angle motor output**

Description

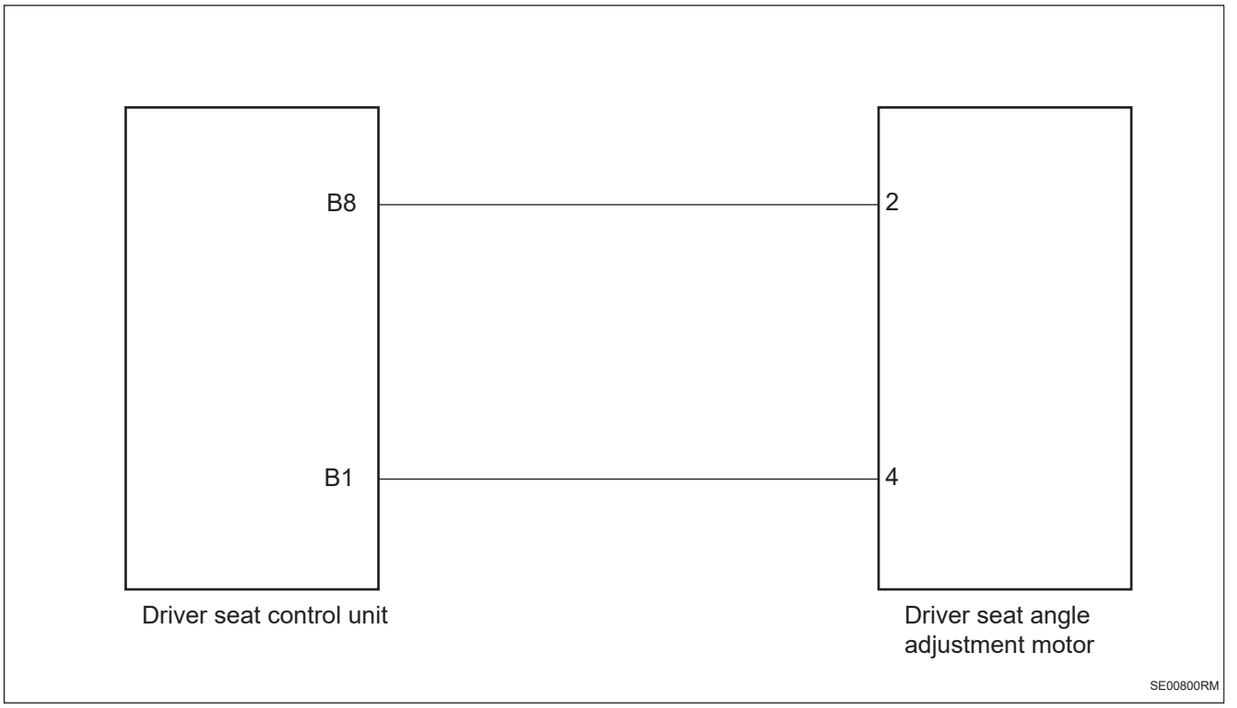
When driver seat angle adjustment motor output is short or open, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B711	KL30 voltage is normal Drive seatback motor	Motor current > 20 A	0.5 s	Periodic type	10 ms	• Driver seat angle adjustment motor • Wire harness and connector • Driver seat control unit
B15B715	KL30 voltage is normal Drive seatback motor	Motor current < 1 A	2 s	Periodic type	10 ms	• Driver seat angle adjustment motor • Wire harness and connector • Driver seat control unit

Fault symptom

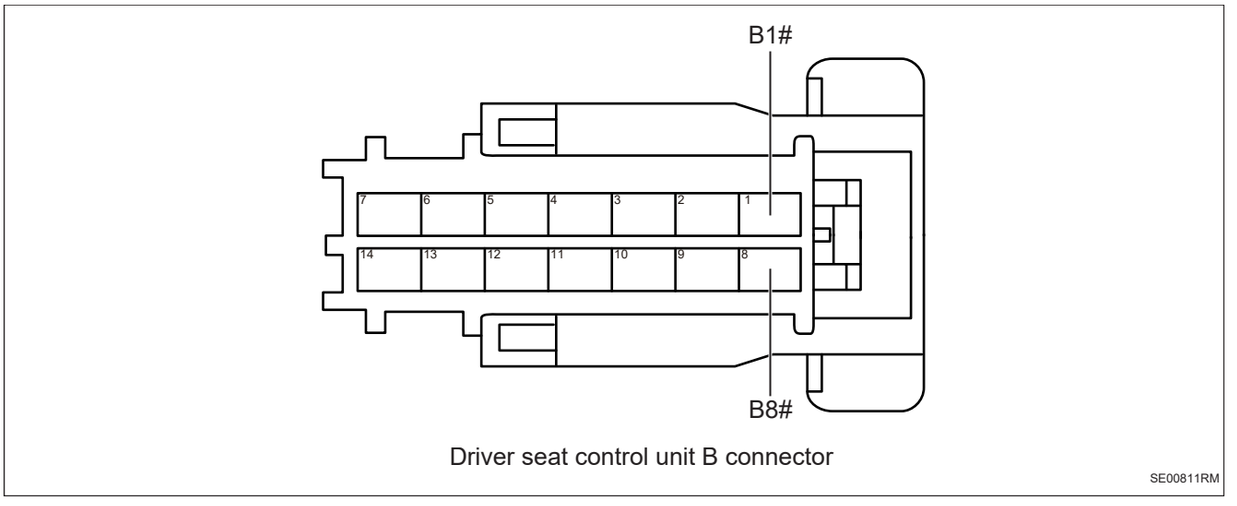
DTC No.	Fault symptom	Warning light
B15B711	Manual adjustment of seatback motor is incontinuous	Not come on
B15B715	Manual adjustment of seatback motor is incontinuous	Not come on

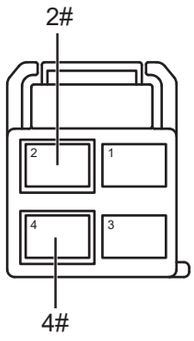
Circuit diagram



Inspection procedure

1	**Check for open in driver seat angle adjustment motor wire harness and connector**





Driver seat angle adjustment motor connector

SE00820RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat angle adjustment motor connector.

(e) According to value in the table, measure resistance.

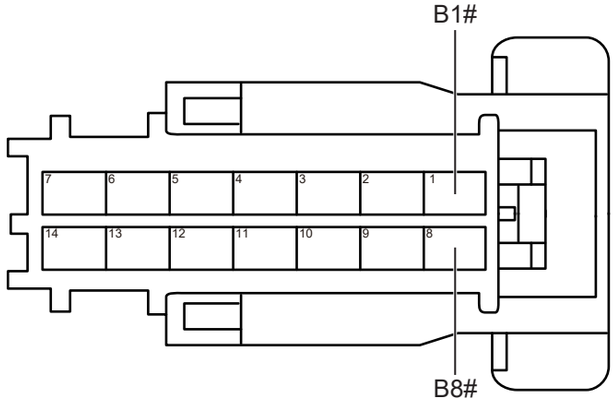
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B1# - driver seat angle adjustment motor connector 4#	Always connected	Less than 1 Ω
Driver seat control unit connector B8# - driver seat angle adjustment motor connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat angle adjustment motor wire harness and connector**



Driver seat control unit B connector

SE00811RM

(a) According to value in the table, measure resistance.

Standard value

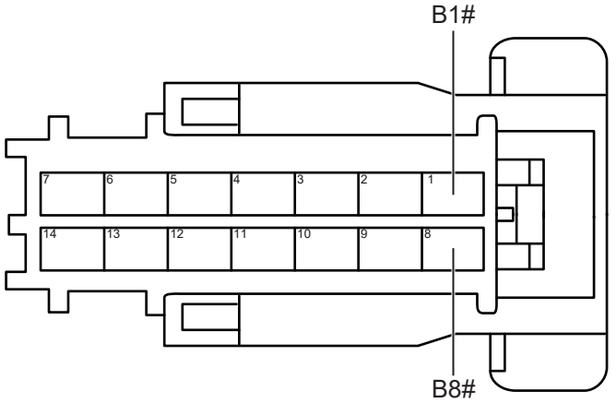
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B1# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector B8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in driver seat angle adjustment motor wire harness and connector**



Driver seat control unit B connector

SE00811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector B1# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector B8# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace driver seat angle adjustment motor (See page NS-67)**

(a) Replace the driver seat angle adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

DTC	B15B907	Seat track forward adjustment switch stuck
DTC	B15BA07	Seat track backward adjustment switch stuck

DTC	**B15BB07**	**Seat height upward adjustment switch stuck**
DTC	**B15BC07**	**Seat height downward adjustment switch stuck**
DTC	**B15BD07**	**Seat angle adjustment motor forward adjustment switch stuck**
DTC	**B15BE07**	**Seat angle adjustment motor backward adjustment switch stuck**
DTC	**B15BF07**	**Seat forward tilt motor upward adjustment switch stuck**
DTC	**B15C007**	**Seat forward tilt motor downward adjustment switch stuck**

Description

When the driver seat adjustment switch (low current) is stuck, the driver seat control unit records DTC.

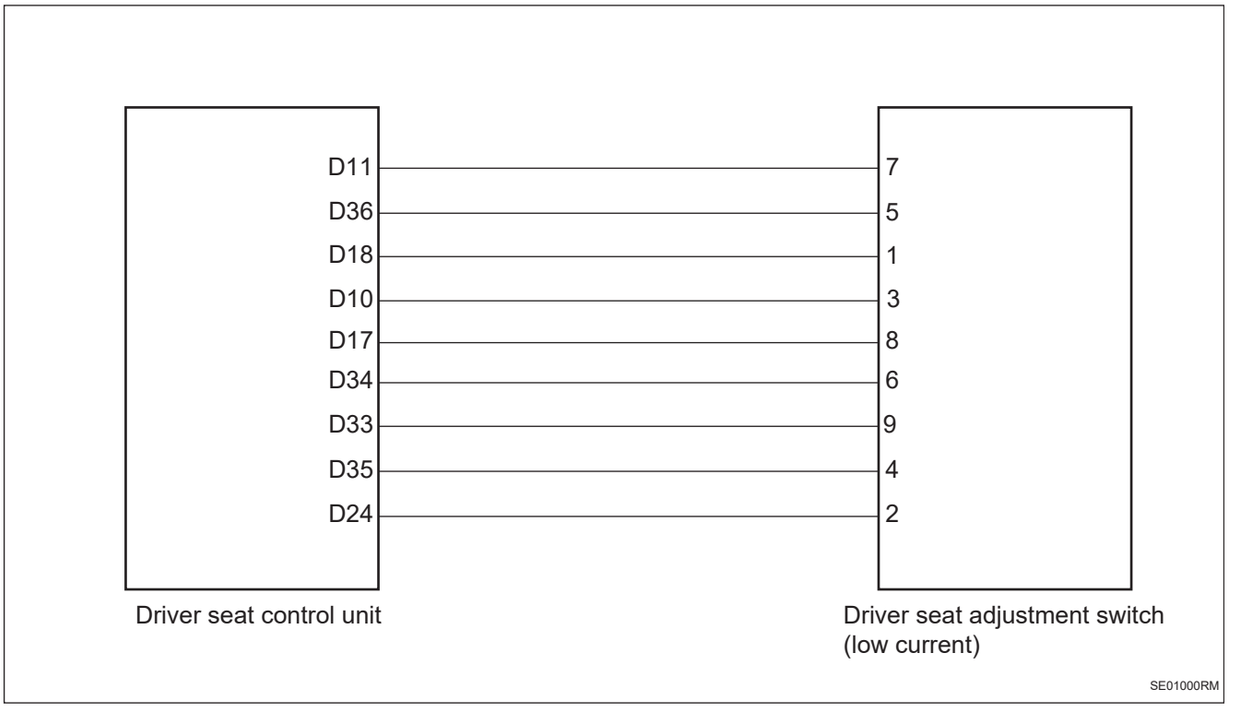
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15B907	KL30 voltage is normal DSCU wake-up	1.8 V < switch voltage < 3.0 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15BA07	KL30 voltage is normal DSCU wake-up	3.0 V < switch voltage < 4.2 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15BB07	KL30 voltage is normal DSCU wake-up	1.8 V < switch voltage < 3.0 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15BC07	KL30 voltage is normal DSCU wake-up	3.0 V < switch voltage < 4.2 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15BD07	KL30 voltage is normal DSCU wake-up	1.8 V < switch voltage < 3.0 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15BE07	KL30 voltage is normal DSCU wake-up	3.0 V < switch voltage < 4.2 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15BF07	KL30 voltage is normal DSCU wake-up	1.8 V < switch voltage < 3.0 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit
B15C007	KL30 voltage is normal DSCU wake-up	3.0 V < switch voltage < 4.2 V	30 s	Periodic type	10 ms	• Driver seat adjustment switch (low current) • Wire harness and connector • Driver seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light
B15B907	Unable to adjust horizontal motor manually	Not come on
B15BA07	Unable to adjust horizontal motor manually	Not come on
B15BB07	The height adjustment motor cannot be adjusted manually	Not come on
B15BC07	The height adjustment motor cannot be adjusted manually	Not come on
B15BD07	Unable to adjust seatback motor manually	Not come on
B15BE07	Unable to adjust seatback motor manually	Not come on
B15BF07	Seat cushion motor cannot be adjusted manually	Not come on
B15C007	Seat cushion motor cannot be adjusted manually	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Check driver seat adjustment switch (low current)**

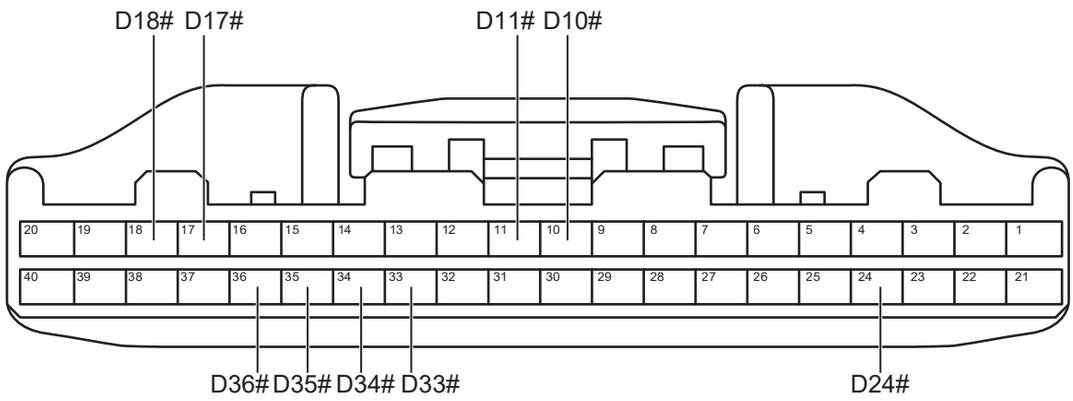
(a) Check for foreign matters in driver seat adjustment switch (low current).

(b) Adjust driver seat adjustment switch (low current) and check for sticking.

NG → **Perform repair according to malfunction**

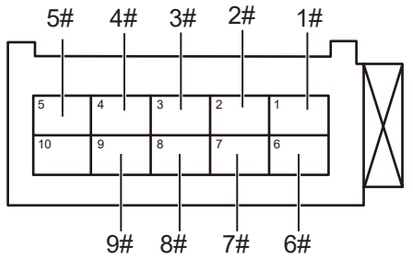
OK

2	**Check for open in driver seat adjustment switch (low current) wire harness and connector**



Driver seat control unit D connector

SE01010RM



Driver seat adjustment switch (low current) connector

SE01020RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Disconnect the driver seat adjustment switch (low current) connector.

(e) According to value in the table, measure resistance.

Standard value

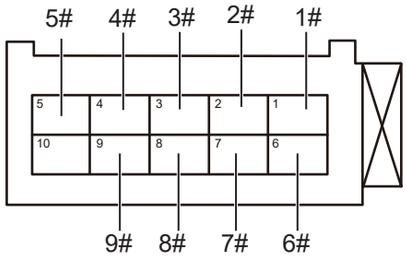
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector D11# - driver seat adjustment switch (low current) connector 7#	Always connected	Less than 1 Ω
Driver seat control unit connector D36# - driver seat adjustment switch (low current) connector 8#	Always connected	Less than 1 Ω
Driver seat control unit connector D18# - driver seat adjustment switch (low current) connector 1#	Always connected	Less than 1 Ω
Driver seat control unit connector D10# - driver seat adjustment switch (low current) connector 3#	Always connected	Less than 1 Ω
Driver seat control unit connector D17# - driver seat adjustment switch (low current) connector 8#	Always connected	Less than 1 Ω
Driver seat control unit connector D34# - driver seat adjustment switch (low current) connector 6#	Always connected	Less than 1 Ω
Driver seat control unit connector D33# - driver seat adjustment switch (low current) connector 9#	Always connected	Less than 1 Ω
Driver seat control unit connector D35# - driver seat adjustment switch (low current) connector 4#	Always connected	Less than 1 Ω
Driver seat control unit connector D24# - driver seat adjustment switch (low current) connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK →

ZD

3	**Check for short to ground in driver seat adjustment switch (low current) wire harness and connector**



Driver seat adjustment switch (low current) connector

SE01020RM

(a) According to value in the table, measure resistance.

Standard value

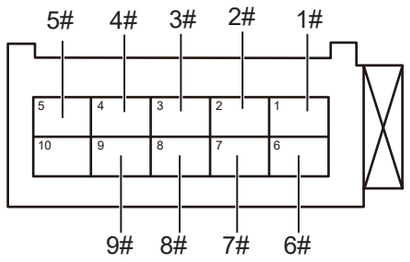
Multimeter connection	Detection condition	Specified condition
Driver seat adjustment switch (low current) connector 1# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 2# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 3# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 4# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 5# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 6# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 7# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 8# - body ground	Always connected	10 KΩ or more
Driver seat adjustment switch (low current) connector 9# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in driver seat adjustment switch (low current) wire harness and connector**



Driver seat adjustment switch (low current) connector

SE01020RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

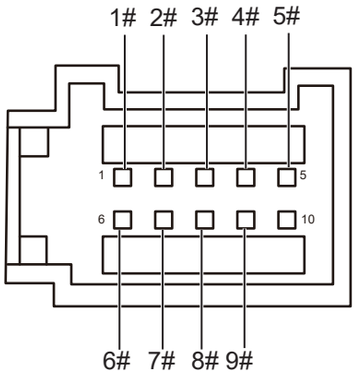
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat adjustment switch (low current) connector 1# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 2# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 3# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 4# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 5# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 6# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 7# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 8# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat adjustment switch (low current) connector 9# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check driver seat adjustment switch (low current)**



Driver seat adjustment switch (low current)

SE01030RM

(a) Adjust the driver seat adjustment switch (low current) to the corresponding position.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat adjustment switch (low current) 8# - driver seat adjustment switch (low current) 2#	The switch is in forward adjustment position	Less than 1 Ω
Driver seat adjustment switch (low current) 8# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 1# - driver seat adjustment switch (low current) 2#	The switch is in backward adjustment position	Less than 1 Ω
Driver seat adjustment switch (low current) 1# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 5# - driver seat adjustment switch (low current) 2#	The switch is in seatback forward adjustment position	Less than 1 Ω
Driver seat adjustment switch (low current) 5# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 4# - driver seat adjustment switch (low current) 2#	The switch is in seatback backward adjustment position	Less than 1 Ω

Multimeter connection	Detecti-on conditi-on	Specifi-ed conditi-on
Driver seat adjustment switch (low current) 4# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 6# - driver seat adjustment switch (low current) 2#	The switch is in angle upward adjustm-ent position	Less than 1 Ω
Driver seat adjustment switch (low current) 6# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 9# - driver seat adjustment switch (low current) 2#	The switch is in angle downwa-rd adjustm-ent position	Less than 1 Ω
Driver seat adjustment switch (low current) 9# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 7# - driver seat adjustment switch (low current) 2#	The switch is in upward adjustm-ent position	Less than 1 Ω
Driver seat adjustment switch (low current) 7# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more
Driver seat adjustment switch (low current) 3# - driver seat adjustment switch (low current) 2#	The switch is in downwa-rd adjustm-ent position	Less than 1 Ω
Driver seat adjustment switch (low current) 3# - driver seat adjustment switch (low current) 2#	The switch is in original position	10 KΩ or more

NG → **Replace driver seat adjustment switch (low current) (See page NS-67)**

OK

Replace driver seat control unit (See page NS-67)

DTC	**B15C411**	**Short to ground in seat cushion heater output**
DTC	**B15C415**	**Open in seat cushion heater output**

Description

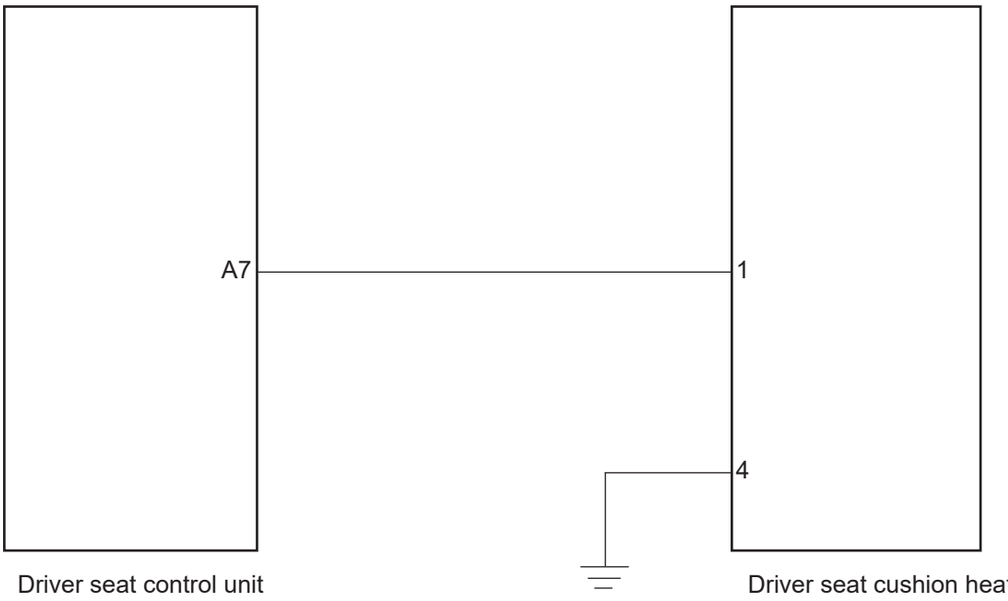
When driver seat cushion heater is short to ground or open, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15C411	KL30 voltage is normal Power supply is ON Heating is in output status	Short to ground in seat cushion heater output (sampling voltage > 4.0 V)	200 ms	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit
B15C415	KL30 voltage is normal Power supply is ON Heating is in output status	Open in seat cushion heater output (sampling voltage < 0.2 V)	2 s	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light
B15C411	Heating function failure	Not come on
B15C415	Heating function failure	Not come on

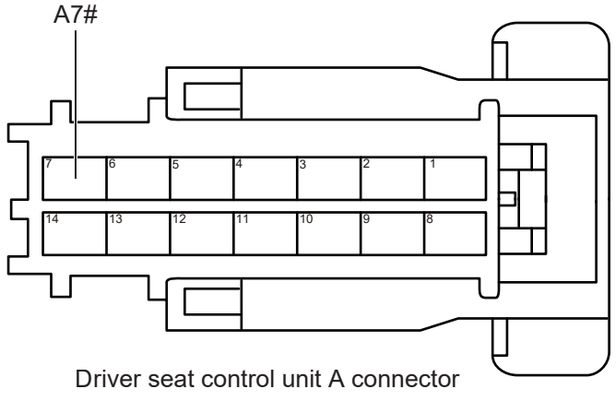
Circuit diagram



SE01200RM

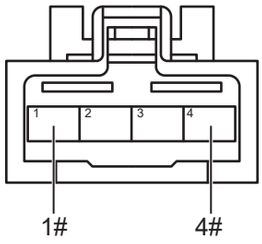
Inspection procedure

1	**Check for open in driver seat cushion heater wire harness and connector**



Driver seat control unit A connector

SE01210RM



Driver seat cushion heater connector

SE01220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat cushion heater connector.

(d) Disconnect the driver seat control unit connector.

(e) According to value in the table, measure resistance.

Standard value

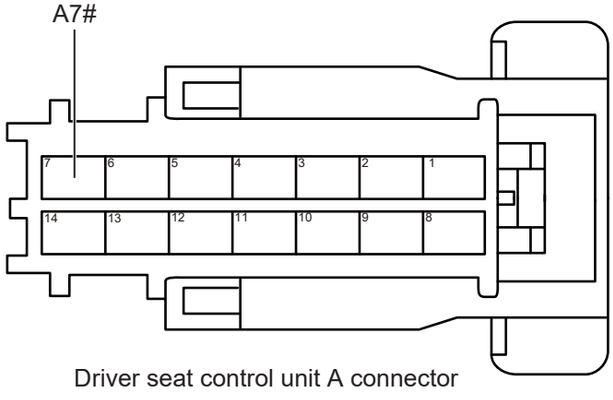
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A7# - driver seat cushion heater connector 1#	Always connected	Less than 1 Ω
Driver seat cushion heater connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat cushion heater wire harness and connector**



Driver seat control unit A connector

SE01210RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Replace driver seat cushion heater (See page NS-67)**

(a) Replace the driver seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

OK

Diagnosis ends

DTC	B15C511	Short to ground in seatback heater output
DTC	B15C515	Open in seatback heater output

Description

When driver seatback heater is short to ground or open, the driver seat control unit records DTC.

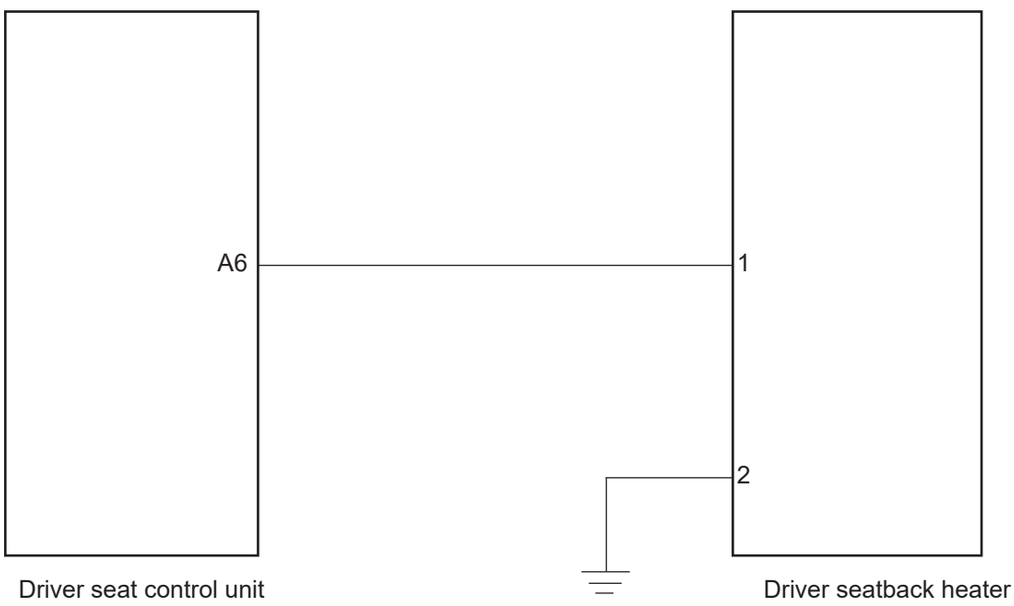
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15C511	KL30 voltage is normal Power supply is ON Heating is in output status	Short to ground in seatback heater output (sampling voltage > 4.0 V)	200 ms	Event-based	10 ms	• Driver seatback heater • Wire harness and connector • Driver seat control unit
B15C515	KL30 voltage is normal Power supply is ON Heating is in output status	Open in seatback heater output (sampling voltage < 0.2 V)	2 s	Event-based	10 ms	• Driver seatback heater • Wire harness and connector • Driver seat control unit

ZD

Fault symptom

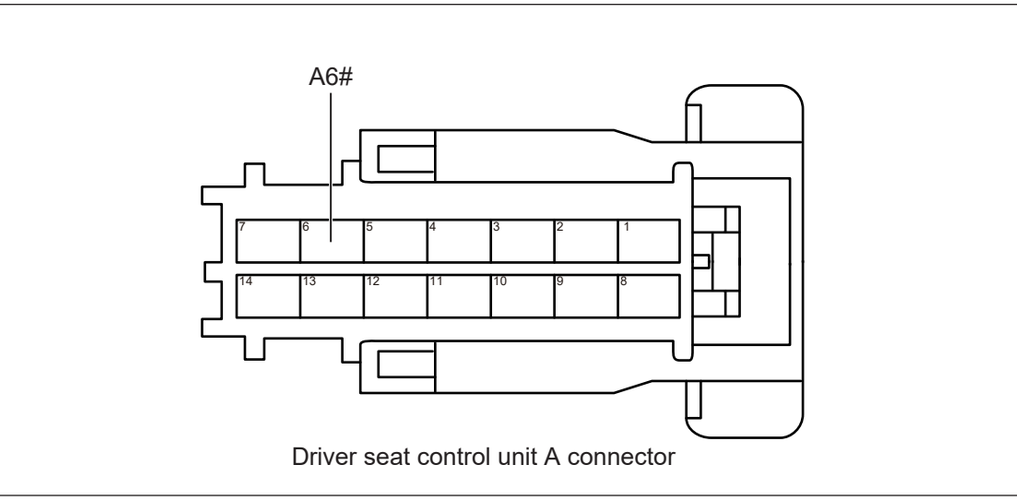
DTC No.	Fault symptom	Warning light
B15C511	Heating function failure	Not come on
B15C515	Heating function failure	Not come on

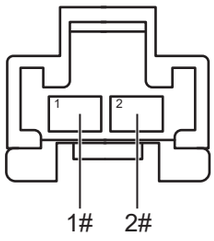
Circuit diagram



Inspection procedure

1	**Check for open in driver seatback heater wire harness and connector**





Driver seatback heater connector
SE01320RM

(a) Turn ignition switch to "OFF".
(b) Disconnect the negative battery terminal.
(c) Disconnect the driver seatback heater connector.
(d) Disconnect the driver seat control unit connector.
(e) According to value in the table, measure resistance.

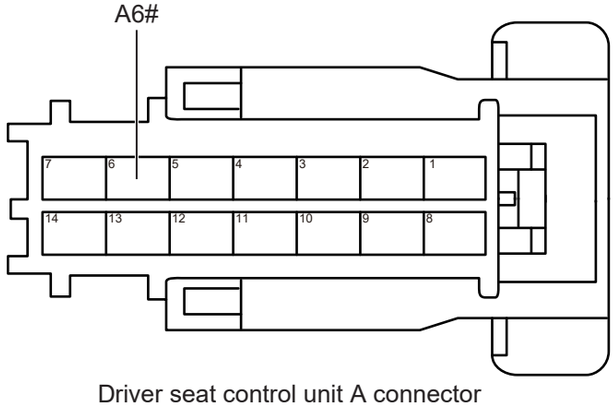
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A6# - driver seatback heater connector 1#	Always connected	Less than 1 Ω
Driver seatback heater connector 2# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seatback heater wire harness and connector**



Driver seat control unit A connector
SE01311RM

(a) According to value in the table, measure resistance.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Replace driver seatback heater (See page NS-67)**

(a) Replace the driver seatback heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

OK

Diagnosis ends

DTC	**B15C611**	**Short to ground in seat cushion heater sensor**
DTC	**B15C615**	**Open in seat cushion heater sensor**
DTC	**B15C711**	**Short to ground in seatback heater sensor**
DTC	**B15C715**	**Open in seatback heater sensor**
DTC	**B15C815**	**Seat NTC abnormal**

Description

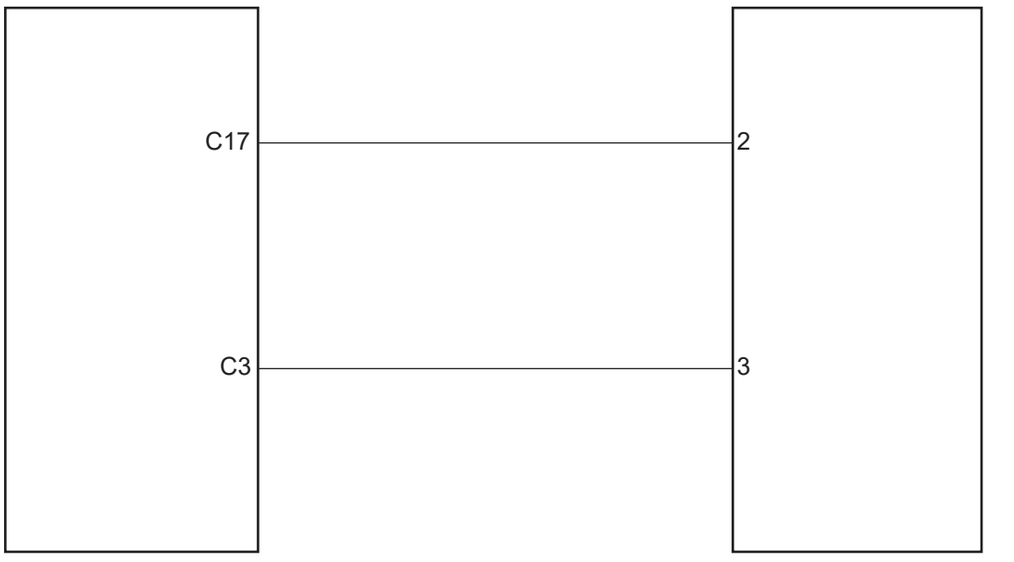
When driver seat cushion heater is short to ground or open, the driver seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15C611	KL30 voltage is normal DSCU wake-up	Short to ground in seat cushion NTC (sampling voltage < 0.1 V)	2 s	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit
B15C615	KL30 voltage is normal DSCU wake-up	Short to ground in seat cushion NTC (sampling voltage > 4.9 V)	2 s	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit
B15C711	KL30 voltage is normal DSCU wake-up	Short to ground in seatback NTC (sampling voltage < 0.1 V)	2 s	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit
B15C715	KL30 voltage is normal DSCU wake-up	Short to ground in seatback NTC (sampling voltage > 4.9 V)	2 s	Event-based	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit
B15C815	Voltage is between 9 V and 16 V NTC is normal	The full-speed heating does not reach the NTC impact temperature within the detection time (TBD) or controlled temperature does not reach the NTC set temperature within the detection time (TBD)	2000 ms	Periodic type	10 ms	• Driver seat cushion heater • Wire harness and connector • Driver seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light
B15C611	Heating function failure	Not come on
B15C615	Heating function failure	Not come on
B15C711	Heating function failure	Not come on
B15C715	Heating function failure	Not come on
B15C815	Heating function failure	Not come on

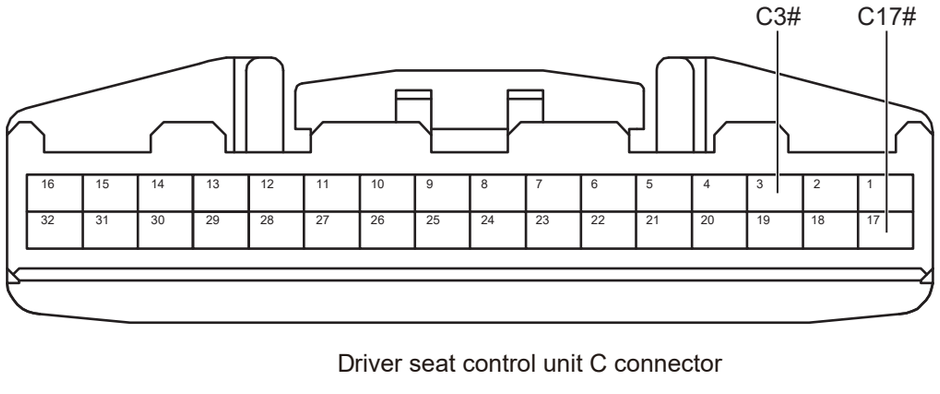
Circuit diagram



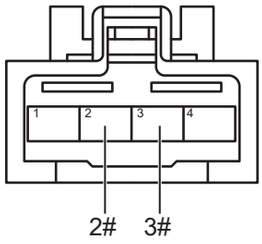
SE01250RM

Inspection procedure

1	**Check for open in driver seat cushion heater wire harness and connector**



SE01261RM



Driver seat cushion heater connector

SE01271RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat cushion heater connector.

(d) Disconnect the driver seat control unit connector.

(e) According to value in the table, measure resistance.

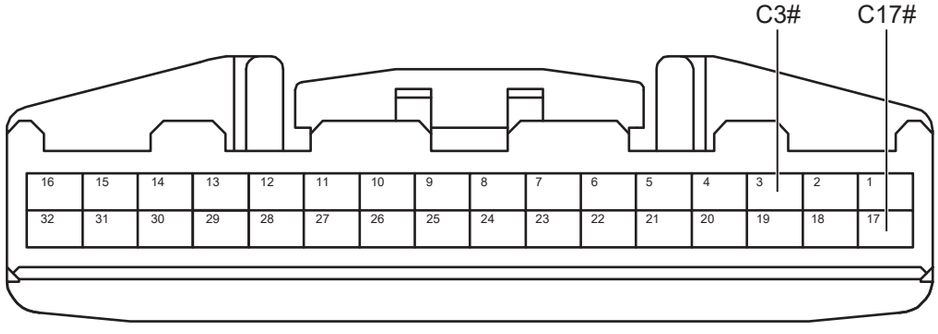
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C17# - driver seat cushion heater connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector C3# - driver seat cushion heater connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in driver seat cushion heater wire harness and connector**



Driver seat control unit C connector

SE01261RM

(a) According to value in the table, measure resistance.

ZD

Standard value

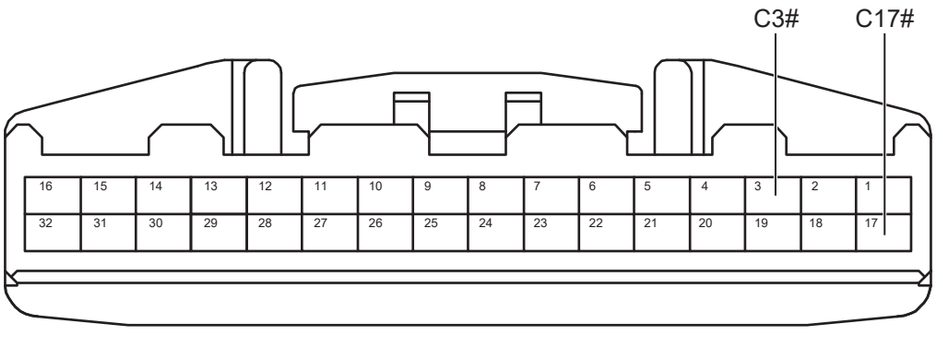
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C17# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check for short to power supply in driver seat cushion heater wire harness and connector**



Driver seat control unit C connector

SE01261RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C17# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector C3# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver seat cushion heater (See page NS-67)**

(a) Replace the driver seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

OK

Diagnosis ends

DTC	**U102388**	**LIN1 physical bus error**
DTC	**U133086**	**Front left seatback ventilation fan LIN communication error**
DTC	**U133186**	**Front left seat cushion ventilation fan LIN communication error**
DTC	**U134086**	**Front left seat massage air pump LIN communication error**
DTC	**U024987**	**Front left seatback ventilation fan node lost**
DTC	**U024A87**	**Front left seat cushion ventilation fan node lost**
DTC	**U025187**	**Front left seat massage air pump node lost**
DTC	**U034086**	**Front left seat massage air pump fault**
DTC	**U035986**	**Front left seat fan fault**

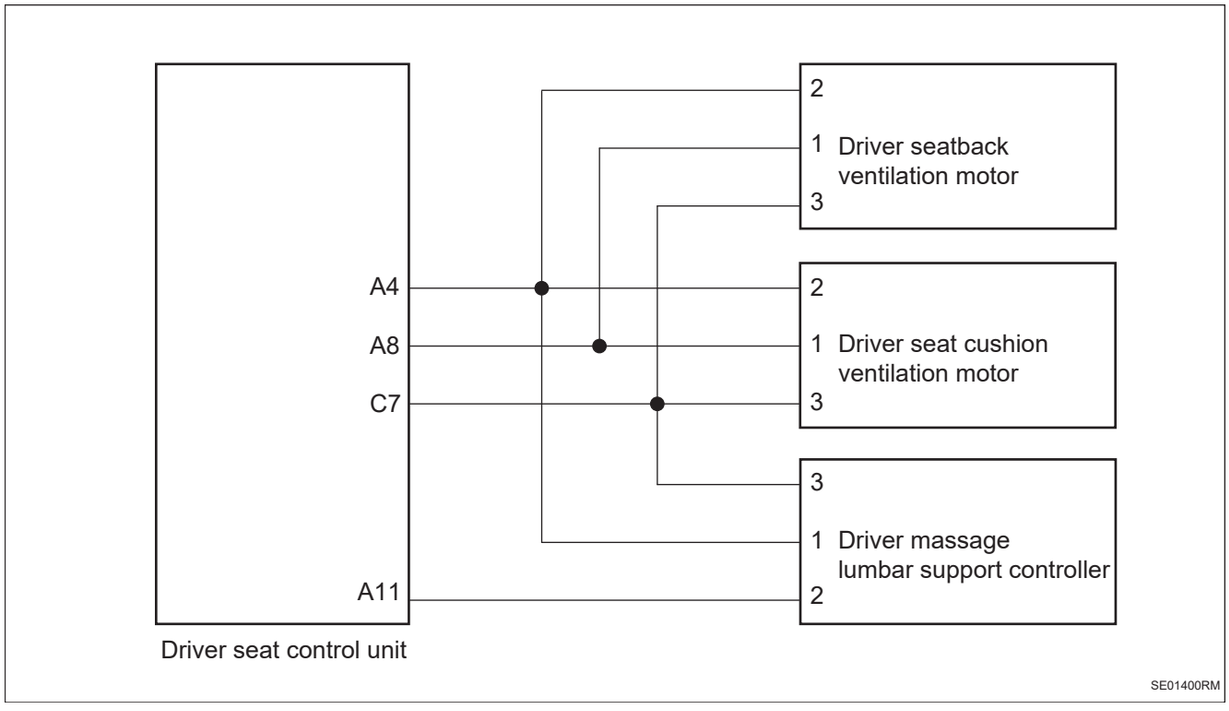
Description

When communication of driver seat ventilation motor, massage lumbar support controller is abnormal or interrupted, the driver seat control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U102388	(a) LIN bus error.	• Driver massage lumbar support controller • Driver seatback ventilation motor • Driver seat cushion ventilation motor • Wire harness and connector • Driver seat control unit
U133086	(a) Front left seatback ventilation fan LIN communication error.	• Driver seatback ventilation motor • Wire harness and connector • Driver seat control unit
U133186	(a) Front left seat cushion ventilation fan LIN communication error.	• Driver seat cushion ventilation motor • Wire harness and connector • Driver seat control unit
U134086	(a) Front left seat massage air pump LIN communication error.	• Driver massage lumbar support controller • Wire harness and connector • Driver seat control unit
U024987	(a) Front left seatback ventilation fan node lost.	• Driver seatback ventilation motor • Wire harness and connector • Driver seat control unit
U024A87	(a) Front left seat cushion ventilation fan node lost.	• Driver seat cushion ventilation motor • Wire harness and connector

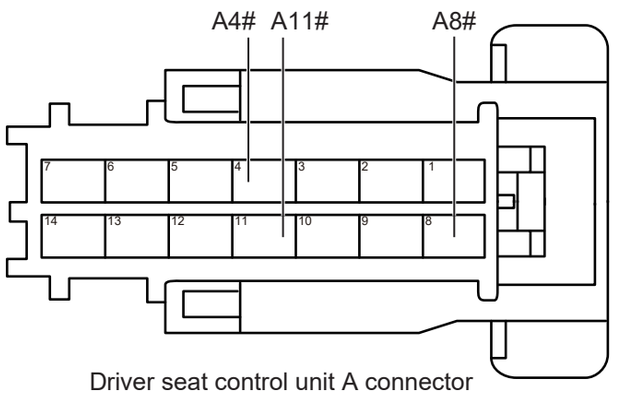
DTC No.	DTC detection condition	Faulty area
		• Driver seat control unit
U025187	(a) Front left seat massage air pump node lost.	• Driver massage lumbar support controller • Wire harness and connector • Driver seat control unit
U034086	(a) Front left seat massage air pump fault.	• Driver massage lumbar support controller • Wire harness and connector • Driver seat control unit
U035986	(a) Front left seat fan fault.	• Driver seat cushion ventilation motor • Driver seatback ventilation motor • Wire harness and connector • Driver seat control unit

Circuit diagram

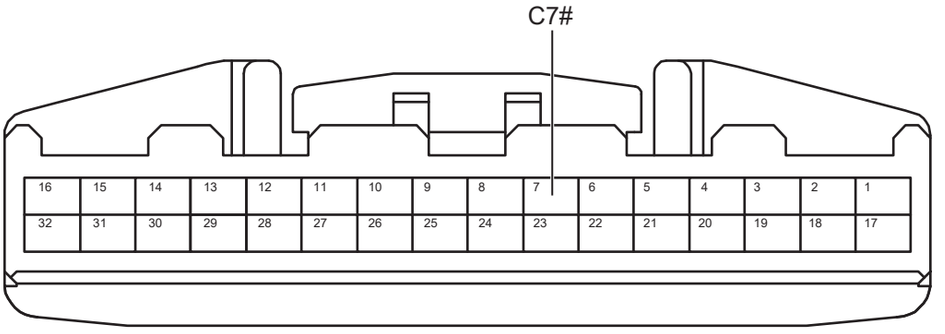


Inspection procedure

1	**Check for open in driver seat ventilation and massage motor wire harness and connector**



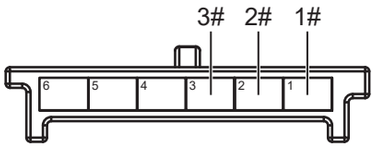
Driver seat control unit A connector



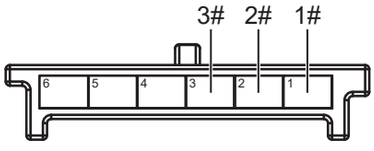
Driver seat control unit C connector

SE01411RM

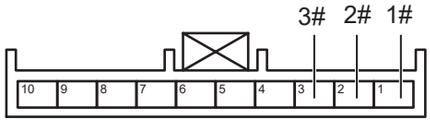
ZD



Driver seatback ventilation motor connector



Driver seat cushion ventilation motor connector



Driver massage lumbar support controller connector

SE01420RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver massage lumbar support controller connector.

(d) Disconnect the driver seat cushion ventilation motor connector.

(e) Disconnect the driver seatback ventilation motor connector.

(f) Disconnect the driver seat control unit connector.

(g) According to value in the table, measure resistance.

Standard value

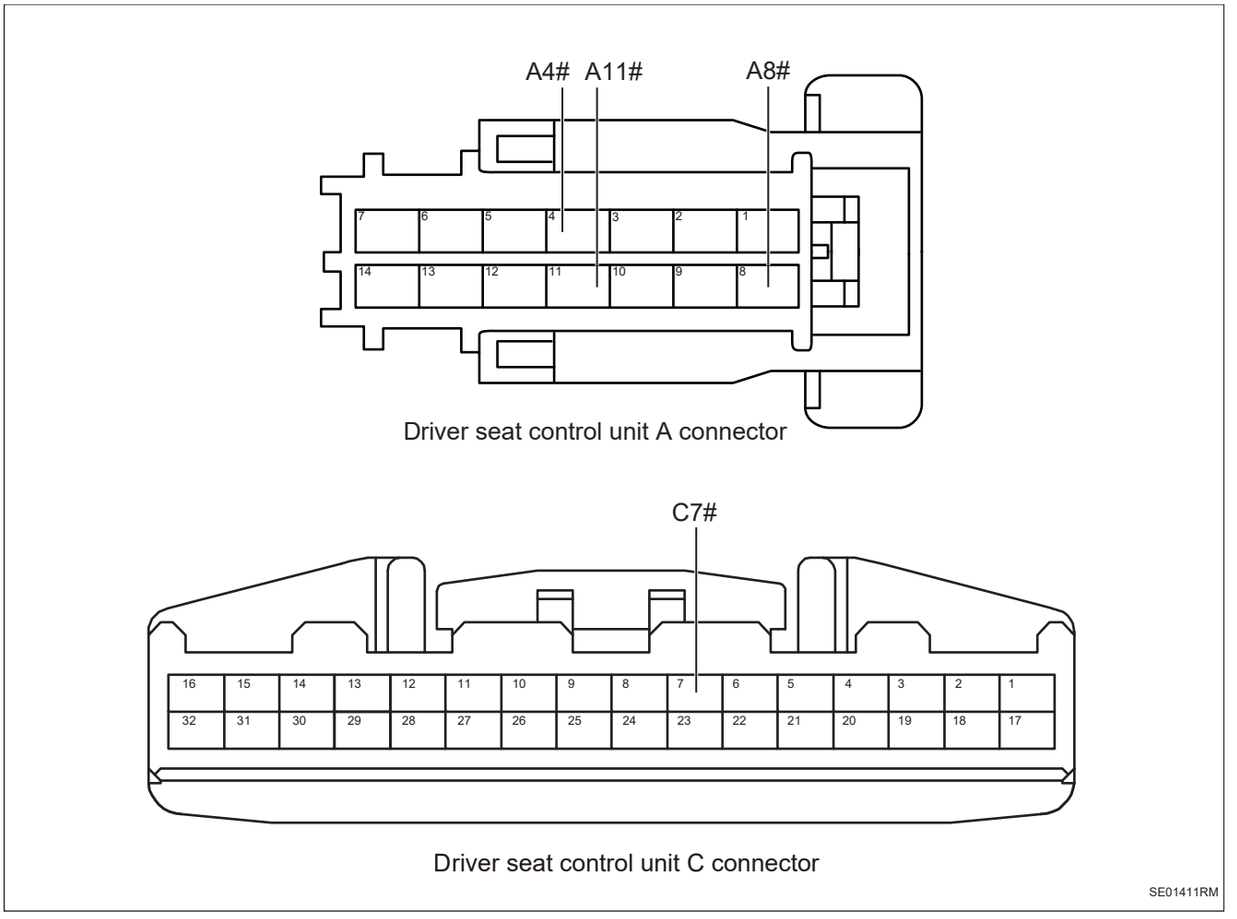
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A4# - driver seatback ventilation motor connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector A8# - driver seatback ventilation motor connector 1#	Always connected	Less than 1 Ω
Driver seat control unit connector C7# - driver seatback ventilation motor connector 3#	Always connected	Less than 1 Ω
Driver seat control unit connector A4# - driver seat cushion ventilation motor connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector A8# - driver seat cushion ventilation motor connector 1#	Always connected	Less than 1 Ω
Driver seat control unit connector C7# - driver seat cushion ventilation motor connector 3#	Always connected	Less than 1 Ω
Driver seat control unit connector A4# - driver massage lumbar support controller connector 1#	Always connected	Less than 1 Ω
Driver seat control unit connector A11# - driver massage lumbar support controller connector 2#	Always connected	Less than 1 Ω
Driver seat control unit connector C7# - driver massage lumbar support controller connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to ground in driver seat ventilation and massage motor wire harness and connector**



(a) According to value in the table, measure resistance.

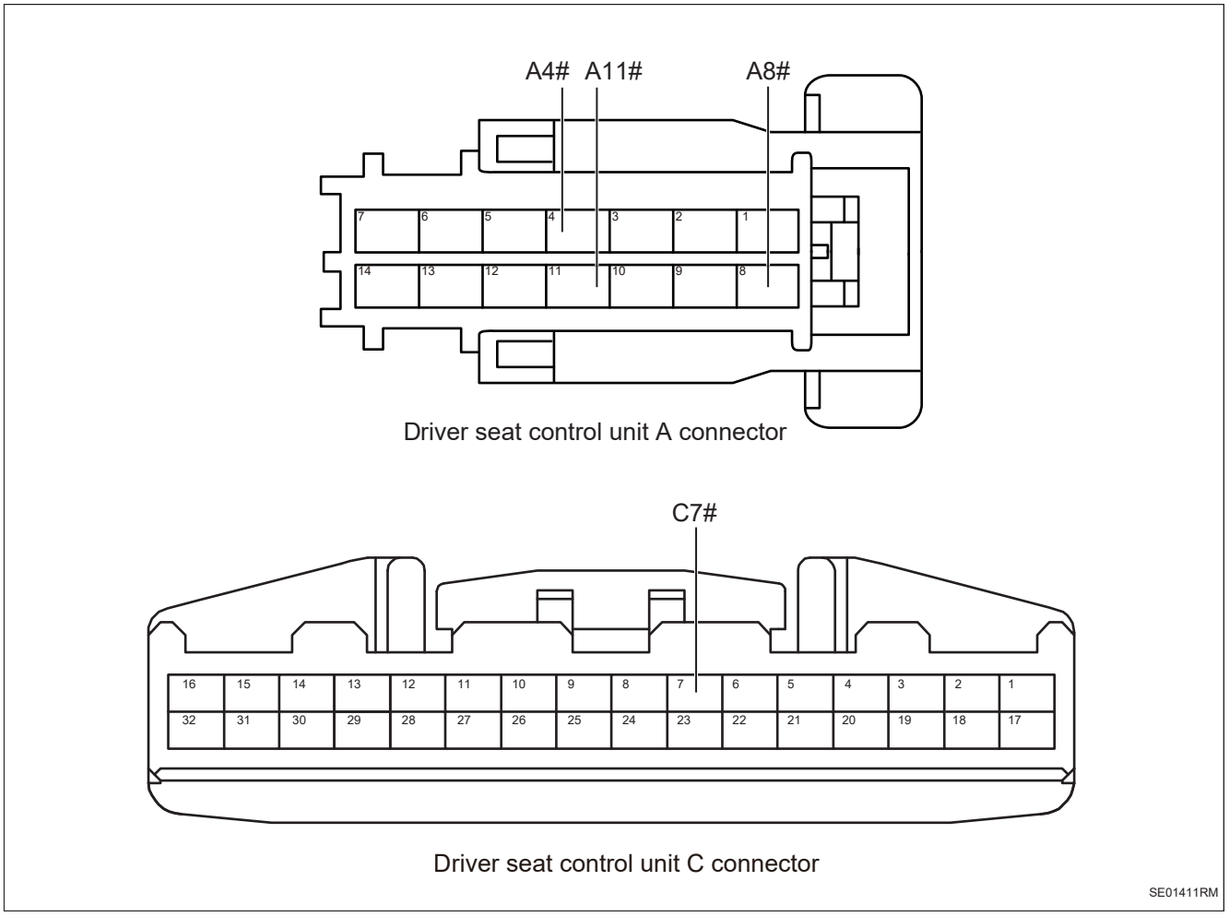
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A8# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector A4# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector A11# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C7# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in driver seat ventilation and massage motor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector A8# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector A4# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector A11# - body ground	Ignition switch "ON"	Less than 1 V
Driver seat control unit connector C7# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace driver seat ventilation motor or driver massage lumbar support controller (See page NS-67)**

(a) Replace the driver seat ventilation motor or driver massage lumbar support controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace driver seat control unit (See page NS-67)**

OK

Diagnosis ends

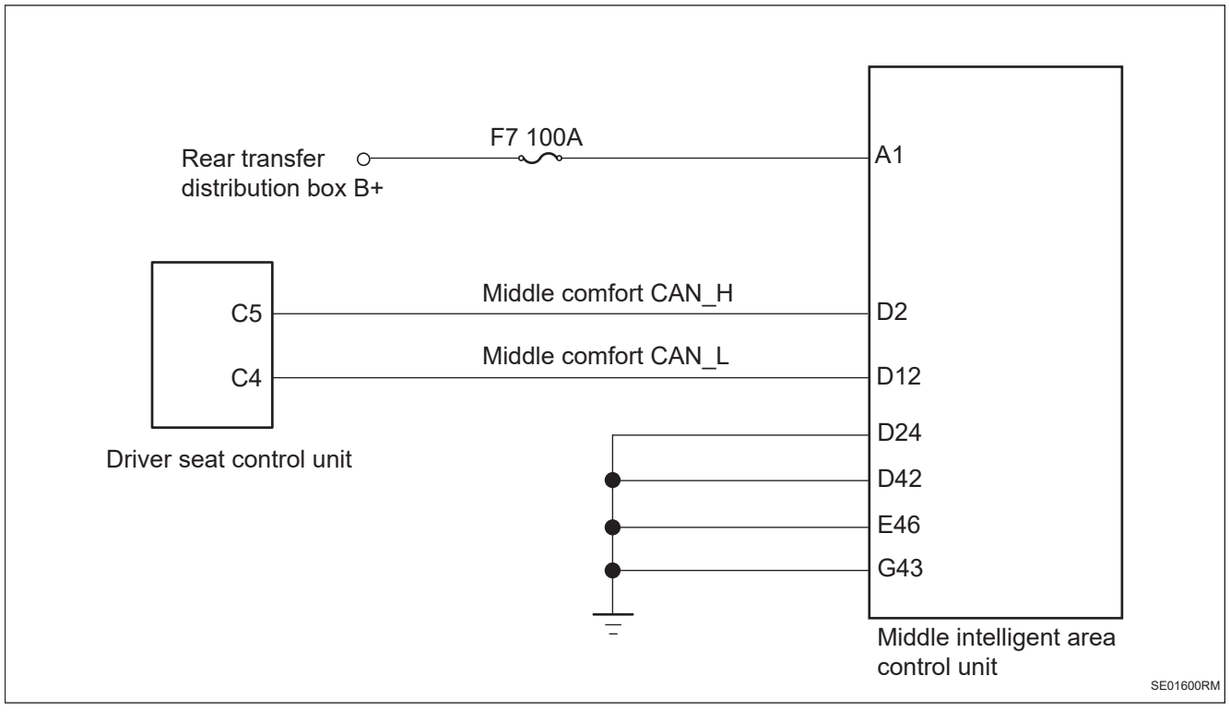
DTC	**U014687**	**PDCM node lost**

Description

When communication between driver seat control unit and middle intelligent area control unit is abnormal or interrupted, the driver seat control unit records DTC.

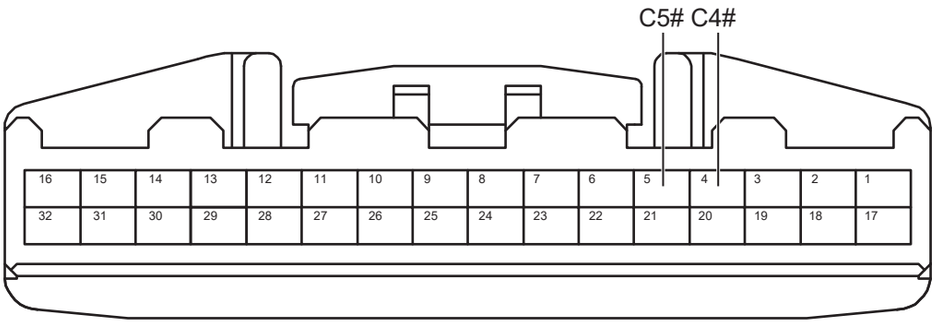
DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Driver seat control unit • Middle intelligent area control unit • Combination switch

Circuit diagram



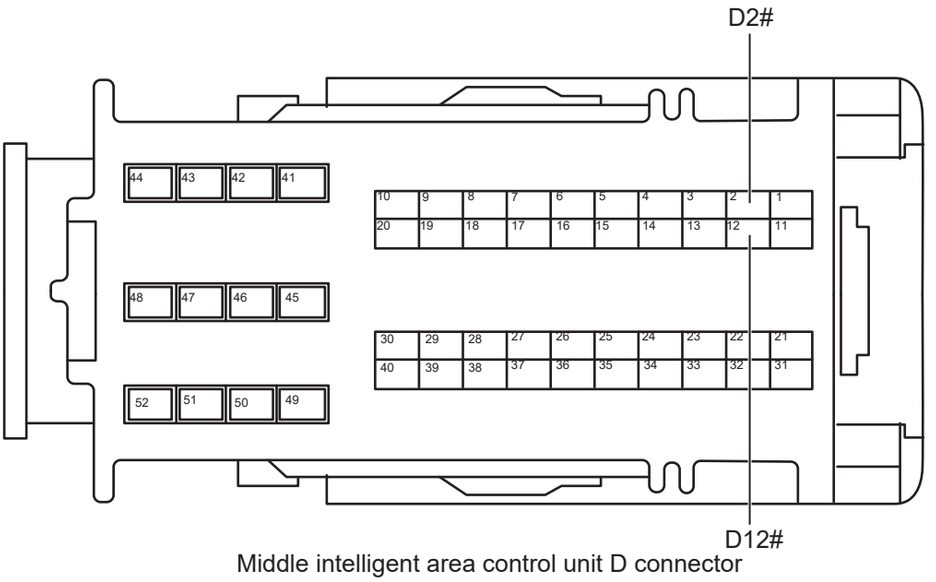
Inspection procedure

1	**Check for open in central comfort CAN bus (driver seat control unit - center intelligent area control unit)**



Driver seat control unit C connector

SE01511RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

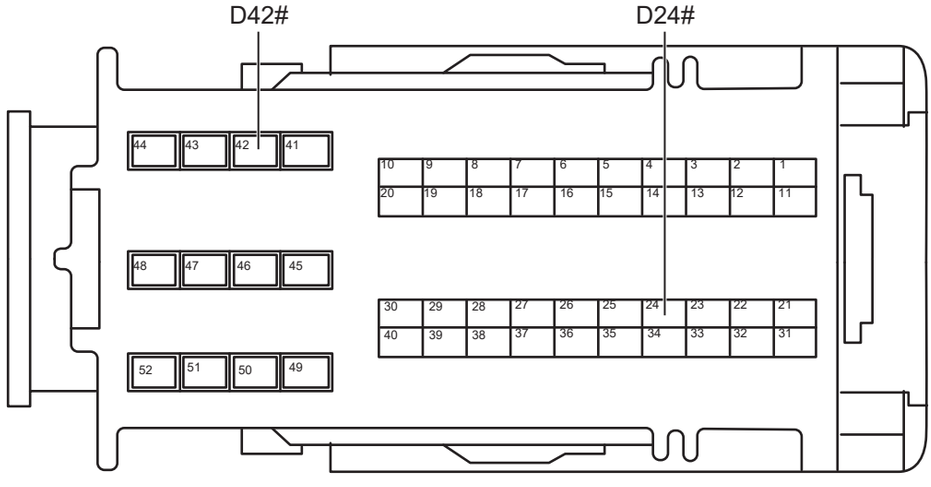
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - center intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Driver seat control unit connector C4# - center intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

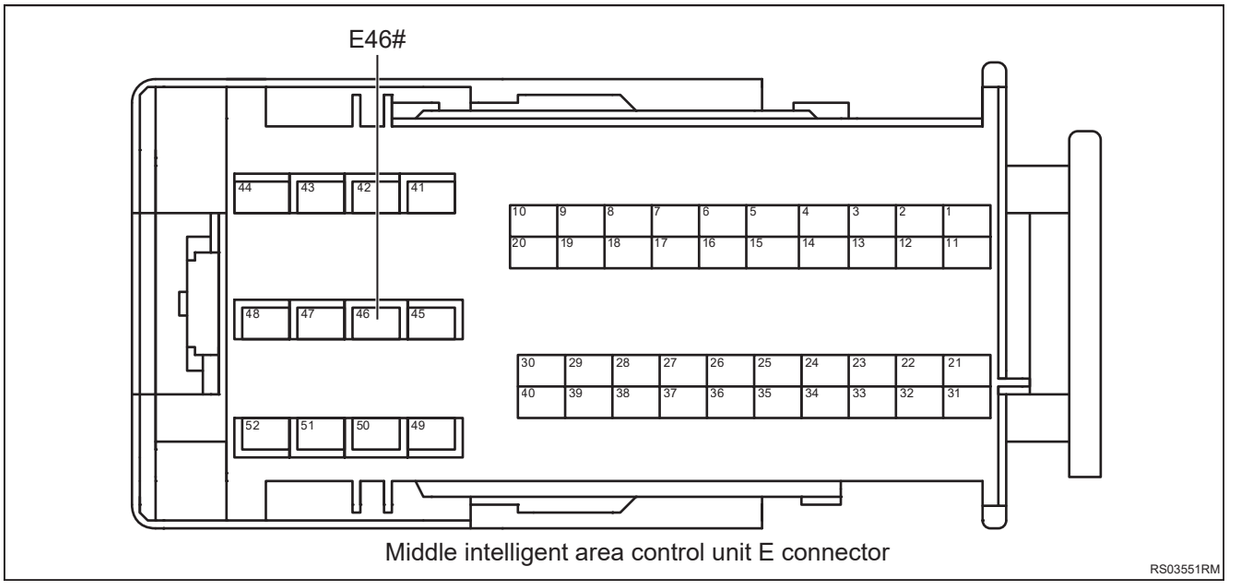
OK

2	Check middle intelligent area control unit ground



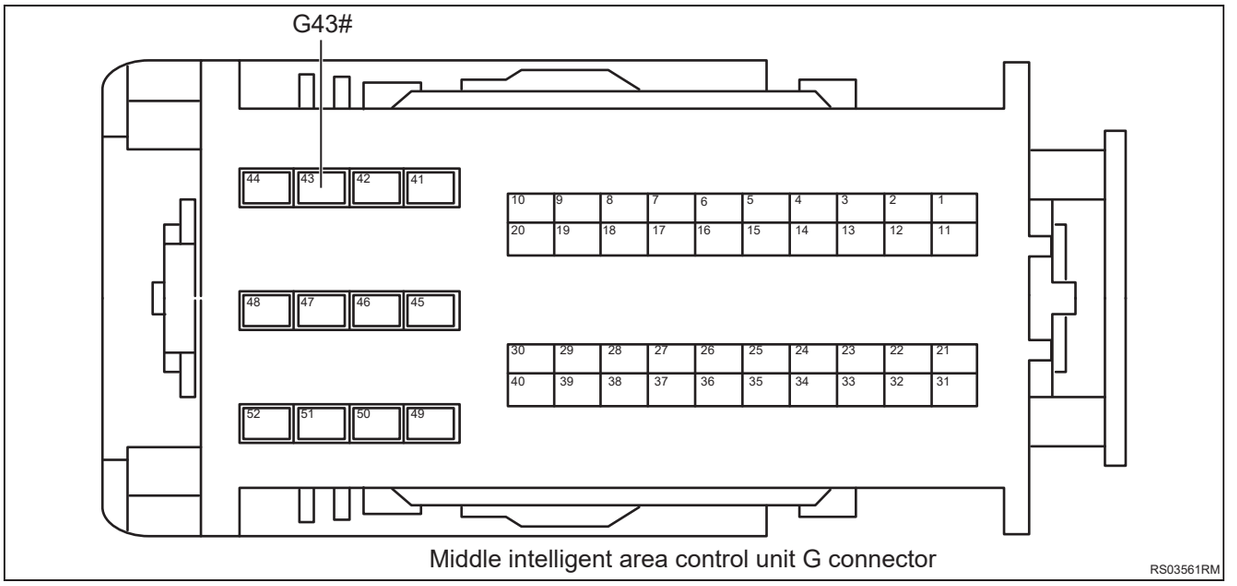
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

RS03561RM

(a) According to value in the table, measure resistance.

Standard value

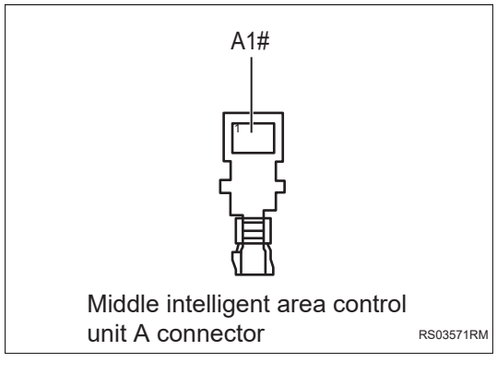
Multimeter connection	Detecti-on conditi-on	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connect-ed	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connect-ed	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check middle intelligent area control unit power supply



Middle intelligent area control unit A connector RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

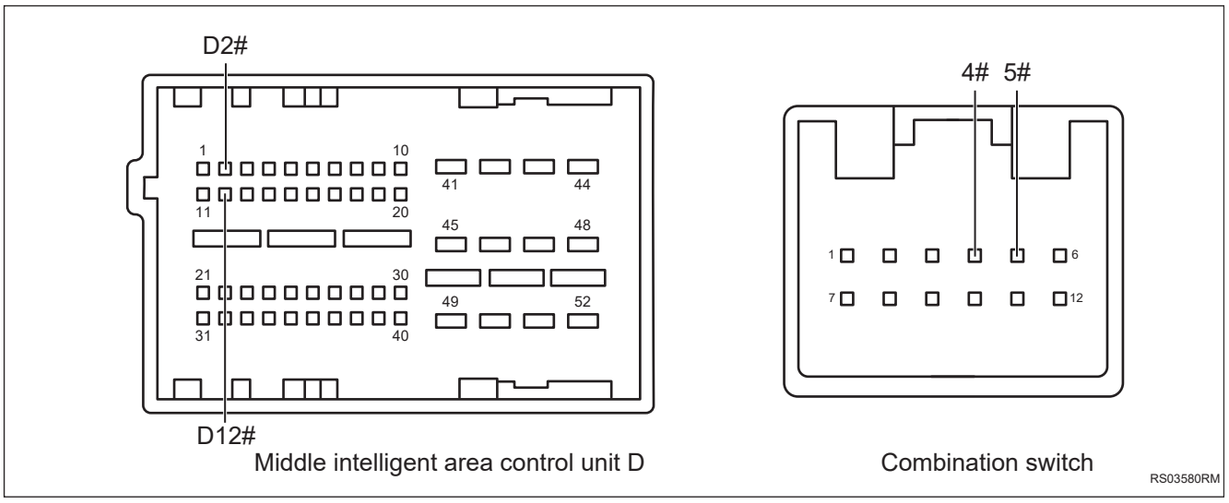
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace driver seat control unit (See page NS-67)**

OK

Diagnosis ends

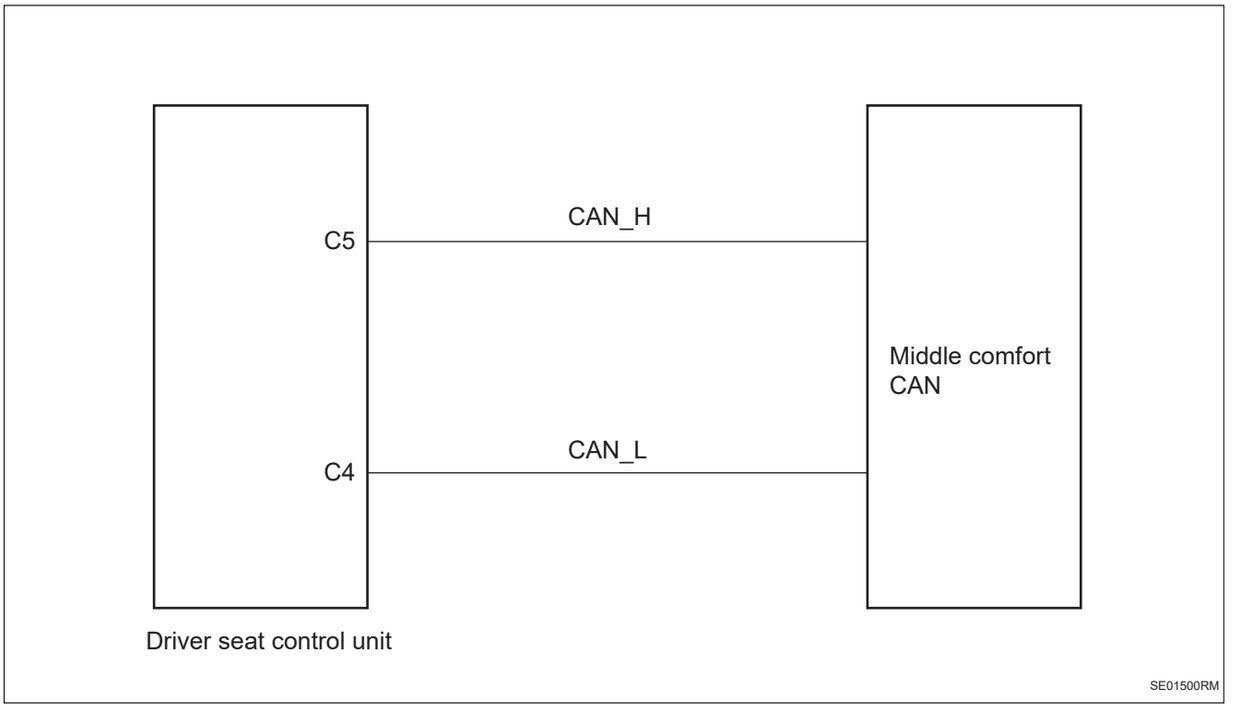
DTC	U002888	Comfort CAN bus off

Description

When driver seat control unit detects an off fault in middle comfort CAN bus, the driver seat control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

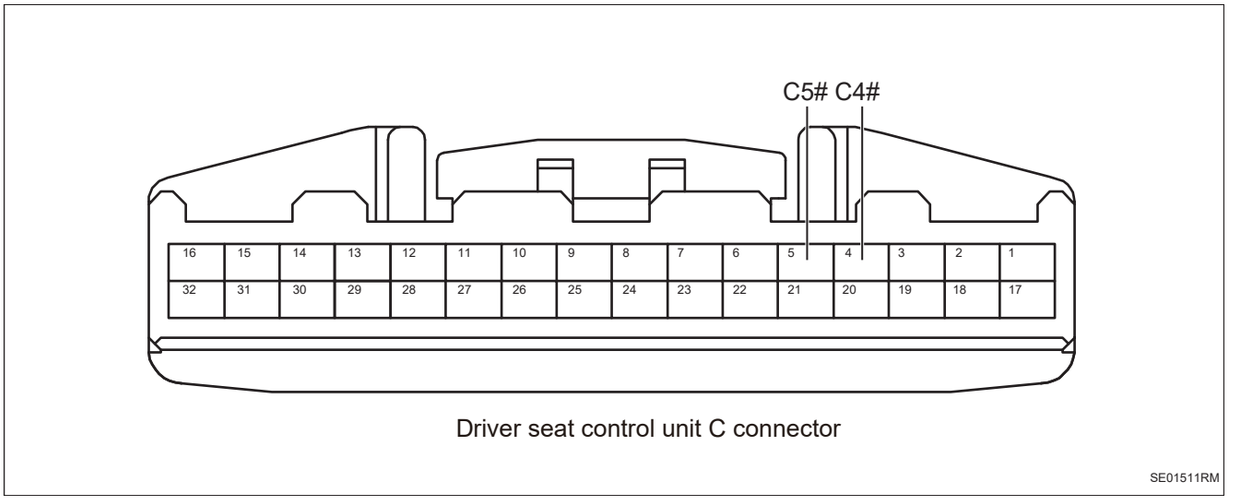
Circuit diagram



ZD

Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the driver seat control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - driver seat control unit connector C4#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

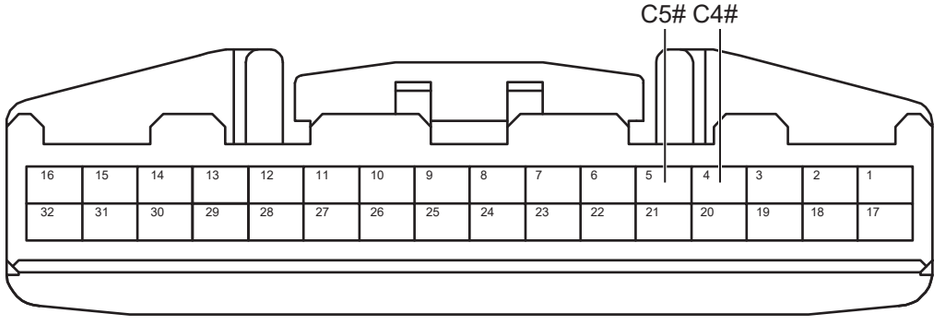
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Driver seat control unit C connector

SE01511RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

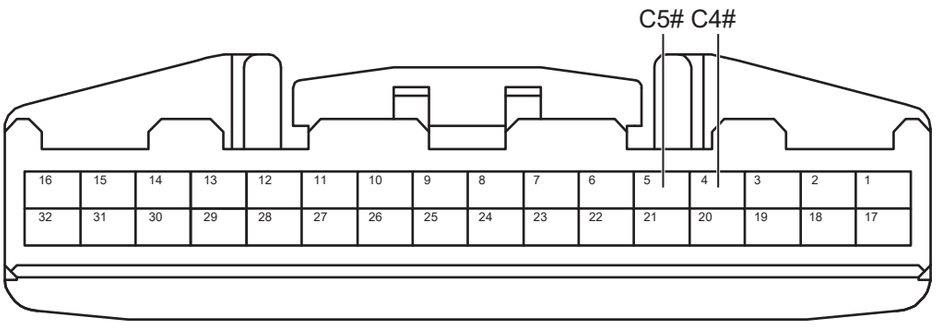
Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - driver seat control unit connector C4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check for short to ground in central comfort CAN bus



Driver seat control unit C connector

SE01511RM

(a) According to value in the table, measure resistance.

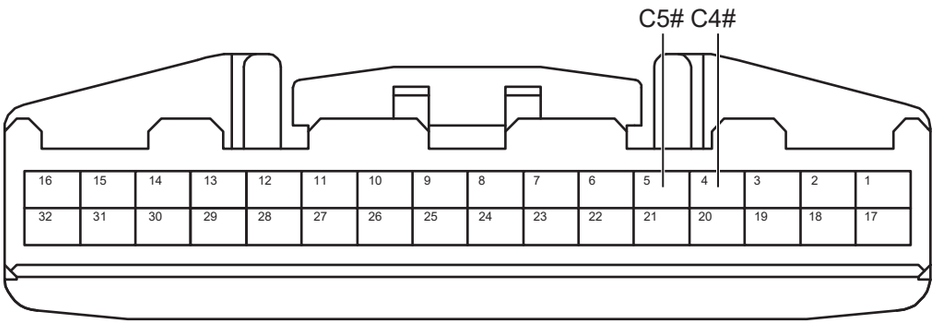
Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - body ground	Always connected	10 KΩ or more
Driver seat control unit connector C4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Driver seat control unit C connector

SE01511RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Driver seat control unit connector C5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Driver seat control unit connector C4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

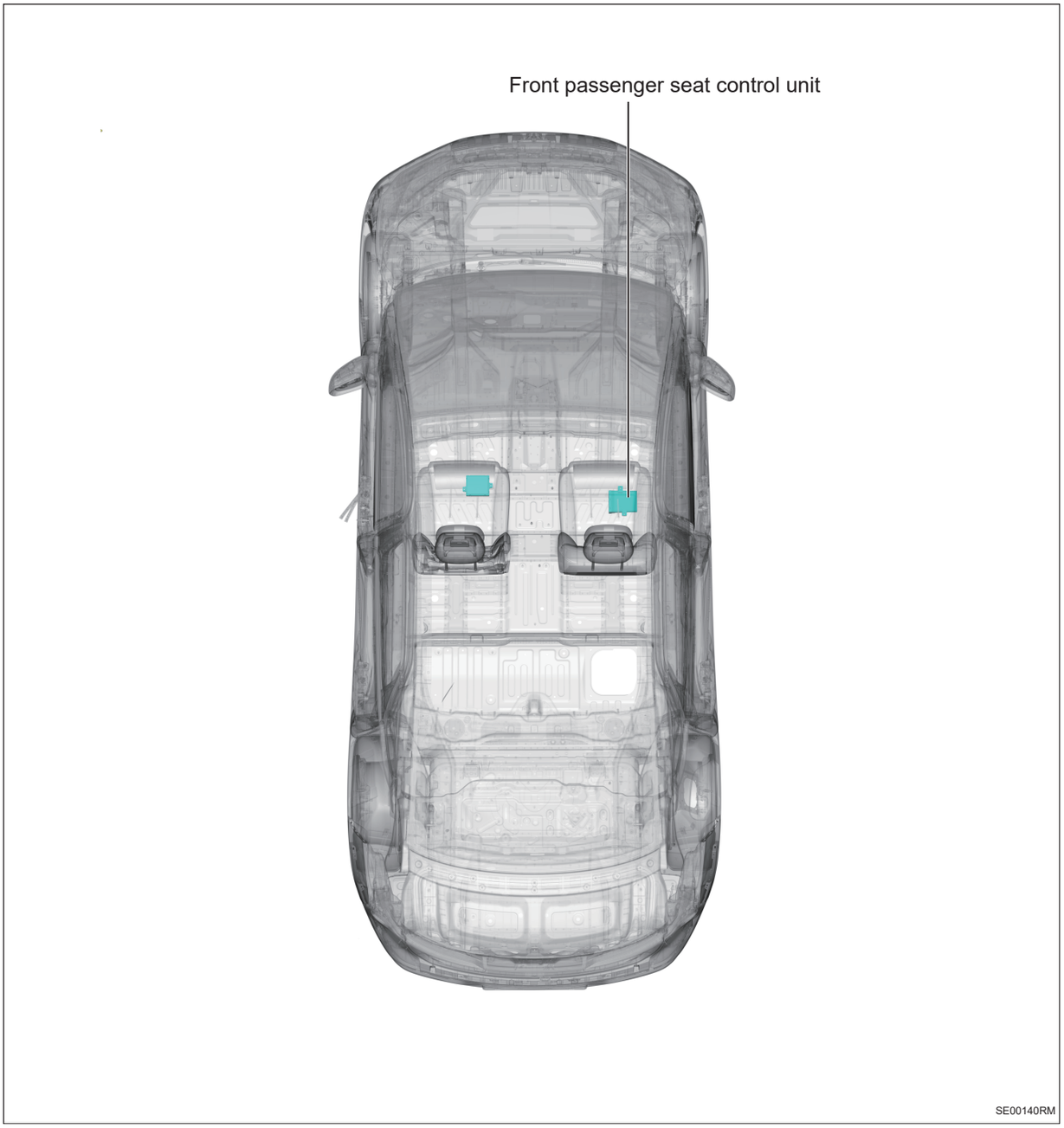
ZD

Front passenger seat control unit

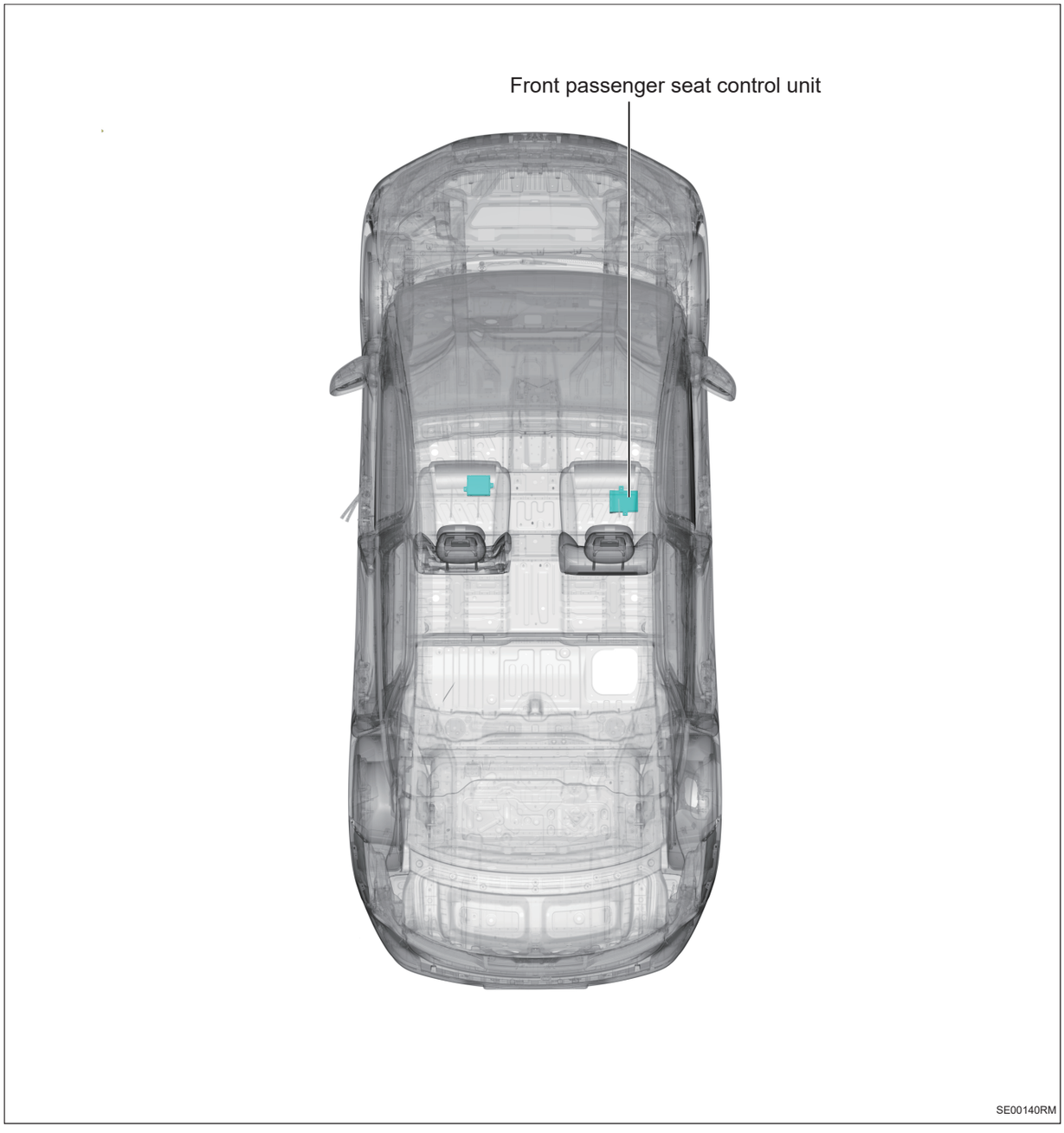
Precautions

1. **When checking seat control system, it may affect the airbag operation. Therefore, before performing servicing, be sure to read airbag precautions carefully.**
2. **When replacing parts or disconnecting connectors during checking and repairing seat control system, disconnect negative battery cable.**

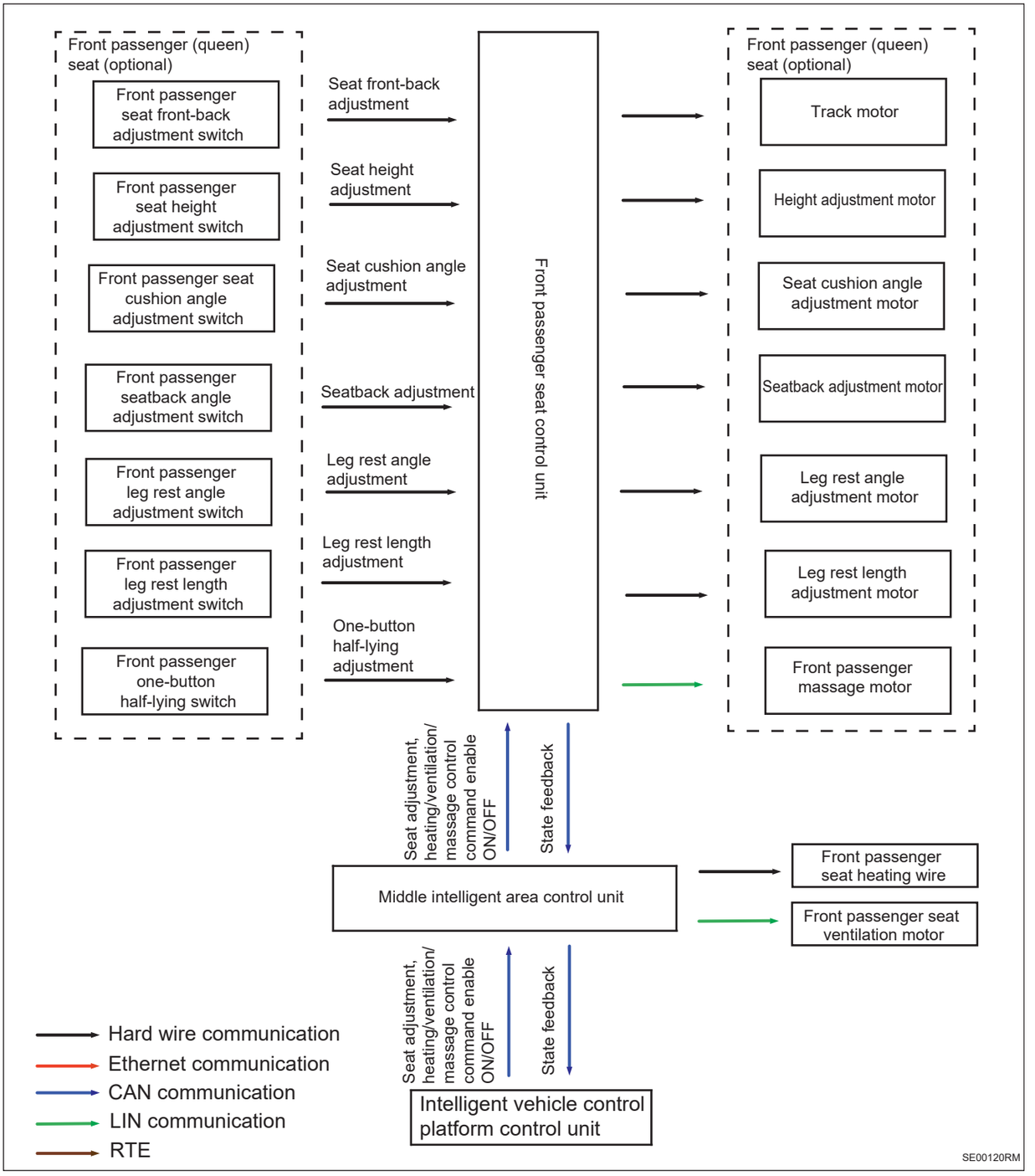
Part position

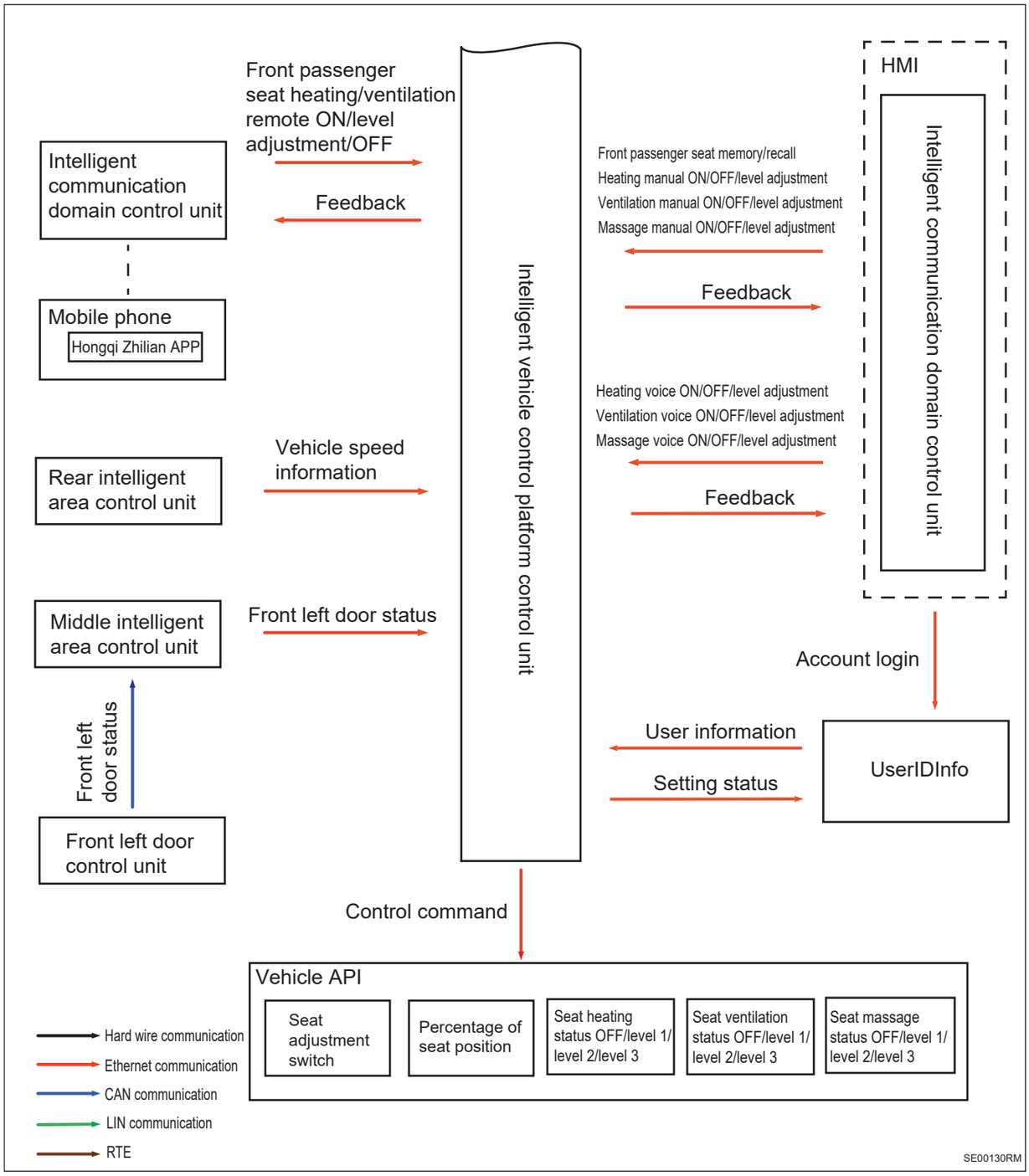


Part position



System diagram





Function description

1. **The user effectively presses the seat adjustment switch and position memory switch to adjust the seat position.**

   (a) Front passenger seat front-back adjustment: The front passenger can adjust the seat forward or backward through seat adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

   (b) Front passenger seat height adjustment: The front passenger can adjust to raise or lower the seat through seat height adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

(c) Front passenger seat cushion angle adjustment: The passenger can increase or decrease the front passenger seat cushion angle through seat cushion angle adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

(d) Front passenger seat semi-inclination manual activation: The driver or front passenger can manually activate the front passenger seat semi-inclination function by switch operation, so as to improve riding comfort of front passenger.

(e) Front passenger seat semi-inclination manual deactivation: The driver or front passenger can deactivate front passenger seat semi-inclination function by switch operation, so as to improve riding comfort of the front passenger.

(f) Front passenger seat semi-inclination activated by voice: The driver or front passenger can realize the front passenger seat semi-inclination control through voice control, so as to improve operational convenience and riding comfort of passenger.

(g) Front passenger seat semi-inclination deactivated by voice: The driver or passenger can deactivate the front passenger seat semi-inclination function through voice control, so as to improve operational convenience and riding comfort.

(h) Front passenger seat semi-inclination position memory: After logging into the account, the front passenger seat semi-inclination position can be memorized by operating the front passenger seat semi-inclination position memory switch, so as to facilitate the subsequent use by the front passenger, quickly obtain a comfortable semi-inclination position, and improve usability and intelligent experience.

2. It supports the function of conveniently getting on and off the vehicle, when user gets off, the seat moves backward; when user gets on, the seat returns to the position before gets off.

(a) Front passenger seat position manual memory: The user can memorize up to three front passenger seat positions by operating the seat memory and recall buttons on the front passenger side. When the current front passenger seat position is memorized, users can quickly obtain their preferred seat positions, simplify user operations and improve usability and intelligent experience.

(b) Front passenger seat position manual recall: The user can recall up to three memorized Front passenger seat positions by operating the seat memory and recall buttons on the Front passenger side, so as to facilitate different users to quickly obtain their preferred seat positions, simplify user operations and improve usability and intelligent experience.

3. The user operates the seat heating, ventilation and massage switches to realize the corresponding functions, and the real-time level can be seen on control panel at the same time.

(a) Front passenger seat massage function manual activation: The front passenger can activate the front passenger seat massage function through front passenger seat massage button to provide appropriate "kneading-relaxation" for the passenger's back and lumbar muscles, so as to relieve fatigue caused by prolonged sitting and improve riding comfort.

(b) Front passenger seat massage mode manual selection: The front passenger can select the front seat massage mode through HMI, after setting, the front passenger seat massage can be performed at the desired mode of user, so as to meet the user's massage needs for mode 1/mode 2/mode 3 and improve riding comfort.

(c) Front passenger seat massage intensity manual selection: The front passenger can select the front seat massage intensity through HMI, after setting, the front passenger seat massage can

be performed at the desired intensity of user, so as to meet the user's needs for low/medium/high massage intensity and improve riding comfort.

(d) Front passenger seat massage function manual deactivation: The front passenger can deactivate the front passenger seat massage function through HMI.

(e) Front passenger seat massage function activated by voice: The front passenger can activate the front passenger seat massage function by voice to provide appropriate "kneading-relaxation" for the passenger's back and lumbar muscles, so as to relieve fatigue caused by prolonged sitting and improve riding comfort.

(f) Front passenger seat massage mode selection by voice: The front passenger can select the front seat massage mode by voice and the front passenger seat massage can be performed at the desired mode of user, so as to meet the user's massage needs for mode 1/mode 2/mode 3 and improve riding comfort.

(g) Front passenger seat massage intensity selection by voice: The front passenger can select the front seat massage intensity by voice and the front passenger seat massage can be performed at the desired intensity of user, so as to meet the user's needs for low/medium/high massage intensity and improve driving comfort.

(h) Front passenger seat massage function deactivated by voice: The front passenger can deactivate the front passenger massage function by voice.

(i) Front passenger seat lumbar support manual adjustment: The user can adjust the seat lumbar support through HMI to change the position of seat lumbar support, so as to provide the most comfortable seat lumbar support position for user and improve riding comfort.

(j) Front passenger seatback angle adjustment: The passenger can adjust to increase/decrease the seatback angle through front passenger seatback angle adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

(k) Front passenger seat leg support front-back adjustment: The passenger can adjust the leg support front-back position through front passenger leg support front-back adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

(l) Front passenger seat leg support angle adjustment: The passenger can adjust the leg support angle position through leg support angle adjustment switch, so as to facilitate the passenger to obtain the most comfortable sitting posture and improve riding experience.

4. Seat adaptive adjustment function

(a) Before the user drives the vehicle for the first time, the system recognizes that there is no memorized position under the logged-in account or in the case of no logged-in account, the driver seat actively adjusts the seat position automatically according to the driver personal information and information captured by the camera, saving the cumbersome operation steps of the driver;

(b) When there is already a memorized seat position under the account bound to the vehicle, but the user feels that this position is not good and wants to reuse the seat adaptive adjustment function, the user can actively retrieve this function on the central control display.

Data parameter

Front passenger seat control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	10	-	3

Front passenger seat angle adjustment motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13	9
Operating current (A)	10	-	3

Front passenger seat track motor

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	Less than 6	4	1

Front passenger seat cushion heater

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	5	4
NTC sensor resistance (KΩ)	359.5644 (-40° C)	343.6326 (-40° C)	328.3739 (-40° C)
	101.0977 (-20° C)	97.8396 (-20° C)	94.6771 (-20° C)
	33.4771 (0° C)	32.7547 (0° C)	32.0447 (0° C)
	12.6537 (20° C)	12.5005 (20° C)	12.3479 (20° C)
	5.4018 (40° C)	5.3146 (40° C)	5.2283 (40° C)

Front passenger seatback heater

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	5	4

Front passenger seat cushion ventilation motor

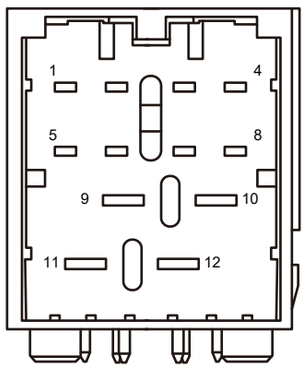
Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	1	0.67	0

Front passenger seatback ventilation motor

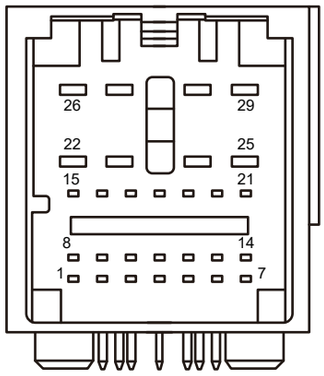
Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	1	0.67	0

ECU terminal

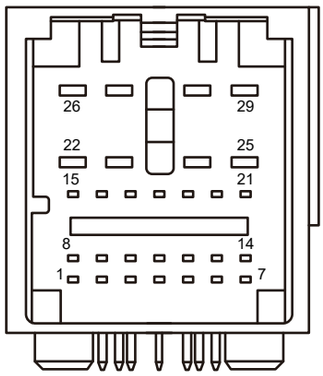
Front passenger seat control unit



Front passenger seat control unit A



Front passenger seat control unit C



Front passenger seat control unit D

SE00100RM

ZD

Front passenger seat control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	A8-, A1+ Seatback backward adjustment output	7	A8-, A7+ Leg rest downward adjustment output
2	-	8	Seat adjustment common terminal output 2 (A8+, A1- seatback forward/A8 +, A7- leg rest upward)
3	A10-,A3+ Leg rest shortened adjustment output	9	Seat motor power supply ground
4	-	10	Seat adjustment common terminal output 1 (A10+, A5- seat track forward/ A10+, A3- leg rest extension adjustment output)
5	A10-, A5+ Seat track backward adjustment output	11	Seat motor power supply
6	-	12	Power ground

Front passenger seat control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	Seat track HALL signal	16	-
2	-	17	-
3	Seatback HALL signal	18	-
4	B+ controller input power supply	19	LIN
5	-	20	CAN-H
6	-	21	CAN-L
7	-	22	-
8	-	23	-
9	Motor 1 Hall signal Leg support length motor Hall signal	24	-

Front passenger seat control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
10	Leg rest up-down Hall signal	25	-
11	-	26	-
12	System power supply ground	27	-
13	-	28	-
14	-	29	-
15	HALL power supply output	-	-

Front passenger seat control unit D			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	16	Seat track forward adjustment switch
2	-	17	-
3	Seat leg rest extension adjustment switch	18	Seat adjustment switch/one-button lie down switch ground
4	Seat leg rest shortening adjustment switch	19	Seat one-button lie down switch
5	Leg rest upward adjustment switch	20	-
6	Leg rest downward adjustment switch	21	-
7	-	22	-
8	-	23	-
9	Seatback forward adjustment switch	24	-
10	Seatback backward adjustment switch	25	-
11	-	26	-
12	-	27	-
13	-	28	-
14	-	29	-
15	Seat track backward adjustment switch	-	-

Diagnostic Trouble Code (DTC) chart

Front passenger seat control unit

DTC	Detection Items	See page
B15D007	Seat horizontal forward adjustment switch stuck	(See page ZD-2804)
B15D107	Seat horizontal backward adjustment switch stuck	(See page ZD-2804)
B15D207	Seatback forward adjustment switch stuck	(See page ZD-2804)
B15D307	Seatback backward adjustment switch stuck	(See page ZD-2804)
B15D407	Seat leg rest telescopic downward (extension) adjustment switch stuck	(See page ZD-2804)
B15D507	Seat leg rest telescopic upward (retraction) adjustment switch stuck	(See page ZD-2804)

DTC	Detection Items	See page
B15D607	Seat leg rest upward adjustment switch stuck	(See page ZD-2804)
B15D707	Seat leg rest downward adjustment switch stuck	(See page ZD-2804)
B15DC07	One-button lie-down switch stuck	(See page ZD-2804)
B15D011	Short to ground in horizontal motor output	(See page ZD-2813)
B15D015	Open in horizontal motor output	(See page ZD-2813)
B15D017	Controller input power supply voltage too high	(See page ZD-2816)
B15D117	Seat motor power supply too high	(See page ZD-2816)
B15D016	Controller input power supply voltage too low	(See page ZD-2816)
B15D116	Seat motor power supply too low	(See page ZD-2816)
B15D111	Short to ground in seatback motor output	(See page ZD-2820)
B15D115	Open in seatback motor output	(See page ZD-2820)
B15D129	Seat horizontal motor Hall signal fault	(See page ZD-2825)
B15D211	Short to ground in leg rest telescopic motor output	(See page ZD-2828)
B15D215	Open in leg rest telescopic motor output	(See page ZD-2828)
B15D311	Short to ground in leg rest upper/lower motor output	(See page ZD-2828)
B15D315	Open in leg rest upper/lower motor output	(See page ZD-2828)
B15D329	Seatback motor Hall signal fault	(See page ZD-2833)
B15D429	Seat leg rest telescopic motor Hall signal fault	(See page ZD-2836)
B15D529	Seat leg rest upper/lower motor Hall signal fault	(See page ZD-2836)
B15D611	Short to ground in seat cushion heater output	(See page ZD-2840)
B15D615	Open in seat cushion heater output	(See page ZD-2840)
B15D811	Short to ground in heater sensor	(See page ZD-2840)
B15D815	Open in heater sensor	(See page ZD-2840)
B15D915	Seat NTC abnormal	(See page ZD-2840)
B15D711	Short to ground in seatback heater output	(See page ZD-2847)
B15D715	Open in seatback heater output	(See page ZD-2847)
U102388	LIN1 physical bus error	(See page ZD-2861)
U134186	Front right seat massage air pump LIN communication error	(See page ZD-2861)
U025287	Front right seat massage air pump node lost	(See page ZD-2861)
U034186	Front right seat massage air pump fault	(See page ZD-2861)

DTC	Detection Items	See page
U002888	Comfort CAN bus off	(See page ZD-2851)
U014687	PDCM node lost	(See page ZD-2855)

DTC	**B15D007**	**Seat horizontal forward adjustment switch stuck**
DTC	**B15D107**	**Seat horizontal backward adjustment switch stuck**
DTC	**B15D207**	**Seatback forward adjustment switch stuck**
DTC	**B15D307**	**Seatback backward adjustment switch stuck**
DTC	**B15D407**	**Seat leg rest telescopic downward (extension) adjustment switch stuck**
DTC	**B15D507**	**Seat leg rest telescopic upward (retraction) adjustment switch stuck**
DTC	**B15D607**	**Seat leg rest upward adjustment switch stuck**
DTC	**B15D707**	**Seat leg rest downward adjustment switch stuck**
DTC	**B15DC07**	**One-button lie-down switch stuck**

Description

When front passenger seat adjustment switch (low current) is stuck, the front passenger seat control unit records DTC.

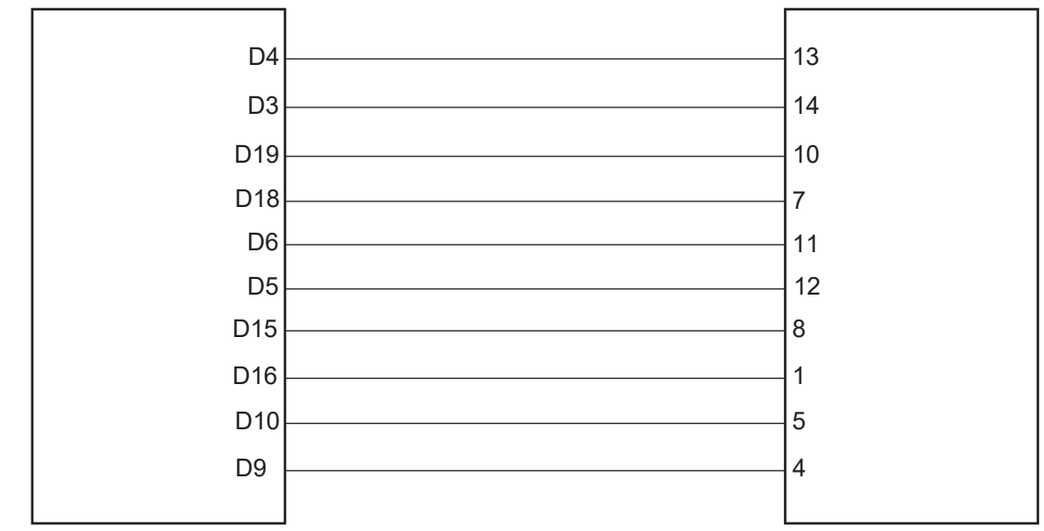
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D007	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D107	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D207	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D307	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D407	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D507	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15D607	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D707	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit
B15DC07	KL30 voltage is normal PSCU wake-up	Short to ground	30s (TBD)	Periodic type	10 ms	• Front passenger seat adjustment switch (low current) • Wire harness and connector • Front passenger seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15D007	Unable to adjust horizontal motor manually	Not come on
B15D107	Unable to adjust horizontal motor manually	Not come on
B15D207	Unable to adjust seatback motor manually	Not come on
B15D307	Unable to adjust seatback motor manually	Not come on
B15D407	Unable to adjust leg rest motor manually	Not come on
B15D507	Unable to adjust leg rest motor manually	Not come on
B15D607	Unable to adjust leg rest motor manually	Not come on
B15D707	Unable to adjust leg rest motor manually	Not come on
B15DC07	The memory function cannot be enabled after pressing the button	Not come on

Circuit diagram



Inspection procedure

1	**Check front passenger seat adjustment switch (low current)**

(a) Check for foreign matters in front passenger seat adjustment switch (low current).

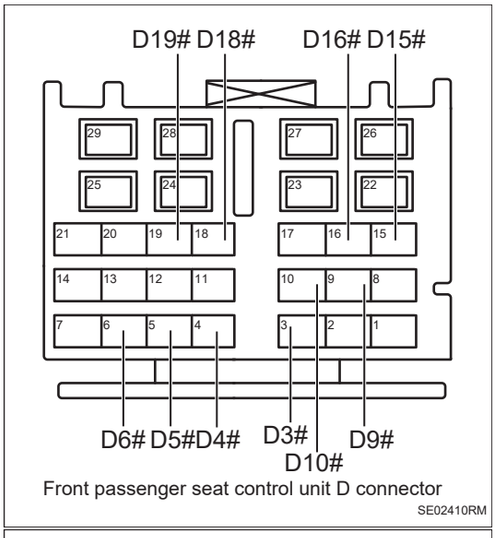
(b) Adjust front passenger seat adjustment switch (low current) and check for sticking.

NG → **Perform repair according to malfunction**

OK

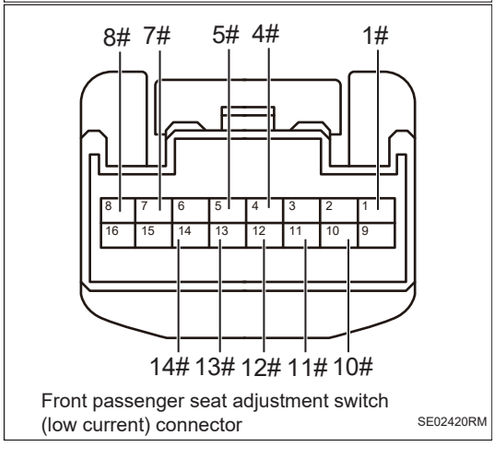
ZD

2	**Check for open in front passenger seat adjustment switch (low current) wire harness and connector**



Front passenger seat control unit D connector

SE02410RM



Front passenger seat adjustment switch (low current) connector

SE02420RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger seat adjustment switch (low current) connector.

(e) According to value in the table, measure resistance.

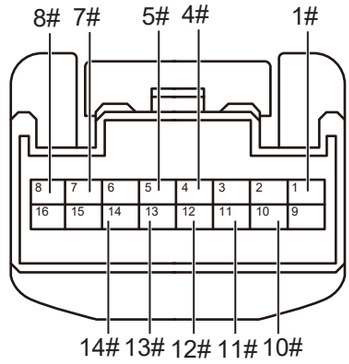
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector D9# - front passenger seat adjustment switch (low current) connector 4#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D10# - front passenger seat adjustment switch (low current) connector 5#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D16# - front passenger seat adjustment switch (low current) connector 1#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D15# - front passenger seat adjustment switch (low current) connector 8#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D5# - front passenger seat adjustment switch (low current) connector 12#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D6# - front passenger seat adjustment switch (low current) connector 11#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D18# - front passenger seat adjustment switch (low current) connector 7#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D19# - front passenger seat adjustment switch (low current) connector 10#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D3# - front passenger seat adjustment switch (low current) connector 14#	Always connected	Less than 1 Ω
Front passenger seat control unit connector D4# - front passenger seat adjustment switch (low current) connector 13#	Always connected	Less than 1 Ω

NG	**Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front passenger seat adjustment switch (low current) wire harness and connector**



Front passenger seat adjustment switch (low current) connector

SE02420RM

(a) According to value in the table, measure resistance.

Standard value

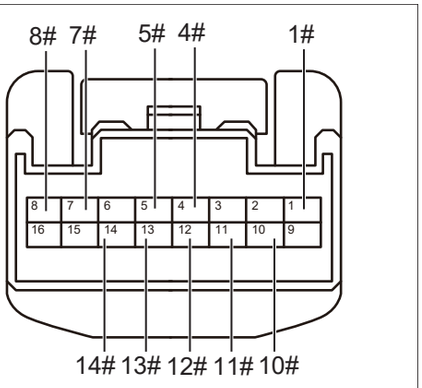
Multimeter connection	Detection condition	Specified condition
Front passenger seat adjustment switch (low current) connector 4# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 5# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 1# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 8# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 12# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 11# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 7# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 10# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 13# - body ground	Always connected	10 KΩ or more
Front passenger seat adjustment switch (low current) connector 14# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to power supply in front passenger seat adjustment switch (low current) wire harness and connector**



Front passenger seat adjustment switch (low current) connector SE02420RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

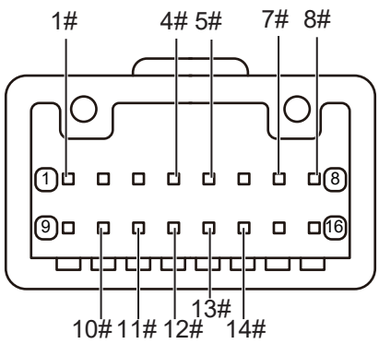
Multimeter connection	Detection condition	Specified condition
Front passenger seat adjustment switch (low current) connector 4# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 5# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 1# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 8# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 12# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 11# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 7# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 10# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 13# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat adjustment switch (low current) connector 14# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check front passenger seat adjustment switch (low current)**



Front passenger seat adjustment switch (low current) SE02430RM

(a) Adjust the front passenger seat adjustment switch (low current) to the corresponding position.

(b) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat adjustment switch (low current) 1# - front passenger seat adjustment switch (low current) 7#	The switch is in forward adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 1# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 8# - front passenger seat adjustment switch (low current) 7#	The switch is in backward adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 8# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 4# - front passenger seat adjustment switch (low current) 7#	The switch is in seatback forward adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 4# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 5# - front passenger seat adjustment switch (low current) 7#	The switch is in seatback backward adjustment position	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Front passenger seat adjustment switch (low current) 5# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 12# - front passenger seat adjustment switch (low current) 7#	The switch is in foot rest upward adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 12# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 11# - front passenger seat adjustment switch (low current) 7#	The switch is in foot rest downward adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 11# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 13# - front passenger seat adjustment switch (low current) 7#	The foot rest is in shortened adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 13# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more
Front passenger seat adjustment switch (low current) 14# - front passenger seat adjustment switch (low current) 7#	The foot rest is in extended adjustment position	Less than 1 Ω
Front passenger seat adjustment switch (low current) 14# - front passenger seat adjustment switch (low current) 7#	The switch is in original position	10 KΩ or more

NG → **Replace front passenger seat adjustment switch (low current) (See page NS-67)**

OK

Replace front passenger seat control unit (See page NS-67)

DTC	**B15D011**	**Short to ground in horizontal motor output**
DTC	**B15D015**	**Open in horizontal motor output**

Description

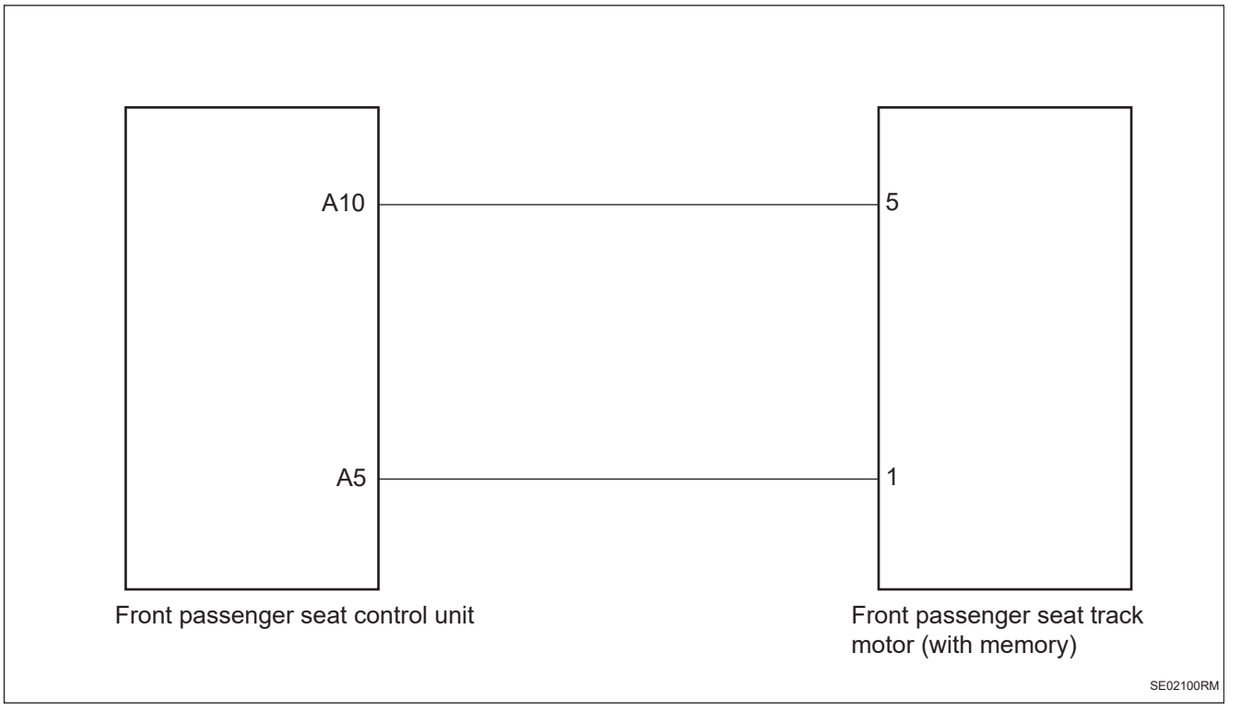
When there is short or open in front passenger seat track motor (with memory) output, the front passenger seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D011	KL30 voltage is normal Drive horizontal motor	The chip detects a short circuit to ground (8 μs) or a current greater than 25 A for 2 ms	2 ms	Periodic type	100 us	• Front passenger seat track motor (with memory) • Wire harness and connector • Front passenger seat control unit
B15D015	KL30 voltage is normal Drive horizontal motor	Motor current < 1 A (TBD) and no valid Hall signal detected	2 s	Periodic type	10 ms	• Front passenger seat track motor (with memory) • Wire harness and connector • Front passenger seat control unit

Fault symptom

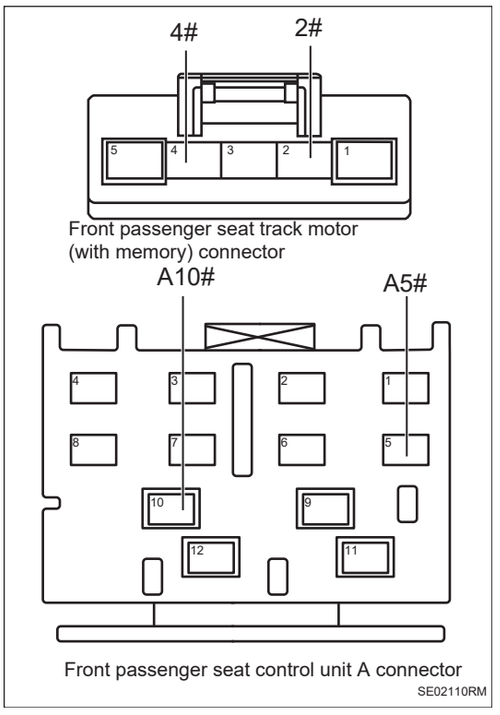
DTC No.	Fault symptom	Warning light/indicator
B15D011	Manual adjustment of horizontal motor is incontinuous	Not come on
B15D015	Manual adjustment of horizontal motor is incontinuous	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in front passenger seat track motor (with memory) wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger seat track motor (with memory) connector.

(e) According to value in the table, measure resistance.

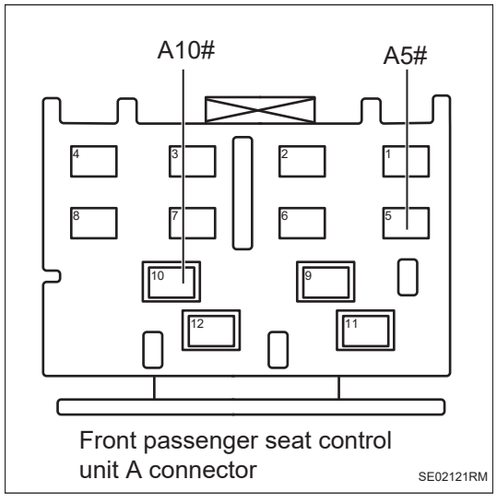
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A10# - front passenger seat track motor (with memory) connector 5#	Always connected	Less than 1 Ω
Front passenger seat control unit connector A5# - front passenger seat track motor (with memory) connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seat track motor (with memory) wire harness and connector**



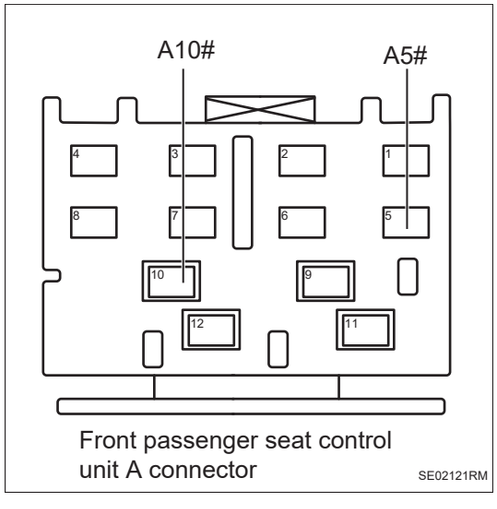
(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A10# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector A5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

3	**Check for short to power supply in front passenger seat track motor (with memory) wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A10# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector A5# - body ground	Ignition switch "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seat track motor (with memory) (See page NS-67)**

(a) Replace the front passenger seat track motor (with memory).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front passenger seat control unit (See page NS-67)**

DTC	**B15D017**	**Controller input power supply voltage too high**
DTC	**B15D117**	**Seat motor power supply too high**
DTC	**B15D016**	**Controller input power supply voltage too low**
DTC	**B15D116**	**Seat motor power supply too low**

Description

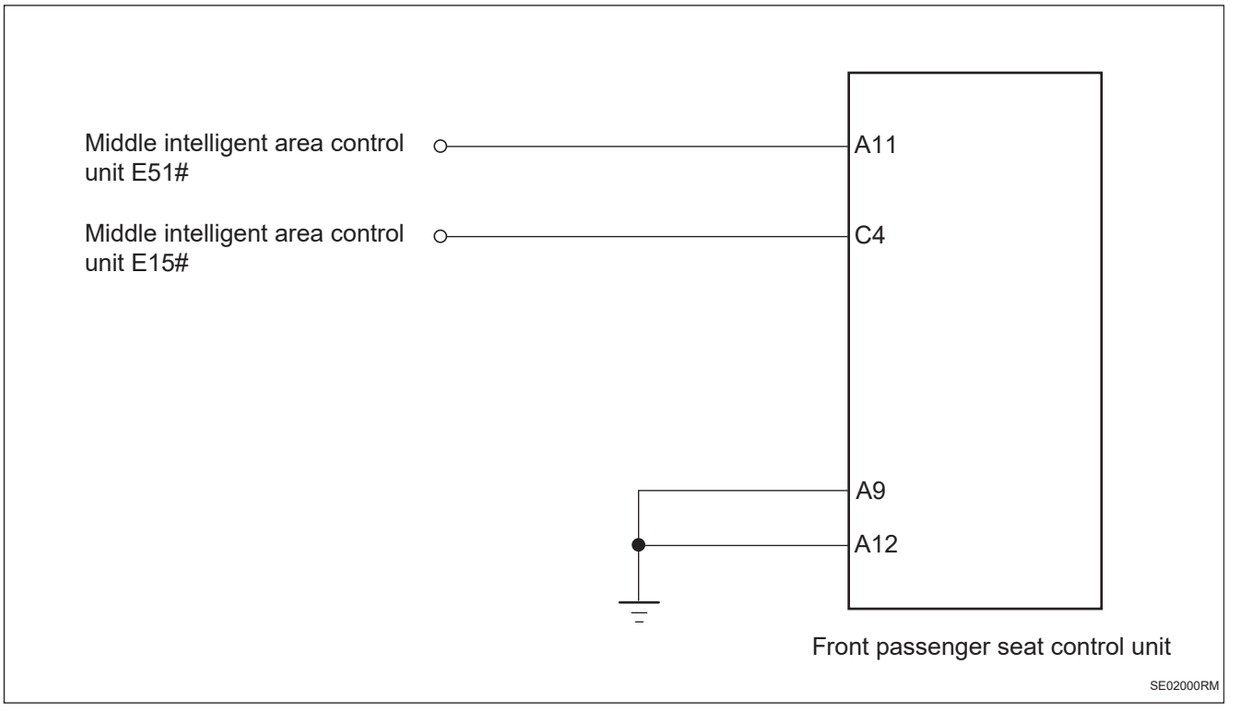
When front passenger seat control unit, seat motor input voltage is too high or too low, the front passenger seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D017	PSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Front passenger seat control unit • Wire harness and connector • Battery/charging system
B15D117	PSCU wake-up	Vbat > 16.5 V	10 s	Periodic type	10 ms	• Front passenger seat control unit • Wire harness and connector • Battery/charging system
B15D016	PSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Front passenger seat control unit • Wire harness and connector • Battery/charging system
B15D116	PSCU wake-up	Vbat < 8.5 V	10 s	Periodic type	10 ms	• Front passenger seat control unit • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15D017	All seat functions disable	Not come on
B15D117	All seat functions disable	Not come on
B15D016	All seat functions disable	Not come on
B15D116	All seat functions disable	Not come on

Circuit diagram



ZD

Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

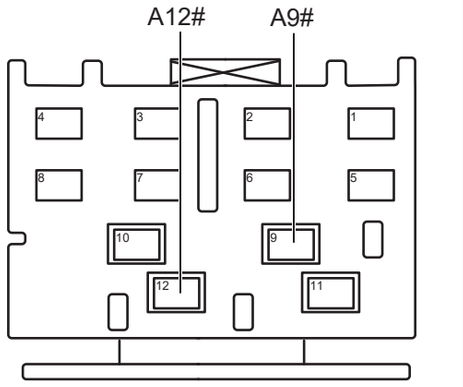
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check front passenger seat control unit ground**



Front passenger seat control unit A connector

SE02031RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) According to value in the table, measure resistance.

Standard value

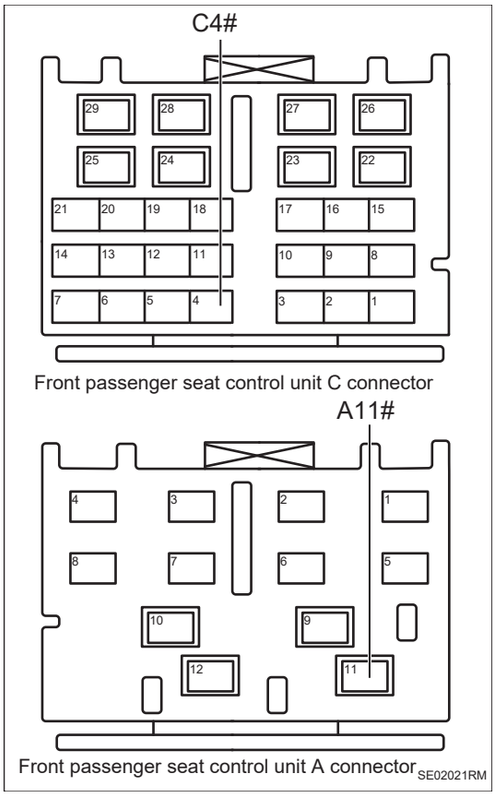
Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A9# - body ground	Always connected	Less than 1 Ω
Front passenger seat control unit connector A12# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check front passenger seat control unit power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A11# - body ground	Ignition switch "ON"	9 V ~ 16 V
Front passenger seat control unit connector C4# - body ground	Ignition switch "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace front passenger seat control unit (See page NS-67)

DTC	B15D111	Short to ground in seatback motor output

DTC	B15D115	Open in seatback motor output

Description

When there is short or open in front passenger seat angle adjustment motor (with memory) output, the front passenger seat control unit records DTC.

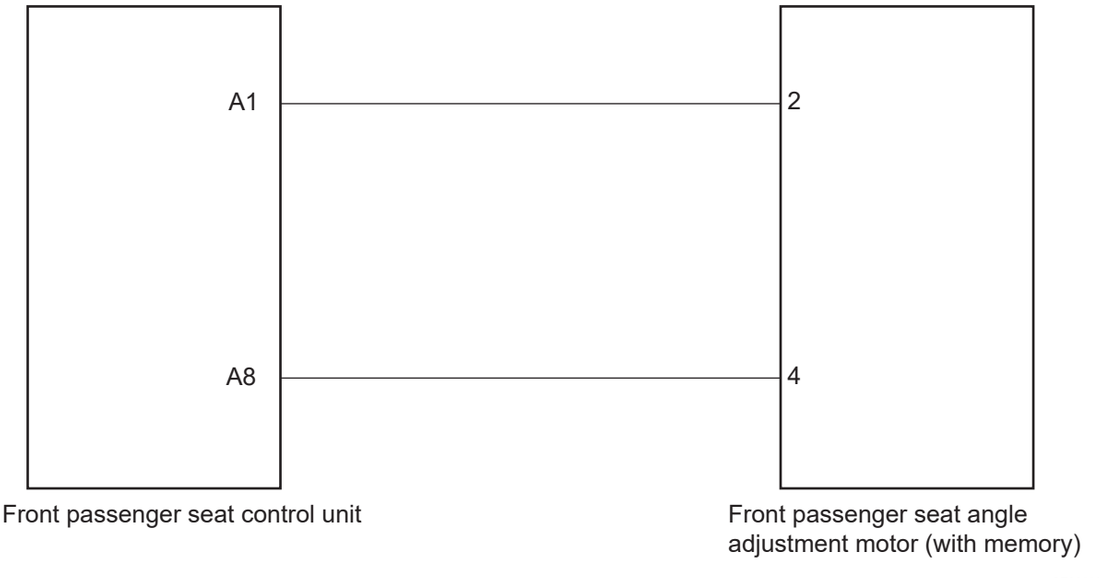
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D111	KL30 voltage is normal Drive seatback motor	The chip detects a short circuit to ground (8 μs) or a current greater than 25 A for 2 ms	2 ms	Periodic type	100 us	• Front passenger seat angle adjustment motor (with memory) • Wire harness and connector • Front passenger seat control unit
B15D115	KL30 voltage is normal Drive seatback motor	Motor current < 1 A (TBD) and no valid Hall signal detected	2 s	Periodic type	10 ms	• Front passenger seat angle adjustment motor (with memory) • Wire harness and connector • Front passenger seat control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15D111	Manual adjustment of seatback motor is incontinuous	Not come on
B15D115	Manual adjustment of seatback motor is incontinuous	Not come on

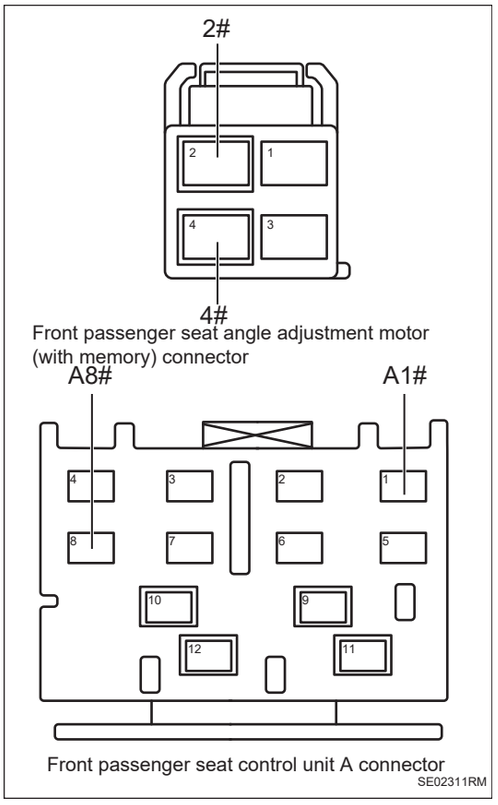
Circuit diagram



ZD

Inspection procedure

1	**Check for open in front passenger seat angle adjustment motor (with memory) wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger seat angle adjustment motor (with memory) connector.

(e) According to value in the table, measure resistance.

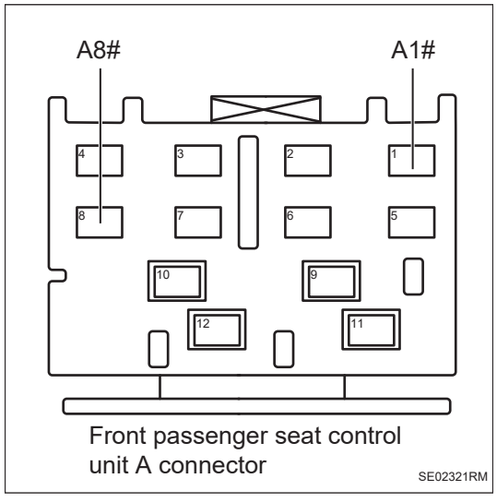
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A1# - front passenger seat angle adjustment motor (with memory) connector 2#	Always connected	Less than 1 Ω
Front passenger seat control unit connector A8# - front passenger seat angle adjustment motor (with memory) connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seat angle adjustment motor (with memory) wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

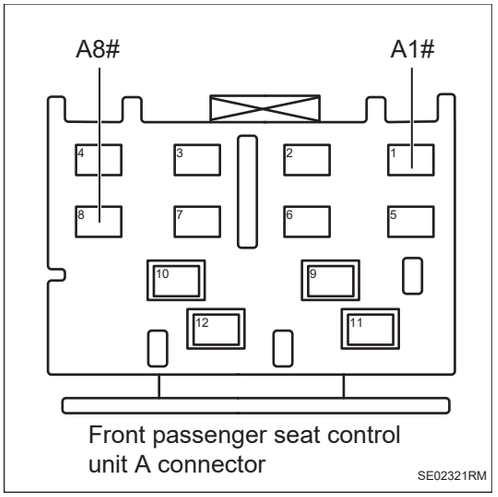
Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A1# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector A8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in front passenger seat angle adjustment motor (with memory) wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A1# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector A8# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seat angle adjustment motor (with memory) (See page NS-67)**

(a) Replace the front passenger seat angle adjustment motor (with memory).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front passenger seat control unit (See page NS-67)**

ZD

DTC	B15D129	Seat horizontal motor Hall signal fault

Description

When front passenger seat track motor (with memory) Hall signal is faulty, the front passenger seat control unit records DTC.

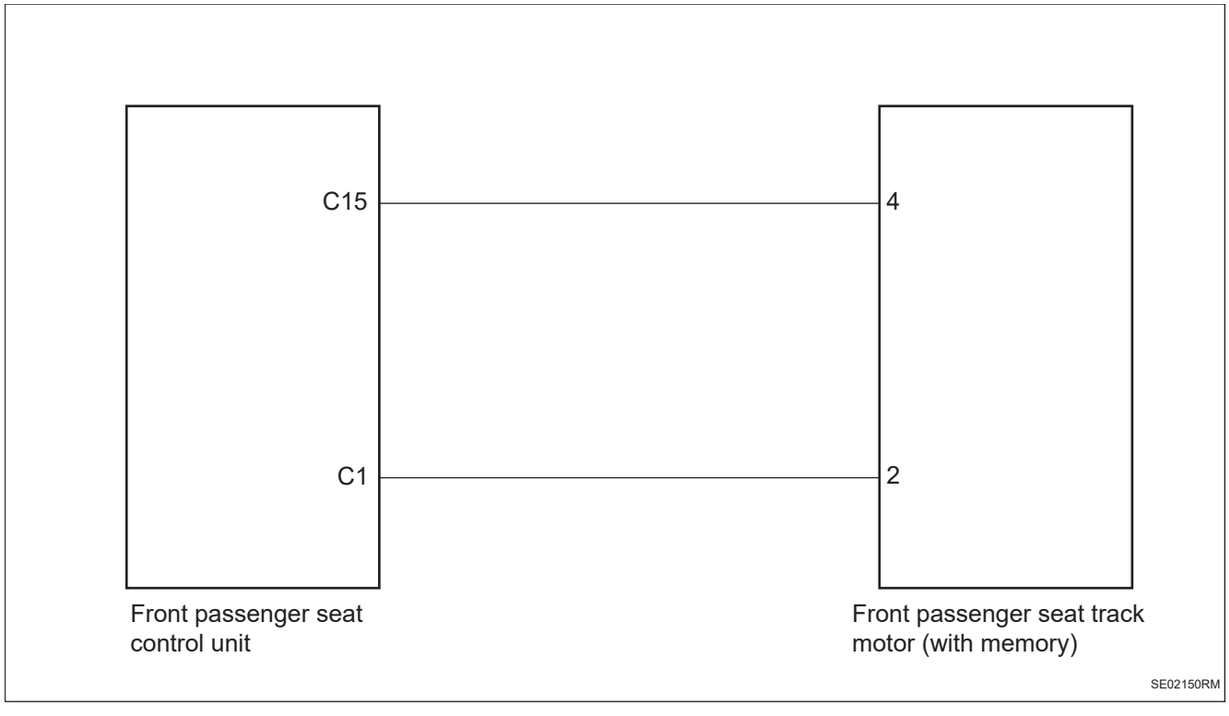
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D129	KL30 voltage is normal Drive horizontal motor 1 A (TBD) < motor current < 5 A (TBD)	Hall signal remains in high or low level	300 ms	Periodic type	1 ms	• Front passenger seat track motor (with memory) • Wire harness and connector • Front passenger seat control unit

ZD

Fault symptom

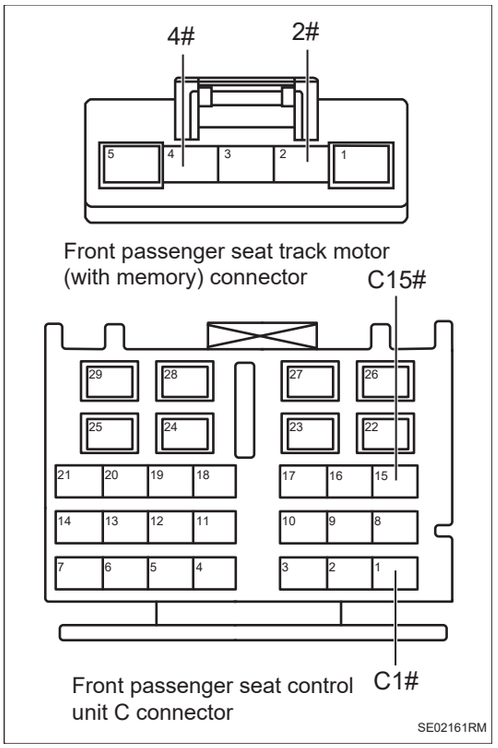
DTC No.	Fault symptom	Warning light/indicator
B15D129	Manual adjustment of horizontal motor is incontinuous	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in front passenger seat track motor (with memory) wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger seat track motor (with memory) connector.

(e) According to value in the table, measure resistance.

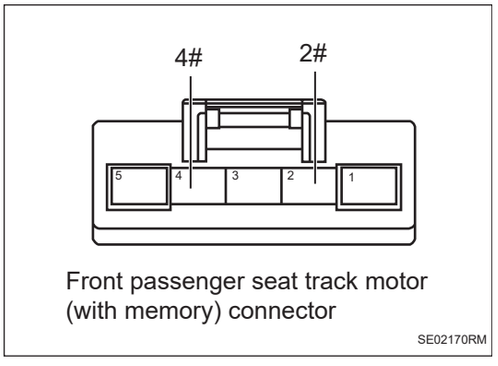
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C15# - front passenger seat track motor (with memory) connector 4#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C1# - front passenger seat track motor (with memory) connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seat track motor (with memory) wire harness and connector**



(a) According to value in the table, measure resistance.

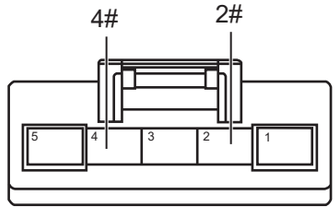
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat track motor (with memory) connector 2# - body ground	Always connected	10 KΩ or more
Front passenger seat track motor (with memory) connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in front passenger seat track motor (with memory) wire harness and connector**



Front passenger seat track motor (with memory) connector

SE02170RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat track motor (with memory) connector 2# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat track motor (with memory) connector 4# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seat track motor (with memory) (See page NS-67)**

(a) Replace the front passenger seat track motor (with memory).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace front passenger seat control unit (See page NS-67)**

DTC	**B15D211**	**Short to ground in leg rest telescopic motor output**
DTC	**B15D215**	**Open in leg rest telescopic motor output**
DTC	**B15D311**	**Short to ground in leg rest upper/lower motor output**
DTC	**B15D315**	**Open in leg rest upper/lower motor output**

Description

When there is short or open in front passenger seat leg rest angle motor, leg rest length motor output, the front passenger seat control unit records DTC.

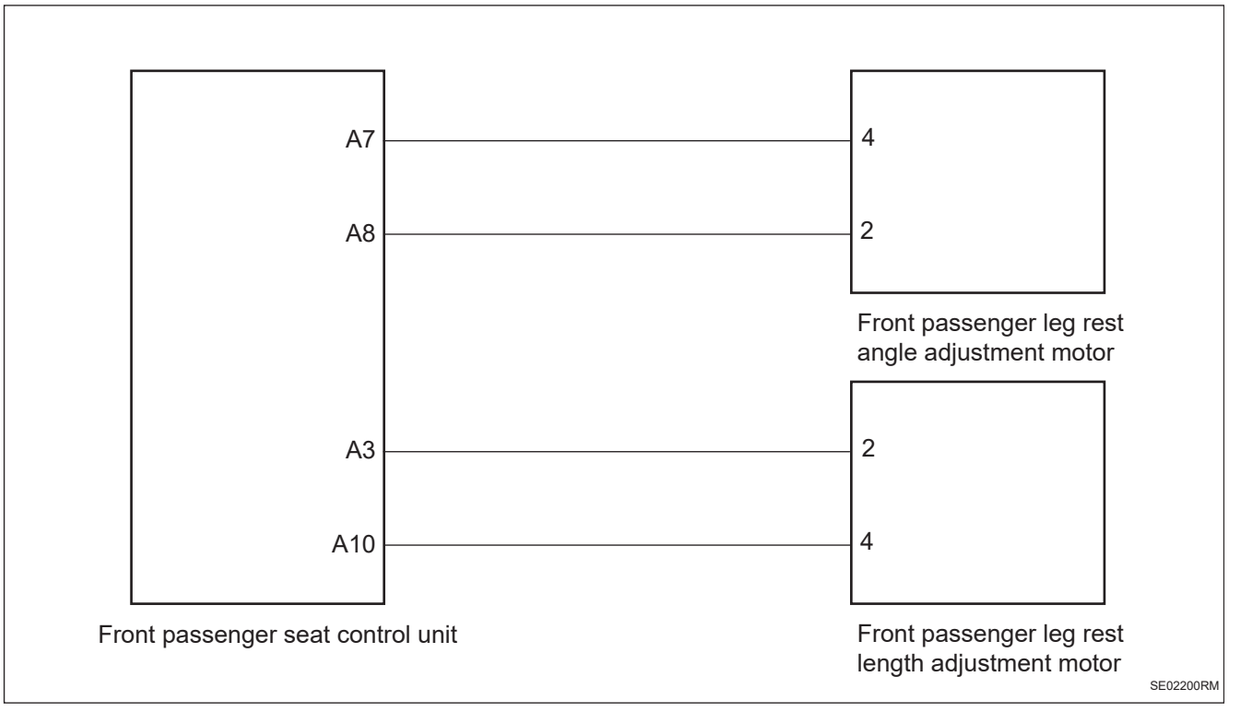
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D211	KL30 voltage is normal Drive leg rest motor	The chip detects a short circuit to ground (8 μs) or a current greater than 25 A for 2 ms	2 ms	Periodic type	100 us	• Front passenger seat leg rest angle adjustment motor • Front passenger seat leg rest length adjustment motor • Wire harness and connector • Front passenger seat control unit
B15D215	KL30 voltage is normal Drive leg rest motor	Motor current < 1 A (TBD) and no valid Hall signal detected	2 s	Periodic type	10 ms	• Front passenger seat leg rest angle adjustment motor • Front passenger seat leg rest length adjustment motor • Wire harness and connector • Front passenger seat control unit

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D311	KL30 voltage is normal Drive leg rest motor	The chip detects a short circuit to ground (8 μs) or a current greater than 25 A for 2 ms	2 ms	Periodic type	100 us	• Front passenger seat leg rest angle adjustment motor • Front passenger seat leg rest length adjustment motor • Wire harness and connector • Front passenger seat control unit
B15D315	KL30 voltage is normal Drive leg rest motor	Motor current < 1 A (TBD) and no valid Hall signal detected	2 s	Periodic type	10 ms	• Front passenger seat leg rest angle adjustment motor • Front passenger seat leg rest length adjustment motor • Wire harness and connector • Front passenger seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15D211	Manual adjustment of leg rest motor is incontinuous	Not come on
B15D215	Manual adjustment of leg rest motor is incontinuous	Not come on
B15D311	Manual adjustment of leg rest motor is incontinuous	Not come on
B15D315	Manual adjustment of leg rest motor is incontinuous	Not come on

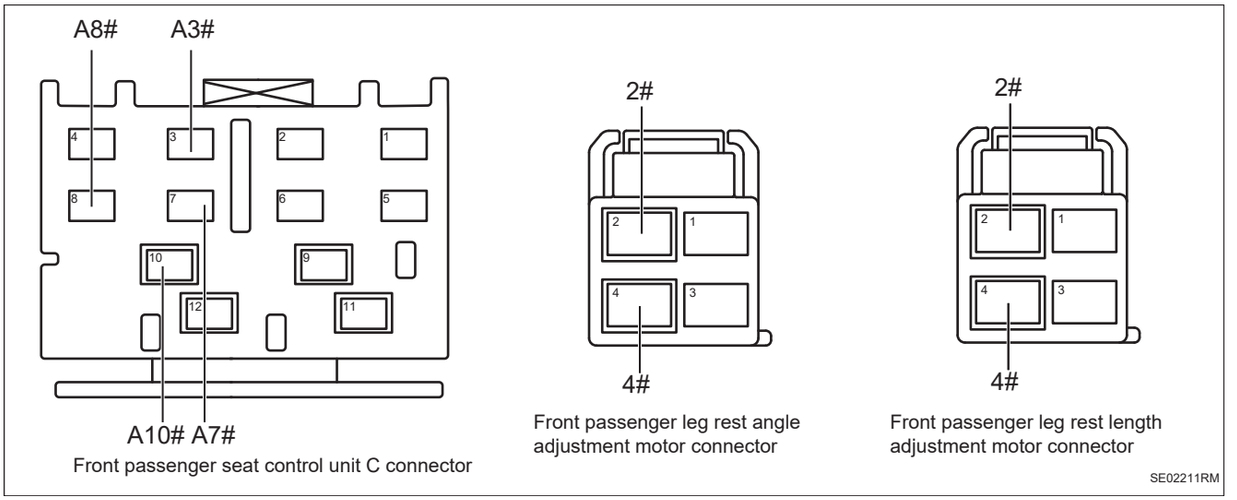
Circuit diagram



ZD

Inspection procedure

1	**Check for open in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger leg rest angle adjustment motor connector.

(e) Disconnect the front passenger leg rest length adjustment motor connector.

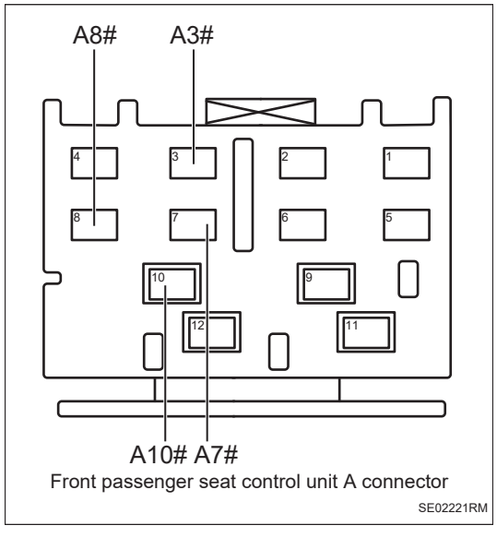
(f) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A7# - front passenger seat leg rest angle adjustment motor connector 4#	Always connected	Less than 1 Ω
Front passenger seat control unit connector A8# - front passenger seat leg rest angle adjustment motor connector 2#	Always connected	Less than 1 Ω
Front passenger seat control unit connector A3# - front passenger seat leg rest length adjustment motor connector 2#	Always connected	Less than 1 Ω
Front passenger seat control unit connector A10# - front passenger seat leg rest length adjustment motor connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

2	**Check for short to ground in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



Front passenger seat control unit A connector

SE02221RM

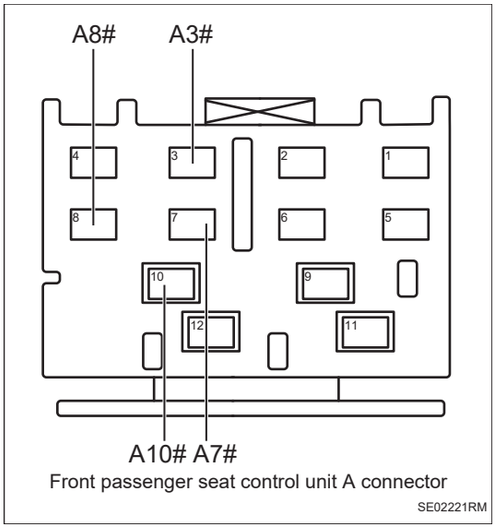
(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A7# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector A8# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector A3# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector A10# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

3	**Check for short to power supply in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



Front passenger seat control unit A connector

SE02221RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector A7# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector A8# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector A3# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector A10# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seat leg rest angle/length adjustment motor (See page NS-67)**

(a) Replace the front passenger seat leg rest angle/length adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace front passenger seat control unit (See page NS-67)**

DTC	B15D329	Seatback motor Hall signal fault

Description

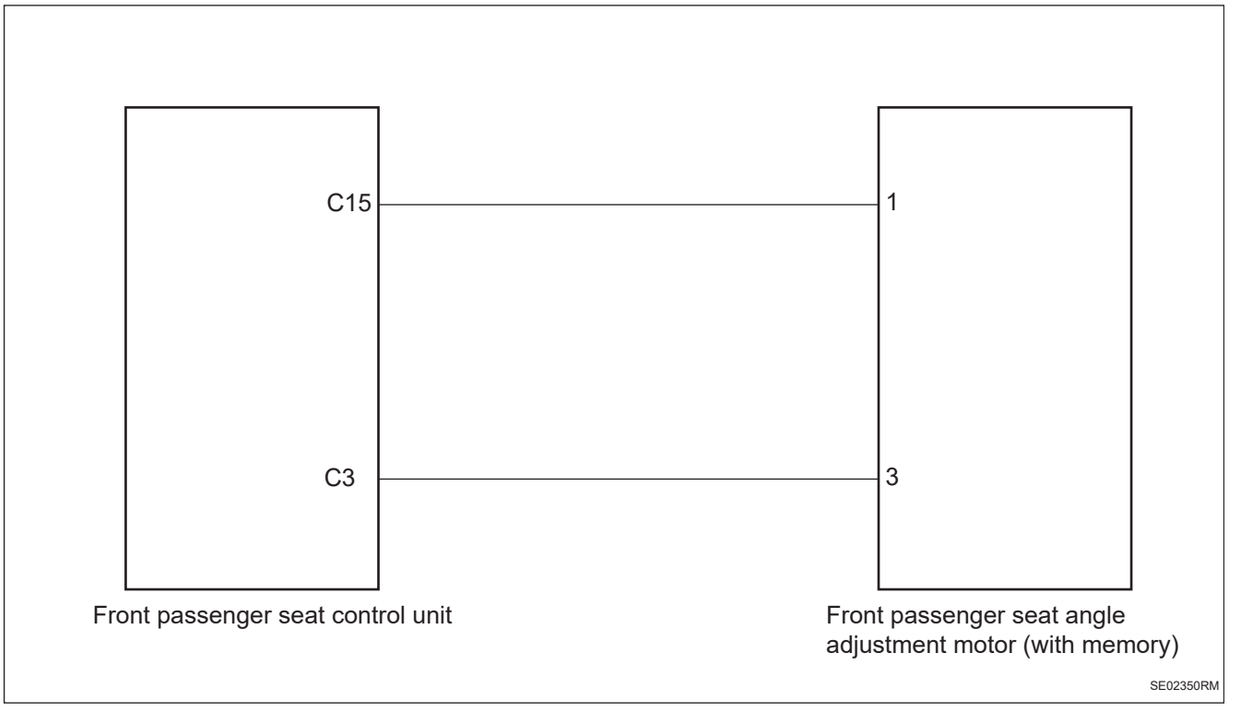
When front passenger seat angle adjustment motor (with memory) Hall signal is faulty, the front passenger seat control unit records the DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D329	KL30 voltage is normal Drive seatback motor 1 A (TBD) < motor current < 5 A (TBD)	Hall signal remains in high or low level	300 ms	Periodic type	1 ms	• Front passenger seat angle adjustment motor (with memory) • Wire harness and connector • Front passenger seat control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B15D329	Manual adjustment of seatback motor is incontinuous	Not come on

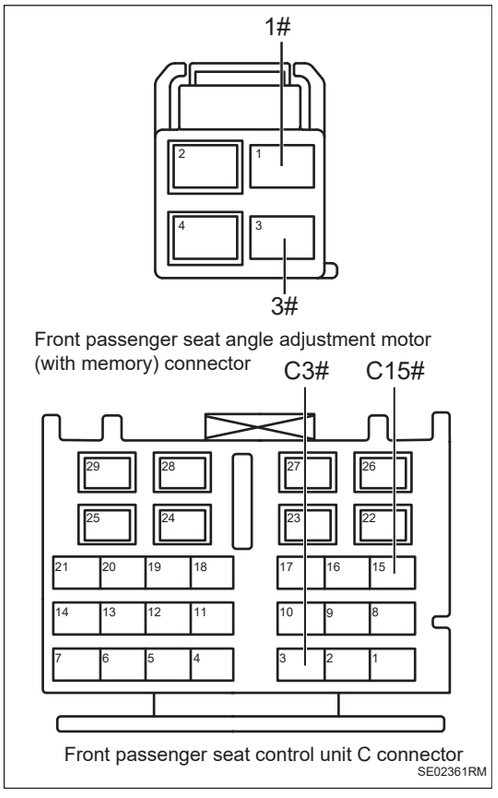
Circuit diagram



ZD

Inspection procedure

1	**Check for open in front passenger seat angle adjustment motor (with memory) wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger seat angle adjustment motor (with memory) connector.

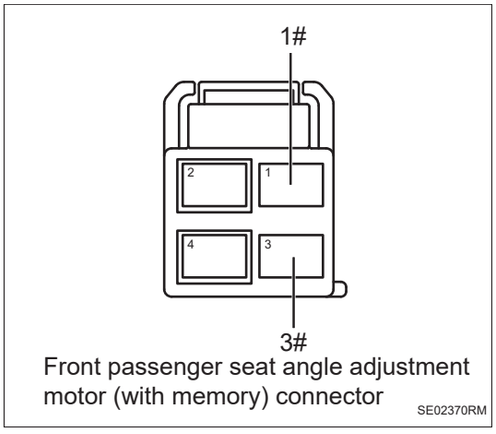
(e) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C15# - front passenger seat angle adjustment motor (with memory) connector 1#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C3# - front passenger seat angle adjustment motor (with memory) connector 3#	Always connected	Less than 1 Ω

NG → Check and repair or replace wire harness and connector

2	Check for short to ground in front passenger seat angle adjustment motor (with memory) wire harness and connector



Front passenger seat angle adjustment motor (with memory) connector
SE02370RM

(a) According to value in the table, measure resistance.

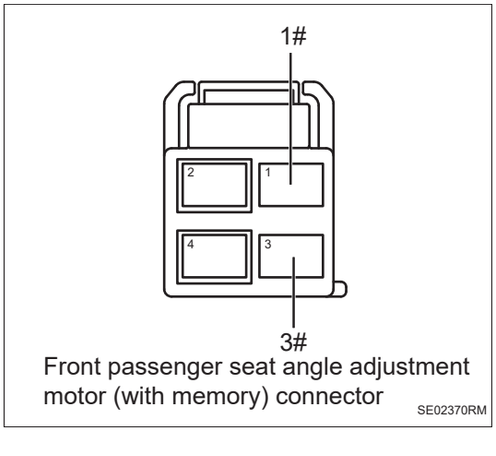
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat angle adjustment motor (with memory) connector 1# - body ground	Always connected	10 KΩ or more
Front passenger seat angle adjustment motor (with memory) connector 3# - body ground	Always connected	10 KΩ or more

ZD

NG → Check and repair or replace wire harness and connector

3	Check for short to power supply in front passenger seat angle adjustment motor (with memory) wire harness and connector



Front passenger seat angle adjustment motor (with memory) connector
SE02370RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat angle adjustment motor (with memory) connector 1# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat angle adjustment motor (with memory) connector 3# - body ground	Ignition switch "ON"	Less than 1 V

NG → Check and repair or replace wire harness and connector

OK

4	**Replace front passenger seat angle adjustment motor (with memory) (See page NS-67)**

(a) Replace the front passenger seat angle adjustment motor (with memory).

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front passenger seat control unit (See page NS-67)**

DTC	**B15D429**	**Seat leg rest telescopic motor Hall signal fault**
DTC	**B15D529**	**Seat leg rest upper/lower motor Hall signal fault**

Description

When front passenger seat leg rest angle motor, leg rest length motor Hall signal is faulty, the front passenger seat control unit records the DTC.

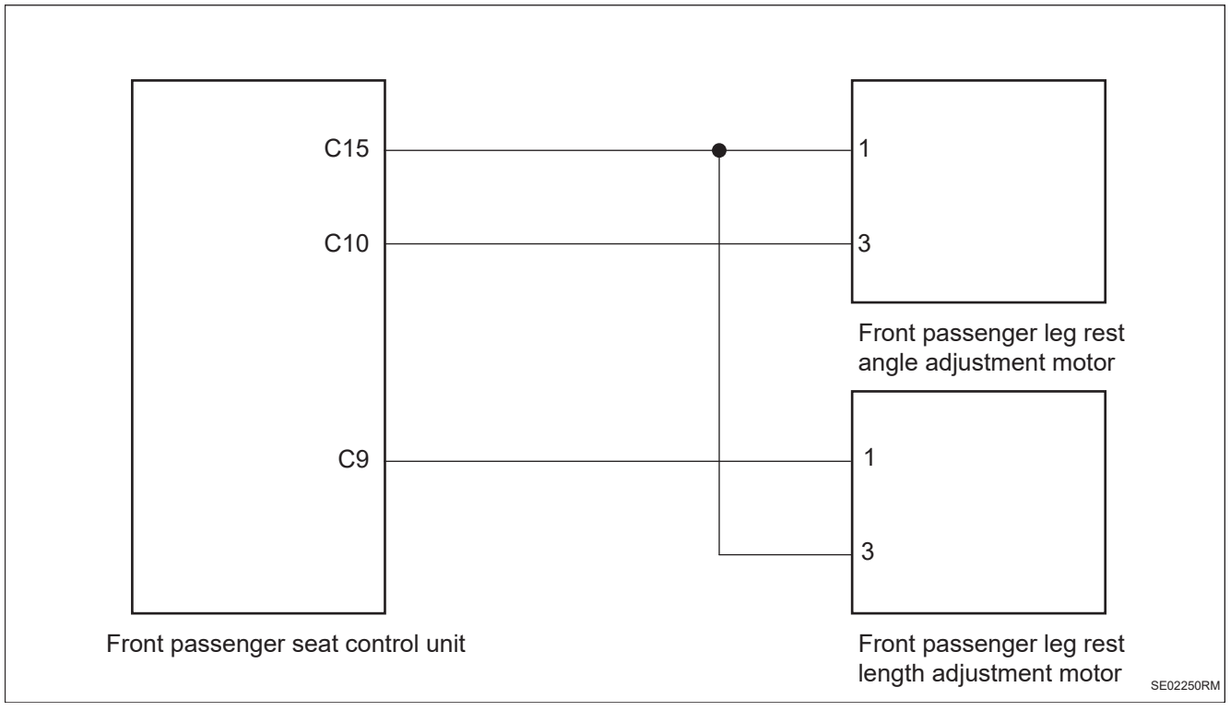
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D429	KL30 voltage is normal Drive leg rest length motor 1 A (TBD) < motor current < 5 A (TBD)	Hall signal remains in high or low level	300 ms	Periodic type	1 ms	• Front passenger seat leg rest length adjustment motor • Wire harness and connector • Front passenger seat control unit
B15D529	KL30 voltage is normal Drive leg rest angle motor 1 A (TBD) < motor current < 5 A (TBD)	Hall signal remains in high or low level	300 ms	Periodic type	1 ms	• Front passenger seat leg rest angle adjustment motor • Wire harness and connector • Front passenger seat control unit

ZD

Fault symptom

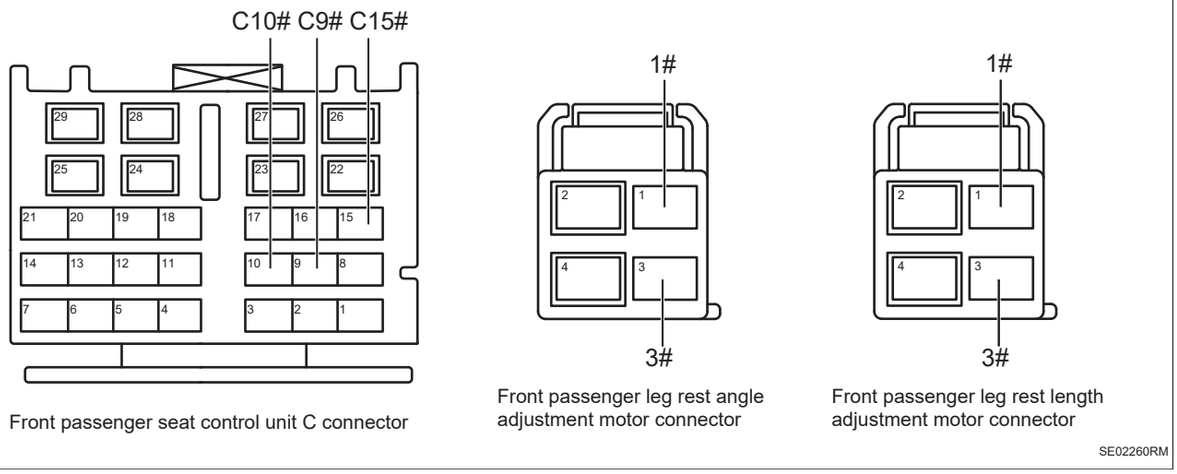
DTC No.	Fault symptom	Warning light/indicator
B15D429	Manual adjustment of leg rest motor is incontinuous	Not come on
B15D529	Manual adjustment of leg rest motor is incontinuous	Not come on

Circuit diagram



Inspection procedure

1	**Check for open in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



Front passenger seat control unit C connector

Front passenger leg rest angle adjustment motor connector

Front passenger leg rest length adjustment motor connector

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Disconnect the front passenger leg rest angle adjustment motor connector.

(e) Disconnect the front passenger leg rest length adjustment motor connector.

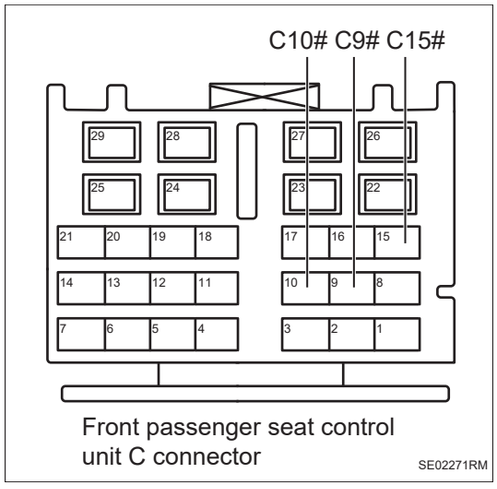
(f) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C15# - front passenger seat leg rest angle adjustment motor connector 1#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C10# - front passenger seat leg rest angle adjustment motor connector 3#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C9# - front passenger seat leg rest length adjustment motor connector 1#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C15# - front passenger seat leg rest length adjustment motor connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

2	**Check for short to ground in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



(a) According to value in the table, measure resistance.

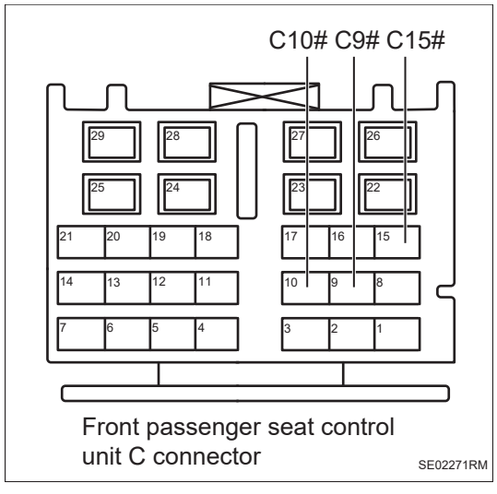
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C15# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector C10# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector C9# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

3	**Check for short to power supply in front passenger seat leg rest angle/length adjustment motor wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C15# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector C10# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger seat control unit connector C9# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seat leg rest angle/length adjustment motor (See page NS-67)**

(a) Replace the front passenger seat leg rest angle/length adjustment motor.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front passenger seat control unit (See page NS-67)**

DTC	**B15D611**	**Short to ground in seat cushion heater output**
DTC	**B15D615**	**Open in seat cushion heater output**
DTC	**B15D811**	**Short to ground in heater sensor**
DTC	**B15D815**	**Open in heater sensor**
DTC	**B15D915**	**Seat NTC abnormal**

Description

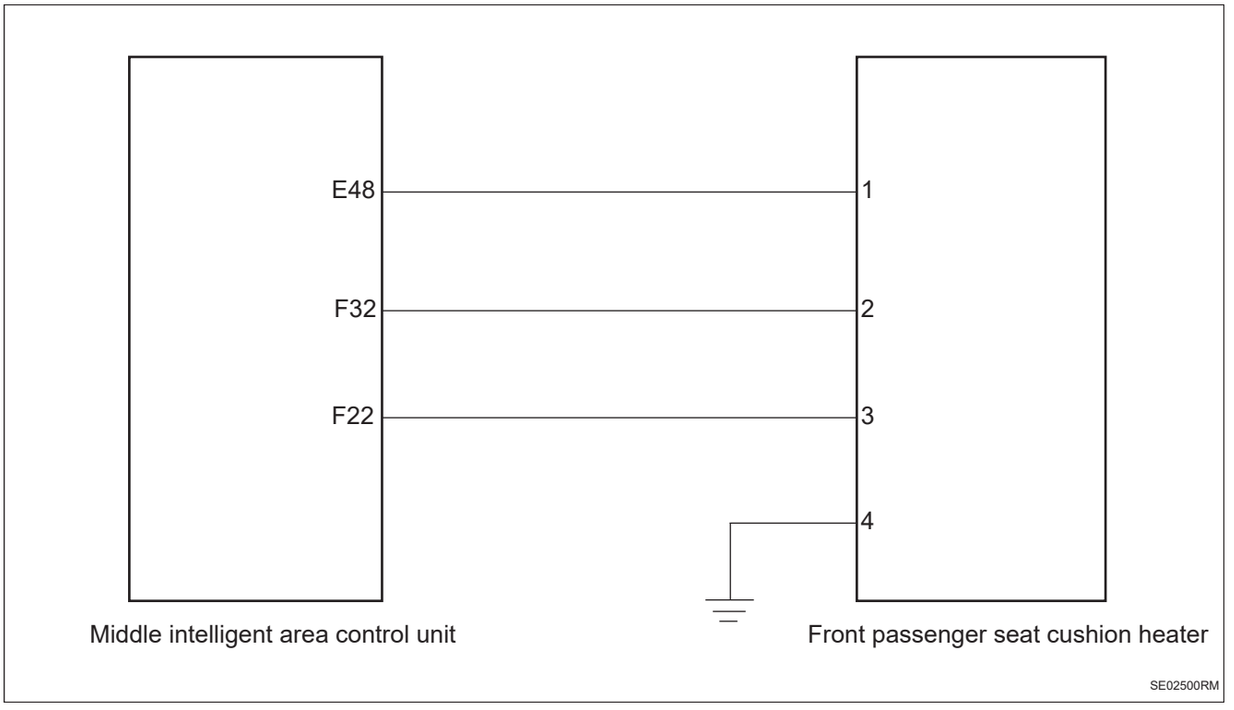
When there are short to ground or open in front passenger seat cushion heater and sensor, the front passenger seat control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D611	KL30 voltage is normal Power supply is ON Heating is in output status	Short to ground in seat cushion heater output (sampling voltage > 4.0 V) or chip cutoff (2 ms)	2 ms/200 ms	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit
B15D615	KL30 voltage is normal Power supply is ON Heating is in output status	Open in seat cushion heater output (sampling voltage < 0.2 V)	2 s	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit
B15D811	KL30 voltage is normal DSCU wake-up	NTC is short to ground (sampling voltage < 0.1 V)	2 s	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit
B15D815	KL30 voltage is normal DSCU wake-up	Short to ground in seat cushion NTC (sampling voltage > 4.9 V)	2 s	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit
B15D915	Voltage is between 9 V and 16 V NTC is normal	The full-speed heating does not reach the NTC impact temperature within the detection time (TBD) or controlled temperature does not reach the NTC set temperature within the detection time (TBD)	2000 ms	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit

Fault symptom

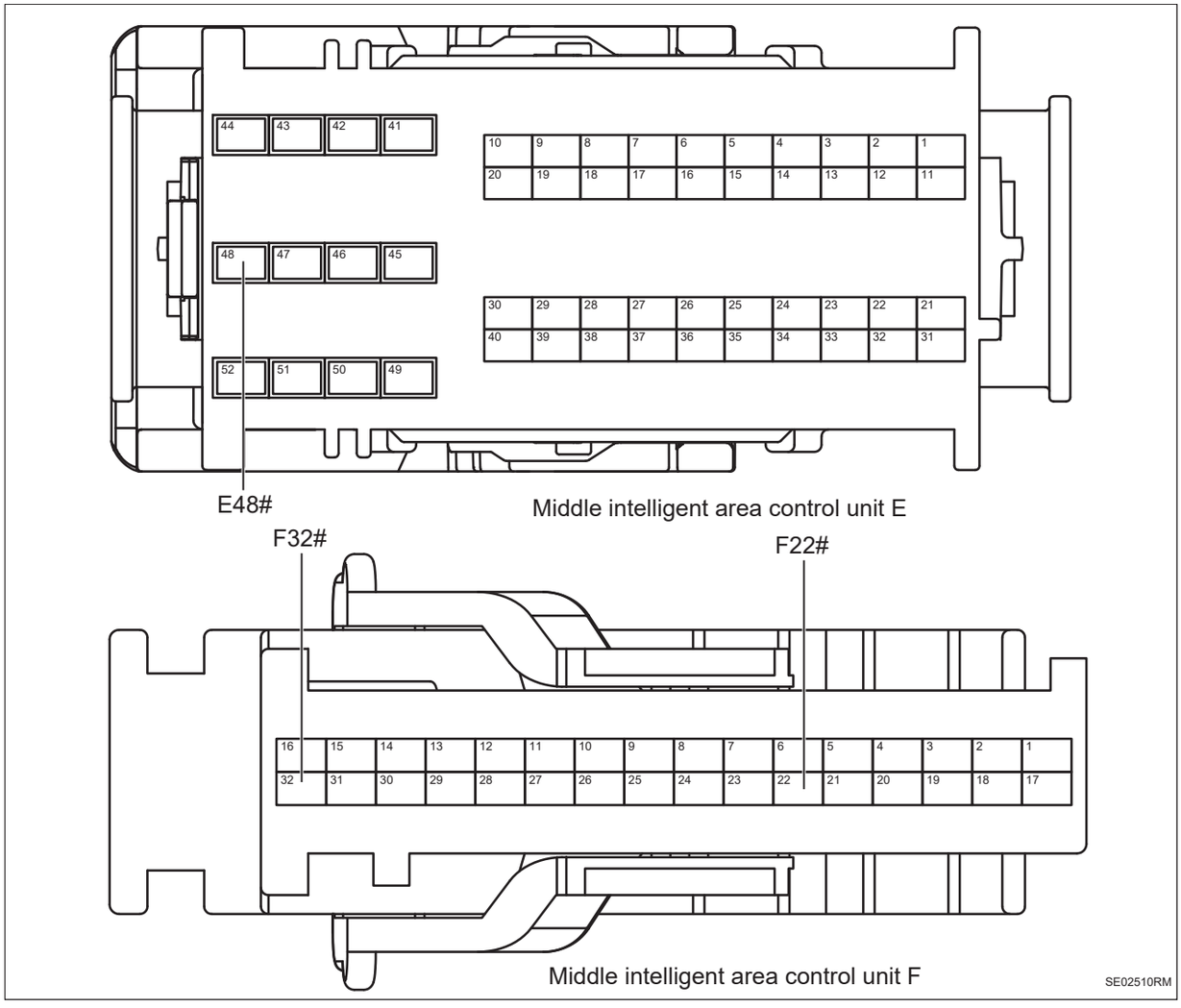
DTC No.	Fault symptom	Warning light/indicator
B15D611	Heating function failure	Not come on
B15D615	Heating function failure	Not come on
B15D811	Heating function failure	Not come on
B15D815	Heating function failure	Not come on
B15D915	NTC function failure	Not come on

Circuit diagram

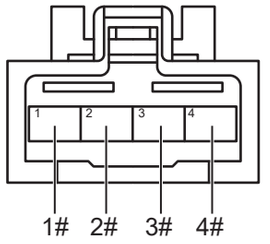


Inspection procedure

1	**Check for open in front passenger seat cushion heater wire harness and connector**



ZD



Front passenger seat cushion heater connector SE02520RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat cushion heater connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

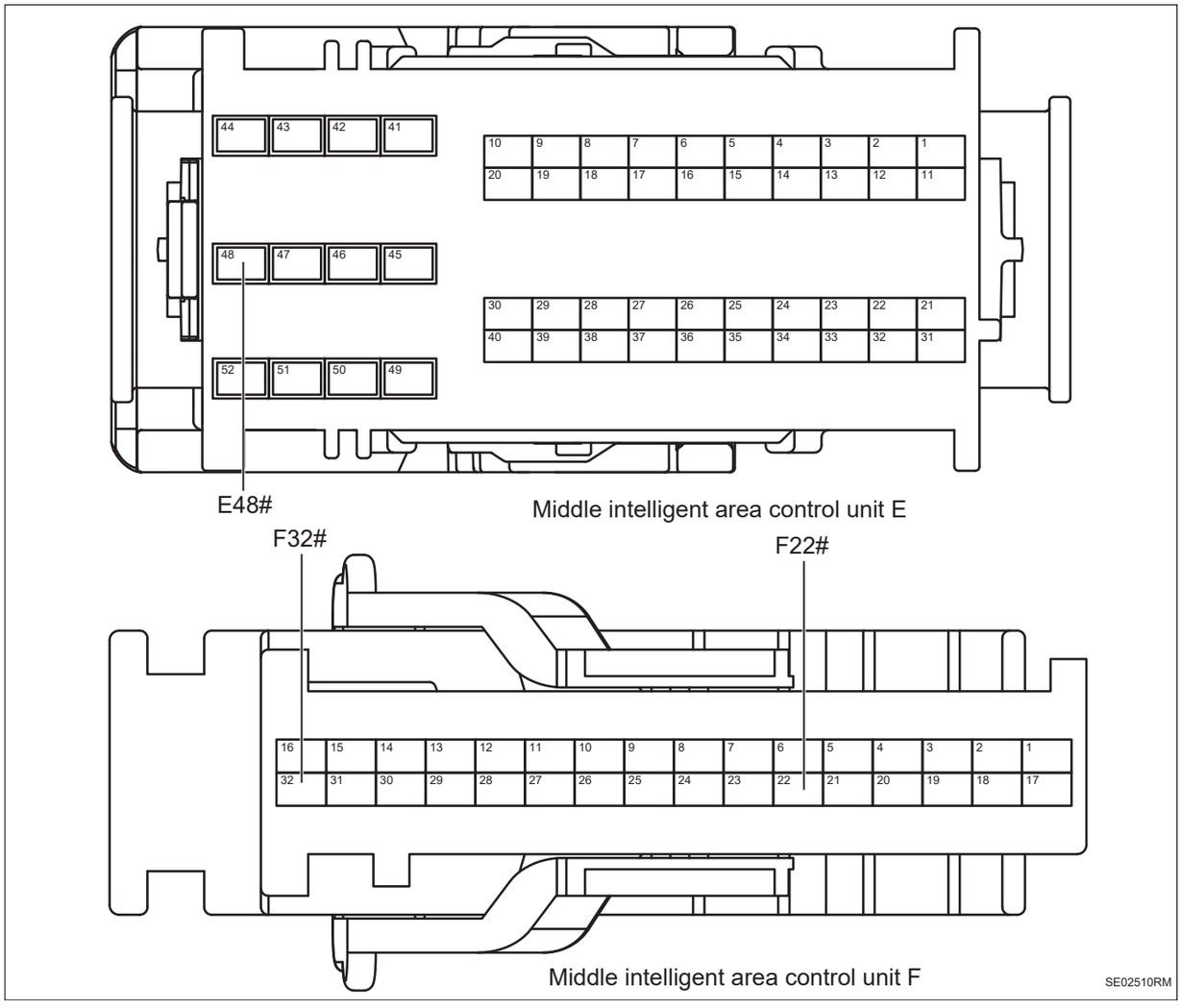
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - front passenger seat cushion heater connector 1#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F32# - front passenger seat cushion heater connector 2#	Always connected	Less than 1 Ω
Middle intelligent area control unit connector F22# - front passenger seat cushion heater connector 3#	Always connected	Less than 1 Ω
Front passenger seat cushion heater connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seat cushion heater wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F32# - body ground	Always connected	10 KΩ or more
Middle intelligent area control unit connector F22# - body ground	Always connected	10 KΩ or more

NG → Check and repair or replace wire harness and connector

OK

3	**Check CAN line (middle intelligent area control unit - front passenger seat control unit)**

(a) Check for open in CAN line.

(b) Check for short in CAN line.

ZD

NG → Check and repair or replace wire harness and connector

OK

4	**Replace front passenger seat cushion heater (See page NS-67)**

(a) Replace the front passenger seat cushion heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → Replace front passenger seat control unit or middle intelligent area control unit

OK

Diagnosis ends

DTC	**B15D711**	**Short to ground in seatback heater output**
DTC	**B15D715**	**Open in seatback heater output**

Description

When there is short to ground or open in front passenger seatback heater, the front passenger seat control unit records DTC.

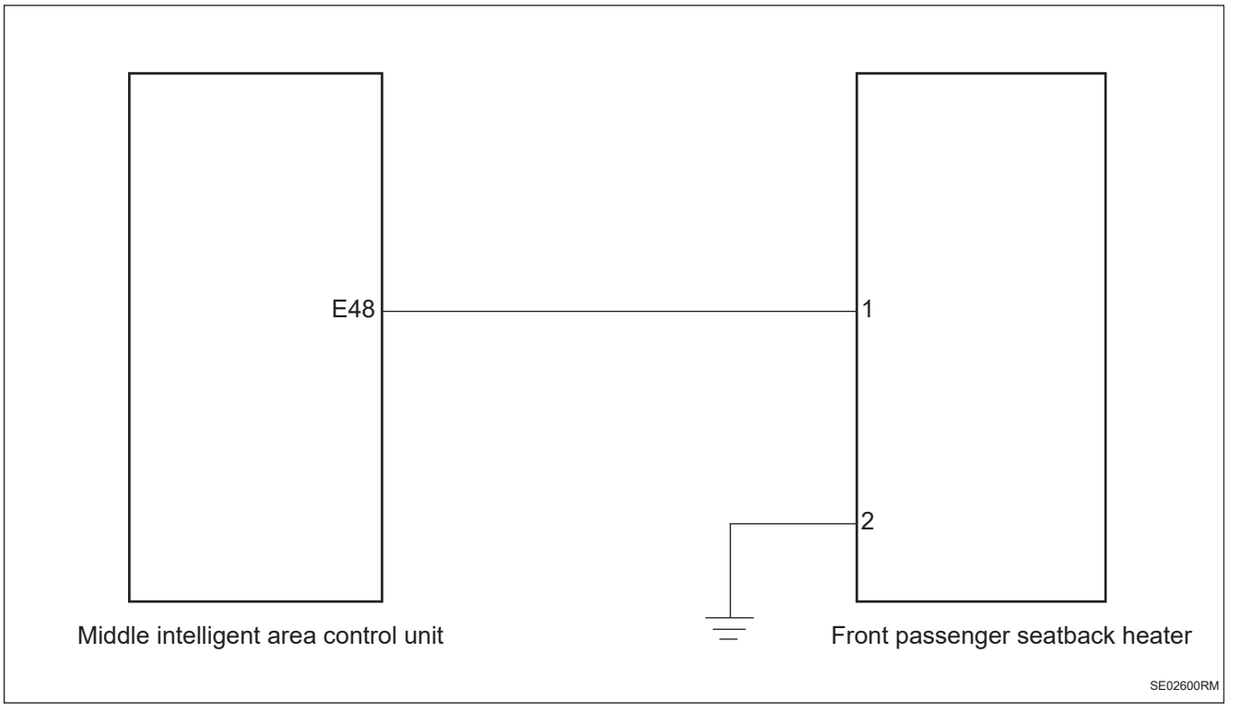
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B15D611	KL30 voltage is normal Power supply is ON Heating is in output status	Short to ground in seat cushion heater output (sampling voltage > 4.0 V) or chip cutoff (2 ms)	2 ms/200 ms	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit
B15D615	KL30 voltage is normal Power supply is ON Heating is in output status	Open in seat cushion heater output (sampling voltage < 0.2 V)	2 s	Periodic type	10 ms	• Front passenger seat cushion heater • Wire harness and connector • Front passenger seat control unit • Middle intelligent area control unit

ZD

Fault symptom

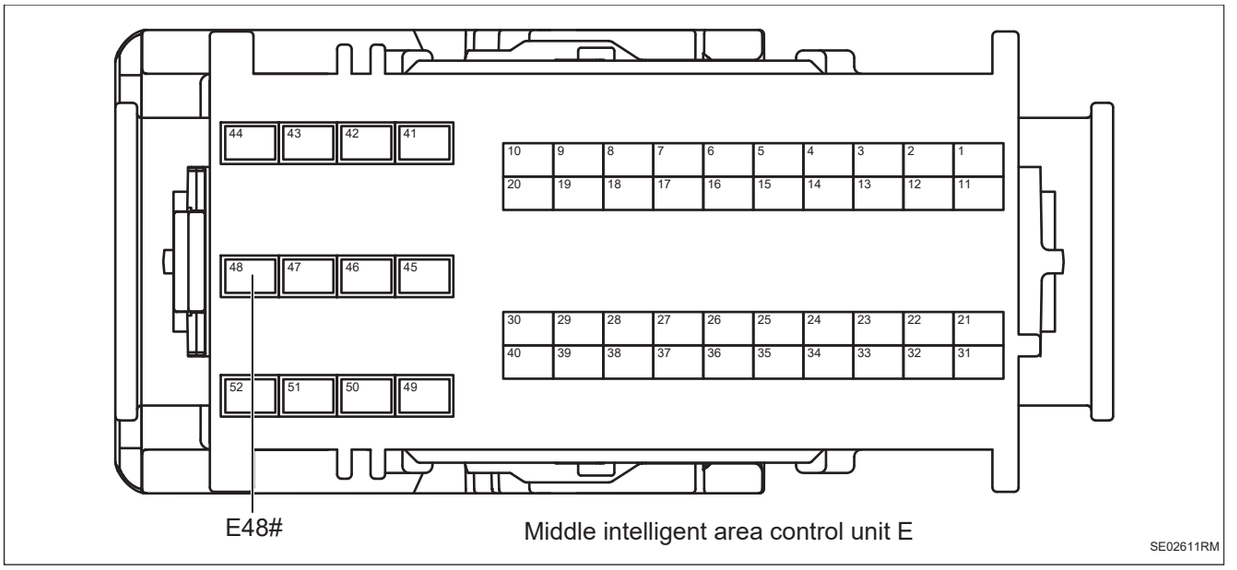
DTC No.	Fault symptom	Warning light/indicator
B15D611	Heating function failure	Not come on
B15D615	Heating function failure	Not come on

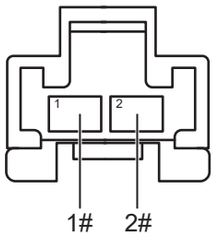
Circuit diagram



Inspection procedure

1	**Check for open in front passenger seatback heater wire harness and connector**





Front passenger seatback heater connector

SE02620RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seatback heater connector.

(d) Disconnect the middle intelligent area control unit connector.

(e) According to value in the table, measure resistance.

Standard value

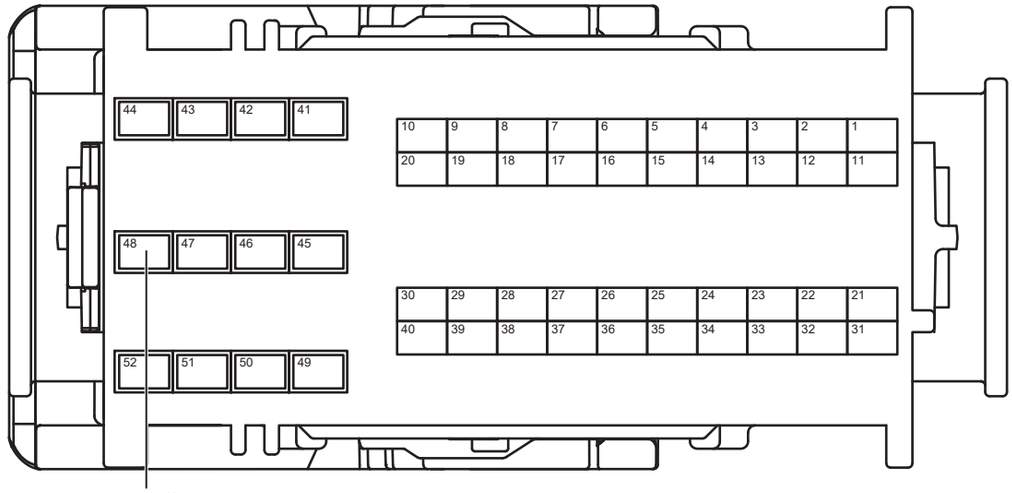
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - front passenger seatback heater connector 1#	Always connected	Less than 1 Ω
Front passenger seatback heater connector 2# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger seatback heater wire harness and connector**



Middle intelligent area control unit E

SE02611RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E48# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check CAN line (middle intelligent area control unit - front passenger seat control unit)**

(a) Check for open in CAN line.

(b) Check for short in CAN line.

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger seatback heater (See page NS-67)**

(a) Replace the front passenger seatback heater.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace front passenger seat control unit (See page NS-67)**

OK

Diagnosis ends

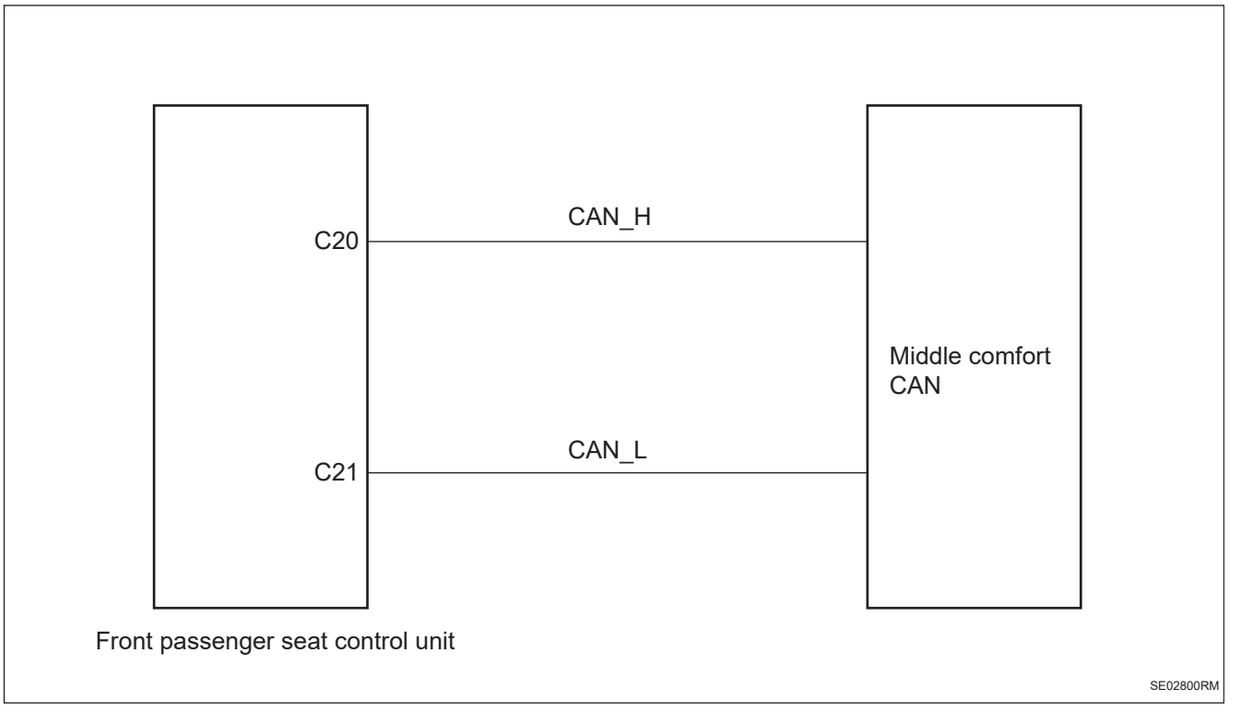
DTC	U002888	Comfort CAN bus off

Description

When front passenger seat control unit detects central comfort CAN bus off fault, the front passenger seat control unit records DTC.

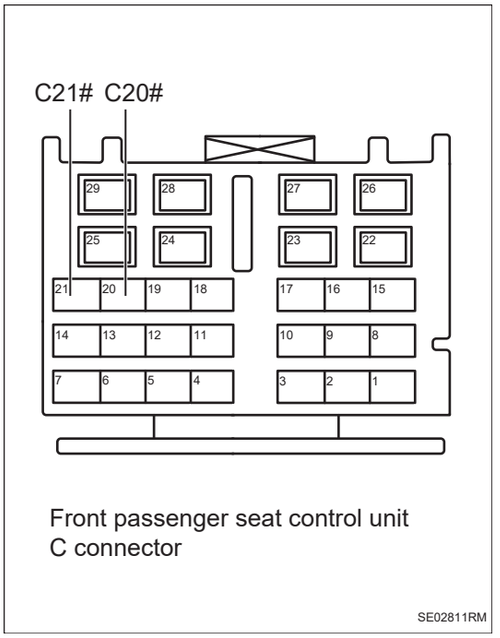
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front passenger seat control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C20# - front passenger seat control unit connector C21#	Always connected	Approximately 60 Ω

NG	**Perform repair according to malfunction**

OK

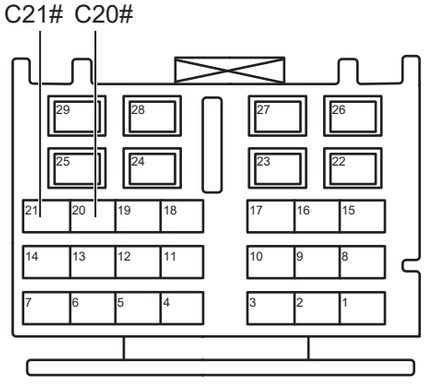
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Front passenger seat control unit
C connector

SE02811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

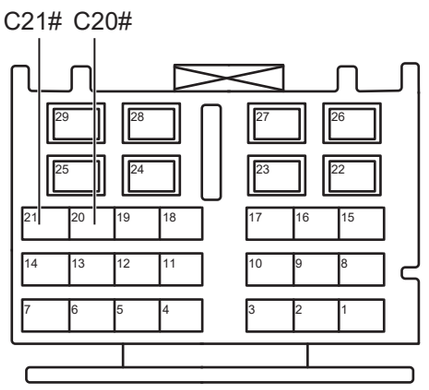
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C20# - front passenger seat control unit connector C21#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in central comfort CAN bus**



Front passenger seat control unit
C connector

SE02811RM

(a) According to value in the table, measure resistance.

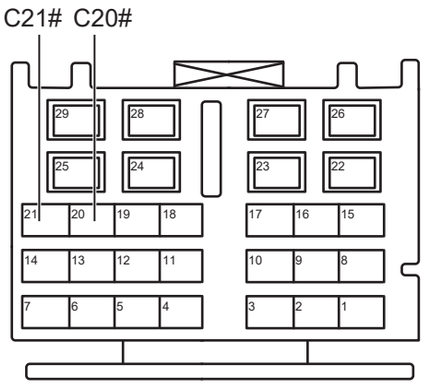
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C20# - body ground	Always connected	10 KΩ or more
Front passenger seat control unit connector C21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Front passenger seat control unit
C connector

SE02811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C20# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front passenger seat control unit connector C21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

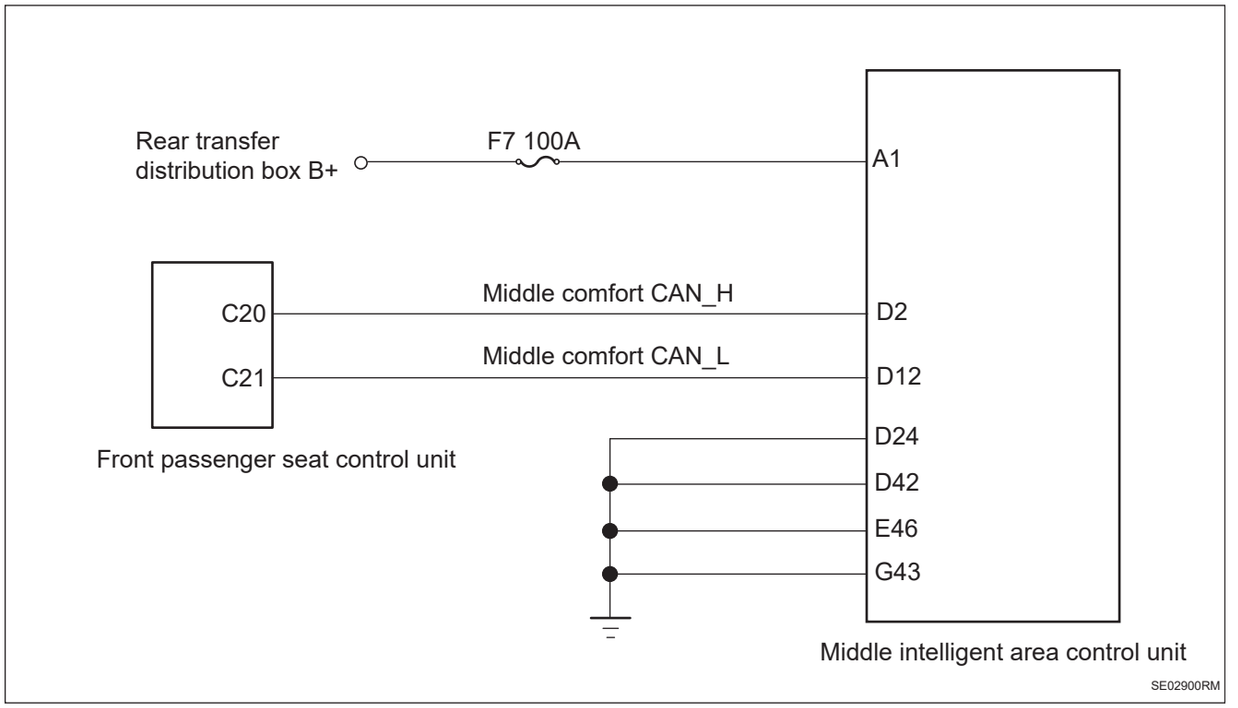
DTC	U014687	PDCM node lost

Description

When communication between front passenger seat control unit and middle intelligent area control unit is abnormal or interrupted, the front passenger seat control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Middle intelligent area control unit • Front passenger seat control unit • Middle intelligent area control unit • Combination switch

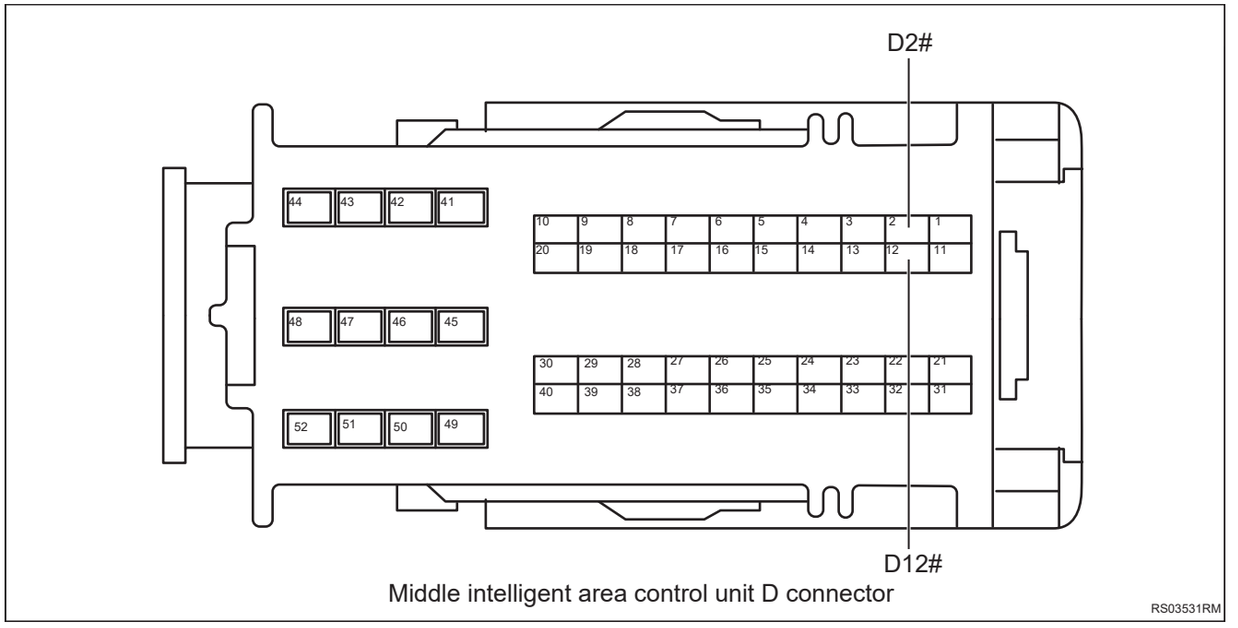
Circuit diagram

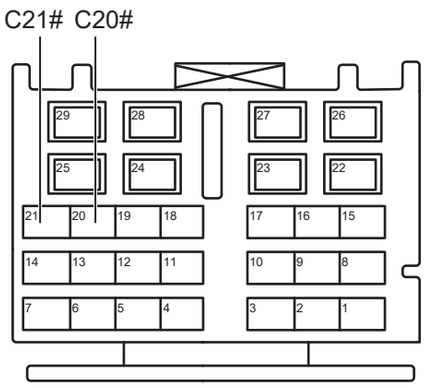


ZD

Inspection procedure

1	**Check for open in middle comfort CAN bus (front passenger seat control unit - middle intelligent area control unit)**





Front passenger seat control unit C connector

SE02811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

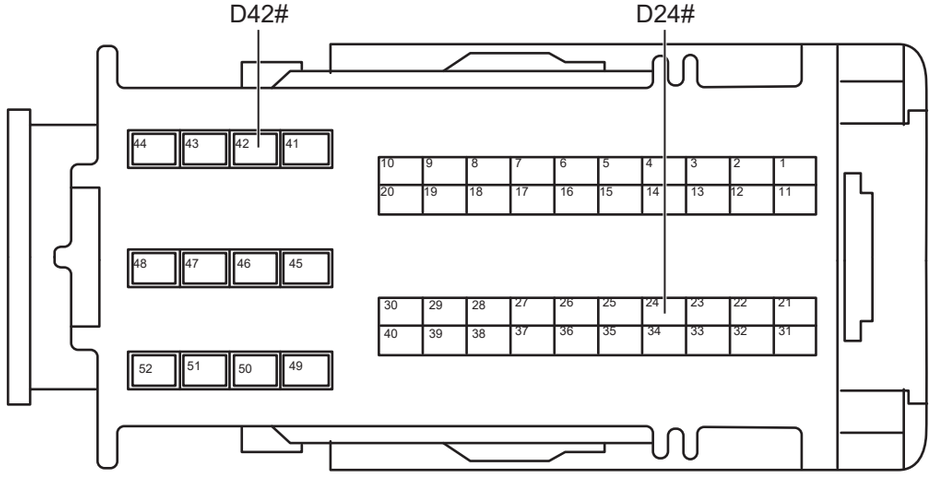
Multimeter connection	Detection condition	Specified condition
Front passenger seat control unit connector C20# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Front passenger seat control unit connector C21# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

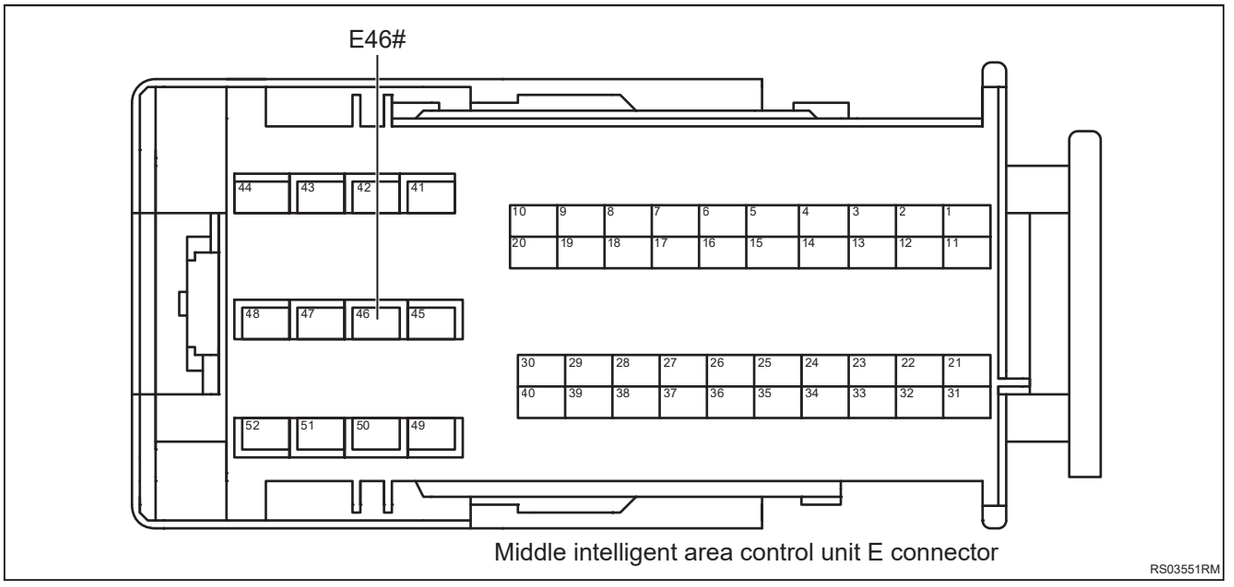
OK

2	**Check middle intelligent area control unit ground**

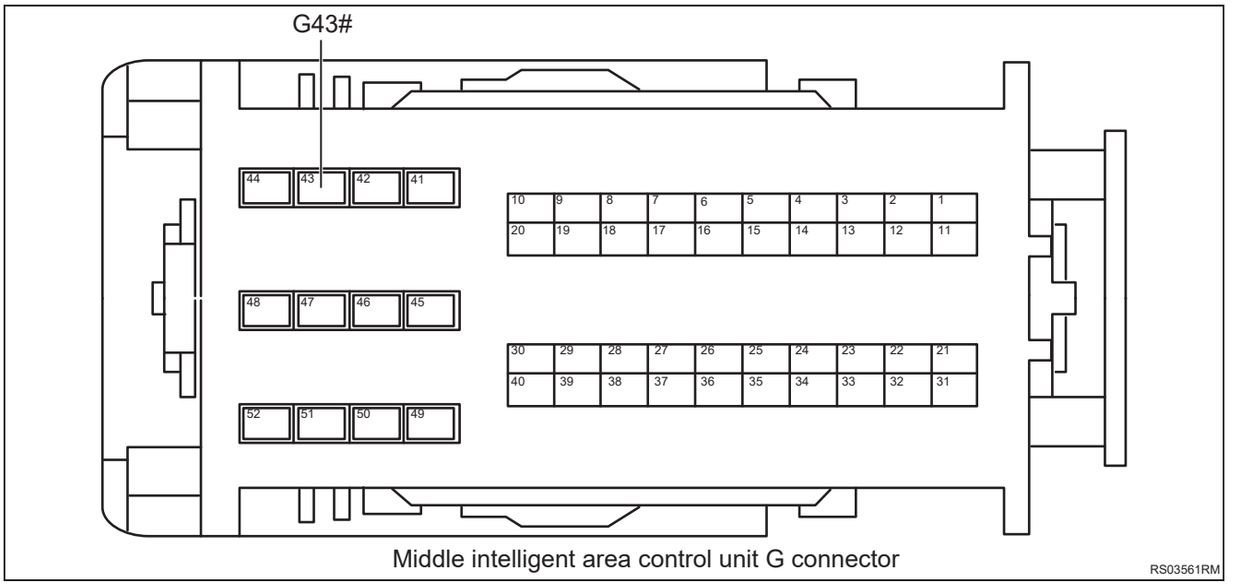


Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector



Middle intelligent area control unit G connector

(a) According to value in the table, measure resistance.

Standard value

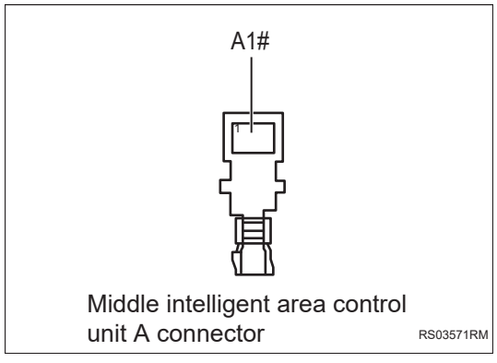
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check middle intelligent area control unit power supply



Middle intelligent area control unit A connector RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

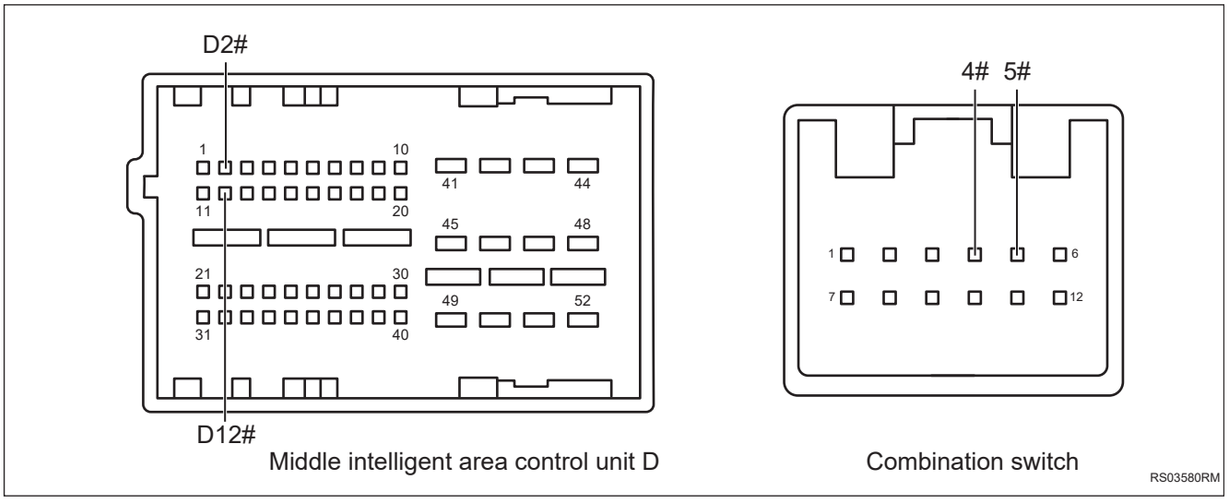
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → Replace front passenger seat control unit (See page NS-67)

OK

Diagnosis ends

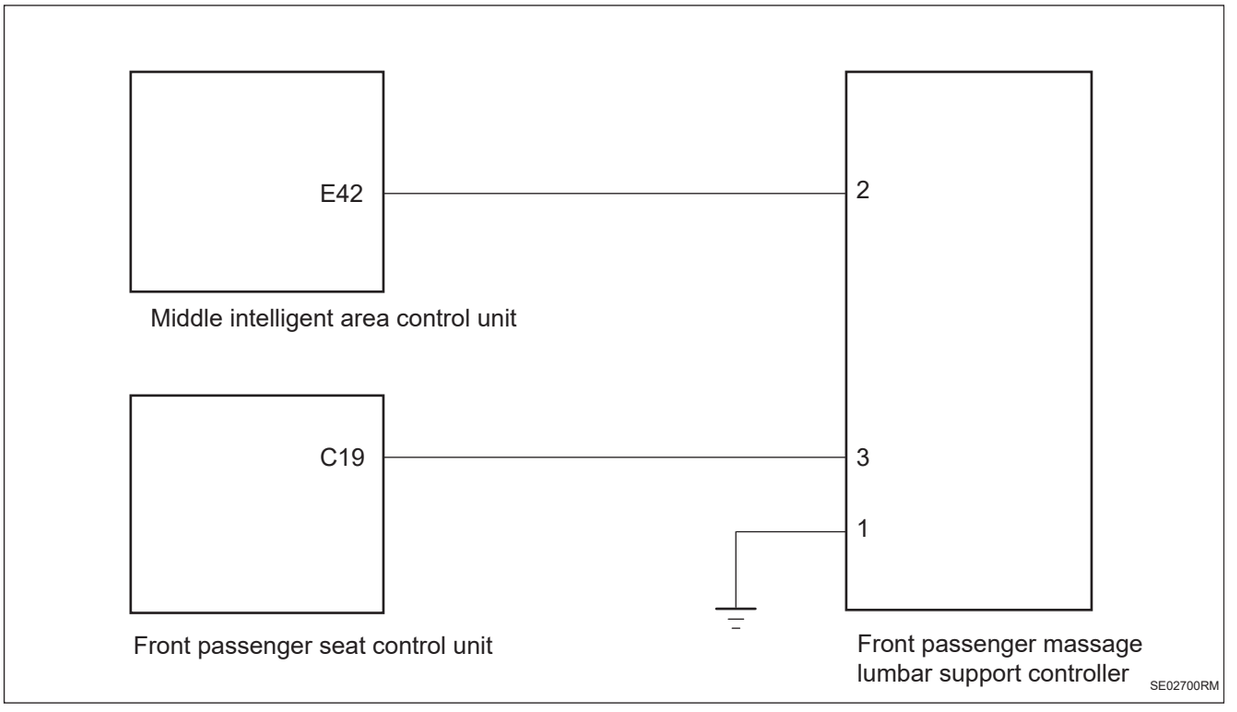
DTC	U102388	LIN1 physical bus error
DTC	U134186	Front right seat massage air pump LIN communication error
DTC	U025287	Front right seat massage air pump node lost
DTC	U034186	Front right seat massage air pump fault

Description

When front passenger massage lumbar support controller communication is abnormal or interrupted, the front passenger seat control unit records DTC.

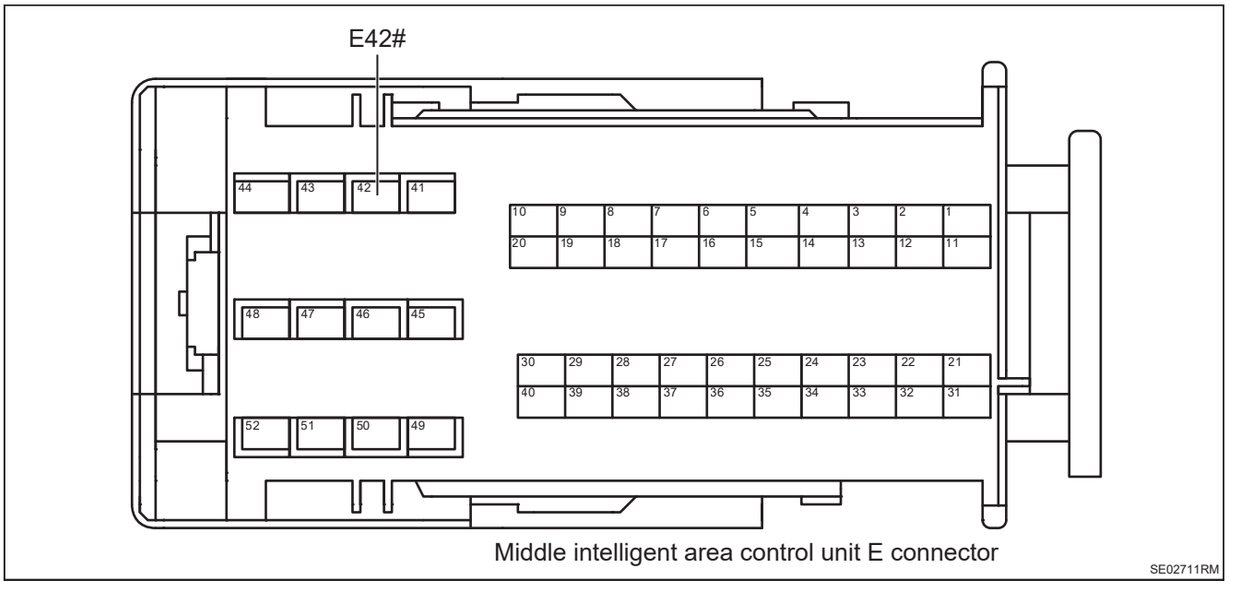
DTC No.	DTC detection condition	Faulty area
U102388	(a) LIN1 physical bus error.	• Front passenger massage lumbar support controller • Wire harness and connector • Front passenger seat control unit
U134186	(a) Front right seat massage air pump LIN communication error.	• Front passenger massage lumbar support controller • Wire harness and connector • Front passenger seat control unit
U025287	(a) Front right seat massage air pump node lost.	• Front passenger massage lumbar support controller • Wire harness and connector • Front passenger seat control unit
U034186	(a) Front right seat massage air pump fault.	• Front passenger massage lumbar support controller • Wire harness and connector • Front passenger seat control unit

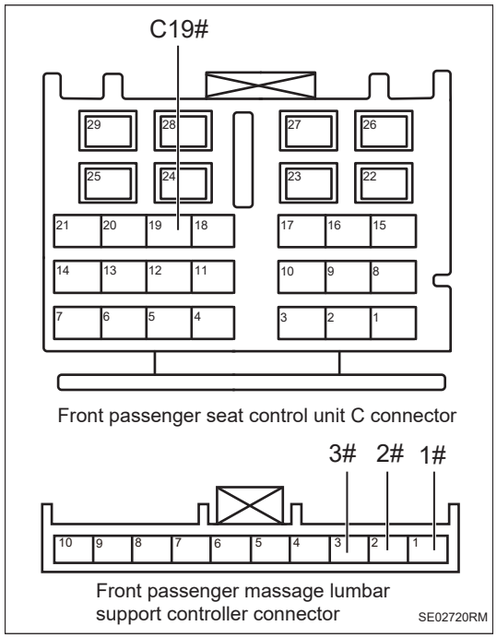
Circuit diagram



Inspection procedure

1	**Check for open in front passenger massage lumbar support controller wire harness and connector**





(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the middle intelligent area control unit connector.

(d) Disconnect the front passenger massage lumbar support controller connector.

(e) Disconnect the front passenger seat control unit connector.

(f) According to value in the table, measure resistance.

Standard value

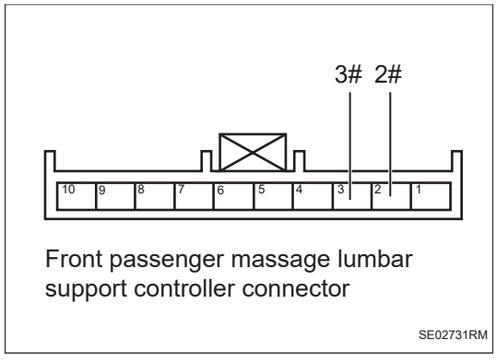
Multimeter connection	Detection condition	Specified condition
Front passenger massage lumbar support controller connector 2# - middle intelligent area control unit connector E42#	Always connected	Less than 1 Ω
Front passenger massage lumbar support controller connector 3#- - front passenger seat control unit connector C19#	Always connected	Less than 1 Ω
Front passenger massage lumbar support controller connector 1# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front passenger massage lumbar support controller wire harness and connector**



(a) According to value in the table, measure resistance.

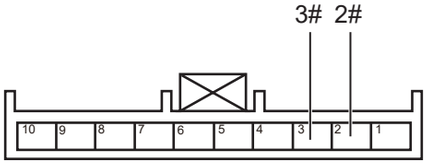
Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger massage lumbar support controller connector 2# - body ground	Always connected	10 KΩ or more
Front passenger massage lumbar support controller connector 3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in front passenger massage lumbar support controller wire harness and connector**



Front passenger massage lumbar support controller connector

SE02731RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front passenger massage lumbar support controller connector 2# - body ground	Ignition switch "ON"	Less than 1 V
Front passenger massage lumbar support controller connector 3# - body ground	Ignition switch "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front passenger massage lumbar support controller (See page NS-67)**

(a) Replace the front passenger massage lumbar support controller.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front passenger seat control unit (See page NS-67)**

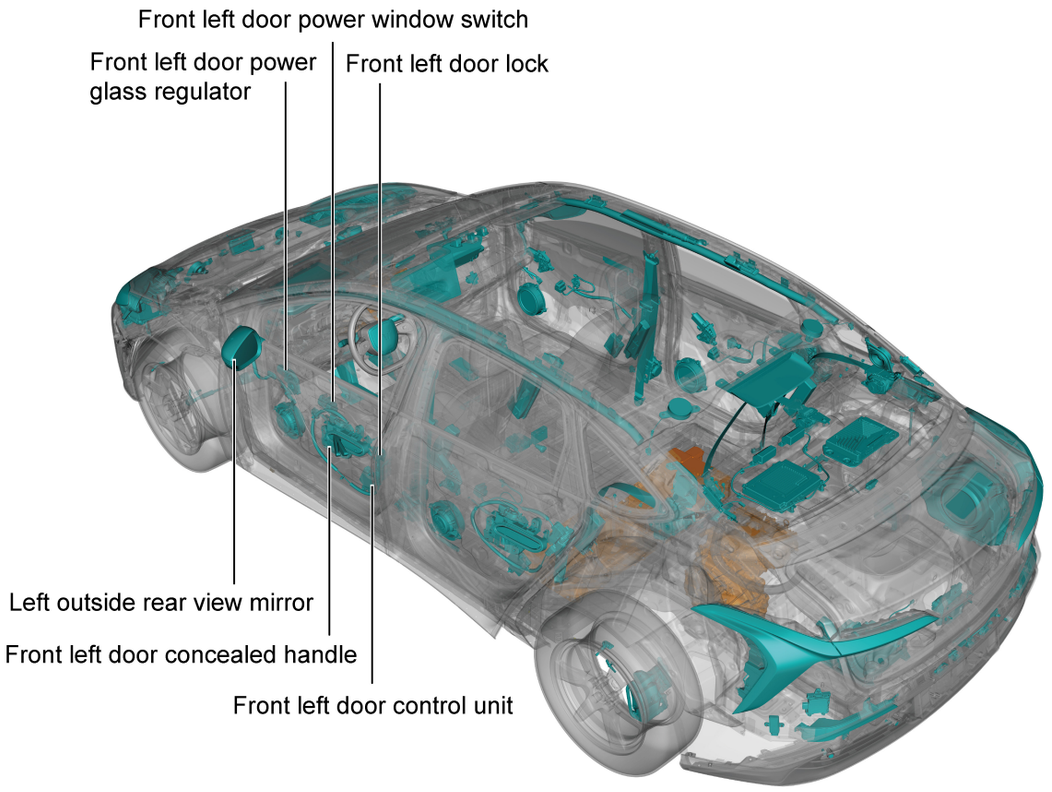
OK

Diagnosis ends

Door control system

Front left door control unit

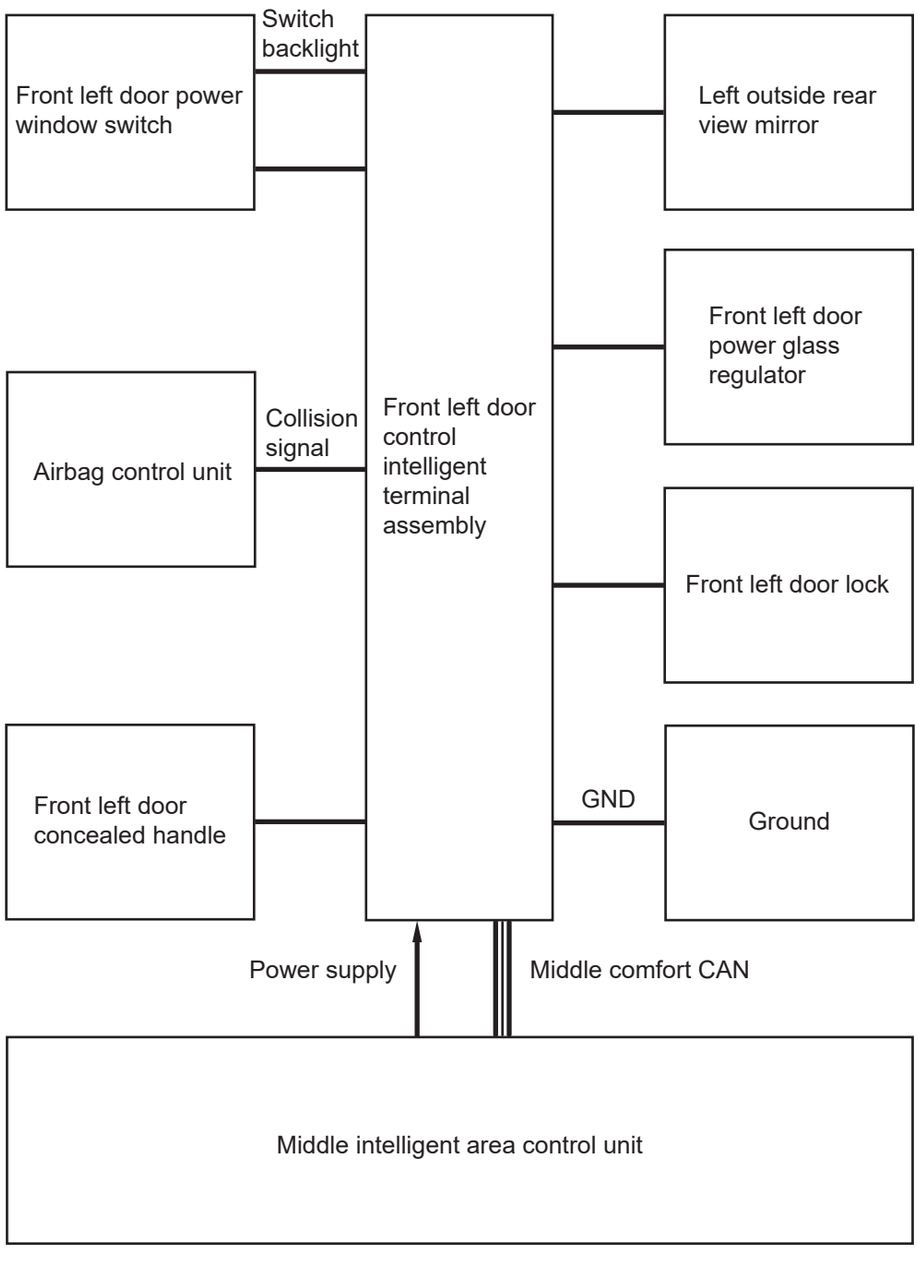
Part position



ED00050RM

ZD

System diagram



Function description

1. Glass regulator:

The user operates the window switches on door inner trim panel, remote control key, voice or remote functions to realize the four-door window up/down and jam protection functions.

(a) Controlling front single side window up/down via voice: The driver or front passenger can rise the window on front sound source side through voice control.

(b) Controlling rear single side window up/down via voice: The driver or front and rear passengers can rise the window on rear sound source side through voice control.

(c) Controlling window up/down via remote key: Users can control the window up/down through remote control key.

(d) Controlling window up/down via voice: Users can control the window up/down through voice control.

(e) Remote control window up/down: Users can control the window up/down through APP.

(f) Bluetooth key control window up/down: Users can realize global window up/down through the control of Bluetooth key.

(g) Automatic window closing on rainy days enabled: User can turn on the function of automatic window closing on rainy days through the soft switch on the central control display.

(h) Automatic window closing on rainy days disabled: User can turn off the function of automatic window closing on rainy days through the soft switch on the central control display.

(i) Automatic window closing on rainy days: Users can turn on the function of automatic window closing on rainy days according to their intention. After this function is turned on, if the vehicle detects rain and the driver or passenger is not in the vehicle, it will automatically perform the window closing operation to prevent rainwater from entering the cabin and causing losses to the user.

(j) Automatic window closing during vehicle locking enabled: User can turn on the function of automatic window closing during vehicle locking through the soft switch on the central control display.

(k) Automatic window closing during vehicle locking disabled: User can turn off the function of automatic window closing during vehicle locking through the soft switch on the central control display.

(l) Automatic window closing during vehicle locking: Users can turn on the function of automatic window closing during vehicle locking according to their intention. After this function is turned on, if the vehicle detects the remote locking and the windows are not closed, it will automatically perform the window closing operation to avoid causing losses to the user.

(m) Rear left window disable: Users can turn on the rear left window disable function in central control screen according to their intention, after this function is turned on, the left rear seat passenger cannot operate the window through local switch.

(n) Rear right window disable: Users can turn on the rear right window disable function in central control screen according to their intention, after this function is turned on, the left right seat passenger cannot operate the window through local switch.

(o) All window opening: Users can enable the all window opening function on the central control display according to their intention. After this function is enabled, it can open all the windows.

(p) All window closing: Users can enable the all window closing function on the central control display according to their intention. After this function is enabled, it can close all the windows.

(q) All window ventilation: Users can enable the all window ventilation function on the central control display according to their intention. After this function is enabled, it can ventilate all the windows.

2. Outside rear view mirror:

The user determines the mirror to be adjusted by operating the rear view mirror selection button on central control screen, adjusts the driver and front passenger side outside rear view mirror lenses through the rear view mirror adjustment button, and releases the adjustment button to stop

adjusting the lenses. The rear view mirror heating function is achieved by operating the rear windshield heating button.

(a) Left outside rear view mirror adjustment: after user presses the rear view mirror adjustment switch on central control screen, continuously presses the adjustment switch on the left side of steering wheel to adjust the left outside rear view mirror lens up and down, left and right.

(b) Right outside rear view mirror adjustment: after user presses the rear view mirror adjustment switch on central control screen, continuously presses the adjustment switch on the right side of steering wheel to adjust the left outside rear view mirror lens up and down, left and right.

(c) Outside rear view mirror position memory: The vehicle is equipped with outside rear view mirror position memory function. By setting the rear view mirror position that matches your viewing angle as the memory position, you can conveniently use this rear view mirror position.

(d) Outside rear view mirror position recall: The vehicle is equipped with outside rear view mirror position recall function. The memorized outside rear view mirror position information can be recalled automatically according to the user, meeting the different needs of different drivers for the rear view mirror position.

(e) Outside rear view mirror auto tilting down during reversing enabled: User can set the function of outside rear view mirror auto tilting down during reversing on the CSC central control display to enable this function.

(f) Outside rear view mirror auto tilting down during reversing disabled: User can set the function of outside rear view mirror auto tilting down during reversing on the CSC central control display to disable this function.

(g) Outside rear view mirror auto tilting down angle setting during reversing: When the vehicle is in R gear, the driver adjusts the rear view mirror to the appropriate tilting down position for reversing. When the vehicle is out of R gear, the vehicle sets this position as the rear view mirror tilting down position during reversing.

(h) Outside rear view mirror auto tilting down during reversing: The rear view mirror tilting down during reversing is enabled on the central control display, shift the gear to R position, the outside rear view mirror automatically tilts down to the set position, meeting the driver's view observation needs when reversing.

(i) Returning for outside rear view mirror auto tilting down during reversing: The rear view mirror tilting down during reversing is enabled on the central control display, the outside rear view mirror is in auto tilting down position for reversing. If the driver does not require the outside rear view mirror to tilt down during reversing or vehicle is in motion, the outside rear view mirror returns to the position before tilting down.

(j) Outside rear view mirror power folding: When the outside rear view mirror is unfolded, the driver presses the outside rear view mirror folding/unfolding switch on the central control display, the outside rear view mirror folds to prevent the vehicle from being scratched in a narrow space.

(k) Outside rear view mirror power unfolding: When the outside rear view mirror is folded, the driver presses the outside rear view mirror folding/unfolding switch on the central control display, the outside rear view mirror unfolds, which is convenient for the driver to unfold the rear view mirror to observe the rear view of the vehicle.

(l) Outside rear view mirror auto folding/unfolding enabled: User can set the outside rear view mirror auto folding/unfolding function on the central control display to enable and disable this function. When it is enabled, the outside rear view mirror can be automatically unfolded when unlocking and automatically folded when locking.

(m) Outside rear view mirror auto folding/unfolding disabled: User can set the outside rear view mirror auto folding/unfolding function on the central control display to enable and disable this function.

(n) Outside rear view mirror auto folding during vehicle locking: When the outside rear view mirror is unfolded, the driver locks the vehicle and leaves, and the whole vehicle is awake, the outside rear view mirror folds automatically.

(o) Outside rear view mirror power unfolding when unlocking/powering on: When the outside rear view mirror is in the folding state, and the driver unlocks the vehicle and gets in/vehicle is in Pre ON/standby/driving state, the outside rear view mirror will automatically unfold.

(p) Outside rear view mirror heating ON: The user turns on the rear windshield heating switch to enable the rear view mirror heating.

(q) Outside rear view mirror heating OFF: The user turns off the rear windshield heating switch to disable the rear view mirror heating.

3. Concealed handle:

Door handle is popped out and retracted through the lock and unlock operation by user.

(a) Concealed handle pop out: After the driver or passenger unlock the door in different ways, the corresponding concealed handle on the unlocked side is popped out, making it easy for the driver and passenger to get on the vehicle.

(b) Concealed handle retraction when locking: After the driver or passenger closes the door in different ways, the corresponding concealed handle on the locked side is retracted, which reduces the wind resistance of the vehicle and improves the aesthetics.

(c) Concealed handle transportation mode: After the driver or passenger lock the door in different ways, the corresponding concealed handle on the locked side is retracted, which reduces the wind resistance of the vehicle and improves the aesthetics.

(d) Concealed handle ice breaker: When the door handle is popped out, the ice breaker function is triggered if it is not popped into place within the calibrated time.

4. Door lock:

The lock control function can control each door to perform unlocking or locking operation from inside and outside the vehicle according to the actual wishes of the user or the current state of the vehicle, meeting a series of related needs of vehicle users such as entering and leaving the vehicle, taking and placing items, and privacy protection.

(a) Unlocking (four door unlocking) via remote control key: The vehicle is set to four door unlocking, that is when the user presses the remote control key unlock switch, the four doors are unlocked synchronously, to meet the needs of the scenario that more than one person gets on the vehicle.

(b) Unlocking (single door unlocking) via remote control key: The vehicle is set to step-by-step unlocking, that is when driver presses the remote control key unlock switch for the first time, only the driver door is unlocked, to meet the needs of the scenario that the driver alone gets on the vehicle.

(c) Proximity unlocking: The user carries the key to approach the vehicle, the vehicle automatically performs four doors unlocking. The user can enter the vehicle without performing any operations, improving the convenience of vehicle usage.

(d) Central control switch unlock: The vehicle can be unlocked by the driver through operating the door central control lock switch inside the vehicle.

(e) Auto unlocking when powering off: When the driver prepares to leave the vehicle, the driver switches the vehicle power mode from the power-on state to the power-off state, all four doors are unlocked, which is convenient for persons in vehicle to get off and for those outside to get in.

(f) Unlocking (vehicle) via voice control: The driver can unlock all the vehicle doors by issuing voice control commands to facilitate the occupants in vehicle to leave.

(g) Remote control unlocking: The driver can unlock the vehicle remotely through mobile phone APP to meet the needs of driver who is not near the vehicle but wants to unlock the vehicle.

(h) Bluetooth control unlocking: The driver can perform the Bluetooth unlocking of four doors through the Bluetooth device, without carrying a physical remote control key, providing a more convenient vehicle usage experience for the driver.

(i) Locking via remote control key: The driver can lock four doors synchronously through the remote control key lock switch to meet the driver locking needs when leaving the vehicle.

(j) Automatic locking when leaving vehicle: The key leaves the vehicle, and the four doors are automatically locked to improve safety.

(k) Central control switch lock: The vehicle can be locked by the driver through operating the vehicle central control lock switch.

(l) Locking (vehicle) via voice control: The driver can lock four doors by issuing voice control commands to improve the convenience of using the vehicle.

(m) Remote control locking: The driver can lock the vehicle remotely through mobile phone APP to meet the needs of driver who is not near the vehicle but wants to lock the vehicle.

(n) Digital key control locking: The driver can perform the Bluetooth locking of four doors through the Bluetooth device, without carrying a physical remote control key, providing a more convenient vehicle usage experience for the driver.

(o) Automatic re-lock: The driver does not open the door after unlocking the vehicle, the vehicle will lock after a period of time to ensure the vehicle safety.

(p) Speed-sensitive auto locking: In the vehicle dynamic driving state, when the vehicle speed exceeds the setting threshold, four doors will automatically lock to improve safety.

Data parameter

Front left door control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	30	13	-

Front left door lock

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	3.8	-

Front left door concealed handle

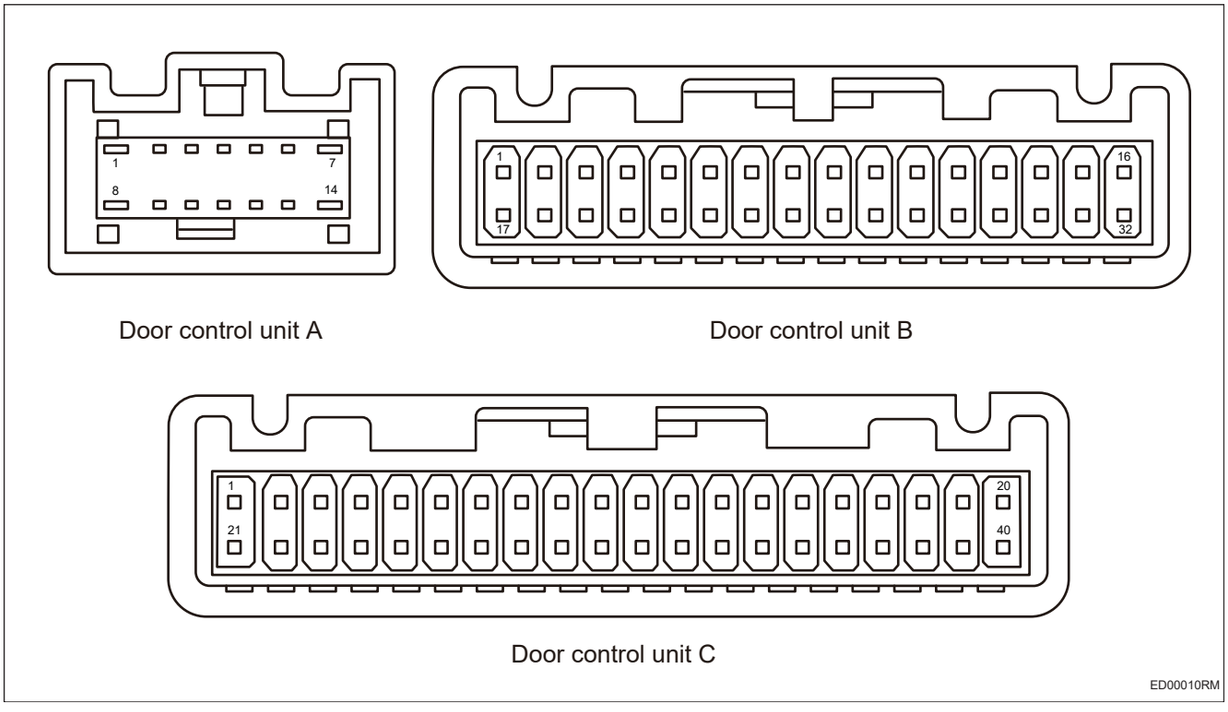
Item	Max	OK	Minimum
Operating voltage (V)	16	14.5	9
Operating current (A)	1.4	0.2	0.065

Front left door power glass regulator

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	12	12 Max.	2.5

ECU terminal

Front left door control unit



Front left door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply/KL30	8	Power ground/PGND
2	-	9	Door unlock output
3	Window down	10	Door lock output
4	Window up	11	-
5	-	12	-
6	-	13	-
7	-	14	-

Front left door control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	-
2	Left outside rear view mirror left/right adjustment	18	-
3	Left outside rear view mirror up/down adjustment	19	-
4	Concealed handle unfolding output	20	Left outside rear view mirror lens adjustment common line/folding
5	Concealed handle folding output	21	Left outside rear view mirror unfolding
6	-	22	-
7	-	23	Switch backlight output
8	-	24	Left rear view mirror turn signal light
9	-	25	-
10	-	26	Central control lock indicator
11	BSD status indicator	27	-
12	Outside rear view mirror upper and lower position memory signal	28	-
13	-	29	-
14	-	30	Outside rear view mirror position memory ground (driver switch analog ground)
15	CAN L	31	Front left rear view mirror heating
16	CAN H	32	-

Front left door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	Hard wire collision signal
3	Central control lock switch signal	23	Front left door handle microswitch 1
4	-	24	-
5	-	25	-
6	-	26	-
7	-	27	-
8	-	28	Outside rear view mirror left and right position memory signal
9	-	29	-
10	-	30	-
11	-	31	Front left door status switch
12	-	32	-
13	-	33	-
14	Front left handle microswitch 2	34	-

Front left door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
15	-	35	Rear view mirror position memory power supply
16	-	36	-
17	Driver rear left window switch/RL_IN	37	-
18	Driver rear right window switch/RR_IN	38	Load ground (indicator)
19	Driver front right window switch/FR_IN	39	-
20	Front left door lock feedback signal	40	Driver front left window switch/FL_IN

Diagnostic Trouble Code (DTC) chart

Front left door control unit

DTC	Detection Items	See page
B110017	Battery (input) voltage too high	(See page ZD-2875)
B110016	Battery (input) voltage too low	(See page ZD-2875)
B110A19	Short in rear view mirror up output	(See page ZD-2891)
B110B19	Short in rear view mirror down output	(See page ZD-2891)
B110C19	Short in rear view mirror left output	(See page ZD-2895)
B110D19	Short in rear view mirror right output	(See page ZD-2895)
B110E11	Rear view mirror up button stuck	(See page ZD-2899)
B110F11	Rear view mirror down button stuck	(See page ZD-2899)
B111011	Rear view mirror left button stuck	(See page ZD-2899)
B111111	Rear view mirror right button stuck	(See page ZD-2899)
B111A19	Short in front left door concealed handle motor output	(See page ZD-2911)
B111E19	Short in BSD light	(See page ZD-2914)
B110111	Front left door window button stuck	(See page ZD-2879)
B110211	Front right door window button stuck	(See page ZD-2879)
B110311	Rear left door window button stuck	(See page ZD-2879)
B110411	Rear right door window button stuck	(See page ZD-2879)
B110918	Open in front left door window motor output	(See page ZD-2886)
B110919	Short in front left door window motor output	(See page ZD-2886)
B111211	Central control button stuck	(See page ZD-2902)
B111511	Rear view mirror left selection button stuck	(See page ZD-2908)
B111611	Rear view mirror right selection button stuck	(See page ZD-2908)
B111811	Rear view mirror folding/unfolding button stuck	(See page ZD-2909)
B111F19	Short in front left electric switch lock motor output	(See page ZD-2917)
U002888	Comfort CAN bus off	(See page ZD-2921)

DTC	Detection Items	See page
U014687	PDCM node lost	(See page ZD-2926)
U020087	Front right door controller node lost	(See page ZD-2926)
U020187	Rear left door controller node lost	(See page ZD-2926)
U020287	Rear right door controller node lost	(See page ZD-2926)
U015187	Airbag control unit node lost	(See page ZD-2926)

DTC	B110017	Battery (input) voltage too high
DTC	B110016	Battery (input) voltage too low

Description

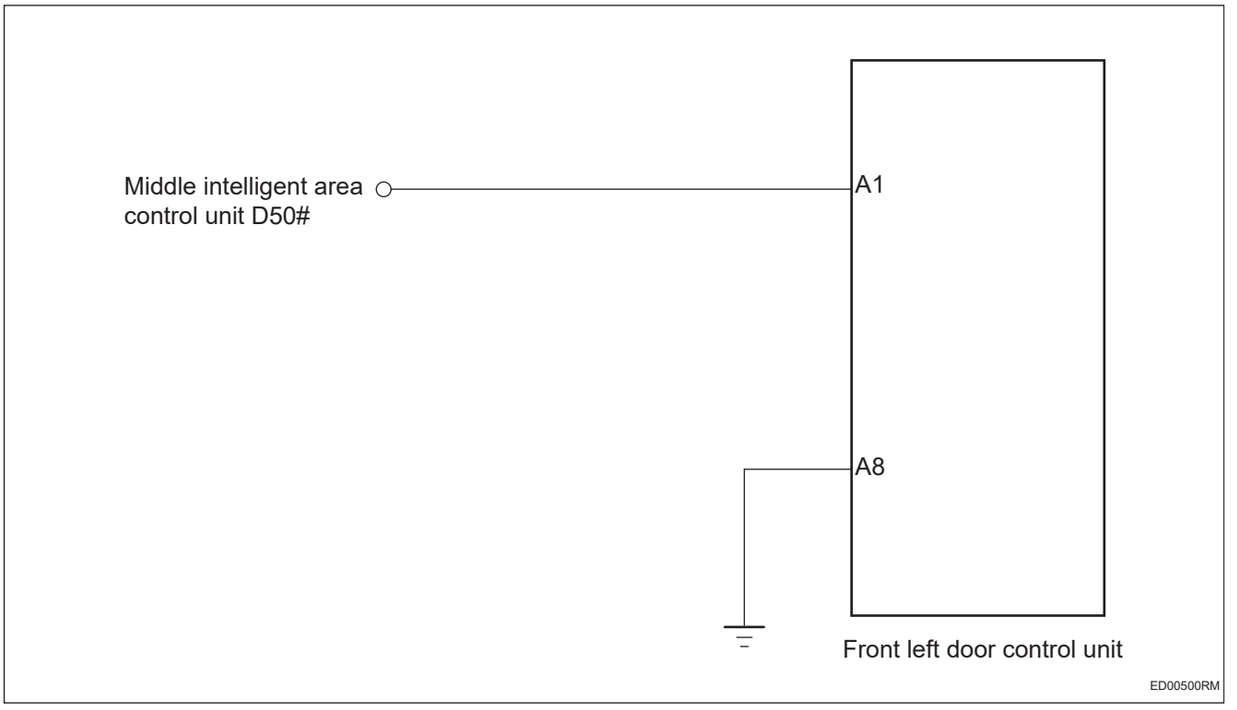
When front left door control unit supply voltage is out of normal operation range, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110017	• Power supply status is normal	Voltage is 16.5 V or higher for more than 10 s	10 s	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Charging system
B110016	• Power supply status is normal	Voltage is 8.5 V or less for more than 10 s	10 s	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B110017	No window up function (all other functions are normal)	-
B110016	No window up function (all other functions are normal)	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

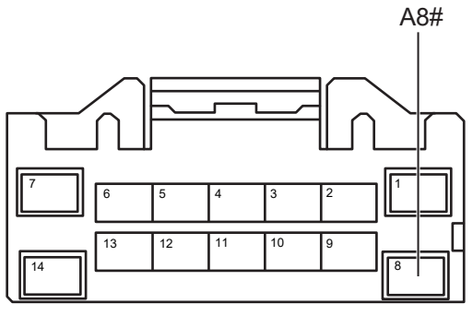
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check front left door control unit ground**



Front left door control unit A connector

ED00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) According to value in the table, measure resistance.

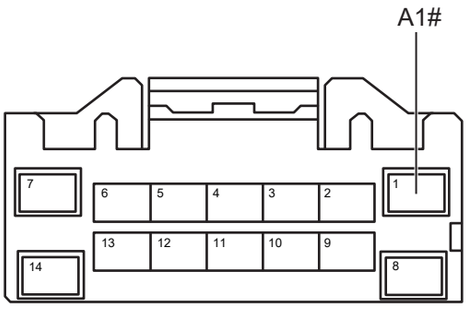
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A8# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front left door control unit power supply**



Front left door control unit A connector

ED00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace front left door control unit (See page CS-12)

DTC	**B110111**	**Front left door window button stuck**
DTC	**B110211**	**Front right door window button stuck**
DTC	**B110311**	**Rear left door window button stuck**
DTC	**B110411**	**Rear right door window button stuck**

Description

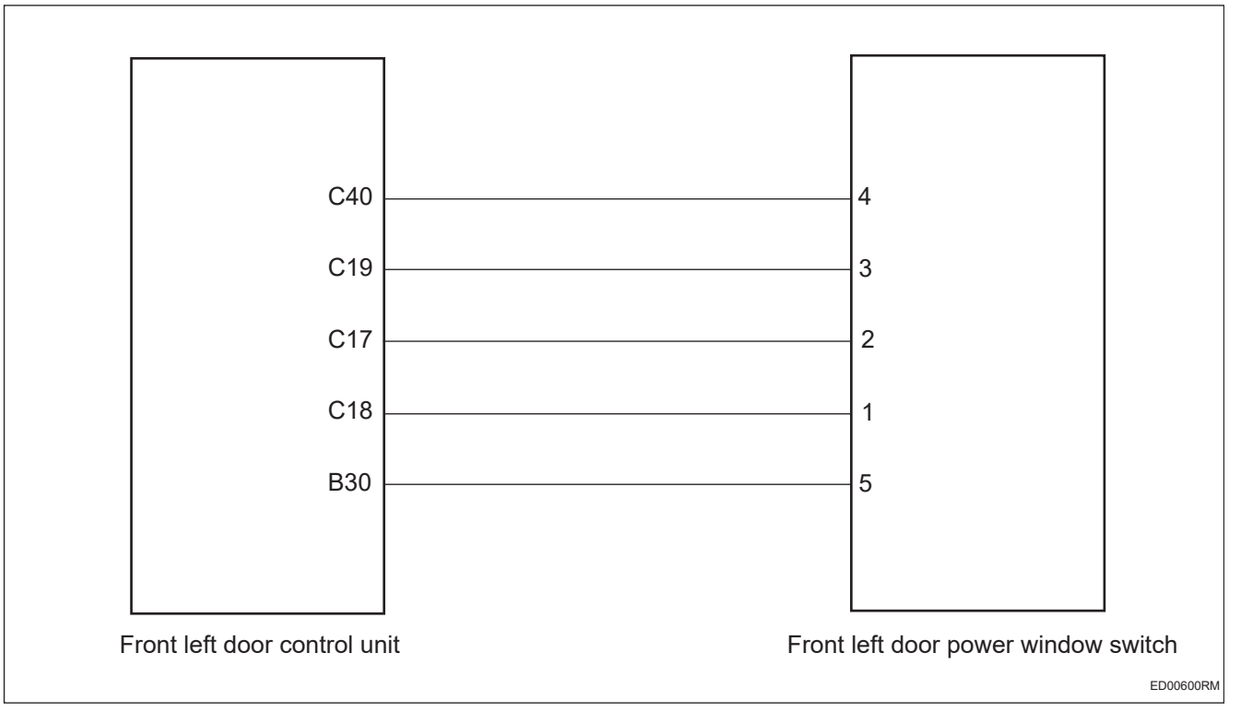
When front left door power window switch is faulty, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110111	• Power supply status is normal	Front left button stuck for more than 30 s	30 s	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power window switch
B110211	• Power supply status is normal	Front right button stuck for more than 30 s	30 s	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power window switch
B110311	• Power supply status is normal	Rear left button stuck for more than 30 s	30 s	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power window switch
B110411	• Power supply status is normal	Rear right button stuck for more than 30 s	30 s	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power window switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B110111	No window up function	-
B110211	No window up function	-
B110311	No window up function	-
B110411	No window up function	-

Circuit diagram



ZD

Inspection procedure

1	**Check front left door power window switch**

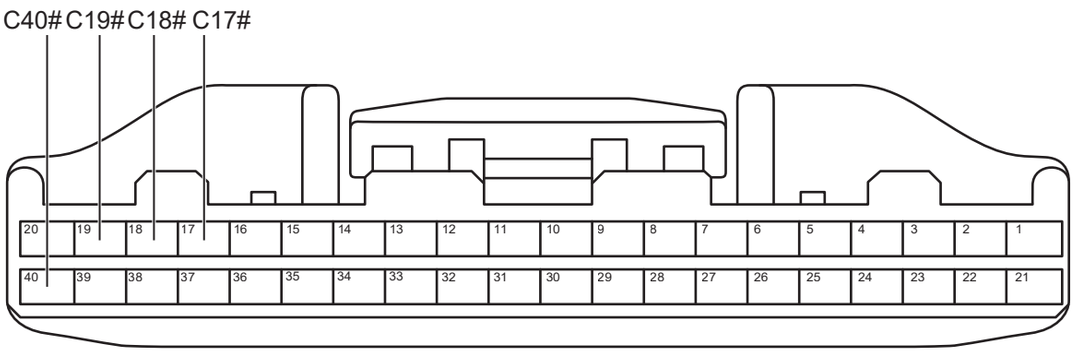
(a) Check for foreign matters in front left door power window switch.

(b) Operate switch to check for sticking.

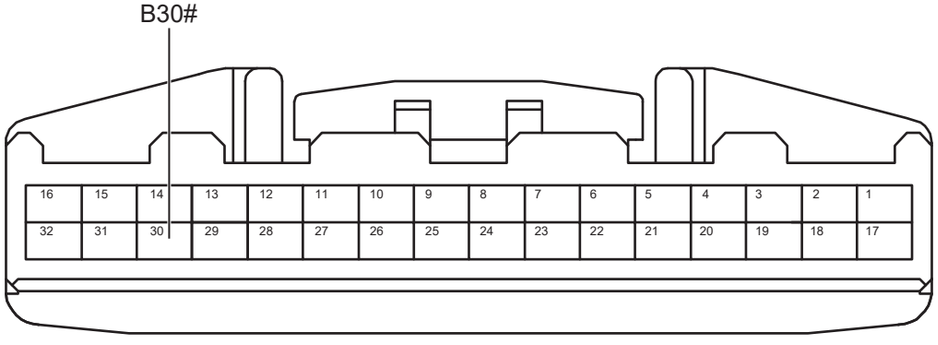
NG → **Perform repair according to malfunction**

OK

2	**Check for open in front left door power window switch wire harness and connector**

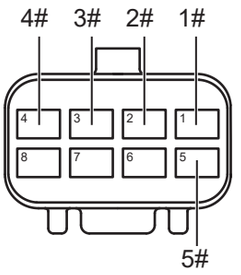


Front left door control unit C connector



Front left door control unit B connector

ED00610RM



Front left door power window switch connector

ED00621RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the front left door power window switch connector.

(e) According to value in the table, measure resistance.

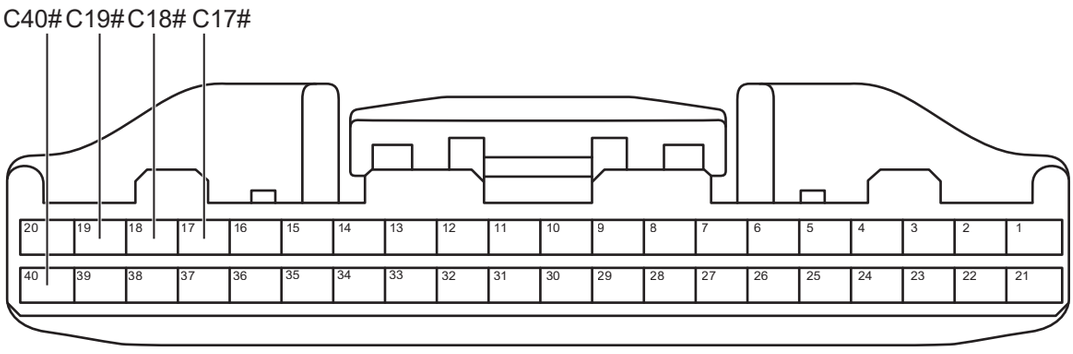
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C40# - front left door power window switch connector 4#	Always connected	Less than 1 Ω
Front left door control unit connector C19# - front left door power window switch connector 3#	Always connected	Less than 1 Ω
Front left door control unit connector C17# - front left door power window switch connector 2#	Always connected	Less than 1 Ω
Front left door control unit connector C18# - front left door power window switch connector 1#	Always connected	Less than 1 Ω
Front left door control unit connector B30# - front left door power window switch connector 5#	Always connected	Less than 1 Ω

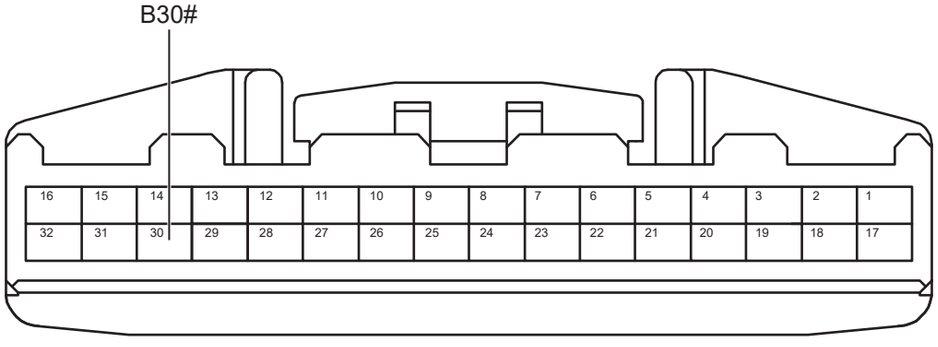
NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left door power window switch wire harness and connector**



Front left door control unit C connector



Front left door control unit B connector

ED00610RM

(a) According to value in the table, measure resistance.

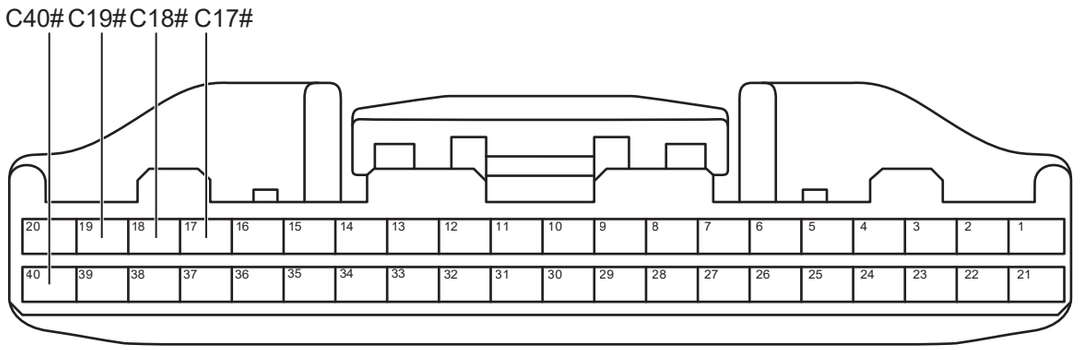
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C40# - body ground	Always connected	10 KΩ or more
Front left door control unit connector C19# - body ground	Always connected	10 KΩ or more
Front left door control unit connector C17# - body ground	Always connected	10 KΩ or more
Front left door control unit connector C18# - body ground	Always connected	10 KΩ or more
Front left door control unit connector B30# - body ground	Always connected	10 KΩ or more

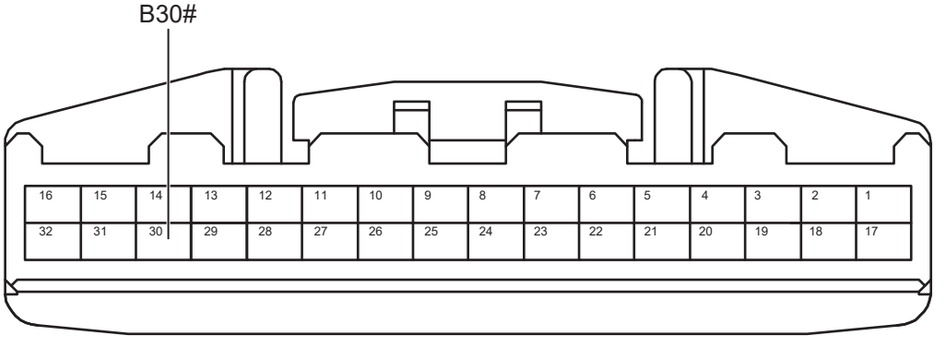
NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door power window switch wire harness and connector**



Front left door control unit C connector



Front left door control unit B connector

ED00610RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C40# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector C19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector C17# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector C18# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK →

5	**Replace front left door power window switch (See page NS-111)**

(a) Replace the front left door power window switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B110918**	**Open in front left door window motor output**
DTC	**B110919**	**Short in front left door window motor output**

Description

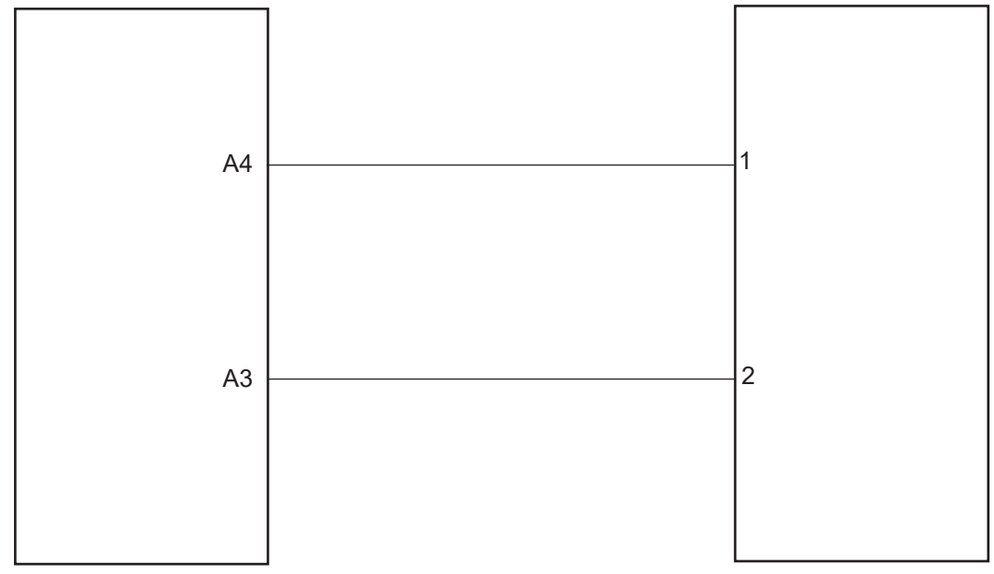
When there is short or open in front left door power glass regulator output circuit, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110918	• Power supply status is normal • IGN is ON • Window up function ON	The current is 1 A or less when window is operating (to be calibrated)	10 ms	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power glass regulator
B110919	• Power supply status is normal • IGN is ON • Window up function ON • The window learning is completed and moved to the middle position (less than 4 mm from the top, more than 3 cm from the bottom)	Determine the current after starting for 100 ms. If it exceeds 28 A (to be calibrated) and after filtering for 10 ms, short circuit is confirmed and cut off the output	10 ms	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power glass regulator

Fault symptom

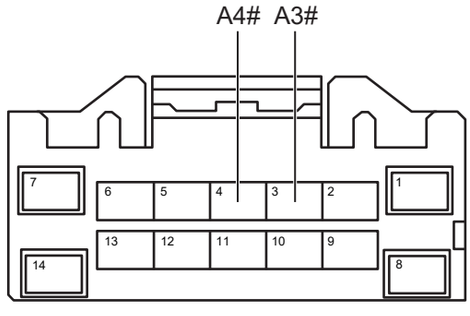
DTC No.	Fault symptom	Warning light/indicator
B110918	No window up function	-
B110919	No window up function	-

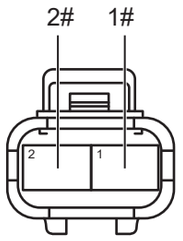
Circuit diagram



Inspection procedure

1	**Check for open in front left door power glass regulator wire harness and connector**





Front left door power glass regulator connector

ED00720RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the front left door power glass regulator connector.

(e) According to value in the table, measure resistance.

Standard value

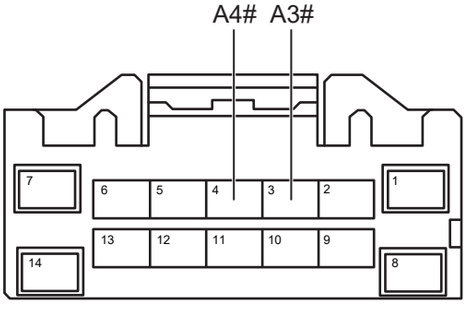
Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A4# - front left door power glass regulator connector 1#	Always connected	Less than 1 Ω
Front left door control unit connector A3# - front left door power glass regulator connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to each other in front left door power glass regulator wire harness and connector**



Front left door control unit A connector

ED00711RM

(a) According to value in the table, measure resistance.

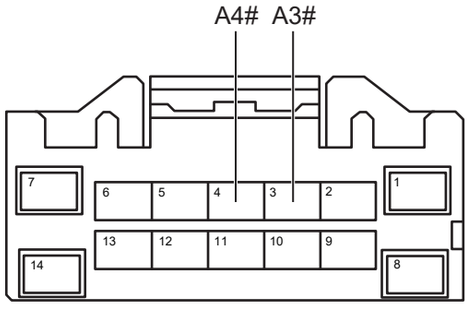
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A4# - front left door control unit connector A3#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left door power glass regulator wire harness and connector**



Front left door control unit A connector

ED00711RM

(a) According to value in the table, measure resistance.

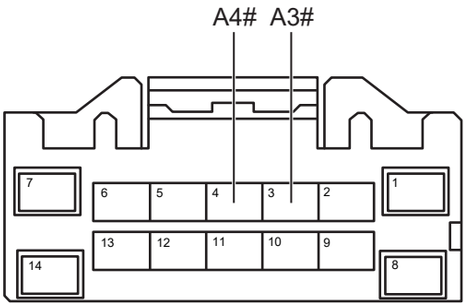
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A4# - body ground	Always connected	10 KΩ or more
Front left door control unit connector A3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door power glass regulator wire harness and connector**



Front left door control unit A connector

ED00711RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector A4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector A3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left door power glass regulator (See page CS-15)**

(a) Replace the front left door power glass regulator.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B110A19**	**Short in rear view mirror up output**
DTC	**B110B19**	**Short in rear view mirror down output**

Description

When left outside rear view mirror upper and lower adjustment output circuits are short, the front left door control unit records DTC.

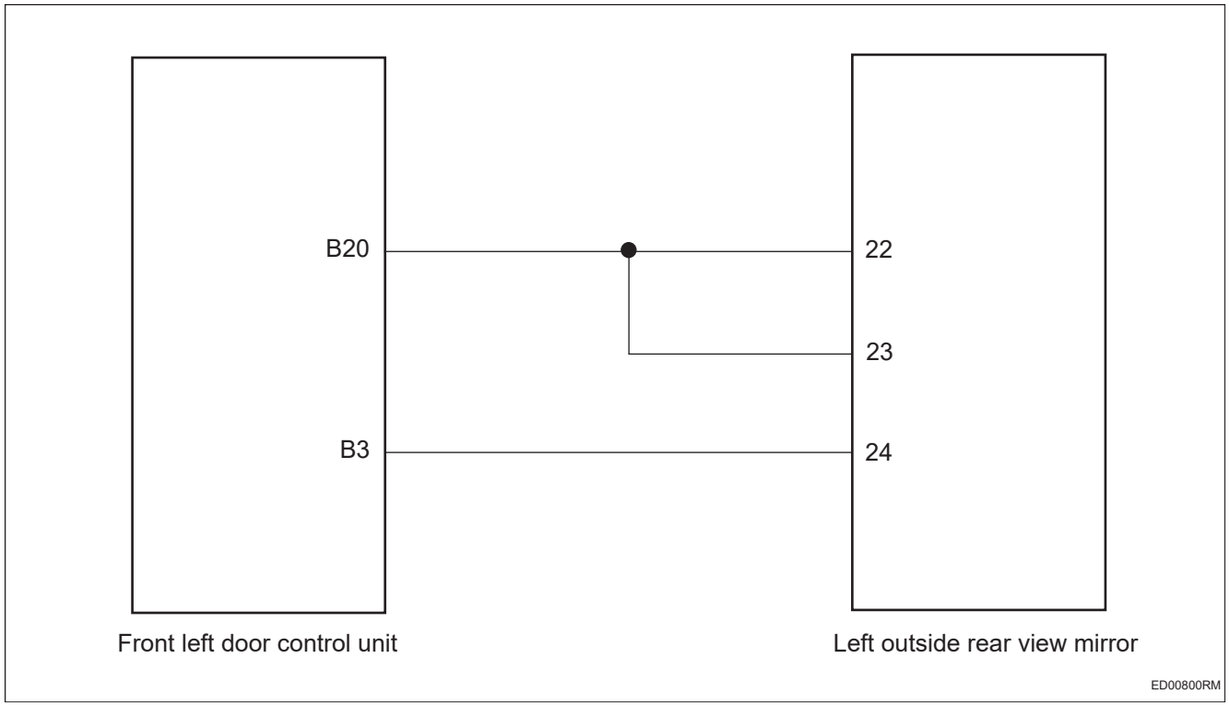
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110A19	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror up output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Left outside rear view mirror
B110B19	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror down output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Left outside rear view mirror

ZD

Fault symptom

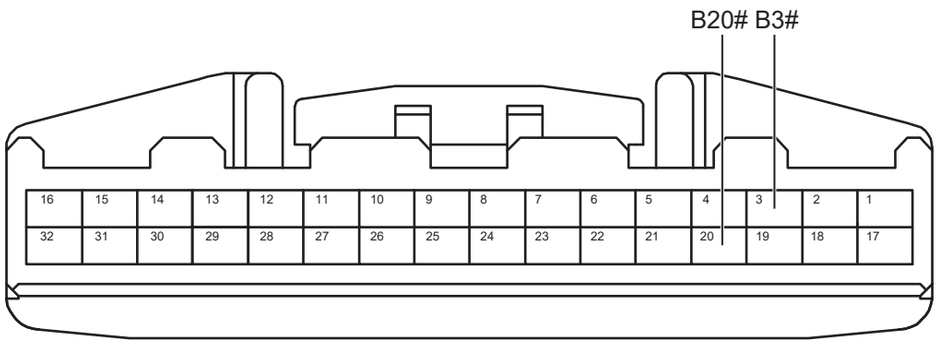
DTC No.	Fault symptom	Warning light/indicator
B110A19	No rear view mirror up adjustment function	-
B110B19	No rear view mirror down adjustment function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in left outside rear view mirror wire harness and connector**



Front left door control unit B connector

ED00821RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the left outside rear view mirror connector.

(e) According to value in the table, measure resistance.

Standard value

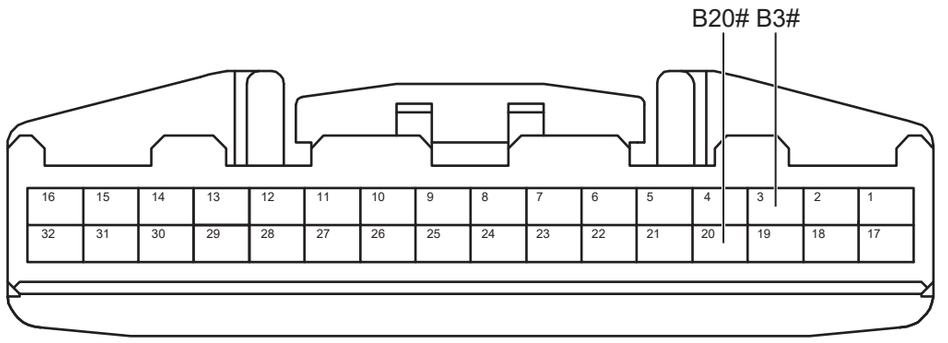
Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B20# - body ground	Always connected	10 KΩ or more
Front left door control unit connector B3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to power supply in left outside rear view mirror wire harness and connector**



Front left door control unit B connector

ED00821RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B20# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace left outside rear view mirror (See page WS-74)**

(a) Replace the left outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B110C19**	**Short in rear view mirror left output**
DTC	**B110D19**	**Short in rear view mirror right output**

Description

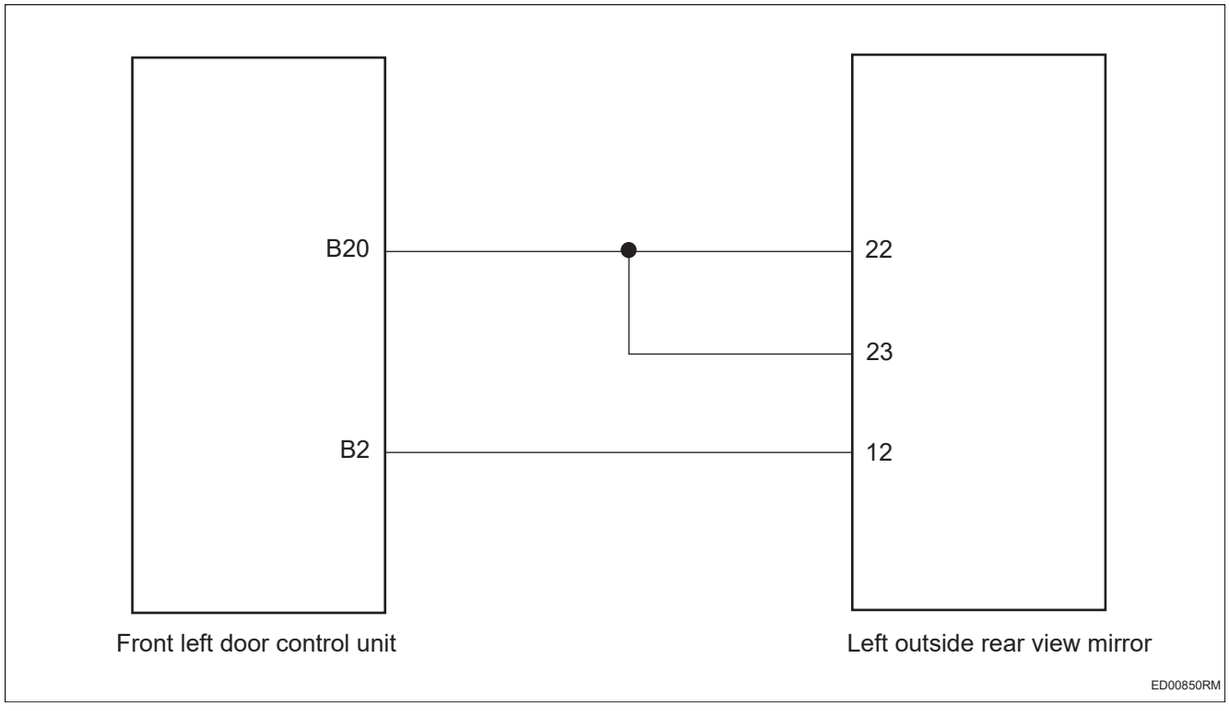
When left outside rear view mirror left and right adjustment output circuits are short, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110C19	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror left output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Left outside rear view mirror
B110D19	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror right output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front left door control unit • Wire harness and connector • Left outside rear view mirror

Fault symptom

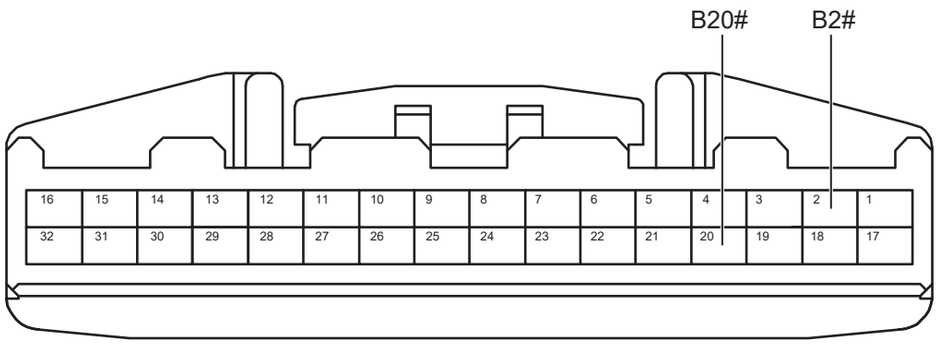
DTC No.	Fault symptom	Warning light/indicator
B110C19	No rear view mirror left adjustment function	-
B110D19	No rear view mirror right adjustment function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in left outside rear view mirror wire harness and connector**



Front left door control unit B connector

ED00861RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the left outside rear view mirror connector.

(e) According to value in the table, measure resistance.

Standard value

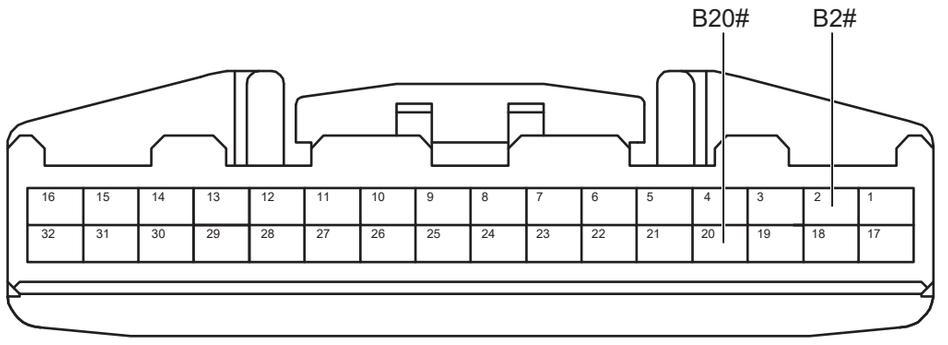
Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B20# - body ground	Always connected	10 KΩ or more
Front left door control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check for short to power supply in left outside rear view mirror wire harness and connector**



Front left door control unit B connector

ED00861RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B20# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace left outside rear view mirror (See page WS-74)**

(a) Replace the left outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B110E11**	**Rear view mirror up button stuck**
DTC	**B110F11**	**Rear view mirror down button stuck**
DTC	**B111011**	**Rear view mirror left button stuck**
DTC	**B111111**	**Rear view mirror right button stuck**

Description

When rear view mirror direction adjustment button is faulty, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B110E11	• Power supply status is normal	Rear view mirror button is stuck at up position for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror direction adjustment button (main display) • Left outside rear view mirror • Right outside rear view mirror • Wire harness and connector • Front left door control unit • Front right door control unit
B110F11	• Power supply status is normal	Rear view mirror button is stuck at down position for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror direction adjustment button (main display) • Left outside rear view mirror • Right outside rear view mirror • Wire harness and connector • Front left door control unit • Front right door control unit
B111011	• Power supply status is normal	Rear view mirror button is stuck at left position for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror direction adjustment button (main display) • Left outside rear view mirror • Right outside rear view mirror • Wire harness and connector • Front left door control unit • Front right door control unit
B111111	• Power supply status is normal	Rear view mirror button is stuck at right position for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror direction adjustment button (main display) • Left outside rear view mirror • Right outside rear view mirror • Wire harness and connector • Front left door control unit • Front right door control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B110E11	No rear view mirror up adjustment function	-
B110F11	No rear view mirror down adjustment function	-
B111011	No rear view mirror left adjustment function	-
B111111	No rear view mirror right adjustment function	-

Inspection procedure

1	**Check rear view mirror direction adjustment button**

(a) Check for foreign matters in rear view mirror direction adjustment button.

(b) Operate the direction adjustment button on the rear view mirror to check for sticking.

NG → **Perform repair according to malfunction**

OK

2	**Check rear view mirror direction adjustment button wire harness and connector**

(a) Check for short in rear view mirror direction adjustment button wire harness and connector.

(b) Check for open in rear view mirror direction adjustment button wire harness and connector.

NG → **Perform repair according to malfunction**

OK

3	**Replace rear view mirror direction adjustment button**

(a) Replace the rear view mirror direction adjustment button.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace left/right outside rear view mirror (See page WS-74)**

OK

Replace front left/right door control unit (See page CS-12)

DTC	B111211	Central control button stuck

Description

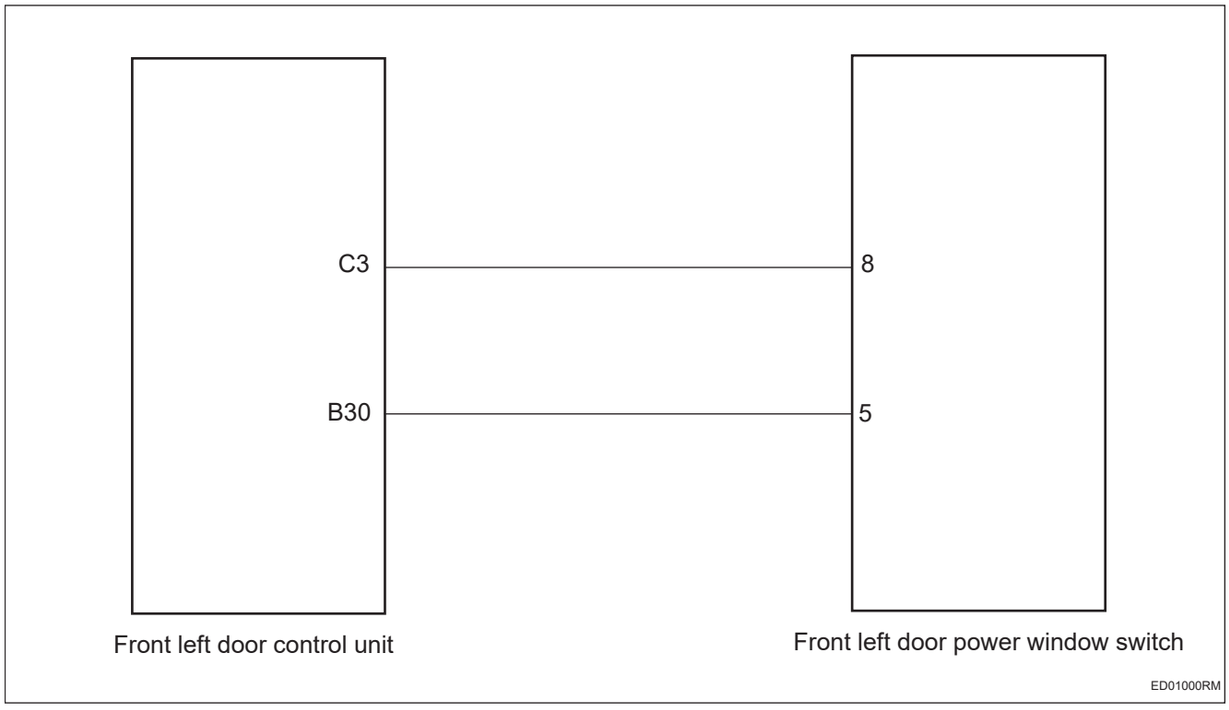
When front left door power window switch button operates normally, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111211	• Power supply status is normal	Central control unlock button stuck for more than 30 s	30 s	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door power window switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111211	No central control unlock function	-

Circuit diagram



Inspection procedure

1	**Check front left door power window switch**

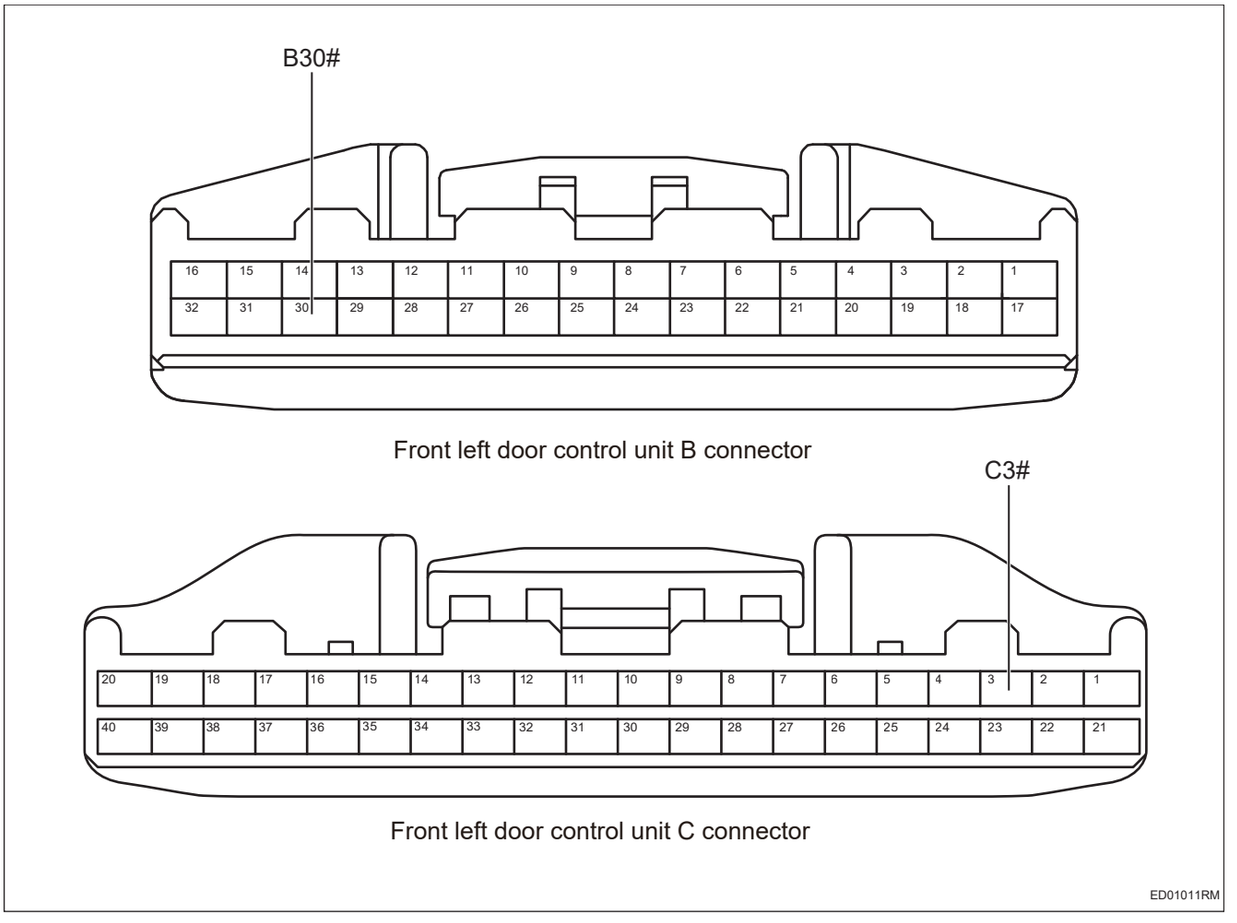
(a) Check for foreign matters in front left door power window switch.

(b) Check front left door power window switch for sticking.

NG → **Perform repair according to malfunction**

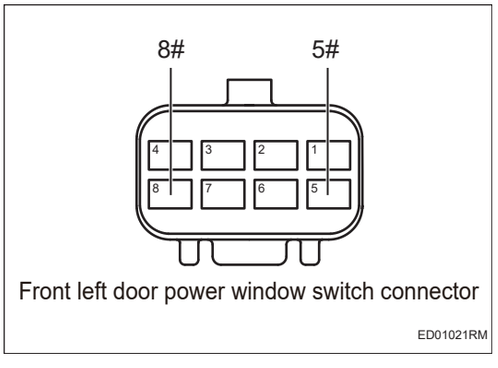
OK

2	**Check for open in front left door power window switch wire harness and connector**



Front left door control unit B connector

Front left door control unit C connector



Front left door power window switch connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the front left door power window switch connector.

(e) According to value in the table, measure resistance.

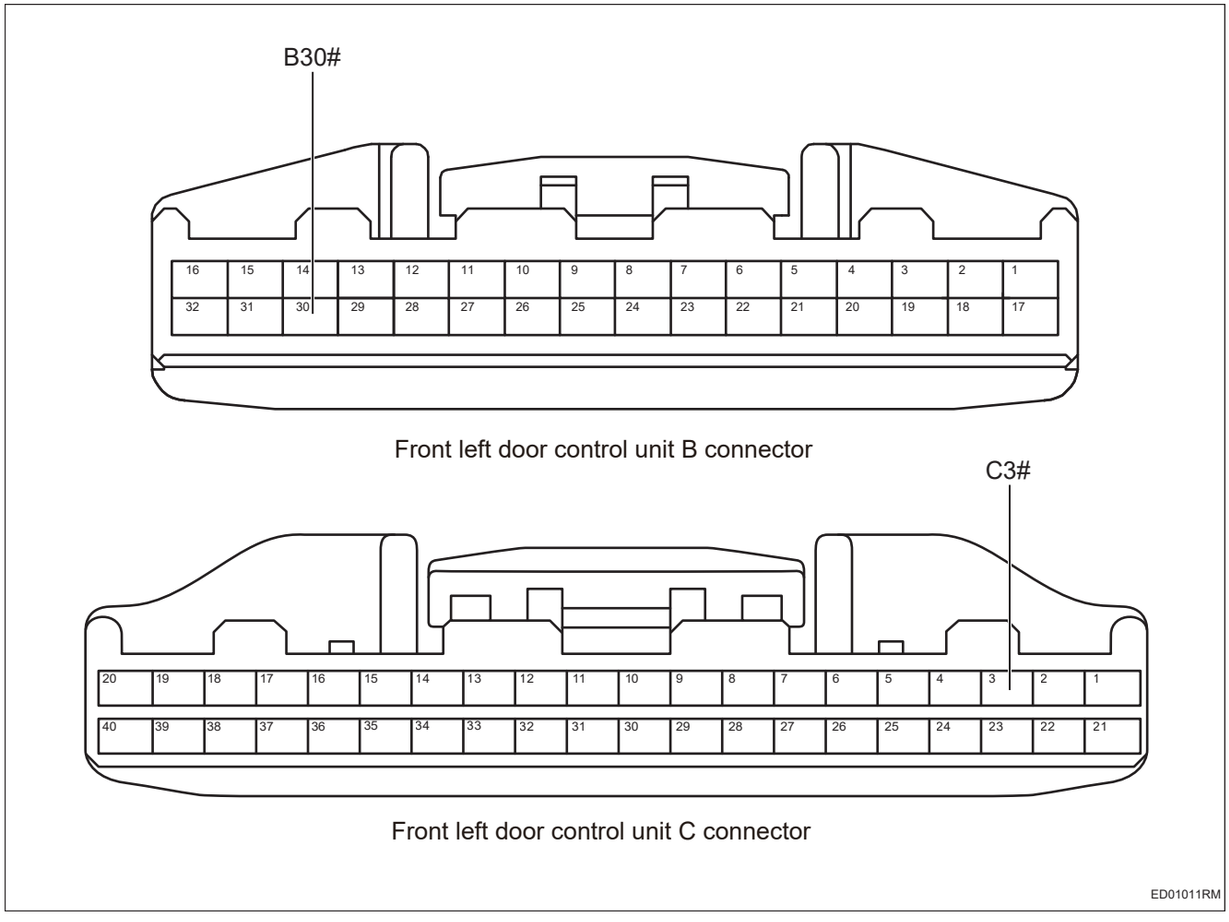
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C3# - front left door power window switch connector 8#	Always connected	Less than 1 Ω
Front left door control unit connector B30# - front left door power window switch connector 5#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front left door power window switch wire harness and connector**



(a) According to value in the table, measure resistance.

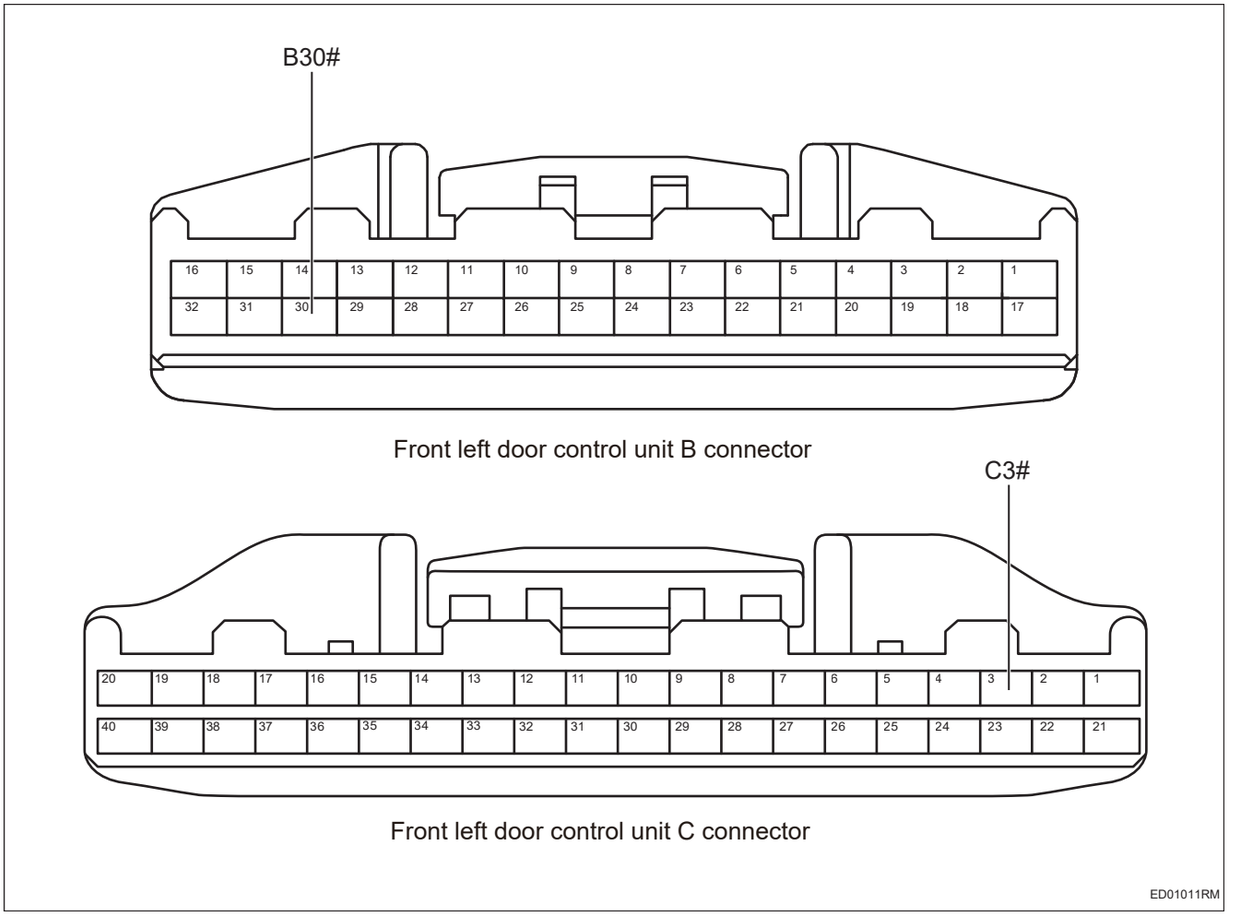
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C3# - body ground	Always connected	10 KΩ or more
Front left door control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left door power window switch wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector C3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front left door power window switch (See page NS-111)**

(a) Replace the front left door power window switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B111511	Rear view mirror left selection button stuck
DTC	B111611	Rear view mirror right selection button stuck

Description

When rear view mirror left/right selection button is stuck, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111511	• Power supply status is normal	Rear view mirror left selection button is stuck for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror left selection button • Wire harness and connector • Front left door control unit
B111611	• Power supply status is normal	Rear view mirror right selection button is stuck for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror right selection button • Wire harness and connector • Front left door control unit

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111511	No rear view mirror adjustment function	-
B111611	No rear view mirror adjustment function	-

Inspection procedure

1	Check rear view mirror left/right selection button

(a) Check for foreign matters in rear view mirror left/right selection button.

(b) Operate the left and right selection buttons on the rear view mirror to check for sticking.

NG → **Perform repair according to malfunction**

OK

2	Check rear view mirror left/right selection button wire harness and connector

(a) Check for short in rear view mirror left/right selection button wire harness and connector.

(b) Check for open in rear view mirror left/right selection button wire harness and connector.

NG → **Perform repair according to malfunction**

OK

3	**Replace rear view mirror left/right selection button**

(a) Replace the rear view mirror left/right selection button.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

ZD

DTC	B111811	Rear view mirror folding/unfolding button stuck

Description

When rear view mirror folding/unfolding button is faulty, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111811	• Power supply status is normal	Rear view mirror folding/ unfolding button is stuck for more than 30 s	30 s	Periodic type	1 ms	• Rear view mirror folding/ unfolding button • Wire harness and connector • Front left door control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111811	No rear view mirror folding/unfolding function	-

Inspection procedure

1	**Check rear view mirror folding/unfolding button**

(a) Check for foreign matters in rear view mirror folding/ unfolding button.

(b) Operate the folding and unfolding button on the rear view mirror to check for sticking.

NG → **Perform repair according to malfunction**

OK

2	**Check rear view mirror folding/unfolding button wire harness and connector**

(a) Check for short in rear view mirror folding/unfolding button wire harness and connector.

(b) Check for open in rear view mirror folding/unfolding button wire harness and connector.

NG → **Perform repair according to malfunction**

OK

3	**Replace rear view mirror folding/unfolding button**

(a) Replace the rear view mirror folding/unfolding button.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B111A19	Short in front left door concealed handle motor output

Description

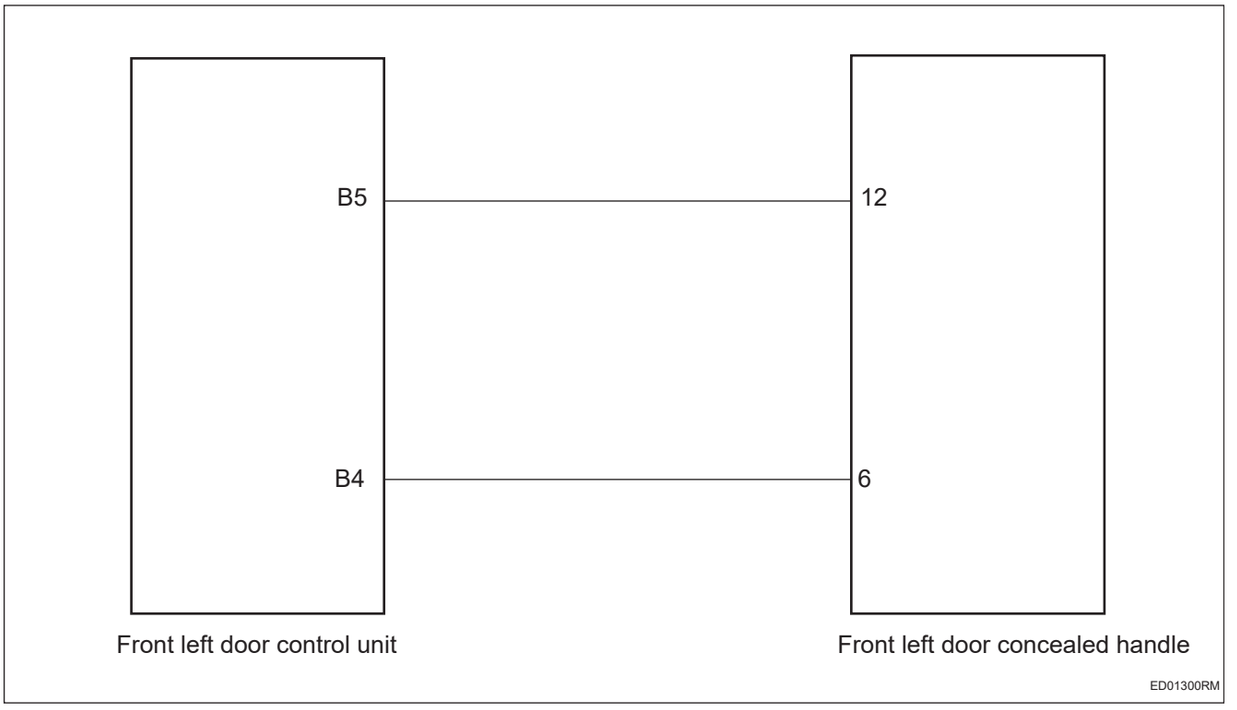
When front left door concealed handle motor output is short, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111A19	• Power supply status is normal • Concealed handle function on	The current is 10 A or more when concealed handle is operating (to be calibrated)	100 ms	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door concealed handle

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111A19	No concealed handle function	-

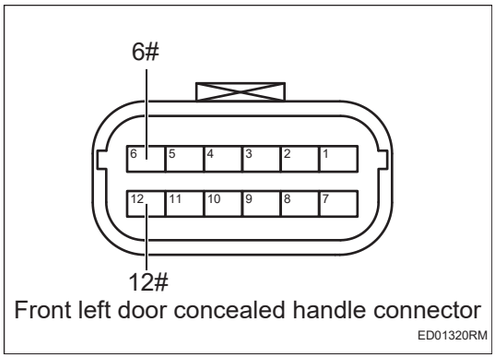
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in front left door concealed handle wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the front left door concealed handle connector.

(e) According to value in the table, measure resistance.

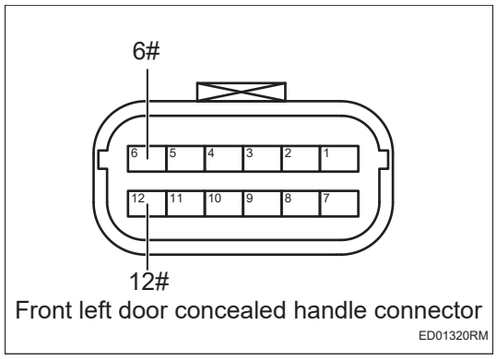
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door concealed handle connector 12# - body ground	Always connected	10 KΩ or more
Front left door concealed handle connector 6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in front left door concealed handle wire harness and connector**



Front left door concealed handle connector

ED01320RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door concealed handle connector 12# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door concealed handle connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace front left door concealed handle (See page CS-44)**

(a) Replace the front left door concealed handle.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

ZD

OK

Diagnosis ends

DTC	**B111E19**	**Short in BSD light**

Description

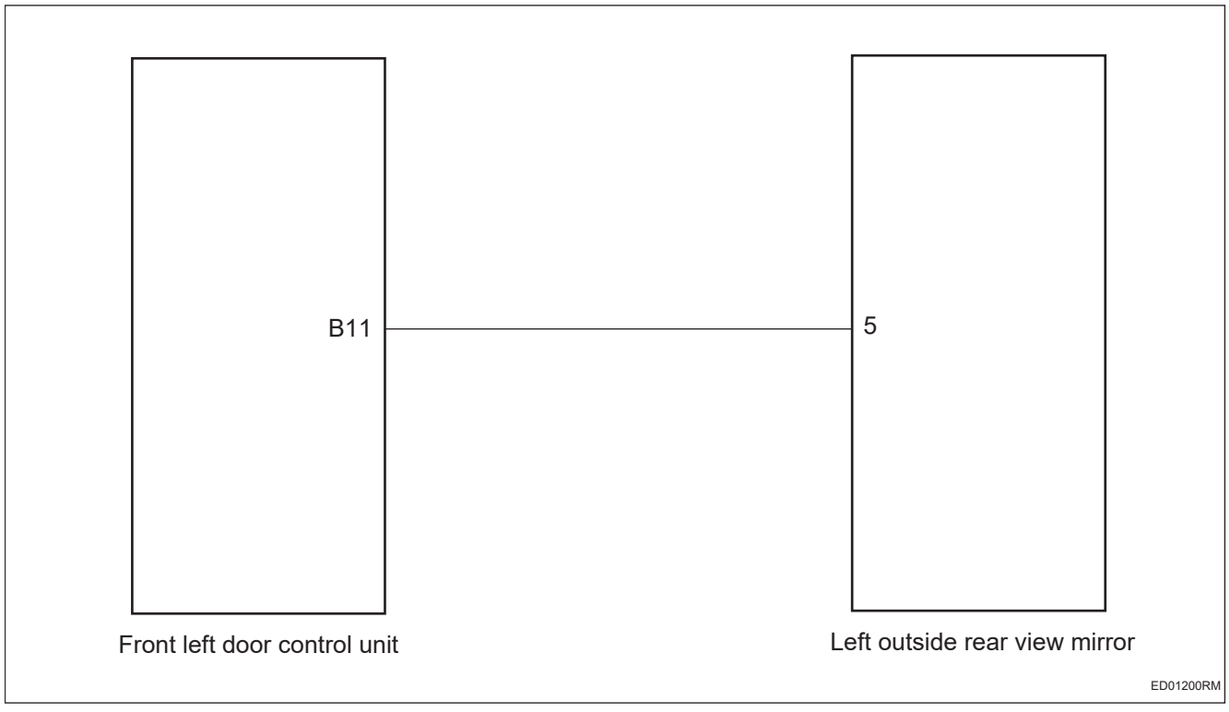
When left outside rear view mirror BSD light circuit is short, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111E19	• Power supply status is normal • IGN is ON • BSD function configuration turns on • BSD function turns on	Current is greater than 5 A when BSD drives (to be calibrated)	100 ms	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Left outside rear view mirror

Fault symptom

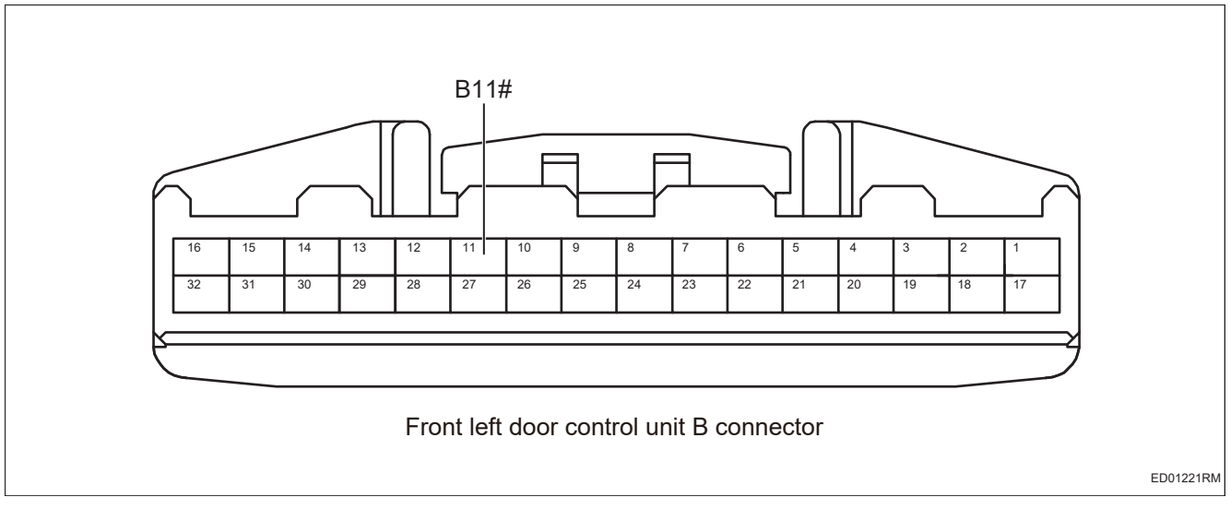
DTC No.	Fault symptom	Warning light/indicator
B111E19	No BSD light function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in left outside rear view mirror wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the left outside rear view mirror connector.

(e) According to value in the table, measure resistance.

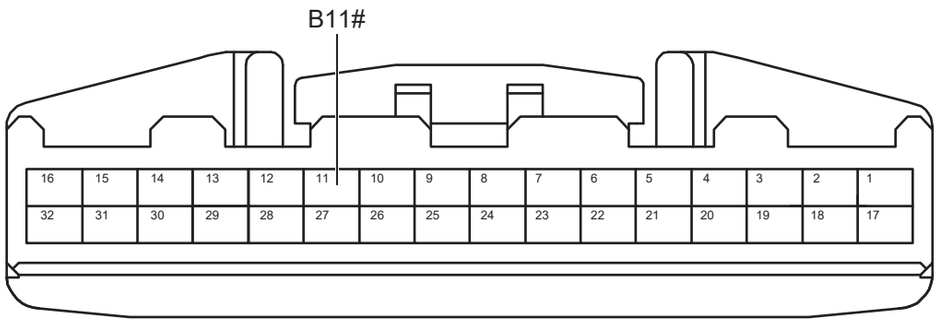
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B11# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in left outside rear view mirror wire harness and connector**



Front left door control unit B connector

ED01221RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace left outside rear view mirror (See page WS-74)**

(a) Replace the left outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B111F19	Short in front left electric switch lock motor output

Description

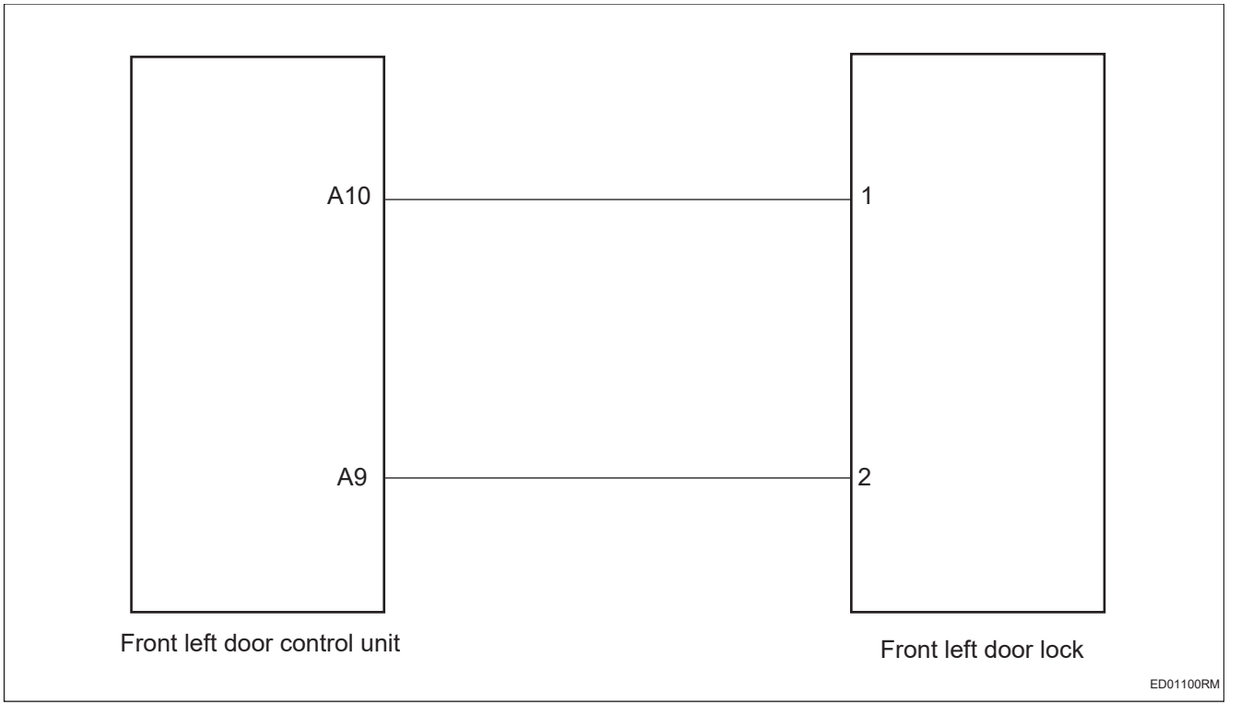
When front left door lock motor output is short, the front left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111F19	• Power supply status is normal	The current is 10 A or more when the electric unlocking action is performed (to be calibrated)	100 ms	Periodic type	1 ms	• Front left door control unit • Wire harness and connector • Front left door lock

Fault symptom

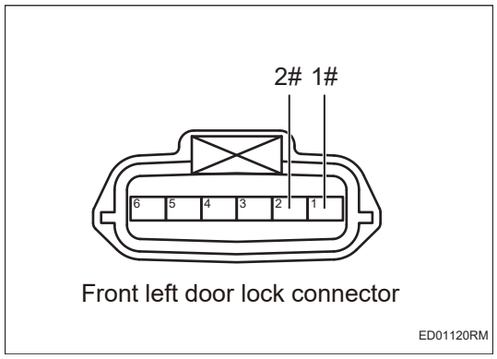
DTC No.	Fault symptom	Warning light/indicator
B111F19	Unable to unlock electrically	-

Circuit diagram



Inspection procedure

1	**Check for short to each other in front left door lock wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Disconnect the front left door lock connector.

(e) According to value in the table, measure resistance.

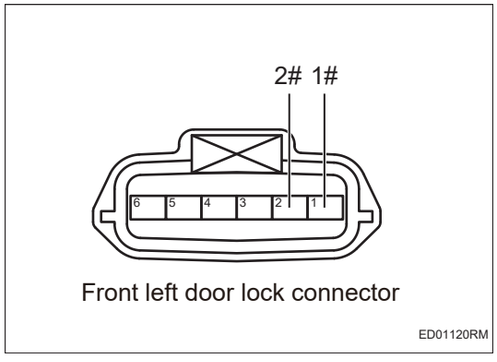
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door lock connector 1# - front left door lock connector 2#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front left door lock wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

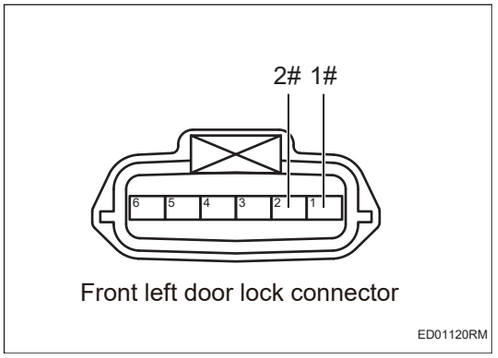
Multimeter connection	Detection condition	Specified condition
Front left door lock connector 1# - body ground	Always connected	10 KΩ or more
Front left door lock connector 2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in front left door lock wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door lock connector 1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door lock connector 2# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front left door lock (See page CS-38)**

(a) Replace the front left door lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left door control unit (See page CS-12)**

OK

Diagnosis ends

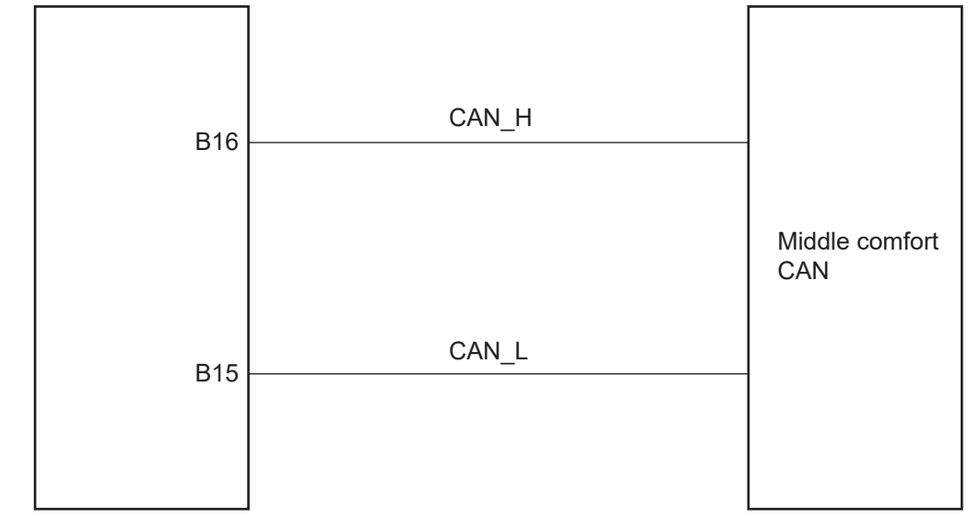
DTC	U002888	Comfort CAN bus off

Description

When front left door control unit detects a mid comfort CAN bus off fault, the front left door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Front left door control unit • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

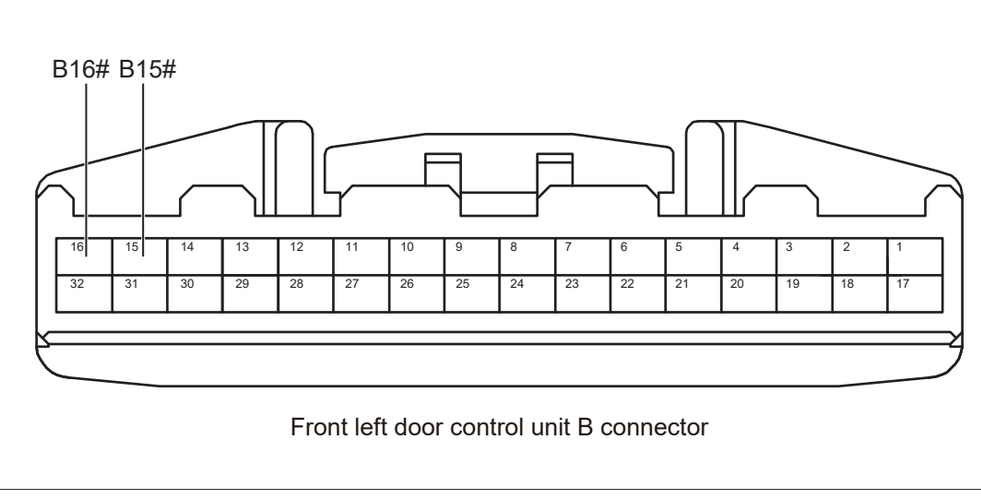
Circuit diagram



ZD

Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front left door control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - front left door control unit connector B15#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

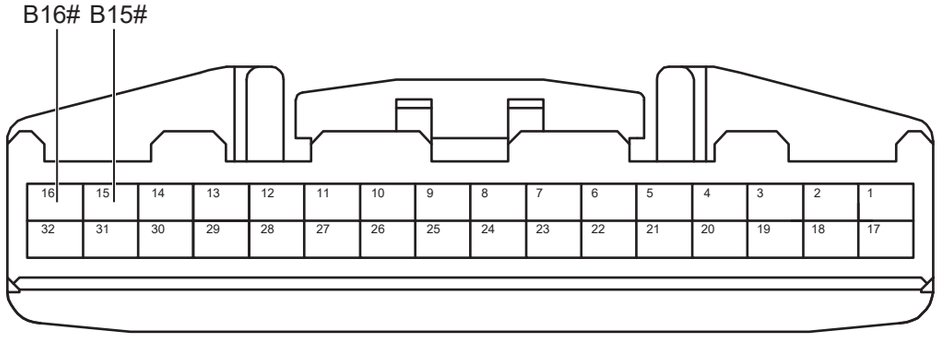
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Front left door control unit B connector

ED01611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

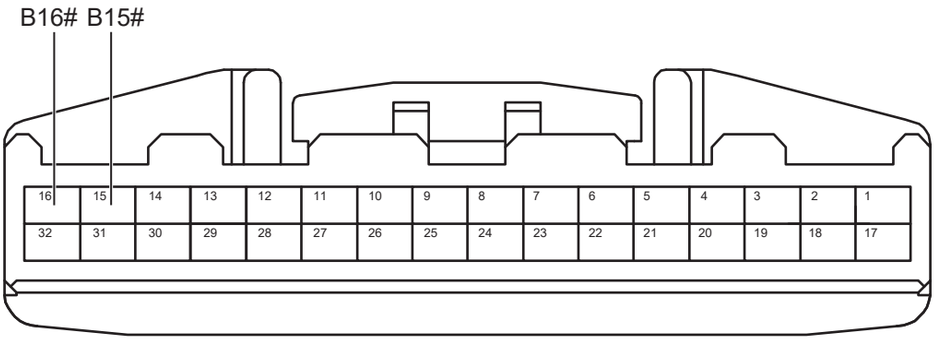
Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - front left door control unit connector B15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check for short to ground in central comfort CAN bus



Front left door control unit B connector

ED01611RM

(a) According to value in the table, measure resistance.

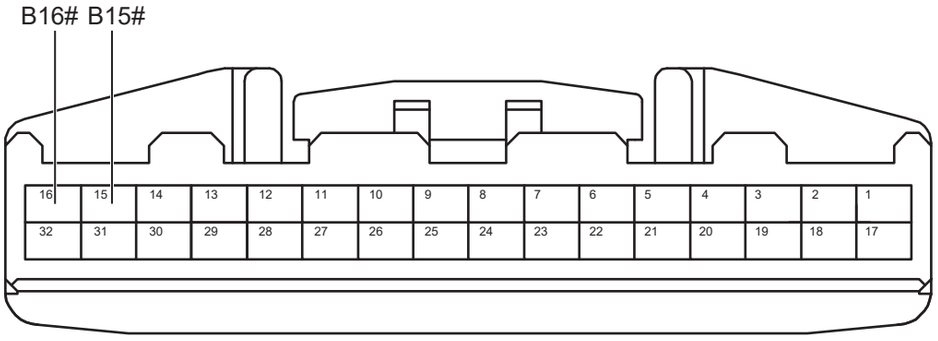
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - body ground	Always connected	10 KΩ or more
Front left door control unit connector B15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Front left door control unit B connector

ED01611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front left door control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

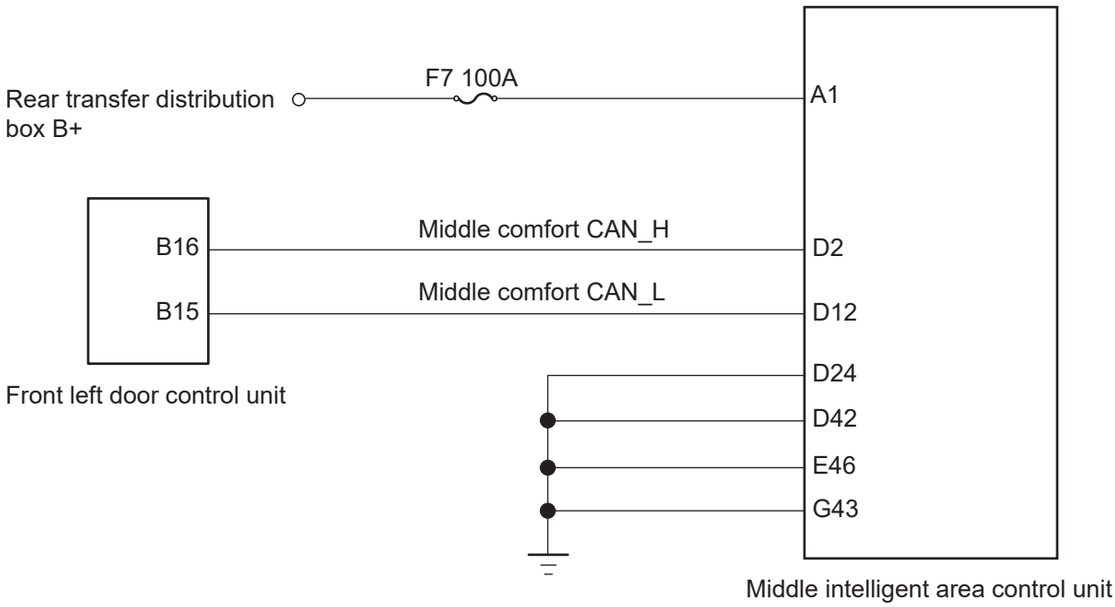
DTC	**U014687**	**PDCM node lost**
DTC	**U020087**	**Front right door controller node lost**
DTC	**U020187**	**Rear left door controller node lost**
DTC	**U020287**	**Rear right door controller node lost**
DTC	**U015187**	**Airbag control unit node lost**

Description

When communication between front left door control unit and other system is abnormal or interrupted, the front left door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Front left door control unit • Middle intelligent area control unit • Combination switch
U020087	(a) Front right door controller node lost.	• Wire harness and connector • Front left door control unit • Front right door control unit • Middle intelligent area control unit • Combination switch
U020187	(a) Rear left door controller node lost.	• Wire harness and connector • Front left door control unit • Rear left door control unit • Middle intelligent area control unit • Combination switch
U020287	(a) Rear right door controller node lost.	• Wire harness and connector • Front left door control unit • Rear right door control unit • Middle intelligent area control unit • Combination switch
U015187	(a) Airbag control unit node lost.	• Wire harness and connector • Front left door control unit • Airbag control unit • Middle intelligent area control unit • Combination switch

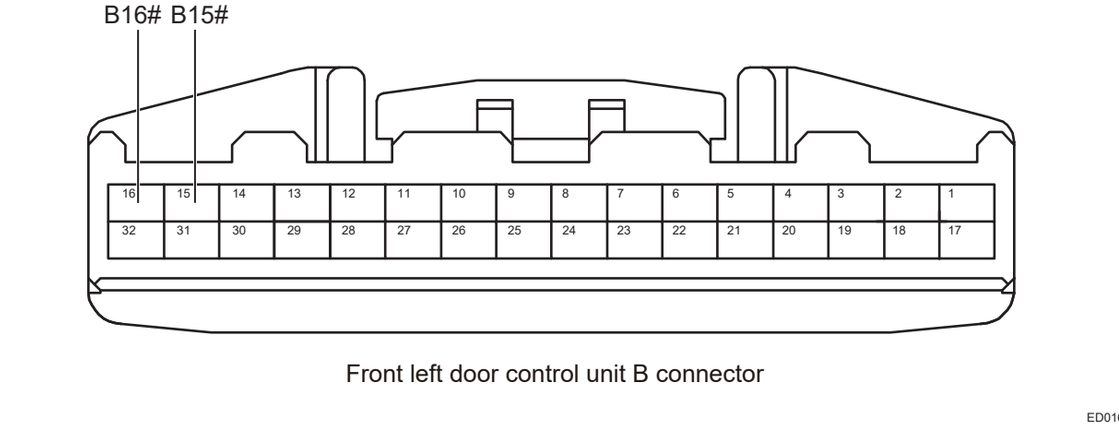
Circuit diagram

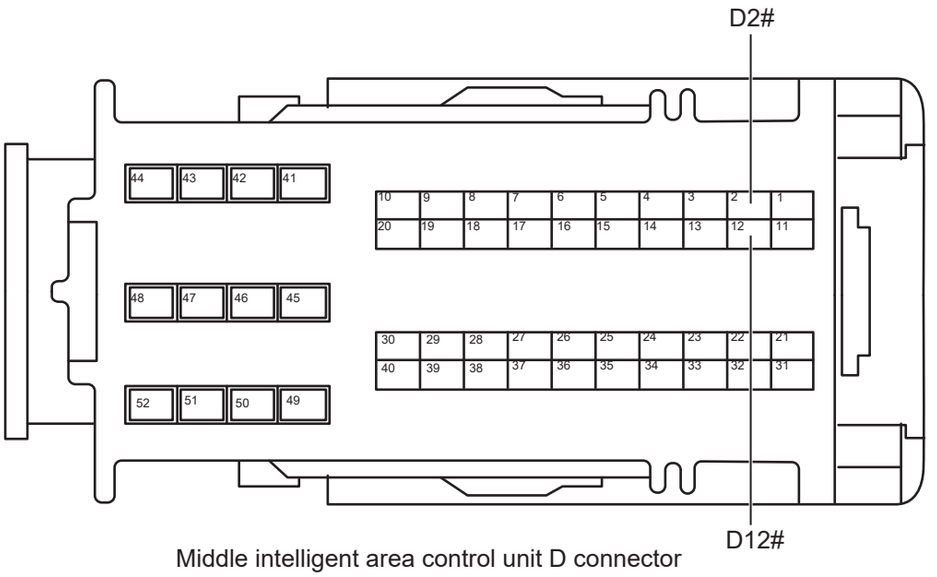


Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in central comfort CAN bus (front left door control unit - middle intelligent area control unit)**





Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

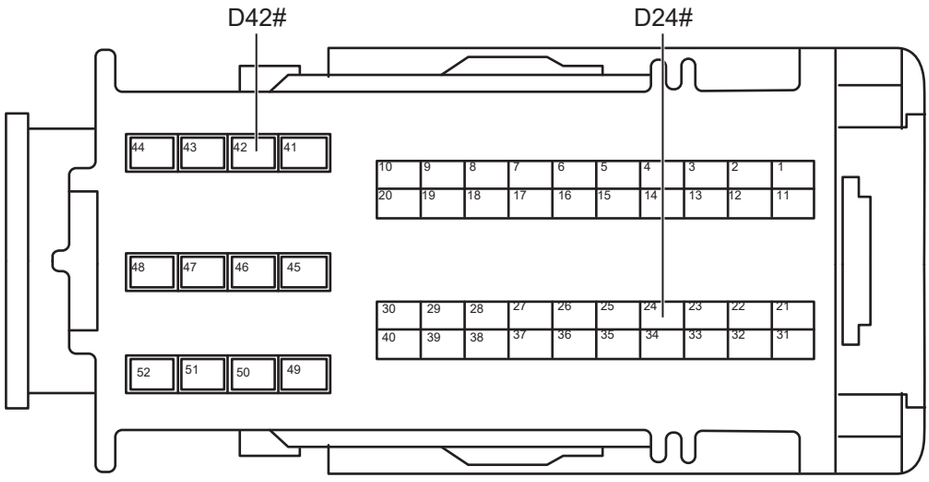
Standard value

Multimeter connection	Detection condition	Specified condition
Front left door control unit connector B16# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Front left door control unit connector B15# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

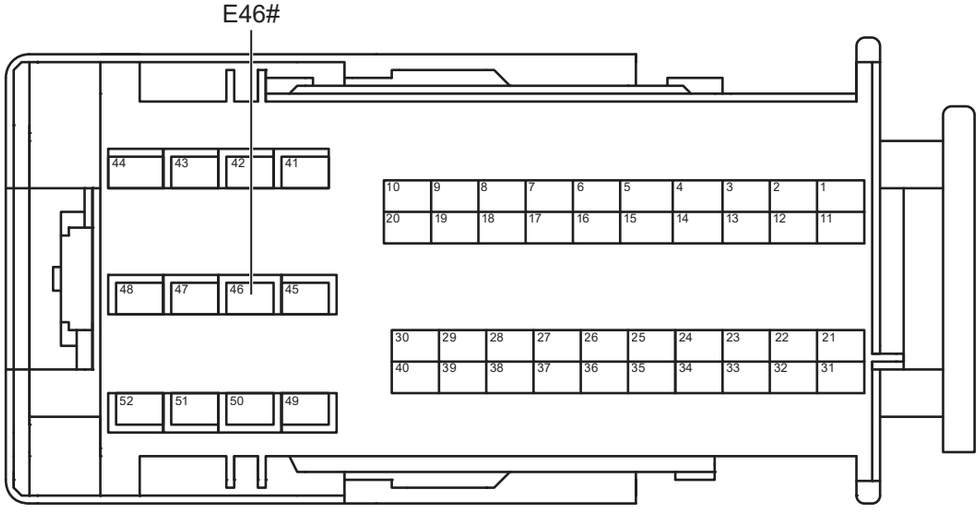
OK

2	**Check middle intelligent area control unit ground**



Middle intelligent area control unit D connector

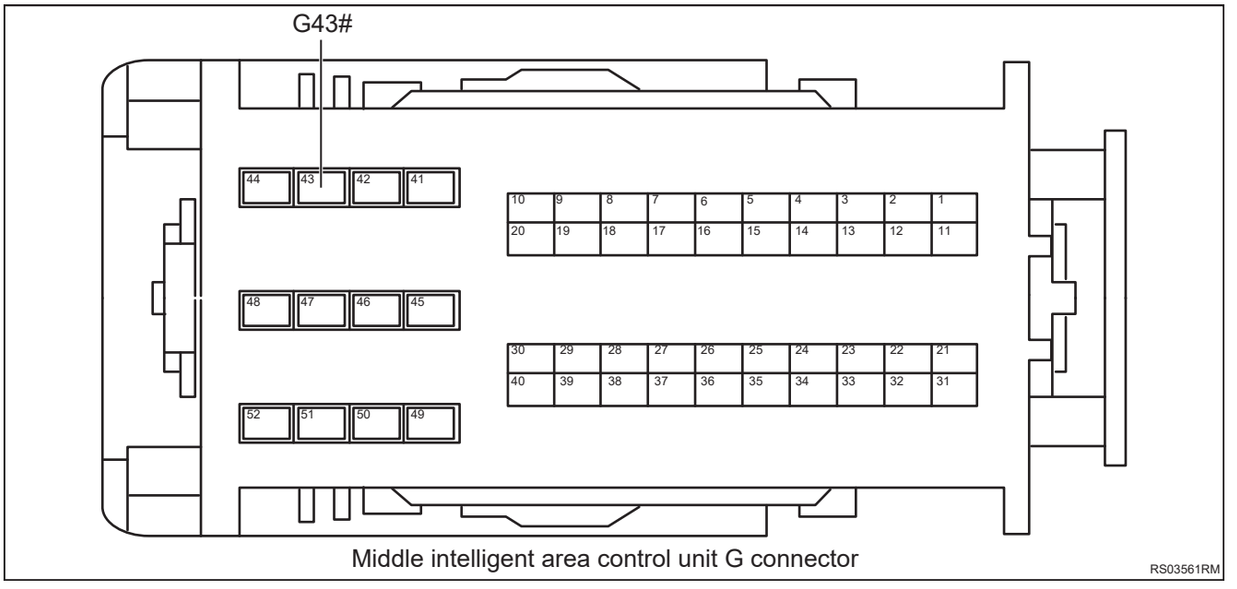
RS03541RM



Middle intelligent area control unit E connector

RS03551RM

ZD



Middle intelligent area control unit G connector

ZD

(a) According to value in the table, measure resistance.

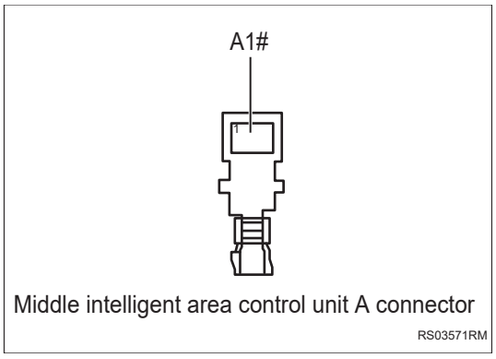
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector
RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

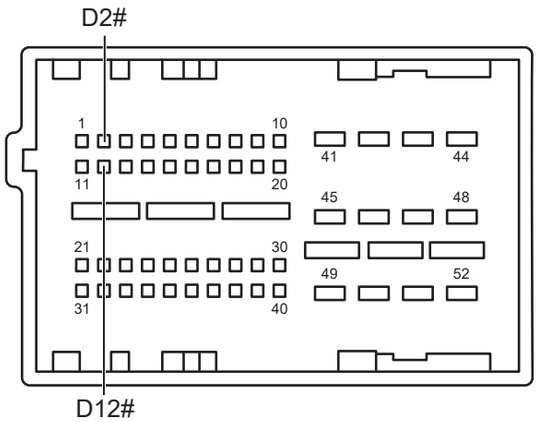
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

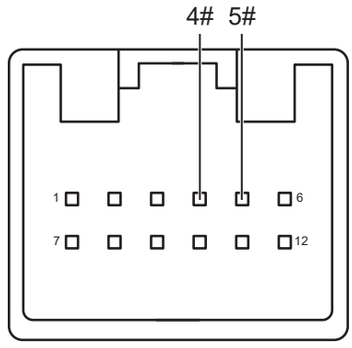
NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



Middle intelligent area control unit D



Combination switch

RS03580RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

ZD

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

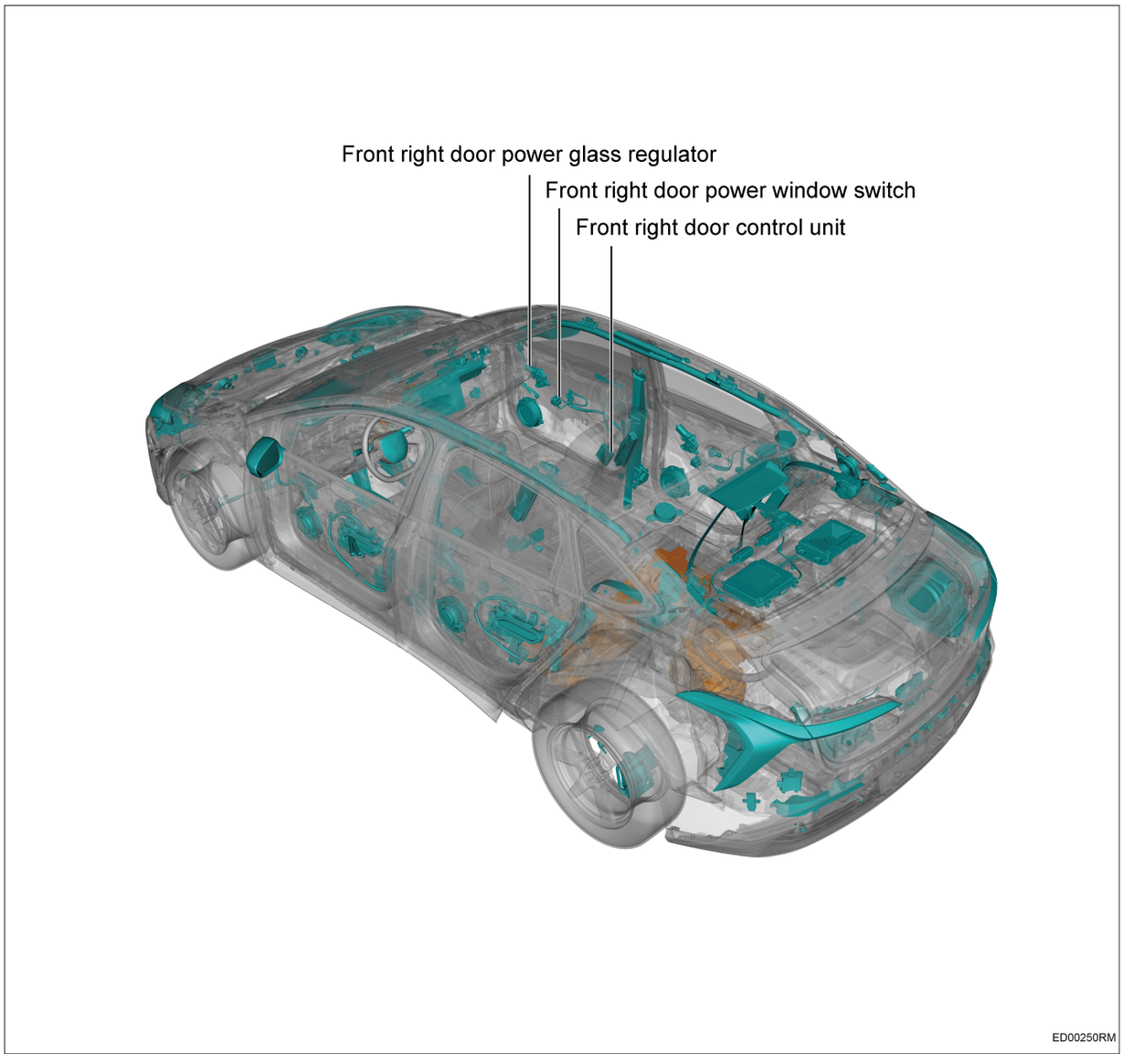
NG → **Replace front left door control unit (See page CS-12)**

OK

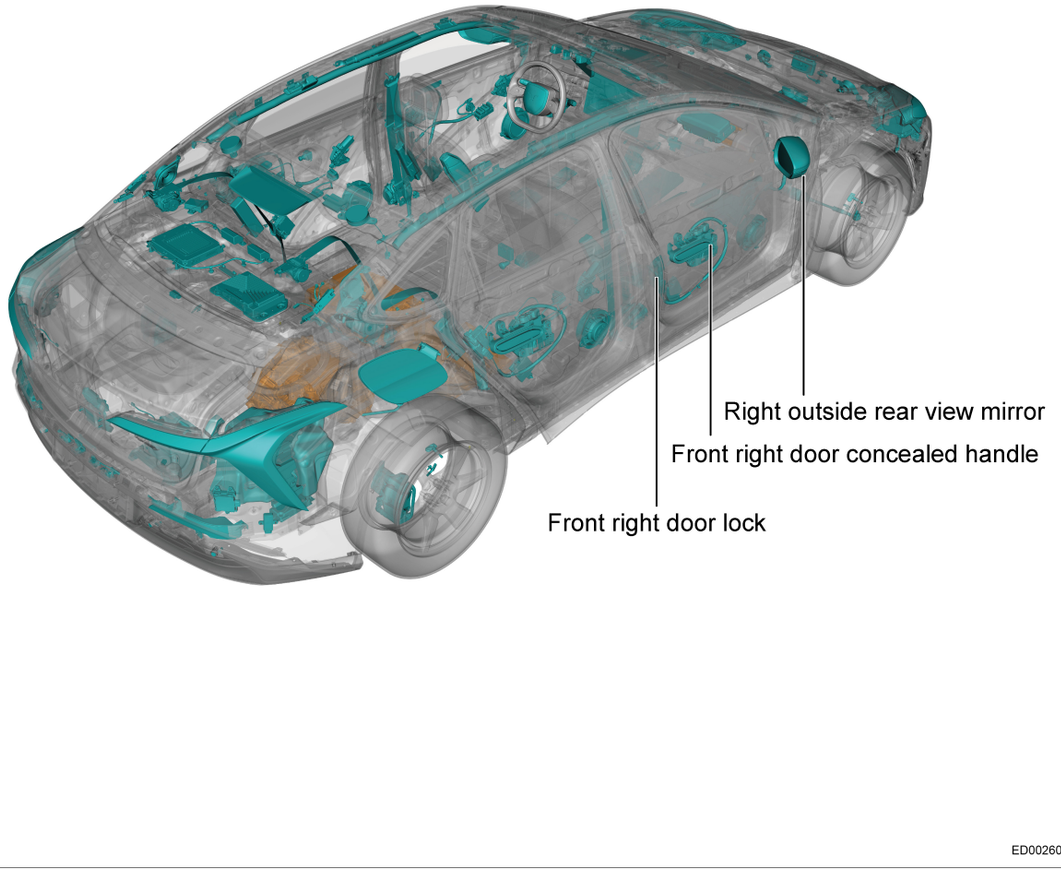
Diagnosis ends

Front right door control unit

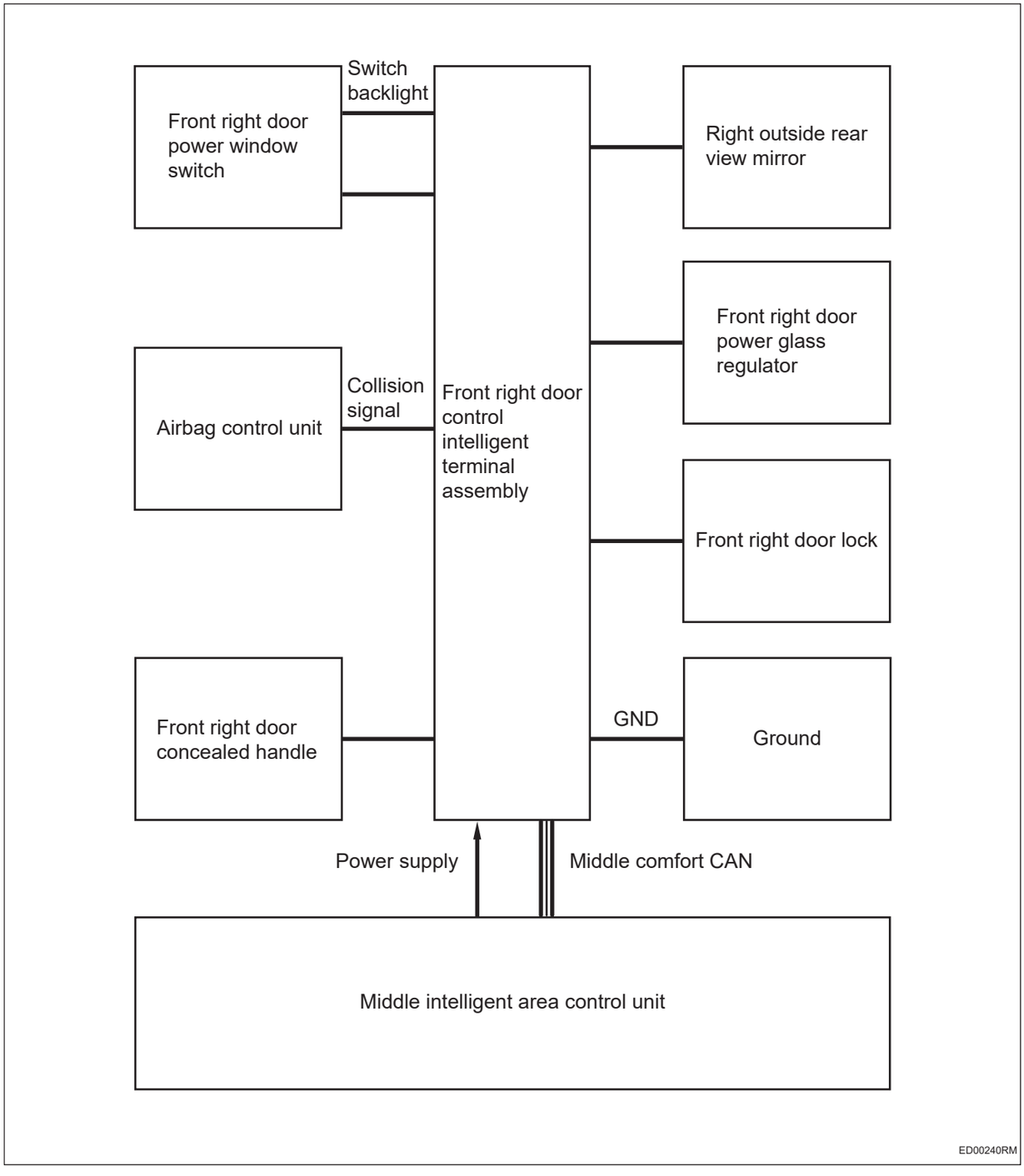
Part position



Part position



System diagram



Data parameter

Front right door control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	30	13	-

Front right door lock

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	3.8	0

Front right door concealed handle

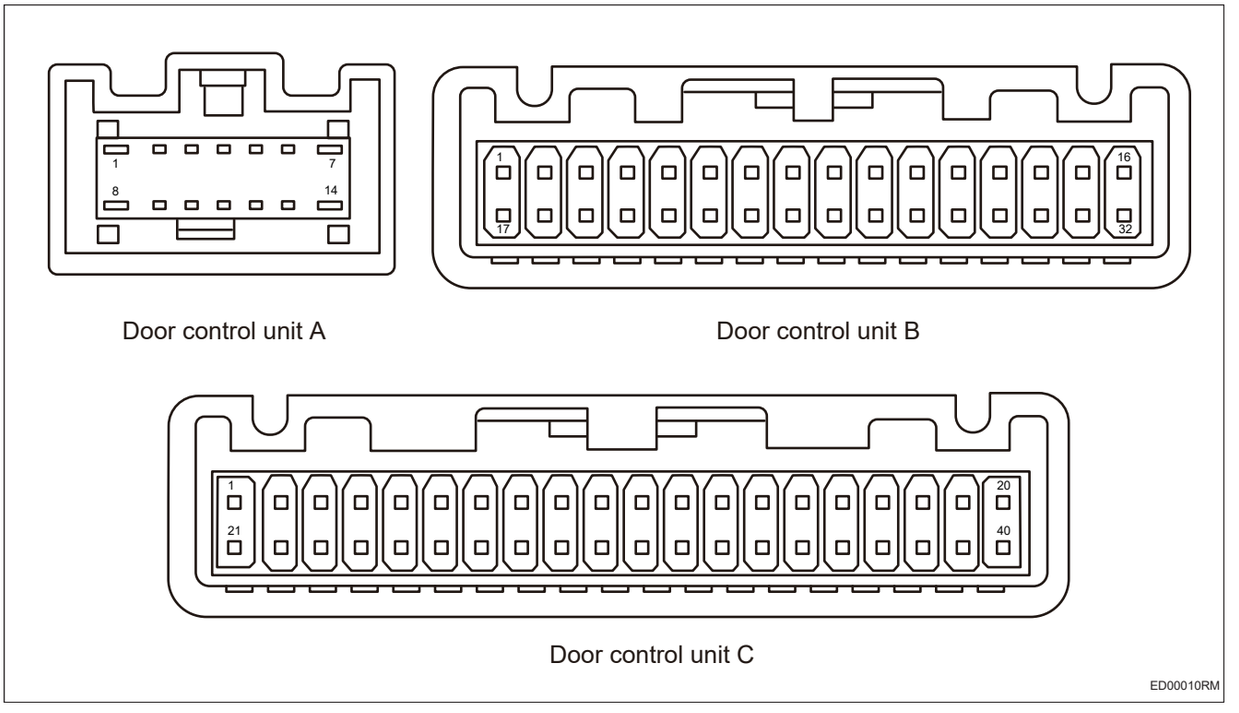
Item	Max	OK	Minimum
Operating voltage (V)	16	14.5	9
Operating current (A)	1.4	0.2	0.065

Front right door power glass regulator

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	12	12 Max.	2.5

ECU terminal

Front right door control unit



Front right door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply B+	8	Power ground
2	-	9	Door unlock output
3	Window down	10	Door lock output
4	Window up	11	-

Front right door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
5	-	12	-
6	-	13	-
7	-	14	-

Front right door control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	-
2	Right outside rear view mirror left/right adjustment	18	-
3	Right outside rear view mirror up/down adjustment	19	-
4	Concealed handle unfolding output	20	Right outside rear view mirror left/up adjustment/folding
5	Concealed handle folding output	21	Rear view mirror unfolding
6	-	22	-
7	-	23	Switch backlight output
8	-	24	Right rear view mirror turn signal light
9	-	25	-
10	-	26	-
11	BSD status indicator	27	-
12	Outside rear view mirror upper and lower position memory signal	28	-
13	-	29	-
14	-	30	Outside rear view mirror position memory ground (driver switch analog ground)
15	CAN L	31	Front right rear view mirror heating
16	CAN H	32	-

Front right door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	Hard wire collision signal
3	-	23	Front right door handle microswitch 1
4	-	24	-
5	-	25	-
6	-	26	-
7	-	27	-
8	-	28	Right outside rear view mirror left and right position memory signal
9	-	29	-

Front right door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
10	-	30	-
11	-	31	Front right door status switch
12	-	32	-
13	-	33	-
14	Front left handle microswitch 2	34	-
15	-	35	Rear view mirror position memory power supply
16	-	36	-
17	-	37	-
18	-	38	Load ground (indicator)
19	Front right window switch	39	-
20	Front right door lock feedback signal	40	-

Diagnostic Trouble Code (DTC) chart

Front right door control unit

DTC	Detection Items	See page
B114017	Battery voltage too high	(See page ZD-2939)
B114016	Battery voltage too low	(See page ZD-2939)
B114A19	Short in BSD light	(See page ZD-2965)
B114F19	Short in front right electric switch lock motor output	(See page ZD-2968)
B114111	Front right door window button stuck	(See page ZD-2943)
B114318	Open in front right door window motor output	(See page ZD-2948)
B114319	Short in front right door window motor output	(See page ZD-2948)
B114419	Short in rear view mirror up output	(See page ZD-2954)
B114519	Short in rear view mirror down output	(See page ZD-2954)
B114619	Short in rear view mirror left output	(See page ZD-2958)
B114719	Short in rear view mirror right output	(See page ZD-2958)
B114819	Short in front right door concealed handle motor output	(See page ZD-2962)
U002888	Comfort CAN bus off	(See page ZD-2972)
U014687	PDCM node lost	(See page ZD-2977)
U019987	Front left door controller node lost	(See page ZD-2977)
U015187	Airbag control unit node lost	(See page ZD-2977)

DTC	B114017	Battery voltage too high
DTC	B114016	Battery voltage too low

Description

When front right door control unit supply voltage is out of normal operation range, the front right door control unit records DTC.

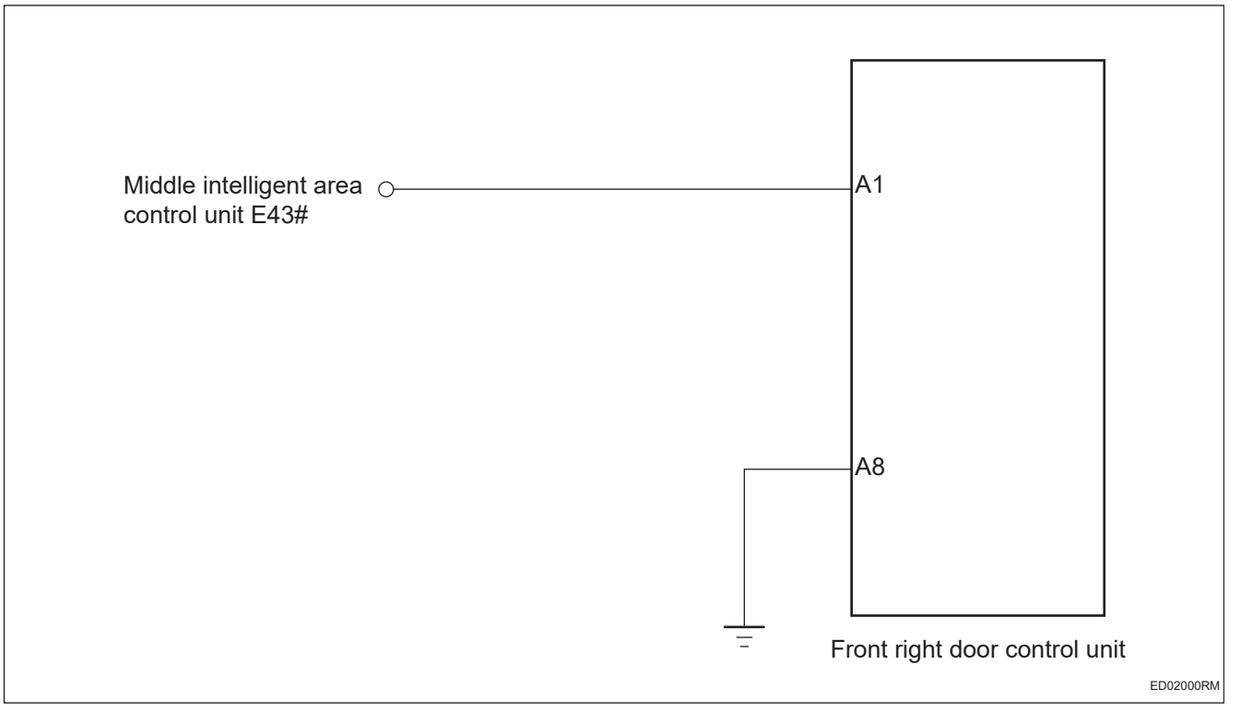
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114017	• Power supply status is normal	Voltage is 16.5 V or higher for more than 10 s	10 s	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Charging system
B114016	• Power supply status is normal	Voltage is 8.5 V or less for more than 10 s	10 s	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B114017	No window up function (all other functions are normal)	-
B114016	No window up function (all other functions are normal)	-

Circuit diagram



ZD

Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

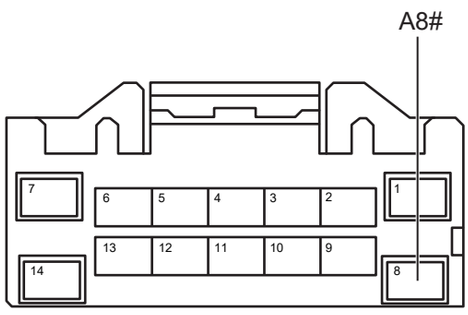
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check front right door control unit ground**



Front right door control unit A connector

ED02010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) According to value in the table, measure resistance.

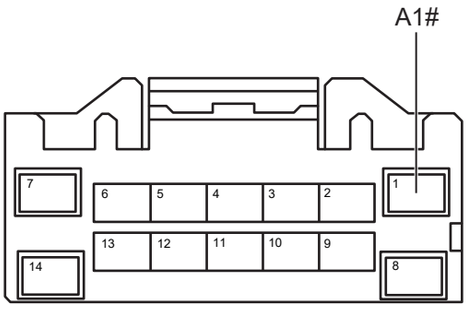
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A8# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front right door control unit power supply**



Front right door control unit A connector

ED02021RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace front right door control unit (See page CS-12)

DTC	B114111	Front right door window button stuck

Description

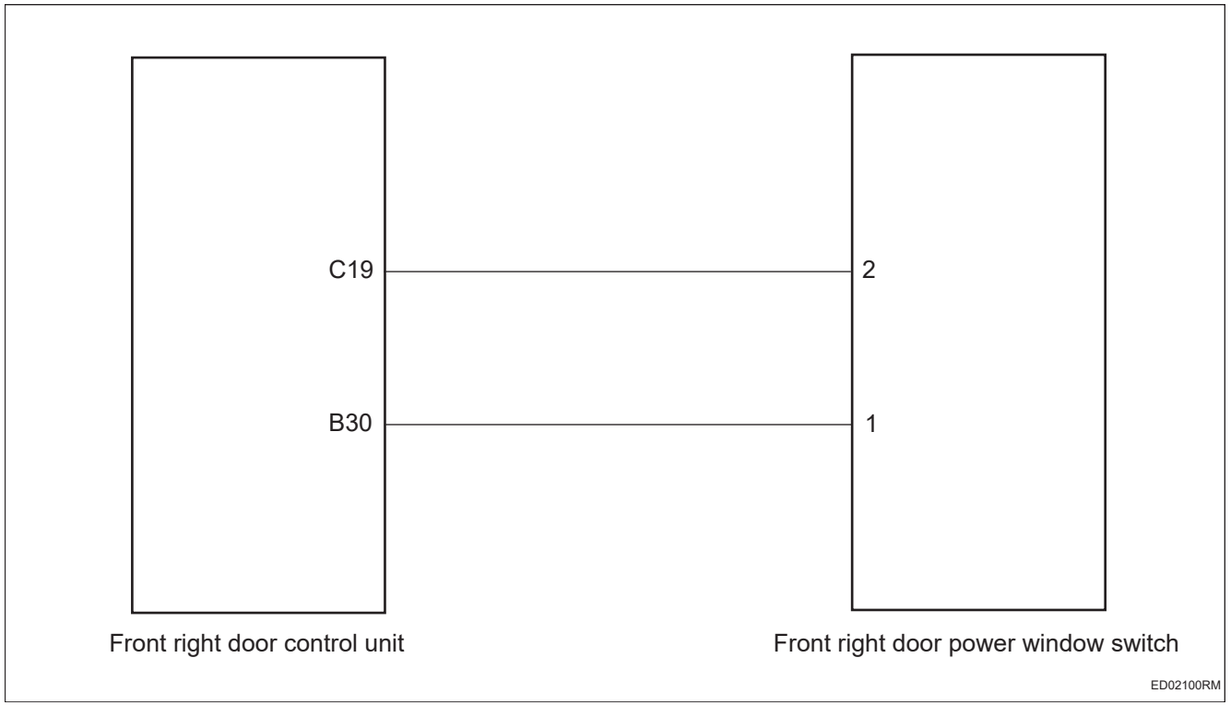
When front right door power window switch is faulty, the front right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114111	• Power supply status is normal	Front right button position stuck for more than 30 s	30 s	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Front right door power window switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B114111	No window up function	-

Circuit diagram



Inspection procedure

1	Check front right door power window switch

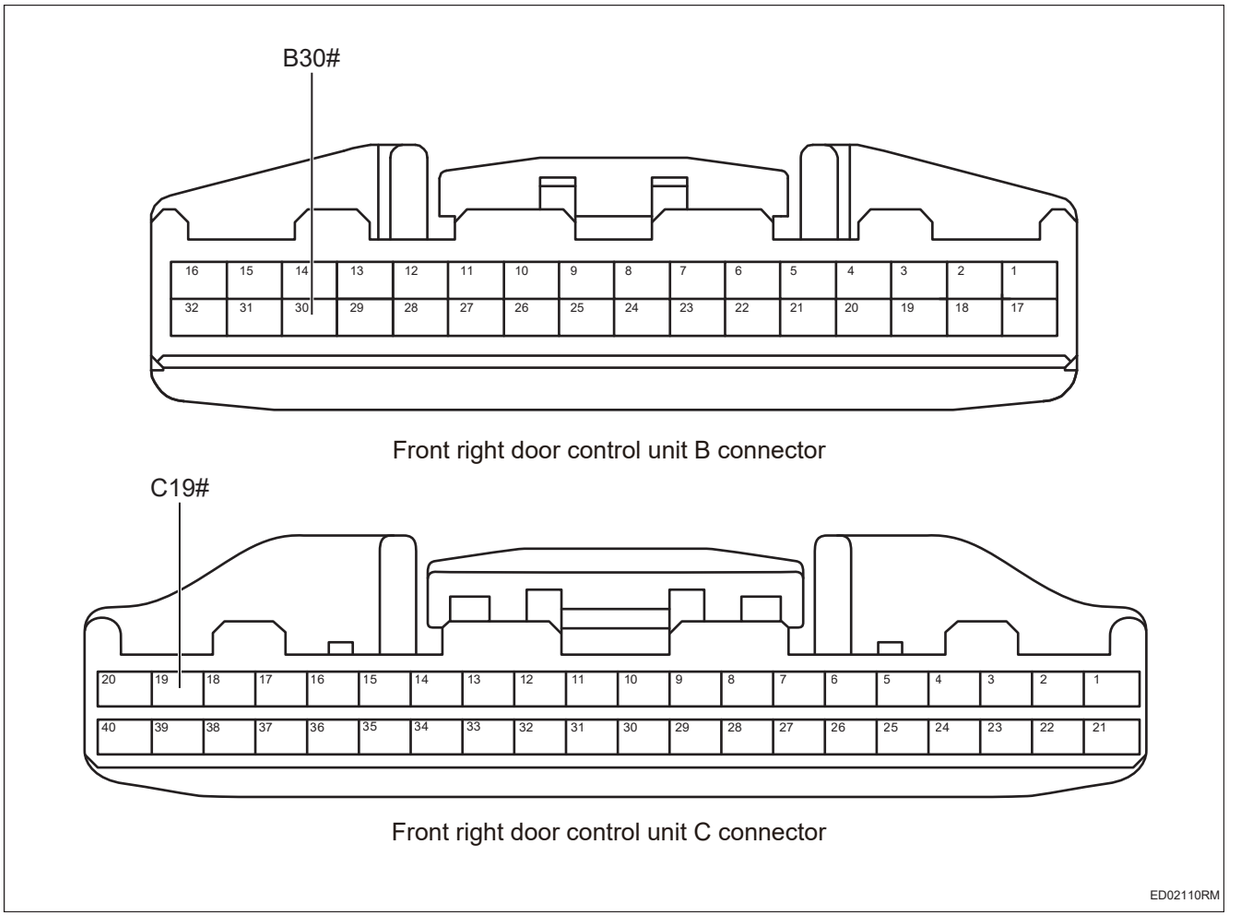
(a) Check for foreign matters in front right door power window switch.

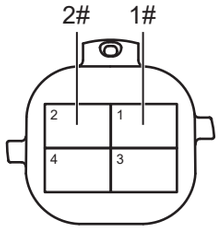
(b) Operate switch to check for sticking.

NG → **Perform repair according to malfunction**

OK

2	**Check for open in front right door power window switch wire harness and connector**





Front right door power window switch connector

ED02120RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the front right door power window switch connector.

(e) According to value in the table, measure resistance.

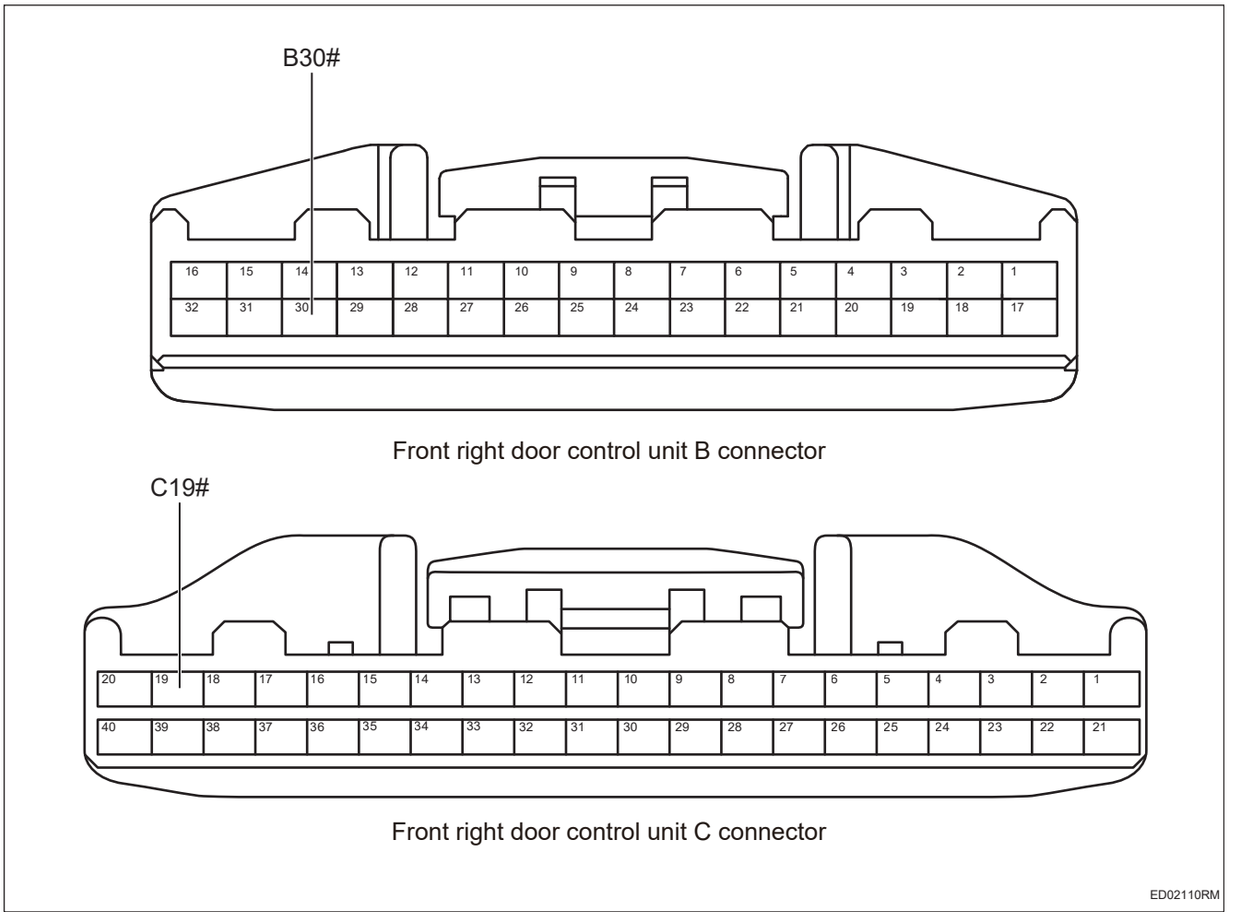
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector C19# - front right door power window switch connector 2#	Always connected	Less than 1 Ω
Front right door control unit connector B30# - front right door power window switch connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front right door power window switch wire harness and connector**



(a) According to value in the table, measure resistance.

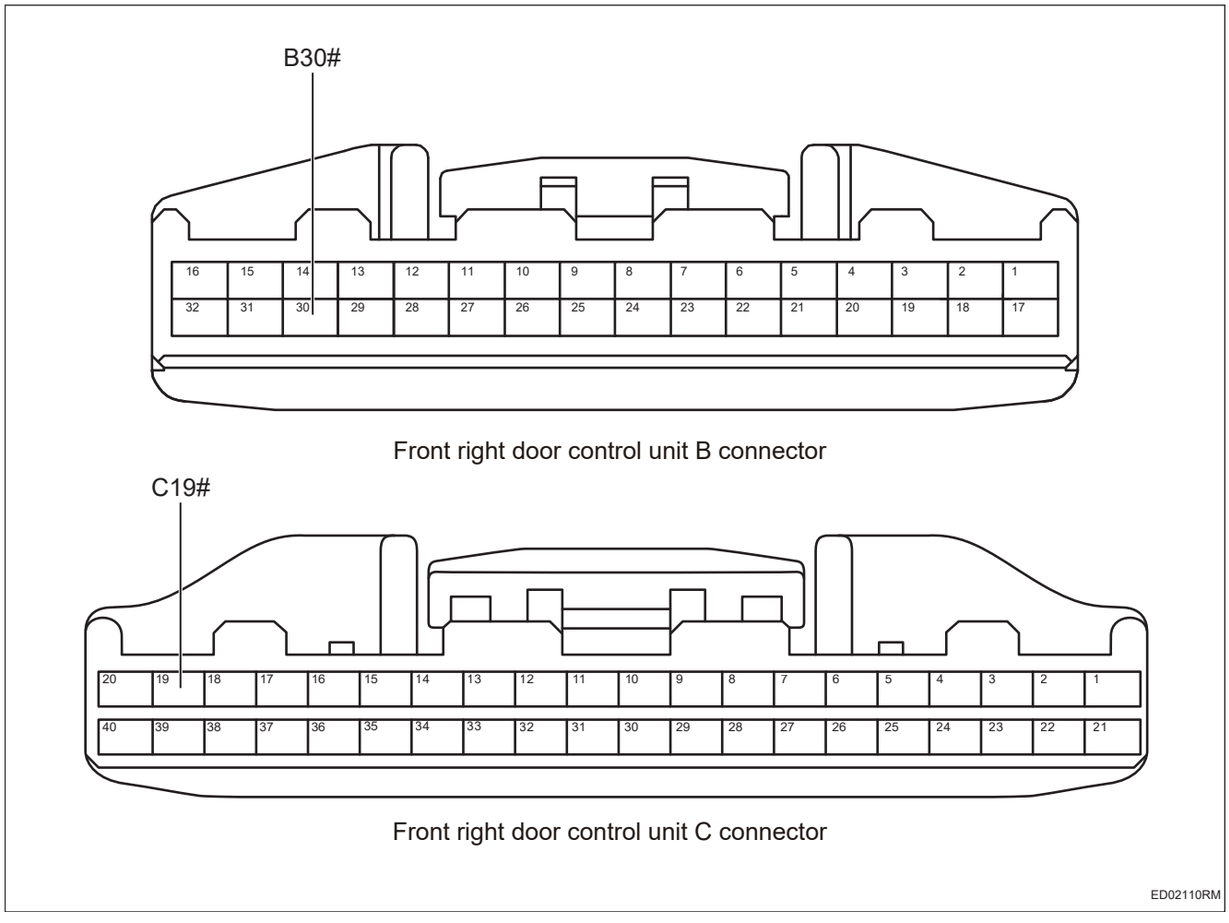
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector C19# - body ground	Always connected	10 KΩ or more
Front right door control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front right door power window switch wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector C19# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace front right door power window switch (See page NS-111)**

(a) Replace the front right door power window switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B114318**	**Open in front right door window motor output**
DTC	**B114319**	**Short in front right door window motor output**

Description

When front right door power glass regulator output circuit is short or open, the front right door control unit records DTC.

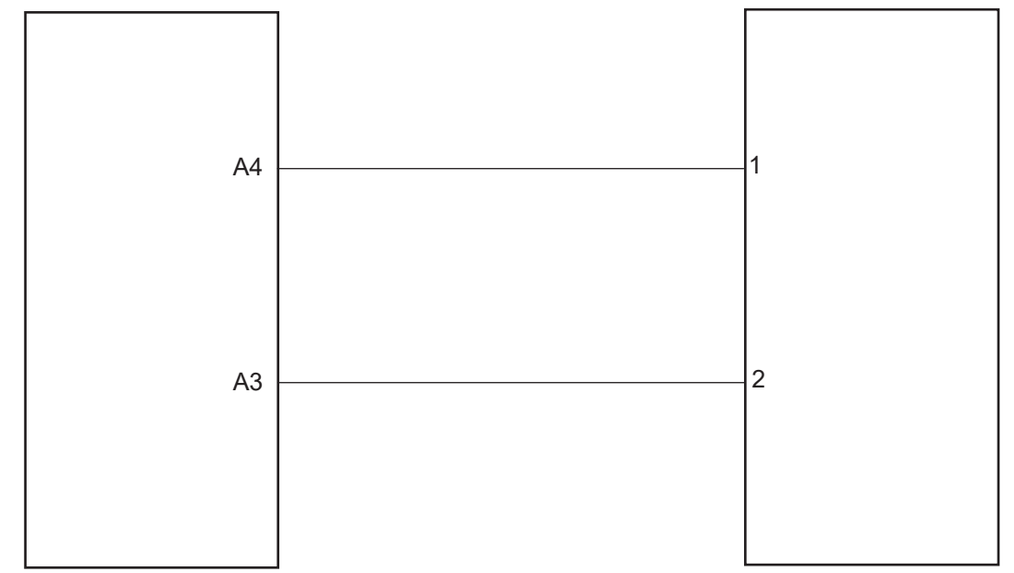
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114318	• Power supply status is normal • IGN is ON • Window up function ON	The current is 1 A or less when window is operating	30 ms	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Front right door power glass regulator
B114319	• Power supply status is normal • IGN is ON • Window up function ON • The window learning is completed and moved to the middle position (less than 4 mm from the top, more than 3 cm from the bottom)	Determine the current after starting for 100 ms. If it exceeds 28 A (to be calibrated) and after filtering for 10 ms, short circuit is confirmed and cut off the output	10 ms	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Front right door power glass regulator

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B114318	No window up function	-
B114319	No window up function	-

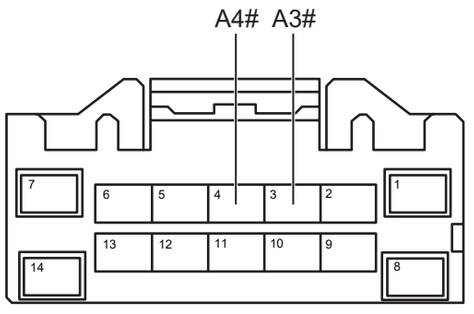
Circuit diagram

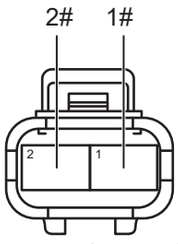


ZD

Inspection procedure

1	**Check for open in front right door power glass regulator wire harness and connector**





Front right door power glass regulator connector

ED02220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the front right door power glass regulator connector.

(e) According to value in the table, measure resistance.

Standard value

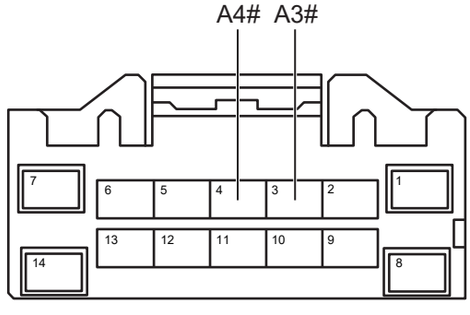
Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A4# - front right door power glass regulator connector 1#	Always connected	Less than 1 Ω
Front right door control unit connector A3# - front right door power glass regulator connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to each other in front right door power glass regulator wire harness and connector**



Front right door control unit A connector

ED02211RM

(a) According to value in the table, measure resistance.

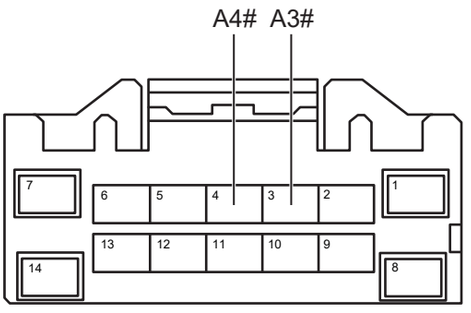
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A4# - front right door control unit connector A3#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front right door power glass regulator wire harness and connector**



Front right door control unit A connector

ED02211RM

(a) According to value in the table, measure resistance.

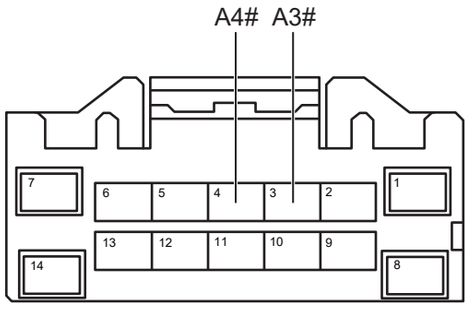
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A4# - body ground	Always connected	10 KΩ or more
Front right door control unit connector A3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front right door power glass regulator wire harness and connector**



Front right door control unit A connector

ED02211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector A4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door control unit connector A3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace front right door power glass regulator (See page CS-15)**

(a) Replace the front right door power glass regulator.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B114419**	**Short in rear view mirror up output**
DTC	**B114519**	**Short in rear view mirror down output**

Description

When right outside rear view mirror upper and lower adjustment output circuits are short, the front right door control unit records DTC.

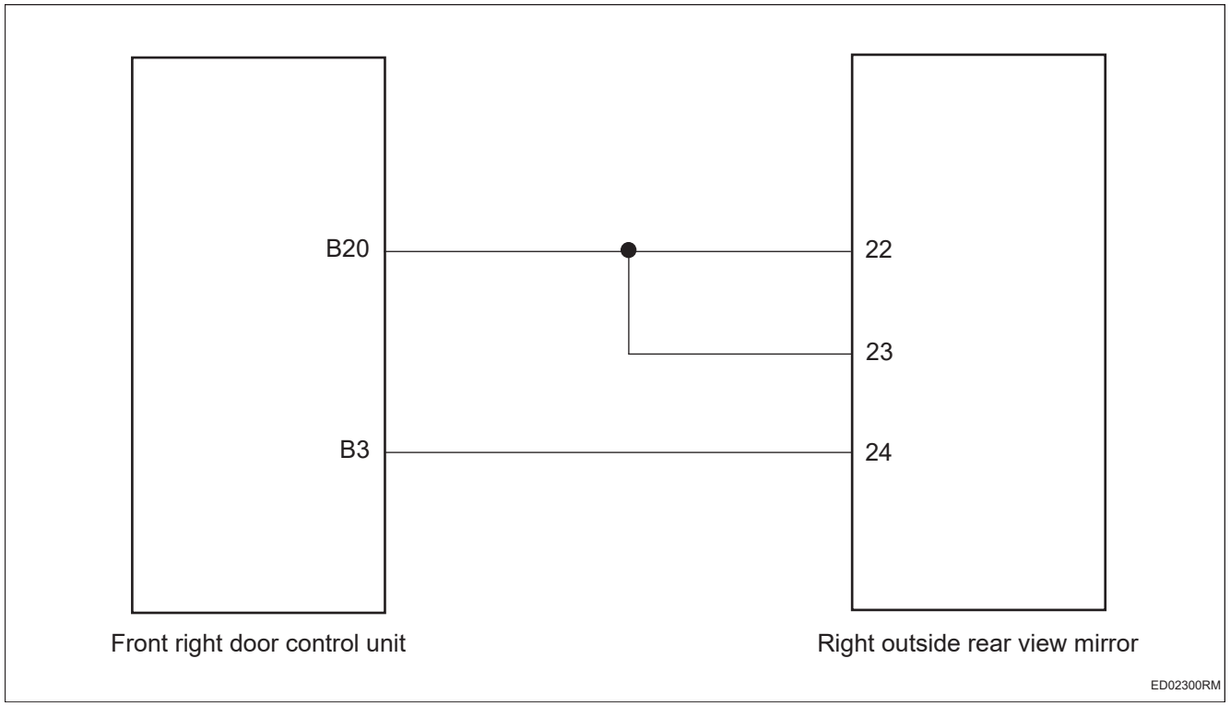
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114419	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror up output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Right outside rear view mirror
B114519	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror down output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Right outside rear view mirror

ZD

Fault symptom

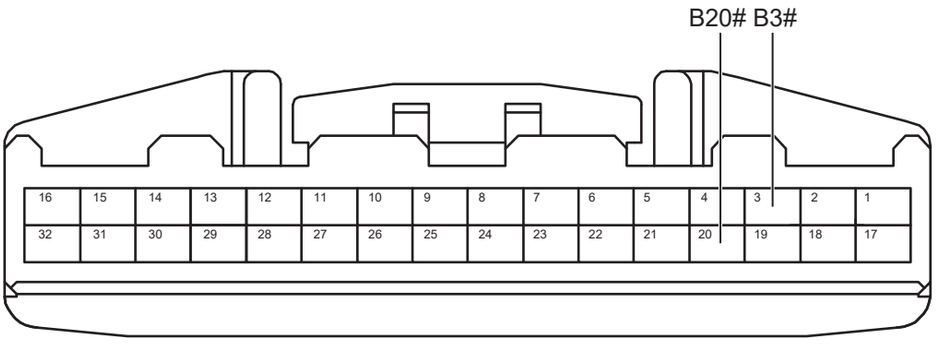
DTC No.	Fault symptom	Warning light/indicator
B114419	No rear view mirror up adjustment function	-
B114519	No rear view mirror down adjustment function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in right outside rear view mirror wire harness and connector**



Front right door control unit B connector

ED02321RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the right outside rear view mirror connector.

(e) According to value in the table, measure resistance.

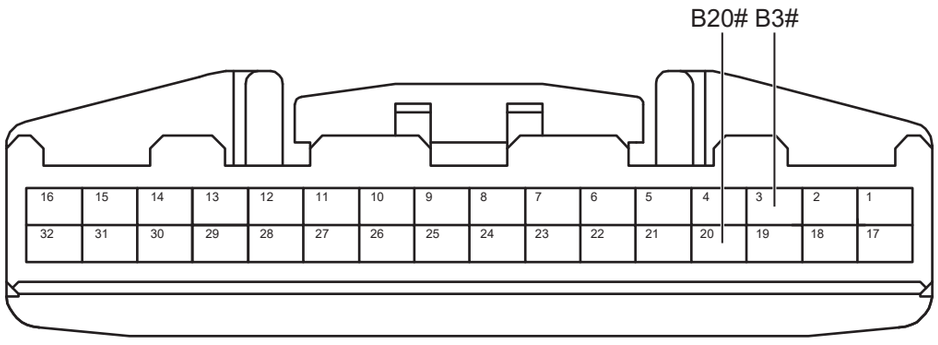
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B20# - body ground	Always connected	10 KΩ or more
Front right door control unit connector B3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in right outside rear view mirror wire harness and connector**



Front right door control unit B connector

ED02321RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B20# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door control unit connector B3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace right outside rear view mirror (See page WS-74)**

(a) Replace the right outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

OK

ZD

Diagnosis ends

DTC	**B114619**	**Short in rear view mirror left output**
DTC	**B114719**	**Short in rear view mirror right output**

Description

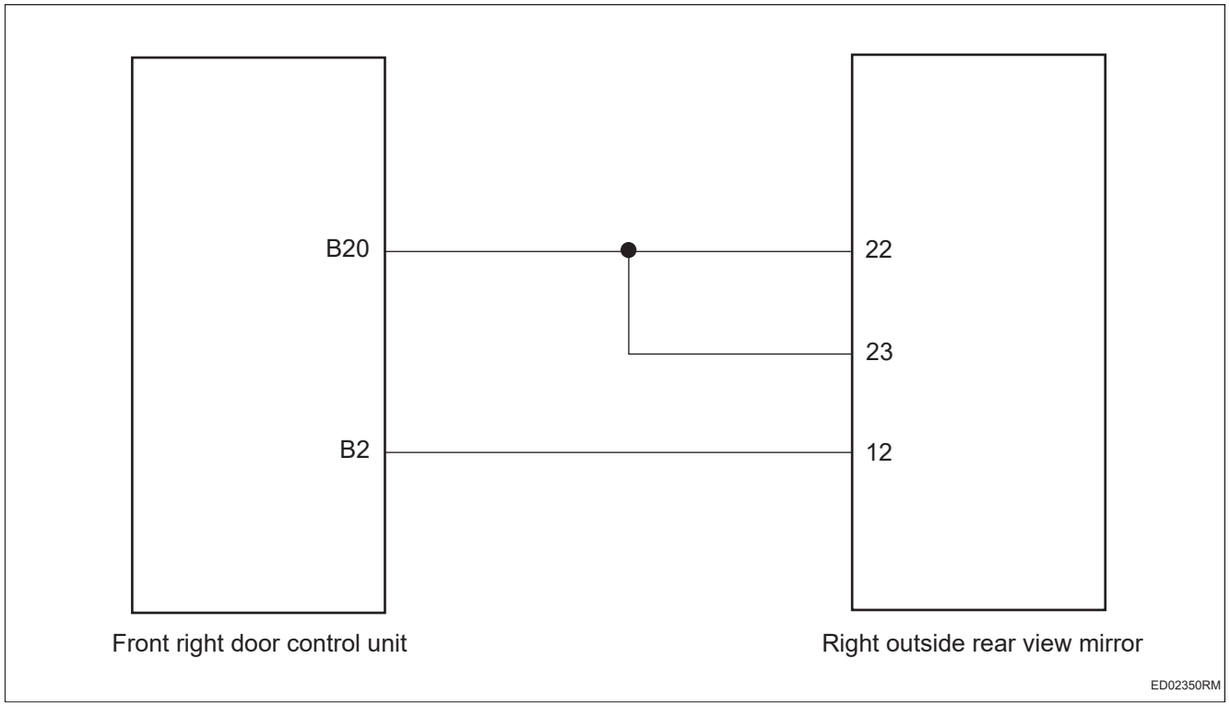
When right outside rear view mirror left and right adjustment output circuits are short, the front right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114619	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror left output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Right outside rear view mirror
B114719	• Power supply status is normal • IGN is ON • Rear view mirror adjustment function is turned on	Rear view mirror right output current is more than 500 mA	100 ms	Periodic type	10 ms	• Front right door control unit • Wire harness and connector • Right outside rear view mirror

Fault symptom

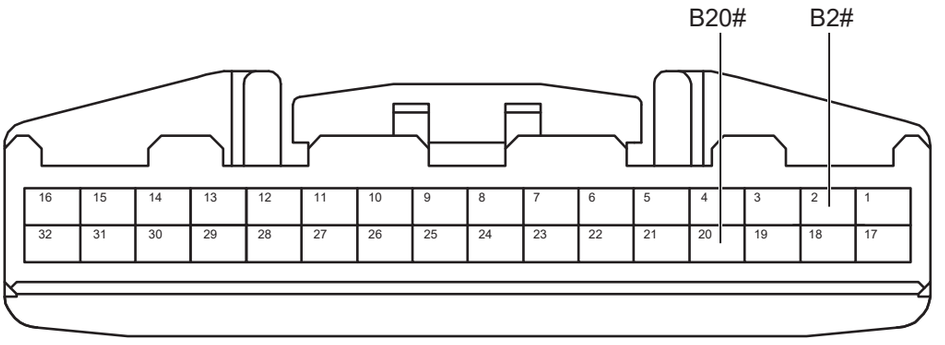
DTC No.	Fault symptom	Warning light/indicator
B114619	No rear view mirror left adjustment function	-
B114719	No rear view mirror right adjustment function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in right outside rear view mirror wire harness and connector**



Front right door control unit B connector

ED02361RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the right outside rear view mirror connector.

(e) According to value in the table, measure resistance.

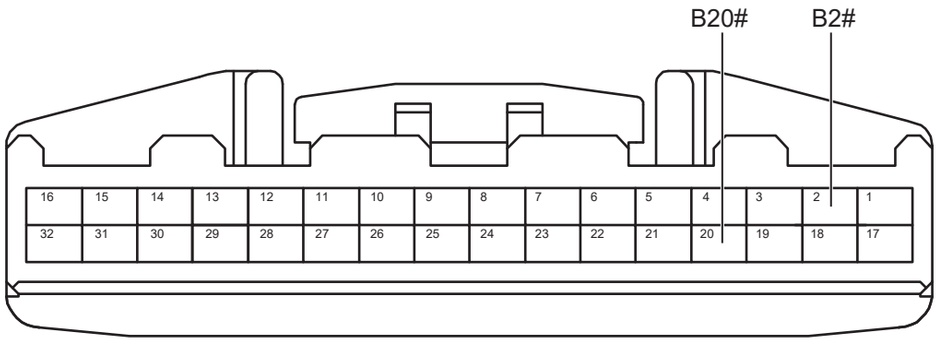
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B20# - body ground	Always connected	10 KΩ or more
Front right door control unit connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in right outside rear view mirror wire harness and connector**



Front right door control unit B connector

ED02361RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B20# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door control unit connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace right outside rear view mirror (See page WS-74)**

(a) Replace the right outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

OK

ZD

Diagnosis ends

DTC	B114819	Short in front right door concealed handle motor output

Description

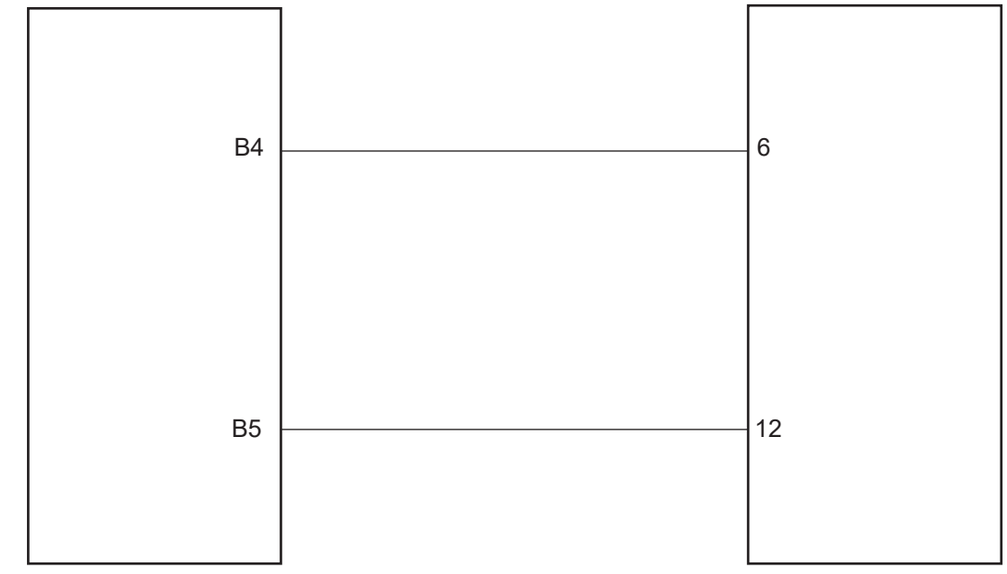
When front right door concealed handle motor output is short, the front right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114819	• Power supply status is normal • Concealed handle function on	The current is 10 A or more when concealed handle is operating (to be calibrated)	100 ms	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Front right door concealed handle

Fault symptom

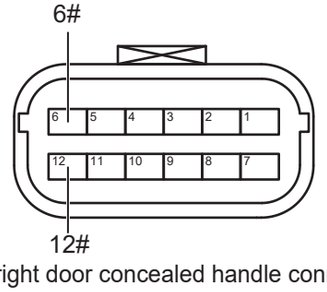
DTC No.	Fault symptom	Warning light/indicator
B114819	No concealed handle function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in front right door concealed handle wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the front right door concealed handle connector.

(e) According to value in the table, measure resistance.

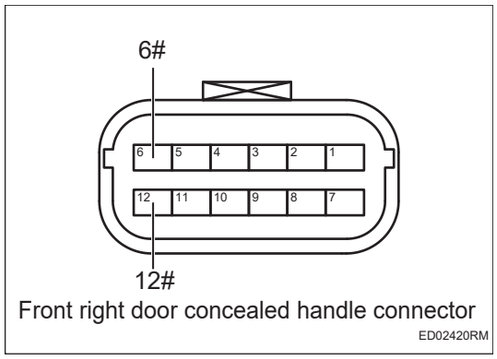
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door concealed handle connector 6# - body ground	Always connected	10 KΩ or more
Front right door concealed handle connector 12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in front right door concealed handle wire harness and connector**



Front right door concealed handle connector
ED02420RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door concealed handle connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door concealed handle connector 12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace front right door concealed handle (See page CS-44)**

(a) Replace the front right door concealed handle.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

ZD

OK

Diagnosis ends

DTC	B114A19	Short in BSD light

Description

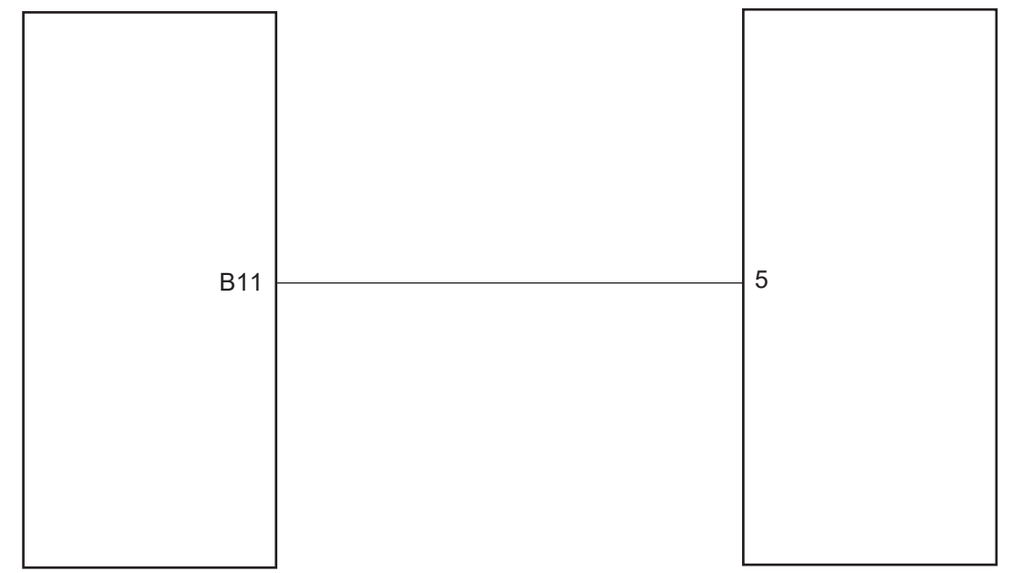
When right outside rear view mirror BSD light circuit is short, the front right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114A19	• Power supply status is normal • IGN is ON • BSD function configuration turns on • BSD function turns on	Current is greater than 5 A when BSD drives (to be calibrated)	100 ms	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Right outside rear view mirror

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B114A19	No BSD light function	-

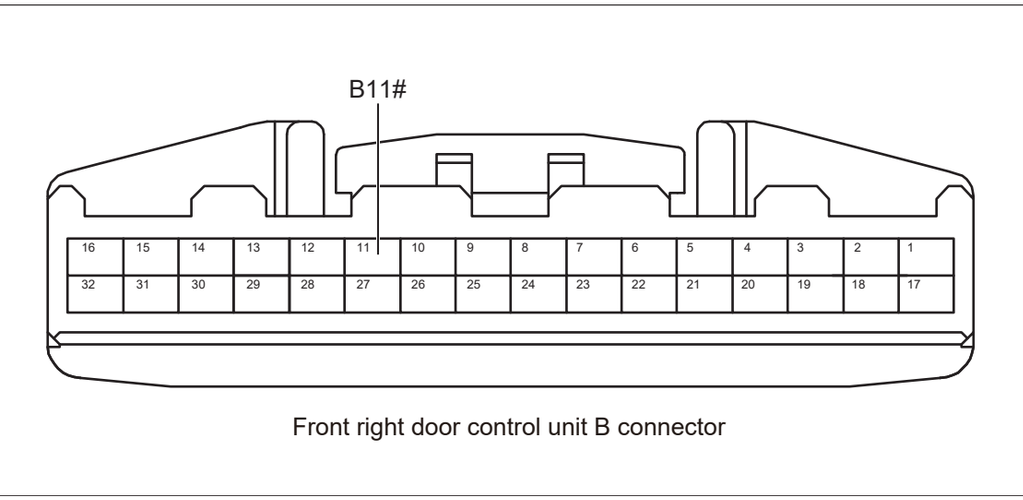
Circuit diagram



ZD

Inspection procedure

1	**Check for short to ground in right outside rear view mirror wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the right outside rear view mirror connector.

(e) According to value in the table, measure resistance.

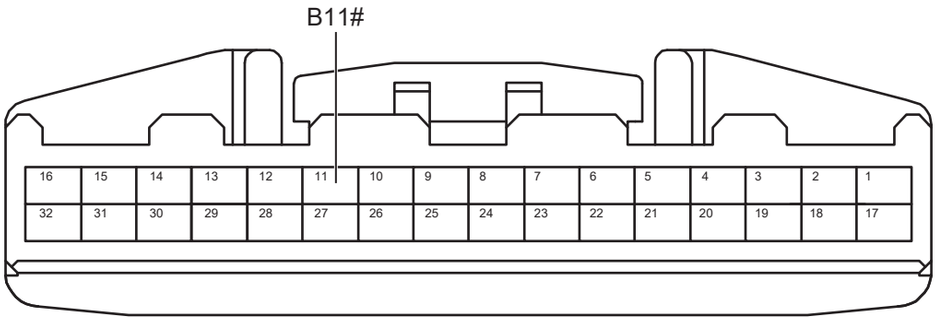
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B11# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in right outside rear view mirror wire harness and connector**



Front right door control unit B connector

ED02521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → Check and repair or replace wire harness and connector

OK

3	Replace right outside rear view mirror (See page WS-74)

(a) Replace the right outside rear view mirror.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace front right door control unit (See page CS-12)

OK

Diagnosis ends

DTC	B114F19	Short in front right electric switch lock motor output

Description

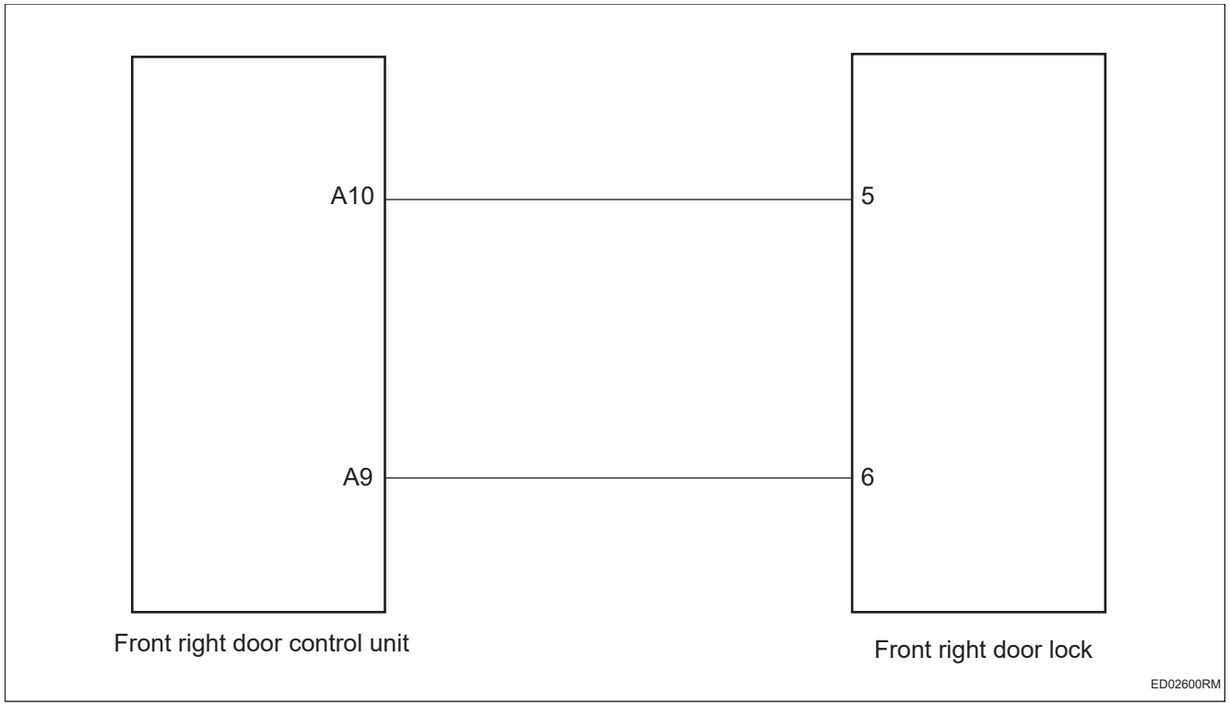
When front right door lock motor output is short, the front right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B114F19	• Power supply status is normal	The current is 10 A or more when the electric unlocking action is performed (to be calibrated)	100 ms	Periodic type	1 ms	• Front right door control unit • Wire harness and connector • Front right door lock

Fault symptom

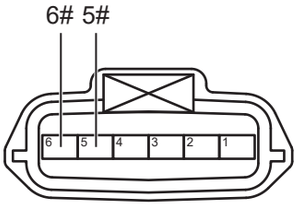
DTC No.	Fault symptom	Warning light/indicator
B114F19	Unable to unlock electrically	-

Circuit diagram



Inspection procedure

1	**Check for short to each other in front right door lock wire harness and connector**



Front right door lock connector

ED02620RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Disconnect the front right door lock connector.

(e) According to value in the table, measure resistance.

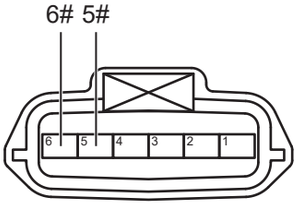
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door lock connector 5# - front right door lock connector 6#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in front right door lock wire harness and connector**



Front right door lock connector

ED02620RM

(a) According to value in the table, measure resistance.

Standard value

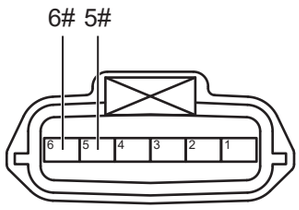
Multimeter connection	Detection condition	Specified condition
Front right door lock connector 5# - body ground	Always connected	10 KΩ or more
Front right door lock connector 6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to power supply in front right door lock wire harness and connector**



Front right door lock connector

ED02620RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door lock connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door lock connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace front right door lock (See page CS-38)**

(a) Replace the front right door lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	U002888	Comfort CAN bus off

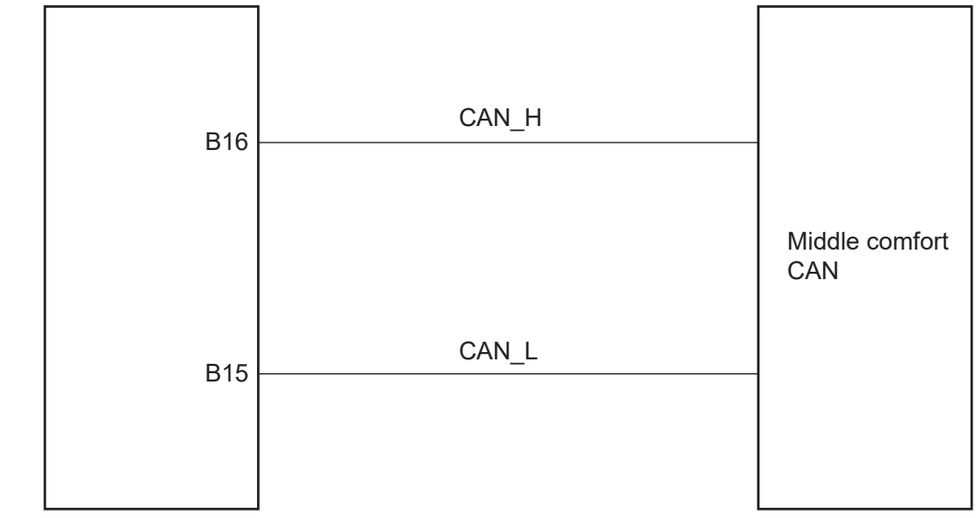
ZD

Description

When the front right door control unit detects middle comfort CAN bus off fault, the front right door control unit records DTC.

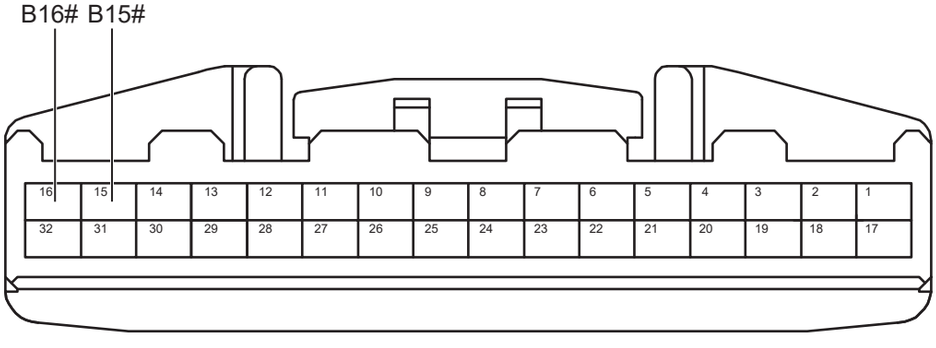
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front right door control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B16# - front right door control unit connector B15#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

ZD

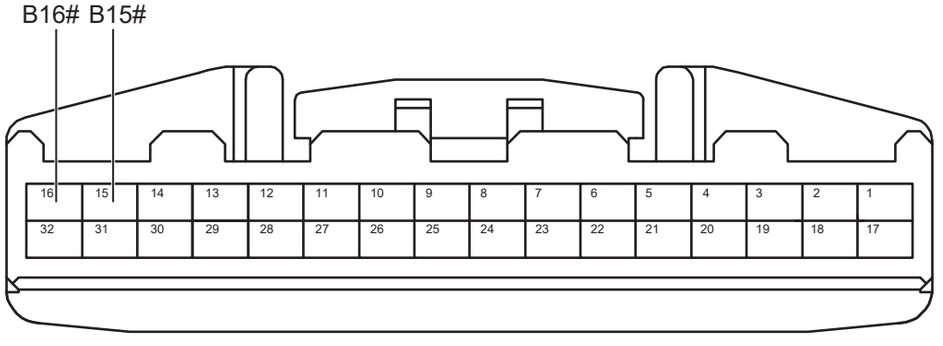
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Front right door control unit B connector

ED02711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

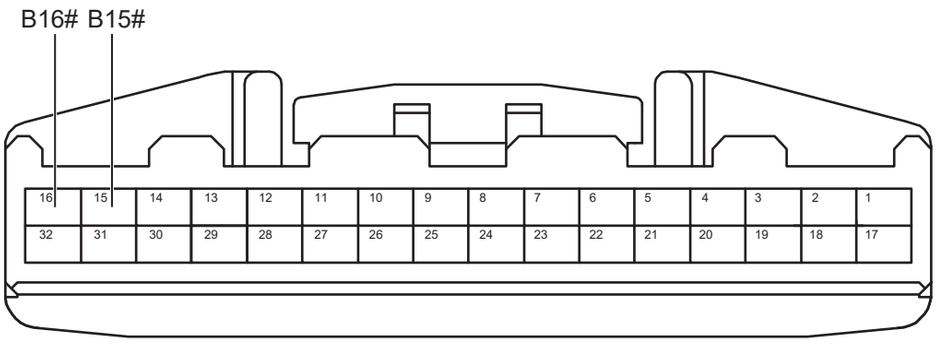
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B16# - front right door control unit connector B15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in central comfort CAN bus



Front right door control unit B connector

ED02711RM

(a) According to value in the table, measure resistance.

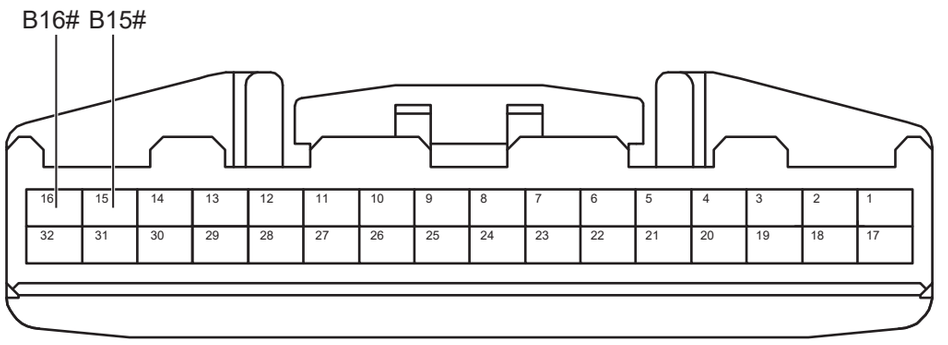
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B16# - body ground	Always connected	10 KΩ or more
Front right door control unit connector B15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Front right door control unit B connector

ED02711RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front right door control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

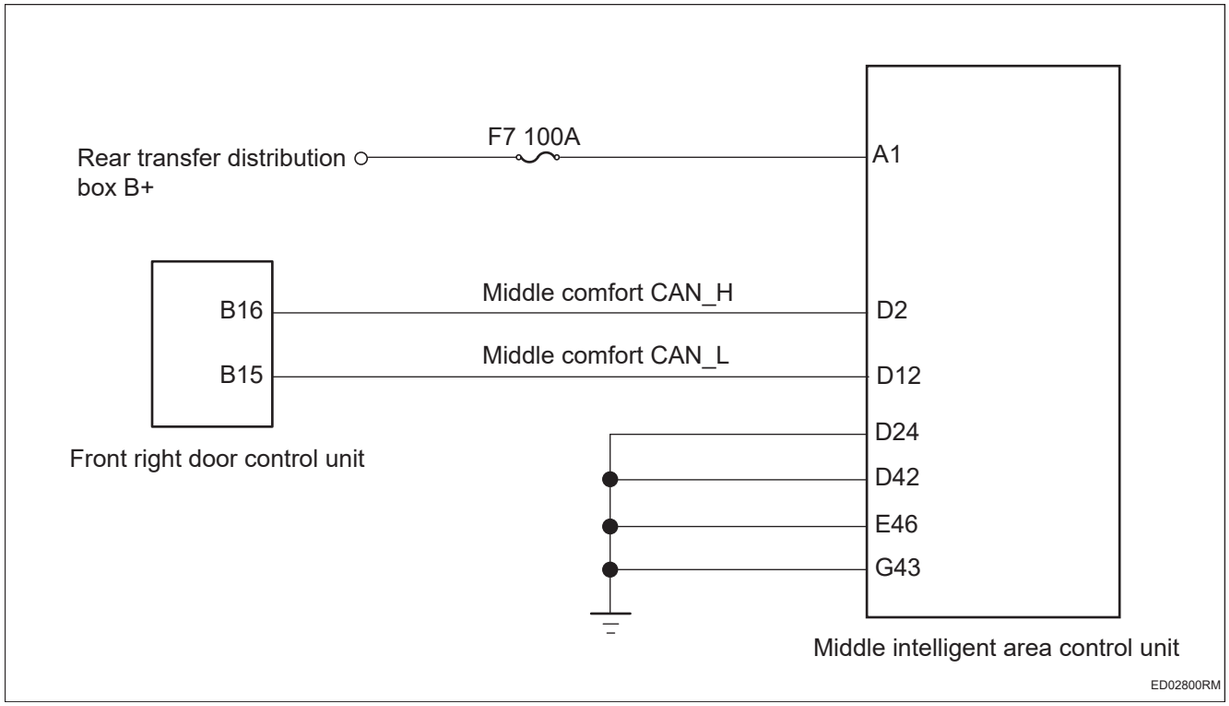
DTC	**U014687**	**PDCM node lost**
DTC	**U019987**	**Front left door controller node lost**
DTC	**U015187**	**Airbag control unit node lost**

Description

When communication between front right door control unit and other system is abnormal or interrupted, the front right door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Front right door control unit • Middle intelligent area control unit • Combination switch
U019987	(a) Front left door controller node lost.	• Wire harness and connector • Front right door control unit • Front left door control unit • Middle intelligent area control unit • Combination switch
U015187	(a) Airbag control unit node lost.	• Wire harness and connector • Front right door control unit • Airbag control unit • Middle intelligent area control unit • Combination switch

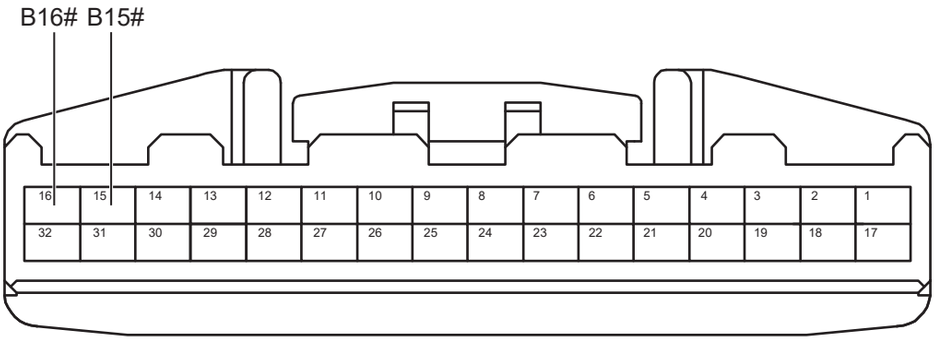
Circuit diagram



Inspection procedure

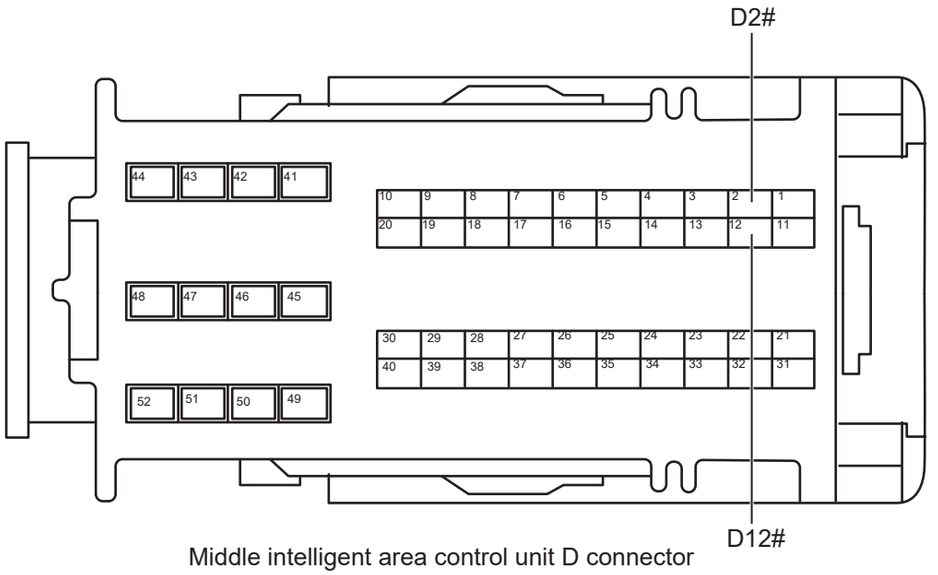
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (front right door control unit - middle intelligent area control unit)**



Front right door control unit B connector

ED02811RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

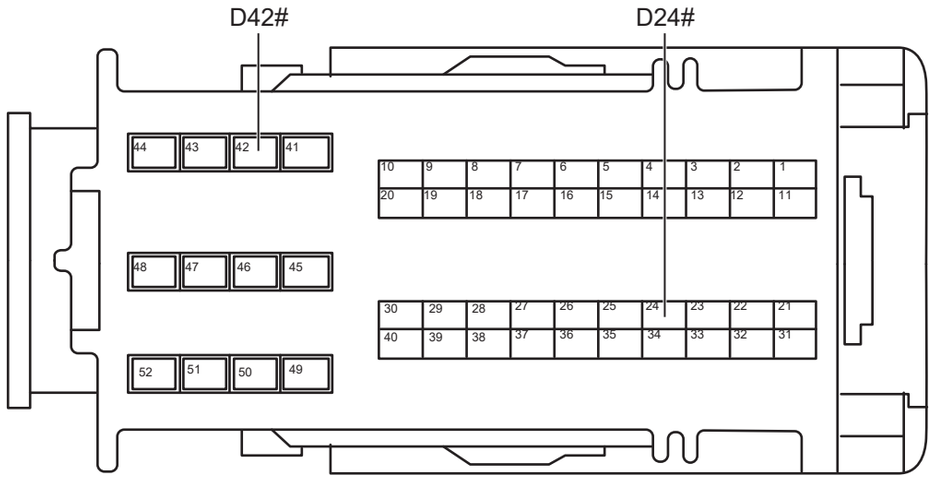
Standard value

Multimeter connection	Detection condition	Specified condition
Front right door control unit connector B16# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Front right door control unit connector B15# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

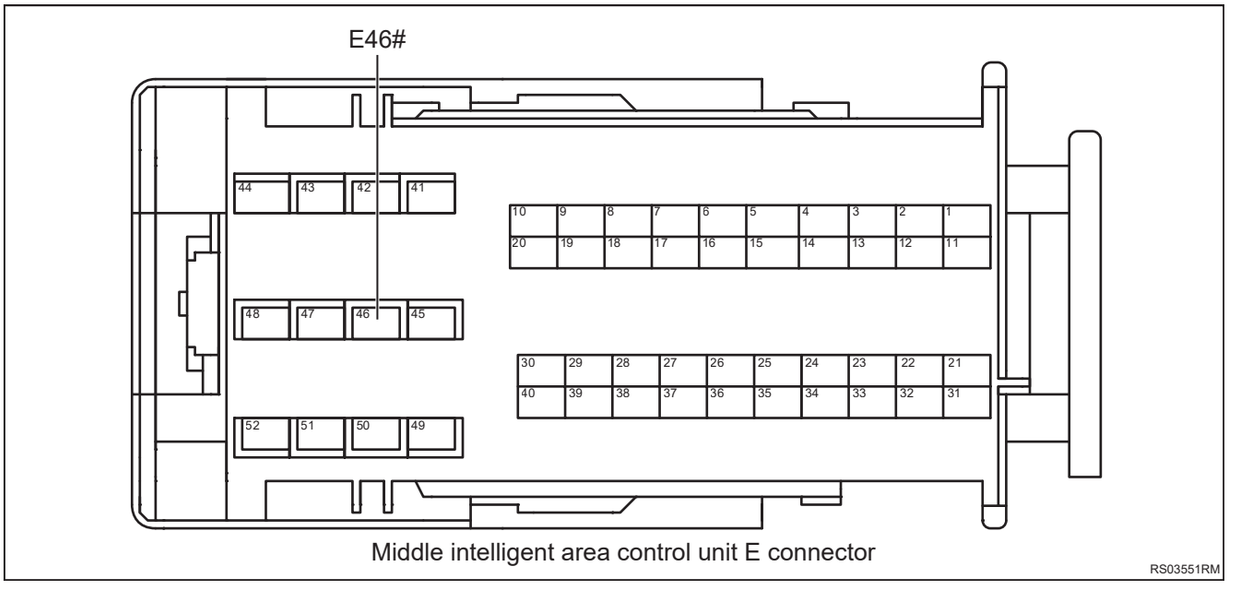
OK

2	**Check middle intelligent area control unit ground**



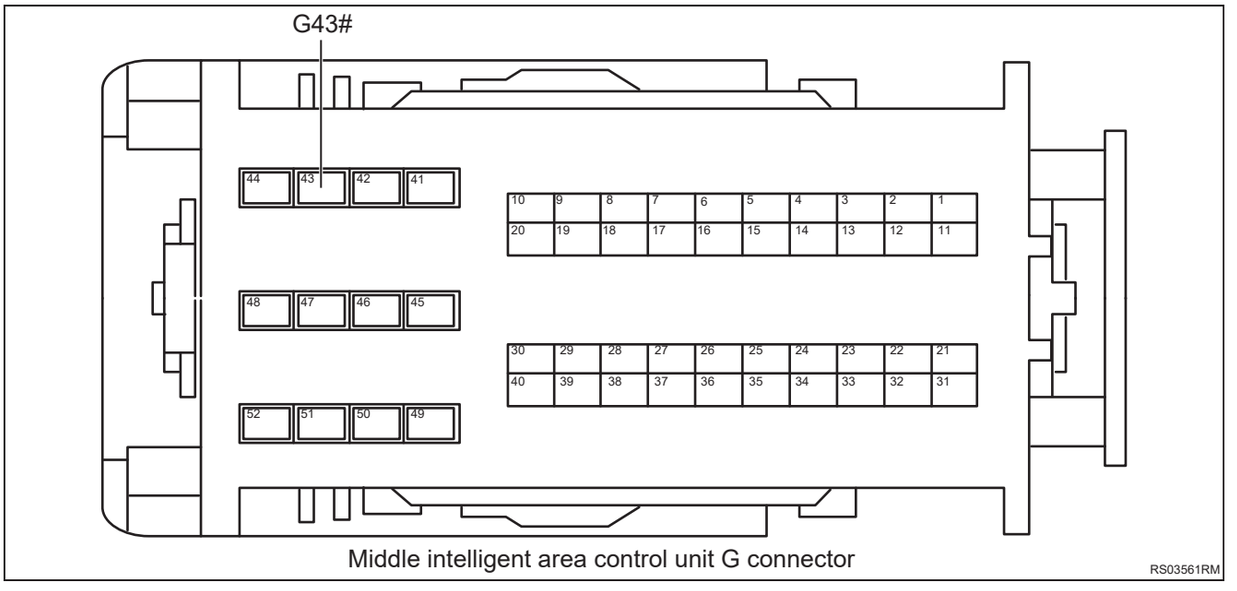
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

RS03561RM

(a) According to value in the table, measure resistance.

Standard value

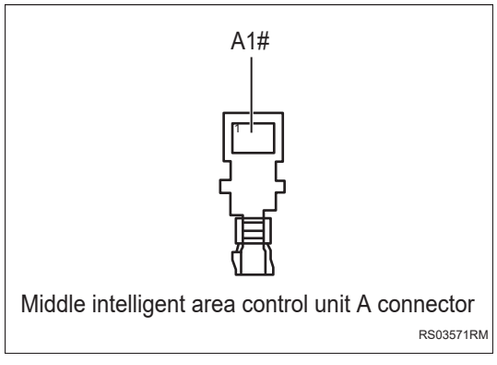
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check middle intelligent area control unit power supply



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

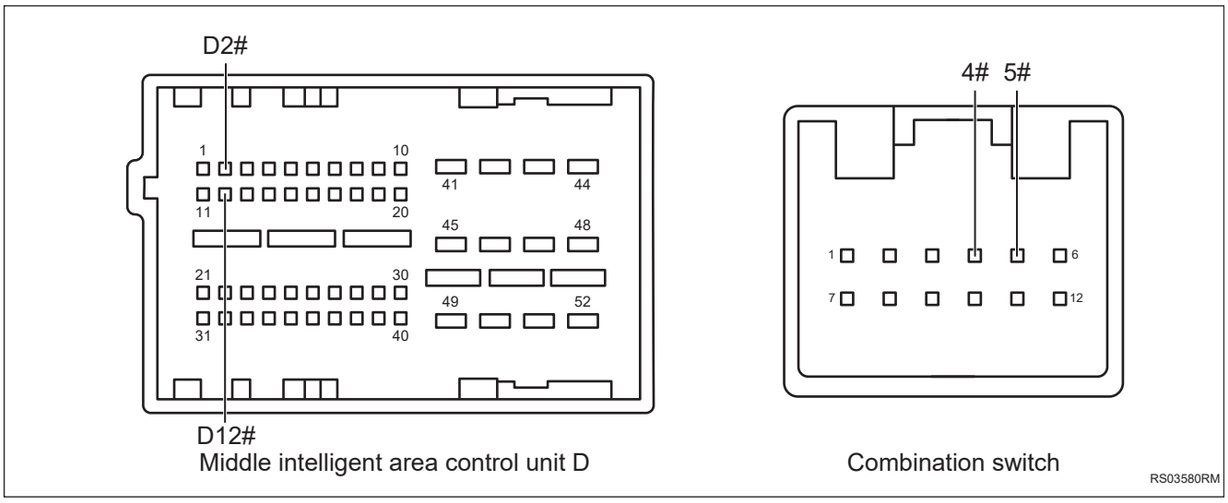
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

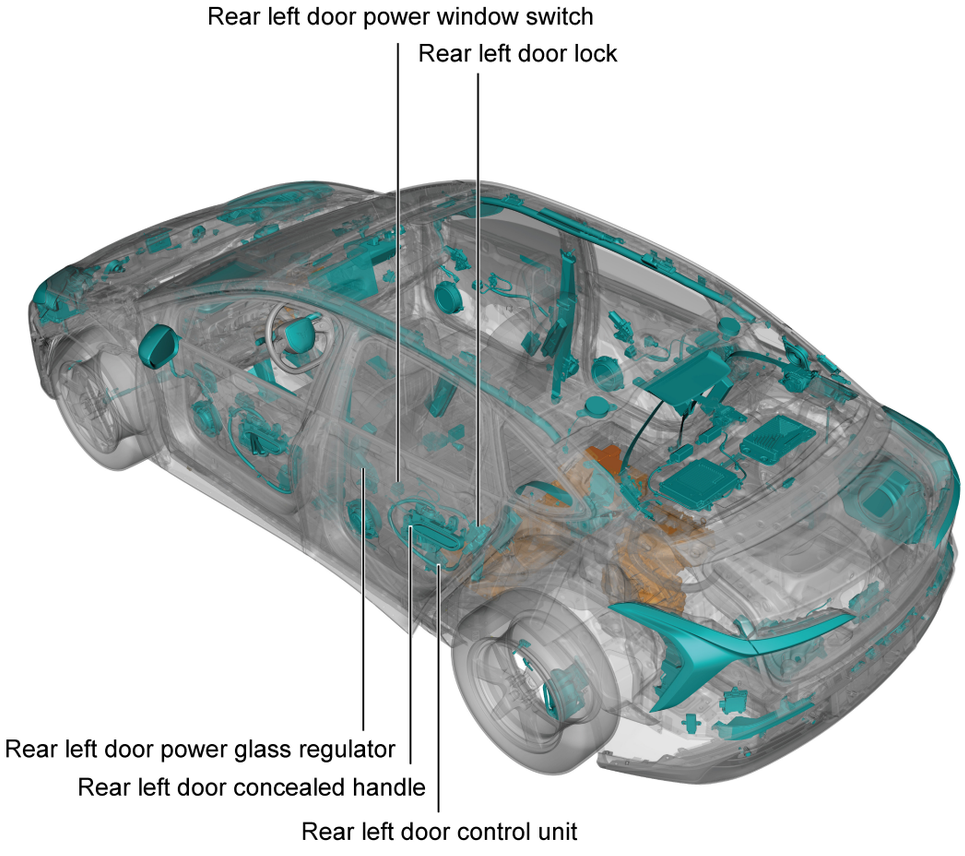
NG → Replace front right door control unit (See page CS-12)

OK

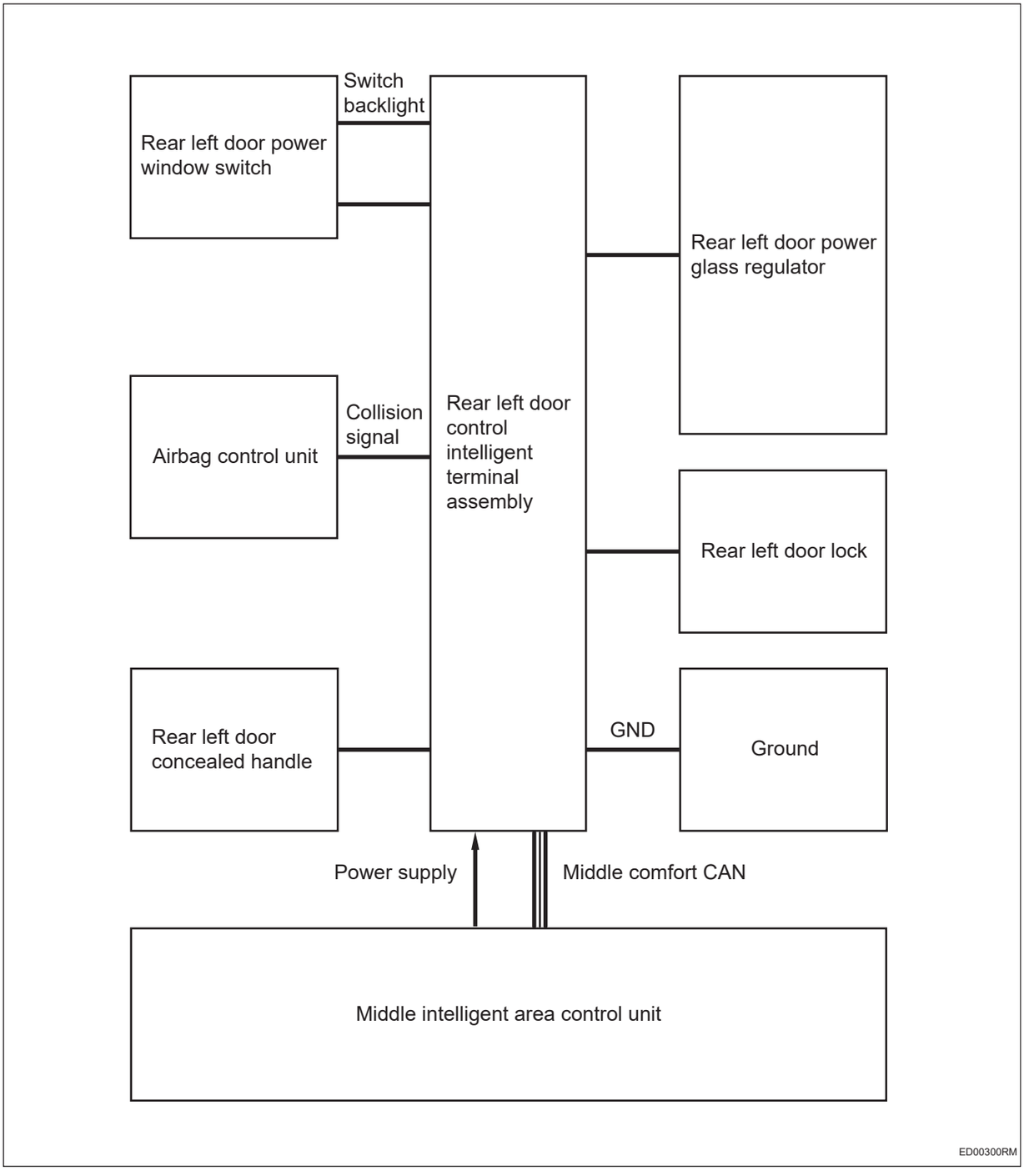
Diagnosis ends

Rear left door control unit

Part position



System diagram



Data parameter

Rear left door control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	30	13	-

Rear left door lock

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	0.01	-

Rear left door concealed handle

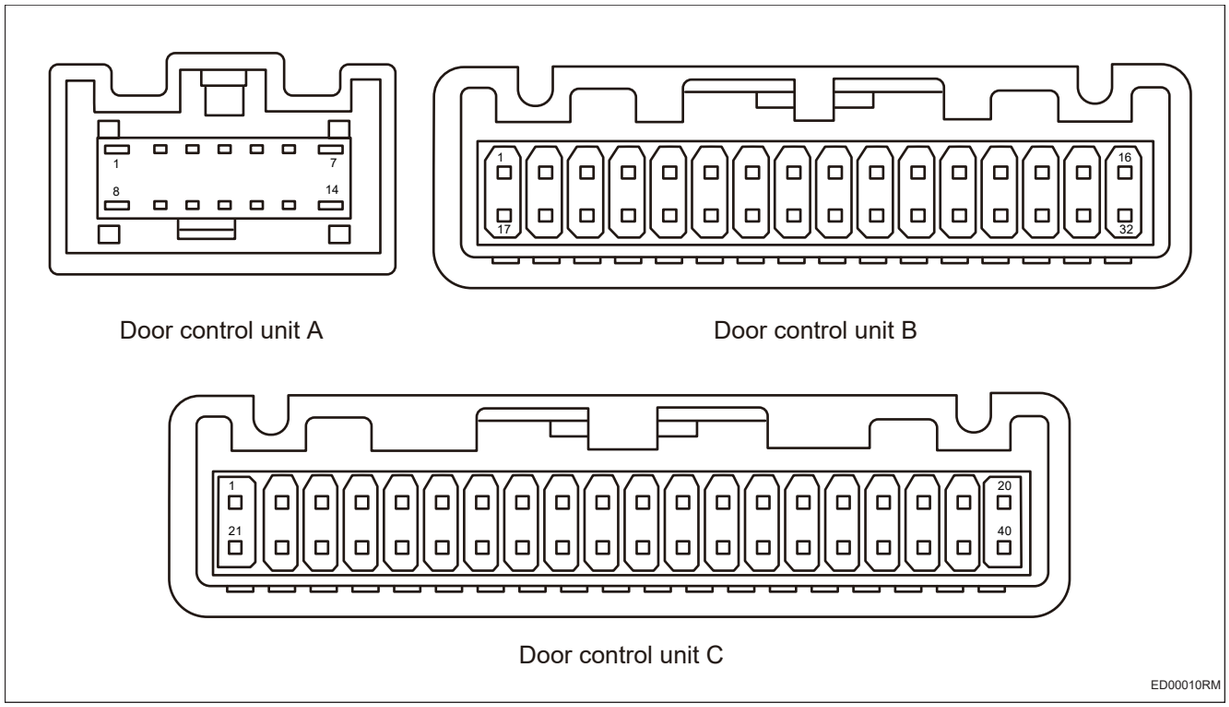
Item	Max	OK	Minimum
Operating voltage (V)	16	14.5	9
Operating current (A)	1.4	0.2	0.065

Rear left door power glass regulator

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	10	10 Max.	2.5

ECU terminal

Rear left door control unit



Rear left door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply/KL30	8	Power ground/PGND
2	-	9	Door unlock output
3	Window down/WINDOW DOWN	10	Door lock output
4	Window up/WINDOW_UP	11	-
5	-	12	-

Rear left door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
6	-	13	-
7	-	14	-

Rear left door control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	-
2	-	18	-
3	-	19	-
4	Concealed handle unfolding output	20	-
5	Concealed handle folding output	21	-
6	-	22	-
7	-	23	Switch backlight output
8	-	24	-
9	-	25	-
10	-	26	-
11	-	27	-
12	-	28	-
13	-	29	-
14	-	30	Switch analog ground
15	CAN-L	31	-
16	CAN-H	32	-

Rear left door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	Hard wire collision signal
3	-	23	Rear left door handle microswitch 1
4	-	24	-
5	-	25	-
6	-	26	-
7	-	27	-
8	-	28	-
9	-	29	-
10	-	30	-
11	-	31	Rear left door status switch
12	-	32	
13	-	33	-
14	Rear left handle microswitch 2	34	-
15	-	35	-

Rear left door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
16	-	36	-
17	Rear left window switch	37	-
18	-	38	-
19	-	39	-
20	Rear left door lock feedback signal	40	-

Diagnostic Trouble Code (DTC) chart

Rear left door control unit

DTC	Detection Items	See page
B118017	Battery voltage too high	(See page ZD-2987)
B118016	Battery voltage too low	(See page ZD-2987)
B118A19	Short in rear left door concealed handle motor output	(See page ZD-3001)
B118F19	Short in rear left electric unlocking motor output	(See page ZD-3004)
B118111	Rear left window button stuck	(See page ZD-2991)
B118518	Open in rear left door window motor output	(See page ZD-2996)
B118519	Short in rear left door window motor output	(See page ZD-2996)
U002888	Comfort CAN bus off	(See page ZD-3007)
U014687	PDCM node lost	(See page ZD-3013)
U019987	Front left door controller node lost	(See page ZD-3013)
U015187	Airbag control unit node lost	(See page ZD-3013)

DTC	**B118017**	**Battery voltage too high**
DTC	**B118016**	**Battery voltage too low**

Description

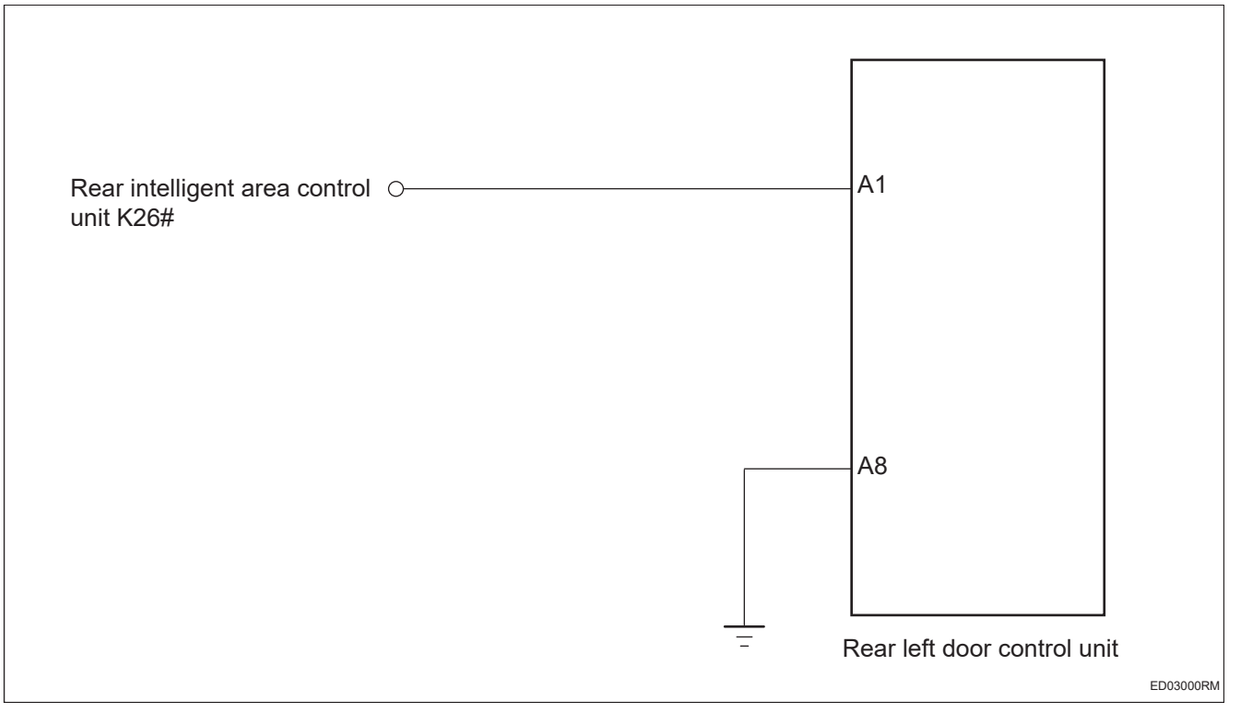
When the rear left door control unit supply voltage is out of normal operation range, the rear left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B118017	• Power supply status is normal	Voltage is 16.5 V or higher for more than 10 s	10 s	Periodic type	10 ms	• Rear left door control unit • Wire harness and connector • Charging system
B118016	• Power supply status is normal	Voltage is 8.5 V or less for more than 10 s	10 s	Periodic type	10 ms	• Rear left door control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B118017	No window up function (all other functions are normal)	-
B118016	No window up function (all other functions are normal)	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

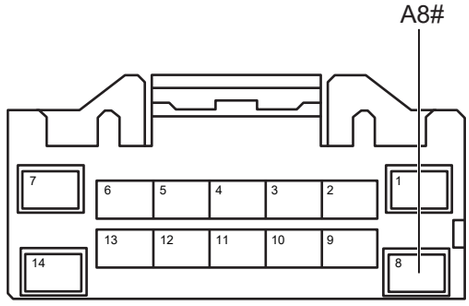
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	Check rear left door control unit ground



Rear left door control unit A connector

ED03010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) According to value in the table, measure resistance.

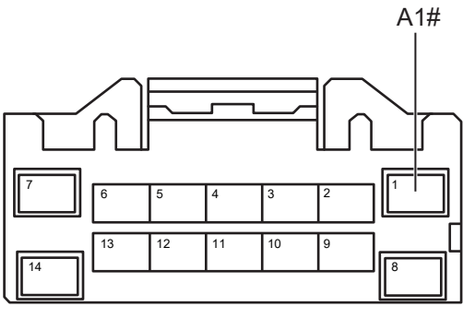
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A8# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear left door control unit power supply**



Rear left door control unit A connector

ED03021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace rear left door control unit (See page CS-12)

DTC	B118111	Rear left window button stuck

Description

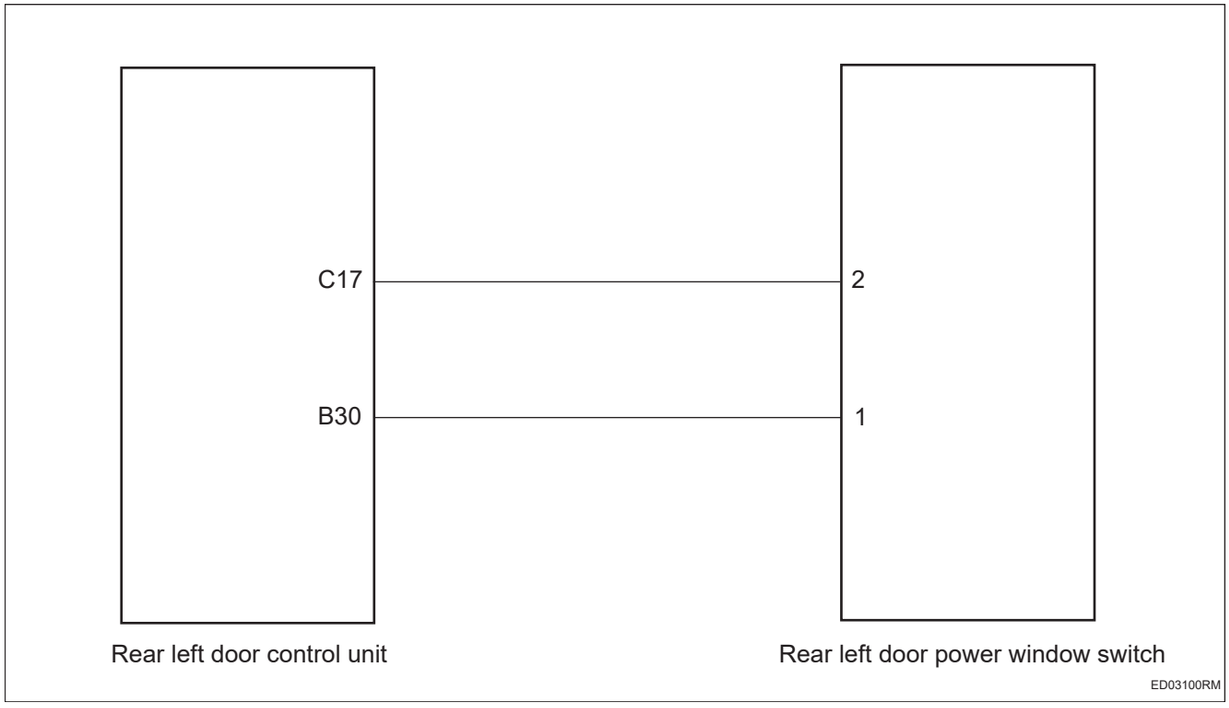
When the rear left door power window switch fault occurs, the rear left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B118111	• Power supply status is normal	Rear left button stuck for more than 30 s	30 s	Periodic type	1 ms	• Rear left door control unit • Wire harness and connector • Rear left door power window switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B118111	No window up function	-

Circuit diagram



Inspection procedure

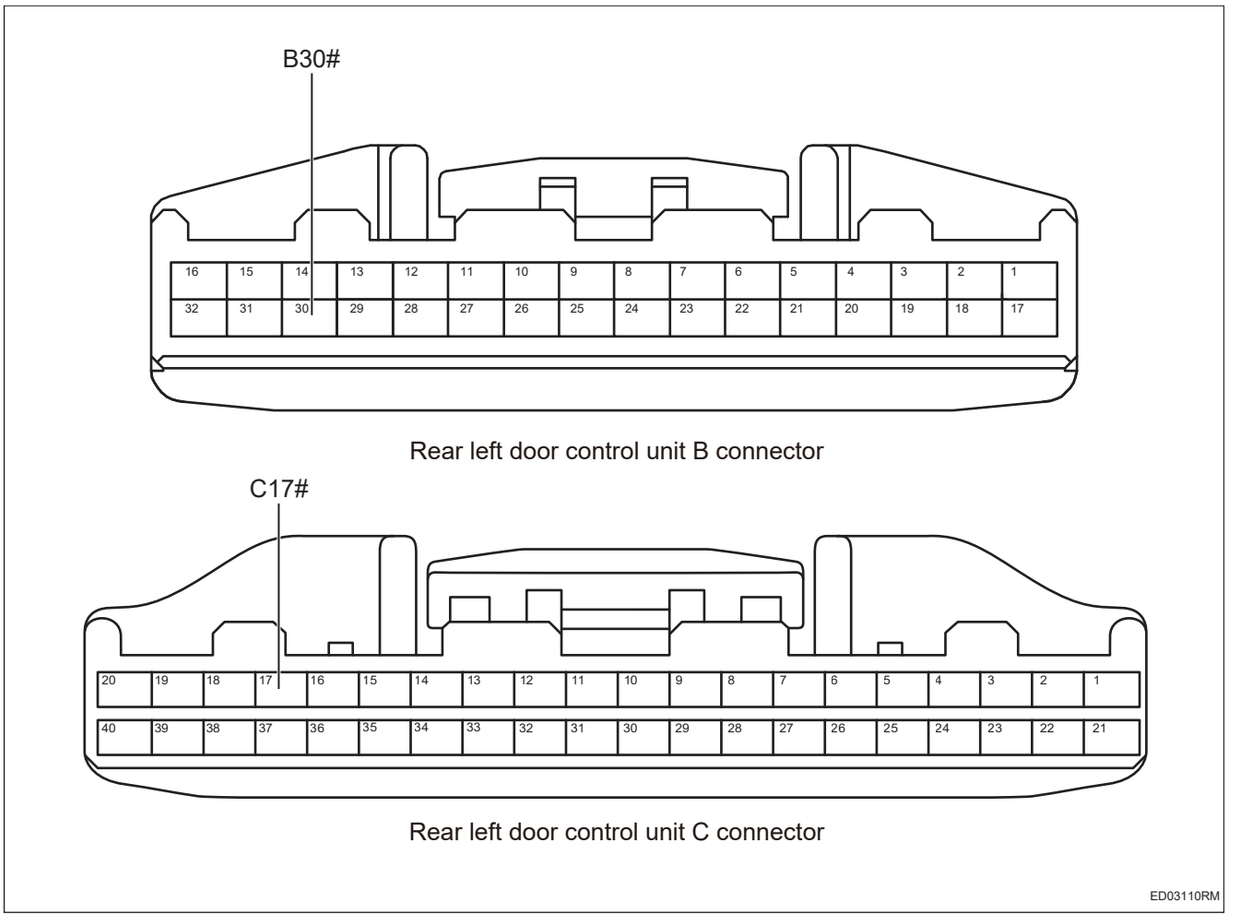
1	Check rear left door power window switch

(a) Check for foreign matters in rear left door power window switch.

(b) Check rear left door power window switch for sticking.

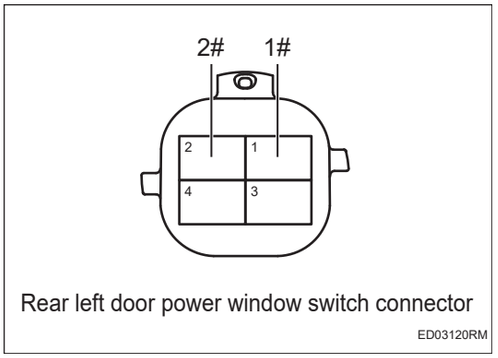
NG → **Perform repair according to malfunction**

2	**Check for open in rear left door power window switch wire harness and connector**



Rear left door control unit B connector

Rear left door control unit C connector



Rear left door power window switch connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) Disconnect the rear left door power window switch connector.

(e) According to value in the table, measure resistance.

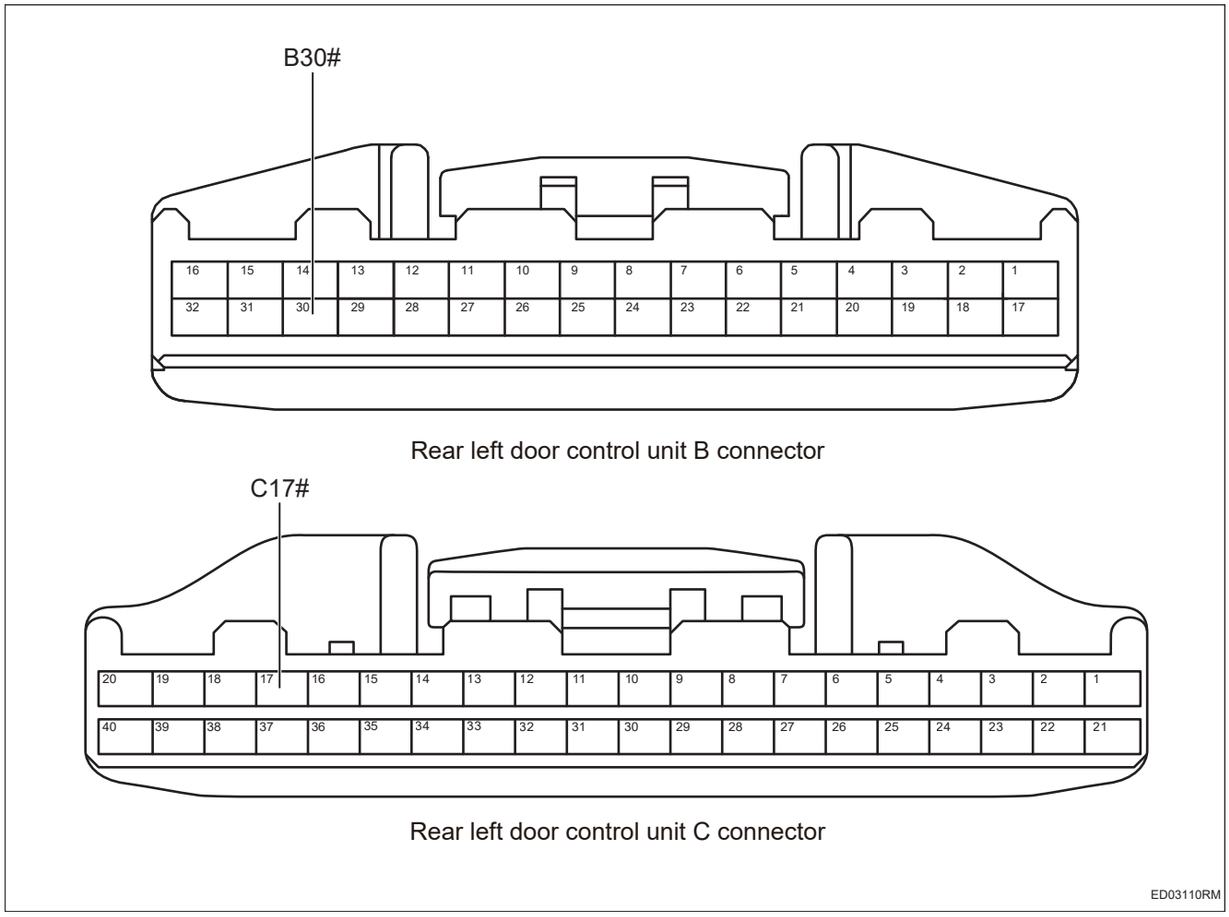
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector C17# - rear left door power window switch connector 2#	Always connected	Less than 1 Ω
Rear left door control unit connector B30# - rear left door power window switch connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left door power window switch wire harness and connector**



(a) According to value in the table, measure resistance.

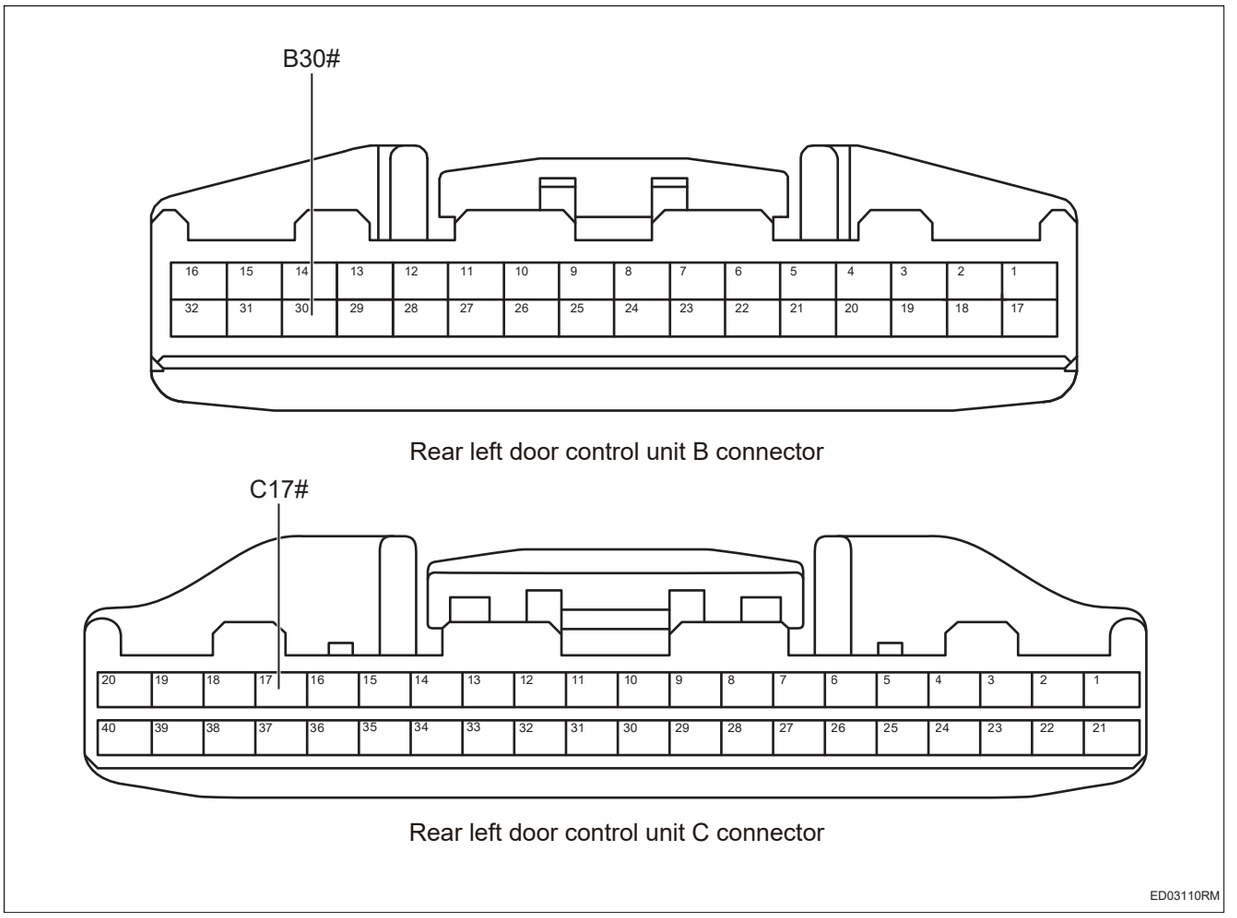
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector C17# - body ground	Always connected	10 KΩ or more
Rear left door control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left door power window switch wire harness and connector**



Rear left door control unit B connector

Rear left door control unit C connector

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector C17# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left door power window switch (See page NS-119)**

(a) Replace the rear left door power window switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B118518	Open in rear left door window motor output
DTC	B118519	Short in rear left door window motor output

Description

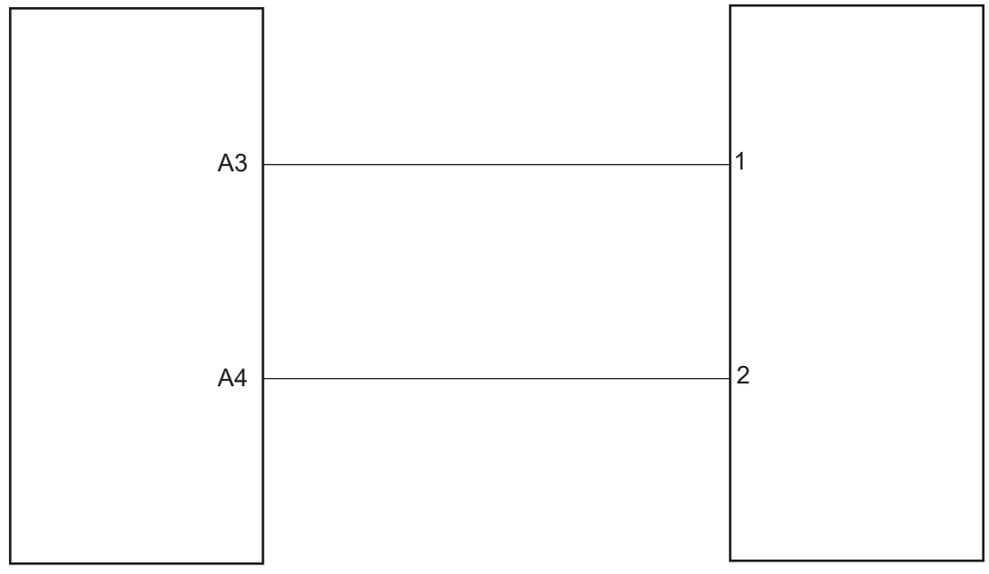
When the rear left door power glass regulator output circuit is short or open, the rear left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B118518	• Power supply status is normal • IGN is ON • Window up function ON	The current is 1 A or less when window is operating (to be calibrated)	30 ms	Periodic type	1 ms	• Rear left door control unit • Wire harness and connector • Rear left door power glass regulator
B118519	• Power supply status is normal • IGN is ON • Window up function ON • The window learning is completed and moved to the middle position (less than 4 mm from the top, more than 3 cm from the bottom)	Determine the current after starting for 100 ms. If it exceeds 28 A (to be calibrated) and after filtering for 10 ms, short circuit is confirmed and cut off the output	10 ms	Periodic type	1 ms	• Rear left door control unit • Wire harness and connector • Rear left door power glass regulator

Fault symptom

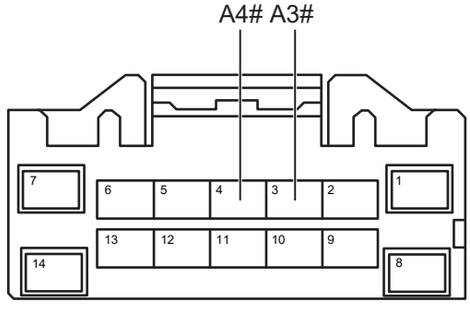
DTC No.	Fault symptom	Warning light/indicator
B118518	No window up function	-
B118519	No window up function	-

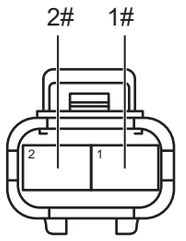
Circuit diagram



Inspection procedure

1	**Check for open in rear left door power glass regulator wire harness and connector**





Rear left door power glass regulator connector

ED03220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) Disconnect the rear left door power glass regulator connector.

(e) According to value in the table, measure resistance.

Standard value

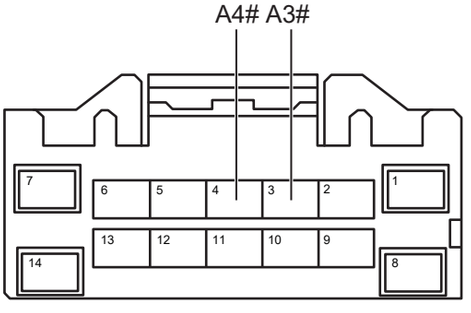
Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A4# - rear left door power glass regulator connector 1#	Always connected	Less than 1 Ω
Rear left door control unit connector A3# - rear left door power glass regulator connector 2#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to each other in rear left door power glass regulator wire harness and connector**



Rear left door control unit A connector

ED03211RM

(a) According to value in the table, measure resistance.

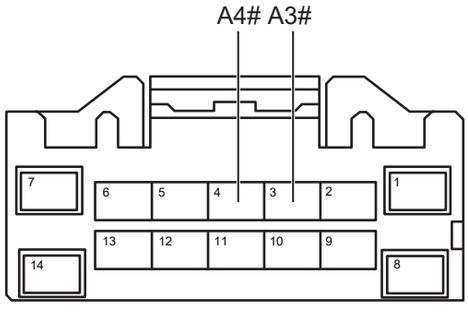
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A4# - rear left door control unit connector A3#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left door power glass regulator wire harness and connector**



Rear left door control unit A connector

ED03211RM

(a) According to value in the table, measure resistance.

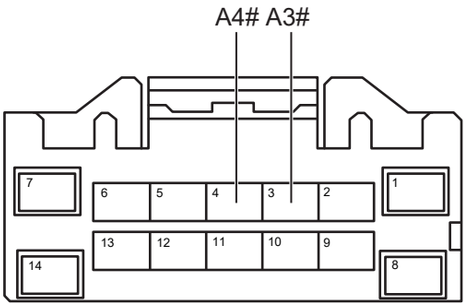
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A4# - body ground	Always connected	10 KΩ or more
Rear left door control unit connector A3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear left door power glass regulator wire harness and connector**



Rear left door control unit A connector

ED03211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector A4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door control unit connector A3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace rear left door power glass regulator (See page CS-19)**

(a) Replace the rear left door power glass regulator.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B118A19	Short in rear left door concealed handle motor output

Description

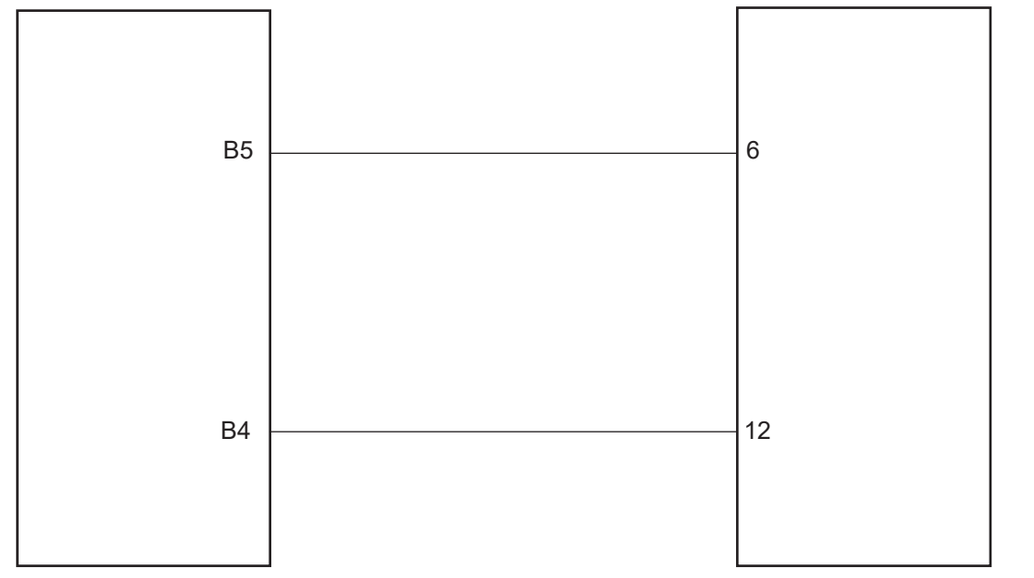
When the rear left door concealed handle motor output is short, the rear left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B118A19	• Power supply status is normal • Concealed handle function on	The current is 10 A or more when concealed handle is operating	100 ms	Periodic type	1 ms	• Rear left door control unit • Wire harness and connector • Rear left door concealed handle

Fault symptom

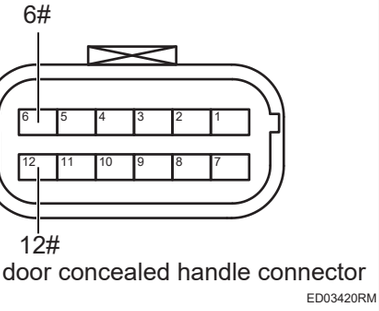
DTC No.	Fault symptom	Warning light/indicator
B118A19	No concealed handle function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear left door concealed handle wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) Disconnect the rear left door concealed handle connector.

(e) According to value in the table, measure resistance.

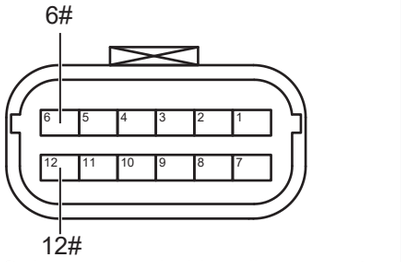
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door concealed handle connector 6# - body ground	Always connected	10 KΩ or more
Rear left door concealed handle connector 12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear left door concealed handle wire harness and connector**



Rear left door concealed handle connector
ED03420RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door concealed handle connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door concealed handle connector 12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear left door concealed handle (See page CS-44)**

(a) Replace the rear left door concealed handle.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

ZD

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B118F19	Short in rear left electric unlocking motor output

Description

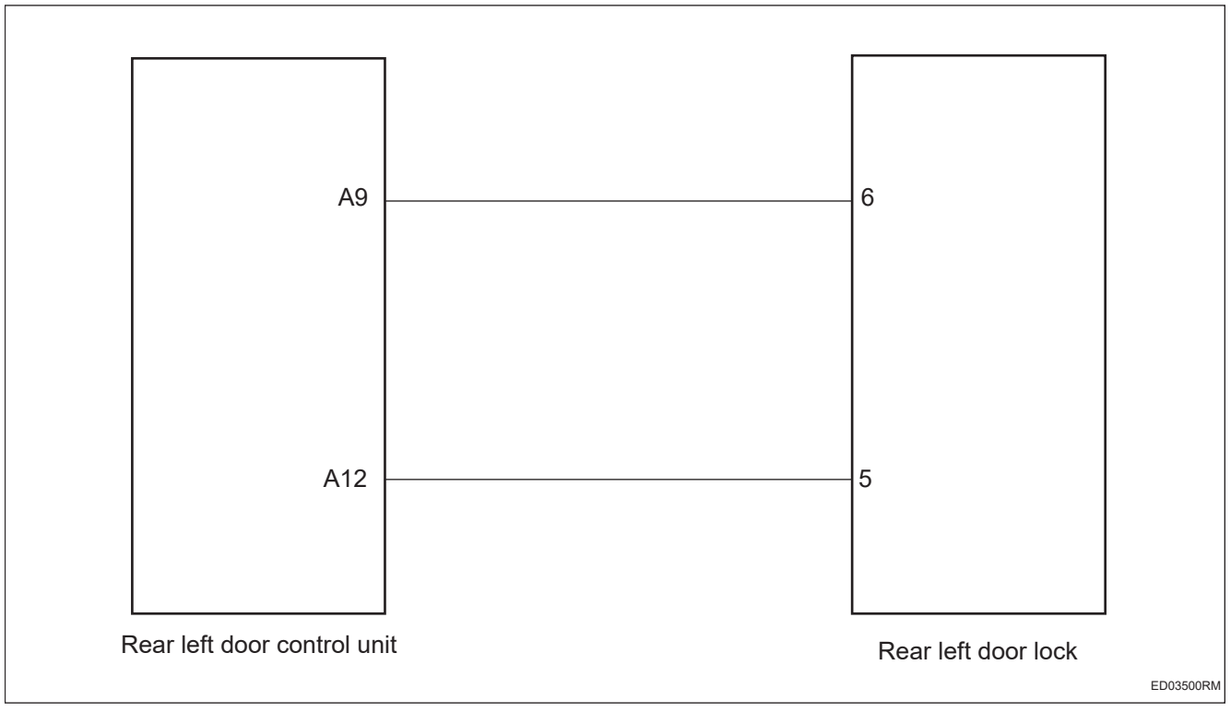
When the rear left door lock motor output is short, the rear left door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B118F19	• Power supply status is normal	The current is 10 A or more when the electric unlocking action is performed (to be calibrated)	100 ms	Periodic type	1 ms	• Rear left door control unit • Wire harness and connector • Rear left door lock

Fault symptom

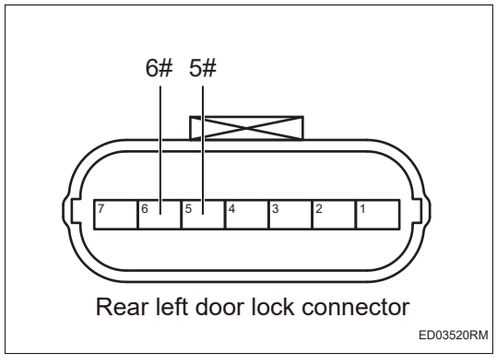
DTC No.	Fault symptom	Warning light/indicator
B118F19	Unable to unlock electrically	-

Circuit diagram



Inspection procedure

1	**Check for short to each other in rear left door lock wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) Disconnect the rear left door lock connector.

(e) According to value in the table, measure resistance.

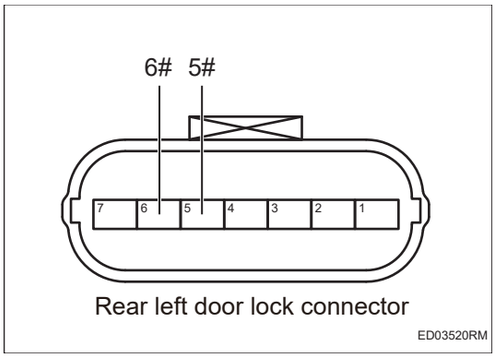
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door lock connector 6# - rear left door lock connector 5#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear left door lock wire harness and connector**



(a) According to value in the table, measure resistance.

Standard value

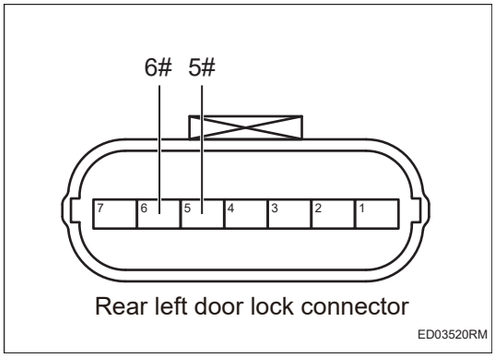
Multimeter connection	Detection condition	Specified condition
Rear left door lock connector 6# - body ground	Always connected	10 KΩ or more
Rear left door lock connector 5# - body ground	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in rear left door lock wire harness and connector**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door lock connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door lock connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

4	**Replace rear left door lock (See page CS-38)**

(a) Replace the rear left door lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left door control unit (See page CS-12)**

OK

Diagnosis ends

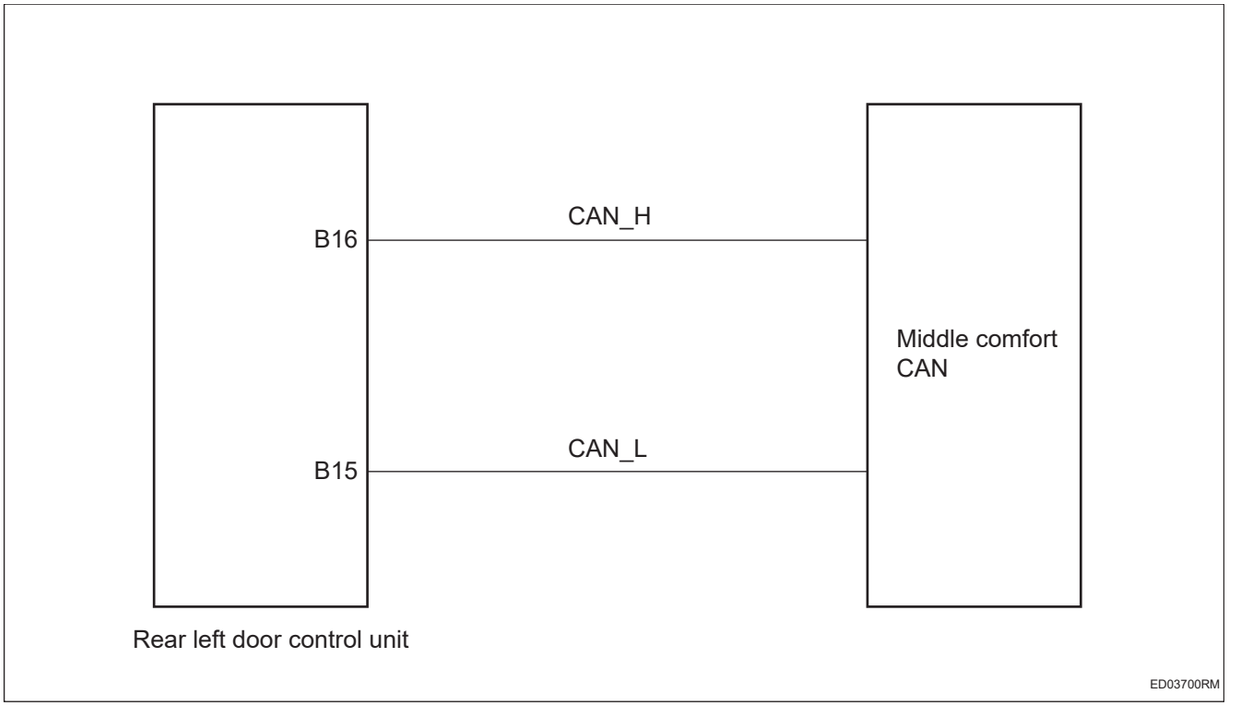
DTC	U002888	Comfort CAN bus off

Description

When the rear left door control unit detects middle comfort CAN bus off fault, the rear left door control unit records DTC.

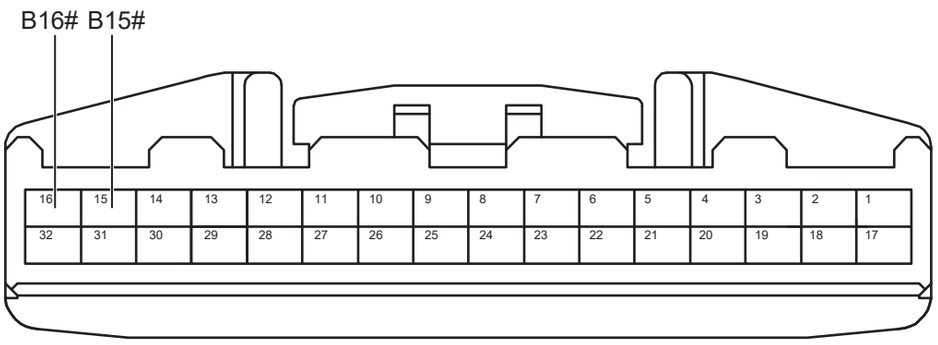
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



Rear left door control unit B connector

ED03711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left door control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector B16# - rear left door control unit connector B15#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controller on central comfort CAN bus**

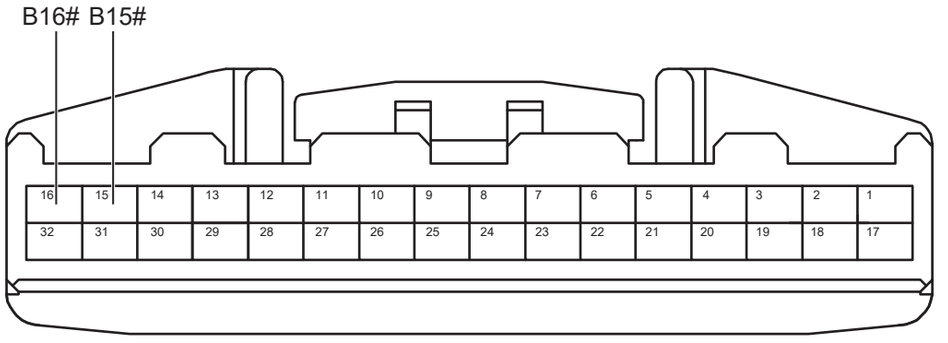
(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

ZD

OK

3	**Check for short between central comfort CAN bus CAN-L and CAN-H**



Rear left door control unit B connector

ED03711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

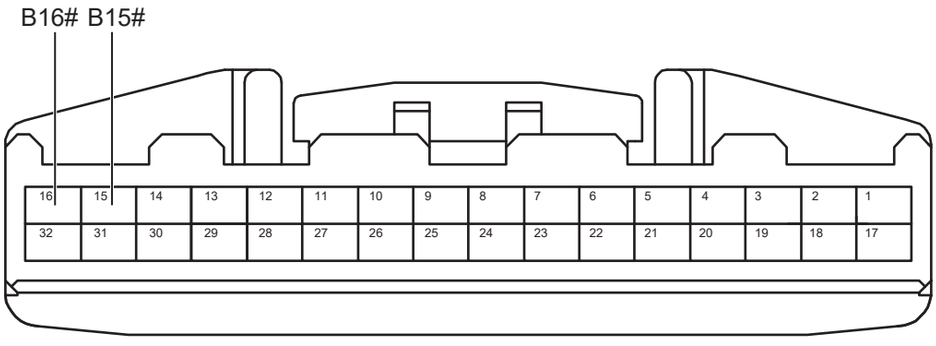
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector B16# - rear left door control unit connector B15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in central comfort CAN bus**



Rear left door control unit B connector

ED03711RM

(a) According to value in the table, measure resistance.

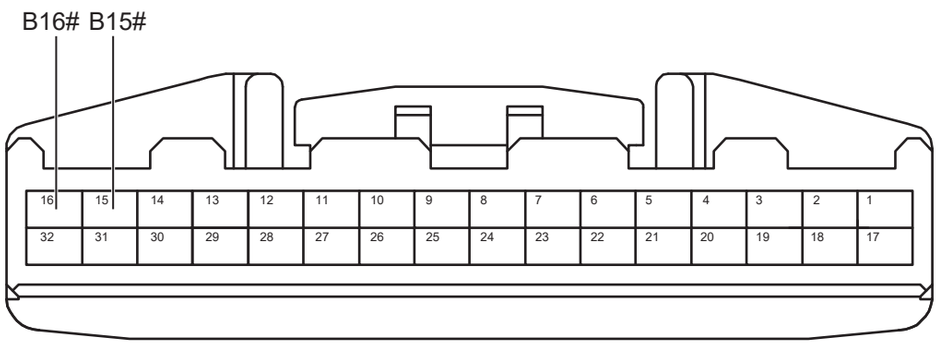
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector B16# - body ground	Always connected	10 KΩ or more
Rear left door control unit connector B15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Rear left door control unit B connector

ED03711RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear left door control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

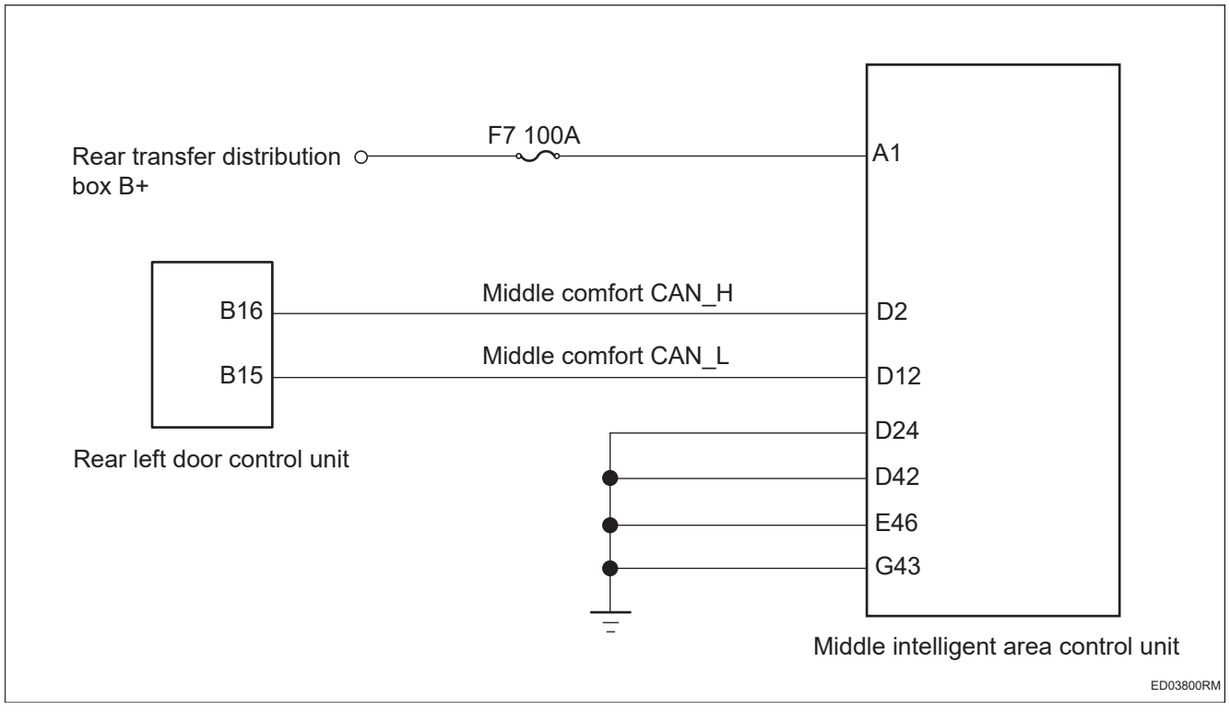
DTC	**U014687**	**PDCM node lost**
DTC	**U019987**	**Front left door controller node lost**
DTC	**U015187**	**Airbag control unit node lost**

Description

When communication between rear left door control unit and other system is abnormal or interrupted, the rear left door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Rear left door control unit • Middle intelligent area control unit • Combination switch
U019987	(a) Front left door controller node lost.	• Wire harness and connector • Rear left door control unit • Front left door control unit • Middle intelligent area control unit • Combination switch
U015187	(a) Airbag control unit node lost.	• Wire harness and connector • Rear left door control unit • Airbag control unit • Middle intelligent area control unit • Combination switch

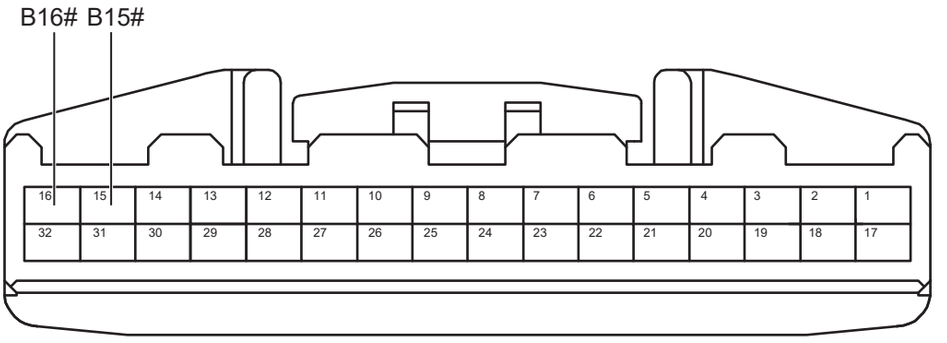
Circuit diagram



Inspection procedure

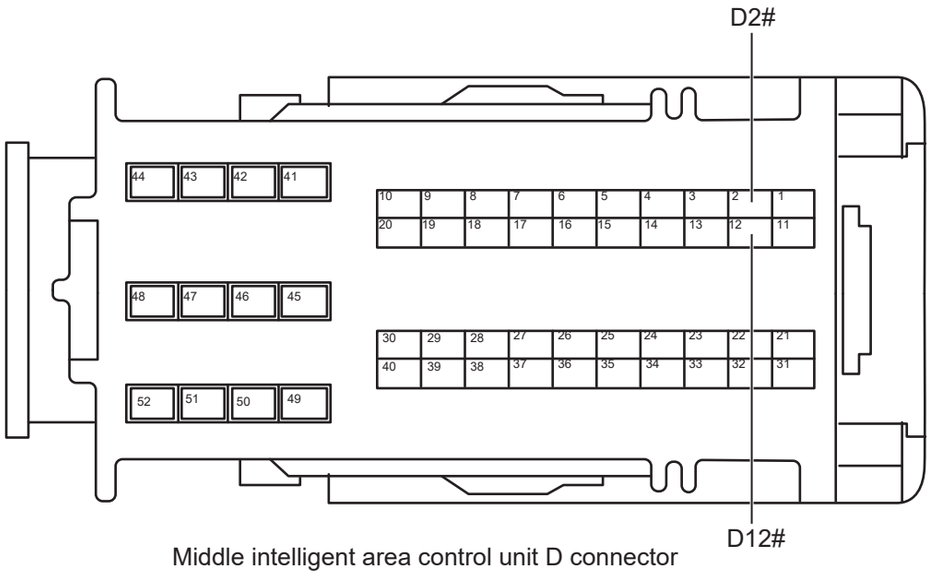
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (rear left door control unit - middle intelligent area control unit)**



Rear left door control unit B connector

ED03811RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

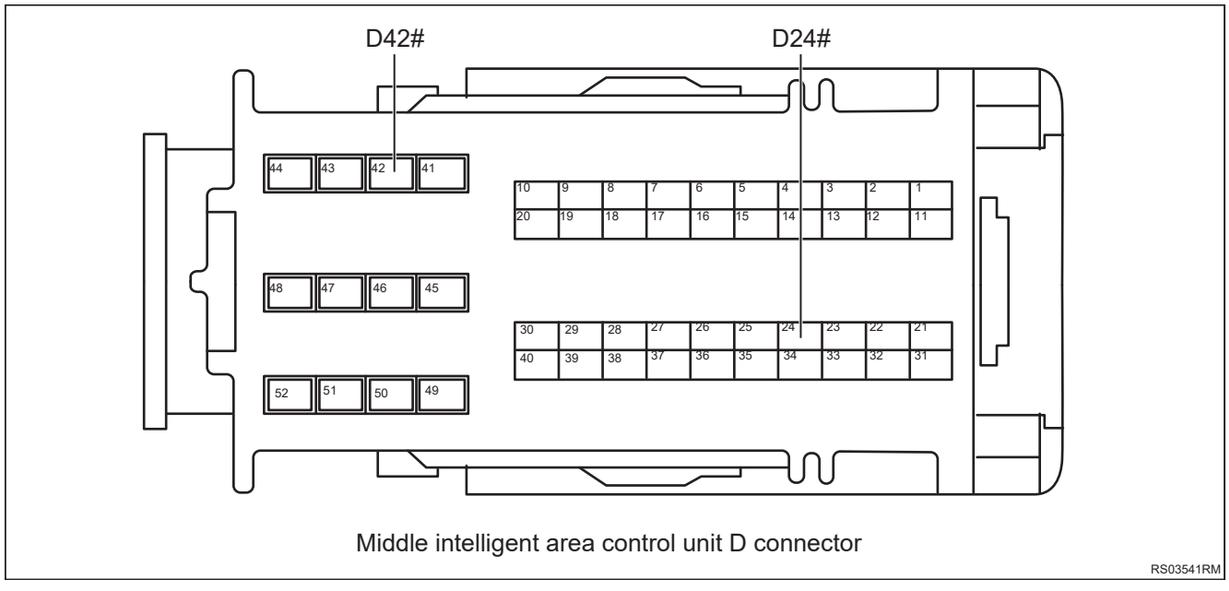
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left door control unit connector B16# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Rear left door control unit connector B15# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

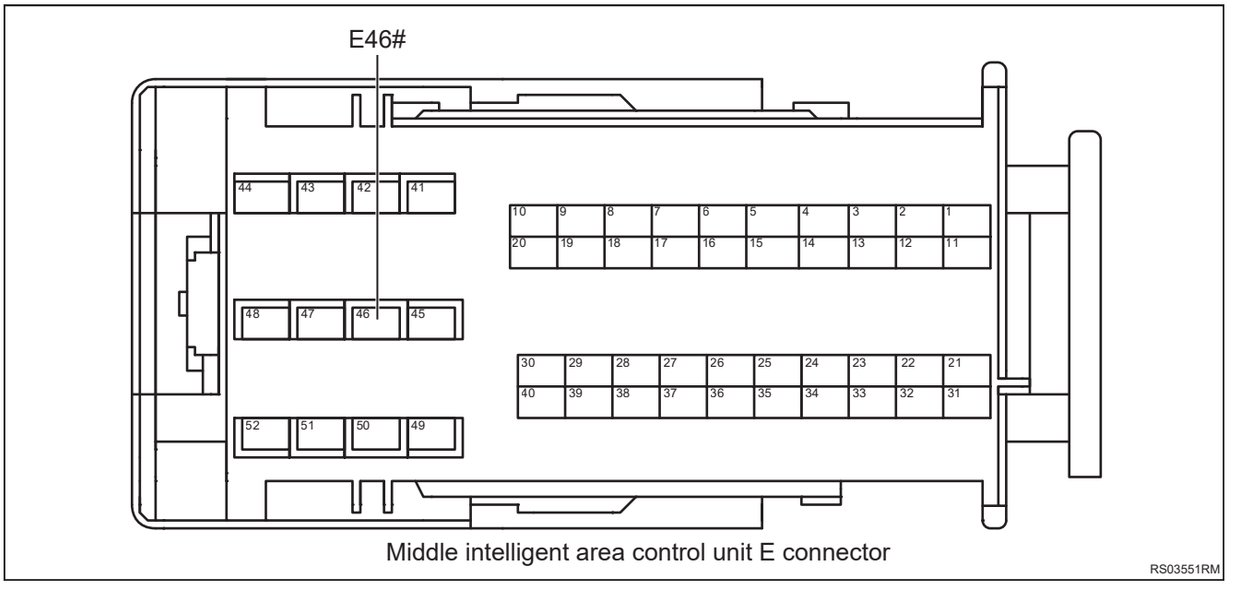
OK

2	**Check middle intelligent area control unit ground**



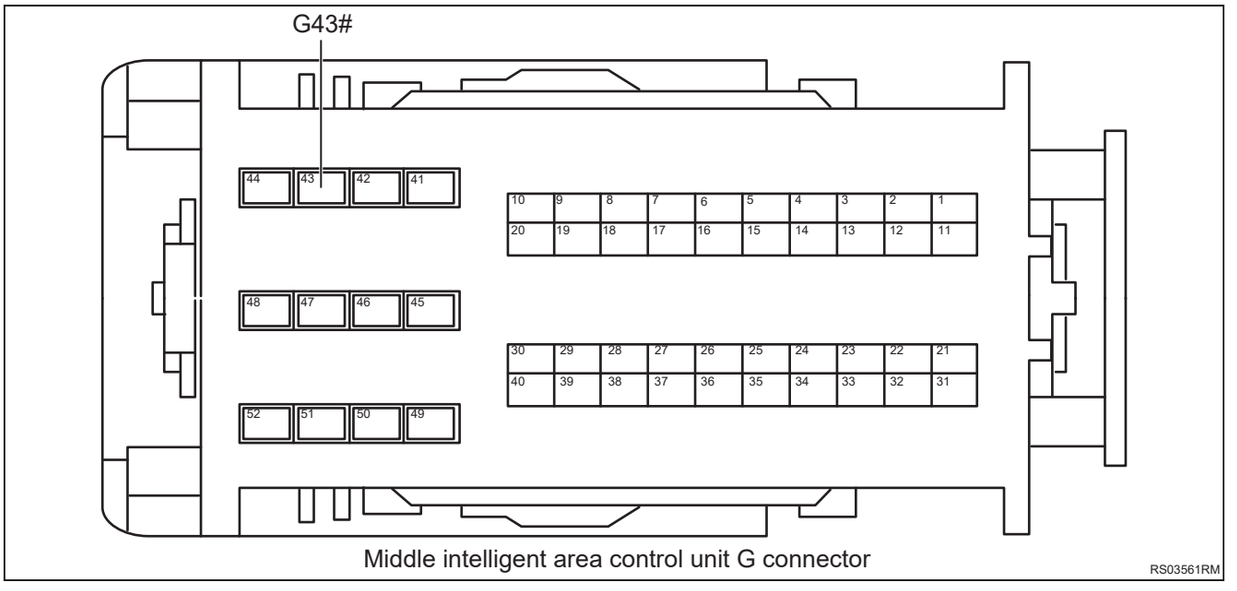
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

RS03561RM

(a) According to value in the table, measure resistance.

Standard value

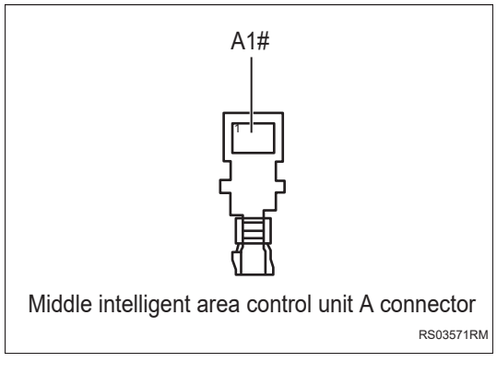
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check middle intelligent area control unit power supply



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

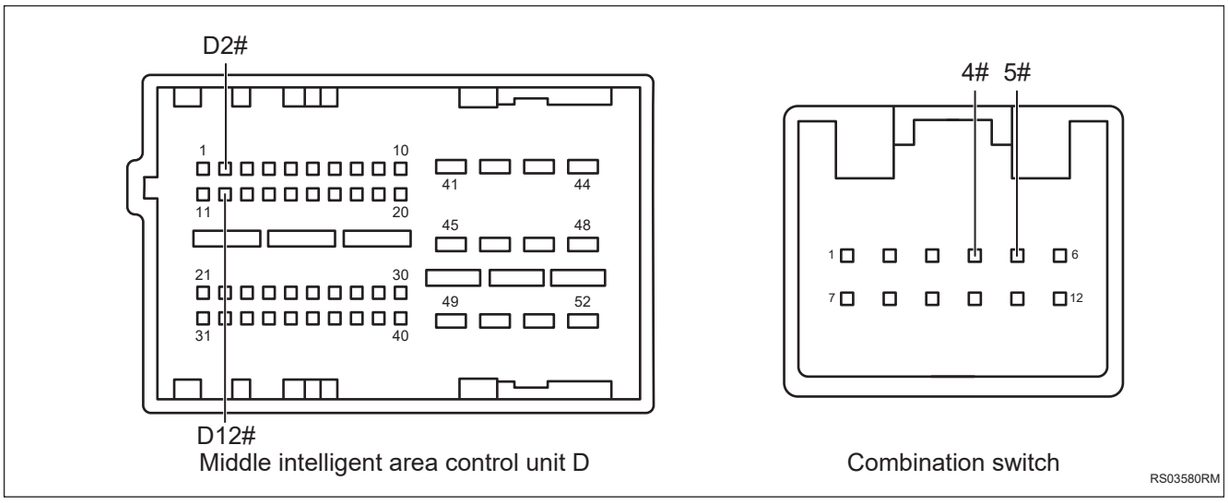
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

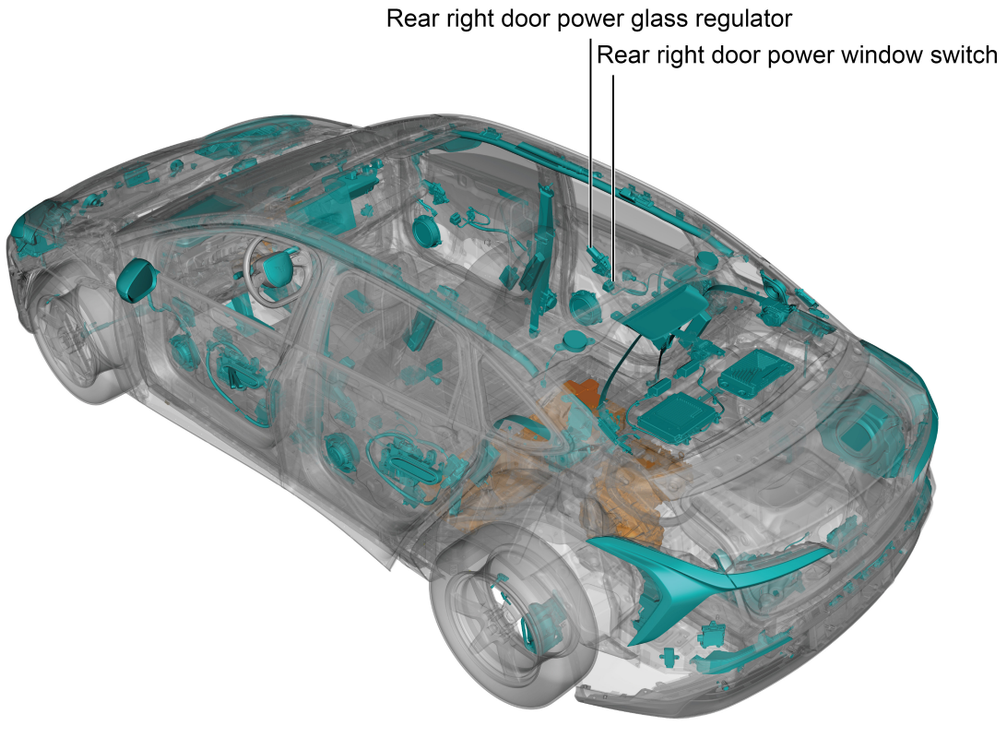
NG → **Replace rear left door control unit (See page CS-12)**

OK

Diagnosis ends

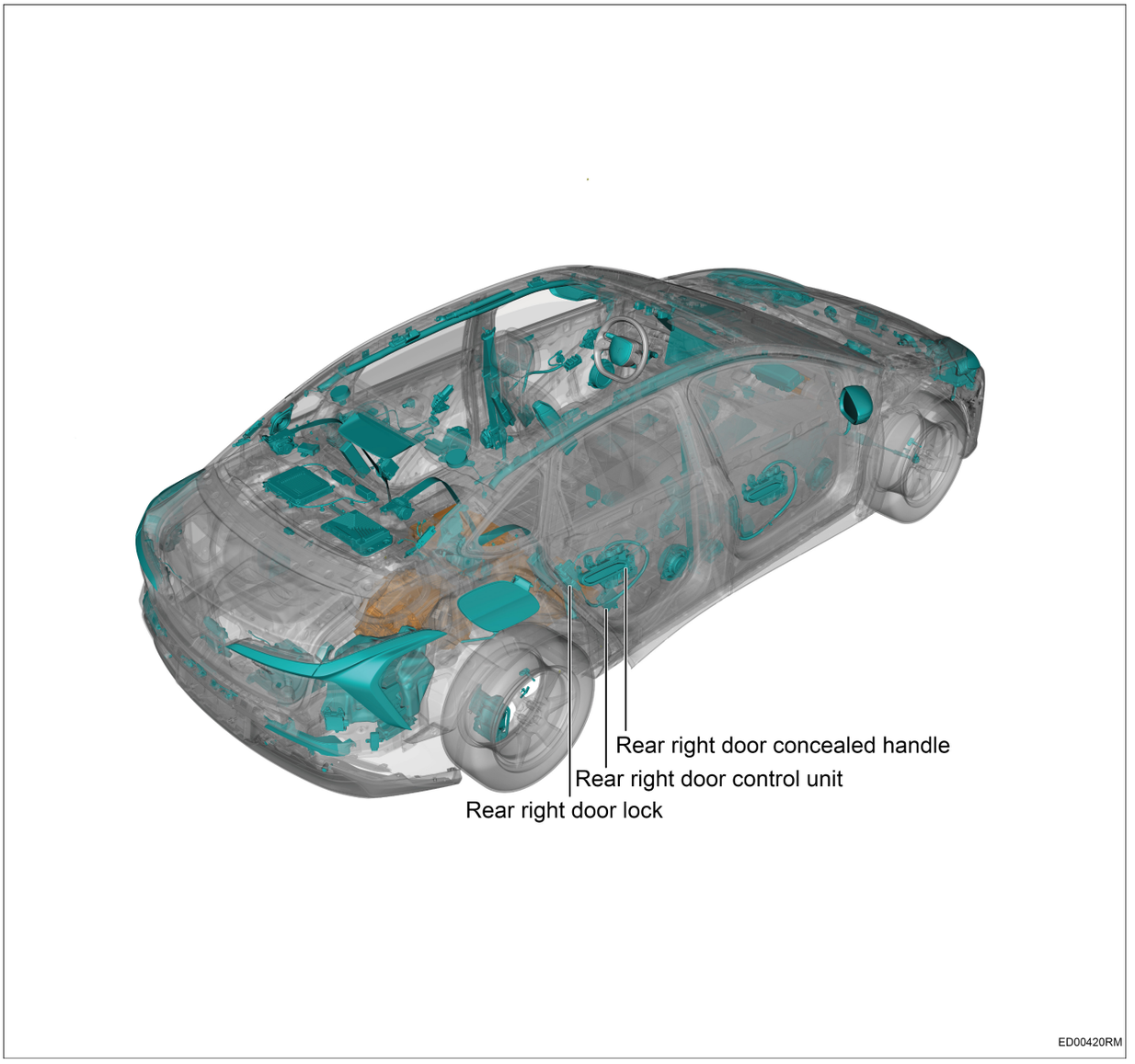
Rear right door control unit

Part position

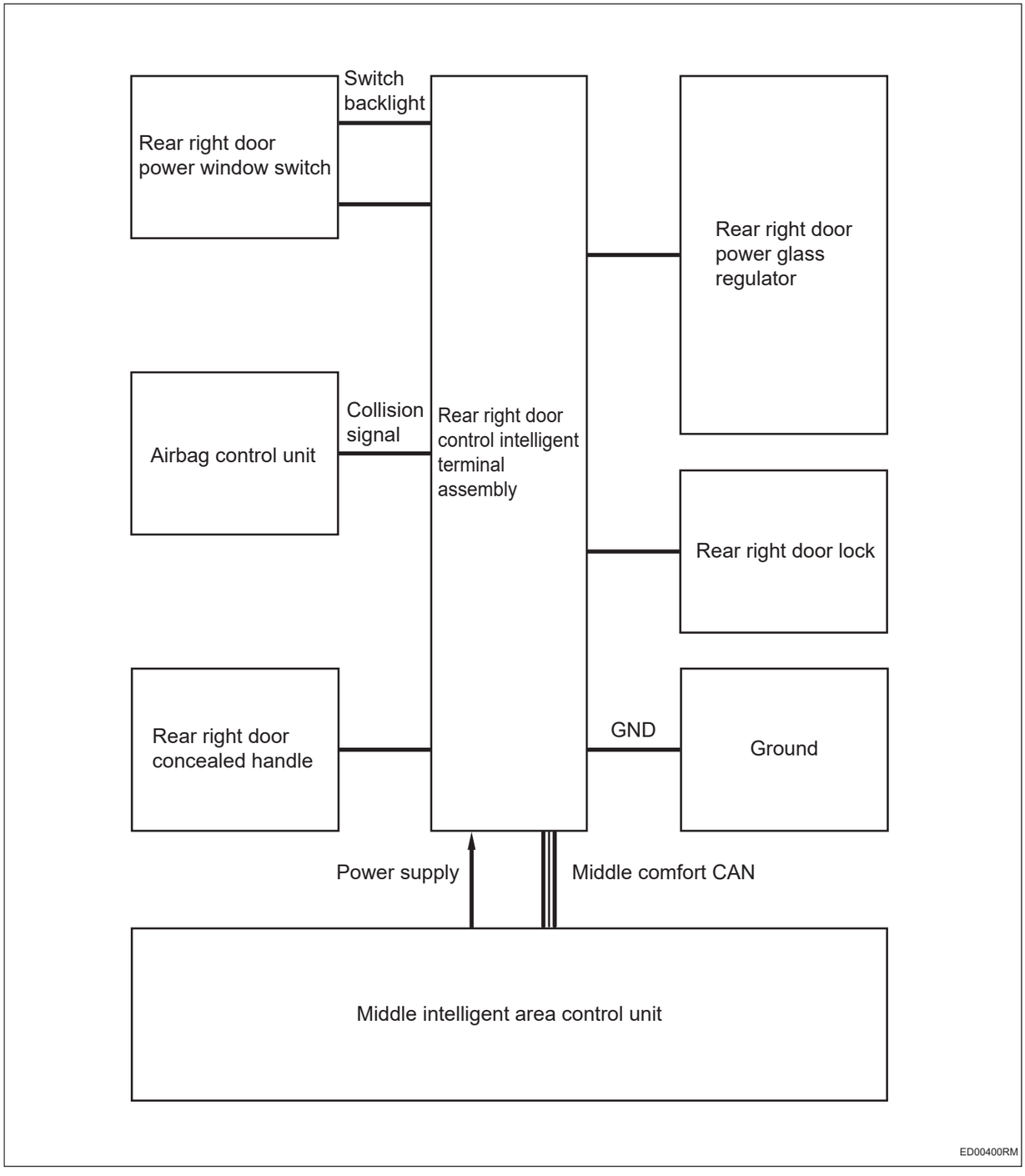


ED00410RM

Part position



System diagram



Data parameter

Rear right door control unit

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	30	13	-

Rear right door lock

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	0.01	-

Rear right door concealed handle

Item	Max	OK	Minimum
Operating voltage (V)	16	14.5	9
Operating current (A)	1.4	0.2	0.065

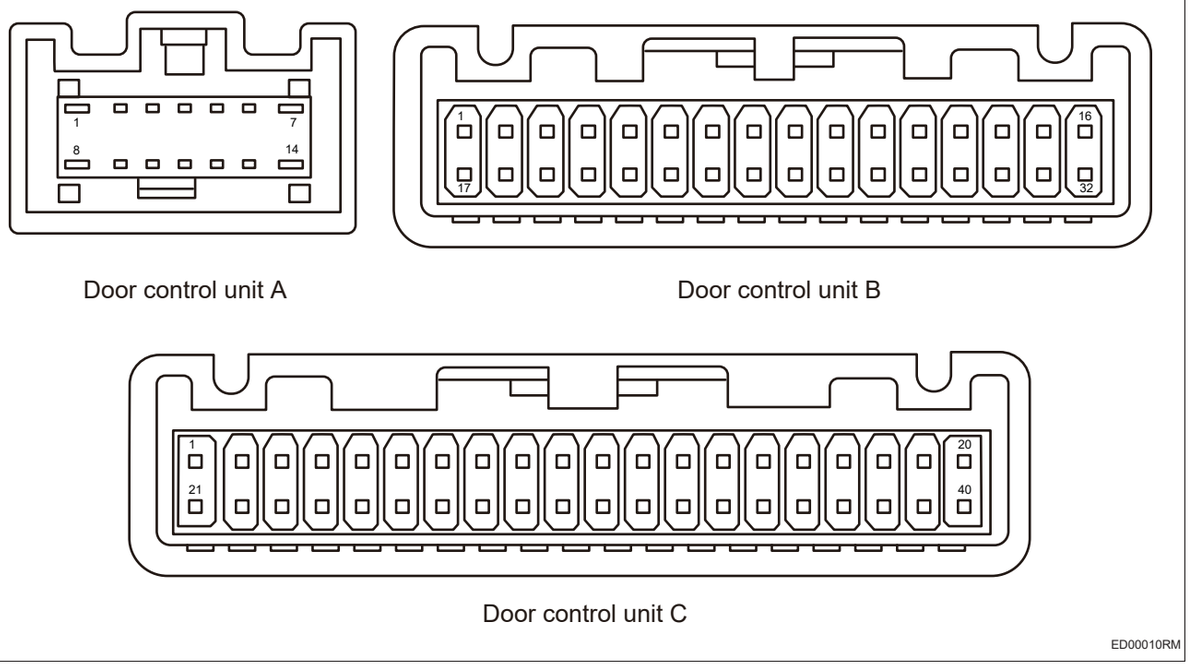
Rear right door power glass regulator

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	10	10 Max.	2.5

ZD

ECU terminal

Rear right door control unit



Door control unit A

Door control unit B

Door control unit C

ED00010RM

Rear right door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply/KL30	8	Power ground/PGND
2	-	9	Door unlock output
3	Window down /WINDOW DOWN	10	Door lock output
4	Window up/WINDOW_UP	11	-

Rear right door control unit A			
Pin number	**Definition**	**Pin number**	**Definition**
5	-	12	-
6	-	13	-
7	-	14	-

Rear right door control unit B			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	17	-
2	-	18	-
3	-	19	-
4	Concealed handle unfolding output	20	-
5	Concealed handle folding output	21	-
6	-	22	-
7	-	23	Switch backlight output
8	-	24	-
9	-	25	-
10	-	26	-
11	-	27	-
12	-	28	-
13	-	29	-
14	-	30	Switch analog ground
15	CAN L	31	-
16	CAN H	32	-

Rear right door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	21	-
2	-	22	Hard wire collision signal
3	-	23	Rear right door handle microswitch 1
4	-	24	-
5	-	25	-
6	-	26	-
7	-	27	-
8	-	28	-
9	-	29	-
10	-	30	-
11	-	31	Rear right door status switch
12	-	32	-
13	-	33	-

Rear right door control unit C			
Pin number	**Definition**	**Pin number**	**Definition**
14	Rear right door handle microswitch 2	34	-
15		35	-
16		36	-
17		37	-
18	Rear right window switch	38	-
19		39	-
20	Rear right door lock feedback signal	40	-

Diagnostic Trouble Code (DTC) chart

ZD

Rear right door control unit

DTC	Detection Items	See page
B11C017	Battery voltage too high	(See page ZD-3024)
B11C016	Battery voltage too low	(See page ZD-3024)
B11C111	Rear right window button stuck	(See page ZD-3028)
B11C518	Open in rear right door window motor output	(See page ZD-3033)
B11C519	Short in rear right door window motor output	(See page ZD-3033)
B11CA19	Short in rear right door concealed handle motor output	(See page ZD-3039)
B11CF19	Short in rear right electric unlocking motor output	(See page ZD-3042)
U002888	Comfort CAN bus off	(See page ZD-3045)
U014687	PDCM node lost	(See page ZD-3050)
U019987	Front left door controller node lost	(See page ZD-3050)
U015187	Airbag control unit node lost	(See page ZD-3050)

DTC	B11C017	Battery voltage too high
DTC	B11C016	Battery voltage too low

Description

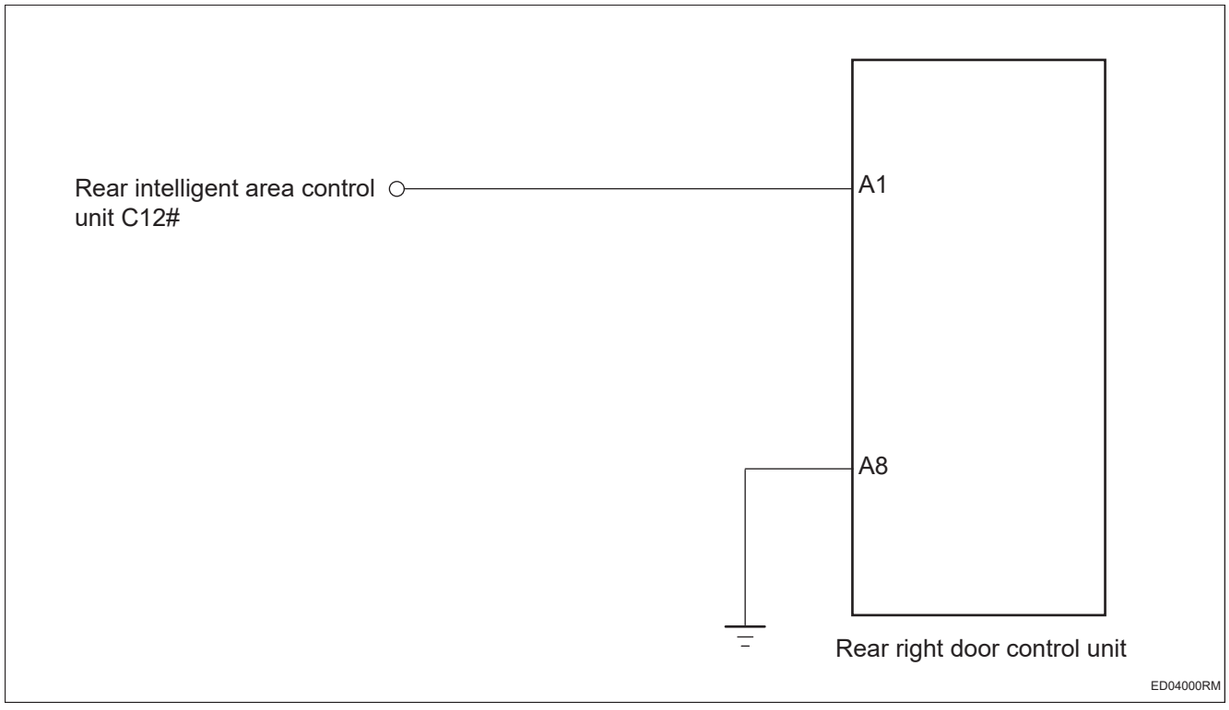
When the rear right door control unit supply voltage is out of normal operation range, the rear right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B11C017	• Power supply status is normal	Voltage is 16.5 V or higher for more than 10 s	10 s	Periodic type	10 ms	• Rear right door control unit • Wire harness and connector • Charging system
B11C016	• Power supply status is normal	Voltage is 8.5 V or less for more than 10 s	10 s	Periodic type	10 ms	• Rear right door control unit • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B11C017	No window up function (all other functions are normal)	-
B11C016	No window up function (all other functions are normal)	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

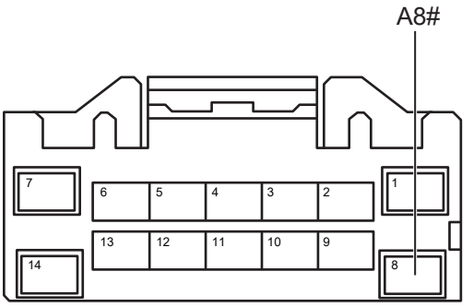
Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

2	Check rear right door control unit ground



Rear right door control unit A connector

ED04010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) According to value in the table, measure resistance.

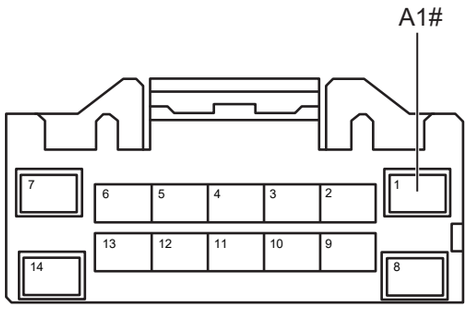
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector A8# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear right door control unit power supply**



Rear right door control unit A connector

ED04021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check rear intelligent area control unit power supply and ground and confirm whether the rear intelligent area control unit is damaged)**

OK

Replace rear right door control unit (See page CS-12)

ZD

DTC	B11C111	Rear right window button stuck

Description

When the rear right door power window switch is faulty, the rear right door control unit records DTC.

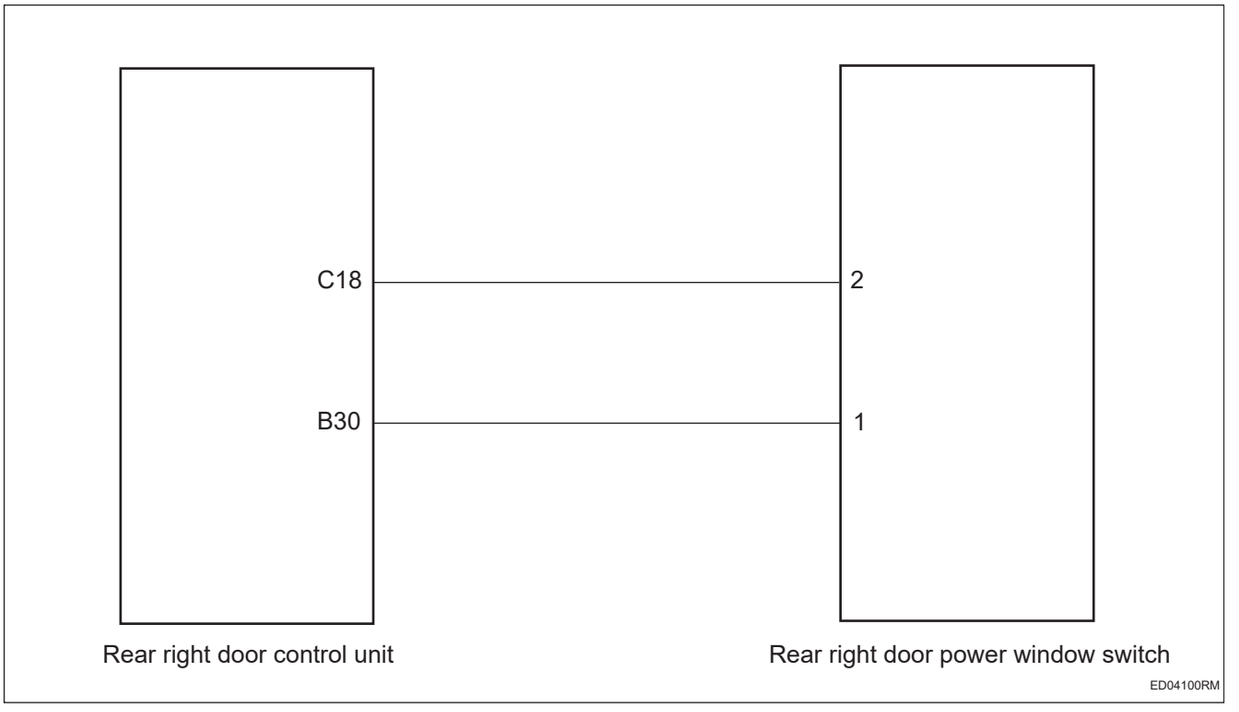
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B11C111	• Power supply status is normal	Rear right button stuck for more than 30 s	30 s	Periodic type	1 ms	• Rear right door control unit • Wire harness and connector • Rear right door power window switch

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B11C111	No window up function	-

Circuit diagram



Inspection procedure

1	Check rear right door power window switch

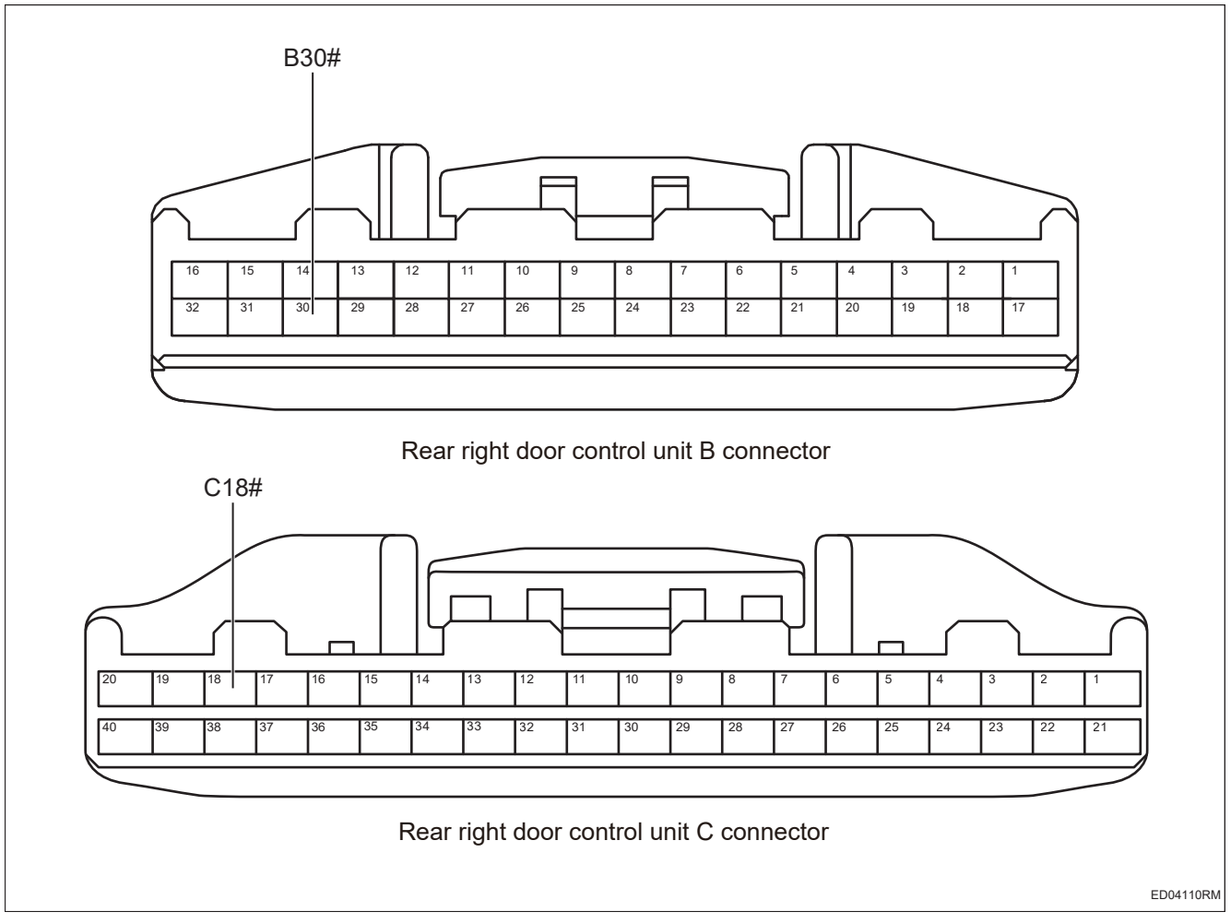
(a) Check for foreign matters in rear right door power window switch.

(b) Check rear right door power window switch for sticking.

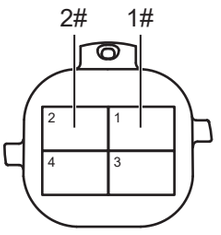
NG → **Perform repair according to malfunction**

OK

2	**Check for open in rear right door power window switch wire harness and connector**



ZD



Rear right door power window switch connector

ED04120RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) Disconnect the rear right door power window switch connector.

(e) According to value in the table, measure resistance.

Standard value

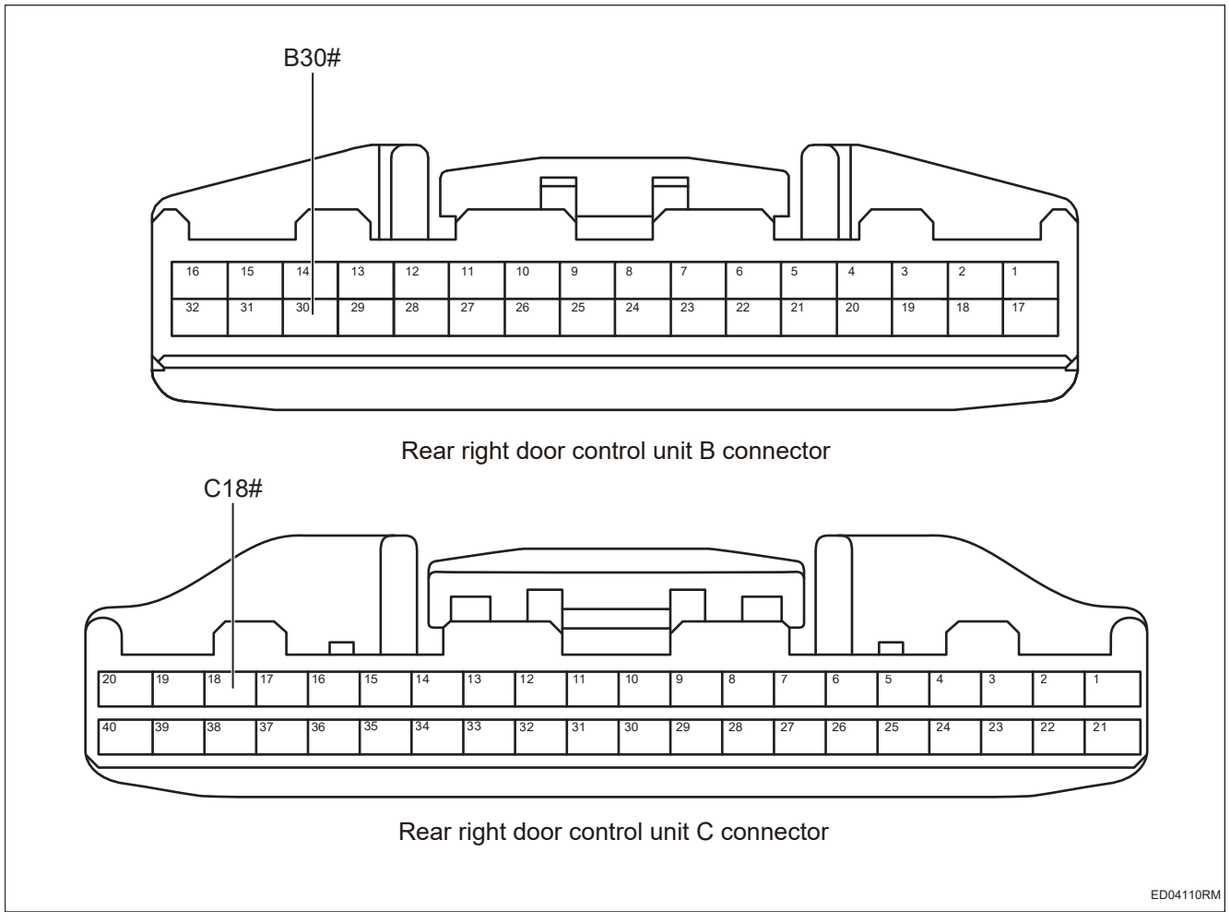
Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector C18# - rear right door power window switch connector 2#	Always connected	Less than 1 Ω
Rear right door control unit connector B30# - rear right door power window switch connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in rear right door power window switch wire harness and connector.**



(a) According to value in the table, measure resistance.

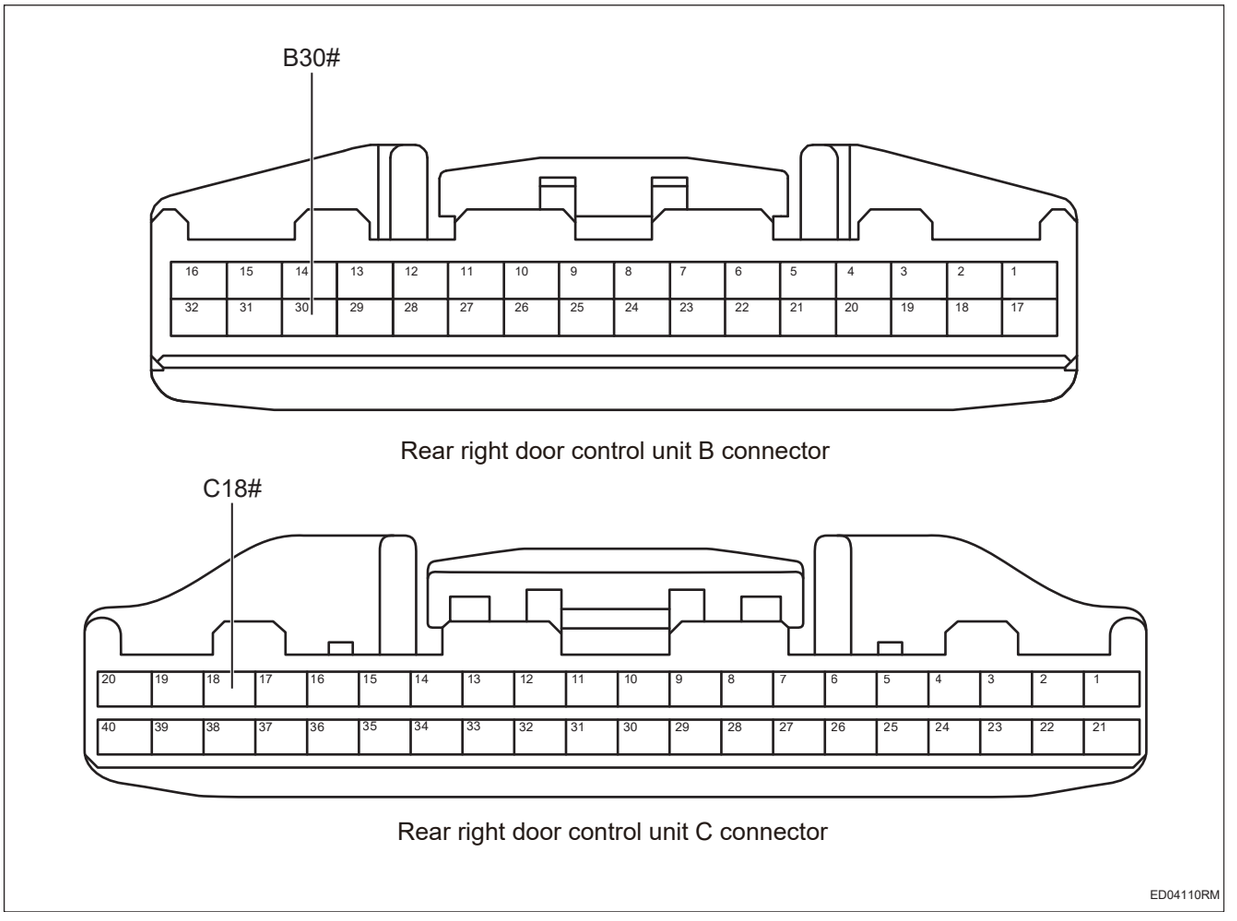
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector C18# - body ground	Always connected	10 KΩ or more
Rear right door control unit connector B30# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in rear right door power window switch wire harness and connector.**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector C18# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door control unit connector B30# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG	**Check and repair or replace wire harness and connector**

OK

5	**Replace rear right door power window switch (See page NS-119)**

(a) Replace the rear right door power window switch.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	**B11C518**	**Open in rear right door window motor output**
DTC	**B11C519**	**Short in rear right door window motor output**

Description

When the rear right door power glass regulator output circuit is short or open, the rear right door control unit records DTC.

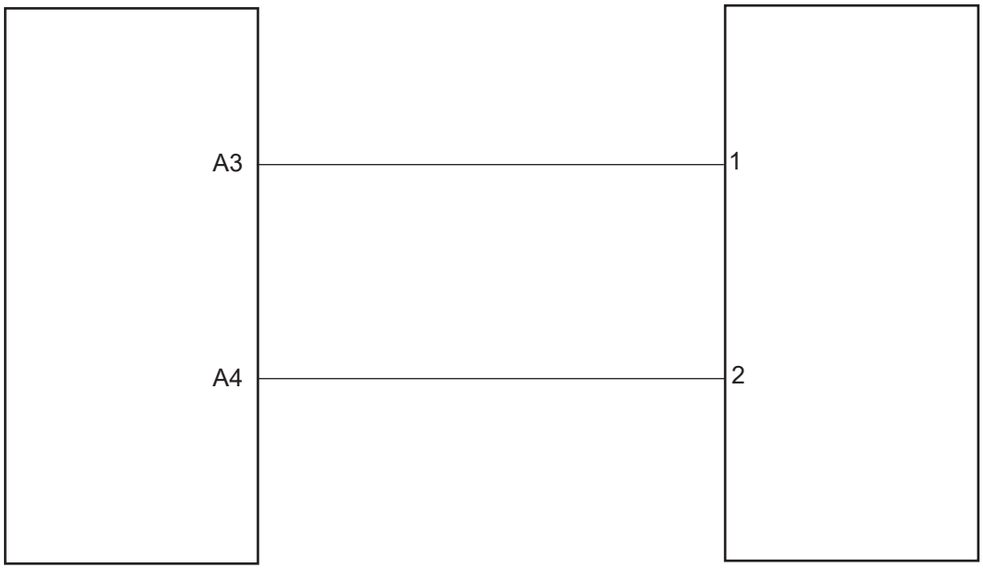
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B11C518	• Power supply status is normal • IGN is ON • Window up function ON	The current is 1 A or less when window is operating	30 ms	Periodic type	1 ms	• Rear right door control unit • Wire harness and connector • Rear right door power glass regulator
B11C519	• Power supply status is normal • IGN is ON • Window up function ON • The window learning is completed and moved to the middle position (less than 4 mm from the top, more than 3 cm from the bottom)	Determine the current after starting for 100 ms. If it exceeds 28 A (to be calibrated) and after filtering for 10 ms, short circuit is confirmed and cut off the output	10 ms	Periodic type	1 ms	• Rear right door control unit • Wire harness and connector • Rear right door power glass regulator

ZD

Fault symptom

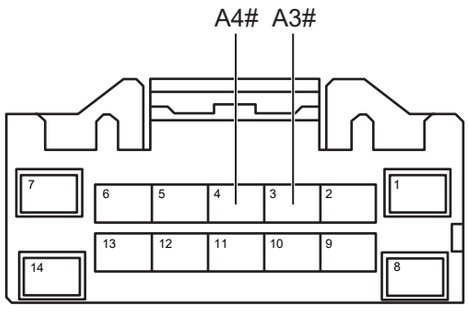
DTC No.	Fault symptom	Warning light/indicator
B11C518	No window up function	-
B11C519	No window up function	-

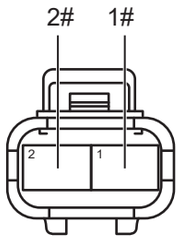
Circuit diagram



Inspection procedure

1	**Check for open in rear right door power glass regulator wire harness and connector**





Rear right door power glass regulator connector

ED04220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) Disconnect the rear right door power glass regulator connector.

(e) According to value in the table, measure resistance.

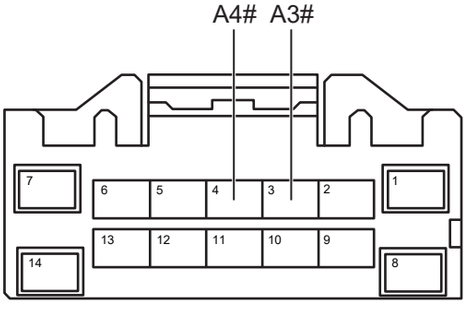
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector A3# - rear right door power glass regulator connector 1#	Always connected	Less than 1 Ω
Rear right door control unit connector A4# - rear right door power glass regulator connector 2#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in rear right door power glass regulator wire harness and connector**



Rear right door control unit A connector

ED04211RM

(a) According to value in the table, measure resistance.

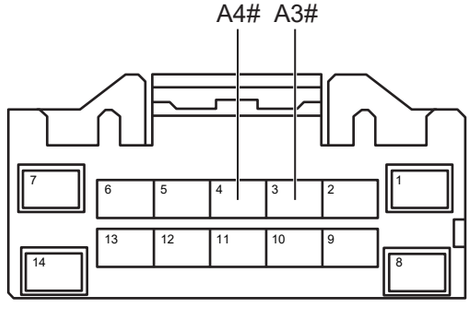
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector A4# - body ground	Always connected	10 KΩ or more
Rear right door control unit connector A3# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in rear right door power glass regulator wire harness and connector**



Rear right door control unit A connector

ED04211RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector A4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door control unit connector A3# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace rear right door power glass regulator (See page CS-19)**

(a) Replace the rear right door power glass regulator.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B11CA19	Short in rear right door concealed handle motor output

Description

When the rear right door concealed handle motor output is short, the rear right door control unit records DTC.

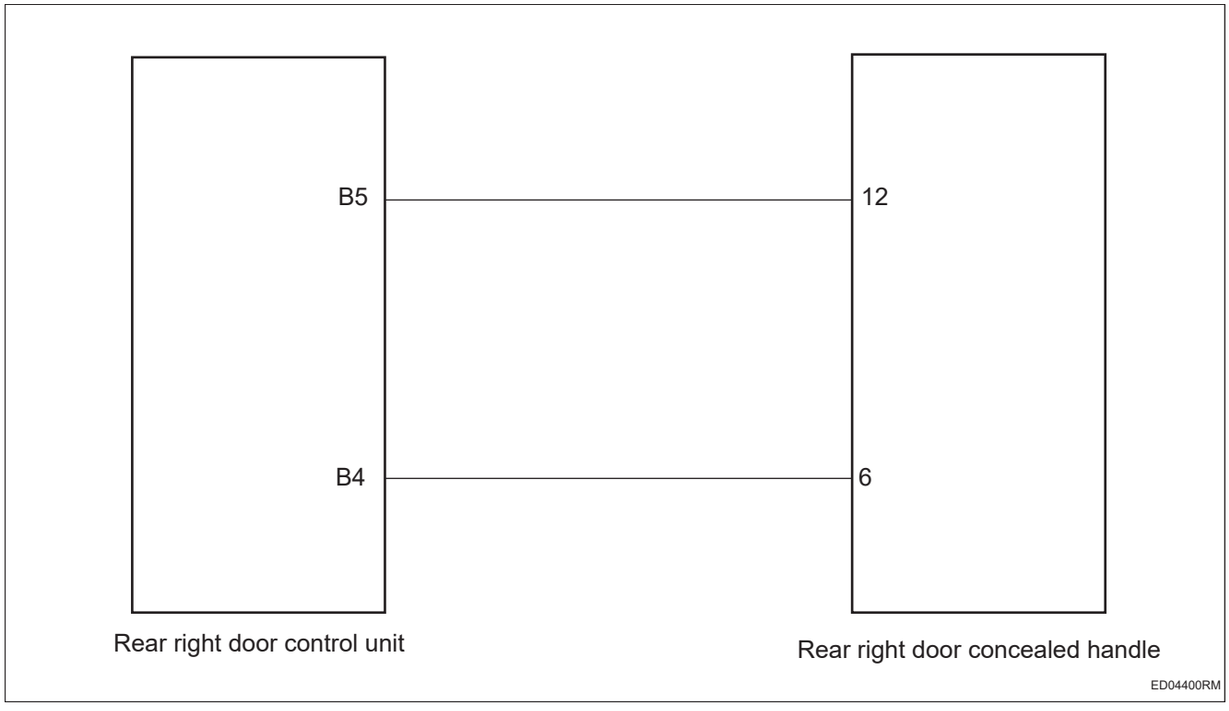
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B11CA19	• Power supply status is normal • Concealed handle function on	The current is 10 A or more when concealed handle is operating (to be calibrated)	100 ms	Periodic type	1 ms	• Rear right door control unit • Wire harness and connector • Rear right door concealed handle

ZD

Fault symptom

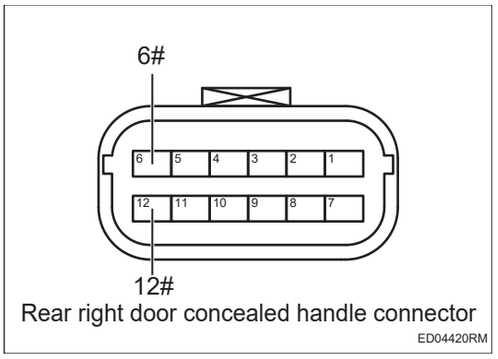
DTC No.	Fault symptom	Warning light/indicator
B11CA19	No concealed handle function	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear right door concealed handle wire harness and connector**



Rear right door concealed handle connector
ED04420RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) Disconnect the rear right door concealed handle connector.

(e) According to value in the table, measure resistance.

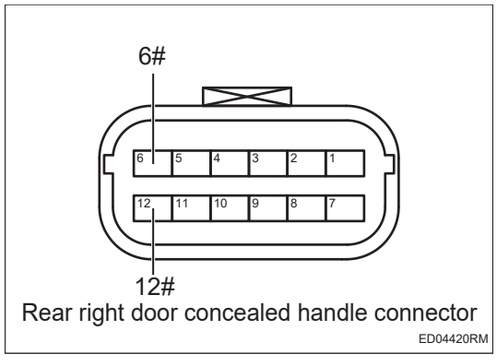
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door concealed handle connector 6# - body ground	Always connected	10 KΩ or more
Rear right door concealed handle connector 12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear right door concealed handle wire harness and connector**



Rear right door concealed handle connector
ED04420RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door concealed handle connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door concealed handle connector 12# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear right door concealed handle (See page CS-44)**

(a) Replace the rear right door concealed handle.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right door control unit (See page CS-12)**

OK

Diagnosis ends

DTC	B11CF19	Short in rear right electric unlocking motor output

Description

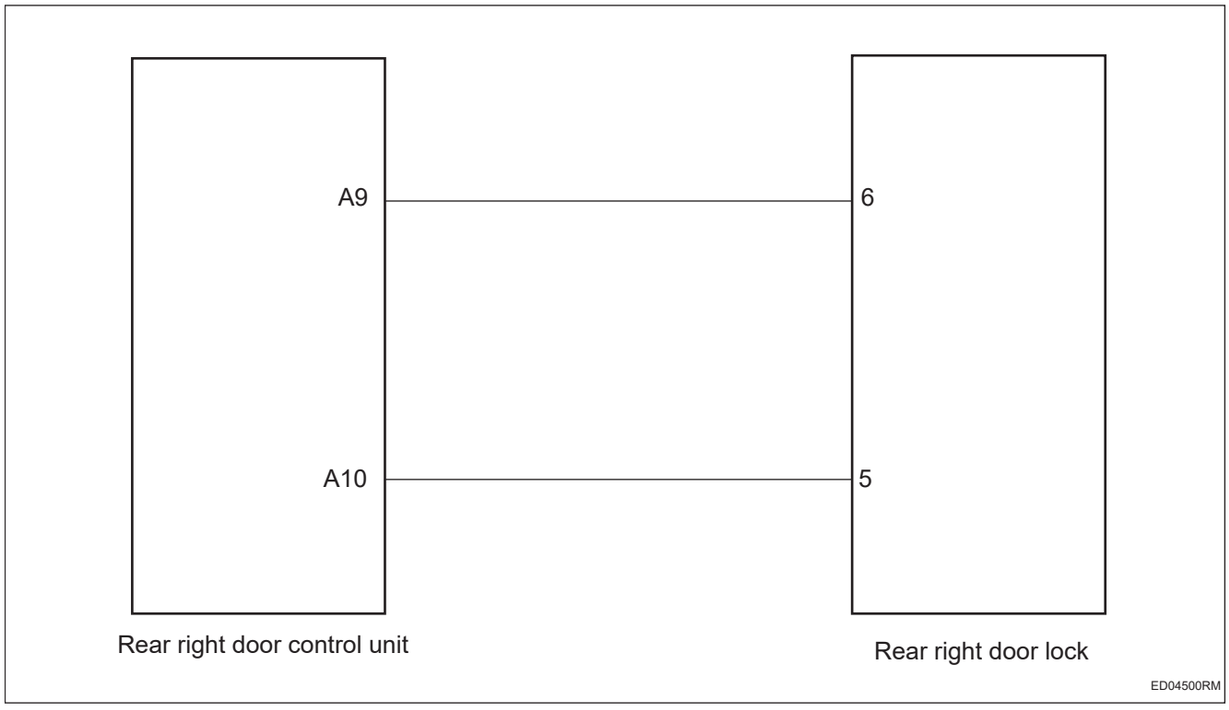
When the rear right door lock motor output is short, the rear right door control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B11CF19	• Power supply status is normal	The current is 10 A or more when the electric unlocking action is performed (to be calibrated)	100 ms	Periodic type	1 ms	• Rear right door control unit • Wire harness and connector • Rear right door lock

Fault symptom

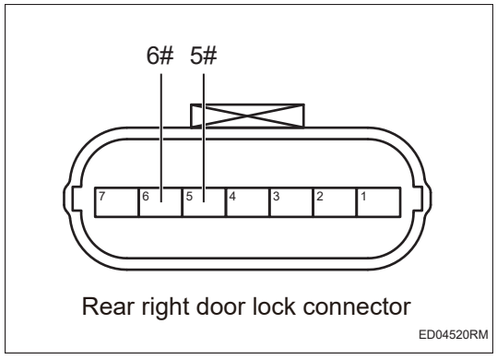
DTC No.	Fault symptom	Warning light/indicator
B11CF19	Unable to unlock electrically	-

Circuit diagram



Inspection procedure

1	**Check for short to ground in rear right door lock wire harness and connector**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) Disconnect the rear right door lock connector.

(e) According to value in the table, measure resistance.

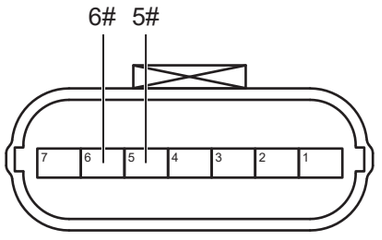
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door lock connector 6# - body ground	Always connected	10 KΩ or more
Rear right door lock connector 5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to power supply in rear right door lock wire harness and connector**



Rear right door lock connector

ED04520RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door lock connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door lock connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

3	**Replace rear right door lock (See page CS-38)**

(a) Replace the rear right door lock.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right door control unit (See page CS-12)**

ZD

OK

Diagnosis ends

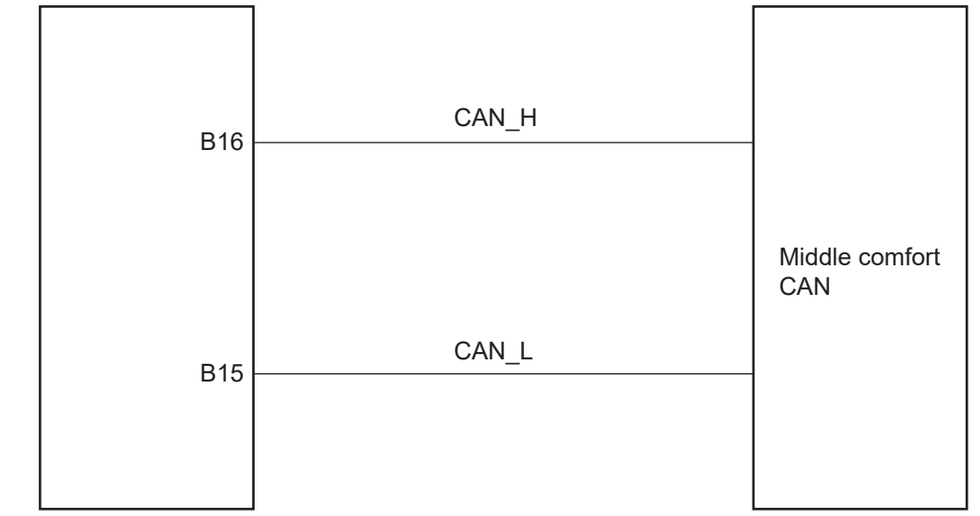
DTC	U002888	Comfort CAN bus off

Description

When the rear right door control unit detects middle comfort CAN bus off fault, the rear right door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller • Driver seat control unit • Front passenger seat control unit • Front left door control unit • Front right door control unit • Rear left door control unit • Rear right door control unit • Airbag control unit

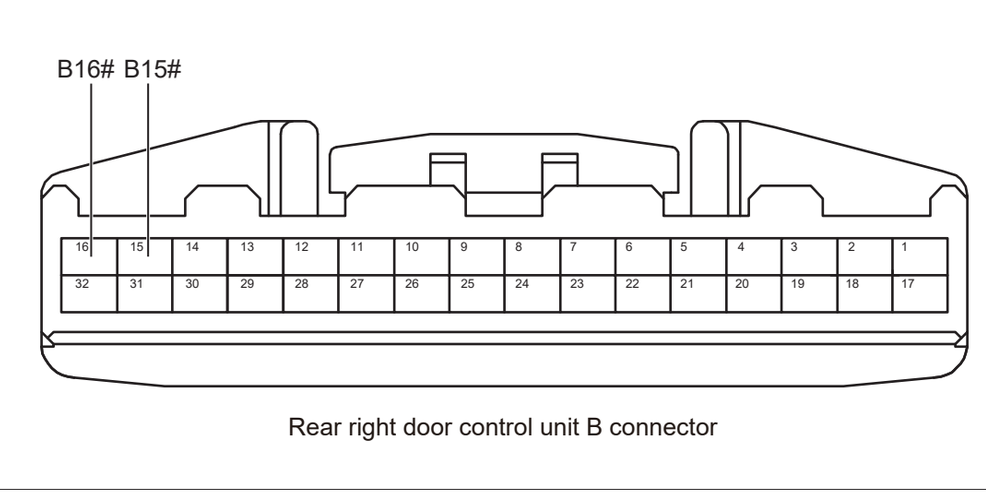
Circuit diagram



ZD

Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right door control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector B16# - rear right door control unit connector B15#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

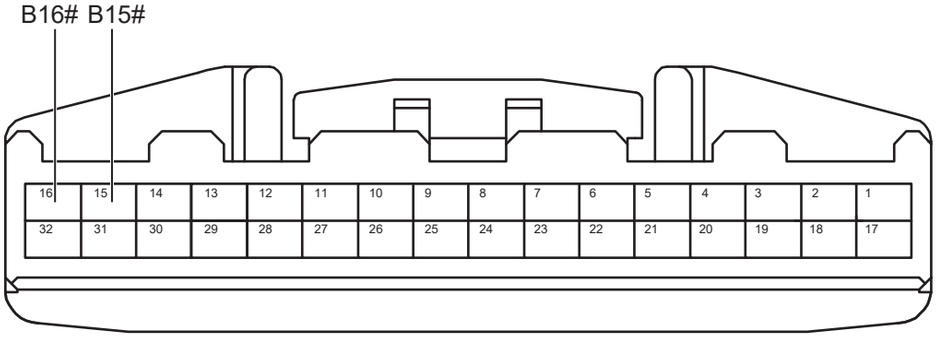
2	Check controller on central comfort CAN bus

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	Check for short between central comfort CAN bus CAN-L and CAN-H



Rear right door control unit B connector

ED04711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

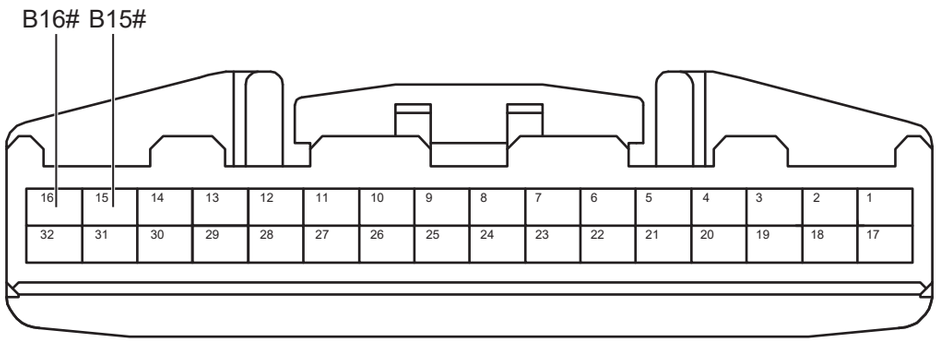
Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector B16# - rear right door control unit connector B15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	Check for short to ground in central comfort CAN bus



Rear right door control unit B connector

ED04711RM

(a) According to value in the table, measure resistance.

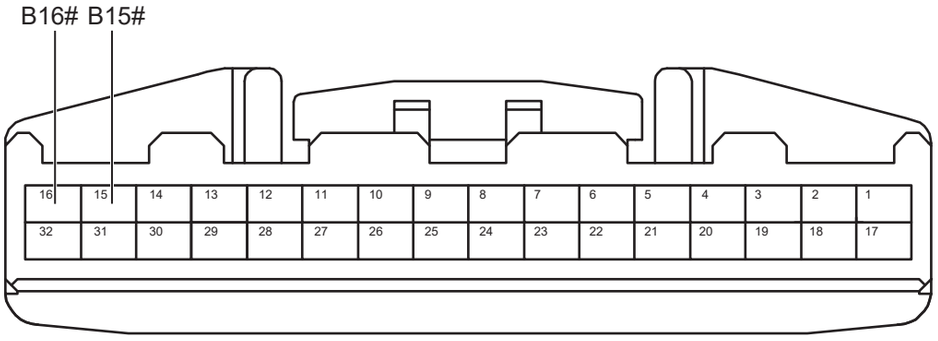
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector B16# - body ground	Always connected	10 KΩ or more
Rear right door control unit connector B15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Rear right door control unit B connector

ED04711RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector B16# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right door control unit connector B15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

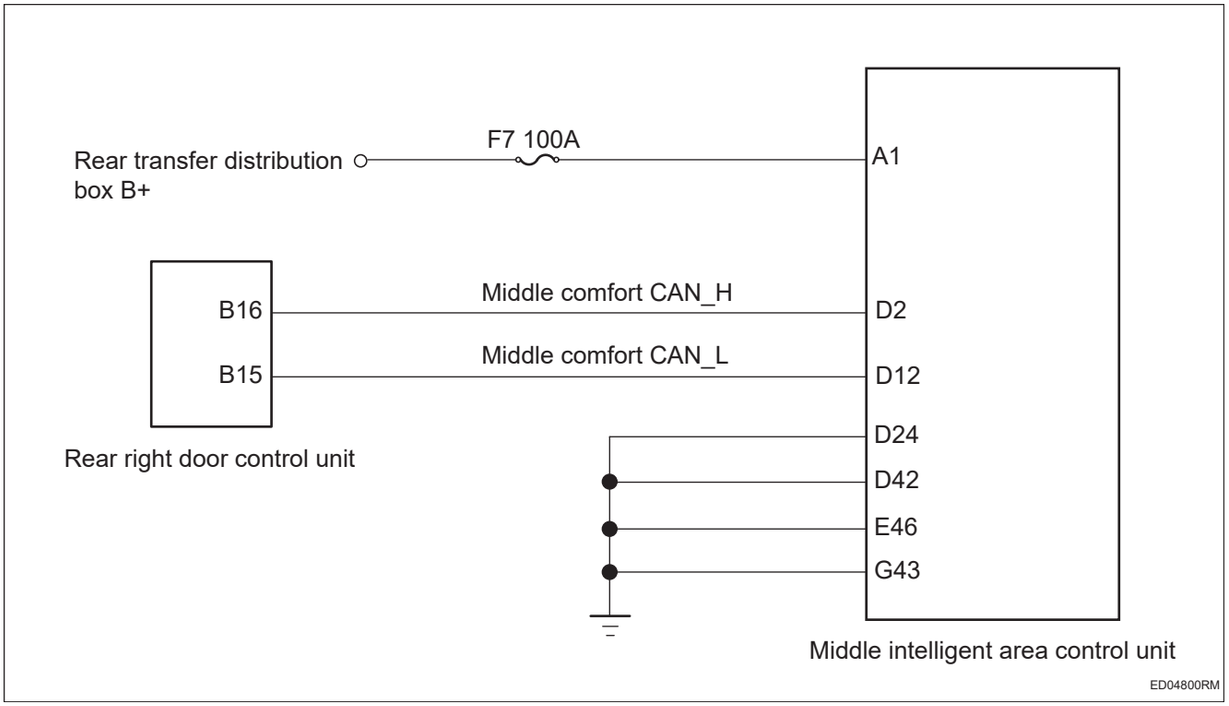
DTC	**U014687**	**PDCM node lost**
DTC	**U019987**	**Front left door controller node lost**
DTC	**U015187**	**Airbag control unit node lost**

Description

When communication between rear right door control unit and other system is abnormal or interrupted, the rear right door control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Rear right door control unit • Middle intelligent area control unit • Combination switch
U019987	(a) Front left door controller node lost.	• Wire harness and connector • Rear right door control unit • Front left door control unit • Middle intelligent area control unit • Combination switch
U015187	(a) Airbag control unit node lost.	• Wire harness and connector • Rear right door control unit • Airbag control unit • Middle intelligent area control unit • Combination switch

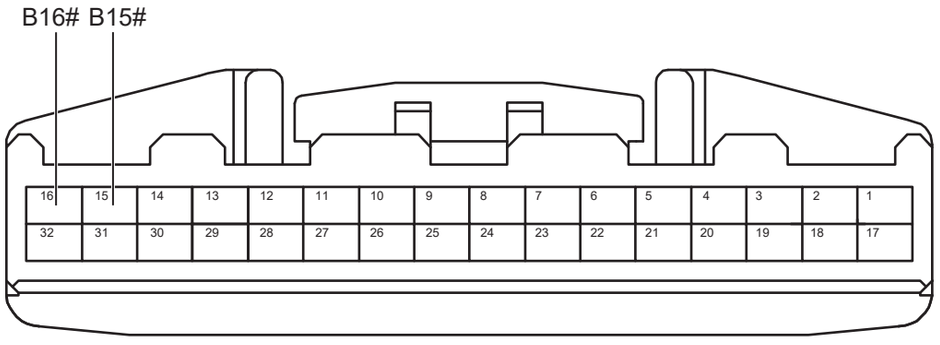
Circuit diagram



Inspection procedure

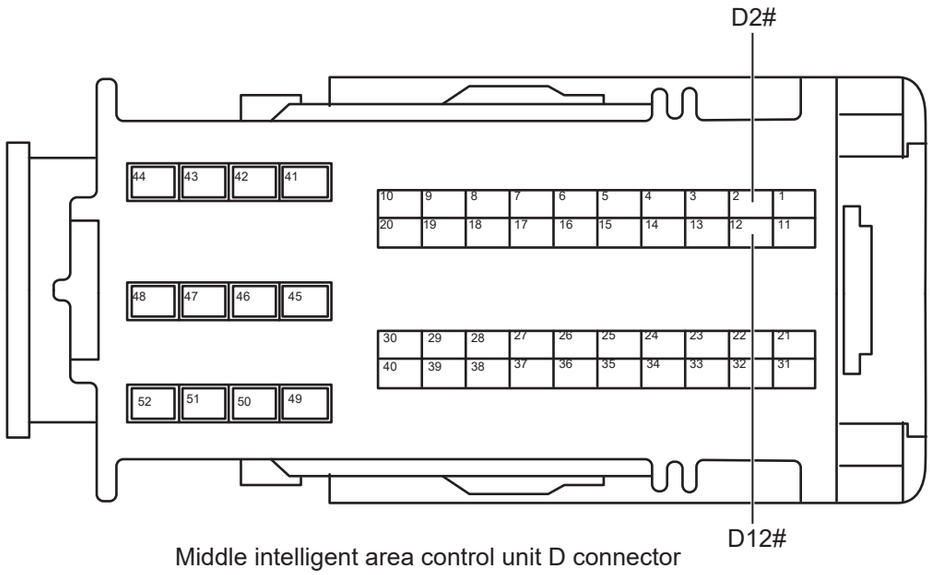
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (rear right door control unit - middle intelligent area control unit)**



Rear right door control unit B connector

ED04811RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

ZD

Standard value

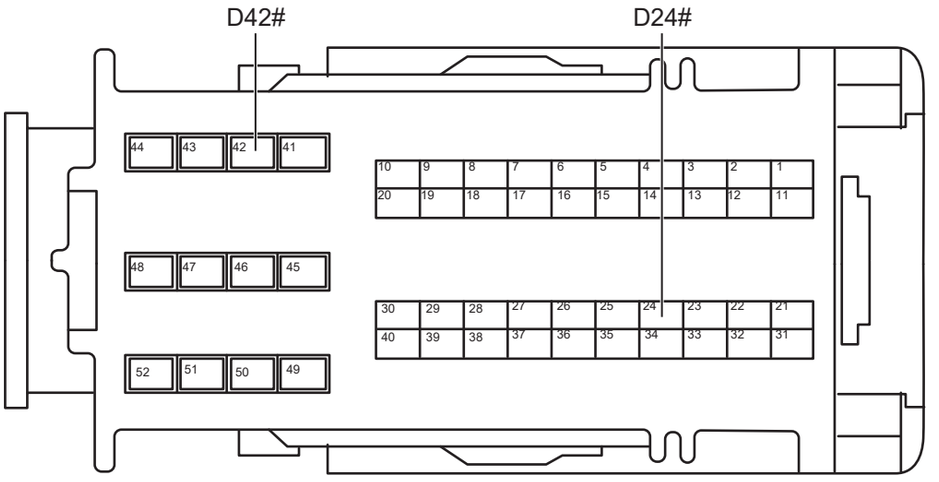
Multimeter connection	Detection condition	Specified condition
Rear right door control unit connector B16# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Rear right door control unit connector B15# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

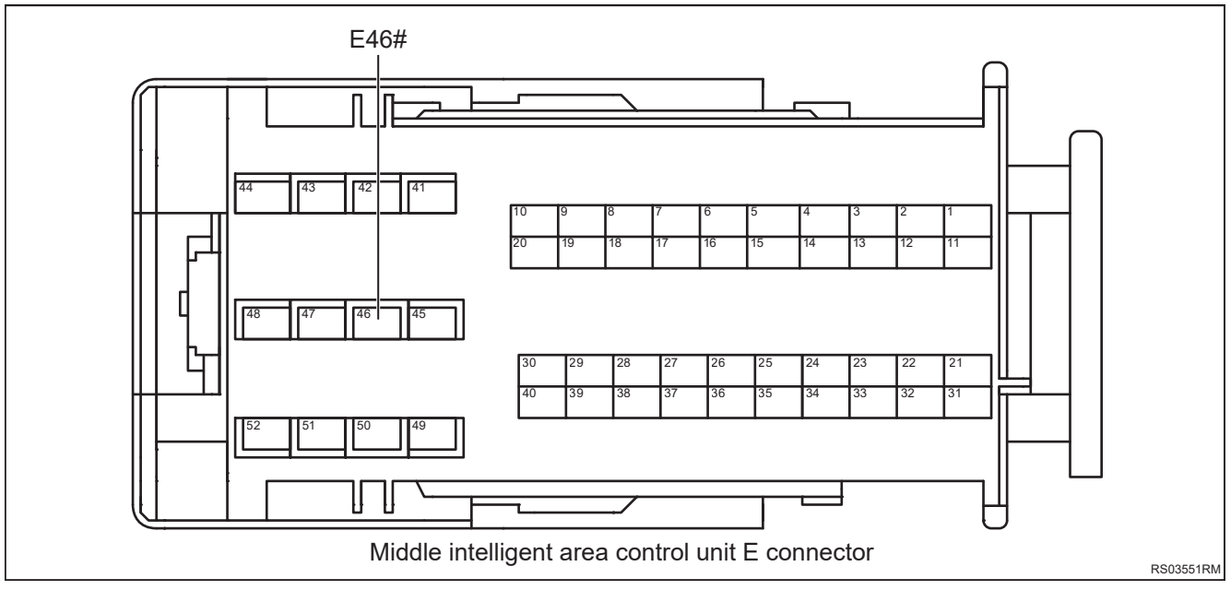
OK

2	**Check middle intelligent area control unit ground**



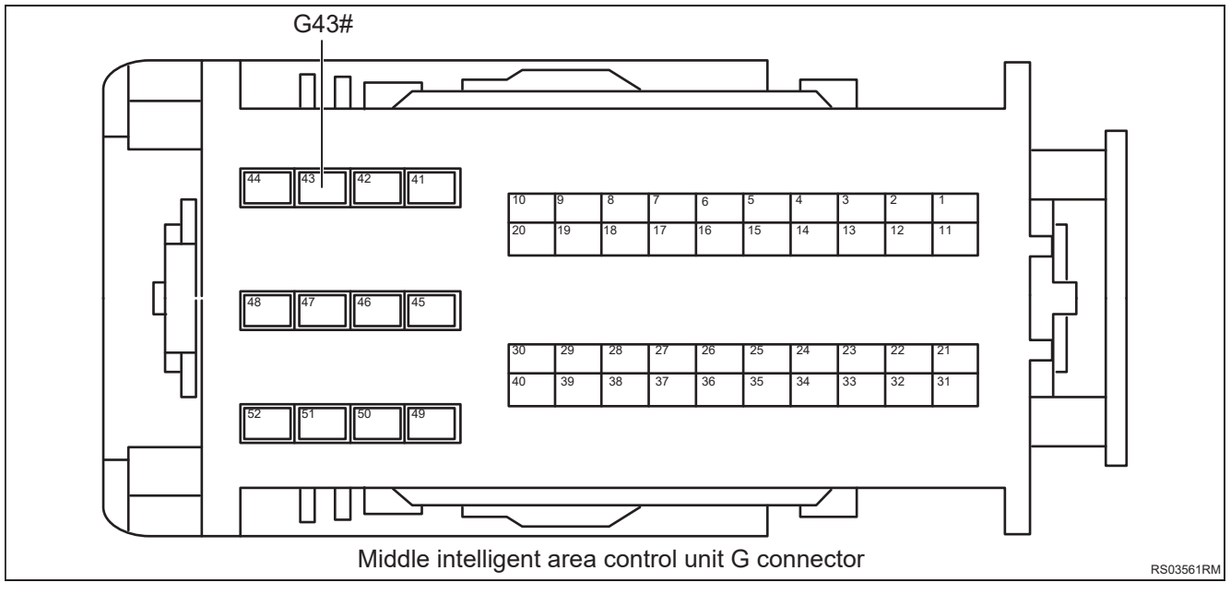
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

RS03561RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

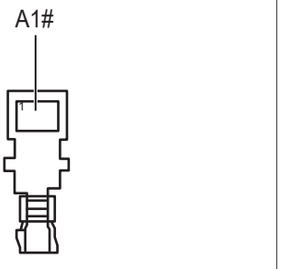
Multimeter connection	Detecti-on conditi-on	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connect-ed	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connect-ed	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

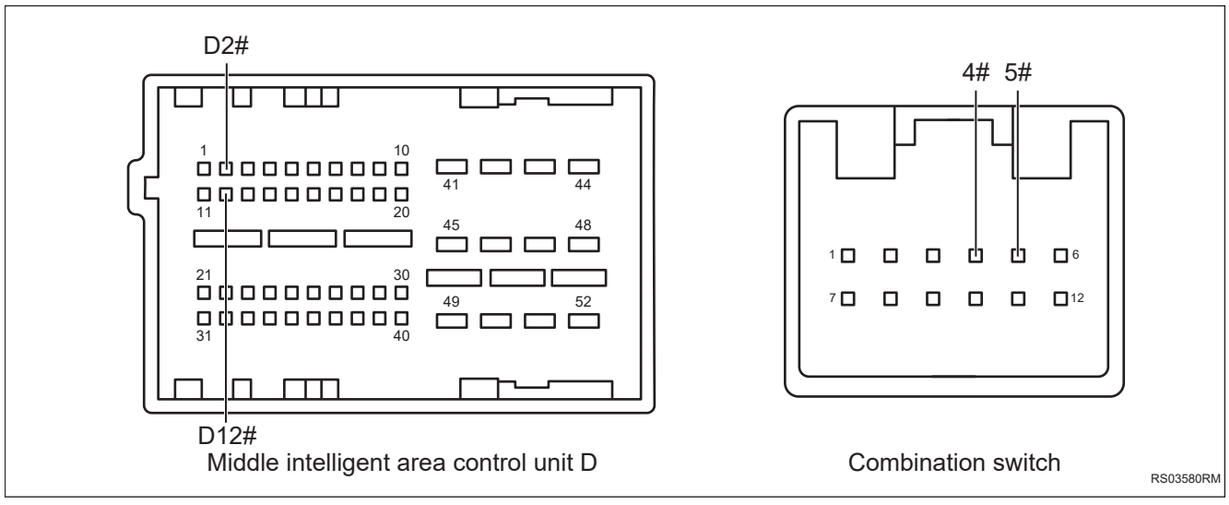
Standard value

Multimeter connection	Detection condition	Specifi-ed conditi-on
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear right door control unit (See page CS-12)**

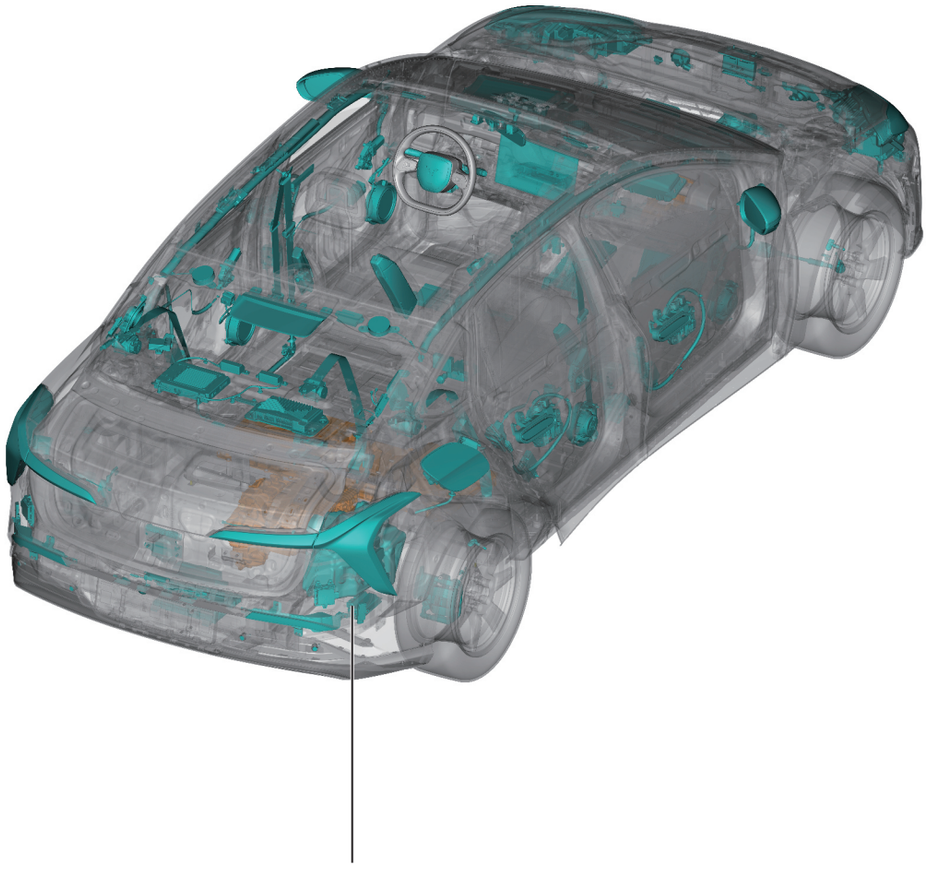
OK

Diagnosis ends

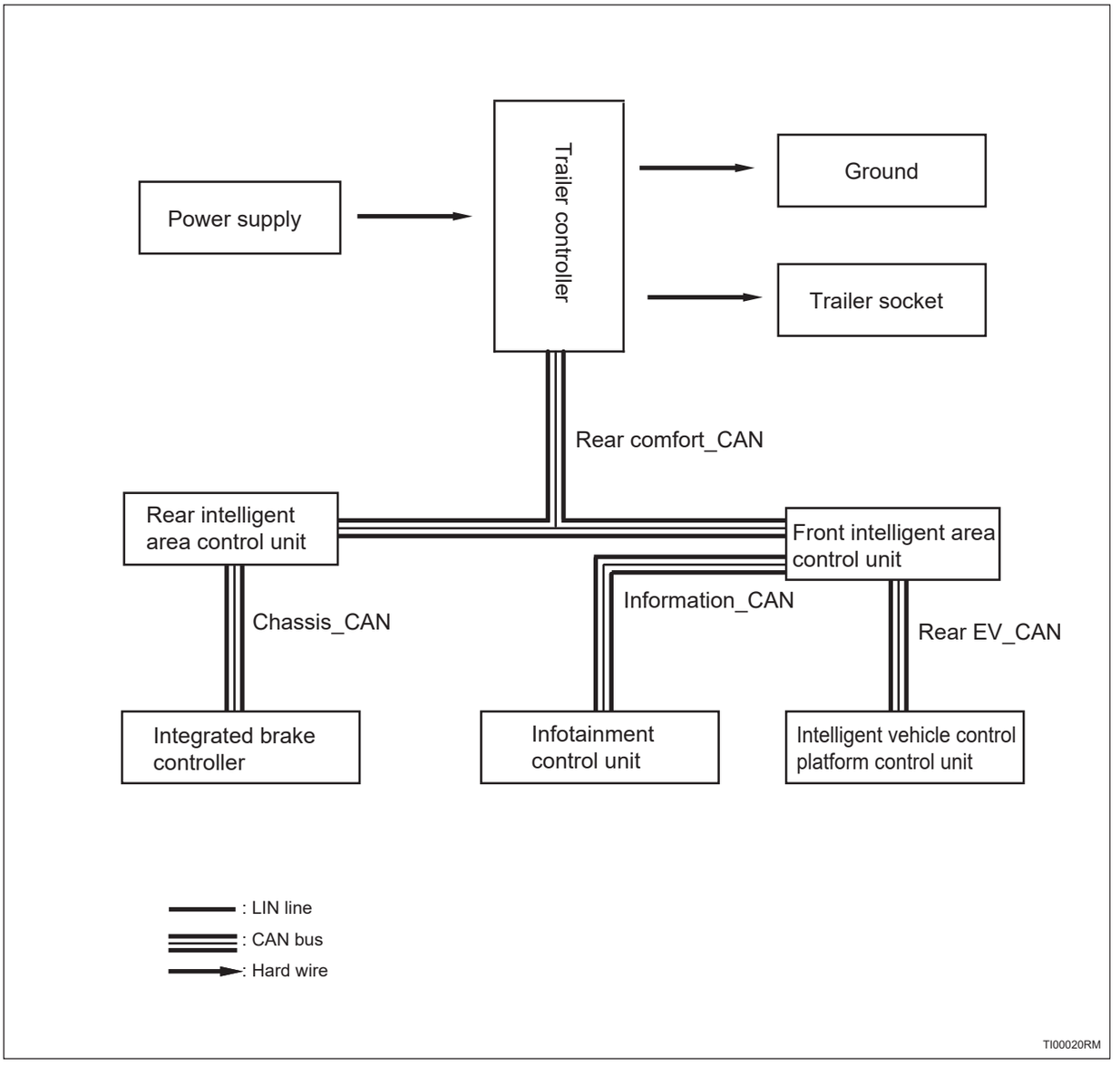
Trailer identification control system

Trailer identification controller

Part position



System diagram



ZD

System description

1. Function overview

(a) After connecting a trailer or recreational vehicle, control the exterior lights of the trailer or recreational vehicle. And according to the standard requirements, output a maximum of 20 A for one IG circuit and a maximum of 20 A for one B+ circuit.

2. Function definition

(a) Rear fog light: After entering trailer mode, the tractor and trailer are connected successfully, and when the driver turns on the rear fog lights of the tractor when driving in foggy weather, the trailer rear fog lights will come on synchronously to remind the rear vehicles and ensure driving safety.

(b) Brake light: When the tractor and trailer are connected successfully, if the driver has braking intention during driving, the trailer brake light and the tractor brake light will come on synchronously to remind the rear vehicles and ensure driving safety.

(c) Position light: When the tractor and trailer are connected successfully, if the driver turns on position light during driving, the trailer position light and the tractor position light will come on synchronously to remind the rear vehicles and ensure driving safety.

(d) Back-up light: When the tractor and trailer are connected successfully, if the driver switches the gear position to reverse during driving, the trailer back-up light and the tractor back-up light will come on synchronously to remind the rear vehicles and ensure driving safety.

(e) Turn signal light: When the tractor and trailer are connected successfully, if the driver has the intention of turning or changing lane during driving, the trailer turn signal light and the tractor turn signal light will come on synchronously to remind the rear vehicles and ensure driving safety.

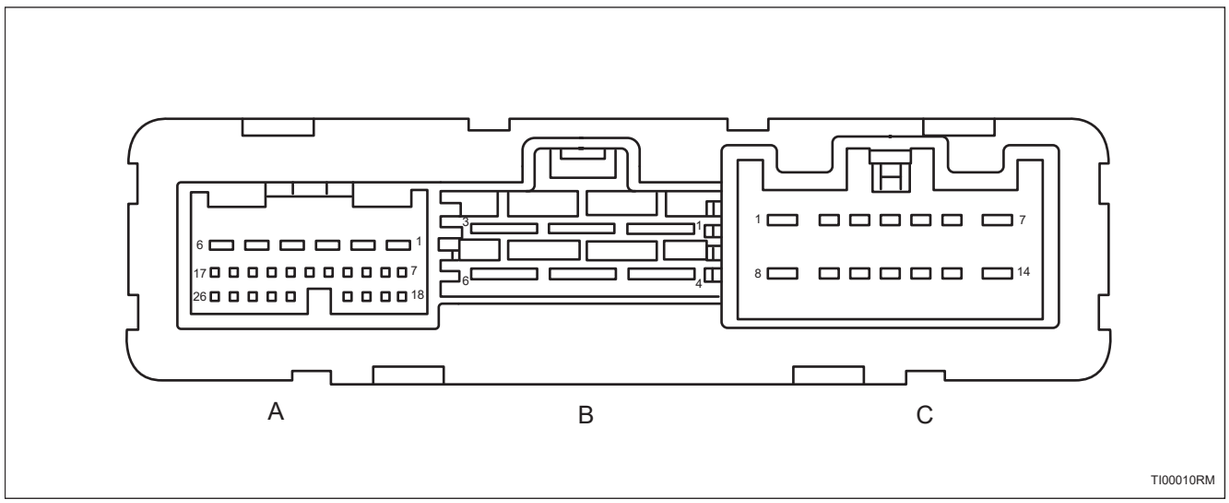
(f) Trailer mode: When the tractor and trailer are successfully connected, the user needs to turn on/off the trailer mode in the setting item on the central control display.

Data parameter

Trailer controller

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.2	0.15	—

ECU terminal



Trailer identification controller A	
Pin number	**Definition**
1	—
2	—
3	—
4	—
5	—
6	—
7	B+ power supply input
8	—

Trailer identification controller A	
Pin number	**Definition**
9	—
10	—
11	—
12	—
13	IG
14	—
15	—
16	—
17	—
18	GND
19	—
20	—
21	Comfort_CAN_L
22	Comfort_CAN_H
23	—
24	—
25	—
26	—

Trailer identification controller B	
Pin number	**Definition**
1	—
2	Light power supply input 2
3	Light power supply input 1
4	—
5	KL30 constant power supply (input)
6	IG power (input)

Trailer identification controller C	
Pin number	**Definition**
1	Supply power IG for trailer
2	Brake light
3	Rear fog light
4	Rear left combination illumination unit
5	Rear right combination illumination unit
6	Back-up light
7	Supply (+12 V) B+ power for trailer
8	—

Trailer identification controller C	
Pin number	**Definition**
9	—
10	—
11	—
12	Left turn signal light
13	Right turn signal light
14	—

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
U300316	TICU controller input end undervoltage	(See page ZD-3088)
U300317	TICU controller input end overvoltage	(See page ZD-3088)
B12A012	Short to power supply in trailer left turn signal light	(See page ZD-3062)
B12A011	Short to ground in trailer left turn signal light	(See page ZD-3062)
B12A013	Open in trailer left turn signal light	(See page ZD-3062)
B12A112	Short to power supply in trailer right turn signal light	(See page ZD-3064)
B12A111	Short to ground in trailer right turn signal light	(See page ZD-3064)
B12A113	Open in trailer right turn signal light	(See page ZD-3064)
B12A212	Short to power supply in trailer rear fog light	(See page ZD-3066)
B12A211	Short to ground in trailer rear fog light	(See page ZD-3066)
B12A213	Open in trailer rear fog light	(See page ZD-3066)
B12A312	Short to power supply in trailer back-up light	(See page ZD-3068)
B12A311	Short to ground in trailer back-up light	(See page ZD-3068)
B12A313	Open in trailer back-up light	(See page ZD-3068)
B12A412	Short to power supply in trailer rear left illumination light set	(See page ZD-3070)
B12A411	Short to ground in trailer rear left illumination light set	(See page ZD-3070)
B12A413	Open in trailer rear left illumination light set	(See page ZD-3070)
B12A512	Short to power supply in trailer rear right illumination light set	(See page ZD-3072)
B12A511	Short to ground in trailer rear right illumination light set	(See page ZD-3072)
B12A513	Open in trailer rear right illumination light set	(See page ZD-3072)
B12A612	Short to power supply in trailer brake light	(See page ZD-3074)
B12A611	Short to ground in trailer brake light	(See page ZD-3074)
B12A613	Open in trailer brake light	(See page ZD-3074)

DTC	Detection Items	See page
B12A801	Trailer power supply circuit fault (M5)	(See page ZD-3076)
B12A817	Trailer power supply input voltage high (M5)	(See page ZD-3076)
B12A816	Trailer power supply input voltage low (pin M5)	(See page ZD-3076)
B12AB17	Direct drive input voltage high (M1 or M2 pin)	(See page ZD-3084)
B12AB16	Direct drive input voltage low (M1 or M2 pin)	(See page ZD-3084)
B12A916	IG voltage too low (pin L11)	(See page ZD-3080)
B12A911	IG short to ground (pin L11)	(See page ZD-3080)
B12A912	IG short to power supply (pin L11)	(See page ZD-3080)
U002888	CAN line BUSOFF	(See page ZD-3093)
U112187	IBC node lost	(See page ZD-3098)
U124587	CSC node lost	(See page ZD-3098)
U014087	VDC821 node lost	(See page ZD-3098)
U014687	PDCR missing	(See page ZD-3098)

DTC	**B12A012**	**Short to power supply in trailer left turn signal light**
DTC	**B12A011**	**Short to ground in trailer left turn signal light**
DTC	**B12A013**	**Open in trailer left turn signal light**

Description

When trailer controller detects short or open in trailer left turn signal light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A012	• Power supply status is normal	When left turn signal light driver is turned off, the driver output voltage is equal to the power supply voltage, short to power supply in output is reported	1 s	Continuous type	50 ms	• Trailer controller • Wire harness and connector • Trailer left turn signal light
B12A011	• Power supply status is normal	After left turn signal light driver is turned on, the current is more than 3 A, short to ground in output is reported	500 ms	Continuous type	50 ms	• Trailer controller • Wire harness and connector • Trailer left turn signal light
B12A013	• Power supply status is normal	After left turn signal light driver is turned on, the current is less than 0.3 A	2 s	Continuous type	50 ms	• Trailer controller • Wire harness and connector • Trailer left turn signal light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A012	• Left turn signal light function failure	—
B12A011	• Left turn signal light function failure	—
B12A013	• Left turn signal light function failure	—

Inspection procedure

1	**Check left turn signal light output wire harness and connector**

(a) Check if left turn signal light output wire harness and connector are connected securely.

(b) Check for short or open in left turn signal light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	Check trailer left turn signal light

(a) Check trailer left turn signal light for proper installation.

(b) Check if trailer left turn signal light is damaged.

NG → Perform repair according to malfunction

OK

ZD Replace trailer controller (See page CS-23)

DTC	B12A112	Short to power supply in trailer right turn signal light
DTC	B12A111	Short to ground in trailer right turn signal light
DTC	B12A113	Open in trailer right turn signal light

Description

When trailer controller detects short or open in trailer right turn signal light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A112	• Power supply status is normal	When right turn signal light driver is turned off, the driver output voltage is equal to the power supply voltage, short to power supply in output is reported	1 s	Continuous type	Right turn signal light function failure	• Trailer controller • Wire harness and connector • Trailer right turn signal light
B12A111	• Power supply status is normal	After right turn signal light driver is turned on, the current is more than 3 A, short to ground in output is reported	500 ms	Continuous type	Right turn signal light function failure	• Trailer controller • Wire harness and connector • Trailer right turn signal light
B12A113	• Power supply status is normal	After right turn signal light driver is turned on, the current is less than 0.3 A	2 s	Continuous type	Right turn signal light function failure	• Trailer controller • Wire harness and connector • Trailer right turn signal light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A112	Right turn signal light function failure	—
B12A111	Right turn signal light function failure	—
B12A113	Right turn signal light function failure	—

Inspection procedure

1	**Check right turn signal light output wire harness and connector**

(a) Check if right turn signal light output wire harness and connector are connected securely.

(b) Check for short or open in right turn signal light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check trailer right turn signal light**

(a) Check trailer right turn signal light for proper installation.

(b) Check if trailer right turn signal light is damaged.

NG → **Perform repair according to malfunction**

OK

Replace trailer controller (See page CS-23)

DTC	B12A212	Short to power supply in trailer rear fog light
DTC	B12A211	Short to ground in trailer rear fog light
DTC	B12A213	Open in trailer rear fog light

Description

When trailer controller detects short or open in trailer rear fog light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A212	• Power supply status is normal	External sensor not connected	1 s	Continuous type	Rear fog light failure	• Trailer controller • Wire harness and connector • Trailer rear fog light
B12A211	• Power supply status is normal	After the rear fog light drive is turned on, the current is more than 5.5 A, and short to ground fault in output is reported (chip thermal protection test 47 W)	500 ms	Continuous type	Rear fog light failure	• Trailer controller • Wire harness and connector • Trailer rear fog light
B12A213	• Power supply status is normal	After the rear fog light drive is turned on, the current is less than 0.3 A	2 s	Continuous type	Rear fog light failure	• Trailer controller • Wire harness and connector • Trailer rear fog light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A212	Rear fog light failure	—
B12A211	Rear fog light failure	—
B12A213	Rear fog light failure	—

Inspection procedure

1	**Check rear fog light output wire harness and connector**

(a) Check if rear fog light output wire harness and connector are connected securely.

(b) Check for short or open in rear fog light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check trailer rear fog light**

(a) Check trailer rear fog light for proper installation.

(b) Check if trailer rear fog light is damaged.

NG → **Perform repair according to malfunction**

OK

Replace trailer identification controller (See page CS-23)

ZD

DTC	**B12A312**	**Short to power supply in trailer back-up light**
DTC	**B12A311**	**Short to ground in trailer back-up light**
DTC	**B12A313**	**Open in trailer back-up light**

Description

When trailer controller detects short or open in trailer reversing light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A312	• Power supply status is normal	When the back-up light driver is deactivated, and the driver output equals the power supply voltage, an output short to power fault is reported.	1 s	Continuous type	Back-up light failure	• Trailer controller • Wire harness and connector • Trailer back-up light
B12A311	• Power supply status is normal	When the back-up light driver is activated and current is more than 5.5 A, an output short to ground fault is reported (chip thermal protection test 47W)	500 ms	Continuous type	Back-up light failure	• Trailer controller • Wire harness and connector • Trailer back-up light
B12A313	• Power supply status is normal	When the back-up light driver is activated, the current is less than 0.3 A.	2 s	Continuous type	Back-up light failure	• Trailer controller • Wire harness and connector • Trailer back-up light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A312	Back-up light failure	—
B12A311	Back-up light failure	—
B12A313	Back-up light failure	—

Inspection procedure

1	**Check back-up light output wire harness and connector**

(a) Check if back-up light output wire harness and connector are connected securely.

(b) Check for short or open in back-up light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG	**Check and repair or replace wire harness and connector**

OK

2	Check trailer back-up light

(a) Check trailer back-up light for proper installation.

(b) Check if trailer back-up light is damaged.

NG → Perform repair according to malfunction

OK

ZD

Replace trailer controller (See page CS-23)

DTC	B12A412	Short to power supply in trailer rear left illumination light set
DTC	B12A411	Short to ground in trailer rear left illumination light set
DTC	B12A413	Open in trailer rear left illumination light set

Description

When trailer controller detects short or open in trailer rear left combination light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A412	• Power supply status is normal	When rear left light unit driver is turned off, the driver output voltage is equal to the power supply voltage, short to power supply in output is reported	1 s	Continuous type	Rear left light invalid	• Trailer controller • Wire harness and connector • Trailer rear left combination light
B12A411	• Power supply status is normal	After rear left light unit driver is turned on, the current is more than 5.5 A, short to ground in output is reported (chip thermal protection 47 W)	500 ms	Continuous type	Rear left light invalid	• Trailer controller • Wire harness and connector • Trailer rear left combination light
B12A413	• Power supply status is normal	After rear left light unit driver is turned on, the current is less than 0.3 A	2 s	Continuous type	Rear left light invalid	• Trailer controller • Wire harness and connector • Trailer rear left combination light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A412	Rear left light invalid	—
B12A411	Rear left light invalid	—
B12A413	Rear left light invalid	—

Inspection procedure

1	**Check rear left combination light output wire harness and connector**

(a) Check if rear left combination light output wire harness and connector are connected securely.

(b) Check for short or open in rear left combination light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check trailer rear left combination light**

(a) Check trailer rear left combination light for proper installation.

(b) Check if trailer rear left combination light is damaged.

NG → **Perform repair according to malfunction**

OK

Replace trailer controller (See page CS-23)

DTC	**B12A512**	**Short to power supply in trailer rear right illumination light set**
DTC	**B12A511**	**Short to ground in trailer rear right illumination light set**
DTC	**B12A513**	**Open in trailer rear right illumination light set**

Description

When trailer controller detects short or open in trailer rear right combination light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A512	• Power supply status is normal	When rear right light driver is turned off, the driver output voltage is equal to the power supply voltage, short to power supply in output is reported	1 s	Continuous type	Rear right light invalid	• Trailer controller • Wire harness and connector • Trailer rear right combination light
B12A511	• Power supply status is normal	After rear right light driver is turned on, the current is more than 5.5 A, short to ground in output is reported (chip thermal protection 47 W)	500 ms	Continuous type	Rear right light invalid	• Trailer controller • Wire harness and connector • Trailer rear right combination light
B12A513	• Power supply status is normal	After rear right light driver is turned on, the current is less than 0.3 A	2 s	Continuous type	Rear right light invalid	• Trailer controller • Wire harness and connector • Trailer rear right combination light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A512	Rear right light invalid	—
B12A511	Rear right light invalid	—
B12A513	Rear right light invalid	—

Inspection procedure

1	**Check rear right combination light output wire harness and connector**

(a) Check if rear right combination light output wire harness and connector are connected securely.

(b) Check for short or open in rear right combination light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check trailer rear right combination light**

(a) Check trailer rear right combination light for proper installation.

(b) Check if trailer rear right combination light is damaged.

NG → **Perform repair according to malfunction**

ZD

OK

Replace trailer controller (See page CS-23)

DTC	**B12A612**	**Short to power supply in trailer brake light**
DTC	**B12A611**	**Short to ground in trailer brake light**
DTC	**B12A613**	**Open in trailer brake light**

Description

When trailer controller detects short or open in trailer brake combination light, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A612	• Power supply status is normal	When the brake light drive is turned off, the drive output is equal to the power supply voltage, reporting short to power supply in output	1 s	Continuous type	Brake light failure	• Trailer controller • Wire harness and connector • Trailer brake combination light
B12A611	• Power supply status is normal	After the brake light drive is turned on, the current is more than 5.5 A, reporting short to ground in output (chip thermal protection 47 W)	500 ms	Continuous type	Brake light failure	• Trailer controller • Wire harness and connector • Trailer brake combination light
B12A613	• Power supply status is normal	After the brake light drive is turned on, the current is less than 0.3 A	2 s	Continuous type	Brake light failure	• Trailer controller • Wire harness and connector • Trailer brake combination light

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A612	Brake light failure	—
B12A611	Brake light failure	—
B12A613	Brake light failure	—

Inspection procedure

1	**Check brake light output wire harness and connector**

(a) Check if brake light output wire harness and connector are connected securely.

(b) Check for short or open in brake light output wire harness and connector.

(c) Check if standard connector is connected correctly.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check trailer brake light**

(a) Check trailer brake light for proper installation.

(b) Check if trailer brake light is damaged.

NG → **Perform repair according to malfunction**

OK

Replace trailer controller (See page CS-23)

DTC	**B12A801**	**Trailer power supply circuit fault (M5)**
DTC	**B12A817**	**Trailer power supply input voltage high (M5)**
DTC	**B12A816**	**Trailer power supply input voltage low (pin M5)**

Description

When the electrical current consumed by the trailer is excessively high or the power supply voltage to the trailer is out of the normal operating range, the trailer controller records a fault code.

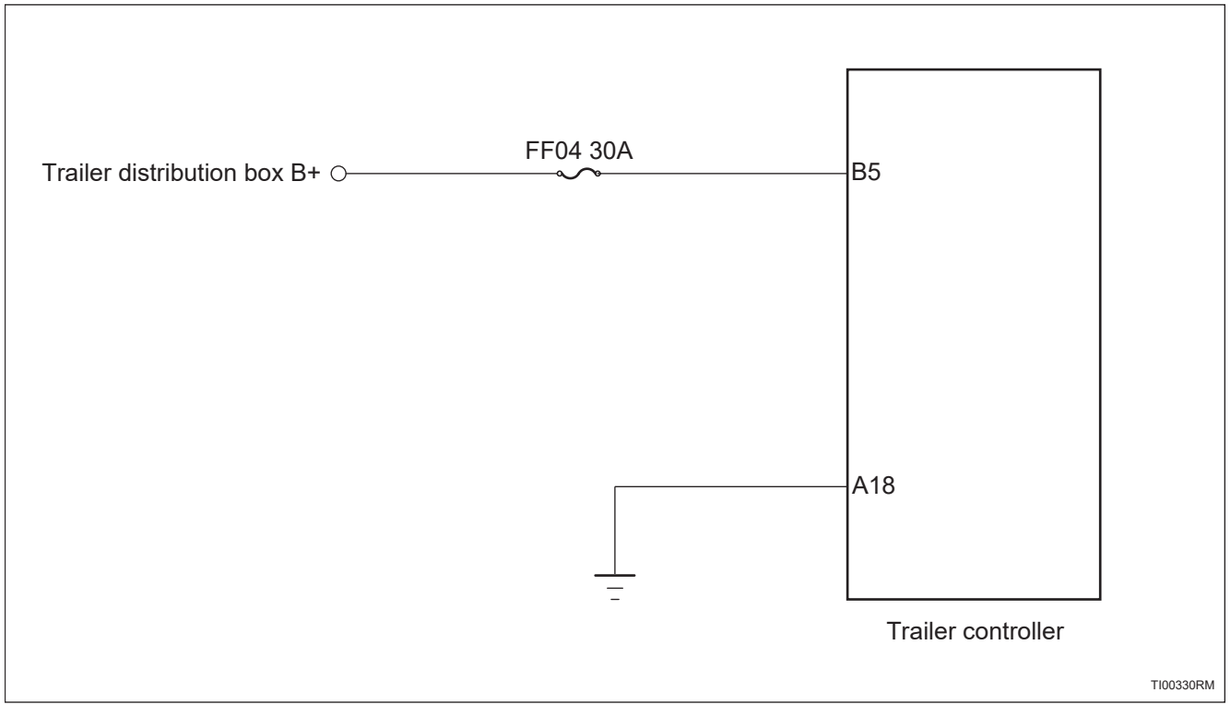
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A801	• Power supply status is normal	After the drive chip drive is turned on, if the current is more than 26 A, an output line fault is reported	500 ms	Continuous type	Trailer power supply failure	• Electrical appliances for trailer • Trailer controller • Wire harness and connector • Charging system
B12A817	• Power supply status is normal	Power supply input voltage is higher than 16.5 V	2 s	Continuous type	Trailer power supply failure	• Trailer controller • Wire harness and connector • Charging system
B12A816	• Power supply status is normal	Power supply input voltage is lower than 8.5 V	2 s	Continuous type	Trailer power supply failure	• Trailer controller • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A801	Trailer power supply failure	—
B12A817	Trailer power supply failure	—
B12A816	Trailer power supply failure	—

Circuit diagram



Inspection procedure

1	**Check current for trailer**

(a) Check if current for trailer exceeds 20 A.

NG → **Perform repair according to malfunction**

OK

2	**Check battery voltage**

ZD

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

3	**Check trailer controller fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the trailer controller fuse.

(d) According to value in the table, measure resistance.

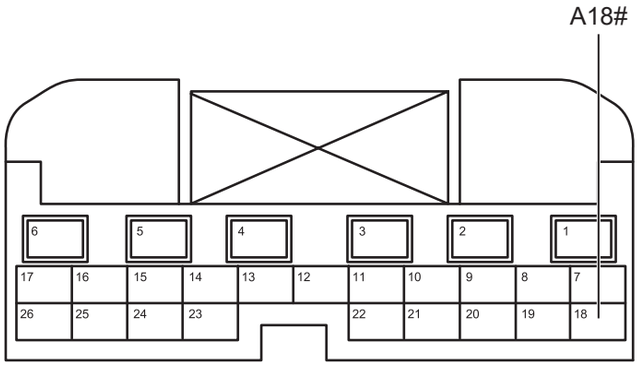
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

4	**Check trailer controller ground**



Trailer controller A connector

TI00321RM

(a) Disconnect the trailer controller connector.

(b) According to value in the table, measure resistance.

Standard value

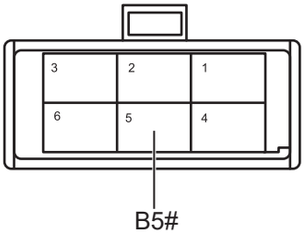
Multimeter connection	Detection condition	Specified condition
Trailer controller connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

5	**Check trailer controller power supply**



Trailer controller B connector

TI00340RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Trailer controller connector B5# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

Replace trailer controller (See page CS-23)

DTC	B12A916	IG voltage too low (pin L11)
DTC	B12A911	IG voltage too low (pin L11)
DTC	B12A912	IG short to power supply (pin L11)

Description

When trailer identification controller IG power supply voltage is out of normal operation range, the trailer identification controller records DTC.

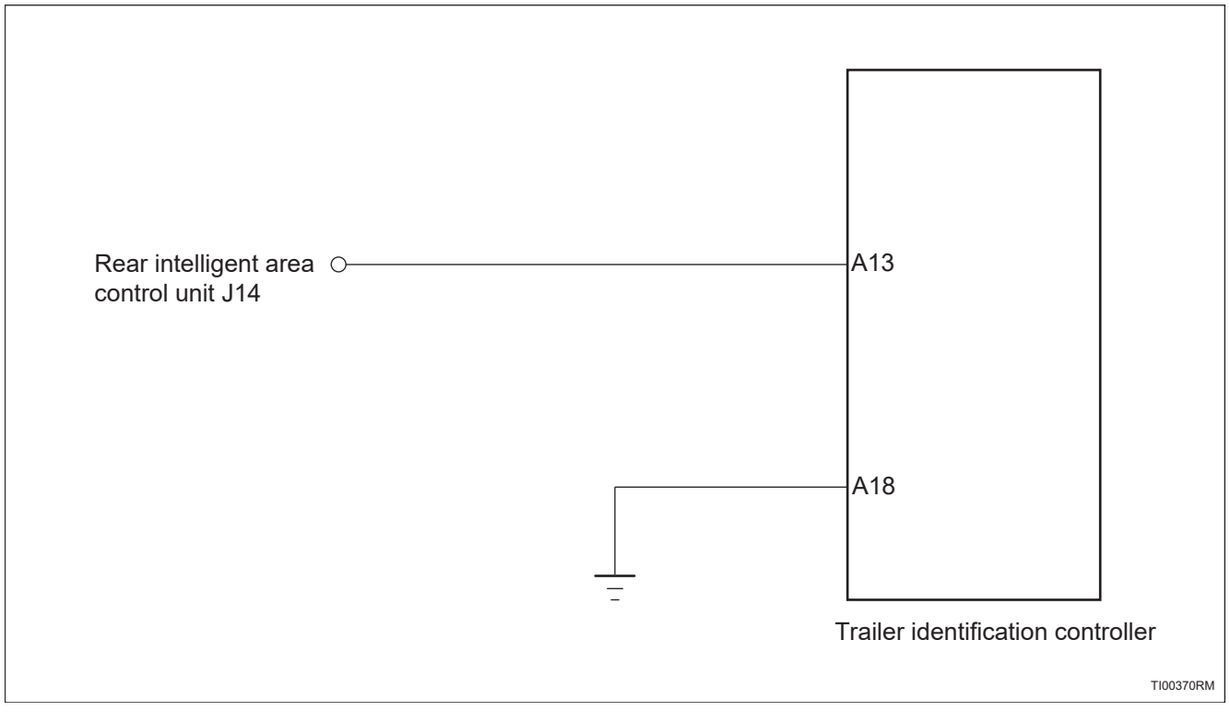
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12A916	• Power supply status is normal	AD detection voltage is too low, lower than 8.5 V	2 s	Continuous type	K15 hard wire wake-up may fail	• Trailer controller • Battery/charging system • Wire harness and connector
B12A911	• Power supply status is normal	CAN wire ig signal is normal, CAN wire ig signal is high, hard wire is low level	2 s	Continuous type	Back-up light failure	• Trailer controller • Battery/charging system • Wire harness and connector
B12A912	• Power supply status is normal	CAN wire ig signal is low, hard wire signal is high level	2 s	Continuous type	Back-up light failure	• Trailer controller • Battery/charging system • Wire harness and connector

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12A916	K15 hard wire wake-up may fail	—
B12A911	K15 hard wire failure	—
B12A912	Hard wire wakeup failure	—

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

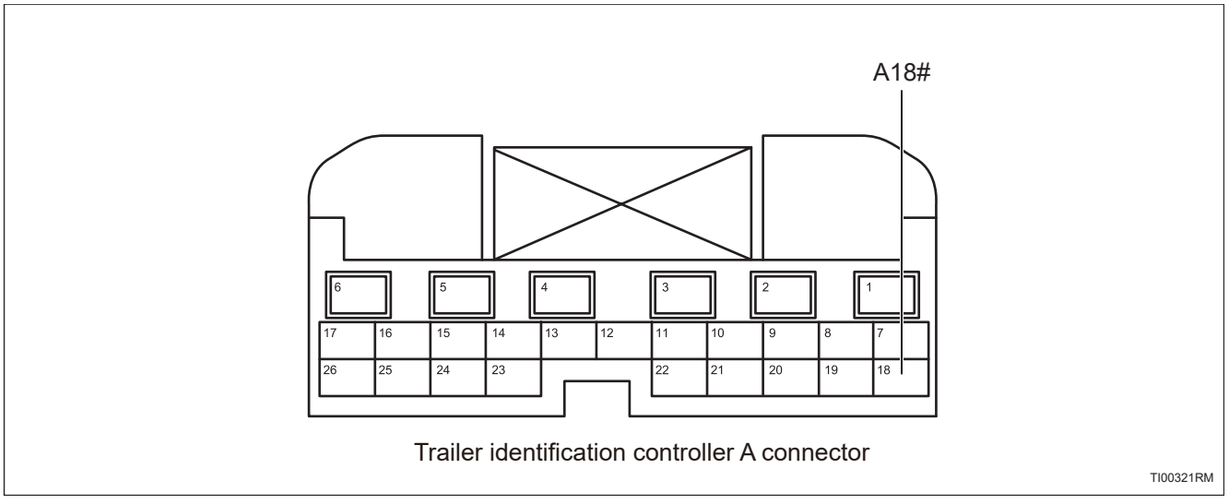
Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

ZD

NG → **Check and repair charging system**

OK

2	**Check trailer controller ground**



Trailer identification controller A connector

TI00321RM

(a) Disconnect the trailer controller connector.

(b) According to value in the table, measure resistance.

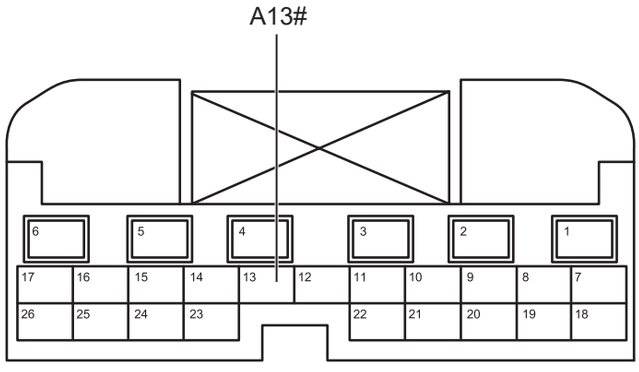
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check trailer controller power supply



Trailer identification controller A connector

TI00381RM

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A13# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace trailer controller (See page CS-23)

DTC	**B12AB17**	**Direct drive input voltage high (M1 or M2 pin)**
DTC	**B12AB16**	**Direct drive input voltage low (M1 or M2 pin)**

Description

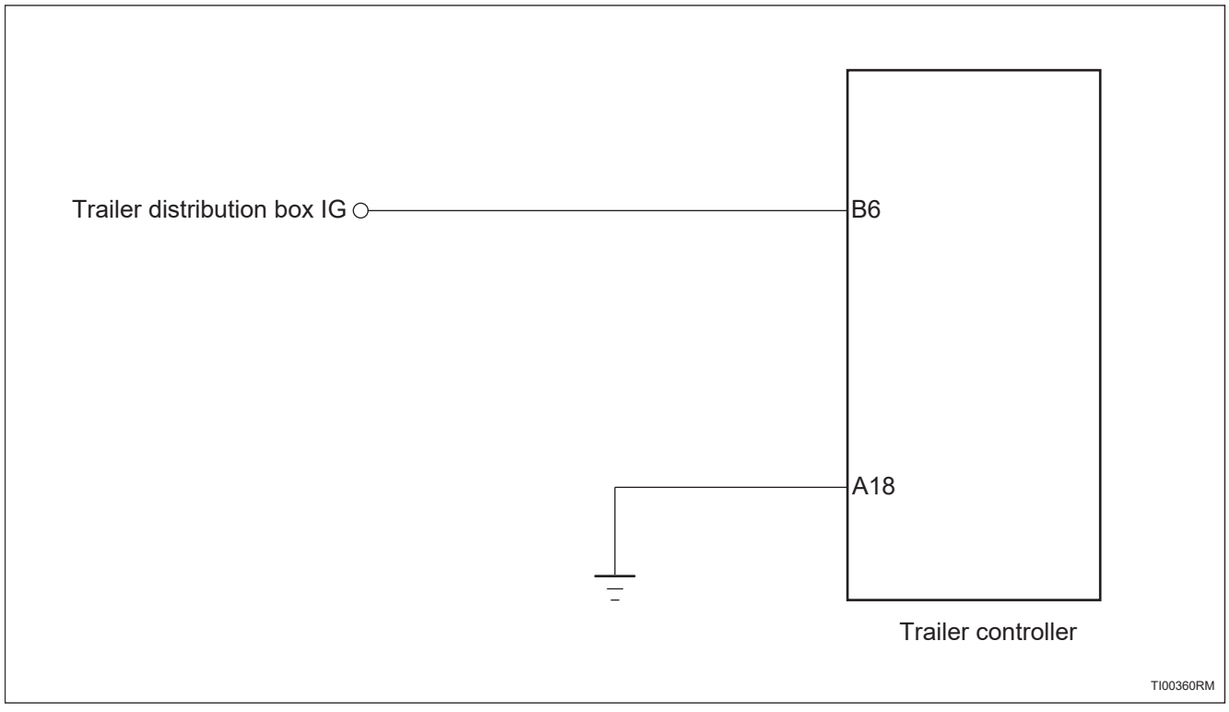
When trailer direct drive input voltage is out of normal operating range, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B12AB17	• Power supply status is normal	Power supply input voltage is higher than 16.5 V	2 s	Continuous type	No effect	• Trailer controller • Wire harness and connector • Charging system
B12AB16	• Power supply status is normal	Power supply input voltage is lower than 8.5 V	2 s	Continuous type	No effect	• Trailer controller • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B12AB17	Left and right lights, left and right turn signal lights, rear fog light, brake light and back-up light function failure	—
B12AB16	Left and right lights, left and right turn signal lights, rear fog light, brake light and back-up light function failure	—

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check trailer controller fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the trailer controller fuse.

(d) According to value in the table, measure resistance.

Standard value

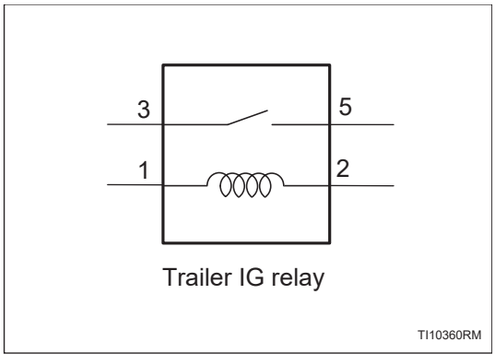
Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

ZD

3	**Check trailer IG relay**



(a) Remove the trailer IG relay.

(b) According to value in the table, measure resistance.

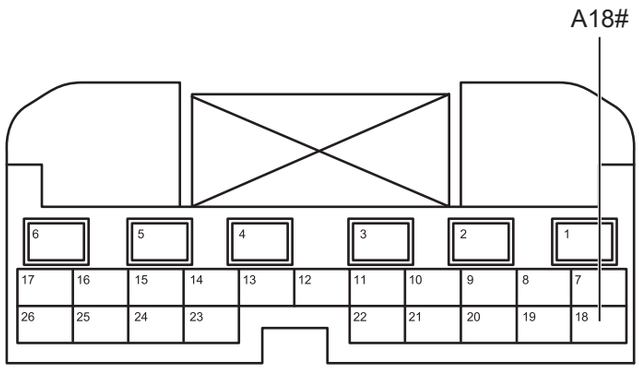
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer IG relay 3# - trailer IG relay 5#	Battery voltage is applied to terminals 1# and 2#	Less than 1 Ω
Trailer IG relay 3# - trailer IG relay 5#	Battery voltage is not applied to terminals 1# and 2#	10 KΩ or more

NG → **Replace trailer IG relay**

OK

4	**Check trailer controller ground**



Trailer controller A connector

TI00321RM

(a) Disconnect the trailer controller connector.

(b) According to value in the table, measure resistance.

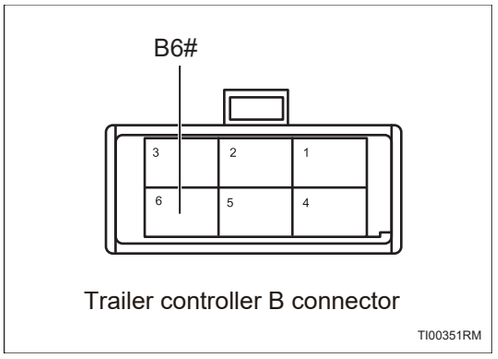
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check trailer controller power supply**



Trailer controller B connector

TI00351RM

(a) Install the fuse.

(b) Install the trailer IG relay.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector B6# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

Replace trailer controller (See page CS-23)

DTC	U300316	TICU controller input end undervoltage
DTC	U300317	TICU controller input end overvoltage

Description

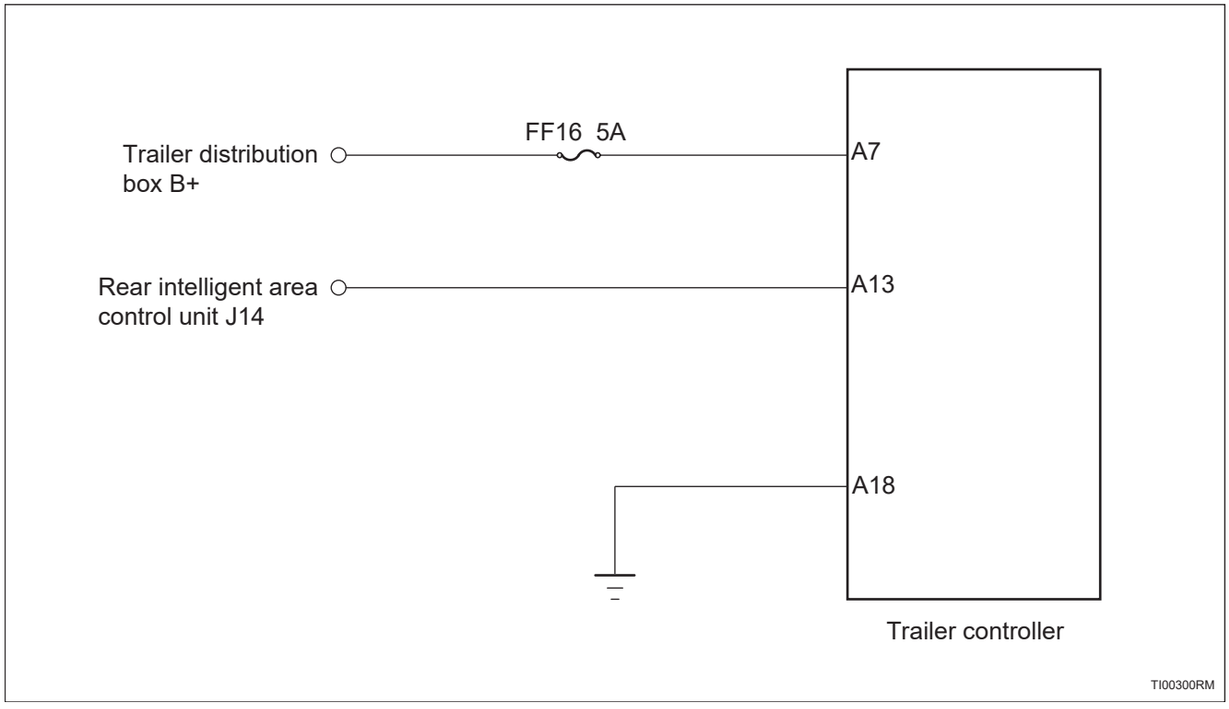
When trailer controller power supply voltage is out of normal operation range, the trailer controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U300316	• Power supply is higher than 6 V	Power supply input voltage is detected to be lower than 8.5 V	10S	Continuous type	Left and right lights, left and right turn signal lights, rear fog light, brake light and back-up light function failure	• Trailer controller • Wire harness and connector • Charging system
U300317	• Power supply is higher than 6 V	Power supply input voltage is detected to be higher than 16.5 V	10S	Continuous type	—	• Trailer controller • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
U300316	• Left and right lights, left and right turn signal lights, rear fog light, brake light and back-up light function failure	—
U300317	• -	—

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

2	**Check trailer controller fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the trailer controller fuse.

(d) According to value in the table, measure resistance.

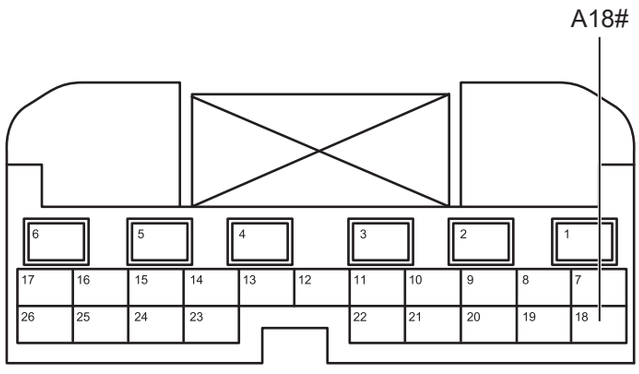
Standard value

Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

3	**Check trailer controller ground**



Trailer identification controller A connector

TI00321RM

(a) Disconnect the trailer controller connector.

(b) According to value in the table, measure resistance.

Standard value

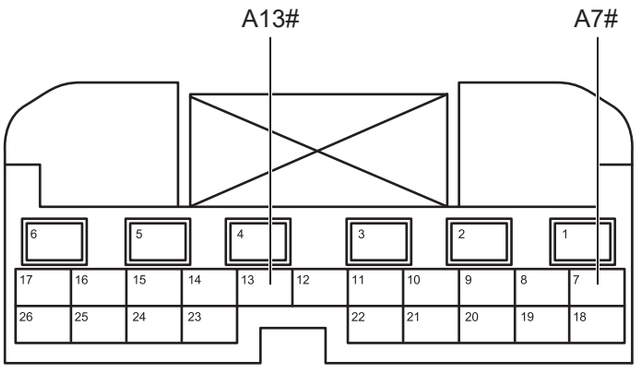
Multimeter connection	Detection condition	Specified condition
Trailer controller connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check trailer controller power supply**



Trailer identification controller A connector

TI00310RM

ZD

(a) Install the fuse.

(b) Connect the negative battery terminal.

(c) Turn ignition switch to "ON".

(d) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Trailer controller connector A7# - body ground	Turn ignition switch to "ON"	Battery voltage
Trailer controller connector A13# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace trailer controller (See page CS-23)

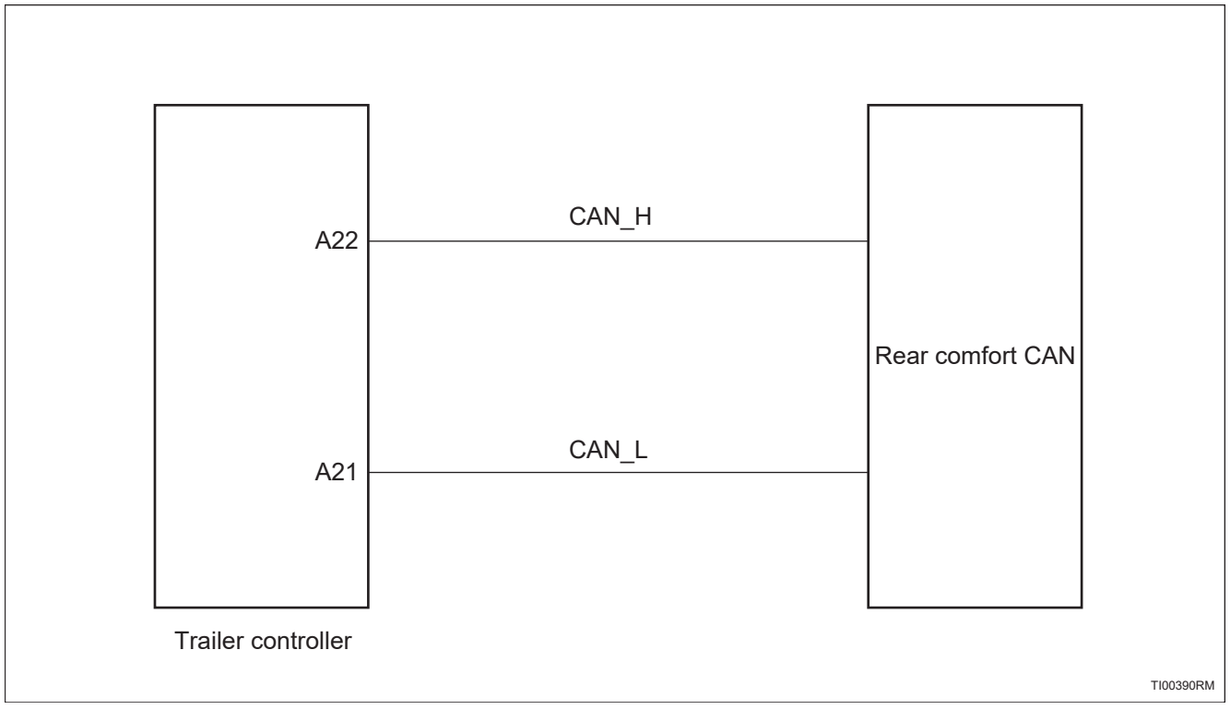
DTC	U002888	CAN line BUSOFF

Description

When the trailer controller detects rear comfort CAN bus off fault, the trailer controller records DTC.

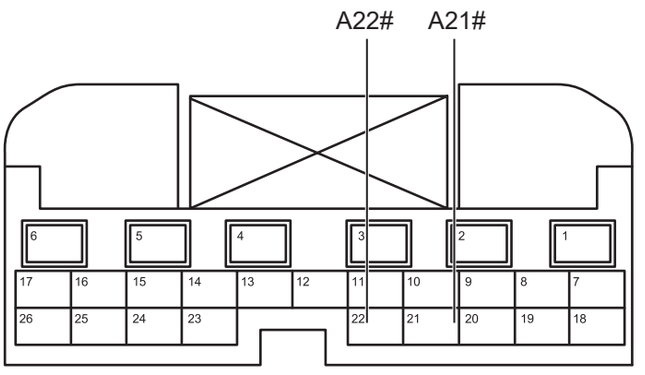
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Rear left combination light I • Rear right combination light I • Trailer controller • Rear intelligent area control unit • Charging controller

Circuit diagram



Inspection procedure

1	**Check rear comfort CAN bus terminal resistance**



Trailer identification controller A connector

TI00390RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the trailer controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A21# - trailer controller connector A22#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

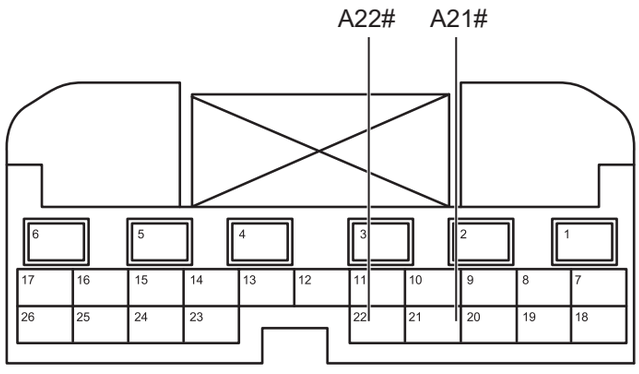
2	**Check controllers on rear comfort CAN bus**

(a) Disconnect the controllers on rear comfort CAN bus in sequence, and check if other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear comfort CAN bus CAN-L and CAN-H**



Trailer identification controller A connector

TI00390RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

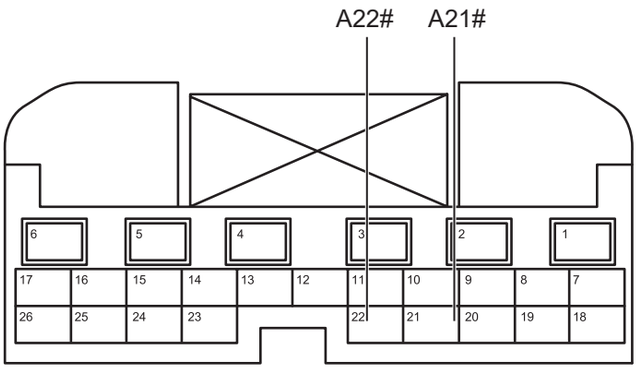
Multimeter connection	Detection condition	Specified condition
Trailer controller connector A21# - trailer controller connector A22#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in rear comfort CAN bus**



Trailer identification controller A connector

TI00390RM

(a) According to value in the table, measure resistance.

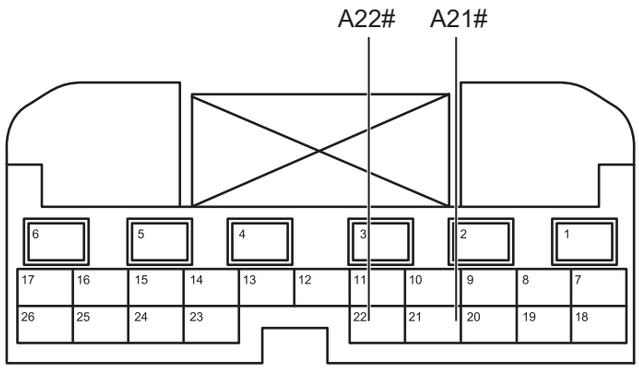
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A22# - body ground	Always connected	10 KΩ or more
Trailer controller connector A21# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear comfort CAN bus**



Trailer identification controller A connector

TI00390RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A22# - body ground	Turn ignition switch to "ON"	Less than 1 V
Trailer controller connector A21# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

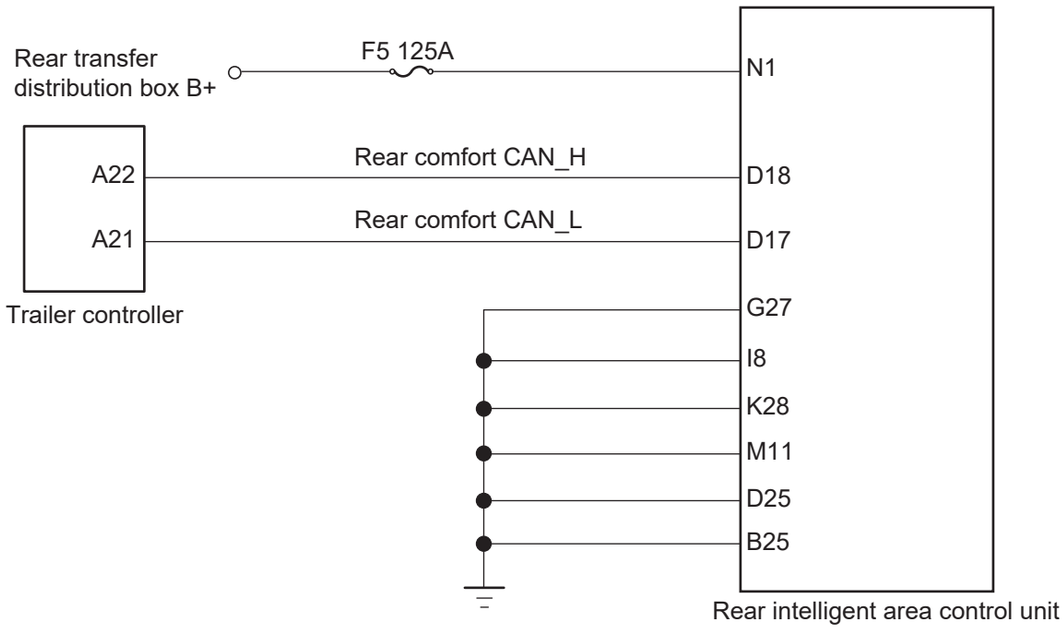
DTC	**U112187**	**IBC node lost**
DTC	**U124587**	**CSC node lost**
DTC	**U014087**	**VDC821 node lost**
DTC	**U014687**	**PDCR missing**

Description

When communication between trailer controller and other system is abnormal or interrupted, the trailer controller records DTC.

DTC No.	DTC detection condition	Faulty area
U112187	(a) IBC node lost.	• Wire harness and connector • Trailer controller • Rear right combination light I • Rear left combination light I • Integrated brake controller • Rear intelligent area control unit • Electric power steering control unit • Front intelligent area control unit
U124587	(a) CSC node lost.	• Wire harness and connector • Trailer controller • Rear right combination light I • Rear left combination light I • Rear intelligent area control unit • Front intelligent area control unit • Infotainment control unit
U014087	(a) VDC821 node lost.	• Wire harness and connector • Trailer controller • Rear right combination light I • Rear left combination light I • Intelligent vehicle control platform control unit • Rear intelligent area control unit • Energy conversion and distribution unit • Electric rear drive system inverter
U014687	(a) PDCR missing.	• Wire harness and connector • Trailer controller • Rear right combination light I • Rear left combination light I • Rear intelligent area control unit

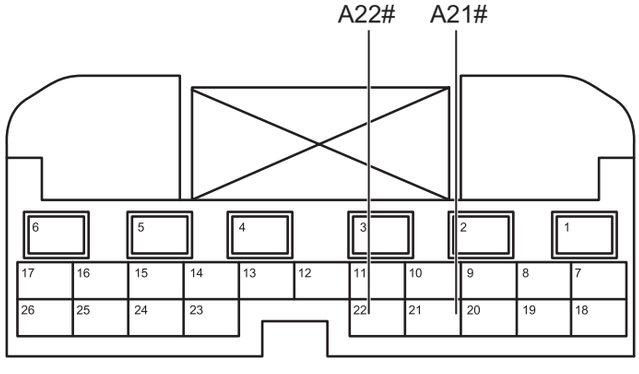
Circuit diagram

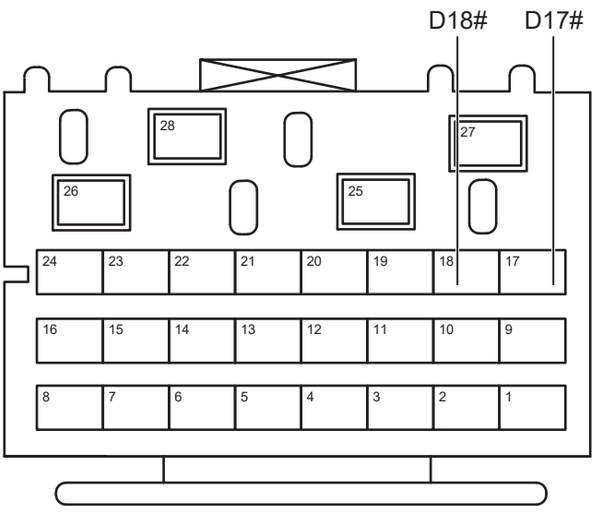


Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear comfort CAN bus (trailer controller - rear intelligent area control unit)**





Rear intelligent area control unit D connector

TI00421RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear comfort CAN bus.

(d) According to value in the table, measure resistance.

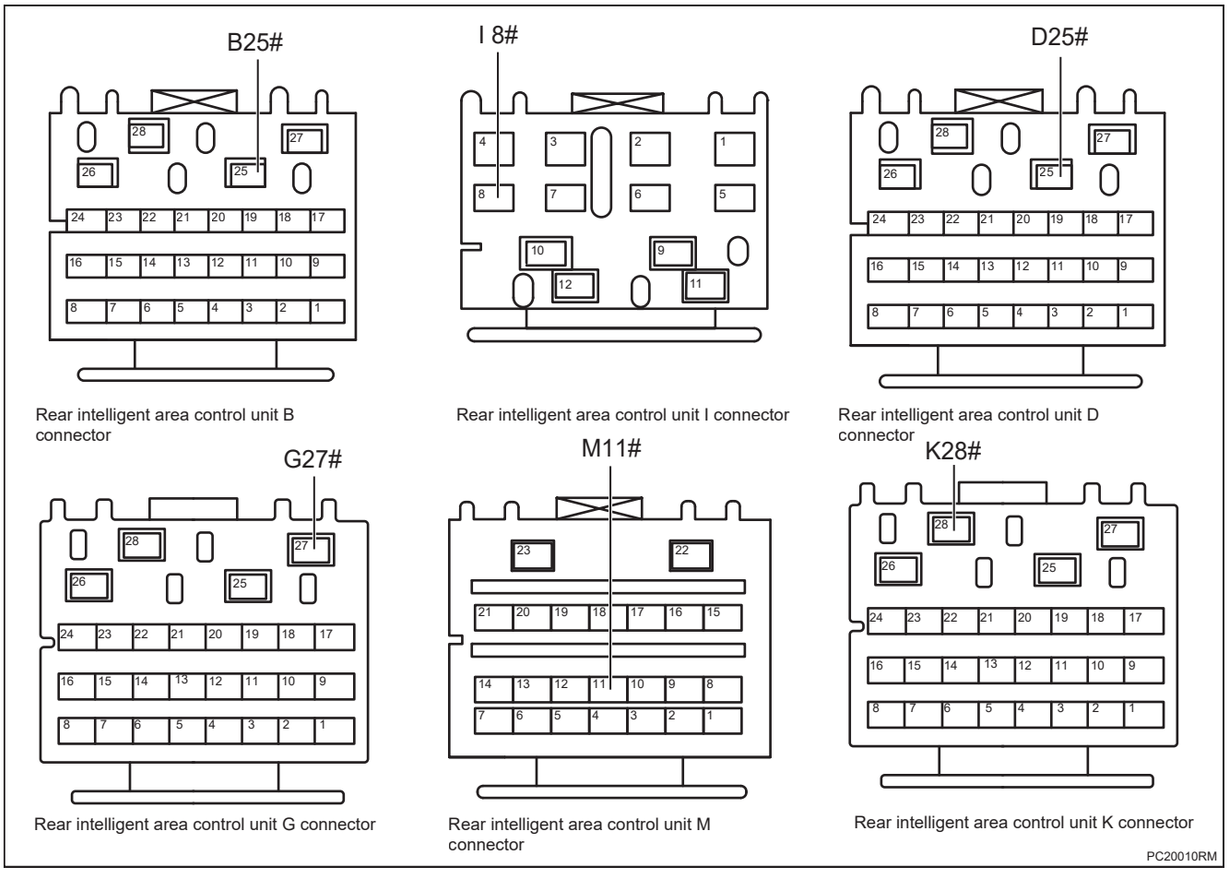
Standard value

Multimeter connection	Detection condition	Specified condition
Trailer controller connector A21# - rear intelligent area control unit connector D17#	Always connected	Less than 1 Ω
Trailer controller connector A22# - rear intelligent area control unit connector D18#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear intelligent area control unit ground**



Rear intelligent area control unit B connector

Rear intelligent area control unit I connector

Rear intelligent area control unit D connector

Rear intelligent area control unit G connector

Rear intelligent area control unit M connector

Rear intelligent area control unit K connector

PC20010RM

(a) According to value in the table, measure resistance.

Standard value

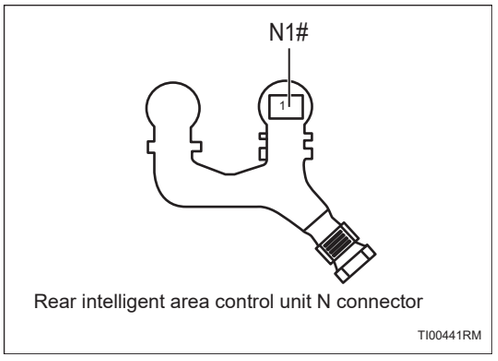
Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector G27# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector I8# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector K28# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector M11# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector D25# - body ground	Always connected	Less than 1 Ω
Rear intelligent area control unit connector B25# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear intelligent area control unit power supply**



Rear intelligent area control unit N connector

TI00441RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

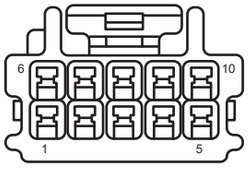
Standard value

Multimeter connection	Detection condition	Specified condition
Rear intelligent area control unit connector N1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

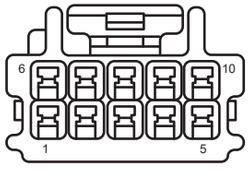
NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check rear comfort CAN bus terminal resistance**



Rear left combination light I



Rear right combination light I

TI00451RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left combination light I 5# - rear left combination light I 6#	Always connected	Approximately 60 Ω
Rear right combination light I 5# - rear right combination light I 6#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace rear intelligent area control unit (See page ZC-135)**

(a) Replace the rear intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace trailer controller (See page CS-23)**

OK

Diagnosis ends

Mobile phone wireless charging control system

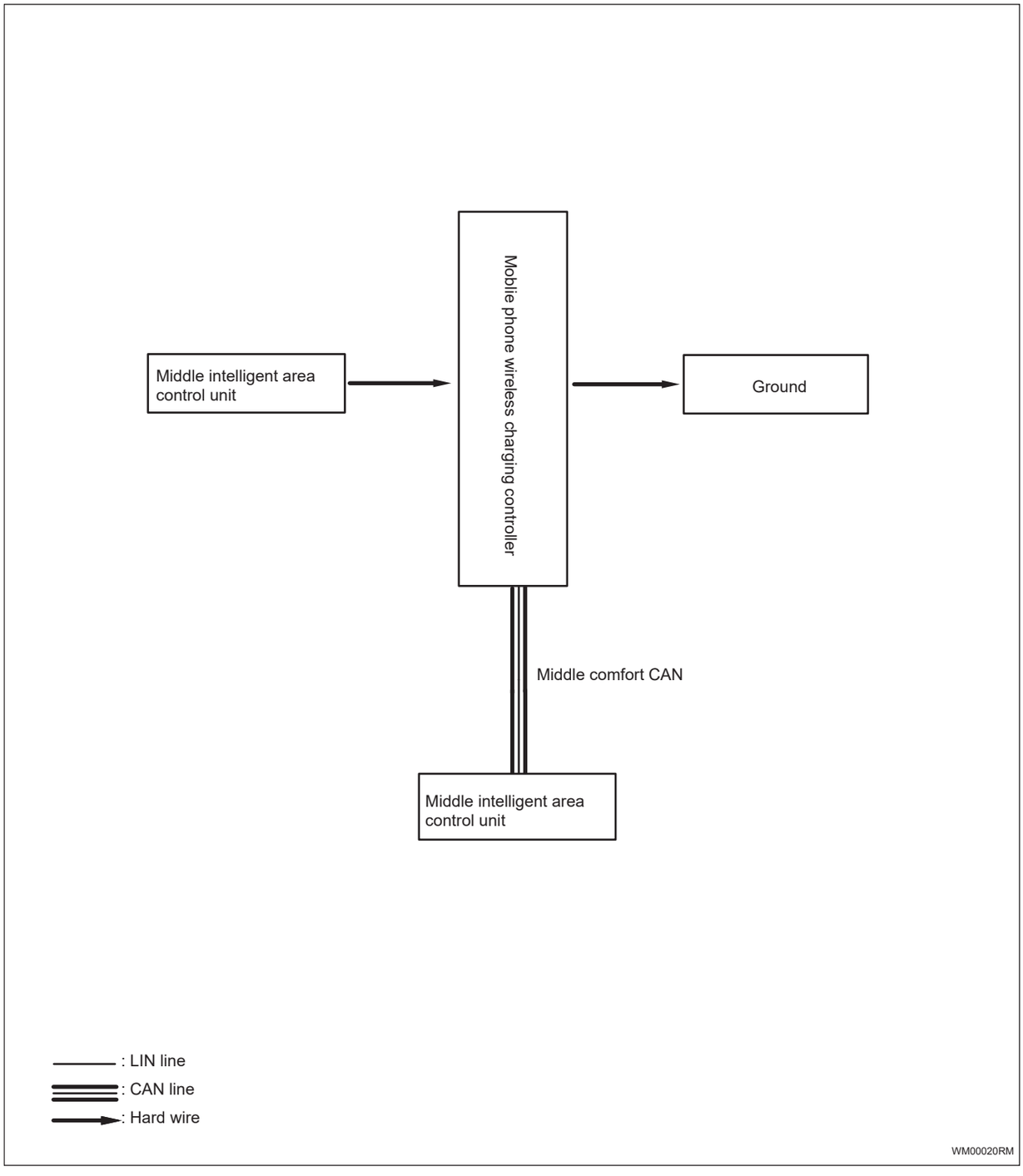
Mobile phone wireless charging controller

Part position



WM00030RM

System diagram



System description

1. System description

(a) Intelligent start-up wireless charger assembly utilizes the electromagnetic induction principle to charge the equipment to be charged (includes, but is not limited to, electronic devices such as mobile phone, headphone, tablet, key, etc.) that meets the charging protocol and can be placed in the vehicle wireless charging area, and can activate the reader through NFC digital key to read the NFC physical card or cell phone NFC analog card information to achieve the

interaction of data related to the identity authentication of NFC digital key, and interaction of swiping the card to start the vehicle.

2. Function overview

(a) After the vehicle is powered on at high voltage, when the smart device supporting wireless charging is placed in the placement area above the on-board wireless charger, the wireless charger operates to perform wireless charging for the smart device, supports PEPS/NFC/other disablement functions, over temperature detection and fan cooling functions. Taking away smart device from the placement area can exit wireless charging;

(b) After the vehicle is powered on, when the smart device supporting wireless charging is placed in the placement area above the on-board wireless charger, the wireless charger interacts with the central control display through CAN and displays the charging state;

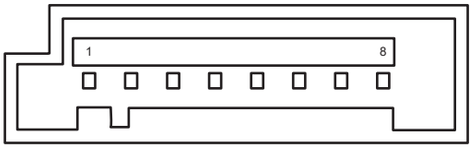
(c) When the gear position is in P or N and the driver is ready to leave the vehicle, open the driver door. At this time, when there is still a smart device in the placement area above the wireless charger, the wireless charger interacts with the instrument cluster through CAN, and the instrument cluster displays "Please do not forget the smart device", prompting the user to take the smart device away.

Data parameter

Mobile phone wireless charging controller

Item	Max	OK	Minimum
Operating voltage (V)	16	13.5	9
Operating current (A)	—	5	—

ECU terminal



Mobile phone wireless charging controller

WM00010RM

Mobile phone wireless charging controller			
Pin number	**Definition**	**Pin number**	**Definition**
1	B+	5	CAN-H
2	-	6	CAN-L
3	-	7	Disabled signal
4	GND	8	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B168017	Mobile phone wireless charging controller input terminal overvoltage	(See page ZD-3113)
B168016	Mobile phone wireless charging controller input terminal undervoltage	(See page ZD-3113)
B17D04B	Wireless charger charging temperature too high	(See page ZD-3107)
B17D176	Metal foreign object fault for charging	(See page ZD-3107)
B17D186	Wireless charging power too high	(See page ZD-3109)
U002888	Comfort CAN bus off	(See page ZD-3117)
U014687	PDCM node lost	(See page ZD-3122)
U019987	Front left door node lost	(See page ZD-3122)
U020087	Front right door node lost	(See page ZD-3122)
U129387	Vehicle controller message missing	(See page ZD-3122)

DTC	**B17D04B**	**Wireless charger charging temperature too high**
DTC	**B17D176**	**Metal foreign object fault for charging**

Description

When system function is abnormal due to internal fault of mobile phone wireless charging controller, the mobile phone wireless charging controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B17D04B	• Power supply status is normal • IGN is ON	• The temperature of charging coil remains above 85° C for 400 ms • The temperature difference between charging coil and other coils is higher than 10° C	400 ms	Periodic type	100 ms	• Mobile phone wireless charging controller
B17D176	• Power supply status is normal • IGN is ON	• If Q value of the operating coil is less than the Q value threshold, it is detected as a fault • Charging consumption value is higher than consumption alarm threshold, which is detected as fault	100 ms	Periodic type	100 ms	• Mobile phone wireless charging controller

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B17D04B	• Stop charging	Not come on
B17D176	• Stop charging	Not come on

Inspection procedure

1	Check mobile phone wireless charging controller

(a) Check if there is a metal foreign object on mobile phone wireless charging controller.

(b) Check if there is a foreign object between mobile phone wireless charging controller and mobile phone.

(c) Check if mobile phone wireless charging controller is damaged.

NG → **Perform repair according to malfunction**

OK

Replace mobile phone wireless charging controller (See page ZC-156)

DTC	B17D186	Wireless charging power too high

Description

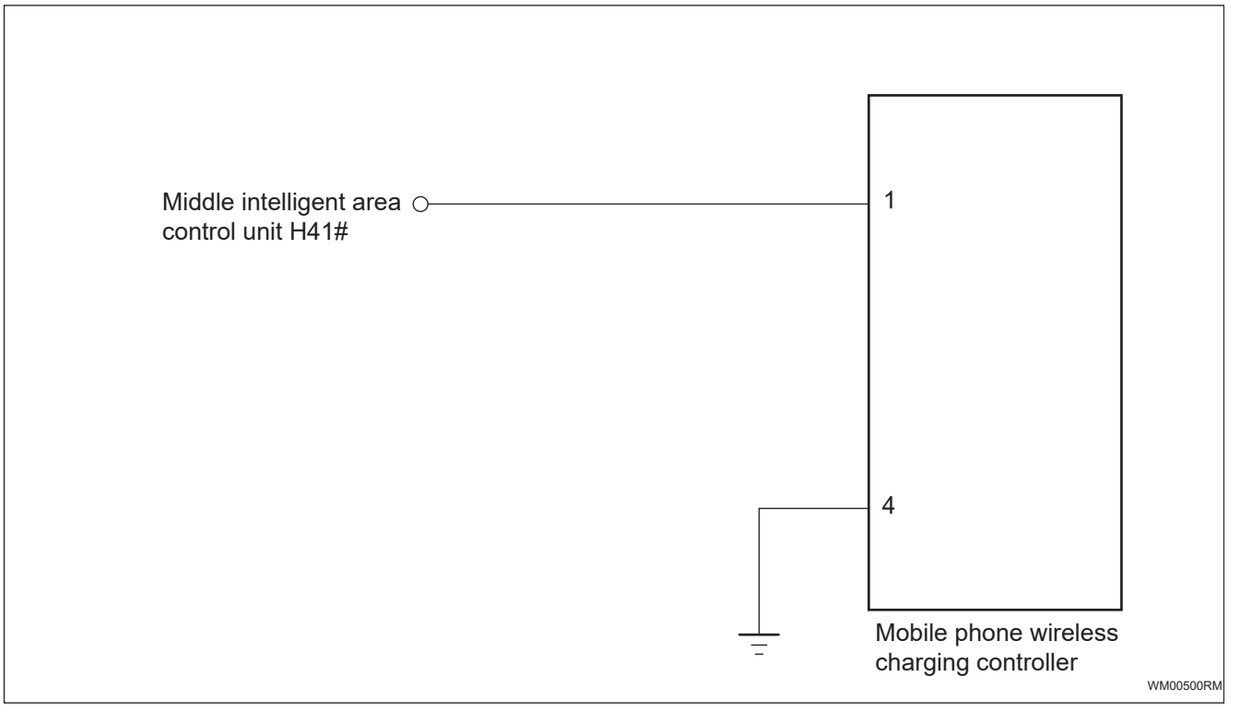
When mobile phone wireless charging controller wireless charging power is too high, the mobile phone wireless charging controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B17D186	• Power supply status is normal • IGN is ON	Current is more than 8 A	100 ms	Periodic type	100 ms	• Mobile phone wireless charging controller • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B17D186	• Stop charging	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

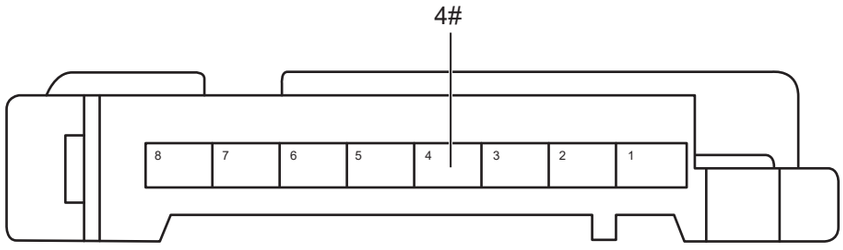
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check mobile phone wireless charging controller ground**



Mobile phone wireless charging controller connector

WM00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mobile phone wireless charging controller connector.

(d) According to value in the table, measure resistance.

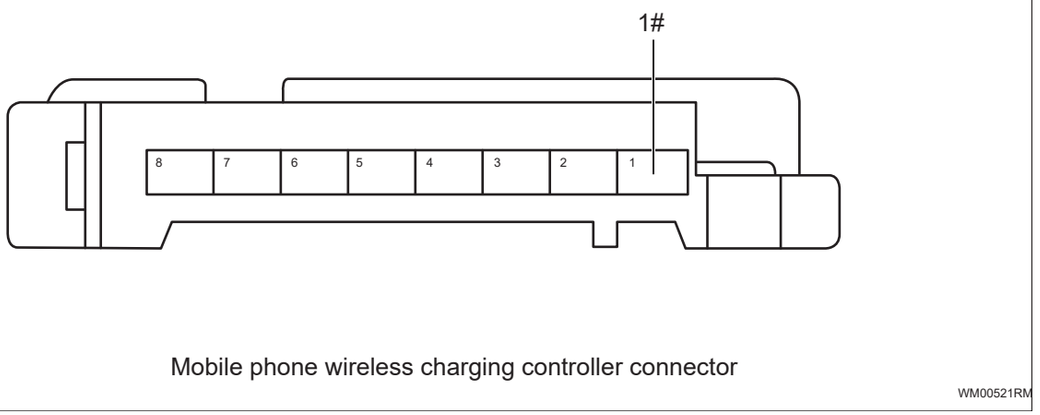
Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check mobile phone wireless charging controller power supply**



Mobile phone wireless charging controller connector

WM00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace mobile phone wireless charging controller (See page ZC-156)

DTC	**B168017**	**Mobile phone wireless charging controller input terminal overvoltage**
DTC	**B168016**	**Mobile phone wireless charging controller input terminal undervoltage**

Description

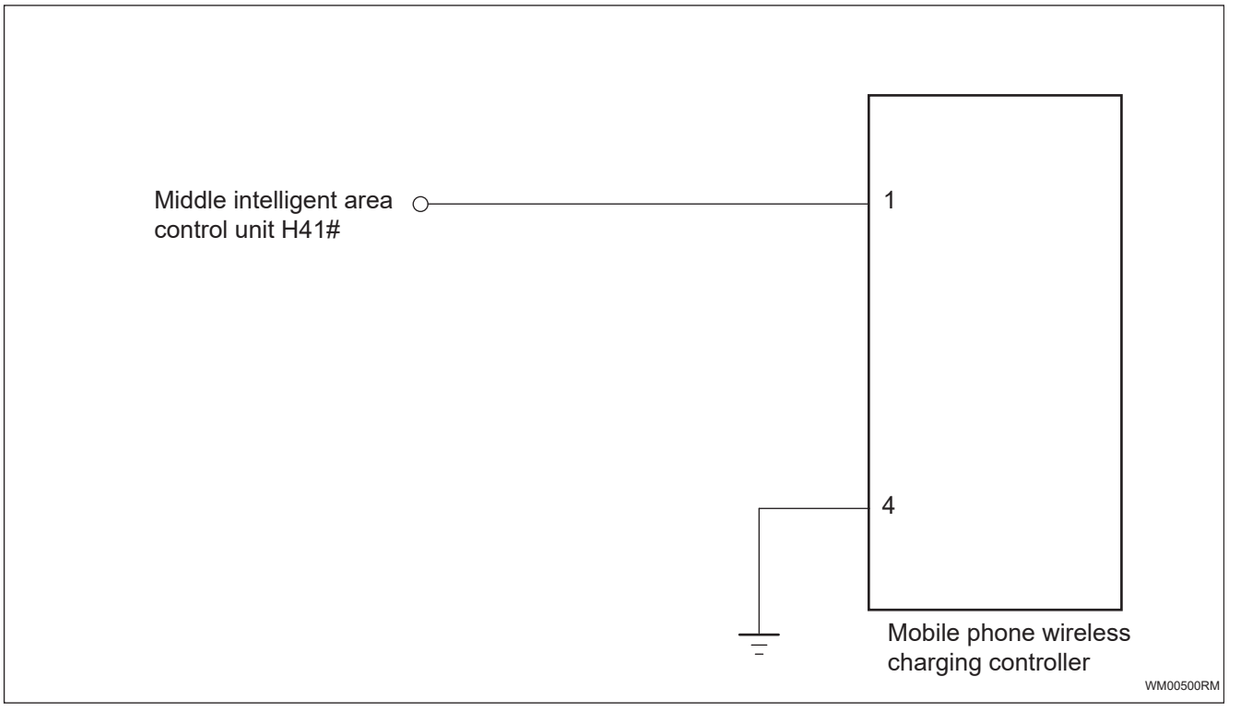
When input voltage of mobile phone wireless charging controller is too high or too low, the mobile phone wireless charging controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B168017	• Power supply status is normal • IGN is ON	• Battery voltage > 16.0 V	2000 ms	Periodic type	10 ms	• Mobile phone wireless charging controller • Wire harness and connector • Battery/charging system
B168016	• Power supply status is normal • IGN is ON	Battery voltage < 9.0 V	2000 ms	Periodic type	10 ms	• Mobile phone wireless charging controller • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B168017	• Stop charging	Not come on
B168016	• Stop charging	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

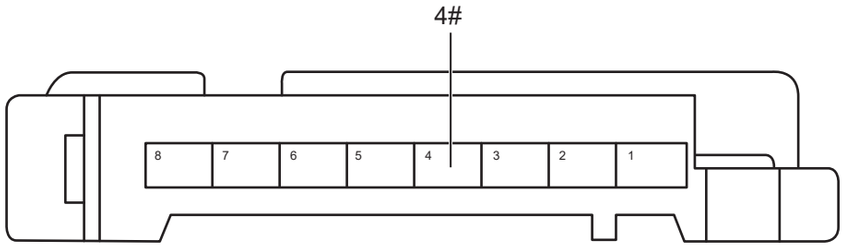
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check mobile phone wireless charging controller ground**



Mobile phone wireless charging controller connector

WM00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mobile phone wireless charging controller connector.

(d) According to value in the table, measure resistance.

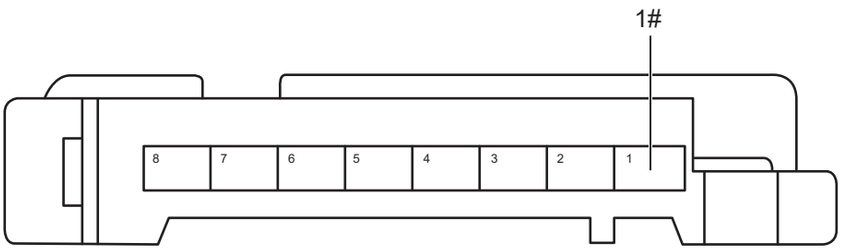
Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check mobile phone wireless charging controller power supply**



Mobile phone wireless charging controller connector

WM00521RM

ZD

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace mobile phone wireless charging controller (See page ZC-156)

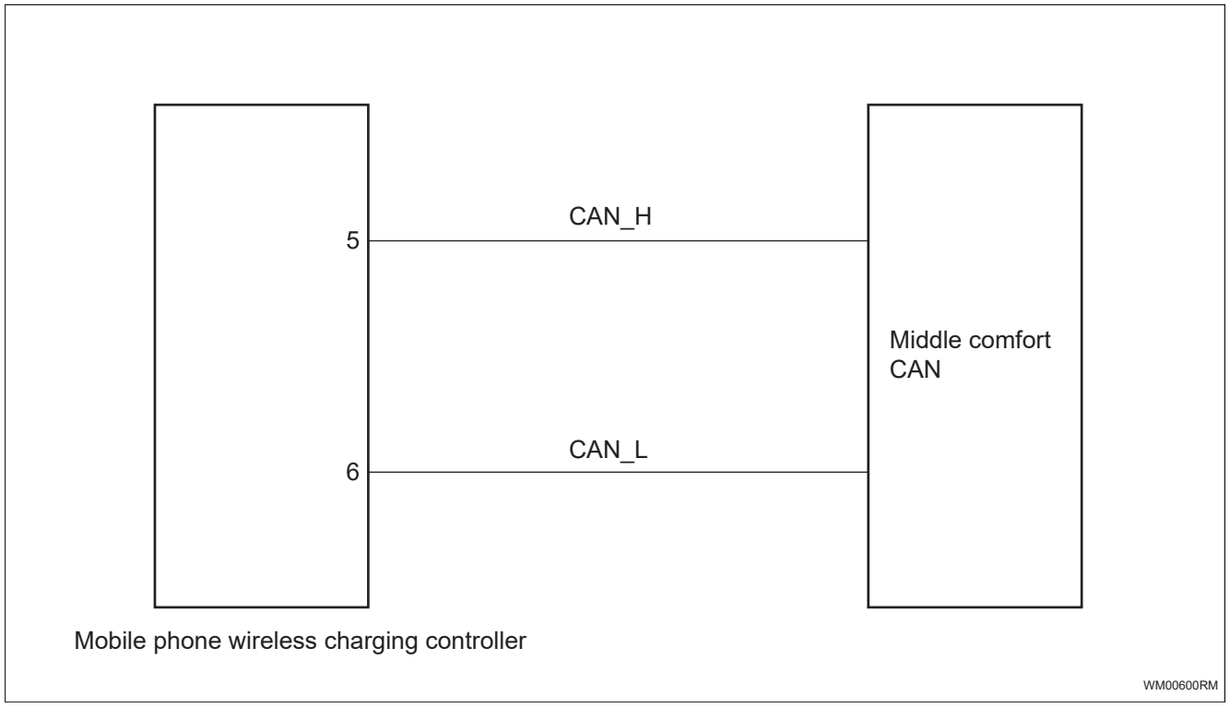
DTC	U002888	Comfort CAN bus off

Description

When front left door control unit detects a mid comfort CAN bus off fault, the front left door control unit records DTC.

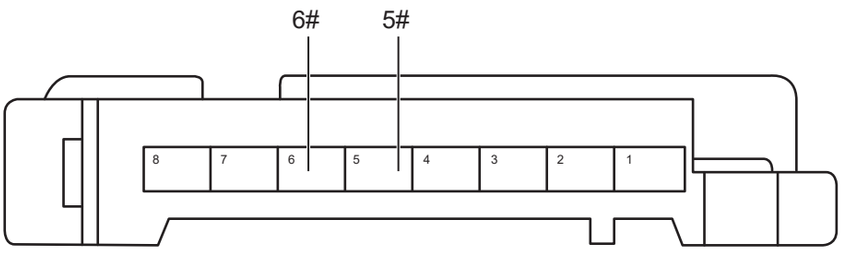
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Middle intelligent area control unit • Combination switch • Mobile phone wireless charging controller

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



Mobile phone wireless charging controller connector

WM00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the mobile phone wireless charging controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 5# - mobile phone wireless charging controller connector 6#	Always connected	120 Ω

NG → **Perform repair according to malfunction**

OK

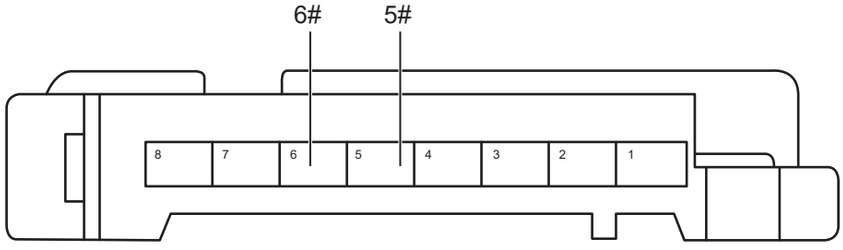
2	**Check controller on central comfort CAN bus**

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between central comfort CAN bus CAN-L and CAN-H**



Mobile phone wireless charging controller connector

WM00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

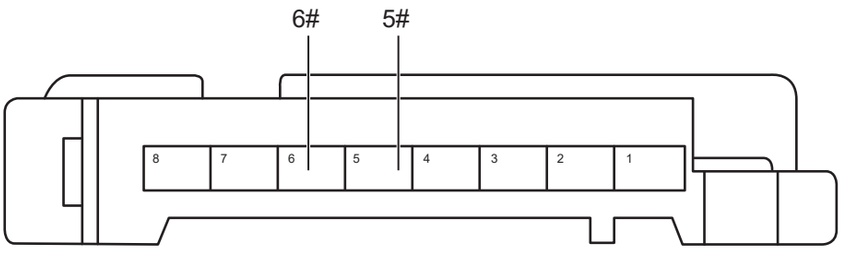
Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 5# - mobile phone wireless charging controller connector 6#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

ZD

4	**Check for short to ground in central comfort CAN bus**



Mobile phone wireless charging controller connector

WM00611RM

(a) According to value in the table, measure resistance.

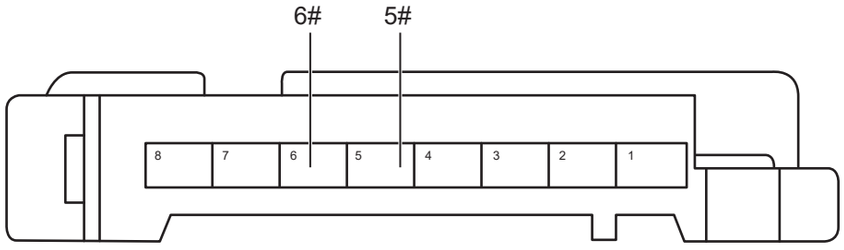
Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 5# - body ground	Always connected	10 KΩ or more
Mobile phone wireless charging controller connector 6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Mobile phone wireless charging controller connector

WM00611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Mobile phone wireless charging controller connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

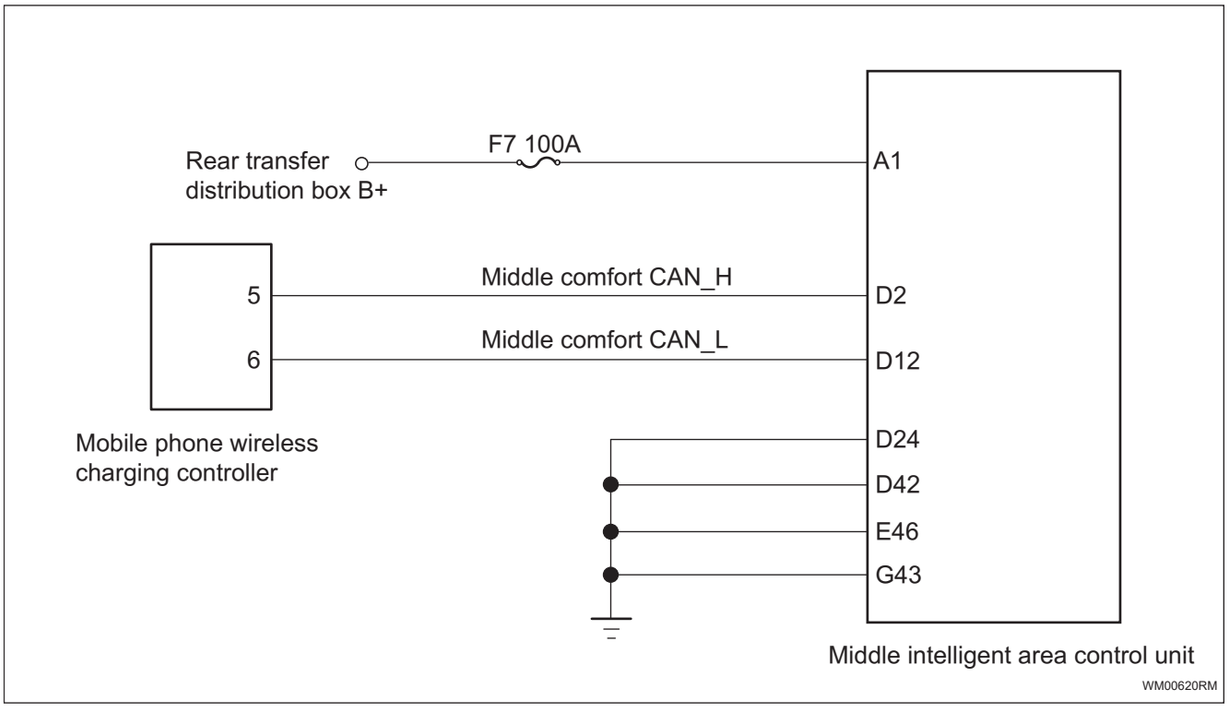
DTC	**U014687**	**PDCM node lost**
DTC	**U019987**	**Front left door node lost**
DTC	**U020087**	**Front right door node lost**
DTC	**U129387**	**Vehicle controller message missing**

Description

When communication between mobile phone wireless charging controller and other systems is abnormal or interrupted, the mobile phone wireless charging controller records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Mobile phone wireless charging controller • Front left door control unit • Middle intelligent area control unit • Combination switch
U019987	(a) Front left door node lost.	• Wire harness and connector • Mobile phone wireless charging controller • Front left door control unit • Middle intelligent area control unit • Combination switch
U020087	(a) Front right door node lost.	• Wire harness and connector • Mobile phone wireless charging controller • Front right door control unit • Middle intelligent area control unit • Combination switch
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Mobile phone wireless charging controller • Intelligent vehicle control platform control unit • Middle intelligent area control unit • Combination switch

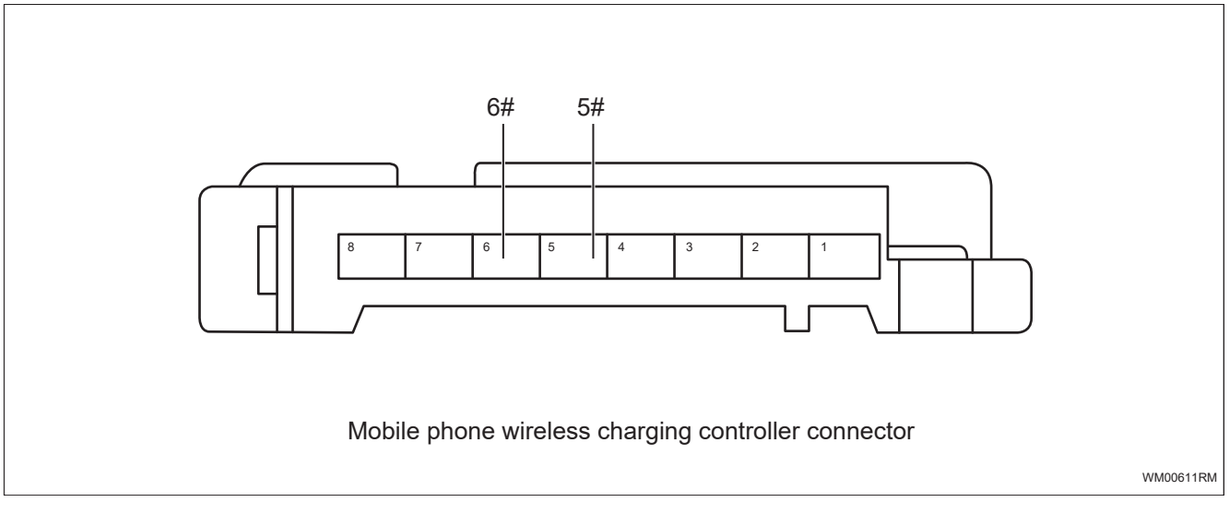
Circuit diagram

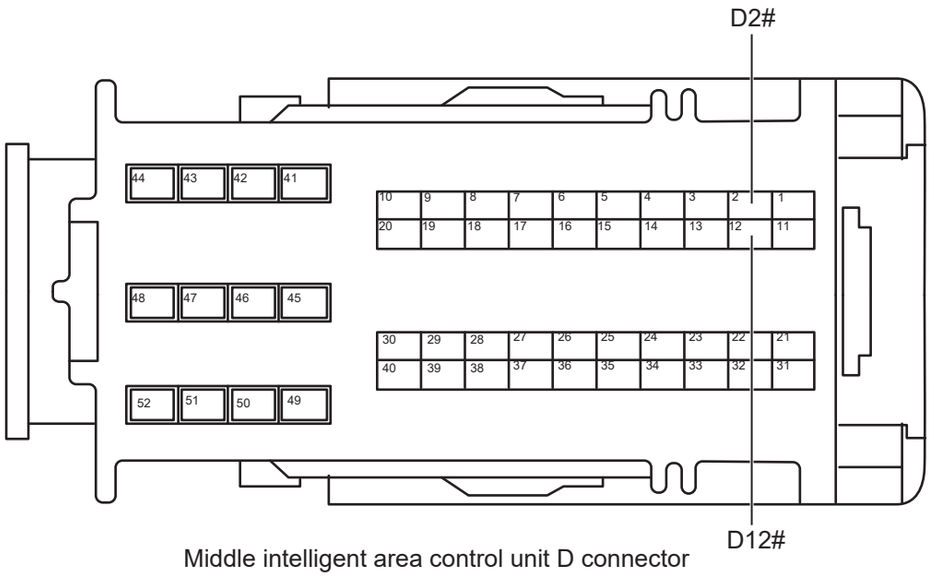


Inspection procedure

Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in middle comfort CAN bus (mobile phone wireless charging controller - middle intelligent area control unit)**





Middle intelligent area control unit D connector

RS03531RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

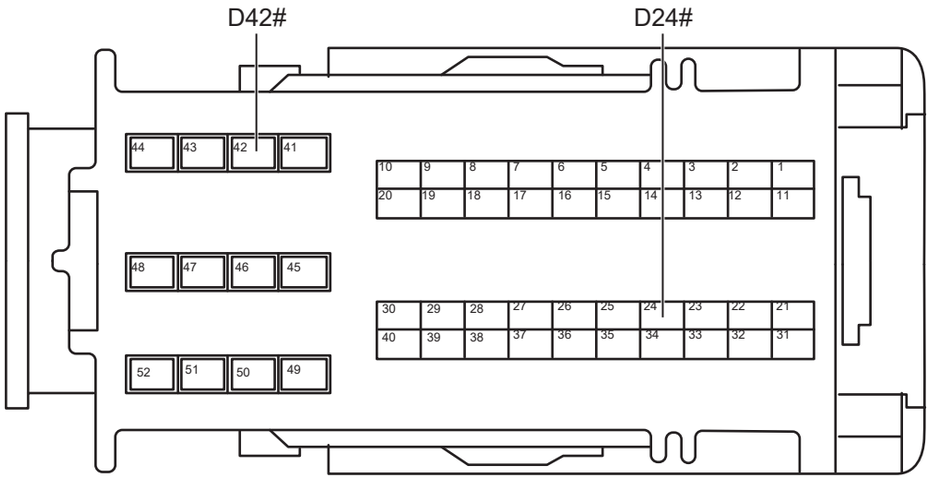
Standard value

Multimeter connection	Detection condition	Specified condition
Mobile phone wireless charging controller connector 5# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Mobile phone wireless charging controller connector 6# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

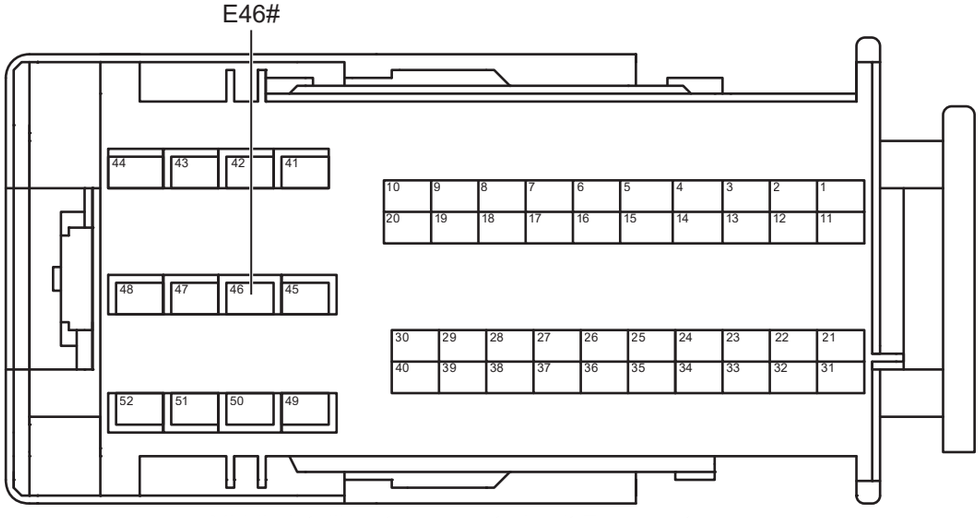
OK

2	**Check middle intelligent area control unit ground**



Middle intelligent area control unit D connector

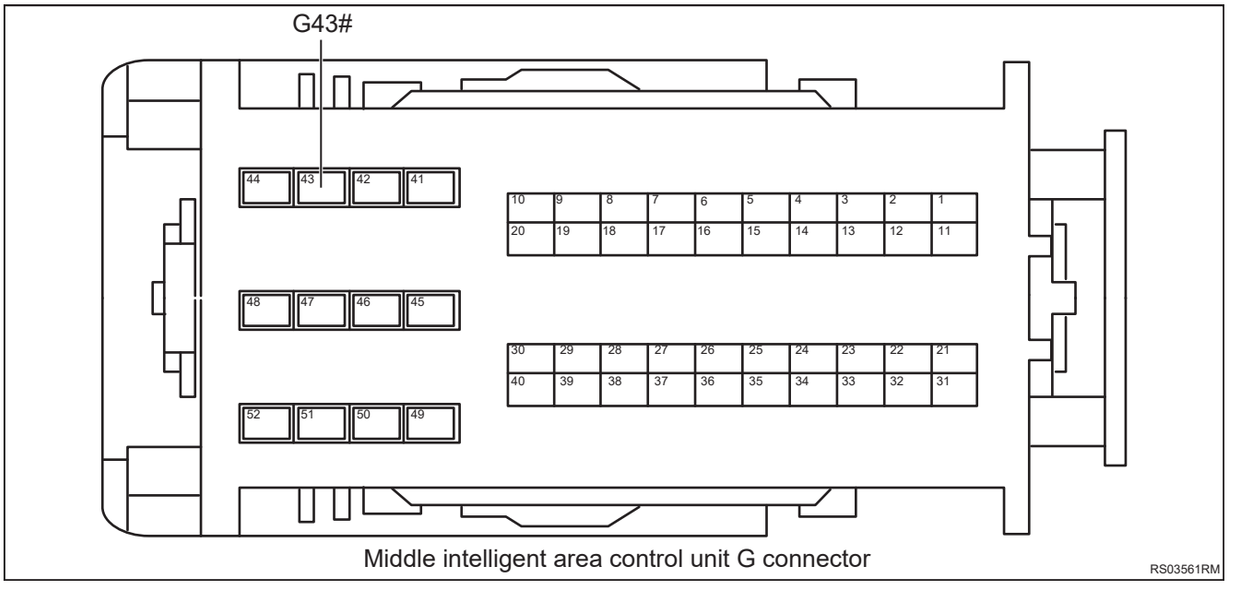
RS03541RM



Middle intelligent area control unit E connector

RS03551RM

ZD



Middle intelligent area control unit G connector

ZD

(a) According to value in the table, measure resistance.

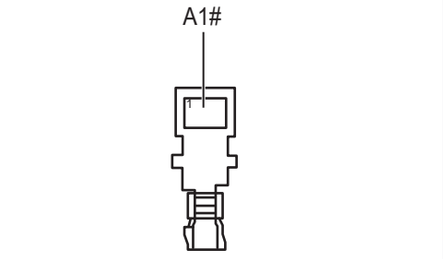
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

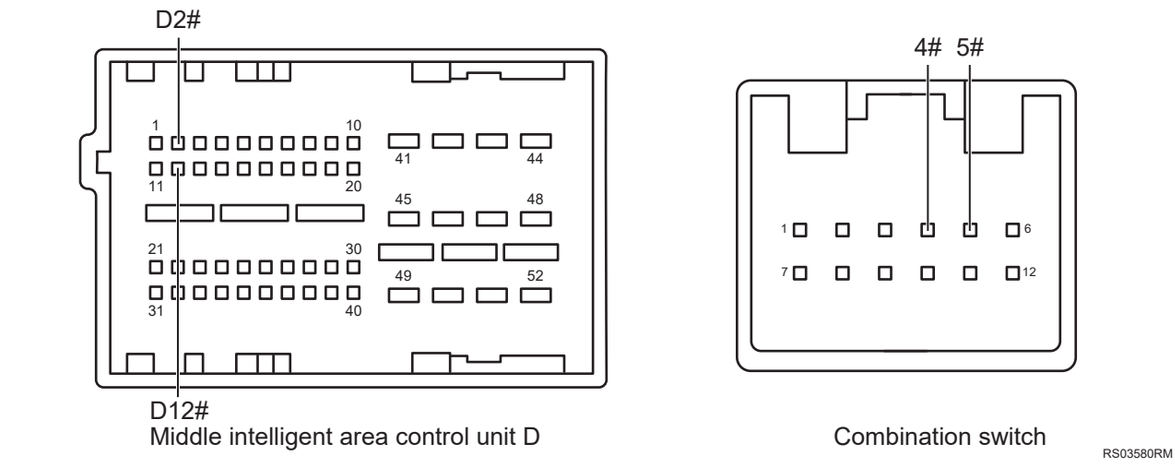
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

ZD

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check central comfort CAN bus terminal resistance**



Middle intelligent area control unit D

Combination switch

RS03580RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

ZD

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace mobile phone wireless charging controller (See page ZC-156)**

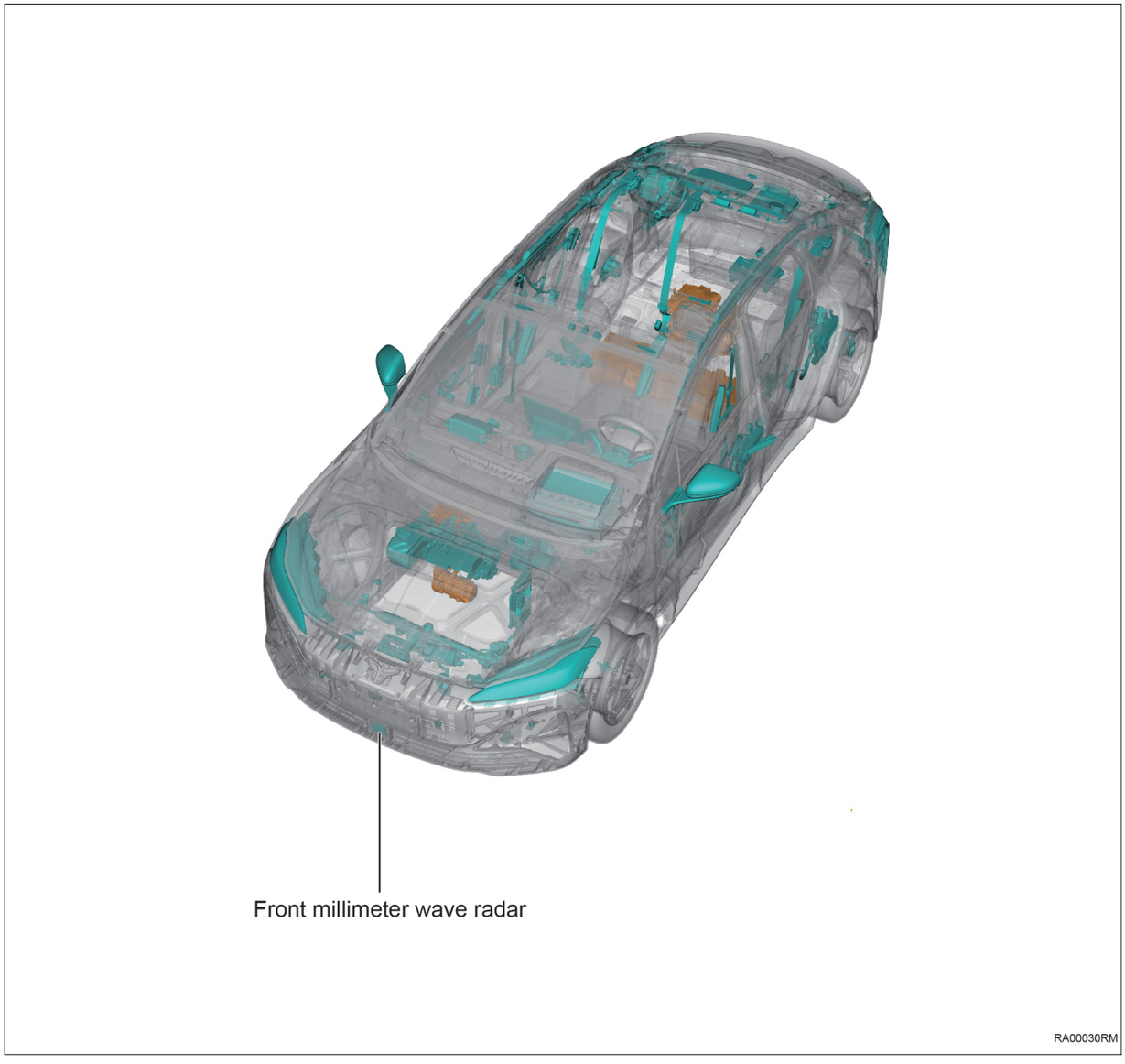
OK

Diagnosis ends

Front millimeter wave radar system

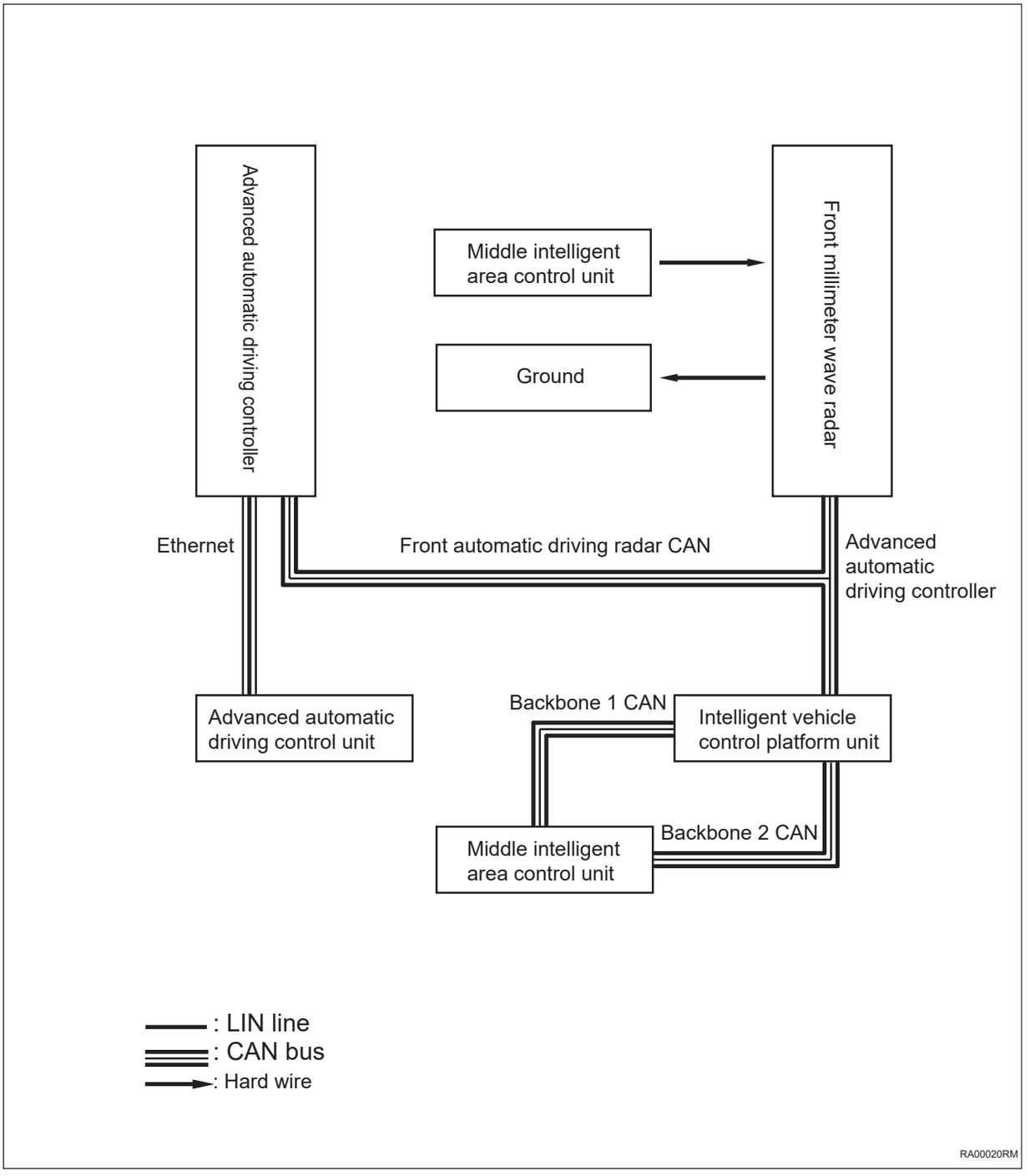
Front millimeter wave radar

Part position



System diagram

Front millimeter wave radar



System description

1. Detailed function description

(a) Millimeter wave radar usually refers to the radar operating in the millimeter wave band, specifically radar sensors operating in 30 ~ 300 GHz frequency band (with wave length of 1 ~ 10 mm). The front millimeter wave radar installed on the body emits radio waves around the vehicle and calculates the distance, velocity and angle of obstacles by measuring and analyzing the reflected waves, thereby completing the vehicle's perception of the surrounding environment. This enables the decision-making system to make comprehensive judgments

and issue control instructions, ultimately achieving the autonomous driving function of the vehicle.

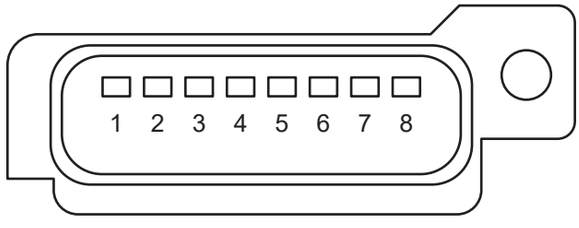
(b) The functions that the front radar needs to achieve include: Target detection and output, 5R integration function requirements for the front radar and corner radar tracks.

Data parameter

Front millimeter wave radar

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	14	9
Operating current (A)	0.5	0.3	0.25

ECU terminal



Front millimeter wave radar

RA00010RM

Front millimeter wave radar	
Pin number	**Definition**
1	-
2	-
3	-
4	-
5	GND
6	CAN-L
7	CAN-H
8	B+

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C12E000	Uncalibrated fault	(See page ZD-3136)
C12E600	Calibration incomplete	(See page ZD-3136)
C12E100	Factory mode	(See page ZD-3138)

DTC	Detection Items	See page
C12E217	Front millimeter wave radar input terminal overvoltage	(See page ZD-3133)
C12E316	Front millimeter wave radar input terminal undervoltage	(See page ZD-3133)
C12E400	Radar position deviation fault	(See page ZD-3139)
C12E500	Radar blocked fault	(See page ZD-3140)
C12E700	Radar signal unreliable fault	(See page ZD-3141)
B213100	Factory data error	(See page ZD-3142)
B213300	Microprocessor procedure checksum fault	(See page ZD-3144)
B213500	Internal power management system fault	(See page ZD-3144)
B214800	Microprocessor temperature out of range	(See page ZD-3144)
B213200	Internal hardware fault	(See page ZD-3144)
B214400	Power management chip overvoltage fault	(See page ZD-3144)
B213900	MMIC (monolithic microwave integrated circuit) over voltage fault	(See page ZD-3144)
B214300	Power management chip undervoltage fault	(See page ZD-3144)
B214000	MMIC undervoltage fault	(See page ZD-3144)
B214500	Radar control unit fault	(See page ZD-3144)
B214100	Radar modulation fault	(See page ZD-3144)
B214700	Software temporary fault	(See page ZD-3144)
B214200	Software fault	(See page ZD-3144)
B214600	Radar front end data processing fault	(See page ZD-3144)
B213700	MMIC temperature out of maximum value fault	(See page ZD-3144)
B213800	MMIC temperature out of operating value fault	(See page ZD-3144)
B213600	Internal microprocessor system fault	(See page ZD-3144)
B213400	ADC self-check error	(See page ZD-3144)
B214900	DSP data-overrun	(See page ZD-3144)
B221000	Radar antenna illegal tampering	(See page ZD-3144)
U007C88	Automatic driving control unit - front radar CAN bus off	(See page ZD-3162)
U024287	Automatic parking/automatic driving control unit 2 node lost	(See page ZD-3149)
U129387	Vehicle controller message missing	(See page ZD-3149)
U112187	ABS/ESP/ESPwithAPB message missing	(See page ZD-3149)
U113187	Electric power steering control unit message missing	(See page ZD-3149)
U014787	Middle PDC/left PDC message missing	(See page ZD-3149)
U114087	Body control unit 1 message missing	(See page ZD-3149)

DTC	Detection Items	See page
U116487	A/C controller 1 message missing	(See page ZD-3149)
U113887	Driving mode selection/all terrain control unit message missing	(See page ZD-3149)
U059482	Vehicle controller message content fault	(See page ZD-3149)
U059483	Vehicle controller message content fault	(See page ZD-3149)
U059484	Vehicle controller message content fault	(See page ZD-3149)
U041582	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3149)
U041583	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3149)
U041584	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3149)
U041586	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3149)
U042082	Electric power steering control unit message content fault	(See page ZD-3149)
U042083	Electric power steering control unit message content fault	(See page ZD-3149)
U042084	Electric power steering control unit message content fault	(See page ZD-3149)
U042086	Electric power steering control unit message content fault	(See page ZD-3149)
U042284	Body control unit 1 message content fault	(See page ZD-3149)
U054984	Automatic parking/automatic driving control unit 2 message content fault	(See page ZD-3149)

DTC	**C12E217**	**Front millimeter wave radar input terminal overvoltage**
DTC	**C12E316**	**Front millimeter wave radar input terminal undervoltage**

Description

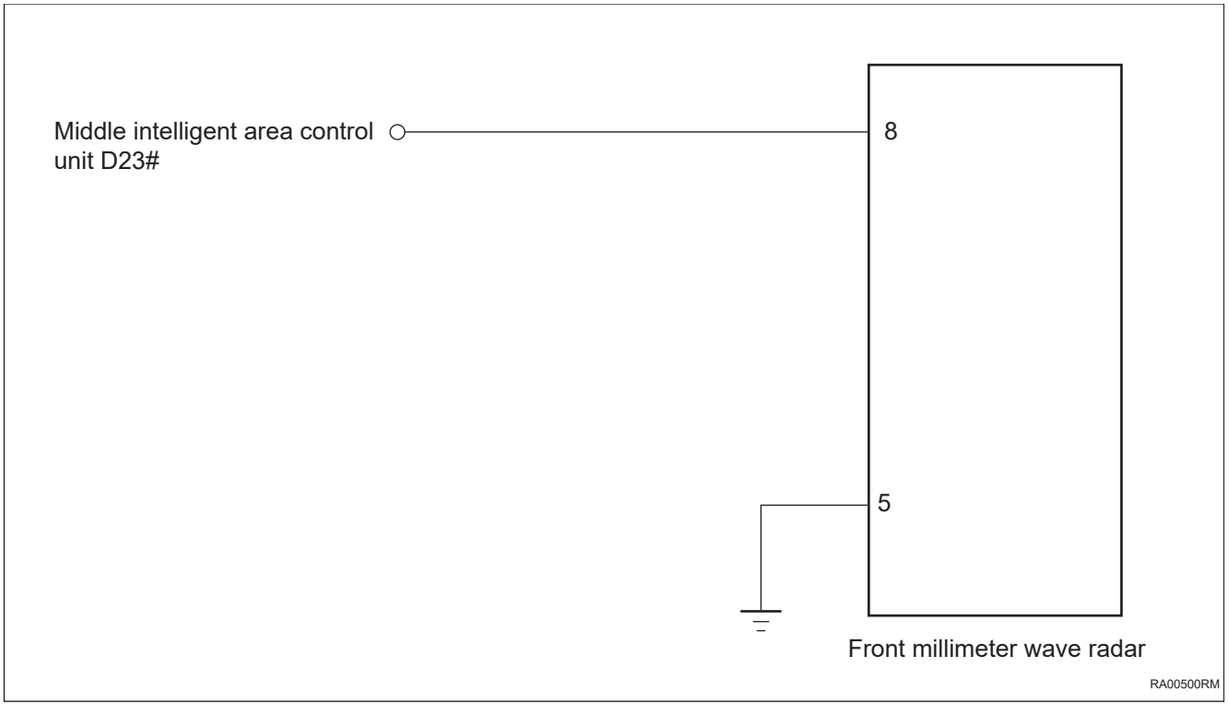
When front millimeter wave radar power supply voltage is too high or too low, front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E217	• 4 s after ignition ON	• If the radar power supply voltage is higher than 16 V for 500 ms, the DTC is triggered	500 ms	Periodic type	10 ms	• Front millimeter wave radar • Wire harness and connector • Battery/charging system
C12E316	• 4 s after ignition ON	If the radar power supply voltage is lower than 9 V for 500 ms, the DTC is triggered	500 ms	Periodic type	10 ms	• Front millimeter wave radar • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E217	• Track target (SGU) degradation	Not come on
C12E316	• Track target (SGU) degradation	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

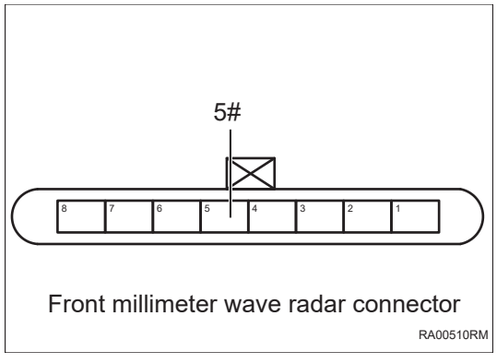
Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check front millimeter wave radar ground



Front millimeter wave radar connector

RA00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front millimeter wave radar connector.

(d) According to value in the table, measure resistance.

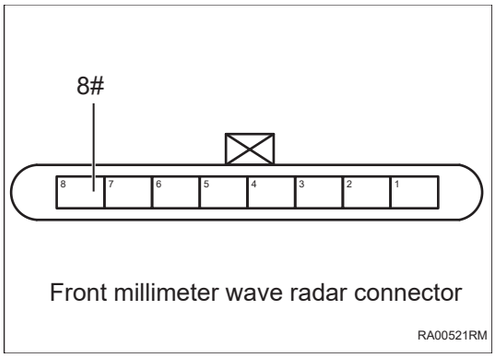
Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 5# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front millimeter wave radar power supply**



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 8# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)**

OK

Replace front millimeter wave radar (See page ZC-110)

DTC	C12E000	Uncalibrated fault
DTC	C12E600	Calibration incomplete

Description

When front millimeter wave radar is not calibrated or calibration is not completed, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E000	• Voltage is between 9 V and 16 V • Factory mode is turned off	• If the radar has never been calibrated, the DTC is triggered	0	Periodic type	10 ms	• Front millimeter wave radar
C12E600	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	If radar calibration is not successful, the DTC is triggered	0	Periodic type	10 ms	• Front millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E000	• Track target (SGU) degradation	Not come on
C12E600	• Track target (SGU) degradation	Not come on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Calibrate front millimeter wave radar**

OK

Replace front millimeter wave radar (See page ZC-110)

DTC	C12E100	Factory mode

Description

When front millimeter wave radar is in factory mode, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E100	• No prerequisites	Factory mode is turned on and DTC is triggered	0	Periodic type	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E100	• Track target (SGU) degradation	Not come on

Inspection procedure

1	Turn off factory mode

(a) Connect HQ-VDS diagnostic tester.

(b) Turn off the factory mode.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front millimeter wave radar (See page ZC-110)**

OK

Diagnosis ends

DTC	C12E400	Radar position deviation fault

Description

When installation angle of front millimeter wave radar is out of range, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E400	• Voltage is between 9 V and 16 V • Factory mode is turned off • No bus-off in public CAN • 4 s after ignition ON	Since the radar position is out of range, the calibration deviation exceeds the calibration correction range	3	Periodic type	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E400	• Track target (SGU) degradation	Not come on

Inspection procedure

1	Check front millimeter wave radar

(a) Check if the installation angle of front millimeter wave radar is correct.

(b) Check if front millimeter wave radar is installed securely.

NG → **Perform repair according to malfunction**

OK

2	Calibrate front millimeter wave radar

(a) Calibrate front millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front millimeter wave radar (See page ZC-110)**

OK

ZD

Diagnosis ends

DTC	C12E500	Radar blocked fault

Description

When front millimeter wave radar is dirty or blocked, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E500	• Voltage is between 9 V and 16 V • Factory mode is turned off • No bus-off in public CAN • 4 s after ignition ON	The radar sensor is blocked or no object target is detected	• 3	Periodic type	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E500	• Track target (SGU) degradation	Not come on

Inspection procedure

1	Check front millimeter wave radar

(a) Check front millimeter wave radar for dirt.

(b) Check front millimeter wave radar for blocking.

NG → **Clean front millimeter wave radar or remove obstruction**

OK

Replace front millimeter wave radar (See page ZC-110)

DTC C12E700 Radar signal unreliable fault

Description

When front millimeter wave radar signal is abnormal, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C12E700	• Voltage is between 9 V and 16 V • Factory mode is turned off • No bus-off in public CAN • 4 s after ignition ON	• Yaw rate signal invalid • At least 3 wheel speeds are invalid • Longitudinal acceleration invalid • Front wheel angle invalid	3	Periodic type	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C12E700	• Track target (SGU) degradation	Not come on

Inspection procedure

1	**Check front millimeter wave radar**

(a) Check front millimeter wave radar for blocking.

(b) Check if the installation of front millimeter wave radar is correct.

NG → **Perform repair according to malfunction**

OK

2	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Calibrate front millimeter wave radar**

OK

Replace front millimeter wave radar (See page ZC-110)

DTC	B213100	Factory data error

Description

When front millimeter wave radar factory data has error, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B213100	• MMIC (monolithic microwave integrated circuit) factory data does not exist or data version number is incorrect • Radar antenna diagram does not exist or version number is incorrect	• MMIC (monolithic microwave integrated circuit) factory data does not exist or data version number is incorrect • Radar antenna diagram does not exist or version number is incorrect	0	Event-based	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B213100	• Track target (SGU) degradation	Not come on

Inspection procedure

1	Check factory mode

(a) Connect HQ-VDS diagnostic tester.

(b) Check if factory mode is normal.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front millimeter wave radar (See page ZC-110)**

OK

Diagnosis ends

DTC	**B213300**	**Microprocessor procedure checksum fault**
DTC	**B213500**	**Internal power management system fault**
DTC	**B214800**	**Microprocessor temperature out of range**
DTC	**B213200**	**Internal hardware fault**
DTC	**B214400**	**Power management chip overvoltage fault**
DTC	**B213900**	**MMIC (monolithic microwave integrated circuit) over voltage fault**
DTC	**B214300**	**Power management chip undervoltage fault**
DTC	**B214000**	**MMIC undervoltage fault**
DTC	**B214500**	**Radar control unit fault**
DTC	**B214100**	**Radar modulation fault**
DTC	**B214700**	**Software temporary fault**
DTC	**B214200**	**Software fault**
DTC	**B214600**	**Radar front end data processing fault**
DTC	**B213700**	**MMIC temperature out of maximum value fault**
DTC	**B213800**	**MMIC temperature out of operating value fault**
DTC	**B213600**	**Internal microprocessor system fault**
DTC	**B213400**	**ADC self-check error**
DTC	**B214900**	**DSP data-overrun**

DTC	B221000	Radar antenna illegal tampering

Description

When front millimeter wave radar signal is abnormal, the front millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B213300	• Application data integrity checksum failure	• Application data integrity checksum failure	0	Event-based	10 ms	• Front millimeter wave radar
B213500	• ASIC Watchdog fault, operating system does not feedback to Watchdog normally for 10 ms task	• ASIC Watchdog fault, operating system does not feedback to Watchdog normally for 10 ms task	0	Event-based	10 ms	• Front millimeter wave radar
B214800	Temperature too high/radar fault • Microcontroller temperature is out of reasonable measurement range of sensor (lower than -44° C or higher than +145.9° C -> fail) • Main board temperature is out of reasonable measurement range of sensor (ADC group 0, channel 7 is higher than +128° C or lower than -41° C -> fail)	Temperature too high/radar fault • Microcontroller temperature is out of reasonable measurement range of sensor (lower than -44° C or higher than +145.9° C -> fail) • Main board temperature is out of reasonable measurement range of sensor (ADC group 0, channel 7 is higher than +128° C or lower than -41° C -> fail) • Front wheel angle invalid	0	Event-based	10 ms	• Front millimeter wave radar
B213200	• Radar system detects	• Radar system detects	0	Event-based	10 ms	• Front millimeter wave radar

ZD

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	hardware fault	hardware fault				
B214400	• Power management chip over voltage fault (3.465 V) Normal operating voltage is 3.3 V	• Power management chip over voltage fault (3.465 V) Normal operating voltage is 3.3 V	0	Event-based	10 ms	• Front millimeter wave radar
B213900	• MMIC (monolithic microwave integrated circuit) over voltage fault (3.465 V) Normal operating voltage is 3.3 V	• MMIC (monolithic microwave integrated circuit) over voltage fault (3.465 V) Normal operating voltage is 3.3 V	0	Event-based	10 ms	• Front millimeter wave radar
B214300	• Power management chip under voltage fault (3.135 V) Normal operating voltage is 3.3 V	• Power management chip under voltage fault (3.135 V) Normal operating voltage is 3.3 V	0	Event-based	10 ms	• Front millimeter wave radar
B214000	• MMIC under voltage fault (3.135 V) Normal operating voltage is 3.3 V	• MMIC under voltage fault (3.135 V) Normal operating voltage is 3.3 V	0	Event-based	10 ms	• Front millimeter wave radar
B214500	• Radar controller fault	• Radar controller fault	0	Event-based	10 ms	• Front millimeter wave radar
B214100	• The amplitude deviation of two radar channels exceeds the threshold	• The amplitude deviation of two radar channels exceeds the threshold	0	Event-based	10 ms	• Front millimeter wave radar
B214700	• Unauthorized operation (such as tampering of special memory) is detected in	• Unauthorized operation (such as tampering of special memory) is detected in	0	Event-based	10 ms	• Front millimeter wave radar

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
	current software operation mode	current software operation mode				
B214200	• Operating time of software task exceeds the threshold (10 ms/20 ms) • Security management unit (SMU) monitoring is turned off	• Operating time of software task exceeds the threshold (10 ms/20 ms) • Security management unit (SMU) monitoring is turned off	0	Event-based	10 ms	• Front millimeter wave radar
B214600	• Signal processing unit (SPU) data consistency error	• Signal processing unit (SPU) data consistency error	0	Event-based	10 ms	• Front millimeter wave radar
B213700	• MMIC temperature out of maximum value overheating error (130° C)	• MMIC temperature out of maximum value overheating error (130° C)	0	Event-based	10 ms	• Front millimeter wave radar
B213800	• MMIC temperature does not exceed operating value overheating error (125° C)	• MMIC temperature does not exceed operating value overheating error (125° C)	0	Event-based	10 ms	• Front millimeter wave radar
B213600	• CPU external clock signal lost • CPU core internal/ external bus communication fault	• CPU external clock signal lost • CPU core internal/ external bus communication fault	0	Event-based	10 ms	• Front millimeter wave radar
B213400	• Radar ADC module self-check fails	• Radar ADC module self-check fails	0	Event-based	10 ms	• Front millimeter wave radar

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B214900	• Invalid or out-of-range values provided through the DSP input interface • Loss of DSV during the cycle	• Invalid or out-of-range values provided through the DSP input interface • Loss of DSV during the cycle	0	Event-based	10 ms	• Front millimeter wave radar
B221000	• The antenna in radar is illegally tampered	• The antenna in radar is illegally tampered	0	Event-based	10 ms	• Front millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B213300	• Track target (SGU) degradation	Not come on
B213500	• Track target (SGU) degradation	Not come on
B214800	• Track target (SGU) degradation	Not come on
B213200	• Track target (SGU) degradation	Not come on
B214400	• Track target (SGU) degradation	Not come on
B213900	• Track target (SGU) degradation	Not come on
B214000	• Track target (SGU) degradation	Not come on
B214500	• Track target (SGU) degradation	Not come on
B214100	• Track target (SGU) degradation	Not come on
B214700	• Track target (SGU) degradation	Not come on
B214200	• Track target (SGU) degradation	Not come on
B214600	• Track target (SGU) degradation	Not come on
B213700	• Track target (SGU) degradation	Not come on
B213800	• Track target (SGU) degradation	Not come on
B213600	• Track target (SGU) degradation	Not come on
B213400	• Track target (SGU) degradation	Not come on
B214900	• Track target (SGU) degradation	Not come on
B221000	• Track target (SGU) degradation	Not come on

Inspection procedure

1	**Check front millimeter wave radar wire harness**

(a) Check for short or open in front millimeter wave radar wire harness.

NG → **Perform repair according to malfunction**

OK

2	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front millimeter wave radar (See page ZC-110)**

OK

Diagnosis ends

DTC	**U024287**	**Automatic parking/automatic driving control unit 2 node lost**
DTC	**U129387**	**Vehicle controller message missing**

DTC	U112187	ABS/ESP/ESPwithAPB message missing
DTC	U113187	Electric power steering control unit message missing
DTC	U014787	Middle PDC/left PDC message missing
DTC	U114087	Body control unit 1 message missing
DTC	U116487	A/C controller 1 message missing
DTC	U113887	Driving mode selection/all terrain control unit message missing
DTC	U059482	Vehicle controller message content fault
DTC	U059483	Vehicle controller message content fault
DTC	U059484	Vehicle controller message content fault
DTC	U041582	ABS/ESP/ESPwithAPB message content fault
DTC	U041583	ABS/ESP/ESPwithAPB message content fault
DTC	U041584	ABS/ESP/ESPwithAPB message content fault
DTC	U041586	ABS/ESP/ESPwithAPB message content fault
DTC	U042082	Electric power steering control unit message content fault
DTC	U042083	Electric power steering control unit message content fault
DTC	U042084	Electric power steering control unit message content fault
DTC	U042086	Electric power steering control unit message content fault
DTC	U042284	Body control unit 1 message content fault

DTC	U054984	Automatic parking/automatic driving control unit 2 message content fault

Description

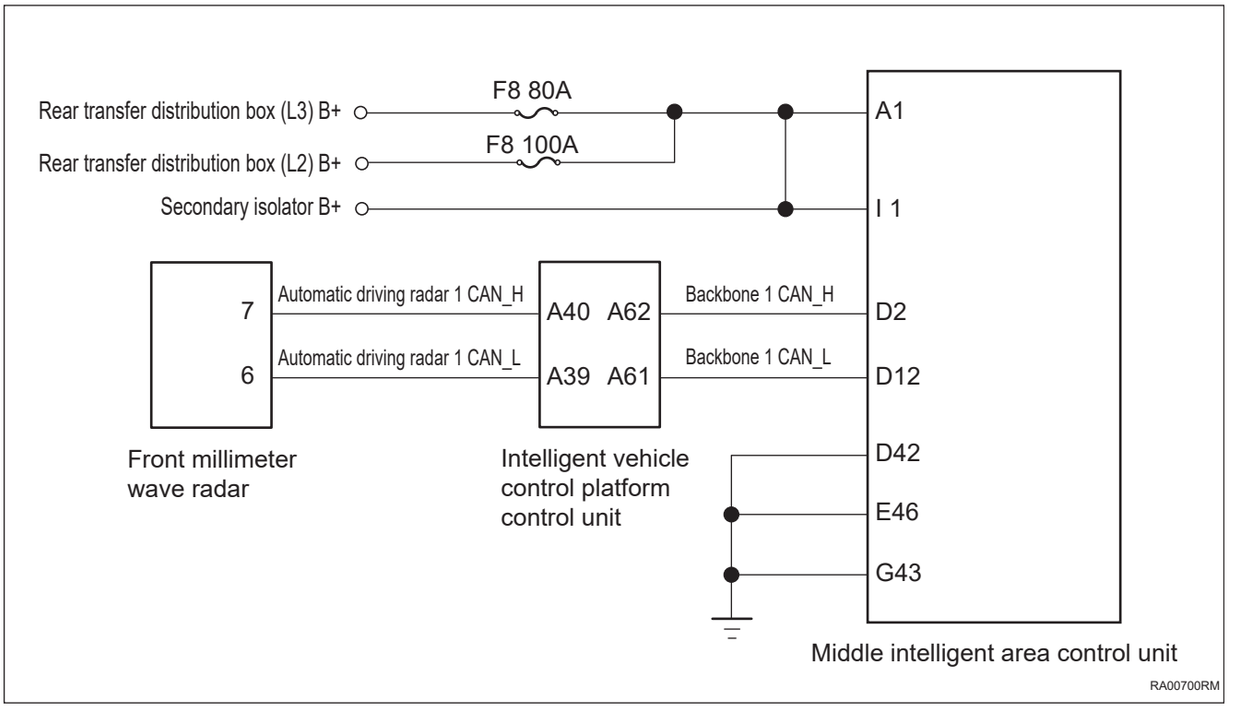
When communication between front millimeter wave radar and other systems is abnormal or interrupted, the front millimeter wave radar records DTC.

DTC No.	DTC detection condition	Faulty area
U024287	(a) Automatic parking/automatic driving control unit 2 node lost.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U112187	(a) ABS/ESP/ESPwithAPB message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Integrated brake controller
U113187	(a) Electric power steering control unit message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Electric power steering control unit
U014787	(a) Middle PDC/left PDC message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Middle intelligent area control unit
U114087	(a) Body control unit 1 message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U112887	(a) Electronic parking brake unit message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit
U12FF87	(a) Electric wiper module message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit
U123187	(a) Rain sensor message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit
U116487	(a) A/C controller 1 message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Middle intelligent area control unit
U124587	(a) Infotainment head unit/audio control unit message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Infotainment control unit
U113887	(a) Driving mode selection/all terrain control unit message missing.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059482	(a) Vehicle controller message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059483	(a) Vehicle controller message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059484	(a) Vehicle controller message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U041582	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Integrated brake controller
U041583	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Front millimeter wave radar

DTC No.	DTC detection condition	Faulty area
		• Advanced automatic driving controller • Front intelligent area control unit • Integrated brake controller
U041584	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Integrated brake controller
U041586	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Integrated brake controller
U042082	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Electric power steering control unit
U042083	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Electric power steering control unit
U042084	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Electric power steering control unit
U042086	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Electric power steering control unit
U042284	(a) Body control unit 1 message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller • Front intelligent area control unit • Intelligent vehicle control platform control unit
U054984	(a) Automatic parking/automatic driving control unit 2 message content fault.	• Wire harness and connector • Front millimeter wave radar • Advanced automatic driving controller

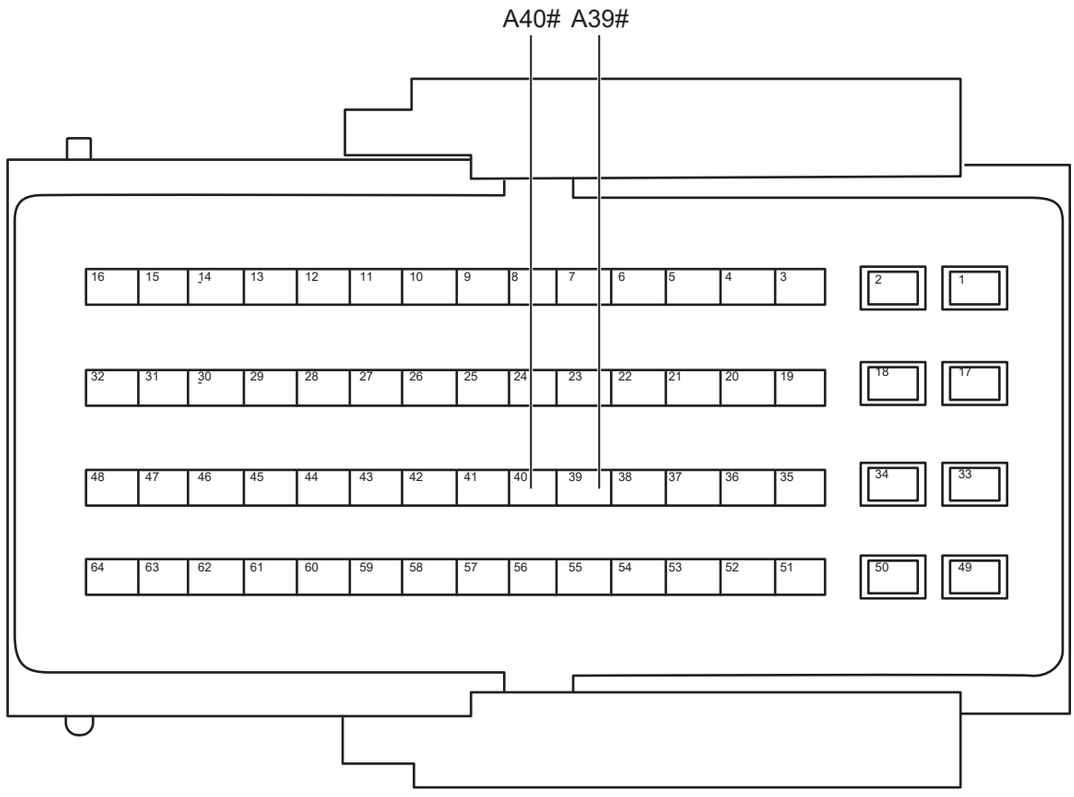
Circuit diagram



Inspection procedure

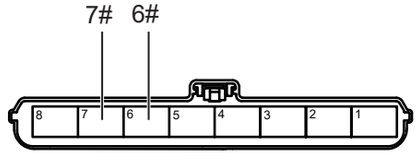
Note: Taking the U114787 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in automatic driving radar 1 CAN bus (front millimeter wave radar - intelligent vehicle control platform control unit)**



Intelligent vehicle control platform unit A connector

RA01111RM



Front millimeter wave radar connector

RA00711RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on automatic driving radar 1 CAN bus.

(d) According to value in the table, measure resistance.

Standard value

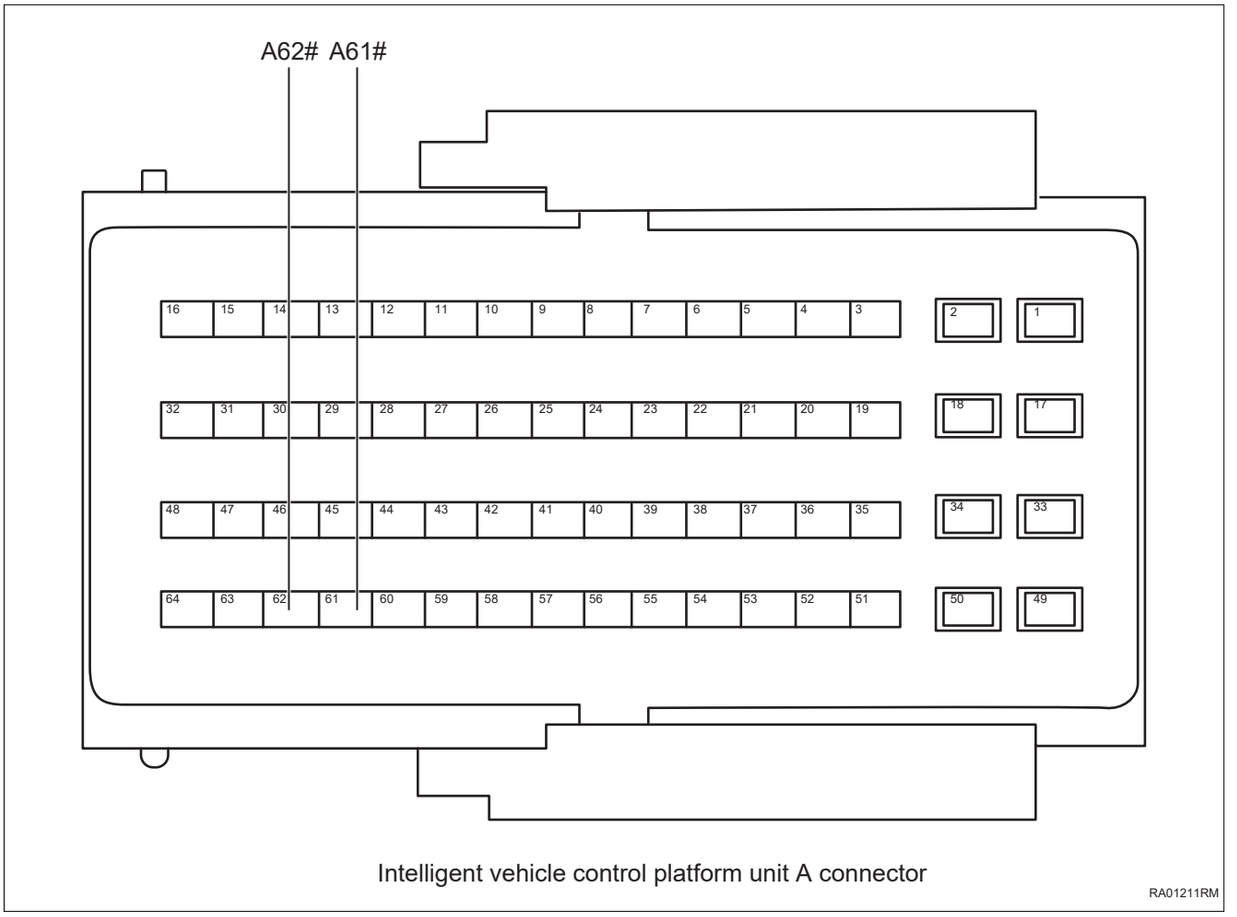
Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 7# - intelligent vehicle control platform control unit connector A40#	Always connected	Less than 1 Ω
Front millimeter wave radar connector 6# - intelligent vehicle control platform control unit connector A39#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

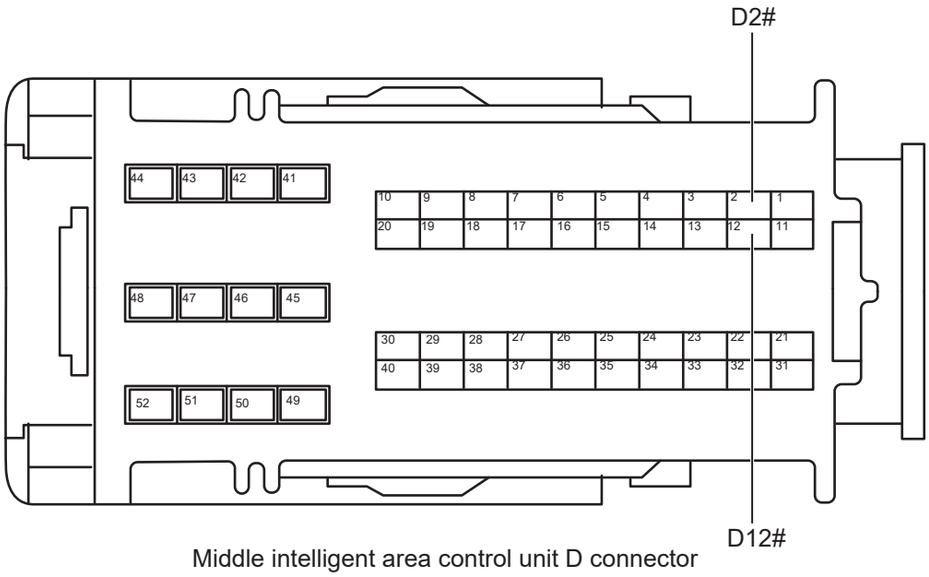
OK

2	**Check for open in backbone 1 CAN bus (intelligent vehicle control platform control unit - middle intelligent area control unit)**



Intelligent vehicle control platform unit A connector

RA01211RM



Middle intelligent area control unit D connector

RS03531RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on backbone 1 CAN bus.

(d) According to value in the table, measure resistance.

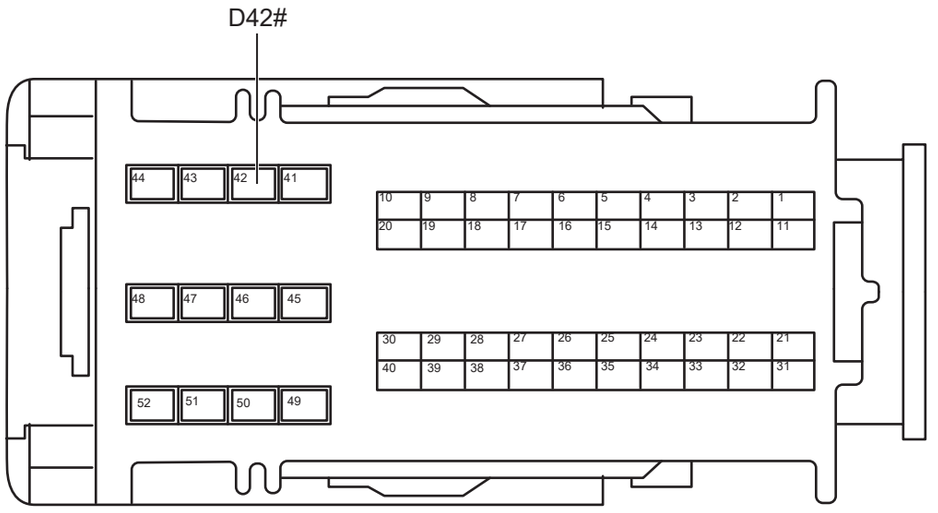
Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A62# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A61# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

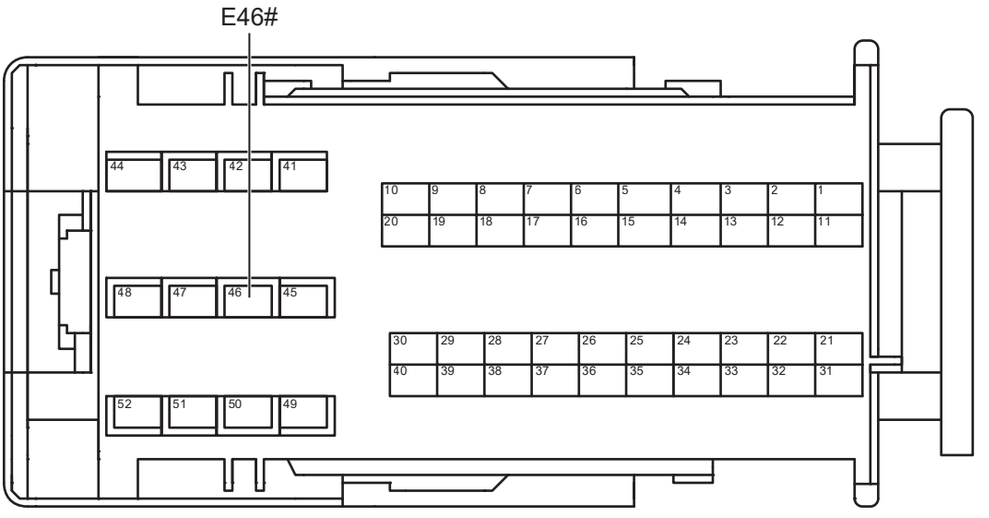
OK

3	**Check middle intelligent area control unit ground**



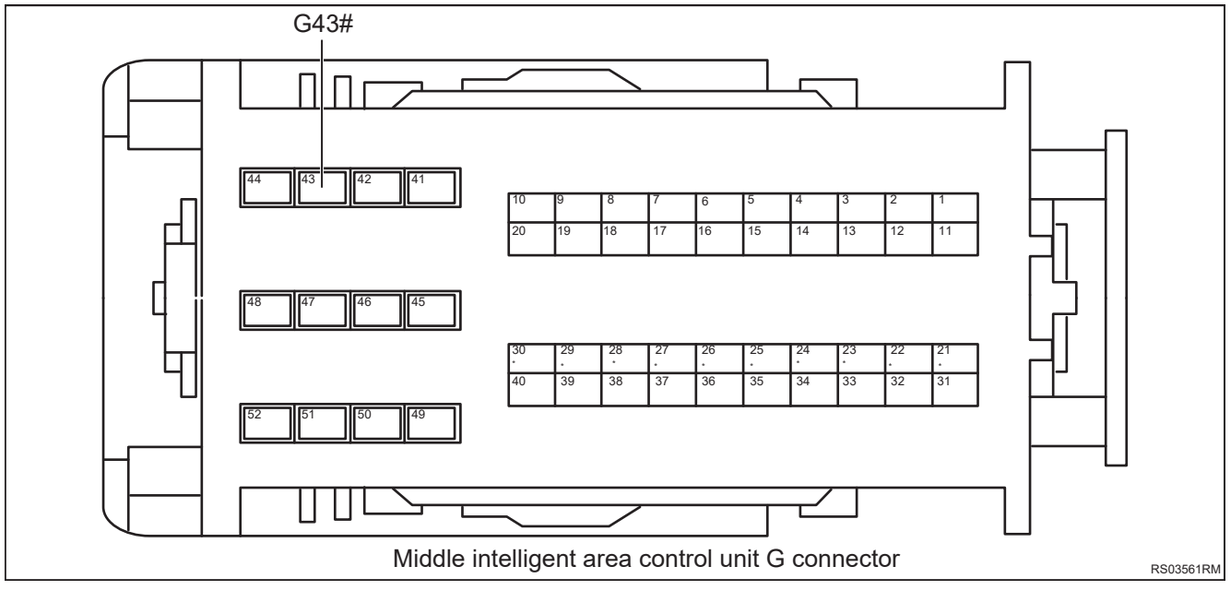
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

ZD

(a) According to value in the table, measure resistance.

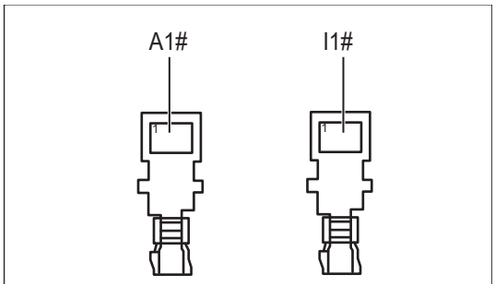
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A/I connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

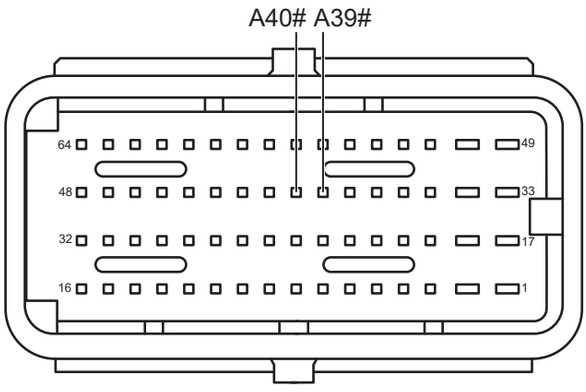
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	Battery voltage
Middle intelligent area control unit connector I1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

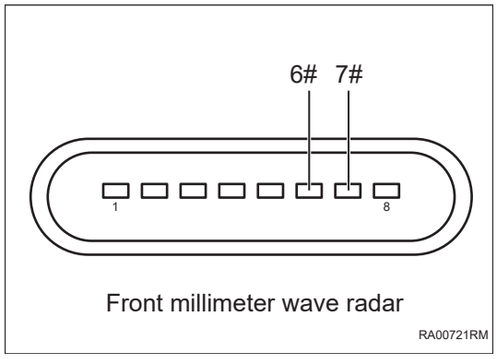
OK

5	**Check terminal resistance of automatic driving radar 1 CAN bus**



Intelligent vehicle control platform control unit A

RA01221RM



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar 7# - front millimeter wave radar 6#	Always connected	Approximately 120 Ω
Intelligent vehicle control platform control unit A40# - intelligent vehicle control platform control unit A39#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	**Replace front millimeter wave radar (See page ZC-110)**

(a) Replace the front millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace middle intelligent area control unit (See page ZC-132)**

OK

Replace intelligent vehicle control platform control unit (See page ZC-154)

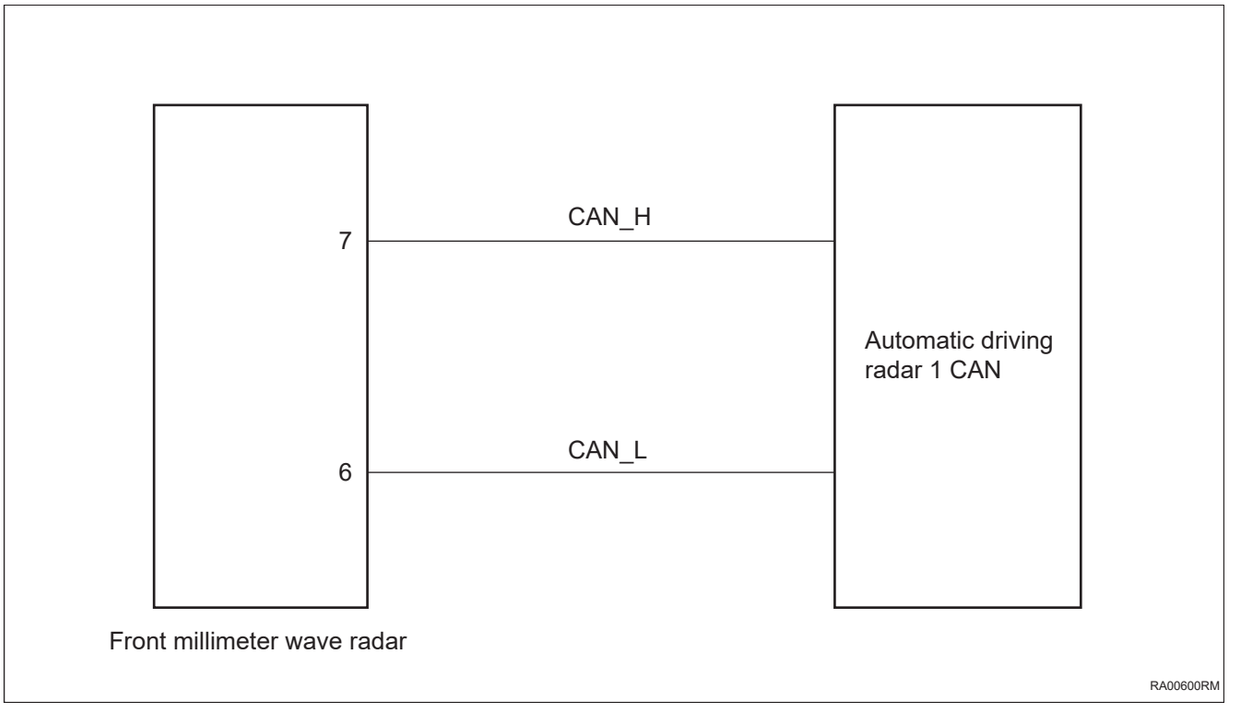
DTC	U007C88	Automatic driving control unit - front radar CAN bus off

Description

When front millimeter wave radar detects automatic driving radar 1 CAN bus off fault, the front millimeter wave radar records DTC.

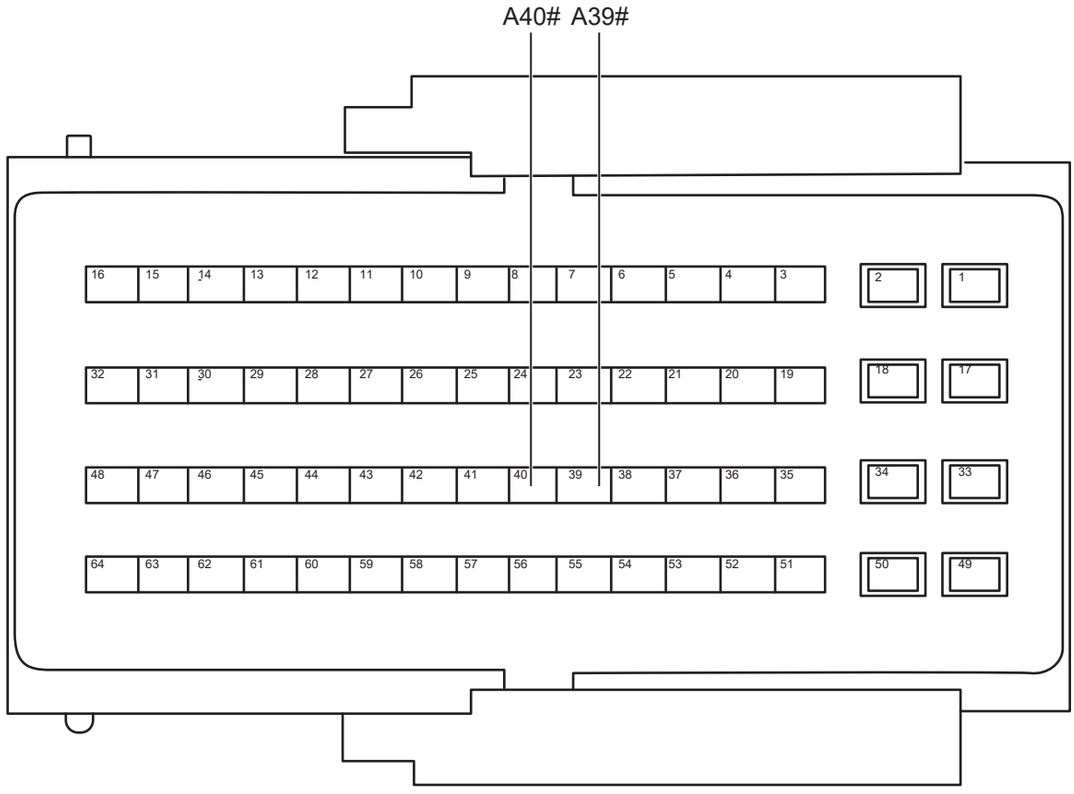
DTC No.	DTC detection condition	Faulty area
U007C88	(a) Automatic driving control unit - front radar CAN bus off.	• CAN line and connector • Front millimeter wave radar • Intelligent vehicle control platform control unit

Circuit diagram



Inspection procedure

1	**Check front millimeter wave radar terminal resistance**



Intelligent vehicle control platform unit A connector

RA01111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the intelligent vehicle control platform control unit connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

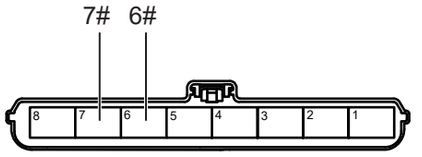
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A40# - intelligent vehicle control platform control unit connector A39#	Always connected	Approximately 120 Ω

NG	**Perform repair according to malfunction**

ZD

OK

2	**Check intelligent vehicle control platform control unit terminal resistance**



Front millimeter wave radar connector

RA00611RM

(a) Connect the intelligent vehicle control platform control unit connector.

(b) Disconnect the front millimeter wave radar connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 7# - front millimeter wave radar connector 6#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

3	**Check controller on automatic driving radar 1 CAN bus**

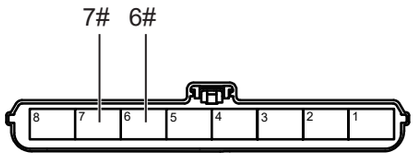
(a) Disconnect the controller on automatic driving radar 1 CAN bus in sequence, check if other controller resumes operation.

NG → **Perform repair according to malfunction**

OK

ZD

4	**Check for short between CAN-L and CAN-H of automatic driving radar 1 CAN bus**



Front millimeter wave radar connector

RA00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on automatic driving radar 1 CAN bus.

(d) According to value in the table, measure resistance.

Standard value

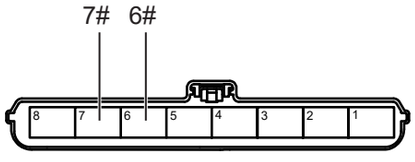
Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 7# - front millimeter wave radar connector 6#	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in automatic driving radar 1 CAN bus**



Front millimeter wave radar connector

RA00611RM

(a) According to value in the table, measure resistance.

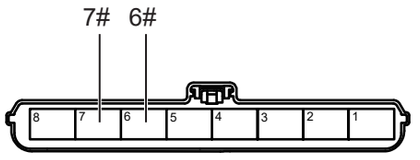
Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 7# - body ground	Always connected	10 KΩ or more
Front millimeter wave radar connector 6# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in automatic driving radar 1 CAN bus**



Front millimeter wave radar connector

RA00611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Front millimeter wave radar connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Front millimeter wave radar connector 6# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

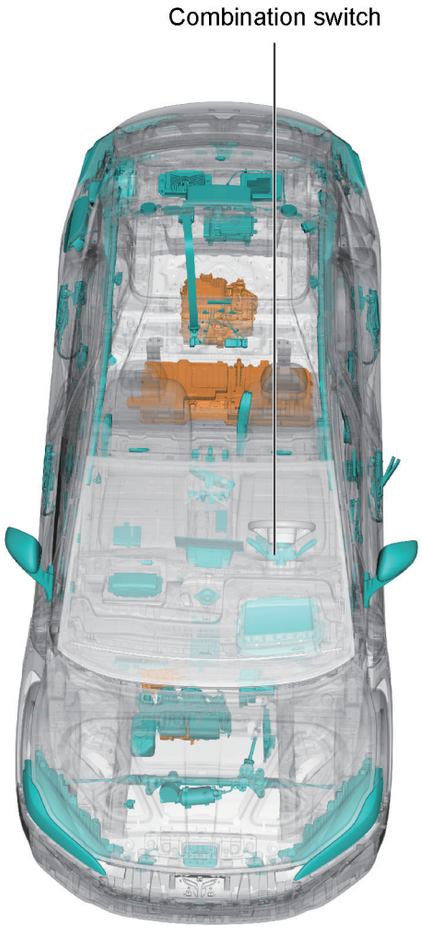
OK

Diagnosis ends

Combination switch control system

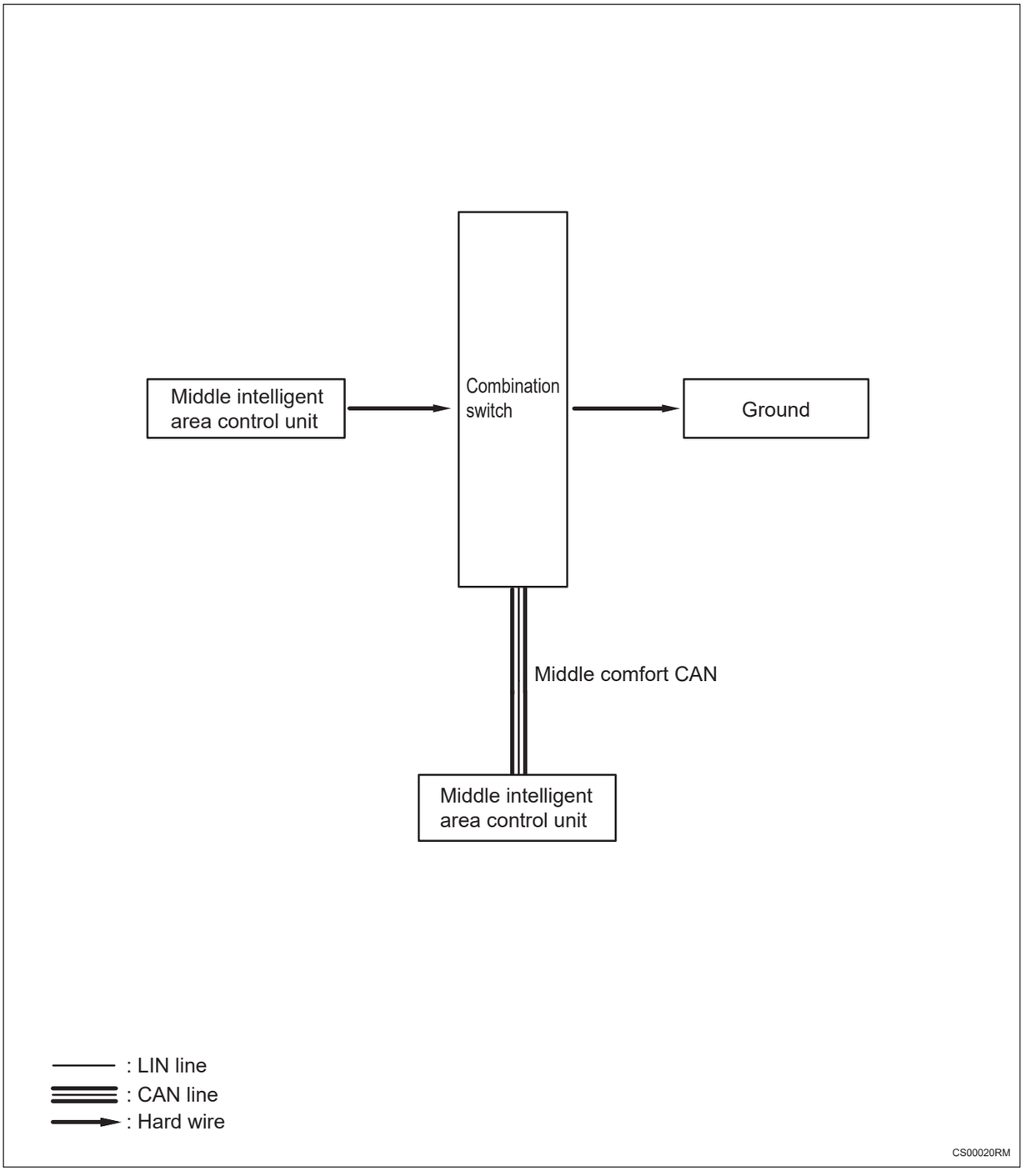
Combination switch

Part position



CS00030RM

System diagram



System description

1. System description

(a) Install the combination switch assembly to steering column, including the light/wiper handle, and shift lever.

(b) The light and wiper lever control function include: Left and right turn signals, left and right lane

change, high beam light, overtake light, front wiper OFF, AUTO I, AUTO II, AUTO III, AUTO IV, LO, HI, MIST, and front windshield washer.

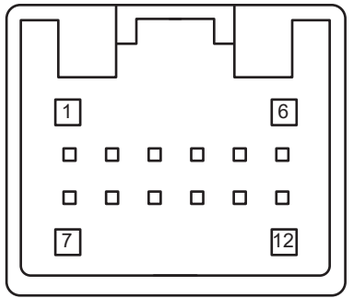
(c) Shift lever control functions include: R, N, D gear changes, cruise control ON/OFF, P gear button. Dual redundant is required for P gear button, and the display panel for P, R, N, D and cruise gear are all with backlight.

Data parameter

Combination switch

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.5	0.24	0.1

ECU terminal



Combination switch

CS00010RM

Combination switch			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	7	
2	Efuse power B+	8	
3	-	9	
4	CAN-H	10	
5	CAN-L	11	-
6	GND	12	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
U002888	Comfort CAN bus off	(See page ZD-3192)
U014687	PDCM node lost	(See page ZD-3186)

DTC	Detection Items	See page
B101016	ECU controller input end undervoltage	(See page ZD-3170)
B101017	ECU controller input end overvoltage	(See page ZD-3170)
B100101	Turn signal light switch fault	(See page ZD-3173)
B100201	High beam light switch fault	(See page ZD-3174)
B100301	Overtake light switch fault	(See page ZD-3175)
B100401	Front wiper switch fault	(See page ZD-3176)
B100501	Front wiper & washer switch fault	(See page ZD-3177)
B100601	Rear wiper & washer switch fault	(See page ZD-3178)
B100701	P button failure	(See page ZD-3179)
B100801	Steering column fault	(See page ZD-3180)
B100901	Shift paddle fault	(See page ZD-3181)
B101001	Gear switch fault	(See page ZD-3182)
B101101	Hall chip fault	(See page ZD-3183)
B101201	Memory check error reported	(See page ZD-3184)
B101301	ADC test fault	(See page ZD-3185)

DTC	**B101016**	**ECU controller input end undervoltage**
DTC	**B101017**	**ECU controller input end overvoltage**

Description

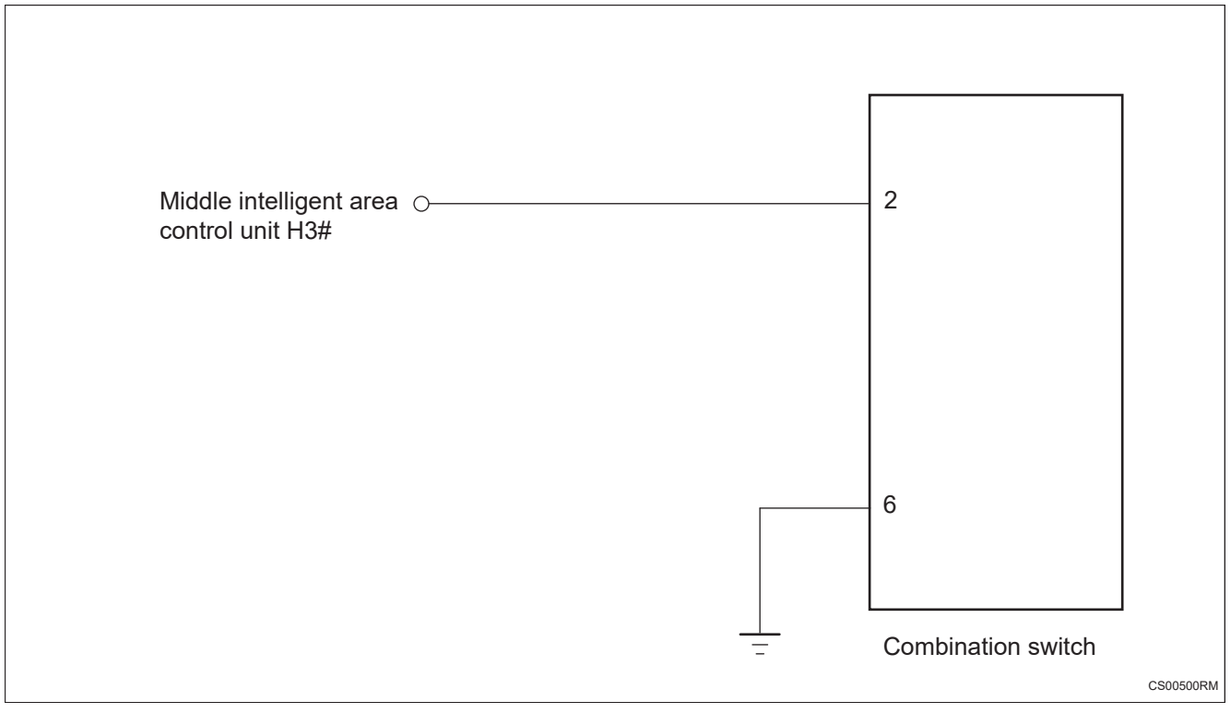
When input voltage of combination switch is too high or too low, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B101016	• 1.5 s after IG ON • 85 02 is not activated	• The system voltage is lower than 8.5 V	2000 ms	Periodic type	10 ms	• Combination switch • Wire harness and connector • Battery/charging system
B101017	• 1.5 s after IG ON • 85 02 is not activated	The system voltage is higher than 16.5 V for 2000 ms or the voltage is higher than 18.5 V for 400 ms	2000 ms/400 ms	Periodic type	10 ms	• Combination switch • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B101016	• ECU undervoltage fault	Not come on
B101017	• ECU overvoltage fault	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

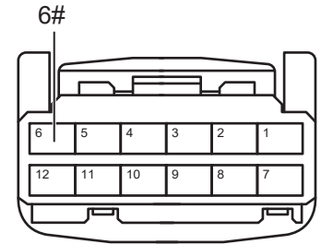
Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

ZD

2	Check combination switch ground



Combination switch connector

CS00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the combination switch connector.

(d) According to value in the table, measure resistance.

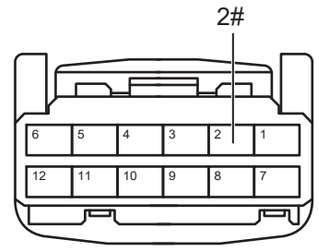
Standard value

Multimeter connection	Detection condition	Specified condition
Combination switch connector 6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check combination switch power supply



Combination switch connector

CS00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Combination switch connector 2# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK →

Replace combination switch (See page ZC-122)

DTC	B100101	Turn signal light switch fault

Description

When turn signal light switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100101	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch fault, short to ground, short to power supply or open in turn signal light (including lane change) switch, or switch stuck	• Stuck for 60 s • Other cases for 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100101	• Switch failed	Comes on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC	B100201	High beam light switch fault

Description

When high beam light switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100201	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch fault, short to ground, short to power supply or open in high beam light switch	• 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100201	• Switch failed	Comes on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B100301 Overtake light switch fault

Description

When overtake light switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100301	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch fault, short to ground, short to power supply or open in overtake light switch, or switch stuck	• Stuck for 60 s • Other cases for 200 ms	Periodic type	10 ms	• Combination switch

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100301	• Switch failed	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC	B100401	Front wiper switch fault

Description

When front wiper switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100401	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch fault, short to ground, short to power supply or open in front wiper switch, or triggering other fault logic with multiple gears on at the same time	• Simultaneo-us conduction of multiple gear positions: 500 ms; other cases: 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100401	• Switch failed	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B100501 Front wiper & washer switch fault

Description

When front wiper & washer switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100501	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch fault, short or open in front wiper or washer switch, or switch stuck	• Stuck for 60 s • Other cases for 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100501	• Switch failed	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC	B100601	Rear wiper & washer switch fault

Description

When rear wiper & washer switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100601	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Left handle switch stuck, rear wiper & washer switch stuck	• 60 s	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100601	• Switch failed	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B100701 P button failure

Description

When P button is failure, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100701	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	P gear switch fault, such as switch short to ground or switch short to power supply, stuck	• Stuck for 60 s • Other cases for 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100701	• P button failure	Comes on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B100801 Steering column fault

Description

When steering column is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100801	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Pin 7-10 stuck	• 60 s	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100801	• Steering column failure	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B100901 Shift paddle fault

Description

When shift paddle is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B100901	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Pin 11-12 stuck	• 60 s	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B100901	• Shift paddle failure	Not come on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC B101001 Gear switch fault

Description

When gear switch is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B101001	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Shift switch faults, such as mechanical fault or sticking	• Stuck for 60 s • Other cases for 200 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B101001	• Shift switch failure	Comes on

Inspection procedure

1	Check combination switch wire harness and connector

(a) Check for short in combination switch wire harness and connector.

(b) Check for open in combination switch wire harness and connector.

NG → **Perform repair according to malfunction**

OK

Replace combination switch (See page ZC-122)

DTC	B101101	Hall chip fault

Description

When combination switch Hall chip is faulty, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B101101	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	Hall chip reports self-diagnostic error/SPI bus communication fault	• Other cases for 200 ms	Periodic type	10 ms	• Combination switch

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B101101	• Hall chip failure	Not come on

Inspection procedure

1	**Replace combination switch (See page ZC-122)**

DTC B101201 Memory check error reported

Description

When memory checksum fault occurs in combination switch, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B101201	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	ECC detection module reports a double bit error	• 1 times	Event-based	100 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B101201	• ECC check error reported	Not come on

Inspection procedure

1	**Replace combination switch (See page ZC-122)**

DTC B101301 ADC test fault

Description

When ADC test fault occurs in combination switch, the combination switch records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B101301	• 1.5 s after IG ON • Not in busoff status • Voltage is between 8.5 V and 16.5 V • 85 02 is not activated	The diode voltage drop remains greater than 0.8 V or less than 0.3 V for a continuous duration of 100 ms	• 100 ms	Periodic type	10 ms	• Combination switch

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B101301	• Abnormal voltage drop of diode detected	Not come on

Inspection procedure

1	**Replace combination switch (See page ZC-122)**

DTC	U014687	PDCM node lost

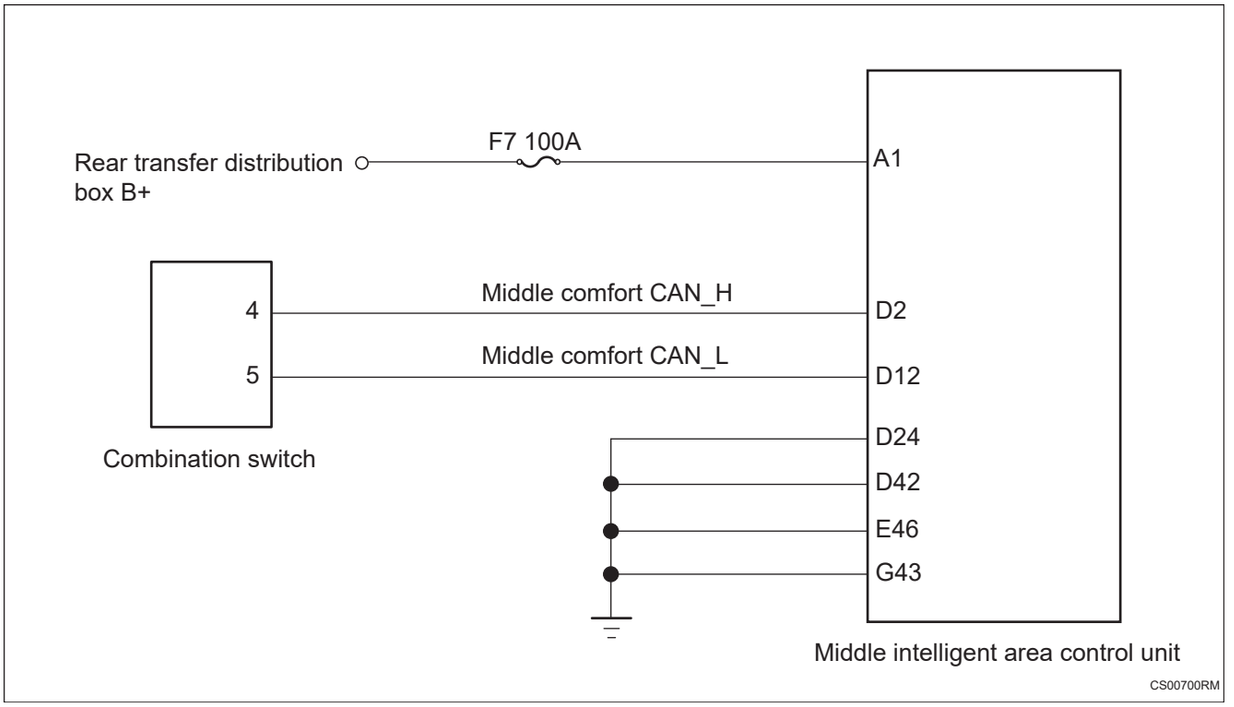
Description

ZD

When communication between combination switch and other system is abnormal or interrupted, the combination switch records DTC.

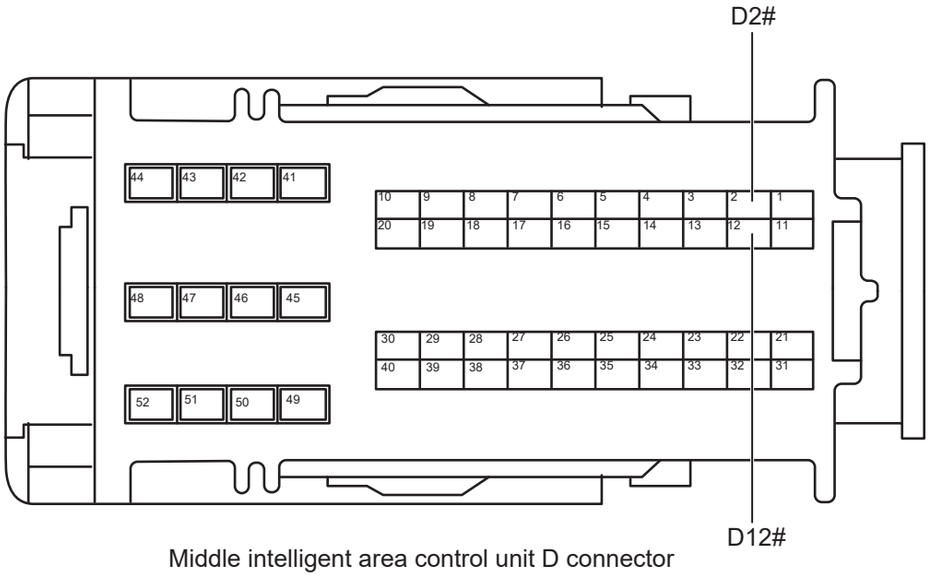
DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCM node lost.	• Wire harness and connector • Middle intelligent area control unit • Combination switch

Circuit diagram



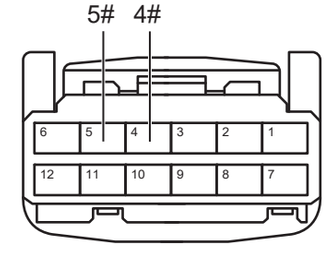
Inspection procedure

1	**Check for open in central comfort CAN bus (combination switch - middle intelligent area control unit)**



Middle intelligent area control unit D connector

RS03531RM



Combination switch connector

CS00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

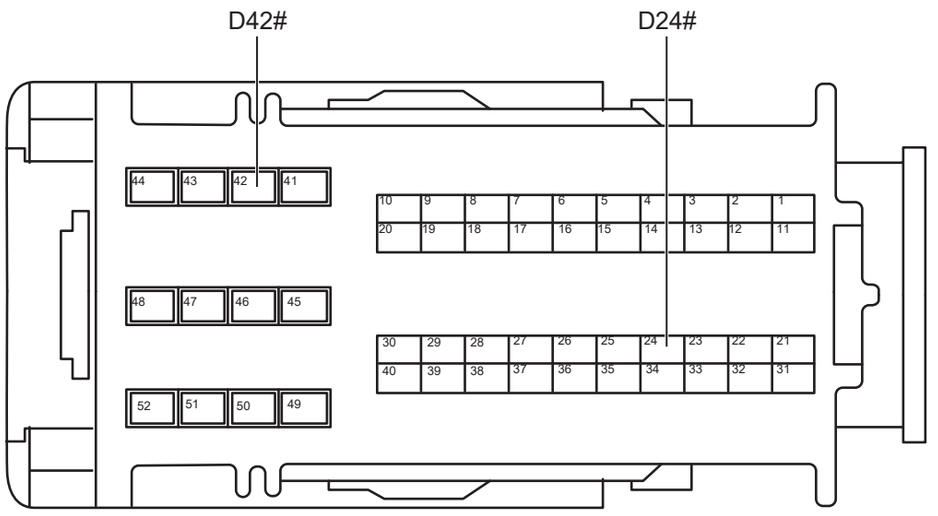
Multimeter connection	Detection condition	Specified condition
Combination switch connector 4# - middle intelligent area control unit connector D2#	Always connected	Less than 1 Ω
Combination switch connector 5# - middle intelligent area control unit connector D12#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

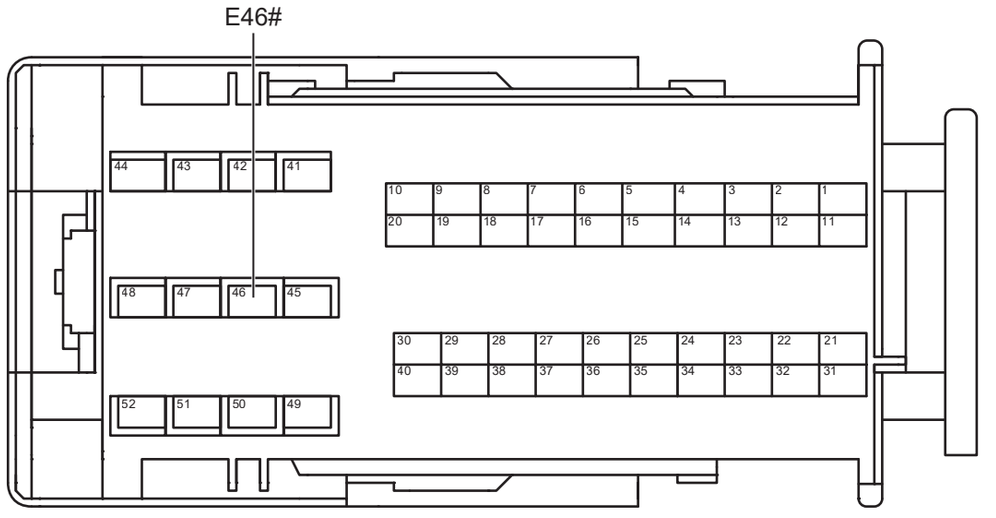
ZD

2	**Check middle intelligent area control unit ground**



Middle intelligent area control unit D connector

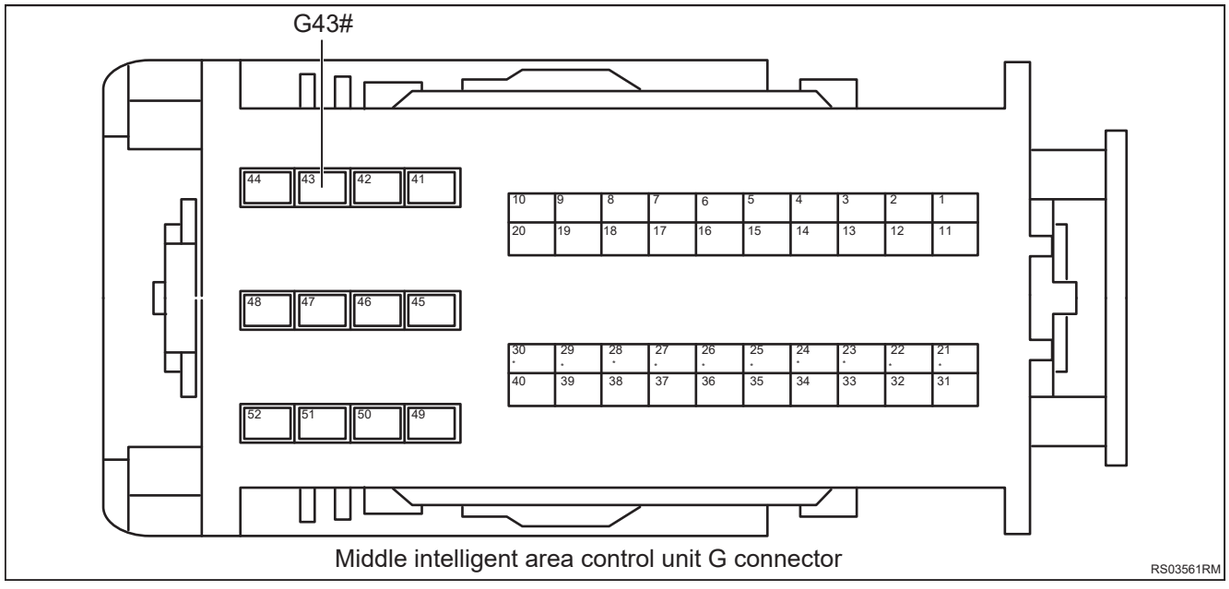
RS03541RM



Middle intelligent area control unit E connector

RS03551RM

ZD



Middle intelligent area control unit G connector

ZD

(a) According to value in the table, measure resistance.

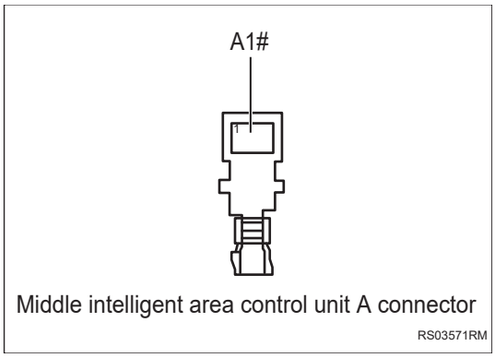
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector
RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

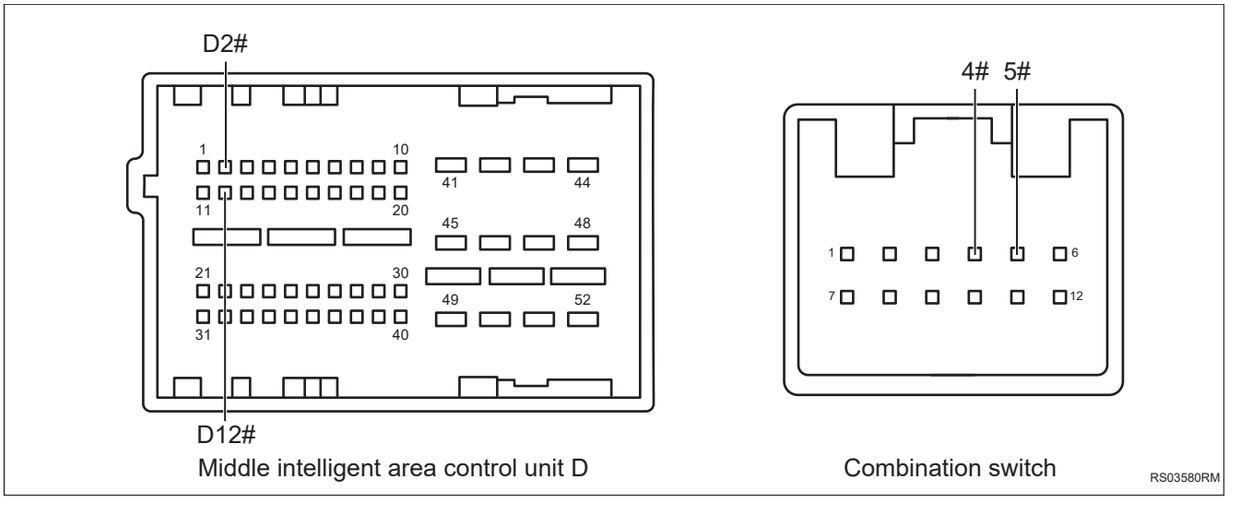
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	Battery voltage

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check central comfort CAN bus terminal resistance**



Middle intelligent area control unit D

Combination switch

RS03580RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit D2# - middle intelligent area control unit D12#	Always connected	Approximately 120 Ω
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	Replace middle intelligent area control unit (See page ZC-132)

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace combination switch (See page CS-12)**

OK

Diagnosis ends

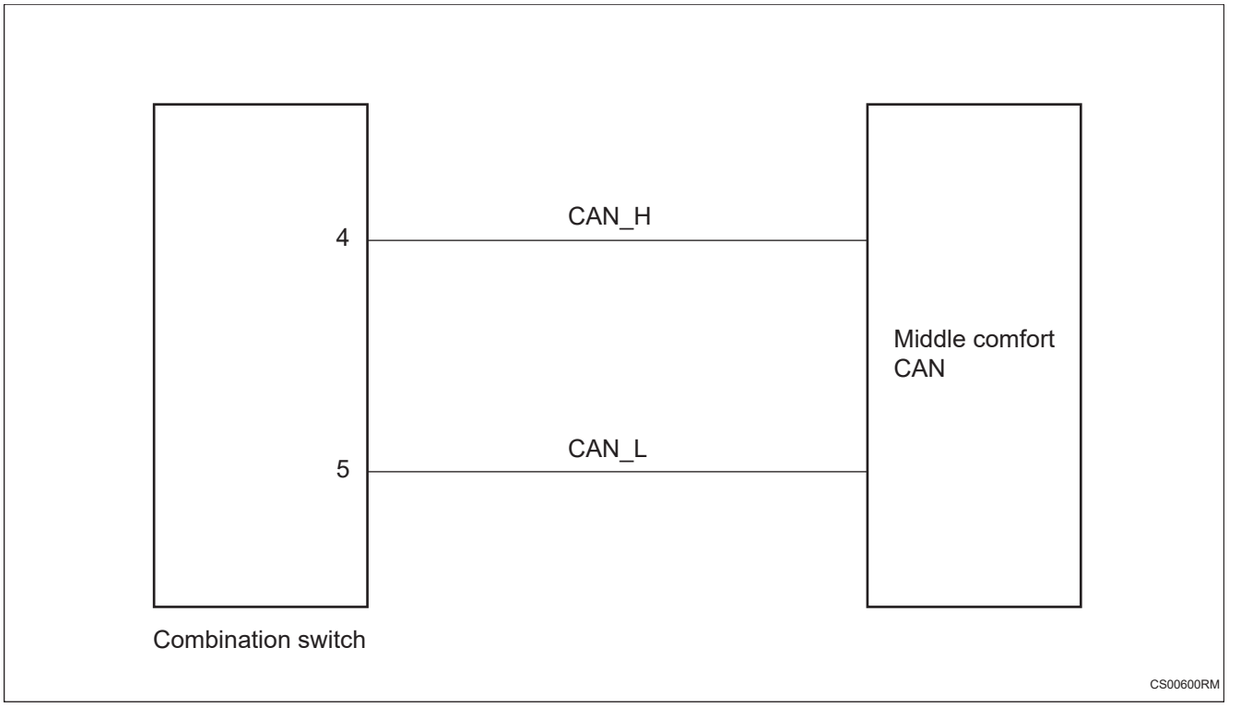
DTC	U002888	Comfort CAN bus off

Description

When combination switch detects an off fault in central comfort CAN bus, the combination switch records DTC.

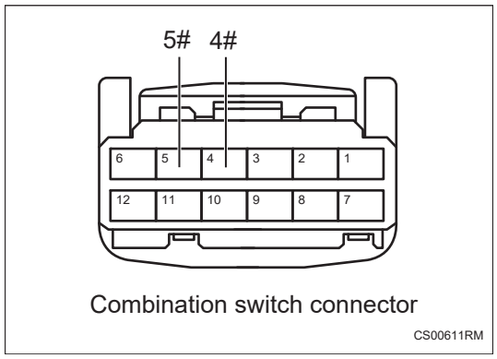
DTC No.	DTC detection condition	Faulty area
U002888	(a) Comfort CAN bus off.	• CAN line and connector • Combination switch • Middle intelligent area control unit

Circuit diagram



Inspection procedure

1	**Check central comfort CAN bus terminal resistance**



Combination switch connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the combination switch connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Combination switch connector 4# - combination switch connector 5#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

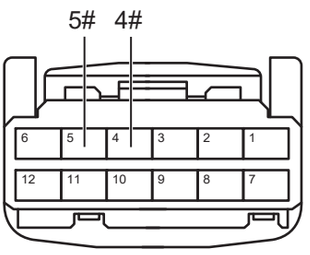
2	**Check controller on central comfort CAN bus**

(a) Disconnect the controllers on the central comfort CAN bus one by one and check if the other controllers resume operation.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between central comfort CAN bus CAN-L and CAN-H**



Combination switch connector

CS00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on central comfort CAN bus.

(d) According to value in the table, measure resistance.

Standard value

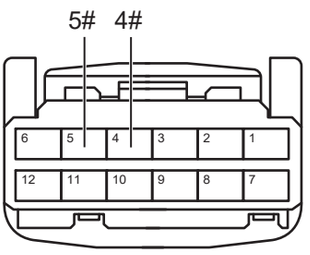
Multimeter connection	Detection condition	Specified condition
Combination switch connector 4# - combination switch connector 5#	Always connected	10 KΩ or more

ZD

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in central comfort CAN bus**



Combination switch connector

CS00611RM

(a) According to value in the table, measure resistance.

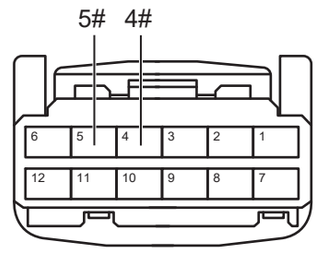
Standard value

Multimeter connection	Detection condition	Specified condition
Combination switch connector 4# - body ground	Always connected	10 KΩ or more
Combination switch connector 5# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in central comfort CAN bus**



Combination switch connector

CS00611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Combination switch connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V
Combination switch connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V

ZD

NG → **Check and repair or replace wire harness and connector**

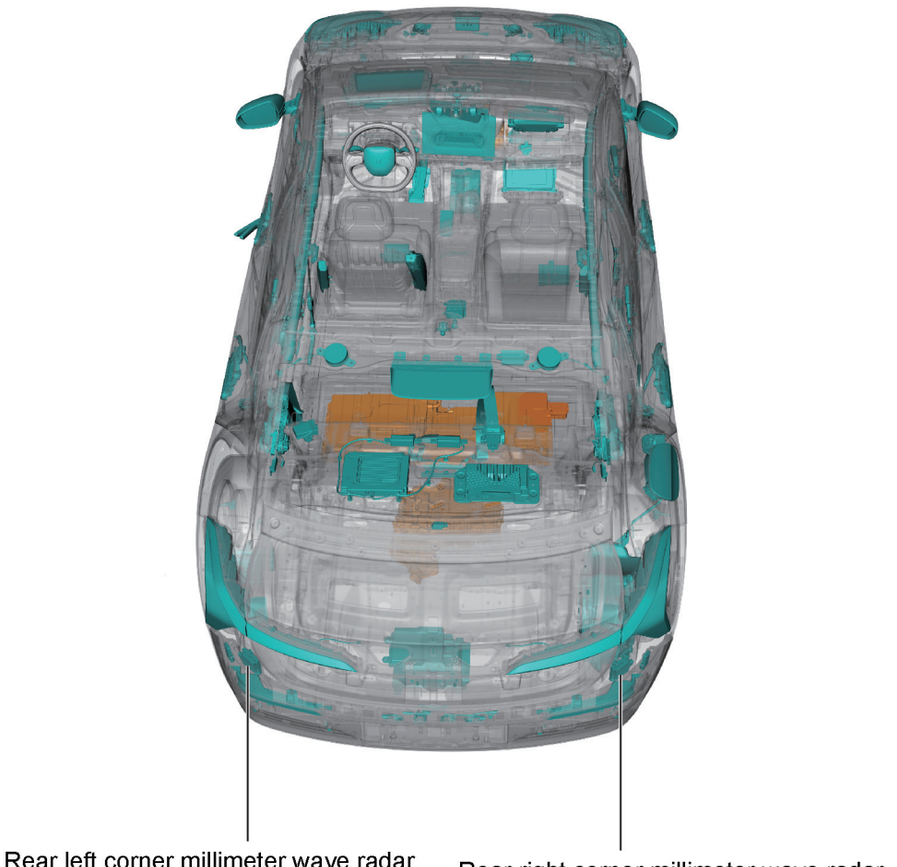
OK

Diagnosis ends

Blind spot detection electronic control system

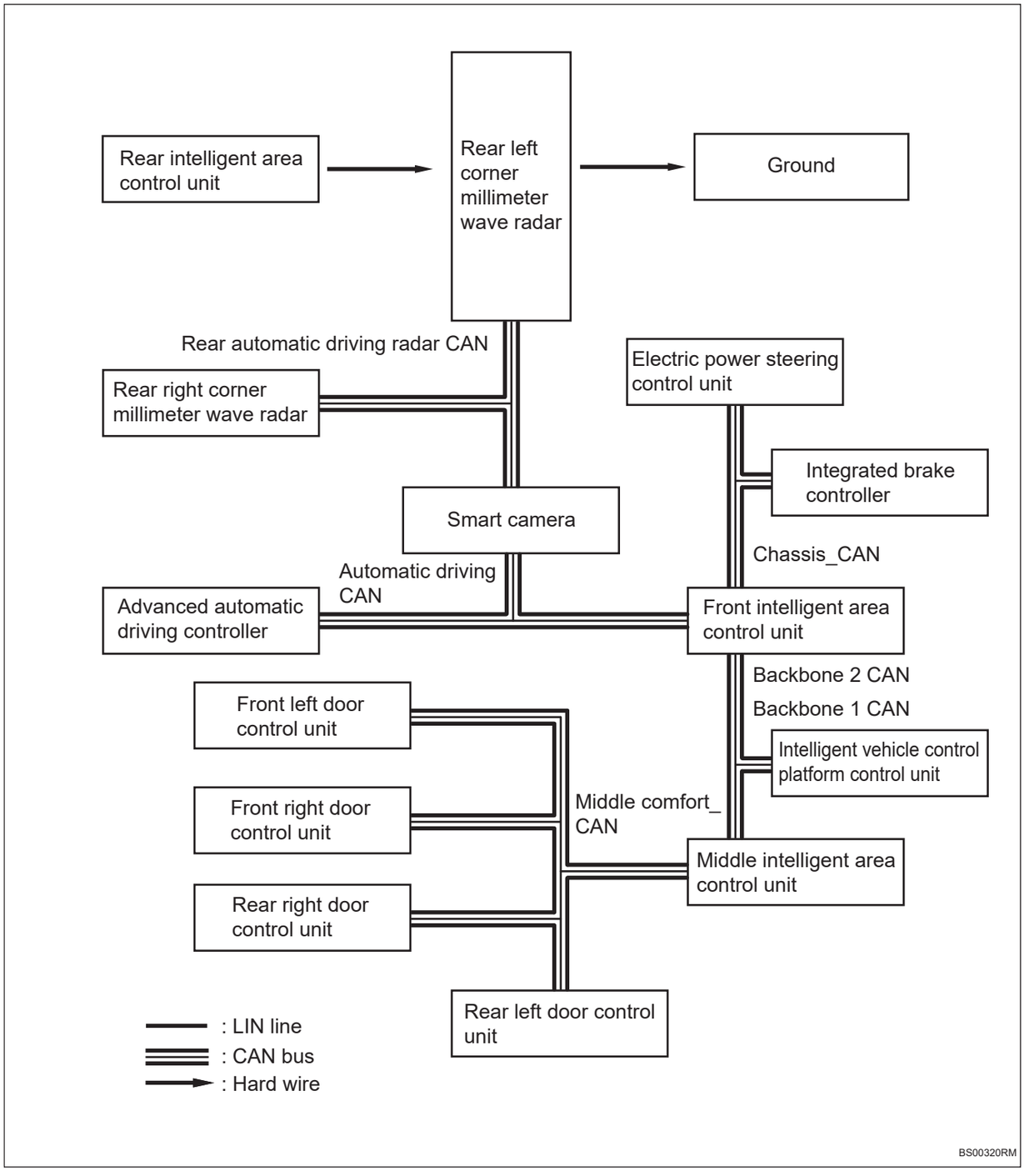
Rear left corner millimeter wave radar

Part position



BS00330RM

System diagram



System description

1. Function overview

(a) Driving alarm: Driving alarm system L2.9 uses 1 forward millimeter wave radar + 11 camera sensors to collect real-time environmental data around the body (L2 program only uses 2 rear corner radars). When the user is driving the vehicle or the vehicle is parked, the vehicle will automatically alarm the user based on the environmental information collected and judgment by the system, to assist the user to improve the safety of driving. Its functions are composed of

the following sub-functions: Door Open Warning (DOW), Blind Spot Detection (BSD), Lane Change Decision Assist (LCDA), Rear Collision Warning (RCW), Rear Cross Traffic Alert (RCTA), Front Cross Traffic Alert (FCTA), Rear Cross Traffic Braking (RCTB), Front Cross Traffic Braking (FCTB) (only models equipped with L2.9 function has the three functions of FCTA, RCTB and FCTB).

(b) Door Open Warning (DOW): In the parking state, the system monitors other road users behind both sides of the vehicle and sends warning signals when there is a risk of collision due to door opening, meeting the safety requirements for users to park vehicle and open door.

(c) Blind Spot Detection (BSD): Blind Spot Detection (BSD) function can monitor the area behind the side of the vehicle through perception system, which can detect the current position, driving speed, and driving direction of other vehicles in adjacent lanes within a certain range. If other vehicles are in a blind spot or approach the vehicle from behind at a high speed, the system will alert the driver to avoid the risk of a collision.

(d) Lane Change Assist (LCDA): Lane Change Assist (LCDA) monitors the adjacent lanes behind the vehicle. When there are vehicles with collision threats in the adjacent lanes behind, it reminds the driver to prevent traffic accidents caused by lane change due to blind spots or other reasons.

(e) Rear Collision Warning (RCW): Rear Collision Warning (RCW) monitors the area behind the vehicle. When there is a vehicle behind posing a risk of rear-end collision, it alerts the driver and the vehicle behind to reduce damage caused by collision.

(f) Rear Cross Traffic Alert (RCTA): Rear Cross Traffic Alert (RCTA) refers to monitoring the areas on both sides behind the vehicle during reversing. When there are vehicles approaching quickly in the areas on both sides behind the vehicle and there is a collision threat with the vehicle, it alerts the driver to avoid traffic accidents due to blind spots of the driver's vision when reversing.

(g) Front Cross Traffic Alert (FCTA): Front Cross Traffic Alert (FCTA) refers to monitoring vehicles on both sides in front of this vehicle. If there are crossing vehicles ahead, and there is a collision risk with this vehicle, it reminds the driver.

(h) Rear Cross Traffic Braking (RCTB): Rear Cross Traffic Braking (RCTB) refers to monitoring the vehicles on both sides behind the vehicle. When there is a laterally driving vehicle behind that has overlapping collision tracks with this vehicle, the system controls the vehicle to slow down to avoid collision.

(i) Front Cross Traffic Braking (FCTB): Front Cross Traffic Braking (FCTB) refers to monitoring the vehicles on both sides in front of the vehicle. When there is a laterally driving vehicle ahead that has overlapping collision tracks with this vehicle, the system controls the vehicle to slow down to avoid collision.

2. Function scenario

(a) DOW function scenario:

(1) After parking, if there are vehicles with non-zero relative speed or obstacles in the adjacent lanes behind this vehicle, the driver may be unable to observe and avoid them through the rear view mirror due to weather conditions such as rain, snow or heavy fog, or other factors such as poor visibility at night or blind spots, or may not have observed the rear view mirror. The DOW function provides vehicle and obstacle alerts in the blind spot range, preventing collisions when the driver and passengers open the door.

(b) BSD function scenario:

(1) The vehicle is driving normally, and there is a vehicle with a relative speed of non-zero in the adjacent lane behind the vehicle. Driver is unable to observe and avoid through the rear view mirror due to weather conditions such as rain, snow, heavy fog, poor visibility at night or blind spots. BSD function can provide vehicle prompts in blind spot range.

(c) LCDA function scenario:

(1) This vehicle is driving normally along the lane line. Due to weather conditions such as rain, snow and heavy fog, the visibility is poor at night, resulting in visual blind spots and other visual reasons, making it impossible to observe the situation of vehicles in adjacent lanes through the rear view mirror. The LCDA function can provide vehicle prompts.

(2) This vehicle is driving normally along the lane line. Turn on the turn signal light, turn the steering wheel, and there is an intention to change lanes. The LCDA function can provide vehicle prompts.

(d) RCW function scenario:

(1) The vehicle is driving normally on this road, but there is a risk of rear-end collision due to the relatively high speed of the vehicles behind. RCW alerts the driver and the vehicles behind.

(e) RCTA functional scenario:

(1) When reversing out of a conventional street-facing parking space, there are vehicles passing by quickly from behind the vehicle or the blind spots on both sides of the vehicle. RCTA can prompt driver to avoid collisions.

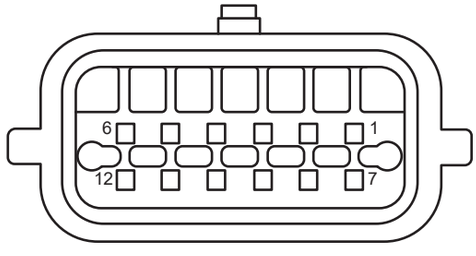
(2) When reversing at the intersection, vehicles are driving quickly in the blind spots behind or on both sides. RCTA can prompt driver to avoid collisions.

Data parameter

Rear left corner millimeter wave radar

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.5	0.25	0.2

ECU terminal



Rear left corner millimeter wave radar

BS00310RM

Rear left corner millimeter wave radar	
Pin number	**Definition**
1	Power supply input positive
2	-
3	-
4	CAN_L
5	Radar installation position identification A
6	-
7	-
8	-
9	CAN_H
10	Power supply input negative
11	-
12	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C134017	Rear left corner millimeter wave radar input end overvoltage	(See page ZD-3202)
C134016	Rear left corner millimeter wave radar input end undervoltage	(See page ZD-3202)
C134100	Radar no calibration	(See page ZD-3205)
C134200	Incorrect calibration of radar azimuthal angle	(See page ZD-3205)
C134300	Calibration angle out of limit of radar azimuthal angle too large	(See page ZD-3205)
C134400	Incorrect calibration of radar pitch angle	(See page ZD-3205)
C134500	Calibration angle out of limit of radar pitch angle too large	(See page ZD-3205)
C13464B	Radar temperature too high	(See page ZD-3208)
C134700	Radar blocked	(See page ZD-3210)
C134804	Storage fault, RF module fault	(See page ZD-3211)
C134904	RF module fault	(See page ZD-3211)
C134A00	Radar is interfered	(See page ZD-3212)
C134B00	Radar installation position is incorrect	(See page ZD-3213)
C134C00	Rear corner millimeter wave radar software version unmatched	(See page ZD-3215)
U007B88	Automatic driving control unit - rear radar CAN bus off	(See page ZD-3228)
U024287	Automatic parking/automatic driving control unit 2 node lost	(See page ZD-3216)
U023D87	Rear slave radar control unit node lost	(See page ZD-3216)
U114087	Body control unit 1 message missing	(See page ZD-3216)

DTC	Detection Items	See page
U119987	Front left door module message missing	(See page ZD-3216)
U120087	Front right door module message missing	(See page ZD-3216)
U120187	Rear left door module message missing	(See page ZD-3216)
U120287	Rear right door module message missing	(See page ZD-3216)
U129387	Vehicle controller message missing	(See page ZD-3216)
U113187	Electric power steering control unit message missing	(See page ZD-3216)
U014787	Middle PDC/left PDC node lost	(See page ZD-3216)
U112187	ABS/ESP/ESPwithAPB message missing	(See page ZD-3216)
U123187	Rain sensor message missing	(See page ZD-3216)
U12FF87	Electric wiper module message missing	(See page ZD-3216)
U054986	Automatic parking/automatic driving control unit 2 message content fault	(See page ZD-3216)
U042284	Body control unit 1 message content fault	(See page ZD-3216)
U049A84	Front left door module message content fault	(See page ZD-3216)
U050184	Front right door module message content fault	(See page ZD-3216)
U050284	Rear left door module message content fault	(See page ZD-3216)
U050384	Rear right door module message content fault	(See page ZD-3216)
U053484	Right lane change assist control unit LCDA message content fault	(See page ZD-3216)
U059482	Vehicle controller message content fault	(See page ZD-3216)
U059483	Vehicle controller message content fault	(See page ZD-3216)
U059484	Vehicle controller message content fault	(See page ZD-3216)
U059486	Vehicle controller message content fault	(See page ZD-3216)
U044782	Gateway message content fault	(See page ZD-3216)
U044783	Gateway message content fault	(See page ZD-3216)
U044784	Gateway message content fault	(See page ZD-3216)
U044786	Gateway message content fault	(See page ZD-3216)
U041582	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3216)
U041583	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3216)
U041584	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3216)
U041586	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3216)
U042082	Electric power steering control unit message content fault	(See page ZD-3216)
U042083	Electric power steering control unit message content fault	(See page ZD-3216)

DTC	Detection Items	See page
U042084	Electric power steering control unit message content fault	(See page ZD-3216)
U042086	Electric power steering control unit message content fault	(See page ZD-3216)
U05FF84	Electronic wiper message content fault	(See page ZD-3216)
U053284	Rain sensor message content fault	(See page ZD-3216)
U053286	Rain sensor message content fault	(See page ZD-3216)

DTC	**C134017**	**Rear left corner millimeter wave radar input end overvoltage**
DTC	**C134016**	**Rear left corner millimeter wave radar input end undervoltage**

Description

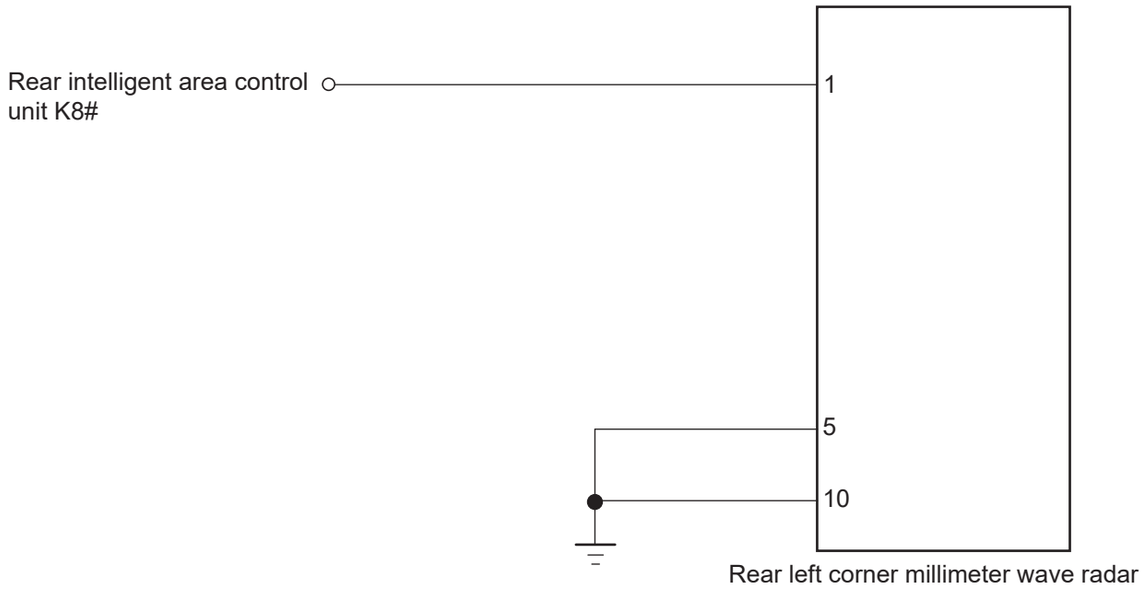
When rear left corner millimeter wave radar input voltage is too high or too low, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134017	• A delay of 1.5 to 2 seconds after power on and startup	The system voltage is detected and confirmed to be higher than 16.5 ± 0.2 V	2000 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar • Wire harness and connector • Battery/charging system
C134016	• A delay of 1.5 to 2 seconds after power on and startup	The system voltage is detected and confirmed to be higher than 16.5 ± 0.2 V	2000 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134017	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134016	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

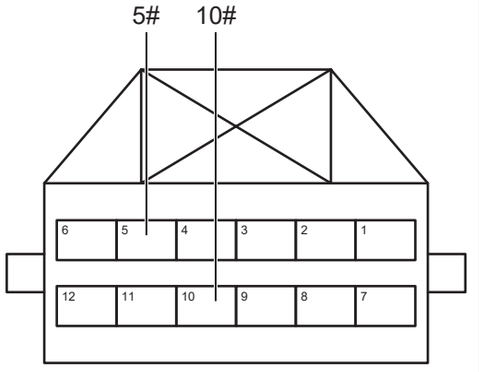
Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check rear left corner millimeter wave radar ground**



Rear left corner millimeter wave radar connector
BS03010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear left corner millimeter wave radar connector.

(d) According to value in the table, measure resistance.

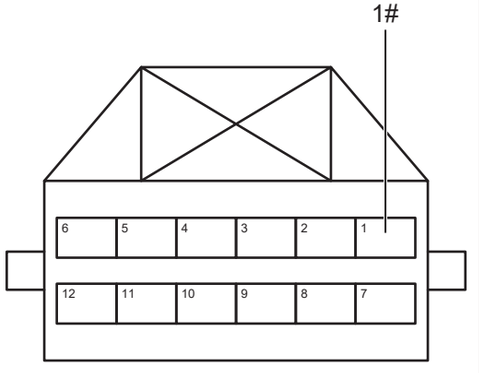
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 5# - body ground	Always connected	Less than 1 Ω
Rear left corner millimeter wave radar connector 10# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness or connector**

OK

3	**Check rear left corner millimeter wave radar power supply**



Rear left corner millimeter wave radar connector
BS03021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness or connector (if the wire harness and connector are not defective, check the power supply and ground of rear intelligent area control unit and confirm if rear intelligent area control unit is damaged)**

OK

Replace rear left corner millimeter wave radar (See page ZC-112)

DTC	C134100	Radar no calibration
DTC	C134200	Incorrect calibration of radar azimuthal angle
DTC	C134300	Calibration angle out of limit of radar azimuthal angle too large
DTC	C134400	Incorrect calibration of radar pitch angle
DTC	C134500	Calibration angle out of limit of radar pitch angle too large

Description

When rear left corner millimeter wave radar calibration is faulty, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134100	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar calibration count is 0	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar
C134200	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar azimuthal angle calibration mark is invalid	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar
C134300	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Too large calibration angle out of limit of radar azimuthal angle is detected during ECU adaptive calibration	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134400	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar pitch angle calibration mark is invalid	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar
C134500	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Too large calibration angle out of limit of radar pitch angle is detected during ECU adaptive calibration	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134100	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134200	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134300	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134400	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134500	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Perform calibration procedure for rear left corner millimeter wave radar**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Perform calibration procedure for rear left corner millimeter wave radar.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear left corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C13464B	Radar temperature too high

Description

When rear left corner millimeter wave radar temperature is too high, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C13464B	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Radar temperature > 125° C	2000 ms	Continuous type	50 ms	• Ambient temperature • Rear left corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C13464B	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Rear left corner millimeter wave radar cooling

(a) Lower the rear left corner millimeter wave radar temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C134700	Radar blocked

Description

When rear left corner millimeter wave radar is dirty or blocked, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134700	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Blocking sign position 1	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134700	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Check rear left corner millimeter wave radar

(a) Check rear left corner millimeter wave radar for dirt.

(b) Check rear left corner millimeter wave radar for blocking.

NG → **Clean rear left corner millimeter wave radar or remove obstruction**

OK

Replace rear left corner millimeter wave radar (See page ZC-112)

DTC	**C134804**	**Storage fault**
DTC	**C134904**	**Storage fault, RF module fault**

Description

When rear left corner millimeter wave radar data is abnormal or radar hardware is damaged, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134804	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	NVM storage fault flag bit 1	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar
C134904	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	RF module fault bit 1	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134804	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C134904	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Restart rear left corner millimeter wave radar**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs, restart rear left corner millimeter wave radar.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace rear left corner millimeter wave radar (See page ZC-112)**

ZD

OK

Diagnosis ends

DTC	C134A00	Radar is interfered

Description

When rear left corner millimeter wave radar is interfered, the rear left corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134A00	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Algorithm module detects that radar is interfered	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134A00	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Check interference source around rear left corner millimeter wave radar**

(a) Remove co-frequency interference source around rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC C134B00 Radar installation position is incorrect

Description

When installation angle of rear left corner millimeter wave radar is out of range, the rear left corner millimeter wave radar records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134B00	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Installation position of radar is detected to be unmatched with the stored calibration position	200 ms	Continuous type	10 ms	• Rear left corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134B00	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Check rear left corner millimeter wave radar

(a) Check if the installation angle of rear left corner millimeter wave radar is correct.

(b) Check if rear left corner millimeter wave radar is installed securely.

NG → **Perform repair according to malfunction**

OK

2	Calibrate rear left corner millimeter wave radar

(a) Calibrate the rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C134C00	Rear corner millimeter wave radar software version unmatched

Description

When rear left/right corner millimeter wave radar software version is abnormal, the rear left corner millimeter wave radar records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C134C00	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Inconsistent radar software versions are detected on left and right sides	3 times in a row	Event-based	10 ms	• Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C134C00	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Check radar software version and upgrade to required version**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Upgrade the rear left/right corner millimeter wave radar software to the required version (rear left/right corner millimeter wave radar version should be same)

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left/right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	**U024287**	**IFC node lost**
DTC	**U023D87**	**Rear slave radar control unit node lost**
DTC	**U114087**	**VDC821MCU message missing**

DTC	U119987	Front left door module message missing
DTC	U120087	Front right door module message missing
DTC	U120287	Rear right door module message missing
DTC	U120187	Rear left door module message missing
DTC	U129387	VDC397 message missing
DTC	U113187	Electric power steering control unit message missing
DTC	U014787	PDCM node lost
DTC	U112187	IBC message missing
DTC	U123187	Rain sensor message missing
DTC	U12FF87	Electric wiper module message missing
DTC	U054986	VDC821MCU power supply mode signal content fault
DTC	U042284	VDC821MCU message content fault
DTC	U049A84	Front left door module message content fault
DTC	U050184	Front right door module message content fault
DTC	U050284	Rear left door module message content fault
DTC	U050384	Rear right door module message content fault
DTC	U053484	Rear slave radar message content fault
DTC	U059482	VDC397 message content fault
DTC	U059483	VDC397 message content fault
DTC	U059484	VDC397 message content fault
DTC	U059486	VDC397 message content fault
DTC	U044782	PDCM message content fault
DTC	U044783	PDCM message content fault

DTC	**U044784**	**PDCM message content fault**
DTC	**U044786**	**PDCM message content fault**
DTC	**U041582**	**IBC message content fault**
DTC	**U041583**	**IBC message content fault**
DTC	**U041584**	**IBC message content fault**
DTC	**U041586**	**IBC message content fault**
DTC	**U042082**	**Electric power steering control unit message content fault**
DTC	**U042083**	**Electric power steering control unit message content fault**
DTC	**U042084**	**Electric power steering control unit message content fault**
DTC	**U042086**	**Electric power steering control unit message content fault**
DTC	**U05FF84**	**Electronic wiper message content fault**
DTC	**U053284**	**Rain sensor message content fault**
DTC	**U053286**	**Rain sensor message content fault**

Description

When communication between rear right corner millimeter wave radar and other systems is abnormal or interrupted, the rear right corner millimeter wave radar records DTC.

DTC No.	DTC detection condition	Faulty area
U024287	(a) Automatic parking/automatic driving control unit 2 node lost.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Advanced automatic driving controller
U023D87	(a) Rear slave radar control unit node lost.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U114087	(a) Body control unit 1 message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

DTC No.	DTC detection condition	Faulty area
		• Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U119987	(a) Front left door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front left door control unit
U120087	(a) Front right door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front right door control unit
U120287	(a) Rear right door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear right door control unit
U120187	(a) Rear left door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear left door control unit
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U113187	(a) Electric power steering control unit message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
U014787	(a) Middle PDC/left PDC node lost.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U112187	(a) ABS/ESP/ESPwithAPB message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U123187	(a) Rain sensor message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U12FF87	(a) Electric wiper module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U054986	(a) Automatic parking/automatic driving control unit 2 message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Advanced automatic driving controller
U042284	(a) Body control unit 1 message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U049A84	(a) Front left door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front left door control unit

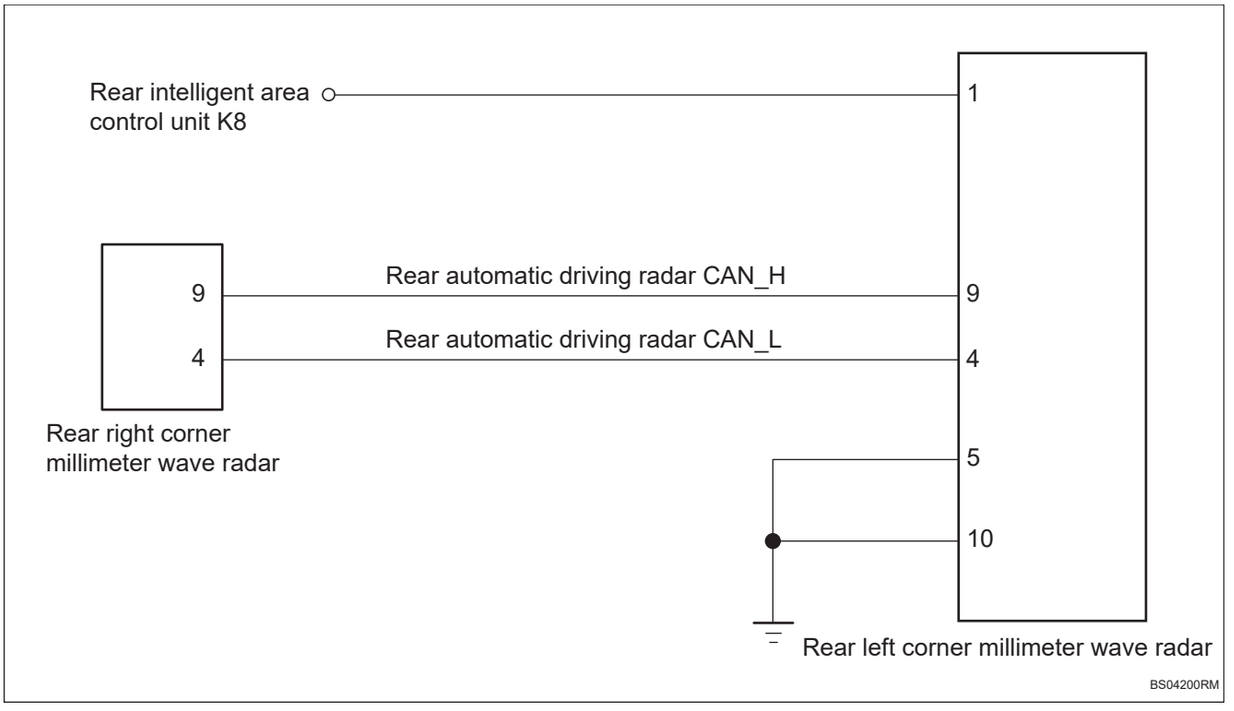
DTC No.	DTC detection condition	Faulty area
U050184	(a) Front right door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front right door control unit
U050284	(a) Rear left door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear left door control unit
U050384	(a) Rear right door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear right door control unit
U053484	(a) Right lane change assist control unit LCDA message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U059482	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059483	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059484	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit

DTC No.	DTC detection condition	Faulty area
U059486	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U044782	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044783	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044784	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044786	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U041582	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U041583	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U041584	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U041586	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U042082	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042083	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042084	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042086	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U05FF84	(a) Electronic wiper message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit

DTC No.	DTC detection condition	Faulty area
U053284	(a) Rain sensor message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U053286	(a) Rain sensor message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit

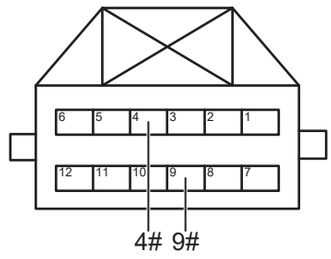
Circuit diagram



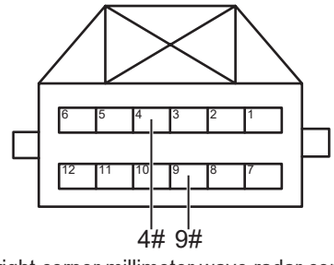
Inspection procedure

Note: Taking the U023D87 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear automatic driving radar CAN bus (rear right corner millimeter wave radar - rear left corner millimeter wave radar)**



Rear left corner millimeter wave radar connector



Rear right corner millimeter wave radar connector

BS04211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

Standard value

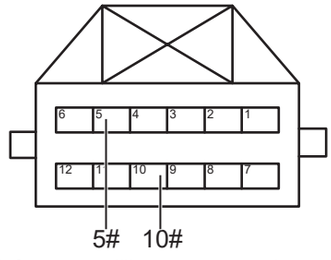
Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - rear left corner millimeter wave radar connector 9#	Always connected	Less than 1 Ω
Rear right corner millimeter wave radar connector 4# - rear left corner millimeter wave radar connector 4#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear left corner millimeter wave radar ground**



Rear left corner millimeter wave radar connector

BS04221RM

(a) According to value in the table, measure resistance.

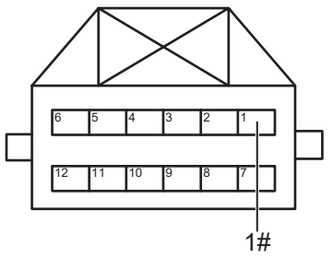
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 5# - body ground	Always connected	Less than 1 Ω
Rear left corner millimeter wave radar connector 10# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear left corner millimeter wave radar power supply**



Rear left corner millimeter wave radar connector

BS04231RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

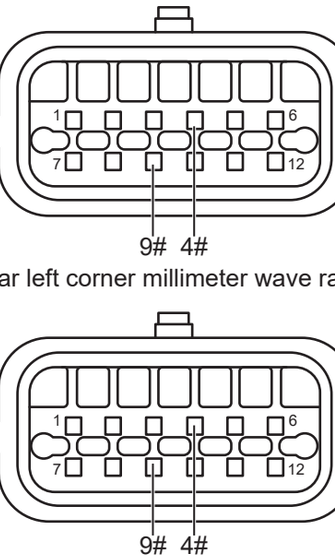
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check rear automatic driving radar CAN bus terminal resistance**



BS04241RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 4# - rear left corner millimeter wave radar connector 9#	Always connected	Approximately 120 Ω
Rear right corner millimeter wave radar connector 4# - rear right corner millimeter wave radar connector 9#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace rear left corner millimeter wave radar (See page ZC-112)**

(a) Replace the rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

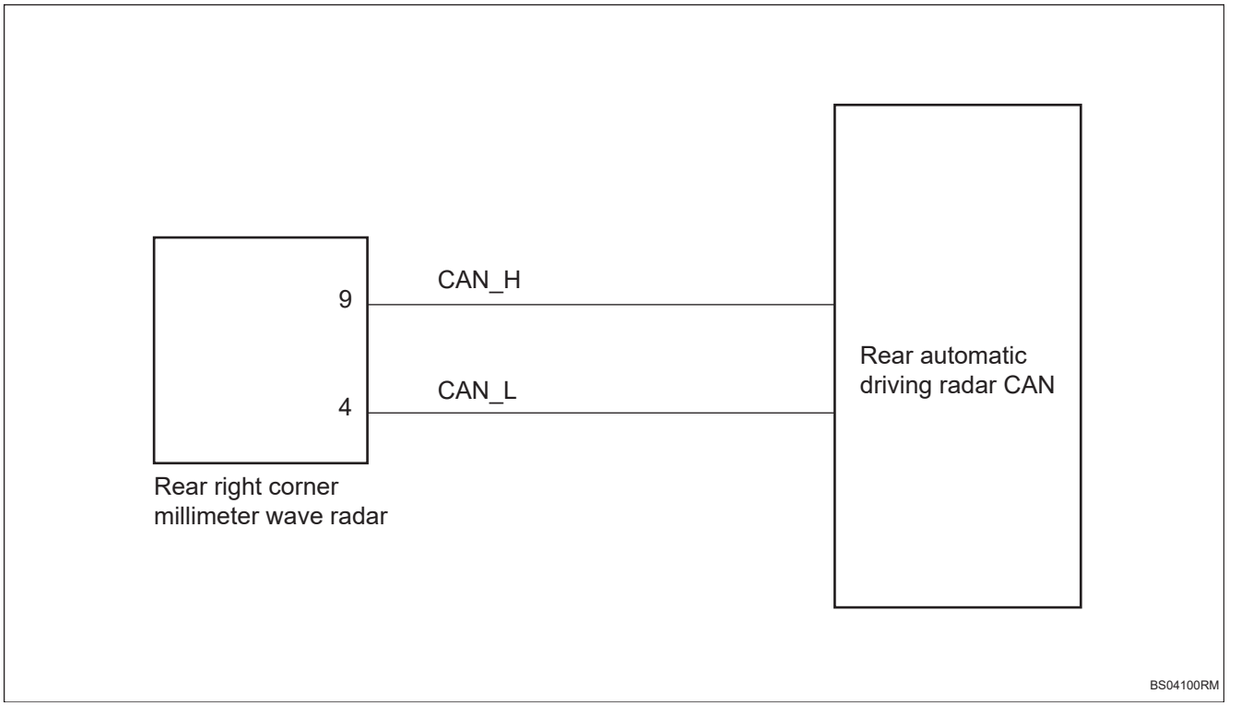
DTC	U007B88	Automatic driving control unit - rear radar CAN bus off

Description

When rear right corner millimeter wave radar detects rear automatic driving radar CAN bus off fault, the rear right corner millimeter wave radar records DTCs.

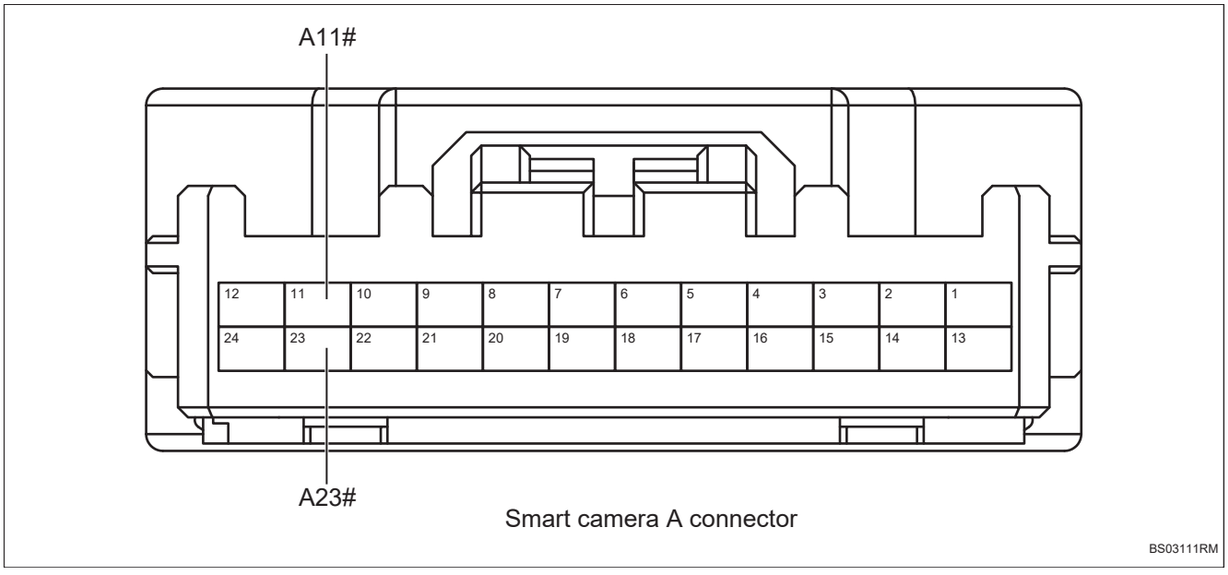
DTC No.	DTC detection condition	Faulty area
U007B88	(a) Automatic driving control unit - rear radar CAN bus off.	• CAN line and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

Circuit diagram



Inspection procedure

1	**Check rear automatic driving radar CAN terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A32# - smart camera connector A31#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controller on automatic driving radar 3 CAN bus**

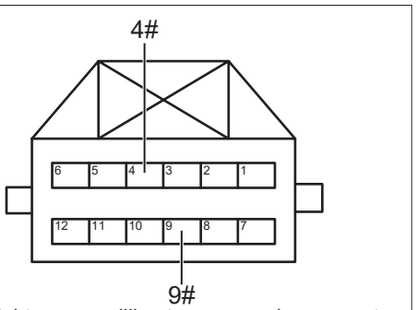
(a) Disconnect the controllers on rear automatic driving radar CAN bus one by one and check if other controller resumes operating.

ZD

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear automatic driving radar CAN bus CAN-L and CAN-H**



Rear right corner millimeter wave radar connector
BS04111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

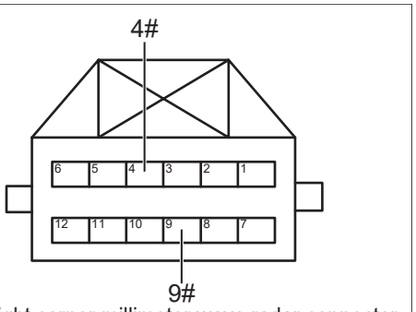
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - rear right corner millimeter wave radar connector 4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in rear automatic driving radar CAN bus**



Rear right corner millimeter wave radar connector
BS04111RM

(a) According to value in the table, measure resistance.

Standard value

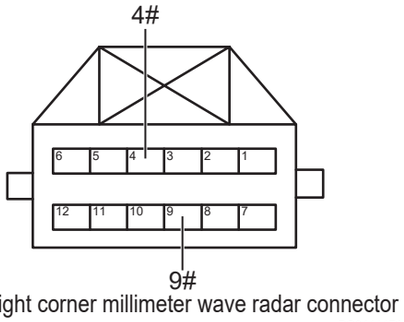
Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - body ground	Always connected	10 KΩ or more
Rear right corner millimeter wave radar connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in rear automatic driving radar CAN bus**



Rear right corner millimeter wave radar connector

BS04111RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right corner millimeter wave radar connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

ZD

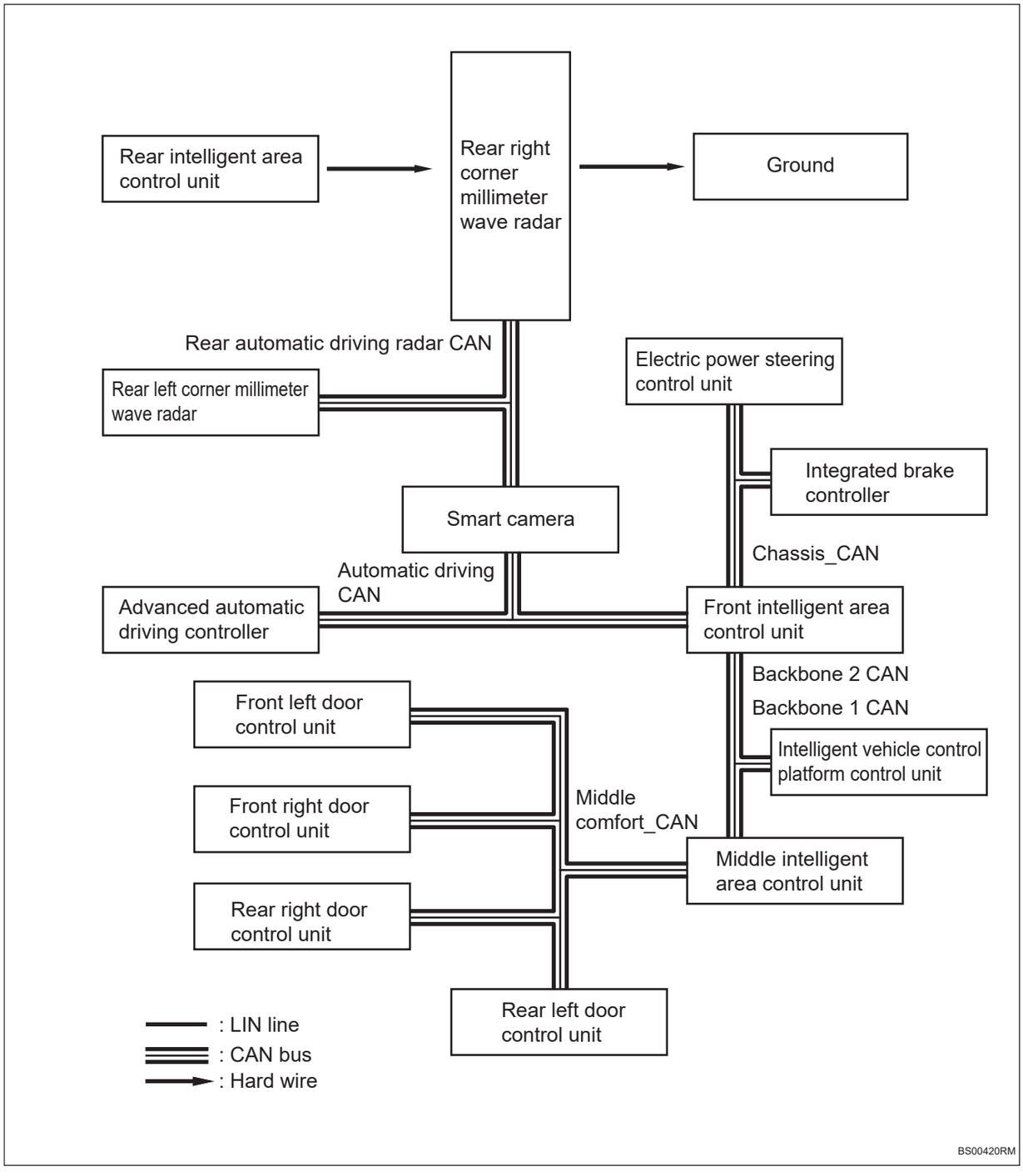
Rear right corner millimeter wave radar

Part position



BS00430RM

System diagram



System description

1. Function overview

(a) Driving alarm: Driving alarm system L2.9 uses 1 forward millimeter wave radar + 11 camera sensors to collect real-time environmental data around the body (L2 program only uses 2 rear corner radars). When the user is driving the vehicle or the vehicle is parked, the vehicle will automatically alarm the user based on the environmental information collected and judgment by the system, to assist the user to improve the safety of driving. Its functions are composed of

the following sub-functions: Door Open Warning (DOW), Blind Spot Detection (BSD), Lane Change Decision Assist (LCDA), Rear Collision Warning (RCW), Rear Cross Traffic Alert (RCTA), Front Cross Traffic Alert (FCTA), Rear Cross Traffic Braking (RCTB), Front Cross Traffic Braking (FCTB) (only models equipped with L2.9 function has the three functions of FCTA, RCTB and FCTB).

(b) Door Open Warning (DOW): In the parking state, the system monitors other road users behind both sides of the vehicle and sends warning signals when there is a risk of collision due to door opening, meeting the safety requirements for users to park vehicle and open door.

(c) Blind Spot Detection (BSD): Blind Spot Detection (BSD) function can monitor the area behind the side of the vehicle through perception system, which can detect the current position, driving speed, and driving direction of other vehicles in adjacent lanes within a certain range. If other vehicles are in a blind spot or approach the vehicle from behind at a high speed, the system will alert the driver to avoid the risk of a collision.

(d) Lane Change Assist (LCDA): Lane Change Assist (LCDA) monitors the adjacent lanes behind the vehicle. When there are vehicles with collision threats in the adjacent lanes behind, it reminds the driver to prevent traffic accidents caused by lane change due to blind spots or other reasons.

(e) Rear Collision Warning (RCW): Rear Collision Warning (RCW) monitors the area behind the vehicle. When there is a vehicle behind posing a risk of rear-end collision, it alerts the driver and the vehicle behind to reduce damage caused by collision.

(f) Rear Cross Traffic Alert (RCTA): Rear Cross Traffic Alert (RCTA) refers to monitoring the areas on both sides behind the vehicle during reversing. When there are vehicles approaching quickly in the areas on both sides behind the vehicle and there is a collision threat with the vehicle, it alerts the driver to avoid traffic accidents due to blind spots of the driver's vision when reversing.

(g) Front Cross Traffic Alert (FCTA): Front Cross Traffic Alert (FCTA) refers to monitoring vehicles on both sides in front of this vehicle. If there are crossing vehicles ahead, and there is a collision risk with this vehicle, it reminds the driver.

(h) Rear Cross Traffic Braking (RCTB): Rear Cross Traffic Braking (RCTB) refers to monitoring the vehicles on both sides behind the vehicle. When there is a laterally driving vehicle behind that has overlapping collision tracks with this vehicle, the system controls the vehicle to slow down to avoid collision.

(i) Front Cross Traffic Braking (FCTB): Front Cross Traffic Braking (FCTB) refers to monitoring the vehicles on both sides in front of the vehicle. When there is a laterally driving vehicle ahead that has overlapping collision tracks with this vehicle, the system controls the vehicle to slow down to avoid collision.

2. Function scenario

(a) DOW function scenario:

(1) After parking, if there are vehicles with non-zero relative speed or obstacles in the adjacent lanes behind this vehicle, the driver may be unable to observe and avoid them through the rear view mirror due to weather conditions such as rain, snow or heavy fog, or other factors such as poor visibility at night or blind spots, or may not have observed the rear view mirror. The DOW function provides vehicle and obstacle alerts in the blind spot range, preventing collisions when the driver and passengers open the door.

(b) BSD function scenario:

(1) The vehicle is driving normally, and there is a vehicle with a relative speed of non-zero in the adjacent lane behind the vehicle. Driver is unable to observe and avoid through the rear view mirror due to weather conditions such as rain, snow, heavy fog, poor visibility at night or blind spots. BSD function can provide vehicle prompts in blind spot range.

(c) LCDA function scenario:

(1) This vehicle is driving normally along the lane line. Due to weather conditions such as rain, snow and heavy fog, the visibility is poor at night, resulting in visual blind spots and other visual reasons, making it impossible to observe the situation of vehicles in adjacent lanes through the rear view mirror. The LCDA function can provide vehicle prompts.

(2) This vehicle is driving normally along the lane line. Turn on the turn signal light, turn the steering wheel, and there is an intention to change lanes. The LCDA function can provide vehicle prompts.

(d) RCW function scenario:

(1) The vehicle is driving normally on this road, but there is a risk of rear-end collision due to the relatively high speed of the vehicles behind. RCW alerts the driver and the vehicles behind.

(e) RCTA functional scenario:

(1) When reversing out of a conventional street-facing parking space, there are vehicles passing by quickly from behind the vehicle or the blind spots on both sides of the vehicle. RCTA can prompt driver to avoid collisions.

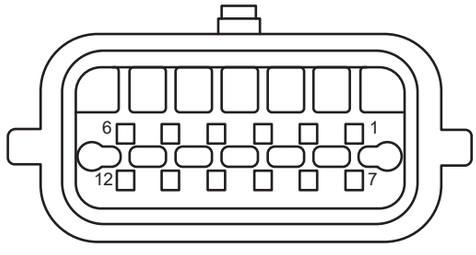
(2) When reversing at the intersection, vehicles are driving quickly in the blind spots behind or on both sides. RCTA can prompt driver to avoid collisions.

Data parameter

Rear right corner millimeter wave radar

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.5	0.25	0.2

ECU terminal



Rear right corner millimeter wave radar

BS00410RM

Rear right corner millimeter wave radar	
Pin number	**Definition**
1	Power supply
2	-
3	-
4	CAN L
5	Radar installation position identification A-
6	-
7	-
8	-
9	CAN H
10	Ground
11	Radar installation position identification B-
12	-

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
C136017	Rear right corner millimeter wave radar input end overvoltage	(See page ZD-3238)
C136016	Rear right corner millimeter wave radar input end undervoltage	(See page ZD-3238)
C136100	Radar no calibration	(See page ZD-3241)
C136200	Incorrect calibration of radar azimuthal angle	(See page ZD-3241)
C136300	Calibration angle out of limit of radar azimuthal angle too large	(See page ZD-3241)
C136400	Incorrect calibration of radar pitch angle	(See page ZD-3241)
C136500	Calibration angle out of limit of radar pitch angle too large	(See page ZD-3241)
C13664B	Radar temperature too high	(See page ZD-3244)
C136700	Radar blocked	(See page ZD-3246)
C136804	Storage fault	(See page ZD-3247)
C136904	RF module fault	(See page ZD-3247)
C136B00	Radar installation position is incorrect	(See page ZD-3248)
U007B88	Automatic driving control unit - rear radar CAN bus off	(See page ZD-3261)
U024287	Automatic parking/automatic driving control unit 2 node lost	(See page ZD-3250)
U023D87	Rear slave radar control unit node lost	(See page ZD-3250)
U114087	Body control unit 1 message missing	(See page ZD-3250)
U119987	Front left door module message missing	(See page ZD-3250)
U120087	Front right door module message missing	(See page ZD-3250)

DTC	Detection Items	See page
U120187	Rear left door module message missing	(See page ZD-3250)
U120287	Rear right door module message missing	(See page ZD-3250)
U129387	Vehicle controller message missing	(See page ZD-3250)
U113187	Electric power steering control unit message missing	(See page ZD-3250)
U014787	Middle PDC/left PDC node lost	(See page ZD-3250)
U112187	ABS/ESP/ESPwithAPB message missing	(See page ZD-3250)
U123187	Rain sensor message missing	(See page ZD-3250)
U12FF87	Electric wiper module message missing	(See page ZD-3250)
U054986	Automatic parking/automatic driving control unit 2 message content fault	(See page ZD-3250)
U042284	Body control unit 1 message content fault	(See page ZD-3250)
U049A84	Front left door module message content fault	(See page ZD-3250)
U050184	Front right door module message content fault	(See page ZD-3250)
U050284	Rear left door module message content fault	(See page ZD-3250)
U050384	Rear right door module message content fault	(See page ZD-3250)
U053484	Right lane change assist control unit LCDA message content fault	(See page ZD-3250)
U059482	Vehicle controller message content fault	(See page ZD-3250)
U059483	Vehicle controller message content fault	(See page ZD-3250)
U059484	Vehicle controller message content fault	(See page ZD-3250)
U059486	Vehicle controller message content fault	(See page ZD-3250)
U044782	Gateway message content fault	(See page ZD-3250)
U044783	Gateway message content fault	(See page ZD-3250)
U044784	Gateway message content fault	(See page ZD-3250)
U044786	Gateway message content fault	(See page ZD-3250)
U041582	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3250)
U041583	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3250)
U041584	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3250)
U041586	ABS/ESP/ESPwithAPB message content fault	(See page ZD-3250)
U042082	Electric power steering control unit message content fault	(See page ZD-3250)
U042083	Electric power steering control unit message content fault	(See page ZD-3250)
U042084	Electric power steering control unit message content fault	(See page ZD-3250)

DTC	Detection Items	See page
U042086	Electric power steering control unit message content fault	(See page ZD-3250)
U05FF84	Electronic wiper message content fault	(See page ZD-3250)
U053284	Rain sensor message content fault	(See page ZD-3250)
U053286	Rain sensor message content fault	(See page ZD-3250)

DTC	**C136017**	**Rear right corner millimeter wave radar input end overvoltage**
DTC	**C136016**	**Rear right corner millimeter wave radar input end undervoltage**

Description

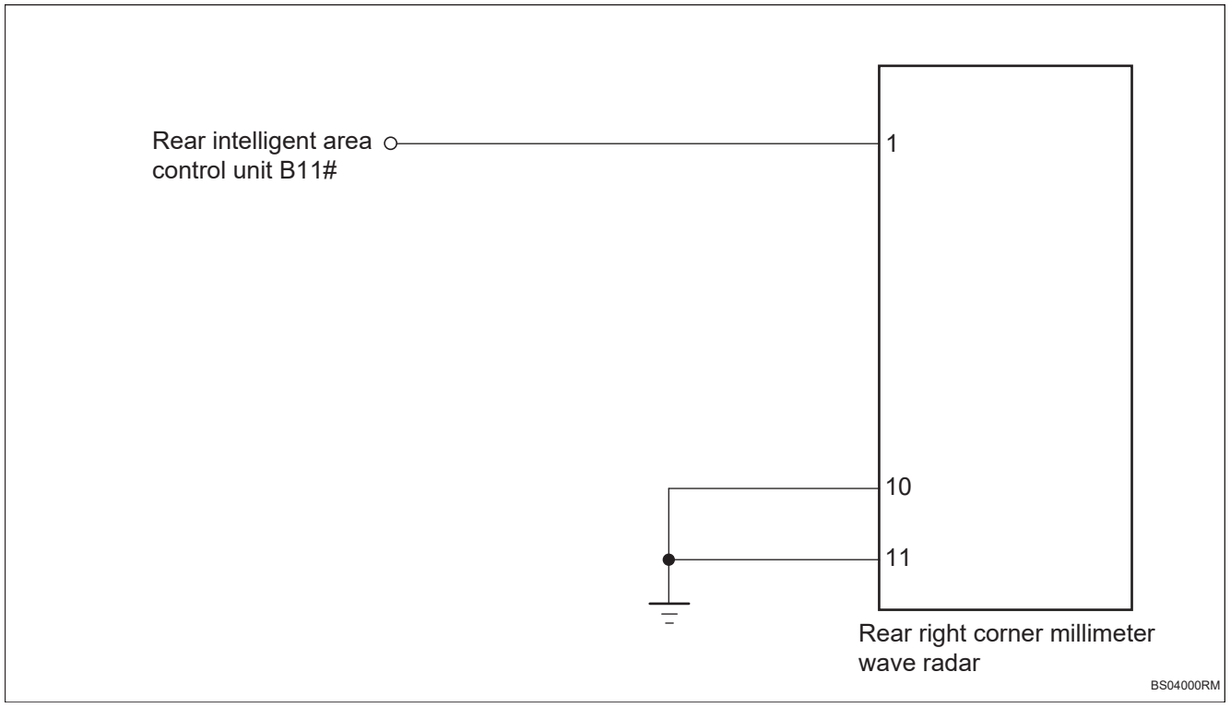
When rear right corner millimeter wave radar input voltage is too high or too low, the rear right corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136017	• A delay of 1.5 to 2 seconds after power on and startup	The system voltage is detected and confirmed to be higher than 16.5 ± 0.2 V	2000 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar • Wire harness and connector • Battery/charging system
C136016	• A delay of 1.5 to 2 seconds after power on and startup	The system voltage is detected and confirmed to be lower than 8.5 ± 0.2 V	2000 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar • Wire harness and connector • Battery/charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C136017	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136016	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

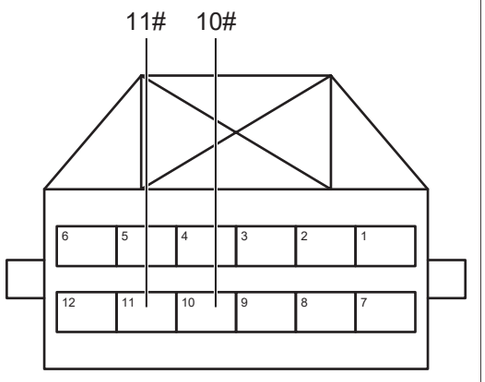
Standard value

Multimeter connection	Detection condition	Specified condition
Battery positive - battery negative	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check rear right corner millimeter wave radar ground**



Rear right corner millimeter wave radar connector

BS04010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the rear right corner millimeter wave radar connector.

(d) According to value in the table, measure resistance.

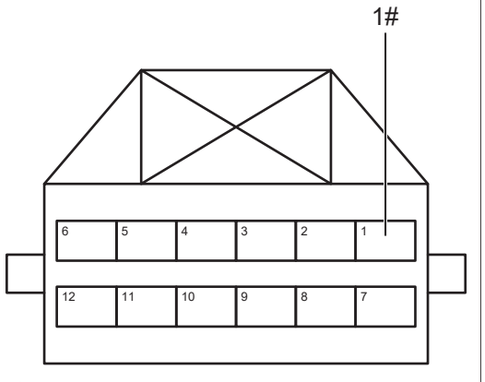
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 10# - body ground	Always connected	Less than 1 Ω
Rear right corner millimeter wave radar connector 11# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness or connector**

OK

3	**Check rear right corner millimeter wave radar power supply**



Rear right corner millimeter wave radar connector

BS04021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG

Check and repair or replace wire harness or connector (if the wire harness and connector are not defective, check the power supply and ground of rear intelligent area control unit and confirm if rear intelligent area control unit is damaged)

OK

Replace rear right corner millimeter wave radar (See page ZC-112)

DTC	**C136100**	**Radar no calibration**
DTC	**C136200**	**Incorrect calibration of radar azimuthal angle**
DTC	**C136300**	**Calibration angle out of limit of radar azimuthal angle too large**
DTC	**C136400**	**Incorrect calibration of radar pitch angle**
DTC	**C136500**	**Calibration angle out of limit of radar pitch angle too large**

Description

When rear right corner millimeter wave radar calibration is faulty, the rear right corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136100	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar calibration count is 0	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar
C136200	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar azimuthal angle calibration mark is invalid	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar
C136300	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Too large calibration angle out of limit of radar azimuthal angle is detected during ECU adaptive calibration	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136400	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	ECU detects that the radar pitch angle calibration mark is invalid	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar
C136500	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Too large calibration angle out of limit of radar pitch angle is detected during ECU adaptive calibration	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C136100	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136200	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136300	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136400	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136500	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Perform calibration procedure for rear right corner millimeter wave radar**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Perform calibration procedure for rear right corner millimeter wave radar.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C13664B	Radar temperature too high

Description

When rear right corner millimeter wave radar temperature is too high, the rear right corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C13464B	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Radar temperature > 125° C	2000 ms	Continuous type	50 ms	• Ambient temperature • Rear right corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C13464B	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Rear right corner millimeter wave radar cooling

(a) Lower the rear right corner millimeter wave radar temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:

No DTC outputs.

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C136700	Radar blocked

Description

When rear right corner millimeter wave radar is dirty or blocked, the rear right corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136700	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Blocking sign position 1	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C136700	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Check rear right corner millimeter wave radar

(a) Check rear right corner millimeter wave radar for dirt.

(b) Check rear right corner millimeter wave radar for blocking.

NG → **Clean rear right corner millimeter wave radar or remove obstruction**

OK

Replace rear right corner millimeter wave radar (See page ZC-112)

DTC	C136804	Storage fault
DTC	C136904	RF module fault

Description

When rear right corner millimeter wave radar data is abnormal or radar hardware is damaged, the rear right corner millimeter wave radar records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136804	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	NVM storage fault flag bit 1	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar
C136904	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	RF module fault bit 1	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C136804	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on
C136904	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	Restart rear right corner millimeter wave radar

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs, restart rear right corner millimeter wave radar.

(d) Read DTCs again.

Result	Proceed to
DTCs exist	NG
DTCs do not exist	OK

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

DTC	C136B00	Radar installation position is incorrect

Description

When installation angle of rear right corner millimeter wave radar is out of range, the rear right corner millimeter wave radar records DTCs.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
C136B00	• A delay of 1.5 to 2 seconds after power on and startup • Power supply voltage is within normal range of 9 ~ 16 V	Installation position of radar is detected to be unmatched with the stored calibration position	200 ms	Continuous type	10 ms	• Rear right corner millimeter wave radar

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
C136B00	• Invalid point cloud track data, sending default value • Alarm function failure (only for low configuration radar)	Comes on

Inspection procedure

1	**Check rear right corner millimeter wave radar**

(a) Check if the installation angle of rear right corner millimeter wave radar is correct.

(b) Check if rear right corner millimeter wave radar is installed securely.

NG → **Perform repair according to malfunction**

OK

2	**Calibrate rear right corner millimeter wave radar**

(a) Calibrate the rear right corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

ZD

DTC	U024287	IFC node lost
DTC	U023D87	Rear slave radar control unit node lost
DTC	U114087	VDC821MCU message missing
DTC	U119987	Front left door module message missing
DTC	U120087	Front right door module message missing
DTC	U120287	Rear right door module message missing
DTC	U120187	Rear left door module message missing
DTC	U129387	VDC397 message missing
DTC	U113187	Electric power steering control unit message missing
DTC	U014787	PDCM node lost
DTC	U112187	IBC message missing
DTC	U123187	Rain sensor message missing
DTC	U12FF87	Electric wiper module message missing
DTC	U054986	VDC821MCU power supply mode signal content fault
DTC	U042284	VDC821MCU message content fault
DTC	U049A84	Front left door module message content fault
DTC	U050184	Front right door module message content fault
DTC	U050284	Rear left door module message content fault
DTC	U050384	Rear right door module message content fault
DTC	U053484	Rear slave radar message content fault
DTC	U059482	VDC397 message content fault
DTC	U059483	VDC397 message content fault
DTC	U059484	VDC397 message content fault

DTC	**U059486**	**VDC397 message content fault**
DTC	**U044782**	**PDCM message content fault**
DTC	**U044783**	**PDCM message content fault**
DTC	**U044784**	**PDCM message content fault**
DTC	**U044786**	**PDCM message content fault**
DTC	**U041582**	**IBC message content fault**
DTC	**U041583**	**IBC message content fault**
DTC	**U041584**	**IBC message content fault**
DTC	**U041586**	**IBC message content fault**
DTC	**U042082**	**Electric power steering control unit message content fault**
DTC	**U042083**	**Electric power steering control unit message content fault**
DTC	**U042084**	**Electric power steering control unit message content fault**
DTC	**U042086**	**Electric power steering control unit message content fault**
DTC	**U05FF84**	**Electronic wiper message content fault**
DTC	**U053284**	**Rain sensor message content fault**
DTC	**U053286**	**Rain sensor message content fault**

Description

When communication between rear right corner millimeter wave radar and other systems is abnormal or interrupted, the rear right corner millimeter wave radar records DTC.

DTC No.	DTC detection condition	Faulty area
U024287	(a) Automatic parking/automatic driving control unit 2 node lost.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Advanced automatic driving controller
U023D87	(a) Rear slave radar control unit node lost.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U114087	(a) Body control unit 1 message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U119987	(a) Front left door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front left door control unit
U120087	(a) Front right door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front right door control unit
U120287	(a) Rear right door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear right door control unit
U120187	(a) Rear left door module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear left door control unit
U129387	(a) Vehicle controller message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U113187	(a) Electric power steering control unit message missing.	• Wire harness and connector

DTC No.	DTC detection condition	Faulty area
		• Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U014787	(a) Middle PDC/left PDC node lost.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U112187	(a) ABS/ESP/ESPwithAPB message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U123187	(a) Rain sensor message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U12FF87	(a) Electric wiper module message missing.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U054986	(a) Automatic parking/automatic driving control unit 2 message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Advanced automatic driving controller
U042284	(a) Body control unit 1 message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U049A84	(a) Front left door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar

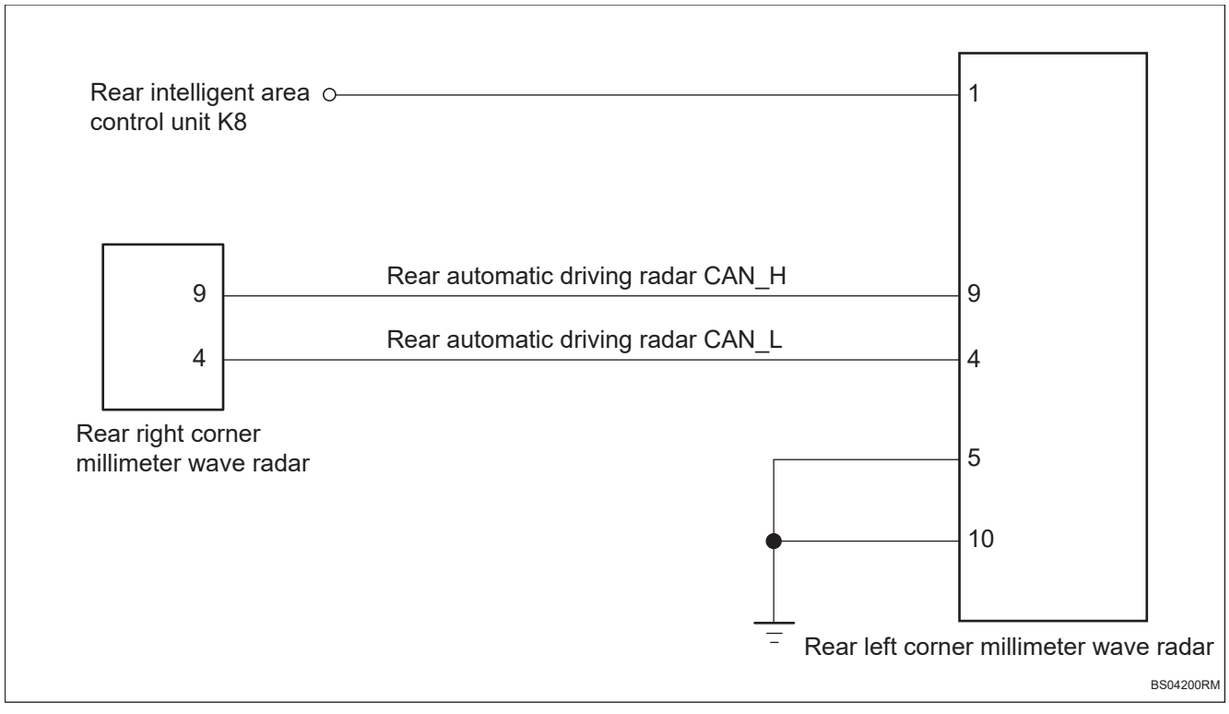
DTC No.	DTC detection condition	Faulty area
		• Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front left door control unit
U050184	(a) Front right door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Front right door control unit
U050284	(a) Rear left door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear left door control unit
U050384	(a) Rear right door module message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear right door control unit
U053484	(a) Right lane change assist control unit LCDA message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U059482	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059483	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059484	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar

DTC No.	DTC detection condition	Faulty area
		• Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U059486	(a) Vehicle controller message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U044782	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044783	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044784	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U044786	(a) Gateway message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Middle intelligent area control unit
U041582	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U041583	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

DTC No.	DTC detection condition	Faulty area
		• Smart camera • Front intelligent area control unit • Integrated brake controller
U041584	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U041586	(a) ABS/ESP/ESPwithAPB message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Integrated brake controller
U042082	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042083	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042084	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042086	(a) Electric power steering control unit message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Electric power steering control unit
U05FF84	(a) Electronic wiper message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit
U053284	(a) Rain sensor message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit
U053286	(a) Rain sensor message content fault.	• Wire harness and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit

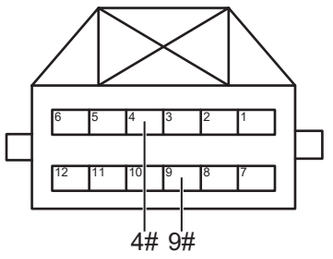
Circuit diagram



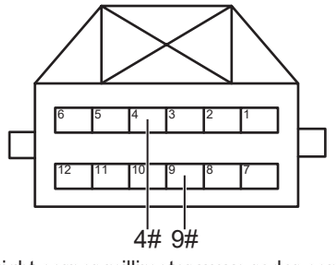
Inspection procedure

Note: Taking the U023D87 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear automatic driving radar CAN bus (rear right corner millimeter wave radar - rear left corner millimeter wave radar)**



Rear left corner millimeter wave radar connector



Rear right corner millimeter wave radar connector

BS04211RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

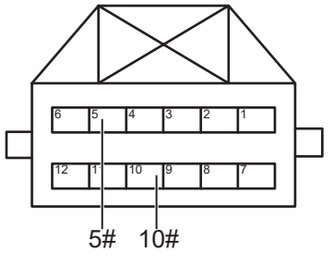
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - rear left corner millimeter wave radar connector 9#	Always connected	Less than 1 Ω
Rear right corner millimeter wave radar connector 4# - rear left corner millimeter wave radar connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check rear left corner millimeter wave radar ground**



Rear left corner millimeter wave radar connector

BS04221RM

(a) According to value in the table, measure resistance.

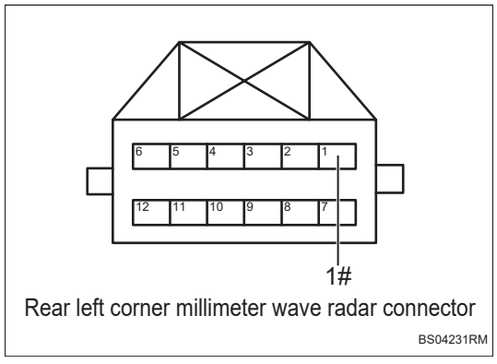
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 5# - body ground	Always connected	Less than 1 Ω
Rear left corner millimeter wave radar connector 10# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear left corner millimeter wave radar power supply**



Rear left corner millimeter wave radar connector

BS04231RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

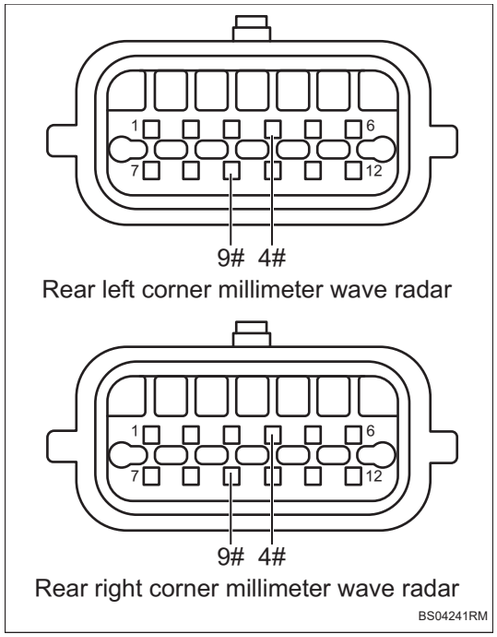
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check rear automatic driving radar CAN bus terminal resistance**



Rear left corner millimeter wave radar

Rear right corner millimeter wave radar

BS04241RM

(a) According to value in the table, measure resistance.

ZD

Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 4# - rear left corner millimeter wave radar connector 9#	Always connected	Approximately 120 Ω
Rear right corner millimeter wave radar connector 4# - rear right corner millimeter wave radar connector 9#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace rear left corner millimeter wave radar (See page ZC-112)**

(a) Replace the rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right corner millimeter wave radar (See page ZC-112)**

OK

Diagnosis ends

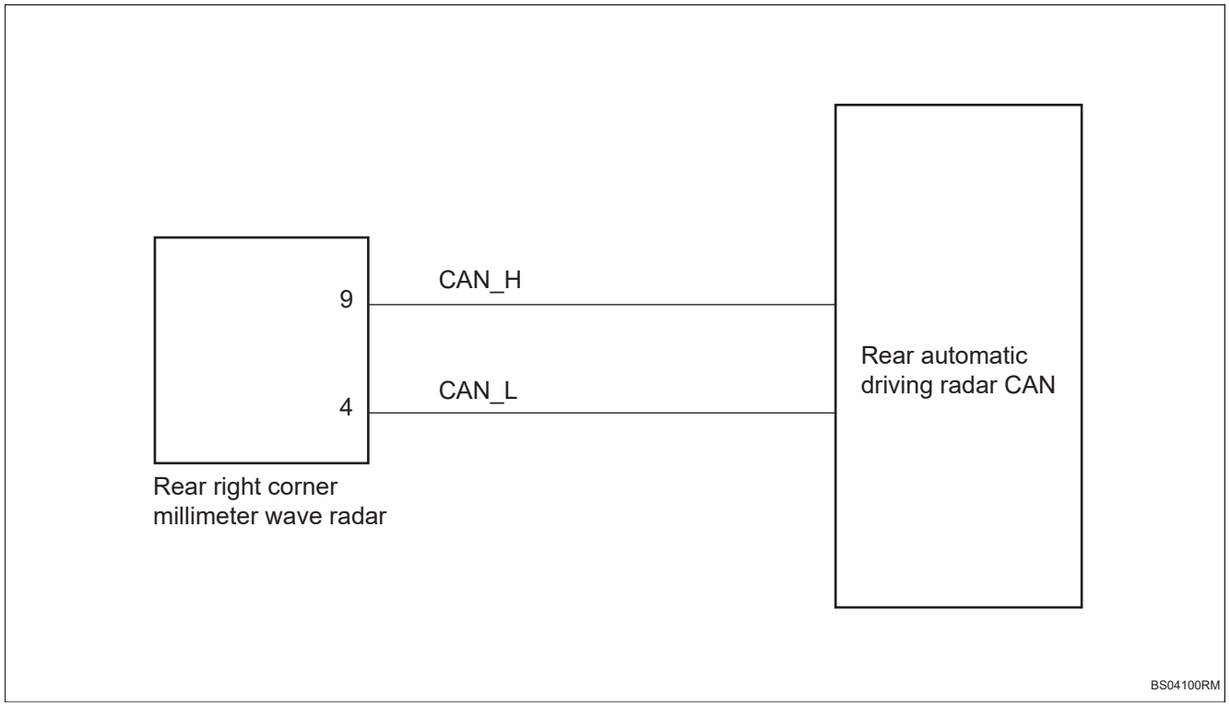
DTC	U007B88	Automatic driving control unit - rear radar CAN bus off

Description

When rear right corner millimeter wave radar detects rear automatic driving radar CAN bus off fault, the rear right corner millimeter wave radar records DTCs.

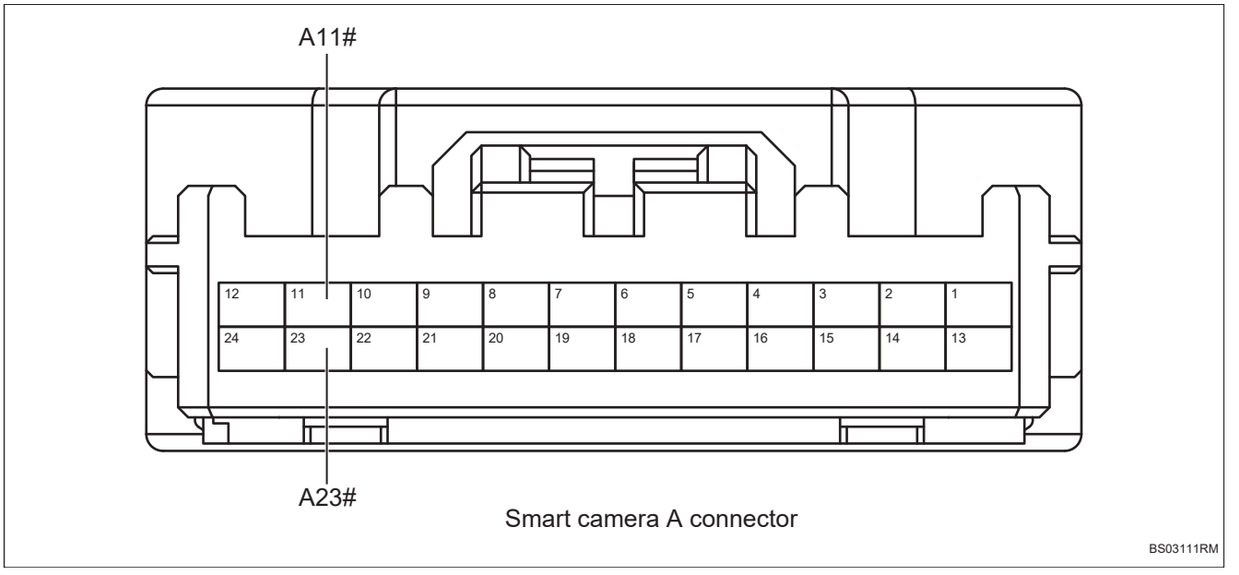
DTC No.	DTC detection condition	Faulty area
U007B88	(a) Automatic driving control unit - rear radar CAN bus off.	• CAN line and connector • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

Circuit diagram



Inspection procedure

1	**Check rear automatic driving radar CAN terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A11# - smart camera connector A23#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

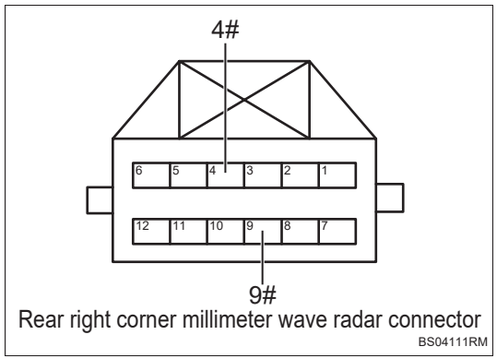
2	**Check controller on automatic driving radar 3 CAN bus**

(a) Disconnect the controllers on rear automatic driving radar CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between rear automatic driving radar CAN bus CAN-L and CAN-H**



Rear right corner millimeter wave radar connector
BS04111RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

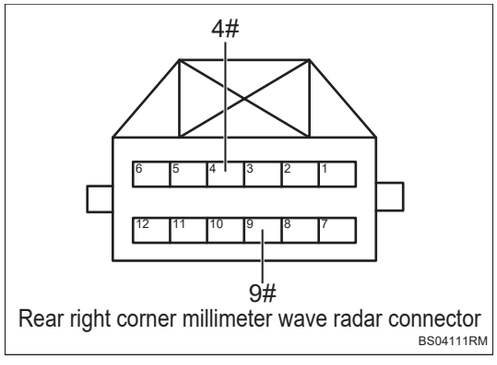
Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - rear right corner millimeter wave radar connector 4#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to ground in rear automatic driving radar CAN bus**



Rear right corner millimeter wave radar connector
BS04111RM

(a) According to value in the table, measure resistance.

Standard value

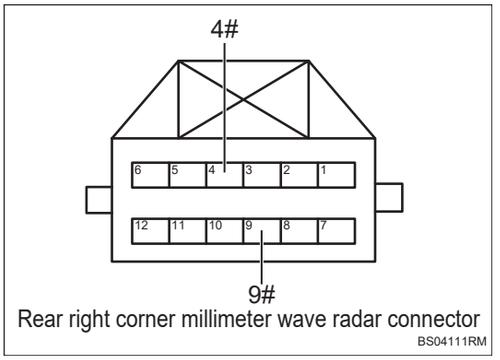
Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - body ground	Always connected	10 KΩ or more
Rear right corner millimeter wave radar connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

ZD

OK

5	**Check for short to power supply in rear automatic driving radar CAN bus**



Rear right corner millimeter wave radar connector

BS04111RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Rear right corner millimeter wave radar connector 9# - body ground	Turn ignition switch to "ON"	Less than 1 V
Rear right corner millimeter wave radar connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

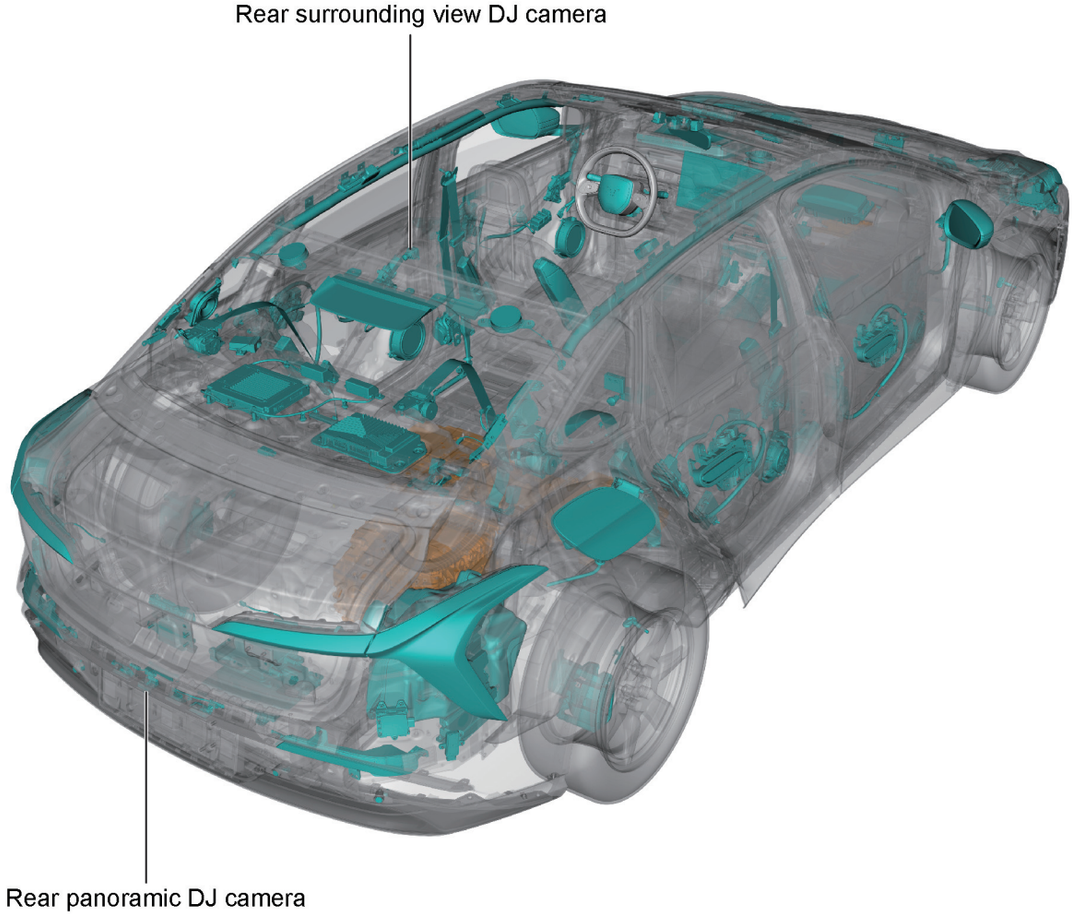
Diagnosis ends

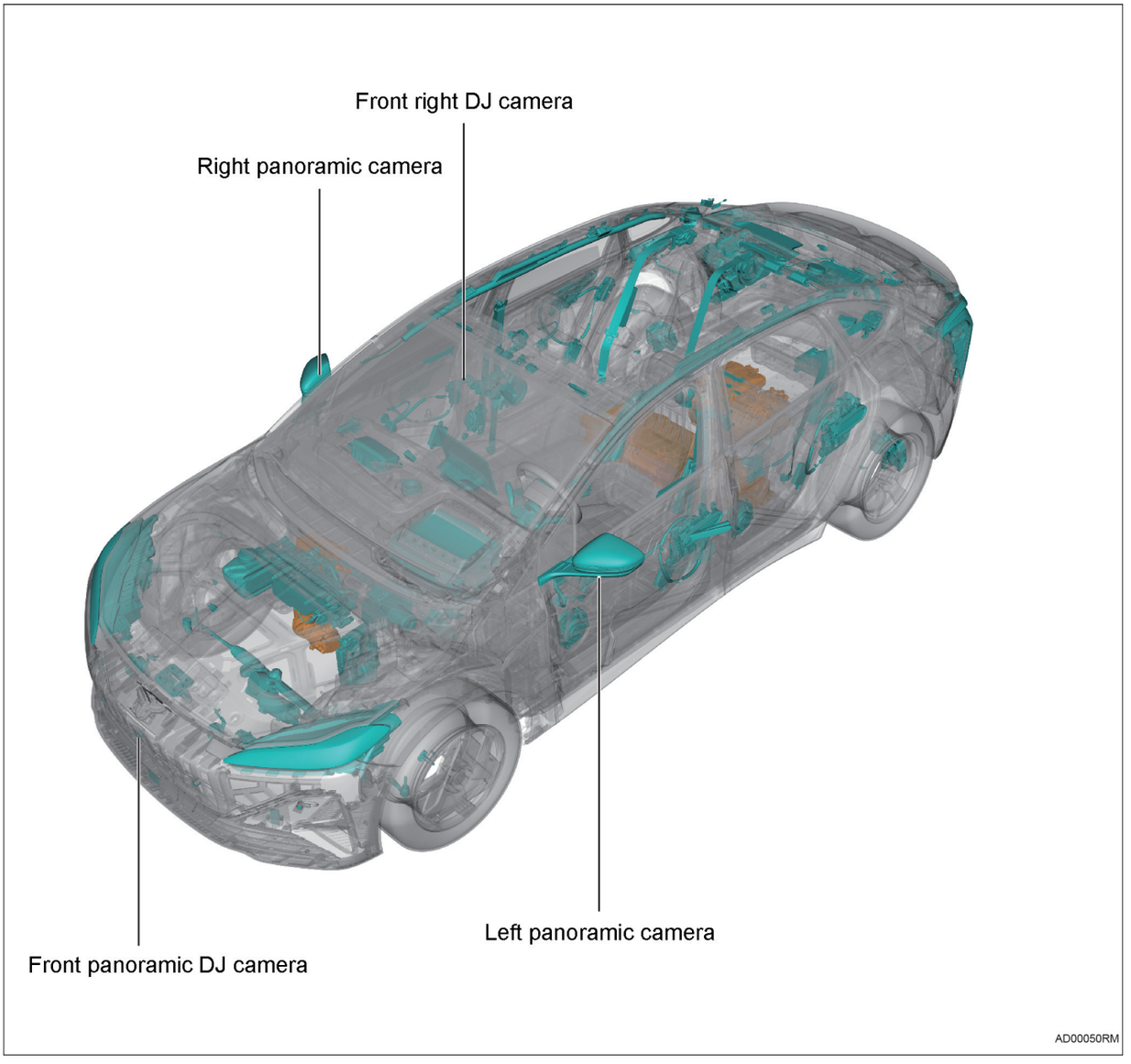
ZD

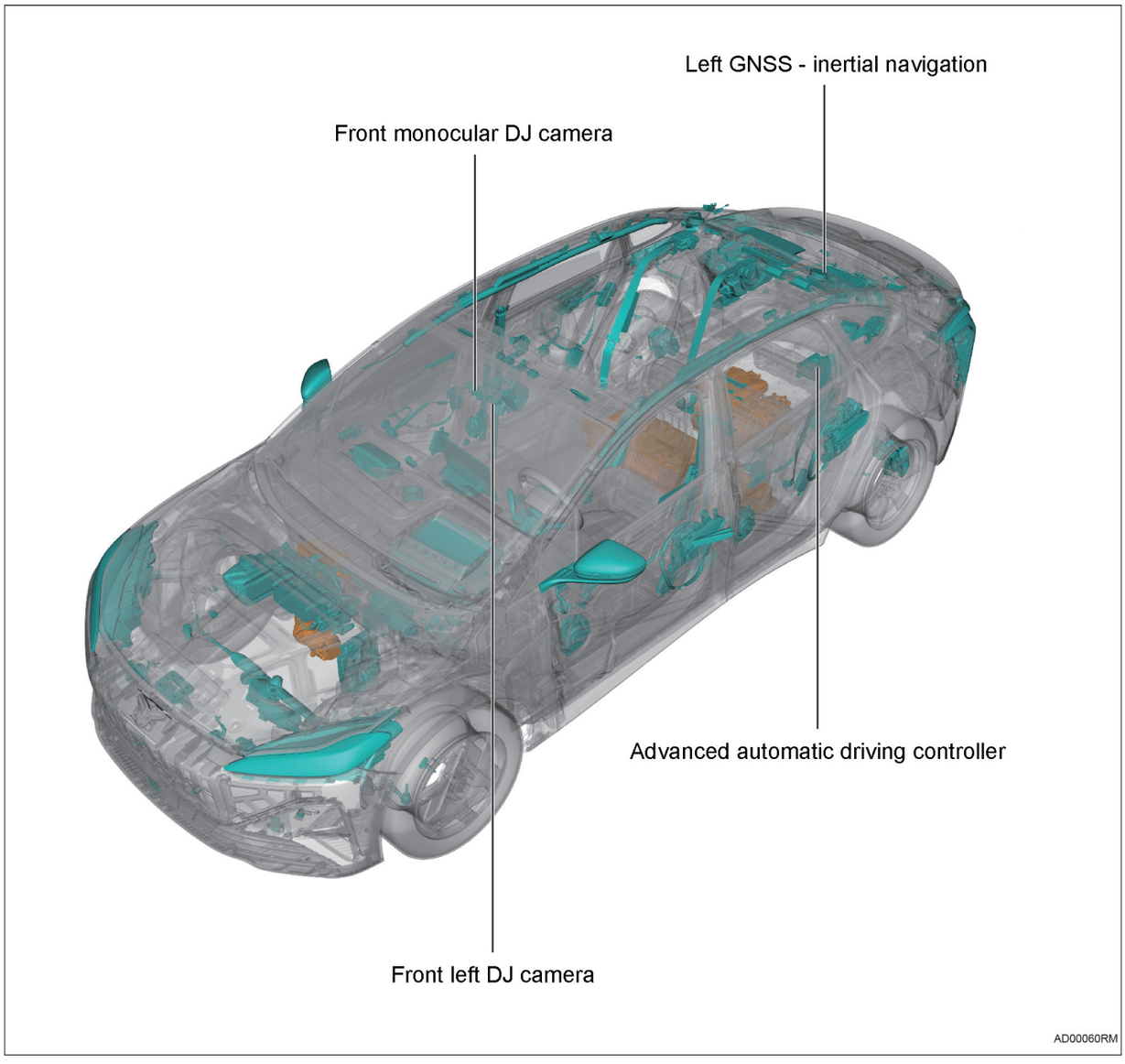
Automatic driving system

Advanced automatic driving control unit

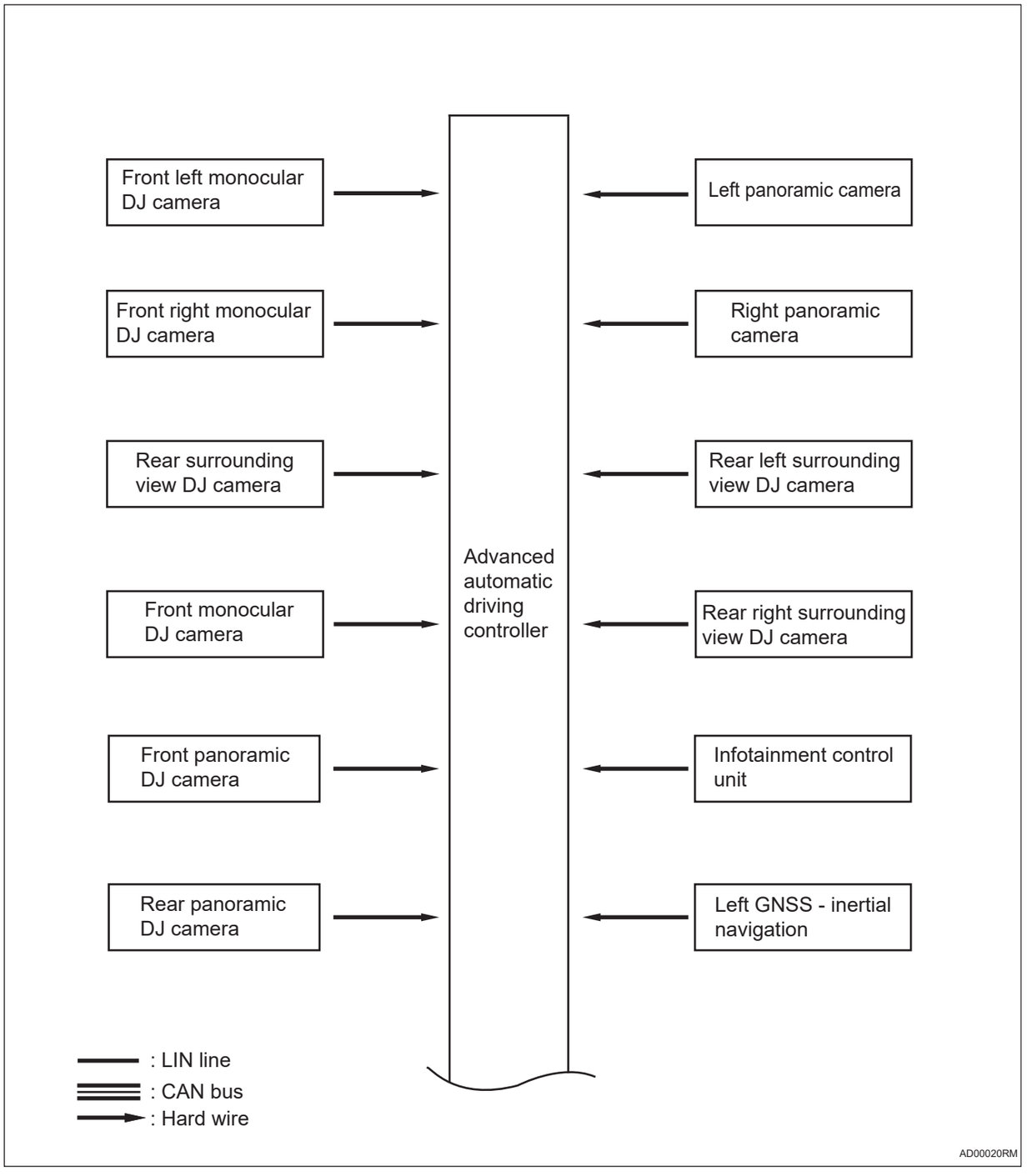
Part position



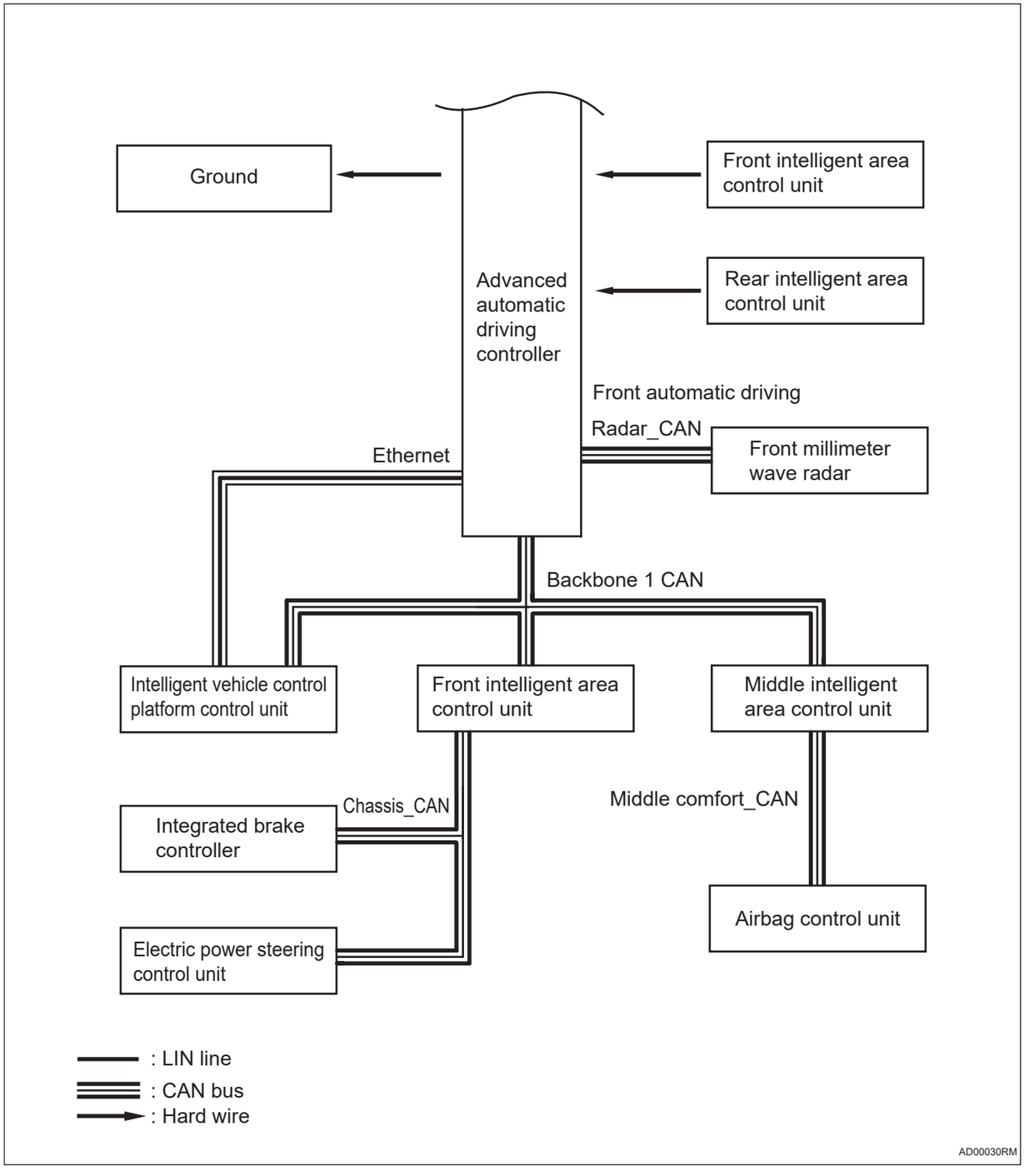

Front right DJ camera
Right panoramic camera
Left panoramic camera
Front panoramic DJ camera
AD00050RM


Left GNSS - inertial navigation
Front monocular DJ camera
Advanced automatic driving controller
Front left DJ camera
AD00060RM

System diagram



System diagram



Function description

1. System description

(a) The automatic driving system includes an advanced automatic driving controller, 10 cameras, 1 forward millimeter wave radar, 12 ultrasonic radars, and other sensors. Driver status monitoring is achieved through the steering wheel HOD or steering wheel torque. Longitudinal and lateral control is achieved through DC actuators such as braking IBC, steering EPS, and drive motor. Human-computer interaction is achieved through CSC, etc.

2. The realized function lists of advanced automatic driving controller assembly is as follows:

(a) Sentinel mode: During the vehicle parking, if someone causes damage to the vehicle, the user will be remotely notified.

(b) 360 panoramic view monitor (transparent chassis): Visual support for parking control. Multiple camera inputs are integrated to provide a 360° view, including a transparent chassis.

(c) Narrow road passing assist: When the vehicle approaches obstacle at low speed, the narrow road passing assist function will automatically turn on 360° panoramic view, and when the vehicle speed increases or moves away from obstacle, the panoramic view will automatically turn off.

(d) Reversing view monitor: Provides rear visual information for parking manoeuvres.

(e) Parking assistance (parking radar alarm): By detecting the distance from the vehicle to obstacles behind through radar, it provides alarm information for parking operation.

(f) Front Collision Warning (FCW): The system automatically detects the information of the vehicle ahead. When there is a collision risk, it sends different alarm messages according to the degree of risk.

(g) Front Cross Traffic Alert (FCTA): This function automatically detects the information of crossing targets ahead. When collision risk is detected, it provides collision warning to the driver according to the danger level.

(h) Rear Collision Warning (RCW): It monitors the area behind the vehicle during driving. When there is a vehicle behind posing a risk of rear-end collision, it alerts the driver and the vehicle behind to avoid collision.

(i) Rear Cross Traffic Alert (RCTA): When reversing, it monitors the areas on both sides behind the vehicle. When there are vehicles approaching quickly in the areas on both sides behind the vehicle and there is a collision threat with the vehicle, it alerts the driver to avoid traffic accidents due to blind spots of the driver's vision when reversing.

(j) Blind Spot Detection (BSD): Monitor the area behind the side of the vehicle through perception system, which can detect the current position, driving speed, and driving direction of other vehicles in adjacent lanes within a certain range. If other vehicles are in a blind spot or approach the vehicle from behind at a high speed, the system will alert the driver to avoid the risk of a collision.

(k) Lane Change Decision Assistance (LCDA): Monitor the left and right adjacent lanes of the vehicle. When a vehicle rapidly approaches your vehicle from that area, the sensing system analyzes its distance and speed information. If there is danger, an alarm is immediately issued to alert the driver.

(l) Door Open Warning (DOW): In the parking state, the system monitors other road users behind both sides of the vehicle and sends warning signals when there is a risk of collision due to door opening, meeting the safety requirements for users to park vehicle and open door.

(m) Lane Departure Warning (LDW): The function recognizes the lane line ahead and the position of the vehicle through the perception system. When the system detects that the vehicle is about to deviate from the lane line, it sends an alarm to remind the driver to avoid lane departure that is not intended by the driver.

(n) Intelligent speed limit warning: By recognizing the road speed limit information (signs), it monitors the speed of the vehicle and sends an alarm to the user when exceeds the speed limit.

(o) Traffic sign recognition: Recognize and inform the driver of relevant traffic signs.

(p) Curve speed warning: Calculate the safe speed of the vehicle passing through the curve, monitor the current speed, and alert the user by alarm.

(q) Reminder for vehicle starting (traffic light reminder + reminder for vehicle ahead starting): Identify the vehicle ahead starting and traffic light information, and remind users to start.

(r) Emergency Maneuver Assist (EMA): Monitor the vehicle driving environment in real time, and assist the driver in steering operations by adjusting steering power in the event of a potential forward collision hazard.

(s) Lane Keeping Assist (LKA): This system monitors the relative position of the vehicle to the lane line in real-time and intervenes in lateral motion control when the vehicle is about to overtake the lane line to assist the driver in keeping the vehicle on the original lane.

(t) Emergency Lane Keeping Assist (ELKA): When the vehicle is at a risk of deviating from the road edge, there is oncoming vehicle in the adjacent lane, or overtaking from the adjacent lane, the vehicle is kept away from the road edge or approaching vehicle through lateral intervention.

(u) Autonomous Emergency Braking (AEB): When there is a danger of collision with the vehicle in front or pedestrians, the system will automatically brake to avoid collision or reduce the degree of collision; when pedestrians crossing the street, it should be automatic emergency braking.

(v) Front Cross Traffic Braking (FCTB): When the vehicle detects that there is traffic participant ahead crossing the road and there is a collision risk that requires the driver to take action, but the driver does not brake, the vehicle automatically applies brake.

(w) Rear Cross Traffic Braking (RCTB): When the vehicle detects a traffic crossing behind and a collision risk that requires the driver to brake but the driver does not, the vehicle automatically performs braking to provide driver with reaction time and help the driver avoid collision or reduce the severity of collision.

(x) Accidental accelerator pedal depression prevention: When vehicle is stationary, if driver accidentally depresses the accelerator pedal, resulting in emergency acceleration that may cause collision with surrounding obstacles, the system controls the vehicle to brake and does not accelerate or start off.

(y) Rear Automatic Emergency Braking (RAEB): When the vehicle detects a rear collision risk that requires driver to brake but the driver does not, the vehicle automatically performs emergency braking to help the driver avoid collision or reduce the severity of collision.

(z) Automatic Emergency Steering(AES): The AES function can perform emergency steering to assist the system in planning a reasonable collision avoidance path when the sensor detects the driver to turn to avoid collision while it is detected a potential collision risk, and supplement the steering request when the driver is understeering to achieve the purpose of collision avoidance. Avoidance targets include motor vehicles, motorcycles, bicycles, pedestrians, construction areas, obstacles, etc. At the same time, ensure that the driver is assisted to return the steering wheel to the center position after avoidance.

(aa) Super Advanced Cruise Control (SACC): It recognizes the lane lines, the speed difference and driving distance from the vehicle ahead through sensors, controls the driving speed and lateral steering wheel to assist the driver in following the vehicle ahead, slowing down, and coming to a stop, etc. while adjusting the steering wheel in real time to keep the vehicle driving in the middle of the lane.

(ab) Adaptive Cruise Control (ACC): Identify the speed difference between the vehicle and vehicle ahead and driving distance via sensors to control the driving speed, and it can assist the driver in following drive, slowing down, following stop.

(ac) Based on Navigate on Autopilot (NOA): According to the end point set by the user in navigation map, it plans the route automatically, controls the lateral and longitudinal systems of vehicle and assists the driver in driving the vehicle from the starting point of the set route to the end point of the set route. During this period, functions such as intelligent vehicle speed adjustment, turning, obstacle avoidance, meeting oncoming vehicles, stopping to avoid pedestrians, etc. can be realized.

(ad) Driving assistance based on self-built map: According to the route set by the user, it controls the lateral and longitudinal systems of vehicle and assist the driver in driving the vehicle from the starting point of the set route to the end point of the set route. During this period, functions such as intelligent vehicle speed adjustment, turning, obstacle avoidance, meeting oncoming vehicles, stopping to avoid pedestrians, etc. can be realized.

(ae) Lane Change by Lever (DCLC): When the system controls the lateral and longitudinal systems of the vehicle, by pulling the turn signal lever, the system will change the lane in the corresponding direction for the driver.

(af) Intelligent offset: When the system controls the vehicle lateral and longitudinal systems and special traffic conditions occur in the next lane (such as large vehicle driving close to the lane or small vehicle driving on the line), the system will control the vehicle centering driving trajectory to actively shift to the other side to realize the intelligent dodge function to reduce the driver sense of oppression during driving and ensure safety.

(ag) Special vehicle avoidance: When a special target vehicle (such as an ambulance or fire fighting truck) performing a task is detected behind the vehicle, and also the possibility of lane changing to the adjacent lane ahead of its own vehicle is detected, the system actively initiates a lane change request, and gives way to the vehicle behind. When there is a special vehicle on an adjacent lane performing a task, the lane-changing maneuver will not be executed.

(ah) Intelligent speed limit control: The system can automatically obtain information about the speed limit that the vehicle should comply with under current conditions and monitor the speed in real time to assist the driver in controlling the speed and keeping it within the speed limit.

(ai) Auto Lane Change (ALC): When the system controls the vehicle lateral and longitudinal systems, it can automatically issue a lane change request based on the actual traveling efficiency or the received map information.

(aj) Automated Parking Assist(APA): After automatic parking, the system will search for a parking space first, and then the system will alert the driver. After that, the system will remind the driver to shift to R. Press and hold the security switch, the system will automatically control steering, braking, accelerating, and shifting to complete the automatic parking.

(ak) Remote Parking Assist (RPA): The driver uses the smart key or mobile APP outside the vehicle to realize the one-button automatic parking function in short distance.

(al) Remote parking (far side): The driver uses a mobile APP outside the vehicle to control the buttons by observing the real-time surroundings displayed on the APP, enabling remote automatic parking function.

(am)Reverse tracing: This system is capable of controlling the vehicle's lateral and longitudinal movements to enable it to reverse over a certain distance, with the reversing direction needing to be exactly the same as the driving-in direction. All the driver needs to do is monitor the area around the vehicle.

(an) Memory parking: According to the route set by the user, it assists the driver in driving the vehicle from the starting point of the set route to the end point of the set route. During this period, functions such as intelligent vehicle speed adjustment, turning, obstacle avoidance, meeting oncoming vehicles, stopping to avoid pedestrians and avoid vehicles entering and

exiting the parking space, etc. can be realized, and vehicle can be parked in a parking space near the end point that has been memorized by the system.

(ao) Valet parking: The driver can select the location for valet parking or getting off the vehicle through the mobile APP or the central control display inside vehicle. According to the choice of user, the vehicle automatically controls the itself to drive automatically in local area, and realizes collision avoidance and automatic change in the process. When arriving at the destination, the vehicle can be parked automatically inside or outside the parking position.

(ap) Automatic driving data record: When the vehicle turns on or stops the automatic driving function and encounters danger during automatic driving, it records and uploads exterior video and interior data.

(aq) Shadow mode: Uses a large amount of vehicle driving data for deep learning to cover more scenarios. By collecting a large amount of actual driving data, automatic driving can have a stronger judgment ability, especially to enhance the prediction of future events.

3. The specific requirements for advanced intelligent driving controller assembly are as follows:

(a) Advanced intelligent driving controller should consider the impact of climate conditions on performance, ensuring normal system performance under all weather conditions except for extreme climates. In addition, the advanced intelligent driving controller should be usable during both daytime and nighttime, and be able to cope with extreme lighting changes such as direct sunlight and entering/exiting tunnels.

(b) The reliability of each function of the advanced intelligent driving controller should meet the requirements of national adaptability test without abnormal responses.

(c) The advanced intelligent driving controller should be able to achieve human-computer interaction of various functional signals through operation buttons, icon displays and sound alarms, such as function switch, function setting, function display, function warning, function limited warning and function fault alarm, etc.

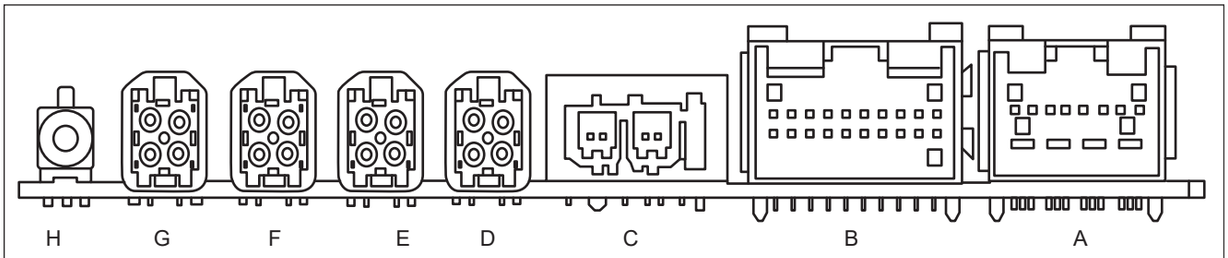
(d) Advanced intelligent driving controller can detect information about the current lane and the lanes on both left and right sides, specifically detect lane lines, vehicles, pedestrians, traffic signs, light information and other road objects.

Data parameter

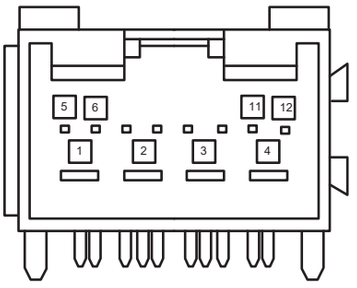
Advanced automatic driving controller

Item	Maximum	Normal	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	6	4.5	—

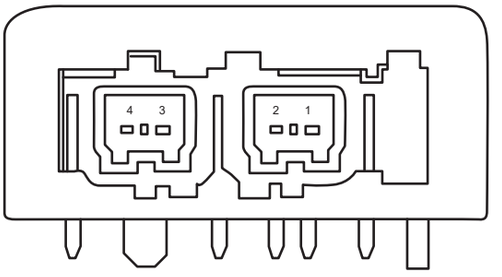
ECU terminal



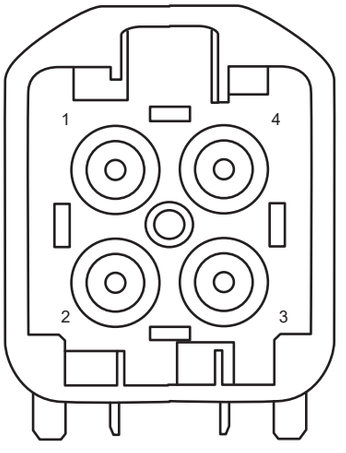
Advanced automatic driving controller A



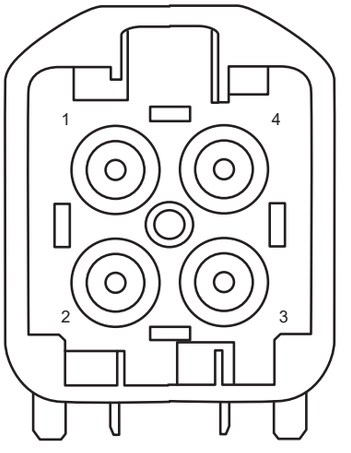
Advanced automatic driving controller C



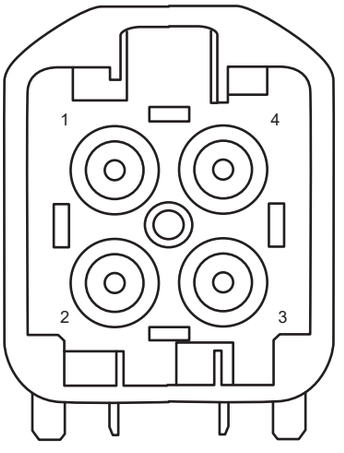
Advanced automatic driving controller D



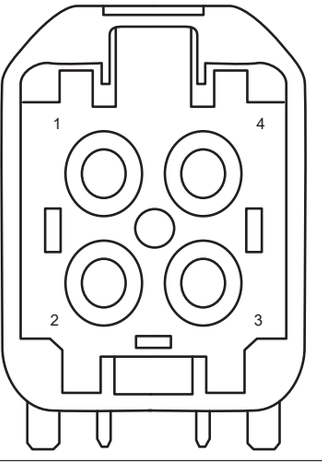
Advanced automatic driving controller E



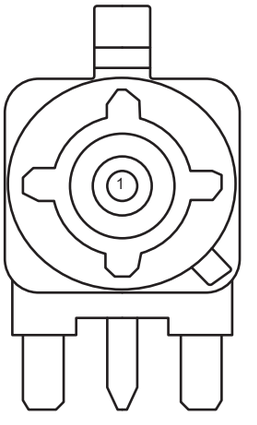
Advanced automatic driving controller F



Advanced automatic driving controller G



Advanced automatic driving controller H



AD00010RM

ZD

Advanced automatic driving control unit-A			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	7	ADAS main CAN-H
2	-	8	ADAS main CAN-L
3	BAT	9	-
4	GND	10	-
5	-	11	Front millimeter wave radar CAN2_H
6	—	12	Front millimeter wave radar CAN2_L

Advanced automatic driving control unit - C			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	3	1000M_MDI2+
2	-	4	1000M_MDI2-

Advanced automatic driving control unit - D			
Pin number	**Definition**	**Pin number**	**Definition**
1	Left side camera	3	—
2	Right side camera	4	—

Advanced automatic driving control unit - E			
Pin number	**Definition**	**Pin number**	**Definition**
1	Front stereo camera left camera	3	Rear camera
2	Front stereo camera right camera	4	Front camera

Advanced automatic driving control unit - F			
Pin number	**Definition**	**Pin number**	**Definition**
1	Front panoramic camera	3	Left panoramic camera
2	Rear panoramic camera	4	Right panoramic camera

Advanced automatic driving control unit - G			
Pin number	**Definition**	**Pin number**	**Definition**
1	—	3	—
2	—	4	HMI Out 1-CSC

Advanced automatic driving control unit - H	
Pin number	**Definition**
1	GNSS ANT

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
U1A50A0	FV trip counter stored in NVM read and write error	(See page ZD-3387)
U1A50A1	HAD fresh value synchronization message MAC check failure	(See page ZD-3387)
U1A50A2	Synchronization/reset counter lower than expected value when synchronization message is received by HAD	(See page ZD-3280)
U1A50A3	Synchronization message missing	(See page ZD-3280)
U1A52A5	RWS_1 message authentication failure	(See page ZD-3387)
U1A52A5	RWS_1 message authentication failure	(See page ZD-3387)
U1A53A5	HCU_2_12 message authentication failure	(See page ZD-3387)
U1A50A7	HAD fresh value synchronization message key reading failure	(See page ZD-3374)
U1A51A7	RVA_1 key reading failure	(See page ZD-3374)
U1A52A7	RWS_1 key reading failure	(See page ZD-3374)
U1A53A7	HCU_2_12 key reading failure	(See page ZD-3374)
U1A54A7	HAD_3 key reading failure	(See page ZD-3374)
U1A55A7	ADV_2 key reading failure	(See page ZD-3374)
U1A54A6	HAD_3 MAC generation failure	(See page ZD-3374)
U1A55A6	ADV_2 MAC generation failure	(See page ZD-3374)
B16A000	ECU Internal Hardware Fault	(See page ZD-3280)
B16A001	Advanced automatic driving controller input terminal overvoltage	(See page ZD-3292)
B16A002	Advanced automatic driving controller input terminal undervoltage	(See page ZD-3292)
B16A027	ECU overtemperature	(See page ZD-3331)
B16A003	Left camera disconnection	(See page ZD-3297)
B16A004	Right camera disconnection	(See page ZD-3299)
B16A005	Front camera disconnection	(See page ZD-3310)
B16A006	Rear camera disconnection	(See page ZD-3313)
B16A007	Rear camera disconnection	(See page ZD-3316)
B16A008	Front camera disconnection	(See page ZD-3319)
B16A009	Rear left side camera disconnection	(See page ZD-3322)
B16A00A	Rear right side camera disconnection	(See page ZD-3283)
B16A00B	Left camera not calibrated or calibration failed	(See page ZD-3286)
B16A00C	Right camera not calibrated or calibration failed	(See page ZD-3287)
B16A00D	Front camera not calibrated or calibration failed	(See page ZD-3289)

DTC	Detection Items	See page
B16A00E	Rear camera not calibrated or calibration failed	(See page ZD-3290)
B16A00F	Rear camera not calibrated or calibration failed	(See page ZD-3291)
B16A010	Front camera not calibrated or calibration failed	(See page ZD-3325)
B16A011	Rear left side camera not calibrated or calibration failed	(See page ZD-3326)
B16A012	Rear right side camera not calibrated or calibration failed	(See page ZD-3328)
B16A013	Short to power supply in left camera power supply	(See page ZD-3297)
B16A014	Short to power supply in right camera power supply	(See page ZD-3299)
B16A015	Short to power supply in front camera power supply	(See page ZD-3310)
B16A016	Short to power supply in rear camera power supply	(See page ZD-3313)
B16A017	Short to power supply in rear camera power supply	(See page ZD-3316)
B16A018	Short to power supply in front camera power supply	(See page ZD-3319)
B16A019	Short to power supply in rear left side camera power supply	(See page ZD-3322)
B16A01A	Short to power supply in rear right side camera power supply	(See page ZD-3283)
B16A01B	Short to ground in left camera power supply	(See page ZD-3297)
B16A01C	Short to ground in right camera power supply	(See page ZD-3299)
B16A01D	Short to ground in front camera power supply	(See page ZD-3310)
B16A01E	Short to ground in rear camera power supply	(See page ZD-3313)
B16A01F	Short to ground in rear camera power supply	(See page ZD-3316)
B16A020	Short to ground in front camera power supply	(See page ZD-3319)
B16A021	Short to ground in rear left side camera power supply	(See page ZD-3322)
B16A022	Short to ground in rear right side camera power supply	(See page ZD-3283)
B16A023	Abnormal communication with cloud HTPPS	(See page ZD-3333)
B16A024	Abnormal ultrasonic communication data received by Someip	(See page ZD-3333)
B16A028	GNSS antenna disconnection	(See page ZD-3333)
B16A029	GNSS module fault	(See page ZD-3333)
B16A030	Left camera temperature abnormal	(See page ZD-3334)
B16A031	Right camera temperature abnormal	(See page ZD-3336)

DTC	Detection Items	See page
B16A032	Front camera temperature abnormal	(See page ZD-3337)
B16A033	Rear camera temperature abnormal	(See page ZD-3339)
B16A034	Rear camera temperature abnormal	(See page ZD-3340)
B16A035	Front camera temperature abnormal	(See page ZD-3342)
B16A036	Rear left side camera temperature abnormal	(See page ZD-3343)
B16A037	Rear right side camera temperature abnormal	(See page ZD-3282)
B16A038	Left camera internal fault	(See page ZD-3345)
B16A039	Right camera internal fault	(See page ZD-3346)
B16A040	Front camera internal fault	(See page ZD-3347)
B16A041	Rear camera internal fault	(See page ZD-3349)
B16A042	Rear camera internal fault	(See page ZD-3350)
B16A043	Front camera internal fault	(See page ZD-3351)
B16A044	Rear left side camera internal fault	(See page ZD-3353)
B16A045	Rear right side camera internal fault	(See page ZD-3354)
B16A046	Left camera frame rate abnormal	(See page ZD-3355)
B16A047	Right camera frame rate abnormal	(See page ZD-3357)
B16A048	Front camera frame rate abnormal	(See page ZD-3358)
B16A049	Rear camera frame rate abnormal	(See page ZD-3360)
B16A04A	Rear camera frame rate abnormal	(See page ZD-3302)
B16A04B	Front camera frame rate abnormal	(See page ZD-3304)
B16A04C	Rear left side camera frame rate abnormal	(See page ZD-3305)
B16A04D	Rear right side camera frame rate abnormal	(See page ZD-3307)
B16A04E	IMU internal fault	(See page ZD-3351)
B16A04F	Abnormal path navigation data	(See page ZD-3309)
B16A050	Left camera blocked	(See page ZD-3361)
B16A051	Right camera blocked	(See page ZD-3363)
B16A052	Front camera blocked	(See page ZD-3365)
B16A053	Rear camera blocked	(See page ZD-3366)
B16A054	Rear camera blocked	(See page ZD-3368)
B16A055	Front camera blocked	(See page ZD-3369)
B16A056	Rear left side camera blocked	(See page ZD-3371)
B16A057	Rear right side camera blocked	(See page ZD-3373)
U003788	ADAS CAN bus off	(See page ZD-3381)
U007C88	Automatic driving control unit - front radar CAN bus off	(See page ZD-3381)
U014687	PDCF node lost	(See page ZD-3387)

DTC	Detection Items	See page
U041882	IBC message content fault	(See page ZD-3387)
U041883	IBC message content fault	(See page ZD-3387)
U041886	IBC message content fault	(See page ZD-3387)
U059482	Vehicle controller message content fault	(See page ZD-3387)
U059483	Vehicle controller message content fault	(See page ZD-3387)
U059486	Vehicle controller message content fault	(See page ZD-3387)
U041782	Electronic parking brake unit message content fault	(See page ZD-3387)
U041783	Electronic parking brake unit message content fault	(See page ZD-3387)
U041786	Electronic parking brake unit message content fault	(See page ZD-3387)
U042082	Electric power steering control unit message content fault	(See page ZD-3387)
U042083	Electric power steering control unit message content fault	(See page ZD-3387)
U042086	Electric power steering control unit message content fault	(See page ZD-3387)
U045282	Airbag controller message content fault	(See page ZD-3387)
U045283	Airbag controller message content fault	(See page ZD-3387)
U045286	Airbag controller message content fault	(See page ZD-3387)
U044682	PDCF message content fault	(See page ZD-3387)
U044683	PDCF message content fault	(See page ZD-3387)
U044782	PDCM message content fault	(See page ZD-3387)
U044783	PDCM message content fault	(See page ZD-3387)
U040482	EGSM message content fault	(See page ZD-3387)
U040483	EGSM message content fault	(See page ZD-3387)
U040486	EGSM message content fault	(See page ZD-3387)
U02DC87	Front millimeter wave radar controller node lost	(See page ZD-3387)
U053582	Front millimeter wave radar controller message content fault	(See page ZD-3387)
U053583	Front millimeter wave radar controller message content fault	(See page ZD-3387)
U053586	Front millimeter wave radar controller message content fault	(See page ZD-3387)
U147C8A	HAD backbone network Eth1 connection establishment failure	(See page ZD-3377)

DTC	B16A000	ECU Internal Hardware Fault
DTC	U1A50A2	Synchronization/reset counter lower than expected value when synchronization message is received by HAD
DTC	U1A50A3	Synchronization message missing

Description

When an internal fault occurs in advanced automatic driving controller, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A000	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• Power rail overcurrent • Power rail overcurrent	1 times	Periodic type	• 100 ms • 50 ms	• Advanced automatic driving controller
U1A50A2	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• If the synchronous message counter of frame freshness value is less than the expected value for 9 consecutive frames, the DTC will be recorded	9	Periodic type	• 30000 ms	• Advanced automatic driving controller
U1A50A3	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• After sending 3 frames of fresh value synchronization request messages, no synchronization message is received after 50 ms	3	Event-based	• Not involved	• Advanced automatic driving controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A000	• All intelligent driving functions exiting	Not come on
U1A50A2	• DTC for SecOC message controller message authentication failure	Not come on
U1A50A3	• DTC for SecOC message controller message authentication failure	Not come on

Inspection procedure

1	**Analyze log to confirm the faulty area**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Analyze the log to confirm which hardware is abnormal.

(d) Clear DTCs, restart front millimeter wave radar.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A037	Rear right side camera temperature abnormal

Description

When temperature of rear right surrounding view DJ camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A037	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Rear right surrounding view DJ camera • Ambient temperature

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A037	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	Cool down rear right surrounding view DJ camera

(a) Lower the rear right surrounding view DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Standard:
No DTC outputs.

NG → **Replace rear right surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

DTC	B16A00A	Rear right side camera disconnection
DTC	B16A01A	Short to power supply in rear right side camera power supply
DTC	B16A022	Short to ground in rear right side camera power supply

Description

When short or open fault occurs in rear right surrounding view camera, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00A	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear right surrounding view camera
B16A01A	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OC = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear right surrounding view camera
B16A022	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OC = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear right surrounding view camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00A	• NOA function exits or is suppressed	Comes on
B16A01A	• NOA function exits or is suppressed	Comes on
B16A022	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	**Check rear right surrounding view camera wire harness and connector**

(a) Check for short in rear right surrounding view camera wire harness and connector.

(b) Check for open in rear right surrounding view camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Restart the advanced automatic driving controller

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

4	Replace rear right surrounding view camera (See page ZC-152)

(a) Replace the rear right surrounding view camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A00B	Left camera not calibrated or calibration failed

Description

When left panoramic camera is not calibrated or fails to be calibrated, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00B	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Left panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00B	• DTC for domain controller triggering left panoramic camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	**Recalibrate left panoramic camera**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace left panoramic camera (See page WS-74)**

OK

Diagnosis ends

DTC	B16A00C	Right camera not calibrated or calibration failed

Description

When right panoramic camera is not calibrated or fails to be calibrated, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00C	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Right panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00C	• DTC for domain controller triggering right panoramic camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	Recalibrate right panoramic camera

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace right panoramic camera (See page WS-74)**

OK

Diagnosis ends

DTC	B16A00D	Front camera not calibrated or calibration failed

Description

When front panoramic DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00D	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Front panoramic DJ camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00D	• DTC for domain controller triggering front panoramic DJ camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	Recalibrate front panoramic DJ camera

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front panoramic DJ camera (See page ZC-146)**

OK

Diagnosis ends

DTC	**B16A00E**	**Rear camera not calibrated or calibration failed**

ZD

Description

When rear panoramic DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00E	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Rear panoramic DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00E	• DTC for domain controller triggering rear panoramic camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	**Recalibrate rear panoramic DJ camera**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace the rear panoramic DJ camera (See page ZC-148)**

OK

Diagnosis ends

DTC	B16A00F	Rear camera not calibrated or calibration failed

Description

When rear surrounding view DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A00F	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Rear surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A00F	• DTC for domain controller triggering rear camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	**Recalibrate rear surrounding view DJ camera**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace rear surrounding view DJ camera (See page ZC-148)**

OK

Diagnosis ends

DTC	**B16A001**	**Advanced automatic driving controller input terminal overvoltage**
DTC	**B16A002**	**Advanced automatic driving controller input terminal undervoltage**

Description

When input voltage of advanced automatic driving controller is too high or too low, the advanced automatic driving controller records DTC.

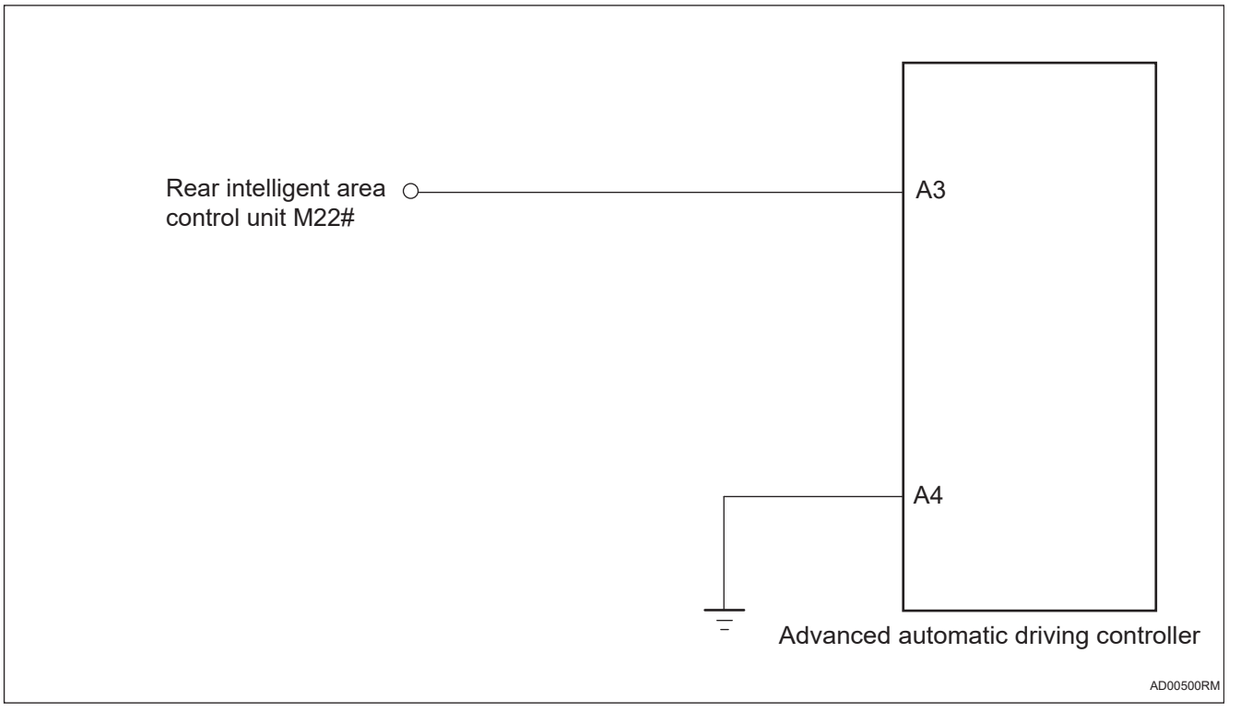
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A001	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Power supply voltage is higher than 16.5 V for 2 s or more than 2 s • Power supply voltage is higher than 17.5 V for 600 ms or more than 600 ms • Power supply voltage is higher than 18.5 V for 400 ms or more than 400 ms	1 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Battery/charging system
B16A002	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	Power supply voltage is lower than 8.5 V for 2 s or more than 2 s	1 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Battery/charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A001	• All intelligent driving functions exiting	Not come on
B16A002	• All intelligent driving functions exiting or suppression	Not come on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

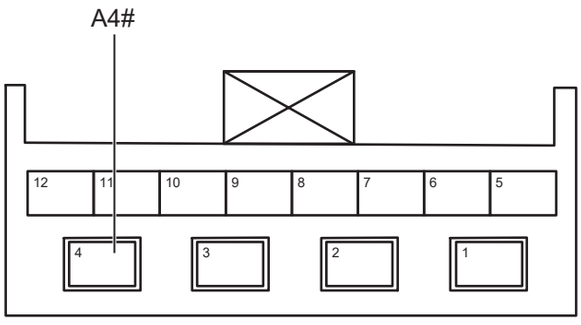
Standard value

Multimeter connection	**Detection condition**	**Specified condition**
Battery positive - battery negative	Always connected	About 11 ~ 14 V

NG → **Check and repair charging system**

OK

2	Check advanced automatic driving controller ground



Advanced automatic driving controller connector

AD00510RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the advanced automatic driving controller connector.

(d) According to value in the table, measure resistance.

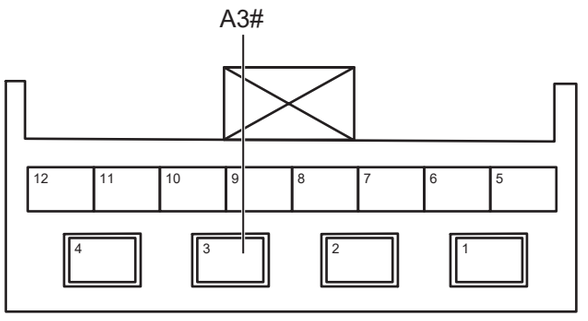
Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness or connector**

OK

3	**Check advanced automatic driving controller power supply**



Advanced automatic driving controller connector

AD00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A3# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check power supply and ground of front/rear intelligent area control unit and confirm if front/rear intelligent area control unit is damaged)**

OK

Replace advanced automatic driving controller (See page ZC-79)

DTC	**B16A003**	**Left camera disconnection**
DTC	**B16A013**	**Short to power supply in left camera power supply**
DTC	**B16A01B**	**Short to ground in left camera power supply**

Description

When short or open fault occurs in left panoramic camera, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A003	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Left panoramic camera
B16A013	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Left panoramic camera
B16A01B	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Left panoramic camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A003	• Parking function exiting or suppression	Comes on
B16A013	• Parking function exiting or suppression	Comes on
B16A01B	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check left panoramic camera wire harness and connector**

(a) Check for short in left panoramic camera wire harness and connector.

(b) Check for open in left panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Restart the advanced automatic driving controller**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	**Replace left panoramic camera (See page WS-74)**

(a) Replace the left panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A004**	**Right camera disconnection**
DTC	**B16A014**	**Short to power supply in right camera power supply**
DTC	**B16A01C**	**Short to ground in right camera power supply**

Description

When short or open fault occurs in right panoramic camera, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A004	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Right panoramic camera
B16A014	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Right panoramic camera
B16A01C	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Right panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A004	• Parking function exiting or suppression	Comes on
B16A014	• Parking function exiting or suppression	Comes on
B16A01C	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check right panoramic camera wire harness and connector**

(a) Check for short in right panoramic camera wire harness and connector.

(b) Check for open in right panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Restart the advanced automatic driving controller

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	Replace right panoramic camera (See page WS-74)

(a) Replace the right panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A04A	Rear camera frame rate abnormal

ZD

Description

When frame rate of rear surrounding view camera is abnormal, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04A	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Rear surrounding view camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04A	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check rear surrounding view camera wire harness and connector

(a) Check for short in rear surrounding view camera wire harness and connector.

(b) Check for open in rear surrounding view camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Perform after-sales calibration**

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

3	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear surrounding view camera (See page ZC-148)**

OK

Diagnosis ends

DTC	B16A04B	Front camera frame rate abnormal

Description

When left / right / monocular front camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04B	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Front left/right/monocular camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04B	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check front left/right/monocular camera wire harness and connector

(a) Check for short in front left/right/monocular camera wire harness and connector.

(b) Check for open in front left/right/monocular camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

3	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left/right/monocular camera (See page ZC-146)**

OK

Diagnosis ends

DTC	B16A04C	Rear left side camera frame rate abnormal

Description

When rear left surrounding view camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04C	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Rear left surrounding view camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04C	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	Check rear left surrounding view camera wire harness and connector

(a) Check for short in rear left surrounding view camera wire harness and connector.

(b) Check for open in rear left surrounding view camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

3	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left surrounding view camera (See page ZC-148)**

OK

Diagnosis ends

DTC	B16A04D	Rear right side camera frame rate abnormal

Description

When rear right surrounding view camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04D	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Rear right surrounding view camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04D	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	Check rear right surrounding view camera wire harness and connector

(a) Check for short in rear right surrounding view camera wire harness and connector.

(b) Check for open in rear right surrounding view camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

3	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right surrounding view camera (See page ZC-148)**

OK

Diagnosis ends

DTC B16A04F Abnormal path navigation data

Description

When path navigation data is abnormal, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04F	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Path navigation data parsing check failure	1 times	Event-based	Not involved	• Advanced automatic driving controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04F	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A005	Front camera disconnection
DTC	B16A015	Short to power supply in front camera power supply

DTC	B16A01D	Short to ground in front camera power supply

Description

When short or open fault occurs in front panoramic camera, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A005	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front panoramic camera
B16A015	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front panoramic camera
B16A01D	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A005	• Parking function exiting or suppression	Comes on
B16A015	• Parking function exiting or suppression	Comes on
B16A01D	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check front panoramic camera wire harness and connector**

(a) Check for short in front panoramic camera wire harness and connector.

(b) Check for open in front panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Restart the advanced automatic driving controller**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	**Replace front panoramic camera (See page ZC-146)**

(a) Replace the front panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A006**	**Rear camera disconnection**
DTC	**B16A016**	**Short to power supply in rear camera power supply**
DTC	**B16A01E**	**Short to ground in rear camera power supply**

Description

When there is short or open in rear panoramic camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A006	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear panoramic camera
B16A016	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear panoramic camera
B16A01E	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear panoramic camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A006	• Parking function exiting or suppression	Comes on
B16A016	• Parking function exiting or suppression	Comes on
B16A01E	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check rear panoramic camera wire harness and connector**

(a) Check for short in rear panoramic camera wire harness and connector.

(b) Check for open in rear panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Restart the advanced automatic driving controller

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	Replace rear panoramic camera (See page ZC-148)

(a) Replace the rear panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A007**	**Rear camera disconnection**
DTC	**B16A017**	**Short to power supply in rear camera power supply**
DTC	**B16A01F**	**Short to ground in rear camera power supply**

Description

When there is short or open in rear surrounding view camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A007	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear surrounding view camera
B16A017	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear surrounding view camera
B16A01F	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear surrounding view camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A007	• Driving and parking function exits or suppresses	Comes on
B16A017	• Driving and parking function exits or suppresses	Comes on
B16A01F	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	**Check rear surrounding view camera wire harness and connector**

(a) Check for short in rear surrounding view camera wire harness and connector.

(b) Check for open in rear surrounding view camera wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

2	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → Repair according to DTC

OK

3	Restart the advanced automatic driving controller

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Repeat above steps 5 times

OK

4	Replace rear surrounding view camera (See page ZC-148)

(a) Replace the rear surrounding view camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A008**	**Front camera disconnection**
DTC	**B16A018**	**Short to power supply in front camera power supply**
DTC	**B16A020**	**Short to ground in front camera power supply**

Description

When there is short or open in left / right / monocular front camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A008	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front left/right/monocular camera
B16A018	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front left/right/monocular camera
B16A020	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Front left/right/monocular camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A008	• Smart driving function exits or suppresses	Comes on
B16A018	• Smart driving function exits or suppresses	Comes on
B16A020	• Smart driving function exits or suppresses	Comes on

Inspection procedure

1	**Check front left/right/monocular camera wire harness and connector**

(a) Check for short in front left/right/monocular camera wire harness and connector.

(b) Check for open in front left/right/monocular camera wire harness and connector.

NG → Check and repair or replace wire harness and connector

OK

2	Perform after-sales calibration

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → Repair according to DTC

OK

3	Restart the advanced automatic driving controller

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Repeat above steps 5 times

OK

4	Replace front left/right/monocular camera (See page ZC-139)

(a) Replace the front left/right/monocular camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A009**	**Rear left side camera disconnection**
DTC	**B16A019**	**Short to power supply in rear left side camera power supply**
DTC	**B16A021**	**Short to ground in rear left side camera power supply**

Description

When short or open fault occurs in rear left surrounding view camera, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A009	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Camera link status is detected to be in disconnect-ed state	2 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear left surrounding view camera
B16A019	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear left surrounding view camera
B16A021	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• LoadSwitch : OV = 1 is detected • Keep 1s to confirm	5 times	Periodic type	200 ms	• Advanced automatic driving controller • Wire harness and connector • Rear left surrounding view camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A009	• NOA function exits or is suppressed	Comes on
B16A019	• NOA function exits or is suppressed	Comes on
B16A021	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	**Check rear left surrounding view camera wire harness and connector**

(a) Check for short in rear left surrounding view camera wire harness and connector.

(b) Check for open in rear left surrounding view camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Restart the advanced automatic driving controller**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Connect the negative battery terminal.

(d) Turn ignition switch to "ON".

(e) Connect HQ-VDS diagnostic tester.

(f) Clear DTCs.

(g) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Repeat above steps 5 times**

OK

3	**Perform after-sales calibration**

(a) Perform after-sales calibration process.

(b) Clear history DTC after successful calibration.

NG → **Repair according to DTC**

OK

4	**Replace rear left surrounding view camera (See page ZC-152)**

(a) Replace the rear left surrounding view camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A010	Front camera not calibrated or calibration failed

Description

When left / right / monocular front DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A010	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Front left/right/monocular DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A010	• DTC for domain controller triggering rear camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	**Recalibrate front left/right/monocular DJ camera**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace front left/right/monocular DJ camera (See page ZC-139)**

OK

Diagnosis ends

DTC	B16A011	Rear left side camera not calibrated or calibration failed

Description

When rear left surrounding view DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A011	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Rear left surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A011	• DTC for domain controller triggering rear camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	Recalibrate rear left surrounding view DJ camera

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

DTC	B16A012	Rear right side camera not calibrated or calibration failed

Description

When rear right surrounding view DJ camera is not calibrated or fails to be calibrated, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A012	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Uncalibrated camera is detected	1 times	Event-based	Not involved	• Advanced automatic driving controller • Rear right surrounding view DJ camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A012	• DTC for domain controller triggering rear camera is not calibrated or calibration failed	Not come on

Inspection procedure

1	Recalibrate rear right surrounding view DJ camera

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Perform calibration process again.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

DTC	B16A023	Abnormal communication with cloud HTPPS

ZD

Description

When communication with cloud HTPPS is abnormal, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A023	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	Illegal HTTPS message is received	1 times	Event-based	Not involved	• Advanced automatic driving controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A023	DTC for abnormal communication between domain control triggering and cloud HTPPS	Comes on

Inspection procedure

1	Check cloud log

(a) Analyze whether the cloud log is normal.

NG → **Replace advanced automatic driving control unit (See page ZC-79)**

OK

Diagnosis ends

DTC	**B16A024**	**Abnormal ultrasonic communication data received by Someip**

ZD

Description

When Someip receives abnormal ultrasonic data communication, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A024	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	Timeout for receiving ultrasonic data for 10 continuous cycles	1 times	Periodic type	200 ms	• Advanced automatic driving controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A024	Parking function abnormal or exiting	Comes on

Inspection procedure

1	**Check advanced automatic driving control unit**

(a) Check for any other DTCs for advanced automatic driving control unit.

NG → **Prioritize handling other faults**

OK

2	Clear DTCs

(a) Turn ignition switch to "ON".

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Check wire harness first and replace ultrasonic radar**

OK

Replace advanced automatic driving control unit (See page ZC-79)

DTC	B16A027	ECU overtemperature

Description

When advanced automatic driving control unit temperature is too high, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A027	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• It is detected that the SOC temperature reaches 110° C for 15 ms	3 times	Periodic type	5 ms	• Cooling system • Advanced automatic driving control unit

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A027	• All intelligent driving functions exiting or suppression	Not come on

Inspection procedure

1	**Check cooling system**

(a) Check if coolant level is normal.

(b) Check if the cooling pipe is leaking or blocked.

NG → **Perform repair according to malfunction**

OK

2	**Advanced automatic driving controller cools down**

(a) Lower the advanced automatic driving controller temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A028	GNSS antenna disconnection
DTC	B16A029	GNSS module fault

Description

When there is module fault or open in left GNSS-inertial navigation system, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A028	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• GNSS antenna is disconnect-ed for 5 s	1 times	Periodic type	1S	• Advanced automatic driving controller • Wire harness and connector • Left GNSS-inertial navigation
B16A029	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• GNSS module data CRC is incorrect for 2 s • GNSS module information is lost for 2 s • Read the abnormal marks from GNSS module for 2s • PPS is lost for 5 s	2 times/2 times/ 2 times/5 times	Periodic type	1S	• Advanced automatic driving controller • Wire harness and connector • Left GNSS-inertial navigation

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A028	NOA function exits or is suppressed	Comes on
B16A029	NOA function exits or is suppressed	Comes on

Inspection procedure

1	Check left GNSS - inertial navigation system wire harness and connector

(a) Check for short in left GNSS - inertial navigation system wire harness and connector.

(b) Check for open in left GNSS - inertial navigation system wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Replace left GNSS - inertial navigation (See page ZC-40)**

(a) Replace the left GNSS - inertial navigation.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A030	Left camera temperature abnormal

Description

When temperature of left panoramic camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A030	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Left panoramic camera • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A030	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	Cool down left panoramic camera

(a) Lower the left panoramic camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace left panoramic camera (See page WS-74)

OK

Diagnosis ends

ZD

DTC	B16A031	Right camera temperature abnormal

Description

When temperature of right panoramic camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A031	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Right panoramic camera • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A031	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → Perform repair according to malfunction

OK

2	Cool down right panoramic camera

(a) Lower the right panoramic camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace right panoramic camera (See page WS-74)

OK

Diagnosis ends

DTC	B16A032	Front camera temperature abnormal

Description

When temperature of front panoramic DJ camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A032	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Front panoramic DJ camera • Ambient temperature

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A032	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	Cool down front panoramic DJ camera

(a) Lower the front panoramic DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace front panoramic DJ camera (See page ZC-146)

OK

Diagnosis ends

ZD

DTC	B16A033	Rear camera temperature abnormal

Description

When temperature of front panoramic DJ camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A033	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Front panoramic DJ camera • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A033	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	**Cool down rear panoramic DJ camera**

(a) Lower the rear panoramic DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace the rear panoramic DJ camera (See page ZC-148)**

OK

Diagnosis ends

DTC	B16A034	Rear camera temperature abnormal

Description

When rear surrounding view DJ camera temperature is too high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A034	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Rear surrounding view DJ camera • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A034	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	Cool down rear surrounding view DJ camera

(a) Lower the rear surrounding view DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG	**Replace rear surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

ZD

DTC	B16A035	Front camera temperature abnormal

Description

When temperature of left / right / monocular front DJ camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A035	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Front left/right/monocular DJ camera • Ambient temperature

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A035	• Smart driving function exits or suppresses	Comes on

Inspection procedure

1	**Check vehicle ambient temperature**

(a) Check if vehicle ambient temperature is normal.

NG → Perform repair according to malfunction

OK

2	Cool down front left/right/monocular DJ camera

(a) Lower the front left/right/monocular DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace front left/right/monocular DJ camera (See page ZC-139)

OK

Diagnosis ends

DTC	B16A036	Rear left side camera temperature abnormal

Description

When temperature of rear left surrounding view DJ camera is high, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A036	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal sensor temperature is detected for continuous 3 detection cycles (the temperature is lower than -40° C or higher than 125° C)	3 times	Periodic type	200 ms	• Rear left surrounding view DJ camera • Ambient temperature

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A036	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	Check vehicle ambient temperature

(a) Check if vehicle ambient temperature is normal.

NG → **Perform repair according to malfunction**

OK

2	Cool down rear left surrounding view DJ camera

(a) Lower the rear left surrounding view DJ camera temperature to the normal operation temperature.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

ZD

DTC	B16A038	Left camera internal fault

Description

When there is an internal fault in left panoramic camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A038	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Left panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A038	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace left panoramic camera (See page WS-74)**

ZD

OK

Diagnosis ends

DTC	B16A039	Right camera internal fault

Description

When there is an internal fault in right panoramic camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A039	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Right panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A039	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace right panoramic camera (See page WS-74)**

OK

Diagnosis ends

DTC B16A040 Front camera internal fault

Description

When there is an internal fault in front panoramic DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A040	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Front panoramic DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A040	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front panoramic DJ camera (See page ZC-146)**

OK

Diagnosis ends

DTC	B16A041	Rear camera internal fault

Description

When an internal fault occurs in rear panoramic DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A041	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Rear panoramic DJ camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A041	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace the rear panoramic DJ camera (See page ZC-148)**

OK

Diagnosis ends

DTC	**B16A042**	**Rear camera internal fault**

ZD

Description

When an internal fault occurs in rear surrounding view DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A042	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Rear surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A042	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

DTC	**B16A043**	**Front camera internal fault**
DTC	**B16A04E**	**IMU internal fault**

Description

When there is an internal fault in left / right / monocular front DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A043	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Front left/right/monocular DJ camera
B16A04E	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Communic-ation interruption between IMU sensor and cECU is detected for 20 seconds	10000 times	Periodic type	2 ms	• Front left/right/monocular DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A043	• Smart driving function exits or suppresses	Comes on
B16A04E	• DTC for domain controller triggering IMU internal fault	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left/right/monocular DJ camera (See page ZC-139)**

OK

Diagnosis ends

ZD

DTC	B16A044	Rear left side camera internal fault

Description

When there is fault in rear left surrounding view DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A044	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Rear left surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A044	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left surrounding view DJ camera (See page ZC-152)**

ZD

OK

Diagnosis ends

DTC	B16A045	Rear right side camera internal fault

Description

When there is fault in rear right surrounding view DJ camera, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A045	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• Abnormal fault signals, including data range out of limit, internal voltage range out of limit, memory ECC error, etc., are detected in camera	5 times	Periodic type	200 ms	• Rear right surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A045	• NOA function exits or is suppressed	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right surrounding view DJ camera (See page ZC-152)**

OK

Diagnosis ends

DTC B16A046 Left camera frame rate abnormal

Description

When left panoramic camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A046	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Left panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A046	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check left panoramic camera wire harness and connector

(a) Check for short in left panoramic camera wire harness and connector.

(b) Check for open in left panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → Replace left panoramic camera (See page WS-74)

OK

Diagnosis ends

DTC	B16A047	Right camera frame rate abnormal

Description

When right panoramic camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A047	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Right panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A047	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check right panoramic camera wire harness and connector

(a) Check for short in right panoramic camera wire harness and connector.

(b) Check for open in right panoramic camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace right panoramic camera (See page WS-74)**

OK

Diagnosis ends

DTC	B16A048	Front camera frame rate abnormal

Description

When front panoramic DJ camera frame rate is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A048	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Front panoramic DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A048	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check front panoramic DJ camera wire harness and connector

(a) Check for short in front panoramic DJ camera wire harness and connector.

(b) Check for open in front panoramic DJ camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front panoramic DJ camera (See page ZC-146)**

OK

Diagnosis ends

ZD

DTC	B16A049	Rear camera frame rate abnormal

Description

When frame rate of rear panoramic DJ camera is abnormal, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A049	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller	• The frame rate deviation of the camera image exceeds ±3 frames for 3 statistical periods	3 times	Periodic type	1000 ms	• Rear panoramic DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A049	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check rear panoramic DJ camera wire harness and connector

(a) Check for short in rear panoramic DJ camera wire harness and connector.

(b) Check for open in rear panoramic DJ camera wire harness and connector.

NG → **Check and repair or replace wire harness and connector**

OK

2	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace the rear panoramic DJ camera (See page ZC-148)**

OK

Diagnosis ends

DTC	B16A050	Left camera blocked

Description

When left panoramic camera is dirty or blocked by foreign object, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A050	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Left panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A050	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check left panoramic camera

(a) Check if there are obvious obstructions on the left panoramic camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check left panoramic camera for scratch or damage.

NG → **Remove obstruction or replace left panoramic camera**

OK

2	Replace left panoramic camera (See page WS-74)

(a) Replace the left panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A051	Right camera blocked

Description

When right panoramic camera is dirty or blocked by foreign object, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A051	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Right panoramic camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A051	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check right panoramic camera**

(a) Check if there are obvious obstructions on the right panoramic camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check right panoramic camera for scratch or damage.

NG → **Remove obstruction or replace right panoramic camera**

OK

2	**Replace right panoramic camera (See page WS-74)**

(a) Replace the right panoramic camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A052	Front camera blocked

Description

When front panoramic camera DJ is dirty or blocked by foreign object, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A052	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Front panoramic DJ camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A052	• Parking function exiting or suppression	Comes on

Inspection procedure

1	Check front panoramic DJ camera

(a) Check if there are obvious obstructions on the front panoramic DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check front panoramic DJ camera for scratch or damage.

NG → **Remove obstruction or replace front panoramic DJ camera**

OK

2	Replace front panoramic DJ camera (See page ZC-146)

(a) Replace the front panoramic DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A053	Rear camera blocked

Description

When rear panoramic DJ camera is dirty or blocked, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A053	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Rear panoramic DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A053	• Parking function exiting or suppression	Comes on

Inspection procedure

1	**Check rear panoramic DJ camera**

(a) Check if there are obvious obstructions on the rear panoramic DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check rear panoramic DJ camera for scratch or damage.

NG → **Remove obstruction or replace rear panoramic DJ camera**

OK

2	**Replace the rear panoramic DJ camera (See page ZC-148)**

(a) Replace the rear panoramic DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A054	Rear camera blocked

Description

When rear surrounding view DJ camera is dirty or blocked by objects, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A054	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Rear surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A054	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check rear surrounding view DJ camera

(a) Check if there are obvious obstructions on the rear surrounding view DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check rear surrounding view DJ camera for scratch or damage.

NG → **Remove obstruction or replace rear surrounding view DJ camera**

OK

2	**Replace rear surrounding view DJ camera (See page ZC-152)**

(a) Replace the rear surrounding view DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A055	Front camera blocked

Description

When left / right / monocular front DJ camera is dirty or blocked by foreign object, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A055	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Front left/right/monocular DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A055	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	**Check front left/right/monocular DJ camera**

(a) Check if there are obvious obstructions on the front left/right/monocular DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check front left/right/monocular DJ camera for scratch or damage.

NG → **Remove obstruction or replace front left/right/monocular DJ camera**

OK

2	**Replace front left/right/monocular DJ camera (See page ZC-139)**

(a) Replace the front left/right/monocular DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC B16A056 Rear left side camera blocked

Description

When rear left surrounding view DJ camera is dirty or blocked by foreign object, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A056	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Rear left surrounding view DJ camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A056	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	**Check rear left surrounding view DJ camera**

(a) Check if there are obvious obstructions on the rear left surrounding view DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check rear left surrounding view DJ camera for scratch or damage.

NG → **Remove obstruction or replace rear left surrounding view DJ camera**

OK

2	**Replace rear left surrounding view DJ camera (See page ZC-152)**

(a) Replace the rear left surrounding view DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	B16A057	Rear right side camera blocked

Description

When rear right surrounding view DJ camera is dirty or blocked by foreign object, the advanced automatic driving control unit records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A057	• Voltage is between 9 V and 16 V • IGN signal is ON • 5 seconds after waking up the controller • Vehicle speed is more than 5 km/h	• Blocked camera image is detected	6 times	Periodic type	1000 ms	• Rear right surrounding view DJ camera

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A057	• Driving and parking function exits or suppresses	Comes on

Inspection procedure

1	Check rear right surrounding view DJ camera

(a) Check if there are obvious obstructions on the rear right surrounding view DJ camera, such as mud, snow, dirt or foreign matter. Clean the obstructions to ensure the camera view is clear.

(b) Check rear right surrounding view DJ camera for scratch or damage.

NG → **Remove obstruction or replace rear right surrounding view DJ camera**

OK

2	**Replace rear right surrounding view DJ camera (See page ZC-152)**

(a) Replace the rear right surrounding view DJ camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	**U1A50A7**	**HAD fresh value synchronization message key reading failure**
DTC	**U1A51A7**	**RVA_1 key reading failure**
DTC	**U1A52A7**	**RWS_1 key reading failure**
DTC	**U1A53A7**	**HCU_2_12 key reading failure**
DTC	**U1A54A7**	**HAD_3 key reading failure**
DTC	**U1A55A7**	**ADV_2 key reading failure**
DTC	**U1A54A6**	**HAD_3 MAC generation failure**

DTC	U1A55A6	ADV_2 MAC generation failure

Description

When HSM key slot is faulty, the advanced automatic driving controller records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U1A50A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• HAD fresh value synchronization message key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A51A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• RVA_1 key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A52A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• RWS_1 key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A53A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• HCU_2_12 key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U1A54A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• HAD_3 key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A55A7	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• ADV_2 key reading failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A54A6	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• HAD_3 MAC generation failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller
U1A55A6	• Voltage is between 9 V and 16 V • 5 seconds after IGN signal is ON • Controller communication function is normal	• ADV_2 MAC generation failure	1 times	Event-based	Not involved	• Remote control key • Advanced automatic driving controller

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
U1A50A7	• DTC for SecOC message controller message authentication failure	Not come on
U1A51A7	• DTC for SecOC message controller message authentication failure	Not come on

DTC No.	Fault symptom	Warning light/indicator
U1A52A7	• DTC for SecOC message controller message authentication failure	Not come on
U1A53A7	• DTC for SecOC message controller message authentication failure	Not come on
U1A54A7	• DTC for SecOC message controller message authentication failure	Not come on
U1A55A7	• DTC for SecOC message controller message authentication failure	Not come on
U1A54A6	• DTC for SecOC message controller message authentication failure	Not come on
U1A55A6	• DTC for SecOC message controller message authentication failure	Not come on

Inspection procedure

1	**Check key**

(a) Query whether the key exists through the key challenge.

NG → **Re-register the key**

OK

Replace advanced automatic driving controller (See page ZC-79)

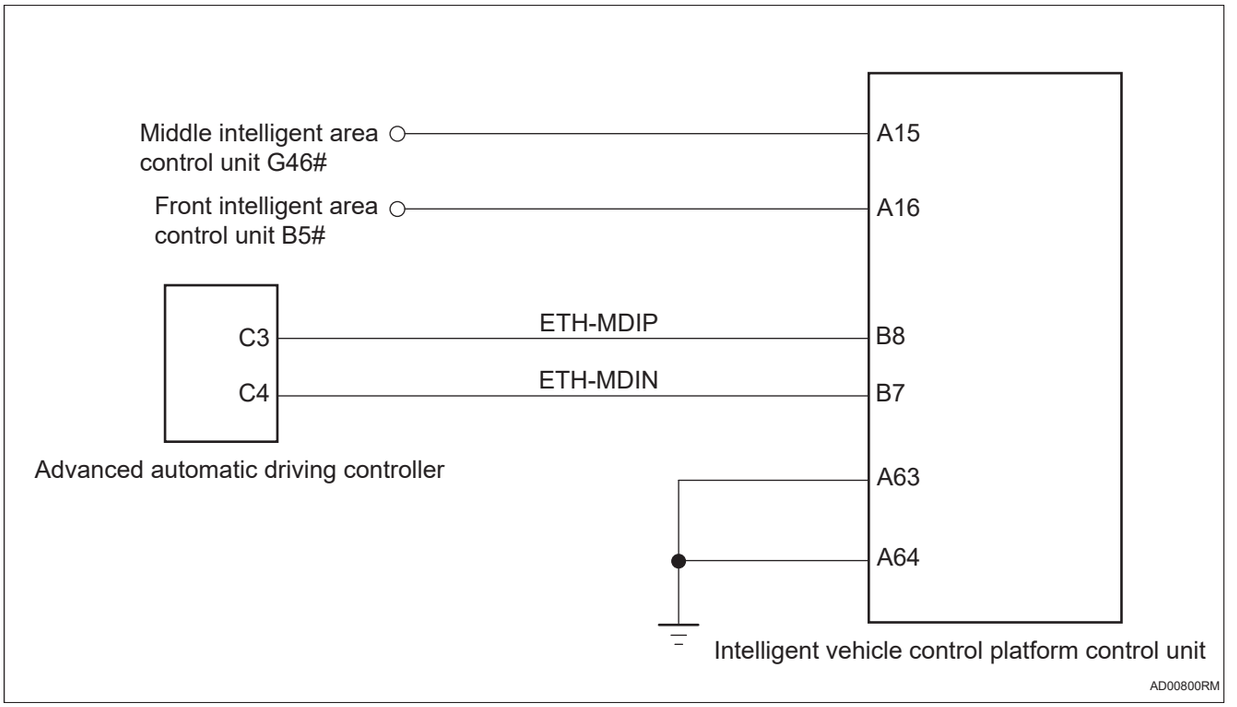
DTC	U147C8A	HAD backbone network Eth1 connection establishment failure

Description

When Ethernet communication between advanced automatic driving controller and other system is abnormal or interrupted, the advanced automatic driving controller records DTC.

DTC No.	DTC detection condition	Faulty area
U147C8A	(a) Connection establishment failure.	• Advanced automatic driving controller • Intelligent vehicle control platform control unit • Ethernet wire and connector

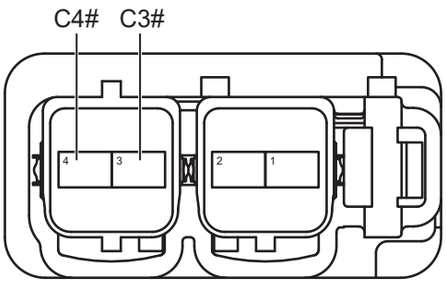
Circuit diagram



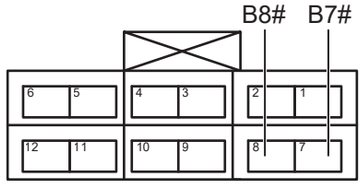
Inspection procedure

Note: Taking U14708A fault as an example, and fault analysis steps for other DTCs are similar.

1	**Check for open in Ethernet wire (advanced automatic driving controller - intelligent vehicle control platform control unit)**



Advanced automatic driving controller C connector



Intelligent vehicle control platform control unit B connector

AD00810RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the advanced automatic driving controller connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

Standard value

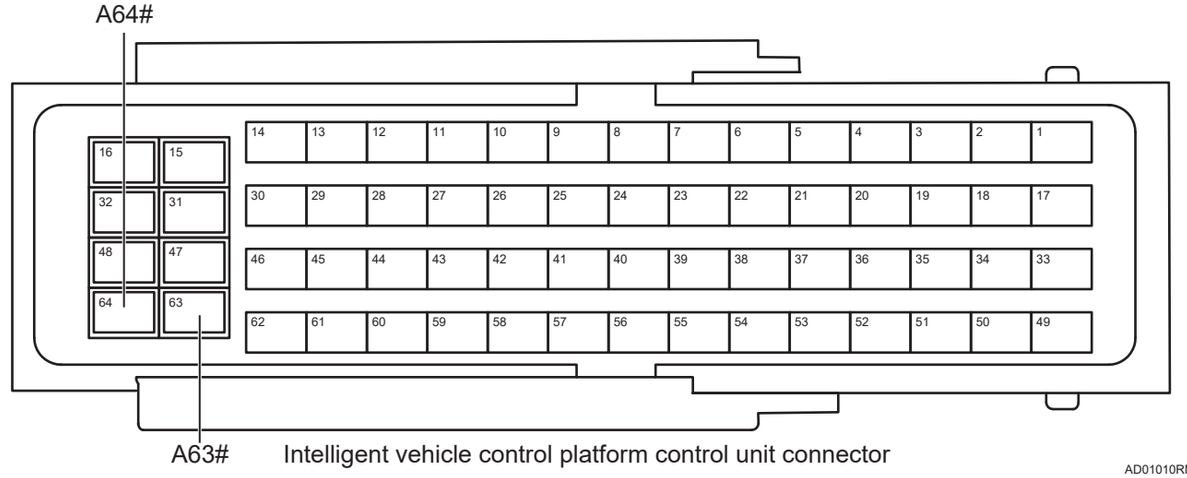
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector B8# - advanced automatic driving controller connector C3#	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector B7# - advanced automatic driving controller connector C4#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check intelligent vehicle control platform control unit ground**



Intelligent vehicle control platform control unit connector

AD01010RM

(a) According to value in the table, measure resistance.

Standard value

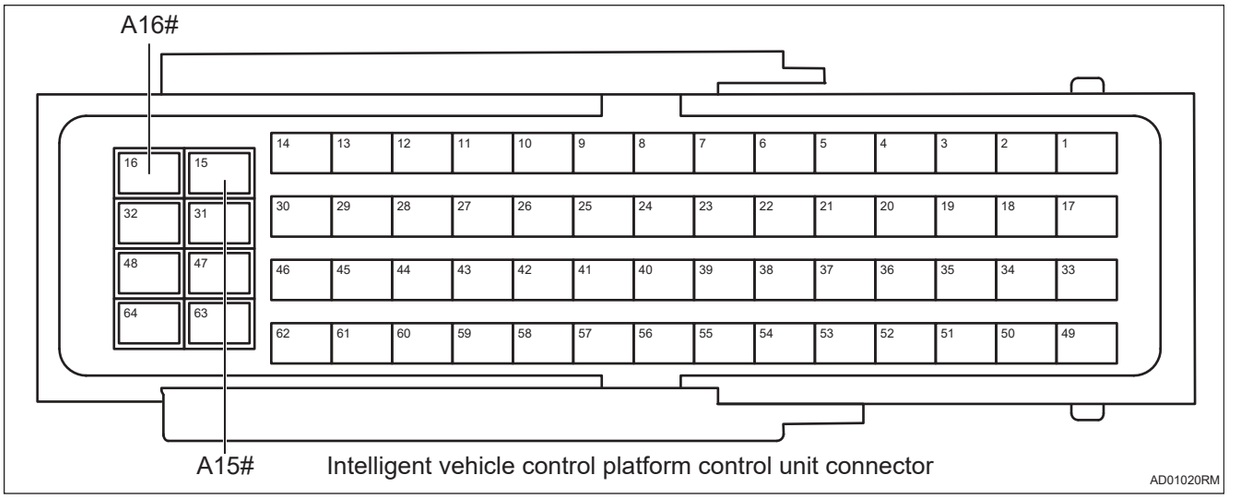
Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A63# - body ground	Always connected	Less than 1 Ω
Intelligent vehicle control platform control unit connector A64# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Check intelligent vehicle control platform control unit power supply



(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Intelligent vehicle control platform control unit connector A15# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Intelligent vehicle control platform control unit connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (if there is no problem with wire harness and connector, check the power supply and ground of front and middle intelligent area control units and confirm if the front and middle intelligent area control units are damaged)**

OK

4	**Replace intelligent vehicle control platform control unit (See page ZC-154)**

ZD

(a) Replace the intelligent vehicle control platform control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace advanced automatic driving controller (See page ZC-79)**

OK

Diagnosis ends

DTC	U003788	ADAS CAN bus off

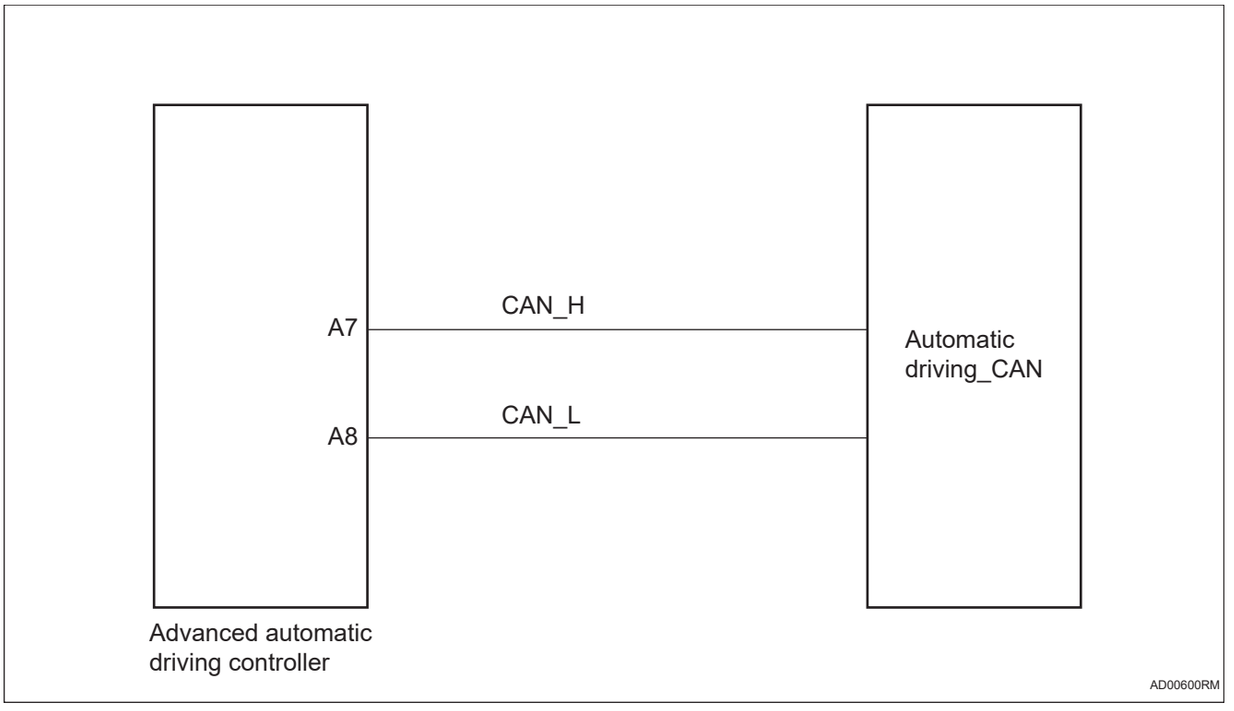
DTC	U007C88	Automatic driving control unit - front radar CAN bus off

Description

When advanced automatic driving controller detects CAN bus off fault, the advanced automatic driving control unit records DTC.

DTC No.	DTC detection condition	Faulty area
U008988	(a) ADAS CAN bus off.	• CAN line and connector • Advanced automatic driving controller • Smart camera
U007C88	(a) Automatic driving control unit - front radar CAN bus off.	• CAN line and connector • Advanced automatic driving controller • Front millimeter wave radar

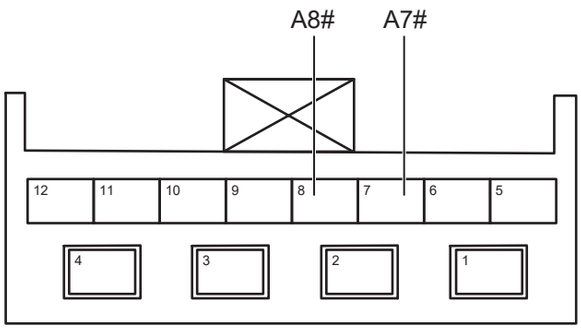
Circuit diagram



Inspection procedure

Note: Taking the U003788 fault as an example, and DTC analysis steps for other communication are similar.

1	Check automatic driving CAN terminal resistance



Advanced automatic driving controller connector

AD00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the advanced automatic driving controller connector.

(d) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A7# - advanced automatic driving controller connector A8#	Always connected	120 Ω

NG → **Perform repair according to malfunction**

OK

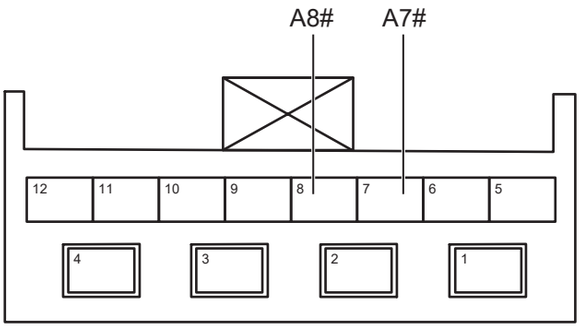
2	Check controllers on automatic driving CAN bus

(a) Disconnect the controllers on automatic driving CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

3	**Check for short between automatic driving_CAN bus CAN-L and CAN-H**



Advanced automatic driving controller connector

AD00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on automatic driving CAN bus.

(d) According to value in the table, measure resistance.

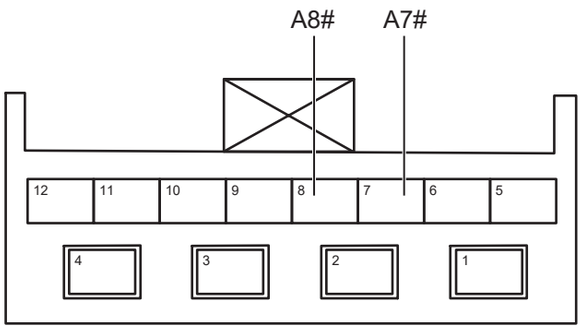
Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A7# - advanced automatic driving controller connector A8#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in automatic driving_CAN bus



Advanced automatic driving controller connector

AD00611RM

ZD

(a) According to value in the table, measure resistance.

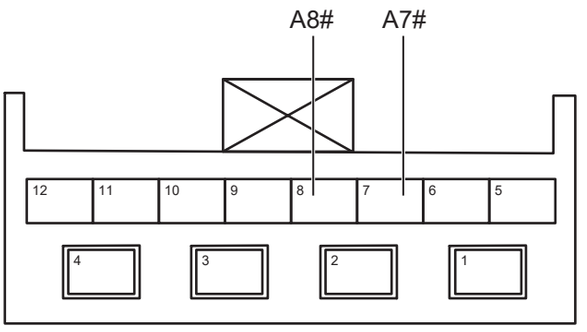
Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A7# - body ground	Always connected	10 KΩ or more
Advanced automatic driving controller connector A8# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in automatic driving_CAN bus**



Advanced automatic driving controller connector

AD00611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Advanced automatic driving controller connector A7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Advanced automatic driving controller connector A8# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	U014687	PDCF node lost
DTC	U041883	IBC message content fault
DTC	U041886	IBC message content fault
DTC	U059482	Vehicle controller message content fault
DTC	U059483	Vehicle controller message content fault
DTC	U059486	Vehicle controller message content fault
DTC	U041782	Electronic parking brake unit message content fault
DTC	U041783	Electronic parking brake unit message content fault
DTC	U041786	Electronic parking brake unit message content fault
DTC	U042082	Electric power steering control unit message content fault
DTC	U042083	Electric power steering control unit message content fault
DTC	U042086	Electric power steering control unit message content fault
DTC	U045282	Airbag controller message content fault
DTC	U045283	Airbag controller message content fault
DTC	U045286	Airbag controller message content fault
DTC	U044682	PDCF message content fault
DTC	U044683	PDCF message content fault
DTC	U044782	PDCM message content fault
DTC	U044783	PDCM message content fault
DTC	U040482	EGSM message content fault
DTC	U040483	EGSM message content fault
DTC	U040486	EGSM message content fault

DTC	**U02DC87**	**Front millimeter wave radar controller node lost**
DTC	**U053582**	**Front millimeter wave radar controller message content fault**
DTC	**U053583**	**Front millimeter wave radar controller message content fault**
DTC	**U053586**	**Front millimeter wave radar controller message content fault**
DTC	**U1A50A0**	**FV trip counter stored in NVM read and write error**
DTC	**U1A50A1**	**HAD fresh value synchronization message MAC check failure**
DTC	**U1A51A5**	**RVA_1 message authentication failure**
DTC	**U1A52A5**	**RWS_1 message authentication failure**
DTC	**U1A53A5**	**HCU_2_12 message authentication failure**

Description

When communication between advanced automatic driving controller and other system is abnormal or interrupted, the advanced automatic driving controller records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCF node lost.	• CAN line and connector • Advanced automatic driving controller • Front intelligent area control unit • Smart camera
U041882	(a) IBC message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Integrated brake controller
U041883	(a) IBC message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Integrated brake controller
U041886	(a) IBC message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera

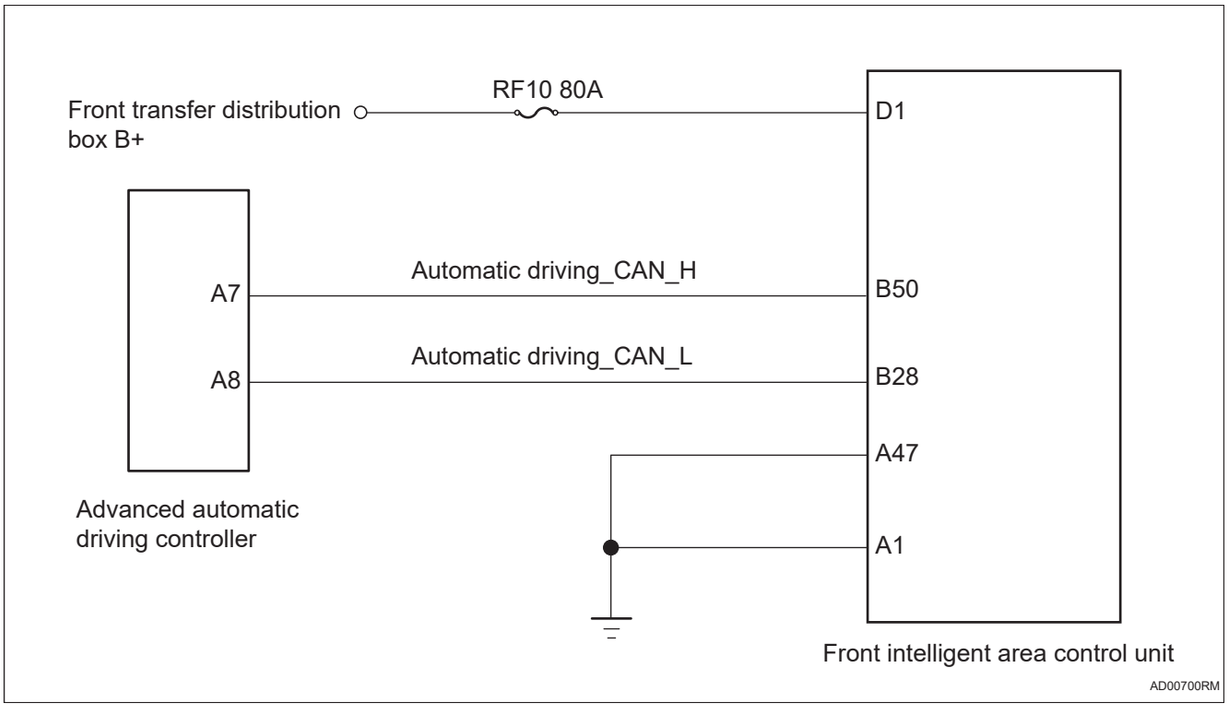
DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit • Integrated brake controller
U059482	(a) Vehicle controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit
U059483	(a) Vehicle controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit
U059486	(a) Vehicle controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Intelligent vehicle control platform control unit • Rear intelligent area control unit
U041782	(a) Electronic parking brake unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U041783	(a) Electronic parking brake unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U041786	(a) Electronic parking brake unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U042082	(a) Electric power steering control unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Electric power steering control unit
U042083	(a) Electric power steering control unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Electric power steering control unit

DTC No.	DTC detection condition	Faulty area
U042086	(a) Electric power steering control unit message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Electric power steering control unit
U045282	(a) Airbag controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Airbag control unit
U045283	(a) Airbag controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Airbag control unit
U045286	(a) Airbag controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Middle intelligent area control unit • Combination switch • Airbag control unit
U044682	(a) PDCF message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U044683	(a) PDCF message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit
U044782	(a) PDCM message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Middle intelligent area control unit • Rear intelligent area control unit
U044783	(a) PDCM message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Middle intelligent area control unit

DTC No.	DTC detection condition	Faulty area
		• Rear intelligent area control unit
U040482	(a) EGSM message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Middle intelligent area control unit • Combination switch
U040483	(a) EGSM message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Middle intelligent area control unit • Combination switch
U040486	(a) EGSM message content fault.	• CAN line and connector • Advanced automatic driving controller • Smart camera • Front intelligent area control unit • Rear intelligent area control unit • Middle intelligent area control unit • Combination switch
U02DC87	(a) Front millimeter wave radar controller node lost.	• CAN line and connector • Advanced automatic driving controller • Front millimeter wave radar
U053582	(a) Front millimeter wave radar controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Front millimeter wave radar
U053583	(a) Front millimeter wave radar controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Front millimeter wave radar
U053586	(a) Front millimeter wave radar controller message content fault.	• CAN line and connector • Advanced automatic driving controller • Front millimeter wave radar
U1A50A0	(a) FV trip counter stored in NVM write error.	• CAN line and connector • Advanced automatic driving controller • Intelligent vehicle control platform control unit
U1A50A1	(a) HAD fresh value synchronization message MAC check failure.	• CAN line and connector • Advanced automatic driving controller • Intelligent vehicle control platform control unit
U1A51A5	(a) RVA_1 message authentication fails.	• CAN line and connector • Advanced automatic driving controller

DTC No.	DTC detection condition	Faulty area
		• Intelligent vehicle control platform control unit
U1A52A5	(a) RWS_1 message authentication fails.	• CAN line and connector • Advanced automatic driving controller • Intelligent vehicle control platform control unit
U1A53A5	(a) HCU_2_12 message authentication fails.	• CAN line and connector • Advanced automatic driving controller • Intelligent vehicle control platform control unit

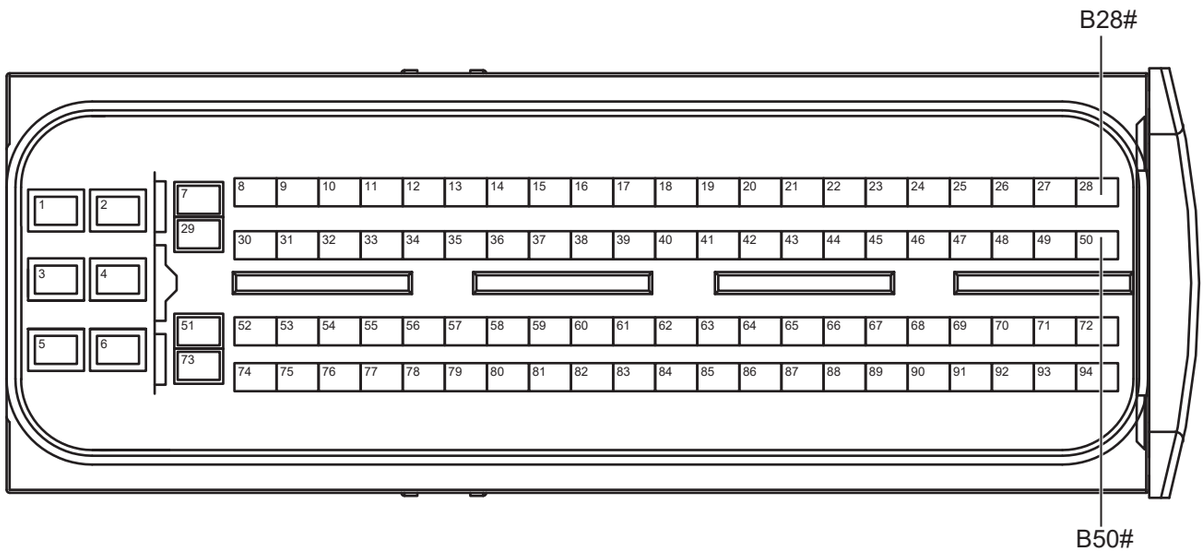
Circuit diagram



Inspection procedure

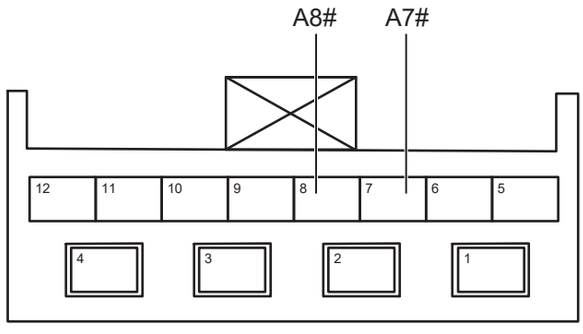
Note: Taking the U014787 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in automatic driving CAN bus (advanced automatic driving control unit - front intelligent area control unit)**



Front intelligent area control unit B connector

AD00910RM



Advanced automatic driving controller connector

AD00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on automatic driving CAN bus.

(d) According to value in the table, measure resistance.

Standard value

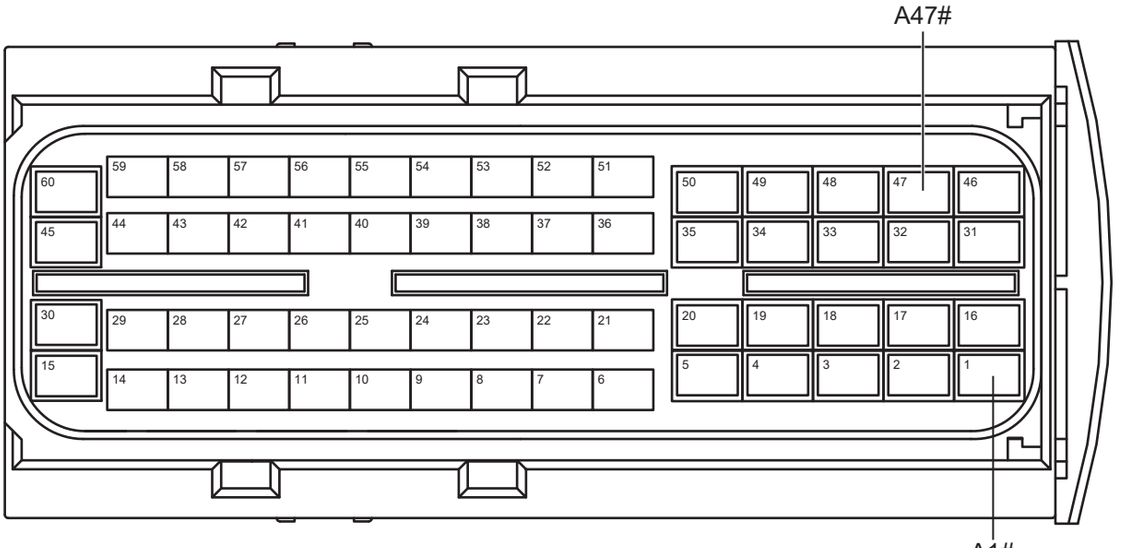
Multimeter connection	Detection condition	Specified condition
Advanced automatic driving control unit connector A7# - front intelligent area control unit connector B50#	Always connected	Less than 1 Ω
Advanced automatic driving control unit connector A8# - front intelligent area control unit connector B28#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

2	**Check front intelligent area control unit ground**



Front intelligent area control unit A connector

AD00920RM

(a) According to value in the table, measure resistance.

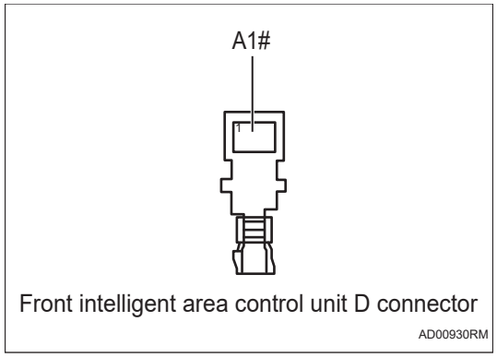
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector A1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector A47# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check front intelligent area control unit power supply**



Front intelligent area control unit D connector

AD00930RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

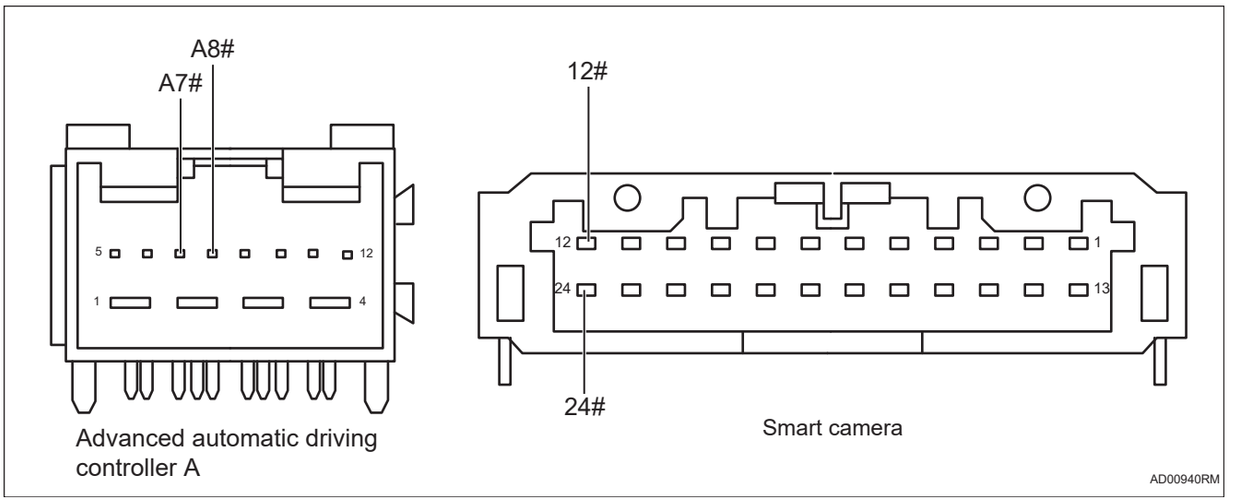
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	Battery voltage

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check automatic driving CAN bus terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - smart camera connector A12#	Always connected	Approximately 120 Ω
Advanced automatic driving controller A7# - advanced automatic driving controller A8#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace smart camera (See page ZC-139)**

(a) Replace the smart camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace front millimeter wave radar (See page ZC-110)**

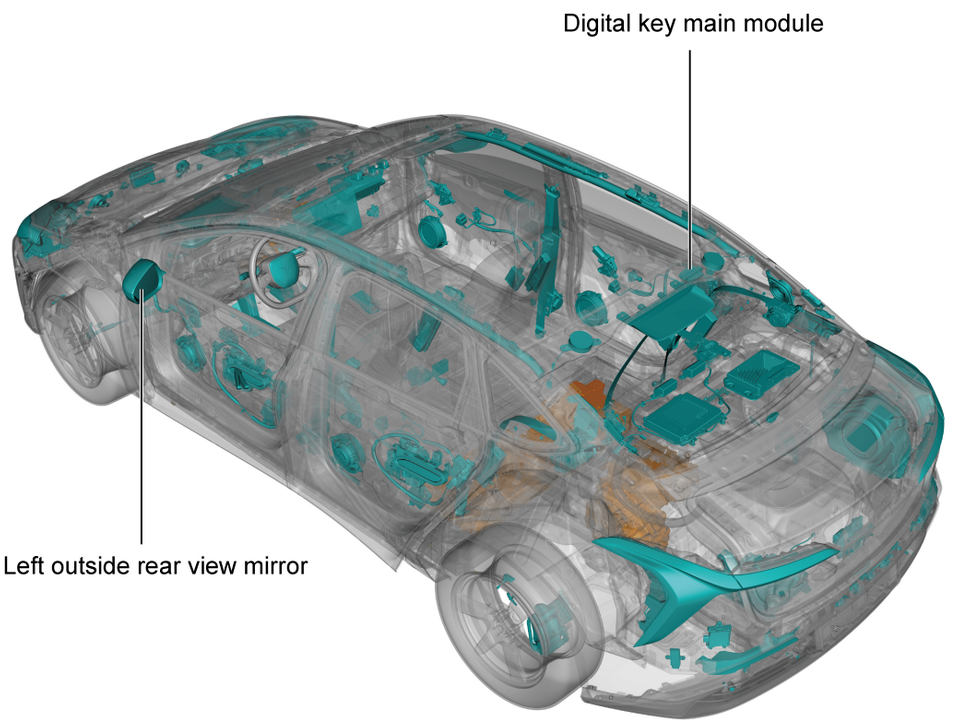
OK

Diagnosis ends

Digital key control system

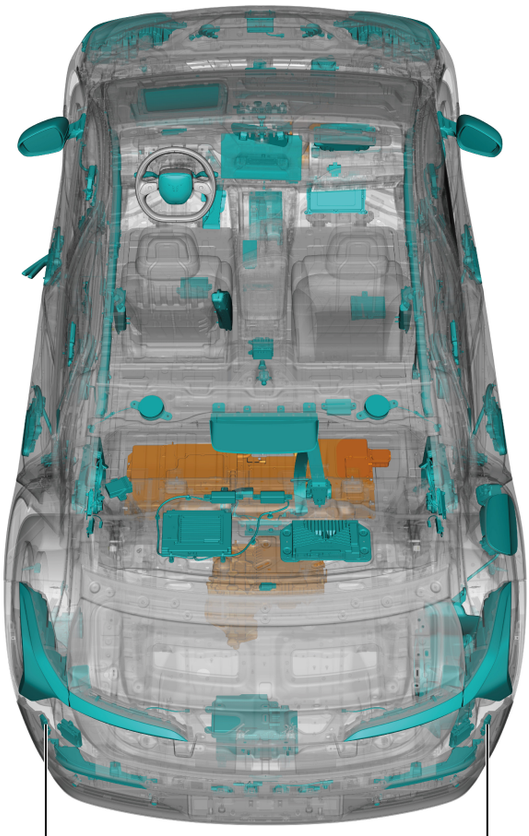
Digital key main module

Part position



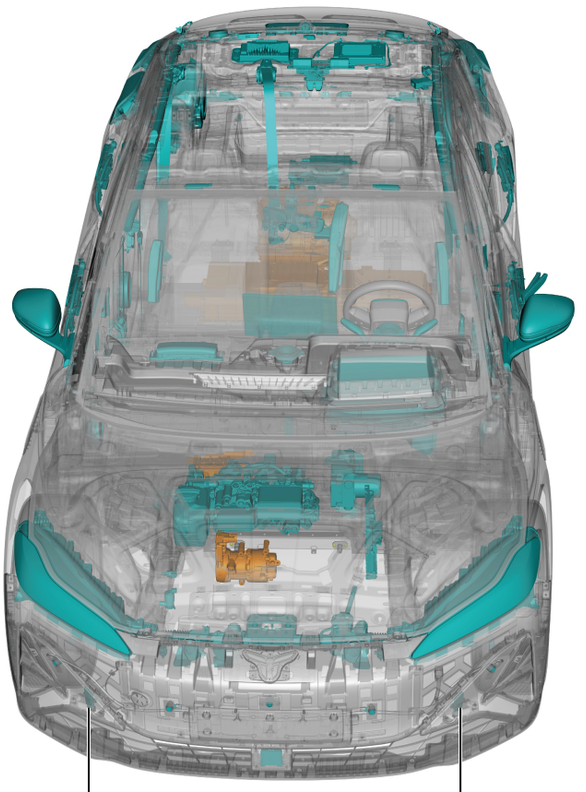
DK00030RM

Part position



DK00040RM

Part position



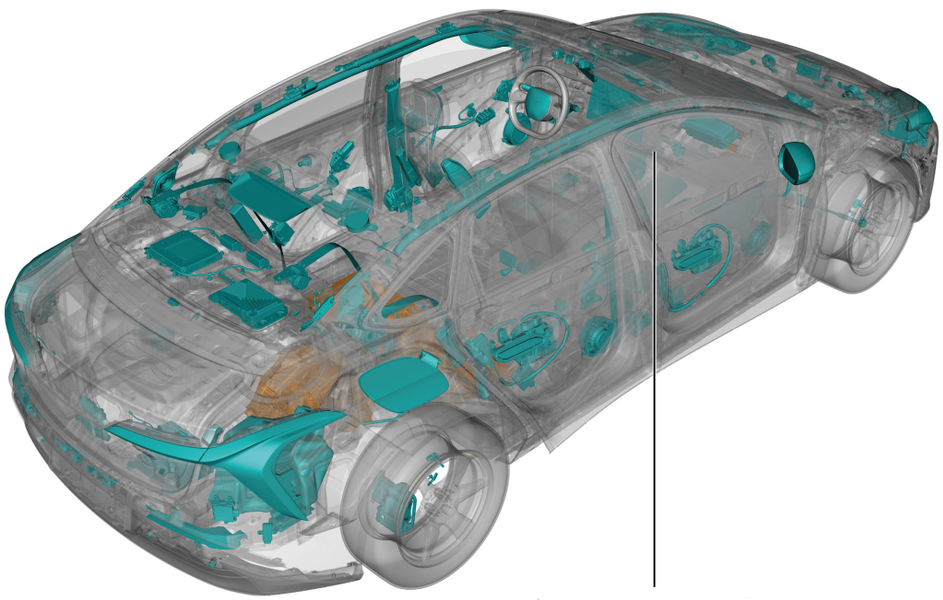
Front right digital key UWB antenna

Front left digital key UWB antenna

DK00050RM

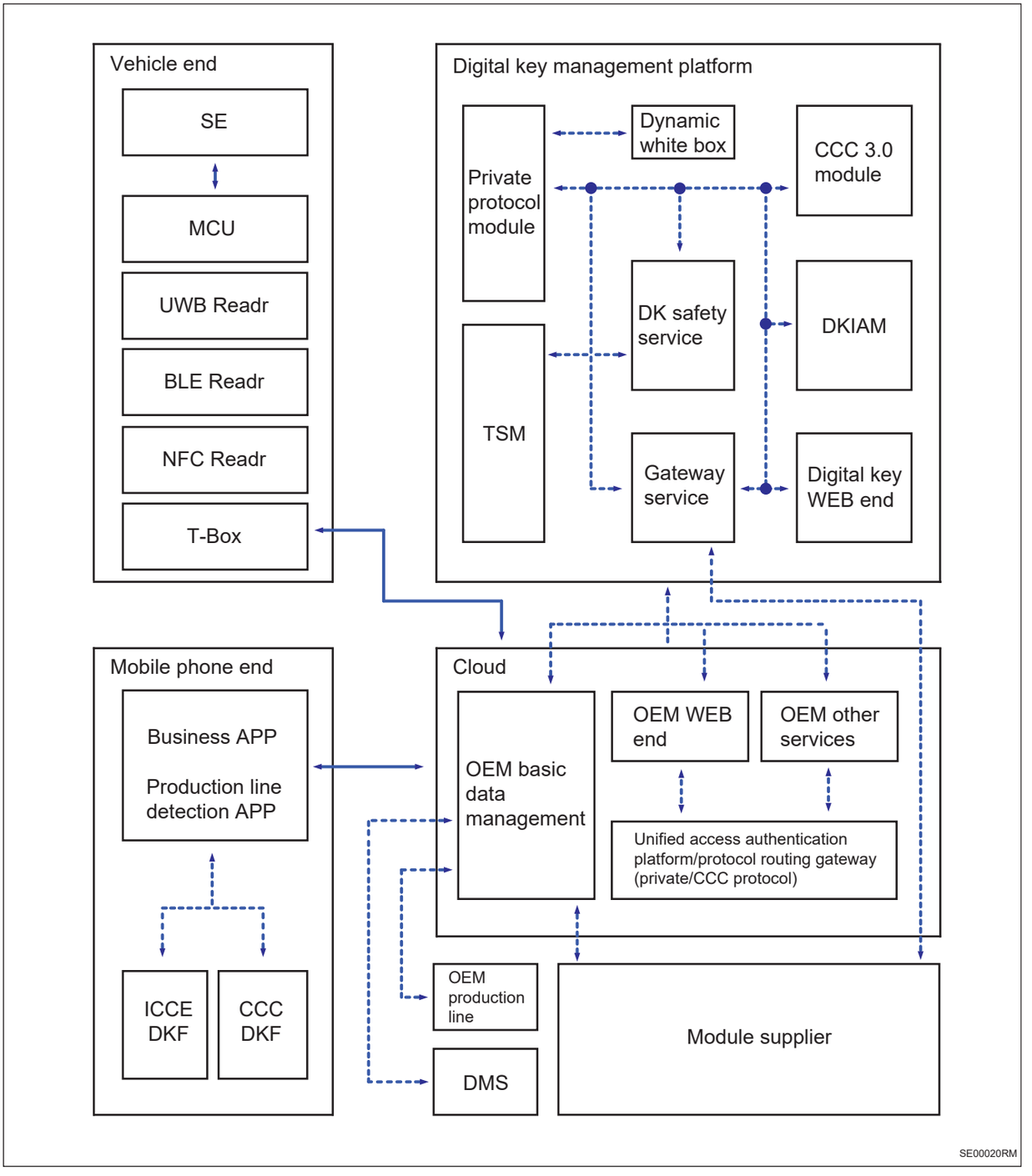
ZD

Part position



DK00060RM

System diagram



System description

1. Digital key system

(a) The digital key system utilizes the interaction among vehicle, mobile phone, and cloud system. The design and development of digital key products are jointly completed by the vehicle digital key hardware assembly, PDC, VDC, ICC, mobile phone APP, digital key component, mobile phone manufacturer DKF and SE, cloud TSP, digital key service platform, and mobile phone manufacturer service platform, which realizes digital key security service based on standard

security architecture and private security architecture, and conduct personalized vehicle control based on wireless communication connection.

Data parameter

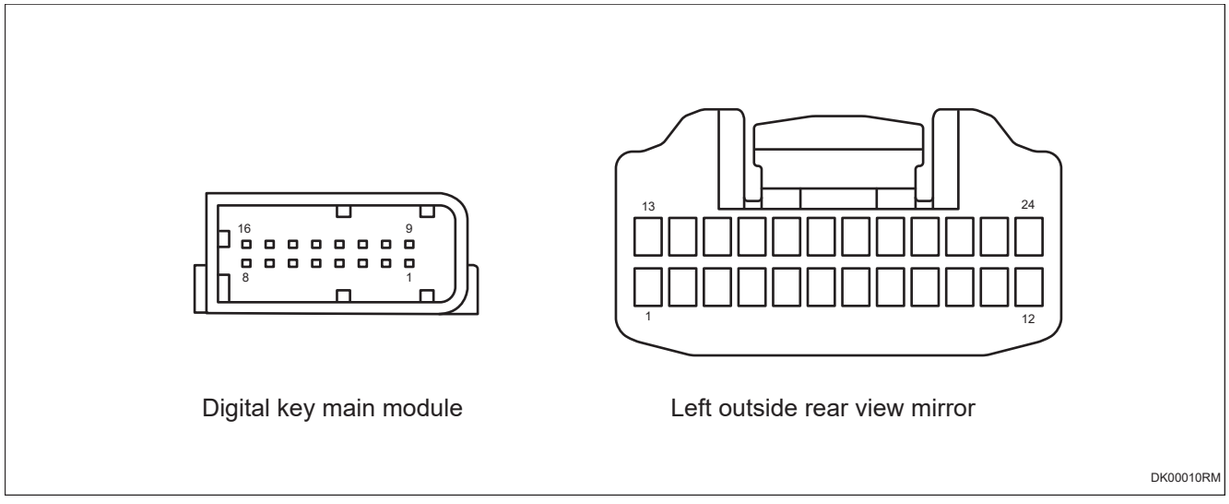
Digital key main module

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.95	0.27	0.002

Digital key UWB antenna

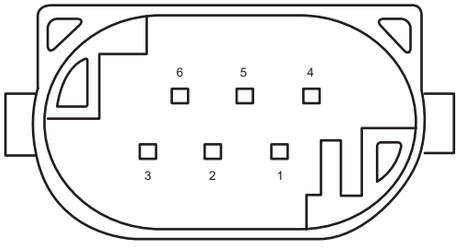
Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	0.15	0.04	0.0002

ECU terminal



Digital key main module			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	9	-
2	-	10	-
3	UWB_CAN_H	11	UWB_CAN_L
4	High drive output	12	PDC wake-up signal
5	NFC_CAN_H	13	NFC_CAN_L
6	-	14	IG
7	Body CAN_H	15	Body CAN_L
8	B+	16	GND

Left outside rear view mirror			
Pin number	**Definition**	**Pin number**	**Definition**
1	Digital key entry module power supply negative (-) (black wire harness)	13	Digital key entry module NFC_ CAN_H (blue wire harness)
2	Digital key entry module power supply positive (+) (red wire harness)	14	Digital key entry module NFC_ CAN_L (green wire harness)
3	-	15	-
4	-	16	-
5	BSM (+)	17	Turn signal light positive (STSL +)
6	-	18	-
7	Lens memory left/right signal (HSS)	19	Lens memory negative (GND)
8	Lens memory positive (VDD)	20	Lens memory up/down signal (VSS)
9	Lens heating (+)	21	Heating, turn signal light, BSM light common wire (-)
10	Folding motor outward (MF)	22	Folding motor inward (MR)
11	-	23	Lens adjustment shared wire (left + right - upper + lower -)
12	Lens adjustment (left - right +)	24	Lens adjustment (upper - lower +)



Digital key UWB antenna

DK00100RM

Front left digital key UWB antenna			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	4	GND
2	-	5	UBD
3	B_D_CAN_L	6	B_D_CAN_H

Front right digital key UWB antenna			
Pin number	**Definition**	**Pin number**	**Definition**
1	-	4	GND
2	POSITION_CODE2-	5	UBD
3	B_D_CAN_L	6	B_D_CAN_H

Rear left digital key UWB antenna			
Pin number	**Definition**	**Pin number**	**Definition**
1	POSITION_CODE1-	4	GND
2	-	5	UBD
3	B_D_CAN_L	6	B_D_CAN_H

Rear right digital key UWB antenna			
Pin number	**Definition**	**Pin number**	**Definition**
1	POSITION_CODE1-	4	GND
2	POSITION_CODE2-	5	UBD
3	B_D_CAN_L	6	B_D_CAN_H

Interior front digital key UWB antenna			
Pin number	**Definition**	**Pin number**	**Definition**
1	POSITION_CODE1+	4	GND
2	-	5	UBD
3	B_D_CAN_L	6	B_D_CAN_H

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B111716	Digital key main module input voltage undervoltage	(See page ZD-3406)
B111717	Digital key main module input voltage overvoltage	(See page ZD-3406)
B111718	NFC power supply input undervoltage	(See page ZD-3410)
B111719	NFC power supply input overvoltage	(See page ZD-3410)
B178491	Interior front digital key UWB antenna switch fault	(See page ZD-3414)
B179155	Main module UWB controller fault	(See page ZD-3418)
B179255	Front bumper left digital key UWB antenna controller fault	(See page ZD-3420)
B179355	Front bumper right digital key UWB antenna controller fault	(See page ZD-3421)
B179455	Rear bumper left digital key UWB antenna controller fault	(See page ZD-3423)
B179555	Rear bumper right digital key UWB antenna controller fault	(See page ZD-3425)

DTC	Detection Items	See page
B179655	Interior front digital key UWB antenna controller fault	(See page ZD-3426)
U238087	Lost communication with front bumper left digital key UWB antenna	(See page ZD-3428)
U238187	Lost communication with front bumper right digital key UWB antenna	(See page ZD-3435)
U238287	Lost communication with rear bumper left digital key UWB antenna	(See page ZD-3441)
U238387	Lost communication with rear bumper right digital key UWB antenna	(See page ZD-3447)
U238487	Lost communication with interior front digital key UWB antenna	(See page ZD-3453)
U008188	Digital key CAN bus off	(See page ZD-3459)
U014787	PDCM node lost	(See page ZD-3477)
U008488	Digital key - NFC CAN bus off	(See page ZD-3465)
U008588	Digital key - UWB CAN bus off	(See page ZD-3471)

ZD

DTC	**B111716**	**Digital key main module input voltage undervoltage**
DTC	**B111717**	**Digital key main module input voltage overvoltage**

Description

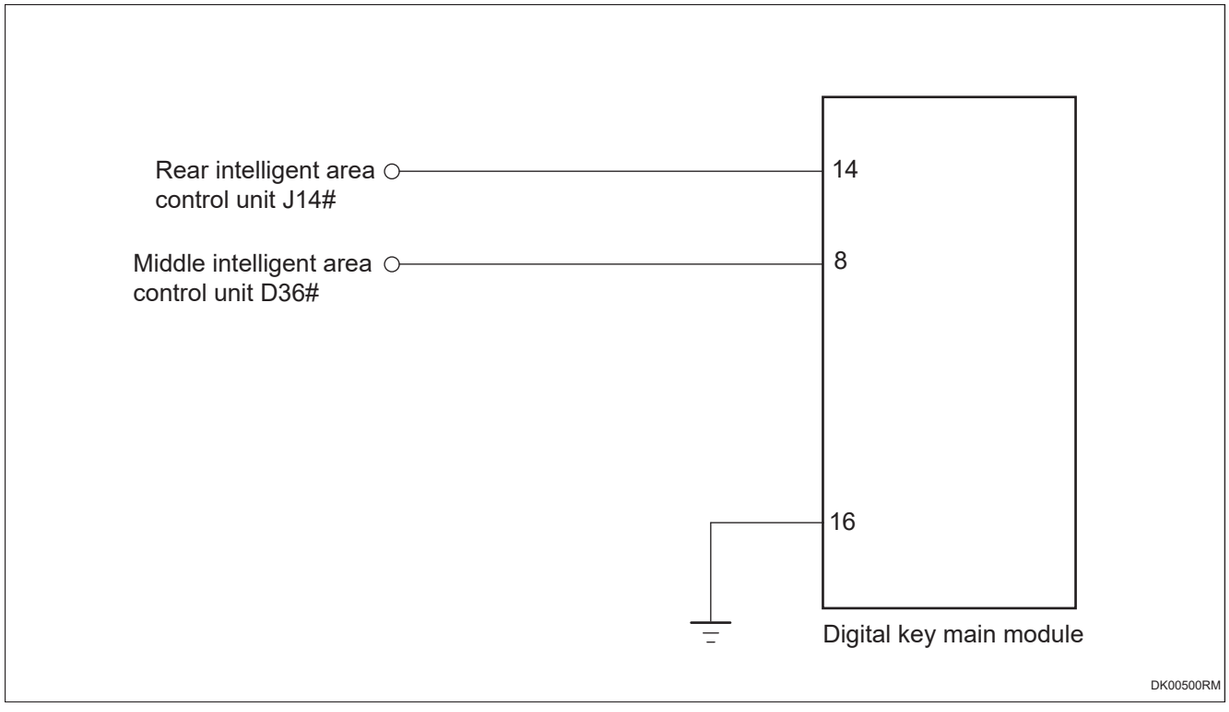
When digital key main module power supply voltage is out of normal operating range, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111716	• Controller power on	Keep 0.5 s to detect that battery voltage is lower than 9 ± 0.2 V	Immediately	Continuous	10 ms	• Digital key main module • Wire harness and connector • Charging system
B111717	• Controller power on	Keep 0.5 s to detect that battery voltage is higher than 16 ± 0.2 V	Immediately	Continuous	10 ms	• Digital key main module • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111716	Keep 0.5 s to detect that battery voltage is lower than 9 ± 0.2 V	-
B111717	Keep 0.5 s to detect that battery voltage is higher than 16 ± 0.2 V	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

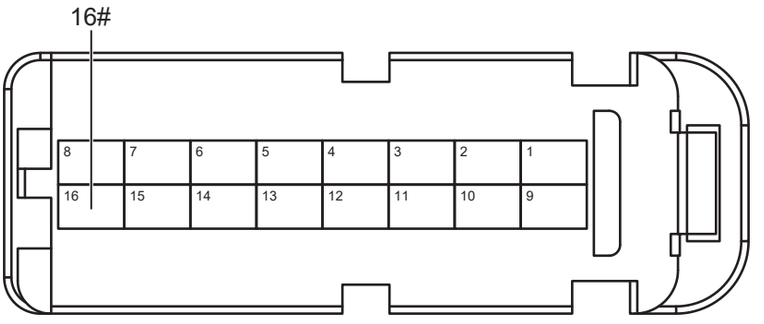
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check digital key main module ground**



Digital key main module connector

DK00510RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) According to value in the table, measure resistance.

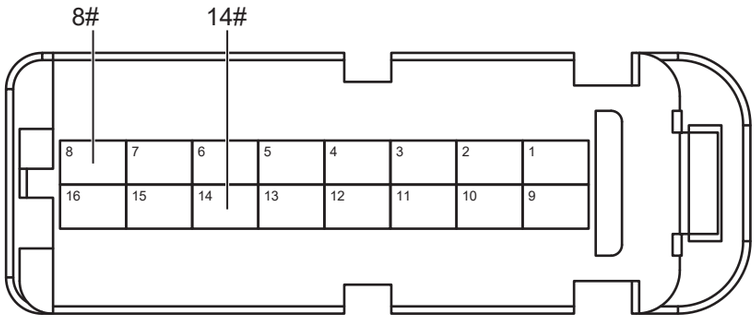
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 16# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check digital key main module power supply**



Digital key main module connector

DK00531RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Digital key main module connector 8# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Digital key main module connector 14# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector (If there is no problem with wire harness and connector, check central/rear intelligent area control unit power supply and ground and confirm whether the central/rear intelligent area control unit is damaged)**

OK

Replace digital key main module (See page ZC-102)

DTC	B111718	NFC power supply input undervoltage
DTC	B111719	NFC power supply input overvoltage

Description

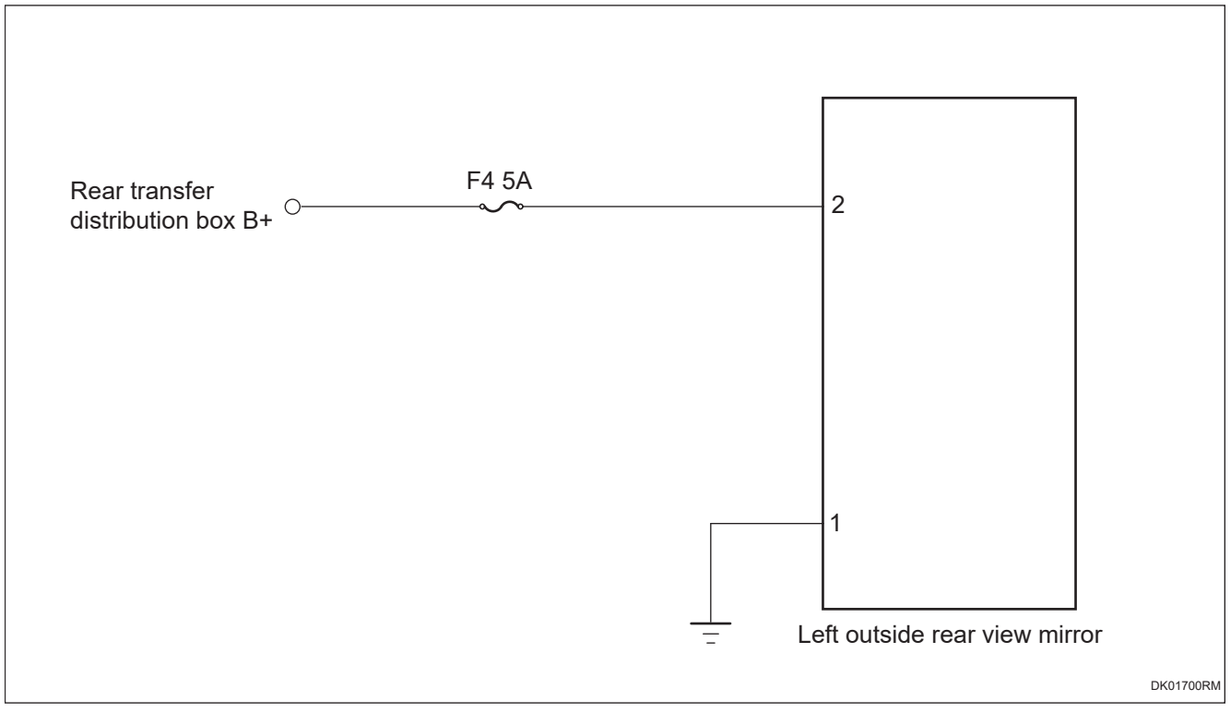
When left outside rear view mirror power supply voltage is out of normal operating range, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B111718	• NFC controller power-on	Keep 0.5 s to detect that battery voltage is lower than 9 ± 0.2 V	Immediately	Continuous	10 ms	• Left outside rear view mirror • Wire harness and connector • Charging system
B111719	• NFC controller power-on	Keep 0.5 s to detect that battery voltage is higher than 16 ± 0.2 V	Immediately	Continuous	10 ms	• Left outside rear view mirror • Wire harness and connector • Charging system

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B111718	Keep 0.5 s to detect that battery voltage is lower than 9 ± 0.2 V	-
B111719	Keep 0.5 s to detect that battery voltage is higher than 16.5 ± 0.2 V	-

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check left outside rear view mirror fuse**

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Remove the left outside rear view mirror fuse.

(d) According to value in the table, measure resistance.

Standard value

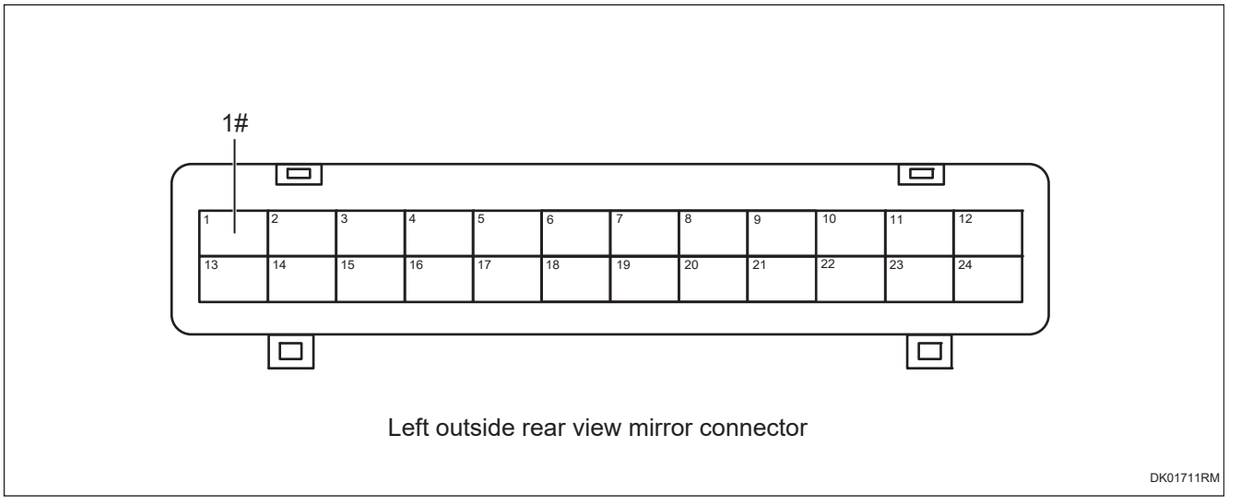
Multimeter connection	Detection condition	Specified condition
Both ends of fuse	Always connected	Less than 1 Ω

NG → **Replace fuse**

OK

ZD

3	Check left outside rear view mirror ground



Left outside rear view mirror connector

DK01711RM

(a) Disconnect the left outside rear view mirror connector.

(b) According to value in the table, measure resistance.

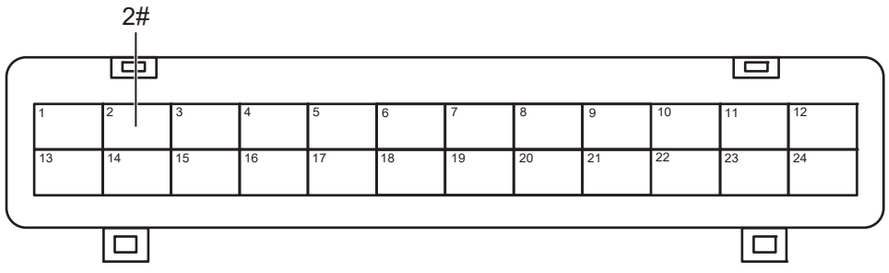
Standard value

Multimeter connection	Detection condition	Specified condition
Left outside rear view mirror connector 1# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check left outside rear view mirror power supply**



Left outside rear view mirror connector

DK01721RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detecti-on conditi-on	Specified condition
Left outside rear view mirror connector 2# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

OK

Replace left outside rear view mirror (See page WS-74)

ZD

DTC	B178491	Interior front digital key UWB antenna switch fault

Description

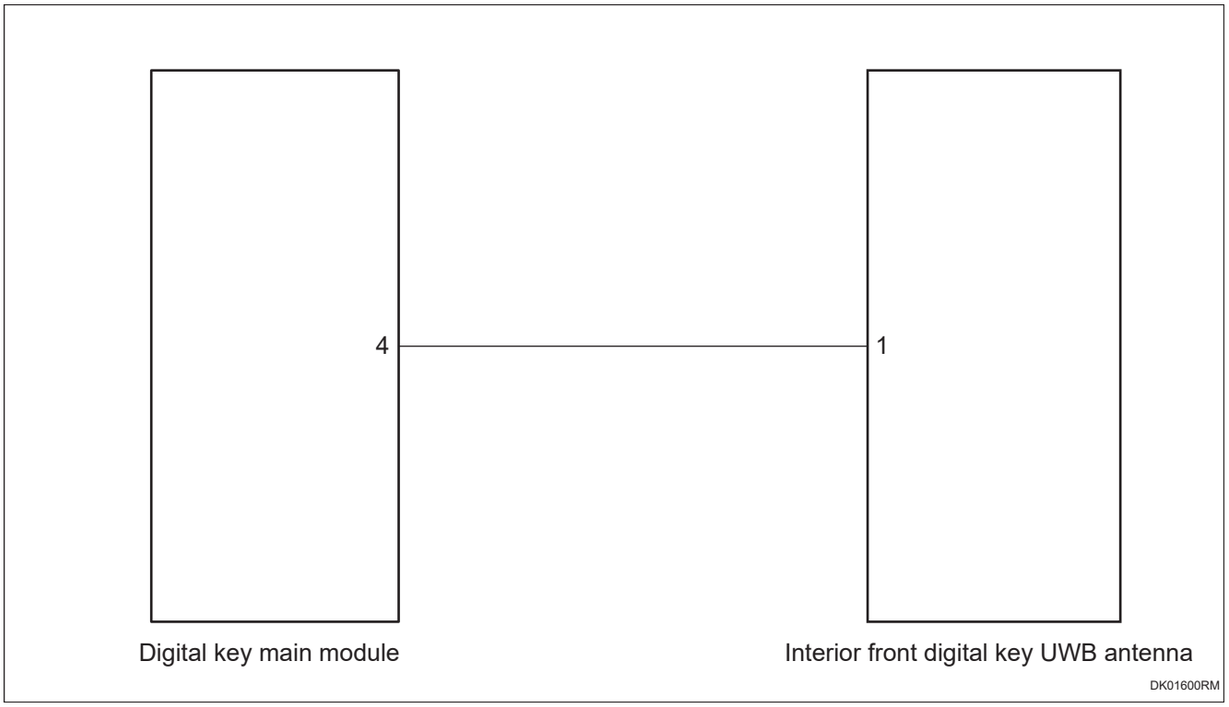
When interior front digital key UWB antenna switch is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B178491	• Within normal voltage range • Connect Bluetooth • 155 message Dtc signal bit0 is 1	DP switch state does not match actual state, this node is a termination resistor	Immediately	Continuous	10 ms	• Wire harness and connector • Interior front digital key UWB antenna • Digital key main module

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B178491	DP switch state does not match actual state, this node is a termination resistor	-

Circuit diagram



Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

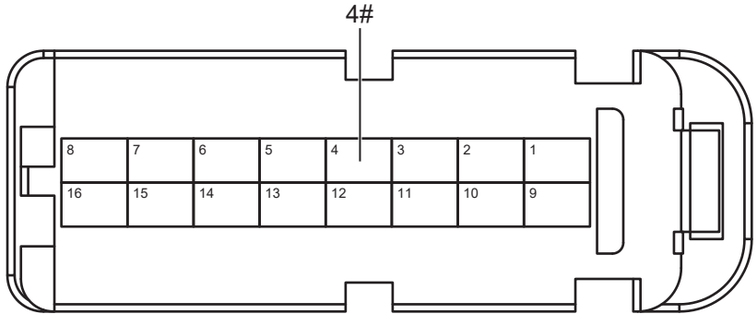
Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Check wire harness and connector (digital key main module - interior front digital key UWB antenna)**

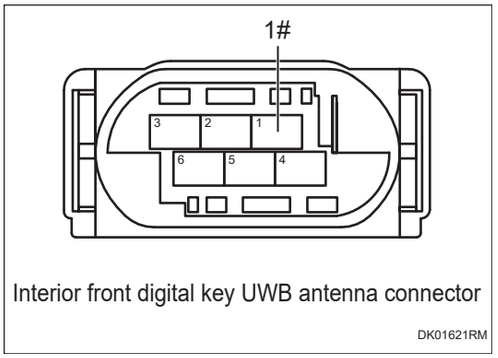
OK

2	**Check for open in interior front digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Interior front digital key UWB antenna connector

DK01621RM

(a) According to value in the table, measure resistance.

Standard value

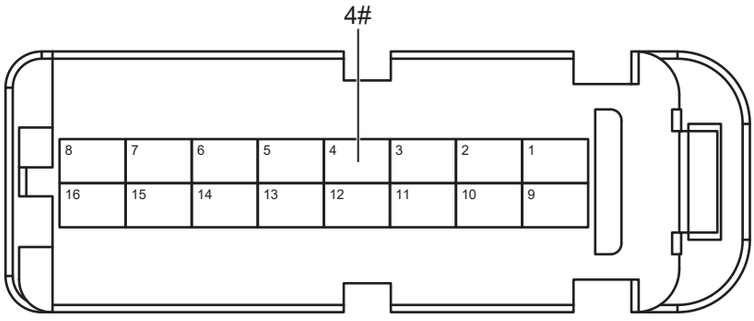
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - interior front digital key UWB antenna connector 1#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	Check for short to ground in interior front digital key UWB antenna wire harness and connector



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

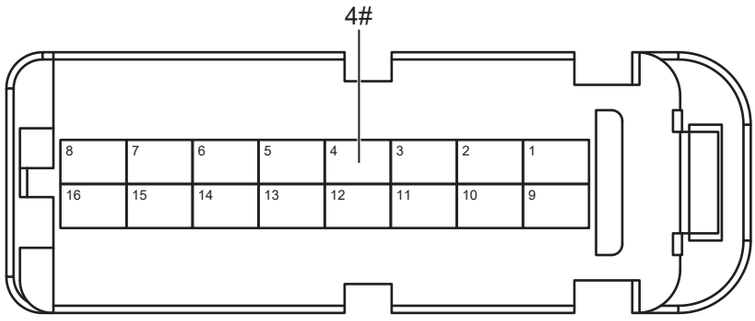
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in interior front digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Replace interior front digital key UWB antenna (See page ZC-104)**

(a) Replace the interior front digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

ZD

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

ZD

OK

Diagnosis ends

DTC B179155 Main module UWB controller fault

Description

When digital key main module UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179155	• Within normal voltage range • Main UWB chip version read failure	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Digital key main module

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179155	Unable to communicate with UWB chip	-

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	**Power on system again**

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

DTC	B179255	Front bumper left digital key UWB antenna controller fault

Description

When front left digital key UWB antenna UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179255	• Within normal voltage range • Connect Bluetooth • 151 message Dtc signal bit1 is 1	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Front left digital key UWB antenna

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179255	No	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	**Power on system again**

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front left digital key UWB antenna (See page ZC-106)**

OK

Diagnosis ends

DTC	B179355	Front bumper right digital key UWB antenna controller fault

Description

When front right digital key UWB antenna UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179355	• Within normal voltage range • Connect Bluetooth • 152 message Dtc signal bit1 is 1	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Front right digital key UWB antenna

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179355	No	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	Power on system again

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace front right digital key UWB antenna (See page ZC-106)**

OK

Diagnosis ends

DTC	B179455	Rear bumper left digital key UWB antenna controller fault

Description

When rear left digital key UWB antenna UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179455	• Within normal voltage range • Connect Bluetooth • 153 message Dtc signal bit1 is 1	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Rear left digital key UWB antenna

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179455	No	-

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	**Power on system again**

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear left digital key UWB antenna (See page ZC-108)**

OK

Diagnosis ends

DTC	B179555	Rear bumper right digital key UWB antenna controller fault

Description

When rear right digital key UWB antenna UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179555	• Within normal voltage range • Connect Bluetooth • 154 message Dtc signal bit1 is 1	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Rear right digital key UWB antenna

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179555	No	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	**Power on system again**

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace rear right digital key UWB antenna (See page ZC-108)**

OK

Diagnosis ends

DTC	B179655	Interior front digital key UWB antenna controller fault

Description

When interior front digital key UWB antenna UWB controller is faulty, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B179655	• Within normal voltage range • Connect Bluetooth • 155 message Dtc signal bit1 is 1	Unable to communicate with UWB chip	Immediately	Continuous	10 ms	• Interior front digital key UWB antenna

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B179655	No	-

Inspection procedure

1	Clear DTCs

(a) Connect HQ-VDS diagnostic tester.

(b) Turn ignition switch to "ON".

(c) Clear DTCs.

(d) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	Diagnosis ends

NG → **Power on system again**

OK

2	Power on system again

(a) Power on the system again.

(b) Connect HQ-VDS diagnostic tester.

(c) Turn ignition switch to "ON".

(d) Clear DTCs.

(e) Read DTCs.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace interior front digital key UWB antenna (See page ZC-104)**

OK

ZD

Diagnosis ends

DTC	U238087	Lost communication with front bumper left digital key UWB antenna

Description

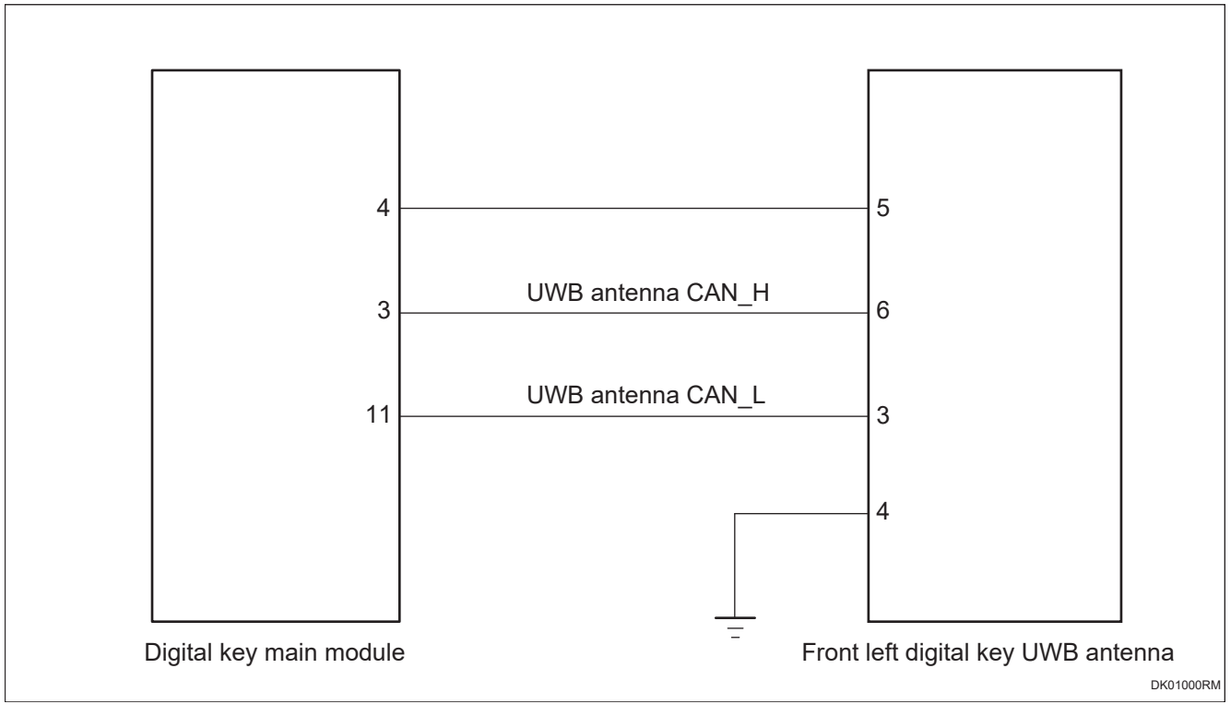
When communication between digital key main module and front left digital key UWB antenna is abnormal or interrupted, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U238087	• Turn ignition switch to ON, with a delay of 1.5 seconds • Non-bus off state • Within normal voltage range • Connect Bluetooth • Message is not received for 5 seconds	Slave module periodic message (0x151) is not received for 5 seconds	Immediately	Continuous	10 ms	• Wire harness and connector • Front left digital key UWB antenna • Digital key main module

Fault symptom

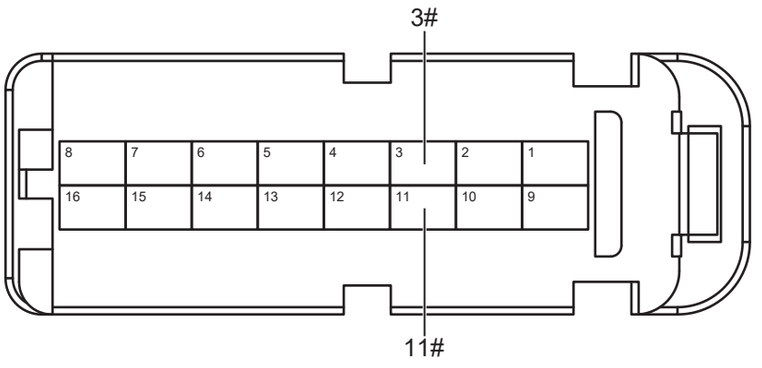
DTC No.	Fault symptom	Warning light/indicator
U238087	Slave module periodic message is not received for 5 seconds	-

Circuit diagram



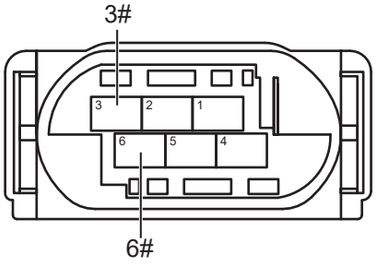
Inspection procedure

1	**Check for open in digital key UWB-CAN (digital key main module - front left digital key UWB antenna)**



Digital key main module connector

DK01011RM



Front left digital key UWB antenna connector

DK01020RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB-CAN.

(d) According to value in the table, measure resistance.

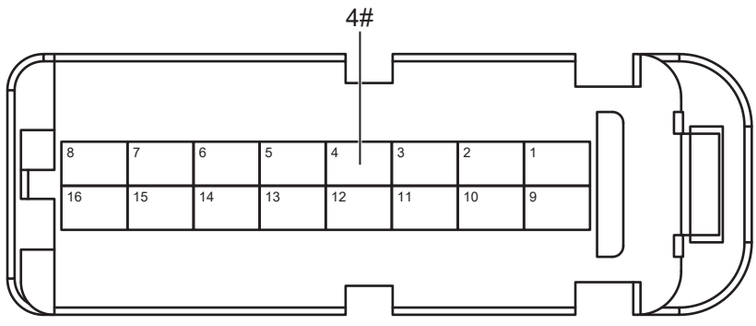
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - front left digital key UWB antenna connector 6#	Always connected	Less than 1 Ω
Digital key main module connector 11# - front left digital key UWB antenna connector 3#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

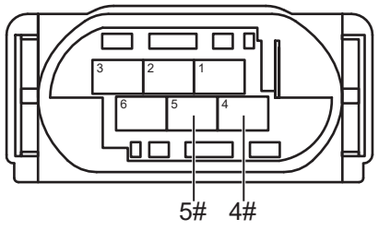
OK

2	**Check for open in front left digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Front left digital key UWB antenna connector

DK01041RM

(a) According to value in the table, measure resistance.

Standard value

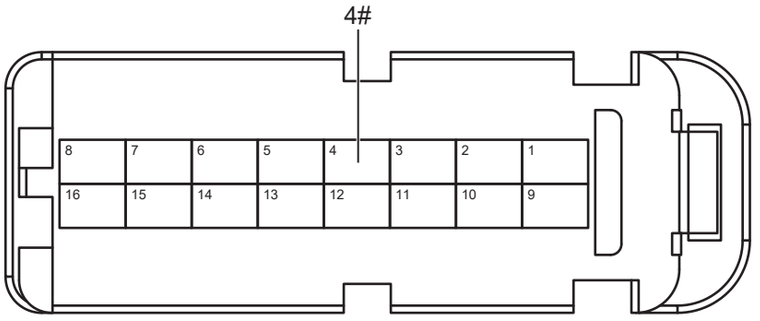
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - front left digital key UWB antenna connector 5#	Always connected	Less than 1 Ω
Front left digital key UWB antenna connector 4# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

3	**Check for short to ground in front left digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

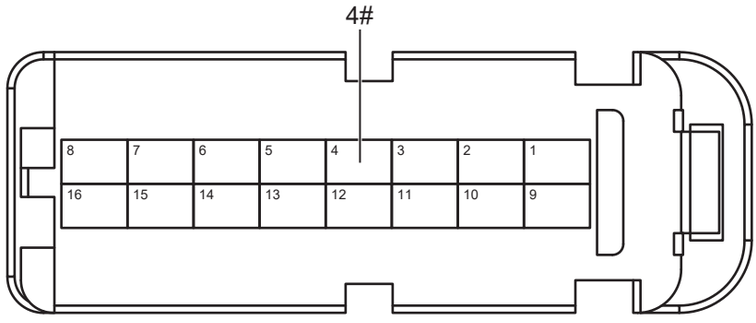
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in front left digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

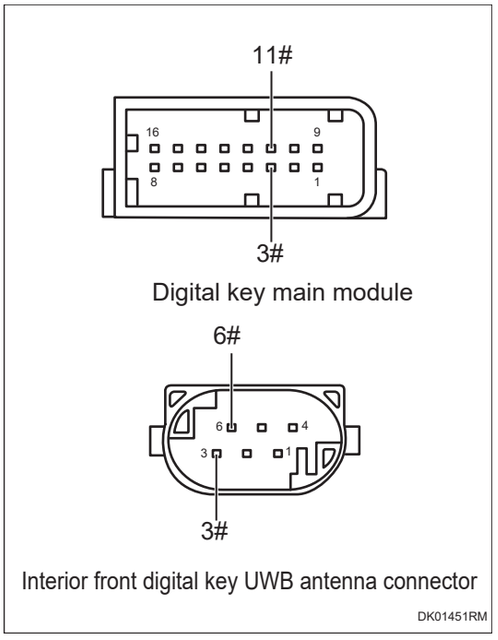
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check digital key main module, interior front digital key UWB antenna terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 3# - digital key main module 11#	Always connected	Approximately 120 Ω
Interior front digital key UWB antenna 6# - interior front digital key UWB antenna 3#	Always connected	Approximately 120 Ω

ZD

NG → **Perform repair according to malfunction**

OK

6	**Replace front left digital key UWB antenna (See page ZC-106)**

(a) Replace the front left digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

DTC	U238187	Lost communication with front bumper right digital key UWB antenna

Description

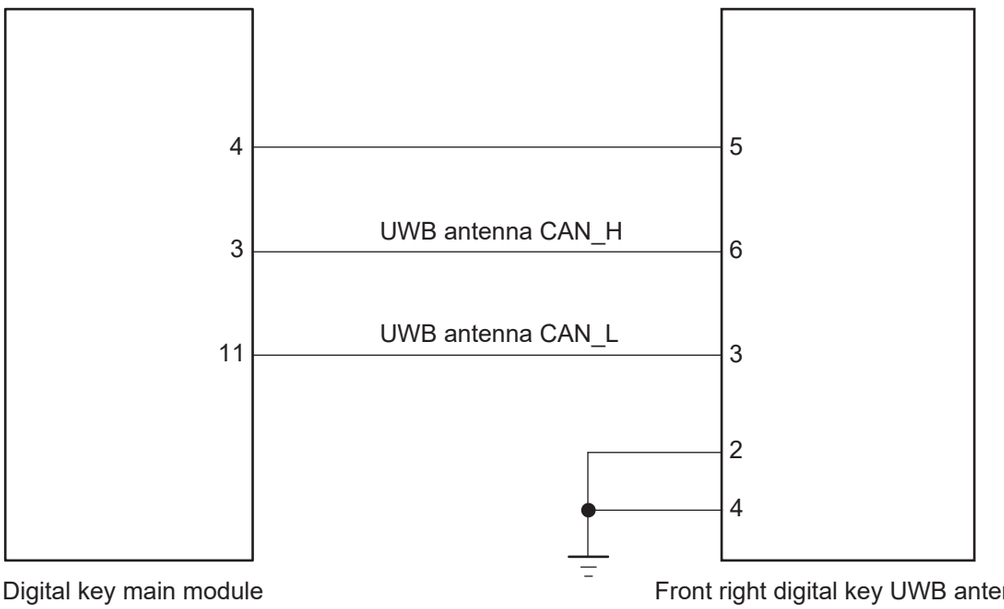
When communication between digital key main module and front right digital key UWB antenna is abnormal or interrupted, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U238187	• Turn ignition switch to ON, with a delay of 1.5 seconds • Non-bus off state • Within normal voltage range • Connect Bluetooth • Message is not received for 5 seconds	Slave module periodic message (0x152) is not received for 5 seconds	Immediately	Continuous	10 ms	• Wire harness and connector • Front right digital key UWB antenna • Digital key main module

Fault symptom

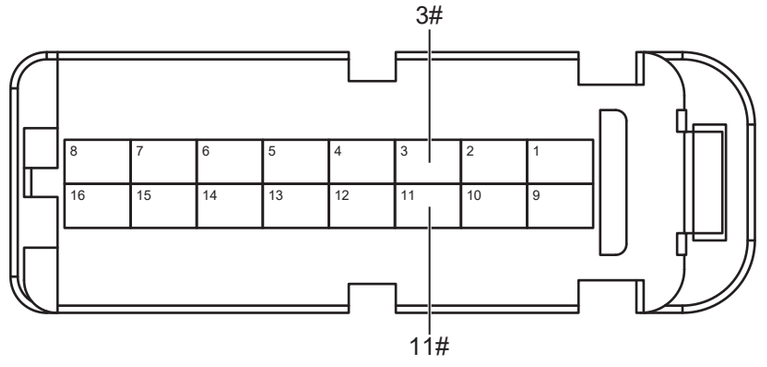
DTC No.	Fault symptom	Warning light/indicator
U238187	Slave module periodic message is not received for 5 seconds	-

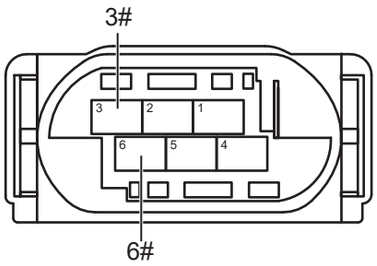
Circuit diagram



Inspection procedure

1	**Check for open in digital key UWB-CAN (digital key main module - front right digital key UWB antenna)**





Front right digital key UWB antenna connector

DK01120RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB-CAN.

(d) According to value in the table, measure resistance.

Standard value

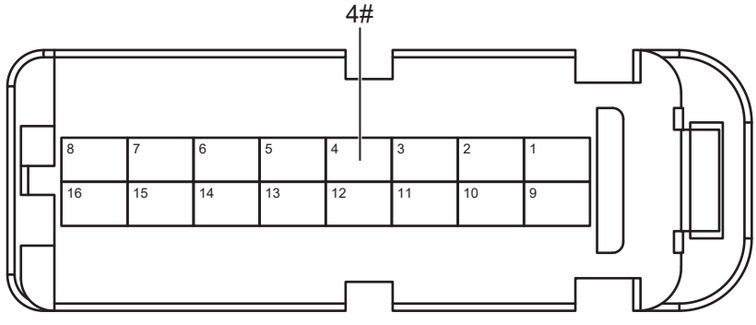
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - front right digital key UWB antenna connector 6#	Always connected	Less than 1 Ω
Digital key main module connector 11# - front right digital key UWB antenna connector 3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

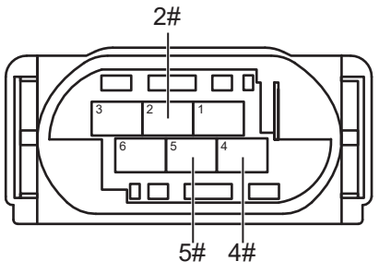
OK

2	**Check for open in front right digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Front right digital key UWB antenna connector

DK01141RM

(a) According to value in the table, measure resistance.

Standard value

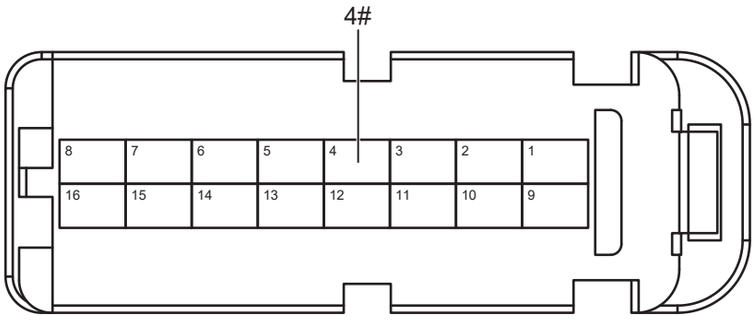
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - front right digital key UWB antenna connector 5#	Always connected	Less than 1 Ω
Front right digital key UWB antenna connector 2# - body ground	Always connected	Less than 1 Ω
Front right digital key UWB antenna connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in front right digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

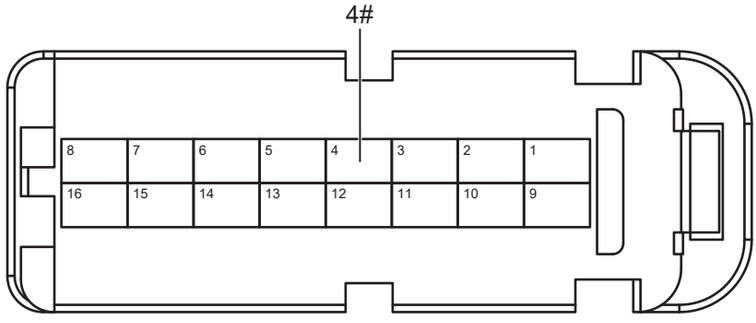
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in front right digital key UWB antenna wire harness and connector



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

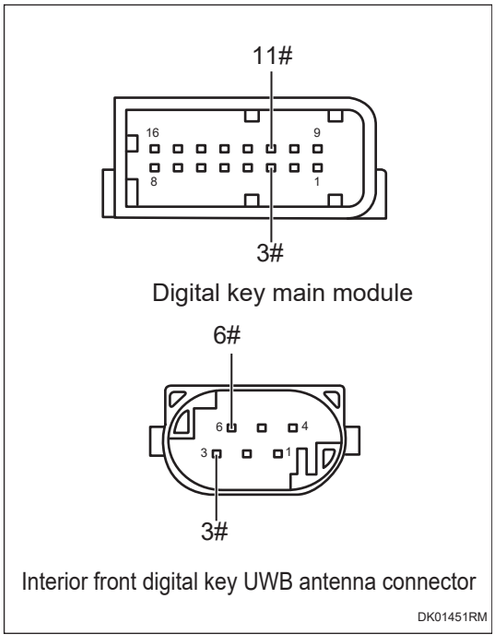
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check digital key main module, interior front digital key UWB antenna terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 3# - digital key main module 11#	Always connected	Approximately 120 Ω
Interior front digital key UWB antenna 6# - interior front digital key UWB antenna 3#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	**Replace front right digital key UWB antenna (See page ZC-106)**

(a) Replace the front right digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

DTC	U238287	Lost communication with rear bumper left digital key UWB antenna

Description

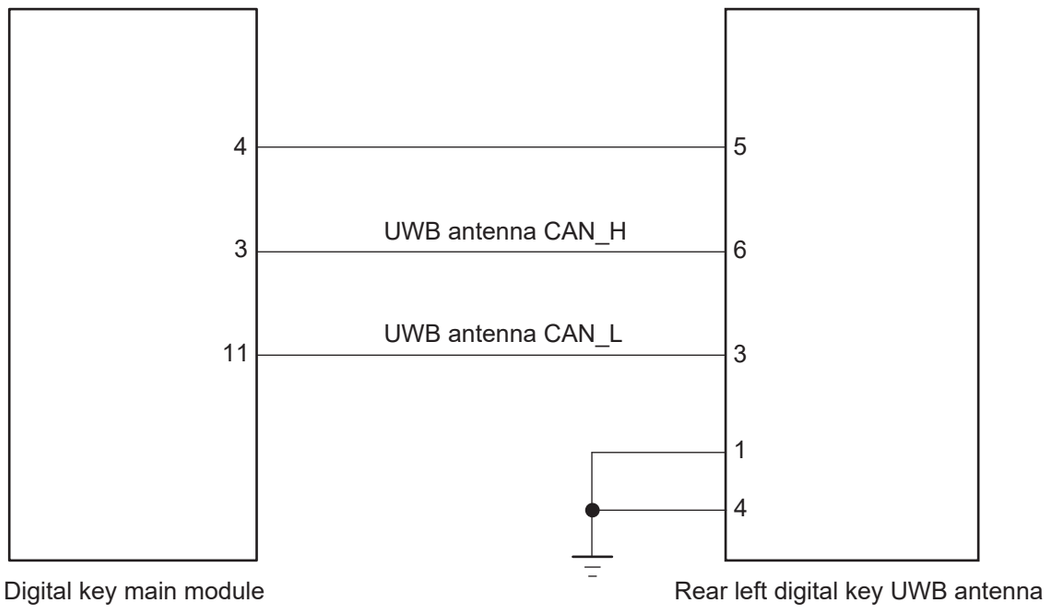
When communication between digital key main module and rear left digital key UWB antenna is abnormal or interrupted, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U238287	• Turn ignition switch to ON, with a delay of 1.5 seconds • Non-bus off state • Within normal voltage range • Connect Bluetooth • Message is not received for 5 seconds	Slave module periodic message (0x153) is not received for 5 seconds	Immediately	Continuous	10 ms	• Wire harness and connector • Rear left digital key UWB antenna • Digital key main module

Fault symptom

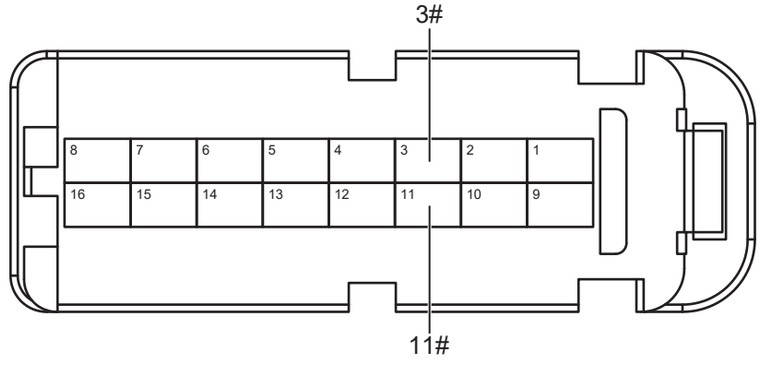
DTC No.	Fault symptom	Warning light/indicator
U238287	Slave module periodic message is not received for 5 seconds	-

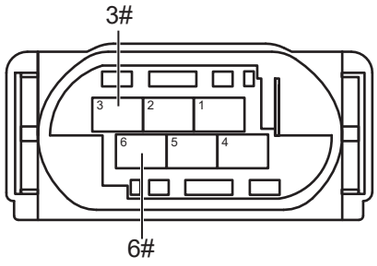
Circuit diagram



Inspection procedure

1	**Check for open in digital key UWB-CAN (digital key main module - rear left digital key UWB antenna)**





Rear left digital key UWB antenna connector

DK01220RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB-CAN.

(d) According to value in the table, measure resistance.

Standard value

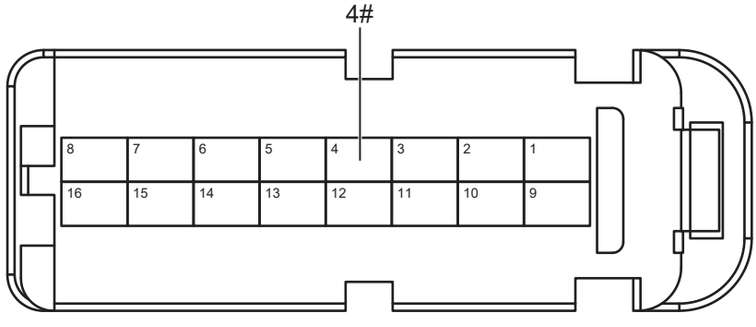
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - rear left digital key UWB antenna connector 6#	Always connected	Less than 1 Ω
Digital key main module connector 11# - rear left digital key UWB antenna connector 3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

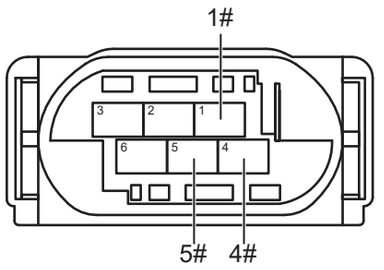
OK

2	**Check for open in rear left digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Rear left digital key UWB antenna connector

DK01241RM

(a) According to value in the table, measure resistance.

Standard value

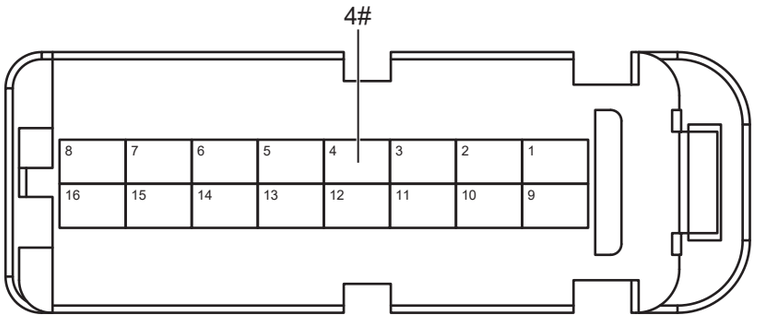
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - rear left digital key UWB antenna connector 5#	Always connected	Less than 1 Ω
Rear left digital key UWB antenna connector 1# - body ground	Always connected	Less than 1 Ω
Rear left digital key UWB antenna connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear left digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

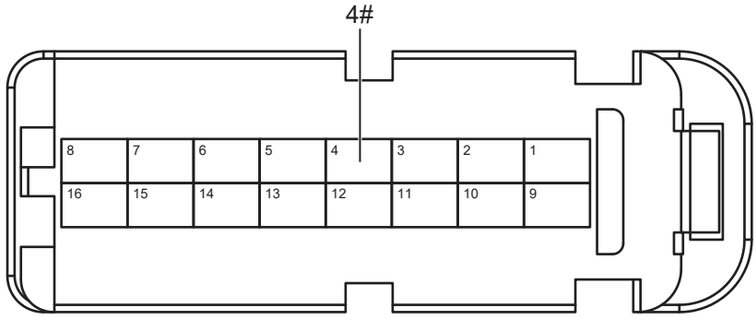
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear left digital key UWB antenna wire harness and connector



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

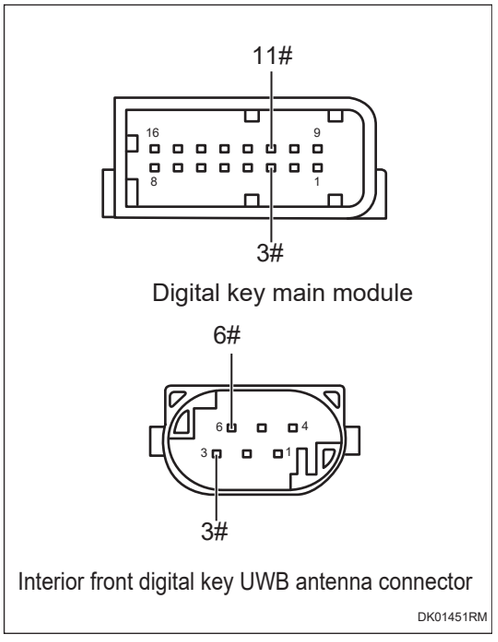
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check digital key main module, interior front digital key UWB antenna terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 3# - digital key main module 11#	Always connected	Approximately 120 Ω
Interior front digital key UWB antenna 6# - interior front digital key UWB antenna 3#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	**Replace rear left digital key UWB antenna (See page ZC-108)**

(a) Replace the rear left digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

DTC	U238387	Lost communication with rear bumper right digital key UWB antenna

Description

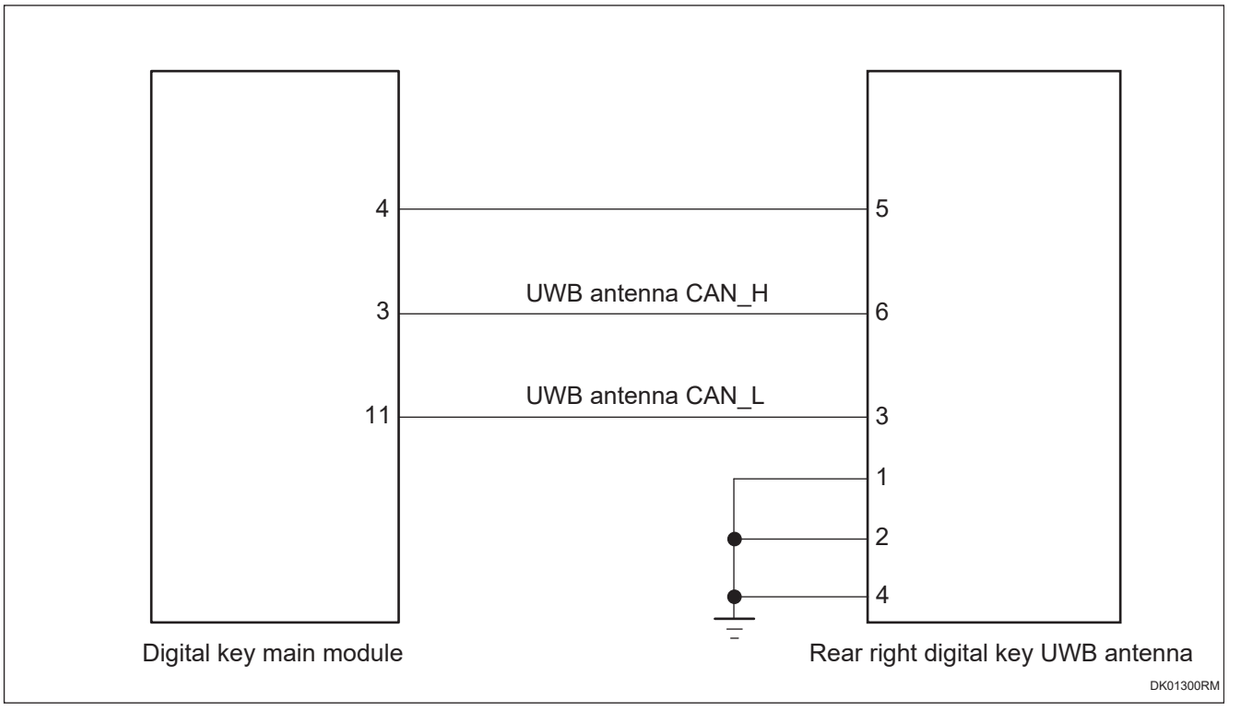
When communication between digital key main module and rear right digital key UWB antenna is abnormal or interrupted, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U238387	• Turn ignition switch to ON, with a delay of 1.5 seconds • Non-bus off state • Within normal voltage range • Connect Bluetooth • Message is not received for 5 seconds	Slave module periodic message (0x154) is not received for 5 seconds	Immediately	Continuous	10 ms	• Wire harness and connector • Rear right digital key UWB antenna • Digital key main module

Fault symptom

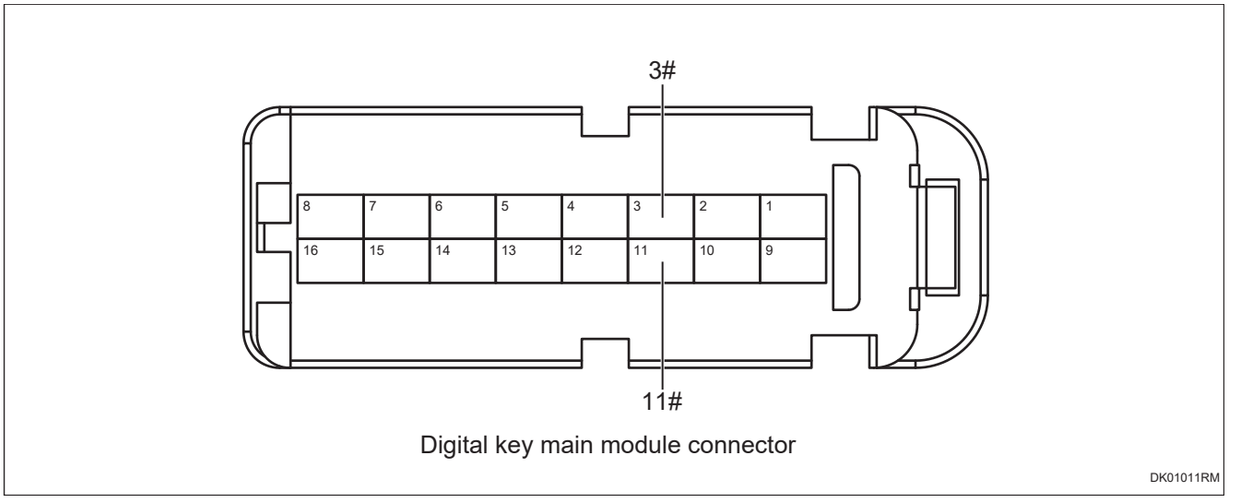
DTC No.	Fault symptom	Warning light/indicator
U238387	Slave module periodic message is not received for 5 seconds	-

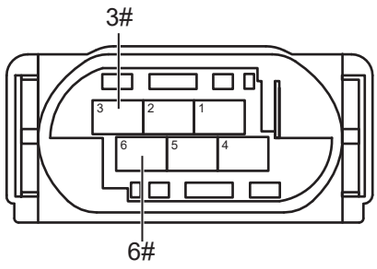
Circuit diagram



Inspection procedure

1	**Check for open in digital key UWB-CAN (digital key main module - rear right digital key UWB antenna)**





Rear right digital key UWB antenna connector

DK01320RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB-CAN.

(d) According to value in the table, measure resistance.

Standard value

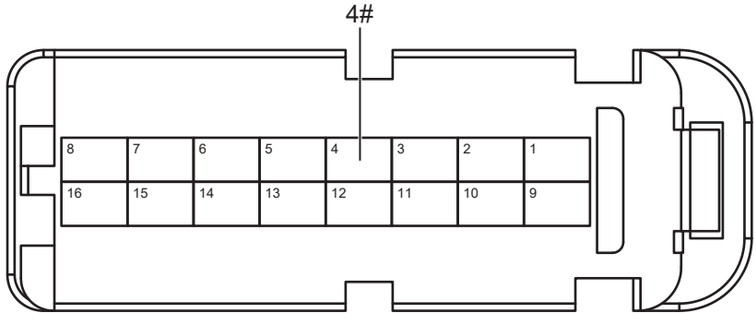
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - rear right digital key UWB antenna connector 6#	Always connected	Less than 1 Ω
Digital key main module connector 11# - rear right digital key UWB antenna connector 3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

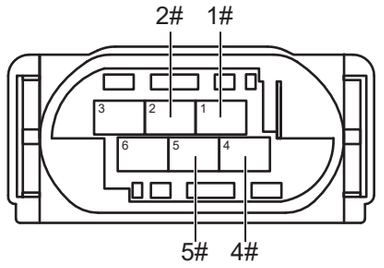
OK

2	**Check for open in rear right digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Rear right digital key UWB antenna connector

DK01341RM

(a) According to value in the table, measure resistance.

Standard value

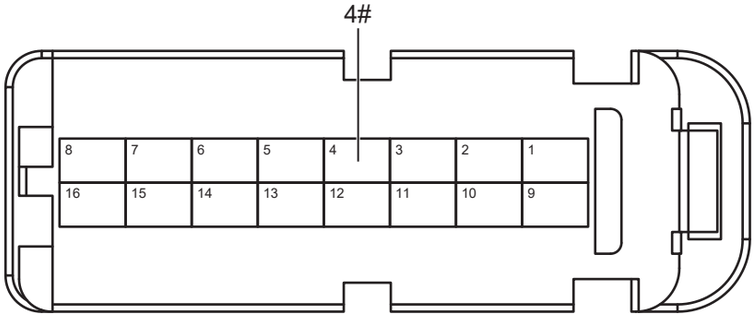
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - rear right digital key UWB antenna connector 5#	Always connected	Less than 1 Ω
Rear right digital key UWB antenna connector 1# - body ground	Always connected	Less than 1 Ω
Rear right digital key UWB antenna connector 2# - body ground	Always connected	Less than 1 Ω
Rear right digital key UWB antenna connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in rear right digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

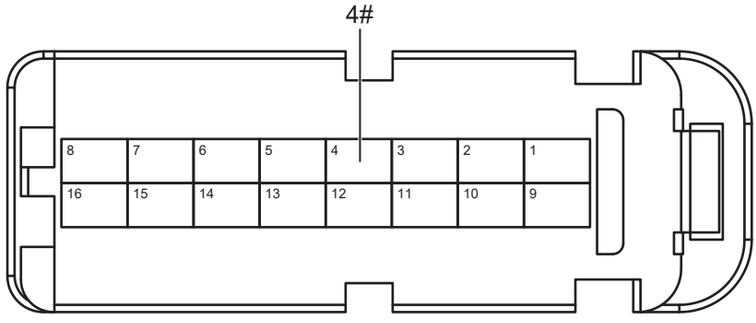
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to power supply in rear right digital key UWB antenna wire harness and connector



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

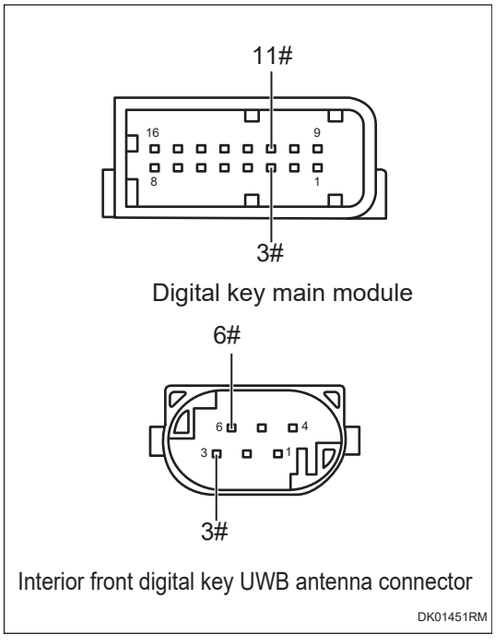
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check digital key main module, interior front digital key UWB antenna terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 3# - digital key main module 11#	Always connected	Approximately 120 Ω
Interior front digital key UWB antenna 6# - interior front digital key UWB antenna 3#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	**Replace rear right digital key UWB antenna (See page ZC-108)**

(a) Replace the rear right digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

DTC	U238487	Lost communication with interior front digital key UWB antenna

Description

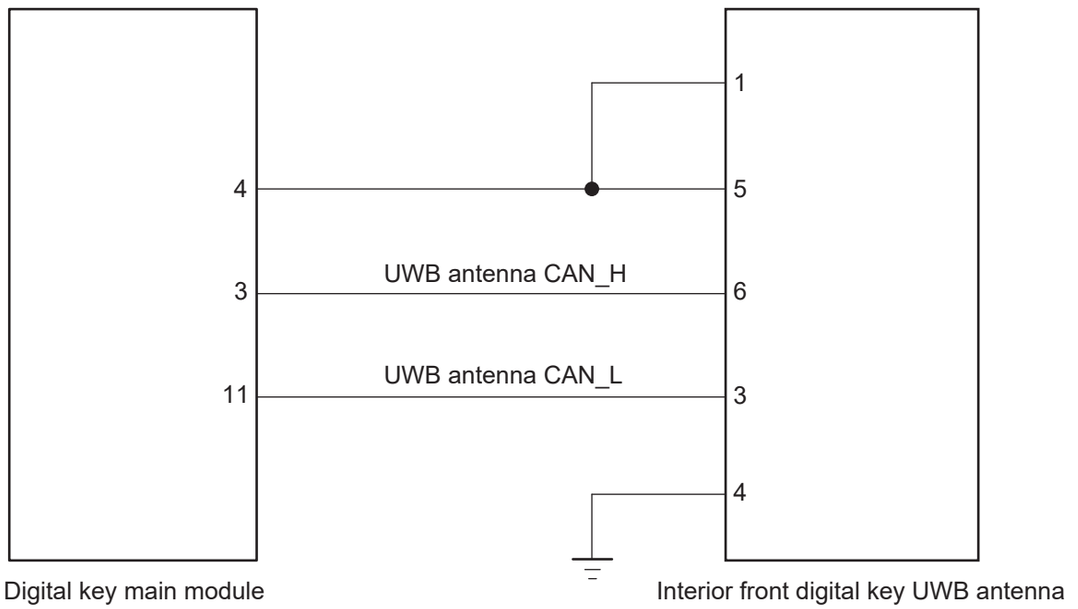
When communication between digital key main module and interior front digital key UWB antenna is abnormal or interrupted, the digital key main module records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
U238487	• Turn ignition switch to ON, with a delay of 1.5 seconds • Non-bus off state • Within normal voltage range • Connect Bluetooth • Message is not received for 5 seconds	Slave module periodic message (0x155) is not received for 5 seconds	Immediately	Continuous	10 ms	• Wire harness and connector • Interior front digital key UWB antenna • Digital key main module

Fault symptom

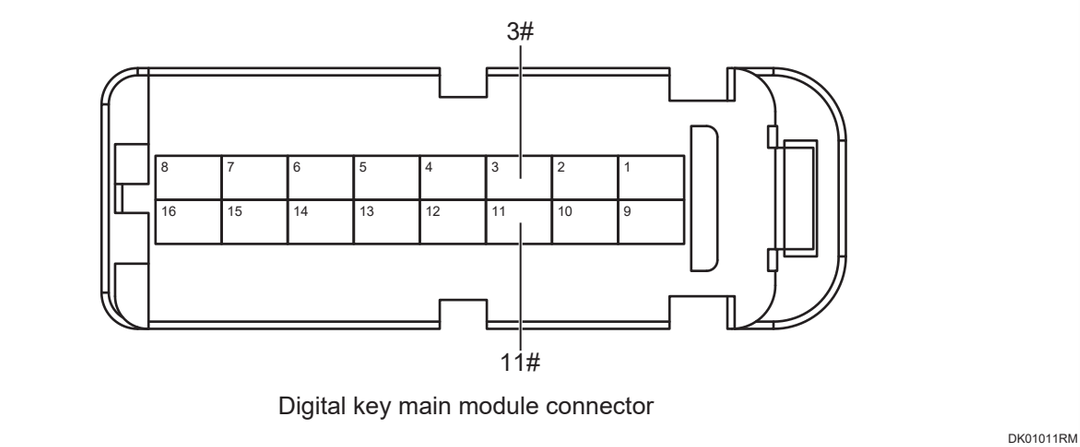
DTC No.	Fault symptom	Warning light/indicator
U238487	Slave module periodic message is not received for 5 seconds	-

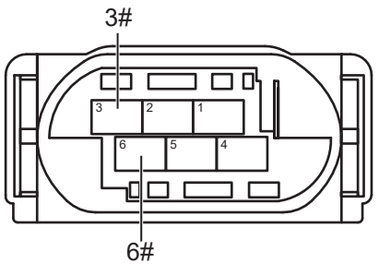
Circuit diagram



Inspection procedure

1	**Check for open in digital key UWB-CAN (digital key main module - interior front digital key UWB antenna)**





Interior front digital key UWB antenna connector

DK01420RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB-CAN.

(d) According to value in the table, measure resistance.

Standard value

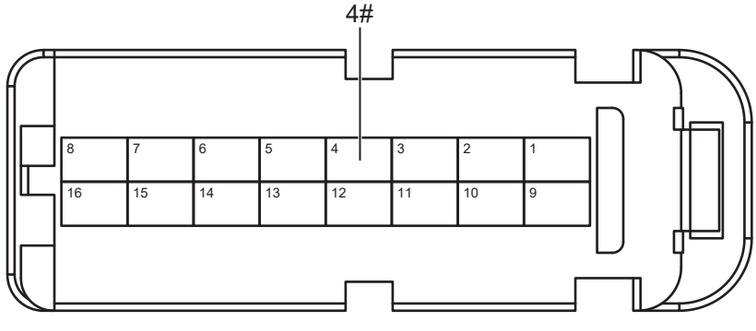
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - interior front digital key UWB antenna connector 6#	Always connected	Less than 1 Ω
Digital key main module connector 11# - interior front digital key UWB antenna connector 3#	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

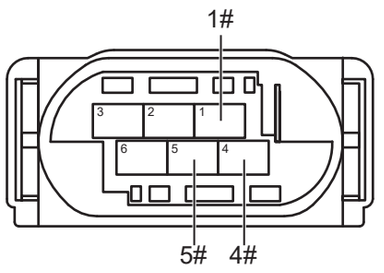
OK

2	**Check for open in interior front digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM



Interior front digital key UWB antenna connector

DK01441RM

(a) According to value in the table, measure resistance.

Standard value

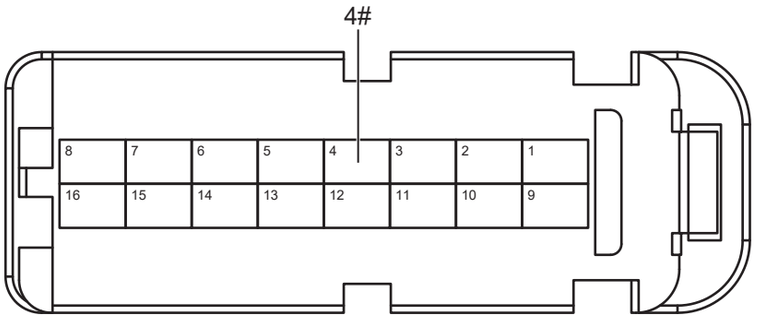
Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - interior front digital key UWB antenna connector 1#	Always connected	Less than 1 Ω
Digital key main module connector 4# - interior front digital key UWB antenna connector 5#	Always connected	Less than 1 Ω
Interior front digital key UWB antenna connector 4# - body ground	Always connected	Less than 1 Ω

ZD

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to ground in interior front digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) According to value in the table, measure resistance.

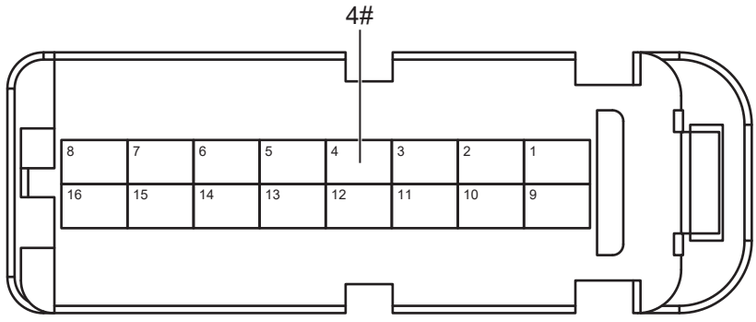
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	**Check for short to power supply in interior front digital key UWB antenna wire harness and connector**



Digital key main module connector

DK01031RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

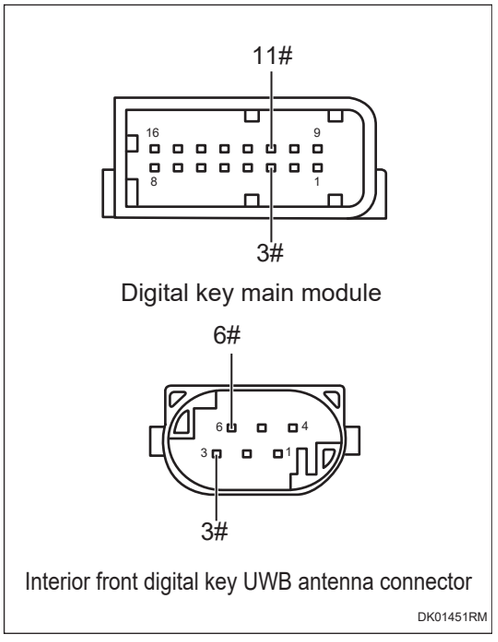
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 4# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check digital key main module, interior front digital key UWB antenna terminal resistance**



(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 3# - digital key main module 11#	Always connected	Approximately 120 Ω
Interior front digital key UWB antenna 6# - interior front digital key UWB antenna 3#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	**Replace interior front digital key UWB antenna (See page ZC-104)**

(a) Replace the interior front digital key UWB antenna.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

OK

Diagnosis ends

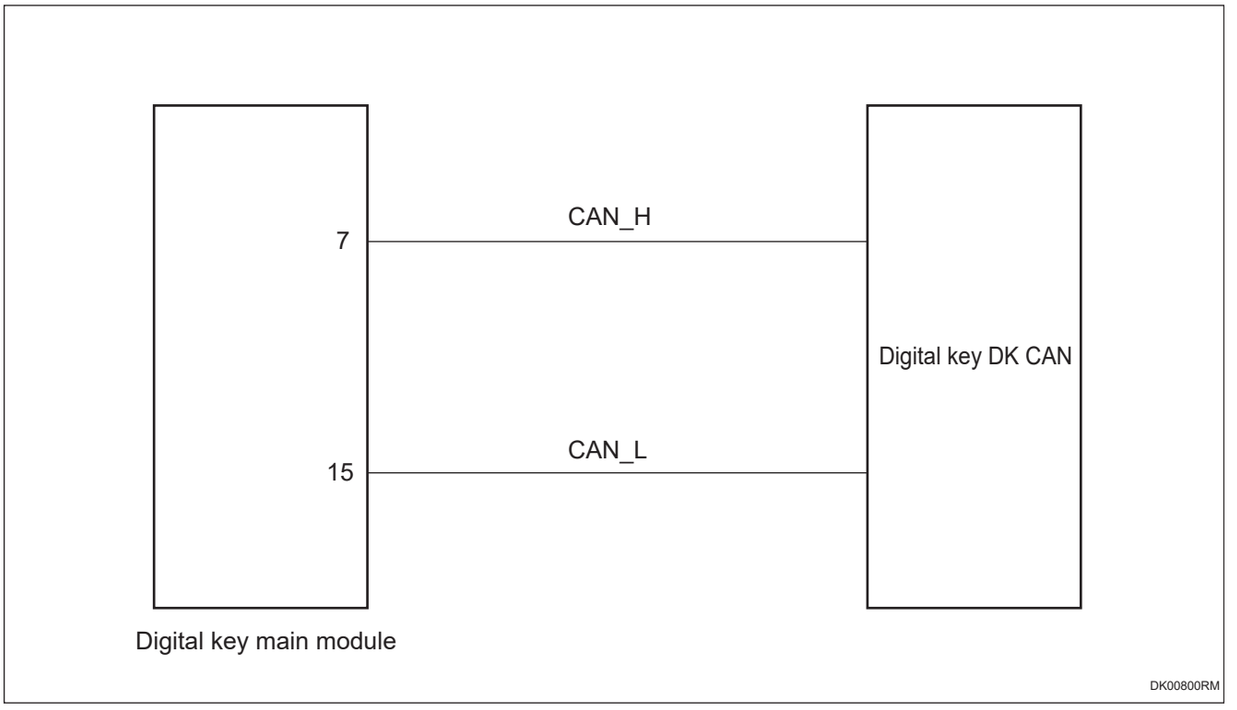
DTC	U008188	Digital key CAN bus off

Description

When digital key main module detects the digital key DK CAN bus off fault, the digital key main module records DTC.

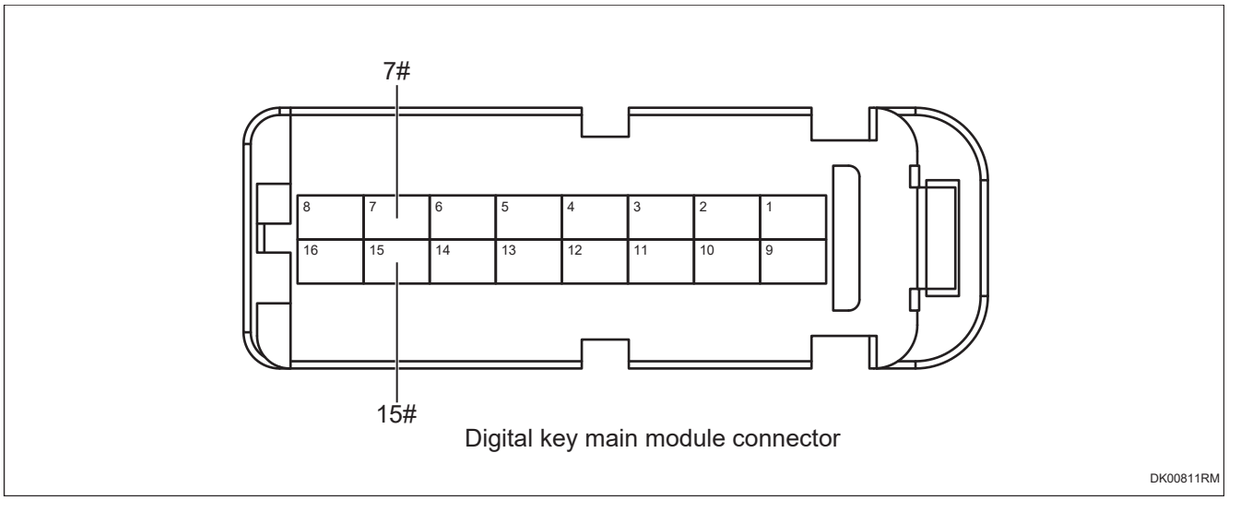
DTC No.	DTC detection condition	Faulty area
U008188	(a) Digital key CAN bus off.	• CAN line and connector • Digital key main module • Middle intelligent area control unit

Circuit diagram



Inspection procedure

1	**Check middle intelligent area control unit terminal resistance**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) Measure terminal resistance according to the values in the table below.

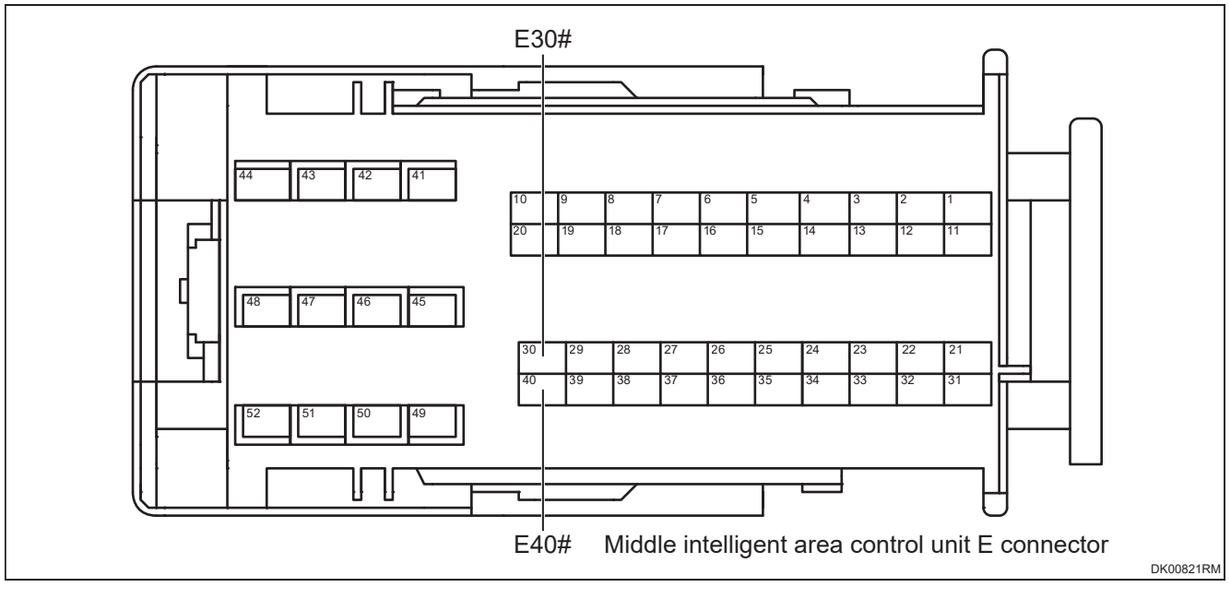
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - digital key main module connector 15#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

2	Check digital key main module terminal resistance



(a) Connect the digital key main module connector.

(b) Disconnect the middle intelligent area control unit connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E30# - middle intelligent area control unit connector E40#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

3	**Check controllers on digital key DK CAN bus**

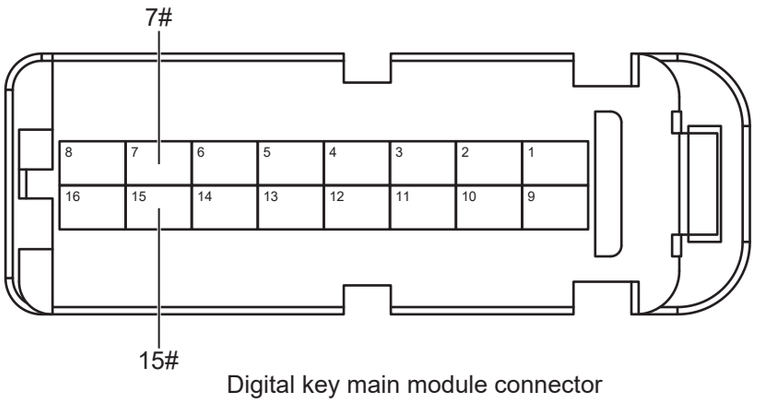
(a) Disconnect controllers on digital key DK CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

ZD

OK

4	**Check for short between digital key DK CAN bus CAN-L and CAN-H**



Digital key main module connector

DK00811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key DK CAN bus.

(d) According to value in the table, measure resistance.

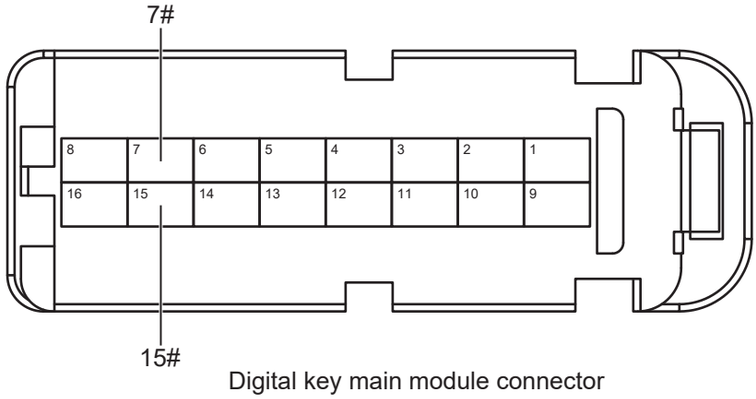
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - digital key main module connector 15#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in digital key DK CAN bus**



Digital key main module connector

DK00811RM

(a) According to value in the table, measure resistance.

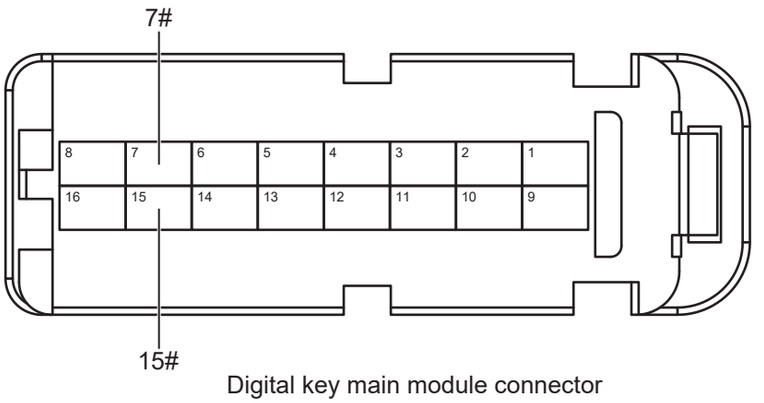
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - body ground	Always connected	10 KΩ or more
Digital key main module connector 15# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in digital key DK CAN bus**



Digital key main module connector

DK00811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - body ground	Turn ignition switch to "ON"	Less than 1 V
Digital key main module connector 15# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

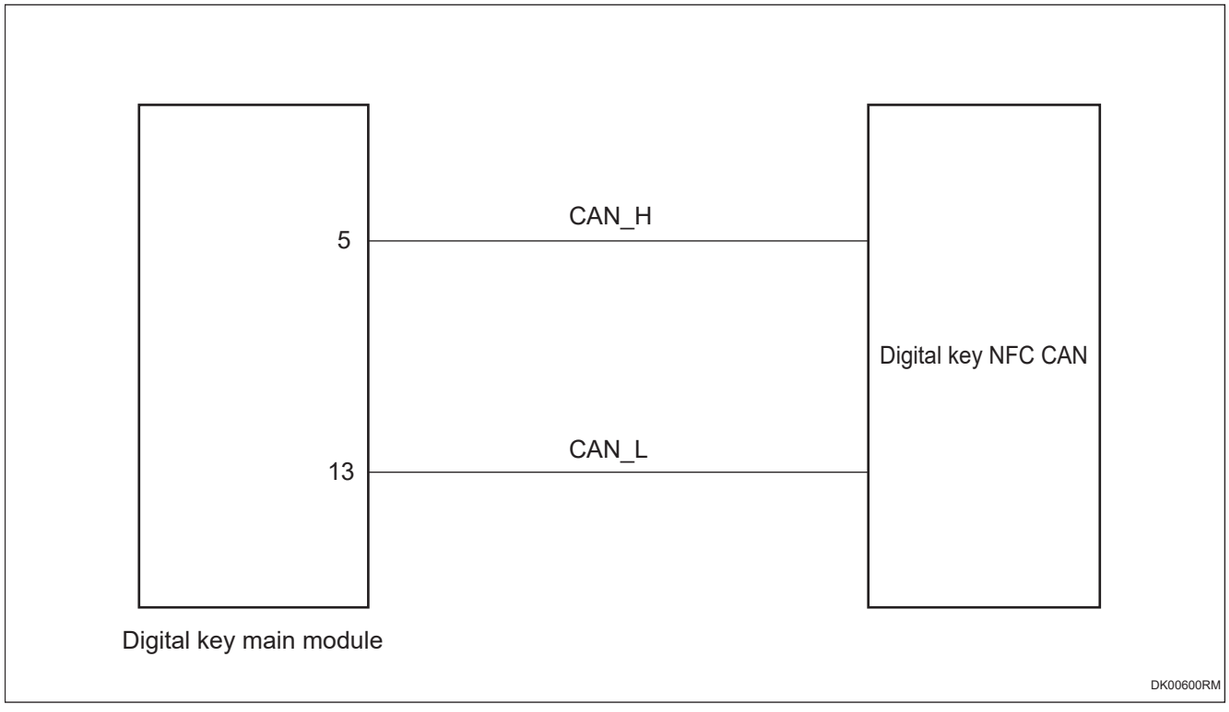
DTC	U008488	Digital key - NFC CAN bus off

Description

When digital key main module detects the digital key NFC CAN bus off fault, the digital key main module records DTC.

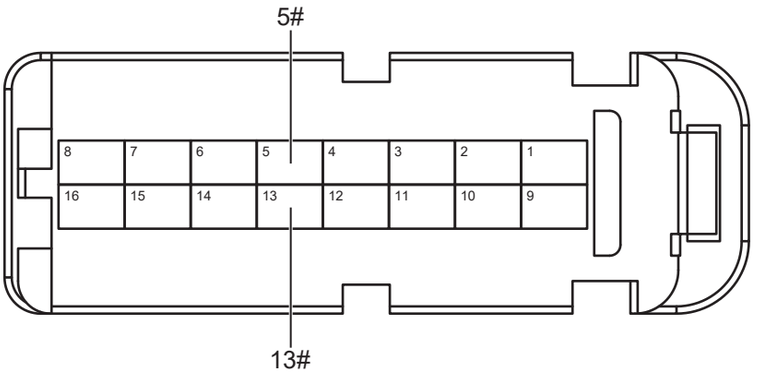
DTC No.	DTC detection condition	Faulty area
U008488	(a) Digital key NFC CAN bus off.	• CAN line and connector • Digital key main module • Left outside rear view mirror

Circuit diagram



Inspection procedure

1	**Check left outside rear view mirror terminal resistance**



Digital key main module connector

DK00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) Measure terminal resistance according to the values in the table below.

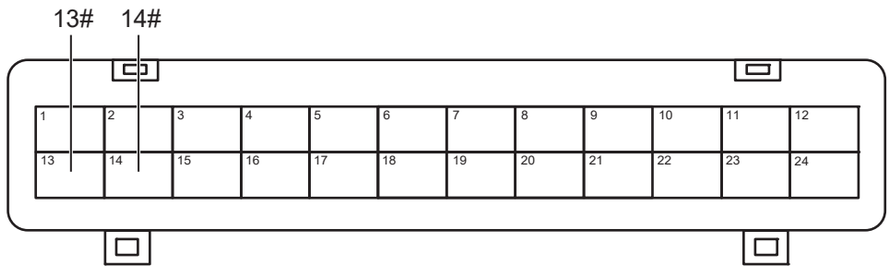
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 5# - digital key main module connector 13#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check digital key main module terminal resistance**



Left outside rear view mirror connector

DK00621RM

(a) Connect the digital key main module connector.

(b) Disconnect the left outside rear view mirror connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Left outside rear view mirror connector 13# - left outside rear view mirror connector 14#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

3	**Check controllers on digital key NFC - CAN bus**

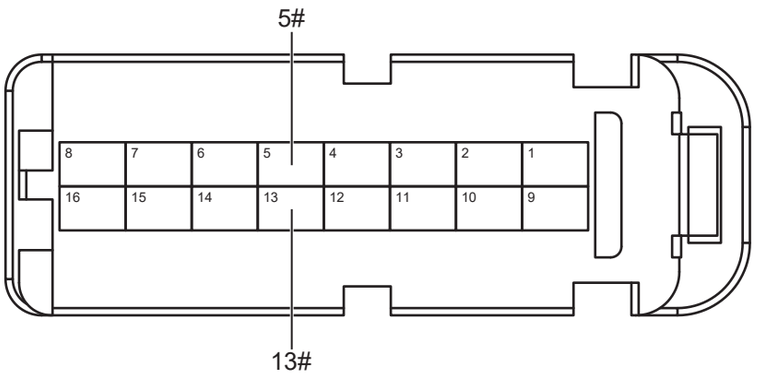
(a) Disconnect controllers on digital key NFC - CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

ZD

OK

4	**Check for short between digital key NFC - CAN bus CAN-L and CAN-H**



Digital key main module connector

DK00611RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key NFC - CAN bus.

(d) According to value in the table, measure resistance.

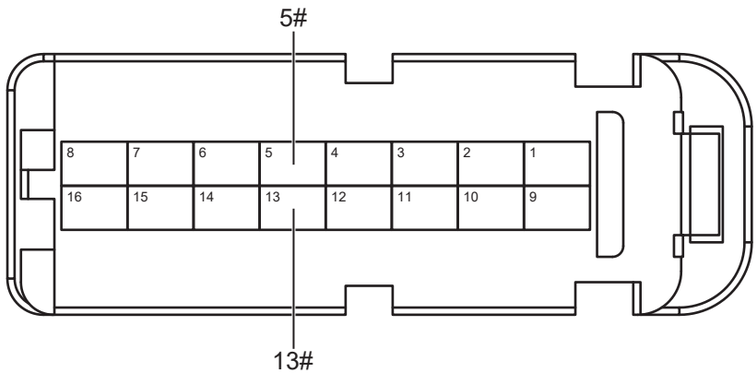
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 5# - digital key main module connector 13#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in digital key NFC - CAN bus**



Digital key main module connector

DK00611RM

(a) According to value in the table, measure resistance.

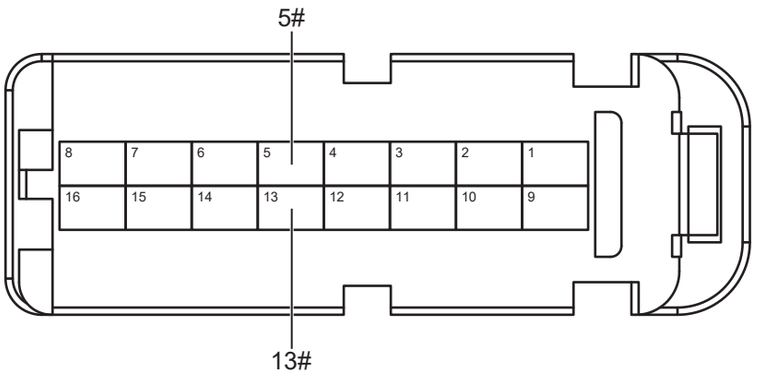
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 5# - body ground	Always connected	10 KΩ or more
Digital key main module connector 13# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in digital key NFC - CAN bus**



Digital key main module connector

DK00611RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 5# - body ground	Turn ignition switch to "ON"	Less than 1 V
Digital key main module connector 13# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

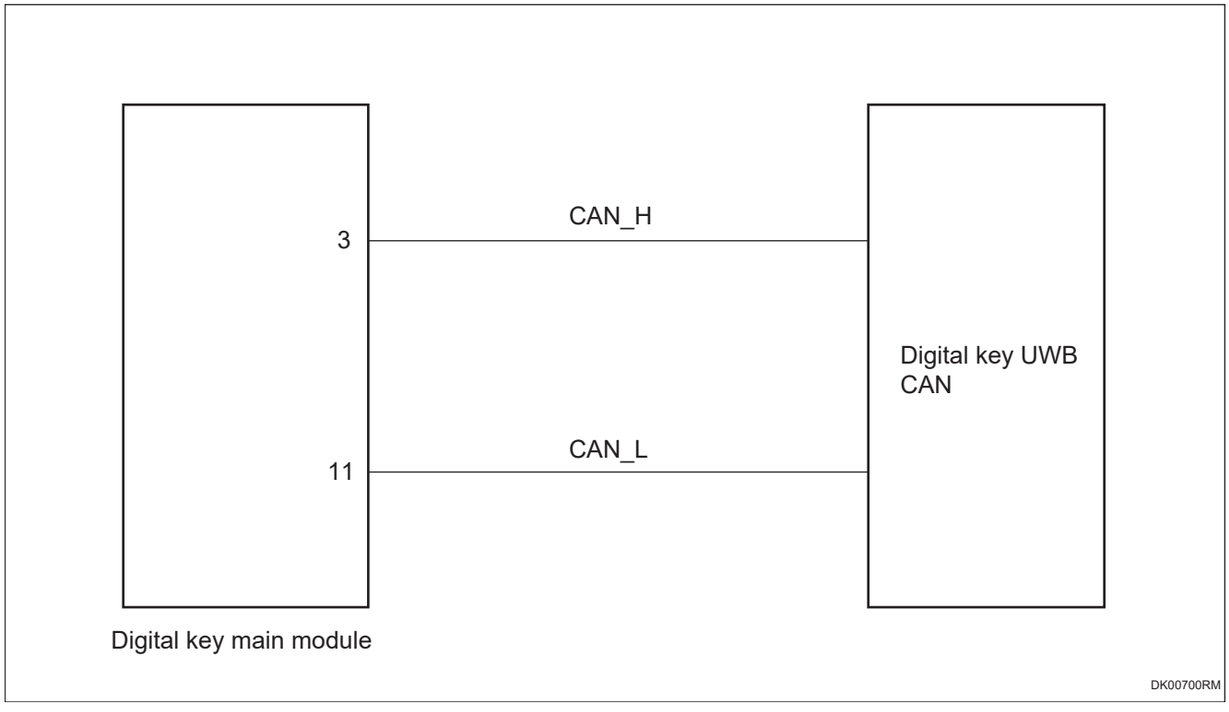
DTC	U008588	Digital key - UWB CAN bus off

Description

When digital key main module detects the digital key UWB-CAN bus off fault, the digital key main module records DTC.

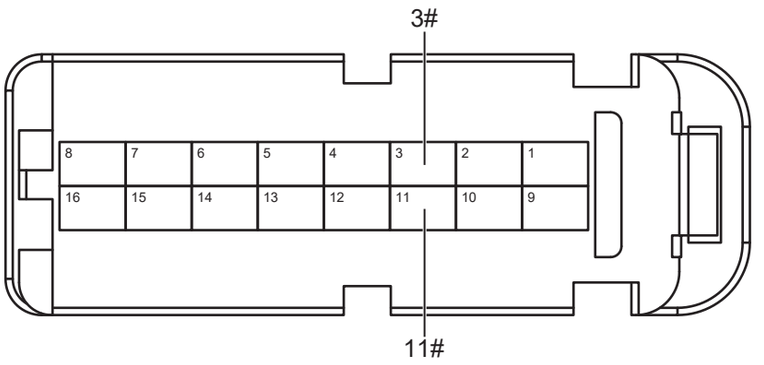
DTC No.	DTC detection condition	Faulty area
U008588	(a) Digital key UWB CAN bus off.	• Wire harness and connector • Digital key main module • Front left digital key UWB antenna • Front right digital key UWB antenna • Rear left digital key UWB antenna • Rear right digital key UWB antenna • Interior front digital key UWB antenna

Circuit diagram



Inspection procedure

1	**Check interior front digital key UWB antenna terminal resistance**



Digital key main module connector

DK01011RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the digital key main module connector.

(d) Measure terminal resistance according to the values in the table below.

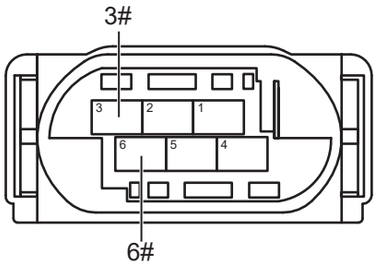
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - digital key main module connector 11#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check digital key main module terminal resistance**



Interior front digital key UWB antenna connector

DK01420RM

(a) Connect the digital key main module connector.

(b) Disconnect the interior front digital key UWB antenna connector.

(c) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Interior front digital key UWB antenna connector 6# - interior front digital key UWB antenna connector 3#	Always connected	Approximately 120 Ω

ZD

NG → **Perform repair according to malfunction**

OK

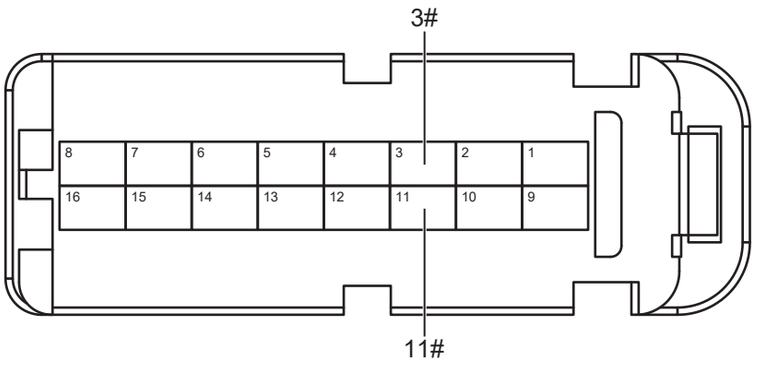
3	**Check controllers on digital key UWB - CAN bus**

(a) Disconnect controllers on digital key UWB - CAN bus in order, and check if other controllers recover operation.

NG → **Perform repair according to malfunction**

OK

4	**Check for short between digital key UWB - CAN bus CAN-L and CAN-H**



Digital key main module connector

DK01011RM

ZD

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key UWB - CAN bus.

(d) According to value in the table, measure resistance.

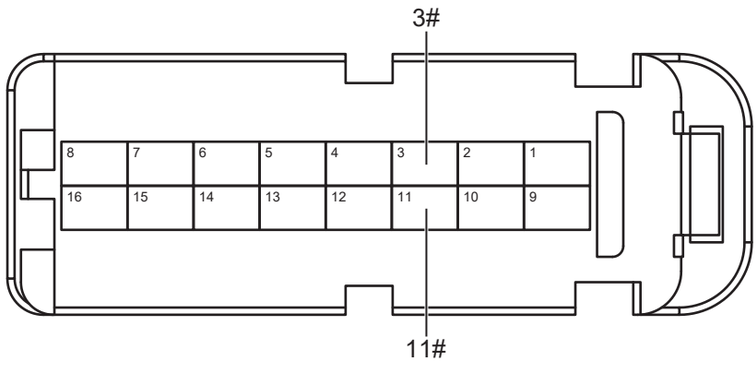
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - digital key main module connector 11#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in digital key UWB - CAN bus**



Digital key main module connector

DK01011RM

(a) According to value in the table, measure resistance.

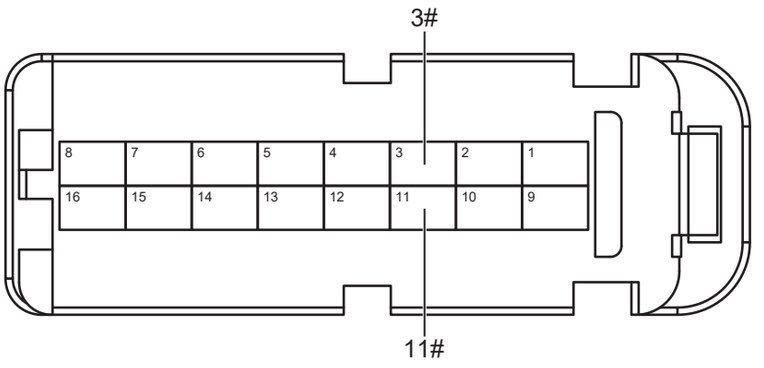
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - body ground	Always connected	10 KΩ or more
Digital key main module connector 11# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in digital key UWB - CAN bus**



Digital key main module connector

DK01011RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 3# - body ground	Turn ignition switch to "ON"	Less than 1 V
Digital key main module connector 11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

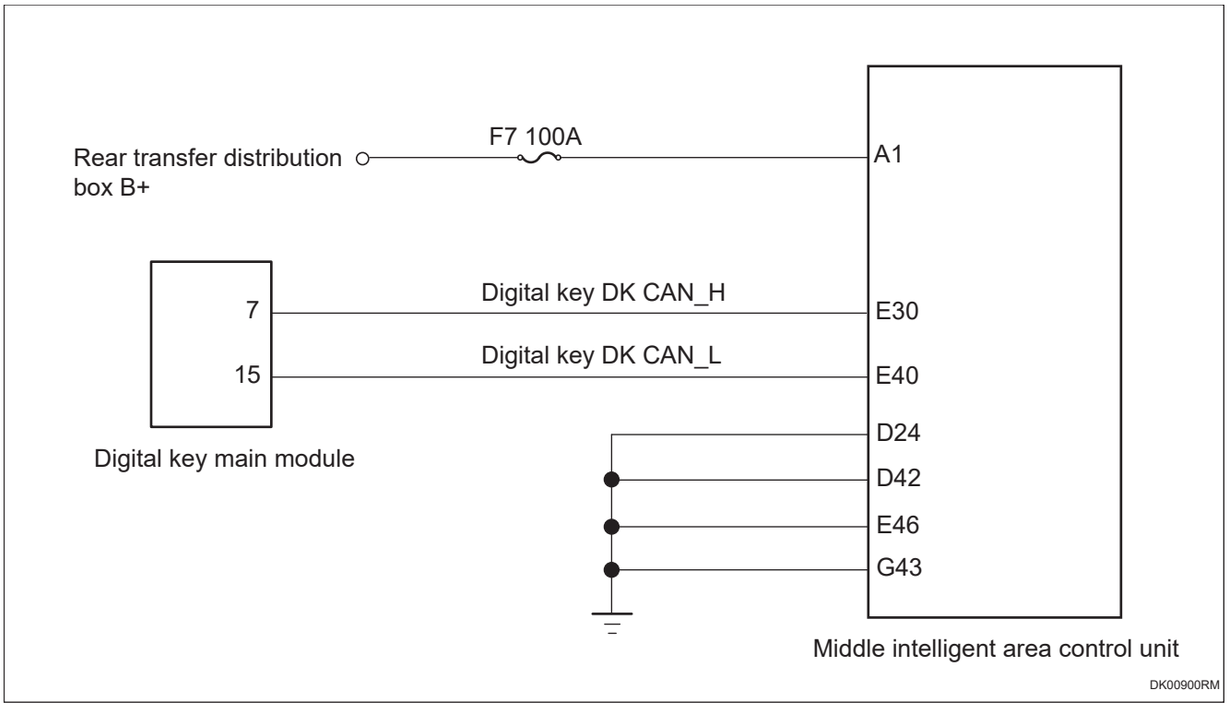
DTC	U014787	PDCM node lost

Description

When communication between digital key main module and middle intelligent area control unit is abnormal or interrupted, the digital key main module records DTC.

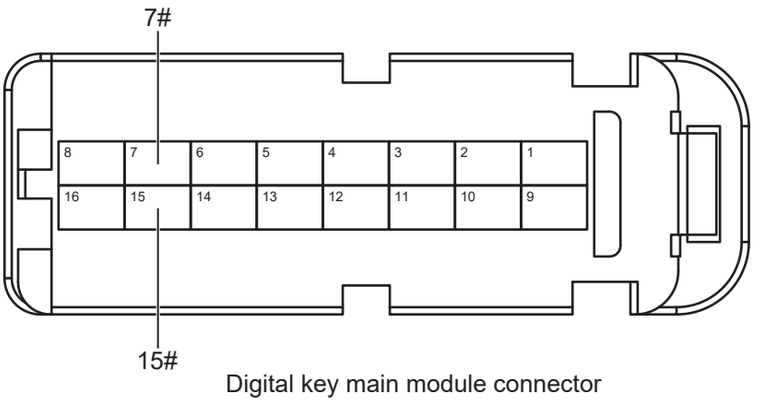
DTC No.	DTC detection condition	Faulty area
U014787	(a) PDCM node lost.	• Wire harness and connector • Middle intelligent area control unit • Digital key main module

Circuit diagram



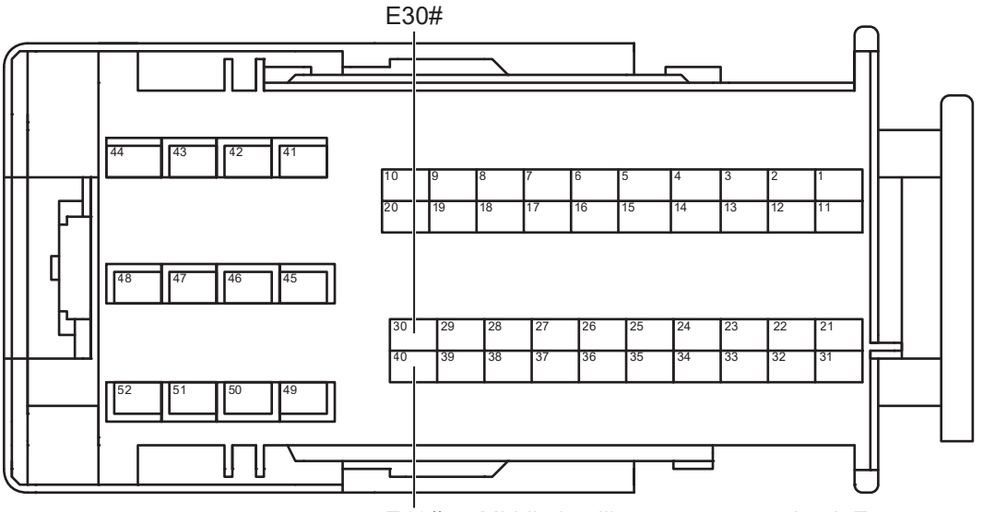
Inspection procedure

1	**Check for open in digital key DK CAN bus (digital key main module - middle intelligent area control unit)**



Digital key main module connector

DK00811RM



Middle intelligent area control unit E connector

DK00821RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on digital key DK CAN bus.

(d) According to value in the table, measure resistance.

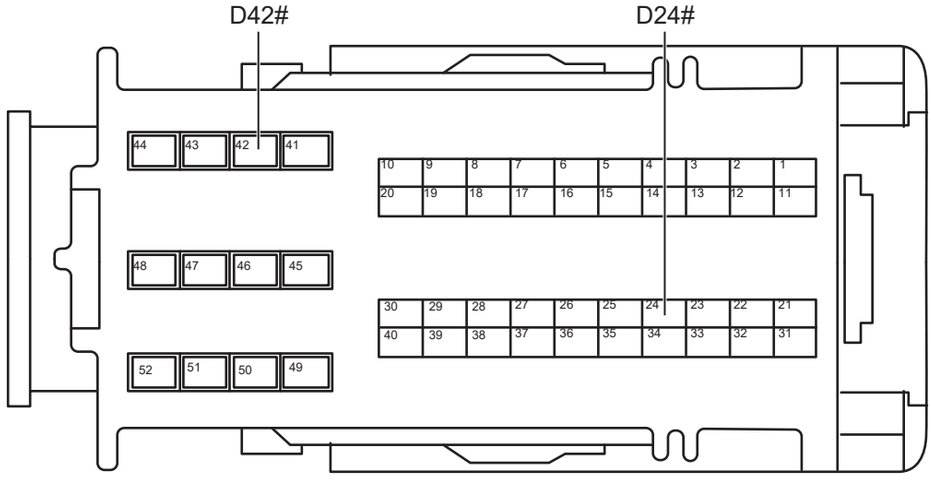
Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module connector 7# - middle intelligent area control unit connector E30#	Always connected	Less than 1 Ω
Digital key main module connector 15# - middle intelligent area control unit connector E40#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

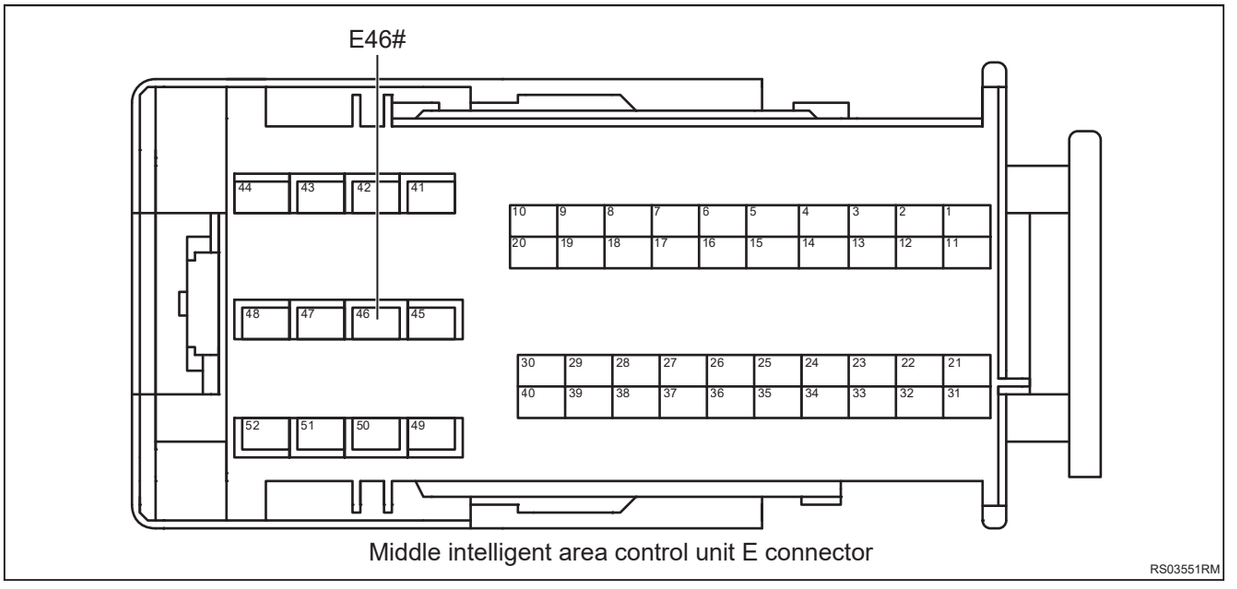
OK

2	Check middle intelligent area control unit ground



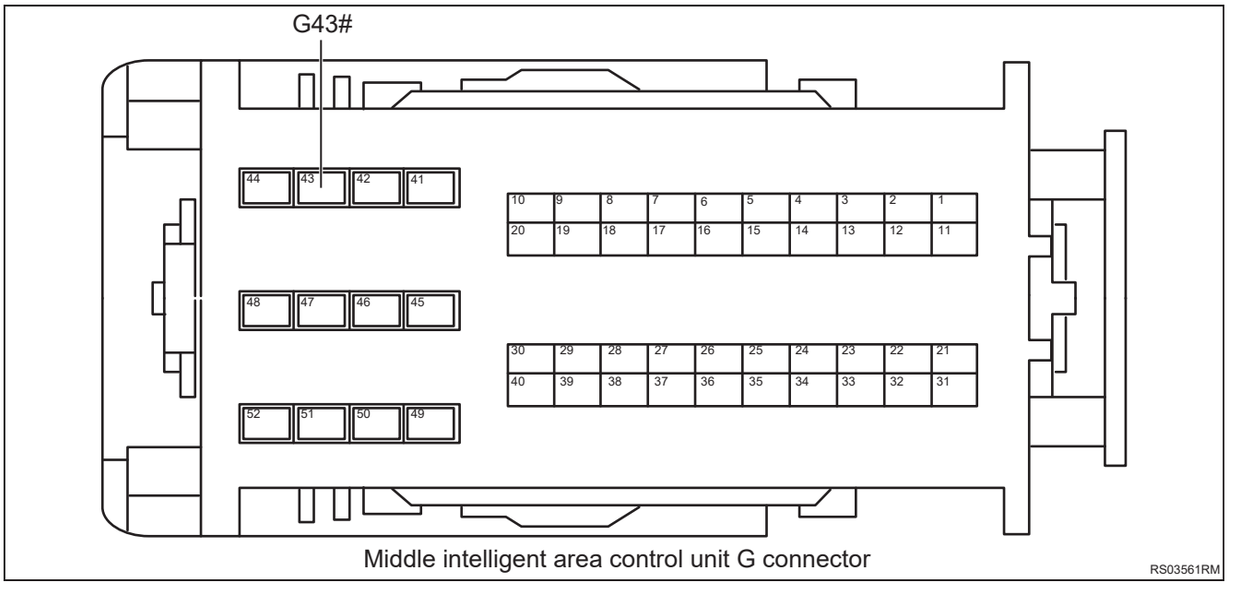
Middle intelligent area control unit D connector

RS03541RM



Middle intelligent area control unit E connector

RS03551RM



Middle intelligent area control unit G connector

RS03561RM

(a) According to value in the table, measure resistance.

Standard value

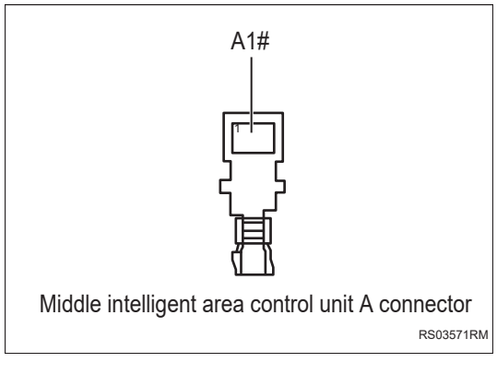
Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector G43# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D42# - body ground	Always connected	Less than 1 Ω

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector E46# - body ground	Always connected	Less than 1 Ω
Middle intelligent area control unit connector D24# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check middle intelligent area control unit power supply**



Middle intelligent area control unit A connector

RS03571RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

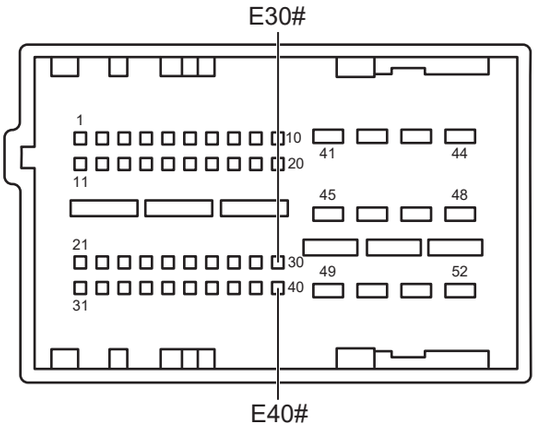
Standard value

Multimeter connection	Detection condition	Specified condition
Middle intelligent area control unit connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector**

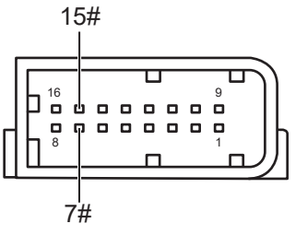
OK

4	**Check digital key DK CAN bus terminal resistance**



Middle intelligent area control unit E

DK00911RM



Digital key main module

DK01021RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Digital key main module 7# - digital key main module 15#	Always connected	Approximately 120 Ω
Middle intelligent area control unit E30# - middle intelligent area control unit E40#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace middle intelligent area control unit (See page ZC-132)**

(a) Replace the middle intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace digital key main module (See page ZC-102)**

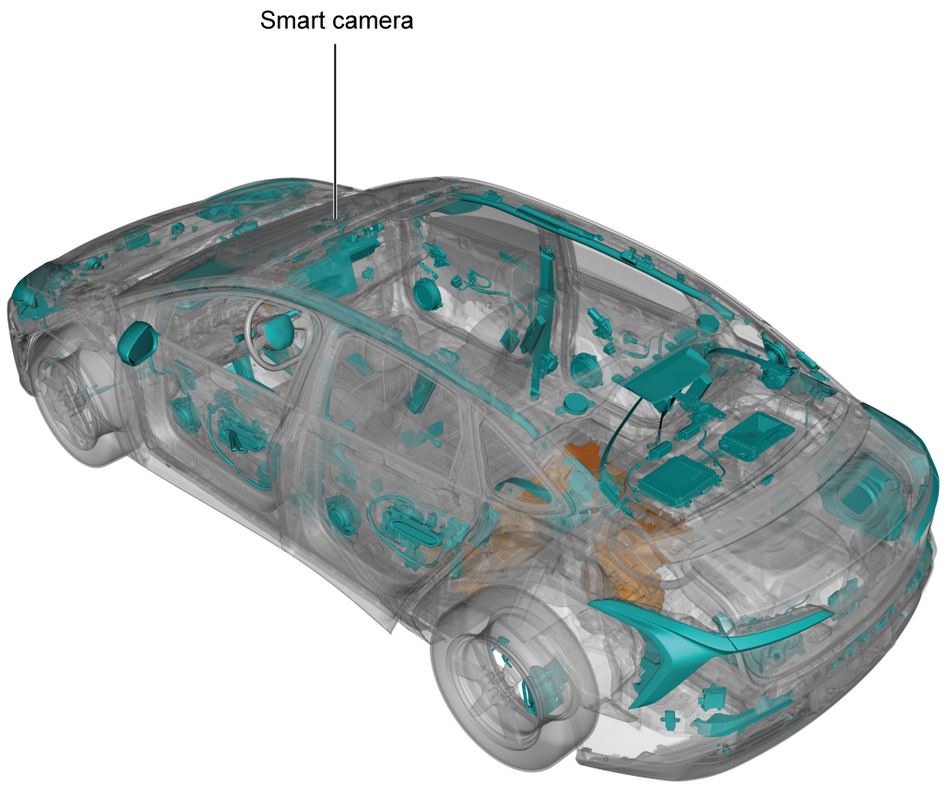
OK

Diagnosis ends

Smart front camera control system

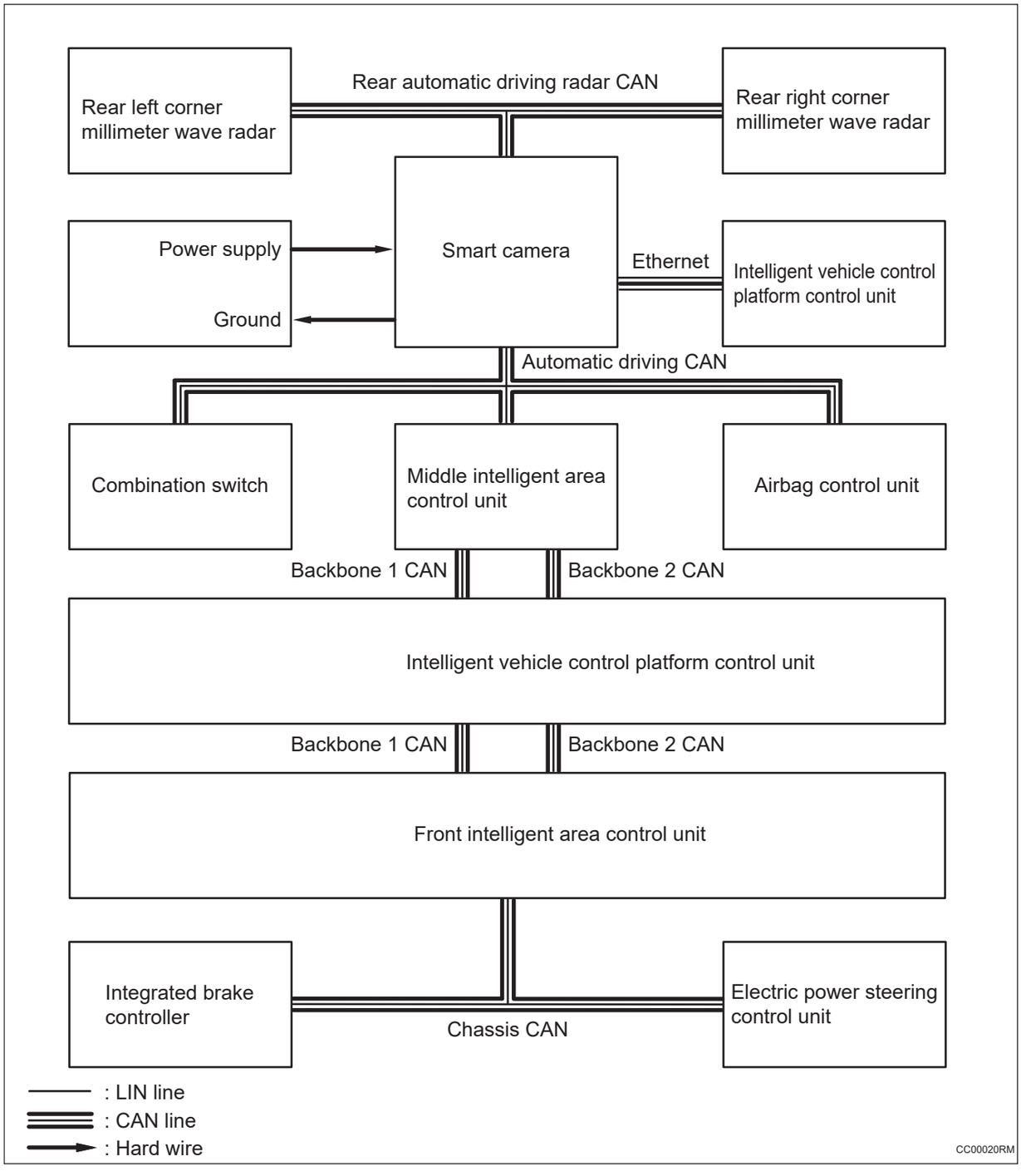
Smart camera

Part position



CC00030RM

System diagram



Function description

1. Function description

(a) SACC: It is used to assist drivers in operating vehicle on highly structured roads, control vehicles to stay within their own lanes, to achieve automatic cruise driving, and reduce driver fatigue caused by repetitive and monotonous driving behaviors during long-distance driving.

(b) ACC: Driving assist system assists the driver to automatically control the vehicle speed and following distance, greatly enhancing driving comfort while ensuring driving safety.

(c) LDW: By monitoring the lane marking line, it assists the driver to keep the vehicle in the driving lane, and when the driver unconsciously (e.g., distracted, sleepy, etc.) deviates from the vehicle lane, it gives an alarm to the driver, prompting to correct the vehicle in time to reduce the side collision and accidents due to lane departure. LDW function system can distinguish unconscious lane departure from active lane change.

(d) LKA: An active intervention of vehicle lateral control function, which can automatically apply corrective torque to turn the vehicle back into the lane when the driver deviates from lane line or is about to deviate from lane line, the preventing lane departure and ensuring driving safety. Meanwhile, for the lane departure risk in emergency conditions, the system should also be able to ensure that the vehicle returns to its own lane for driving (i.e., the ELKA function).

(e) FCW: It provides alarm to drivers when there is a risk of collision between the vehicle and the preceding vehicle in the same direction or a pedestrian ahead, reducing the occurrence of rear-end collision and alerting the driver to take action to decrease accident severity level in event of rear-end collision. Among them, the "vehicles driving in the same direction ahead" include three situations: The vehicle ahead is stationary, the vehicle ahead is driving at a speed lower than that of this vehicle, or the vehicle is braking.

(f) AEB: It automatically performs braking when a collision is about to occur between the vehicle and the preceding vehicle in the same direction to avoid or reduce the injuries caused by the collision, reducing the occurrence of rear-end collision, and it automatically performs braking to reduce the severity of the accident before the rear-end collision occurs. Among them, the "vehicles driving in the same direction ahead" include three situations: The vehicle ahead is stationary, the vehicle ahead is driving at a speed lower than that of this vehicle, or the vehicle is braking. In addition, AEB system should be equipped with collision warning function, pre-pressurization function and emergency braking function (including two stages of low-intensity braking and high-intensity braking).

(g) TSR: Automatically detect speed limit warning signs on the road and send them to the instrument cluster display or speed assistance system, making judgments according to the current vehicle speed and alerting the driver when overspeeding. TSR system can detect speed limit signs and speed limit release signs in the required area.

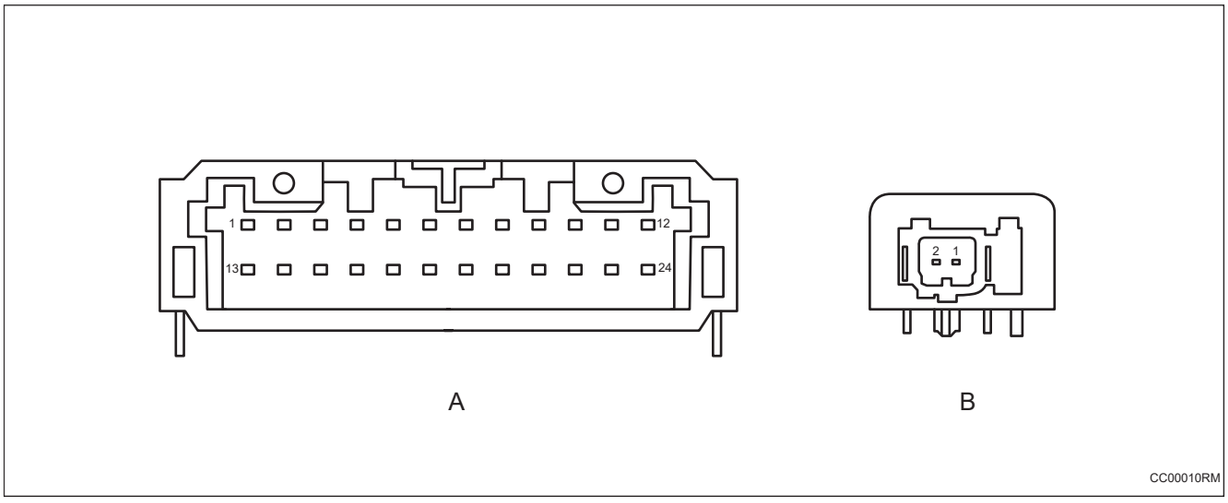
Data parameter

Smart camera

Item	Max	OK	Minimum
Operating voltage (V)	16	12	9
Operating current (A)	-	-	-

ECU terminal

Smart camera



Smart camera - A			
Pin number	**Definition**	**Pin number**	**Definition**
1	Power supply	13	-
2	-	14	-
3	-	15	-
4	-	16	KL15 wake-up
5	-	17	-
6	Ground	18	Ground
7	-	19	-
8	-	20	-
9	-	21	-
10	-	22	-
11	CAN1L - rear corner radar	23	CAN1H - rear corner radar
12	CAN0L - vehicle CAN	24	CAN0H - vehicle CAN

Smart camera - B			
Pin number	**Definition**	**Pin number**	**Definition**
1	B_D_ETHP	13	B_D_ETHN

Diagnostic Trouble Code (DTC) chart

DTC	Detection Items	See page
B16A017	Smart camera controller input terminal overvoltage	(See page ZD-3489)
B16A016	Smart camera controller input terminal undervoltage	(See page ZD-3489)
B16A001	IFC internal voltage fault	(See page ZD-3496)
B16A004	EyeQ ASIL (sensing chip function safety) fault	(See page ZD-3496)
B16A045	EQ BOOT (sensing chip guide load program) start fault	(See page ZD-3496)

DTC	Detection Items	See page
B16A053	EQ APP (sensing chip application software) start fault	(See page ZD-3496)
B16A104	MCU (control chip) and EQ (sensing chip) communication fault	(See page ZD-3496)
B16A009	IFC MCU fault	(See page ZD-3496)
B16A04B	Image processor temperature too high	(See page ZD-3493)
B16A051	IFC software version unmatched	(See page ZD-3494)
B16A054	Abnormal IFC calibration	(See page ZD-3502)
B16A068	IFC camera view blocked	(See page ZD-3503)
U003788	ADAS CAN bus Off	(See page ZD-3505)
U014687	PDCF node lost	(See page ZD-3511)
U114B87	VDC397 message missing	(See page ZD-3511)
U113187	Electric power steering control unit message missing	(See page ZD-3511)
U112987	IBC message missing	(See page ZD-3511)
U115187	Airbag control unit message missing	(See page ZD-3511)
U114787	PDC message missing	(See page ZD-3511)
U12F187	Combination switch message missing	(See page ZD-3511)
U114A87	VDC821 message missing	(See page ZD-3511)
U041882	IBC message content fault	(See page ZD-3511)
U041883	IBC message content fault	(See page ZD-3511)
U041886	IBC message content fault	(See page ZD-3511)
U059482	Vehicle controller message content fault	(See page ZD-3511)
U059483	Vehicle controller message content fault	(See page ZD-3511)
U059486	Vehicle controller message content fault	(See page ZD-3511)
U041782	Electronic parking brake unit message content fault	(See page ZD-3511)
U041783	Electronic parking brake unit message content fault	(See page ZD-3511)
U041786	Electronic parking brake unit message content fault	(See page ZD-3511)
U042082	Electric power steering control unit message content fault	(See page ZD-3511)
U042083	Electric power steering control unit message content fault	(See page ZD-3511)
U042086	Electric power steering control unit message content fault	(See page ZD-3511)
U045282	Airbag controller message content fault	(See page ZD-3511)
U045283	Airbag controller message content fault	(See page ZD-3511)
U044782	PDCM message content fault	(See page ZD-3511)
U044783	PDCM message content fault	(See page ZD-3511)

DTC	Detection Items	See page
U044786	PDCM message content fault	(See page ZD-3511)
U040482	EGSM message content fault	(See page ZD-3511)
U040483	EGSM message content fault	(See page ZD-3511)
U044D86	VDC821MCU message content fault	(See page ZD-3511)
U008388	Front camera - millimeter wave radar CAN bus off	(See page ZD-3522)
U023987	Rear left radar control unit node lost	(See page ZD-3527)
U023D87	Rear right radar control unit node lost	(See page ZD-3527)
U053682	Rear left corner millimeter wave radar message content fault	(See page ZD-3527)
U053683	Rear left corner millimeter wave radar message content fault	(See page ZD-3527)
U053686	Rear left corner millimeter wave radar message content fault	(See page ZD-3527)
U053882	Rear right corner millimeter wave radar message content fault	(See page ZD-3527)
U053883	Rear right corner millimeter wave radar message content fault	(See page ZD-3527)
U053886	Rear right corner millimeter wave radar message content fault	(See page ZD-3527)
U147C8A	IFC backbone network Eth1 connection establishment failure	(See page ZD-3532)

DTC	**B16A017**	**Smart camera controller input terminal overvoltage**
DTC	**B16A016**	**Smart camera controller input terminal undervoltage**

Description

When smart camera power supply voltage is out of normal operation range, the smart camera records DTC.

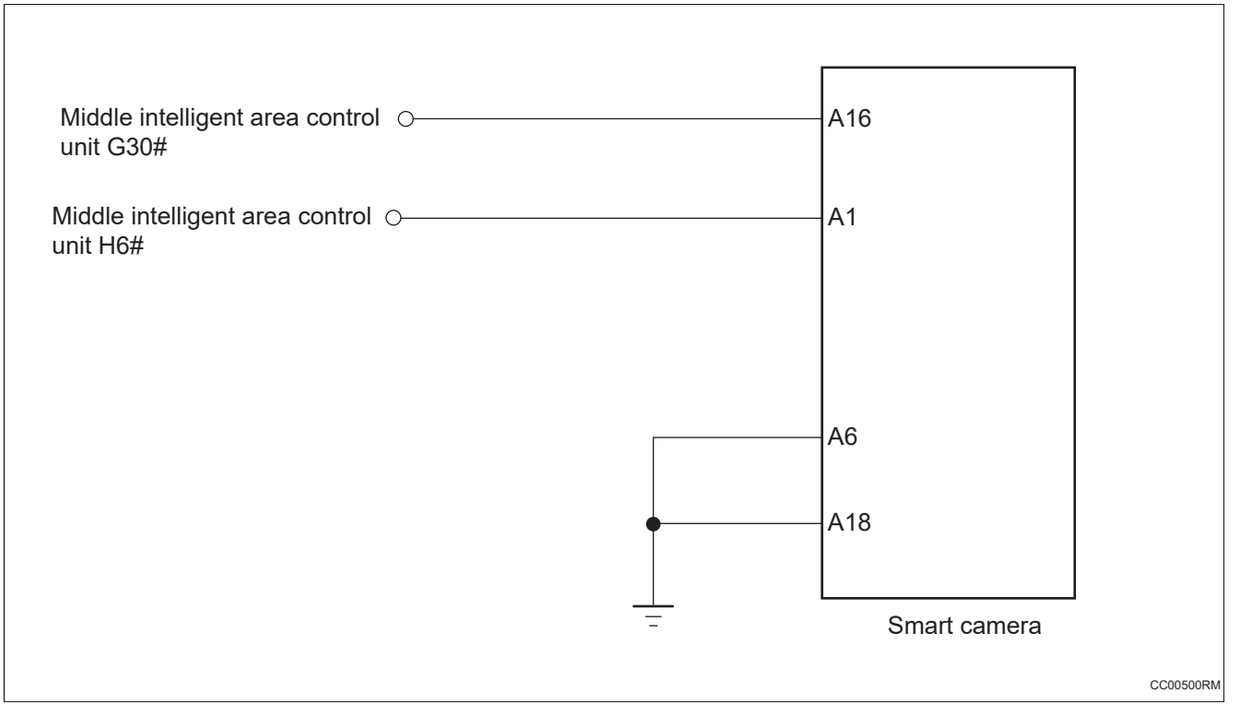
DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A017	• The ignition key position is not in the Crank and 1s is elapsed after the Crank state ends.	Power supply voltage > 16 V ± 0.2 V	1000 ms	Event-based	10 ms	• Smart camera • Wire harness and connector • Charging system
B16A016	• The ignition key position is not in the Crank and 1s is elapsed after the Crank state ends.	Power supply voltage < 9 V ± 0.2 V	1000 ms	Event-based	10 ms	• Smart camera • Wire harness and connector • Charging system

ZD

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A017	All IFC functions failure	Comes on
B16A016	All IFC functions failure	Comes on

Circuit diagram



Inspection procedure

1	**Check battery voltage**

(a) Start the vehicle, measure battery voltage.

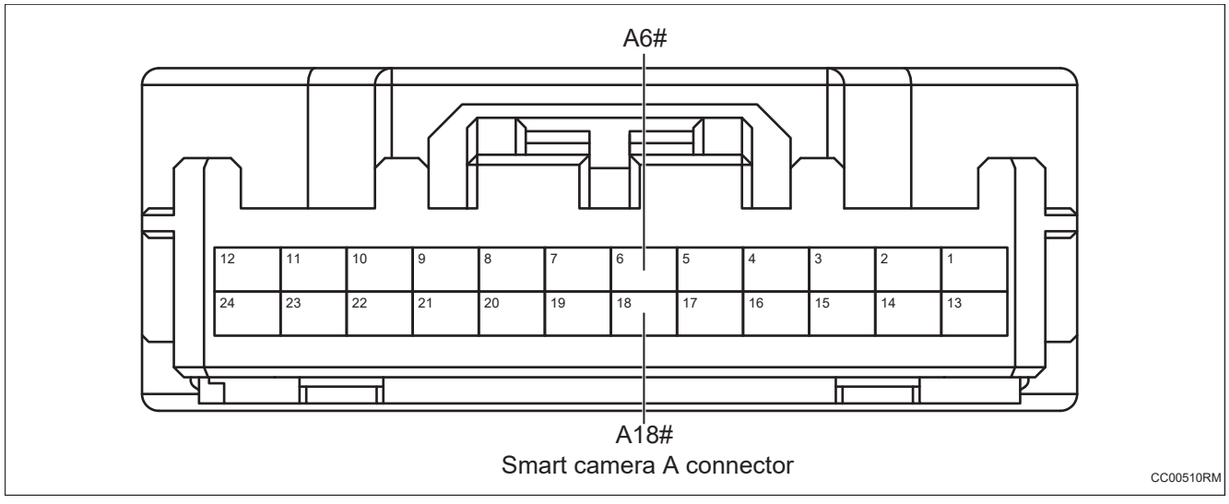
Standard value

Multimeter connection	Detection condition	Specified condition
Positive battery terminal - negative battery terminal	Always connected	9 V ~ 16 V

NG → **Check and repair charging system**

OK

2	**Check smart camera ground**



Smart camera A connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) According to value in the table, measure resistance.

Standard value

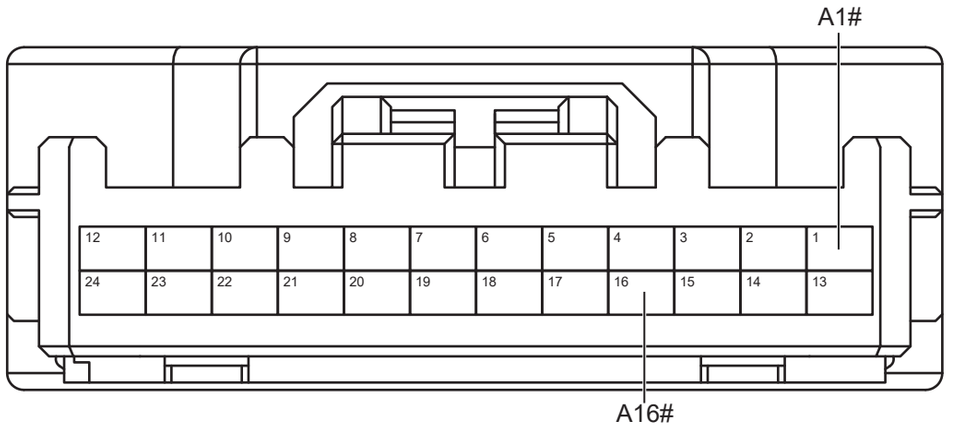
Multimeter connection	Detection condition	Specified condition
Smart camera connector A6# - body ground	Always connected	Less than 1 Ω
Smart camera connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

ZD

OK

3	**Check smart camera power supply**



Smart camera A connector

CC00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Smart camera connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)

OK

Replace smart camera (See page ZC-139)

DTC	B16A04B	Image processor temperature too high

Description

When the operating temperature of smart camera is too high, the smart camera records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A04B	• No high/low voltage fault • No IFC internal fault • Turn ignition switch to ON state	• EyeQ Boot acquisition temperature out of range or acquisition temperature out of range APP _ DDR = 2 (Above _ spec) when EyeQ is running or APP1 APP2 temperature exceeds 124° C • During power-on initialization, the image process unit temperature is higher than 105° C	5 s	Periodic type	30 ms	• Ambient temperature • Smart camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A04B	All IFC functions failure	Comes on

Inspection procedure

1	Smart camera cooling (natural cooling)

(a) Turn off the smart camera.

(b) Lower the smart camera temperature to the normal operation temperature.

(c) Connect HQ-VDS diagnostic tester.

(d) Clear DTCs.

(e) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

ZD

NG → **Replace smart camera (See page ZC-139)**

OK

Diagnosis ends

DTC	B16A051	IFC software version unmatched

Description

When internal software of smart camera fails, the smart camera records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A051	• No high/low voltage fault • Turn ignition switch to ON state	• MCU application version does not match image processor application version • MCU calibration file version does not match the image processor calibration file version; (MCU application and MCU calibration file can be updated through the diagnostic tester, image processor application and image processor calibration file cannot be updated through the diagnostic tester)	1 times	Periodic type	Initialization	• Smart camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A051	All IFC functions failure	Comes on

Inspection procedure

1	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Update smart camera software**

OK

Diagnosis ends

DTC	**B16A001**	**IFC internal voltage fault**
DTC	**B16A004**	**EyeQ ASIL (sensing chip function safety) fault**
DTC	**B16A045**	**EQ BOOT (sensing chip guide load program) start fault**
DTC	**B16A053**	**EQ APP (sensing chip application software) start fault**
DTC	**B16A104**	**MCU (control chip) and EQ (sensing chip) communication fault**
DTC	**B16A009**	**IFC MCU fault**

Description

When smart camera function is abnormal, the smart camera records DTC.

DTC No.	Prereq-uisites for fault	Monitoring threshold	Monito-ring time or number of times	Monito-ring type	Monito-ring rate	Faulty area
B16-A001	• No high/low voltage fault • Turn ignition switch to ON state	• INTERNAL_F_CODE_5V_OVER voltage > 5.5 V • INTERNAL_F_CODE_5V_LOW voltage < 4.5 V • INTERNAL_F_CODE_3V3_OVER voltage > 3.465 V • INTERNAL_F_CODE_3V3_LOW voltage < 3.135 V • INTERNAL_F_CODE_1V8_OVER voltage > 1.89 V • INTERNAL_F_CODE_1V8_LOW voltage < 1.71 V • INTERNAL_F_CODE_1V8_EQ_OVER voltage > 1.89 V • INTERNAL_F_CODE_1V8_EQ_LOW voltage < 1.71 V • INTERNAL_F_CODE_0V75_OVER voltage > 0.775 V • INTERNAL_F_CODE_0V75_LOW voltage < 0.725 V • INTERNAL_F_CODE_0V75_MIPI_OVER voltage > 0.775 V • INTERNAL_F_CODE_0V75_MIPI_LOW voltage < 0.725 V • INTERNAL_F_CODE_1V1_OVER voltage > 1.17 V • INTERNAL_F_CODE_1V1_LOW voltage < 1.06 V • INTERNAL_F_CODE_CAM_1V05_OVER voltage > 1.13 V • INTERNAL_F_CODE_CAM_1V05_LOW voltage < 1.00 V • INTERNAL_F_CODE_CAM_1V8_OVER voltage > 1.89 V • INTERNAL_F_CODE_CAM_1V8_LOW voltage < 1.71 V • INTERNAL_F_CODE_CAM_2V8_OVER voltage > 2.94 V • INTERNAL_F_CODE_CAM_2V8_LOW voltage < 2.66 V • INTERNAL_F_CODE_ETH_3V3_OVER voltage > 3.465 V • INTERNAL_F_CODE_ETH_3V3_LOW voltage < 3.135 V	500 ms	Periodic type	10 ms	• Smart camera
B16-A004	• No high/low voltage fault • Turn ignition switch to ON state	• INTERNAL_F_CODE_EQ_SDM (4, 6, 7, 9, 11, 13, 18, 21, 24~27, 29~31, 34, 50, 54, 59) error • INTERNAL_F_CODE_EQ_SDM_C_R error • INTERNAL_F_CODE_EQ_CR_REPEAT error • INTERNAL_F_CODE_EQ_CRC error • INTERNAL_F_CODE_EQ_RFC error • INTERNAL_F_CODE_CAM_VOL_OVER error • INTERNAL_F_CODE_CAM_VOL_LOW error • INTERNAL_Critical Safety Error (signaled by CRERR) error • INTERNAL_FCMU Error2 (signaled by NCRERR) error	1000 ms	Periodic type	10 ms	• Smart camera

ZD

ZD

DTC No.	Prereq-uisites for fault	Monitoring threshold	Monito-ring time or number of times	Monito-ring type	Monito-ring rate	Faulty area
B16-A045	• No high/ low volt-age fault • Turn igniti-on swit-ch to ON state	• (BIT_0)Temperature_read_error • (BIT_1)BIST_error • (BIT_2)PLL_error • (BIT_3)Thread_init_error • (BIT_4)DDR_General_error • (BIT_5)DDR_ATE_failure • (BIT_6)Decompression_error • (BIT_7)Security_init_error • (BIT_8)Security_Authentication_issue • (BIT_9)Security_Description_issue • (BIT_10)Security_other_issue • (BIT_11)OTP_failure • (BIT_12－1)OTP_RVK_increment_cannot • (BIT_12－2)be_executed_due_to_temperature • (BIT_13)MI_DRAM_configuration_sanity_check_ error • (BIT_14)FOTA_swap_partition • (BIT_15)Loader_common_error • (BIT_16)Flash_init_error • (BIT_17)Fpd_load_error • (BIT_18)Fota_load_error • (BIT_19)Reserved_For_Future_Use_(1~13) • BOOT FAIL (separate byte)	10 ms	Periodic type	10 ms	• Smart camera
B16-A053	• No high/ low volt-age fault • Turn igniti-on swit-ch to ON state	• APP_CONFIGURATION_ERROR • APP_TIMESYNC2_ERROR • APP_INIT_FAILED • APP_INIT_CAMERA_INIT • APP_INIT_CAMERA_EEPROM • APP_INIT_CAMERA_SER_CONNECTIVITY • APP_INIT_CAMERA_SENSOR_ID_MISMATCH • APP_ASIL_CAMERA_ERROR • APP_CODING_FROM_FLASH_FAILED • APP_INIT_FROM_FLASH_FAILED • APP_CTFF_QUERY_FAILED • APP_I2C_VIDEO_GRAB_FAILED • APP_I2C_TIMEOUT_ERROR • APP_PATTERN_TEST • APP_CAM_PARAMS_CCFT_CRC_FAILED • PV_GENERAL_ERROR • APP_GVPU_STATE_TERMINAL • EDR_WROTE_TO_FLASH • DIAGNOSTICS_ASIL_FAILED • SPIDEV_INIT_FAILED	100 ms	Periodic type	100 ms	• Smart camera

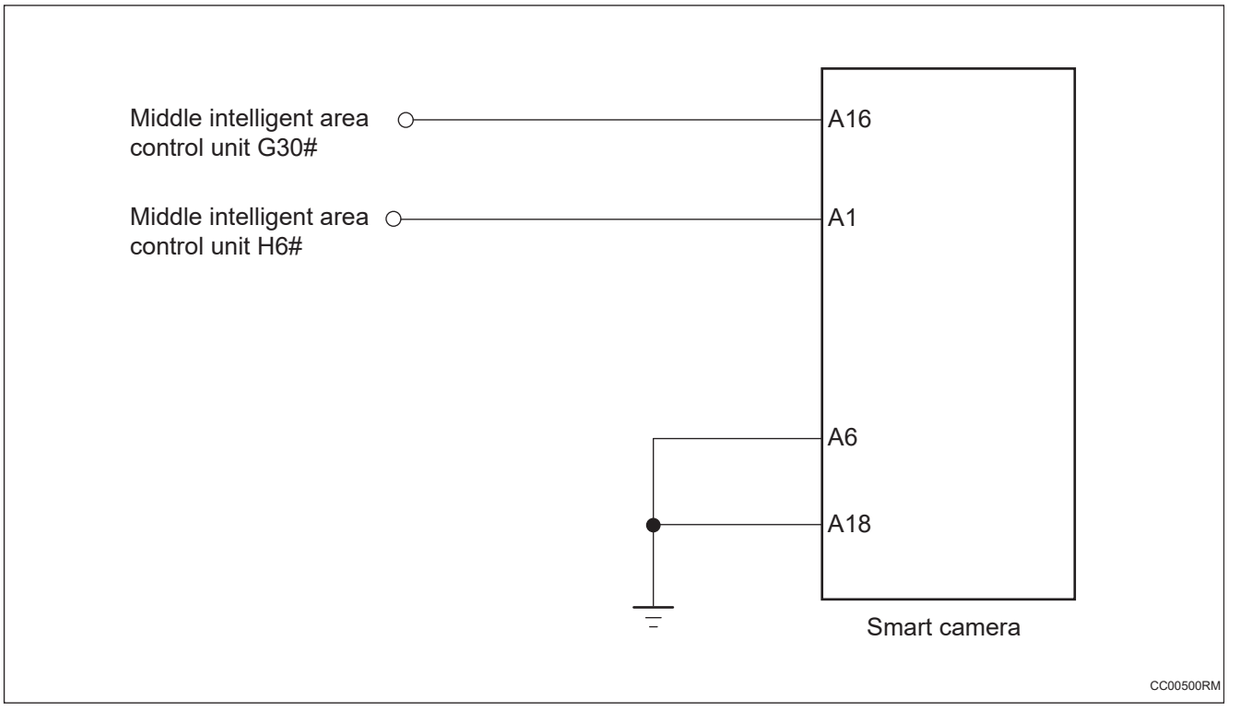
DTC No.	Prereq-uisites for fault	Monitoring threshold	Monito-ring time or number of times	Monito-ring type	Monito-ring rate	Faulty area
		• INTERNAL_F_CODE_EQ_APP_DIAG				
B16-A104	• No high/ low volt-age fault • Turn igniti-on swit-ch to ON state	• Abnormal SPI communication between MCU and EQ	1000 ms	Periodic type	10 ms	• Smart camera
B16-A009	• No high/ low volt-age fault • Turn igniti-on swit-ch to ON state	• INTERNAL_F_CODE_PLL • INTERNAL_F_CODE_ABNORMAL_RST • INTERNAL_F_CODE_FLASH • INTERNAL_F_CODE_RAM • INTERNAL_F_CODE_EEPROM • INTERNAL_F_CODE_LBIST_ERROR • INTERNAL_F_CODE_MONBIST_ERROR • INTERNAL_F_CODE_Core0_MBIST_ERROR • INTERNAL_F_CODE_REG_MONTOR_ERROR • INTERNAL_F_CODE_FW_CHECK_ERROR • INTERNAL_F_CODE_SMU_ALIVE_ERROR • INTERNAL_F_CODE_ISR_MONITOR_ERROR • INTERNAL_F_CODE_Adc_InitCheck_ERROR • INTERNAL_F_CODE_Port_InitCheck_ERROR • INTERNAL_F_CODE_Mcu_InitCheck_ERROR • INTERNAL_F_CODE_Wdg_InitCheck_ERROR • INTERNAL_F_CODE_Smu_InitCheck_ERROR	100 ms	Periodic type	10 ms	• Smart camera

ZD

Fault symptom

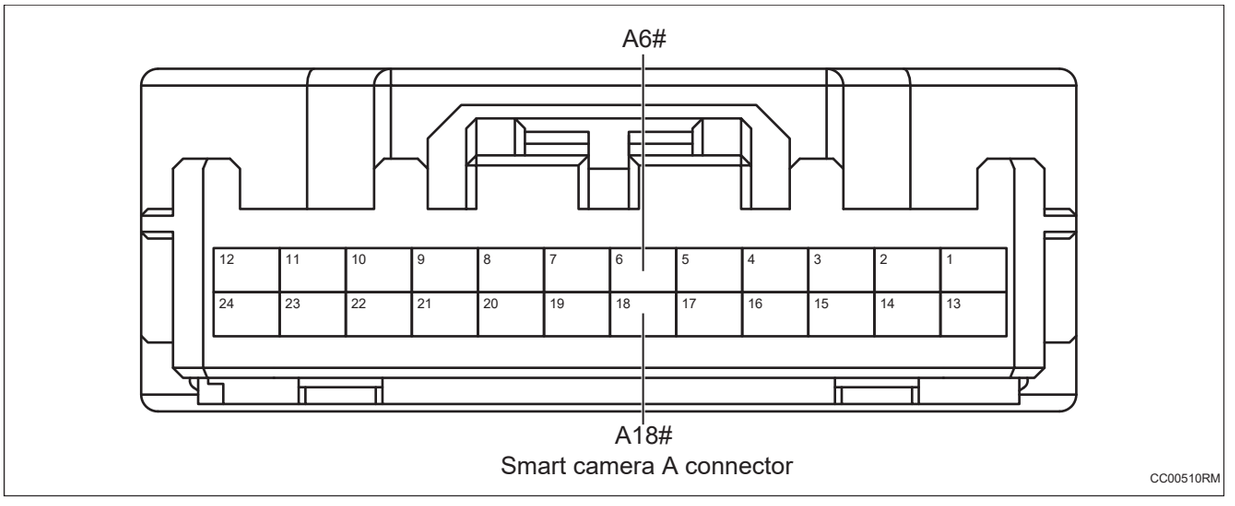
DTC No.	Fault symptom	Warning light/indicator
B16A001	All IFC functions failure	Comes on
B16A004	All IFC functions failure	Comes on
B16A045	All IFC functions failure	Comes on
B16A053	All IFC functions failure	Comes on
B16A104	All IFC functions failure	Comes on
B16A009	All IFC functions failure	Comes on

Circuit diagram



Inspection procedure

1	**Check smart camera ground**



(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) According to value in the table, measure resistance.

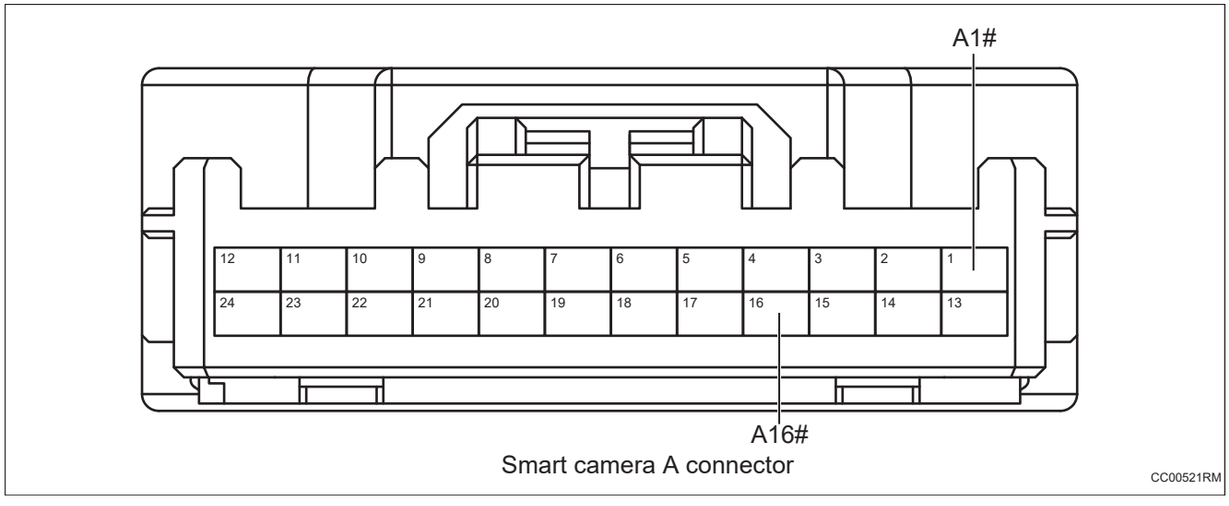
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A6# - body ground	Always connected	Less than 1 Ω
Smart camera connector A18# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	Check smart camera power supply



Smart camera A connector

CC00521RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V
Smart camera connector A16# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG

Check and repair or replace wire harness and connector (if the wire harness and connector are not defective, check the power supply and ground of middle intelligent area control unit and confirm if middle intelligent area control unit is damaged)

OK

Replace smart camera (See page ZC-139)

DTC	B16A054	Abnormal IFC calibration

Description

When smart camera calibration is abnormal, the smart camera records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A054	• No high/low voltage fault • No IFC internal fault • Turn ignition switch to ON state	• Image processor reports abnormal calibration • EOL workstation calibration has not been performed	• 2 times • 1 times	Periodic type	30 ms	• Smart camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A054	All IFC functions failure	Comes on

Inspection procedure

1	**Check smart camera bracket**

(a) Check if smart camera bracket is installed properly.

(b) Check if smart camera bracket is damaged, deformed or loose.

NG → **Perform repair according to malfunction**

OK

2	**Clear DTCs**

(a) Connect HQ-VDS diagnostic tester.

(b) Clear DTCs.

(c) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Calibrate smart camera**

OK

Diagnosis ends

DTC	B16A068	IFC camera view blocked

Description

When smart camera is dirty or blocked, the smart camera records DTC.

DTC No.	Prerequisites for fault	Monitoring threshold	Monitoring time or number of times	Monitoring type	Monitoring rate	Faulty area
B16A068	• No high/low voltage fault • No IFC internal fault • Turn ignition switch to ON state • Vehicle speed is more than 4 kph	Image processor reports view obstruction	1 s	Event-based	30 ms	• Smart camera

Fault symptom

DTC No.	Fault symptom	Warning light/indicator
B16A068	All IFC functions failure	Comes on

Inspection procedure

1	Check smart camera

(a) Check if smart camera is dirty.

(b) Check if smart camera is covered.

NG → **From the outside, check the upper middle part of front windshield and the camera for obstruction, dirt, water mist, etc.; From the inside, check if there is any foreign matter between the glass and the lens; Check the lens for dirt. Clean glass, defog windshield or remove foreign objects**

OK

Replace smart camera (See page ZC-139)

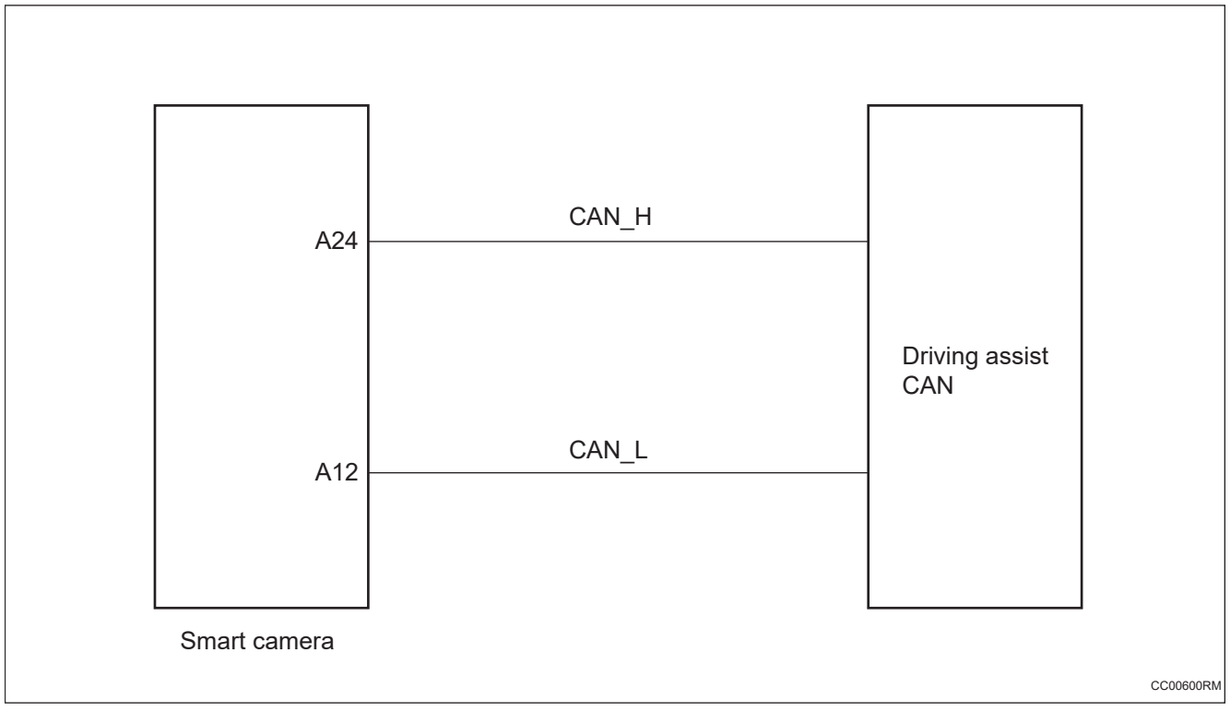
DTC	U003788	ADAS CAN bus Off

Description

When smart camera detects driving assist CAN bus off fault, the smart camera records DTC.

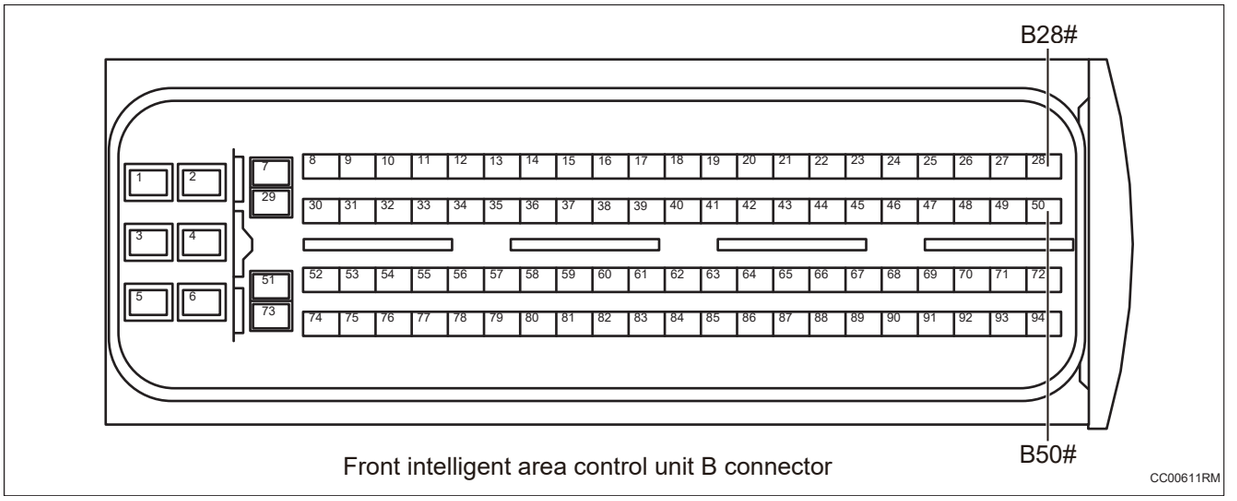
DTC No.	DTC detection condition	Faulty area
U003788	(a) ADAS CAN bus off.	• Wire harness and connector • Front intelligent area control unit • Smart camera • Advanced automatic driving controller

Circuit diagram



Inspection procedure

1	**Check driving assist CAN bus terminal resistance (smart camera and advanced automatic driving controller)**



Front intelligent area control unit B connector

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the front intelligent area control unit connector.

(d) Measure terminal resistance according to the values in the table below.

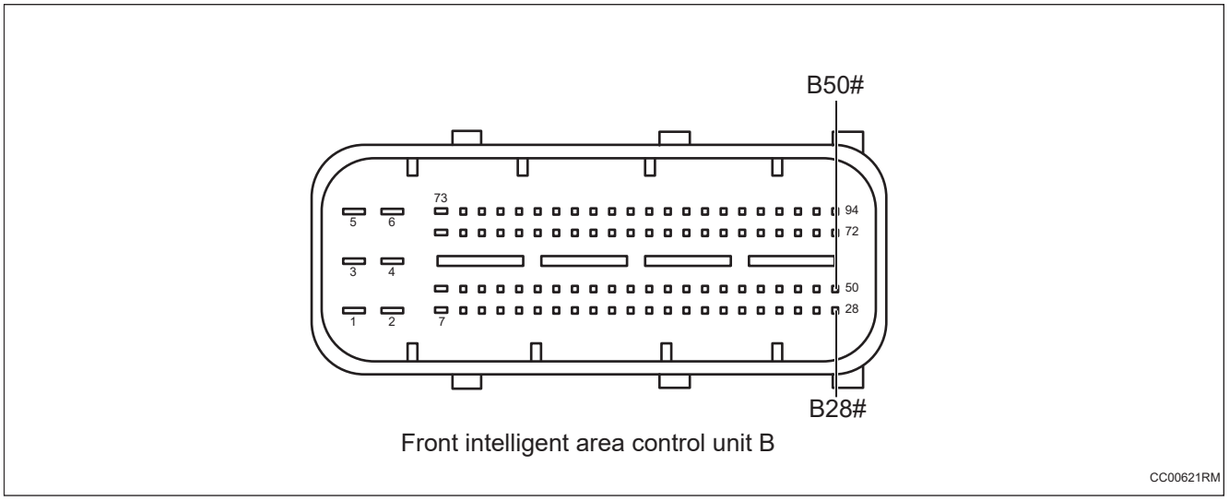
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector B50# - front intelligent area control unit connector B28#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	Check driving assist CAN bus terminal resistance (front intelligent area control unit)



(a) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit B50# - front intelligent area control unit B28#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

3	Check controllers on driving assist CAN bus

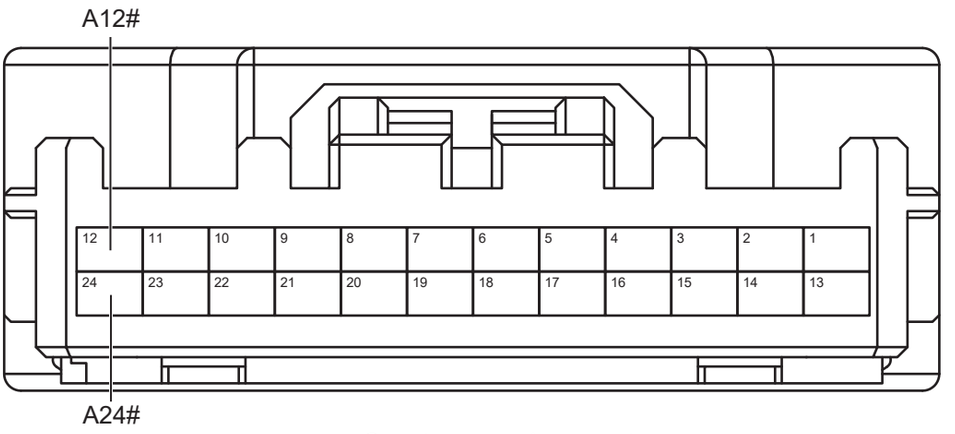
(a) Disconnect the controllers on driving assist CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

ZD

4	**Check for short between CAN-L and CAN-H of driving assist CAN bus**



Smart camera A connector

CC00631RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on driving assist CAN bus.

(d) According to value in the table, measure resistance.

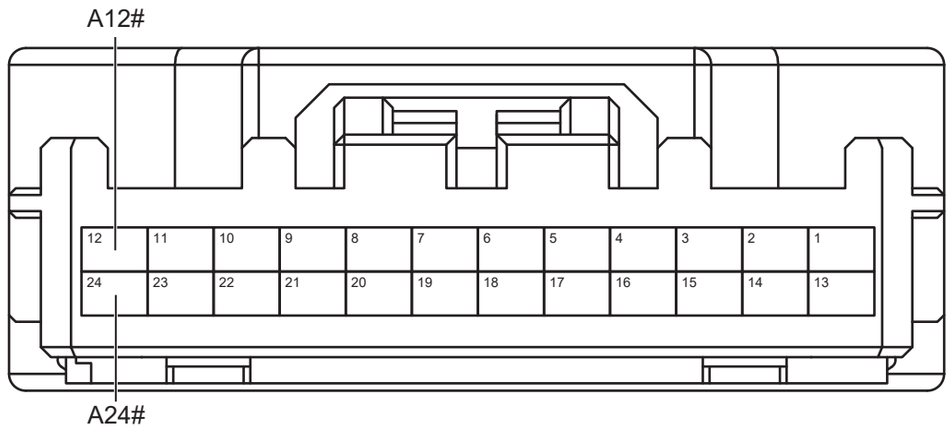
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - smart camera connector A12#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to ground in driving assist CAN bus**



Smart camera A connector

CC00631RM

(a) According to value in the table, measure resistance.

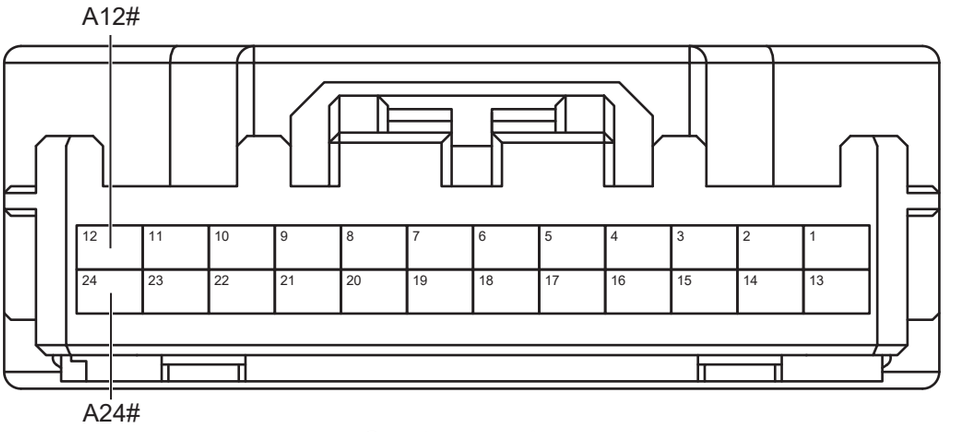
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - body ground	Always connected	10 KΩ or more
Smart camera connector A12# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

6	**Check for short to power supply in driving assist CAN bus**



Smart camera A connector

CC00631RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - body ground	Turn ignition switch to "ON"	Less than 1 V
Smart camera connector A12# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	U014687	PDCF node lost
DTC	U114687	PDCF message missing
DTC	U114B87	VDC397 message missing
DTC	U113187	Electric power steering control unit message missing
DTC	U112987	IBC message missing
DTC	U115187	Airbag control unit message missing
DTC	U114787	PDC message missing
DTC	U12F187	Combination switch message missing
DTC	U114A87	VDC821 message missing
DTC	U041882	IBC message content fault
DTC	U041883	IBC message content fault
DTC	U041886	IBC message content fault
DTC	U059482	VDC397 message content fault
DTC	U059483	VDC397 message content fault
DTC	U059486	VDC397 message content fault
DTC	U041782	Electronic parking brake unit message content fault
DTC	U041783	Electronic parking brake unit message content fault
DTC	U041786	Electronic parking brake unit message content fault
DTC	U042082	Electric power steering control unit message content fault
DTC	U042083	Electric power steering control unit message content fault
DTC	U042086	Electric power steering control unit message content fault
DTC	U045282	Airbag controller message content fault

DTC	**U045283**	**Airbag controller message content fault**
DTC	**U044782**	**PDCM message content fault**
DTC	**U044783**	**PDCM message content fault**
DTC	**U044786**	**PDCM message content fault**
DTC	**U040482**	**EGSM message content fault**
DTC	**U040483**	**EGSM message content fault**
DTC	**U044D86**	**VDC821MCU message content fault**

ZD Description

When communication between smart camera and other system is abnormal or interrupted, the smart camera records DTC.

DTC No.	DTC detection condition	Faulty area
U014687	(a) PDCF node lost.	• Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U114687	(a) PDCF message missing.	• Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U114B87	(a) VDC397 message missing.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U113187	(a) Electric power steering control unit message missing.	• Electric power steering control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U112987	(a) IBC message missing.	• Electric power steering control unit • Integrated brake controller • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U115187	(a) Airbag control unit message missing.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit

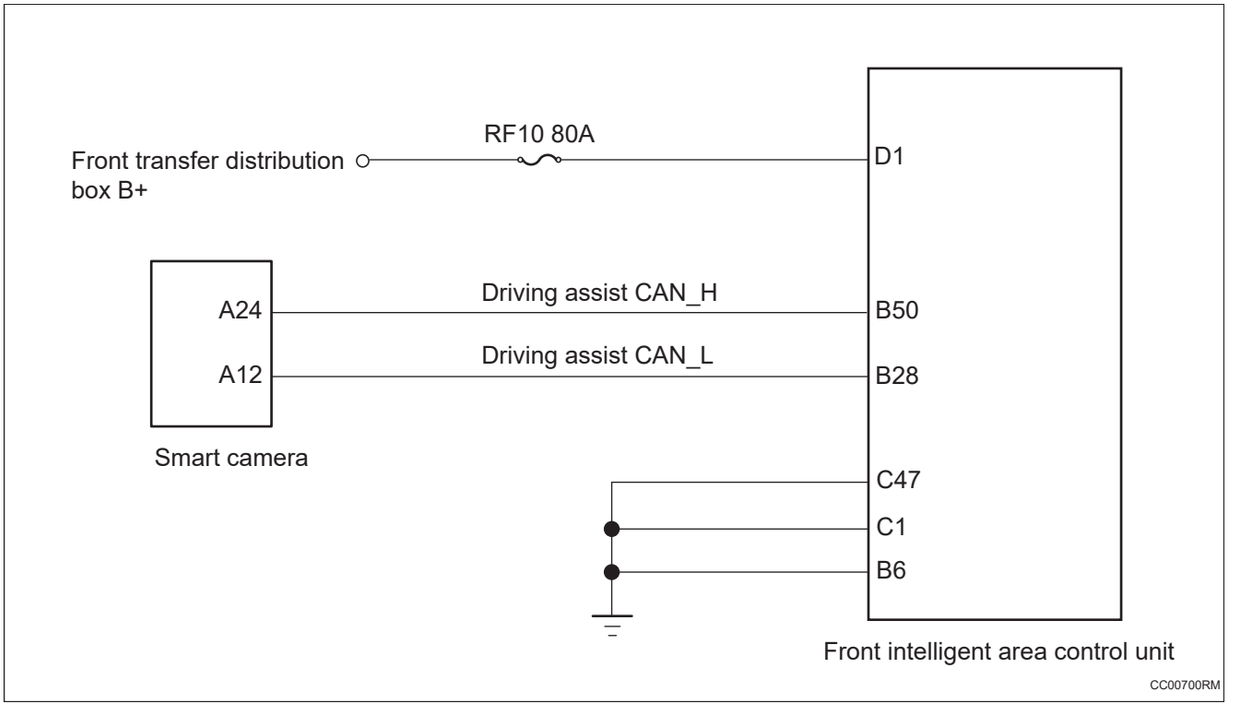
DTC No.	DTC detection condition	Faulty area
		• Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U114787	(a) Center PDC message missing.	• Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U12F187	(a) Combination switch message missing.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U114A87	(a) VDC821 message missing.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041882	(a) IBC message content fault.	• Electric power steering control unit • Integrated brake controller • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041883	(a) IBC message content fault.	• Electric power steering control unit • Integrated brake controller • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041886	(a) IBC message content fault.	• Electric power steering control unit • Integrated brake controller • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U059482	(a) VDC397 message content fault.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit
U059483	(a) VDC397 message content fault.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U059486	(a) VDC397 message content fault.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041782	(a) Electronic parking brake unit message content fault.	• Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041783	(a) Electronic parking brake unit message content fault.	• Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U041786	(a) Electronic parking brake unit message content fault.	• Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U042082	(a) Electric power steering control unit message content fault.	• Electric power steering control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U042083	(a) Electric power steering control unit message content fault.	• Electric power steering control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U042086	(a) Electric power steering control unit message content fault.	• Electric power steering control unit • Wire harness and connector • Smart camera/advanced automatic driving controller

DTC No.	DTC detection condition	Faulty area
		• Front intelligent area control unit
U045282	(a) Airbag controller message content fault.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U045283	(a) Airbag controller message content fault.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U044782	(a) PDCM message content fault.	• Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U044783	(a) PDCM message content fault.	• Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U044786	(a) PDCM message content fault.	• Middle intelligent area control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U040482	(a) CS combination switch message content fault.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit

DTC No.	DTC detection condition	Faulty area
U040483	(a) CS combination switch message content fault.	• Rear intelligent area control unit • Combination switch • Middle intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit
U044D86	(a) VDC821MCU message content fault.	• Intelligent vehicle control platform control unit • Rear intelligent area control unit • Wire harness and connector • Smart camera/advanced automatic driving controller • Front intelligent area control unit

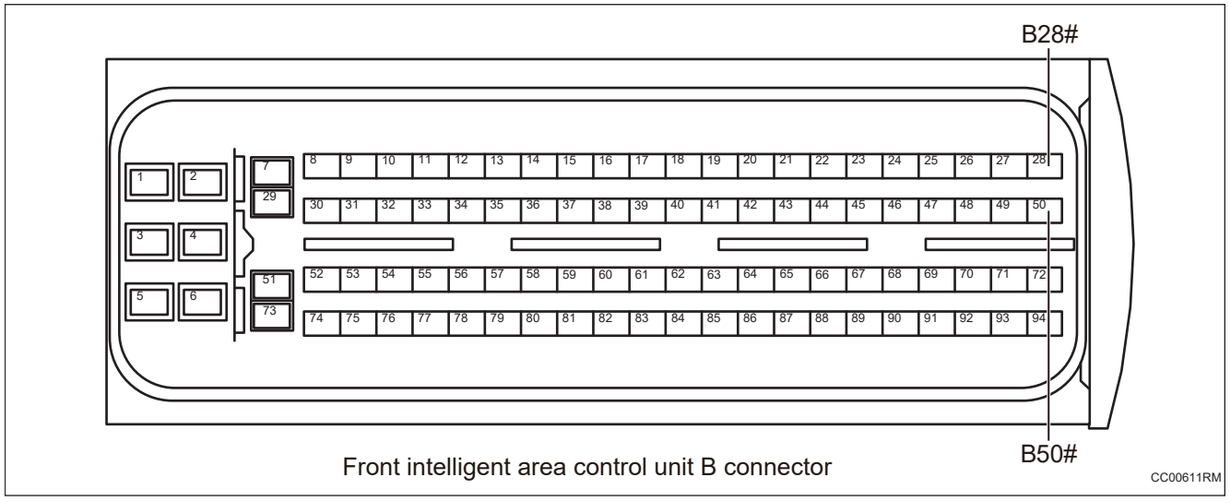
Circuit diagram



Inspection procedure

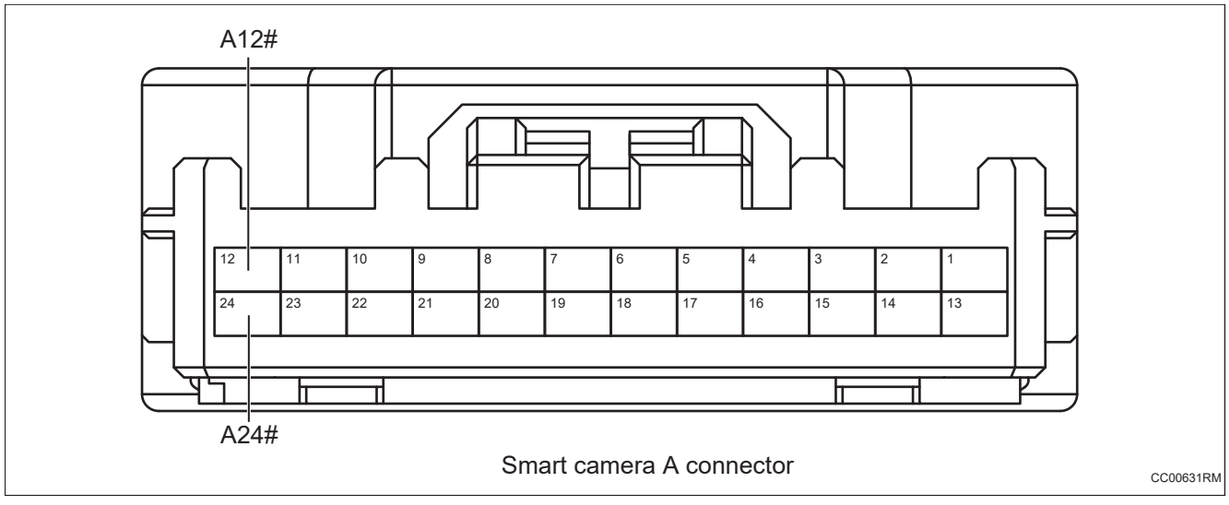
Note: Taking the U014687 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in driving assist CAN bus (smart camera - front intelligent area control unit)**



Front intelligent area control unit B connector

CC00611RM



Smart camera A connector

CC00631RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on driving assist CAN bus.

(d) According to value in the table, measure resistance.

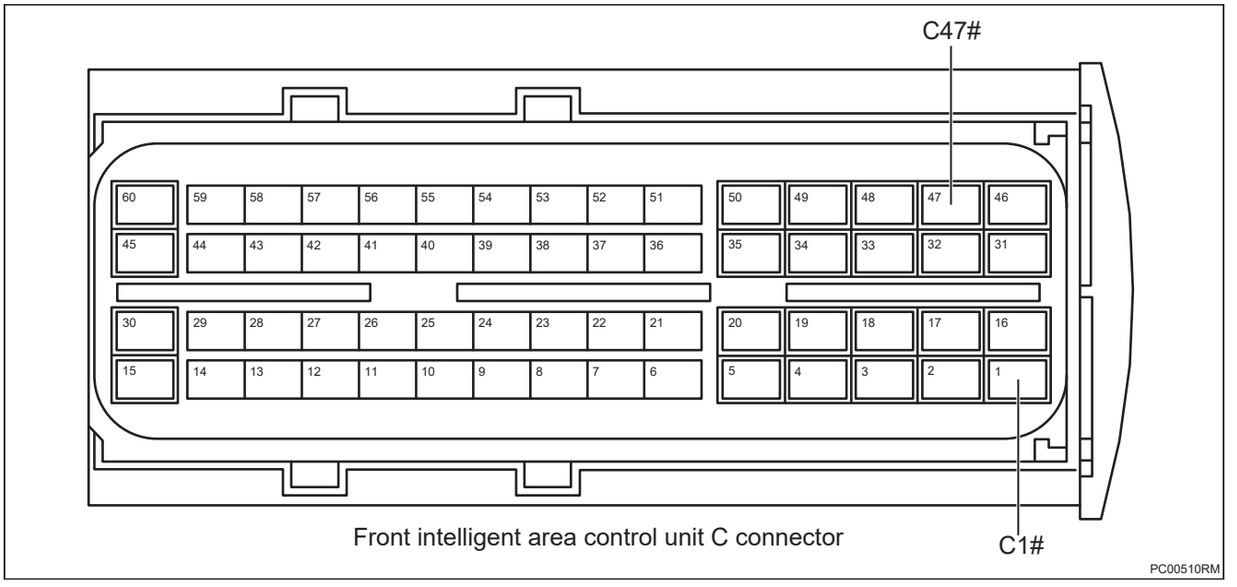
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - front intelligent area control unit connector B50#	Always connected	Less than 1 Ω
Smart camera connector A12# - front intelligent area control unit connector B28#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

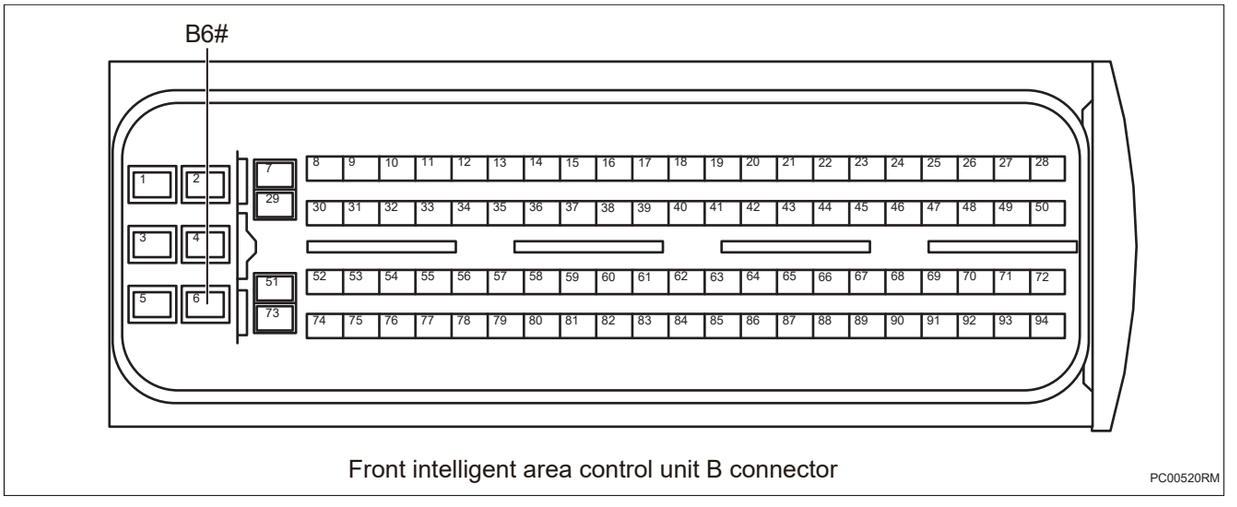
OK

2	**Check front intelligent area control unit ground**



Front intelligent area control unit C connector

PC00510RM



Front intelligent area control unit B connector

PC00520RM

(a) According to value in the table, measure resistance.

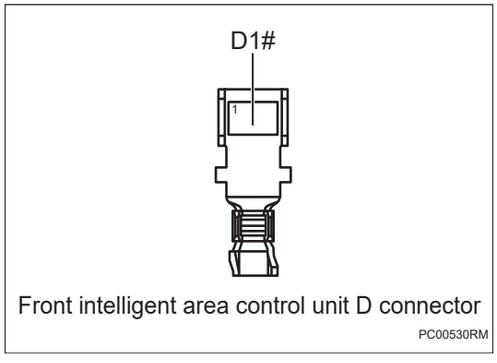
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector C47# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector C1# - body ground	Always connected	Less than 1 Ω
Front intelligent area control unit connector B6# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	Check front intelligent area control unit power supply



Front intelligent area control unit D connector
PC00530RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

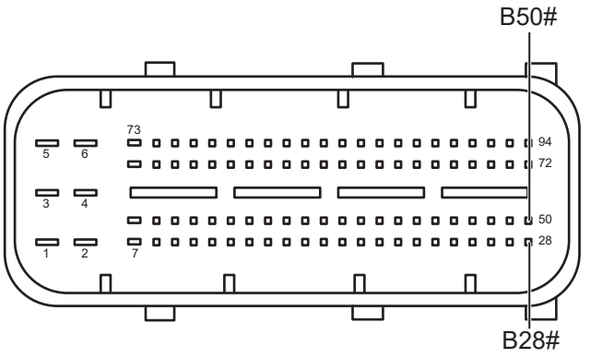
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit connector D1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check front intelligent area control unit terminal resistance**



Front intelligent area control unit B

CC00621RM

ZD

(a) According to value in the table, measure resistance.

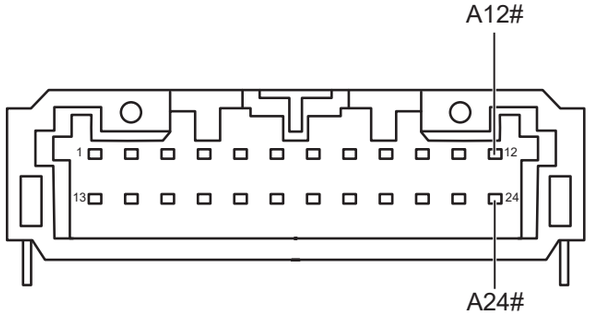
Standard value

Multimeter connection	Detection condition	Specified condition
Front intelligent area control unit B50# - front intelligent area control unit B28#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

5	**Check smart camera terminal resistance**



Smart camera

CC00641RM

(a) According to value in the table, measure resistance.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A24# - smart camera connector A12#	Always connected	Approximately 120 Ω

NG → **Perform repair according to malfunction**

OK

6	Replace front intelligent area control unit

(a) Replace the front intelligent area control unit.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace smart camera (See page ZC-139)**

OK

Diagnosis ends

DTC	U008388	Front camera - millimeter wave radar CAN bus off

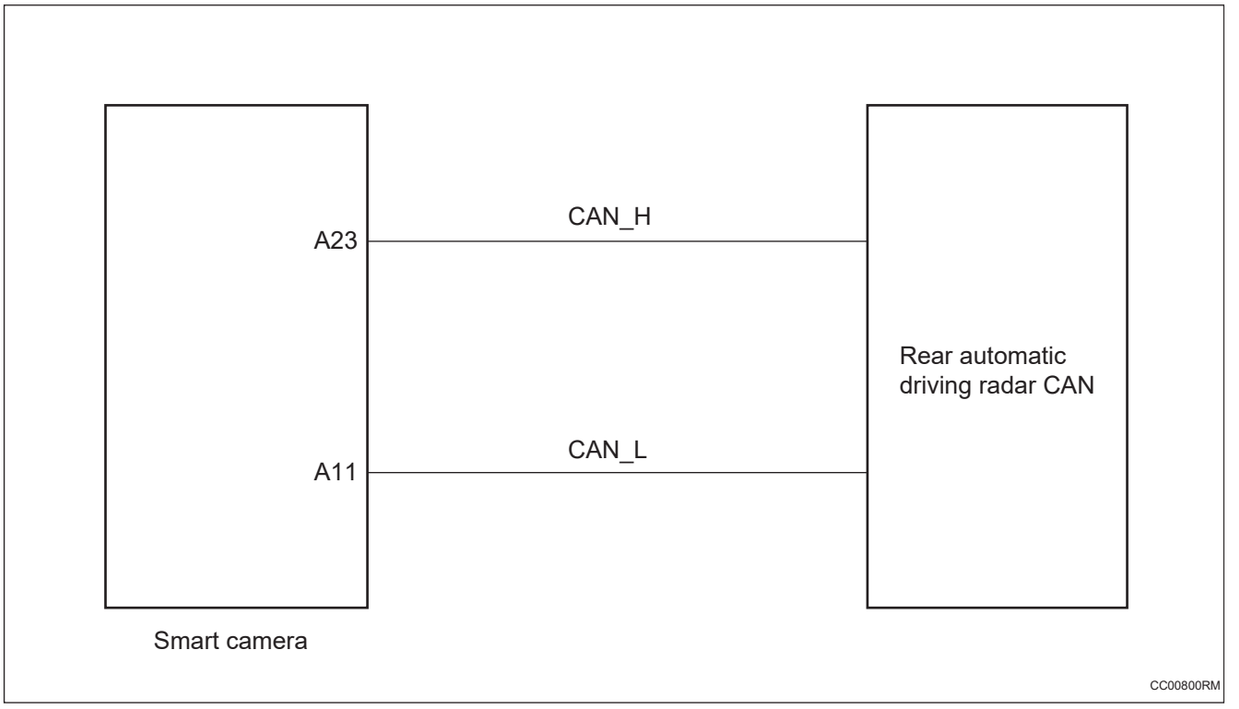
Description

When smart camera detects an off fault in rear automatic driving radar CAN bus, the smart camera records DTC.

DTC No.	DTC detection condition	Faulty area
U008388	(a) Front camera - millimeter wave radar CAN bus off.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

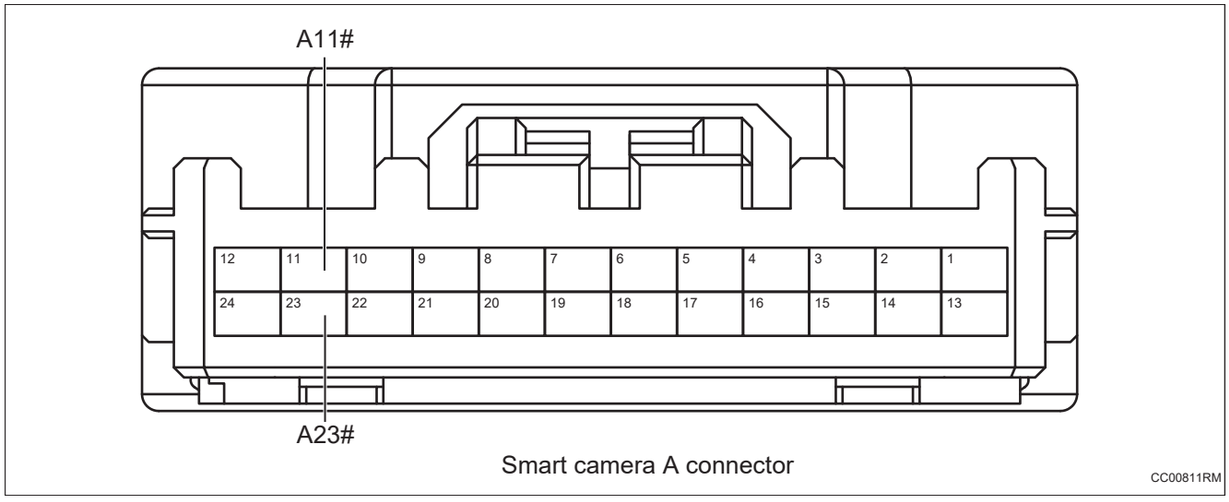
ZD

Circuit diagram



Inspection procedure

1	**Check rear automatic driving radar CAN bus terminal resistance**



(a) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - smart camera connector A11#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

2	**Check controllers on rear automatic driving radar CAN bus**

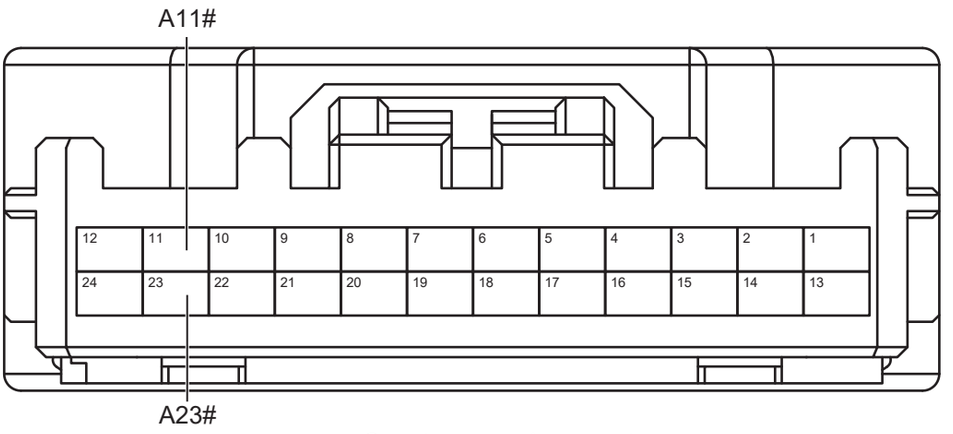
(a) Disconnect the controllers on rear automatic driving radar CAN bus one by one and check if other controller resumes operating.

NG → **Perform repair according to malfunction**

OK

ZD

3	**Check for short between rear automatic driving radar CAN bus CAN-L and CAN-H**



Smart camera A connector

CC00811RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

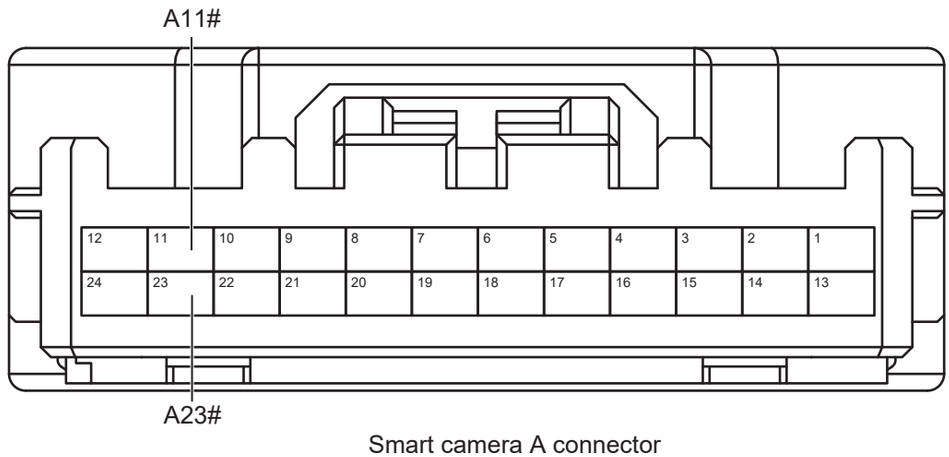
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - smart camera connector A11#	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

4	Check for short to ground in rear automatic driving radar CAN bus



Smart camera A connector

CC00811RM

ZD

(a) According to value in the table, measure resistance.

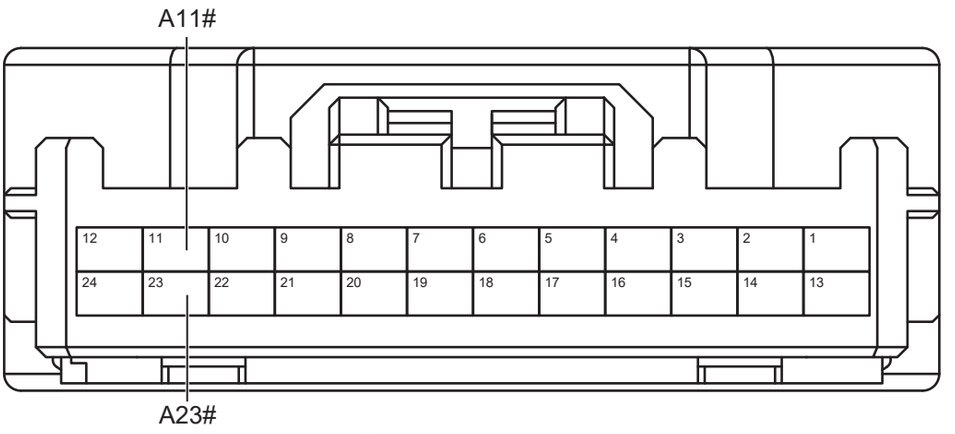
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - body ground	Always connected	10 KΩ or more
Smart camera connector A11# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

5	**Check for short to power supply in rear automatic driving radar CAN bus**



Smart camera A connector

CC00811RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - body ground	Turn ignition switch to "ON"	Less than 1 V
Smart camera connector A11# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

OK

Diagnosis ends

DTC	**U023987**	**Rear left radar control unit node lost**
DTC	**U023D87**	**Rear right radar control unit node lost**
DTC	**U053682**	**Rear left corner millimeter wave radar message content fault**
DTC	**U053683**	**Rear left corner millimeter wave radar message content fault**
DTC	**U053686**	**Rear left corner millimeter wave radar message content fault**
DTC	**U053882**	**Rear right corner millimeter wave radar message content fault**
DTC	**U053883**	**Rear right corner millimeter wave radar message content fault**
DTC	**U053886**	**Rear right corner millimeter wave radar message content fault**

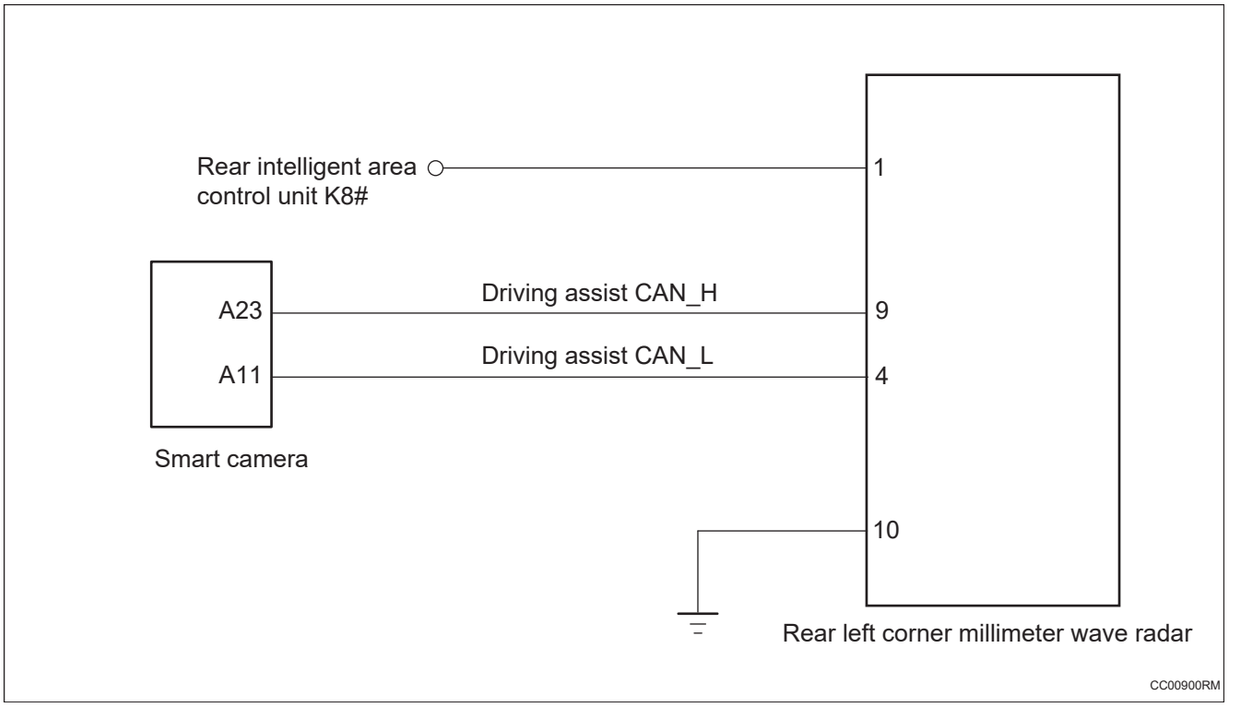
Description

When communication between smart camera and other system is abnormal or interrupted, the smart camera records DTC.

DTC No.	DTC detection condition	Faulty area
U023987	(a) Rear left radar control unit node lost.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U023D87	(a) Rear right radar control unit node lost.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053682	(a) Rear left corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053683	(a) Rear left corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053686	(a) Rear left corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera

DTC No.	DTC detection condition	Faulty area
		• Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053882	(a) Rear right corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053883	(a) Rear right corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar
U053886	(a) Rear right corner millimeter wave radar message content fault.	• Wire harness and connector • Smart camera • Rear left corner millimeter wave radar • Rear right corner millimeter wave radar

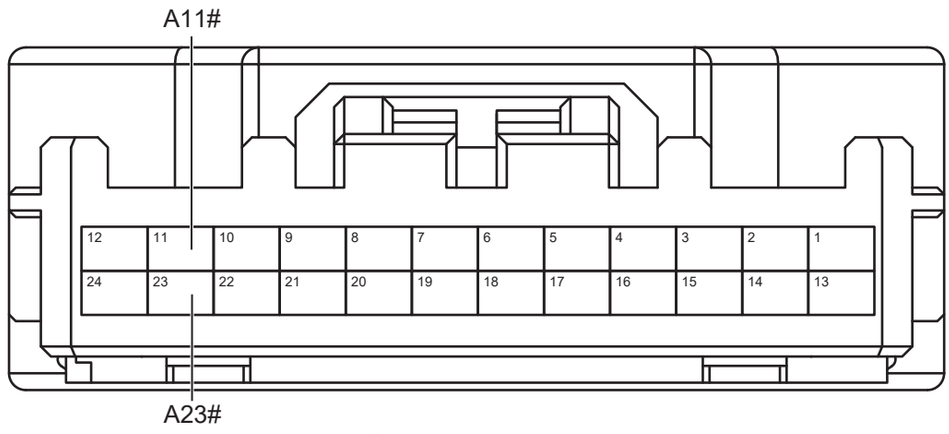
Circuit diagram



Inspection procedure

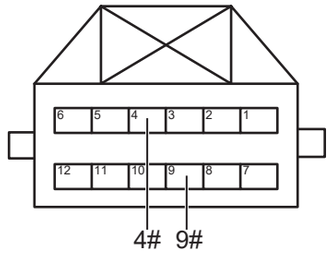
Note: Taking the U023987 fault as an example, and DTC analysis steps for other communication are similar.

1	**Check for open in rear automatic driving radar CAN bus (smart camera - rear left corner millimeter wave radar)**



Smart camera A connector

CC00811RM



Rear left corner millimeter wave radar connector

CC00911RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect all control unit connectors on rear automatic driving radar CAN bus.

(d) According to value in the table, measure resistance.

Standard value

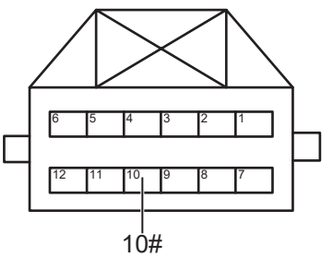
Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - rear left corner millimeter wave radar connector 9#	Always connected	Less than 1 Ω
Smart camera connector A11# - rear left corner millimeter wave radar connector 4#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

ZD

2	**Check rear left corner millimeter wave radar ground**



Rear left corner millimeter wave radar connector

BS03010RM

(a) According to value in the table, measure resistance.

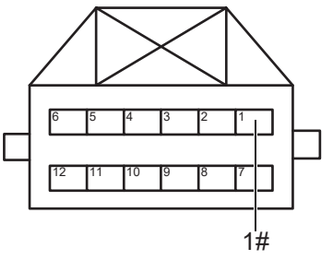
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 10# - body ground	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check rear left corner millimeter wave radar power supply**



Rear left corner millimeter wave radar connector

BS03021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

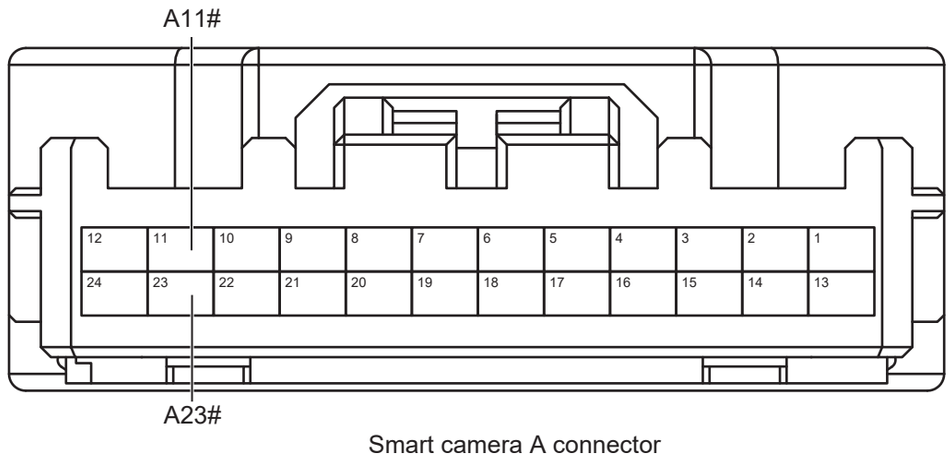
Standard value

Multimeter connection	Detection condition	Specified condition
Rear left corner millimeter wave radar connector 1# - body ground	Turn ignition switch to "ON"	9 V ~ 16 V

NG → **Check and repair or replace wire harness and connector as well as fuse**

OK

4	**Check rear automatic driving radar CAN bus terminal resistance**



Smart camera A connector

CC00811RM

(a) Measure terminal resistance according to the values in the table below.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector A23# - smart camera connector A11#	Always connected	Approximately 60 Ω

NG → **Perform repair according to malfunction**

OK

5	**Replace rear left corner millimeter wave radar**

(a) Replace the rear left corner millimeter wave radar.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace smart camera (See page ZC-139)**

OK

Diagnosis ends

ZD

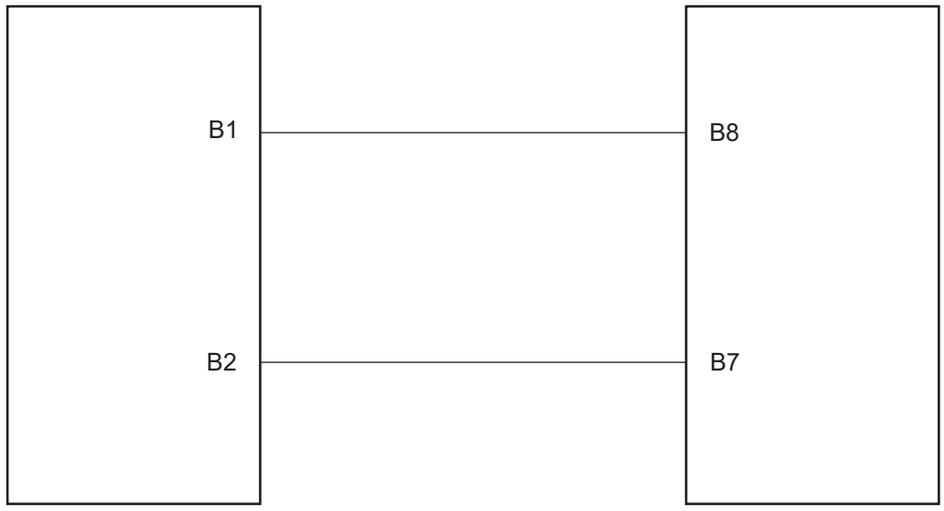
DTC	U147C8A	IFC backbone network Eth1 connection establishment failure

Description

When smart camera Ethernet fails, the smart camera records DTC.

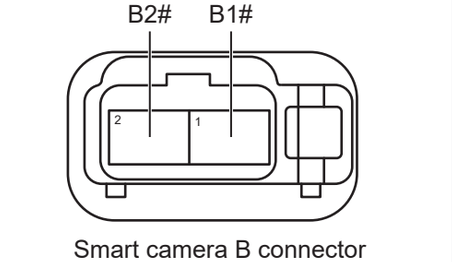
DTC No.	DTC detection condition	Faulty area
U147C8A	(a) IFC backbone network Eth1 connection establishment failure.	• Smart camera • Wire harness and connector • Intelligent vehicle control platform control unit

Circuit diagram

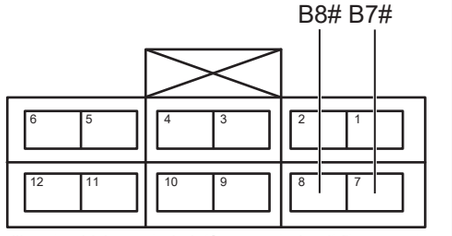


Inspection procedure

1	**Check for open in smart camera wire harness and connector**



Smart camera B connector



Intelligent vehicle control platform control unit B connector

CC01010RM

(a) Turn ignition switch to "OFF".

(b) Disconnect the negative battery terminal.

(c) Disconnect the smart camera connector.

(d) Disconnect the intelligent vehicle control platform control unit connector.

(e) According to value in the table, measure resistance.

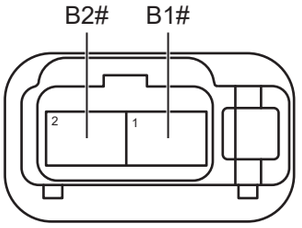
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector B1# - intelligent vehicle control platform control unit connector B8#	Always connected	Less than 1 Ω
Smart camera connector B2# - intelligent vehicle control platform control unit connector B7#	Always connected	Less than 1 Ω

NG → **Check and repair or replace wire harness and connector**

OK

2	**Check for short to ground in smart camera wire harness and connector**



Smart camera B connector

CC01021RM

(a) According to value in the table, measure resistance.

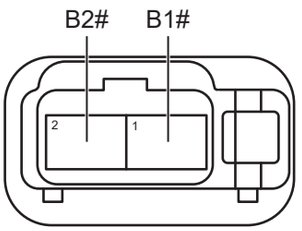
Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector B1# - body ground	Always connected	10 KΩ or more
Smart camera connector B2# - body ground	Always connected	10 KΩ or more

NG → **Check and repair or replace wire harness and connector**

OK

3	**Check for short to power supply in smart camera wire harness and connector**



Smart camera B connector

CC01021RM

(a) Connect the negative battery terminal.

(b) Turn ignition switch to "ON".

(c) According to value in the table, measure voltage.

Standard value

Multimeter connection	Detection condition	Specified condition
Smart camera connector B1# - body ground	Turn ignition switch to "ON"	Less than 1 V
Smart camera connector B2# - body ground	Turn ignition switch to "ON"	Less than 1 V

NG → **Check and repair or replace wire harness and connector**

ZD

OK

4	**Replace smart camera (See page ZC-139)**

(a) Replace the smart camera.

(b) Connect HQ-VDS diagnostic tester.

(c) Clear DTCs.

(d) Read DTCs again.

Result:

Result	Proceed to
Fault occurs again	NG
Fault does not occur again	OK

NG → **Replace intelligent vehicle control platform control unit (See page ZC-154)**

OK

Diagnosis ends

Operating instruction for Hongqi diagnostic tester

Basic diagnostic function

Basic diagnostic function GUI display DT-1
Version information function DT-1
DTC function DT-6
Reading freeze frame on DTC screen DT-11
Data stream function DT-11
Data stream recording and playback DT-17

Operation test

Operation test function DT-23

Vehicle report

Vehicle report function DT-29

Vehicle configuration

Vehicle configuration function DT-33
Automatic configuration function DT-33
Configuration writing function DT-44

Special function

Special function introduction DT-51
Special function example 1 - DSCU driver seat self-learning calibration DT-51
Special function example 2 - DSCU driver seat fan self-learning calibration DT-58

Basic diagnostic function

Basic diagnostic function GUI display

1. **Basic diagnostic functions include ECU version information, data stream, DTC and freeze frame functions. The Hongqi diagnostic tester items including basic diagnosis, vehicle report and special functions such as writing as well as special function buttons are integrated on the left side of the GUI page;**

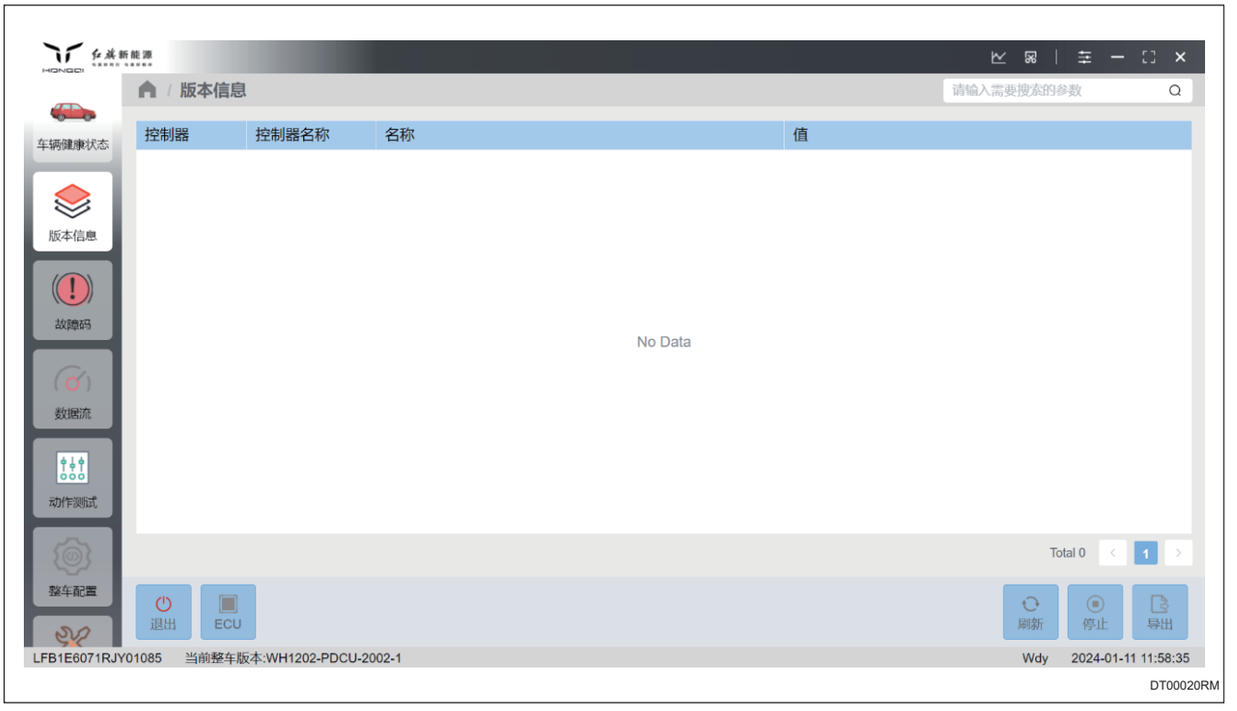


DT

Version information function

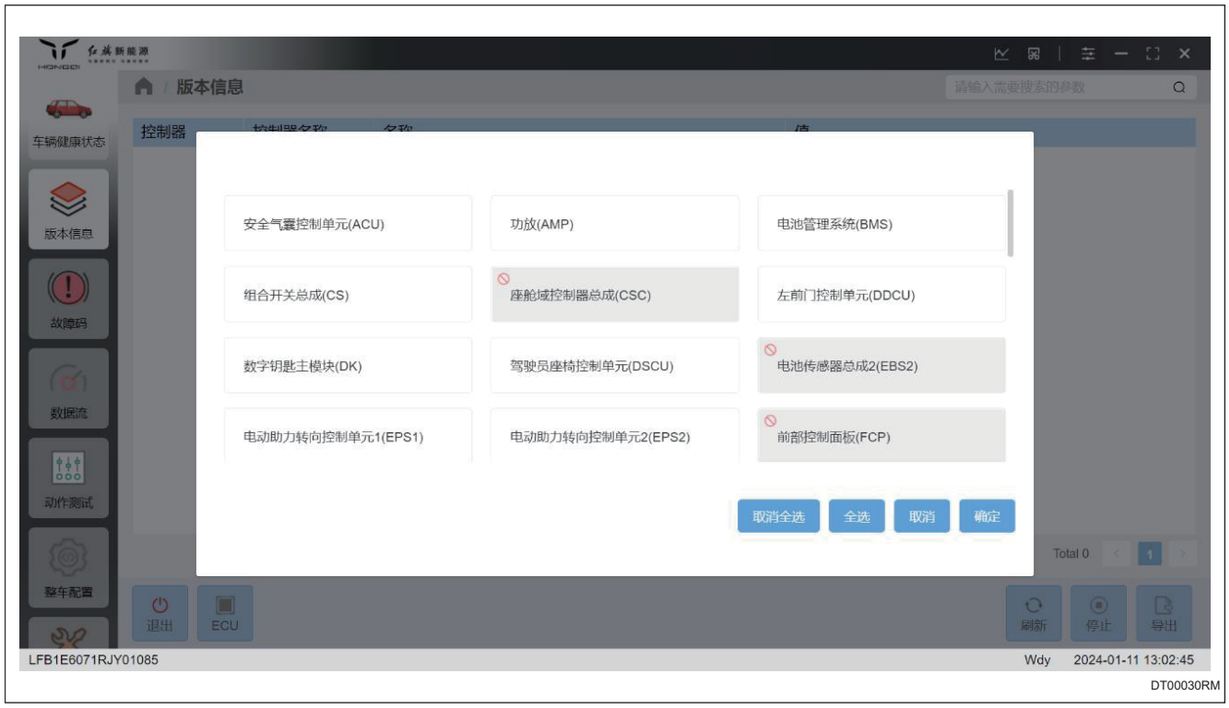
Data identifier of the vehicle refers to the trademark that distinguishes the vehicle from other manufacturers, as well as used to indicate the vehicle manufacturer, model, engine power, load capacity, factory number of engine and vehicle, etc. Their function is to facilitate the identification of vehicle by sellers, users, maintenance personnel and traffic management departments. According to national regulations in our country, these signs must be checked during new vehicle registration and annual inspection.

1. **At diagnostic session, user clicks [Version information] button on the left side of GUI to enter version information function page; If user has not selected ECU currently, the version information data on page displays "No data available", as shown in screenshot below:**



2. **Click the ECU checkbox button to enter the vehicle ECU selection interface. Diagnosis experts or 4S technicians can select the target ECU(s) based on the actual fault conditions of the vehicle to perform version information reading. The diagnostic tool sends a targeted physically addressed version information service, and the ECU(s) receive the broadcast message and execute the response messages in segments.**

   - ECU check prompt box button function and page ECU status selection introduction:
   - ECU status selection: If the ECU status assembled on the vehicle is assembly online, the ECU in the check box is in optional status, a check mark is in the upper right corner of "ECU frame" when it is selected; if the ECU status assembled on the vehicle is assembled but the ECU communication is abnormal and offline, the ECU frame is grayed out and the icon in the upper left corner shows a forbidden icon; at this time, the user cannot choose to perform the ersion information reading function.
   - When the user clicks the Unselect All button, the status of the last selected ECU is unchecked;
   - The user clicks the Select All button to select all online ECUs in the current ECU list box by default;
   - The user clicks the cancel button to cancel the selection of the current ECU list box, and the prompt box automatically exits;
   - The user clicks the OK button to confirm that the operation of the currently selected ECU is about to perform the function of reading version information of the ECU to be selected.



DT00030RM

DT

3. **Select to read the version information of the vehicle ECU, and the result of the version information read by the vehicle ECUs is as follows:**



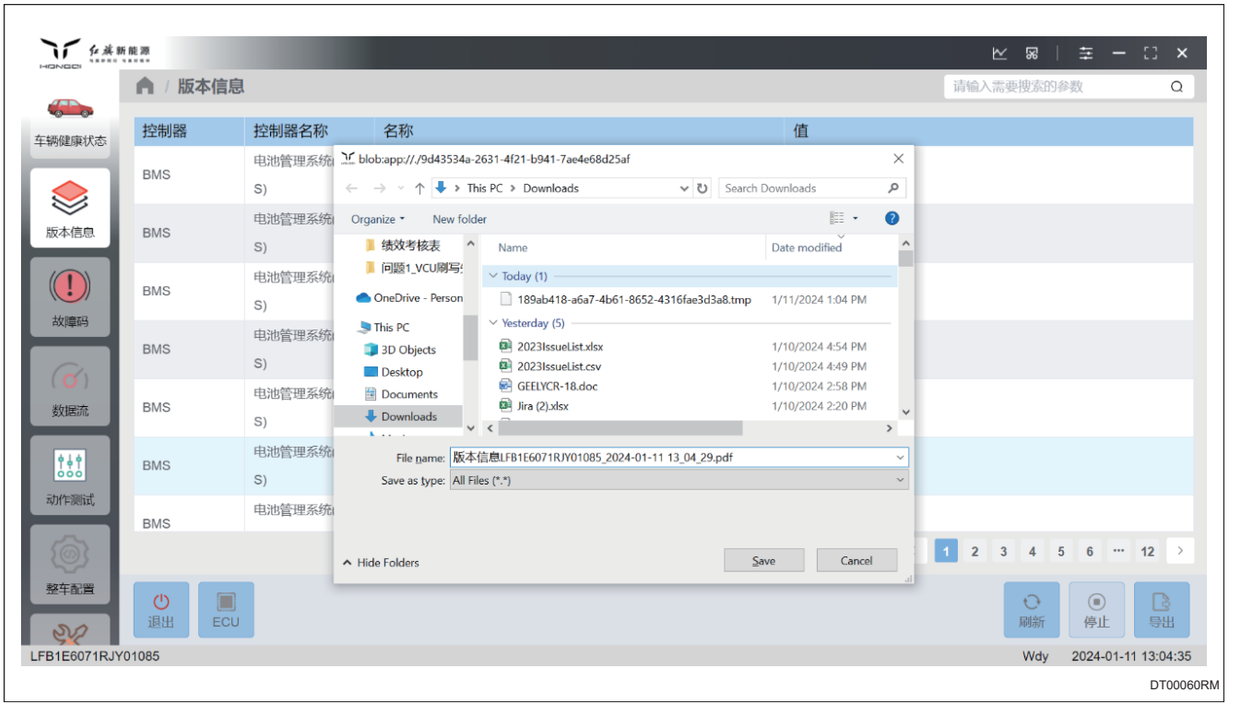
DT00040RM

4. **When the target ECUs perform version information data reading, click the [Stop] button, the value column of version information data related to the time period after clicking the [Stop] button will display "Not read" status:**



DT

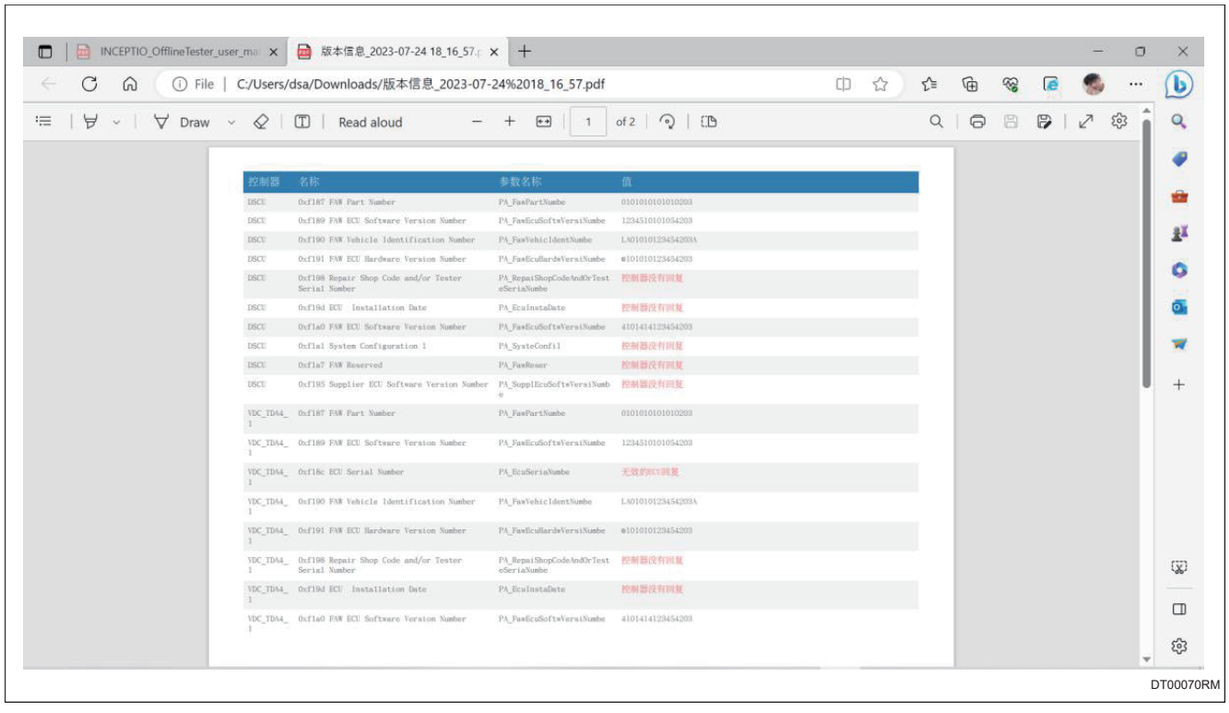
5. **When the version information data reading of the target ECUs is completed, click the [Export] button to export the version information data in PDF format:**



6. **The exported PDF report content for the version information of the target ECUs is as follows:**

   - If the ECU responds negatively, such as the ECU reply 7F 22 13, the corresponding prompt "Byte length or format of ECU reply is incorrect" is listed in the value column of the diagnostic page;

- The ECU response time out or no reply, and the corresponding prompt "Controller no reply" is listed in the value column of the diagnostic page;
- After clicking the stop button, during the period after stopping the action, the value column for reading version information displays "Not read";
- During the diagnostic process, ECU doip communication link is disconnected, causing the ECU to be offline, and diagnostic tester displays corresponding prompt "ECU not online currently".



DT00070RM



DT00040RM

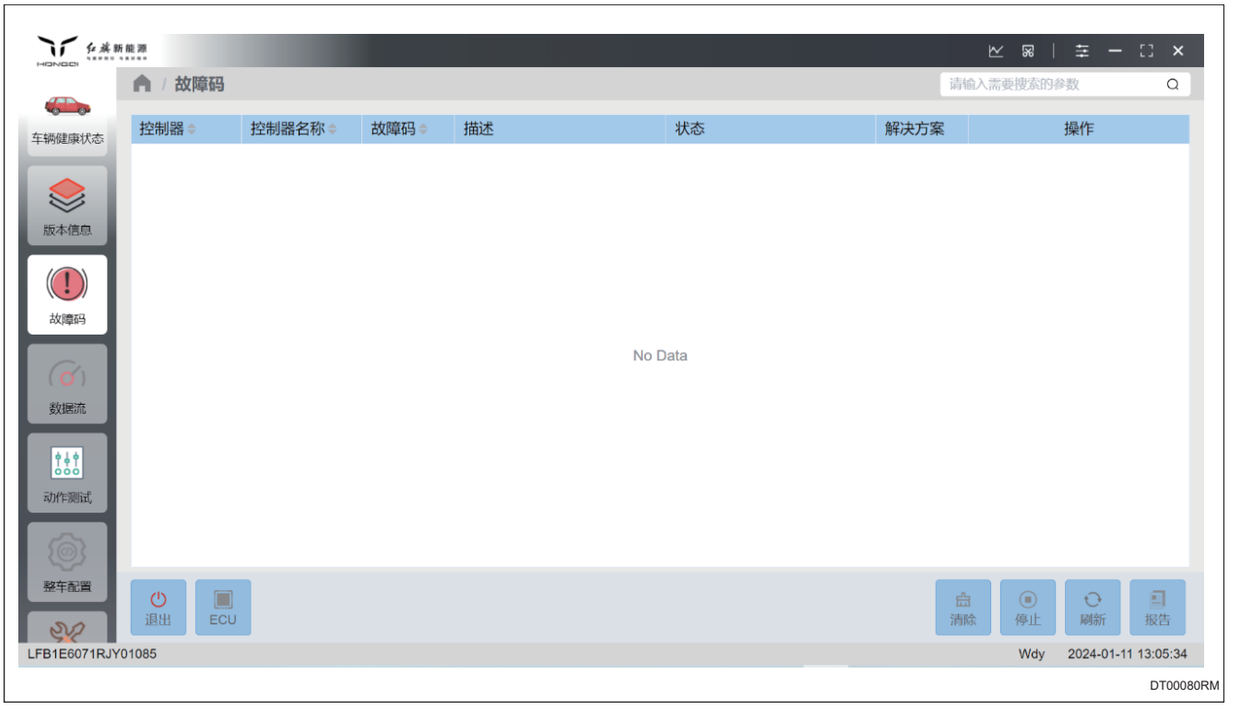
7. Version information function page button introduction:

- Clicking the [ECU] checkbox button allows users to select the target ECUs based on the actual fault conditions of the vehicle to perform version information reading;
- Click the [Exit] button to exit the current diagnostic session and return to the doip vehicle communication interface query screen;
- Click the [Refresh] button to re-read the version information of the target ECUs;
- Click the [Stop] button. When a large amount of version information data is selected for the target ECUs and the diagnostic prompt indicates "Reading version information," users can attempt to cancel the reading of the version information data by clicking the [Stop] button. This action will halt the reading of version information data from the current moment onward, and the value displayed in the interface data will show as "Not Read";
- Click the [Export] button to export the displayed version information data of the current target ECUs in PDF file format for archiving, analysis, and data comparison purposes;
- Click the [Return to Vehicle Health Status Interface] button to enable returning from the current main functional page to the main interface of the vehicle health status.

DTC function

Vehicle DTC is a fault code reflected by the analysis of vehicle ECU after vehicle malfunction occurs. The general DTC is caused by a sensor failure, but some mechanical failures cannot be read by the ECU. When a fault occurs in the vehicle engine, after the detection computer identifies it, the computer will display a DTC. Through this code, maintenance personnel can accurately locate the faulty parts and then perform repair.

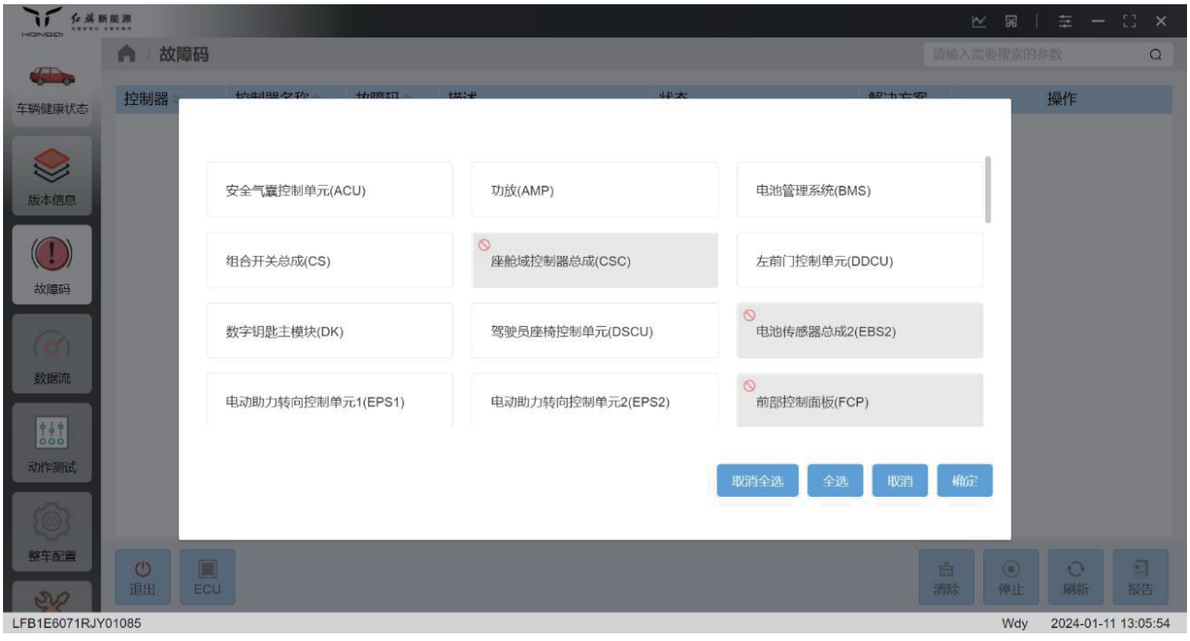
1. **At diagnostic session, user clicks [DTC] button on the left side of GUI to enter DTC function page; If user has not selected ECU currently, the DTC data on page displays "No data available", as shown in screenshot below:**



2. **Click the ECU checkbox button to enter the vehicle ECU selection interface. Diagnosis experts or 4S technicians can select the target ECU(s) based on the actual fault conditions of the vehicle to perform DTC reading. The diagnostic tool sends a targeted physically**

addressed DTC reading service, and the ECU(s) receive the broadcast message and execute the response messages in segments:

- ECU check prompt box button function and page ECU status selection introduction:
- ECU status selection: If the ECU status assembled on the vehicle is assembly online, the ECU in the check box is in optional status, a check mark is in the upper right corner of "ECU frame" when it is selected; if the ECU status assembled on the vehicle is assembled but the ECU communication is abnormal and offline, the ECU frame is grayed out and the icon in the upper left corner shows a forbidden icon; at this time, the user cannot choose to perform the DTC reading function;
- When the user clicks the Unselect All button, the status of the last selected ECU is unchecked;
- The user clicks the Select All button to select all online ECUs in the current ECU list box by default;
- The user clicks the cancel button to cancel the selection of the current ECU list box, and the prompt box automatically exits;
- The user clicks the OK button to confirm that the operation of the currently selected ECU is about to perform the function of reading DTC of the ECU to be selected.

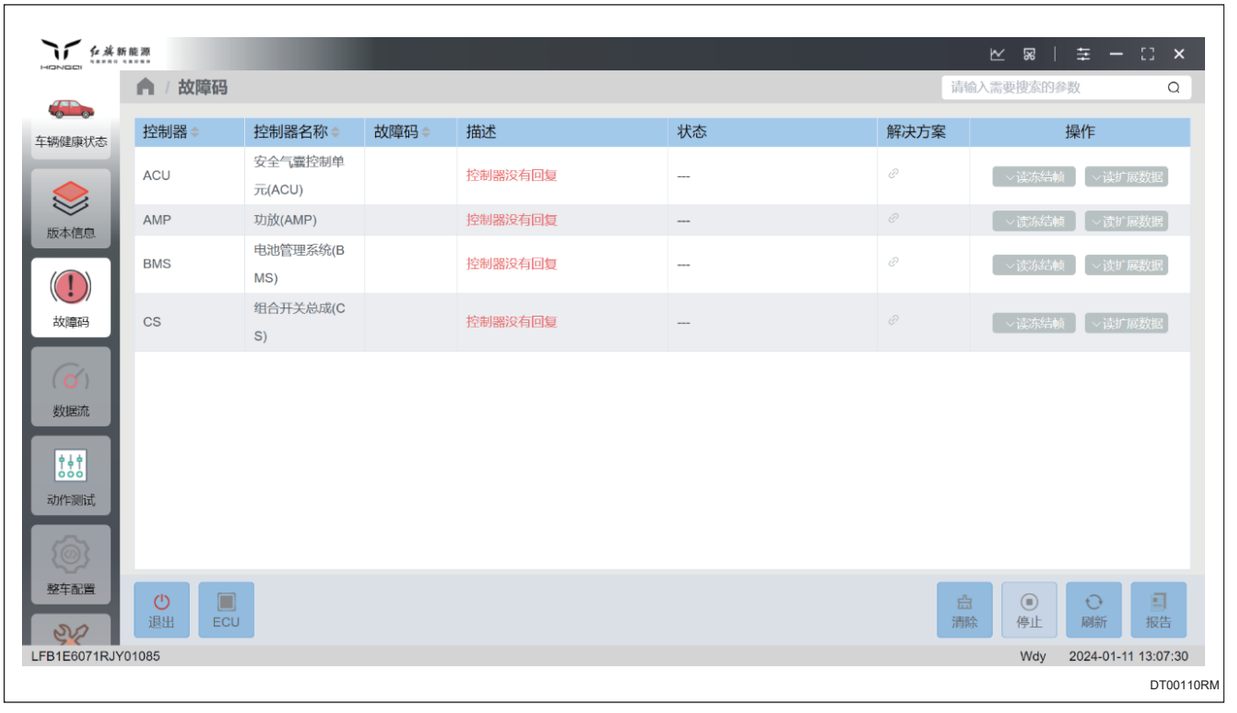


DT00090RM

3. **Select to read the vehicle ECU DTC, the result of the DTC information read by the vehicle ECUs is as follows:**



4. When the target ECUs perform DTC data reading, click the [Stop] button, the DTC data related to the time period after clicking the [Stop] button will not be displayed:



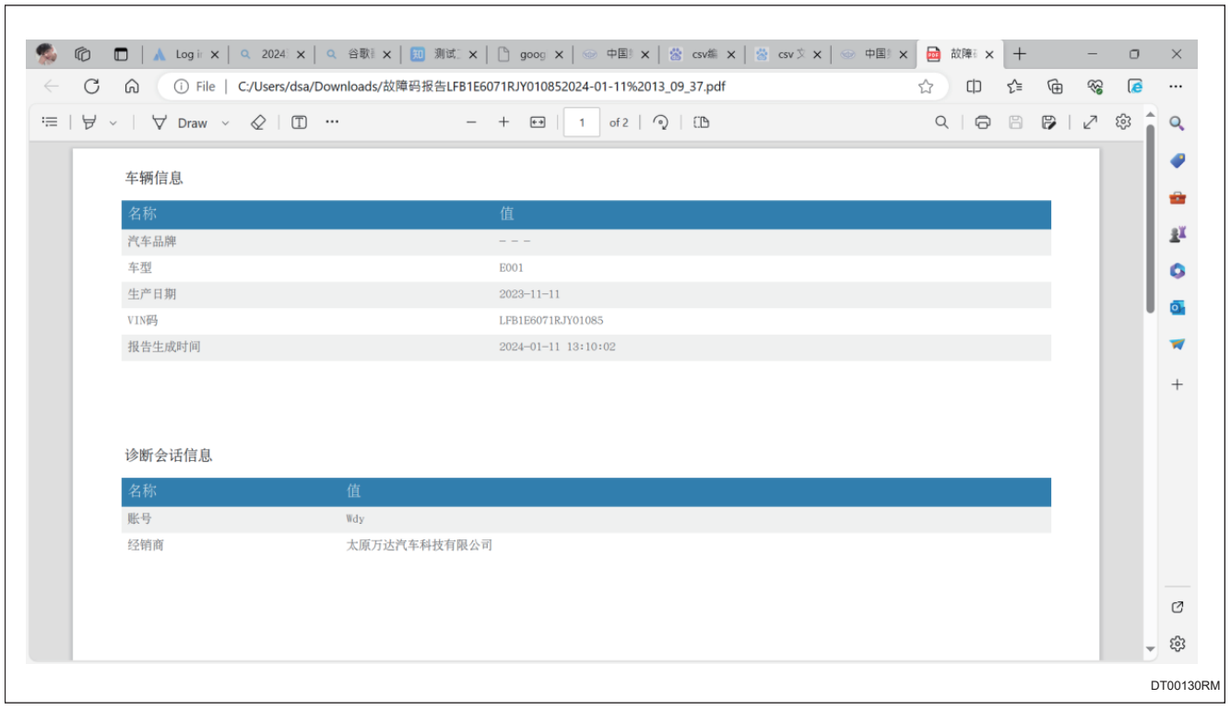
5. On the DTC function page, click [Report] button to enter the DTC report screen, where the user can view the current vehicle information and browse the DTC report data, as shown in screenshot below:



DT00120RM

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6. On the DTC report screen, click [Export] button to export the DTC report content in a file format of .pdf. The content of the DTC report file in .pdf format is shown in screenshot below:



DT00130RM

7. The abnormal display of DTC data read by the target ECUs includes the following situations:

- If the ECU responds negatively, such as the ECU reply 7F 19 13, the corresponding prompt "Controller negative feedback: NRC:13; Description: Got negative response from ECU!" is listed in the value column of the diagnostic page;

- The ECU response time out or no reply, and the corresponding prompt "Controller no reply" is listed in the value column of the diagnostic page;
- After clicking the stop button, during the period after stopping the action, the fault code reading value column displays "Not read" or the reading speed is very fast. During this period, when the controller reads DTCs, the controller name and the corresponding fault code data are not displayed;
- ECU responds positively but the ECU has no DTC, and the corresponding prompt "No DTC" is on the diagnosis page;
- During the diagnostic process, ECU doip communication link is disconnected, causing the ECU to be offline, and diagnostic tester displays corresponding prompt "ECU not online currently".



8. Introduction to DTC function page button:

- Clicking the [ECU] checkbox button allows users to select the target ECUs based on the actual fault conditions of the vehicle to perform version information reading;
- Click the [Exit] button to exit the current diagnostic session and return to the doip vehicle communication interface query screen;
- Click the [Refresh] button to re-read the version information of the target ECUs;
- Click the [Stop] button. When a large amount of version information data is selected for the target ECUs and the diagnostic prompt indicates "Reading version information," users can attempt to cancel the reading of the version information data by clicking the [Stop] button. This action will halt the reading of version information data from the current moment onward, and the value displayed in the interface data will show as "Not Read";
- Click the [Export] button to export the displayed version information data of the current target ECUs in PDF file format for archiving, analysis, and data comparison purposes;
- Click the "Return to Vehicle Health Status Interface" button to enable returning from the current main functional page to the main interface of the vehicle health status.

Reading freeze frame on DTC screen

A freeze frame refers to the important information automatically stored by the electronic control module when a vehicle experiences a fault, including the fault code and the values of relevant sensor parameters. This information enables vehicle owners and mechanics to accurately diagnose and repair the fault during inspection and maintenance. In the vehicle OBD system, the frozen frame can be understood as a "snapshot", that is, record the next specific time point, DTC and related information status.

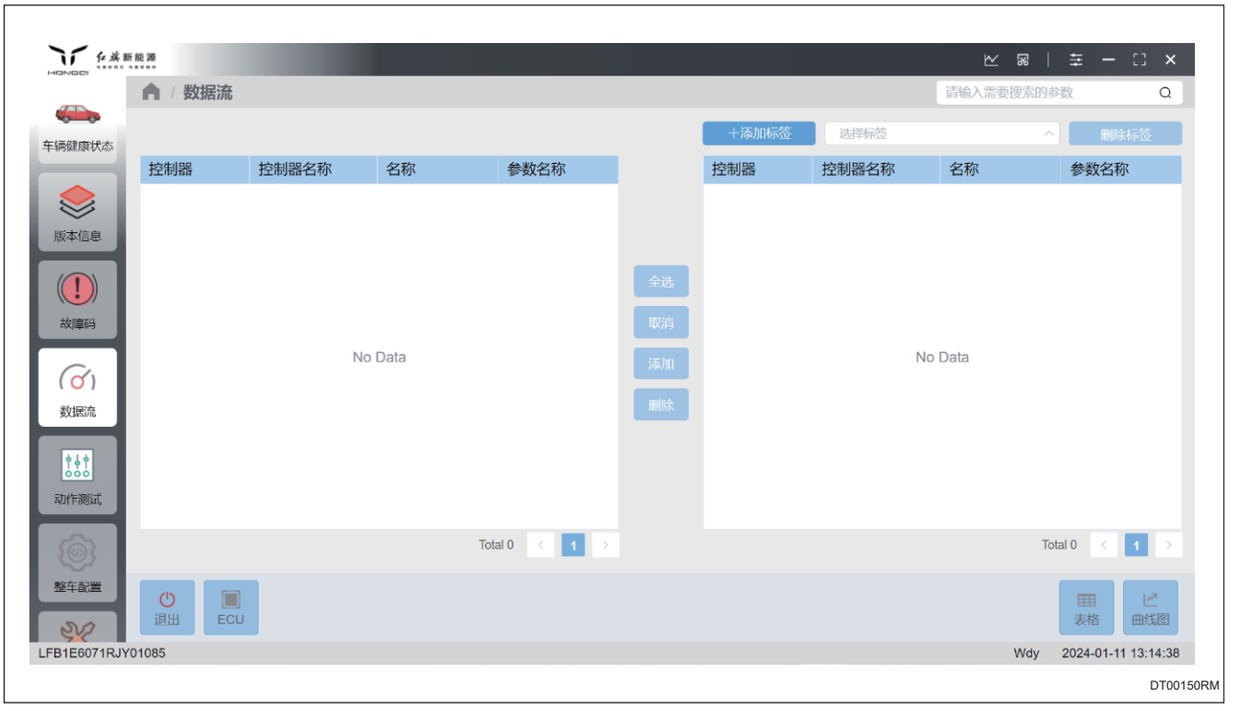
1. **At diagnostic session, user clicks [Read freeze frame] button on fault code function page (such as the [Freeze frame] button for DTC P190098 in screenshot); when ECU supports the freeze frame service, it will display the freeze frame data for that DTC, as shown in screenshot below:**



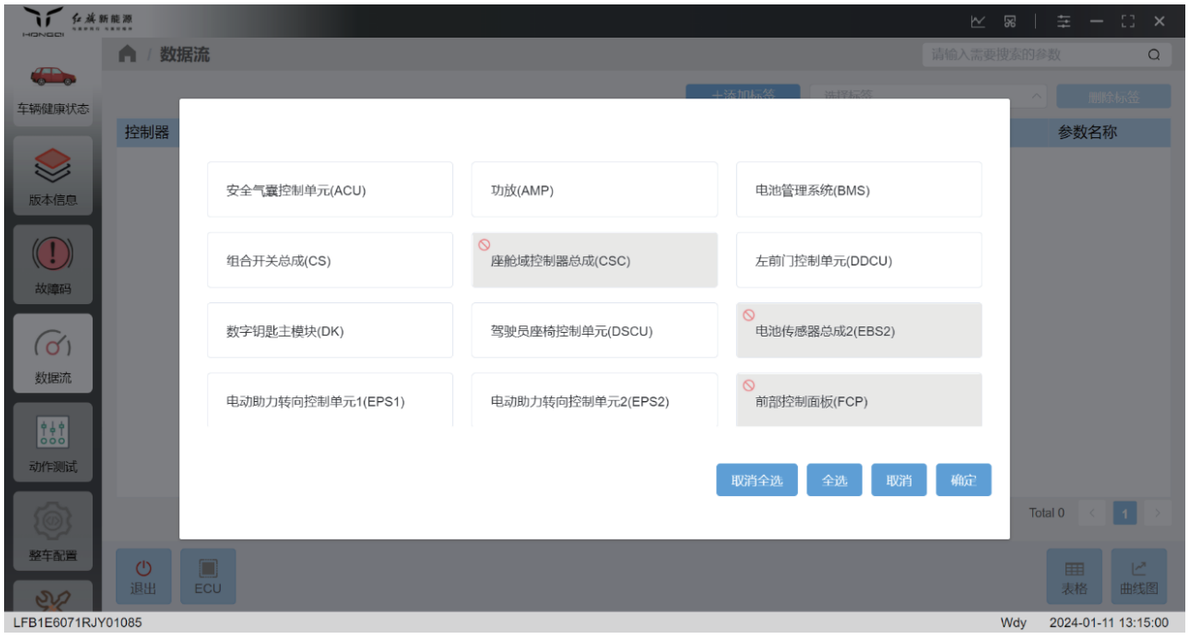
Data stream function

Vehicle data stream refers to the data parameters exchanged between Electronic Control Unit (ECU), sensor, and actuator. This data can be read through the diagnostic interface by a specialized diagnostic tester and it changes with time and operating conditions. The data transmission is like queuing up, flowing to the diagnostic tester through the data line one by one; The data stream memorized in the ECU truly reflects the operation voltage and status of each sensor and actuator, providing a basis for vehicle fault diagnosis. The data stream can only be read by the dedicated diagnostic tester; During the vehicle operation, the vehicle data stream changes with time and operating conditions. In addition to "flowing" from the diagnostic interface to the diagnostic tester during troubleshooting, the vehicle data stream is constantly exchanging data (signal transmission) among its sensors, controllers, and actuators during the operation of vehicle's electronic control system.

1. **At diagnostic session, user clicks [Data stream] button on the left side of GUI to enter data stream function page; If user has not selected ECU currently, the data stream data on page displays "No data available", as shown in screenshot below:**



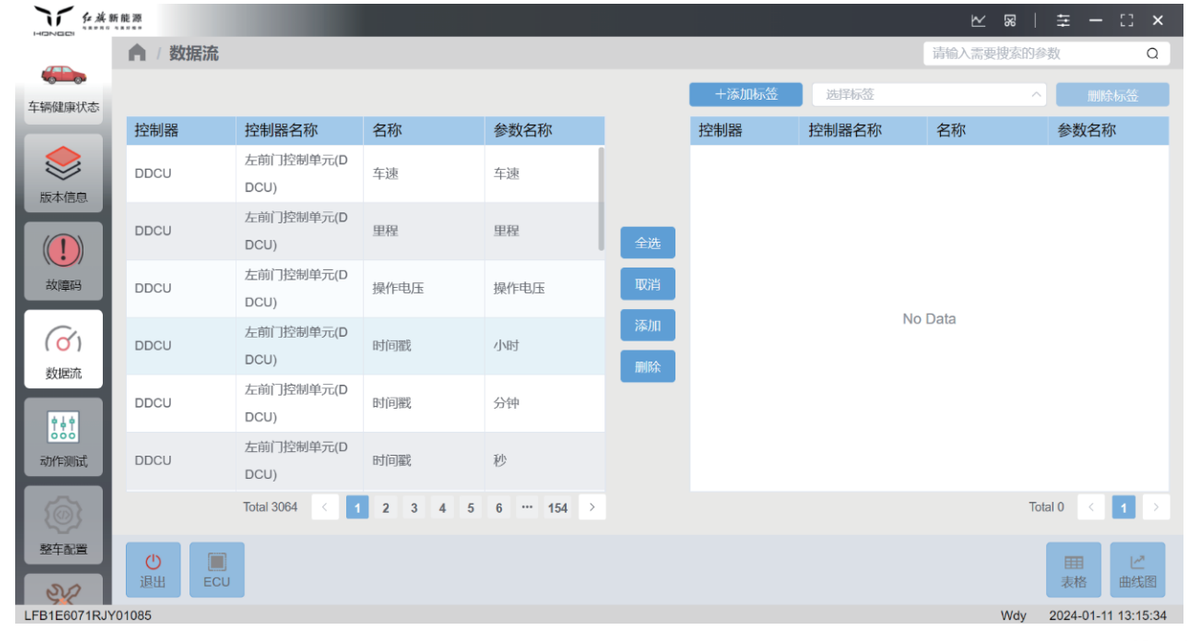
2. **Click the ECU checkbox button to enter the vehicle ECU selection interface. Diagnosis experts or 4S technicians can select the target ECU(s) based on the actual fault conditions of the vehicle to perform data stream reading. The diagnostic tool sends a targeted physically addressed data stream reading service, and the ECU(s) receive the broadcast message and execute the response messages in segments:**
   - ECU check prompt box button function and page ECU status selection introduction:
   - ECU status selection: If the ECU status assembled on the vehicle is assembly online, the ECU in the check box is in optional status, a check mark is in the upper right corner of "ECU frame" when it is selected; if the ECU status assembled on the vehicle is assembled but the ECU communication is abnormal and offline, the ECU frame is grayed out and the icon in the upper left corner shows a forbidden icon; at this time, the user cannot choose to perform the data stream reading function;
   - When the user clicks the Unselect All button, the status of the last selected ECU is unchecked;
   - The user clicks the Select All button to select all online ECUs in the current ECU list box by default;
   - The user clicks the cancel button to cancel the selection of the current ECU list box, and the prompt box automatically exits;
   - The user clicks the OK button to confirm that the operation of the currently selected ECU is about to perform the function of reading data stream of the ECU to be selected.



DT00160RM

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3. **Select to read the parameter list of the vehicle ECU data stream. The parameter list of the data stream read by the vehicle ECUs shows the following results:**



DT00170RM

4. **Before the target ECUs perform data stream reading, user needs to manually select some or all ECU data stream parameters from the left data stream parameter list to the right data stream parameter list box to be read. After the selected ECU data stream parameters are added to the right box to be read, they will show "Selected green status":**



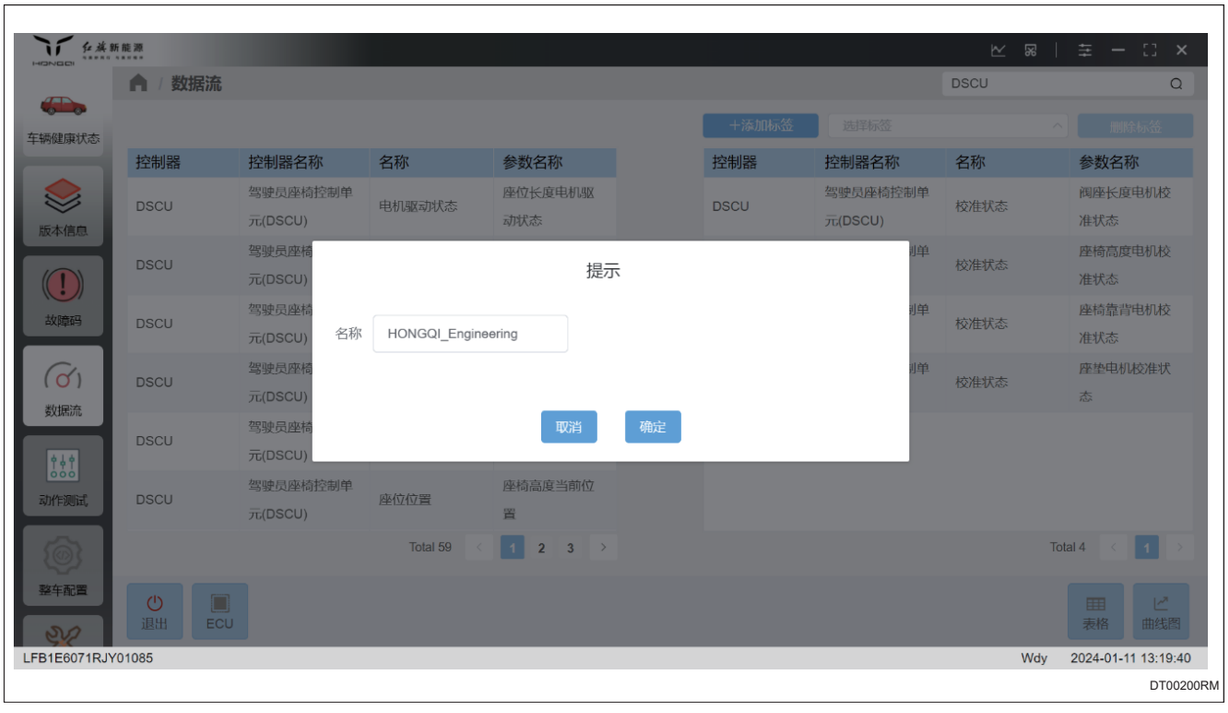
5. Click the [Read] button for the data stream to initiate the data reading process from the target ECUs. The "value" column in the diagnostic display will show specific results based on the different response messages from the ECUs. (The data stream reading is set to cyclically read the selected data stream identifiers by default, with a cyclic reading frequency of 1 second.), as shown in the figure below:



6. [Create Data Stream Label] grouping, creating a label in the form of grouping from the last selected data stream parameter list for user local data recording. When the user restarts the diagnostic tester to execute the data stream reading function, the user can select the

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currently created data stream label to execute the target data stream reading; If this data stream label grouping is not required, click [Delete Label] on the right to delete it:



DT00200RM

7. The curve chart of the target ECUs data stream parameters selection dynamically displays their changes:



DT00210RM

8. The abnormal display of data stream data read by the target ECUs includes the following situations:

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- If the ECU responds negatively, such as the ECU reply 7F 22 13, the corresponding prompt "Byte length or format of ECU reply is incorrect" is listed in the value column of the diagnostic page;
- The ECU response time out or no reply, and the corresponding prompt "Controller no reply" is listed in the value column of the diagnostic page;
- After clicking the stop button, during the period after stopping the action, the value column for reading version information displays "Not read";
- During the diagnostic process, ECU doip communication link is disconnected, causing the ECU to be offline, and diagnostic tester displays corresponding prompt "ECU not online currently".



9. Data stream function page button introduction:

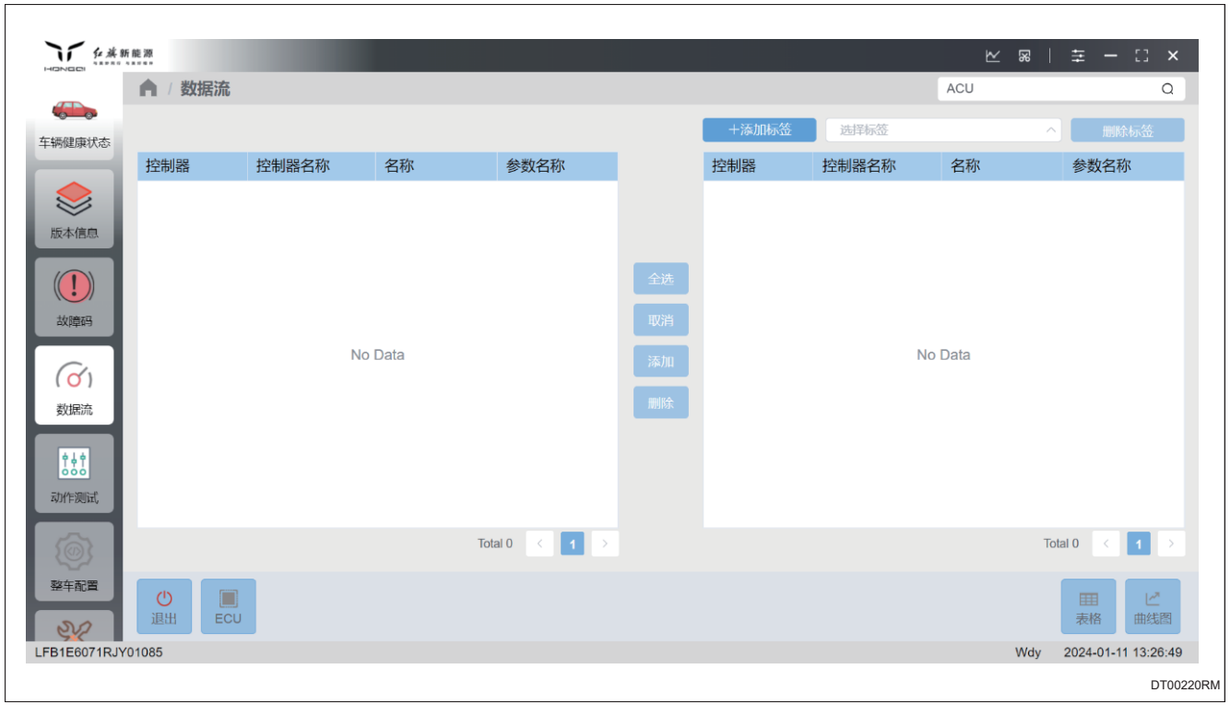
- Clicking the [ECU] checkbox button allows users to select the target ECUs based on the actual fault conditions of the vehicle to perform version information reading;
- Click the [Exit] button to exit the current diagnostic session and return to the doip vehicle communication interface query screen;
- Click the [Select All] button to add all the data stream parameters of the target ECUs on the left-hand side to the data stream box on the right-hand side for pending reading by default;
- Click the [Cancel] button to clear the list of data stream parameters pending reading that were selected last time, and then reselect the data stream parameters for the target ECUs;
- Click the [Add] button to transfer the data stream parameters that need to be read from the target ECU from the left-hand list box to the right-hand list box of parameters pending reading;
- Click the [Remove] button, users can select and remove unwanted data stream parameter entries from the list on the right-hand side where the data stream parameters pending reading are displayed, according to their needs;
- Click the [Create Label] button to create labeled groups for the data stream parameters pending reading on the right-hand side, and cache these labeled groups for the user to utilize when executing data stream reading operations next time;

- Click the [Delete Label] button to remove the currently created data stream label;
- Click the [Table] button for the data stream to initiate the reading of the data streams selected from the target ECUs;
- Click the data stream [curve chart] button to perform the dynamic feature display of data stream from the target ECUs;
- The parameter search box can be used to select target data stream parameter entries according to user needs, which supports user data query and comparison;
- Click the "Return to Vehicle Health Status Interface" button to enable returning from the current main functional page to the main interface of the vehicle health status.

Data stream recording and playback

Hongqi after-sales diagnostic tester supports data stream recording and playback functions. Diagnostic technicians in 4S store can select the target data stream and perform the dynamic playback of data stream through the generated data stream recording files.

1. **At diagnostic session, user clicks [Data stream] button on the left side of GUI to enter data stream function page; If user has not selected ECU currently, the data stream data on page displays "No data available", as shown in screenshot below:**



2. **Click the ECU checkbox button to enter the vehicle ECU selection interface. Diagnosis experts or 4S technicians can select the target ECU(s) based on the actual fault conditions of the vehicle to perform data stream reading. The diagnostic tool sends a targeted physically addressed data stream reading service, and the ECU(s) receive the broadcast message and execute the response messages in segments:**



DT00230RM

3. Select the parameter list of the target controller airbag control unit read data stream as shown in the screenshot below:



DT00240RM

4. Select the target data stream parameters such as speed, mileage, voltage to add to the right data stream box to be read:



DT00250RM

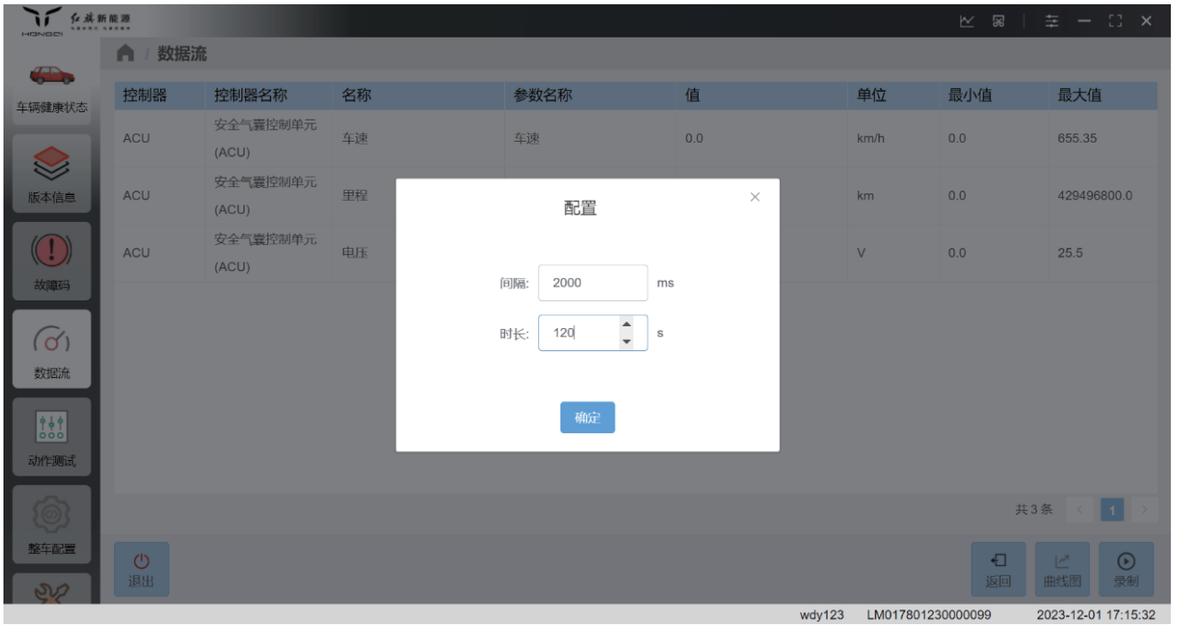
DT

5. Continue to click [Table] button to navigate to the data stream reading interface, as shown in figure below:



DT00260RM

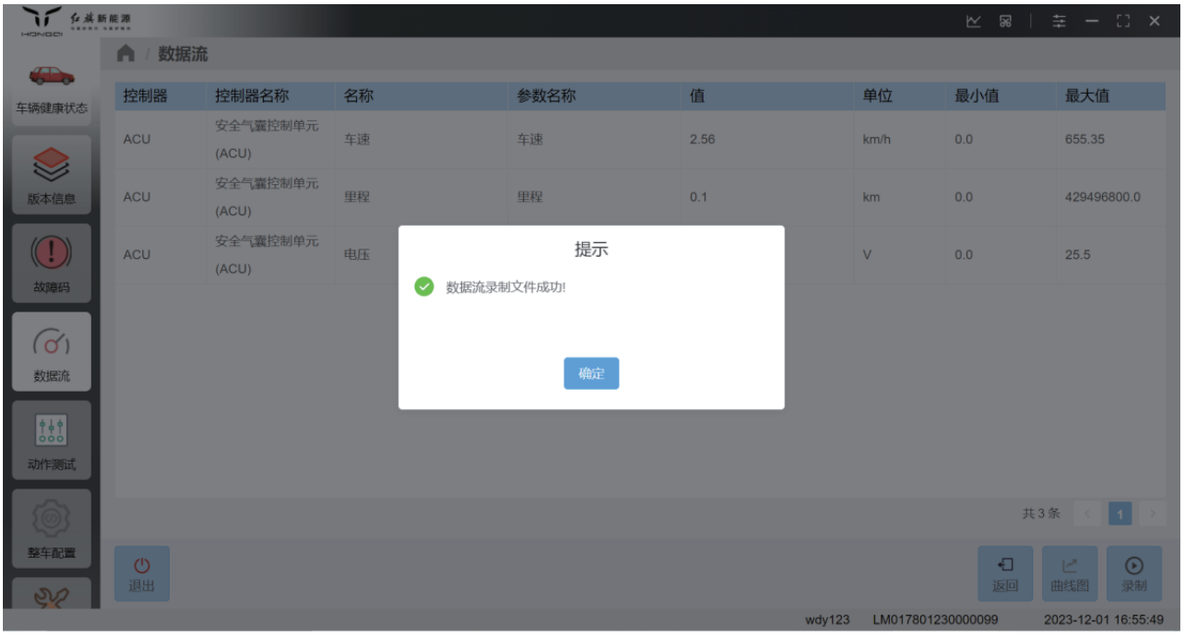
6. On the data stream reading function interface, click the data stream [Record] button, and a configuration prompt box will pop up, prompting the user to select and enter the specified time interval and recording duration. The allowable input range for time interval is 200 ms ~ 5000 ms, the allowable input range for recording duration is 1 s ~ 3600 s; If the current time interval is input 2000 ms and the recording duration is input 120 s, click the [OK] button to start the data stream recording (during the data stream file recording, user is allowed to click the [Stop] button in the midway to end the recording function in advance):



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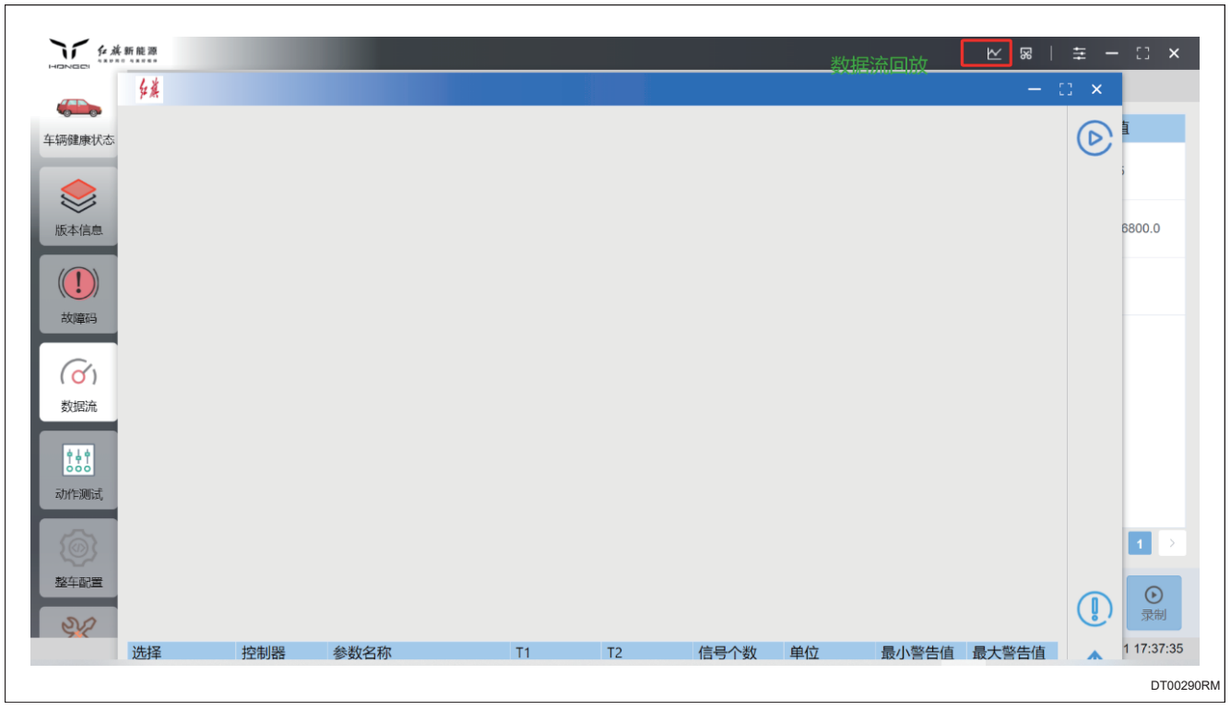
7. **The data stream file is recorded successfully, and the diagnostic tester pops up a prompt box indicating "Data stream file is recorded successfully". Local storage path: C:\FAW \HQIVDS\db\session,and file format is .mrp; The data stream recording files are regularly uploaded to the server synchronously every 5 minutes. Therefore, if diagnostic technicians need to view the data stream recording files, please contact the system manager of Hongqi diagnostic tester:**



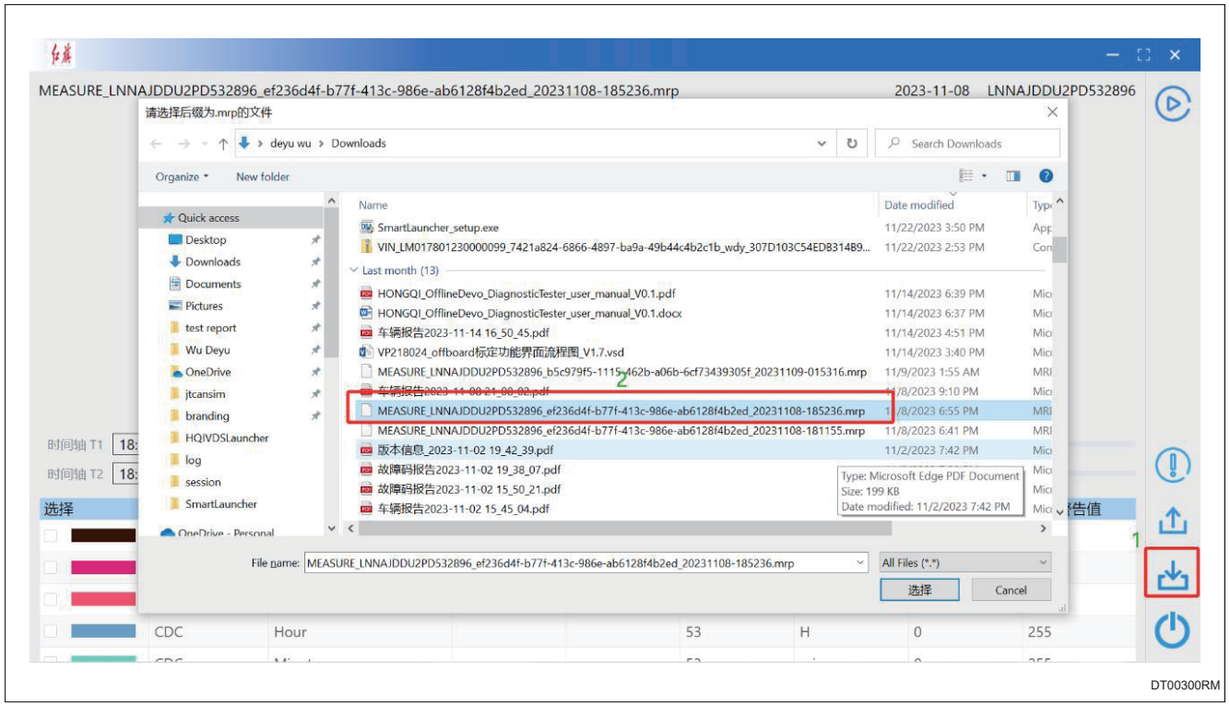
DT00280RM

8. **After obtaining the data stream recording file from the system administrator, turn on the data stream playback platform tool by clicking the [Data Stream Playback] button (the red**

marked box in the screenshot) at the upper right of the main function interface of diagnostic tester, as shown in the following screenshot:



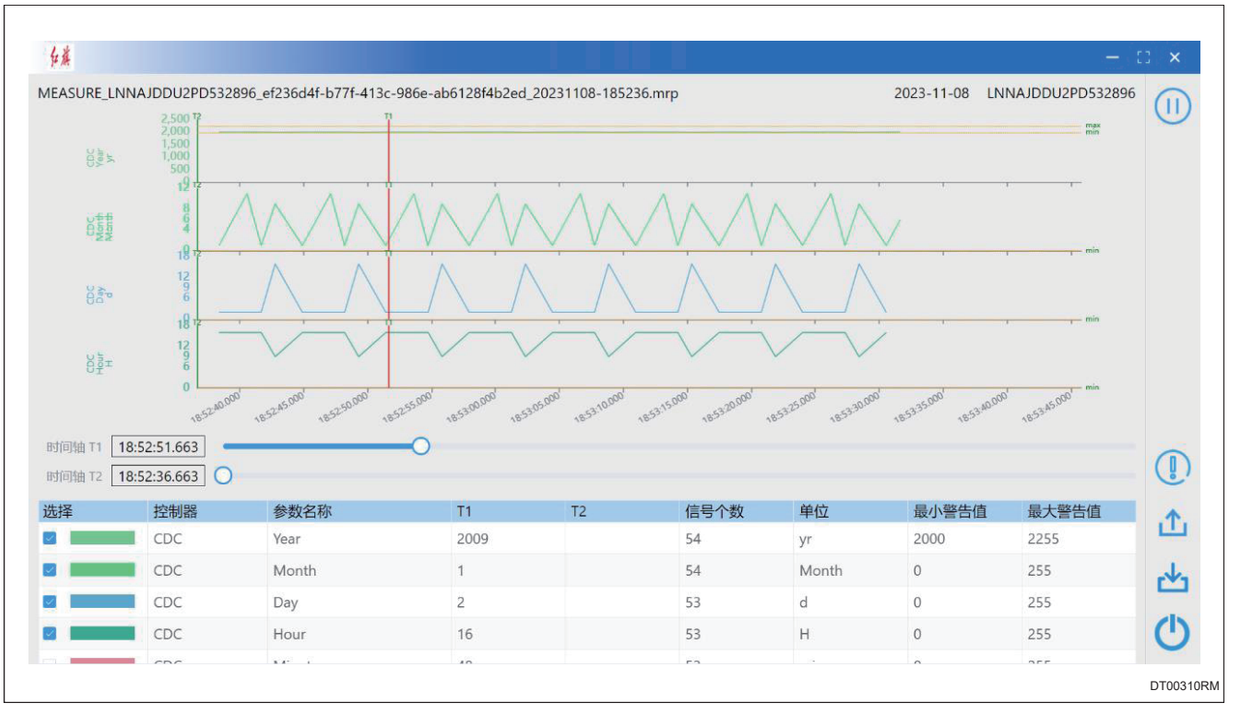
9. On the data stream playback tool interface, first click the file [Import] button of marked 1 part to pop up the local file selection path prompt box. Then, select the data stream recording file .mrp stored in the local path and click to confirm loading:



10. After the target data stream recording file is loaded successfully, as shown in screenshot below: Up to 5 data streams can be selected simultaneously to perform data stream playback function:

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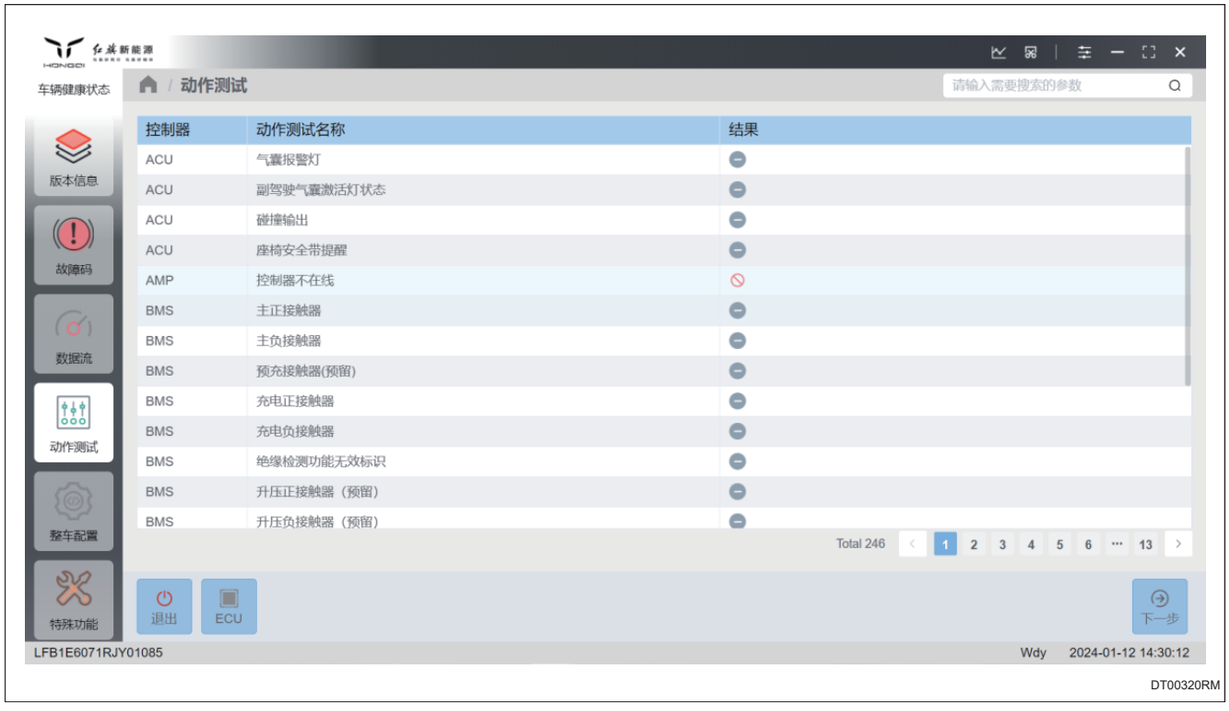
- Playback tool version release information query button: It can be used to check the playback tool version information;
- Playback tool data stream file export button: It can be used to export the target data stream recording file to the local device;
- Playback tool data stream file import button: It can be used to import the target data stream recording file from the local device to the tool;
- Playback tool OFF button: It can be used to end the current application;
- Playback tool play button: After selecting the target data stream parameters, it can be used to perform the playback function;
- When recording the data stream, if the set playback time interval is 2 seconds, the timeline T1 moves forward every 2 seconds;
- For reference scale, user can set a reference scale on the X-axis to observe the changes in specific signal values of the vehicle ECU.



Operation test

Operation test function

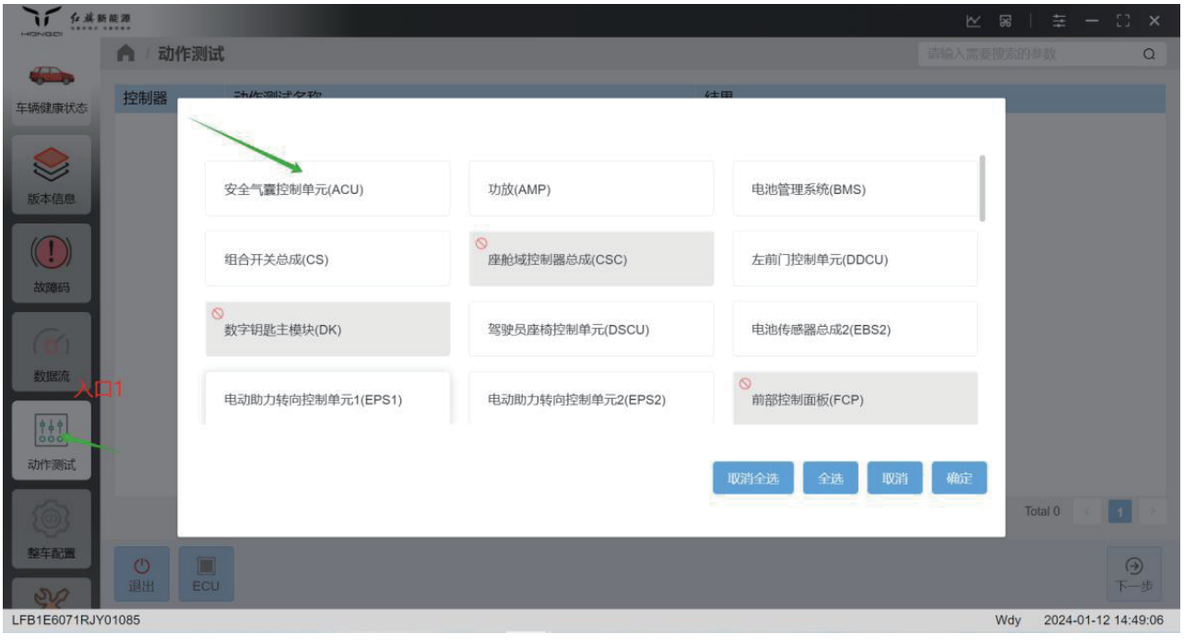
Vehicle action test, also known as vehicle actuator test. Vehicle actuator is a component of small intelligent electronic control system, which can convert control signal from the ECU (Electronic Control Unit) into certain mechanical motion or electrical motion to complete control function. The diagnostic technician or diagnostic expert uses the diagnostic tester to obtain the list of active test functions supported by vehicle ECU. The active test page mainly displays the controller, name of active test, result, etc., as shown in the screenshot below:



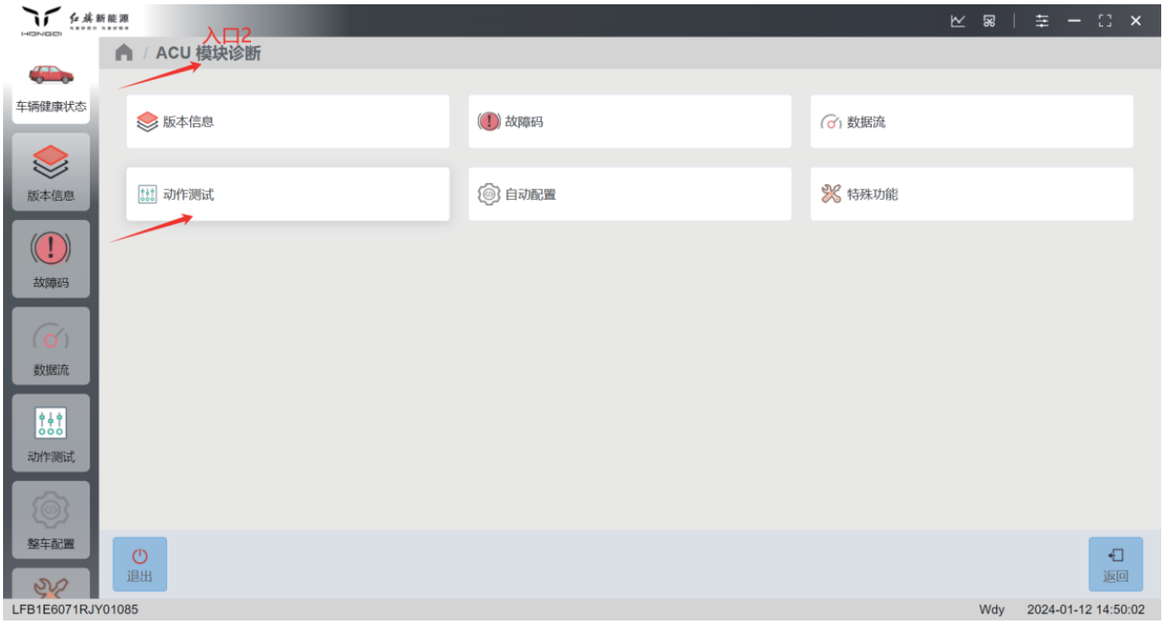
Take the ACU active test function "airbag warning light" as an example to describe in detail the operation steps of Hongqi after-sales diagnostic tester to perform the active test and the description of some abnormal scenarios encountered in the process of daily use.

1. **There are two ways to access the operation test function: 1. Click the [operation test] button on the left side of main function interface to enter the operation test. 2. Select the target online controller (e.g., ACU) from the "VHSS Vehicle Topology" or "ECU List," to enter module diagnostics and select operation test:**

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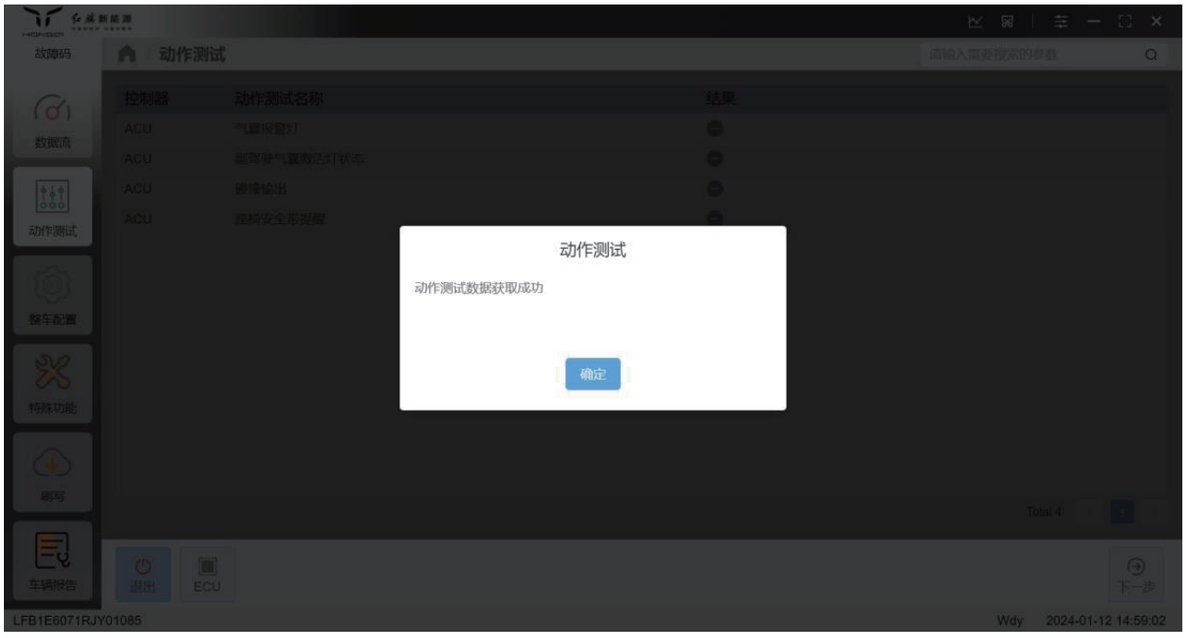


DT00330RM

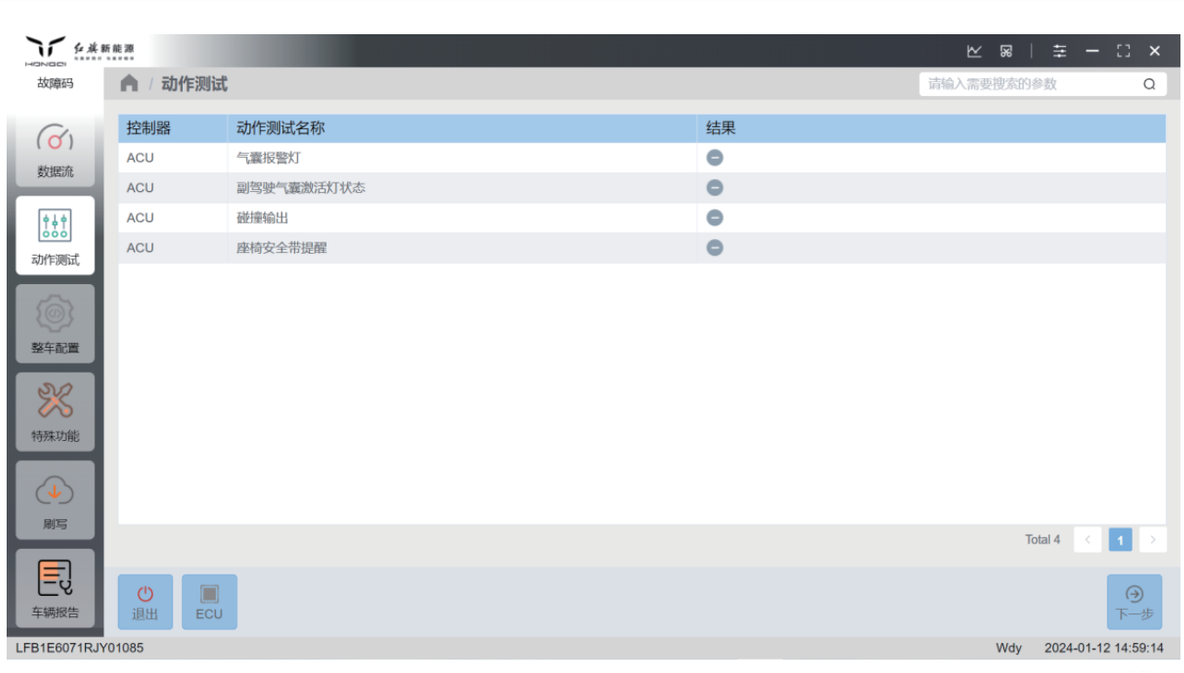


DT00340RM

2. Select the target controller ACU to load the controller active test function name, after the data loading is completed, the diagnostic tester prompts "active test data obtained successfully", as shown in the interface: ACU contains active test function with airbag warning light, front passenger airbag activation light status, collision output, seat belt reminder. The initial status of operation test is "not executed":



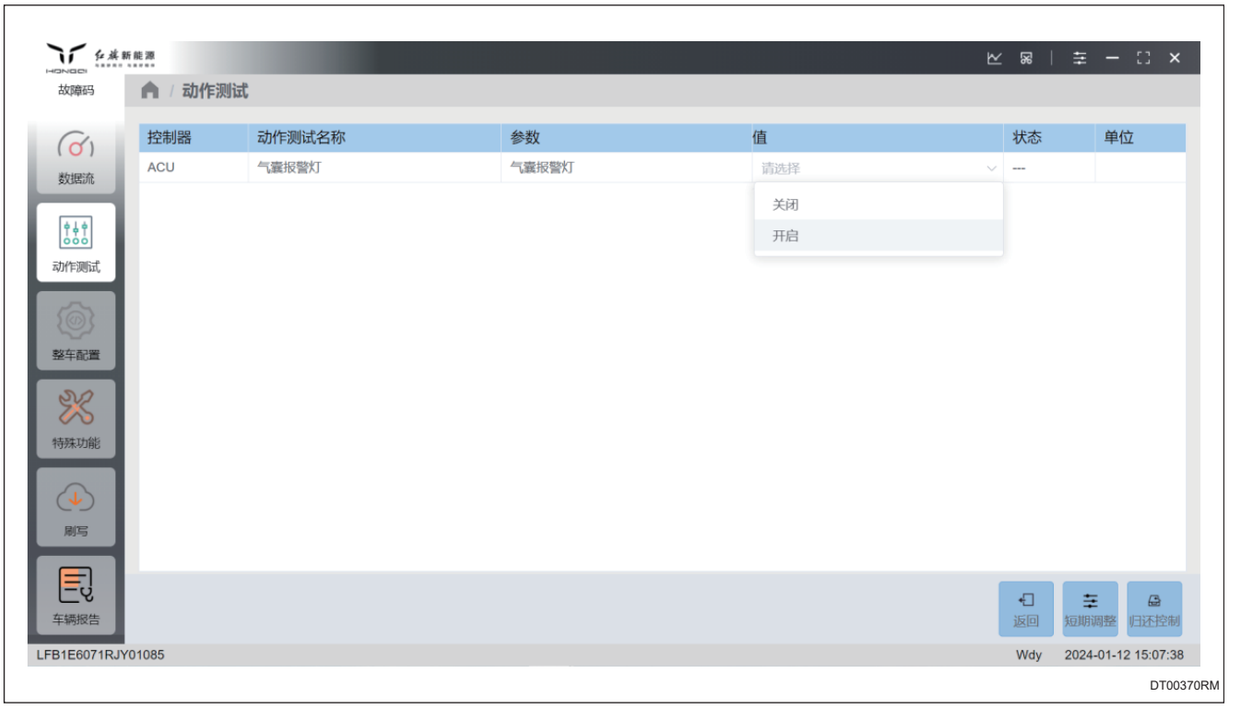
DT00350RM



DT00360RM

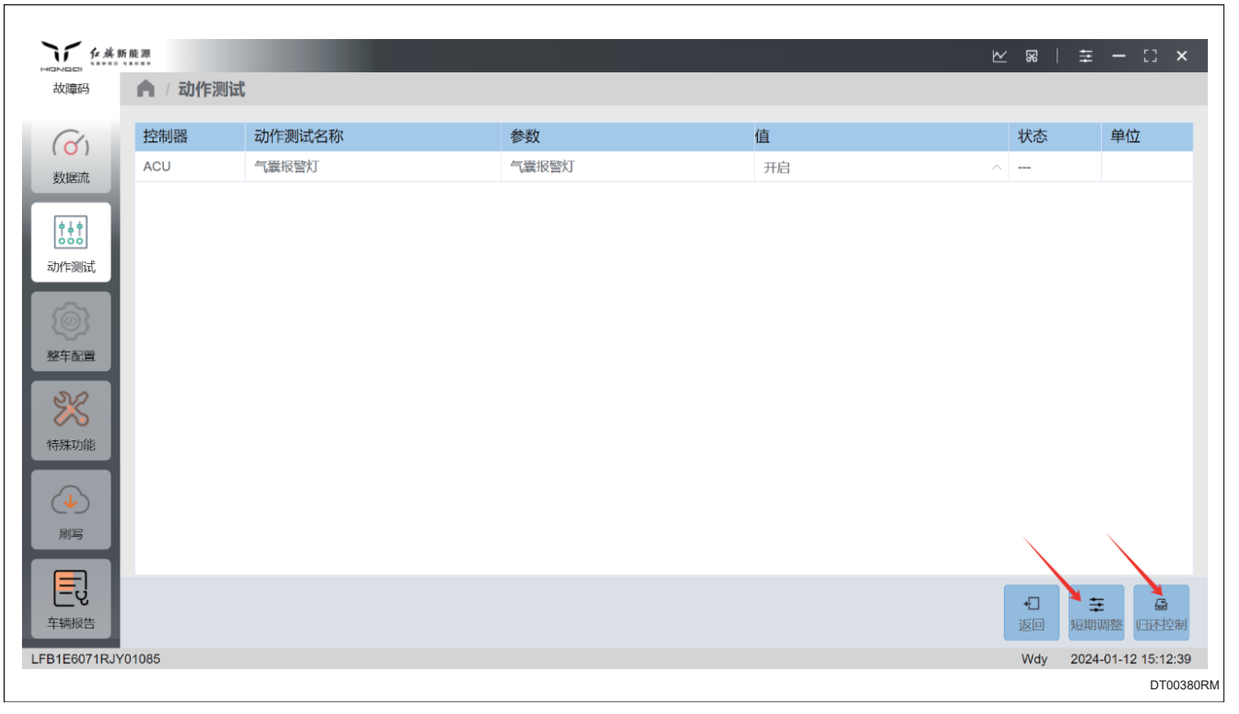
3. Select the target active test function (such as "Airbag warning light") to perform the active test, when user uses the mouse to select the row where "Airbag warning light" is located turns gray, click Next to obtain the active test parameter configuration display information, such as active test name "Airbag warning light", parameter "Airbag warning light", "Value" can be selected as "OFF", "ON", status and unit, etc.:

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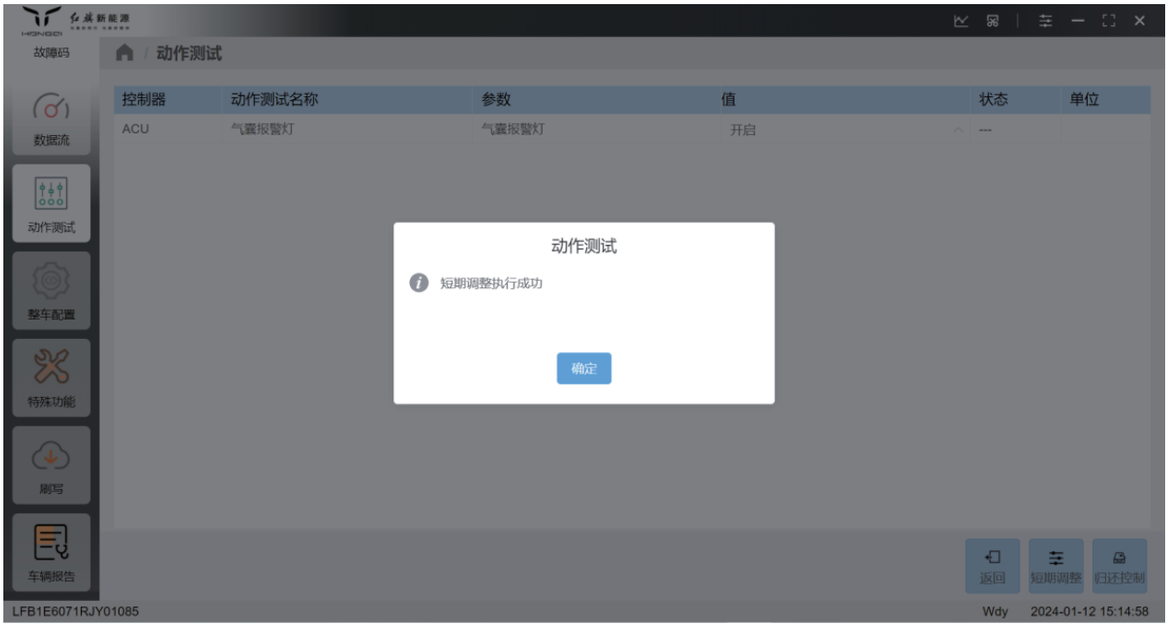


DT

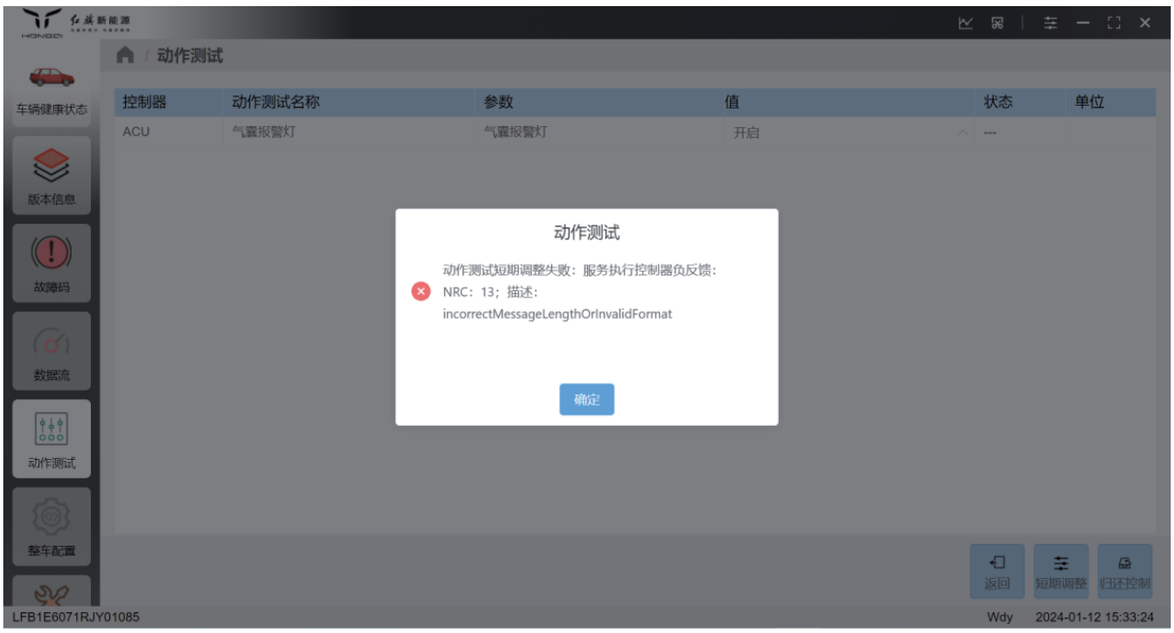
4. **Operation test "Airbag warning light" signal value select "ON" and click short term adjustment and return control to execute IO control Start diagnostic service and IO control Return diagnostic service:**



5. **When the operation test "airbag warning light" "ON" short term adjustment service is performed successfully, the diagnostic tester prompts successful information; When the operation test "airbag warning light" "ON" short term adjustment service is performed unsuccessfully, the diagnostic tester prompts failure information "Short term adjustment failed". As shown in the screenshot below:**



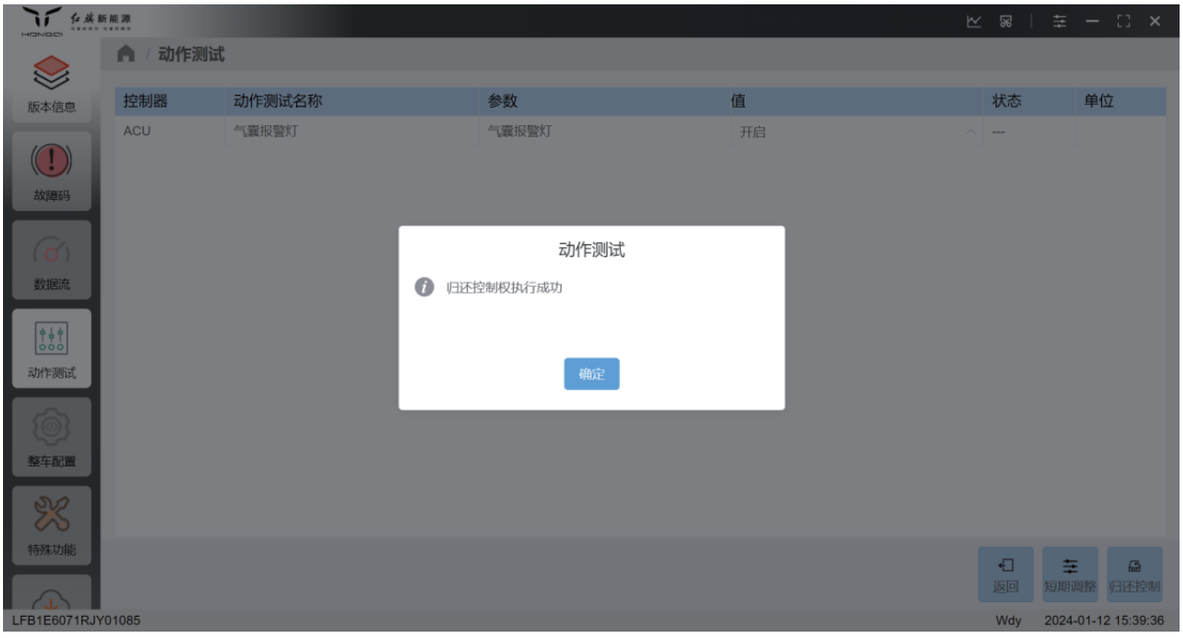
DT00390RM



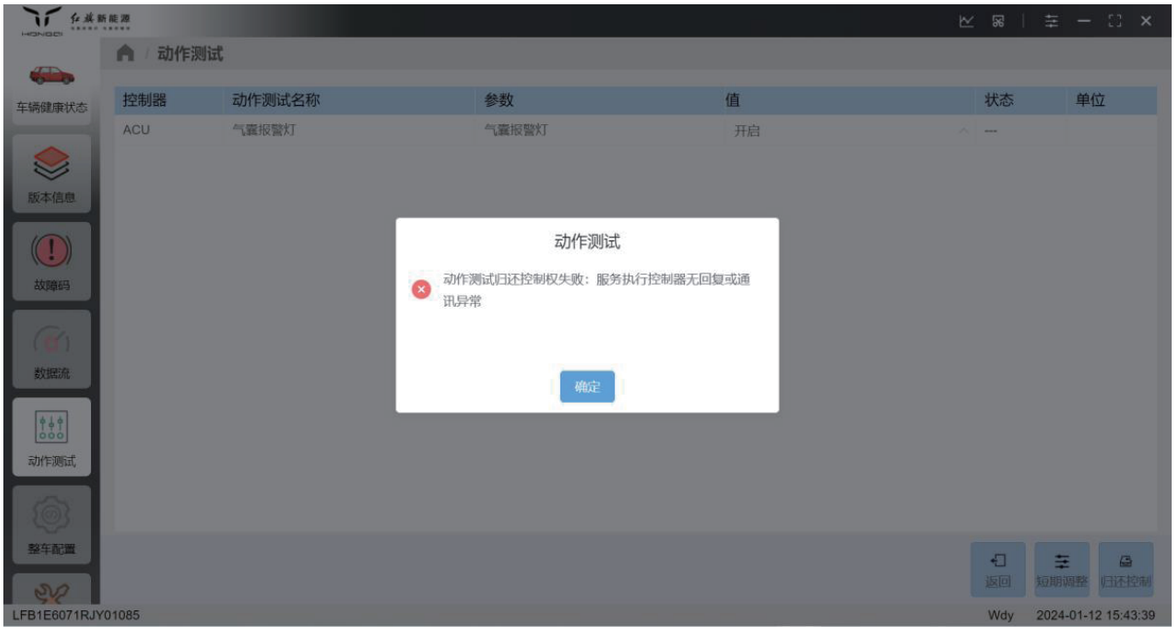
DT00400RM

6. When the operation test "airbag warning light" "ON" return control service is performed successfully, the diagnostic tester prompts successful information; When the operation test "airbag warning light" "ON" return control service is performed unsuccessfully, the diagnostic tester prompts failure information. As shown in the screenshot below:

DT



DT00410RM



DT00420RM

DT

Vehicle report

Vehicle report function

Vehicle report function integrates 4 big data function modules, which are vehicle information, version information, DTC report and diagnostic operation record; The each basic diagnostic execution data and operation record of user, the corresponding special function and writing diagnostic record result, will be displayed in the vehicle report; If the user performs the same 2 basic diagnostic operations, including selecting the basic diagnostic data to read, the version information and DTC related data recorded in the vehicle report will not change:

1. **[Vehicle Information] The vehicle information data recorded in the vehicle report includes "Account", "Vehicle Brand", "Model", "Production Date", "VIN Code", "Dealer", "Report Generation Time":**



2. **[Version Information] The version information data recorded in the vehicle report includes "Controller", "Name", "Parameter Name" and "Value"; If the user does not execute the ECU version information reading function, the version information data currently recorded in the [Version Information] column is empty; If the user executes the ECU version information reading function, the current [Version Information] column records the version information data read by the target ECU, as shown in the following screenshot:**



DT00440RM



DT00450RM

3. [DTC Report] The DTC data recorded in the vehicle report includes "Controller", "DTC", "Description" and "Status"; If the user does not execute the ECU DTC reading function, the current DTC data recorded in the [DTC] column is empty; If the user executes the ECU DTC reading function, the current [DTC] column records the DTC data read by the target ECUs, as shown in the following screenshot:



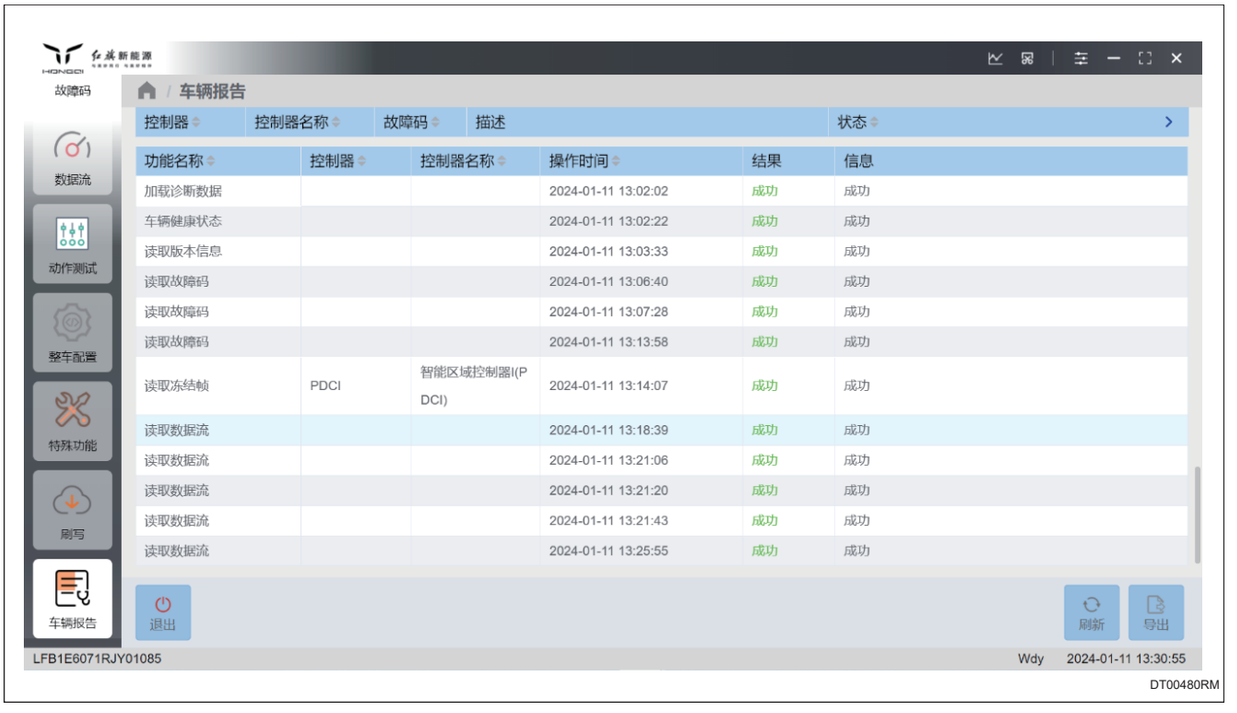
DT00460RM



DT00470RM

4. [Diagnostic Record] The diagnostic record data recorded in the vehicle report contains "Function name", "Controller", "Operation time", "Result", "Information"; When the diagnostic session is just entered, the diagnostic tester executes the VHSS vehicle health status function by default. At this time, the vehicle report is read, and the diagnostic record records the vehicle health status; The operation record program for performing basic diagnosis of the whole vehicle in the diagnosis record does not record all controller names, but the operation record for performing basic diagnosis of a single ECU records controller names; Vehicle version information reading, vehicle DTC reading, and VHSS vehicle health status diagnostic operation records default to "Successful execution". Other functions

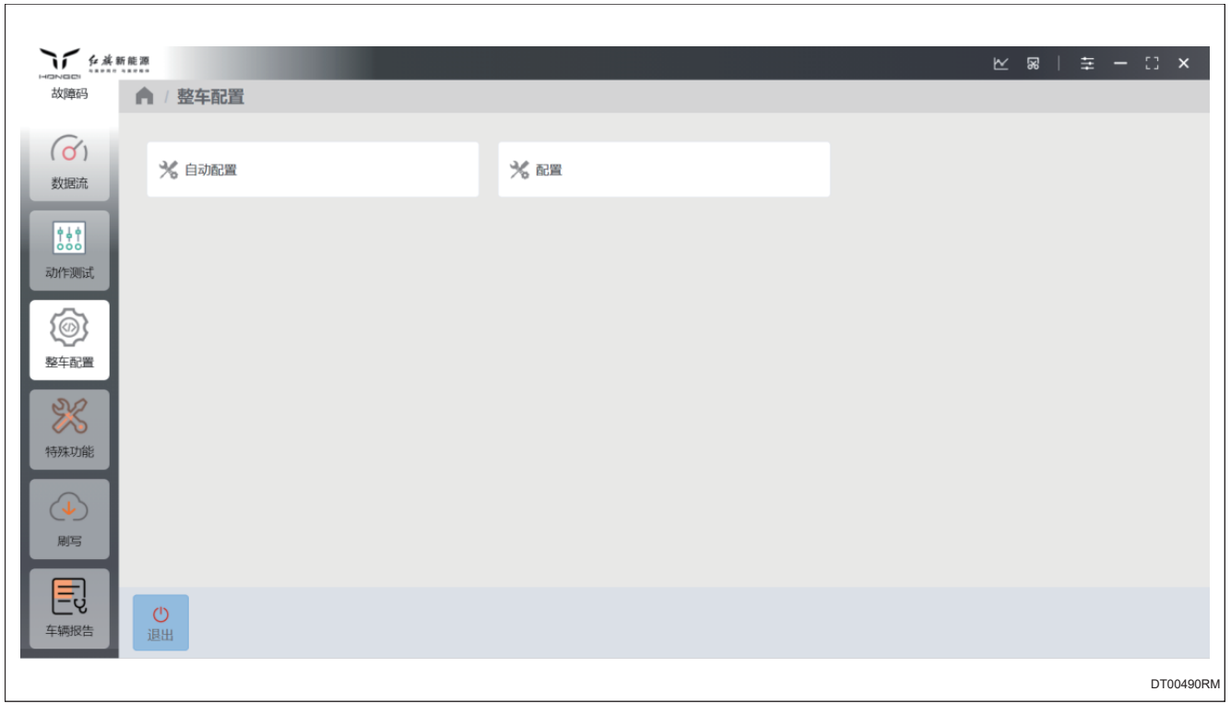
include freeze frame reading, DTC clearing, extended data reading, special functions, and flashing, there are successful or failed execution diagnostic operation records; When the corresponding diagnostic record fails to execute, there is a corresponding failure reason prompt:



Vehicle configuration

Vehicle configuration function

For the vehicle configuration function of Hongqi online version, sub menus include automatic configuration and configuration (offline configuration writing) functions; The configuration information includes: VIN code, ECU configuration data, date information and repair station information, etc; Because there are large number of vehicle end controllers that support automatic configuration and offline configuration writing functions, DSCU automatic configuration function and ACU offline configuration writing function have been added. The screen is as shown in figure below:



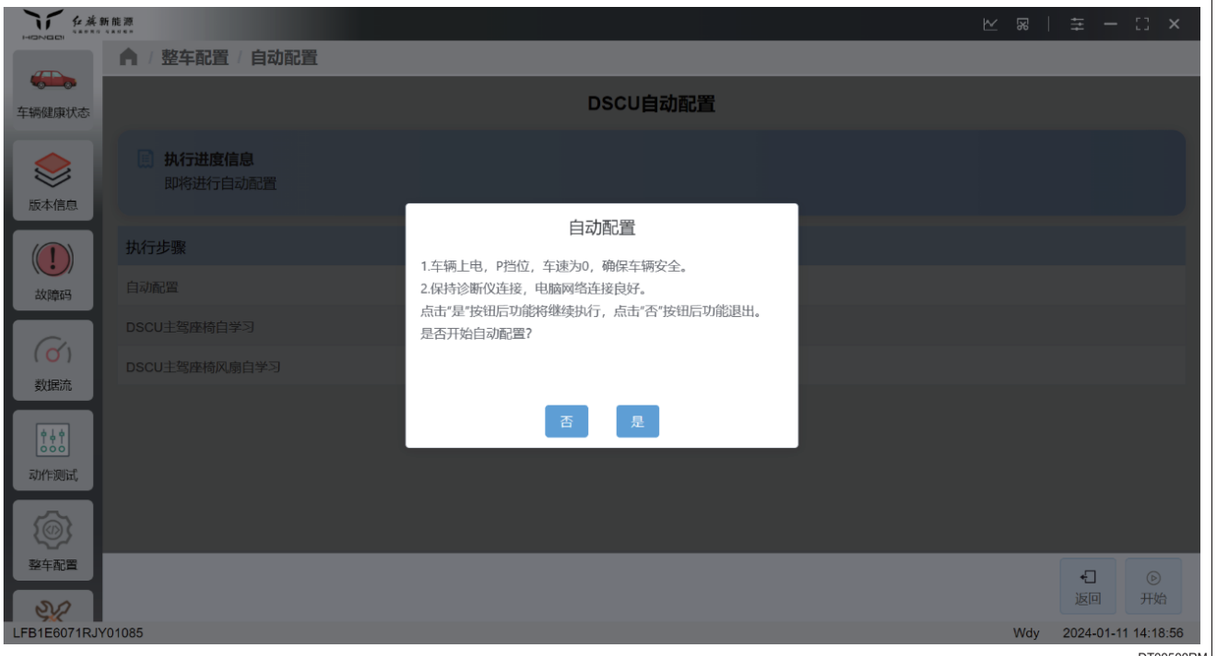
1. **Introduction of buttons on current interface:**
   (a) [Automatic configuration]: User clicks the automatic configuration button to enter the ECU automatic configuration submenu;
   (b) [Configuration]: User clicks the Configuration button to enter the offline configuration function screen.

Automatic configuration function

Through the GUI human-computer interface interaction of the diagnostic tester, the user clicks the menu [Vehicle configuration] → clicks [Auto configuration] → clicks [DSCU auto configuration] function menu button to obtain the target ECU configuration code from the server and write it into the target ECU:

1. **At diagnostic session, user clicks [DSCU automatic configuration] button on automatic configuration page to start performing the DSCU automatic configuration function, and diagnostic system prompts "1. Vehicle powered on, P gear, speed is 0, ensure vehicle safety. 2. Keep the diagnostic tester connected and the computer network well connected. After clicking the "Yes" button, the function will continue to operate. After clicking the "No" button, the function will exit. Is auto configuration started? After clicking the "Yes" button, the function will proceed with execution. After clicking the "No" button, the function will**

exit; In the precondition prompt dialog box for the function, clicking the [Yes] button confirms and initiates the function execution, whereas clicking the [No] button cancels the initiation of the DSCU automatic configuration function and returns to the special function submenu page of the previous directory level, as illustrated in the screenshot below:



DT00500RM

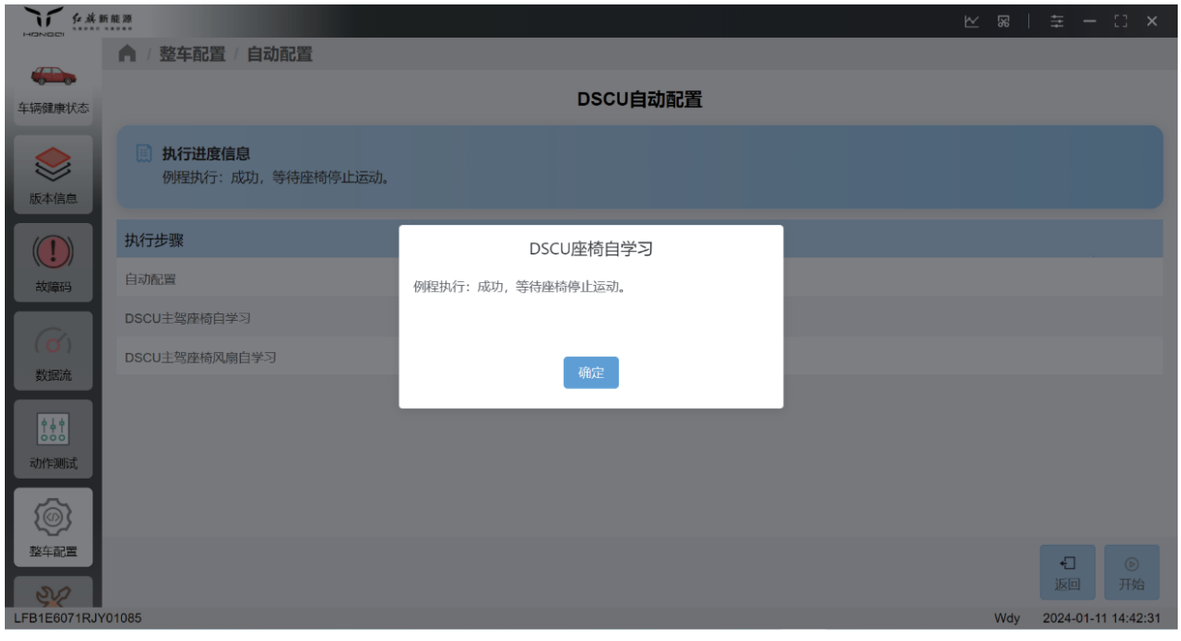
2. After the DSCU automatic configuration writing is complete, continue to perform following seat self-learning calibration function:



DT00510RM

3. Following the previous diagnostic process step, click [Yes] button in "Be about to perform seat learning" prompt box to start performing the seat learning calibration function. The

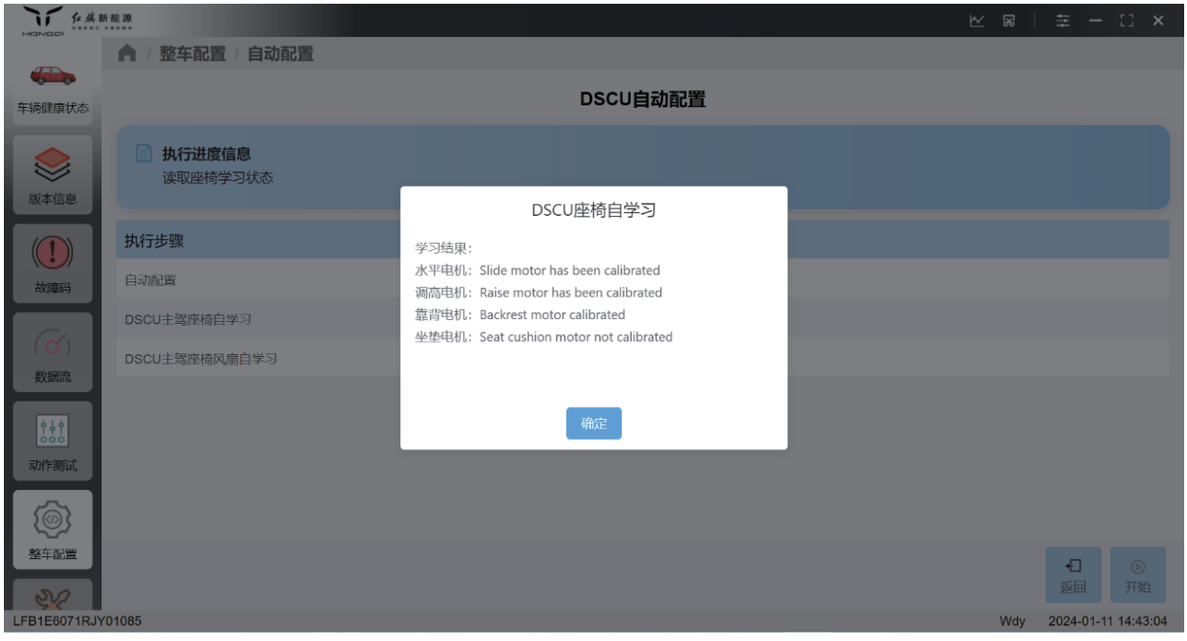
diagnostic tester will send diagnostic services in sequence according to the diagnostic process steps corresponding to the seat learning calibration function. At any stage of the diagnostic process service, if ECU communication is abnormal or ECU responds negatively or fails to respond after a timeout period, the diagnostic tester GUI page will display corresponding error prompts:



DT00520RM

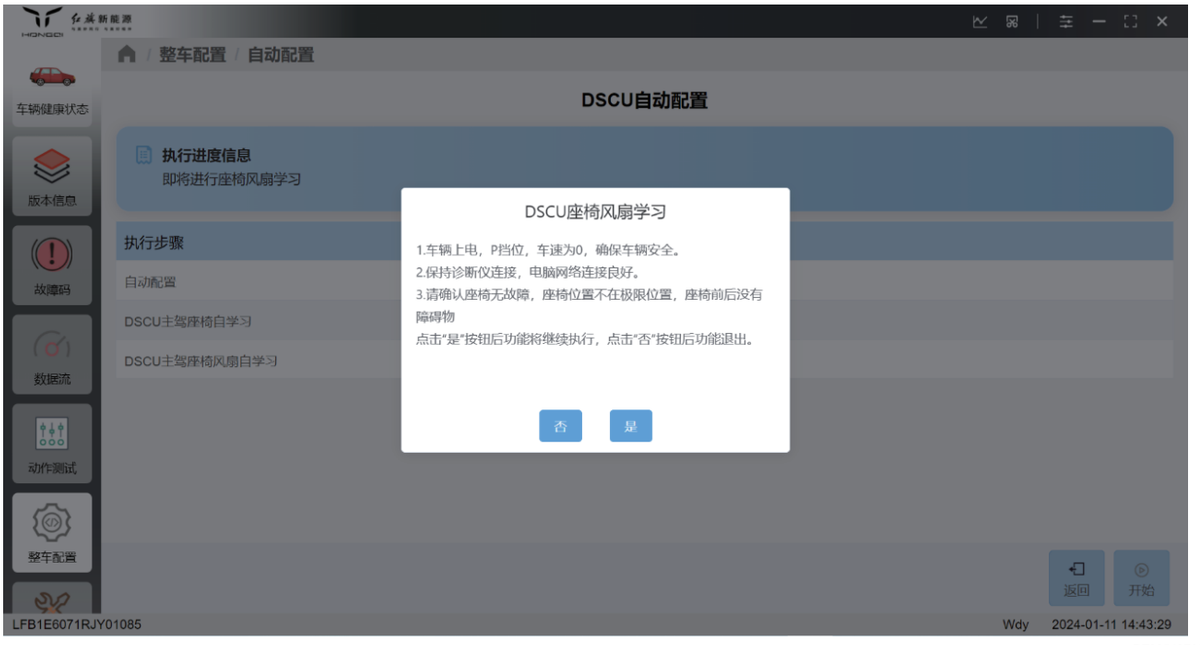
DT

4. **After the seat self-learning calibration routine is executed successfully, click [OK] button on prompt box "Routine executed successful" to start querying the seat learning calibration status:**



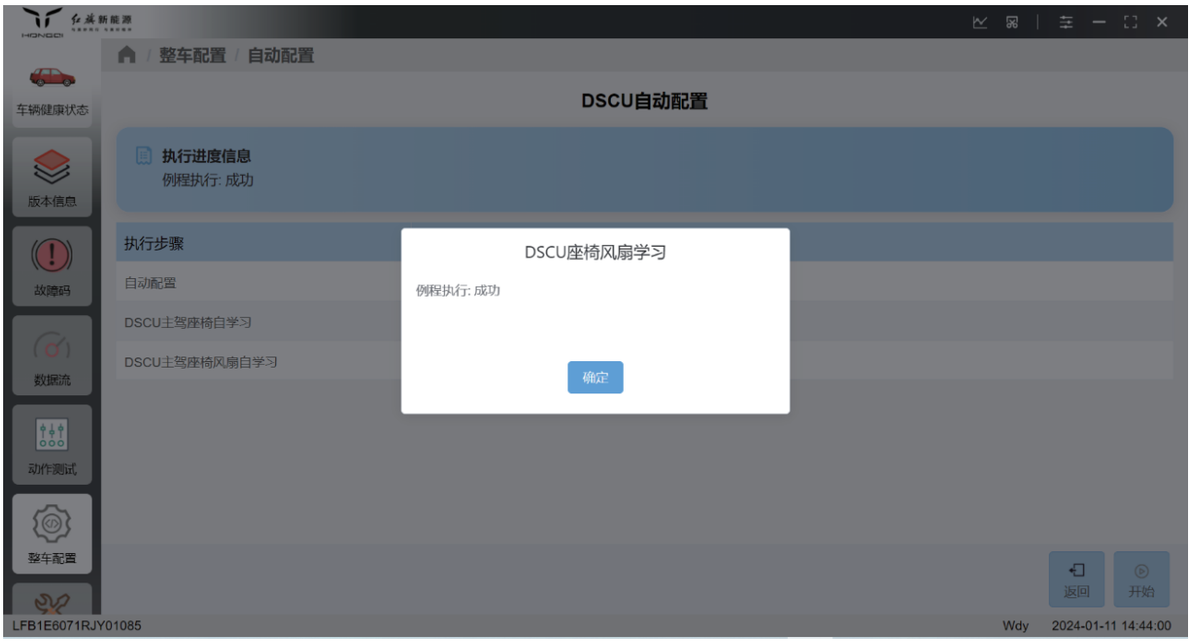
DT00530RM

5. After the execution of the above seat calibration function is completed, continue to perform the subsequent seat fan self-learning calibration function:



DT00540RM

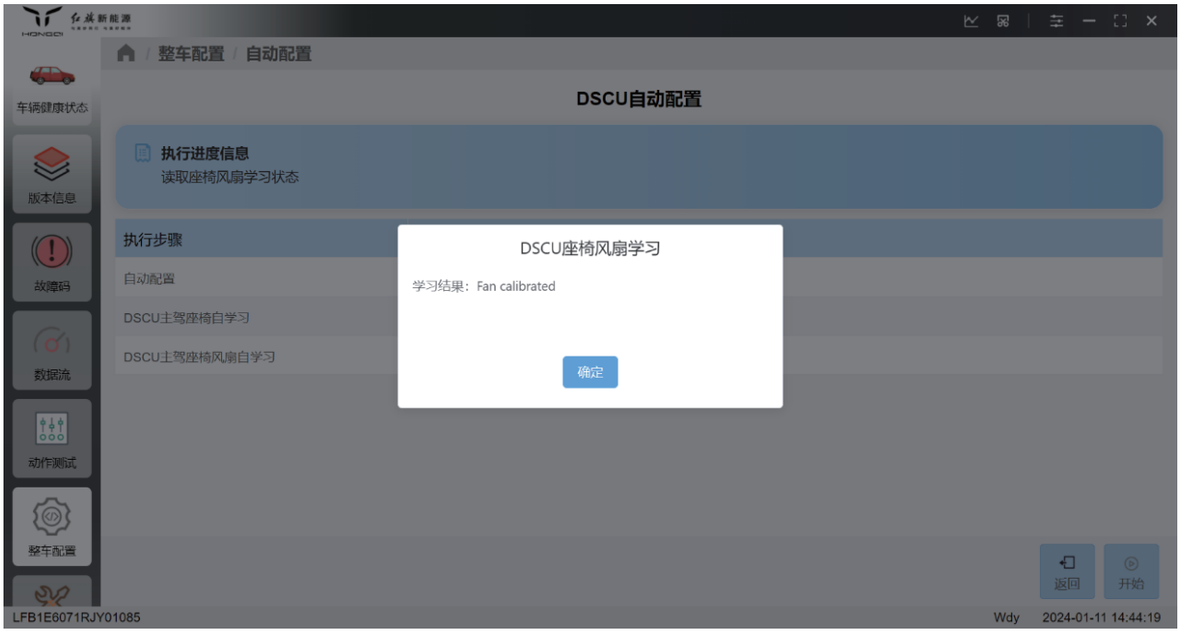
6. Click [Yes] button in the prompt box "Seat Fan Learning is About to be Executed" to start the seat fan learning calibration function. The diagnostic tester will send diagnostic services in sequence according to the diagnostic process steps corresponding to the seat fan learning calibration function. If the ECU communication is abnormal at a certain stage in the diagnostic process service, or the ECU responds negatively or ECU has no reply due to time out, there will be corresponding error prompts on the GUI page of the diagnostic tester:



DT00550RM

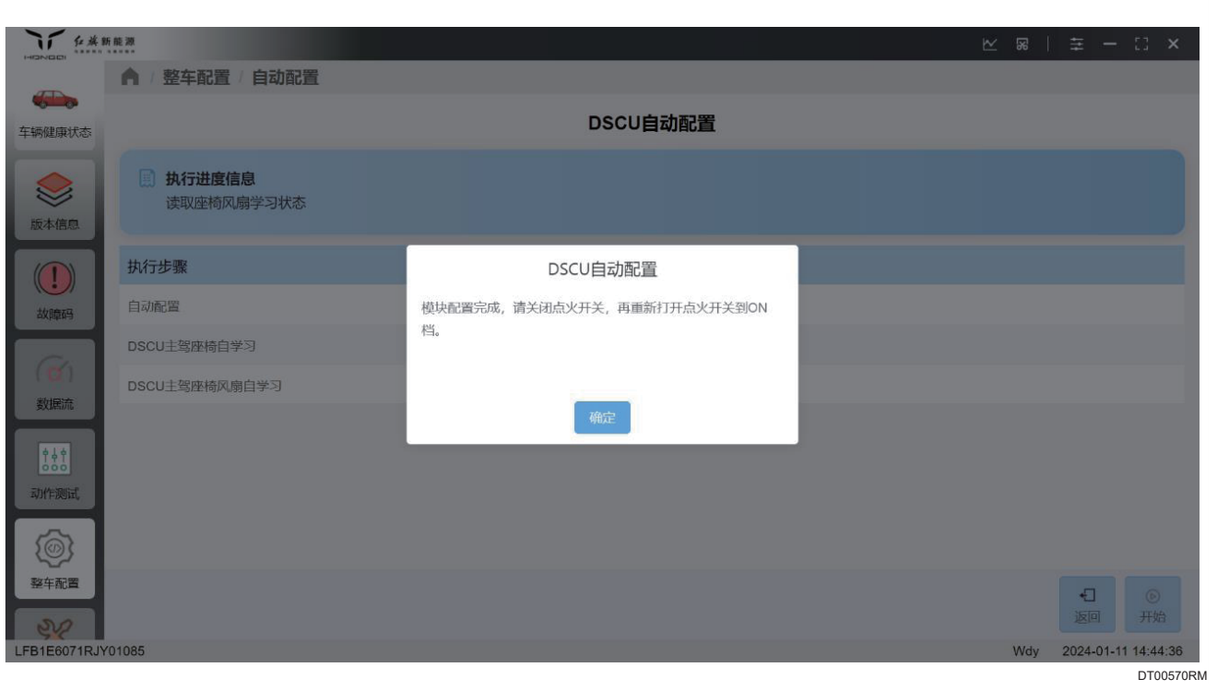
DT

7. After the seat fan self-learning calibration routine is executed successfully, click [OK] button on prompt box "Routine executed successful" to start querying the seat fan learning calibration status:



DT00560RM

8. After the auto-configuration writing is completed and seat learning and fan learning are calibrated successfully, the diagnostic tester prompts "Module configuration is completed, please turn off the ignition switch and then turn the ignition switch to ON again":



DT00570RM

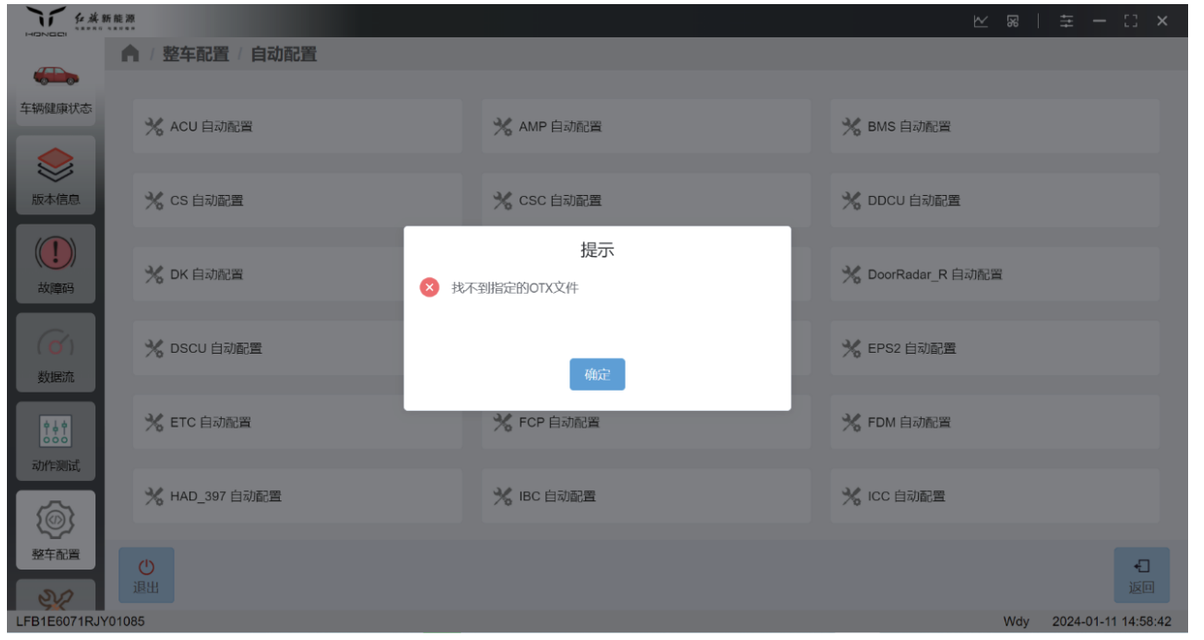
9. Example 1 of abnormal diagnosis during DSCU automatic configuration function: Before performing DSCU automatic configuration function, ECU communication is abnormal, diagnostic system prompts "Communication fault occurs in the physical link":

DT



DT00580RM

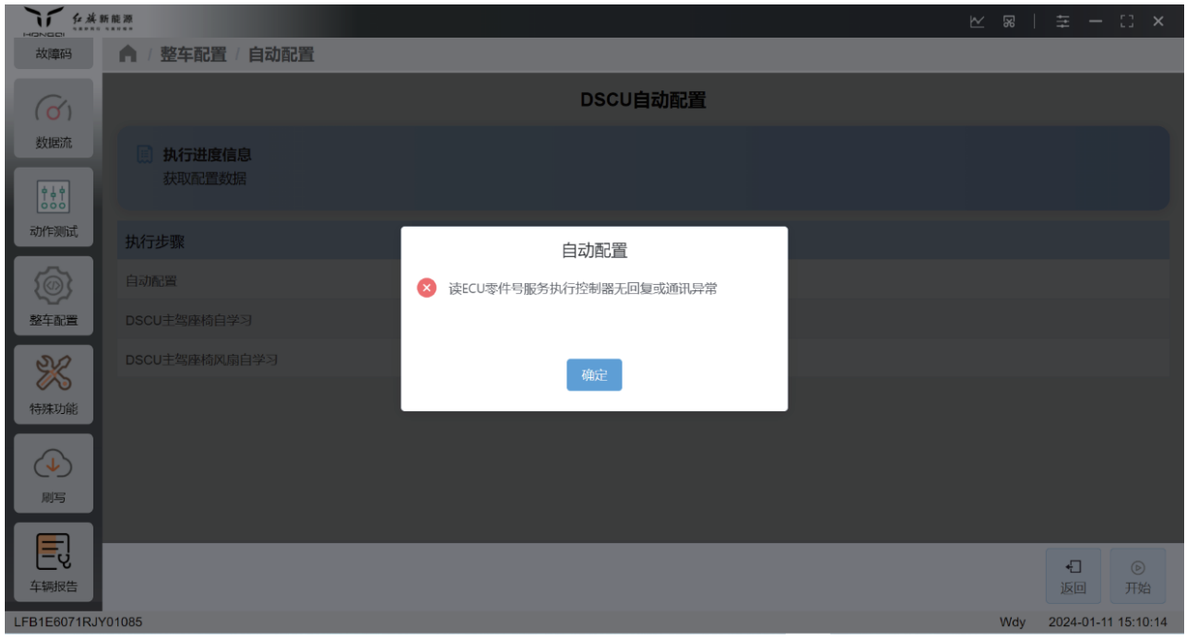
10. Example 2 of abnormal diagnosis during DSCU automatic configuration function: Before performing DSCU automatic configuration function, OTX configuration file is lost, diagnostic system prompts "The specified OTX file cannot be found":



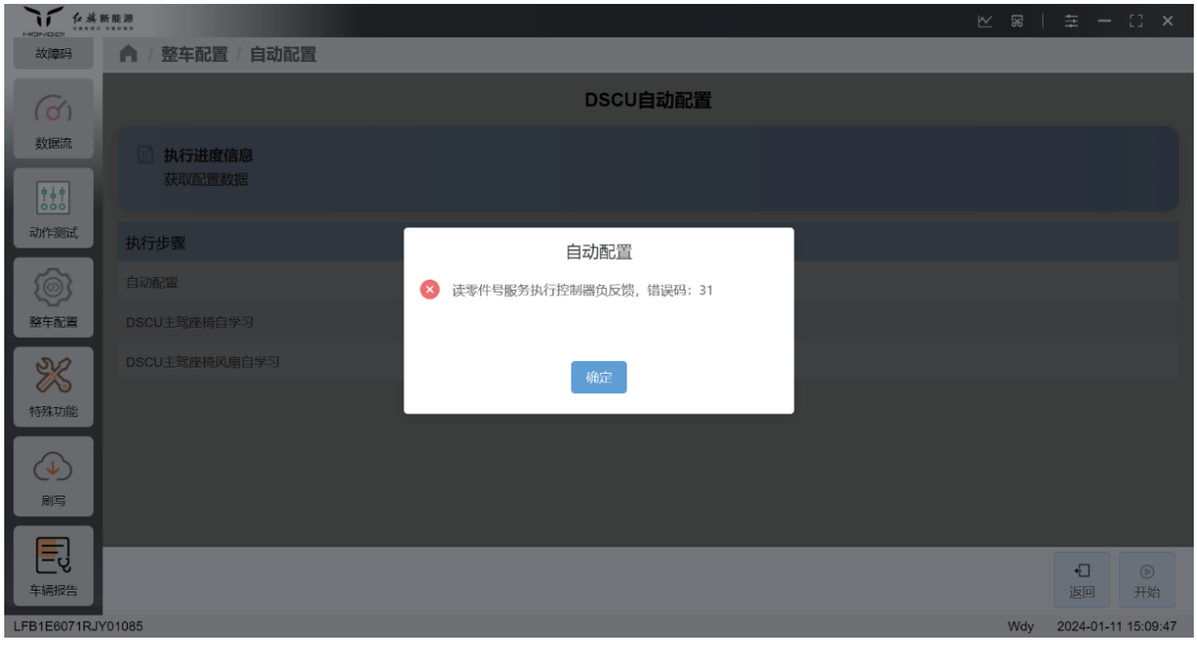
DT00590RM

11. Example 3 of abnormal diagnosis during DSCU automatic configuration function: During the execution of the DSCU automatic configuration function, the diagnostic tester fails to read stored information (part number/software number/hardware number), the ECU responds negatively or the ECU communication fault replies, and the diagnostic system prompts "Read ECU part number service controller to perform no reply" or "Read part

number controller to perform negative feedback, error code: 31" (UDS diagnostic service negative response code "31" indicates request out of range):



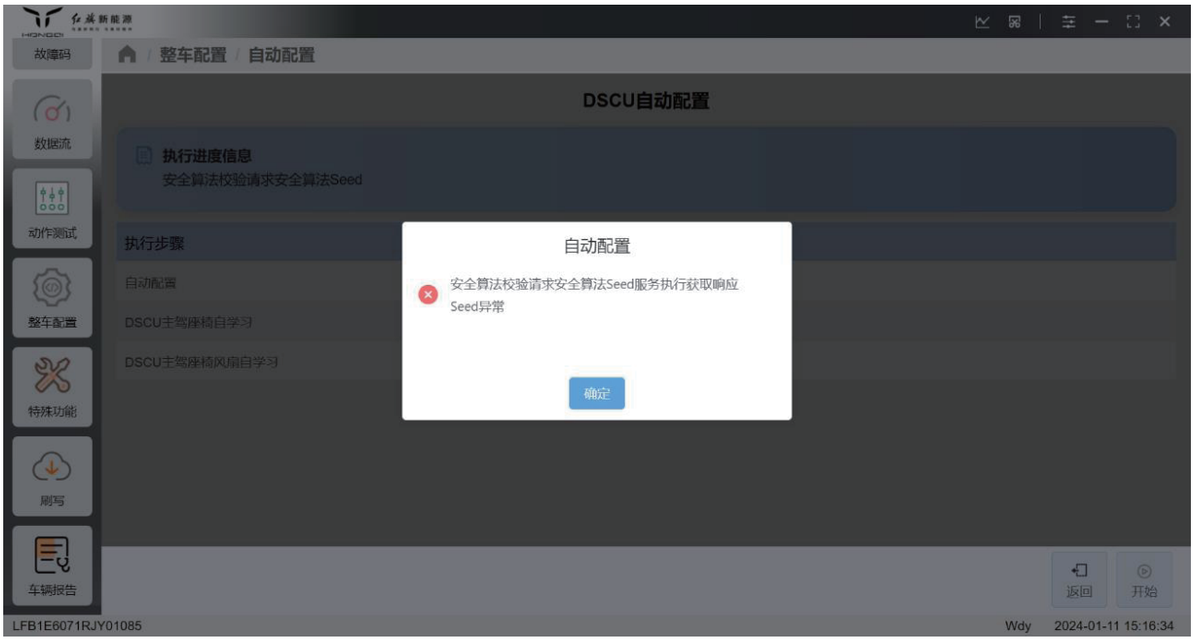
DT00600RM



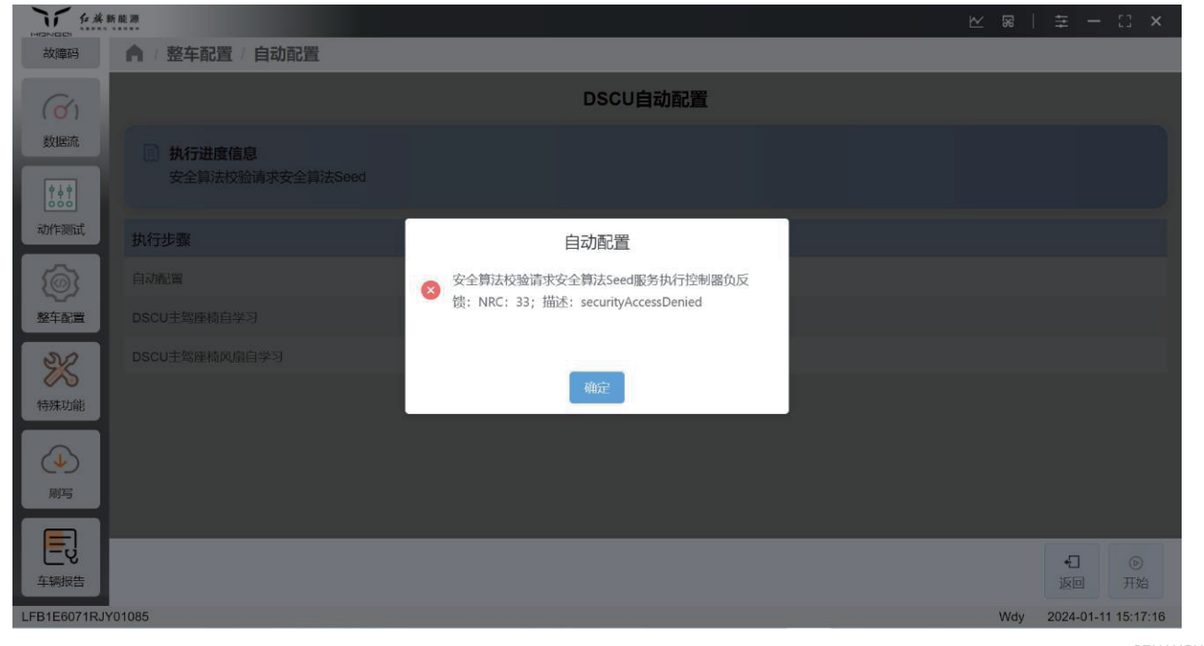
DT00610RM

12. **Example 4 of abnormal diagnosis during DSCU automatic configuration function: During the execution of DSCU automatic configuration function, the diagnostic tester enters the extended session and sends the security algorithm LEVEL1 service, but there is no seed value in the ECU response message or the ECU responds negatively. The diagnostic tester prompts "Enter the security algorithm to perform abnormal controller reply, "seed" is not obtained" or "Enter the security algorithm service controller negative feedback, error code**

33" (UDS diagnostic service negative response code "33" indicates security access denied):

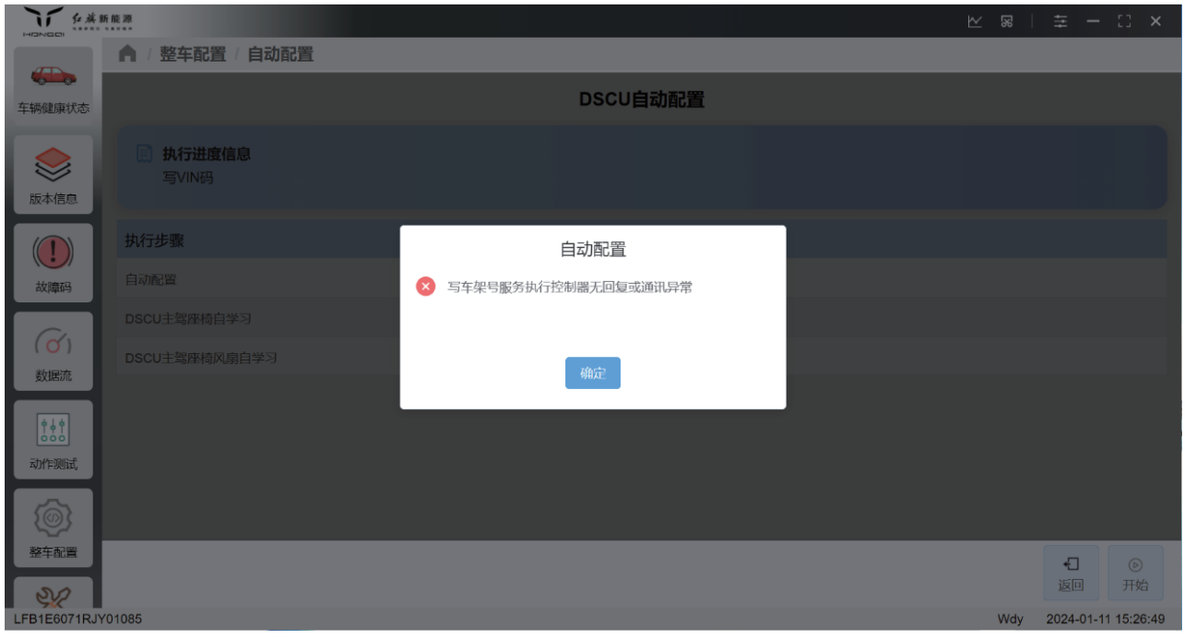


DT00620RM

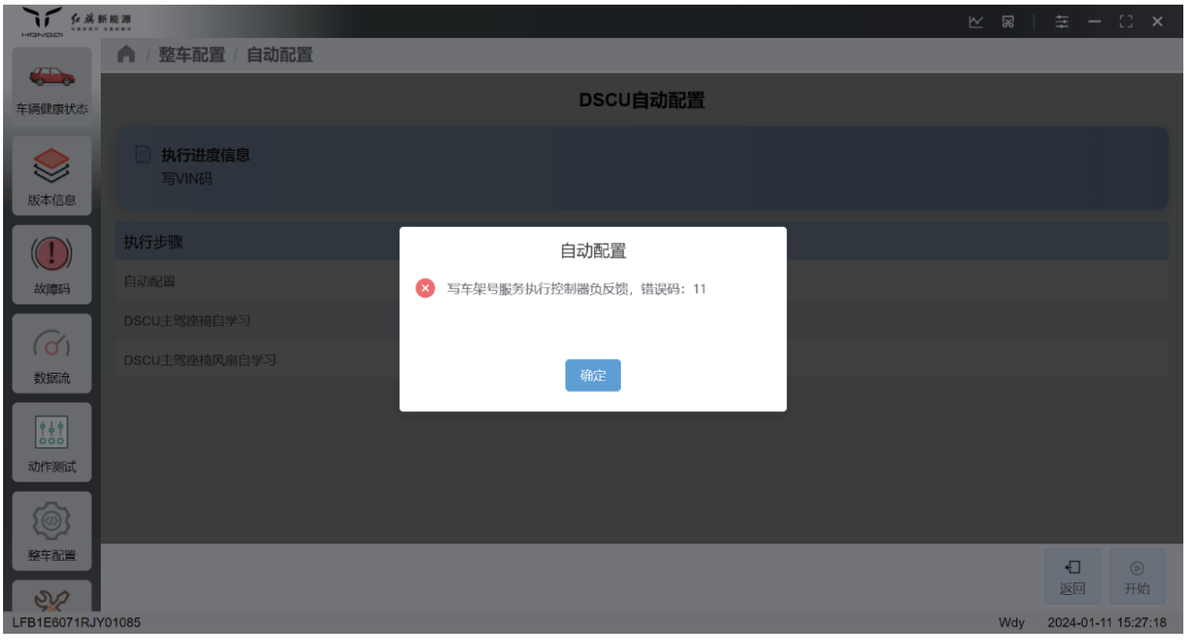


DT00630RM

13. **Example 5 of abnormal diagnosis during DSCU automatic configuration function: During the execution of DSCU automatic configuration function, after the security algorithm service verification is passed, write VIN, ECU responds negatively or ECU has no reply due to time out, and the diagnostic tester prompts "Write frame number service controller to perform no reply or communication is abnormal" or "Write frame number service to perform controller reply negative feedback, error code: 11" (UDS diagnostic service negative response code "11" indicates that service is not supported):**



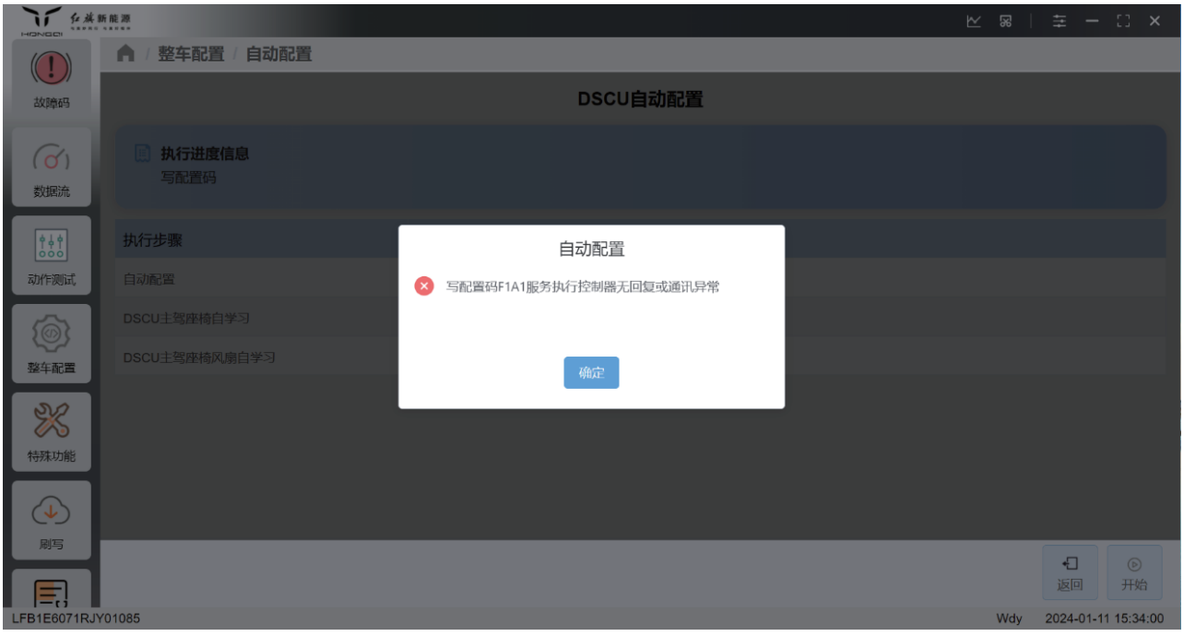
DT00640RM



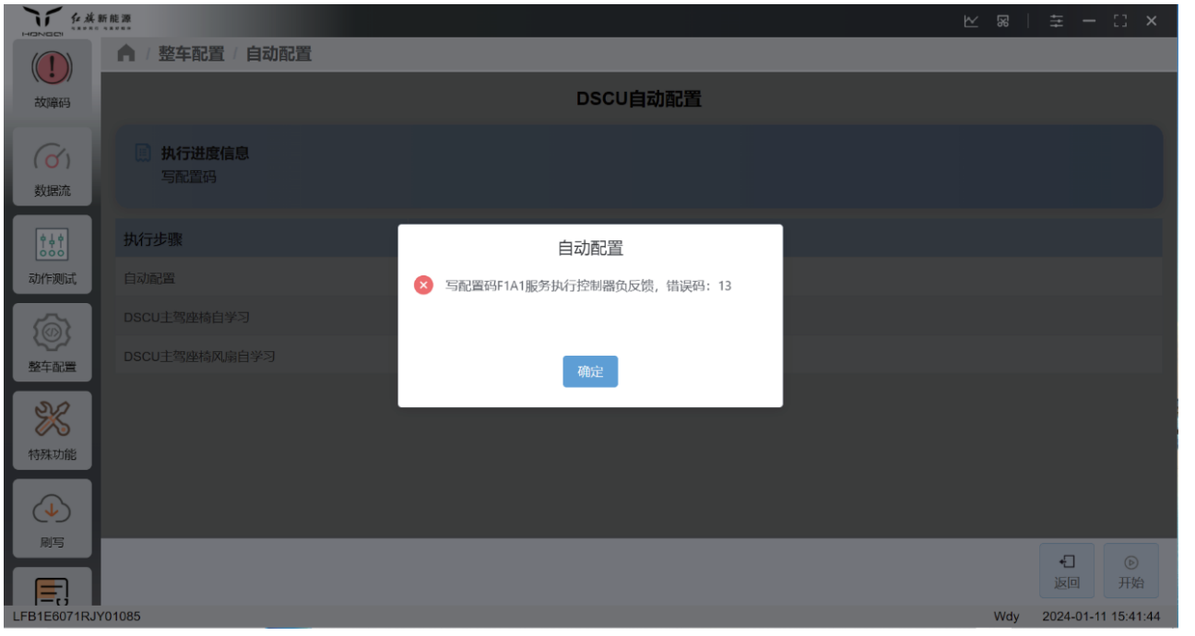
DT00650RM

14. Example 6 of abnormal diagnosis during DSCU automatic configuration function: During the execution of DSCU automatic configuration function, after the security algorithm service verification is passed, write configuration code, ECU responds negatively or ECU has no reply due to time out, and the diagnostic tester prompts "Write configuration code service controller to perform no reply or communication is abnormal" or "Write configuration code service to perform controller reply negative feedback, error code: 13" (UDS diagnostic service negative response code "13" indicates incorrect message length or invalid format):

DT

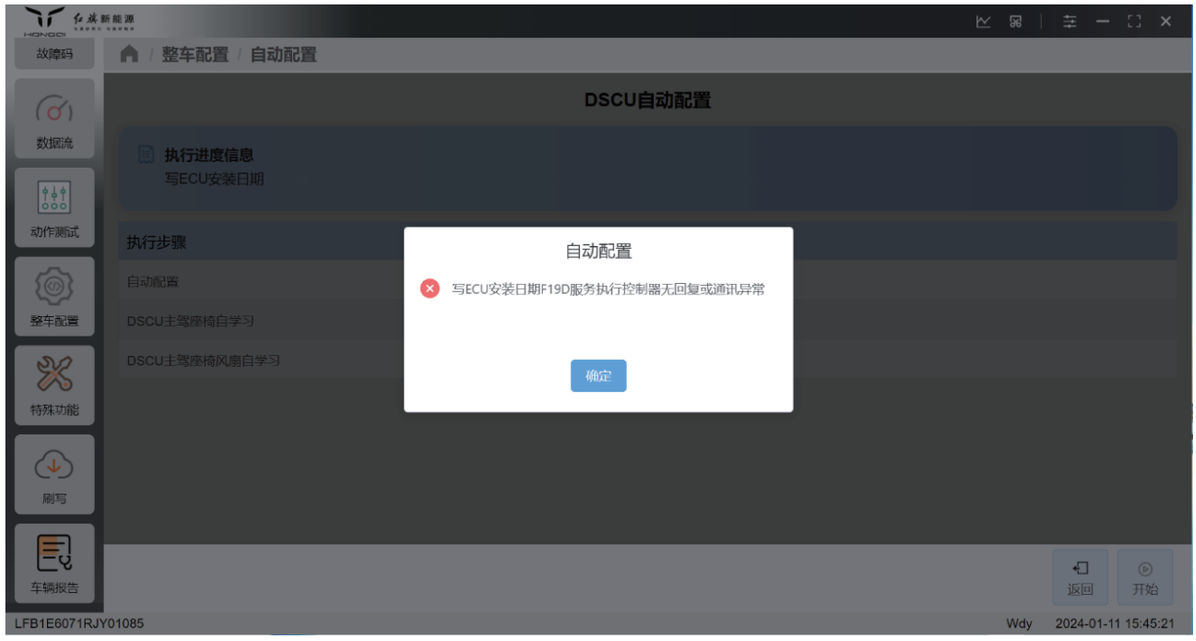


DT00660RM

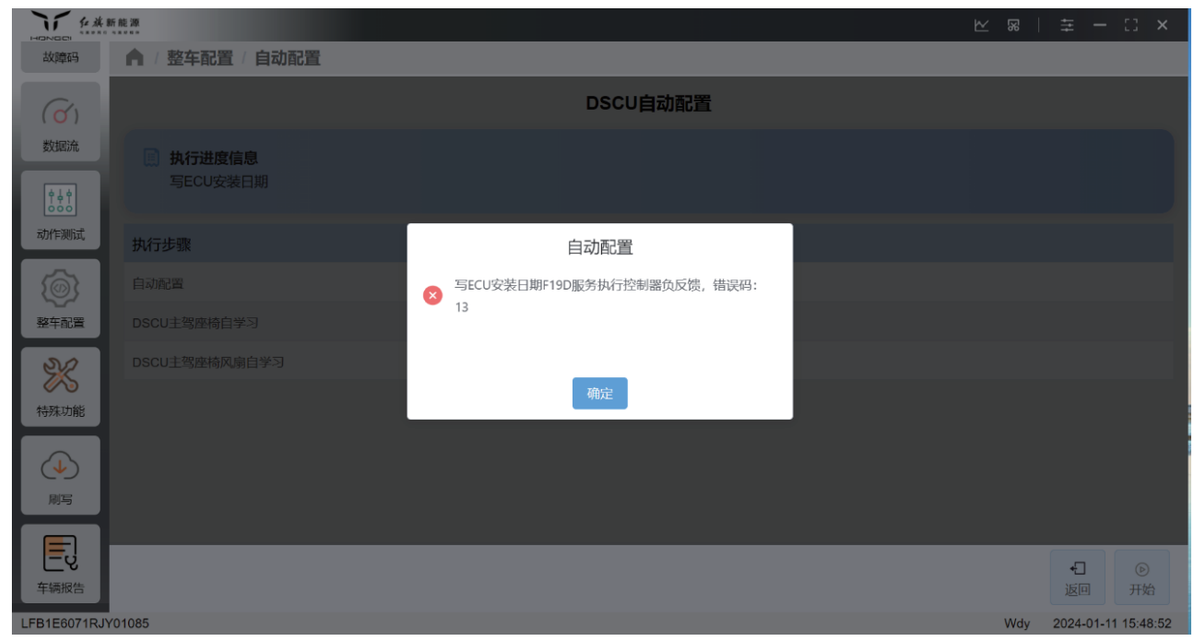


DT00670RM

15. **Example 7 of abnormal diagnosis during DSCU automatic configuration function: During the execution of DSCU automatic configuration function, after the security algorithm service verification is passed, write installation date, ECU responds negatively or ECU has no reply due to time out, and the diagnostic tester prompts "Write installation date service controller to perform no reply or communication is abnormal" or "Write installation date service to perform controller reply negative feedback, error code: 11" (UDS diagnostic service negative response code "13" indicates incorrect message length or invalid format):**

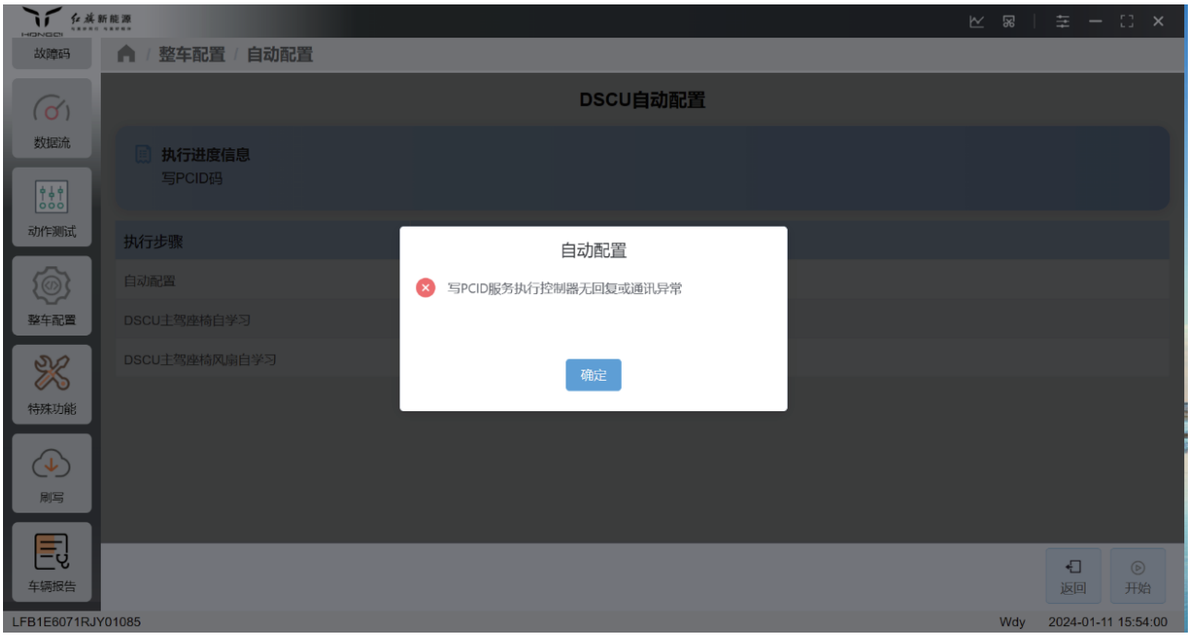


DT00680RM

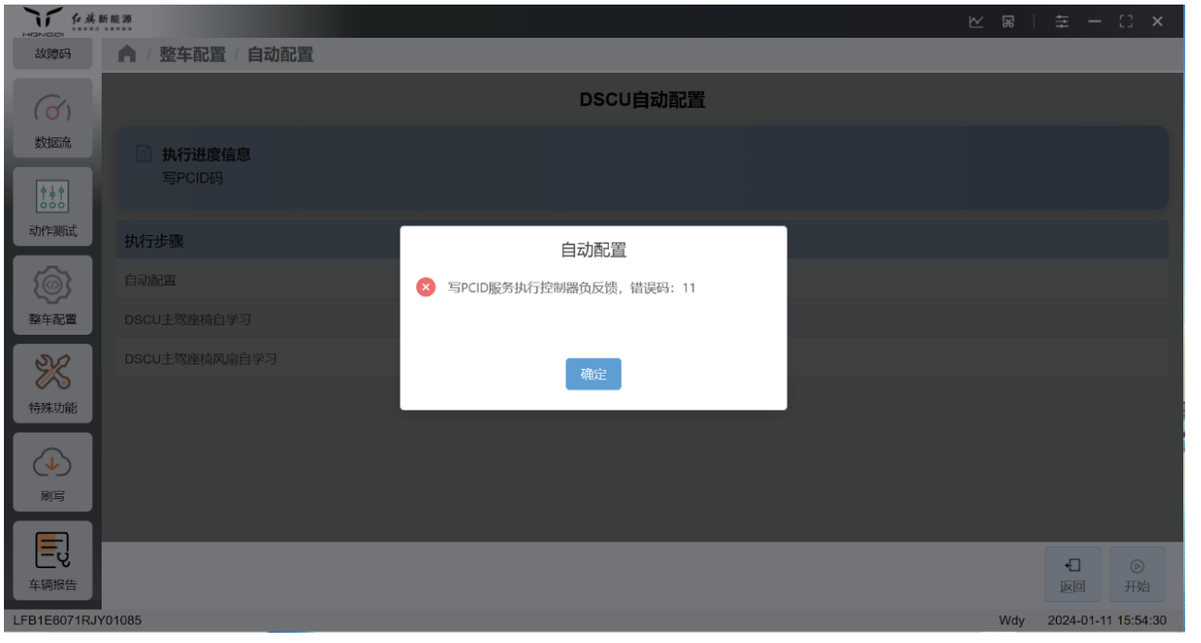


DT00690RM

16. Example 8 of abnormal diagnosis during DSCU automatic configuration function: During the execution of DSCU automatic configuration function, after the security algorithm service verification is passed, write PCID, ECU responds negatively or ECU has no reply due to time out, and the diagnostic tester prompts "Write PCID service controller to perform no reply or communication is abnormal" or "Write PCID service to perform controller reply negative feedback, error code: 11" (UDS diagnostic service negative response code "11" indicates that service is not supported):



DT00700RM

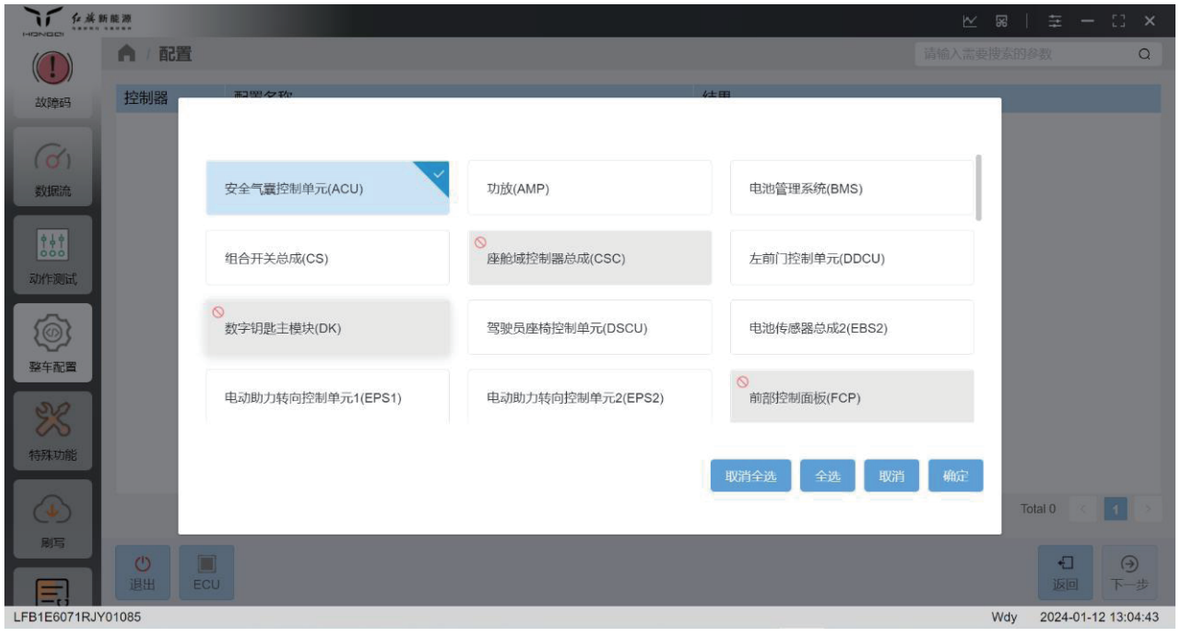


DT00710RM

Configuration writing function

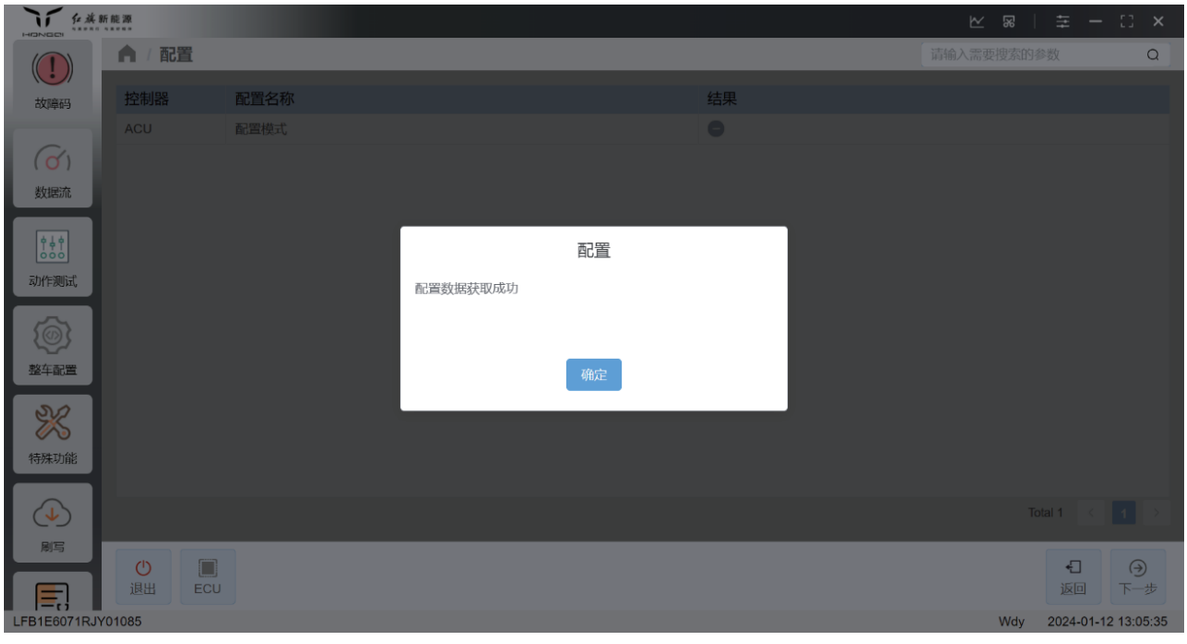
Through the GUI human-computer interface interaction of the diagnostic tester, the user clicks the menu [Configuration] → checks the ECU check box and selects the controller ACU to perform the configuration writing function, obtaining the configuration code of the controller ACU from the local ODX database and writing it into the ECU. For example, the current controller ACU successfully obtains the configuration code F100 Mode Configuration.

1. **At diagnostic session, user clicks [Configuration] button on vehicle configuration function page and then clicks ECU checkbox to select the controller ACU, and starts to perform ACU configuration writing function, as shown in screenshot below:**



DT00720RM

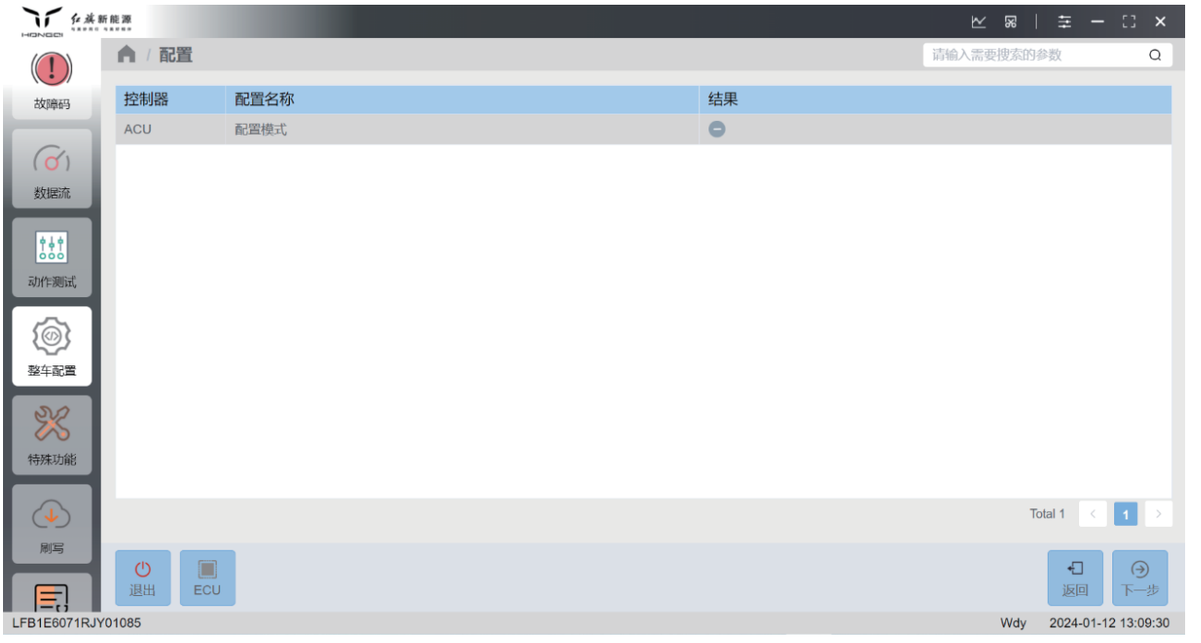
2. **Diagnostic tester obtains configuration function name of target controller ACU from ODX diagnostic database, such as configuration mode; when diagnostic tester front-end successfully obtains configuration data, the interface prompts "Configuration data obtained successfully":**



DT00730RM

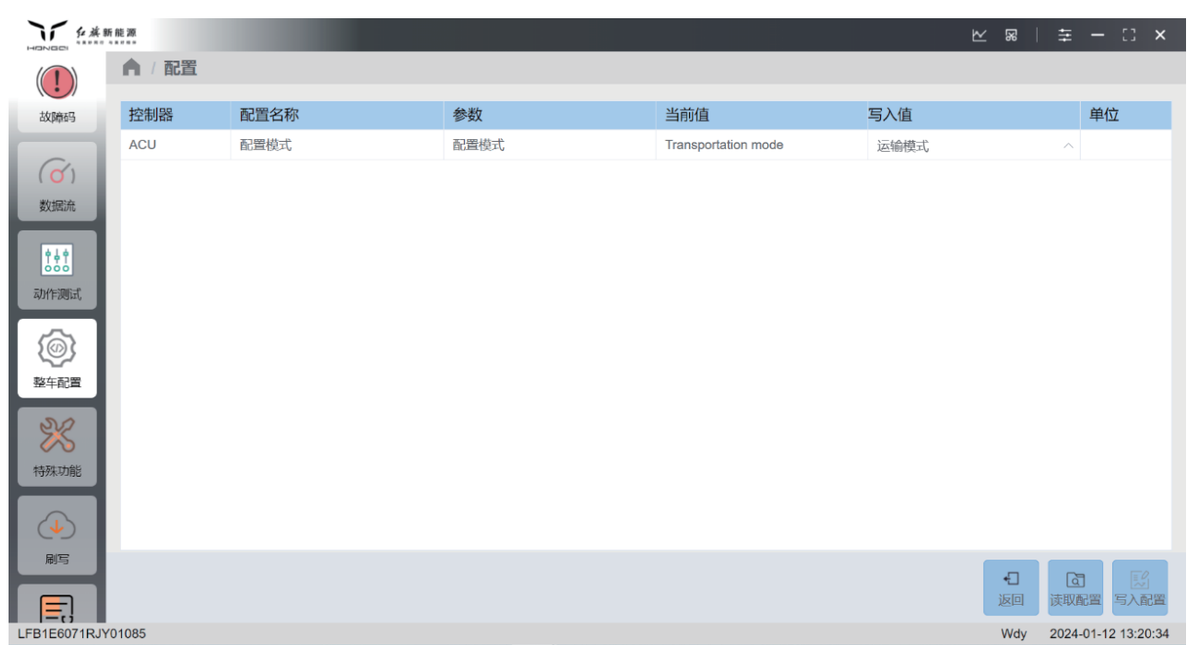
DT

3. After the controller configuration writing function name is successfully obtained, the user can select the configuration writing function "Configuration mode" and click the Next button to perform configuration parameters acquisition:



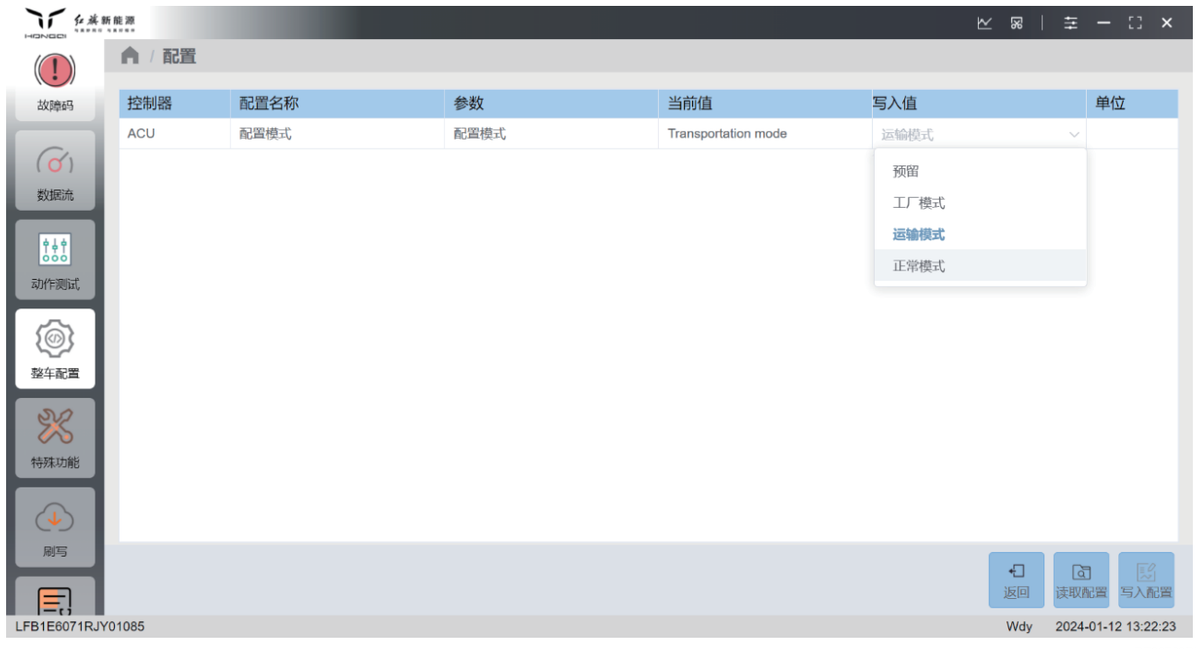
DT00740RM

4. Depending on the actual configuration value stored in the vehicle end controller ACU, the diagnostic tester automatically retrieves the parameter value of the configuration function. For example, if the configuration value stored in current ECU is Transportation mode, the configuration parameter screen displays the written value as Transportation mode by default, as shown in screenshot below:



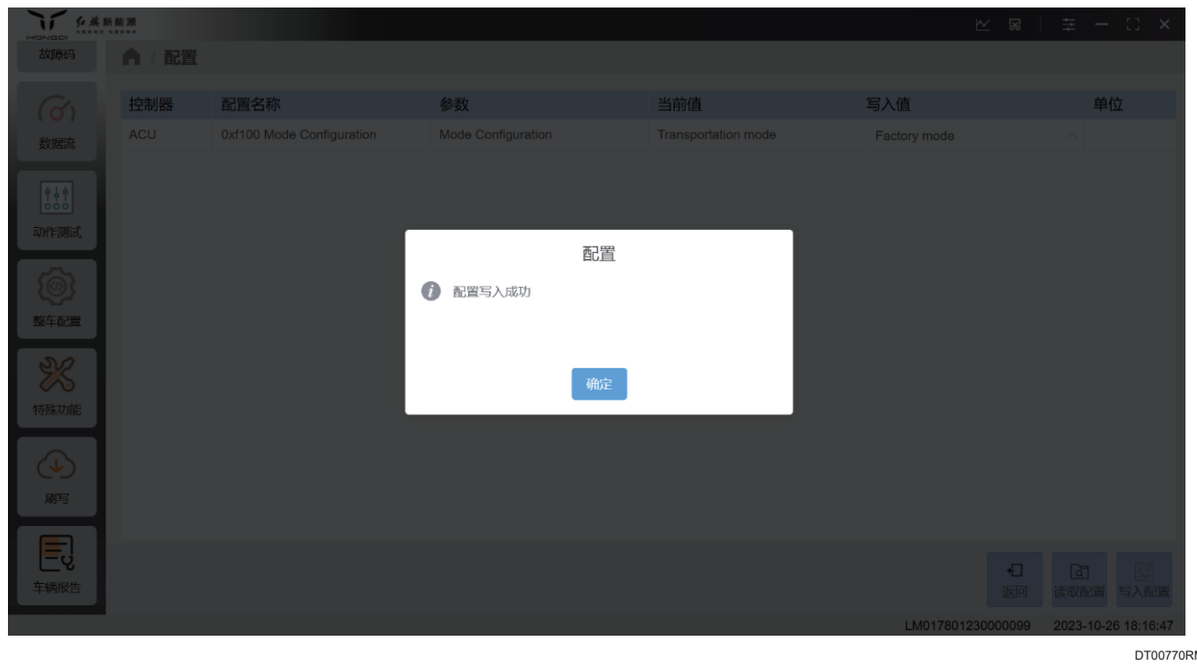
DT00750RM

5. **Expanding the write value drop-down box button displays all the parameters for configuring the transportation mode definition, such as reserved, factory mode, transportation mode, and normal mode;**



DT00760RM

6. **The diagnostic technician can select the corresponding configuration parameter values according to the actual vehicle needs and click button [Write configuration] to perform the target configuration writing function configuration mode:**



DT00770RM

7. **The target configuration writing function configuration mode executes successfully, and the front page prompts "Configuration written successfully". Click the [OK] button in the**

prompt box, and continue to perform the configuration reading function to ensure that the controller ACU has successfully written the target configuration value:

(a) [Configuration DID data search] box: Consider selecting the vehicle ECU to obtain too many configuration function names, you can search the configuration function name identification of the target controller or search the target configuration write function by keyword;

(b) [Data pagination] button: Previous page and next page data buttons;

(c) [ECU check box]: Click [ECU check box] to select one or more ECUs on the vehicle end or the whole vehicle ECU to perform configuration DID data acquisition;

(d) [Back] button: Click [Back] button to return to the previous menu screen;

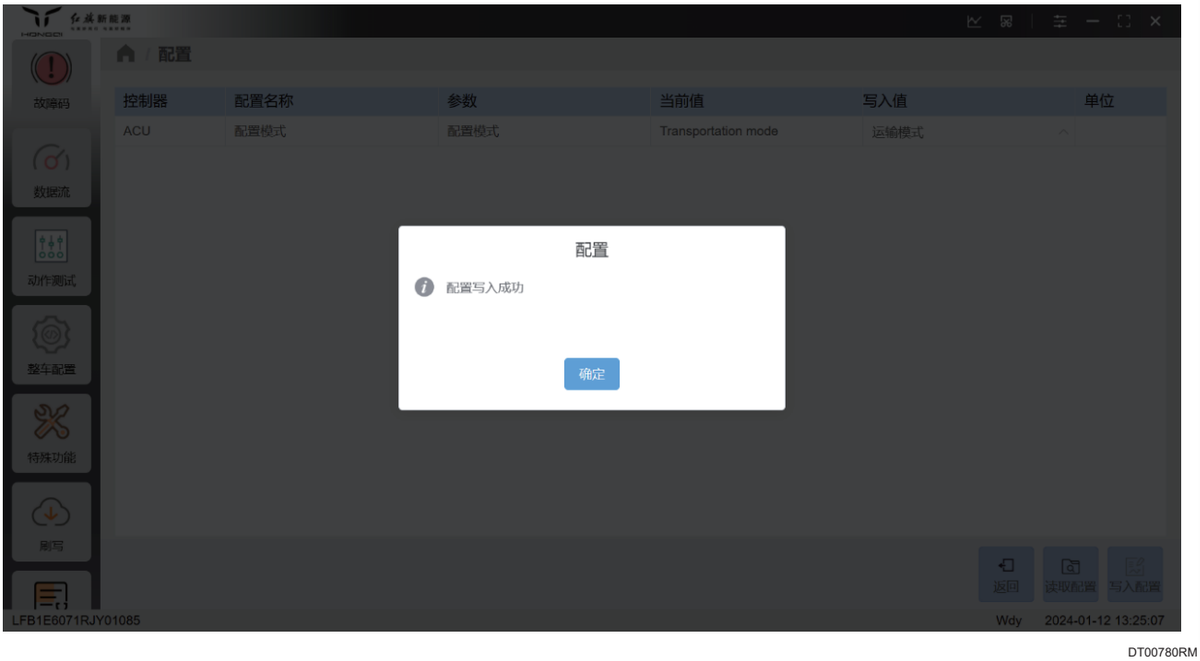
(e) [Next] button: Click [Next] button to perform target configuration DID parameter acquisition;

(f) [Exit] button: Click [Exit] button to allow the user to exit the current diagnostic session and re-identify the vehicle communication interface and model configuration information;

(g) [Read configuration] button: Click [Read Configuration] button to query the stored configuration value of the current ECU target configuration function, such as Transportation mode;

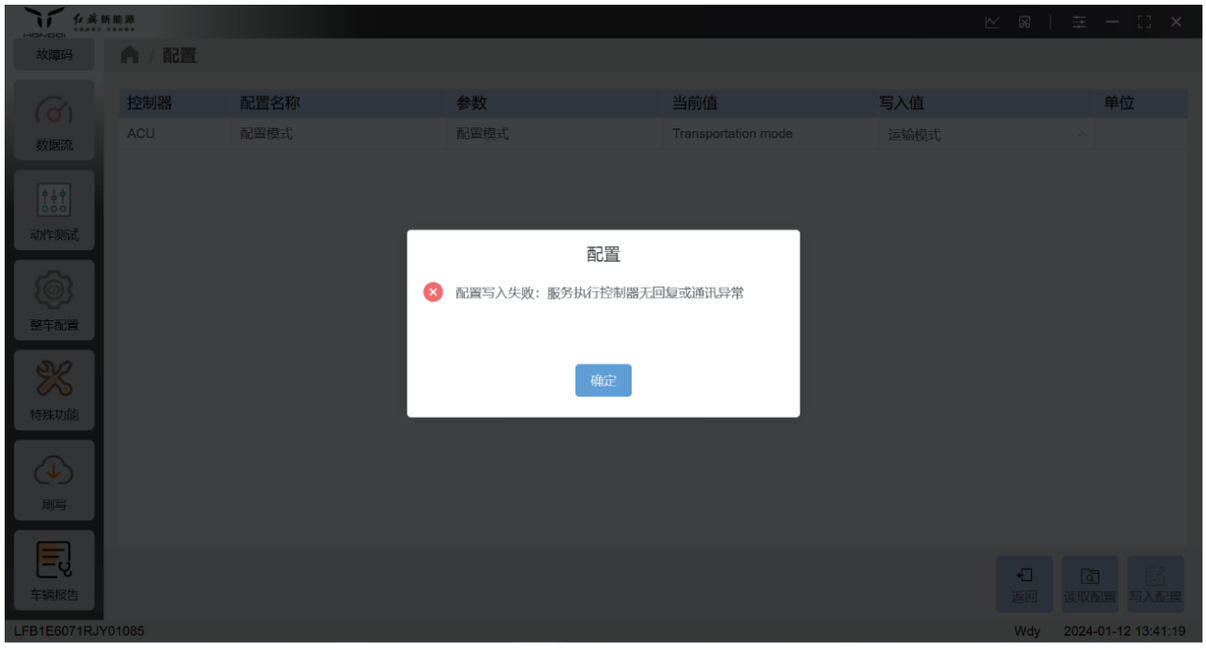
(h) [Write configuration] button: Click [Write Configuration] button to perform target configuration writing function;

(i) [Drop-down box]: Click the drop-down box on write value column to expand all parameter values;

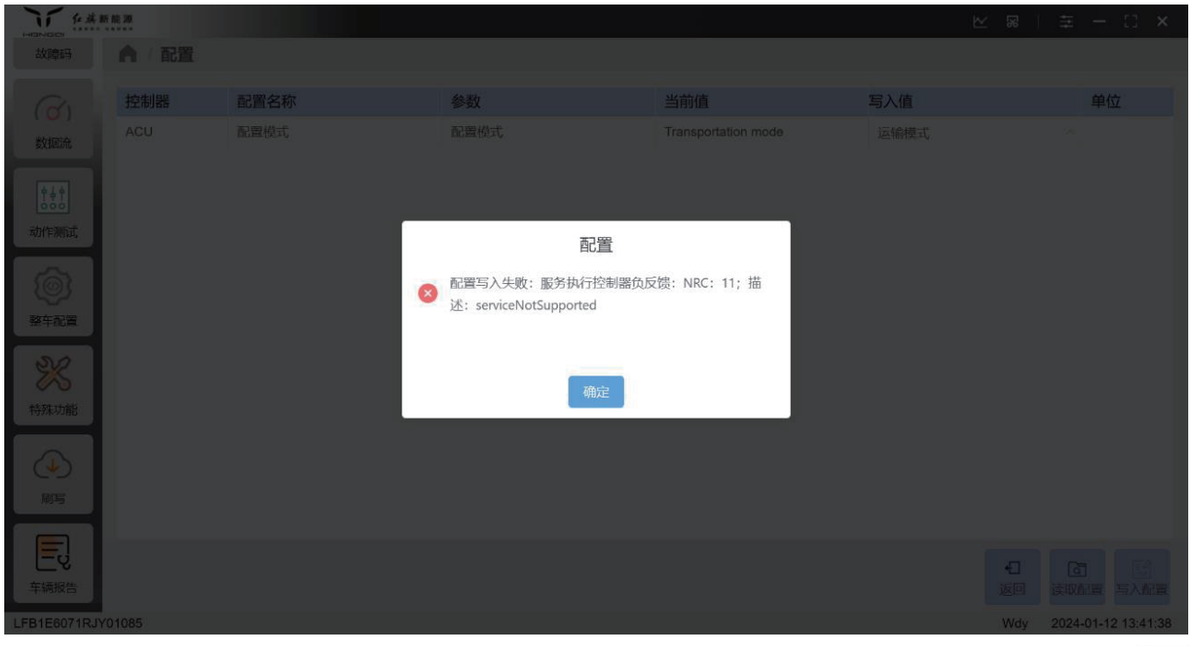


DT00780RM

8. **Example 1 of abnormal diagnosis during ACU target configuration write function: During the ACU target configuration write function, after the security algorithm service verification is passed, write the configuration value, ECU responds negatively or ECU has no reply due to time out, and the diagnostic tester prompts "Configuration write failed: The service performs controller no reply or communication is abnormal" or "Configuration write failed: The service performs controller negative feedback: NRC: 11; Description: serviceNotSupported":**



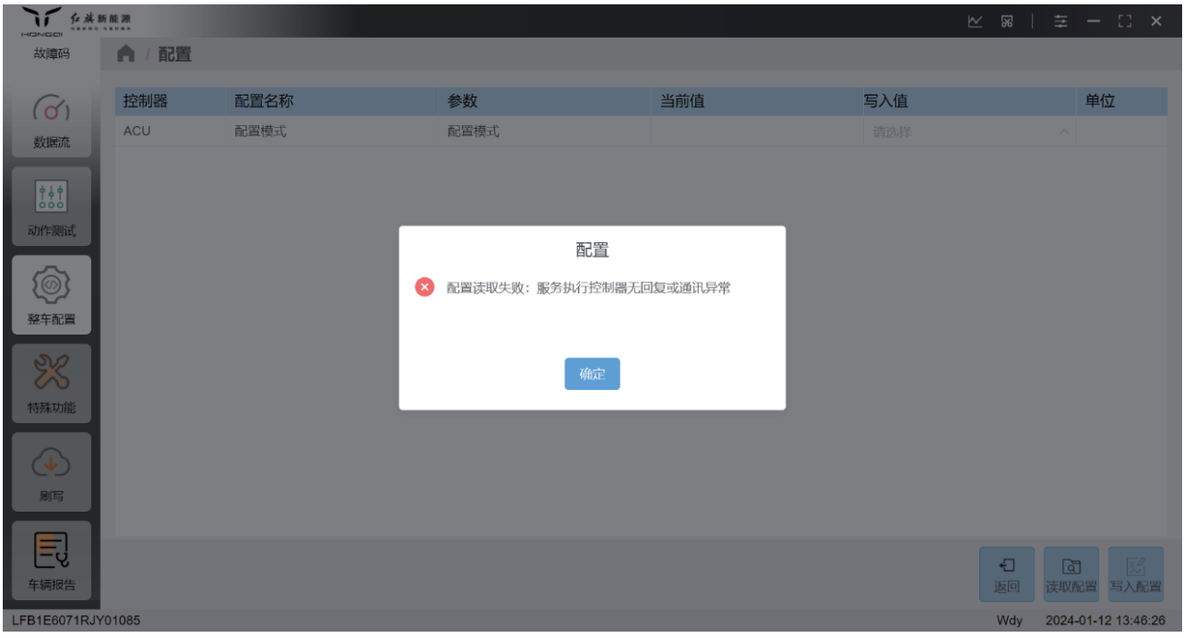
DT00790RM



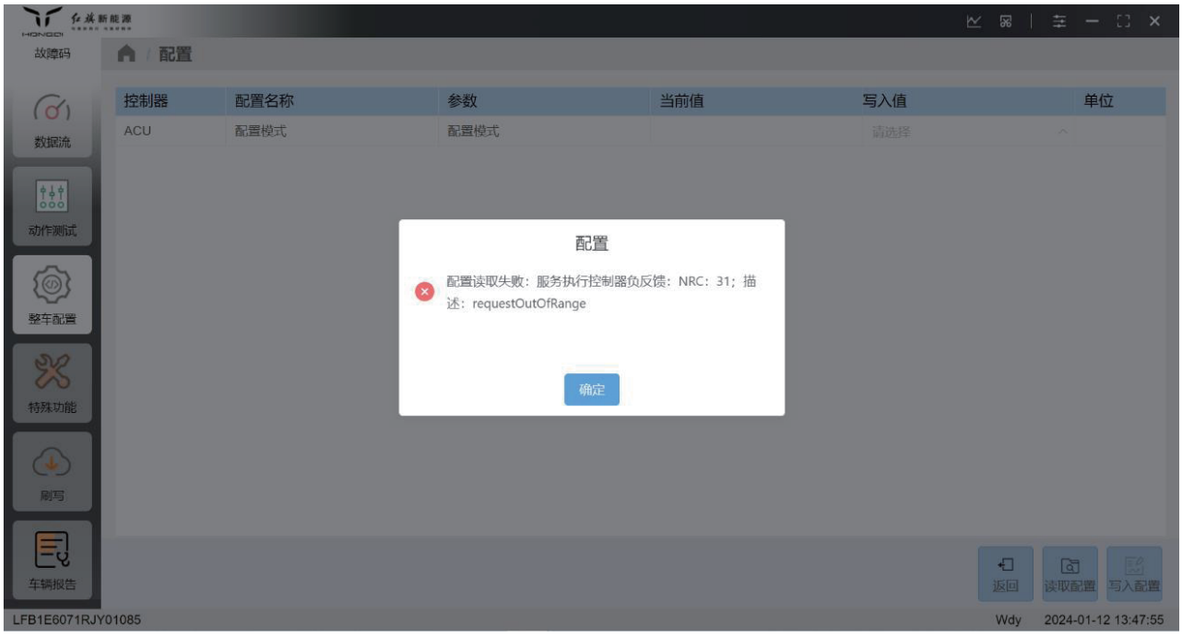
DT00800RM

9. Example 2 of abnormal diagnosis during ACU target configuration write function: During the ACU target configuration write function, after the security algorithm service verification is passed, read the configuration, ECU negatively responds or ECU has no reply due to time out, and the diagnostic tester prompts "Configuration read failed: The service performs controller no reply or communication is abnormal" or "Configuration read failed: The service performs controller negative feedback: NRC: 31; Description: RequstOutOfRange":

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DT00810RM

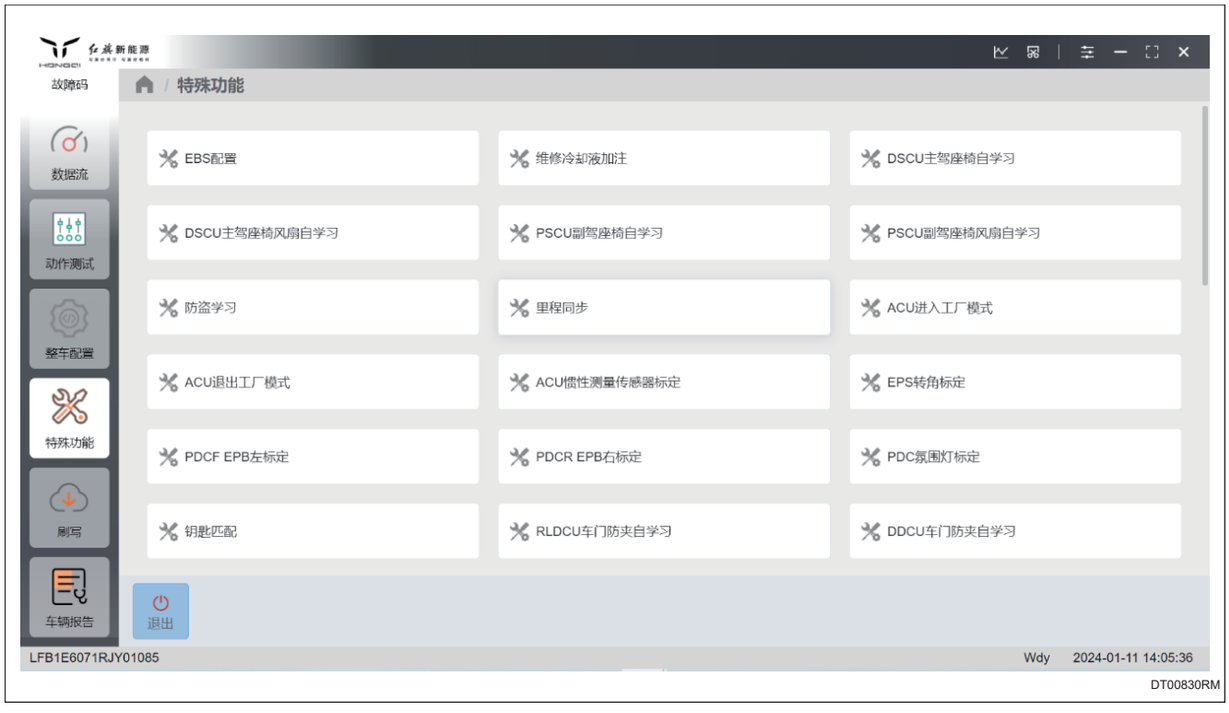


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Special function

Special function introduction

The screen of special functions customized for Hongqi online version is shown in figure below:



Special function example 1 - DSCU driver seat self-learning calibration

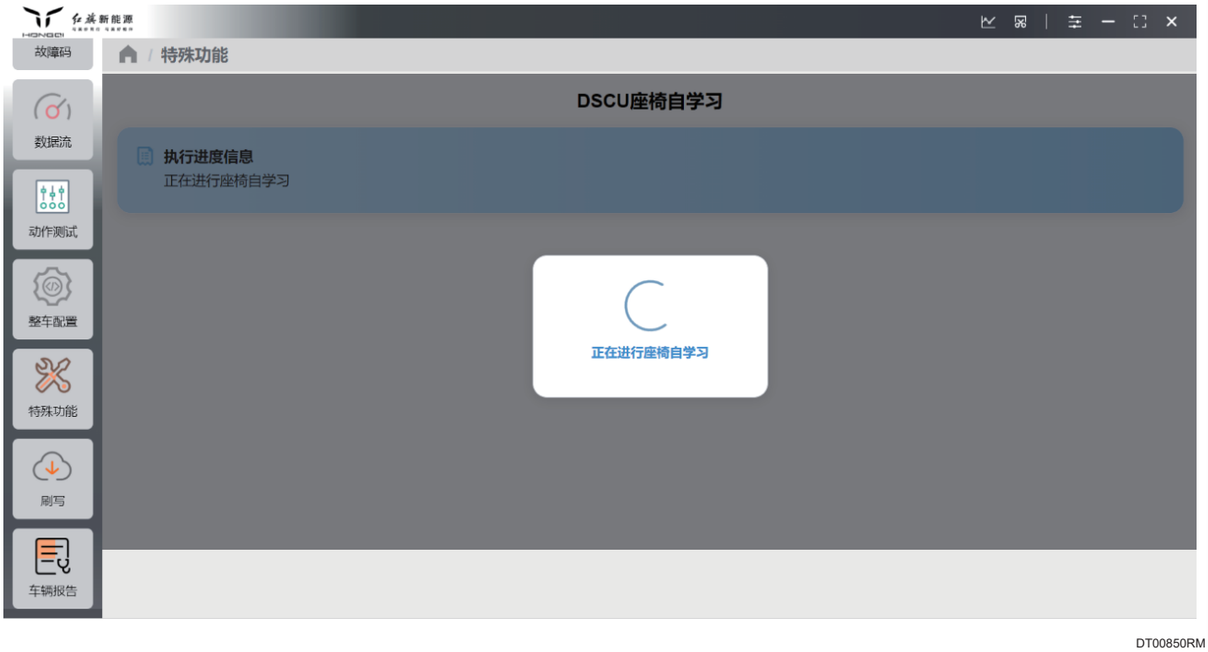
Through the GUI human-computer interface interaction of the diagnostic tester, the user clicks the DSCU seat self-learning function menu button to automatically control DSCU to trigger 4 motors to enter the self-learning state from the communication between the diagnostic tester and the ECU. Meanwhile, only 2 motors are allowed to operate to complete the seat self-learning calibration:

1. **At diagnostic session, user clicks [Seat self-learning] button on special function page to start performing the DSCU seat self-learning calibration function, and diagnostic system prompts "1. Vehicle powered on, P gear, speed is 0, ensure vehicle safety. 2. Keep the diagnostic tester connected and the computer network well connected. 3. Please make sure that the seat has no fault, the seat position is not in the limit position, and there are no obstacles in front of or behind the seat. Click "Yes" button to continue the function, click "No" button to exit the function. On the function precondition prompt box, click [Yes] button to confirm the start of function execution, and click [No] button to cancel the start of seat self-learning function execution and return to the special function sub menu page in the previous directory, as shown in screenshot below:**



DT00840RM

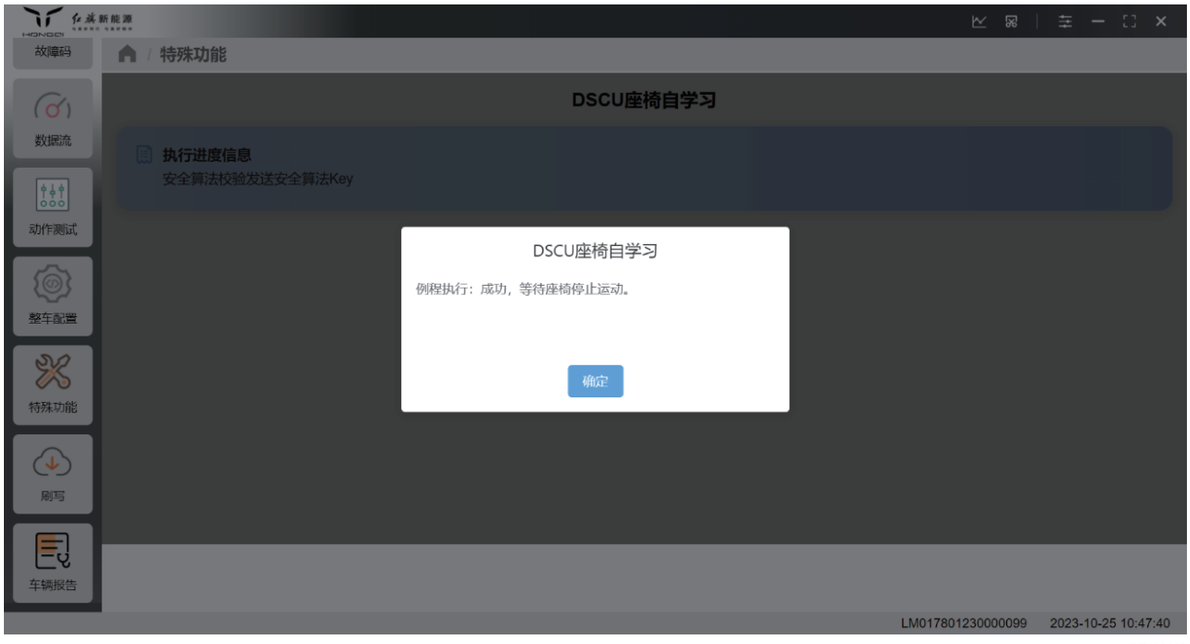
2. During the execution of seat self-learning calibration function, the page starts with the prompt "Seat self-learning is in progress", the diagnostic tester will send diagnostic services according to the diagnostic process steps corresponding to the seat self-learning calibration function in sequence, if the ECU communication is abnormal in a certain stage of diagnostic process services, or if the ECU responds negatively, or fails to respond while timeout, the GUI page of diagnostic tester will display corresponding error prompts:



DT00850RM

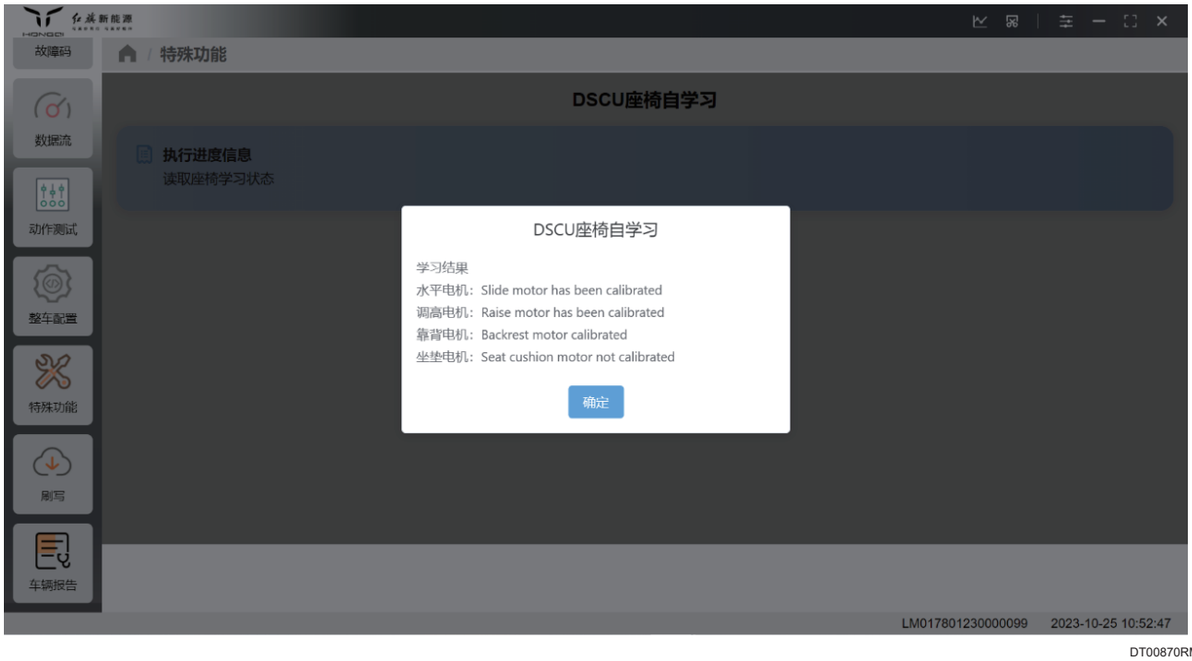
3. After the seat self-learning calibration function is executed successfully, the diagnostic tester page will prompt "Routine executed successfully, waiting for seat to stop moving." In

the prompt box, the user clicks the [OK] button to continue performing the checking seat position learning status service, as shown in the following figure:



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4. Check that the seat position learning status service is executed successfully. The learning result of DSCU driver seat learning status is as shown in the prompt box. Click the [OK] button to return to the special function menu page:

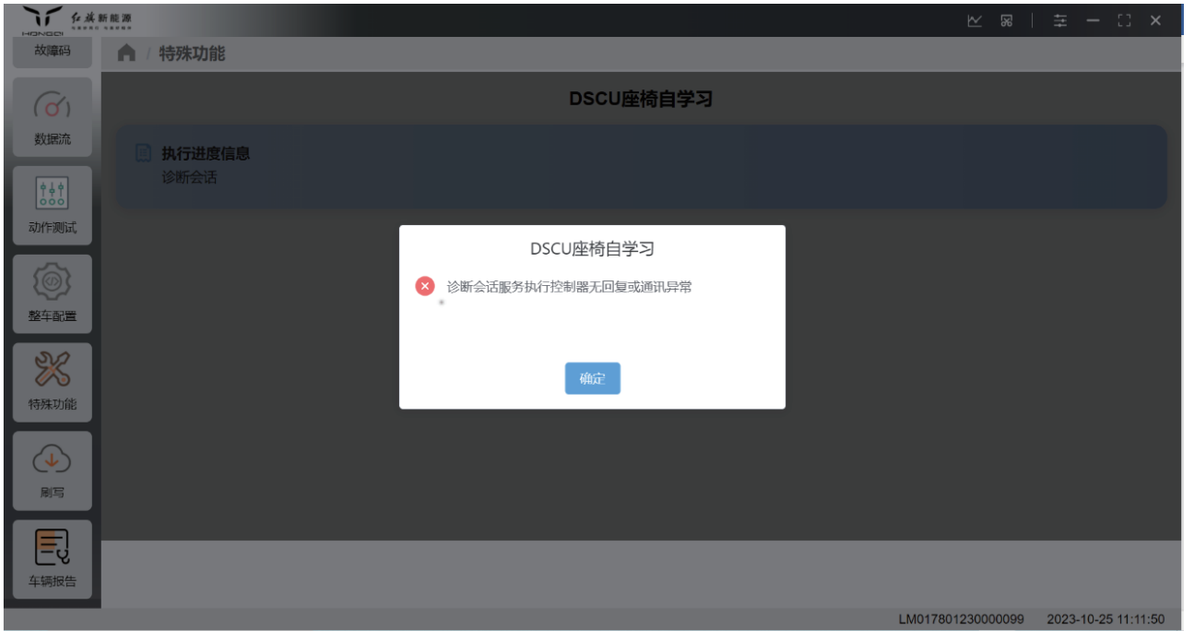


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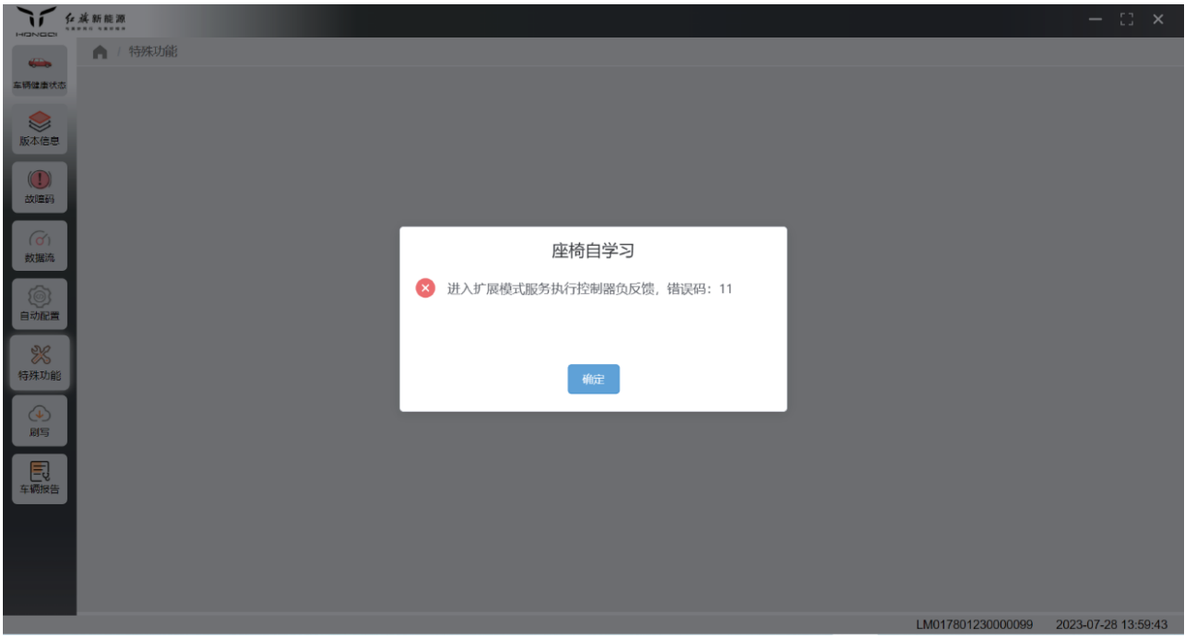
5. Example 1 of abnormal situations that occur during the execution of seat self-learning calibration function: Failure to enter extended session, no response from ECU or negative response from ECU, the diagnostic tester displays corresponding prompt "Execute

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extended mode service, and no response from controller or communication abnormal" or "Execute extended mode service, and negative response from the controller, error code: 11":

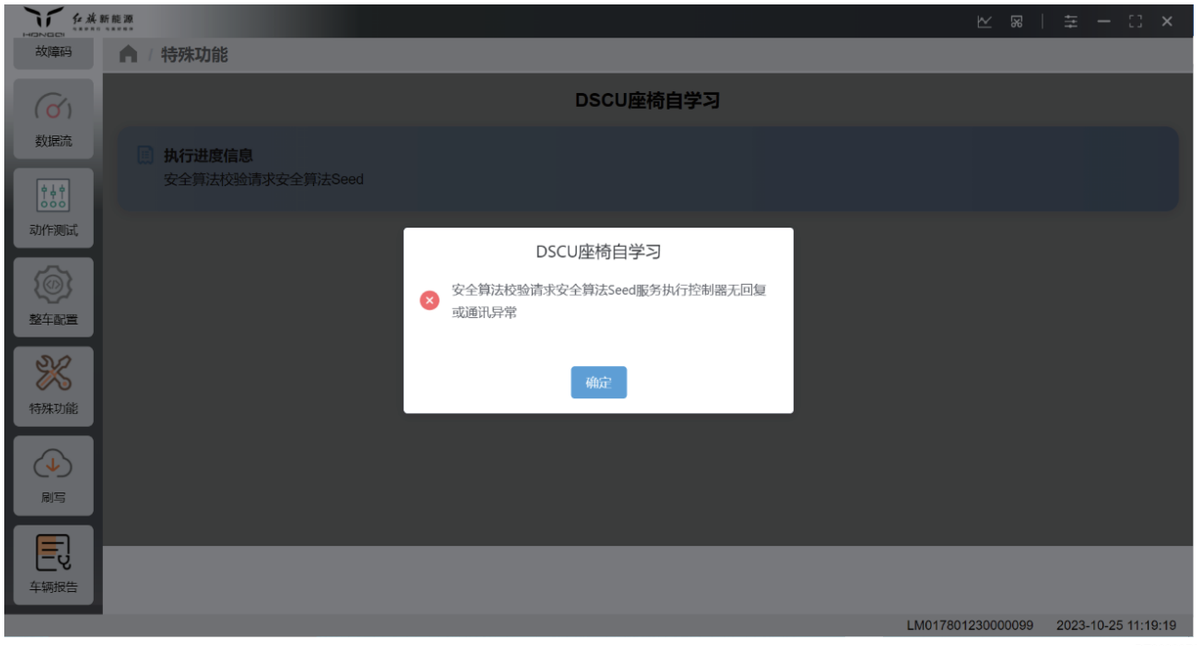


DT00880RM

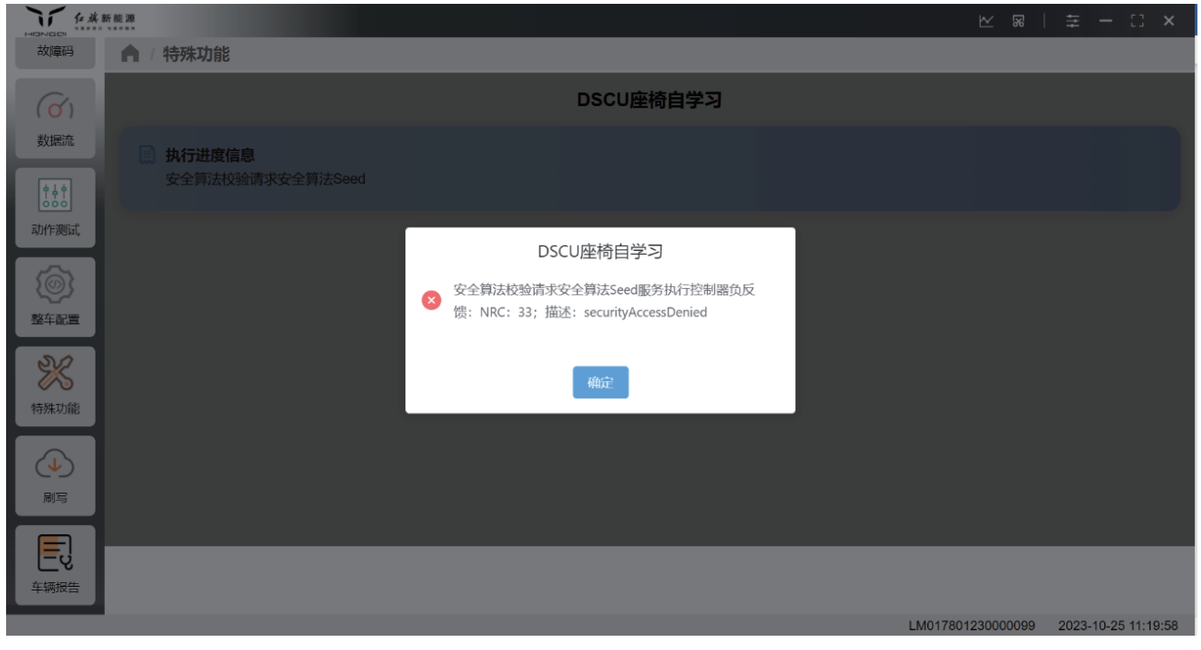


DT00890RM

6. **Example 2 of abnormal situations that occur during the execution of seat self-learning calibration function: After entering the extended session, no response from ECU or negative response from ECU during the execution of security algorithm verification service, the diagnostic tester displays corresponding prompt "Execute security verification service, and no response from controller or communication abnormal" or "Execute security verification service, and negative response from the controller, error code: 33":**



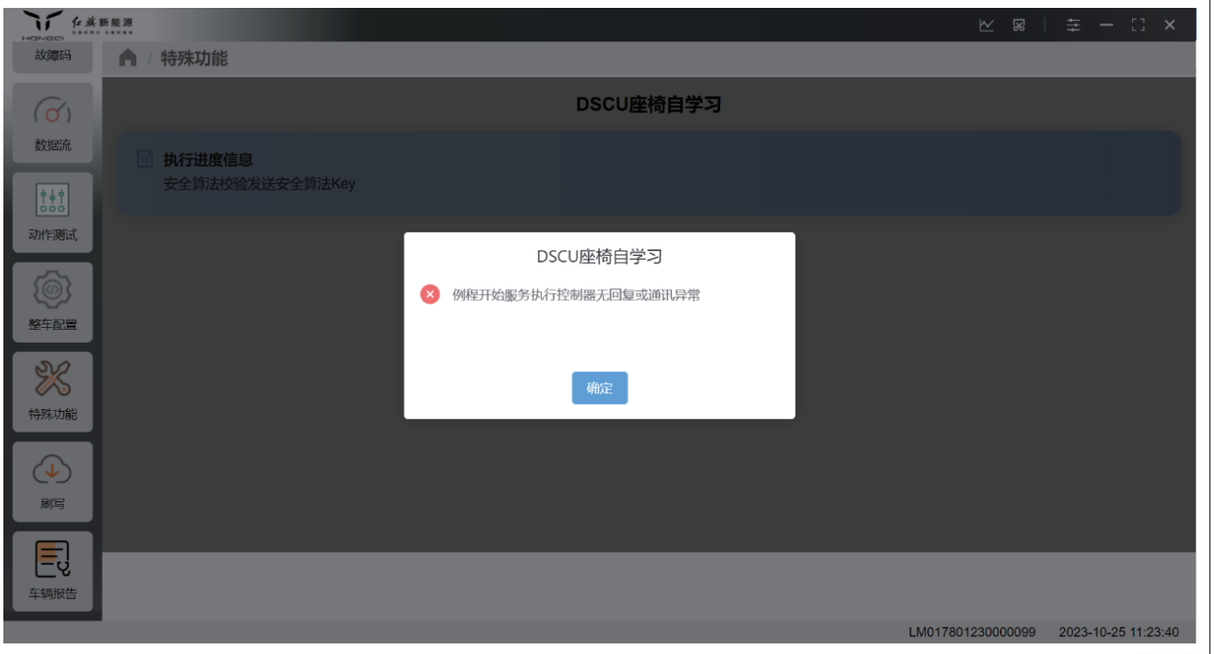
DT00900RM



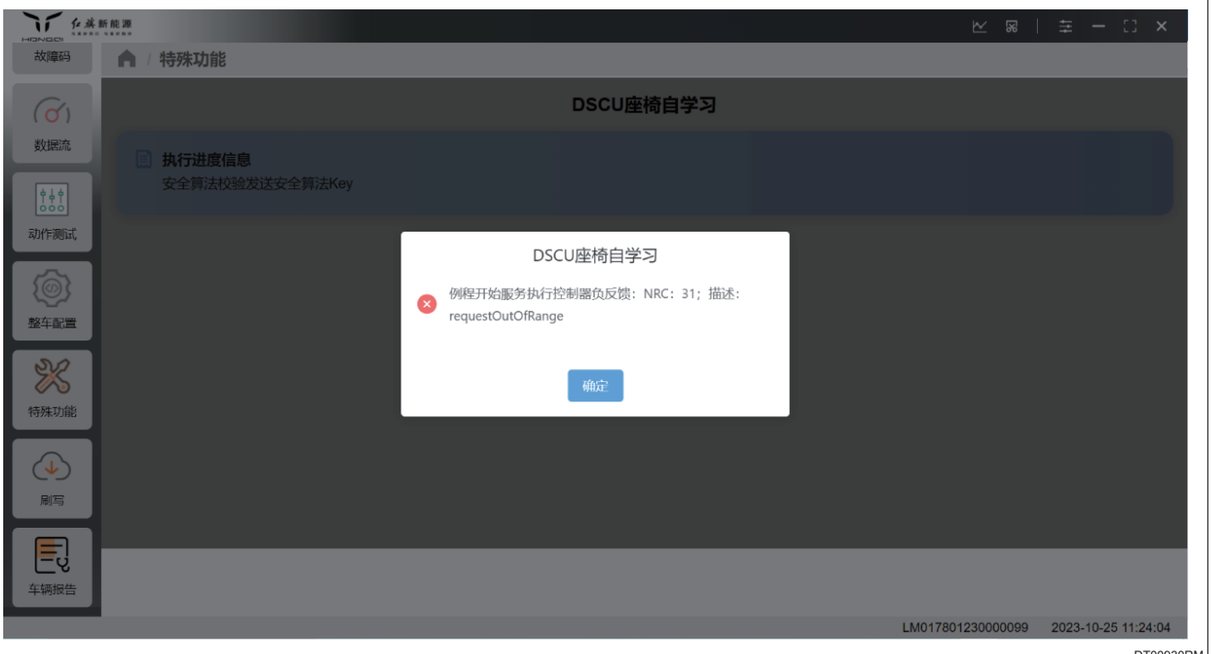
DT00910RM

7. Example 3 of abnormal situations that occur during the execution of seat self-learning calibration function: No response from ECU or negative response from ECU during the execution of seat position self-learning routine service, the diagnostic tester displays corresponding prompt "Execute routine service, and no response from controller or communication abnormal" or "Execute routine service, and negative response from the controller, error code: 31":

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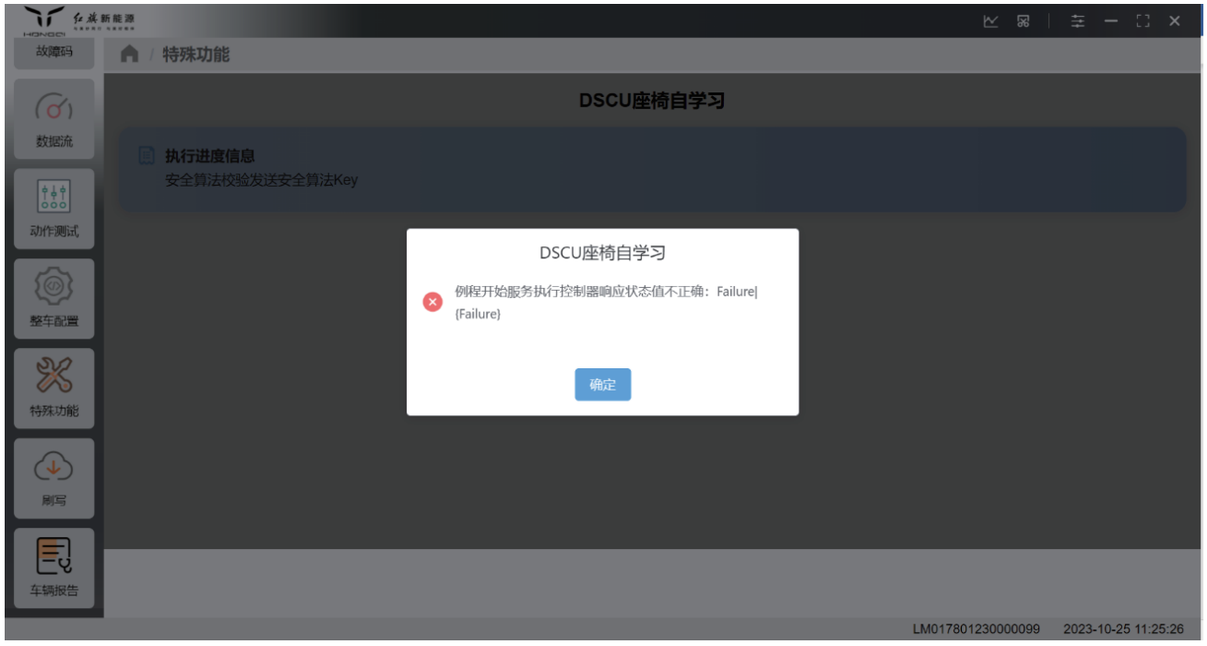


DT00920RM



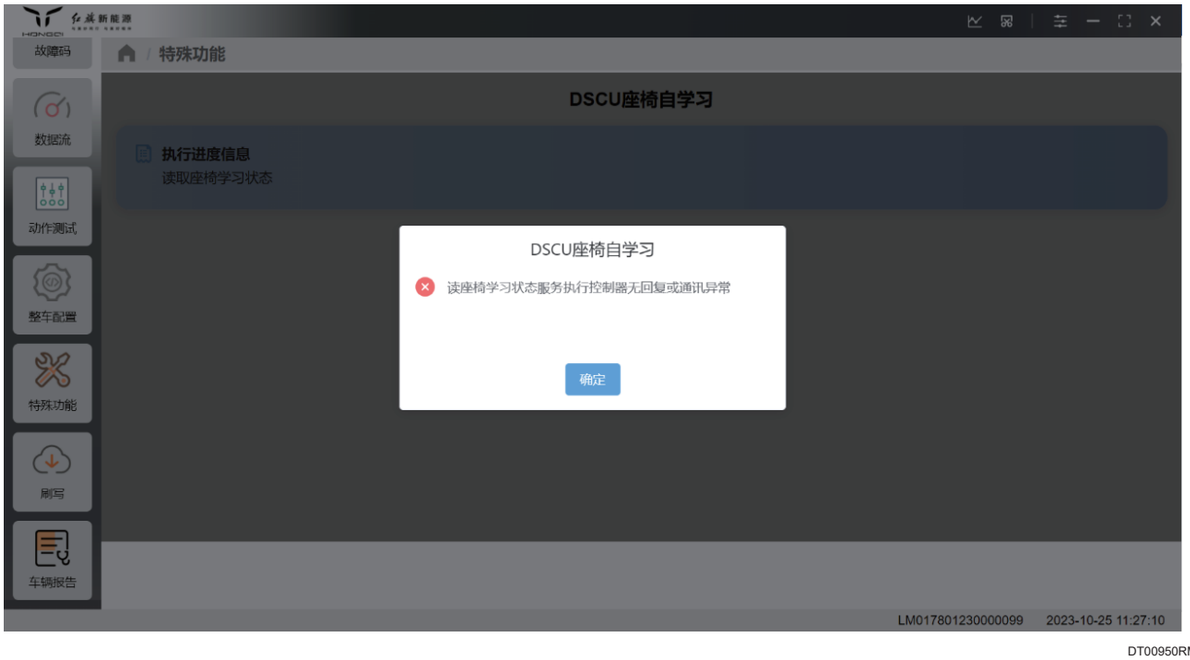
DT00930RM

8. Example 4 of abnormal situations that occur during the execution of seat self-learning calibration function: During the execution of seat position self-learning routine service, the ECU response with a calibration failure status value of 01, and diagnostic tester displays corresponding prompt "Routine execution: Incorrect response status value of controller when the routine starts service: "Failure":

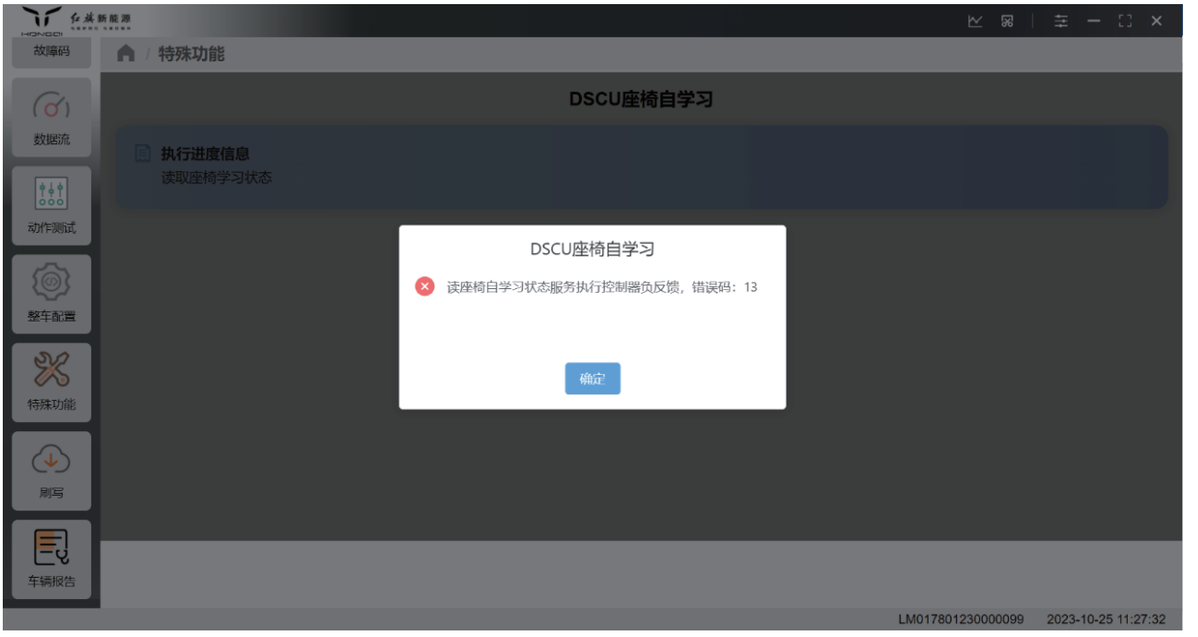


DT00940RM

9. Example 5 of abnormal situations that occur during the execution of seat self-learning calibration function: No response from ECU or negative response from ECU during the execution of seat position learning status service checking, the diagnostic tester displays corresponding prompt "Check seat position learning status service, and no response from controller or communication abnormal" or "Check seat position learning status service, and negative response from the controller, error code: 31";



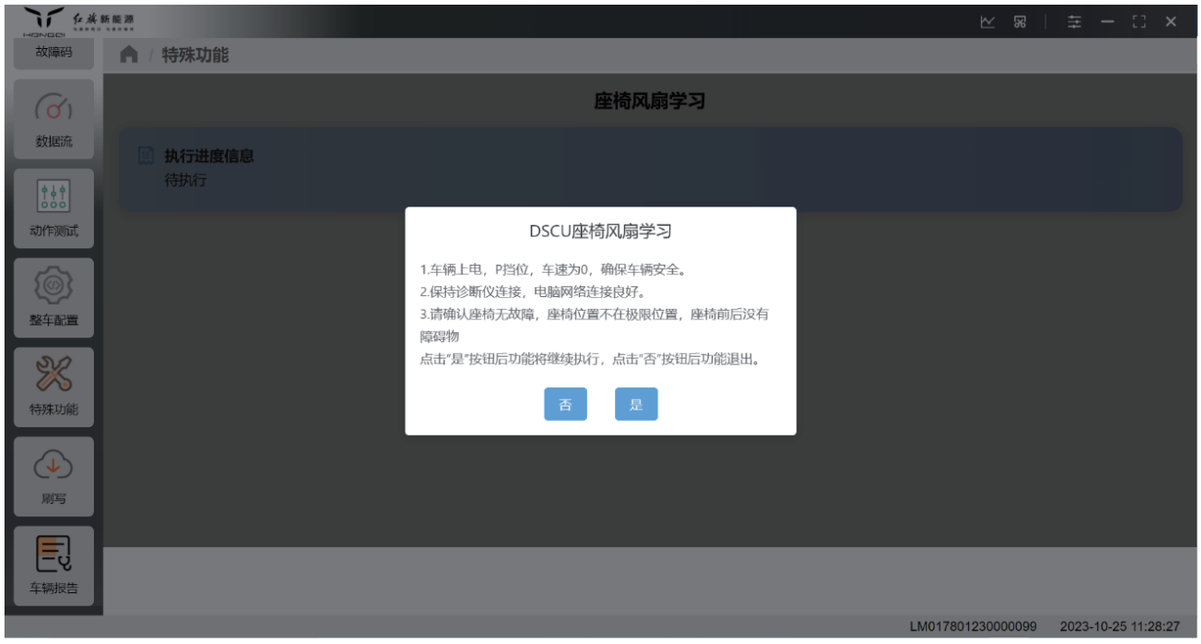
DT00950RM



Special function example 2 - DSCU driver seat fan self-learning calibration

Through the GUI human-computer interface interaction of the diagnostic tester, the user clicks the DSCU seat self-learning function menu button to automatically control DSCU to perform routine calibration from the communication between the diagnostic tester and the ECU to complete the fan self-learning calibration:

1. **At diagnostic session, user clicks [Fan self-learning] button on special function page to start performing the DSCU fan self-learning calibration function, and diagnostic system prompts "1. Vehicle powered on, P gear, speed is 0, ensure vehicle safety. 2. Keep the diagnostic tester connected and the computer network well connected. 3. Please make sure that the seat has no fault, the seat position is not in the limit position, and there are no obstacles in front of or behind the seat. After clicking the "Yes" button, the function will continue to operate. After clicking the "No" button, the function will exit. On the function precondition prompt box, click [Yes] button to confirm the start of function execution, and click [No] button to cancel the start of fan self-learning function execution and return to the special function sub menu page in the previous directory, as shown in screenshot below:**



DT00970RM

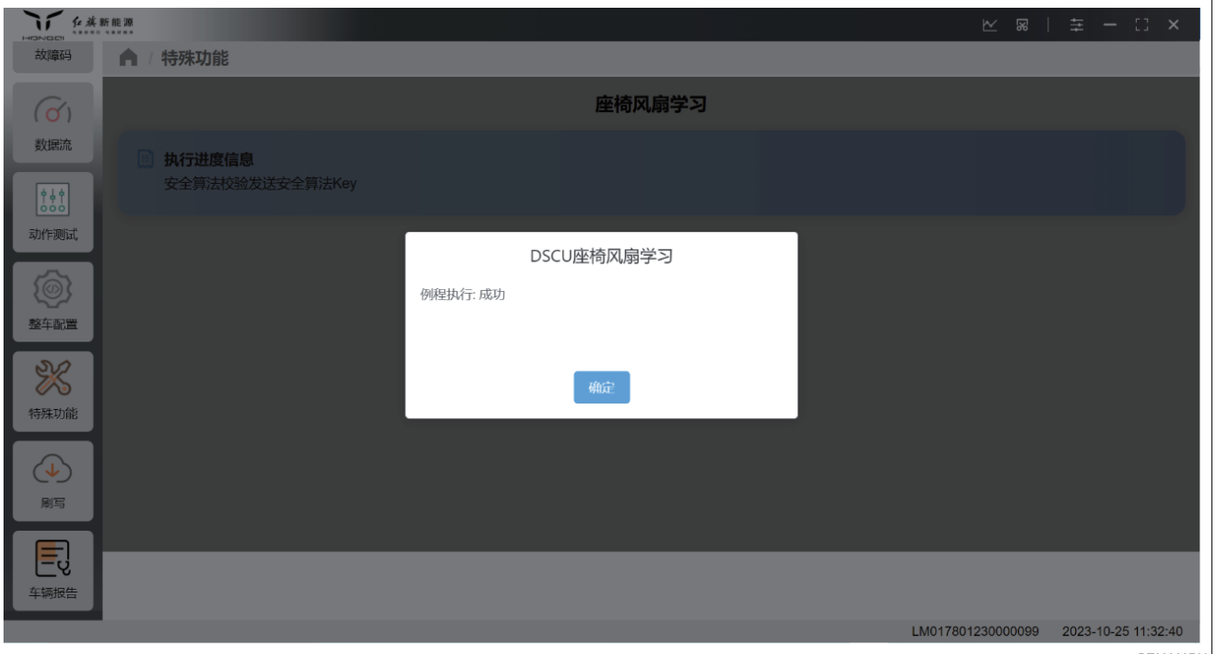
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2. During the execution of fan self-learning calibration function, the page initially prompts "Fan self-learning is being performed". The diagnostic tester will send diagnostic services in sequence according to the diagnostic process steps corresponding to the fan self-learning calibration function. At any stage of the diagnostic process service, if ECU communication is abnormal or ECU responds negatively or fails to respond after a timeout period, the diagnostic tester GUI page will display corresponding error prompts:



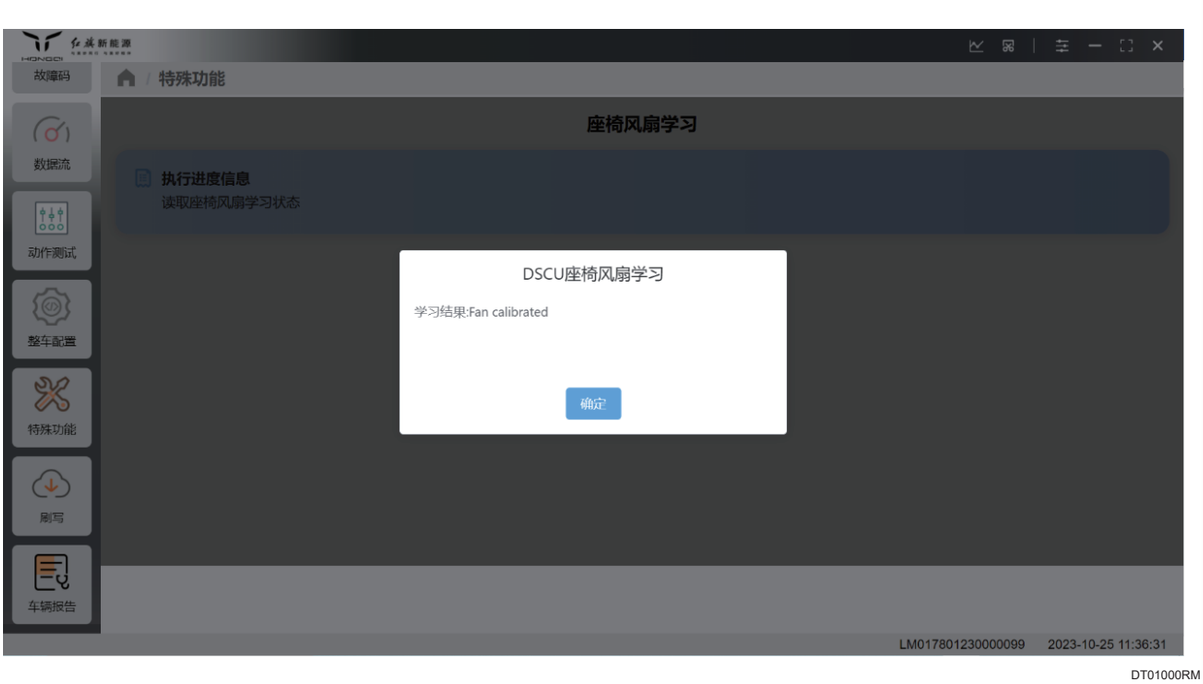
DT00980RM

3. ©After the seat self-learning calibration function is executed successfully, the diagnostic tester page will prompt "Routine executed successfully", user clicks [OK] button on prompt box to continue to check the fan position learning status service, as shown in figure below:



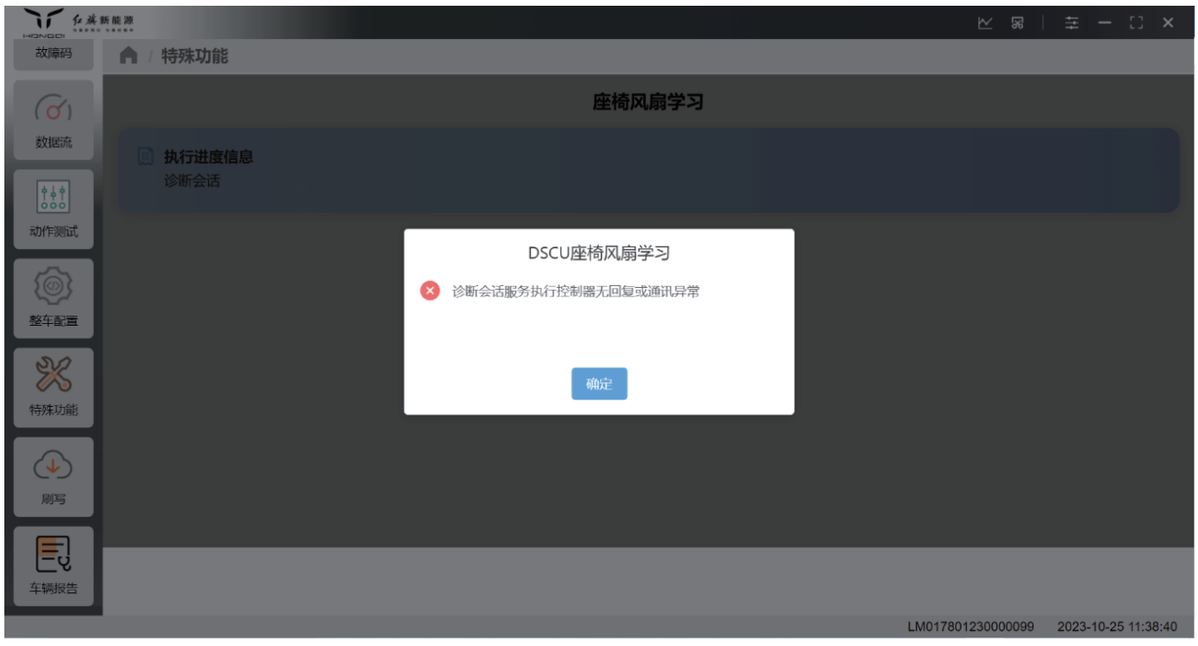
DT00990RM

4. Check the fan position learning state result "Fan calibrated", as shown in figure below:

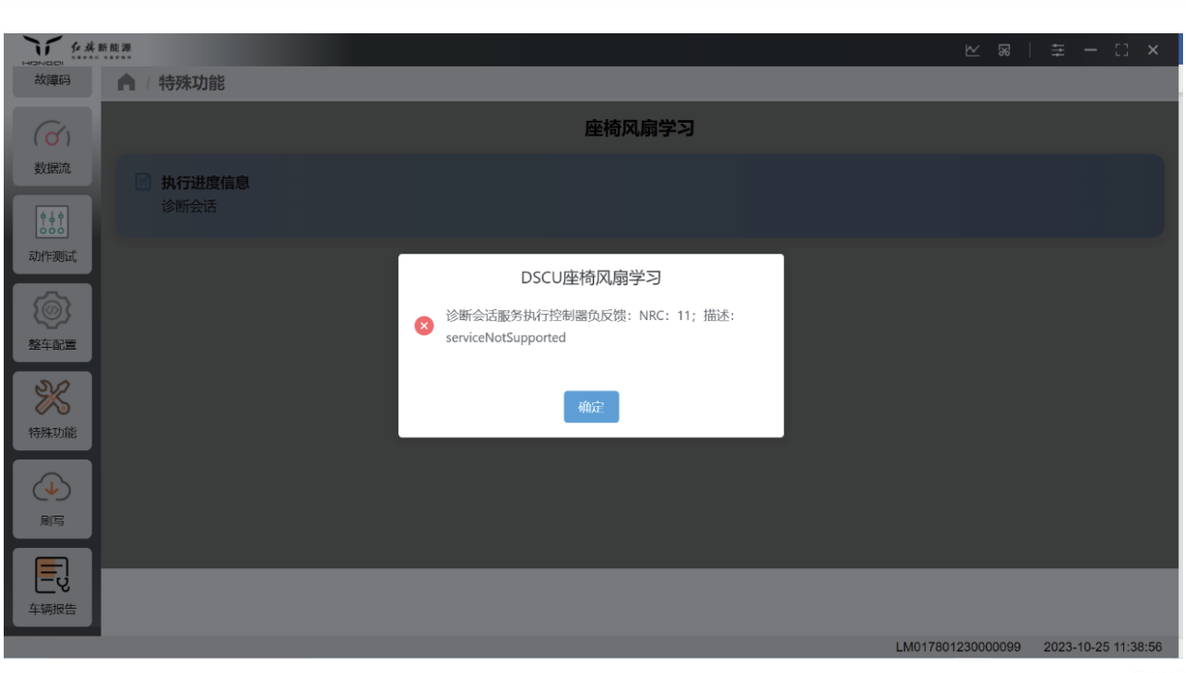


DT01000RM

5. Example 1 of abnormal situations during the execution of fan self-learning calibration function: If entering the extended session fails, and ECU does not respond or responds negatively, the diagnostic tester will display the corresponding prompt "No response from the controller after entering the extended mode service or communication is abnormal" or "Controller responds negatively entering the extended mode service, error code: 11":



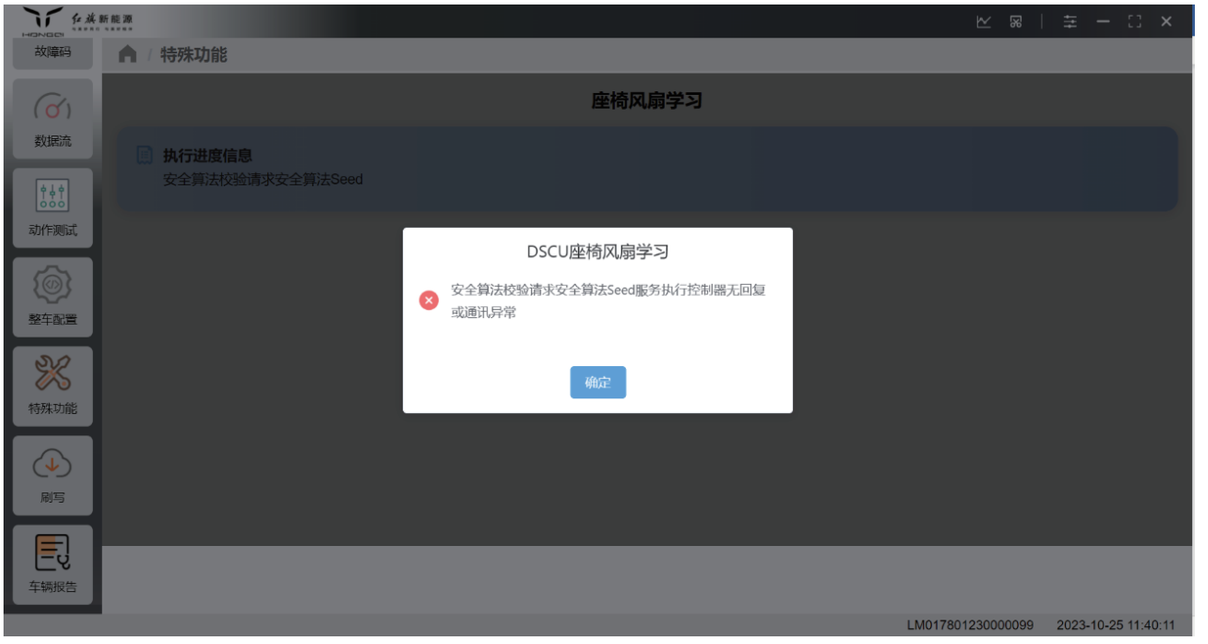
DT01010RM



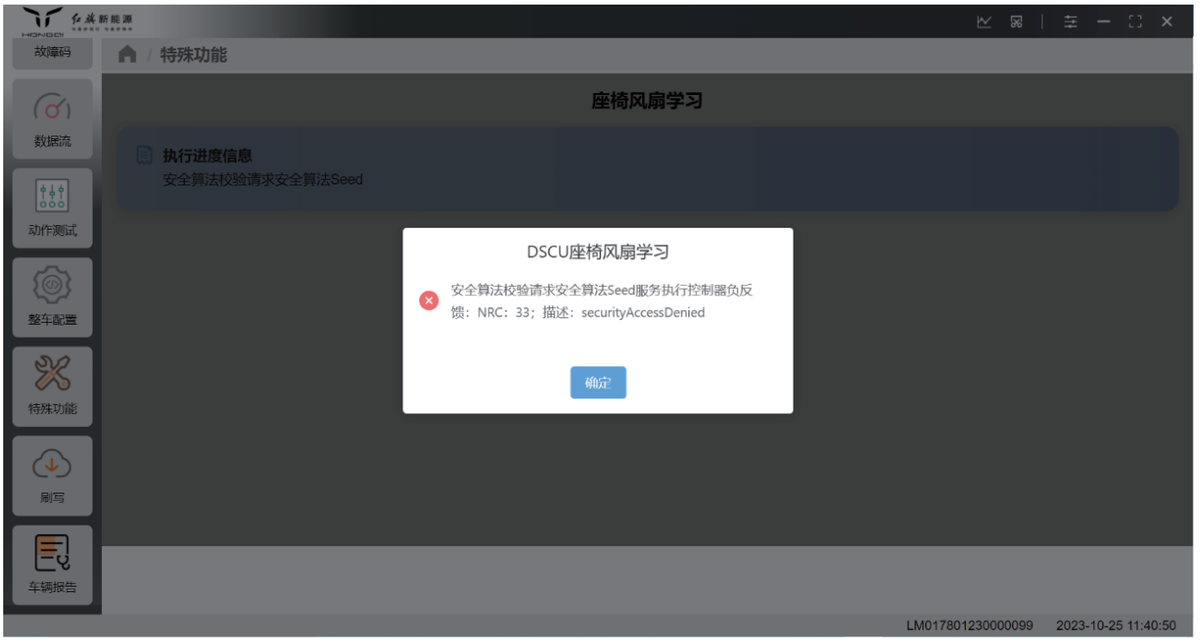
DT01020RM

6. Example 2 of abnormal situations during the execution of fan self-learning calibration function: After entering the extended session, during the execution of security algorithm verification service, if ECU does not respond or responds negatively, the diagnostic tester will display the corresponding prompt "No response from the controller after entering security verification service or communication is abnormal" or "Controller responds negatively after entering security verification service, error code: 33":

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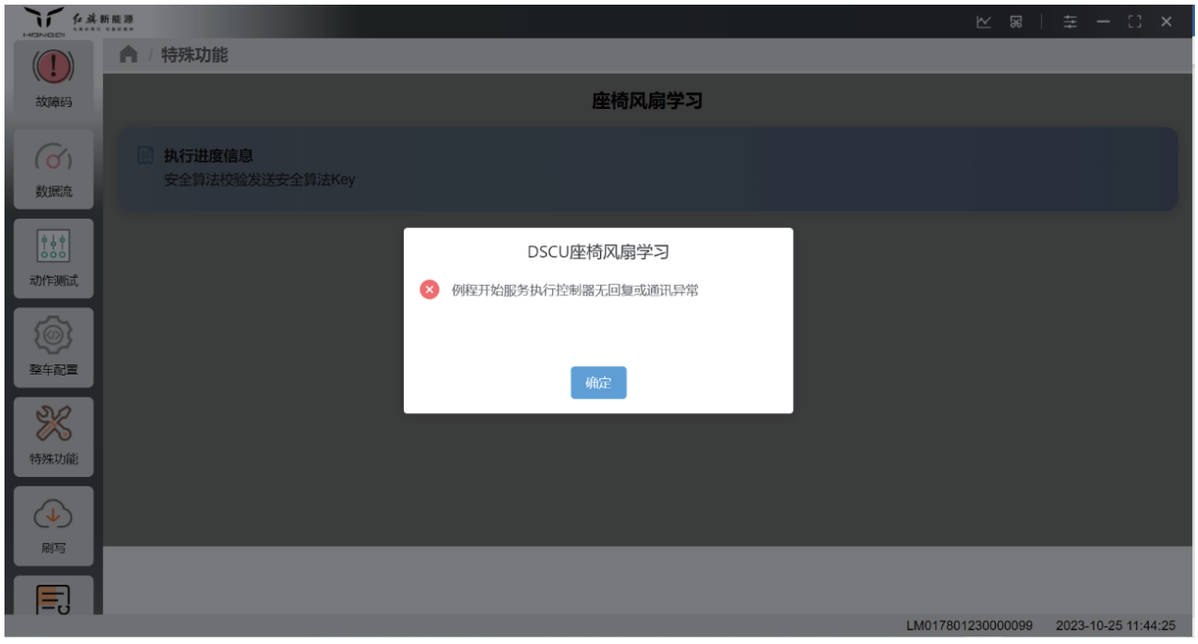


DT01030RM

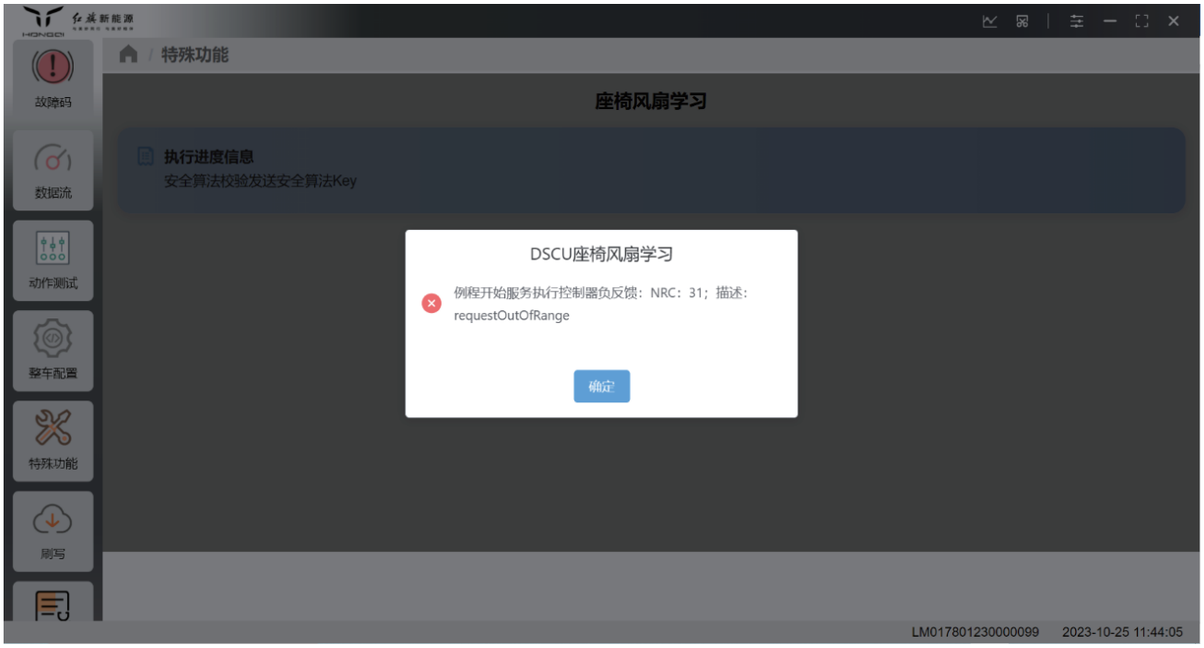


DT01040RM

7. Example 3 of abnormal situations during the execution of fan self-learning calibration function: During the execution of fan position self-learning routine service, if ECU does not respond or responds negatively, the diagnostic tester will display the corresponding prompt "No response from the controller during the execution of routine service or communication is abnormal" or "Controller responds negatively during the execution of routine service, error code: 31":

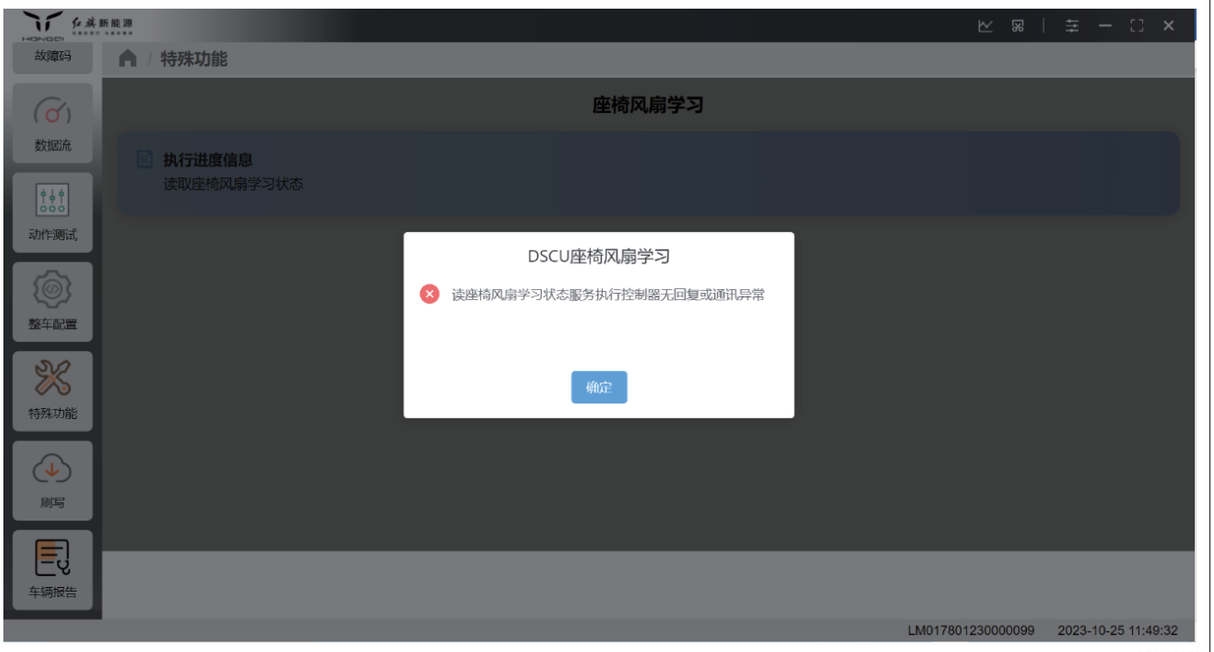


DT01050RM

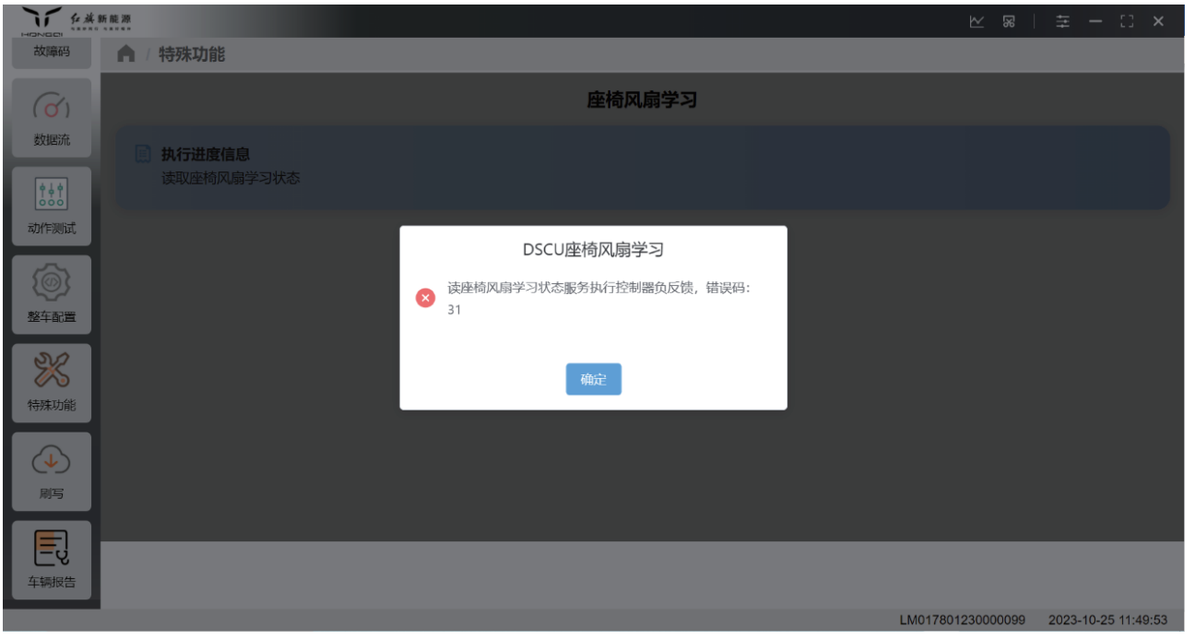


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8. Example 4 of abnormal situations during the execution of fan self-learning calibration function: During the execution of fan position learning status inspection service, if ECU does not respond or responds negatively, the diagnostic tester will display the corresponding prompt "No response from the controller during the execution of fan position learning status inspection service or communication is abnormal" or "Controller responds negatively during the execution of fan position learning status inspection service, error code: 31":



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After-sales calibration specification

Special function table for controller

Operation process of diagnostic tester for controller replacement

Corner millimeter wave radar calibration

Front millimeter wave radar calibration

ACU inertial measurement sensor calibration

AVM calibration (for L2 models)

Static calibration BD-16
Dynamic calibration BD-24

HAD visual dynamic after-sales calibration

IFC after-sales dynamic calibration

Special function table for controller

Special function table for controller				
Abbreviation of controller	**Full name of controller**	**Calibration matching content**	**Diagnostic tester path**	**Brief process**
ACU	Airbag control unit	ACU inertial measurement sensor calibration	Special function - ACU inertial measurement sensor calibration	Refer to chapter “ACU inertial measurement sensor calibration” for details
CSC	Cabin domain controller assembly	AVM calibration	Infotainment head unit operation	Refer to chapter “AVM calibration (for L2.0)” for details
		Mileage synchronization	Special function - mileage synchronization	After replacing CSC or VDC, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
DDCU	Front left door control unit	Door jam protection self-learning	Special function - DDCU door anti-pinch self-learning	After window jam protection function fails, use the diagnostic tester and perform operation according to the prompt requirements of the diagnostic tester
PDCU	Front right door control unit	Door jam protection self-learning	Special function - PDCU door anti-pinch self-learning	After window jam protection function fails, use the diagnostic tester and perform operation according to the prompt requirements of the diagnostic tester
RLDCU	Rear left door control unit	Door jam protection self-learning	Special function - RLDCU door anti-pinch self-learning	After window jam protection function fails, use the diagnostic tester and perform operation according to the prompt requirements of the diagnostic tester
RRDC-U	Rear right door control unit	Door jam protection self-learning	Special function - RRDCU door anti-pinch self-learning	After window jam protection function fails, use the diagnostic tester and perform operation according to the prompt requirements of the diagnostic tester
DK	Digital key main module	NFC card key learning deletion	Special function - NFC card key deletion learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
DSCU	Driver seat control unit	Seat self-learning	Special function - DSCU driver seat self-learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
		Fan self-learning	Special function - DSCU driver seat fan self-learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
PSCU	Front passenger seat control unit	Seat self-learning	Special function - PSCU front passenger seat self-learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
		Fan self-learning	Special function - PSCU front passenger seat fan self-learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
EBS2	Battery sensor assembly	Battery sensor ID writing	Special function - battery sensor ID writing	Use the diagnostic tester and follow the prompts on the diagnostic tester
EPS	Electric power	EPS steering angle calibration	Special function - EPS steering angle calibration	Use the diagnostic tester and follow the prompts on the diagnostic tester

Special function table for controller				
Abbreviation of controller	**Full name of controller**	**Calibration matching content**	**Diagnostic tester path**	**Brief process**
	steering control unit			
FRAD-AR	Front millimeter wave radar assembly	Front millimeter wave radar calibration	Special function - front millimeter wave radar calibration	Refer to chapter “Front millimeter wave radar calibration” for details
HAD	Advanced automatic driving controller assembly	HAD after-sales road calibration	Special function - HAD after-sales road calibration	Refer to chapter “HAD after-sales road calibration” for details
IBC	Integrated brake control assembly	Manual bleeding	Special function - IBC inflation/ bleeding	Use the diagnostic tester and follow the prompts on the diagnostic tester
IFC	Smart front camera assembly	IFC dynamic calibration	Special function - IFC dynamic calibration	Refer to chapter “IFC dynamic calibration” for details
		EDR time record	Special function - EDR event recording	Use the diagnostic tester and follow the prompts on the diagnostic tester
MCU_R	Rear motor control unit	MCU initial angle calibration	Special function - MCU_R initial angle calibration	Replace the electric drive assembly, perform operation according to the prompts from the diagnostic tester.
MCU_F	Front motor control unit	MCU initial angle calibration	Special function - MCU_F initial angle calibration	Replace the electric drive assembly, perform operation according to the prompts from the diagnostic tester.
PDCI	Intelligent area controller I	PDCF water valve self-learning	Special function - PDCF water valve self-learning	After replacing PDCI or water valve, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
		PDCF EPB left calibration	Special function - PDCF EPB left calibration	Use the diagnostic tester and follow the prompts on the diagnostic tester
PDCII	Intelligent area controller II	Anti-theft matching	Special function - anti-theft matching	After replacing PDCII, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
		Key matching	Special function - key matching	When replacing the key, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
		TPMS tire pressure calibration	Special function - TPMS tire pressure calibration	After replacing PDCII or tire pressure sensor, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
PDCIII	Intelligent area controller III	PDCR back door calibration	Special function - PDCR tailgate calibration	After replacing PDCIII or back door, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
		PDCR EPB right calibration	Special function - PDCR EPB right calibration	Use the diagnostic tester and follow the prompts on the diagnostic tester

Special function table for controller				
Abbreviation of controller	**Full name of controller**	**Calibration matching content**	**Diagnostic tester path**	**Brief process**
Radar_RL	Rear left corner millimeter wave radar assembly	Corner millimeter wave radar calibration	Special function - left corner millimeter wave radar calibration	Refer to chapter “Corner millimeter wave radar calibration” for details
Radar_RR	Rear right corner millimeter wave radar assembly	Corner millimeter wave radar calibration	Special function - right corner millimeter wave radar calibration	Refer to chapter “Corner millimeter wave radar calibration” for details
VDC	Intelligent vehicle control platform control unit	Vehicle mode switching	Special function - vehicle mode switching	Use the diagnostic tester and follow the prompts on the diagnostic tester
		SecOC counter reset	Special function - SecOC counter reset	Use the diagnostic tester and follow the prompts on the diagnostic tester
		VDC replacement parts	Special function - VDC parts replacement	After replacing VDC, use a diagnostic tester to perform operation according to the prompts on diagnostic tester
		Anti-theft matching	Special function - anti-theft matching	Use the diagnostic tester and follow the prompts on the diagnostic tester
		Mileage synchronization	Special function - mileage synchronization	Use the diagnostic tester and follow the prompts on the diagnostic tester
		Maintenance coolant filling	Special function - maintenance coolant filling	Use the diagnostic tester and follow the prompts on the diagnostic tester
		OTA software/hardware prebuilt list writing	Special function - OTA software and hardware prefabrication list writing	Use the diagnostic tester and follow the prompts on the diagnostic tester

Operation process of diagnostic tester for controller replacement

The operation procedures in the following table refer to the operation procedures that need to be carried out after replacing the new ECU module without special instructions [(before replacement), (after replacement)].

Before part replacement: Refer to the procedures that need to be performed before removing the used ECU module.

After part replacement: Refer to the procedures that need to be performed after installing the new ECU module.

Operation process of diagnostic tester for controller replacement					
Abbreviation of controller	**Full name of controller**	**Operation items**		**Diagnostic tester path**	**Brief process**
ACU	Airbag control unit	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. ACU inertial measurement sensor calibration		Special function - ACU inertial measurement sensor calibration	Refer to chapter “ACU inertial measurement sensor calibration” for details
		3. Automatic configuration		Vehicle configuration - automatic configuration - ACU automatic configuration	Write VIN, configuration code, perform mode switching
AMP	Power amplifier	1. Automatic configuration		Vehicle configuration - automatic configuration - AMP automatic configuration	Write VIN, configuration code
BMS	Battery management system	Before part replacement	Read and record the data stream "battery SOH", "battery SOC", "battery serial number", "configuration code" from original BMS.		
		After part replacement	1. Software upgrading		New part writing
			2. Automatic configuration	Vehicle configuration - automatic configuration - BMS automatic configuration	Write VIN, configuration code, SOC, SOH, sensor configuration, battery configuration, etc.
CS	Combination switch assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - CS automatic configuration	Write VIN
CSC	Cabin domain controller assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - CSC automatic configuration	Write VIN, configuration code, mileage backup
		3. AVM calibration			Manual calibration for L2 model

Operation process of diagnostic tester for controller replacement				
Abbreviation of controller	**Full name of controller**	**Operation items**	**Diagnostic tester path**	**Brief process**
DDCU	Front left door control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - DDCU automatic configuration	Write VIN, door jam protection self-learning
PDCU	Front right door control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - PDCU automatic configuration	Write VIN, door jam protection self-learning
RLDCU	Rear left door control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - RLDCU automatic configuration	Write VIN, door jam protection self-learning
RRDCU	Rear right door control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - RRDCU automatic configuration	Write VIN, door jam protection self-learning
DK	Digital key main module	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - DK automatic configuration	Write VIN, configuration code, anti-theft matching
		3. NFC card key learning deletion	Special function - NFC card key deletion learning	Use the diagnostic tester and follow the prompts on the diagnostic tester
DSCU	Driver seat control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - DSCU automatic configuration	Write VIN, configuration code, seat self-learning, fan self-learning
PSCU	Front passenger seat control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - PSCU automatic configuration	Write VIN, configuration code, seat self-learning
EBS2	Battery sensor assembly	1. Battery sensor ID writing	Special function - battery sensor ID writing	

Operation process of diagnostic tester for controller replacement				
Abbreviation of controller	**Full name of controller**	**Operation items**	**Diagnostic tester path**	**Brief process**
EPS	Electric power steering control unit	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - EPS automatic configuration	Write VIN, configuration code
		3. EPS steering angle calibration	Special function - EPS steering angle calibration	
EVCC	Charging controller assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - EVCC automatic configuration	Write VIN
LAMPDR_FL	Front left combination light driver assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
LAMPDR_FR	Front right combination light driver assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
LAMPDR_RL	Rear left combination light driver assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
LAMPDR_RR	Rear right combination light driver assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
Lamp_FL	Front left combination light assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
Lamp_FL	Front right combination light assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
Lamp_RL	Rear left combination light assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
Lamp_RL	Rear right combination light assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
FRADAR	Front millimeter wave radar assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - FRADAR automatic configuration	Write VIN, configuration code

Operation process of diagnostic tester for controller replacement					
Abbreviation of controller	**Full name of controller**	**Operation items**		**Diagnostic tester path**	**Brief process**
		3. Front millimeter wave radar calibration		Special function - front millimeter wave radar calibration	
HAD	Advanced automatic driving controller assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - HAD automatic configuration	Write VIN, configuration code
		3. HAD after-sales road calibration		Special function - HAD after-sales road calibration	
IBC	Integrated brake control assembly	1. Software upgrading			
		2. Automatic configuration		Vehicle configuration - automatic configuration - IBC automatic configuration	Write VIN and configuration code IBC inflation and deflation
ICC	Intelligent domain controller	Before part replacement	Read ICC five-digit code information from original vehicle		
		After part replacement	1. Software upgrading		New part writing
			2. Automatic configuration	Vehicle configuration - automatic configuration - ICC automatic configuration	Write VIN, configuration code, anti-theft matching, ICC battery code writing, mode switching
			3. Read ICC 5-code information	Data stream - ICC	
			4. Update vehicle ICC 5-code information through DMS system or DingTalk		
			5. Confirm certificate status	Data stream - ICC	The application for the certificate is successful and has a valid certificate
IFC	Smart front camera assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - IFC automatic configuration	Write VIN, configuration code
		3. IFC dynamic calibration		Special function - IFC dynamic calibration	
MCU_R	Rear motor control unit	1. Software upgrading			New part writing
		2. Automatic configuration		Vehicle configuration - automatic configuration - MCU automatic configuration	Write VIN, configuration code, anti-theft matching
		3. MCU initial angle calibration		Special function - MCU initial angle calibration	Write motor initial angle

Operation process of diagnostic tester for controller replacement				
Abbreviation of controller	**Full name of controller**	**Operation items**	**Diagnostic tester path**	**Brief process**
NFCE	Digital key entry module	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - NFCE automatic configuration	Write VIN, NFC card key deleting learning
PCDU	Energy conversion and distribution unit assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - PCDU automatic configuration	Write VIN, configuration code
PDCI	Intelligent area controller I	1. Software upgrading		New part writing
		2. Automatic configuration	Vehicle configuration - automatic configuration - PDCI automatic configuration	Write VIN, configuration code, PDCF water valve self-learning, PDCF EPB left calibration
PDCII	Intelligent area controller II	1. Software upgrading		New part writing
		2. Automatic configuration	Vehicle configuration - automatic configuration - PDCII automatic configuration	Write VIN, configuration code, front passenger seat ventilation fan learning, key matching, anti-theft matching, TPMS tire pressure calibration
PDCIII	Intelligent area controller III	1. Software upgrading		New part writing
		2. Automatic configuration	Vehicle configuration - automatic configuration - PDCIII automatic configuration	Write VIN, configuration code, PDCR back door calibration, PDCR EPB right calibration
Radar_RL	Rear left corner millimeter wave radar assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - Radar_RL automatic configuration	Write VIN, configuration code
		3. Corner millimeter wave radar calibration	Special function - corner millimeter wave radar calibration	
Radar_RR	Rear right corner millimeter wave radar assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - Radar_RL automatic configuration	Write VIN, configuration code
		3. Corner millimeter wave radar calibration	Special function - corner millimeter wave radar calibration	
RFR	Radio frequency transceiver assembly	1. Software upgrading (alignment version)		Confirm whether the replaced software version needs to be updated
		2. Automatic configuration	Vehicle configuration - automatic configuration - RFR automatic configuration	Write VIN

Operation process of diagnostic tester for controller replacement					
Abbreviation of controller	**Full name of controller**	**Operation items**		**Diagnostic tester path**	**Brief process**
TICU	Trailer control unit	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - TICU automatic configuration	Write VIN
BLE_and_UWB (FL/FR/RL/RR)	Digital key UWB antenna assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - BLE_and_UWB (FL/FR/RL/RR) automatic configuration	Write VIN
BLE_and_UWB_M	Digital key inner antenna	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - BLE_and_UWB_M automatic configuration	Write VIN
VDC	Intelligent vehicle control platform control unit	Before part replacement	Read VDC-821A SN from original vehicle		It is used to update the VDC SN for DMS system, and can also be obtained through the lower part of VDC component housing barcode
		After part replacement	1. Version confirmation	Version information	
			2. Software upgrading		New part writing
			3. VDC replacement parts	Special function - VDC parts replacement	Perform following operations automatically after clicking VDC replacement:
					1. Switching to factory mode
					2. Perform automatic configuration
					3. Anti-theft matching
					4. SecOC counter reset
					5. Certificate mode switching
					6. OTA initialization
					7. Mileage backup
					8. Switching to normal mode
WCM	On-board wireless charger assembly	1. Software upgrading (alignment version)			Confirm whether the replaced software version needs to be updated
		2. Automatic configuration		Vehicle configuration - automatic configuration - WCM automatic configuration	Write VIN

Corner millimeter wave radar calibration

When the radar installation angle changes due to radar replacement or bumps, the radar will not operate normally, at this time, it is necessary to perform after-sale calibration of the radar to make sure that the actual installation angle is consistent with the software compensation installation angle to ensure accurate measurement of the target position and avoid false alarms and missed alarms caused by angle installation errors.

1. **Calibration scenario: It is required to perform radar calibration when the following conditions occur in the after-sales market**

   (a) The radar reports an error and the DTCs read by the diagnostic tester indicate that the radar is not calibrated, the radar azimuthal angle (pitch angle) is calibrated incorrectly, or the calibration angle out of limit of radar azimuthal angle (pitch angle) is too large;

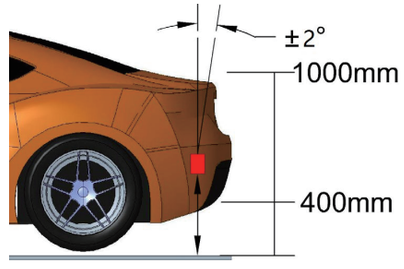
   (b) When replacing radar or relevant parts with a new one, such as replacing radar, radar bracket or bumper;

   (c) When the vehicle has been involved in a bumper-related traffic accident.

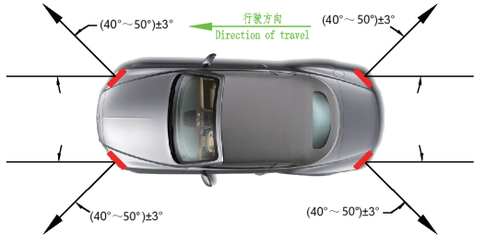
2. **Installation requirements:**

   (a) Radar installation error refers to the angle error caused by the radar mounting bracket and installation problems.

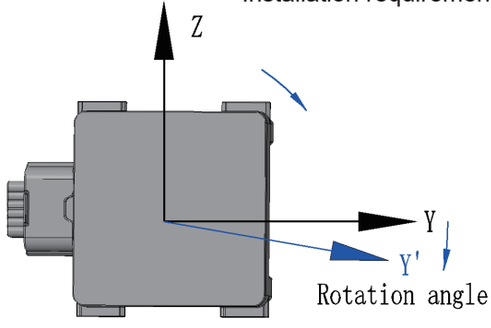
Error composition	Vertical direction	Horizontal direction	Rotation angle
Radar installation error	± 2°	± 2°	± 1.5°



Installation requirements in vertical direction



Installation requirements in horizontal direction



Rotation angle error requirements θ

BD00010RM

3. **Calibration tool: After-sales diagnostic tester**

4. **Calibration environment**

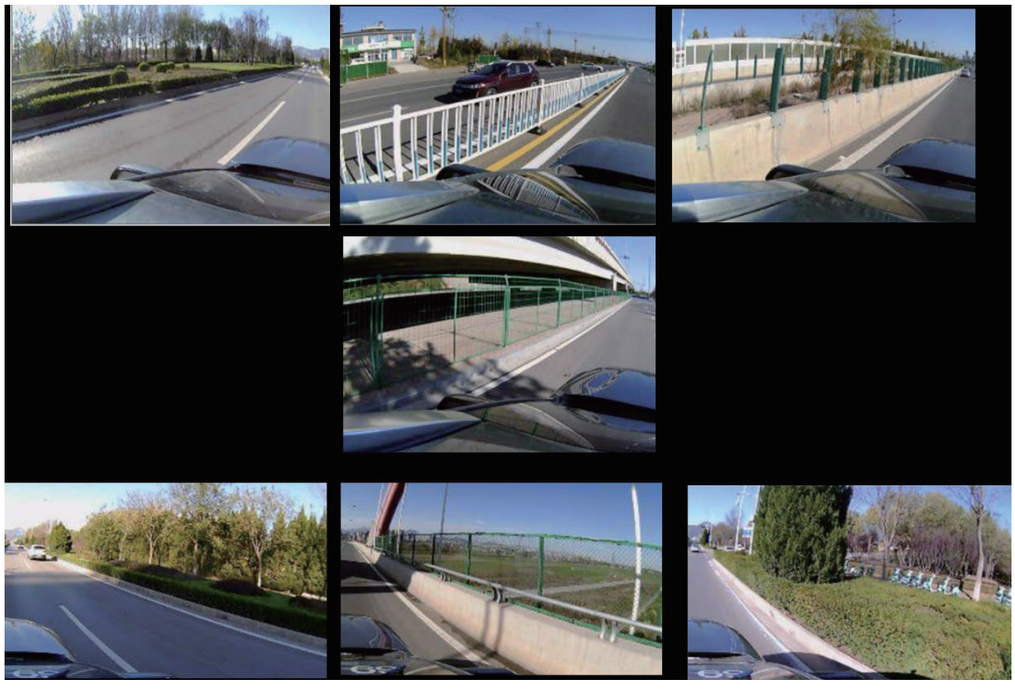
   (a) The road surface should be flat without excessive potholes or bumps. It is prohibited to calibrate on a road with a significant upward and downward slope;

(b) The road surface should free of water, snow, ice, mud and other road conditions that may cause tire slip;

(c) Avoid calibration in rainy and snowy weather;

(d) The radar surface is clean and free of water, snow, ice, mud and other covers;

(e) Select the road edge where there is stationary metal guardrail or green belt, etc., and the effective stationary point is within a lateral range of 0.5 - 8 m and a longitudinal range of less than 6 m. (Take the front left corner radar as an example, with the radar as the center, the lateral range is within 0.5 m - 8 m and the longitudinal range is less than 6 m).



BD00020RM

5. Requirements for vehicle

(a) Make sure that the four-wheel alignment is performed before radar calibration;

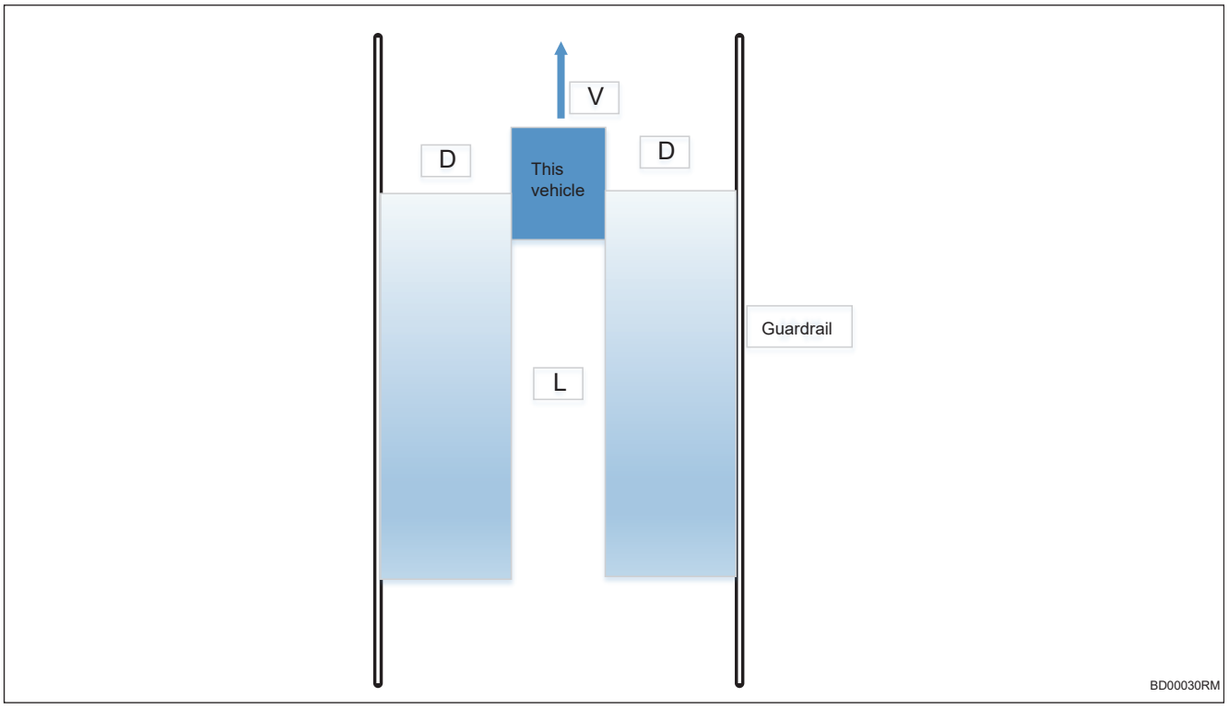
(b) Correct tire pressure.

6. Driving requirements: It is require that the vehicle is driving normally on a straight road. The radar automatically enters the calibration process when the radar receives the command to turn on after-sales calibration and the vehicle meets the following conditions. It will automatically pause when the conditions are not met, and will automatically start calibration the next time the conditions are met. Under the following conditions, the estimated time is 1-3 minutes.

(a) Turning radius of the vehicle: $\geqslant$ 1500 m;

(b) Vehicle speed is controlled between 30 - 60 km/h;

(c) There is a road edge (iron guardrail or green belt), and the effective stationary point is within a lateral D range of 0.5 - 8 m and a longitudinal L range of less than 6 m.



7. Calibration process

(a) If there is a DTC unrelated to calibration, clear it;

(b) Perform rear corner millimeter wave radar calibration with diagnostic tester and then start:

(1) The calibration environment and calibration requirements are met (the above calibration environment and driving requirements);

(2) After the calibration is completed, reading DTC can confirm whether there are any calibration-related faults.

(c) The vehicle is driven back to the after-sales service station.

8. Calibration result and exception handling

Calibration result	Possible cause	Measures to be taken
Calibration successful	-	-
Target missed	During the calibration process, if the road conditions or driving conditions do not meet the requirements, the cumulative number of valid target points required for calibration may not reach the required number	1. Check if the driving conditions (speed, yaw angle, etc.) meet the calibration requirements 2. Check if the road conditions and surrounding environment meet the calibration requirements during vehicle driving 3. According to the calibration requirements, after confirming that there are no problems with the driving status and road conditions, trigger the after-sales calibration process again
Azimuthal angle out of limit (deviation)	Cumulative error of azimuthal angle installation is out of range	Use a spirit level to check the azimuthal angle installation error

Front millimeter wave radar calibration

Determine the deviation between radar antenna axis and vehicle driving axis in horizontal and vertical directions, then compensating the deviation by algorithm to make them overlap or within an allowable range, to ensure that the calibrated radar can meet the relevant functional requirements after radar replacement, vehicle collision and other situations that need to be recalibrated in the aftermarket.

1. **Calibration scenario: It is required to perform radar calibration when the following conditions occur in the after-sales market**
   (a) Radar replacement;
   (b) Vehicle collision, etc.
2. **Calibration environment: When performing dynamic driving calibration SDA, the environmental requirements are as follows**
   (a) The radar surface is clean and free of snow, ice, mud and other covers;
   (b) Avoid calibration in extreme weather such as rain and snow;
   (c) There should be a certain number of stationary metal objects on both sides of the road, such as street light posts, road guardrails, road signs, etc., and it is recommended to choose closed roads with metal railings if possible;
   (d) The road surface should be flat without excessive potholes or bumps. The road surface should free of snow, ice, mud and other road conditions that may cause tire slip.



BD00040RM

3. **Driving condition requirements**
   (a) After dynamic driving calibration is started, the vehicle must be driven under certain conditions before finishing dynamic driving calibration. The driving conditions for dynamic driving calibration are as follows:

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限制条件 Constraint	阈值 Value	超差提示 Warning if not match
最小车速 **Minimum Velocity**	10 km/h	车速过低 ego velocity too slow
最大车速 **Maximum Velocity**	250 km/h	车速过高 ego velocity too fast
最小纵向加速度 **Minimum longitudinal acceleration**	-5.0 m/s^2	纵向加速度过小 longitudinal acceleration too small
最大纵向加速度 **Maximum Longitudinal acceleration**	5.0 m/s^2	纵向加速度过大 longitudinal acceleration too large
最大横摆角速度 **Maximum Yaw Velocity**	±0.1 rad/s	横摆角速度过大 Yaw velocity too large
反射点数量 **Location number**	n.a	反射点数量不满足 Location number not sufficient

BD00050RM

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4. Calibration process

(a) Before starting calibration, ensure that the calibration status of vehicle yaw rate sensor, steering wheel angle sensor and wheel speed sensor are normal, and vehicle has no other DTCs other than radar calibration;

(b) Ensure that the radar, covering parts or bumper are correctly installed, check vehicle conditions such as fluid, tire pressure, seats, etc., and ensure the safety of driving on public roads;

(c) Establish communication between diagnostic tester and vehicle, start the after-sales calibration service via diagnostic tester, and select front millimeter wave radar calibration on diagnostic tester;

(d) Keep the communication between diagnostic tester and vehicle, and drive according to requirements of driving behavior listed in table above until diagnostic tester displays the calibration is completed;

(e) If single dynamic driving calibration is not successful after more than 30 minutes, please check if calibration environment, driving behavior, installation position, etc. comply with the relevant requirements correctly, and repeat the above steps after confirmation;

(f) If the diagnostic tester displays that the radar offset angle is too large after driving for a period of time, please check radar installation position and environment, and perform adjustment accordingly, and repeat the above steps after confirmation.

5. Radar calibration failure description: SDA calibration may fail if following conditions occur

(a) Driving conditions always do not meet the requirements: Peripheral reference objects, road conditions;

(b) Communication between diagnostic tester and vehicle body is interrupted during calibration.

(c) Installation deviation of radar is too large.

ACU inertial measurement sensor calibration

When installing the airbag controller integrated with an inertial measurement unit to the vehicle, the angle between the airbag controller and the horizontal plane will affect the output value of the inertial measurement unit, especially the acceleration. Inertial measurement unit vehicle calibration can improve the accuracy of acceleration and angular velocity values, and adjust the output value according to the actual installation situation of the vehicle. The adjusted output value can reflect the actual dynamic situation of the vehicle. The inertial measurement unit signals that have not undergone the vehicle calibration are not allowed to be used directly.

1. **The following prerequisites must be met before calibrating the inertial measurement sensor:**
   (a) The vehicle to be calibrated should be placed in a horizontal position without external interference;
   (b) Airbag controller should be installed on a horizontal plane, with a deviation of no more than ± 3° in any direction;
   (c) The vehicle to be calibrated has no external loads such as personnel and remains stationary. There is no operator inside the vehicle during calibration;
   (d) The inertial measurement unit has no faults;
   (e) Vehicle speed signal is normal;
   (f) During calibration, the airbag controller should remain power supply status.
2. **Calibration tool: After-sales diagnostic tester**
3. **Calibration process**
   (a) After the vehicle meets the calibration prerequisites, connect the diagnostic tester, and select "ACU Inertial Measurement Sensor Calibration" in the "Special Function" of the diagnostic tester for calibration;
   (b) In general, all calibration processes take 5-10 seconds;
   (c) If the calibration conditions are not met, it is required to check the causes and recalibrate until it is successful.

AVM calibration (for L2 models)

Static calibration

1. Calibration premise (AVM): Precondition check for calibration

(a) Confirm the connection status of the camera (check the vehicle DTCs and confirm that there are no faults related to the panoramic camera);

(b) Check the appearance of the camera for dirt or moisture. If there are any problems, clean them before proceeding with calibration;

(c) Check the installation position of the camera for looseness or shaking. If the position of the camera changes, it will cause calibration timeout or failure;

(d) Check if tire pressure of vehicle is normal, and make sure that the vehicle posture is stable;

(e) Check vehicle load, and make sure that vehicle is in an unloaded state;

(f) Check door status, and make sure that four doors of vehicle are closed;

(g) Check the status of the front compartment cover and luggage compartment, and ensure that front compartment cover and luggage compartment are closed;

(h) Check the status of the rear view mirror, and ensure that the rear view mirror is not in the folding status and is fully unfolded;

(i) Check gear position of vehicle, and make sure that gear position is in P and vehicle is stationary;

(j) Check headlight, and confirm that the high beam light and low beam light are in off status;

(k) Check that calibration area is not obstructed by any persons/objects.

2. Calibration environment;

(a) Minimum area for site requirement to be calibrated for AVM system is 5.5 m * 9.3 m;

(b) There are color blocks of black and white checkerboard pattern on the calibration cloth, consisting of four areas (A, B, C, D), with the dimensions of each part referring to the figure below;

(c) Light intensity: Between 300 - 1000 lux;

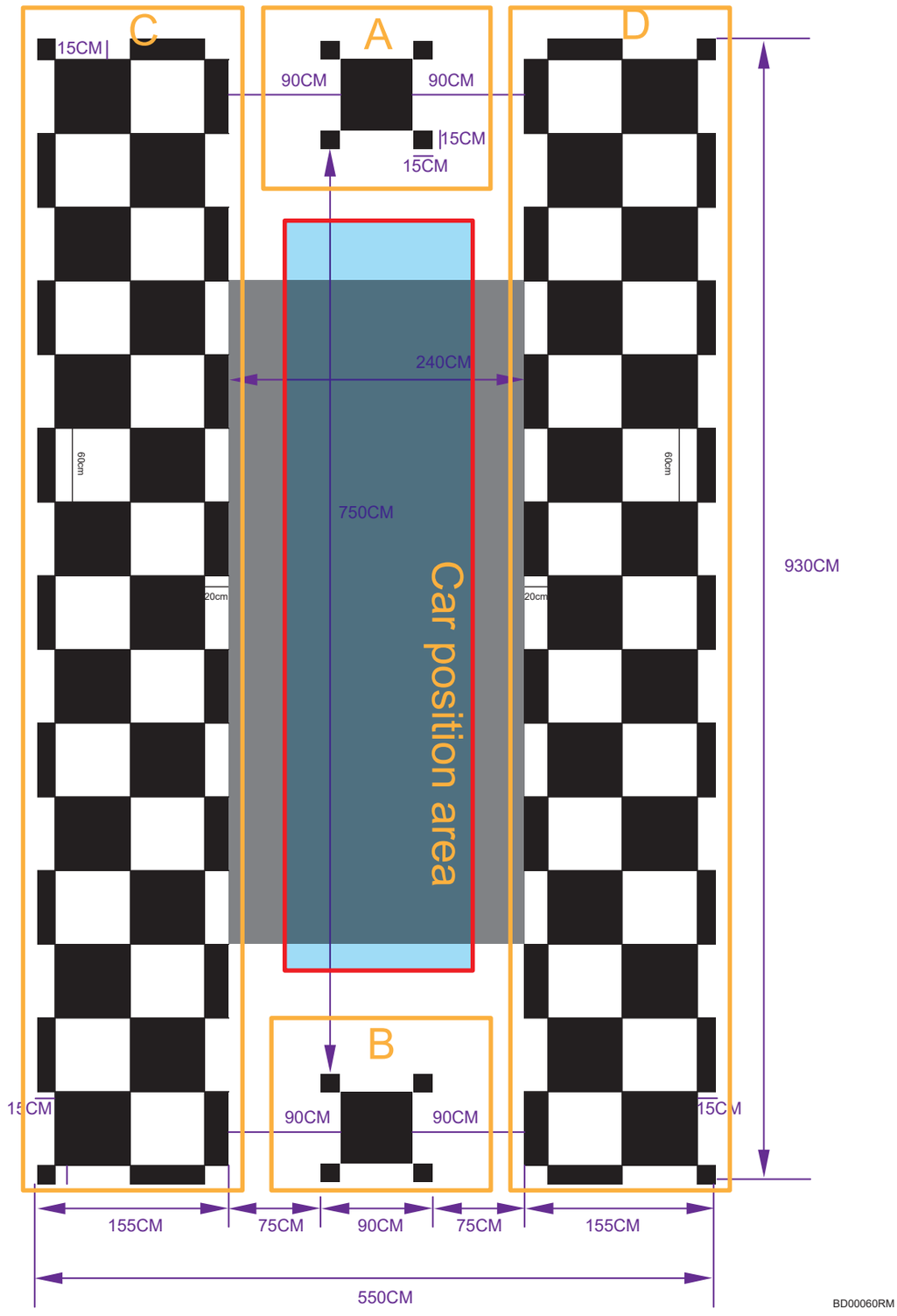
(d) Light distribution: Uniform light, no direct strong light on the camera, no obvious light spots and shadows on the ground;

(e) Ground flatness: For any two points within the calibration pattern area, the deviation in ground height shall not exceed 3mm;

(f) Ground reflectance requirements: The ground surface should be coated with a matte-finish material to eliminate any mirror-like reflections;

Notice:

When laying calibration cloth for calibration, it is necessary to ensure that the calibration cloth is flat, free of pollution, unblocked and not inclined.



3. Requirements for vehicle parking condition

(a) Park the vehicle according to the designated positions in the figure below;

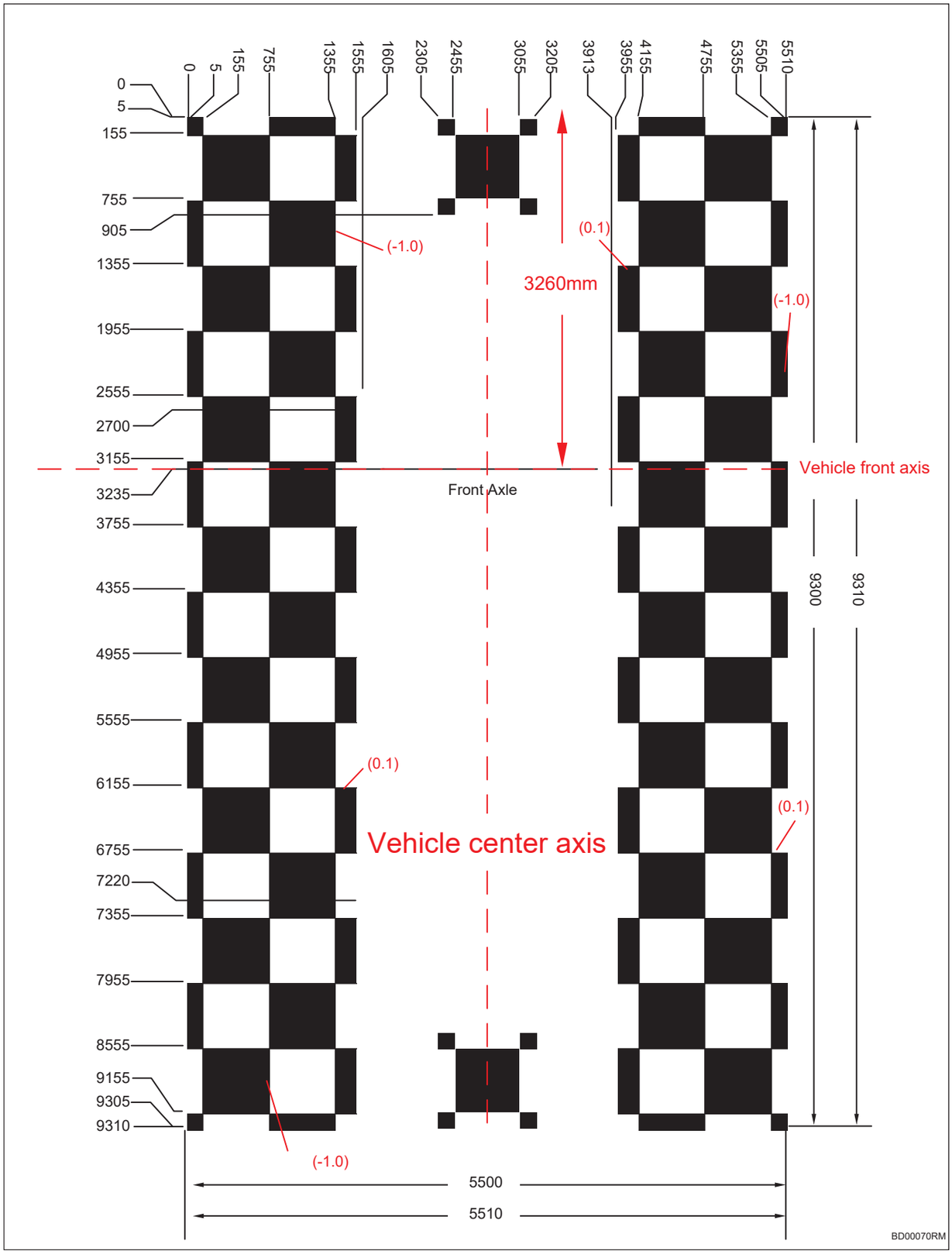
(b) Left-right direction of vehicle: It is located in the center of the calibration pattern;

(c) Front-rear direction of vehicle: the center of front axle of the vehicle is 3260 mm away from the edge of the black lattice;

(d) Vehicle parking deviation (lateral): ± 50 mm;

(e) Vehicle parking deviation (longitudinal): ± 50 mm;

(f) Vehicle parking angle deviation: ± 2 deg.



4. Calibration process

(a) Click panoramic view monitor soft switch to enter panoramic view monitor screen. As shown in the illustration: BD00080RM;

(b) Click four times in a row in the lower left corner of panoramic view interface single view area to enter the factory mode interface. As shown in the illustration: BD00090RM;

(c) Click "Auto Calib" button in factory mode interface. As shown in the illustration: BD00100RM;

(d) Click the "Start" button. As shown in the illustration: BD00110RM;

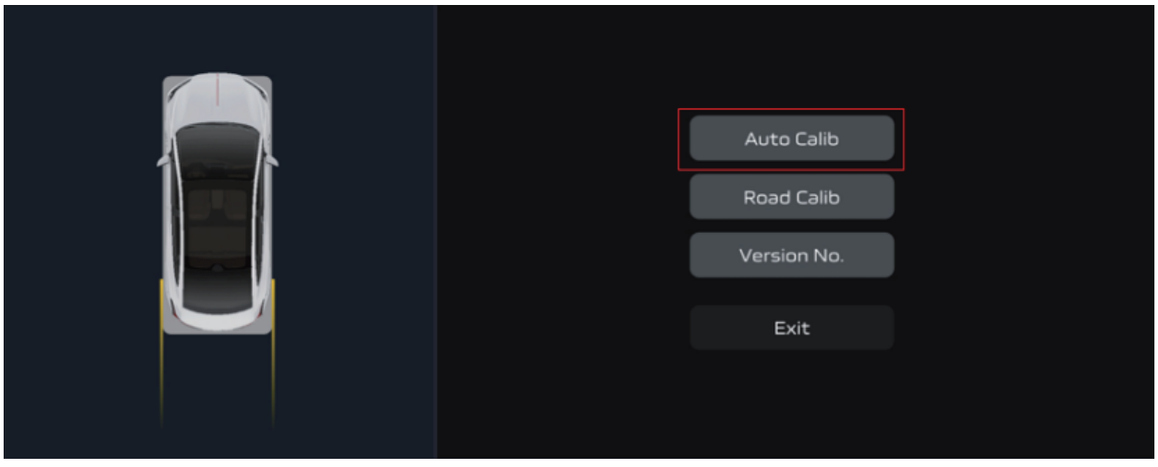
(e) Enter the calibration, and wait for calibration to complete. As shown in the illustration: BD00120RM;



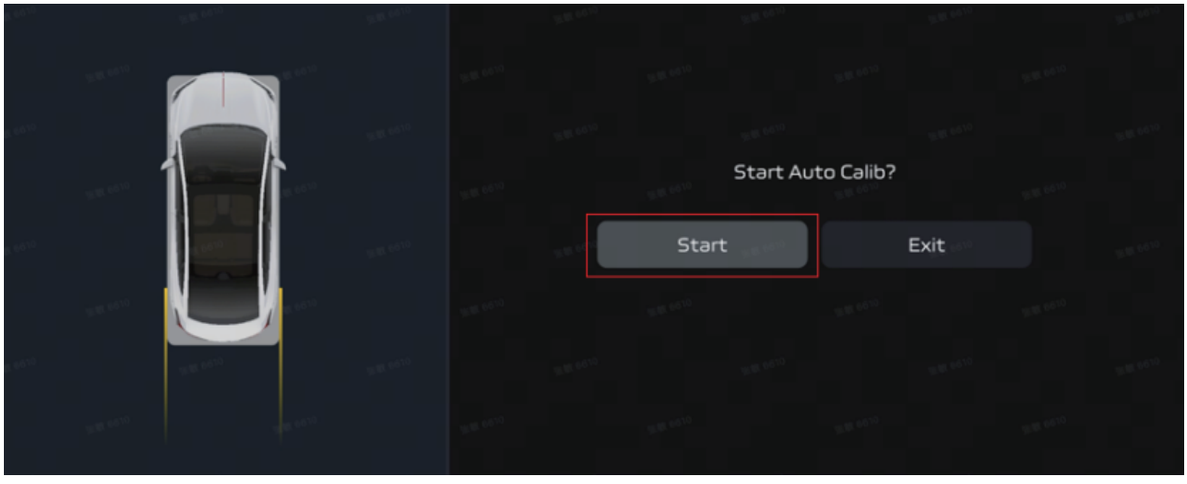
BD00080RM



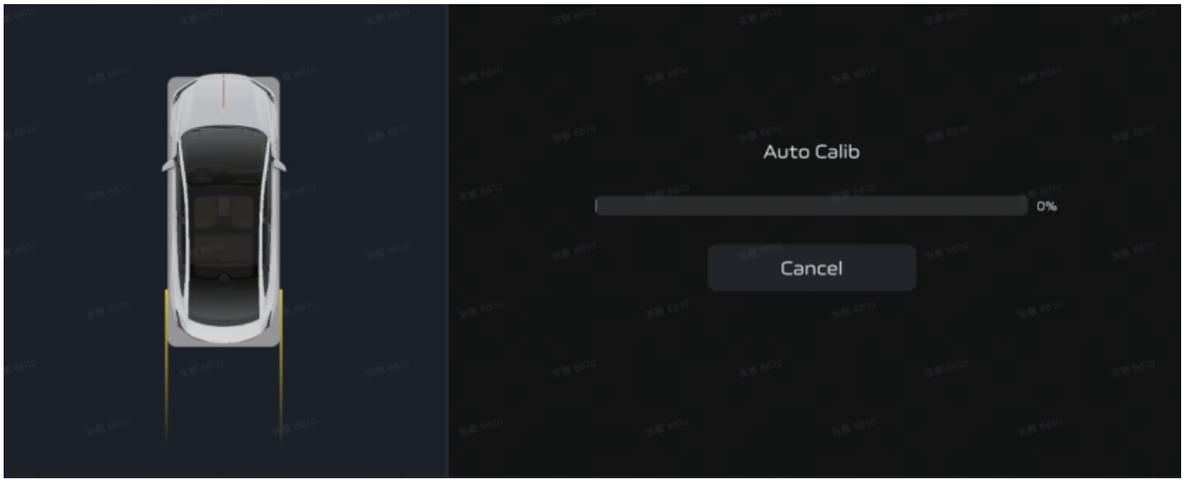
BD00090RM



BD00100RM



BD00110RM

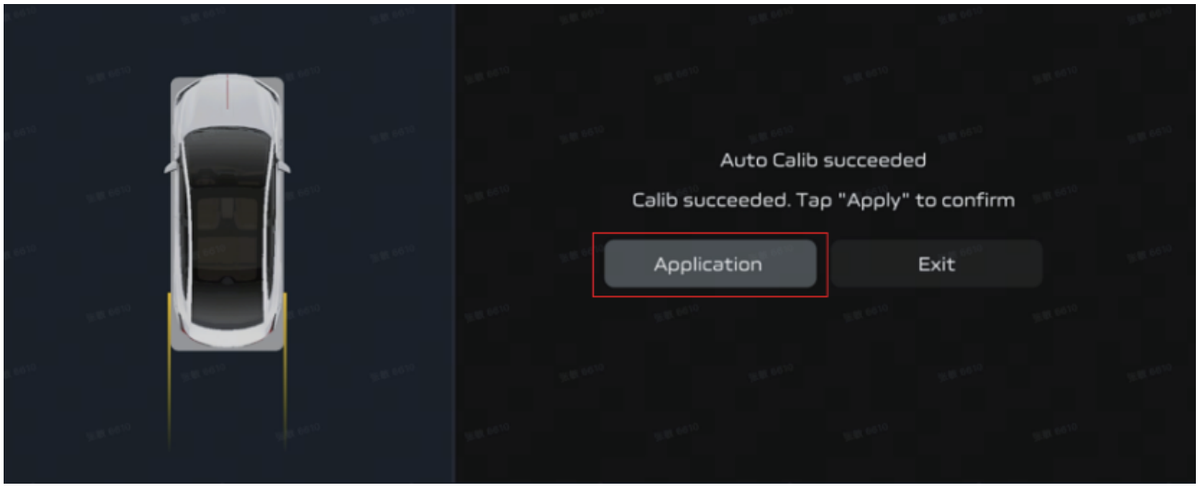


BD00120RM

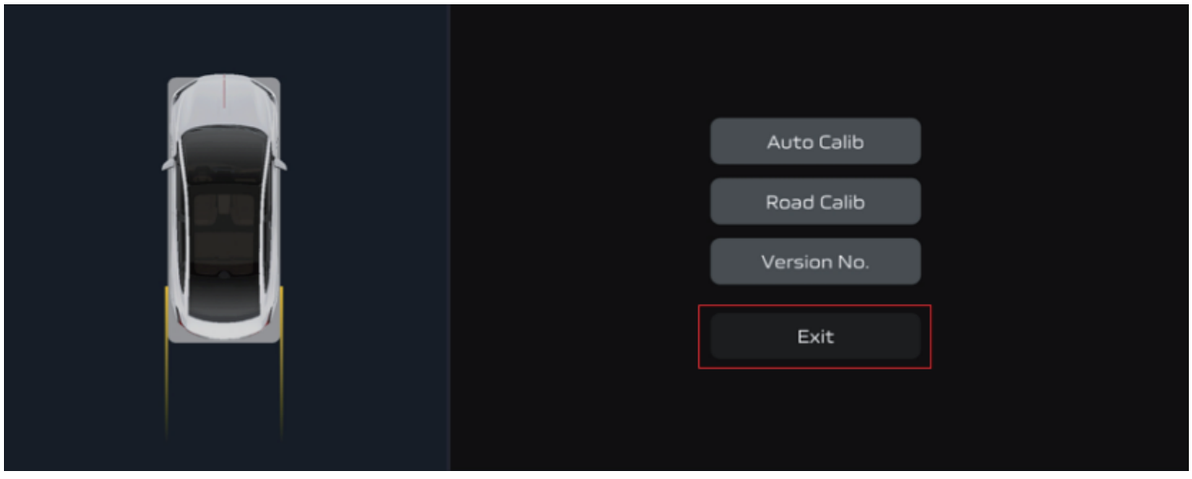
5. When the calibration is successful, the system will automatically skip to the calibration success interface

(a) Click "Application" button on the calibration success screen to enable the calibration results. As shown in the illustration: BD00130RM;

(b) Click the "Exit" button to exit factory mode and view the calibrated image effect. As shown in the illustration: BD00140RM;



BD00130RM

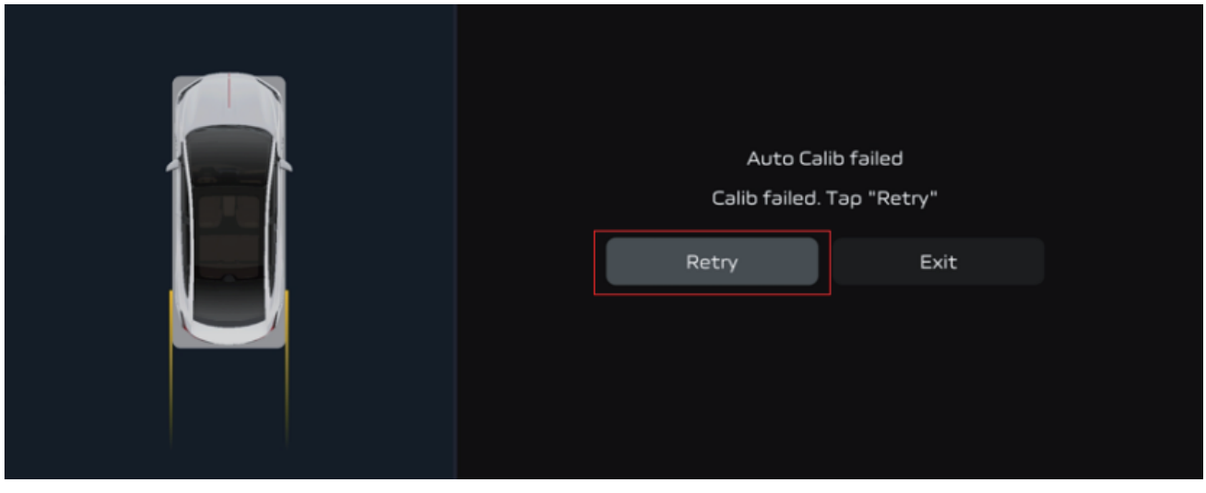


BD00140RM

6. When calibration fails, the system will automatically skip to the calibration failure interface

(a) Please check in accordance with the calibration preconditions;

(b) Click the "Retry" button on the calibration failure interface to restart the calibration process.



BD00150RM

7. Reason for calibration failure: If calibration fails, the following faults can be reported. Follow the prompts below to check, repair and retry.

Reason for failure	
Description	**Inspection items**
Front left door not closed	Check if front left door of vehicle is closed
Rear left door not closed	Check if rear left door of vehicle is closed
Front right door not closed	Check if front right door of vehicle is closed
Rear right door not closed	Check if rear right door of vehicle is closed
Luggage compartment/back door is not closed	Check if luggage compartment/back door of vehicle is closed
Left rear view mirror folding	Check if left rear view mirror is in unfolding status
Right rear view mirror folding	Check if right rear view mirror is in unfolding status
Abnormal calibration handling	Attempt to recalibrate
The vehicle is not stationary	Check if vehicle is stationary
Calibration failure	Check if calibration environment meets requirements
Calibration aborted	Check if calibration suspension has been requested on the after-sales diagnostic tester
No intrinsic parameters of the camera are obtained	Attempt to recalibrate
Last calibration has not been stopped	Check if calibration request has been initiated repeatedly

Static calibration can also be performed using a diagnostic tester (triggered by the diagnostic tester)

Dynamic calibration

1. Calibration environment requirement

(a) Weather requirements

(1) During the day (without strong light), there is no rain and no standing water on the ground.

(b) Requirements for lane

(1) Straight and flat road without any slope;

(2) Try to choose three-lane road, and drive in the middle lane (avoid being close to the green belt with low shrubs on the side of the lane);

(3) The lane should be asphalt or cement pavement, without any color differences, patches, or other factors that may cause inconsistent lane colors.

(c) Requirements for lane line

(1) There should be clear and continuous lane lines on both sides of the lane where vehicle is driving, and the lane lines should not be obstructed by obstacles (such as barriers in the center of the lane, moving electric bicycles, bicycles);

(2) The lane line width is between 10 and 25 cm;

(3) Lane line type: Dotted line, solid line. As shown in the figure below:

(4) Lane line color: The lane line colors supported for recognition are white and yellow. As shown in the figure below:

(d) Obstacle requirements

(1) During calibration, efforts should be made to avoid obstacles around the vehicle that may interfere with the calibration, such as avoid roads with heavy traffic or crowds, and avoid situations with traffic jams or crowded.



2. Calibration process

(a) Precondition inspection for calibration

(1) Confirm the connection status of the camera (check the vehicle DTCs and confirm that there are no faults related to the panoramic camera);

(2) Check the appearance of the camera for dirt or moisture. If there are any problems, clean them before proceeding with calibration;

(3) Check the installation position of the camera for looseness or shaking. If the position of the camera changes, it will cause calibration timeout or failure;

(4) Check if tire pressure of vehicle is normal, and make sure that the vehicle posture is stable;

(5) Check vehicle load, and make sure that vehicle is in a lightly loaded state;

(6) Check door status, and make sure that four doors of vehicle are closed;

(7) Check the status of the front compartment cover and luggage compartment, and ensure that front compartment cover and luggage compartment are closed;

(8) Check the status of the rear view mirror, and ensure that the rear view mirror is not in the folding status and is fully unfolded;

(9) Check if power system and light system of vehicle are normal.

(b) Calibration initiation stage

(1) Step 1: Drive the vehicle to a road section that meets the requirements of the road calibration environment.

(2) Step 2: Click on the panoramic view soft switch on the screen to enter the panoramic view interface.

(3) Step 3: Continuously click on the lower left corner of single view area in panoramic view interface to enter the factory mode interface.

(4) Step 4: Click "Road Calib" button in factory mode interface to enable road calibration.

(5) Step 5: Click "Start" button to start calibration

(6) Step 6: Drive the vehicle, keep it centered in the lane, and drive at a constant speed under low speed conditions (5 km/h ⩽ vehicle speed ⩽ 15 km/h). Keep the vehicle stable during driving until the system prompts calibration success or failure.

Notice:

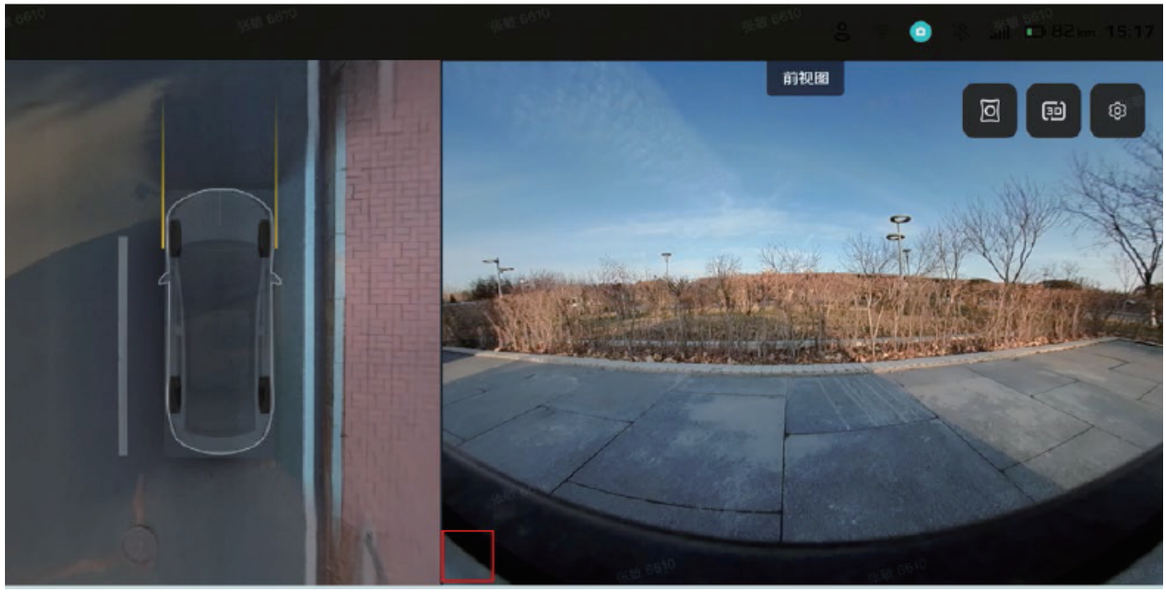
During calibration, it should be ensure that the vehicle is kept moving as much as possible. Parking at the intersection will reduce the probability of successful calibration.

Step2



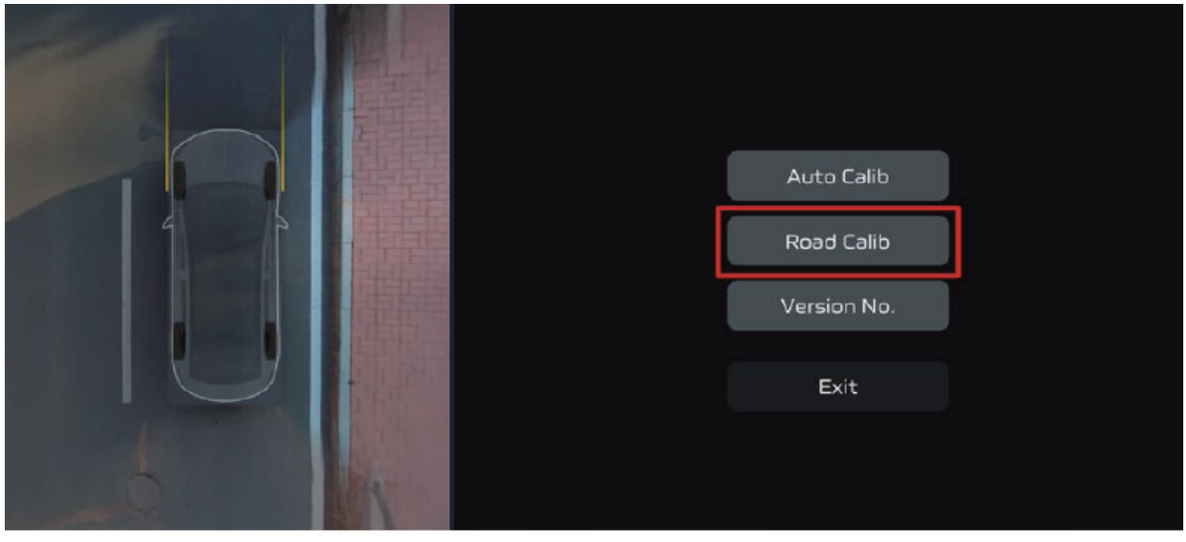
BD00190RM

Step3



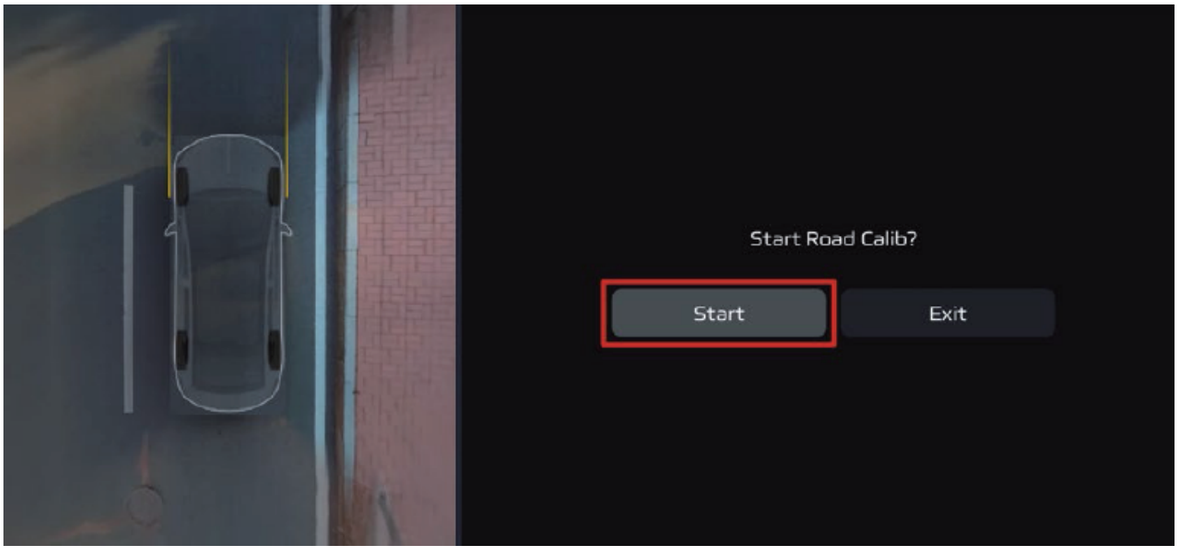
BD00200RM

Step4



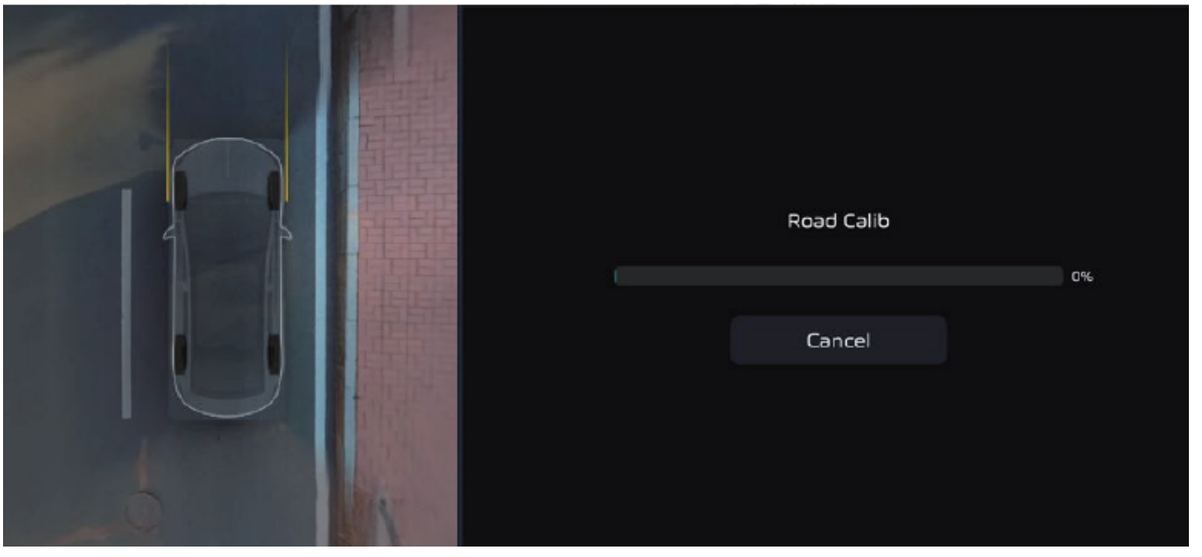
BD00210RM

Step5



BD00220RM

Step6



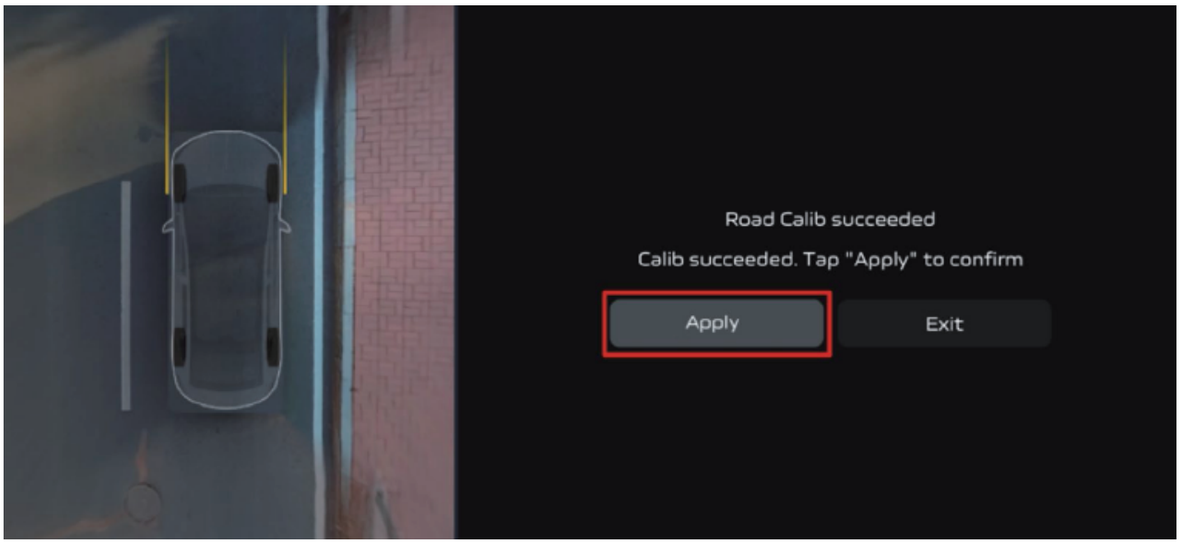
BD00230RM

3. Calibration successful handling

(a) When the calibration is successful, the system will automatically skip to the calibration success interface

(1) Step 1: Click "Apply" button on the calibration successful interface to make the calibration result effective;

(2) Step 2: The system automatically exits the factory mode, and the calibrated image stitching effect can be viewed in the panoramic view interface.



BD00240RM

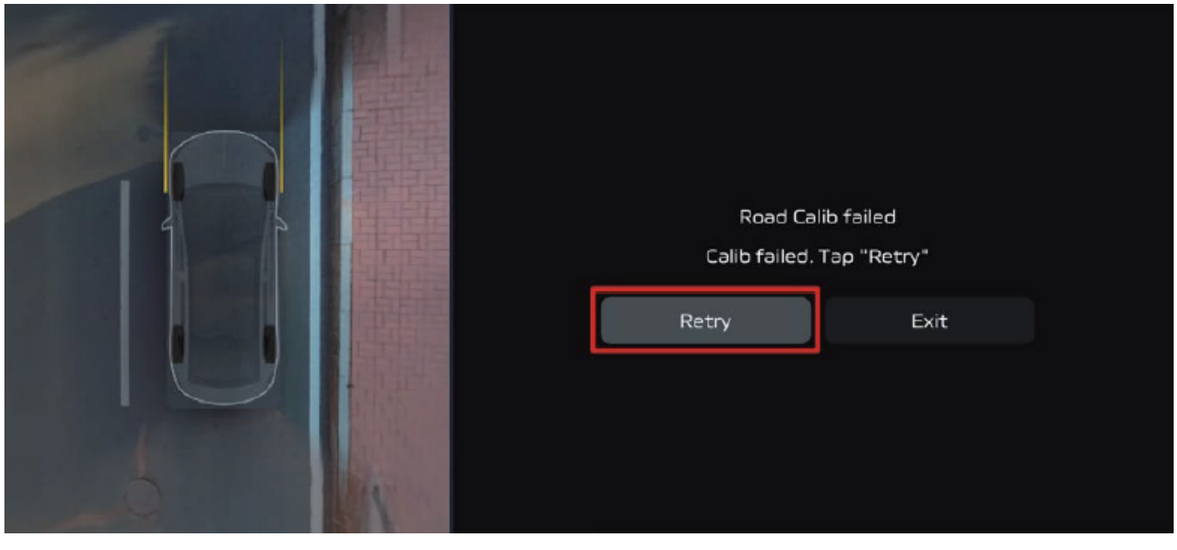
4. Handling for calibration failure

(a) When calibration fails, the system will automatically skip to the calibration failure interface

(1) Step 1: Confirm that the road calibration section meets the requirements of the calibration environment;

(2) Step 2: Recheck the calibration precondition;

(3) Step 3: Click "Retry" button on the calibration failure interface to restart the calibration.



BD00250RM

HAD visual dynamic after-sales calibration

The visual dynamic after-sales calibration can support the following calibration functions: Simultaneous trinocular calibration + surround view + side view + rear view

1. Calibration process

(a) Precondition inspection for calibration:

(1) Check for vehicle DTCs, confirm the connection status of camera, and confirm that no system DTCs affecting calibration are reported, including but not limited to: Camera disconnection, camera obstruction, camera blurring, insufficient voltage, chassis data disconnection, sensor matching fault, etc.;

(2) Check the appearance of the camera for intactness, dirt or moisture. If there are any problems, resolve them before proceeding with calibration;

(3) Check if power system, tire pressure and light system of vehicle are normal;

(4) The camera should be firmly installed and can not be loose or shaken. Compare the actual installation position and angle with the design value: Single-axis angle $\leqslant 3^{\circ}$, single-axis position $\leqslant$ 10 mm. If the installation accuracy is insufficient, it will lead to calibration timeout or result over-limit.

(b) Calibration initiation stage:

(1) Drive the vehicle to the designated road section and pull over to the side;

(2) Use a after-sales diagnostic tester to calibrate.

(c) During calibration:

(1) Drive the vehicle as required (refer to "Driving requirements");

(2) During driving, results and progress can be queried;

(3) If it succeeds, the calibration success result code will be returned; If it fails, the reasons for the failure will be fed back;

(4) The calibration process can be exited using commands.

(d) After calibration is completed:

(1) You can use the diagnostic tester to query the values of the updated calibration parameters.

2. Calibration requirements

(a) Road requirements:

(1) Most of them are straight roads, with a small number of curves allowed. Do not support continuous curves similar to mountainous areas;

(2) Cement or asphalt roads must not be covered with snow.

(b) Light and weather requirements:

(1) Daytime: Support sunny and cloudy days. At night: a well lit environment is required;

(2) Not support moderate rain, heavy rain, torrential rain and heavy snow;

(3) Avoid direct strong light shining onto the camera, including but not limited to the sun and vehicle lights.

(c) Environmental requirements:

(1) Common industrial and residential area roads can be supported;

(2) Not support large open spaces, such as vast sandy or snowy areas with missing visual textures, or roads surrounded by flat and monotonous colored walls or building facades.

(d) Driving requirements. As shown in the illustration: BD00160RM, BD00170RM

(1) Try to drive straight, avoid unnecessary steering and S-shaped driving, and necessary turns and U-turns are allowed;

(2) Allowable speed is 10 km/h - 40 km/h, recommended to keep it at 30 km/h;

(3) Necessary stops are allowed, but calibration and data collection are suspended when stopping;

(4) During driving, the vehicle should maintain a centered position as much as possible, with left and right panoramic cameras at least 3 meters away from non-ground level obstacles (such as guardrails, curbs, sidewalks, green belts, etc.). It is recommended to reserve one lane on each side of the vehicle.

(5) Not recommended scenario: Congested vehicles and overgrown weeds on the side.

(e) Required time:

(1) Depending on different roads and environments, the required time is about 10 - 25 minutes.

(f) Calibration accuracy:

(1) Binocular: About 0.1 degree;

(2) Panoramic view: About 0.3 degrees;

(3) Side view and rear view: About 0.2 degrees;

(g) Calibration success rate:

(1) If the above requirements are met, the success rate can reach 95%.

Recommended scenarios



BD00160RM

Non-recommended scenarios





BD00170RM

3. Description for calibration failure: If calibration fails, the following faults can be reported. Follow the prompts below to check, repair and retry

Fault content	Inspection items
Failed to read the camera design installation parameters	Check if the designed installation parameters are correctly written
Failed to read the camera internal parameters	Check the camera matching DTC and try to replace the part
Parameter writing failure	Check for memory related DTCs in system
Calibration algorithm calculation failure	Check if the environment meets the description in the manual
Calibration timeout	Check for communication related DTCs in system Check if calibration environment complies with manual description
Calibration result exceeds the tolerance	Check if the installation angle of the camera is correct

IFC after-sales dynamic calibration

During the entire life cycle of the vehicle, if the camera needs to be reinstalled due to drop, damage, or other reasons, it needs to be recalibrated.

1. **Calibration process: IFC can enter the service point dynamic calibration mode through diagnostic service. In this mode, the vehicle should drive parallel to the lane line on a straight road for a period of time until calibration is completed.**

   (a) Precondition for calibration:

   (1) No DTCs that affect calibration;

   (2) EyeQ status is normal;

   (3) Vehicle speed is between 36 km/h - 252 km/h;

   (4) The vehicle is driving at constant speed and acceleration is less than 0.3m/s2;

   (5) The yaw rate of vehicle is less than 0.026 rad/s;

   (6) The radius of curvature is more than 600 m.

   Notice:

   Failure to meet any of the above conditions will cause the calibration program to pause, and calibration will continue after the conditions are met; when calibration is successful or the maximum time (1800 s) is reached, the service point calibration program stops running. The calibration results will be automatically stored in the IFC non-volatile memory.

   (b) Calibration site:

   (1) On a straight road, the radius of curvature shall not be lower than the minimum requirement (600 m);

   (2) Lane lines are clear.

   Notice:

   The following conditions can cause calibration to slow down:

   Poor visibility, such as heavy rain, snow;

   Lane markings are blurred or obstructed.

   (c) Requirements for vehicle:

   (1) Correct tire pressure;

   (2) During calibration, there is no mandatory requirement for vehicle load.

   (d) Diagnostic tester requirements:

   (1) Keep the diagnostic tester online during the calibration: the diagnostic tester can indicate the current calibration status.