2026 Service Manual for Forthing Taikon 5 EV Model

This maintenance manual provides specifications, diagnostics, and repair service information for the Forthing Taikon 5 EV model.

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1.1 Precautions

Warning: Before repair, carefully read the precautions related to the airbag module.

1. Before maintenance, turn off the ignition switch, disconnect the negative terminal of battery for more than 3 min, and release static electricity.
2. Operate on the side of the airbag instead of on the front.
3. Be sure to check all seat belt assemblies after any collision. Replace the seat belt assembly with a new one unless a qualified professional technician confirms that the assembly can work normally without damage. In addition, check the seat belt assembly not used during the collision, and replace it with a new one if it is damaged. Installing a new seat belt assembly using an incorrect installation procedure may increase the risk of personal injury during a collision.
4. The seat belt pretensioner is a pyrotechnic device. Always wear goggles when repairing a seat belt equipped with a pretensioner. Do not probe the electrical terminals of a pretensioner, as this operation may deploy the pretensioner or airbag and cause personal injury.
5. Failure to follow the correct operation will result in accidental deployment of airbags and failure of safety protection devices when necessary.

Caution: The seat belt should maintain a normal connection relationship with the retractor and buckle.

1. Keep sharp and destructive objects away from the seat belt.
2. Do not bleach or dye the webbing (clean it only with neutral soap and warm water).
3. When installing the seat belt, pre-tighten the threaded rod by hand to avoid stripping.
4. Do not attempt to repair the retractor or its cover. Replace the non-functioning assembly with a new one.
5. Keep the webbing dry and clean.
6. Replace the seat belt that has been cut or damaged.
7. Do not fill anything into the trim panel hole through which the seat belt webbing passes.
8. When disconnecting the seat belt retractor connector, insert a small screwdriver wrapped with adhesive tape into the slot of the connector to pry up the buckle, and then remove the connector.
9. After installing the seat belt retractor connector, check whether the buckle has been fully pressed in.
10. After removing fasteners, be sure to put them back in place. If a fastener needs to be replaced, use the fastener with the same part number. If a fastener with the same part number cannot be found, use one of the same size and strength (or higher). Remove any fastener, which cannot be reused or requires thread locking, from the vehicle. For fasteners requiring a specified tightening torque, tighten them to the specified torque during reinstallation. Failure to comply with the above requirements may result in damage to components or systems.
11. Seat belts and their accessories can affect the main components and systems of the vehicle. Therefore, they must be carefully inspected and replaced with original parts.
12. Do not use the pretensioner (retractor) that has been triggered, but replace it in the form of an assembly.

1.2 How to use this manual

Terms

The "warning" and "cautions" are used to remind you of the steps you must follow to avoid personal injury and/or damage to vehicle parts and components.

The "warning" indicates an emergency that may result in personal injury if the instructions are not followed.

The "cautions" indicate an emergency which may result in damage to parts and components if the instructions are not followed.

In addition to "warnings" and "cautions", the texts in bold letters also provide useful information.

Standard value: an acceptable value in check and adjustment.

Limit value: a maximum or minimum limit that shall not be exceeded in check and adjustment.

Unit

This manual mainly uses SI UNIT (International System of Units) for units of measurement.

"Example" : sleeve locknut: 59-78 N·m

Table of Contents

The "Contents" is provided on the first page of each section.

Titles are provided in the upper parts and components of each page, indicating the part or component or system involved in that page;

Each section is marked with a page number;

A small illustration shows inspection, use of special tools, operative skills and implicit or complex steps that are not shown in a previous large figure.

How to carry out fault diagnosis in steps:

Caution:

Each fault diagnosis section provides operation steps necessary for carrying out effective fault diagnosis. Read the following instructions before diagnosis:

1. After repair, recheck if the fault has been thoroughly removed.

2. To determine parts and components and harness connectors and their positions, please refer to the description of these parts and components and harness connectors and their positions of the system provided in that section.

3. If more detailed inspection of continuity between harness connectors is to be performed (for example, where branch harness is available), please refer to the circuit diagrams and harness layout plans in each section to identify the harness connectors.

4. Before checking the circuit continuity, turn the ignition switch to the OFF position.

5. Before checking the voltage of a connector, check the battery voltage first.

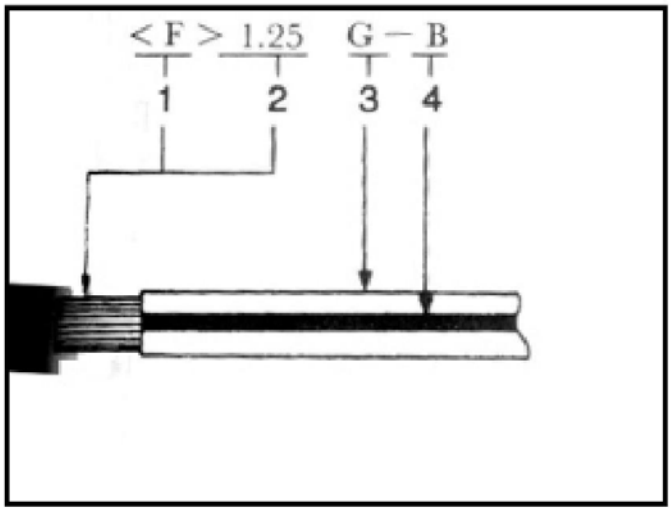
6. After completing the diagnosis steps and inspection of electrical components, make sure that all harness connectors have been reconnected according to their original conditions.

Harness wire colour representation method

Wire colours are identified via the following codes:

Code	Wire colour	Code	Wire colour
B	Black	P	Pink
Br	Brown	R	Red
G	Green	W	White
Gr	Grey	L	Blue
Lg	Light green	V	Purple
O	Orange	Y	Yellow

If the cable has two colours, the first character in the codes of these two colours represents the basic colour (that of the cable coating) and the second character represents the marker colour.



S/N	Meaning
1	<F>: flexible wire
	<T>: stranded wire
2	Wiring size (mm²)
3	Basic colour
4	Marker colour

Remarks

The wire for which the code is not specified is of a cross section of 0.5mm2.

The cable colour code in the bracket indicates that its cross section is 0.3mm2.

How to read circuit diagram

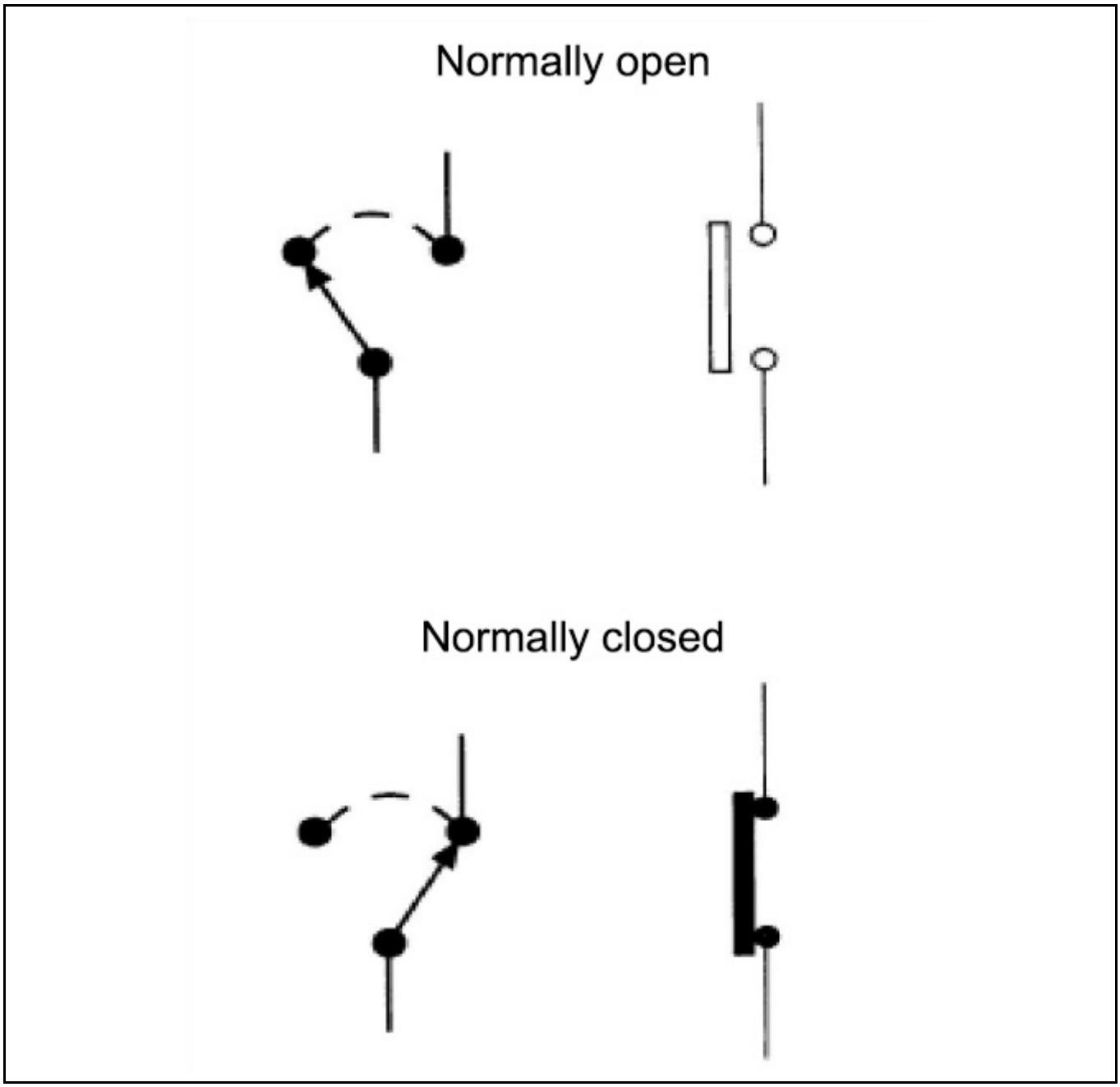
Connector symbols

Most connector symbols in the circuit diagrams are shown in the view from the port side.

A connector symbol shown in a view from the port side is represented by single-line box and direction mark.

A connector symbol shown in a view from the harness side is represented by double-line box and direction mark.

Some systems and components, especially those related to OBD, may use a switch position circuit diagram where the switch position shown is when the vehicle is in a "normal" state. The "normal" state of a vehicle requires that:



The ignition switch is in the "OFF" position.

The doors, bonnet and boot lid/trunk lid are closed.

No pedal is depressed.

The parking brake is released.

Multi-way switch

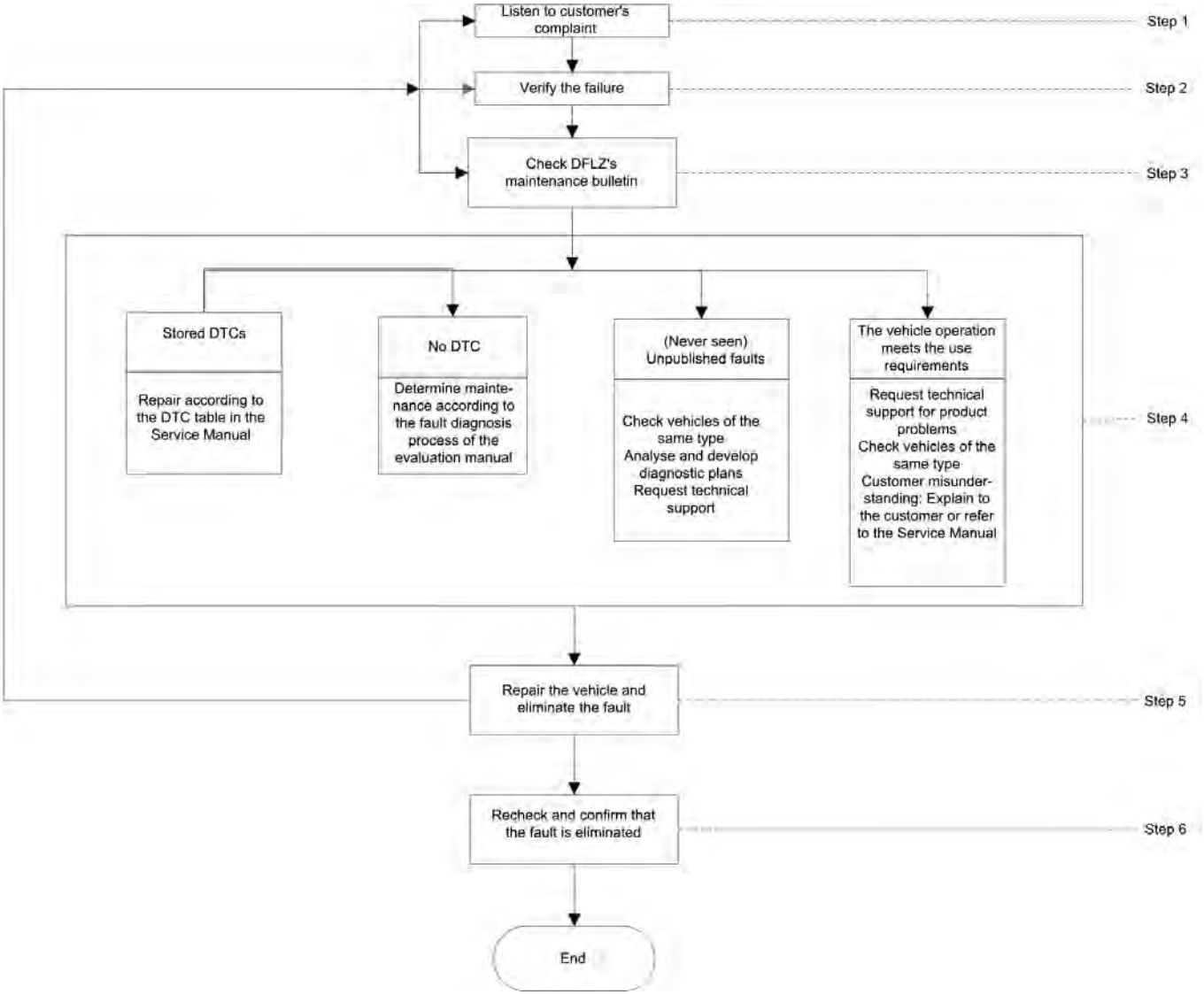
The continuity of a multi-way switch can be represented in the following two manners.

A switching table used in a schematic diagram.

A switching chart used in a circuit diagram.

1.3 Fault Repair Information

Diagnostic procedure



Steps	Description	
Step 1	Get detailed information about the relevant situation and environmental conditions when the fault occurs. The following key information helps to make a correct analysis:	
	What	Vehicle type, engine, transmission/ transaxle and systems (e.g. radio).
	When	Date, time, weather conditions and frequency of occurrence.
	Where	Road conditions, altitude and traffic conditions.
	How	System symptoms and operation conditions (impacts of other components). Service history and whether other accessories have been installed after sale.

Step 2	Run the system, and carry out a road test if necessary. Identify the fault parameters. If the fault does not recur, please refer to the "fault simulation test ".
Step 3	If DFLZ after-sales releases repair guidelines for related faults, follow the guidelines to repair and eliminate them.
Step 4	Diagnose according to the form of the fault, including: DTC detected No DTC There are corresponding parts in the service manual and evaluation manual. Determine where to start the work according to the customer's description and your knowledge.
Step 5	Check the system for tangled wires, loose joints, or damaged wires. Determine the circuits and elements involved in the fault and diagnose the fault based on the power supply circuit and harness layout plan. Repair or replace faulty circuits or elements.
Step 6	Run the system in all modes. Make sure that the system can work normally under all conditions. Ensure that there is no failure caused due to your carelessness during diagnosis or repair.

Fault simulation test

Introduction

Sometimes, when the vehicle is sent in for repairs, the fault does not appear. Therefore, it is necessary to simulate the conditions and environment in which the fault occurs. This helps avoid unnecessary fault diagnosis. The following section uses diagrams to show the conditions and environment in which an electrical fault occurs.

This part is divided into 6 subjects:

1. Vehicle Vibration

2. Heat sensitivity

3. Freezing

4. Immersion

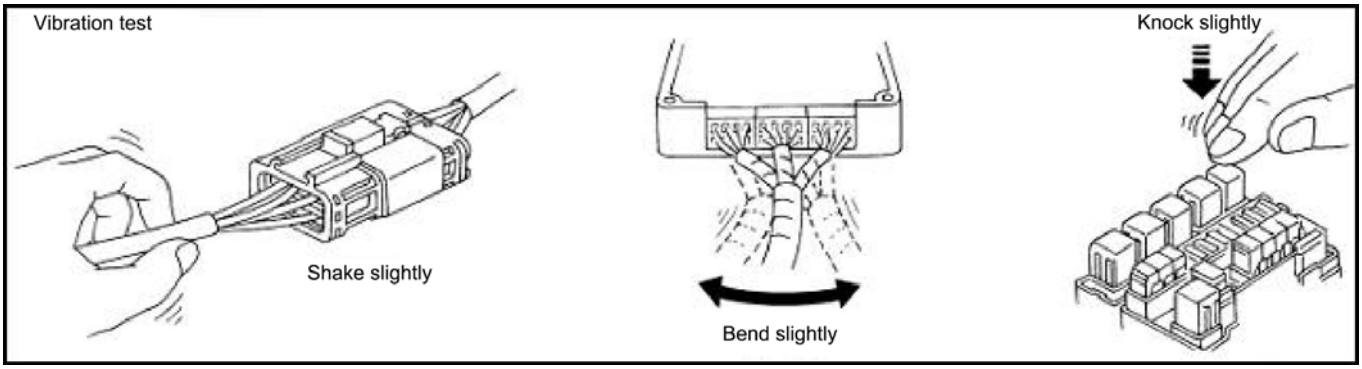
5. Electrical load

6. Cold start or hot start

Have the customer describe in detail how the incident happened. It is very important to simulate the conditions under which the fault occurs.

1. Vehicle Vibration

When the vehicle is running on a rough road or when the engine vibrates (A/C operates at idle speed), the fault may occur or the symptoms become more obvious. In this case, check for conditions related to vibration. Refer to the figure below:



Connectors and harnesses

Find out which connectors and harnesses affect the electrical system being checked. Then gently wiggle each connector and harness, and watch if the system fails again. This helps to find any loose or poor electrical connections.

Harness

Moisture exposure can cause a thin layer of corrosion on connector terminals. A fault in a connected joint cannot be detected by visual inspection. If the fault happens off and on, corrosion may be the cause. Therefore, it's best to disassemble, inspect, and clean the connectors' ports related to the system.

Sensors and relays

Gently shake the sensors and relays in the system you are checking. This can help you find if any sensor or relay is loose or not fixed properly.

Engine compartment

There are several reasons for electrical issues caused by vehicle or engine vibration. The following are some issues that should be checked:

1. The connector is not fully in place.

2. The harness length is insufficient and it will be stressed when the engine vibrates or shakes.

3. The wire contacts a bracket or moving components.

4. The ground wire is loose, dirty, or corroded.

5. The circuit is too close to the hot parts.

When checking components under the engine bonnet, start by making sure the GND wire is in good condition. First, confirm that the system is properly grounded. Then gently shake the wire or component as described above to check whether the connection is loose. Use the circuit diagram to check the continuity of the circuit.

Rear side of Instrument panel

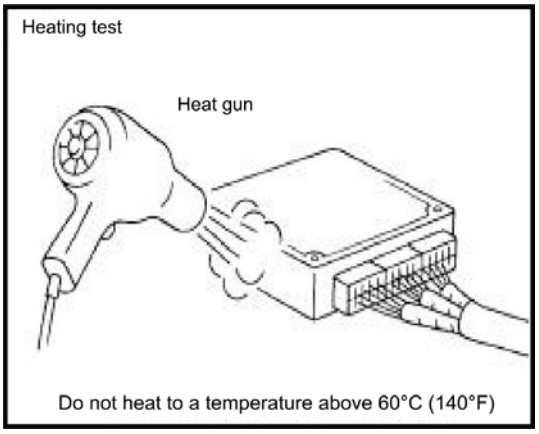
When installing accessories, incorrect wiring or an unsecured harness may be pinched. Vibration of the vehicle will damage the harnesses arranged along the bracket or close to the screws.

Underneath the seat

Loose or unsecured harnesses can cause wires to be pinched by seat components such as slide rails when the vehicle vibrates. If wires run under the seat, check whether the harness is damaged or pinched

2. Heat sensitivity

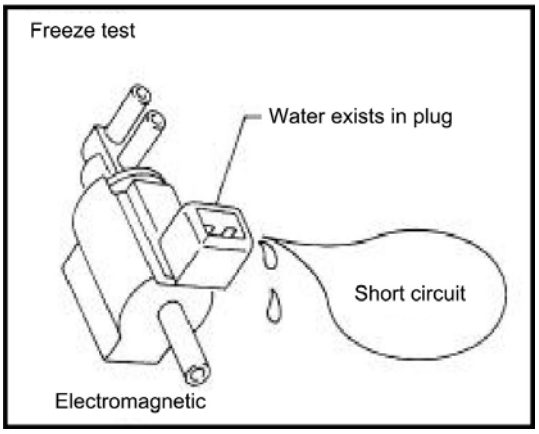
Sometimes customers experience problems in hot weather or after stopping for a short time. In this case, you should inspect the thermal sensitivity. To determine if an electrical component is thermally sensitive, use a heat gun or a similar tool to heat the component. Do not heat parts above 60 °C (140 °F). If a fault occurs while heating the unit, replace or properly isolate the element.



3. Freezing

The customer may point out that the fault disappears after warm-up (in winter). The reason for this may be related to the icing of some part of the electrical system.

There are two ways to check. The first is to leave the customer's vehicle overnight. To reproduce the fault described by the customer, make sure the ambient temperature is low enough. Park the vehicle in the open air overnight. The next morning, perform a quick and comprehensive check of the possibly affected electrical elements. The second method is to freeze the suspected parts in the freezer for a long enough time until freezing occurs. Reinstall the parts and check if the fault recurs. If any, repair or replace the parts and components.

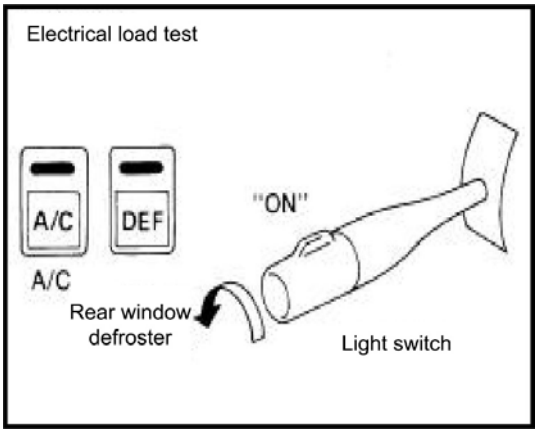


4. Immersion

The fault may only occur in high humidity or rainy and snowy weather. In this case, the fault may be caused by water intrusion into electrical elements. Fault conditions can be simulated by soaking the vehicle or driving it through a car wash.

Caution: Do not spray water on any electrical element

5. Electrical load



The fault may also be caused by the sensitivity to electrical loads. Turn on all accessories (including A/C, rear window defroster, radio, fog light, etc.) before diagnosis.

6. Cold start or hot start

In some cases, an electrical fault occurs only during the cold start of a vehicle or a hot start after the engine is stalled. In this case, leave the vehicle overnight for proper diagnosis.

Circuit inspection

Introduction

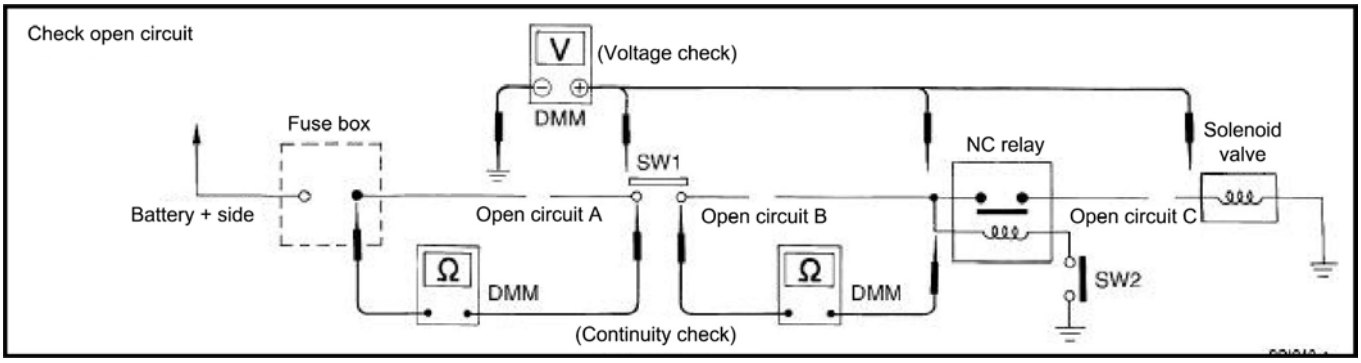
Generally, it is easy to test the circuit if it is operated in a logical and systematic way. First, you must understand all relevant information about the system being tested. Similarly, you need to fully understand how the system works. Then you will be able to choose the right equipment and follow the correct test steps.

When testing electrical components, you have to simulate vehicle vibration. When simulating vibration, the harness or electrical components should be gently shaken.

Open-circuited	When a part of the circuit is not conducting, it is open-circuited
Short-circuited	There are two forms of short circuits
	l Line short circuit: one line contacts another line and causes a change in normal resistance
	l GND short circuit: the line contacts the ground wire and makes the circuit grounded

Check "open circuit" of a line

Before diagnosing and checking a system, draw a sketch of the system. This helps to perform the diagnostic steps logically during the diagnosis process. Sketching can also improve your understanding of the system operation.



Continuity check method

The continuity inspection is used to find an open circuit in the circuit. The digital multimeter is set to the resistance range. If the reading exceeds the measuring range, it indicates an open circuit (no "beep" sound or no resistance symbol). Always start checking from the highest resistance range on the digital multimeter. To help understand the diagnosis of open circuits, please refer to the figure above.

1. Disconnect the battery negative cable.
2. Start checking from one end of the line until the other end. (Fuse device in the figure)
3. Connect one probe of a digital multimeter to the fuse port on the load side.
4. Connect the other probe to the fuse block (power supply) side of SW1. Resistance being small or zero indicates that this section of the circuit has good continuity. If the circuit is open, the digital multimeter will show "over range" or infinite resistance (point A).
5. Connect the probe between SW1 and the relay. Resistance being small or zero indicates that this section of the circuit has good continuity. If the circuit is open, the digital multimeter will show "over range" or infinite resistance (point B).
6. Connect the probe between relay and solenoid valve. Resistance being small or zero indicates that this section of the circuit has good continuity. If the circuit is open, the digital multimeter will show "over range" or infinite resistance (point C).

All circuits can be checked using the above method.

Voltage check method

To help understand the diagnosis of open circuits, please refer to the figure above.

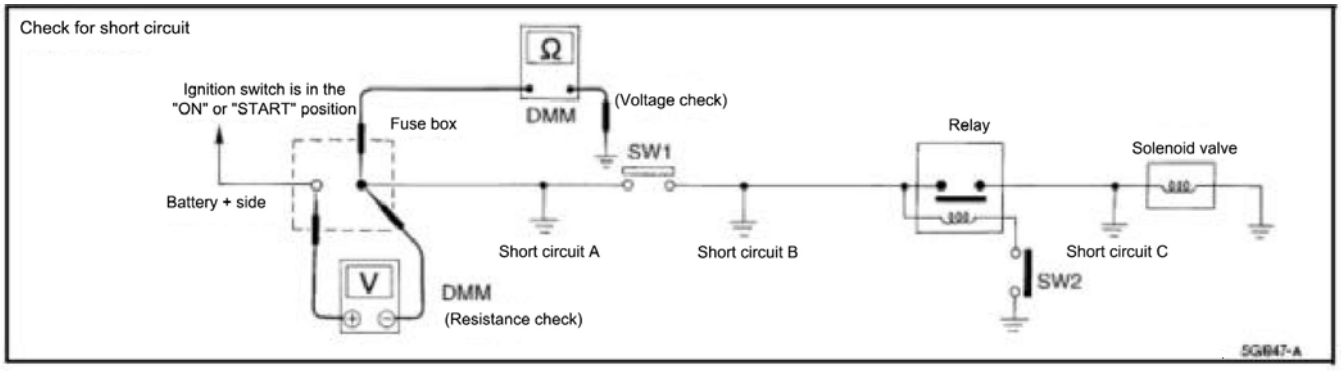
In any live line, an open circuit can be identified by methodically checking the voltage in the system. At this point, switch the digital multimeter to the voltage setting.

1. Connect one probe of the digital multimeter to a known good earth wire.
2. Check the circuit from one end to the other end.
3. Disconnect switch SW1 and measure the voltage at SW1
4. If voltage exists, the open circuit point is far behind SW1.
5. If no voltage exists, the open circuit point is between the fuse box and SW1 (Point A).
6. If no voltage exists, the short circuit point is far behind SW1.
7. Close SW1, disconnect the relay and the solenoid valve, and connect the digital multimeter probes across the fuse port to measure the voltage.
8. If voltage exists, the short circuit point is between SW1 and the relay (Point B).
9. If no voltage exists, the short circuit point is far behind the relay.
10. Close SW1 and close the relay by applying a jumper with fuse across the relay to measure voltage.
11. When there is voltage, the short circuit point is behind the relay line or between the relay and the disconnected solenoid valve (point C).
12. If no voltage exists, return to the check procedure and check the power supply of the fuse box.

All live lines can be diagnosed using the above method.

Check "short circuit" of a line

To simplify the discussion of short circuit in a system, please refer to the figure below.



Resistance check method

1. Disconnect the battery negative pole and remove the fuse that has blown.
2. Disconnect all loads powered through the fuse (disconnect SW1, relay and solenoid valve).
3. Connect one probe of the ohmmeter to the load side of the fuse port. Connect another probe to a known good earth wire.
4. Disconnect SW1 and check for continuity.
5. Continuity: the short circuit point is between the fuse and SW1 (Point A).
6. No continuity: the short circuit point is far behind SW1.
7. Close the SW1 and disconnect the relay. Place the probe between the load side of the fuse port and a known good ground. Then check for continuity.
8. Continuity: the short circuit point is between SW1 and the relay (Point B).
9. No continuity: the short circuit point is far behind the relay.
10. Close SW1 and engage the relay by using a jumper. Place the probe between the load side of the fuse port and a known good ground. Then check for continuity.

    When the circuit is conductive: the short circuit point is between the relay and the solenoid valve (point C).

    If the circuit is not conductive, check the solenoid valve and return to the check process.

Voltage check method

1. Remove the blown fuse and disconnect all loads powered through the fuse (i.e., disconnect SW1, relay and solenoid valve).
2. Turn the ignition switch to the ON or START position. Confirm that the battery positive side at the fuse port is the battery voltage (by connecting one probe to the fuse box and battery positive port side and the other probe to a known good grounding point).
3. Disconnect SW1, and apply the DMM probes across the fuse to its two ports to measure the voltage

    Voltage exists: the short circuit is between the fuse box and SW1 (point A).

    No voltage: the short circuit is further after SW1.
4. Close SW1, disconnect the relay and the solenoid valve, and connect the probes of the digital multimeter across the fuse port to both sides to measure the voltage

    When there is voltage, the short circuit point is between the SW1 and the relay (point B).

    When there is no voltage: the short circuit point is further behind the relay.
5. Close SW1 and close the relay by applying a jumper with fuse across the relay to measure voltage.

When there is voltage, the short circuit is behind the relay line or between the relay and the disconnected solenoid valve (point C).

When there is no voltage: return to the check procedures and check the fuse box Power supply.

GND inspection

1. Remove the ground wire bolts or screws.

2. Check all contact surfaces for darkening, dirt, rust, or others.

3. Clean the contact points as required and ensure good contact.

4. Reinstall the bolts or screws securely.

5. Inspect whether "additional" accessories will interfere with the GND circuit.

6. If several wires are twined on a metal ring of ground wire, check whether the wire is twisted correctly. Make sure all circuits are clean, tight, and well grounded.

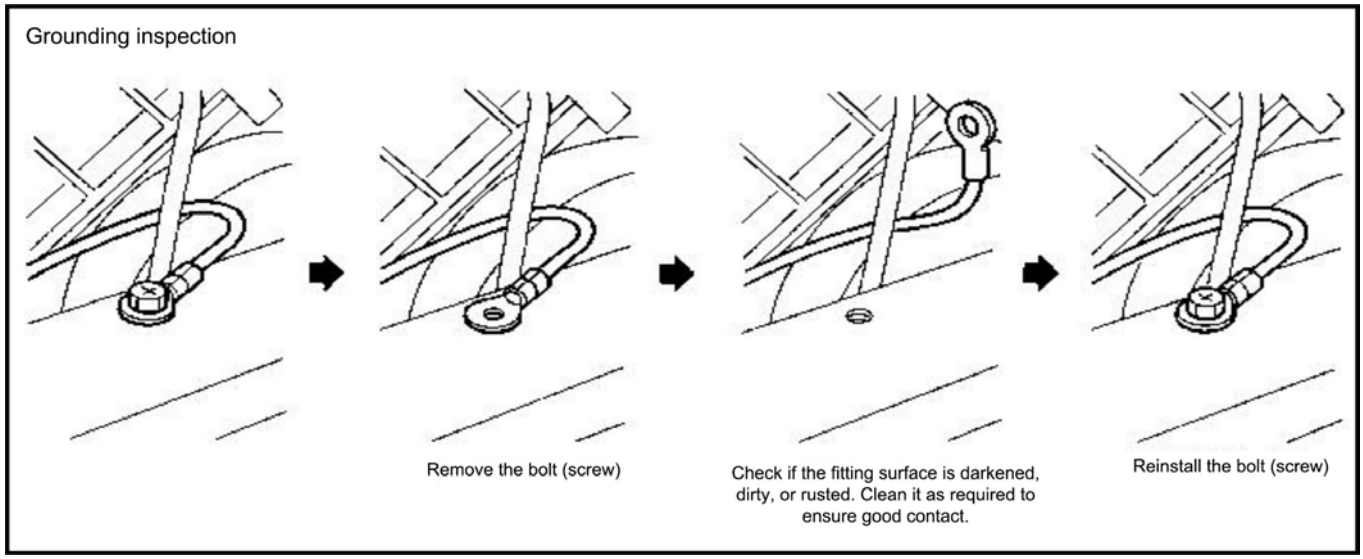
7. If multi-strand wires are installed in a GND metal ring, ensure that there is no wire with excessive insulation.

8. For details about GND distribution, please refer to the electrical repair part in this manual.

GND connections are important for the normal operation of electrical and electronic circuits. GND connections are often exposed to moisture, dirt, and other corrosive chemicals. Corroded (rusty) points will generate additional resistance. Extra resistance will affect the circuit's operation.

Electronic control circuits are very sensitive to proper GND connection. Loose or corroded GND wires can seriously affect electronic control circuits. The circuit is easily affected by poor contact or corrosion. Even if the GND wire looks clean, its surface may also have a thin layer of rust.

Inspect the ground wire connection as follows:



Voltage drop test

Voltage drop detection is often used to find parts or circuits with excessive resistance. The voltage drop in the circuit is caused by the resistance of the circuit during operation. Check the wire in the figure When the resistance is measured with an ohmmeter and a single-strand conductor is connected, the reading will be zero. This shows the circuit is normal. but a single-strand of conductor cannot carry the current of circuit during operation. A single-strand conductor will generate high resistance to current. This will generate a small voltage drop.

Many of the following conditions may generate additional resistance:

1. Too thin wire (e.g. single-strand conductor)

2. Corrosion of switch contacts

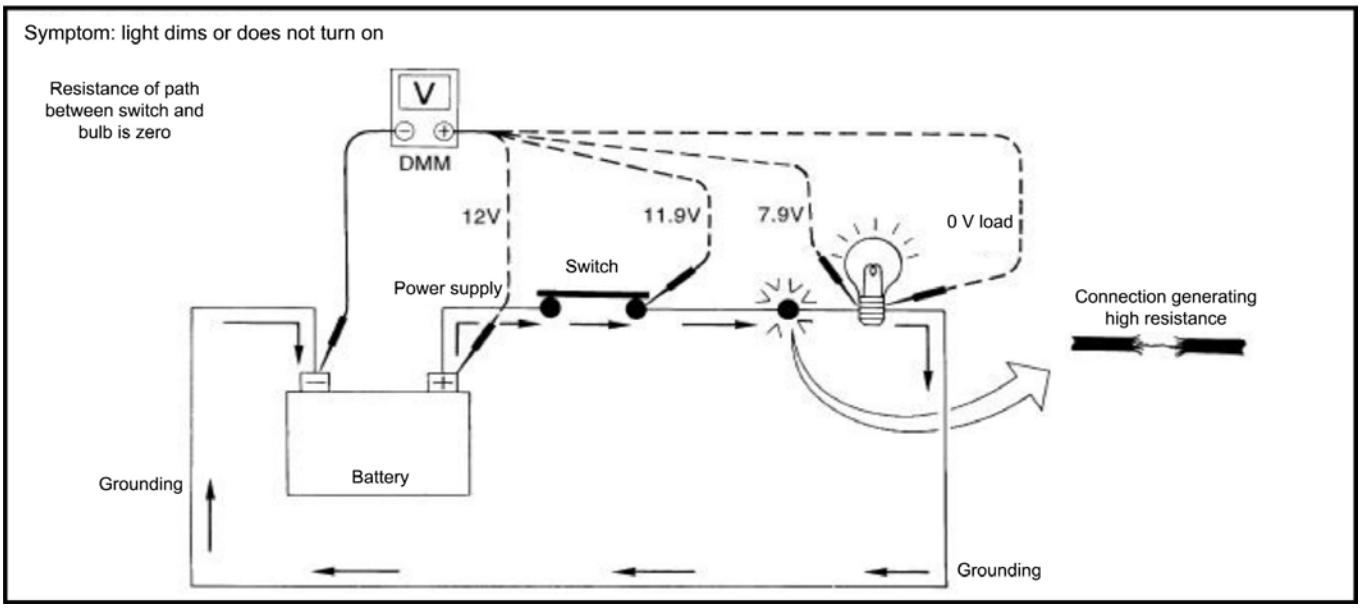
Measurement of voltage drop – accumulation method

1. Connect a voltmeter across the connector or component of the circuit to be checked. The positive pole of the voltmeter should be placed near the power supply, and the negative pole should be near the ground switch.

2. Make the circuit operate.

3. The voltmeter displays the voltage of the circuit through which current flows.

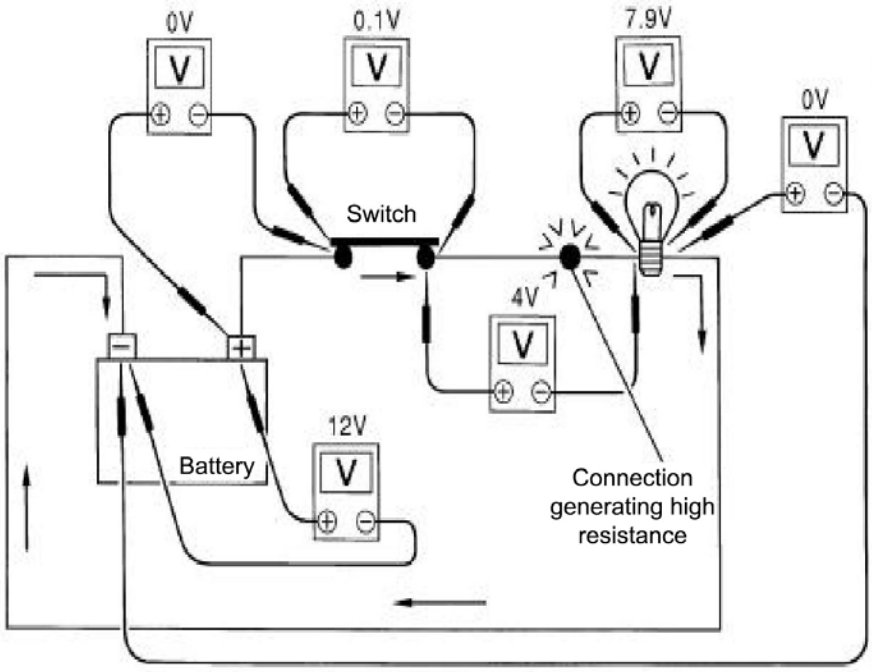
Caution: In the illustration, there is an excessive voltage drop of 4.1 V between the battery and the light.



Measurement of voltage drop - step-by-step method

The step-by-step method is the most effective way to inspect too large voltage drop in a Low-voltage/pressure system (e.g. "computer control system").

The operating current in the circuit of a "computer control system" is very low. The operation of the computer control system will be adversely affected due to any resistance change within it. Resistance changes can be caused by poor contact, incorrect installation, improper wire specifications or corrosion. By voltage drop measurement using the step-by-step method, parts and components or wires with too large resistance can be identified.



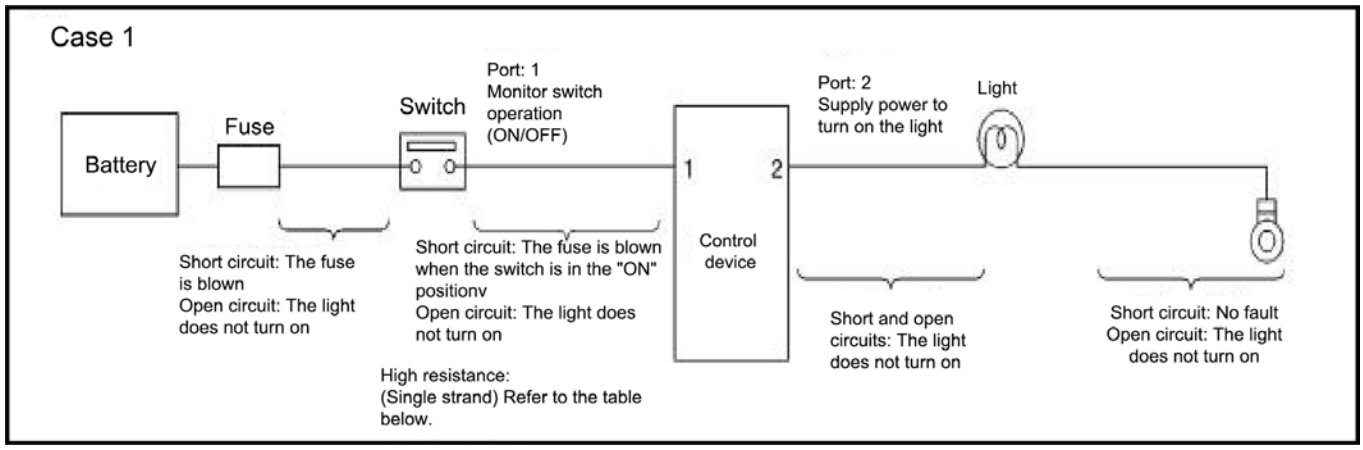
1. Connect the voltmeter as shown in the figure. Switch on the battery and operate around the circuit.
2. An abnormal voltage drop indicates that a component or wire needs to be repaired.
As illustrated above, a poor connection results in a 4V drop.

The table below lists the maximum allowable voltage drop. These values are for information only. The specific of each part or component should be determined depending on the actual condition.

Parts and components	Voltage drop
Cables	Negligible <.001 volts
Grounding connection	About 0.1 V
Switch contacts	About 0.3 V

Control unit circuit test

System description: When the switch is in the ON position, the control unit will light the bulb.

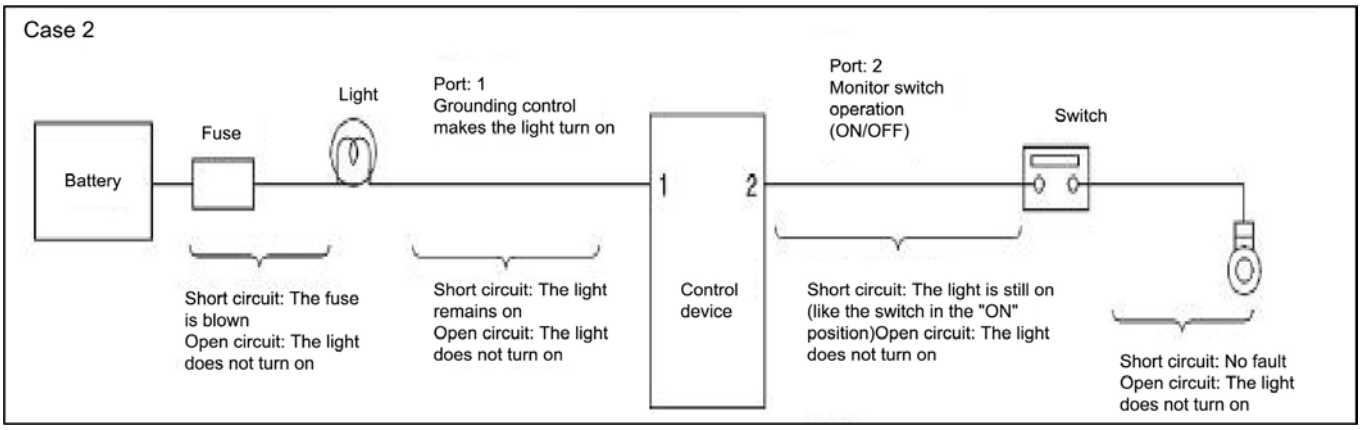


Input-output voltmeter

Pin No.	Item	Test Conditions	Voltage value <V>	For example, when a single-strand wire has high resistance [V]*
1	Switch	Switch ON	Battery voltage	Lower than the battery voltage, about 8 (for example)
		Switch OFF	About 0	About 0
2	Bulb	Switch ON	Battery voltage	About 0 (the light is not on)
		Switch OFF	About 0	About 0

The voltage value is based on the body GND.

High resistance exists in the circuit on the switch side (caused by a single wire), so at port 1, you cannot read the battery voltage. Even if the switch is in the ON (connected) position, the control unit cannot detect whether the switch is on or off. Therefore, the control unit does not supply power to the light to make it illuminate.



Input - Output Voltmeter

Pin No.	Item	Test conditions	Voltage value "**V**"	For example, when a single-strand wire has high resistance **[V]***
1	Switch	Switch ON	About 0	Battery voltage (the bulb is not on)
		Switch OFF	Battery voltage	Battery voltage
2	Bulb	Switch ON	About 0	Above 0 is about 4 (example)
		Switch OFF	About 5	About 5

The voltage value is between the item tested and body GND.

High resistance exists in the circuit on the switch side (caused by single-strand wire), and a voltage of about 0V cannot be measured at port 2. Even if the switch is in the ON (connected) position, the control unit cannot monitor whether the switch is on or off. Therefore, the control unit does not provide a GND signal to the bulb to illuminate. Control unit and electrical parts and components.

Control unit and electrical parts and components

Caution: Do not reverse the positive and negative terminals of the battery

Caution: Install only specified parts and components onto the vehicle

Caution: Before replacing the control device, check the input and output functions of the parts and components

Caution: Do not use excessive force when disconnecting the connector

Caution: If a connector is installed by fastening bolts, loosen the fixing bolts and then remove them by hand

Caution: Before installing the joint, first confirm that the port is not bent or damaged, and then install it correctly

. When installing the joint with fastening bolts, fix it with fastening mounting bolts until the protrusion of the joint is flush with the surface. Do not drop or hit the control device



Caution: Prevent condensation inside the control unit caused by rapid temperature changes. Do not allow the control unit to come into contact with water or rain. If water gets into the control unit, let it dry completely before installing it in the vehicle.

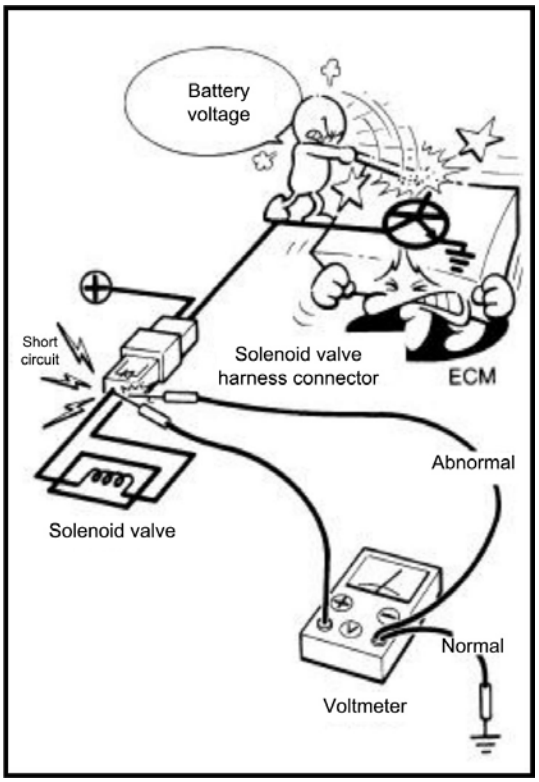
Caution: Be careful not to let engine oil stick to the control device connector

Caution: Do not use volatile oil to clean the control device

Caution: Do not disassemble the control device and remove the upper and lower covers

Caution: When using a digital multimeter, be careful not to let the test probes get close to each other to avoid a battery short circuit and damage to the power transistor in the control unit.

When checking the input and output signals of the control device, please use the specified inspection connector



1.4 Lifting the vehicle

Rear wheel

Warning: Place the vehicle on a hard surface. If the vehicle must perform jacking operations on a soft surface, load distribution cushion blocks should be use d under the jack. A wedge shall be provided on the outside of the wheel opposite to the lifting point. Failure to follow this warning may cause personal injury.

Caution: It is very important to use the correct jack at the appropriate support points.

Caution: When jacking the vehicle, refer to the user manual for correct operation guidance.

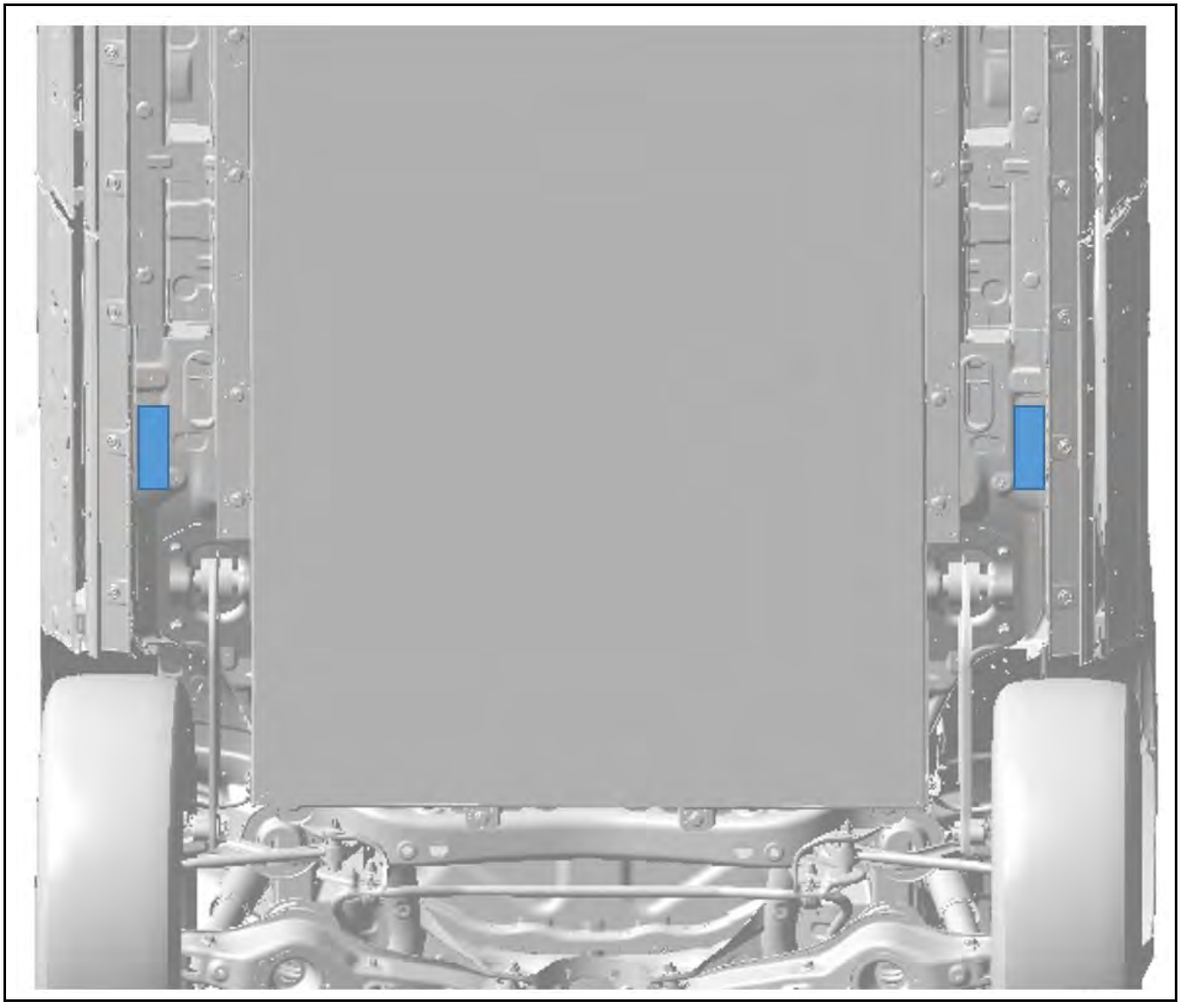
Caution: When lifting the vehicle, the lifting point should not be in the middle of the rear axle housing; otherwise, it will cause component damage.

Caution: Use the correct lifting and support position at all times.

Front wheel

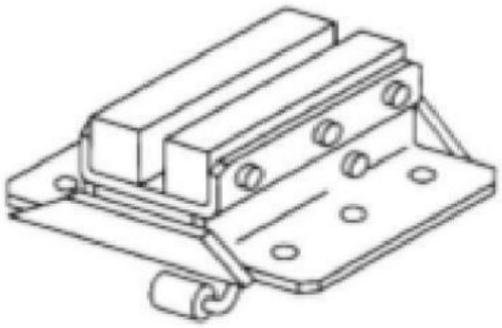
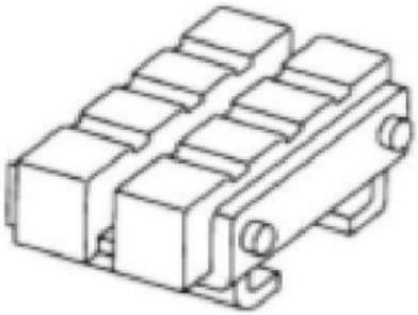
Caution: It is very important to use the correct jack at the appropriate support points.

Caution: When jacking the vehicle, refer to the user manual for correct operation guidance.



1.5 Lifting Point

Repair tools

Tool name	Description
Supporting plate lifter accessory	
Safety bracket accessory	

Caution:

Be sure to confirm that the vehicle is empty before lifting.

Because the gravity centre of a vehicle changes as main components in the front part of the vehicle are removed, use a lifter or equivalent tool to support the fulcrum of the workshop lifter at the rear.

Because the centre of gravity of the vehicle changes as the main components (rear axle, suspension, etc.) in the rear part of the vehicle are removed, use a lifter or equivalent tool to support the fulcrum of the workshop lifter at the front.

Notice not to impact any circuit or perform any operation that may affect the pipeline.

Workshop jacks and safety bracket

WARNING:

Before using a lifter, park the vehicle on level ground. Make sure that pipelines, tubes and others in the lower part of the vehicle will not be damaged.

When the vehicle is supported by a jack only, do not work below the vehicle. If you must work below the vehicle, use a safety support to hold the vehicle.

Place wheel pads in front of and behind the wheels on the ground.

Two-post lift

WARNING:

When lifting a vehicle, spread the lifting arms as much as possible to balance the vehicle in terms of its front and rear ends.

When placing the lifting arms, do not allow them to contact the brake pipeline, brake cable, fuel pipeline, and side beam spoiler.

Pallet lift

Caution:

Be sure to confirm that the vehicle is empty before lifting.

Place the pallet lift accessory at the front of the vehicle at the front of the side beam under the front door.

Place the accessory at the front and rear ends of the pallet lift.

1.6 Tightening Torques for Standard Bolts

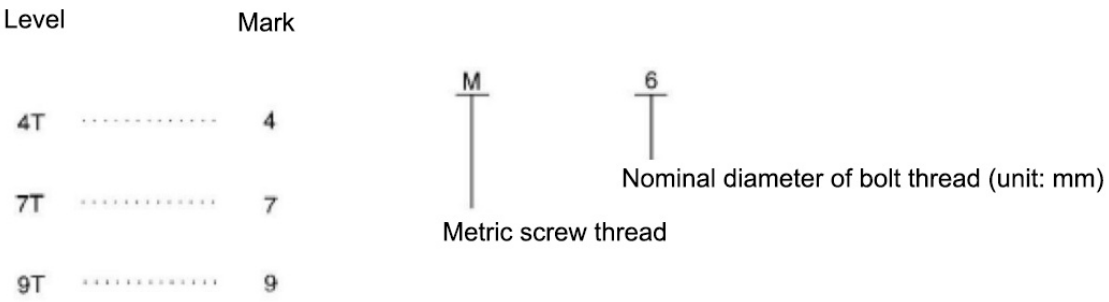
Tightening torque table

Level	Bolt specification	Bolt Diameter (mm)	Thread pitch, mm	Tightening torque (no lubricant)	
				Hexagon head bolt	Hexagon flange bolt
				N·m	N·m
4T	M6	6.0	1.0	5.5	7
	M8	8.0	1.25	13.5	17
			1.0	13.8	17
	M10	10.0	1.5	28	35
			1.25	28	35
	M12	12.0	1.75	45	55
			1.25	45	65
	M14	14.0	1.5	80	100
7T	M6	6.0	1.0	9	11
	M8	8.0	1.25	22	28
			1.0	22	28
	M10	10.0	1.5	45	55
			1.25	45	55
	M12	12.0	1.75	90	100
	M14	14.0	1.25	90	100
			1.5	190	170
9T	M6	6.0	1.0	11	13.5
	M8	8.0	1.25	28	35
			1.0	28	35
	M10	10.0	1.5	55	80
			1.25	55	80
	M12	12.0	1.75	100	130
			1.25	100	130
	M14	14.0	1.5	170	210

Note:

Special parts are not included.

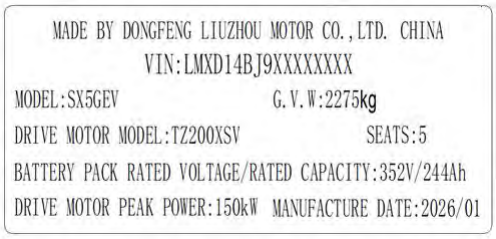
These criteria are also applicable to bolts whose heads are engraved with the following marks.



1.7 Identification Information

Vehicle's factory nameplate

The vehicle's factory nameplate is at the lower external surface of the middle column at the right side of the vehicle body. The nameplate format is as follows:

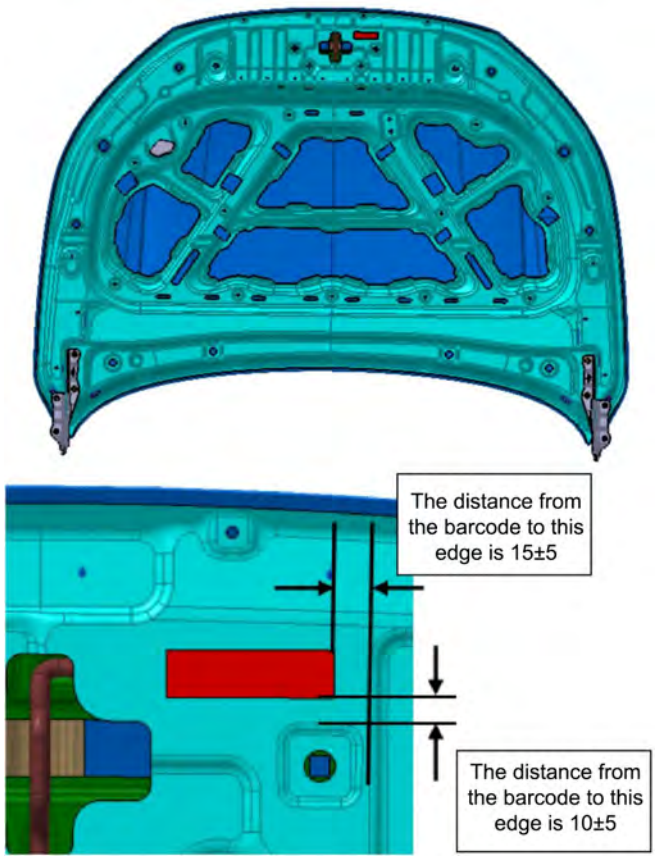
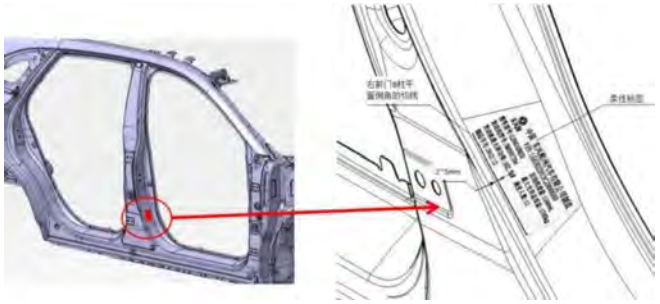


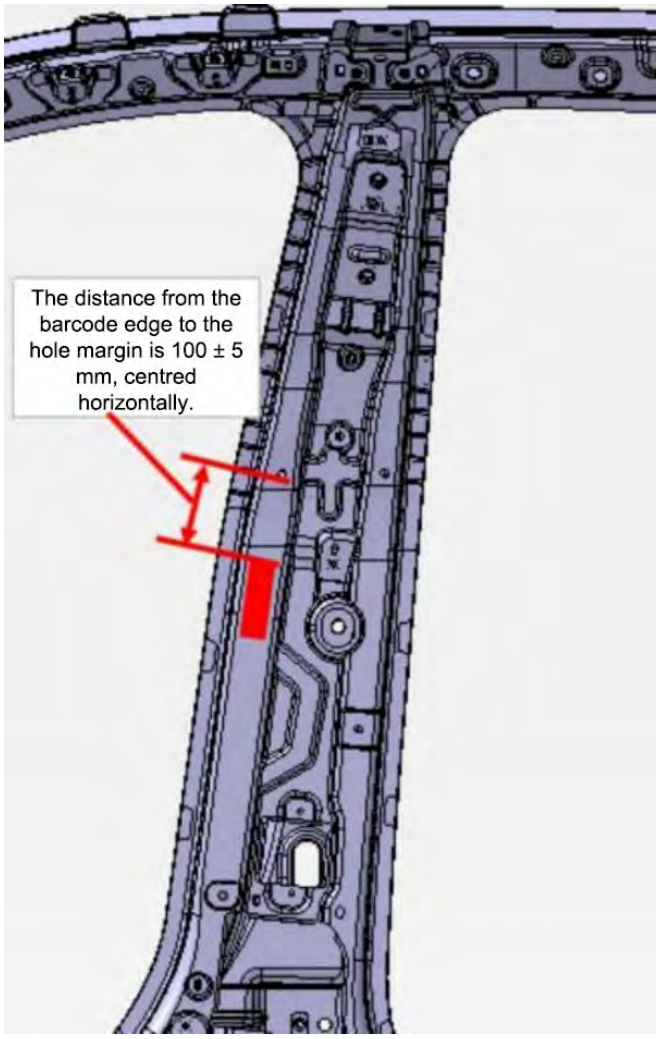
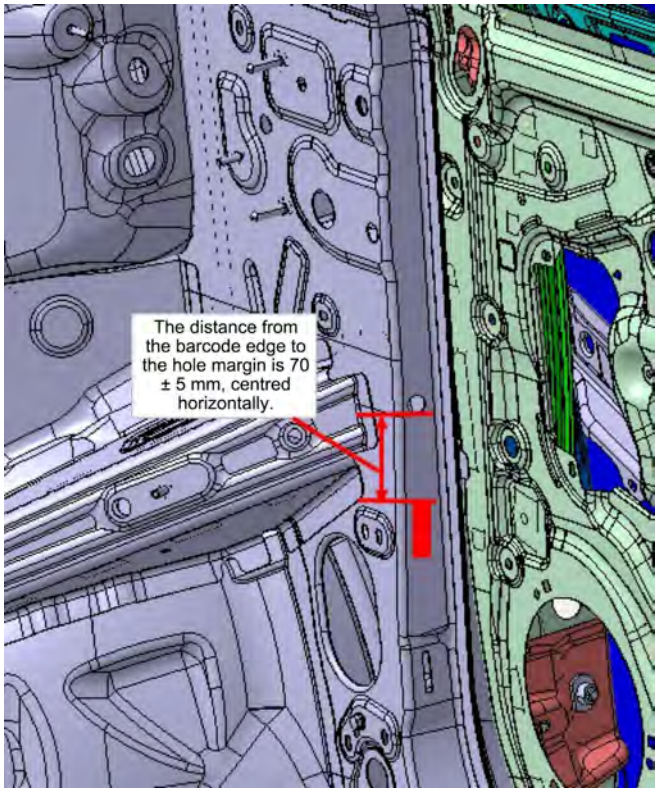
VIN

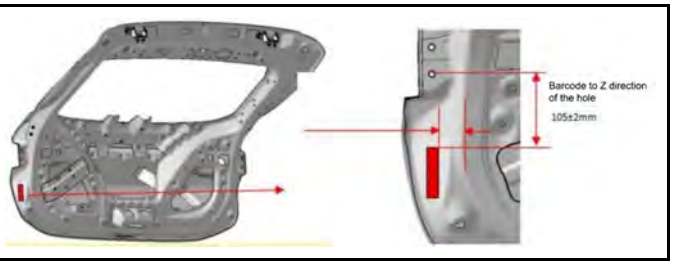
The vehicle identification code is engraved on the crossbeam of the body under the co-pilot seat and can be seen by opening the carpet gap.



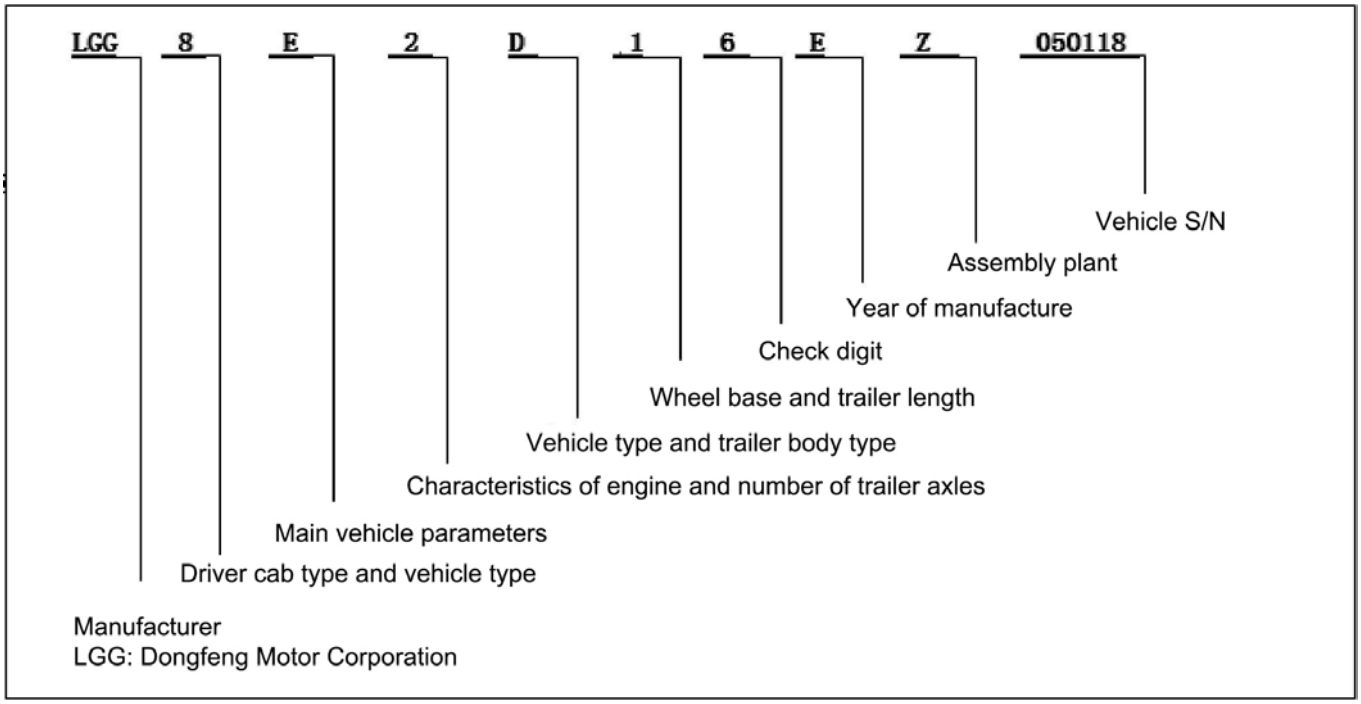
Identification number

Position	Illustration
Location of VIN label on the inner panel of the bonnet	
Location of VIN label on the inner side of the right B-pillar surface	

Location of VIN label on the inner panel of the B-pillar	
Location of VIN label in the middle of the inner panel of the A-pillar of the front right wall	

VIN code pasting position of the right hinge of the boot lid	

Encoding of vehicle identification number



Main dimension parameters of vehicle

Item	Unit	Luxury model	Premium/Prestige/Flagship
Vehicle length	mm	4565	4565
Vehicle width	mm	1860	1860
Vehicle height	mm	1690	1690
Front wheel track	mm	1590	1590
Rear wheel track	mm	1595	1595
Wheelbase	mm	2715	2715
Front overhang	mm	990	990
Rear overhang	mm	860	860

Vehicle mass parameters

Item	Unit	Luxury model	Premium/Prestige/Flagship
Kerb mass	Kg	1500	1550
Front axle kerb mass	Kg	870	905
Rear axle kerb mass	Kg	630	645
Maximum mass	Kg	1875	1925
Maximum mass of front axle	Kg	995	1013

Maximum mass of rear axle	Kg	880	912
Number of passengers	Person	5	5

Vehicle trafficability

Item	Unit	Luxury model	Premium/Prestige/Flagship
Approach angle (no load)	°	17	17
Departure angle (no load)	°	26	26
Minimum turning diameter	m	11.8	11.8
Minimum ground clearance (full load)	mm	165±10	165±10

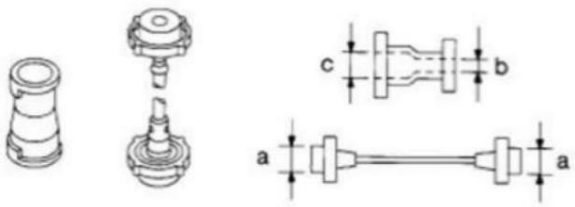
Wheels and tyres

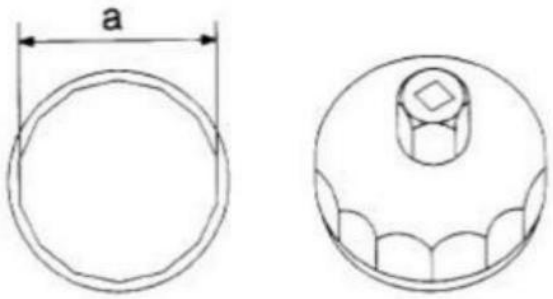
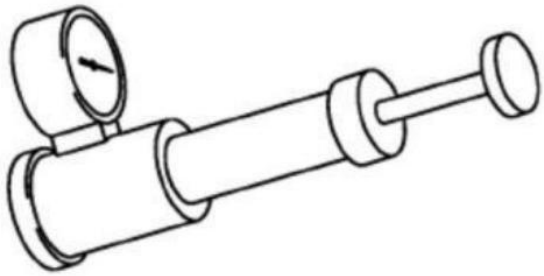
Wheels	
Size	18×7J, 19×7J, 17×4T
Tyre dimension	
Standard	235/60R18, 235/55R9
Spare tyre	T155/90R17

1.8 Maintenance

Preparations

Special service tools

Tool number/description	Illustration
Radiator cap tester connector: Connect the radiator cap tester to the radiator cap and the radiator filler a: 28 (1.10) diameter b: 31.4 (1.236) diameter c: 41.3 (1.626) diameter Unit: mm	

Reducer lubricating oil filter wrench: removal and installation of reducer lubricating oil filter a: 64.3mm	
Radiator cap tester: Check the radiator and the radiator cap	

Inspection Items before Delivery

The following are the inspection items before the delivery of new vehicles. According to the different conditions in each country, it is recommended to add other necessary inspection items. Only the inspection items applicable to this model are carried out. For specific technical specifications, please refer to the relevant content of this chapter.

Lower engine bonnet - high-voltage power-off

Check the radiator coolant and if the coolant hose fitting leaks.

Check the brake fluid reservoir and if the line leaks.

Windscreen washer and reservoir.

Interior and exterior

Operate all instruments, lights and attachments.

Operate the horn, wipers and washers

Check the steering lock functions

Check that the air flow in each mode is normal when the heater or A/C is operating.

Check whether the A/C for air leakage.

Check the functions of the front and rear seats and seat belts.

Check the fit and positioning of all molded parts, trims and devices.

Check the functions and positioning of all windows

The coordination and positioning of the trunk lid and doors.

Check the functions of door latch key and door locks

Check whether the sealing strips are well attached and fitted.

Check the headlight aiming

Tighten wheel nuts (including inner nuts).

Check the air pressure of tyres (including spare tyres)

Check the front wheel toe-in.

Underbody

Check whether the brake and various oil reservoirs are leaking.

Tighten the bolts and nuts of the steering pull rod and steering gear, suspension, drive shaft and actuating shaft.

Tighten the connecting bolts at both ends of the steering drive shaft.

Road test

Check the parking brake performance

Check the main brake performance

Check the steering control and return performance.

Check if squeak or cluck is produced

Final inspection

Install necessary parts and components (exterior rearview mirrors, seat belts, foot pads, carpet or mudguard).

Check whether the interior or exterior metal parts and paintwork are damaged.

Check the jack tools for spare tyres and documentation delivered with the vehicle.

Wash and clean the interior and exterior

General Maintenance

General maintenance items are those that should be checked every day during daily use of the vehicle. These maintenance items are important to keep the vehicle in normal working condition. The owner can perform these checks, or ask a Dongfeng Forthing franchise shop to help (there may be a small fee).

Vehicle exterior

The maintenance items listed below should be conducted frequently, unless specially specified.

Item	
Tyre	Check the tyre pressure (including that of spare tyres) with an air pressure gauge to a service station regularly. Adjust the tyre air pressure against the technical data if necessary. Carefully check the tyres for damage, cracks or excessive wear.
Windscreen	Clean the windscreen regularly. Check the windscreen for cracks or other damages at least once every six months. Repair or replace it if necessary.
Windscreen wiper blade	If the wiper is not working well, check whether the blade is detached, broken, or worn.
Door	Check that all doors, the boot lid and the tailgate can be opened and closed normally. All latches are securely locked. Lubricate if necessary. Confirm that when the main lock of the engine bonnet is released, the second lock can still prevent the engine bonnet from opening. Check the lubrication frequently if the vehicle frequently travels on roads on which salt is spread or in areas with corrosive substance.

Tyre rotation	Rotate the tyres once every 20,000 km.
Vehicle lights	Confirm that the headlight, brake light, taillight, turn signal light and other lighting equipment can be used normally and installed firmly. At the same time, check the headlight aiming function.

Vehicle interior

The maintenance items listed below should be conducted regularly, such as when routine maintenance is carried out or the vehicle is washed.

Item	
Warning light and buzzer	Make sure that all warning lights and buzzers work normally.
Windscreen wiper and washer	Check whether the windscreen wiper and washer work normally and that the wiper does not leave streaks.
Windscreen defroster	Check if air can be discharged correctly from the defroster air outlets and air is sufficiently taken in when the heater or A/C is working.
Steering Wheel	Check whether the free travel of the steering wheel is within the standard range. Check the change of the steering performance, such as excessive free travel, heavy steering or abnormal noise. Free travel: less than 30 mm
Seat belt	Check whether all the parts of the seat belt system (such as buckles, anchor bolts, adjusters and retractors) work normally and flexibly and are reliably installed. Check whether any seat belt is cracked, scratched, worn or damaged.
Accelerator pedal	Check whether the accelerator pedal operates smoothly. Make sure that the pedal is not jammed or unevenly stressed. Make sure that the lower cover plate pad is kept far away from the pedal.
Item	
Brake pedal and booster	Check whether the pedal moves smoothly, and make sure it has the right distance from the lower cover when fully pressed. Check the function of the booster. Make sure that the lower cover plate pad is kept far away from the pedal.
Parking brake	Check whether the handbrake functions normally.

Under the engine bonnet and vehicle

The maintenance items listed here should be performed regularly, such as each time you check the reducer lubricant or refuel.

Item	
Windscreen washer fluid	Check that the fluid reservoir contains sufficient washer fluid.
Brake fluid level	Ensure that the fluid level reaches more than 2/3 of the distance between the "MAX" and "MIN" scale marks on the reservoir.
Fluid leakage	After the car has stopped for a period of time, check whether there is any leakage of reducer lubricating oil, water or other liquids under the vehicle. After use, it is normal for the A/C to drip. If obvious leakage or odour is noticed, locate the cause and repair it immediately.

Regular maintenance

This regular maintenance chart lists the minimum tasks required to keep the vehicle running properly. Depending on the region and climate, extra maintenance items may be needed. For more detailed information, please refer to your warranty booklet.

Maintenance items and mileage

Service according to the specified distance or time (whichever comes first)	
Check the front and rear brakes	Every 5,000 km or 3 months
Replace brake fluid	Every 2 years or 40,000 km
Rotate tyres (check tyre pressure and wear monthly, including the spare tyre) and check wheel alignment	Rotate the tyres every 20,000 km
Replace the dust and pollen filter	Every 20,000 km

Service according to the specified distance or time (whichever comes first)	
Read: self-diagnostic memory	Every 3 months or 5,000 km
Door lock, hinge, sunroof, bonnet lock and trunk lid lock	Lubricate once every 20,000 km
Check signal lights, lighting, indicators and horn, tyre torque, and the sealing and condition of various pipelines	Every 3 months or 5,000 km
Visually inspect the following items:	
Tie rod joint, steering gear housing and dust cover, suspension components, and drive shaft dust cover	Every 5,000 km
Condition of front and rear shock absorbers and springs	Every 3 months or 5,000 km
All fluid levels and fluid status of brake hoses and pipelines (including ABS) Exhaust system Pipeline and its connection	Every 3 months or 5,000 km

Specifications of oil/fluid and lubricant

Item	Specification	Filling amount
Total amount of reducer lubricating oil	Total API GL-4 75W-90	1.3±0.05L
Three-in-one coolant	0AT-35	4L
Power battery coolant	0AT-35	6L
Brake fluid	DOT4	0.7±0.1L
Windscreen washer fluid	NFC-60	2.0L
A/C refrigerant	HFC134a	550±20g

Caution:

Please use Dongfeng Forthing coolant or products of equivalent quality to avoid aluminium corrosion in the cooling system caused by the use of inferior coolant.

Please note that if the cooling system is damaged due to the use of inferior coolant, Dongfeng Liuzhou Motor Co., Ltd. is not responsible for the warranty even if it is within the warranty period.

Specific gravity of coolant

The cooling system is filled with high-quality, long-life antifreeze coolant before leaving the factory. This antifreeze contains special additives to prevent corrosion and freezing. There is no need to add any cooling system additives.

Caution:

When filling or replacing coolant, make sure to use DFLZ Forthing original coolant or products with equivalent quality and correct mixing ratio.

See examples in the table below.

Ambient Temperature Drop to		Component	
℃	°F	Coolant (concentrated)	Distilled or demineralised water
-15	5	30%	70%
-35	-30	50%	50%

Using other types of coolant may damage the cooling system.

When checking the coolant mix ratio with a coolant gravimeter, correct the gravimeter readings (specific gravity) based on the coolant temperature against the table below.

Coolant mixing ratio	Coolant temperature, °C (°F)			
	15 (59)	25 (77)	35 (95)	45 (113)
30%	1.046-1.050	1.042-1.046	1.038-1.042	1.033-1.038
50%	1.076-1.080	1.070-1.076	1.065-1.071	1.059-1.065

Tyre inflation pressure

Tyre model	Item	At no load	At full load
235/60 R18	Front tyre	230±5kPa	230±5kPa
	Rear tyre	230±5kPa	230±5kPa
235/55 R19	Front tyre	230±5kPa	230±5kPa
	Rear tyre	230±5kPa	230±5kPa
T155/90 R17	420±5kPa		

Applies only to cold tyres. The unit of air pressure is (kPa).

Coolant and cooling system

Inspection of coolant level

The translucent coolant expansion tank is installed in the engine compartment. The coolant level in this expansion tank should be kept between the "MINI" and "MAX" marks. Check the coolant level when it is cool.



The cooling system is sealed, and under normal conditions, coolant consumption should be very low. If the coolant level drops, there may be a leak. If this happens, have the cooling system inspected and repaired immediately at a DFLZ-approved service station.

If the coolant level drops below the "MINI" mark on the expansion tank, open the cap and add coolant in time.

WARNING:

The antifreeze used is grade -35. If you need to use a different grade, drain all the original antifreeze and flush the system. Mixing different types of antifreeze can damage the parts.

Replace the coolant

The coolant level should not go beyond the "MAX" mark. Surplus coolant will overflow from the cooling system due to expansion with heat.

Caution:

Coolant is harmful to health! Therefore, the coolant shall be properly stored in the original container and especially protected from children.

Note:

As a rule, only DFLZ special coolant should be used. If you cannot buy this easily, you may use Monarch or Great Wall brand coolants that have been approved by the National Technical Testing Centre. Other brands of coolant may seriously reduce the anti-corrosion protection. Corrosion damage caused by this may result in coolant loss or even serious faults.

Coolants of different brands should not be mixed. When you need to replace coolant with a coolant of a different brand, be sure to completely drain the previously used coolant from the water tank.

Coolant replacement steps

1. Remove the radiator cap.

2. Remove the radiator drain valve (the drain valve is at the left lower part of the radiator). Drain the coolant from the radiator and water jacket.

3. Remove the expansion tank and drain the coolant from the tank.

4. Loosen the radiator water inlet pipe clamp and remove the radiator water inlet pipe. Clean the cooling line by adding clean water through the radiator water inlet until clean water is discharged from the line. Fit the radiator water inlet pipe and clamp it.

5. Tighten the radiator drain valve firmly.

6. Slowly fill the radiator with the coolant specified for Dongfeng Liuzhou Motor Co., Ltd. passenger vehicles until the radiator is full.

7. Add coolant to the expansion tank until the coolant level reaches the "MAX" (full) mark.

8. Install the expansion tank cover.

9. When the thermostat opens, run at high speed (not above 4800rpm) several times, then turn off the engine. After cooling, fill the expansion tank with coolant until it reaches the "MAX" (full) line. If the coolant level remains low, repeat the operation from step 8.

Caution:

During operation, make sure not to open the expansion tank cap when it is hot. The hot cooling system is under pressure. If you open it, the hot coolant could spray out and cause serious burns. Do not mix coolants of different brands.

Antifreeze

1. The coolant contains ethylene glycol corrosion inhibitor. To prevent corrosion of parts, the coolant must be replaced regularly. As coolant contains such corrosion inhibitor, ordinary water should not be used to replace coolant even in summer.

2. The required content of antifreeze varies with the ambient temperature.

Minimum ambient temperature (°C)	-10	-20	-35	-45
Glycol content (%)	25	30	35	40

Caution:

When charging antifreeze, do not allow liquid to spill; if it spills, wipe it off immediately with a cloth.

As antifreeze contains harmful corrosion inhibitors, if liquid accidentally splashes onto a human body in the process of charging antifreeze, flush it away immediately with clean water.

3. In cold seasons, if the temperature in the area where you drive your car drops below 0°C, the coolant in the radiator may freeze and cause serious damage to the radiator. To prevent the coolant from freezing, sufficient amount of antifreeze should be added to the coolant. The coolant used when the vehicle is delivered from the factory can function with the anti-freeze effect at a low temperature of about -35°C. Before a cold season starts, check the content of antifreeze and add antifreeze to the system when necessary.

Flush cooling system

1. Install the removed fluid reservoir and radiator drain plug.

Caution:

Be sure to clean the water drain plug and install new O-rings.

2. Disconnect the heater hose (at the left of the vehicle).

Caution:

Lift the heater hose as much as possible.

3. Add water to the radiator and fluid reservoir and install the radiator cap.

Caution:

Disconnect the heater hose when the coolant overflows. Then reconnect the heater hose and continue charging the coolant.

4. Install the air pipe assembly.

5. Drain water from the system.

6. Repeat the above steps until clear water begins to drain from the radiator.

Inspection of cooling system

WARNING:

Never open the radiator cap before the engine is completely cooled. High-pressure liquid escaping from the radiator can cause serious burns.

Wrap the radiator cap with a thick cloth, rotate it for 1/4 turn to release pressure in the radiator, and then unscrew the cap completely.

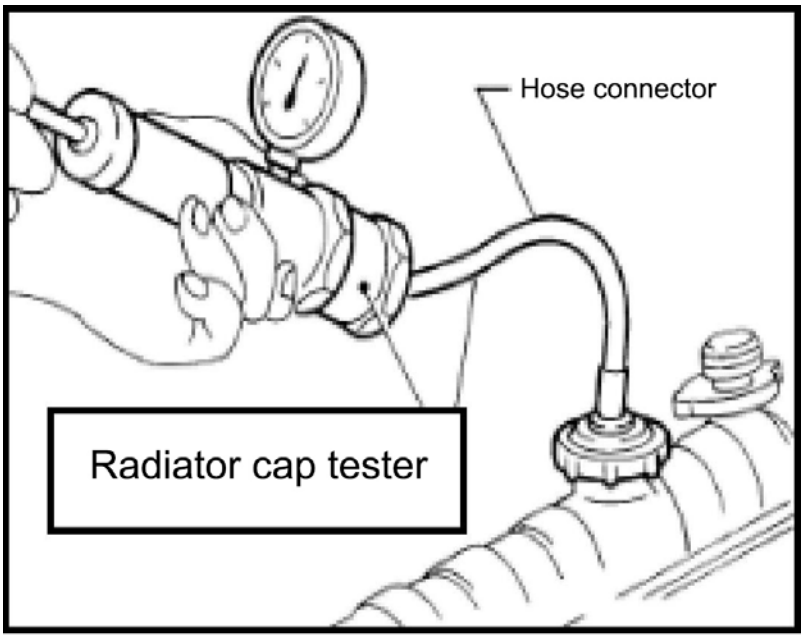
Inspection of cooling system hose

Check the hoses for installation errors, leaks, cracks, damages, loose connections, wear or ageing.

Repair or replace damaged parts or components if necessary.

Inspection of cooling system for leakage

Use a radiator cap tester (general repair tools) and radiator cap tester connector pressurize the cooling system to check it for leakage.



Body and Chassis Maintenance

Brake fluid

Check the brake fluid level in the reservoir. The brake fluid level must be between the "MAX" and "MIN" marks on the reservoir. When the brake pads wear down, the brake fluid level will drop slightly.



If the brake fluid level drops noticeably in a short time, it means there is a leak in the braking system. In this case, the vehicle shall be immediately sent to a service station recognised by DFLZ for maintenance.

DOT3 or DOT4 brake fluid should be used. Brake fluid absorbs moisture. If there is too much water in the brake fluid, braking performance will decrease. The brake fluid reservoir has a special sealing cap to prevent air from entering. Do not remove this cap unless necessary.

The brake fluid level is monitored by a float. When the brake fluid level drops below the "MIN" mark, the brake fluid warning light illuminates.

Replace brake fluid

Brake fluid can absorb moisture, Over time, it will take in moisture from the air around it. However, excessive water content in brake fluid can cause corrosion damage to the braking system. In addition, the boiling point of brake fluid will drop obviously. Therefore, the brake fluid must be replaced every two years.

Caution:

If brake fluid has been used for too long, bubbles will be generated in the braking system at a very high braking load. In this case, the braking performance and driving safety performance will be severely compromised.

Only DOT4 brake fluid approved by DFLZ can be used for replacement, and the brake pipeline shall be thoroughly cleaned to ensure that two kinds of brake fluid are not mixed.

Brake fluid is harmful to human body! Therefore, it must be properly stored in its original sealed container, and children should be kept away from it. In addition, pay attention to preventing the brake fluid from corroding the vehicle topcoat.

When handling the brake fluid, pay attention to that it will damage eyes and skin as well as the paint coat. In case of accidental splashing on the human body, wash it with clean water immediately

Be sure to keep the fluid reservoir clean and tighten the fluid reservoir cap to prevent dirt from ingression.

Before filling the brake fluid, wipe the fluid reservoir cap and fluid filler port with a clean cloth. Then fill designated clean brake fluid.

If the brake fluid deteriorates, immediately discharge the brake fluid that has deteriorated from the braking system. Fill designated clean brake fluid

Inspection of brake pipeline and brake cable

Check if the brake pipeline and parking brake cable are in right positions and have leaks, wear, abrasion and ageing.

Inspection of disc brake

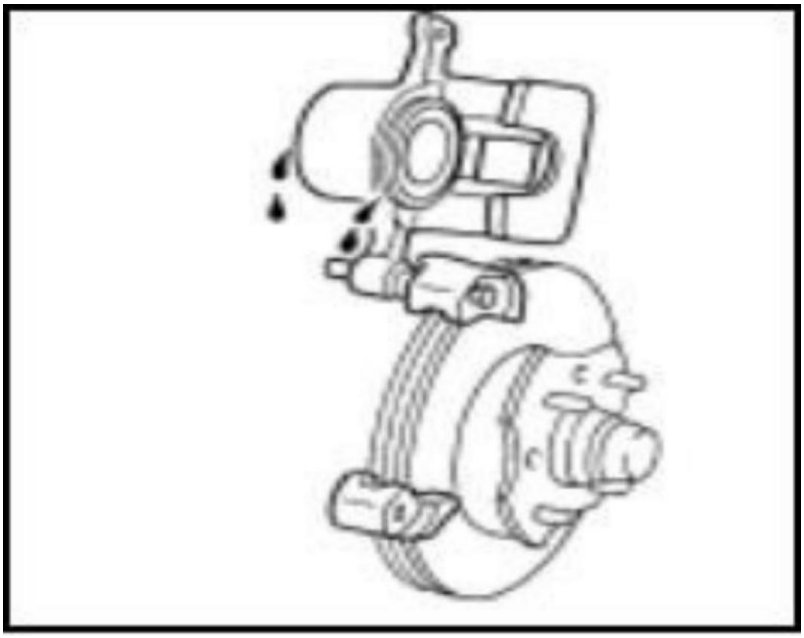
Brake disc

Check it for wear and damage.

Category	Front	Rear
Standard thickness	28mm	14mm
Maximum runout	0.025mm	0.025mm
Minimum thickness (wear limit)	26mm	12mm

Brake caliper

Check for oil leakage.



Brake pads

Check it for wear and damage

Category	Front (mm)	Rear (mm)
Standard thickness	10	10.2
Minimum thickness (wear limit)	2	2

Inspection of steering gear and tie rod

Inspection of steering gear

1. Check the steering gear housing and dust cover for looseness, damage and grease leakage.

2. Check its connection with the steering column for looseness.

Inspection of steering tie rod

1. Check the spherical hinge, dust cover and other parts for looseness, wear, damage and grease leakage.

Check the power/electronic steering system

1. Check whether there is grease accumulation on the rack dust cover.

2. Check the power steering column and intermediate shaft (for EPS model).

Caution:

Do not turn the steering wheel in place for a long time.

Check whether the steering column connector is loose.

Check whether the EPS warning light stays on in the instrument panel.

Axle and suspension parts and components

Suspension

Check the front and rear axles and suspension parts and components for excessive clearance, cracks, wear or other damages.

Shake each wheel to check whether the clearance is excessive.

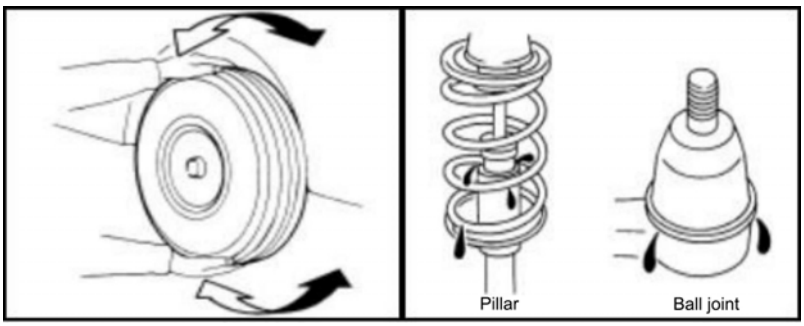
Check the operation of the wheel bearing.

Check the axles and suspension for loose nuts and bolts.

Check the strut (shock absorber) for reducer lubricating oil leakage or other damage.

Check the suspension ball joint for grease leakage.

Check the ball joint dust cover for cracks or other damages.



Tyre

In order to drive the vehicle safely, the model and size of the tyres must be suitable, and the tyres must have good tread pattern and appropriate tyre pressure. The operation methods for the maintenance and replacement of tyres are listed below.



Use of tyres with excessive wear or insufficient tyre pressure will cause accidents, personal injury or death.

All descriptions about tyre inflation and maintenance in this Manual must be complied with.

Tyre inflation

Keep the tyres properly inflated, which can provide the best combination of manoeuvrability, tread life and driving comfort.

Tyres that are insufficiently inflated will suffer uneven wear, affecting operation and fuel consumption and even air leaks due to overheating.

Tyres that are excessively inflated will cause uncomfortable rides and are more susceptible to damage due to uneven pavement, with uneven wear.

It is suggested that you shall conduct visual inspection for the vehicle tyres every day. If you think the height of a tyre is low, measure it with a tyre pressure gauge immediately. Measure the tyre pressure with a tyre pressure gauge at least once a month. Even if a tyre is in good condition, its pressure may decrease by 10 to 20 kPa (0.1 to 0.2 kgf/cm2) per month. Remember to check the spare tyre after checking all others.

Measure the tyre pressure when the tyres are cold. This means that it shall be measured at least after stopping for three hours or when the driving distance is not more than 1.6 km. If necessary, inflate or deflate the tyre to match the cold tyre pressure recommended on the driver's side door frame plate. If tyre pressure measurement is carried out in hot state (after vehicle has run for several kilometres), the pressure reading will be 30~40 kPa (0.3 to 0.4 kgf/cm2) higher than that measured in cold state. This is a normal phenomenon. Do not deflate to meet the specified tyre pressure reading in cold state; otherwise, under-inflation of tyres may occur. You shall carry a tyre pressure gauge and use it to check tyre pressure every time. In this way, it is easier to judge whether the decrease in tyre pressure is due to the problem of the tyre itself or the difference between different tyre pressure gauges.

Tubeless tyres can be self-sealed when punctured. If the tyre pressure starts to decrease, carefully find out the leaking position.

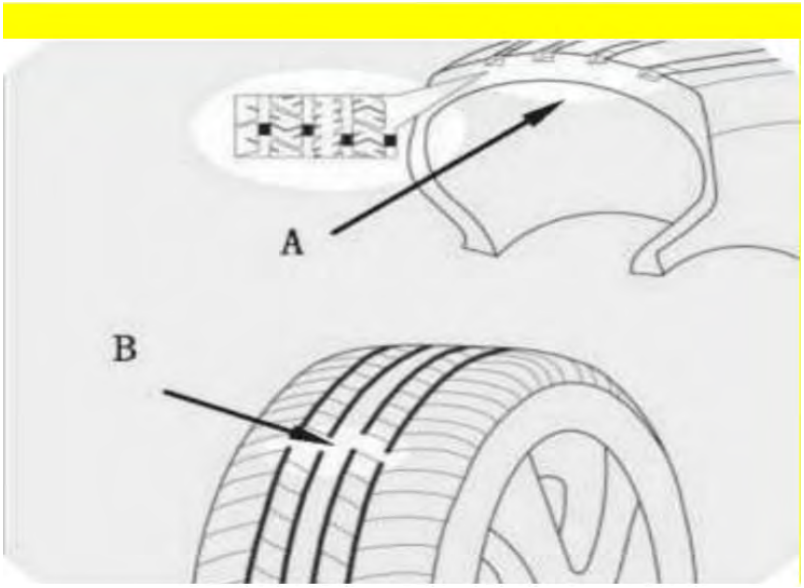
Inspection of tyres

When checking the inflation state of the tyres, check the tyres for damage, foreign object penetration and wear. You shall check:

Replace a tyre if any damage or bulge is found on its tread or wall.

Replace a tyre if its wall is scratched, cracked or ruptured to the fabric or cord.

Excessive tread wear.



The tyre must be kept in good condition, and the tread pattern on the tyre surface shall be deep enough. Tyres approved by Dongfeng Forthing are marked with A to measure the wear degree of tyres, and this mark is the raised point inside the tyre running belt.

When the raised point on the tyre is worn down to level B, the tyre must be replaced. At this point, the tread depth is only 1.6 mm, meaning such tyres lack grip on wet roads.

Tyre maintenance

In addition to proper inflation, correct wheel alignment also helps reduce tread wear. If you find that the tyre wear is uneven, please contact the Dongfeng Forthing authorised sales service shop to check the wheel alignment status.

If you feel some kind of continuous vibration while driving, please go to Dongfeng Forthing's authorised sales service shop to check the tyres. Tyre balancing must be performed whenever a tyre has been removed from the wheel. When installing a new tyre, be sure to balance the tyre so as to increase the riding comfort and prolong the service life of the tyre. It is best to have the installer perform tyre balancing.

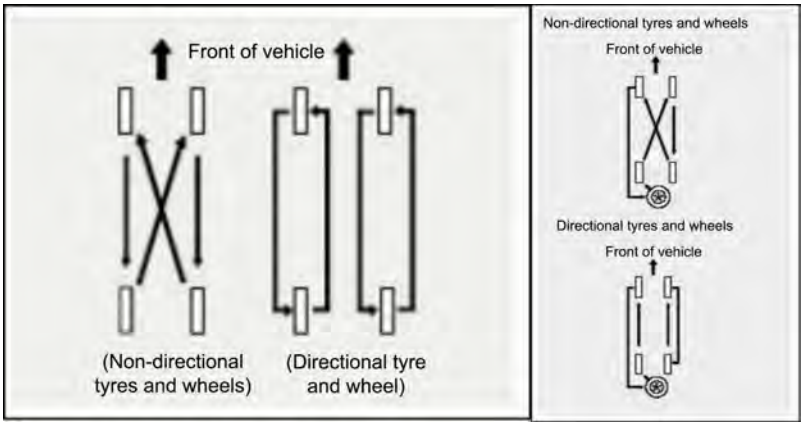
Caution:

Inappropriate wheel balance weights will damage aluminium alloy wheels. Therefore, only the original wheel balancing weights of Dongfeng Forthing can be used to keep balance.

Tyre rotation

To extend the service life of tyres and allow tyres to wear evenly, the positions of tyres shall be changed once a vehicle has travelled for 20,000 km. During each rotation, rotate the tyres as shown in the figure below. The following figure shows how to change the tyre position of a vehicle without a standard spare tyre.

If directional tyres are used, only the positions of front and rear tyres can be interchanged.



If a standard spare tyre is used for tyre rotation, please refer to the figure above.

Replacement of tyres and wheels

Replace with radial tyres having the same size, load scope, rated speed and maximum cold tyre pressure (indicated on the tyre wall). Mixed use of radial and diagonal tyres may reduce the vehicle's braking capacity, driving force (ground adhesive force) and steering accuracy. Using tyres of different sizes or structures will cause the ESP and ABS to fail to work normally.

The anti-lock brake system (ABS) works by comparing the speed of wheels. Therefore, when replacing tyres, you must use tyres with the same size as the original tyres. The size and structure of the tyre affect the wheel speed and may lead to uncoordinated operation of the system.

It is best to replace all four tyres at the same time. If it is not possible or not necessary to do so, the two front tyres or rear tyres shall be replaced symmetrically. Replacing only one tyre will seriously affect the vehicle's handling performance.

If the wheels need to be replaced, make sure that the specifications of the new wheels are consistent with those of the original ones. Before replacing the tyre, consult a Dongfeng Forthing authorised sales service shop.

Wheels for replacement can be purchased from a Dongfeng Forthing Exclusive Sales Service Shop.

WARNING:

Installation of improper tyres will affect the manoeuvring flexibility and stability of a vehicle and can result in accidents, causing death.

Always use tyres of the size and type recommended on your vehicle tyre label.

2.1 Front suspension

2.1.1 Specification

2.1.1.1 General specifications

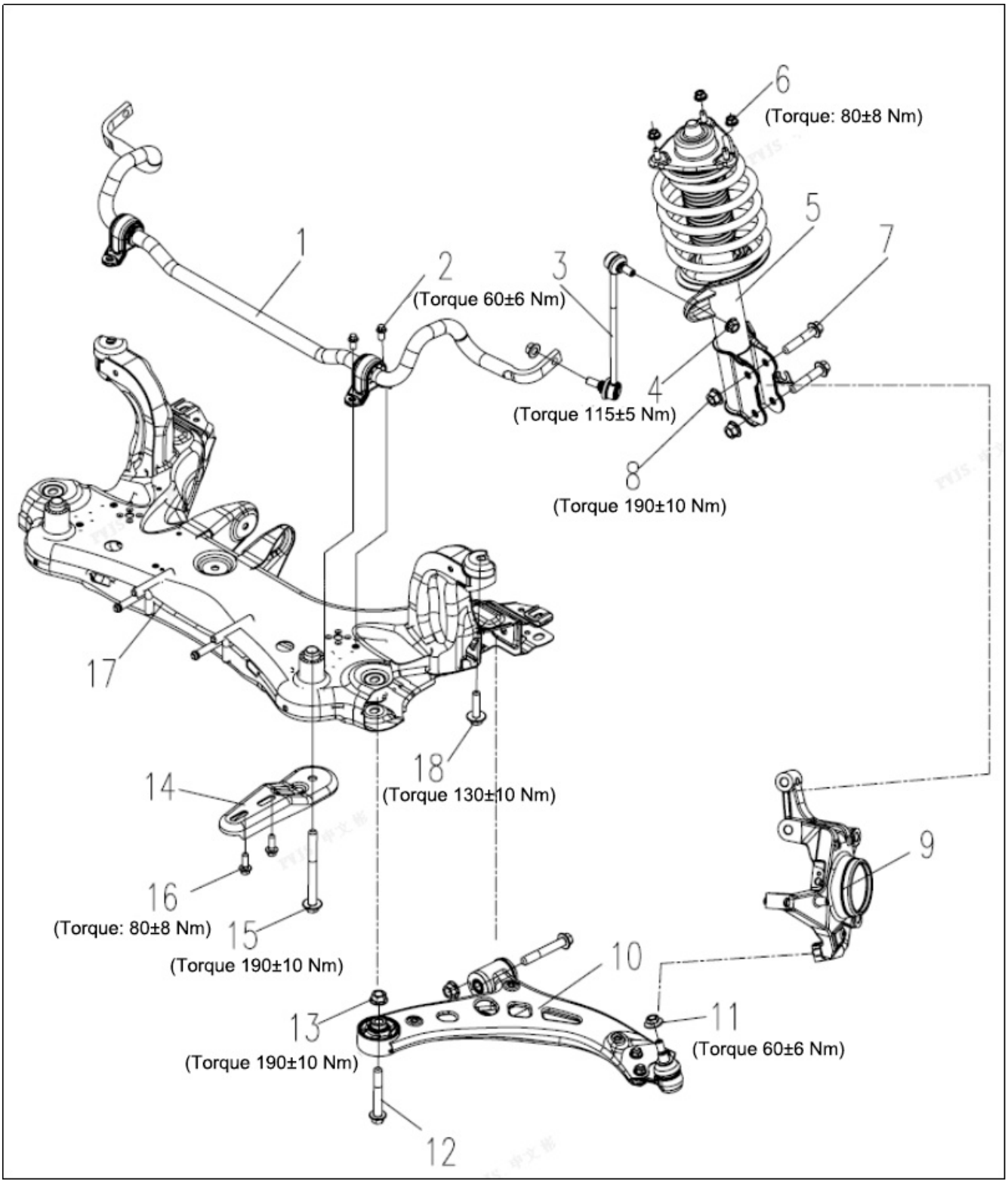
Item		Data
Front wheel toe-in	Front wheel	0.08°±0.04°
	Rear wheel	0.1°±0.25°
Wheel camber angle	Front wheel	-0.3°±0.5°
	Rear wheel	-0.1°±0.4°
Kingpin caster angle	Front wheel	6.01°±0.5°
Kingpin inclination angle	Rear wheel	13.29°±0.5
Suspension system	Front suspension	MacPherson type independent suspension + horizontal stabiliser bar
	Rear suspension	Rear trailing arm dependent suspension

2.1.1.2 Torque specification

Name	Nm
Connecting bolt of front strut and steering knuckle	190±10
Connecting nut of front strut and steering knuckle	190±10
Connecting bolt of front strut and vehicle body	70±2
Mounting bolt for front stabiliser bar bracket	60±6
Mounting bolt of front swing arm	190±10
Mounting nut of front swing arm	190±10
Front swing arm ball joint lock nut	60±6
Front mounting bolt of front subframe	130±10
Rear mounting bolt of front subframe	190±10
Mounting bolt of front subframe connecting plate	70±2
Linkage ball joint lock nut of front suspension	155±45
Lock nut of steering knuckle connecting front swing arm ball joint	60±6
Ball joint nut of steering knuckle connecting steering gear tie rod	60±6
Bolt of steering knuckle connecting front brake	150±15
Nut of steering knuckle connecting front wheel hub bearing unit assembly	95±9
Bolt of steering knuckle connecting front wheel speed sensor	8±2
Screw of steering knuckle connected to front brake mudguard	9±1
Nut of front hub bearing unit assembly connecting wheel	130±10

2.1.2 Operation Manual

2.1.2.1 Disassembling of the front suspension



Exploded view code name comparison table

label	name	label	name
1	Front lateral stabiliser bar with bushing assembly	10	Left/right front swing arm assembly

2	Front stabiliser bar bracket mounting bolt	11	Front swing arm ball joint locking nut
3	Left/right front stabiliser bar connecting rod assembly	12	Front swing arm mounting bolt
4	Stabiliser bar connecting rod mounting nut	13	Front swing arm mounting nut
5	Left/right front suspension strut assembly 14 Left/right front	subframe connecting plate	
6	Front suspension strut connecting body nut	15	Subframe rear mounting bolt
7	Front suspension strut connecting steering knuckle bolt	16	Subframe connecting plate mounting bolt
8	Front suspension strut connecting steering knuckle nut	17	Front subframe assembly
9	Left/right steering knuckle	18	Subframe front mounting bolt

2.1.2.2 System overview

project		**name**
Suspension configuration Suspension system	Front suspension	MacPherson independent suspension + lateral stabiliser bar

The front suspension adopts MacPherson suspension, which absorbs the impact energy of wheels when running on uneven roads and disperses this energy to the whole suspension system. The suspension system determines a vehicle's ride comfort based on the ratio of energy dissipation to energy absorption. The suspension system has been designed for ride comfort and cannot be adjusted. The steering knuckle is suspended between the lower control arm and the strut assembly. The lower control arm is connected to the steering knuckle at its outermost point. This connection is realised through a ball joint. The innermost end of the control arm is connected to the frame at two points through bushings. The upper part of the steering knuckle is connected with the strut assembly. The strut assembly is connected to the vehicle body by an upper bearing. The steering knuckle can move vertically independent of the body structure and frame. When the vehicle travels over uneven roads, most of the steering knuckle's vertical movement is absorbed by the coil spring. The spring is kept under compression on the strut assembly. Each end of the strut serves as a connection point between the suspension system and the vehicle, and as a seat for the coil spring. This allows the strut to use damping action to individually reduce the spring's reaction force. The lower control arm can rotate vertically on the frame. The ball joint keeps the steering knuckle perpendicular to the road surface. The front suspension system is equipped with a stabiliser bar. The stabiliser bar is connected between the left and right lower control arm assemblies through stabiliser links and stabiliser bar bushings. The stabiliser bar can control the independent displacement of the suspension system during vehicle cornering.

Steering knuckle with hub bearing

The steering knuckle with wheel hub assembly and rear wheel hub assembly system mainly includes the front steering knuckle, brake mudguard and front and rear wheel hub bearing unit assemblies. It is a bridge connecting the suspension system and the braking system. When the whole vehicle is working, it provides basic support and rotation functions.

2.1.2.3 Precautions

Caution

1. Before removing parts, the vehicle should be powered off and the battery GND cable should be disconnected.
2. Disassemble in a clean working area. It is important to avoid the internal parts being polluted by dust or other foreign objects.
3. Place the disassembled parts on part racks in sequence for easier and more accurate assembling.
4. Please use genuine parts for maintenance work, and do not reuse unusable parts.
5. Please follow the standard maintenance diagnosis process for maintenance work, and make sure that there is no oil stain or grease on the tightening surface.
6. After replacing the steering knuckle and wheel hub bearing parts, the wheel alignment must be checked.
7. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

Precautions during repair

1. Upon assembling of the rubber bushing, final tightening must be done when the vehicle is not loaded and on ground. The rubber bushing shall not come into contact with engine oil during removal and installation as the engine oil will shorten the service life of the rubber bushing.
2. When a vehicle is not loaded, it means the fuel oil, engine coolant, and lubricant are all full, and spare tyre, jack, on-board tool, and foot pad are all in specified positions.
3. Wheel alignment must be checked after the suspension parts and components are installed.
4. The self-locking nuts shall not be reused; new self-locking nuts must be used upon each assembling. Do not wipe off the grease precoated on new self-locking nuts when tightening them.
5. The tightening interface must be free from oil stains or grease.

2.1.3 Diagnosis and testing

2.1.3.1 Front Suspension - Troubleshooting of Noise, Vibration and Harshness

The following table can help you find the cause and determine the repair or replacement of these components and parts where necessary. Repair or replace these parts and components as necessary.

Front suspension		Symptoms				
		Noise	Shaking	Vibration	Judder	Uncomfortable riding or difficult to operate
Possible cause and suspicious parts	Improper assembling and looseness	•	•	•	•	•
	Deformation, damages or distortion of strut	•	•	•	•	•
	Deterioration of bushing or assembling positions	•	•	•	•	•
	Interference of parts and components	•	•	•	•	•
	Spring fatigue	•		•		•
Possible cause and suspicious parts	Suspension looseness	•	•			
	Incorrect wheel alignment				•	•
	Stabiliser bar fatigue					•
	Front axle and front suspension	•	•	•	•	•
	Wheels	•	•		•	•
	Brake	•	•		•	
	Steering	•	•	•	•	
	Damage of upper steering bearing of front strut	•				

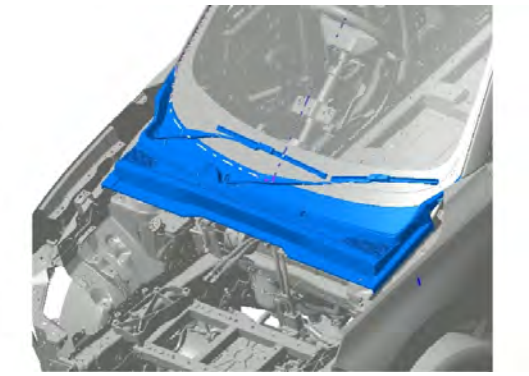
– Applicable

2.1.4 Removal and installation

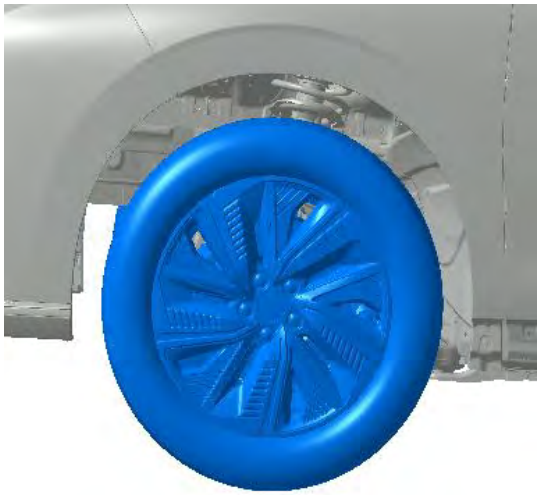
2.1.4.1 Front suspension strut assembly

Removal

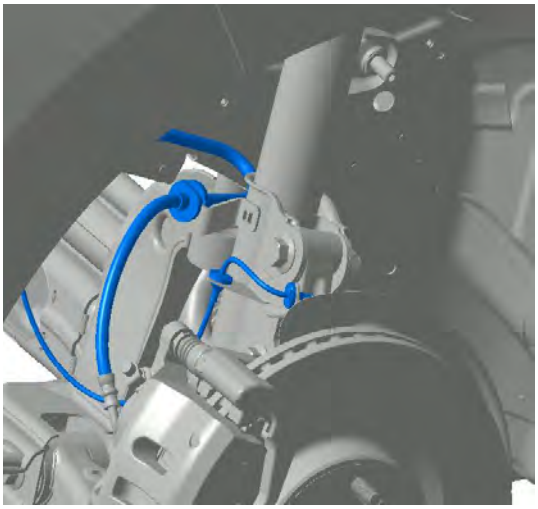
1. Open the bonnet.
2. Remove the wiper arm. Refer to: Wiper Arm.
3. Remove the cover plate.



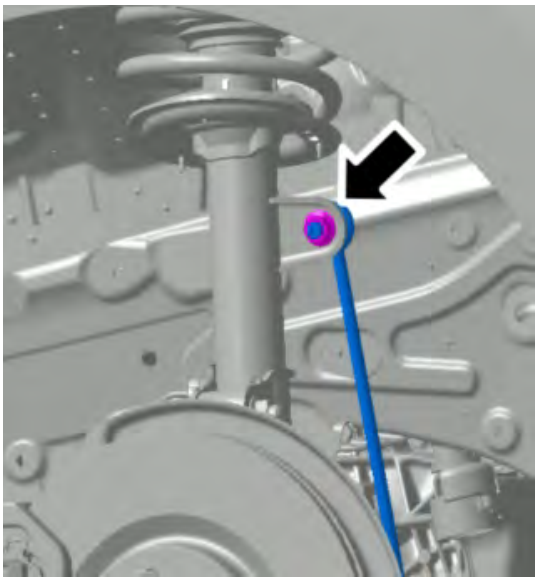
4. Lift and support the vehicle. Refer to: Lifting the vehicle.
5. Remove the tyre.Refer to: Tyre.



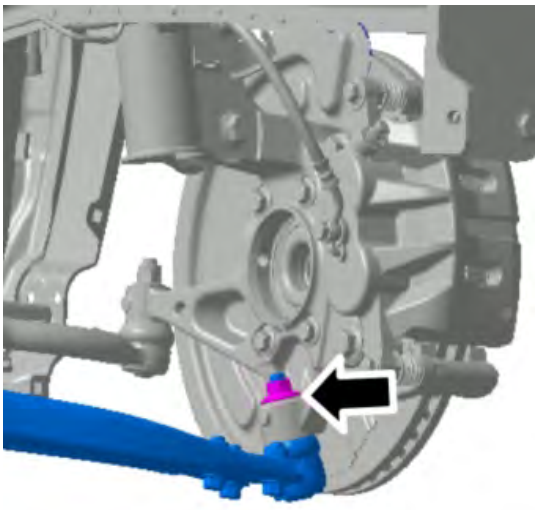
6. Remove the ABS wheel speed sensor and brake hose from the front strut.



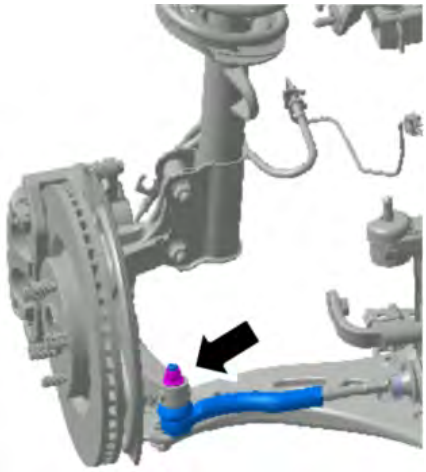
7. Unscrew the nut connecting the stabiliser bar link to the front strut.



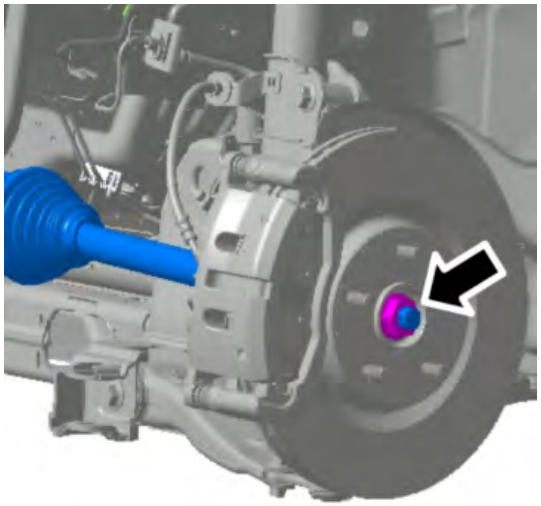
8. Remove the fixing nuts of the front swing arm assembly and the steering knuckle.



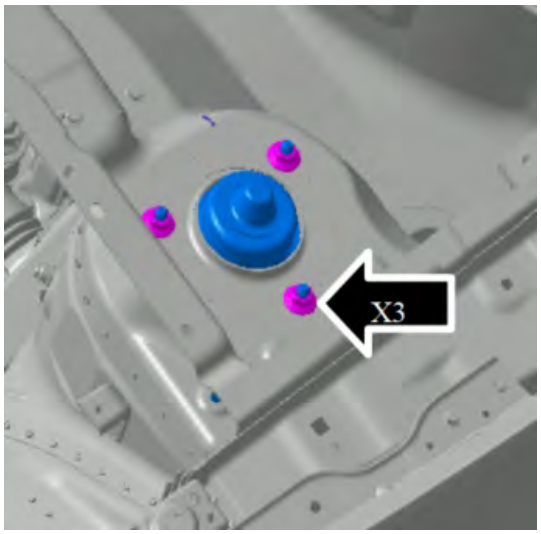
9. Disassemble fixing nuts of steering tie rod and steering knuckle.



10. Remove the drive shaft.



11. Remove the fixing nut of the front suspension strut assembly in the engine compartment, and remove the strut with bearing assembly.





12. Remove the front suspension strut assembly and the front axle with caliper assembly, and unscrew the bolts connecting the strut to the front axle with caliper assembly.



13. Remove the front suspension strut assembly and the front axle together with the caliper assembly.

Inspection after removal

1. Check the front strut assembly for deformation, cracks, or other damage.
2. Check whether the shock absorber oil leaks.
3. Whether the rubber parts are cracked or damaged.

Installation

1. The installation order is the reverse of the removal order.

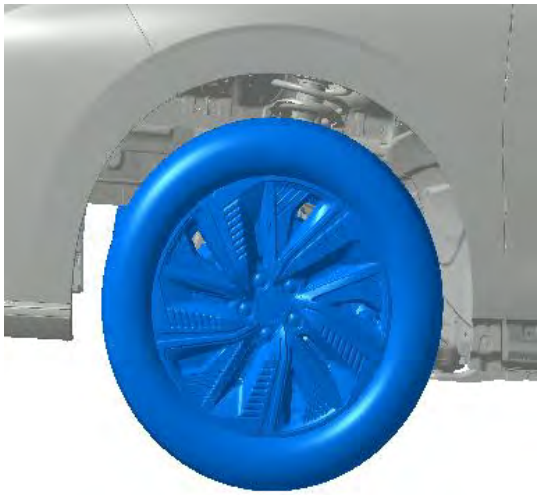
Inspection after installation

1. Check the wheel alignment. Refer to: Wheel alignment.

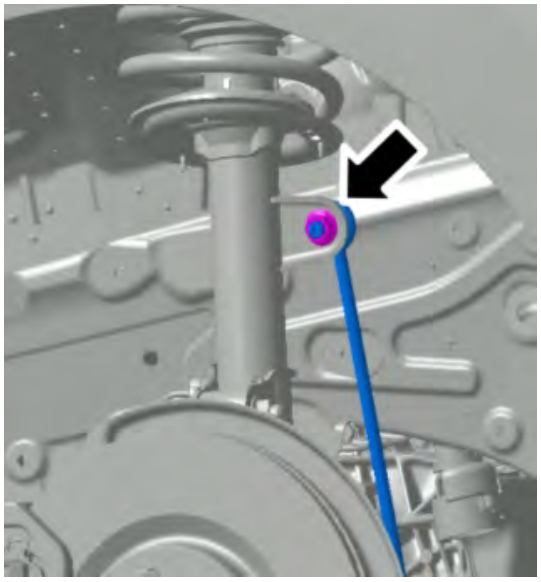
2.1.4.2 Front stabiliser bar and tie rod assembly

Removal

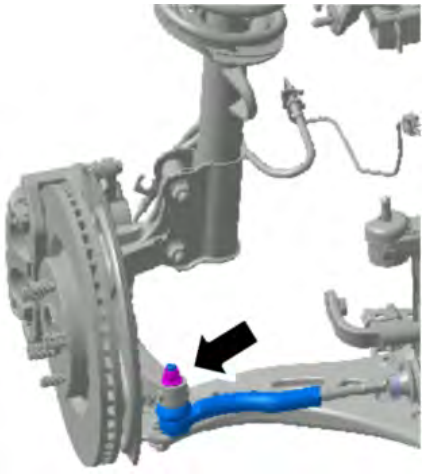
1. Lift and support the vehicle. Refer to: Lifting the vehicle.
2. Remove the wheel from the vehicle. Refer to: Wheels.



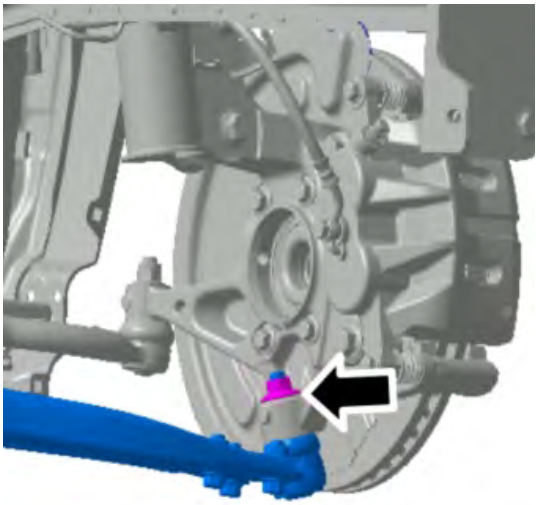
3. Remove the nut connecting the stabiliser bar link to the strut.



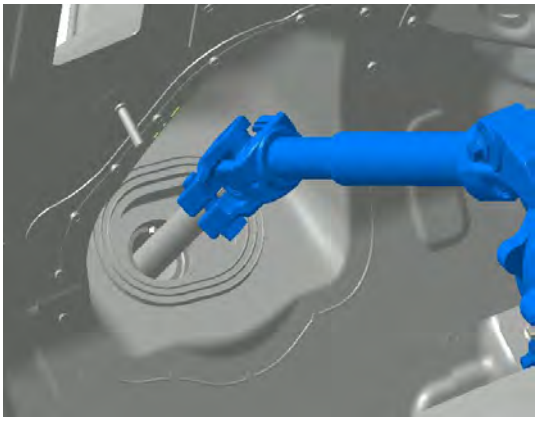
4. Remove the steering outer tie rod from the steering knuckle.



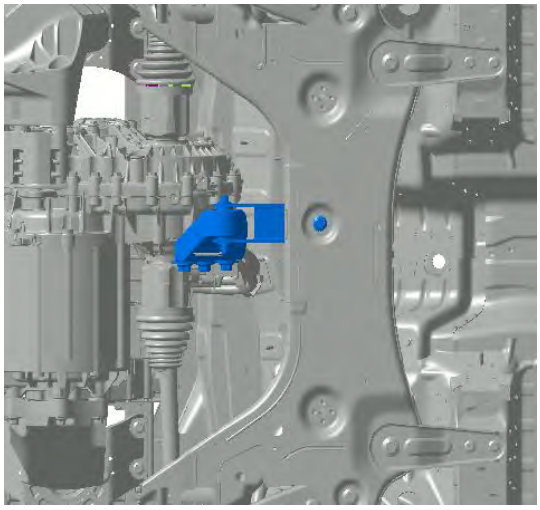
5. Disassemble the ball joint of swing arm from steering knuckle;



6. Remove the intermediate shaft fastening bolts and separate the intermediate shaft.

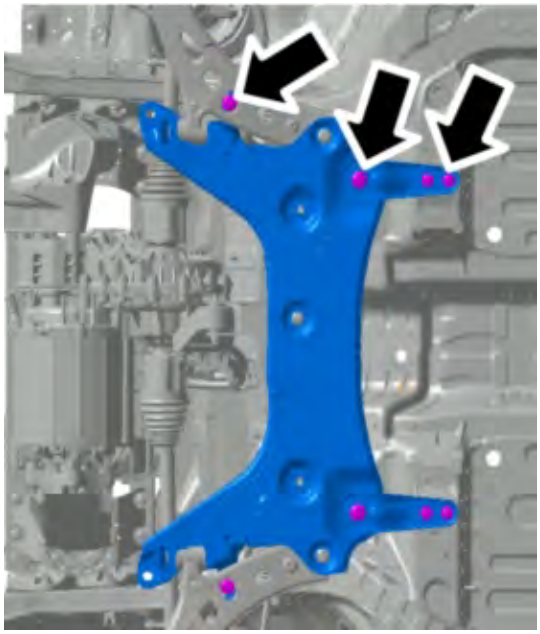


7. Remove the rear mount.



8. Fix an appropriate jack under the front subframe;

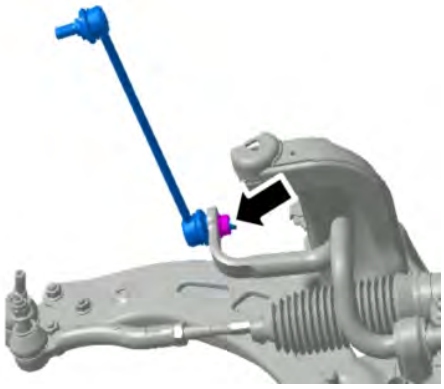
9. Remove the assembling bolts of the front subframe.



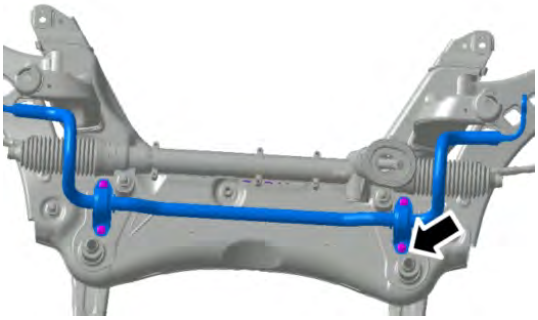
10. Gradually lower the jack to remove the front subframe assembly.



11. Remove the stabiliser bar connecting rod and the stabiliser bar connecting nut to obtain the stabiliser bar connecting rod.



12. Remove the stabiliser bar and subframe mounting bolts.



Inspection after removal

1. Check whether the stabiliser bar and its tie rod, bushing, and mounting bracket have such defects as deformation, crack or damage, and replace the defective one(s) where necessary. Replace the defective one(s) where necessary.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points

Caution: Ensure that the mounting bolts of the swing arm and subframe are tightened when the vehicle is in the unloaded condition.

Inspection after installation

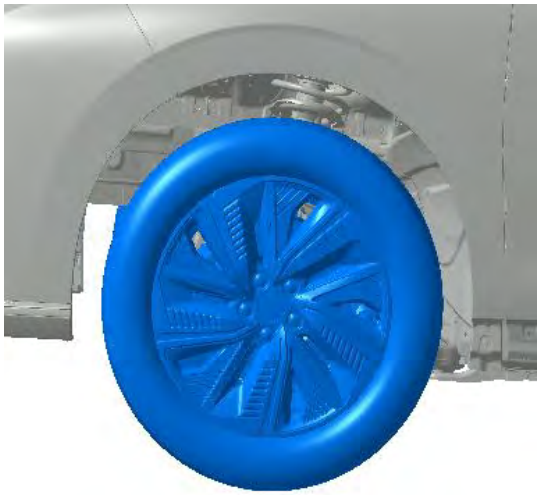
1. Check the wheel alignment.Refer to: Wheel alignment.

2.1.4.3 Front swing arm assembly

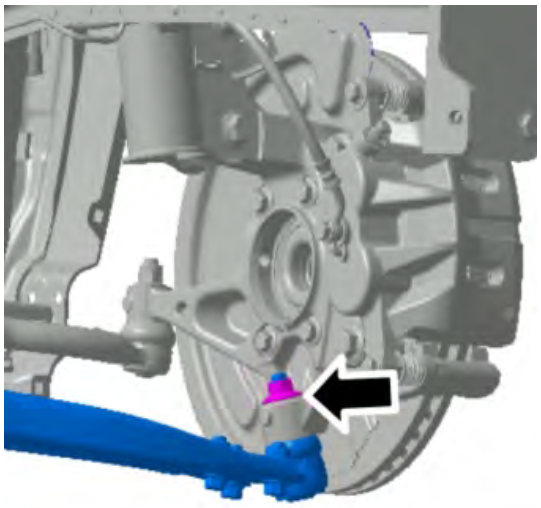
Removal

1. Lift and support the vehicle. Refer to: Lifting the vehicle.

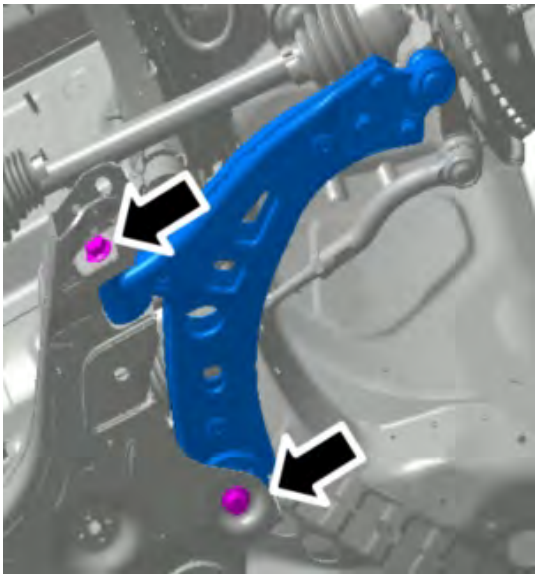
2. Remove tyres from the vehicle.Refer to: Tyre.



3. Use a special ball joint disassembly and assembly tool to remove the front swing arm ball joint from the steering knuckle. Be careful not to hit the front swing arm with hard objects such as hammers.



4. Disassemble the front swing arm assembly from front subframe assembly.



Inspection after removal

1. Visually inspect the following:

   1. Check whether the front swing arm assembly, ball joint and bushing are deformed, cracked, or damaged. Replace it if necessary.

   2. Check the ball joint dust cover for crack and other damage, and grease leakage Replace it if necessary.

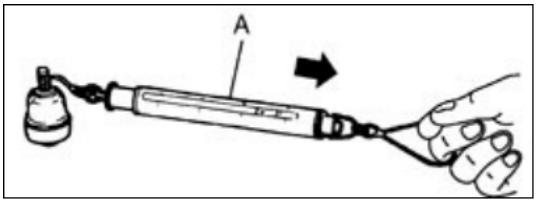
2. Manually move the ball pin to check whether it can move flexibly.

3. Inspection of swing torque:

   1. Manually move the ball pin at least ten times before measuring to check whether it can move flexibly.

   2. Make spring scale (A) hook the fixing hole of cotter pin. Confirm that the spring scale measurement value is within the specified range when the ball pin starts to move. If the swing torque exceeds the standard range, replace the front swing arm assembly.

   3 Swing torque: 0.5~5.0Nm



4. Inspection of shaft end play:

   1 Move the end of the ball pin axially to check whether it is loose. If the axial end clearance exceeds the standard value, replace the front swing arm assembly.

   2 Standard shaft end clearance: 0mm

Installation

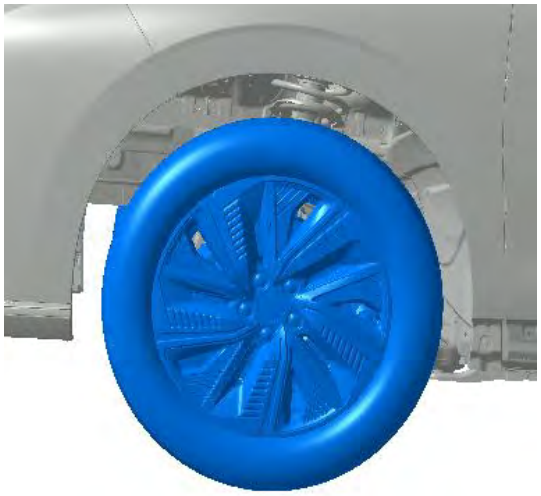
1. The installation order is reverse to the removal order. Pay attention to the following points

Caution: Ensure that the mounting bolts of the swing arm and subframe are tightened when the vehicle is in the unloaded condition.

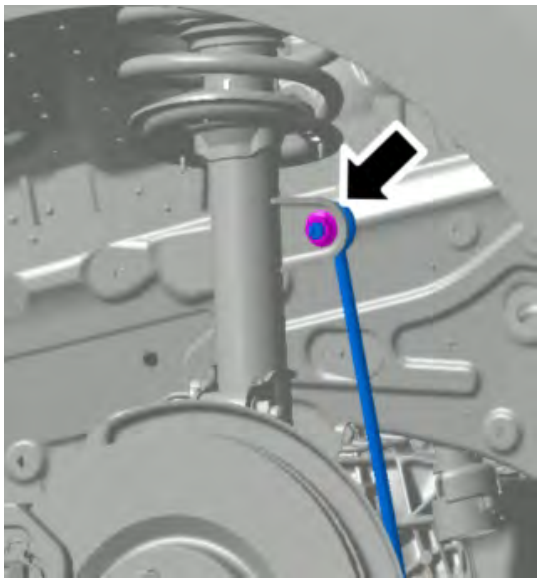
2.1.4.4 Front subframe assembly

Removal

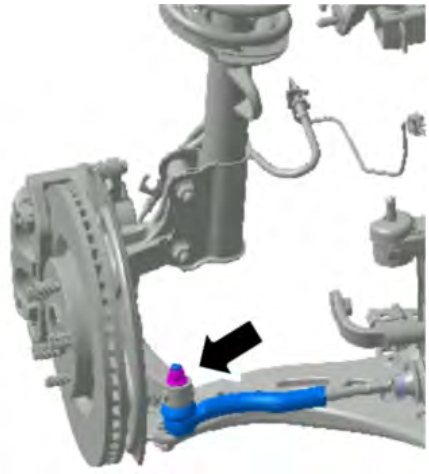
1. Lift and support the vehicle. Refer to: Lifting the vehicle.
2. Remove tyres from the vehicle.Refer to: Tyre.



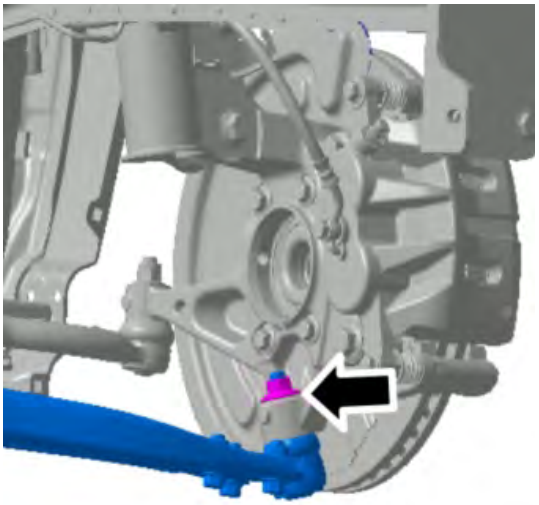
3. Remove the nut connecting the stabiliser bar link to the strut.



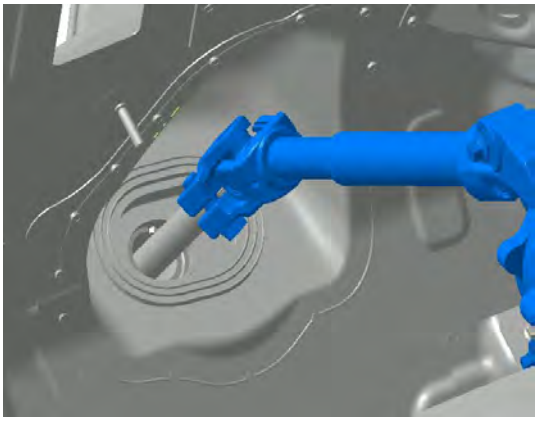
4. Remove the steering outer tie rod from the steering knuckle.



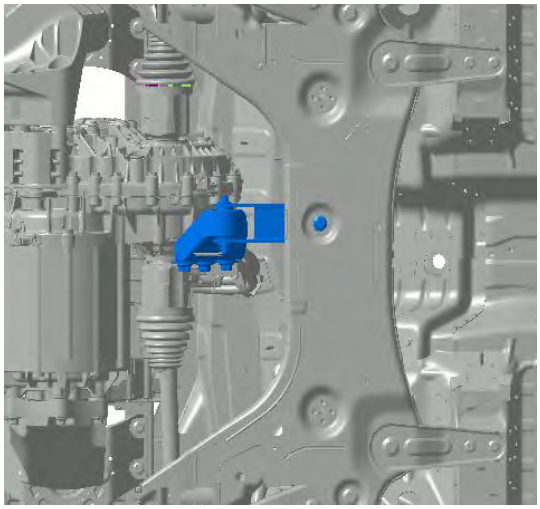
5. Disassemble the ball joint of swing arm from steering knuckle;



6. Remove the intermediate shaft fastening bolts and separate the intermediate shaft.

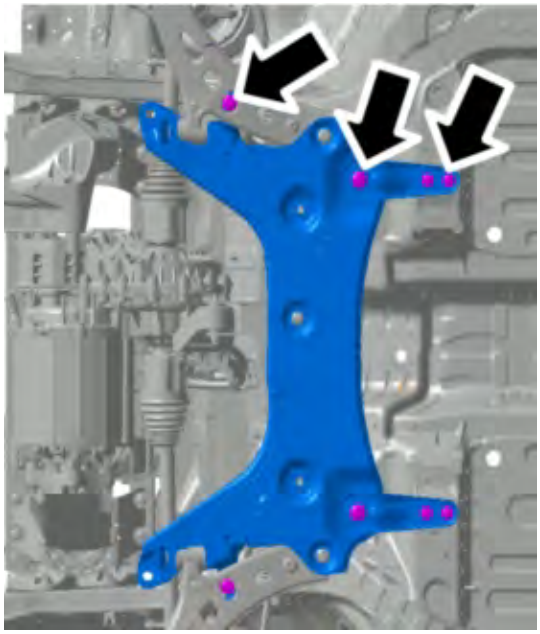


7. Remove the engine rear mount.

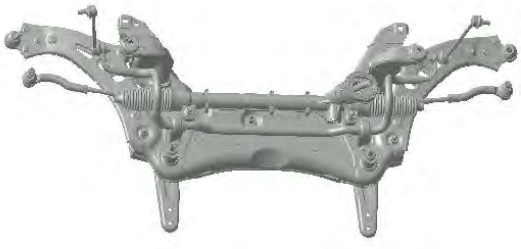


8. Fix an appropriate jack under the front subframe;

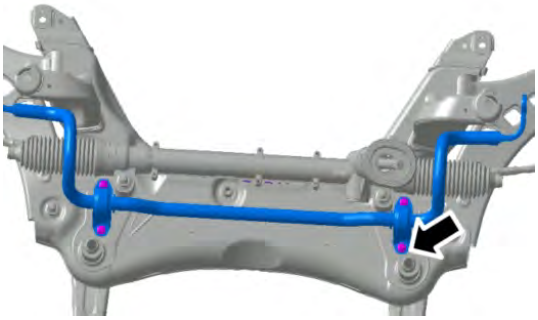
9. Remove the assembling bolts of the front subframe.



10. Gradually lower the jack to remove the front subframe assembly.



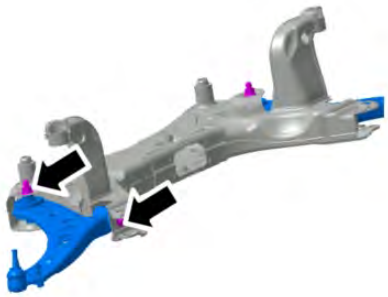
11. Remove the stabiliser bar and subframe mounting bolts.



12. Remove the steering gear to subframe mounting bolts.



13. Remove the swing arm and subframe mounting nuts.



Inspection after removal

1. Check whether the front subframe (including subframe bushing) is obviously deformed, cracked or otherwise damaged. Replace it if necessary.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

Note: Ensure that the mounting bolts of the swing arm and subframe are tightened when the vehicle is in the unloaded condition.

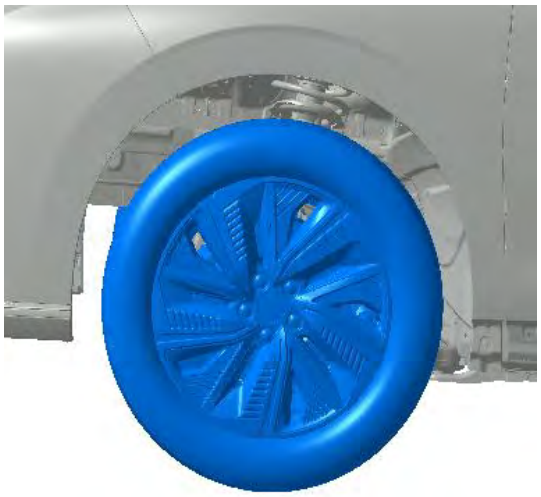
Inspection after installation

1. Check the wheel alignment. Refer to: Wheel alignment.

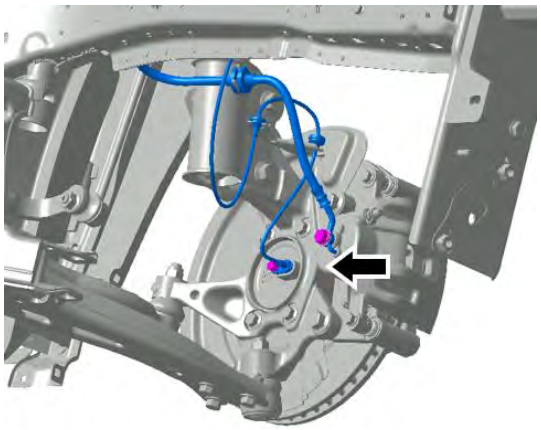
2.1.4.5 Steering knuckle with hub bearing

Removal

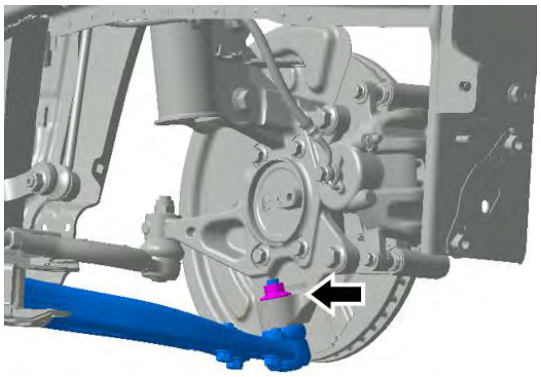
1. Lift and support the vehicle. Refer to: Lifting the vehicle.
2. Remove the wheel (above the lifting platform). Refer to: Wheel .



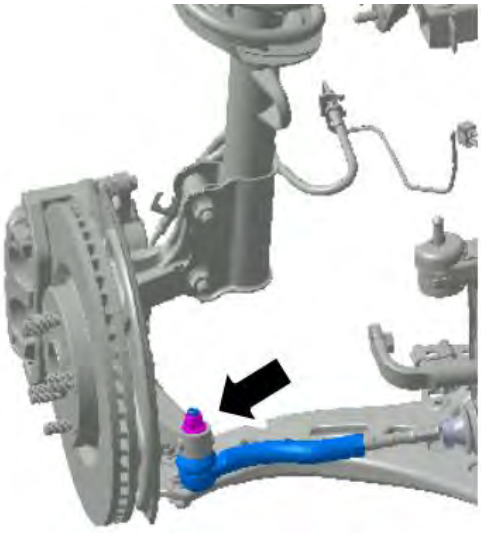
3. Remove the ABS wheel speed sensor and brake hose from the front strut. Refer to Brake Harness and Pipeline.



4. Remove the fixing nuts of the front swing arm assembly and the steering knuckle.



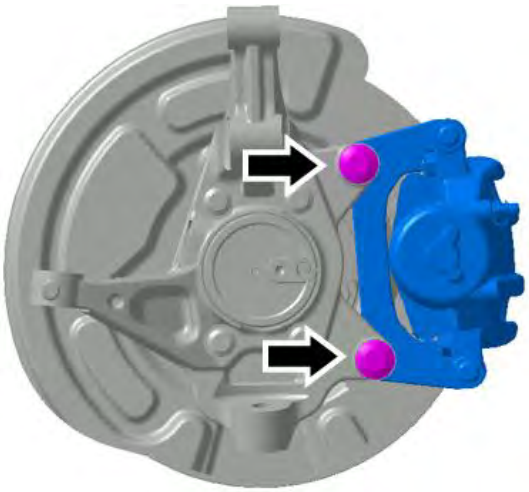
5. Disassemble fixing nuts of steering tie rod and steering knuckle.



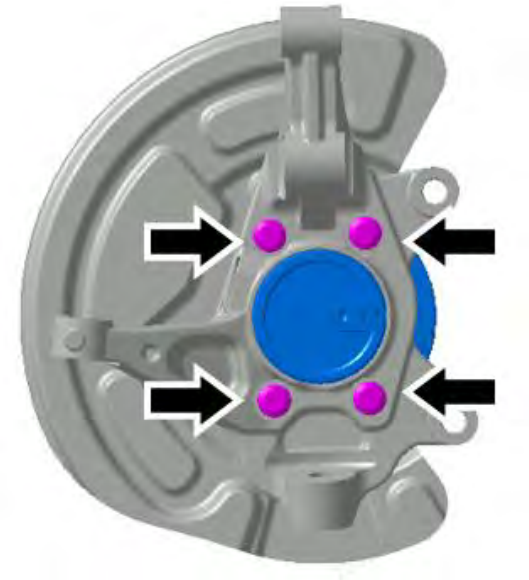
6. Remove the fixing bolts and nuts of the front suspension strut assembly and the front axle with caliper assembly, and remove the front axle with caliper assembly.



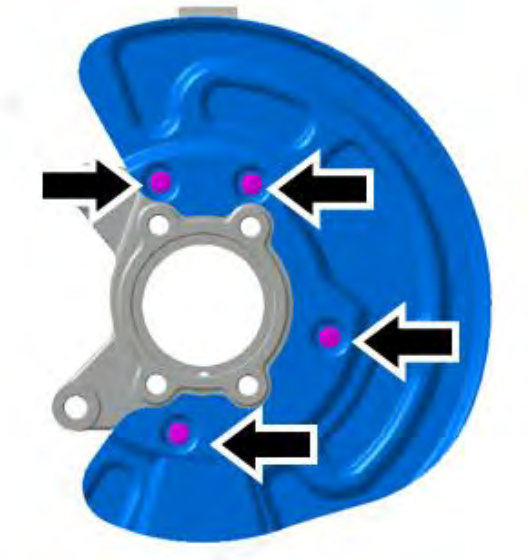
7. Remove the front brake assembly and brake disc.



8. Remove the front hub bearing unit assembly.



9. Remove the front brake mudguard.



Inspection after removal

1. Check the steering knuckle for deformation, cracks or other damage.
2. Check the hub bearing for oil leakage.
3. Check whether the wheel hub bearing rotates smoothly, whether there is a sense of jamming or abnormal rotation noise, etc.

Replace the defective one(s) where necessary.

Installation

The installation order is the reverse of the removal order.

For details on front wheel alignment, please refer to the front wheel alignment requirements of the suspension system. Refer to: Front wheel alignment.

Inspection after installation

1. Confirm fixation (looseness and gaps) of each part; ensure normal status (wear, damage and deformation) of all the parts.
2. Check the front hub bearing unit assembly for grease leakage and damage, and replace it if any fault is found.

2.1.5 Removal and installation

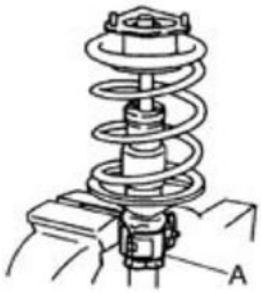
2.1.5.1 Front suspension strut assembly

Caution: Do not damage the piston rod of front strut assembly when removing parts from the front suspension strut assembly.

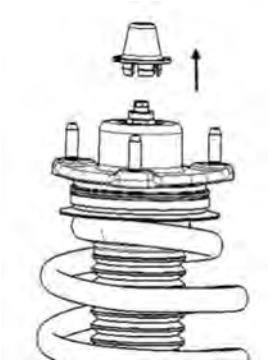
Removal

1. Assemble the front strut holder (A) (special repair kit) to front suspension strut assembly and fix it in bench clamp.

   Caution: Wrap the outer tube of the front strut absorber with a rag to avoid damage to it when assembling the front strut holder to the front strut.



2. Remove the waterproof cover by hand.



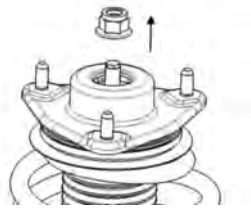
3. Use spring compressor (A) (general repair tool) to compress the coil spring between front strut bearing and spring cushion (on the front strut assembly) until the coil spring and spring compressor can move freely.

   Caution: Ensure that the spring compressor is securely connected to the coil spring and compress the coil spring.

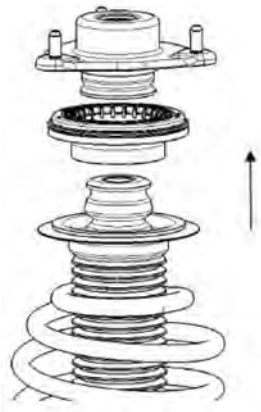
   Caution: Protect the spring with a piece of rag or other articles to avoid damage to the spring surface during removal and installation.



4. Ensure that the coil spring between front strut bearing and spring cushion (on the front strut assembly) and the spring compressor can move freely. Fix the piston rod point to make it unable to rotate and disassemble the piston rod lock nut.

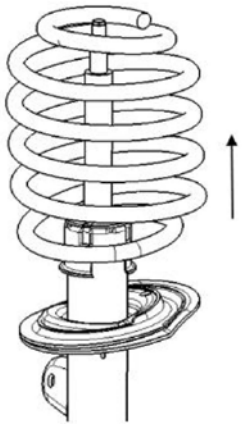


5. Disassemble the subassembly of outer adapter sleeve of front strut, front strut bearing, dust cover, and buffer block.

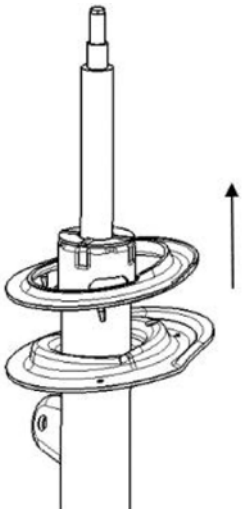


6. Disassemble coil spring with spring compressor, and then slowly loosen the compressor and take down the coil spring.

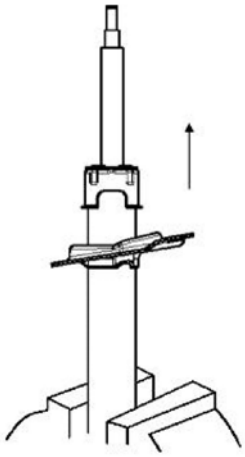
   Caution: Loosen the accessories on the basis of making sure that the position of the coil spring accessories is not displaced.



7. Disassemble the spring cushion from front strut.



8. Disassemble the front strut holder from front strut.



Inspection after disassembly

1. Check the following items for the front strut absorber and replace parts if necessary.

   Check if the front strut absorber is deformed, cracked, or damaged.

   Check whether the piston rod is damaged, unevenly worn, or deformed.

   Oil leakage.

2. Inspection of strut installation for insulation and rubber parts.

   Check if the subassembly of outer adapter sleeve assembly of front strut is cracked and if the rubber parts are worn. Replace it if necessary.

3. the coil spring.

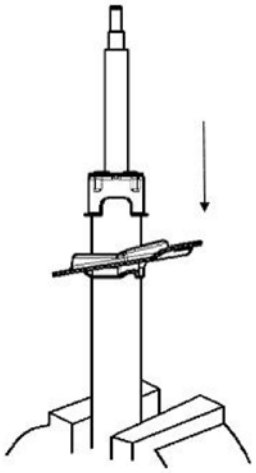
   Check the coil spring for cracks, wear, or damage. Replace if necessary.

   Caution: Ensure that grouped colours of left and right springs are the same before replacing the front strut assembly or front coil spring; the grouped colours of spare springs include: green, yellow, and white. The left and right springs must be of the same colour upon maintenance or replacement.

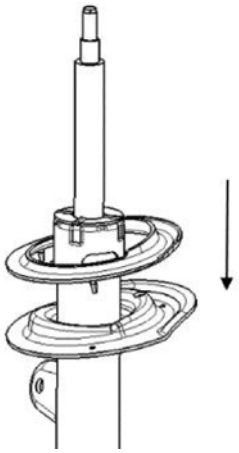
Installation

1. Assemble the front strut holder to strut and fix it in bench clamp.

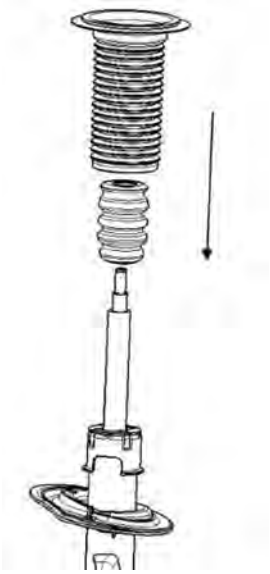
   Caution: Wrap the outer tube of the front strut absorber with a rag to avoid damage to it when assembling the front strut holder to the front strut.



2. Assemble spring cushion.



3. Install the dust cover and buffer block onto the front strut absorber.



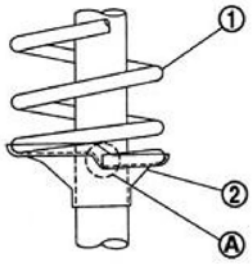
4. Use a spring compressor (general repair tool) to compress the coil spring, and then install it onto the front shock absorber.

Caution: Install the coil spring (1) with its tubular end facing downward and flat end facing upward. Align lower end (A) with spring cushion (2).

Caution: Ensure that the spring compressor is securely connected to the coil spring and compress the coil spring.

Caution: Assemble the coil spring; the coil spring and (A) end of spring cushion must be aligned with the spring tray of the front strut absorber and put in place.

Caution: Protect the spring with a piece of rag or other articles to avoid damage to the spring surface during removal and installation.



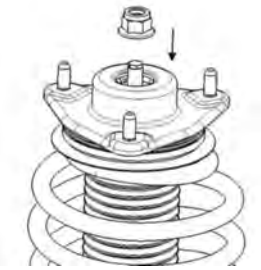
5. Assemble the front strut bearing and outer adapter sleeve assembly successively on the front strut absorber.



6. Fix the piston rod end to make it unable to rotate and screw the piston rod lock nut to specified torque.

Torque standard: 80 ~ 90 N·m

Caution: Do not reuse the piston rod lock nut; new lock nuts must be used for each assembling.

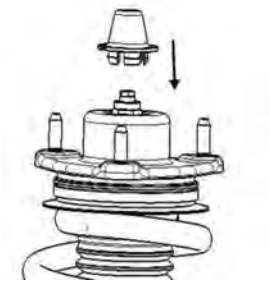


7. Gradually relieve the spring compressor, then remove it from the coil spring.

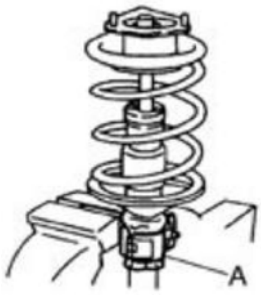
Caution: Loosen the accessories on the basis of making sure that the position of the coil spring accessories is not displaced.



8. Tighten the waterproof cover by hand.



9. Disassemble the front strut holder from front suspension strut assembly.



2.1.5.2 Front swing arm assembly

Disassembly

1. Remove the swing arm ball joint mounting bolts and nuts, and separate the front swing arm body from the swing arm ball joint pin assembly.

   Tightening torque of bolt and nut: 78±5 N.m



Installation

The installation order is the reverse of the removal order.

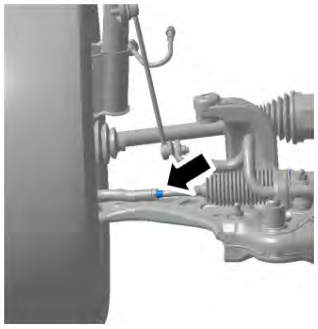
2.1.6 General procedures

2.1.6.1 Adjustment of toe-in

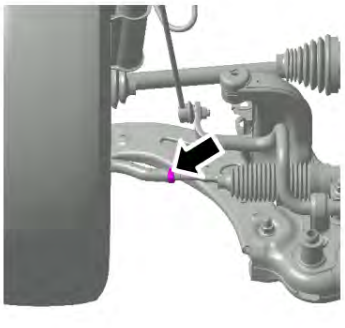
Carry out the following steps at the lifting station.

1. Before adjusting toe-in, ensure that the camber angle, caster angle, and kingpin inclination angle meet requirements or are adjusted to meet standards.
2. Lock the steering wheel with a steering wheel lock in the straight direction of the vehicle tyres and lift the vehicle to the adjustment position. Refer to: Lifting the vehicle.
3. Measure the length of the threads at both the left and right ends of the rack.

   Standard: The length difference of threads at the ends of left and right racks shall not exceed 1.5 mm (equivalent to 1 thread pitch)

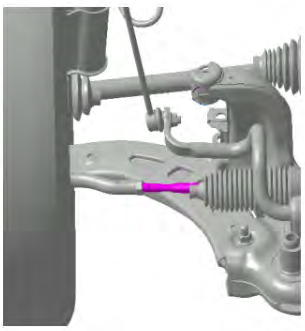


4. Remove the fixing clip of the dust cover at the telescopic end of the rack.
5. Loosen the track rod ball joint lock nut.



6. Rotate the left and right rack ends to adjust toe-in to the specified value.

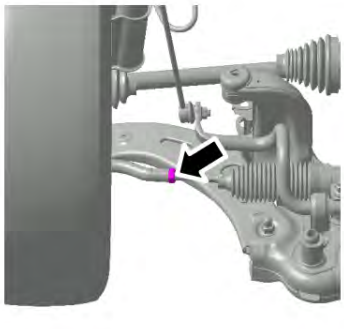
   Note: Adjust the end thread lengths of left and right racks to be equal as much as possible.



7. Tighten the tie rod end locking nut.

   Torque: 54 ~ 66 N·m

   Caution: Make sure that the tie rod ball joint is not deflected



8. Place the dust cover on the seat and install the retaining clip.

   Caution: Make sure that the dust cover is not twisted.

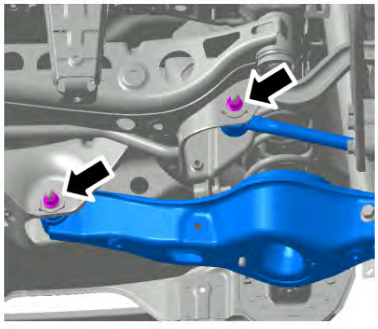
9. Lower the vehicle and remove the steering wheel lock.

2.1.6.2 Check the camber angle and toe-in

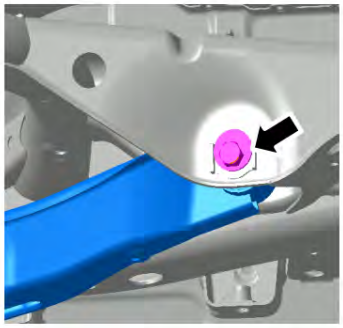
Use a suitable aligner to measure the camber angle and toe of the left and right wheels.

If the camber angle or toe is out of the standard range, adjust it by adjusting the spring control arm and the eccentric bolt on the toe connecting rod.

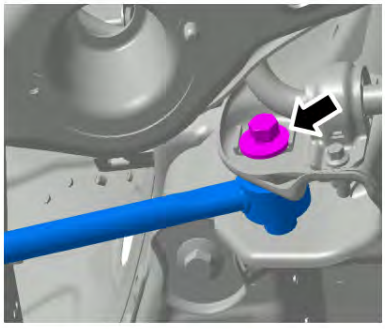
1. Loosen the nuts at the spring control arm and toe-in link adjustment bolts.



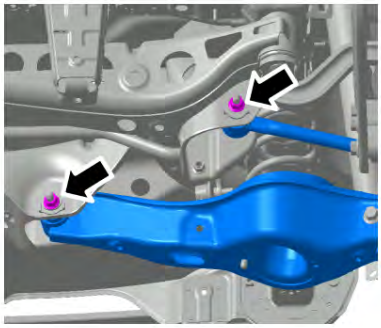
2. First adjust the camber angle into the proper range using the spring control arm eccentric bolt.



3. Adjust the toe connecting rod eccentric bolt to bring the toe and camber within the specified range.



4. Tighten the nut to the specified torque.



2.1.6.3 Front wheel alignment

Check the following:

1. Proper tyre pressure and tyre wear.
2. If the wheels bounce: check balance condition of tyres.
3. End play of wheel bearings: check the wheel bearings.
4. Ball joint end play of front swing arm: check the ball head end play.
5. Operation of front suspension strut assembly.
6. If retaining elements of suspension are loose and deformed.
7. Check whether the front subframe assembly, subframe connecting plate assembly, and front swing arm assembly have any cracks, deformation, or other damage.
8. Vehicle height (position).

Front wheel alignment parameter table

Alignment angle	Value	Remark
Front wheel camber (no-load)	-0.3°±0.5°	The difference between left and right is within 0.55°
Front wheel toe-in (no-load)	0.08°±0.04°	No judgment to the left-right difference
Kingpin inclination angle (no-load)	13.29°±0.5°	No judgment to the left-right difference.
King pin caster (no-load)	6.01°±0.5°	The difference between left and right is within 0.55°

Note: The front wheel camber, kingpin inclination, and caster angles cannot be adjusted. If the front wheel camber angle is not within the standard range, check for wear or damage in the front suspension components. Replace suspicious parts if any faults are found. Check the wheel alignment when a vehicle is not loaded and on ground.

Note: When a vehicle is "not loaded", it means that the coolant, and lubricant are all full, and spare tyre, jack, manual tools, and foot pads are all in specified positions.

2.2 Rear suspension

2.2.1 Specification

2.2.1.1 Torque specification

Name	Nm
Bolts and nuts (M12) connecting the rear suspension upper swing arm to the subframe	120±12
Rear suspension upper swing arm connecting steering knuckle bolts and nuts (M14)	190±10
Rear suspension toe control arm adjustment bolts and nuts (M12)	120±12
Rear suspension toe control arm mounting bolts and nuts (M14)	190±10
Rear lateral stabiliser bar bracket mounting bolt (M8)	55±5
Rear suspension spring swing arm mounting bolts and nuts (M12)	120±12
Rear suspension spring swing arm adjustment bolts and nuts (M12)	120±12
Rear suspension longitudinal arm mounting bolt (M14)	190±10
Rear suspension longitudinal arm connecting steering knuckle bolt (M14)	190±10
Rear stabiliser bar connecting rod assembly mounting bolts and nuts (M12)	120±12
Rear shock absorber mounting bolts and nuts (M14)	190±10
Bolts for connecting rear shock absorber to vehicle body (M10)	80±8
Rear subframe mounting bolt (M12)	100±10
Rear subframe mounting nut (M12)	100±10
Rear suspension longitudinal arm bracket mounting bolt (M12)	120±12

2.2.1.2 General specifications

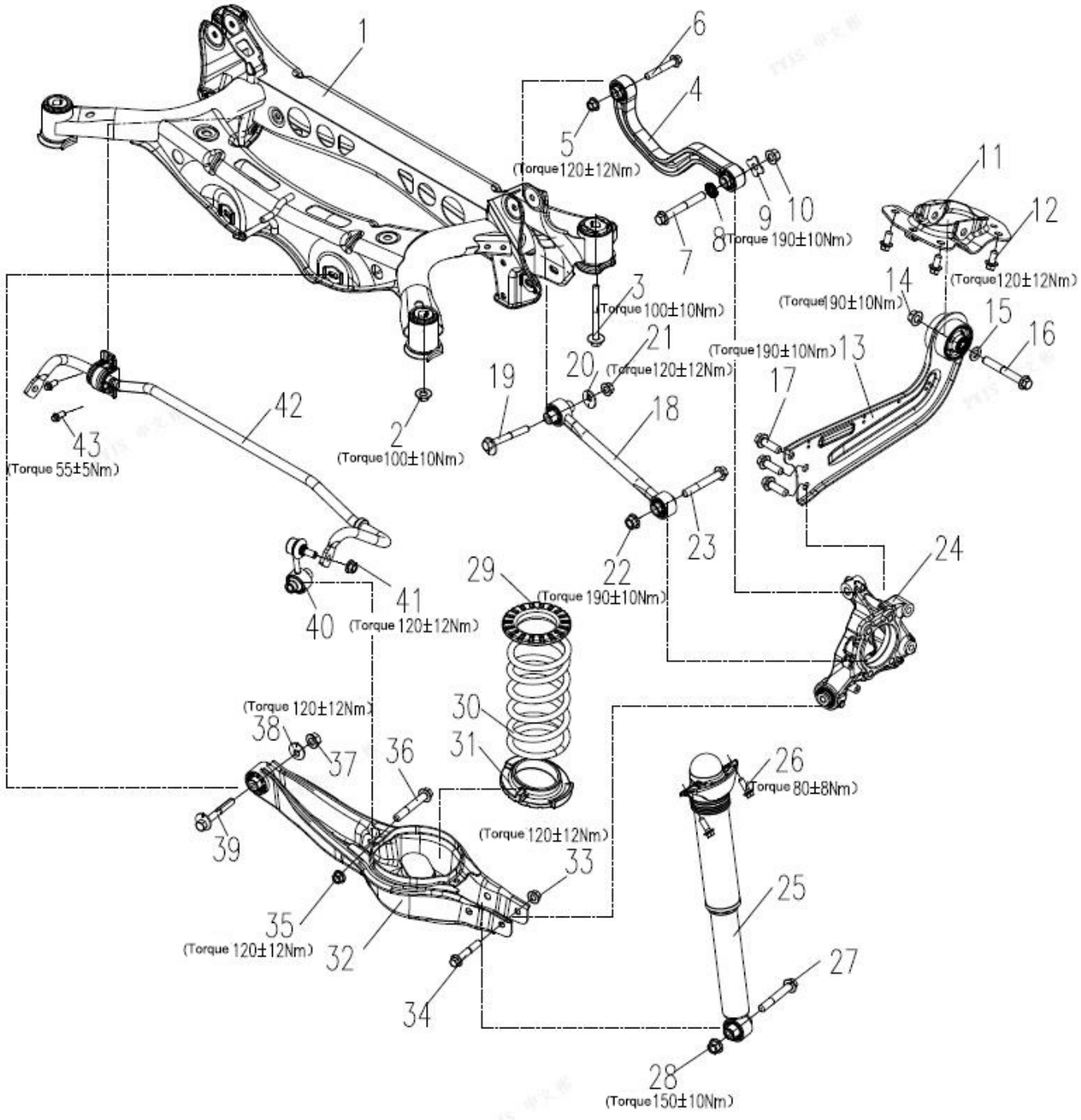
Item	Alignment angle	Value	Remarks
Rear wheel alignment parameter list	Camber (no-load)	-0.86°±0.5°	No judgment to the left-right difference.
	Toe-in (no-load)	0.08°±0.08°	No judgment to the left-right difference.

Note: When a vehicle is "not loaded", it means that the fuel oil, engine coolant, and lubricant are all full, and spare tyre, jack, manual tools, and foot pads are all in specified positions.

2.2.2 Operation Manual

2.2.2.1 Exploded view

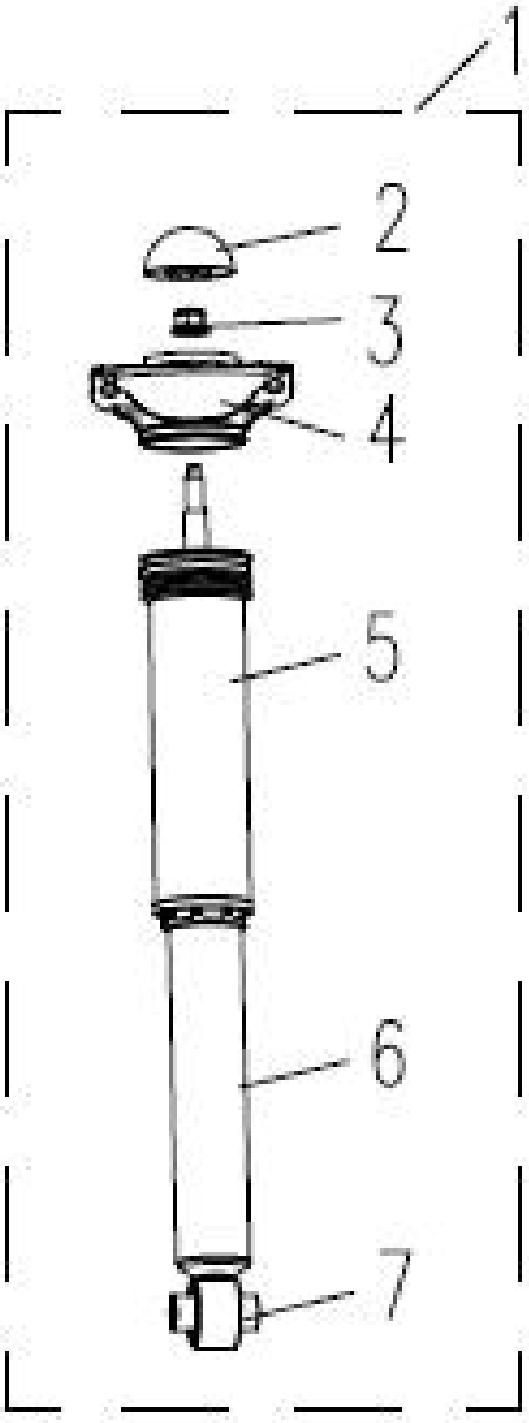
Structure Diagram of Rear Suspension Component



Item	Description	Item	Description
1	Rear subframe assembly	23	Toe-in connecting rod mounting bolt
2	Mounting bolt of rear subframe	24	Rear steering knuckle assembly

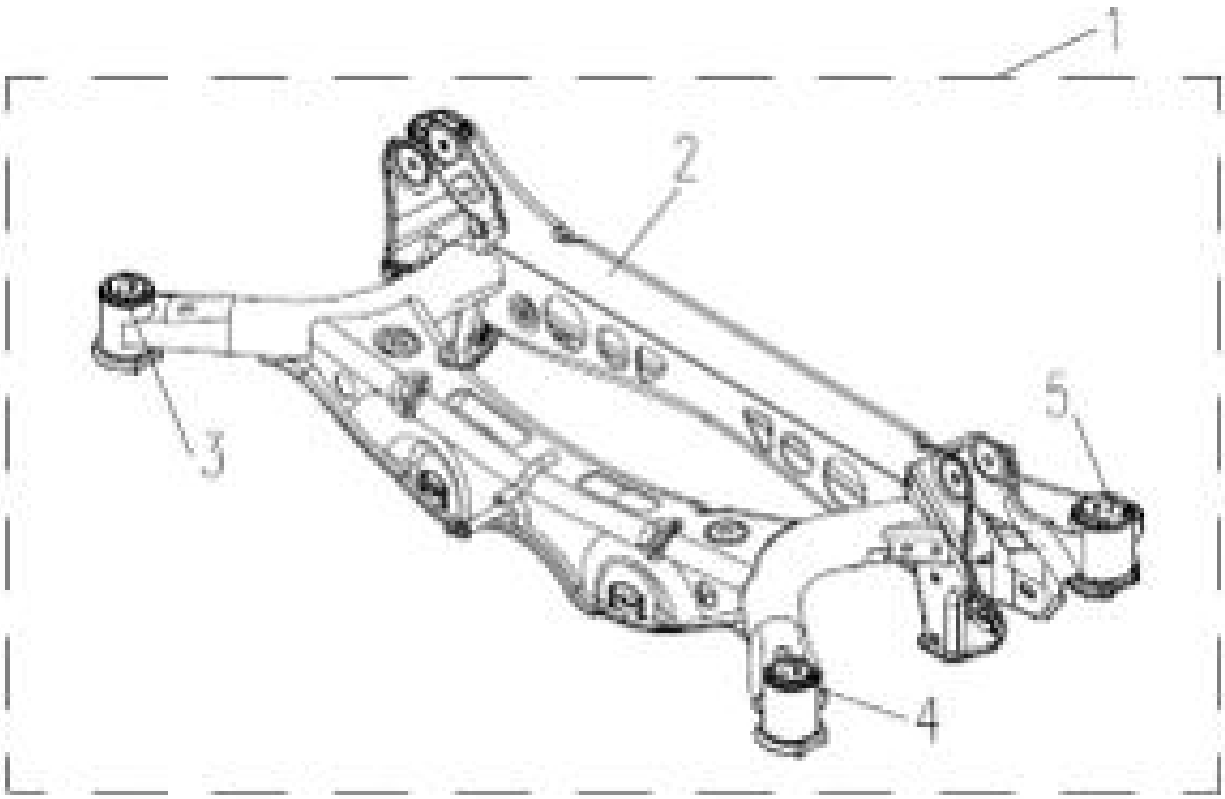
3	Mounting nut of rear subframe	25	Rear shock absorber assembly
4	Rear suspension upper swing arm assembly	26	Bolts for connecting the shock absorber to the vehicle body
5	Mounting nut of rear suspension upper swing arm	27	Shock absorber mounting bolt
6	Mounting bolt of rear suspension upper swing arm	28	Shock absorber mounting nut
7	Mounting bolt of rear suspension upper swing arm	29	Rear spring upper pad
8	Knurled gasket	30	Rear coil spring
9	Anti-drop gasket	31	Rear spring lower pad
10	Mounting nut of rear suspension upper swing arm	32	Left/right spring swing arm assembly
11	Rear left/right suspension longitudinal arm bracket	33	Spring swing arm mounting nut
12	Longitudinal arm bracket mounting bolt	34	Spring swing arm mounting bolt
13	Rear left/right suspension longitudinal arm assembly	35	Stabiliser bar connecting rod mounting nut
14	Longitudinal arm assembly mounting nut	36	Stabiliser bar connecting rod mounting bolt
15	Gasket	37	Spring swing arm mounting nut
16	Longitudinal arm assembly mounting bolt	38	Adjusting shim
17	Mounting bolt of longitudinal arm connecting steering knuckle	39	Adjusting bolt
18	Rear suspension toe-in connecting rod assembly	40	Rear stabiliser bar link assembly
19	Adjusting bolt	41	Stabiliser bar connecting rod mounting nut
20	Adjusting shim	42	Rear stabiliser bar assembly with bushings
21	Toe-in connecting rod mounting nut	43	Mounting bolt of stabiliser bar bracket
22	Toe-in connecting rod mounting nut		

Structure Diagram of Rear Shock Absorber Assembly



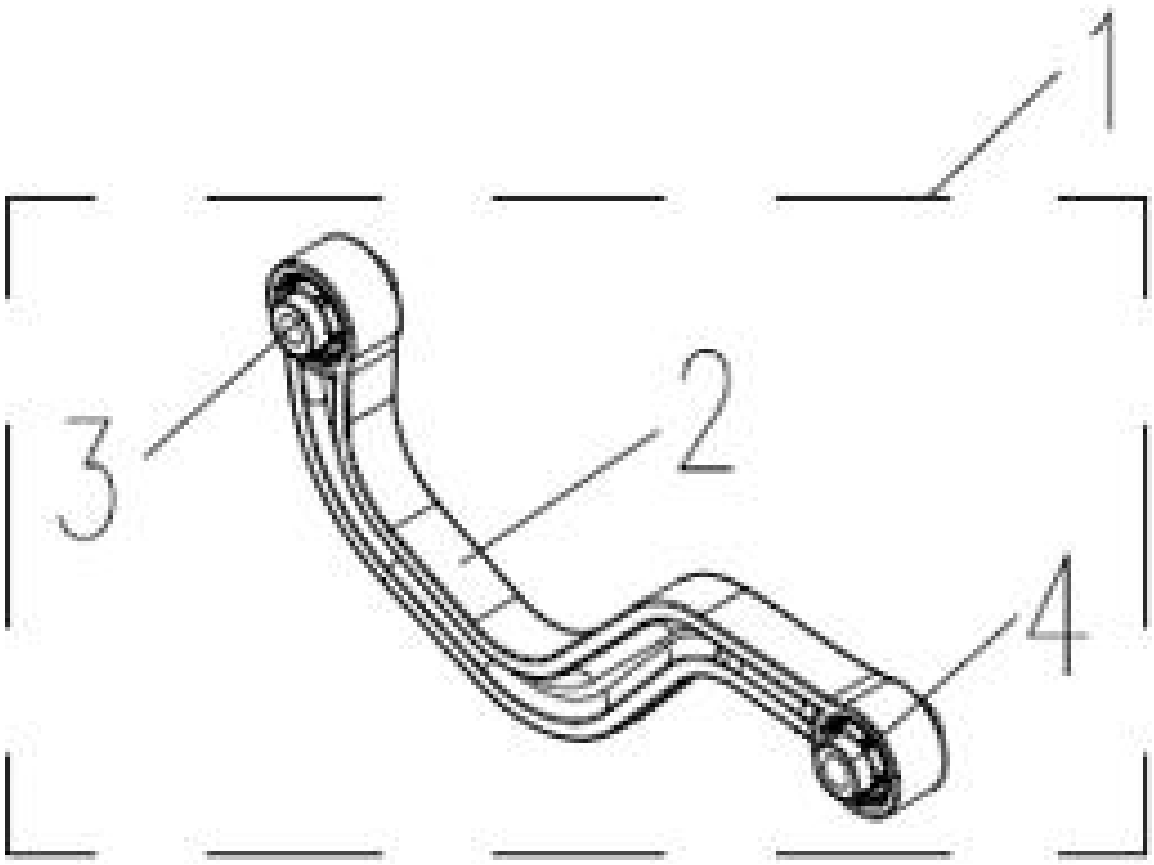
Item	Description	Item	Description
1	Rear shock absorber assembly	5	Dust cover
2	Waterproof cover	6	Shock absorber body
3	Fastening nut	7	Lower bushing
4	Upper support		

Rear subframe assembly



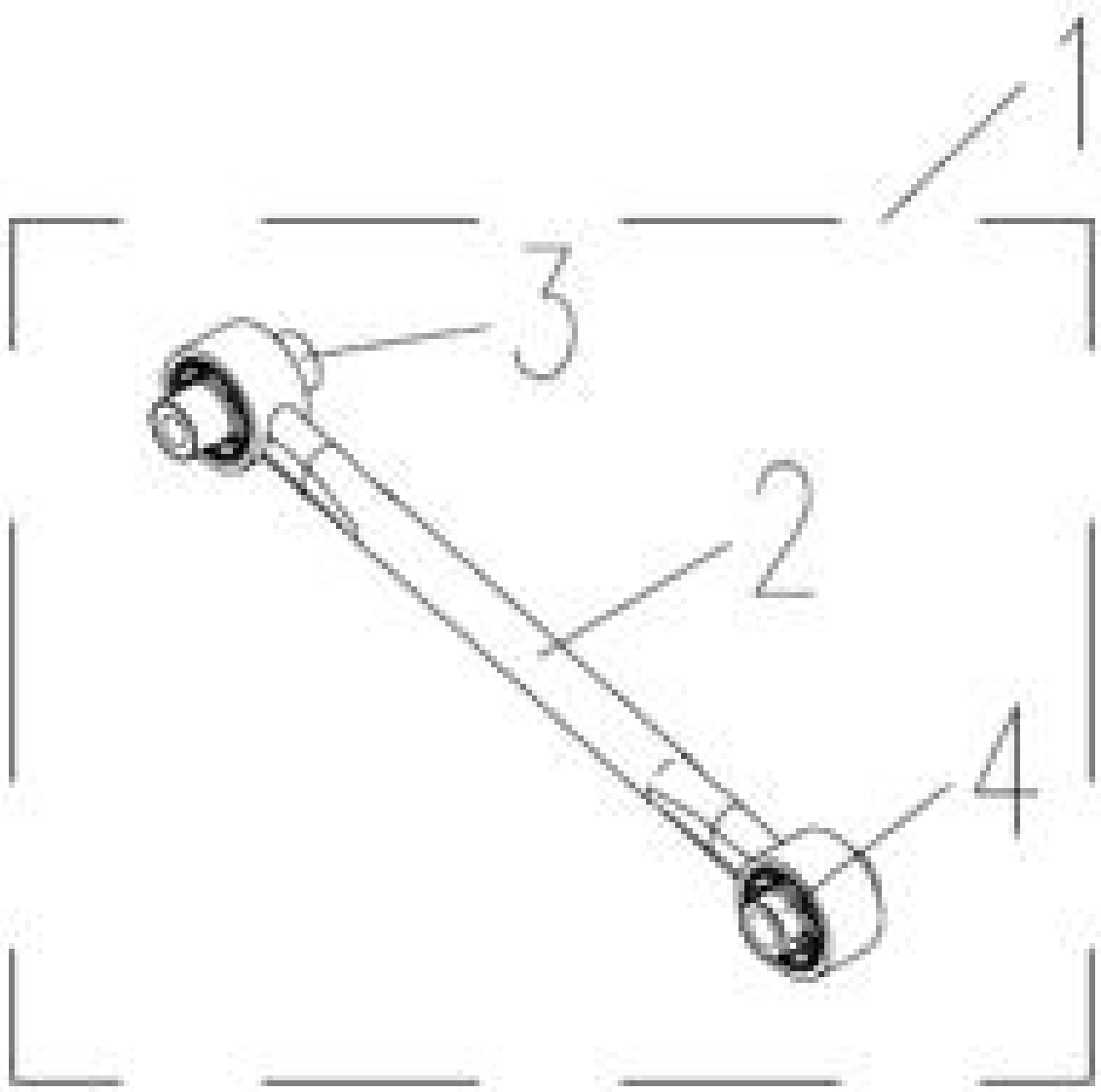
Item	Description	Item	Description
1	Rear subframe assembly	4	Rear subframe rear right bushing
2	Rear subframe body	5	Rear subframe front bushing
3	Rear subframe rear left bushing		

Rear suspension upper swing arm assembly



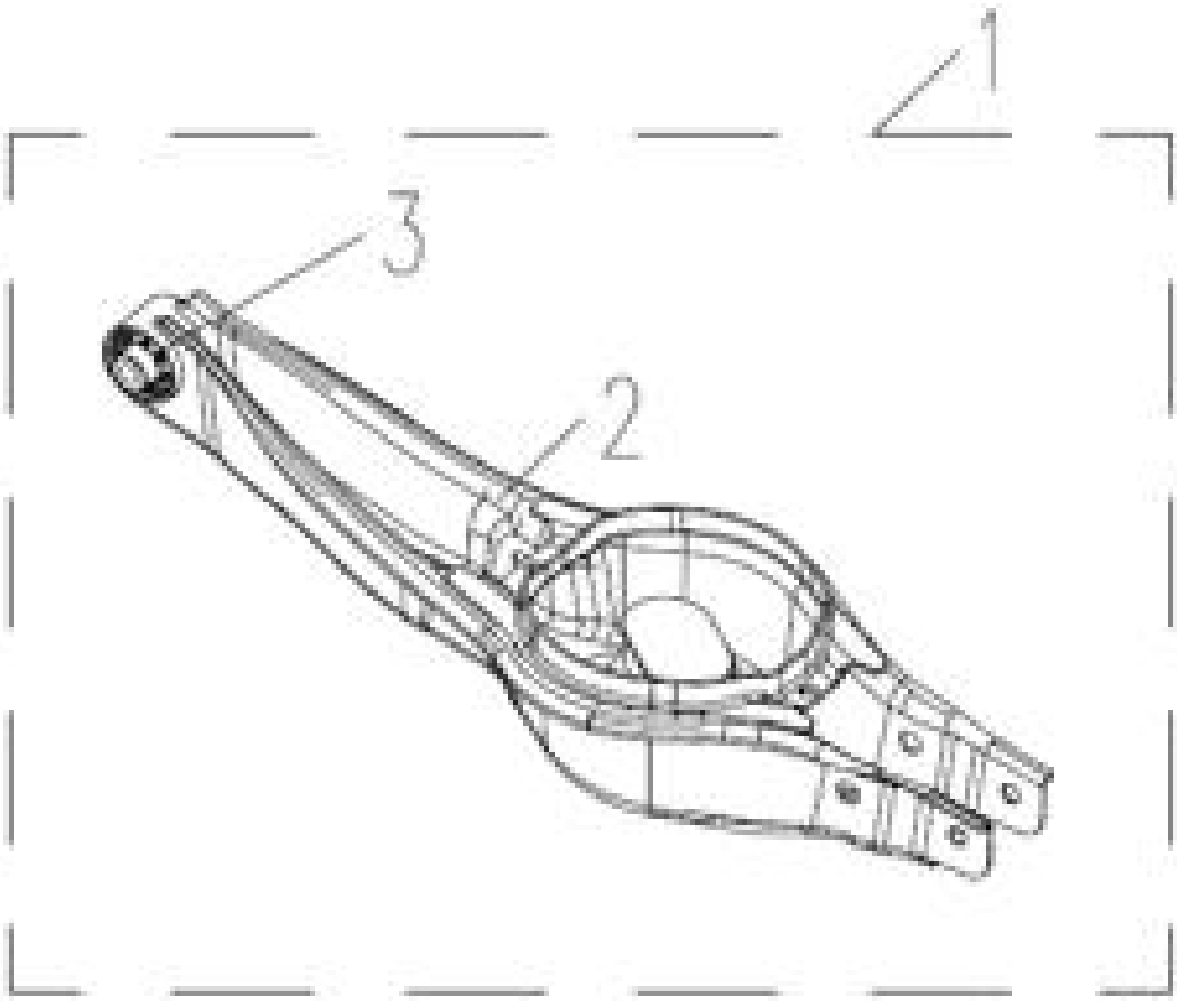
Item	Description	Item	Description
1	Rear suspension upper swing arm assembly	3	Rear suspension upper swing arm inner bushing
2	Rear suspension upper swing arm body	4	Rear suspension upper swing arm outer bushing

Rear suspension toe-in connecting rod assembly



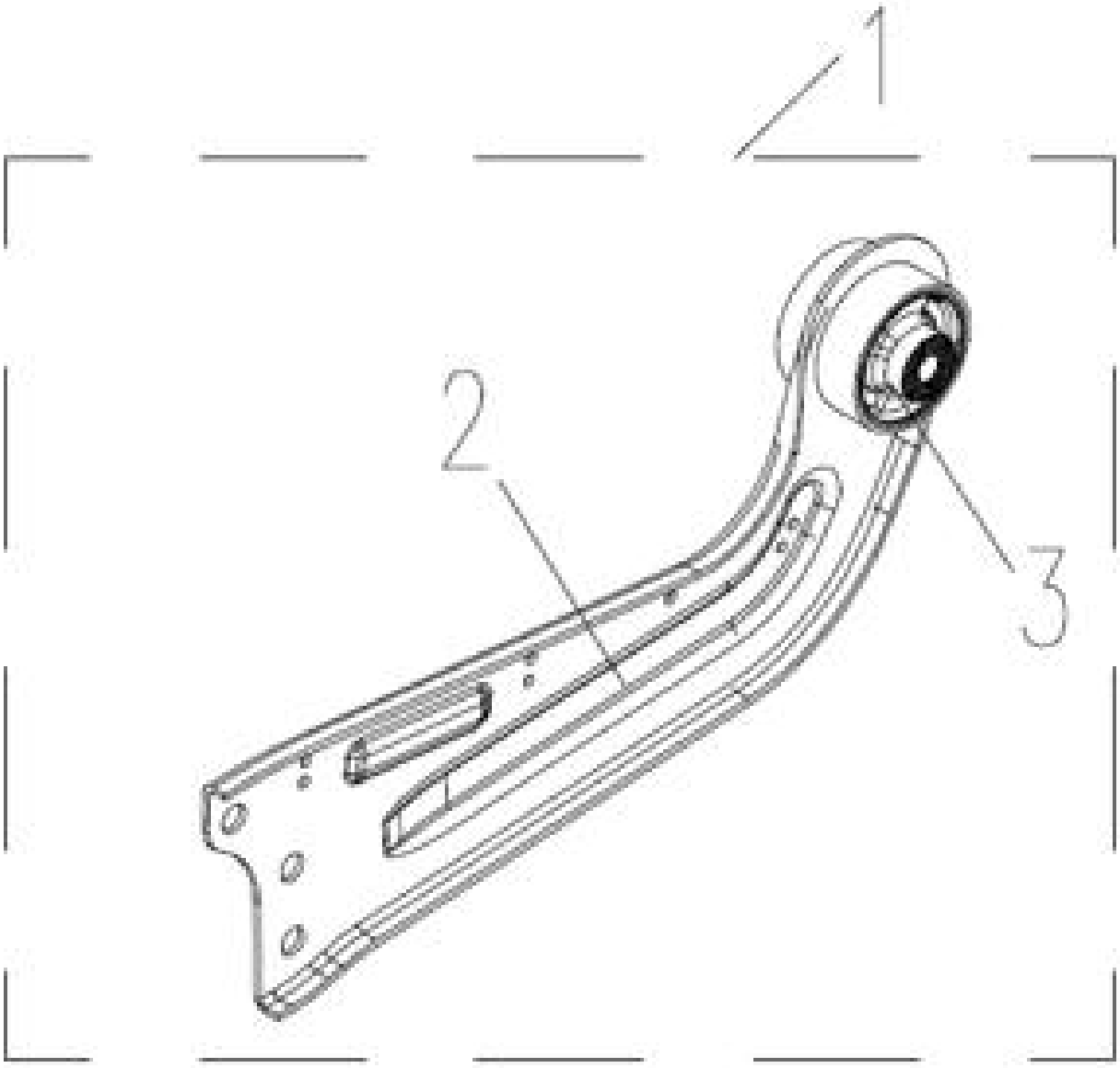
Item	Description	Item	Description
1	Rear suspension toe-in connecting rod assembly	3	Rear suspension toe-in connecting rod inner bushing
2	Rear suspension toe-in connecting rod body	4	Rear suspension toe-in connecting rod outer bushing

Rear suspension spring swing arm assembly



Item	Description	Item	Description
1	Rear left/right suspension spring swing arm assembly	3	Rear suspension spring swing arm inner bushing
2	Rear suspension spring swing arm main body		

Rear suspension longitudinal arm assembly



Item	Description	Item	Description
1	Rear left/right suspension longitudinal arm assembly	3	Rear suspension longitudinal arm bushing
2	Rear suspension longitudinal arm body		

2.2.2.2 Overview

project		name
Suspension system configuration	Rear suspension	Multi-link independent suspension & rear trailing arm Non-independent rear suspension

The SX5GEV rear suspension is a multi-link independent suspension. This suspension connects independently to each wheel through four control arms on one side, and absorbs the impact energy transmitted from the wheel via coil springs, shock

absorbers, and suspension bushings. At the same time, a stabiliser bar is adopted to control the independent displacement of the suspension system during vehicle body roll.

The rear suspension system of SX5GREEV is a non-independent rear trailing arm suspension. The suspension is connected to the wheels through the rear torsion beam assembly, and absorbs the impact energy transmitted by the wheels through the coil spring, shock absorber and suspension bushing.

Steering knuckle with hub bearing

The steering knuckle with wheel hub assembly and rear wheel hub assembly system mainly includes the front steering knuckle, brake mudguard and front and rear wheel hub bearing unit assemblies. It is a bridge connecting the suspension system and the braking system. When the whole vehicle is working, it provides basic support and rotation functions.

2.2.2.3 Precautions

Caution

1. Before removing parts, the vehicle should be powered off and the battery GND cable should be disconnected.
2. Disassemble in a clean working area. It is important to avoid the internal parts being polluted by dust or other foreign objects.
3. Place the disassembled parts on part racks in sequence for easier and more accurate assembling.
4. Please use genuine parts for maintenance work, and do not reuse unusable parts.
5. Please follow the standard maintenance diagnosis process for maintenance work, and make sure that there is no oil stain or grease on the tightening surface.
6. After replacing the steering knuckle and wheel hub bearing parts, the wheel alignment must be checked.
7. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

Precautions during repair

1. Upon assembling of the rubber bushing, final tightening must be done when the vehicle is not loaded and on ground. The rubber bushing shall not come into contact with engine oil during removal and installation as the engine oil will shorten the service life of the rubber bushing.
2. When a vehicle is not loaded, it means the fuel oil, engine coolant, and lubricant are all full, and spare tyre, jack, on-board tool, and foot pad are all in specified positions.
3. Wheel alignment must be checked after the suspension parts and components are installed.
4. The self-locking nuts shall not be reused; new self-locking nuts must be used upon each assembling. Do not wipe off the grease precoated on new self-locking nuts when tightening them.
5. The tightening interface must be free from oil stains or grease.

2.2.3 Diagnosis and testing

2.2.3.1 Troubleshooting of noise, vibration, and irregularity

The following table can help you find the cause and determine the repair or replacement of these components and parts where necessary. Repair or replace these parts and components as necessary.

Rear suspension		Symptoms				
		Noise	Shaking	Vibration	Judder	Uncomfortable riding or difficult to operate
Possible cause and suspicious parts	Improper assembling and looseness	•	•	•	•	•
	Deformation, damages or distortion of shock absorber	•	•	•	•	•
	Deterioration of bushing or mounting positions	•	•	•	•	•
	Interference of parts and components	•	•	•	•	•
Possible cause and suspicious parts	Spring fatigue	•		•		•
	Suspension looseness	•	•			
	Incorrect wheel alignment				•	•
	Rear axle and rear suspension	•	•	•	•	•
	Tyre	•	•	•	•	•
	Wheels	•	•		•	•
	Brake	•	•		•	

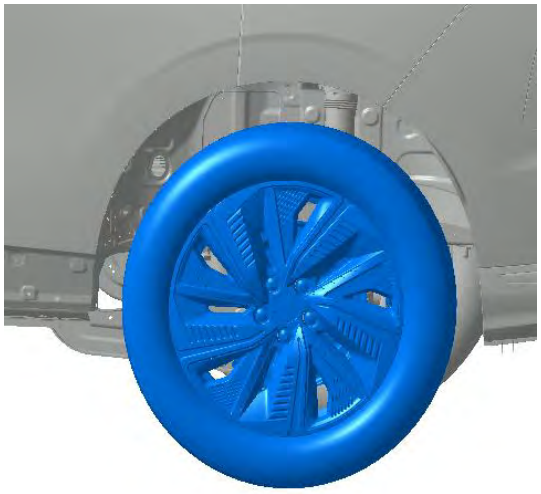
– Applicable

2.2.4 Removal and installation

2.2.4.1 Rear shock absorber

Removal

1. Remove the rear wheel tyres. Refer to: Tyre.



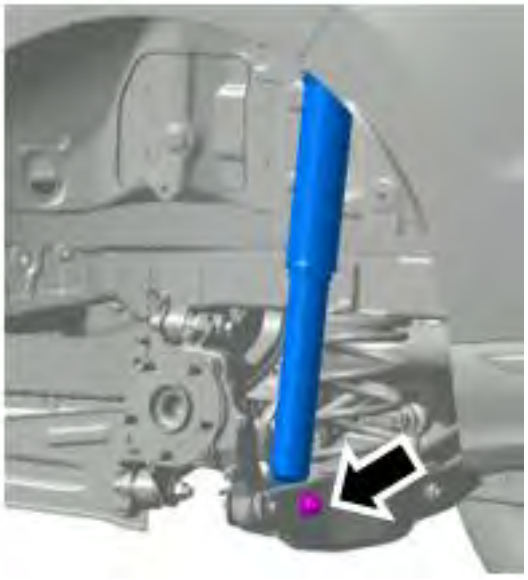
2. Use a suitable jack to support under the spring control arm.

   Caution: In this step, the jack is only used as support during disassembling.

   Caution: Do not allow the jack to damage the spring swing arm assembly.

   Caution: Check whether the state is stable when using a jack.

3. Remove the lower mounting bolts and nuts of the shock absorber. Torque: 150±10 Nm



4. Remove the upper bolts and nuts of the shock absorber. Torque: 80±8 Nm



5. Remove the shock absorber.

Inspection after removal

1. Check whether the shock absorber has such defects as deformation, crack or damage.
2. Check for oil leaks.
3. Check whether the upper and lower rubber bushings have cracks or are damaged.

Installation

1. The installation order is the reverse of the removal order.

2.2.4.2 Rear coil spring and spring pad

Removal

1. Remove the rear wheel tyres. Refer to: Tyre.



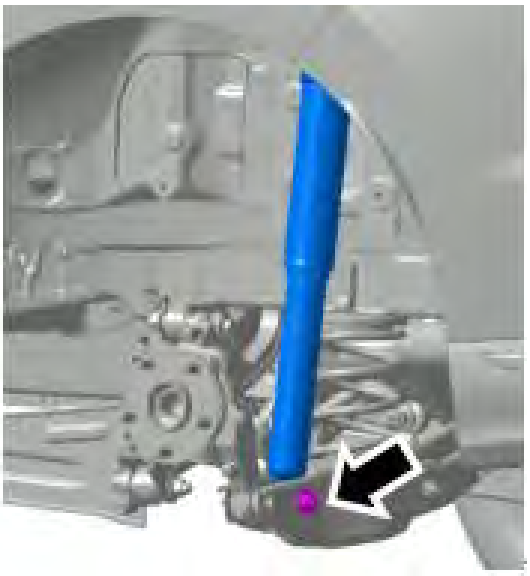
2. 2. Use a suitable jack to support under the spring control arm assembly.

   Caution 1: In this step, the jack is only used as support during disassembling.

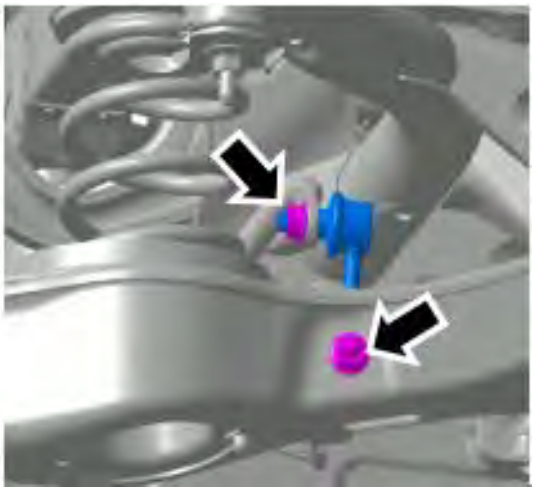
Caution 2: Do not allow the jack to damage the spring swing arm assembly.

Caution 3: Check whether the state is stable when using a jack.

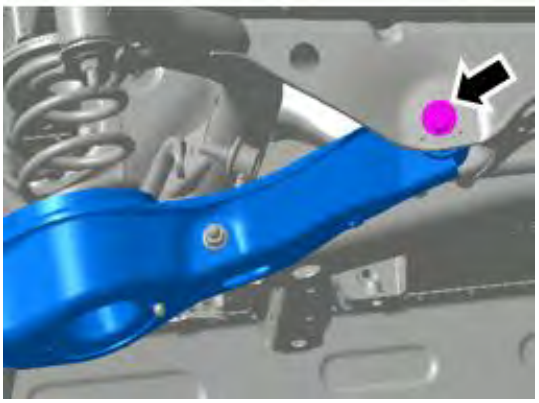
3. Remove the mounting bolts and nuts of the shock absorber. Torque: 150±10 Nm



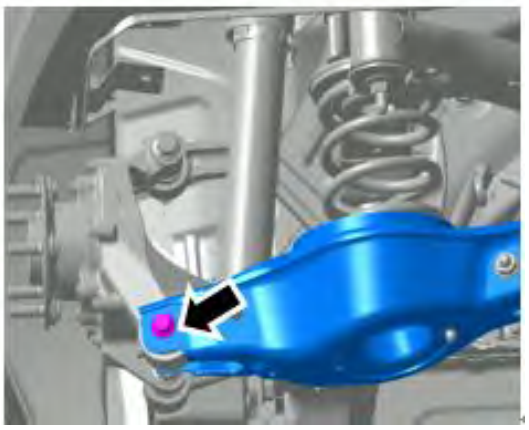
4. Loosen the stabiliser bar connecting rod spring arm nut, remove the stabiliser bar connecting rod ball joint nut and push out the ball pin. Torque: 120±12 Nm



5. Loosen the bolts and nuts connecting the inner side of the spring swing arm to the subframe. Torque: 120±12 Nm



6. Remove the bolts and nuts connecting the spring swing arm and the steering knuckle. Torque: 120±12 Nm



7. Slowly lower the jack, gently pull down the spring arm, and then remove the rear coil spring and spring pad from the spring swing arm assembly.



Inspection after removal

Check whether the rubber seat or spiral spring such defects as deformation, crack or damage have and replace the defective one(s) where necessary. Replace it if necessary.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: The top of the coil spring is flat-headed.

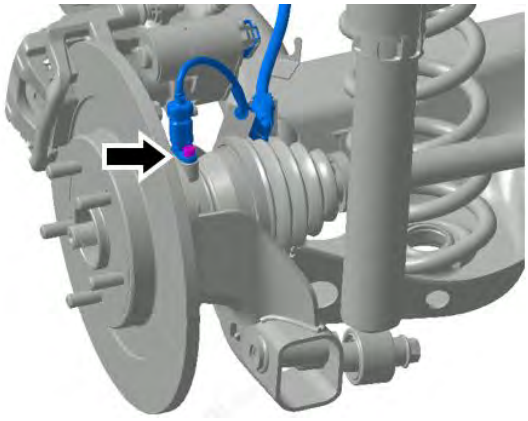
   Caution: Firmly install the coil spring, and align its lower end with the stop end of the rear coil spring lower cushion block;

   Caution: The lower positioning protrusion of the rear coil spring lower pad should fit into the corresponding locating hole in the spring tray of the spring swing arm assembly.

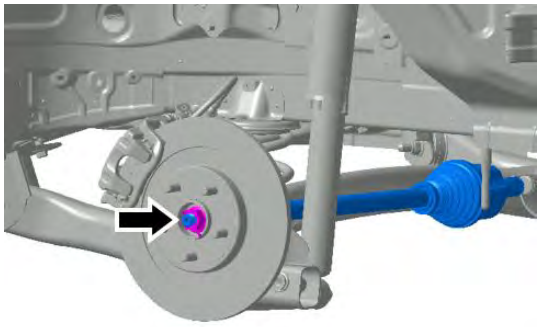
2.2.4.3 Rear hub bearing

Removal

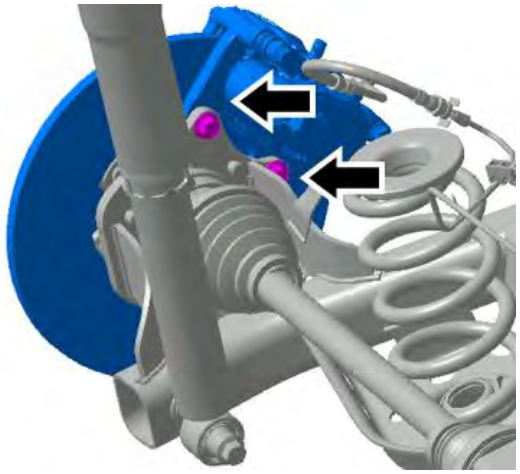
1. Lift and support the vehicle. Refer to: Lifting the vehicle.
2. Remove the rear wheel tyre (above the lifting platform). Refer to: Wheel.
3. Remove the rear wheel speed sensor and harness.



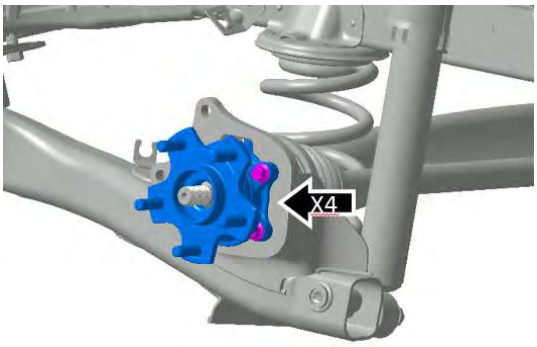
4. Remove the drive shaft nut.



5. Remove the bolts of rear brake assembly.



6. Remove the fixing bolt of rear hub bearing unit.



Inspection after removal

1. Check the rear steering knuckle for deformation, cracks or other damage.
2. Check the hub bearing for oil leakage.
3. Check whether the wheel hub bearing rotates smoothly, whether there is a sense of jamming or abnormal rotation noise, etc.

Replace the defective one(s) where necessary.

Installation

The installation order is the reverse of the removal order.

For details on rear wheel alignment, please refer to the rear wheel alignment requirements of the suspension system. Refer to: Rear wheel alignment.

Inspection after installation

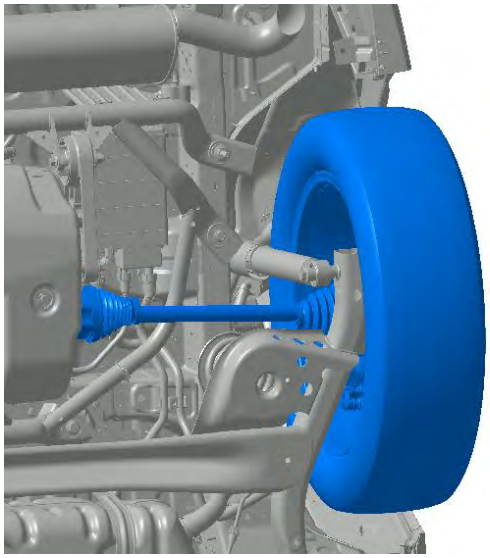
1. Confirm fixation (looseness and gaps) of each part; ensure normal status (wear, damage and deformation) of all the parts.
2. Check the rear hub bearing unit assembly for grease leakage and damage, and replace it if any fault is found.

2.2.4.4 Rear axle assembly

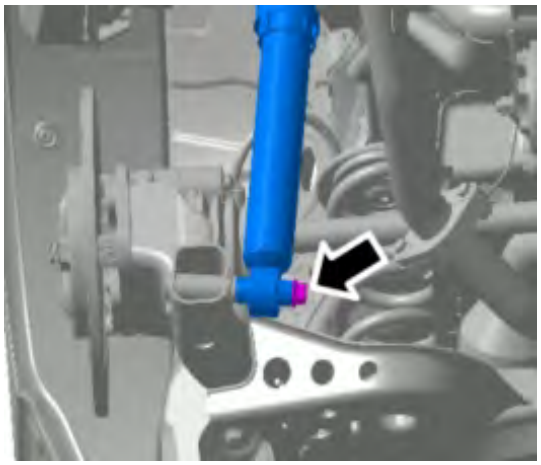
Removal

1. Lift and support the vehicle. Refer to: Lifting the vehicle.

2. Remove the rear drive shaft (above the lifting platform).

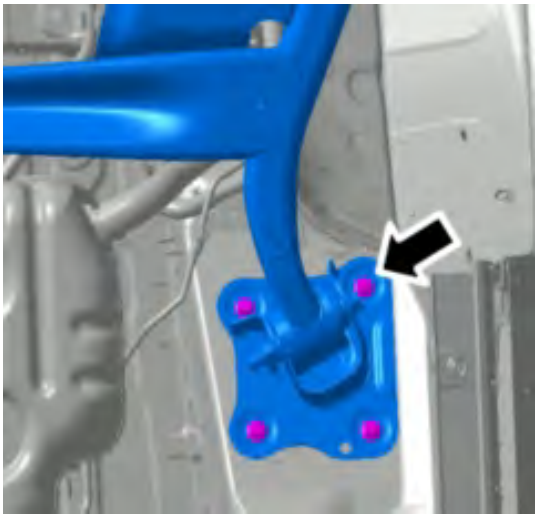


3. Remove the lower mounting bolts of shock absorber.



4. Take out the spring.

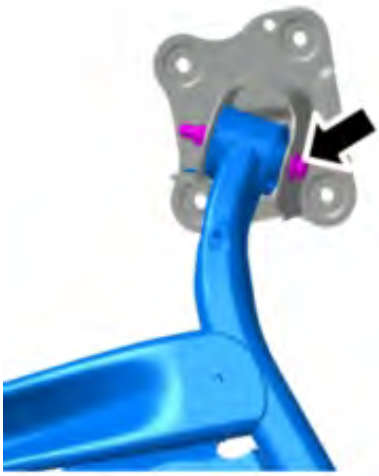
5. Hold the rear axle assembly crossmember with bracket, and then remove the mounting bolts connecting the rear axle bracket to vehicle body.



6. Slowly lower the bracket and remove the entire rear axle assembly.



7. Remove the mounting bolts and nuts of torsion beam bracket.



Inspection after removal

1. Visually inspect the rear axle assembly (including the rear axle bushing) for obvious deformation, cracks or other damage. Replace it if necessary.

Installation

1. The installation order is opposite to that of removal.
2. Before installation, make sure that the bolts and nuts connecting the rear axle body to the rear axle bracket are not tightened. After the rear axle with bracket assembly is installed onto the vehicle body, tighten the bolts and nuts connecting the rear axle body to the rear axle bracket when the vehicle is on the ground without load.

Inspection after installation

1. Check whether the caliper harness is connected correctly.
2. Adjust the brake and check whether the air in the brake pipe is completely vented to ensure proper operation of the brake system.
3. Check the wheel alignment. Refer to: Rear wheel alignment.

2.2.5 Removal and installation

2.2.5.1 Rear shock absorber assembly

Removal

Caution: When removing components from the shock absorber assembly, be sure to prevent damage to the piston rod of the shock absorber assembly.

1. Remove the waterproof cover.



2. Remove the upper end nut of shock absorber.



3. Remove the shock absorber parts.



Installation

1. The installation order is the reverse of the removal order.

2.2.6 General procedures

2.2.6.1 Rear wheel alignment

Preliminary inspection before rear wheel alignment check

Check the following:

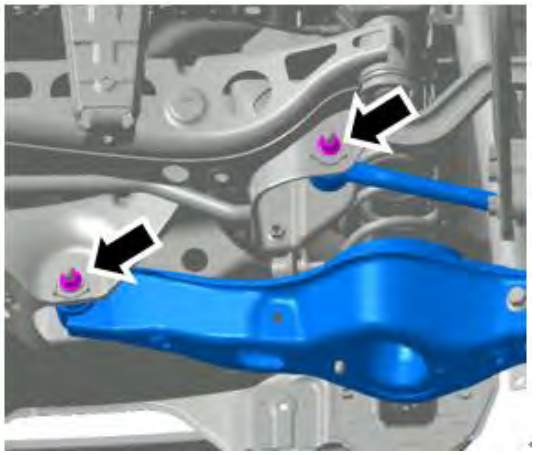
1. Proper tyre pressure and tyre wear.
2. If the wheels bounce: check balance condition of tyres.
3. End play of wheel bearings: check the wheel bearings.
4. If retaining elements of suspension are loose and deformed.
5. Check if the subframe, each link, or control arm has any cracks, deformation, or other damage.
6. Vehicle height (position).

Check the camber angle and toe-in

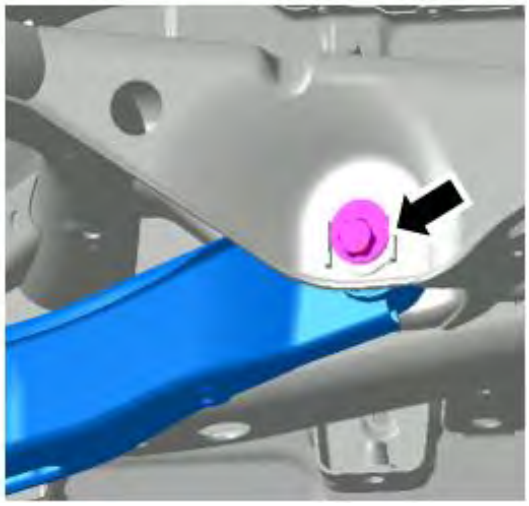
Caution: Use a suitable aligner to measure the camber angle and toe of the left and right wheels.

Caution: If the camber angle or toe is out of the standard range, adjust it by adjusting the spring control arm and the eccentric bolt on the toe connecting rod.

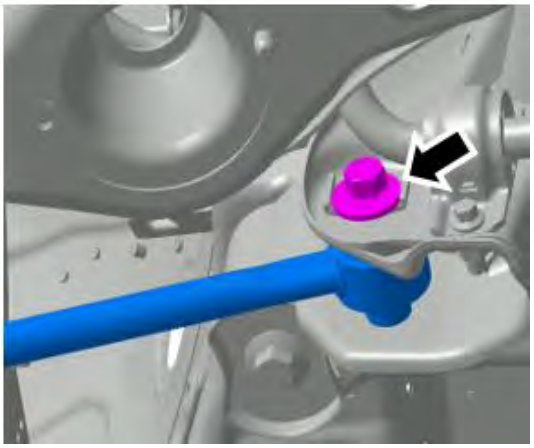
1. Loosen the nuts at the spring control arm and toe-in link adjustment bolts.



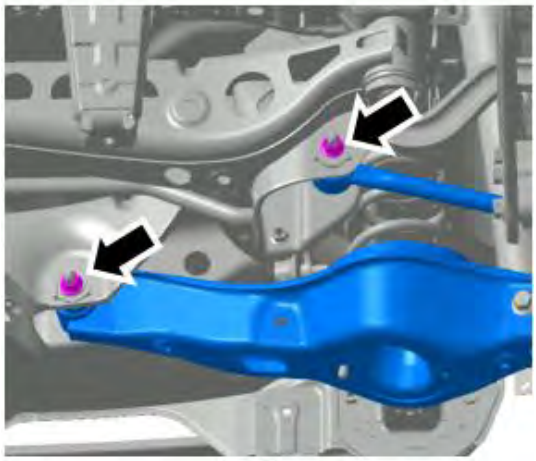
2. First adjust the camber angle into the proper range using the spring control arm eccentric bolt.



3. Adjust the toe-in connecting rod eccentric bolt to adjust the toe-in and camber angle to the specified range.



4. Tighten the nut to the specified torque.



2.2.6.2 Inspection of camber angle and caster angle

Inspection

1. Before inspection, drive the vehicle onto the lifting frame workstation of four-wheel aligner and keep the vehicle level. The front wheels shall be in the centre of corner plate and the rear wheels shall be in sliding plate.
2. Inspect camber, caster, kingpin inclination, and toe according to the instrument instructions.

2.3 Steering system

2.3.1 Specification

2.3.1.1 Torque specification

Standard and limit

Item		Standard value	Limit value
Steering wheel free play		\	30mm
Steering angle	Inner wheel	36.0 ° ± 1 °	\
	Outer wheel	30.1 ° ±1	\
Steering tie rod ball joint starting torque (N·m)		1．5～3	\

Tightening torque

Application	Nm
Steering wheel lock nut	35±3
Steering column fixing nut	28±2
Steering drive shaft to steering column connecting bolt	67±3
Steering drive shaft to steering gear connecting bolt	65±5
Tie rod joint to steering knuckle arm	60±6
Steering gear assembly mounting bolt	150±15
Lock nuts at both ends of steering tie rod	100±10

Tightening torque requirements for unspecified steering system bolts and nuts are as follows:

Thread Specification	Nm
M5	5
M6	9
M8	24
M10	45
M12	85
M14	130
Tightening torque tolerance shall not exceed 10%.	

2.3.2 Operation Manual

2.3.2.1 Overview

Necessary materials for maintenance

Lubricants:

Application	Item	Specified lubricant	Quantity
Steering wheel assembly	Spline	Lithium-based grease	As per prescribed requirements
Steering transmission device	Cross shaft	2# lithium-based grease	As per prescribed requirements
Steering gear assembly	Bellows	Silicone grease	As per prescribed requirements
	Upper oil seal	3# lithium-based grease	As per prescribed requirements

Sealant:

Item	Specified sealant	Remarks
Mechanical steering rack support cover screw	3M ATD product No. 8661 or equivalent	Semi-dry sealant
Steering tie rod end ball joint dust cover lip		

System Description

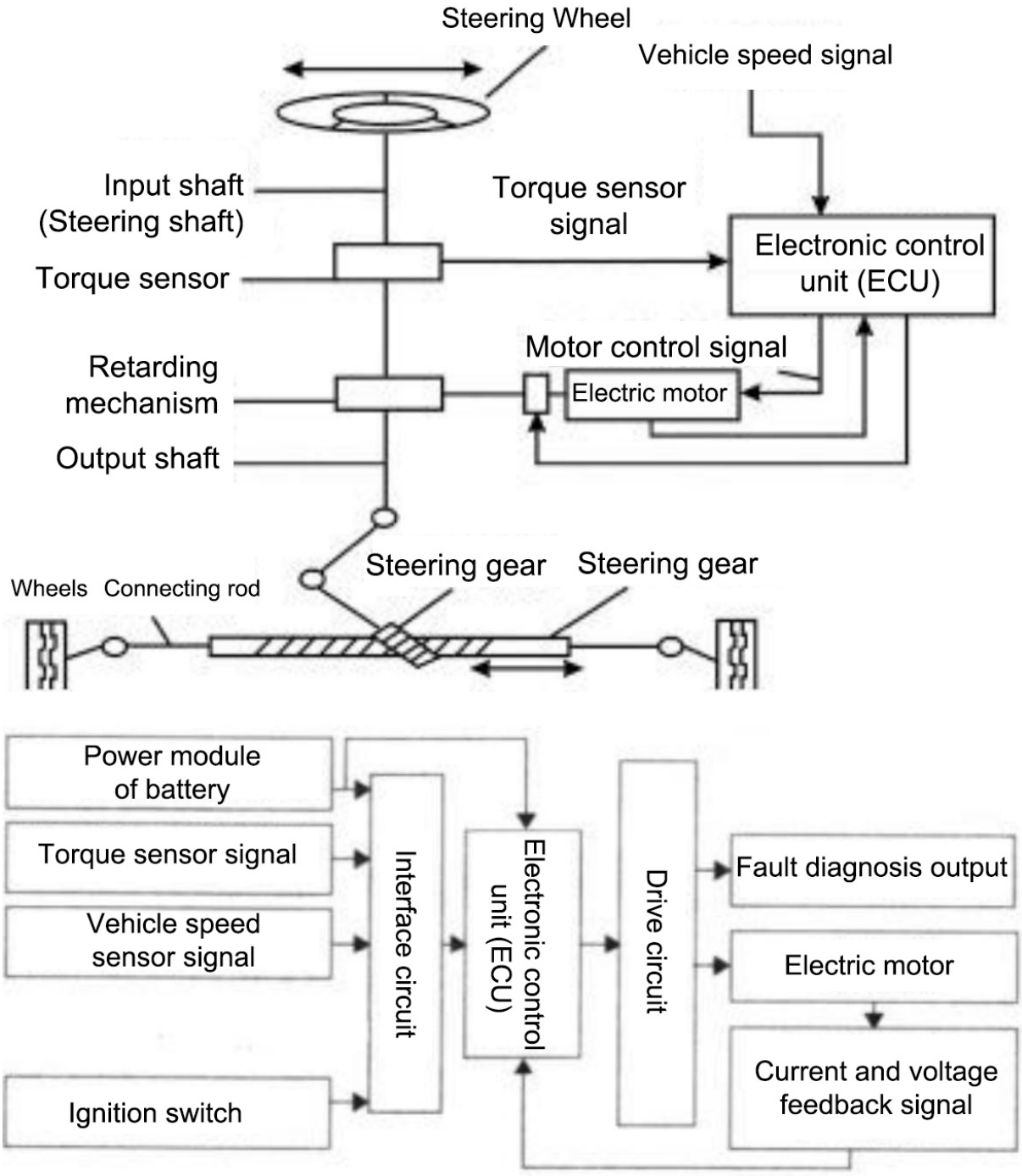
This vehicle is equipped with an electric power steering system.

The electric power steering system mainly includes: steering wheel assembly, EPS column assembly, mechanical steering gear assembly, electric steering drive shaft assembly and other main parts and components. The EPS column assembly is mainly composed of a torque (steering) sensor, ECU, motor, and reduction mechanism. When the vehicle is driving straight and there is no torque input to the steering wheel, the motor stops working; when the vehicle needs to turn, i.e., when there is torque input to the steering wheel, the EPS control unit ECU will control the motor torque output according to the input torque of the steering wheel, vehicle speed, and steering wheel angle signal, finally achieving power-assisted steering.

Working principle

EPS principle:

The electric power steering system is mainly composed of a torque (steering) sensor, electronic control unit (ECU), motor, and reduction mechanism. When the vehicle is driving straight, the motor stops working; the system only provides the power assistance required for steering in real time when the vehicle is turning.



2.3.2.2 Precautions

Precautions for airbag

1. **Caution:** Airbags can help reduce injury risk or severity for the driver and front passenger in case of vehicle collision. For details about information concerning correct maintenance of this system, please see SRS section in this manual.

Precautions for steering system

1. **Caution:** In case the steering system goes wrong, item-by-item check should be performed in accordance with the steps and methods as specified in the fault criterion and aimless replacement of components must be avoided.

During installation of steering gear, the ball joint of tie rod must be tightened up finally after the vehicle is reliably grounded and in the no-load condition and before wheel alignment.

Precautions for Removal

1. **Caution:** Thoroughly clean the outside of the device before removing it.
2. **Caution:** Disassemble in a clean working area to avoid that internal components and parts are polluted by dust or other foreign objects. Preventing internal parts and components from pollution by dust or other foreign objects is very important.
3. **Caution:** Place the removed parts on the parts rack for easier and more accurate assembly.
4. **Caution:** Clean the parts and components with nylon cloth or tissue as ordinary shop rags may leave cloth scraps that will affect the operation thereof.
5. **Caution:** Never reuse non-reusable parts.
6. **Caution: Lubricate** the designated parts and components with specified grease before assembling.

2.3.3 Diagnosis and testing

2.3.3.1 Steering System - Troubleshooting of noise, vibration and harshness

The following table can help you find the cause and determine the repair or replacement of these components and parts where necessary. Repair or replace these parts and components as necessary.

Steering		Symptoms			
		Noise	Shaking	Vibration	Judder
Possible cause and suspicious parts	Ball joint swing torque	•			
	Ball joint torsional torque	•			
	Ball joint end clearance	•	•		
	Free travel of steering wheel	•	•		
	Steering gear rack and pinion clearance	•	•		
	Insufficient torque on the steering wheel gland nut	•	•	•	•
	Adjustment handle not locked	•	•	•	•
Possible cause and suspicious parts	Steering dust cover rubber interference	•		•	•
	Deformation or damage of steering column	•		•	
	Incorrect or loose installation of steering column		•	•	
	Excessive clearance in the steering drive shaft	•	•		•
	Insufficient torque on the steering drive shaft locking bolt	•	•	•	•
	Insufficient suspension system torque	•			

Steering		Symptoms			
		Noise	Shaking	Vibration	Judder
	Tyre	●	●		●
	Wheels	●	●	●	
	Drive shaft	●	●		●
	Brake	●			

2.3.3.2 Steering System - DTC and corresponding handling method

DTC and corresponding handling method

S/N	DTC	Description	Possible causes	Handling methods
1	U012100	Vehicle speed signal loss	ABS/ESP system abnormal	1. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 2. Check whether the ABS/ESP system is normal. If the ABS/ESP system also displays abnormal vehicle speed signal, handle it according to the chapter of ABS/ESP.
2	U012110	Speed signal invalid		
3	U007300	CAN communication failure	CAN communication signal lost; vehicle CAN network abnormal; steering wheel angle sensor is additionally installed	1. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 2. Check the vehicle's CAN network. 3. Check whether the steering wheel angle sensor is additionally installed in the multi-function switch.

S/N	DTC	Description	Possible causes	Handling methods
4	C105900	Absolute angle not calibrated	Steering wheel angle signal not calibrated	Perform zero calibration for the steering wheel angle signal with a diagnostic scanner according to the above zero calibration process.
5	C105910	Steering angle signal invalid	Steering angle signal invalid	1. Perform zero calibration for the steering wheel angle signal with a diagnostic scanner according to the above zero calibration process. 2. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 3. If the same DTC recurs, replace the EPS controller. 4. If no improvement after replacement of the EPS controller, replace the EPS steering column.

S/N	DTC	Description	Possible causes	Handling methods
6	C105800	Angle sensor fault	Angle sensor fault	1. Check whether the EPS sensor harness is well connected and whether there is interference at the connector position. 2. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 3. If the same DTC recurs, replace the EPS controller. 4. If no improvement after replacement of the EPS controller, replace the EPS steering column.
7	C105700	Column ECU fault	EPS controller fault	1. Visually check the controller cover for impact marks. 2. If the appearance is intact, clear the DTC first. The MIL will still be on after restart. Test the DTC again with a diagnostic tool for confirmation. If the DTC is consistent after confirmation, replace the EPS controller directly.

S/N	DTC	Description	Possible causes	Handling methods
8	C105600	RAM storage error	EPS controller fault	1. Visually check the appearance of the housing for impact marks. 2. If the appearance is intact, clear the DTC first. The MIL will still be on after restart. Test the DTC again with a diagnostic tool for confirmation. If the DTC is consistent after confirmation, replace the EPS controller directly.
9	C105710	Relay fault	Relay fault	1. Visually check the appearance of the housing for impact marks. 2. If the appearance is intact, clear the DTC first. The MIL will still be on after restart. Test the DTC again with a diagnostic tool for confirmation. If the DTC is consistent after confirmation, replace the EPS controller directly.

S/N	DTC	Description	Possible causes	Handling methods
10	C105720	Temperature sensor fault	ECU temperature sensor fault	1. Visually check the appearance of the housing for impact marks. 2. If the appearance is intact, clear the DTC first. The MIL will still be on after restart. Test the DTC again with a diagnostic tool for confirmation. If the DTC is consistent after confirmation, replace the EPS controller directly.
11	C105400	ROM storage error	EPS controller fault	1. Visually check the appearance of the housing for impact marks. 2. If the appearance is intact, clear the DTC first. The MIL will still be on after restart. Test the DTC again with a diagnostic tool for confirmation. If the DTC is consistent after confirmation, replace the EPS controller directly.
12	C105317	Battery overvoltage	17V	1. Check the generator and battery voltage. 2. Check whether the power harness connection is in good condition.
13	C105316	Battery undervoltage	<9V	1. Check the generator and battery voltage. 2. Check whether the power harness connection is in good condition.

S/N	DTC	Description	Possible causes	Handling methods
14	C105200	Motor rotor position signal abnormal	Motor fault.	1. Check whether the EPS sensor harness is well connected and whether there is interference at the connector position. 2. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 3. If the same DTC recurs, replace the EPS controller. 4. If no improvement after replacement of the EPS controller, replace the EPS steering column.
15	C105210	Motor voltage/current abnormal		
16	C105220	Motor short-circuited or open-circuited		

S/N	DTC	Description	Possible causes	Handling methods
17	C105100	Torque sensor fault	Torque sensor fault	1. Check whether the EPS sensor harness is well connected and whether there is interference at the connector position. 2. Clear the DTC with a diagnostic scanner, turn off the ignition switch, wait for two minutes, and restart to check whether the DTC reappears. 3. If the same DTC recurs, replace the EPS controller. 4. If no improvement after replacement of the EPS controller, replace the EPS steering column.
18	C0176.54	Overheating protection	EPS enters thermal protection mode	Turn off the ignition switch, and start again after cooling for a while.

2.3.3.3 Steering System - Checklist of fault symptoms

Understand the fault symptoms and check as per possible causes.

Fault symptom		Possible causes	Checking sequence
Communication with X-431 fails	Communication with any systems fails	– Faults of diagnostic connectors – Faults of X-431 connectors – Faults of CAN communication lines – Faults of X-431	1
	Only unable to communicate with EPS.	– EPS fuse blown – Fault of CAN communication line (only connected to EPS part) – Fault of EPS connector – EPS-ECU fault	2

2.3.3.4 Steering System - Standard process for fault diagnosis

Standard flow chart of fault diagnosis

Steps	Diagnosis action	Yes	No
1	1. If possible, connect or install all parts that were previously disconnected or removed. 2. Turn the key to the ON position, and the vehicle does not start. 3. Connect the X431 diagnostic host to the vehicle's diagnostic interface via the diagnostic line and enable it to communicate with the ECU. Confirm whether the X431 diagnostic host can communicate with the ECU.	Go to Step 2	Go to Step 4
2	Are there any current or stored DTCs?	Go to Step 3	Go to Step 7
3	1. Record the present DTC and occurrence time. 2. Record the previous DTC and occurrence time. Please do not clear the DTC before the X431 diagnostic host records the necessary information.		
4	Can the X431 main unit communicate with other modules (such as airbags) on the same data line?	Go to Step 5	Go to Step 6
5	To the DTC and corresponding handling method "CAN Communication Failure".		
6	Inspect the data link connector of the electrical diagnosis part.		

Steps	Diagnosis action	Yes	No
7	1. Remove the key. 2. Wait for 10 seconds. 3. Turn the key to the ON position, do not start the vehicle, and observe the orange EPS warning light. 4. Do the EPS and brake warning lights turn on and then off for an instant? (Bulb test)	Go to Step 8	Go to Step 9
8	System functions normally.		
9	Are there any lights still on?	Go to Step 10	Proceed to Step 11
10	Handle according to the current fault points recorded in Step 3, and restart the detection after troubleshooting (starting from Step 1).		
11	Check the circuit.		

2.3.3.5 Steering System - Common faults and troubleshooting methods of electric steering

Fault	Main Causes	Troubleshooting Method
Heavy steering in one direction	1. Insufficient tyre pressure on one side.	Inspect the tyre pressure.
	2. Excessive deviation in the no-load torque value	X431 reads EPS data flow, and confirms whether the torque value of the steering wheel in the free state is within ±0.5Nm.
Heavy steering	1. Tyre pressure too low	Inspection of tyre pressure
	2. Incorrect front wheel alignment.	Check and adjust as per relevant provisions
	3. Friction due to bending of the steering drive shaft or denting of the steering column.	Correct or replace
	4. Steering tie rod system parts bent, and the friction of the ball pins too large	Lubricate or replace
	5. Vehicle speed signal abnormal	Diagnose with a diagnostic scanner
	6. EPS system fault	Diagnose with a diagnostic scanner
	7. Serious overload of vehicle	Reduce the load

Fault	Main Causes	Troubleshooting Method
	8. EPS system overheating protection	Restart the vehicle. Avoid repeatedly turning the steering wheel sharply back and forth when the vehicle is stationary or at very low speed; avoid holding the steering wheel at either extreme lock position for more than 5 seconds.
	9. Insufficient battery voltage or poor harness contact	Check the battery voltage and harness connections.
Heavy steering when the vehicle is driven on uneven, bumpy roads	1. The EPS controller harness connector is loose, resulting in poor contact. When driving on bumpy roads, the signal becomes intermittent, causing heavy steering 2. The battery's positive and negative poles are loose, resulting in poor contact. When driving on bumpy roads, the power supply becomes intermittent, causing heavy steering	1. Check whether the power supply and communication interface connections are secure 2. Reconnect the power supply and communication plugs
Large free travel of steering wheel	1. Loose fitting between steering wheel and steering column.	Tighten the loose parts
	2. Insufficient torque of locking bolts at both ends of steering drive shaft.	Tighten the loose parts
	3. Looseness of steering gear fixing bolt.	Tighten the loose parts
	4. Worn front wheel bearings	Replace the front wheel bearing
	5. Worn components of the steering tie rod system.	Replace worn parts
	6. Worn steering gear pinion and rack.	Replace the steering gear.
Abnormal noise of mechanical system	1. Looseness of steering drive system.	Tighten the connectors, especially the locking bolts at both ends of the steering drive shaft.
	2. Worn steering system universal joints.	Replace the steering drive shaft and locking bolt.
	3. Excessively loose backlash adjustment or damage of steering gear racks	Adjust or replace the steering gear assembly.
Poor returnability	1. Different tyre pressures or insufficient tyre pressure for left and right tyres.	Adjust and inflate as per relevant provisions.
	2. Interference between steering gear input shaft and steering dust cover.	Adjust.
	3. Zero position deviation of steering wheel angle signal.	Check and adjust with X431.

Fault	Main Causes	Troubleshooting Method
	4. Improper alignment of front wheels.	Adjust.
Unstable steering	1. Loose or worn steering system components	Tighten or replace.
	2. Loose or worn front suspension and wheel system parts	Tighten or replace.
	3. Non-compliance with wheel dynamic balance or four-wheel alignment parameters	Check and adjust.
Steering mode selection failure	1. Conditions not met.	Stop the vehicle and move your hands away from the steering wheel to make a selection.
	2. X431 set to "selection via diagnostic scanner"	Use X431 to set "select through the central control panel".
	3. The EPS system is faulty.	Carry out troubleshooting according to the "EPS system fault diagnosis" in this section.
	4. Fault present in the central control panel	Troubleshoot and rectify according to the In-Vehicle Infotainment (IVI) System section
EPS itself does not report a fault, but the ESP system reports an SAS fault	The zero position of the angle signal is incorrect.	Zero the steering wheel angle signal with X431 again according to the process (if EPS works normally and no fault is reported, do not replace the EPS column).

2.3.4 Removal and installation

2.3.4.1 Steering Wheel

Removal

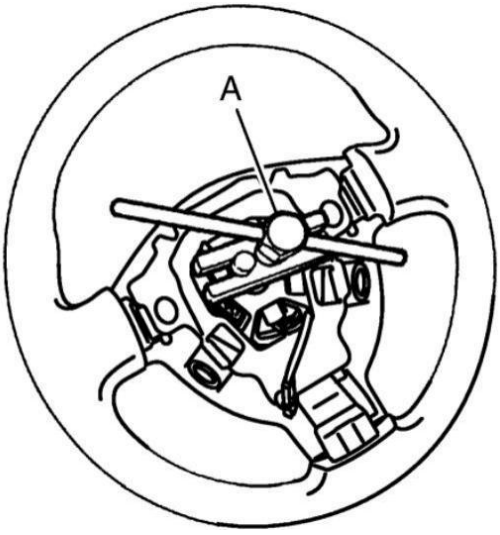
1. Remove the SRS (airbag). SRS parts are installed in this area. Before maintenance or service, review the SRS parts location, precautions and steps in the SRS section. Refer to: Driver SRS components.
2. Disconnect the horn connector, SRS connector, and multi-function button connector (if equipped). Remove the driver's SRS module and place it in a safe, secure location to prevent damage.
3. After the steering is locked, use a torque wrench to remove the steering wheel lock nut.

   Torque: 35±3Nm



4. Pull the steering wheel out of the steering column spline tooth with a special tool.

   Note: Do not knock the steering wheel in any way when removing it.



Installation

Install in the reverse order of disassembly and pay attention to the following matters:

Note: The installation order is opposite to the disassembly order.

Note: Check the brake fluid level in the brake fluid reservoir, and fill the brake fluid to the maximum scale if necessary.

Note: Exhaust air from the brake system according to the specified method. Refer to: Brake system bleeding.

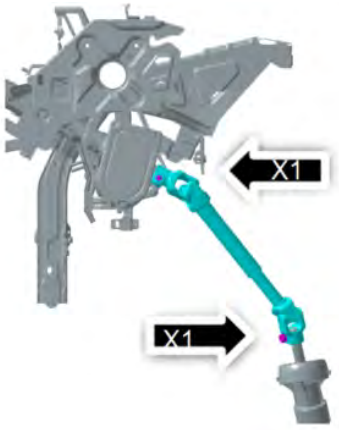
2.3.4.2 EPS steering column

Removal

1. Park the vehicle perfectly straight (straighten the steering wheel).
2. Unplug the vehicle harness connector from the controller, including power line and communication line.
3. Remove the steering wheel. Refer to: Steering Wheel.
4. Remove the upper and lower covers of steering column. Refer to: Steering Column Upper and Lower Shield Assembly.
5. Remove the instrument panel lower cover plate. Refer to: Instrument Panel.
6. Remove the multi-function switch. Refer to: Multi-function switch.
7. Remove the Start switch. Refer to: Start switch.
8. Disengage the harness connector and take out the multi-function switch and spiral cable from the steering column.
9. Remove the locking bolt of universal joint on the lower side of instrument panel (as shown in figure), and disconnect steering drive shaft from power steering gear and steering column.

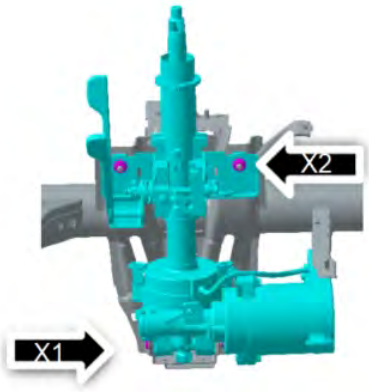
   1 Torque: 67±3Nm (upper M10 bolt)

   2 Torque: 65±5Nm (lower M10 bolt)



10. Firstly remove the (two) fixing nuts at the upper end of the steering column and then turn the steering column backward, prop up its lower end by hand and remove the (one) fixing bolt at the lower end.

    Torque: 28±2Nm



11. Hold the lower end of steering column with hand and take out the steering column assembly from vehicle.

    Note: Disconnect the steering drive shaft from the steering gear. The steering drive shaft must be taken out along the axis of the steering gear input shaft, and must also be installed along the axis of the steering gear input shaft during assembly. Gloves must be worn when taking out, placing and assembling the steering drive shaft; otherwise, it will cause rust.

    Note: Once the locking bolts at both ends of the steering drive shaft are removed, be sure to replace them. During each maintenance, please check the torque of locking bolt at the lower end of steering drive shaft and ensure that it is within the specified torque range.

    Note: During removal and assembling of EPS steering column, its lower end must be propped by hand, while its upper section should not be lifted. Otherwise, it may be damaged.

    Note: Avoid hitting the steering column assembly during removal and installation, especially the motor and controller. If the steering column assembly is dropped or subjected to severe impact, it must be replaced with a new one.

    Note: Do wear gloves when taking out and placing the EPS steering column. Handle with both hands (one hand for booster mechanism, one hand for protective pipe).



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

Note: The four mounting points of the EPS steering column must be installed in the following order: tighten 2 bolts on the lower side → tighten right bolt → tighten left bolt → apply torque from the lower side first, then the right side and finally the left side. If this sequence is not followed, adjustment jamming may occur. Please follow the requirements.

Note: After the EPS steering column is installed, perform zero calibration for the steering wheel angle signal. The steering wheel angle signal must be zeroed every time any spline connection between the steering drive shaft and the steering gear, the steering drive shaft and the steering column, and the steering column and the steering wheel is reassembled. During zero calibration, ensure the front wheels are in the straight-ahead position.

1. X-431 diagnostic scanner path: Dongfeng Forthing-Forthing Jingyi Series-T5 EVO Series-System Selection-(EPS) Electric Power Steering System-Special Function-Steering Wheel Angle Sensor Zero Marking.

2. After entering, the interface shown in Fig. 1 is displayed, and DTC reading and clearing, EPS neutral position

calibration, etc. can be performed. During the neutral position calibration, tap "Calibration Neutral Position" and a prompt message as shown in Fig. 2 will pop up. If the prompt conditions are met, tap "OK" to start zero calibration. The EPS zero calibration is completed when a prompt message of "Calibration Succeeded" as shown in Fig. 3 pops up.



Fig. 1



Fig. 2



Fig. 3

Inspection after installation

1. Properly assemble the steering wheel in the centre position and turn it left and right to the limit positions several times to ensure that it operates flexibly.
2. Check steering wheel free play
3. Check whether the steering column is securely locked. If not, be sure to adjust the adjustment handle of the steering column. Specifically, adjust the lock nut (left-hand nut) on the adjustment handle to make the adjustment handle in a proper locking state.
4. Check whether the angle adjustment of steering column is smooth. If it gets stuck:

   1. The upper mounting point is not parallel to the lower mounting point, i.e. the steering column collapses due to torsion

   2 Wrong tightening sequence
5. Adjustment scheme: Loosen the right bolt (do not completely remove it) → loosen the left bolt (do not completely remove it) → adjust the steering wheel up and down, forward and backward → tighten the right bolt → tighten the left bolt → adjust the steering wheel up and down, forward and backward to try the adjustment force → apply torque, first on the right side and then on the left side.
6. Check whether the EPS harness connector is firmly connected and whether the instrument panel fault indicator stays on; use X431 to check the DTC and clear it.

2.3.4.3 Mechanical steering gear assembly

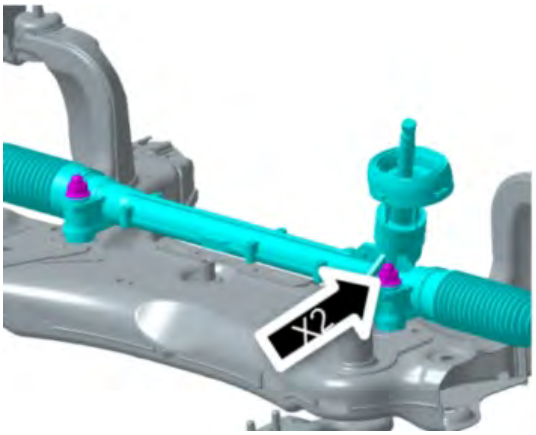
Removal

1. Park the vehicle perfectly straight (straighten the steering wheel).
2. Remove the connecting bolts of the universal joint and disconnect the steering column and power steering gear.
3. Remove the front left and right wheels. Refer to: Tyre.
4. Disconnect the steering tie rod and steering knuckle.

   Torque: 60±6Nm



5. Remove the front subframe. Refer to: Front Subframe.
6. Screw out the two bolts fixing the steering gear on the subframe and take out the steering gear. Torque tightening standard: 150±15Nm.



Installation

1. Assemble the steering gear onto the subframe.
2. Connect properly the steering column and tighten it as per torque requirements.
3. Turn the steering wheel to the limit position at one side and then turn it half back (about 1.35 turns) and maintain it.
4. Connect the steering gear ball joint tie rod to the steering knuckle under the condition that the front wheels face straight forward, and tighten the torque as required. If the steering wheel is misaligned at this time, reassemble it.

Caution: After replacing the steering gear, recheck and adjust the four-wheel alignment and perform zero calibration for EPS with X431 diagnostic scanner.

2.4 Wheels and tyres

2.4.1 Specification

2.4.1.1 Torque specification

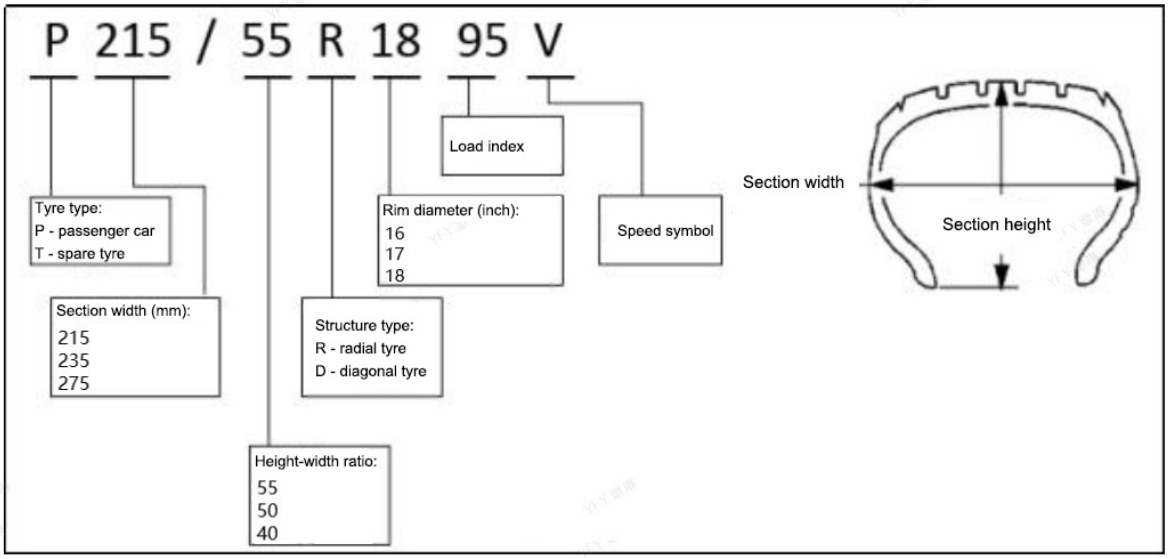
Name	Nm
Wheel nut	130±10

2.4.2 Operation Manual

2.4.2.1 Overview

Description of metric-size tyres for passenger vehicles

Replacement tyres should be of the same tyre performance criteria TPC specification number including the same size, the same load range, and the same construction as those originally installed on the vehicle.



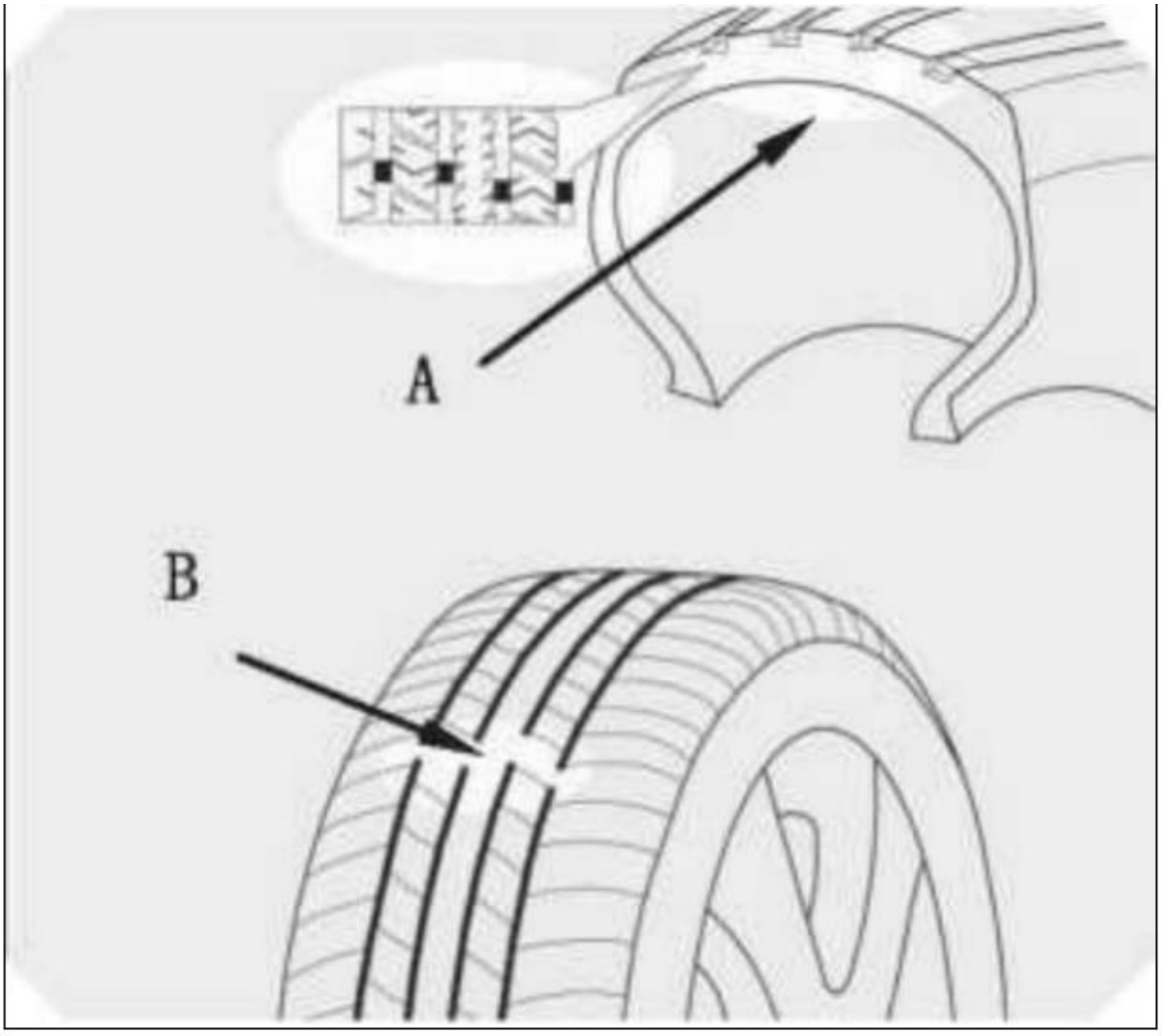
Wheel and tyre assembly

On-board inspection and maintenance

Check the tyres. Each time you check the tyre inflation state, you shall also check the tyres for external injury, puncture by foreign objects and wear. You shall check:

1. Replace a tyre if any damage or bulge If any of the conditions is found, replace the tyre.

2. Replace a tyre if its wall is scratched, cracked or ruptured to the fabric or cord.



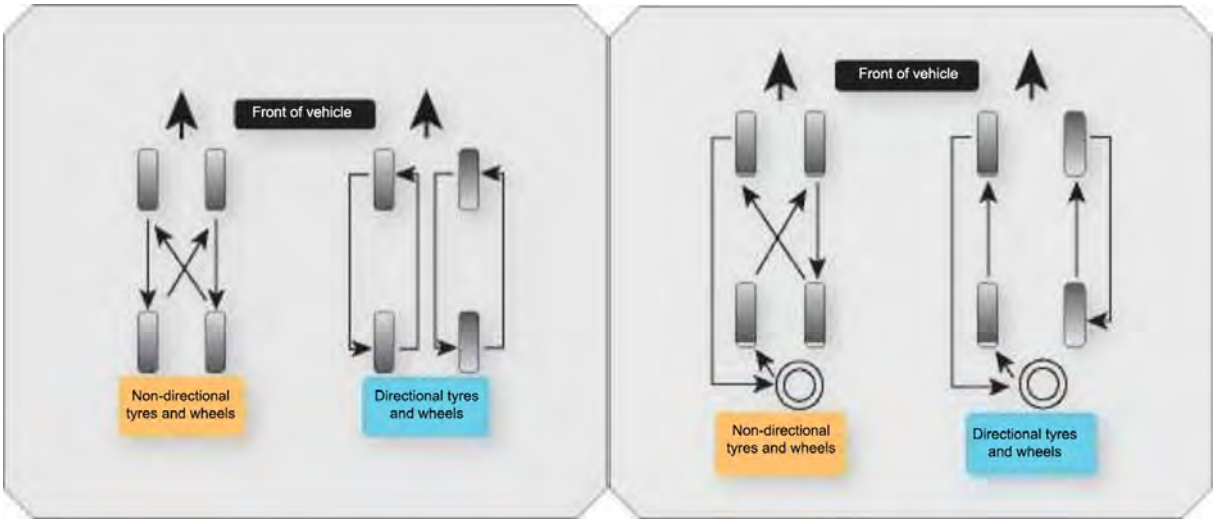
Excessive Tread Wear

The tyre must be kept in good condition, and the tread pattern on the tyre surface shall be deep enough. Tyres approved by Forthing Auto are marked with A to measure the wear degree of tyres, and this mark is the raised point inside the tyre running belt. When the raised point of a tyre is worn to the extent of B, the tyre must be replaced. At this time, the tread thickness is only 1.6 mm, and such a tyre lacks adhesion when running on wet roads.

Tyre maintenance

1. In addition to proper inflation, correct wheel alignment also helps reduce tread wear. If uneven tyre wear is found, the wheel alignment should be checked. Refer to: Wheel alignment.
2. If you feel continuous vibration while driving, have the tyres checked. Tyre balancing must be performed whenever a tyre has been removed from the wheel. When installing a new tyre, be sure to balance the tyre so as to increase the riding comfort and prolong the service life of the tyre. It is best to have the installer do a tyre dynamic balancing. Refer to: Wheel Balance Adjustment.

Tyre rotation



To extend the service life of tyres and ensure even wear, the positions of tyres should be changed every 10,000 kilometers driven. Each time tyres are changed, reposition them as shown in the above figure. The above figure shows how to change the tyre position of a vehicle without a standard spare tyre.

Replacement of tyres and wheels

1. Replace with radial tyres having the same size, load scope, rated speed and maximum cold tyre pressure (indicated on the tyre wall). Mixed use of radial and diagonal tyres may reduce the vehicle's braking capacity, driving force (ground adhesive force) and steering accuracy. Using tyres of different sizes or structures will result in the ABS not functioning properly.
2. The anti-lock braking system (ABS) works by comparing the rotation speeds of the wheels. Therefore, when replacing tyres, you must use tyres with the same size as the original tyres. The size and structure of the tyre affect the wheel speed and may lead to uncoordinated operation of the system.
3. It is best to replace all four tyres at the same time. If it is not possible or not necessary to do so, the two front tyres or rear tyres shall be replaced in pairs. Replacing only one tyre will seriously affect the vehicle's handling performance.

2.4.2.2 Precautions

Caution

1. **Caution:** Be sure to use a 12V battery
2. **Caution: Do not disconnect the battery cable when the engine is running.**
3. **Caution: Before connecting or disconnecting the engine ECU harness connector, turn the ignition switch to OFF position and disconnect the GND cable of battery. Failure to do so may damage the engine ECU, because even if the ignition switch is turned to OFF position, the ECU still has 12V voltage.**
4. **Caution: Before disassembling components, turn the ignition switch to the "OFF" position and disconnect the GND cable of the battery.**
5. **Caution: Do not disassemble the engine ECU**
6. **Caution: It is only allowed to use a digital multimeter to inspect the electronic fuel injection (EFI) system.**
7. **Caution: Please use authentic components and parts for maintenance; otherwise, the EFI system may not operate properly.**
8. **Caution: During maintenance, use unleaded gasoline only.**
9. **Caution: Please follow the specified maintenance and diagnostic procedures for maintenance work.**
10. **Caution: Do not disassemble the components and parts of the EFI system during maintenance.**

11. **Caution: During maintenance, take all electronic components (such as ECUs and sensors) carefully and never let them fall to the ground.**

12. **Caution: Develop an awareness of environmental protection and effectively handle any waste generated during maintenance.**

Precautions during repair

Caution: Tyre replacement may be dangerous, so it should be carried out by professionals using correct tools and following appropriate procedures. Be sure to carefully read and understand the manufacturer's warnings provided in the user manual or stamped on the tyre sidewall.

Caution: Do not let the tyre changing equipment scratch or damage the transparent coating on aluminium wheels. Scratching the clear coating may lead to corrosion of the aluminium wheels and cause the coating to peel away from the wheels.

Caution: Improper wheel accessories or tyre installation procedures can cause damage to the tyre beads or wheel mounting holes. If the correct procedure is not followed, the tyre changer may exert excessive force on the tyre, causing the wheel to bend at the mounting surface. This kind of damage may result in vibration and/or wobble, and in severe cases can cause the wheel to crack.

Caution: Do not stand on the tyre during inflation to avoid personal injury.

2.4.3 Diagnosis and testing

2.4.3.1 Troubleshooting of Tyre Pressure Monitoring System

3.1 Brief description of troubleshooting:

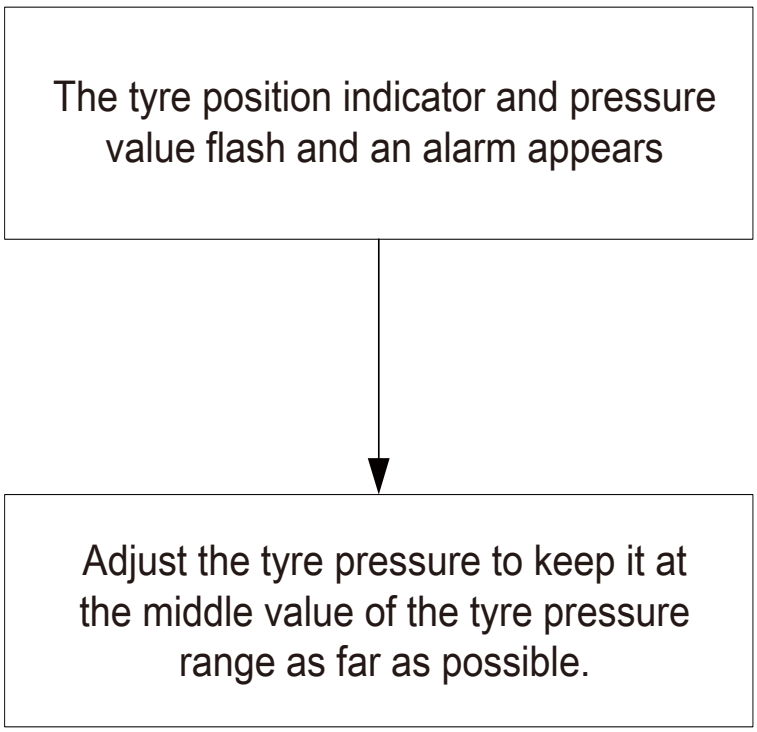
All faults of the tyre pressure system can be reflected through the instrument. However, the alarm information of the tyre pressure system on the instrument does not necessarily indicate that the tyre pressure system is faulty. The following will briefly describe and handle several common situations.

3.2 The alarm information prompts of the instrument are summarized in Table below:

Alarm mode		Buzzer	Vehicle body	Current tyre position light	Current tyre temperature value	Current tyre pressure	Frequency
Alarm for low tyre pressure	Fault warning mode	Sounding	On	Flash	On	Flash	1 Hz frequency Sounding/on 0.5 s Not sounding/off 0.5 s
Alarm for high tyre pressure	Fault warning mode	Sounding	On	Flash	On	Flash	
Sensor loss warning	Fault warning mode	Not sounding	On	On	Display"  "	Display "  "	

2.4.3.2 Handling of abnormal conditions

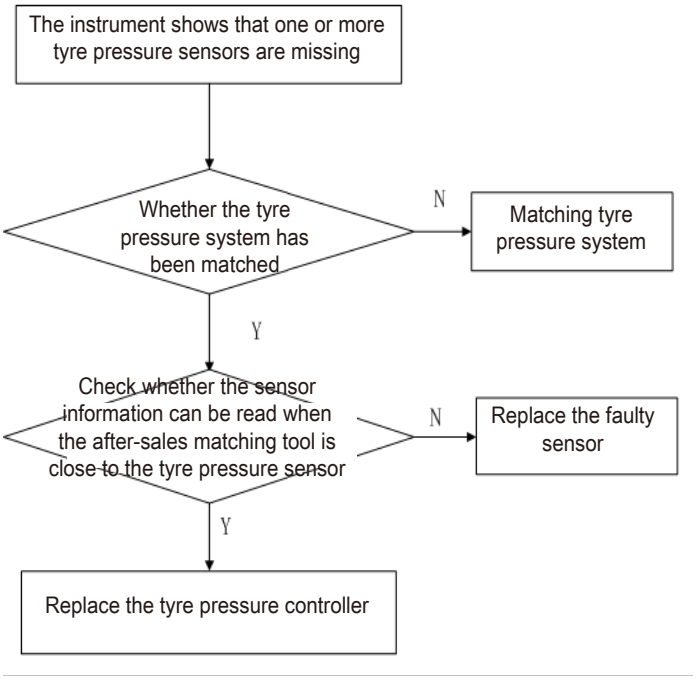
Abnormal phenomenon 1: abnormal tyre pressure



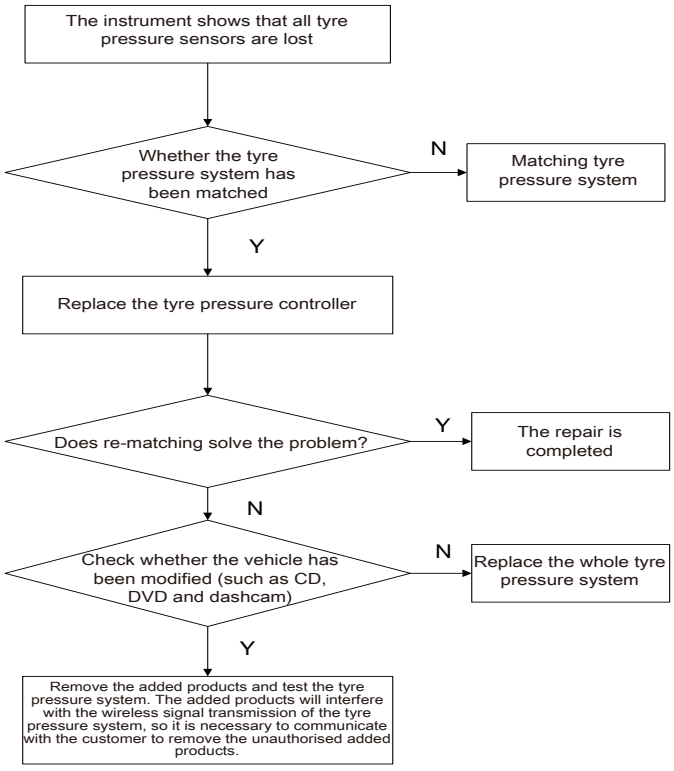
Abnormal phenomenon 2: There is no tyre pressure related information in the tyre pressure display area on the instrument

Use a diagnostic scanner to determine whether the tyre pressure part of BCM is correct (the configuration value corresponding to Baolong tyre pressure monitoring sensor is 0x08). If the battery or BCM is powered off, the tyre pressure data needs to reach 30km/h for more than one minute before it can be displayed.

Abnormal phenomenon 3: One or more tyre pressure sensors are missing



Abnormal phenomenon 4: All tyre pressure sensors are lost



2.4.3.3 Troubleshooting of Tyre Pressure Monitoring System

3.2 The alarm information prompts of the instrument are summarized in Table below:

Alarm mode		Buzzer	Vehicle body	Current tyre position light	Current tyre temperature value	Current tyre pressure	Frequency
Alarm for low tyre pressure	Fault warning mode	Sounding	On	Flash	On	Flash	1 Hz frequency Sounding/on 0.5 s Not sounding/off 0.5 s
Alarm for high tyre pressure	Fault warning mode	Sounding	On	Flash	On	Flash	
Sensor loss warning	Fault warning mode	Not sounding	On	On	Display" "	Display " "	

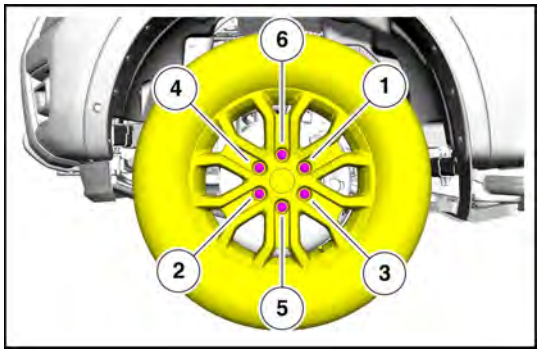
2.4.4 Removal and installation

2.4.4.1 Wheel assembly

Removal

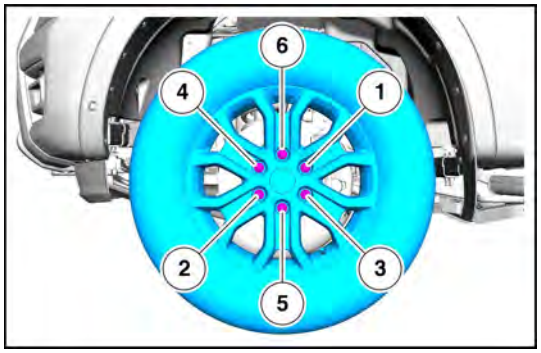
Caution: Do not heat to loosen a stuck wheel nut; heating may damage the wheel and hub.

1. Loosen the wheel nuts in the sequence shown in the figure.



2. Lift and support the vehicle. Refer to: Lifting the vehicle.

3. Remove the wheels.

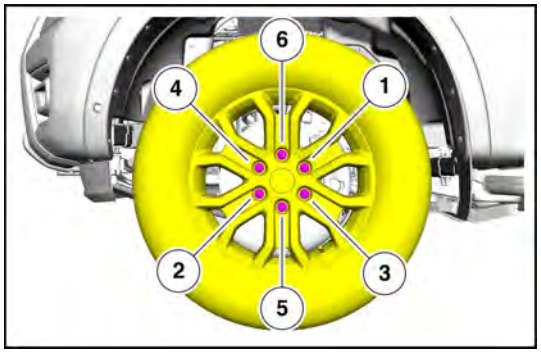


Installation

Warning: Remove the rust or dust on the installation faces of the wheel, hub or brake disc. Rust on the mounting surface may cause the wheel nut to loosen and the wheel to come off while the vehicle is in motion. Failure to observe these operating instructions may result in personal injury.

1. Clean the rust or dust on the wheel, hub or brake disc mounting surface.

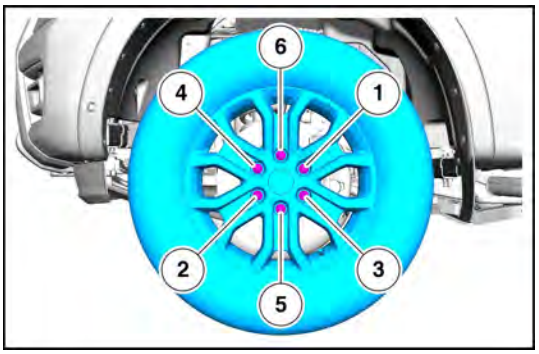
2. Install the tyres and pre-tighten all wheel nuts.



3. Lower the vehicle.

4. Tighten the wheel nuts in the order shown in the figure.

   Torque: 133±13Nm



2.4.4.2 Tyre

Removal



1. Dismantle the counterbalances on both sides of the wheels.

   Caution: Do not scratch the wheel during removal.

2. Tear off the double-sided adhesive tape from the wheel with adhesive remover (used when bonded balance weight is equipped).

   Caution: After removing the double-sided adhesive tape, wipe off the residual adhesive remover from the wheel.

Installation

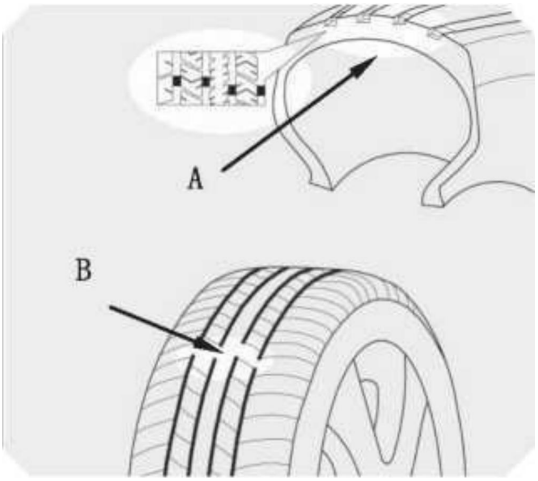
The installation order is reverse to the removal order.

2.4.5 General procedures

2.4.5.1 Tyre inspection

When checking the inflation state of the tyres, check the tyres for damage, penetration, and wear. You shall check:

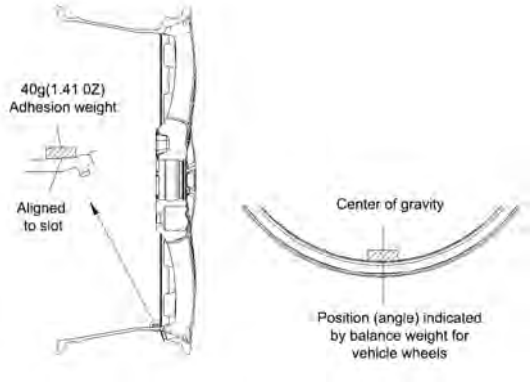
1. Replace a tyre if any damage or bulge If any of the conditions is found, replace the tyre.
2. Replace a tyre if its wall is scratched, cracked or ruptured to the fabric or cord.
3. Excessive tread wear. The tyre must be kept in good condition, and the tread pattern on the tyre surface shall be deep enough. Tyres approved by Forthing Auto are marked with A to measure the wear degree of tyres, and this mark is the raised point inside the tyre running belt. When the raised point of a tyre is worn to the extent of B, the tyre must be replaced. At this time, the tread thickness is only 1.6 mm, and such a tyre lacks adhesion when running on wet roads.



2.4.5.2 Adjustment for wheel balance

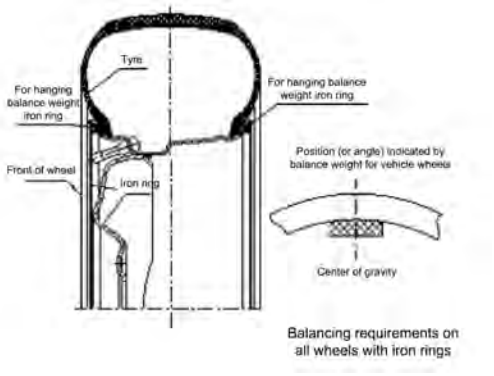
1. If the tyre balancing machine has two setting modes as the adhesive balance weight mode and the embedded balance weight mode, select the latter which applies to the driving wheels.
2. Mount the wheels on the balancing machine with the centre hole as the orientation. Start the tyre balancer.
3. Multiply the outside imbalance value by 5/3 to confirm the actual operational weight of balance weight when the imbalance values of both sides occur on the display of the wheel balancing machine. Then select the outer balance weight closest to the calculated value and install it at the specified outer position or at a specified angle relative to the wheel.

   Caution: Install the outside balance weight before installing the inside balance weight. Be sure to clean the fitting surface of the wheel before installing the balance weight.



   Caution: Install the balance weight at the position shown in the figure above.

4. When installing the balance weight on the running wheel, first confirm the condition of the rim and then install as shown in the figure below. The balance weight should be placed in the groove area of the running wheel, with the centre of the balance weight aligned with the position (angle) indicated by the wheel balancing machine.



   Mount the two balance weights on the same circumference if the calculated balance weight value exceeds 50 g (1.76 oz).

   Caution: Always use original Dongfeng DFLZ adhesive and hanging balance weights.

   Caution: Balance weights are not reusable; a new one should be used every time.

   Caution: For 16-inch/17-inch aluminium wheels, it is not recommended that the adhesive balance weight used on each side of a single wheel exceeds 80 g.

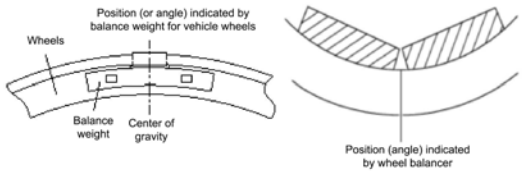
   Caution: It is not recommended that the hanging balance weights (all types) used on each side of a single wheel exceed 50 g.

   Caution: Only one hanging balance weight can be used on each side of a single wheel.

Caution: Only hanging balance weights can be used for steel wheels.

5. Restart the wheel balancer.

6. Hang or paste the balance weight in the corresponding groove of the running wheel according to the position (angle) indicated by the wheel balancer.



7. Start the balancing machine. Confirm that the residual inside and outside imbalance values are 10 g (0.35 oz) or lower respectively. If the residual imbalance value on either side exceeds 10 g (0.35 oz), repeat the steps for installing balance weights.

Wheel balance (maximum allowable imbalance):

Maximum allowable imbalance	Dynamic (rim edge)	10 g (0.35 oz) (one side)
	Static (rim edge)	20g (0.71oz)

2.5 EHB

2.5.1 Specification

2.5.1.1 General specifications

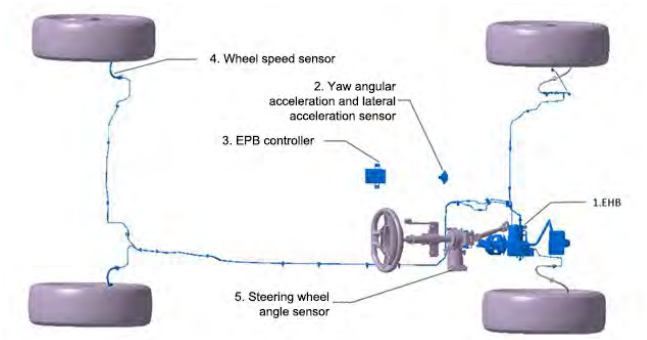
Name	Specification	Capacity
Brake fluid	DOT4	Minimum liquid level of 1L reservoir < filling amount < maximum liquid level of reservoir
Number of ring gears and teeth of front axle	48	
Number of ring gears and teeth of rear axle	48	

2.5.1.2 Torque specification

Name	Nm
Connection between brake pipe and EHB of integrated electro-hydraulic brake system	16±1
Fixing bolt of yaw rate sensor	8±2
Wheel speed sensor mounting bolt	6 ~ 10

2.5.2 Operation Manual

2.5.2.1 EHB system exploded view

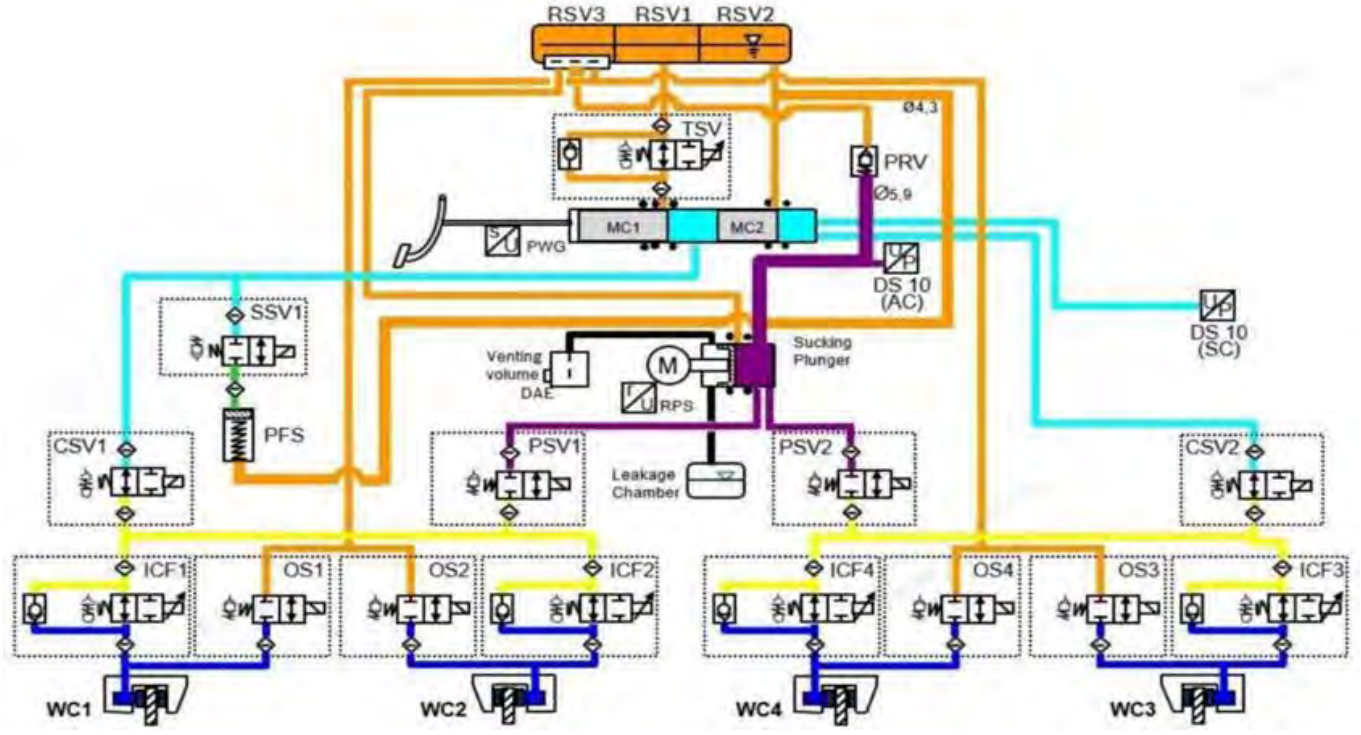


S/N	Name	S/N	Name
1	EHB hydraulic adjustment module with electronic control unit	4	Wheel speed sensor
2	Yaw rate and lateral acceleration sensor	5	Steering wheel angle sensor
3	EPB control unit		

2.5.2.2 Overview

System Layout

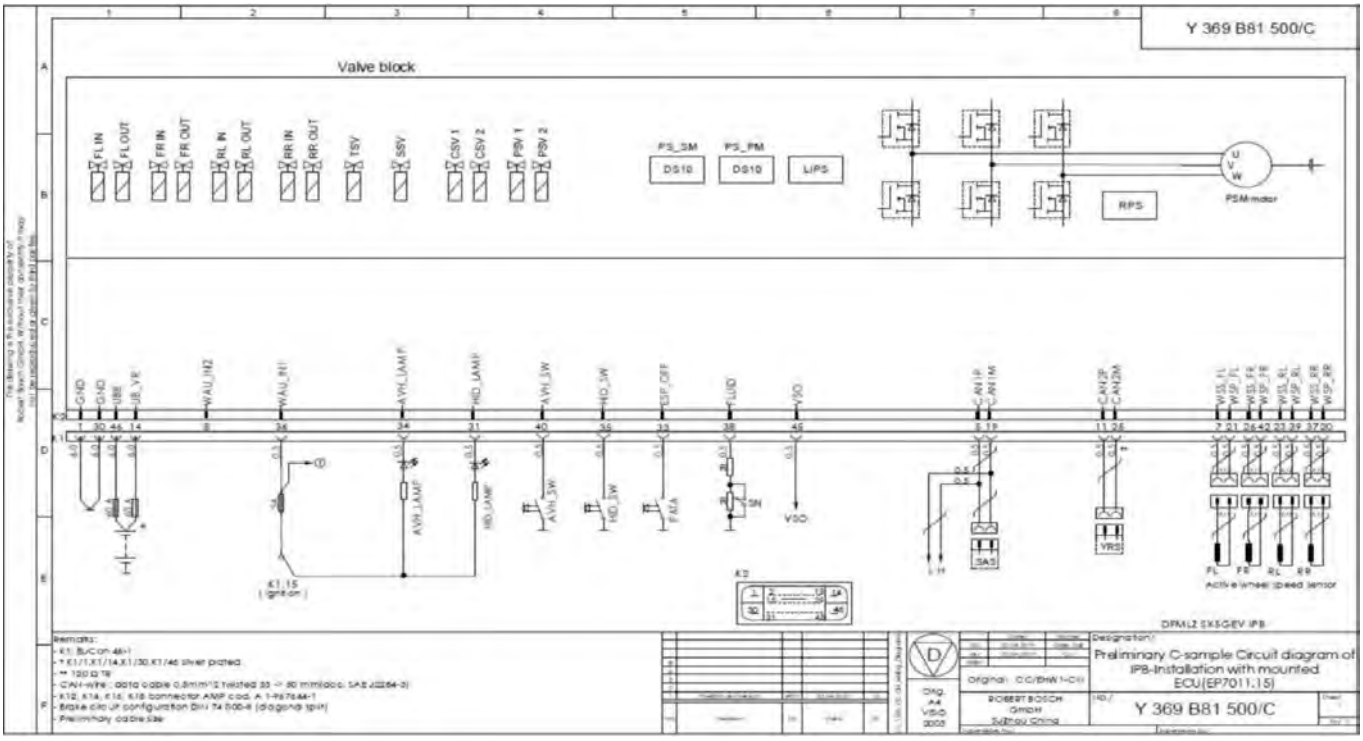
The brake system of this vehicle is arranged in X shape, as shown in the following figure. The EHB brake-by-wire system includes motor, pedal sense simulator, pedal displacement sensor, fluid reservoir, etc.



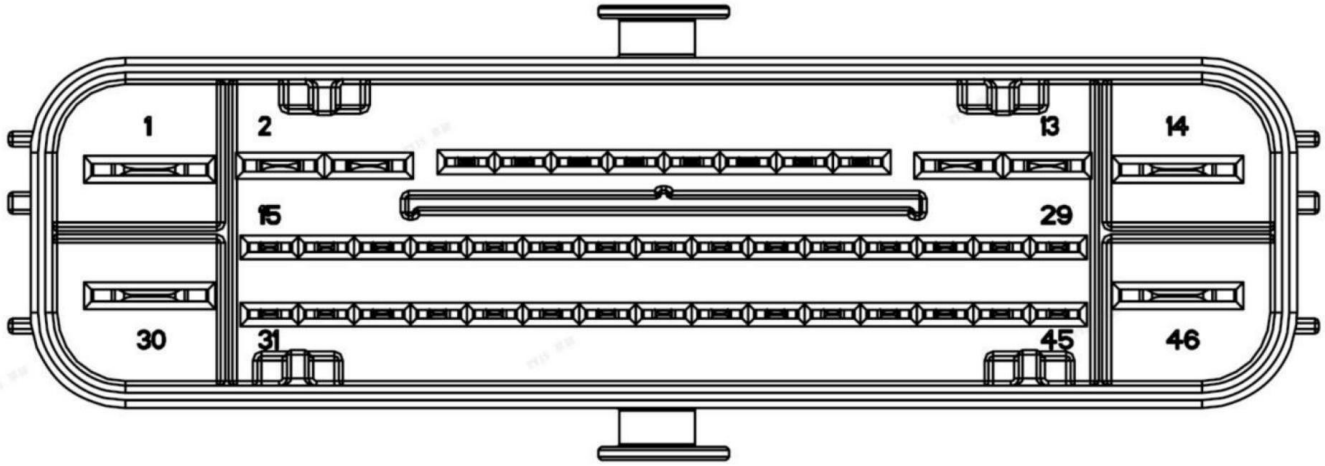
English Abbreviation	Meaning	English Abbreviation	Meaning
RSV1	First oil outlet of fluid reservoir	RPS	Rotor position sensor
RSV2	Second oil outlet of fluid reservoir	CSV2	Circuit isolation valve 2
RSV3	Third oil outlet of fluid reservoir	ICF1	Inlet valve 1
TSV	Test isolation valve	ICF2	Inlet valve 2

English Abbreviation	Meaning	English Abbreviation	Meaning
RPV	Pre-tighten valve (check valve)	ICF3	Inlet valve 3
PWG	Pedal displacement sensor	ICF4	Inlet valve 4
MC1	First circuit of brake master cylinder	OS1	Liquid outlet valve 1
MC2	Second circuit of brake master cylinder	OS2	Liquid outlet valve 2
SSV1	Simulator isolation valve 1	OS3	Liquid outlet valve 3
PFS	Pedal feel simulator	OS4	Liquid outlet valve 4
CSV1	Circuit isolation valve 1	WC1	Wheel circuit 1
PSV1	Plunger isolation valve 1	WC2	Wheel circuit 2
PSV2	Plunger isolation valve 1	WC3	Wheel circuit 3
PS(DG,DS)	Pressure sensor	WC4	Wheel circuit 4
M	Motor		

Schematic Diagram



Terminal diagram

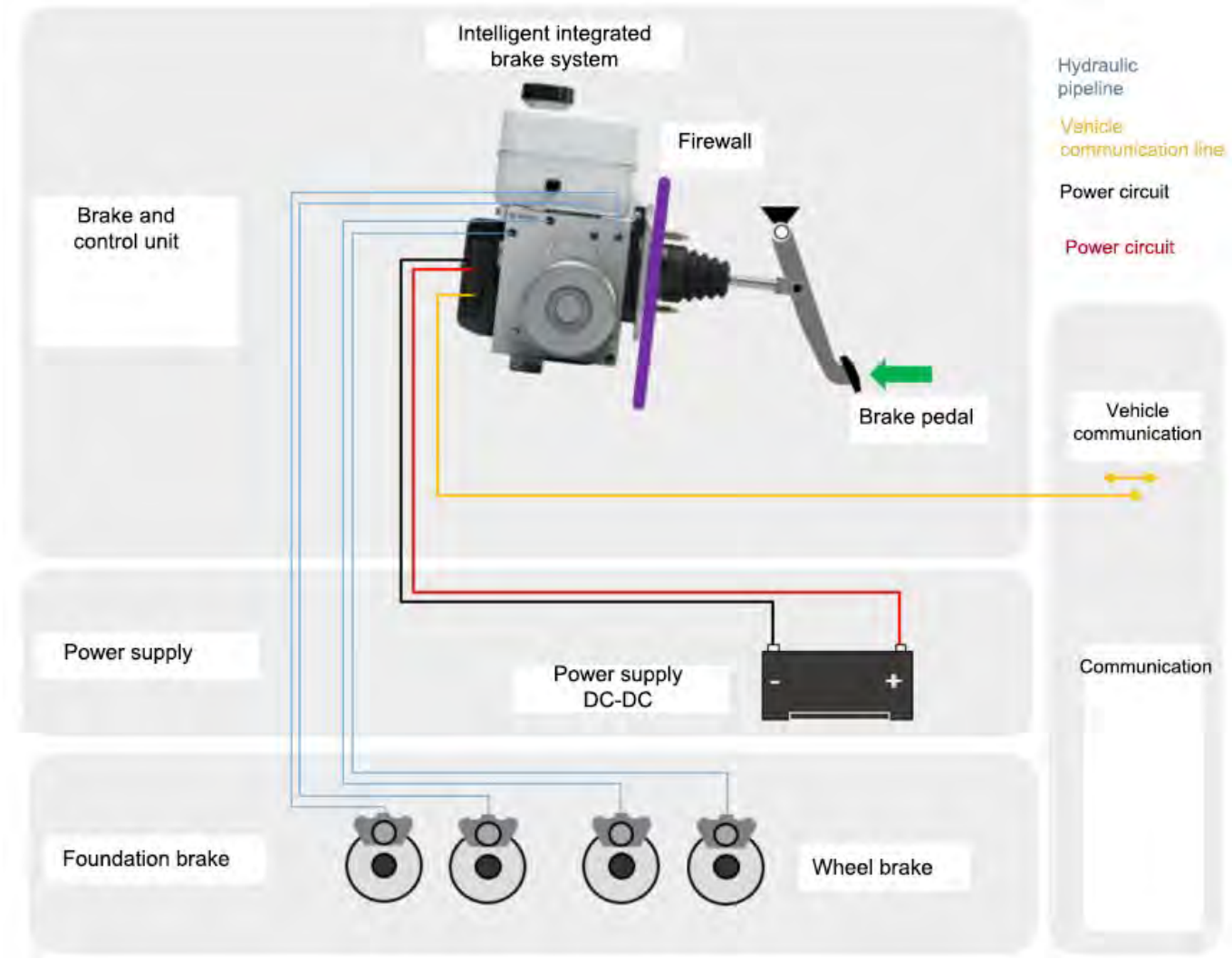


Pin No.	Definition of pin	Pin No.	Definition of pin
1	GND 1	24	Not defined
2	Not defined	25	CAN bus 2 (low)
3	Not defined	26	Wheel speed signal wire (front right)
4	Not defined	27	Not defined
5	CAN bus 1 (high)	28	Not defined
6	Not defined	29	Not defined
7	Wheel speed signal wire (front left)	30	GND 2
8	ECU 2 wake-up	31	HDC switch indicator
9	Not defined	32	Not defined
10	Not defined	33	ESP switch
11	CAN bus 2 (high)	34	AVH switch indicator
12	Not defined	35	HDC switch
13	Not defined	36	ECU 1 wake-up
14	Power supply	37	Wheel speed signal wire (rear right)
15	Not defined	38	Brake fluid level
16	Not defined	39	Wheel speed power supply wire (rear left)
17	Not defined	40	Auto Hold switch
18	Not defined	41	NC
19	CAN bus 1 (low)	42	Wheel speed power supply wire (front right)
20	Wheel speed power supply wire (rear right)	43	Not defined
21	Wheel speed power supply wire (front left)	44	Not defined

Pin No.	Definition of pin	Pin No.	Definition of pin
22	Not defined	45	Vehicle speed output
23	Wheel speed signal wire (rear left)	46	Power supply

EHB

The EHB brake-by-wire system includes the ESP electronic stability system function and adopts a four-circuit configuration. Each circuit is equipped for the left front, right front, left rear and right rear wheels respectively. During emergency braking, the brake pressure of each wheel hydraulic circuit is adjusted by monitoring the rotation speed of each wheel. Reduce wheel slippage and body instability. Maintain directional stability and body stability.



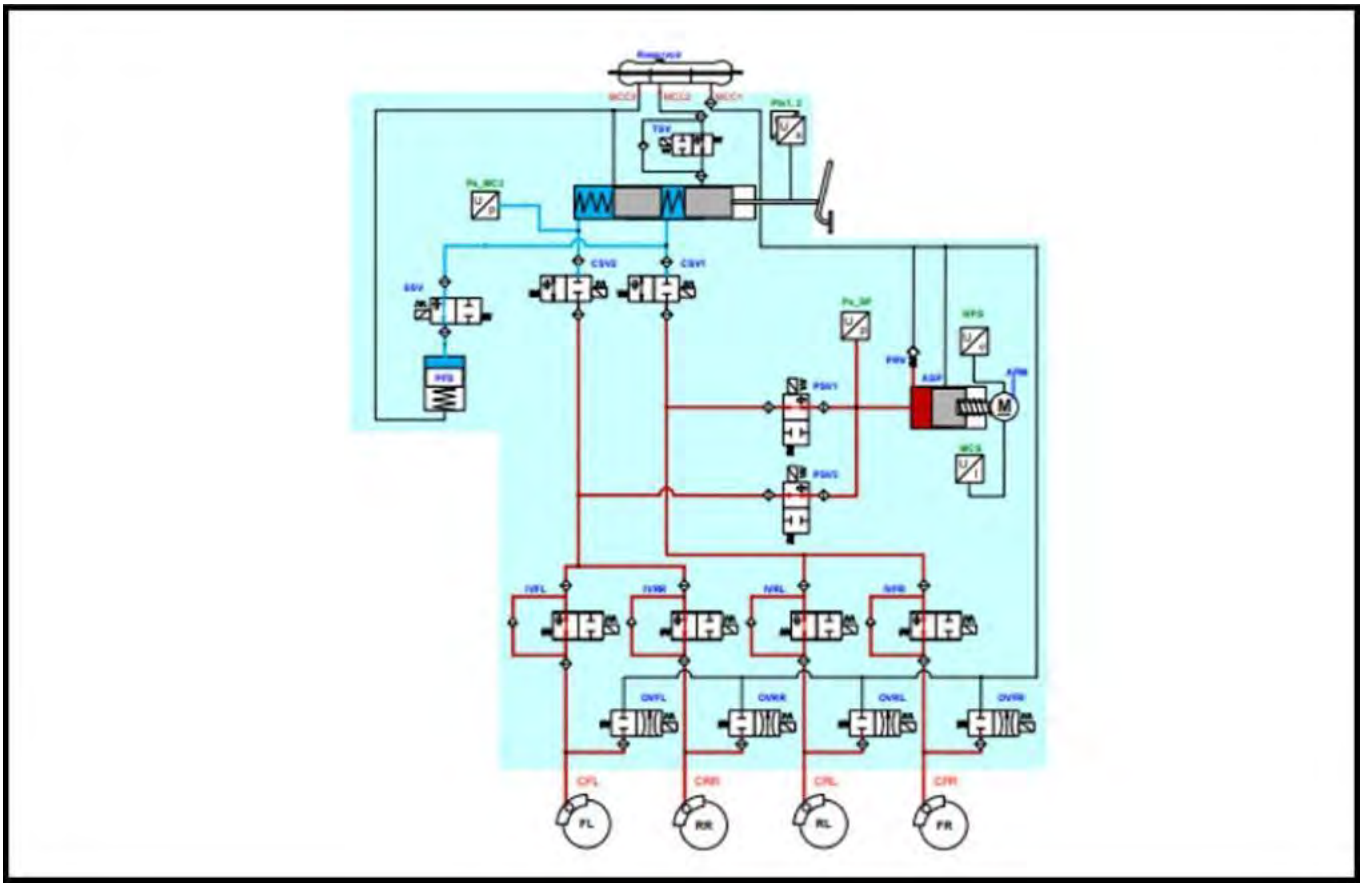
EHB brake-by-wire mode

When the brake pedal is depressed:

1. The CSV valve is closed to isolate the hydraulic connection between the TMC circuit and the plunger circuit.

2. The SSV valve is opened to simulate the pedal feel.

3. PSV1/2 opens to release brake pressure to the wheel cylinder.



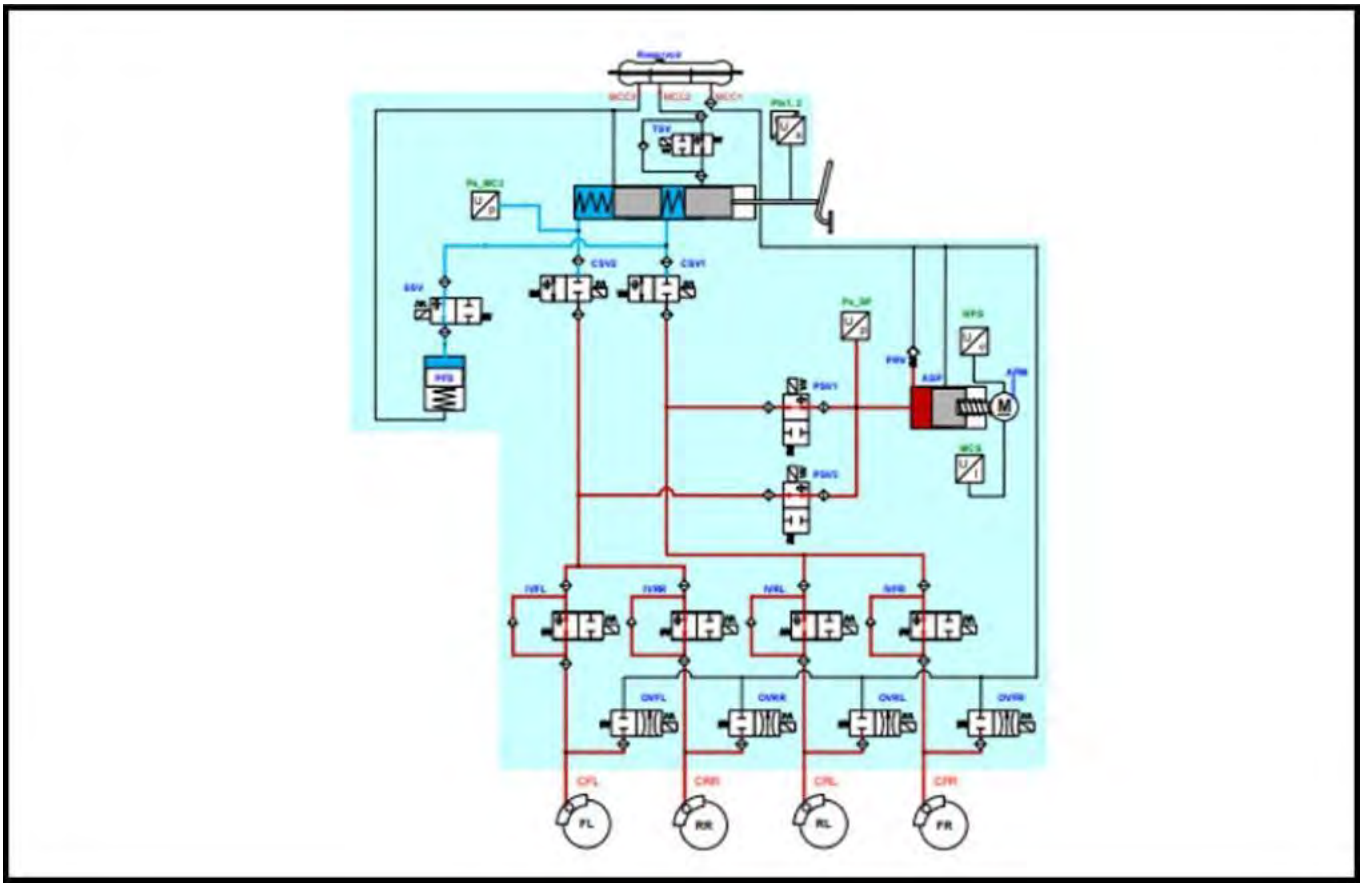
EHB mechanical backup mode

When the brake pedal is depressed:

1. The CSV valve opens to introduce brake fluid into the brake wheel cylinder.

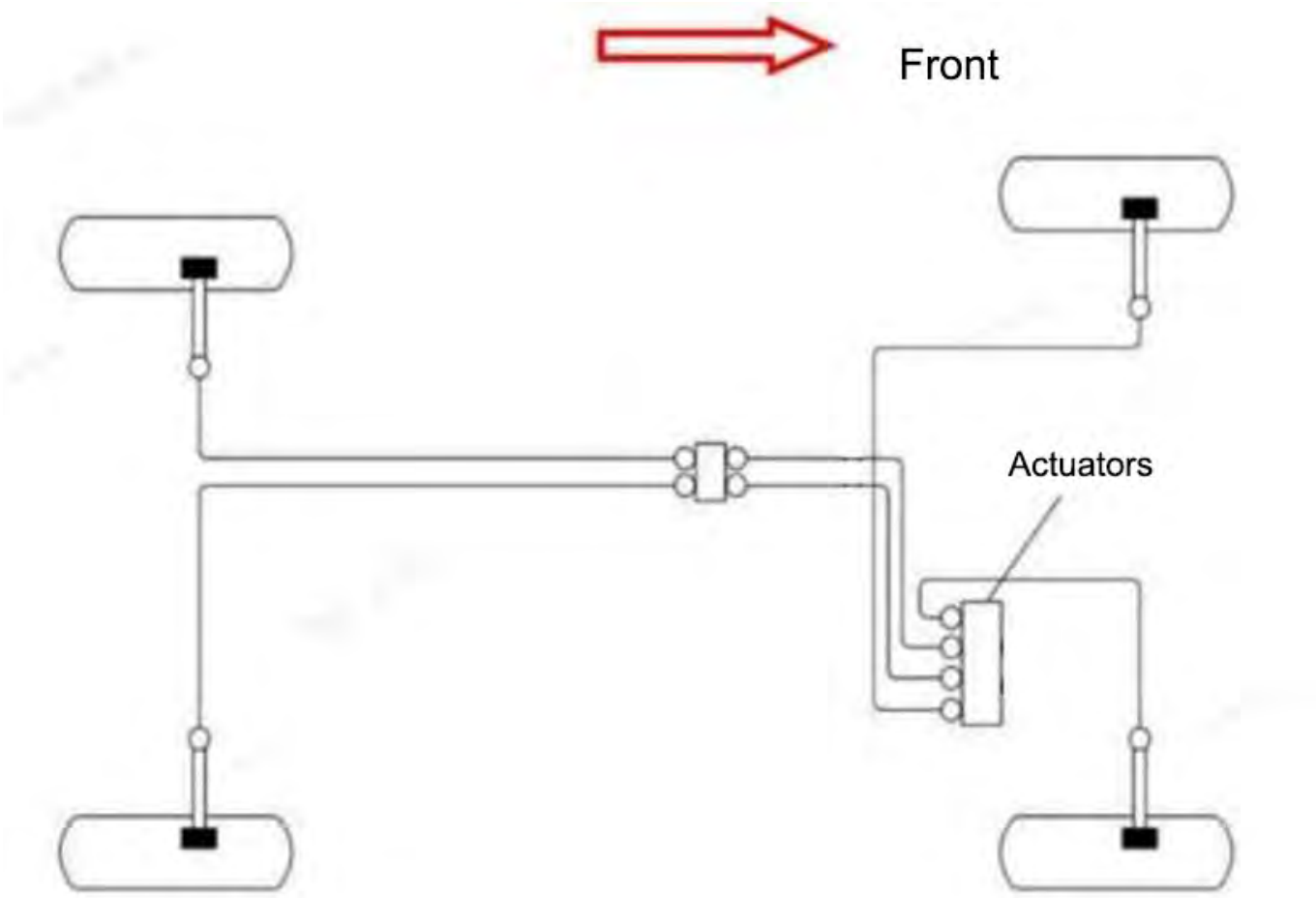
2. The SSV valve is closed to prevent brake fluid from entering the PFS.

3. PSV1/2 is closed to prevent brake fluid from entering the plunger circuit.



2.5.2.3 Precautions

Layout of Hydraulic Pipes (Top View)



Caution:

1. All brake hoses and brake steel pipes shall be free of excessive bending, twisting or stretching.
2. Torque of brake steel pipe joint: 16±1 Nm.
3. Make sure that they don’t interfere with other parts and components when turned clockwise and counterclockwise.
4. Brake steel pipes and hoses are key safety parts and components. If any brake fluid leakage is found at any pipe joint, the joint needs to be loosened and retightened. If any parts and components are found damaged, please replace them with new ones.
5. Take care not to spill any brake fluid on any paint; otherwise, the paint may be damaged. If the brake fluid is spilt on any paint on the vehicle body, clean it with clear water immediately.
6. Before removing the brake steel pipe and hose, cover their open ends to prevent dust from entering.
7. Refill brake fluid "DOT 4".
8. Do not reuse discharged brake fluid.

2.5.3 Removal and installation

2.5.3.1 Brake fluid reservoir

Removal

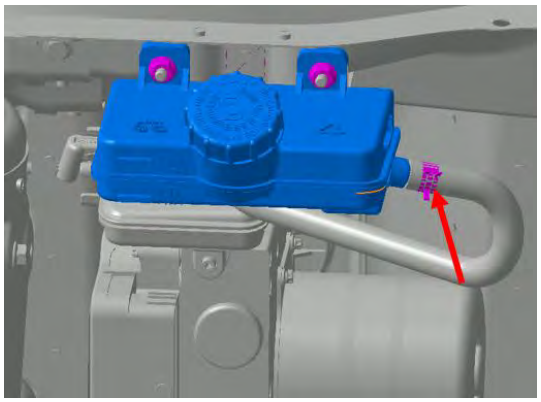
1. 1. Power off the vehicle and disconnect the negative battery cable.Refer to: Disconnect the battery negative cable.

   Warning: The brake fluid contains polyglycol ether and polyglycol. Avoid contact with the eyes. Wash hands thoroughly after maintenance. If brake fluid comes into contact with eyes, rinse them with clean water for 15min. If discomfort persists, seek medical attention immediately. In case of ingestion or entry of drinking water, which can lead to vomiting, seek medical attention immediately or it may lead to personal injury.

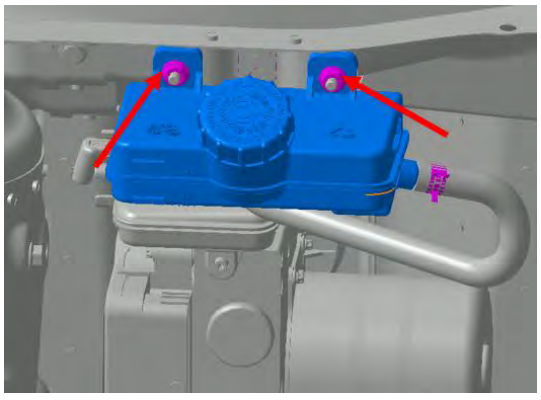
   Caution: If the brake fluid splashes onto the paintwork, flush the area with cold water immediately.

2. Drain the brake fluid. Refer to: Brake fluid draining.

3. Loosen the clamp and disengage the brake fluid hose assembly.



4. Remove the fixing bolt of brake fluid reservoir. Torque: 8 ±1.2 Nm



5. Remove the brake fluid reservoir.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the brake fluid level in the brake fluid reservoir, and fill the brake fluid to the maximum scale if necessary.

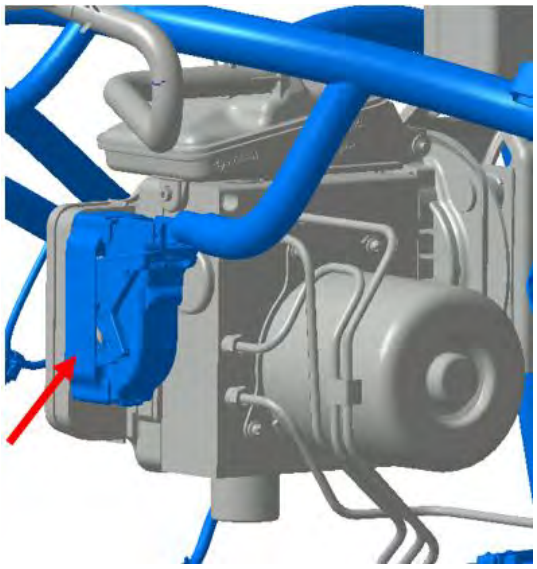
2. Bleed the brake system according to the specified method. Refer to: Brake system bleeding.

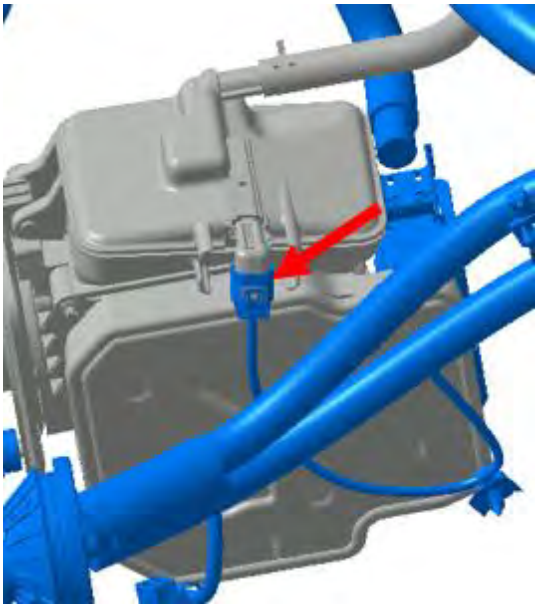
2.5.3.2 EHB assembly

Removal

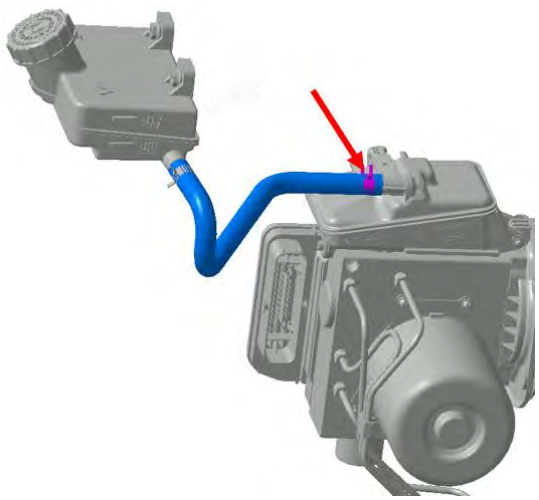
1. Power off the vehicle and disconnect the battery negative terminal.Refer to: Disconnect the battery negative cable.

2. Remove the harness from the EHB assembly and fluid level sensor.





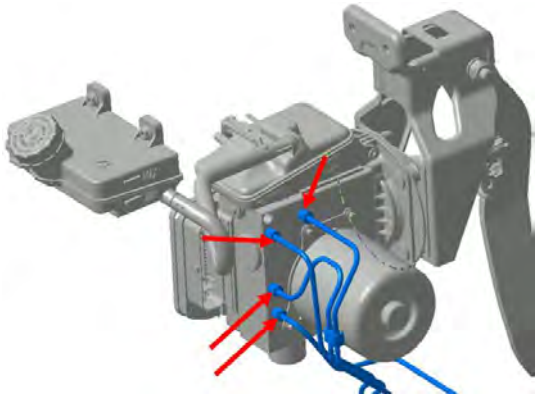
3. Remove the brake fluid pipe assembly from EHB assembly.



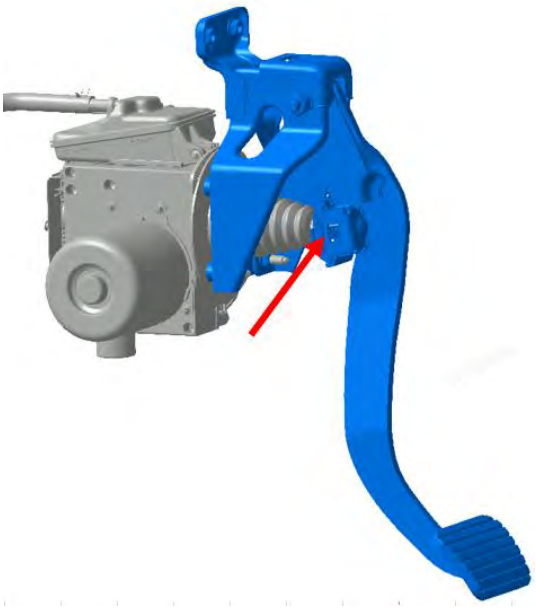
Warning: The brake fluid contains polyglycol ether and polyglycol. Avoid contact with the eyes. Wash hands thoroughly after maintenance. If brake fluid comes into contact with eyes, rinse them with clean water for 15min. If discomfort persists, seek medical attention immediately. In case of ingestion or entry of drinking water, which can lead to vomiting, seek medical attention immediately or it may lead to personal injury.

Caution: If the brake fluid splashes out on the paintwork, flush the area with cold water immediately.

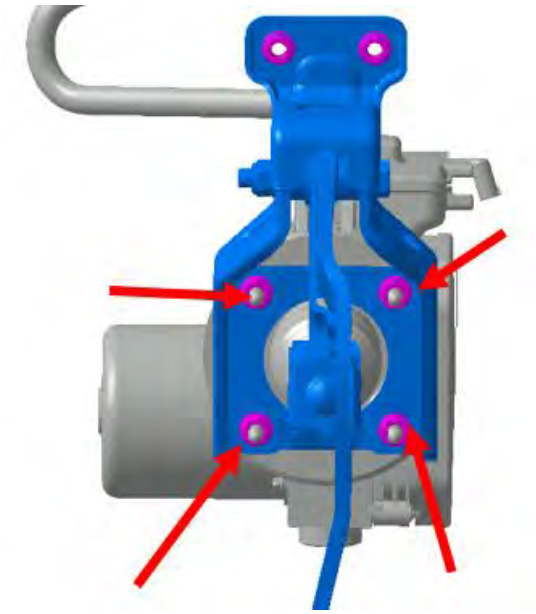
4. Remove the brake steel pipe on the EHB assembly, torque: 16±1Nm.



5. Remove the ball joint connection structure from the brake pedal assembly.

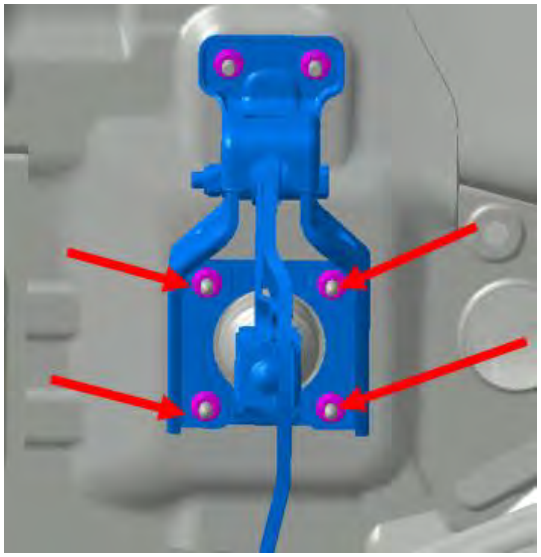


6. Remove the mounting nuts of brake pedal assembly and EHB system from the front wall mounting plate, torque: 21~29Nm.

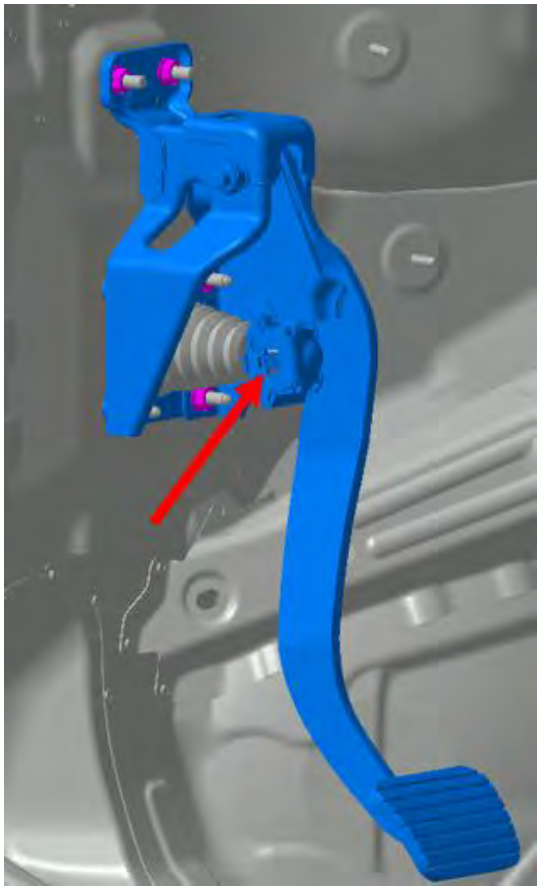


Installation

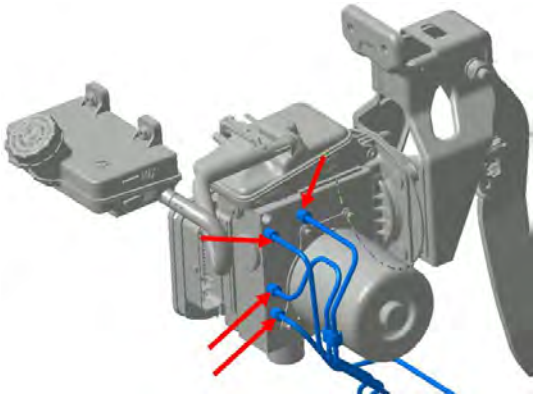
1. Install the mounting nuts (tightening torque: 21~29 N·m) connecting the brake pedal assembly and EHB system brake system from the front wall mounting plate.



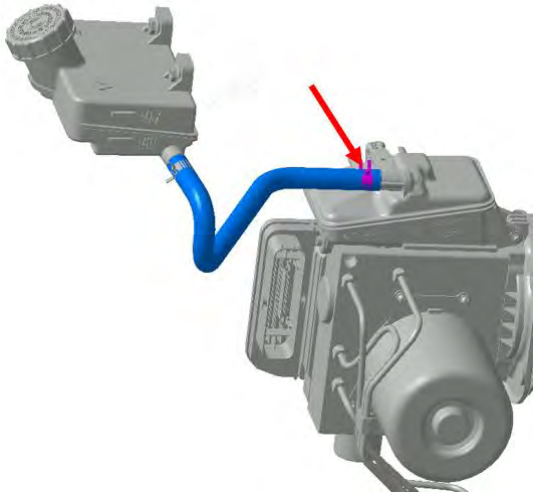
2. Install the ball joint connection structure between the brake pedal assembly and the EHB brake-by-wire system.



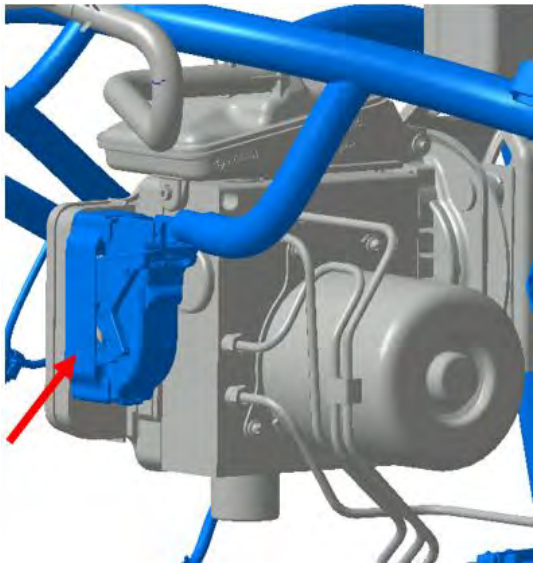
3. Remove the plugs on the EHB threaded hole and brake pipeline, connect the brake pipeline to the EHB brake system, and tighten the torque to 16±1Nm.

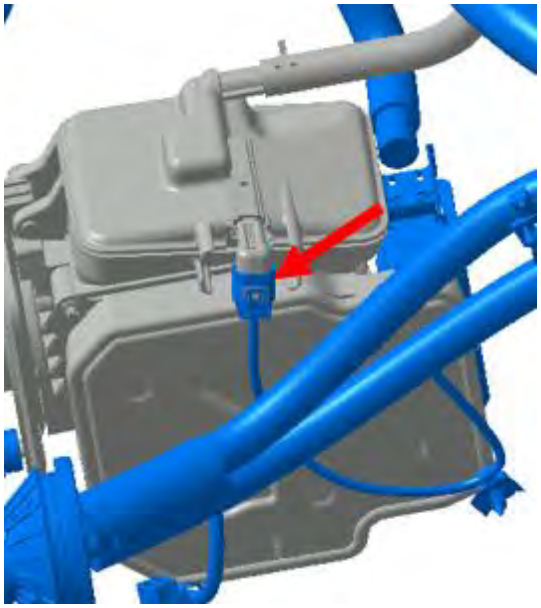


4. Connect the brake fluid pipe assembly to the EHB assembly.



5. Connect the engine compartment harness connector to the EHB assembly and fluid level sensor.





6. Check the brake fluid level in the brake fluid reservoir and, if necessary, add brake fluid to the Max.
7. Bleed the brake system according to the specified method. Refer to: Brake system bleeding.
8. After replacing the EHB assembly, a diagnostic scanner must be used to write in the configuration information (i.e. variable code).

   EHB variable code and vehicle model correspondence table:

Model variables				
Bosch	**model**	**DFLZM equipm-ent decimal**	**braking force type**	
Remarks 1 (Default)			T5HE-V01HEV+	FWDT5-HEV series rear multi-link suspens-ion, without ADAS, without
APA		2T5HE-V02HEV	+FWDT	5HEV series rear multi-link suspens-ion, with ADAS, without
APA		3T5HE-V03HEV	+FWDT	5HEV series rear multi-link suspens-ion, With ADAS, with
APA		4SX5G-EV11EV	+FWDS-X	5GEV series rear multi-link suspens-ion; without ADAS, without

Model variables				
Bosch	**model**	**DFLZM equipment decimal**	**braking force type**	
APA		5SX5G-EV12EV	+FWDS-X	5GEV series rear multi-link suspension; with ADAS, without
	APA		6SX5G-EV13EV+	FWDS-X5GEV series rear multi-link suspension With
APA		7M4HE-V21HEV	+FWD-M4HEV	series rear torsion beam suspension, without ADAS, without

Model variables				
Bosch	**model**	**DFLZM equipment decimal**	**braking force type**	
APA		8M4HE-V22HEV	+FWD-M4HEV	series rear torsion beam suspension, with ADAS, without
APA	9M4HE-V23HEV		+FWD-M4HEV	series rear torsion beam suspension, with ADAS, with APA

9. Be sure to calibrate the steering wheel angle sensor and yaw rate (IMU) sensor upon replacing the EHB assembly.

2.6 Brake system

2.6.1 Specification

2.6.1.1 General specifications

Front brake system

Name	Specification	Capacity
Brake fluid	DOT4	Minimum liquid level of 1L reservoir < filling volume < storage Maximum liquid level scale of tank

Rear brake system

Name	Specification	Capacity
Brake fluid	DOT4	Minimum liquid level of 1L reservoir < filling volume < storage Maximum liquid level scale of tank

2.6.1.2 Torque specification

Front brake system

Name	Nm
Butt Torque of Brake Hose and Pipe Joint	15 ~ 17
Fixing bolt between brake hose bracket and steering knuckle	\
Brake hose and caliper hollow bolt	35 ~ 45

Rear brake system

Name	Nm
Butt Torque of Brake Hose and Pipe Joint	15~17
Brake hose and caliper hollow bolt	35~45

2.6.1.3 Brake System Specifications

Brake system	Front brake	Ventilated disc, floating caliper type gap self-adjustment
	Rear brake	Solid disc, floating caliper type gap self-adjustment
	Dimensions of front/rear brake disc (mm)	321×28/313×14

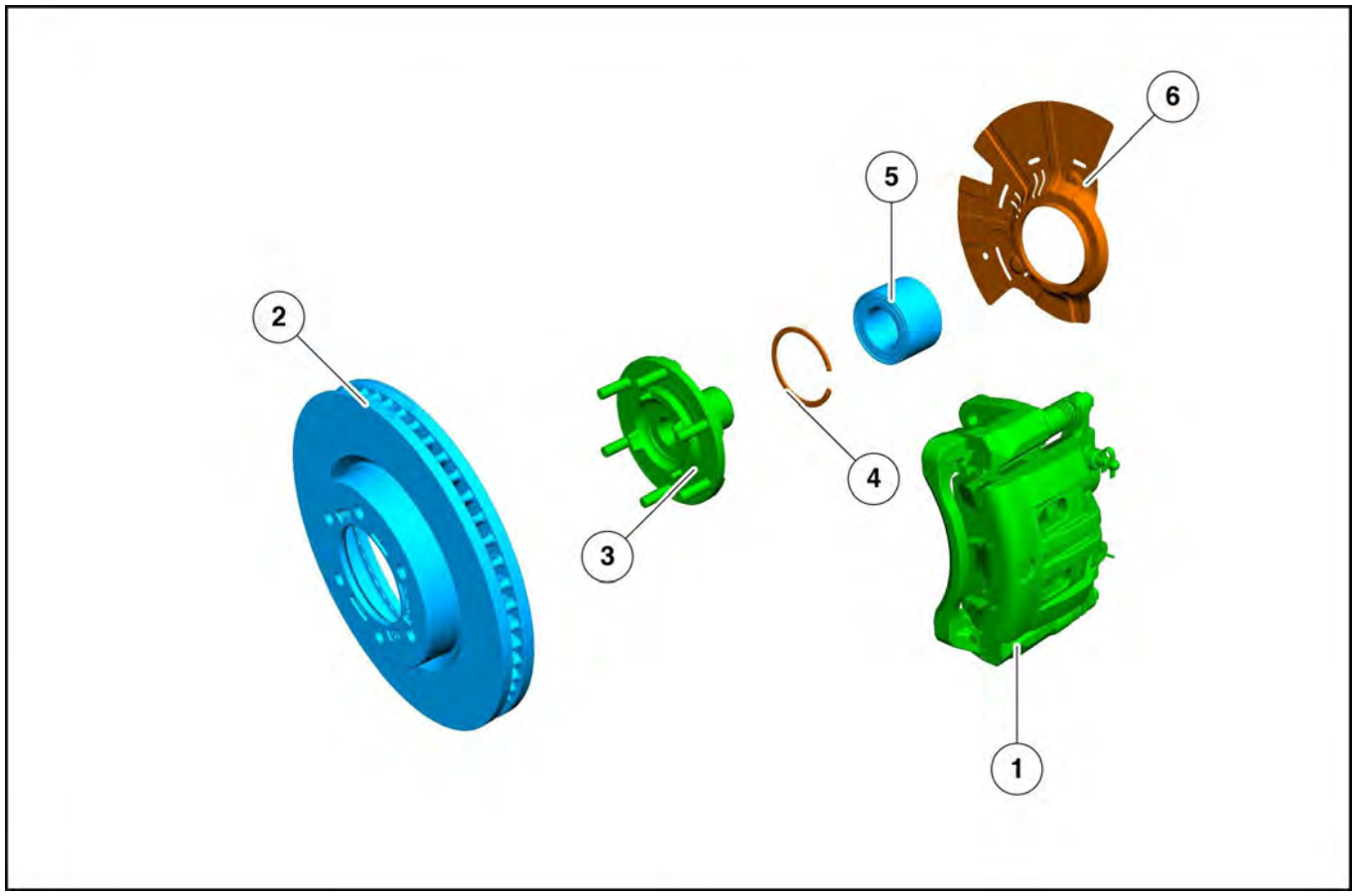
Item	Standard Size	Wear Limit
Thickness of front brake pad	10mm	2mm
Thickness of front brake disc	28mm	26mm
Thickness of rear brake pad	10.2mm	2mm
Thickness of rear brake disc	14mm	12mm
Pedal force of brake pedal	≤500N	
Free travel	1-12mm	

Distance from the initial position of brake pedal to carpet (vertical height)	150.3mm
Reasonable service range of brake friction pair	The maximum allowable wear thickness of the brake disc friction surface is 2mm, and the maximum allowable wear thickness of the brake pad: 8mm for the front wheel and 8.2mm for the rear wheel

When the diameter of brake disc and drum reaches the scrapping standard, they must be replaced. Please take special care when polishing brake discs or drums that have not yet reached the scrap thickness.

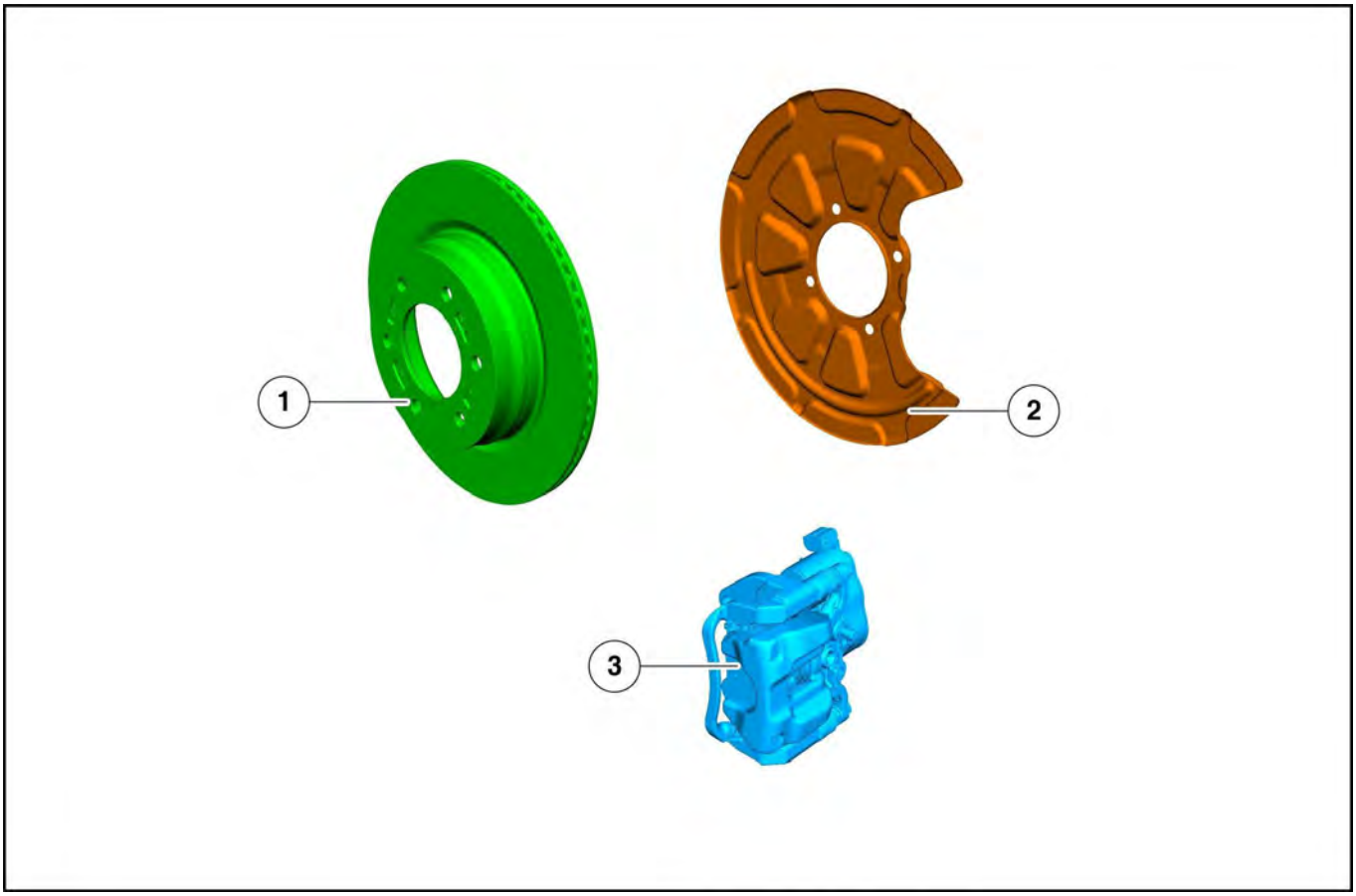
2.6.2 Operation Manual

2.6.2.1 Exploded View of Front Disc Brake



Item	Description	Item	Description
1	Brake caliper	4	Hub bearing mounting snap ring
2	Front brake disc	5	Front wheel hub bearing
3	Front hub	6	Front left brake disc dust cover

2.6.2.2 Electronic parking brake exploded view



Item	Description	Item	Description
1	Rear brake disc	3	Rear brake electronic caliper
2	Rear brake disc dust cover		

2.6.2.3 Overview

Electronic parking brake (EPB) system

The electronic parking brake system consists of a auxiliary dashboard switch, an EPB controller module, a parking brake actuator motor, etc. The EPB controller module monitors the input of the auxiliary dashboard switch and controls the application or release of the rear brake caliper by the parking brake actuator.

Automatic Hold Function (AUTOHOLD)

AUTO HOLD is a function that helps the driver automatically realize temporary parking brake during driving. The driver does not need to depress the brake pedal for a long time after the vehicle stops stably. After releasing the brake pedal, the system will continue to maintain braking, so that the driver has enough time to depress the accelerator pedal and start more comfortably. It can also reduce the risk of sliding downhill when used on slopes.

When the driver presses the AVH switch, the vehicle activates the automatic parking function. When the driver steps on the brake until the vehicle stops, the AVH function is activated. After the driver releases the brake, the vehicle will not slide; when the driver needs to leave, he only needs to step on the accelerator and the AVH will be automatically released.

Parking brake system operation

Enable AUTOHOLD Function

When the vehicle is powered on at high voltage, the gearshift lever is not in "P" position, the front left door is closed and the driver fastens the seat belt, press the AUTO HOLD ON/OFF button to turn on the AUTO HOLD function and the indicator light on the button will illuminate.

If the driver's door is not closed or the seat belt is not fastened before the automatic parking function is turned on, the instrument cluster information display will prompt "Please close the door and fasten the seat belt."

AUTO HOLD OFF

The automatic parking function is turned on. Press the automatic parking on/off button OFF again, and the indicator light on the button will go out.

Enabling

When the vehicle is powered on at high voltage, close the front left door and fasten the seat belt. After the automatic parking function is turned on, the speed is 0km/h. Press the brake pedal to activate the automatic parking function, and the automatic parking function working indicator (green) on the instrument cluster lights up.

Press the accelerator pedal lightly, the automatic parking function will be automatically released, and the automatic parking function working indicator (green) on the instrument cluster will go out. If the accelerator pedal is not pressed for more than 3 minutes, it will switch to EPB mode and the red EPB working indicator will light up.

Forced Disabling

Unfasten the main driver's seat belt, switch the gear to "P", open the front left door, and the automatic parking function will automatically exit.

Open the left front door or unfasten the main driver's seat belt. At this time, EPB is executed, and the automatic parking function working indicator on the instrument cluster switches to the red EPB working indicator.

Malfunction

When the instrument cluster information display screen prompts "Automatic parking function failure", please contact an authorised dealer for repair in time.

EPB system

The EPB system receives the release and release instructions from the auxiliary dashboard switch through the PBC software integrated in the EPB controller, combines some signals on the vehicle communication bus, and finally outputs forward and reverse rotation signals to the caliper motor to drive the clamping and releasing of the caliper.

Automatic vehicle hold (AVH)

The AVH system is integrated into the ESP system. The driver needs to press the AVH switch first to support the activation of the AVH function; when the driver steps on the brake until the vehicle stops, the AVH function is activated. After the driver releases the brake, the vehicle will not slide; when the driver needs to drive away, he only needs to step on the accelerator and the AVH will be automatically released.

Manual release

Press the auxiliary dashboard switch to manually release the parking brake. The parking brake can only be released after the whole vehicle is powered on and the brake pedal is pressed.

Drive away release

There are two situations for departure release, as follows:

1. When the EPB is in a clamped state and the driver starts with a gear engaged, the EPB will be automatically released when the powertrain generates sufficient torque to achieve a comfortable start.
2. Hydraulic pressure is maintained until automatic release: The vehicle is in a hydraulic braking state and does not move in place (AVH works). When the driver starts in gear and the powertrain generates sufficient torque, if the driver operates the

auxiliary dashboard switch to release the caliper, additional release conditions should also be met to ensure the safety of the driver and passengers.

The following conditions shall be met when the parking brake caliper is released:

1. The driver's door is closed.

2. The driver has fastened the seat belt.

3. The transmission must be in either forward or reverse gear.

Automatic clearance adjustment function

During the use of the vehicle, the brake pad gap will be automatically adjusted according to the wear condition, and the clamping force will not be insufficient due to the wear of the brake pad. As the brake pad wears, the piston is required to extend outward to compensate for the wear. Since the piston is connected to the ball screw, it gradually rotates and extends outward while stepping on the brake to achieve wear compensation.

Red parking function indicator

This indicator lights up when the parking function is activated or the handbrake is pulled up.

Red brake system warning light

This light illuminates when the parking brake is applied and the ignition switch is turned on.

If this warning indicator lights up while the vehicle is moving, make sure to release the parking brake. If the parking brake has been released, it indicates that the brake fluid level is too low or there is a fault in the brake system.

Description of parking brake system components

Parking brake actuator motor

The parking brake actuator motor is a single-speed reversible motor, and the actuator motor is installed on the rear brake caliper. The motor can work independently of the brake caliper.

EPB switch

The EPB switch is a three-position switch installed behind the shift knob. The three positions of the switch are pull-on (pull up), neutral (sleep or static) and release (pull down). It is connected to the EPB controller through a hardwire to control the electronic opening clamping/release.

Auto Hold switch

The automatic parking switch (AVH switch) is installed on the left side of the EPB switch and connected to the EHB through a Hardwire to control whether the automatic parking works.

2.6.2.4 Precautions

Caution: The brake friction material itself may generate noise and heat to consume energy. Therefore, there may be occasional "squeaking", and it is more possible to be heard under severe operating conditions, such as cold, heat, rainy and snowy weathers, and salty, muddy situations.

Caution: Excessive water content in the brake fluid will not only cause poor braking due to water vaporization, but may also corrode the brake system and lead to a decrease in ABS performance. Therefore , the brake fluid should be updated regularly.

2.6.3 Diagnosis and testing

2.6.3.1 Brake system inspection and confirmation

Inspection and confirmation

Note: Before diagnosis, make sure that the brake warning indicator works normally.

1. Confirm the problems raised by the customer, and make the corresponding checks. If necessary, carry out the road test with the customer.

2. Observe for obvious signs of mechanical damage.

3. Before the next check, solve the identified problem first.

4. If the cause cannot be confirmed from the appearance, confirm the symptoms first and then check according to the symptom table.

2.6.3.2 Brake System Appearance Checklist

Appearance Checklist

Mechanical
– Tyre pressure – Wheels and tyres – Brake lines – Brake disc – Brake pads – Brake caliper – EHB brake-by-wire system assembly – Brake master cylinder – EPB switch

2.6.3.3 Brake system - symptom table

Symptoms	Possible causes	Measures
Braking deviation	– Wheel alignment	– Check the brake pad. – Check the brake disc. – Check the wheel alignment.
	– Hub assembly	– Check the hub assembly, and replace it with a new one if necessary.
Brake warning light always on	– Brake fluid level	– Add brake fluid to the specified level, and check whether the brake pipe leaks.
	– Brake warning light circuit – Anti-lock brake system (ESP)	– Check the brake warning light. – Check the parking brake – Check the brake fluid level. – Check the brake fluid level sensor. – Check the brake fluid level sensor circuit.

Symptoms	Possible causes	Measures
Vibration during braking	– Inadequate lubrication of sliding parts	– Apply grease if necessary.
	– Foreign object or scratches on the contact surface of the front brake disc	– Install a new brake disc. Refer to: Front Brake Disc (206-03 Front Disc Brake, Removal and Installation).
	– Wheel hub nuts are loose	– Tighten them or install new hub nuts.
Vibration during braking	– Hub assembly	– Check the hub assembly, and replace it if necessary.
When the brake pedal is depressed, the pedal moves down too fast	– Wheels and tyres are unbalanced	– Check the wheels and tyres, and carry out dynamic balance on the wheels if necessary.
	– Brake system leakage	– Check the brake pedal force. – Check the brake fluid level. – Check brake pedal height - pressurise the system – Check whether the brake system leaks.
	– Presence of air in the brake system	– Bleed the brake system. Refer to: Brake System Bleeding (206-00 Brake System-Overview, General Procedures).
	– Brake pads	– Check the brake pad, and install a new one if necessary. Refer to: Brake Pad (206-03 Front Disc Brake, Removal and Installation).
Slow pedal rebound	– Presence of air in the brake system	– Bleed the brake system. Refer to: Brake System Bleeding (206-00 Brake System-Overview, General Procedures).
	– EHB brake-by-wire system assembly	– Check the EHB brake-by-wire system assembly. – Check the actuation of the brake pedal. – Check whether the brake system leaks.
Low brake pedal or spongy feeling when depressing the pedal	– Presence of air in the brake system	– Bleed the brake system. Refer to: Brake System Bleeding (206-00 Brake System-Overview, General Procedures).

Symptoms	Possible causes	Measures
	– Brake pads	– Check the brake pads and shoes, and install new ones if necessary. Refer to: Brake Pad (206-03 Front Disc Brake, Removal and Installation).
Low brake pedal or spongy feeling when depressing the pedal	– Brake system	– Check if the brake pedal is spongy when depressing it – Check the brake travel reserve – Check the brake fluid level.
The brake locks up when the brake pedal is gently depressed	– Brake pads	– Test whether the brake locks up – Check the brake pad
Excessive/unfixed brake pedal travel	– Brake pads – Presence of air in the brake system	– Check the brake pad, and install a new one if necessary. Refer to: Brake Pad (206-03 Front Disc Brake, Removal and Installation). – Bleed the brake system. Refer to: Brake System Bleeding (206-00 Brake System-Overview, General Procedures).
Brake dragging	– EHB brake-by-wire system assembly – Parking brake is applied, or the mechanism is not working or over-adjusted. – Electronic handbrake control module	– Road test – Check the EHB brake-by-wire system assembly.
Excessive brake pedal force	– EHB brake-by-wire system assembly	– Check the EHB brake-by-wire system assembly, perform component testing, and replace it with a new one if necessary.
	– Brake pads	– Check the brake pad, and install a new one if necessary. Refer to: Brake Pad (206-03 Front Disc Brake, Removal and Installation).
Slow or incomplete return of brake pedal	– EHB brake-by-wire system assembly	– Check the return of the brake pedal. – Check whether the brake pedal is blocked.

2.6.3.4 Brake System - Parking Brake and Control Diagnosis and Testing

Inspection and confirmation

1. Confirm problems that owners complain about and check accordingly.

2. Observe for obvious signs of mechanical or electrical damage.

3. Before the next check, solve the identified problem first.

4. If the cause cannot be determined by visual check, confirm the symptom first and then check according to the List of Symptoms.

Appearance Checklist

Electrical
– Electronic caliper motor harness – EPB switch – Left and right slave cylinder motors

2.6.3.5 Brake System - List of Parking Brake and Control Symptoms

Symptoms	Possible causes	Measures
Parking brake does not work	– Parking switch damaged – Left and right slave cylinder motors	– Check whether the parking switch is damaged. – Check whether the left and right slave cylinder motors are worn.

2.6.3.6 Brake system-EPB controller assembly fault diagnosis

Diagnostic procedure

1	Drive the vehicle into the maintenance shop.	
2	Customer fault analysis inspection and symptom inspection	
3	Check the CAN communication system.	
Check whether the CAN communication system works normally with a diagnostic scanner.		
A	No CAN DTC output	Check the CAN communication circuit.
B	Output CAN DTC	Next
4	Check DTC and refer to the DTC list	
5	Check and confirm the fault	
6	Repair or replace	
7	Confirm the test	
A	Clear DTC, function is abnormal	Go back to Step 5
B	Clear DTC, function is normal	Next
C	Check DTC, output DTC	Go back to Step 4
D	Check DTC, no DTC output	Next
8	End	

2.6.3.7 Brake system-EPB controller DTC

DTC Vehicle Designation	DTC	DTC description
U007300	C07300	CAN BusOff error CAN Bus off
C110116	510116	IGN Line (Short to ground or open) Ignition circuit fault

DTC Vehicle Designation	DTC	DTC description
C110017	510017	Communication Over Voltage System power supply overvoltage
C110016	510016	Communication Under Voltage System power supply undervoltage
C110060	510060	Voltage outof actuator spec range Abnormal actuator voltage
C11A418	51A418	Actuator mechanical fault Actuator mechanism fault (abnormal feedback current)
C11A477	51A477	Actuator Error or Incoherent Actuator mechanism fault (slope sliding and re-clamping timeout)
C11A07C	51A07C	Left Actuator fault (Operates for too long) Left actuator fault - operation timeout
C11A013	51A013	Left Actuator fault(Open) Left actuator fault - open-circuited
C11A011	51A011	Left Actuator fault (Control circuit fault) Left actuator fault - control circuit fault
C11A07E	51A07E	Left Actuator fault(Failure of Mosfet) Left actuator fault - MOS fault
C11A070	51A070	Left Actuator fault(Actuator Broken) Left actuator fault - mechanism damaged
C11A015	51A015	Left Actuator fault(Motor Short) Left actuator fault - short-circuited
C11A07D	51A07D	Right Actuator fault Right actuator fault - abnormal motor voltage
C11A054	51A054	Right Motor Drive chip Failure Right motor drive chip fault
C113800	513800	Switch Broken Switch fault
C113861	513861	Switch Broken(Switch not stable) Switch fault - unstable status
C11352A	51352A	Switch Broken(Switch apply stuck) Switch fault - pull-up stuck
C11362A	51362A	Switch Broken(Switch release stuck) Switch fault - release stuck

DTC Vehicle Designation	DTC	DTC description
C110860	510860	Switch Broken(Failure of line) Switch fault or circuit fault
C110862	510862	Switch Broken(Switch state not agree) Switch fault - inconsistent status
C116045	516045	ECU fault ECU(Failure of stack) Controller fault - stack
C116040	516040	ECU Hardware fault ECU(AD module) Controller fault - digital-to-analogue conversion
C116042	516042	ECU Hardware fault(EEPROM) Controller hardware fault - EEPROM
C116055	516055	ECU Hardware fault(Not configed) Controller fault - incorrect configuration
C116086	516086	ECU Hardware fault(Unexpected Power Down) Controller fault - unexpected power down
C116054	516054	ECU Hardware fault(Not calibrated correctly) Controller fault - uncalibrated
C11604C	51604C	ECU Hardware fault (Interprocessor Communication Error)
C116004	516004	ECU Hardware fault ECU(Sub) Controller fault - serial communication fault
C116046	516046	ECU Hardware fault(Flash/ROM) Controller hardware fault - main memory
C116044	516044	ECU Hardware fault(RAM) Controller hardware fault - random memory
C11607C	51607C	ECU Hardware fault (Sub ECU control fault) Controller fault - auxiliary chip input and output control
C111329	511329	G Sensor (Signal Invalid) Acceleration sensor signal invalid.

DTC Vehicle Designation	DTC	DTC description
C111396	511396	G Sensor (Self Test Fail) Acceleration sensor self-check failure.
U012100	C12100	Lost communication of ABS/ESP ABS-ESP node lost
U012200	C12200	Lost communication of VCM VCM node lost
U120000	D20000	Lost communication of SRS SRS node lost
U014000	C14000	Lost communication BCM BCM node lost
U014001	C14001	Lost communication PEPS PEPS node lost
U012000	C12000	Lost communication EPB EPB node lost
U012186	C12186	Invalid data from ABS/ESP ABS/ESP node signal invalid
U012286	C12286	Invalid data from VCM VCM node signal invalid
U120086	D20086	Invalid data from SRS SRS node signal invalid
U014186	C14186	Invalid data from BCM BCM node signal invalid
U014086	C14086	Invalid data from PEPS PEPS node signal invalid
U012086	C12086	Invalid data from EPB EPB node signal invalid
C11D112	51D112	EPB status Lamp Line (Short to battery) Demand light - short-circuited to high-voltage
C11D114	51D114	EPB status Lamp Line (Short to ground or Open) EPB state light - open-circuited or short-circuited to ground

2.6.3.8 CAN bus failure (U007300)

Fault Name	CAN Bus error
DTC	U007300

Fault status	1. The EPB fault indicator is on; 2. In static state, the EPB can be manually released or clamped; 3. The automatic release and dynamic braking functions cannot be operated normally.
Possible causes	1. CAN line open circuit, short circuit; 2. CAN_H and CAN_L are connected reversely, or CAN_H/L is short-circuited to power supply or ground; 3. The whole CAN network failure; 4. ECU internal circuit fault
Judgment criteria	The CAN network monitoring module inside ECU detects a bus fault of the CAN bus.
Failed function	1. In static state, the EPB can respond to the manual release or clamping command (the function is limited at that time); 2. The automatic release and dynamic braking functions cannot be operated normally

Troubleshooting:

1. Connect the diagnostic scanner to OBD interface for diagnosis. If it cannot be connected to EPB, check whether the CAN bus connection is normal; if the CAN bus connection is normal, it indicates that the circuit of EPB controller CAN signal receiving/transmitting module is faulty. Replace the EPB ECU and test again.

2. If the diagnostic scanner can be connected to EPB normally, clear the DTC and then turn on the ignition switch for inspection again. If the DTC still exists, check and repair other electronic control units of the vehicle. After confirming normal CAN communication with other control units, recheck.

3. Clear the EPB DTC with a diagnostic scanner, turn on the ignition switch again and wait for 5s to read the DTC. Check whether the DTC will appear in the EPB again. If the DTC still exists, replace the EPB ECU and test again.

Note:

When the CAN cable of EPB or the vehicle CAN bus is faulty, in addition to "CAN bus off" prompt, EPB may also prompt other node timeout faults such as "VCU node timeout" and "ABS node timeout". In this case, maintenance personnel should not judge the node timeout fault as damage to VCU, ABS and other nodes, because EPB cannot receive information from these nodes due to the fault of CAN bus. Therefore, when "CAN bus off fault" and "node timeout fault" occur at the same time, maintenance personnel shall first check and repair the CAN bus

2.6.3.9 System power supply overvoltage (C110017)

Fault Name	Battery Voltage is abnormal (over voltage)
DTC	C110017
Fault status	1. The EPB fault indicator is on; 2. Read the DTC with a diagnostic scanner, "battery overvoltage" displayed.
Possible causes	1. The external power supply voltage is too high or the battery is damaged; 2. Internal fault of EPB controller.

Judgement criteria	The battery voltage exceeds the set threshold voltage for a long time.
Failed function	The EPB may not be able to clamp or release the actuator normally.

Troubleshooting:

1. Measure the voltage of on-board battery and check whether the battery voltage is too high (greater than 16V). If it is too high, maintenance is required. If the battery voltage value is not within the rated voltage range due to an internal structural fault of the battery, the battery needs to be replaced to prevent damage to the EPB or other on-board ECUs.

2. If the battery voltage is normal, but the EPB still detects the "battery overvoltage" fault, it means that the internal voltage detection circuit of the EPB is faulty and the EPB controller needs to be replaced.

3. Use the diagnostic scanner to clear the EPB DTC, re-ignite, and read the DTC after waiting for a period of time. Check whether the DTC will appear inside the EPB again.

Note:

– When the EPB shows a "battery overvoltage" fault, although the EPB function may still be used normally, troubleshooting is still required immediately. This is mainly to prevent excessively high voltage from damaging the EPB actuator and controller.

2.6.3.10 System power supply undervoltage (C110016)

Fault Name	Battery Voltage is abnormal (under voltage)
DTC	C110016
Fault status	1. The EPB fault indicator is on; 2. EPB does not respond to the clamping and releasing actions of the actuator.
Possible causes	1. Battery voltage is too low or the battery is damaged; 2. The connecting wire is poorly connected to the positive/ negative pole of the battery; 3. EPB internal circuit fault.
Judgement criteria	The battery voltage is lower than the set threshold voltage for too long.
Failed function	The EPB cannot clamp or release the actuator normally.

Troubleshooting:

1. Check whether the battery voltage is too low. If the battery voltage is indeed too low, you need to charge the battery first and retest it after the voltage reaches the rated voltage of the battery. If the battery voltage still cannot reach the rated voltage after a long period of charging, it means that the battery has an internal fault and needs to be replaced.

2. If the battery voltage is normal, but the EPB still detects a "battery undervoltage" fault, check whether the EPB power supply connecting wire has poor contact with the positive/negative pole of the battery or the large area of oxidation on the contact surface causes excessive resistance at the connection. If the contact is poor, reconnection is required.

3. Use the diagnostic scanner to clear the EPB DTC, re-ignite, and read the DTC after waiting for a period of time. Check whether the DTC will appear again inside the EPB. If the DTC still exists, it means that the voltage detection circuit inside the EPB is damaged. Replace the ECU and test again.

2.6.3.11 Ignition circuit fault (C110116)

Fault Name	IGN Line (Short to ground or Open)
DTC	C110116
Fault status	1. The EPB fault indicator is on; 2. Read the DTC, "EPB ignition status invalid" displayed.
Possible causes	1. The EPB IGN line is not correctly connected to the IGN line of the vehicle; 2. EPB internal circuit fault.
Judgement criteria	The vehicle ignition state obtained by EPB from the CAN bus is inconsistent with that obtained from the IGN line.
Failed function	EPB does not respond to external commands

Troubleshooting:

1. Check whether the IGN line of EPB is correctly connected to the IGN line of the vehicle. If not, make corrections;

2. Check whether the IGN line is open-circuited. If so, replace it.

3. Read the current information inside the EPB with a diagnostic scanner and check whether the ignition state flag of the EPB obtained by the diagnostic scanner is consistent with the actual ignition state of the vehicle. If not, it indicates that the ignition state detection circuit inside the EPB may be faulty. Replace the EPB and test again. Clear the fault with a diagnostic scanner and repeatedly test by turning the ignition on and off. If the fault still exists, it is confirmed that the internal circuit of EPB is damaged. Replace the EPB ECU and test again.

2.6.3.12 Abnormal actuator voltage (C110060)

Fault Name	Actuator voltage out of range
DTC	C110060
Fault status	1. The EPB fault indicator is on; 2. The actuator mechanism cannot operate normally.
Possible causes	1. The actuator connecting wire is open-circuited; 2. The actuator internal motor connecting wire is open-circuited; 3. The actuator connecting wire is short-circuited; 4. The actuator internal motor connecting wire is short-circuited; 5. The circuit of EPB internal control motor is damaged.
Judgement criteria	When the EPB operates, the voltage at both ends of the actuator mechanism connecting wire is abnormal.
Failed function	EPB actuator cannot operate normally

Troubleshooting:

1. Check whether the actuator and caliper are installed correctly. If not, reinstall them and test again;

2. Check whether the connector and harness on the actuator are connected correctly. If not, reconnect the connector. In addition, check whether the clip on the connector is damaged. If it is damaged, replace the connector to prevent the fault from happening again.

3. Check whether the pin on the actuator connecting wire falls off from the plastic housing of the connector. If it falls off, the inside of the plastic housing may be damaged or the pin is directly pulled out of the plastic housing due to external force. In this case, replace the connector and the pin on the connecting wire.

4. Check the connecting harness of the actuator for open circuit or damage, and replace the harness if it is damaged. If the motor open circuit fault is caused by an open circuit in the connecting wire, it is also necessary to check whether there are sharp materials near the open circuit position of the connecting wire that can cut the connecting wire. If so, corrective measures need to be taken to prevent the fault from occurring again.

5. Check whether there is an open circuit between the two metal pins in the connector on the actuator (the metal pins are connected to both ends of the actuator motor through internal wires), and replace the actuator if there is an open circuit. At this time, also check whether the poor contact between the metal pin and the metal pin in the female connector is caused by other factors such as water ingress or corrosion. If so, replacement is required.

6. Check whether the actuator connecting wire is short-circuited. If it is short-circuited, replace the connecting wire; if the motor short circuit fault is caused by two connecting wires being cut by external sharp objects, timely investigate the cause of the short circuit while replacing the connecting wire to avoid the recurrence of the same fault.

7. In order to check whether it is caused by a short circuit of the motor connecting wire inside the actuator or a stuck motor due to mechanical problems, you can disconnect the actuator connector, then connect a fault-free actuator (to check whether the actuator is faulty), turn on the ignition again, operate the EPB switch to control the clamping/releasing of the actuator, and check whether the actuator can operate normally. If it can operate normally, it means that the original actuator is faulty. The actuator needs to be replaced.

8. If no problems are found in the above inspections, it indicates that the internal circuit of the EPB controller is damaged and the EPB controller needs to be replaced.

9. Clear the EPB DTC with a diagnostic scanner, then turn on the ignition switch and check whether the DTC will appear in the EPB again. Operate the EPB switch repeatedly for clamping and releasing to confirm that the fault has been completely eliminated.

2.6.3.13 Motor fault (C12A07C, C12A013, C12A011, C12A07E, C12A070, C12A015, C12A07D, C12A054)

Fault Name	Actuator fault
DTC	C12A07C, C12A013, C12A011, C12A07E, C12A070, C12A015, C12A07D, C12A054
Fault status	1. The EPB fault indicator is on (C12A054 does not illuminate fault indicator); 2. The actuator cannot operate normally.

Possible causes	1. The actuator connecting wire is open-circuited; 2. The actuator internal motor connecting wire is open-circuited; 3. The actuator connecting wire is short-circuited; 4. The actuator internal motor connecting wire is short-circuited; 5. The internal motor of the actuator is stuck; 6. The actuator is not equipped with a brake pad or the brake pad is too thin, resulting in EPB braking time being too long but still unable to brake normally; 7. Internal mechanical fault of actuator; 8. The circuit of EPB internal control motor is damaged.
Judgement criteria	1. When the EPB is powered on for self-inspection, the voltage and current signals at both ends of the actuator connecting wire are abnormal; 2. When EPB operates, the voltage and current signals at both ends of the actuator connecting wire are abnormal.
Failed function	The actuator cannot operate normally in case of manual parking, manual release, automatic release, dynamic braking and automatic parking at ignition off.

Troubleshooting:

1. Check whether the actuator and caliper are installed correctly. If not, reinstall them and test again;

2. Check whether the connector and harness on the actuator are connected correctly. If not, reconnect the connector. In addition, check whether the clip on the connector is damaged. If it is damaged, replace the connector to prevent the fault from happening again.

3. Check whether the pin on the actuator connecting wire falls off from the plastic housing of the connector. If it falls off, the inside of the plastic housing may be damaged or the pin is directly pulled out of the plastic housing due to external force. In this case, replace the connector and the pin on the connecting wire.

4. Check the connecting harness of the actuator for open circuit or damage, and replace the harness if it is damaged. If the left motor open circuit fault is caused by an open circuit in the connecting wire, it is also necessary to check whether there are sharp materials near the open circuit position of connecting wire that can cut the connecting wire. If so, corrective measures need to be taken to prevent the fault from occurring again.

5. Check whether there is an open circuit between the two metal pins in the connector on the left actuator (the metal pins are connected to both ends of the actuator motor through internal wires), and replace the actuator if there is an open circuit. At this time, also check whether the poor contact between the metal pin and the metal pin in the female connector is caused by other factors such as water ingress or corrosion. If so, replacement is required.

6. Check whether the left actuator connecting wire is short-circuited. In case of short circuit, replace the connecting wire; if the left motor is short-circuited due to two connecting wires being cut by external sharp objects, it is necessary to timely investigate the cause of short circuit while replacing the connecting wire, so as to avoid the recurrence of the same fault.

7. In order to check whether it is caused by short circuit of the internal motor connecting wire of the left actuator or stuck motor due to mechanical problems, you can disconnect the connector of the left actuator, connect a fault-free actuator (to check whether the actuator is faulty), turn on the ignition again, operate the EPB switch to control the clamping/releasing of the actuator, and check whether the actuator can act normally. If it acts normally, it means that the original actuator is faulty. The actuator needs to be replaced.

8. If no problems are found in the above inspections, it indicates that the internal circuit of the EPB controller is damaged and the EPB controller needs to be replaced.

9. Clear the EPB DTC with a diagnostic scanner, then turn on the ignition switch and check whether the DTC will appear in the EPB again. Operate the EPB switch repeatedly for clamping and releasing to confirm that the fault has been completely eliminated.

2.6.3.14 Switch fault (C123800, C123861, C12352A, C12362A, C120860, C120862)

Fault Name	Switch Broken
DTC	C123800, C123861, C12352A, C12362A, C120860, C120862
Fault status	1. The EPB fault indicator is on; 2. EPB does not respond to the switch command, and the EPB actuator cannot be clamped or released normally in static state.
Possible causes	1. The circuit connecting the EPB to the switch is short-circuited or open-circuited; 2. Internal circuit fault of the switch, etc. 3. EPB internal switch detection circuit failure; 4. The EPB switch is stuck.
Judgement criteria	The main and auxiliary single-chip microcomputers continuously detect the abnormal state of the switch multiple times.
Failed function	Release and parking cannot be achieved by operating the switch.

Troubleshooting:

1. Check whether the circuit connected to the switch is short-circuited or open-circuited, and replace the connecting wire if there is any fault in the circuit;

2. Check whether the connector on the connecting wire is correctly engaged with the switch. If not, reconnect it;

3. Pull up and press the switch several times, release the switch and wait for more than 3s to observe if the switch light flashes. If so, replace the switch;

4. Pull up the EPB switch, use the diagnostic scanner to read the current information inside the EPB and check whether the switch position obtained by the diagnostic scanner is the "parking position"; Press the EPB switch, use the diagnostic scanner to read the current information inside the EPB and check whether the switch position obtained by the diagnostic scanner is the "release position"; In addition, when not operating the EPB switch, obtain the position information of the switch with the diagnostic scanner to check whether it is at "natural position"; If the information of these three positions of the EPB switch is inconsistent with the actual operation, it indicates that there may be a fault inside the EPB switch and the EPB switch needs to be replaced.

5. Use the diagnostic scanner to clear the EPB DTC and turn on the ignition switch, operate the EPB switch repeatedly and then read the DTC. Check whether the DTC will appear in the EPB again. If the DTC still exists, the EPB internal switch detection circuit is damaged. Replace the ECU and test again.

2.6.3.15 Controller failure (C126045, C126040, C126042, C126054, C126055, C126086, C12604C, C126004, C126046, C126044, C12607C)

Fault Name	ECU Hardware fault
DTC	C126045, C126040, C126042, C126054, C126055, C126086, C12604C, C126004, C126046, C126044, C12607C
Fault status	1. The EPB fault indicator is on (C126086, C126054, C12604C and C126004 do not illuminate the fault indicator) 2. Read the DTC and it will show "controller failure".
Possible causes	1. The data stored in the main single-chip microcomputer of the EPB controller is wrong; 2. Auxiliary single-chip microcomputer fault.
Judgement criteria	1. Failed to operate on the EEPROM; 2. Communication failure between the main and auxiliary single-chip microcomputers; 3. Serial communication failed
Failed function	C126086, C126054, C12604C and C126004 do not affect the normal function of the EPB; other faults will cause abnormal function of the EPB.

Troubleshooting:

1. Clear the DTC with a diagnostic scanner, turn on the ignition switch again, operate the EPB switch for clamping and releasing, and check whether the function is normal. If the fault still exists, replace the EPB controller and check again.

2. Clear the DTC with a diagnostic scanner. Turn on the ignition switch again and read the DTC to check whether the fault recurs.

2.6.3.16 Tilt sensor signal abnormal (C121329, C121396)

Fault Name	G Sensor(Signal invalid/self test fail)
DTC	C121329, C121396
Fault status	1. The EPB fault indicator is on; 2. The automatic release function cannot be realised.

Possible causes	1. The EPB is not correctly fixed at the specified position; 2. EPB tilt sensor component failure or poor welding; 3. EPB tilt detection circuit failure.
Judgement criteria	The acceleration value calculated by EPB from the vehicle is inconsistent with that obtained from the tilt sensor.
Failed function	Automatic release function fails

Troubleshooting:

1. Check whether the EPB is correctly fixed at the specified position, and correct it if it is incorrect. Check whether the EPB circuit board is separated from the EPB housing, and replace the EPB if it is separated;

2. Read the current vehicle tilt information obtained inside the EPB with a diagnostic scanner, and check whether this tilt information matches the current vehicle's tilt status. If not, replace the EPB controller and test again.

3. Clear the DTC with a diagnostic scanner. Turn on the ignition switch again and read the DTC to check whether the fault recurs.

2.6.3.17 Network node timeout fault (U012000, U012100, U012200, U120000, U014000, U014001)

Fault Name	Lost Communication With EPB/ABS/VCM/SRS/BCM/PEPS
DTC	U012000,U012100,U012200,U120000,U014000,U014001
Fault status	1. The EPB fault indicator is on; (U120000 and U014000 do not illuminate fault indicator) 2. Read the DTC with a diagnostic scanner 3. Loss of some functions of the EPB system
Possible causes	1. The node is disconnected from the CAN network; 2. The cycle of messages sent by the node to CAN network is incorrect; 3. CAN network fault or EPB internal circuit fault.
Judgement criteria	The message signal timeout of any node reaches the maximum time among 10 message cycles and 300 ms
Failed function	EPB partially fails.

Troubleshooting:

1. Check whether the CAN bus connecting line of network node is disconnected from the vehicle CAN network (e.g. VCU node disconnection). For specific nodes, it is necessary to first ensure that the CAN bus connecting line of the corresponding node is correctly connected;

2. Check whether the ECU of the faulty node is damaged or correctly installed. If the ECU is damaged or not correctly installed, it is necessary to carry out troubleshooting.

3. Check whether the message cycle of the node meets the requirements. If not, messages need to be sent according to a specific cycle.

4. Clear the DTC with a diagnostic scanner, turn on the ignition switch again and read the DTC to check whether the node timeout exists. If it still exists, it means that EPB has not received the message from the network node, which indicates that the internal circuit of EPB is faulty. Replace the EPB ECU and test again. If the fault occurs repeatedly after initial installation and cannot be eliminated, it is suspected that the EPB ECU does not correspond to this vehicle model. In this case, read the EPB identifier with a diagnostic scanner immediately to verify whether the faulty EPB corresponds to the vehicle model and avoid more installation of defective EPB.

2.6.3.18 Network node signal invalid (U012086, U012186, U012286, U120086, U014186, U014086)

Fault Name	Invalid Data Received From EPB/ABS/VCM/SRS/BCM/PEPS
DTC	U012086,U012186,U012286,U120086,U014186,U014086
Fault status	1. The EPB fault indicator is on; (U120086 and U014186 do not illuminate fault indicator) 2. Read the DTC with a diagnostic scanner 3. Loss of some functions of the EPB system
Possible causes	Signal status sent from node to CAN network is invalid
Judgement criteria	The invalid time of the message signal of any node reaches 1.6s
Failed function	EPB partially fails.

Troubleshooting:

1. Check whether the CAN message sent from the network node is invalid. If so, relevant controllers are required to correct it;

2. Clear the DTC with a diagnostic scanner, turn on the ignition switch again and read the DTC to check whether invalid node exists. If it still exists, it means that relevant controller has not passed correction and needs to be corrected continuously. If the fault occurs repeatedly after initial installation and cannot be eliminated, it is suspected that the EPB ECU does not correspond to this vehicle model. In this case, read the EPB identifier with a diagnostic scanner immediately to verify whether the faulty EPB corresponds to the vehicle model and avoid more installation of defective EPB.

2.6.3.19 Indicator error (C11D112, C11D114)

Fault Name	EPB status Lamp Line
DTC	C11D112, C11D114
Fault status	1. The EPB fault indicator does not light up; 2. EPB button and dashboard indicator inconsistent with actual control
Possible causes	1. Switch light is short-circuited to the power supply 2. Open-circuited or short-circuited to GND
Judgement criteria	EPB button and dashboard indicator inconsistent with actual control
Failed function	No indicator prompt

Troubleshooting:

1. Check whether the switch indicator port is short-circuited to GND or open-circuited. If it is short-circuited to GND, replace the connecting wire. Check whether the connecting wire is in direct contact with the vehicle housing (short-circuited to GND) due to long-term cutting by a sharp object on the vehicle body. If so, it is necessary to rectify the sharp object or add an insulating housing around the affected connecting wire.

2. Check whether the EPB switch indicator port is short-circuited to the power supply. If the circuit fails, replace the connecting wire.

3. If there is no problem after the above two checks, clear the EPB DTC with a diagnostic scanner, operate the EPB switch to clamp and release, and check whether the DTC still exists. If the fault still exists, replace the ECU and test again.

4. Clear the EPB DTC with a diagnostic scanner, turn on the ignition switch again, operate the EPB switch repeatedly for clamping and releasing, read the DTC, and check whether the DTC appears in the EPB again.

2.6.3.20 Actuator mechanism fault (C12A418, C12A477)

Fault Name	Mechanical failure
DTC	P15B216, P15B301
Fault status	1. The EPB fault indicator is on; (C12A477 does not illuminate the fault indicator) 2. Actuator fails to operate.
Possible causes	1. Actuator mechanism internal fault; 2. Caliper mechanical structure fault.
Judgement criteria	1. The caliper's clamping time exceeds 3s without reaching the current corresponding to the set clamping force; 2. The minimum current of the motor during clamping is greater than a specific threshold current;
Failed function	EPB actuator cannot operate normally

Troubleshooting:

1. Replace actuators that do not operate normally.

2. Connect the diagnostic scanner to clear the DTC. Operate the EPB switch repeatedly for clamping and releasing, read the EPB DTC and check whether the fault still exists. If the DTC still exists, it indicates that the internal resistance of the connecting wire between the actuator and EPB controller is too large due to poor contact at the connection or oxidation of the contact surface, resulting in insufficient clamping current of the actuator. In this case, replace the connecting wire and connector, and then test again.

2.6.3.21 EHB-Diagnostic Process

2.6.3.22 Brake System - Standard Flow Chart for Fault Diagnosis

Steps	Diagnosis action	Yes	No
1	1. Connect or mount, if possible, all the parts and components disconnected or dismantled previously; 2. Turn the key to the ON position without starting the engine or powering the vehicle up to high-voltage; 3. Connect the X431 diagnostic host to the vehicle's diagnostic interface via the diagnostic line and enable it to communicate with the ECU. Confirm whether the X431 diagnostic host can communicate with the ECU.	Go to Step 2	Go to Step 4
2	Are there any current or stored diagnostic trouble codes?	Go to Step 3	Go to Step 7
3	1. Record the current DTC and occurrence time; 2. Record the historical DTC and occurrence time; Please do not clear the DTC before the X431 diagnostic host records the necessary information.		
4	Can the X431 diagnostic host communicate with other modules (such as airbag, engine ECU and VCM) on the same data cable?	Go to Step 5	Go to Step 6
5	To "No communication with ECU" in the ECU fault diagram.		
6	Inspect the data link connector of the electrical diagnosis part.		

Steps	Diagnosis action	Yes	No
7	1. Remove the key. 2. Wait for 5 minutes and 10 seconds (or disconnect the battery power supply for 5S and then reconnect it). 3. Turn the key to the ON position, and observe the orange ABS warning light when the engine does not start or the vehicle is not powered up to high-voltage. 4. Do the ABS and brake warning lights illuminate briefly and then extinguish? (Bulb test)	Go to Step 8	Go to Step 9
8	The system functions normally		
9	Are there any lights still on?	Go to Step 10	Go to Step 11
10	Handle according to the current fault points recorded in Step 3, and restart the detection after troubleshooting (starting from Step 1).		
11	Check the circuit.		

2.6.3.23 Brake System - Precautions for Fault Diagnosis

The following listed in the table below are normal.

Symptom	Description
Inspection on system noise	After starting the engine or applying high voltage to the vehicle, a buzzing sound can be heard from the engine compartment when starting to drive, but this is caused by the EHB performing a system operation check and is normal.
EHB action sound	The sound emitted by the internal motor when the EHB hydraulic assembly operates. (Rattling) The sound emitted along with the vibration of the brake pedal. (scraping) When the EHB is activated, the noise coming from the vehicle chassis is due to the repeated application and release of the brakes. (Low deep noise: suspension, squeak: tyre)
EHB action (long braking distance)	The braking distance of the vehicle with an ABS system is longer than that without ABS on the snowy and gravelly pavements. Therefore, it is suggested that the users be careful when driving on such pavements and lower the speed, and not be too confident.

Note:

● Diagnostic test conditions vary with different DTCs.

● When inspecting the fault symptoms again after the elimination of diagnostic codes, it has to ensure that the inspection conditions in the “Description” column are met.

2.6.3.24 Brake System - Troubleshooting without DTC

If the brake system has a fault, but the EHB has no DTC stored, this fault is called a fault without DTC. The fault without DTC is generally caused by basic brake system faults. For example:

1. Brake fluid leakage (possibly resulting in soft brake, brake pedal travel excessively large, or even braking failure).

Use of inferior brake fluid (which will corrode the brake pipeline and internal components of EHB brake-by-wire system, or even lead to brake failure in a serious condition).

2. Air in brake pipeline (possibly resulting in brake pedal too soft or even braking failure).

3. Brake pipeline blocked (possibly resulting in brake pedal too hard or even braking failure).

4. Brake disc excessive wear (possibly resulting in brake pedal too soft and brake pedal travel excessively large).

5. Brake pipeline connection error (may lead to decreased EHB performance, tail-flicking, longer braking distances, etc.). For the correct installation method, please refer to the identification near the oil hole on EHB brake-by-wire system; FL represents the front left wheel cylinder oil pipe; FR represents the front right wheel cylinder oil pipe; RL represents the rear left wheel cylinder oil pipe; RR represents the rear right wheel cylinder oil pipe).

Note:

● No power supply or abnormal interruption of EHB will cause ABS and ESP warning lights to stay on without DTC.

6. Troubleshooting recommendations: inspect the appropriate components for the malfunction phenomenon, and carry out troubleshooting according to the vehicle service manual.

2.6.3.25 Brake System-Occasional Fault Maintenance

In electronic systems, transient poor contact problems may occur in electrical circuits and at places where input and output signals are present, leading to episodic failures. Sometimes the fault cause will disappear on its own, so it is not easy to identify the problem. In case of accidental faults, the faults can be simulated in the following manner to inspect whether the fault recurs.

S/N	Possible causes	Simulated Fault	Remarks
1	When vibration may be the main cause	Gently shake the EHB ECU connector up and down, left and right. Gently shake the EHB harness up and down, left and right. Gently shake the sensor up and down, left and right. Gently shake other moving parts (such as wheel bearings).	If the wire harness is twisted or broken because of being too taut, it must be replaced with a new one. When the vehicle is running, the wheel speed sensor harnesses will form a temporary open/short circuit as the suspension system moves up and down. Therefore, the vehicle driving test must be performed when the sensor harness is checked.
2	When temperature may be the main cause	Use a blower to heat the parts that are considered to be faulty, and use cold spray to check for cold welding.	
3	When excessively high power load may be the main cause	Turn on all switches of electrical appliances such as head lamp and wiper, so as to make the vehicle power supply work under high load.	

2.6.3.26 Brake System - Electro-Hydraulic Braking (EHB) Diagnosis and Testing

General equipment

Diagnostic scanner X431

Inspection and confirmation

1. Confirm problems that owners complain about and check accordingly.
2. Check the appearance for any obvious mechanical or electrical damage.
3. Before the next check, solve the identified problem first.
4. If the cause cannot be confirmed from the appearance, confirm the symptoms first and then check according to the symptom table.

Appearance Checklist

Mechanical	Electrical
– Wheel speed sensor – Tyre pressure – Tyre dimension – Tyre damage	– Fuse – Electronic connector – Harness

2.6.3.27 Brake System - DTC List (EHB)

The diagnosis in this manual requires technicians to have a certain skill level and diagnostic practical experience.

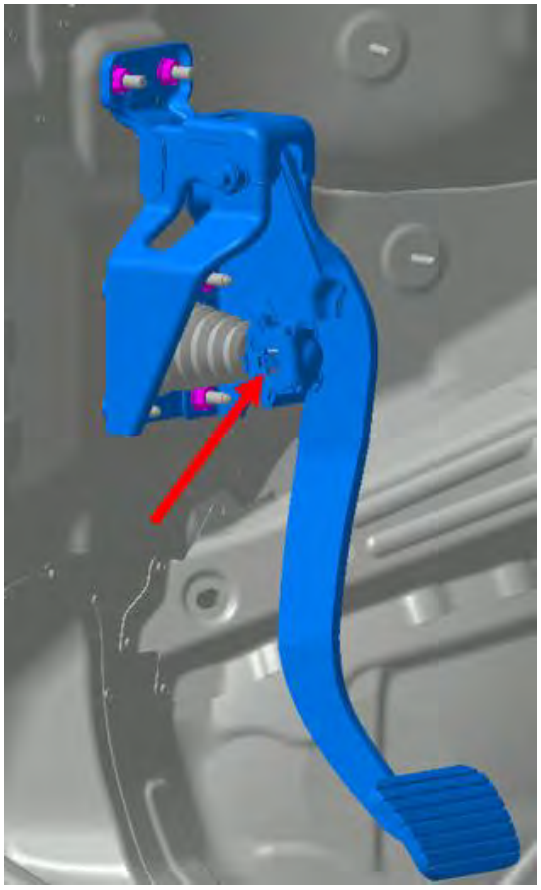
Refer to: Diagnosis Method (100-00 General Information, Description and Operation).

2.6.4 Removal and installation

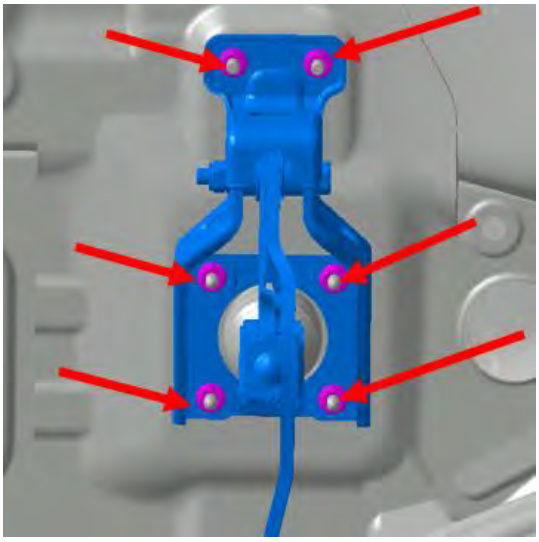
2.6.4.1 Brake pedal assembly

Removal

1. Disconnect the negative battery cable. Refer to: Disconnect the battery negative cable.
2. Remove the lower left shield assembly. Refer to: Lower left shield assembly
3. Remove the ball joint connecting structure from the EHB brake-by-wire system assembly.



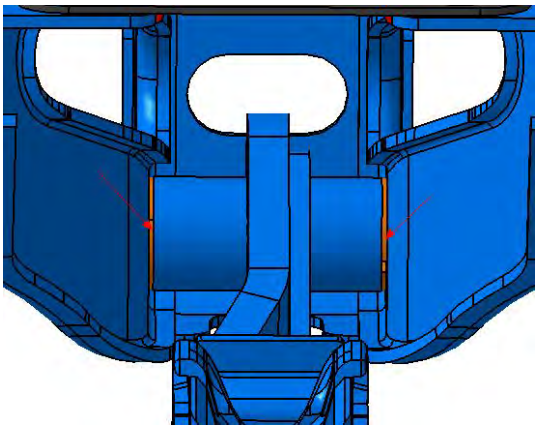
4. Remove the pedal bracket fixing nuts (6 pieces), and the tightening torque of the pedal mounting nut is: 21~29Nm.



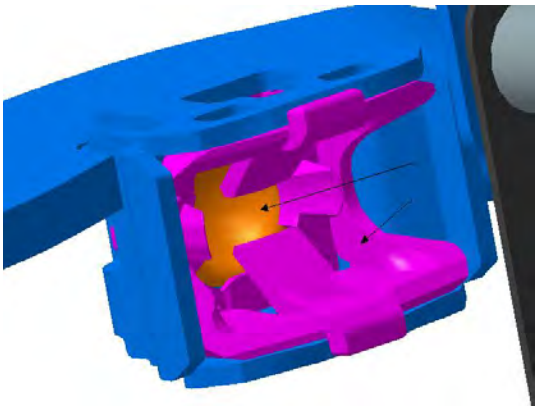
5. Take out the brake pedal assembly.

Installation

1. After the pedal is removed, if it is found that the brake pedal is stuck during idling, apply specified grease to the inside of the bushing. Specified grease: RN-MF11 I



2. If it is found that the grease on the plastic clip and ball bowl is insufficient, the specified grease can be applied to the plastic clip and ball bowl before pressing in the booster ball joint push rod. Specified grease: RN-MF11 I

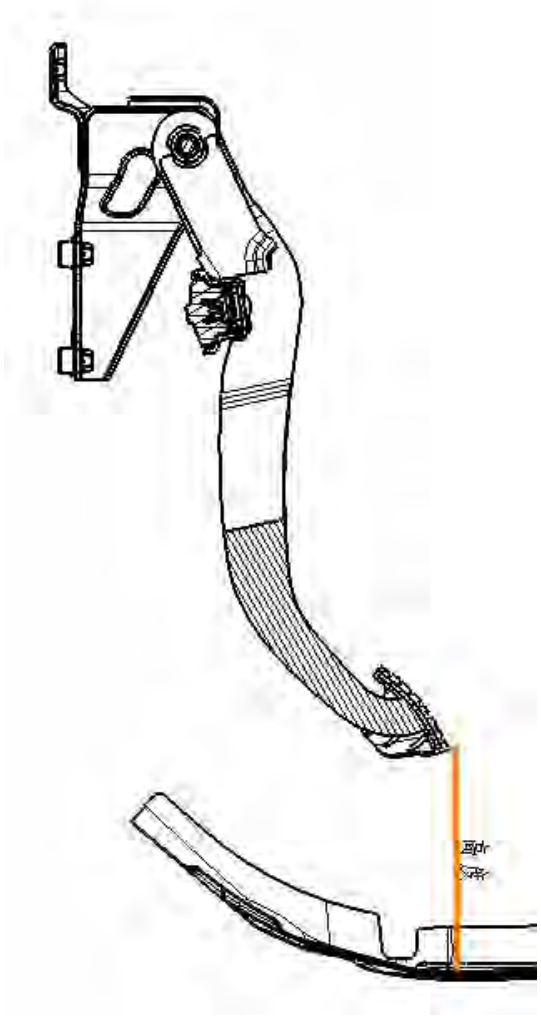


3. Assemble in the procedure opposite against that of disassembling.

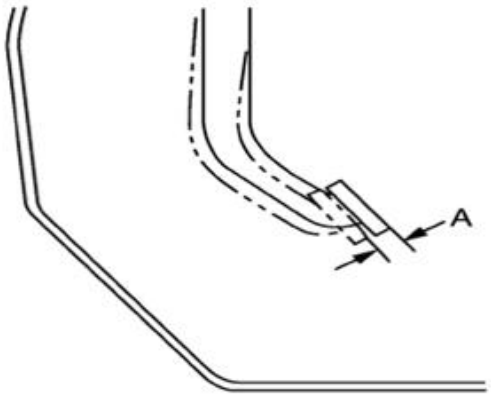
Inspection after installation

1. Press down the brake pedal and check the free stroke and clearance between the pedal and the floor.

2. Check the height between brake pedal and metal floor. Standard: 150.3±8mm



3. The free travel A of the brake pedal (the travel when the vehicle is turned off and the key is in the OFF position, and resistance (≤15N) is felt when the brake pedal is pressed). Standard: 1~12mm



2.6.4.2 Front brake caliper

General Tools

Brake hose clamp

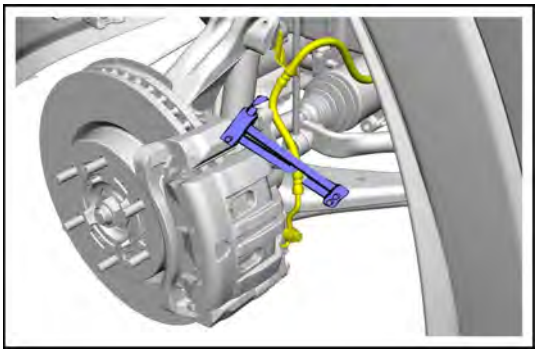
Removal

Caution: If the brake fluid splashes on the paintwork, flush the splashed area with cold water immediately.

1. Remove the wheels and tyres. Refer to: Tyre.

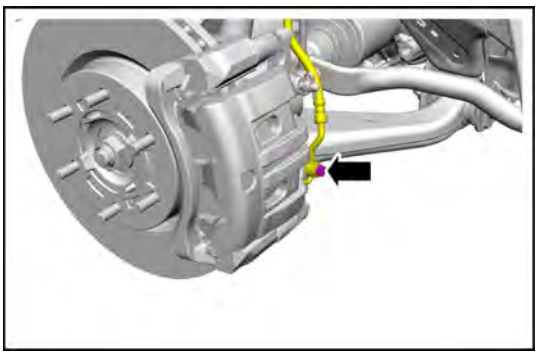
2. Remove the brake block. Refer to: Brake Pad.

3. Clamp the brake hose with a proper brake hose clamp.

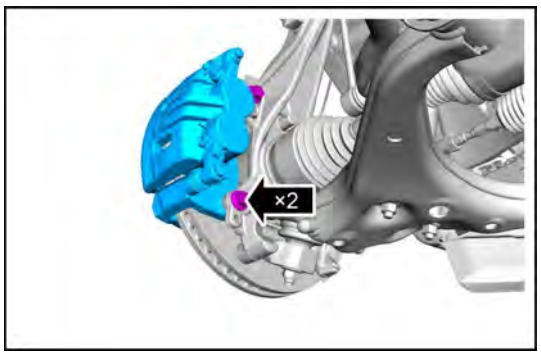


Caution: Seal the interface of hard brake pipe to avoid brake fluid leakage or dust entry.

4. Remove the brake hose fixing bolts, and then disconnect the brake hose from the brake caliper. Torque: 35~45 N•m



5. Remove the fixing bolt of brake caliper bracket, and move aside the brake caliper.

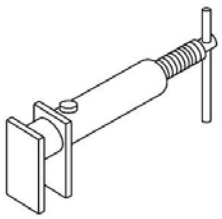


Installation

1. The installation order is the reverse of the removal order.
2. Check the brake fluid level in the brake fluid reservoir, and fill the brake fluid to the maximum scale if necessary.
3. Bleed air from the brake system.Refer to: Brake system bleeding.

2.6.4.3 Front brake pad

General Tools

	Brake caliper piston tractor

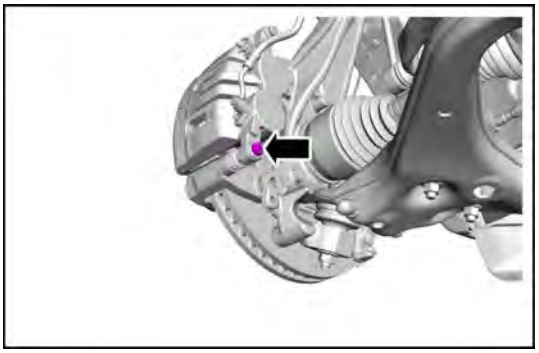
Material

Name	Specification
Brake fluid	DOT4

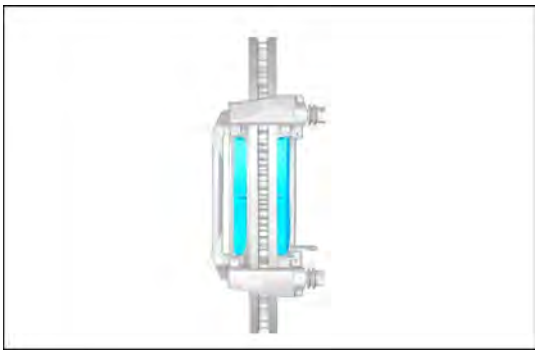
Removal

Caution: If the brake fluid splashes out on paintwork, flush the area with cold water immediately.

1. Remove the wheels and tyres. Refer to: Tyre.
2. Remove the brake caliper connecting bolt.



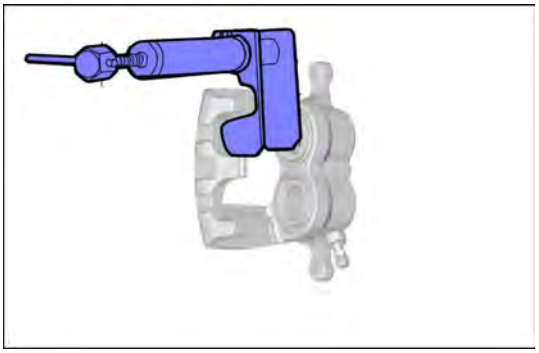
3. Rotate the brake caliper upwards to remove the brake pad.



Installation

1. Install the brake pad.
2. Fully pull the caliper piston with the caliper piston tractor.

   Caution: When the caliper piston is pulled into the piston chamber, the brake fluid will be discharged into the brake fluid reservoir.



3. Return the caliper and tighten the lower connecting bolt of the caliper.
4. Install wheels and tyres.Refer to: Tyre.

2.6.4.4 Electronic parking brake caliper assembly

General Tools

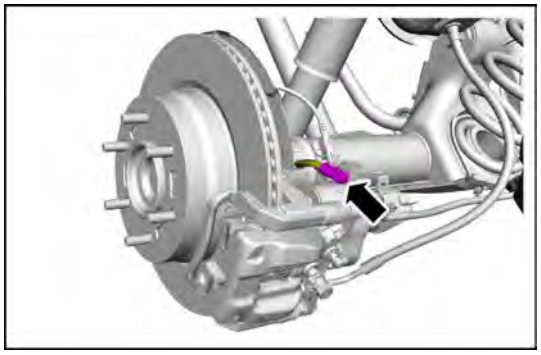
Brake hose clamp

Removal

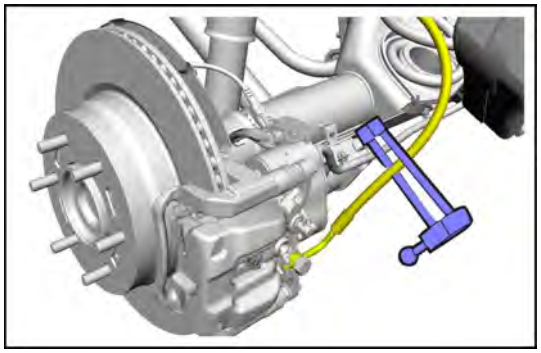
Caution: If the brake fluid splashes on the paintwork, flush the splashed area with cold water immediately.

1. Release the hand brake.
2. Remove the wheels and tyres. Refer to: Tyre.
3. Disconnect the connecting plug between brake caliper motor and chassis harness.

   Caution: This step is only applicable to EPB models.



4. Clamp the brake hose with a proper brake hose clamp.

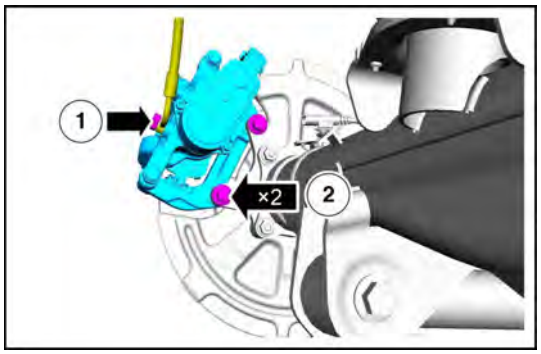


   Caution: If brake fluid is spilled on painted surfaces, the area must be rinsed immediately with cold water.

5. Remove the rear brake caliper fixing bolts.

   1. Remove the fixing bolts of the brake hose and brake caliper. Torque: 35~45 N•m

   2. Remove the fixing bolt on the rear brake caliper bracket.



6. Remove the rear brake caliper.

   Caution: When removing the rear brake caliper, do not apply torsional, pulling or bending forces between the MGU and the caliper.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the brake fluid level in the brake fluid reservoir, and fill the brake fluid to the maximum scale if necessary.

2. Bleed air from the brake system. Refer to: Brake system bleeding.

2.6.4.5 Electronic parking brake pad

General Tools

Brake caliper piston tractor

Material

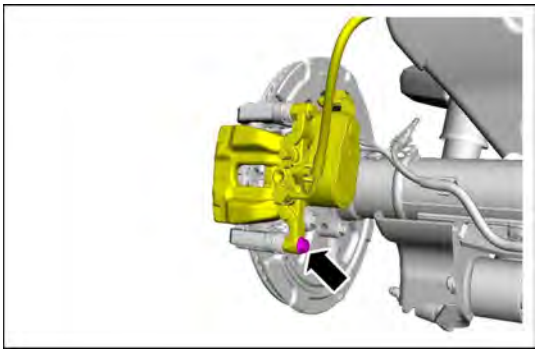
Name	Specification
Brake fluid	DOT4

Removal

1. Release the hand brake.

   Caution: If the brake fluid splashes out on paintwork, flush the area with cold water immediately.

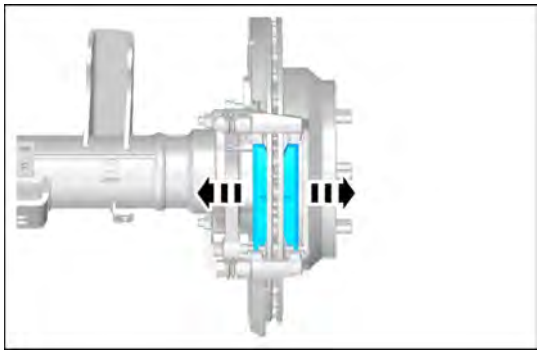
2. Lift up and support the vehicle. Refer to: Lifting the vehicle.
3. Remove the wheels and tyres. Refer to: Tyre.
4. Remove the rear brake caliper fixing bolts and turn over the brake caliper.



5. Hang the rear brake caliper with a wire and fix it.

   Caution: If the brake fluid splashes out on paintwork, flush the area with cold water immediately.

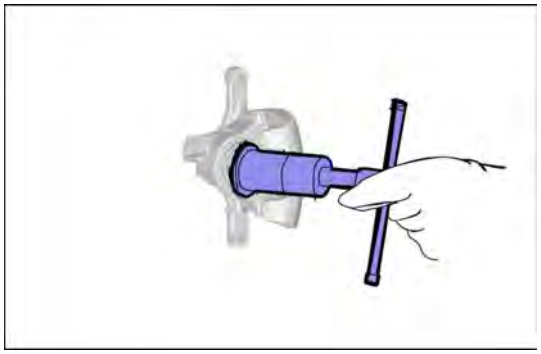
6. Remove the rear brake pad.



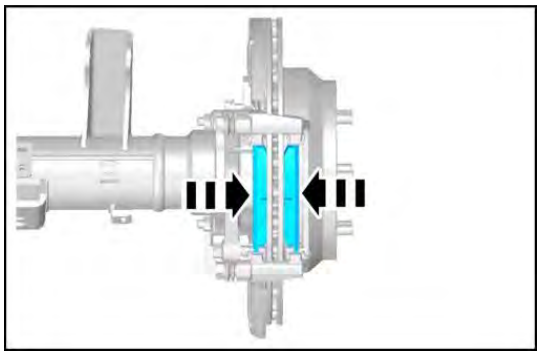
Installation

1. Compress the wheel cylinder piston with the tool.

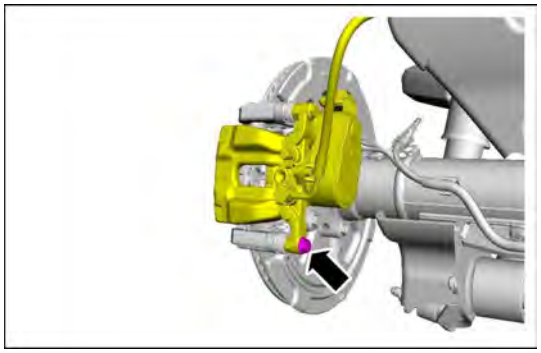
   Caution: The brake fluid will spill out from the brake fluid reservoir when the wheel cylinder piston is compressed tightly into the cylinder block.



2. Install the rear brake pad.



3. Reset the brake caliper and install the rear brake caliper fixing bolts.



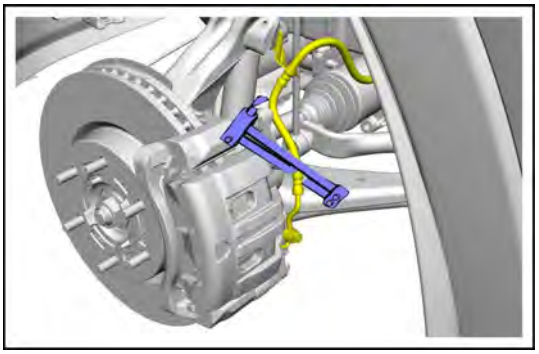
4. The installation order is the reverse of the removal order.

2.6.4.6 Front brake disc

Removal

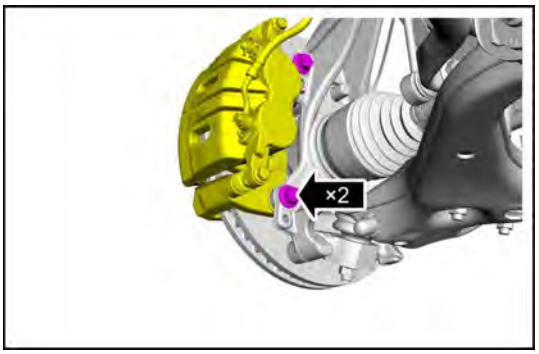
1. Remove the wheels and tyres. Refer to: Tyre.

2. Clamp the brake hose with a proper brake hose clamp.

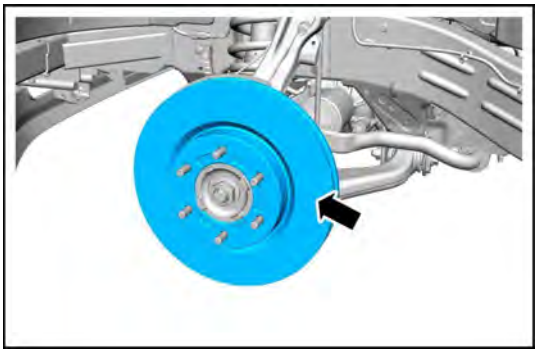


   Caution: Seal the interface of the brake pipe to avoid brake fluid leakage or dust entry.

3. Remove the fixing bolt of brake caliper bracket, and move aside the brake caliper.



4. Remove the brake disc.



Installation

1. The installation order is the reverse of the removal order.

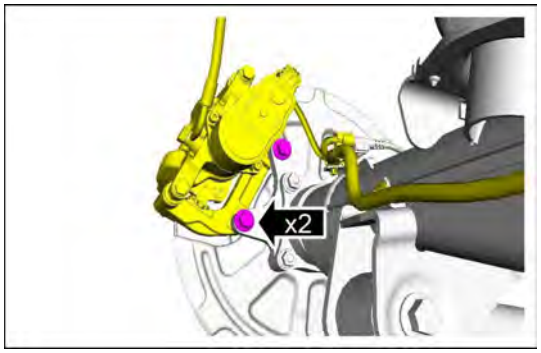
2. Check the brake fluid level in the brake fluid reservoir, and fill the brake fluid to the maximum scale if necessary.

3. Bleed air from the brake system.Refer to: Brake system bleeding.

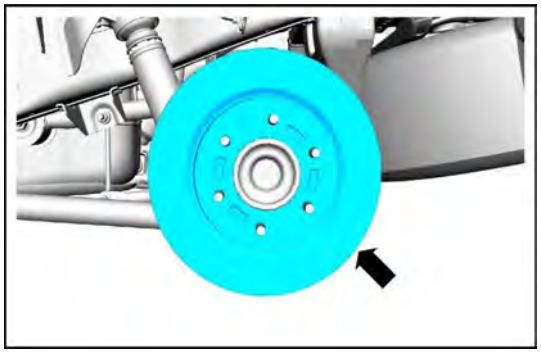
2.6.4.7 Rear brake disc

Removal

1. Release the hand brake.
2. Lift the vehicle. Refer to: Lifting the vehicle.
3. Remove the wheels and tyres. Refer to: Tyre.
4. Remove the brake caliper fixing bolts and move away the brake caliper.



5. Remove the rear brake disc.



Installation

1. The installation order is reverse to the removal order.

2.6.5 General procedures

2.6.5.1 Bleeding of brake system

General Tools

Nylon tube, diagnostic scanner X431

Bleeding

Warning: The brake fluid contains polyethylene glycol ether and polyethylene glycol. Avoid contact with the eyes. Wash your hands thoroughly after use. If the brake fluid comes into contact with your eyes, rinse them with running water for 15 minutes. If discomfort persists, seek medical attention immediately. If you swallowed accidentally, drink water and induce vomiting. Seek medical attention immediately. Failure to comply with these instructions may result in personal injury.

Caution: If brake fluid splashes on the paint surface, the splashed area must be immediately rinsed with cold water.

Caution: When bleeding, the brake fluid reservoir must be filled with new and clean brake fluid at all times.

Caution: Please make sure that the vehicle is parked on a level surface.

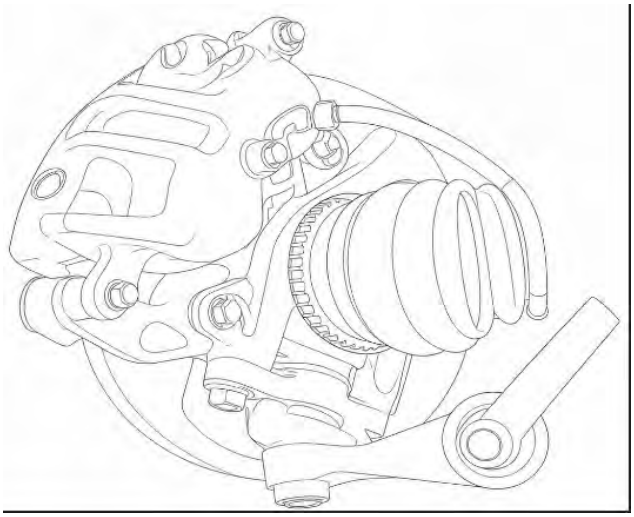
Caution: The system consists of separate pipelines for the front and rear wheels, each of which can be connected independently.

Caution: Pull up the parking brake before bleeding.

1. The vehicle is powered off and the negative pole of the battery is disconnected.

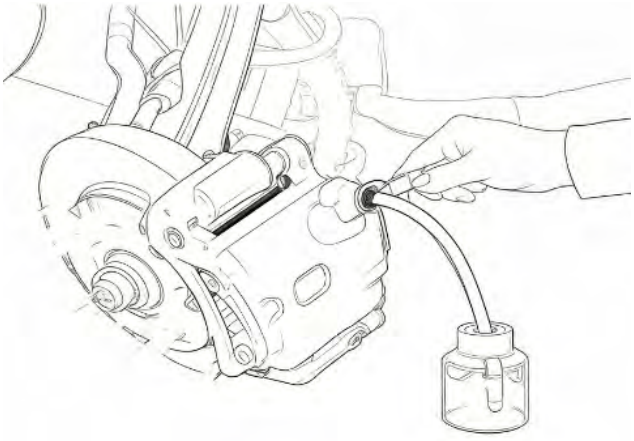
2. Bleed the four wheel end brakes of rear right, front left, rear left and front right respectively according to the following operation method.

   1. Connect a transparent nylon tube to the drain plug of the wheel cylinder and put the other end of the tube into a half-full brake fluid container.



2. Press the brake pedal to the bottom 4 or 5 times.

3. Hold the brake pedal down, loosen the bleed bolt to expel air from the brake pipeline, and then tighten it immediately.



4. Repeat steps 3 and 4 until there are no bubbles in the liquid.

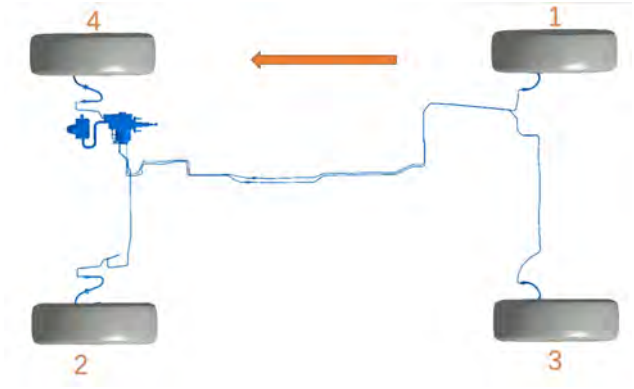
5. Tighten the bleed bolt. Torque: 9 ± 2 Nm.

6. Bleed air from the bleed bolt of the brake hydraulic line as per the sequence (rear right - front left - rear left - front right).

Caution: Pay attention to the fluid level in the brake fluid reservoir and add brake fluid timely.

Caution: When bleeding air from dry EHB components (which contain no brake fluid), power supply off the vehicle, disconnect the power supply from the battery's negative pole, and perform manual air bleeding according to the steps above. After bleeding the air from all four brakes, connect the negative battery pole, turn the vehicle ignition to ON, use the diagnostic scanner to access the special function of the EHB brake-

by-wire system, enter the manual bleeding mode, and bleed the air from inside the EHB according to the prompts.



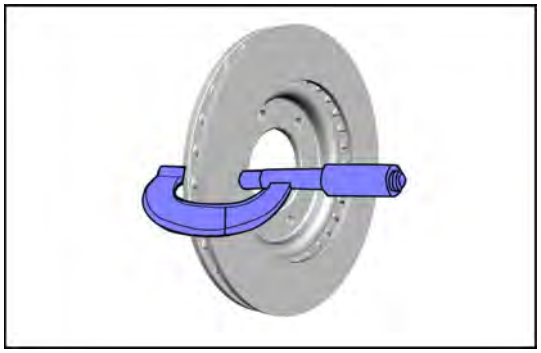
2.6.5.2 Brake Disc Thickness Check

General Tools

Micrometer

Inspection

1. Remove the wheel. Refer to: Wheels.
2. Remove the tyre. Refer to: Tyre.
3. Clean the friction surface of the brake disc with industrial alcohol or equivalent brake cleaning agent.
4. Measure and record the minimum thickness of 4 or more points evenly distributed along the circumference of the brake disc with a micrometer. Ensure that the measurement is only carried out in the contact area of the brake pad lining, and the distance between the micrometer and the outer edge of the brake disc must be equal for each measurement. General tool: Micrometer



5. Trim the brake disc surface or replace the brake disc if the brake disc is thicker than the specified value.

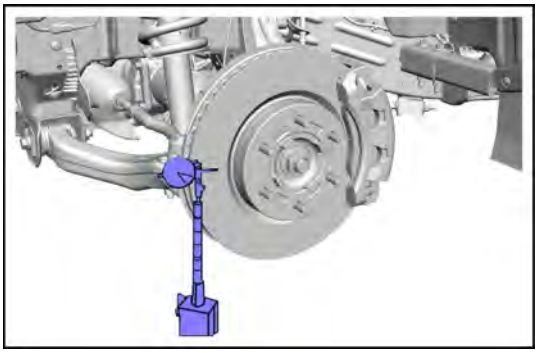
2.6.5.3 Brake Disc Runout Check

General Tools

Dial indicator
Dial gauge mounting bracket

Inspection

1. Remove the wheel. Refer to: Wheels.
2. Remove the tyre. Refer to: Tyre.
3. Install the dial gauge base and place the dial gauge measuring head with a certain pre-tightening force, so that it contacts with the friction surface of the brake disc and forms an angle of 90°.



4. Turn the brake disc slowly, and record the reading.

   Caution: If the measurement result exceeds the allowable range of runout, it is necessary to install a new brake disc and re-check the runout of the brake disc.

2.6.5.4 Brake System Leakage Check

Inspection

Caution: Brake fluid can be dissolved in water, and the leakage traces of brake fluid may be washed away in rainy and snowy weather.

1. Depress the brake pedal several times, confirm that the pedal is not spongy, and bleed air from the brake system if necessary. Refer to: Brake system bleeding.
2. Check the brake fluid level.

   Caution: If the brake fluid level drops, but there is no obvious sign of leakage, check whether the end seal of the brake master cylinder body leaks.

2.6.5.5 Brake pad wear inspection

Inspection of front brake pad

1. Check the brake pad thickness through the inspection hole on the cylinder body. If necessary, check with a scale.

   Standard thickness: 9.5 mm

   Limit wear thickness: 2.0 mm

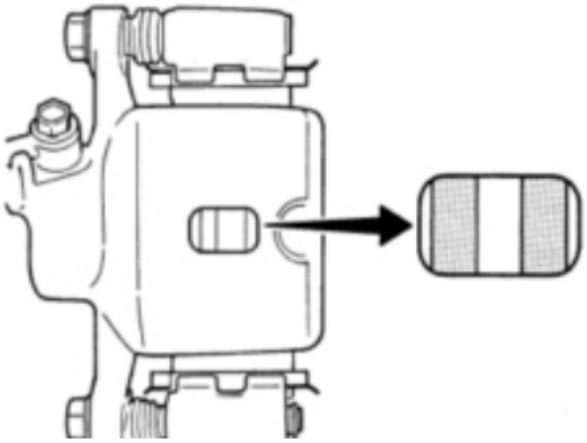
   Warning: Clean the caliper and brake pad with a vacuum cleaner to minimise damage caused by particulates and other substances in the air

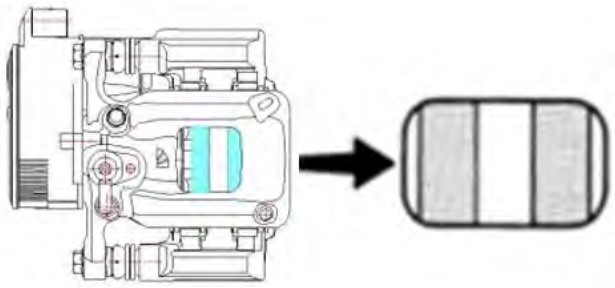
Caution: When removing the cylinder, please don't press down the brake pedal, otherwise the piston will pop up.

Caution: Please don't remove the bolts on the torsion bearing arm and brake hose unless the caliper component is to be removed or replaced. In such cases, ropes can be used to lift the cylinder up to prevent the brake hoses from being dragged.

Caution: Do not damage the piston dust cover.

Caution: Make sure there is no brake fluid on the brake disc.





Inspection of rear brake pad

1. Check the brake pad thickness through the inspection hole on the cylinder body. If necessary, check with a scale.

   Standard thickness: 9 mm

   Limit wear thickness: 2.0 mm

   Warning: Clean the caliper and brake pad with a vacuum cleaner to minimize damage caused by particulates and other substances in the air

   Warning: When removing the cylinder, please don't press down the brake pedal, otherwise the piston will pop up.

   Warning: Please don't remove the bolts on the torsion bearing arm and brake hose unless the caliper component is to be removed or replaced. In such cases, ropes can be used to lift the cylinder up to prevent the brake hoses from being dragged.

   Warning: Do not damage the piston dust cover.

   Warning: Make sure there is no brake fluid on the brake disc.

2.7 Drive shaft

2.7.1 Specification

2.7.1.1 Torque specification

Symbol	Part No.	Name	Quantity	Nm
1	B-2203081	Hex flange bolt	2	295±15

2.7.2 Operation Manual

2.7.2.1 Overview

The drive shaft system is a key component in electric vehicles. It is divided into the left front drive shaft assembly and the right front drive shaft assembly, both of which are composed of a telescopic constant velocity joint (inner universal joint), a centre-fixed constant velocity joint (outer universal joint) and an intermediate shaft. The intermediate shaft connects the telescopic constant velocity joint and the centre-fixed constant velocity joint. The sheath (sealing cover) and clamp are the internal parts that protect the centre-fixed constant velocity universal joint and the telescopic constant velocity universal joint. They should be protected from damage caused by harmful atmospheric conditions (such as extreme ambient temperature or ozone gas), foreign objects (such as dust or water). The telescopic constant velocity universal joint can change the working angle and perform telescopic sliding movement, while the centre-fixed constant velocity universal joint can only change the working angle.

The external splines of the universal joint handle are respectively connected to the internal splines of the drive motor differential and the chassis hub bearing, which plays a role in transmitting the power of the drive motor to the wheel end.

2.7.2.2 Exploded view

Item	Description
1	Front left drive shaft assembly
2	Front right drive shaft assembly



2.7.2.3 Precautions

Precautions during repair

1. Operate on a dust-free workbench whenever possible.
2. Please clean the outer surfaces of parts before disassembly and assembly.
3. Avoid contaminating parts and prevent foreign objects from entering during operation.
4. The disassembled parts must be carefully reassembled in the correct order. If the work is interrupted, cover the parts with a clean cover.
5. Use paper towels instead of fibre cloths to prevent lint from adhering to the parts.
6. After assembly, ensure the fasteners are checked for the specified torque.
7. Do not reuse the disposable parts and components.
8. Conduct a thorough inspection before repairing or replacing parts.

2.7.3 Diagnosis and testing

2.7.3.1 Accurate test A: vehicle deviation

Accurate test A: vehicle deviation

Fault phenomenon fault triggering conditions

Fault symptom	Description	Fault Recovery Conditions
Vehicle deviation	Drive shaft steering knuckle wear	Replace

Possible causes

– Drive shaft steering knuckle wear.

Repair recommendations

– Replace the drive shaft.

Visual inspection and inspection before diagnosis

– Check for looseness.

2.7.3.2 Accurate test A: vehicle vibration

Accurate test A: vehicle vibration

Fault phenomenon fault triggering conditions

Fault symptom	Description	Fault Recovery Conditions
Vibration	Drive shaft wear, damage, or bending	Replace
	Clearance between drive shaft and hub spline	Replace

Possible causes

– Drive shaft wear, damage, or bending.

– Clearance between drive shaft and hub spline.

Repair recommendations

– Replace the drive shaft parts.

– Replace the drive shaft or hub.

Visual inspection and inspection before diagnosis

– Check whether the drive shaft itself is loose or has other abnormal conditions.

– Check whether the drive shaft and hub unit are loose.

2.7.3.3 Accurate Test A: Abnormal noise and loud noise

Accurate Test A: Abnormal noise and loud noise

Fault phenomenon fault triggering conditions

Fault symptom	Description	Fault Recovery Conditions
Abnormal and loud noise	Drive shaft wear, damage, or bending	Replace
	Drive shaft hub spline wear	Replace
	Loose lock nut of drive shaft	Adjust or replace

Possible causes

– Drive shaft wear, damage, or bending.

– Drive shaft hub spline wear.

– Loose lock nut of drive shaft.

Repair recommendations

– Replace the drive shaft parts.

– Replace the drive shaft parts.

– Adjust or replace the nut.

Visual inspection and inspection before diagnosis

– Check whether the drive shaft itself is loose or has other abnormal conditions.

– Check whether the drive shaft and hub unit are loose.

– Check whether the drive shaft lock nut is loose.

2.7.3.4 On-board inspection and maintenance

Check if the drive shaft and universal joint are loose or subjected to other damages.

Check if the dust cover is subjected to crack or other damages.

Caution: In case of drive shaft subjected to noise or vibration, please replace the drive shaft assembly.

Common troubleshooting diagnosis table

Fault symptom	Possible causes	Solutions
Vehicle deviation	Drive shaft steering knuckle wear	Replace
Vibration	Drive shaft wear, damage, or bending	Replace
	Clearance between drive shaft and hub spline	Replace
Abnormal and loud noise	Drive shaft wear, damage, or bending	Replace
	Drive shaft hub spline wear	Replace
	Loosening of drive shaft nut of front axle	Adjust or replace

2.7.4 Removal and installation

2.7.4.1 Drive shaft assembly

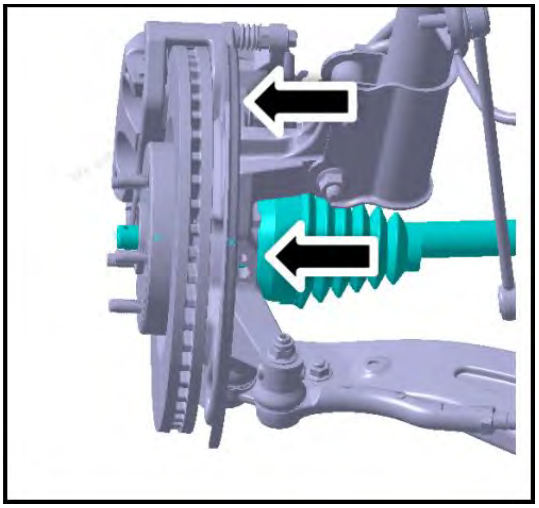
Removal

Caution: Protect the sheath (sealing cover) from damage by sharp tools and sharp edges of surrounding parts. Any damage to the sheath (sealing cover) or clamp will cause leakage. Leakage will cause water to leak into the telescopic constant velocity joint and the centre-fixed constant velocity joint. Leakage can also cause grease to escape from telescopic and centre-fixed constant velocity joints. Leakage may cause working noise of the front wheel drive axle and damage to internal components.

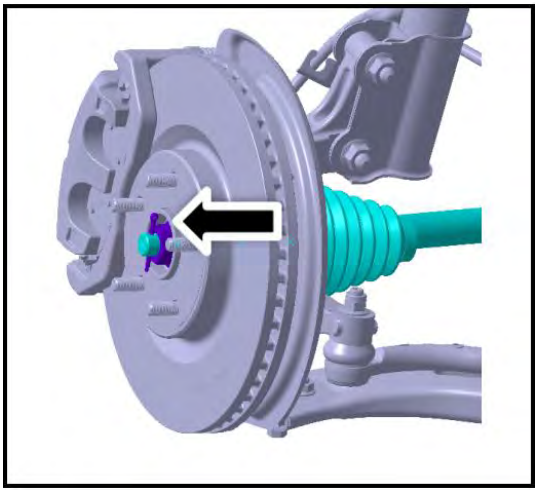
Caution: The function of the clamp is to prevent leakage of telescopic constant velocity joints and centre-fixed constant velocity joints at the housing and intermediate shaft positions.

Caution: The disassembly methods of the left and right front drive shaft assemblies are the same. This scheme is only explained with respect to the left front drive shaft assembly.

1. Lift the vehicle.Refer to: Lifting the vehicle.
2. Remove the rear tyres.Refer to: Tyre.
3. Remove the wheel speed sensor from the rear axle, then remove the front brake caliper assembly from the steering knuckle and fix it by hanging (Caution: Do not pull the wheel speed sensor harness, and do not step on the brake pedal after removing the brake caliper).



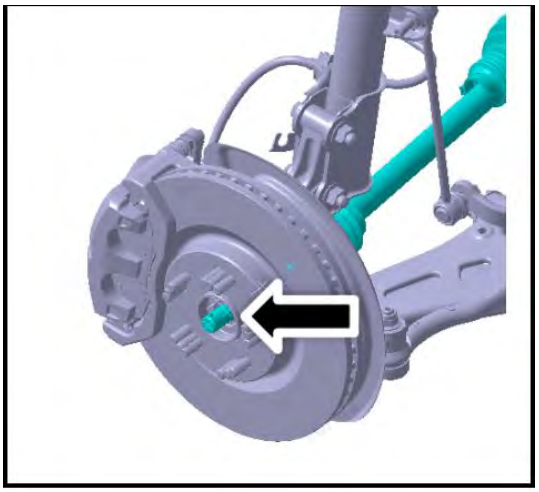
4. Remove the split pin and loosen the drive shaft nut of the front axle.



5. Lightly strike the drive shaft with a hammer (or suitable tool) and wood block to separate the drive shaft from the front axle steering knuckle assembly, and then remove the drive shaft nut of the front axle.

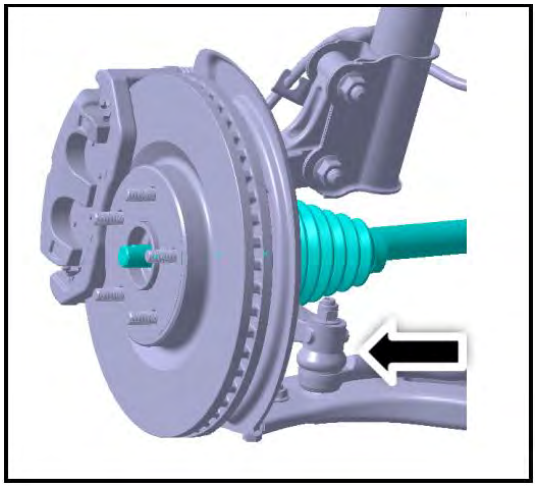
   Caution: When lowering the drive shaft, be sure to support the housing (universal joint assembly), shaft and other parts and components.

   Caution: If the hub still cannot be separated from the drive shaft after carrying out the steps above, use a puller (or suitable tools).

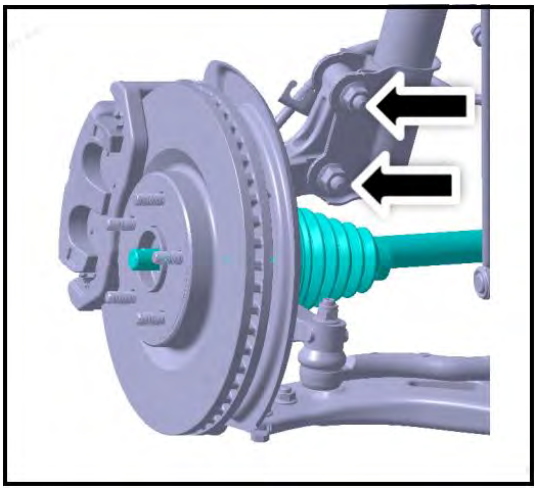


6. Remove the steering tie rod ball joint from the steering knuckle.

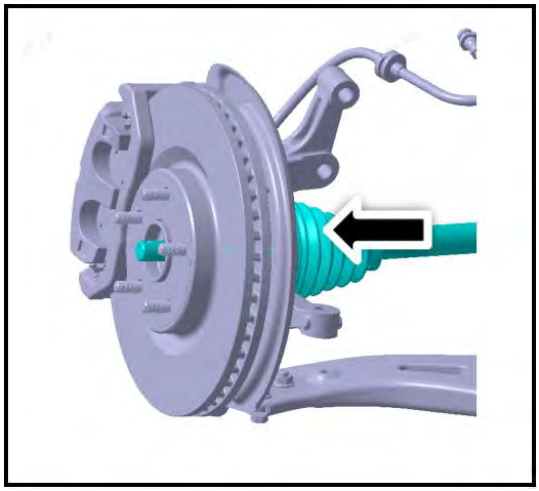
   Caution: Special tools should be used to avoid damaging the ball joint dust cover.



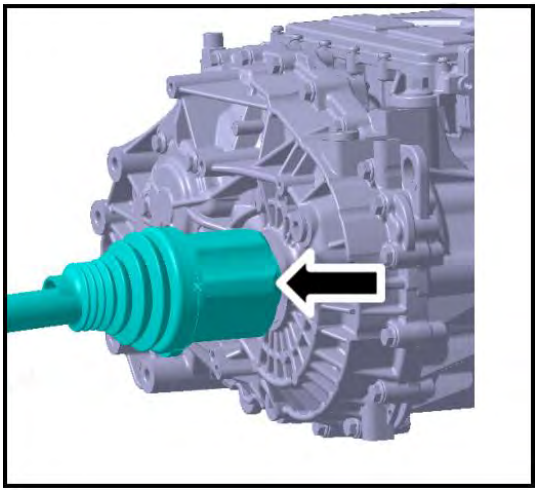
7. Loosen the fixing bolts of the shock absorber and the steering knuckle.



8. Remove the drive shaft from the hub bearing assembly.



9. Remove the drive shaft from the gearbox side.



10.

Installation

1. The installation order is the reverse of the removal order.

3.1 Safety and special operations

3.1.1 Battery safety

Risk identification

The power battery is at risk under the following conditions:

1. The wading depth of the vehicle reaches the sill height with no water inside the vehicle, and the wading time exceeds 30 min.
2. The high- and low-voltage connectors of the vehicle power battery are immersed in water.
3. The power battery of the vehicle is deformed, punctured and leaking liquid after collision.

Risk judgement

It is necessary to use a hand-held infrared thermal imager or an infrared thermometer to measure the highest temperature of the power battery at the first time when the risky vehicle is transported or enters the store. The measuring range of hand-held infrared thermal imager/infrared temperature tester must be -50 °C ~ 380 °C.

1. The temperature of the damaged part of the battery pack is 10°C higher than the ambient temperature or there is a significant temperature rise (2 °C/min) relative to the ambient temperature.

   Caution: In this case, it is necessary to cool the battery pack by spraying a large amount of water until the temperature drops below the ambient temperature.
2. The battery tray is seriously deformed (the depression depth of the bearing area is more than 10 mm) and damaged.
3. The battery has been ablated by flame or baked for a long time (distance to flame > 10 cm, duration > 10 min).
4. The battery is ablated by flame with ablation marks and baked closely (distance to flame < 10 cm, duration > 3 min).
5. Electric leakage is reported after wading and the wading time exceeds 30 min.
6. The battery tray is damaged or leaks.

   Caution: Any vehicle that meets any of the above conditions is considered a high-risk vehicle.

Risk handling

Transportation of risky vehicle

For vehicles that need to be transported to the store for maintenance, the risk level should be determined according to the risk identification content, and corresponding pre-transportation treatment should be carried out accordingly.

1. For risky vehicles, a hand-held infrared thermal imager or an infrared thermometer must be used to detect the highest temperature of the power battery. Vehicles with no abnormal temperature and not at high-risk level can be normally transported to the store for maintenance.
2. For vehicles with abnormal temperature or at high risk, the battery pack must be cooled by spraying a large amount of water. After fire extinguishing, it is necessary to continuously use water for cooling for more than 30 min until the temperature drops below the ambient temperature before transportation.
3. For batteries with abnormal temperature, the temperature should be measured every 5 min during transportation to determine whether cooling is required. For high-risk vehicles with no abnormal temperature, the temperature should be measured every 10 min during transportation to determine whether cooling is required.

Disposal of risky vehicles

After a risky vehicle arrives at the service centre, the risk level of the vehicle should be determined according to the risk identification content, and the vehicle shall be treated accordingly.

1. For risky vehicles, a hand-held infrared thermal imager or an infrared thermometer must be used to detect the highest temperature of the power battery. Vehicles with no abnormal temperature and not at high-risk level should be repaired normally according to the Service Manual, but the battery temperature must be detected every 1 h during the repair. If there is no abnormality for 12 h, it can be determined that the battery has no risk.

2. For vehicles with abnormal temperature or at high risk, the battery pack must be cooled by spraying a large amount of water until the temperature drops below the ambient temperature before the next step. The specific operation is as follows:

   1. If a vehicle with abnormal temperature arrives at the service centre, it should be cooled down (and the low-voltage power supply of the vehicle should be disconnected at the same time) to below the ambient temperature immediately before the next step.

   After a vehicle with abnormal temperature cools down or for a high-risk vehicle, it is necessary to remove the battery pack as soon as possible following the "Safe Repair" in Chapter III Safety. In addition, the power battery temperature must be monitored throughout the whole process. For abnormal temperature rise, a large amount of water shall be used for cooling.

   3. After being removed, the power battery should be moved to a safe area immediately to remove the sealing cover (cut the adhesive sealing cover directly with a knife, and please pay attention to avoid scratching personnel), and the connecting plates between all modules and BIC connectors should be disconnected quickly with electric insulating tools.

   4. All deformed and heating modules should be taken out separately and soaked in 3.6% salt water. During the soaking process, a large amount of hydrogen and oxygen will be generated by electrolysis, and the soaking place must be far away from fire sources and well-ventilated. Operators shall not wear any metal accessories to avoid sparks during operation, and shall pay attention to avoid static electricity generation in dry environment. Water spraying method can be used to eliminate static electricity generation. After being placed in 3.6% salt water for 12 h, the module voltage is measured to be lower than 1/2 of the nominal voltage, and then the module is dried with an air gun before being moved to the high-risk battery storage area. All other modules are lifted out of the tray synchronously and dried with an air gun. After being put back into the tray, they are transferred to the high-risk battery storage area and discharged to 5% SOC by discharging equipment.

   5. In case of water immersion, damage and heating of the sampling circuit, the side cover of each module shall be opened and all core sampling circuits shall be cut off (the part close to the core is cut off by 1 cm to prevent contact again). This operation is only applicable to batteries with centralized BMS using wires as sampling circuit. For batteries with distributed BMS using FPC sampling circuit, there is no need to cut off the sampling circuit.

   6. Maintenance after battery disassembly. See Safe Repair.

Storage and transportation of high-risk batteries

Storage conditions

The storage area for high-risk batteries shall meet the following requirements:

1. The stored high-risk batteries must be discharged and dried, and the batteries with various risk modes shall be stored in different categories in the storage area, which are divided into Class A - accident, Class B - soaking in water, Class C - abnormal voltage collection, Class D - high temperature and Class E - electric leakage, and relevant information labelling (vehicle information, fault conditions, etc.) shall be done. Leaking batteries shall be stored after being packed with anti-corrosion and leakage prevention treatment. There shall be no other live products or metal debris in the storage site.
2. The storage site is a separate storage area for dangerous batteries, which shall be far away from the production area and provided with warning signs such as "High Voltage" and "WARNING". No other materials or personnel are allowed to approach the site. The site needs to be provided with basic monitoring facilities and be inspected regularly. After the power battery enters the storage area, if it needs to be returned to the manufacturer, the battery should be packed well, and the claim label information shall be accurate and firmly affixed to ensure the traceability of the battery return. It is forbidden to store the battery with other liquids, inflammables, explosives, and hazardous chemicals.
3. It is not allowed to stack batteries. Multi-layer shelves made of steel can be used (the bearing weight of each layer shall be greater than twice the battery limited storage weight, and the shelf shall be clearly marked with the limited bearing capacity). In addition, the batteries shall be placed horizontally rather than obliquely, inverted or in a sleeper position, and other objects shall not be piled up on the batteries to avoid damage to the batteries caused by compression.
4. The storage environment shall be kept ventilated and dry, and shall avoid direct sunlight, exposure to the sun or rain. Dust-proof, waterproof and anti-static protection measures shall be taken. The storage temperature of batteries shall be within -20 ° C - 40 °C and the humidity shall be within 5 - 90%.

5. The storage area shall be equipped with fire-fighting facilities such as smoke alarm, automatic sprinkler system and automatic smoke exhaust system (it should be equipped with an infrared temperature monitoring system at the same time to realise remote alarm in case of abnormal temperature).

Transportation conditions

The transportation of high-risk batteries shall meet the following requirements:

1. The high-risk batteries to be transported must be those that have been discharged and dried without abnormal temperature rise for 24 h.
2. Protective packaging (waterproof, moisture-proof, anti-static and anti-corrosion) shall be used for high-risk batteries to be transported.
3. Loading environment: The road shall be unobstructed, and direct sunlight shall be avoided within the scope of loading activities. Inflammables, explosives, and hazardous chemicals are not allowed. Water and other liquids shall be prevented from entering the battery. Outdoor loading shall be suspended in case of severe weather such as rain.
4. Requirements for handling equipment: Professional equipment and tools, such as electric forklifts, manual forklifts with suitable carrying capacity or other suitable equipment, shall be used to handle and place the power batteries, so as to avoid damage to the power batteries during handling.
5. Requirements for transport vehicles: High-risk batteries shall be transported in closed compartments to prevent water from entering the battery due to rain during transportation. The power battery needs to be transported separately. If other objects need to be loaded on the transport vehicle, it is forbidden to transport them together with liquids, inflammables, explosives and hazardous chemicals.
6. Loading process: When the power battery is handled with equipment, professionals shall operate the equipment and handle the battery gently; throwing, rolling and heavy pressure are strictly prohibited. The packaged power batteries shall be loaded from the warehouse. It is not allowed to stack them halfway or on transport vehicles, making the power batteries bear heavy pressure.
7. Land transportation: During transportation, squeezing and collision between batteries or between the battery and the transport vehicle body due to sudden braking shall be avoided; during transportation, the storage temperature of power batteries shall be at -20 °C~45 °C, the humidity shall be 5~95%, and the time shall be within 72 h. If it exceeds the time limit, special treatment shall be carried out to control the temperature and humidity and ensure that the products are not exposed to water or sunlight.
8. Sea and air transportation: Specialised packaging certified for hazardous materials must be used for sea and air transportation, and ordinary packaging is not allowed. Packages for air transportation shall meet MH/T1020-2009 standard and pass UN38.3 test. The ambient temperature around the power battery package box shall not exceed 45℃, and the product must be kept away from water or sunlight.
9. Handling of land transportation emergencies:

   1. If the power battery leaks, stop the transportation and contact BYD's relevant after-sales personnel for handling. If the electrolyte of the power battery splashes on the skin and eyes, please rinse it with plenty of clean water for more than 15 min immediately, and then go to hospital for medical treatment.

   2. When the power battery catches fire, please use a non-water based fire extinguisher to put out the fire. In case of a large fire, put out the fire with plenty of water and keep cooling for 30 min after putting out the fire.

   3. During transportation, if the battery package box is accidentally wetted by water, remove it immediately to prevent the wetted box from becoming a conductor and causing battery discharge or burning of battery terminals.

   4. In case of collision, severe squeezing and other situations during transportation of the power battery, stop transportation and continue after potential safety hazards are eliminated by professionals.

10. Requirements for unloading process: The unloading environment and equipment shall be consistent with those for loading. The unloading storage site shall be free of direct sunlight, and the distance from heat source shall not be less than 2 m; before unloading, check the power battery package box for damage on the transport vehicle. When unloading, pay attention to the height of the compartment to prevent the battery from being damaged due to collision with the compartment caused by excessive lifting of the forklift.

3.1.2 General knowledge of safety

SRS

Due to high inflammability and explosibility, please observe the regulations of No Fireworks.

There is a gas generator inside, which contains a high-energy propellant. The propellant is completely sealed in the generator normally. Do not open it, otherwise explosion may occur. After the propellant is ignited, it will be completely consumed in reaction and can produce high-temperature gas (up to 2500 °C). In case of rupture of the gas generator, wear full protective equipment (such as protective clothing, protective gloves and goggles) to dispose of spillage.

Used SRS shall be packed in plastic bags and disposed of according to local regulations. If the human body is in direct contact with the gas generator, wash it thoroughly with clean water and seek medical advice depending on the severity.

Dos for operation of SRS:

1. Store the component in an upright position.

2. Keep the component dry.

3. When handling the component, place the protective cover side opposite to the human body.

4. Place the protective cover of the component upward.

5. Carefully check the component for damage.

6. When connecting the SRS, stand on the side of the component.

7. Calibrate and maintain all equipment.

8. Be sure to wash hands after handling a deployed SRS.

Don'ts for operation of SRS:

1. Do not store with highly flammable materials.

2. The storage temperature shall not exceed 80 °C.

3. Do not store upside down.

4. Do not open the housing.

5. Do not be exposed to naked flames or heat.

6. Do not place anything on the surface covering.

7. Do not use damaged SRS.

8. Do not touch the gas generator on fire for at least 10 min.

9. Do not use any electronic detector on its harness.

Refrigerant

Due to high inflammability and explosibility, please observe the regulations of No Fireworks.

Direct contact between the refrigerant and skin may cause frostbite.

Follow the instructions provided by the manufacturer. Wear appropriate protective gloves and goggles during operation.

If the refrigerant comes into direct contact with skin or eyes, immediately flush the contaminated area with clean water. In case of contact with eyes, wash with appropriate cleaning solution. Do not wipe. Seek medical help if you feel unwell.

Don'ts for refrigerant operation:

1. Do not expose the refrigerant bottle to sunlight or place it in a heat source.

2. Do not place the refrigerant bottle upright. Keep the valve downward during filling.

3. Do not refrigerate the refrigerant bottle.

4. Do not drop the refrigerant bottle.

5. Do not discharge the refrigerant into the air.

6. Do not mix different refrigerants, such as R12 (freon) and R134a.

Precautions for marking, packaging, transportation and storage of refrigerant:

1. The refrigerant container shall have firm and clear marks, including product name, trademark, manufacturer and its address, net content, batch number, product grade, standard number and "Keep away from the sun" mark specified in GB 191.

2. It shall be packed in special steel cylinders. Reusable cylinders shall be coated in aluminium white, and non-reusable cylinders shall be coated in sky blue.

3. The filling coefficient shall not be greater than 1.02 kg/L during filling of the cylinder.

4. The reused cylinders shall be maintained in positive pressure after use.

5. During loading, unloading and transportation, safety helmets shall be worn to prevent impact, dragging, dropping and direct exposure. The cylinder shall be transported in accordance with relevant national or regional regulations.

6. It shall be stored in a cool and dry place, kept away from heat sources, and strictly prohibited from sunlight and rain.

Coolant

Common coolants include isopropanol, ethylene glycol and methanol, which are highly inflammable.

When the coolant is heated, vapour will be generated. In order to avoid inhalation and burns of vapour, the coolant shall cool down before operation.

The coolant will be absorbed through the skin, which is harmful if the human body absorbs too much. It is very dangerous to swallow the coolant. In case of swallowing, seek medical advice immediately.

Do not come into contact with any public articles, food or drinking water source.

Low-voltage battery acid

For models equipped with ordinary lead-acid batteries, the gas released during charging is flammable and explosive. Do not use naked flames or generate sparks near lead-acid batteries that are being charged or newly fully charged. During charging, ensure good ventilation.

Brake fluid

Splashing the brake fluid to the skin or eyes will cause slight irritation. Therefore, avoid contact with skin and eyes as much as possible.

It is corrosive to the body paint. Therefore, avoid dripping on the surfaces of the body and painted parts during operation, or wipe off the brake fluid on the painted surface as soon as possible.

Observe the followings for operation of the brake system:

1. For the brake pipeline joint with two fastening nuts, use two tools to loosen or tighten the nuts at the same time to prevent the brake pipeline from being deformed under stress.

2. Ensure that the brake hose is naturally bent without distortion and deformation.

3. Secure the brake pipe with fixing clips so that it does not come into contact with the positions with potential wear.

4. Keep the container for brake fluid clean.

5. Seal and store the brake fluid. Otherwise, it will absorb moisture in the air, resulting in decrease of the ignition point and failure, which is easy to cause danger during use.

6. Do not contaminate the brake fluid with mineral oil, or store unused brake fluid in a container that is filled with mineral oil.

7. Do not reuse the brake fluid discharged from the vehicle brake system.

8. Always use clean brake fluid or an acceptable substitute to clean hydraulic parts.

9. After disconnecting the brake pipeline, install a suitable end cap or plug immediately to prevent sundries from entering.

10. Use only brake pipeline joints with appropriate threads or vents.

11. When operating hydraulic parts, keep them absolutely clean.

Fuel

It includes petrol and diesel. For fuel vehicles, gasoline is highly volatile and flammable, so exposure to the air shall be avoided, especially in confined spaces. The naked flame and heat shall be kept away from the fuel.

Kerosene

It is usually used as fuel for heating, solvent and detergent.

For inflammables, please observe the regulations of No Fireworks.

Swallowing will cause irritation to mouth and throat. This can be more dangerous if the liquid is inhaled into the lungs as a result of swallowing.

Contact with the skin will lead to dry skin and allergy or dermatitis. Slight discomfort may occur if it splashes into eyes.

Under normal conditions, it does not generate harmful vapors due to low volatility. Avoid exposure to high temperature. Avoid contact with the skin and eyes, and ensure good ventilation.

Lubricant and grease

Avoid prolonged or repeated contact of the body with the lubricant or grease. All lubricants and greases may be irritating to eyes and skin.

Used lubricating oil: Prolonged and repeated contact with mineral oil can result in loss of natural fat from the skin, causing dryness, irritation and dermatitis. In addition, used lubricating oil contains potentially harmful contaminants that may cause cancer. Appropriate skin protection methods and washing equipment must be provided.

The combustion of used lubricating oil in smaller heaters or boilers is limited to units permitted by the design. In case of doubt, contact the relevant local government agencies and manufacturers of licensed products.

Do not discharge lubricants and grease into the environment.

Acids and alkalis

Materials generally used for batteries and cleaning, such as corrosive sodium carbonate and sulfuric acid. Avoid splashing on the skin, eyes and clothing. Wear appropriate protective aprons, gloves and goggles. Do not inhale the spray.

It is irritating and corrosive to the skin, eyes, smell and throat, causing burns and destroying ordinary protective clothing.

When in use, ensure that the eye lotion, showers and soap are available for emergency treatment in case of contact.

There shall be danger signs in the storage place.

Solvent

Common solvents include acetone, petroleum spirit, toluene, xylene and trichloroethane. They are used for cleaning and dewaxing of materials, paints, plastics, resins and diluent.

Some solvents are highly flammable. Repeated or prolonged contact with the skin will degrease the skin and cause skin irritation and dermatitis. Some solvents may be inhaled by the skin, resulting in increased damage to human body. Splashing into the eyes may cause severe irritation and blindness. Short exposure to high concentrations of steam or fumes may cause irritation to eyes and throat, drowsiness, dizziness, headache, and in severe cases, loss of consciousness. Repeated or prolonged exposure to excessive but lower concentrations of steam or fumes may result in more serious human injuries. Choking the solvent into the lungs due to vomiting will have serious consequences. Avoid splashing on the skin, eyes and clothing. Wear protective gloves,

goggles and protective clothing during operation. Ensure good ventilation during use, avoid inhalation of fumes, steam and spray, and keep the container tightly sealed. Do not use in a closed environment. When organic solvents such as paint, adhesive and coating are sprayed, use special ventilation equipment or personal respiratory protection equipment under poor ventilation. Do not heat or ignite the solvent unless specifically detailed by the manufacturer.

Adhesives and sealing materials

Due to high inflammability, please observe the regulations of No Fireworks. During use, pay attention to keeping the articles clean and tidy, such as covering seats with discardable paper. Use other containers with appropriate labels as far as possible, such as applicators and secondary containers.

Solvent adhesives/sealing materials

Follow the manufacturer's instructions for use. Refer to "Solvents" in this section for solvent instructions.

Aqueous adhesives/sealing materials

Polymeric emulsions and rubber latex materials may contain small amounts of volatile poisonous and harmful chemicals. Avoid contact with the skin and eyes during use, and pay attention to ventilation.

Hot melt adhesives

They are harmless in solid state. They may cause burns in melted state, or inhalation of poisonous fumes presents health hazards. Wear appropriate protective clothing and pay attention to ventilation during use. The heater shall have the temperature control function such as automatic cut-off.

Resin adhesives/sealing materials

Examples are epoxide and resin-based formaldehyde. Mixing shall be carried out in a well-ventilated place because harmful or poisonous volatile chemicals may be released. Direct contact of the skin with untreated resin and hardener will result in absorption of poisonous and harmful chemicals, causing allergy and dermatitis. Splashings may cause injury to eyes.

Anaerobic cyanoacrylate adhesives (super glue) and other acrylic adhesives

Most of them are irritating, which can cause allergy or injury to the skin and respiratory tract. Some of them are irritating to eyes. Follow the manufacturer's instructions for use to avoid contact with the skin and eyes.

Cyanoacrylate adhesives (super glue)

They shall not be in contact with the skin or eyes. If the skin or eye tissue is adhered, cover with a clean wet towel and seek medical advice immediately. Do not tear off the adhesion. Use in a well-ventilated area because vapour can irritate the nose and eyes.

For dual-combination systems, refer to "Resin adhesives/sealing materials" and "Isocyanate adhesives/sealing materials" in this section.

Isocyanate (polyurethane) adhesives/sealing materials

Personnel with asthma or respiratory sensitivity shall not handle or approach these materials to avoid allergic reactions. Prolonged exposure can cause eye and respiratory irritation. High concentration can affect the nervous system, such as sleepiness. Under extreme conditions, shock due to loss of consciousness may occur. Prolonged exposure to high concentrations of vapour can cause adverse health effects. Prolonged skin contact will lead to degreasing and cause skin allergies, and in some cases dermatitis. Splashes into the eyes can cause eye discomfort and may cause damage. Carry out spraying preferably at the exhaust vent, keep the vapour and mist droplets away from the area for breathing, and wear appropriate gloves, goggles and respiratory protection equipment.

Foam materials

They are generally used for noise insulation. The treated foam materials are used for seats and decorative cushions, which can enhance the comfort of stepping on the carpet and also provide protection for feet in case of collision. Persons who suffer from chronic respiratory disease, asthma, bronchial disease or allergies are not allowed to work in or near untreated materials. Their

parts, vapour or spray can cause direct irritation or allergic reactions, and may even be poisonous or harmful. Do not inhale the vapour or spray of foam materials. Such materials must be used with good ventilation and respiratory protection. Remove the respirator after the vapour/spray is completely eliminated, otherwise the vapour and spray will be inhaled into the human body. The combustion of foam materials will produce poisonous and harmful fumes. Do not smoke or use open flame or electrical equipment during foaming operation, but wait until the vapour completely disappears. Carry out thermal cutting of any foam material or specially treated foam material with good ventilation.

Chemical Materials

Chemical materials such as solvents, sealing materials, adhesives, paints, resin foam materials, battery acid, high-voltage battery electrolyte, coolant, brake fluid, lubricating oil and grease must be stored and handled carefully. They may be poisonous, harmful, corrosive, irritating or highly flammable, producing harmful fume and dust.

Dos for operation of chemical materials:

1. Please carefully read and follow the hazard warnings and protection requirements on the material container label, attached instructions or other instructions. The data sheet of material health and safety can be obtained from the manufacturer.
2. Remove chemical materials from the skin and clothing immediately after contamination. Wash or discard seriously contaminated clothing.
3. Organise work practices, wear protective clothing to avoid contact with the skin and eyes, and avoid inhalation of vapour, mist, dust or fume, improper container labelling, and combustion and explosion hazards.
4. After handling chemical materials, wash hands before taking a break, eating, smoking, drinking or using toilets.
5. Keep the workplace clean, tidy and free of spillage.
6. Store chemical materials according to relevant national and local regulations.
7. Keep chemical materials out of the reach of children.

Don'ts for operation of chemical materials:

1. Do not mix chemical materials without the manufacturer's instructions. Some chemical materials will produce other poisonous and harmful chemical materials after mixing, thus releasing toxic fumes or becoming explosive.
2. Do not spray chemical materials, especially solvent-based materials, in closed space, such as when someone is in the vehicle.
3. Do not put chemical materials near heat sources or open flames unless directed by the manufacturer. Some materials are highly flammable, or may release poisonous or harmful fumes.
4. Do not leave the container open. The released fumes will accumulate to poisonous, harmful or explosive concentrations. Some fumes are heavier than the air and will accumulate in confined spaces, such as wells.
5. Do not put chemical materials into unmarked containers.

Anti-corrosion materials

Due to high inflammability and explosibility, please observe the regulations of No Fireworks. There are wide varieties of these materials, including solvents, resins or petroleum products, which must follow the manufacturer's instructions. Avoid contact with the skin and eyes. They shall only be sprayed in well-ventilated space, rather than confined space.

Fibre isolation materials

They are generally used for sound insulation. Fibre surfaces and cut edges can irritate the skin, which is usually a physical rather than chemical reaction. Take some measures, such as the use of gloves to avoid excessive contact with the skin.

Fluororubber

It is usually used to make parts such as O-ring, seal or cylinder gasket. Fluororubber is a fluoroelastomer, which is a kind of fluorinated synthetic rubber materials. It is very safe normally. However, in case of exposure to a temperature exceeding 400 °C, this material will not burn but will decompose, producing hydrofluoric acid and other substances. Hydrofluoric acid is very

corrosive and can be directly absorbed into the human body by contact. O-rings, seals or gaskets exposed to high temperature will be charred or turn into black viscous substances. Do not touch them or their attached objects in any case. Make consultations firstly to determine if the affected O-ring, seal or gasket contains fluororubber or other fluoroelastomers. Take care in case of any uncertainty, because the raw materials of such parts are likely to be fluororubber or other fluoroelastomers. If the parts containing fluororubber or other fluoroelastomers have been exposed to high temperature, carefully clean the potentially affected areas before working. Always wear disposable protective plastic gloves for hazards, before disposing of decomposed fluororubber residues and cleaning the area at last, neutralise the acid with steel wool and lime water (containing sodium hydroxide), and wash the affected area with clean water. Carefully dispose of waste plastic gloves.

Soldering tin

Soldering tin is a mixture of metals with a melting point lower than that of structural metals (usually lead and tin). If a gas-air flame is used to heat the solder, the use of solder does not usually produce toxic lead gas. Do not use acetylene-oxygen flame to heat solder, because the temperature is too high and lead gas is easily generated. If inhaled by human body, it will cause poisoning. For use of any flame on the soldering tin surface covered with grease, some gases may be generated, and shall not be inhaled. Be careful when removing excess soldering tin to avoid inhaling fine lead dust. Use respiratory protective equipment if necessary. Collect spilled soldering tin and filings and remove immediately to avoid electrical short circuit and environmental pollution. After using the welding tongs, wash hands or clothes in contact with soldering tin to avoid lead intake by the body.

Dirt and dust

Powder, dirt or dust may be irritating, harmful or poisonous. Avoid inhaling powdery chemical materials, or dust caused by dryness and friction. In case of poor ventilation, wear protective equipment such as breathing mask. Since fine dust of combustibles may cause explosion, keep them away from naked flames or sparks.

Electric shock

Electric shock may result from electric leakage of high-voltage components, use of faulty components or incorrect operation of normal equipment. The orange cables on the vehicle are high-voltage cables, and the components labelled with "High Voltage" are high-voltage components. When the vehicle is in a high-voltage state or when such components are damaged, they are particularly dangerous. Do not touch them at will.

Precautions for electrical safety:

1. Ensure that the electrical equipment is well maintained and frequently tested. Mark faulty equipment and preferably remove.
2. Ensure that the wires, cables and connectors are not worn, kinked, cut, cracked or otherwise damaged.
3. Make sure that electrical equipment and cables do not come into contact with other liquids such as water and coolant.
4. Make sure that the electrical equipment is protected by the correctly rated fuse.
5. Do not misuse electrical equipment or use it in any wrong way. It may be fatal.
6. Ensure that the cables of movable electrical equipment are not tangled or damaged, such as during the vehicle lifting.
7. Ensure that relevant staff have received basic first aid training.

In case of electric shock:

1. Turn off the power supply before touching the victim.
2. If the power supply cannot be turned off, push or drag the victim away from the power supply by using dry insulating materials.
3. If the victim falls into a coma after being away from the power supply, perform correct cardiopulmonary resuscitation immediately.
4. Seek medical advice as soon as possible.

For hybrid and pure electric vehicles, observe the following for operation of high-voltage system:

1. The components of high-voltage system must be maintained by qualified maintenance technicians. Improper maintenance may cause damage to personnel, vehicles or equipment.
2. The high-voltage system is subject to several hundreds of volts or more. During removal and installation of high-voltage components, wear protective articles at all times, such as insulating gloves and shoes.
3. Before repair, removal and installation of high-voltage components, deactivate the high-voltage power supply of the vehicle. Make sure that the negative cable of starter Fe battery has been disconnected, and leave the vehicle standing for more than 5 min.
4. If the maintenance area is close to high-voltage components, turn off the ignition switch/Start switch of the vehicle before maintenance, and leave the vehicle standing for more than 5 min.
5. Do not place the power battery pack near naked flames or heat it.
6. The power battery pack contains acid electrolyte to avoid contact with eyes, skin and clothing. In case of accident, rinse with clean water and seek medical advice immediately.
7. In case of severe collision or waterlogging, the power supply battery pack may be damaged or the vehicle cannot be driven from the flooded area. Cut off the power supply provided it is safe to do so. Deactivate the high-voltage power supply of the vehicle as appropriate, and disconnect the negative cable of battery (lead-acid battery or starter Fe battery), and take rescue measures as required. Keep a safe distance from the vehicle, and place high-voltage warning signs around the vehicle.

Charging

Electromagnetic radiation will be generated when the vehicle is charged, and the people with cardiac pacemaker or AED shall not get close to the vehicle (including getting in the vehicle and loading/unloading articles in the boot). Ensure that the socket of the charging connector is dry before charging, and the charging connection is not wetted by rainwater or other liquids during charging.

Fire

Many materials related to vehicle maintenance are highly flammable. Some materials will produce poisonous or harmful gases after burning. For storage and disposal of flammable and explosive materials or solvents, strictly observe safety regulations, especially when approaching electrical equipment or performing welding operations. Provide corresponding fire extinguishers for use of welding or heating equipment.

In case of a fire in the vehicle, carry out the following operations provided it is safe to do so:

1. Turn off the ignition switch/Start switch of the vehicle, and look for a dry powder fire extinguisher nearby to put out the naked flame.
2. Immediately call the local rescue centre for rescue.
3. Deactivate the high-voltage power supply of the vehicle as appropriate, and disconnect the negative cable of battery (lead-acid battery or starter Fe battery).
4. If the fire is serious, keep away from the vehicle.

Fire extinguisher

For some highly diffusive gases, such as hydrogen and acetylene gas, it is difficult to dilute the gas in the whole space after using the dry powder fire extinguisher. Dry powder residues will be left in the precision instruments and meters. In these cases, dry powder fire extinguishers are not suitable. Follow the instructions on the fire extinguisher for use. Do not use the fire extinguisher improperly.

Noise

Some operations may generate high noise, so wear appropriate hearing protection equipment. Otherwise, it may cause damage to hearing.

General repair shop tools and equipment

It is important that all tools and equipment are well maintained and safety equipment is correctly equipped as specified. Do not use tools or equipment for purposes other than those as designed. Do not overload equipment such as cranes, jacks, axles and chassis or lifting ropes. Damage due to overload will not be immediately apparent and may cause fatal injury in the future use of the equipment. Do not use damaged or faulty tools or equipment, especially high-speed equipment such as grinders. A damaged grinder may disintegrate at any time, resulting in serious injury.

Wear goggles when using grinders, chisels or sand blasting equipment. Wear an appropriate breathing mask when using sand blasting equipment, handling asbestos-based materials or using spraying equipment. Ensure adequate ventilation to control dust, fumes and gases.

Suspended load

Do not use non-special equipment to lift the vehicle, so as to avoid injury caused by sliding of the vehicle. There is always a risk when the load is lifted or suspended. Do not work under a load without support or suspension or under a lifted load, such as a hoisted powertrain. Ensure that lifting equipment such as lifts, jacks, cranes, axle stands and slings are suitable for the type of work and that they are in good condition and properly maintained.

Warning signs for vehicles, equipment or places

There are warning labels on the surface of some vehicle parts, equipment surfaces and in the display area in some places. Do not remove these warning labels, and make sure that contents on their surfaces are legible and unobstructed. These warning labels are used to remind relevant personnel. If they cannot be seen, these warnings may be ignored, resulting in safety hazards.

Electrical safety

Hazardous current

1. AC above 25 V and DC above 60 V are dangerous.
2. The maximum allowable contact voltage in Germany (according to VDE standard) is 50 V AC and 120 V DC.
3. A current of about 5 mA flowing through the human body can be regarded as an "electrical accident". In this case, the person feels numb, but can still conduct away the current.
4. When the current of about 10 mA flows through the human body, it reaches the limit of conduction current. The human body starts to contract and cannot conduct the current anymore, and the current lasts longer accordingly.
5. Prolonged duration of 0 to 50 mA AC can cause respiratory arrest and ventricular fibrillation.
6. A current of about 80 mA flowing through the human body is considered "lethal".
7. AC voltage produces AC in the human body, which will cause the muscle tissue and heart to fibrillate.
8. The lower the frequency of AC voltage, the higher the risk.
9. AC will cause ventricular fibrillation, which will be fatal in case of no first aid.

Internal resistance of human body

For high current caused by high voltage, as the corresponding resistance in the human body is very low, and the blood in all blood vessels acts as a good conductor, different contact points in electrical accidents have different influences on human body accordingly. The skin resistance varies greatly (depending on skin hardness, humidity, conductivity, etc.). However, for voltages above 100 V, the skin resistance is almost 0 Ω! The skin may be completely punctured. For AC, it is fatal if the current stays in the heart for about 10-15 ms! (ventricular fibrillation).

Electrical accident

Electric shock and accident consequences

Electric shock effect: When the current is lower than the conduction limit, corresponding electric shock response will occur, which may easily cause injuries due to uncontrolled limbs and loss of balance.

Thermal effect: Burns, scorching and internal burns can occur at the current lead-in/lead-out points. As a result, the kidney is overloaded and even fatal injuries occur.

Chemical effect: Blood and cell sap become electrolytes and are electrolysed. Severe poisoning occurs consequently. The poisoning can only be noticed after several days, with serious injury.

Muscle stimulation effect: All body functions and muscle movements are controlled by the brain through electrical stimulation of the nervous system. In case of high current through the body, muscle twitch occurs and the brain cannot control the muscular tissue.

Thermal effect in case of static short circuit: The sudden heating of the tool can cause the material to melt, resulting in burns.

Sparks due to short circuit: The metal melts quickly, generating splashing sparks. The temperature of the splashing metal particles exceeds 5000 °C. It may cause burns and serious injury to eyes.

Arc generated when the live high-voltage line is connected or disconnected: Light radiation may cause electric ophthalmia.

First aid measures for electric shock accidents

The following first aid measures shall be taken to rescue the injured in an electrical accident:

1. Your own safety is the first priority. Do not touch any person who is still in contact with the power supply.

2. If possible, power off the electrical system immediately (turn off the ignition switch).

3. Use non-conductive objects (wooden boards, broom handles, etc.) to separate the injured or conductor from the power supply.

3.1.3 Important warnings for disconnecting battery

CAUTION

1. Unless otherwise stated in the operating procedures, make sure that the vehicle is in the "OFF" mode and all electrical loads are turned off before starting the repair of any electrical component.
2. Disconnect the negative pole of the battery if the tool or equipment is liable to touch any exposed live electrical terminal during operation.
3. Violation against the above safety instructions may result in personal injury and vehicle damage.

Important warnings for road test

Warning: Perform a road test on the vehicle while ensuring safety and complying with all traffic regulations. Do not try any operation that may endanger the control over the vehicle.

Warning: Violation against the above safety instructions may result in personal injury and/or vehicle damage.

Guidance on troubleshooting of high-voltage electrical system

Troubleshooting of high-voltage electrical system at power-off

Caution: Situations requiring power-off of high-voltage electrical systems: Before repairing any components of the high-voltage electrical system, power off the system according to the following requirements, and power it on after repair, unless otherwise specified in the operating procedure.

Caution: All high-voltage system harnesses of the vehicle are orange. Before repairing any components of the high-voltage system, take protective measures according to the repair requirements of the high-voltage system, such as wearing insulating gloves, insulating shoes and goggles, laying insulating pads, and setting high voltage warning signs.

Caution: Repair operations on the high-voltage electrical system must be carried out by technicians with qualifications recognised by BYD and in compliance with local regulations.

Caution: Violation against these safety reminders may result in personal injury or vehicle damage.

Caution: High-voltage live line measurement must be carried out with one hand. For example, at least one probe end of the instrument used for measurement shall be equipped with an insulating alligator clip. During measurement, the alligator clip shall be clamped to one terminal of the positive and negative terminals of the circuit first, and then another probe shall be connected to the other terminal of the circuit for measurement. During measurement, only one hand can be used to hold the probe, and the other hand must not touch the vehicle.

Caution: Before operation, power off the high-voltage system. Firstly, power off the vehicle, disconnect the negative terminal of battery and the low-voltage service disconnect, wait for 5 min, and then disconnect the high-voltage bus led out from the power battery pack to ensure that the voltage between the disconnected high-voltage buses is within a safe voltage range (less than 60 VDC).

Caution: During operation, operators shall properly keep the removed high-voltage and low-voltage system wires, wrap them with special insulating rubber sleeves, and do not expose wire terminals to prevent electric shock or other accidents.

Power-off and power-on of high-voltage electrical system

Caution: Situations requiring power-off of high-voltage electrical systems: Before repairing any components of the high-voltage electrical system, power off the system according to the following requirements, and power it on after repair, unless otherwise specified in the operating procedure.

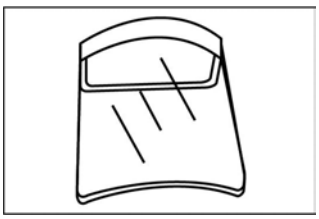
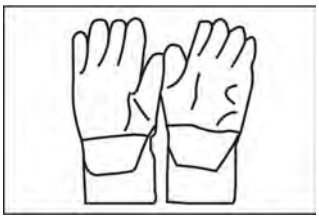
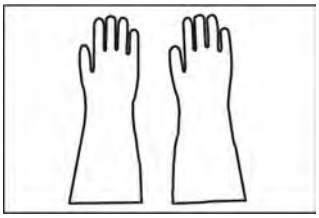
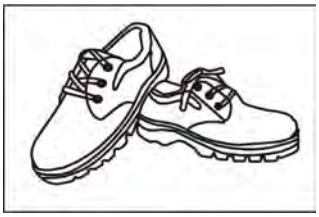
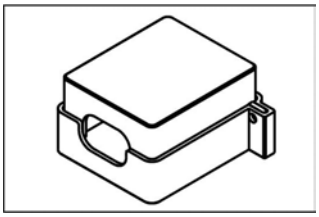
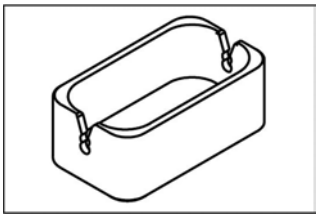
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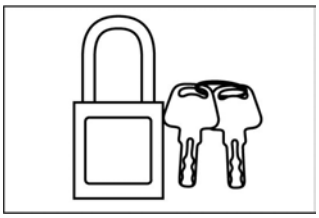
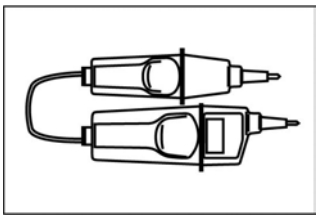
wearing insulating gloves, insulating shoes and goggles, laying insulating pads, and setting high voltage warning signs.

Caution: Repair operations on the high-voltage electrical system must be carried out by technicians with qualifications recognised by BYD and in compliance with local regulations.

Caution: Violation against these safety reminders may result in personal injury or vehicle damage.

Personal protective equipment and tools

S/N	Picture	Name	Description
1		Protective mask	
2		Insulating gloves	Insulation voltage above 1000 V
3		Non-slip gloves	
4		Insulating shoes	Insulation voltage above 1000 V
5		Protective cover for high-voltage cable connector	For protecting the plug and preventing electric shock
6		Protective cover for high-voltage cable connector	For protecting the plug and preventing electric shock

S/N	Picture	Name	Description
7		Insulating lock	
8		Voltage tester	For checking voltage of high-voltage components

3.2 Powertrain mount

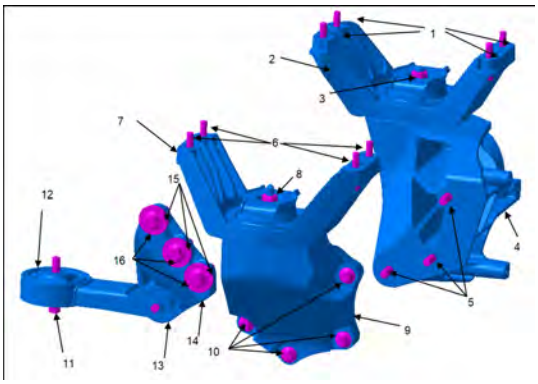
3.2.1 Specification

3.2.1.1 Specification

Symbol	Part No.	**Name**	Quantity	**Nm**
1	Q1841045TF38	Hex flange bolt	4	55±5
3	Q33114T13F38	All-metal hex flange lock nut	1	140±15
5	Q1851250TF38	Hex flange bolt	3	110±10
6	Q1841045TF38	Hex flange bolt	4	55±5
8	Q33114T13F38	All-metal hex flange lock nut	1	140±15
10	Q1851250TF38	Hex flange bolt	4	110±10
11	Q1851270TF38	Hex flange bolt	1	110±10
13	Q1851280TF38	Hex flange bolt	1	110±10
15	Q1851460TF38	Hex flange bolt	3	140±15

3.2.2 Instructions and operations

3.2.2.1 Instructions and operations



Symbol	Part No.	Name	Quantity
2	SX5G-1001540	Left mount cushion assembly of drive unit	1
4	SX5G-1001510	Drive unit left mount bracket assembly	1
7	SX5G-1001540	Left mount cushion assembly of drive unit	1
9	SX5G-1001520	Drive unit right mount bracket assembly	1
12	SX5G-1001560	Rear mount cushion assembly of drive unit	1
14	SX5G-1001530	Rear mount bracket of drive unit	1
16	Q402B14F36	Large washer	3

3.2.2.2 Overview

The drive motor mount system is a key component in electric vehicles. It plays a role in two-way vibration isolation between the drive motor and the frame. It not only reduces the transmission of drive motor vibration and howling to the vehicle, but also attenuates the vibration caused by road excitation.

3.2.3 Removal and installation

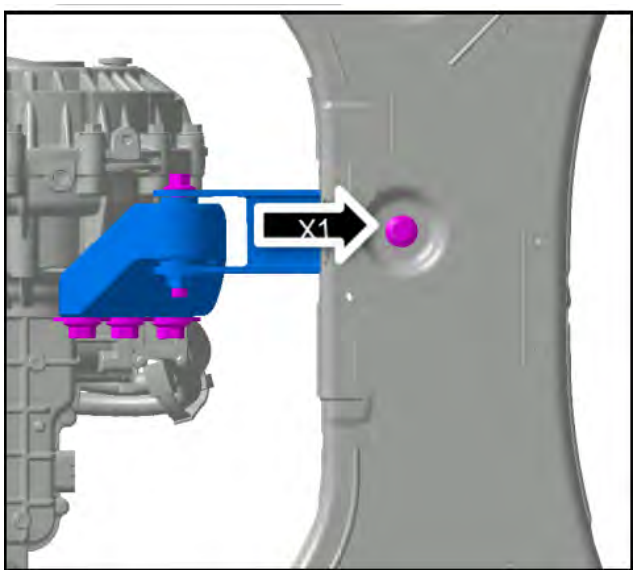
3.2.3.1 Removal and installation of drive motor mount assembly

Removal of rear mount

Caution: The removal steps in this process may include detailed information on the installation steps. To ensure safety, before performing this step, the crane wire rope should be installed on the motor lifting lugs, or the bottom of the motor should be supported by a jacking device to prevent the motor from falling.

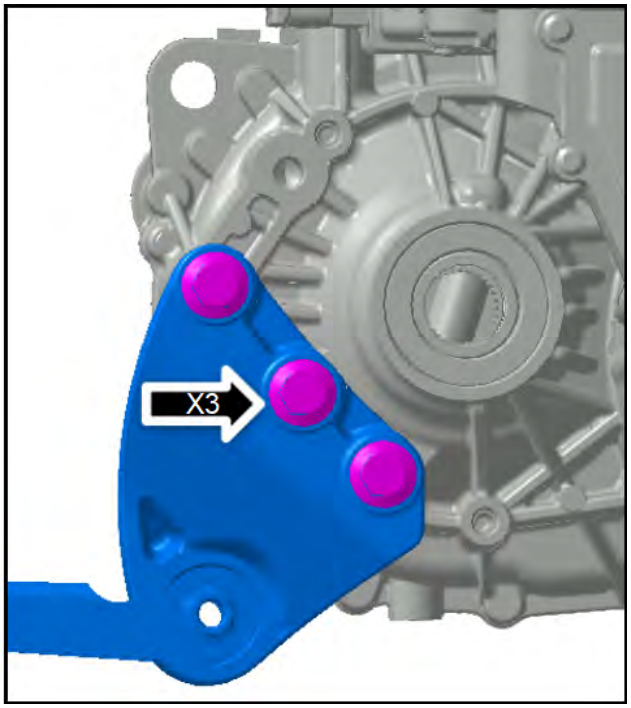
1. Use a torque wrench to remove the fixing bolts of the drive unit rear mount cushion and subframe.

   Torque: 110 ± 10 Nm



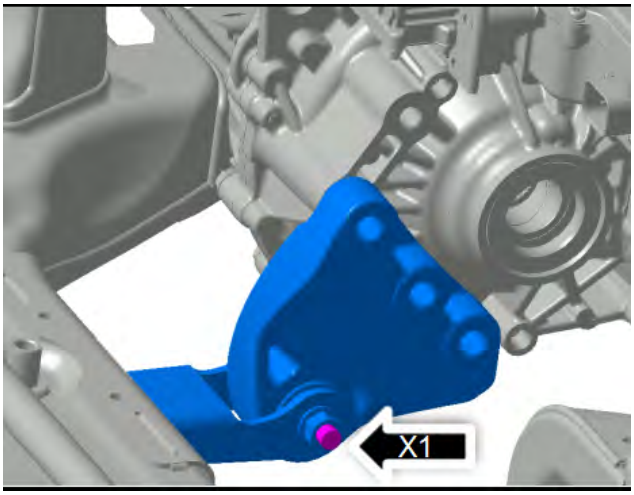
2. Use a torque wrench to remove the fixing bolts and large washers between the drive unit rear mount bracket and the motor.

   Torque: 140 ± 15 Nm



3. Use a torque wrench to remove the drive unit rear mount cushion and the drive unit rear mount bracket connection bolts.

   Torque: 110 ± 10 Nm



4. Remove the rear mount cushion and rear mount bracket.

Installation

1. The installation order is reverse to the removal order.

3.3 Electronic gear shifter module

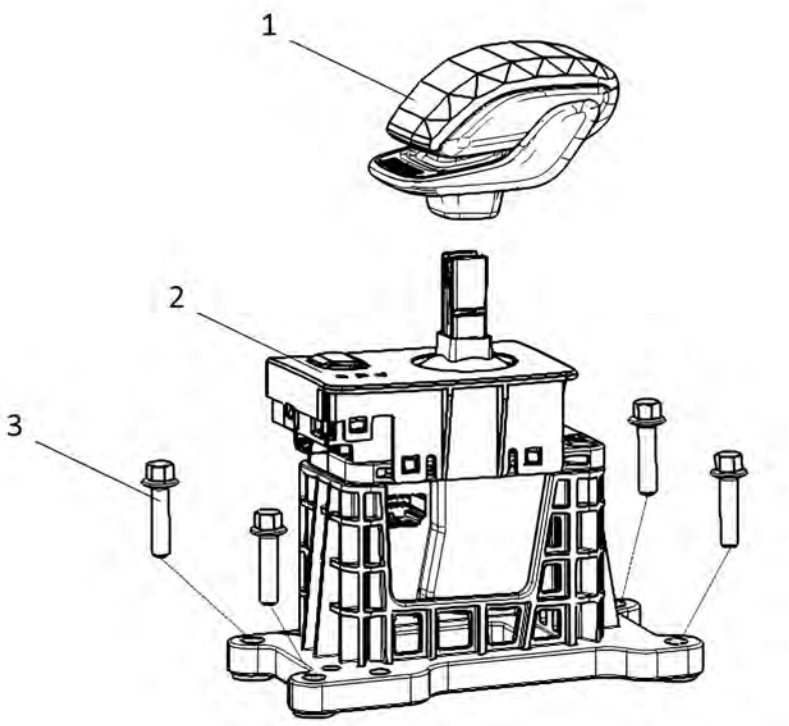
3.3.1 Specification

3.3.1.1 Torque specification

Name	Nm
Nut connection between gear shifter body and console	9±1

3.3.2 Instructions and operations

3.3.2.1 Electronic gear shifter module



Item	Description	Item	Description
1.	Gearshift knob assembly	3	Hex nut and conical spring washer assembling unit
2	Electronic gear shifter module body assembly		

3.3.2.2 Overview (GSM)

The full name of GSM is "electronic gear shifter module".

(1) Gear information

Gear P (Park)

This gear is used when the vehicle is parked or placed in a state ready to drive. Press the P gear button on the panel to enter the P gear. Be sure to stop the vehicle completely before shifting to the P gear.

Gear D (Drive)

The D gear can only be engaged when the vehicle is started. Use this gear when driving forward.

Gear R (Reverse)

The R gear can only be engaged when the vehicle is started. Please reverse using this gear. Be sure to stop the vehicle completely before shifting to the R gear.

Gear N (Neutral)

When the vehicle is in this gear, the drive assembly cannot output power and will not provide auxiliary parking. Be sure to stop the vehicle completely before shifting to the N gear.

(2) Jinshi logo light

The Jinshi logo can be lit. When any door is opened, the Jinshi logo on the crystal handball will light up in the form of a breathing light;

When all doors are closed and the backlight of the vehicle is turned on, the Jinshi logo on the crystal handball will be always on; if the IVI can adjust the colour of the whole vehicle ambient light, the colour of the Jinshi logo light can change with the colour of the whole vehicle ambient light.

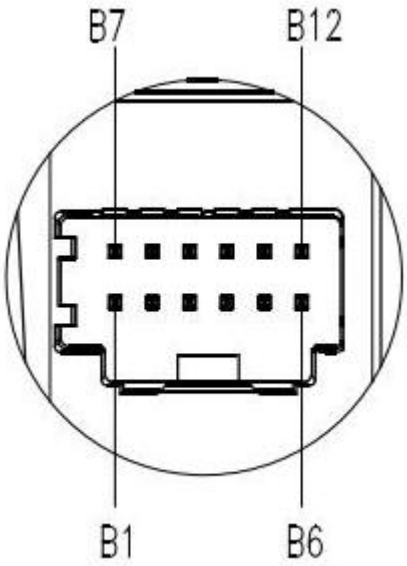


Item	Description	Item	Description
1	Electronic gear shifter module	3	Driving mode button
2	. P gear button	4	Jinshi logo

(3) Electrical interface: The electronic gear shifter module is connected to the vehicle harness through the body connector, and the relevant signals communicate with the vehicle controller through CAN communication.

Electronic gear shifter module body connector

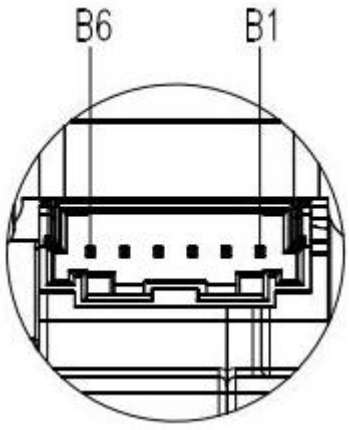
Model of gear shifter connector	TE 1-1318772-3
Model of vehicle harness connector	TE 1318774-1



Pin	Function definition	Pin	Function definition
Pin 1	KL30	Pin 7	CAN L
Pin 2	LIN	Pin 8	CAN H
Pin 3	GND	Pin 9	PWM1
Pin 4	P_SW	Pin 10	PWM2
Pin 5	KL15	Pin 11	PWM3
Pin 6	/	Pin 12	ILL+

P gear button and gear indicator light connector

Model of gearshift panel connector	CJT A2010WRC-S-6P-BK
Model of vehicle harness connector	CJT A2010HC-6P



Pin	Function definition	Pin	Function definition
Pin 1	ILL+	Pin 4	PWM3
Pin 2	PWM1	Pin 5	P_SW
Pin 3	PWM2	Pin 6	GND

3.3.3 Removal and installation

3.3.3.1 Removal and installation of electronic gear shifter module

Removal

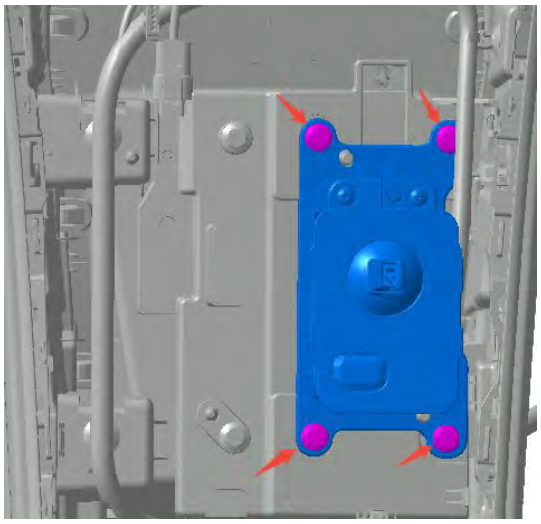
1. Grab the shift handball and pull it out vertically upward directly from the electronic gear shifter module body.



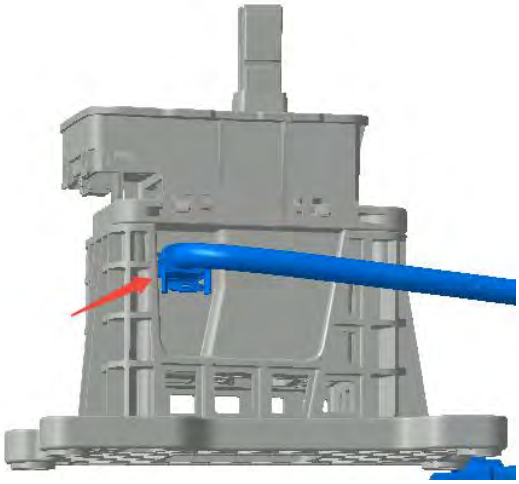
2. Remove the upper trim panel of auxiliary dashboard. Refer to: Auxiliary dashboard assembly.

3. Loosen the 4 fixing bolts on the electronic gear shifter module base.

   Torque: 9±1 Nm



4. Remove the low-voltage harness connector on the electronic gear shifter module to complete the disassembly.



Installation

1. The installation order is reverse to the removal order.

3.4 Electric drive axle

3.4.1 Specification

3.4.1.1 Electric drive axle assembly specifications

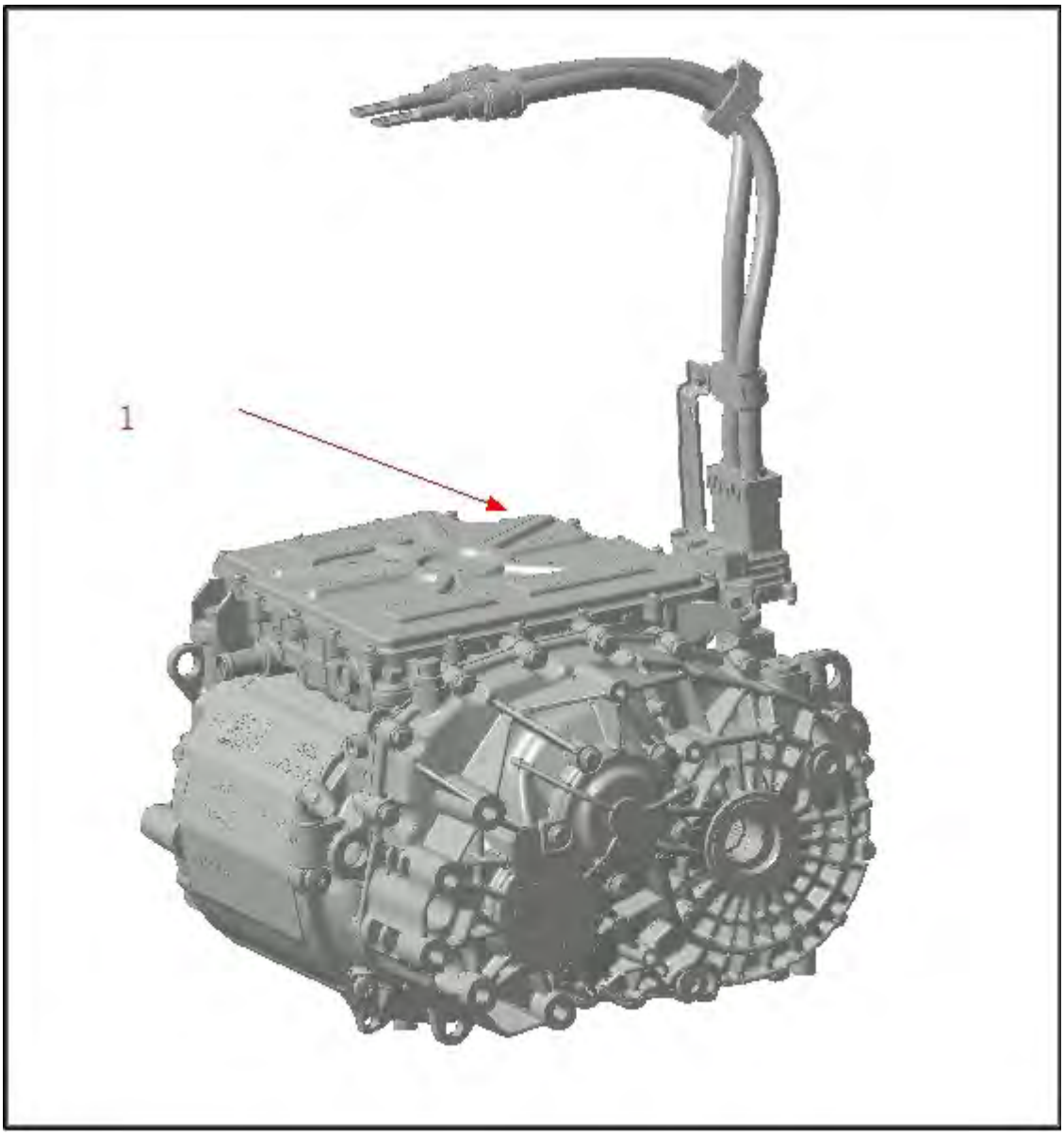
Continuous power (kW)	80kw	
Peak power (kW)	150kw	30s
Continuous torque (N·m)	140	
Peak torque (Nm)	340	30s
Continuous speed (rpm)	5457	
Maximum working speed (rpm)	16000	
Cooling mode	Water-cooled	
Gear ratio	11.558	
Lubricating oil volume	1.3L±0.05L	
Lubricating oil type	Castrol BOT 384	Oil change mileage: 5000km for the first maintenance/replacement frequency in the later period 30000Km

3.4.2 Operation and Instructions

3.4.2.1 Overview

The electric drive system is the power heart of new energy vehicles, responsible for converting the electrical energy of the power battery into mechanical energy to drive the vehicle, and can also generate electricity in reverse to recover energy during braking/deceleration.

3.4.2.2 Electric drive axle assembly

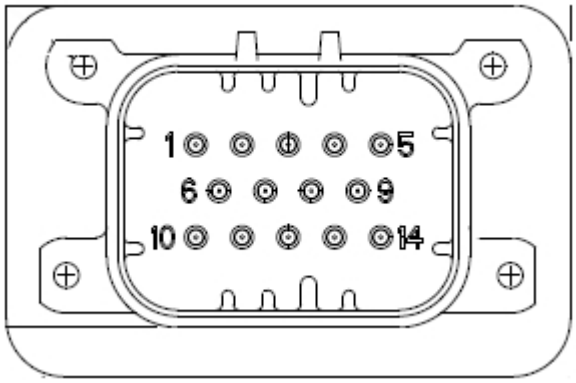


Item	Description	Item	Description
1.	Electric drive axle assembly		

The electric drive axle assembly is a complete unit and does not need to be taken apart internally during maintenance. The removal process mainly involves separating the electric drive axle assembly from the vehicle.

3.4.2.3 Pin definition of electric drive axle assembly

Pin definition



Pin	Function		Rated current (A)
	Item	Item	
1	GND-IN	12V power supply GND	1A
2	GND-IN	12V power supply GND	1A
3	DRN1	Collision signal GND	1A
4	CANH1	CANH1	2mA
5	CANL1	CANL1	2mA
6	\	\	\
7	\	\	\
8			
9			
10	+B 1	12 V power supply +	1A
11	+B 2	12 V power supply +	1A
12	\	\	\
13	\	\	\
14	\	\	\

3.4.3 Diagnosis and testing

3.4.3.1 Diagnosis and testing

Electric drive axle assembly

Inspection and confirmation

1.Confirm the issues raised by customers.

2. Perform a visual inspection of the vehicle to determine if there are obvious signs of electrical damage.

3. The found problems should be solved before performing the next inspection.

4. If the cause cannot be determined by appearance, confirm the symptom first and then check according to the symptom table.

3.4.3.2 Diagnosis and testing

Electric drive axle assembly

Appearance Checklist

Electrical
• Fuse • Harness • Junction box • Switch • Battery

3.4.3.3 Symptoms of Electric Drive Axle Assembly

Symptoms	Possible cause	Measures
DC bus overvoltage power reduction/ DC bus overvoltage fault	Occurring when the high voltage connected to the high-voltage battery is greater than the set value. A. Abnormal high voltage may occur in the battery pack; B. The high-voltage detection circuit in the electric drive axle assembly may have a problem;	Refer to: Battery (414-01 battery, bracket and cable, diagnosis and testing). Refer to: Wiper and Washer (501-16 Wiper and washer, diagnosis and testing).

DC bus overvoltage power reduction/ DC bus overvoltage fault	Occurring when the high voltage connected to the high-voltage battery is greater than the set value. A. Abnormal high voltage may occur in the battery pack; B. The high-voltage detection circuit in the electric drive axle assembly may have a problem;	1. Check whether the battery pack is normal. Read the "Battery Pack" diagnosis and testing in detail; 2. When the vehicle is powered up to high voltage, use a diagnostic scanner to read whether the data flow input voltage value (High voltage) in the diagnosis program of electric drive axle assembly is within 240~450 V. If it is out of range, disassemble the electric drive axle assembly according to reason B and return it to the factory for repair or replacement; 3. After the fault is eliminated, check whether the data flow input voltage value (High voltage) of the electric drive axle assembly is 0V in the LOCK state. After high-voltage power-on, finally confirm whether the input voltage value (High voltage) of electric drive axle assembly data flow is within 240~450 V.
Hardware overvoltage fault	Occurring when the high voltage connected to the high-voltage battery is greater than the set value. A. Power battery overvoltage; B. Bus voltage oscillation; C. Abnormal voltage detection;	1. Check whether the battery pack is normal. Refer to the diagnosis and test of Battery Pack for details; 2. When the vehicle is powered up to high voltage, use a diagnostic scanner to read whether the data flow input voltage value (High voltage) in the electric drive axle assembly diagnostic procedure is within 240~450 V. If it exceeds the range, disassemble the electric drive axle assembly according to reason B, return it to the factory for repair or replace it; 3. After the fault is eliminated, check whether the data flow input voltage value (High voltage) of the electric drive axle assembly is 0V in the LOCK state. After high-voltage power-on, finally confirm whether the data flow input voltage value (High voltage) of electric drive axle assembly is within 240~450 V.

DC bus undervoltage drop power/DC bus undervoltage fault	Occurs when the high voltage of the connected high-voltage battery is less than the set value. A. Abnormal high voltage may occur in the battery; B. The high-voltage detection circuit in the electric drive axle assembly may have a problem;	1. Check whether the battery pack is normal. Refer to the Service Manual "Battery Pack" for relevant information on abnormal battery packs; 2. When the vehicle is powered up to high voltage, use a diagnostic scanner to read whether the data flow input voltage value (High voltage) in the diagnosis program of electric drive axle assembly is within 240~450 V. If it is out of range, disassemble the electric drive axle assembly according to reason B (refer to Chapter 5) and return it to the factory for repair or replacement; 3. After the fault is eliminated, check whether the data flow input voltage value (High voltage) of the electric drive axle assembly is 0V in the LOCK state. After high-voltage power-on, finally confirm whether the data flow input voltage value (Highvoltage) of electric drive axle assembly is within 240~450 V.
Three-phase overcurrent/hardware detection three-phase overcurrent	Occurring when the motor 3-phase current is greater than the set value. A. Overload operation; B. Abnormal current detection; C. Hall or detection circuit is disturbed or abnormal; D. Hall offline or abnormal; E. Abnormal resolver signal; F. The controller hardware protection circuit is seriously disturbed;	1. If a three-phase overcurrent/ hardware detection three-phase overcurrent fault occurs, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to Disassembly and Installation of Electric Drive Axle Assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

IGBT upper bridge arm fault	If the electric drive axle assembly has irreparable faults, it must be handed over to professional controller maintenance personnel for inspection and repair. Unauthorized repairs are not allowed. Occurring when an abnormality occurs in the electric drive axle assembly circuit connected to the IGBT: A. IGBT hardware is damaged; B. Abnormal drive upper axle chip; C. The upper bridge drive power supply is abnormal; D. The error signal is interfered with;	1. Use the UDS diagnostic scanner to clear the fault. After powering off, re-power on to IGN ON to confirm whether the fault reappears; 2. If there is no fault, it is an interference error signal; 3. If the fault recurs, it indicates that there is an irreparable fault in the electric drive axle assembly. Remove the electric drive axle assembly (refer to "Removal and Installation of Electric Drive Axle Assembly"), return it to the factory for repair or replace it; 4. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
IGBT lower bridge arm fault	If the electric drive axle assembly has irreparable faults, it must be handed over to professional controller maintenance personnel for inspection and repair. Unauthorized repairs are not allowed. Occurring when an abnormality occurs in the electric drive axle assembly circuit connected to the IGBT: A. IGBT hardware is damaged; B. The drive lower bridge chip is abnormal; C. The lower bridge drive power supply is abnormal; D. The error signal is interfered with;	1. Use the UDS diagnostic scanner to clear the fault. After powering off, re-power on to IGN ON to confirm whether the fault reappears; 2. If there is no fault, it is an interference error signal; 3. If the fault recurs, it indicates that there is an irreparable fault in the electric drive axle assembly. Remove the electric drive axle assembly (refer to "Removal and Installation of Electric Drive Axle Assembly"), return it to the factory for repair or replace it; 4. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

Driver board fault	If the electric drive axle assembly has irreparable faults, it must be handed over to professional controller maintenance personnel for inspection and repair. Unauthorized repairs are not allowed. Occurring when an abnormality occurs in the electric drive axle assembly circuit connected to the IGBT: A. IGBT hardware is damaged; B. Any chip of the drive axle is abnormal; C. The drive power supply of the upper or lower bridge is abnormal; D. The error pin level is seriously disturbed;	1. Use the UDS diagnostic scanner to clear the fault. After powering off, re-power on to IGN ON to confirm whether the fault reappears; 2. If there is no fault, it is an interference error signal; 3. If the fault recurs, it indicates that there is an irreparable fault in the electric drive axle assembly. Remove the electric drive axle assembly (refer to "Removal and Installation of Electric Drive Axle Assembly"), return it to the factory for repair or replace it; 4. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
Three-phase current imbalance fault	Occurs when there is no current in a phase. A. The three-phase circuit of the controller or motor is abnormal; B. Abnormal current detection;	1. If there is a three-phase current imbalance fault, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

Current sensor zero drift fault	A. Hall anomaly; B. The current sampling circuit is abnormal; C. The Hall harness is damaged or abnormal;	1. If the current sensor zero drift fault occurs, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
MCU torque offset out of range	Occurs when VCM input torque exceeds maximum torque A. VCM torque command is abnormal; B. Abnormal MCU torque processing;	1. Use a diagnostic scanner to check whether the VCM has CAN communication fault. If so, replace the VCM 2. If the MCU torque offset is out of range, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 3. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
Resolver signal attenuation	Occurring when the resolver signal of electric drive axle assembly is distorted A. The motor resolver may be damaged B. Internal fault of electric drive axle assembly	1. If there is a resolver signal attenuation fault, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

Abnormal resolver signal tracking	Occurring when the resolver signal of electric drive axle assembly is distorted A. The motor resolver may be damaged B. Internal fault of electric drive axle assembly C. Abnormal resolver signal	1. In case of abnormal resolver signal tracking, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
Motor overspeed alarm/motor overspeed power reduction/motor overspeed fault	Occurs when the motor speed is greater than the set value. A. The assembly load is small, and the speed rises higher after the throttle is applied B. Abnormal fault of motor body C. Abnormal control due to abnormal state of MCU	1. Ask the driver whether the driving speed exceeds 180 km/h or excessive sliding occurs. In this case, the normal protection logic is executed and it means that the electric drive axle assembly is normal. 2. For reasons B and C, the electric drive axle assembly needs to be disassembled (refer to the disassembly and installation of the electric drive axle assembly), returned to the factory for repair or replaced; 3. After the fault is eliminated, when the vehicle stops and the accelerator pedal is not pressed, use a diagnostic scanner to read whether the data flow motor speed (Motor Speed) value is within the range of -10 ~ 10 rpm.

MCU sub-processor fault	A. The sub-processor chip application is accidentally erased; B. The sub-processor chip is seriously interfered with or damaged, resulting in abnormal operation;	1. If cause A occurs, rewrite the program. If the fault is eliminated, it can continue to be used. If the fault cannot be eliminated, disassemble the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. If cause B occurs, an irreparable fault has occurred inside the electric drive axle assembly; disassemble the electric drive axle assembly (refer to Chapter 5) and return it to the factory for repair or replacement; 3. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
12V battery voltage out of range	Occurring when the low voltage of the connected low-voltage battery is greater than or less than the set value. A. The low-voltage battery or DCDC may be abnormal; B. Low-voltage cables and connectors may be damaged; C. Internal fault of electric drive axle assembly;	1. The vehicle is shut down (the whole vehicle is in LOCK state); 2. Check whether the data flow (Operating voltage value) of electric drive axle assembly is 0 V with a diagnostic scanner; 3. Open the vehicle bonnet to detect the low-voltage battery voltage. If the detected value exceeds the normal range, replace the low-voltage battery according to reason A; 4. Turn on the vehicle power supply and check the DCDC DTC. If there is any abnormality, replace the DCDC according to reason A; 5. After the vehicle is turned off, unplug the low-voltage connector at the electric drive axle assembly end and replace the low-voltage cable; 6. After the cable is replaced, if the electric drive axle assembly still fails, disassemble it according to reason C (refer to the disassembly and installation of the electric drive axle

		assembly), return it to the factory for repair or replace it; 7. After the fault is eliminated, finally confirm whether the 12V power supply voltage (Operating voltage value) of the electric drive axle assembly diagnostic data flow is within the range of 9~16V.
5V voltage out of range	Occurring when the CPU power supply (5V) in the electric drive axle assembly exceeds the set range A. The supply voltage is out of range; B. There is a fault in the 5V voltage regulator circuit;	1. Use the diagnostic scanner to check whether there is a 12V battery overvoltage /12V battery undervoltage fault. If there is, replace the battery or DCDC according to reason A; 2. In addition, disassemble the electric drive axle assembly according to reason B (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly;

IGBT overtemperature power reduction/ IGBT overtemperature fault	When the inferred IGBT temperature is greater than the set value. A. Abnormal cooling system (pump, coolant channel, etc.) B. Internal fault of electric drive axle assembly	1. After the vehicle has been turned off for 30 minutes, restart it and use a diagnostic scanner to check whether the IGBT temperature value of the electric drive axle assembly data flow is close to the actual coolant temperature. If it is, check the cooling system according to reason A. Confirm whether the coolant pump is operating incorrectly or whether there are foreign objects in the coolant pipe, and then repair the cooling system; 2. For others, disassemble the electric drive axle assembly according to reason B (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 3. After the fault is eliminated, use a diagnostic scanner to check whether the IGBT temperature value of the electric drive axle assembly data flow is close to the actual coolant temperature.
Abnormal IGBT temperature signal	A. The IGBT temperature sensor connector in the controller is abnormal; B. Temperature sensor abnormal;	1. In case of abnormal IGBT temperature signal, disassemble the electric drive axle assembly (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace it; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

Power reduction due to IGBT junction overtemperature/IGBT junction overtemperature	When the inferred IGBT temperature is greater than the set value. A. Abnormal cooling system (pump, coolant channel, etc.) B. Internal fault of electric drive axle assembly	1. After the vehicle has been turned off for 30 minutes, restart it and use a diagnostic scanner to check whether the IGBT temperature value of the electric drive axle assembly data flow is close to the actual coolant temperature. If it is, check the cooling system according to reason A. Confirm whether the coolant pump is operating incorrectly or whether there are foreign objects in the coolant pipe, and then repair the cooling system; 2. For others, disassemble the electric drive axle assembly according to reason B (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 3. After the fault is eliminated, use a diagnostic scanner to check whether the IGBT temperature value of the electric drive axle assembly data flow is close to the actual coolant temperature.
Motor overtemperature power reduction/motor overtemperature fault	Occurring when the motor temperature is greater than the set value. A. The motor continues to run in a stalled state; B. Abnormal cooling system (pump, coolant channel); C. The motor temperature sensor may be damaged; D. Internal fault of electric drive axle assembly;	1. Confirm with the driver whether the vehicle continues to run in a stalled state, because in this case the normal protection logic will be activated, so the electric drive axle assembly is normal; 2. After the vehicle has been turned off for 30 minutes, restart it and use a diagnostic scanner to check whether the data flow motor temperature value (Motor Temperature) is close to the actual coolant temperature. If it is, check the cooling system according to reason B. Check whether the coolant pump is operating incorrectly or whether there are foreign objects in the coolant pipe, and then repair the cooling system; 3. For others, disassemble the electric drive axle assembly according to reason D (refer to the disassembly and

		installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 4. After the fault is eliminated, use a diagnostic scanner to check whether the motor temperature value (Motor Temperature) of the electric drive axle assembly data flow is close to the actual coolant temperature.
Drive motor temperature signal short-circuited to GND	Occurs when the motor temperature sensor is abnormal. A. The motor temperature sensor may be damaged B. The temperature sensor circuit in the electric drive axle assembly may be damaged	1. If the drive motor temperature signal is short-circuited to GND, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to Disassembly and Installation of Electric Drive Axle Assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
Drive motor temperature signal open-circuited	Occurs when the motor temperature sensor is abnormal. A. The motor temperature sensor may be damaged B. The temperature sensor circuit in the electric drive axle assembly may be damaged	1. If the drive motor temperature signal is open-circuited, an irreparable fault occurs inside the electric drive axle assembly; remove the electric drive axle assembly (refer to Disassembly and Installation of Electric Drive Axle Assembly), return it to the factory for repair or replace the electric drive axle assembly; 2. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

Active discharging fault	After the power battery is disconnected, the electric drive axle assembly fails to discharge the supporting capacitor voltage to within the 60V range for more than 3s. A. Abnormal VCU discharging command; B. The main circuit contactor is stuck; C. Discharge timeout; D. The motor speed exceeds 100Rpm during discharge; E. The motor coil is abnormal; F. Internal fault of electric drive axle assembly	1. Shut down the vehicle; 2. Use a diagnostic scanner to check whether the data flow (High voltage) value of the electric drive axle assembly is 0V. If the voltage remains constant above 200V, the battery pack relay is determined to be stuck. Refer to Service Manual Battery Pack for relevant contents about abnormal battery pack; 3. Use a diagnostic scanner to check whether the VCM has CAN communication failure. If so, replace the VCM; 4. For others, disassemble the electric drive axle assembly according to reason F (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 5. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
Passive discharge fault	After the power battery is disconnected, the electric drive axle assembly fails to discharge the supporting capacitor voltage to within the 60V range for more than 2 min. A. The main circuit contactor is stuck; B. Internal fault of electric drive axle assembly	1. Shut down the vehicle. 2. Use a diagnostic scanner to check whether the data flow (High voltage) value of the electric drive axle assembly is 0V. If the voltage remains constant above 200V, the battery pack relay is determined to be stuck. Refer to Service Manual Battery Pack for relevant contents about abnormal battery pack; 3. For others, disassemble the electric drive axle assembly according to reason B (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 4. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light

		is off.
VCM (vehicle control unit) communication lost	A. Occurring when communication with VCM cannot be achieved for a certain period of time B. Possibility of VCM fault C. LVIO cable may be disconnected D. The CAN communication circuit inside the electric drive axle assembly is damaged	1. Check whether the VCM has CAN communication failure. In case of failure, replace the VCM for reason A; 2. Shut down the vehicle; 3. Check whether the data flow (High voltage) value of electric drive axle assembly is 0 V with a diagnostic scanner; 4. Pull out the low-voltage connector and replace the low-voltage cable; 5. For others, disassemble the electric drive axle assembly according to reason C (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 6. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

VCM Frame Counter error	Occurring when VCM verification mismatch happens. A. Possibility of VCM fault B. The low-voltage harness may be broken C. The internal circuit of electric drive axle assembly is damaged	1. Check whether the VCM has CAN-related faults. In case of failure, replace the VCM for reason A; 2. Shut down the vehicle; 3. Check whether the data flow (High voltage) value of electric drive axle assembly is 0 V with a diagnostic scanner; 4. Pull out the low-voltage connector and replace the low-voltage harness; 5. For others, disassemble the electric drive axle assembly according to reason C (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 6. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.
VCM verification failed	Occurring when VCM verification mismatch happens. A. Possibility of VCM fault B. The low-voltage harness may be broken C. The internal circuit of electric drive axle assembly is damaged	1. Check whether the VCM has CAN-related faults. In case of failure, replace the VCM for reason A; 2. Shut down the vehicle; 3. Check whether the data flow (High voltage) value of electric drive axle assembly is 0 V with a diagnostic scanner; 4. Pull out the low-voltage connector and replace the low-voltage harness; 5. For others, disassemble the electric drive axle assembly according to reason C (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 6. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

CAN bus off	Occurring when the number of CAN errors detected by electric drive axle assembly is greater than the set value A. VCM fault possibility; B. Low-voltage cables may be damaged; C. The low-voltage connector may be damaged; D. The CAN communication circuit inside the electric drive axle assembly is faulty;	1. Check whether the VCM has CAN communication failure. In case of failure, replace the VCM for reason A; 2. Shut down the vehicle; 3. Use a diagnostic scanner to check whether the data flow input voltage (High voltage) of electric drive axle assembly is 0 V; 4. Pull out the low-voltage connector and replace the low-voltage cable; 5. Remove the electric drive axle assembly (refer to "Removal and Installation of Electric Drive Axle Assembly"), and return it to the factory for repair or replacement; 6. After the fault is eliminated, confirm whether normal communication can be achieved when the vehicle warning light is not turned on.
Lost communication with BMS	Occurring when communication with BMS fails for a certain period of time A. Possibility of BMS fault B. Low-voltage cables may be disconnected C. The CAN communication circuit inside the electric drive axle assembly is damaged	1. Check whether the BMS has CAN communication fault. In case of failure, replace the BMS due to reason A; 2. Shut down the vehicle; 3. Check whether the data flow (High voltage) value of electric drive axle assembly is 0 V with a diagnostic scanner; 4. Pull out the low-voltage connector and replace the low-voltage cable; 5. For others, disassemble the electric drive axle assembly according to reason C (refer to the disassembly and installation of the electric drive axle assembly), return it to the factory for repair or replace the electric drive axle assembly; 6. After the fault is eliminated, confirm whether the vehicle can be driven normally when the vehicle warning light is off.

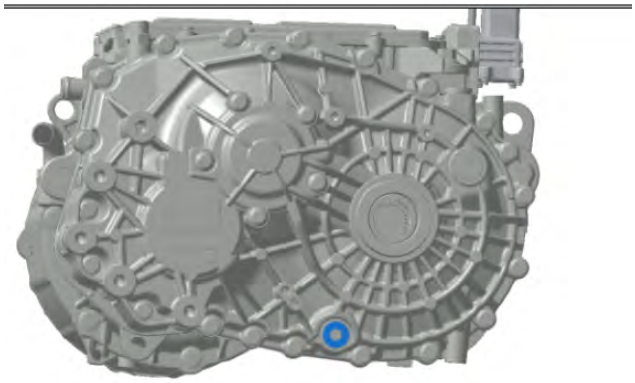
3.4.4 Removal and installation

3.4.4.1 Electric drive axle assembly

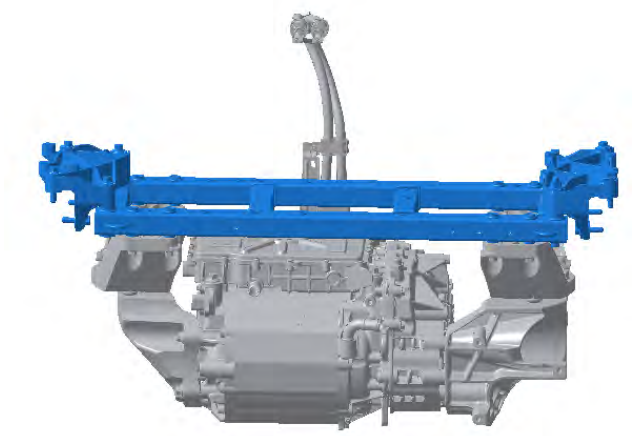
Removal

1. Power off the vehicle at high voltage and disconnect the battery negative cable.Refer to: Disconnect the battery negative cable.
2. Disassemble the components on the motor mount crossmember.
3. Lift up and support the vehicle.Refer to: Lifting the vehicle.
4. Remove the motor lower shield assembly.Refer to: Underbody shield system.
5. Drain the lubricating oil of electric drive axle assembly.

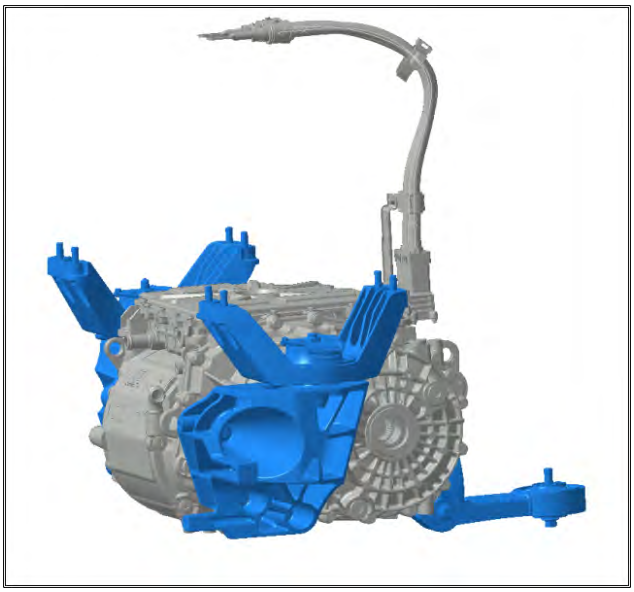
   Open the drain bolt to drain all lubricating oil in the electric drive axle assembly. Then tighten the drain bolt to the housing with a torque of 47~53Nm to prevent foreign objects from entering the case during removal.



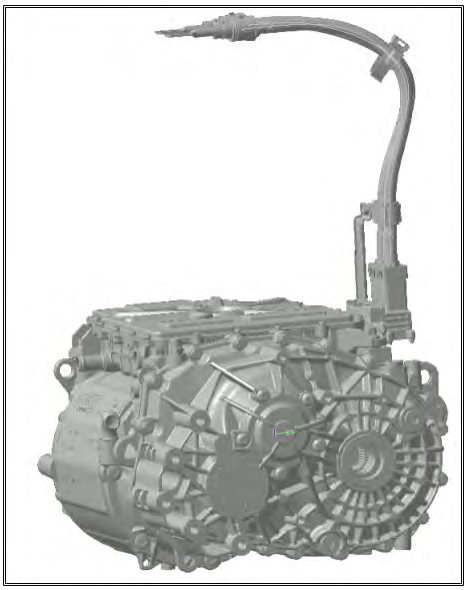
6. Remove the wheels and tyres.Refer to: Tyre.
7. Remove the drive shaft.Refer to:Drive shaft assembly.
8. Remove the motor mount crossmember of electric drive axle



9. Remove the motor mount bracket assembly



10. The disassembled assembly is as follows



Installation

1. The installation order is reverse to the removal order.

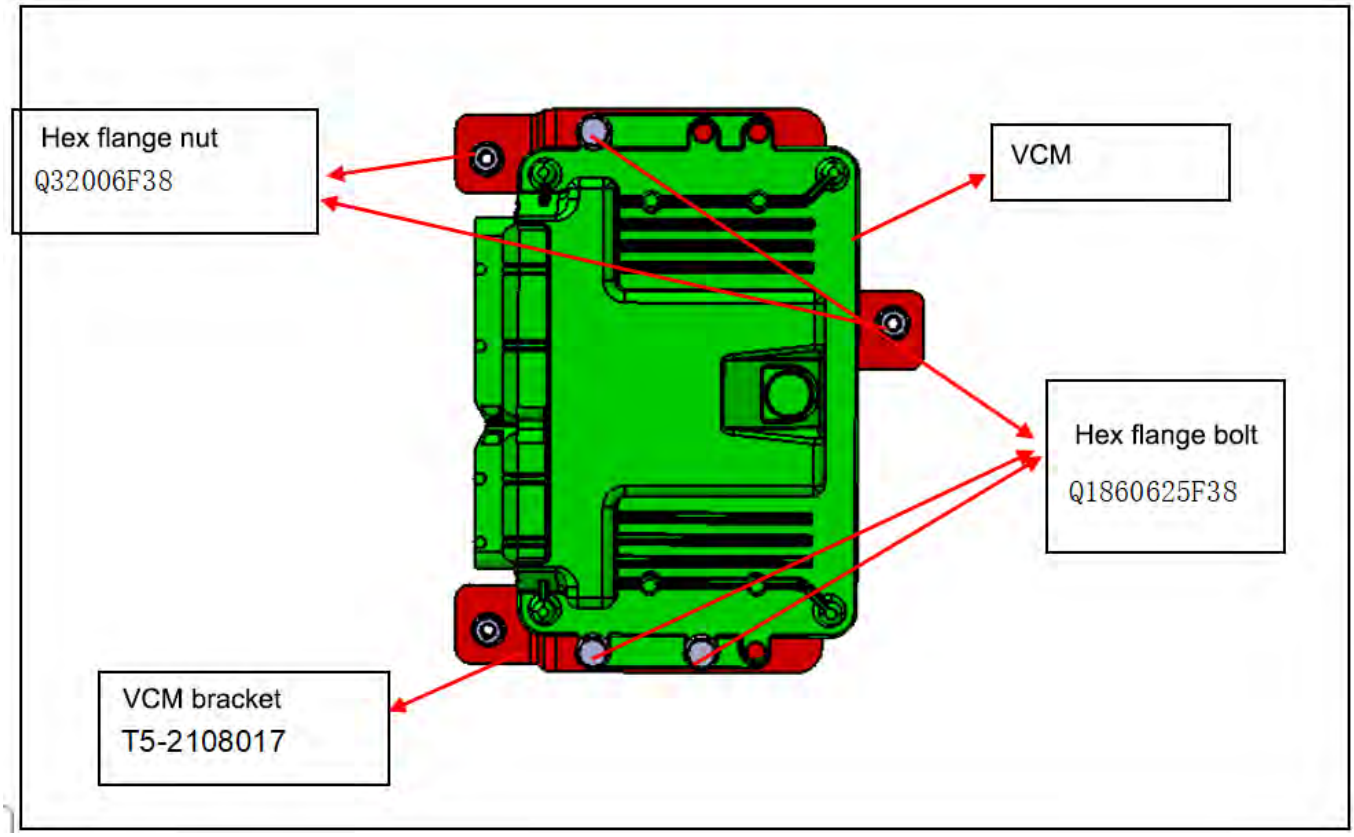
3.5 Vehicle control system

3.5.1 Specification

3.5.1.1 **扭矩规格**

标号	件号	名称	数量	Nm
1	T5EV-2108220	整车控制器	1	/
2	T5-2108017	整车控制器支架	1	/
3	Q32006F38	六角法兰面螺母	3	9±1
4	Q1860625F38	六角法兰面螺栓	3	9±1

3.5.1.2 Component Locating Diagram



Symbol	Part No.	Name	Quantity	Nm
1	T5EV-2108220	VCM	1	/
2	T5-2108017	VCM bracket	1	/
3	Q32006F38	Hex flange nut	3	9±1
4	Q1860625F38	Hex flange bolt	3	9±1

3.5.2 Instructions and operations

3.5.2.1 Overview

As the core main control unit of the vehicle, VCM exchanges information with ordinary control units, ECU or other EV system proprietary control units through hardwires or CAN. By processing the received information, it judges the status of each sub-control unit and the vehicle system, and makes reasonable and safe instructions, so that each sub-control unit can work in a coordinated and safe manner to realise the functions of the hybrid vehicle system.

3.5.3 Removal and installation

3.5.3.1 Removal and installation of VCU

Removal

The disassembly order of the vehicle controller is opposite to the installation order. First, unplug the harness end connector, then unscrew the 3 Q32006F38 nuts to remove the vehicle controller and the vehicle controller bracket, and finally unscrew the 3 bolts Q1860625F38 that install the vehicle controller to remove the vehicle controller.

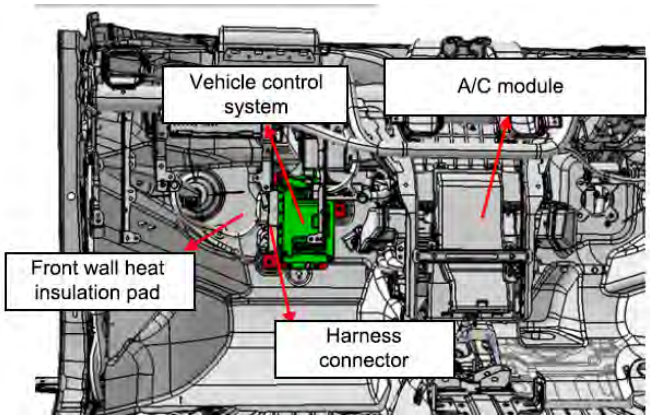
For the disassembly method of the harness terminal connector, please refer to the disassembly instruction manual of the relevant system.

Other requirements

During the assembly process of the vehicle controller, the coordination and assembly adjustment with the surrounding related components must comply with the requirements of the corresponding vehicle controller drawings of the vehicle model.

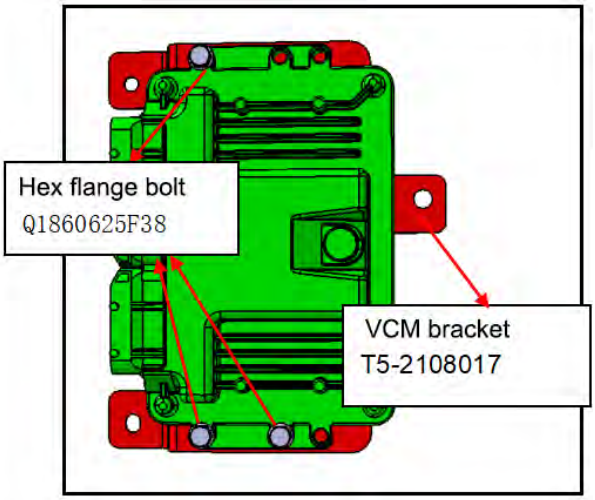
Installation

The schematic diagram of the installation position of the vehicle controller is as follows. It is arranged in the front passenger's cab, below the dashboard and above the driver's feet. The right side is close to the A/C module, with the connector facing left, and is fixed to the BIW through the vehicle controller bracket.



1. Assemble the vehicle controller module in advance, and install the vehicle controller on the vehicle controller bracket with three Q1860625F38 hexagonal flange bolts. The bolt tightening torque is 9± 1N·m.

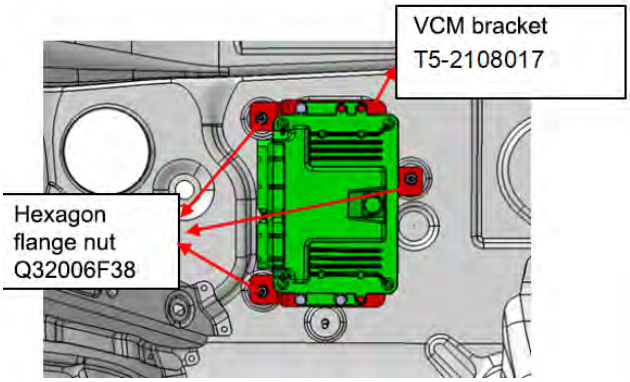
   Torque: 9±1 Nm



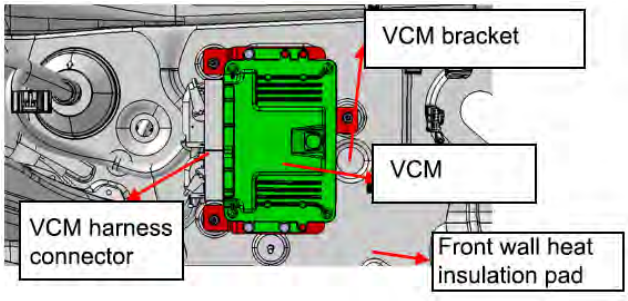
2. Install the front wall heat insulation pad. For details on the installation method, please refer to the front wall insulation pad Service Manual.

3. Place the VCU bracket in the installation area, and fix it on the welding stud of BIW with 3 Q32006F38 nuts (pressed tightly above the front wall heat insulation pad). The tightening torque of the nut is 9±1 N·m.

   Torque: 9±1 Nm



4. Install the harness of the vehicle controller connector. For specific installation methods, please refer to the technical conditions for assembly and adjustment of the harness system.



3.6 Cooling system

3.6.1 Specification

3.6.1.1 Coolant specification

Name	Specification	Capacity	Remarks
Coolant	OAT-35	4	Freezing point: -35° C, suitable for areas with an ambient temperature of -30° C-45° C

Note: Refer to the A/C system for relevant parameters of refrigerant filled in condenser assembly.

3.6.1.2 Torque specification

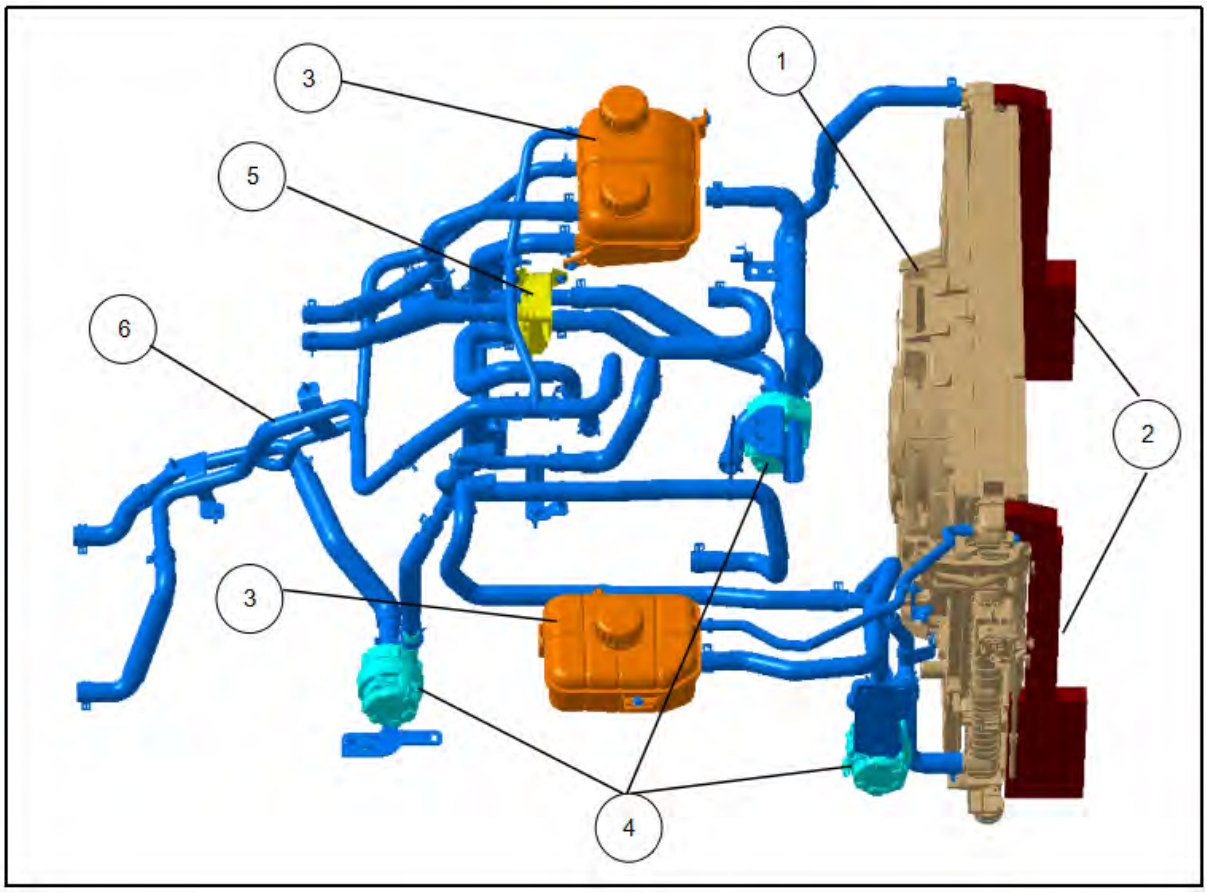
The recommended tightening torque value for bolts and nuts used in the cooling system is 8N·m.

3.6.2 Instructions and operations

3.6.2.1 Overview

The cooling system is a key component in electric vehicles. It realizes electric drive and electronic control cooling, battery pack cooling and heating to ensure that the electric drive, electronic control and battery pack work within an applicable temperature range.

3.6.2.2 Cooling system



S/N	Module name	Remarks
1.	Cooling module	Including radiator assembly, condenser assembly, electronic fan assembly and upper suspension I of radiator
2.	Sealing sponge	The sealing sponge is pasted in the plastic front frame, and the probability of removal is extremely low
3.	Expansion tank module	Including expansion tank pad
4.	Coolant pump module	Including coolant pump fixing bracket
5.	Three-way coolant valve	Including water valve fixing bracket
6.	Coolant pipeline	Including water pipe bracket and fastening hoop

3.6.3 Diagnosis and testing

3.6.3.1 Cooling System - Troubleshooting Table

Troubleshooting table

	Fault mode	Symptoms	Inspection Items	
Fault of parts and components of cooling system	Poor heat dissipation	Coolant pump fault	Electronic coolant pump	The liquid in the expansion tank does not flow
		Coolant temperature sensor fault	—	Abnormal temperature alarm
		Damaged cooling fin	Blocked by dust or paper scraps	Poor air circulation
			Mechanical damage	Damaged cooling fin
		Radiator coolant pipe blockage	Excessive foreign objects (rust, dirt, sand, etc.)	Coolant circulation failure
		Cooling fan fault	Fan assembly	Fan damage
		Chiller fault	Chiller	The compressor fails to refrigerate
	Insufficient system coolant	Pipeline coolant leakage	Coolant water hose	Loose clamp
				Hose rupture
			Coolant pump	Poor sealing
			Radiator	Damage, aging or poor installation of O-ring
				Radiator water tank breakage
				Radiator core breakage
			Expansion tank	Expansion tank breakage
Fault of parts and components other than the cooling system	—	Motor overload	Abnormal driving	Prolonged high-speed driving
				Ultra-high speed driving
			Transmission system fault	—
			Wheels and tyres of incorrect specifications are installed	
			Brake retardation	
	—	Battery overload	Abnormal driving	Long-time driving with heavy load

	Fault mode	Symptoms	Inspection Items	
	Poor air circulation	Bumper air vent blocked	—	—
		Radiator grille blocked	Installation of bonnet	
			Blocked by mud or paper scraps	
		Blocked radiator	—	
		Condenser blocked	Poor air circulation	
	Communication fault	The system is unresponsive	VCM	Communication fault

3.6.4 Removal and installation

3.6.4.1 Cooling module and sealing sponge

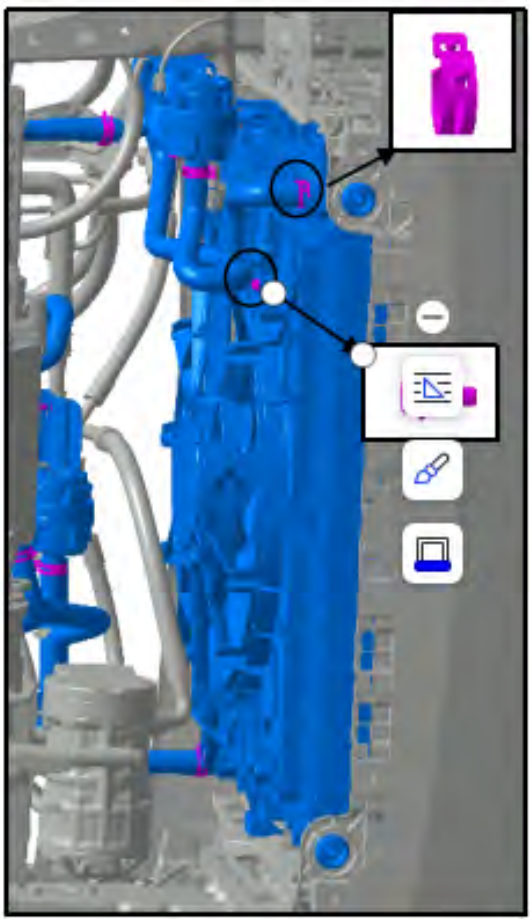
Material

Name	Specification
Refrigerant	Refer to A/C system
Coolant	OAT-35

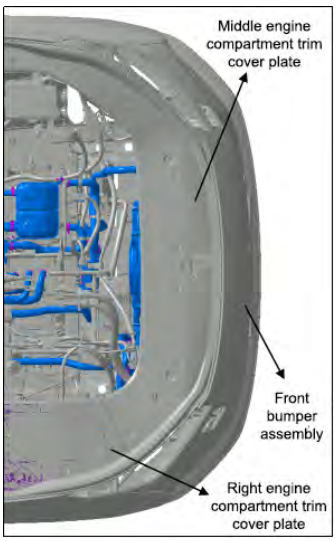
Removal

Caution: During maintenance, pay attention to sealing all A/C connectors.

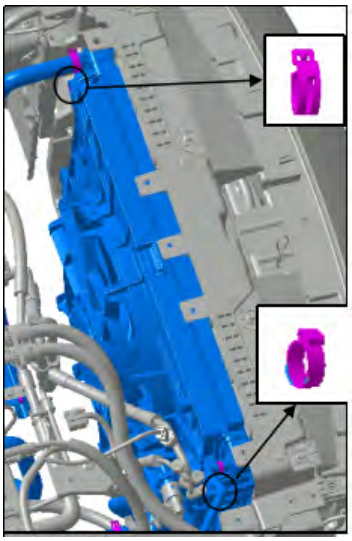
1. Lift the vehicle .Refer to: Lifting the vehicle.
2. Remove the engine lower mudguard assembly.Refer to: Underbody shield system.
3. Remove the pipeline fixing bolts fixed on the Electronic fan with an electric screwdriver, place the coolant recovery container under the radiator water outlet position, then use the hoop assembly tool pliers to remove the radiator water outlet water pipe hoop, loosen the water outlet rubber hose to discharge the coolant until no coolant flows out.



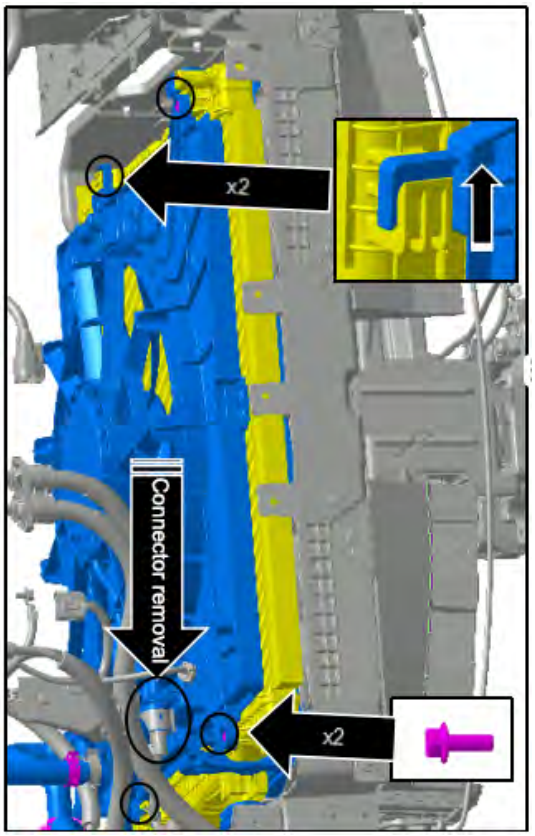
4. Lower the vehicle lifting frame to a proper height, and remove the right/middle engine compartment trim cover plate and front bumper assembly.



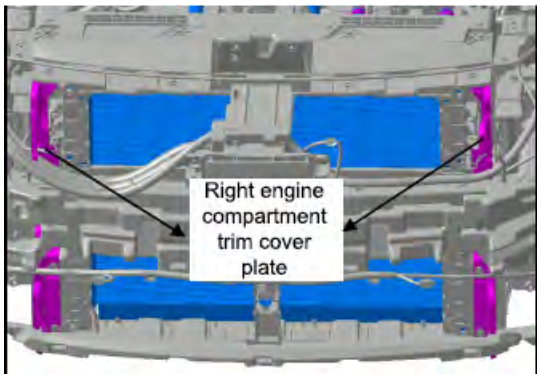
5. Remove the A/C pipes at the inlet and outlet of the docking condenser assembly and drain the A/C refrigerant. Refer to indoor refrigeration system
6. Use tools to remove the hoops of the radiator water inlet and degassing port, and loosen the water inlet rubber hose and degassing rubber hose.



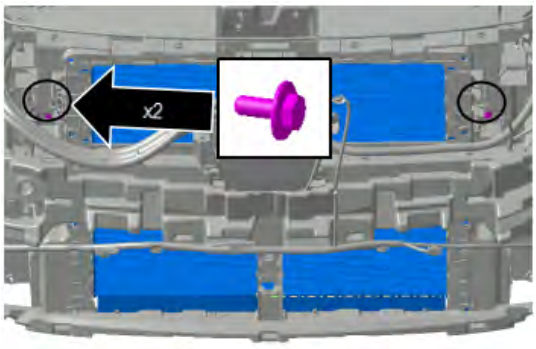
7. Remove the 2 fixing bolts of the electronic fan, press the electronic fan connector to disengage the harness connector, and then pull it up to disengage the fixing clip to remove the electronic fan assembly.



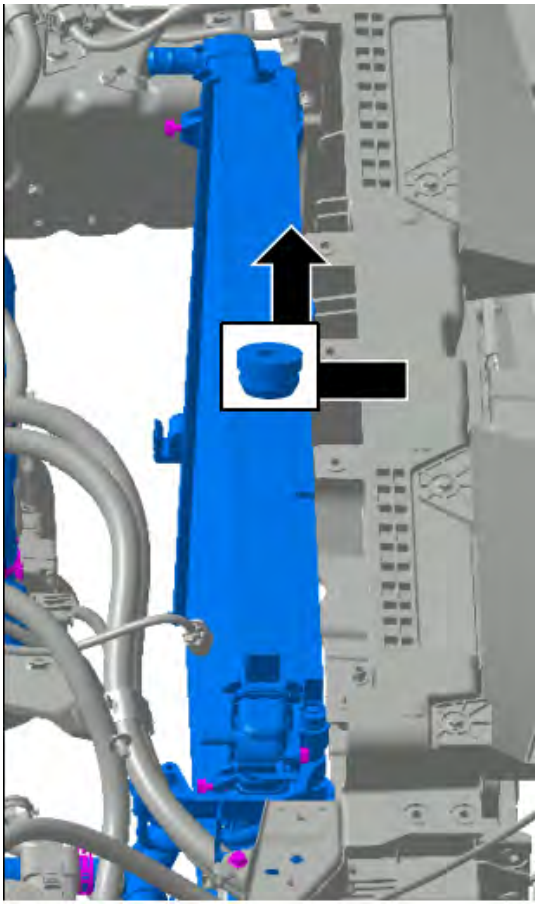
8. Remove the left and right deflector assemblies on both sides.



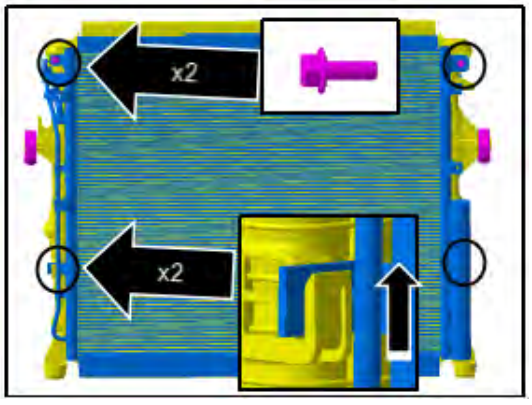
9. Remove the 2 fixing bolts of the cooling module upper mount. First withdraw a certain distance backward, and then pull out the entire cooling module upward.



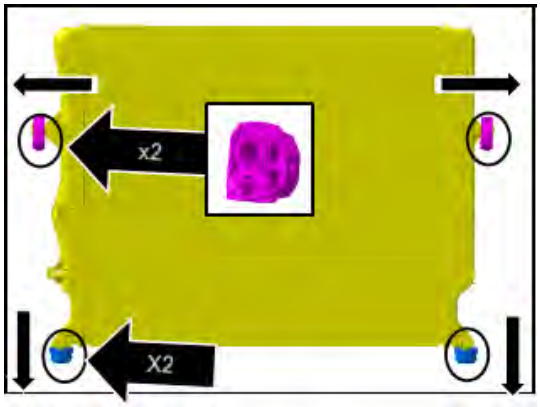
10. First withdraw a certain distance backward, and then pull out the whole cooling module upward. Pay attention to avoiding surrounding components in the engine compartment during the process.



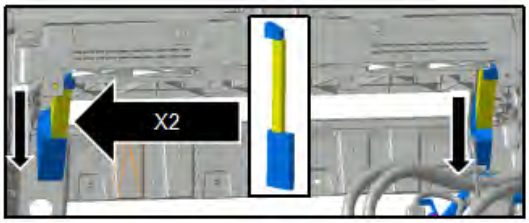
11. Remove the 2 fixing bolts of the condenser, then pull up to disengage the fixing clips and remove the condenser assembly.



12. Remove the 2 upper mounts and 2 lower mount cushions to remove the radiator assembly.



13. Remove 6 sealing sponges by tearing them backward with force (it is recommended not to remove them unless necessary).



Installation

1. The assembly steps are in reverse order of disassembly steps.

3.6.4.2 Expansion tank module

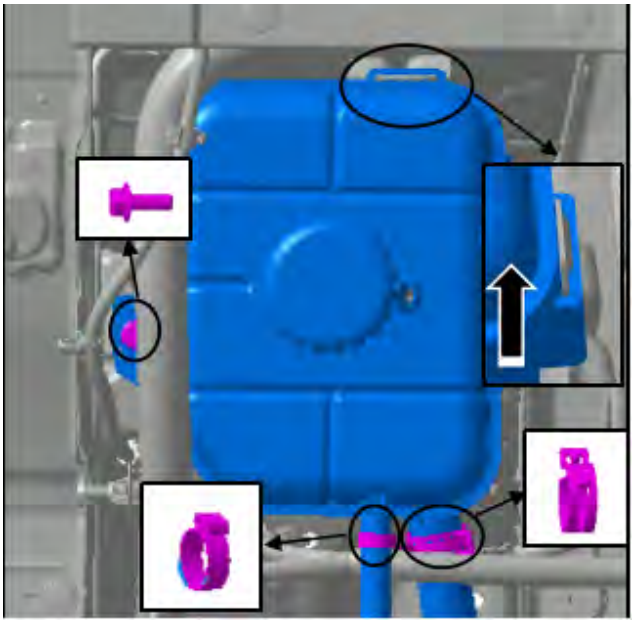
Material

Name	Specification
Coolant	OAT-35

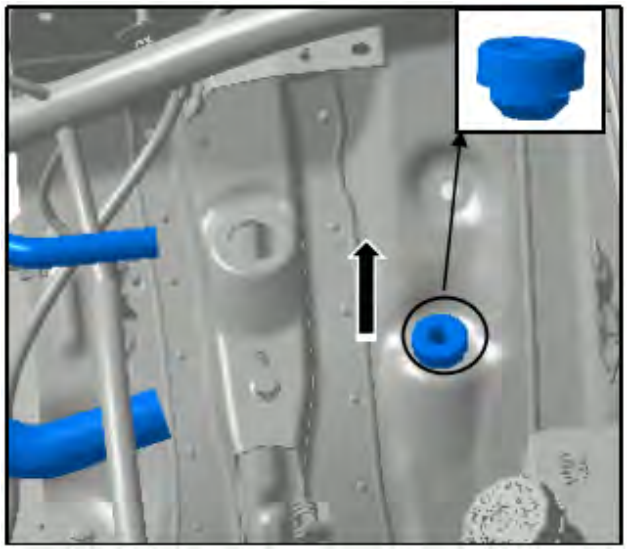
Removal

Caution: During maintenance, pay attention to the discharge and recovery of coolant, and avoid it flowing onto surrounding electrical connectors. It is recommended not to disassemble unless necessary.

1. Remove 1 fixing bolt of the electric drive expansion tank, loosen 2 water pipe hoops, withdraw the water pipe, drain the coolant, and then pull upward to remove the expansion tank.



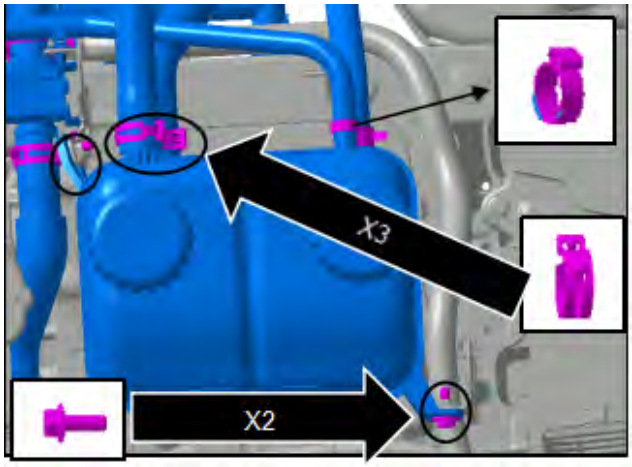
2. Remove the expansion tank pad of electric drive expansion tank.



3. Remove the expansion tank cover of electric drive expansion tank before filling coolant.



4. Remove the 2 fixing bolts of the battery pack and the heater (two-in-one) expansion tank, loosen the 4 water pipe hoops, withdraw the water pipe, drain the coolant, and then remove the expansion tank.



5. Before filling the coolant, remove the expansion tank cover of the battery pack heater expansion tank.



Installation

1. The assembly steps are in reverse order of disassembly steps.

3.6.4.3 Coolant pump module

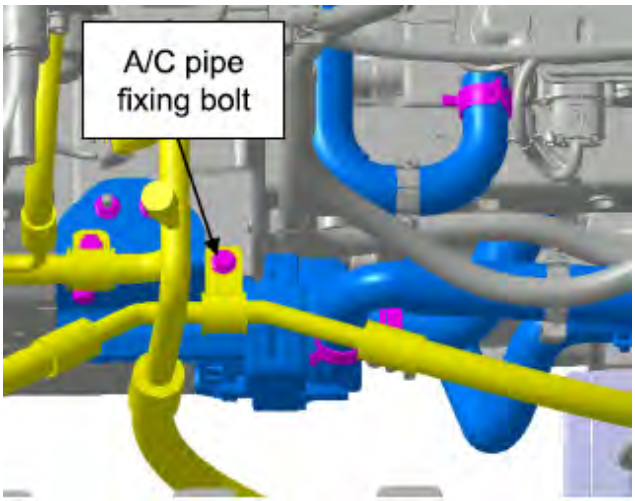
Material

Name	Specification
Coolant	OAT-35

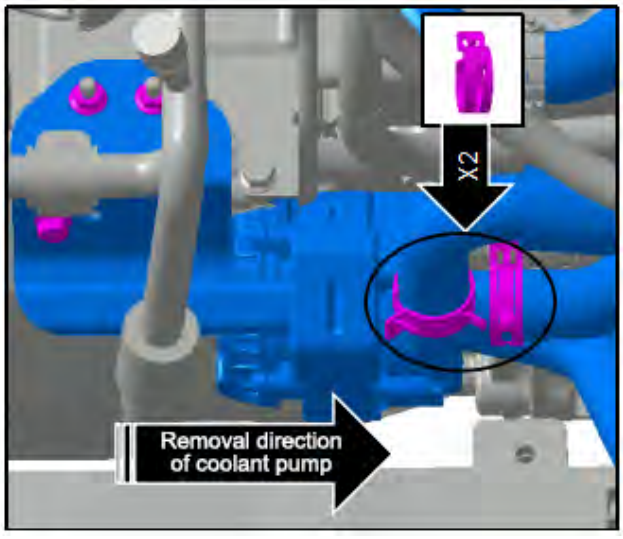
Removal

Caution: During maintenance, pay attention to the discharge and recovery of coolant, and avoid it flowing onto surrounding electrical connectors.

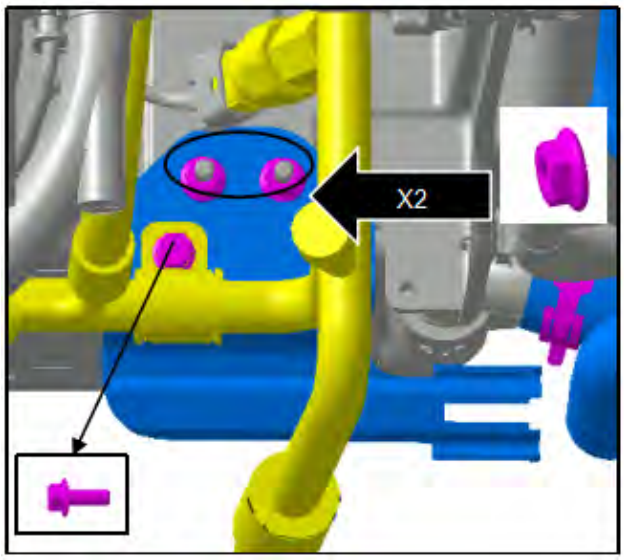
1. First remove the surrounding A/C pipe fixing bolts to avoid the space for removing the heater coolant pump.



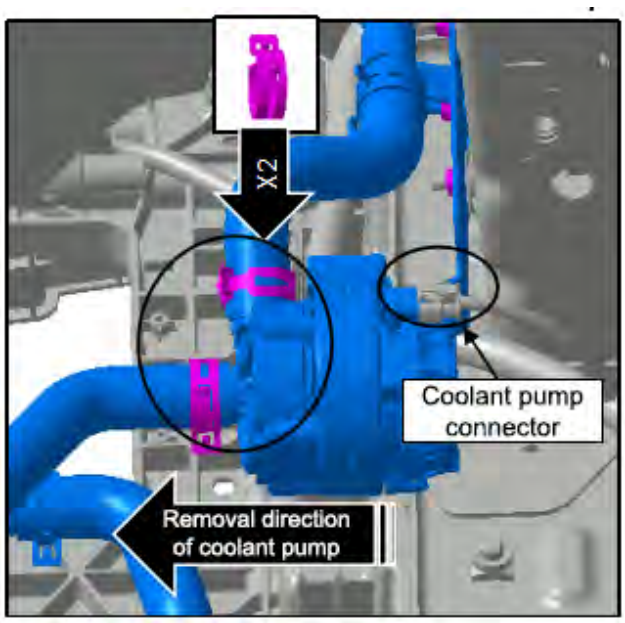
2. Remove the heater coolant pump (fixed in the middle and lower part of the engine compartment): Loosen 2 water pipe hoops, withdraw the water pipe, drain the coolant, withdraw it along the specified direction of the coolant pump bracket, and finally withdraw the coolant pump connector harness.



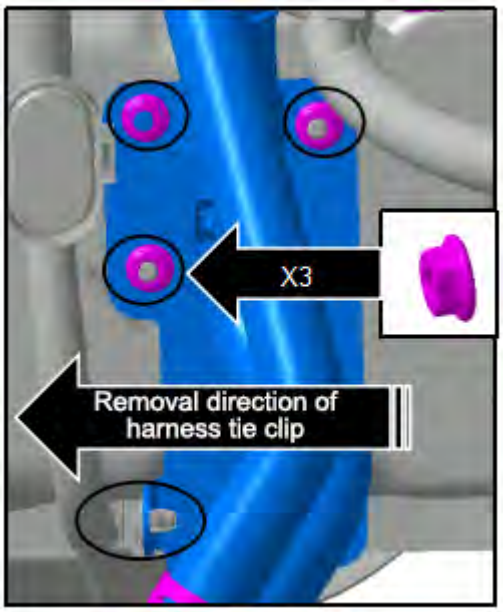
3. Remove the heater coolant pump fixing bracket (removal is not required unless necessary): Loosen 1 A/C pipe bracket fixing bolt first, and then loosen 2 coolant pump bracket fixing nuts.



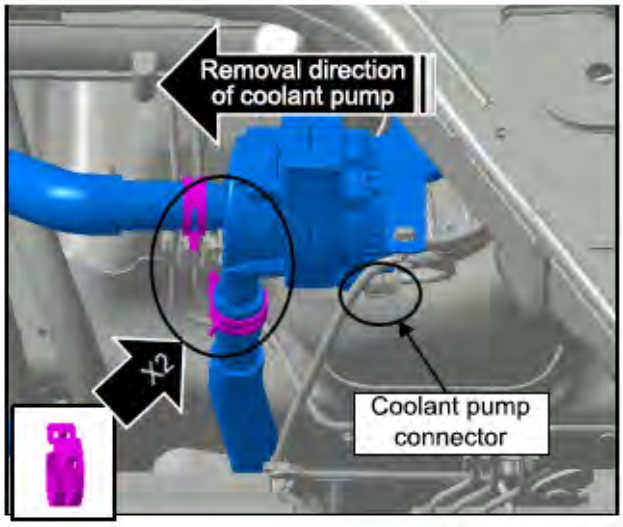
4. Removal of electric drive coolant pump (fixed on the right longitudinal beam of vehicle body): After lifting the vehicle, withdraw the coolant pump connector harness first, then loosen 2 coolant pipe hoops. After withdrawing the coolant pipe and draining the coolant, withdraw it along the specified direction of the coolant pump bracket.



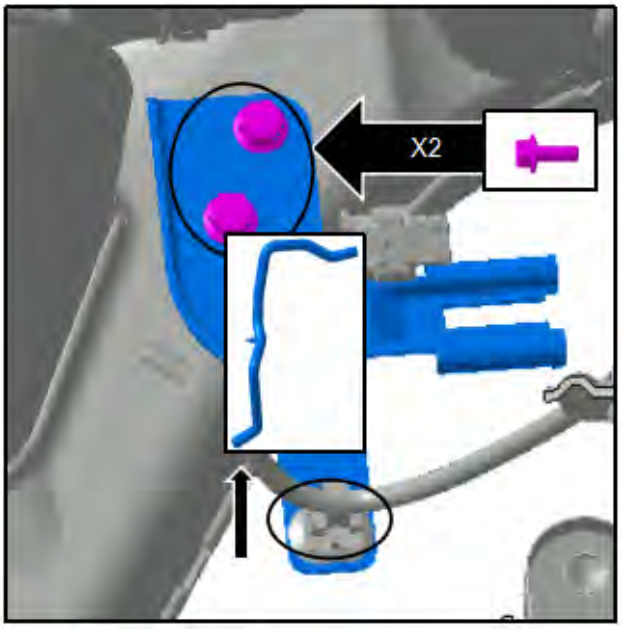
5. Remove the fixing bracket of electric drive coolant pump (it is recommended not to remove it unless necessary): Loosen 3 fixing nuts, and then withdraw the harness tie clip from the clip mounting hole on the bracket.



6. Remove the battery pack coolant pump (fixed on the subframe): After lifting the vehicle, first withdraw the coolant pump connector harness, then loosen the 2 coolant pipe hoops. After withdrawing the coolant pipe and draining the coolant, withdraw it in the specified direction of the coolant pump bracket.



7. Remove the battery pack coolant pump fixing bracket (it is convenient to remove it only after the subframe assembly is removed. It is recommended not to remove it unless necessary): Loosen 2 fixing bolts, and then withdraw the harness tie clip from the clip mounting hole on the bracket.



Installation

1. The assembly steps are in reverse order of disassembly steps.

3.6.4.4 Coolant pipeline and three-way coolant valve

Material

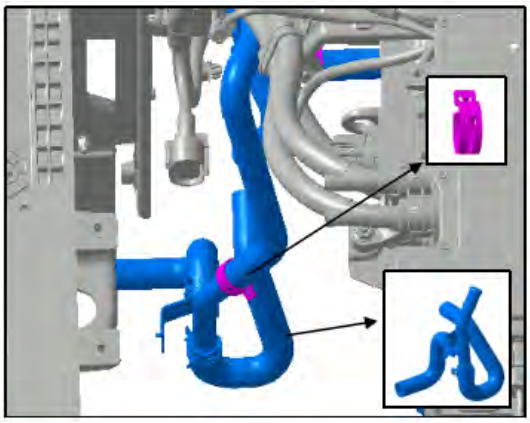
Name	Specification
Coolant	OAT-35

Electric drive cooling circuit

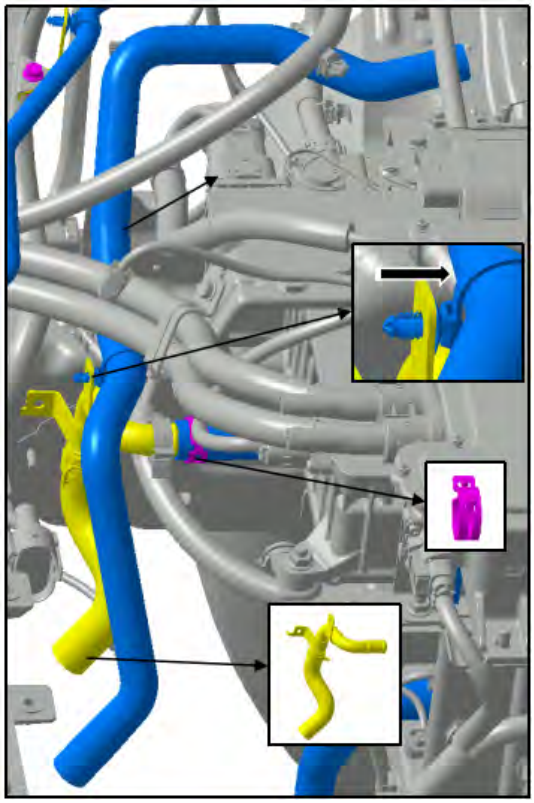
Removal

Caution: During maintenance, pay attention to the discharge and recovery of coolant, and avoid flowing onto surrounding electrical connectors. It is recommended not to disassemble it unless necessary.

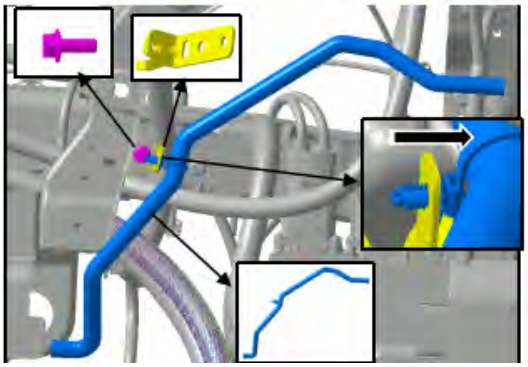
1. Loosen 1 coolant pipe hoop to remove the radiator outlet pipe assembly.



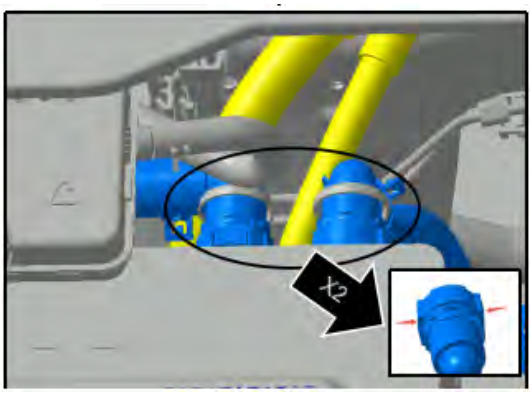
2. Loosen 1 coolant pipe hoop and withdraw the coolant pipe tie clip from the mounting hole to remove the water supply pipe assembly and the two-in-one coolant pipeline assembly.



3. Loosen 1 bracket bolt and withdraw the coolant pipe tie clip from the mounting hole to remove the degassing pipe assembly and coolant pipe bracket.

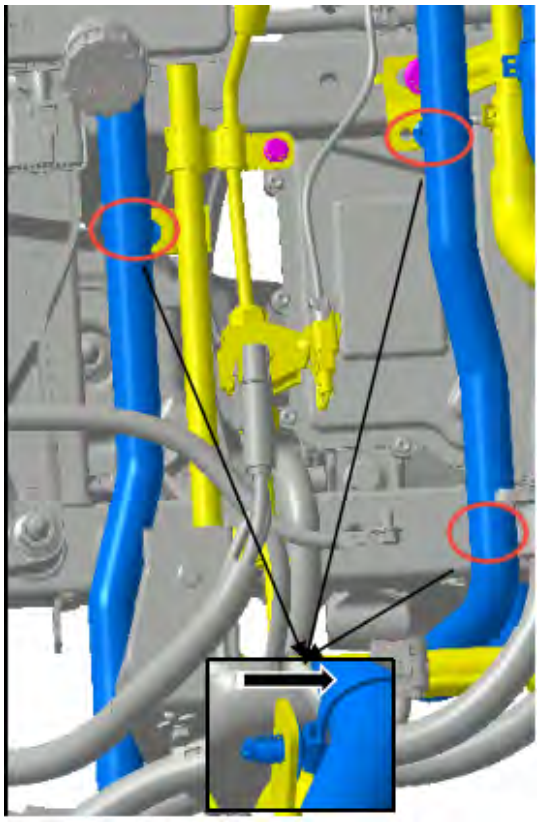


4. Remove the two-in-one water inlet and water outlet quick connector: first remove the high-voltage/pressure distribution box and related harness (refer to the high-voltage/pressure distribution box disassembly and assembly instructions), press the pressing planes on both sides of the quick connector with the thumb and index finger of one hand, deactivate the water pipe interface.

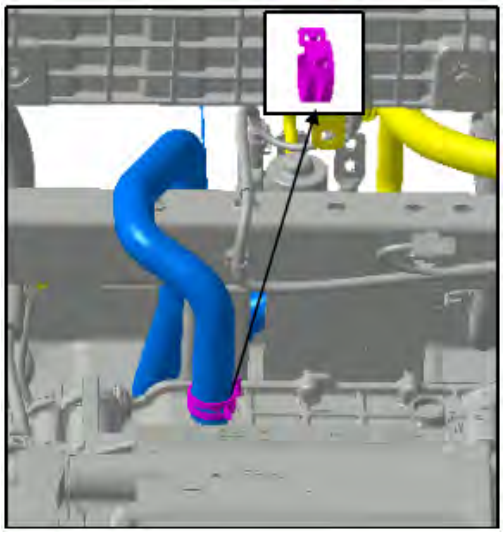


5. Remove the two-in-one module and bracket. Refer to: Charging and distribution system.

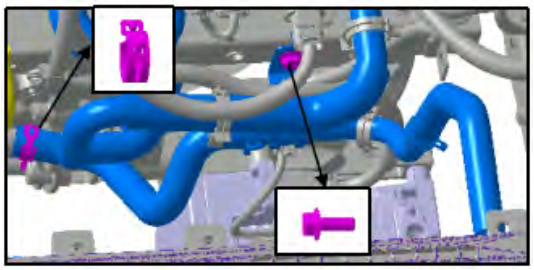
6. Remove the two-in-one coolant inlet and outlet pipes: withdraw the 3 coolant pipe tie clips from the mounting holes to remove the two-in-one coolant inlet pipe.



7. Loosen the water pipe hoop at the motor water inlet, deactivate the water pipe, and then remove the two-in-one water outlet pipe.



8. Loosen the water pipe hoop at the motor water outlet, deactivate the water pipe, and remove 1 water pipe fixing bolt to remove the radiator water inlet pipe assembly.



Battery pack and heater circuit

Removal

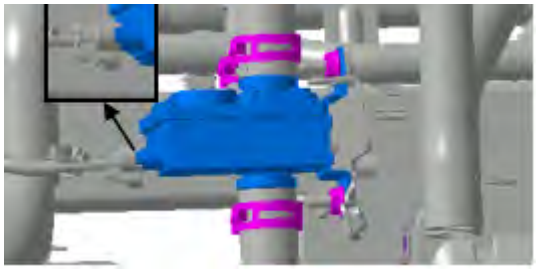
1. Remove the expansion tank degassing rubber hose: first remove the rubber hose hoop and withdraw the hose.



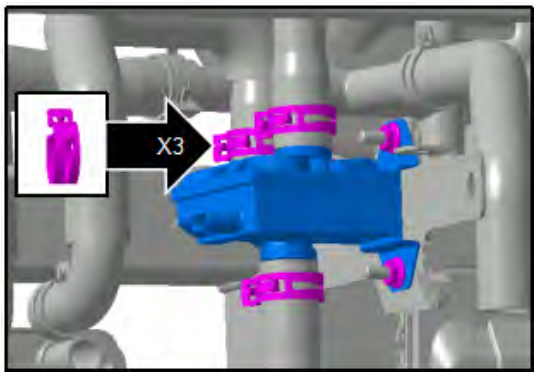
2. Remove the expansion tank degassing rubber hose: then withdraw the rubber hose tie clip from the mounting hole.



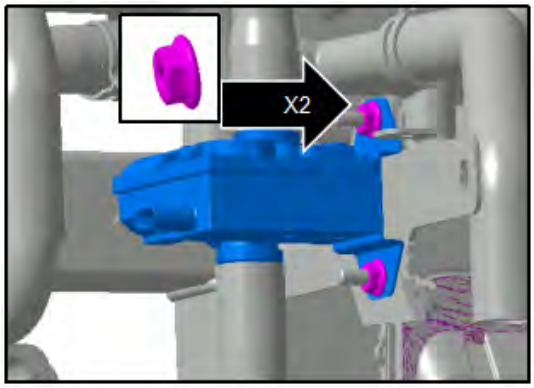
3. Remove the three-way coolant valve: first withdraw the harness connector.



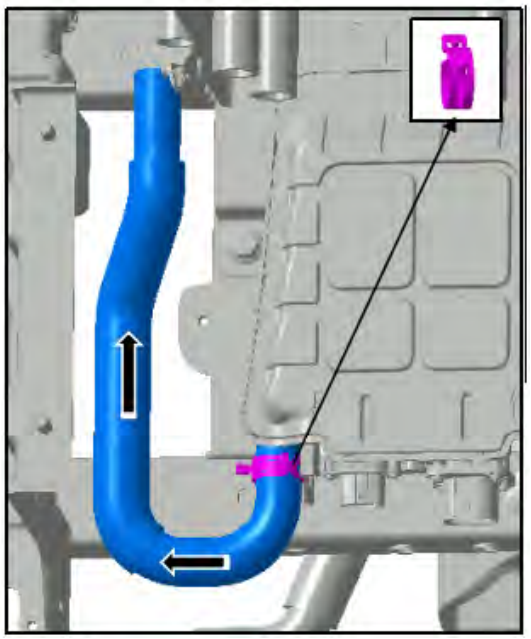
4. Removal of three-way coolant valve: Remove 3 rubber hose hoops and withdraw the rubber hose.



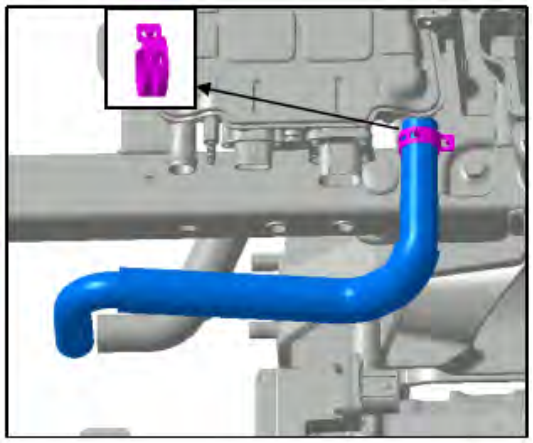
5. Removal of three-way coolant valve: Remove the 2 fixing nuts to remove the three-way coolant valve.



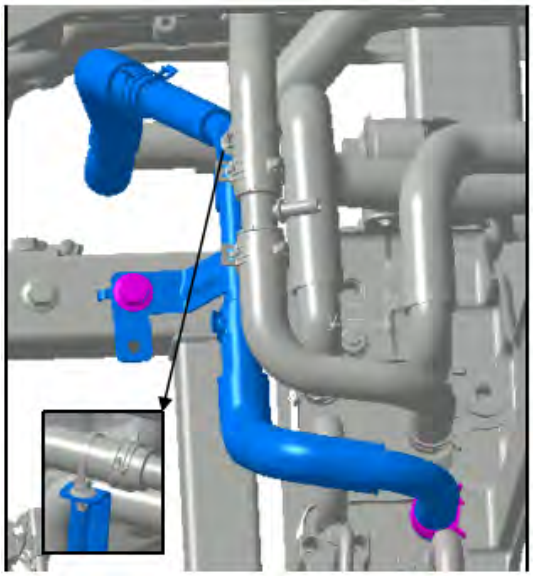
6. Removal of PTC coolant outlet pipe assembly: Remove 1 rubber hose hoop and withdraw the rubber hose.



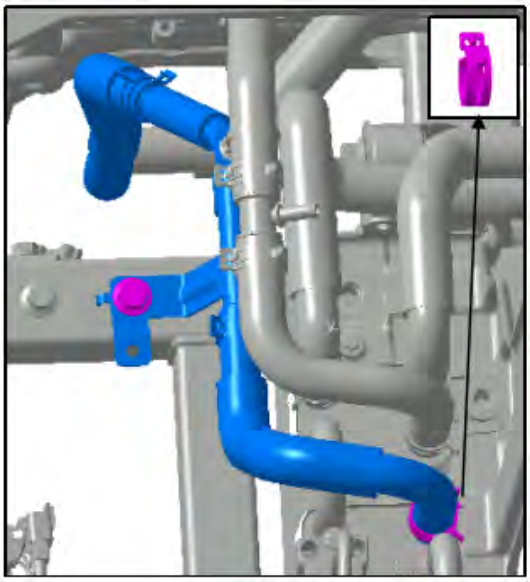
7. Removal of PTC coolant inlet pipe: Remove 1 rubber hose hoop and withdraw the rubber hose.



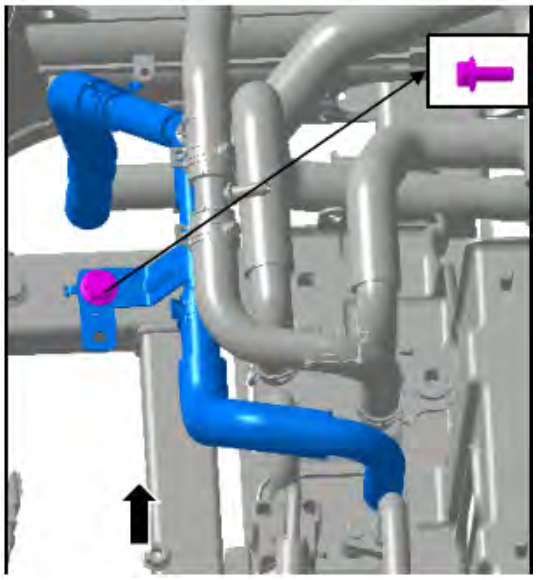
8. Remove the coolant pump outlet pipe assembly: withdraw the rubber hose tie clip from the mounting hole.



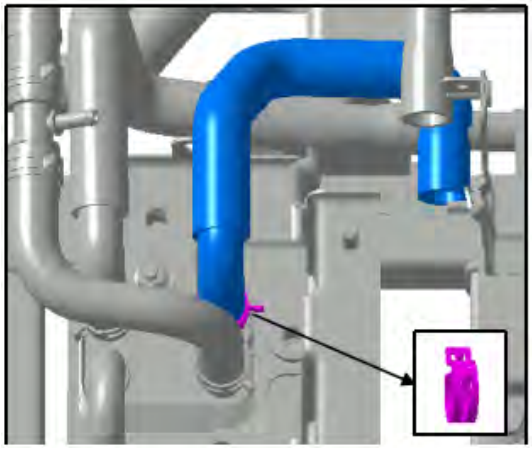
9. Removal of coolant pump outlet pipe assembly: Remove 1 rubber hose hoop and withdraw the rubber hose.



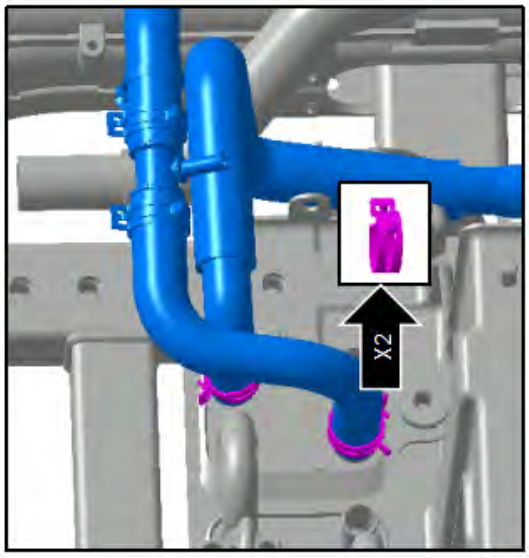
10. Removal of coolant pump outlet pipe assembly: Remove 1 fixing bolt.



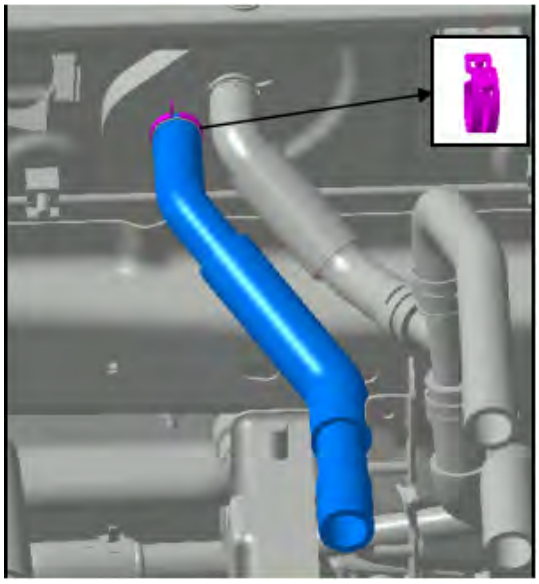
11. Removal of chiller coolant inlet pipe: Remove 1 rubber hose hoop and withdraw the rubber hose.



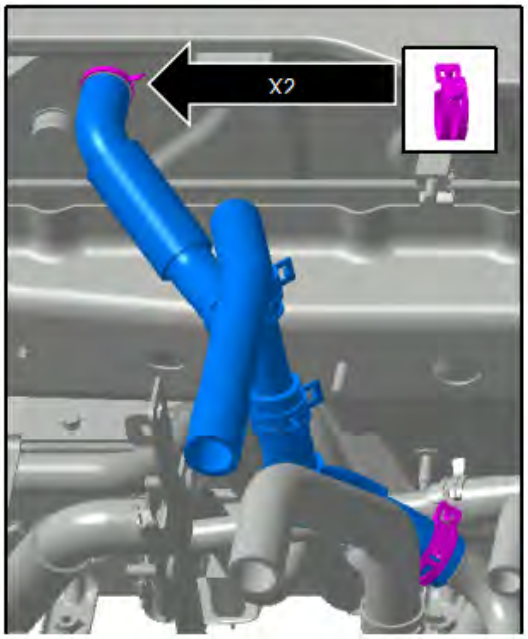
12. Remove the 2 rubber hose hoops of the remaining two nozzles of the chiller and deactivate the rubber hose.



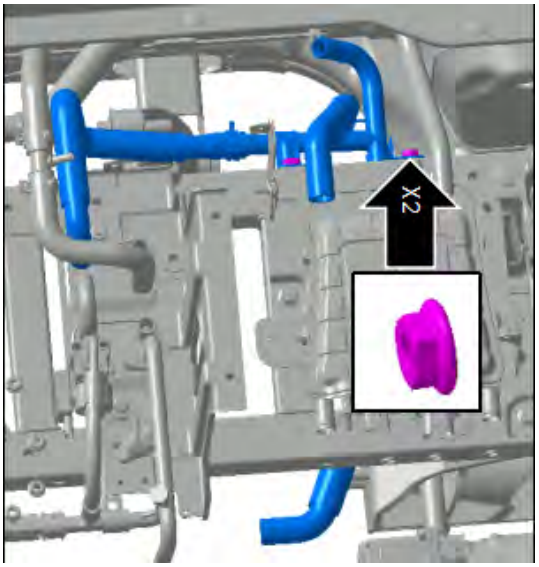
13. Removal of heater coolant inlet pipe: Remove 1 rubber hose hoop and withdraw the rubber hose.



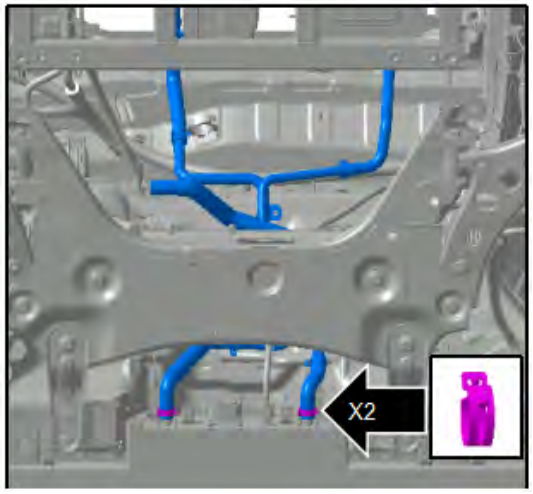
14. Removal of heater coolant outlet pipe assembly: Remove 2 rubber hose hoops and withdraw the rubber hose.



15. Removal of coolant pipeline assembly: Remove the 2 fixing bolts.

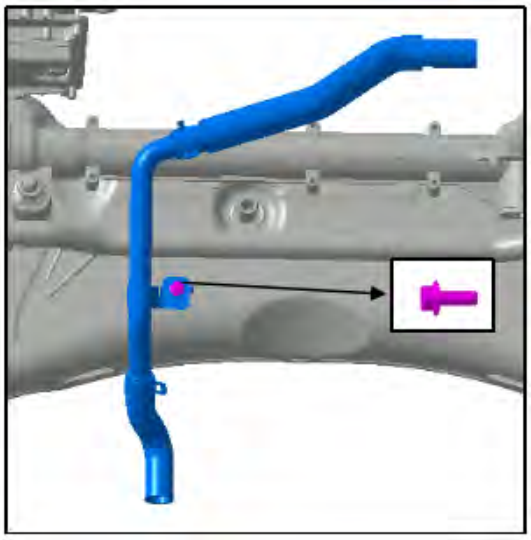


16. After the vehicle is lifted, remove the 2 rubber hose clamps at the battery pack water inlet and water outlet and deactivate the rubber hose.

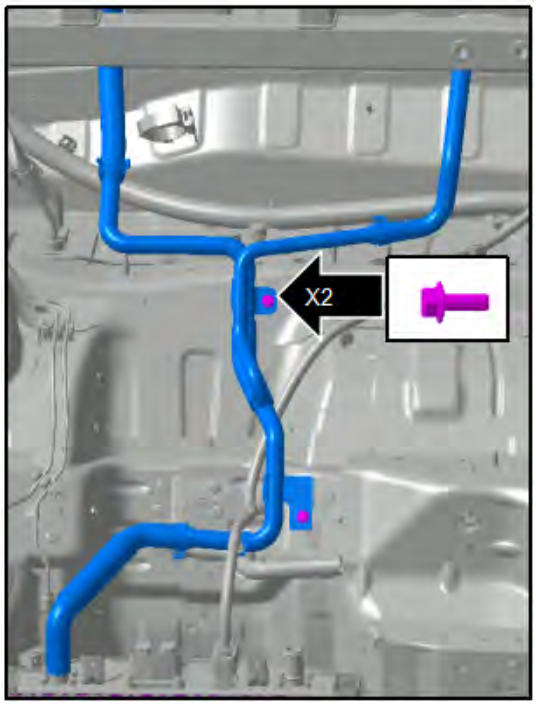


17. Remove the subframe assembly and mount assembly. Refer to mount

18. Removal of battery pack coolant outlet pipe assembly: Remove 1 bolt fixed on the subframe.



19. Removal of battery pack coolant inlet pipe assembly:
    Remove the 2 water pipe fixing bolts.



Assembling

1. The assembly steps are in reverse order of disassembly steps.

2. After all cooling system components are assembled, open the corresponding expansion tank cap to fill coolant.

3.7 Charging and distribution system

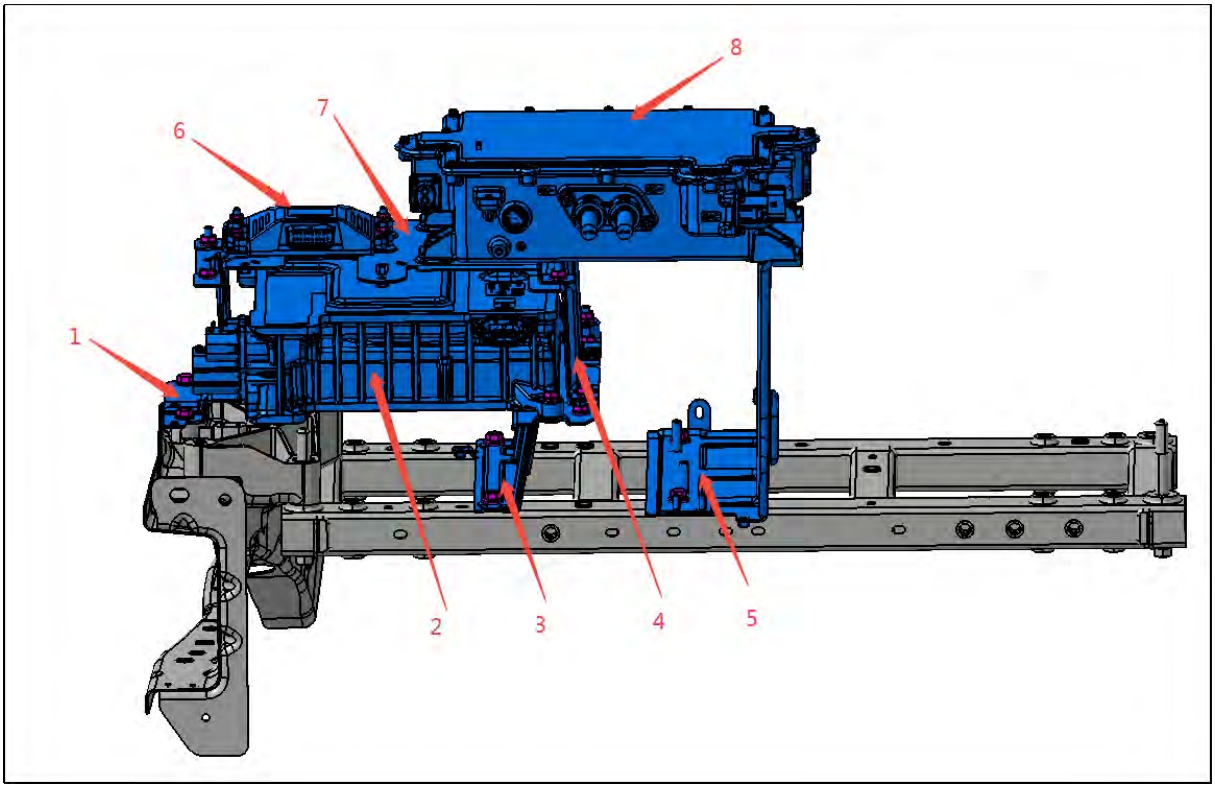
3.7.1 Specification

3.7.1.1 Torque specification

Name	Specification	Quantity	Capacity
Q1860816F38	Hex flange bolt	2	30±3 N.m
Q32008F38	Hex flange nut	16	30±3 N.m
Q1841020TF38	Hex flange bolt	4	72±6 N.m
Q32006F38	Hex flange nut	4	10±1 N.m

3.7.2 Instructions and operations

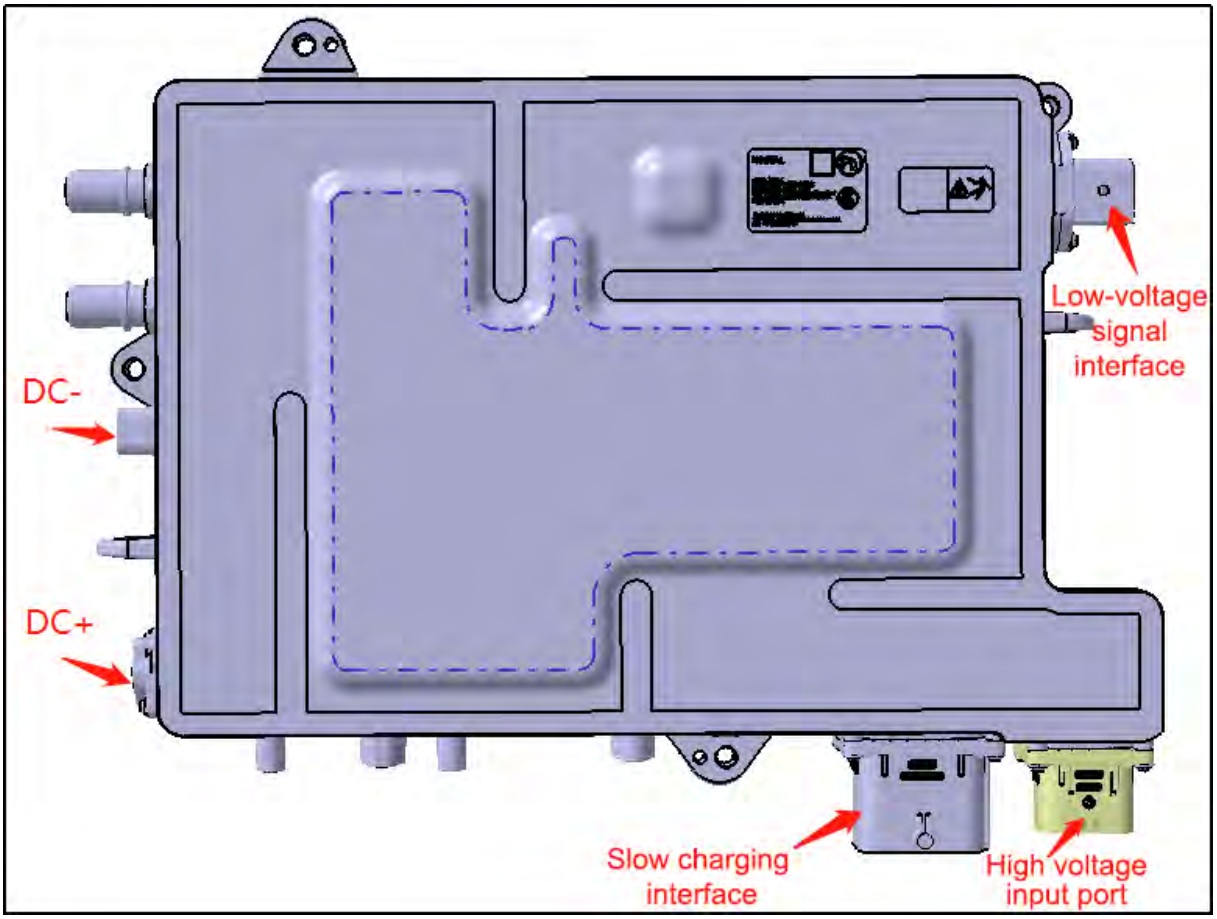
3.7.2.1 Installation Position Diagram of Charging and Distribution System



Symbol	Part No.	Part Name	Quantity
1	T5EV-2107312	Power supply two-in-one fixing bracket	1
	Q1860816F38	Hex flange bolt - power supply two-in-one fixing bracket use	2
	Q32008F38	Hex flange nut - power supply two-in-one fixing bracket use	2
2	T5EV-2107110	Power supply two-in-one module	1
	Q32008F38	Hex flange nut - for power supply two-in-one module	4
3	T5EV-2107311	Two-in-one power supply mounting transition bracket	1
	Q1841020TF38	Hex flange bolt - for installing transition bracket of power supply two-in-one	2
4	T5EV-2107313	PDU mounting transition bracket	1
	Q32008F38	Hex flange nut - PDU installation transition bracket use	2
5	SX5GEV-2107410	High-voltage distribution box mounting bracket	1
	Q1841020TF38	Hex flange bolt - PDU installation transition bracket use	2
6	SX5GEV-2107910	Communication protocol converter	1
	Q32006F38	Hex flange nut - communication protocol converter use	4
7	SX5GEV-2107902	EVCC bracket assembly	1
	Q32008F38	Hex flange nut - EVCC bracket assembly use	4

Symbol	Part No.	Part Name	Quantity
8	SX5GEV-2107210	PDU	1
	Q32008F38	Hex flange nut - high-voltage distribution box use	4

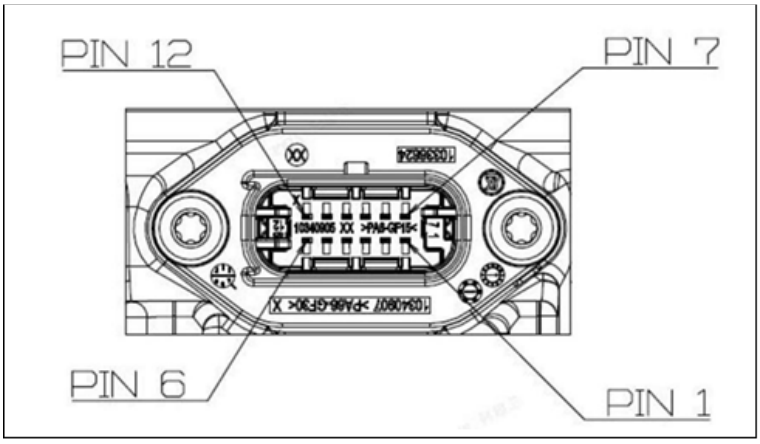
3.7.2.2 Position Diagram of Power supply Two-in-one Module Connector



Caution:

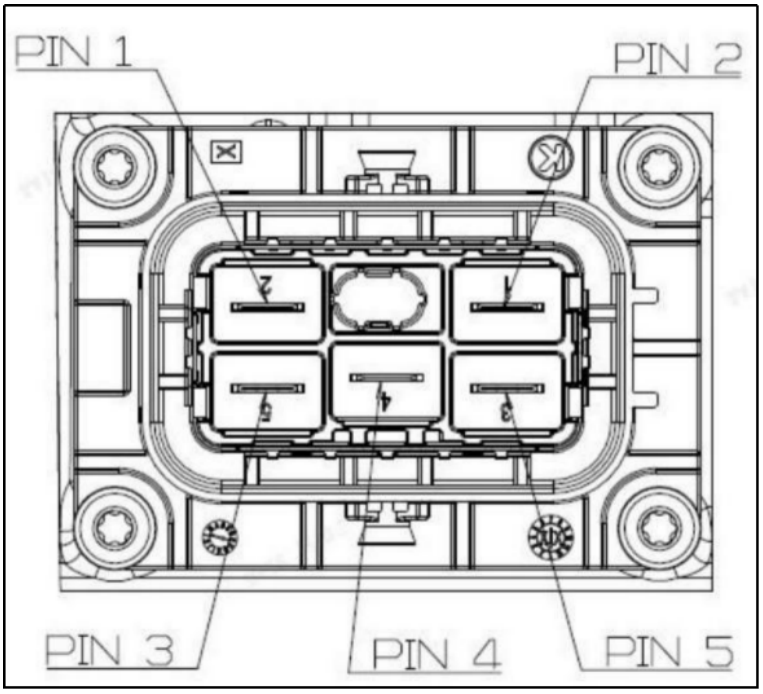
DC- should be based on the actual contacts of the vehicle.

3.7.2.3 Low-voltage signal interface



Pin	Signal	Pin definition	Rated current max (A)
1.	GND	Power supply GND	3
2.	-	-	0
3.	VB	12V positive pole	3
4.	-	-	0
5.	G_CANFD_H	CAN_H	0.1
6.	G_CANFD_L	CAN_L	0.1
7.	GND	Power supply GND	3
8.	-	-	0
9.	VB	12V positive pole	3
10.	IG3 (KL15)	Wake-up signal	0.1
11.	-	-	0
12.	-	-	0

3.7.2.4 Slow charging interface

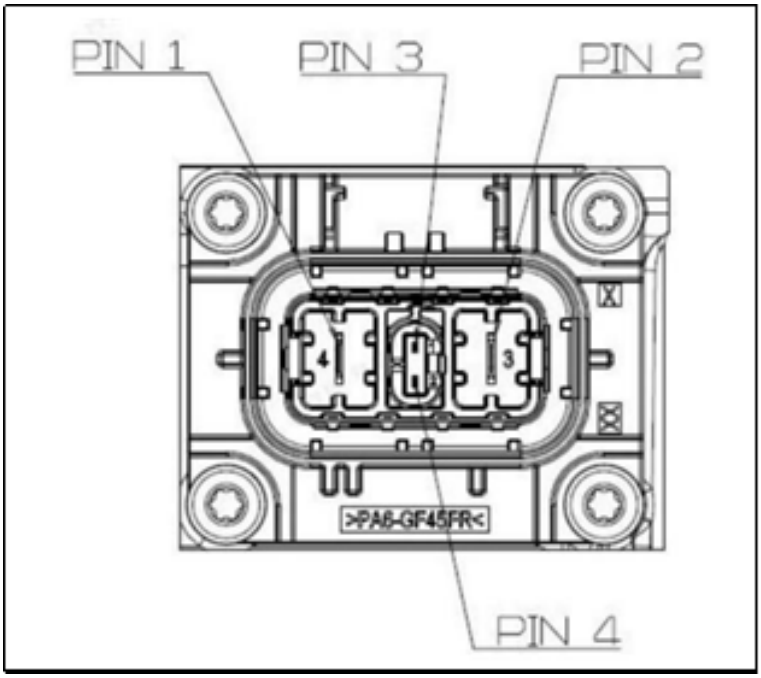


Pin	Signal	Pin definition	Rated current max (A)
1.	AC-L2	/	16
2.	AC-L1	/	48
3.	AC-L3	/	16
4.	-	-	-
5.	AC-N	GND	48

Parts terminal connector (KKS: 10528716)

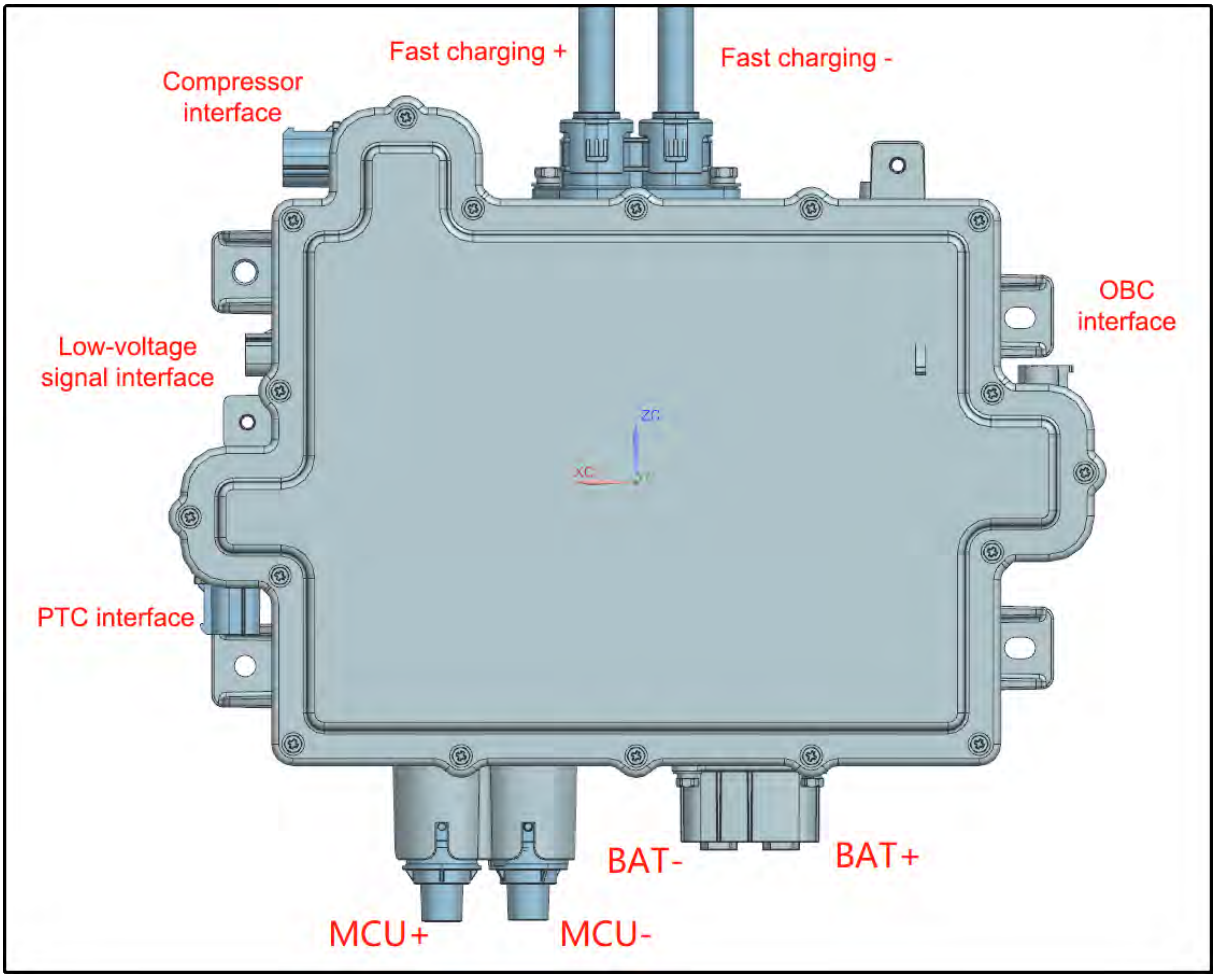
Harness terminal connector (KKS: 10525748)

3.7.2.5 High voltage input port

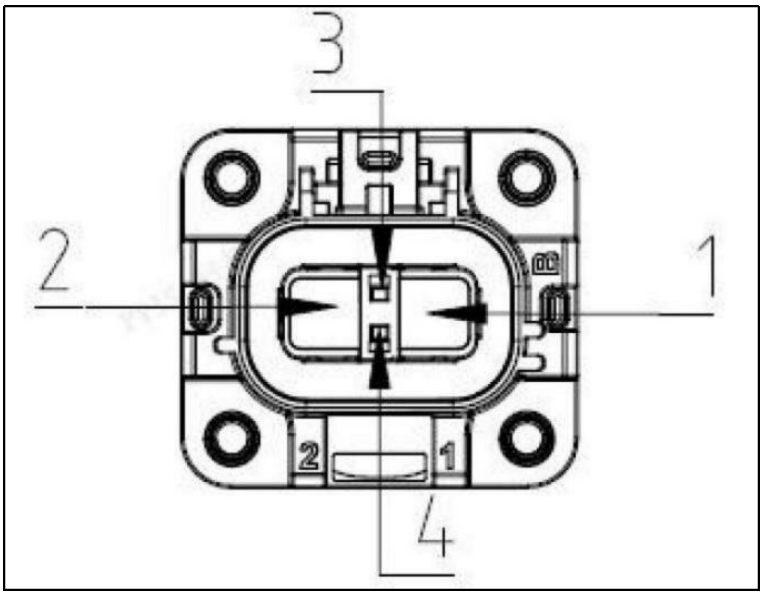


Pin	Signal	Pin definition	Rated current max (A)
1.	HVDC+	Positive	45
2.	HVDC-	Negative	45
3.	Interlock	High-voltage interlocking	-
4.	Interlock	High-voltage interlocking	-

3.7.2.6 Location diagram of high-voltage distribution box connectors



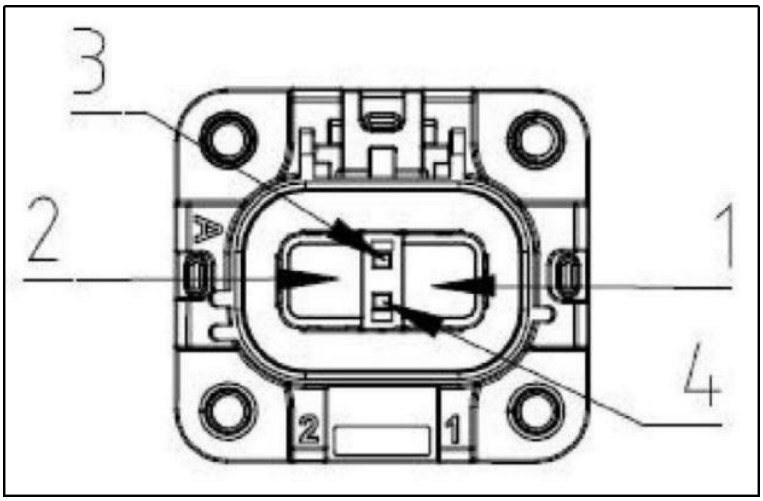
3.7.2.7 Compressor interface



Pin	Signal	Pin definition	Rated current max (A)
1.	HV+	Positive	32
2.	HV-	Negative	32

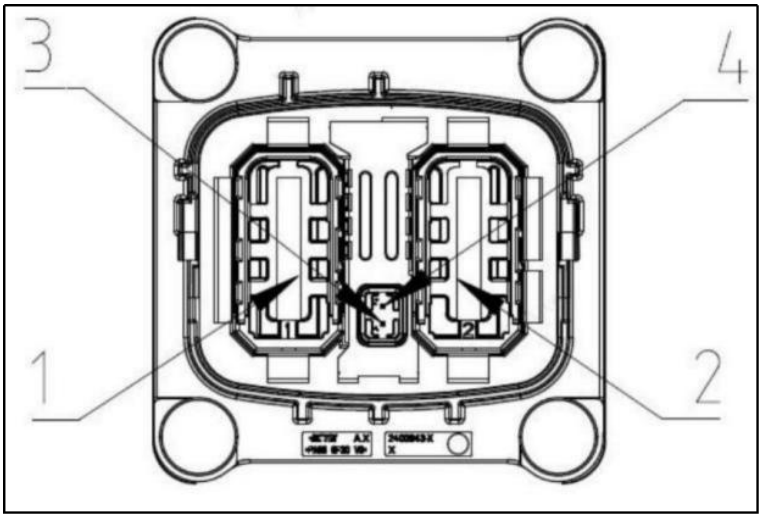
Pin	Signal	Pin definition	Rated current max (A)
3.	Interlock 1	High-voltage interlock detection (low-voltage signal)	0.5
4.	Interlock 2	High-voltage interlock detection (low-voltage signal)	0.5

3.7.2.8 PTC interface



Pin	Signal	Pin definition	Rated current max (A)
1.	HV+	High-voltage positive pole	32
2.	HV-	High-voltage negative pole	32
3.	Interlock 1	High-voltage interlock detection (low-voltage signal)	0.5
4.	Interlock 2	High-voltage interlock detection (low-voltage signal)	0.5

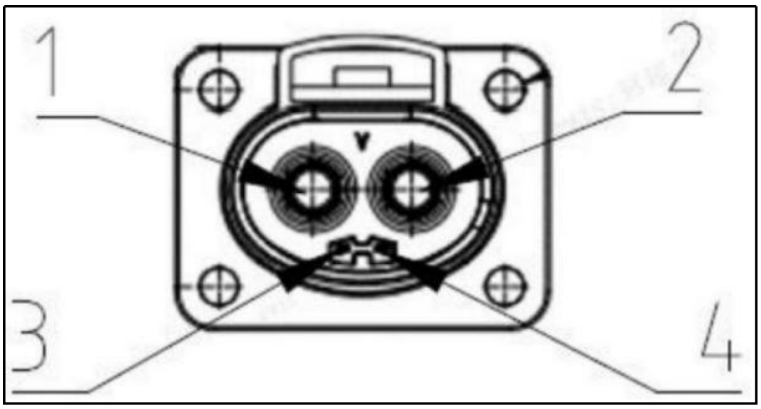
3.7.2.9 Battery pack interface



Pin	Signal	Pin definition	Rated current max (A)
1.	HV-	High-voltage negative pole	250
2.	HV+	High-voltage positive pole	250

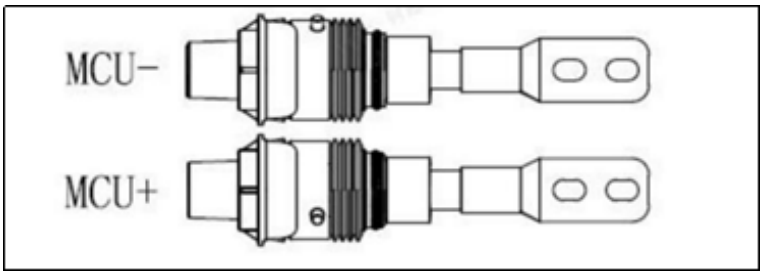
Pin	Signal	Pin definition	Rated current max (A)
3.	Interlock 1	High-voltage interlock detection (low-voltage signal)	0.5
4.	Interlock 2	High-voltage interlocking (low-voltage line)	0.5

3.7.2.10 OBC interface



Pin	Signal	Pin definition	Rated current max (A)
1.	HV+	High-voltage positive pole	32
2.	HV-	High-voltage negative pole	32
3.	Interlock 1	High-voltage interlock detection (low-voltage signal)	0.5
4.	Interlock 2	High-voltage interlock detection (low-voltage signal)	0.5

3.7.2.11 MCU interface

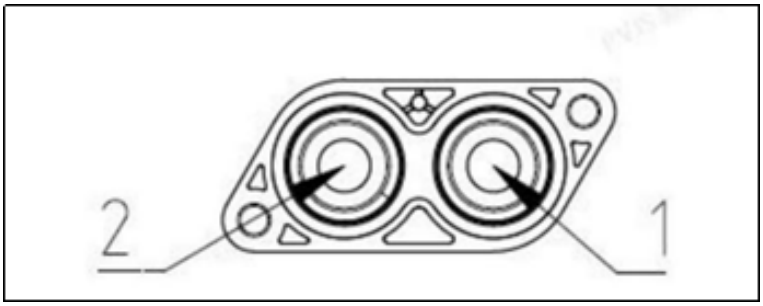


Terminal model

Positive pole: crimping lug_90° —50–2×16–3.5_connector

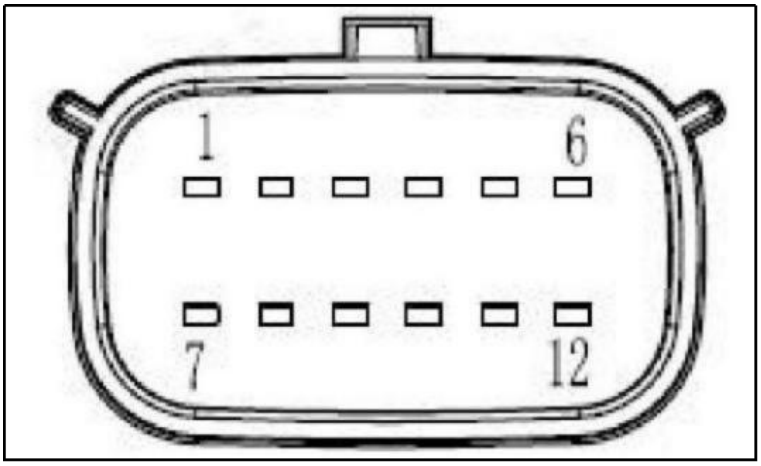
Negative pole: crimping lug_180° —50–2×16–3.5_connector

3.7.2.12 Fast charging interface



Pin	Pin definition
1.	HV- (high-voltage negative pole)
2.	HV+ (high-voltage positive pole)

3.7.2.13 Low-voltage signal interface



Pin	Signal
1.	DC charging contactor positive control signal
2.	Adhesion detection -12V
3.	Adhesion detection -GND
4.	High-voltage interlocking 1 - #1
5.	Adhesion detection - signal output
6.	DC charging contactor negative control signal
7.	-
8.	-
9.	High-voltage interlocking 1 - #2
10.	High-voltage interlocking 2 - #1
11.	High-voltage interlocking 2 - #2
12.	-
Note: 4/11 pin is short-circuited in the box	

3.7.2.14 Overview

The charging and distribution system consists of a two-in-one power supply module (on-board charger OBC + DC converter DCDC), a high voltage distribution unit (PDU) and its mounting bracket.

Function description

1. AC charging conversion function.

   The on-board charger OBC is a device that can convert the AC power of the public power grid into the DC power required by the on-board energy storage device and charge the on-board energy storage device.

2. Low-voltage power supply function of the vehicle.

   The DCDC converter converts high-voltage direct current into low-voltage direct current to supply power to the low-voltage electrical equipment of the entire vehicle.

3. High-voltage distribution function.

   The high-voltage power distribution unit (PDU) includes input and output parts. The input part includes: high-voltage DC (fast charging) input and vehicle DC (battery pack) input, and the output part includes: heater PTC high voltage, A/C compressor high voltage, motor controller high voltage.

4. Information transmission and protection functions.

   The two-in-one power supply module should have a CAN communication function for information interaction with the BMS, etc., with a baud rate of 500kbps, and should have protection functions such as overvoltage, undervoltage, and short circuit.

3.7.2.15 Precautions

High-voltage safety requirements for assembly

To ensure the safety of high-voltage operation, the insulation resistance of the power supply two-in-one module and the high-voltage distribution box must be tested before assembly.

1. Use the 1000V range on the megohmmeter for the test. When measuring, read the value only after the megohmmeter pointer or display becomes stable. Caution: The surface of the object to be measured must be dry and free from contaminants.

2. Before the test, the sample to be tested should be separated from the external power supply and load. Electrical components that cannot withstand the high-voltage impact of the megohmmeter (such as semiconductor rectifiers, semiconductor tubes and capacitors) should be removed from the circuit or short-circuited before measurement.

3.7.3 Diagnosis and testing

3.7.3.1 Charging and distribution system-DCDC module DTC diagnosis and maintenance

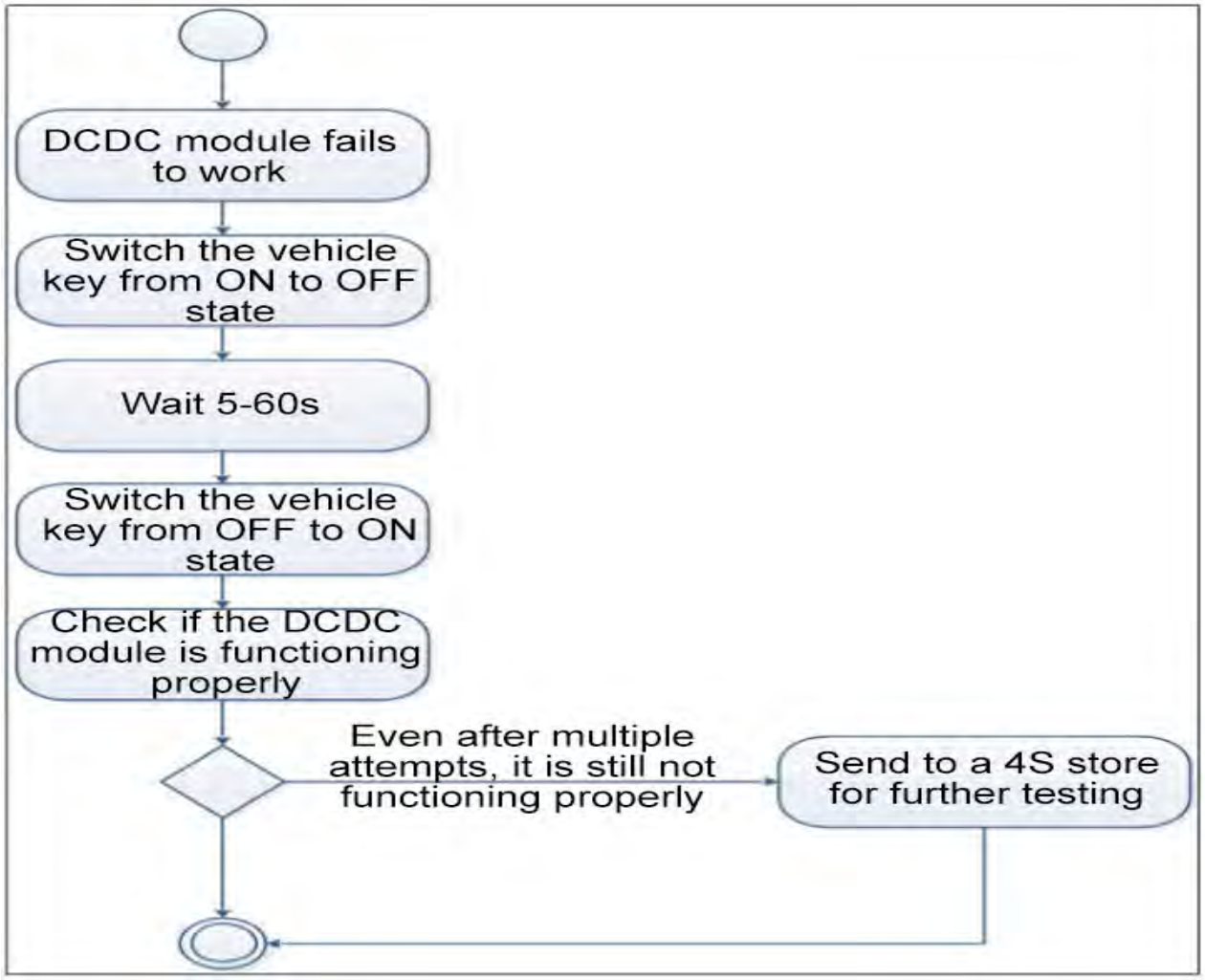
DTC	Fault description	Repair recommendations
B21E17	Input over-voltage software protection	Check whether the input voltage is between 200V and 450V. If the input voltage is normal and the fault cannot be eliminated, it is recommended to replace the CDU
B22016	Input under-voltage software protection	
C12200	VCM control message lost	Check whether the VCM component communication is normal
B22416	DCDC module A drive part overtemperature	1. Check whether the vehicle cooling system works normally. 2. Check whether the CDU is overheated. If so, let it cool for a period of time. After cooling, the DCDC is still abnormal. It is recommended to replace the CDU.
B22A4B	DCDC module MOS overtemperature high	
B22317	Output over-voltage software protection	1. Check whether the low-voltage battery voltage is between 9-16V. 2. If the low-voltage battery is abnormal, try to replace it for test.
B22516	Output under-voltage software protection	
B22719	Output over-current software protection	Check whether the output terminal is short-circuited.
B20916	The internal 12V voltage is less than 9V	1. Disconnect the low-voltage battery and try to charge it 2. If the fault still exists, replace the machine
B20A17	Internal 12V voltage exceeds 15V	
B20C87	Module SCI communication error	
E20D00	Network management limp	
B22800	Input voltage comparator fault protection	
B22801	Synchronous rectification drive fault protection	
B22802	Power supply fault protection of pre-drive chip	
B22803	Hardware output current reverse protection	
B22804	Hardware transient output current overcurrent protection	
B22805	Hardware transient output voltage overvoltage protection	
B22806	Internal auxiliary power supply undervoltage fault protection	

DTC	Fault description	Repair recommendations
B22807	Hardware protection redundancy protection	
B22789	Hardware fault	
B22808	Output current failure	
C07300	通信关闭	Check whether the circuit is normal
B21B17	External low-voltage power supply input overvoltage	1. Disconnect the low-voltage battery and try to charge it 2. If the fault still exists, replace the machine 3. Check whether the battery voltage is normal
B21C16	External low-voltage power supply input undervoltage	
Others		Disconnect the low-voltage battery and then connect it. If the fault cannot be eliminated, it is recommended to replace the CDU

3.7.3.2 Charging and Distribution System-DCDC Module Troubleshooting Process

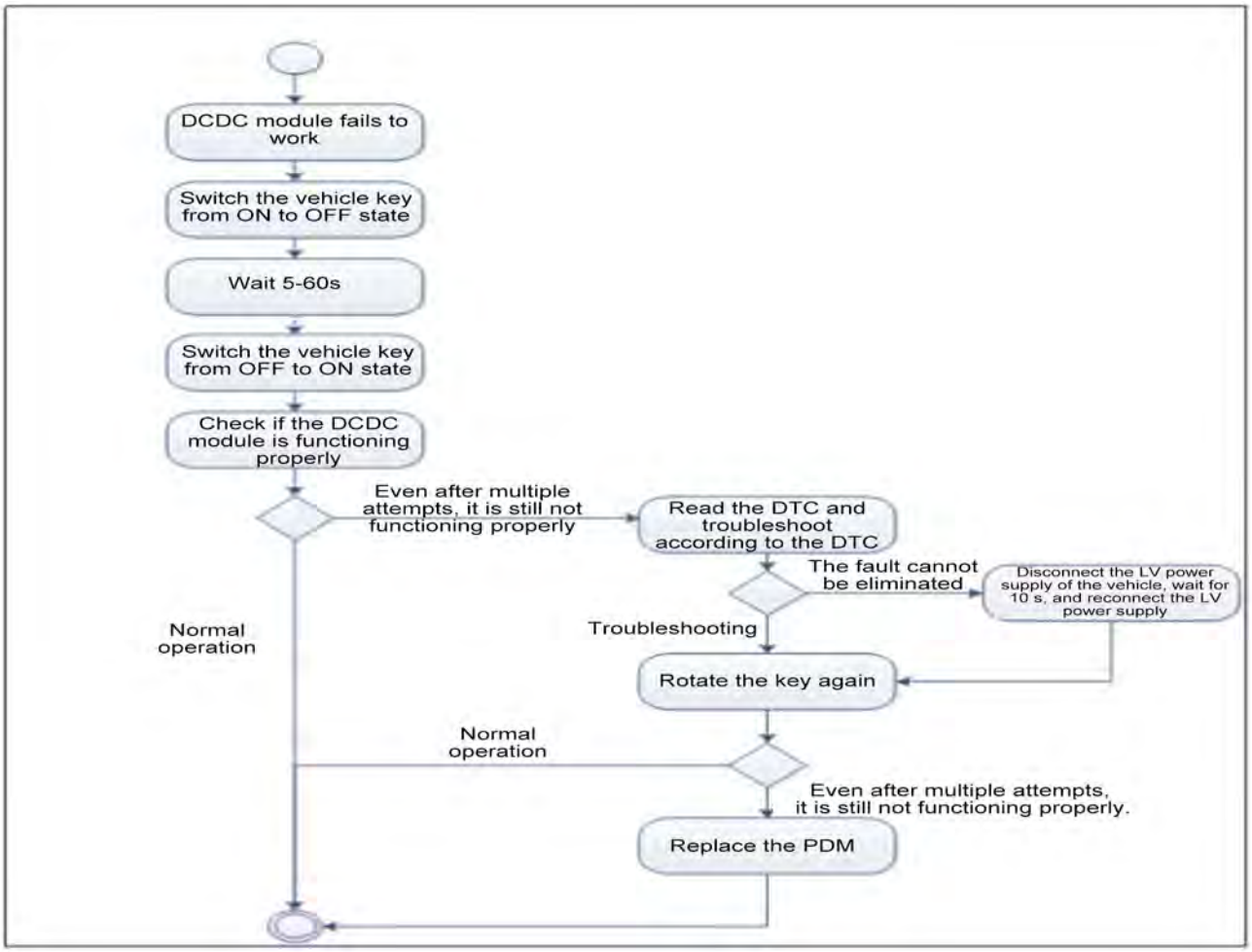
User self-inspection process

If the DCDC module does not work properly, please follow the self-inspection steps below to troubleshoot. If the DCDC module still does not work properly, please take it to a 4S shop for further inspection.



4S Store Repair Process

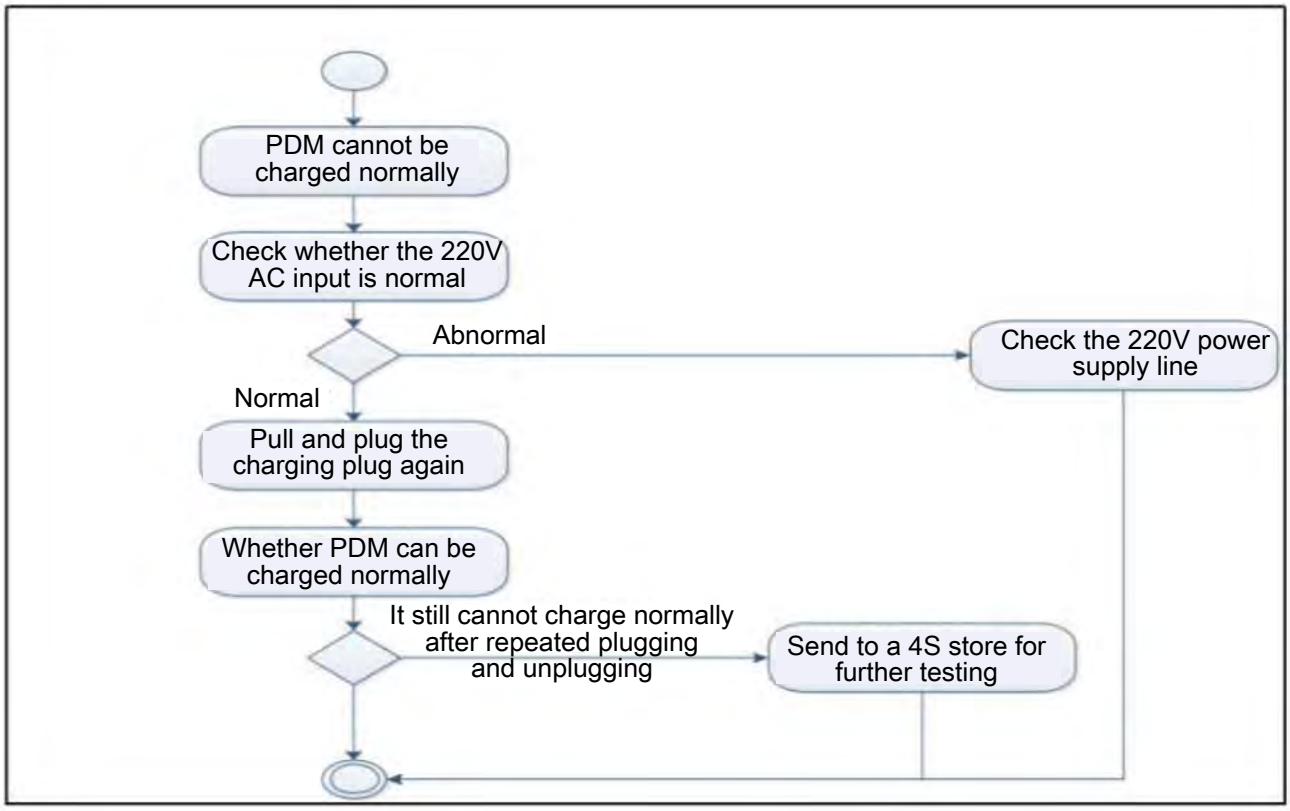
The following procedure is for 4S shop repair staff.



3.7.3.3 Charging and Distribution System-Troubleshooting Process for Charger Module

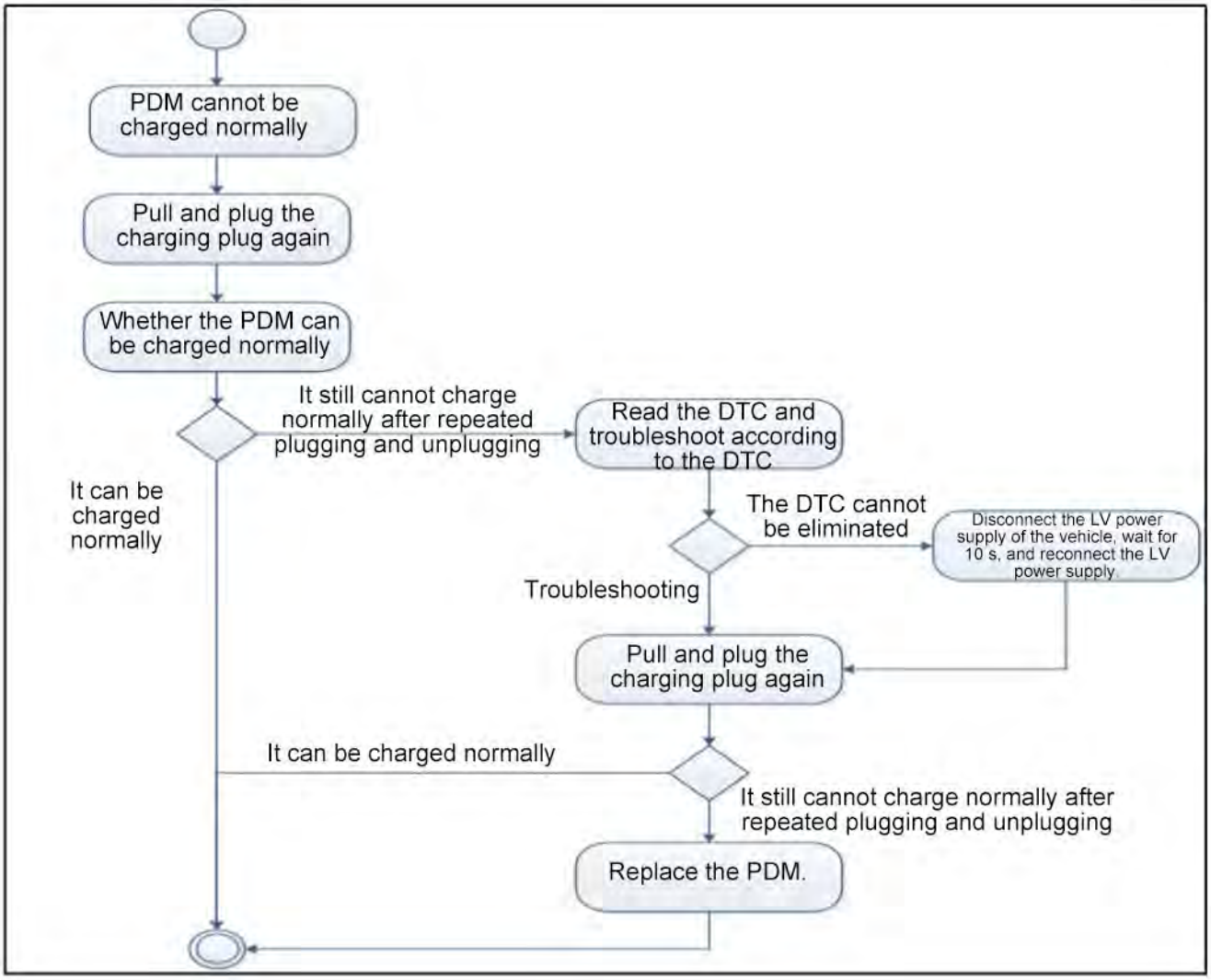
When the vehicle cannot be charged as a whole, first ensure that 1. the voltage of the vehicle's 12V battery is between (9~15V) and 2. there are no other faults in the vehicle.

User self-inspection process



4S Store Repair Process

The following procedure is for 4S shop repair staff.



3.7.3.4 Charging and distribution system-charging module DTC diagnosis and maintenance

DTC	Fault description	Repair recommendations
B20613	AC input interruption	Check whether the external AC input voltage is between 85V-265V. If the external voltage is normal, replace the charging plug for testing If it still does not recover, replace the CDU
B20816	AC input undervoltage	
B20417	AC input overvoltage	
B20119	AC input overcurrent	
B21B17	Low-voltage input over-voltage	Check whether the low-voltage battery voltage is between 9-16V. If the low-voltage battery is abnormal, try to replace it for test.
B21C16	Low-voltage input under-voltage	
C11100	BMS communication lost	Check whether the communication of BMS components is normal

DTC	Fault description	Repair recommendations
C10000	Loss of communication with HECU	Check whether the communication of HECU components is normal
C07300	Bus-off error	Check whether the system CAN bus is normal
B21219	Output hardware overcurrent protection	Check whether there is a short circuit at the output end. If not and the fault cannot be eliminated, it is recommended to replace the CDU
B21417	High voltage output over-voltage protection	Check whether the pre-charge relay or main relay is abnormal. If not and the fault cannot be eliminated, it is recommended to replace the CDU. If replacing the CDU still does not solve the problem, it is recommended to replace the pre-charge relay or main relay.
B20F4B	LLC MOS tube over-temperature protection	Measure whether the charger is overheated. If so, let it cool for a period of time. After cooling, the CDU is still abnormal. It is recommended to replace the CDU.
B2074B	PFC MOS tube over-temperature protection	
B20017	PFC output overvoltage	1. Disconnect the low-voltage battery and try to charge it 2. If the fault still exists, it is recommended to replace the CDU
B20093	PFC startup failed	
B20C87	OBC hardware fault	
B21516	High-voltage output undervoltage	
Others		If the fault cannot be eliminated, it is recommended to replace the CDU

3.7.3.5 Charging and distribution system-fault diagnosis and maintenance of high-voltage power distribution box

Use the system schematic diagram to check the circuit, fuse, and relay, identify the faulty part, and repair or replace the fuse, etc.

Caution:

– This work should be done by professionals at 4S shops. If it cannot be repaired, replace the whole assembly.

Fuse

1. PTC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of a multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the side from the PTC fuse to the relay direction. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

2. OBC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of a multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the other side of the OBC fuse. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

3. EAC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of the multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the other side of the EAC. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

Relay

Pay special attention to maintenance and confirm that the vehicle is powered off from high voltage.

1. Fast charging relay detection: Open the cover for detection, use the multimeter buzzer gear, touch the test lead to both ends of the relay, the buzzer does not respond, the low-voltage connector 7+/9-pin is connected to the 12V power supply, there is a click sound, the test lead touches the two ends of the relay again, the buzzer keeps ringing, and any point does not meet the requirements, it indicates a fault.

2. PTC relay: Open the cover for inspection, use the multimeter buzzer gear, touch the test lead to both ends of the relay, the buzzer does not respond, the low-voltage connector 12+/6-pin is connected to the 12V power supply, there is a click sound, the test lead touches both ends of the relay again, the buzzer keeps ringing, and any point does not meet the requirements, it indicates a fault.

Microswitch

Open the cover for inspection, remove the microswitch connector, manually press the microswitch pressure rod, adjust the multimeter to the buzzer gear, touch the probe to the connector terminal, and the buzzer will sound for a long time. Release the microswitch pressure rod, and the buzzer will not respond. Otherwise, it is a fault.

Sintering detection module

The HECU message status can be read by the diagnostic scanner to determine whether the sintering detection module is faulty.

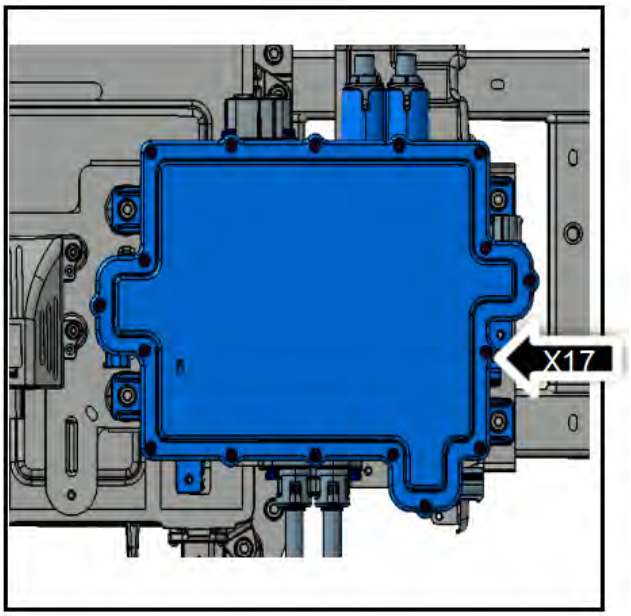
3.7.4 Removal and installation

3.7.4.1 Removal and installation of on-board power supply system

Removal of high-voltage distribution box

Caution: When removing the on-board power supply system, make sure that the vehicle's high voltage is deactivated and disconnect the negative battery cable.Refer to: Disconnect the battery negative cable.

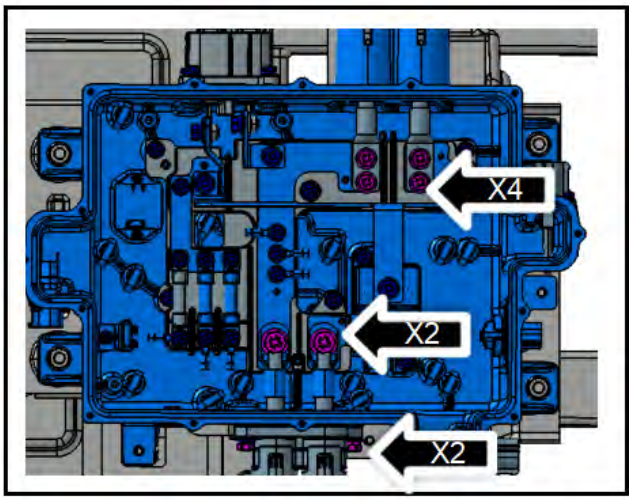
1. Disconnect the quick connector on the high-voltage distribution box, and use a screwdriver to remove 17 fastening screws from the upper cover plate of the high-voltage distribution box. The tightening torque of the fastening screws is 2.4±10% N.m.



2. Use an electric screwdriver to remove the 2 M6*18 cross-toothed screws of the fast charging connector, with a torque of 8±1N.m.

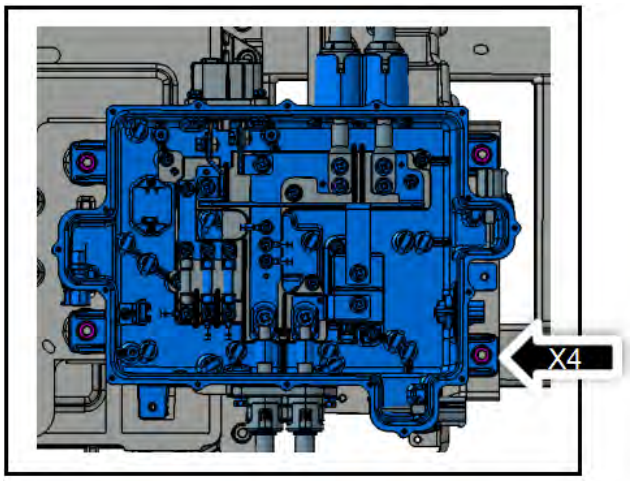
   Use an electric screwdriver to remove the 2 M8*18 cross-toothed screws of the fast charging copper bar, with a torque of 14±10%N.m.

   Use an electric screwdriver to remove the 2 M6*16 cross-toothed screws from the motor terminal, with a torque of 8 ±1 N.m.



3. Remove the 4 M8 hex flange nuts with an electric screwdriver.

   Nut tightening torque 30±3 N.m



4. Remove the high-voltage distribution box.

Installation

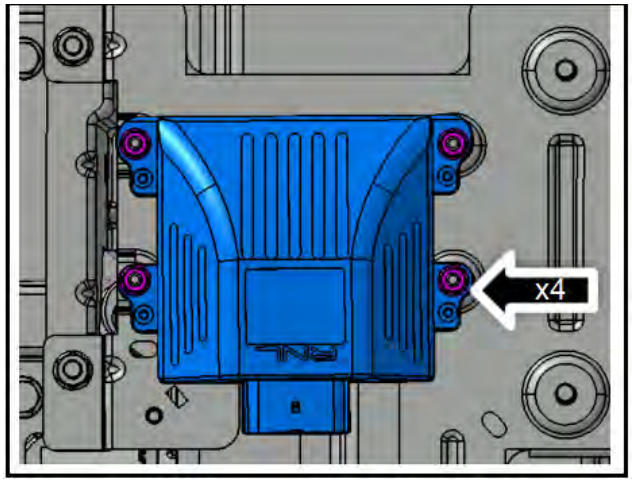
1. The installation order is reverse to the removal order.

3.7.4.2 Removal and installation of communication protocol converter

Removal

1. Disconnect the low-voltage connection harness of the communication protocol converter, and use an electric screwdriver to remove the 4 M6 hex flange nuts of the communication protocol converter.

   The nut tightening torque is 30±3 N.m.



Installation

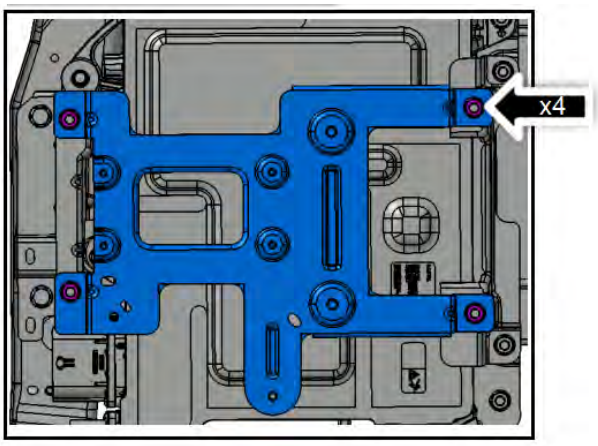
1. The installation order is reverse to the removal order.

3.7.4.3 Removal and installation of two-in-one power supply module

Removal

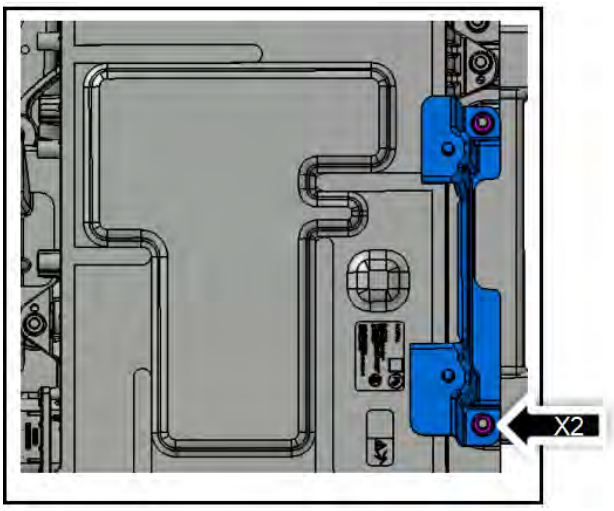
1. Use an electric screwdriver to remove the 4 M8 hex flange nuts of the EVCC bracket assembly and remove the EVCC bracket assembly.

   The tightening torque of the nut is 30±3 N.m.



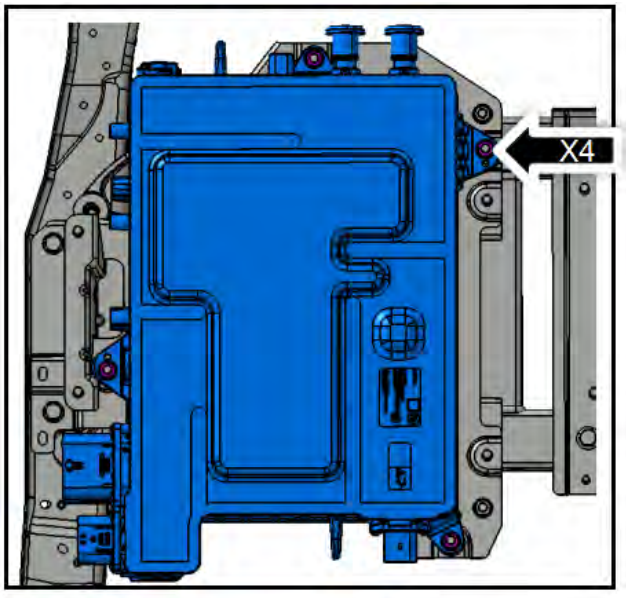
2. Use an electric screwdriver to remove the 2 M8 hex flange nuts of PDU mounting transition bracket and remove the PDU mounting transition bracket.

   The tightening torque of the nut is 30±3 N.m.



3. Disconnect the high and low voltage harness connectors of the two-in-one power supply module, use an electric screwdriver to remove the 4 M8 hex flange nuts of the two-in-one power supply, and remove the two-in-one power supply module.

   The tightening torque of the nut is 30±3 N.m.



Installation

1. The installation order is reverse to the removal order.

3.8 Traction battery

3.8.1 Specification

3.8.1.1 Material specifications

Name	Specification	Capacity
Cooling mode	Liquid cooling	
Rated voltage (V)	312	
Rated energy (kWh)	64.4	

3.8.1.2 Torque specification

Name	Torque
Torque of mounting bolt between battery pack and body	69±7Nm

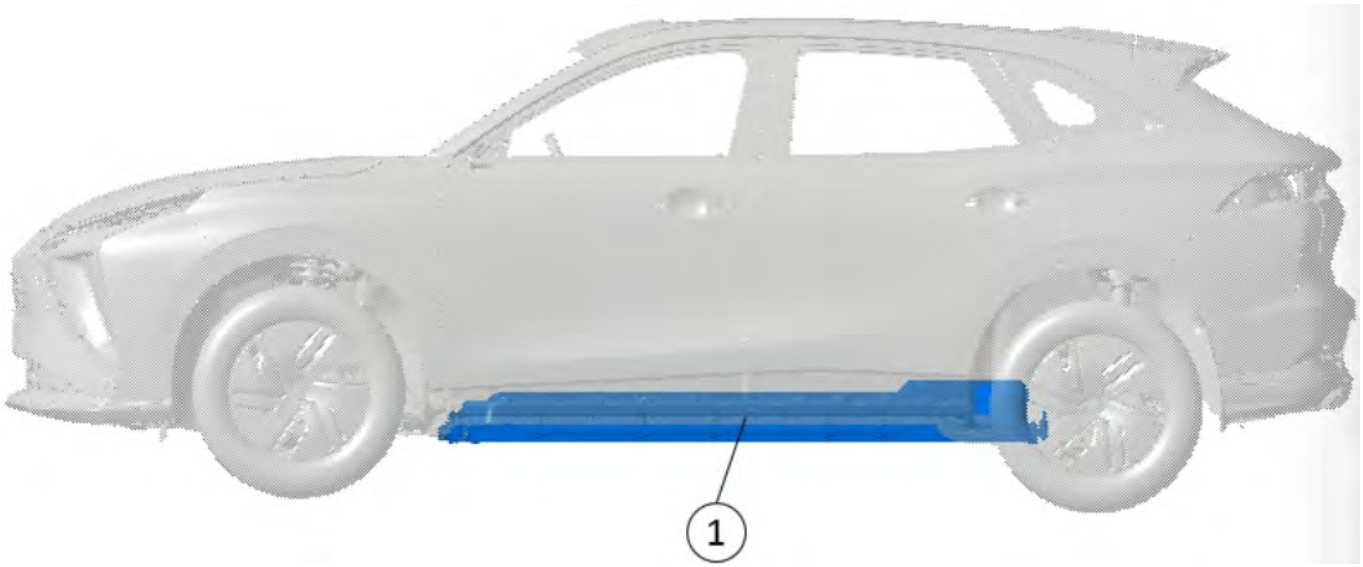
3.8.2 Instructions and operations

3.8.2.1 Overview

The power battery pack assembly is the core energy storage device in BEVs, which provides electric energy for high-voltage electrical equipment such as drive motor, A/C compressor and PTC heater. Its performance directly affects the endurance, power and service life of the vehicle.

The power battery pack assembly of this vehicle is designed with high-strength rolled steel box, advanced CTP cell grouping, efficient liquid cooling and heating, intelligent battery management and other technologies to provide strong, durable and safe power output for the vehicle.

3.8.2.2 Power battery pack assembly



Symbol	Name	Quantity
1	Power battery pack assembly	1

3.8.2.3 Precautions

1. The storage point must be dry, cool, ventilated, clean, and carefully protected from water. It must be rainproof and away from other water sources;

2. To avoid the accumulation of dangerous gases, the storage site must ensure air circulation;

3. The temperature of the storage environment is -20°C ~ 45°C; the storage humidity is ≤80%, and the atmospheric pressure is 86 ~ 106kPa;

4. Avoid contact between the battery pack and corrosive objects;

5. The walkway is unobstructed, and it is strictly forbidden to mix with other items. A special storage area should be established;

6. Keep away from heat sources, and the distance to heat sources shall not be less than 2m;

7. No fireworks, avoid direct sunlight;

8. Protective measures shall be taken for the storage and transportation of battery packs to avoid safety risks such as electric shock.

Precautions for storage of battery pack

1. Make sure that the protective cover plate above the battery pack box is installed firmly without damage;

2. Wrap the positive and negative terminals of the battery box with insulating tape or other insulating materials to ensure that no metal parts are exposed and that the positive and negative terminals will not be short-circuited;

3. A full range of dry powder fire extinguishers and other fire-fighting equipment should be equipped near the battery storage site for emergency use;

4. High-voltage batteries are not allowed to be temporarily stored in the open air and within the working range of direct contact;

5. The shelves or containers should be firm to prevent collapse and be ≥20cm away from the wall;

6. It shall not be placed upside down, horizontally or obliquely. Mechanical impact and pressing of heavy objects are prohibited;

7. The storage point must restrict access to personnel and must be managed as a dangerous goods storage point.

3.8.3 Diagnosis and testing

3.8.3.1 DTC List

DTC	Fault description	Operation
B340000	Abnormal management system of battery cell and power battery pack	Accurate Test A: B340000
B34001F	Abnormal power battery pack management system	Accurate Test B: B34001F
B340020	Abnormal main positive relay, power battery pack management system and harness in battery pack	Accurate Test C: B340020
B340025	Abnormal main negative relay, power battery pack management system and harness in battery pack	Accurate Test D: B340025
B340026	Abnormal pre-charging relay, power battery pack management system and harness in battery pack	Accurate Test E: B340026
B340005	Abnormal main positive relay, main negative relay, pre-charging relay, vehicle high-voltage wire, motor controller, power output module, A/C compressor, heating PTC and DCDC	Accurate Test F: B340005
B34001D	Abnormal vehicle high-voltage wire, motor controller, power output module, A/C compressor, heating PTC and DCDC	Accurate Test G: B34001D
B34001E	Abnormal charging pile and current sensor	Accurate Test H: B34001E
B340027	Abnormal motor controller, motor, power output module, DCDC, A/C compressor and heating PTC	Accurate Test I: B340027
B340028	Abnormal lead-acid battery, DCDC and BMS system	Accurate Test J: B340028
B340029	Abnormal lead-acid battery, DCDC and BMS system	Accurate Test K: B340029
B340009	Abnormal power battery pack management system	Accurate Test L: B340009
B34000A	VCM abnormal	Accurate Test M: B34000A
B34000B	VCM abnormal	Accurate Test N: B34000B
B34000C	VCM abnormal	Accurate Test O: B34000C
B34000D	VCM abnormal	Accurate Test P: B34000D
B34000E	Charging pile abnormality	Accurate Test Q: B34000E
B34000F	Charging pile abnormality	Accurate Test R: B34000F
B340010	OBC abnormal	Accurate Test S: B340010

B340011	VCM abnormal	Accurate Test T: B340011
B340031	Abnormal battery pack heating PTC	Accurate Test U: B340031
B340014	Abnormal A/C compressor, battery pack coolant pipeline and A/C solenoid valve	Accurate Test V: B340014
B340015	Abnormal fast charging port base, harness, fast charging pile and power battery pack management system	Accurate Test W: B340015
U240001	Abnormal harness, T-BOX and power battery pack management system	Accurate Test X: U240001
U240002	Abnormal harness, charging pile and power battery pack management system	Accurate Test Y: U240002
U240003	Abnormal internal harness of power battery pack and power battery pack management system	Accurate Test Z: U240003
U029800	Abnormal DCDC, power battery pack management system	Accurate Test AA: U029800
U011000	Abnormal MCU, power battery pack management system	Accurate Test AB: U011000
U019B00	Abnormal OBC, power battery pack management system	Accurate Test AC: U019B00
B340016	Abnormal water inlet temperature sensor, water inlet temperature acquisition line and power battery pack management system	Accurate Test AD: B340016
B340017	Abnormal water inlet temperature sensor, water inlet temperature acquisition line and power battery pack management system	Accurate Test AE: B340017
B340018	Abnormal water inlet temperature sensor, heater PTC, A/C compressor and power battery pack management system	Accurate Test AF: B340018
B340019	Abnormal water inlet temperature sensor, heater PTC, A/C compressor and power battery pack management system	Accurate Test AG: B340019
B34001A	Abnormal water outlet temperature sensor, water outlet temperature acquisition line and power battery pack management system	Accurate Test AH: B34001A

B34001B	Abnormal water outlet temperature sensor, water outlet temperature acquisition line and power battery pack management system	Accurate Test AI: B34001B
B34001C	Abnormal water outlet temperature sensor, heater PTC, A/C compressor and power battery pack management system	Accurate Test AJ: B34001C
B340100	Abnormal power battery pack and power battery pack management system	Accurate Test AK: B340100
B340130	Abnormal power battery pack and power battery pack management system	Accurate Test AL: B340130
B340102	Abnormal power battery pack and power battery pack management system	Accurate Test AM: B340102
B340103	Abnormal power battery pack and power battery pack management system	Accurate Test AN: B340103
B340104	power battery pack and power battery pack management system	Accurate Test AO: B340104
B340105	Abnormalities of MSD and power battery pack management system	Accurate Test AP: B340105
B340106	Abnormal power battery pack management system, motor, EHB and VCM	Accurate Test AQ: B340106
B340107	Abnormal external electrical equipment and current sensor	Accurate Test AR: B340107
B340109	Abnormal power battery pack management system, motor, EHB, VCM and current sensor	Accurate Test AS: B340109
B34010A	Abnormal external electrical equipment, current sensor and power battery pack management system	Accurate Test AT: B34010A
B34010B	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test AU: B34010B

B34010C	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test AV: B34010C
B34010E	Abnormal power battery pack, slave control of power battery pack management system and acquisition harness in the battery pack	Accurate Test AW: B34010E
B340110	Abnormal module temperature sensor, acquisition harness in battery pack and power battery pack	Accurate Test AX: B340110
B340112	Abnormal power battery pack, air compressor, A/C solenoid valve, coolant pipeline, battery heater PTC, module temperature sensor and power battery pack management system	Accurate Test BA: B340112
B340114	Abnormal main negative relay, power battery pack management system	Accurate Test BB: B340114
B340117	Abnormal high-voltage connector of battery pack, power battery pack management system and internal harness of battery pack	Accurate Test BC: B340117
B340119	Abnormal power battery pack and power battery pack management system	Accurate Test BD: B340119
B34011A	Abnormal power battery pack and power battery pack management system	Accurate Test BE: B34011A
B34011C	Abnormal power battery pack and power battery pack management system	Accurate Test BF: B34011C
B34011D	Abnormal power battery pack and power battery pack management system	Accurate Test BG: B34011D
B34011F	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test BH: B34011F

B340120	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test BI: B340120
B340121	Abnormal slave control of power battery pack management system, abnormal cell acquisition line and slave control acquisition line of power battery pack management system	Accurate Test BJ: B340121
B340123	Abnormal power battery pack cell, slave control of power battery pack management system	Accurate Test BK: B340123
B340124	Abnormal power battery pack module, power battery pack management system slave control and power battery pack management system slave control acquisition line	Accurate Test BL: B340124
B340125	Abnormal power battery pack module, power battery pack management system slave control and power battery pack management system slave control acquisition line	Accurate Test BM: B340125
B34012C	Abnormal power battery pack management system, motor, EHB, VCM and current sensor	Accurate Test BN: B34012C
B34012D	Abnormal external electrical equipment, current sensor and power battery pack management system	Accurate Test BO: B34012D
U240010	Abnormal slave control of power battery pack management system	Accurate Test BP: U240010
U240012	Abnormal VCM, instrument harness assembly and power battery pack management system	Accurate Test BQ: U240012
U240013	Abnormal slave control of power battery pack management system and internal harness of power battery pack	Accurate Test BR: U240013
B340200	Abnormal power battery pack and power battery pack management system	Accurate Test BS: B340200

B340219	Abnormal power battery pack and power battery pack management system	Accurate Test BT: B340219
B340136	Lead-acid battery abnormal	Accurate Test BU: B340136
B340203	Abnormal power battery pack and power battery pack management system	Accurate Test BV: B340203
B340204	Abnormal power battery pack and power battery pack management system	Accurate Test BW: B340204
B340205	Abnormal module temperature sensor, acquisition harness in battery pack and power battery pack	Accurate Test BX: B340205
B340206	Abnormal module temperature sensor, acquisition harness in battery pack and power battery pack	Accurate Test BY: B340206
B340208	Abnormal power battery pack management system, motor, EHB and VCM	Accurate Test BZ: B340208
B340209	Abnormal external electrical equipment and current sensor	Accurate Test CA: B340209
B34020B	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test CB: B34020B
B34020C	Abnormal power battery pack, MCU, air compressor, power output module, battery pack heater, high-voltage harness, and power battery pack management system	Accurate Test CC: B34020C
B34020D	Abnormal slave control of power battery pack management system, abnormal cell acquisition line and slave control acquisition line of power battery pack management system	Accurate Test CD: B34020D
B34020F	Abnormal power battery pack cell, slave control of power battery pack management system	Accurate Test CE: B34020F

B340210	Abnormal power battery pack module, power battery pack management system slave control and power battery pack management system slave control acquisition line	Accurate Test CF: B340210
B340211	Abnormal power battery pack module, power battery pack management system slave control and power battery pack management system slave control acquisition line	Accurate Test CG: B340211
U01220	Abnormal VCM, instrument harness assembly and power battery pack management system	Accurate Test CH: U01220
U007300	The harness where EV CAN_H and CAN_L are located, and the power battery pack management system are abnormal	Accurate Test CI: U007300
U240021	Abnormal power battery pack management system	Accurate Test CJ: U240021
B34021E	Battery pack main positive relay stuck	Accurate Test CK: B34021E
B340300	Abnormal power battery pack	Accurate Test CL: B340300
B340301	Collision fault	Accurate Test CM: B340301
B340304	Abnormal power battery pack	Accurate Test CN: B340304
B340305	Abnormal power battery pack	Accurate Test CO: B340305

3.8.3.2 Accurate test

Accurate Test A: B340000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340000	SOC jump	– Excessive SOC jump	– No SOC jump

Possible cause

– Poor cell consistency

– Abnormal BMS

Repair recommendations

• After the vehicle has been powered off and left stationary for 1h, power it on, read the maximum and minimum cell voltages of the battery pack with a diagnostic scanner, and judge whether the difference between them is ≥ 200mv, if so, it means that the cell consistency becomes poor, and contact the battery manufacturer for maintenance; if not, please give feedback to the vehicle factory for further troubleshooting.

3.8.3.3 Accurate test

Accurate Test AA: U029800

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U029800	Communication with DCDC lost	– BMS cannot receive DCDC CAN signal	– DCDC communication recovery

Possible cause

– Problems with the CAN line cause communication disconnection or DCDC failure.

– Internal CAN communication circuit fault of the BMS.

Repair recommendations

Detect whether DCDC in EV_CAN sends a CAN signal through CAN communication equipment. If the equipment detects a DCDC CAN signal, it is judged that the CAN communication circuit inside the BMS has a fault, replace the BMS

If the equipment cannot detect the DCDC CAN signal, it is judged that the communication disconnection or DCDC failure is caused by a problem with the CAN line. Please check the status of the CAN line (instrument harness assembly) and DCDC (if the diagnostic scanner cannot enter the DCDC diagnosis interface, it can be preliminarily judged that DCDC is abnormal)

3.8.3.4 Accurate test

Accurate Test AB: U011000

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U011000	MCU communication lost	– BMS cannot receive MCU CAN signal	– MCU communication recovery

Possible cause

– Communication disconnection or MCU fault caused by CAN bus problem.

– Internal CAN communication circuit fault of the BMS.

Repair recommendations

• Contact the battery manufacturer to replace the BMS or communication harness in the battery.

3.8.3.5 Accurate test

Accurate Test AC: U019B00

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U019B00	OBC communication lost	– BMS master control cannot receive OBC CAN signal	– OBC communication recovery

Possible cause

– Communication disconnection or OBC fault caused by CAN bus problem

– Internal CAN communication circuit fault of the BMS.

Repair recommendations

• Contact the battery manufacturer to replace the BMS or communication harness in the battery.

3.8.3.6 Accurate test

Accurate Test AD**:** B340016

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340016	Water inlet temperature acquisition line open-circuited fault	– Water inlet temperature acquisition line open-circuited	– Normal water inlet temperature acquisition line

Possible cause

– Poor contact of water inlet temperature sensor.

– Disconnection of water inlet temperature acquisition line.

– Water inlet temperature acquisition circuit fault.

Repair recommendations

• Re-plug the water inlet temperature sensor to connect it properly.

• Check whether the pins from the water inlet temperature sensor to the battery pack connector are conductive. If not, replace the harness.

• If it is not caused by the above reasons, contact the battery factory to check whether the water inlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.7 Accurate test

Accurate Test AE**:** B340017

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340017	Water inlet temperature acquisition line short-circuited fault	– Water inlet temperature acquisition line short-circuited	– Normal water inlet temperature acquisition line

Possible cause

– Poor contact of water inlet temperature sensor.

– Water inlet temperature acquisition line short-circuited.

– Water inlet temperature acquisition circuit fault.

Repair recommendations

• Re-plug the water inlet temperature sensor to connect it properly.

• Check whether the pins of the connector from the water inlet temperature sensor to the battery pack are short-circuited to the body ground; if so, replace the harness.

• If it is not caused by the above reasons, contact the battery factory to check whether the water inlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.8 Accurate test

Accurate Test AF**:** B340018

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340018	Water inlet temperature out of range fault	– Water inlet temperature out of range	– Water inlet temperature returns to normal

Possible cause

– The water inlet temperature is too high (>125°C) or too low (<-40°C).

– The water inlet temperature sensor is damaged.

– Water inlet temperature acquisition circuit fault.

Repair recommendations

• Check whether the water temperature at the battery pack water inlet is abnormally high (>125°C) or low (<-40°C). If so, check whether the heater PTC and A/C compressor are damaged.

• Replace the original water inlet temperature sensor with a normal one (the water outlet temperature sensor without reported fault can be used). If no fault is reported at this time, it indicates that the water inlet temperature sensor is damaged and needs to be replaced.

• If it is not caused by the above reasons, contact the battery factory to check whether the water inlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.9 Accurate test

Accurate Test AG**:** B340019

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340019	Water inlet temperature too high fault	– Water inlet temperature too high	– Water inlet temperature returns to normal

Possible cause

– The water inlet temperature is too high (≥70°C).

– The water inlet temperature sensor is damaged.

– Water inlet temperature acquisition circuit fault.

Repair recommendations

• Check whether the water temperature at the water inlet of the battery pack is abnormally high (≥70°C), and if so, check whether the heater PTC is damaged.

• Replace the original water inlet temperature sensor with a normal one (the water outlet temperature sensor without reported fault can be used). If no fault is reported at this time, it indicates that the water inlet temperature sensor is damaged and needs to be replaced.

• If it is not caused by the above reasons, contact the battery factory to check whether the water inlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.10 Accurate test

Accurate Test AH**:** B34001A

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001A	Water outlet temperature acquisition line open-circuited fault	– Water outlet temperature acquisition line open-circuited	– Normal water outlet temperature acquisition line

Possible cause

– Poor contact of water outlet temperature sensor.

– Disconnection of water outlet temperature acquisition line.

– Water outlet temperature acquisition circuit fault.

Repair recommendations

• Re-plug the water outlet temperature sensor to connect it properly.

• Check whether the pins from the water outlet temperature sensor to the battery pack connector are conductive. If not, replace the harness.

• If it is not caused by the above reasons, contact the battery factory to check whether the water outlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.11 Accurate test

Accurate Test AI**:** B34001B

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001B	Water outlet temperature acquisition line short-circuited fault	– Water outlet temperature acquisition line short-circuited	– Normal water outlet temperature acquisition line

Possible cause

– Poor contact of water outlet temperature sensor.

– Water outlet temperature acquisition line short-circuited.

– Water outlet temperature acquisition circuit fault.

Repair recommendations

• Re-plug the water outlet temperature sensor to connect it properly.

• Check whether the pins of the connector from the water outlet temperature sensor to the battery pack are short-circuited; if so, replace the harness.

• If it is not caused by the above reasons, contact the battery factory to check whether the water outlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.12 Accurate test

Accurate Test AJ**:** B34001C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001C	Water outlet temperature out of range fault	– Water outlet temperature out of range	– The water outlet temperature value is normal

Possible cause

– The water outlet temperature is too high (>125°C) or too low (<-40°C).

– The water outlet temperature sensor is damaged.

– Water outlet temperature acquisition circuit fault.

Repair recommendations

• Check whether the water temperature at the battery pack water outlet is abnormally high (>125°C) or low (<-40°C). If so, check whether the heater PTC and A/C compressor are damaged.

• Replace the original water outlet temperature sensor with a normal one (the water inlet temperature sensor without reported fault can be used). If no fault is reported at this time, it indicates that the water outlet temperature sensor is damaged and needs to be replaced.

• If it is not caused by the above reasons, contact the battery factory to check whether the water outlet temperature acquisition circuit of the BMS is abnormal.

3.8.3.13 Accurate test

Accurate Test AK**:** B340100

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340100	Cell voltage level 1 too high	– Cell voltage is detected to exceed the normal operating voltage range.	– Cell voltage returns to normal

Possible cause

– The battery pack is overcharged, causing the cell voltage to exceed 3.66V.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Discharge the vehicle to 90% SOC. If the fault disappears, it is battery pack overcharge; if the fault still exists after discharging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.14 Accurate test

Accurate Test AL**:** B340130

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340130	Cell voltage level 1 too low	– Cell voltage is detected to exceed the normal operating voltage range.	– Cell voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Cell fault.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Charge the vehicle to 10% SOC. If the fault disappears, it is battery pack over-discharge; if the fault still exists after charging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.15 Accurate test

Accurate Test AM**:** B340102

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340102	Cell voltage level 1 difference too large	– The voltage deviation between the cells is detected to exceed a certain range.	– Cell voltage difference is normal

Possible cause

– Over-discharge of cells.

– The internal resistance of the cell increases.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Charge with a small current and then discharge. Repeat several times, let it stand for 30 minutes, and check again whether the fault still exists.

• The fault disappears, and it is determined that the battery cell is over-discharged and can be used normally.

• If the fault still exists, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.16 Accurate test

Accurate Test AN**:** B340103

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340103	Battery pack level 1 overvoltage	– The battery pack voltage is detected to be higher than the operating voltage.	– Cell voltage returns to normal

Possible cause

– Overcharge of battery pack.

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle to consume the power to 50%, if the voltage recovers to normal and the fault disappears, it is determined as battery overcharge, and the vehicle can be used normally; if the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the battery pack voltage measured by the multimeter differs from the voltage displayed by the diagnostic scanner by more than 5V, the BMS is abnormal. Please contact the battery pack manufacturer for on-site inspection and repair.

3.8.3.17 Accurate test

Accurate Test AO**:** B340104

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340104	Battery pack level 1 undervoltage	– The battery pack voltage is detected to be lower than the operating voltage.	– The battery pack voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle and charge the battery to 50%. If the voltage recovers to normal and the fault disappears, it is determined as battery pack over-discharge, and the vehicle can be used normally; if the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the battery pack voltage measured by the multimeter differs from the voltage displayed by the diagnostic scanner by more than 5V, the cause is that the BMS is abnormal. Please contact the battery pack manufacturer for on-site inspection and repair.

3.8.3.18 Accurate test

Accurate Test AP**:** B340105

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340105	Abnormal total voltage of battery pack	– Abnormal total voltage of battery pack	– The battery pack voltage returns to normal

Possible cause

– Abnormal total voltage acquisition of battery pack.

Repair recommendations

• If the total voltage collection of the BMS is abnormal, it is necessary to contact the battery manufacturer to replace the BMS.

3.8.3.19 Accurate test

Accurate Test AQ**:** B340106

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340106	Feedback current level 1 too high	– Fault of too high battery pack charging current is detected	– Battery pack charging current is normal

Possible cause

– Excessive charging current during vehicle energy recovery.

– The current sensor installed in the battery pack fails.

Repair recommendations

• Check whether the motor, EHB and VCM are faulty, resulting in excessive current during energy recovery.

• If there is no abnormality in the motor, EHB, and VCM, it is determined that the current sensor is abnormal, and the battery manufacturer needs to be contacted to replace the current sensor.

3.8.3.20 Accurate test

Accurate Test AR**:** B340107

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340106	Feedback current level 1 too high	– Too high discharging current of battery pack is detected	– Battery pack discharge current is normal

Possible cause

– Excessive discharging current

– The current sensor installed in the battery pack fails.

Repair recommendations

• Stop the vehicle, turn off all electrical equipment and power off from high-voltage. After the vehicle goes into sleep mode, restart the vehicle to a high-voltage state without turning on electrical equipment (A/C and external equipment). If the fault disappears, it is determined that the discharging current of the vehicle is too large. Please confirm whether the vehicle is equipped with other electrical equipment resulting in excessive power consumption. It is not allowed to install additional high-voltage electrical equipment. The vehicle can be used normally after the fault disappears.

• If this fault still occurs frequently in the future, or the fault does not disappear, the current sensor is faulty and the battery manufacturer needs to be contacted to replace the current sensor.

3.8.3.21 Accurate test

Accurate Test AS**:** B340109

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340109	Feedback power of battery pack too high	– Battery pack energy recovery too high	– Battery pack energy recovery returns to normal

Possible cause

– Excessive charging power during vehicle energy recovery.

– The current sensor installed in the battery pack fails.

– Abnormal total voltage acquisition of battery pack.

Repair recommendations

• Check whether the motor, EHB and VCM are faulty, resulting in excessive power during energy recovery.

• If there is no abnormality in the motor, EHB and VCM, contact the battery manufacturer to check the current sensor and the battery pack management system on site.

3.8.3.22 Accurate test

Accurate Test AT**:** B34010A

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34010A	Excessive discharging power of battery pack	– Excessive discharging power of battery pack	– The discharging power of battery pack returns to normal

Possible cause

– Excessive discharging power of battery pack.

– The current sensor installed inside the high-voltage distribution box is faulty.

– Abnormal total voltage acquisition of battery pack.

Repair recommendations

• Stop the vehicle, turn off all electrical equipment and power off from high-voltage. After the vehicle goes into sleep mode, restart the vehicle to a high-voltage state without turning on electrical equipment (A/C and external equipment). If the fault disappears, it is determined that the discharging current of the vehicle is too large. Please confirm whether the vehicle is equipped with other electrical equipment resulting in excessive power consumption. It is not allowed to install additional high-voltage electrical equipment. The vehicle can be used normally after the fault disappears.

• If this fault occurs frequently in subsequent uses or does not disappear, contact the battery manufacturer to check the current sensor and battery pack management system on site.

3.8.3.23 Accurate test

Accurate Test AU**:** B34010B

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34010B	Positive insulation resistance level 1 leakage	– The insulation resistance between high-voltage (+) and body GND is too low.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

• Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's positive pole with a megohmmeter. If the detected insulation resistance value is less than 300KΩ (less than 100kΩ during fast charging), it is determined that the insulation of the vehicle is low, please detect which high-voltage device of the vehicle fails according to the insulation resistance detection step in the technical requirements for assembling of OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identifying.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging 150KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.24 Accurate test

Accurate Test AV**:** B34010C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34010C	Negative insulation resistance level 1 leakage	– Excessively low insulation resistance is detected between high-voltage (-) and body GND.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

• Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's positive pole with a megohmmeter. If the detected insulation resistance value is less than 300KΩ (less than 100kΩ during fast charging), it is determined that the insulation of the vehicle is low, please detect which high-voltage device of the vehicle fails according to the insulation resistance detection step in the technical requirements for assembling of OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identifying.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging 150KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.25 Accurate test

Accurate Test AW**:** B34010E

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34010E	SOC too low	– The battery pack SOC is detected to be too low.	– SOC returns to normal

Possible cause

– Overdischarging of battery pack

– Abnormal voltage of slave control acquisition cell

– Battery pack fault

Repair recommendations

• Charge for a period of time to allow the battery pack SOC to rise to 50%. If the fault disappears, it is determined that the battery pack is over-discharged. After the fault disappears, the vehicle can be used normally. If this fault occurs frequently, remove the battery pack and contact the battery manufacturer for on-site inspection and maintenance.

• If the fault remains, remove the battery pack and use a multimeter to measure the voltage between the high-voltage positive and negative terminals. Confirm the actual battery pack voltage.

• If the voltage is abnormal (the measured voltage differs from the total voltage reported by BMS by more than 5V), it is determined that the battery pack is faulty or the cell voltage collection is abnormal. Contact the battery manufacturer for on-site inspection and maintenance.

3.8.3.26 Accurate test

Accurate Test AX**:** B340110

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340110	Cell temperature level 1 too high	– The cell temperature is detected to be too high, exceeding a certain range	– Cell temperature returns to normal

Possible cause

– The temperature sensor installed in the cell module fails.

– Fault of temperature sensor detection circuit inside the BMS.

– Battery pack overtemperature

Repair recommendations

• Stop the vehicle, power it to high-voltage, let it stand for 30 minutes under the premise that there is sufficient coolant and the cooling system can work normally, and then check whether the fault disappears. If the fault disappears, it means that the actual temperature of the battery pack is too high. After the fault disappears, if the vehicle can be used normally, the fault is caused by the excessive temperature of the battery pack;

• If this fault occurs frequently in the future, please check whether the battery pack cooling system is effective and whether the coolant is leaking.

• If the fault still exists, contact the battery manufacturer for on-site inspection and maintenance.

3.8.3.27 Accurate test

Accurate Test B**:** B34001F

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001F	SOH degradation	– Battery capacity attenuation	– Battery capacity returns to normal

Possible cause

– Battery capacity attenuation

Repair recommendations

• Handle according to warranty terms.

3.8.3.28 Accurate test

Accurate Test BA**:** B340112

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340112	Cell level 1 temperature difference too large	– Excessive temperature difference between battery cells is detected	– Cell temperature difference returns to normal

Possible cause

– The temperature sensor installed in the cell module fails.

– Fault of temperature sensor detection circuit inside the BMS.

– The actual temperature difference of the battery pack cell is large.

Repair recommendations

• Under room temperature, park the vehicle for 24 hours in a sleep state. After 24 hours, restart the vehicle. If the fault disappears and the vehicle can be used normally, it is determined that there is an excessive actual temperature difference between battery cells. The possible causes are as follows:

① Coolant leakage, resulting in insufficient coolant which leads to poor cooling effect;

② The cooler solenoid valve is abnormal, and the coolant in the passenger compartment cooling circuit leaks into the battery pack cooling circuit. At this time, the coolant pump of the battery pack cooling circuit is not driven, and the coolant cannot cool the upper modules of the battery pack, which results in a large temperature difference between the upper modules and the lower modules of the battery pack, thus the cell temperature difference warning is reported.

• If the fault still exists, contact the battery manufacturer for on-site inspection and maintenance.

3.8.3.29 Accurate test

Accurate Test BB**:** B340114

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340114	Negative contactor adhesion	– Negative relay adhesion	– No negative relay adhesion

Possible cause

– Main negative relay high-voltage contact adhesion

– BMS fault

Repair recommendations

• Turn off the vehicle, wear insulating gloves, and unplug the high-voltage connector of the battery pack.

• Power on the vehicle, close the main positive relay with a diagnostic scanner (if the positive contactor adhesion and negative contactor adhesion exist at the same time, there is no need to use a diagnostic scanner), and then measure the voltage between the positive and negative terminals of the battery pack with a multimeter. If the detected voltage is > 300V, the main negative relay is adhered. In this case, contact the battery manufacturer to replace the main negative relay on site.

• If there is no adhesion in the main negative relay, the BMS detection is abnormal. In this case, contact the battery manufacturer for inspection, maintenance and replacement of the BMS on site.

3.8.3.30 Accurate test

Accurate Test BC**:** B340117

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340117	High-voltage interlocking disconnection fault at high-voltage connector	– Battery pack high-voltage interlock disconnected	– Battery pack high-voltage interlock connected

Possible cause

– Battery pack high-voltage connector fault

– Interlock circuit fault of high-voltage connector unit in BMS

Repair recommendations

• Replace the high-voltage connector of the battery pack, wait for the vehicle to sleep and restart the vehicle. If the fault disappears, it is determined that the high-voltage connector of the battery pack is faulty; if the fault does not disappear, the cause of the fault is a fault in the high-voltage connector interlock circuit in the BMS. Contact the battery pack factory to go to the site for repair (suspected faulty parts in the battery pack: BMS harness assembly, BMS main control board).

3.8.3.31 Accurate test

Accurate Test BD**:** B340119

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340119	Cell voltage level-2 too high	– Cell voltage is detected to exceed the normal operating voltage range.	– The cell voltage returns to normal

Possible cause

– The battery pack is overcharged, and the cell voltage exceeds 3.70V.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Discharge the vehicle to 90% SOC. If the fault disappears, the battery pack is overcharged; if the fault still exists after discharging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.32 Accurate test

Accurate Test BE**:** B34011A

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34011A	Cell voltage level-2 too low	– Cell voltage is detected to be below the normal operating voltage range.	– The cell voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Cell fault.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Charge the vehicle to 10% SOC. If the fault disappears, it is battery pack over-discharge; if the fault still exists after charging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.33 Accurate test

Accurate Test BF**:** B34011C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34011C	Battery pack level 2 overvoltage	– The battery pack voltage is detected to be higher than the operating voltage.	– The battery pack voltage returns to normal

Possible cause

– Overcharge of battery pack.

– Battery pack fault

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle to consume the power to 50%. If the voltage returns to normal and the fault disappears, it is determined that the battery pack is overcharged and the vehicle can be used normally. If the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the difference between the battery pack voltage measured by a multimeter and the voltage displayed on the instrument is more than 5V, the battery pack is faulty, please contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.34 Accurate test

Accurate Test BG**:** B34011D

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34011D	Battery pack level 2 undervoltage	– The battery pack voltage is detected to be lower than the operating voltage.	– The battery pack voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Battery pack fault

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle and charge the battery to 50%. If the voltage recovers to normal and the fault disappears, it is determined as battery pack over-discharge, and the vehicle can be used normally; if the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the difference between the battery pack voltage measured by a multimeter and the voltage displayed on the instrument is more than 5V, the battery pack is faulty, please contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.35 Accurate test

Accurate Test BH: B34011F

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34011F	Positive insulation resistance level 2 leakage	– The insulation resistance between high-voltage (+) and body GND is too low.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

• Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's positive pole with a megohmmeter. If the detected insulation resistance value is less than 250 KΩ (less than 60 kΩ during fast charging), it is determined that the vehicle insulation is low. Please detect which high-voltage device of the vehicle fails according to the insulation resistance detection step in the technical requirements for assembling of OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identifying.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging 80KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.36 Accurate test

Accurate Test BI: B340120

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340120	Negative insulation resistance level 2 leakage	– The insulation resistance between high-voltage (-) and body GND is too low.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

• Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's negative pole with a megohmmeter. If the detected insulation resistance value is less than 250 KΩ (less than 60 kΩ during fast charging), it is determined that the vehicle insulation is low. Please detect which high-voltage device of the vehicle fails according to the insulation resistance detection step in the technical requirements for assembling of OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identifying.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging > 80KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.37 Accurate test

Accurate Test BJ**:** B340121

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340121	Slave control voltage acquisition line open-circuited	– Slave control voltage acquisition line open-circuited	– Slave control voltage acquisition line normal

Possible cause

– Poor connection of slave control acquisition harness.

– Open circuit of cell voltage acquisition line.

– Fault of slave control voltage acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.38 Accurate test

Accurate Test BK**:** B340123

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340123	Slave control voltage value out of range	– Slave control voltage value out of range	– Slave control voltage returns to normal

Possible cause

– Cell voltage out of range, < 1V or > 4.5V.

– Fault of slave control voltage acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.39 Accurate test

Accurate Test BL**:** B340124

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340124	Slave control temperature acquisition line open-circuited	– Slave control temperature acquisition line open-circuited	– Slave control temperature acquisition line normal

Possible cause

– Poor contact of the temperature sensor on the module.

– Open circuit of module temperature acquisition line.

– Fault of slave control temperature acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.40 Accurate test

Accurate Test BM**:** B340125

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340125	Slave control temperature acquisition line short-circuited	– Slave controller temperature acquisition line short-circuited	– Slave control temperature acquisition line normal

Possible cause

– Poor contact of the temperature sensor on the module.

– Short circuit of module temperature acquisition line.

– Fault of slave control temperature acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.41 Accurate test

Accurate Test BN**:** B34012C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34012C	Feedback current level-2 too high	– Too high charging current of battery pack is detected	– Battery pack charging current is normal

Possible cause

– Excessive charging current during vehicle energy recovery.

– The current sensor installed in the battery pack fails.

Repair recommendations

• Check whether the motor, EHB and VCM are faulty, resulting in excessive current during energy recovery.

• If there is no abnormality in the motor, EHB, and VCM, it is determined that the current sensor is faulty. Please contact the battery manufacturer to repair and replace the current sensor.

3.8.3.42 Accurate test

Accurate Test BO**:** B34012D

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34012D	Instantaneous discharge current level 2 too high	– Fault of too high battery pack discharging current is detected.	– Battery pack discharge current is normal

Possible cause

– The discharging current of battery pack is too high.

– The current sensor installed in the battery pack fails.

Repair recommendations

• Stop the vehicle, turn off all electrical equipment and power off from high-voltage. After the vehicle goes into sleep mode, restart the vehicle to a high-voltage state without turning on electrical equipment (A/C and external equipment). If the fault disappears, it is determined that the discharging current of the vehicle is too large. Please confirm whether the vehicle is equipped with other electrical equipment resulting in excessive power consumption. It is not allowed to install additional high-voltage electrical equipment. The vehicle can be used normally after the fault disappears.

• If this fault still occurs frequently in the future, or the fault has not disappeared, it is determined to be a current sensor fault. Please contact the battery manufacturer for repair and replacement of the current sensor.

3.8.3.43 Accurate test

Accurate Test BP**:** U240010

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240010	Loss of communication with high-voltage acquisition module	– BMS high-voltage module communication lost	– BMS high-voltage module resumes communication

Possible cause

– BMS high-voltage module communication lost

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.44 Accurate test

Accurate Test BQ**:** U240012

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240012	VCM communication lost	– BMS cannot receive VCM CAN signal	– BMS receives VCM CAN signal

Possible cause

– Communication disconnection or VCM fault caused by CAN bus problem.

– Internal CAN communication circuit fault of the BMS.

Repair recommendations

• Detect whether VCM in EV_CAN sends a CAN signal through CAN communication equipment. If the equipment detects a VCM CAN signal, it is judged that the CAN communication circuit inside the BMS fails and the BMS shall be replaced.

• If the equipment fails to detect the VCM CAN signal, it is judged that communication disconnection or VCM fault is caused by the CAN bus problem. Please check the communication CAN bus (instrument harness assembly) between VCM and BMS and the status of VCM (if the diagnostic scanner cannot enter the VCM diagnosis interface, it can be preliminarily judged that VCM is abnormal).

3.8.3.45 Accurate test

Accurate Test BR**:** U240013

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240013	BMS cannot receive the CAN signal from the slave controller.	– BMS cannot receive the CAN signal from the slave controller.	– BMS receives CAN signal from slave controller

Possible cause

– Disconnection of CAN bus leads to communication disconnection.

– Slave controller fault of battery pack management system.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.46 Accurate test

Accurate Test BS**:** B340200

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340200	Cell voltage level-2 too high	– Cell voltage is detected to exceed the normal operating voltage range.	– Cell voltage returns to normal

Possible cause

– The battery pack is overcharged, and the cell voltage exceeds 3.74V.

– Cell fault.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Discharge the vehicle to 90% SOC. If the fault disappears, the battery pack is overcharged; if the fault still exists after discharging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.47 Accurate test

Accurate Test BT**:** B340219

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340219	Cell voltage level-2 too low	– Cell voltage is detected to be below the normal operating voltage range.	– The cell voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Cell fault.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Charge the vehicle to 10% SOC. If the fault disappears, it is battery pack over-discharge; if the fault still exists after charging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.48 Accurate test

Accurate Test BU**:** B340136

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340136	Lead-acid battery undervoltage - LV2	– BMS detects that the lead-acid battery voltage is too low	– The lead-acid battery voltage returns to normal

Possible cause

– Lead-acid battery undervoltage.

– The battery voltage detection circuit of the BMS fails.

Repair recommendations

• After the vehicle is powered off from high voltage, use a multimeter to detect the lead-acid battery voltage. If it is lower than 11V, it is determined that the lead-acid battery voltage is too low; if not, it is determined that the BMS is abnormal, and the battery manufacturer should be contacted for on-site inspection and repair.

3.8.3.49 Accurate test

Accurate Test BV**:** B340203

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340203	Battery pack level 2 overvoltage	– The battery pack voltage is detected to be higher than the operating voltage.	– The battery pack voltage returns to normal

Possible cause

– Overcharge of battery pack.

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle to consume the power to 50%, if the voltage recovers to normal and the fault disappears, it is determined as battery pack overcharge, the vehicle can be used normally, if the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the difference between the battery pack voltage measured by a multimeter and the voltage displayed on the instrument is more than 5V, the BMS is abnormal, please contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.50 Accurate test

Accurate Test BW**:** B340204

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340204	Battery pack level 2 undervoltage	– The battery pack voltage is detected to be lower than the operating voltage.	– The battery pack voltage returns to normal

Possible cause

– Over-discharge of battery pack.

– Fault of battery pack voltage detection circuit inside the BMS.

Repair recommendations

• Drive the vehicle and charge the power to 50%. If the voltage recovers to normal and the fault disappears, it is determined as battery pack over-discharge, and the vehicle can be used normally; if the fault still occurs frequently after recovery, contact the battery pack manufacturer to replace the BMS on-site; if the fault never disappears, proceed to step 2.

• With the vehicle in high-voltage READY state, use a diagnostic scanner to close the fast charging positive relay, wear insulating gloves and measure the voltage between the positive and negative terminals of the vehicle's fast charging port with a multimeter to confirm the actual battery pack voltage.

• If the difference between the battery pack voltage measured by a multimeter and the voltage displayed on the instrument is more than 5V, the BMS is abnormal, please contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.51 Accurate test

Accurate Test BX**:** B340205

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340205	Cell temperature level-2 too high	– The cell temperature is detected to be too high, exceeding a certain range	– Cell temperature is normal

Possible cause

– The temperature sensor installed in the cell module fails.

– Fault of temperature sensor detection circuit inside the BMS.

– Battery pack overtemperature

Repair recommendations

• Stop the vehicle, power it to high-voltage, let it stand for 30 minutes under the premise that there is sufficient coolant and the cooling system can work normally, and then check whether the fault disappears. If the fault disappears, it means that the actual temperature of the battery pack is too high. After the fault disappears, if the vehicle can be used normally, the fault is caused by the excessive temperature of the battery pack.

• If this fault occurs frequently in the future, please check whether the battery pack cooling system is effective and whether the coolant is leaking.

• If the fault still exists, contact the battery manufacturer for on-site inspection and maintenance.

3.8.3.52 Accurate test

Accurate Test BY**:** B340206

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340206	Cell temperature level-2 too low	– Cell temperature is detected to be too low, exceeding a certain range.	– Cell temperature is normal

Possible cause

– Battery heater PTC fault.

– The temperature sensor installed in the cell module fails.

– Fault of temperature sensor detection circuit inside the BMS.

Repair recommendations

• Stop the vehicle in a HV READY state. When there is sufficient coolant, check whether the battery heater PTC works normally. If not, replace the battery heater PTC, and then check whether the fault disappears. If the fault disappears, it is caused by the battery heater PTC failure, and the vehicle can be used normally later; If there is no abnormality in the heater and the fault does not disappear, contact the battery manufacturer for inspection and maintenance on-site.

3.8.3.53 Accurate test

Accurate Test BZ**:** B340208

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340208	Feedback current level-2 too high	– Too high charging current of battery pack is detected	– Battery pack charging current is normal

Possible cause

– Excessive charging current during vehicle energy recovery.

– The current sensor installed in the battery pack fails.

Repair recommendations

Check whether the motor, EHB and VCM are faulty, resulting in excessive current during energy recovery.

• If there is no abnormality in the motor, EHB, and VCM, it is determined that the cause is a current sensor fault. Contact the battery manufacturer to replace the current sensor on-site.

3.8.3.54 Accurate test

Accurate Test C: B340020

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340020	Main positive relay cannot close fault	– Main positive relay cannot close	– The main positive relay closes normally

Possible cause

– Main positive relay fault.

– BMS fault

– Poor contact of harness inside the battery pack.

Repair recommendations
• After recording all current and historical faults, turn the key off to shut down the vehicle. Disconnect the negative terminal of the lead-acid battery (small battery) for 10s, then reconnect it. Next, try turning the key on to high-voltage mode.
• If the fault cannot be cleared after several attempts of Step 1, please contact the battery pack manufacturer for on-site troubleshooting and maintenance.

3.8.3.55 Accurate test

Accurate Test CA**:** B340209

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340209	Instantaneous discharge current level 2 too high	– Too high discharging current of battery pack is detected	– Battery pack discharge current is normal

Possible cause

– Excessive discharging current

– The current sensor installed in the battery pack fails.

Repair recommendations

• Stop the vehicle, turn off all electrical equipment and power off from high-voltage. After the vehicle goes into sleep mode, restart the vehicle to a high-voltage state without turning on electrical equipment (A/C and external equipment). If the fault disappears, it is determined that the discharging current of the vehicle is too large. Please confirm whether the vehicle is equipped with other electrical equipment resulting in excessive power consumption. It is not allowed to install additional high-voltage electrical equipment. The vehicle can be used normally after the fault disappears.

• If this fault still occurs frequently in the future, or the fault does not disappear, it is determined to be a current sensor fault. Contact the battery manufacturer to check and replace the current sensor on-site.

3.8.3.56 Accurate test

Accurate Test CB**:** B34020B

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34020B	Positive insulation resistance level 2 leakage	– The insulation resistance between high-voltage (+) and body GND is too low.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's positive pole with a megohmmeter. If the detected insulation resistance value is less than 250KΩ (less than 60KΩ during fast charging), it is determined that the insulation of the whole vehicle is low, please detect which high-voltage device of the vehicle fails according to the insulation resistance detection step in the technical requirements for assembling of OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identifying.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging 80KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.57 Accurate test

Accurate Test CC**:** B34020C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34020C	Negative insulation resistance level 2 leakage	– Excessively low insulation resistance is detected between high-voltage (-) and body GND.	– Insulation returns to normal

Possible cause

– Low vehicle insulation

– Low battery pack insulation

– Fault of insulation resistance detection circuit of the BMS.

Repair recommendations

Disconnect the high-voltage harness connecting the battery pack to the vehicle, and measure the insulation resistance of the vehicle's negative pole with a megohmmeter. If the detected insulation resistance value is less than 250 kΩ (less than 60 kΩ during fast charging), it is determined that the vehicle insulation is low. Please identify which high-voltage device of the vehicle is faulty according to the insulation resistance detection steps in the assembly technical requirements for the OBC/MCU/A/C compressor/battery pack heater/high-voltage harness, and replace the faulty part after identification.

• If the normal insulation resistance value measured is large enough (500KΩ, fast charging > 80KΩ), it is determined that the battery pack insulation is low or the BMS is abnormal. Contact the battery manufacturer to go to the site for inspection and repair.

3.8.3.58 Accurate test

Accurate Test CD**:** B34020D

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34020D	Slave control voltage acquisition line open-circuited	– Slave control voltage acquisition line open-circuited	– Slave control voltage acquisition line normal

Possible cause

– Poor connection of slave control acquisition harness.

– Open circuit of cell voltage acquisition line.

– Fault of slave control voltage acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.59 Accurate test

Accurate Test CE**:** B34020F

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34020F	Slave control voltage value out of range	– Slave control voltage value out of range	– Slave control voltage value range is normal

Possible cause

– Cell voltage out of range, < 1V or > 4.5V.

– Fault of slave control voltage acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.60 Accurate test

Accurate Test CF**:** B340210

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340210	Slave control temperature acquisition line open-circuited	– Slave control temperature acquisition line open-circuited	– Slave control temperature acquisition line normal

Possible cause

– Poor contact of the temperature sensor on the module.

– Open circuit of module temperature acquisition line.

– Fault of slave control temperature acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.61 Accurate test

Accurate Test CG**:** B340211

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340211	Slave control temperature acquisition line short-circuited	– Slave control temperature acquisition line open-circuited	– Slave control temperature acquisition line normal

Possible cause

– Poor contact of the temperature sensor on the module.

– Short circuit of module temperature acquisition line.

– Fault of slave control temperature acquisition circuit.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance.

3.8.3.62 Accurate test

Accurate Test CH**:** U01220

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U01220	VCM communication lost	– BMS cannot receive VCM CAN signal	– BMS receives VCM CAN signal

Possible cause

– Communication disconnection or VCM fault caused by CAN bus problem.

– Internal CAN communication circuit fault of the BMS.

Repair recommendations

• Detect whether VCM in EV_CAN sends a CAN signal through CAN communication equipment. If the equipment detects a VCM CAN signal, it is judged that the CAN communication circuit inside the BMS fails and the BMS shall be replaced.

• If the equipment fails to detect the VCM CAN signal, it is judged that communication disconnection or VCM fault is caused by the CAN bus problem. Please check the communication CAN bus (instrument harness assembly) between VCM and BMS and the status of VCM (if the diagnostic scanner cannot enter the VCM diagnosis interface, it can be preliminarily judged that VCM is abnormal).

3.8.3.63 Accurate test

Accurate Test CI**:** U007300

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U007300	EVCAN BusOff fault	– BMS cannot receive all signals on EV CAN.	– BMS receives all EV CAN signals

Possible cause

– Communication disconnection or CAN_H and CAN_L short-circuited to each other due to CAN bus issues.

– The current sensor in the CAN communication circuit inside the BMS is faulty.

Repair recommendations

• Detect whether the EV_CAN sends a CAN signal through CAN communication equipment. If the equipment detects an EV CAN signal, it is determined that the CAN communication circuit inside the BMS is faulty and the BMS shall be replaced;

• If the equipment fails to detect the EV CAN signal, it is determined that a CAN bus issue has caused communication disconnection or EV CAN_H and EV CAN_L are short-circuited to each other. Please check whether the communication CAN bus between EV CAN and BMS has an open or short circuit fault.

3.8.3.64 Accurate test

Accurate Test CJ**:** U240021

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240021	Loss of communication with high-voltage acquisition module	– BMS high-voltage module communication lost	– BMS high-voltage module communication is normal

Possible cause

– BMS high-voltage module communication lost.

Repair recommendations

• If this fault occurs, please contact the battery manufacturer for maintenance and replacement of the BMS master control.

3.8.3.65 Accurate test

Accurate Test CK**:** B34021E

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34021E	Main positive relay stuck fault	– The main positive relay in the battery pack is detected to be stuck	– The main positive relay of the battery pack is not stuck

Possible cause

– Main positive relay high-voltage contact adhesion.

– BMS fault

Repair recommendations

• Turn off the vehicle, wear insulating gloves, and unplug the high-voltage connector of the battery pack.

• Power on the vehicle, close the main negative relay with a diagnostic scanner (if the positive pole contactor adhesion and negative pole contactor adhesion exist at the same time, there is no need to use a diagnostic scanner), and then measure the voltage between the positive pole and negative pole of the battery pack with a multimeter. If the detected voltage is > 300V, the main positive relay is adhered. In this case, contact the battery manufacturer to replace the main positive relay on site.

• If there is no adhesion in the main positive relay, the BMS detection is abnormal. In this case, contact the battery manufacturer for inspection, maintenance and replacement of the BMS on site.

3.8.3.66 Accurate test

Accurate Test CL**:** B340300

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340300	Thermal runaway fault	– Thermal runaway	– Unrecoverable, manual clear

Possible cause

– Battery overheating.

– The battery is severely extruded or impacted.

Repair recommendations

• Directly move the vehicle to an open area for isolation, and notify professionals to handle it.

3.8.3.67 Accurate test

Accurate Test CM**:** B340301

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340301	The collision signal is valid	– The fault diagnosis occurs when the BMS receives collision signals as airbag operation is detected.	– Sleep power-off

Possible cause

– The vehicle has a collision fault.

Repair recommendations

1) Confirm whether the vehicle has a collision. If yes, check whether the appearance and function of the battery pack are normal, and contact the battery manufacturer for status evaluation.

2) If no collision has occurred, check to confirm whether the airbag has returned to normal. Once normal, use the diagnostic scanner to clear the current fault in the BMS. After clearing, the system can be restarted and used as normal.

3.8.3.68 Accurate test

Accurate Test CN**:** B40304

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B40304	Autonomous high-voltage power-off fault due to cell overvoltage	– Cell voltage is detected to exceed the normal operating voltage range.	– The cell voltage returns to normal

Possible cause

– Cell fault.

– The battery pack is overcharged, and the cell voltage exceeds 3.76V.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

• Discharge the vehicle to SOC 90%, if the fault disappears, it is a cell fault; if the fault still exists after discharging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.69 Accurate test

Accurate Test CO**:** B40305

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B40305	Autonomous high-voltage power-off fault due to cell undervoltage	– Cell voltage is detected to be below the normal operating voltage range.	– The cell voltage returns to normal

Possible cause

– Cell fault.

– The battery pack is over-discharged, and the cell voltage is lower than 2.1V.

– Fault of cell voltage detection circuit inside the BMS.

Repair recommendations

Charge the vehicle to SOC 10%. If the fault disappears, it is a cell fault; if the fault still exists after charging or often occurs in subsequent uses after the fault disappears, contact the battery pack manufacturer for on-site inspection and maintenance.

3.8.3.70 Accurate test

Accurate Test D: B340025

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340025	Main negative relay cannot close	– Main negative relay cannot close	– The main negative relay closes normally

Possible cause

– Main negative relay fault

– BMS fault

– Poor contact of harness inside the battery pack.

Repair recommendations

• After recording all current and historical faults, turn the key off to shut down the vehicle. Disconnect the negative terminal of the lead-acid battery (small battery) for 10s, then reconnect it. Next, try turning the key on to high-voltage mode.

• If the fault cannot be cleared after several attempts of Step 1, please contact the battery pack manufacturer for on-site troubleshooting and maintenance.

3.8.3.71 Accurate test

Accurate Test E: B340026

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340026	Pre-charge relay cannot close	– Pre-charge relay cannot close	– The pre-charge relay closes normally

Possible cause

– Pre-charge relay fault

– BMS fault

– Poor contact of harness inside the battery pack.

Repair recommendations

• After recording all current and historical faults, turn the key off to shut down the vehicle. Disconnect the negative terminal of the lead-acid battery (small battery) for 10s, then reconnect it. Next, try turning the key on to high-voltage mode.

• If the fault cannot be cleared after several attempts of Step 1, please contact the battery pack manufacturer for on-site troubleshooting and maintenance.

3.8.3.72 Accurate test

Accurate Test F: B340005

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340005	Pre-charging failure	– Relay fails to close	– The relay closes normally

Possible cause

– Pre-charge relay cannot close

– Main positive relay cannot close

– Main negative relay cannot close

– Abnormal vehicle capacitor circuit

Repair recommendations

• If the current fault includes not only the pre-charging failure, but also the B340020 main positive relay cannot close, the B340025 main negative relay cannot close, or the B340026 pre-charge relay cannot close, then first check them separately according to step 1 of the corresponding fault measures. If the

current fault does not include any of the above 3 inability-to-close faults, it means that the vehicle capacitor circuit is abnormal.
• If the capacitor circuit of the vehicle is abnormal, it is necessary to check whether the high-voltage wires, A/C compressors, motors, heating PTC and other high-voltage parts of the vehicle have abnormal starting, short circuits, poor contact, and abnormal discharge.

3.8.3.73 Accurate test

Accurate Test G: B34001D

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001D	Pre-charging overcurrent	– Pre-charging overcurrent	– Pre-charge current is normal

Possible cause

– On-load discharge occurs during the pre-charging of vehicle powered up to high-voltage.

Repair recommendations
• Check the high-voltage components such as the vehicle's high-voltage wire, motor, A/C compressor and heating PTC for abnormal startup, short circuit, poor contact or abnormal discharge.

3.8.3.74 Accurate test

Accurate Test H: B34001E

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34001E	Charging current overcurrent fault	– Charging overcurrent	– Pull out the plug for recovery

Possible cause

– Abnormal charging pile: During charging, the current entering the battery pack is greater than the requested current of the battery pack.

– The current sensor detection is abnormal.

Repair recommendations
• Compare the requested current of the battery with the output current of the charging pile. If the output current of the charging pile is continuously greater than the requested current of the battery pack, the charging pile is abnormal.
If the output current of the charging pile is not continuously greater than the requested current of the battery pack, it indicates that the current sensor in the battery pack is abnormal. Contact the battery pack manufacturer for maintenance or replacement.

3.8.3.75 Accurate test

Accurate Test I: B340027

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340027	Overcurrent fault when main relay is disconnected	– Power-off overcurrent	– Sleep and wake-up

Possible cause

– When the vehicle is powered off from high voltage, high-voltage components such as motor, A/C compressor and heating PTC are still working, and the current on the high-voltage circuit is > 5A.

Maintenance suggestions

– Check if high-voltage components such as the motor, A/C compressor and heating PTC work abnormally, and replace any abnormal components.

3.8.3.76 Accurate test

Accurate Test J: B340028

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340028	Lead-acid battery overvoltage	– Vehicle lead-acid battery overvoltage	– Lead-acid battery voltage normal

Possible cause

– Overcharge of lead-acid battery caused by abnormal DCDC.

– Fault of voltage detection circuit inside the BMS.

Repair recommendations

• Open the engine bonnet at the front of the vehicle and check the voltage of the lead-acid battery when the high-voltage is off.

• If the lead-acid battery voltage is above 16V when the high-voltage is off, check according to the battery's technical standards whether the battery is damaged. If it is damaged, replace it. If not, adjust it to within 12V-14V for use. If the battery voltage only goes over 16V when the high-voltage is on, check whether the DC/DC converter is faulty.

• If the lead-acid battery voltage is within 10~15V under both high-voltage on and off conditions, it is determined that the BMS is abnormal and the battery pack factory should be contacted for inspection and repair.

3.8.3.77 Accurate test

Accurate Test K: B340029

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340029	Lead-acid battery undervoltage	– Lead-acid battery undervoltage	– The lead-acid battery voltage is normal

Possible cause

– Over-discharge of lead-acid battery caused by abnormal DCDC.

– Fault of voltage detection circuit inside the BMS.

Repair recommendations

• Open the engine bonnet at the front of the vehicle and check the voltage of the lead-acid battery when the high-voltage is off.

• If the lead-acid battery voltage is lower than 9V when the vehicle is in high-voltage power-off mode, check whether the battery is damaged using its technical standards. Replace the battery if it is damaged. If not, charge the battery to between 12V and 14V before use. If the battery voltage drops below 9V only when the vehicle is in high-voltage power-on mode, check whether the DCDC converter is faulty.

• If the lead-acid battery voltage is within 10~15V under both high-voltage on and off conditions, it is determined that the BMS is abnormal and the battery pack factory should be contacted for inspection and repair.

3.8.3.78 Accurate test

Accurate Test L: B340009

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340009	EEPROM abnormal fault	– Central memory (CPU) error in the BMS	– Normal storage

Possible cause

– The central memory (CPU) in the BMS has an error, resulting in the loss of some stored information. It can be judged that the cause is inside the BMS.

Repair recommendations

• After the vehicle is restarted after being powered off to sleep, if this fault is historical, no handling is required. If it is a current fault, contact the battery pack manufacturer for inspection and maintenance.

3.8.3.79 Accurate test

Accurate Test M: B34000A

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000A	DC charging - Charging termination fault due to incorrect VCM signal at parameter configuration phase	– DC charging - Charging termination due to incorrect VCM signal at parameter configuration phase	– Pull out the plug for recovery

Possible cause

– In the fast charging parameter configuration phase, VCM sends a signal indicating that charging is not allowed or the vehicle is in a non-charging state

Repair recommendations

• Reproduce the fault, check the current fault of VCM, and solve the fault that stops charging under the charging plug state.

3.8.3.80 Accurate test

Accurate Test N: B34000B

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000B	DC charging - VCM charging request termination fault at parameter configuration phase	– DC charging - VCM charging request termination at parameter configuration phase	– Pull out the plug for recovery

Possible cause

– In the fast charging parameter configuration phase, VCM sends a fast charging stop request signal.

Repair recommendations

• Reproduce the fault, check the current fault of VCM, and solve the fault that stops charging under the charging plug state.

3.8.3.81 Accurate test

Accurate Test O: B34000C

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000C	Charging termination due to VCM signal change in DC charging phase	– Charging termination due to VCM signal change in DC charging phase	– Pull out the plug for recovery

Possible cause

– In the fast charging phase, VCM sends a signal indicating that charging is not allowed or the vehicle is in a non-charging state.

Repair recommendations

• Reproduce the fault, check the current fault of VCM, and solve the fault that stops charging under the charging plug state.

3.8.3.82 Accurate test

Accurate Test P: B34000D

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000D	DC charging - VCM charging request termination fault in charging phase	– DC charging - VCM charging request termination fault in charging phase	– Pull out the plug for recovery

Possible cause

– In the fast charging phase, VCM sends a fast charging stop request signal.

Repair recommendations

• Reproduce the fault, check the current fault of VCM, and solve the fault that stops charging under the charging plug state.

3.8.3.83 Accurate test

Accurate Test Q: B34000E

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000E	DC charging - Charging pile sending signal timeout fault	– DC charging - Charging pile sending signal timeout	– Pull out the plug for recovery

Possible cause

– In the fast charging phase, the charging pile does not send the corresponding interactive signal to BMS on time, and BMS reports a timeout fault.

Repair recommendations

• Pull out the charging plug to recharge or change a charging pile.

3.8.3.84 Accurate test

Accurate Test R: B34000F

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B34000F	DC charging - charging termination request fault due to charging pile fault	– DC charging - charging termination request due to charging pile fault	– Pull out the plug for recovery

Possible cause

– In the fast charging stage, the charging pile sends a charging stop request to BMS due to a fault.

Repair recommendations

• Pull out the charging plug to recharge or change a charging pile.

3.8.3.85 Accurate test

Accurate Test S: B340010

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340010	AC charging - Charging termination fault caused by OBC signal	– AC charging - Charging termination fault caused by OBC signal	– Pull out the plug for recovery

Possible cause

– During the slow charging process, the OBC status is abnormal charging or CP status.

Repair recommendations

• Reproduce the fault and check the cause of the OBC abnormality when the charging plug is inserted.

3.8.3.86 Accurate test

Accurate Test T: B340011

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340011	AC charging - Charging termination fault caused by VCM signal	– AC charging - Charging termination fault caused by VCM signal	– Pull out the plug for recovery

Possible cause

– During slow charging, VCM sends a signal indicating that charging is not allowed, the vehicle is in a non-charging state, or a request to stop charging.

Repair recommendations

• Reproduce the fault, check the current fault of VCM, and solve the fault that stops charging under the charging plug state.

3.8.3.87 Accurate test

Accurate Test U: B340031

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340031	Charging termination fault due to low battery pack temperature and no heating during charging	– Charging termination due to low battery pack temperature and no heating during charging	– Pull out the plug for recovery

Possible cause

– During low temperature charging at -20°C, the battery pack heating PTC is not started

Repair recommendations

• Check if the battery pack heating PTC is faulty.

3.8.3.88 Accurate test

Accurate Test V**:** B340014

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340014	Cooling not started	– Battery overheating, cooling not started	– Battery cooling is normal

Possible cause

– The battery is at high temperature, and the cooling of battery pack is not started.

Repair recommendations

• Check whether the battery pack cooling circuit (A/C compressor, battery pack coolant pipeline and A/C solenoid valve) is faulty.

3.8.3.89 Accurate test

Accurate Test W**:** B340015

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B340015	Abnormal CC2 state fault detected by BMS	– Abnormal CC2 state detected by BMS	– Pull out the plug for recovery

Possible cause

– Abnormal resistance of fast charging port base

– Abnormal vehicle CC2 signal line

– Abnormal resistance of fast charging plug of charging pile

– Abnormal BMS

Repair recommendations

• Use a multimeter to detect whether the resistance between vehicle CC1, CC2 and PE is 1000±30Ω respectively. If the resistance is abnormal, replace the fast charging port base.

• Check whether pin 18 of the low-voltage connector of the battery pack to the charging port base CC2 is connected. If it is abnormal, replace the harness.

• Detect whether the resistance between the fast charging plug CC1 and the PE of the charging pile is 1000 ± 30Ω with a multimeter. If the resistance is abnormal, contact the charging pile manufacturer for maintenance.

• If the above reasons are eliminated and charging still fails after replacing with a normal charging pile, contact the battery manufacturer to check whether the battery pack BMS is abnormal.

3.8.3.90 Accurate test

Accurate Test X**:** U240001

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240001	CANBusOff fault with the network connection to T-BOX	– Connect to T-BOX network CAN Bus Off	– CAN bus returns to normal

Possible cause

– CAN short circuit between pins 16 and 17 of the low-voltage connector of the battery pack.

– Abnormal terminal resistance between pins 16 and 17 of the low-voltage connector of the battery pack.

– Abnormal terminal resistance between pins 16 and 17 of the low-voltage connector of the battery pack corresponding to the T-BOX.

Repair recommendations

• Check the wiring between the T-CAN H and T-CAN L pins of the battery pack low-voltage connector for any abnormal points, and replace the harness.
• Check whether the resistance between the T-CAN H and T-CAN L pins of the battery pack low-voltage connector is 120Ω. If not, contact the battery manufacturer to replace the BMS.
• Check whether the terminal resistance between the T-CAN H and T-CAN L pins of the battery pack low-voltage connector corresponding to the T-BOX is 120Ω. If not, contact the T-BOX manufacturer to replace the T-BOX.

3.8.3.91 Accurate test

Accurate Test Y**:** U240002

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240002	Fast charging CAN Bus Off fault	– Fast charging CANBusOff	– CAN bus returns to normal

Possible cause

– There is a CAN short circuit between the fast charging CAN H and Fast charging CAN L pins of the battery pack low-voltage connector.

– The terminal resistance between the fast charging CAN H and fast charging CAN L pins of the battery pack low-voltage connector is abnormal.

– Abnormal terminal resistance of the charging pile

Repair recommendations

• Check the wiring between the fast charging CAN H and fast charging CAN L pins of the battery pack low-voltage connector for any abnormal points, and replace the harness.
• Check whether the resistance between the fast charging CAN H and fast charging CAN L pins of the battery pack low-voltage connector is 120Ω. If not, contact the battery manufacturer to replace the BMS.
• Check the terminal resistance of the charging pile S+ and S- for abnormalities. If the resistance is abnormal, contact the charging pile manufacturer for maintenance.

3.8.3.92 Accurate test

Accurate Test Z**:** U240003

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U240003	Internal CAN Bus Off fault	– Internal CAN Bus Off	– CAN bus returns to normal

Possible cause

– CAN between slave control and master control in the battery pack is short-circuited.

Repair recommendations

• Contact the battery manufacturer to replace the BMS or communication harness in the battery.

3.8.4 Removal and installation

3.8.4.1 Power battery pack assembly

Removal

Warning: This battery pack contains high-voltage electricity, and maintenance personnel must wear insulating protective equipment.

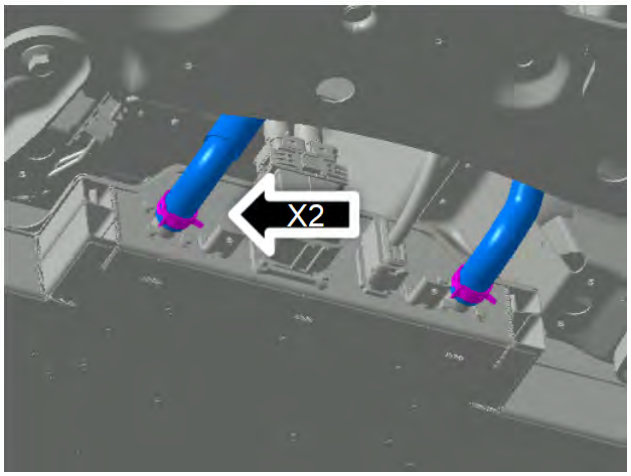
Warning: Handle with care during transportation, do not bump violently or tilt.

Warning: During loading and unloading, it is strictly forbidden to throw or roll over. Mechanical impact, bumping and heavy pressure are prohibited.

Power battery pack assembly disassembly

tools	and purposes
: Lift	- Lifting the vehicle;
Insulating gloves and insulating safety shoes -	Preventing high-voltage electric shock
; Lifting platform (bearing capacity ≥ 500 kg	) - Used to carry the battery pack during disassembly and installation

1. Turn off all electrical equipment, switch the vehicle power supply to OFF position and pull up the handbrake.
2. Disconnect the negative cable of 12V battery in the engine compartment.Refer to: Disconnect the battery negative cable.
3. Use a lift to lift the vehicle to a convenient disassembly and assembly position.Refer to: Lifting the vehicle.
4. Remove the fixing clamp and move aside the water inlet and outlet pipes on the battery pack.

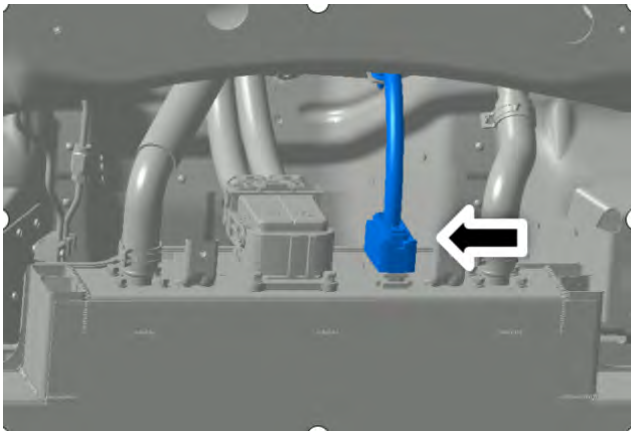


Caution: After removing the inlet and outlet pipes, the battery pack interface and pipeline interface need to be sealed to prevent foreign object such as dust and impurities from entering the interior and causing abnormalities.

5. Drain the coolant into a suitable container.

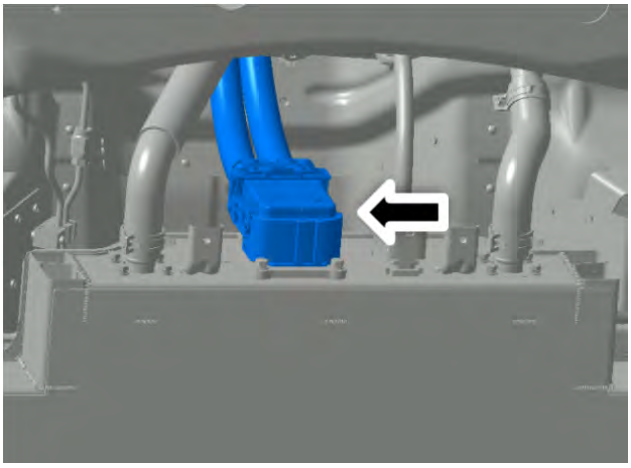
   Caution: Recycle and dispose of the old coolant in a centralised manner, waiting for scrapping or recycling. Do not discharge old coolant into the sewer pipe to protect the environment.

6. Pull out the low-voltage connector wire of the battery pack.



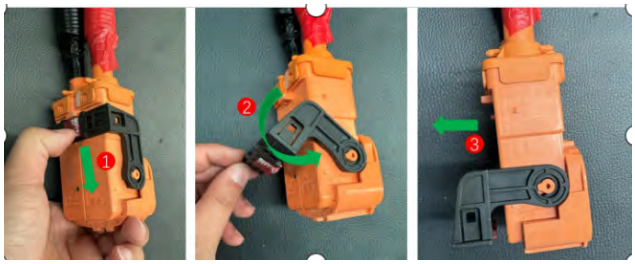
   Caution: After the low-voltage connector is removed, it must be sealed in time to prevent foreign objects such as dust and impurities from entering.

7. Remove the high-voltage connector of the battery pack.



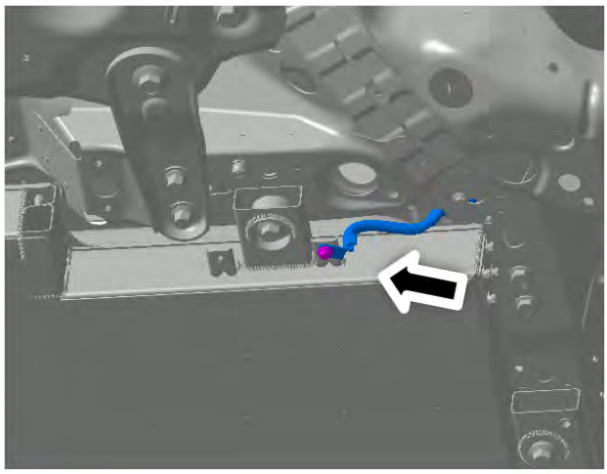
   High-voltage connector removal steps:

1. Pull the clip in place in the direction of the arrow;
2. Pull down the connector handle in the direction of the arrow to make it rotate fully;
3. Pull the plug in the direction of the arrow to separate the high-voltage connector.



Caution: After the high-voltage connector is removed, it must be insulated and sealed in time to prevent foreign objects such as dust and impurities from entering or electric shock by accidentally touching the high-voltage terminal.

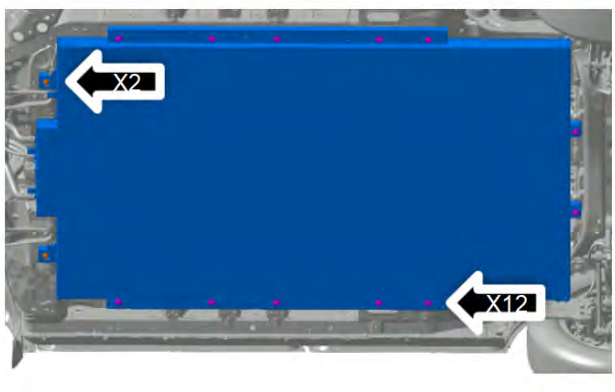
8. Remove the battery pack housing GND wire bolts and remove the GND wire. Torque: 7±1 Nm



9. Adjust the liftable platform to contact the bottom of the battery pack.

10. Remove the fixing bolts and gaskets at the battery pack lifting lug.

Torque: 69±7 Nm



11. Adjust the liftable platform to slowly separate the battery pack from the vehicle body in the vertical direction.

Installation

1. The installation order is reverse to the removal order.

4.1 Low-voltage harness

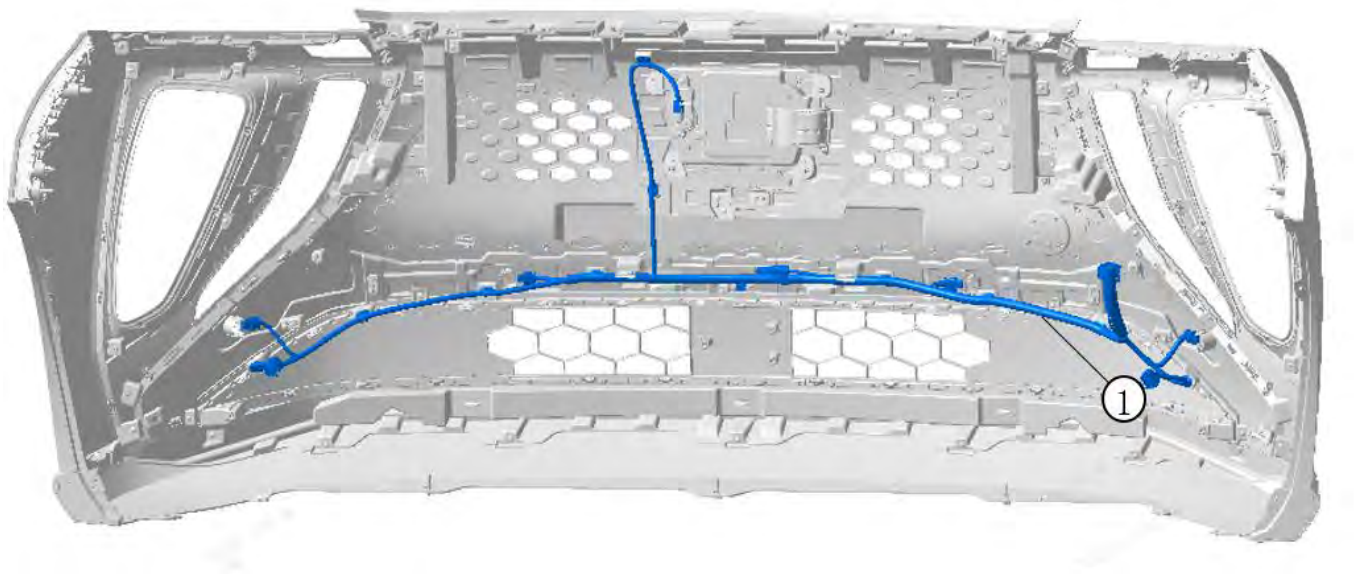
4.1.1 Specification

4.1.1.1 Torque specification

Name	Nm
Fixing nut	10.5±1.6
Fuse box fixing bolt	10.5±1.6
Fixing bolt of instrument panel harness GND	10.5±1.6

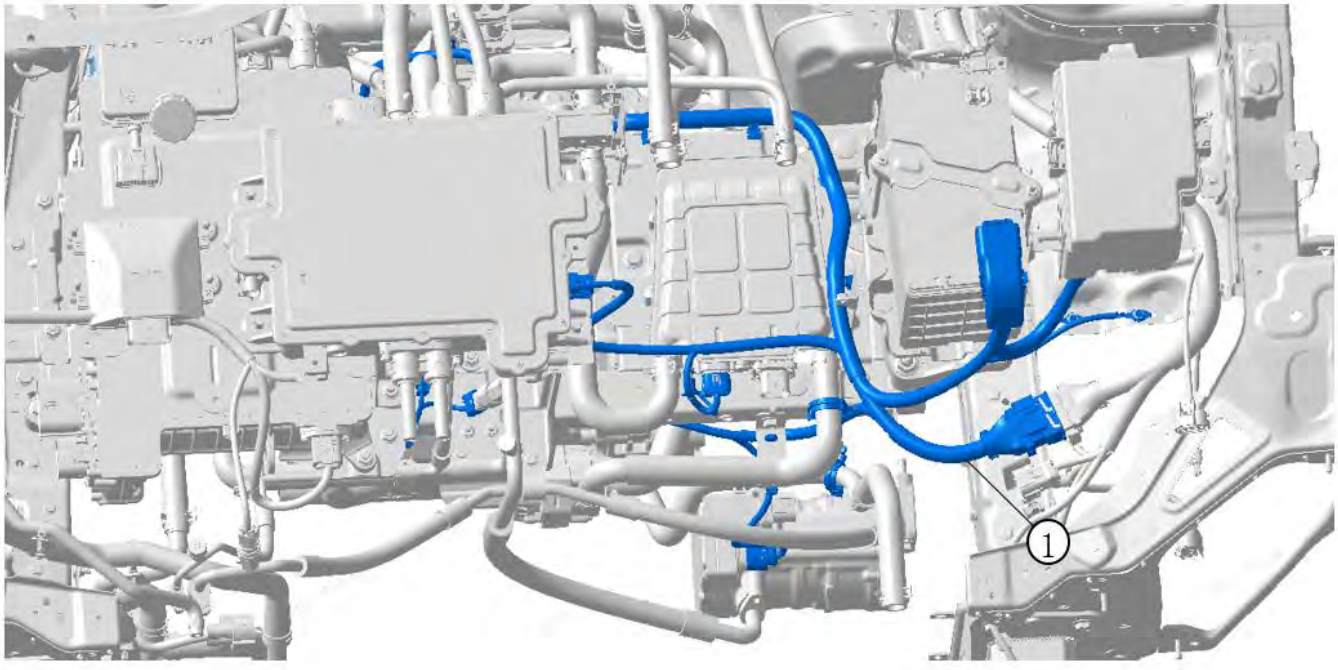
4.1.2 Instructions and operations

4.1.2.1 Front bumper harness assembly



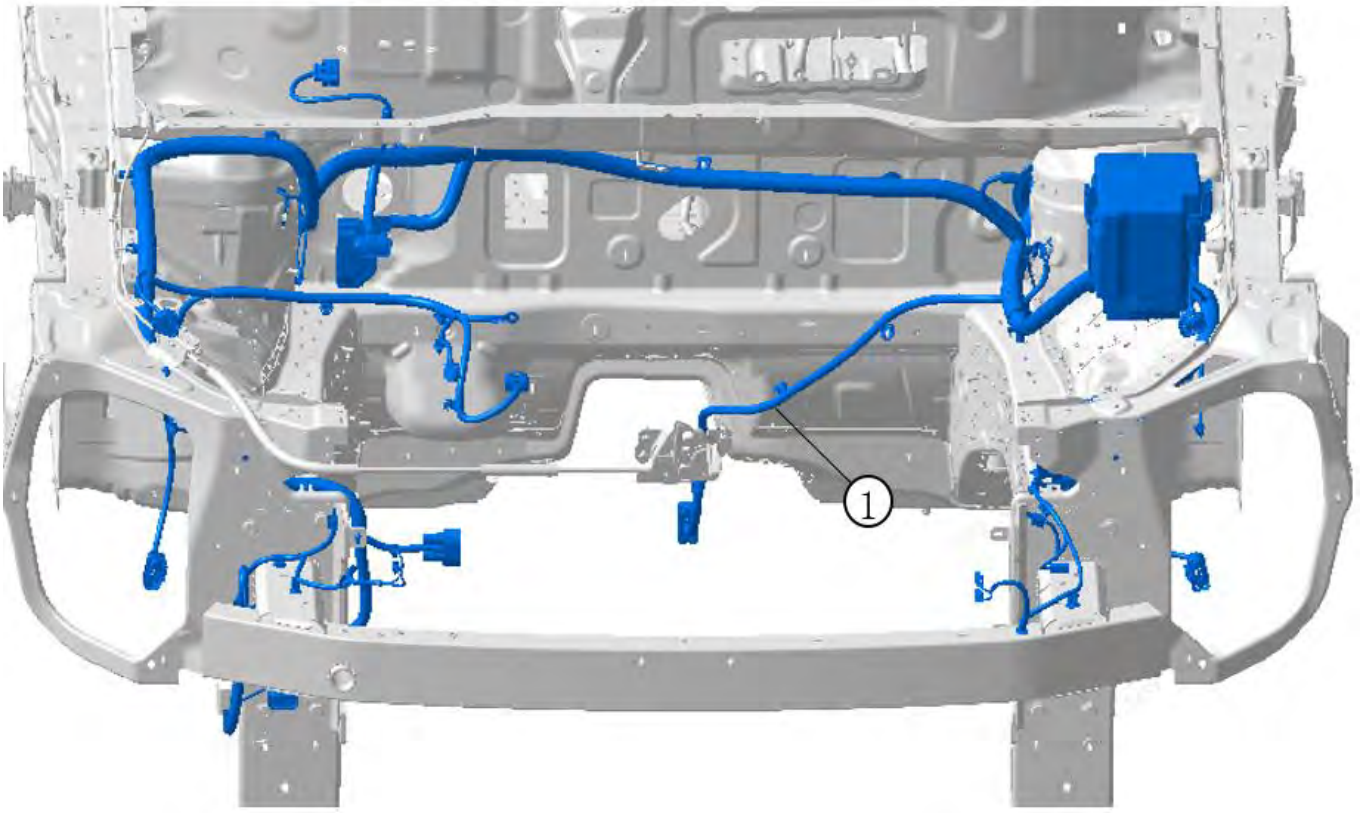
Item	Description	Item	Description
1.	Front bumper harness assembly		

4.1.2.2 Low-voltage control harness assembly of high-voltage system



Item	Description	Item	Description
1.	Low-voltage control harness assembly of high-voltage system		

4.1.2.3 Engine compartment harness assembly



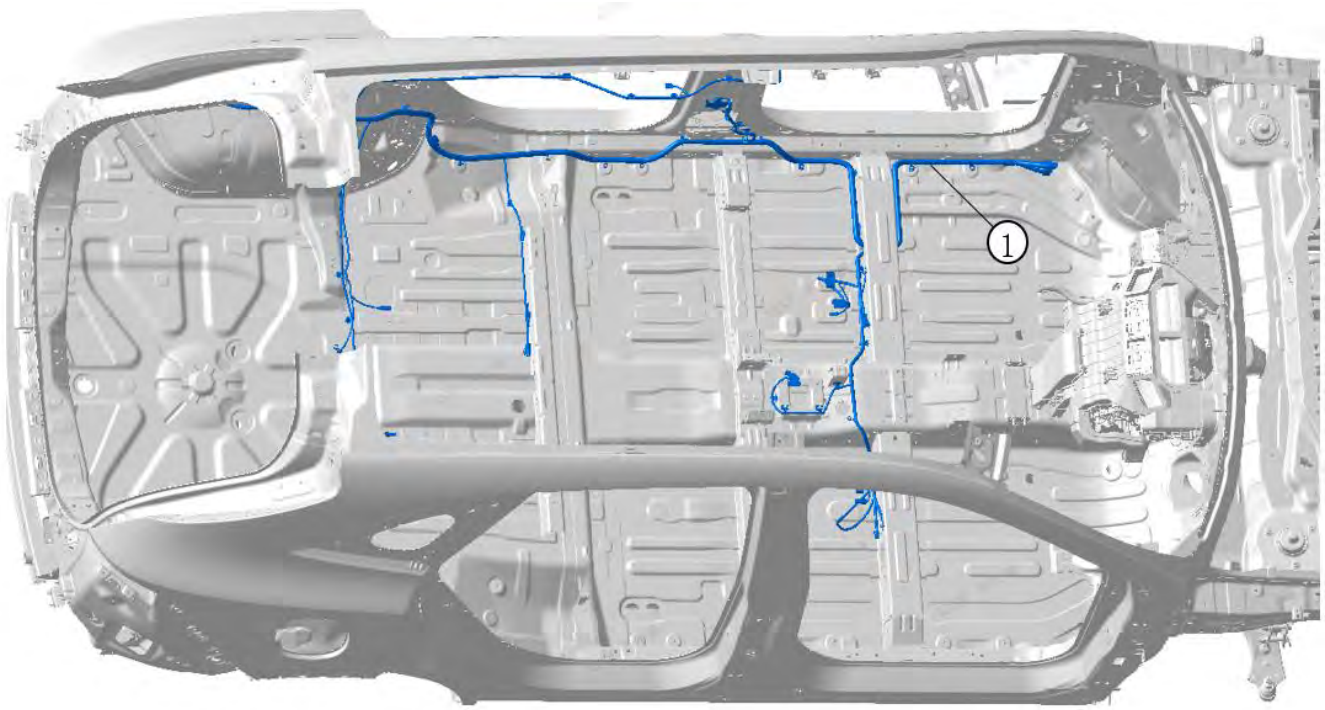
Item	Description	Item	Description
1.	Engine compartment harness assembly		

4.1.2.4 Instrument panel harness assembly



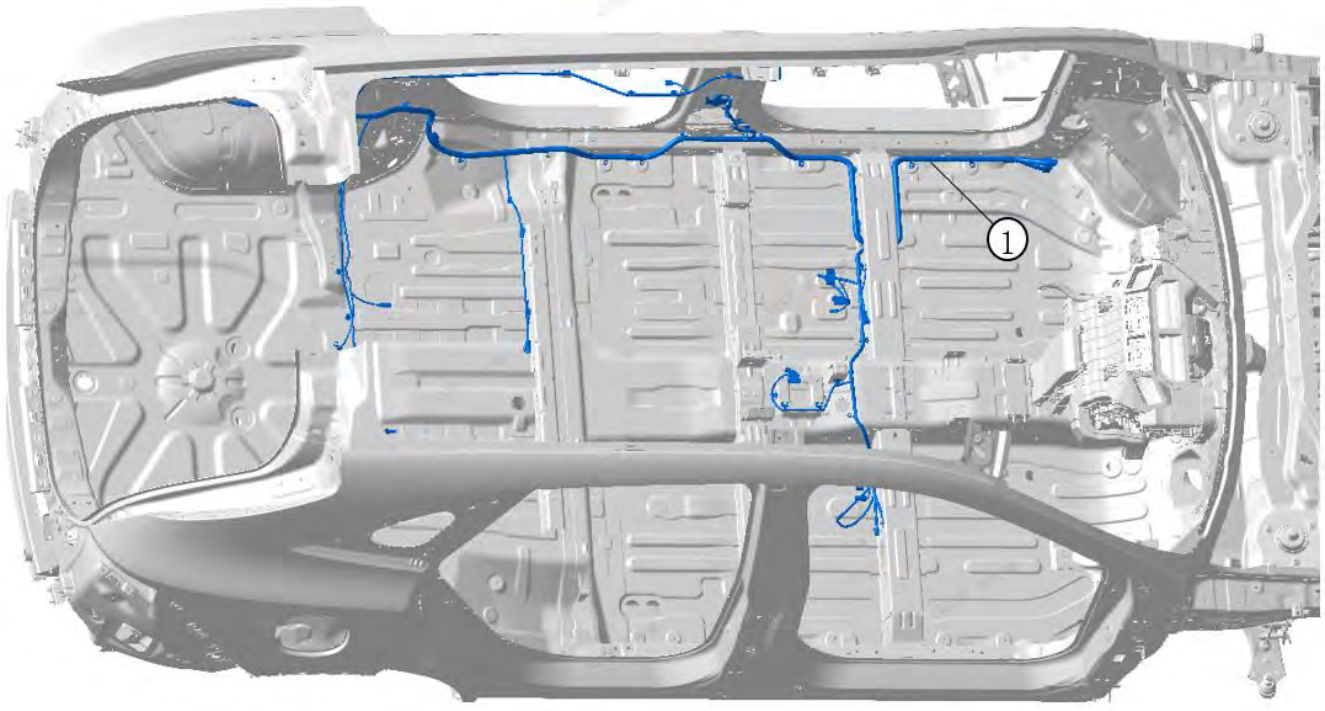
Item	Description	Item	Description
1.	Instrument panel harness assembly		

4.1.2.5 Left body harness assembly



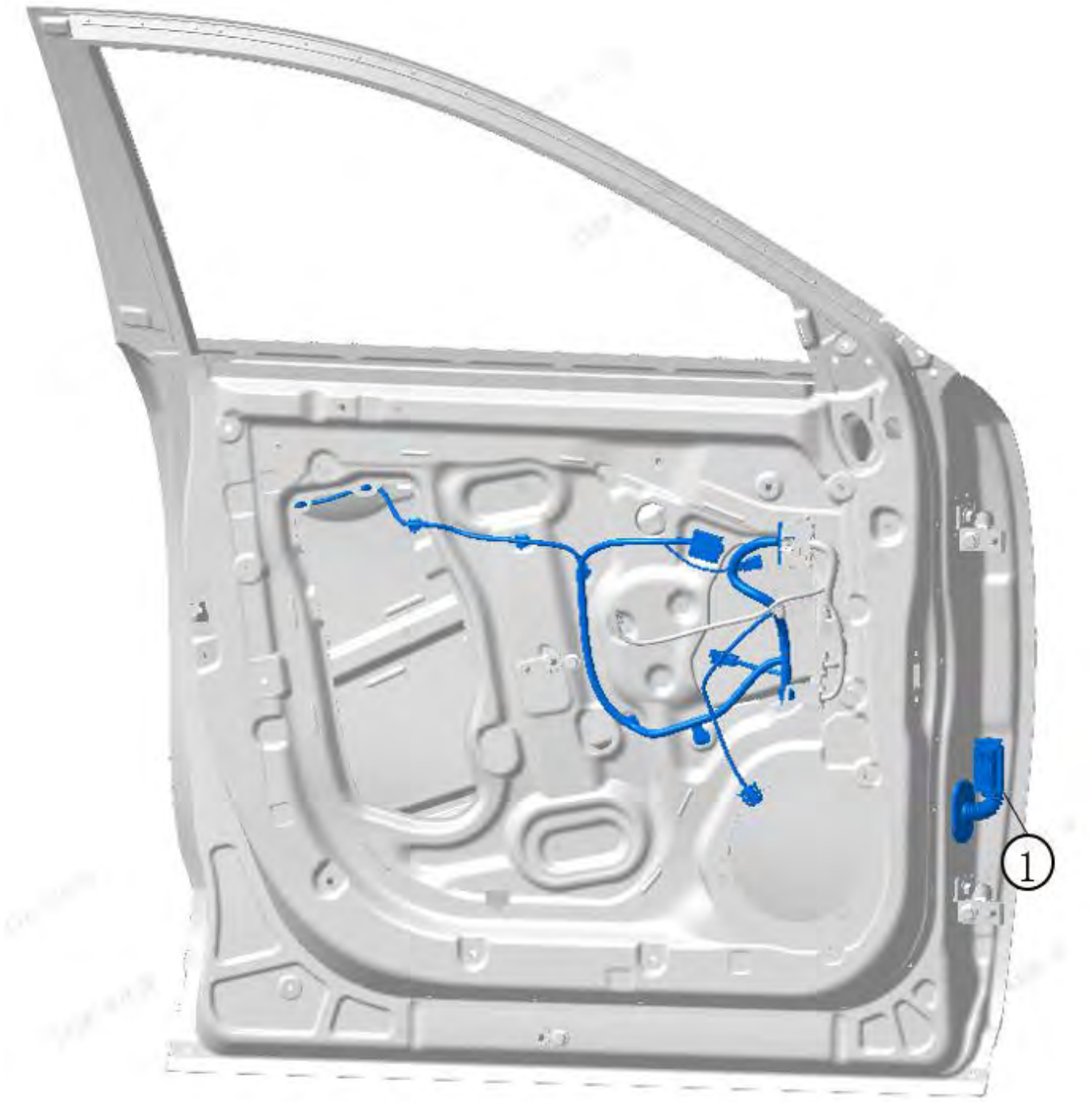
Item	Description	Item	Description
1.	Left body harness assembly		

4.1.2.6 Right body harness assembly



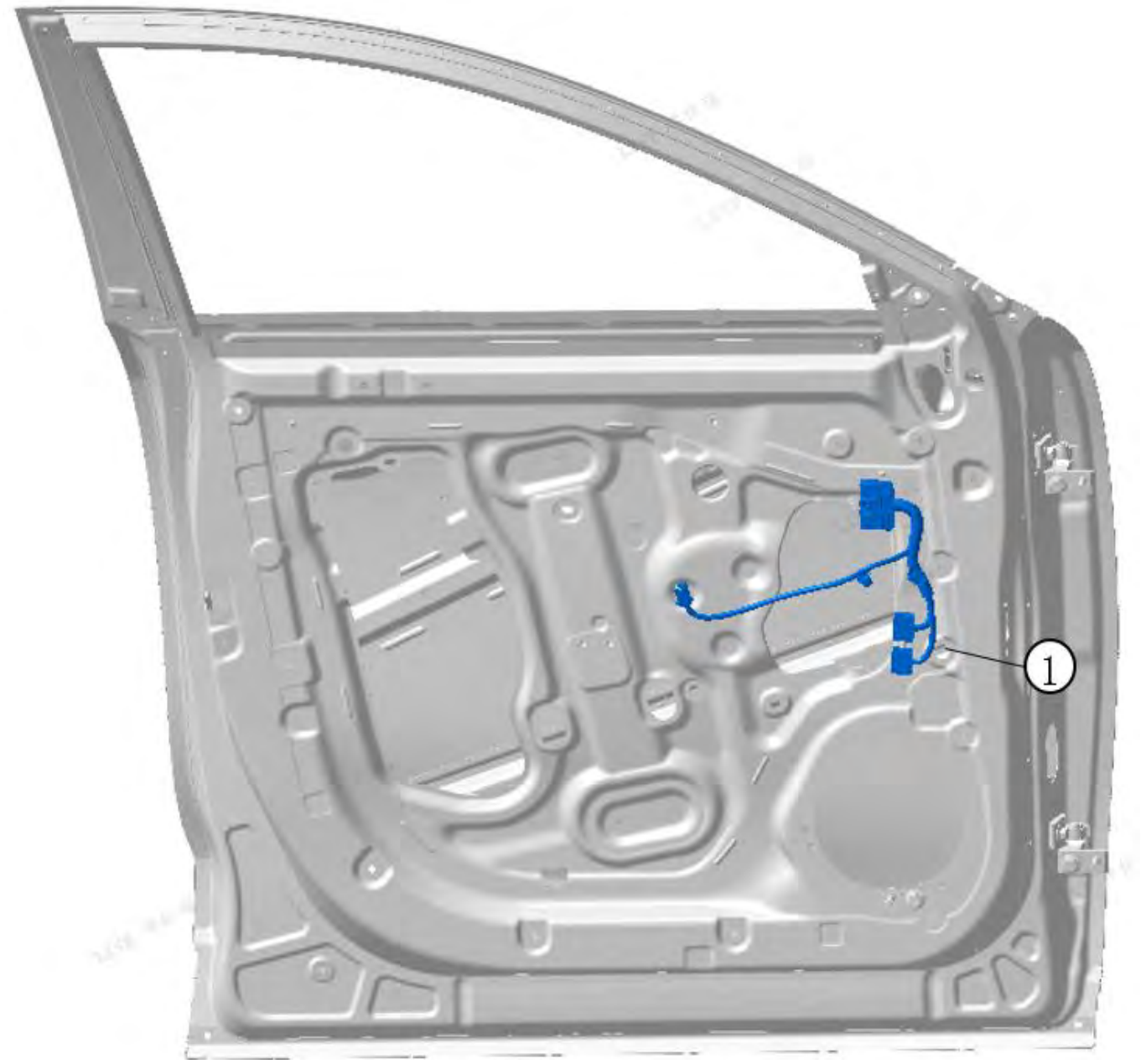
Item	Description	Item	Description
1.	Right body harness assembly		

4.1.2.7 Front left door harness assembly



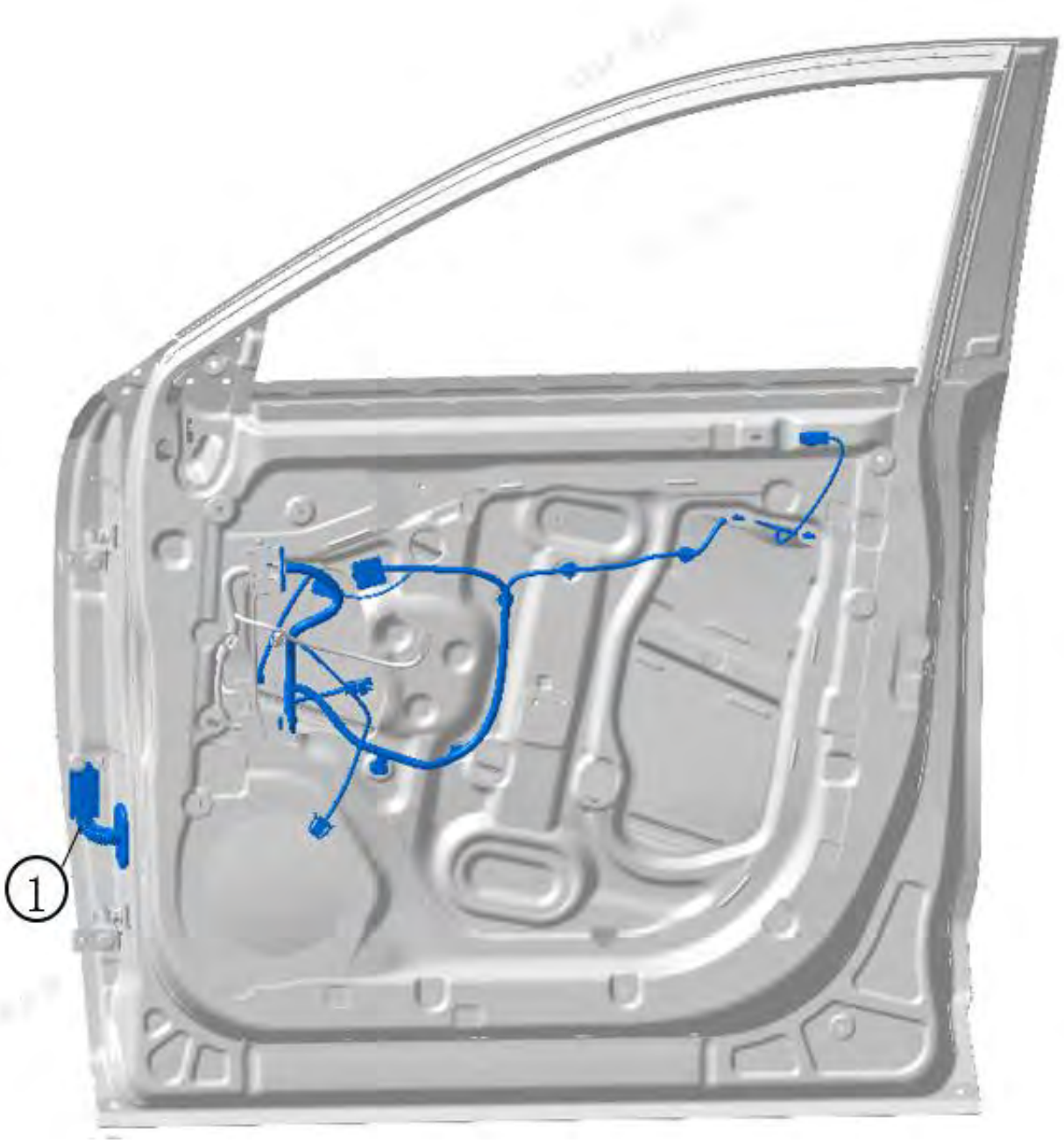
Item	Description	Item	Description
1.	Front left door harness assembly		

4.1.2.8 Front left door control transition line assembly



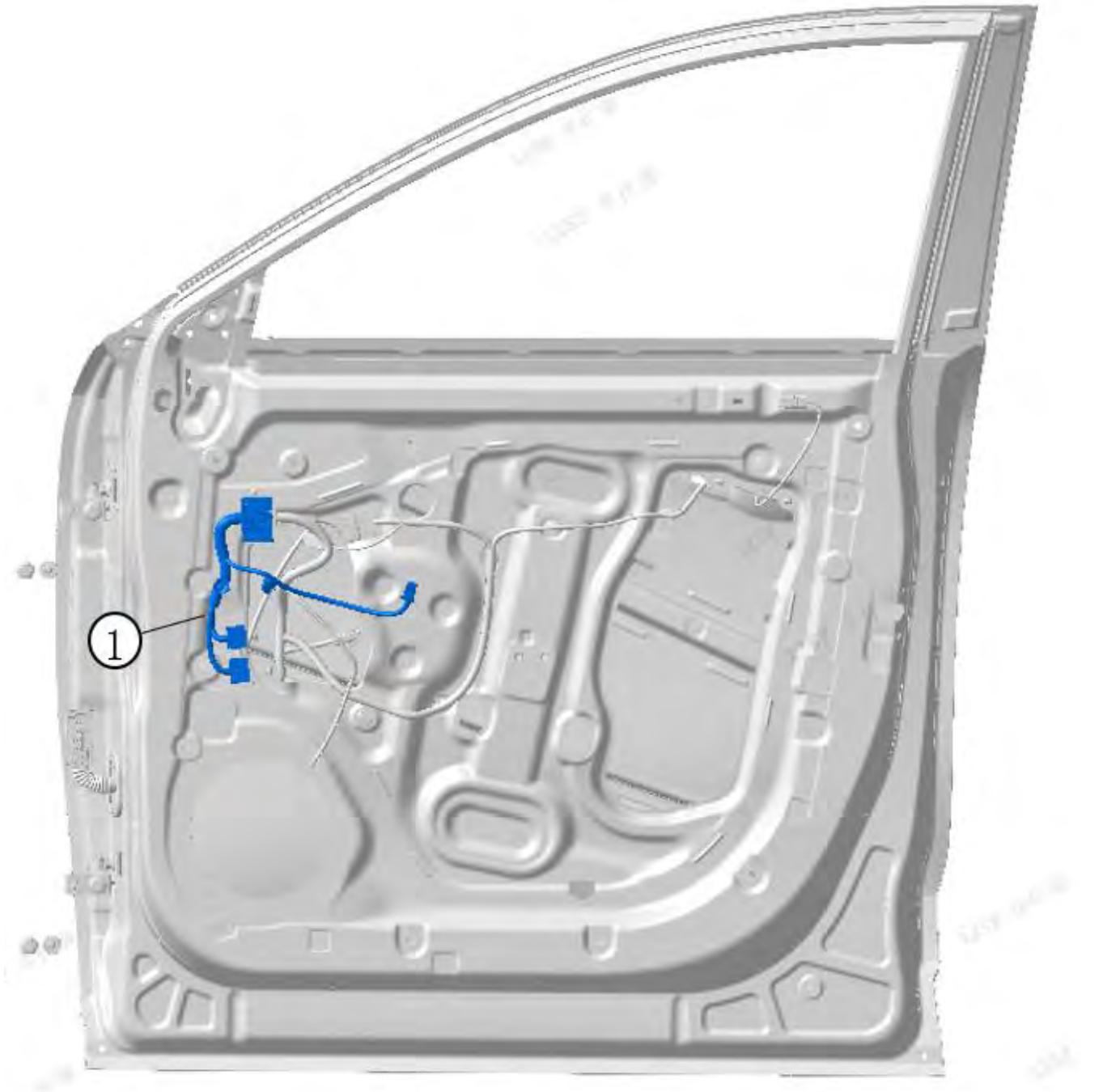
Item	Description	Item	Description
1.	Front left door control transition line assembly		

4.1.2.9 Front right door harness assembly



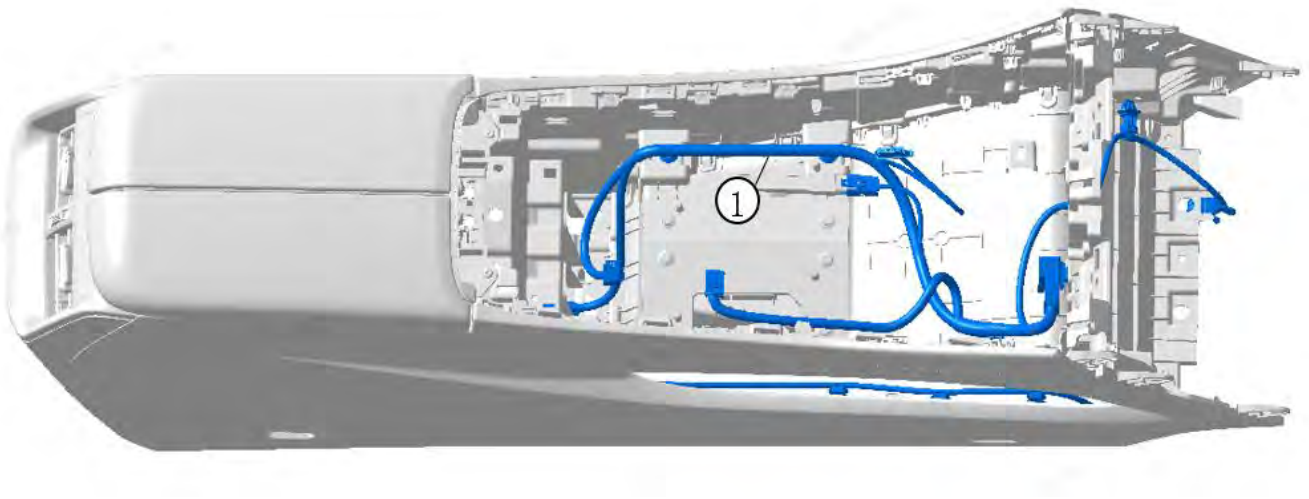
Item	Description	Item	Description
1.	Front right door harness assembly		

4.1.2.10 Front right door control transition line assembly



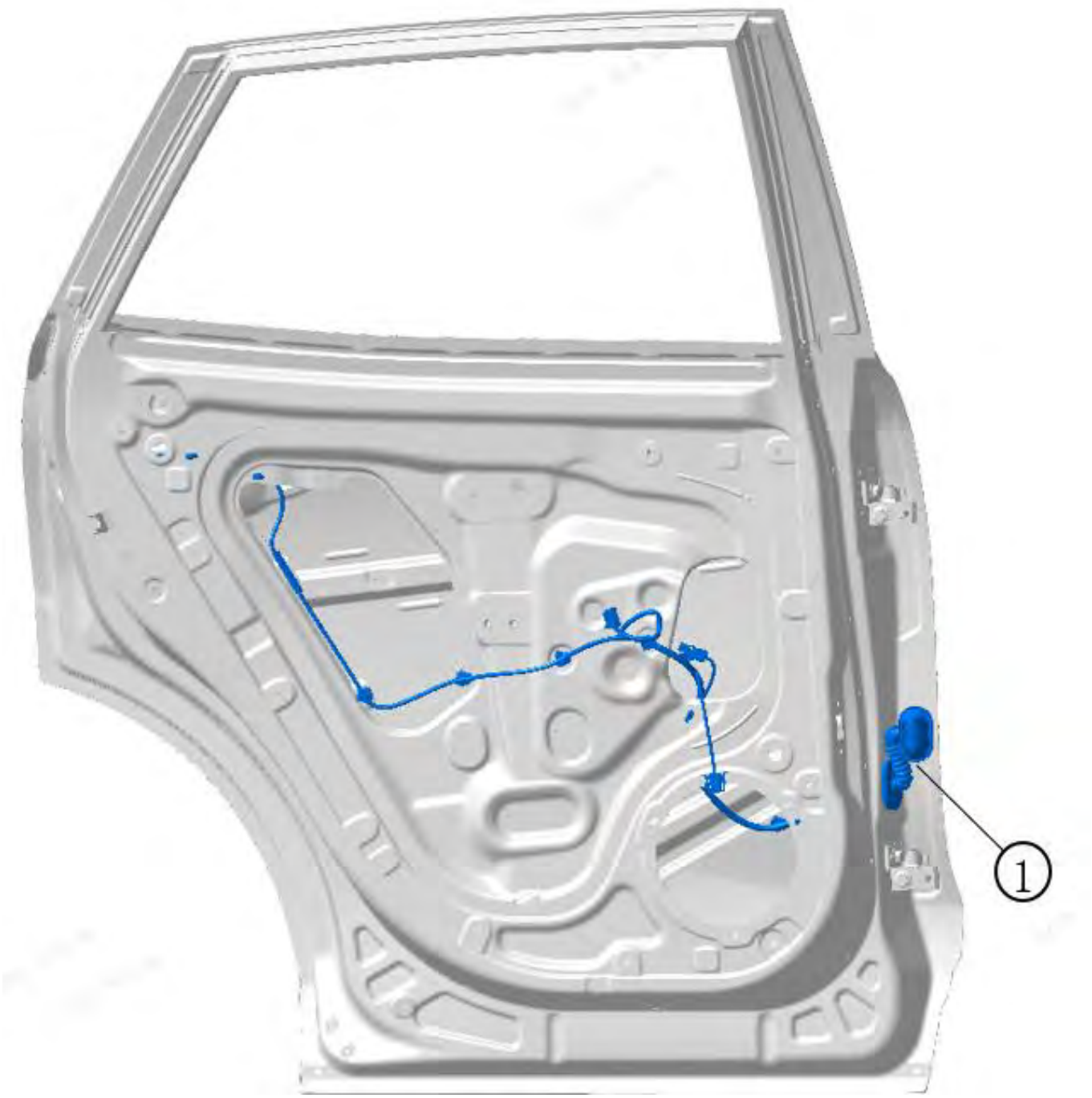
Item	Description	Item	Description
1.	Front right door control transition line assembly		

4.1.2.11 Console harness assembly



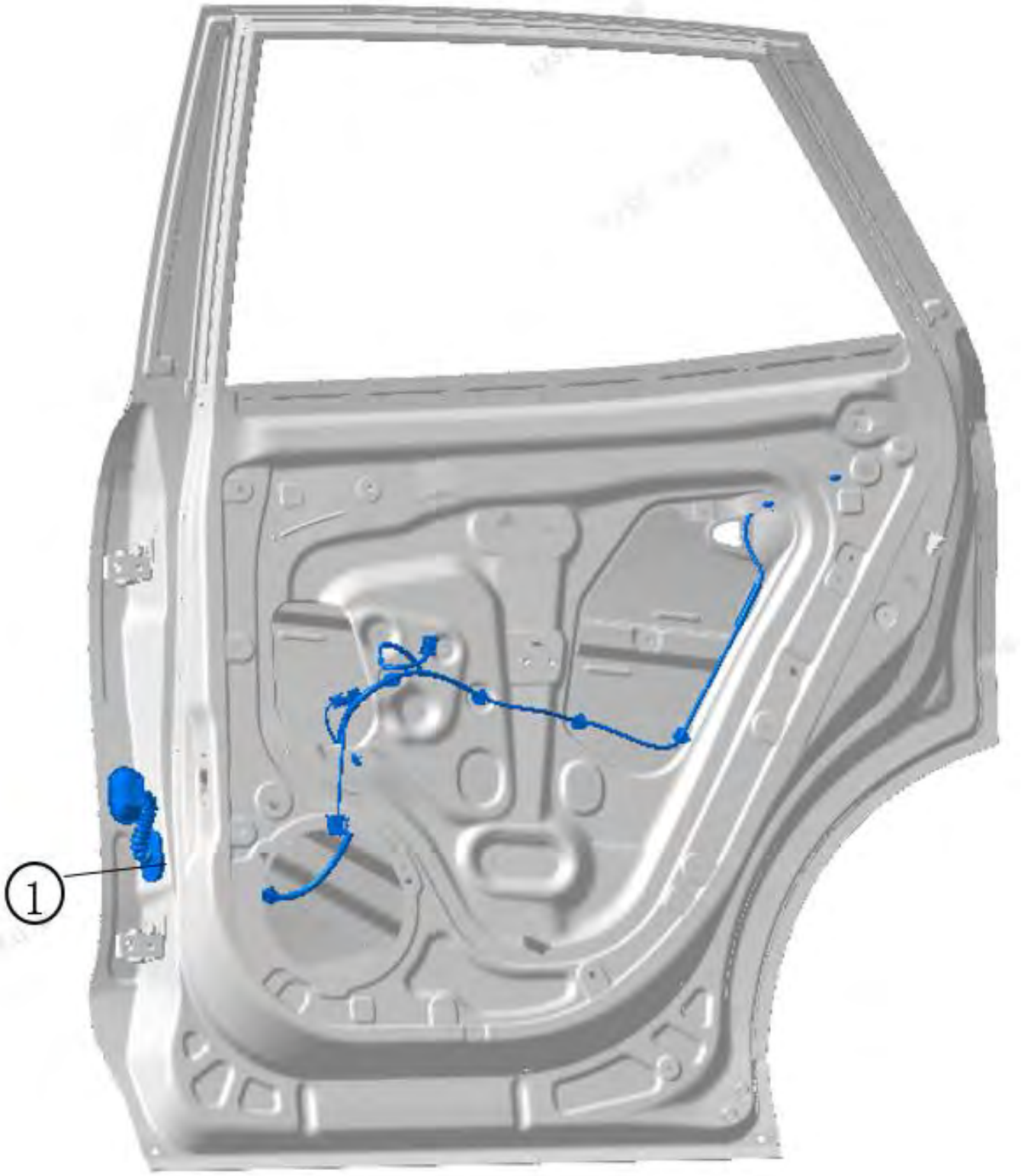
Item	Description	Item	Description
1.	Console harness assembly		

4.1.2.12 Rear left door harness assembly



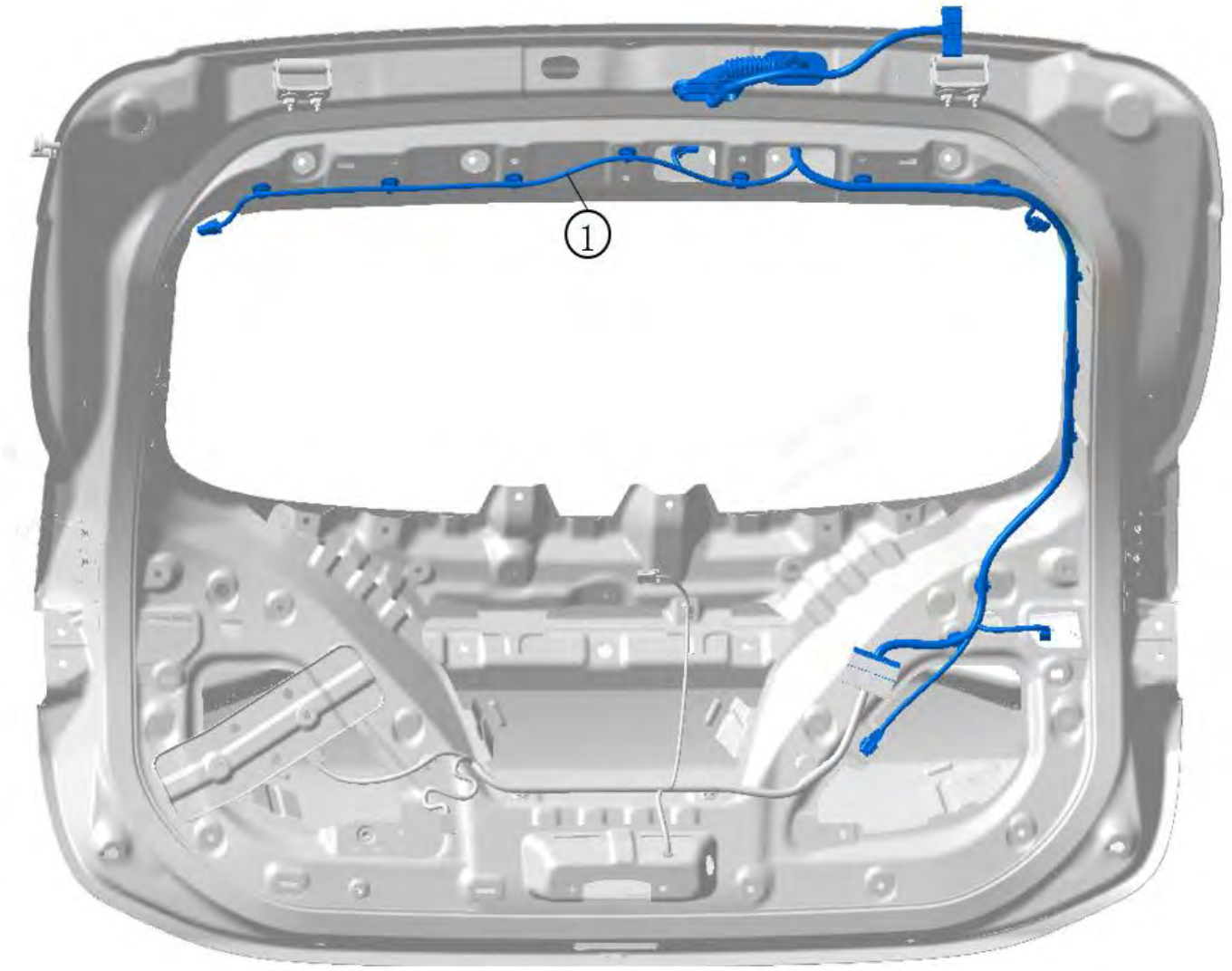
Item	Description	Item	Description
1.	Rear left door harness assembly		

4.1.2.13 Rear right door harness assembly



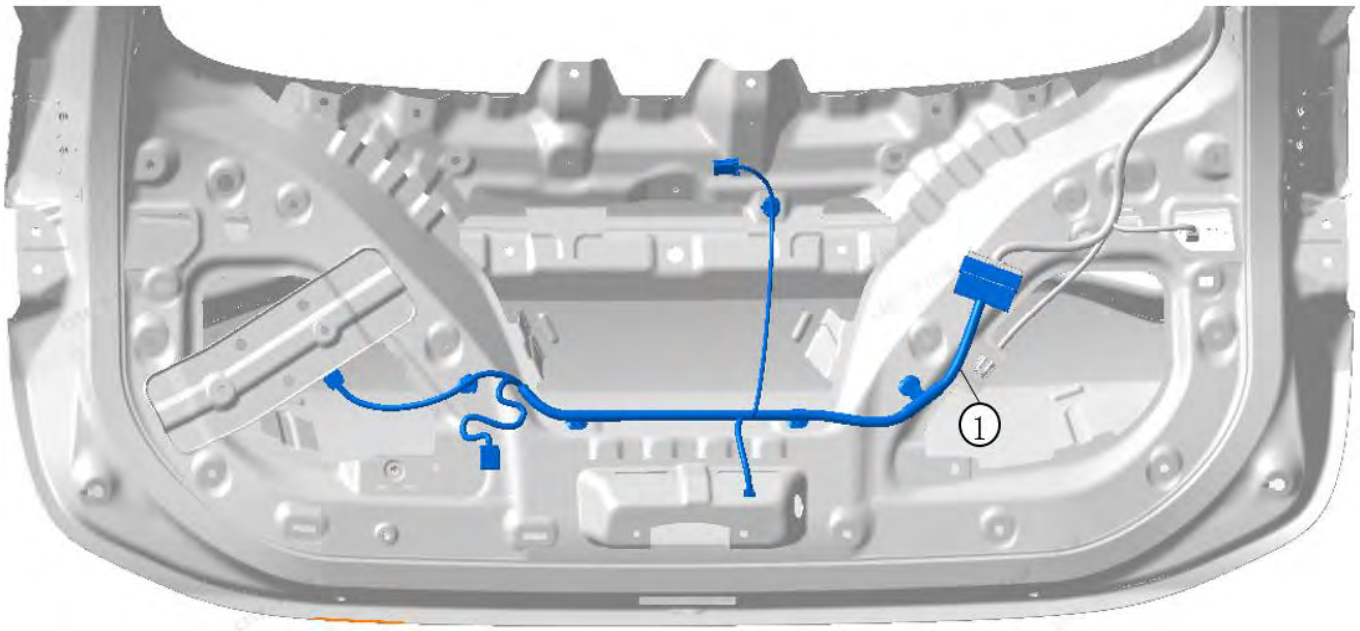
Item	Description	Item	Description
1.	Rear right door harness assembly		

4.1.2.14 Boot lid transition line 1



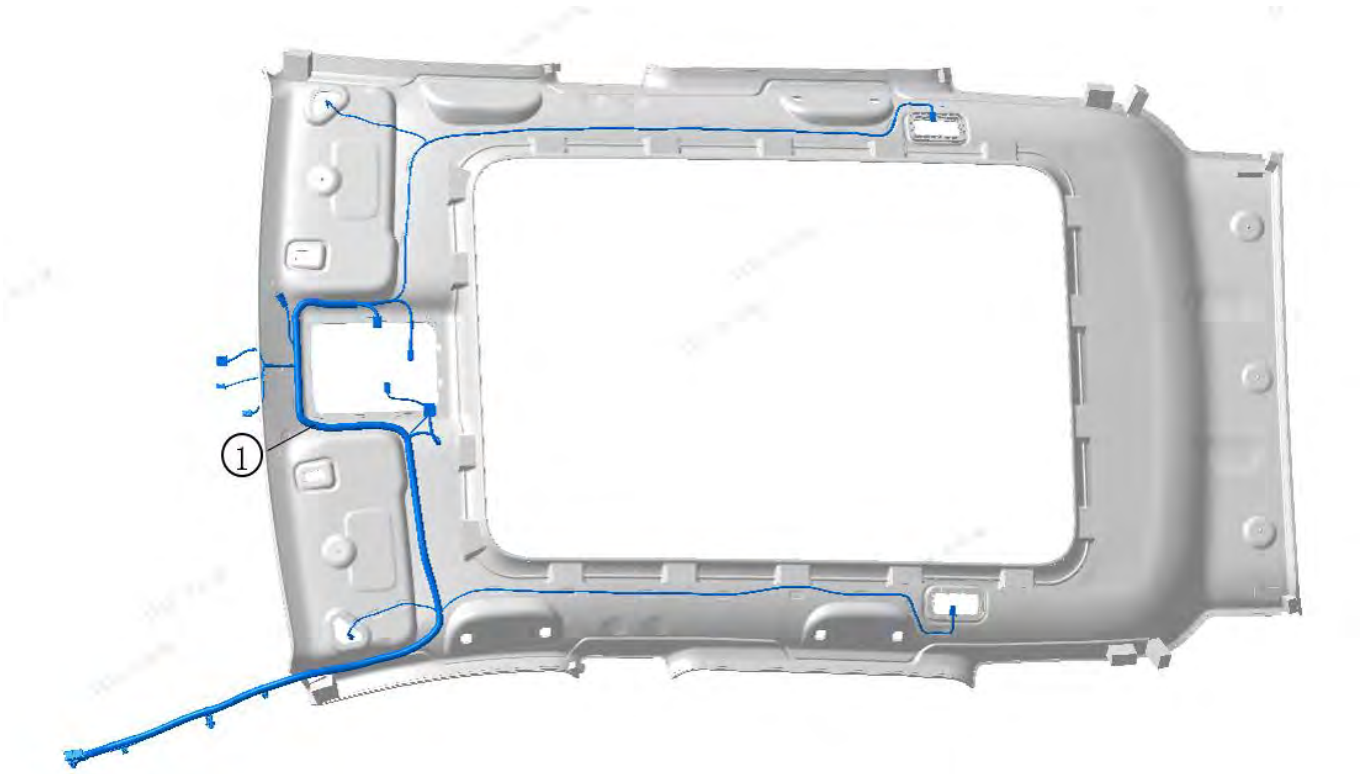
Item	Description	Item	Description
1.	Boot lid transition line 1		

4.1.2.15 Boot lid transition line 2



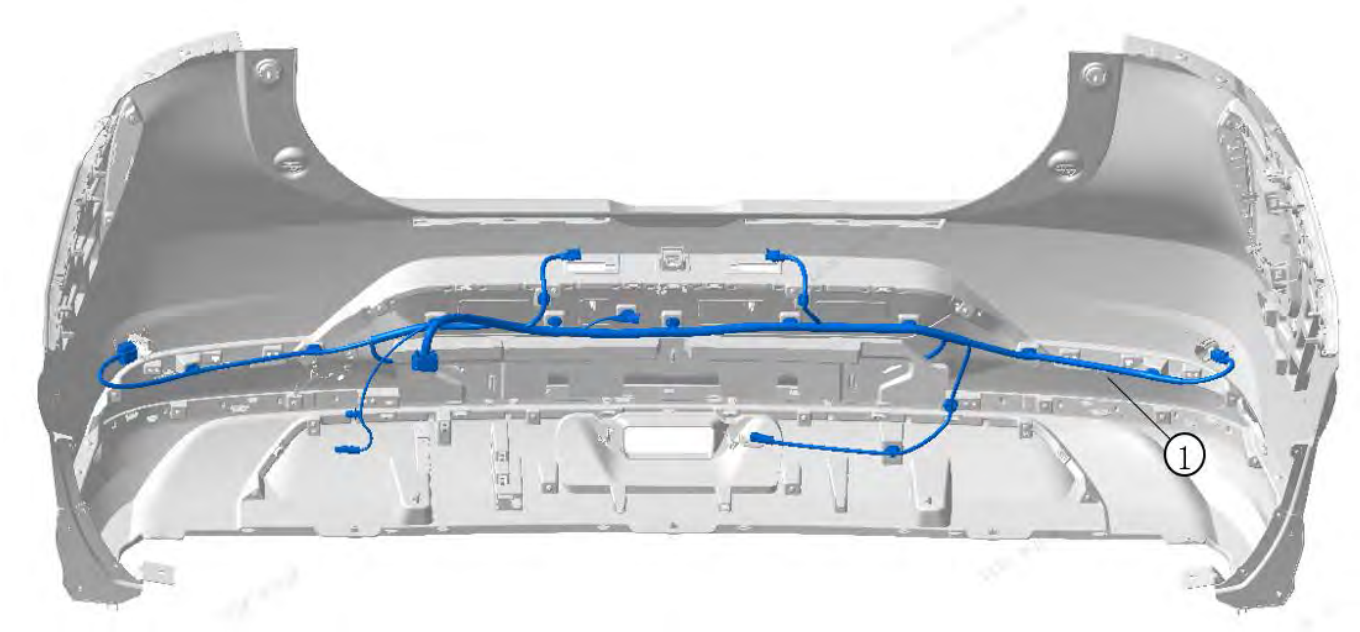
Item	Description	Item	Description
1.	Boot lid transition line 2		

4.1.2.16 Roof harness assembly



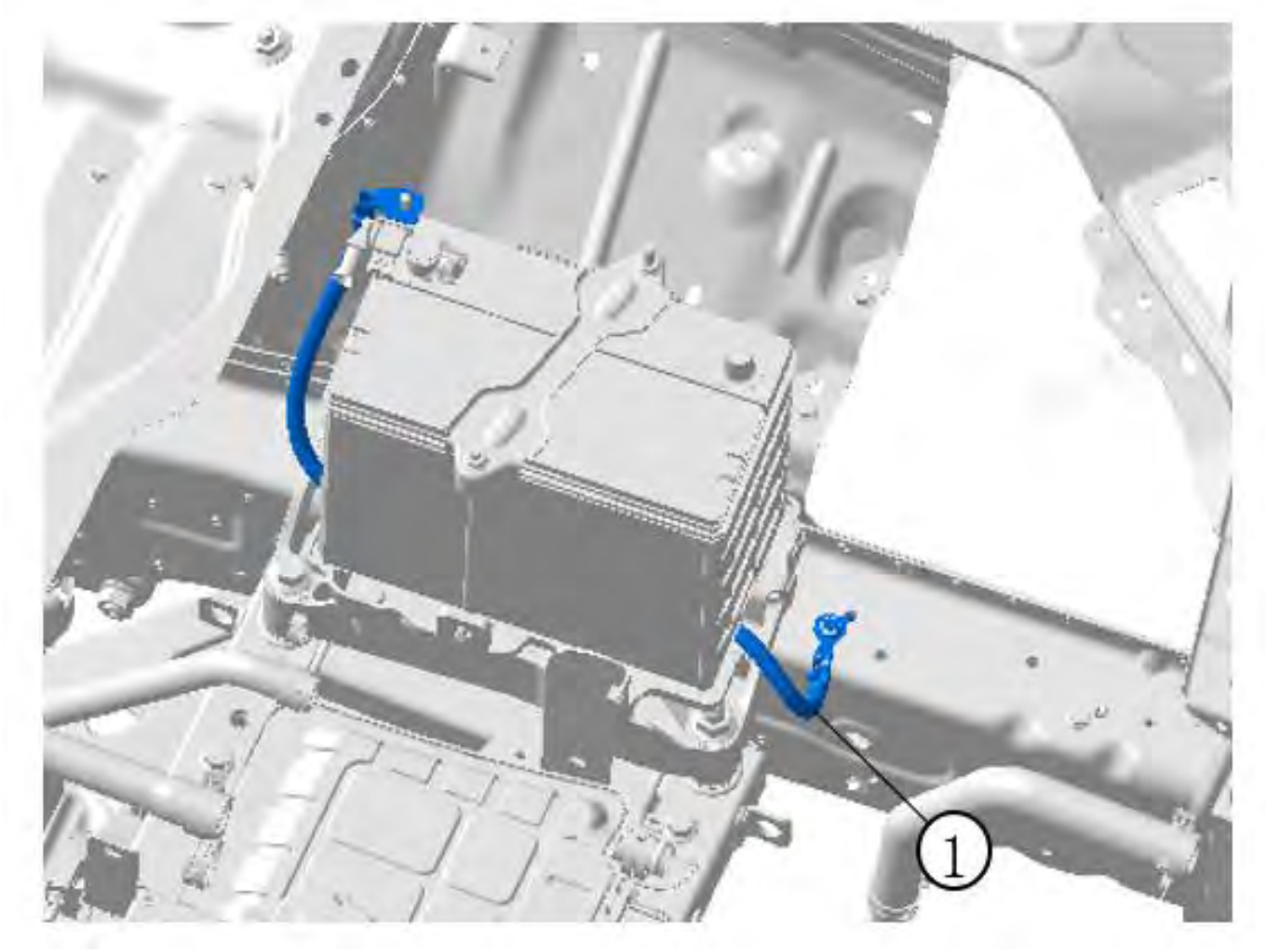
Item	Description	Item	Description
1.	Roof harness assembly		

4.1.2.17 Rear bumper harness assembly



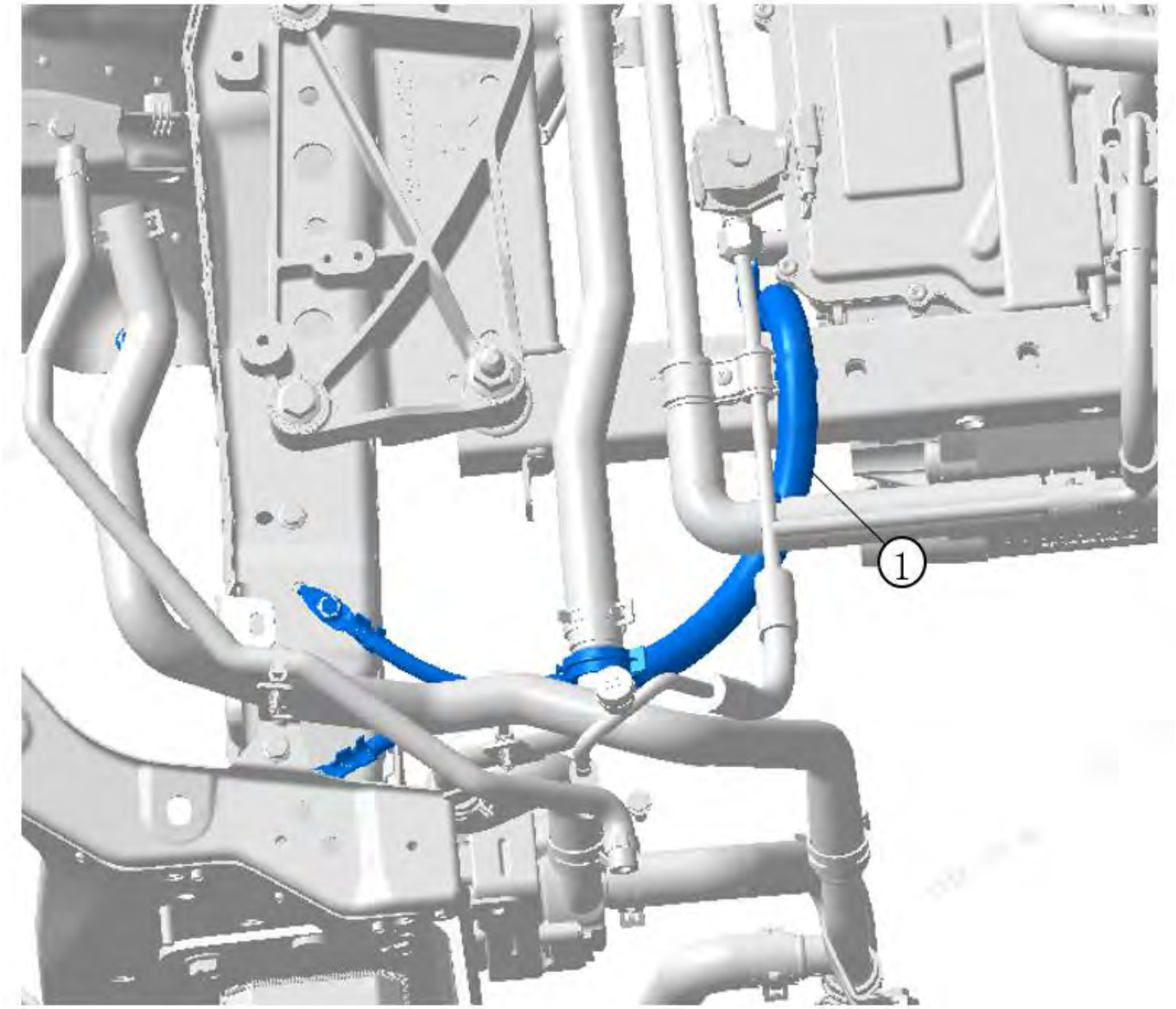
Item	Description	Item	Description
1.	Rear bumper harness assembly		

4.1.2.18 Battery negative harness assembly



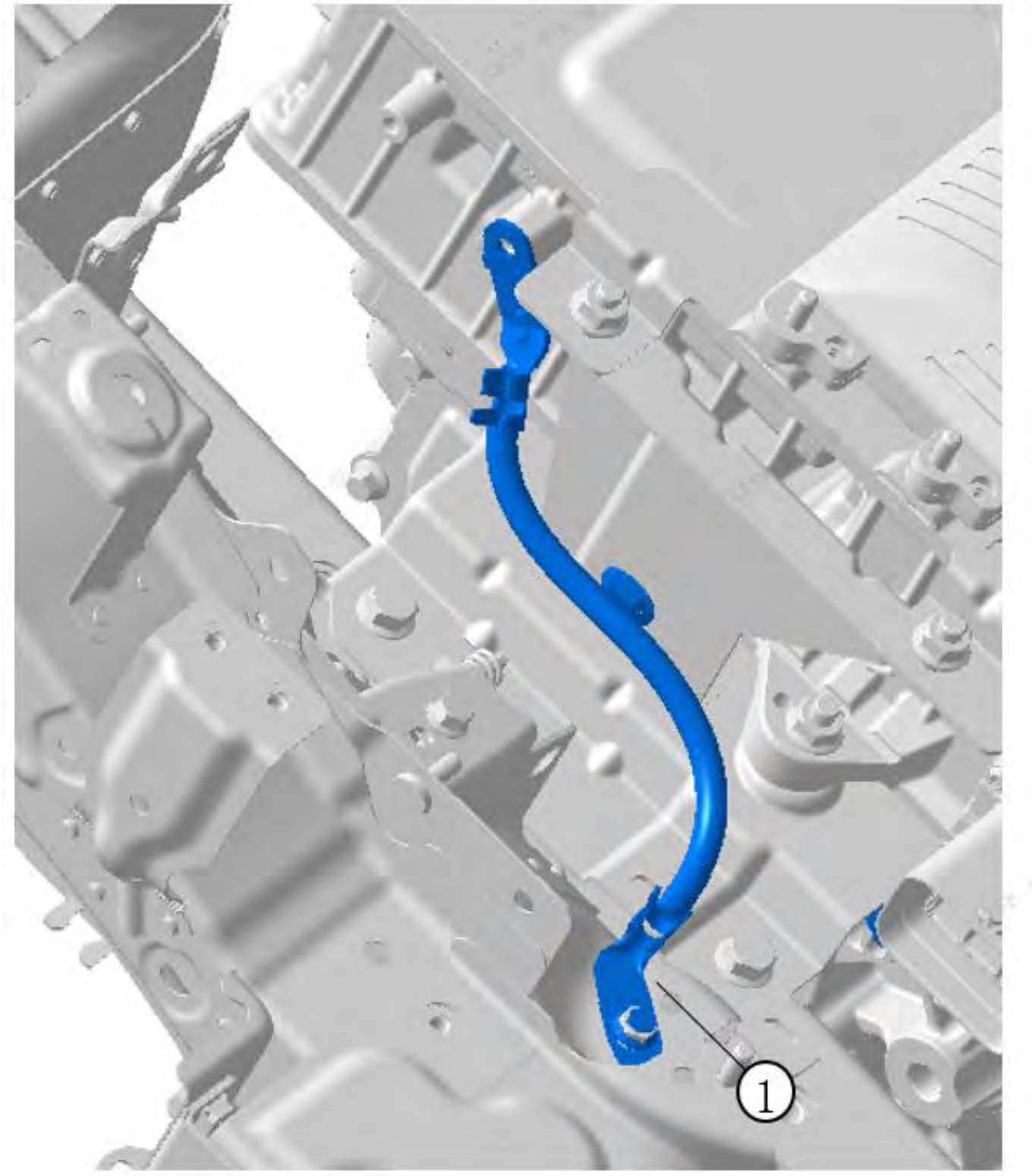
Item	Description	Item	Description
1.	Battery power supply harness assembly		

4.1.2.19 Motor GND harness assembly



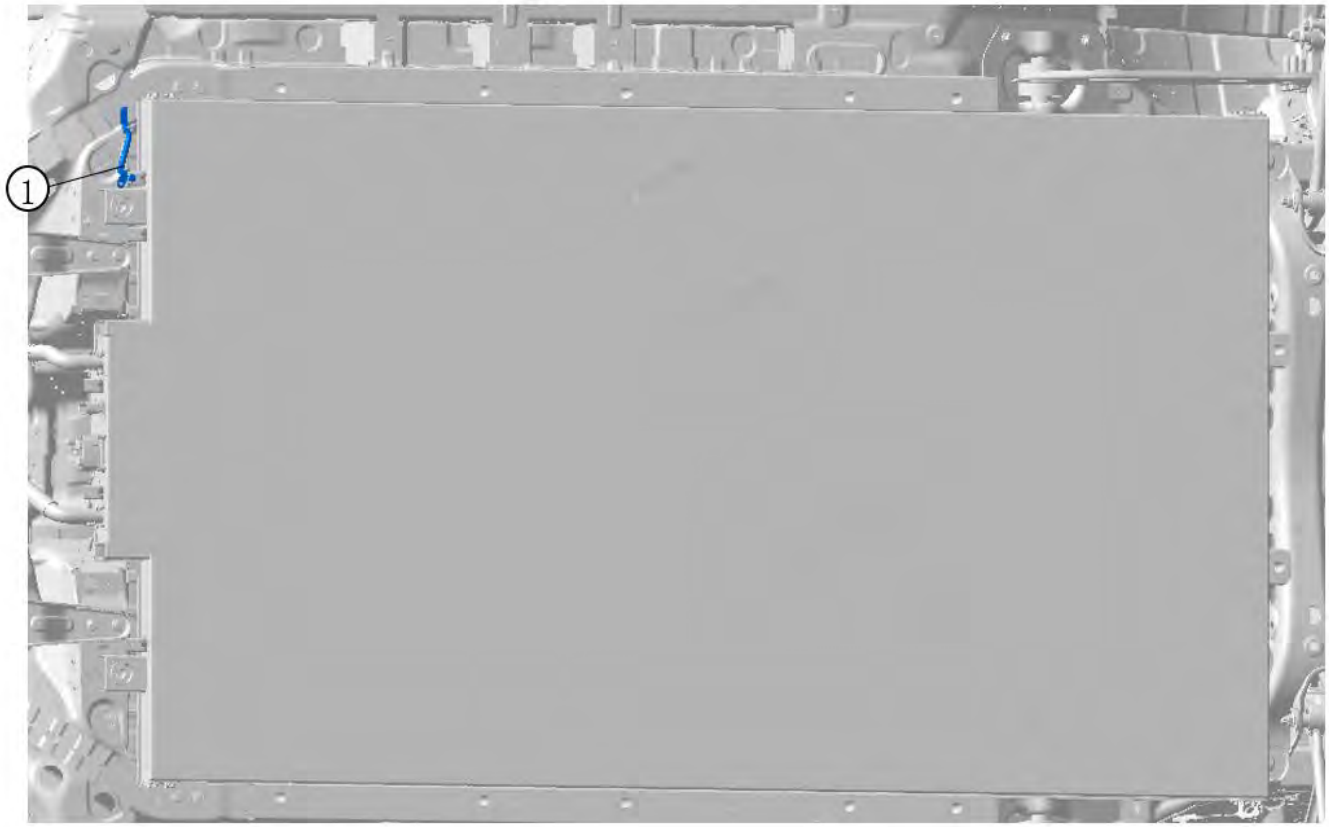
Item	Description	Item	Description
1.	Motor GND harness assembly		

4.1.2.20 Two-in-one GND harness assembly



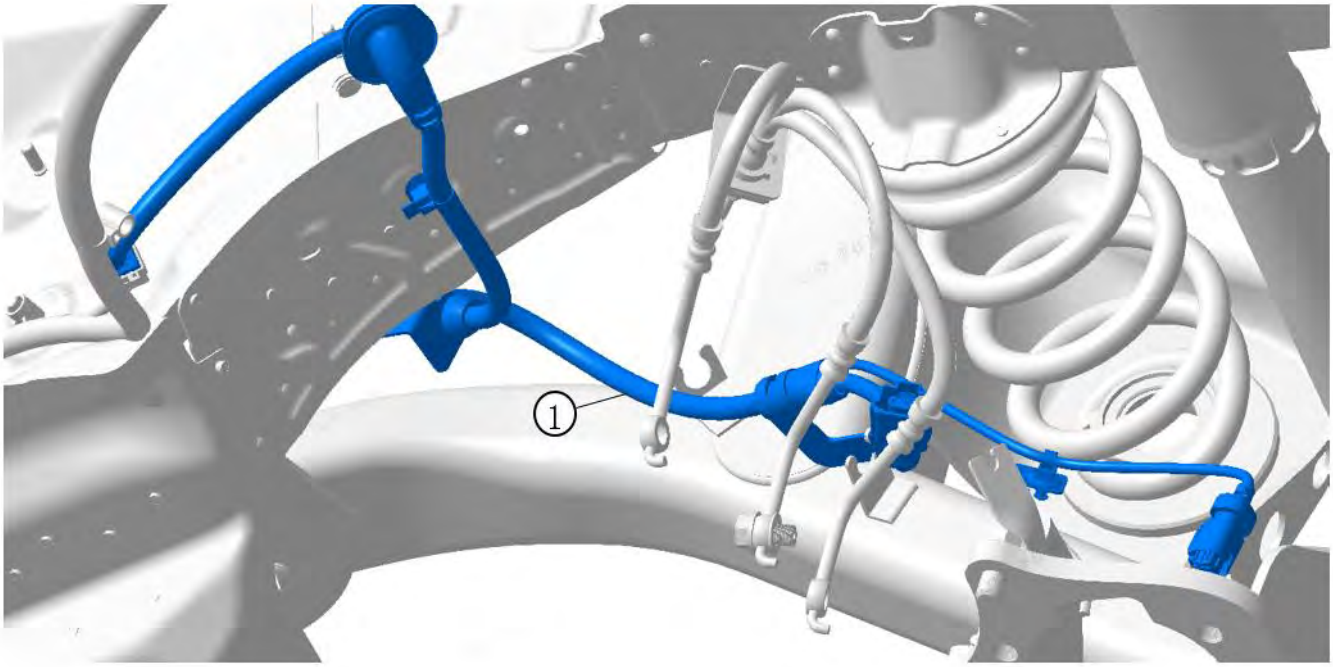
Item	Description	Item	Description
1.	Two-in-one GND harness assembly		

4.1.2.21 Battery pack GND harness assembly



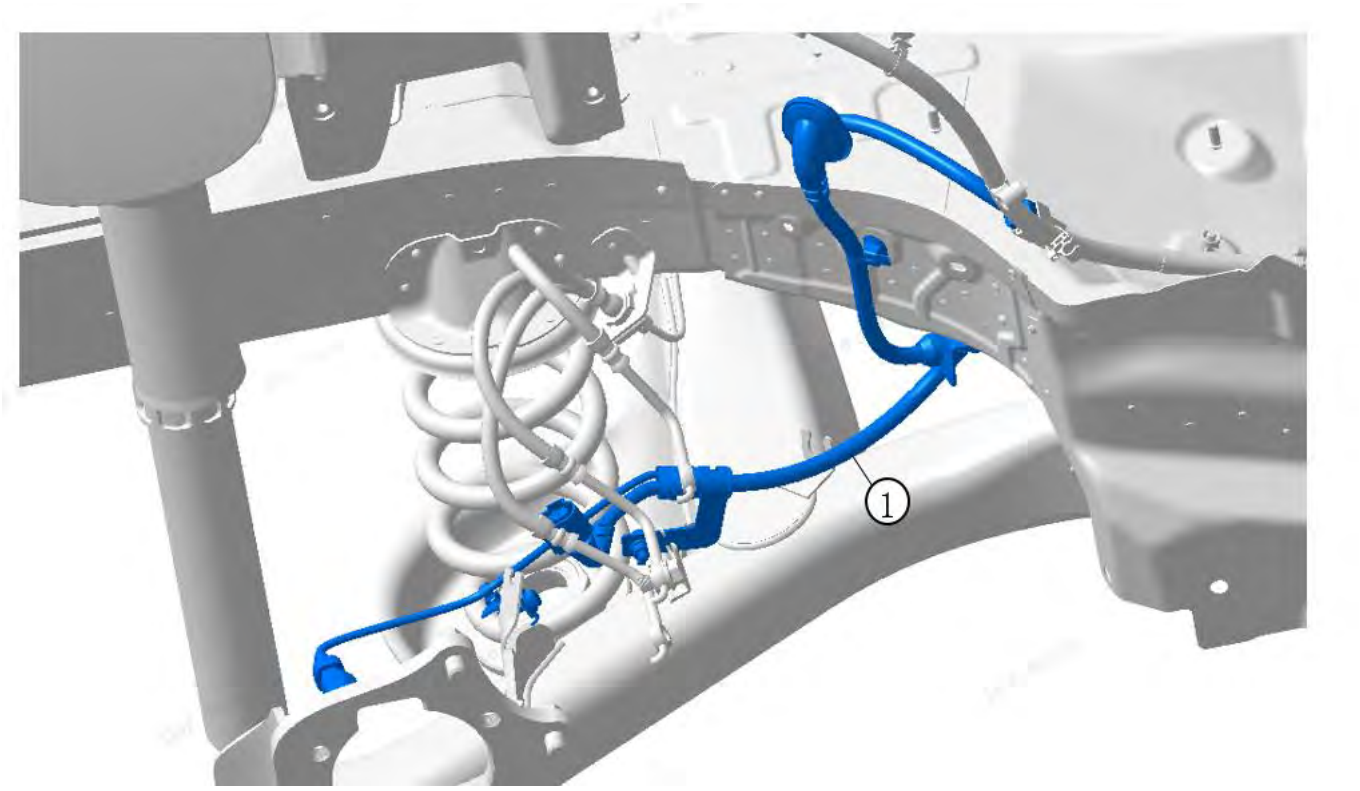
Item	Description	Item	Description
1.	Battery pack GND harness assembly		

4.1.2.22 Left caliper harness assembly



Item	Description	Item	Description
1.	Left caliper harness assembly		

4.1.2.23 Right caliper harness assembly

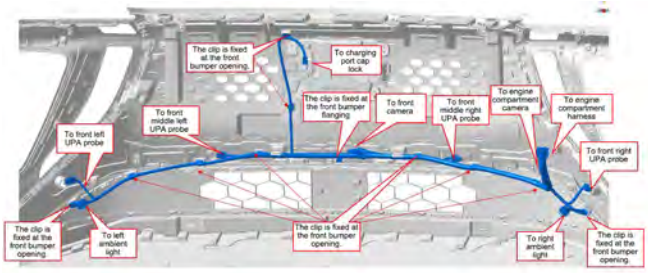


Item	Description	Item	Description
1.	Right caliper harness assembly		

4.1.3 Removal and installation

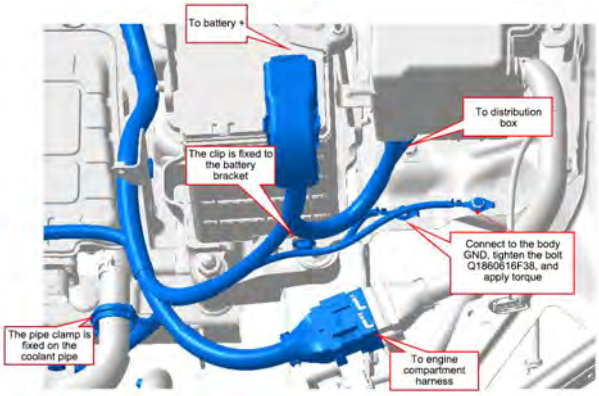
4.1.3.1 Assembly of front bumper harness

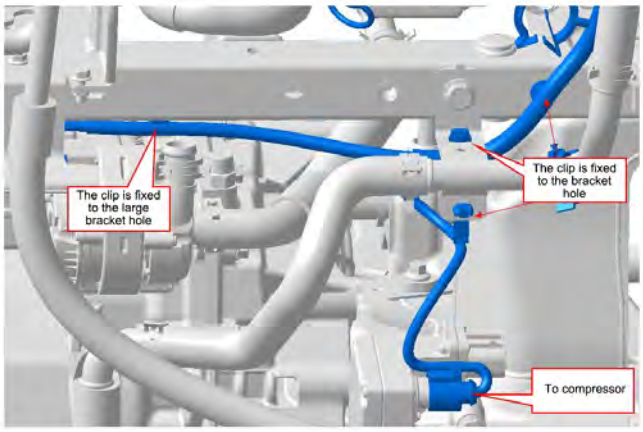
Schematic diagram

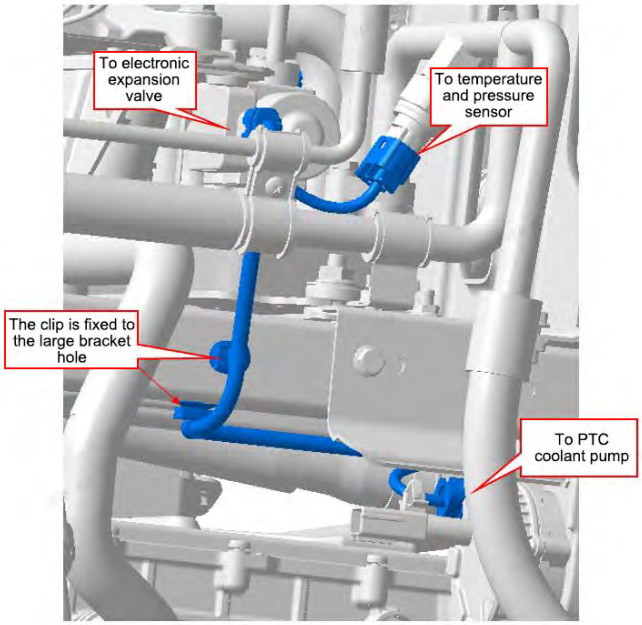


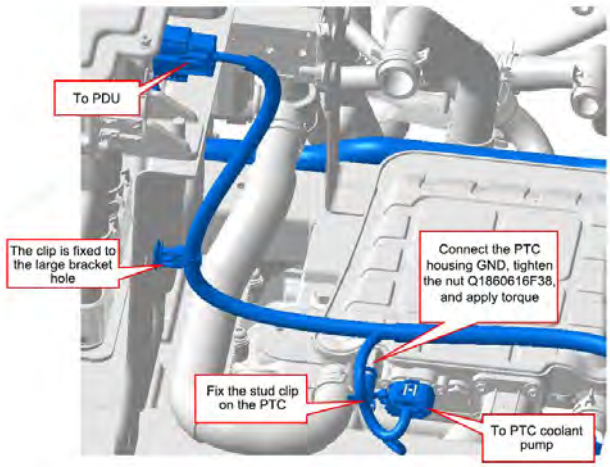
4.1.3.2 High-voltage system low-voltage control harness

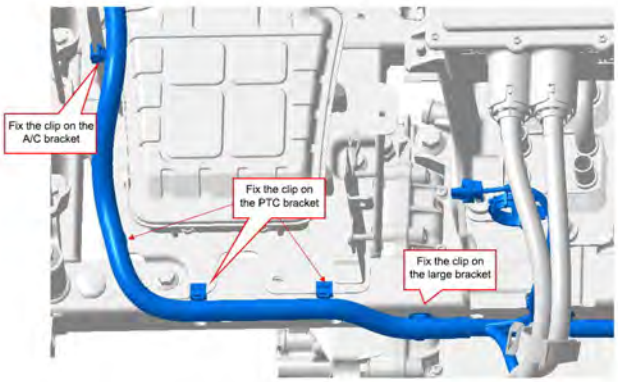
Schematic diagram

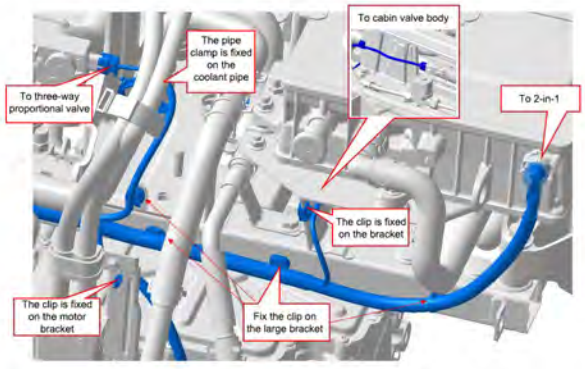


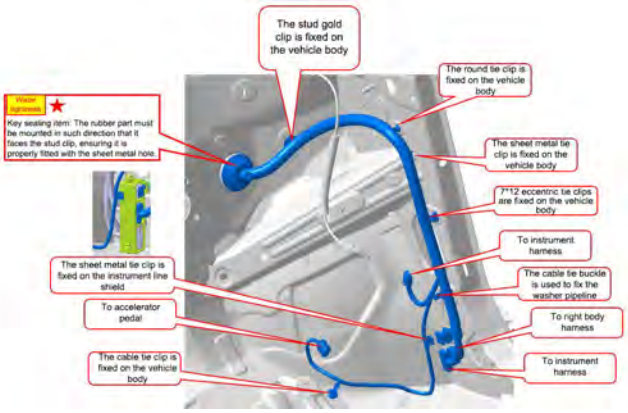


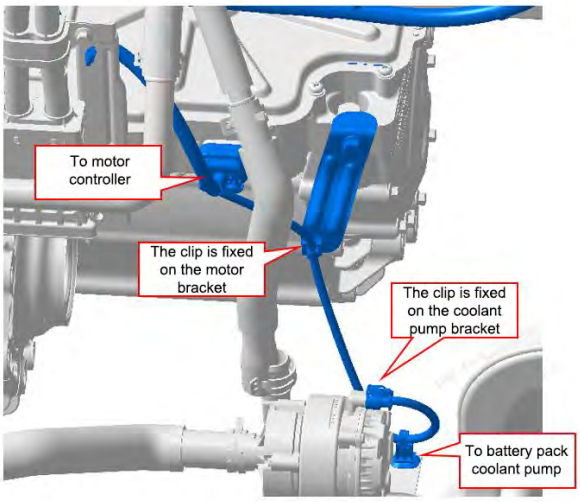


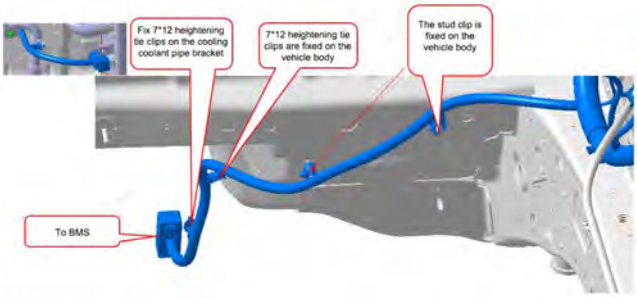






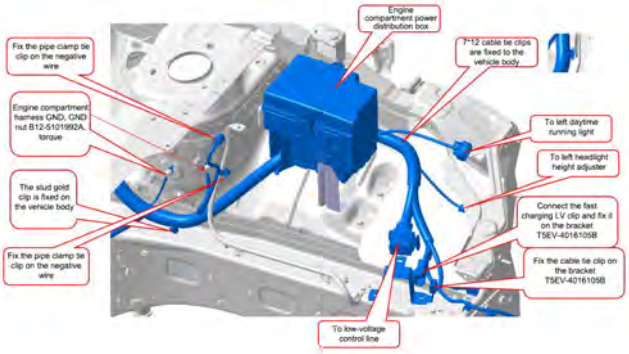


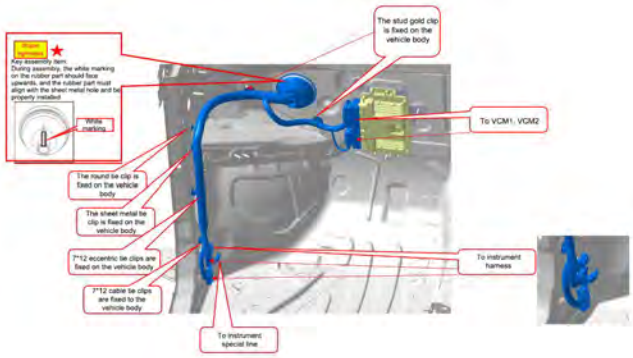


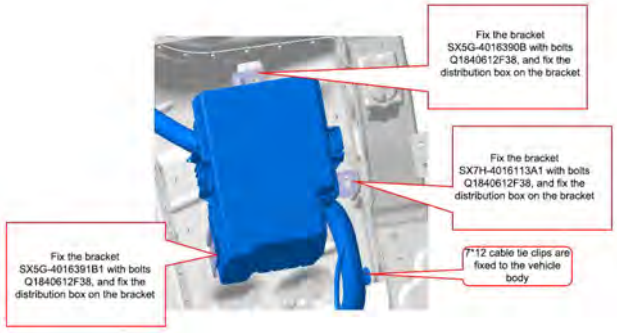


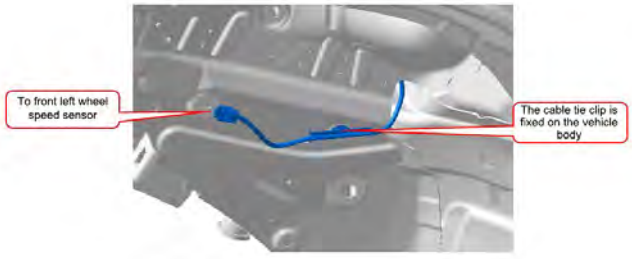
4.1.3.3 Assembly of engine compartment harness

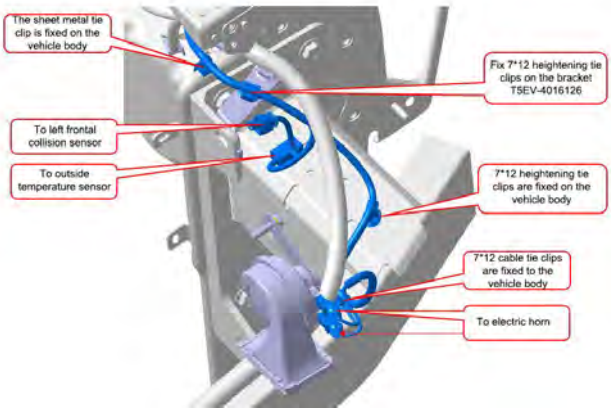
Schematic diagram

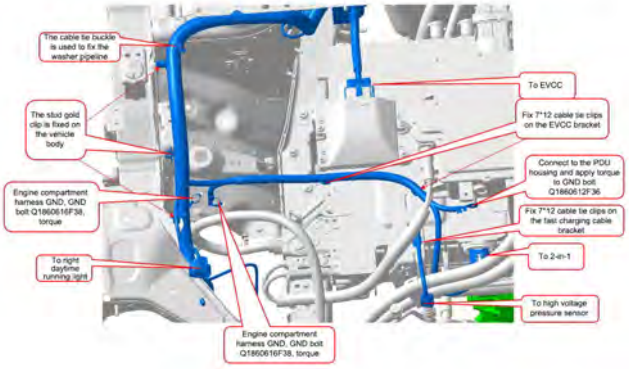


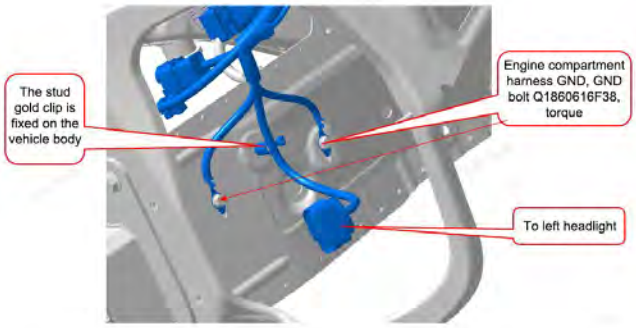


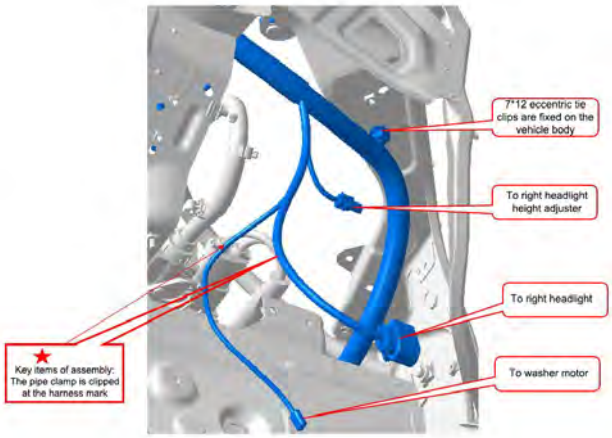


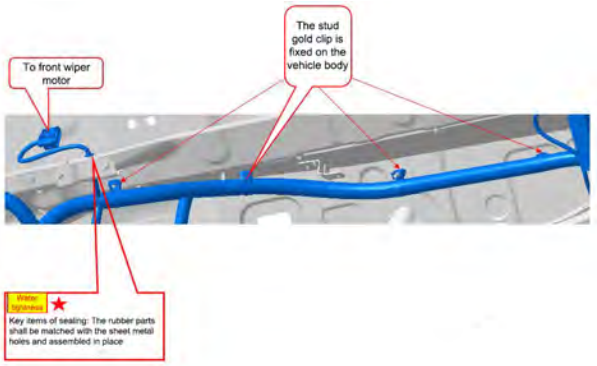


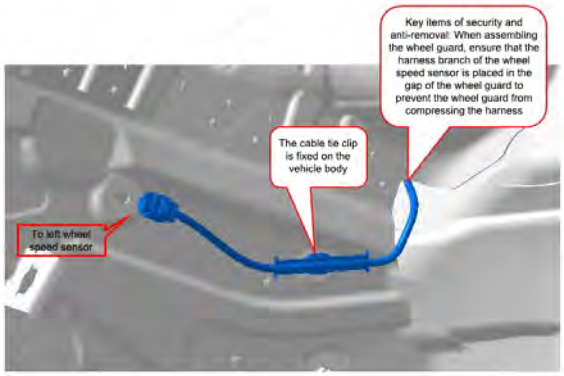

The sheet metal tie clip is fixed on the vehicle body
Fix 7*12 heightening tie clips on the bracket T5EV-4016126
To left frontal collision sensor
To outside temperature sensor
7*12 heightening tie clips are fixed on the vehicle body
7*12 cable tie clips are fixed to the vehicle body
To electric horn

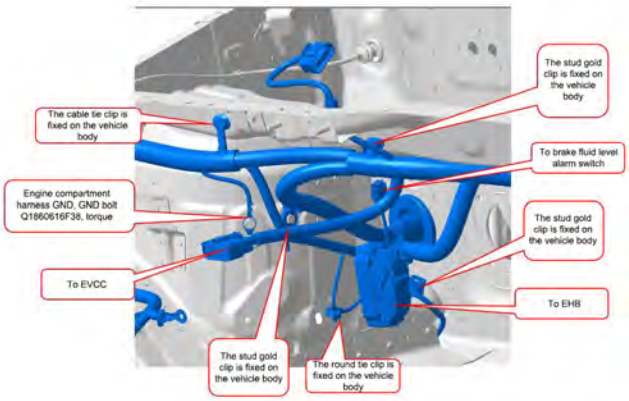

The cable tie buckle is used to fix the washer pipeline
To EVCC
The stud gold clip is fixed on the vehicle body
Fix 7*12 cable tie clips on the EVCC bracket
Connect to the PDU housing and apply torque to GND bolt Q1860612F36
Engine compartment harness GND, GND bolt Q1860616F38, torque
Fix 7*12 cable tie clips on the fast charging cable bracket
To right daytime running light
To 2-in-1
To high voltage pressure sensor
Engine compartment harness GND, GND bolt Q1860616F38, torque

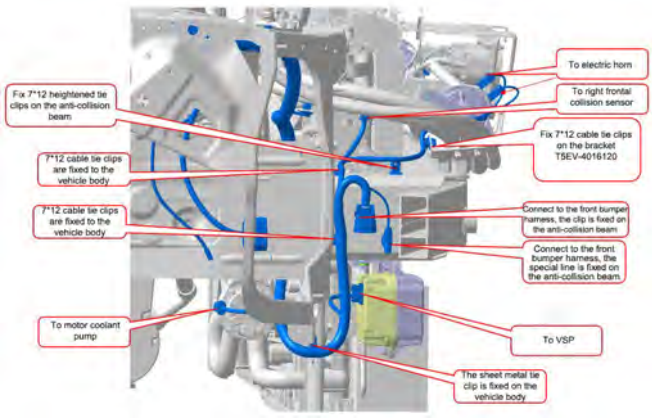

The stud gold clip is fixed on the vehicle body
Engine compartment harness GND, GND bolt Q1860616F38, torque
To left headlight

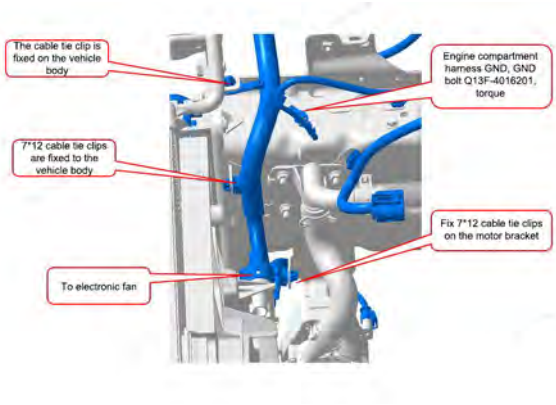

7*12 eccentric tie clips are fixed on the vehicle body
To right headlight height adjuster
To right headlight
Key items of assembly: The pipe clamp is clipped at the harness mark
To washer motor

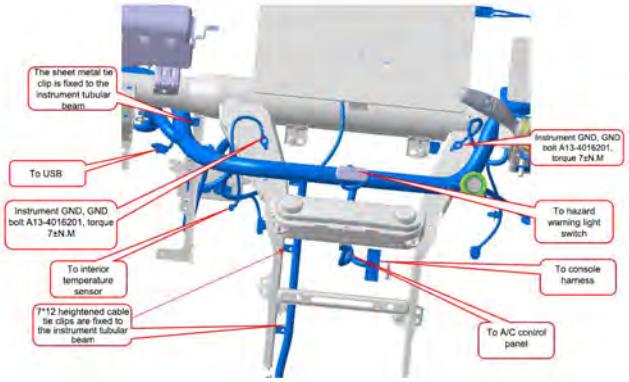

To front wiper motor
The stud gold clip is fixed on the vehicle body
Key items of sealing: The rubber parts shall be matched with the sheet metal holes and assembled in place


Key items of security and anti-removal: When assembling the wheel guard, ensure that the harness branch of the wheel speed sensor is placed in the gap of the wheel guard to prevent the wheel guard from compressing the harness
The cable tie clip is fixed on the vehicle body
To left wheel speed sensor


The stud gold clip is fixed on the vehicle body
The cable tie clip is fixed on the vehicle body
To brake fluid level alarm switch
Engine compartment harness GND, GND bolt Q1860616F38, torque
The stud gold clip is fixed on the vehicle body
To EVCC
To EHB
The stud gold clip is fixed on the vehicle body
The round tie clip is fixed on the vehicle body

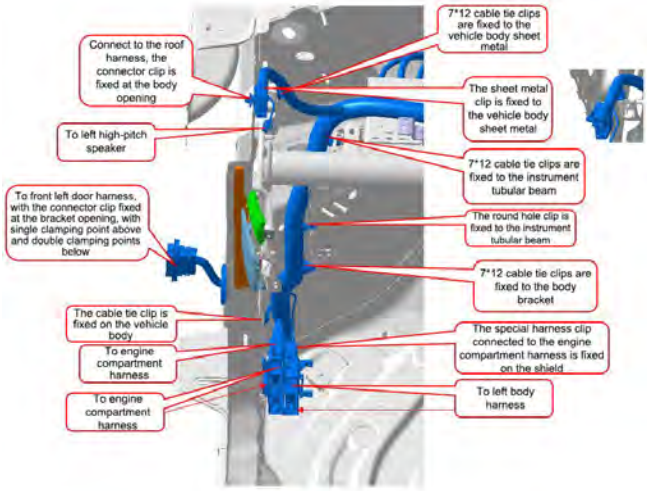

To electric horn
Fix 7*12 heightened tie clips on the anti-collision beam
To right frontal collision sensor
Fix 7*12 cable tie clips on the bracket T5EV-4016120
7*12 cable tie clips are fixed to the vehicle body
7*12 cable tie clips are fixed to the vehicle body
Connect to the front bumper harness, the clip is fixed on the anti-collision beam
Connect to the front bumper harness, the special line is fixed on the anti-collision beam
To motor coolant pump
To VSP
The sheet metal tie clip is fixed on the vehicle body

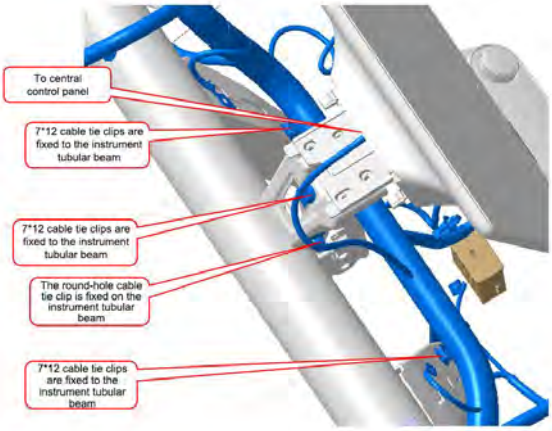


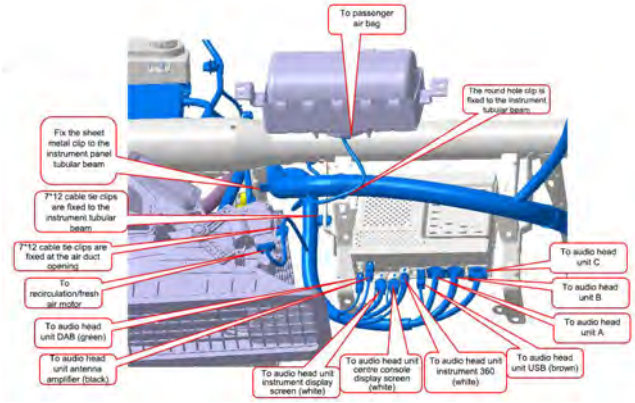


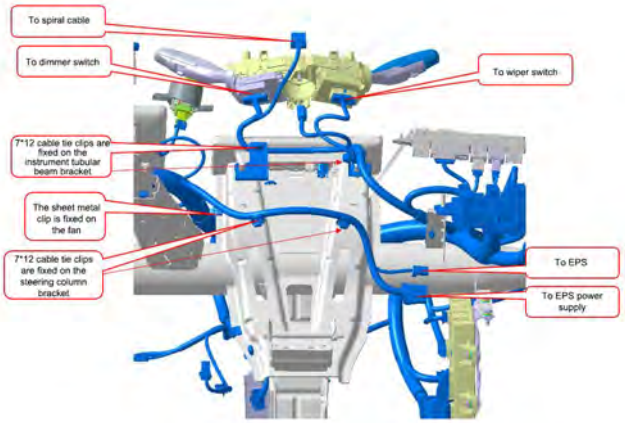
4.1.3.4 Assembling of instrument harness

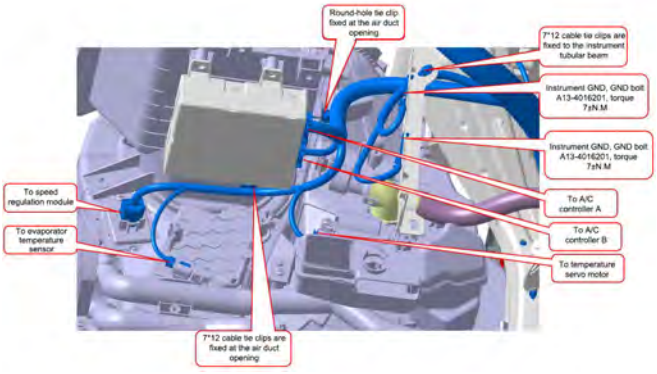
Schematic diagram

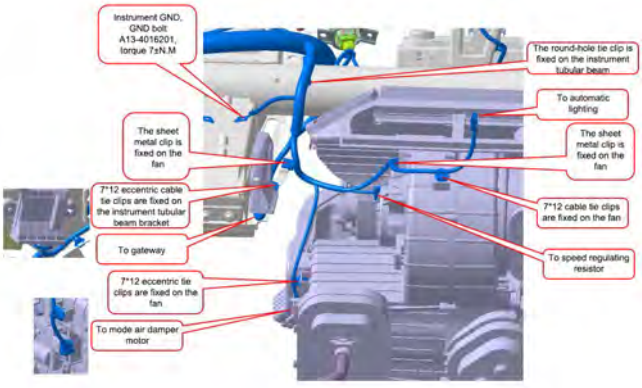


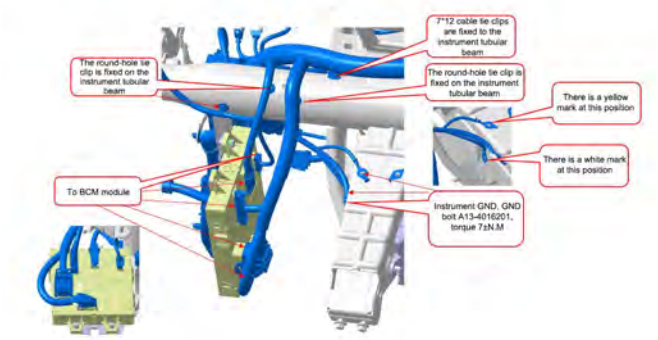


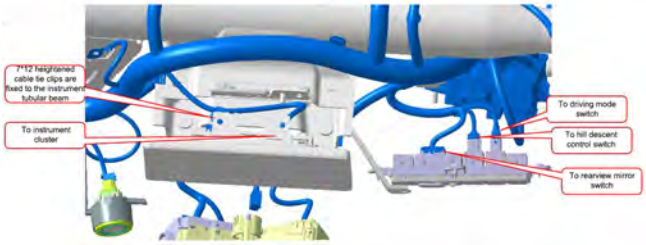


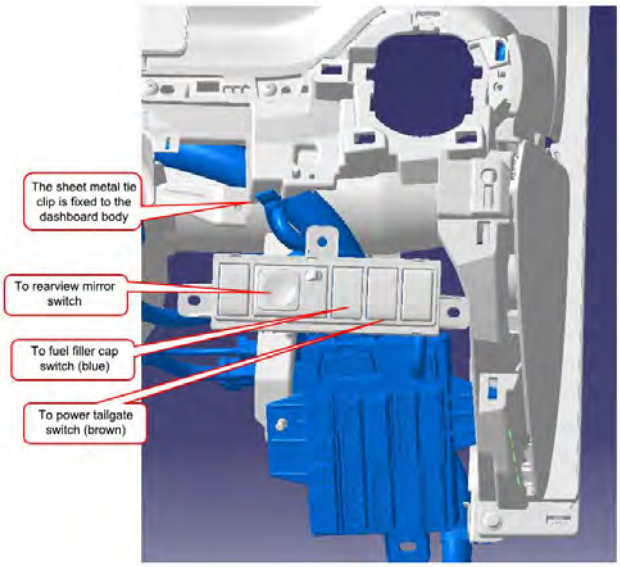


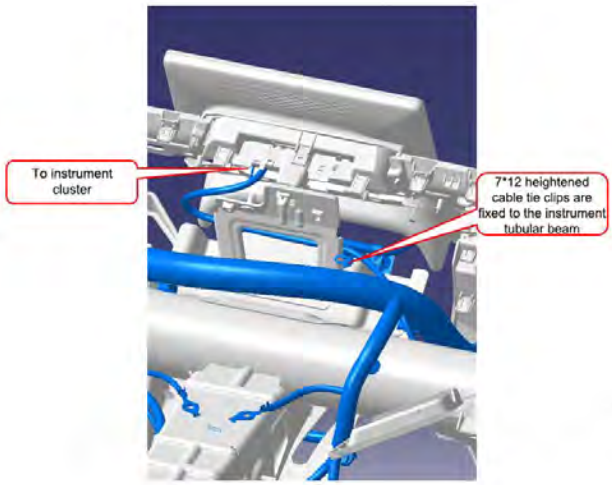


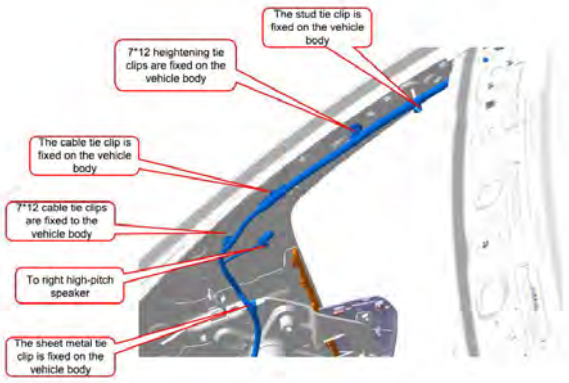


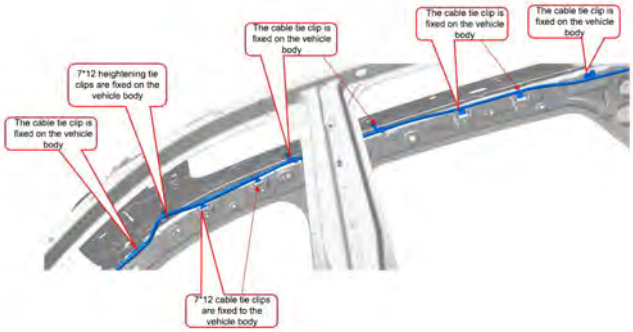


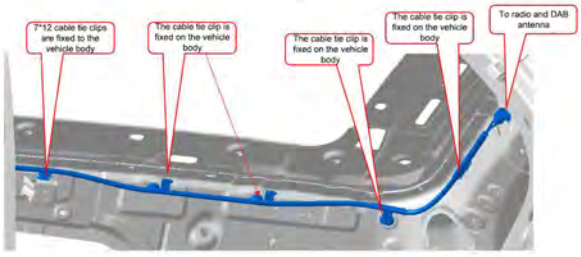


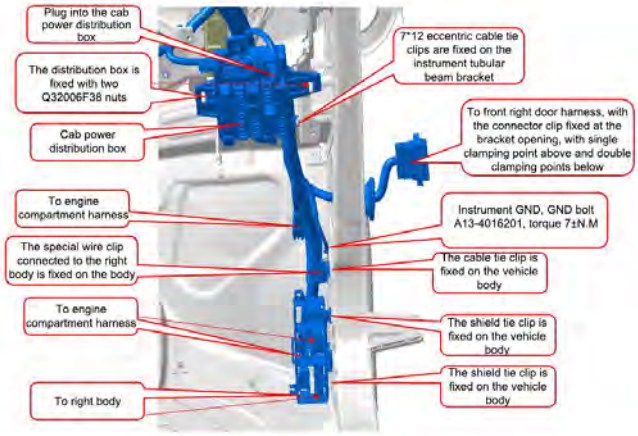






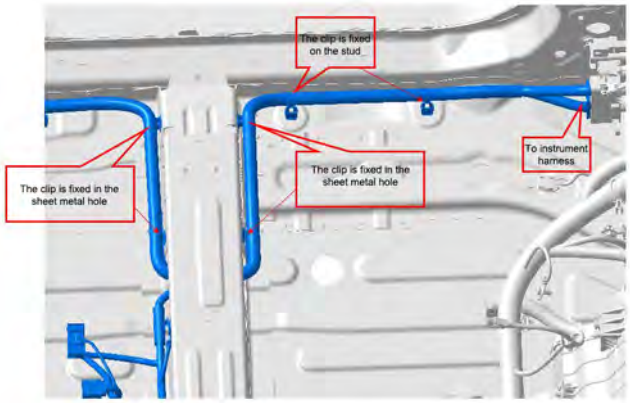


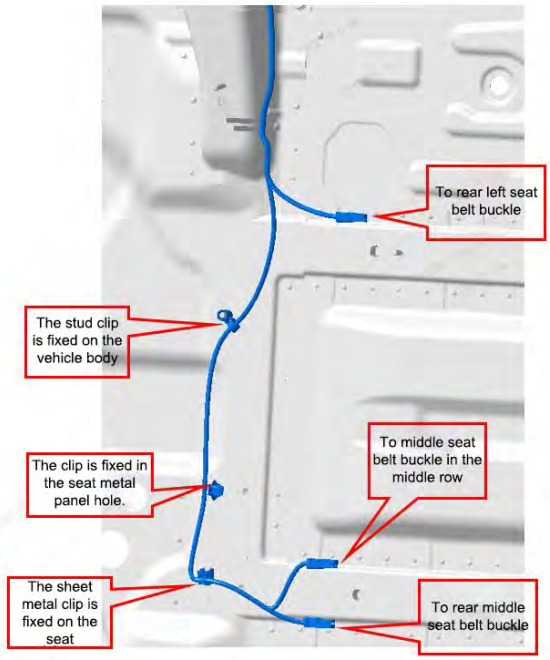


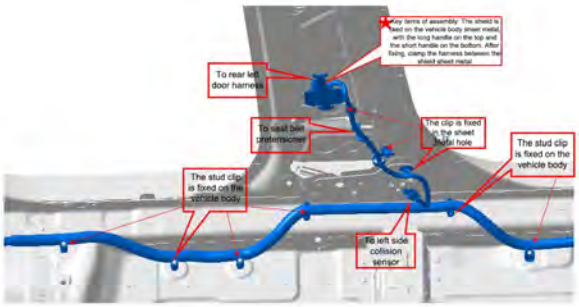


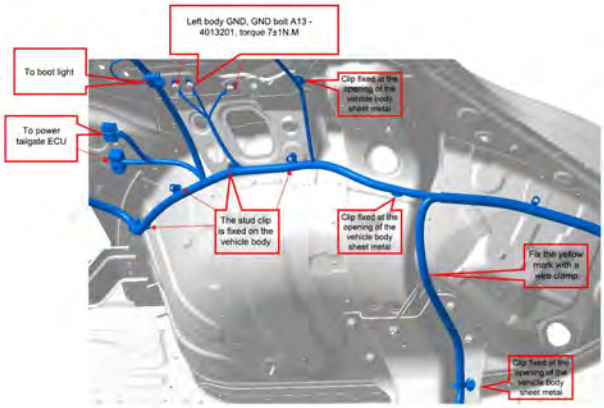
4.1.3.5 Assembly of left body harness

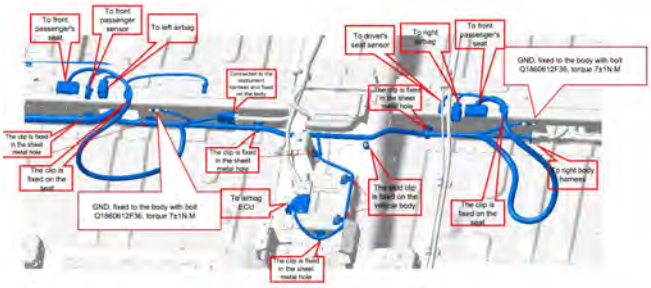
Schematic diagram

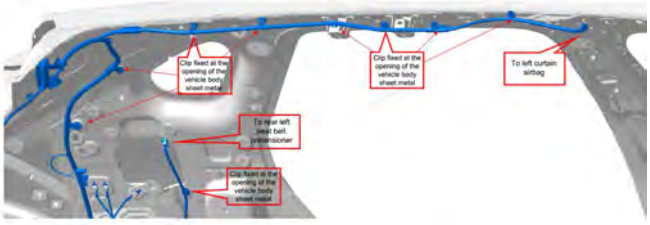

The clip is fixed on the stud
The clip is fixed in the sheet metal hole
The clip is fixed in the sheet metal hole
To instrument harness

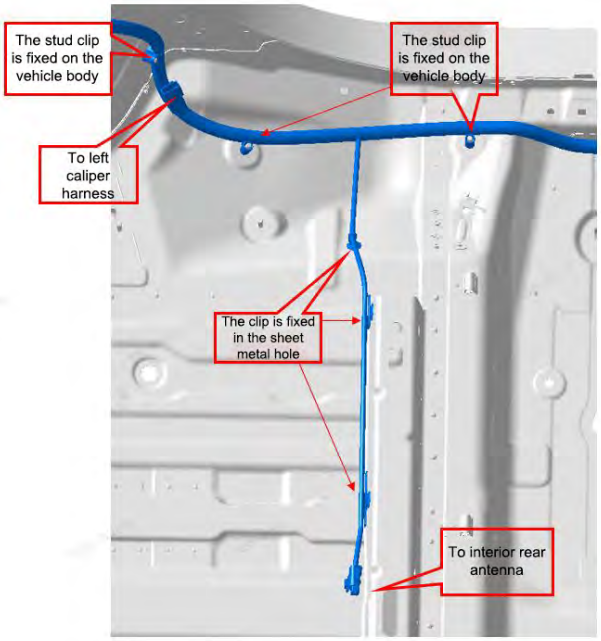

To rear left seat belt buckle
The stud clip is fixed on the vehicle body
To middle seat belt buckle in the middle row
The clip is fixed in the seat metal panel hole.
The sheet metal clip is fixed on the seat
To rear middle seat belt buckle


To rear left door harness
To seat belt pretensioner
The clip is fixed in the sheet metal hole
The stud clip is fixed on the vehicle body
The stud clip is fixed on the vehicle body
To left side collision sensor

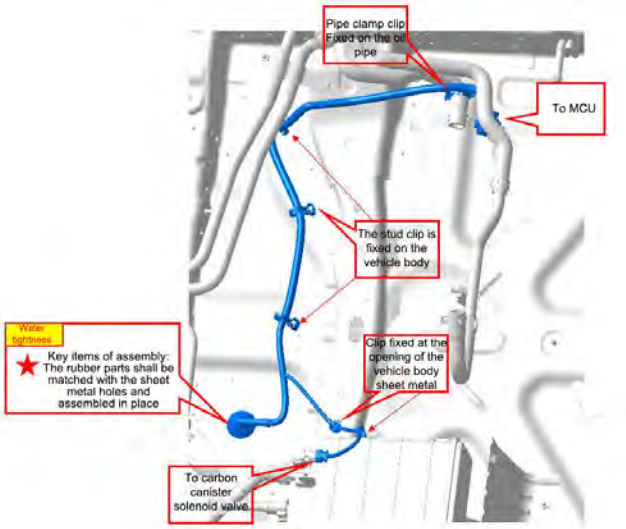

Left body GND, GND bolt A13 - 4013201, torque 7±1N.M
To boot light
To power tailgate ECU
The stud clip is fixed on the vehicle body
Fix the yellow mark with a wire clamp


To front passenger's seat
To front passenger sensor
To left airbag
To driver's seat sensor
To right airbag
To front passenger's seat
GND, fixed to the body with bolt Q1860612F36, torque 7±1N.M
To right body harness
To airbag ECU
GND, fixed to the body with bolt Q1860612F36, torque 7±1N.M


To left curtain airbag
To rear left seat belt pretensioner

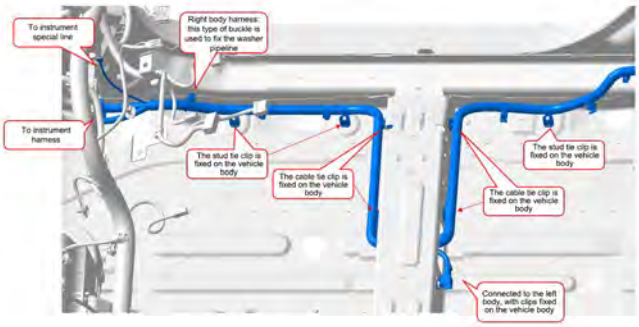

The stud clip is fixed on the vehicle body
The stud clip is fixed on the vehicle body
To left caliper harness
The clip is fixed in the sheet metal hole
To interior rear antenna

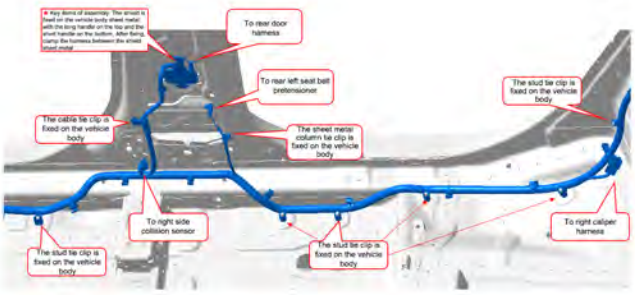

To boot lid harness
To right electric strut
To left electric strut

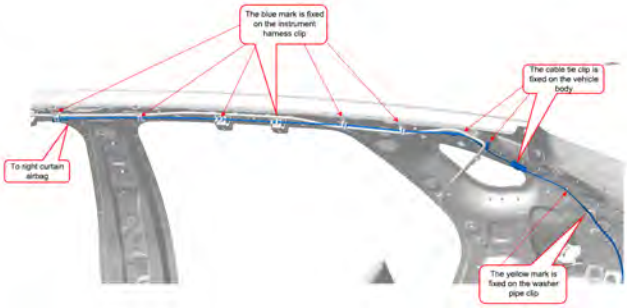


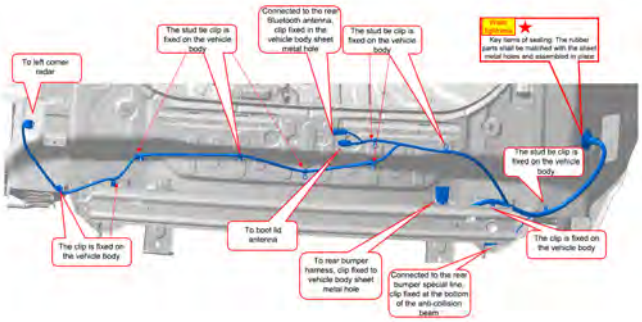
4.1.3.6 Assembly of right body harness

Schematic diagram



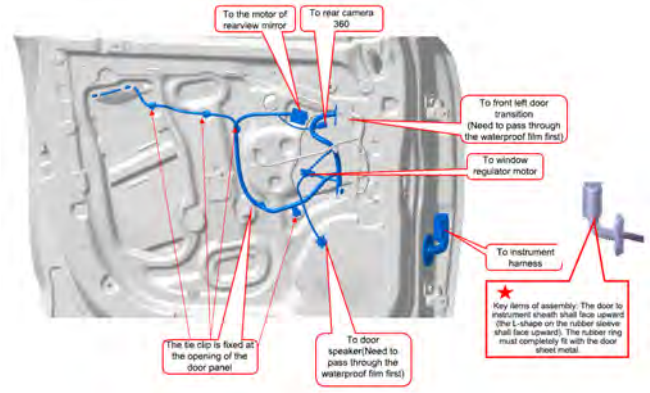


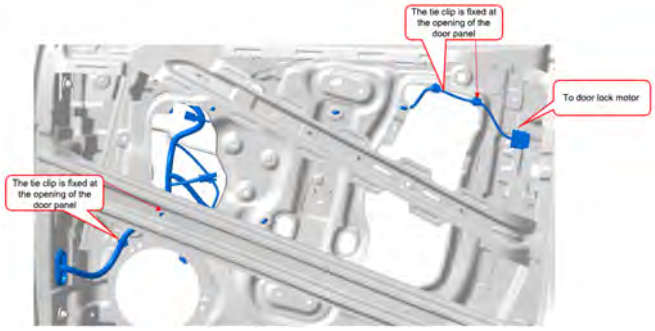




4.1.3.7 Assembly of left door harness

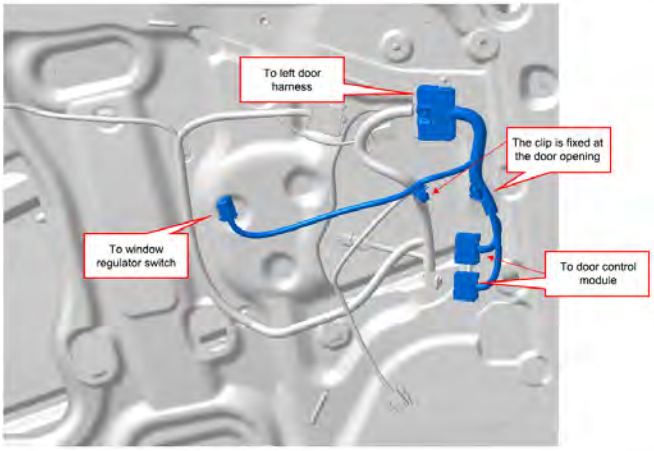
Schematic diagram





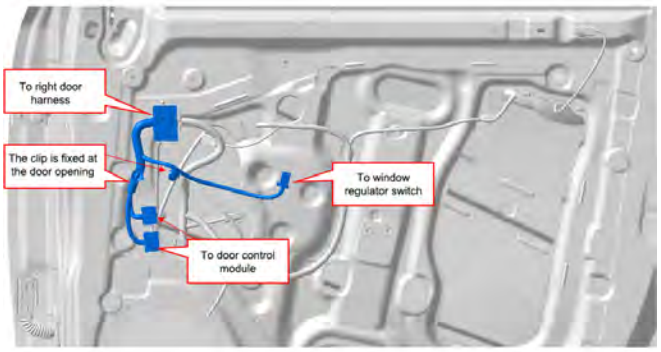
4.1.3.8 Assembly of left door control transition line

Schematic diagram



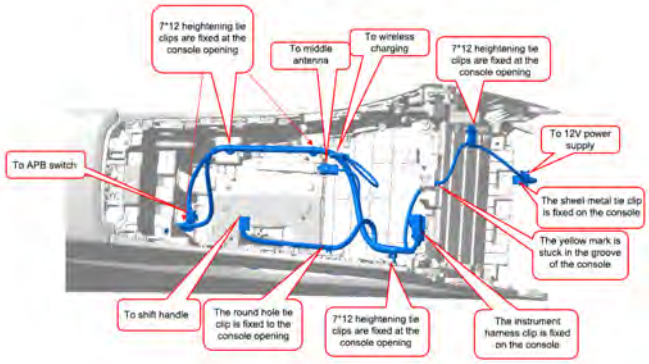
4.1.3.9 Assembly of front right door control transition line

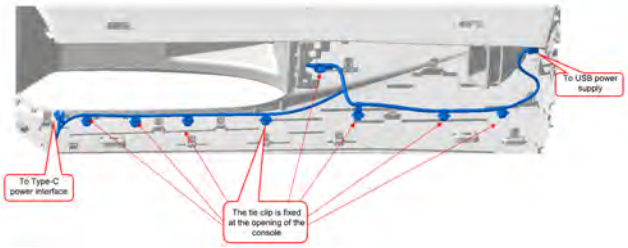
Schematic diagram



4.1.3.10 Assembly of console harness

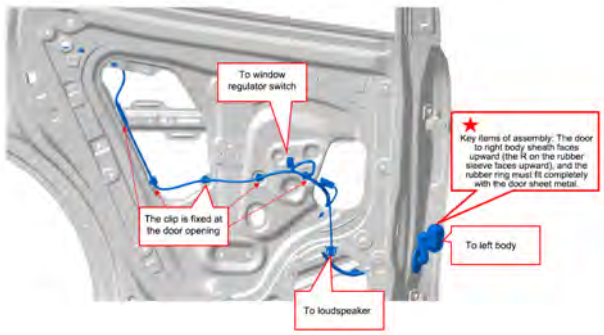
Schematic diagram

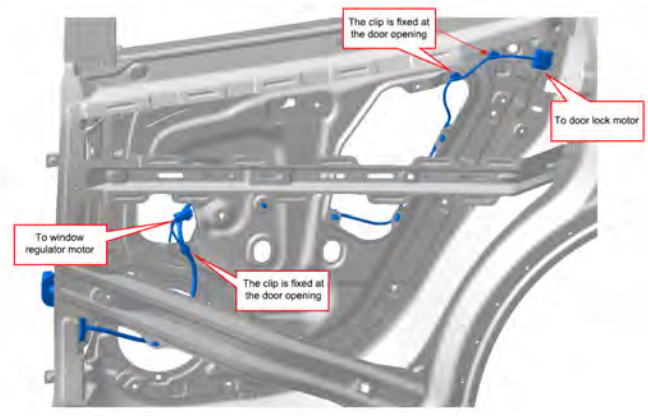




4.1.3.11 Assembly of rear left door harness

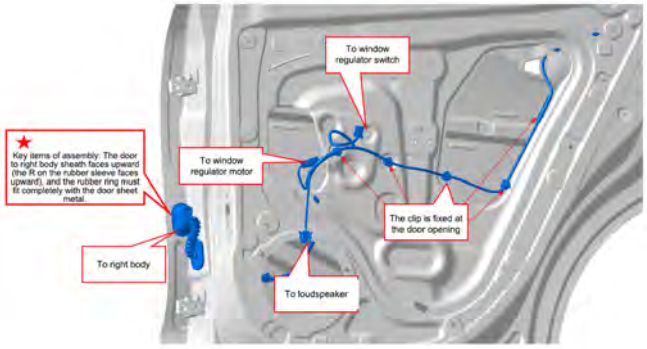
Schematic diagram

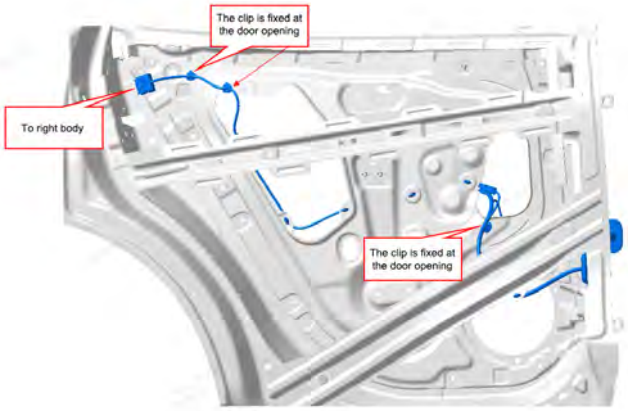




4.1.3.12 Assembly of rear right door harness

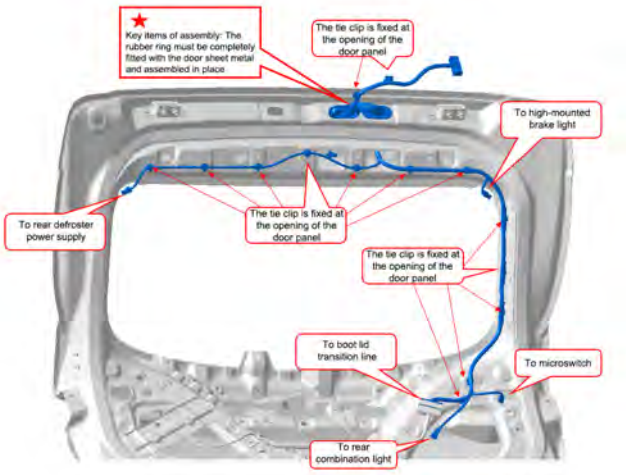
Schematic diagram





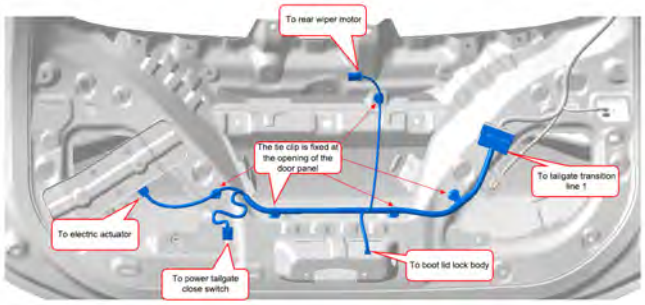
4.1.3.13 Assembly of trunk lid transition line 1

Schematic diagram



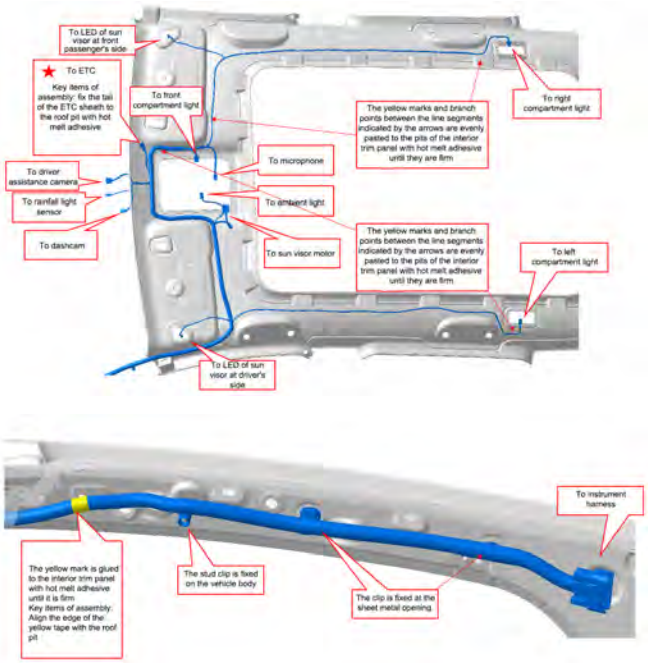
4.1.3.14 Assembly of trunk lid transition line 2

Schematic diagram



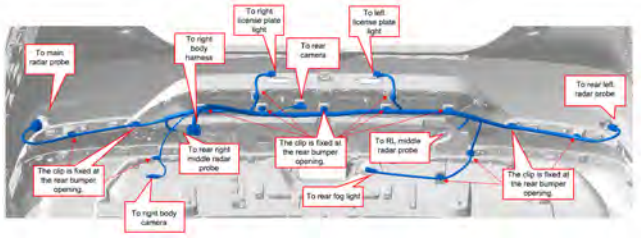
4.1.3.15 Assembling of roof harness

Schematic diagram



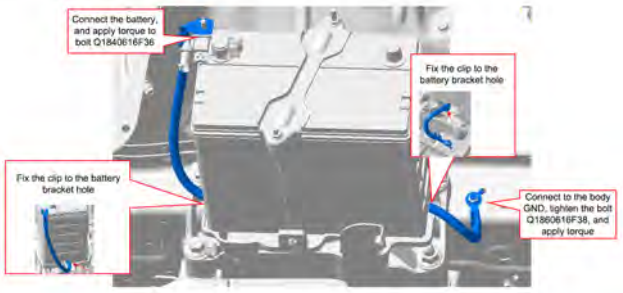
4.1.3.16 Rear bumper harness assembly

Schematic diagram



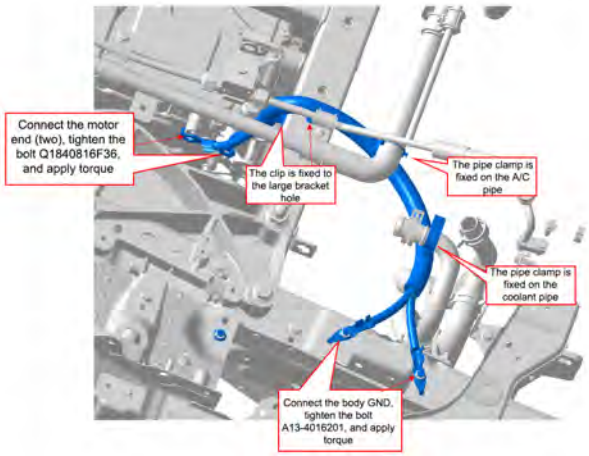
4.1.3.17 Assembling of battery negative harness

Schematic diagram



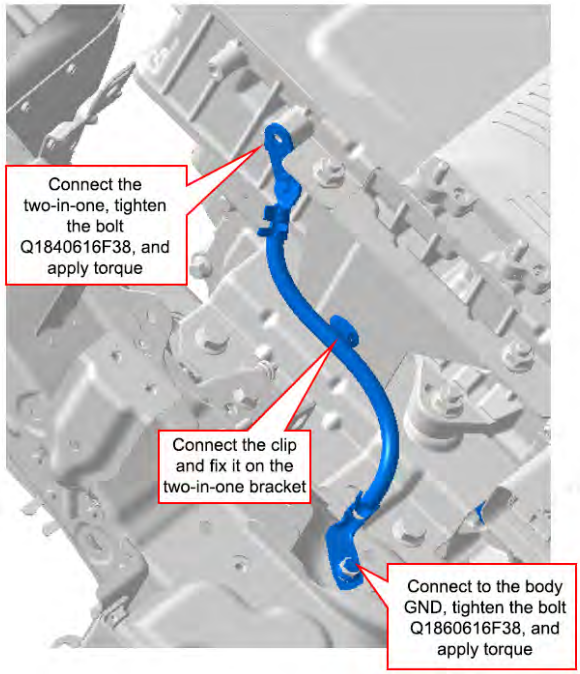
4.1.3.18 Assembly of motor GND harness

Schematic diagram



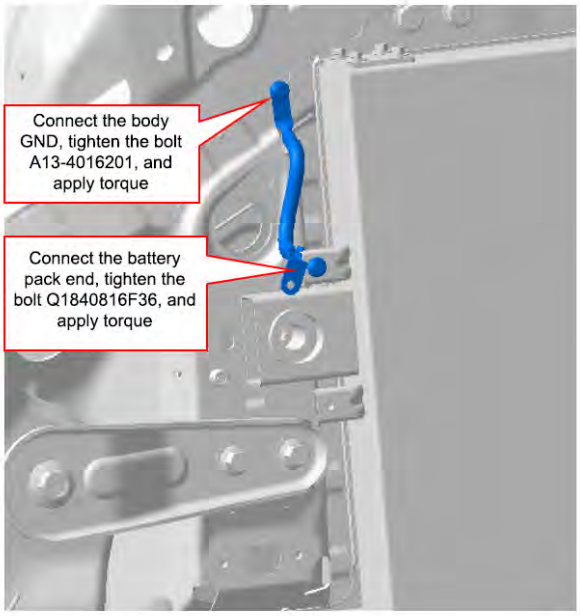
4.1.3.19 Assembly of two-in-one GND wire harness

Schematic diagram



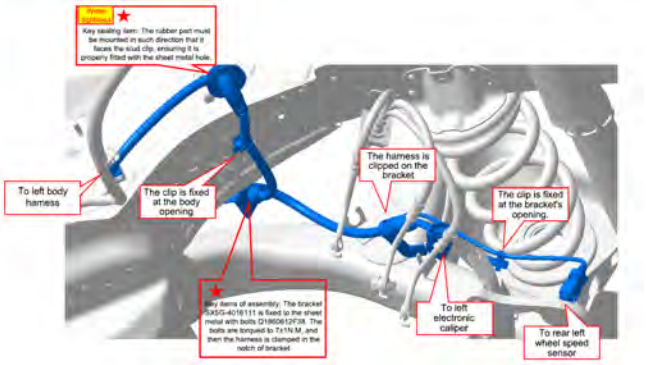
4.1.3.20 Assembly of battery pack GND harness

Schematic diagram



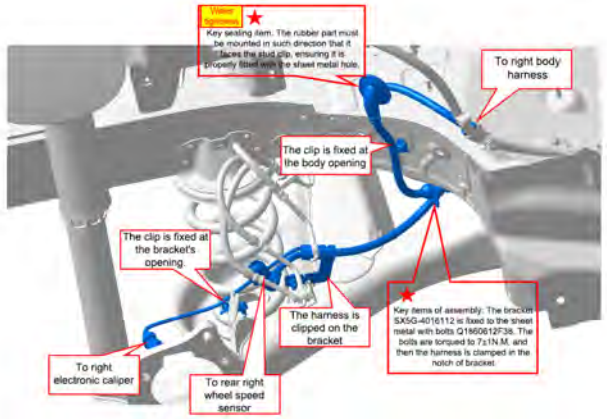
4.1.3.21 Assembly of left caliper harness

Schematic diagram



4.1.3.22 Assembly of right caliper harness

Schematic diagram



4.2 Battery

4.2.1 Specification

4.2.1.1 Battery specifications

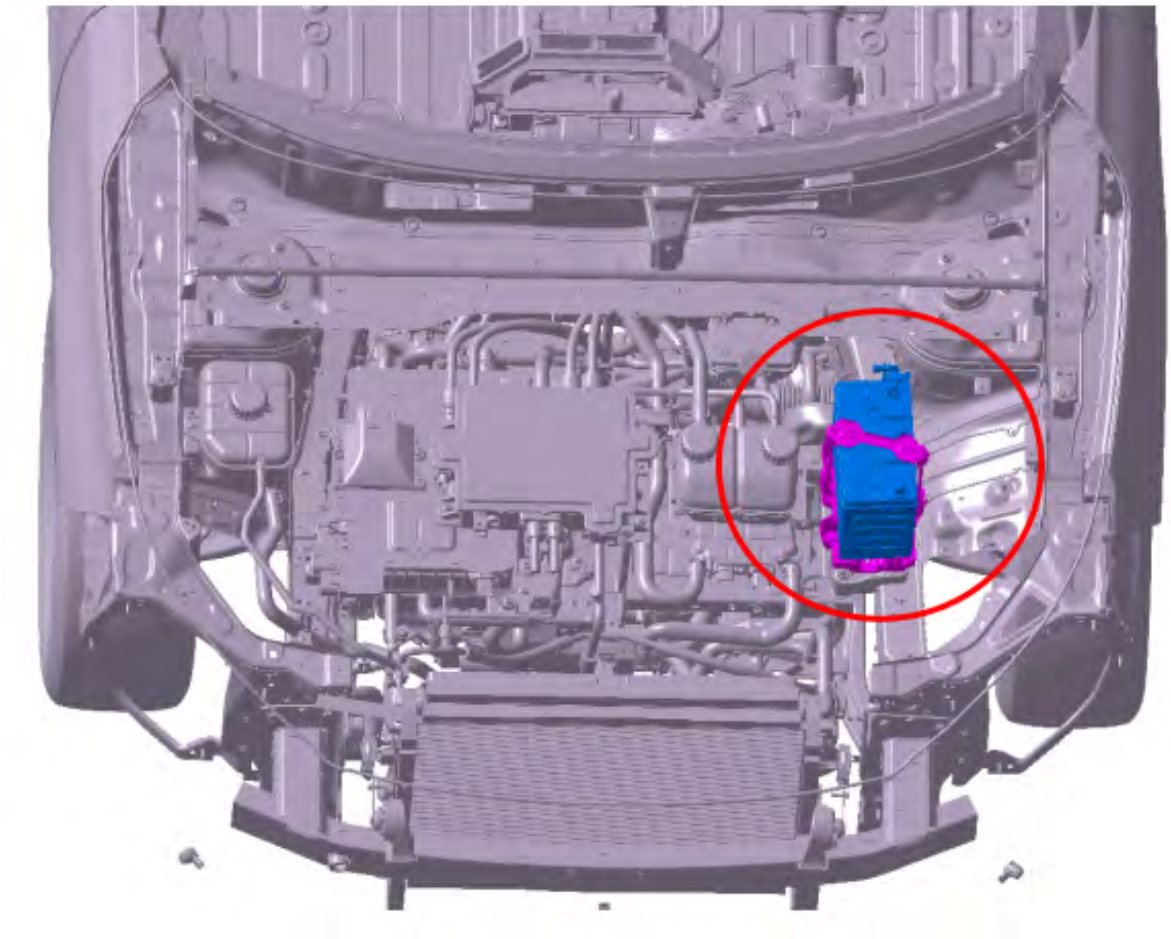
Name	Specification	Capacity
Battery	S50EVK-3703020	45Ah
Shape of battery	238*128*203	-

4.2.1.2 Torque specification

Name	Nm
Battery sensor and battery connection pile head	6±1.5

4.2.2 Instructions and operations

4.2.2.1 Battery Component Locating Diagram



4.2.2.2 Overview

The main function of the battery is to supply power to the starter and ignition system when the engine starts, supply power to the electrical system of the vehicle when the alternator fails and does not work, and maintain the current consumption of each controller storage, memory and other modules when the vehicle is stationary.

4.2.2.3 Precautions

1. Before removing the battery, turn off all electrical appliances of the vehicle
2. When removing the battery, the negative terminal should be disconnected first; during reassembly, the positive terminal should be connected first.
3. When disassembling and assembling the battery, the inclination angle of the battery should not be greater than 45°.
4. Prevent the battery's positive and negative terminals from short circuiting during removal.

4.2.3 Diagnosis and testing

4.2.3.1 Fault Diagnosis

Common battery faults and countermeasures

S/N	Fault Symptom	Fault analysis	Handling measures
1	The battery cannot work due to unstable voltage The reading is 0A and 0V during a load test. When the charging voltage is 16V, the charging current is 0A	Open circuit within the battery	Scrap the battery and replace it with a new one
2	The open-circuit voltage of the battery is about 10.5V, or decreases progressively by multiples of 2.1V.	Short circuit within the battery	Scrap the battery and replace it with a new one
3	Obvious acid mist, accompanied with pungent smell, leaks from the vent hole during charging. During the discharge test, the battery voltage drops rapidly and falls to about 6V within 10 seconds. The voltage and temperature of the battery, when charged, increase quickly.	Sulfation of the battery plates due to serious voltage insufficiency of the battery.	Slow charging with a low current (less than 4A) can partially restore capacity, but it should be replaced as soon as possible.
4	If the open-circuit voltage of the battery is 10.5V~12.2V, the current and voltage reduce quickly during a load discharge.	Failure to timely compensate electricity after a deep discharge of the battery.	The performance can be restored by replenishing electric energy. Note that the charging current is about one-sixth of the capacity and it takes about 10 hours to charge.
5	White or light yellow powders appear around the battery terminals.	The battery terminals are contaminated and corroded.	It can be used normally and, when necessary, cleaned with hot water or alkaline water and applied with Vaseline.

Caution:

– The negative harness should be removed when the battery is charged separately, i.e. no-load charging is required;

– The normal charging current is about one-sixth of the capacity. Excessive charging current will affect the charging efficiency and the battery's lifespan.

– The new battery must be checked before installation to ensure its open-circuited voltage is no less than 12.6V; otherwise, it needs recharging.

– Conditions for determining full charge.

– Measure the voltage of the battery terminals 15 minutes after stopping the charge (battery in open-circuited state, not connected to any load). The voltage must not be less than 12.8V and should not drop below 12.6V within 12 hours.

4.2.4 Removal and installation

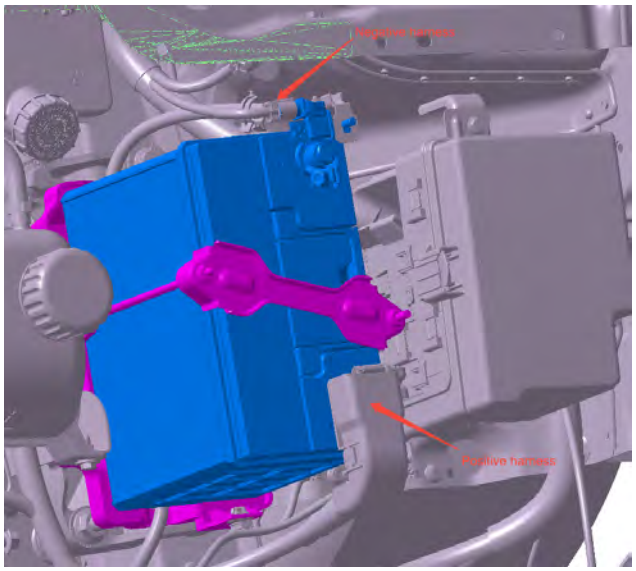
4.2.4.1 Battery

Removal

1. Open the engine bonnet and locate the battery. Refer to the battery installation location diagram

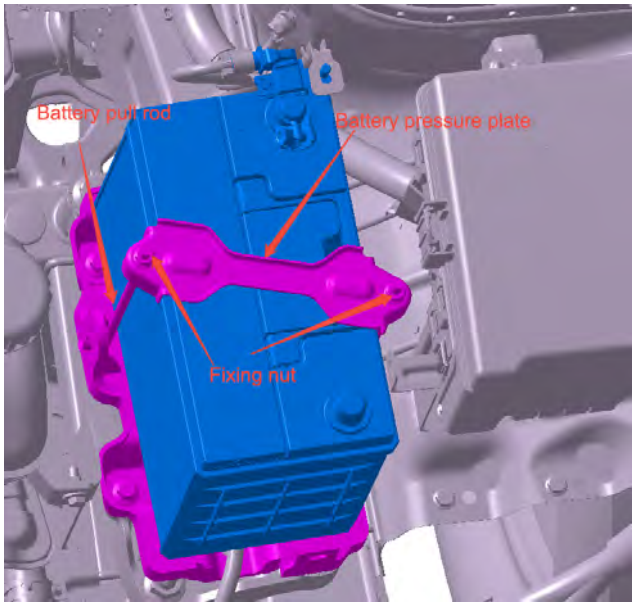
2. Loosen the fixing bolts of battery negative pole terminal and positive pole terminal harness, remove the negative pole harness first, and then remove the positive pole harness.

   Sensor bolt torque: 4.5-7.5 N·m, positive terminal harness fixing bolt torque: 6-8 N·m



3. Loosen the pull rod fixing nut and remove the battery pressure plate and pull rod.

   Torque: Meet QC/T 518 Tightening Torque for Automotive Threaded Fasteners



4. Lift the battery and move it out of the engine compartment.



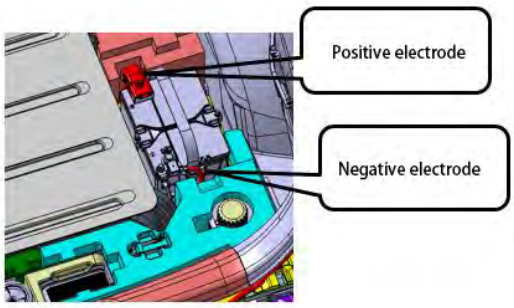
Installation

1. The installation order is reverse to the removal order.

4.2.5 General procedures

4.2.5.1 Disconnect the battery negative cable

1. Turn off all electrical equipment and the vehicle power supply is in the OFF position.
2. Loosen the negative terminal of the battery and remove the battery sensor and negative harness first.



3. Wrap the negative cable clamp with a suitable insulation sleeve to prevent the negative cable clamp from contacting the body.
4. Guarantee that the ignition switch is at “OFF”.
5. Connect the negative battery cable and tighten the terminal connecting the battery sensor to the battery with a torque of 4.5-7.5 N·m.

4.3 Independent gateway controller

4.3.1 Instructions and operations

4.3.1.1 Precautions

Precautions during repair

1. The gateway is not a waterproof part; caution should be taken to keep it dry.

2. Before removing the independent gateway controller, disconnect it from the harness.

3. During removal of the gateway, take care not to damage the shells of parts and components and the internal circuit board.

4.3.2 Diagnosis and testing

4.3.2.1 Independent Gateway-Fault Diagnosis

Symptoms		Inspection Items	
Routing not activated	Vehicle cannot start	Is the gateway power supply connected?	—
	All instrument fault lights are illuminated, and signal loss is reported.	—	

After the gateway is upgraded, it is necessary to clear the DTC of the vehicle.

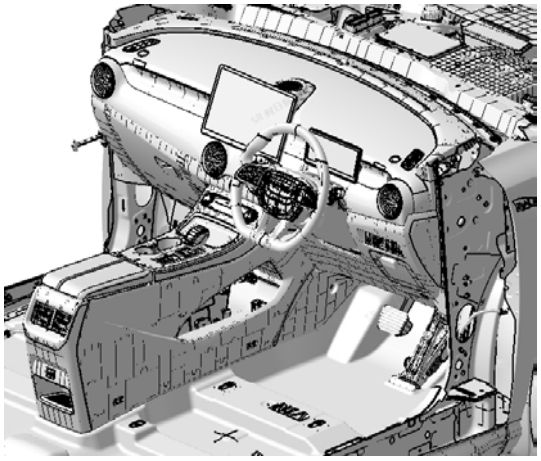
4.3.3 Removal and installation

4.3.3.1 Independent gateway controller

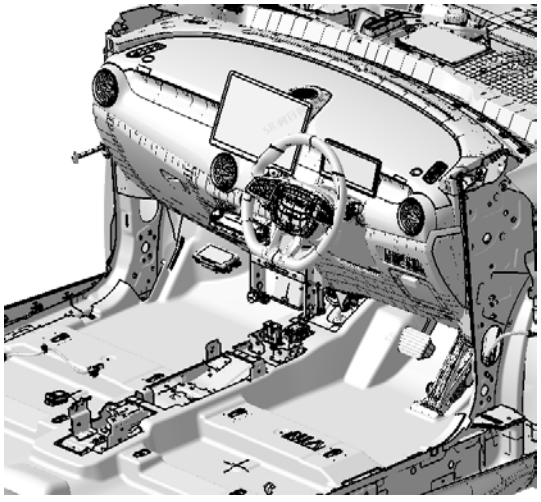
Caution: The gateway controller is arranged under the steering wheel at the driver's seat. Use M6 bolts to fix the water pipe bracket 2 on the tubular beam bracket, and then use M6 bolts to fix the independent gateway on the fixing holes of the tubular beam bracket and the water pipe bracket 2. If a ratchet wrench is used for blind operation, the following steps are not necessary.

Removal

1. Remove the end cover plate first.



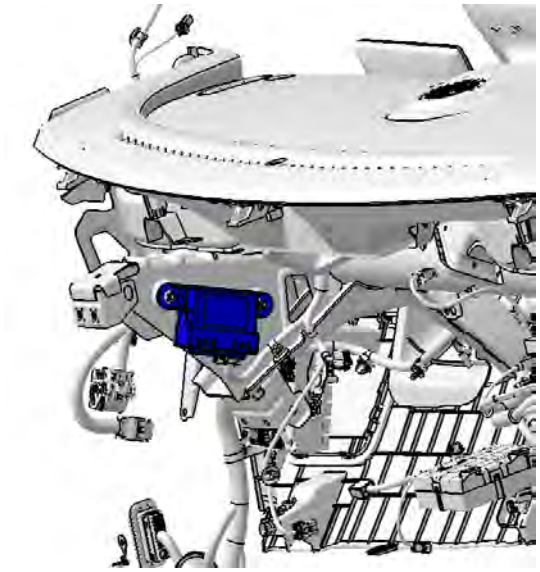
2. Then remove the knee bolster.



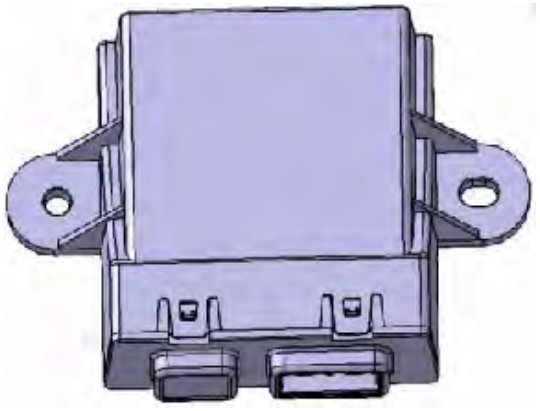
3. Remove the BCM and move it away in the direction of the arrow to increase the operating space (this step can be skipped during blind operation).



4. Use an electric screwdriver (or ratchet wrench) for removal.



5. Remove the gateway.



Inspection after removal

1. Check whether the gateway housing has cracks, damage, or ageing, and whether the connector pins are bent. Replace them if necessary.

Installation

1. The installation order is reverse to the removal order.

Inspection after installation

1. After installation is complete, power on and start the vehicle. Observe whether the instrument reports a node loss fault, and check if the vehicle can be started. If the instrument displays normally, does not report a node loss

fault, and the vehicle starts successfully, it indicates the gateway is operating normally.

4.4 MmWave radar

4.4.1 Specification

4.4.1.1 General specifications

Front mmWave radar

Item	Specification
Rated voltage	DC 12V
Voltage range	DC 9.0V ~ DC 16V
Static current	≤0.1mA
Operating temperature	-40℃~+85℃
Detection range	Horizontal 150 °, vertical 15 °
Maximum detection distance	120m
Angle accuracy	±0.5 °
Relative vehicle speed operating range	-60 ~ +60m/s
Velocity accuracy	±0.05m/s
Detection range resolution	0.2m
Horizontal angle resolution	6 °
IP rating	IP67

4.4.2 Instructions and operations

4.4.2.1 Overview

The mmWave radar system consists of 2 radars fixed on the rear bumper, with the left side as the main radar and the right side as the auxiliary radar. The following functions can be realised: Door Opening Warning (DOW), Rear Cross Traffic Alert (RCTA), Lane Change Assist (LCA) and Rear Collision Warning (RCW).

Precautions:

1. Under the following special circumstances, the system functions may not work normally or there is no early warning.

   1 Under severe weather conditions, such as rainstorm and heavy snow.

   2 Sand and dust pavement, grass pavement, etc.

   3 Ice or mud adheres to the rear bumper, and the radar is blocked.

   4 When driving continuously up and down steep slopes, such as mountain roads, rough roads, slopes on the road, etc.

   5 When a row of vehicles approach and there is only a small gap between the vehicles.

   6 Turn sharply or make a U-turn, and drive on very wide or narrow roads.

   7 When the vehicle overtakes the adjacent vehicle and the relative speed > 20km/h, there is no risk by default and no alarm will be given.

2. Under the following special circumstances, the false positive and negative rate of the system may increase.

   1 When a vehicle in the third lane is close to the SV and rapidly changes lane and overtakes the SV in adjacent lane.

   2 Small targets such as pedestrians may be missed.

   3 Especially when the vehicle is running parallel to a long vehicle (such as a truck), the alarm may be interrupted, and there is only a short distance between the vehicle and the guardrail, wall, tunnel, etc.

4.4.3 Diagnosis and testing

4.4.3.1 Accurate Test L: B1B9681

Accurate Test L: B1B9681

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9681	Abnormal longitudinal distance of offline calibration simulator/corner reflector	Parameter exception (exceeding 0x0014~0x0032 2m~5m)	Parameter is normal (2m <= Parameter <= 5m)

Possible cause

Offline calibration not written

Repair recommendations

– Re-perform offline calibration

4.4.3.2 Accurate Test K: B1B9881

Accurate Test K: B1B9881

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9881	Abnormal lateral distance of offline calibration simulator/corner reflector	Parameter exception (exceeding 0x000A~0x001E 1m~3m)	Parameter is normal (1m <= Parameter <= 3m)

Possible cause

Offline calibration not written

Repair recommendations

– Re-perform offline calibration

4.4.3.3 Accurate Test J: B1B9C78

Accurate Test J: B1B9C78

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9C78	Radar offline calibration not completed	At least one of the left and right radars) has not completed offline calibration, KL15 is valid	(Both left and right radars must meet the requirements) End-of-line calibration completed

Possible cause

– Offline fault

Repair recommendations

– Re-perform offline calibration

4.4.3.4 Accurate Test I: U100100

Accurate Test I: U100100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U100100	Auxiliary radar lost	Private CAN1, auxiliary radar status message 0x443 is not received for more than 500ms (10*cycles)	Successfully received 0x443 message for 500ms

Possible cause

– Network fault

Repair recommendations

– Check the harness and auxiliary radar

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.5 Accurate Test H: U012600

Accurate Test H: U012600

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012600	EPS node lost	The message has not been received for 10 consecutive cycles. (Monitoring message: SAS1=0xC2, message cycle 10ms)	1 frame of this message received

Possible cause

– Network fault

Repair recommendations

– Check SAS bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.6 Accurate Test G: U012100

Accurate Test G: U012100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012100	ABS node lost	The message has not been received for 10 consecutive message cycles. (Monitoring message: ABS1=0x200, message cycle 20ms)	1 frame of this message received

Possible cause

– Network fault

Repair recommendations

– Check the ESP bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.7 Accurate Test F: U010100

Accurate Test F: U010100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U010100	VCM node lost	No VCM3/TCU2 message has been received for 10 consecutive message cycles. (Monitoring message: VCM3=0x216, message cycle 10ms; TCU2=0x10, message cycle 10ms)	Any 1 frame of VCM3/TCU2 message received

Possible cause

Network fault

Repair recommendations

– Check the BCM bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.8 Accurate Test E: U014000

Accurate Test E: U014000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U014000	BCM node lost	The message has not been received for 10 consecutive cycles. (Monitoring message: BCM1=0x180, message cycle 100ms)	1 frame of this message received

Possible cause

Network fault

Repair recommendations

– Check the BCM bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.9 Accurate Test D: U220D00

Accurate Test D: U220D00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U220D00	Network management LimpHome fault	After keeping the limp home state tLimphomeLog for 2000ms, record the diagnostic DTC	CAN network deactivates limphome status

Possible cause

Network fault

Repair recommendations

– Check CAN bus

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.10 Accurate Test C: U007300

Accurate Test C: U007300

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U007300	CAN bus off (body CAN)	The ECU's transmission error counter has accumulated to more than 255, and a DTC is recorded after three consecutive times	First, execute the fast recovery mode for up to 5 consecutive times. If there are still errors, switch to the slow recovery mode. Slow recovery shall be performed continuously until the Bus Off fault is recovered.

Possible cause

– Network fault

Repair recommendations

– Check CAN bus

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.11 Accurate Test B: U300316

Accurate Test B: U300316

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300316	Low voltage fault	The power supply voltage is below 9V for 1000ms	The power supply voltage is above 9.5V for 1000ms

Possible cause

Power supply undervoltage

Repair recommendations

Check the connection of generator and battery

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.12 Accurate Test A: U300317

Accurate Test A: U300317

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300317	High voltage fault	The power supply voltage is above 16.5V for 1000ms	The power supply voltage is below 16V for 1000ms

Possible cause

– Power supply overvoltage.

Repair recommendations

Check the connection of generator and battery

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.4.3.13 DTC List of ADAS (Corner Radar)

DTC	Fault description	Operation
U300317	Battery Voltage Too High	Go to Accurate Test **A: U300317**
U300316	Battery Voltage Tool low	Go to Accurate Test **B: U300316**
U007300	CAN Controller Bus-off (Body CAN)	Go to Accurate Test **C: U007300**
U300316	NM Limphome DTC	Go to Accurate Test **D: U300316**1
U014000	Lost communication with BCM (BCM node lost)	Go to Accurate Test **E: U014000**
U010100	Lost communication with VCM (VCM node lost)	Go to Accurate Test **F: U010100**
U012100	Lost communication with ABS1 (ABS node lost)	Go to Accurate Test **G: U012100**
U012600	Lost communication with SAS1 (EPS node lost)	Go to Accurate Test **H: U012600**
U100100	Lost communicaiton with private-can	**Go to Accurate Test** I: U100100
B1B9C78	EOL Calibration is not done	**Go to Accurate Test** J: B1B9C78

B1B9881	parameter(L)failure Abnormal lateral distance of end-of-line calibration simulator/corner reflector	**Go to Accurate Test** K: B1B9881
B1B9681	parameter(R)failure Abnormal longitudinal distance of end-of-line calibration simulator/corner reflector	**Go to Accurate Test** L: B1B9681

4.4.3.14 Inspection and confirmation of ADAS (corner radar)

ADAS (corner radar)

Inspection and confirmation

1. Confirm the problems raised by the customers and perform the appropriate checks and tests.

2. Check the appearance for obvious traces of mechanical and electrical damage.

3. Before the next check, solve the identified problem first.

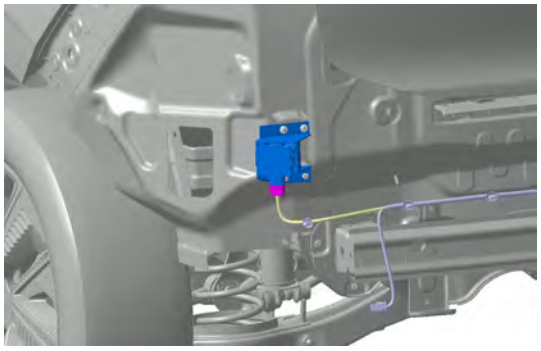
4. If the cause cannot be determined by visual check, confirm the symptom firstly and then check according to the List of Symptoms.

4.4.4 Removal and installation

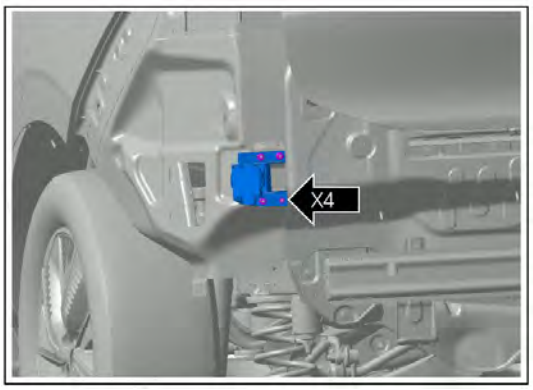
4.4.4.1 Corner mmWave radar

Removal

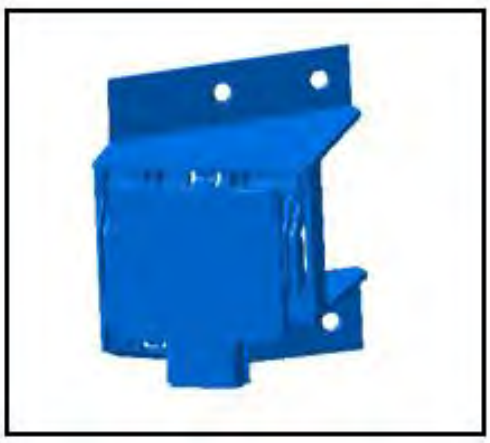
1. Disconnect the negative battery cable.Refer to: Disconnect the battery negative cable.
2. Remove the rear bumper.Refer to: Removal and installation of rear bumper.
3. After removing the rear bumper, disconnect the corner mmWave radar harness connector first.



4. Remove the corner radar fixing bolts fixed to the rear body.



5. Take out the corner mmWave radar.



Installation

1. The installation order is the reverse of the removal order.

4.5 Fin antenna, loudspeaker, microphone and VSP

4.5.1 Instructions and operations

4.5.1.1 Overview

Shark fin antenna

System overview

Fin antenna body:

The fin antenna body integrates radio and DAB functions to reduce wind resistance and wind noise, requiring the roof to be centred and sealed reliably.

Combination nut:

Connect the roof cover assembly to the fin antenna body, and ensure that the connection is reliable without looseness or slipping.

DAB connector:

The DAB socket is a special electrical connection port for on-board digital audio broadcasting signals, which is used to realise the radio frequency signal transmission between the DAB antenna and the main unit, power amplifier and other audio and video modules.

Radio socket:

The radio socket is the connection port between the on-board FM/AM radio antenna and the audio and video main unit to achieve stable transmission of broadcast signals.

Speaker

System overview

The on-board audio system consists of 6 speakers, which constitute the vehicle audio playback unit, realise multi-channel and high-fidelity sound restoration in the car, and provide a high-quality auditory experience for drivers and passengers.

Front left door speaker (mid-range speaker):

Responsible for the restoration of mid-band audio signals, mainly presenting core sounds such as human voice and instrument mid-frequency. It is arranged on the front left door to improve the fullness of the front left sound field.

Front right door speaker (mid-range speaker):

It is responsible for the output of mid-band audio signals, forming the front stereo mid-frequency foundation with the front left door mid-range speaker to ensure the sound layering and balance.

Rear left door speaker (full-range speaker):

Covering the full-band audio signal, taking into account high and low bass playback, it is arranged on the rear left door to expand the coverage of the sound field on the left side of the rear row.

Rear right door speaker (full-range speaker):

Realise full-band sound playback, cooperate with the rear left full-range speaker to build the overall sound field of the rear row and improve the auditory experience of the rear row.

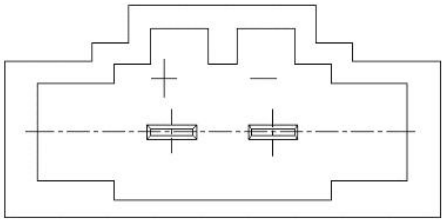
Front left A-pillar speaker (high-pitch speaker):

Dedicated to high-frequency audio signal restoration, presenting delicate treble details, arranged on the front left A-pillar, optimising the directivity and transparency of the front row treble.

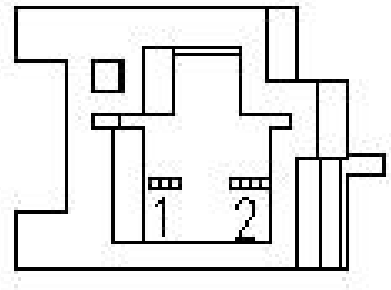
Front right A-pillar tweeter (high-pitch speaker):

Responsible for high-frequency sound output, paired with the front left A-pillar high-pitch speaker to form a clear and bright high-pitched sound field in the front row and enhance the sense of sound space.

Mid-range/Full-range Speaker Pin Description



Description of high-pitch speaker pins



S/N	Function
1	Negative
2	Positive

Microphone

System overview

This on-board analogue dual microphone system consists of an analogue microphone body and a microphone plug-in. Its core function is to collect in-vehicle voice commands, call voice and environmental sound, and provide audio input support for voice recognition and on-board call functions.

Simulated microphone body:

It is responsible for collecting the sound field, environmental noise and voice signals in the car, converting the sound signals into electrical signal output. It is the core pickup component of on-board voice interaction, active noise reduction and audio detection to ensure the accuracy of voice recognition and the quality of audio acquisition.

Microphone connector:

It is responsible for simulating the electrical connection and signal transmission between the microphone body, on-board harness and main unit controller to realise stable transmission of power supply and audio signals. At the same time, it plays a role in mechanical fixation, anti-loosening, waterproof and dustproof to ensure long-term reliable operation of the microphone.

Pedestrian approaching vehicle sound warning system

System overview

The pedestrian approaching vehicle sound warning system (hereinafter referred to as VSP) consists of a pedestrian approaching vehicle sound warning system assembly (hereinafter referred to as the body) and a pedestrian approaching vehicle sound warning assembly bracket (hereinafter referred to as the bracket). Its core function is to make sounds during low-speed driving, making up for the safety shortcoming of new energy vehicles being quiet.

Pedestrian approaching vehicle sound warning system assembly:

It is responsible for electroacoustic conversion, adopts automotive-grade full-frequency sound unit design, has no built-in PCB, driver chip and energy storage element, restores preset warning sound effects such as low-speed driving, reversing, starting, etc., and is driven by the IVI.

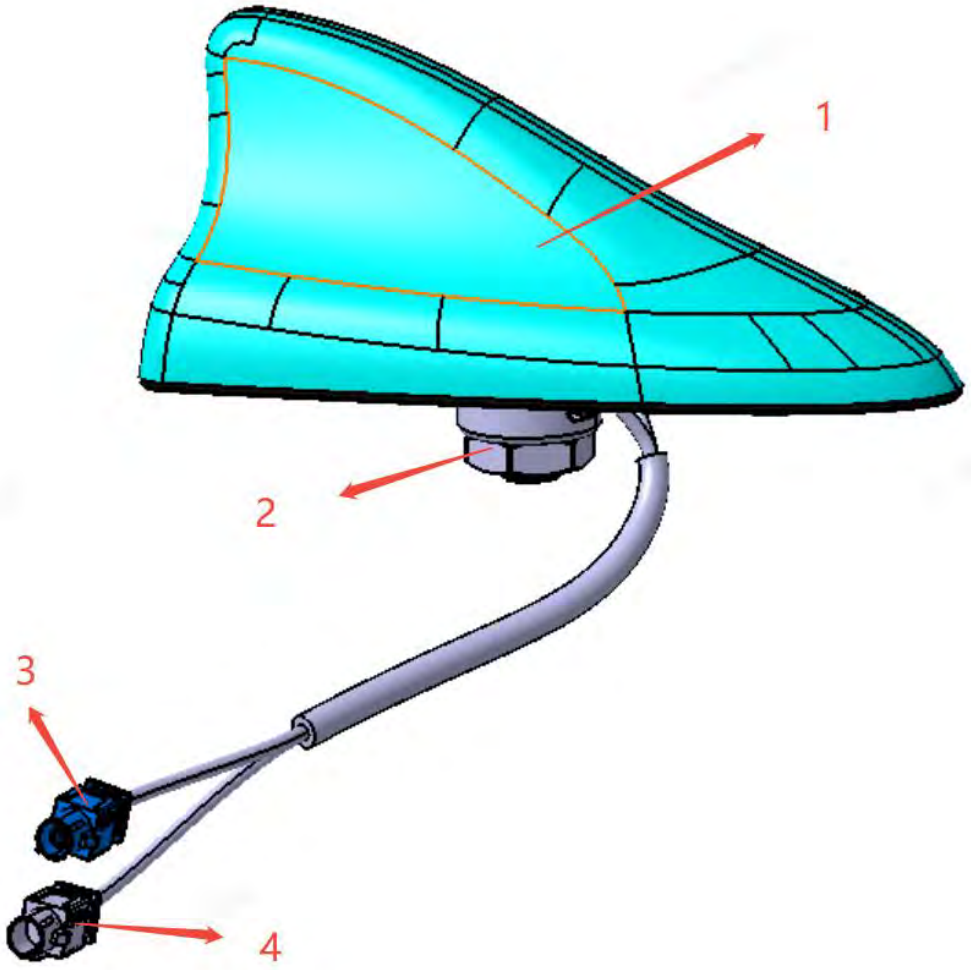
Pedestrian approaching vehicle sound warning assembly bracket:

Responsible for connecting the pedestrian approaching vehicle sound warning system assembly and the anti-collision beam.

4.5.1.2 Component Locating Diagram

Shark fin antenna

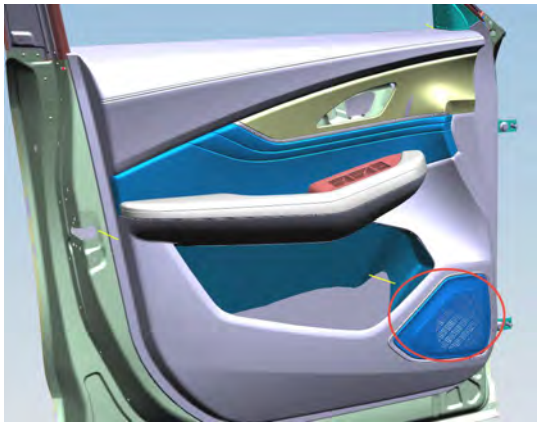
Instructions and operations



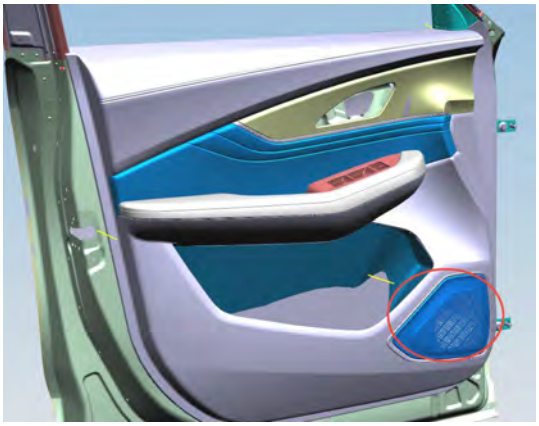
Item	Description
1	Fin antenna body
2	Combination nut
3	DAB connector
4	Radio socket

Speaker

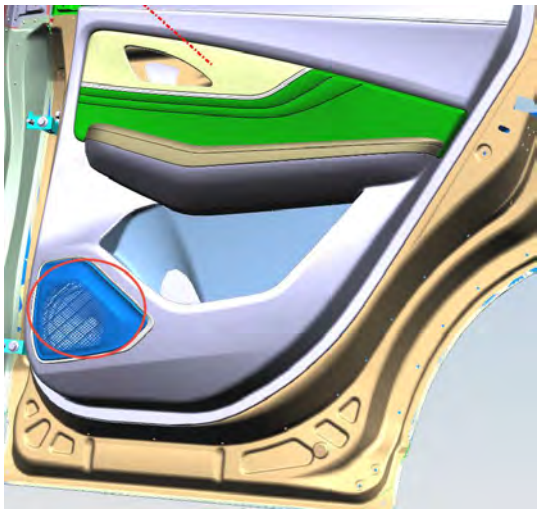
Instructions and operations



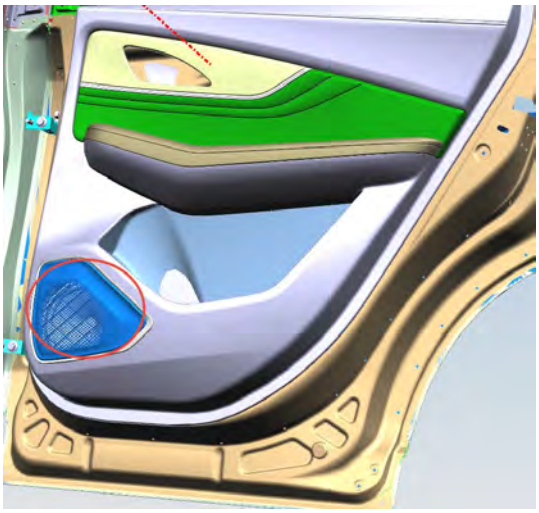
1 Front left door speaker (mid-range speaker)



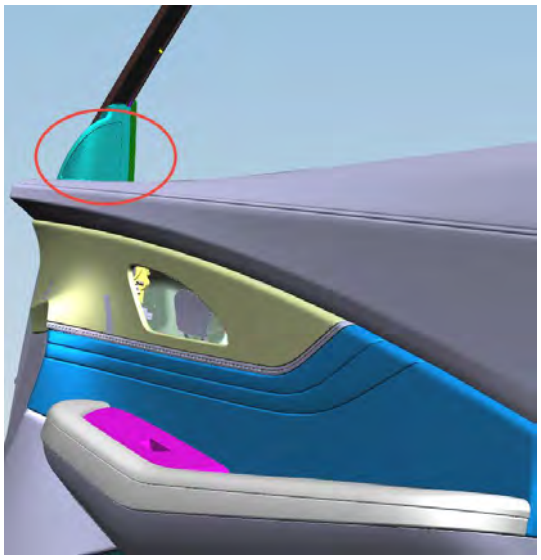
2 Front right door speaker (mid-range speaker)



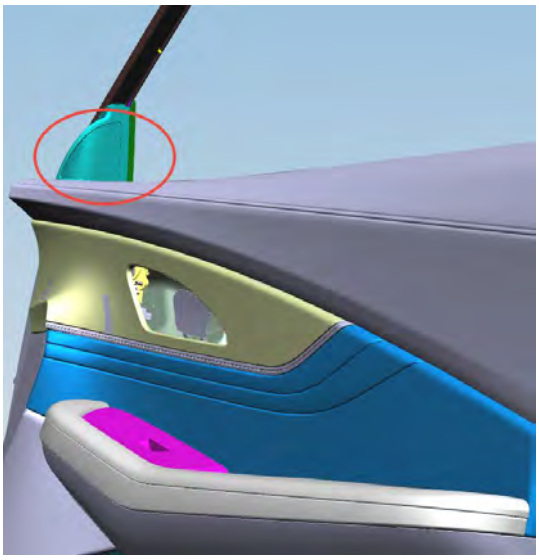
3 Rear left door speaker (full-range speaker)



4 Rear right door speaker (full-range speaker)



5 Left A-pillar speaker (high pitch)



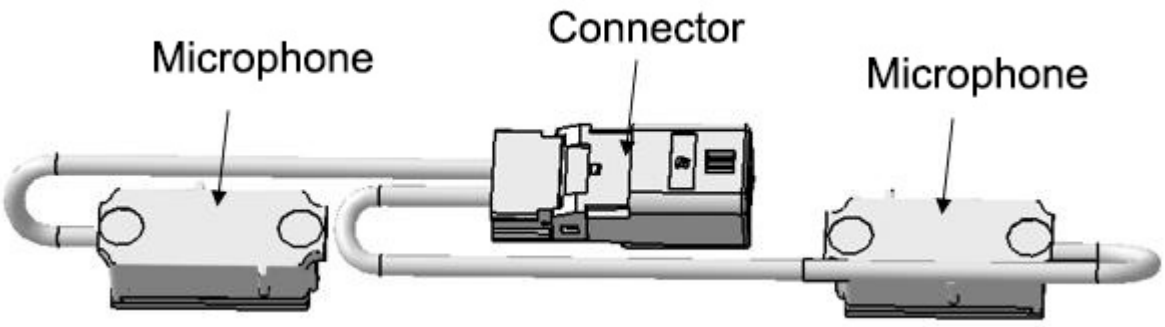
6 Right A-pillar speaker (high pitch)

Item	Description
1	Front left door speaker (mid-range speaker)
2	Front right door speaker (mid-range speaker)

Item	Description
3	Rear left door speaker (full-range speaker)
4	Rear right door speaker (full-range speaker)
5	Front left A-pillar speaker (high-pitch speaker)
6	Front right A-pillar speaker (high-pitch speaker)

Microphone

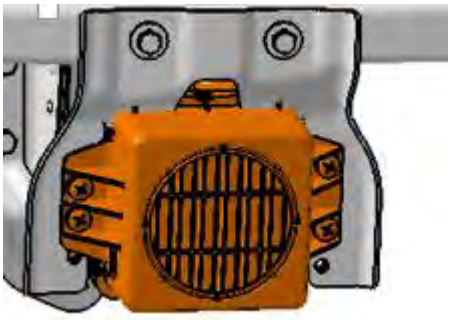
Instructions and operations



Item	Description
1	Microphone body
2	Connector

Pedestrian approaching vehicle sound warning system

Instructions and operations



Item	Description
1	Pedestrian approaching vehicle sound warning system assembly
2	Pedestrian approaching vehicle sound warning assembly bracket

4.5.2 Diagnosis and testing

4.5.2.1 Antenna inspection and confirmation diagnosis and testing

Antenna inspection and confirmation

1. Confirm the problems raised by the customers and perform the appropriate checks and tests.

2. Check the appearance for obvious traces of mechanical and electrical damage.

3. If the cause cannot be confirmed by appearance, confirm the signal reception symptoms again, and then check the antenna housing, harness, and connector according to the symptoms.

Appearance Checklist

Mechanical	Mechanical
– DAB connector – Radio socket	– Combination nut – Harness – Housing

4.5.2.2 Antenna Inspection and Confirmation Symptom Table

Symptoms	Possible Cause	Measures
No signal at all, no station can be found	– Antenna failure – Poor power supply	– Replacement of fin antenna assembly – Replace the harness.
Loud noise, weak station loss	– Oxidation of joints – Shielding layer damage	– Clean the terminal, apply conductive paste and re-tighten it – Replace the harness.
FM/AM/DAB signals are intermittent, and the door opening signal is interrupted due to bumps	– Looseness of combination nut – Poor connection of connector	– Tighten the combination nut to standard torque – Reconnect the connector and perform a shaking test

4.5.2.3 Speaker inspection and confirmation diagnosis and testing

Speaker inspection and confirmation

1. Visual inspection of speaker

Check that the front left and front right door mid-range speakers, the rear left and rear right door full-range speakers, and the front left and front right A-pillar high-pitch speakers are intact in appearance, without damage, deformation, stains, looseness, firm installation, accurate positioning, and no risk of interference and abnormal sound.

2. Inspection of speaker harness and connector

Check that the harnesses of each speaker are arranged neatly and fixed reliably, without extrusion, pulling, wear or aging; the connectors are plugged in place and locked effectively, the terminals have no pin withdrawal, no rust or poor contact, and ensure stable and reliable electrical connections.

3. Confirmation of speaker function

Play the audio signal through the main unit/power amplifier, and conduct sound tests on the front left and front right mid-range speakers, the rear left and rear right door full-range speakers, and the front left and front right high-pitch speakers in turn to confirm that each speaker functions normally, without noise, cracking, silence, or howling, the left and right channels are balanced, and the sound field is normal.

4. Confirmation of assembly consistency

Confirm that the model, specification and installation position of the speaker are consistent with the design requirements, meet the technical specifications for loading, and meet the use requirements of the vehicle audio system.

4.5.2.4 Symptom Table for Speaker Inspection and Confirmation

Symptoms	Possible Cause	Measures
Speaker silent station	– Speaker connector not plugged in tightly/pin withdrawn – Speaker body damaged	– Reconnect and confirm locking – Replace the damaged speaker
Speaker noise/cracking	– Speaker diaphragm damage/ foreign object ingress – Loose speaker installation	– Clean up foreign objects and check the appearance of speaker – Re-tighten and install
The speaker on one side does not sound	– Poor contact of connector on one side – Single-sided speaker fault	– Check the corresponding side connector and harness – Replace the faulty speaker
Low/abnormal sound	– Wrong speaker model/installed in the wrong position – IVI output abnormal	– Check the speaker specification and installation position – Check the working status of IVI

4.5.2.5 Microphone inspection and confirmation diagnosis and testing

Microphone inspection and confirmation

1. Visual inspection of microphone

Check whether the microphone pickup hole is blocked, including dust, water stains, and glue debris.

2. Inspection of microphone harness and connector

Check whether the microphone harness connectors are fixed and reliable, and whether there is oxidation.

4.5.2.6 Microphone Inspection and Confirmation Symptom Table

Symptoms	Possible Cause	Measures
No sound input for both microphones	– Loss of microphone power supply – The connector is not firmly connected	– Use a multimeter to measure the power supply voltage to see if it is 8 ±0.8V – Check the abnormal channel harness and replace the microphone
Low Bluetooth call sound	– Pickup hole blocked – Poor contact of harness	– Clean up foreign objects in the pickup hole – Re-tighten and install

4.5.2.7 VSP inspection and confirmation diagnosis and testing

VSP inspection and confirmation

1. VSP appearance inspection

Check whether the VSP housing is deformed, scratched, or faded, whether the connector sealant has fallen off, and whether the terminal is oxidized.

2. VSP bracket

Check whether the VSP bracket has changes and burrs.

4.5.2.8 VSP Inspection and Confirmation Symptom Table

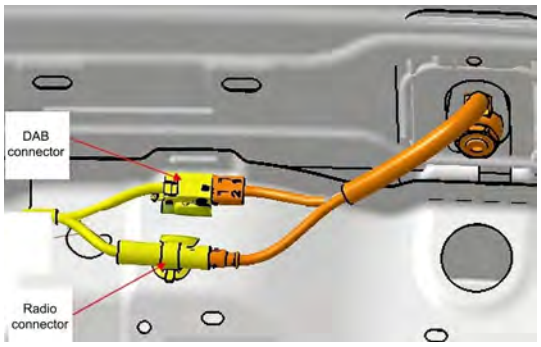
Symptoms	Possible Cause	Measures
0-30km/h, no warning sound when reversing	– VSP damaged – The IVI has no output drive signal	– VSP replacement – Read the DTC with a diagnostic scanner and troubleshoot IVI problems
Low sound of VSP	– Magnetic steel demagnetisation – Blockage of protective mesh – Insufficient IVI output power	– VSP replacement – Clear the abnormalities of protective mesh – Check the built-in power amplifier of IVI
Abnormal sound during driving	– Interference with the surrounding area due to bracket deformation – Untightened bolts	– Replace the bracket – Tighten the bolts
VSP has noise	– Water enters the socket on rainy days, and the waterproof ring ages and fails	– Replace the waterproof ring

4.5.3 Removal and installation

4.5.3.1 Fin antenna assembly

Removal

1. Disconnect the fixing clip between the antenna transition line and the body sheet metal hole, and disconnect the fin antenna from the antenna transition line.



2. Loosen the mounting studs on the combination nut and the fin antenna assembly body.

   Torque: 7±1Nm

3. Carefully pull out the fin antenna assembly leads one by one from the roof cover sheet metal mounting holes and remove the fin antenna assembly.



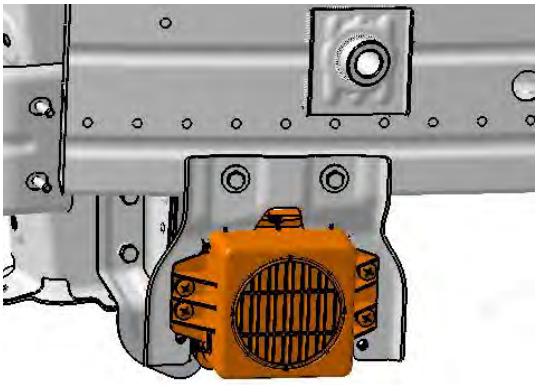
Installation

1. The installation order is the reverse of the removal order.

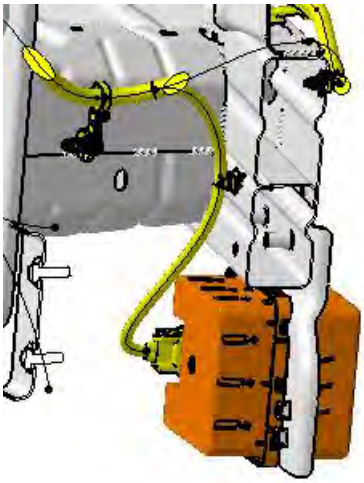
4.5.3.2 Pedestrian approaching audible warning system

Removal

1. Remove the fixing bolts of VSP.



2. Disconnect the VSP harness and remove the VSP.



Installation

1. The installation order is the reverse of the removal order.

4.6 Horn

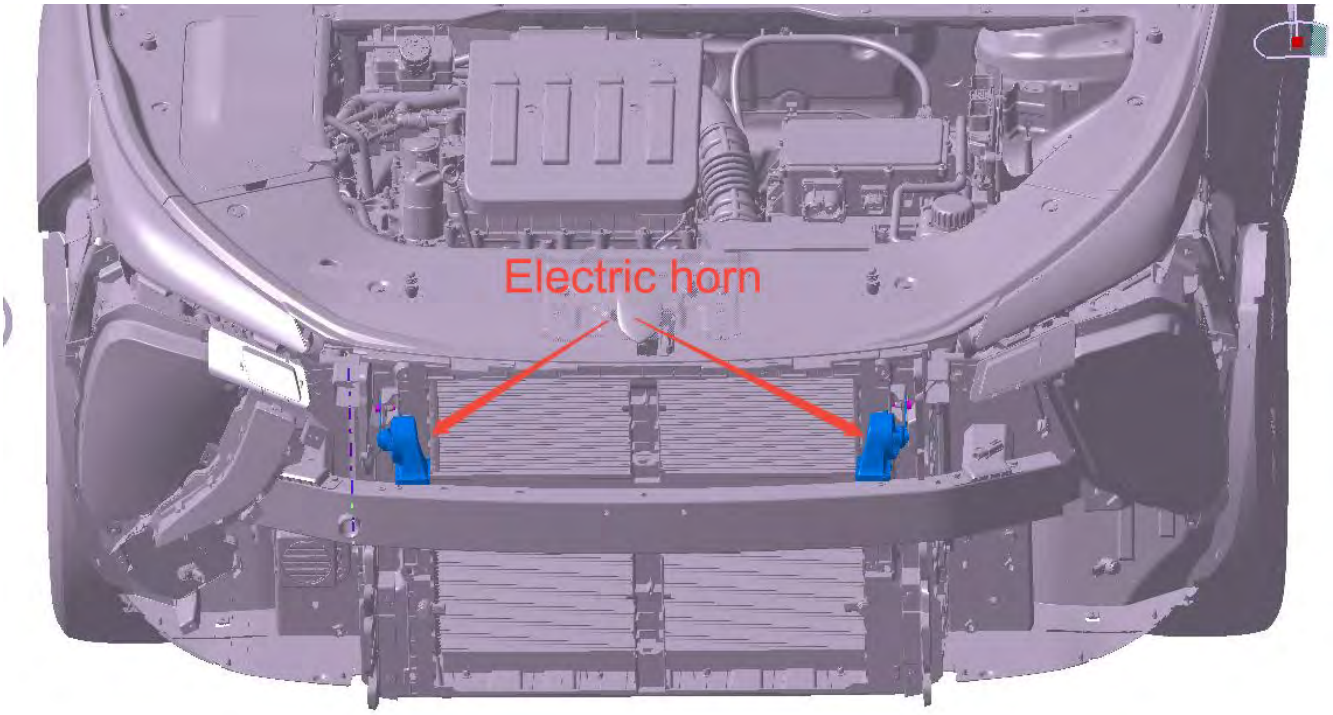
4.6.1 Specification

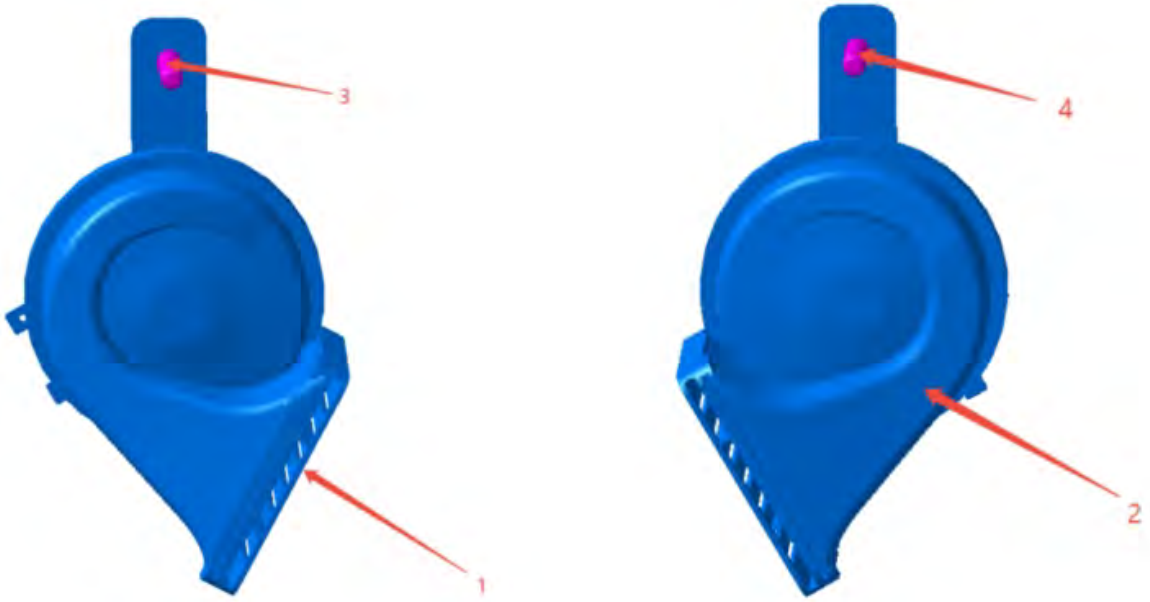
4.6.1.1 General specifications

Model	Operating voltage (V)	Operating current (A)	Sound level (dB(A))	Fundamental frequency (Hz)
Snail electric horn (high-pitch)	9	≤4.0	Normal sound	510±35
	13		105-118	
	15		Normal sound	
Snail electric horn (low-pitch)	9	≤4.0	Normal sound	420±35
	13		105-118	
	15		Normal sound	

4.6.2 Operation Manual

4.6.2.1 Horn





Item	Description	Item	Description
1	Snail electric horn (high-pitch)	3	Hex bolt, spring washer, and flat washer assembling unit
2	Snail electric horn (low-pitch)	4	Hex bolt, spring washer, and flat washer assembling unit

4.6.2.2 Precautions

Precautions

1. Be sure to use **12** V battery.
2. Do not disconnect the battery cable when the engine is running.
3. Before connecting or disconnecting the engine **ECU** harness connector, turn the ignition switch to the **OFF** position and disconnect the GND cable of the battery. Failure to do so may damage the engine **ECU**, because even if the ignition switch is turned to the **OFF** position, the **ECU** still has **12** V voltage.
4. Before removing parts and components, turn the ignition switch to the **OFF** position, and then disconnect the battery GND cable.
5. Do not disassemble the engine **ECU**.
6. Only a digital multimeter is allowed to be used to check the EFI system.
7. Always use genuine parts and components for maintenance; otherwise, the EFI system may not be able to work properly.
8. During maintenance, use unleaded petrol only.
9. Please follow the specified maintenance and diagnostic procedures for maintenance work.
10. Do not disassemble or remove parts and components of the EFI system during maintenance.
11. During maintenance, take all electronic components (such as ECUs and sensors) carefully and never let them fall to the ground.
12. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

Precautions during repair

1. Before maintenance, please disconnect the start battery negative terminal to avoid the harness being short-circuited during disassembly, which may result in fuse blowout or even fire, and avoid personal injury.
2. When removing and installing the USB power interface, 12V on-board power supply and wireless charging, please arrange professionals to operate to avoid appearance scratches caused by improper operation.
3. Please do not insert cigarette lighters of other brands into the cigarette lighter base.

4.6.3 Diagnostic tests

4.6.3.1 Fault Diagnosis

The electric horn does not sound

Steps	Measures	Yes	No
1	Check whether the electric horn circuit is functioning normally according to the harness principle.		
2	If the line path is functional, please confirm whether the electric horn sounds normally according to the inspection steps. If not, please replace the electric horn directly.		

4.6.3.2 Fault Diagnosis

Hoarse sound of electric horn

Steps	Measures	Yes	No
1	Check if there is water ingress in the electric horn. If so, drain out any water inside.		
2	If the horn still sounds hoarse after draining, replace the electric horn directly.		

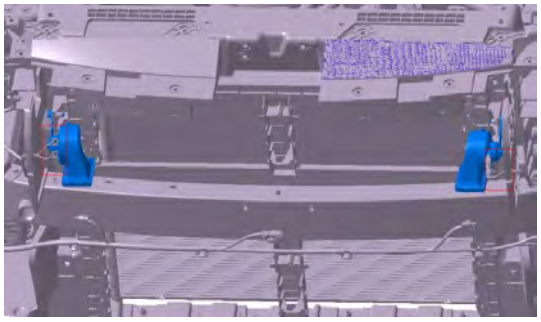
4.6.4 Removal and installation

4.6.4.1 Horn

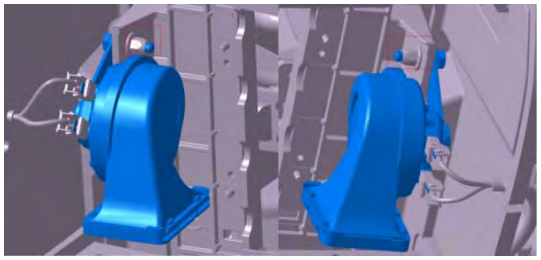
Removal

1. Remove the front bumper assembly.Refer to: Front bumper assembly.

2. Disconnect the horn harness.



3. Remove the horn fixing bolts and take down the horn.



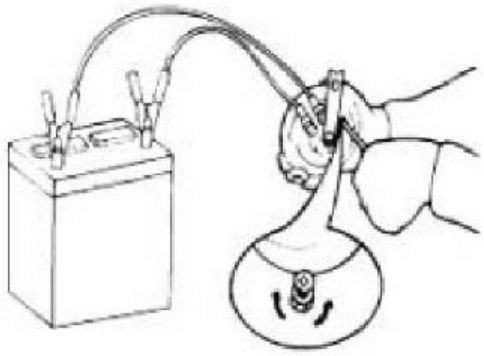
Installation

1. The disassembly sequence is reverse to the installation sequence.

Test

1. Test the horn through connection to the voltage terminal 1 and GND terminal 2 of the battery.

2. The horn should make a sound. If not, replace it.



3. Sound the horn and adjust the horn by rotating the adjusting screw to provide appropriate sound quality.

Caution: After the adjustment, apply a small amount of glue around the screw to avoid looseness.

4.7 Car Power and Wireless Charging

4.7.1 Specification

4.7.1.1 General specifications

12V on-board power supply assembly

Item	Specification
Rated voltage	DC 12V
Voltage range	DC 9.0V ~ DC 16V
Rated current	10A

USB Power Supply Interface

Item	Type-C power supply interface specifications	Type-A power supply interface specifications
Rated voltage	DC 12V	DC 12V
Voltage range	DC 9.0V ~ DC 16V	DC 9.0V ~ DC 16V
Output voltage	5V/9V/12V	5V/9V
Rated current	MAX 5A	MAX 2.4A
Operating temperature	-40℃~ 85℃	-40℃~ 85℃
Storage temperature	-40℃~ 90℃	-40℃ ~ 90℃

Wireless charging assembly

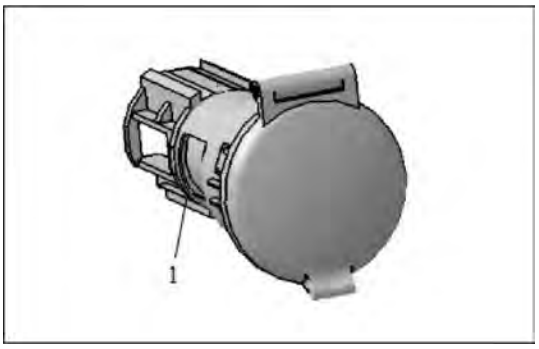
Item	15W specification	50W specification
Rated voltage	DC 12V	DC 12V
Voltage range	DC 9.0V ~ DC 16V	DC 9.0V ~ DC 16V
Output voltage	5V	5V/9V/12V
Rated current	3A (maximum)	5A (maximum)
Operating frequency	125±5%KHz	127KHz
Standby current	≤110mA	≤100mA
Operating temperature	-40℃~ 85℃	-40℃~ 85℃
Storage temperature	-40℃~ 90℃	-40℃ ~ 90℃

4.7.2 Instructions and operations

4.7.2.1 Part location diagram

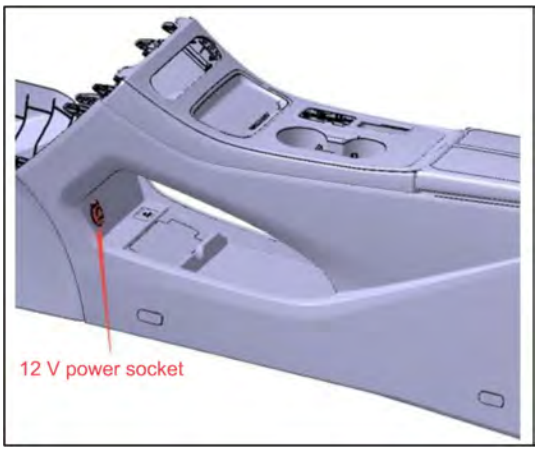
12V on-board power supply assembly

Part drawing



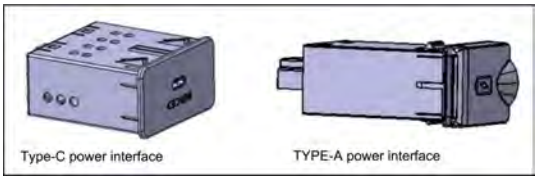
Part location diagram

The 12V on-board power supply assembly is located below the front end of the auxiliary dashboard and below the rear cover of the auxiliary dashboard.



USB Power Supply Interface

Part drawing



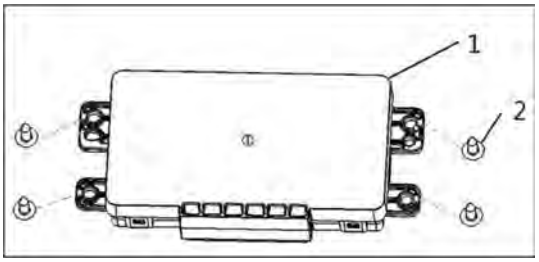
Part location diagram

The TYPE-C power supply interface is located at the front lower part of the auxiliary dashboard penetration, and the TYPE-A power supply interface is located on the rear end cover of the auxiliary dashboard.



Wireless charging assembly

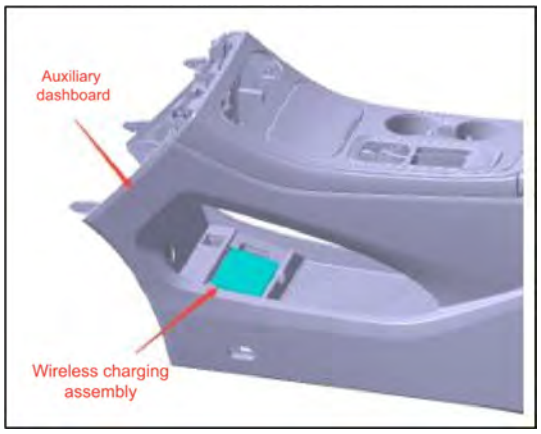
Part drawing



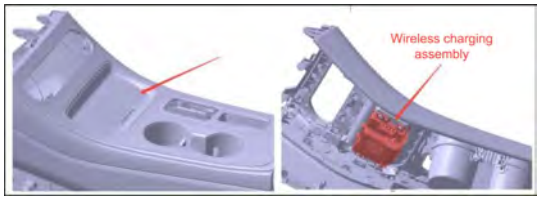
S/N	Name	S/N	Name
1	Wireless charging assembly	2	Cross recessed truss head self-tapping screw

Part location diagram

1. The 15W wireless charging assembly is installed at the through-hole of the auxiliary dashboard, at the lower body of the auxiliary dashboard frame, and fixed by screws.



2. The 50W wireless charging assembly is placed on the upper trim panel of the console.



4.7.2.2 Precautions

Precautions during repair

1. Before maintenance, please disconnect the start battery negative terminal to avoid the harness being short-circuited during disassembly, which may result in fuse blowout or even fire, and avoid personal injury.
2. When removing and installing the USB power interface, 12V on-board power supply and wireless charging, please arrange professionals to operate to avoid appearance scratches caused by improper operation.
3. Please do not insert cigarette lighters of other brands into the cigarette lighter base.

4.7.3 Diagnosis and testing

4.7.3.1 Charging and distribution system-fault diagnosis and maintenance of high-voltage power distribution box

Use the system schematic diagram to check the circuit, fuse, and relay, identify the faulty part, and repair or replace the fuse, etc.

Caution:

– This work should be done by professionals at 4S shops. If it cannot be repaired, replace the whole assembly.

Fuse

1. PTC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of a multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the side from the PTC fuse to the relay direction. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

2. OBC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of a multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the other side of the OBC fuse. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

3. EAC: It is necessary to open the cover for measurement. The measurement method is to use the ohm range/buzzer range of the multimeter, connect the red test lead to the positive terminal (positive copper bar) of the battery, and the black test lead to the other side of the EAC. If the resistance value is less than 0.5 ohms/the buzzer keeps ringing, it is normal; otherwise, the fuse fails.

Relay

Pay special attention to maintenance and confirm that the vehicle is powered off from high voltage.

1. Fast charging relay detection: Open the cover for detection, use the multimeter buzzer gear, touch the test lead to both ends of the relay, the buzzer does not respond, the low-voltage connector 7+/9-pin is connected to the 12V power supply, there is a click sound, the test lead touches the two ends of the relay again, the buzzer keeps ringing, and any point does not meet the requirements, it indicates a fault.

2. PTC relay: Open the cover for inspection, use the multimeter buzzer gear, touch the test lead to both ends of the relay, the buzzer does not respond, the low-voltage connector 12+/6-pin is connected to the 12V power supply, there is a click sound, the test lead touches both ends of the relay again, the buzzer keeps ringing, and any point does not meet the requirements, it indicates a fault.

Microswitch

Open the cover for inspection, remove the microswitch connector, manually press the microswitch pressure rod, adjust the multimeter to the buzzer gear, touch the probe to the connector terminal, and the buzzer will sound for a long time. Release the microswitch pressure rod, and the buzzer will not respond. Otherwise, it is a fault.

Sintering detection module

The HECU message status can be read by the diagnostic scanner to determine whether the sintering detection module is faulty.

4.7.3.2 On-board Power Supply System - Diagnosis and Testing

On-board power supply system

Inspection and confirmation

1. Confirm the problem proposed by customers.

2. Check the vehicle visually for obvious signs of electrical damage.

3. Read the system DTC through the diagnostic scanner.

4. Address problems found before next inspection.

5. If the cause cannot be confirmed from the appearance, confirm the symptoms first and then check according to the symptom table.

4.7.3.3 On-board Power Supply System - Diagnosis and Testing

Appearance Checklist

Mechanical
– Fuse – Harness – Junction box – Switch – Battery

4.7.3.4 On-board Power Supply System - DTC Diagnosis

DTC	Fault description	Repair recommendations
B20816	AC undervoltage	1. Check whether the external AC input voltage is between 85V and 265V 2. If the external voltage is normal, replace the charging plug for testing If it still does not recover, replace the PDM
B20417	AC overvoltage	
B2A519	Hardware overcurrent	
B21B17	System overvoltage	1. Check whether the low-voltage battery voltage is between 9V and 16V 2.If the low-voltage battery is abnormal, try to replace it for test
B21C16	System undervoltage	
C11100	BMS communication lost	Check whether the communication of BMS components is normal
C12200	VCM communication lost	Check whether the VCM component communication is normal
B26C87	PFC control command lost	1. Disconnect the low-voltage battery and try to restart 2. If the fault still exists, it is recommended to replace PDM
B21F08/ B21C09	Loss of communication between MCU and OBC DSP	
B22416	Coolant overtemperature	1. Check whether the rated power is exceeded 2. Check whether the fan and coolant pump are normal 3. Check whether the coolant is too little
B24538	AC frequency too high/AC frequency too low	Check if the CP signal of the charging plug is normal, or whether the CP detection function is normal.

DTC	Fault description	Repair recommendations
B28D13	Difference between DCDC output voltage and battery supply voltage	Check whether the DCDC output terminal is reliably connected to the low-voltage battery
B2A316	Input undervoltage	1. Check whether the high-voltage cable is well connected and whether the connector is damaged 2. Check whether the battery pack is normal 3. If the cable connection is good, the battery pack is normal, and the fault cannot be recovered, replace the two-in-one power supply module
B2B316	Input software undervoltage at HV side	
B29116	Interlink undervoltage	
B29117	Interlink overvoltage	
B2A217	Input hardware overvoltage	
B2B117	Input software overvoltage	
B2B519	Input hardware overcurrent	
B2BE4B	DCDC overtemperature	1. Check whether the vehicle cooling system works normally. 2. Measure whether the power supply two-in-one module is overheated. If so, let it cool for a period of time. After cooling, DCDC is still abnormal. It is recommended to replace the two-in-one power supply module.
B2BD4B	HV overtemperature	
B2B917	Output software overvoltage	1. Check whether the low-voltage battery voltage is between 9 and 16V. 2. If the low-voltage battery is abnormal, try to replace it for test.
B2AB17	Output hardware overvoltage	
B2AD16	Output undervoltage	
B2B119	Output hardware overcurrent	Check whether the output terminal is short-circuited.
B2BF19	Output software overcurrent	

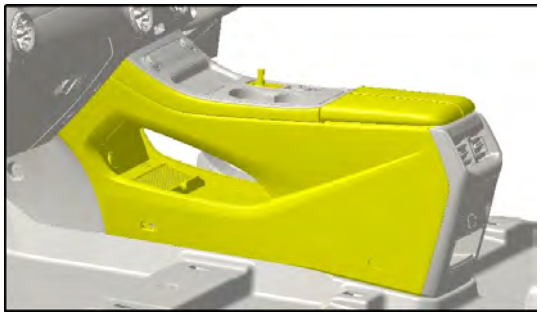
DTC	Fault description	Repair recommendations
B29304	Verification failed	1. Check whether the vehicle CAN network signal is normal. 2. Check whether the CAN communication low-voltage harness is properly connected. 3. Check whether the communication circuit is normal.
B21E08	Loss of communication between MCU and LDC DSP	
C07300	CAN bus off	1. Check whether the vehicle CAN network signal is normal. 2. Check whether the CAN communication low-voltage harness is properly connected. 3. Check whether the communication circuit is normal.
Others	/	It is recommended to restart (disconnect the negative pole of the battery, wait for one minute and then reconnect it) to see if the fault exists. If it still exists, contact the manufacturer. It is recommended to replace the two-in-one power supply module

4.7.4 Removal and installation

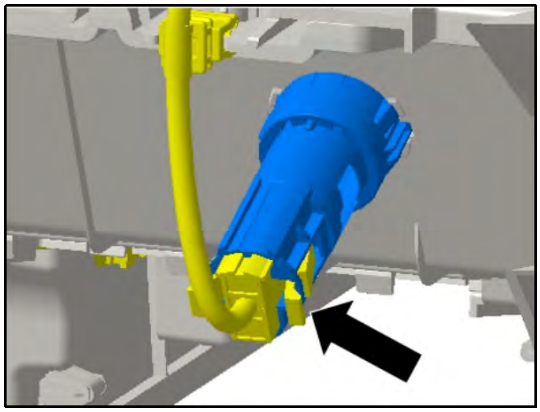
4.7.4.1 12V power supply interface

Removal

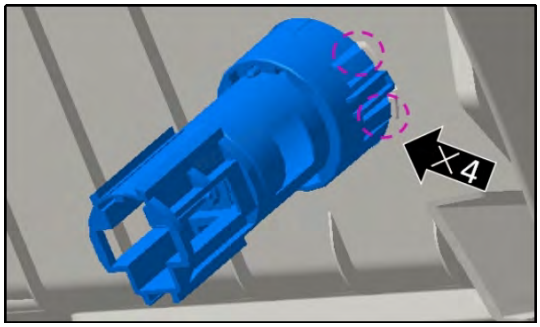
1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the auxiliary dashboard body.



3. Disconnect the harness connector from the 12V power supply interface.



4. Hold the fixed clip structure of the 12V power supply interface and push out the 12V power supply interface.



5. Remove the 12V power supply interface.

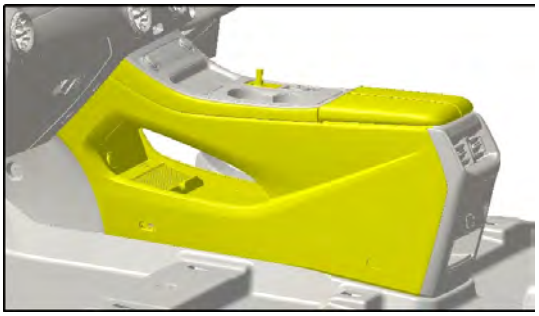
Installation

1. The installation order is the reverse of the removal order.

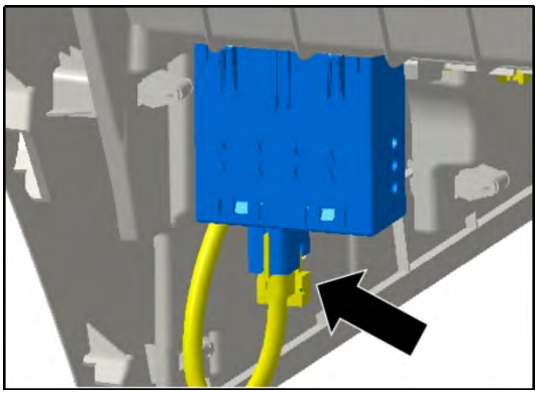
4.7.4.2 Front Type-C power supply interface

Removal

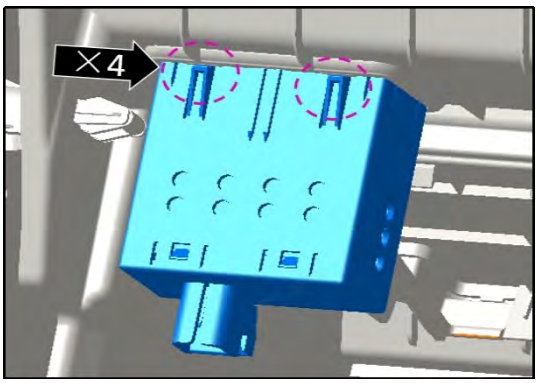
1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the auxiliary dashboard body.



3. Disconnect the harness connector from the Type-C power supply interface.



4. Hold the clip structure on the Type-C power supply interface and push the Type-C power supply interface outward.



5. Remove the Type-C power supply interface.

Installation

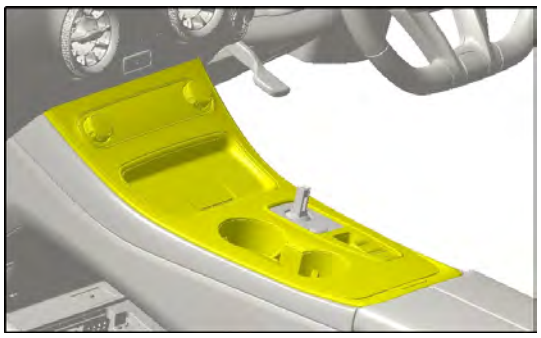
1. The installation order is the reverse of the removal order.

4.7.4.3 Wireless charging module

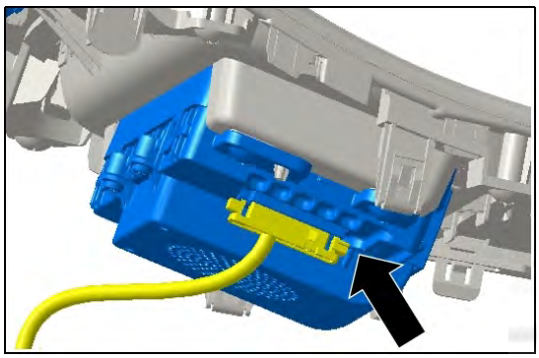
Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

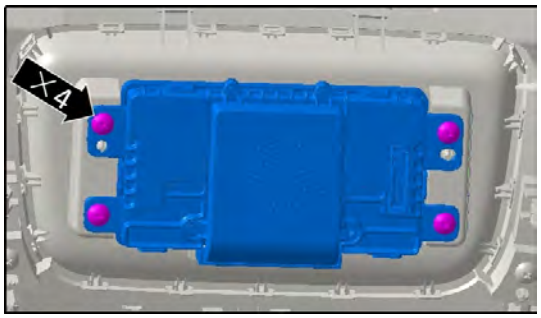
2. Remove the auxiliary dashboard upper trim panel assembly.



3. Disconnect the harness plug from the wireless charging module.



4. Remove the connecting screws between the wireless charging module and the upper trim panel of the auxiliary dashboard.



5. Remove the wireless charging module.

Installation

The installation order is the reverse of the removal order.

4.7.4.4 Rear USB power supply interface

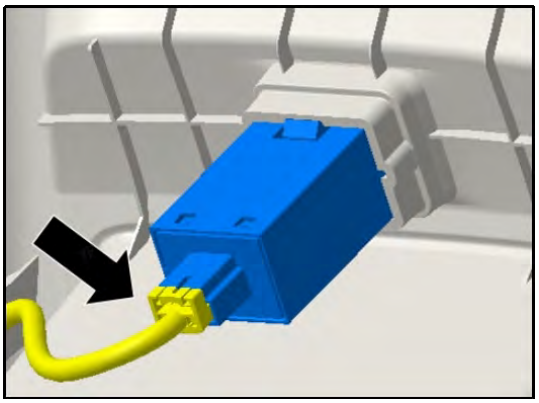
Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

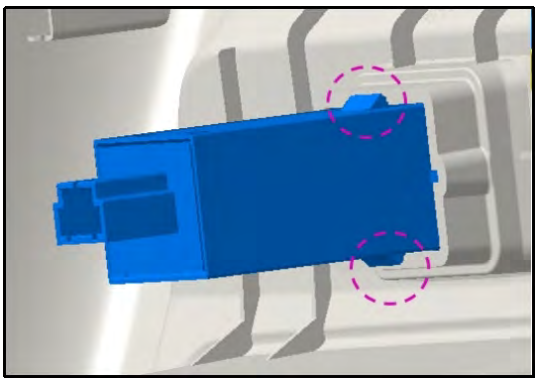
2. Remove the auxiliary dashboard rear end cover assembly.



3. Disconnect the harness connector from the USB power supply interface.



4. Hold the clip structure on the USB power supply interface and push the USB power supply interface outward.



5. Take out the USB power supply interface.

Installation

1. The installation order is the reverse of the removal order.

4.8 Advanced Driver Assistance System

4.8.1 Specification

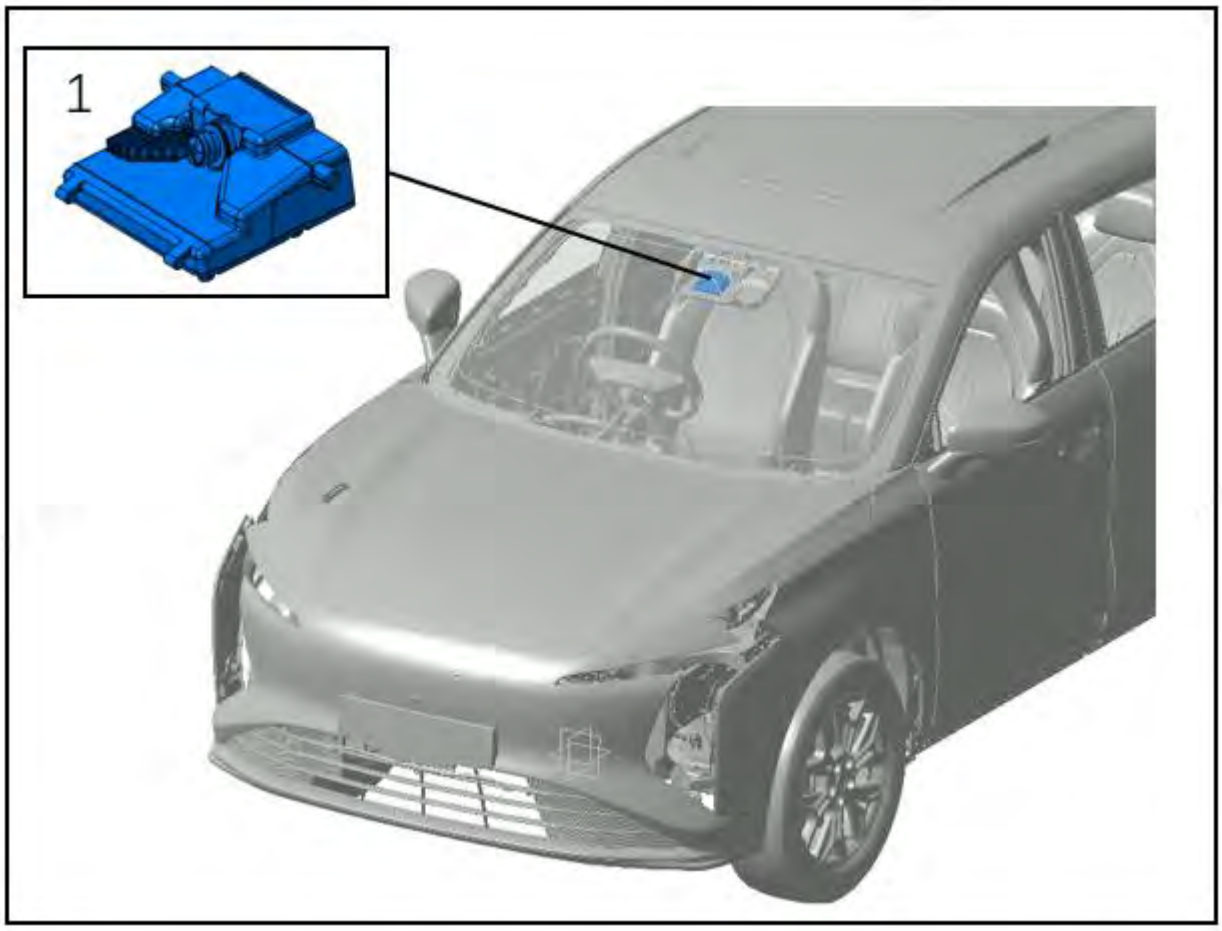
4.8.1.1 General specifications

Item	Specification
Rated voltage	DC 12V
Voltage range	DC 9.0V ~ DC 16V
Power consumption	≤4.5W
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+95℃

4.8.2 Instructions and operations

4.8.2.1 Component Locating Diagram

ADAS



Item	Description
1	Driver assistance multi-function camera

4.8.2.2 Overview

1. The automotive advanced assistance system consists of a driving assistance multi-function camera integrated with a control chip. The sensor and the control unit are designed as one. The camera captures the road information ahead and identifies vehicles, pedestrians, lane lines, traffic speed limit signs and front vehicle light information, and sends the target information to the internal control unit. The internal control unit interacts with the whole vehicle through the CAN network and sends an alarm signal to the vehicle instrument to warn the driver; Send out acceleration and deceleration signals of the driving vehicle and steering wheel torque signals to control the longitudinal and lateral driving positions of the vehicle.

2. When the vehicle is ignited, the camera will be initialised. After the initialisation is completed, it will be powered on and enter the working state. After the effective conditions of each function are met, each function works independently.

3. The driver assistance system consists of a driving assistance multi-function camera integrated with a control chip. The sensor and the control unit are designed as one. The camera captures the road information ahead and identifies vehicles, pedestrians, lane lines, traffic speed limit signs and front vehicle light information, and sends the target information to the internal control unit. The internal control unit interacts with the whole vehicle through the CAN network and sends an alarm signal to the vehicle instrument to warn the driver; Send out acceleration and deceleration signals of the driving vehicle and steering wheel torque signals to control the longitudinal and lateral driving positions of the vehicle. The following functions can be realised: Automatic Emergency Braking (AEB), Forward Collision Warning (FCW), Adaptive Cruise Control (ACC), Lane

Keeping Assist (LKA), Lane Departure Warning (LDW), Traffic Sign Recognition (TSR) and Intelligent High Beam Control (IHC).

Function introduction

Function Name	Function description
Forward collision assist	Forward collision assist includes forward collision warning (FCW) and automatic emergency braking (AEB). During driving, it provides alarm prompts and auxiliary braking for the driver when there is a risk of collision in front of the vehicle; The automatic emergency braking (AEB) function is used to automatically perform braking action when the vehicle is about to collide with a vehicle running in the same direction ahead, so as to remind the driver and avoid or reduce injuries caused by collision (including car-to-car and car-to-person emergency braking).
Lane departure assist	Lane Departure Assist (LDA) includes deviation correction and departure warning. During driving, it provides steering assistance and alarm prompts to the driver when the vehicle unconsciously deviates from the lane.
Adaptive cruise control (ACC)	Adaptive cruise control (ACC) includes cruise control, fixed-distance following, and vehicle-following start-stop. The vehicle can run at the cruise speed set by the driver, or follow the front vehicle to run, stop or start according to the cruising distance set by the driver.
Advanced cruise control system (SCC)	Advanced cruise control system (SCC) adds lateral control function on the basis of realizing longitudinal control of constant speed cruise, fixed distance cruise and vehicle-following start-stop to keep the vehicle running within the lane line.
Intelligent High Beam Control (IHC)	During driving, the vehicle automatically switches between high and low beams according to the driving environment.
Traffic sign recognition	When the vehicle is running, it identifies road traffic signs and displays them on the instrument interface, providing visual prompts when speeding.

Component description

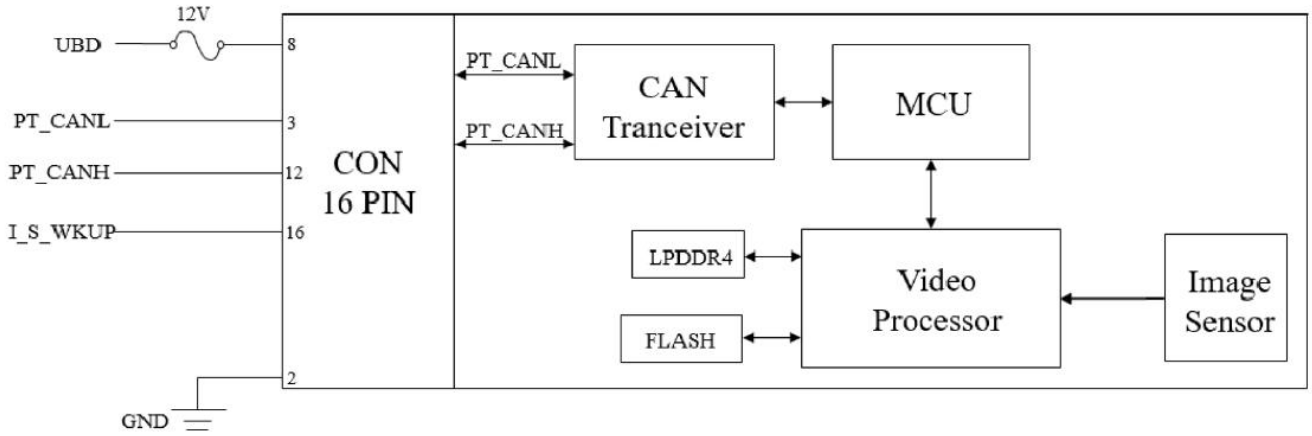
Driver Assistance Multi-Purpose Camera (ADAS):

1. The driver assistance multi-function camera is installed on the plastic bracket in the middle of the front windscreen, and is combined with the dashcam and rain light sensor in the shield of the interior rearview mirror.
2. The driver assistance multi-function camera controls the longitudinal and lateral driving position of the vehicle by capturing the road information ahead and identifying vehicles, pedestrians, lane lines and other information, processing the target information, sending an alarm signal to the vehicle instrument to warn the driver or sending acceleration and deceleration signals and steering wheel torque signals to drive the vehicle.

3. The driver assistance multi-function camera is an unrepairable parts and components and shall not be disassembled for repair. When it is judged as an ADAS fault, only parts replacement is permitted.

System Schematic Diagram

Schematic diagram of external wiring of advanced driver assistance system:



4.8.2.3 Precautions

Precautions

1. The purpose of this system is to remind and assist the driver through its functions when the vehicle is running, so as to improve the active safety of the vehicle. It does not exempt the driver from his duty of care. Therefore, the driver should not be over-dependent on the system and must be careful. The manufacturer is not responsible for accidents caused by the driver's negligence.
2. The road environment, light, weather and dirt on the front windscreen of the camera during driving may cause the sensor performance to degrade or even fail. When the system fails, it will remind the driver and require the driver to be ready to take over driving at any time.
3. After replacing the camera, camera bracket or windscreen, it is necessary to re-calibrate the camera; otherwise, the sensor performance may be degraded due to the deviation of camera position, affecting the function effect.
4. The advanced driver assistance function is only applicable to normal hard-surface roads. It may cause performance degradation or even failure on roads with accumulated water, ice and snow, potholes and large slopes.

Precautions during repair

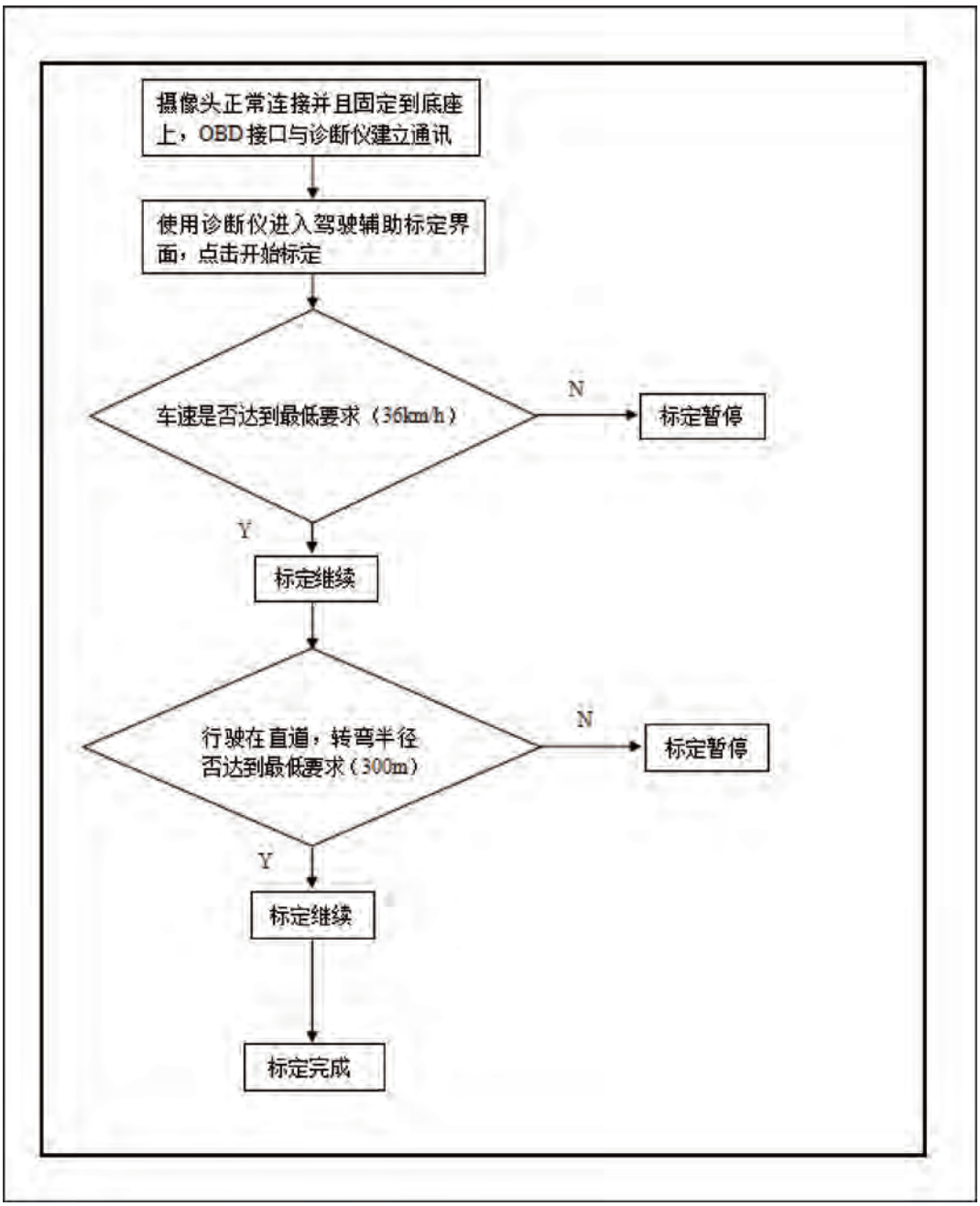
1. Be sure to disassemble and repair the driver assistance multi-function camera when the vehicle is turned off.
2. Only digital multimeters and passive test lights are allowed to check the advanced driver assistance system (ADAS).
3. Please use authentic parts and components for maintenance; otherwise, the ADAS may not operate properly.
4. Please follow the specified maintenance and diagnostic procedures for maintenance work.
5. Do not disassemble or remove parts and components of the ADAS during maintenance.
6. During maintenance, take all electronic components (such as ECUs and sensors) carefully and never let them fall to the ground.
7. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

4.8.3 Diagnosis and testing

4.8.3.1 Advanced Driver Assistance System-Calibration Process of ADAS Multi-purpose Camera

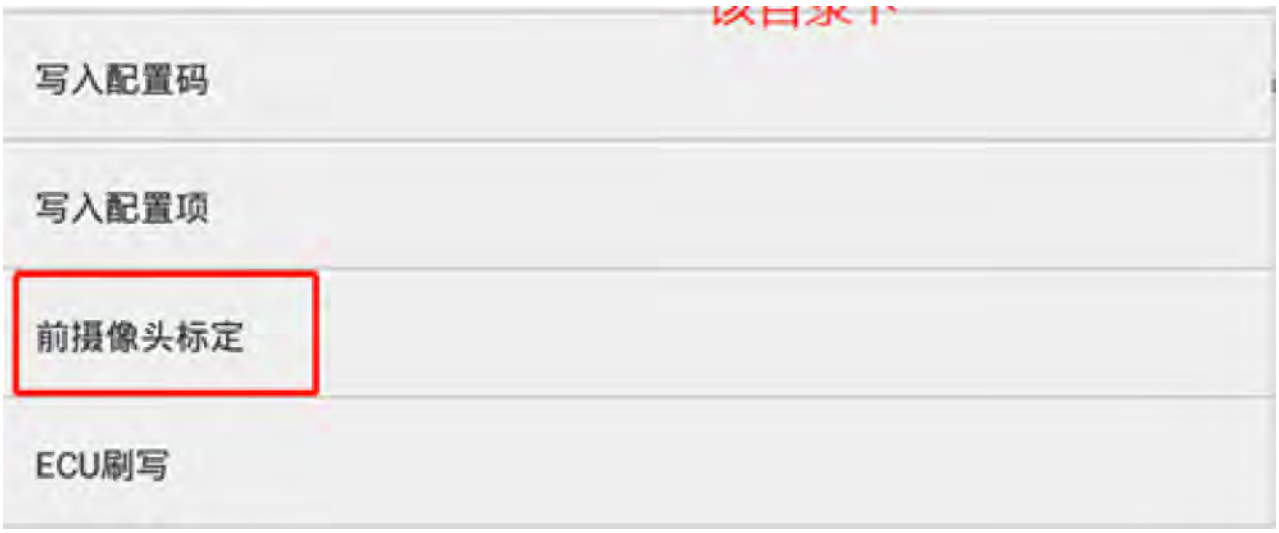
When the camera needs to be reinstalled due to falling, damage, or other reasons, it must be recalibrated. It can be recalibrated by portable diagnostic scanner (X431 diagnostic scanner, the same below).

The operation steps of portable diagnostic scanner are described as follows:

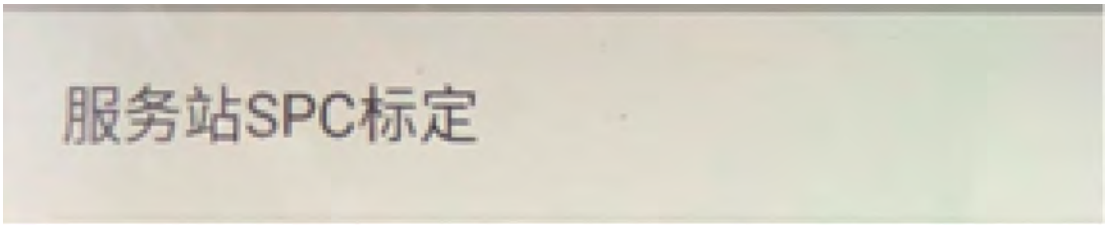


Calibration is carried out on ordinary roads according to the requirements of the above flow chart, as shown in the figure below:

⑤ Enter the Leiting REEV diagnosis system page



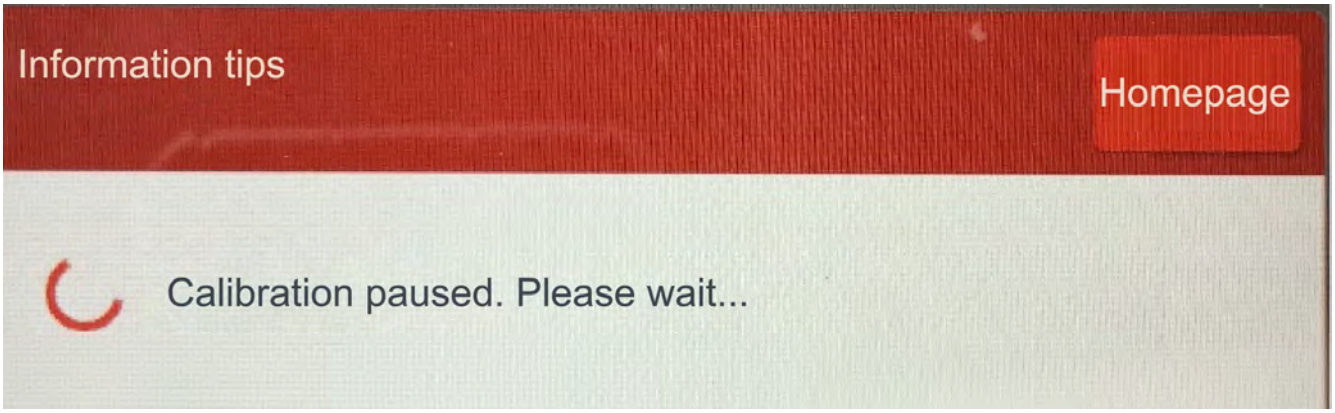
⑥ Tap "Service Station SPC Calibration"



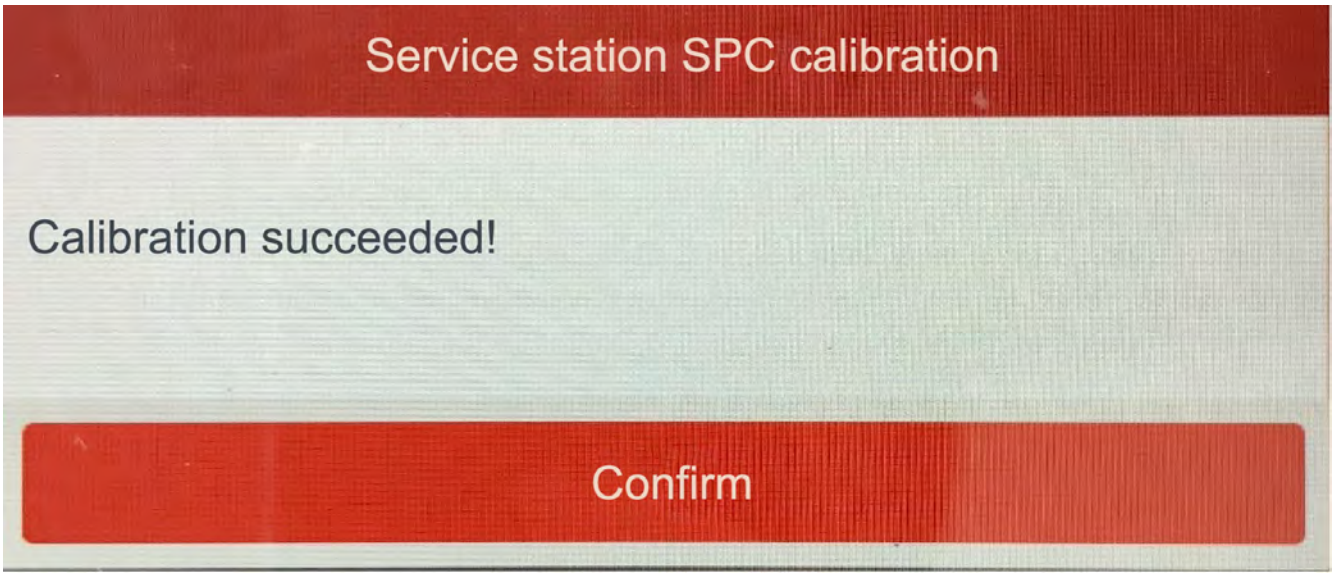
⑦ When the vehicle speed exceeds 36 km/h and the vehicle is on a straight road, the following pop-up will appear.



⑧ If the requirements in item ③ are not met, the following pop-up window will appear.



⑨ The following pop-up window will be displayed when the calibration is completed.



If the calibration procedure reports the following errors, they must be handled as appropriate:

– "Initialisation not completed", check the circuit and recalibrate;

– "Field of view out of calibration range", check whether the camera installation position is correct and recalibrate;

– "Roll angle out of range", check whether the camera installation position, angle and vehicle posture are correct, and recalibrate.

The following situations will cause the calibration speed to slow down or fail:

– Roads with poor lighting conditions at night;

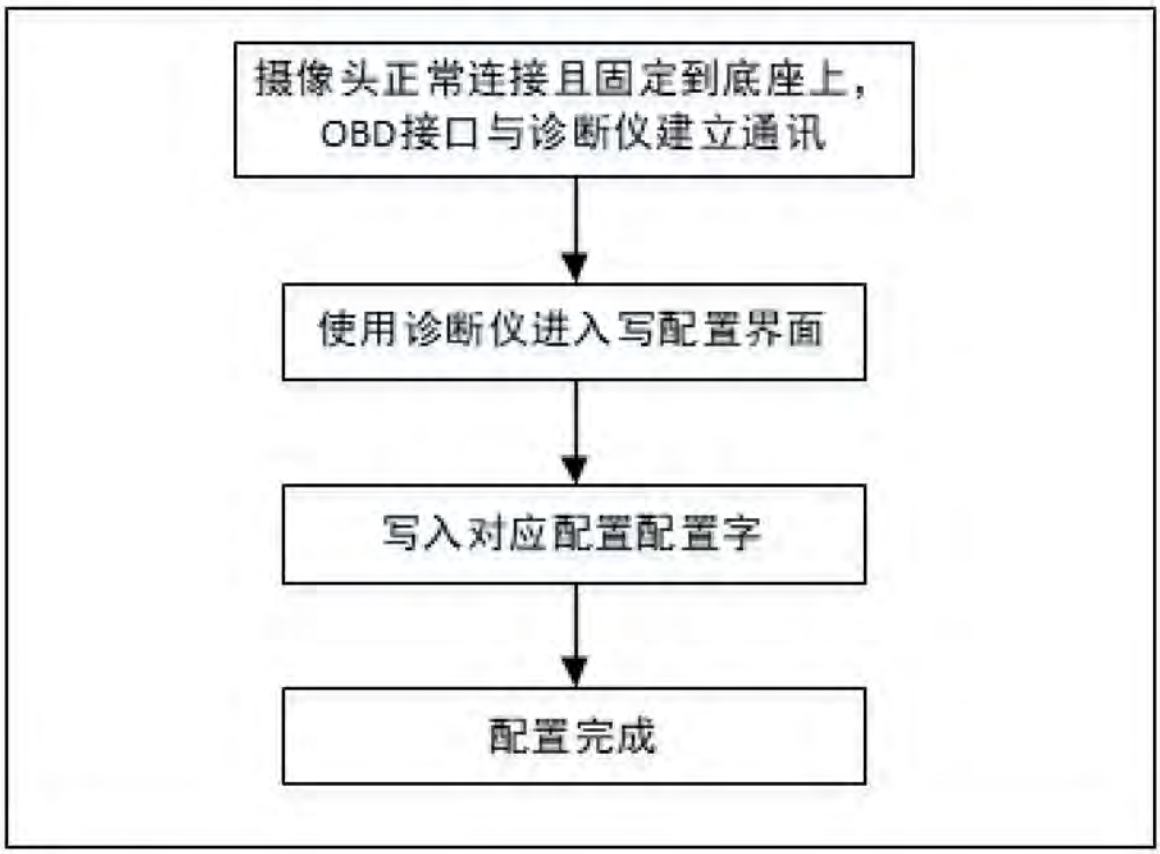
– Poor camera vision, such as in heavy rain and snowy days;

– The lane line is blurred or blocked.

4.8.3.2 Advanced driver assistance system-driver assistance multi-function camera writing configuration process

When the camera needs to be reinstalled due to slipping, damage, etc., it must be rewritten and configured. It can be recalibrated by portable diagnostic scanner (X431 diagnostic scanner, the same below).

The operation steps of portable diagnostic scanner are described as follows:



Calibration is carried out on ordinary roads according to the requirements of the above flow chart, as shown in the figure below:

① Enter the Leiting diagnostic system page and tap "Write Configuration Code"



② Write function configuration code:



③ Input configuration word:



④ The following pop-up window will be displayed when the write configuration is completed.



4.8.3.3 Accurate Test A: U300317

Accurate Test A: U300317

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300317	High voltage fault	The power supply voltage is above 16.5V for 1000ms	The power supply voltage is below 16V for 1000ms

Possible cause

– Power supply overvoltage.

Repair recommendations

Check the connection of generator and battery

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.4 Accurate Test B: U300316

Accurate Test B: U300316

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300316	Low voltage fault	The power supply voltage is below 9V for 1000ms	The power supply voltage is above 9.5V for 1000ms

Possible cause

Power supply undervoltage

Repair recommendations

Check the connection of generator and battery

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.5 Accurate Test C: U007300

Accurate Test C: U007300

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U007300	CAN bus off (body CAN)	The ECU's transmission error counter has accumulated to more than 255, and a DTC is recorded after three consecutive times	First, execute the fast recovery mode for up to 5 consecutive times. If there are still errors, switch to the slow recovery mode. Slow recovery shall be performed continuously until the Bus Off fault is recovered.

Possible cause

– Network fault

Repair recommendations

– Check CAN bus

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.6 Accurate Test D: U220D00

Accurate Test D: U220D00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U220D00	Network management LimpHome fault	After keeping the limp home state tLimphomeLog for 2000ms, record the diagnostic DTC	CAN network deactivates limphome status

Possible cause

Network fault

Repair recommendations

– Check CAN bus

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.7 Accurate Test E: U014000

Accurate Test E: U014000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U014000	BCM node lost	The message has not been received for 10 consecutive cycles. (Monitoring message: BCM1=0x180, message cycle 100ms)	1 frame of this message received

Possible cause

Network fault

Repair recommendations

– Check the BCM bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.8 Accurate Test F: U010100

Accurate Test F: U010100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U010100	VCM node lost	No VCM3/TCU2 message has been received for 10 consecutive message cycles. (Monitoring message: VCM3= 0x216, message cycle 10ms; TCU2=0x10, message cycle 10ms)	Any 1 frame of VCM3/ TCU2 message received

Possible cause

Network fault

Repair recommendations

– Check the BCM bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.9 Accurate Test G: U012100

Accurate Test G: U012100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012100	ABS node lost	The message has not been received for 10 consecutive message cycles. (Monitoring message: ABS1=0x200, message cycle 20ms)	1 frame of this message received

Possible cause

– Network fault

Repair recommendations

– Check the ESP bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.10 Accurate Test H: U012600

Accurate Test H: U012600

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012600	EPS node lost	The message has not been received for 10 consecutive cycles. (Monitoring message: SAS1=0xC2, message cycle 10ms)	1 frame of this message received

Possible cause

– Network fault

Repair recommendations

– Check SAS bus connection

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.11 Accurate Test I: U100100

Accurate Test I: U100100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U100100	Auxiliary radar lost	Private CAN1, auxiliary radar status message 0x443 is not received for more than 500ms (10*cycles)	Successfully received 0x443 message for 500ms

Possible cause

– Network fault

Repair recommendations

– Check the harness and auxiliary radar

Visual inspection and inspection before diagnosis

– Check whether there is a damaged harness

– Check whether there is a loose or damaged connector

4.8.3.12 Accurate Test J: B1B9C78

Accurate Test J: B1B9C78

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9C78	Radar offline calibration not completed	At least one of the left and right radars) has not completed offline calibration, KL15 is valid	(Both left and right radars must meet the requirements) End-of-line calibration completed

Possible cause

– Offline fault

Repair recommendations

– Re-perform offline calibration

4.8.3.13 Accurate Test K: B1B9881

Accurate Test K: B1B9881

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9881	Abnormal lateral distance of offline calibration simulator/corner reflector	Parameter exception (exceeding 0x000A~0x001E 1m~3m)	Parameter is normal (1m <= Parameter <= 3m)

Possible cause

Offline calibration not written

Repair recommendations

– Re-perform offline calibration

4.8.3.14 Accurate Test L: B1B9681

Accurate Test L: B1B9681

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and Fault Triggering Condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B1B9681	Abnormal longitudinal distance of offline calibration simulator/corner reflector	Parameter exception (exceeding 0x0014~0x0032 2m~5m)	Parameter is normal (2m <= Parameter <= 5m)

Possible cause

Offline calibration not written

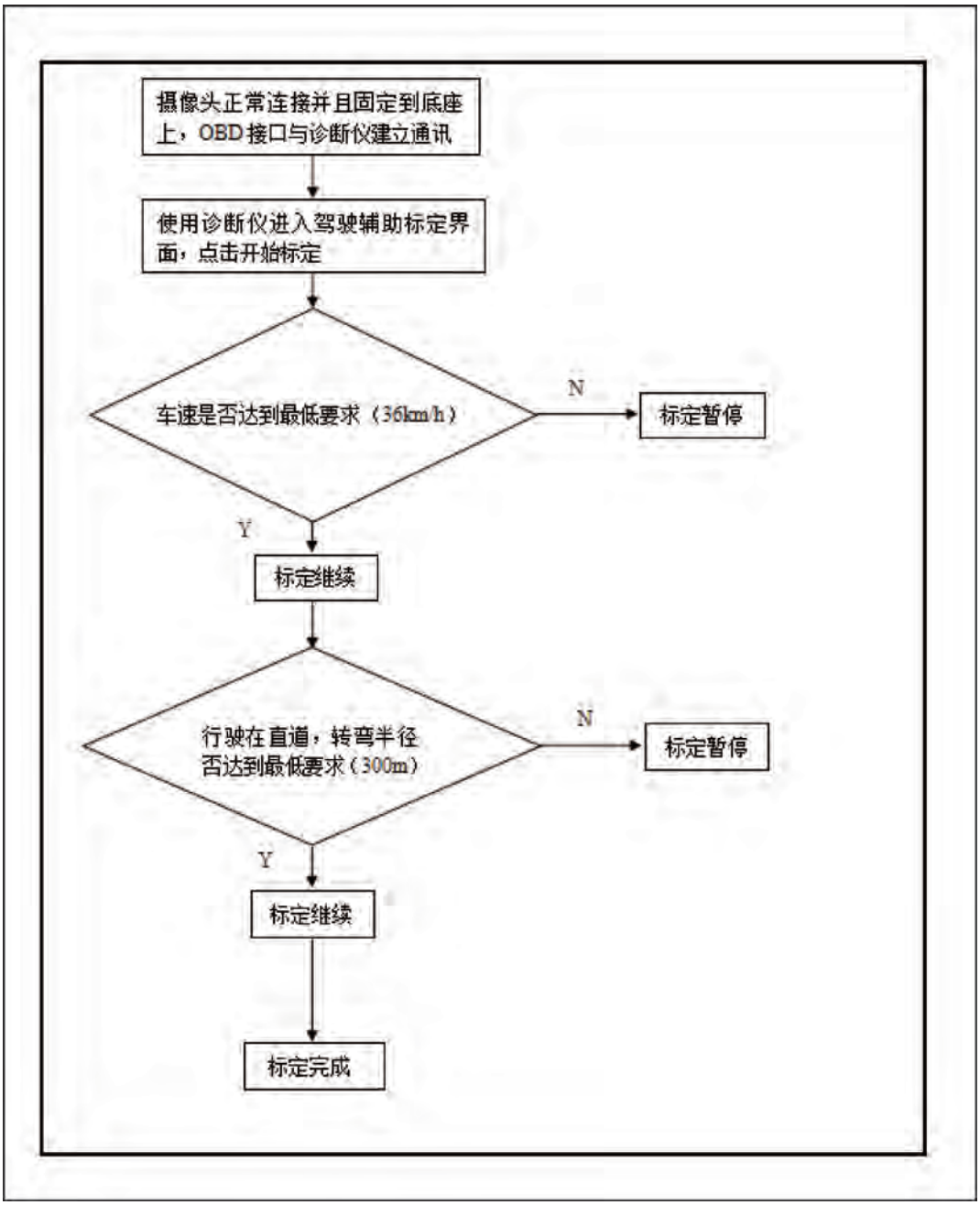
Repair recommendations

– Re-perform offline calibration

4.8.3.15 Advanced Driver Assistance System-Calibration Process of ADAS Multi-purpose Camera

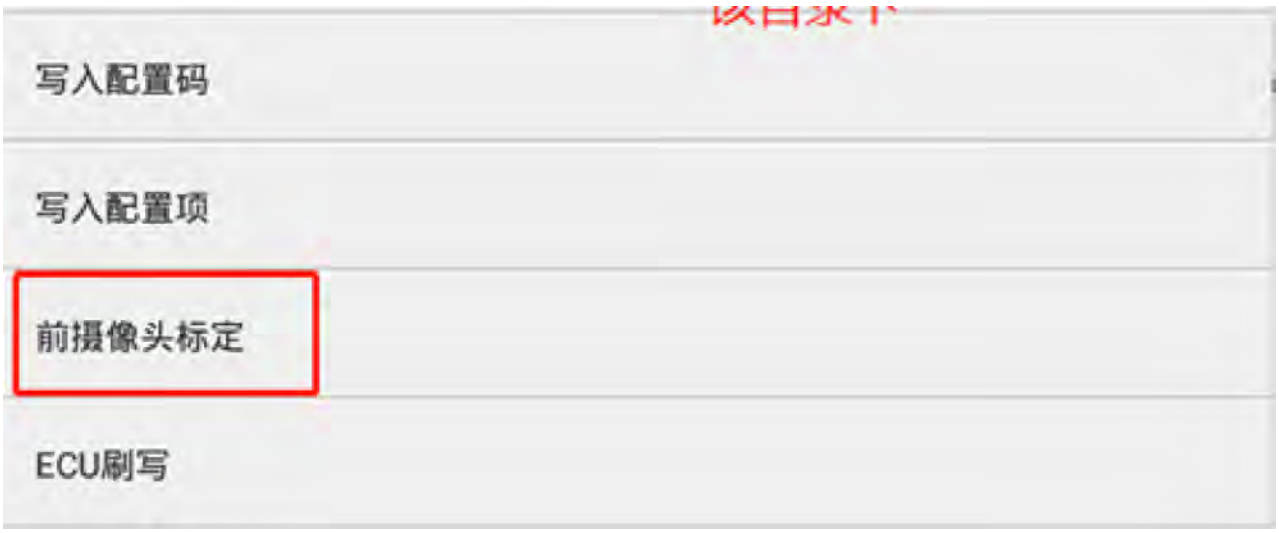
When the camera needs to be reinstalled due to falling, damage, or other reasons, it must be recalibrated. It can be recalibrated by portable diagnostic scanner (X431 diagnostic scanner, the same below).

The operation steps of portable diagnostic scanner are described as follows:

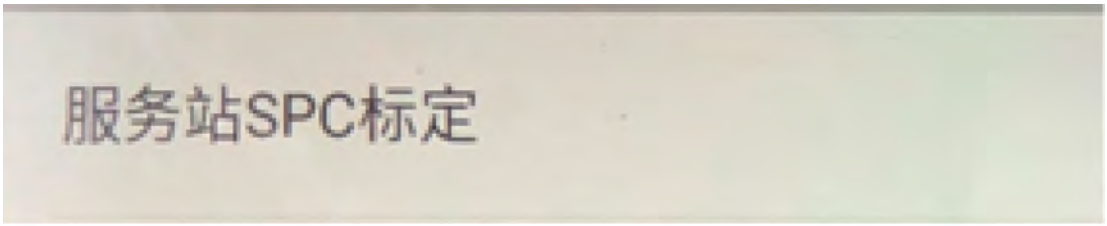


Calibration is carried out on ordinary roads according to the requirements of the above flow chart, as shown in the figure below:

⑤ Enter the Leiting REEV diagnosis system page



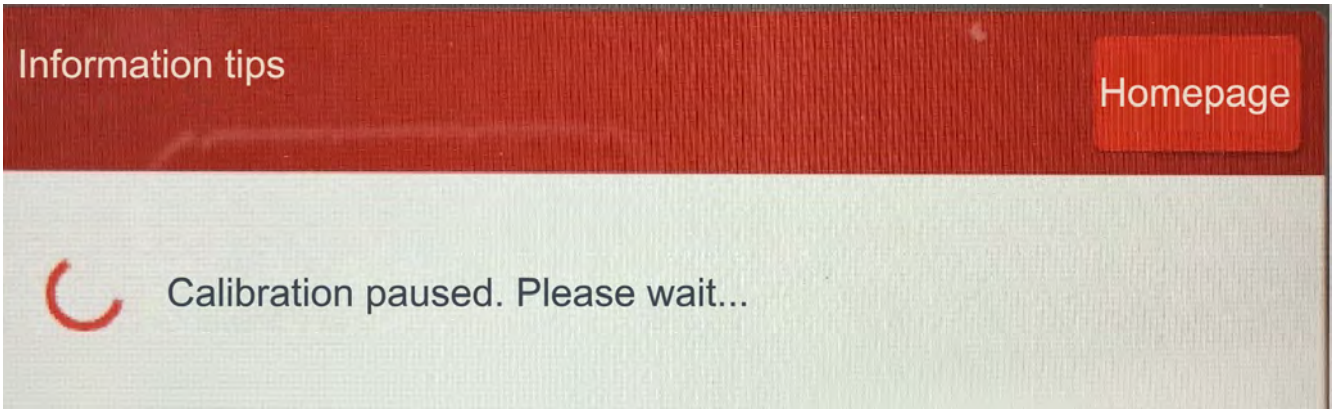
⑥ Tap "Service Station SPC Calibration"



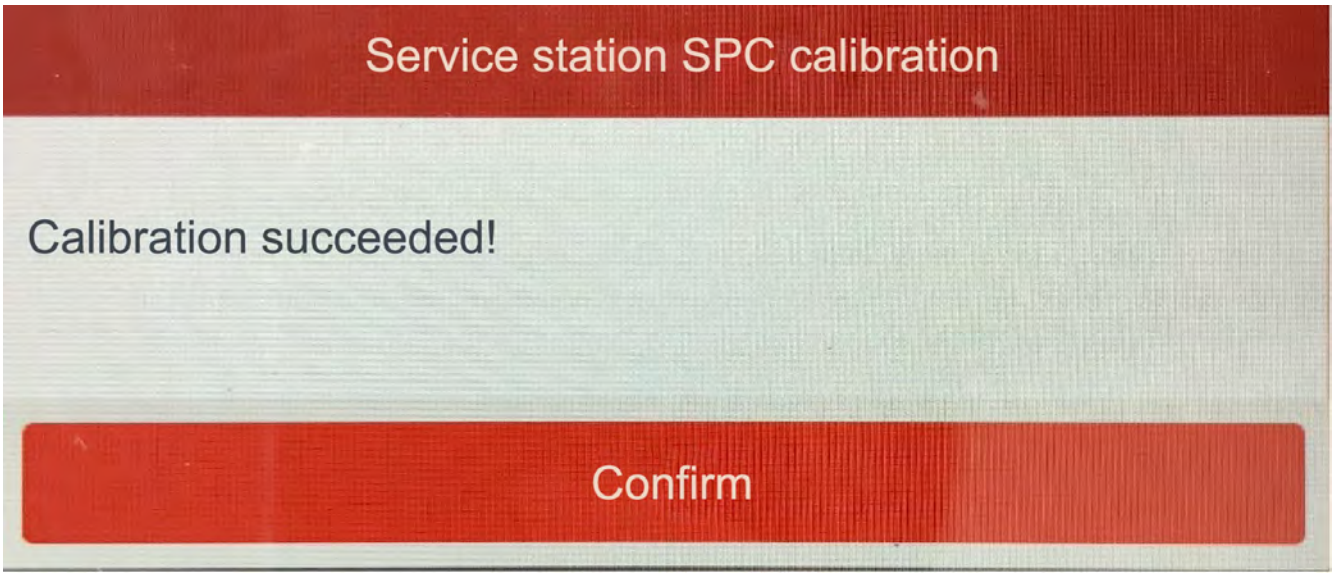
⑦ When the vehicle speed exceeds 36 km/h and the vehicle is on a straight road, the following pop-up will appear.



⑧ If the requirements in item ③ are not met, the following pop-up window will appear.



⑨ The following pop-up window will be displayed when the calibration is completed.



If the calibration procedure reports the following errors, they must be handled as appropriate:

– "Initialisation not completed", check the circuit and recalibrate;

– "Field of view out of calibration range", check whether the camera installation position is correct and recalibrate;

– "Roll angle out of range", check whether the camera installation position, angle and vehicle posture are correct, and recalibrate.

The following situations will cause the calibration speed to slow down or fail:

– Roads with poor lighting conditions at night;

– Poor camera vision, such as in heavy rain and snowy days;

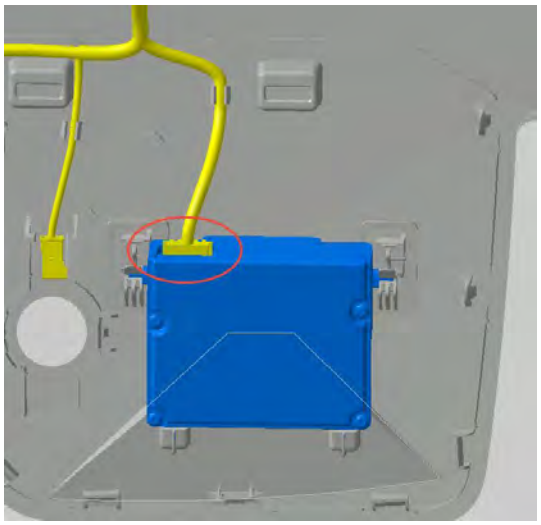
– The lane line is blurred or blocked.

4.8.4 Removal and installation

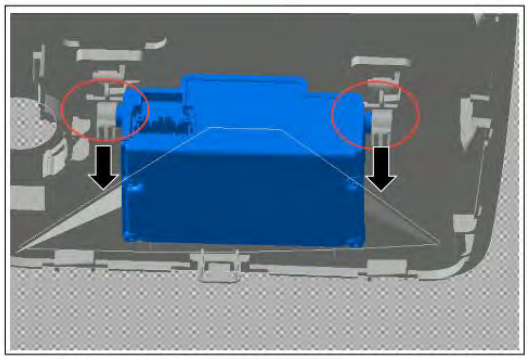
4.8.4.1 Driver assistance multi-function camera

Removal

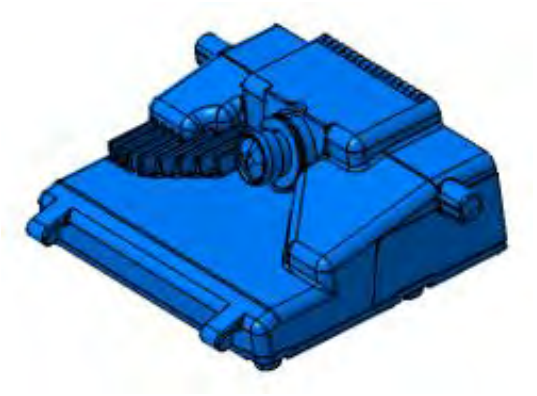
1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the interior rearview mirror cover plate.
3. After removing the interior rearview mirror cover plate, disconnect the driver assistance multi-function camera harness connector first.



4. Pull out the driver assistance multi-function camera in the direction of the arrow.



5. Remove the driver assistance multi-function camera.



Installation

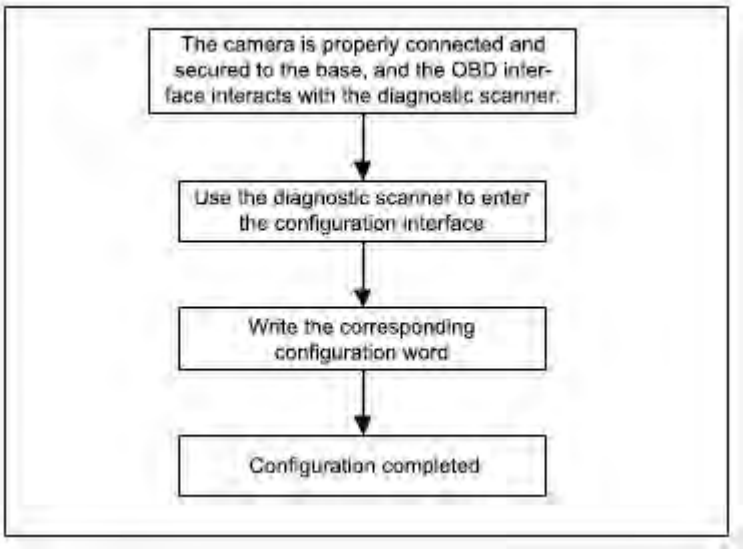
The installation order is the reverse of the removal order.

4.8.5 General procedures

4.8.5.1 Configuration writing process of the driving assist multi-functional camera

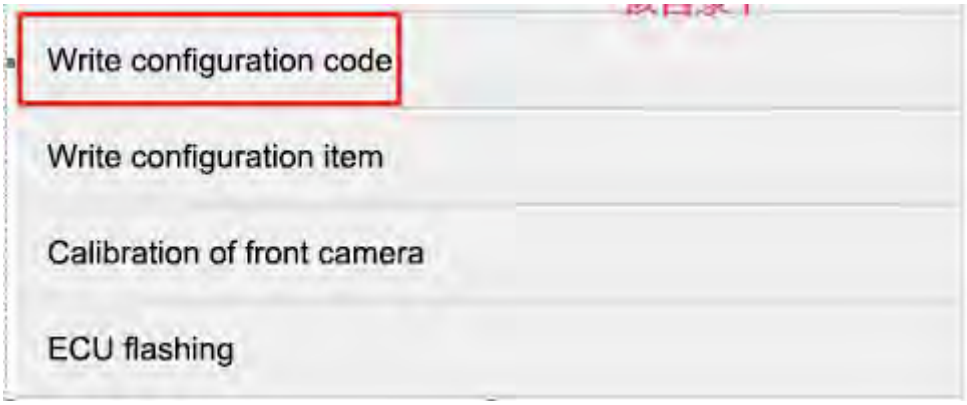
When the camera needs to be reinstalled due to slipping, damage, etc., it must be rewritten and configured. It can be recalibrated by portable diagnostic scanner (X431 diagnostic scanner, the same below).

The operation steps of portable diagnostic scanner are described as follows:

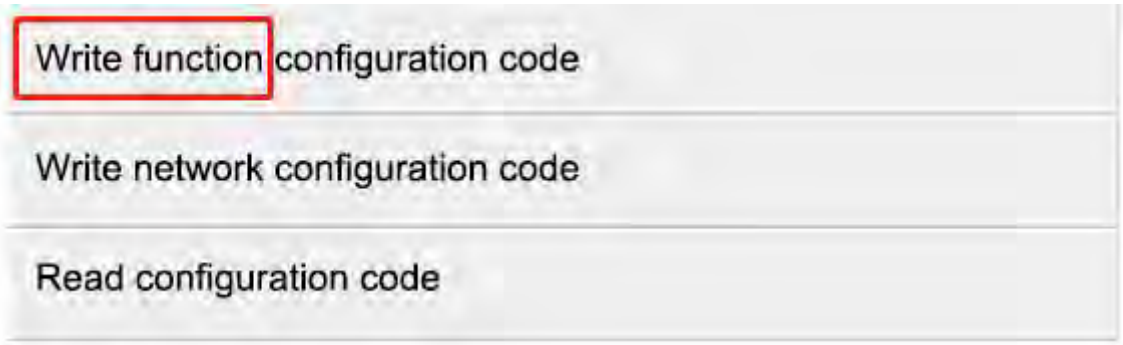


Calibrate on ordinary roads according to the requirements of the above flow chart.

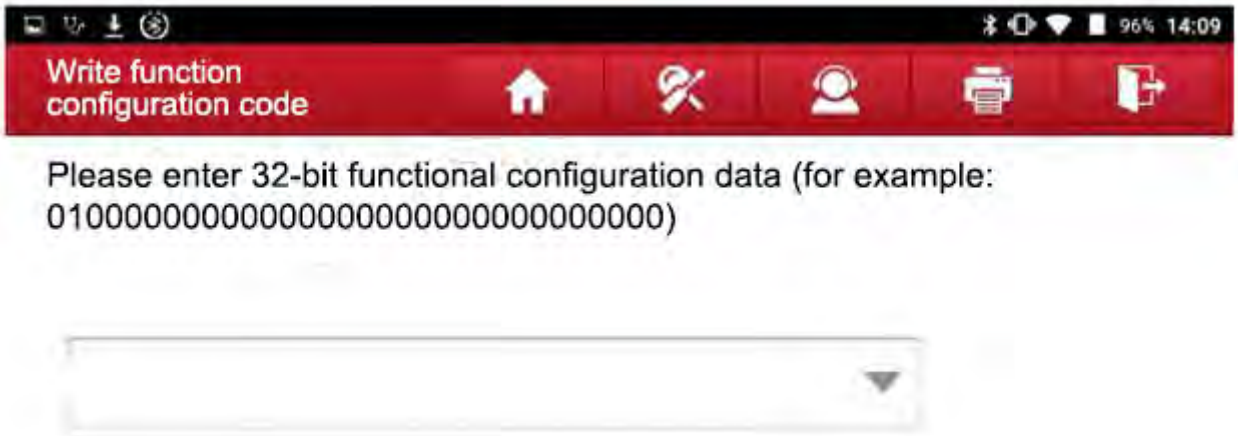
1. Enter the Leiting diagnostic system page and tap "Write configuration code".



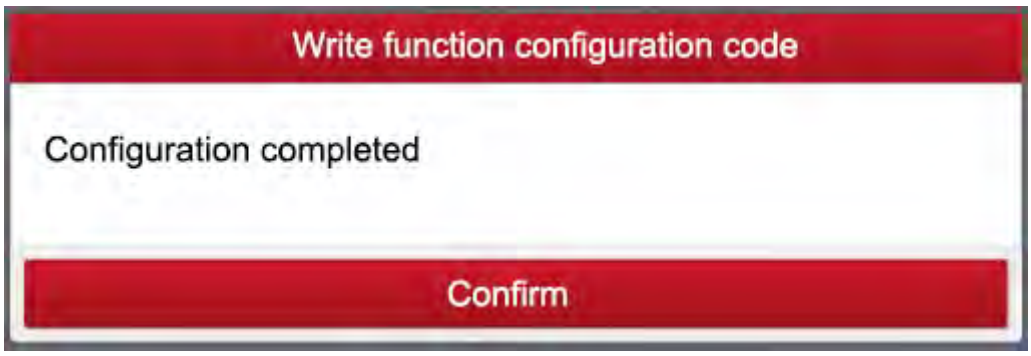
2. Write function configuration code.



3. Enter configuration word: 00000000000000000000000000001F9.



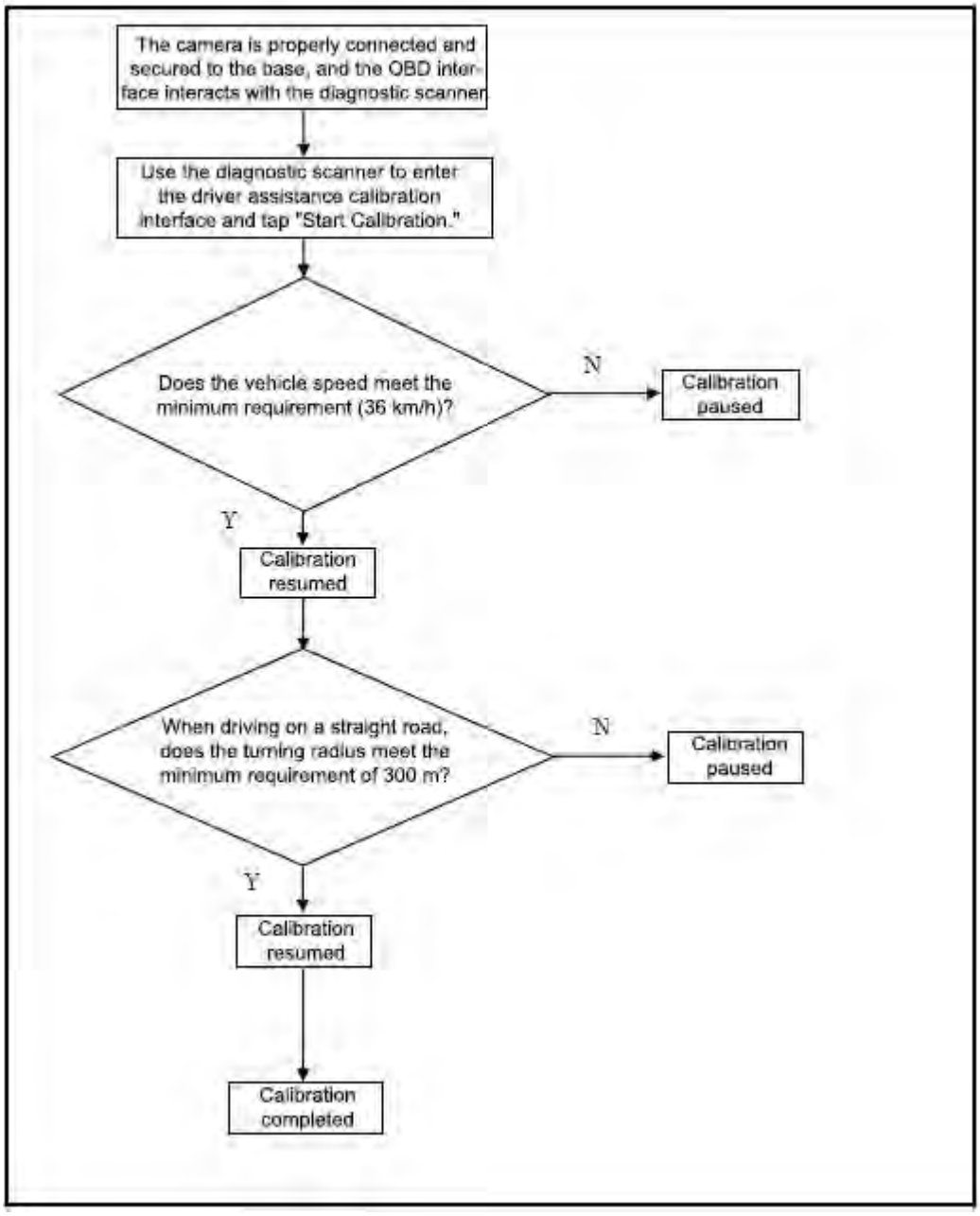
4. The following pop-up window will be displayed when the write configuration is completed.



Calibration process of the driving assist multi-functional camera

When the camera needs to be reinstalled due to falling, damage, or other reasons, it must be recalibrated. It can be recalibrated by portable diagnostic scanner (X431 diagnostic scanner, the same below).

The operation steps of portable diagnostic scanner are described as follows:

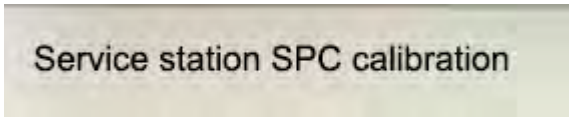


Calibrate on ordinary roads according to the requirements of the above flow chart.

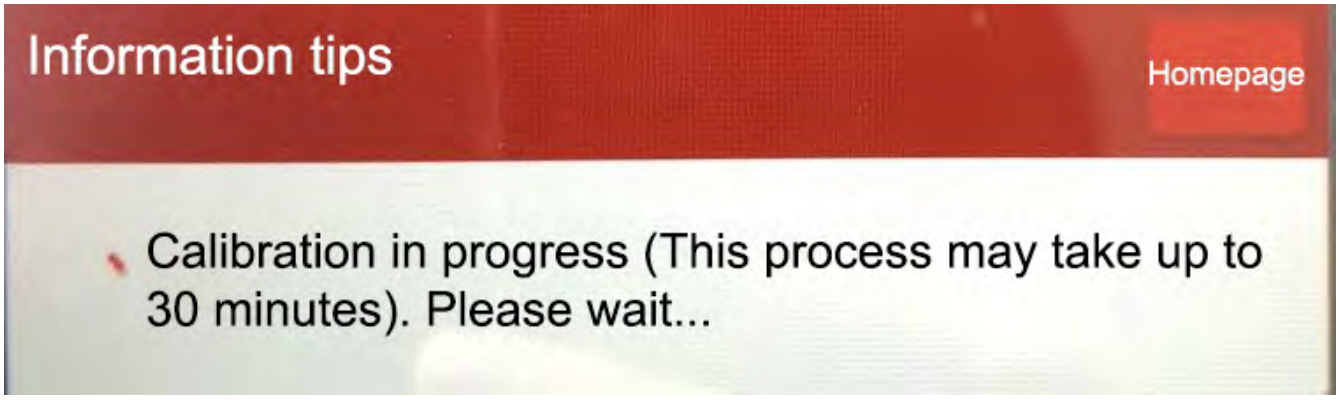
1. Enter the Leiting REEV diagnosis system page.



2. Tap "Service Station SPC Calibration".



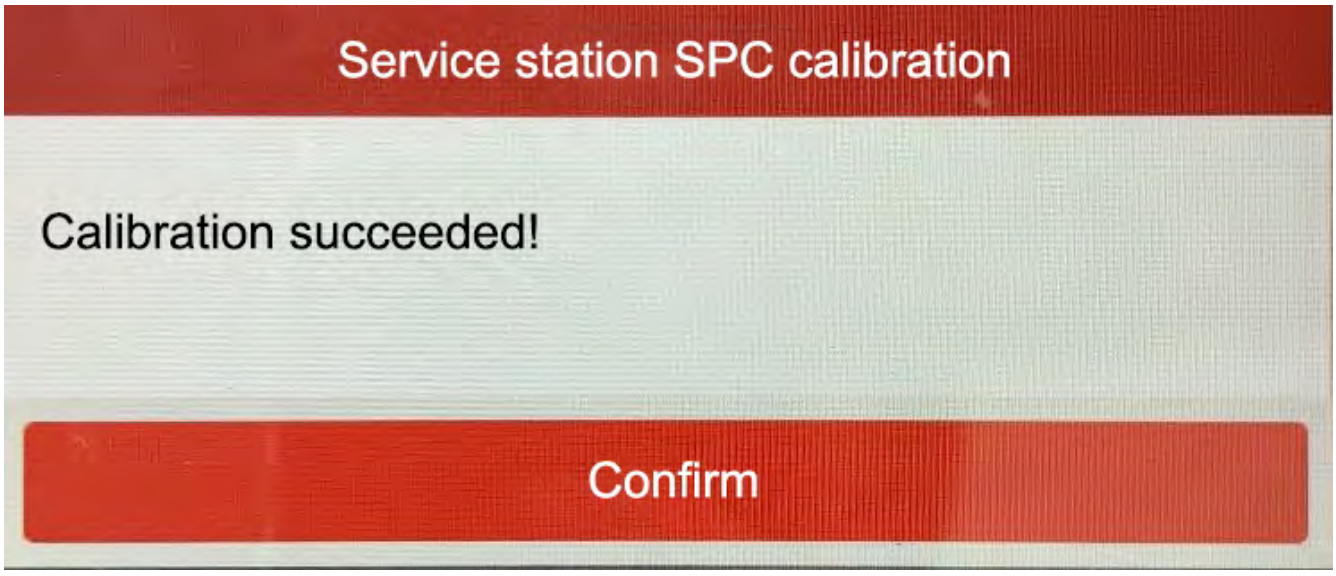
3. When the vehicle speed exceeds 36 km/h and the vehicle is on a straight road, the following pop-up will appear.



4. If the requirements in item 3 are not met, the following pop-up window will appear.



5. The following pop-up window will be displayed when the calibration is completed.



If the calibration procedure reports the following errors, they must be handled as appropriate:

1. "initialisation not completed", check the circuit and recalibrate.

2. "Field of view out of calibration range", check whether the camera installation position is correct and recalibrate.

3. "Roll angle out of range", check whether the camera installation position, angle and vehicle posture are correct, and recalibrate.

The following situations will cause the calibration speed to slow down or fail:

1. Roads with poor lighting conditions at night.

2. Poor camera vision, such as in heavy rain and snowy days.

3. The lane line is blurred or blocked.

4.9 Parking assist system

4.9.1 Specification

4.9.1.1 General specifications

Reversing radar system

Hostless radar main sensor

Item	Specification
Rated voltage	DC 12V
Voltage range	DC 9V ~ 16V
Input frequency	55.5±2KHZ
Operating temperature	-30℃~+80℃
Storage temperature	-40℃~+85℃
Maximum detection distance	60±10cm (PVC pipe with a diameter of 75mm)

UPA sensor

Item	Specification
Input voltage	7 ~ 9V
Operating temperature	-30℃~+80℃
Storage temperature	-40℃~+85℃
Detection distance	Both sides: 60±10cm, middle part: 150±10cm (PVC pipe with a diameter of 75mm)
Input frequency	55.5±2KHZ

Rear view camera system

Reversing camera (SD)

Item	Specification
Rated voltage	DC 12V
Voltage range	DC 9.0V ~ DC 16V
Operating Current	<120mA
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+90℃
Signal output	CVBS
Horizontal field of view	122 ° ±5 °
Vertical field of view	95 ° ±5 °
Effective pixel	640(H)x480(V)
Frame rate	30fps

Panoramic view system

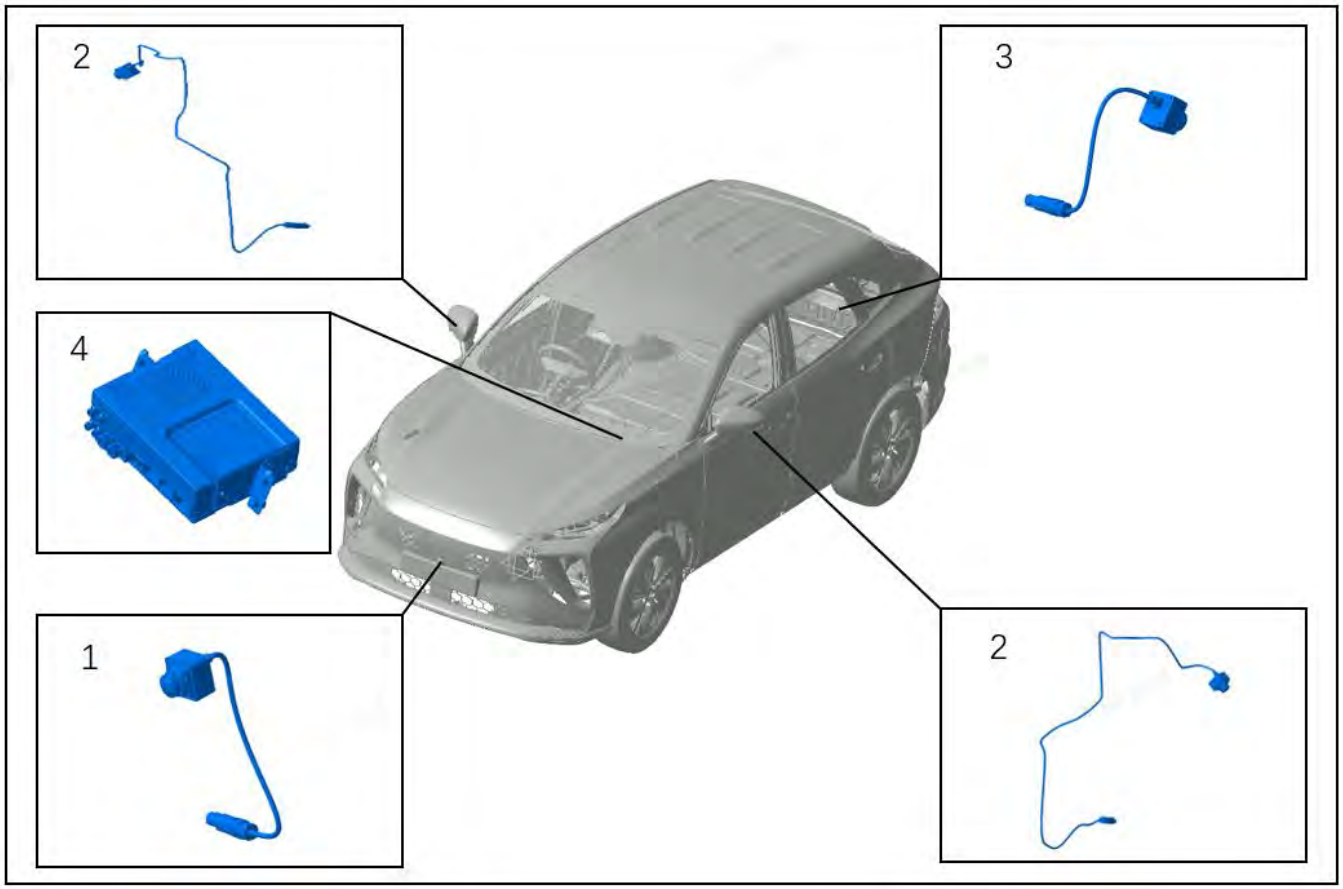
AVM camera

Item	Specification
Voltage range	DC7 ~ 13V
Operating Current	<200mA
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+95℃
Signal format	YUV422 BT601
Display frame rate	30fps
Horizontal field of view	196 ° ±5 °
Vertical field of view	147 ° ±5 °

4.9.2 Instructions and operations

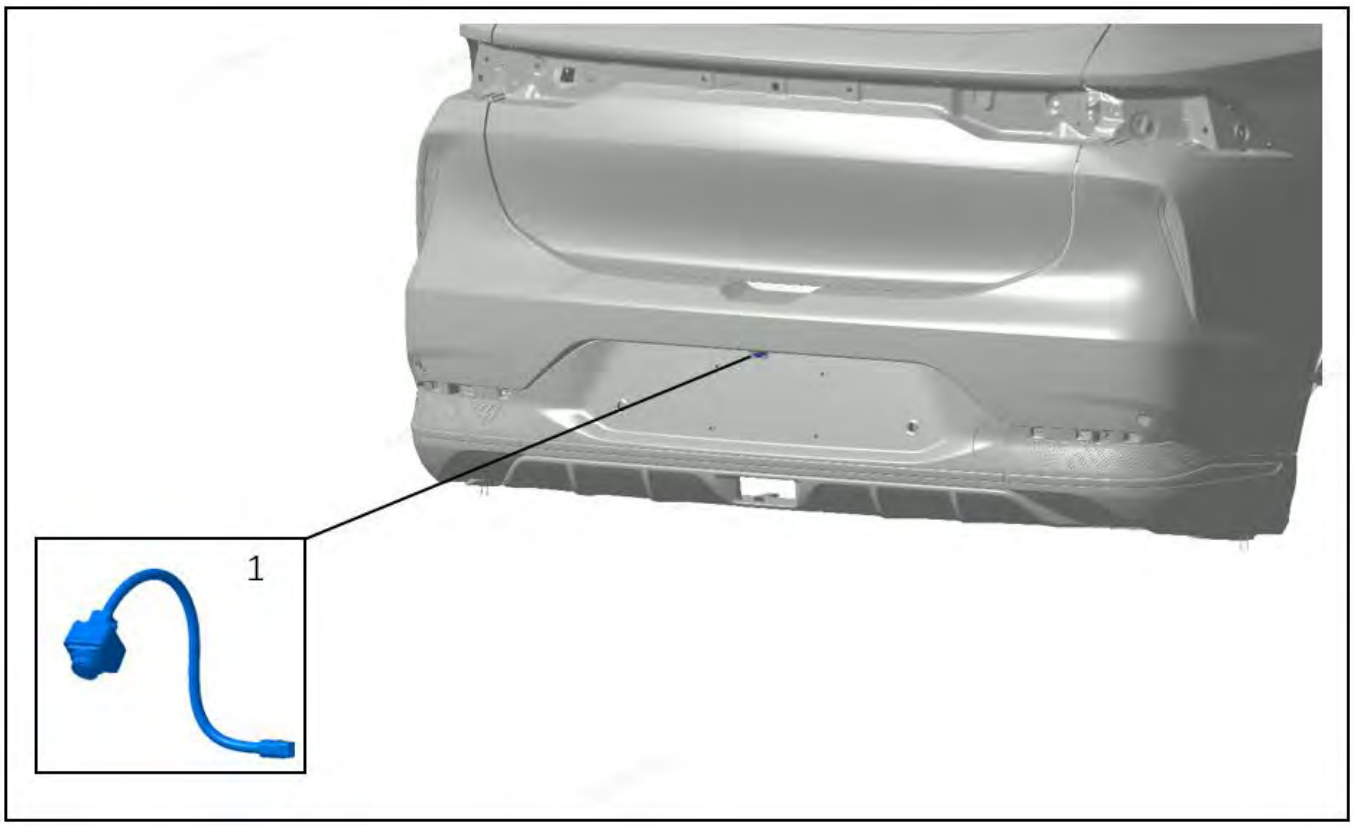
4.9.2.1 Component Locating Diagram

Parking assist system



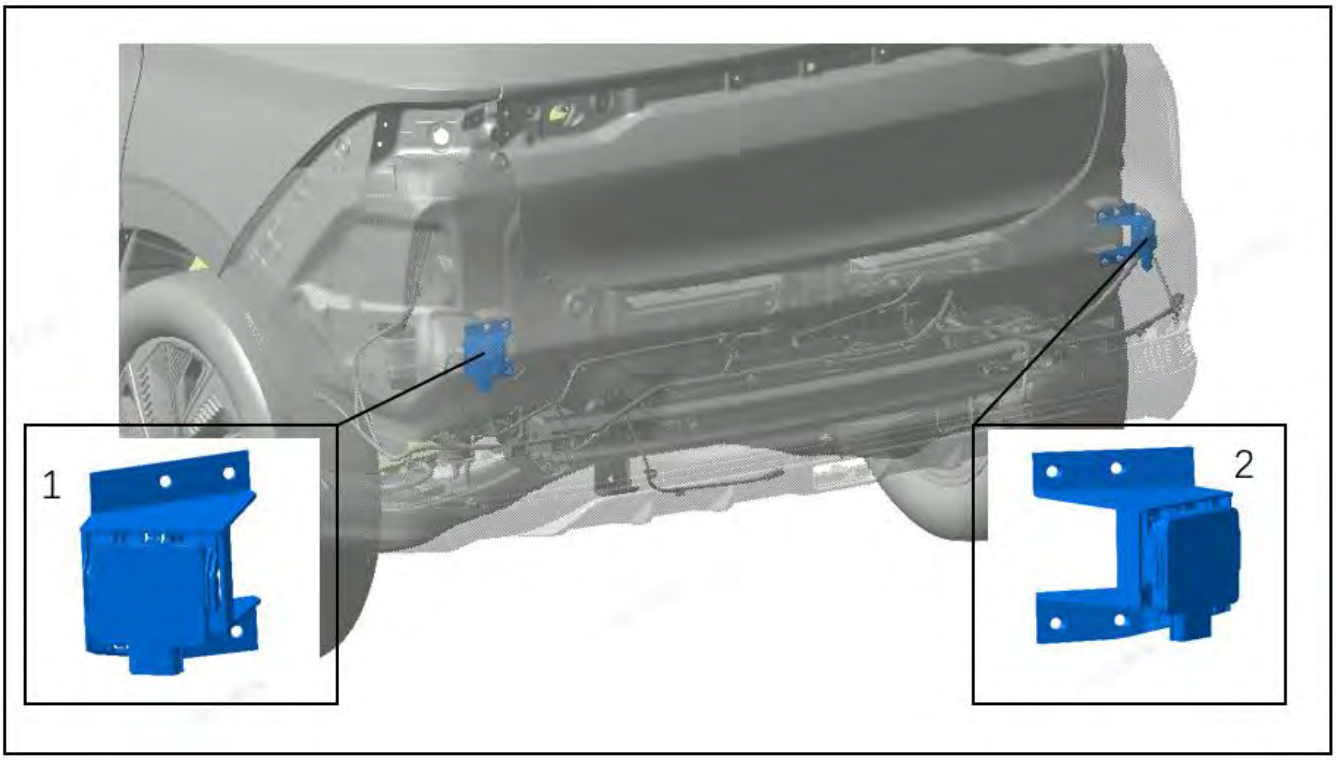
Item	Description
1	Front camera
2	Side-view camera
3	Rear camera
4	Audio module

Parking assist system



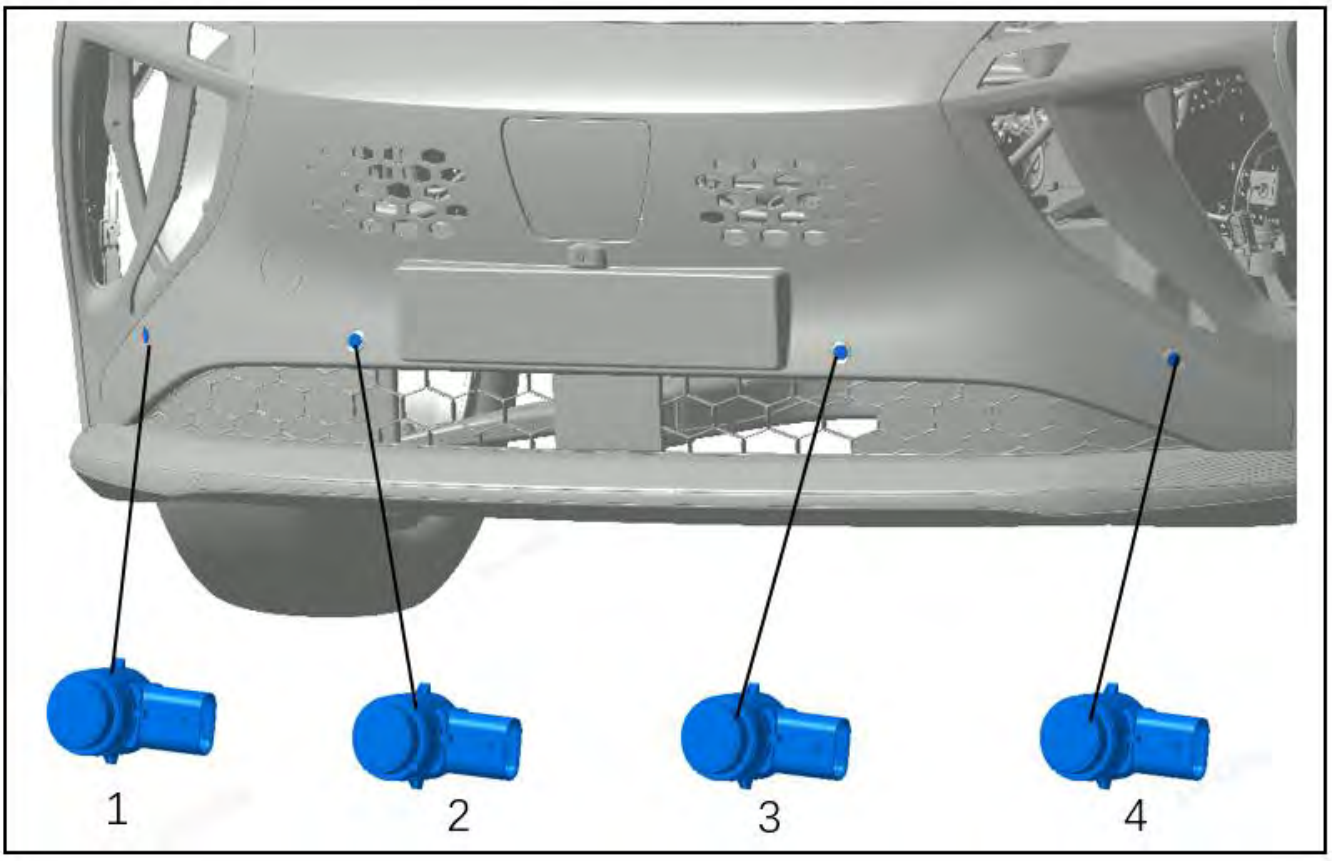
Item	Description
1	Rear view camera

Rear corner mmWave radar



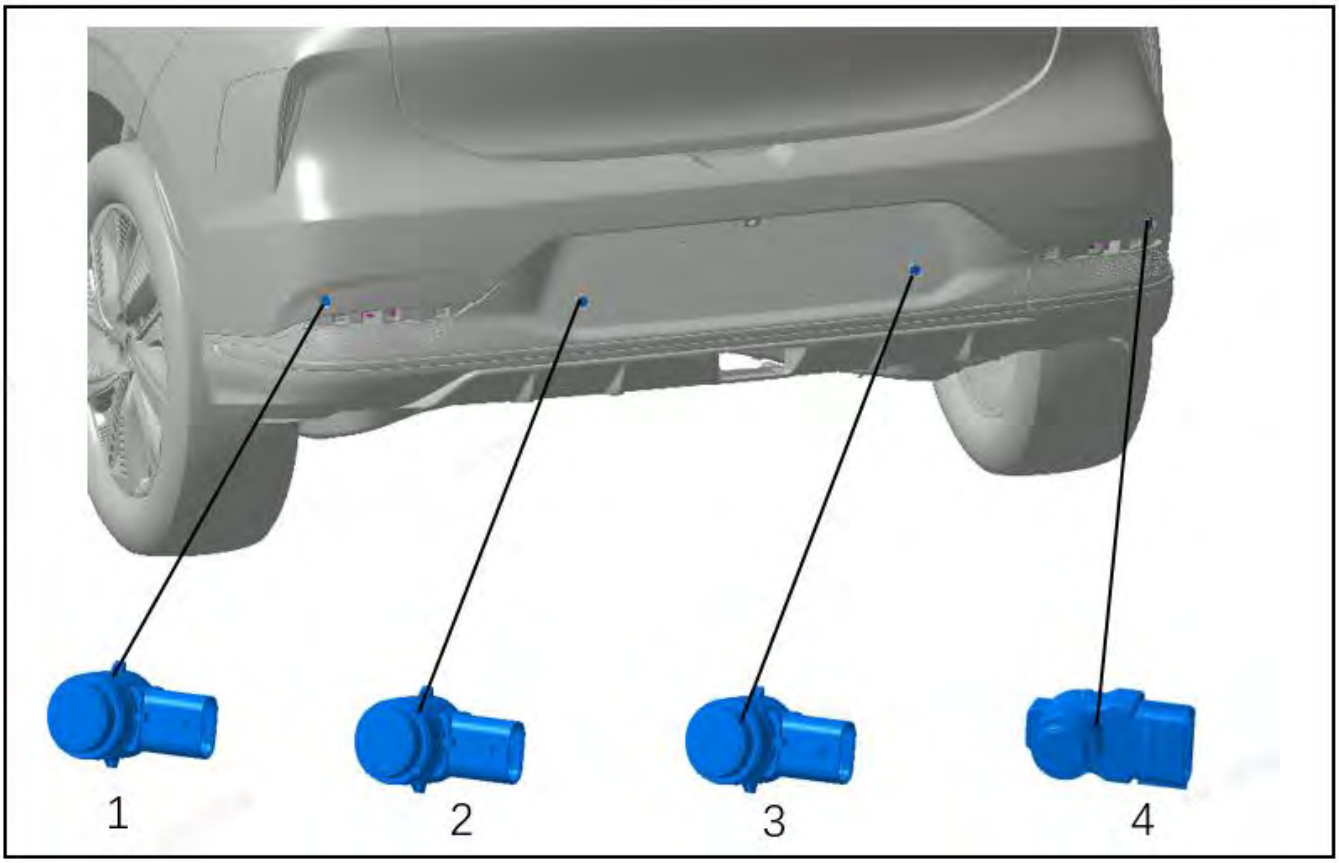
Item	Description
1	Corner mmWave radar (rear left)
2	Corner mmWave radar (rear right)

Front parking radar



Item	Description
1	Front parking sensor F2
2	Front parking sensor F3
3	Front parking sensor F4
4	Front parking sensor F5

Rear reversing radar



Item	Description
1	Reversing radar sensor R2
2	Reversing radar sensor R3
3	Reversing radar sensor R4
4	Reversing radar sensor R5

4.9.2.2 Overview

Reversing radar system

The reversing radar function is mainly composed of a hostless radar main sensor and three or seven slave sensors. The main sensor contains a built-in microcomputer processing chip that can command the slave sensor to send out detection signals. After these signals are reflected by an obstacle, the main sensor instructs the slave sensor to receive the reflected signals. The main sensor analyses and calculates the data, and promptly transmits the obstacle distance and warning information via the CAN bus to the audio head unit or instrument cluster. The instrument cluster then controls the internal buzzer to emit different tones, alerting the driver to how far the vehicle is from the obstacle. When the car is reversing, the reversing radar receives information such as gear position and handbrake status via the CAN bus to determine whether the reversing radar should be activated. For example, in an automatic transmission vehicle, when the gear is in the R position, the reversing radar function becomes active to alert the driver about obstacles behind the vehicle.

Precautions:

Caution: The system is an auxiliary tool that senses the obstacles in a short distance via an ultrasonic sensor to help the driver to determine the distance from the obstacles when the vehicle is in reverse gear, without exempting the driver from the duty of care. Therefore, the driver should not be over-dependent on the system and must be careful. The manufacturer is not responsible for accidents caused by the driver's negligence.

Caution: Keep driving at a speed below 5 km/h during reversing.

Caution: Physical characteristics, position, angle, size and materials of the object or complicated background may lead to detection range narrowing down, failure to actuate or working by mistake. All these are normal aspects, not because of the system itself.

Caution: When the vehicle is reversing uphill or downhill, false alarm may occur to remind you to be more careful.

Caution: The following unfavourable sites or obstacles may be undetectable or cannot be well detected:

1 Wire mesh, small objects such as ropes.

2 Driving in the grass or on rough roads.

3 Materials such as cotton or those whose surfaces easily absorb sound waves.

4 Foreign objects on the detector surface.

5 Ultrasonic noise, metallic sounds, and high-pressure gas emission noises at the same frequency (55.5KHz).

6 Non-standard radio communication equipment installed in the vehicle: Using these devices will interfere with the system's functions (excluding mobile phones and audio systems).

Rear view camera system

The reversing image system mainly consists of a reversing camera (SD). The camera is powered by the audio head unit and displays video.

Precautions:

Caution: This system features a 1-megapixel SD camera with limited image clarity. Maintenance personnel must be able to assess the camera's condition. For customer complaints about insufficient clarity, if the camera is functioning properly, maintenance personnel should provide a proper explanation.

Caution: Due to the limited range of the camera, it cannot guarantee that all obstacles behind the vehicle will be displayed. When reversing, the driver must carefully assess the surrounding environment.

Caution: The camera operates similarly to the human eye, with limited visibility in conditions such as dusk, night, dawn, snow, rain, and fog. This product is intended primarily to assist drivers; the driver remains fully responsible for keeping a safe distance from all obstacles at all times.

Caution: A dirty camera will affect the use of the system. Please clean it up in time.

Panoramic view system

The panoramic surround view system (hereinafter referred to as AVM) consists of 4 cameras and 1 main unit. The main unit is responsible for supplying power to the cameras, receiving and processing the video input from the cameras, receiving external input signals for logical analysis, and outputting the processed video to the audio system for display. The system collects images from 4 cameras positioned around the body, processes and stitches them together for display. The system functions when the vehicle speed is below 30KM/h and can be activated by shifting to the reverse gear, using the left or right turn signals, or pressing the AVM switch. Once the display is activated, you can use the audio system touchscreen to switch between 2D view, 3D view, front and rear wide-angle views, wheel view, 3D surround view, and the settings interface.

Precautions:

Caution: Failure to follow the instructions may lead to death or serious injury.

Caution: The panoramic view system is not used to reduce the driver's attention.

Caution: Excessive reliance on the panoramic view system may cause major accidents.

Caution: Please use it after correctly understanding its functions.

Caution: Please note that excessive rain or fog may prevent obstacles from being visible on the display.

Caution: Due to the characteristics of the camera and environmental factors, there may be differences between the displayed image and the actual situation around the vehicle body. For those unfamiliar with the system, please use it with extra caution during the initial period.

Caution: Suggestions for preventing faults or damage to this product are provided.

Caution: The handling method of abnormal situations is recorded.

Caution: This system captures images of the external environment via an image sensor when the vehicle is reversing or turning. It is an auxiliary tool to help the driver make judgments, but does not relieve the driver from maintaining safety awareness. Therefore, the driver should not be over-dependent on the system and must be careful. The manufacturer is not responsible for the accidents due to the driver's negligence.

Caution: Keep driving at a speed below 5 km/h during reversing.

Caution: Due to physical characteristics such as the position, angle, size, material of objects, or complex backgrounds, differences in the field of view may occur. This does not indicate a system malfunction.

Caution: When reversing uphill or downhill, visual perception errors may occur. Please be especially careful in these situations.

Caution: The following unfavourable sites or obstacles may hinder detection or result in poor visibility:

1 Wire mesh, small objects such as ropes.

2 Driving in the grass or on rough roads.

3 Three-dimensional obstacles may be partially unobservable or appear distorted.

4 Foreign objects exist on the camera surface.

5 The camera lens is scratched or damaged.

4.9.2.3 Precautions

Precautions during repair

1. Before maintenance, please disconnect the start battery negative terminal to avoid the harness being short-circuited during disassembly, which may result in fuse blowout or even fire, and avoid personal injury.
2. Have professionals perform the operation to avoid scratches on the exterior caused by improper handling.
3. Please arrange for professionals to operate it. When removing the ADC, take caution to protect surrounding components to avoid damage caused by improper handling.

4.9.3 Diagnosis and testing

4.9.3.1 General tools for parking assist system (reversing radar)

General tools for parking assist system

General Tools

Digital multimeter

4.9.3.2 Appearance inspection form of parking assist system (reversing radar)

Parking assist system

Appearance Checklist

Electrical
• Fuse • Circuit • Reversing radar sensor

4.9.3.3 Parking Assist System (Reversing Radar) Symptom Table

Symptoms	Possible cause	Measures
No alarm in meeting of obstacles during reversing	• Circuit.	• Check the radar main unit fuse. • Check the lines between the left reversing radar sensor, the right reversing radar sensor and the radar main unit harness connector. • Check the GND circuits of the left and right reversing radar sensors.
	• Reversing main radar sensor.	• Check the reversing radar sensor.
	• Reversing radar sensor	• Check the reversing radar sensor.
	• Reverse gear disabled.	• Check the power supply circuit of the main reversing radar sensor. • Check the GND circuit of the reversing main radar sensor.
Buzzer alarm with no obstacles during reversing	• Reversing main radar sensor.	• Reversing main radar sensor. Refer to Main Reversing Radar Sensor (Parking Assist System, Removal and Installation)
	• There is foreign object on sensor.	• Remove foreign objects.
	• Sensor incorrectly installed.	• Re-install the reversing radar sensor. Refer to Main Reversing Radar Sensor (Parking Assist System, Removal and Installation)
Inaccurate warning of distance to obstacles during reversing	• Obstacles are sound-absorbing materials. Such as: sponge, foam, etc.	• Sensor characteristics, no returning sound wave.
	• The obstacle is too small.	• The sensor cannot detect.
	• Poor contact of sensor connector.	• Check the sensor connection connector.

	• Dirt or foreign matter on the sensor surface.	• Keep the sensor surface clean and wipe off dirt on the surface.
	• Sensor.	• Replace the reversing radar sensor. Refer to Main Reversing Radar Sensor (Parking Assist System, Removal and Installation)

4.9.3.4 Diagnosis and testing of parking assist system (reversing image)

Inspection and confirmation

1. Confirm the problems raised by customers and carry out corresponding inspections and tests.

2. Check the appearance for obvious signs of mechanical and electrical damage.

3. Resolve the problems found before performing the next step of inspection.

4. If the cause cannot be determined from the appearance, confirm the symptoms first, and then check according to the symptom table.

4.9.3.5 Diagnosis and testing of parking assist system (reversing image)

Appearance Checklist

Electrical
• Fuse
• Harness
• Plug
• Reversing camera

4.9.3.6 Diagnosis and testing of parking assist system (panoramic image)

Inspection and confirmation

1. Confirm the problems raised by customers and carry out corresponding inspections and tests.

2. Check the appearance for obvious signs of mechanical and electrical damage.

3. Resolve the problems found before performing the next step of inspection.

4. If the cause cannot be determined from the appearance, confirm the symptoms first, and then check according to the symptom table.

4.9.3.7 Diagnosis and testing of parking assist system (panoramic image)

Appearance Checklist

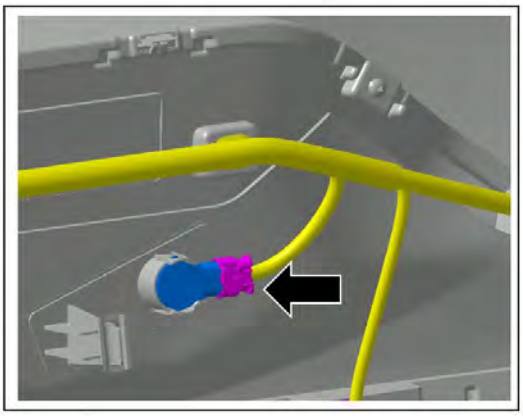
Electrical
• Fuse
• Harness loose or corroded
• Audio module
• Front camera
• Side-view camera
• Rear camera

4.9.4 Removal and installation

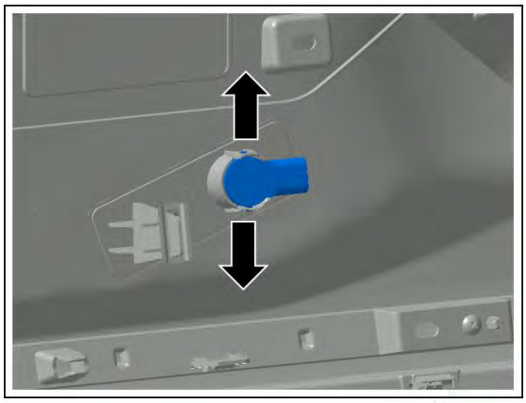
4.9.4.1 Hostless radar main sensor and UPA sensor

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Lift the vehicle. Refer to: Lifting the vehicle.
3. Remove the rear bumper assembly. Refer to: Rear bumper assembly.
4. Disconnect the sensor harness connector.



5. Remove the sensor bracket and take down the radar sensor.



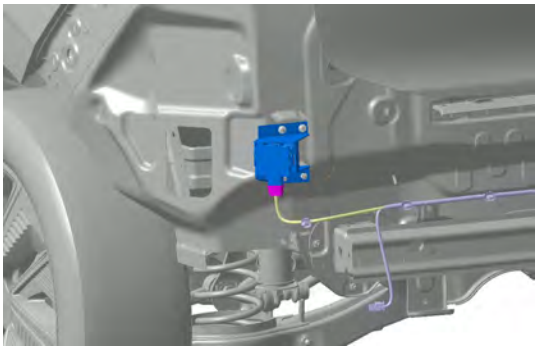
Installation

1. The installation order is the reverse of the removal order.

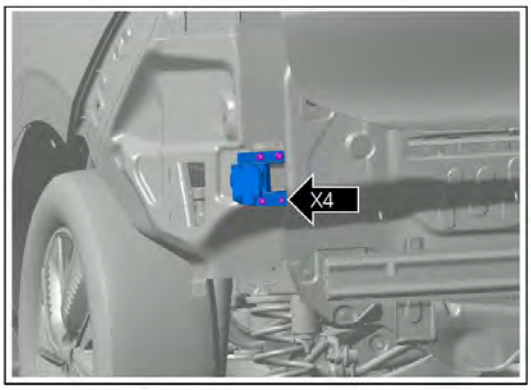
4.9.4.2 Corner mmWave radar

Removal

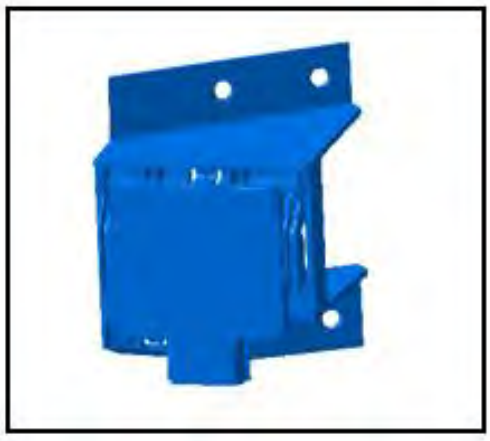
1. Disconnect the negative battery cable.Refer to: Disconnect the battery negative cable.
2. Remove the rear bumper.Refer to: Removal and installation of rear bumper.
3. After removing the rear bumper, disconnect the corner mmWave radar harness connector first.



4. Remove the corner radar fixing bolts fixed to the rear body.



5. Take out the corner mmWave radar.



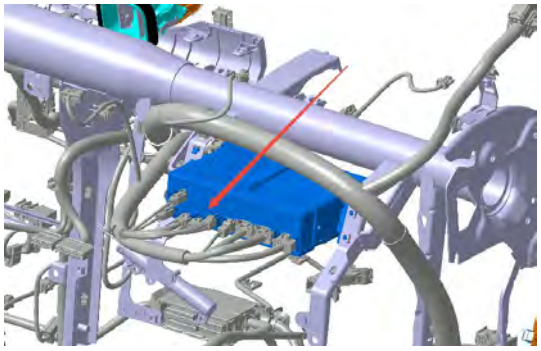
Installation

1. The installation order is the reverse of the removal order.

4.9.4.3 AVM control module

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the dashboard assembly. Refer to: Dashboard.
3. Remove the AVM control module



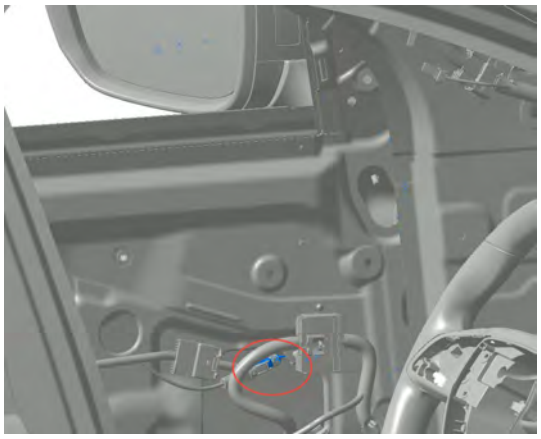
Installation

1. The installation order is the reverse of the removal order.

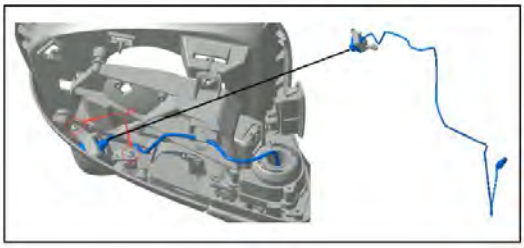
4.9.4.4 AVM side view camera

Removal

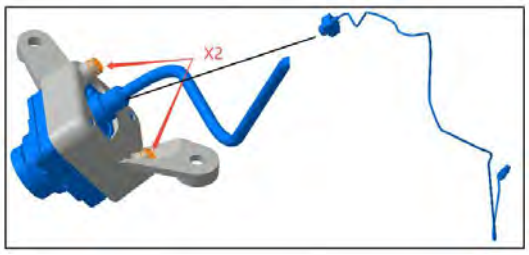
1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front left and right door shields. Refer to: Front door shield.
3. Disconnect the AVM side-view camera harness connector.



4. Remove the left and right exterior rearview mirrors. Refer to: Exterior rearview mirror assembly.
5. Remove the fixing screws of the side-view camera, and then take out the side-view camera.



6. Remove the camera fixing bracket.



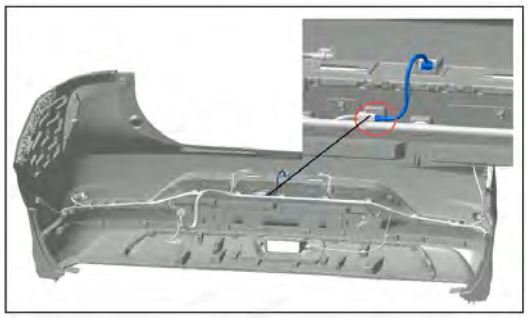
Installation

The installation order is the reverse of the removal order.

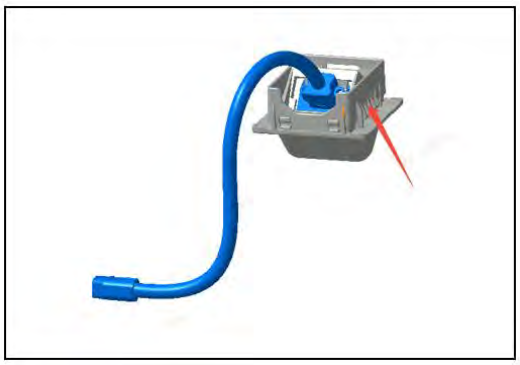
4.9.4.5 Rear view camera

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear bumper. Refer to: Rear bumper assembly.
3. Disconnect the reversing camera harness connector.



4. Press the camera bracket clip on the rear bumper and remove the camera.



5. Remove the reversing image camera fixing bracket, and take off the reversing image camera.



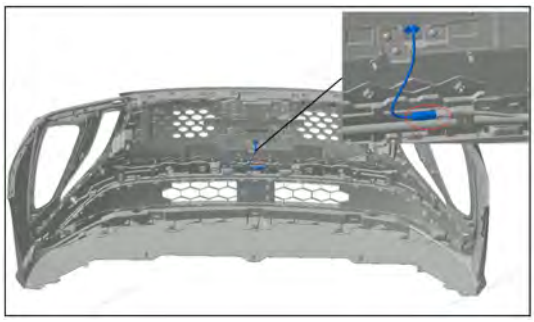
Installation

1. The installation order is the reverse of the removal order.

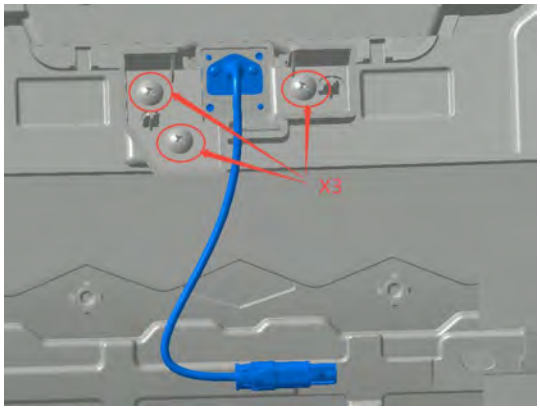
4.9.4.6 Front camera

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front bumper assembly. Refer to: Front bumper assembly.
3. Disconnect the AVM front camera harness connector.



4. Remove the fixing screws of the front camera, and then take out the front camera.



Installation

The installation order is the reverse of the removal order.

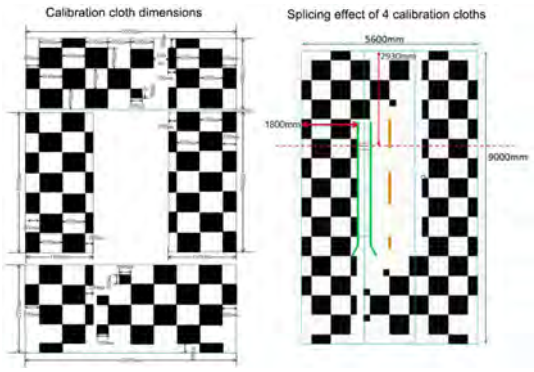
4.9.5 General procedures

4.9.5.1 After-sales calibration

S/N	Calibration tools	Remarks
1	Calibration cloth*4	This is a required item. Refer to the figure below for the pattern dimensions.

Calibration cloth fabrication

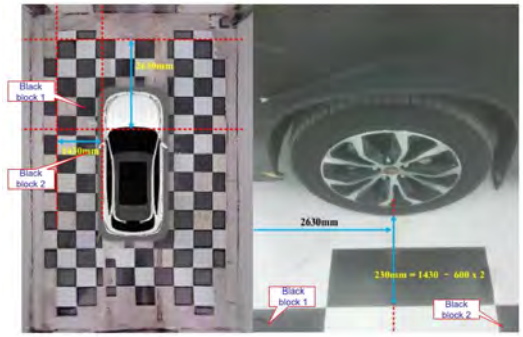
The calibration cloth is divided into four sections: front, rear, left, and right. The dimensions are shown in Fig. 3. The 4S store is responsible for providing the calibration cloth. The material should not be overly reflective (soft fabric is recommended). The 4S store can contact an advertising banner production company to make the calibration cloth according to the dimensions provided in Fig. 6.



Vehicle placement

Drive the vehicle to a cement floor with good flatness (caution: calibration cannot be performed on the ground with pits or slopes, preferably an indoor site), and then spread four pieces of calibration cloth around the vehicle.

Caution: Adjust the placement of the calibration cloths: The lighting at the placement site should be moderate; calibration cloths must not have wrinkles, must not be skewed, and all calibration cloths should be aligned.



Vehicle placement requirements: As shown in the figure, use the front left wheel as the positioning benchmark. After the vehicle is parked stably, first align the left calibration cloth with the front left wheel (the operator shall calculate the corresponding distance based on the data given in the figure above), and then align the front, rear, and right calibration cloths. Note that each calibration cloth shall be parallel to the body and not tilted to one side.

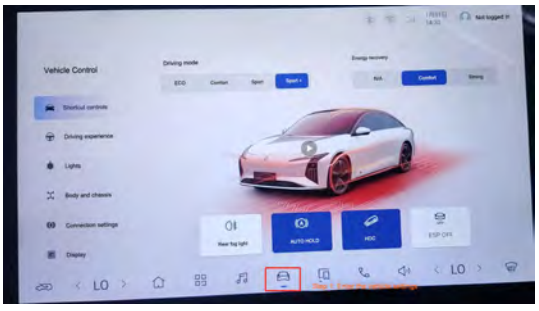
Note: The right side of Fig. 4 shows the pattern of the in-plant calibration pattern. Match black block 1 on the right with black block 1 on the left, and black block 2 on the right with red block 2 on the black edge.

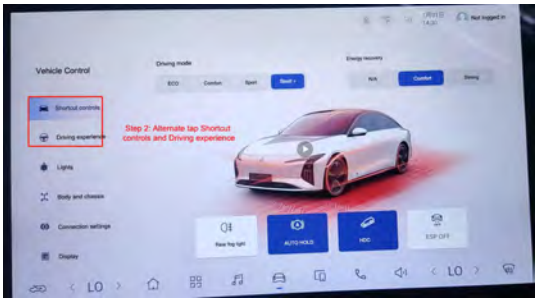
Calibration method

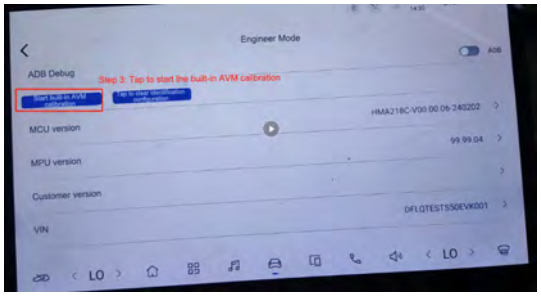
Due to differences caused by camera or main unit replacement, every vehicle coming off the production line needs to undergo production line or after-sales calibration to correct and optimise the stitched image effect.

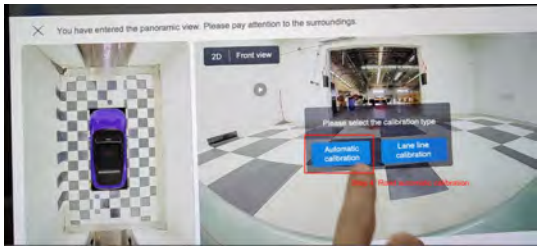
Automatic calibration

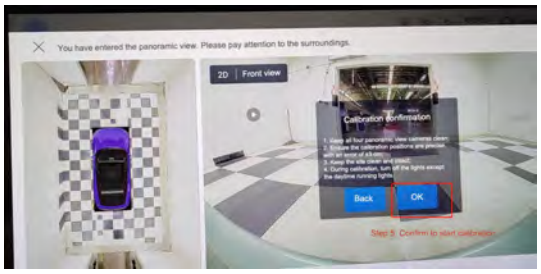
1. After driving the vehicle to the designated position, turn the ignition switch to the ON position and then enter the engineering mode of the audio system: Tap the "Vehicle" icon on the main interface to enter the setting interface. Alternately and quickly tap the two buttons "Quick Control"-"Driving Experience" for 6 cycles to enter the main unit engineering mode. Tap the calibration button to enter the calibration interface. Select "Start Built-in AVM Calibration" according to the vehicle configuration. After selecting the configuration, select "Automatic Calibration" to enter the AVM calibration interface. The operation steps are shown in the Fig. below:



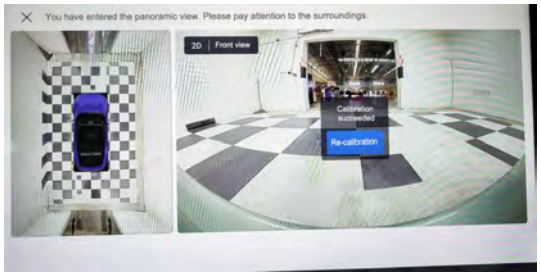




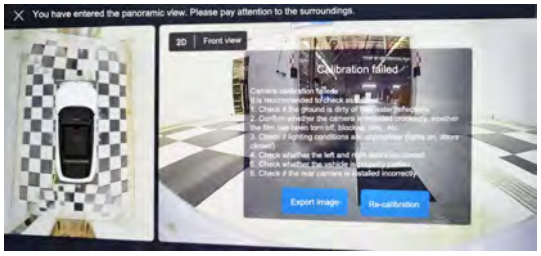




2. The system completes the automatic identification of the image and pops up the automatic calibration results. If the calibration is successful, the interface is as follows, and the panoramic stitching effect on the left-hand side should be normal.



3. If automatic calibration fails, the system will pop up a "Calibration failed, whether to recalibrate" dialog box. In this case, automatic calibration can be performed again. If automatic calibration is unsuccessful multiple times, please check the camera assembly and for dirt, or deactivate the automatic calibration and then enter calibration again.



Confirmation of calibration effect

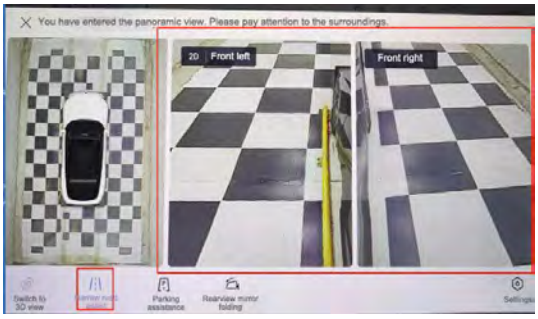
1. Confirmation of panorama stitching effect

After successful calibration, check the panoramic mosaic image. The blocks in the panoramic image are spliced normally without obvious misalignment; if there is obvious splicing dislocation (as shown in Fig. 7 of the panoramic image stitching effect), it needs to be calibrated again.

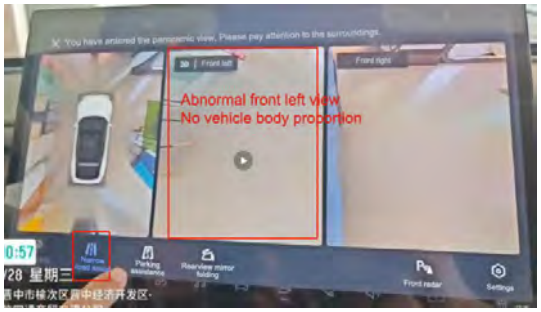


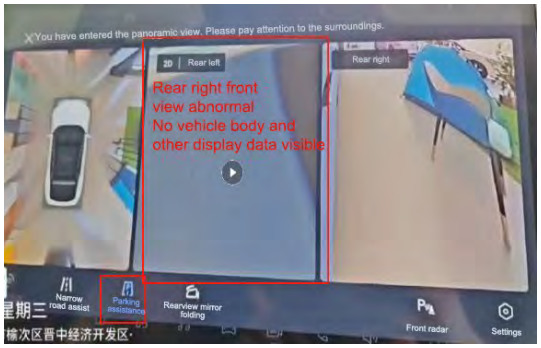
2. Confirmation of panoramic view

After calibration is complete, deactivate the calibration node and use the soft button to enter the 360° panoramic interface to confirm the "narrow lane assist" and "parking assist" views. For vehicles with abnormal views (as shown in Fig. 9, such as no valid data or incorrect body proportion), recalibration is required (you may retry calibration or adjust the calibration mat and calibrate again). After completing calibration, reconfirm the views. If they display normally, the vehicle can proceed to the next process.









Note: There is no need to restart the system after calibration.

Common problems and handling methods

FAQs	Troubleshooting steps
Automatic calibration frequently fails	1. Check if the ground is dirty or has water reflections 2. Confirm whether the camera is misaligned, the protective film has been removed, or whether the camera is blocked or dirty, or if there is water on the ground causing reflections. 3. Check if lighting conditions are appropriate (lights on, doors closed) 4. Check whether the left and right doors are closed 5. Check whether the vehicle is properly parked 6. Check if the rear camera is installed incorrectly
No Camera Image	1. Check if the camera is installed incorrectly. 2. Check if the harness is not connected properly. 3. If the screen is black or blue, please contact technical personnel for troubleshooting
Touch screen not responding	1. Check the harness problem 2. If there is no problem with the harness, then contact technical personnel for troubleshooting

4.10 Audio system

4.10.1 Specification

4.10.1.1 General specifications

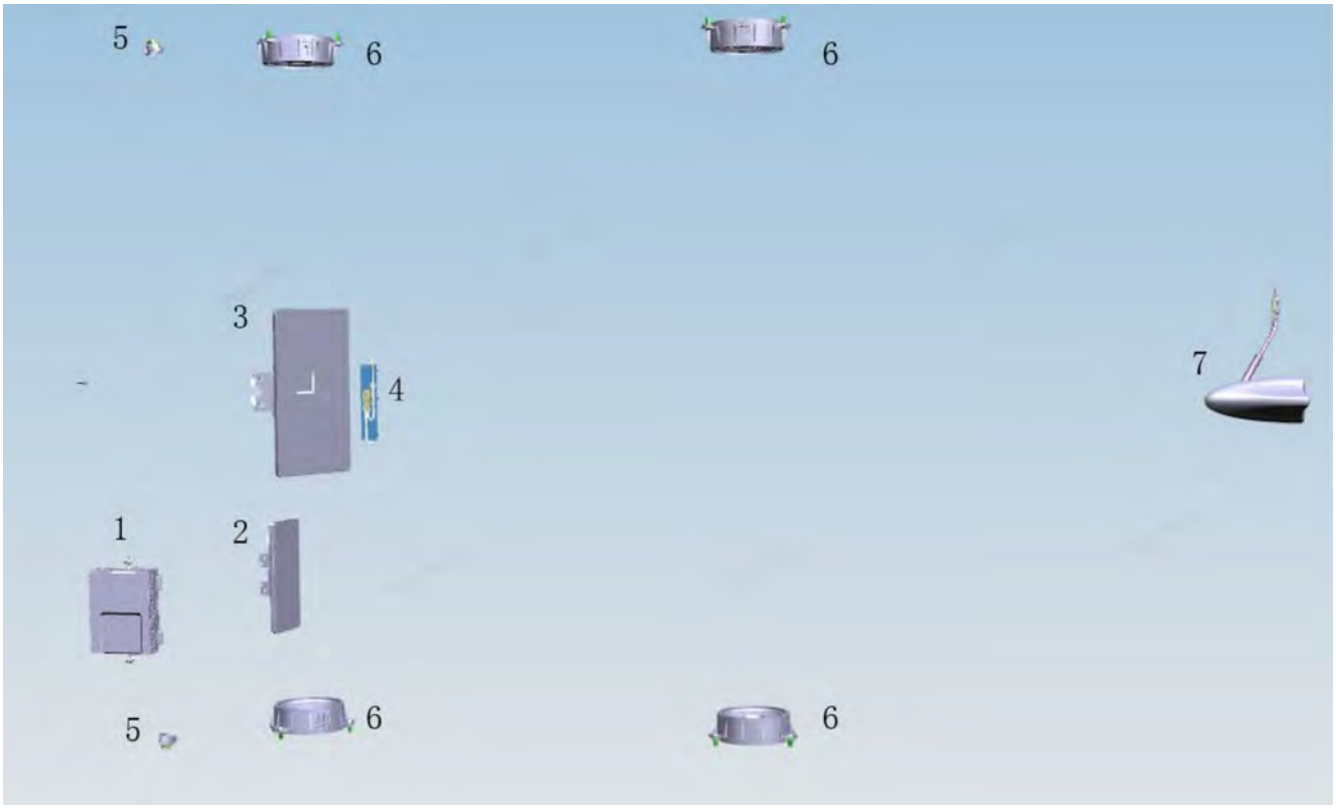
S/N	Part Name	Rated voltage	Rated current	Maximum power
1	Audio control unit assembly	9~16V	<20A	

4.10.1.2 Torque specification

Symbol	Name	Standard part No.	Standard part name	Quantity	Torque
1	Fixing bolt of main unit	Q1460612F38	Hex bolt, spring washer, and flat washer assembling unit	4	8-10N*m

4.10.2 Instructions and operations

4.10.2.1 Audio system



S/N	Part Name	S/N	Part Name
1	Audio control unit assembly	5	High-pitch speaker assembly
2	Instrument display assembly	6	Mid-range/full-range speaker assembly
3	Centre control display screen assembly	7	Fin antenna assembly
4	Microphone assembly		

4.10.2.2 Precautions

Precautions during repair

1. Before repairing the audio control unit assembly, speaker, antenna assembly and microphone assembly, please disconnect the negative pole of 12V battery to avoid short circuiting and other uncontrollable risks during maintenance.
2. The audio control unit uses 12V voltage. Do not connect the unit to a power supply exceeding 16V or lower than 9V.
3. Do not disassemble the audio control unit assembly, speakers, antenna assembly, or microphone assembly, as this may result in damage.
4. When disassembling the audio control unit assembly, speaker, antenna assembly or microphone assembly, wrap the tools with a soft cloth to prevent damaging the dashboard and other interior trim parts.
5. During maintenance, please protect the system parts and components. Especially, the centre control display shall not be scratched and the dust screen of microphone assembly shall not be damaged.
6. Please use genuine parts and components for maintenance operations.
7. Please follow the specified maintenance and diagnostic procedures for maintenance work.

8. After replacing the audio control unit assembly, please perform VIN code and configuration writing as required by the Service Manual.

9. After replacing the audio control unit assembly, please confirm whether the software version is the latest. If not, update it with a USB flash disk.

10. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

Overview

The audio system can realise radio + Bluetooth + reversing camera + USB and other functions.

4.10.3 Diagnosis and testing

4.10.3.1 Audio System-Fault Diagnosis

VIN update

During maintenance, if the audio head unit is replaced, the X431 diagnostic scanner must be used to write the VIN code into the replaced audio head unit system.

Write configuration update

During maintenance, if the audio head unit is replaced, the X431 diagnostic scanner must be used to write configuration information into the replaced audio head unit system to ensure correct function recognition. Write configuration includes module function configuration and module network configuration.

1. Module function configuration: before replacement, use the X431 diagnostic scanner to read and record the module function configuration information, then write this information into the replaced audio head unit system according to the recorded data. If the IVI cannot read the write configuration information before replacement, please refer to a vehicle of the same model and configuration for the configuration data, or contact the after-sales service department to obtain it.

2. Network configuration information: Use the X431 diagnostic scanner to rewrite the network configuration information for the replaced audio head unit. The network configuration information code consists of 32 hexadecimal digits. The configuration information is as follows:

Item	Coding
Network configuration code	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

4.10.3.2 Fault Diagnosis

Diagnostic Questionnaire 4-1-DTC List

DTC	Fault description	Possible cause	Repair recommendations
U007300	Bus off indicated by network management when BUSOFF for 3 consecutive times	CAN disconnected network interference	Check the CAN connection for network interference and short circuit
U220D00	Be in NMLimpHome state for more than TlimphomeLog (2s). Keep the limp home state in network management for 2s	CAN disconnected	Check the CAN connection for looseness
U1B0000	Not receive slave node response,t>5*Schedule cycle	LIN disconnected	Check the CAN connection for looseness
U1B0001	Not receive slave node response,t>5*Schedule cycle	LIN disconnected	Check the CAN connection for looseness
U007301	Failure to receive any vehicle signal for 5 consecutive seconds	CAN disconnected	Check the CAN connection for looseness
U012700	The 0x3E0 node message cannot be received for 5 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection

DTC	Fault description	Possible cause	Repair recommendations
U015900	The 0x260 node message cannot be received for 1s continuously	CAN disconnected	Check power supply Check the CAN connection
U012100	0x200 node message cannot be received for consecutive 200ms	CAN disconnected	Check power supply Check the CAN connection
U100700	The 0x522 node message cannot be received for 5 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
U010100	No 0x010 node message is received for consecutive 100ms	CAN disconnected	Check power supply Check the CAN connection
U100900	No 0x270 node message is received for consecutive 500ms	CAN disconnected	Check power supply Check the CAN connection
U010000	No 0x210 node message is received for consecutive 100ms	CAN disconnected	Check power supply Check the CAN connection
U016400	The 0x190 node message cannot be received for 1s continuously	CAN disconnected	Check power supply Check the CAN connection
U120000	The 0x31C node message cannot be received for 5 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
U013100	No 0xC4 node message is received for consecutive 100s	CAN disconnected	Check power supply Check the CAN connection
U010FE2	The 0x386 node message cannot be received for 2 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
U023000	The 0x525 node message cannot be received for 2 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
U014001	The 0x170 node message cannot be received for 1s continuously	CAN disconnected	Check power supply Check the CAN connection
U014000	The 0x180 node message cannot be received for 1s continuously	CAN disconnected	Check power supply Check the CAN connection
U014200	The 0x37A node message cannot be received for 1s continuously	CAN disconnected	Check power supply Check the CAN connection

DTC	Fault description	Possible cause	Repair recommendations
U100800	The 0x528 node message cannot be received for 2 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
U019800	The 0x55B node message cannot be received for 2 consecutive seconds	CAN disconnected	Check power supply Check the CAN connection
B200000	CPU Temp>= TH, t> 500ms (TH = 110℃)	1. Heat sink is badly ; 2. The surrounding devices are too hot; 3. CPU power consumption is abnormal; 4. HU temperature is too high;	Check Device
U1B0617	Voltage is out of range 1S, Voltage >16V	Battery voltage too high	Check power supply
U1B0616	Voltage is out of range 1S, Voltage < 9V	Battery voltage too low	Check power supply
B200001	1.Short circuit or current limit: 2.4V < Vsense < 2.65V; 2.Thermal shutdown: 2.7V < Vsense < 3V; 3.Output short-to-battery/ Reverse Current: 3.05V < Vsense < 3.3V;	1.Thermal shutdown: 2.Device is shorted to ground; 3.Device is shorted to battery;	Check Device
B200002	1.Short circuit or current limit: 2.4V < Vsense < 2.65V; 2.open circuit : Vsense < 0.3V; 3.Thermal shutdown: 2.7V < Vsense < 3V; 4.Output short-to-battery/ Reverse Current: 3.05V < Vsense < 3.3V;	1.Device is open; 2.Device is shorted to ground; 3.Device is shorted to battery; 4.Thermal shutdown:	1. Check battery status; 2. Check whether the antenna plugs are loose or defective; 3. Check the radio reception in the open area.Bad reception/interference can be caused by one of the following situations: a. Radio stations are further away; b. Poor weather conditions; c. Car parts market purchase window film; d. There are tall buildings, high mountains or high pressure lines nearby ;

DTC	Fault description	Possible cause	Repair recommendations
B200100	Fuel input Res <2 ± 1Ω Fuel input resistance <2 ± 1Ω (Note: The input resistance here is the input resistance determined by the instrument fuel gauge strategy)	Fuel sensor failure or circuit fault	Check fuel sensor and related circuits
B200101	Fuel input Res >400 ± 5Ω Fuel input resistance >400 ± 5Ω (Note: The input resistance here is the input resistance determined by the instrument fuel gauge strategy)	Fuel sensor failure or circuit fault	Check fuel sensor and related circuits
B200102	The input resistance of steering control button is low. The input resistance of steering control button is <1K ± 5Ω	Wheelkey Res failure Steering control button fault or circuit fault	Check wheelkey. Check the steering control buttons and related lines
B200103	High input resistance of steering control button. The input resistance of steering control button is >170K ± 5Ω	Wheelkey Res failure Steering control button fault or circuit fault	Check wheelkey. Check the steering control buttons and related lines
B200104	This fault only occurs in high-end vehicles 1. A2B no response in discovery phase continuous 5 times (A2B has no response for 5 consecutive times during the discovery phase) 2. Detect errors when in normal work state	1. Connection Error 2. EMC issue 3. Slave node malfunction	Check Device
B200105	Short circuit or current limit: Voltage < 0.7V;	1. Device is short-circuited to GND;	Check Device
B200106	LVDS BIST Count (Fault)>10, t>2s (LVDS BIST Count (fault)>10, t>2s)	1. Hardware is abnormal; (Hardware abnormality;) 2. DVR LVDS is not inserted; (DVR LVDS is not inserted;) 3. DVR LVDS interface power supply abnormal; (Abnormal power supply of DVR LVDS interface)	Check Device

DTC	Fault description	Possible cause	Repair recommendations
B200200	The voltage exceeds 16.5V (voltage exceeds 16.5V)	Abnormal voltage (abnormal voltage)	Check the battery
B200201	The voltage is below 8V (voltage is lower than 8V)	Abnormal voltage (abnormal voltage)	Check the battery
B200202	Receiving command timeout (receiving command timeout)	Communication fault (communication fault)	Check the HU or the coaxial cable
B200203	Receiving command timeout (receiving command timeout)	Communication fault (communication fault)	Check the HU or the coaxial cable
B200204	TFT Pin fault output (TFT Pin fault output)	Hardware fault (hardware fault)	Check hardware
B200205	Communication fault (communication fault)	1. Communication fault (communication fault) 2. Hardware fault (hardware fault)	Check TP
B200206	The temperature exceeds the limit (temperature exceeds the limit)	1. The backlight value is too high (backlight value is too high) 2. The NTC fault (NTC fault)	1. Lower the backlight value (lower the backlight value) 2. Check hardware (check hardware)
B200207	Backlight fault output (backlight fault output)	Hardware fault (hardware fault)	Check hardware
B200208	LVDS BIST Count (Fault)>10, t>2s (LVDS BIST Count (fault)>10, t>2s)	1. Hardware is abnormal; (hardware fault) 2. Display is not inserted; (display not inserted) 3. Display interface power supply abnormal; (screen power supply abnormality)	Check Device
B200209	Lost communication with I2C for 10 cycles (Communication with I2C lost for 10 cycles)	1. Hardware is abnormal; (hardware fault) 2. Display is not inserted; (display not inserted) 3. Display interface power supply abnormal; (screen power supply abnormality)	Check Device
B20020A	Short circuit or current limit: Voltage < 0.7V;	1. Device is short-circuited to GND;	Check Device

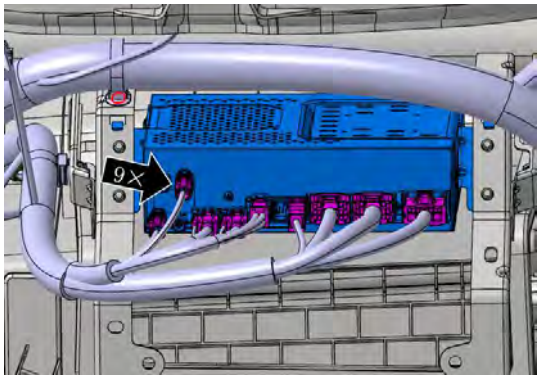
DTC	Fault description	Possible cause	Repair recommendations
B20020B	DMS Count (Fault)>10, t>2s (DMS Count (fault)>10, t>2s)	1. Hardware is abnormal; (Hardware abnormality;) 2. DMS is not inserted; (DMS not inserted;) 3. DMS interface power supply abnormal; (Abnormal DMS interface power supply)	Check Device
B20020C	Short circuit or current limit: Voltage < 0.7V;	1. Device is short-circuited to GND;	Check Device
B20020D	OMS Count (Fault)>10, t>2s (OMS Count (fault)>10, t>2s)	1. Hardware is abnormal; (Hardware abnormality;) 2. OMS is not inserted; (OMS not inserted;) 3. OMS interface power supply abnormal; (OMS interface power supply abnormal)	Check Device

4.10.4 Removal and installation

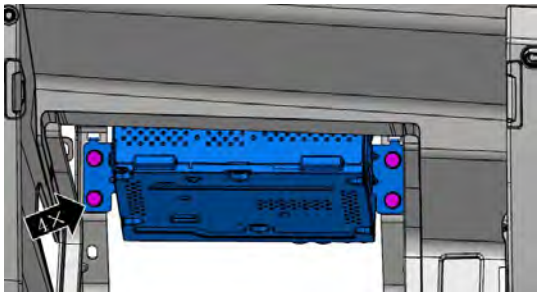
4.10.4.1 Audio control unit

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the glove box assembly.Refer to: Glove box assembly.
3. Remove the glove box repair cover plate.
4. Disconnect the harness connector of audio control unit assembly.



5. Remove the fixing bolts of the audio control unit assembly.



6. Remove the audio control unit assembly.

Installation

The installation order is the reverse of the removal order.

4.11 SRS

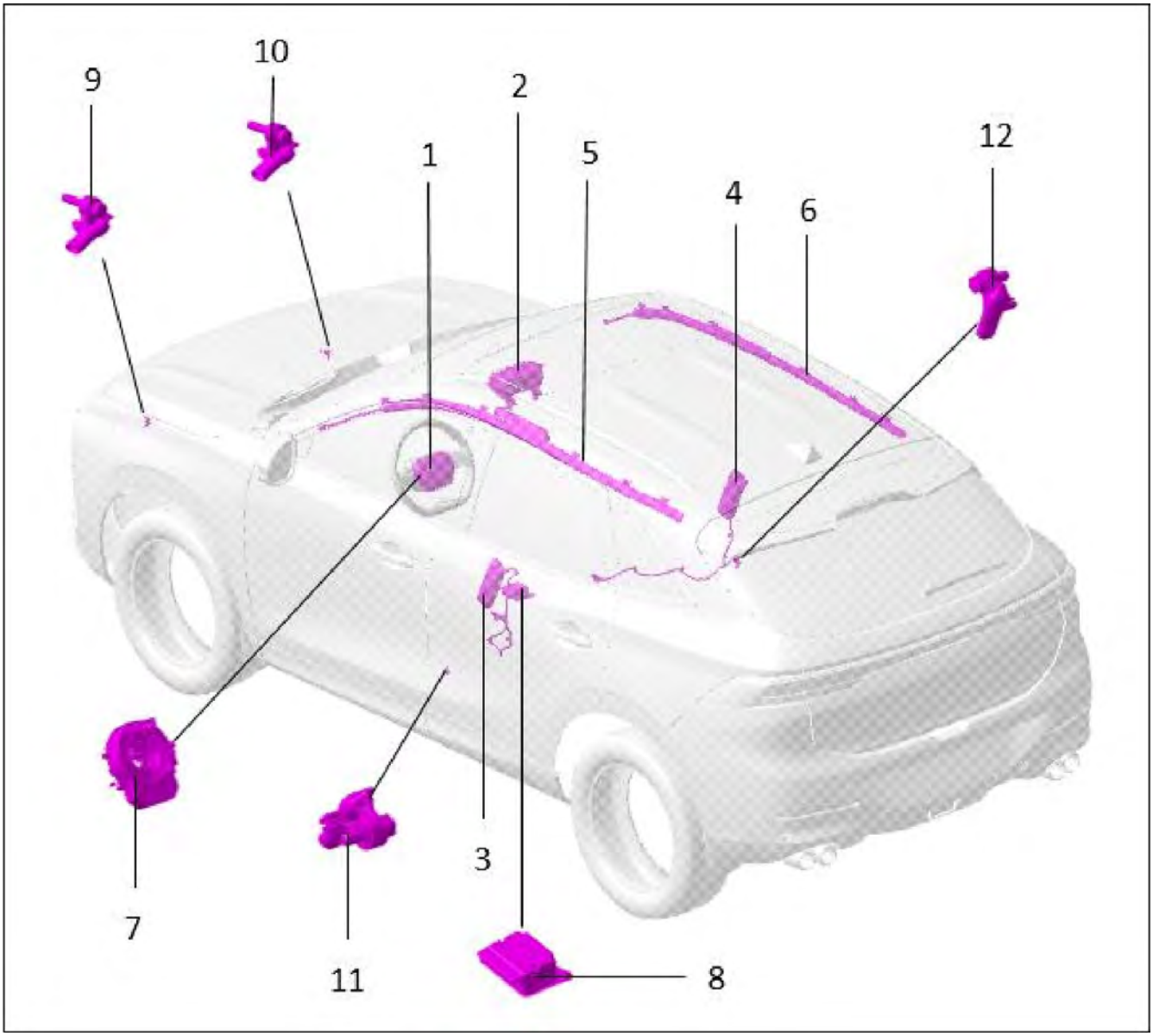
4.11.1 Specification

4.11.1.1 General specifications

Item	Specification
Rated voltage	DC 12V
Input voltage	DC 9.V ~ DC 16V
Operating Current	≤300mA
Static current	≤1mA
Operating temperature	-30℃ ~ +80℃
Storage temperature	-40℃ ~ +90℃

4.11.2 Instructions and operations

4.11.2.1 SRS



S/N	Name	S/N	Name
1	Driver frontal airbag assembly	2	Passenger frontal airbag assembly
3	Driver seat side airbag assembly	4	Passenger seat side airbag assembly
5	Left side curtain airbag assembly	6	Right side curtain airbag assembly
7	Spiral cable assembly	8	SRS ECU assembly
9	Driver front collision sensor assembly	10	Passenger front collision sensor assembly
11	Driver side impact sensor assembly	12	Passenger side collision sensor assembly

4.11.2.2 Overview

To improve safety, the SRS is provided as a standard configuration. SRS improves collision safety through restraining passengers when front collision with large impact occurs.

The SRS consists of the driver's airbag assembly, front passenger airbag assembly, collision sensors, airbag electronic control unit (SRS-ECU), airbag warning light, airbag harness, and clock spring.

1. Driver side SRS assembly is located at the centre of steering wheel, within which there is a folding air bag and an inflator.
2. Passenger side airbag assembly is located on the Instrument panel right ahead of front passenger.
3. Collision sensors are divided into front collision sensor and side collision sensor. The front impact sensor is located behind the bumper, and the side collision sensor is located below the B-pillar.
4. The airbag control unit (SRS-ECU) and its mounting bracket are located on the front floor below the instrument panel. This control unit (SRS-ECU).
5. The SRS warning indicator light on the instrument cluster indicates the SRS operating condition.
6. Clock spring is at the lower end of steering wheel and above the fixed multi-function switch.

Only maintenance personnel trained and authorised can check and repair SRS parts and components or the surrounding parts. Before checking and repairing, maintenance personnel shall carefully read this manual.

Special caution should be paid during repair to avoid injury to maintenance personnel or driver due to error detonation and deploying of SRS caused by misoperation.

In the following cases, the airbag does not detonate:

1. If the vehicle is rear-ended or involved in similar collisions, the airbags will not deploy.
2. When the relative speed between the vehicle and a rigid collision object ahead in the vehicle running direction is less than 15km/h, the airbag does not deploy.
3. When vehicle is subjected to rollover around longitudinal axis, airbag does not detonate.
4. When vehicle is in normal running, braking or running on unsmooth road, airbag does not detonate.
5. When the vehicle is subjected to collision from such deformable and movable objects (eg. road sign, sandpile, snowdrift, ice block, highway guard bars, etc.) that cannot reach the condition to detonate airbag, the airbag does not detonate.

Working principle

The system mainly includes: driver airbag components, front passenger airbag components, front collision sensor, side collision sensor, clock spring, harness assembly and controller (ECU) assembly. When the vehicle ignition switch is turned to the ON position, the SRS is activated, and the ECU performs a self-inspection according to a preset programme. If the indicator remains on for about 6 seconds and then turns off, it signifies that the self-inspection has passed and the system is normal. Afterward, the ECU enters monitoring mode. If the indicator flashes intermittently or remains on, it indicates a failed self-inspection and system abnormality. During normal driving (including on various road surfaces and under interference conditions), the ECU does not issue an ignition command, and the airbag is not deployed. When the vehicle experiences a severe frontal or side collision, the crash sensor receives and transmits the impact signal to the ECU. The ECU then sends a timely ignition command to trigger the airbag assembly, deploying the airbag to absorb part of the collision energy affecting the vehicle occupants, thereby mitigating potential injuries and providing protection.

Ignition circuit description of SRS

S/N	Configuration programme name	Description
1	DAB+PAB (2 circuits)	DAB—Driver Frontal SRS PAB—Passenger Frontal SRS FSAB—Front Seat Side Airbag RSAB—Front Seat Side Airbag CAB - side curtain airbag B1TFD - front left retractor seat belt B1TFP—Front right retractor seat belt B2TFD—Front left end plate seat belt B2TFP - front right end seat belt B1TR—Rear Retractor Seat Belt UFS—Front Impact Sensor PAS - side collision sensor
2	DAB+PAB+UFS+PAS (2 circuits)	
3	DAB+PAB+B1TFD+B1TFP+UFS+PAS (4 circuits)	
4	DAB + PAB + B1TFD + B2TFD + B1TFP + B1TR + FSAB + RSAB + CAB + UFS + PAS (13 circuits)	
5	DAB + PAB + B1TFD + B2TFD + B1TFP + B2TFP + B1TR + FSAB + RSAB + CA B + UFS + PAS (14 circuits)	

4.11.2.3 Precautions

Precautions

1. Be sure to use **12** V battery.
2. Do not disconnect the battery cable when the engine is running.
3. Before connecting or disconnecting the engine **ECU** harness connector, turn the ignition switch to the **OFF** position and disconnect the GND cable of the battery. Failure to do so may damage the engine **ECU**, because even if the ignition switch is turned to the **OFF** position, the **ECU** still has **12** V voltage.
4. Before removing parts and components, turn the ignition switch to the **OFF** position, and then disconnect the battery GND cable.
5. Do not disassemble the engine **ECU**.
6. Only a digital multimeter is allowed to be used to check the EFI system.
7. Always use genuine parts and components for maintenance; otherwise, the EFI system may not be able to work properly.
8. During maintenance, use unleaded petrol only.
9. Please follow the specified maintenance and diagnostic procedures for maintenance work.
10. Do not disassemble or remove parts and components of the EFI system during maintenance.
11. During maintenance, take all electronic components (such as ECUs and sensors) carefully and never let them fall to the ground.
12. Establish environment protection awareness and effectively dispose of waste produced during maintenance.

Precautions during repair

1. Simultaneous use of the SRS and seat belt helps reduce the risk or severity of injury to the driver and front passenger in the event of a vehicle collision.

CAUTION

1. To avoid increasing risks of injury or death caused by **SRS** faults, all maintenance operations shall be conducted in the authorised service centre of Dongfeng Forthing Lingzhi Exclusive Shop.
2. Improper maintenance, including improper removal and installation of the SRS, may cause malfunctions in the system, resulting in personal injury or death accidents.
3. Do not use electrical test equipment to test any circuit of the **SRS** except for operations described in this manual.

1. Personnel for disassembling, assembling or maintaining SRS shall be subject to professional training.

2. When steering wheel is removed for vehicle maintenance, the steering wheel shall be straightened, clock spring assembly can thus be locked in right position. Otherwise it will damage the clock spring assembly.

3 Extremely dangerous! Rear-facing child seats are not permitted on the front seats.

4. Before the product is properly assembled in vehicle, non-professional personnel shall not energise the vehicle to avoid personal injury or death caused by accidents.

5. Fasten the seat belt when driving, and use the airbag together with the seat belt to achieve the best protective effect in accidents. Do not mistake that it is unnecessary to tighten seat belt with the aid of SRS.

6. The technical parameters of ECU and SRS components match each other, so they shall be used with each other. ECU or SRS components of other brands shall not be used with the ECU or SRS components of this SRS product.

7. After the power supply is turned on, if the airbag indicator is always on or off, it indicates that there is a fault in the split-type vehicle airbag system. This fault indicates that the ECU itself is damaged or the ECU is not connected to the power supply (or the harness is open-circuited).

8. Power supply voltage faults can be repaired by the vehicle owner, but other faults shall be repaired at an authorised service centre.

9. Removal or repair is prohibited at unauthorised service centres.

10 In case of a fault alarm, repair must be carried out. If the vehicle is not repaired and use continues, you are responsible for any loss caused by a frontal collision. When repairing the vehicle (especially when using electric welding), be sure to turn off the ignition switch and set it to the 1st gear. Ideally, disconnect the positive battery terminal completely.

11 When repairing vehicle, special tools shall be used to disassemble SRS assembly. After airbag detonation, SRS components and clock spring shall be replaced completely, and the controller (ECU) shall be maintained in the authorised service centre for reuse.

12 SRS assembly is beyond repair and shall be replaced in case of fault.

13. When airbag components are being disassembled or transported, the trim cover should be facing upward. Airbag components must not be stacked to prevent accidents caused by accidental deployment.

14. SRS components shall be stored in a place with a temperature lower than 93°C, Relative Humidity (RH) $\leq$ 75%, and free from disturbance from electric field.

15. Using a pointer-type multimeter to measure the resistance of an SRS electric igniter is strictly prohibited. Otherwise, it may result in unintentional airbag deployment.

16 Extremely dangerous! Do not disassemble the SRS components or its internal gas generator!

17. The controller must not be connected to AC power or to DC power exceeding 20 volts to prevent damage.

18. Statement: In the event of any of the following collision accidents, this product cannot guarantee to reduce injuries to the driver and front passenger.

4.11.3 Removal and installation

4.11.3.1 Driver seat airbag assembly

Removal

1. Turn the steering wheel from the 3 o'clock, 6 o'clock and 9 o'clock positions to the uppermost position (close to the 12 o'clock direction of the dashboard) respectively, and use a straight screwdriver to push open the SRS module clamping steel wires one by one from the bottom of the lower shield of the steering wheel.
2. Slightly pull out the driver seat SRS components and release the connector between such components and the clock spring.

   Caution: When disconnecting the clock spring connector of the SRS module, do not apply too much force.
3. Take out the driver seat SRS components and place the trim cover side upward.

Installation

The installation order is the reverse of the removal order.

4.11.3.2 Front passenger SRS components

Removal

1. Remove the glove box. Refer to: Glove box assembly.
2. Remove SRS fixed bolt.
3. Remove the lower instrument panel body. Refer to: Dashboard.
4. Slightly pull out SRS components and release connector between such components and airbag harness.

   Caution: When disconnecting the clock spring connector of the SRS module, do not apply too much force.
5. Take out the front passenger seat SRS components and place the trim cover side upward.

Installation

The installation order is the reverse of the removal order.

4.11.3.3 Side SRS component

Removal

1. If the side airbag is assembled in the seat, the entire seat needs to be replaced.
2. If the side airbag is assembled inside the B-pillar, remove it according to the following steps:

   Remove the B-pillar shield. Refer to: B-pillar upper shield.

   Disconnect the connector with the airbag harness.

   Remove the side airbag screw.

Installation

The installation order is the reverse of the removal order.

4.11.3.4 Clock cable

Caution: Clock spring (coil spring) is composed of 2 current-carrying coils and is connected between steering column and steering wheel. When unfolding circuit is constantly connected with a charger module, the steering wheel is allowed to rotate. Steering wheel shall be properly assembled in steering column and clock spring shall be in neutral position. Otherwise it will cause cable disconnection and other faults.

Removal

1. After removing driver SRS components, use special tools to remove the steering wheel.
2. Remove the steering column shield.
3. Release the connector between the clock spring and the airbag harness.
4. Use a crosshead screwdriver to remove the tapping screw of the clock spring and remove the clock spring.

Installation

1. The installation order is reverse to the removal order.

4.11.3.5 Airbag harness

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal.
2. Disconnect the connectors between the SRS harness and the SRS-ECU, driver SRS component, and front passenger SRS components (the next operation must be performed after disconnecting the negative battery cable from the battery for 3 minutes).
3. Remove the dashboard body. Refer to: Dashboard.
4. Remove the SRS harness.

Installation

The installation order is the reverse of the removal order.

4.11.3.6 Airbag controller (SRS-ECU)

Caution: Airbag controller (SRS-ECU) of this vehicle type only has driver seat airbag ignition circuit and front passenger seat airbag ignition circuit (without front pretensioner seat belt circuit).

Caution: Once a fault occurs, the SRS-ECU must not be repaired and should be replaced only with an SRS-ECU specifically matched to this vehicle model.

Removal

1. Remove the gear control panel lower plate component, carpet and auxiliary dashboard glove box respectively.
2. Disconnect SRS-ECU from the airbag harness (it must be carried out 3 minutes after the negative wire of the battery is disconnected on the battery), loosen SRS-ECU fixing nuts and take down SRS-ECU.

Installation

1. The installation order is the reverse of the removal order.

Test

After assembling all SRS components, connect the negative wire of the battery, turn on the ignition switch (at ON position), observe whether the SRS warning light is normal. If it is normal, replacement work is done; if not, use a diagnostic scanner to diagnose and remove faults according to diagnostic results.

4.11.3.7 Frontal collision sensor

Removal

1. Open the engine cover plate.
2. Disconnect the connector with the airbag harness.
3. Remove the sensor bolt.

Installation

1. The installation order is the reverse of the removal order.

4.11.3.8 Side collision sensor

Removal

1. Remove the B-pillar shield. Refer to: B-pillar upper shield.
2. Disconnect the connector with the airbag harness.
3. Remove the sensor bolt.

Installation

1. The installation order is the reverse of the removal order.

4.12 Electric seat

4.12.1 Specification

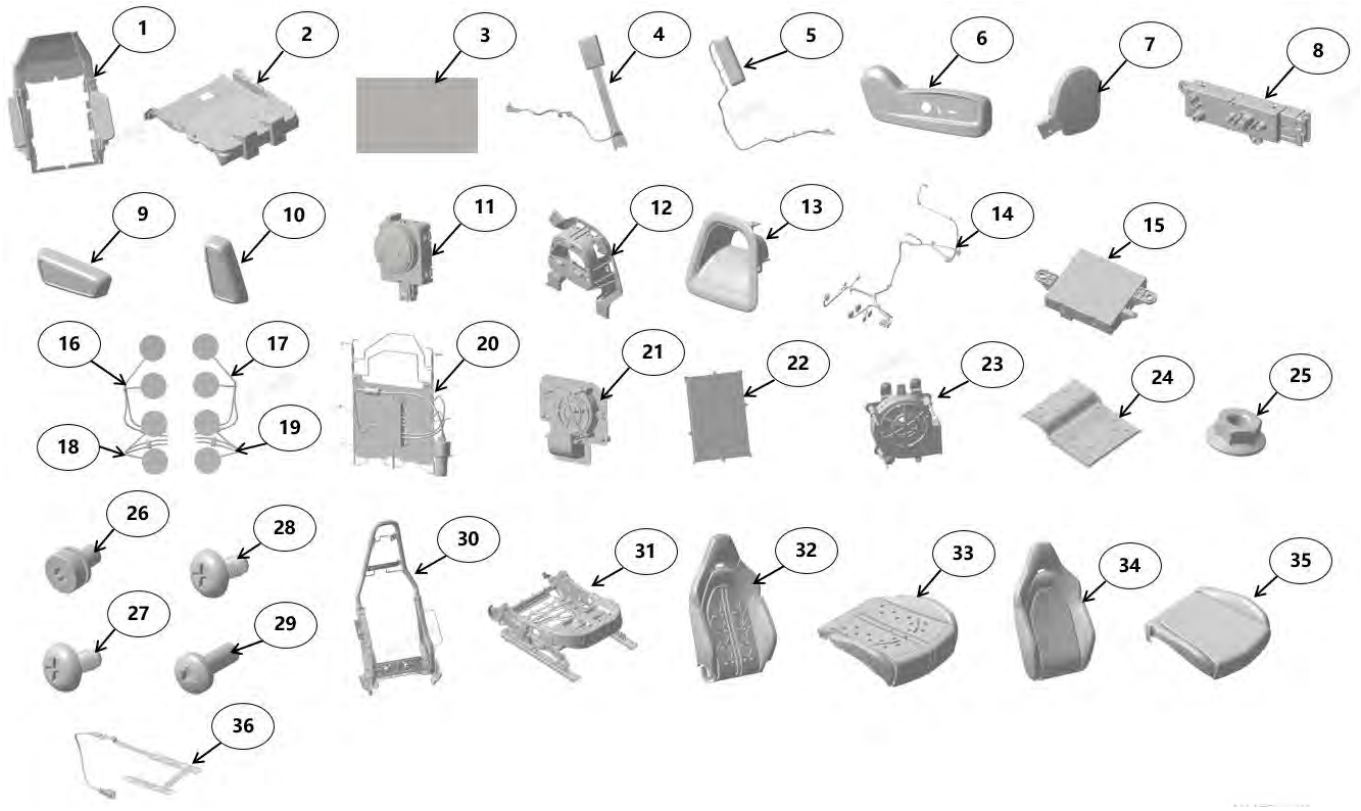
4.12.1.1 Torque specification

Name	Nm
Connecting bolt (M10) between front seat assembly and body floor	45±5Nm
Connecting bolt between front seat belt buckle and seat frame	45±5Nm
Connecting bolt (M8) between fixed backrest of rear seat and body	23±3Nm
Connecting bolt (M10) between rear seat and hinge plate on both sides of body	45±5Nm
Connecting bolt (M10) between central hinge bracket of rear seat and body bottom plate	45±5Nm
Connecting bolt (M10) between central hinge bracket of rear seat and seat backrest	45±5Nm

4.12.2 Instructions and operations

4.12.2.1 Electric seat

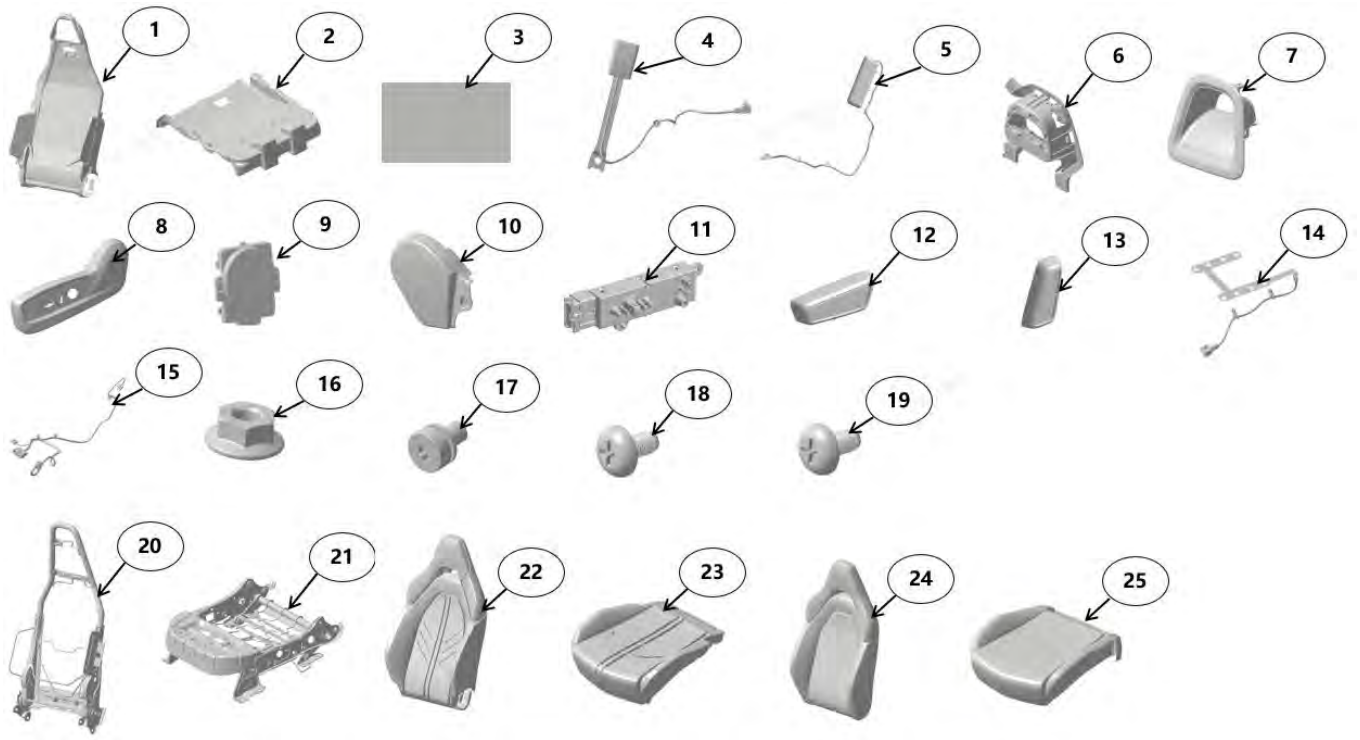
Front seats



S/N	Name	Quantity	S/N	Name	Quantity
1	LV2 front-row backrest silencing cloth	1	21	Backrest vent fan	3
2	Front-row seat cushion silencing cloth	1	22	Backrest ventilation airbag	2
3	Non-woven fabric (with adhesive backing)	2	23	Ventilation fan of seat cushion	1
4	Buckle assembly – driver seat belt	1	24	Ventilation airbag of seat cushion	1
5	Driver seat side SRS module	1	25	Hex flange nut with serrated bearing surface	2
6	Driver's seat outer trim cover (electric)	1	26	Hex lobular socket cylindrical head spring washer assembling bolt	4

S/N	Name	Quantity	S/N	Name	Quantity
7	Driver's seat inner trim cover (electric)	1	27	Cross recessed truss head self-tapping screw	6
8	Driver's seat adjustment button component	1	28	Cross recessed truss head self-tapping screw	2
9	Driver's seat slide rail/height adjustment button	1	29	Torx bolt	2
10	Driver seat backrest adjustment button	1	30	Driver seat backrest frame assembly	1
11	Backrest lumbar support massage adjustment switch box	1	31	Driver's seat cushion frame assembly	1
12	Neck trim lining base	1	32	Driver's backrest foam assembly LV2	1
13	Neck trim lining	1	33	Driver's seat cushion foam assembly LV2	1
14	Electric driver's seat harness assembly	1	34	Driver's seat backrest cover assembly	1
15	Seat controller ECU	1	35	Driver's seat cushion cover assembly	1
16	Upper left massage airbag	1	36	Seat belt reminder sensor **(if any)**	1
17	Right upper massage airbag	8			
18	Left lower massage airbag	1			
19	Right lower massage airbag	8			
20	Backrest massage lumbar support assembly	2			

Front passenger seat (electric adjustment) exploded view

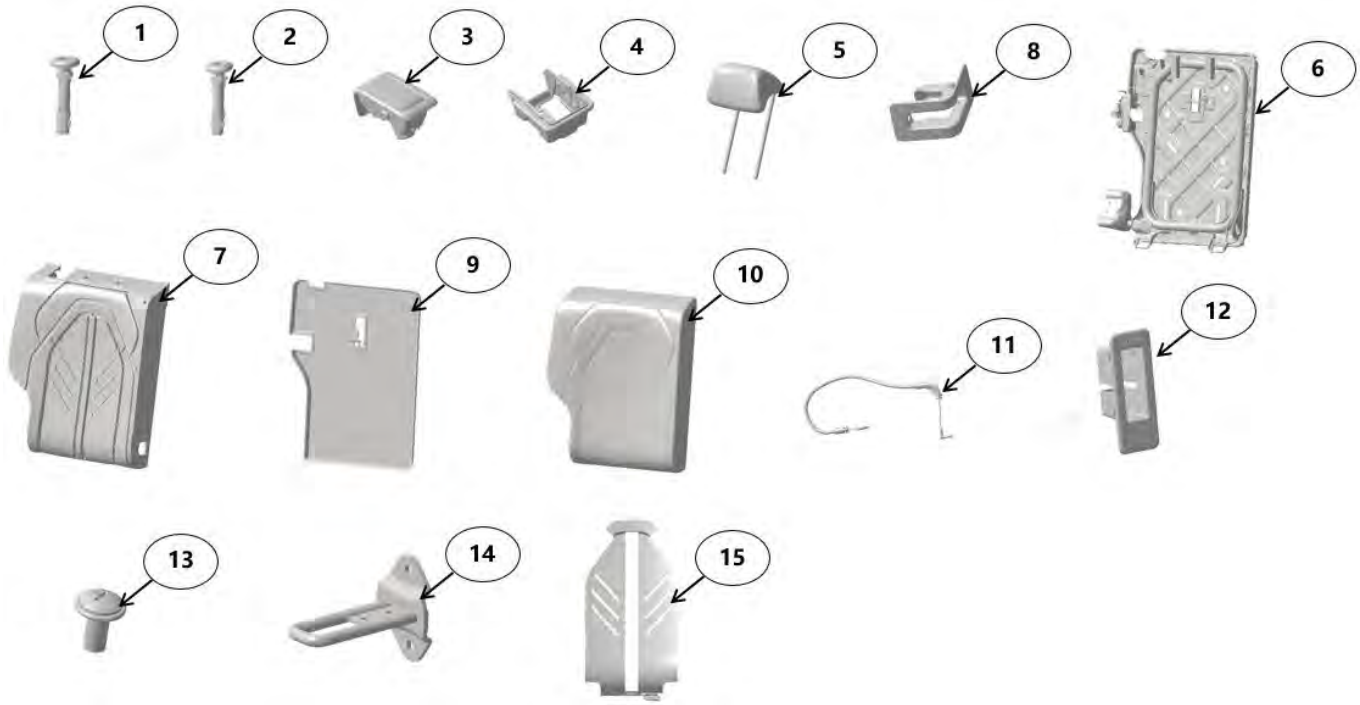


S/N	Name	Quantity	S/N	Name	Quantity
1	LV2 front-row backrest silencing cloth	1	16	Hex flange nut with serrated bearing surface	2
2	Front-row seat cushion silencing cloth	1	17	Hex lobular socket cylindrical head spring washer assembling bolt	4
3	Non-woven fabric (with adhesive backing)	2	18	Cross recessed truss head self-tapping screw	6
4	Buckle assembly – front passenger seat belt	1	19	Cross recessed truss head self-tapping screw	2
5	Front passenger seat side SRS module	1	20	Front passenger seat backrest frame assembly	1
6	Neck trim lining base	1	21	Front passenger seat cushion frame assembly	1
7	Neck trim lining	1	22	Front passenger's seat backrest foam assembly LV2	1

S/N	Name	Quantity	S/N	Name	Quantity
8	Front passenger's seat outer trim cover (electric)	1	23	Front passenger's seat cushion foam assembly LV2	1
9	Front passenger seat outer trim cover plug cap	1	24	Front passenger seat backrest cover assembly	1
10	Front passenger's seat inner trim cover (electric	1	25	Front passenger seat cushion cover assembly	1
11	Front passenger seat switch component	1			
12	Front passenger seat slide rail adjustment button	1			
13	Front passenger seat backrest adjustment button	1			
14	Seat belt reminder sensor	1			
15	Electric front passenger's seat harness assembly	1			

Rear seat

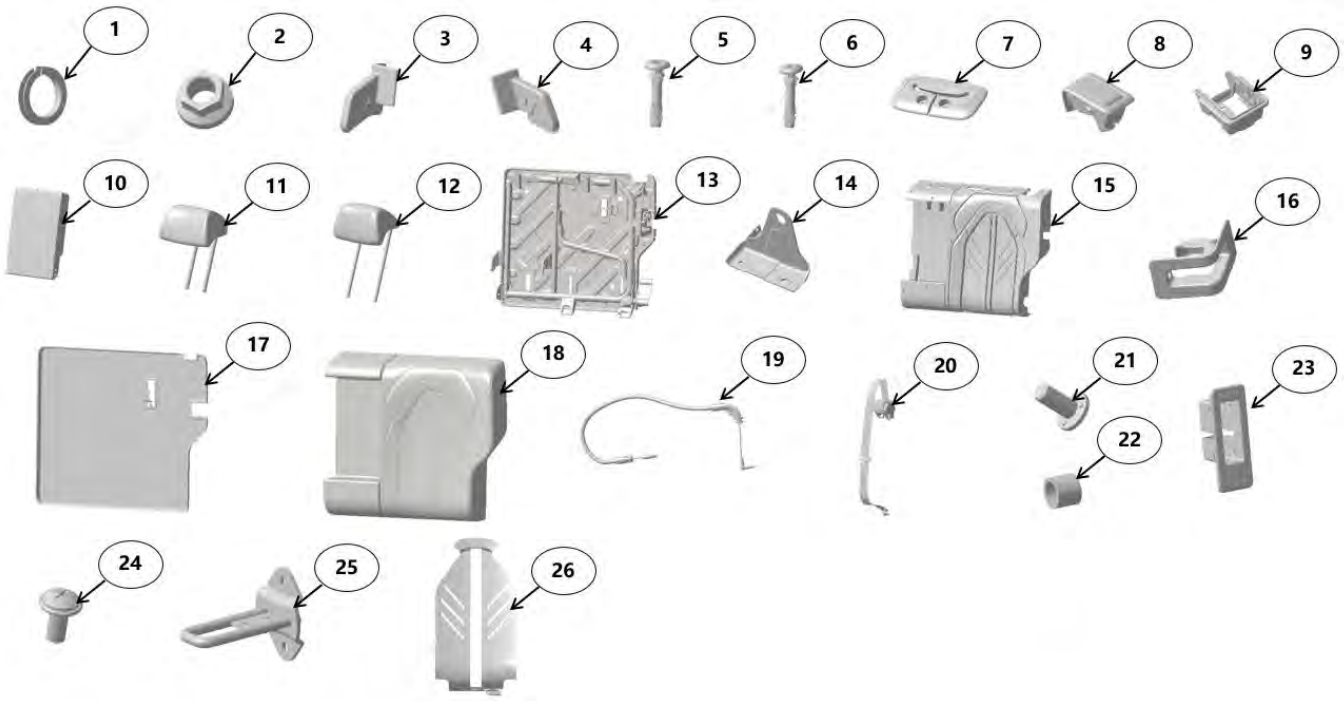
40% split rear seat backrest exploded view



S/N	Name	Quantity	S/N	Name	Quantity
1	Locking end of headrest guide sleeve	1	11	40%-portion rear seat backrest unlocking cable	1
2	Headrest guide sleeve free end	1	12	ISOFIX cover	1
3	Second-row backrest unlock mechanism assembly	1	13	Type C cross recessed pan head tapping screw	2
4	Second-row backrest unlock mechanism base	1	14	Backrest lock rod assembling unit	1
5	Rear seat side headrest assembly	1	15	Rear seat backrest heating pad **(if any)**	1
6	Five-seat second-row 40%-portion backrest frame assembly	1			
7	40% rear seat backrest foam assembly	1			
8	Rear 40%-portion backrest lock trim cover	1			

S/N	Name	Quantity	S/N	Name	Quantity
9	40%-portion rear seat backrest molded carpet	1			
10	40%-portion backrest cover assembly, imitation leather	1			

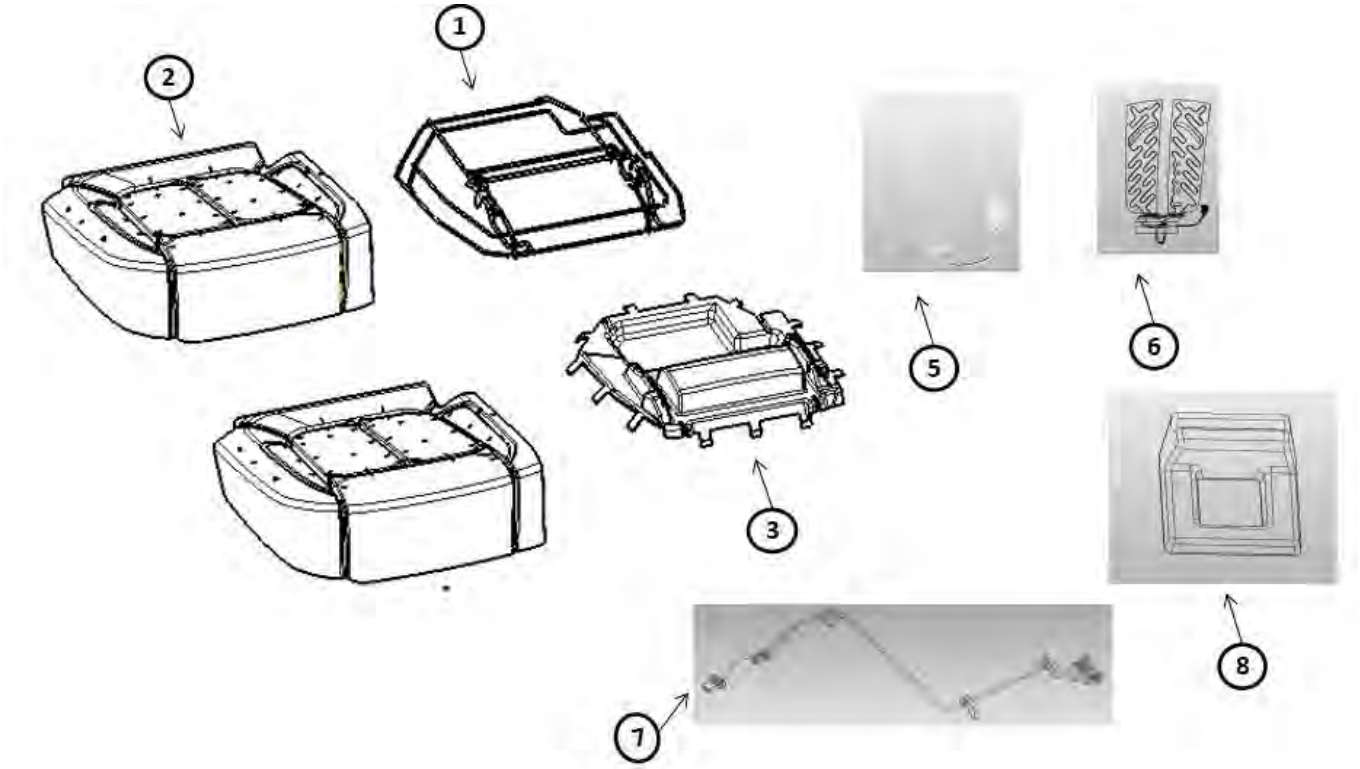
Exploded view of 60% split rear seat backrest



S/N	Name	Quantity	S/N	Name	Quantity
1	Hinge shaft sleeve	1	16	Rear 60%-portion backrest lock trim cover	1
2	7/16 connecting nut environmentally friendly Dacromet	1	17	60%-portion rear seat backrest molded carpet assembly	1
3	Second-row armrest cover inner side	1	18	60%-portion backrest cover assembly, imitation leather	1
4	Second-row armrest cover outer side	1	19	40%-portion rear seat backrest unlocking cable	1

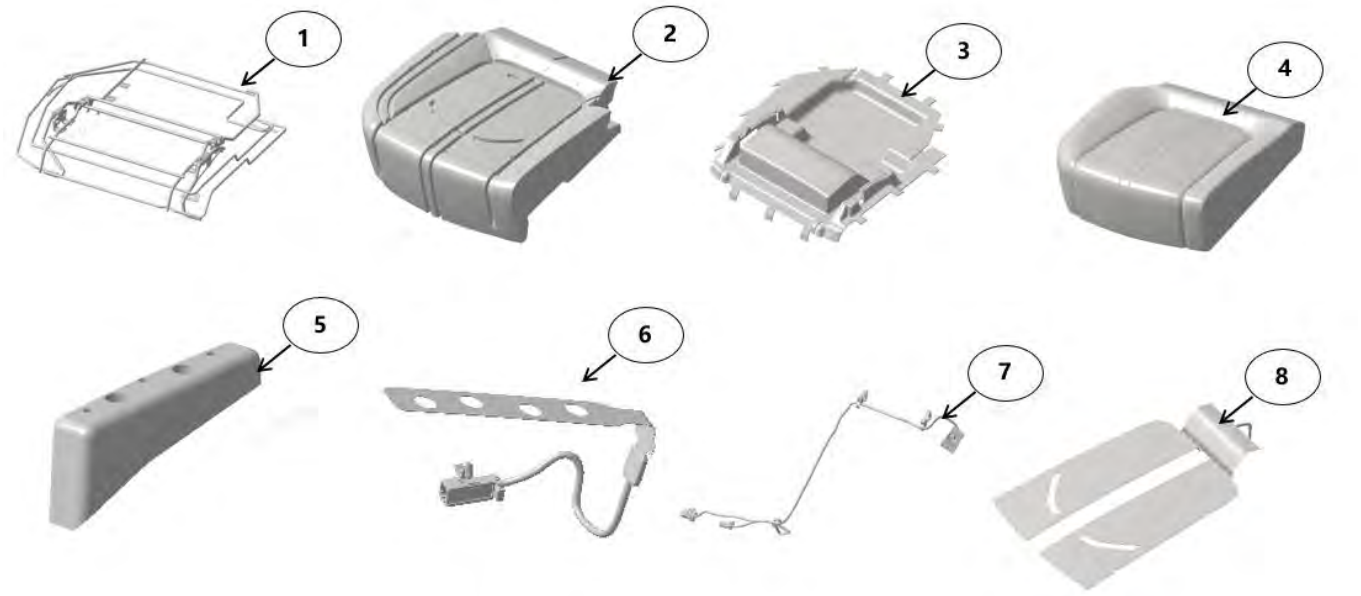
S/N	Name	Quantity	S/N	Name	Quantity
5	Locking end of headrest guide sleeve	2	20	60% rear seats without screw retractor assembly	1
6	Headrest guide sleeve free end	2	21	Hex socket step bolt M6*10	1
7	Second-row seat belt guide cover	1	22	60%-portion seat pivot shaft sleeve	1
8	Second-row backrest unlock mechanism assembly	1	23	ISOFIX cover	1
9	Second-row backrest unlock mechanism base	1	24	Type C cross recessed pan head tapping screw	4
10	Handrail assembly imitation leather	1	25	Backrest lock rod assembling unit	1
11	Rear middle seat headrest assembly, imitation leather	1	26	Rear seat backrest heating pad **(if any)**	1
12	Rear side headrest assembly, imitation leather	1			
13	Five-seat second-row 60%-portion backrest frame	1			
14	Five-seat second row middle mounting bracket assembly	1			
15	60% rear seat backrest foam assembly	1			

Exploded view of 40% split rear seat cushion



S/N	Name	Quantity	S/N	Name	Quantity
1	Five-seat second-row 40%-portion seat cushion frame	1	6	Rear seat cushion heating pad **(if any)**	1
2	40% rear seat cushion foam assembly	1			
3	40%-portion rear seat cushion molded carpet	1			
4	40% seat cushion cover assembly, genuine leather, EV	1			
5	Rear seat cushion EPP	1			

Exploded view of 60% rear seat cushion



S/N	Name	Quantity	S/N	Name	Quantity
1	Five-seat second-row 60%-portion seat cushion frame assembly	1	6	Rear 40%-portion SBR	1
2	60% rear seat cushion foam assembly	1	7	Rear 60%-portion middle SBR	1
3	60%-portion rear seat cushion molded carpet	1	8	Rear 60%-portion harness assembly-SBR	1
4	60% seat cushion cover assembly orange imitation leather EV	1	9	Rear seat cushion heating pad **(if any)**	1
5	Rear seat cushion EPP	1	10		

4.12.2.2 Precautions

Precautions during repair

1. Protect the disassembled parts and components with a cloth during disassembling and assembling.

2. Turn the ignition switch to OFF, disconnect the battery negative terminal, and wait for 3 minutes or more before repair.

3. The operation must be carried out on the side of the seat-side SRS module, and never from the front.

4. Never use pneumatic or electric tools for repairs.

5. Before removing the seat, operate the regulator handle to lower the seat to the lowest position.

6. Check the installation positions of harness connectors and harness retaining clips before performing the operation.

7. Never insert foreign objects such as a screwdriver into the side airbag module connector. (Prevent accidental activation caused by static electricity)

4.12.3 Diagnosis and testing

4.12.3.1 Electric Seat-Fault Diagnosis

5.1 Abnormal noise fault troubleshooting

5.1.1 Seat noise

Exercise special caution regarding the position of seats and the articles thereon when isolating the noise arising therefrom. These conditions shall reappear when confirming and isolating the noise sources.

5.1.2 Causes of seat noise include:

1. Noise caused by clearance between headrest rod and mounting hole.
2. Noise caused by squeak between seat cushion and seat frame, rocking and friction of slide rails and rocking of adjuster.
3. Noise due to the clearance in the lock mechanisms of the rear seats.
4. Noise caused by friction between the seat and surrounding interior trims.

Such noise can be isolated by shifting or pressing any suspicious element when the noise reappears. Most faults can be eliminated by placing the element again or using polyurethane adhesive tapes on the contact area.

4.12.3.2 Fault Diagnosis

5.2 Troubleshooting other faults

Condition	Possible Cause	Correction
Drop of front & rear adjuster control rods	– The springs thereof are unable to return back. – The seat front & rear adjuster control rods are twisted or broken.	– Lubricate the return springs with special lubricating oil or replace. – Repair or replace the control rods.
Self-locking failure of front-back adjuster	– The front & rear adjuster control rods are bent. – The latch return springs thereof are fractured. – The lock is adhered to the adjuster.	– Repair or replace the control rods. – Mount new latch return springs – Lubricate the lock latch pivot with special lubricant.
It is hard to move the seat forward and backward.	– The new front & rear seat adjusters have not been run in (in need of 20 running-ins). – The front & rear seat adjusters have not been well lubricated. – The adjuster is not smooth due to bent or damaged rails.	– Shift the seat between the foremost to the rearmost ends for several times to make the rails slide smoothly. – Lubricate the front & rear seat adjuster rails with specialised vehicle lubricating oil or equivalent products. – Replace the seat.

4.12.3.3 Electric Seat-Fault Diagnosis

5.2 Troubleshooting other faults

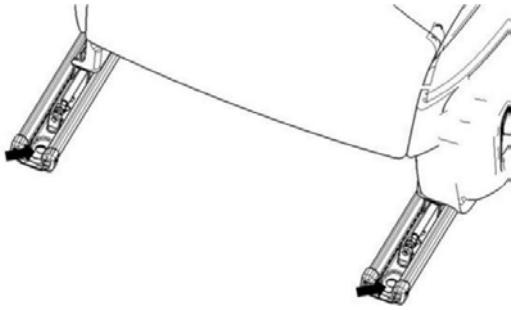
Condition	Possible Cause	Correction
Drop of front & rear adjuster control rods	– The springs thereof are unable to return back. – The seat front & rear adjuster control rods are twisted or broken.	– Lubricate the return springs with special lubricating oil or replace. – Repair or replace the control rods.
Self-locking failure of front-back adjuster	– The front & rear adjuster control rods are bent. – The latch return springs thereof are fractured. – The lock is adhered to the adjuster.	– Repair or replace the control rods. – Mount new latch return springs – Lubricate the lock latch pivot with special lubricant.
It is hard to move the seat forward and backward.	– The new front & rear seat adjusters have not been run in (in need of 20 running-ins). – The front & rear seat adjusters have not been well lubricated. – The adjuster is not smooth due to bent or damaged rails.	– Shift the seat between the foremost to the rearmost ends for several times to make the rails slide smoothly. – Lubricate the front & rear seat adjuster rails with specialised vehicle lubricating oil or equivalent products. – Replace the seat.

4.12.4 Removal and installation

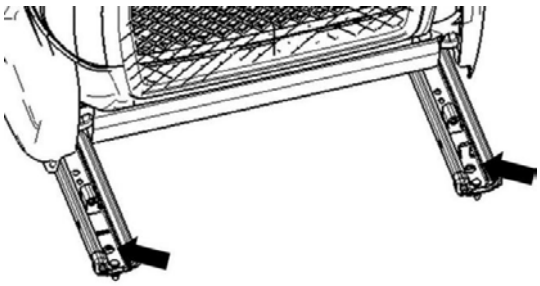
4.12.4.1 Front seats

Removal

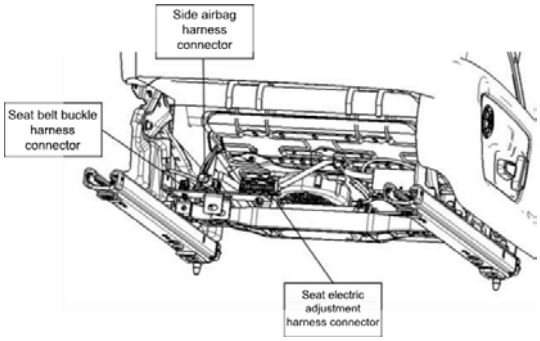
1. Pull up the seat forward/backward adjustment pull rod (move the electric seat forward/backward adjustment switch) to make the seat move backward to the backmost position, and remove two fixing bolts at the front end of the seat.



2. Pull up the seat forward/backward adjustment pull rod (move the electric seat forward/backward adjustment switch) to make the seat move foremost, and remove two fixing bolts at the rear end of the seat.



3. Disconnect the harness connector between body and seat.



4. Lift the seat out of the vehicle.

Installation

1. Install in the reverse order of disassembly and pay attention to the following matters:

Caution: Make sure that the inner and outer locks of the slide are at the same position before assembling.

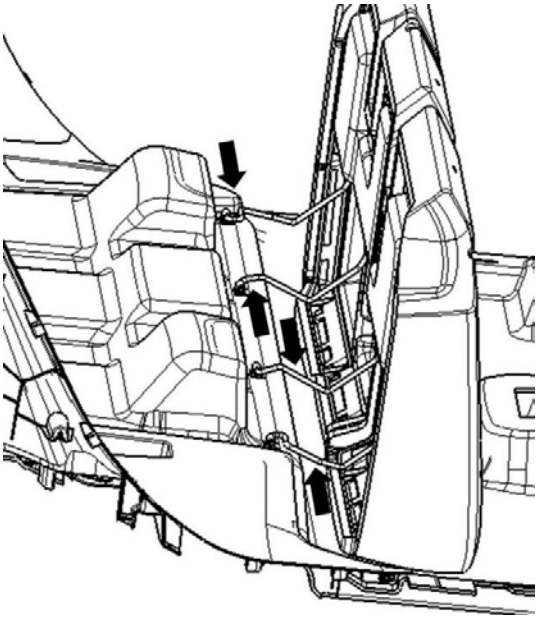
Note: Make sure that the slide rail fixing pin is placed in the hole of the floor.

Caution: Use a torque wrench to apply torque to the four bolts of the seat.

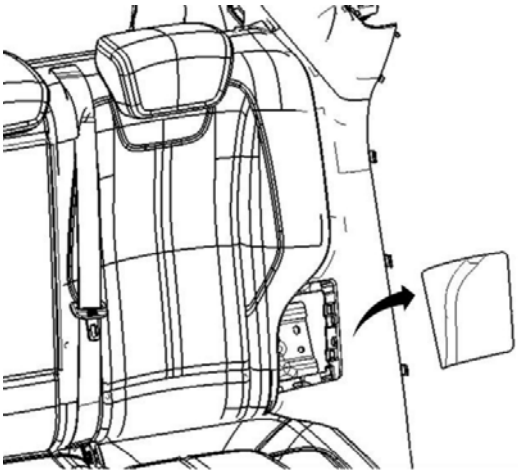
4.12.4.2 Rear 40%/60%-portion seat

Removal

1. Seat cushion removal: Fold the 40%/60%-portion seat cushion forward and place it on the body floor. Forcefully push the seat cushion overturn steel wire out of the body mounting bracket.

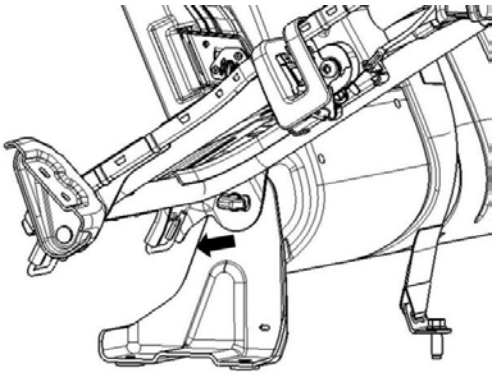


2. Backrest removal: Open the plastic covers on both side walls of the body and then remove the nuts.

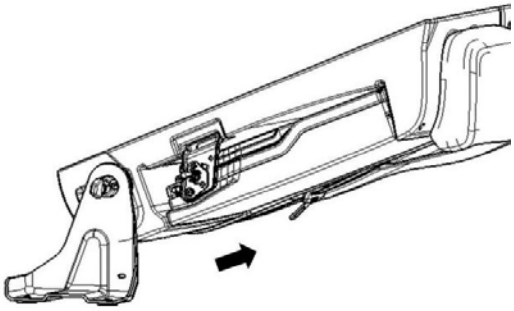


3. Remove the 40%-portion backrest; the maintenance personnel shall face the seat backrest and operate the unlocking device at the shoulder of the 40%-portion backrest upper end to unlock the backrest. Fold the 40%-portion backrest forward (make the angle of the pin hole consistent with that of the pin shaft), pull out the backrest

obliquely, pay attention to the outer rotating bracket to separate its mounting hole from the corresponding bolt, gradually pull out the backrest and adjust the backrest angle, and separate the inner pin hole of the backrest from the 60%-portion backrest pin shaft.



4. Remove the 60%-portion backrest; the maintenance personnel shall face the seat backrest and operate the unlocking device at the upper shoulder of the 60%-portion backrest to unlock the backrest. Fold the 60%-portion backrest forward (make the angle of pin hole consistent with that of pin shaft), pull out the backrest obliquely, pay attention to the outer rotating bracket to separate its mounting hole from the corresponding bolt, gradually pull out the backrest and adjust the backrest angle, and disengage the inner pin of the backrest from the hole of the middle hinge bracket of the backrest.



Installation

1. Install in the reverse order of disassembly and pay attention to the following matters:

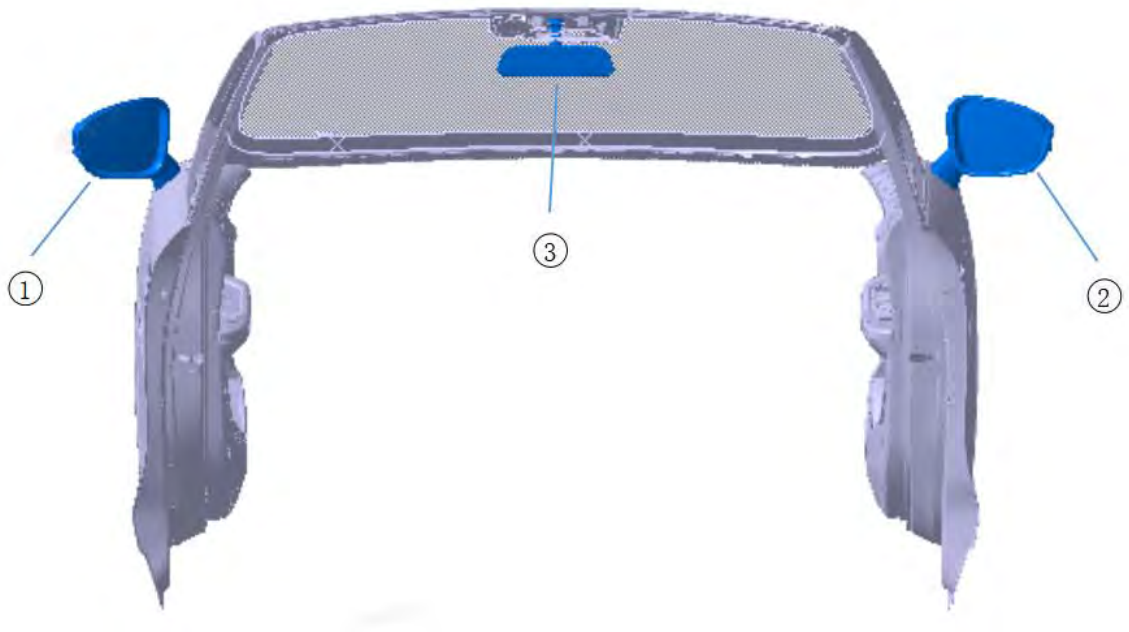
Caution: When assembling the backrest, turn up the backrest and try to lock the backrest with the lock lever. Repeat the "unlocking-locking" operation. If it is not smooth, loosen the fastening bolt of the lock lever and adjust the threaded rod upwards and downwards.

Caution: Use a torque wrench to apply torque to the seat fixing nut.

4.13 Rearview mirror

4.13.1 Instructions and operations

4.13.1.1 Component Locating Diagram



Item	Part Name	Instruction for mounting positions
1	Left rearview mirror assembly	On the door
2	Right rearview mirror assembly	On the door
3	Interior rearview mirror assembly (manual dimming)	On the front windscreen

4.13.1.2 Precautions

Precautions

1. **Caution:** Be sure to use a 12V battery.
2. **Caution:** Do not disconnect the battery cable when the engine is running.
3. **Caution:** Before connecting or disconnecting the engine ECU harness connector, turn the ignition switch to the OFF position and disconnect the GND cable of the battery. If not, the engine ECU may be damaged because the ECU voltage is still 12 V even when the ignition switch is at the "OFF" position.
4. **Caution:** Before disassembling parts and components, turn the ignition switch to the OFF position, and then disconnect the battery GND cable.
5. **Caution:** Do not disassemble the engine ECU.
6. **Caution:** Only use a digital multimeter to inspect the electronic fuel injection (EFI) system.
7. **Caution: Please use authentic parts and components for maintenance; otherwise, the EFI system may not operate properly.**
8. **Caution:** During maintenance, only unleaded petrol can be used.
9. **Caution: Please follow the specified maintenance and diagnostic procedures for maintenance work.**
10. **Caution: Do not disassemble the parts and components of the EFI system during maintenance.**

11. **Caution:** During maintenance, handle electronic components (ECU, sensors, etc.) with great care and do not let them fall to the ground.

12. **Caution: Develop an awareness of environmental protection and effectively handle any waste generated during maintenance.**

4.13.2 Removal and installation

4.13.2.1 Exterior rearview mirror assembly

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

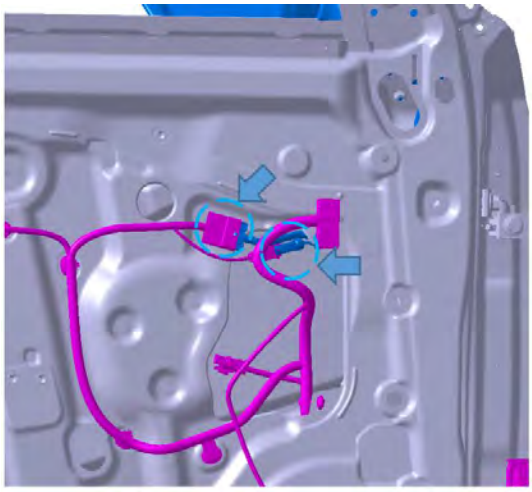
2. Remove the front door shield.



3. Remove the door waterproof film.

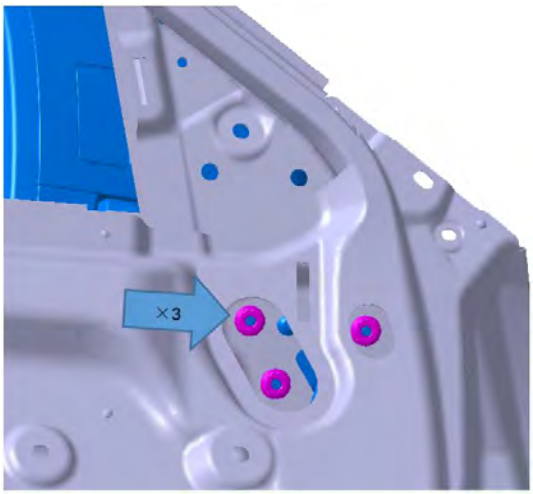


4. Remove the exterior rearview mirror harness connector and camera harness connector from the door harness.



5. Use a socket wrench to remove the 3 exterior rearview mirror nuts.

   Torque: 8 N·m



6. Take out the exterior rearview mirror.

Installation

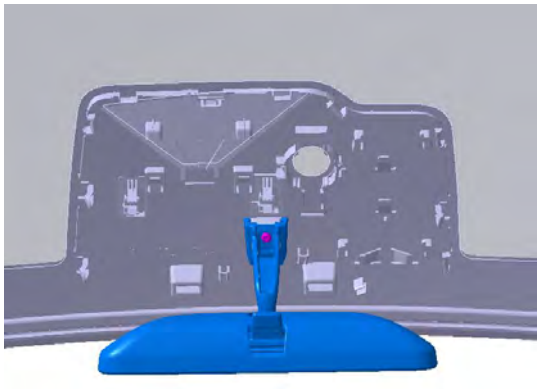
1. The installation order is reverse to the removal order.

4.13.2.2 Interior rearview mirror assembly

Removal

1. Remove the interior rearview mirror cover plate.

2. Loosen the interior rearview mirror screws with a T20 Allen wrench.



3. Remove the interior rearview mirror.

Installation

1. The installation order is reverse to the removal order.

4.13.3 Removal and installation

4.13.3.1 Exterior rearview mirror component

Mirror glass assembly removal

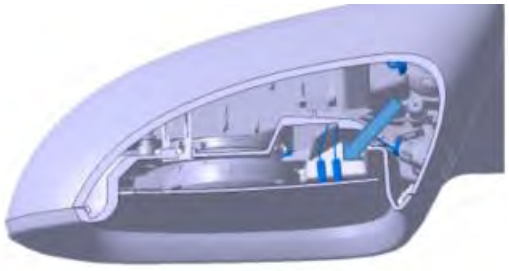
1. Press and hold the lens assembly at a to turn the lens at b outward to the maximum.



2. Insert a straight screwdriver between the regulator and the mirror assembly to pry up and separate the mirror glass assembly from the regulator.



3. Disconnect the harness connector of heating plate on the mirror glass assembly.



4. Remove the mirror assembly.

   Caution: Before disassembly, wrap the b area with protective tape to prevent tools from scratching the housing.

Installation

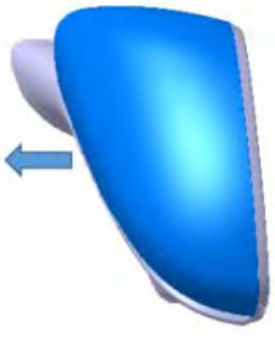
1. The installation order is reverse to the removal order.

Removal of trim cover

1. Use a straight screwdriver to pick up the four pawls of the trim cover (the pawls at a-d, d are hidden behind the mirror ring).



2. Hold the outer edge of the trim cover by hand and apply force in the arrow direction until the pawl is detached from the mirror body assembly.
3. Remove the trim cover in the direction of arrow.

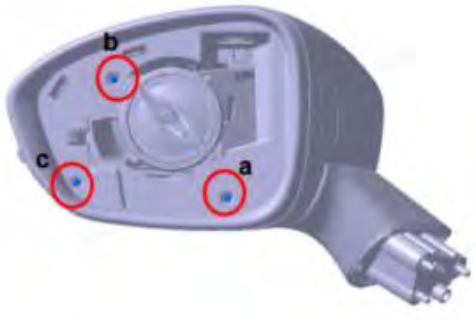


Installation

1. The installation order is reverse to the removal order.

Removal of mirror ring

1. Use a cross-head screwdriver to remove the 3 screws (a/b/c) of the mirror ring.



2. Use a straight screwdriver to pick up the 3 pawls in the ring and remove the mirror ring; remove the trim cover along the D direction.



Installation

1. The installation order is reverse to the removal order.

Removal of turn signal

1. Remove the two screws of the turn signal using a cross-head screwdriver.



2. Hold the first and last positions of the turn signal with your fingers and remove the turn signal in the direction of the arrow. (The turn signal will slightly interfere with the lower mirror housing during this process).



3. Disconnect the harness connector and remove the turn signal.



Installation

1. The installation order is reverse to the removal order.

4.14 Power sunroof

4.14.1 Specification

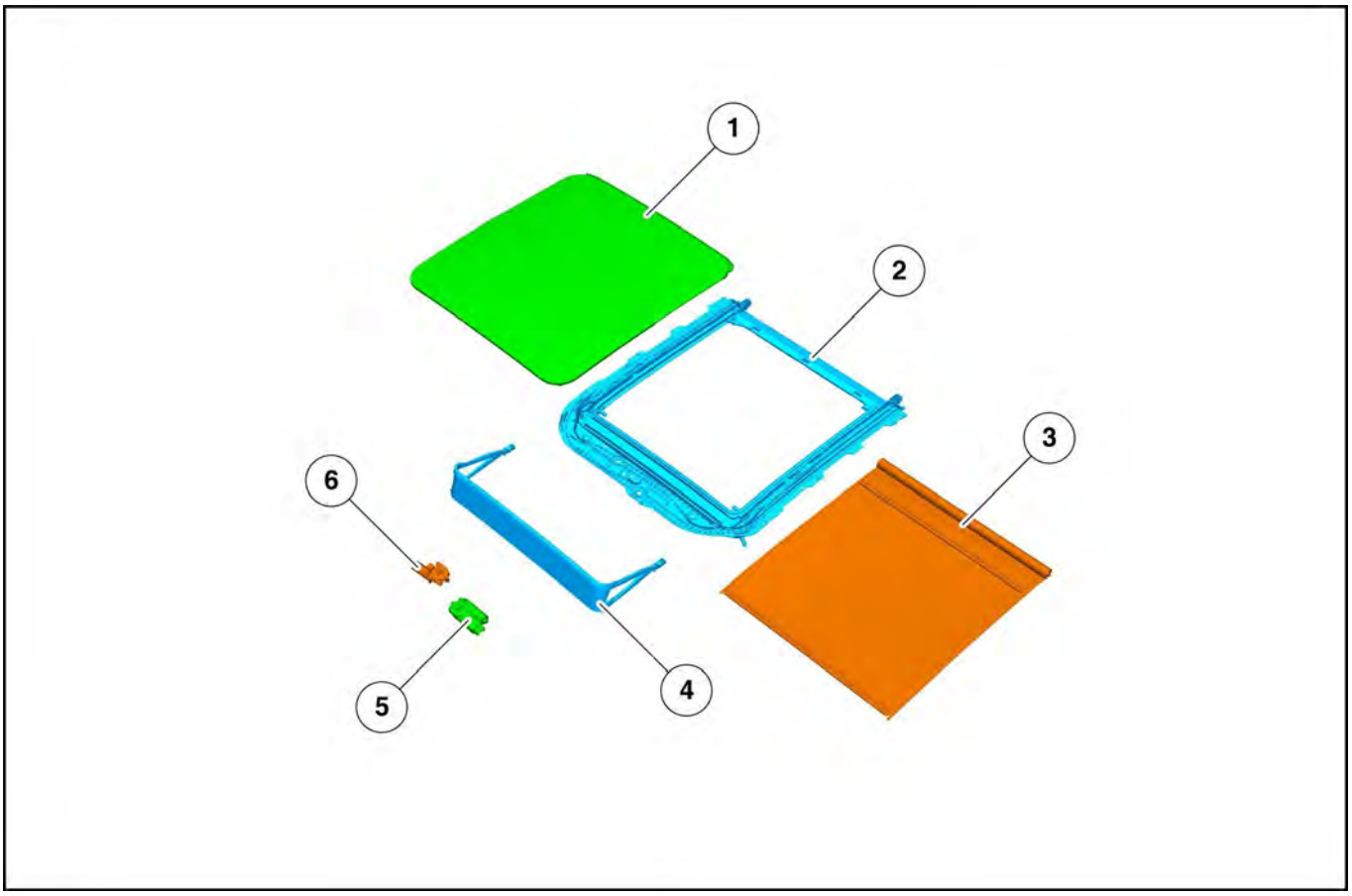
4.14.1.1 Torque specification

Name	Nm
Fixing bolt of sunroof assembly	7.0±0.7
Fixing screw of sunroof motor	Torque: 3±12.5%Nm
Sun visor motor fixing screw	Torque: 3±12.5%Nm

4.14.2 Instructions and operations

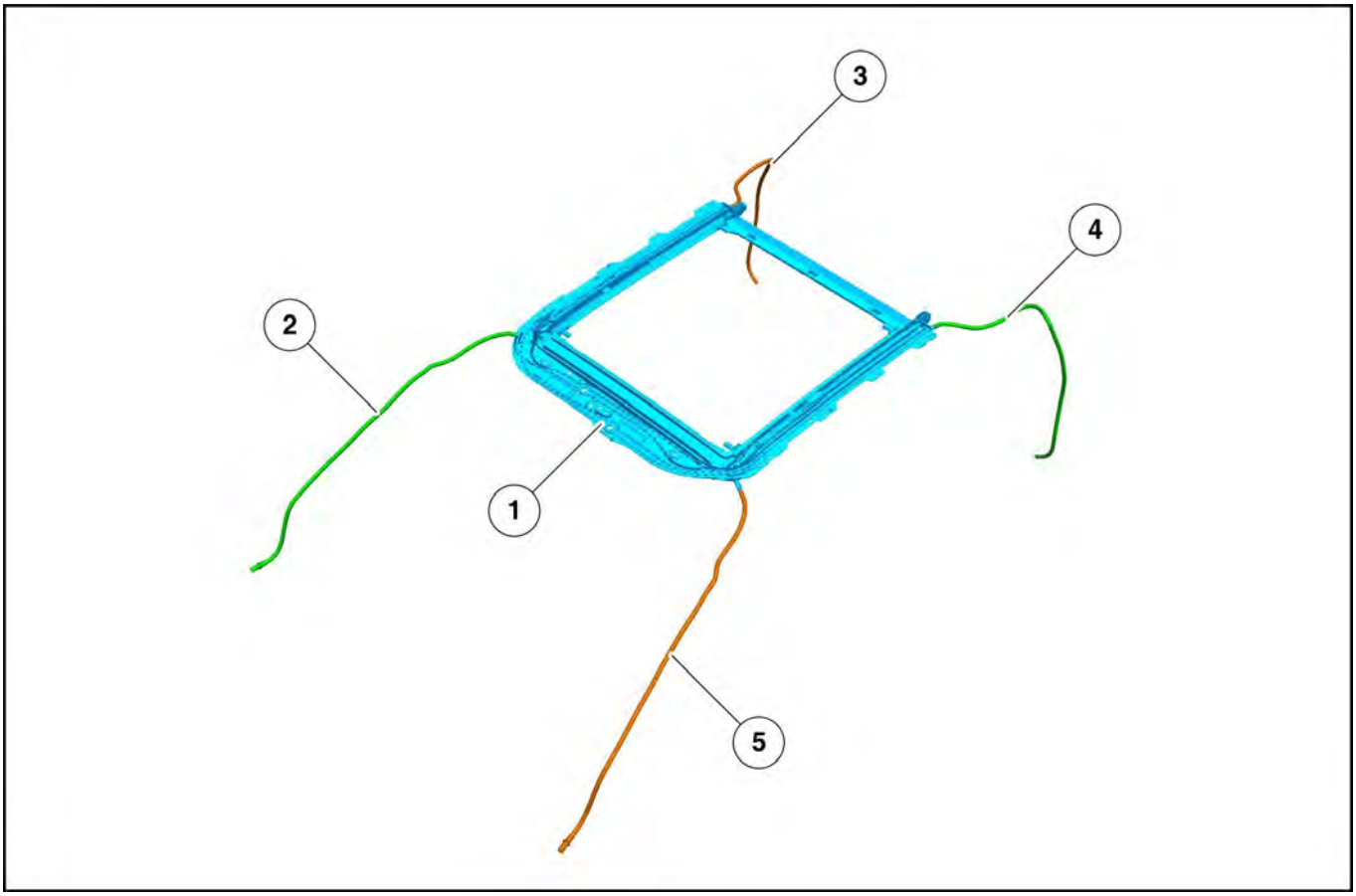
4.14.2.1 Exploded view

Sunroof system



Item	Description	Item	Description
1	Sunroof glass assembly	4	air deflector assembly
2	Sunroof frame assembly	5	Sunroof motor
3	Sun visor	6	Sun visor motor

Sunroof frame assembly



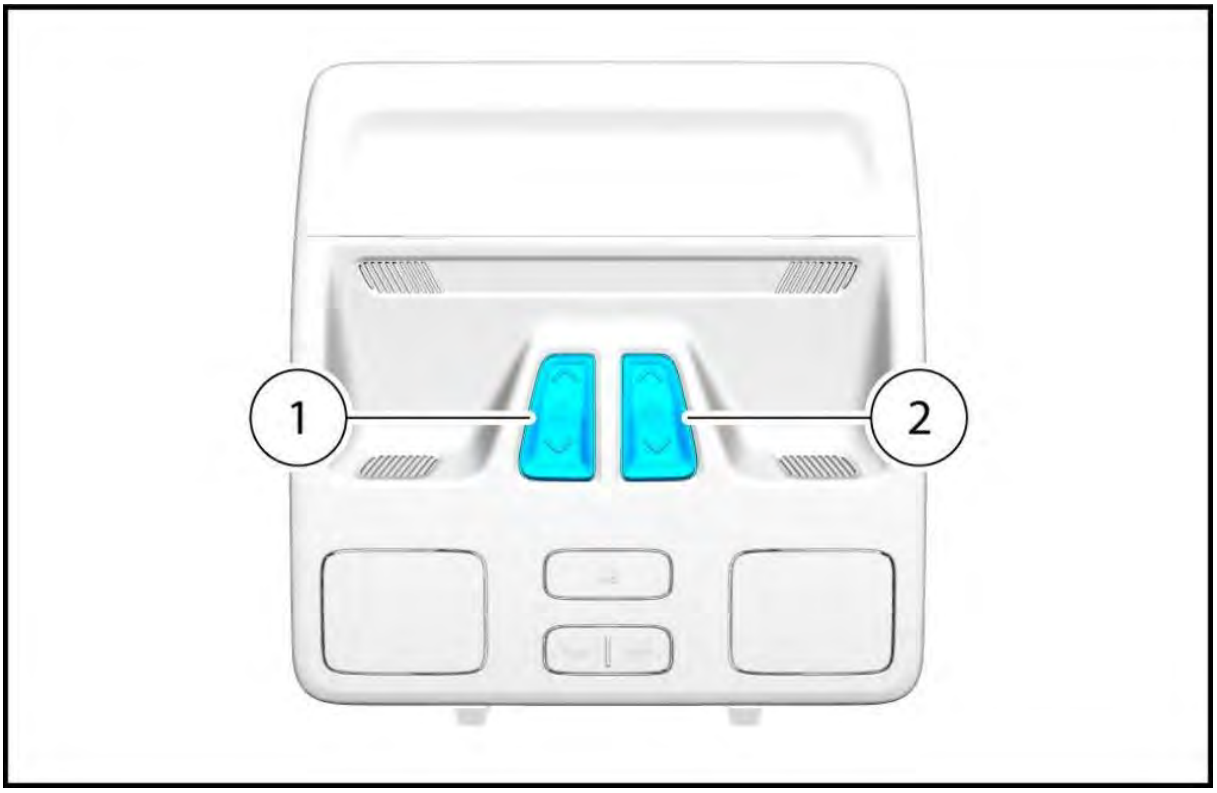
Item	Description	Item	Description
1	Sunroof frame assembly	4	Sunroof rear left water pipe
2	Front right water pipe of sunroof	5	Front left water pipe of sunroof
3	Right rear water pipe of sunroof		

4.14.2.2 Overview

Sliding sunroof (if equipped)

Warning: It is strictly forbidden to leave children alone in the car; it is strictly forbidden to let children play with the sunroof. Failure to observe the instructions may cause personal injury.

Warning: Before closing the sunroof, make sure there are no obstacles in its operating area and that children and pets are not near the open sunroof.



The sliding sunroof switch is located on the overhead control panel.

1 sliding sunroof switch

2 Sliding glass roof switch

The sunroof switch and the glass roof switch can only work when the one-button start switch is in the "ON" mode.

When the sunshade is closed, you can also turn the sunroof switch directly to the rear of the car. The sunshade will be opened first and then the sunroof will open. When the sunroof sunshade and sunroof glass are open, turn the sunroof sunshade switch toward the front of the car, and the sunroof glass will close together with the sunshade.

The sunroof sunshade can only be opened or closed when the panoramic sunroof glass is closed.

Sunroof sunshade opening/closing

Open the sunroof sunshade

1. When the sunroof sunshade is closed, turn the sunroof sunshade switch to the rear of the car and the sunroof sunshade will open automatically. If you need to stop opening during the opening process, just turn on the sunroof sunshade switch again.
2. Press and hold the sunroof sunshade switch toward the rear of the vehicle, and the sunroof sunshade will be opened manually. Release the switch, and the sunroof sunshade will stop opening.

Close the sunroof sunshade

Press the sunroof sunshade switch toward the front of the car, and the sunroof sunshade will automatically close. If you need to stop closing during the closing process, just turn on the sunroof sunshade switch again. Press and hold the sunroof sunshade switch toward the front of the vehicle, and the sunroof sunshade will be manually closed. Release the switch and the sunroof sunshade will stop closing.

Open or close the sunroof and glass roof

Tilt up and open

When the sliding sunroof and glass roof are closed, turn the sliding sunroof and glass roof switch toward the front of the car, and the sliding sunroof and glass roof will automatically tilt up and open. If you need to stop opening during the opening process, just turn the switch again.

Press and hold the sliding sunroof switch and glass roof switch toward the front of the vehicle to manually control the tilting opening. Release the switch, and the sunroof and glass roof will stop tilting.

Tilt closed

When the sliding sunroof and glass roof are tilted open, press it toward the rear of the car to close the tilt. If you need to stop closing during the closing process, just flip the tilt switch again.

Press and hold the tilting switch towards the rear of the vehicle to manually control the tilting to close. Release the switch and the tilting closing action will stop.

Slide opening

When the sliding sunroof is closed, turn the tilt switch toward the rear of the car, and the sliding sunroof A and glass roof B will slide open. If you need to stop opening during the opening process, turn the sunroof and glass roof switches again.

When the sliding sunroof is closed, press and hold the rocker switch toward the rear of the vehicle, and the sliding sunroof will be manually controlled to slide open. Release the switch and the opening action will stop.

Slide closing

When the sunroof is fully or partially open, press the sliding sunroof switch and the glass roof switch toward the front of the car, and the sliding sunroof will automatically slide closed. If you need to stop closing during the closing process, just turn on the sunroof switch again.

When the sunroof is fully or partially open, press and hold the sliding sunroof switch and glass roof switch toward the front of the car. The sliding sunroof will automatically slide closed. Release the switch and the sunroof closing action will stop.

Sunroof and sunshade anti-pinch function

During the process of automatically closing the sunroof or sunshade, if an obstacle is encountered, the automatic anti-pinch function of the sunroof or sunshade will open the sunroof or sunshade for a distance.

Panoramic Sunroof Initialisation

When the battery cable is disconnected or some faults are detected, and the panoramic sunroof and sunshade cannot work properly, follow the steps below to initialise the panoramic sunroof:

Start the engine, close the panoramic sunroof and sunroof sunshade, press and hold the panoramic sunroof switch or sunroof sunshade switch in the forward direction of the vehicle for more than 7 seconds (do not release the button at this time, otherwise the initialisation will fail). After completion, the initialisation of the sunroof and sunshade is completed. You can confirm whether their functions are normal by operating the sunroof and sunshade switches.

Sensor window closing setting (if equipped)

Set the opening and disabling of the sensor window through the "Vehicle settings"-"Body settings"-"Doors and Windows"-"Sensor Window" menu in the Ford intelligent IVI system (see "Ford Intelligent IVI System User Manual") or ask an authorised dealer to perform this operation for you.

Inductive window closing (if equipped)

The inductive window closing function is enabled by default. When the Start switch is in "ON" mode, click "Sensor Window Closing" in Ford intelligent IVI system to turn off or on this function.

When the sensor window closing function is turned on, 10 to 15 minutes after the Start switch is in the "OFF" mode, the vehicle enters a low power consumption state and the sensor window closing function takes effect: when rainfall is sensed, the doors, windows and panoramic sunroof will automatically close; when no rainfall is sensed for more than 12 hours, the timeout window closing will be started, and the doors, windows and panoramic sunroof will also automatically close.

Sensor window closing

Caution: If it is likely to rain 10 to 15 minutes after leaving the car, please close the windows and sunroof in time to avoid property loss.

4.14.3 Removal and installation

4.14.3.1 Sunroof assembly

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Disconnect the four water pipes of sunroof.



4. Remove the left fixing bolt of sunroof assembly.

   Torque: 7±0.7Nm



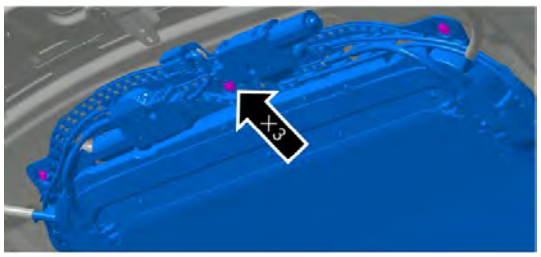
5. Remove the right fixing bolt of sunroof assembly.

   Torque: 7±0.7Nm



6. Remove the fixing bolts on the front side of the sunroof assembly, and remove the sunroof assembly.

   Torque: 7±0.7Nm



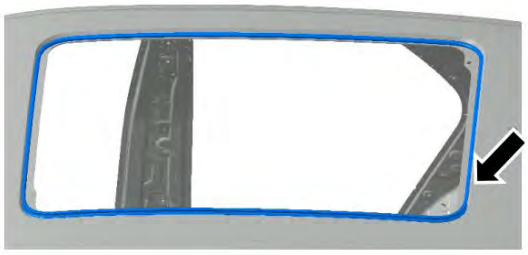
Installation

1. The installation order is reverse to the removal order.
2. Perform the sunroof initialisation procedure.

4.14.3.2 Sunroof assembly sealing strip

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Remove the sunroof assembly. Refer to: Sunroof assembly.
4. Remove the sunroof assembly sealing strip.



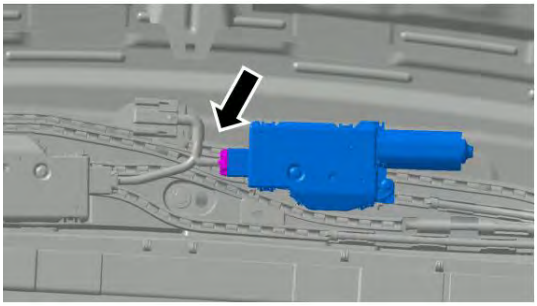
Installation

1. The installation order is reverse to the removal order.
2. Perform the sunroof initialisation procedure.

4.14.3.3 Sunroof motor assembly

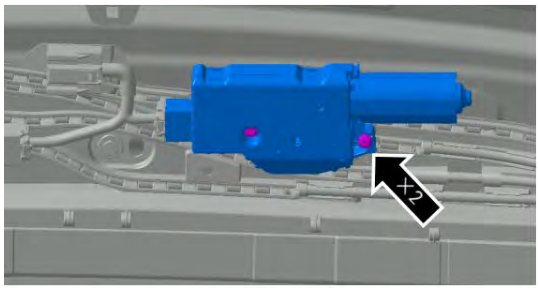
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Disconnect the harness connector of sunroof motor.



4. Remove the fixing screws of sunroof motor, and take off the sunroof motor assembly.

   Torque: 3±12.5%Nm



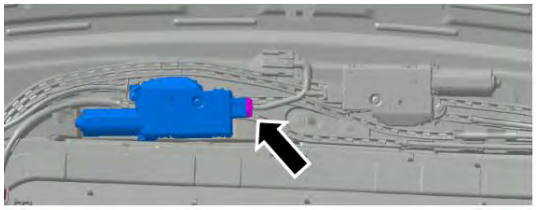
Installation

The installation order is reverse to the removal order.

4.14.3.4 Sun visor motor assembly

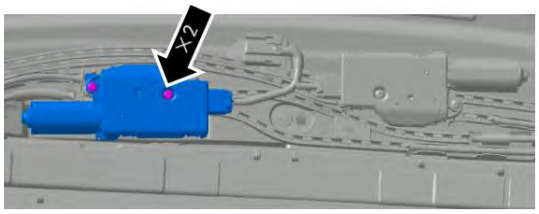
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Disconnect the sun visor motor harness connector.



4. Remove the fixing screws of sun visor motor, and remove the sun visor motor.

   Torque: 3±12.5%Nm



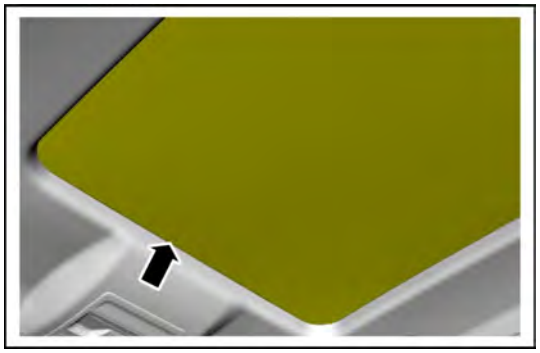
Installation

1. The installation order is reverse to the removal order.

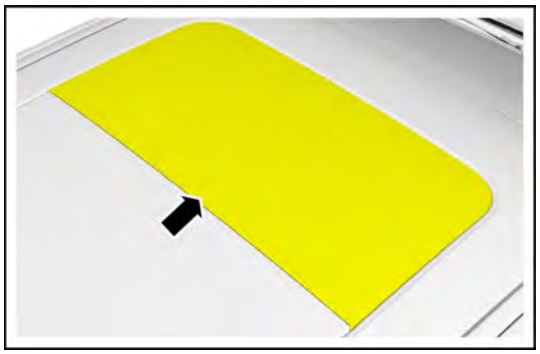
4.14.3.5 Sunroof glass

Removal

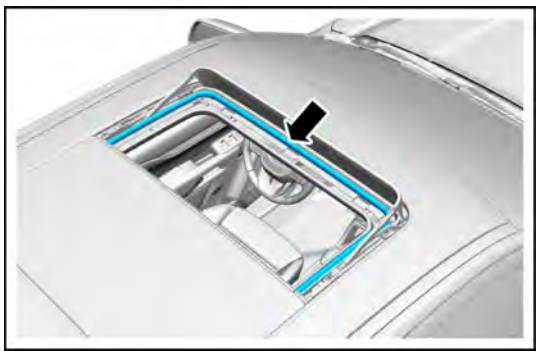
1. Fully open the sunshade.



2. Fully open the sunroof glass.

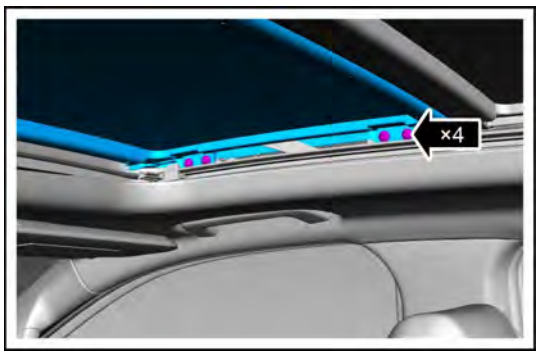


3. Remove the sunroof glass sealing strip.



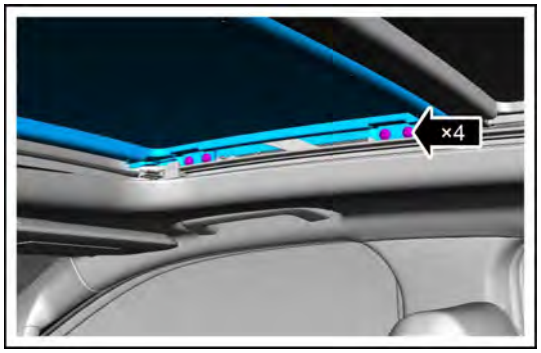
4. Remove the right fixing bolt of sunroof glass.

   Torque: 7±0.7Nm



5. Remove the left fixing bolt of sunroof glass, and take off the sunroof glass.

   Torque: 7±0.7Nm



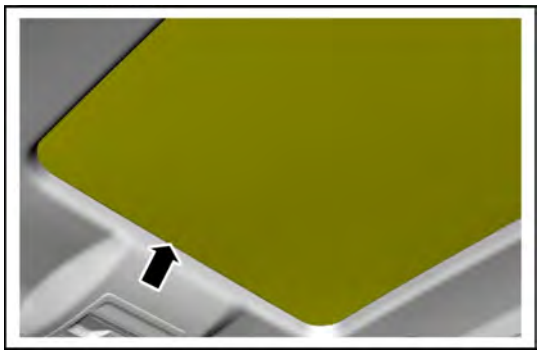
Installation

1. The installation order is reverse to the removal order.

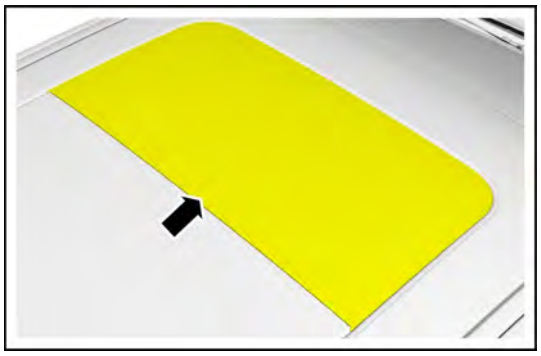
4.14.3.6 Sunroof fixed glass

Removal

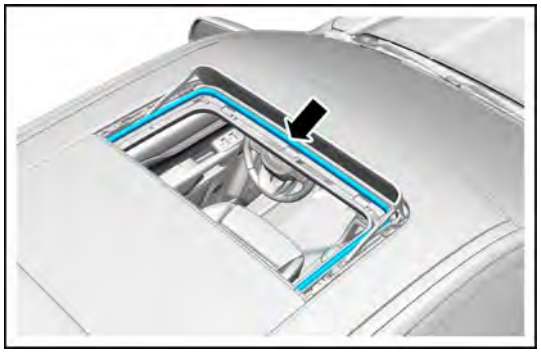
1. Fully open the sunshade.



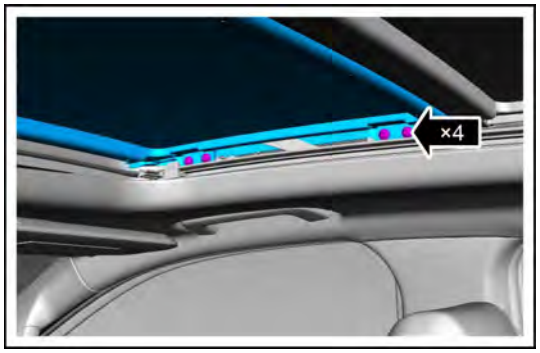
2. Fully open the sunroof glass.



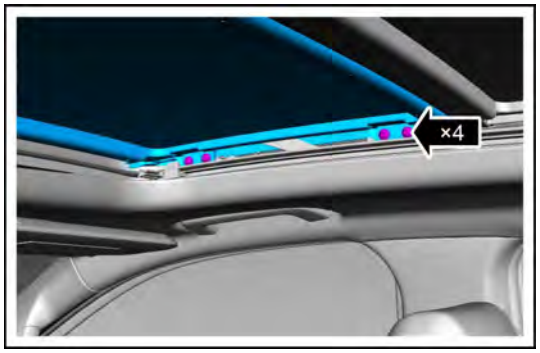
3. Remove the sunroof glass sealing strip.



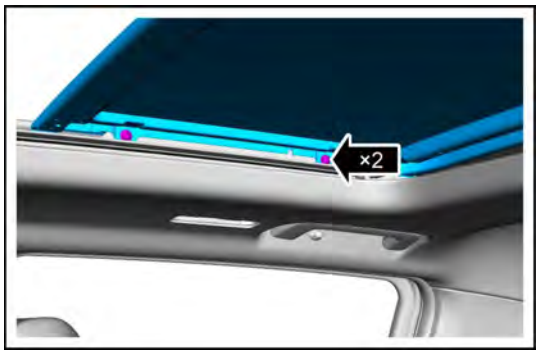
4. Remove the right fixing bolt of sunroof glass.



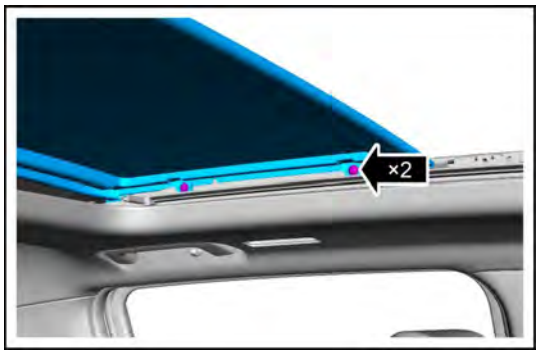
5. Remove the left fixing bolt of sunroof glass, and take off the sunroof glass.



6. Remove the right fixing bolt of sunroof fixed glass.



7. Remove the left fixing bolt of sunroof fixed glass, and take off the sunroof fixed glass.



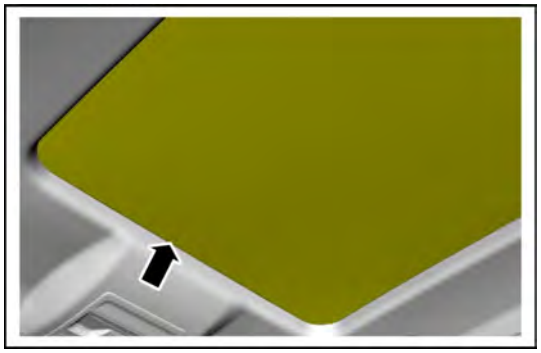
Installation

1. The installation order is reverse to the removal order.

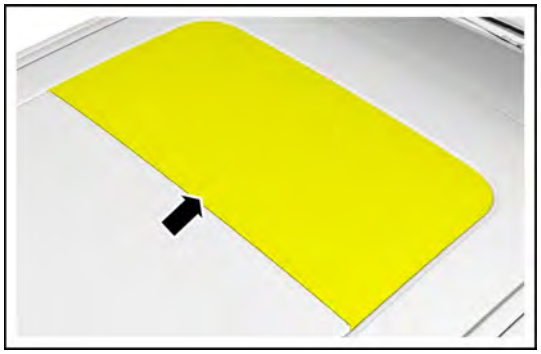
4.14.3.7 Sunroof glass sealing strip

Removal

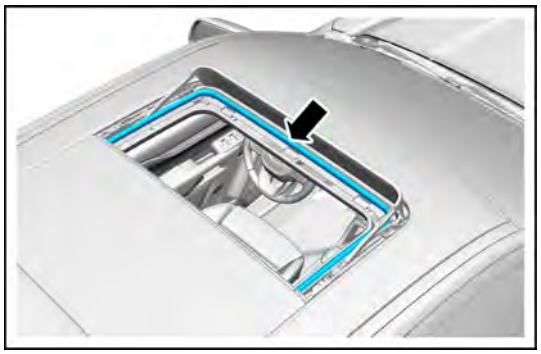
1. Fully open the sunshade.



2. Fully open the sunroof glass.



3. Remove the sunroof glass sealing strip.



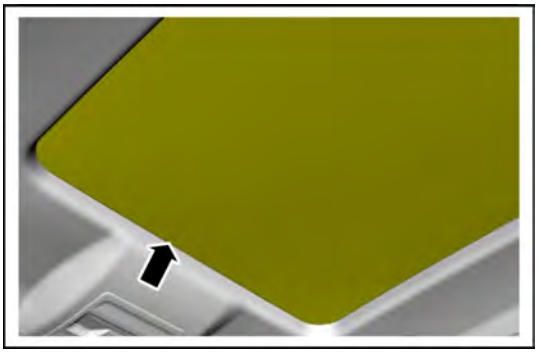
Installation

1. The installation order is reverse to the removal order.

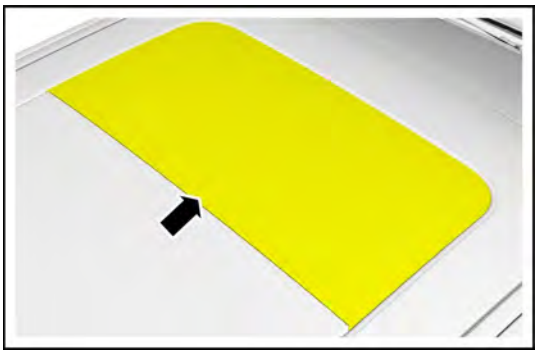
4.14.3.8 air deflector assembly

Removal

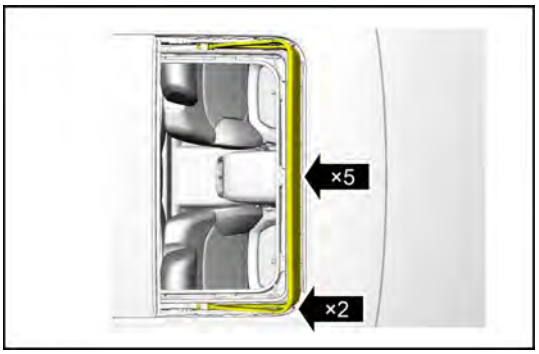
1. Fully open the sunshade.



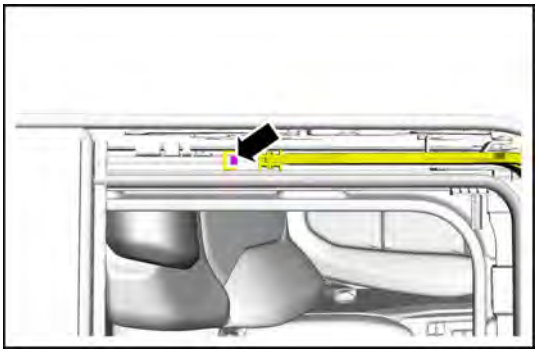
2. Fully open the sunroof glass.



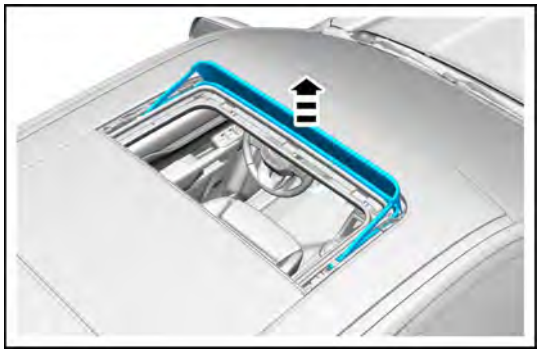
3. Disengage the fixing clips connecting the wind deflector assembly and the sunroof frame.



4. Remove the fixing clips of the wind deflector assembly.



5. Remove the wind deflector assembly.



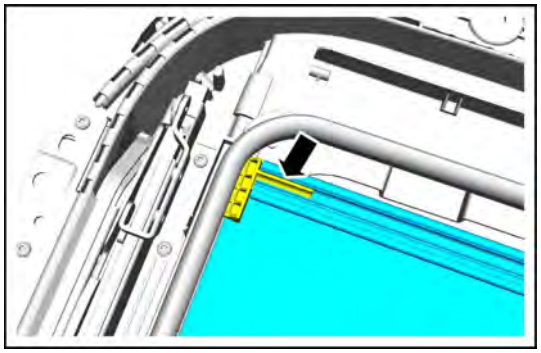
Installation

1. The installation order is reverse to the removal order.

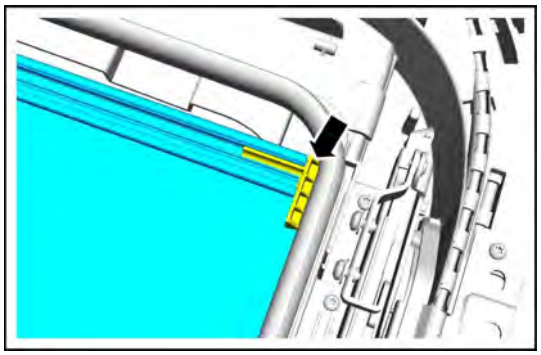
4.14.3.9 Sun visor

Removal

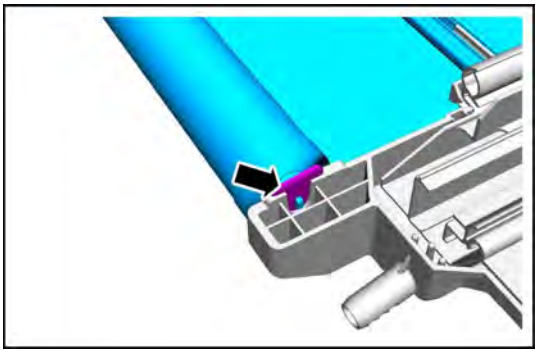
1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Remove the sunroof assembly. Refer to: Sunroof assembly.
4. Remove the left fixing clip of sun visor.



5. Remove the right fixing clip of sun visor.



6. Remove the fixing clips of sun visor, and then take out the sunroof sun visor.



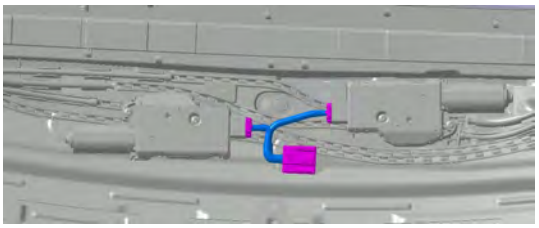
Installation

1. The installation order is the reverse of the removal order.

4.14.3.10 Sunroof harness

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front roof light assembly.
3. Remove the sun visors on both sides. Refer to: Sun visor.
4. Remove the front passenger's roof armrest. Refer to: Roof armrest.
5. Remove the A-pillar interior trim panels on both sides. Refer to: A-pillar upper shield.
6. Disconnect the sunroof harness connector and remove the sunroof harness.



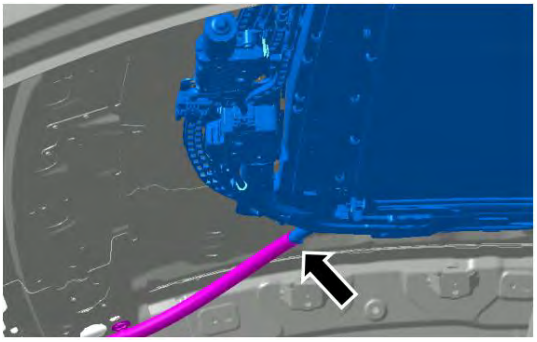
Installation

1. The installation order is the reverse of the removal order.

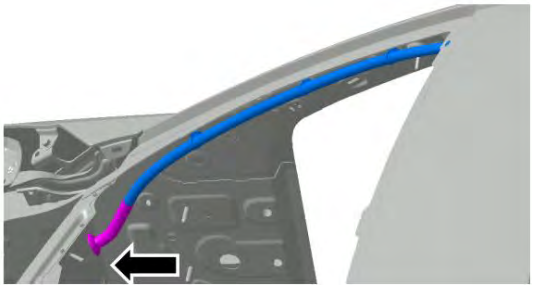
4.14.3.11 Front water pipe, sunroof

Removal

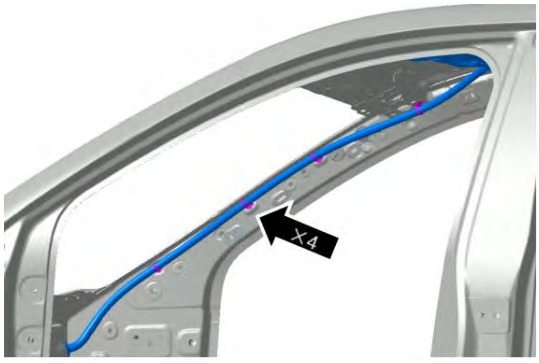
1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Remove the sunroof assembly. Refer to: Sunroof assembly.
4. Remove the A-pillar trim panel. Refer to: A-pillar upper shield..
5. Detach the sunroof front water pipe from the sunroof.



6. Detach the sunroof front water pipe from the body end.



7. Remove the sunroof front water pipe clip, and then take out the sunroof front water pipe.



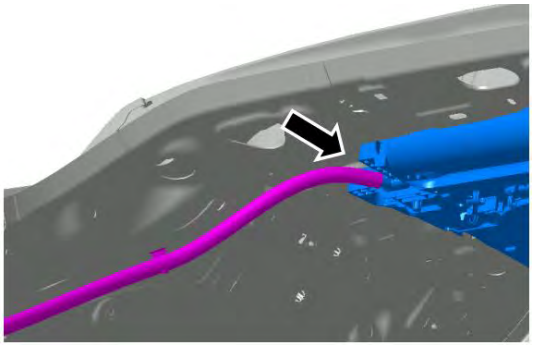
Installation

The installation order is the reverse of the removal order.

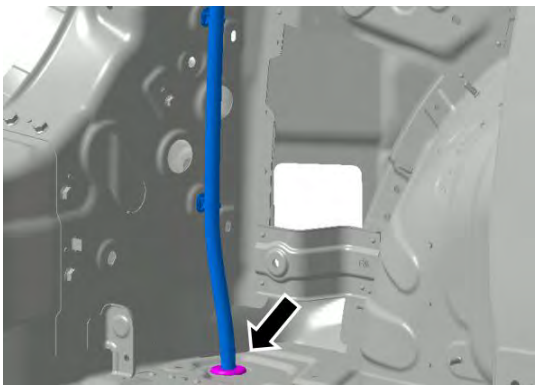
4.14.3.12 Rear water pipe, sunroof

Removal

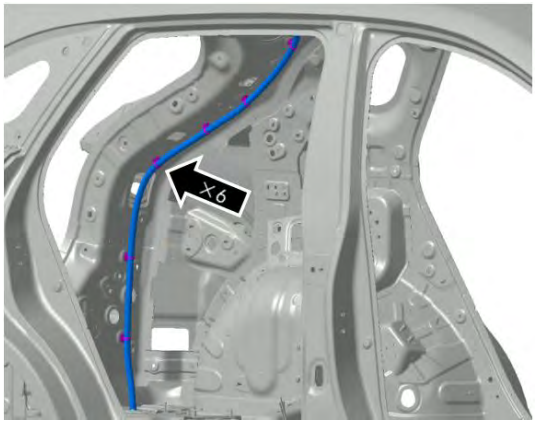
1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
3. Detach the sunroof rear water pipe from the sunroof.



4. Detach the sunroof rear water pipe from the body end.



5. Remove the sunroof rear water pipe clip, and then take out the sunroof rear water pipe.



Installation

1. The installation order is the reverse of the removal order.

4.14.4 General procedures

4.14.4.1 General procedures

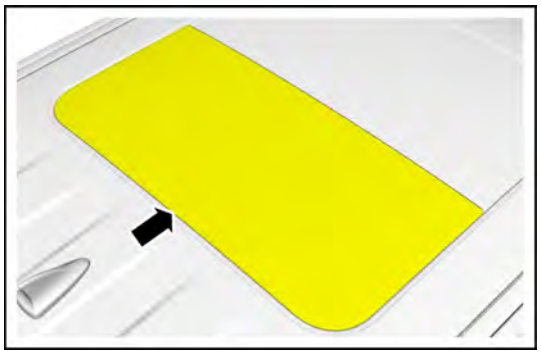
Sunroof glass flushness adjustment

1. Loosen the fixing bolts on both sides.



2. Push the rear edge of the sunroof glass up and down to ensure its correct positioning (-1±1.5mm).

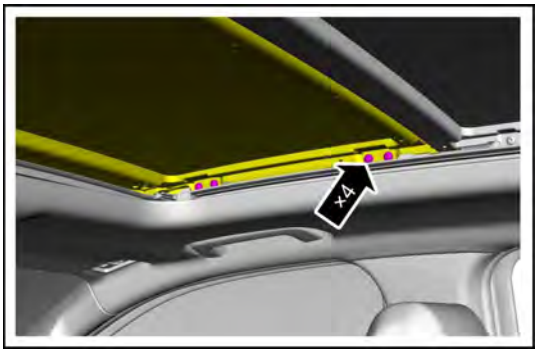
   Caution: Ensure that there is no gap between the glass circumference and the roof cover sheet metal.



3. Tighten the fixing bolts on both sides.

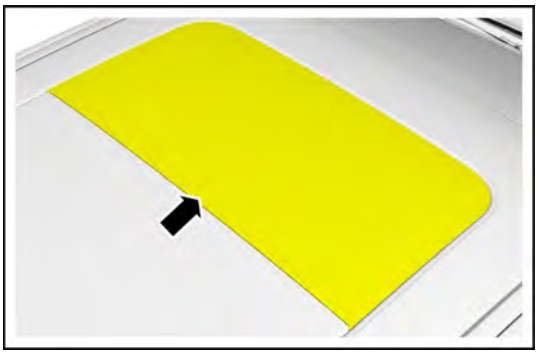


4. Loosen the fixing bolts on both sides.

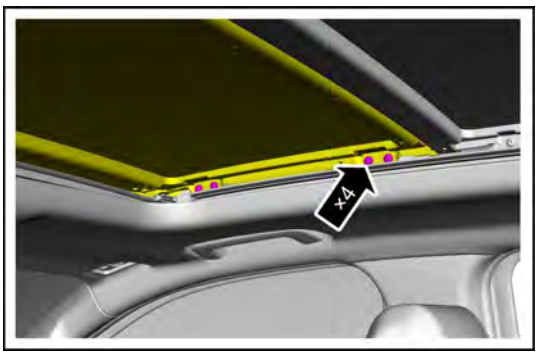


5. Push the rear edge of the sunroof glass up and down to ensure its correct positioning (-1±1.5mm).

   Caution: Ensure that there is no gap between the glass circumference and the roof cover sheet metal.



6. Tighten the fixing bolts on both sides.



7. Operate the sunroof and check whether the positioning of the sunroof glass is accurate.

Timing adjustment

1. Sunroof calibration. Refer to: Sunroof glass.
2. Remove the sun visor. Refer to: Sun Visor.
3. Remove the roof sunroof panel sliding glass motor. Refer to: Sunroof motor assembly.

   Caution: Before installing the motor for proper cable timing, both roof panel glass drive cable units must be fully forward and in both the left and right main guide rail assemblies.

4. Install the roof sunroof panel sliding glass and shield motor. Refer to: Sunroof motor assembly.
5. Installation of sun visor. Refer to: Sun Visor.
6. Mount the sunroof glass. Refer to: Sunroof glass.
7. Initialise the roof sunroof panel. Refer to: Sunroof initialisation.
8.

Sunroof initialisation

1. Press the sunroof Slide Close button to close the sunroof to the tilted position.
2. Release the switch and press it again for more than 10S.
3. The sunroof glass stalls and stops at the mechanical stop point in closing direction.
4. Release the switch and press it again within 5 seconds.
5. After 3 seconds, the sunroof will begin to perform self-learning actions for opening and closing windows, and finally stop at the tilting position after completion.

The above steps are applicable to forced initialisation when the position is not offset or lagging behind synchronisation.

1. Short press the sunroof Slide Close button to trigger the anti-pinch retraction of the sunroof.
2. During the anti-pinch retraction process of the sunroof, press and hold the Slide Close button for more than 10S.
3. The sunroof glass stalls and stops at the mechanical stop point in closing direction.
4. Release the switch and press it again within 5 seconds.
5. After 3 seconds, the sunroof will begin to perform self-learning actions for opening and closing windows, and finally stop at the tilting position after completion.

The above steps are applicable to forced initialisation in the case of position advance synchronisation.

4.15 Power window

4.15.1 Specification

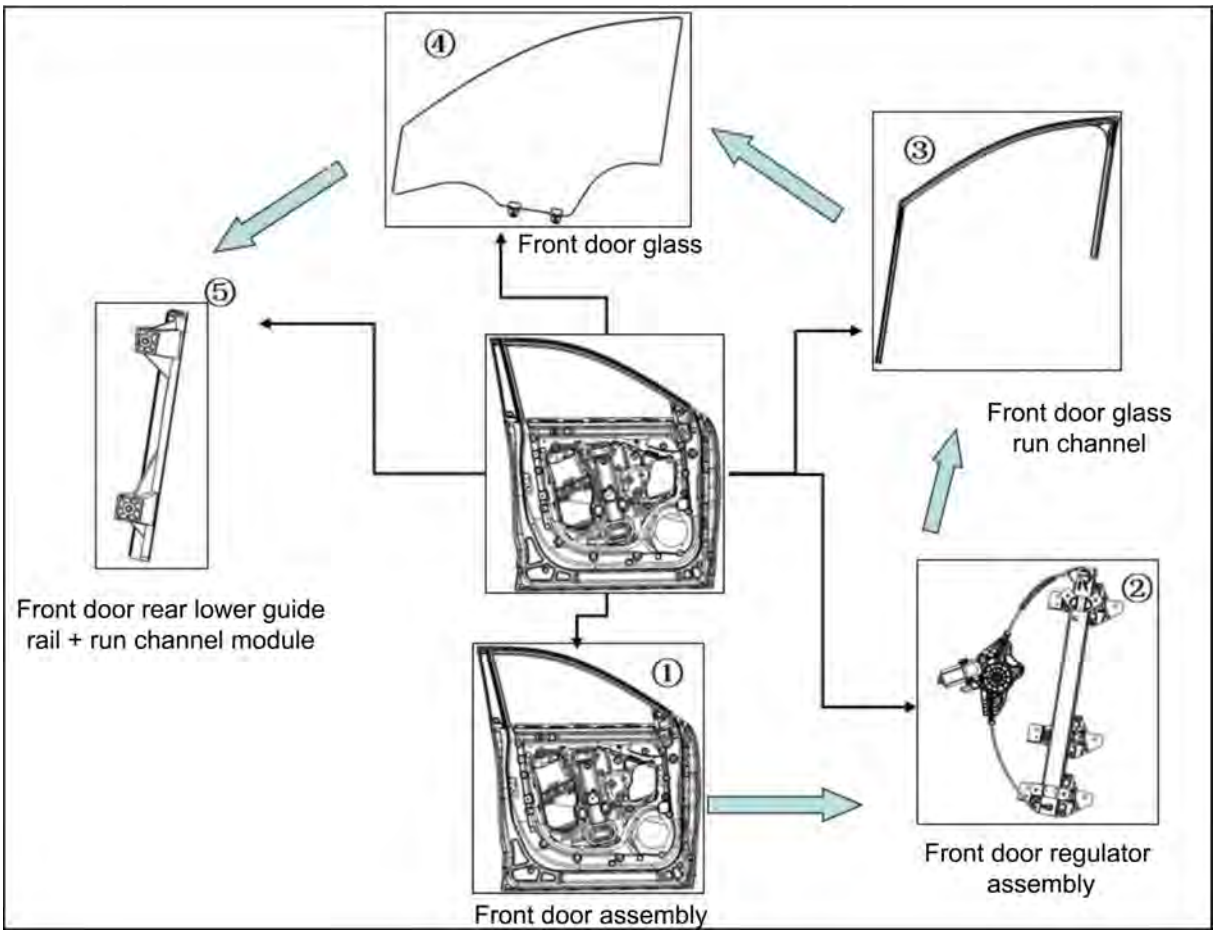
4.15.1.1 General specifications

Name	Specification
Rated voltage	12V
Input voltage	9V~16V
Operating Current	<60A
Static current	<0.5mA
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+85℃

4.15.2 Instructions and operations

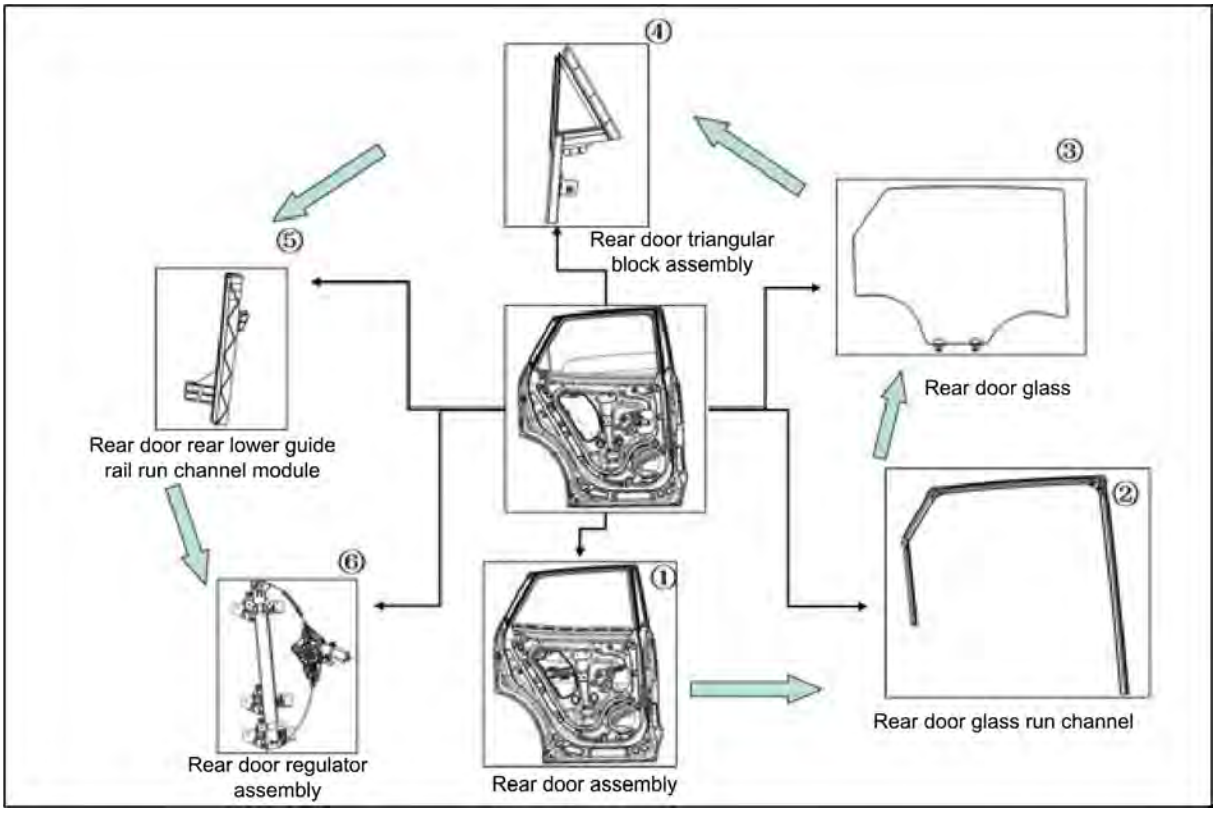
4.15.2.1 Power window

Exploded View of Front Door Window and Regulator



Item	Description	Item	Description
1.	Front door assembly	4.	Front door glass
2.	Front door window regulator	5.	Front door rear lower guide rail assembly + run channel module
3.	Front door glass run channel		

Exploded View of Rear Door Window and Regulator



Item	Description	Item	Description
1.	Rear door assembly	4.	Rear door triangle block
2.	Rear door glass run channel	5.	Rear door rear lower guide rail assembly + run channel module
3.	Rear door glass	6.	Rear door window regulator

4.15.2.2 Precautions

Precautions

1. **Caution:** Be sure to use a 12V battery.
2. **Caution:** Do not disconnect the battery cable when the engine is running.
3. **Caution:** Before connecting or disconnecting the engine ECU harness connector, turn the ignition switch to the OFF position and disconnect the GND cable of the battery. If not, the engine ECU may be damaged because the ECU voltage is still 12 V even when the ignition switch is at the "OFF" position.
4. **Caution:** Before disassembling parts and components, turn the ignition switch to the OFF position, and then disconnect the battery GND cable.
5. **Caution:** Do not disassemble the engine ECU.
6. **Caution:** Only use a digital multimeter to inspect the electronic fuel injection (EFI) system.
7. **Caution: Please use authentic parts and components for maintenance; otherwise, the EFI system may not operate properly.**
8. **Caution:** During maintenance, only unleaded petrol can be used.
9. **Caution: Please follow the specified maintenance and diagnostic procedures for maintenance work.**
10. **Caution: Do not disassemble the parts and components of the EFI system during maintenance.**

11. **Caution:** During maintenance, handle electronic components (ECU, sensors, etc.) with great care and do not let them fall to the ground.

12. **Caution: Develop an awareness of environmental protection and effectively handle any waste generated during maintenance.**

Precautions during repair

1. **Caution:** Do not use any part of human body to test the anti-pinch function, so as to avoid pinching.

4.15.3 Diagnosis and testing

4.15.3.1 Power Window-Troubleshooting and Maintenance

Window anti-pinch DTC list

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendatio-ns
B230000	Battery overvoltage	The voltage is detected to be greater than 16V for 100ms at a cycle of 1ms;	Battery fault	Check the battery voltage.
B230100	Battery undervoltage	The voltage is detected to be less than 9V for 100ms at a cycle of 1ms;	Battery failure	Check the battery voltage.
B230400	Passenger side front right window up button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch
B230500	Passenger side rear left window up button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch
B230600	Passenger side rear right window up button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch
B230700	Passenger side front right window down button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch
B230800	Passenger side rear left window down button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch
B230900	Passenger side rear right window down button short-circuited	The effective duration of the button is detected to be greater than 30s at a cycle of 10ms;	Button switch fault	Replacement of button switch

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendations
B231000	Front left door motor output undercurrent	When the motor is in action, detect the motor output current at a 1ms cycle. If the motor output current is less than 0.5A and lasts for 60MS;	Window motor harness disconnected/fuse blown	Check the window motor harness/fuse
B231100	Front right door motor output undercurrent	When the motor is in action, detect the motor output current at a 1ms cycle. If the motor output current is less than 0.5A and lasts for 60MS;	Window motor harness disconnected/fuse blown	Check the window motor harness/fuse
B231200	Rear left door motor output undercurrent	When the motor is in action, detect the motor output current at a 1ms cycle. If the motor output current is less than 0.5A and lasts for 60MS;	Window motor harness disconnected/fuse blown	Check the window motor harness/fuse
B231300	Rear right door motor output undercurrent	When the motor is in action, detect the motor output current at a 1ms cycle. If the motor output current is less than 0.5A and lasts for 60MS;	Window motor harness disconnected/fuse blown	Check the window motor harness/fuse
B231400	Front left door motor output overcurrent	When the motor is in operation, detect the motor output current at a 1ms cycle. If the motor output current is greater than 25A and lasts for 20MS;	Window motor harness short-circuited	Check the window motor harness

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendatio-ns
B231500	Front right door motor output overcurrent	When the motor is in operation, detect the motor output current at a 1ms cycle. If the motor output current is greater than 25A and lasts for 20MS;	Window motor harness short-circuited	Check the window motor harness
B231600	Rear left door motor output overcurrent	When the motor is in operation, detect the motor output current at a 1ms cycle. If the motor output current is greater than 25A and lasts for 20MS;	Window motor harness short-circuited	Check the window motor harness
B231700	Rear right door motor output overcurrent	When the motor is in operation, detect the motor output current at a 1ms cycle. If the motor output current is greater than 25A and lasts for 20MS;	Window motor harness short-circuited	Check the window motor harness
B231800	Left window fuse disconnected	In the ON gear state, the left window power supply voltage is detected to be 0V in a cycle of 1ms and lasts for 100ms;	Left window power supply fuse blown	Replacement of fuse
B231900	Right window fuse disconnected	In the ON gear state, the right window power supply voltage is detected to be 0V in a cycle of 1ms and lasts for 100ms;	Left window power supply fuse blown	Replacement of fuse
B232000	Excessive resistance of front left window	The motor working current is greater than 50% of the stall current and the resistance changes within 100ms during the window rising process.	Detect window system status	Replace seal strip/ regulator

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendations
B232100	Excessive resistance of front right window	The motor working current is greater than 50% of the stall current and the resistance changes within 100ms during the window rising process.	Detect window system status	Replace seal strip/ regulator
B232200	Excessive resistance of rear left window	The motor working current is greater than 50% of the stall current and the resistance changes within 100ms during the window rising process.	Detect window system status	Replace seal strip/ regulator
B232300	Excessive resistance of rear right window	The motor working current is greater than 50% of the stall current and the resistance changes within 100ms during the window rising process.	Detect window system status	Replace seal strip/ regulator
B232400	Internal controller fault (reserved fault)	Reserved	No	
B232500	Front left motor position signal error	After the window self-learning is successful, when the top is blocked, the window position deviates by 20MM from the window during the window self-learning;	Motor fault.	Replace the motor
B232600	Front right motor position signal error	After the window self-learning is successful, when the top is blocked, the window position deviates by 20MM from the window during the window self-learning;	Motor fault.	Replace the motor

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendations
B232700	Rear left motor position signal error	After the window self-learning is successful, when the top is blocked, the window position deviates by 20MM from the window during the window self-learning;	Motor fault.	Replace the motor
B232800	Rear right motor position signal error	After the window self-learning is successful, when the top is blocked, the window position deviates by 20MM from the window during the window self-learning;	Motor fault.	Replace the motor
UO14000	Lost communication with BCM	In the ON gear state, BCM1 message loss is detected at a cycle of 100ms and lasts for 1S	BCM1 fault	Replace BCM/1 and detect CAN bus
U007300	Controller BUSOFF fault	Detect the BUSOFF fault at a cycle of 10ms. After three consecutive BUSOFF faults are detected	CAN bus fault	Inspect the CAN bus
U220D00	The controller network management enters the LimpHome state for more than 2s	In the ON gear state, the bus signal is detected at a cycle of 5ms, and the controller network management enters the LimpHome state for more than 2s	CAN bus fault	Inspect the CAN bus
UO14001	Loss of communication with PEPS1 controller	In the ON gear state, the PEPS1 message is detected to be lost at a cycle of 100ms for 1S	PEPS1 fault	Replace PEPS1/detect CAN bus
U100200	Loss of communication with TBOX1 controller	In the ON gear state, TBOX1 message loss is detected at a cycle of 500ms for 5S	TBOX1 fault	Replace TBOX1 and detect CAN bus

DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendatio-ns
UO30100	DDSMLIN bus network fault status	In the ON gear state, detect DDSMLIN messages at a cycle of 100ms. When DDSM_ Status_LIN is 1 in the DDSMLIN message	DDSM fault	Replace DDSM/detect LIN bus
UO30200	Central door lock unlocking/locking switch fault status	In the ON gear state, detect DDSMLIN message at a cycle of 100ms. DDSM_ Status_CCSwt_ LockUnlock position in the DDSMLIN message is 3	DDSM fault	Replace DDSM/detect LIN bus
UO30300	Front left window control switch fault status	In the ON gear state, detect the DDSMLIN message at a cycle of 100ms. The DDSM_ Status_ FLWindowCtrlSwt position in the DDSMLIN message is 5	DDSM fault	Replace DDSM/detect LIN bus
UO30400	Front right window control switch fault status	In the ON gear state, detect the DDSMLIN message at a cycle of 100ms. The DDSM_ Status_ FRWindowCtrlSwt position in the DDSMLIN message is 5	DDSM fault	Replace DDSM/detect LIN bus
UO30500	Rear left window control switch fault status	In the ON gear state, detect DDSMLIN message at a cycle of 100ms. DDSM_ Status_ RLWindowCtrlSwt position in the DDSMLIN message is 5	DDSM fault	Replace DDSM/detect LIN bus

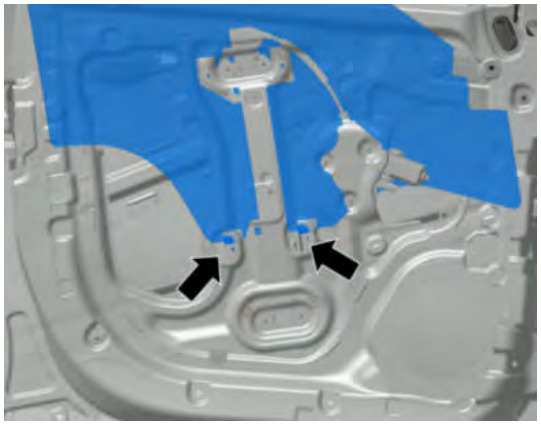
DTC display code	DTC name	Fault conditions	Possible cause	Repairrecommendatio-ns
UO30600	Rear right window control switch fault status	In the ON gear state, detect the DDSMLIN message at a cycle of 100ms. The DDSM_ Status_ RRWindowCtrlSwt position in the DDSMLIN message is 5	DDSM fault	Replace DDSM/detect LIN bus
UO30700	SHM system fault status	In the ON gear state, the SHM message is detected at a cycle of 100ms. When the SHM_REP_Error in the SHM message is 1	SHM fault	Replace SHM/detect LIN bus
UO30800	SHMLIN bus network fault status	In the ON gear state, the SHM message is detected at a cycle of 100ms. When the SHM_Status_LIN in the SHM message is 1	SHM fault	Replace SHM/detect LIN bus
UO17500	Loss of communication with DDSM controller	In the ON gear state, DDSM message loss is detected at a cycle of 100ms and lasts for 1S	DDSM fault	Replace DDSM/detect LIN bus
UO24500	Loss of communication with SHM controller	In the ON gear state, the SHM message is detected to be lost at a cycle of 100ms for 1S	SHM fault	Replace SHM/detect LIN bus

4.15.4 Removal and installation

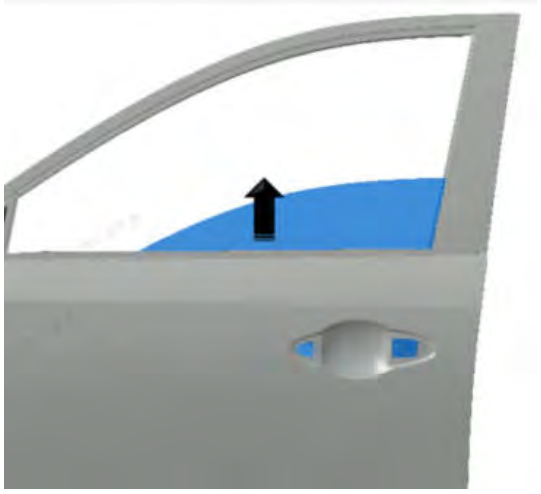
4.15.4.1 Front Door Glass Assembly

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front door interior trim panel. Refer to: Front door shield.
3. Remove the front door waterproof film.
4. Remove the front door windowsill inner seal strip.
5. Remove the fixing bolts of front door glass.



6. Remove the front door glass assembly.



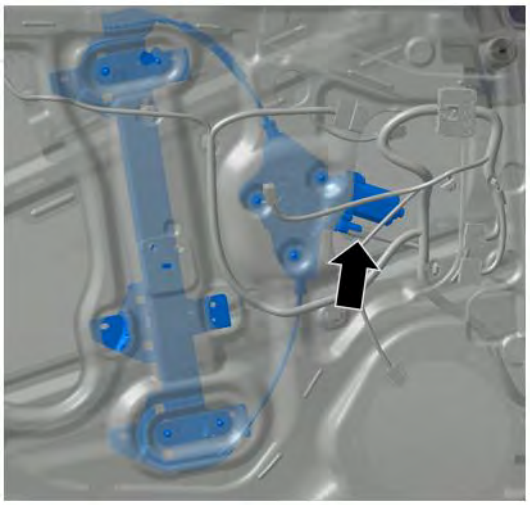
Installation

1. The installation order is the reverse of the removal order.

4.15.4.2 Front door window regulator assembly

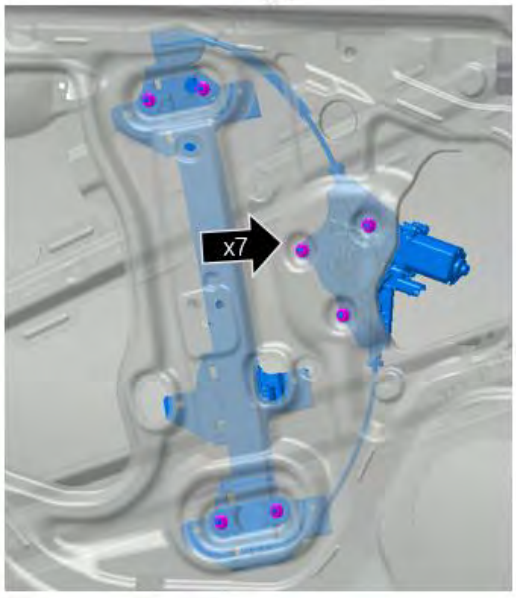
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front door interior trim panel. Refer to: Front door shield.
3. Remove the front door waterproof film.
4. Remove the front door glass assembly. Refer to: Front door glass.
5. Disconnect the harness connector of front door window regulator.



6. Remove the fixing bolts and nuts of the front door window regulator assembly, and then take out the front door window regulator assembly.

   Nut torque: 9±1Nm



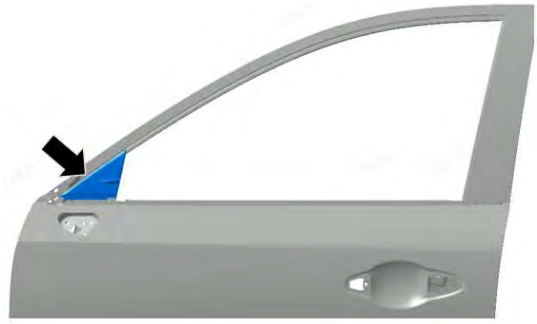
Installation

The installation order is the reverse of the removal order.

4.15.4.3 Front door triangle block

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front door interior trim panel. Refer to: Front door shield.
3. Remove the front door windowsill outer seal strip.
4. Remove the front door triangle block.



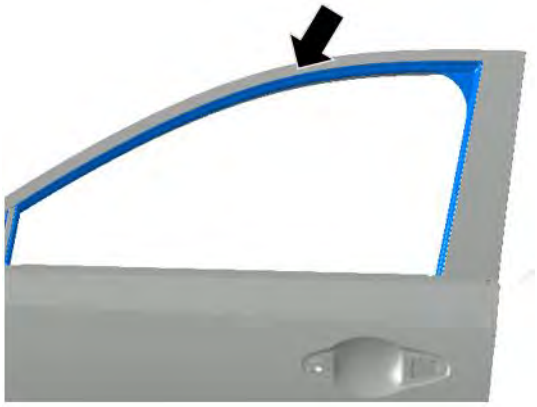
Installation

The installation order is the reverse of the removal order.

4.15.4.4 Front door glass run channel

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front door interior trim panel. Refer to: Front door shield.
3. Remove the front door glass assembly. Refer to: Front door glass.
4. Remove the front door triangle block. Refer to: Front door triangle block.
5. Remove the glass run and take it down.



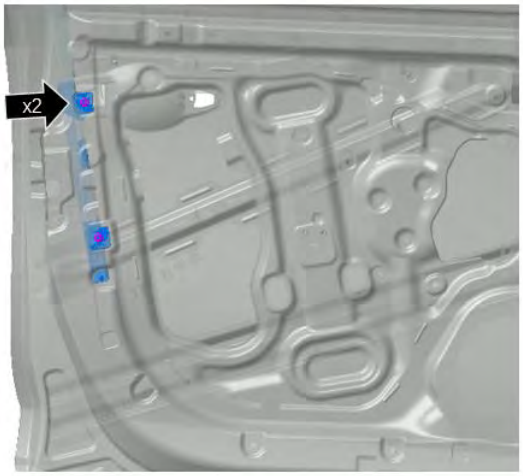
Installation

The installation order is the reverse of the removal order.

4.15.4.5 Rear lower guide rail of front door glass

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the front door interior trim panel. Refer to: Front door shield.
3. Remove the front door waterproof film.
4. Remove the fixing bolts at the lower end of the glass rear guide rail, and remove the lower section component of the glass rear guide rail.



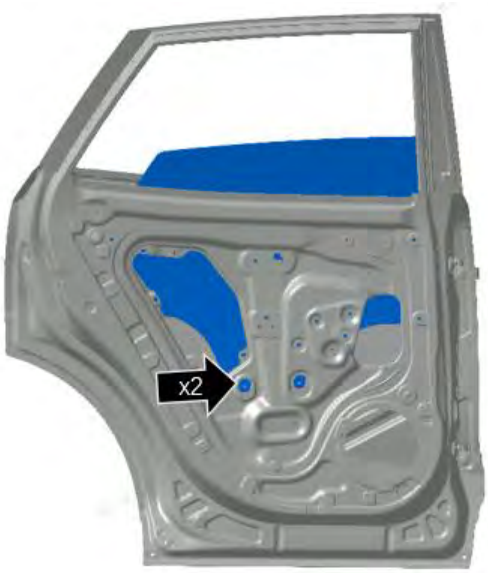
Installation

1. The installation order is the reverse of the removal order.

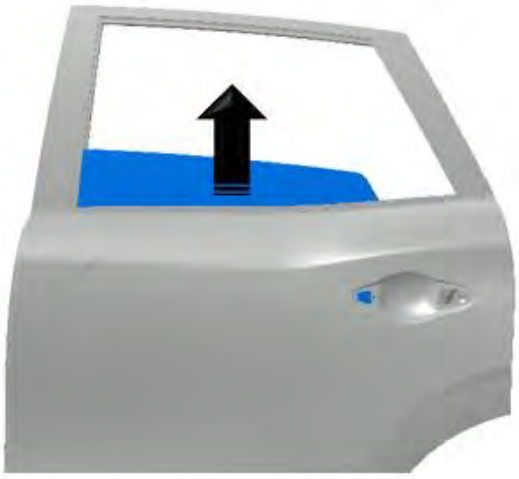
4.15.4.6 Rear door glass assembly

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear door interior trim panel. Refer to: Rear door shield.
3. Remove the rear door waterproof film.
4. Remove the rear door window inner weatherstrip.
5. Remove the rear door windowsill outer seal strip.
6. Remove the rear door glass rear lower guide rail. Refer to: Rear door glass rear lower guide rail.
7. Remove the rear door glass fixing bolts.



8. Remove the rear door glass assembly.



Installation

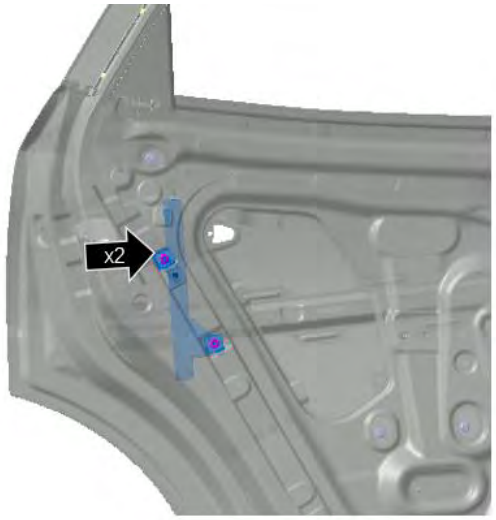
The installation order is the reverse of the removal order.

4.15.4.7 Rear lower guide rail of rear door glass

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear door interior trim panel. Refer to: Rear door shield.
3. Remove the rear door waterproof film.
4. Remove the fixing bolts at the lower end of the glass rear guide rail, and remove the rear door glass rear lower guide rail.

   Torque: 9±1 Nm



Installation

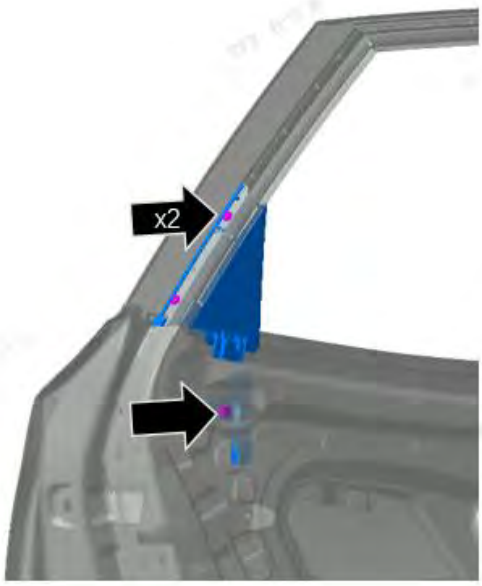
The installation order is the reverse of the removal order.

4.15.4.8 Rear door triangle block

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear door interior trim panel. Refer to: Rear door shield.
3. Remove the rear door waterproof film.
4. Remove the rear door glass run channel.
5. Remove the rear door triangle block fixing bolts and screws, and remove the rear door triangle block.

   Torque: 9±1 Nm



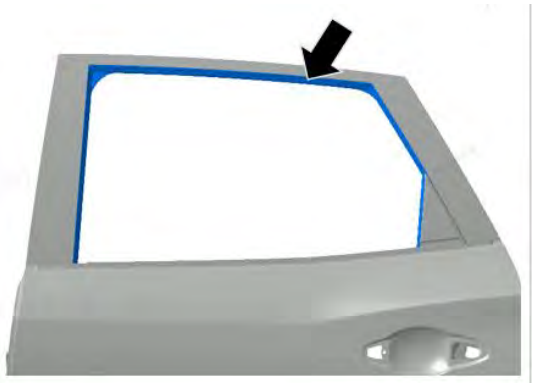
Installation

The installation order is the reverse of the removal order.

4.15.4.9 Rear door glass run channel

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear door interior trim panel. Refer to: Rear door shield.
3. Remove the rear door waterproof film.
4. Remove the rear door glass. Refer to: Rear door glass assembly.
5. Remove the glass run and take it down.



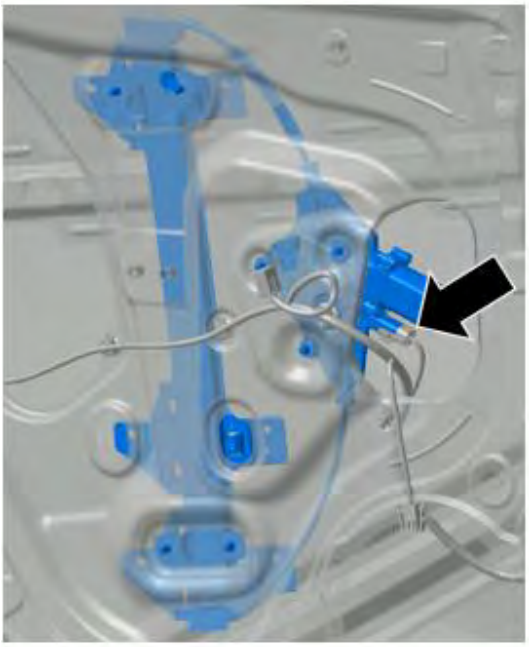
Installation

1. The installation order is the reverse of the removal order.

4.15.4.10 Rear Door Window Glass Regulator Assembly

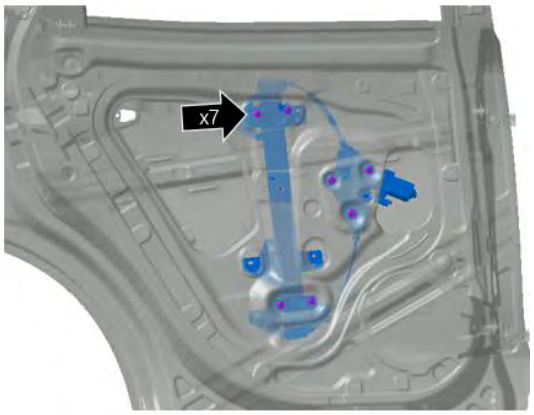
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative pole.
2. Remove the rear door interior trim panel. Refer to: Rear door shield.
3. Remove the rear door waterproof film.
4. Remove the rear door glass. Refer to: Rear door glass assembly.
5. Disconnect the rear door regulator harness connector.



6. Remove the window regulator fixing bolts and nuts, and remove the rear door window regulator.

   Bolt torque: 9±1Nm



Installation

1. The installation order is the reverse of the removal order.

4.16 BCM system

4.16.1 Specification

4.16.1.1 General specifications

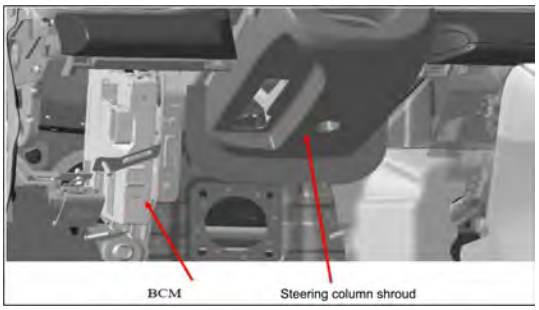
Name	Specification
Rated voltage	DC12V
Input voltage	DC9.0V ~ DC16V
Operating Current	≤300mA
Static current	≤4mA
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+95℃
High-frequency communication rate	433.92M Hz

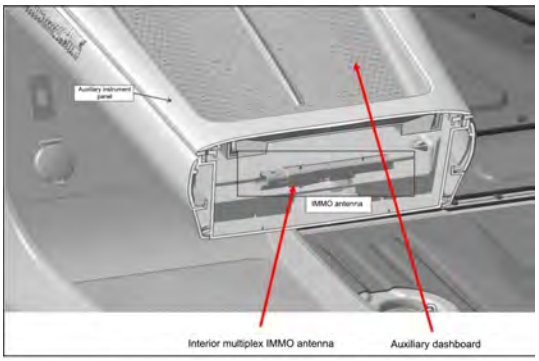
4.16.2 Instructions and operations

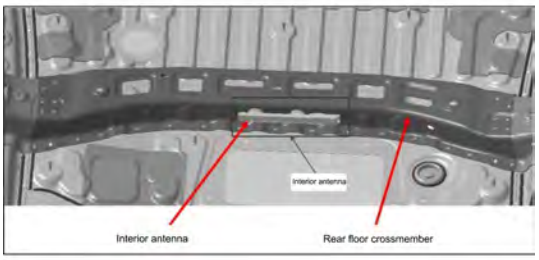
4.16.2.1 BCM system

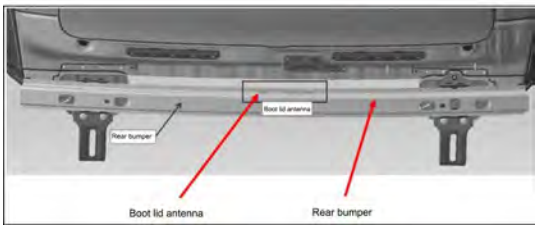
Part location diagram

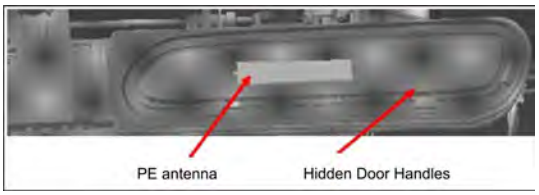
The BCM is located on the tubular beam at the driver's side and close to the power distribution box in the cab. The specific location is as follows.











4.16.2.2 Precautions

Precautions during repair

When the BCM body controller is replaced and repaired, it is necessary to use a diagnostic scanner to diagnose and write configuration for the newly installed BCM.

1. **Caution:** BCM configuration information can be obtained by querying VIN code in the configuration information inquiry path of dealer management system (DMS).
2. **Caution:** Turn the vehicle power supply to ON position, wait for more than 10s, and successfully write the obtained configuration data into BCM through diagnostic scanner.
3. **Caution:** immobiliser matching and other operations can only be performed on BCM after the configuration is written.

Precautions for TPMS maintenance process

1. **Caution:** When reading the sensor ID and data, please keep the tool as close to the tyre valve as possible because of wireless communication transmission between the tool and the tyre pressure sensor. If it doesn't trigger successfully once, try again. If the triggering fails for several times, please check whether any sensor is not installed on the tyre or replace the sensor.
2. **Caution:** If only the valve is replaced and the original vehicle sensor is still used, there is no need to re-match.
3. **Caution:** As long as the tyre pressure sensor is not replaced and the original tyre pressure sensor is not damaged due to installation or removal of tyre, there is no need to re-match the tyre pressure sensor.
4. **Caution:** When the vehicle is stationary, the tyre pressure sensor does not send data to the outside, but only sends data when the vehicle is running. Therefore, after deflation or inflation of tyres, if you want to update the tyre pressure data, drive the vehicle at a speed above 30 km/h and keep it for 1 minute before the tyre pressure and temperature data will be updated on the instrument panel.
5. **Caution:** After the vehicle tyre position is changed, the tyre pressure sensor position changes and needs to be re-matched. The tyre pressure system includes wireless communication transmission characteristics. Therefore, the tyre pressure system is easily interfered by electromagnetic radiation, and electronic products installed privately after sales (such as CDs, DVDs, dashcams, etc.) are prone to electromagnetic radiation. Therefore, when there is a problem with the tyre pressure system, it is necessary to check whether it is due to the installed electronics.

4.16.3 Diagnosis and testing

4.16.3.1 BCM System-DTC List

DTC	DTC description	Code reporting conditions
B100116	BCM Voltage Low	Battery voltage < 9v for 400ms
B100117	BCM Voltage High	Battery voltage > 16v for 400ms
B100112	Interior light low-side output short-circuited to the power supply	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) for more than 500ms
B104111	Left turn signal short-circuited to GND	After starting (170ms), the load is detected to exceed the threshold value (10A) for more than 130ms150ms
B104113	Left turn signal open-circuited	After starting (170ms), the load is detected to be too small and exceeds 150ms
B104211	Right turn signal short-circuited to GND	After starting (170ms), the load is detected to exceed the threshold value (10A) for more than 130ms150ms
B104213	Right turn signal open-circuited	After starting (170ms), the load is detected to be too small and exceeds 150ms
B107011	Daytime running light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (6.3A) for more than 500ms: AD: 285
B105311	Rear fog light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (6.3A) for more than 500ms; AD: 285
B105112	Front fog light relay control terminal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
B103112	Low beam relay control terminal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
B103212	High beam relay control terminal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
B101411	Power-saving light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (6.3A) and exceeds 500msAD:285

DTC	DTC description	Code reporting conditions
B101111	Position light and licence plate light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (10.5A) for more than 500ms AD: 470 (280)
B101712	Rear defroster relay control terminal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
B101012	Horn relay control terminal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
B101512	Window hardwire enable signal short-circuited to power supply	The chip self-diagnoses a short circuit for more than 500ms
U007300	Body CAN Bus Off	The BCAN bus error count has accumulated to 255, and 5 fast recoveries and 3 slow recoveries have failed
U110188	Power CAN Bus Off	The PCAN bus error count has accumulated to 255, and 5 fast recoveries and 3 slow recoveries have failed
U012100	Lost Communication with ABS	No ABS1 (0x200) message received in 10 message cycles
U010000	Lost Communication with EMS	Engine1 (0x212 or 0x13a) message is not received in 10 message cycles
U015500	Lost Communication with IC	No IC1 (0x149) message received in 10 message cycles
B106111	Brake light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (6.3A) for more than 500ms AD: 285
B106211	High-mounted brake light short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (6.3A) for more than 500ms AD: 836
B150129	Key Authentication Failure	The key authentication is failed
B150251	Invalid key information	All key information is "0x00" or "0xFF"
B150351	Invalid PIN	All PIN codes are "0x00" or "0xFF"
B150451	SK invalid	SK code is all "0x00" or "0xFF"
B150555	IMMO unlock	1 of VIN, PIN and SK is invalid
B150687	ECM initiating authentication timeout	No challenge message sent by ECU is received within 2s
B150662	Immobiliser authentication failed	BCM and ECM authentication failed

DTC	DTC description	Code reporting conditions
U1F0211	LIN2 channel short-circuited to GND	The chip self-diagnoses a short circuit for more than 1000ms
U1F0201	LIN2 slave node fault	LIN2 receives RLS message: RLS_ Fault_Rain=1 or RLS_Fault_Light=1 or RLS_REP_Error=1
U1F1287	Rain/light sensor LIN message timeout	Message not received in 1000 ms (ID: 0x23)
U1F0411	LIN3 channel short-circuited to GND	The chip self-diagnoses a short circuit for more than 1000ms
B1305 55	Standard pressure value not configured	The read wrong standard pressure configuration data is 0xFF
B1307 54	Transmitter not learnt	Read sensor ID as 0xFFFFFFFF
B1301 16	Front left wheel transmitter battery low	Battery low fault sign received from FL sensor
B1302 16	Front right wheel transmitter battery low	Battery low fault sign received from FR sensor
B1303 16	Rear left wheel transmitter battery low	Battery low fault sign received from RL sensor
B1304 16	Rear right wheel transmitter battery low	Battery low fault sign received from RR sensor
B1301 31	Front left wheel transmitter lost	No FL sensor information received within 10 minutes
B1302 31	Transmitter for the front right wheel is lost	No FR sensor information received within 10 minutes
B1303 31	Transmitter for the rear left wheel is lost	No RL sensor information received within 10 minutes
B1304 31	Transmitter for the rear right wheel is lost	No RR sensor information received within 10 minutes
B130132	Front left wheel sensor fault alarm	Received sensor failure fault flag from FL sensor
B130232	Front right wheel sensor fault alarm	Received sensor failure fault flag from FR sensor
B130332	Rear left wheel sensor fault alarm	Received sensor failure fault flag from RL sensor
B130432	Rear right wheel sensor fault alarm	The sensor failure fault flag sent by the RR sensor is received
U220D00	BCM enters the network Limphome state	BCM enters the network Limphome state
U1EE100	ESCL locking failed	BCM receives a frame of ESCL_ LockSwitchFailure = 0x01
U1EE101	ESCL unlocking failed	BCM receives a frame of ESCL_ UnlockSwitchFailure = 0x01

DTC	DTC description	Code reporting conditions
U1EE103	Abnormal ESCL lock enabling power supply	BCM receives a frame of ESCL_ LockEnableBatteryFailure = 0x01
U1EE106	ESCL motor power supply abnormal	BCM receives a frame of ESCL_ MotorEnableBatteryFailure = 0x01
U1EE107	ESCL failed to read and write ROM/ RAM	BCM receives a frame of ESCL_ RamRomFailure = 0x01
U1EE108	ESCL unlocking feedback state inconsistency	After ESCL unlocking is completed, the feedback state of LIN bus and hardwire is inconsistent
U1EE109	ESCL state query failed	BCM inquired about ESCL status for 3 times without receiving a reply
B12E071	Start switch fault	Certain SSB switch is valid for more than 20s or the other SSB switch is not triggered during 4 consecutive pressing periods of certain SSB switch.
B12E313	The load end of the ACC output relay is open-circuited or short-circuited to GND	The ACC relay control terminal is normal for more than 510ms and the ACC feedback terminal is still detected as invalid
B12E311	ACC output relay load terminal short-circuited to power supply	The ACC relay control terminal has no output for more than 510ms and the ACC feedback terminal is still detected as valid
B140913	ACC relay control terminal open-circuited	The detected load is too small for more than 500ms
B140911	ACC relay control terminal short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (2A) for more than 500ms
B12E413	The load end of the IGN1 output relay is open-circuited or short-circuited to GND	IGN1 relay control terminal is normal for more than 510ms and ACC feedback terminal is still detected as invalid
B12E411	IGN1 output relay load terminal short-circuited to power supply	The IGN1 relay control terminal has no output for more than 510 ms and the ACC feedback terminal is still detected as valid
B141913	IGN1 relay control terminal open-circuited	The detected load is too small for more than 500ms
B141911	IGN1 relay control terminal short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (2A) for more than 500ms

DTC	DTC description	Code reporting conditions
B12E513	The load end of the IGN2 output relay is open-circuited or short-circuited to GND	IGN2 relay control terminal is normal for more than 510ms and ACC feedback terminal is still detected as invalid
B12E511	IGN2 output relay load terminal short-circuited to power supply	The IGN2 relay control terminal has no output for more than 510 ms and the ACC feedback terminal is still detected as valid
B142913	IGN2 relay control terminal open-circuited	The detected load is too small for more than 500ms
B142911	IGN2 relay control terminal short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (2A) for more than 500ms
B120113	Front left door low-frequency antenna fault	Chip self-diagnosis
B120313	Interior low-frequency antenna 1 fault	Chip self-diagnosis
B120413	Interior low-frequency antenna 2 fault	Chip self-diagnosis
B120613	Boot lid low-frequency antenna fault	Chip self-diagnosis
B122113	Interior low-frequency antenna 3 short-circuited	Chip self-diagnosis
B122313	Front right door low-frequency antenna fault	Chip self-diagnosis
B141E11	Start switch backlight short-circuited to GND	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (4.2A) for more than 500ms
B140B12	Yellow indicator short-circuited to power supply	Chip self-short-circuited for more than 500 ms
B140D12	Green indicator short-circuited to power supply	Chip self-short-circuited for more than 500 ms
B141611	Left door handle switch short-circuited to GND	The button is pressed for more than 20s
B141B11	Boot switch short-circuited to GND	The button is pressed for more than 20s
U010100	TCU communication lost	No corresponding message received in 10 consecutive cycles: automatic transmission models did not receive (0x10, 0x418, 0x216) FWD improvement platform EVs, VCM3 (0x13D) messages not received;
B104113	Left turn signal open-circuited (LED)	Left turn signal LED feedback signal reports open-circuited feedback is valid

DTC	DTC description	Code reporting conditions
B104213	Right turn signal open-circuited (LED)	Right turn signal LED feedback signal reports open-circuited feedback is valid
B104513	Brake sensor power supply line short-circuited	After starting (120ms), the load is detected to exceed the threshold value (i.e. 1.5 times the maximum current) (4.2A) for more than 500ms
B102001	Power-on reset has occurred in the past 40 ignition cycles	BCM power-on process
B102002	Hardware reset (RESET)	Hardware reset of BCM
B102003	Software reset	BCM has a software reset (watchdog)

4.16.3.2 Fault Diagnosis

No response from the main unit

Steps	Measures	Yes	No
1	Measure if each input voltage of BCM is 12 V	Replace the main unit	Go to Step 2
2	Check whether the unit has power supply	Go to Step 3	
3	Check whether the fuse is damaged	Replacement of fuse	Go to Step 4
4	Check whether the battery is charged	Go to Step 5	Charge the battery
5	The harness and connector are of poor contact, and please check and repair		

4.16.3.3 Fault Diagnosis

No output at any gears of front/rear wiper, while other functions of the main parts are normal

Steps	Measures	Yes	No
1	Read the DTC with diagnostic scanner	If the homing signal has not been received for several times, wiper lock-rotor protection is provided. Check the wiper motor and harness	No DTC Go to Step 2
2	Check if the wiper acts via the action test of diagnostic scanner	Go to Step 3	Check the wiper motor, wiper power supply and output

Steps	Measures	Yes	No
3	Check the input signal by using the data flow reading function of diagnostic scanner	Go to Step 4	If there is no change in the data flow, inspect the BCM's wiper power supply, multi-function switch, and harness
4	Replace the BCM		

4.16.3.4 Fault Diagnosis

Other functions of the main parts are normal with fault in locking while pressing down the switch of centre control lock

Steps	Measures	Yes	No
1	Whether all the four doors are fully closed	Go to Step 2	Close the four doors fully
2	Whether the centre control lock switch is damaged	Replacement of centre control lock switch	Go to Step 3
3	Whether the door light switch is damaged	Replace the door light switch	Go to Step 4
4	Whether the harness is short-circuited	Repair or replace the harness (including the connector)	Go to Step 5
5	Read the DTC information of BCM with a diagnostic scanner and handle the fault based on the information.		

4.16.3.5 Fault Diagnosis

Only one high beam or low beam does not work

Steps	Measures	Yes	No
1	Check whether the bulb is intact.	Go to Step 2	Replace the bulb
2	Check whether the fuse is intact	Go to Step 3	Replacement of fuse
3	Check whether relevant harnesses and connectors work normally according to the schematic diagram.		

4.16.3.6 Fault Diagnosis

Reversing light does not work

Steps	Measures	Yes	No
1	Check whether the fuse is intact.	Go to Step 3	Go to Step 2
2	Replace the damaged fuse. Is the reversing light intact?		Go to Step 3

Steps	Measures	Yes	No
3	Check the connector between instrument panel and rear body harness. Is the measured voltage normal?	Go to Step 4	Go to Step 6
4	Please check the reversing lights and their connectors to the harness to ensure that there is no problem.	Go to Step 5	Go to Step 10
5	Check the rear body harness from the connector to the reversing light.		
6	Separate the connector of the reversing light switch and measure whether the voltage of the pin is normal.	Go to Step 8	Go to Step 7
7	Please check the instrument panel harness from the fuse to the reversing light switch.		
8	Check the instrument panel harness from the connector of the reversing light switch to the connector to ensure that there is no problem.	Go to Step 9	
9	Check the reversing light and its connector to the harness.	Go to Step 10	
10	Check the GND points of the rear body harness to ensure that it is well grounded.		

4.16.3.7 Fault Diagnosis

Front or rear washer does not work

Steps	Measures	Yes	No
1	Read the DTC information with diagnostic scanner and shoot the trouble based on the information.	Shoot the trouble based on the DTC	No DTC Go to Step 2
2	Check if the scrubber acts via the action test of diagnostic scanner	Go to Step 3	Check the scrubber motor, power supply and output

Steps	Measures	Yes	No
3	Check the input signal by using the data flow reading function of diagnostic scanner	Go to Step 4	If there is no change in the data flow, inspect the BCM's wiper power supply, multi-function switch, and harness
4	Replace the BCM		

4.16.3.8 Fault Diagnosis

Front or rear wiper does not work in some gears

Steps	Measures	Yes	No
1	Read the DTC information with diagnostic scanner and shoot the trouble based on the information.	Shoot the trouble based on the DTC	No DTC Go to Step 2
2	Check if there is any corresponding change in the data flow by using the data flow reading function of diagnostic scanner and turning the multi-function switch to the fault position	Go to Step 3	Check the multi-function switch and harness
3	Check the wiper output harness and fuse of BCM.		

4.16.3.9 Fault Diagnosis

The front fog light does not work (the front fog light can be turned on only when the position light is turned on)

Steps	Measures	Yes	No
1	Turn the light switch to position and turn the fog light switch knob to position. Check whether the front fog light indicator on the instrument is on.	Go to Step 2	Go to Step 4
2	Check whether the front fog light fuse is intact	Go to Step 3	Replacement of fuse
3	Check whether the front fog light relay is intact.	Go to Step 4	Replace the relay
4	Perform fault diagnosis according to Section 7.3 of BCM.		

4.16.3.10 Fault Diagnosis

Only the high beam does not work

Steps	Measures	Yes	No
1	Turn the light switch to position to turn the high/low beam switch to the high beam position. Check whether the high beam indicator on the instrument is on.	Go to Step 2	Go to Step 4
2	Check whether the high beam fuse is intact	Go to Step 3	Replacement of fuse
3	Check whether the high beam relay is intact.	Go to Step 4	Replace the relay
4	Perform fault diagnosis according to Section 7.3 of BCM.		

4.16.3.11 Fault Diagnosis

The rear fog light cannot be turned on (the rear fog light can be turned on only when the low beam is turned on)

Steps	Measures	Yes	No
1	Turn the light switch to position and turn the fog light switch knob to position. Check whether the rear fog light indicator on the instrument is on.	Go to Step 2	Go to Step 4
2	Check whether the rear fog light fuse is intact	Go to Step 3	Replacement of fuse
3	Check whether the rear fog light relay is intact.	Go to Step 4	Replace the relay
4	Perform fault diagnosis according to Section 7.3 of BCM.		

4.16.3.12 Fault Diagnosis

Start button fault

Steps	Measures	Yes	No
1	Pull and insert the Start/Stop button again to observe whether it is normal.		Go to Step 2
2	Read and clear the DTC to confirm whether it can be cleared.		Go to Step 3

Steps	Measures	Yes	No
3	Check whether the harness related to start/stop button, fuse and power supply of start/stop button are normal	Go to Step 4	Replace the harness and fuse
4	Replace the start/stop button.		

4.16.3.13 Fault Diagnosis

All the brake lights and high-mount brake lights do not work

Steps	Measures	Yes	No
1	Turn the ignition switch to the ON position and check whether the fuse is in good condition or not.	Go to Step 3	Go to Step 2
2	Replace the fuse. Is it still damaged after replacement?	Go to Step 5	Go to Step 3
3	Measure the voltage at the fuse to see if the voltage is normal.	Go to Step 5	Go to Step 4
4	Please check the instrument panel harness.		
5	Separate the brake switch connector and check the brake switch to ensure that there is no problem with the brake switch , measure whether the voltage is normal.	Go to Step 7	Go to Step 6
6	Check the instrument panel harness from the brake switch to the fuse.		
7	Check the connector between the instrument panel and the rear body harness to make sure there is no problem.	Go to Step 8	
8	Please check the rear body harness from connector to brake light.	Go to Step 9	

Steps	Measures	Yes	No
9	Please check the brake light and its connector to the harness.	Go to Step 10	
10	Please check the GND points of the rear body harness to make sure it is well grounded.		

4.16.3.14 Fault Diagnosis

Locking failure when operating the remote key

Steps	Measures	Yes	No
1	Whether all the four doors are closed	Go to Step 2	Close the four doors fully
2	Whether the door light is damaged	Replace the door light switch	Go to Step 3
3	Whether the line is short-circuited	Repair or replace the harness	Go to Step 4
4	Read the DTC information of BCM with a diagnostic scanner and handle the fault based on the information.		

4.16.3.15 Fault Diagnosis

When the headlight height adjustment switch is rotated, the height of one low beam does not change (low beams work normally)

Steps	Measures	Yes	No
1	Turn the light switch to position, unplug the harness connector of the faulty side headlight height adjustment motor, and use a voltmeter to measure whether the voltage between pins 1 and 3 is 12V.	Go to Step 2	Go to Step 4
2	Rotate the headlight height adjustment switch, and use a voltmeter to measure whether there is any change in voltage between pins 1 and 2 of harness connector of headlight height adjustment motor.	Go to Step 5	Go to Step 3

Steps	Measures	Yes	No
4	Check the harness between the headlight height adjustment switch and the headlight height adjustment motor according to the harness diagram to ensure that there is no problem with the harness	Go to Step 2	
5	Replace the headlight height adjustment motor.	Go to Step 6	
6	Turn the height adjustment switch to mode 0 and recalibrate the low beam height		

4.16.3.16 Fault Diagnosis

The height of all low beams does not change when the headlight height adjustment switch is rotated (low beams work normally)

Steps	Measures	Yes	No
1	Turn the light switch to position, unplug the harness connector of left and right headlight height adjustment motors, and use a voltmeter to measure whether the voltage between pins 1 and 3 is 12V.	Go to Step 2	Go to Step 4
2	Rotate the headlight height adjustment switch, and use a voltmeter to measure whether there is any change in voltage between pins 1 and 2 of harness connector of headlight height adjustment motor.	Go to Step 5	Go to Step 3
3	Remove the headlight height adjustment switch and use a voltmeter to measure whether the voltage between pins 1 and 4 of the harness connector is 12V	Go to Step 7	Go to Step 4

Steps	Measures	Yes	No
4	Check the harness between the headlight height adjustment switch and the headlight height adjustment motor according to the harness diagram to ensure that there is no problem with the harness	Go to Step 2	
5	Connect the height adjustment motor harness on one side and rotate the headlight height adjustment switch to see if there is any change in the height of the low beam	Go to Step 6	Go to Step 7
6	Connect the height adjustment motor harness on the other side and rotate the headlight height adjustment switch to see if there is any change in the height of the low beam		Go to Step 7
7	Replace the headlight height adjustment switch and check if the fault is eliminated.		Go to Step 2
8	Replace the headlight height adjustment motor on this side	Go to Step 9	
9	Turn the height adjustment switch to mode 0 and recalibrate the low beam height		

4.16.3.17 Fault Diagnosis

Failure to start fault

Steps	Measures	Yes	No
1	Check whether the battery power supply is above 12V	Go to Step 2	Replace or charge the vehicle battery.
2	Check whether the power supply can be switched	Go to Step 3	Go to Step 4

Steps	Measures	Yes	No
3	Check whether the immobiliser test is passed (turn to ON position and observe whether the immobiliser indicator lights up).	Go to Step 5	Go to Step 6
4	Press the start button and observe as follows: Is there a prompt on the instrument that the key cannot be found? If so, try to put the key flat in the cup holder and press the start switch again. If possible, please replace the key battery. If not, please re-match the key. If there is no prompt on the instrument, check the start button fuse and circuit, including re-plugging the start button, checking the line continuity, and checking the antenna fault in the car. If none of the above can be solved, replace the BCM unit.		
5	In the OFF gear, shift to P/N gear, and step on the brake. Does the indicator turn green?	Go to Step 7	Go to Step 8

Steps	Measures	Yes	No
6	If the immobiliser light flashes: Check whether the CAN bus and gateway are normal (read DTCs of BCM, independent gateway and EMS respectively) If there is no problem with bus communication, the immobiliser needs to be re-matched If the above steps do not work, replace the engine EMS or ECM unit		
7	In the OFF gear, shift to P/N gear, step on the brake, press the start button, and the starter is dragged, but it fails to start successfully. The battery needs to be replaced or charged.	Go to Step 9	Go to Step 10
8	Check the brake signal Check the start button itself, related circuits and fuses		
9	Replacement of battery		
10	Check the brake signal Check the start button itself, related circuits and fuses		

4.16.3.18 Fault Diagnosis

Unable to remotely control

Steps	Measures	Yes	No
1	Check if the indicator is on when pressing the remote key	Go to Step 2	Replace the battery
2	Whether the remote key battery is above 2.8V	Go to Step 3	Replace the battery
3	Whether the ignition switch is at ON	Go to Step 4	Replace the remote key
4	Pull the remote control key out		

Steps	Measures	Yes	No
5	After re-learning, check whether the remote control function is restored	Go to Step 6	Replace the remote key
6	The remote control function is restored and continues to be used		

Note:

– Refer to Remote Key – Lock Body Pairing & Learning Methods for specific supporting learning methods.

4.16.3.19 Fault Diagnosis

Roof light does not work

Steps	Measures	Yes	No
1	Check whether the filament of roof light bulb is blown. Is a blowout found?	Go to Step 4	Go to Step 2
2	Check whether the fuse is blown.	Go to Step 5	Go to Step 3
3	Use test lights to connect the two terminals of the contact switch (front left, front right, rear left, rear right) and the terminal of the Illuminating light switch respectively. Check whether the test light is on?	Go to Step 6	Go to Step 7
4	Replace the bulb		
5	Replacement of fuse		
6	Replace the touch switch or light switch		
7	Repair the circuit with poor contact.		

4.16.3.20 Fault Diagnosis

The low beam does not work, and the high beam works normally

Steps	Measures	Yes	No
1	Turn the light switch to position and check whether the low beam fuse is intact.	Go to Step 3	Go to Step 2
2	Please replace the damaged fuse. Is the fault eliminated after replacement?	Successful	Go to Step 3

Steps	Measures	Yes	No
3	Check whether the high beam relay is intact.	Go to Step 5	Go to Step 4
4	Please replace the damaged relay. Is the fault eliminated after replacement?	Successful	Go to Step 5
5	Perform fault diagnosis according to Section 7.3 of BCM.		

4.16.3.21 Fault Diagnosis

Remote control without unlocking and locking

Steps	Measures	Yes	No
1	First, make sure that the five doors are closed		
2	Check whether the indicator on the key flashes.	Go to Step 3	Replace the key
3	Use a diagnostic scanner to read if BCM has bus-related faults	Check whether the CAN bus is normal	Go to Step 4
4	Check whether the door lock, BCM and harness are intact	Go to Step 5	Replace the harness or door lock
5	Replace the BCM		

4.16.3.22 Fault Diagnosis

Distance for remote control is too close

Steps	Measures	Yes	No
1	Whether the indicator of the remote key is too dim	Insufficient voltage, replace the battery	Go to Step 2
2	Test whether the voltage of the battery is above 2.8V	Go to Step 3	Replace the battery
3	Whether the components on the PCB are touched while replacing the battery	The frequency for remote control is offset, and please send to the maintenance centre	Go to Step 4
4	Whether the remote key is damp	The frequency for remote control is offset, and please send to the maintenance centre	Go to Step 5
5	Replace the remote key and check if the remote control distance is normal	The original remote key is faulty, replace the remote key	Go to Step 6
6	Replace the BCM		

Note:

– Refer to "Matching of remote control key" for detailed methods.

– Precise components are equipped inside the remote key, so please handle it carefully while replacing the battery. Do not touch or collide with the components inside the PCB, otherwise the remote control distance may be shortened or the remote control may be invalid.

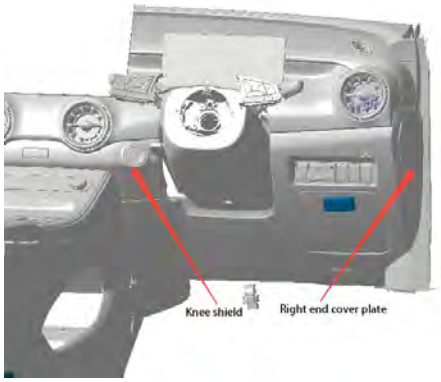
– Please use the battery of the same specifications and models while replacing, or otherwise the remote key may be damaged.

4.16.4 Removal and installation

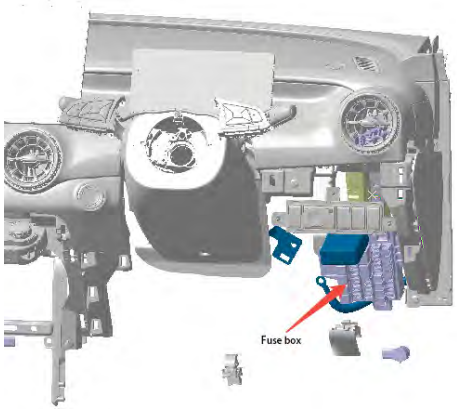
4.16.4.1 BCM

Removal

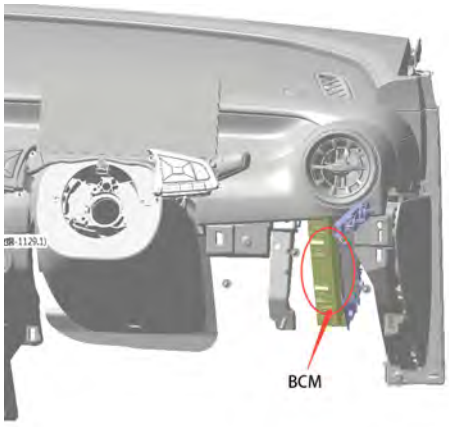
1. Remove the left end cover and left lower shield of the dashboard. Loosen the power distribution box to expose BCM.



2. Remove the dashboard driver's seat storage box and knee pad cover plate assembly.



3. Remove the fuse box bolts, loosen the fuse box, and then use a sleeve to remove the BCM mounting bracket and take out the BCM.



Installation

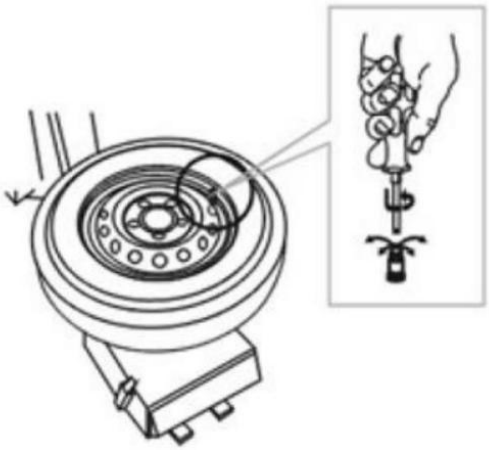
The installation order is reverse to the removal order. Pay attention to the following points

Caution: For all models with an rain-sensing wiper function, the vehicle battery must be connected after the dashboard harness (especially BCM rain light sensor) is installed properly to ensure that BCM can correctly identify the wiper control type. If it is detected that the induction wiper function fails, please unplug the battery and wait for 5S before powering on again to test the induction wiper function.

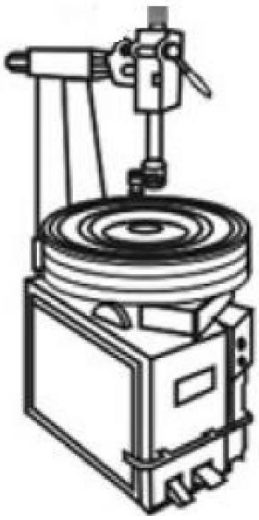
4.16.4.2 Tyre pressure monitoring sensor

Removal

1. Deflate the tyre.

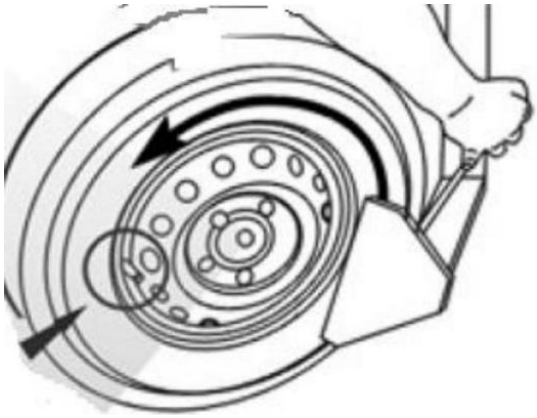


2. Use tyre removal equipment to separate the tyre from the rim. During the disassembly process, be careful to avoid tools and equipment scratching or squeezing the tyre pressure sensor.



3. Use a crowbar to pry the tyre off the rim as per the method for removing the tyre. During removal, take care not to

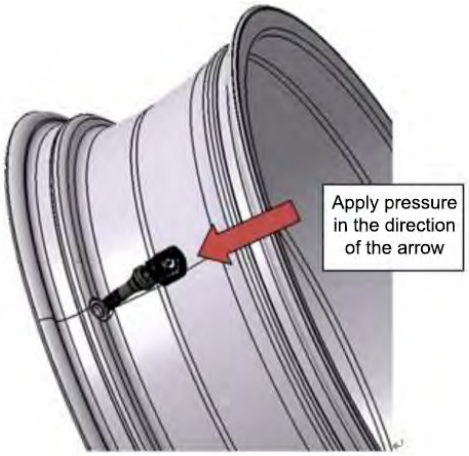
scratch or squeeze the tyre pressure sensor with the removal tool and inside of the tyre.



4. After removing the tyre, it is also necessary to check whether the tyre pressure sensor is damaged. If there is no obvious damage on the appearance, it means that the tyre pressure sensor is intact. If cracks or damage are obviously seen on the appearance of the tyre pressure sensor, the tyre pressure sensor needs to be replaced.

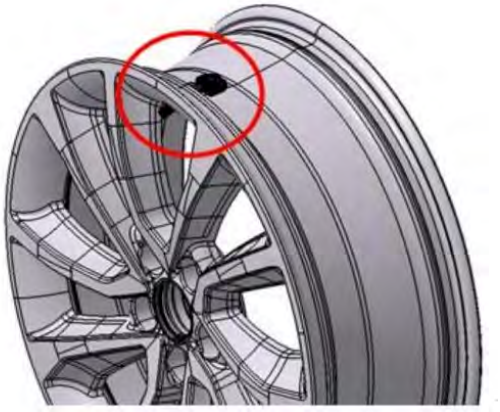
Installation

1. Pass the valve stem of the tyre pressure monitoring sensor through the rim valve mounting hole, and apply pressure to fix the tyre pressure monitoring sensor tightly on the rim valve mounting hole.



2. After complete assembly.

Assembly renderings



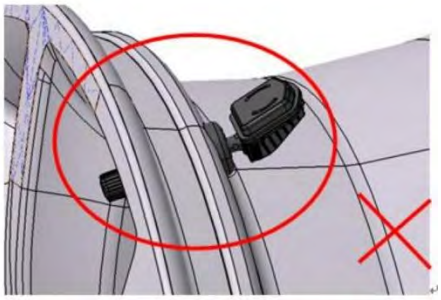
Partial Enlarged Rendering



Caution: Do not install the sensor in a wrong direction, otherwise it will cause damage or failure of the sensor.

Caution: Wrong assembly direction.

Enlarged rendering of wrong installation direction



Caution: Assemble the tyre into the rim. Pay attention to protect the tyre pressure sensor during assembly, and it is strictly prohibited to squeeze or pry the tyre pressure sensor with the assembly tool.

4.17 A/C system

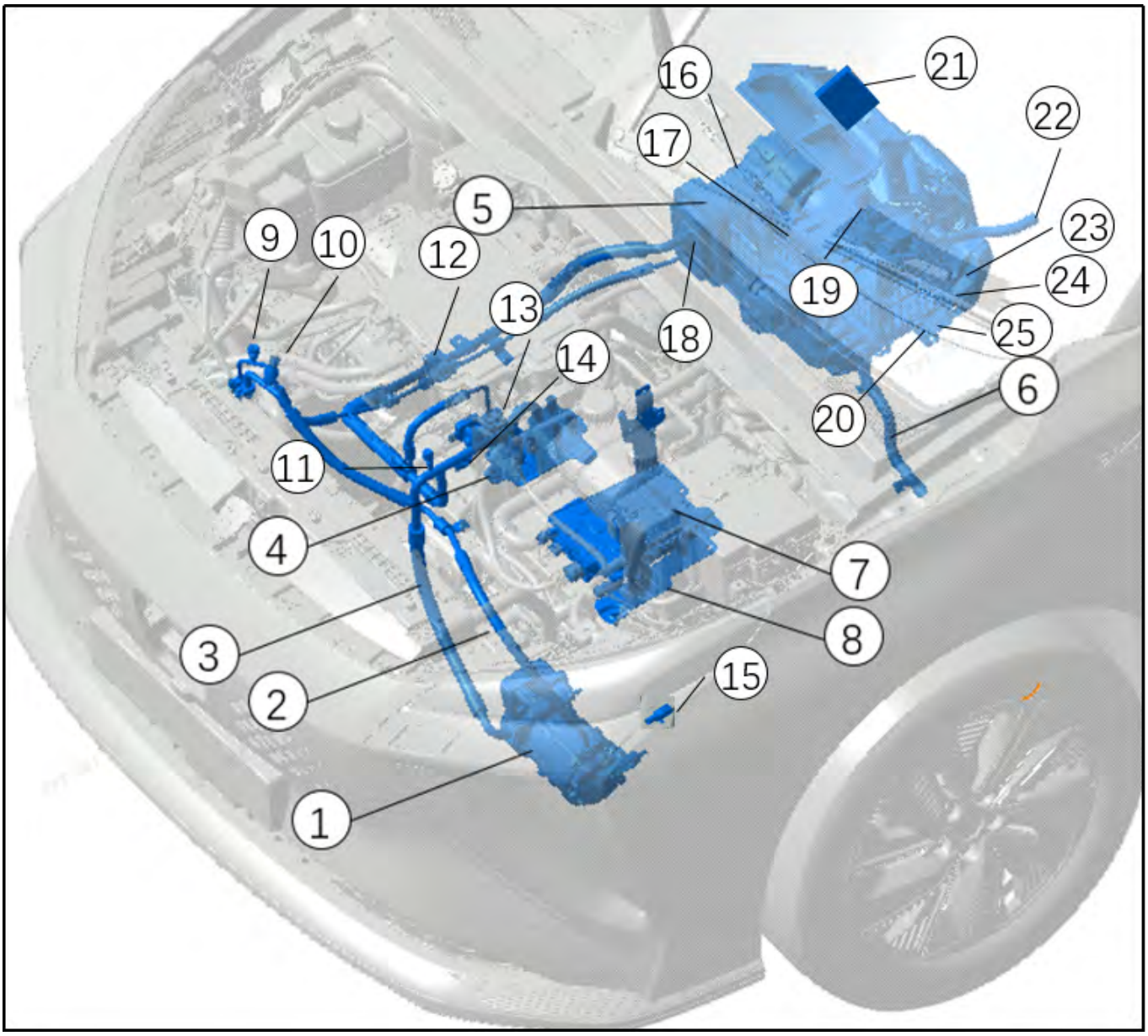
4.17.1 Specification

4.17.1.1 Material specifications

Name	Specification	Capacity
Refrigerant	R-134a(HFC-134a)	600±20g

4.17.2 Instructions and operations

4.17.2.1 Instructions and operations



Item	Description	Item	Description
1	Electric compressor assembly	14	PT sensor
2	Compressor exhaust pipe assembly	15	Exterior temperature sensor
3	High/low pressure pipe assembly	16	Mode actuator
4	Chiller	17	Sunlight sensor
5	HVAC assembly	18	Expansion valve
6	DRAIN PIPE, A/C	19	Blower
7	PTC heater assembly	20	Speed regulation module
8	PTC heater bracket	21	A/C control box

Item	Description	Item	Description
9	High-pressure filling valve	22	Interior temperature sensor
10	Pressure sensor	23	Internal/external air actuator
11	Low-pressure filling valve	24	Temperature actuator
12	Solenoid valve	25	Evaporator temperature sensor
13	Electronic expansion valve		

4.17.3 Diagnosis and testing

4.17.3.1 DTC List

The diagnosis in this manual requires technicians to have a certain skill level and diagnostic practical experience.

Refer to: Diagnosis Method (100-00 General Information, Description and Operation).

DTC	Fault Description	Operation
U300616	Battery undervoltage	Accurate Test A: U300616
U300617	Battery overvoltage	Accurate Test B: U300617
U007300	CAN bus off	Accurate Test C: U007300
U220D00	Network management limp home	Accurate Test D: U220D00
U015500	Loss of communication with IC node (0x149)	Accurate Test E: U015500
U014000	Loss of communication with BCM node (0x180)	Accurate Test F: U014000
U012100	Loss of communication with ABS node (0x200)	Accurate Test G: U012100
U010000	Loss of communication with Engine node (0x608)	Accurate Test H: U010000
U019800	Loss of communication with SBM node (0x526)	Accurate Test I: U019800
U100400	Loss of communication with APM node (0x520)	Accurate Test J: U100400
U015600	Loss of communication with ICE node (0x3B0)	Accurate Test K: U015600
U014001	Loss of communication with PEPS node (0x170)	Accurate Test L: U014001
U100200	Loss of communication with TBOX node (0x4E5)	Accurate Test M: U100200
U011100	Loss of communication with BMS node (0x362)	Accurate Test N: U011100
U029800	Loss of communication with DCDC node (0x148)	Accurate Test O: U029800
U012200	Loss of communication with VCM node (0x216)	Accurate Test P: U012200
U011000	Loss of communication with MCU node (0x240)	Accurate Test Q: U011000
U019B00	Loss of communication with OBC node (0x268)	Accurate Test R: U019B00
U120000	Loss of communication with SRS node (0x31C)	Accurate Test S: U120000

DTC	Fault Description	Operation
U101100	Loss of communication with BCM LIN node (0x11, 0x24)	Accurate Test T: U101100
U101200	Loss of communication with AC LIN node (0x03, 0x04, 0x13)	Accurate Test U: U101200
B190013	Blower open-circuited	Accurate Test V: B190013
B190014	Left side temperature door motor short-circuited to GND or open-circuited	Accurate Test W: B190014
B190015	Left temperature motor short-circuited to power supply	Accurate Test X: B190015
B190214	Mode motor short-circuited to GND or open-circuited	Accurate Test Y: B190214
B190215	Mode motor short-circuited to power supply	Accurate Test Z: B190215
B190216	Circulation motor short-circuited to GND or open-circuited	Accurate Test AA: B190216
B190217	Circulation motor short-circuited to power supply fault	Accurate Test AB: B190217
B190314	Internal temperature sensor short-circuited to GND fault	Accurate Test AC: B190314
B190315	Internal temperature sensor short-circuited to power supply or open-circuited fault	Accurate Test AD: B190315
B190414	Evaporator sensor short-circuited to GND fault	Accurate Test AE: B190414
B190415	Evaporator sensor short-circuited to power supply or open-circuited fault	Accurate Test AF: B190415
B190514	External temperature sensor short-circuited to GND fault	Accurate Test AG: B190514
B190515	Outside temperature sensor short-circuited to power supply or open-circuited	Accurate Test AH: B190515
B190614	Sunlight sensor short-circuited to GND	Accurate Test AI: B190614
B190714	Pressure (high pressure) sensor short-circuited to GND or open-circuited fault	Accurate Test AJ: B190714
B190715	Pressure (high pressure) sensor short-circuited to power supply fault	Accurate Test AK: B190715
B190814	PT sensor temperature side short-circuited to GND	Accurate Test AL: B190814
B190815	PT sensor temperature side is short-circuited to power supply or open-circuited	Accurate Test AM: B190815

DTC	Fault Description	Operation
B190914	PT sensor pressure side short-circuited to GND or open-circuited	Accurate Test AN: B190914
B190915	PT sensor pressure side short-circuited to power supply	Accurate Test AO: B190915
B190A00	Electric compressor fault	Accurate Test AP: B190A00
B190B00	Electronic expansion valve (EXV3) fault	Accurate Test AQ: B190B00
B190C00	PTC fault	Accurate Test AR: B190C00

4.17.3.2 Accurate Test (FACM)

Accurate Test A: U300616

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300616	Battery undervoltage	– The battery voltage is lower than 9V for more than 1.5 seconds	– The battery voltage is between 9V-16V for more than 1.5 seconds

Possible cause

– Battery voltage low

Repair recommendations

• Check the battery power supply.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.3 Accurate Test (FACM)

Accurate Test AA: B190216

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190216	Circulation control motor short-circuited to GND or open-circuited fault	– It is detected that the feedback voltage of circulation control motor is less than 0.3V for 2s.	– The feedback voltage value of the circulation motor is detected to be ≥0.3V for 4 seconds

Possible cause

– Circulation control motor actuator circuit fault

Repair recommendations

• Check the circulation damper actuator circuit.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.4 Accurate Test (FACM)

Accurate Test AB: B190217

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190217	Circulation motor short-circuited to power supply fault	– It is detected that the feedback voltage of circulation control motor is greater than 4.7V for 2s.	– The feedback voltage value of the circulation motor is detected to be ≤4.7V for 4 seconds

Possible cause

– Circulation control motor actuator circuit fault

Repair recommendations
• Check the circulation damper actuator circuit.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.5 Accurate Test (FACM)

Accurate Test AC: B190314

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190314	Internal temperature sensor short-circuited to GND fault	– The feedback voltage value of the internal temperature sensor is detected to be less than 0.3V for 2 seconds	– The feedback voltage value of the internal temperature sensor is detected to be ≥0.3V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations
• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.6 Accurate Test (FACM)

Accurate Test AD: B190315

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190315	Internal temperature sensor short-circuited to power supply or open-circuited fault	– The feedback voltage value of the internal temperature sensor is detected to be greater than 4.7V for 2 seconds	– The feedback voltage value of the internal temperature sensor is detected to be ≤4.7V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations

• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.7 Accurate Test (FACM)

Accurate Test AE: B190414

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190414	Evaporator temperature sensor short-circuited to GND fault	– The evaporator temperature sensor feedback voltage value is detected to be less than 0.3V for 2 seconds	– The evaporator temperature sensor feedback voltage value is detected to be ≥0.3V for 4 seconds

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.8 Accurate Test (FACM)

Accurate Test AF: B190415

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190415	Evaporator temperature sensor short-circuited to power supply or open-circuited fault	– The evaporator temperature sensor feedback voltage value is detected to be greater than 4.7V for 2 seconds	– The evaporator temperature sensor feedback voltage value is detected to be ≤4.7V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations
• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.9 Accurate Test (FACM)

Accurate Test AG: B190514

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190514	External temperature sensor short-circuited to GND fault	– The external temperature sensor feedback voltage value is detected to be less than 0.3V for 2 seconds	– The feedback voltage value of the external temperature sensor is detected to be ≥0.3V for 4 seconds

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.10 Accurate Test (FACM)

Accurate Test AH: B190515

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190515	Outside temperature sensor short-circuited to power supply or open-circuited	– The feedback voltage value of the external temperature sensor is detected to be greater than 4.7V for 2 seconds	– The feedback voltage value of the external temperature sensor is detected to be ≤4.7V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations
• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.11 Accurate Test (FACM)

Accurate Test AI: B190614

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190614	Sunlight sensor short-circuited to GND fault short-circuited to GND fault	– The feedback voltage value of the sunlight sensor short-circuited to GND fault is detected to be less than 0.3V for 2 seconds.	– It is detected that the feedback voltage of sunlight sensor is ≥0.3V for 4s.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.12 Accurate Test (FACM)

Accurate Test AJ: B190714

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190714	Pressure sensor (high-voltage) short-circuited to GND or open-circuited	– The pressure sensor feedback voltage value is detected to be less than 0.3V for 2 seconds	– The pressure sensor feedback voltage value is detected to be ≥0.3V for 4 seconds

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.13 Accurate Test (FACM)

Accurate Test AK: B190715

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190715	Pressure sensor (high-voltage) short-circuited to power supply	– The pressure sensor feedback voltage value is detected to be greater than 4.7V for 2s.	– The pressure sensor feedback voltage value is detected to be ≤4.7V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations
• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.14 Accurate Test (FACM)

Accurate Test AL: B190814

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190814	PT sensor temperature side short-circuited to GND	– It is detected that the feedback voltage at PT sensor temperature side is less than 0.3V for 2s.	– The feedback voltage value of the PT sensor temperature side is detected to be ≥0.3V for 4 seconds

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.15 Accurate Test (FACM)

Accurate Test AM: B190815

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190815	PT sensor temperature side is short-circuited to power supply or open-circuited	– PT sensor temperature side feedback voltage greater than 4.7V detected for 2 seconds	– PT sensor temperature side feedback voltage ≤4.7V detected for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations
• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.16 Accurate Test (FACM)

Accurate Test AN: B190914

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190914	PT sensor pressure side short-circuited to GND or open-circuited	– It is detected that the feedback voltage value on pressure side of PT sensor is less than 0.3V for 2s.	– The feedback voltage value of the PT sensor pressure side is detected to be ≥0.3V for 4 seconds

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.17 Accurate Test (FACM)

Accurate Test AO: B190915

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190915	PT sensor pressure side short-circuited to power supply	– PT sensor pressure side feedback voltage greater than 4.7V detected for 2 seconds	– The feedback voltage value of the PT sensor pressure side is detected to be ≤4.7V for 4 seconds

Possible cause

– Sensor fault.

– Abnormal harness.

Repair recommendations

• Replace the sensor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.18 Accurate Test (FACM)

Accurate Test AP: B190A00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190A00	Electric compressor fault	– The electric compressor sends an error message for 2s	– The electric compressor sends normal status information for 4 seconds

Possible cause

– Compressor fault (high and low pressure overvoltage or undervoltage, compressor overheating, overload, overtemperature, overcurrent, etc.).

– Abnormal harness.

Repair recommendations

• Extract AC LIN messages, clarify the cause of compressor fault and then confirm whether to replace the compressor.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.19 Accurate Test (FACM)

Accurate Test AQ: B190B00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190B00	Electronic expansion valve (EXV3) fault	– Electronic expansion valve sends error message for 2s	– The electronic expansion valve sends normal status information for 4 seconds

Possible cause

– Electronic expansion valve fault (overvoltage, undervoltage, abnormal temperature, etc.).

– Abnormal harness.

Repair recommendations

• Extract AC LIN messages, clarify the cause of the electronic expansion valve fault and then confirm whether to replace the electronic expansion valve.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.20 Accurate Test (FACM)

Accurate Test AR: B190C00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190C00	PTC fault	– PTC sends an error message for 2 seconds	– PTC sends normal status information for 4 seconds

Possible cause

– PTC fault (high and low voltage overvoltage or undervoltage, PTC overheating, overload, overtemperature, overcurrent, etc.).

– Abnormal harness.

Repair recommendations

• Extract AC LIN messages, clarify the cause of PTC fault and then confirm whether to replace the PTC.

• Check the harness.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.3.21 Accurate Test (FACM)

Accurate Test B: U300617

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U300617	Battery overvoltage	– The battery voltage is higher than 16V for more than 1.5 seconds	– The battery voltage is between 9V-16V for more than 1.5 seconds

Possible cause

– High battery voltage

Repair recommendations
• Check the battery power supply.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.22 Accurate Test (FACM)

Accurate Test C: U007300

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U007300	CAN bus off	– There are 3 consecutive BUSOFF faults (faults of node loss, message loss and data invalidity should not be reported again when BUSOFF DTC is reported).	– The CAN bus resumes normal communication and sends 5 frames of messages continuously and normally

Possible cause

– Short-circuited between CAN high and CAN low

Repair recommendations
• Check network connection.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.23 Accurate Test (FACM)

Accurate Test D: U220D00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U220D00	Network management limp home	– The continuous time of entering limp home exceeds 2 seconds	– CAN network management enters the normal ring construction process

Possible cause

–

Repair recommendations
• Check network connection.

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.24 Accurate Test (FACM)

Accurate Test E: U015500

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U015500	Loss of communication with IC node (0x149)	– The message from the IC node cannot be received for more than 100ms	– The message sent by the IC node is successfully received

Possible cause

– IC node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.25 Accurate Test (FACM)

Accurate Test F: U014000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U014000	Loss of communication with BCM node (0x180)	– Messages from BCM node cannot be received for more than 100ms	– The message sent by the BCM node is successfully received

Possible cause

– BCM node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.26 Accurate Test (FACM)

Accurate Test G: U012100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012100	Loss of communication with ABS node (0x200)	– The message from the ABS node cannot be received for more than 200ms	– The message sent by the ABS node is successfully received

Possible cause

– ABS node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.27 Accurate Test (FACM)

Accurate Test H: U010000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U010000	Loss of communication with Engine Node (0x608)	– Engine node message cannot be received for more than 100ms	– Message sent by Engine node received successfully

Possible cause

– Engine node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.28 Accurate Test (FACM)

Accurate Test I: U019800

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U019800	Loss of communication with SBM node (0x526)	– The message from the SBM node cannot be received for more than 100ms	– The message sent by the SBM node is successfully received

Possible cause

– SBM node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.29 Accurate Test (FACM)

Accurate Test J: U100400

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U100400	Loss of communication with APM node (0x520)	– The message from the SBM node cannot be received for more than 200ms	– The message sent by the SBM node is successfully received

Possible cause

– APM node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.30 Accurate Test (FACM)

Accurate Test K: U015600

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U015600	Loss of communication with ICE node (0x3B0)	– The message from the ICE node cannot be received for more than 100ms	– The message sent by the ICE node is successfully received

Possible cause

– ICE node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.31 Accurate Test (FACM)

Accurate Test L: U014001

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U014001	Loss of communication with PEPS node (0x170)	– The message from the PEPS node cannot be received for more than 100ms	– The message sent by the PEPS node is successfully received

Possible cause

– PEPS node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.32 Accurate Test (FACM)

Accurate Test M: U100200

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U100200	Loss of communication with TBOX node (0x4E5)	– Messages from TBOX node cannot be received for more than 500ms	– The message sent by TBOX node is successfully received

Possible cause

– TBOX node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.33 Accurate Test (FACM)

Accurate Test N: U100200

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U011100	Loss of communication with BMS node (0x362)	– Messages from BMS node cannot be received for more than 100ms	– The message sent by the BMS node is successfully received

Possible cause

– BMS node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.34 Accurate Test (FACM)

Accurate Test O: U029800

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U029800	Loss of communication with DCDC node (0x362)	– Message from DCDC node cannot be received for more than 100 ms	– Message sent by DCDC node received successfully

Possible cause

– DCDC node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.35 Accurate Test (FACM)

Accurate Test P: U012200

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U012200	Loss of communication with VCM node (0x216)	– Messages from VCM node cannot be received for more than 100ms	– The message sent by the VCM node is successfully received

Possible cause

– VCM node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.36 Accurate Test (FACM)

Accurate Test Q: U011000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U011000	Loss of communication with MCU node (0x240)	– Message from MCU node cannot be received for more than 500 ms	– The message sent by the MCU node is successfully received

Possible cause

– MCU node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.37 Accurate Test (FACM)

Accurate Test R: U019B00

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U019B00	Loss of communication with OBC node (0x268)	– Message from OBC node cannot be received for more than 100 ms	– Message sent by OBC node received successfully

Possible cause

– OBC node fault.

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis

• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.38 Accurate Test (FACM)

Accurate Test S: U120000

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U120000	Loss of communication with SRS node (0x31C)	– The message from the SRS node cannot be received for more than 500ms	– The message sent by the SRS node is successfully received

Possible cause

– SRS node fault

Repair recommendations
• Check the CAN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.39 Accurate Test (FACM)

Accurate Test T: U101100

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U101100	Loss of communication with BCM LIN node (0x11, 0x24)	– Messages from BCM LIN node cannot be received for more than 100ms	– The message sent by the BCM LIN node is successfully received

Possible cause

– BCM LIN node fault

Repair recommendations
• Check the LIN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.40 Accurate Test (FACM)

Accurate Test U: U101200

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
U101200	Loss of communication with AC LIN node (0x03, 0x04, 0x13)	– Messages from AC LIN node cannot be received for more than 100ms	– Message sent by AC LIN node received successfully

Possible cause

– AC LIN node fault

Repair recommendations
• Check the LIN circuit

• Check the module

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.41 Accurate Test (FACM)

Accurate Test V: U101200

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190013	Blower open circuit fault	– When the blower is not in gear 0, it is detected that the blower feedback voltage value is less than 1V for 3 seconds	– When the blower is not in gear 0, it is detected that the blower feedback voltage value is ≥1V for 6 seconds

Repair recommendations
• Check the circuit

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.42 Accurate Test (FACM)

Accurate Test W: B190014

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190014	Left side temperature door motor short-circuited to GND or open-circuited	– The left temperature motor feedback voltage value is detected to be less than 0.3V for 2 seconds	– The left temperature motor feedback voltage value is detected to be ≥0.3V for 4 seconds

Possible cause

– Circuit fault of motor actuator.

Repair recommendations
• Check the left temperature damper actuator circuit.

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.43 Accurate Test (FACM)

Accurate Test X: B190015

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190015	Left temperature motor short-circuited to power supply	– The left temperature motor feedback voltage value is detected to be greater than 4.7V for 2 seconds	– The left temperature motor feedback voltage value ≤4.7V is detected for 4 seconds

Possible cause

– Left temperature motor actuator circuit fault

Repair recommendations
• Check the left temperature damper actuator circuit.

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.44 Accurate Test (FACM)

Accurate Test Y: B190214

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190214	Mode control motor short-circuited to GND or open-circuited	– The mode motor feedback voltage value is detected to be less than 0.3V for 2 seconds	– The mode motor feedback voltage value is detected to be ≥0.3V for 4 seconds

Possible cause

– Mode motor actuator circuit fault

Repair recommendations
• Check the mode damper actuator circuit

Visual inspection and inspection before diagnosis
• Check for any damaged harness.
• Check for any loose or damaged connector.

4.17.3.45 Accurate Test (FACM)

Accurate Test Z: B190215

Refer to the Circuit Diagram Manual for system diagrams, schematic diagrams, and connector information.

DTC and fault triggering condition

DTC	Description	Fault triggering conditions	Fault Recovery Conditions
B190215	Mode motor short-circuited to power supply	– Mode motor feedback voltage greater than 4.7V detected for 2s	– Mode motor feedback voltage ≤4.7V detected for 4 seconds

Possible cause

– Mode motor actuator circuit fault

Repair recommendations
• Check the mode damper actuator circuit

Visual inspection and inspection before diagnosis
• Check for any damaged harness.

• Check for any loose or damaged connector.

4.17.4 Removal and installation

4.17.4.1 Removal and installation of sunlight sensor

Removal

1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket and Cable, General Procedures).

2. Pry out the sunlight sensor with a straight screwdriver.



3. Disconnect the sunlight sensor harness connector.

4. Remove the sunlight sensor.

Installation

1. The installation order is reverse to the removal order.

4.17.4.2 Removal and installation of interior temperature sensor

Removal

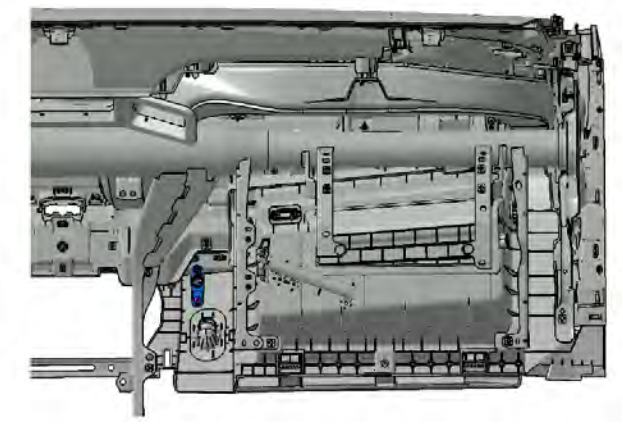
1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket and Cable, General Procedures).

2. Remove the front bumper assembly.

   Refer to: Removal of dashboard left lower shield (501-19 left lower shield, removal and installation).

3. Remove the fixing screws of interior temperature sensor.



4. Disconnect the harness connector of interior temperature sensor.

5. Remove the interior temperature sensor.

Installation

1. The installation order is reverse to the removal order.

4.17.4.3 Removal and installation of exterior temperature sensor

Removal

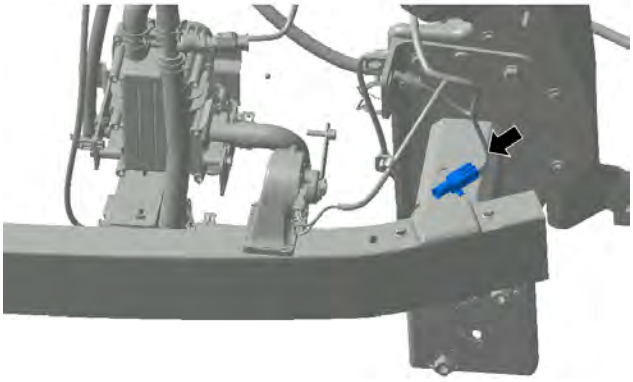
1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket and Cable, General Procedures).

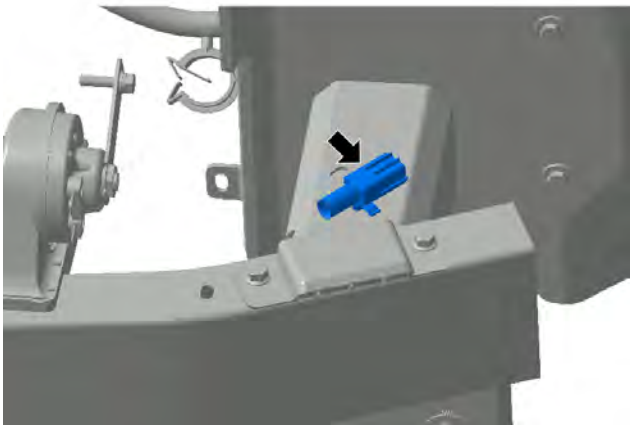
2. Remove the front bumper assembly.

   Refer to: Removal of front bumper assembly (501-19 bumper, removal and installation).

3. Disconnect the harness connector of exterior temperature sensor.



4. Remove the exterior temperature sensor from the upper part of anti-collision beam and take it out.



Installation

1. The installation order is reverse to the removal order.

4.17.4.4 Removal and installation of compressor discharge pipe assembly

Removal

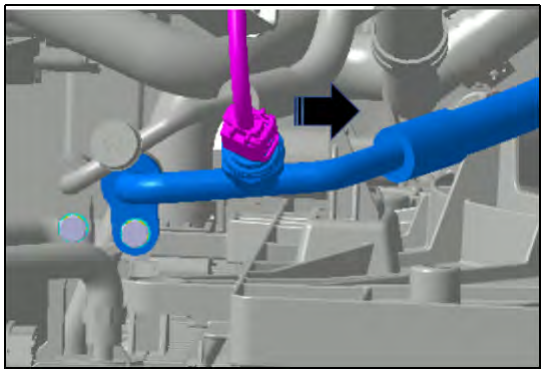
1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket And Cable, General Procedures).

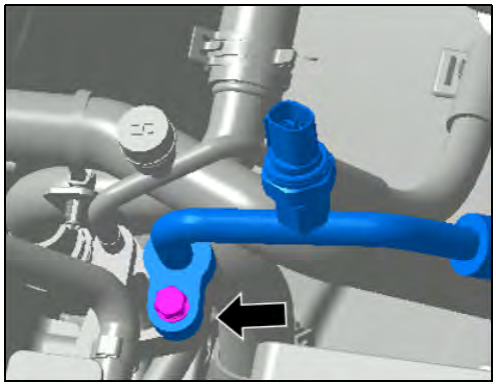
2. Discharge the A/C refrigerant.

   Refer to: Recovery, discharge and filling of A/C system (412-00 A/C system-overview, general procedures)

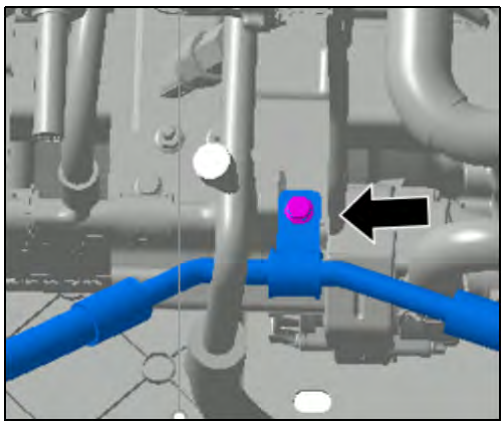
3. Disconnect the pressure sensor harness connector.



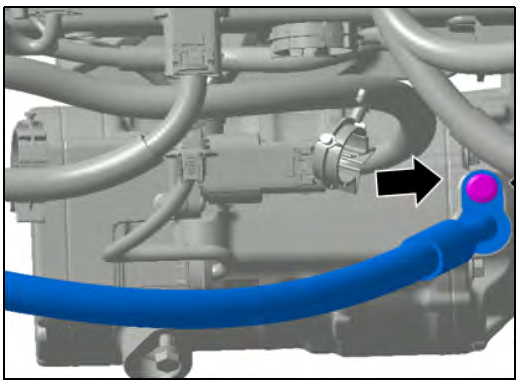
4. Remove the fixing bolts connecting the compressor discharge pipe assembly to the condenser end, and disengage the compressor discharge pipe assembly from the condenser.



5. Remove the fixing bolt of self-equipped pipe clamp of compressor discharge pipe assembly.



6. Remove the fixing bolts of compressor discharge pipe assembly, and disengage the compressor discharge pipe assembly from the compressor.



Installation

1. The installation order is reverse to the removal order.

2. Fill refrigerant. Refer to: Recovery, discharge and filling of A/C system (412-00 A/C system-overview, general procedures)

4.17.4.5 Removal and installation of electric compressor assembly

Removal

1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket And Cable, General Procedures).

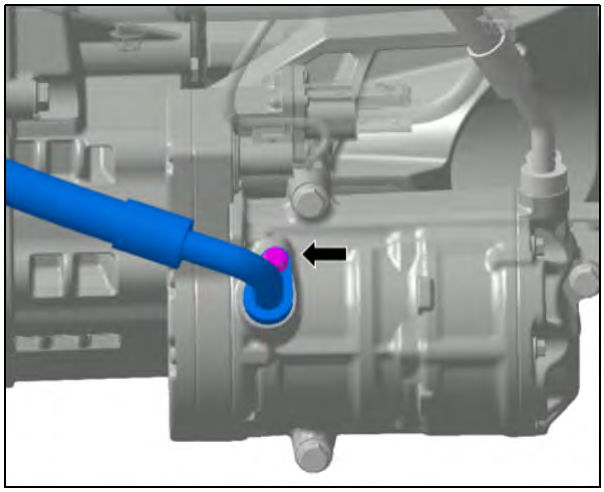
2. Discharge the A/C refrigerant.

   Refer to: Recovery, discharge and filling of A/C system (412-00 A/C system-overview, general procedures)

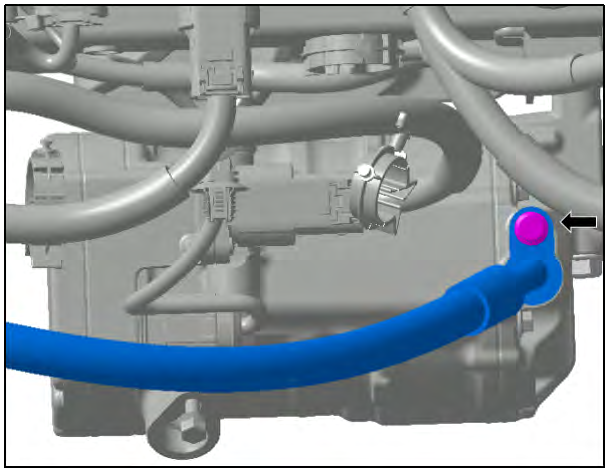
3. Lift the vehicle.

   Refer to: (100-02 Traction and Lifting, Description and Operation).

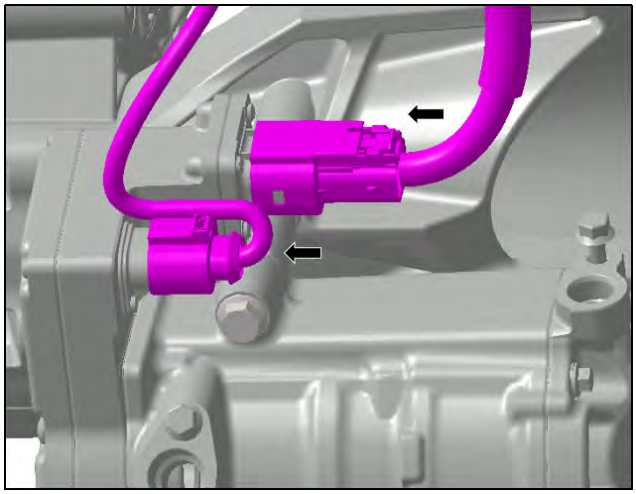
4. Remove the fixing bolts of high and low pressure pipe assembly, and disengage the high/low pressure pipe assembly from the compressor.



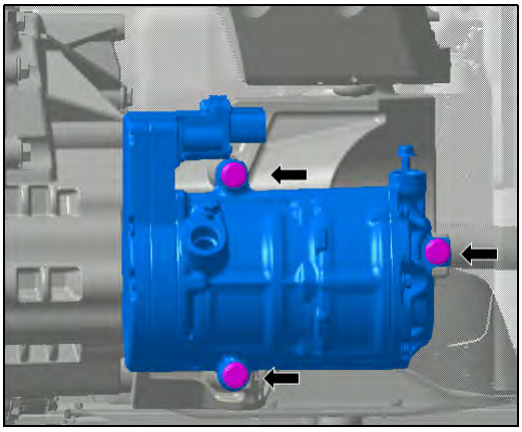
5. Remove the fixing bolts of compressor discharge pipe assembly, and disengage the compressor discharge pipe assembly from the compressor.



6. Disconnect the high and low voltage harness plugs of electric compressor assembly.



7. Remove the electric compressor assembly fixing bolts, and remove the electric compressor assembly.



Installation

1. The installation order is reverse to the removal order.
2. Fill refrigerant. Refer to: Recovery, discharge and filling of A/C system (412-00 A/C system-overview, general procedures)

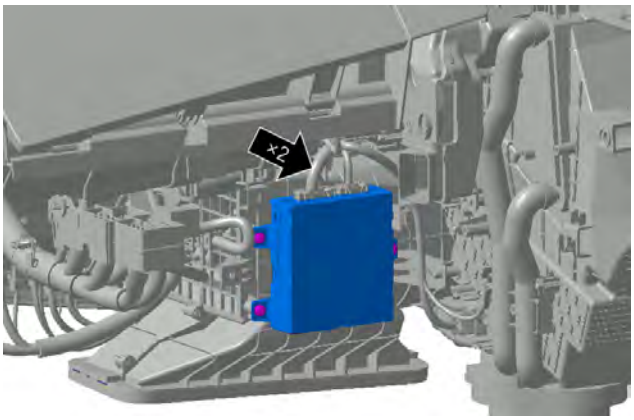
4.17.4.6 Removal and installation of A/C control box

Removal

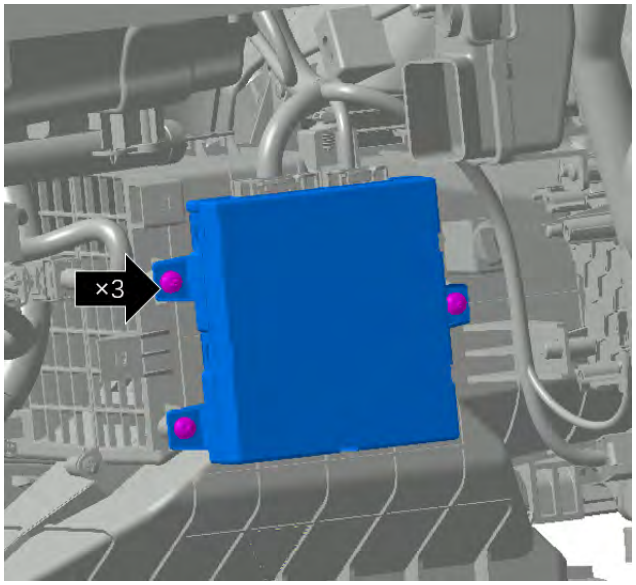
1. Disconnect the negative battery cable.

   Refer to: Disconnect Negative Battery Cable (414-01 Battery, Bracket and Cable, General Procedures).

2. Disconnect the two harness connectors of A/C control box (the A/C control box is arranged below the dashboard in the front left cab).



3. Remove the fixing screws of A/C control box.



4. Remove the A/C control box.

Installation

1. The installation order is reverse to the removal order.

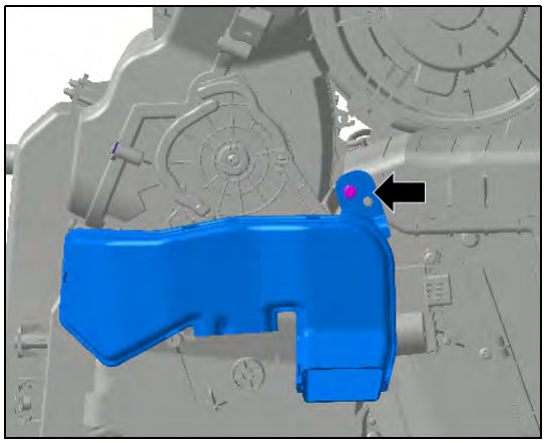
4.17.4.7 Removal and installation of A/C filter screen

Removal

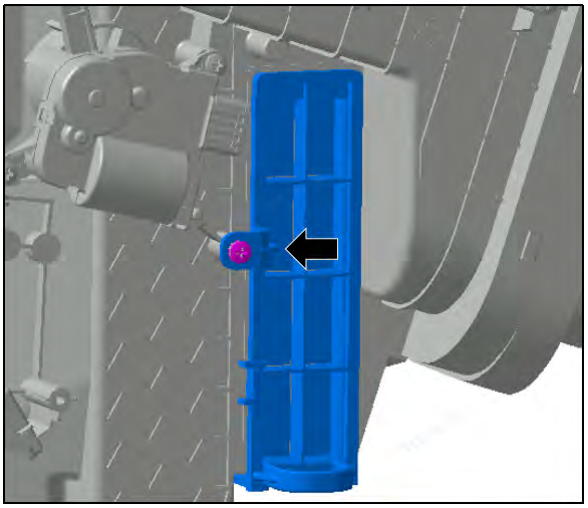
1. Remove the front HVAC assembly

   Refer to: **HVAC** assembly (**412-02** heating and ventilation, removal and installation).

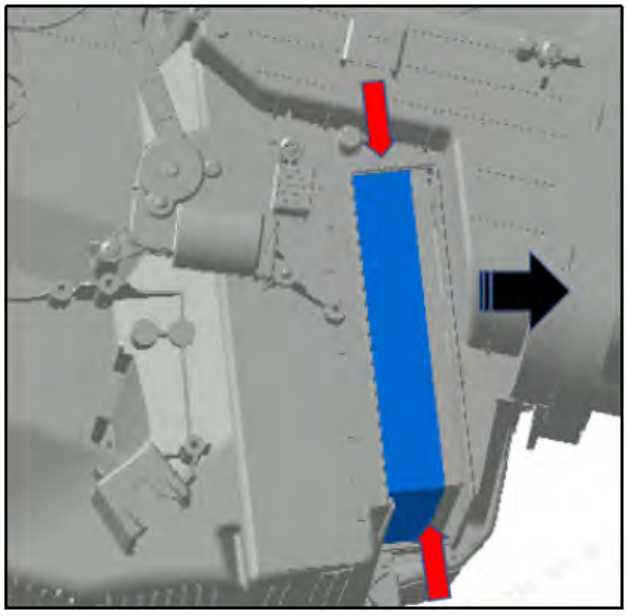
2. Remove the right air-to-footwell air duct fixing screw and remove the right air-to-footwell air duct.



3. Remove the A/C filter screen cover plate fixing screws and remove the A/C filter screen cover plate.



4. Pinch the A/C filter at the top and bottom and remove it.



Installation

1. The installation order is reverse to the removal order.

4.17.4.8 Removal and installation of A/C HVAC assembly

Removal

1. Disconnect the negative battery cable.

   Refer to: Disconnect the battery negative cable.

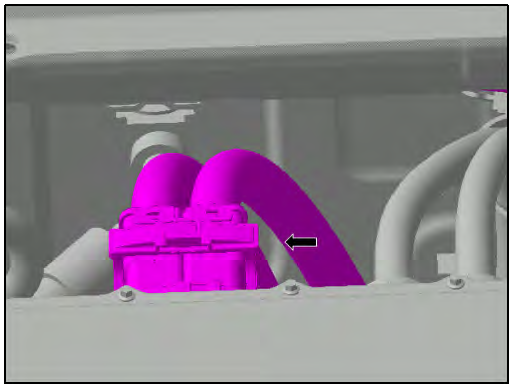
2. Drain the coolant.

   Refer to: Cooling system draining, filling and bleeding.

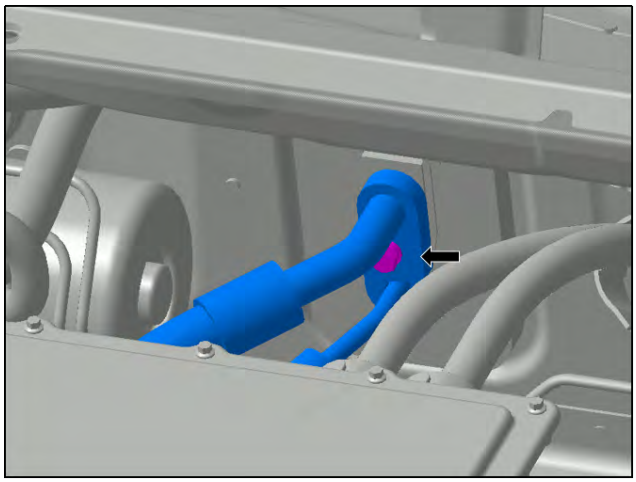
3. Discharge the A/C refrigerant.

   Refer to: Recovery, discharge and filling of A/C system.

4. Disconnect the high-voltage fuse box plug



5. Remove the fixing bolts of high/low pressure pipe assembly, and disconnect the high and low pressure pipe assembly.



6. Remove the fixing bolts of high/low pressure pipe assembly, and disconnect the high and low pressure pipe assembly.

7. Remove the heater coolant inlet/outlet pipe assembly.
   Refer to: Heater water inlet and outlet pipe assembly

8. Remove the dashboard assembly.

   Refer to: Instrument panel assembly

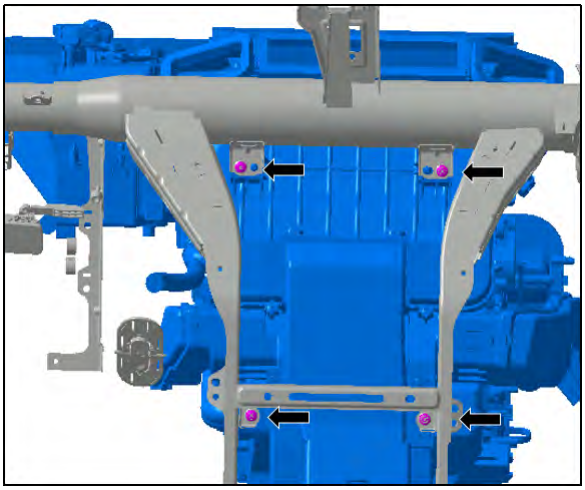
9. Remove the upper trim panel assembly.

   Refer to: Upper trim panel assembly

10. Remove the lower trim panel assembly.

    Refer to: Lower trim panel assembly

11. Remove the fixing bolts of HVAC assembly, and remove the HVAC assembly.



Installation

1. The installation order is the reverse of the removal order.

2. Fill the refrigerant.

   Refer to: Cooling system drainage, filling and bleeding

4.17.5 General procedures

4.17.5.1 Treatment of Contaminated Refrigerant

1. Refrigerant identification equipment is used to check the A/C system for the presence of any contaminated refrigerant.
2. Advise the customer of additional costs arising from system repairs due to contamination.
3. Remove contaminated refrigerant.

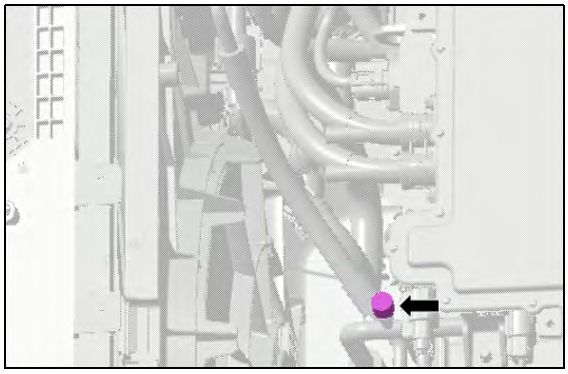
Vacuum leak detection
Recover the A/C system refrigerant

Refer to: Recovery, discharge and filling of A/C system (412-00 A/C system-overview, general procedures)

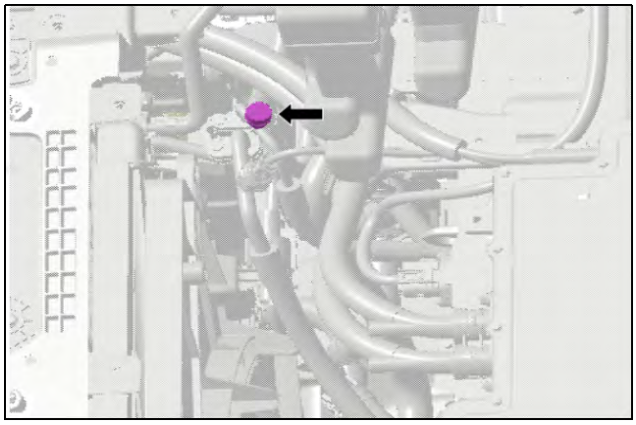
4.17.5.2 Recovery, discharge and filling of the A/C system

Removal

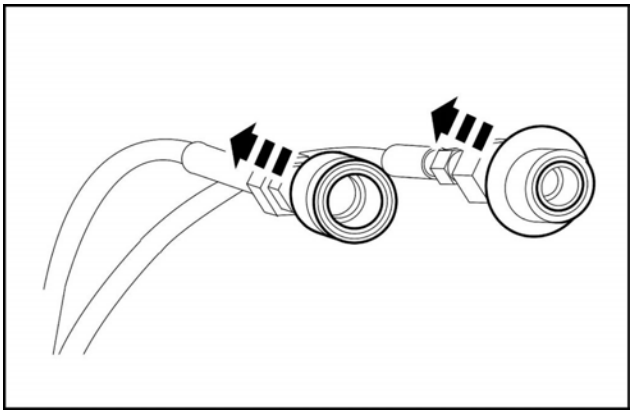
1. Remove the protective cover of the low-pressure A/C filling port.



2. Remove the protective cover of the high-pressure A/C filling port.



3. Pull back the quick-fit connection on the maintenance equipment tube.



Caution: The inner diameter at the high-pressure side is small. The inner diameter of the low-pressure side is large.

Warning: Do not let the refrigerant directly enter the air under any conditions when discharging the refrigerant.

Caution: When removing the A/C system parts, calculate the amount of refrigerant remaining in them.

4. Evacuate the A/C system through the low-pressure port according to the maintenance equipment manufacturer's instructions.

   Caution: The A/C system must be refilled after being evacuated for about 30 min so as to ensure correct operation.

   Caution: If the open system is exposed to moisture for a long time, replace the battery/dryer and extend the evacuation time to 2~3h. Evacuate the A/C system in accordance with the maintenance equipment manufacturer's guidelines.

5. Evacuate the A/C system in accordance with the maintenance equipment manufacturer's guidelines.

   Caution: If the A/C system is evacuated before evacuation of refrigerant, some refrigerant will remain in the compressor refrigerant. This residual refrigerant may evaporate, causing a slight pressure increase during leakage detection. The A/C system will not cause leakage when the pressure increase does not exceed 20 mbar.

6. Check for leaks by closing the manual valve on the gauge, turning off the vacuum pump of the maintenance equipment and observing the low pressure gauge.

   Caution: This step can only be carried out if the pressure increases by more than 20 mbar.

7. A leak detector is used to locate any leakage in the A/C refrigeration line.
8. Fill refrigerant into the A/C system.

Caution: Fill the A/C system with gas only through a low pressure connection.

Caution: The A/C system must be evacuated before filling.

Caution: Depending on the maintenance equipment (with or without a heatable filler cylinder), the A/C system can be filled with liquid through the high-pressure port or gas through the low-pressure port.

Caution: The filling amount is marked on a label in the compartment.

9. Fill the A/C system with liquid through a high-pressure connection.

10. Cut-off valve

    1. Open the cut-off valve on the HP side. 2. Turn on the maintenance equipment to "Fill" mode and fill a certain amount of liquid refrigerant (R134a) into the system.

11. Fill the A/C system with gas through a low-pressure connection.

12. Low-pressure valve

    1 Open the cut-off valve on the LP side.

    2 Turn on the maintenance equipment to "Fill" mode and fill a certain amount of gas refrigerant into the system.

    3 Fill residual refrigerant with the A/C system turned on. For this purpose, run at a speed of 1200-1500 rpm. Set the A/C system to the most forced cooling and fresh air mode. Set the blower to its maximum setting. Fill the residual amount of specified filling volume.

    Caution: Do not disconnect the high-pressure hose when the A/C is turned on.

13. Disconnect the maintenance equipment.

14. Close the valve

    1. Close the cut-off valve.

    2. Turn off the maintenance equipment.

    3. Disconnect the maintenance equipment connecting pipe from the A/C system filling connector.

    4. Screw the protective cover onto the filling port.

Installation

1. The installation order is reverse to the removal order.

4.17.5.3 General procedures

Ultraviolet leak detector

1. Refer to: Health and Safety Precautions for A/C System (100-00 Overview, Description and Operation).

2. Add 7.4 ml of fluorescent tracer. Caution: Some vehicles are marked with refrigerant at the spring lockup clutch. This may be left over from some procedures applied to the product prior to installation in order to aid assembly. When leakage is suspected from the spring locking connector, the parts shall be cleaned up, and the 134a is used to automatically calibrate the halogen leak detector to confirm the leak. Caution: The leakage point can be accurately located by the bright yellow-green light of the tracer. Since there may be more than one leakage, each part shall usually be checked.

3. Confirm the source of the leak. Check all parts, equipment and pipelines of the A/C system for leakage.

   General equipment: Ultraviolet leak detector

4. After the leak has been identified and corrected, remove any traces left by the tracer with the specified solvent.

5. Run the system for a few minutes to check and repair, and use an ultraviolet lamp again for inspection purposes.

Electronic leak detection method

1. Refer to: Health and Safety Precautions for A/C System (100-00 Overview, Description and Operation).
   Warning: Ensure that the working area is well ventilated before leak detection. If the surrounding air is contaminated by refrigerant gas, the leak detector will indicate this gas at any time. The smell of other chemicals such as antifreeze, diesel oil, brake disc cleaner or other cleaning agents will cause the same problem.
   Warning: The refrigerant identification device must be connected before using the manifold instrument. Otherwise, the manifold instrument may be contaminated. Contaminated refrigerant must be disposed of as special waste. Follow the manufacturer's instructions when performing repairs. Caution: When the electric compressor is not working, the readings of both manifold instruments should be between 4.1 and 5.5 bar.

2. Connect the manifold instrument to the service gauge valve port.

3. Close the manual valve of measuring equipment for leak detection.

4. If the pressure is found to be too low or absent, re-vacuum the system and fill it with refrigerant.

5. Use an R-134a automatic calibration halogen leak detector to check for leakage in the refrigeration system. Follow all

operating instructions, including the handling and operation techniques of leak detectors.

6. If leakage is found, pump out the refrigerant through a suction pump.

5.1 Lights

5.1.1 Specification

5.1.1.1 General specifications

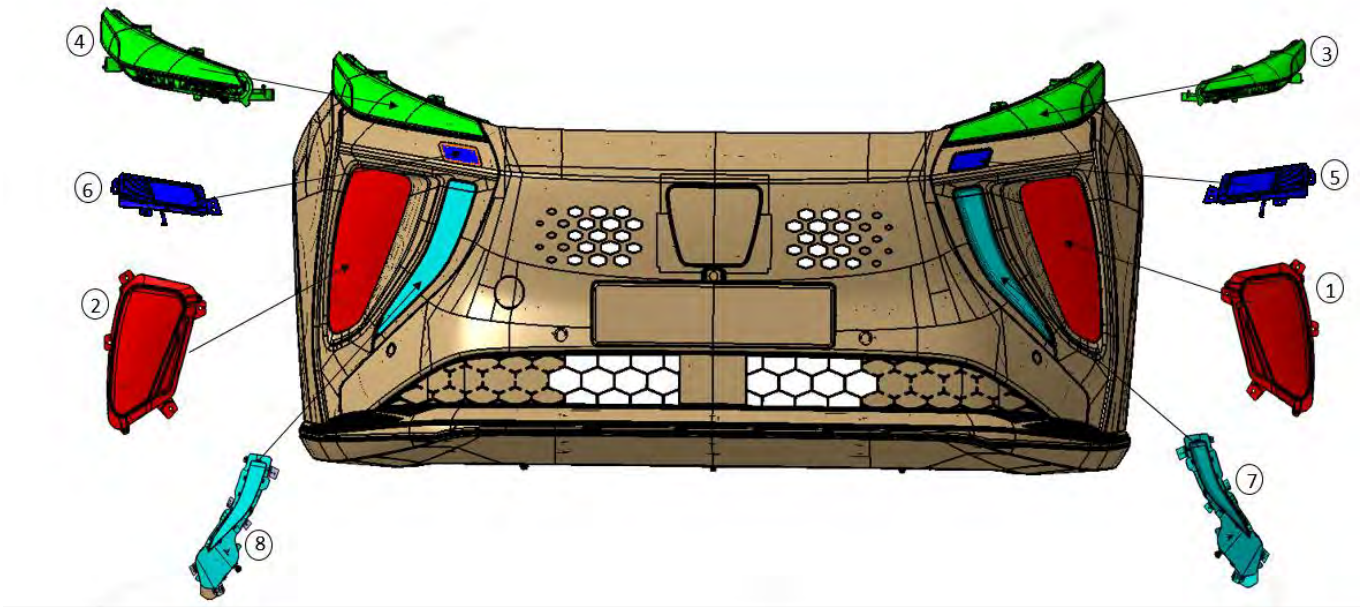
Name	Power/Nr.	Specification
Headlight		
Low beam	28W	LED
High beam	19W	LED
Daytime running light		
Front turn signal	8.5W	LED
Front position light	1.5W	LED
Daytime running light	13W	LED
Rear combination light		
Rear turn signal	7.77W	LED
Rear brake light	3.85W	LED
Rear position light	11W	LED
Reversing light	3.3W	LED
High-mount brake light		
High-mount brake light	1.8W	LED
Licence plate light		
Licence plate light	1.35W	LED
Rear fog light		
Rear fog light	21w	Bulb
Boot light		
Boot light	0.5W	LED

5.1.1.2 Torque specification

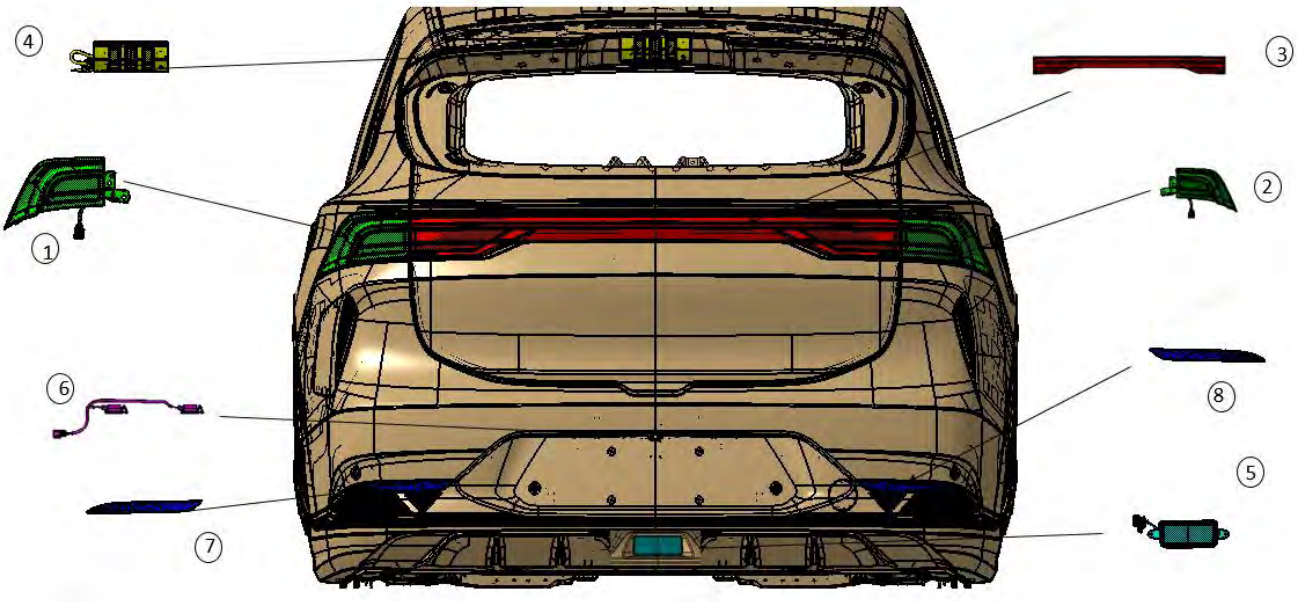
Name	Nm
Fixing bolt of front combination light	5±2
Rear combination light fixing bolt	5±2
Clearance light screw	1.1±0.2

5.1.2 Instructions and operations

5.1.2.1 Component Locating Diagram of Combination Light



Item	Description
1	Front left combination light assembly
2	Front right combination light assembly
3	Left daytime running light assembly
4	Right daytime running light assembly
5	Front bumper upper left trim assembly
6	Front bumper upper right trim assembly
7	Front bumper lower left trim assembly
8	Front bumper lower right trim assembly



Item	Description
1	Rear left combination light assembly A
2	Rear right combination light assembly A
3	Rear combination light assembly B
4	High-mount brake light assembly
5	Rear fog light assembly
6	Licence plate light assembly
7	Rear left retro-reflector
8	Rear right retro-reflector

5.1.3 Diagnosis and testing

5.1.3.1 External Lighting Appearance Checklist

Appearance Checklist

Electrical
– Fuse – Harness – Harness connector – Instrument fuse box – Bulb – Switch – BCM – Instrument cluster

5.1.3.2 Exterior light inspection and confirmation

Interior lighting

General Tools

Digital multimeter

Inspection and confirmation

1. Check the problems reported by customers.

2. Visually check for obvious electrical damage.

3. Before further testing, eliminate the obvious faults found in visual inspection and check whether the system works normally.

4. If the fault still exists after visual inspection, use a diagnostic scanner for diagnosis and correct all displayed faults according to the fault description displayed. Check whether the system works normally.

5.1.3.3 Exterior Lighting Symptom Table

Symptoms	Possible cause	Measures
Low beam light not working	– Fuse	– Appearance inspection – Check the fuse of low beam. – Check the BCM circuit – Check the low beam circuit – Check the low beam circuit – Check the multi-function switch – Check the low beam drive relay
	– Circuit	
	– Light multi-function switch	
	– Bulb	

Symptoms	Possible cause	Measures
The low beam is always on.	– BCM – Light multi-function switch – Bulb	– Appearance inspection – Check the fuse of low beam. – Check the low beam relay ER02 – Check the low beam circuit – Check the grounding circuit of headlight – Check the multi-function switch – Check the low beam drive relay
Failure of high beam	– Fuse – Circuit – Light multi-function switch – Bulb	– Remove the high beam relay – Check the control circuit of the high beam relay.
The high beam is always on.	– Fuse – Circuit – Light multi-function switch – Bulb	– Appearance inspection – Check the fuse of the front fog light – Check the front fog light circuit – Check the GND circuit of front fog light – Check the BCM circuit – Check the light combination switch
Failure of front fog light	– Fuse – Circuit – Light multi-function switch – Bulb	– Check the light combination switch
Front fog light always ON	– Fuse – Circuit – Light multi-function switch – Bulb	– Appearance inspection – Check the fuse of the rear fog light – Check the rear fog light circuit – Check the rear fog light grounding circuit – Check the BCM circuit – Check the light combination switch
The rear fog light does not illuminate.	– Fuse – Circuit – Light multi-function switch – Bulb	– Check the light combination switch

Symptoms	Possible cause	Measures
Rear fog light always ON	– Fuse – Circuit – Light multi-function switch – Bulb	– Appearance inspection – Check the fuse of the position light – Check the position light circuit – Check the position light GND circuit – Check the BCM circuit – Check the light combination switch
Failure of position light	– Fuse – Circuit – Light multi-function switch – Bulb	– Check the light combination switch
Position light always ON	– Fuse – Circuit – Light multi-function switch – Bulb	– Appearance inspection – Check the fuse. – Check the BCM circuit – Check the power supply circuit of brake switch – Check the brake light switch circuit. – Check the power supply circuit of brake light – Check the brake light GND – Check the brake light.
Failure of brake light	– Fuse – Circuit – Bulb – Brake light switch	– Check the light combination switch
The brake light is always on.	– Fuse – Circuit – Bulb – Brake light switch	– Appearance inspection – Check the front turn signal circuit – Check the grounding circuit of the front turn signal light. – Check the light combination switch
Front left/right turn signal light not working	– Fuse – Circuit – Bulb – Light multi-function switch	– Appearance inspection – Check the corner light circuit – Check the left/right rearview mirror turn signal GND circuit

Symptoms	Possible cause	Measures
Left/right rearview mirror turn signal does not work	– Fuse – Circuit – Bulb – Light multi-function switch – Flasher relay	– Appearance inspection – Check the rear turn signal circuit – Check the rear turn signal GND circuit.
Rear left/right turn signal light not working	– Fuse – Circuit – Bulb – Light multi-function switch	– Appearance inspection – Check the reversing light fuse – Check the reversing light switch fuse. – Check the reversing light switch circuit. – Check the reversing light switch – Check the reversing light switch circuit. – Check the reversing light circuit – Check the rear reversing light circuit GND
Reversing light does not work (MT)	– Fuse – Circuit – Bulb – Reversing light switch	– Check the reversing light control harness
The reversing light is always on.	– Fuse – Circuit – Bulb – Reversing light switch	– Appearance inspection – Observe the rear left position light – Check the licence plate light circuit – Check the GND circuit of licence plate light
Licence plate light does not work	– Fuse – Circuit – Bulb – Light multi-function switch	– Fault Confirmation – Check the line connecting the dashboard switch to BCM – Check the dashboard switch connection BCM line BCM line – Check the dashboard switch
Hazard warning light not working	– Fuse – Circuit – Bulb – Warning switch	– Fault Confirmation – Check the dashboard switch

Symptoms	Possible cause	Measures
The light soft switch (centre control display screen) does not work	– Centre control screen	– Fault Confirmation – Appearance inspection – Check the line between the centre control display screen and the audio head unit – Check the communication line between the audio head unit and BCM – Check the light circuit
	– Audio head unit	
	– BCM	
	– Circuit	
	– Bulb	

5.1.4 Removal and installation

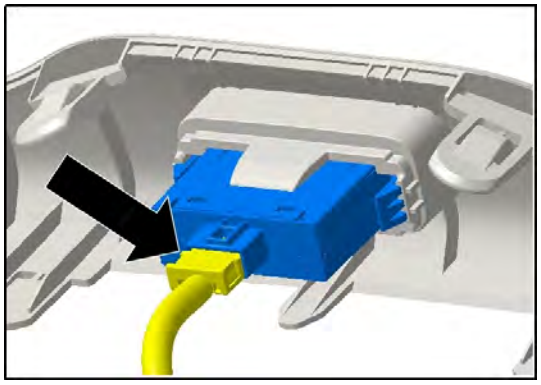
5.1.4.1 Hazard warning light switch assembly

Removal

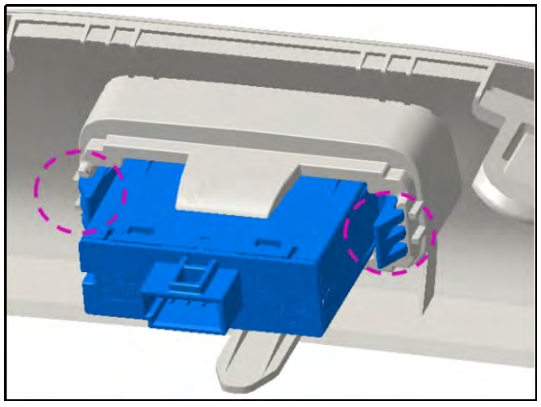
1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.
2. Remove the middle lower trim panel body of the dashboard. Refer to: Removal and installation of the dashboard.



3. Disconnect the harness connector connected to the hazard warning light.



4. Hold the clip structure on the switch on the hazard warning light and push the hazard warning light switch outward.



5. Remove the hazard warning light switch assembly.

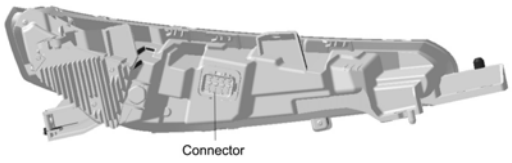
Installation

1. The installation order is the reverse of the removal order.

5.1.4.2 Daytime running light assembly

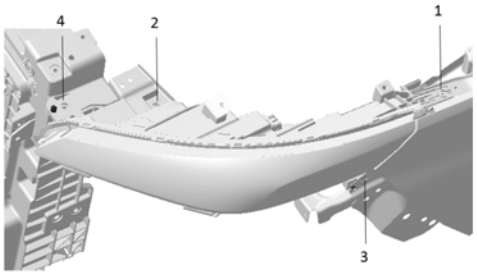
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Remove the front bumper assembly. Refer to: Front bumper assembly.
3. Disconnect the harness connector from the daytime running light assembly.



4. Remove the mounting bolts of daytime running light.

   Torque: 5±2Nm



5. Remove the daytime running light assembly.

Installation

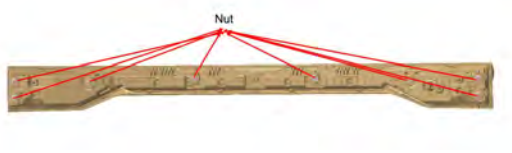
1. The installation order is the reverse of the removal order.

5.1.4.3 Rear combination light B

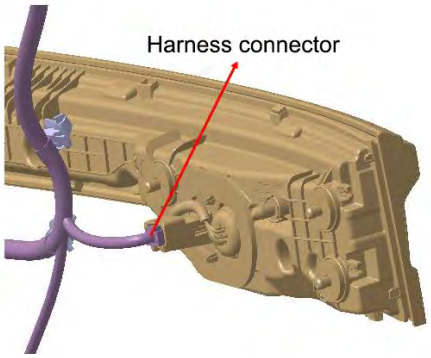
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Open the vehicle boot lid.
3. Remove the boot lid lower shield assembly. Refer to: Boot lid lower shield assembly.
4. Remove the rear combination light mounting nut.

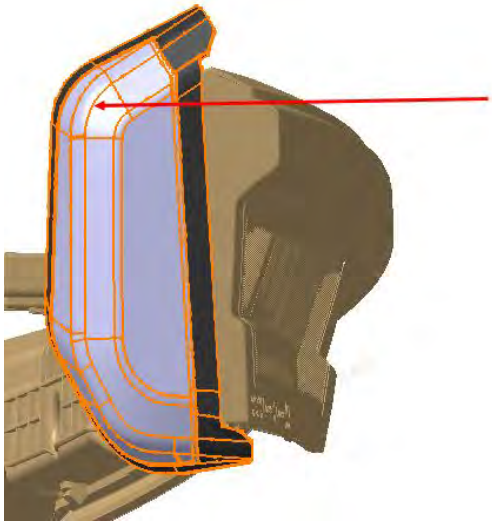
   Torque: 5±2Nm



5. Unplug the connector of rear combination light B.



6. Remove the rear combination light B shield and apply force in the direction of the arrow.



7. Take out the rear combination light B.

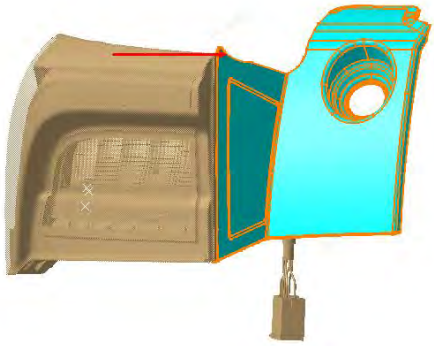
Installation

1. The installation order is the reverse of the removal order.

5.1.4.4 Rear combination light A

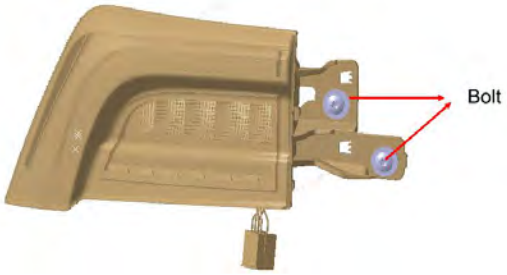
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Open the boot lid of vehicle
3. Apply force in the direction of the arrow to pry off the rear combination light A shield.

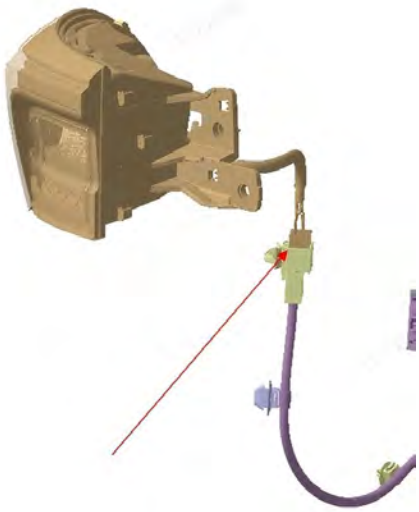


4. Remove the rear combination light mounting bolts

   Torque: 5±2Nm



5. Remove the shield of the light repair access hole with a crowbar.
6. Disconnect the rear combination light connector.



7. Tap the side of the rear combination light hard toward the rear of the car until the rear combination light comes loose, then remove the rear combination light.

Installation

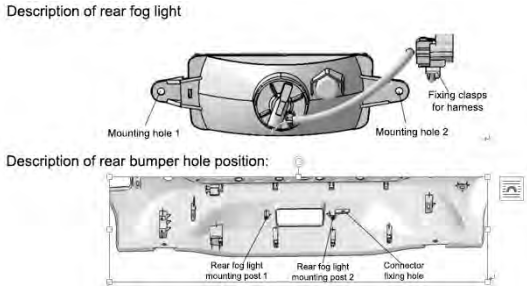
1. The installation order is the reverse of the removal order.

5.1.4.5 Rear fog light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Remove the rear bumper. Refer to: Rear bumper assembly.
3. Remove the mounting screws on the rear fog light.

   Torque: 1±0.2 Nm



4. Unplug the rear fog light harness connector and remove the rear fog light.

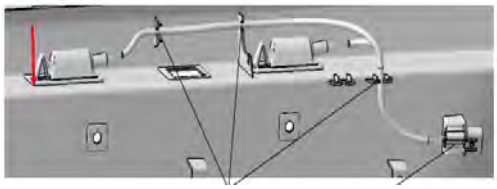
Installation

1. The installation order is the reverse of the removal order.

5.1.4.6 Licence plate light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Use a crowbar to pry off the licence plate light in the direction of the red arrow



Installation

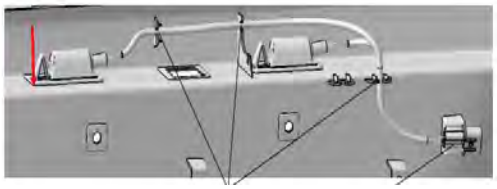
1. Connect the rear licence plate light harness; pass the licence plate light through the rear bumper, and clamp the licence plate light upward to the rear bumper from the other side.

5.1.4.7 High-mount brake light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Open the vehicle boot lid.
3. Remove the boot lid upper shield. Refer to: Boot lid upper shield.
4. Remove the high-mounted brake light mounting nut.

   Torque: 5±2Nm



5. Unplug the high-mounted brake harness connector and remove the high-mounted brake light.

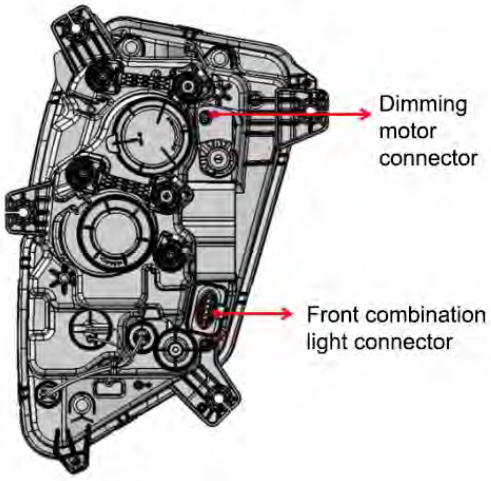
Installation

1. The installation order is the reverse of the removal order.

5.1.4.8 Front combination light

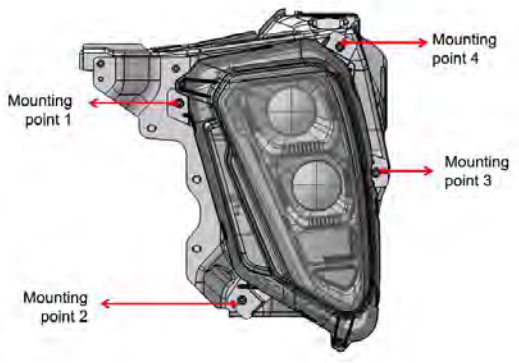
Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Remove the front bumper assembly. Refer to: Front bumper assembly.
3. Unplug the harness connector connected to the front combination light.



4. Remove the mounting bolts of front combination headlight.

   Torque: 5±2Nm



5. Remove the front combination light.

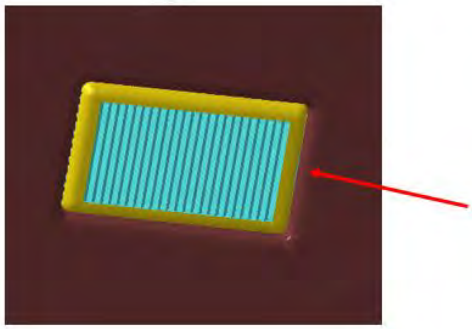
Installation

1. The installation order is the reverse of the removal order.

5.1.4.9 Boot light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Use a crowbar to lift one end of the trunk light.



3. Unplug the trunk light harness.

Installation

1. The installation order is the reverse of the removal order.

5.1.4.10 Side compartment light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Pry up one end of the side compartment light with a crowbar.



3. Unplug the side compartment light harness.

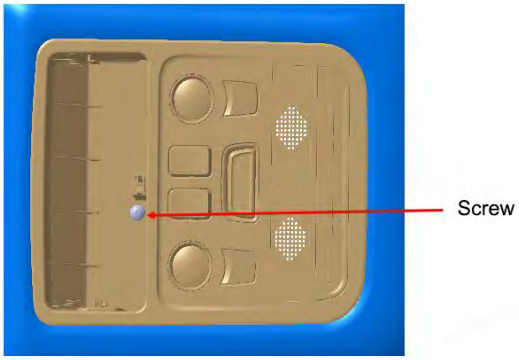
Installation

1. The installation order is the reverse of the removal order.

5.1.4.11 Interior light

Removal

1. Power off the vehicle and disconnect the battery negative cable. Refer to: Disconnect the battery negative terminal.
2. Open the interior roof light glasses case and unscrew the interior dome light mounting screws.



3. Use a crowbar to lift one end of the front interior light, then pull the interior light down from top to bottom and remove the front interior light.



4. Unplug the interior roof light connector.

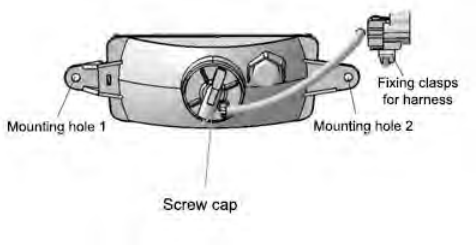
Installation

1. The installation order is the reverse of the removal order.

5.1.4.12 Rear fog light bulb

Removal

1. Rotate the rear fog light cap counterclockwise to remove the bulb. After replacing the bulb, tighten the cap clockwise.



Installation

1. The installation order is the reverse of the removal order.

5.2 Wiper and washer

5.2.1 Specification

5.2.1.1 Torque specification

Name	Nm
Front wiper arm fastening nut	22±2
Fixing bolt of front wiper connecting rod mechanism assembly	9±1
Rear wiper nut	22±2
Rear wiper motor mounting bolt	9±1
Washer bolt	9±1

5.2.2 Instructions and operations

5.2.2.1 Torque specification

Name	Nm
Front wiper arm fastening nut	22±2
Fixing bolt of front wiper connecting rod mechanism assembly	9±1
Rear wiper nut	22±2
Rear wiper motor mounting bolt	9±1
Washer bolt	9±1

5.2.3 Diagnosis and testing

5.2.3.1 Diagnosis and testing

Wiper and washer

Appearance Checklist

Mechanical	Electrical
• Wiper blade	• Fuse
• Wiper arm shaft	• Circuit
• Washer reservoir	• Wiper multi-function switch
• Hose	• Front wiper motor
• Nozzle	• Front washer motor

5.2.3.2 Wiper and washer

Inspection and confirmation

1. Confirm the problems reported by the customer and perform corresponding inspections.

2. Observe for obvious signs of mechanical or electrical damage.

3. Resolve the problems found before performing the next step of inspection.

4. If the cause cannot be confirmed from the appearance, confirm the symptoms first, and then check according to the symptom table.

Appearance Checklist

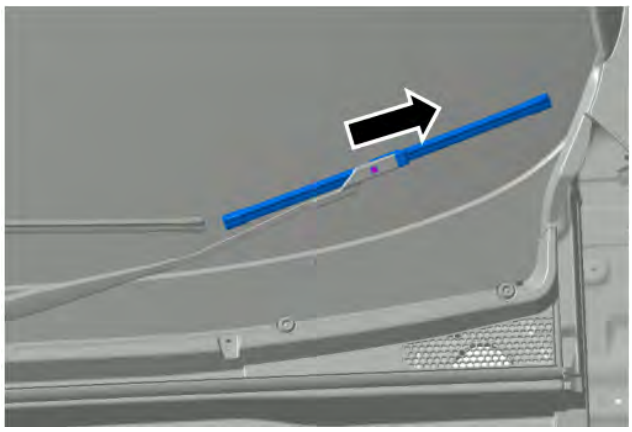
Mechanical	Electrical
• Wiper blade	• Fuse
• Wiper arm shaft	• Circuit
• Washer reservoir	• Wiper multi-function switch
• Hose	• Front wiper motor
• Nozzle	• Front washer motor

5.2.4 Removal and installation

5.2.4.1 Removal and installation of wiper blade

Removal

1. Press the release lock pin, and then push the wiper blade in the direction of arrow to remove it.



Installation

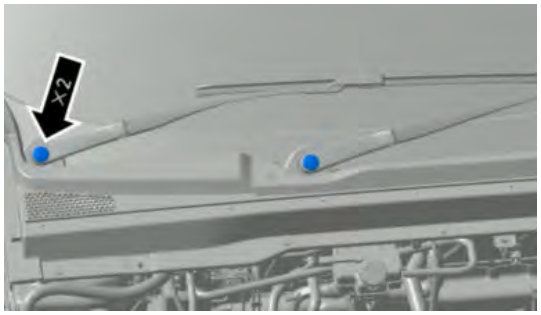
1. The installation order is reverse to the removal order.

5.2.4.2 Front Wiper Arm

Removal

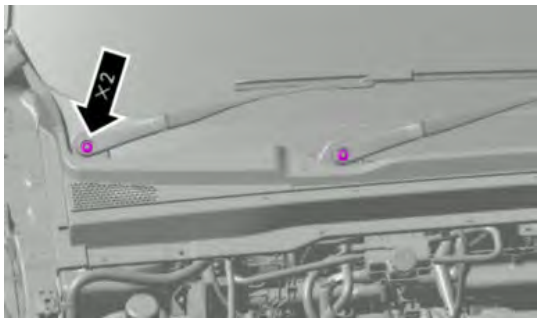
Caution: When disassembling and assembling the wiper arm, pay attention to the mounting point on the glass.

1. Turn on wiper maintenance mode.
2. Remove the front wiper mounting nut cap.



3. Remove the front wiper mounting nut.

   Torque: 22±2Nm



4. Remove the front wiper arm.

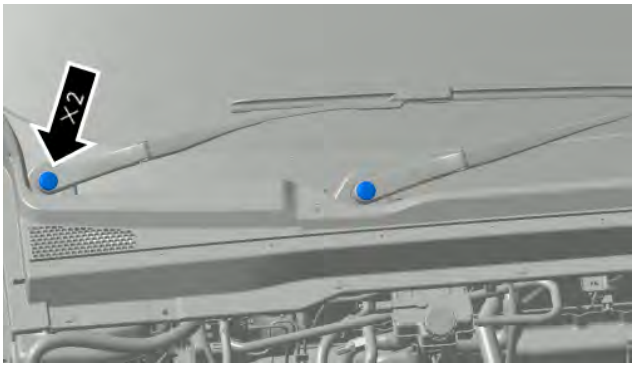
Installation

1. The installation order is the reverse of the removal order.

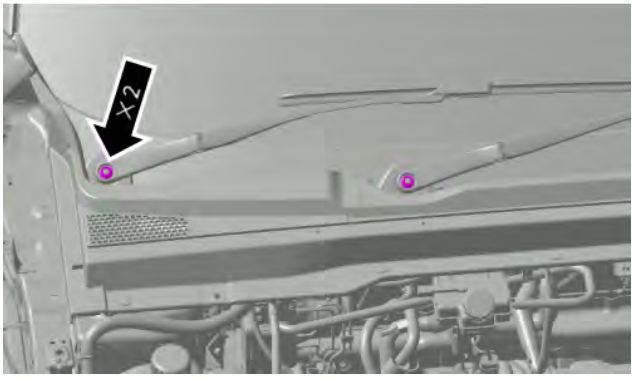
5.2.4.3 Removal and installation of front wiper arm

Removal

1. Remove the front wiper mounting nut cap.



2. Remove the front wiper mounting nut.



3. Remove the front wiper arm.

Installation

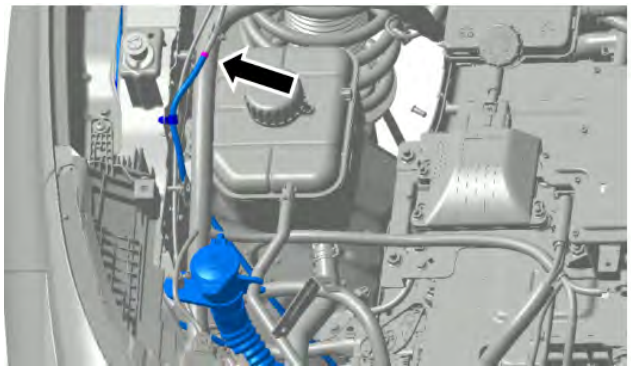
1. The installation order is reverse to the removal order.

5.2.4.4 Removal and installation of washer fluid reservoir and motor assembly

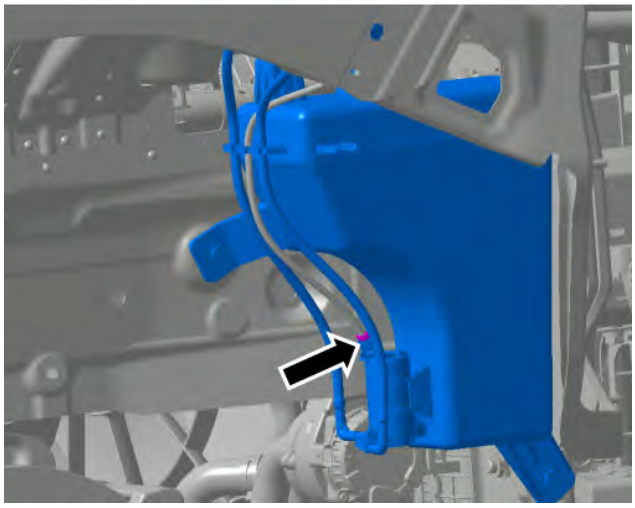
Removal

1. Disconnect the negative battery cable.Refer to: Disconnect the negative terminal of the battery.
2. Remove the front bumper assembly.Refer to: Front bumper system .
3. Remove the headlight assembly.Refer to: Front combination light.
4. Remove the engine compartment covering parts.Refer to: Engine compartment cover plate.

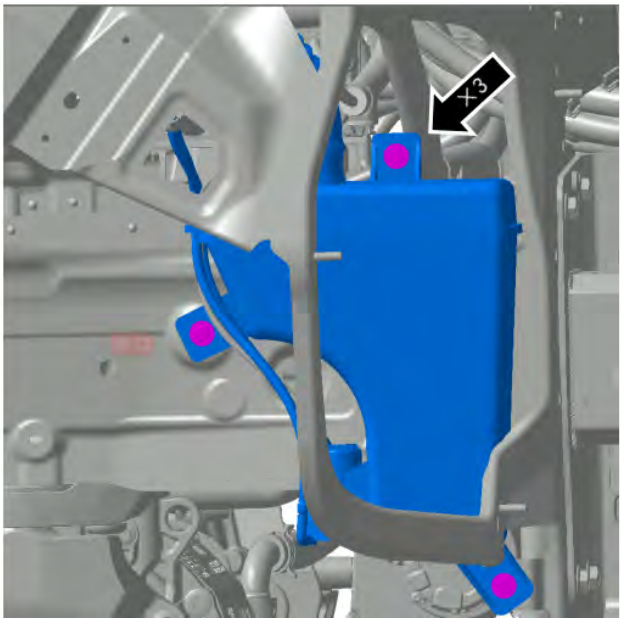
5. Disconnect the two washer fluid reservoir hoses at the two-way joint shown in the figure.



6. Disconnect the harness connector of washer fluid reservoir with motor assembly.



7. Remove the fixing bolts of the washer fluid reservoir with motor assembly, and remove the washer fluid reservoir with motor assembly.



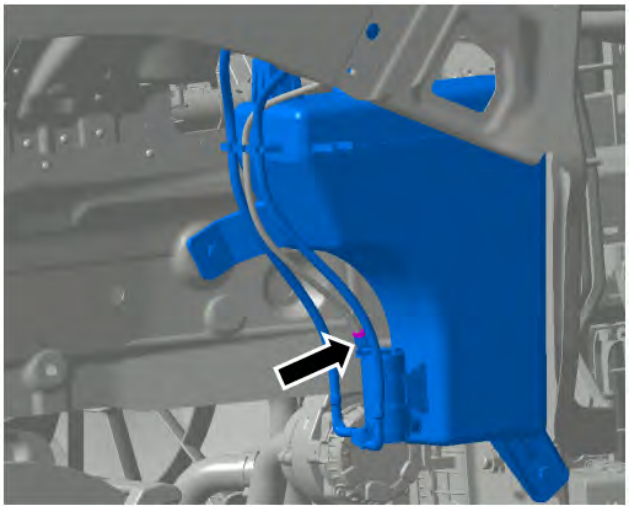
Installation

1. The installation order is reverse to the removal order.

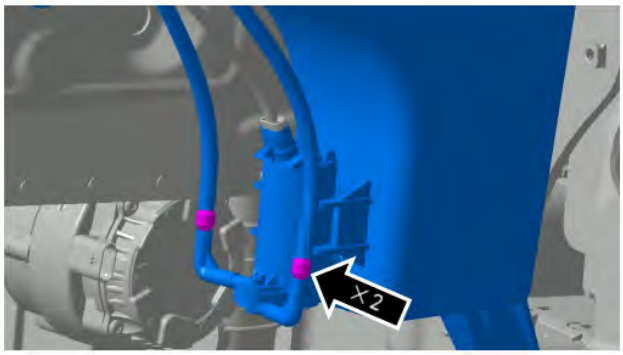
5.2.4.5 Removal and installation of washer pump

Removal

1. Disconnect the negative battery cable.Refer to: Disconnect the negative terminal of the battery.
2. Remove the front bumper assembly.Refer to: Front bumper system .
3. Remove the headlight assembly.Refer to: Front combination light.
4. Remove the engine compartment covering parts.Refer to: Engine compartment cover plate.
5. Disconnect the washer pump harness plug.



6. Disconnect the washer pump harness plug. Disconnect the two washer hoses at the two two-way joints shown in the figure and remove the washer pump.



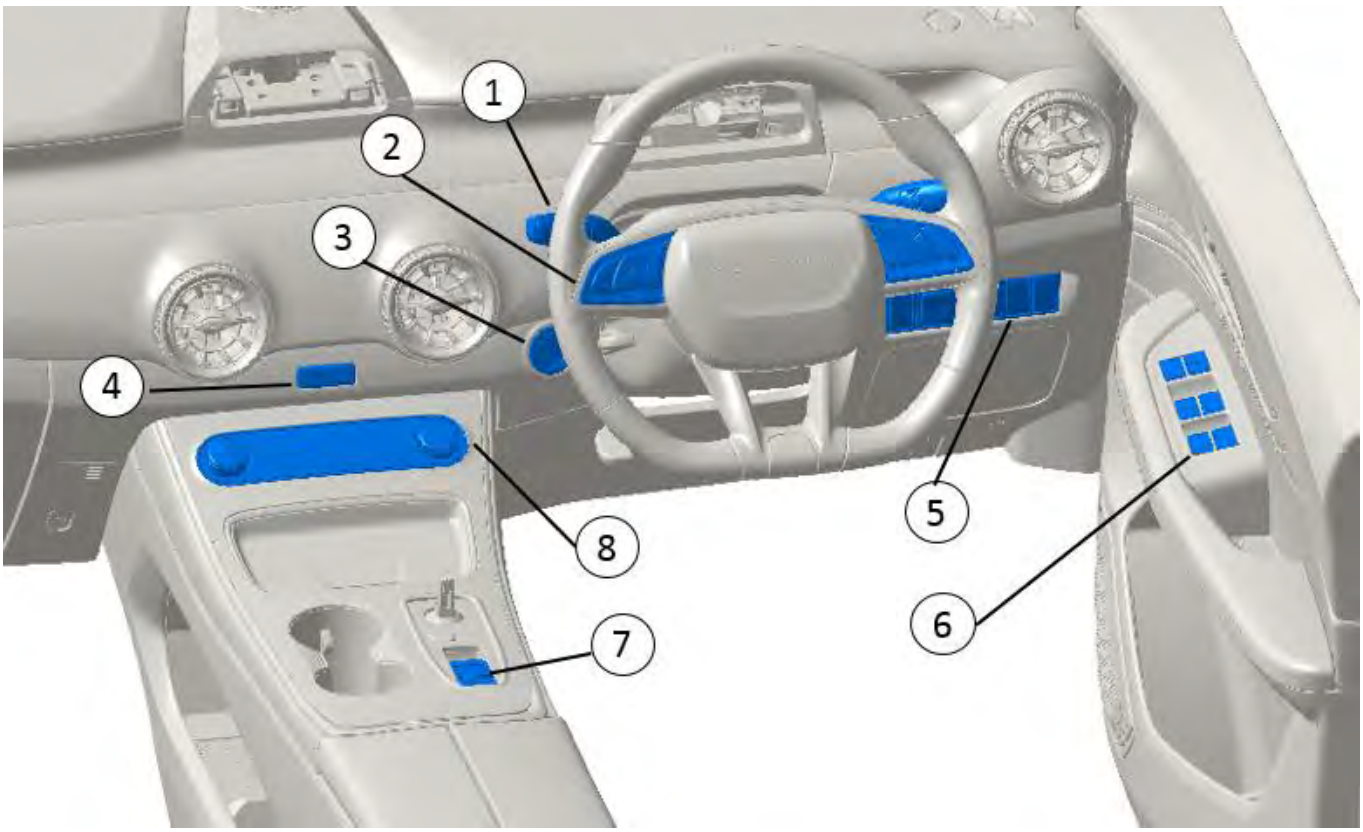
Installation

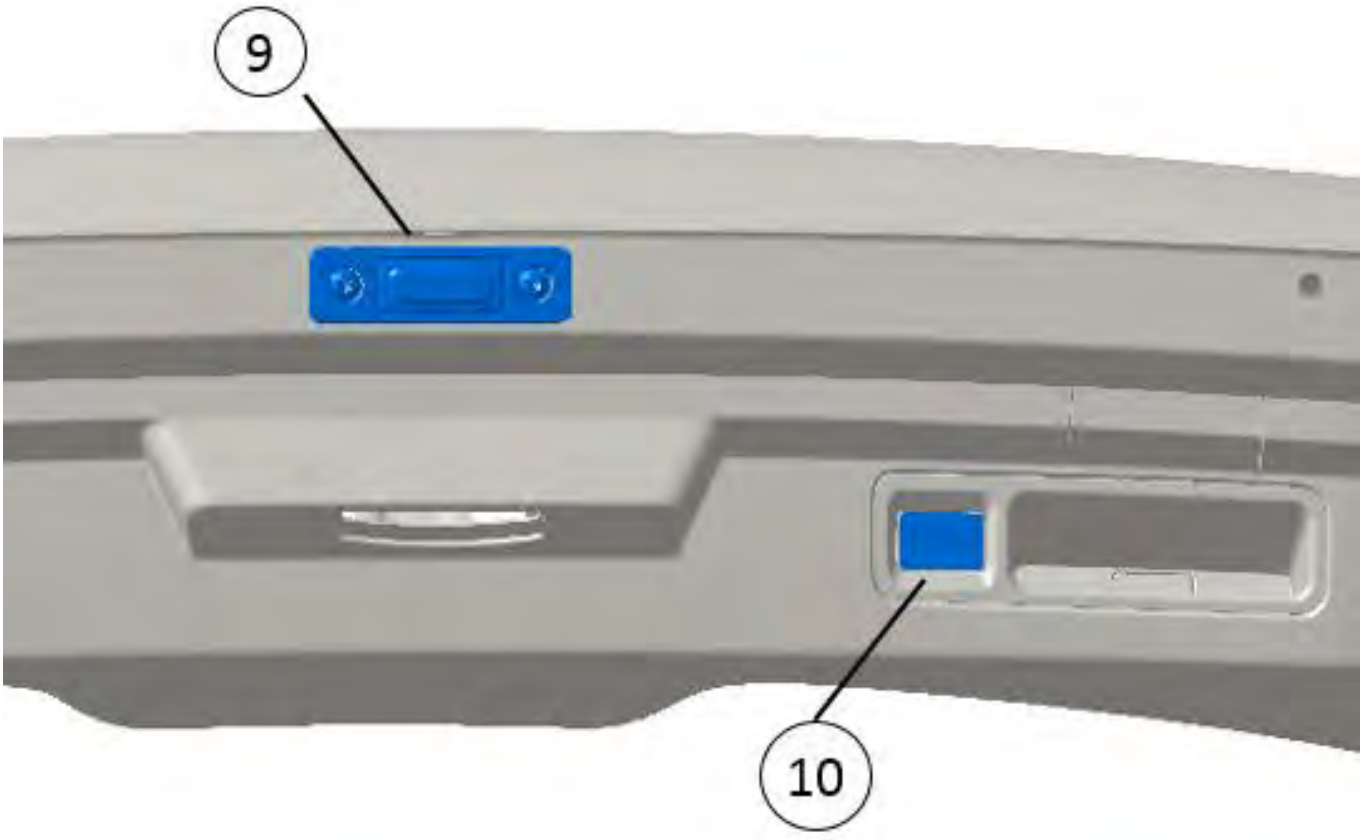
1. The installation order is reverse to the removal order.

5.3 Control switch

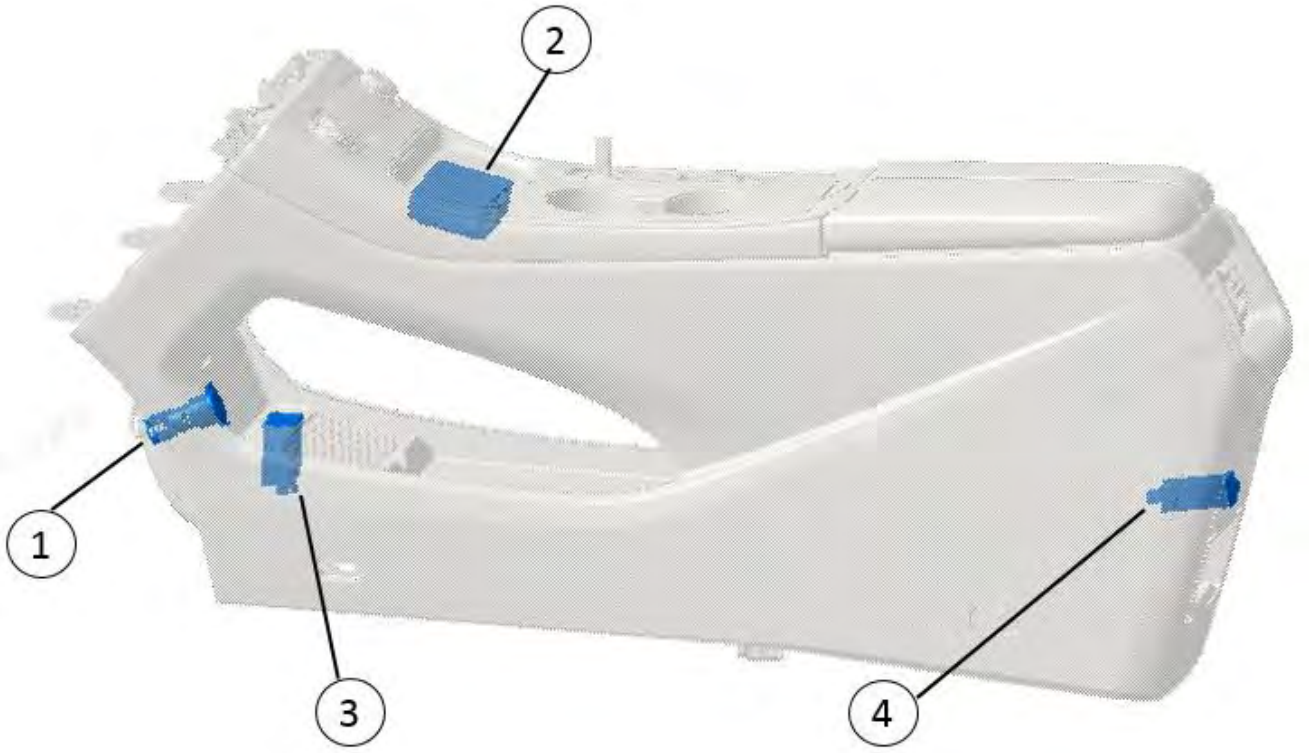
5.3.1 Instructions and operations

5.3.1.1 Component Locating Diagram





Item	Description
1	Multi-function switch assembly
2	Multi-function steering wheel switch assembly
3	One-button start switch
4	Hazard warning light assembly
5	Panel switch component
6	APB switch assembly
7	A/C touch switch assembly
8	Window regulator switch assembly
9	Boot lid microswitch
10	Power boot lid closing switch



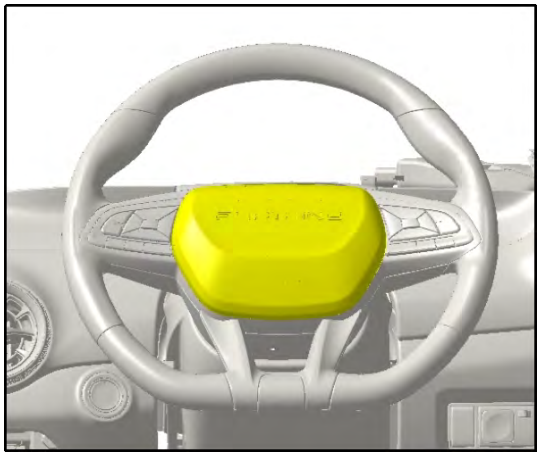
Item	Description
1	12V Power Supply Interface
2	Wireless charging assembly
3	Type-C power supply interface
4	USB power supply interface

5.3.2 Removal and installation

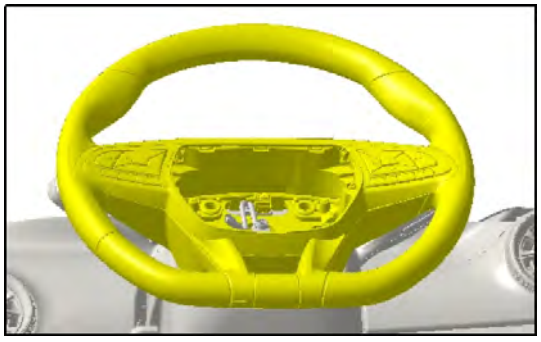
5.3.2.1 Multi-function switch

Removal

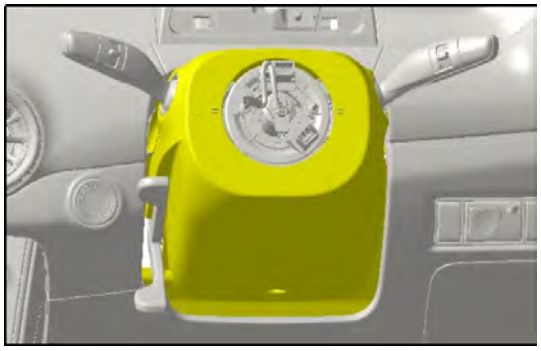
1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.
2. Remove the airbag. Refer to: Removal and installation of SRS.



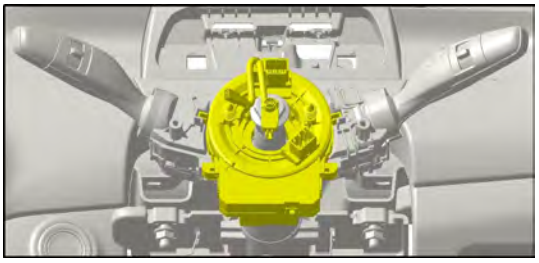
3. Remove the steering wheel assembly. Refer to: Removal and installation of steering wheel.



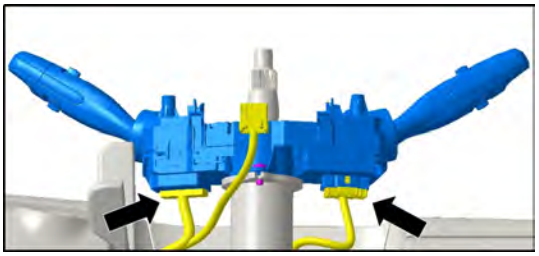
4. Remove the steering shield. Refer to: Removal and installation of the dashboard.



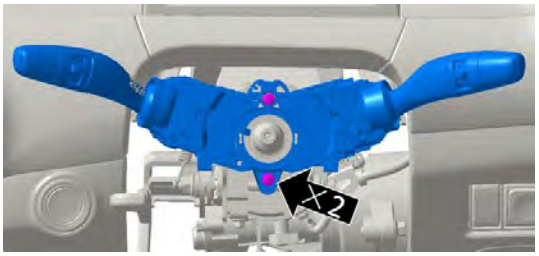
5. Remove the spiral cable assembly. Refer to: Removal and installation of spiral cable.



6. Disconnect the harness connector connected to the multi-function switch.



7. Remove the fixing screws of multi-function switch with a cross-head screwdriver.



8. Remove the combination switch assembly.

Installation

1. The installation order is the reverse of the removal order.

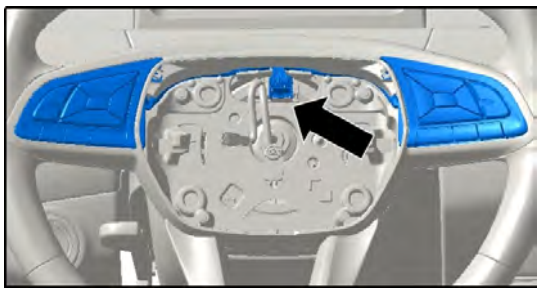
5.3.2.2 Steering wheel switch

Removal

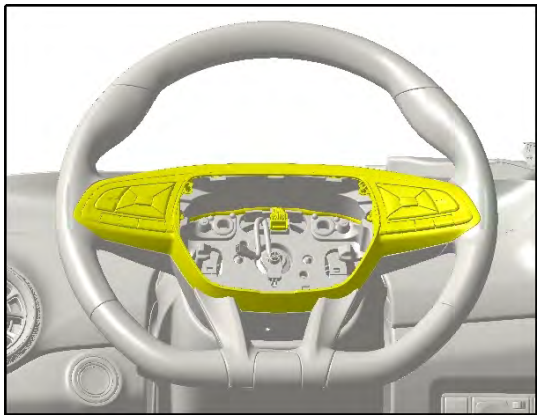
1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.
2. Remove the airbag.



3. Disconnect the wiring harness connector that connects the steering wheel switch to the spiral cable.



4. Remove the steering wheel trim strip.



5. Remove the fixing screws on the steering wheel switch with a cross-head screwdriver.



6. Remove the steering wheel switch assembly.

Installation

1. The installation order is the reverse of the removal order.

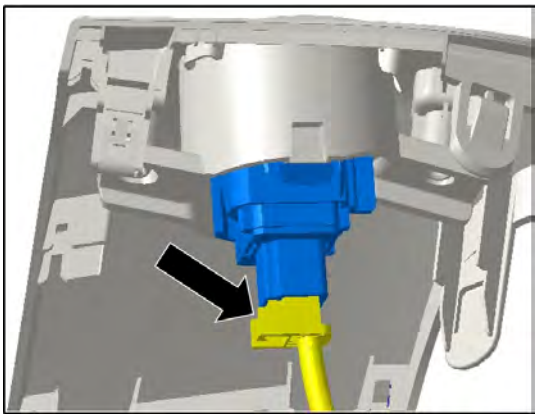
5.3.2.3 One-button start switch assembly

Removal

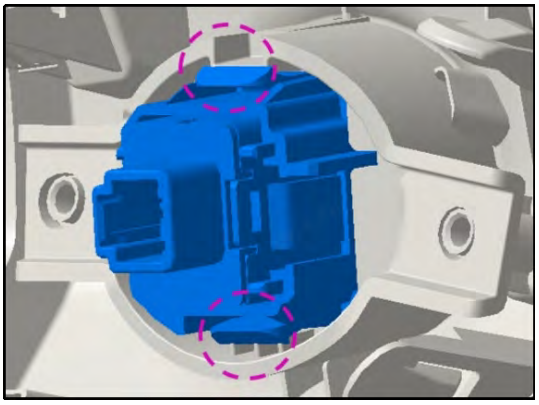
1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.
2. Remove the middle lower trim panel body of the dashboard. Refer to: Removal and installation of the dashboard.



3. Disconnect the harness connector connected to the one-button start switch assembly.



4. Hold the clip structure on the one-button start switch assembly and push the one-button start switch assembly outward.



5. Remove the one-button start switch assembly.

Installation

1. The installation order is the reverse of the removal order.

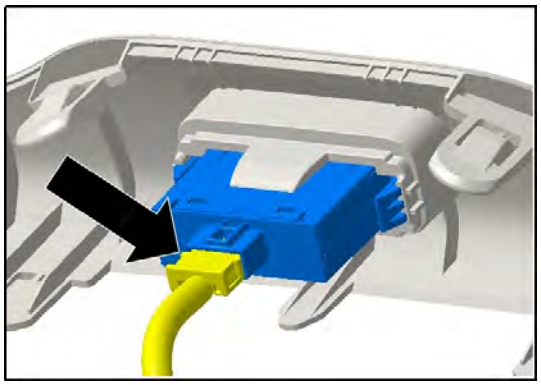
5.3.2.4 Hazard warning light switch assembly

Removal

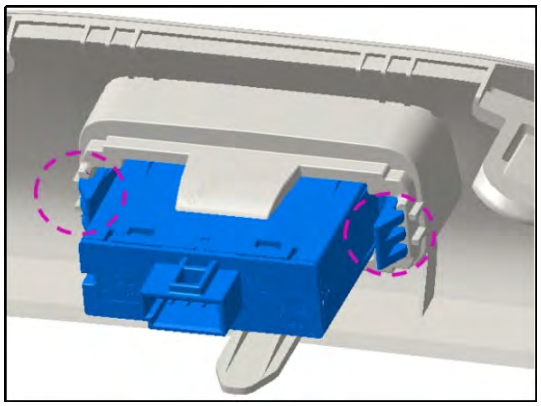
1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.
2. Remove the middle lower trim panel body of the dashboard. Refer to: Removal and installation of the dashboard.



3. Disconnect the harness connector connected to the hazard warning light.



4. Hold the clip structure on the switch on the hazard warning light and push the hazard warning light switch outward.



5. Remove the hazard warning light switch assembly.

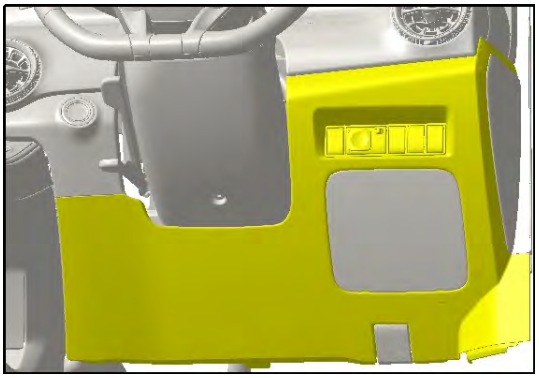
Installation

1. The installation order is the reverse of the removal order.

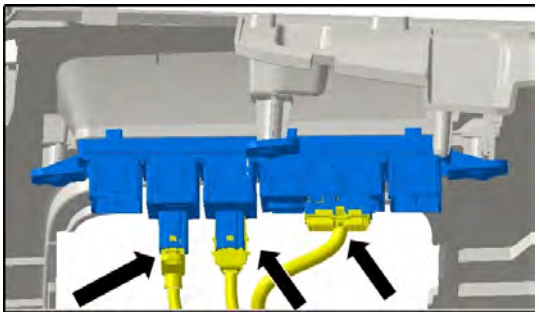
5.3.2.5 Panel switch component

Removal

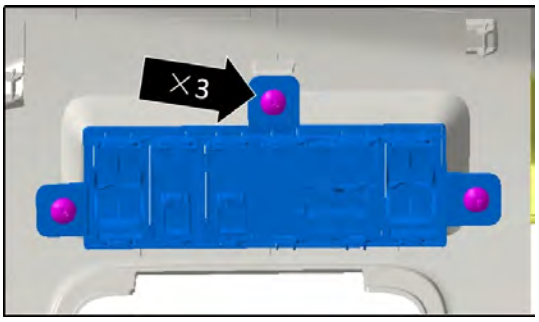
1. Remove the right lower shield body of dashboard.



2. Disconnect the harness connector that connects to the panel switch component.



3. Remove the fixing screws of panel switch component with a cross-head screwdriver.



4. Remove the panel switch component.

Installation

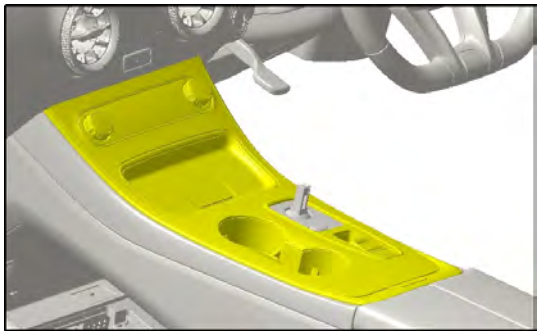
1. The installation order is the reverse of the removal order.

5.3.2.6 APB switch assembly

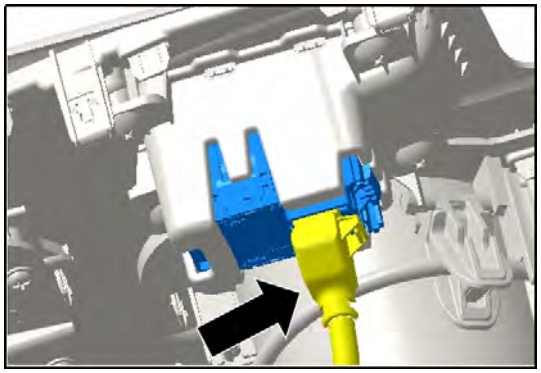
Removal

1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.

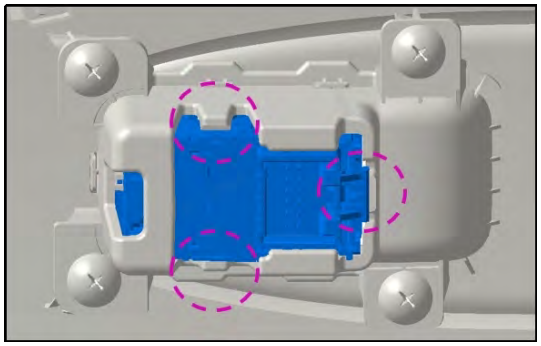
2. Remove the console upper trim panel assembly.



3. Disconnect the harness connector connected to the APB switch assembly.



4. Pry open the clip structure on the upper trim panel assembly and push out the APB switch assembly.



5. Remove the APB switch assembly.

Installation

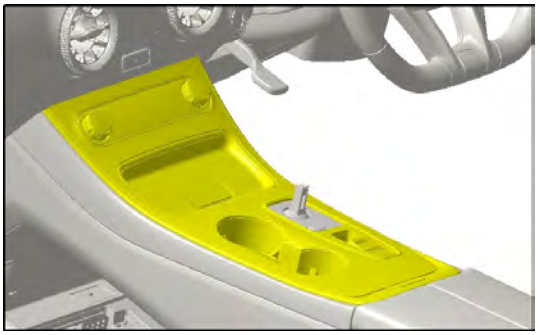
1. The installation order is the reverse of the removal order.

5.3.2.7 A/C switch assembly

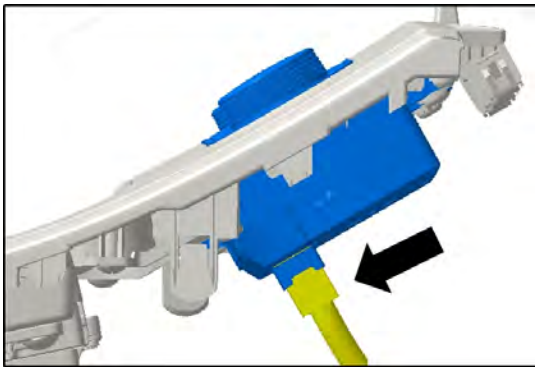
Removal

1. Confirm that the ignition switch is in the OFF position or the battery negative cable is disconnected.Refer to: Disconnect the negative terminal of the battery.

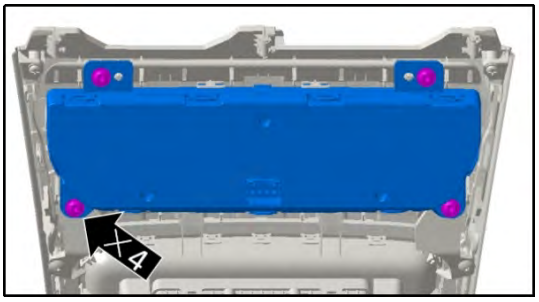
2. Remove the console upper trim panel assembly.



3. Disconnect the harness connector connected to the A/C switch assembly.



4. Remove the fixing screws of A/C switch assembly with a cross-head screwdriver.



5. Remove the A/C switch assembly.

Installation

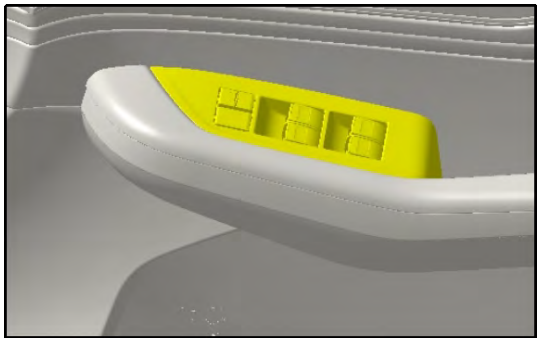
1. The installation order is the reverse of the removal order.

5.3.2.8 Driver's seat window regulator switch assembly

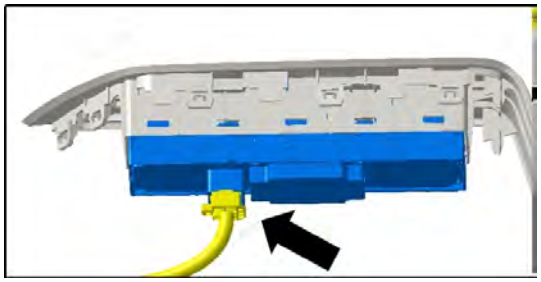
Removal

1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.

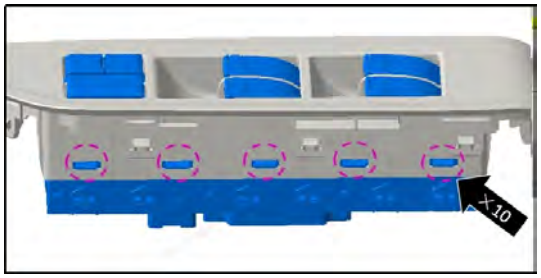
2. Remove the switch panel.



3. Disconnect the harness connector that connects to the window regulator switch assembly.



4. Pry open the clip structure of the window regulator switch assembly and push out the switch.



5. Remove the window regulator switch assembly.

Installation

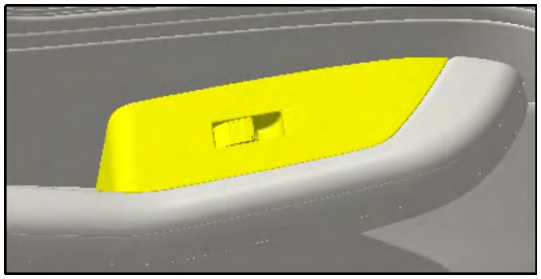
1. The installation order is the reverse of the removal order.

5.3.2.9 Front passenger and rear door window regulator switch assembly

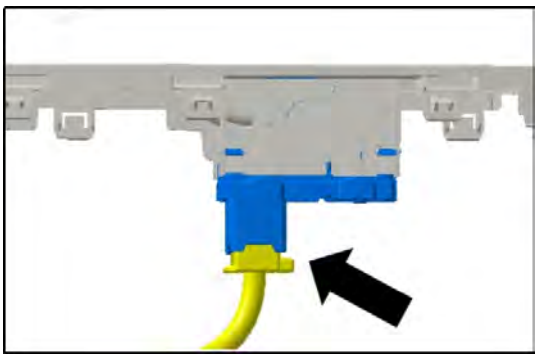
Removal

1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.

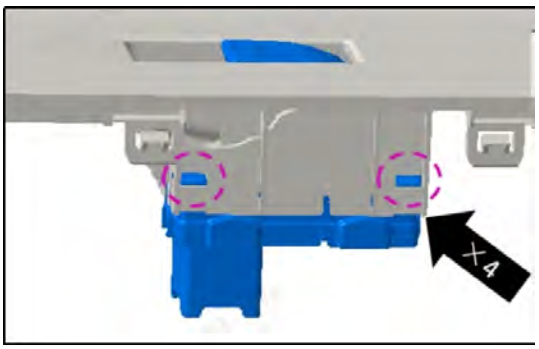
2. Remove the switch panel.



3. Disconnect the harness connector that connects to the window regulator switch assembly.



4. Pry open the clip structure of the window regulator switch assembly and push out the switch.



5. Remove the window regulator switch assembly.

Installation

1. The installation order is the reverse of the removal order.

5.3.2.10 Boot lid microswitch

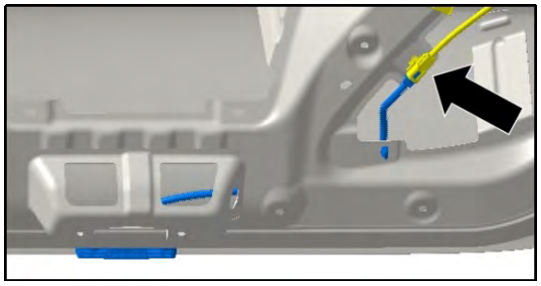
Removal

1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.

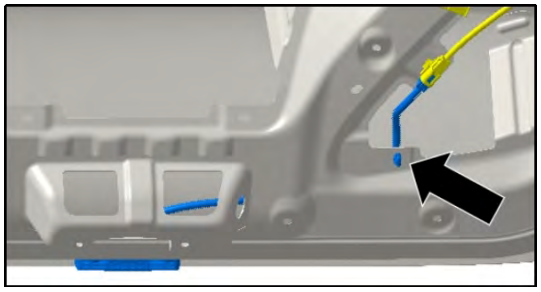
2. Remove the boot lid shield assembly.



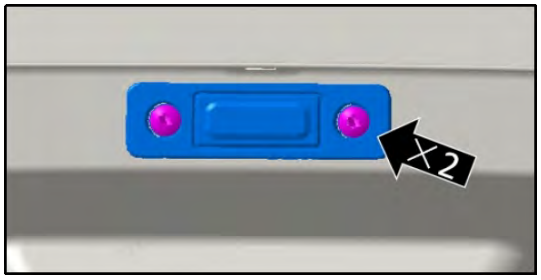
3. Disconnect the harness connector connected to the rear door microswitch.



4. Remove the rear door microswitch harness fixing clip.



5. Use a cross-head screwdriver to remove the fixing screws of the boot lid microswitch.



6. Take out the boot lid microswitch.

Installation

1. The installation order is the reverse of the removal order.

5.3.2.11 Power boot lid closing switch assembly

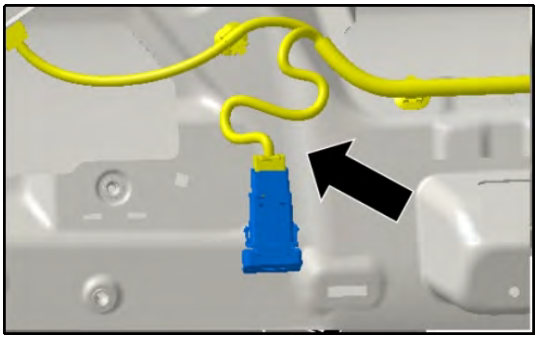
Removal

1. Disconnect the battery negative terminal.Refer to: Disconnect the negative terminal of the battery.

2. Remove the boot lid shield assembly.



3. Disconnect the harness connector connected to the electric boot lid closing switch.



4. Hold the clip structure on the power boot lid closing switch and push out the power boot lid closing switch.

5. Remove the power boot lid closing switch.

Installation

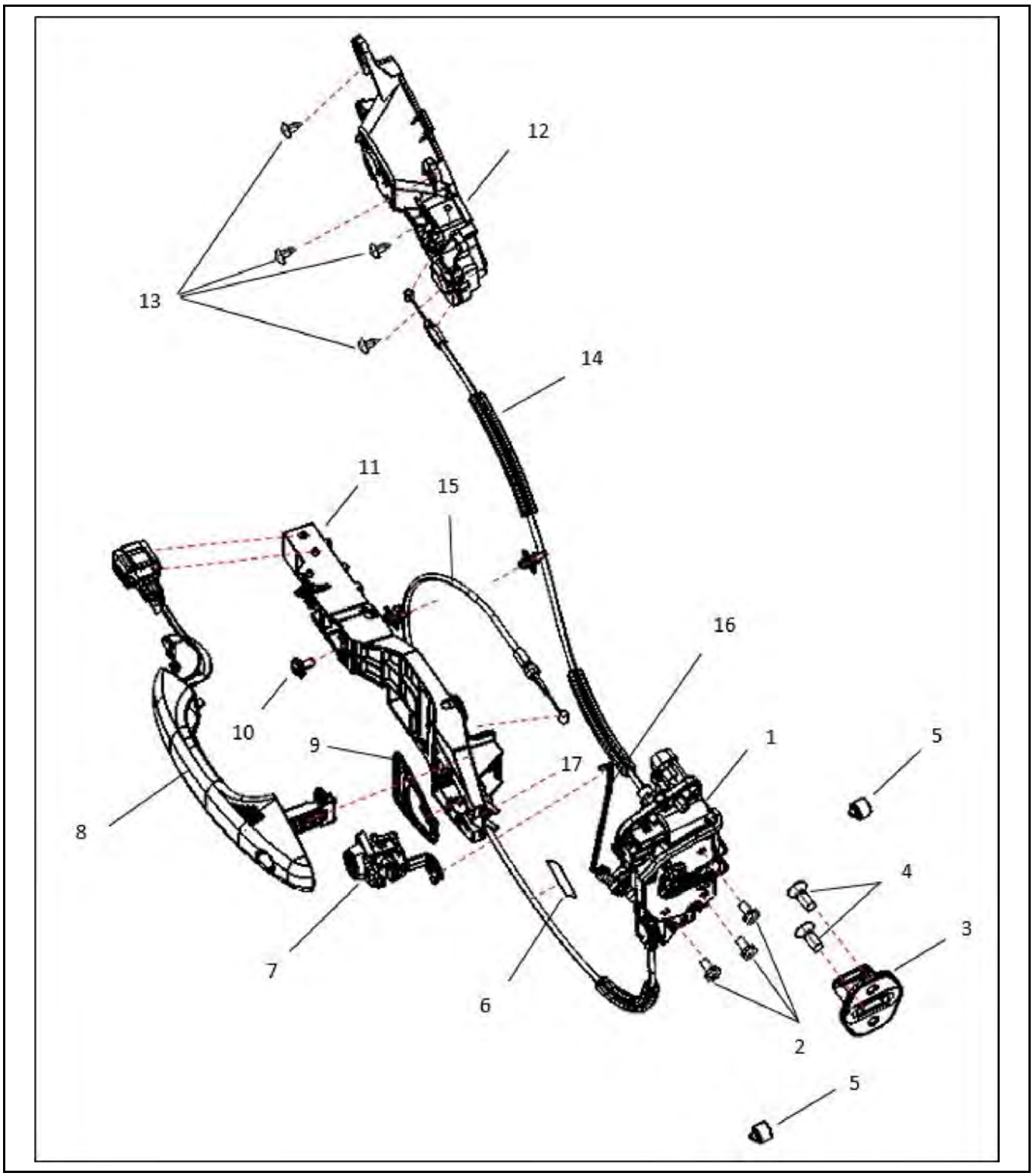
1. The installation order is the reverse of the removal order.

5.4 Door lock and handle system

5.4.1 Instructions and operations

5.4.1.1 Door lock system

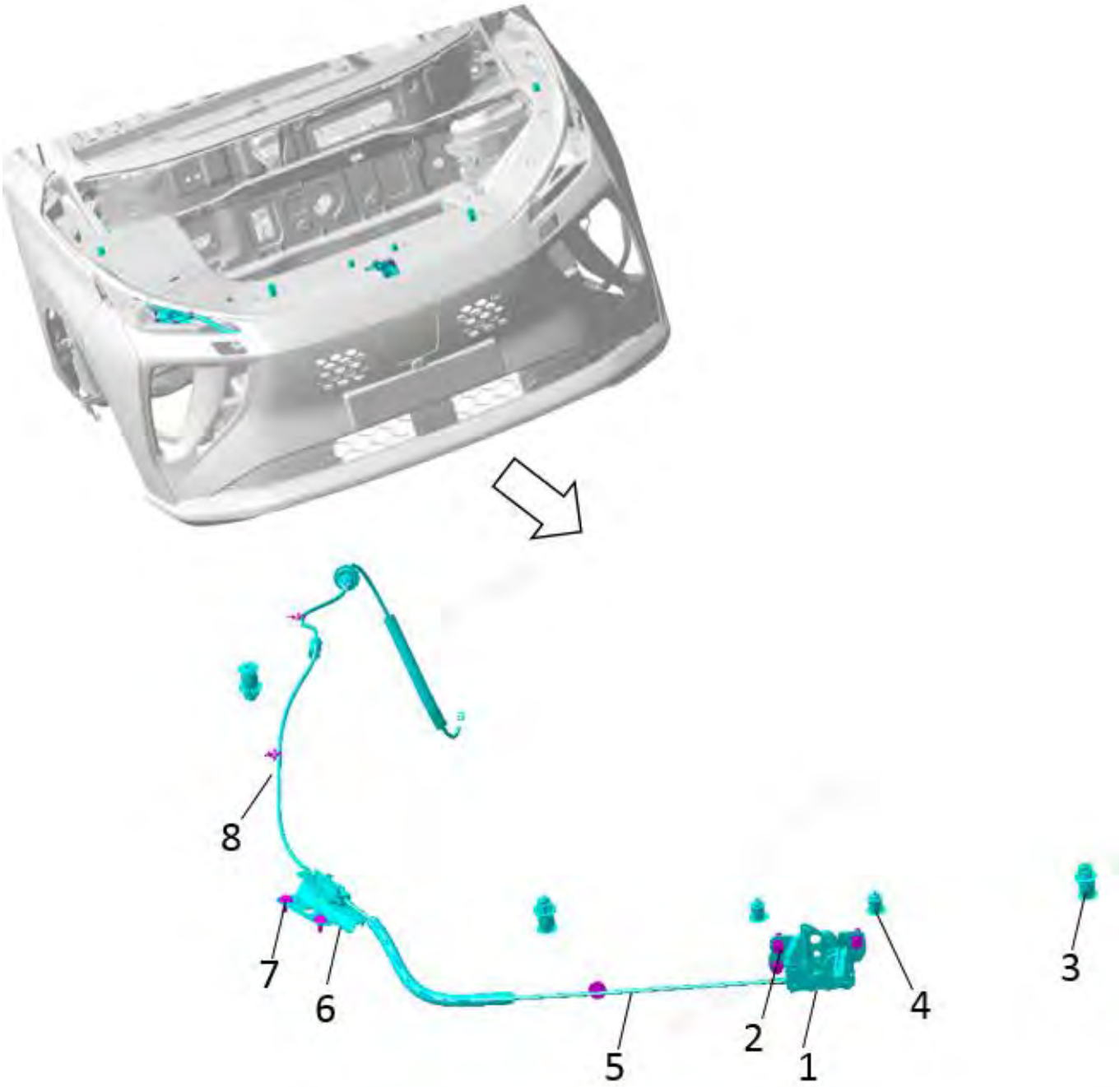
Exploded view (front door)



Item	Description	Item	Description
1.	Lock body	9.	Exterior handle mounting bolt component
2.	Lock body mounting bolt	10.	Handle base
3.	Buckle	11.	Interior handle
4.	Mounting bolt for lock catch	12.	Interior handle mounting screw
5.	Non-woven fabric of front wall (for fixing exterior release cable)	13.	Interior release cable of door lock
6.	Lock cylinder (driver side)/ fake lock cylinder (non-driver side)	14.	Exterior release cable of door lock
7.	Handle grip	15.	Lock cylinder pull rod (driver side)
8.	Sealing gasket of handle		

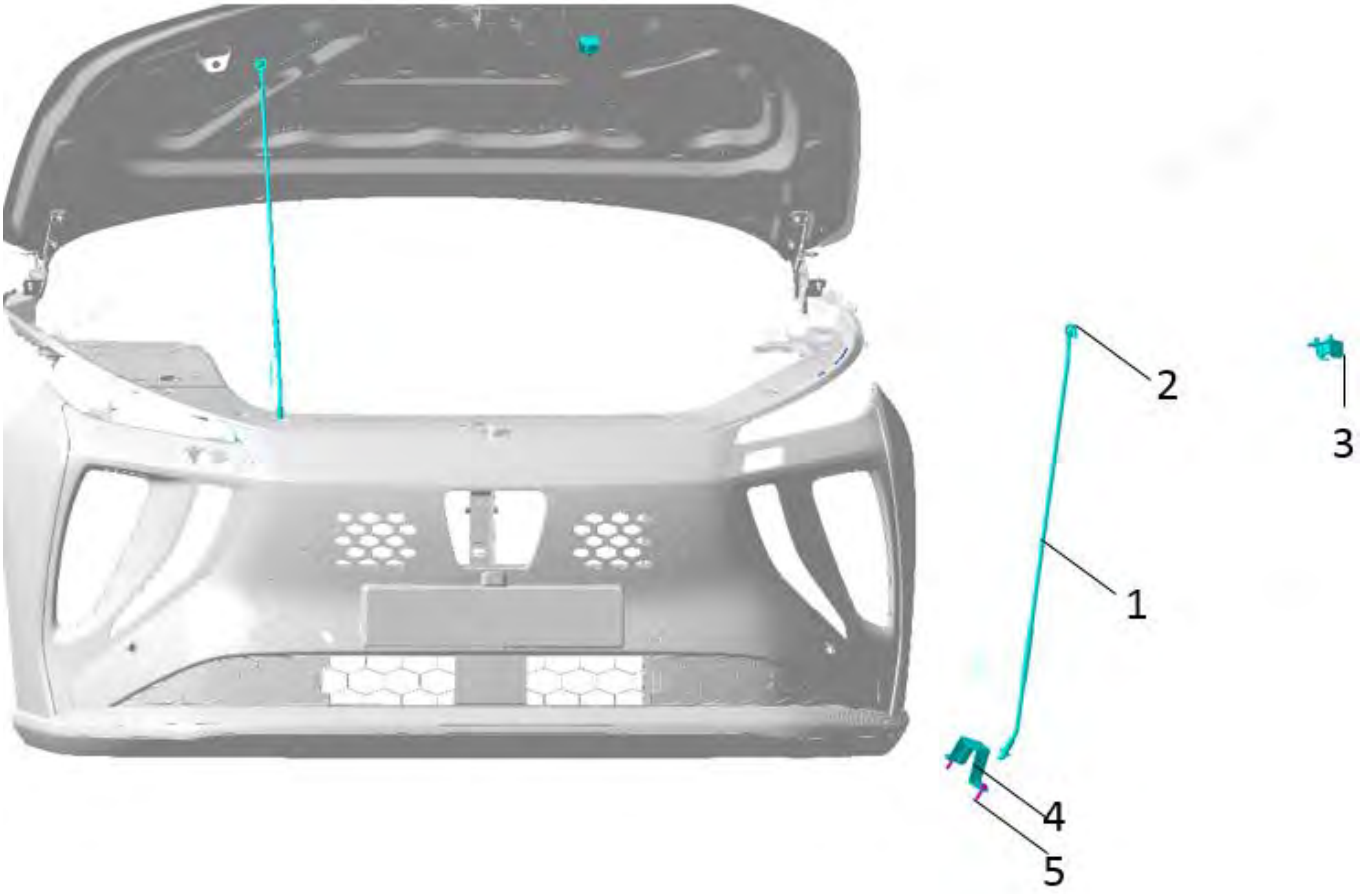
5.4.1.2 Exploded view

Engine bonnet lock system



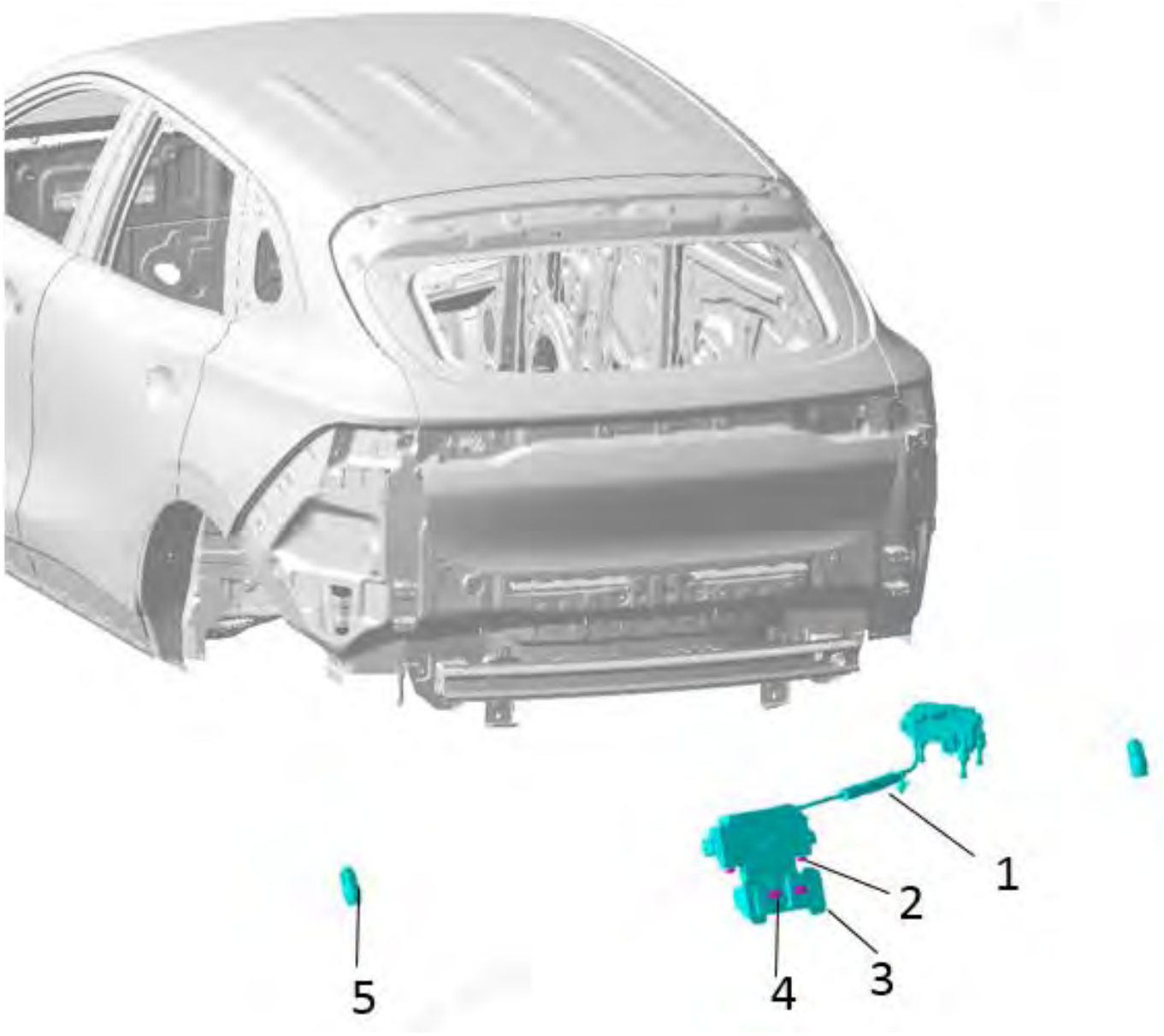
1	Engine bonnet lock body assembly	5	Bonnet release cable I
2	Bonnet lock body mounting bolt (M8)	6	Connection box bracket
3	Adjustable buffer block	7	Connection box bracket mounting bolt (M6)
4	Fixed buffer block	8	Bonnet release cable II

Engine bonnet stay bar system



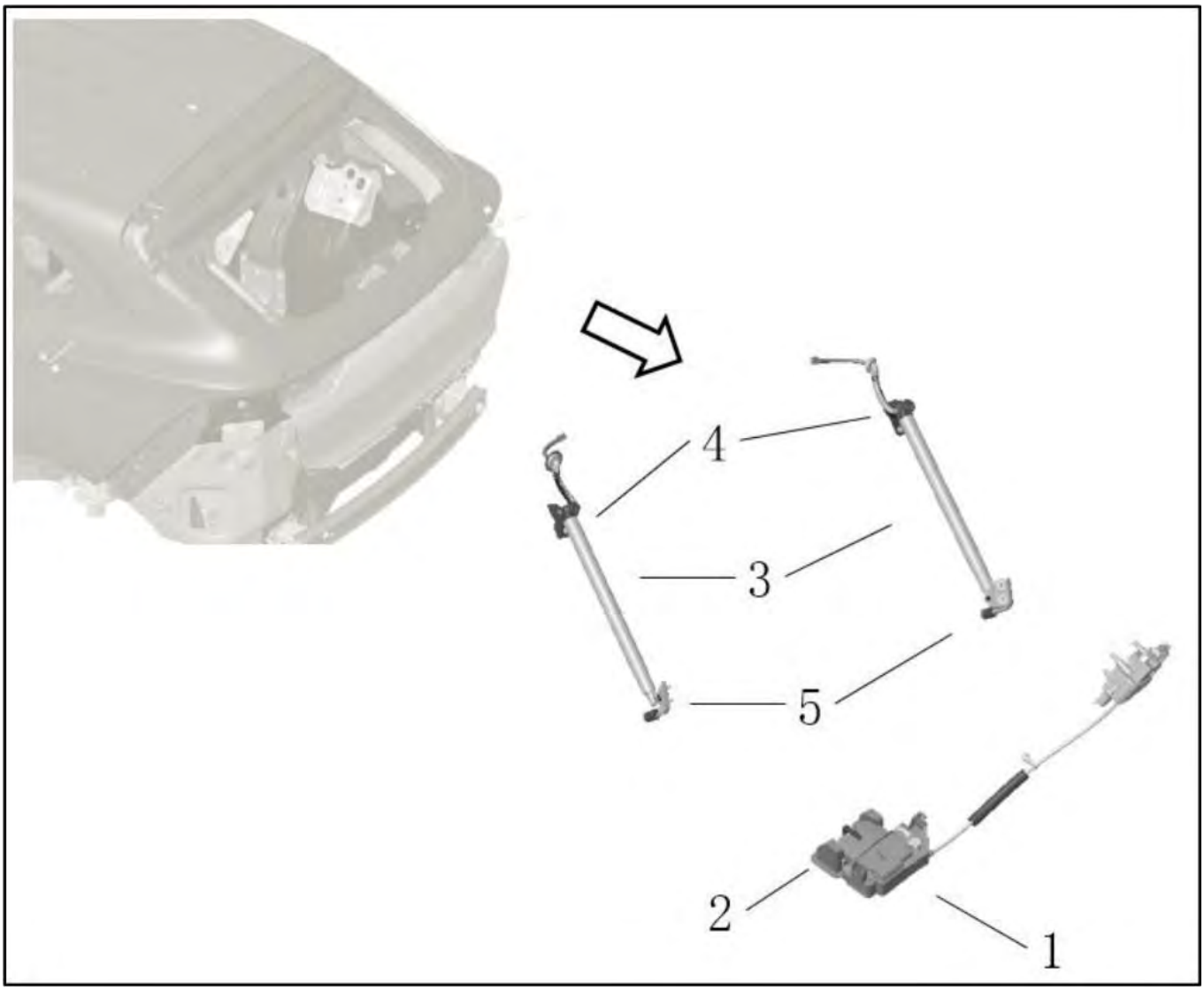
1	Engine bonnet stay bar assembly	4	Stay bar support bracket
2	Bonnet stay bar support clip	5	Hex flange bolt (M6)
3	Placement clip of bonnet stay bar		

Boot lid lock mechanism



1	Boot lid lock mechanism	4	Boot lid lock catch bolt (M6)
2	Boot lid lock body bolt (M6)	5	Boot lid buffer block
3	Boot lid lock catch		

5.4.1.3 Boot lid lock mechanism



Item	Description	Item	Description
1.	Boot lid lock mechanism	4.	Side wall bracket
2.	Boot lid lock catch	5.	Boot lid bracket
3.	boot lid strut		

5.4.1.4 Precautions

1. **Caution: Please use authentic parts and components for maintenance; otherwise, the EFI system may not operate properly.**
2. **Caution: Please follow the specified maintenance and diagnostic procedures for maintenance work.**
3. **Caution: Do not disassemble the parts and components of the EFI system during maintenance.**
4. **Caution: Develop an awareness of environmental protection and effectively handle any waste generated during maintenance.**

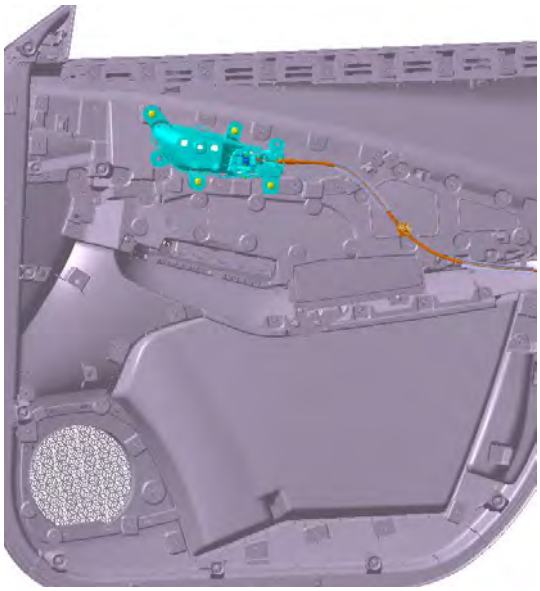
5.4.2 Removal and installation

5.4.2.1 Front door interior handle

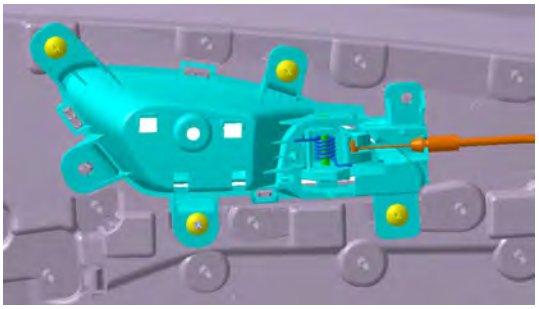
Removal

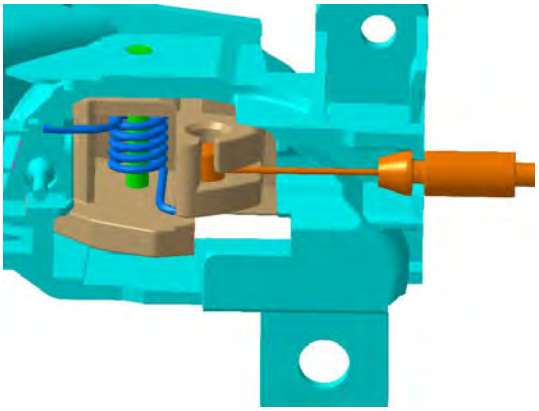
1. Remove front door shield.

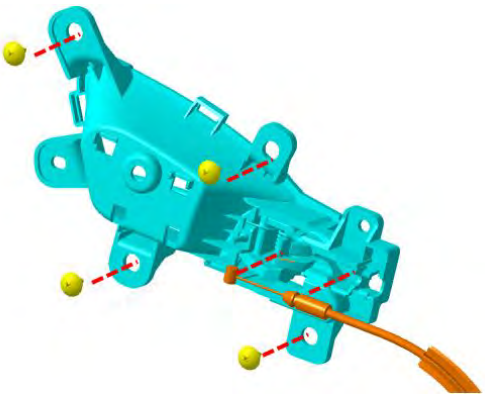




2. Pull the cable out of the slot on the inner handle base, remove the cable cylindrical head, remove the handle fastening screw and take out the inner handle.







Installation

1 Installation order is the reverse of the removal order. The following matters should be noted:

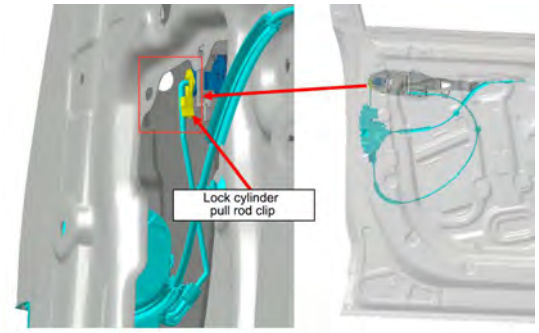
Caution: When installing the cable, carefully check if the cable groove is properly secured in place.

Caution: Check whether the door opening/closing and inner handle operation are normal.

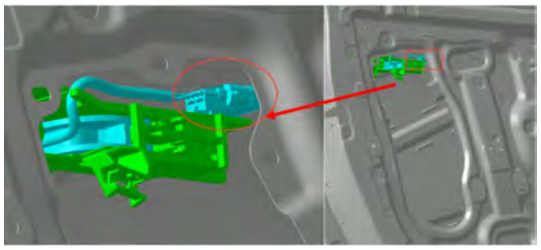
5.4.2.2 Door outer handle and lock cylinder

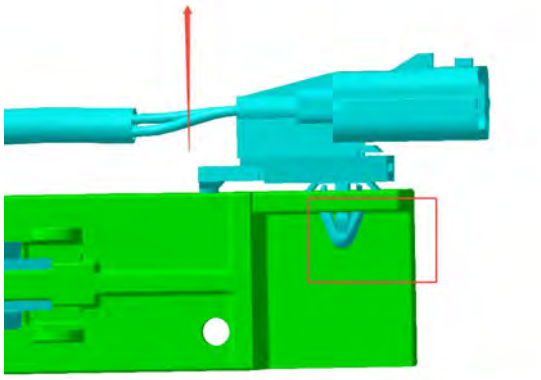
Removal

1. Close the door glass completely.
2. Remove the door shield assembly.Refer to: Door inner shield.
3. Remove the cable on the inner handle.
4. Remove the door waterproof film.
5. Remove the lock cylinder pull rod clip.

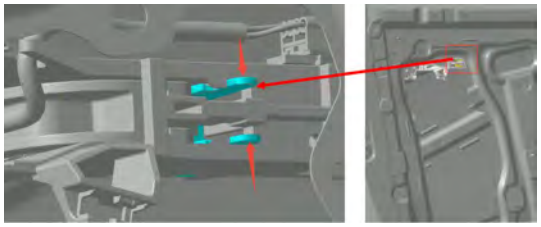


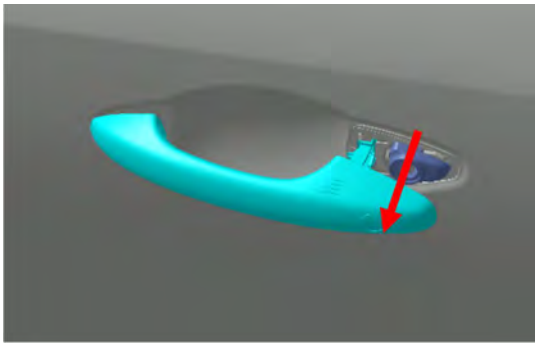
6. Use a screwdriver to lift the outer handle connector upward, remove the connector on the handle base, and disassemble its mating part harness connector.



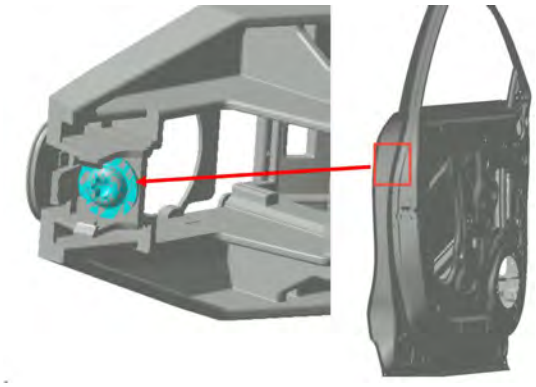


7. Press the 2 white paddles on the outer handle base to the middle and pull it toward the rear of the car at the same time. At this time, the outer handle bounces up slightly and remove the outer handle.

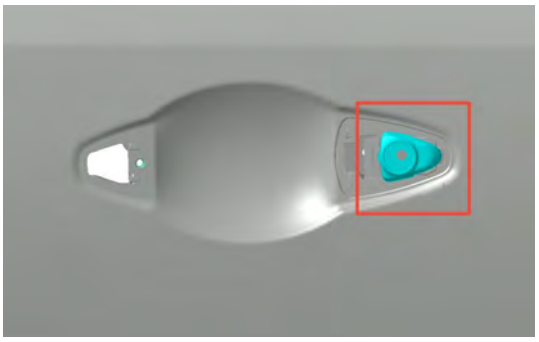




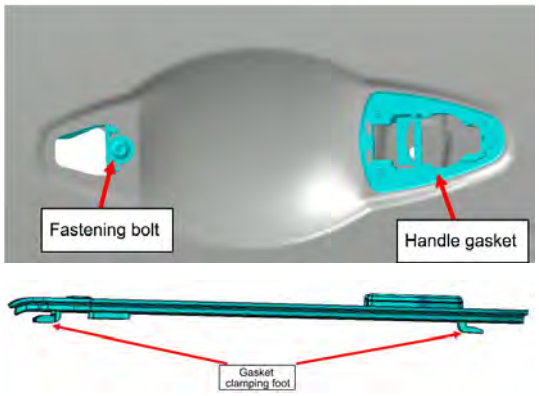
8. Loosen the lock cylinder mounting bolts (first remove the rubber plug cover at its opening position).



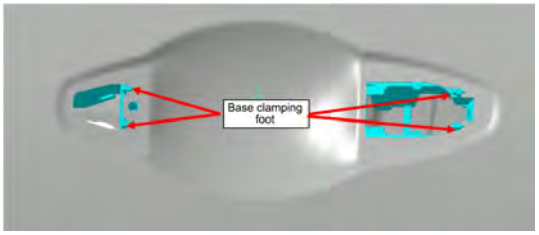
9. Take out the lock cylinder/fake lock cylinder.

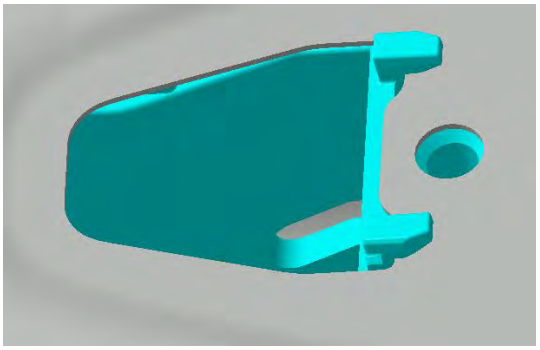


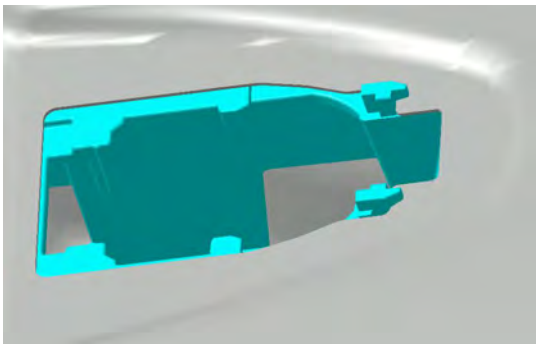
10. Remove the handle gasket (the front and rear of the handle gasket are fixed with clips), and remove the fastening bolts at the front end of the handle base.



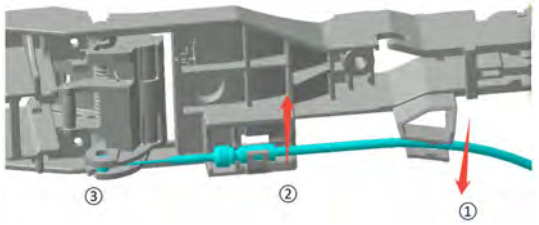
11. Push the handle base toward the front of the vehicle to disengage it from the 4 clamping feet, and remove the outer handle base.







12. Remove the door lock cable on the handle base in the order of ①②③.



Installation

1 Installation order is the reverse of the removal order. The following matters should be noted:

Caution: During disassembly and installation, do not lose the gasket, and be careful not to damage the gasket claws.

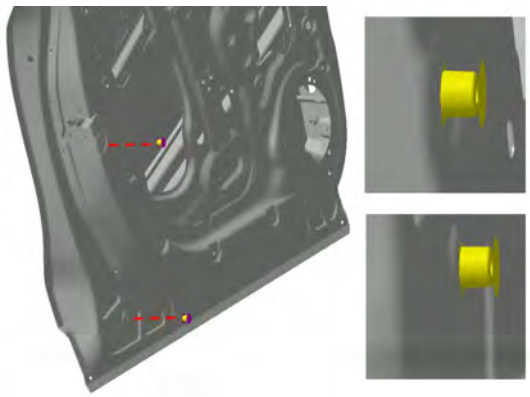
Caution: When installing the cable, carefully check if the cable groove is properly secured in place.

Caution: The base of the front door outer handle fitted to PEPS models is equipped with a harness clip. Be mindful of the harness routing during installation, and ensure the connector is securely fastened; during removal, remember to disconnect the harness connector before removing the outer handle.

5.4.2.3 Door buffer block

Removal

1. Press the outermost end of the door buffer block to remove it.



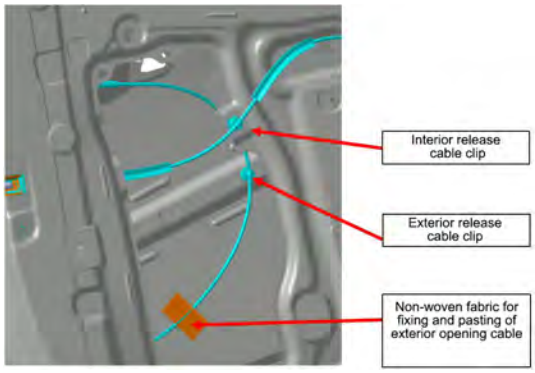
Installation

Directly press and rotate the buffer block to install it into the mounting hole.

5.4.2.4 Door lock

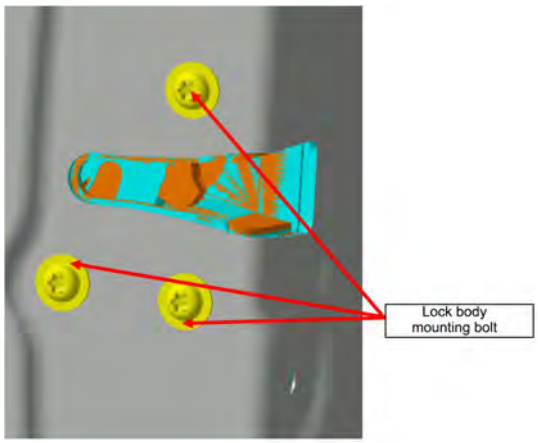
Removal

1. Remove the door shield. Refer to: Door inner shield.
2. Take down the cable on the interior handle.
3. Remove the door waterproof film.
4. Remove the rear lower guide rail of door glass. Refer to: Rear lower guide rail of door glass.
5. Remove the front door outer handle. Refer to: Outer door handle.
6. Remove the interior and exterior opening cable clips and adhesive cloth of the door lock body.



7. Loosen the door lock body mounting bolts and remove the lock body.

Torque: 5±0.5 Nm



Installation

The installation order is the reverse of the removal order. The following matters should be noted:

Caution: During removal of the front door lock body, remove the lock cylinder pull rod on the exterior handle base. The installation order is reverse to the removal order.

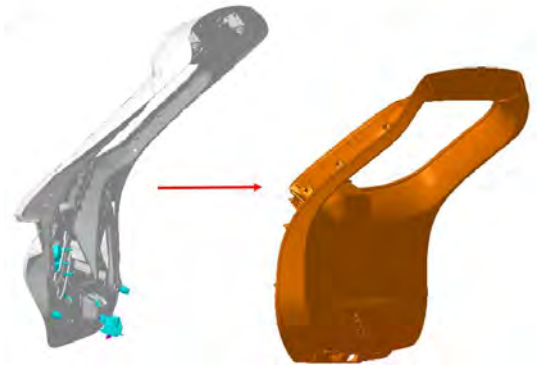
Caution: When removing the front door lock body, keep the lock cylinder pull rod directly on the lock body to avoid reverse installation of the pull rod end during assembling.

Caution: Check whether the door opening/closing and inner handle locking/unlocking operations are normal, whether the outer handle can be opened normally, and whether the lock cylinder is locked and unlocked normally.

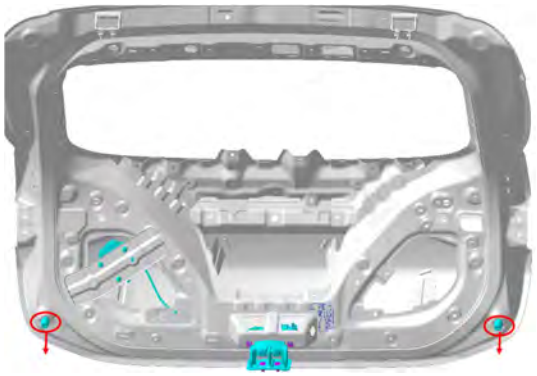
5.4.2.5 Boot lid lock body

Removal

1. Remove the boot lid inner shield.



2. Unscrew the adjustable buffer block out of the boot lid sheet metal.



3. Remove the boot lid lock body mounting bolts and self-priming motor mounting nuts (power boot lid configuration).

   Torque: 9±1 Nm



4. Unplug the lock body and suction motor connector (power boot lid configuration), and take out the lock body.



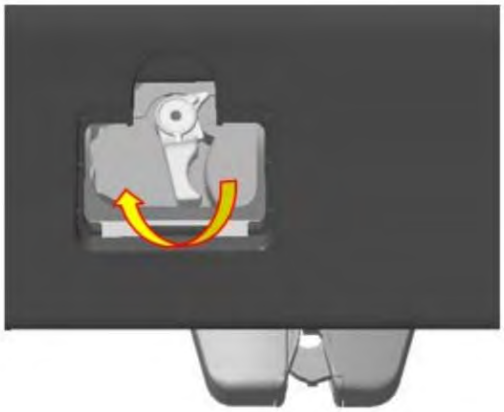
Installation

1. Install in the reverse order of disassembly and pay attention to the following matters:

Caution: Check whether the opening/closing, locking/unlocking operations of the boot lid lock are normal.

Caution: When you want to open the boot lid, besides unlocking by pressing the microswitch below the licence plate under the boot lid, there is another way to open the boot lid, which is emergency opening: there is an emergency opening trim cover on the boot lid shield. In an emergency, remove the

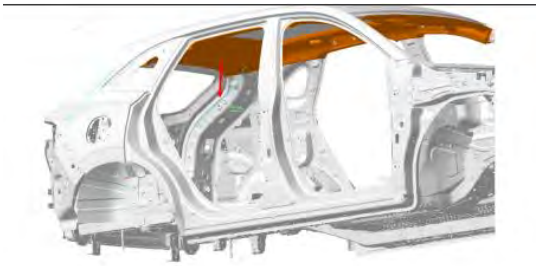
trim cover and pull the emergency opening handle upward by hand from inside the vehicle to unlock the door lock, so as to open the boot lid.

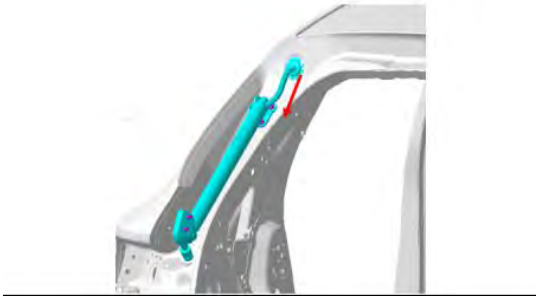


5.4.2.6 Boot lid stay bar

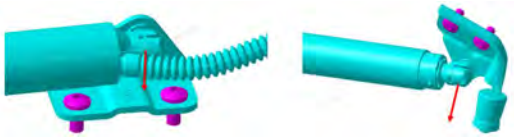
Removal

1. Remove the rear part of the roof and unplug the strut connector (for electric strut configuration).



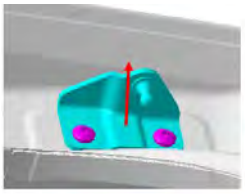


2. Use a straight screwdriver to remove the support rods from the boot lid bracket and side wall bracket ball joints in turn.



3. Remove the boot lid bracket and side wall bracket in turn.





Installation

1. Install in the reverse order of disassembly and pay attention to the following matters:

Caution: Two people are required to work together for removing and installing the boot lid strut (one for removal and installation, and one to assist in supporting the boot lid) to prevent the boot lid from falling and causing personal injury during the removal and installation process.

Caution: After completing the disassembly and assembly, check whether the strut opens and closes properly.

5.5 Glass system

5.5.1 Instructions and operations

5.5.1.1 Precautions

Adhesive and primer handling

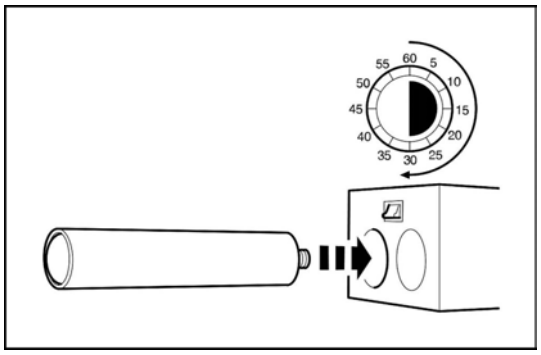
1. **Caution:** Do not use adhesive beyond its expiration date. The shelf life of such products is within six months from the date of production. The deadline or the production date printed on the box shall be strictly followed.
2. **Caution:** Store primers and adhesives in a cool, dry place. Ideally, keep them in a refrigerator.
3. **Caution:** Only open the seal of the primer and adhesive when ready to use. Discard any leftovers.
4. **Caution:** Shake the primer container thoroughly before use to ensure the primer is well mixed. Do not use if any foreign matter or floating particles are found.
5. **Caution:** Wipe off the primer or adhesive adhering to the skin with petrol or similar articles and clean the skin with soap.
6. **Caution:** The precautions listed in the operation manual shall always be followed in mind when using primer and adhesive.

5.5.2 Removal and installation

5.5.2.1 Rear side window

Removal

1. Remove the cap of glass glue DA533, and heat the glass glue DA533 for at least 30min.



2. Power off the vehicle and disconnect the battery negative cable.Refer to: Disconnect the negative terminal of the battery.

3. Remove the upper interior trim panels of D pillars on both sides.

4. Cut the glass adhesive around the rear side window with a thin steel wire

   General tool: glass cutting wire



5. Remove the rear side window glass from the side window frame.



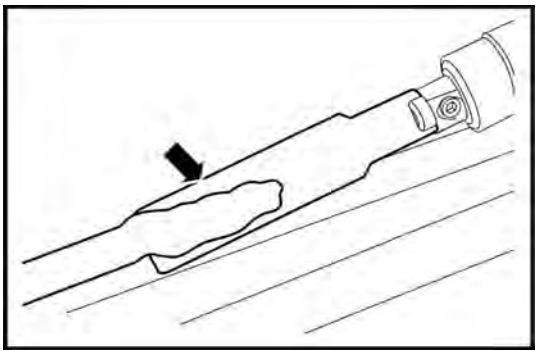
Installation

Caution: Leave 1 mm of adhesive at the edge.

Caution: Ensure that the surface to be bonded is clean and free of foreign objects.

1. Remove glass adhesives from the rear windscreen and window frame.

   General tool: knife



   Caution: It is very important to ensure that the PU adhesive is cured and all bonding surfaces must be kept dry.

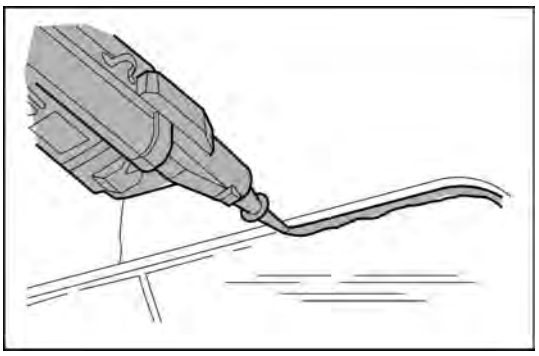
2. Deliver hot air (25°C) to the edges of the windscreen and the glass bonding joints with a heat gun, to remove all moisture.

3. Prepare glass, rear windscreen edges, and trimmed PU adhesive according to the instructions provided in the adhesive kit.

   Caution: Discard the first 100 mm of PU adhesive because the service life of this part may be short.

   Caution: To avoid water leakage, any breakage must be covered with 20 mm of adhesive.

4. Apply a continuous thin layer of PU adhesive to the edges of the rear windscreen with a mixing/spraying gun.



5. Press the glass evenly and tightly into place, pressing it on the glass surface. It is not allowed to press the bright trim strip.



Caution: During the curing process of the PU adhesive, the door windows must be open, to avoid pressure generated from opening and closing of doors.

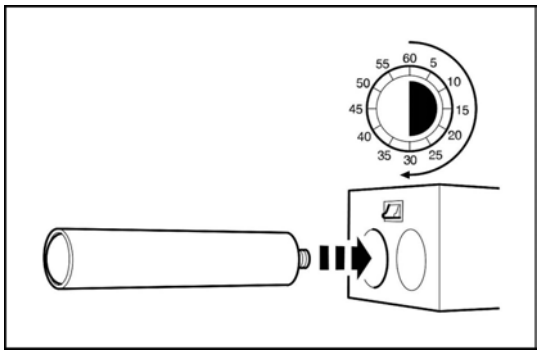
6. If the surrounding temperature is less than 10°C, deliver hot air (25°C) for 15 min (inside or outside the vehicle) continuously with a heat gun.

   General tool: heat gun

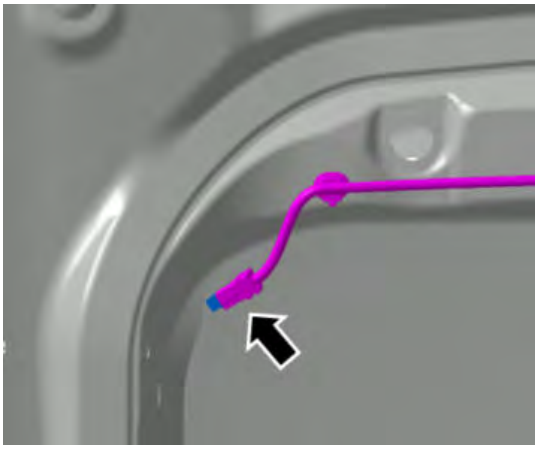
5.5.2.2 Rear windscreen

Removal

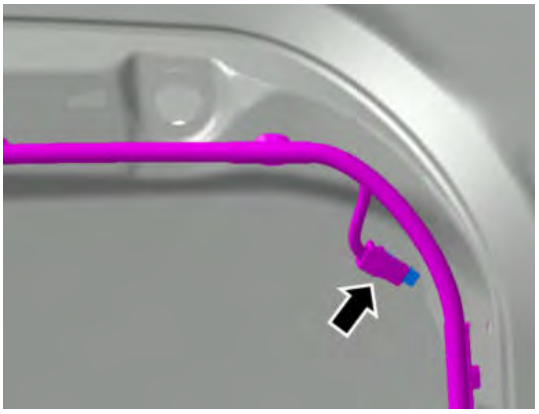
1. Remove the cap of glass glue DA533, and heat the glass glue DA533 for at least 30min.



2. Power off the vehicle and disconnect the battery negative cable.Refer to: Disconnect the negative terminal of the battery.
3. Remove the interior trim panels of the rear wall.
4. Remove the rear spoiler assembly. Refer to: Rear spoiler assembly.
5. Remove the C-pillar upper interior trim panels on both sides. Refer to: C-pillar upper interior trim panel.
6. Disconnect the upper left rear windscreen harness connector.



7. Disconnect the upper right rear windscreen harness connector.



Caution: Wrap wood blocks on both ends of the fine wire and have two persons work together to facilitate removal. Place a plastic gasket on the dashboard during operation to protect it from being scratched.

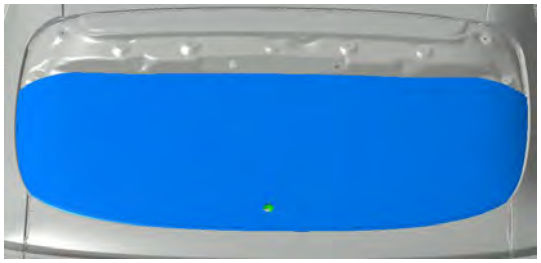
8. Cut the windscreen adhesive around the rear windscreen with fine wire.

   General tool: glass cutting wire



Caution: This step needs to be completed by two maintenance technicians.

9. Remove the rear windscreen from the rear windscreen window frame.



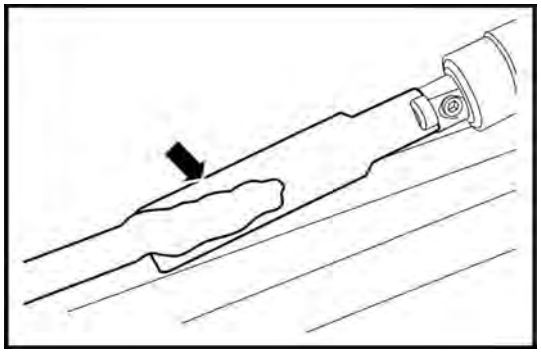
Installation

Caution: Leave 1 mm of adhesive at the edge.

Caution: Ensure that the surface to be bonded is clean and free of foreign objects.

1. Remove glass adhesives from the rear windscreen and window frame.

   General tool: knife



   Caution: It is very important to ensure that the PU adhesive is cured and all bonding surfaces must be kept dry.

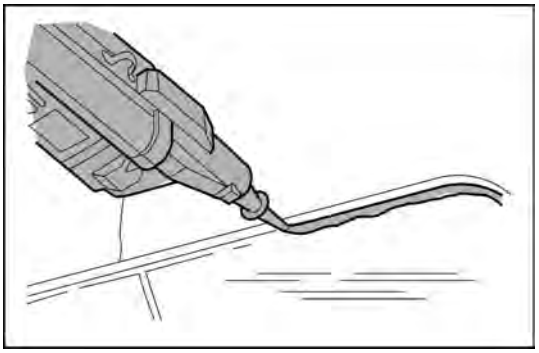
2. Deliver hot air (25°C) to the edges of the windscreen and the glass bonding joints with a heat gun, to remove all moisture.

3. Prepare glass, rear windscreen edges, and trimmed PU adhesive according to the instructions provided in the adhesive kit.

   Caution: Discard the first 100 mm of PU adhesive because the service life of this part may be short.

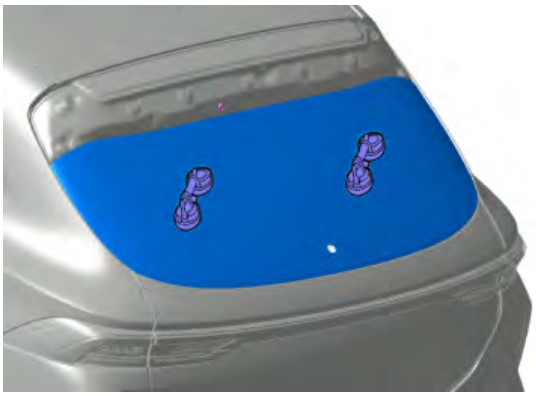
   Caution: To avoid water leakage, any breakage must be covered with 20 mm of adhesive.

4. Apply a continuous thin layer of PU adhesive to the edges of the rear windscreen with a mixing/spraying gun.



5. Use a glass sucker with the assistance of another technician.

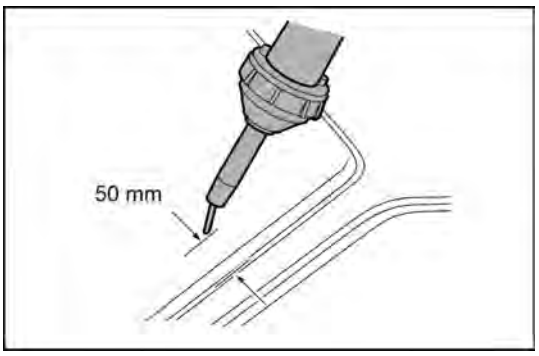
   General tool: glass sucker



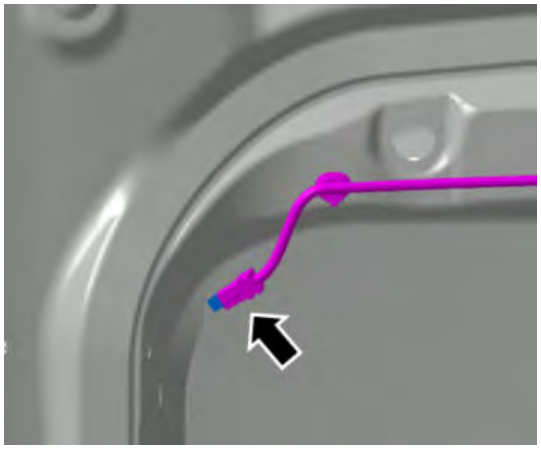
   Caution: During the curing process of the PU adhesive, the door windows must be open, to avoid pressure generated from opening and closing of doors.

6. Secure the windscreen at the correct position with suitable tape until PU adhesive cures.

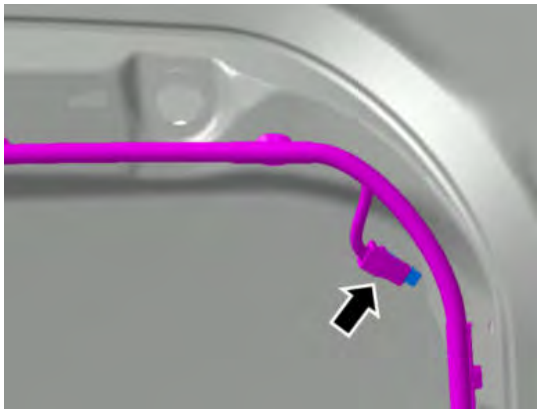
7. If the surrounding temperature is less than 10°C, deliver hot air (25°C) for 15 min (inside or outside the vehicle) continuously with a heat gun.



8. Connect the upper left rear windscreen harness connector.



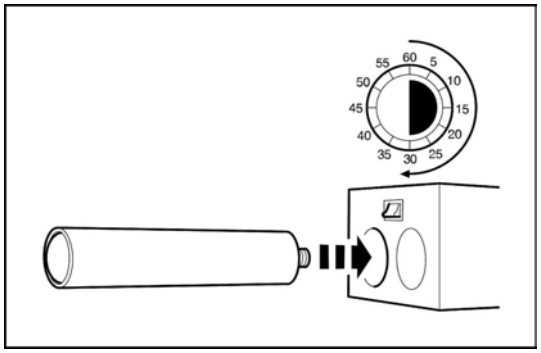
9. Connect the upper right rear windscreen harness connector.



5.5.2.3 Front windscreen

Removal

1. Remove the cap of glass glue DA533, and heat the glass glue DA533 for at least 30min.



2. Power off the vehicle and disconnect the battery negative cable.Refer to: Disconnect the negative terminal of the battery.
3. Remove the front wiper arm. Refer to: Front wiper arm.
4. Remove the front windscreen trim cover.
5. Remove the interior rearview mirror assembly-manual anti-glare (if equipped). Refer to: Interior rearview mirror assembly.
6. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.
7. Remove the light/rain sensor (if equipped).
8. Remove the front-view camera.

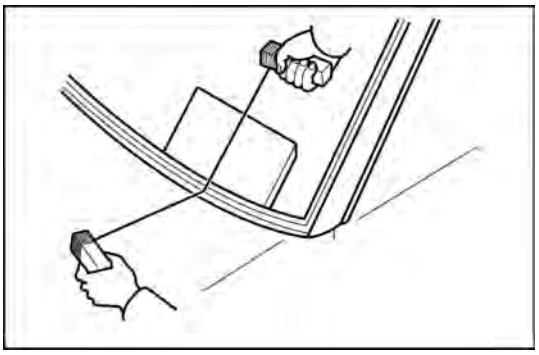
   Caution: Wrap wood blocks on both ends of the fine wire and have two persons work together to facilitate removal. Place a plastic gasket on the dashboard during operation to protect it from being scratched.

9. Cut the windscreen adhesive around the front windscreen with fine wire.

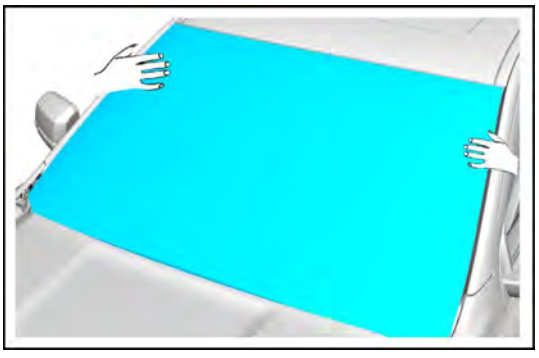
   Caution: This step needs to be completed by two maintenance technicians.

   Caution: Instrument protection measures must be taken during the cutting process to avoid scratching the instrument.

   General tool: glass cutting wire



10. Remove the front windscreen from the front windscreen frame.



Installation

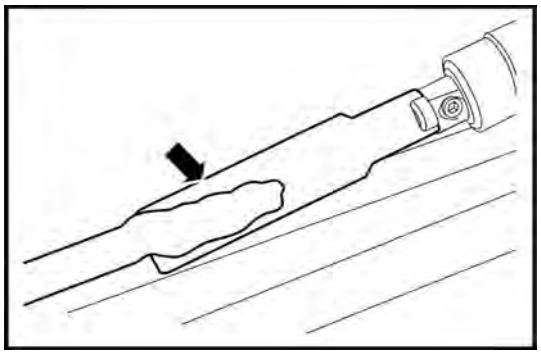
The installation order is reverse to the removal order. Pay attention to the following points

Caution: Leave 1 mm of adhesive at the edge.

Caution: Ensure that the surface to be bonded is clean and free of foreign objects.

1. Remove glass adhesives from the front windscreen and its frame.

   General tool: knife



   Caution: It is very important to ensure that the PU adhesive is cured and all bonding surfaces must be kept dry.

2. Deliver hot air (25°C) to the edges of the windscreen and the glass bonding joints with a heat gun, to remove all moisture.

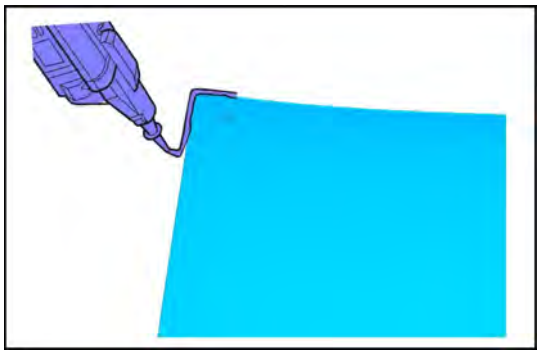
3. Prepare glass, windscreen edges, and trimmed PU adhesive according to the instructions provided in the adhesive kit.

   Caution: Discard the first 100 mm of PU adhesive because the service life of this part may be short.

   Caution: To avoid water leakage, any breakage must be covered with 20 mm of adhesive.

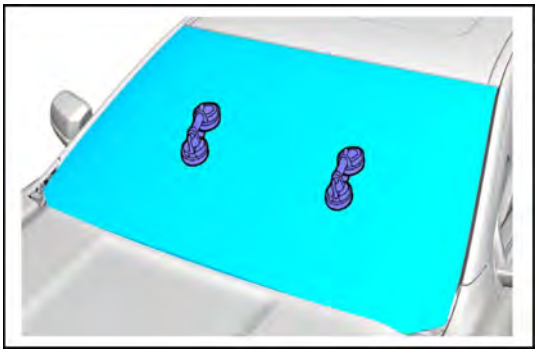
4. Using a mixing/spraying gun, apply a layer of PU adhesive evenly and continuously around the windscreen.

   General tool: mixing/spraying gun



5. With the assistance of another technician, use a glass suction cup to press the glass evenly and tightly into place.

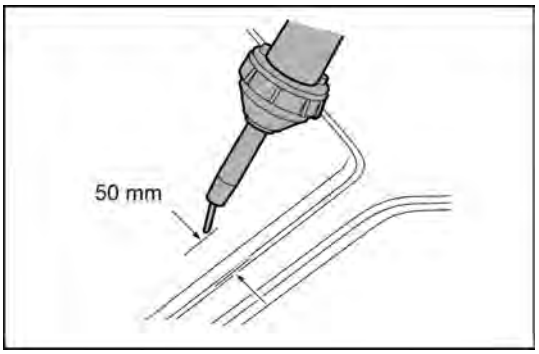
   General tool: glass sucker



   Caution: During the curing process of the PU adhesive, the door windows must be open, to avoid pressure generated from opening and closing of doors.

6. Secure the windscreen at the correct position with suitable tape until PU adhesive cures.

7. If the surrounding temperature is less than 10°C, use a heat gun to deliver hot air (25°C) for 15 min (inside or outside the vehicle) continuously.



5.6 Auxiliary dashboard

5.6.1 Diagnosis and testing

5.6.1.1 Diagnosis and testing

Electronic gear shifter module (GSM)

General equipment

Diagnostic scanner

Inspection and confirmation

1. Confirm problems that owners complain about and check accordingly.
2. Check the parts and components thoroughly before repairing or replacing them.
3. Before the next check, solve the identified problem first.
4. The gear shifter handball and panel are exterior parts, please take care to avoid scratches.

5.6.1.2 Diagnosis and testing

Appearance Checklist

Mechanical	Electrical
– Gear lever	– Fuse – Electronic connector – Harness

5.6.1.3 Troubleshooting and Maintenance

Fault Symptom and Troubleshooting Method

Fault Symptom	Possible causes	Maintenance Measures
Unable to shift out of P gear	1. Loss of electronic gear shifter module body assembly signal 2. Loss of brake signal	Do not depress the brake pedal, push the gear shifter handball and observe the instrument cluster to see if there is a prompt of "Please depress the brake pedal for gear shifting": (1) If there is no prompt, it may be that the electronic gear selector module body assembly does not work normally. Please check whether the relevant harness lines and fuses are normal. (2) If there is a message "Please depress the brake pedal for gear shifting" on the instrument, please depress the brake pedal and then push the gear shifter handball to shift gears. If there is a message of "Please depress the brake pedal for gear shifting" again, it may be that the brake signal is lost. Please check the brake signal.
Gear indicator light (yellow light) on the panel does not illuminate	1. Poor contact of connectors on the panel 2. Component fault of indicator light module inside the panel	1. Pull out the panel harness connector for inspection and then reinstall it 2. Replace the electronic gear shifter module body assembly with a new one
Panel gear backlight (red light) does not illuminate	1. Poor contact of connectors on the panel 2. Component fault of indicator light module inside the panel	1. Pull out the panel harness connector for inspection and then reinstall it 2. Replace the electronic gear shifter module body assembly with a new one
The gear lever is jammed and does not return after shifting.	Electronic gear shifter module internal fault	Replace the electronic gear shifter module body assembly with a new one
The P gear button is stuck and does not return after being pressed	P gear button internal fault	Remove the panel to check the P gear button or replace with a new electronic gear shifter module body assembly

5.6.1.4 DTC List

The diagnosis in this manual requires technicians to have a certain skill level and diagnostic practical experience.

Refer to: Diagnostic methods.

S/N	DTC	Fault Name	Possible cause	Repairrecommendatio-ns
1	U007300	CAN bus off	CAN bus fault	Check CAN bus
2	U012200	Lost communication with VCM (vehicle control module)	VCM offline	Check VCM

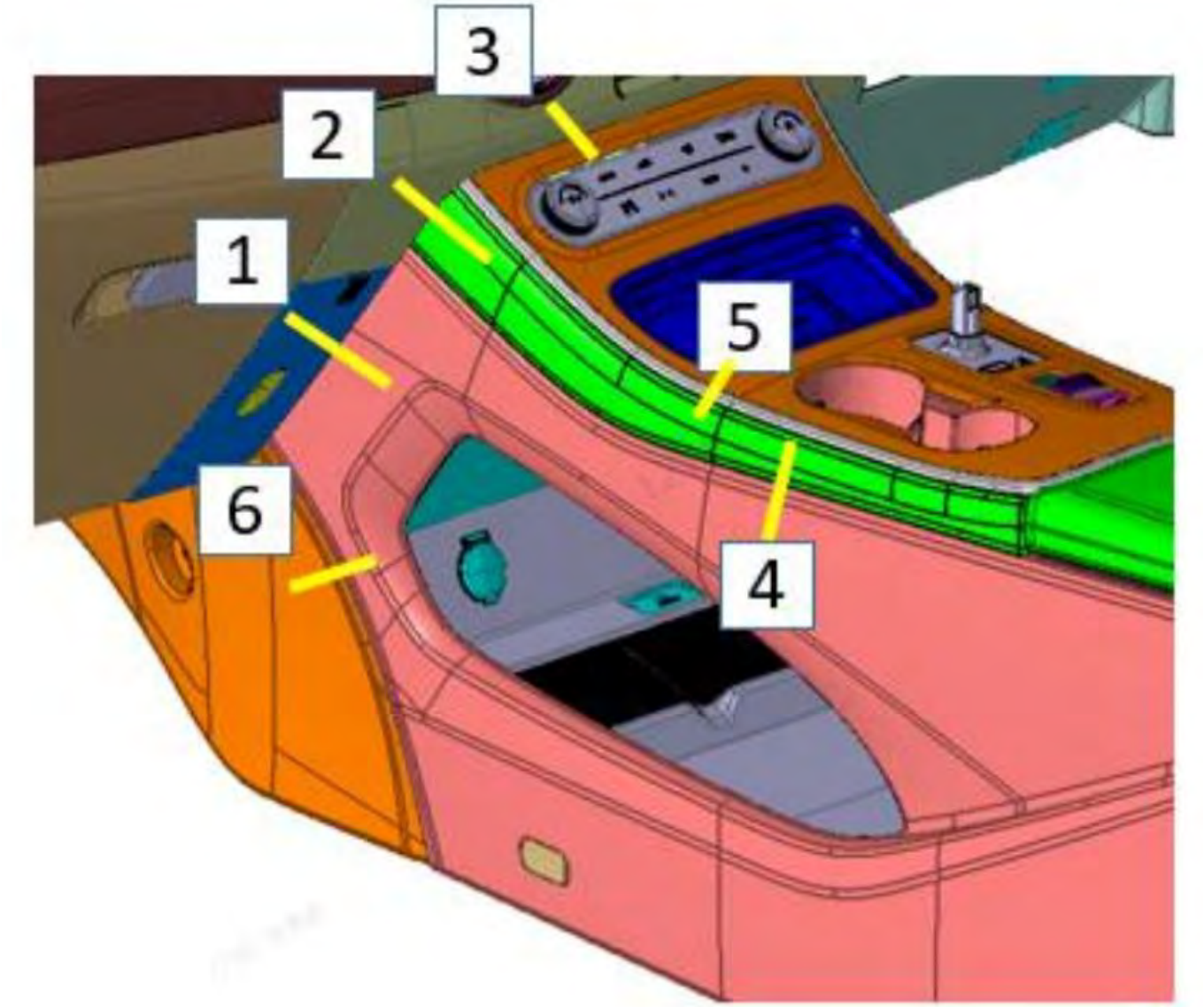
S/N	DTC	Fault Name	Possible cause	Repairrecommendatio-ns
3	U014000	Lost communication with BCM (body control module)	BCM offline	Check the BCM.
4	B350016	System undervoltage	Battery fault	Check the battery.
5	B350017	System overvoltage	Battery fault	Check the battery.
6	B350100	Hall sensor fault	Hall chip damaged	If gear shifting is not possible, replace the electronic gear shifter
7	B350200	P gear button stuck	P gear button stuck	Check whether the P button is pressed/stuck
8	B350300	X1 position stuck	X1 position stuck	Check whether the gear lever is in the X1 position
9	B350400	Y1 position stuck	Y1 position stuck	Check whether the gear lever is in the Y1 position
10	B350500	Calibration parameters are changed	Not calibrated	If gear shifting is not possible, replace the electronic gear shifter

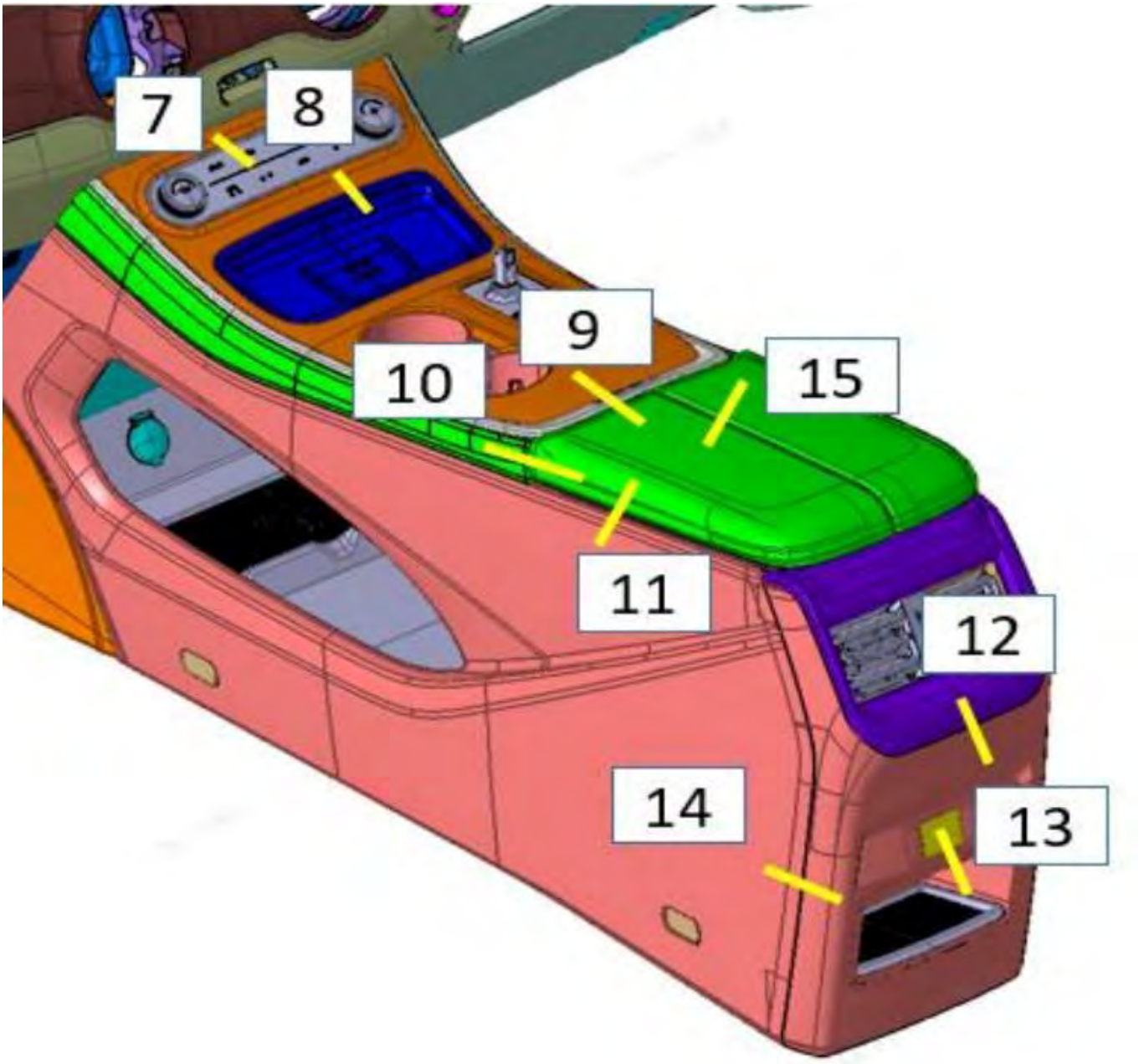
5.6.2 Specification

5.6.2.1 General specifications

Assembling gap of auxiliary dashboard assembly

The reference clearance data for maintenance and assembling are as follows:



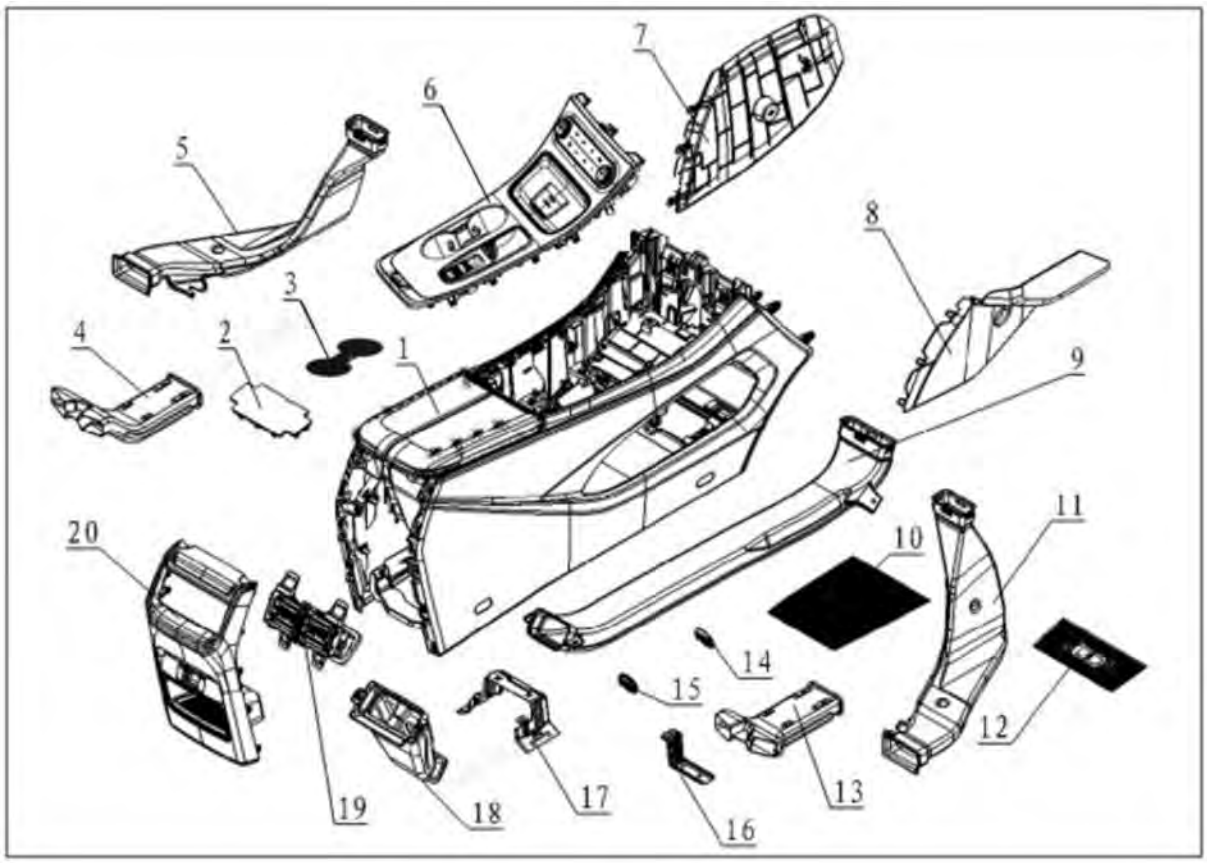


S/N	Fitting area	Description	Design status
1.	Console assembly / IP	Clearance G	2±1
2.	Console assembly (coating) / IP	Clearance G	2±1
3.	Console assembly / IP	Clearance G	2±1
4.	Left soft coating assembly/ console body	Clearance G	0/+0.5
5.	Upper trim assembly panel/ left soft coating assembly	Clearance G	0/+0.5
6.	Extension plate / console body	Clearance G	0.5

7.	Control panel / upper trim panel	Clearance G	0.5±0.5/1.5±0.7
8.	Storage box cover plate/ upper trim panel	Clearance G/flushness F	2±1.5
9.	Armrest / upper trim panel	Flushness F	2±1.5
10.	Armrest / left soft coating assembly	Clearance G	2±1.5
11.	Armrest / console body	Clearance G	4.5±1.5
12.	Rear end cover body/rear end cover trim panel	Clearance G/flushness F	0.3±0.3/-0.5±0.5
13.	Rear end cover body/plug cap	Clearance G	0.5±0.5
14.	Rear end cover / console body	Clearance G/flushness F	0.3±0.3/-0.5±0.5
15.	Armrest skin (left/right)	Clearance G/flushness F	3±1.5/0±1.5

5.6.3 Instructions and operations

5.6.3.1 Auxiliary dashboard assembly



Item	Description	Item	Description
1.	Auxiliary dashboard body assembly	11.	Front section assembly of rear right air-to-footwell air duct
2.	Wireless charging block board	12.	Hollow-out front cushion (without wireless charging sign)
3.	Cup holder pad	13.	Rear left air-to-footwell air duct rear section assembly
4.	Rear left air-to-footwell air duct rear section assembly	14.	Refrigeration switch assembly
5.	Front section assembly of rear left air-to-footwell air duct	15.	Refrigerator reaming block board
6.	Upper trim panel assembly	16.	Front section mounting bracket assembly of face level air-to-face duct
7.	Left extension baffle assembly	17.	Rear storage box mounting bracket assembly

Item	Description	Item	Description
8.	Right extension baffle assembly	18.	Rear section assembly of rear air duct
9.	Front section assembly of rear air duct	19.	Rear air vent assembly
10.	Hollow-out rear cushion	20.	Rear end cover assembly

5.6.3.2 Overview

1. Gear information:

   P gear (parking gear): This gear is used when parking or putting the vehicle in a ready-to-drive state. Press the P gear button on the panel to enter the P gear. Be sure to stop the vehicle completely before shifting to the P gear.

   D gear (driving gear): The D gear can only be engaged when the vehicle is started . Use this gear when driving forward.

   R gear (reverse gear): The R gear can only be engaged when the vehicle is started. Please reverse using this gear. Be sure to stop the vehicle completely before shifting to the R gear.

   N gear (neutral): When the vehicle is in this gear, the drive assembly cannot output power and will not provide auxiliary parking. Be sure to stop the vehicle completely before shifting to the N gear.

2. Jinshi logo lighting:

   The Jinshi logo can be lit up. When any door is opened, the Jinshi logo on the crystal handball will light up in the form of a breathing light.

   When all doors are closed and the backlight of the vehicle is turned on, the Jinshi logo on the crystal handball will be always on; if the IVI can adjust the colour of the whole vehicle ambient light, the colour of the Jinshi logo light can change with the colour of the whole vehicle ambient light.

   1 Electronic gear shifter

   2 P gear button

   3 Drive mode button

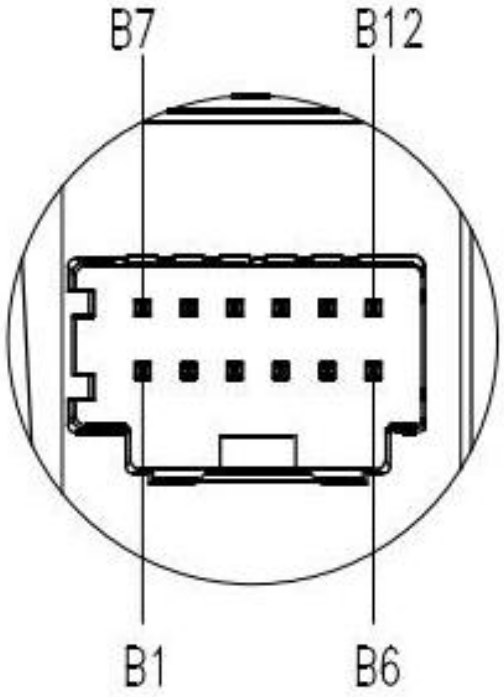
   4 Jinshi logo



3. Electrical interface: The electronic gear shifter is connected to the vehicle harness through the body connector, and the relevant signals communicate with the VCM through CAN communication.

1 Electronic gear shifter body connector.

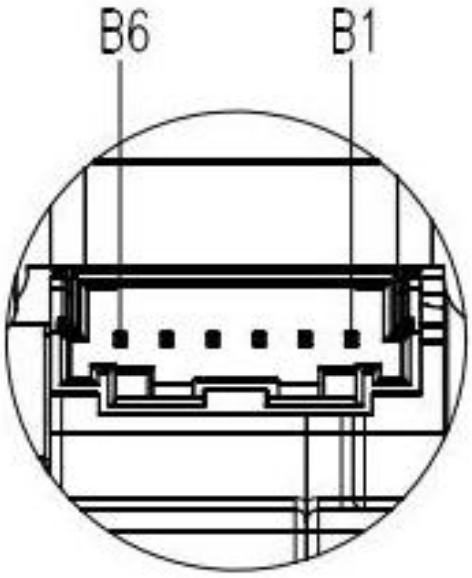
Gear shifter connector model	TE 1-1318772-3
Vehicle harness connector model	TE 1318774-1



Pin	Function definition	Pin	Function definition
Pin 1	KL30	Pin 7	CAN L
Pin 2	LIN	Pin 8	CAN H
Pin 3	GND	Pin 9	PWM1
Pin 4	P_SW	Pin 10	PWM2
Pin 5	KL15	Pin 11	PWM3
Pin 6	/	Pin 12	ILL+

2 P gear button and gear indicator connector

Shift panel connector model	CJT A2010WRC-S-6P-BK
Vehicle harness connector model	CJT A2010HC-6P



Pin	Function definition	Pin	Function definition
Pin 1	ILL+	Pin 4	PWM3
Pin 2	PWM1	Pin 5	P_SW
Pin 3	PWM2	Pin 6	GND

5.6.3.3 Precautions

Precautions for auxiliary dashboard maintenance process

1. **Caution:** Disconnect the battery cable in advance.
2. **Caution:** Be careful not to scratch the gasket and other parts and components.
3. **Caution:** When removing or disassembling any parts, be careful not to damage or deform them. Exercise caution to protect those parts and components that may tear the cloth.
4. **Caution:** When disassembling parts and components with a screwdriver or other tools, wrap the parts and components with vinyl tape or cloth for protection.
5. **Caution:** Protect the removed parts and components with cloth.
6. **Caution:** If non-reusable parts and components are removed, replace them with new ones.
7. **Caution:** Tighten the bolts and nuts to the specified torque.
8. **Caution:** After reassembling is completed, confirm that each part and component works normally.
9. **Caution:** Remove dirt as follows.
10. **Caution:** Water-soluble stains: Soak a soft cloth in water and wring it out vigorously. After removing stains, wipe with a soft, dry cloth.
11. **Caution:**Oil stains: Dissolve the synthetic detergent (concentration: 2~3% or lower) in warm water, wet the cloth and wipe away the oil stain. Then immerse the cloth in clean water and wring it out. Wipe away the detergent completely. At last, wipe the cleaned area with soft dry cloth. Then completely wipe off any detergent. Finally, wipe the cleaned area with a soft, dry cloth.
12. **Caution:** Do not use organic solvents such as thinners or petrol.

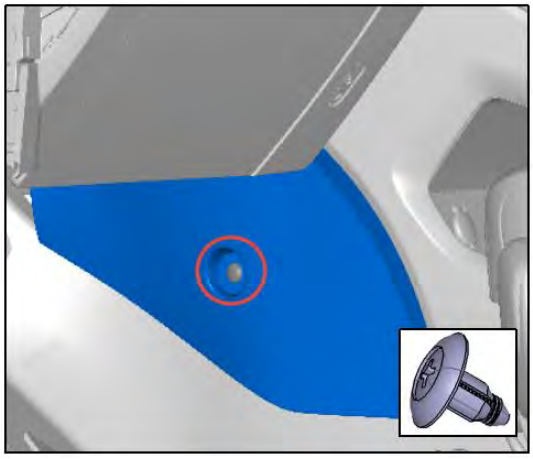
5.6.4 Removal and installation

5.6.4.1 Auxiliary dashboard assembly

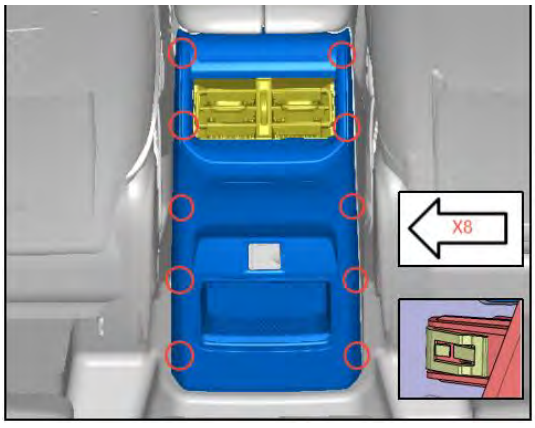
Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

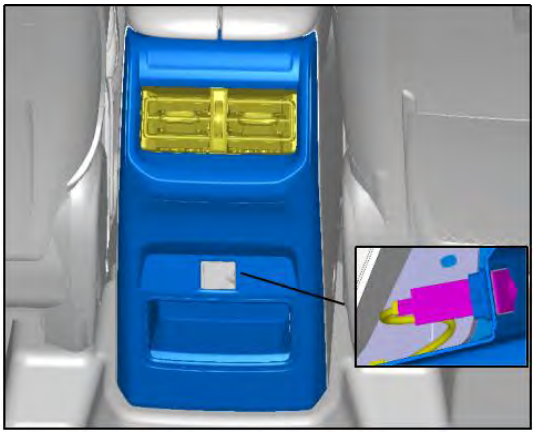
2. Remove 1 fixed plastic clip of the left/right extension plate with a cross-head screwdriver, and pull out the extension plate towards the front of the vehicle.



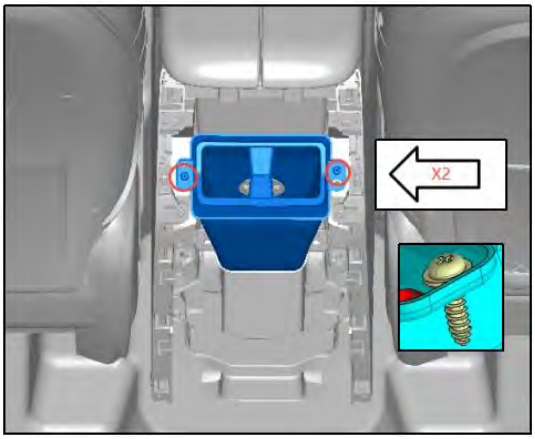
3. Pry loose the rear cover plate assembly from the bottom carpet with a straight screwdriver, pull out the rear cover plate assembly towards the rear of the vehicle with force, loosen the harness connector and take out the rear cover plate assembly.



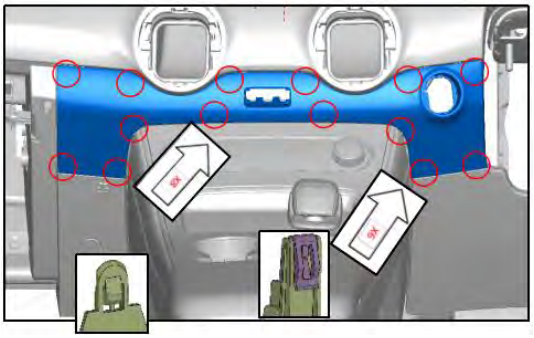
4. Disconnect the rear end cover connector of the console and remove the rear end cover harness of the auxiliary dashboard.



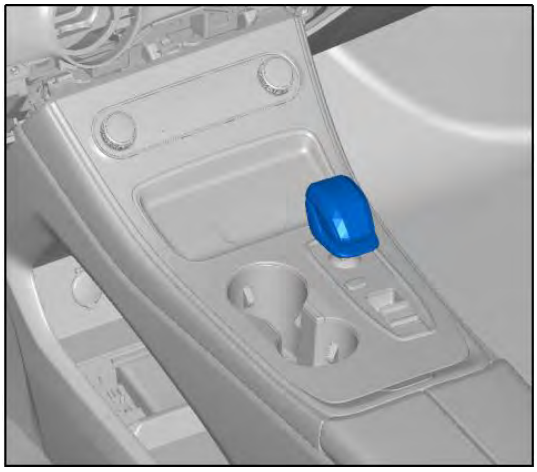
5. Loosen the 2 screws fixing the rear air duct with a cross-head screwdriver, and take out the rear end of the rear air-to-face duct.



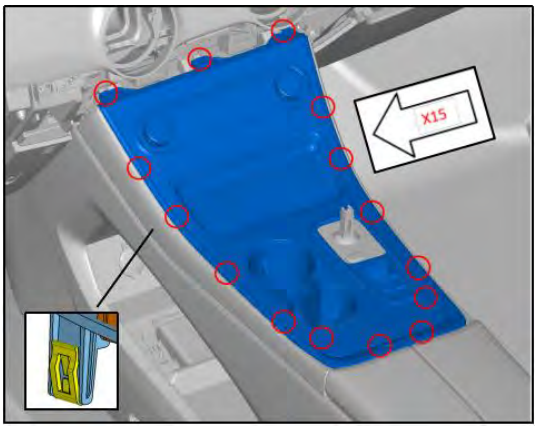
6. Pry loose the middle lower trim panel assembly with a straight screwdriver, and pull out the middle lower trim panel assembly with force along the rear direction of the vehicle.



7. Pull out the gearshift ball joint upward.



8. Pry up the upper trim panel assembly with force and remove the clip.

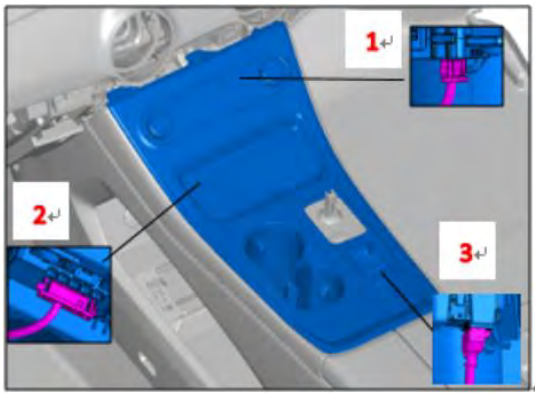


9. Disconnect the harness connector.

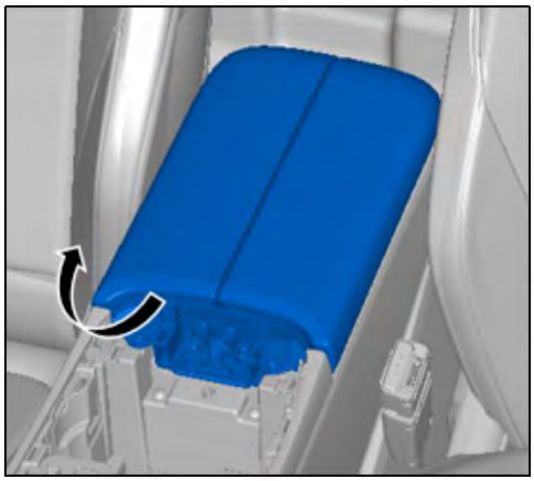
1 Disconnect the A/C controller connector.

2 Disconnect the wireless charging module connector.

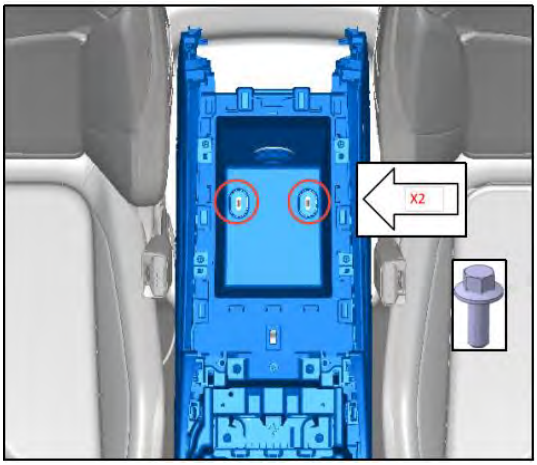
3 Disconnect the parking brake switch connector.



10. Open the console storage box cover and take out the rear storage box pad.

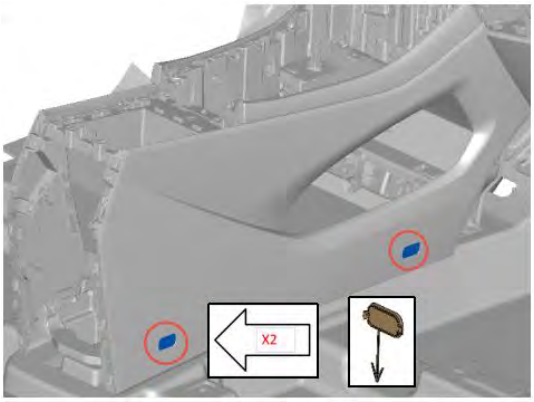


11. Remove the 2 bolts connecting the rear storage box mounting bracket assembly.



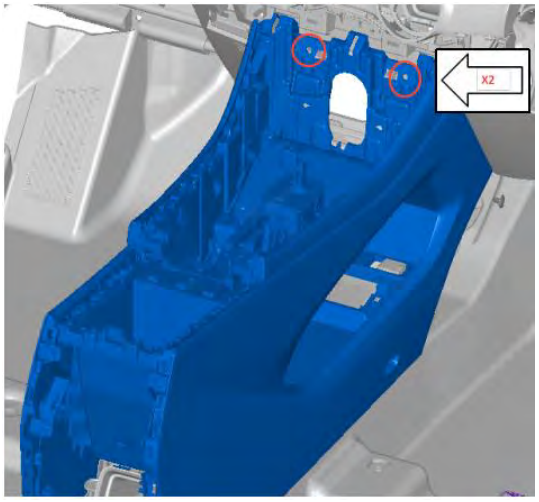
12. Use a straight screwdriver to remove the 4 symmetrical plugs on the side of the auxiliary dashboard body, and use a Phillips screwdriver to remove the four screws.

Torque: 5±0.5 Nm

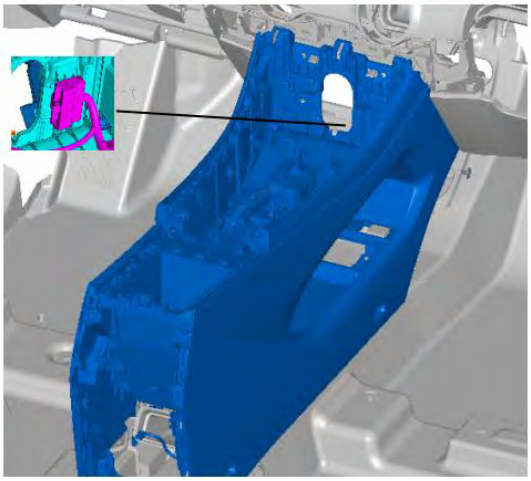


13. Remove the 2 screws on the front of the auxiliary dashboard body.

Torque: 5±0.5 Nm



14. Loosen all harness connectors of the auxiliary dashboard body, and remove the console body assembly backward.



Installation

The installation order is reverse to the removal order.

5.7 Dashboard

5.7.1 Diagnosis and testing

5.7.1.1 Diagnosis and testing

Instrument cluster

Inspection and confirmation

1. Confirm the problems raised by the customers and perform the appropriate checks and tests.
2. Check the appearance for obvious traces of mechanical and electrical damage.
3. Before the next check, solve the identified problem first.
4. If the cause cannot be determined by visual check, confirm the symptom firstly and then check according to the List of Symptoms.

5.7.1.2 Diagnosis and testing

Appearance Checklist

Mechanical	Mechanical
– Instrument panel – Instrument trim panel	– Fuse – Harness – Control switch – Instrument cluster

5.7.1.3 Symptom Table

Symptoms	Possible Cause	Measures
The speedometer does not work	– Circuit – Instrument cluster	– Check whether the instrument cluster circuit is damaged. – Check the circuit
The SOC indicator does not display	– Circuit – Instrument cluster – Power battery controller	– Check the instrument panel cluster. – Check the power battery controller.
The fuel gauge does not work	– Circuit – Instrument cluster – Fuel level sensor	– Check the instrument panel cluster. – Check whether the instrument cluster circuit is damaged. – Check the fuel level sensor.
When the ignition switch is in the "ON" position, the fuel gauge indicates below the 1/8 scale line and the fuel alarm indicator does not illuminate	– Instrument cluster	
The power meter does not work	– Circuit – Instrument cluster – ECU – ECU circuit	– Check the instrument panel cluster. – Check the ECU and ECU circuit

Symptoms	Possible Cause	Measures
When the ignition switch is in “ON” position and the vehicle is in parking state, the parking indicator light does not light up	– Circuit – Instrument cluster – EPB switch	– Check the parking brake switch – Check the circuit for damage
When the ignition switch is in the "ON" position, the brake fluid position warning indicator does not light up	– Circuit – Instrument cluster – Brake fluid level switch –	– Check the brake fluid level switch. – Check the instrument panel cluster. – Check whether the instrument cluster circuit is damaged.
When the ignition switch is in the "ON" position, the indicator does not light up during ESP self-inspection	– Circuit – Instrument cluster – ESP module – ESP module circuit	– Check whether the ESP module is damaged – Check the ESP module circuit – Check whether the instrument cluster circuit is damaged.

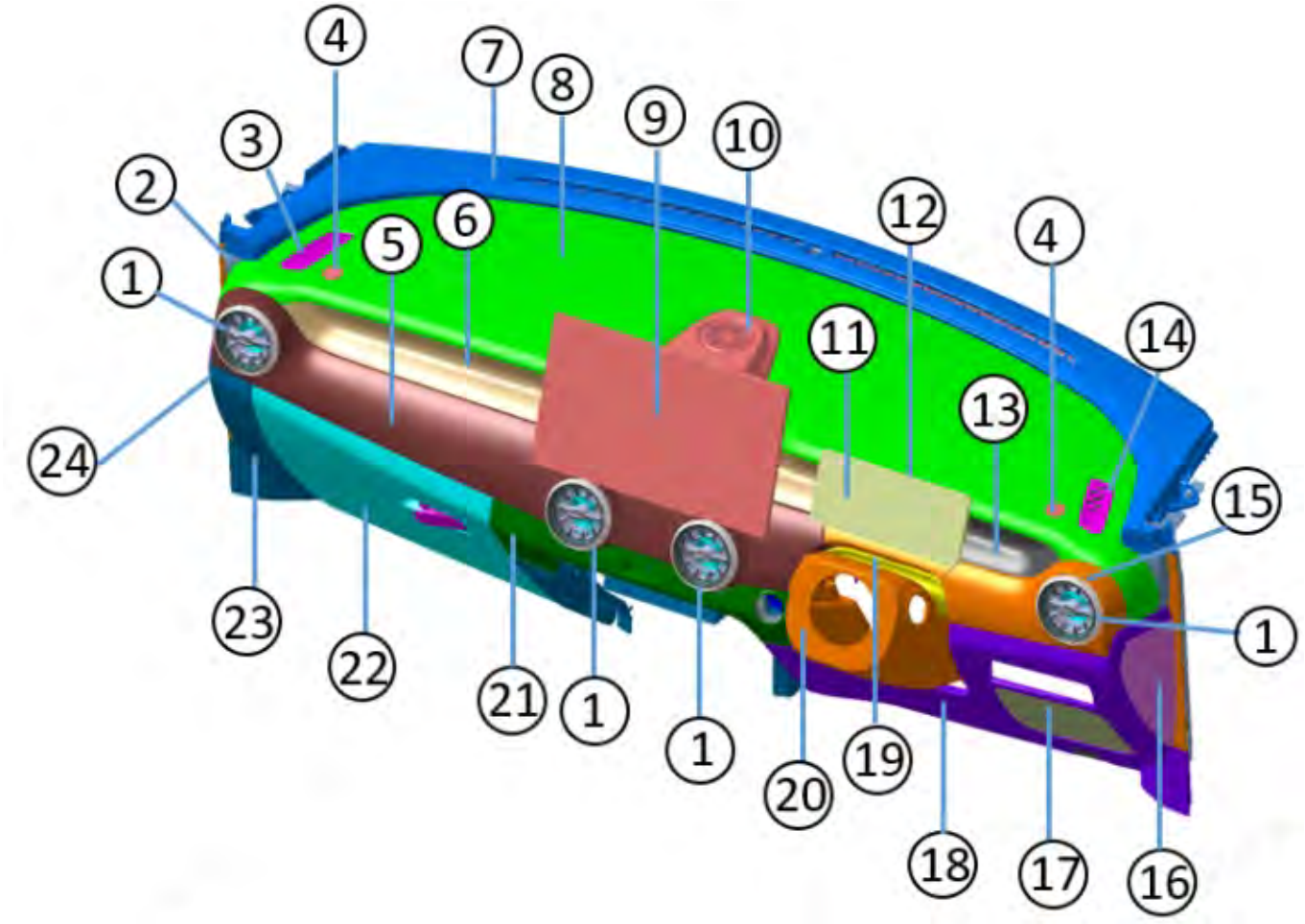
5.7.2 Specification

5.7.2.1 Torque specification

Name	Nm
Instrument panel system plastic parts (not specific to parts and components) screws	2.5±0.5
Tubular beam assembly and BIW bolt	25±2
Tubular beam assembly and left/right bracket	13±2
Instrument panel plastic parts and tubular beam bolts	13±2

5.7.3 Instructions and operations

5.7.3.1 Instrument Panel and Console



Item	Description	Item	Description
1.	Air vent assembly	13.	Right transition trim panel - RHD
2.	Instrument panel upper body assembly	14.	Right window defrosting air vent
3.	Left window defrosting air vent	15.	Right trim panel assembly
4.	Plug cap	16.	Right end cover plate assembly
5.	Left trim panel assembly	17.	Repair cover plate assembly
6.	Left transition trim panel - RHD	18.	Lower right shield assembly
7.	Front defrost cover plate	19.	Upper shield assembly of steering column
8.	Upper trim panel assembly	20.	Steering column lower shroud assembly

Item	Description	Item	Description
9.	Multimedia player display screen	21.	Middle lower trim panel assembly
10.	Large screen upper cover plate assembly	22.	Glove box assembly
11.	Instrument cluster - RHD	23.	Instrument panel lower body assembly
12.	Instrument mounting cover plate	24.	Left end cover plate assembly

5.7.3.2 Precautions

Precautions

1. **Caution:** Disconnect the battery cable in advance.
2. **Caution:** Disconnect the SRS circuit in advance.
3. **Caution:** Do not damage or force to open the airbag cover, otherwise it will have an adverse effect on the performance of the airbag.
4. **Caution:** Be careful not to scratch the gasket and other parts and components.
5. **Caution:** When removing or disassembling any parts, be careful not to damage or deform them. Exercise caution to protect those parts and components that may tear the cloth.
6. **Caution:** When removing parts and components with a screwdriver or other tools, wrap the parts and components with vinyl tape or cloth tape for protection.
7. **Caution:** Protect the removed parts and components with cloth.
8. **Caution:** If non-reusable parts and components are removed, replace them with new ones.
9. **Caution:** Tighten the bolts and nuts to the specified torque.
10. **Caution:** After reassembling is completed, confirm that each part and component works normally.
11. **Caution:** Remove dirt as follows.

    1 Water-soluble stains: Soak a soft cloth in water, then wring it out vigorously. After removing stains, wipe with a soft, dry cloth.

    2 Oil stains: Dissolve synthetic detergent (concentration 2-3% or lower) in warm water, wet the cloth, and then wipe away the oil stains vigorously. Then immerse the cloth in clean water and wring it out. Wipe away the detergent completely. At last, wipe the cleaned area with soft dry cloth. Then completely wipe off any detergent. Finally, wipe the cleaned area with a soft, dry cloth.

12. **Caution:** Do not use organic solvents such as thinners or petrol.

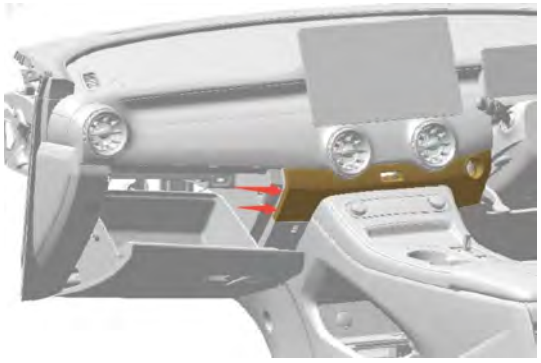
5.7.4 Removal and installation

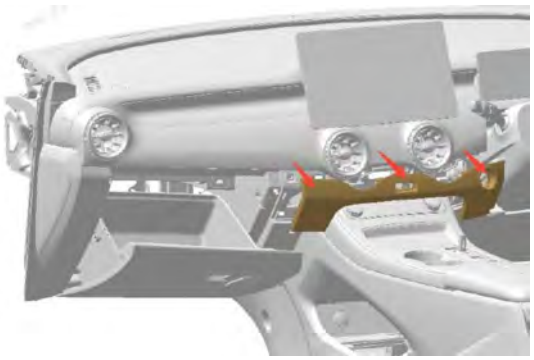
5.7.4.1 Dashboard

Removal

1. Remove the middle lower trim panel assembly of the dashboard, open the glove box, use a straight screwdriver to pry loose the middle lower trim panel assembly from the position indicated by the arrow in Fig. 1 below, pull out the middle lower trim panel assembly with force along the rear direction of the vehicle, disconnect the hazard warning switch and one-button start switch connectors, and remove the middle lower trim panel assembly.

   Caution: Pay attention to protection during the disassembly process to avoid scratching surrounding parts.

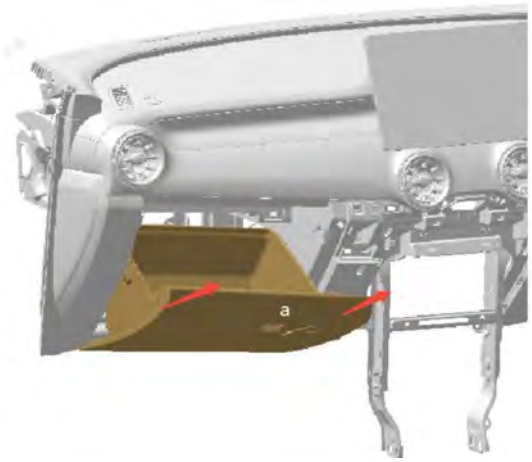




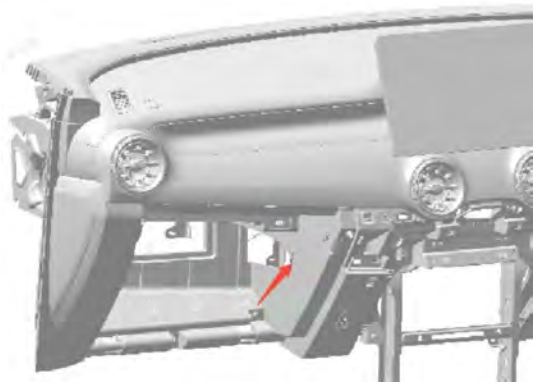
2. Remove the auxiliary instrument panel assembly. Refer to: Auxiliary dashboard assembly.

3. Remove the glove box assembly.

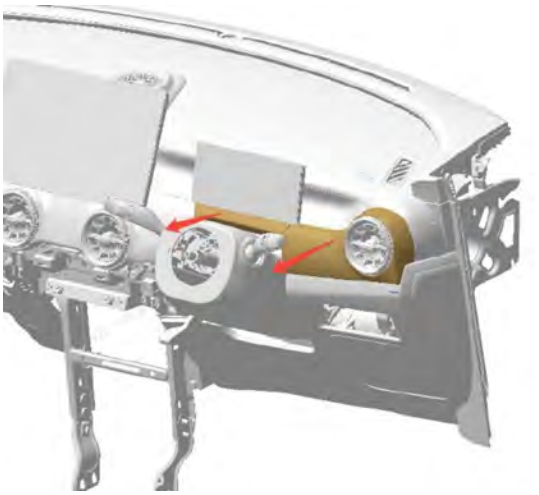
   1 Open the glove box (not to the maximum position) and use a large force to loosen the glove box hinge obliquely upward in the direction of the arrow;



   2 Take off the glove box by tilting it sideways, untie the right damper cable and hang the cable end at the arrow position of the lower body. Pay attention to check the left and right buffer rubbers to avoid loss.

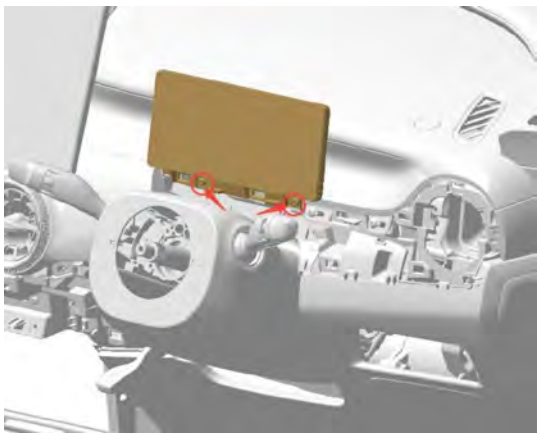


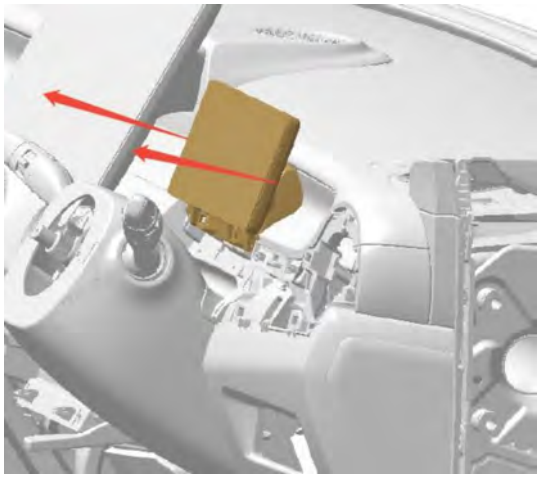
4. Remove the right trim panel assembly, adjust the steering column assembly to the lowest position, and use the Roof lining clamp removal tool or hook to remove it evenly in the direction shown. The right air vent will also be removed accordingly.



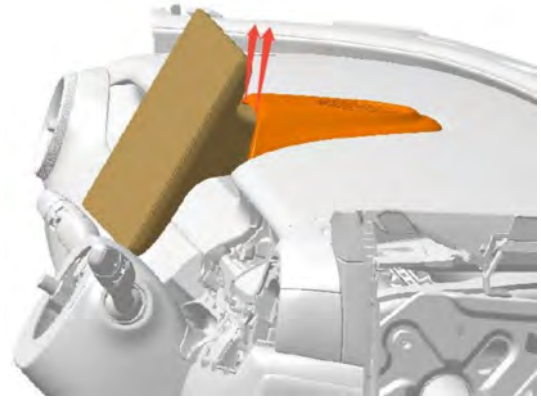
5. Remove the instrument, adjust the steering column to the lowest position, remove the two self-tapping screws with a cross-head screwdriver, and then grab both sides of the

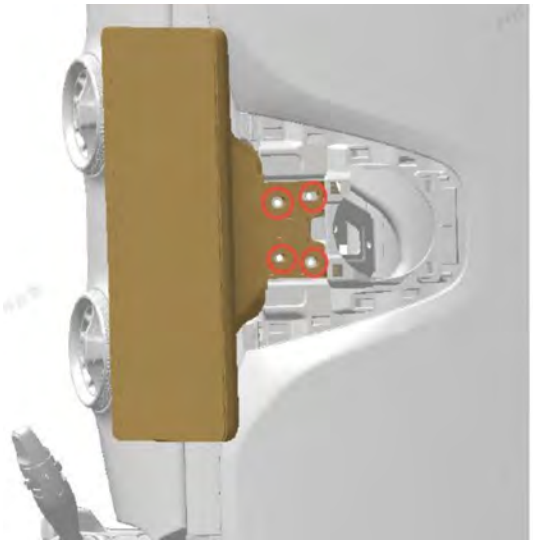
instrument in the direction shown in Fig. 8 and use a little force to remove the instrument. The instrument mounting bracket will also be removed together with the instrument.



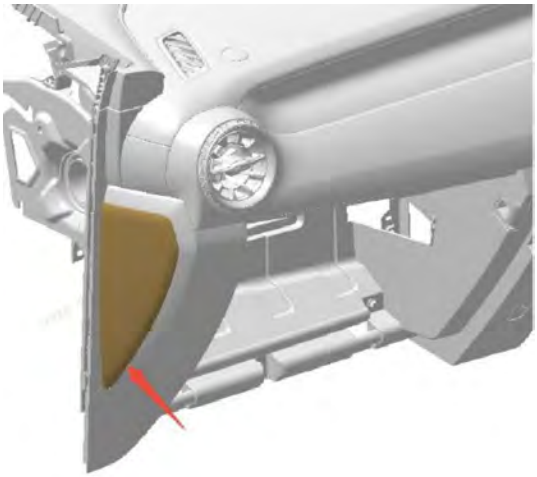


6. Remove the centre control panel assembly, use the roof lining clamp removal tool to forcefully pry up the back plate of the centre control panel in the direction of the arrow, use the S10 socket to knock down the 4 nuts installed on the large screen, and remove the centre control panel assembly downward.

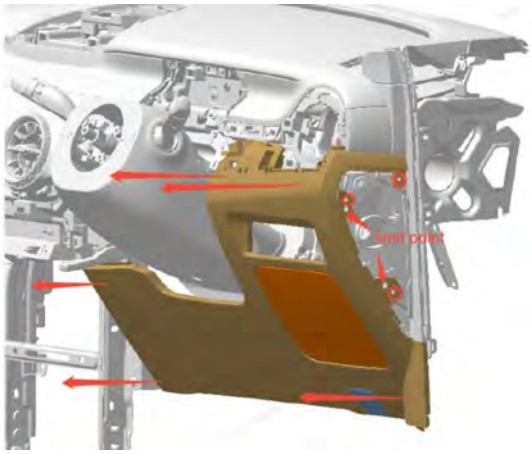




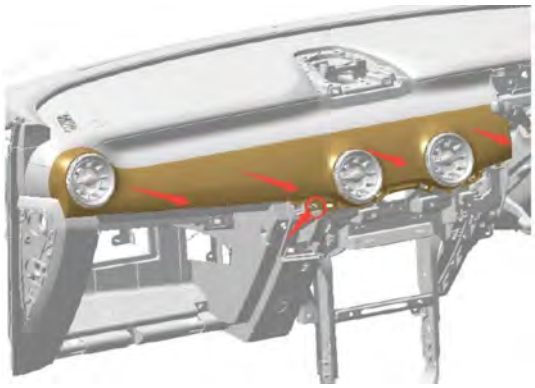
7. Remove the left/right end cover plate assembly, pry up the end cover plate from the position indicated by the arrow with a straight screwdriver, and remove the end cover plate (the removal scheme of the left/right end cover plates is the same).



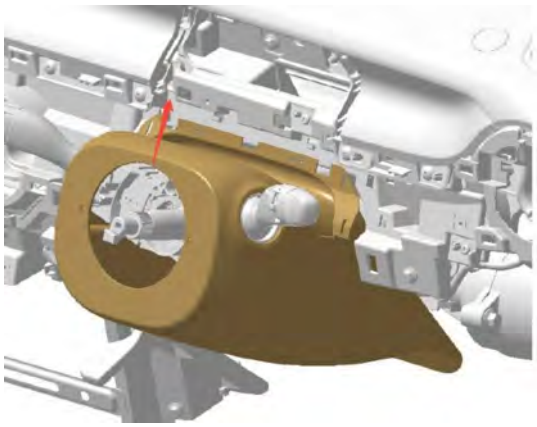
8. Remove the right lower shield assembly, remove the 3 self-tapping screws on the side with a cross-head screwdriver, and then use a straight screwdriver to pry up the limit and slightly apply force to remove the right lower shield assembly in the direction of the arrow. The repair cover plate (which can be removed separately from the two lower openings) and the engine bonnet opening handle assembly can be removed with the right lower shield assembly.

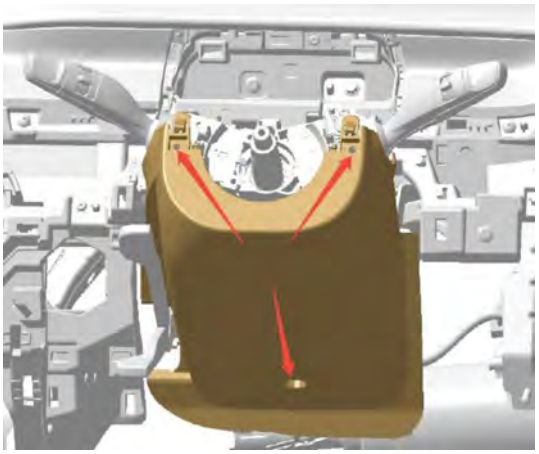


9. Use a cross-head screwdriver to remove the self-tapping screws shown by the arrow, and then remove the left trim panel assembly with a little force in the direction indicated by the arrow along the X direction. (The left air vent and the central air vent are removed together with the left trim panel)

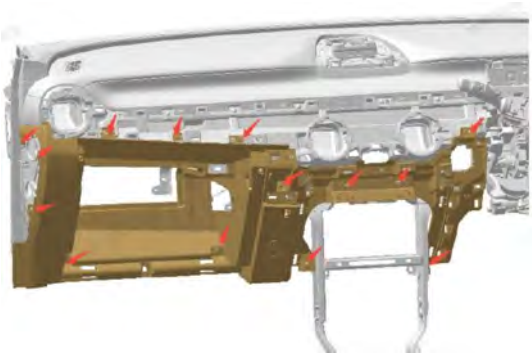


10. Remove the steering column shield, pull it up slightly from the gap on the end face of the steering wheel with a lining removal tool or hook-like tool to remove the upper shield of the steering column, and use a cross-head screwdriver to remove the 3 self-tapping screws shown by the arrow before removing the shield.





11. Remove the instrument panel lower body assembly, use a cross-head screwdriver and an S8 socket to remove the self-tapping screws and M6 bolts shown by the arrow, and then remove the lower body assembly with force along the X direction.

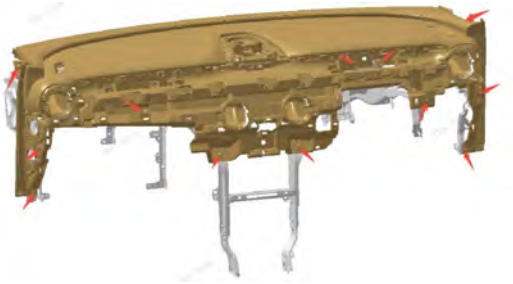


12. Remove the left/right transition trim panel assembly, use a cross-head screwdriver to drive down the self-tapping screws shown in the circle, and then remove the left/right transition trim panel assembly with a little force in the direction of the arrow.

Caution: The surface-treated parts must be well protected to avoid scratching the parts.



13. Remove the instrument panel upper body assembly, use an S8 socket to remove the bolts indicated by the arrow, and then remove the upper body assembly 23 degrees upward along the X direction.



14. To dismantle the tubular beam assembly, first use an S13 socket to remove the nuts that fasten the left/right connecting brackets as shown in the figure, and then remove the bolts connecting the tubular beam to the body. After all are removed, lift the tubular beam assembly slightly and then remove it in the +X direction.



Installation

1. The installation order is reverse to the removal order, and pay attention to the following items.

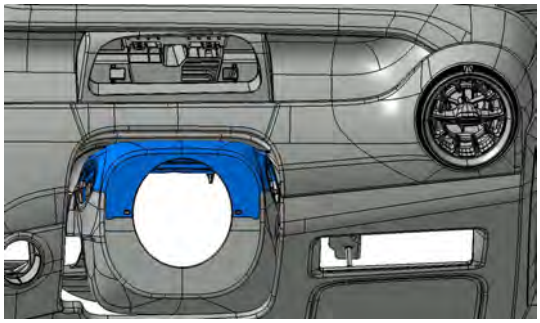
Caution: Assembly clearance meets the standard.

5.7.4.2 Instrument cluster

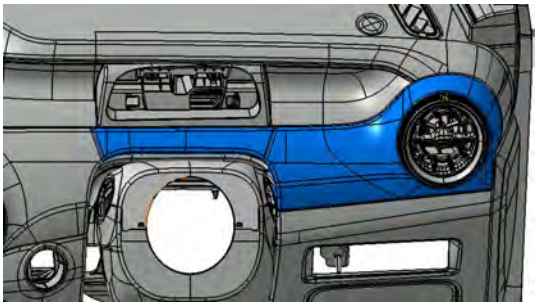
Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

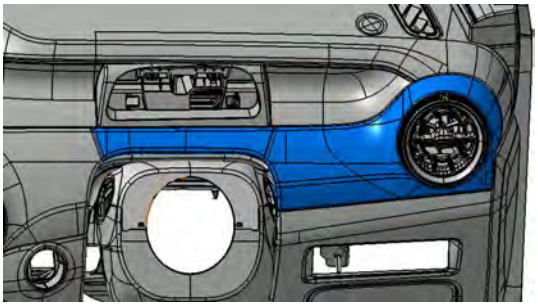
2. Adjust the steering wheel downward to the lowest position.



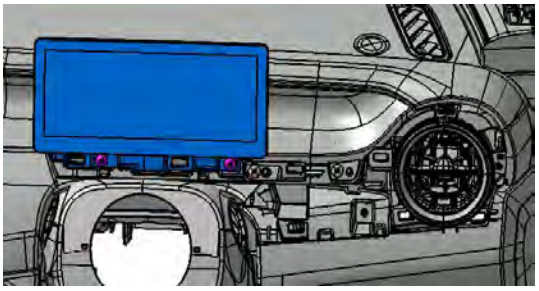
3. Remove the right trim panel covering skin.



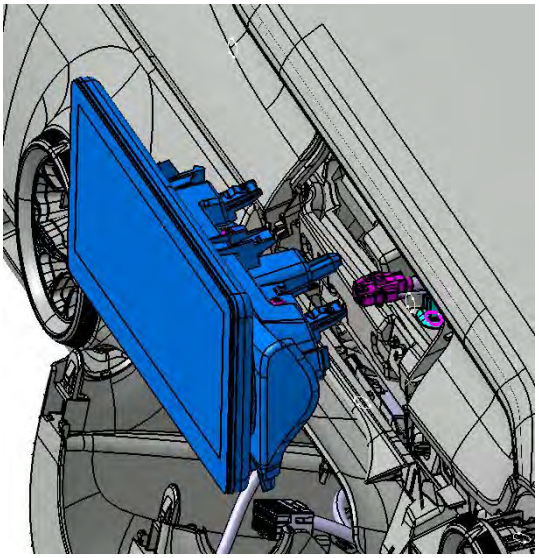
4. Remove the fixing screws of instrument mounting cover plate.



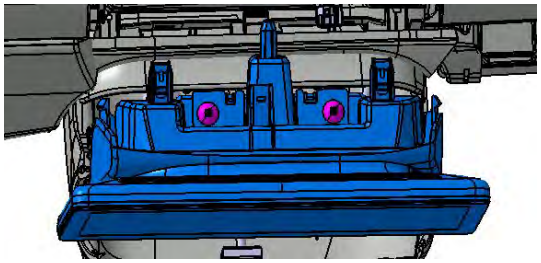
5. Remove the instrument mounting cover plate and disconnect the instrument screen connector.



6. Remove the fixing screws of instrument panel, and take off the instrument display screen assembly.



7. Take out the instrument display screen.



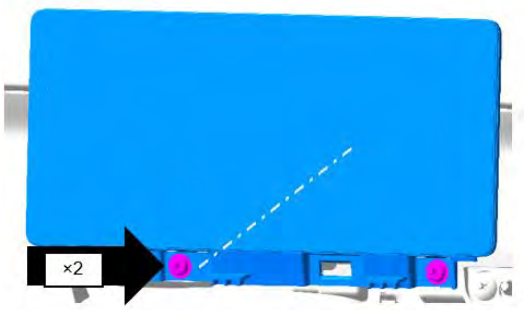
Installation

1. The installation order is the reverse of the removal order.

5.7.4.3 Mounting bracket of instrument panel cluster

Removal

1. Remove the left/right end A-pillar upper shield assembly. Pry up the end cover plate with a straight screwdriver and remove it (the removal schemes of left/right end cover plates are the same).



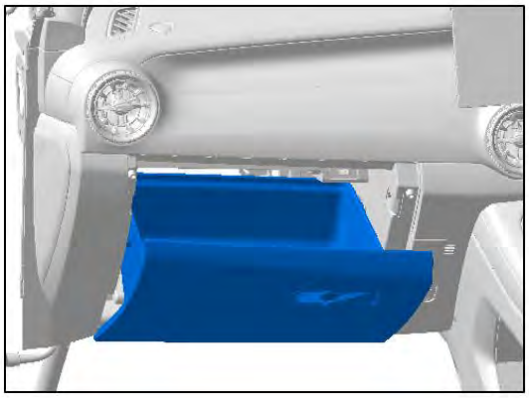
Installation

1. The installation order is the reverse of the removal order.

5.7.4.4 Glove box assembly

Removal

1. Open the glove box assembly.



2. Untie the right damper cable.



3. Loosen the glove box hinge obliquely upward and remove the glove box sideways.

Installation

1. The installation order is the reverse of the removal order.

5.7.4.5 Middle lower trim panel assembly

Removal

1. Loosen the middle and lower trim panel assembly with a straight screwdriver.
2. Remove the fixing clips of the middle and lower trim panel assembly.



3. Disconnect the hazard warning switch.
4. Disconnect the one-button start switch.

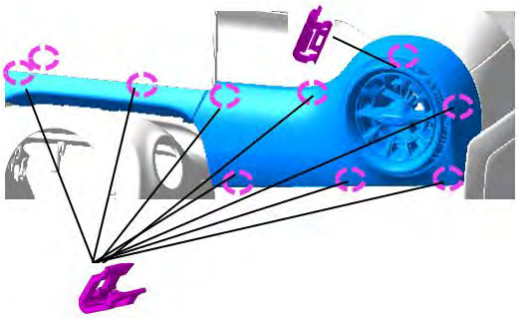
Installation

1. The installation order is the reverse of the removal order.

5.7.4.6 Right trim panel assembly

Removal

1. Remove the right trim panel assembly, adjust the steering column assembly to the lowest position, and remove it evenly with a headlining clamp removal tool or hook. The right air vent will also be removed.



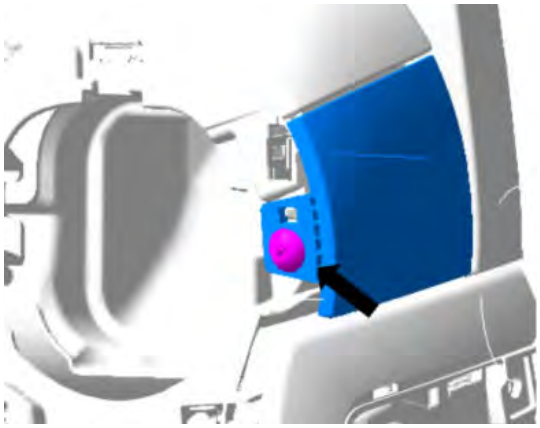
Installation

1. The installation order is the reverse of the removal order.

5.7.4.7 Left/right trim panel subassembly

Removal

1. Remove the screws with a screwdriver.



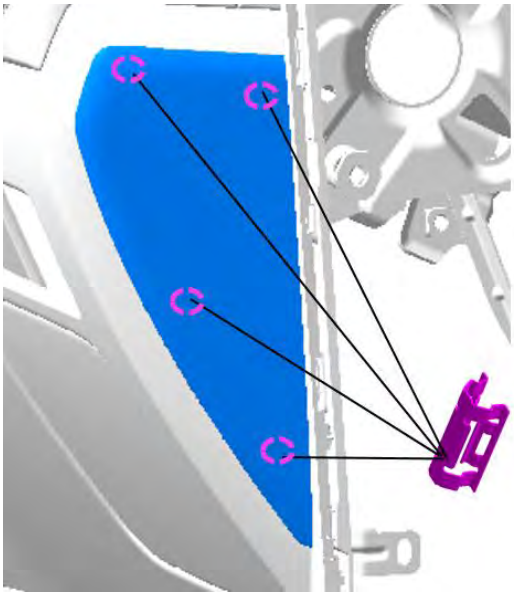
Installation

1. The installation order is the reverse of the removal order.

5.7.4.8 Left/right end cover plate assembly

Removal

1. Remove the left/right end cover plate assembly. Pry up the end cover plate with a straight screwdriver and remove it (the removal schemes of left/right end cover plates are the same).



Installation

1. The installation order is the reverse of the removal order.

5.7.4.9 Large screen upper cover plate assembly

Removal

1. Remove the centre control panel assembly. Use the Roof lining clamp removal tool to pry up the large screen upper cover assembly in the direction of the arrow shown in Fig. 9.



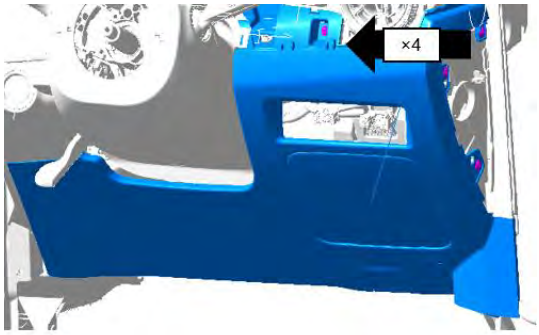
Installation

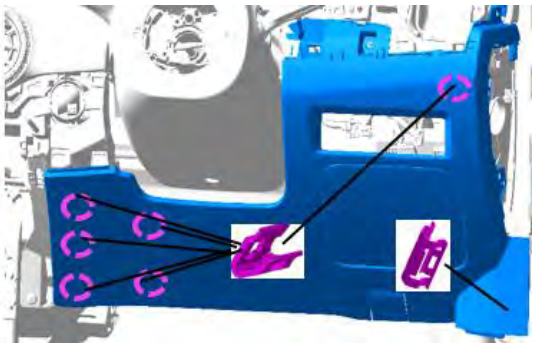
1. The installation order is the reverse of the removal order.

5.7.4.10 Lower right shield assembly

Removal

1. After removing the 4 self-tapping screws on the side with a screwdriver, use a straight screwdriver to pry up the limit and remove the right lower shield assembly with a little force. The repair cover plate (which can be removed separately from the two lower openings) and the engine compartment cover opening handle assembly can be removed with the right lower shield assembly.





Installation

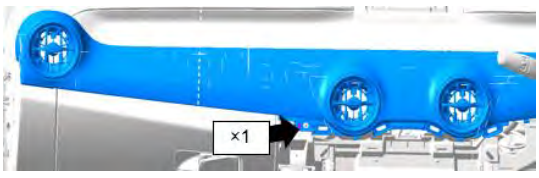
1. The installation order is the reverse of the removal order.

5.7.4.11 Left trim panel assembly

Removal

1. After removing the self-tapping screws shown by the arrow with a cross-head screwdriver, remove the left trim panel assembly slightly along the X direction. (The left air vent and the central air vent are removed together with the left trim panel)





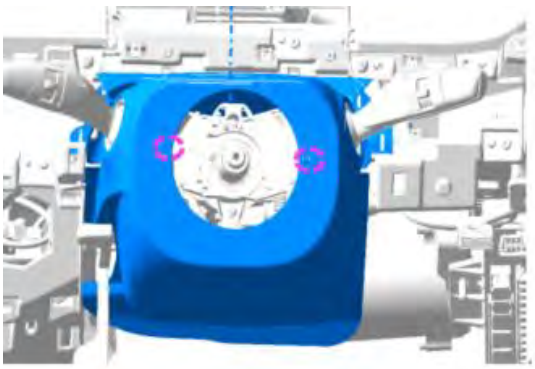
Installation

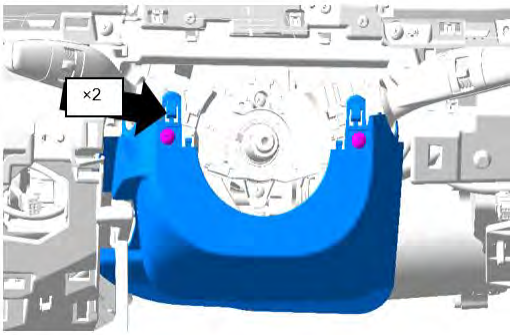
1. The installation order is the reverse of the removal order.

5.7.4.12 Upper and lower shield assemblies of steering column

Removal

1. Use a lining removal tool or hook-type tool (as shown by the arrow in Figure XIV) to pull up slightly from the gap on the end face of the steering wheel to remove the upper shield of the steering column, and use a cross-head screwdriver to remove the three self-tapping screws as shown by the arrow in Figure XV before removing the shield.







Installation

1. The installation order is the reverse of the removal order.

5.7.4.13 Instrument panel upper body assembly

Removal

1. After removing the bolts indicated by the arrow with a socket, remove the instrument panel upper body assembly diagonally facing the roof.



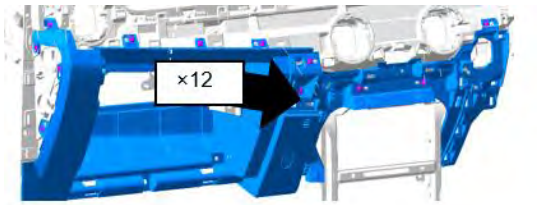
Installation

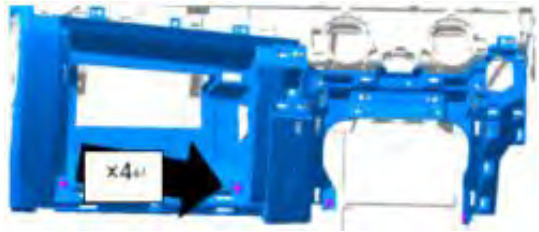
1. The installation order is the reverse of the removal order.

5.7.4.14 Instrument panel lower body assembly

Removal

1. Remove the instrument panel lower body assembly. After removing the self-tapping screws and M6 bolts shown by the arrow with a cross-head screwdriver and an S8 socket, remove the lower body assembly with force toward the rear of the vehicle.









Installation

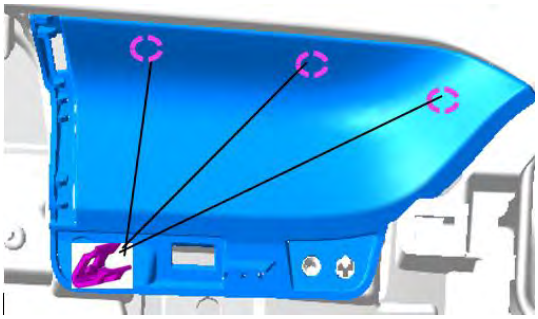
1. The installation order is the reverse of the removal order.

5.7.4.15 Left/right transition trim panel assembly

Removal

1. After removing the self-tapping screws shown with a screwdriver, remove the left/right transition trim panel assembly.





Installation

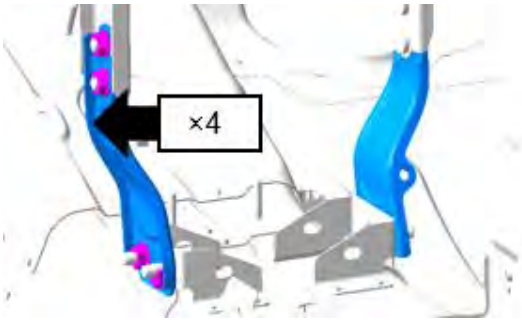
1. The installation order is the reverse of the removal order.

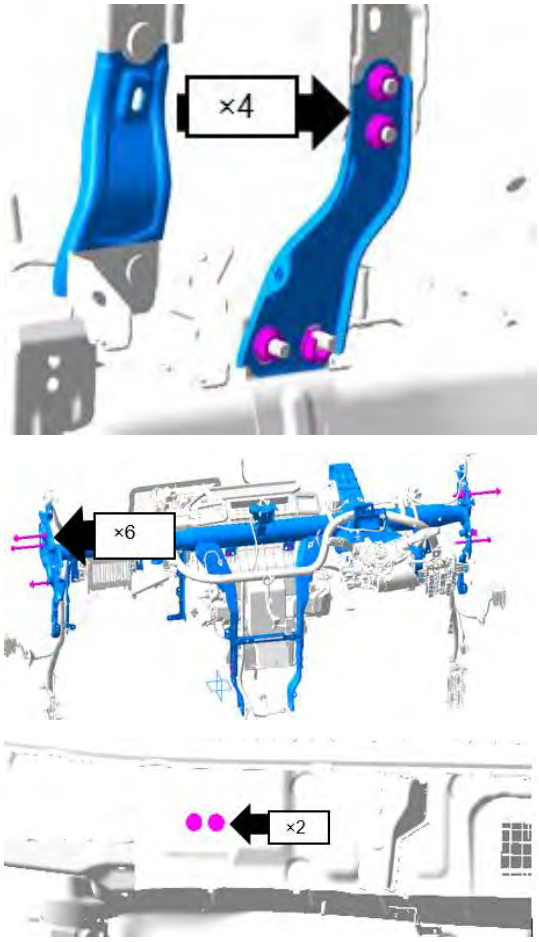
5.7.4.16 CCB assembly

Removal

1. To dismantle the tubular beam assembly, first use a sleeve to remove the nuts that tighten the left/right connecting brackets as shown in the figure, and then remove the bolts and washers connecting the tubular beam to the body. After all are removed, lift the tubular beam assembly slightly and then remove it toward the rear of the vehicle.

   Caution: After disassembling some electrical components in sequence, the pipe beam can be removed.





Installation

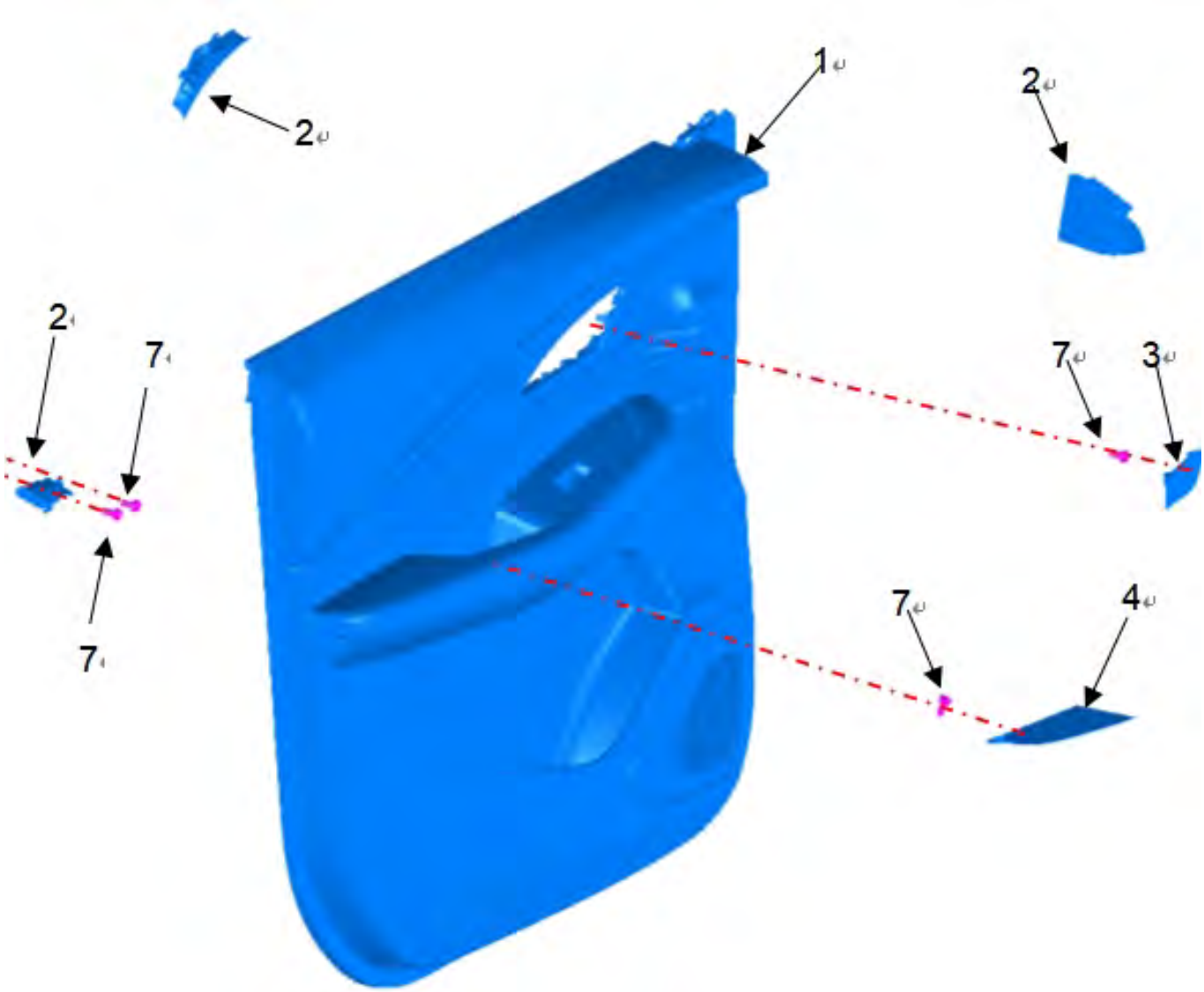
1. The installation order is the reverse of the removal order.

5.8 Interiors

5.8.1 Instructions and operations

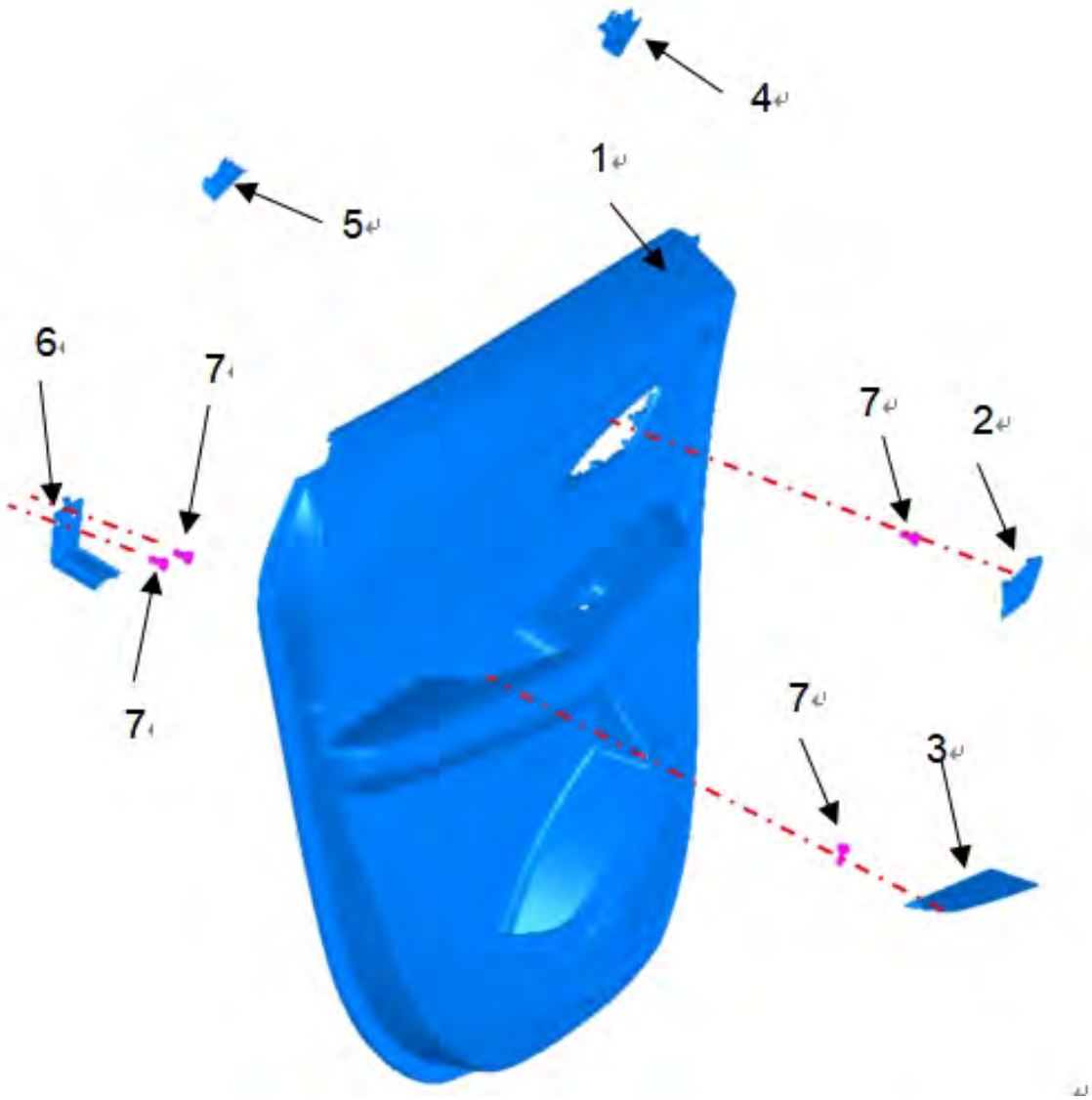
5.8.1.1 Interiors

Front Door Shield - Exploded View



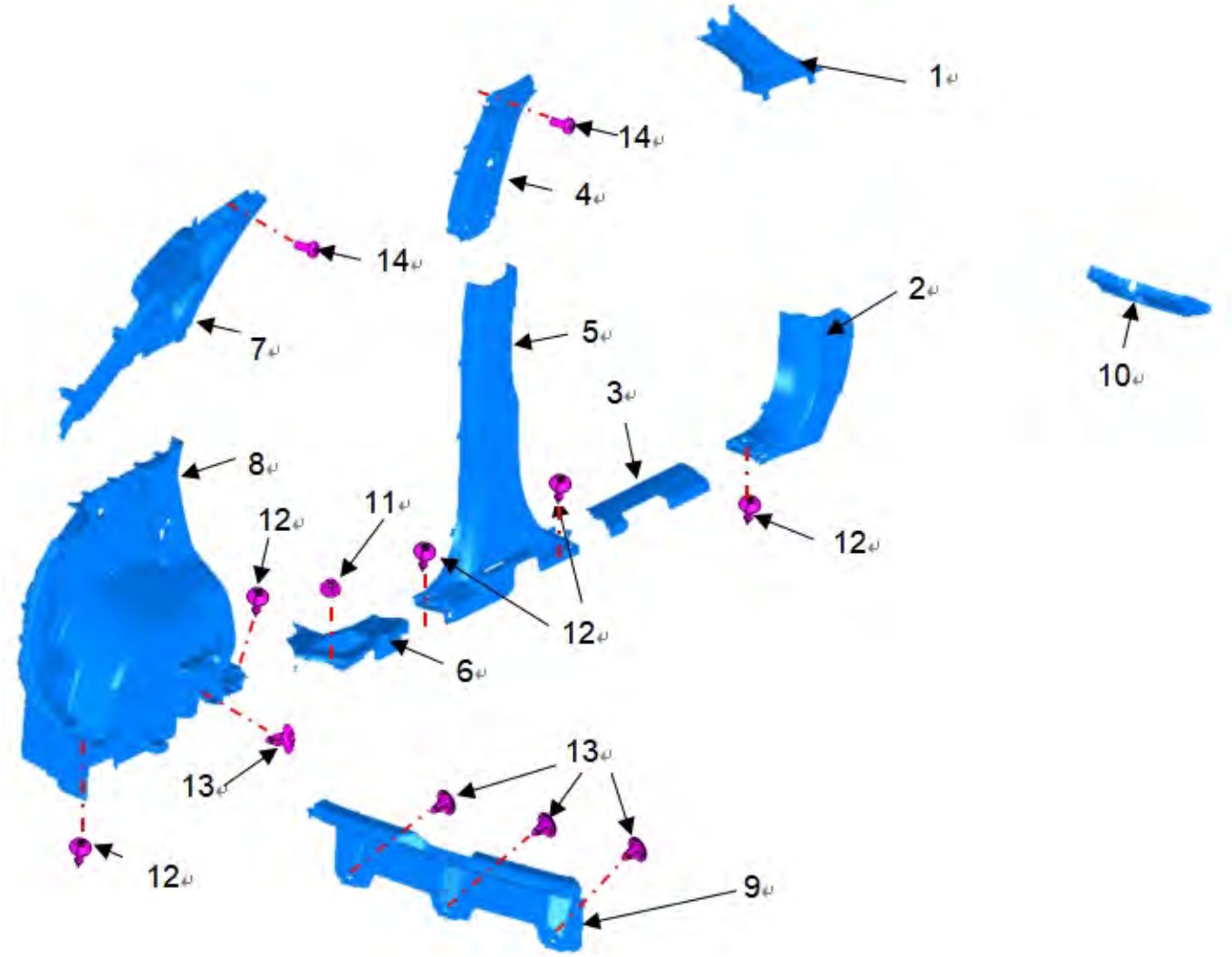
Item	Description	Item	Description
1.	Front left door shield assembly	5.	Front left sealing block
2.	Front left door triangle piece assembly	6.	Front left door armrest fixing bracket assembly
3.	Left door interior handle plug cap	7.	Pan head screw with cross recess and flat washer assembling unit
4.	Front left door handle recess plug cap		

Rear Door Shield - Exploded View



Item	Description	Item	Description
1.	Rear left door shield assembly	5.	Rear left sealing block
2.	Left door interior handle plug cap	6.	Rear door armrest fixing bracket assembly
3.	Rear left door handle box plug cap	7.	Pan head screw with cross recess and flat washer assembling unit
4.	Middle left sealing block		

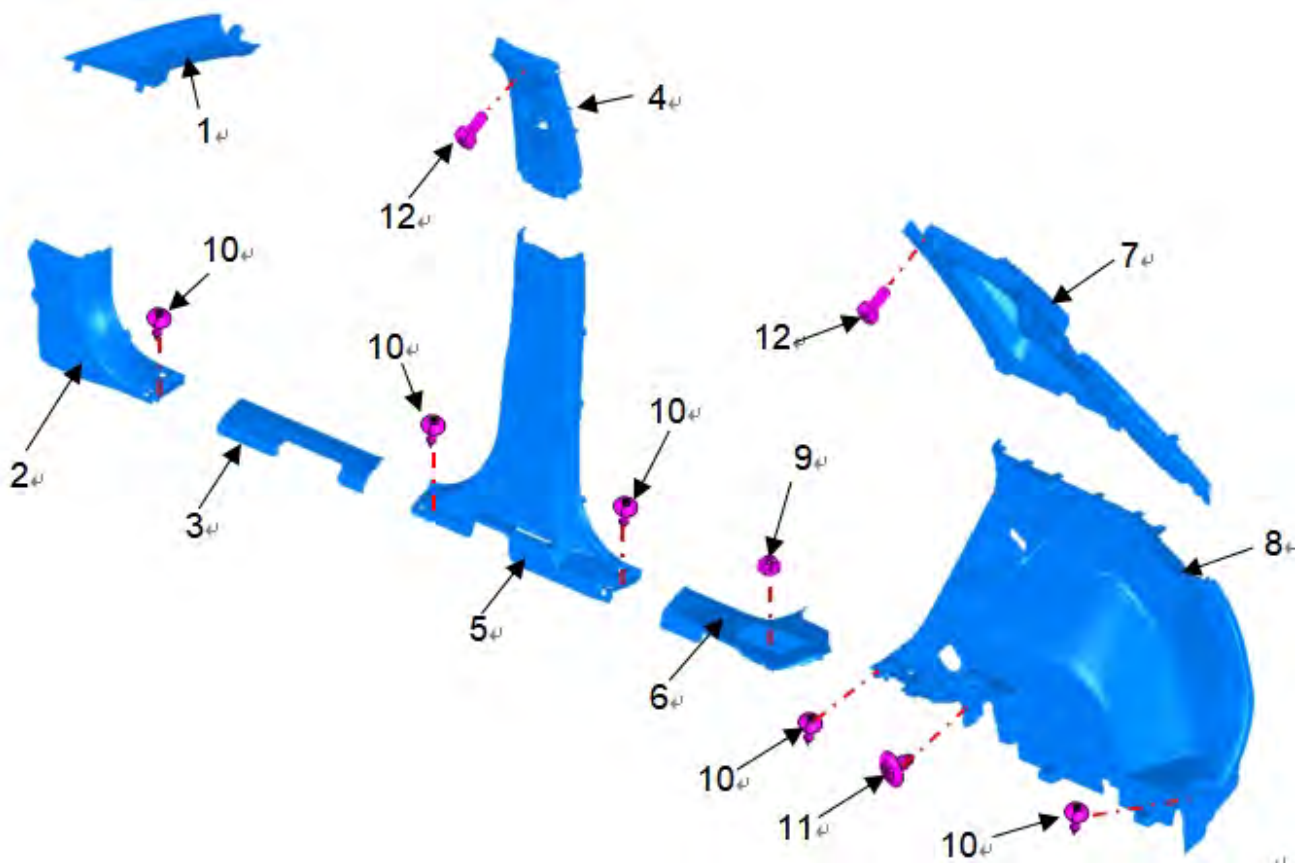
Exploded View of Left Side Wall Shield



Item	Description	Item	Description
1.	Left A-pillar upper shield assembly	6.	Rear left sill assembly
2.	Left A-pillar lower shield assembly	7.	Left C-pillar upper shield assembly
3.	Front left sill assembly	8.	Left C-pillar lower shield assembly
4.	Left B-pillar upper shield assembly	9.	Boot lid sill shield assembly
5.	Left B-pillar lower shield assembly	10.	Interior rearview mirror cover plate assembly

Right side wall shield

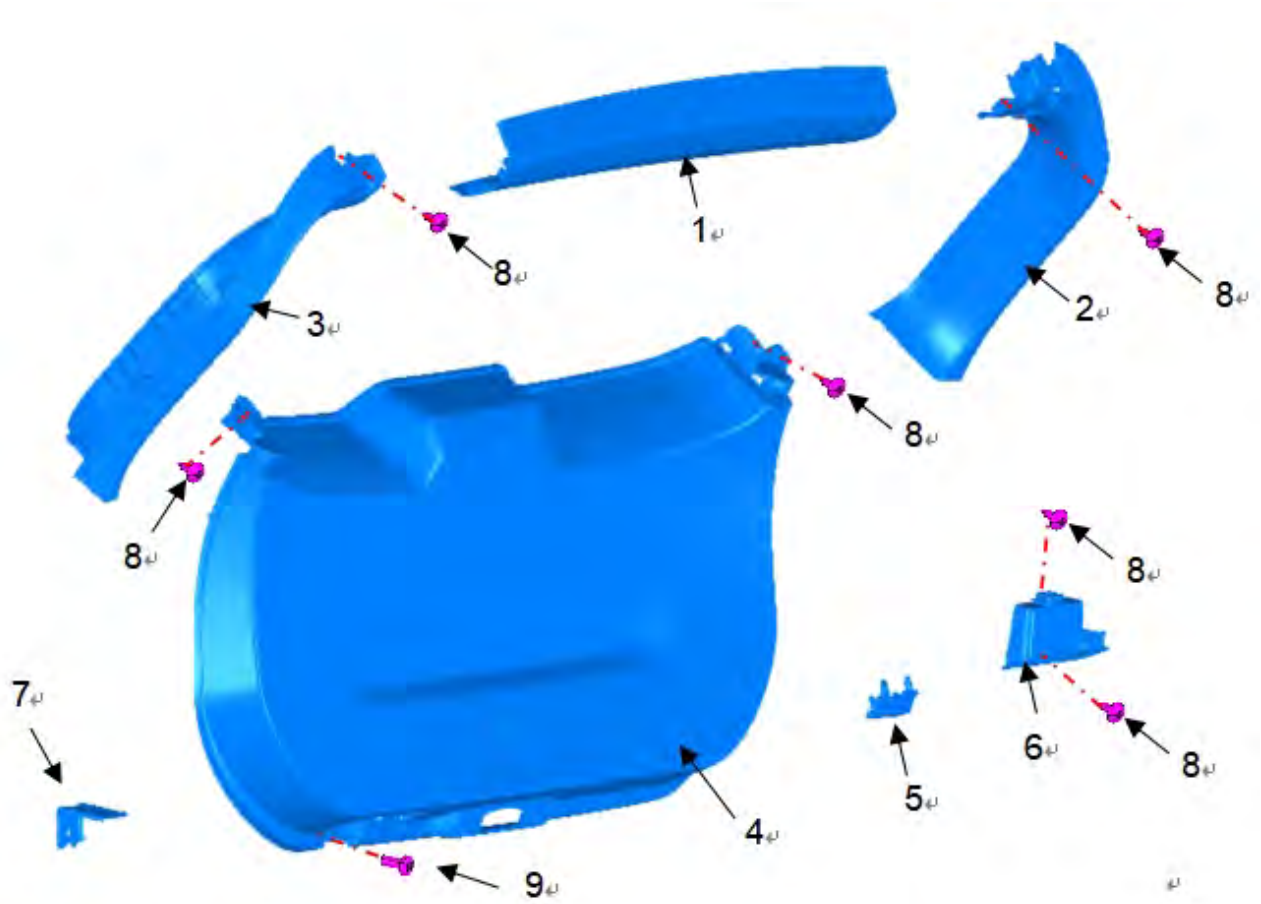
Exploded view



Item	Description	Item	Description
1.	Right A-pillar upper shield assembly	5.	Right B-pillar lower shield assembly
2.	Right A-pillar lower shield assembly	6.	Rear right sill assembly
3.	Front right door sill assembly	7.	Right C-pillar upper shield assembly
4.	Right B-pillar upper shield assembly	8.	Right C-pillar lower shield assembly

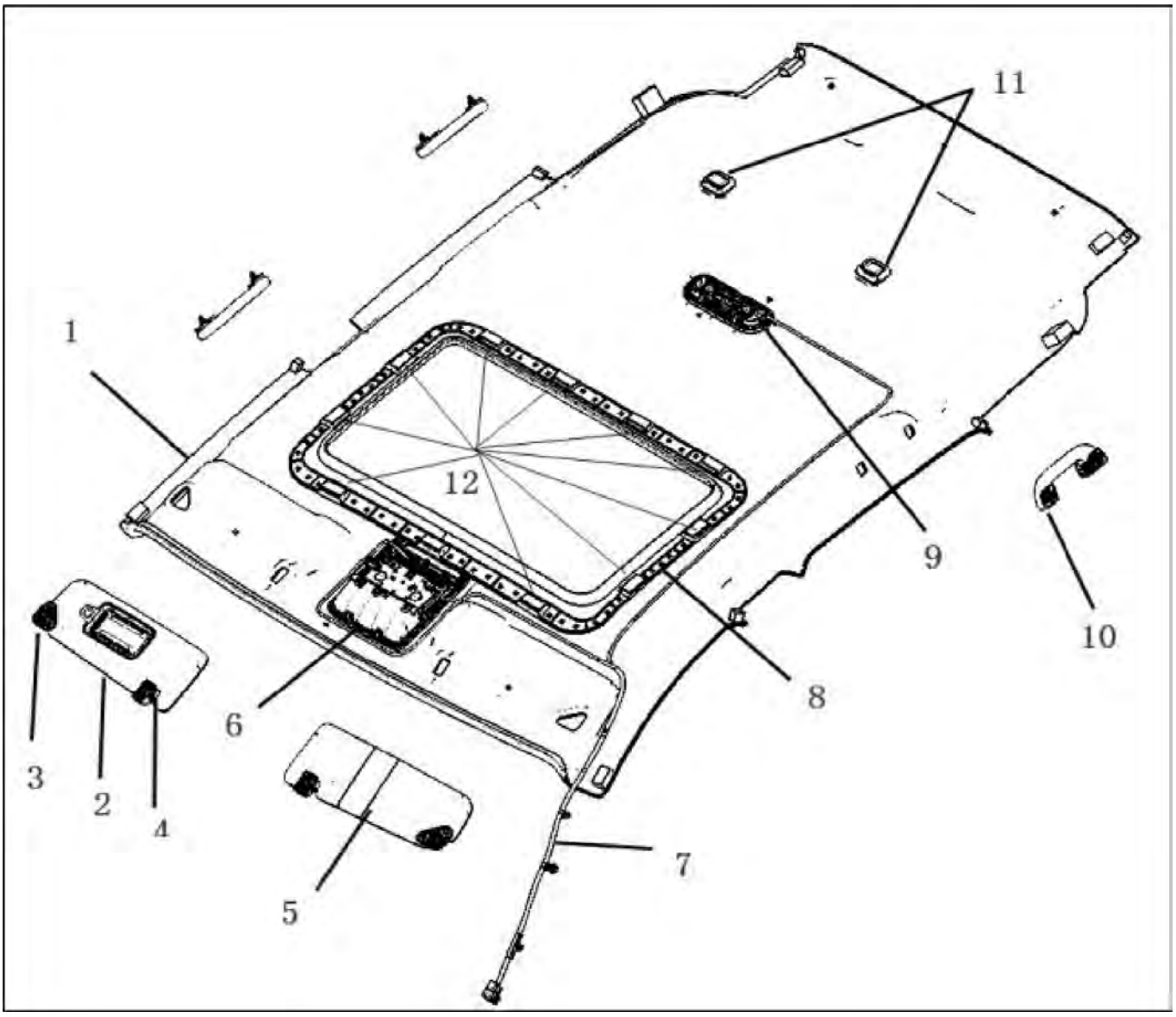
Boot lid protection cover

Exploded view



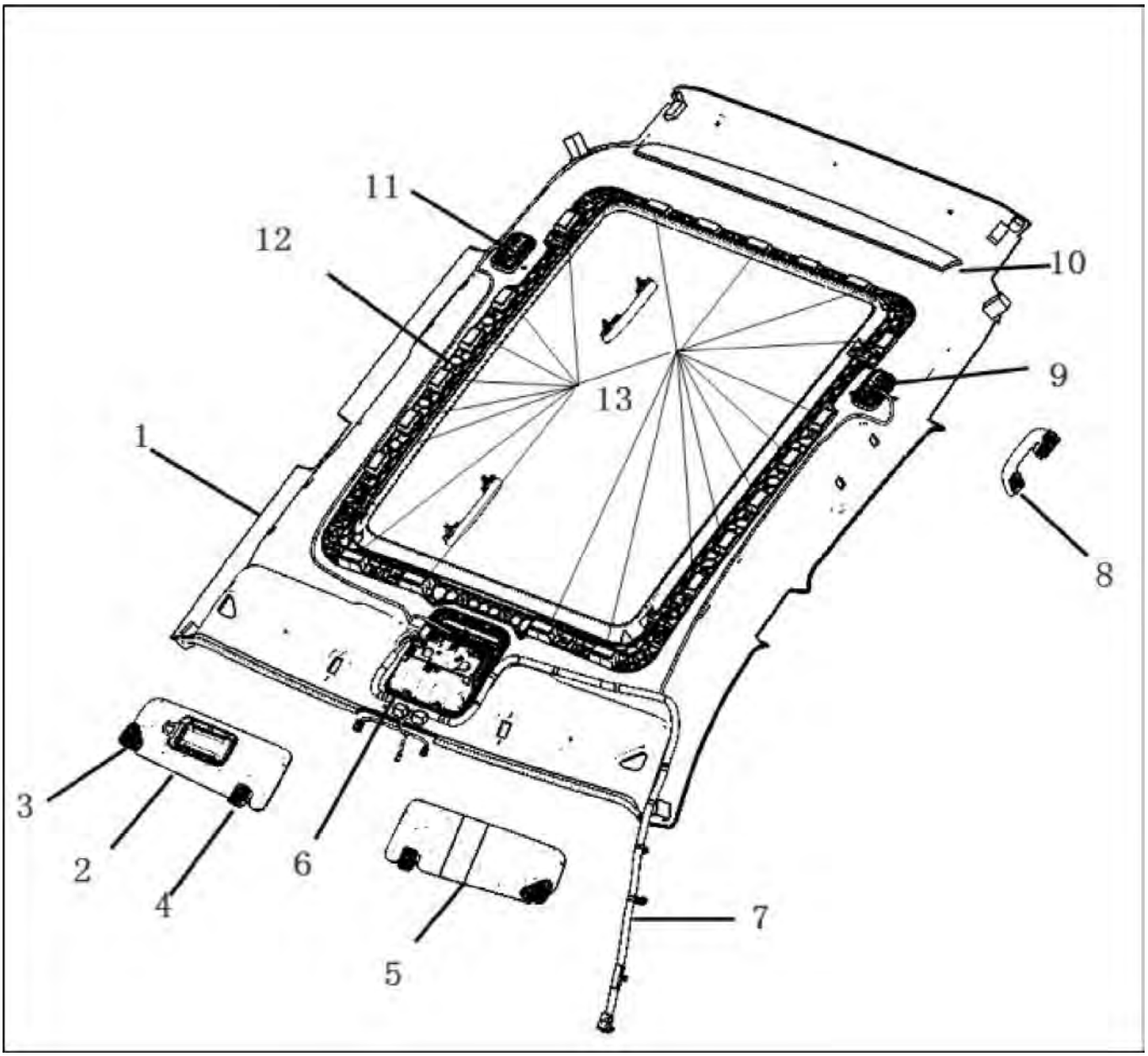
Item	Description	Item	Description
1.	Trunk lid upper shield assembly	6.	Handle box
2.	Trunk lid left shield assembly	7.	Handle bracket
3.	Boot lid right shield assembly	8.	Cross recessed truss head self-tapping screw
4.	Boot lid lower side shield assembly	9.	Pan head screw with cross recess
5.	Plug cap		

Roof Interior Trims



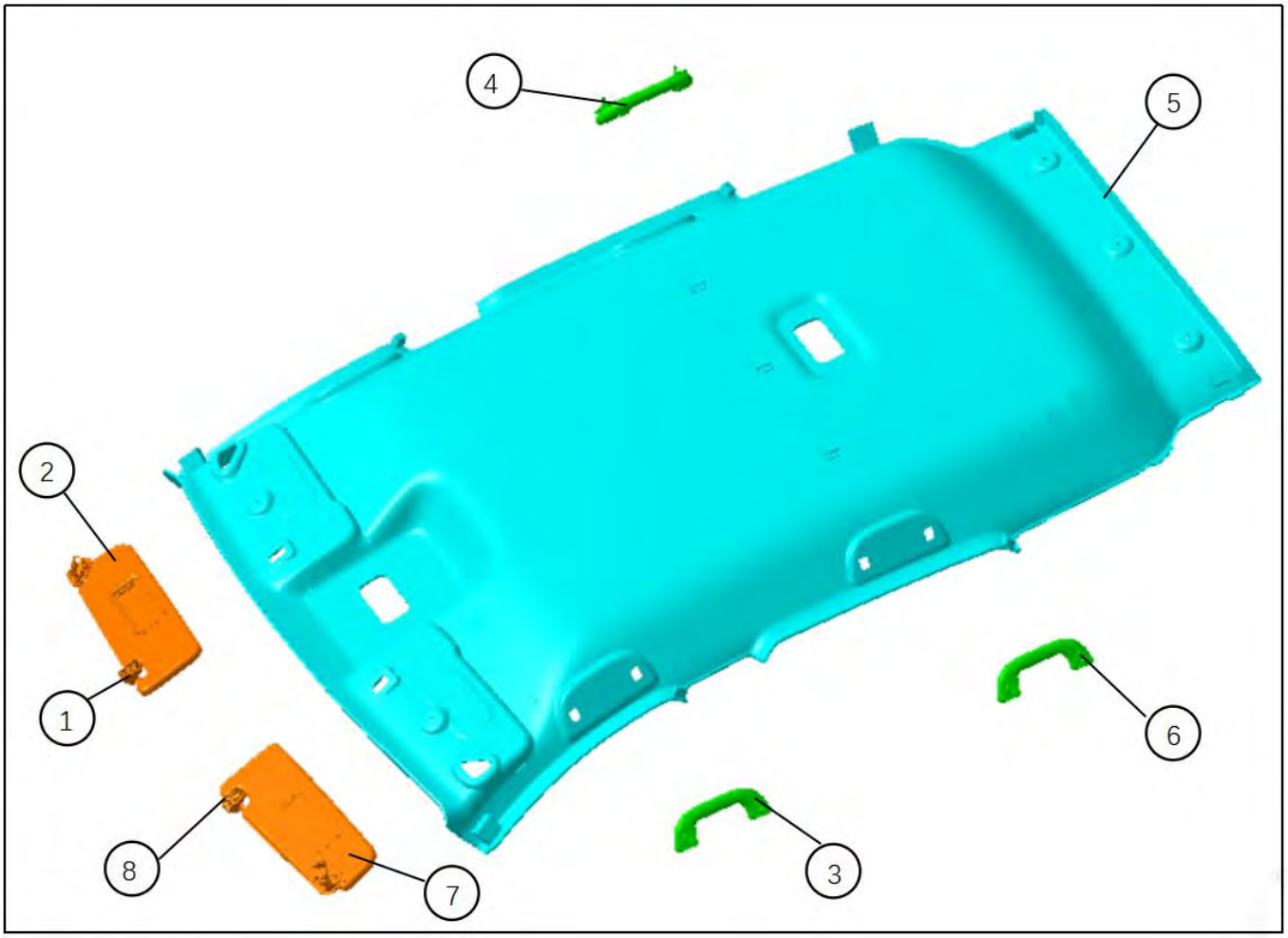
Item	Description	Item	Description
1.	Roof	7.	Roof harness
2.	Right sun visor	8.	Small sunroof opening reinforcement bracket
3.	Sun visor support	9.	Rear interior roof light assembly
4.	Sun visor hook	10.	Grab handle assembly
5.	Left sun visor	11.	Dual lock
6.	Front interior roof light assembly	12.	Dual lock of sunroof reinforcement bracket

Roof interior trim (with sunroof)



Item	Description	Item	Description
1.	Roof	8.	Grab handle assembly
2.	Right sun visor	9.	Left side compartment light
3.	Sun visor support	10.	Roof sound-absorbing cotton
4.	Sun visor hook	11.	Right side compartment light
5.	Left sun visor	12.	Panoramic sunroof opening reinforcement bracket
6.	Front interior light assembly	13.	Dual lock
7.	Roof harness		

Roof interior trim (without sunroof)



Item	Description	Item	Description
1	Right sun visor hook	5	Roof assembly
2	Right sun visor	6	Rear passenger handrail (left)
3	FRONT PASSENGER'S ARMREST	7	Left sun visor
4	Rear passenger handrail (right)	8	left sun visor hook

5.8.1.2 Precautions for interior shield

1. **Caution:** Disconnect the battery cable in advance.
2. **Caution:** Disconnect the SRS circuit in advance.
3. **Caution:** Do not damage or force to open the airbag cover, otherwise it will have an adverse effect on the performance of the airbag.
4. **Caution:** Be careful not to scratch the gasket and other parts and components.
5. **Caution:** When removing or disassembling any parts, be careful not to damage or deform them. Exercise caution to protect those parts and components that may tear the cloth.

6. **Caution:** When removing parts and components with a screwdriver or other tools, wrap the parts and components with vinyl tape or cloth tape for protection.

7. **Caution:** Protect the removed parts and components with cloth.

8. **Caution:** Do not apply excessive force to the PP plastic parts in the shield.

9. **Caution:**During removal and installation of interior trim, avoid contact between sharp objects and the outer surface.

10. **Caution:**When prying open the shield, pay attention to protecting it from scratches.

11. **Caution:** If non-reusable parts and components are removed, replace them with new ones.

12. **Caution:** Tighten the bolts and nuts to the specified torque.

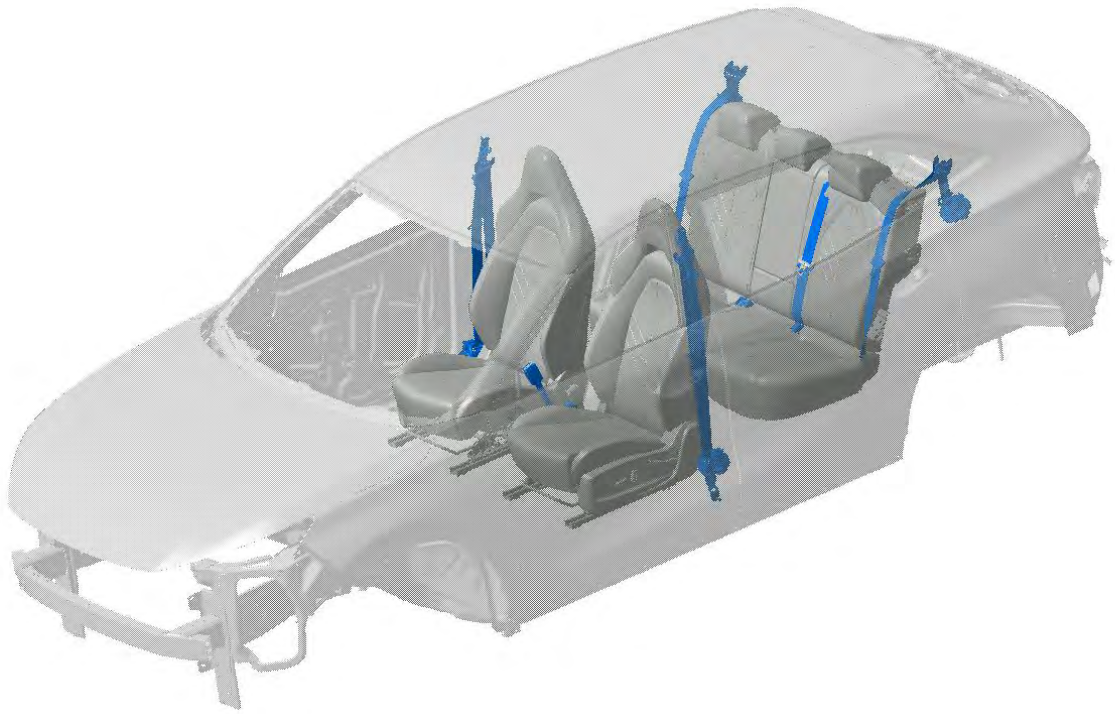
13. **Caution:** After reassembling is completed, confirm that each part and component works normally.

14. **Caution:**Treatment of water-soluble stains during maintenance: Soak a soft cloth in water, then wring it out thoroughly. After removing the stain, wipe the area with a soft, dry cloth.

15. **Caution:**Treatment of oil stains during maintenance: Dissolve synthetic detergent (with a concentration of 2% ~ 3% or less) in warm water, dampen a cloth with the solution, and vigorously wipe off the oil stains. Next, soak the cloth in clean water, wring it out thoroughly, and use it to completely remove any detergent residue. Finally, wipe the cleaned area with a soft, dry cloth.

16. **Caution:** Do not use organic solvents such as thinners or petrol.

5.8.1.3 Component Locating Diagram



S/N	Name	S/N	Name
1	Front left seat belt assembly	6	Front left seat belt buckle assembly
2	Front right seat belt assembly	7	Front right seat belt buckle assembly

S/N	Name	S/N	Name
3	Rear left seat belt assembly	8	Rear seat left seat belt buckle assembly
4	Rear right seat belt assembly	9	Rear seat right seat belt buckle assembly
5	Rear middle seat belt assembly	10	Seat belt height adjuster assembly

5.8.2 Removal and installation

5.8.2.1 Front door shield

Removal

Caution: The front left door shield is a PP plastic part. Do not apply excessive force to it.

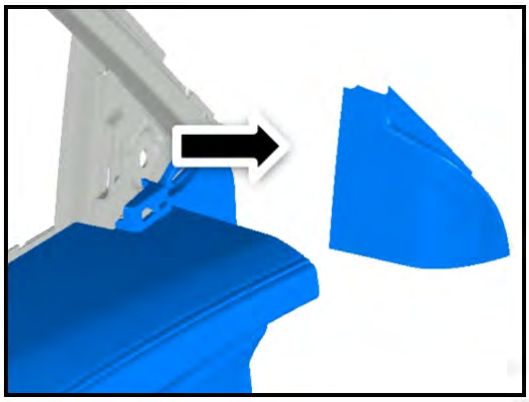
Caution: Prevent sharp objects from contacting the exterior surface during removal and installation.

Caution: During prying off the panel, protect the trim panel from being scratched.

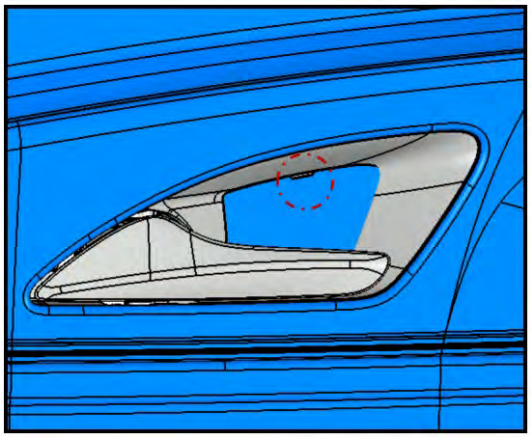
Caution: Please replace disposable parts and components, such as forceful clips (with assembly).

Caution: Keep removed small parts such as plugs and screws safe to prevent loss.

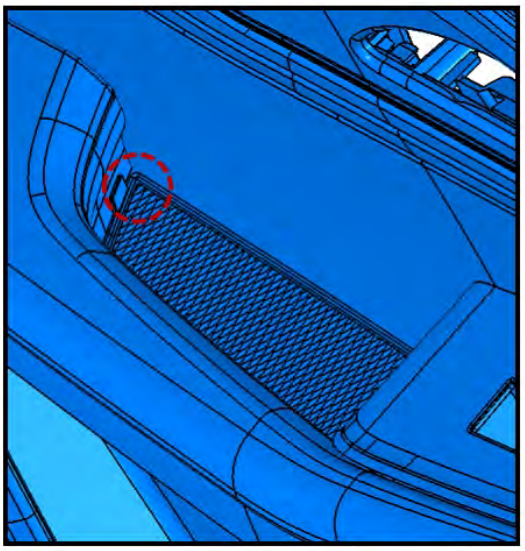
1. Remove the front left door triangle block assembly. Open the door, pry up the edge of front left door triangle block assembly along the interior direction, then disengage the fixing clip and take out the front left door triangle block assembly.



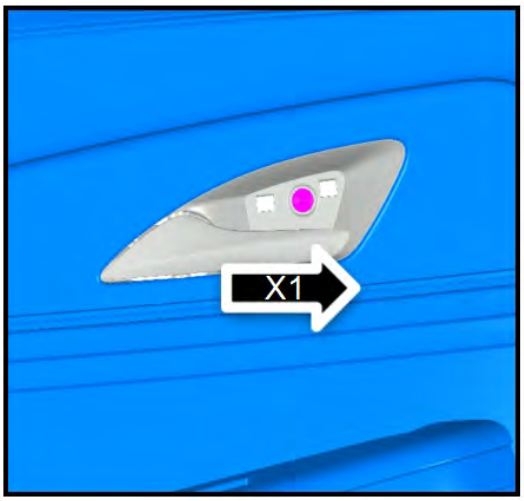
2. Remove the left interior door handle cover cap. Remove the interior handle cover cap using a straight screwdriver.

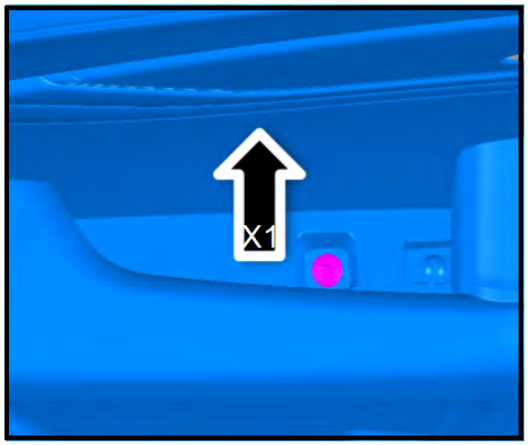


3. Drive to remove the front left door handle box plug cap. Hold the small blade of the handle box plug cap with fingers, and lift up the plug cap to take it out.



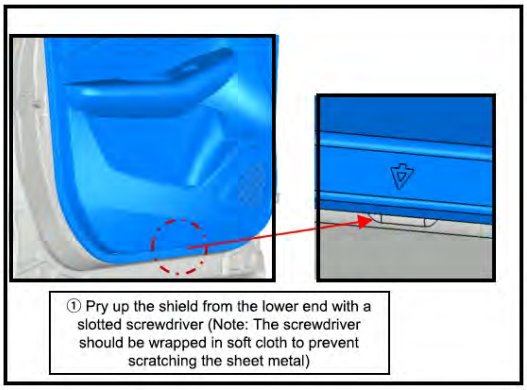
4. Remove screws. Use an electric screwdriver (cross-head screwdriver/straight screwdriver) to remove the two screws at the inner handle and handle box.

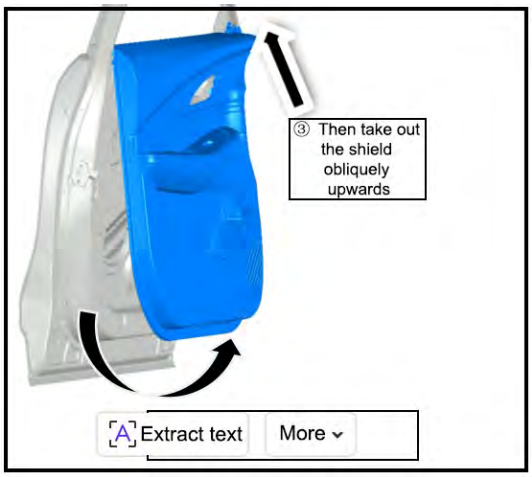




5. Remove the front left door shield assembly. First, use a flat screwdriver to pry open the shield from the bottom.

   Caution: The screwdriver needs to be covered with soft cloth to avoid scratching the sheet metal, disengage the clips on the shield, then take out the shield obliquely upwards, and then remove the interior handle cable and harness connector. Refer to relevant instructions for removing the interior handle cable and harness connector, and remove the front door shield.





6. Remove the armrest fixing bracket and sealing block on the door sheet metal inner panel.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The front right door shield has the same structure as the front left door shield, and the disassembly and assembly order is the same.

5.8.2.2 Rear door shield

Removal

Caution: The rear left door shield is a PP plastic part, please do not apply strong force to it.

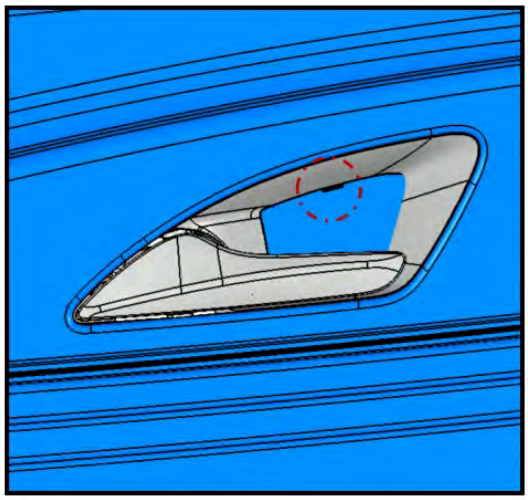
Caution: Prevent sharp objects from contacting the exterior surface during removal and installation.

Caution: During prying off the panel, protect the trim panel from being scratched.

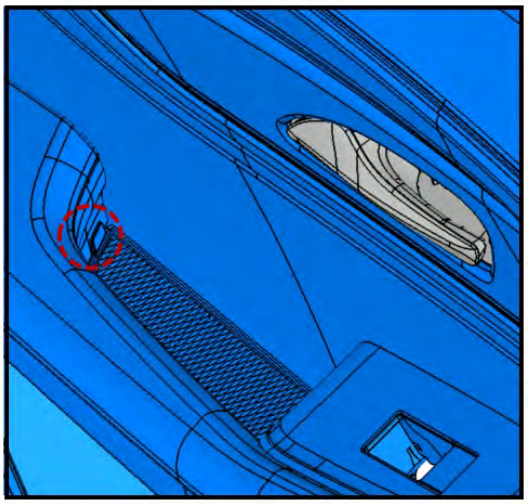
Caution: Please replace disposable parts and components, such as forceful clips (with assembly).

Caution: Keep removed small parts such as plugs and screws safe to prevent loss.

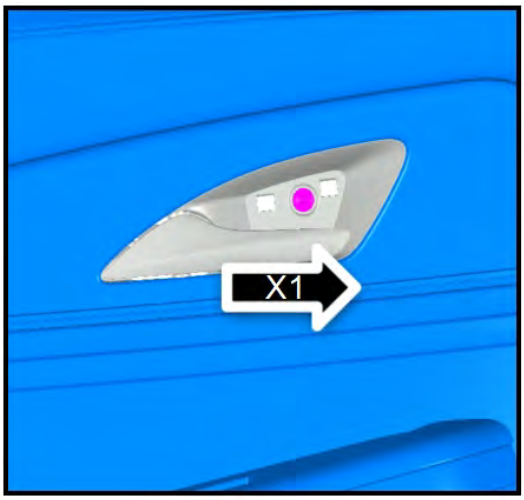
1. Remove the left interior door handle cover cap. Remove the interior handle cover cap using a straight screwdriver.

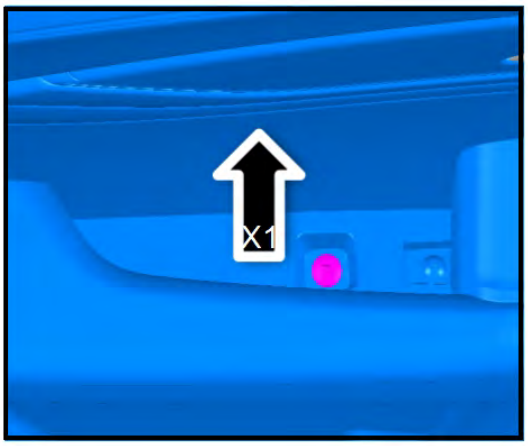


2. Drive to remove the rear left door handle box plug cap. Hold the small blade of the handle box plug cap with fingers, and lift up the plug cap to take it out.



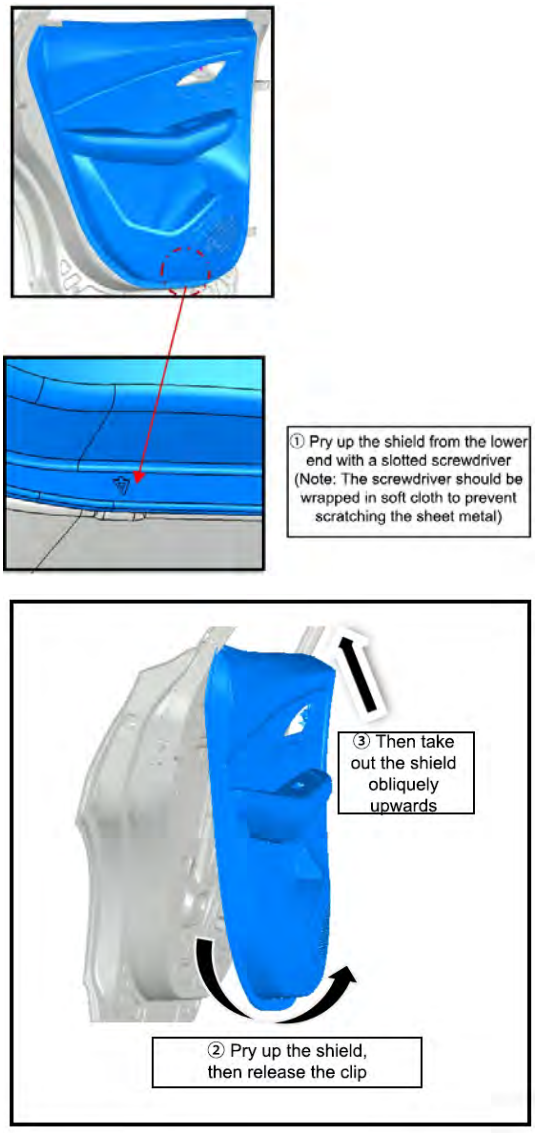
3. Remove screws. Use an electric screwdriver (cross-head screwdriver/straight screwdriver) to remove the two screws at the inner handle and handle box.





4. Remove the rear left door shield assembly. First, use a flat screwdriver to pry open the shield from the bottom.

   Caution: The screwdriver needs to be covered with soft cloth to avoid scratching the sheet metal, disengage the clips on the shield, then take out the shield obliquely upwards, and then remove the interior handle cable and harness connector. Refer to relevant instructions for removing the interior handle cable and harness connector, and remove the front door shield.



5. Remove the armrest fixing bracket and sealing block on the door sheet metal inner panel.

Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The rear right door shield has the same structure as the rear left door shield, and the disassembly and assembly order is the same.

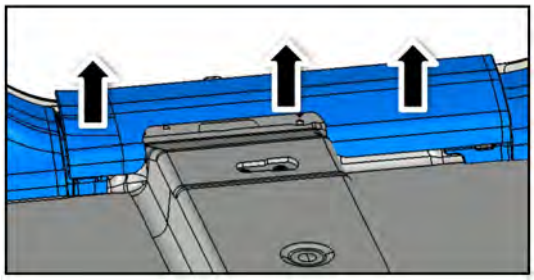
5.8.2.3 Front left door sill shield

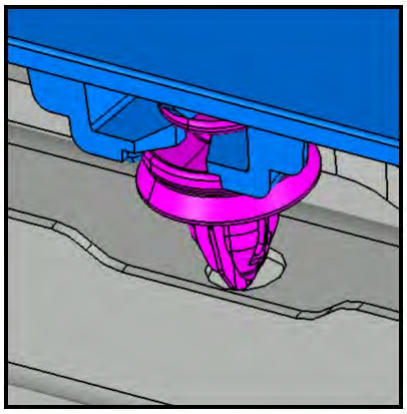
Removal

Caution: The side wall shield is a PP plastic part. Do not apply strong force to it. During disassembly and assembly, avoid sharp objects from contacting the outer surface. When

prying open the shield, pay attention to protecting the shield to avoid scratches.

1. Remove the door frame sealing rubber strip first.
2. Grab the edge of the sill trim panel upward from the carpet and pry it up. Pull out the forceful clip snapped into the sheet metal to remove the front sill shield.





Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

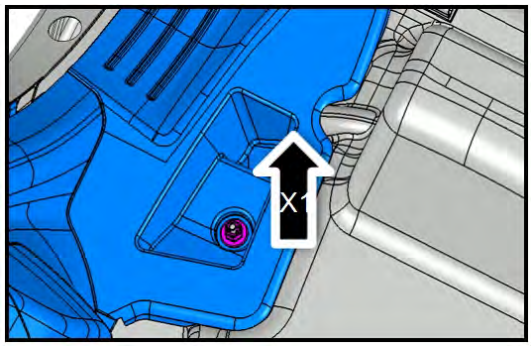
   Caution: The front right door sill shield has the same structure as the front left door sill shield, and the disassembly and assembly order is the same.

5.8.2.4 Rear left door sill shield

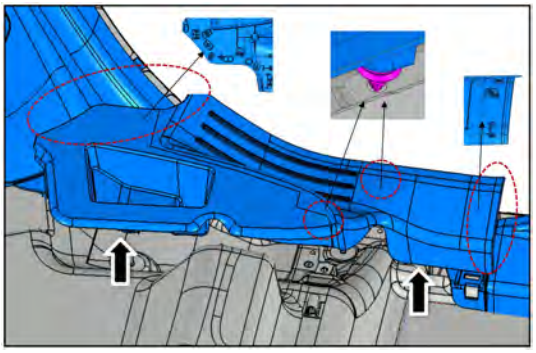
Removal

Caution: The side wall shield is a PP plastic part. Do not apply strong force to it. During disassembly and assembly, avoid sharp objects from contacting the outer surface. When prying open the shield, pay attention to protecting the shield to avoid scratches.

1. Remove the door frame sealing rubber strip first.
2. Lift the rear seat cushion and pull out the plastic nut hidden under the cushion.



3. Pry up from the direction of the arrow shown in the figure, and pull out all the clips and fasteners.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

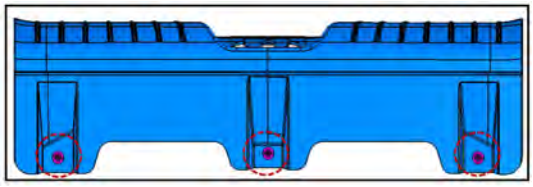
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The rear right door sill shield has the same structure as the rear left door sill shield, and the disassembly and assembly order is the same.

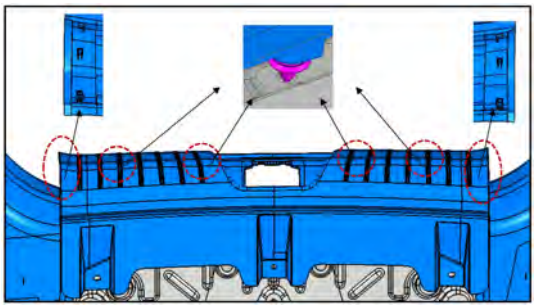
5.8.2.5 Trunk lid sill shield

Removal

1. Remove the door frame sealing rubber strip first.
2. Remove the spare tyre cover plate. Refer to: Rear carpet system (trunk cover plate and trunk cover plate support).
3. Remove the carpet support block under the cover plate and take out the spare tyre.
4. Use a cross-head screwdriver or blade to remove the 3 snap fasteners that fix the boot lid sill.



5. Pull upward to disengage the forceful clips (4 in total) and self-retaining clips (2 in total), and then remove the boot lid threshold.



Installation

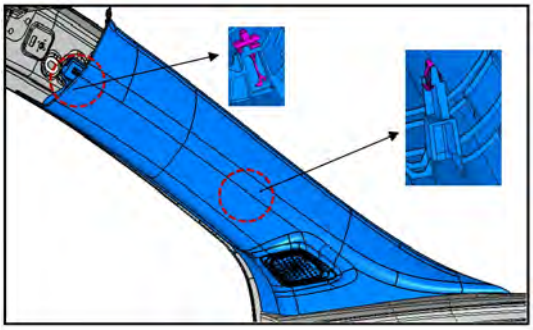
1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

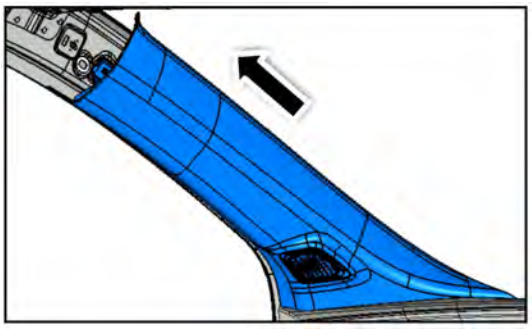
5.8.2.6 Left A-pillar upper shield

Removal

1. Remove the front door sealing rubber strip first.
2. Open the A-pillar upper shield from the upper end to the inside of the car, use a straight screwdriver to disengage the upper end of the A-pillar upper shield, and remove 2 mounting points, an anti-dislodgement buckle and a metal clip.



3. For models equipped with high-pitch speakers, the harness connector must be disconnected first. The method refers to the harness and high-pitch speaker disassembly instructions, and then the A-pillar upper shield is pulled out obliquely upwards.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

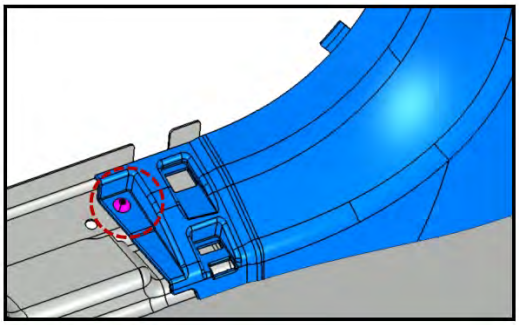
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right A-pillar upper shield has the same structure as the left A-pillar upper shield, and the removal and installation sequence is the same.

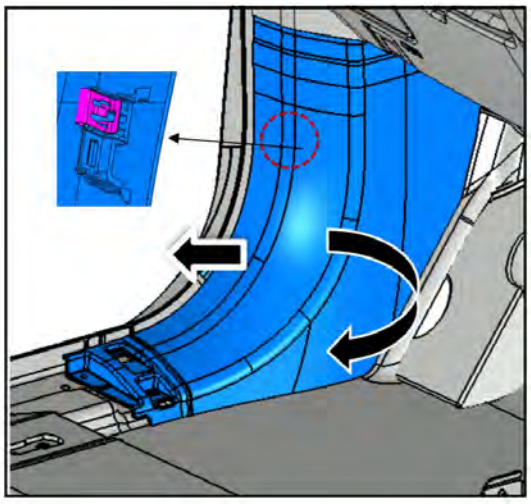
5.8.2.7 Left A-pillar lower shield

Removal

1. Remove the front door frame sealing rubber strip first.
2. Remove the engine bonnet opening handle.
3. Remove the front sill shield. Refer to: Front left sill shield.
4. Use a cross-head screwdriver or blade to disassemble 1 snap fastener on the lower side of the sub-A-pillar at the position shown in the Fig.



5. Pull the shield toward the rear of the vehicle (X direction) and pull out the metal card that matches the upper end of the A-pillar lower shield with the sheet metal.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

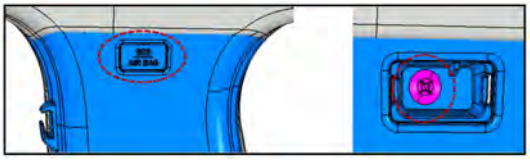
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right A-pillar lower shield has the same structure as the left A-pillar lower shield, and the disassembly and assembly order is the same.

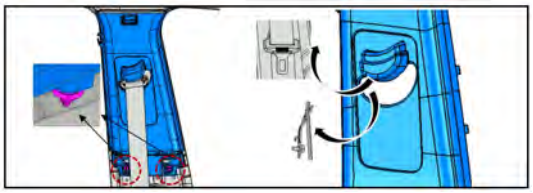
5.8.2.8 Left B-pillar upper shield

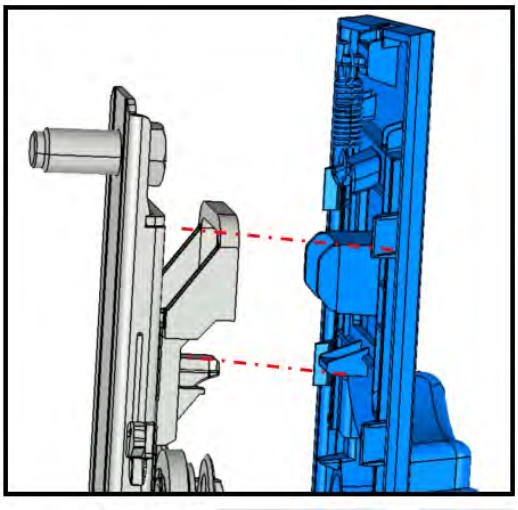
Removal

1. Remove the front and rear door sealing rubber strips first.
2. Remove the B-pillar lower shield, Refer to: Left B-pillar lower shield.
3. Disassemble the seat belt lower webbing fixing point, Refer to: Front left seat belt assembly.
4. Use a straight screwdriver to pry out the left B-pillar upper shield plug from the disassembly slot, and then use a cross-head screwdriver to remove 1 bolt under the plug.



5. Use a straight screwdriver to pry open the 2 plastic clips at the lower end of the shield, then pull out the left B-pillar upper shield obliquely downward, and pass the seat belt latch plate and lower fixing point structure through the shield through hole.





Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: For models equipped with high-profile seat belts, it is necessary to ensure that the sliding structure of the seat belt height adjuster and the sliding structure of the B-pillar upper shield are pushed to the upper limit position during assembly to ensure the accuracy of the relative position of the matching structure.

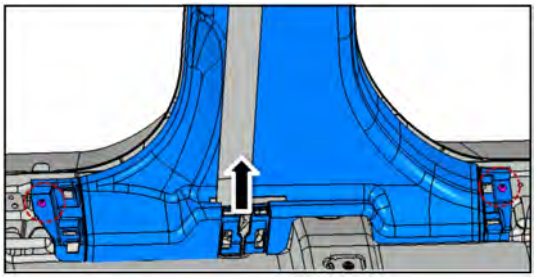
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right B-pillar upper shield has the same structure as the left B-pillar upper shield, and the removal and installation sequence is the same.

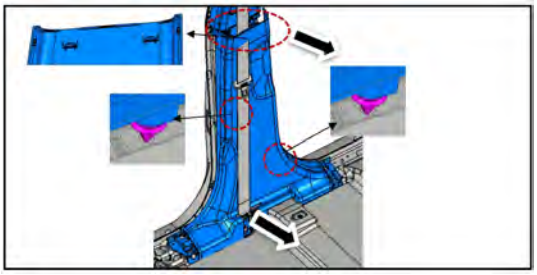
5.8.2.9 Left B-pillar lower shield

Removal

1. Remove the front and rear door sealing rubber strips first.
2. Remove the front door sill shield. Refer to: Front left door sill shield.
3. Remove the rear door sill shield. Refer to: Rear left door sill shield.
4. Use a cross-head screwdriver or blade to disassemble the snap fasteners at the front and rear ends, and pull out the small plug cover below upward.



5. Pull the flanges (both sides) indicated by the arrow, first disengage the clips that match the B-pillar upper shield, then disengage the clips (a total of 2 places) and, and remove the left B-pillar lower shield in the Y direction (the seat belt webbing is removed from the gap at the small plug position).



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

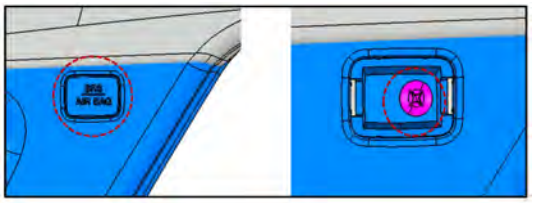
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right B-pillar lower shield has the same structure as the left B-pillar lower shield, and the removal and installation sequence is the same.

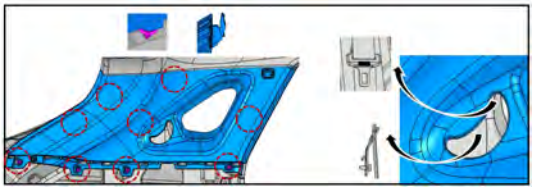
5.8.2.10 Left C-pillar upper shield

Removal

1. Remove the rear door sealing strip.
2. Remove the boot lid sealing strip.
3. Remove the left C-pillar lower shield, Refer to: Left C-pillar lower shield.
4. Disassemble the lower fixing point of the second row seat belt, Refer to: Rear left seat belt assembly.
5. Use a straight screwdriver to pry out the left C-pillar upper shield screw plug cover, and then use a cross-head screwdriver to remove the bolts under the plug cover.



6. Disengage the clip (9 places in total) and limit hook (1 place) toward the inside of the vehicle, remove the left C-pillar upper shield obliquely downward, and then pass the seat belt clip and lower fixing point through the shield hole.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

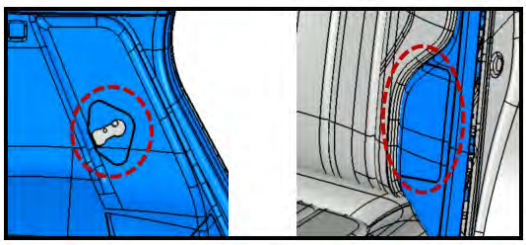
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right C-pillar upper shield has the same structure as the left C-pillar upper shield, and the disassembly and assembly sequence is the same.

5.8.2.11 Left C-pillar lower shield

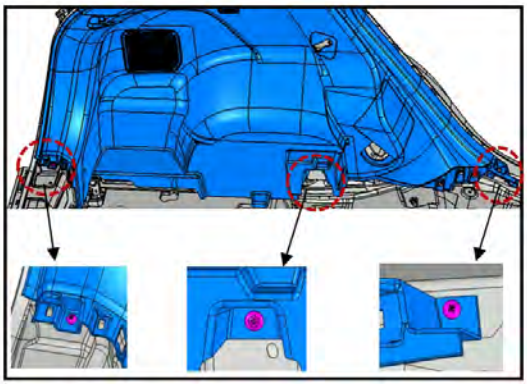
Removal

1. Remove the retractable trunk partition and remove the rear door seal.
2. Remove the boot lid sealing strip.
3. Remove the rear sill shield. Refer to: Rear left sill shield.
4. Remove the boot lid sill shield. Refer to: Boot lid sill shield.
5. Lay down the seat backrest, pry open the lock cover plate with a straight screwdriver, open the seat cover plate by hand, and then disassemble the seat. Refer to: Seat disassembly instructions.

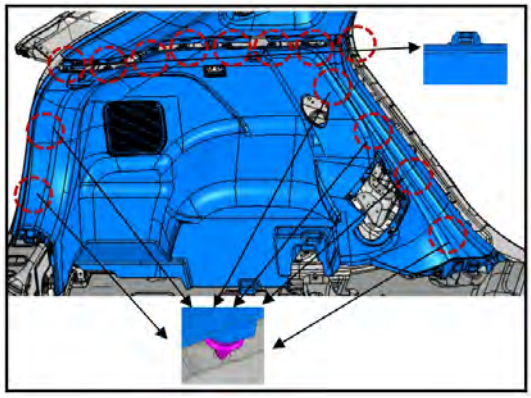


6. Remove the lower fixing point of the second row seat belt. Refer to: Rear left seat belt assembly.

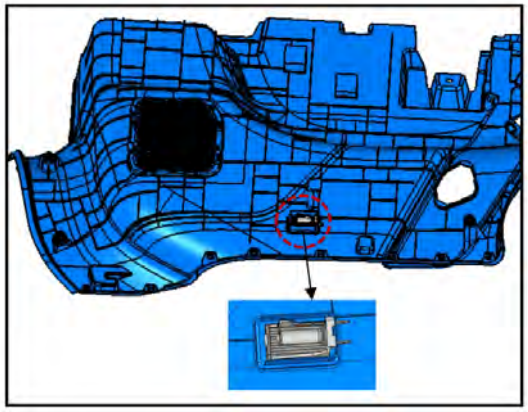
7. Use a cross-head screwdriver to disassemble the self-tapping screws at the front and rear ends of the left C-pillar lower shield and 1 snap fastener in the middle.



8. Remove the gantry card and clip that match the C-pillar upper shield.



9. Pull out the trunk light connector (only for the left C-pillar, refer to the light disassembly instructions), and remove the left C-pillar lower shield.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The right C-pillar lower shield has the same structure as the left C-pillar lower shield, and the disassembly and assembly sequence is the same.

5.8.2.12 Trunk lid upper shield assembly

Removal

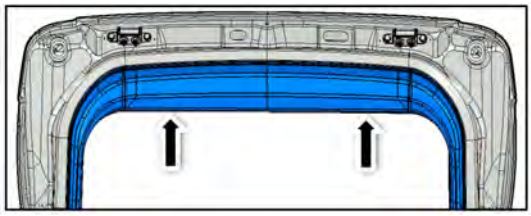
Caution: The boot lid cover is a PP plastic part, please do not apply strong force to it.

Caution: During removal and installation of interior trim, avoid contact between sharp objects and the outer surface.

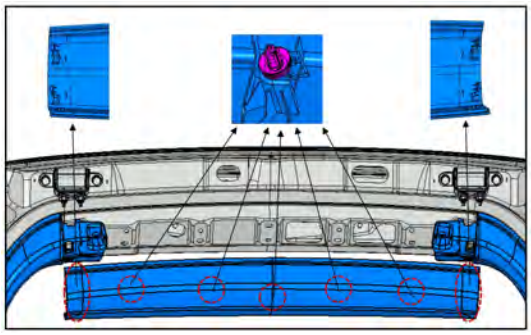
Caution: When prying open the shield, pay attention to protecting it from scratches.

Caution: Please replace disposable parts and components.

1. Insert a straight screwdriver (wrapped in cloth to prevent scratching or damaging the rear windscreen) into the clearance between the rear windscreen and the trunk lid upper trim panel, then pry it out with force.



2. Remove the clips (4 in total) and pin assemblies (2 in total), then remove the parts.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The removal method for the right boot lid shield assembly is the same as for the left one.

5.8.2.13 Trunk lid left shield assembly

Removal

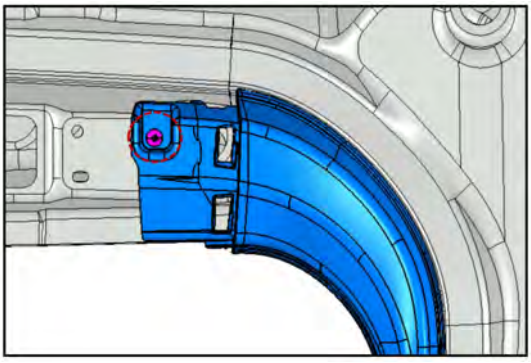
Caution: The boot lid cover is a PP plastic part, please do not apply strong force to it.

Caution: During removal and installation of interior trim, avoid contact between sharp objects and the outer surface.

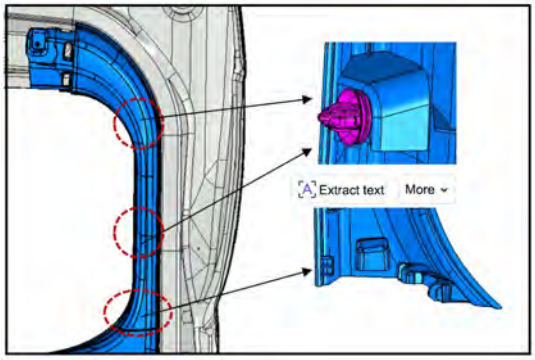
Caution: When prying open the shield, pay attention to protecting it from scratches.

Caution: Please replace disposable parts and components.

1. First remove the Boot lid upper side shield assembly, Refer to: Boot lid upper side shield assembly.
2. Remove the self-tapping screws using a cross-head screwdriver or electric screwdriver.



3. Remove the clips (2 places in total) and clip assembly (1 place in total), and then remove the parts (disassembled in Y direction).



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

   Caution: The removal method for the right boot lid shield assembly is the same as for the left one.

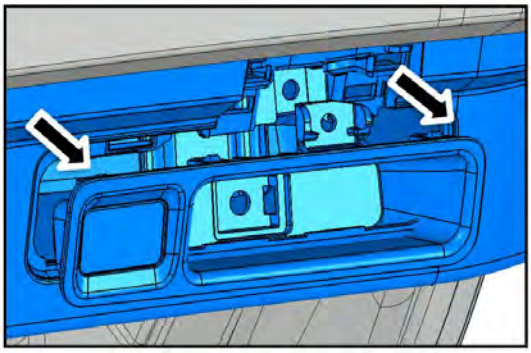
5.8.2.14 Trunk lid lower shield assembly

Removal

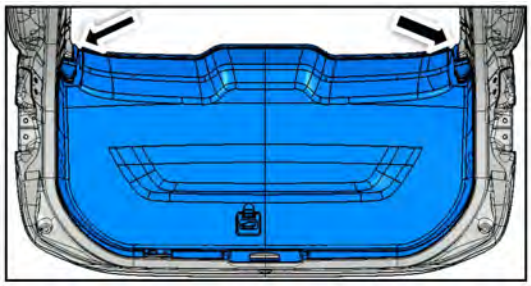
1. First remove the Boot lid upper side shield assembly, Refer to: Boot lid upper side shield assembly.
2. Remove the Boot lid left/right side shield assembly, Refer to: Boot lid left side shield assembly.
3. Use a straight screwdriver to pry open the boot lid plug cover and the small plug cover at the bottom of the handle box, and then use a cross-head screwdriver to disassemble the screws at the left and right corners of the boot lid shield and under the cover plate.



4. Pry out the boot lid handle box with a straight screwdriver. For power boot lid models, it is necessary to disconnect the boot lid switch connector.



5. Pry open the shield from both corners of the boot lid shield, disassemble the concealed clips from left to right (or from right to left), and then remove the part.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

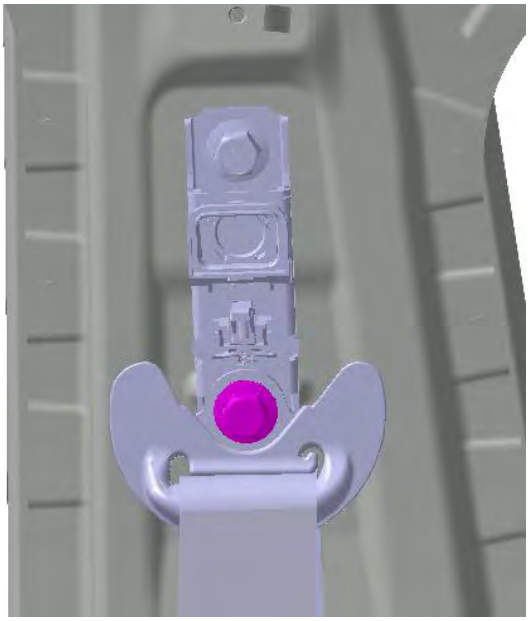
   Caution: Pay attention to adjusting the assembly gap of the shield after installation.

5.8.2.15 Seat belt height adjuster assembly

Caution: The removal and installation methods of the left and right seat belt height adjuster assemblies are the same. Take the left one as an example.

Removal

1. Remove the left B-pillar upper shield assembly. Refer to: Left B-pillar upper shield.
2. Remove 1 fixing nut at the upper part of front left seat belt assembly. Tightening torque: 45±5Nm



3. Remove 1 fixing bolt and take out the seat belt height adjuster assembly. Tightening torque: 45±5Nm



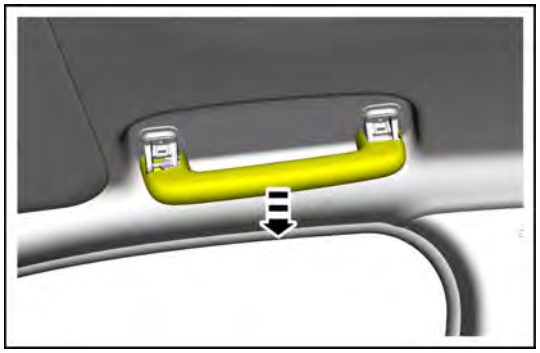
Installation

1. The installation order is the reverse of the removal order.

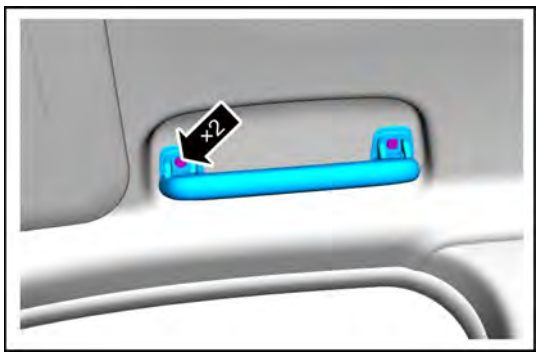
5.8.2.16 Roof armrests

Removal

1. Pull the roof armrest.



2. Remove the fixing screws of roof armrest, and take down the armrest.



Installation

1. The installation order is the reverse of the removal order.

5.8.2.17 Roof interior trim assembly

General Tools

Interior trim panel clip remover

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the front door sill shields on both sides. Refer to: Front left door sill shield.
3. Remove the rear door sill shields on both sides. Refer to: Rear left door sill shield.
4. Remove the A-pillar upper shields on both sides. Refer to: Left A-pillar upper shield.
5. Remove the B-pillar lower shields on both sides. Refer to: Left B-pillar lower shield.
6. Remove the B-pillar upper shields on both sides. Refer to: Left B-pillar upper shield.
7. Remove the C-pillar upper shields on both sides. Refer to: Left C-pillar upper shield.
8. Remove the harness connector of front roof light.

9. Remove the front passenger's armrest. Refer to: Roof armrest.

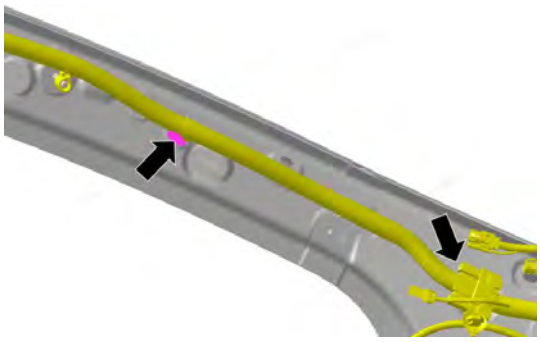
10. Remove the sun visors on both sides. Refer to: Sun visor.

11. Remove the interior rearview mirror housing (without USB). Refer to: Interior rearview mirror assembly.

12. Remove the interior rearview mirror housing (with USB). Refer to: Interior rearview mirror assembly.

Caution: While removing the rear fixing clip of roof interior trim, a person is required to help hold the front end of the roof interior trim.

13. Disconnect the left Roof harness connector and remove the fixing clip of the left Roof harness.



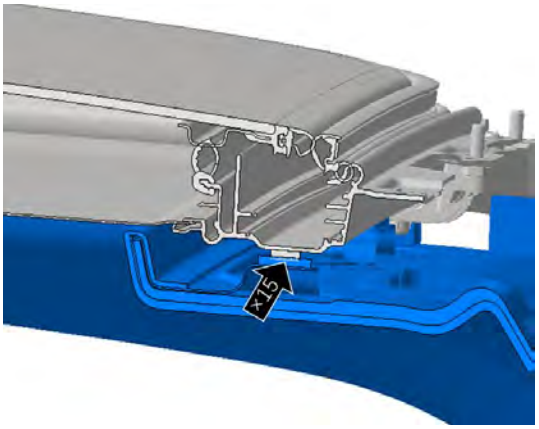
14. Disconnect the interior rearview mirror harness connector. Refer to: Interior rearview mirror assembly.

15. Remove the front and rear blade clips of Roof.



Caution: The following steps are applicable to low-end models.

16. Remove the mushroom buckle that overlaps the back of the Roof with the panoramic sunroof bracket.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

Caution: The installation of Roof with and without sunroof is basically the same.

5.8.2.18 Sun visor

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal

2. Remove the fixing screw cover plate of sun visor.

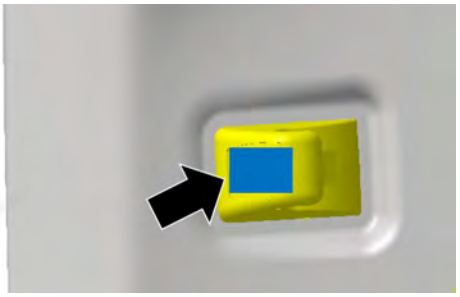


3. Remove the fixing screws of sun visor.

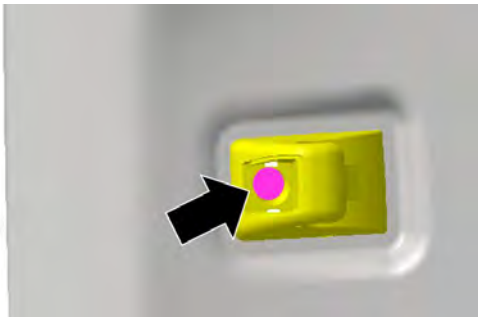


4. Disconnect the sun visor harness connector and remove the sun visor.

5. Remove the sun visor hook plug cap.



6. Remove the sun visor hook fixing screws and remove the sun visor hook.



Installation

1. The installation order is the reverse of the removal order.

5.8.2.19 Removal and installation of front left seat belt assembly

Caution: Before repair, the ignition switch should be turned off, the battery negative pole disconnected for more than 3 min, and static electricity prevented.

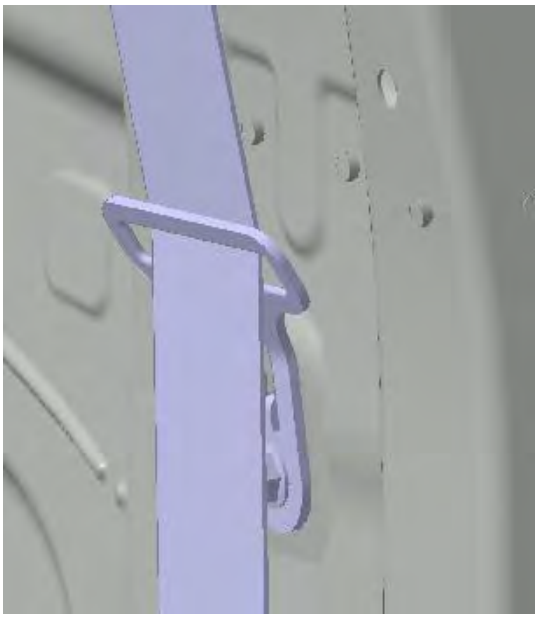
Caution: Never operate on the front of the SRS; operate on the side of the SRS.

Caution: The removal and installation methods of the left and right seat belt assemblies are the same. Take the left one as an example.

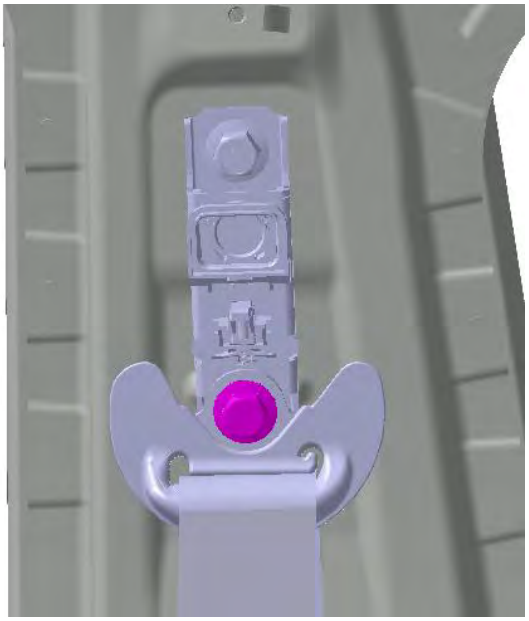
Removal

1. Remove the left B-pillar upper shield assembly. Refer to: Left B-pillar upper shield.

2. Remove the webbing guide. Tightening torque: 9±1 N•m



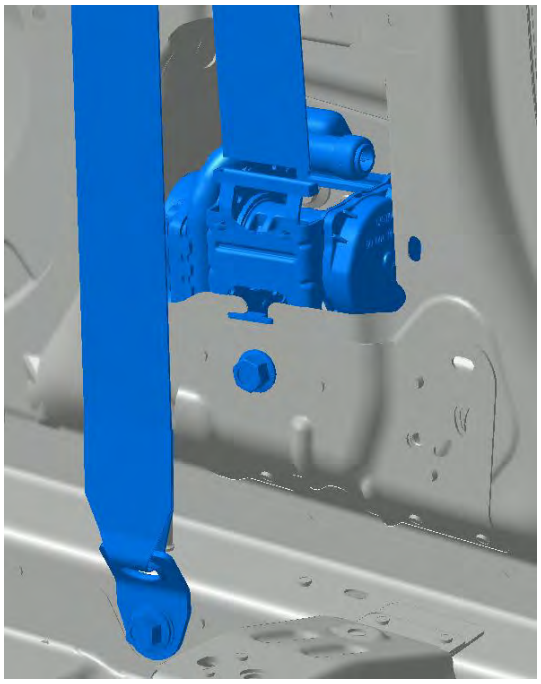
3. Remove 1 fixing nut at the upper part of front left seat belt assembly. Tightening torque: 45±5Nm



4. Remove the front left seat belt retractor assembly. After disconnecting 1 connector, remove 1 fixing bolt of the front

left seat belt retractor and take out the front left seat belt retractor assembly. Tightening torque: 45±5Nm

Caution: When disconnecting the connector, it is necessary to use a small screwdriver wrapped in adhesive tape to insert into the connector slot to pry up the lock catch before the connector can be unplugged.



Installation

1. The installation order is the reverse of the removal order.

   Caution: After installation, check whether the seat belt is installed in place, and make sure that it is not twisted or stuck.

5.8.2.20 Front left seat belt buckle assembly

Caution: The removal and installation methods of the left and right seat belt buckle assemblies are the same. Take the left one as an example.

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the auxiliary instrument panel body assembly. Refer to: Auxiliary dashboard assembly.
3. Remove the front left seat belt buckle assembly.

   Caution: Before removal, the seat assembly must be adjusted to the rearmost position.

   Disconnect 1 connector, then detach 1 harness clip, remove 1 fixing bolt, and take out the front left seat belt clip assembly. Tightening torque: 45±5Nm.



Installation

1. The installation order is the reverse of the removal order.

5.8.2.21 Rear left seat belt assembly

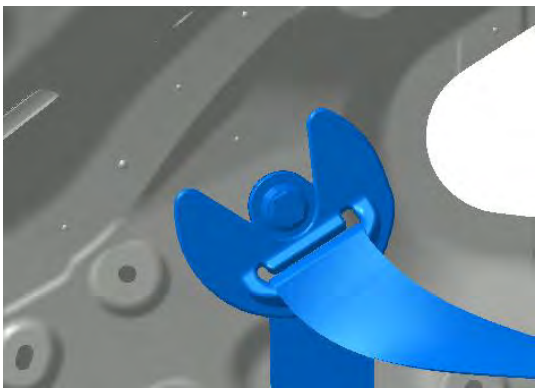
Caution: Before repair, the ignition switch should be turned off, the battery negative pole disconnected for more than 3 min, and static electricity prevented.

Caution: Never operate on the front of the SRS; operate on the side of the SRS.

Caution: The removal and installation methods of the left and right seat belt assemblies are the same. Take the left one as an example.

Removal

1. Remove the left C-pillar upper shield. Refer to: Left C-pillar upper shield.
2. Remove 1 fixing nut at the upper part of the rear left seat belt assembly. Tightening torque: 45±5Nm



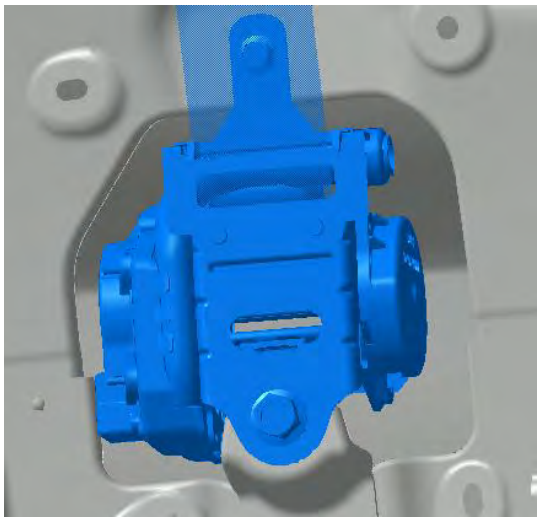
3. Remove the side wall shield assembly. Refer to: Boot lid left shield assembly.

4. Remove the rear left seat belt retractor assembly.

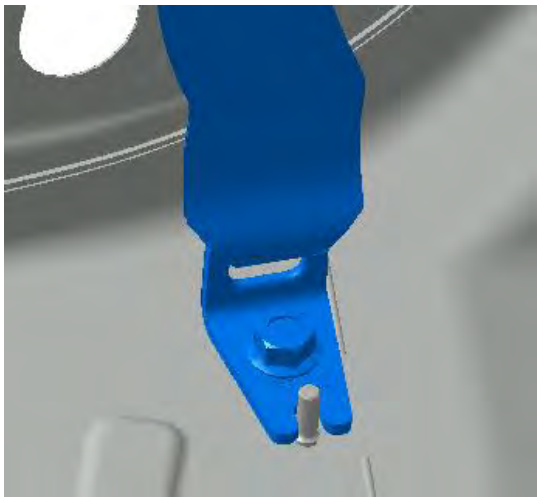
Caution: When disconnecting the connector, it is necessary to use a small screwdriver wrapped in adhesive tape to insert into the connector slot to pry up the lock catch before the connector can be unplugged.

After disconnecting 1 connector, remove 1 fixing bolt at the upper part of rear left seat belt retractor. Tightening torque: 9±1Nm.

Remove 1 fixing bolt of the rear left seat belt retractor, and then take out the front left seat belt retractor assembly. Tightening torque: 45±5Nm.



Remove 1 fixing bolt at the lower part of the front left seat belt. Tightening torque: 45±5Nm



Installation

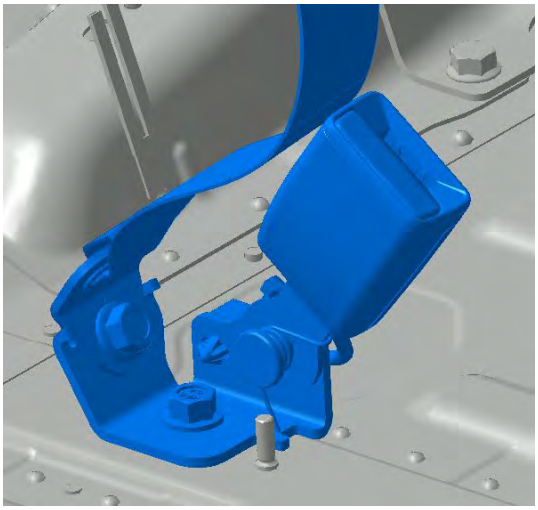
1. The installation order is the reverse of the removal order.

Caution: After installation, check whether the seat belt is installed in place, and make sure that it is not twisted or stuck.

5.8.2.22 Rear seat left seat belt buckle assembly

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the rear seat cushion assembly. Refer to: Rear 40%/60%-portion seat.
3. Remove the rear left seat belt buckle assembly. Disconnect 1 connector, remove 1 fixing bolt and take out the rear left seat belt buckle assembly. Tightening torque: 45±5Nm.



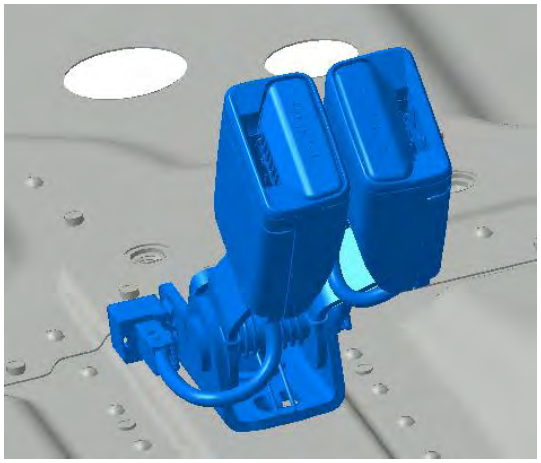
Installation

1. The installation order is the reverse of the removal order.

5.8.2.23 Rear seat right seat belt buckle assembly

Removal

1. Disconnect the battery negative terminal. Refer to: Disconnect the battery negative terminal
2. Remove the rear seat cushion assembly. Refer to: Rear 40%/60%-portion seat.
3. Remove the rear right seat belt buckle assembly. Disconnect 1 connector, remove 1 fixing bolt and take out the rear right seat belt buckle assembly. Tightening torque: 45±5Nm.



Installation

1. The installation order is the reverse of the removal order.

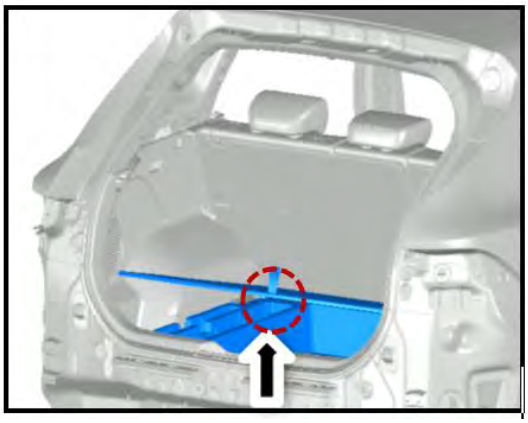
5.8.2.24 Rear carpet system (trunk cover plate and trunk cover plate support)

Removal

Caution: The lower support of the trunk cover plate is an EPP foam part, please do not apply strong force to it.

Caution: Prevent sharp objects from contacting the exterior surface during removal and installation.

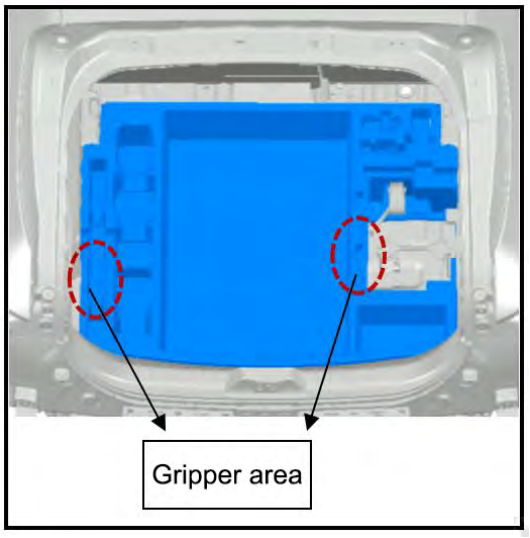
1. Remove the boot cover plate assembly. (The trunk cover plate is installed flat. Open the boot lid, grab the webbing handle, and take it out of the car directly after lifting it).



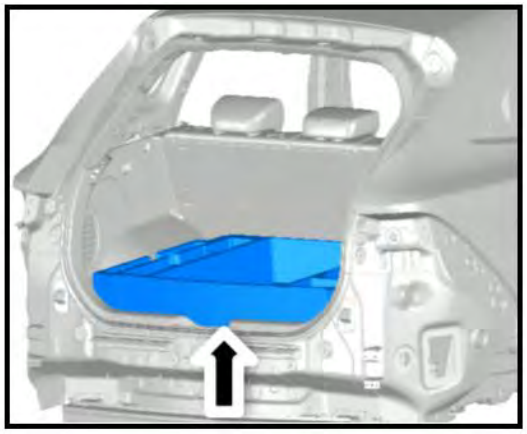
2. Remove the battery baffle, which is installed flat without fixing points and can be taken out directly upwards.



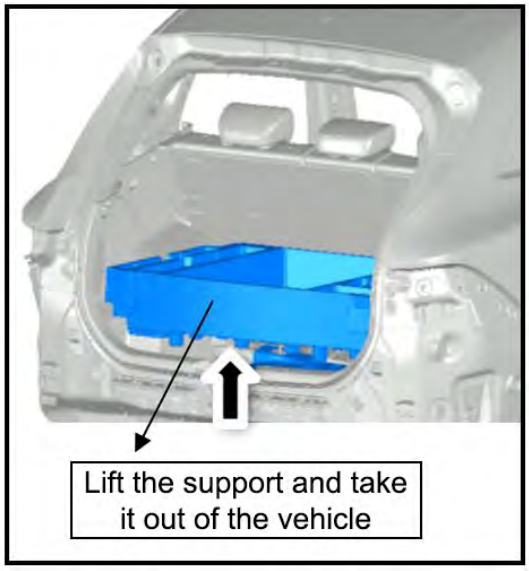
3. Remove the lower support of the trunk cover plate. The lower support of the trunk cover plate is installed flat without fixing points. After removing the trunk cover plate, use both hands to grasp the gripper area shown in Fig. on the right.



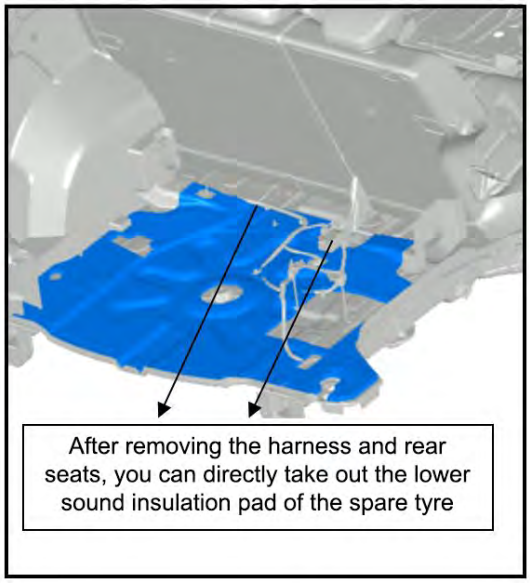
4. Lift it vertically upward until the front end of the support contacts the seat backrest.



5. Then lift the rear end of the support higher than the boot lid sill shield and take it out of the car along the direction of the boot lid opening.



6. To remove the lower NVH pad of the spare tyre, you need to remove the rear seats and harness first. After removing the rear seats and harnesses, directly lift the lower NVH pad of the spare tyre to remove it.



Installation

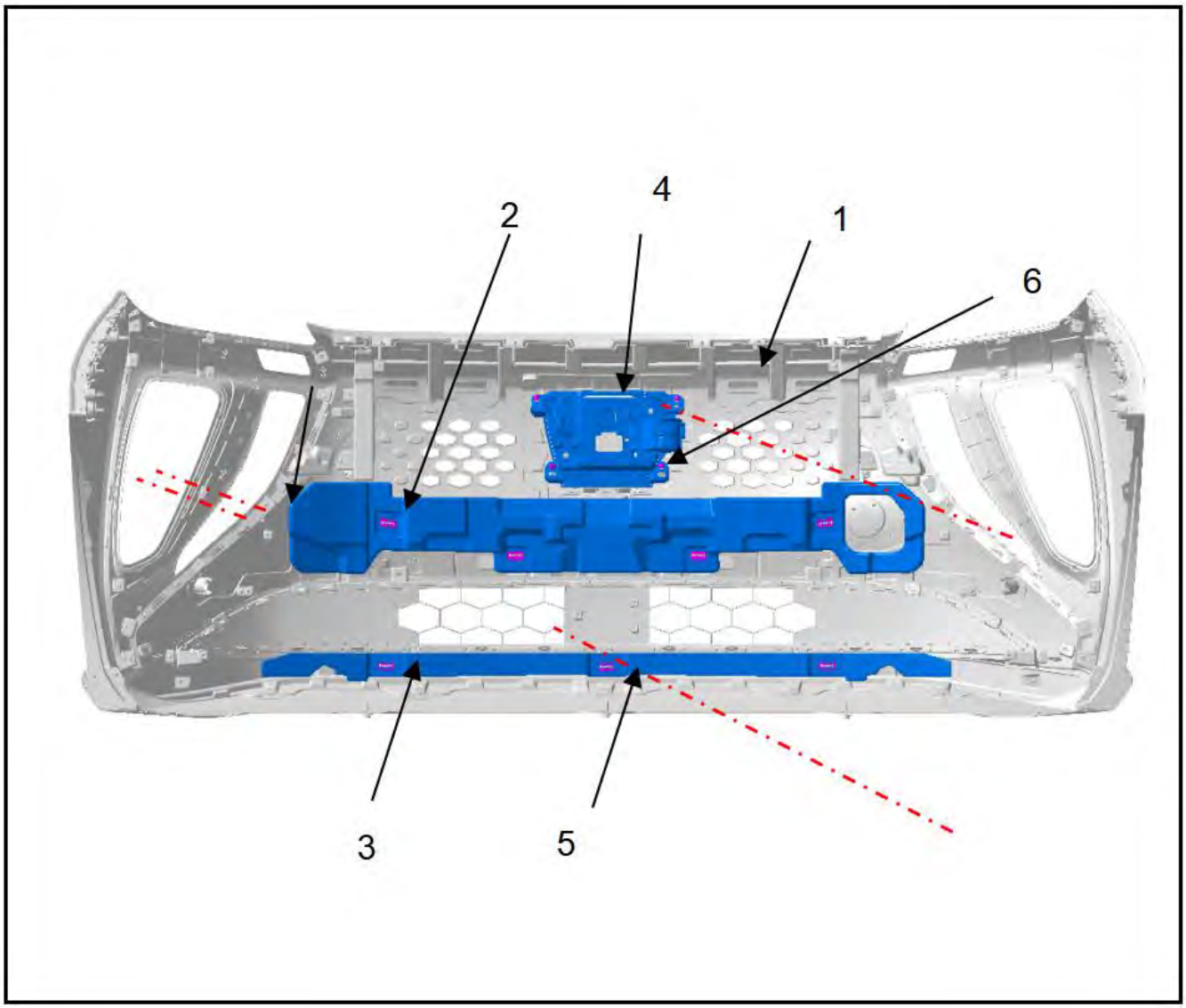
1. The installation order is reverse to the removal order.

5.9 Body exterior trim

5.9.1 Instructions and operations

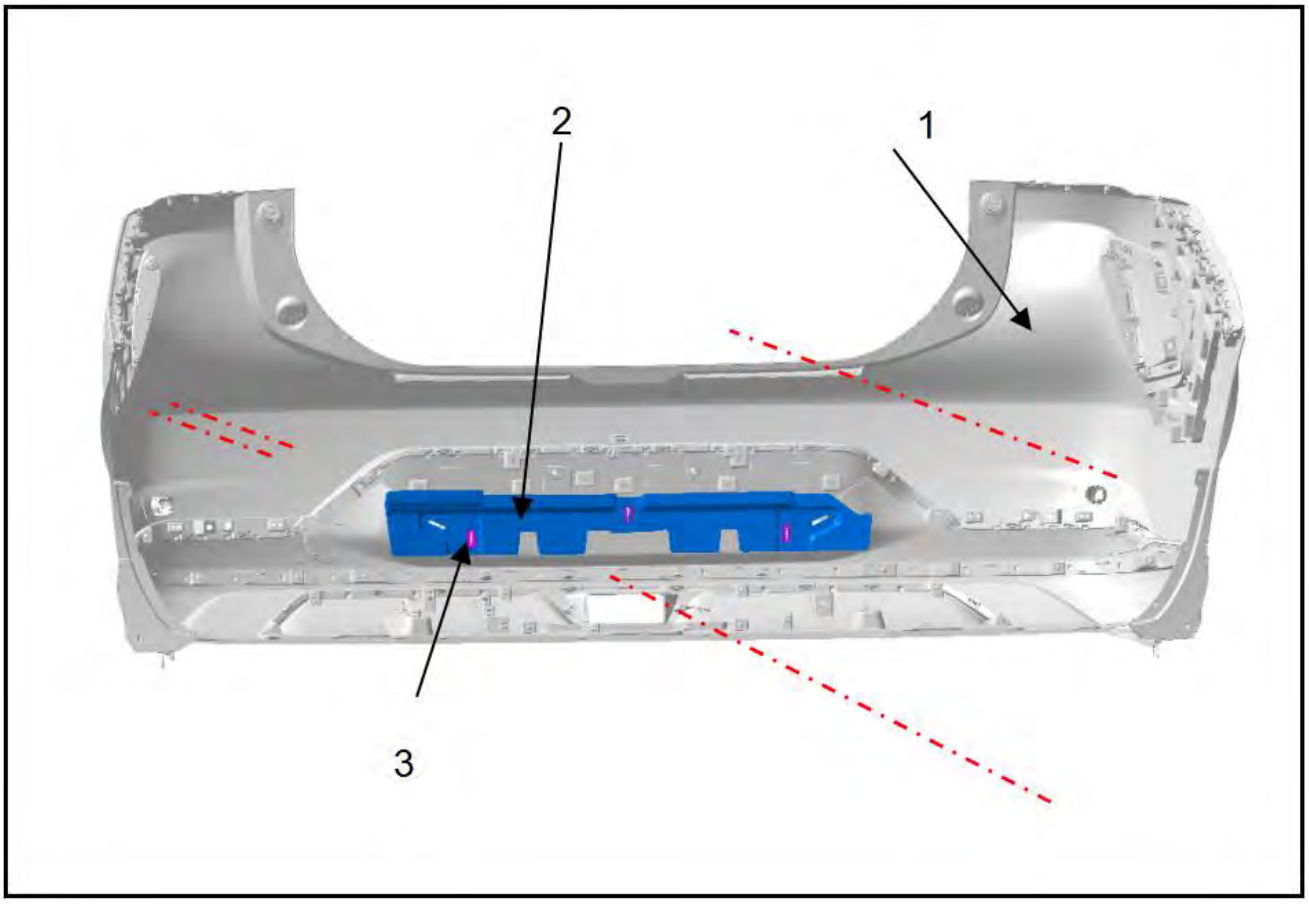
5.9.1.1 Body exterior trim

Exploded view of front bumper assembly



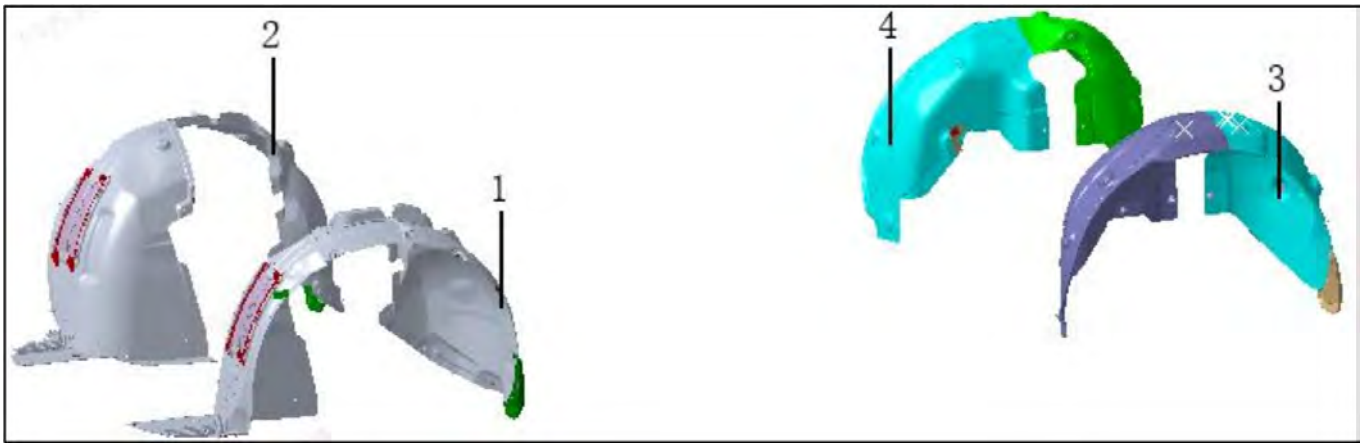
Symbol	Name	Quantity
1	Front bumper assembly	1
2	Front bumper foam block	1
3	Calf protection foam block	1
4	Front charging port cap assembly	1
5	C20-2804543 metal card	7
6	Q2734213F38 self-tapping screw	4

Exploded view of rear bumper



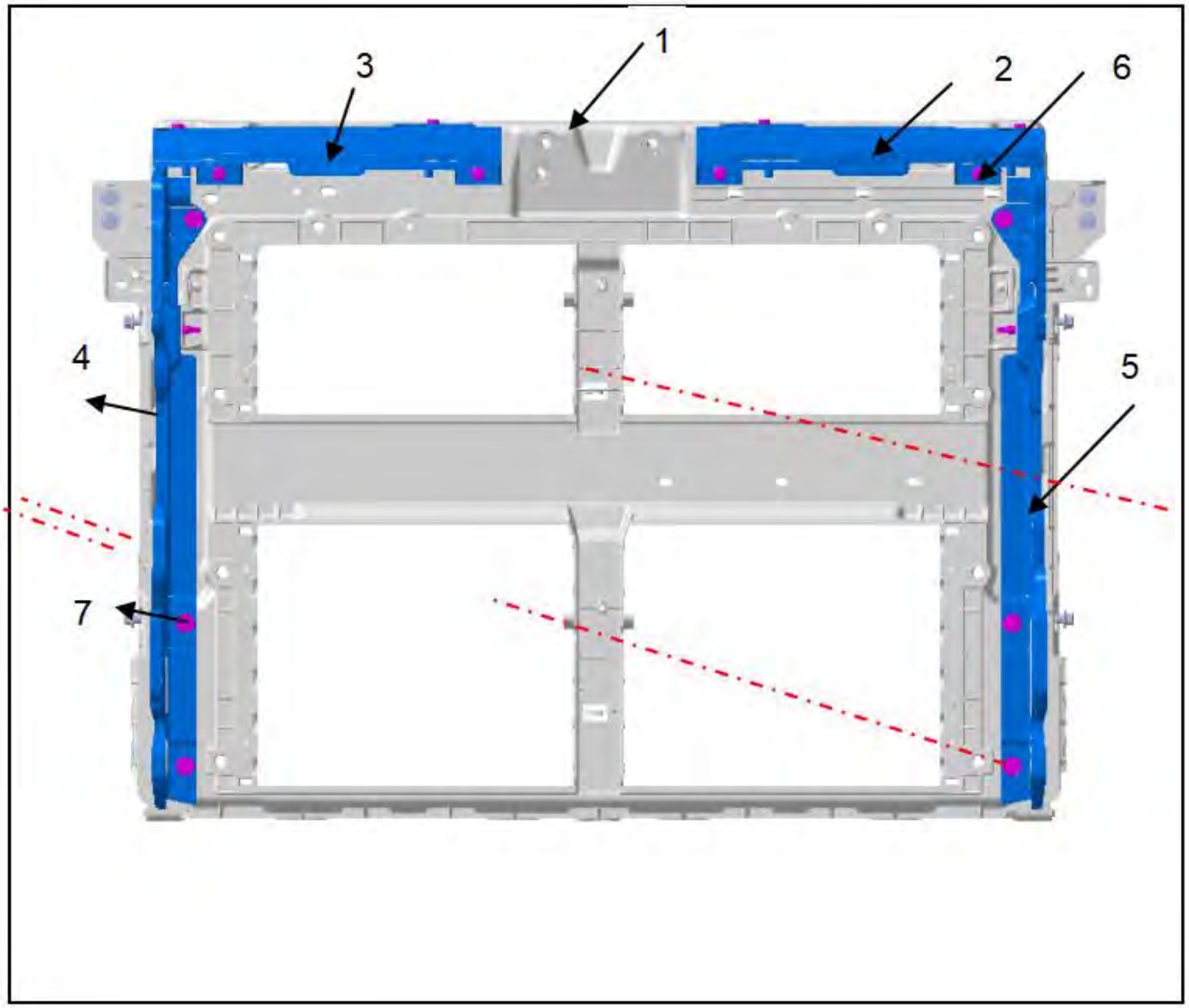
Symbol	Name	Quantity
1	Rear bumper assembly	1
2	Rear bumper foam block	1
5	C20-2804543 metal card	3

Exploded view of wheel guard mudguard system



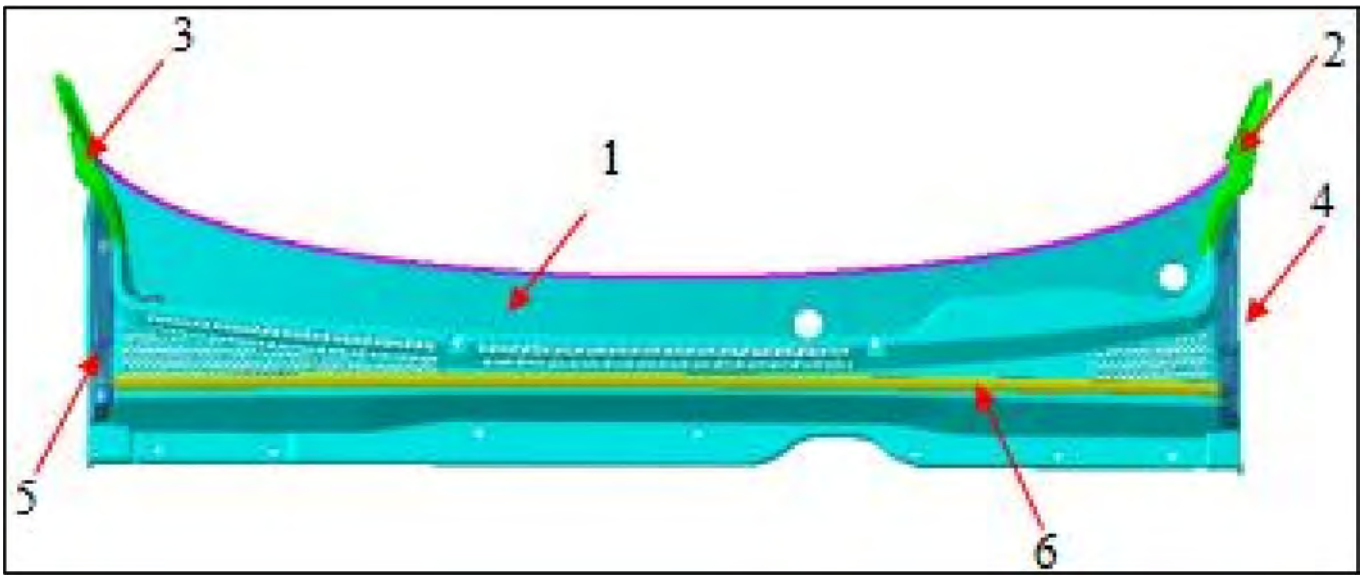
Item	Description	Item	Description
1.	Front left mudguard wheel guard	3.	Rear left mudguard wheel guard
2.	Front right mudguard wheel guard	4.	Rear right mudguard wheel guard

Exploded View of Front-end Frame Assembly



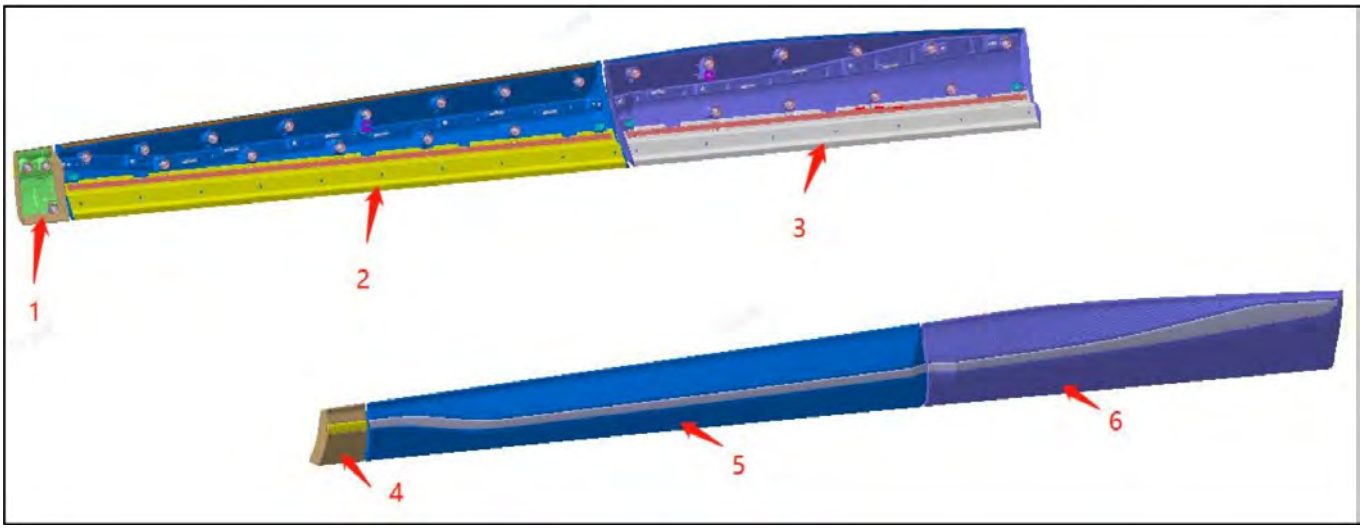
Symbol	Name	Quantity
1	Front-end frame assembly	1
2	Front left end bracket assembly	1
3	Front right end bracket assembly	1
4	Left deflector assembly	1
5	Right deflector assembly	1
6	Q1860625F38 bolt	4
7	BL346 snap fastener	8

Exploded view of wiper cover plate assembly



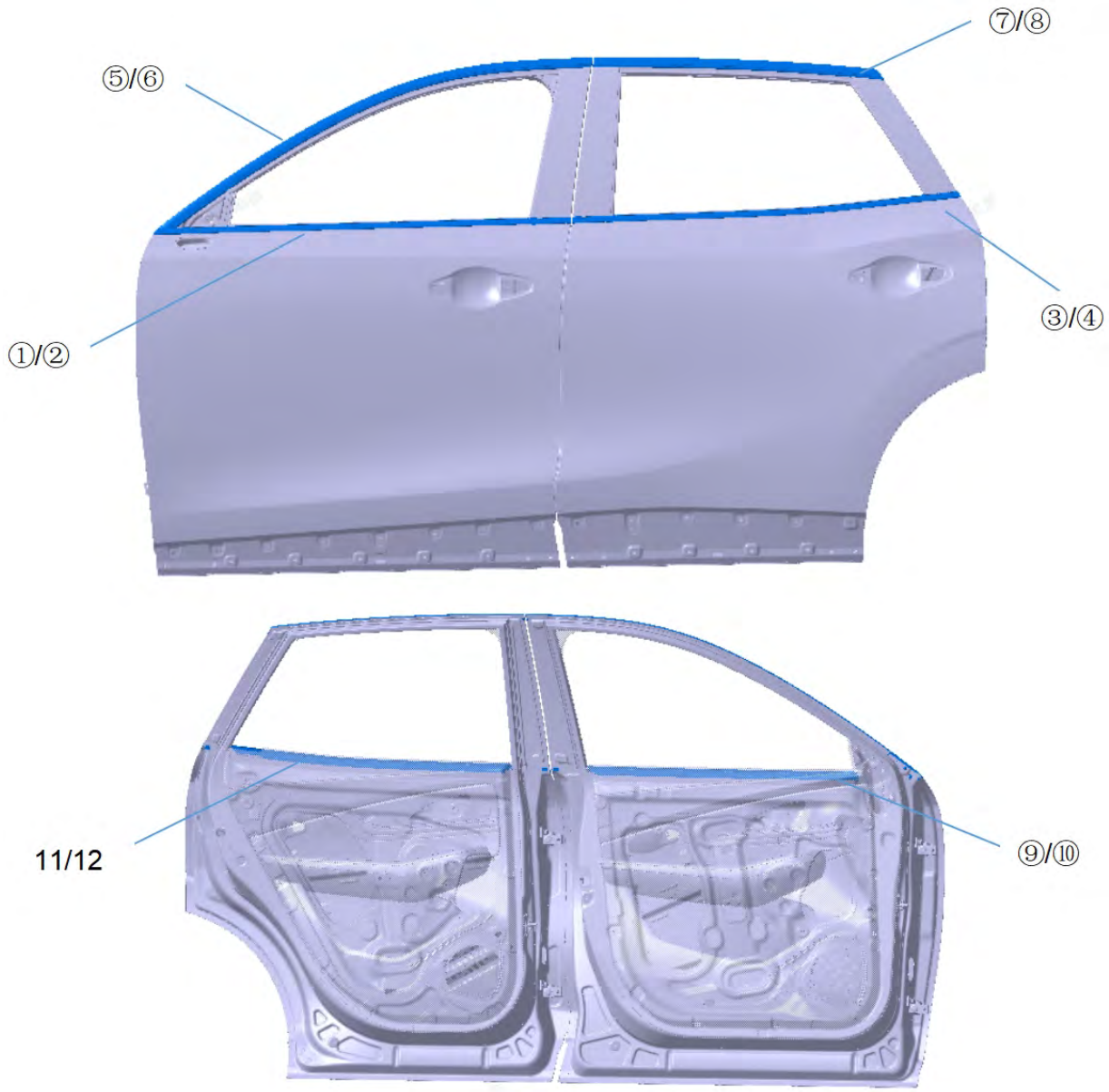
Item	Description	Item	Description
1.	Wiper cover plate assembly	4.	Left air block
2.	Upper trim panel of left wiper cover plate	5.	Right air block
3.	Upper trim panel of right wiper cover plate	6.	Sealing strip

Exploded view of exterior door trim panel assembly



Item	Description	Item	Description
1.	Right fender bottom trim	4.	Left fender bottom trim
2.	Front right door exterior trim panel	5.	Front left door exterior trim panel
3.	Exterior trim panel of rear right door	6.	Exterior trim panel of rear left door

5.9.1.2 Component Locating Diagram



Item	Part Name	Instruction for mounting positions
1	Outer weatherstrip of front left door	On the door
2	Outer weatherstrip of front left door	On the door
3	Rear left door outer weatherstrip	On the door
4	Rear right door outer weatherstrip	On the door
5	Front left door window frame trim strip assembly	On the door
6	Front right door window frame trim strip assembly	On the door
7	Rear left door window frame trim strip assembly	On the door
8	Rear right door window frame trim strip assembly	On the door

Item	Part Name	Instruction for mounting positions
9	Inner weatherstrip of front left door	On the door shield
10	Front right door inner weatherstrip	On the door shield
11	Rear left door inner weatherstrip	On the door shield
12	Rear right door inner weatherstrip	On the door shield

5.9.1.3 Precautions

Precautions during repair

1. **Caution:** Exterior parts and components are made of PP or ABS materials. Do not apply strong force to them.
2. **Caution:**During disassembly and assembly, avoid contact between sharp objects and the outer surface of the parts to prevent scratches.
3. **Caution:** When removing the clip, pay attention to protecting the surface of the parts and avoid scratches.
4. **Caution:** Please replace disposable parts and components, such as forceful clips (with assembly).

5.9.2 Removal and installation

5.9.2.1 Front bumper system

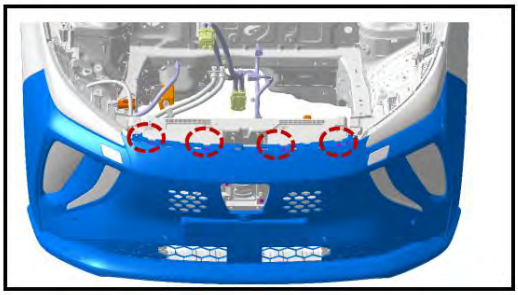
Removal

Caution: The front bumper is a PP plastic part. Do not apply excessive force to it.

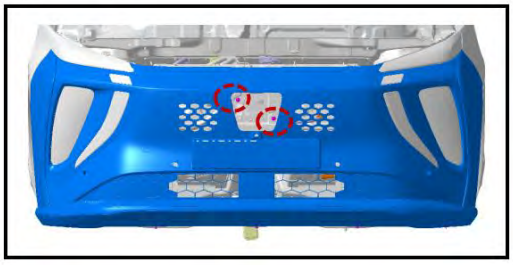
Caution: Prevent sharp objects from contacting the exterior surface during removal and installation.

Caution: When prying open the panel, pay attention to protecting the front bumper paint surface and avoid scratches.

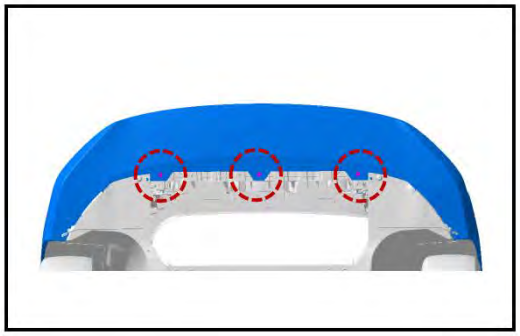
1. Open the bonnet and loosen the 4 bolts on the upper part of the front bumper with a socket.



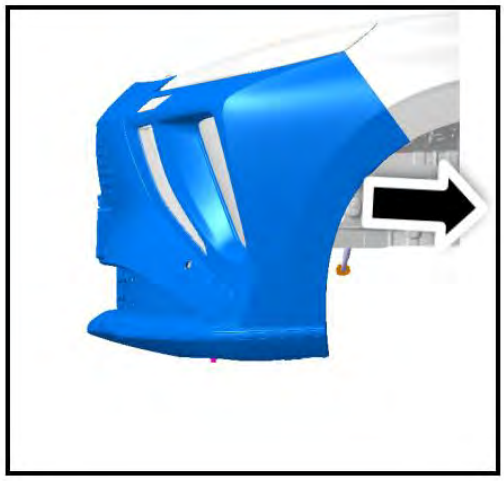
2. Open the Charging port cap and loosen the 2 bolts (hex socket) installed on the upper part of the front bumper.



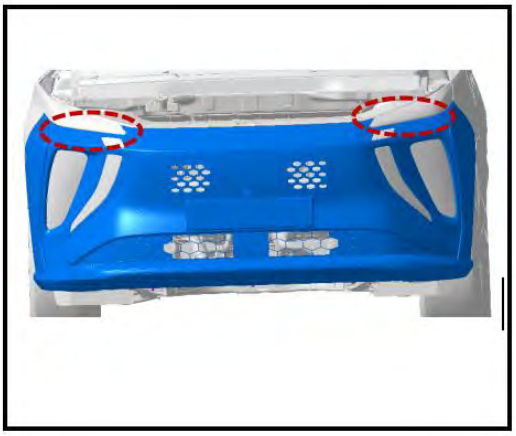
3. Lift the vehicle and loosen the 3 bolt mounting points at the bottom of the front bumper.



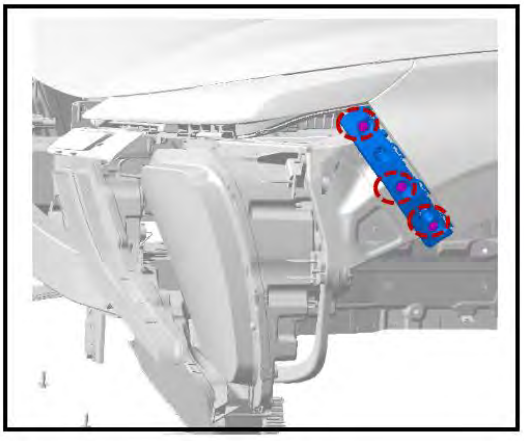
4. At the joint between the front bumper and the fender, pull out the front bumper vertically with force, and pull off the clamping structure of the front bumper and the plastic bracket.



5. The front bumper is connected to the light with a lower clamping connection. Pull out the clamping structure in the X direction and pull it off to complete the removal of the front bumper.



6. The left and right plastic brackets of the front bumper can be removed by loosening the 3 bolts with a socket and pulling them out with force.



Caution: After removing the front bumper, pay attention to the harness connecting the front bumper and the body. Unplug

the harness connector between the front bumper and the body, and then remove the front bumper.

Installation

The installation order is the reverse of the removal order.

5.9.2.2 Rear bumper assembly

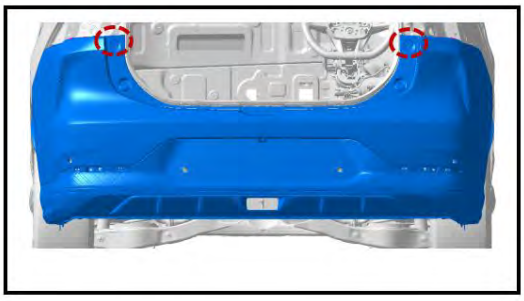
Removal

Caution: The rear bumper is a PP plastic part. Do not apply strong force to it.

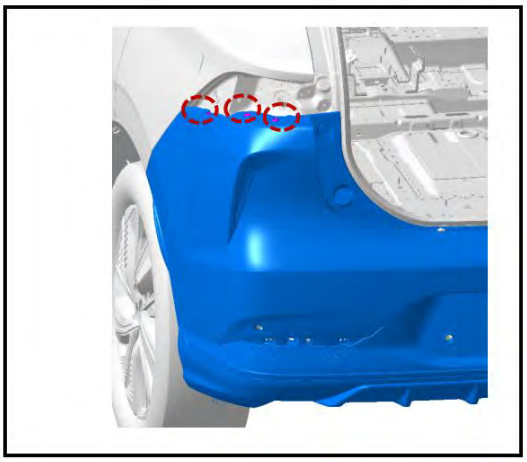
Caution: Prevent sharp objects from contacting the exterior surface during removal and installation.

Caution: When prying open the panel, pay attention to protecting the front bumper paint surface and avoid scratches.

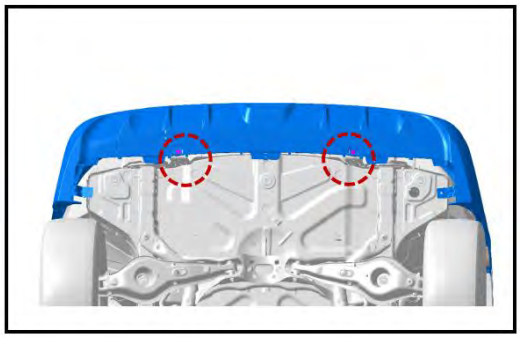
1. Open the boot lid, remove the rear combination light A before removing the rear bumper, and read the rear combination light disassembly instructions for details. After removing the rear combination light, use a straight screwdriver to remove the bolt installation cover plate on both sides of the rear bumper, and use a socket to loosen the 2 mounting bolts on both sides of the rear bumper.



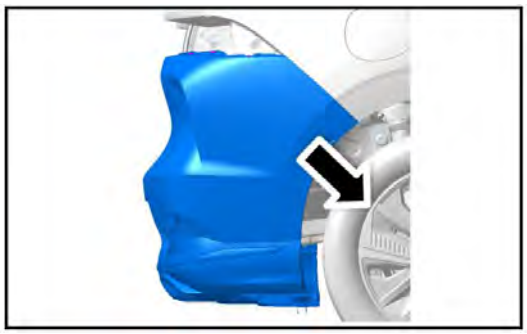
2. After the rear combination light A is removed, there are 3 mounting points on the rear bumper at the lower part of the rear combination light A. Remove 1 self-tapping screw and 2 plastic nails.



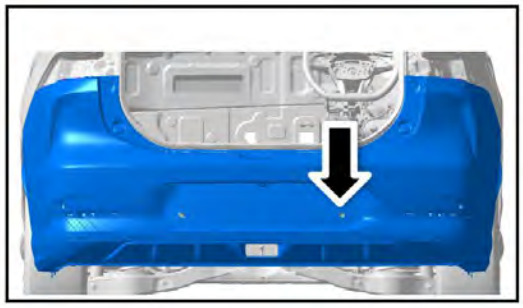
3. Lift the vehicle and loosen 2 bolt mounting points at the lower part of rear bumper.



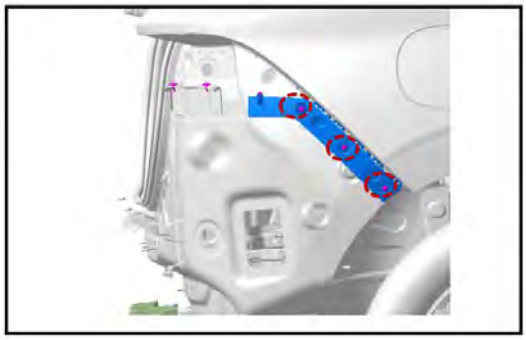
4. Pull out the rear bumper with force in a direction perpendicular to the rear side wall, and pull off the clamping structure between the rear bumper and the plastic bracket. Pull out the middle position of the rear bumper on both sides and pull it backward and outward along the X direction of the body to remove the rear bumper.



5. The front bumper is connected to the light with a lower clamping connection. Pull out the clamping structure in the X direction and pull it off to complete the removal of the front bumper.



6. The left and right plastic brackets of the front bumper can be removed by loosening 3 self-tapping screws through a sleeve and pulling them out with force.



Caution: After removing the rear bumper, pay attention to the harness connecting the front bumper and the body. Unplug the harness connecting the front bumper and the body, and then remove the front bumper.

Installation

The installation order is the reverse of the removal order.

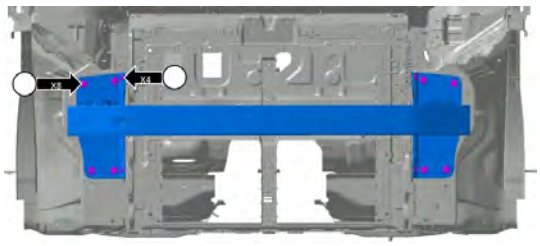
5.9.2.3 Front anti-collision beam assembly

Removal

1. Remove the front bumper assembly. Refer to: Front bumper assembly.
2. Remove the front bumper harness. Refer to: Front bumper harness.
3. Remove the fast and slow charging harness.
4. Remove the two-in-one power supply mounting bracket. Refer to: Power supply two-in-one mounting bracket.
5. Remove 12 fixing bolts and take out the front anti-collision beam assembly:

   1 Remove Q1840825F38, torque 23±2Nm

   2 Remove Q1861020F38, torque 45±5Nm



Installation

1. The installation order is the reverse of the removal order.

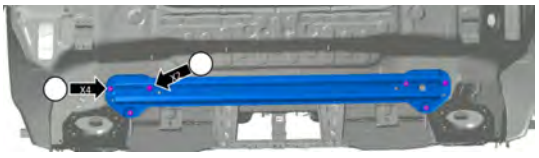
5.9.2.4 Rear anti-collision beam assembly

Removal

1. Remove the rear bumper assembly. Refer to: Rear bumper assembly.
2. Remove the rear bumper harness. Refer to: Rear bumper harness.
3. Remove 6 fixing bolts and take out the rear anti-collision beam assembly.

   1 Remove Q32008F36, torque 23±2Nm

   2 Remove Q1860816F38, torque 23±2Nm



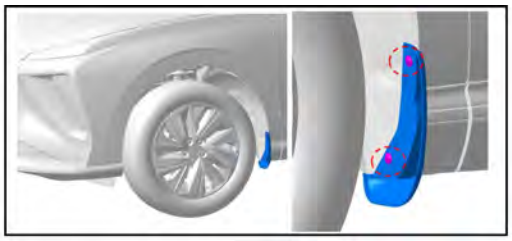
Installation

1. The installation order is the reverse of the removal order.

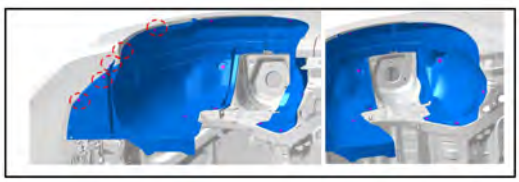
5.9.2.5 Left and right front/rear wheel guard assembly

Removal

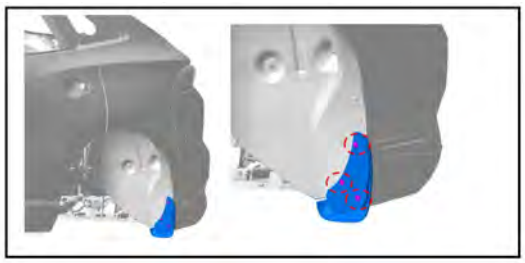
1. Lift the vehicle. Refer to: Lifting the vehicle.
2. Left and right front mudguards: Use a cross-head screwdriver to loosen the two self-tapping screws. After loosening the self-tapping screws, remove the mudguards directly (bilaterally symmetrical).



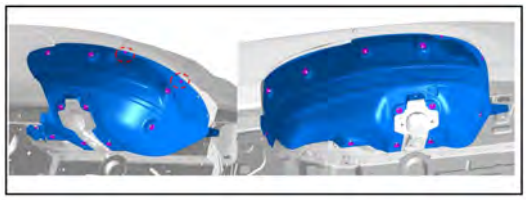
3. Left and right front wheel guards: First loosen and remove the 5 self-tapping screws connecting the wheel guard to the front guard, then pry out and pull out the plastic clip connected to the body to complete the removal of the front wheel guard.



4. Left and right rear mudguards: Use a cross-head screwdriver to loosen the two self-tapping screws. After loosening the self-tapping screws, remove the mudguards directly (symmetrical on both sides).



5. Left and right rear wheel guards: Loosen and remove the 2 self-tapping screws connecting the wheel guard to the rear bumper, then pry out and pull out the plastic clip connected to the body to complete the removal of the front wheel guard.



Installation

The installation order is the reverse of the removal order. The following matters should be noted:

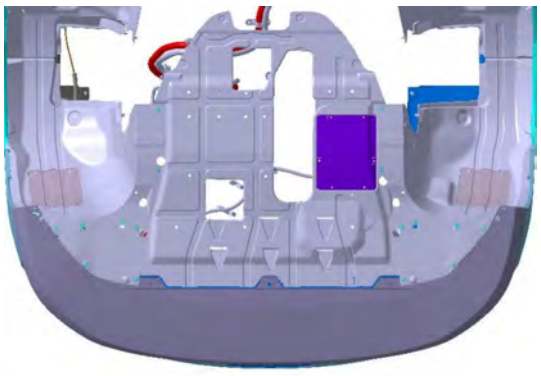
Caution: After installation, pay attention to check whether all wheel guard mounting points are tightened.

5.9.2.6 Underbody trim

Removal

1. Lift the vehicle. Refer to: Lifting the vehicle.

2. Engine lower shield: Raise the vehicle with a lift and remove the standard mounting parts. Remove 5 bolts, 8 self-tapping screws and 9 snap fasteners.



Installation

The installation order is the reverse of the removal order.

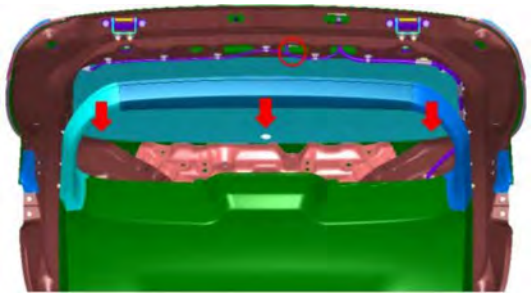
5.9.2.7 Rear spoiler assembly

Removal

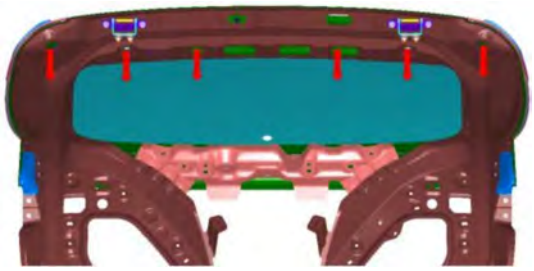
1. Open the tailgate and remove the tailgate inner shield.

2. Remove the high-mounted brake light harness.

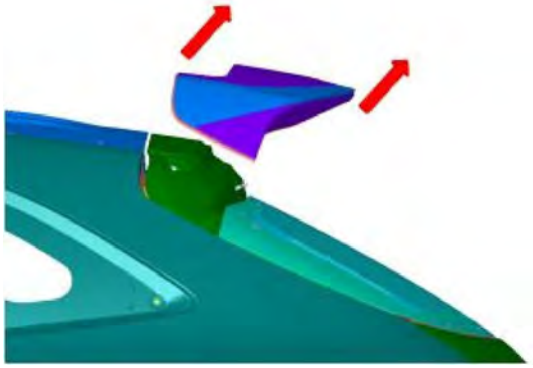
3. Remove the washer pipe. Refer to: Washer hose.



4. Remove the four bolts in the middle and two flange nuts on both sides respectively.



5. Close the tailgate, pull the rear spoiler out of the mounting hole between the buckle and the sheet metal with force, and remove the rear spoiler.



Installation

The installation order is the reverse of the removal order.

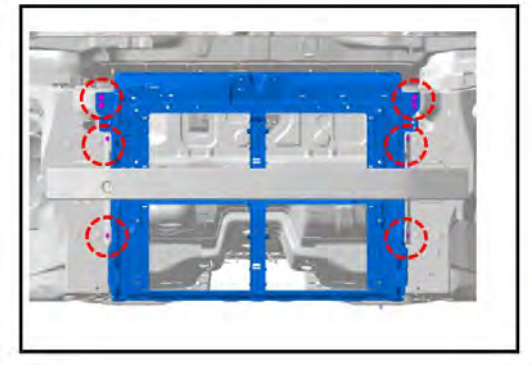
5.9.2.8 Front-end frame assembly

Removal

Caution: The front end frame is a PP+GF40 plastic part. Protect the disassembled small parts, such as bolts, to prevent loss.

1. Remove the front end frame assembly. After removing the front bumper assembly, front combination light assembly and peripheral parts of front anti-collision beam, loosen and remove 8 bolts connecting the front end frame with the front

longitudinal beam of body in turn. The front end frame can be removed upwards.



Installation

The installation order is the reverse of the removal order. The following matters should be noted:

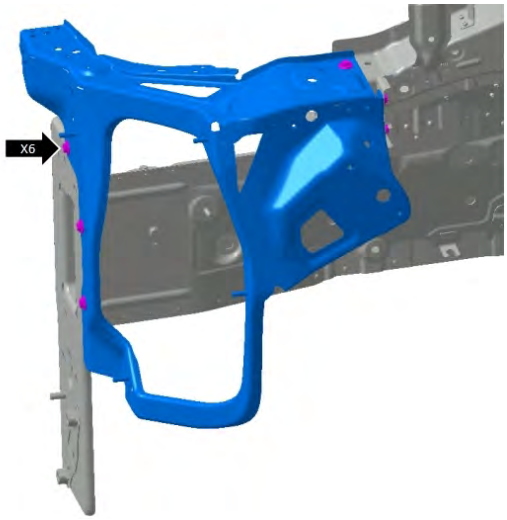
Caution: After installation, pay attention to the coordination between the front end frame and the surrounding area.

5.9.2.9 Left connecting plate assembly of front end frame

Removal

1. Remove the front bumper assembly. Refer to: Front bumper assembly.
2. Remove the front bumper harness. Refer to: Front bumper harness.
3. Remove the fast and slow charging harness.
4. Remove the two-in-one power supply mounting bracket. Refer to: Power supply two-in-one mounting bracket.
5. Remove the front anti-collision beam assembly. Refer to: Front anti-collision beam assembly.
6. Remove the underbody shield system. Refer to: Underbody shield system.
7. Remove the front left wheel guard mudguard assembly. Refer to: Left and right front/rear wheel guard assemblies.
8. Remove the radiator assembly.
9. Remove the front-end module assembly.
10. Remove the front left combination light assembly. Refer to: Front combination light.
11. Remove the front left fender. Refer to: Left fender.
12. Remove 6 fastening bolts (Q140B0616F38L) from the left connecting plate assembly of front frame.

    Torque: 11±1 Nm



Installation

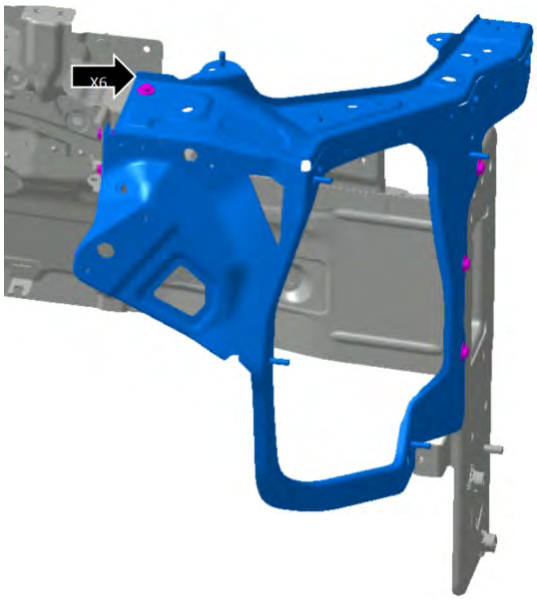
1. The installation order is reverse to the removal order. Pay attention to the following precautions:

Caution: After the fender is installed, confirm that the surrounding gap is normal and that there is no interference with each other when opening or closing the door.

5.9.2.10 Right connecting plate assembly of front end frame

Removal

1. Remove the front bumper assembly. Refer to: Front bumper assembly.
2. Remove the front bumper harness. Refer to: Front bumper harness.
3. Remove the fast and slow charging harness.
4. Remove the two-in-one power supply mounting bracket. Refer to: Power supply two-in-one mounting bracket.
5. Remove the front anti-collision beam assembly. Refer to: Front anti-collision beam assembly.
6. Remove the underbody shield system. Refer to: Underbody shield system.
7. Remove the front right wheel guard mudguard assembly. Refer to: Left and right front/rear wheel guard assemblies.
8. Remove the radiator assembly.
9. Remove the front-end module assembly.
10. Remove the front right combination light assembly. Refer to: Front combination light.
11. Remove the front right fender. Refer to: Right fender.
12. Remove 6 fastening bolts (Q140B0616F38L) from the front end frame right connecting plate assembly.



Installation

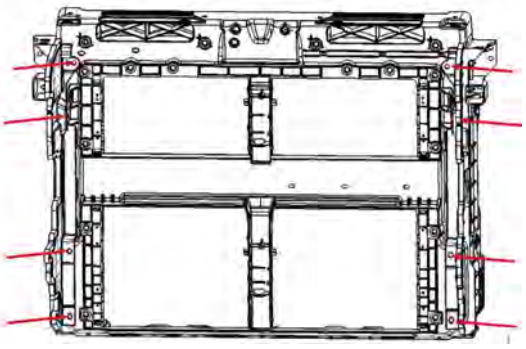
1. The installation order is reverse to the removal order. Pay attention to the following precautions:

Caution: After the fender is installed, confirm that the surrounding gap is normal and that there is no interference with each other when opening or closing the door.

5.9.2.11 Deflector assembly

Removal

1. Open the engine bonnet and remove the front bumper assembly.Refer to: Front bumper assembly.
2. Remove the front grille assembly. Refer to: Front grille assembly.
3. Remove the left and right deflectors.
4. Remove the snap fastener of front-end frame.



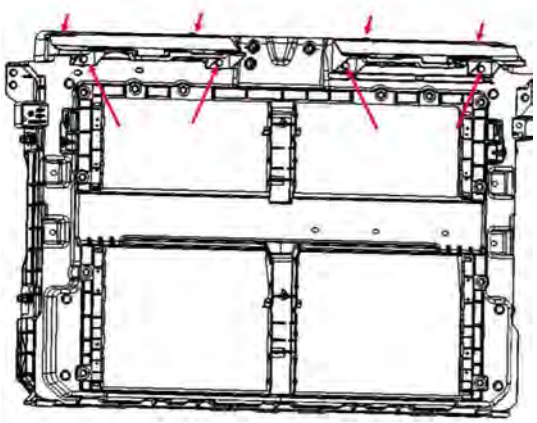
Installation

The installation order is the reverse of the removal order.

5.9.2.12 Front-end bracket assembly

Removal

1. Open the engine bonnet and remove the front bumper assembly.Refer to: Front bumper assembly.
2. Remove the front grille assembly.
3. Remove the M6 bolts between the front bracket and the front frame.



Installation

The installation order is the reverse of the removal order.

5.9.2.13 Black film system

Removal

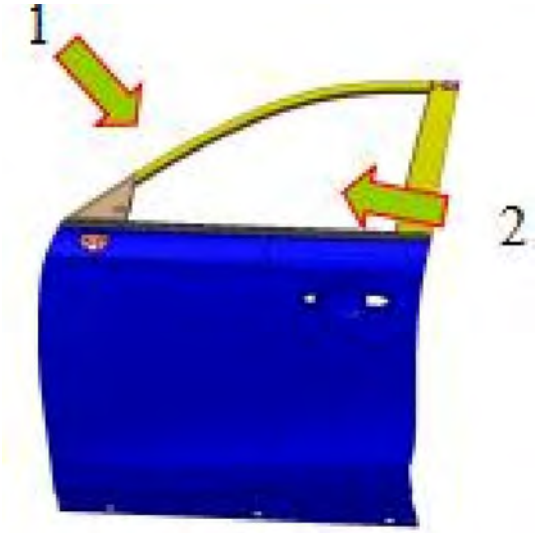
1. Open the front and rear doors, and remove partial window frame sealing strip.
2. Remove the door outer weatherstrip.



3. Remove the triangle cover plate of front door.



4. Remove the horizontal sticker first, and then remove the vertical sticker.



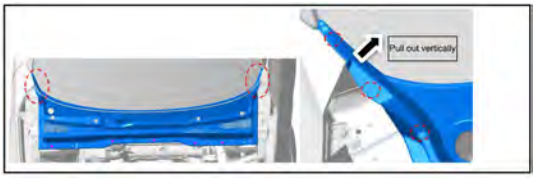
Installation

1. The installation order is the reverse of the removal order.

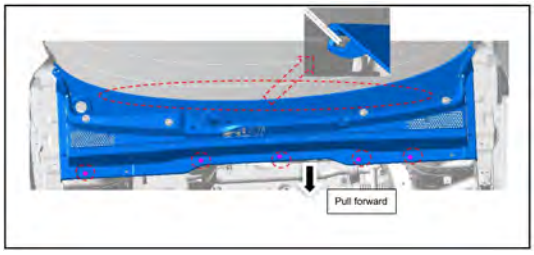
5.9.2.14 Wiper cover plate assembly

Removal

1. Open the bonnet first.
2. Wiper left and right trim panels: The wiper left and right trim panels are connected to the fender and wiper cover plate body through their own clips. Use a straight screwdriver to lift the wiper left and right trim panels, pull them up hard, and disengage the wiper left and right trim panel clips from the clips. The removal of the wiper left and right trim panel cover plates can be completed.



3. Wiper cover plate body: First, pry out and remove the mounting buckle of the wiper cover plate body, pull out the wiper cover plate along the front direction of the vehicle, and the wiper cover plate is disengaged from the glass card to complete the removal of the wiper cover plate body.



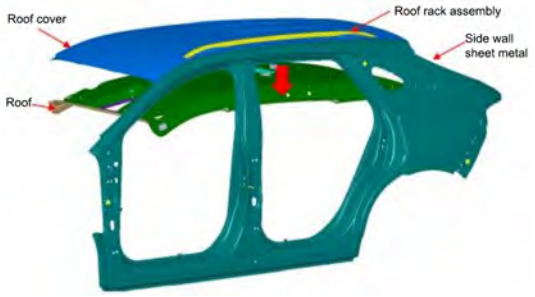
Installation

The installation order is the reverse of the removal order.

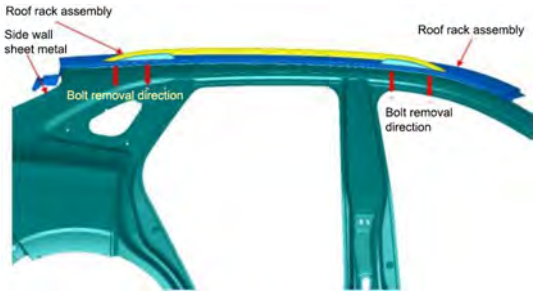
5.9.2.15 Roof rack assembly

Removal

1. Remove the roof, inner panel and other interior trims before removing the luggage rack.



2. Remove the nuts in sequence from inside of the body after removing the roof.



3. Take out the luggage rack upward from the upper end in the direction of the second installation point.



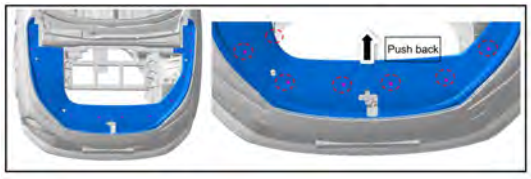
Installation

The installation order is the reverse of the removal order.

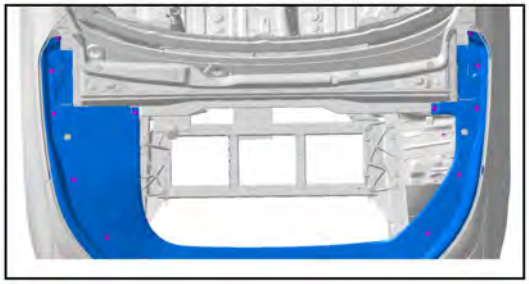
5.9.2.16 Engine compartment cover plate

Removal

1. Open the bonnet first.
2. Front engine compartment cover plate: The engine compartment cover plate is divided into three parts: front, left and right. You need to remove the front engine compartment cover plate first, pry out the front engine compartment cover plate connection clip and remove it. You can push the engine compartment cover plate backwards to complete the removal of the engine compartment cover plate.



3. Left and right engine compartment cover plates: Refer to the front engine compartment cover plate, pry out and remove the connecting clips of the left and right engine compartment cover plates, and pull out the engine compartment cover plates upwards to complete the removal of the left and right engine compartment cover plates.



Installation

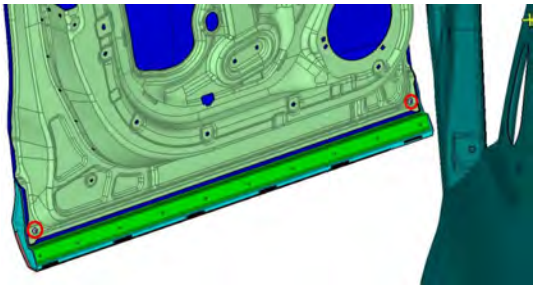
The installation order is the reverse of the removal order. The following matters should be noted:

Caution: After installation, pay attention to check whether all the mounting points of the engine compartment cover plate are tightened.

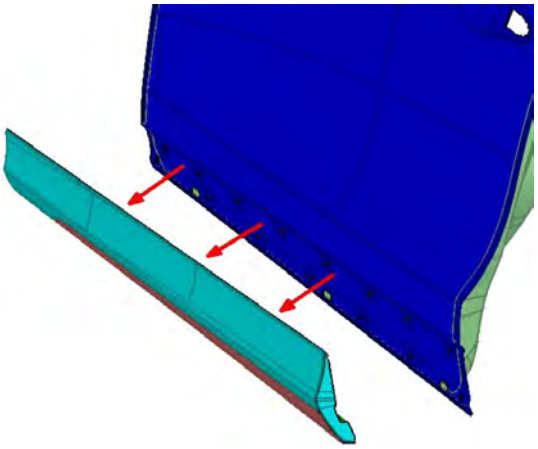
5.9.2.17 Door exterior trim panel assembly

Removal

1. Open the door to the maximum opening angle and remove the 2 self-tapping screws shown in Fig.



2. Remove the connecting clip between the lower door exterior trim panel and the body, and remove the door exterior trim panel.



Pay attention to the following matters:

Caution: The front, rear, left and right door exterior trim panels are removed in the same way.

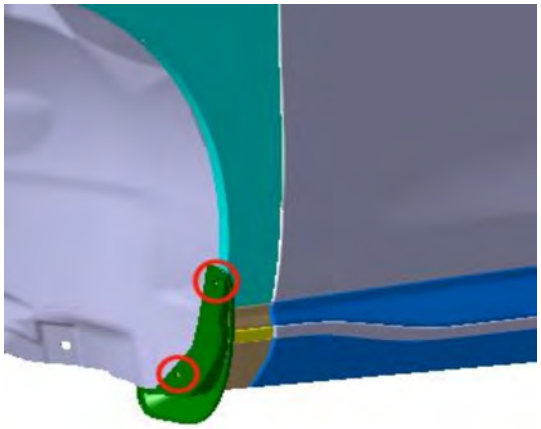
Installation

The installation order is the reverse of the removal order.

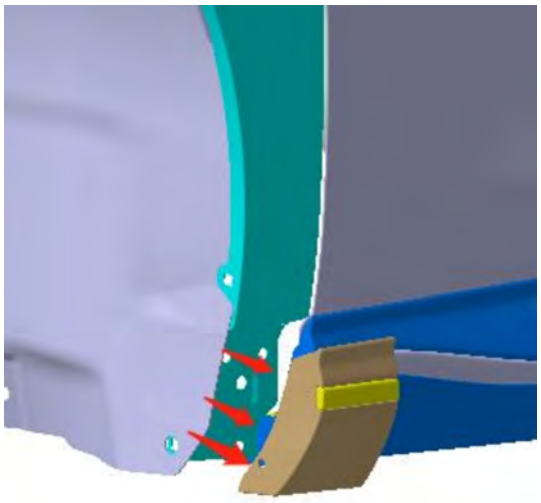
5.9.2.18 Removal and installation of fender bottom trim

Removal

1. Remove the self-tapping screws shared by the front end of the fender bottom trim and the wheel guard.



2. Remove the connecting clip between fender bottom trim and fender.



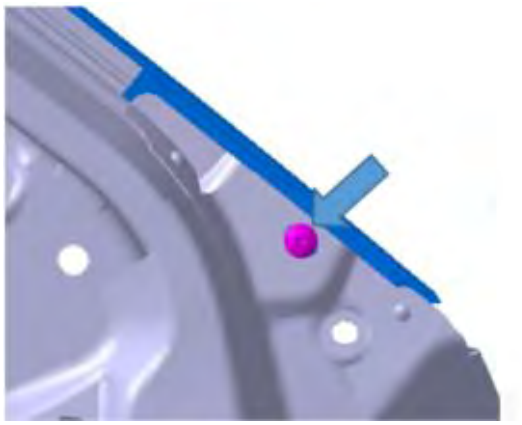
Installation

The installation order is the reverse of the removal order.

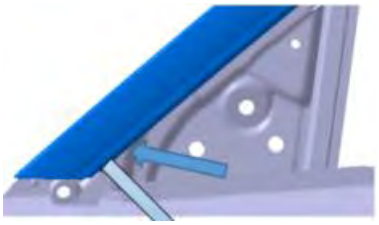
5.9.2.19 Front left/right door window frame trim strip

Removal

1. Use a cross-head screwdriver to remove the weatherstrip mounting screws at the A-pillar end and turn up the corners of the door outer sealing strip.



2. Remove the front door outer weatherstrip.
3. Remove the front door triangle block, Refer to: Front door triangle block.
4. Pry up the lower part of the trim strip with a removal tool, rotate it outward and lift it upward from the A-pillar end to the B-pillar end, and gradually remove the trim strip.

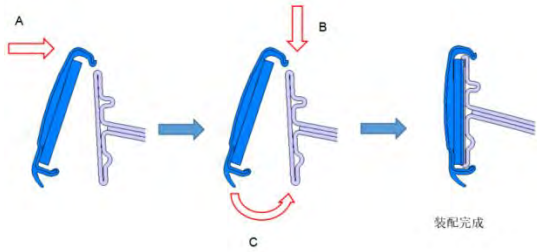


Installation

1. Buckle the window frame trim strip from the top of the window frame to the window frame, push the window frame bright strip forward from the B-pillar, align the end face of the window frame trim strip with the sheet metal of the window frame B-pillar, and ensure that the inner side of the end cover clamps the sheet metal tightly.



2. Fit the front door bright trim strip onto the window frame from back to front. The specific method is as follows: hook the upper part on the window frame, press down to ensure that the upper part is completely fitted into the window frame, and then fit the lower part of the front door bright trim strip into the lower part of the window frame.



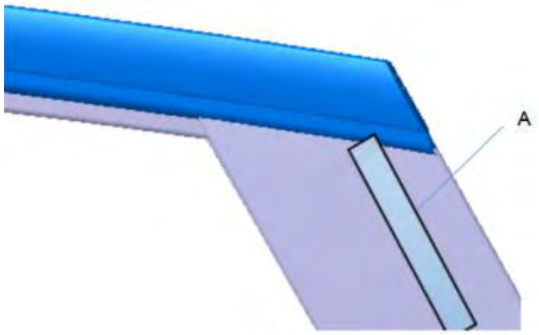
3. Tighten the front end with a cross-head screwdriver to align the bright strip stud with the hole on the front door sheet metal, tighten the front end of the front door bright strip with an M5 bolt (Q2140506F38), and finally confirm that the window frame trim strip is firmly inserted and pulled outward without looseness.



5.9.2.20 Rear left/right door window frame trim strip

Removal

1. Use the removal tool to pry up the C-pillar end at the bottom of the trim strip, rotate it outward and lift it upward from the C-pillar end to the B-pillar end, and gradually remove the trim strip.

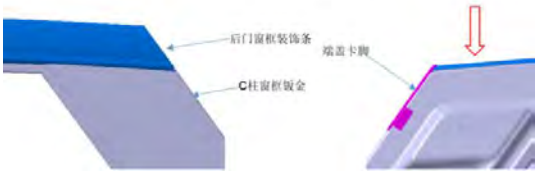


Installation

1. Buckle the rear door window frame trim strip from the top of the window frame to the window frame, push the window frame bright strip back from the B-pillar, align the end face of the rear door window frame trim strip with the sheet metal of the window frame B-pillar, and ensure that the inner side of the end cover clamps the sheet metal tightly.



2. Align the C-pillar end of the window frame trim strip with the window frame, and move it downward so that the end cover clip is inserted into the sheet metal.

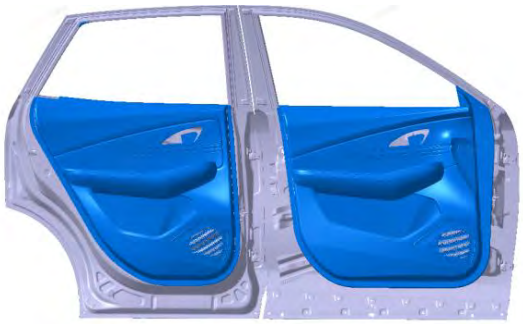


3. Clamp the window frame trim strip on the upper window frame from front to back. Refer to: Front door window frame trim strip.

5.9.2.21 Inner weatherstrip

Removal

1. Remove the door inner shield from the door.



2. Remove the inner water stop sealing strip from the inner shield.

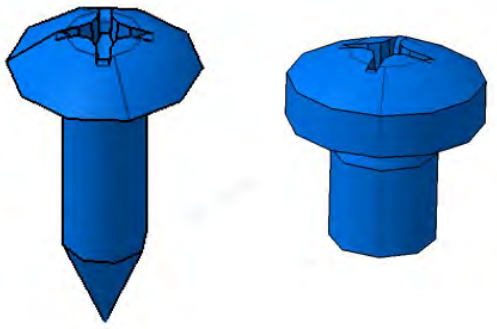
Installation

1. The installation order is the reverse of the removal order.

5.9.2.22 Front triangle outer cover plate

Removal

1. Remove the front triangular outer cover plate fastening self-tapping screws.



2. Remove the front pan head screw with cross recess of the front triangular outer cover plate (configuration 2 only).

3. Remove the front triangle outer cover plate clip.

Removal:
Remove by bending with a flat-head screwdriver or clip removal tool.

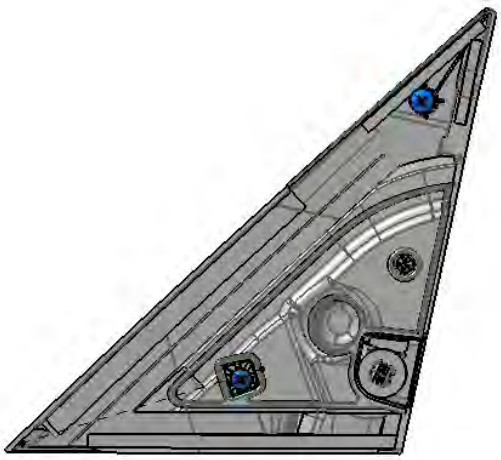


4. Take out the front triangle outer cover plate in the direction of arrow.

Installation

1. The installation order is reverse to the removal order, and pay attention to the following items.

Caution: Before installation, check whether the clip of the disassembled front triangular outer cover plate has been deformed or damaged. If deformation/damage is found, replace the clip. **The installation direction of clips is shown in the figure below:**

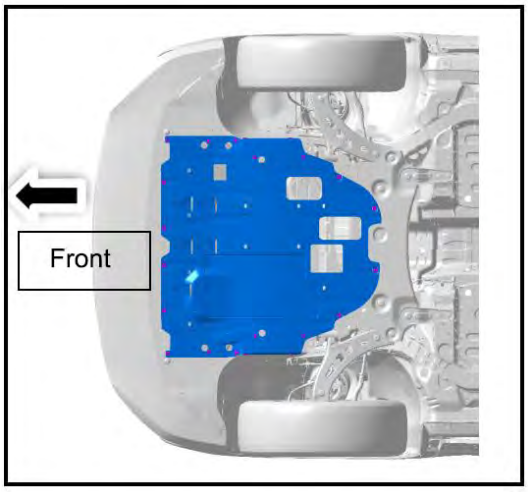


5.9.2.23 Underbody shield system

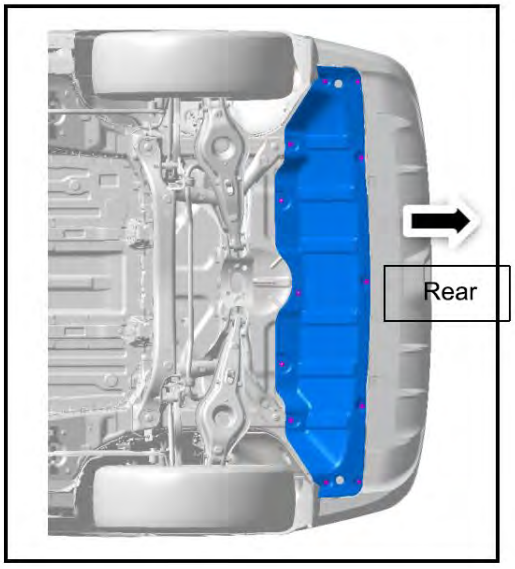
Removal

1. Lift and support the vehicle. Refer to: Lifting the vehicle.

2. Front underbody shield: First remove the front bolts, then loosen the self-tapping screws connected to the wheel guard, and lift out the clips connected to the subframe and wheel guard to complete the removal of the front underbody shield.



3. Rear underbody shield: First remove the rear bolts, then loosen the self-tapping screws and clips connected to the rear bumper, and loosen the nut sleeve connected to the body to complete the removal of the front underbody shield.



Installation

The installation order is the reverse of the removal order. The following matters should be noted:

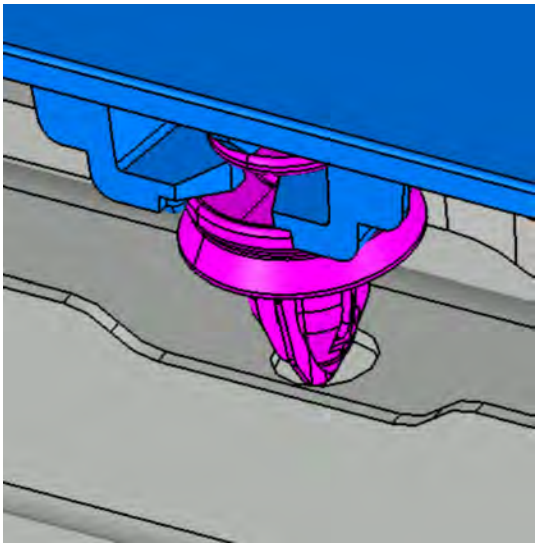
Caution: After installation, pay attention to check whether all the shield mounting points are tightened.

5.9.2.24 Door exterior trim panel

Removal

1. Open the front and rear doors, first loosen and remove the 4 self-tapping screws (2 for the front door and 2 for the rear door) that fasten the front and rear door exterior trim panels to the car door. The fender trim is clamped on the fender sheet metal through 3 clips.
2. Pull outward from the door exterior trim panel perpendicular to the door exterior trim panel, and pull out the strong clip that fits into the sheet metal to remove the door exterior trim panel.





Installation

The installation order is the reverse of the removal order. The following matters should be noted:

Caution: Pay attention to adjusting the assembly gap of the shield after installation.

Caution: The right door exterior trim panel has the same structure as the left door exterior trim panel, and the disassembly and assembly order is the same.

5.10 Body-in-white

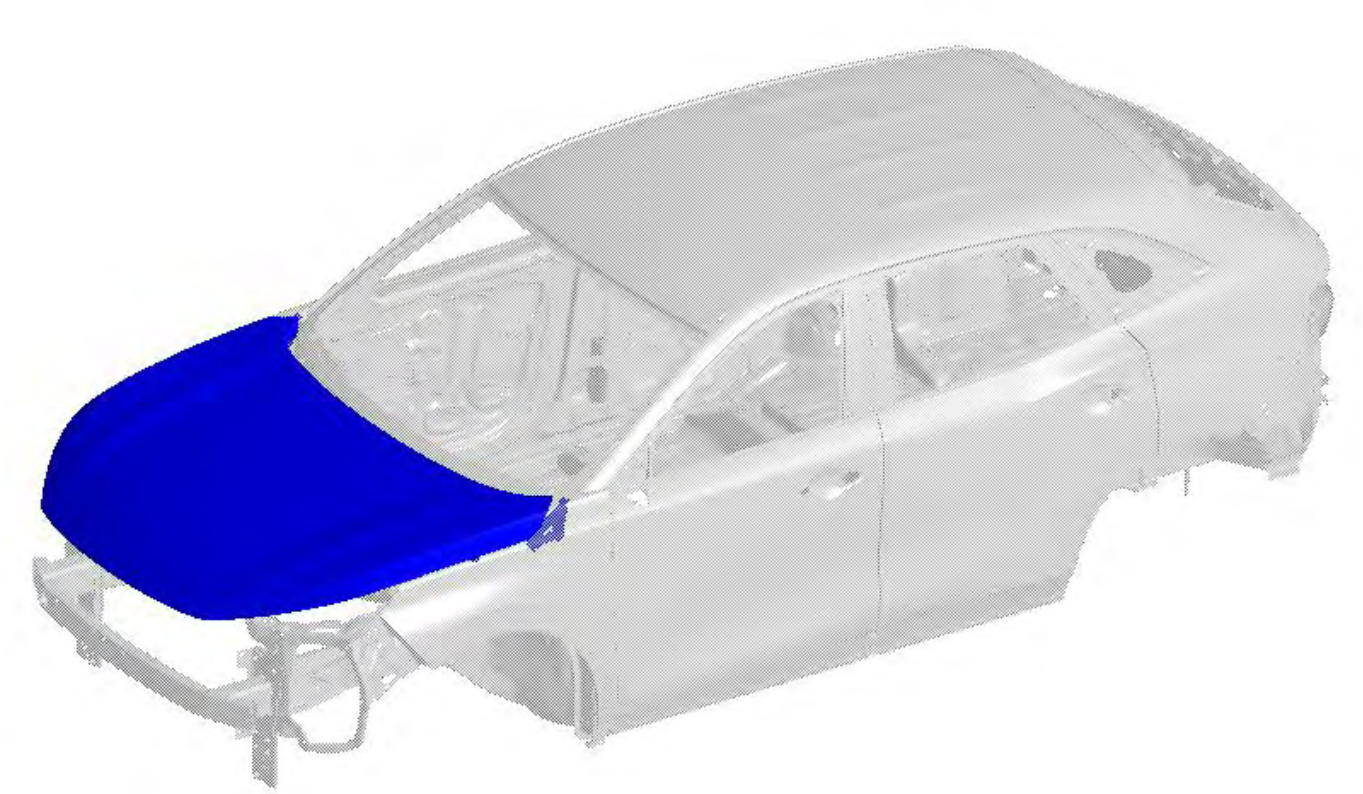
5.10.1 Specification

5.10.1.1 Torque specification

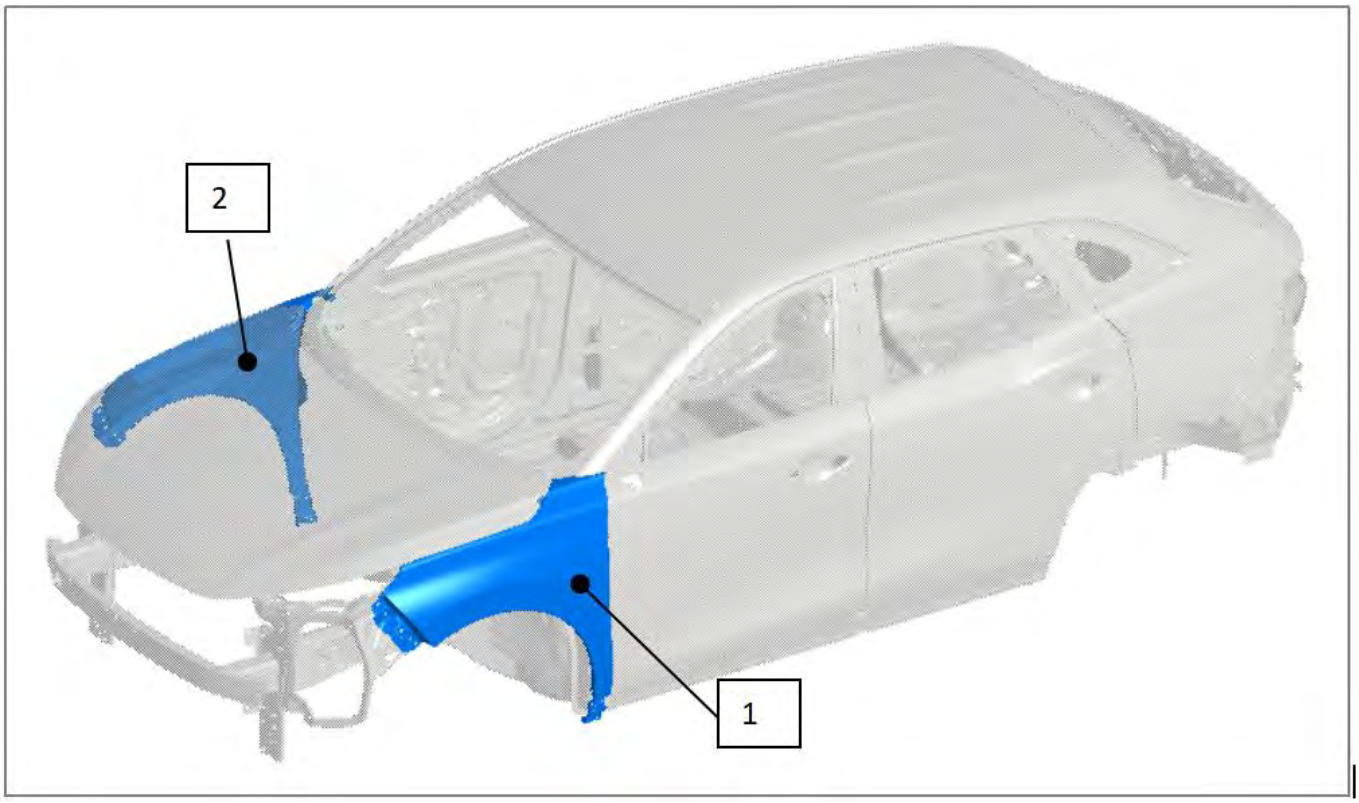
Name	Nm
Fixing bolt of front bumper	9±1
Wheel guard mudguard self-tapping screw	4
Engine lower shield fixing bolt	9±1
Rear spoiler mounting fixing bolt	9±1
Connecting bolt between front-end frame and front longitudinal beam of body	20±2
Front-end frame right connecting plate assembly fastening bolt	9±1
M6 bolts between the front bracket and the front-end frame	9±1
Luggage rack fixing bolt	9±1
Self-tapping screw of door exterior trim panel	4
Self-tapping screws shared by the front end of the fender bottom trim and the wheel guard	4
Front triangle outer cover plate fastening self-tapping screw	4
Front triangle outer cover plate front pan head screw with cross recess	5.5±1
Fixing bolt of underbody shield	9±1

5.10.2 Instructions and operations

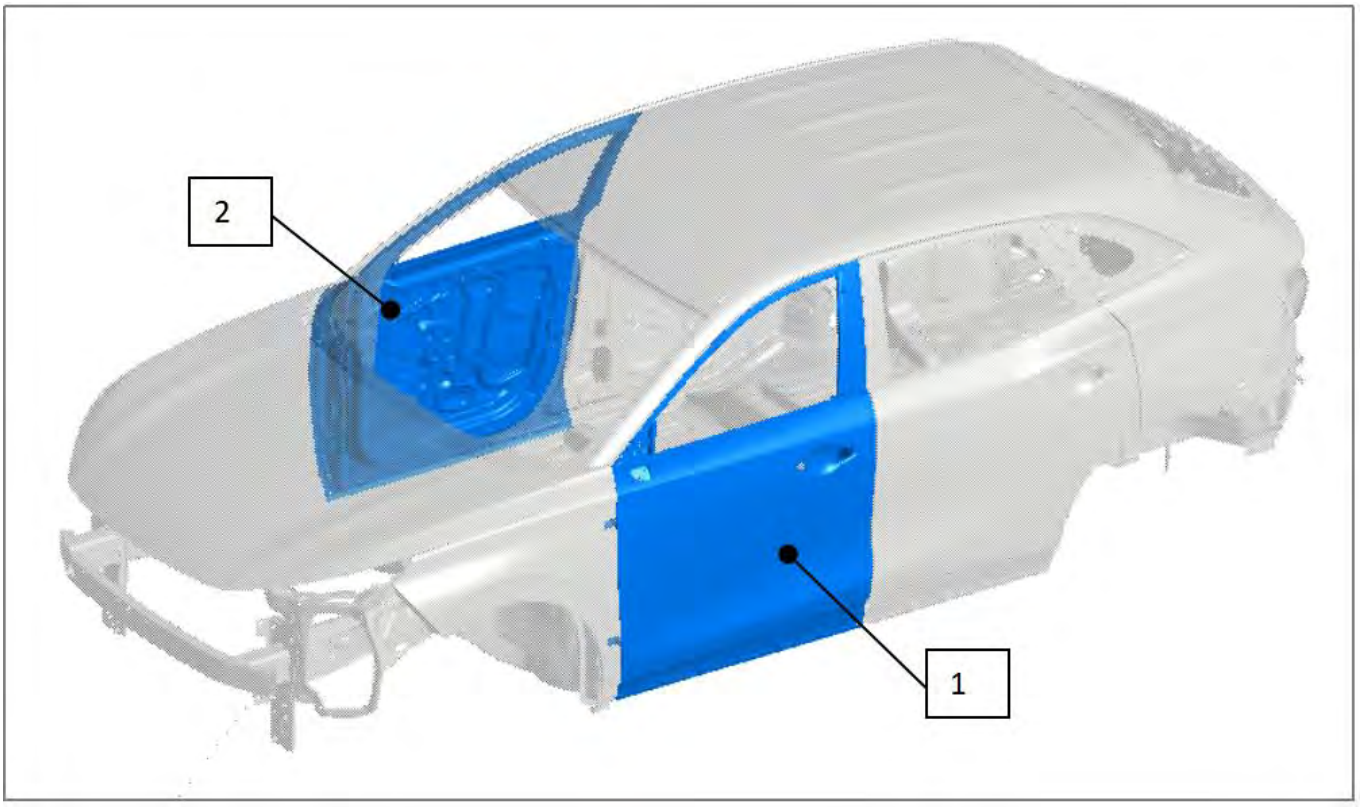
5.10.2.1 Component Locating Diagram



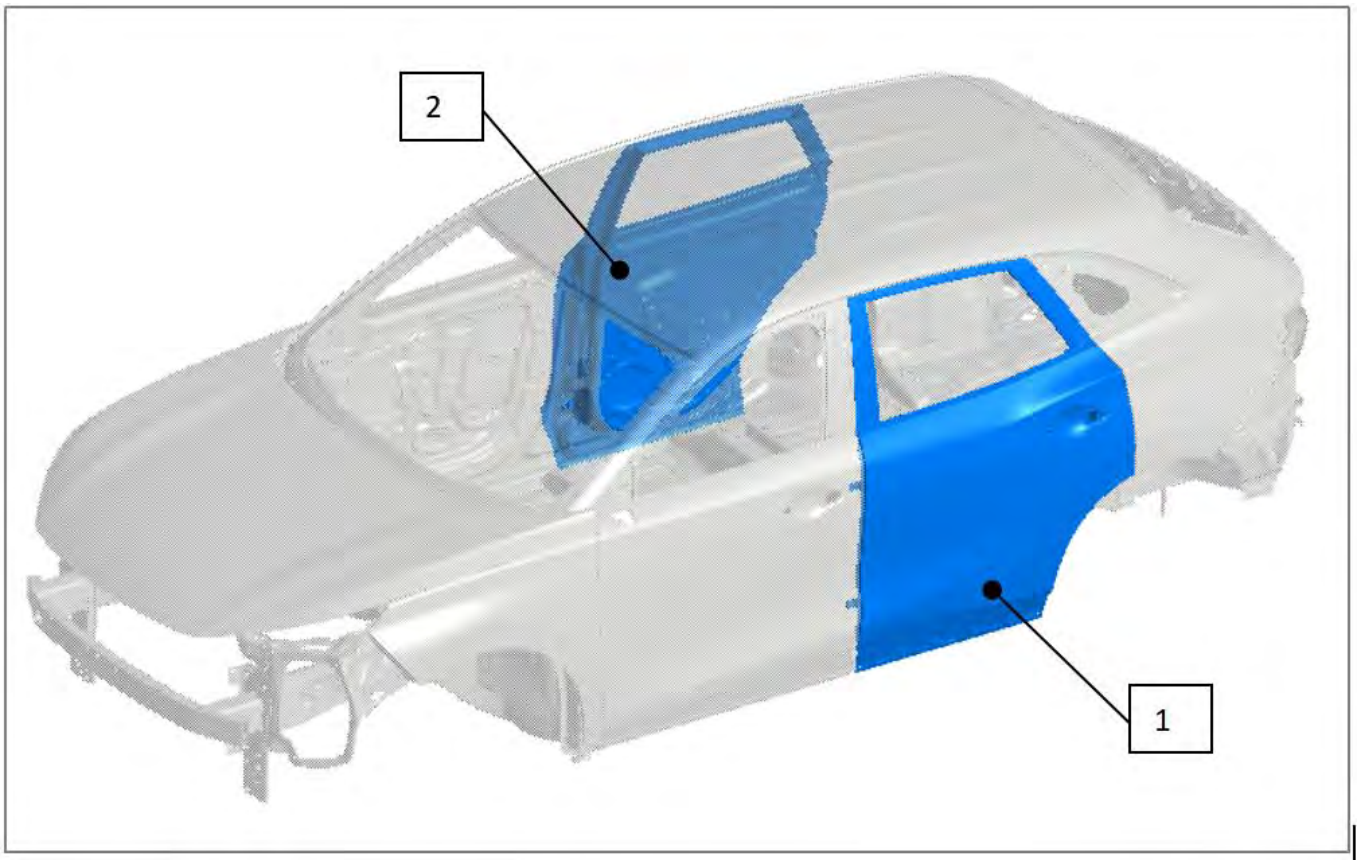
S/N	Name
1	Engine bonnet assembly



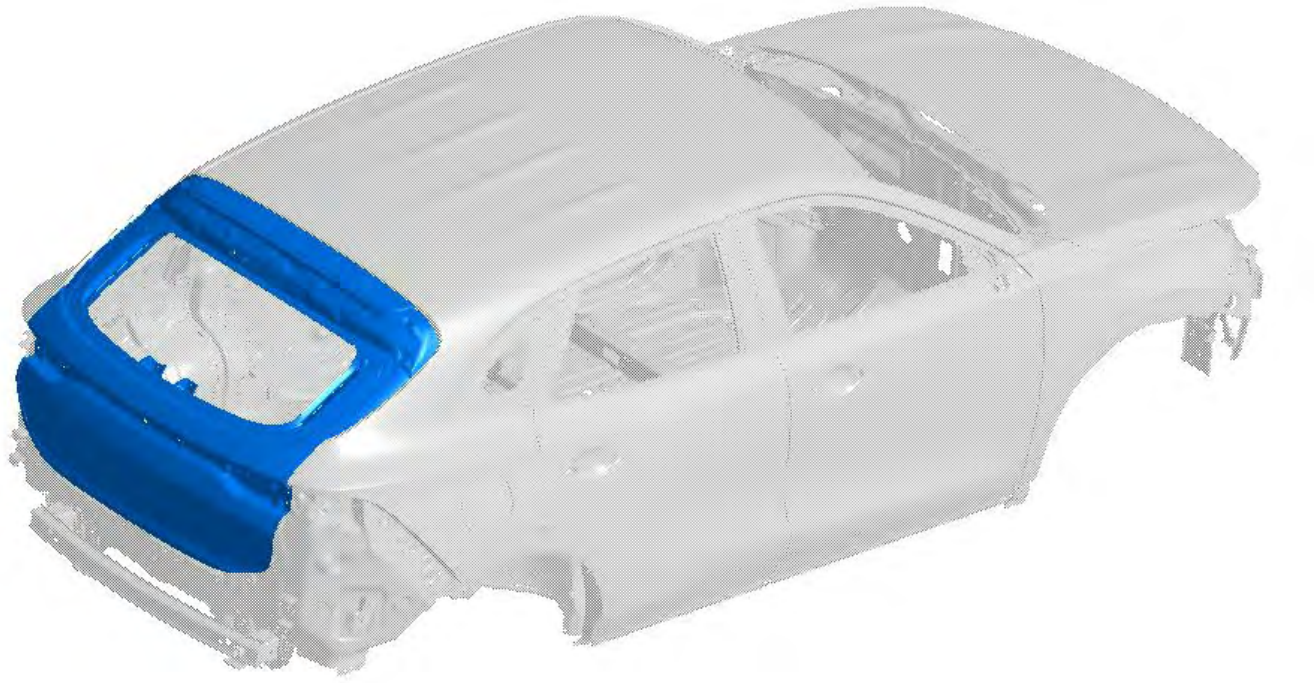
S/N	Name
1	Left fender
2	Right fender



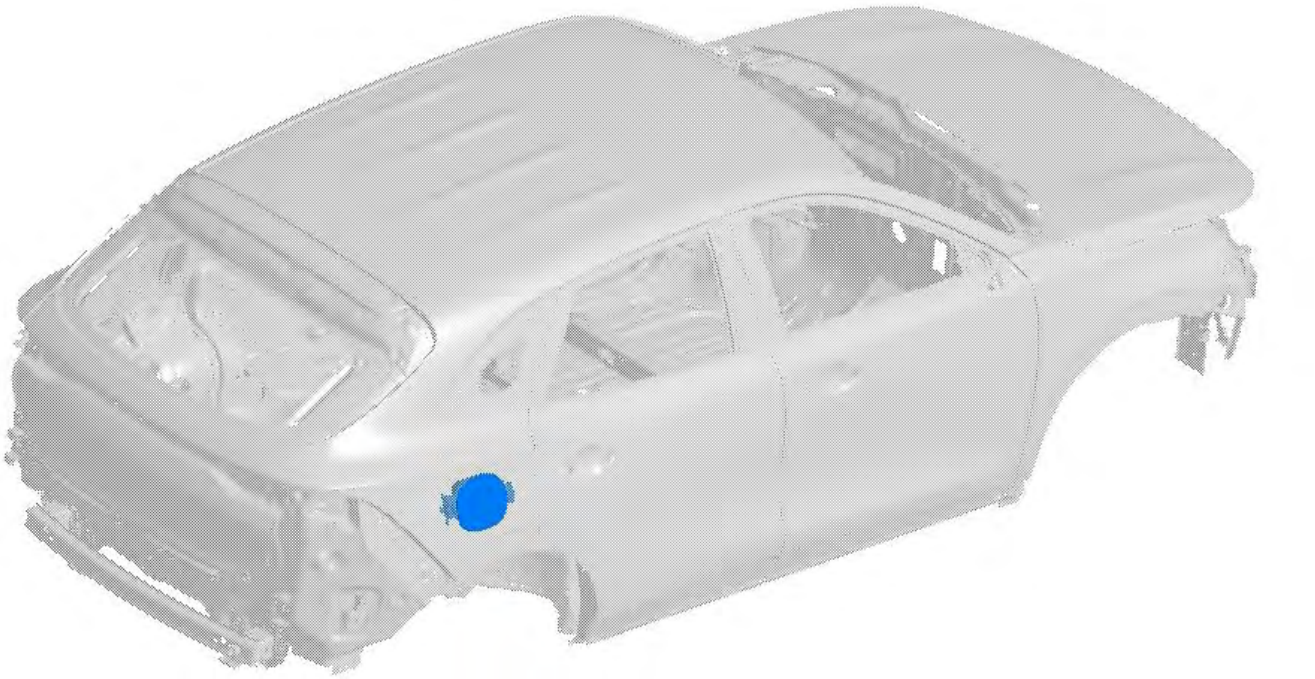
S/N	Name
1	Front left door assembly
2	Front right door assembly



S/N	Name
1	Rear left door assembly
2	Rear right door assembly



S/N	Name
1	Boot lid assembly



S/N	Name
1	Fuel filler/charging port assembly

5.10.3 Diagnosis and testing

5.10.3.1 Fault Diagnosis

G11-6-4-1. Basic inspection and fault diagnosis of power boot lid Fault detection and diagnosis method

Power boot lid:

Steps	Measures	Yes	No
1	Press the cab power boot lid switch and boot lid microswitch, and listen to whether there is a buzzer sound from the power boot lid ECU.	Go to Step 5	Go to Step 2
2	Check whether the fuse is normal	Go to Step 3	Replacement of fuse
3	Use a digital multimeter to check whether the connector power supply is normal	Go to Step 4	Check the harness
4	Replace the power boot lid ECU.		
5	Use the X431 diagnostic scanner to read the DTC for repair.		

Inductive boot lid:

Steps	Measures	Yes	No
1	Press the power boot lid switch and boot lid microswitch in the cab to check whether the power boot lid works normally	Go to Step 2	Check the power boot lid
2	With the vehicle off, carry the key and perform a kick under the middle of the rear bumper, whether the boot lid opens normally		Go to Step 3
3	Check whether the key is charged	Go to Step 4	Repair the key.
4	Check whether the fuse is normal	Go to Step 5	Replacement of fuse
5	Check whether the power supply of the kick controller connector is normal with a digital multimeter	Go to Step 6	Check the harness

Steps	Measures	Yes	No
6	Replace the kick controller. With the vehicle off, carry the key and perform a kick under the middle of the rear bumper, whether the boot lid opens normally	Replace the kick controller	Go to Step 7
7	Replace the upper and lower kick sensors. With the vehicle off, carry the key and perform a kick under the middle of the rear bumper, whether the boot lid opens normally	Replace the upper and lower kick sensors	Go to Step 8
8	Replace the kick controller and upper and lower kick sensors		

5.10.3.2 G11-6-4-2. Basic inspection of power boot lid Check fault diagnosis DTC and detection method

S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
1	U014000	Lost BCM communicaiton Loss of communication with BCM module	Circuit Short ,open or other Short-circuited, open-circuited or others	Check the BCM HW or EMC. Check BCM hardware or electromagnetic compatibility
2	U014001	Lost PEPS communication Lost communication with PEPS module	Circuit Short ,open or othe Short-circuited, open-circuited or others	Check the PEPS HW or EMC Check PEPS hardware or electromagnetic compatibility
3	U007300	CAN Bus Signal / Message Failures Bus off CAN bus fault	Circuit Short ,open or other Short-circuited, open-circuited or others	check CAN wires or EMC Check CAN harness and Electromagncetic Compatibility (EMC)
4	B240616	ECU Supply Voltage Low (non-powertrain system) ECU undervoltage (non-powertrain system)	Check whether the battery is abnormal	/

S/N	DTC	Meaning	Possible cause	Repairrecommendations
5	B240617	ECU Supply Voltage high (non-powertrain system) ECU overvoltage (non-powertrain system)	Check whether the battery is abnormal	/
6	B240054	POT isn't intialized/ Mechanical up end position is unlearned Power boot lid full stroke not learnt	learning procedure is not triggered The self-learning process has not been triggered.	trigger position learning procedure Trigger the self-learning process
7	B240123	Shutface stuck error Shutface switch stuck error	Shutface switch short to GND Shutface switch shorted to ground	check Shutface switch Check the Shutface switch
8	B240267	Boot/Trunk Primary Switch Algorithm Based Failures Signal incorrect after event Main lock signal timing fault of boot lid lock	unstable wire connection of primary signal or latch mechanical failure The primary lock signal connection is unstable or the boot lid lock has mechanical fault.	Check latch wires and latch. Check the boot lid lock harness and boot lid lock.
9	B240367	Boot/Trunk Motor Close switch Algorithm Based Failures Signal incorrect after event Back-to-zero signal timing fault of boot lid lock	a. home signal is stuck to high voltage b/c. unstable wire connection of home signal or latch mechanical failure a. The lock zero position signal sticks to the high level b/c. The lock zero position signal connection is unreliable or there is a mechanical fault of the door lock	Check Latch wires and latch Check the boot lid lock harness and boot lid lock.

S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
10	B240412	Boot/Trunk motor close General Electrical Failures Circuit short to battery Boot lid self-priming motor drive circuit shorted to power supply	1 of power closing motor pin short to battery One of the self-priming motor output terminals shorted to power supply	Check PCU motor and wires Check the self-priming motor and harness
11	B240413	Boot/Trunk motor close General Electrical Failures Circuit open Boot lid self-priming motor drive circuit open-circuited fault	PCU drive circuit error or PCU motor failure Self-priming motor drive circuit fault or self-priming motor fault	Check PCU motor and wires Check the self-priming motor and harness
12	B240419	Boot/Trunk Motor Close General Electrical Failures Circuit current above threshold Boot lid self-priming motor running current excessively high fault	Obstacle during PCU contracting or Latch internal mechanical failure Obstacles or mechanical faults inside the lock exist during self-priming motor actuation	Check Latch and possible obstacle. Check whether there are obstacles at the lock and the boot lid
13	B240511	Trunk Motor General Electrical Failures Circuit short to ground Boot lid electric stay bar circuit short-circuited to GND	1 of left(right) spindle motor pin short to ground One of the left (right) boot lid stay bar motor output terminals shorted to ground	Check left and right spindle motor and wires. Check the left and right stay bar motors and harnesses
14	B240512	Trunk motor General Electrical Failures Circuit short to battery Boot lid electric stay bar circuit short-circuited to power supply	1 of left(right) spindle motor pin short to battery One of the left (right) boot lid stay bar motor output terminals shorted to power supply	Check left and right spindle motor and wires. Check the left and right stay bar motors and harnesses

S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
15	B240519	Trunk Motor General Electrical Failures Circuit current above threshold Boot lid stay bar motor running current excessively high fault	Spindle motor error or extensive loads Boot lid stay bar motor fault or boot lid overload	Check spindle motor and possible extensive loads Check the boot lid stay bar motor and possible additional boot lid load
16	B240613	Trunk motor (left) General Electrical Failures Circuit open Boot lid left stay bar motor drive circuit open-circuited fault	unstable wire connection of left Spindle motor pins or Spindle internal failure Unreliable connection of output terminal of boot lid left stay bar motor or internal fault of stay bar motor	Check left spindle motor and wires. Check the left stay bar motor and harness
17	B240711	Sensor Power Supply 1 (left) General Electrical Failures Circuit short to ground Hall sensor power supply output signal of left stay bar motor short-circuited to GND	Hall Sensor power supply (left) short to Ground Hall sensor power supply output terminal of left stay bar motor shorted to GND	Check left spindle motor and wires. Check the left stay bar motor and harness
18	B240712	Sensor Power Supply 1 (left) General Electrical Failures Circuit short to battery Hall sensor power supply output signal of left stay bar motor short-circuited to power supply	Hall Sensor power supply (left) short to Battery Hall sensor power supply output terminal of left stay bar motor shorted to power supply	Check left spindle motor and wires. Check the left stay bar motor and harness

S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
19	B240813	Trunk Motor 2 (right) General Electrical Failures Circuit open Boot lid right stay bar motor drive circuit open-circuited fault	unstable wire connection of right Spindle motor pins or Spindle internal failur Unreliable connection of output terminal of boot lid right stay bar motor or internal fault of stay bar motor	Check right spindle motor and wires. Check the right stay bar motor and harness
20	B240911	Sensor Power Supply 2 (right) General Electrical Failures Circuit short to ground Hall sensor power supply output signal of right stay bar motor short-circuited to GND	Hall Sensor power supply (right) short to Ground Hall sensor power supply output terminal of right stay bar motor shorted to ground	Check right spindle motor and wires. Check the right stay bar motor and harness
21	B240912	Sensor Power Supply 2 (right) General Electrical Failures Circuit short to battery Hall sensor power supply output signal of right stay bar motor short-circuited to power supply	Hall Sensor power supply (right) short to Battery Hall sensor power supply output terminal of right stay bar motor shorted to power supply	Check right spindle motor and wires. Check the right stay bar motor and harness
22	B240A11	Power Operated Tailgate (POT) Left Position Sensor 1 General Electrical Failures Circuit short to ground Hall sensor position signal 1 of left stay bar motor for power boot lid short-circuited to GND	Hall signal stuck on left position sensor 1 Hall sensor position signal 1 of left stay bar motor stuck	Check left spindle motor and wires. Check the left stay bar motor and harness

S/N	DTC	Meaning	Possible cause	Repairrecommendations
23	B240A15	Power Operated Tailgate (POT) Left Position Sensor 1 General Electrical Failures Circuit short to battery or open Hall sensor position signal 1 of left stay bar motor for power boot lid short-circuited to power supply or open-circuited fault	Hall signal stuck on left position sensor 1 Hall sensor position signal 1 of left stay bar motor stuck	Check left spindle motor and wires. Check the left stay bar motor and harness
24	B240B11	Power Operated Tailgate (POT) Left Position Sensor 2 General Electrical Failures Circuit short to ground Hall sensor position signal 2 of left stay bar motor for power boot lid short-circuited to GND	Hall signal stuck on left position sensor 2 Hall sensor position signal 2 of left stay bar motor stuck	Check left spindle motor and wires. Check the left stay bar motor and harness
25	B240B15	Power Operated Tailgate (POT) Left Position Sensor 2 General Electrical Failures Circuit short to battery or open Hall sensor position signal 2 of left stay bar motor for power boot lid short-circuited to power supply or open-circuited fault	Hall signal stuck on left position sensor 2 Hall sensor position signal 2 of left stay bar motor stuck	Check left spindle motor and wires. Check the left stay bar motor and harness

S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
26	B240C11	Power Operated Tailgate (POT) Right Position Sensor 1 General Electrical Failures Circuit short to ground Hall sensor position signal 1 of right stay bar motor for power boot lid short-circuited to GND	Hall signal stuck on right position sensor 1 Hall sensor position signal 1 of right stay bar motor stuck	Check right spindle motor and wires. Check the right stay bar motor and harness
27	B240C15	Power Operated Tailgate (POT) Right Position Sensor 1 General Electrical Failures Circuit short to battery or open Hall sensor position signal 1 of right stay bar motor for power boot lid short-circuited to power supply or open-circuited fault	Hall signal stuck on right position sensor 1 Hall sensor position signal 1 of right stay bar motor stuck	Check right spindle motor and wires. Check the right stay bar motor and harness
28	B240D11	Power Operated Tailgate (POT) Right Position Sensor 2 General Electrical Failures Circuit short to ground Hall sensor position signal 2 of right stay bar motor for power boot lid short-circuited to GND	Hall signal stuck on right position sensor 2 Hall sensor position signal 2 of right stay bar motor stuck	Check right spindle motor and wires. Check the right stay bar motor and harness

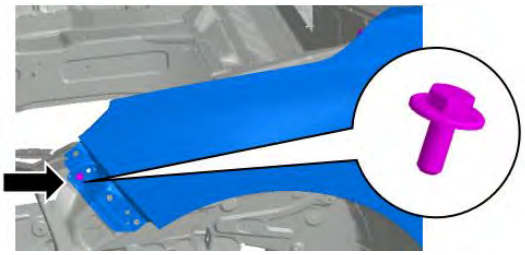
S/N	DTC	Meaning	Possible cause	Repairrecommendatio-ns
29	B240D15	Power Operated Tailgate (POT) Right Position Sensor 2 General Electrical Failures Circuit short to battery or open Hall sensor position signal 2 of right stay bar motor for power boot lid short-circuited to power supply or open-circuited fault	Hall signal stuck on right position sensor 2 Hall sensor position signal 2 of right stay bar motor stuck	Check right spindle motor and wires. Check the right stay bar motor and harness
30	U220D00	Limphome Network management limp home	Circuit Short ,open or other Short-circuited, open-circuited or others	check CAN wires or EMC Check CAN harness or electromagnetic compatibility

5.10.4 Removal and installation

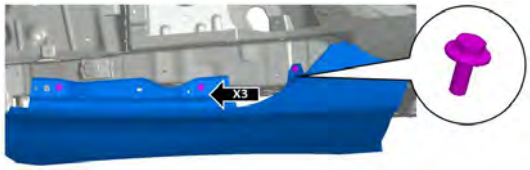
5.10.4.1 Left fender

Removal

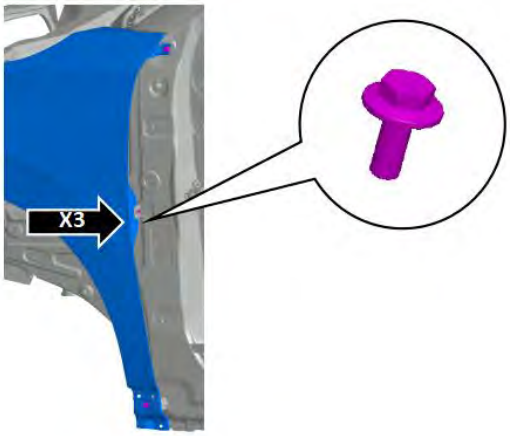
1. Remove the front bumper assembly. Refer to: Front bumper assembly.
2. Remove the left daytime running light assembly. Refer to: Daytime running light assembly.
3. Remove the engine compartment interior trim panel assembly.
4. Remove the front left mudguard. Refer to: Left and right front/rear wheel guard assemblies.
5. Remove the front left fender barrier pad. Refer to: Front left fender barrier pad.
6. Remove the fender bottom trim. Refer to: Fender bottom trim.
7. Remove one fixing bolt from the left fender.



8. Remove 3 fixing bolts from the left fender.



9. Remove 3 fixing bolts from the left fender.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

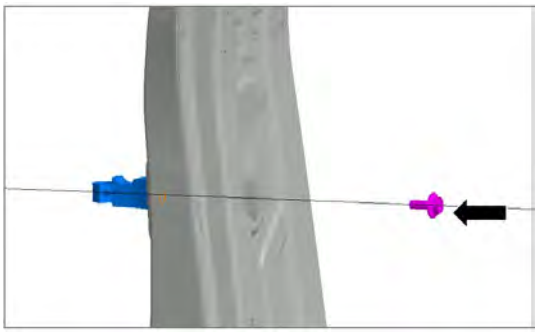
   Caution: When removing and installing sheet metal parts, please wear long-sleeved workwear and protective gloves to avoid being cut by sheet metal parts.

   Caution: Make sure that the peripheral clearance is normal when installing the fender assembly.

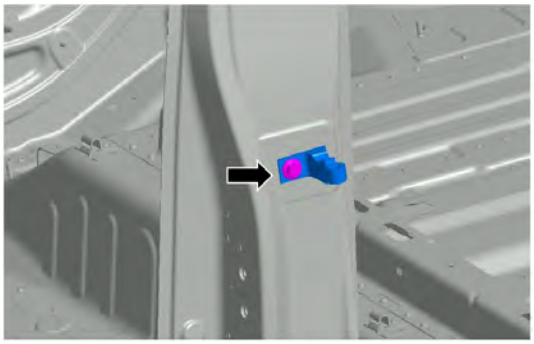
5.10.4.2 Rear left door upper hinge base plate

Removal

1. Remove the rear left door assembly. Refer to: Rear left door assembly.
2. Remove the upper hinge plate assembly of rear left door. Refer to: Front door hinge plate.
3. Remove the left B-pillar lower shield. Refer to: Left B-pillar lower shield.
4. Remove 1 fixing bolt from the inner side of rear left door upper hinge base plate. Tightening torque: 23±3N·m.



5. Remove 1 fixing bolt and take out the rear left door upper hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

Caution: Check the parts and components thoroughly before repairing or replacing them.

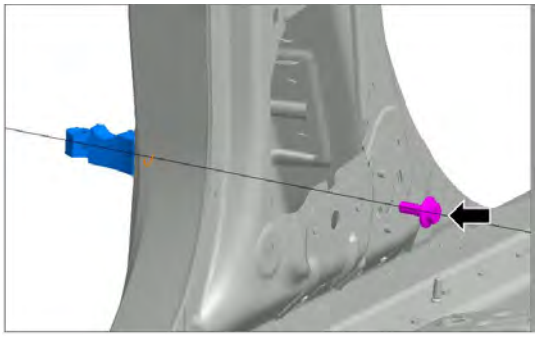
Caution: Remove the door assembly with the assistance of another repair technician.

Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

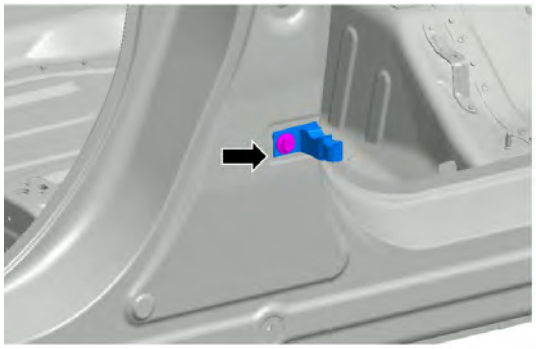
5.10.4.3 Rear left door lower hinge base plate

Removal

1. Remove the rear left door assembly. Refer to: Rear left door assembly.
2. Remove the lower hinge plate assembly of rear left door. Refer to: Front door hinge plate.
3. Remove the left B-pillar lower shield. Refer to: Left B-pillar lower shield.
4. Remove 1 fixing bolt on the inner side of rear left door lower hinge base plate. Tightening torque: 23±3N·m.



5. Remove 1 fixing bolt and take down the rear left door lower hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

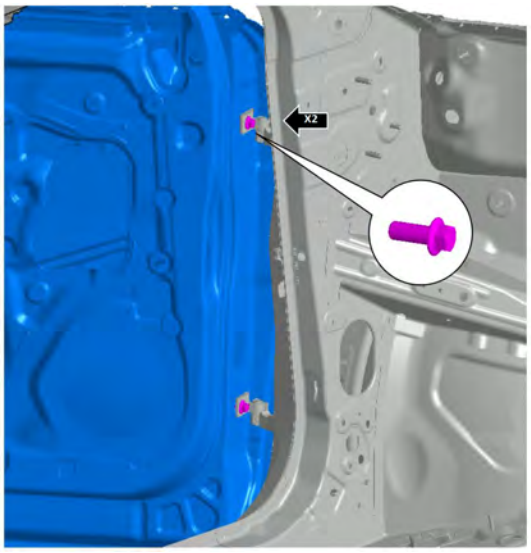
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

5.10.4.4 Front left door assembly

Removal

1. Remove the left door harness. Refer to: Left door harness.
2. Remove the front door check. Refer to: Front door check.
3. Remove 2 fixing bolts and take down the front left door assembly. Tightening torque: 70±5N·M.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

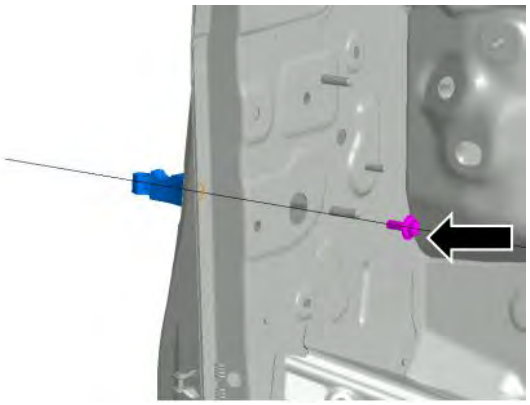
5.10.4.5 Front left door upper hinge base plate

Removal

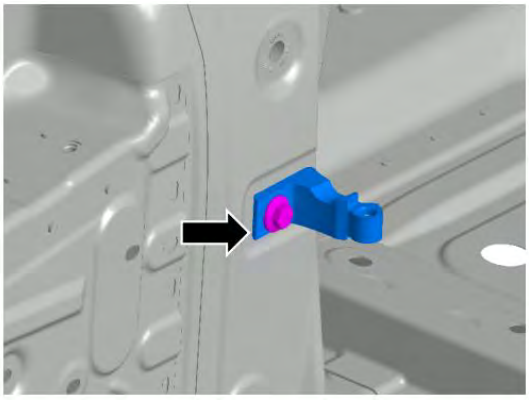
1. Remove the left fender. Refer to: Left fender.
2. Remove the front left door assembly. Refer to: Front left door assembly.
3. Remove the front left door hinge plate. Refer to: Front door hinge plate.

4. Remove the tubular beam assembly. Refer to: Tubular beam assembly.

5. Remove 1 fixing bolt from the inner side of front left door upper hinge base plate. Tightening torque: 23±3N·m.



6. Remove 1 fixing bolt and take out the front left door upper hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

5.10.4.6 Front left door lower hinge base plate

Removal

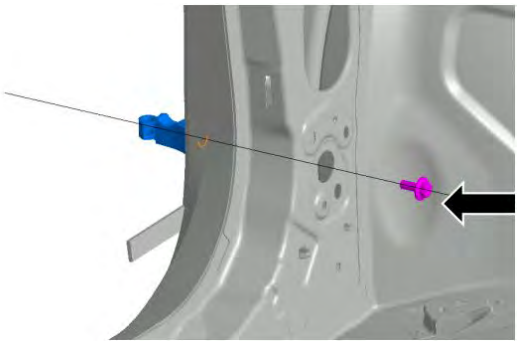
1. Remove the left fender. Refer to: Left fender.

2. Remove the front left door assembly. Refer to: Front left door assembly.

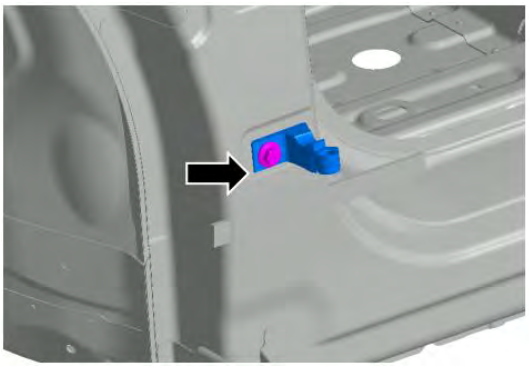
3. Remove the front left door lower hinge plate. Refer to: Refer to: Front door hinge plate.

4. Remove the left A-pillar lower shield assembly. Refer to: Left a-pillar lower shield.

5. Remove 1 fixing bolt from the inner side of front left door upper hinge base plate. Tightening torque: 23±3N·m.



6. Remove 1 fixing bolt and take out the front left lower hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

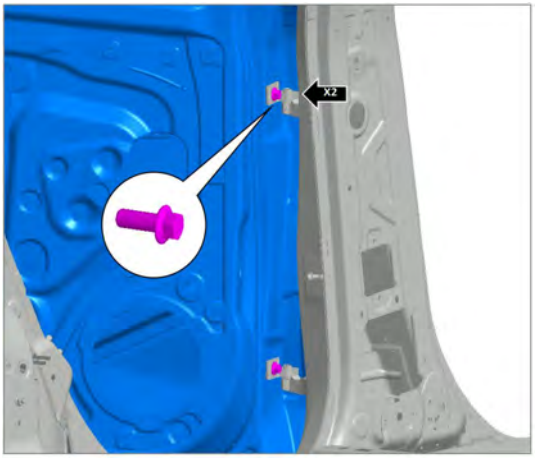
5.10.4.7 Rear left door assembly

Removal

1. Remove the rear left door harness. Refer to: Rear left door harness.

2. Remove the rear door check. Refer to: Rear door check.

3. Remove 2 fixing bolts and take down the rear left door assembly. Tightening torque: 70±5N·M.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

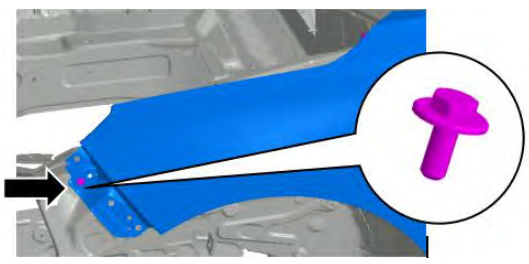
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

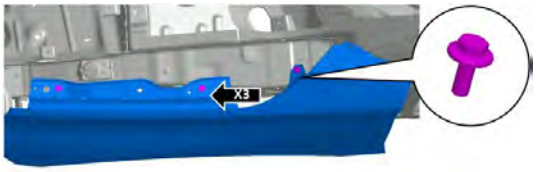
5.10.4.8 Right fender

Removal

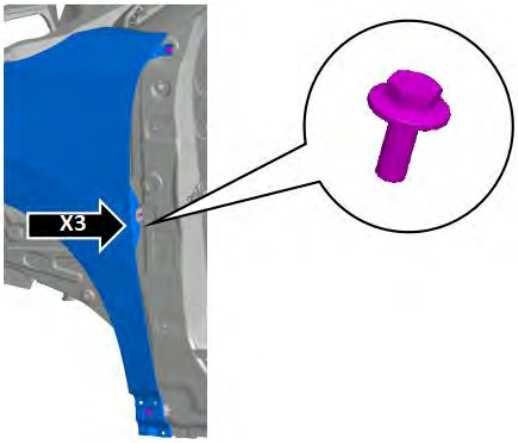
1. Remove the front bumper assembly. Refer to: Front bumper assembly.
2. Remove the right daytime running light assembly. Refer to: Daytime running light assembly.
3. Remove the right engine compartment trim cover plate.
4. Remove the front right mudguard. Refer to: Disassembly and assembly of left and right front and rear wheel guard systems.
5. Remove the right fender barrier pad. Refer to: Removal and installation of right fender barrier pad.
6. Remove the right fender bottom trim body. Refer to: Fender bottom trim.
7. Remove one fixing bolt from the right fender.



8. Remove 3 fixing bolts from the right fender.



9. Remove 3 fixing bolts from the right fender.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

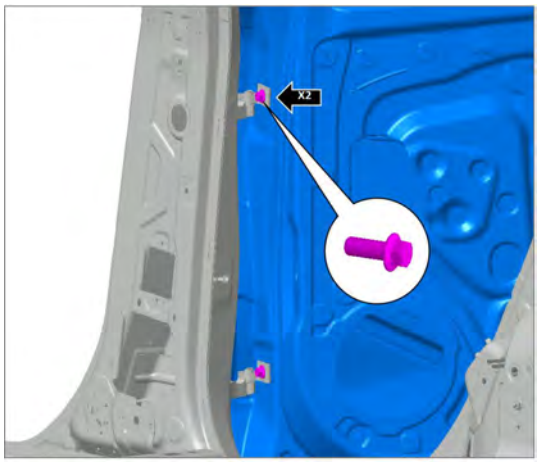
   Caution: When removing and installing sheet metal parts, please wear long-sleeved workwear and protective gloves to avoid being cut by sheet metal parts.

   Caution: Make sure that the peripheral clearance is normal when installing the fender assembly.

5.10.4.9 Rear right door assembly

Removal

1. Remove the rear right door harness. Refer to: Rear right door harness.
2. Remove the rear door check. Refer to: Rear door check.
3. Remove 2 fixing bolts and take out the rear right door assembly. Tightening torque: 70±5N·M.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

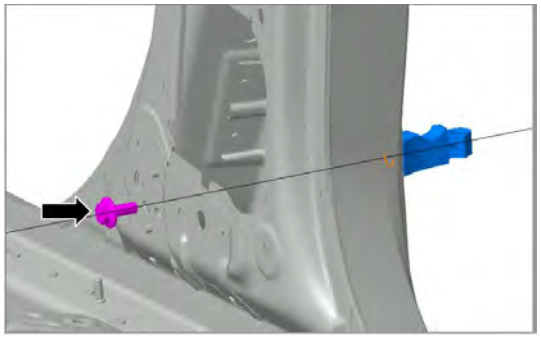
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

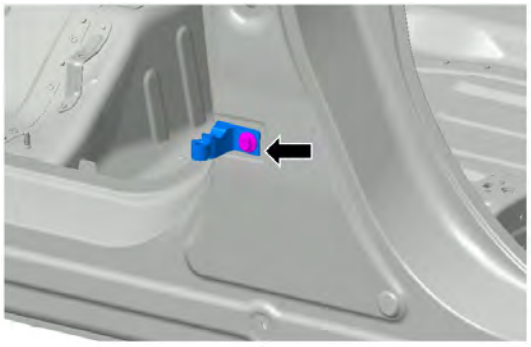
5.10.4.10 Rear right door lower hinge seat plate

Removal

1. Remove the rear right door assembly. Refer to: Rear right door assembly.
2. Remove the lower hinge plate assembly of rear right door. Refer to: Front door hinge plate.
3. Remove the right B-pillar lower shield assembly. Refer to: Left B-pillar lower shield.
4. Remove 1 fixing bolt on the inner side of rear right door lower hinge base plate. Tightening torque: 23±3N·m.



5. Remove 1 fixing bolt and take out the rear right lower hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

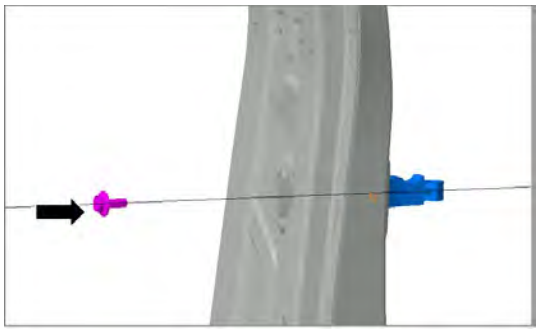
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

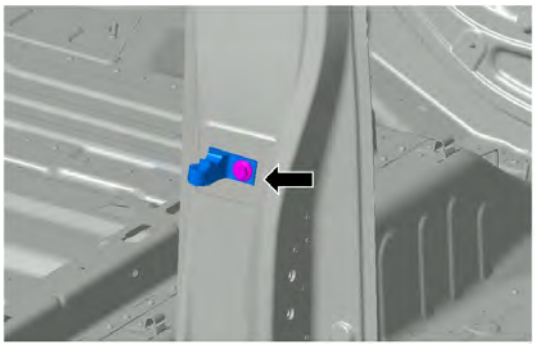
5.10.4.11 Rear right door upper hinge base plate

Removal

1. Remove the rear right door assembly. Refer to: Rear right door assembly.
2. Remove the upper hinge plate assembly of rear right door. Refer to: Front door hinge plate.
3. Remove the right B-pillar lower shield. Refer to: Left B-pillar lower shield.
4. Remove 1 fixing bolt from the inner side of rear right door upper hinge base plate. Tightening torque: 23±3N·m.



5. Remove 1 fixing bolt and take out the rear right upper hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

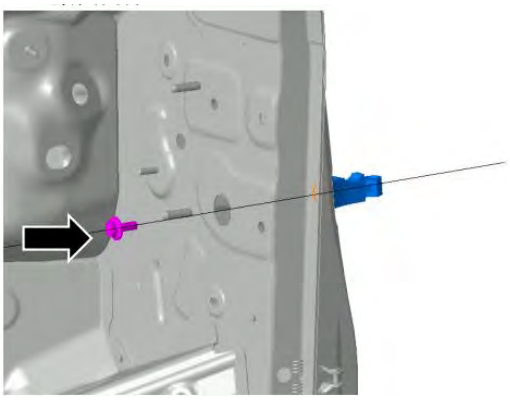
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

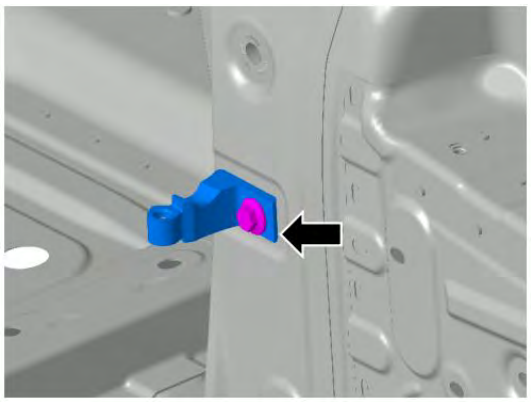
5.10.4.12 Front right door upper hinge base plate

Removal

1. Remove the right fender. Refer to: Right fender.
2. Remove the front right door assembly. Refer to: Front right door assembly.
3. Remove the upper hinge plate of front right door. Refer to: Front door hinge plate.
4. Remove the tubular beam assembly. Refer to: Tubular beam assembly.
5. Remove 1 fixing bolt from the inner side of front right door upper hinge base plate. Tightening torque: 23±3N·m.



6. Remove 1 fixing bolt and take out the front right lower hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

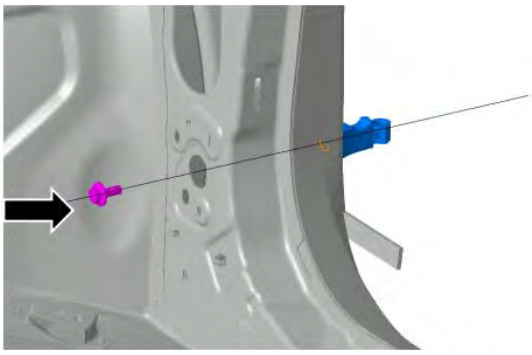
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

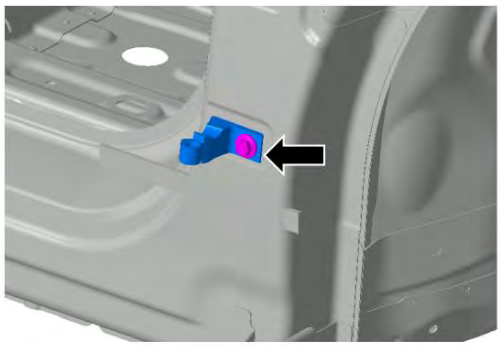
5.10.4.13 Front right door lower hinge base plate

Removal

1. Remove the right fender. Refer to: Right fender.
2. Remove the front right door assembly. Refer to: Front right door assembly.
3. Remove the lower hinge plate of front right door. Refer to: Front door hinge plate.
4. Remove the right A-pillar lower shield. Refer to: Left a-pillar lower shield.
5. Remove 1 fixing bolt from the inner side of front left door upper hinge base plate. Tightening torque: 23±3N·m.



6. Remove 1 fixing bolt and take out the front right lower hinge base plate. Tightening torque: 23±3N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

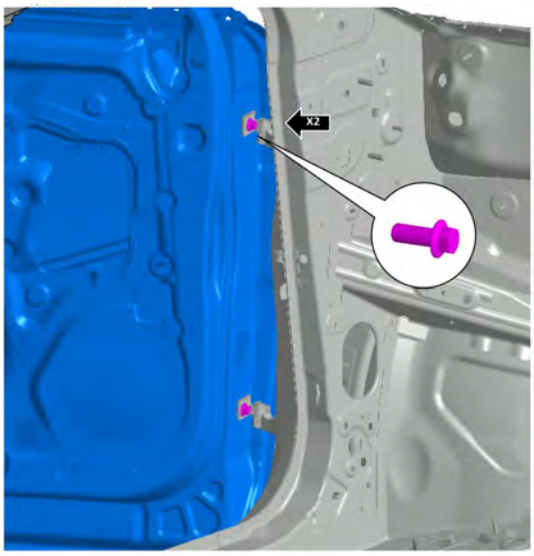
   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

5.10.4.14 Front right door assembly

Removal

1. Remove the front right door harness. Refer to: Front right door harness.
2. Remove the front door check. Refer to: Front door check.
3. Remove 2 fixing bolts and take out the front right door assembly. Tightening torque: 70±5N·M.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the door assembly with the assistance of another repair technician.

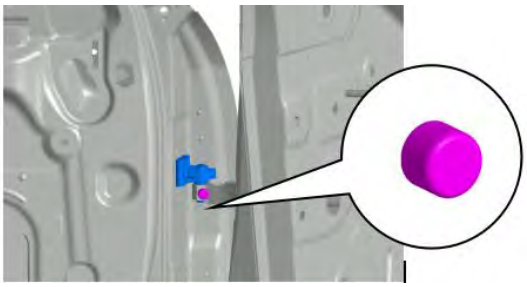
   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

5.10.4.15 Front door hinge plate

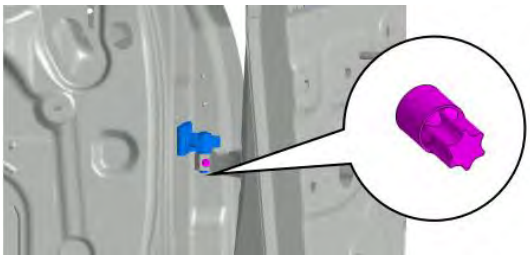
Removal

Caution: The removal and installation methods of the left and right front door (upper and lower) hinge plates are the same as those of the left and right rear door (upper and lower). Take the upper part of the left front door as an example.

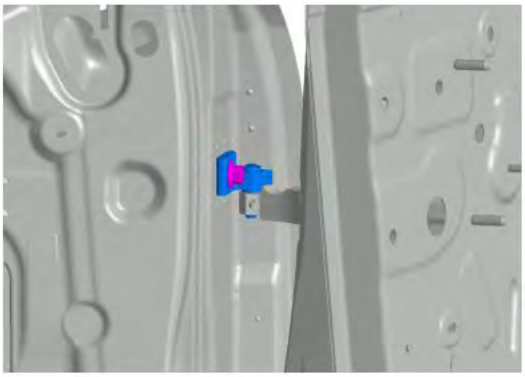
1. Remove the hinge fixing bolt plug cap.



2. Remove 1 hinge locking mechanism. Tightening torque: 23 ±3N·m.



3. Remove 1 fixing bolt and take out the front left door upper hinge plate. Tightening torque: 70±5N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the door assembly with the assistance of another repair technician.

   Caution: When installing the front door assembly, it is necessary to confirm that the surrounding clearance is normal.

5.10.4.16 Front door check

Removal

Notice:

The removal and installation methods of the front left and front right door check assemblies are the same. Take the left one as an example.

Caution:

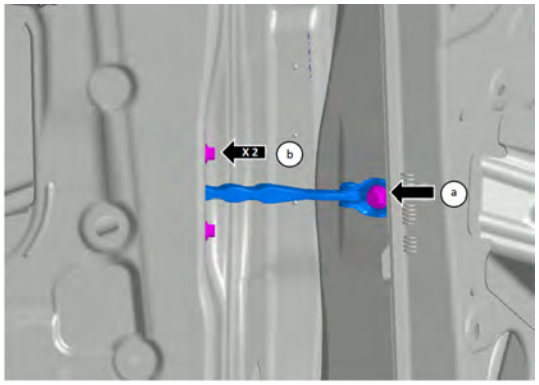
Raise the window glass assembly to the highest position before removing the door check assembly.

1. Remove 1 fixing bolt a.

   - Tightening torque: 23±3 N·m

2. Remove 2 fixing bolts b and take out the front door check assembly.

   - Tightening torque: 8±1 N·M



Installation

The installation order is reverse to the removal order. Pay attention to the following points:

Caution: After installation, open and close the door 5~10 times to confirm whether the door check is loose or makes an abnormal sound. If any, loosen the bolt at a, open and close the door 5 times, and then tighten it again.

1. .

5.10.4.17 Removal and installation of rear door check

Removal

NOTICE

The removal and installation methods of the rear left and rear right door check assemblies are the same. Take the left one as an example.

Caution

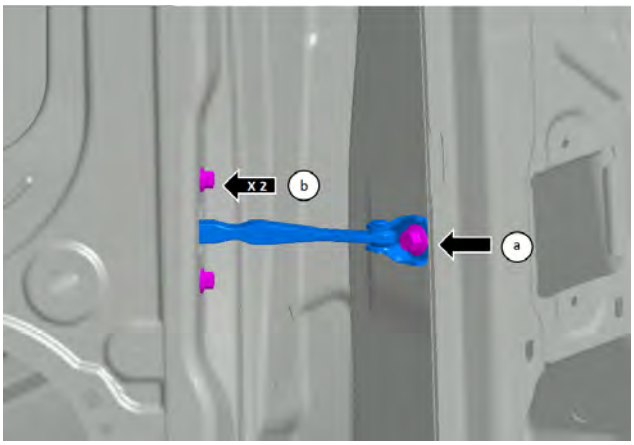
Raise the window glass assembly to the highest position before removing the door check assembly.

1. Remove 1 fixing bolt a.

   - Tightening torque: 23±3 N·m

2. Remove 2 fixing bolts b and take out the rear door check assembly.

   - Tightening torque: 8±1 N·M



Installation

Caution

After installation, open and close the door 5~10 times to confirm whether the door **check is loose or has abnormal noise. If any, loosen the bolt at a, open and close the door 5 times, and then tighten it again.**

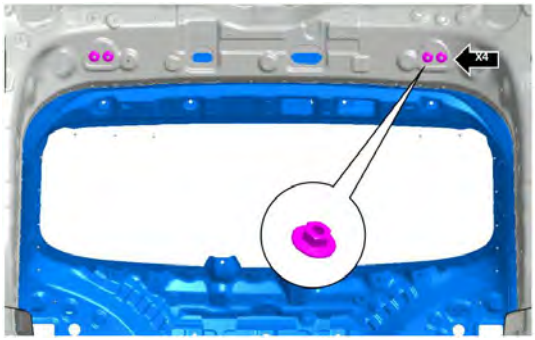
1. Install in the reverse order of removal.

5.10.4.18 Boot lid assembly

Removal

1. Remove the roof interior trim assembly. Refer to: Roof interior trim assembly.

2. Remove 2 fixing nuts of the boot lid. Tightening torque: 23 ±5N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the boot lid assembly with the assistance of another repair technician.

   Caution: When installing the boot lid assembly, it is necessary to confirm that the surrounding gap is normal.

5.10.4.19 Boot lid hinge assembly

Removal

1. Remove the boot lid assembly. Refer to: Boot lid assembly.
2. Remove the 4 fixing bolts of the boot lid hinge. Tightening torque: 23±5N·m.



Installation

1. The installation order is reverse to the removal order. Pay attention to the following points:

   Caution: Check the parts and components thoroughly before repairing or replacing them.

   Caution: Remove the boot lid assembly with the assistance of another repair technician.

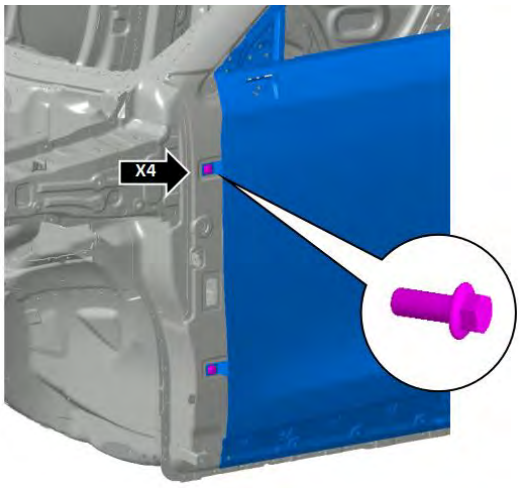
   Caution: When installing the boot lid assembly, it is necessary to confirm that the surrounding gap is normal.

5.10.5 General procedures

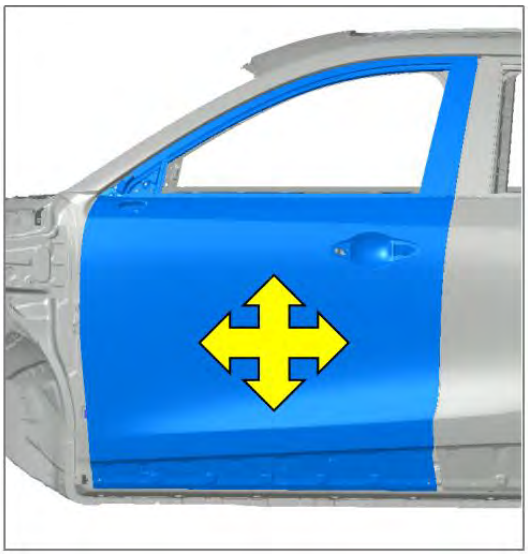
5.10.5.1 Adjustment of front door assembly

Caution: The adjustment method of the front left and right door assemblies is the same. Take the left one as an example.

1. Loosen 4 fixing bolts of front left door upper hinge base plate, which are on the inner and outer sides of the body. Tightening torque: 23±3N·m.



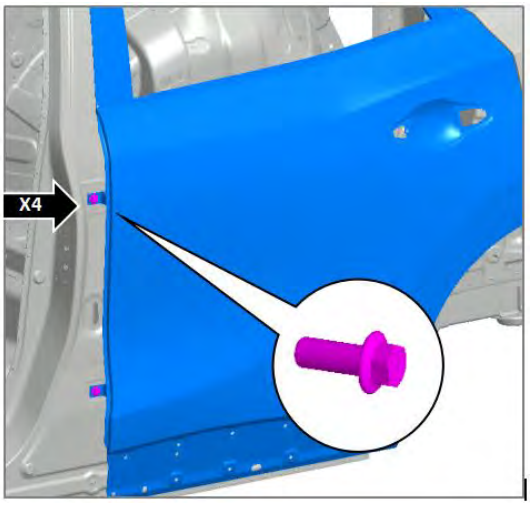
2. Adjust the front left door assembly horizontally and vertically.



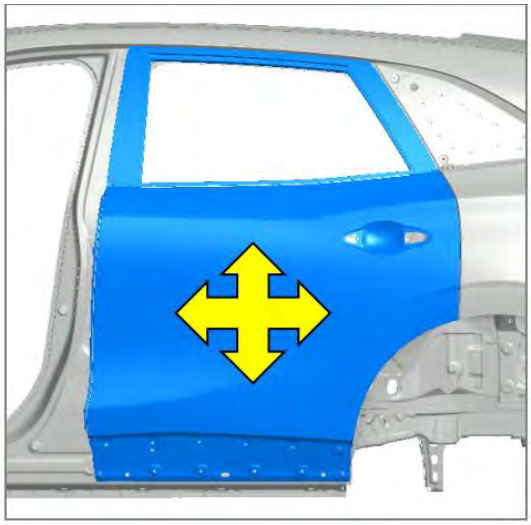
5.10.5.2 Adjustment of rear door assembly

Caution: The adjustment methods for the left and right rear door assemblies are the same, the following takes the left side as an example.

1. Loosen the 4 fixing bolts of the rear left door upper hinge base plate located on the inner and outer sides of the body. Tightening torque: 23±3N·m.

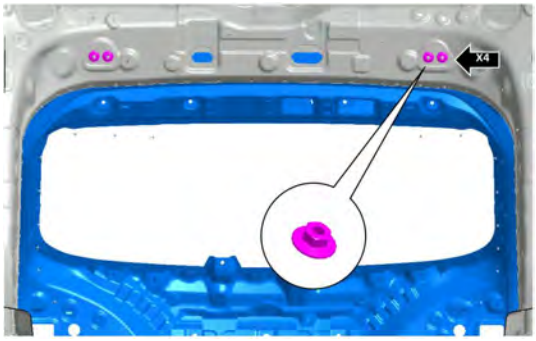


2. Adjust the rear left door assembly horizontally and vertically.

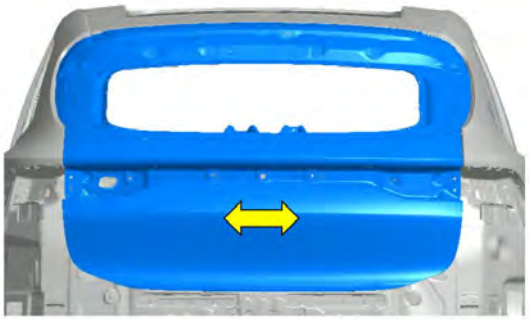


5.10.5.3 Adjustment of boot lid assembly

1. Loosen the 4 mounting nuts of the boot lid on the body side. Tightening torque: 23±3N·m.



2. Adjust the left and right positions of the boot lid to ensure that the gap between the boot lid and the side wall is uniform.



6.1 Maintenance List

Maintenance operations	Symbol Explanation: I = Check and adjust or replace as necessary (materials are calculated separately). **Note:**Oils of different models cannot be mixed.								
Regard every 12 months or 20,000 kilometers as the maintenance interval, whichever comes first.	Months	12	24	36	48	60	72	84	96
	km×2,000	10	20	30	40	50	60	70	80

Front compartment

Brake fluid (oil level height and leakage)	Check every 12 months or 20,000 kilometers. Replace every 2 years or 40,000 kilometers							
Coolant (liquid level and leakage)	Check every 12 months or 20,000 kilometers, and replace every 4 years or 80,000 kilometers							
Air conditioner filter	Clean every 12 months, and replace every 2 year or 20,000 kilometers							
All vacuum pipelines and connectors	Check every 2 years or every 20,000 kilometers							
Lubricating oil of the drive unit (leakage)	I	I	I	I	I	I	I	I
Replace the lubricating oil of the drive unit	Replace every 40,000 kilometers							
Whether the wiring harness connections in the front compartment are secure and free from damage	I	I	I	I	I	I	I	I
Check for damage to the electric fan connector, and inspect the nearby wiring harness for abnormalities such as damage or aging	I	I	I	I	I	I	I	I
Cooling system	I	I	I	I	I	I	I	I
Battery voltage, the fixation of terminals and wiring, and whether there are abnormal phenomena such as corrosion and ablation	I	I	I	I	I	I	I	I

Chassis and body

Steering, driving, transmission system parts and dust covers	I	I	I	I	I	I	I	I
Inspection of the tightening of bolts between the power battery pack assembly, the box body and the chassis. Check whether there are scratches, corrosion, deformation and damage on the battery box body, bolts and lower protective plate	I	I	I	I	I	I	I	I
Torque of main fasteners of the chassis	I	I	I	I	I	I	I	I
Tire condition, wear and tire pressure (including spare tire)	I	I	I	I	I	I	I	I
The wear condition of the front and rear brake friction pads (discs)	I	I	I	I	I	I	I	I

Free play, travel and operation of foot brake and parking brake	I	I	I	I	I	I	I	I
The condition of the sheet metal paint in the visible area of the cabin	I	I	I	I	I	I	I	I
Inspection oftire rotation and alignment status	Rotate the tires every 1 year or 20,000 kilometers							
Brake booster vacuum tube , connector and stop valve	Check every 2 years or every 20,000 kilometers							
Door locks, hinges, sunroofs, hood locks and trunk locks	Lubricate every 20,000 kilometers							
Seat belts, buckles and retractors	I	I	I	I	I	I	I	I
Signal lights, lighting, indicator lights and horns	I	I	I	I	I	I	I	I
Front and rear wipers, wiper blades and washer	I	I	I	I	I	I	I	I
Read system fault codes	I	I	I	I	I	I	I	I
The sheet metal and paint condition of the exterior body panels (including the inner panels of doors and covers)	I	I	I	I	I	I	I	I
Paint condition of the visible areas of the chassis and its components	I	I	I	I	I	I	I	I
Airbag: Visually check if there is any external damage and diagnose the fault code	inspection every 1 year or 20,000 kilometers							
Road driving test	First maintenance and inspection every 2 years or 20,000 kilometers							

6.2 New car inventory maintenance

If the wiper protection cover is not required, do not raise the wiper. If the wiper protection cover is not available, raise the wiper so that it does not come into direct contact with the windshield
Measure the static voltage and CCA value with a battery tester. The static voltage ≥ 12.5V, and the CCA value ≥ rated value. If the test voltage or CCA value is below the standard, disassemble the battery and charge it according to the procedure (After standing for 4 hours, measure the static voltage to be ≥ 12.65V, and the CCA value ≥ rated value). Then reassemble it on the vehicle (keep the negative terminal disconnected).
Measure the tire pressure value, and inflate it to meet the standard when it is insufficient. The standard tire pressure value of each model is on the label on the driver's seat side
Move the vehicle once
Start the vehicle, lightly press the brake pedal, move the vehicle 3~5m, lubricate the engine, remove the rust on the brake disc
Operation and maintenance are carried out by air condition switch, and the internal parts of the air conditioning compressor are lubricated
Open all doors and engine hood at one time, check and confirm that all doors, electrical appliances and lighting lights are closed
Traction Batteries of Plug-in and Extended-Range Hybrid Vehicles special: 1. If the checked power is less than 40%, charge it to more than 50% (slow charging is recommended); 2. If the inventory time exceeds 3 months, it is recommended to check once a month starting from the third month.
Start the vehicle and switch to Sport mode, turn on the air conditioner and set it to cooling mode for discharging, then roll down all four windows (do not turn on the heating function). When the battery pack power is low, the vehicle will automatically switch to the engine start state and charge the battery pack. Maintain the entire charging and discharging process for 30 minutes.

Notes :

When disconnecting and reconnecting the battery, always turn the ignition switch to OFF, otherwise it may damage the vehicle parts

Before moving the vehicle, reconnect and correctly tighten the negative terminal of the battery to the negative terminal

If the inventory time is less than 60 days, fill in the information at the top of the form, and fill in "The car was sold on X month X day, the inventory is less than 60 days, no inventory maintenance is required" in the inspection record; if the new car exceeds the inventory period of 180 days, please print a new form to continue the record

Problems must be repaired immediately, and inspection records should be filled in. New cars with quality problems are not allowed to be delivered to customers

The items listed in this table are not equipped in all models. Please check the actual vehicle

6.3 Parts Warranty Period

The warranty period of Forthing new vehicles starts from the date of first registration of the vehicle. The warranty period for each Forthing vehicle is 8 years/200,000 km, subject to the terms and conditions set out in this Warranty and Service Manual. The specific warranty period of parts is as follows:

S/N	Detailed parts	Warranty period
1	Power battery pack assembly, drive unit and motor controller	Eight years or 200,000 km （SOC≥70%）
2	Engine block, cylinder head, crankshaft, connecting rod, subframe, rear axle welding assembly, rear axle bracket assembly, engine hood lock body, engine mount bracket, engine hood lock body, vehicle body (including vehicle body frame, vehicle body steel plate, door; excluding paint)	Six years or 200,000 km
3	Power output module, vehicle control module (VCM), battery heater assembly (optional), pedestrian approaching vehicle sound warning system, vacuum booster assembly, brake master cylinder, brake bottom plate assembly, brake cable assembly, brake pedal assembly, parking control device assembly, steering wheel body assembly (excluding leather trim), steering column assembly (excluding EPS steering column assembly) steering drive shaft assembly, power steering fluid reservoir, power steering gear assembly, mechanical steering gear assembly, steering knuckle, valve, valve tappet, camshaft, timing sprocket, timing gear, timing chain, piston, piston pin, oil pan	Five years or 150,000 km

4	Battery and tire	One year or 20,000 km
5	Spark plug, clutch disc, brake pad, remote key battery, bulb, fuse and ordinary relay (excluding integrated control unit), air filter, A/C filter, oil filter, fuel filter and wiper blade	Six months or 5,000 km
6	Warranty of anti-corrosion perforation: covers cases where painted metal vehicle body panels develop rust penetration from the inside or bottom due to material or process defects during the vehicle's original manufacturing process, or quality problems in the original factory paint application process. This warranty does not cover superficial damages such as surface corrosion, paint blistering, scabbing, peeling and fading; nor does it include corrosion and damage caused or aggravated by insufficient maintenance or improper operation, external impact (including foreign object bumps and scratches that are not handled in time), environmental factors (such as pollution, acid rain, saline-alkali erosion, dampness and mildew). Any corrosion problems caused by external factors beyond the control of the brand (such as long-term open-air storage, lack of anti-rust treatment after accidental damage and contact with corrosive substances) are not covered by this warranty.	Seven years or 200,000 km