

General Information

Screw Threads

General

Metric threads to ISO standards are used.

Damaged nuts, bolts and screws must always be discarded. Cleaning damaged threads with a die or tap impairs the strength and fit of the threads and is not recommended.

Always ensure that replacement bolts are at least equal in strength to those replaced.

Castellated nuts must not be loosened to accept a split-pin, except in recommended cases when this forms part of an adjustment.

Do not allow oil or grease to enter blind threaded holes. The hydraulic action on screwing in the bolt or stud could split the housing.

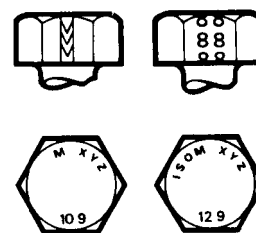
Always tighten a nut or bolt to the recommended torque figure. Damaged or corroded threads can affect the torque reading.

To check or re-tighten a bolt or screw to a specified torque figure, first loosen a quarter of a turn, then re-tighten to the correct torque figure.

Oil thread lightly before tightening to ensure a free running thread, except in the case of threads treated with sealant/lubricant, and selflocking nuts.

Fasteners Identification

Bolt Identification



S003044

An ISO metric bolt or screw made of steel and larger than 6 mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of the bolt head.

In addition to marks identifying the manufacturer, the top of the bolt head is also marked with symbols indicating the strength grade, e.g. 8.8; 10.9; 12.9; 14.9. As an alternative, some bolts and screws have the M and strength grade symbol stamped on the flats of the hexagon.

Encapsulated Bolts and Screws



S003045

Encapsulated bolts and screws have a microencapsulated locking agent pre-applied to the thread. They are identified by a coloured section which extends 360° around the thread. The locking agent is released and activated by the assembly process and is then chemically cured to provide the locking action.

Unless a specific repair procedure states otherwise, encapsulated bolts may be reused providing the threads are undamaged and the following procedure is adopted:

- Remove loose adhesive from the bolt and housing threads.
- Ensure threads are clean and free of oil and grease.
- Apply an approved locking agent.

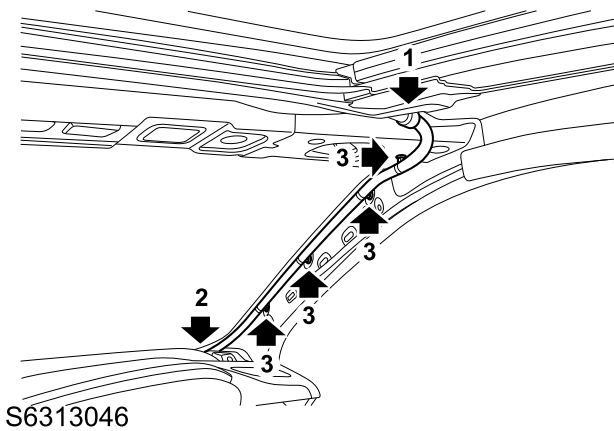
Right Front Sunroof Drain Pipe

Remove

1. Carefully release and lower the right front roof lining trim to make it accessible for a hand.

Roof Trim Panel Assembly - Sedan - Sunroof Remove

2. Disconnect the right front sunroof drain pipe from the sunroof drain channel (1).
3. Disconnect the front end of the right front sunroof drain pipe from the body (2).
4. Loosen the right front sunroof drain pipe clip (3) and remove the drain pipe.



Refit

1. Fit the right front sunroof drain pipe to the body, and secure it with clips.
2. Refit the right front sunroof drain pipe to the sunroof drain channel and the interior drain channel.
3. Fit the roof trim panel assembly - sedan - sunroof.

Roof Trim Panel Assembly - Sedan - Sunroof Refit

Left Rear Sunroof Drain Pipe

Remove

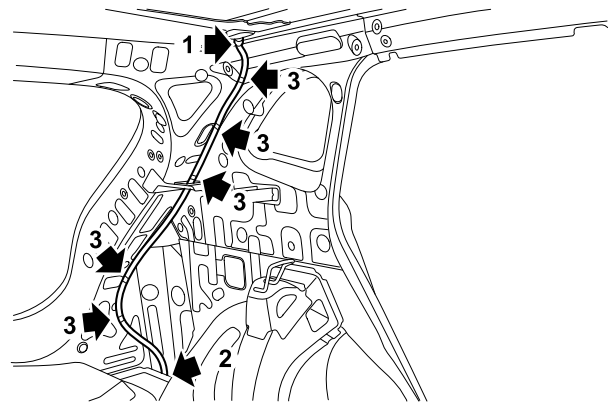
1. Carefully release and lower the left C pillar ceiling trim to make it accessible for a hand.

Roof Trim Panel Assembly - Sedan - Sunroof Remove

2. Remove the upper trim panel of the left C pillar.

C Pillar Upper Trim Panel Remove

3. Disconnect the left rear sunroof drain pipe from the sunroof drain channel (1).
4. Disconnect the front end of the left rear sunroof drain pipe from the body (2).
5. Loosen the retaining clip (3) and remove the left rear sunroof drain pipe.



Refit

1. Fit the left rear sunroof drain pipe to the body, and secure it with clips.
2. Connect the left rear sunroof drain pipe to the sunroof drain channel and the interior drain channel.
3. Fit the roof trim panel assembly - sedan - sunroof.

Roof Trim Panel Assembly - Sedan - Sunroof Refit

4. Fit the C pillar upper trim panel.

C Pillar Upper Trim Panel Refit

Service Procedures

Upper Radiator Beam

Remove

1. Remove the front bumper and bracket.

Front Bumper Remove

2. Remove the headlamp assembly.

Headlamp Assembly Remove

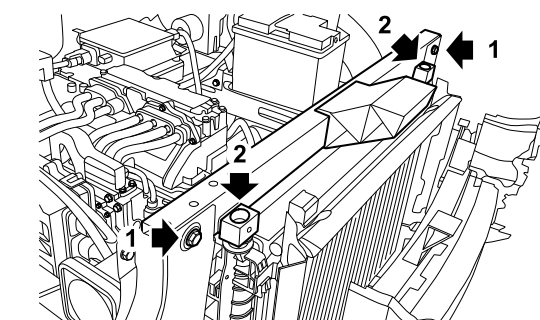
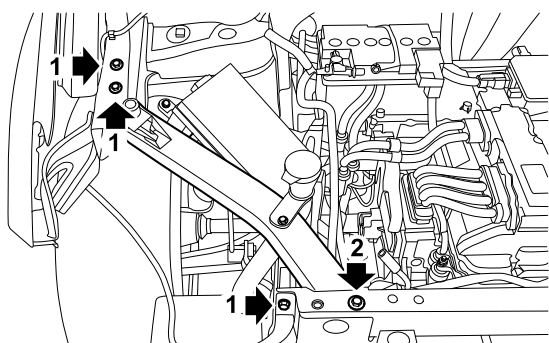
3. Remove the front compartment trim cover.

Front Compartment Trim Cover Remove

4. Remove the bonnet lock assembly.

Bonnet Lock Assembly Remove

5. Remove 3 bolts (1) fixing the headlamp assembly mounting bracket to the body and 2 bolts (2) fixed to the upper radiator beam, and release the filler pipe from the bracket.



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Refit

1. Position the upper radiator beam on the body, fit it with the radiator in place, fit 2 bolts, tighten them to **19-25Nm**, check the torque.
2. Position the headlamp assembly mounting bracket to the body, fit 3 bolts fixed to the body and 2 bolts fixed to the upper radiator beam, tighten them to **19-25Nm**, check the torque.
3. Fix the filler pipe to the filler pipe bracket.
4. Fit the bonnet lock assembly.

Bonnet Lock Assembly Refit

5. Install the front compartment trim cover.

Front Compartment Trim Cover Refit

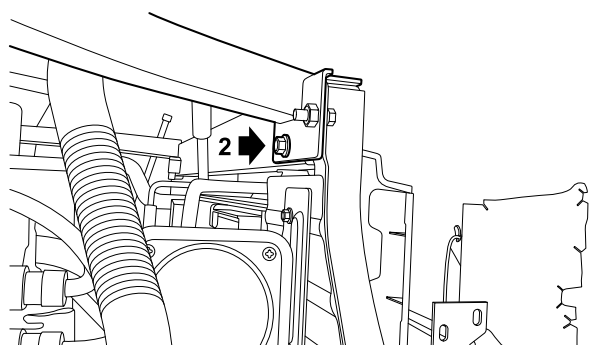
6. Fit the headlamp assembly.

Headlamp Assembly Refit

7. Fit the front bumper and bracket.

Front Bumper Refit

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6. Remove 2 bolts (1) fixing the upper radiator beam to the body, release it from the radiator (2), and remove the upper radiator beam.

Service Procedures

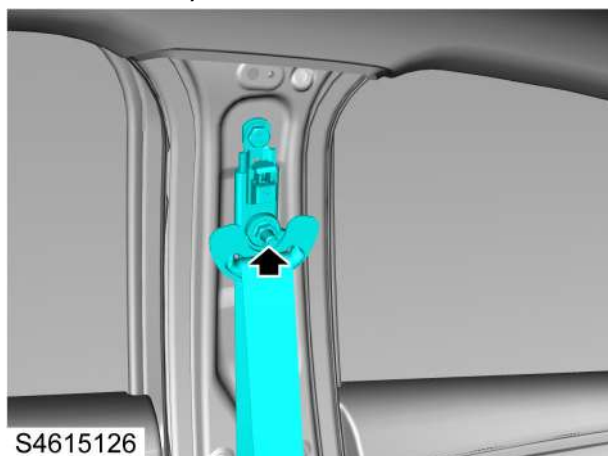
Front Seat Belt Assembly

Remove

1. Ensure the vehicle power system is switch OFF, remove the key from the vehicle and disconnect the negative battery cable. Wait for 10 minutes until the **SRS** backup circuit is discharged.
2. Remove the B pillar upper trim panel.

B Pillar Upper Trim Panel Remove

3. Remove the bolt fixing the D-ring of the front seat belt to the body.



4. Disconnect the connector (1) from the seat belt pretensioner.
5. Remove the bolt (2) fixing the front seat belt retractor to the body.

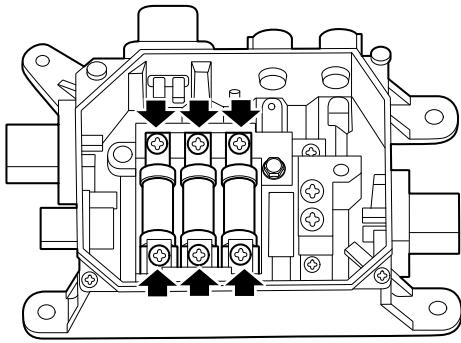


Refit

1. Position the front seat belt retractor to the body , fit 1 bolt, tighten it to **30-35Nm** (2WD) , **35-45Nm** (4WD) , check the torque.
2. Connect the electrical connector to the pretensioner.
3. Position the D-ring of the front seat belt to the body, fit 1 bolt, tighten it to **30-35Nm** (2WD),**35-45Nm** (4WD), check the torque.
4. Fit the B pillar upper trim panel.

B Pillar Upper Trim Panel Refit

5. Connect the negative battery cable. Perform a system check, set the START STOP Switch to ON, check if the **SRS** warning lamp illuminates for several seconds, and then goes out.



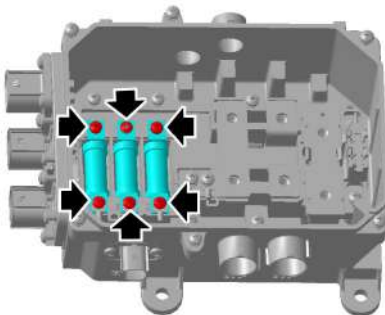
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5. Remove the front PDU fuse - 4WD.

- Remove the front compartment trim cover.

Front Compartment Trim Cover Remove

- Remove 6 screws that fix the PDU cover to PDU assembly, and loosen the wire harness and water pipe buckle. And remove the upper cover of PDU.
- Remove 6 screws securing the front PDU fuse to PDU, and loosen the high-voltage wires inside the PDU.



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- Remove the front PDU fuse - 4WD.

Refit

1. Refit the front PDU fuse - 4WD.

- Fix the PDU fuse and high-voltage line into the PDU, install and tighten 6 screws.
- Fix the PDU cover to PDU assembly, install 6 screws and tighten them to 5–7Nm, check the torque.
- Fix the wiring harness and water pipe to the upper cover of PDU and fasten it with a buckle.
- Refit the front compartment trim cover.

Front Compartment Trim Cover Refit

2. Refit the front PDU fuse - 2WD.

- Position the PDU fuse and high-voltage line into the PDU, install and tighten 6 screws.

- Position the PDU cover on the PDU assembly, install 4 screws, and tighten to 5–7Nm, check the torque.

- Refit the front compartment trim cover.

Front Compartment Trim Cover Refit

3. Refit rear PDU fuse.

- Position the fuse and high-voltage line into the PDU, install 2 screws and tighten them.
- Position the PDU cover on the PDU assembly, install 6 screws and tighten them to 5–7Nm, check the torque.
- Refit rear PDU protective cover and restore the carpet.
- Refit rear seat cushion assembly.

Rear Seat Cushion Assembly Refit

- Refit the manual service disconnect (MSD).

Manual Service Disconnect Refit

- Connect the negative terminal of the battery.

Operation

Definition

The Gateway connects several **CAN/LIN** networks and realizes signal/frame routing of the network. It also provides an input/output interface for some hardwire connections and realizes some controls. It provides the following functions:

1. Network Signal Routing
2. Network Management Master Node
3. Vehicle Power Mode Management Master Node
4. Switch Detection
5. Vehicle Configuration Information

Network Signal Routing

The function of the Gateway is to establish connection between different **CAN** network and **LIN** network, transmit signals from the source **CAN/LIN** network to the target **CAN/LIN** network according to the requirements for network design and realize information exchange and sharing among multiple networks.

Network Management Master Node

As a network management master node, the Gateway meets the following requirements for network management:

- When the vehicle power system is in ACC/ON position, all networks shall communicate.
- When the vehicle power system is turned to the OFF position from ACC or ON position, the network communication shall remain for at least 30s. If the vehicle speed is not 0, the Gateway shall maintain network communication; when the vehicle speed achieves 0, the Gateway will maintain network communication for a further 10s.
- The Gateway can wake up the network to communicate via the network..

Vehicle Power Mode Management Master Node

- The Gateway is the master node for the vehicle power mode management. The Gateway determines the status of the vehicle power mode according to the status of the START/STOP Switch or hard wire input from the **BCM** and **PEPS**. The Gateway sends the status of the vehicle power mode to the **CAN** or **LIN** network. Each **CAN** or **LIN** module will receive the status signal of the power mode from the Gateway, and the **CAN/LIN** module enables/disables the corresponding function according to the signal.
- The Gateway operates the high side drive (power) of critical relays according to the status of the vehicle power mode. Among them KL.R, Ignition, KL.I5.

Vehicle Power Mode	KL.R High Side Drive	IGN High Side Drive	KL.I5 Switch High Side Drive	ACC Wake-up High Side Drive	Wake-up Enable High Side Drive
OFF	Low	Low	Low	Low	Low
ACC	High	Low	Low	High	High
RUN	High	High	High	High	High
CRANK	Low	High	Low	Low	High

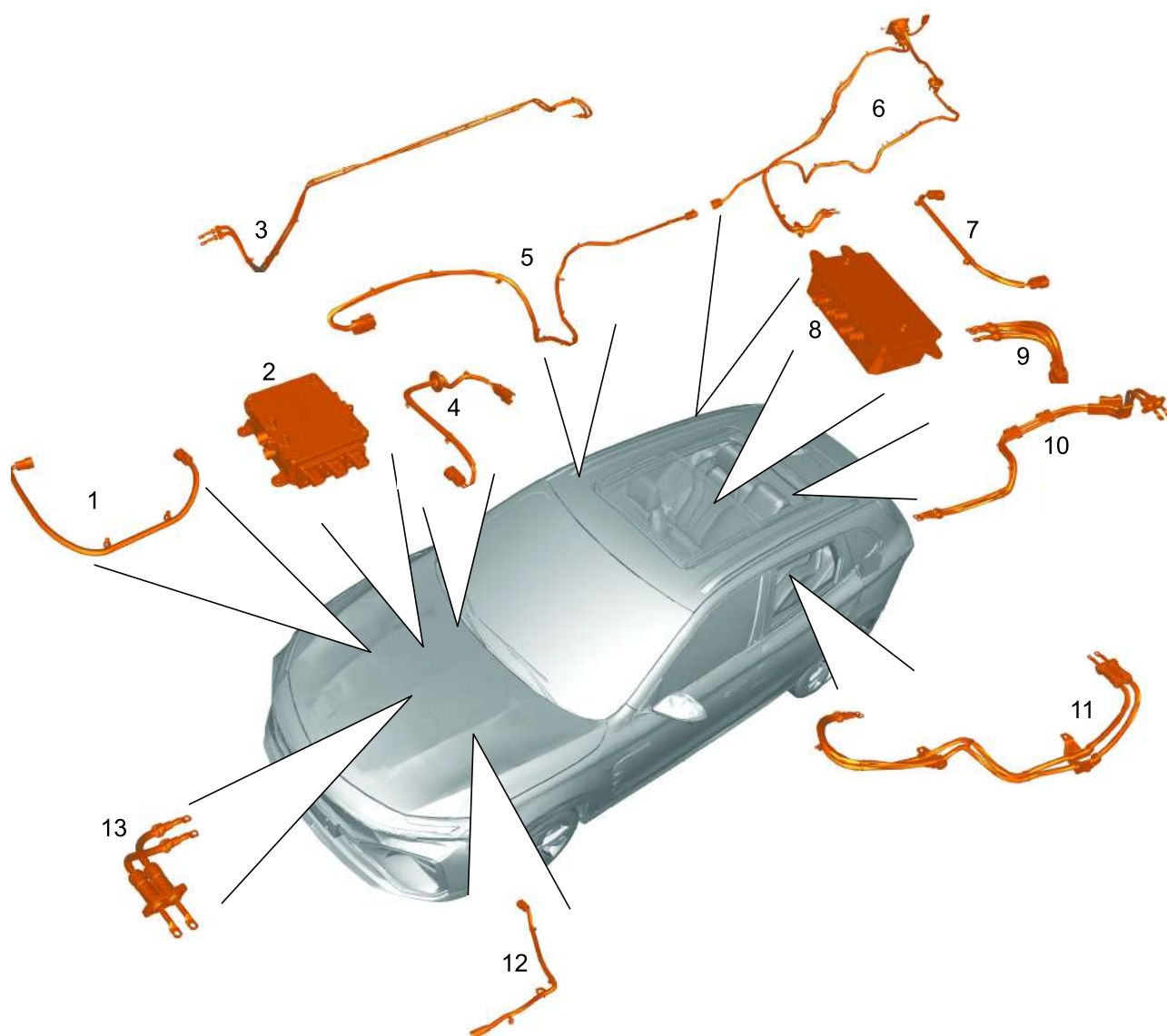
- Vehicle Voltage Detection: the Gateway collects battery voltage, determines the status of the battery voltage and transmits the voltage signal to the network.

Switch Detection

- Shift control knob: The Gateway collects the status signal of the gear shift switch and transmits the signal to the transmission control unit.
- Cruise switch: the Gateway collects the reliable status signal of the cruise switch and transmits the signal to the vehicle control unit.
- Collection of brake pedal position sensor signal: the Gateway collects the signal of the brake pedal position sensor and transmits the position signal (%) of the brake pedal to the transmission control unit and voltage control unit. The Gateway shall perform a self-learning for the zero output voltage of the brake pedal position sensor before identifying the position of the brake pedal.

Configuration of Vehicle Information

When the vehicle leaves the assembly line, the Gateway is configured with the vehicle configuration information on-line and saves the information to the **EEPROM** memory of the Gateway. The Gateway sends the vehicle configuration information to the network as per the information in the **EEPROM**.

High Voltage Harness**Description and Operation****System Layout**

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- | | |
|-------------------------------|-------------------------------------|
| 1. CCU HV Harness | 12. EACP HV Harness |
| 2. Front PDU | 13. Front PEB HV Harness (4WD Only) |
| 3. PDU HV Harness | |
| 4. PTC HV Harness | |
| 5. Slow Charging HV Harness | |
| 6. Charging Socket | |
| 7. ESS PTC HV Harness | |
| 8. Rear PDU | |
| 9. Main HV Harness | |
| 10. Rear Right PEB HV Harness | |
| 11. Rear RLeft PEB HV Harness | |

Seat Heater Failure (No Heating or Abnormal Heating Temperature)

Test Condition	Detail/Result/Action
1. Check the appearance and functionality	Check if the related functions of seat heater work normally and check the visual component for obvious damage. If yes: replace related parts; after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step 2.
2. Check fuses	Check if the seat heater fuse is damaged. If yes: replace the fuse; after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step 3.
3. Check the relay	Check if the seat heater relay is damaged. If yes: replace the relay; after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step 4.
4. Check related circuits or connectors of BCM	A. Check related harness connectors for looseness. If yes: after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step B. B. Disconnect the fuse box harness connector from the BCM, check the conductivity of the corresponding pin, and check for short to ground or short to battery. If yes: repair/replace related circuits; after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step 5.
5. Check related circuits or connectors of seat cushion heating element	A. Check related harness connectors for looseness. If yes: after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step B. B. Disconnect the harness connector of seat cushion heating element. Check if the power supply and the ground are normal. If not: repair/replace the related circuits; after the repair/replacement, confirm if the symptom disappears. • Yes → Diagnosis is completed. • No → Go to Step 6.
6. Check seat cushion heating element	After the above causes are excluded, it indicates that the seat cushion heating element has failed, please replace the upper level assembly of seat cushion heating element, and confirm that the system works normally.

Reference Information	
Circuit Diagram	Seat Heating

PIDC9 and PIDCB**DTC Description**

DTC	FTB	Failure Description
PIDC9	00	Gear Shift Motor Torque Request Signal Out Of Range
PIDCB	00	Gear Shift Motor Torque Request Not Reach

Subsystem Principle

When the gear shift motor controller (GSMC) is working, it will monitor the operating state of gear shift motor in rear time.

Conditions for Running DTCs

- The module is activated.
- Communication is activated.

Conditions for Setting DTCs

PIDC9: Gear shift motor torque request is out of normal range.

PIDCB: Gear shift motor request torque is out of actual torque.

Operations of ECU after Failure

PIDC9: Record a DTC.

PIDCB: Cut off the power supply output from GSMC to GSM.

Conditions for Clearing DTCs

PIDC9:

- Gear shift motor torque request is within the normal range.
- History DTCs will be cleared after 40 wake-up-standby cycles.

PIDCB:

- Gear shift motor request torque is not out of actual torque.
- History DTCs will be cleared after 40 wake-up-standby cycles.

Possible Causes

- Related circuits failure.
- Connector failure or poor fit.
- Gear shift motor failure.
- Gear shift motor controller failure.

Reference Information

Reference Circuit Information

Shift Control Unit

Reference Connector End View Information

BY046 and BY060

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:
 - a. Connect the scan tool, and place the start switch in "ON" position.
 - b. Read "Gear Shift Motor Torque" and "Gear Shift Motor Torque Request" to check whether they are within the rational value range (refer to the Appendix for rational value range).
 - Yes → Gear shift motor controller is detected;
 - No → Go to Step 2.
2. Check the connectivity of connectors:
 - a. Check harness connector BY046 of the gear shift motor controller and harness connector BY060 of the gear shift motor for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.
 - b. Clean, repair or replace the faulty parts found in visual check.
 - c. After the test/repair of relevant failures, turn off the start switch and turn it on again, read the DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 3;
 - No → Diagnosis is completed.
3. Test/replace the gear shift motor controller or the gear shift motor:

If the DTC still exists after above tests and repairs, test/replace the gear shift motor controller or the gear shift motor.

Service Guide

Please refer to the relevant sections of service manual (Remove & Refit) and self learning programming manual.

PIDE2, PIDE3, PIDE9 and PIDEB

DTC Description

DTC	FTB	Failure Description
PIDE2	00	Rotor Over Temperature Derating Warning
PIDE3	00	Coolant Over Temperature Derating Warning
PIDE9	00	Coolant over Temp Derating Error
PIDEB	00	Rotor Over Temperature Derating Error

Subsystem Principle

The temperature of the motor rotor is too high, and the power electronic box (PEB) will limit the motor torque.

Conditions for Running DTCs

The system voltage is normal.

Conditions for Setting DTCs

PIDE2: Post-rotor over-temperature limit torque < 70% of external characteristic torque.

PIDE3: Post-cooling water over-temperature limit torque < 70% of external characteristic torque.

PIDE9: Post-cooling water over-temperature limit torque < external characteristic torque.

PIDEB: Post-rotor over-temperature limit torque < external characteristic torque.

Operations of ECU after Failure

- Report the DTC only.
- SVS MIL turns on.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 wake-up-standby cycles.

Possible Causes

- Related circuits failure.
- Connector failure or poor fit.
- 4WD front shaft motor failure.
- Front Compartment Power Electronic Box failure.

Reference Information

Reference Circuit Information

Electric Drive System

Reference Connector End View Information

EB067 and EB068

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:
 - a. Connect the scan tool, and place the start switch in "ON" position.
 - b. Read the "Causes of Limited Torque for Electric Drive" and "Causes of Limited Torque for Power Generation" to check whether they are within the rational value range (refer to the Appendix for rational value range).
 - No → Test/repair the Front Compartment Power Electronic Box.
 - Yes → Go to Step 2.
2. Check the connectivity of connectors:
 - a. Check harness connector EB068 of the Front Compartment Power Electronic Box and harness connector EB067 of the 4WD front shaft motor for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.
 - b. Clean, repair or replace the faulty parts found in visual check.
 - c. After the test/repair of relevant failures, turn off the start switch and turn it on again, read the DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 3;
 - No → Diagnosis is completed.
3. Test related circuits:
 - a. Place the start switch in "OFF" position, keep the vehicle in standstill for more than 5min, disconnect the negative battery cable, and operate the manual service disconnect to cut off the high-voltage battery power supply.
 - b. Disconnect harness connector EB067 of the 4WD front shaft motor and harness connector EB068 of the Front Compartment Power Electronic Box.
 - c. Test if the resistance between terminals of harness connector EB068 of Front Compartment Power Electronic Box and terminals of harness connector EB067 of 4WD front shaft motor is less than 5Ω.
 - Terminal EB068-6 and Terminal EB067-2
 - Terminal EB068-7 and Terminal EB067-1

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.
 - d. Test if the resistance between harness connector terminal EB068 of the Front Compartment Power Electronic Box or harness connector terminal EB067

- Terminal ED005-D1 or terminal BY071-17

If it is not within the specified range, test/repair the circuit for short to battery.

- f. After the test/repair of relevant failures, turn off the start switch and turn it on again, read DTCs again and confirm if the DTC still exists.

- Yes → Test/replace the VCU;
- No → Diagnosis is completed.

- g. If the DTC still exists after above tests and repairs, try to open the cover for repair of high-voltage battery pack.

3. Test related internal circuits of the high-voltage battery pack:

- a. Place the start switch in "OFF" position, keep the vehicle in standstill for more than 5min, disconnect the negative battery cable, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. The refit and remove of high-voltage battery pack must be carried out in strict accordance with the requirements in "Refit and Remove" section of the service manual.
- b. Check harness connector J2 of the traction battery management module and harness connector J17 of the electric distribution module for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.

Clean, repair or replace the faulty parts found in visual check.

- c. Disconnect harness connector J2 of the traction battery management module and harness connector J17 of the electric distribution module.

Test if the resistance between the following harness connector terminals of traction battery management module and those of electric distribution module is less than 5Ω.

- Terminal J2-10 and terminal J17-6
- Terminal J2-11 and terminal J17-7
- Terminal J2-8 and terminal J17-4
- Terminal J2-9 and terminal J17-5

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.

- d. Test if the resistance between the following harness connector terminals of traction battery management module or those of electric distribution module and the ground is infinite.

- Terminal J2-10 or terminal J17-6
- Terminal J2-11 or terminal J17-7
- Terminal J2-8 or terminal J17-4
- Terminal J2-9 or terminal J17-5

If it is not within the specified range, test/repair the circuit for short to ground.

- e. Test if the resistance between the following harness connector terminals of traction battery management module or those of electric distribution module and the power supply is infinite.

- Terminal J2-10 or terminal J17-6
- Terminal J2-11 or terminal J17-7
- Terminal J2-8 or terminal J17-4
- Terminal J2-9 or terminal J17-5

If it is not within the specified range, test/repair the circuit for short to battery.

- f. If the above circuit tests are normal, try to replace the BMS and confirm if the failure disappears.
- Yes → Diagnosis is completed.
 - No → Replace with the previous BMS, and then replace the EDM.

Service Guide

Please refer to the relevant sections of service manual (Remove & Refit) and self learning programming manual.

B1450**DTC Description**

DTC	FTB	Failure Description
B1450	11	Cabin Thermostatic Expansion Valve (TXV) Short to Ground
	15	Cabin Thermostatic Expansion Valve (TXV) Short to Battery/Open Circuit

Subsystem Principle

The cabin expansion valve regulates the flow of the refrigerant and matches the refrigerant flow with the heat load of the air passing through the evaporator core.

Conditions for Running DTCs

- The start switch is in "ON" position.
- The system voltage is normal.
- Cabin expansion valve opens.

Conditions for Setting DTCs

B1450 11: The load current of the cabin expansion valve is greater than 2A.

B1450 15: The cabin expansion valve has no load current.

Operations of ECU after Failure

Close the cabin expansion valve.

Conditions for Clearing DTCs

B1450 11:

- The load current of cabin expansion valve is less than 2A for 10s.
- History DTCs will be cleared after 40 wake-up-standby cycles.

B1450 15:

- The load current of cabin expansion valve is less than 2A.
- History DTCs will be cleared after 40 wake-up-standby cycles.

Possible Causes

- Related circuits failure.
- Connector failure or poor fit.
- Cabin expansion valve failure.
- A/C controller failure.

Reference Information

Reference Circuit Information

Automatic Temperature Control

Reference Connector End View Information

FA041 and EB079

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Check the connectivity of connectors:
 - a. Check harness connector FA041 of the A/C controller and harness connector EB079 of the cabin expansion valve for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.

Clean, lubricate, repair or replace the faulty parts found in visual check.
 - b. After the test/repair of relevant failures, turn off the start switch and turn it on again, read DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 2;
 - No → Diagnosis is completed.
2. Test related circuits:
 - a. Place the start switch in "OFF" position, disconnect the negative battery cable, and disconnect harness connector EB079 of the cabin expansion valve.

Test if the resistance between harness connector terminal EB079-2 of the cabin expansion valve and the ground is less than 5Ω.

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.
 - b. Disconnect harness connector FA041 of the A/C controller.

Test if the resistance between harness connector terminal FA041-9 of the A/C controller and harness connector terminal EB079-1 of the cabin expansion valve is less than 5Ω.

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.
 - c. Test if the resistance between harness connector terminal FA041-9 of the A/C controller or harness connector terminal EB079-1 of the cabin expansion valve and the ground is infinite.

If it is not within the specified range, test/repair the circuit for short to ground.

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:
 - a. Connect the scan tool, and place the start switch in "ON" position.
 - b. Read the "Right Parking Brake Status" to check whether it is within rational value range (refer to the Appendix for rational value range).
 - Yes → Test/replace the EPB control module;
 - No → Go to Step 2.
2. Check the connectivity of connectors:
 - a. Check harness connector ED003 of the rear right EPB motor and harness connector BY087 of the EPB control module for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.
 - b. Clean, lubricate, repair or replace the faulty parts found in visual check.
 - c. After the test/repair of relevant failures, turn off the start switch and turn it on again, read the DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 3;
 - No → Diagnosis is completed.
3. Test related circuits:
 - a. Place the start switch in "OFF" position, and disconnect the negative battery cable.
 - b. Disconnect harness connector ED003 of the rear right EPB motor and harness connector BY087 of the EPB control module.
 - c. Test if the resistance between the following terminals of rear right EPB motor harness connector or terminals of EPB control module harness connector is infinite.
 - Terminal ED003-1 and Terminal ED003-2
 - Terminal BY087-12 and Terminal BY087-27

If it is not within the specified range, test/repair the circuits for mutual short circuit.
 - d. Test if the resistance between the following terminals of rear right EPB motor harness connector and terminals of EPB control module harness connector is less than 5Ω.
 - Terminal ED003-1 and Terminal BY087-12
 - Terminal ED003-2 and Terminal BY087-27

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.
 - e. Test if the resistance between the following terminals of rear right EPB motor harness connector or terminals of EPB control module harness connector and the ground is infinite.
 - Terminal ED003-1 or Terminal BY087-12
 - Terminal ED003-2 or Terminal BY087-27

If it is not within the specified range, test/repair the circuit for short to ground.
 - f. Test if the resistance between the following terminals of rear right EPB motor harness connector or terminals of EPB control module harness connector and the power supply is infinite.
 - Terminal ED003-1 or Terminal BY087-12
 - Terminal ED003-2 or Terminal BY087-27

If it is not within the specified range, test/repair the circuit for short to battery.
 - g. After the test/repair of relevant failures, turn off the start switch and turn it on again, read the DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 4;
 - No → Diagnosis is completed.
4. Test/replace the rear right EPB motor or the EPB control module.

If the DTC still exists after above tests and repairs, test/replace the rear right EPB motor or the EPB control module.

Service Guide

Please refer to the relevant sections of service manual (Remove & Refit) and self learning programming manual.

B1055 and B1078**DTC Description**

DTC	FTB	Failure Description
B1055	71	Rear Fog Lamps Switch Stuck
B1078	11	Fog Light Switch Circuit Short to Ground
	15	Fog Light Switch Circuit Short to Battery or Open
	1C	Fog Light Switch Circuit Resistance Out of Range

Subsystem Principle

With the start switch in "ACC" or "ON/START" position, the rear fog lamp switch is turned on, and the rear fog lamps will light up.

Conditions for Running DTCs

B1055: The start switch is in "ON" position.

B1078:

- DTCs U1562 and U1563 are not set.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B1055: If the rear fog lamp switch is in the state of being pressed for more than 30s, then switch stuck conditions will be set, and the switch detects that release is ignored once.

B1078 11: The AD converter detects a short to ground failure for 2s.

B1078 15 and 1C: The AD converter detects an out-of-range for 2s.

Operations of ECU after Failure

B1055: The rear fog lamp switch signal is ignored till it is cleared.

B1078: The start switch signal is ignored till the test is passed.

Conditions for Clearing DTCs

B1055:

- The switch is detected to be off once.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

B1078:

- The switch AD converter is detected to be in the normal range once.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Causes

- Related circuits failure.
- Connector failure or poor fit.

- Body control module failure.
- Fog lamp failure.
- Light stalk switch failure.

Reference Information

Reference Circuit Information

Rear Fog Lamps

Reference Connector End View Information

FA031 and FA002

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:
 - a. Connect the scan tool, and place the start switch in "ON" position.
 - b. Perform the forced output of "Rear Fog Lamp ON" and observe the rear fog lamp for relevant response or action.
 - Yes → Test/replace the BCM;
 - No → Go to Step 2.
2. Check the connectivity of connectors:
 - a. Check harness connector FA031 of the BCM and harness connector FA002 of the light stalk switch for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.
 - b. Clean, lubricate, repair or replace the faulty parts found in visual check.
 - c. After the test/repair of relevant failures, turn off the start switch and turn it on again, read the DTCs again and confirm if the DTC still exists.
 - Yes → Go to Step 3;
 - No → Diagnosis is completed.
3. Test related circuits:
 - a. Place the start switch in "OFF" position, and disconnect the negative battery cable.
 - b. Disconnect harness connector FA031 of the BCM and harness connector FA002 of the light stalk switch.
 - c. Test if the resistance between harness connector terminal FA002-1 of the light stalk switch and the ground is less than 5Ω.
If it is not within the specified range, test the circuit for open circuit/high resistance.
 - d. Test if the resistance between harness connector terminal FA002-4 of the light stalk switch and harness

BIAE2**DTC Description**

DTC	FTB	Failure Description
BIAE2	12	Front 360° Camera Video Signal Short to Battery
	14	Front 360° Camera Video Signal Short to Ground or Open

Subsystem Principle

For vehicles with an around view monitor (AVM), when any camera or entertainment mainframe is replaced, the system shall be re-calibrated to realize the image stitching function. Failure to calibrate may lead to error in the panoramic stitching due to camera internal parameter error and installation angle error, resulting in image deformation or misalignment.

Conditions for Running DTCs

- The system voltage is normal.
- ECU communication is activated for 1s.
- The start switch is in "ON" position.

Conditions for Setting DTCs

BIAE2 12: It is detected that the camera video signal circuit is short to battery.

BIAE2 14: It is detected that the camera video signal circuit is short to ground or open circuit.

Operations of ECU after Failure

Turn off the 360° front view camera display.

Conditions for Clearing DTCs

BIAE2 12 and 14:

- It is detected that the 360° front view camera circuit is normal.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Causes

- Related circuits failure.
- Connector failure or poor fit.
- HD Around View Monitor (AVM).
- Front infotainment control module failure.

Reference Information

Reference Circuit Information

360 High Definition Around View Module

Reference Connector End View Information

BY186 and FA146

Reference Electrical Information

Basic Methods of Circuit Inspection

Diagnostic Test Steps

1. Check the connectivity of connectors:

- Check harness connector BY186 of the HD AVM or harness connector FA146 of the FICM for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.

Clean, repair or replace the faulty parts found in visual check.

- After the test/repair of relevant failures, turn off the start switch and turn it on again, read DTCs again and confirm if the DTC still exists.

2. Test related circuits:

- Place the start switch in "OFF" position, disconnect the negative battery cable, and disconnect harness connector BY186 of the HD AVM and harness connector FA146 of the FICM.
- Test if the resistance between terminals of HD AVM harness connector and terminals of FICM harness connector is less than 5Ω.

- Terminal BY186-1 and Terminal FA146-Signal

- Terminal BY186-2 and Terminal FA146-Shield

If it is not within the specified range, test/repair the circuit for open circuit or high resistance.

- Test if the resistance between terminals of HD AVM harness connector or terminals of FICM harness connector and the power supply is infinite.

- Terminal BY186-1 or Terminal FA146-Signal

- Terminal BY186-2 or Terminal FA146-Shield

If it is not within the specified range, test/repair the circuit for short to battery.

- Test if the resistance between terminals of HD AVM harness connector or terminals of FICM harness connector and the ground is infinite.

- Terminal BY186-1 or Terminal FA146-Signal

- Terminal BY186-2 or Terminal FA146-Shield

If it is not within the specified range, test/repair the circuit for short to ground.

- After the test/repair of relevant failures, turn off the start switch and turn it on again, read DTCs again and confirm if the DTC still exists.

3. Test/replace the HD AVM or the FICM.

If the DTC still exists after above tests and repairs, replace the HD AVM or the FICM.

Service Guide

Refer to the relevant sections in the Refit and Remove Manual and Module Self-learning and Programming Manual.