

CONTENTS

FOREWORD	01 - 1	Special Tool	07 - 29
FOREWORD	01 - 2	Diagnosis & Test.....	07 - 29
General Description	01 - 2	On-vehicle Service	07 - 48
Usage Precautions	01 - 2	BODY ELECTRICAL	08 - 1
ELECTRICAL SYSTEM	02 - 1	INTERIOR LIGHTING SYSTEM.....	08 - 2
AIR CONDITIONING SYSTEM	02 - 2	Warnings and precautions	08 - 2
Warnings and Precautions	02 - 2	System Overview	08 - 2
General Information	02 - 2	Tools	08 - 3
Specifications	02 - 15	Diagnosis & Test.....	08 - 3
System Circuit Diagram	02 - 16	On-vehicle Service	08 - 13
Diagnosis & Test.....	02 - 22	BODY ELECTRICAL	09 - 1
On-vehicle Service	02 - 57	LIGHTING SYSTEM	09 - 2
ELECTRICAL SYSTEM	03 - 1	Warnings and precautions	09 - 2
SUPPLEMENTAL RESTRAINT		System Overview	09 - 2
SYSTEM.....	03 - 2	Tools	09 - 7
Warnings and Precautions	03 - 2	Diagnosis & Test.....	09 - 7
General Information	03 - 2	On-vehicle Service	09 - 25
Functional Principle	03 - 4	BODY ELECTRICAL	10 - 1
Specifications	03 - 11	DOOR LOCK SYSTEM	10 - 2
Circuit Diagram	03 - 12	System Overview	10 - 2
Tools	03 - 13	Safe Mode	10 - 2
Diagnosis & Testing	03 - 14	Tools	10 - 6
On-vehicle Service	03 - 45	Torque Specifications.....	10 - 7
BODY ELECTRICAL	04 - 1	Diagnosis & Testing	10 - 7
CAN SYSTEM	04 - 2	On-vehicle Service	10 - 20
General Information	04 - 2	BODY ELECTRICAL	11 - 1
Tools	04 - 2	INSTRUMENT CLUSTER SYSTEM.....	11 - 2
Diagnosis & Test.....	04 - 3	Warnings and precautions	11 - 2
On-vehicle Service	04 - 20	General Information	11 - 2
BODY ELECTRICAL	05 - 1	Tools	11 - 8
BODY CONTROL SYSTEM	05 - 2	Torque Specifications.....	11 - 8
System Overview	05 - 2	Diagnosis & Testing	11 - 8
BCM Function Test Report	05 - 2	On-vehicle Service	11 - 17
Tools	05 - 17	BODY ELECTRICAL	12 - 1
Torque Specifications.....	05 - 18	PARKING RADAR SYSTEM	12 - 2
Diagnosis & Testing	05 - 19	System Overview	12 - 2
Diagnosis Contents	05 - 19	Tools	12 - 8
On-vehicle Service	05 - 27	Torque Specifications.....	12 - 8
BODY ELECTRICAL	06 - 1	Diagnosis & Testing	12 - 8
PASSIVE ENTRY & PASSIVE START	06 - 2	On-vehicle Service	12 - 29
System Overview	06 - 2	BODY ELECTRICAL	13 - 1
Tools	06 - 64	BLIND SPOT DETECTION	13 - 2
Torque Specifications.....	06 - 64	Warnings and precautions	13 - 2
Diagnosis & Testing	06 - 64	System Overview	13 - 2
On-vehicle Service	06 - 70	Tools	13 - 8
BODY ELECTRICAL	07 - 1	System Circuit Diagram	13 - 8
DRIVING ASSIST	07 - 3	Diagnosis & Test.....	13 - 8
General Information	07 - 3	On-vehicle Service	13 - 15
System Principle.....	07 - 3	BODY ELECTRICAL	14 - 1
Matching Learning	07 - 18		

CONTENTS

TIRE PRESSURE MONITORING	
SYSTEM.....	14 - 2
System Overview	14 - 2
Tire Pressure System Warning	
Information	14 - 3
Configuration & Learning for Tire Pressure	
Monitoring System	14 - 5
Precautions for Maintaining Tire Pressure	
Monitoring System	14 - 7
Tools	14 - 8
Torque Specifications.....	14 - 9
Diagnosis & Testing	14 - 9
On-vehicle Service	14 - 11
BODY ELECTRICAL	15 - 1
NAVIGATION AUDIO	
ENTERTAINMENT	15 - 2
Warnings and precautions	15 - 2
System Overview	15 - 2
Tools	15 - 5
Diagnosis & Test.....	15 - 5
On-vehicle Service	15 - 11
BODY ELECTRICAL	16 - 1
WIPER AND WASHER	16 - 2
Warnings and precautions	16 - 2
System Overview	16 - 2
Tools	16 - 5
Diagnosis & Test.....	16 - 5
On-vehicle Service	16 - 12
BODY ELECTRICAL	17 - 1
HORN	17 - 2
Warnings and precautions	17 - 2
System Overview	17 - 2
Tools	17 - 3
Diagnosis & Test.....	17 - 4
On-vehicle Service	17 - 8
BODY ELECTRICAL	18 - 1
WIRELESS CHARGING AND ACCESSORY	
POWER SUPPLY	18 - 2
System Overview	18 - 2
Tools	18 - 5
Fasteners Torque List	18 - 5
Diagnosis & Testing	18 - 5
On-vehicle Service	18 - 10
BODY ELECTRICAL	19 - 1
INTERIOR MONITORING	19 - 2
Warnings and precautions	19 - 2
System Overview	19 - 2
On-vehicle Service.....	19 - 10
Tools	19 - 10
Removal and Installation of Interior Monitoring	
Camera	19 - 10

AIR CONDITIONING SYSTEM

Warnings and Precautions

Precautions

1. The connector of negative ion generator must be disconnected when cleaning the air conditioning line after sale to avoid fire.
2. To prevent battery is depleted, turn off A/C system after engine stopping if it is not necessary.
3. Do not insert or stick anything to each vent, or use the spray around vents; Otherwise, these objects may cause system can not operate normally.
4. When you find that the air volume or speed at the air outlet is obviously reduced, please check whether the A/C element is dirty or blocked. If so, please clean or replace the air conditioning element in time; It is recommended to check or replace A/C element every 5000 km.
5. When you find that the refrigeration effect is obviously reduced, check whether the refrigerant in A/C system is sufficient, and check whether there is dirt blockage on the windward side of the condenser. If so, please add refrigerant or clean the dirt on the condenser surface.
6. When the air quality outside vehicle is poor (during dusty or air pollution), it is recommended to use the inner air circulation mode of air conditioning (when the button character shows blue, the mode is in inner air circulation mode; when the character shows white, the mode is in outer air circulation mode).
7. When the air conditioning system is not in use for a long time, it is recommended to start air conditioning once every month and operate it for about 5 minutes. The purpose is to ensure the good sealing of main shaft of A/C compressor. At the same time, it can also avoid electrolytic corrosion of compressor internal parts, resulting in poor refrigeration effect of A/C system.
8. During assembly of line, it is necessary to confirm that O-ring is installed into groove first, if there is wear on O-ring during assembly, it is necessary to replace O-ring.
9. Before refrigerant filling, nitrogen leakage detection, pressure keeping and vacuum pre-pumping must be performed through nitrogen vacuum pre-pumping equipment.
10. After the completion of nitrogen leakage detection and pressure keeping process, screw on the A/C pipe filler cap in time to avoid touching the valve core in filler by mis-operation, so that A/C system can be communicated with atmosphere.
11. When filling refrigerant, the filling gun should be vertically installed on the filler. Do not shake filling gun left and right to avoid touching the valve core in filler after install it into place.

General Information

System Description

Automobile A/C system is a device which can refrigerate, heat, exchange air and purify air in the cabin. It can provide comfortable riding environment for passengers, reduce fatigue intensity of driver and improve driving safety. Air conditioning system is a micro-motor driven, constant displacement, multiple function, integrated heating and cooling, single-zone system. Use environmentally friendly refrigerant R134a. The system consists of five basic components: constant displacement compressor, cooling condenser, electric HVAC assembly, line (including expansion valve) and electric control panel assembly. It also includes other accessories (such as pressure switch, O-ring).

DTC	Description	Detection Condition	Recovery Condition	Possible Causes	Malfunction Protection Measures
B1702-13	Filtered Evaporator Temperature Circuit Open	CLM detects that sensor output voltage is equal to 5V continually		- Open in temperature sensor itself - Open in connecting wire between CLM and temperature sensor - CLM internal malfunction	The sensor uses 6.8 K pull-up resistor to 5 V power supply. ADC sampling end is connected to the sampling point through a 4.7 K resistor. When there is open or short in temperature resistor, ADC sampling pin is pulled to 5 V through a 4.7 K resistor or grounded, which will not cause any adverse effects on the hardware circuit.

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

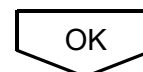
Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check the evaporator temperature sensor connector.
----------	---

- (a) Use circuit diagram as a guide to perform the following inspection procedures:
- (b) Turn ignition switch to OFF.
- (c) Check connector for bad contact, bending, distortion, poor contact, etc.

NG	Repair or replace evaporator temperature sensor
----	--



2	Check if evaporator temperature sensor circuit is short to ground or open.
----------	---

Refrigerant Oil Charging

1. Perform vacuum pumping with a vacuum pump. Wait for 10 minutes after completing operation, check if there is any change in A/C system pressure. If there is any change, the A/C system leakage may exist, you should check and repair the A/C system. If there is no change, proceed to perform refrigerant oil charging procedures.
2. Open the suction valve and close the exhaust valve, and then open the charging valve to allow refrigerant oil to flow into the system.
3. Close the charging valve after refrigerant oil charging is completed.
4. Perform vacuum pumping again for 3 minutes.
5. Continue to perform refrigerant charging procedures after operation is completed.

Refrigerant Oil Charging Amount Specifications Adopts SP-10 refrigerant oil and refilling amount is 150 ml. Newly installed air conditioning system does not need to be recharged. Recharge when repairing a part or after driving a certain distance. The reference quantity of oil to be added when replacing parts: Evaporator, condenser: 30ml each; Line: 10ml; Compressor: Pour out all the oil inside newly replaced compressor, add oil according to the replaced actual oil amount in the compressor (- required to turn the compressor pulley in the manual suction state to pour out as much lubricating oil as possible).

Removal of Front Control Panel A

Removal

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove IP upper A/C panel with remover.
4. Disconnect wire harness connector connected to the rear of A/C panel.
5. Remove the front A/C control panel.

Caution

Do not scratch the cover panel when prying with a crow plate.

Installation

1. Installation is in the reverse order of removal.

Removal of Front Control Panel B

Removal

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Use a crow plate to pry off the suspension cover plate in the suspension area of auxiliary fascia console.
4. Disconnect the light connector (arrow) in suspension area.
5. Remove 2 front control panel fixing bolts (arrow) with 8 # socket.
6. Remove the front A/C control panel.

Caution

Do not scratch the cover panel when prying with a crow plate.

Installation

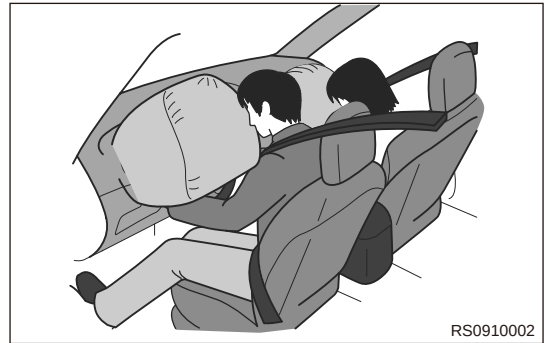
1. Installation is in the reverse order of removal.

- The front seat belt is unfastened or improperly fastened (if equipped): Vehicle speed < 25 km/h; red indicator on combination meter flashes; vehicle speed $\geq$ 25 km/h and red indicator on combination meter flashes with sound warning.

System Components Description

Airbag

The control module controls initiation circuit and make airbag deploy, so as to form an air curtain between passenger and interior, thus playing the role of protecting the occupant in the vehicle.



RS0910002

Driver Frontal Airbag

Resistance value is between 1.7 Ω and 3.8 Ω , it' s strictly forbidden to measure resistance with multimeter!



RS0918002

Passenger Frontal Airbag

Resistance value is between 1.7 Ω and 3.8 Ω , it' s strictly forbidden to measure resistance with multimeter!



RS0917002

Side Collision Sensor

Side collision sensor is used to detect the vehicle side collision signal.



Spiral Cable

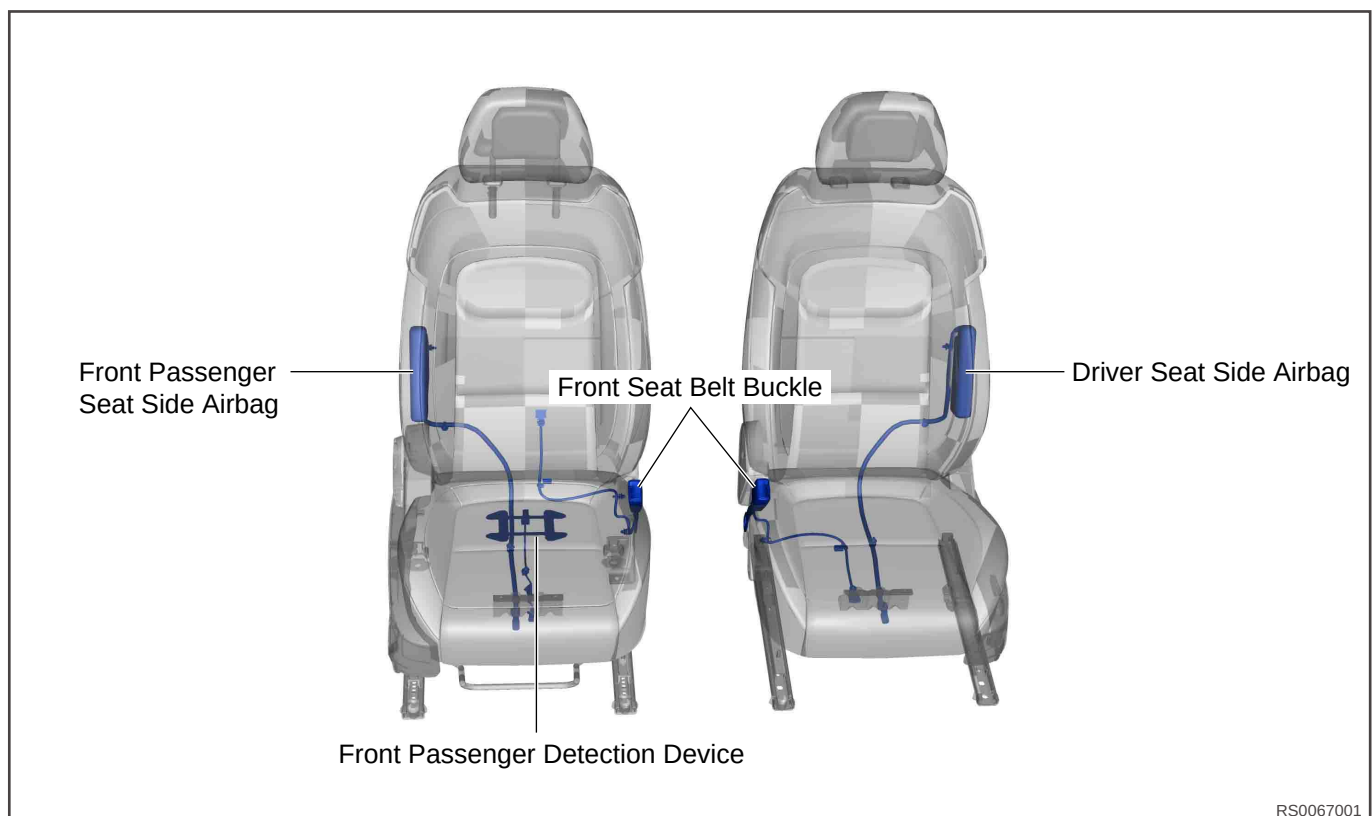
It is used to connect driver airbag while ensuring that steering wheel has enough steering angle.

Wire Harness

It is yellow and used to connect elements of supplemental restraint system. The connector has a safety mechanism.

- In order to meet the requirements of electromagnetic immunity and system stability, and to avoid the risks related to occupant safety, CAN and collision sensor adopt twisted pair, the airbag circuit wire harness also needs to adopt twisted pair. All twisted pair requires at least 30 turns per meter, wire diameter ≥ 0.5 square millimeters.

Front Passenger Side Airbag, Front Passenger Seat Belt Buckle and Front Passenger Detection Device



Airbag resistance on seat: $2.0 + 0.5 / -0.3 \Omega$, it's strictly forbidden to measure resistance with multimeter!

5. When window is operated under manual mode: For example, after 2 minutes which described in point 1, the operating window stops immediately.
6. Within 2 minutes when key is in ACC or OFF: If any front door opens, window function is disabled.
7. When window disable switch is activated: Input of passenger side will be disabled; if the operating window is activated by switch of passenger side, it will stop immediately. When window disable switch is not activated, passenger side input disable is canceled and window disable indicator goes off
8. When key is in ACC or OFF: Window switch input will be invalid if any front door is opened (it is still invalid when closing the door after front door is opened); And if window is operating when front door is opened, stop the window immediately.
9. When engine starts, the operating window will stop immediately and it cannot resume after engine has started

PEPS ENGINE START STOP switch backlight control

1. When position light is on: BCM continuously sends CAN signal to illuminate PEPS backlight
2. When position light is off
 - a. The door status changes as follows:
 - When any door is opened, BCM continuously sends CAN signal to turn on the backlight for 3 minutes, and then sends CAN signal after 3 minutes to turn off the backlight.
 - If another door is opened within 3 minutes of backlight illumination, timing will restart again.
 - In IGN-ON state, during 3 minutes of backlight illumination, if all doors are closed, backlight will be turned off after 3 seconds.
 - In IGN-OFF/ACC status, within 3 minutes of backlight illumination, if all doors are closed, backlight will turn off after continuously turning on for 11 s.
 - b. PEPS SMART/RKE control:
 - When BCM receives locking failure signal (regardless of door status) for 2 times, BCM continuously illuminates backlight for 18 s and then turn it off after 18 s.
 - If key is switched to ON within 18 s, backlight will turn off immediately.
 - If key lock signal is received within 18 seconds, backlight will be turned off immediately.
 - If any door is opened within 18 s, it is performed according to door status control strategy.

Anti-theft Management

1. Fortifying mode
 - a. Trigger conditions:
 - IGN is in OFF (not in IGN ON or ACC)
 - Four doors & two covers are closed;
 - BCM receives remote control lock command.
 - b. BCM feedback when fortifying mode is entered:
 - Turn signal light flashes once (turn on for 500 ms) and sends the corresponding CAN signal;
 - Theft deterrent indicator is continuous flash at frequency of 100ms on, 1900ms off.
 - Actuate the anti-theft horn 50 ms and high and low pitched horns 15 ms.
2. Fortifying failure mode
 - a. Trigger conditions:
 - IGN is in OFF (not in IGN ON or ACC)
 - Any of four doors & two covers is open;
 - BCM receives remote control lock command.
 - b. BCM light feedback when fortifying failure mode is entered:
 - Turn signal light flashes two times (flashing for 500 ms, interval time is 1s) and sends the corresponding CAN signal.

Symptom	Suspected Area
Vehicle cannot be started (PEPS) (starter runs)	Anti-theft verification does not pass
Vehicle cannot be started (PEPS) (starter does not run)	Gear position is not in P/N (for DCT models)
	Clutch (for MT models)/brake switch (for DCT models) is abnormal
	ENGINE START STOP switch malfunction
	Circuit or starter relay is abnormal
	Starter malfunction
	Start times limit is activated
ESCL cannot be locked or unlocked	Vehicle is parked on slope (lock pin is stuck)
	Door signal is abnormal
	ENGINE START STOP switch cannot be turned on or off
	Short or open in wire harness
	Anti-theft verification fails
	Network communication malfunction

Problem Repair (No DTC)

If PEPS system has problems, but no DTC is stored in PEPS system, this problem is called a problem without DTC. Problems without DTC for PEPS system are divided into following types:

- Indicator in instrument cluster does not come on or illuminates constantly (incorrect wire harness connection or indicator is damaged).
- Troubleshooting recommendation: Check corresponding components according to problem symptom, and troubleshoot by following the vehicle repair manual.

Diagnostic Help

- Connect diagnostic tester X-431 3G (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
- Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
- If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
- Only use a digital multimeter to measure voltage of electronic system.
- Refer to any Technical Bulletin that may apply to this malfunction.
- Visually check related wire harness and connector.
- Check and clean all CD system grounds related to the latest DTCs.
- If numerous trouble codes are set, refer to circuit diagram and look for any common ground circuit or power supply circuit applied to DTC.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Monitor diagnostic tester (the latest software) data that is related to this circuit.
- Wiggle related wire harnesses and connectors and observe if signal is interrupt in related circuit.

DTC	DTC Definition	Possible Causes
C193F53	DTC Production Mode Active	Production mode turns on

1	Turn production mode off
---	--------------------------

(a) Use diagnostic tester, enter system "Special Operation" to turn off production mode.

OK	Perform running test after clearing DTCs
----	--

DTC	C193009	Communication Failure
DTC	C193405	Radar Hardware and Software Mismatch
DTC	C193804	Radar Modulation Abnormal
DTC	C193C09	Radar Digital Signal Processor Power Abnormal
DTC	530204	Radar Reference Speed Unavailable
DTC	53134B	Temporary Failure
DTC	531210	Radar Heater Unavailable

DTC	DTC Definition	Possible Causes
C193009	Communication Failure	PEPS control module or interior wire harness damaged
C193405	Radar Hardware and Software Mismatch	
C193804	Radar Modulation Abnormal	
C193C09	Radar Digital Signal Processor Power Abnormal	
530204	Radar Reference Speed Unavailable	
53134B	Temporary Failure	
531210	Radar Heater Unavailable	

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check for DTCs
---	----------------

- When high beam light is operating: When key is turned from IGN ON to ACC or OFF, high beam light turns off.

Intelligent Headlight

Function description

The main function of intelligent headlight control system is the intelligent low/high beam switching. The system can request high beam ON/OFF according to the traffic and environmental factors. If there are no relevant traffic participants in front, the system will activate high beam; With system activated, if there is a meeting or following vehicle or street lighting, high beam will be turned off.

Control principle

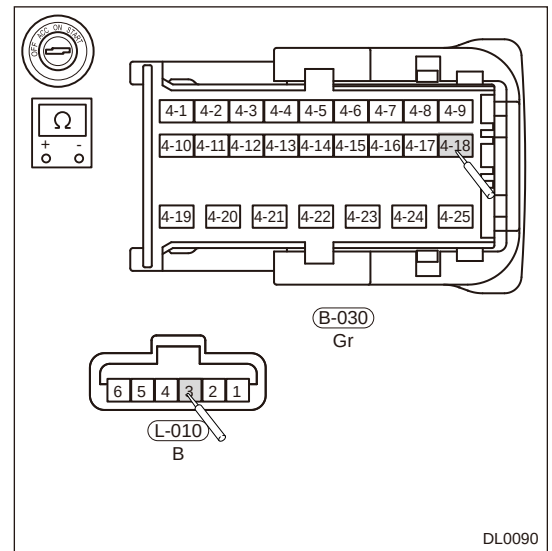
After IGN ON, system switch is turned to ON, and headlight is in AUTO, camera will detect vehicle status, surrounding environment and road condition in front. If IHC opening conditions are met, system will request high beam to be turned ON; When followings, oncomings or vehicles related environment (- including the existence of multiple street lights, if external environment brightness is higher than the threshold, etc.) do not meet the IHC open conditions, system will request high beam to be turned off, once the system ON conditions resume, system will follow a certain delay mechanism and send high beam request without interfering with other traffic participants (ECE48 defined vehicles driving in opposite or same directions, ECE50 defined motorbikes driving in opposite or same directions, electric motorcars with light as well as bicycles with light driving in same direction, light size must be more than 150*150 mm and light intensity is greater than 30 cd). The request of low/high beam switching is transmitted to BCM from multi-function front camera via CAN signal, and driver can change lighting state at any time using light rod.

System operating precondition

1. IGN ON.
2. Headlight switch is in AUTO.
3. Low beam light turns on automatically.
4. BCM judges that all the above conditions are met, then BCM sends corresponding system switch requests according to functional logic. If any condition is not met, it will send HWASW = 0 continuously and system cancels activation requests.

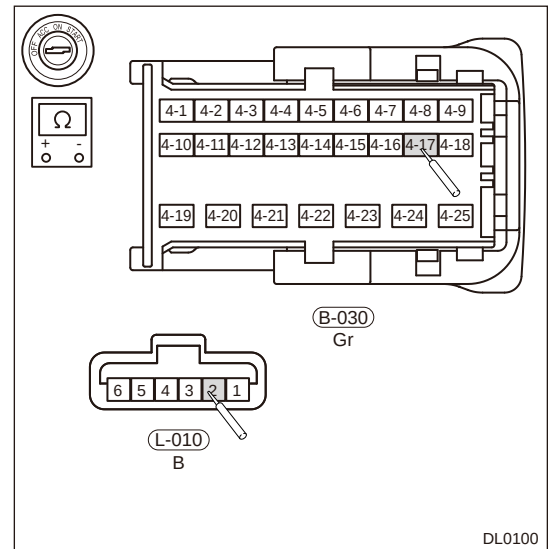
- (a) Turn ENGINE START STOP switch to "OFF".
- (b) Disconnect the negative battery cable.
- (c) Using ohm band of multimeter, check for continuity between BCM lock output B-030 (18) terminal and rear left door lock motor connector L-010 (3).

Multimeter Connection	Condition	Specified Condition
B-030 (18) - L-010 (3)	Always	$\leq 1 \Omega$



- (d) Using ohm band of multimeter, check for continuity between BCM unlock output B-030 (17) terminal and L-010 (2).

Multimeter Connection	Condition	Specified Condition
B-030 (17) - L-010 (2)	Always	$\leq 1 \Omega$



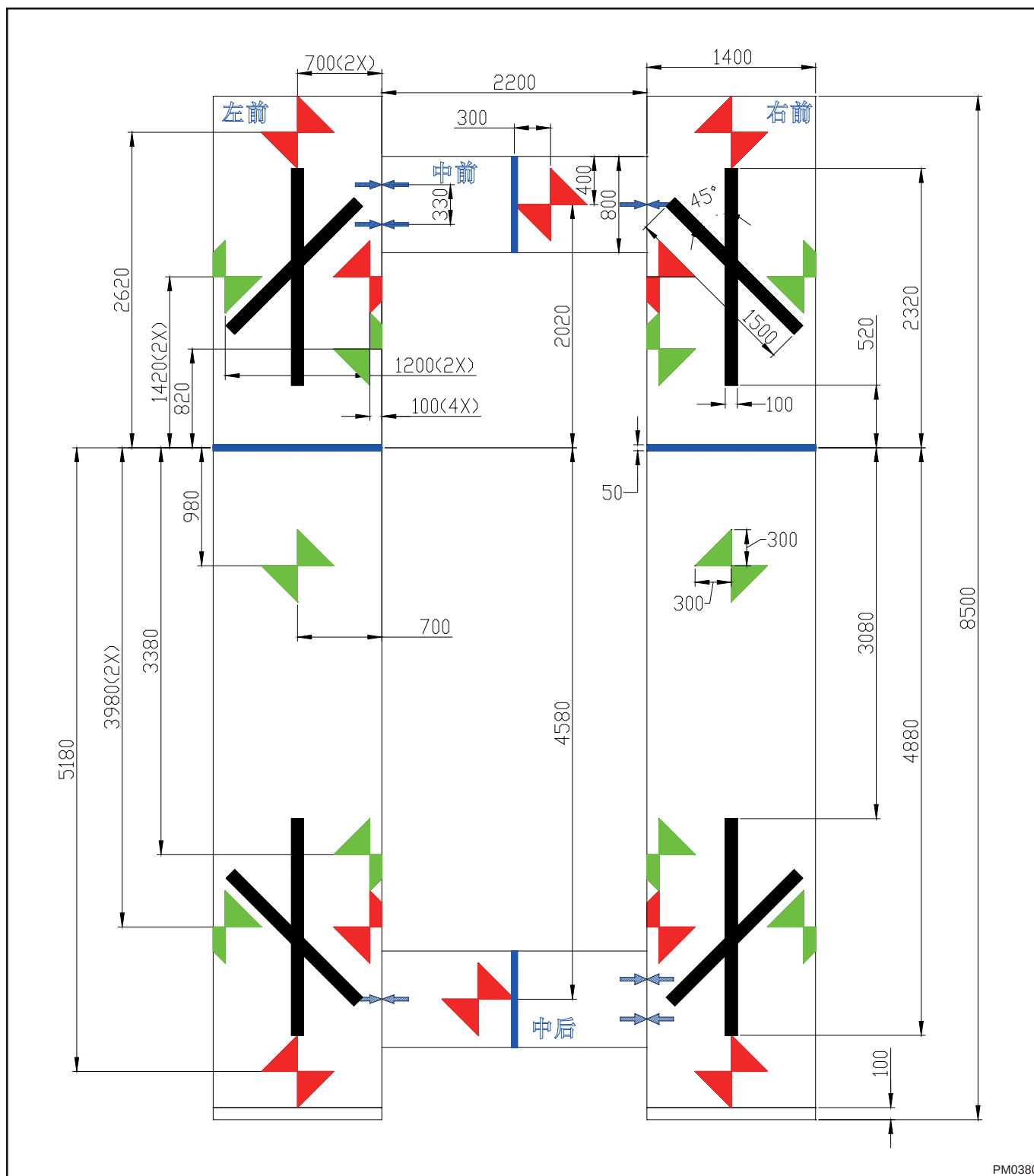
NG

Repair or replace rear left door lock related wire harness

OK

3

Check rear left door lock contact switch signal circuit



PM0380

Reversing Radar System Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
B1A01-25	Front Left Radar Failure
B1A04-25	Front Right Radar Failure
B1A05-25	Rear Left Radar Failure

6. Remove the reversing radar control module assembly

Installation

Warning

- Tighten fixing bolts to the specified torque, when installing reverse radar control module assembly.
- Install connector in place when installing reverse radar control module assembly.
- Check reverse radar system for proper operation, after installing reverse radar control module assembly.

1. Installation is in the reverse order of removal.

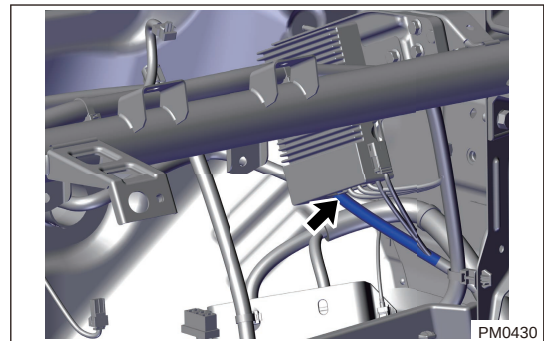
Panoramic Control System Module (If Equipped)

Removal

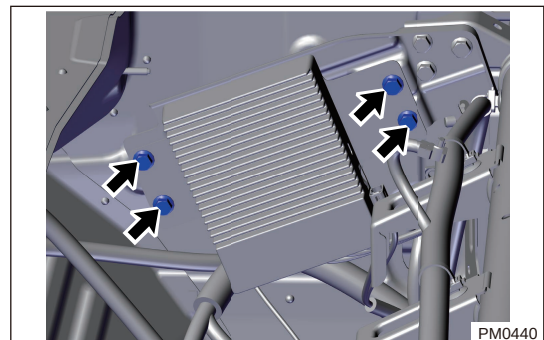
Caution

- Be sure to wear safety equipment to prevent accidents, when removing panoramic control system module assembly.
- Appropriate force should be applied, when removing panoramic control system module assembly. Be careful not to operate roughly.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly.
4. Disconnect the panoramic view monitor control module connector.



5. Remove 4 fixing bolts from panoramic control system module bracket.



Symptom	Suspected Area	Troubleshooting
	Replaced tire pressure sensor is not configured correctly, sensor is not learned	Perform configuration and learning
	Body Control Module (BCM)	Replace body control module and perform sensor learning
	Electromagnetic interference/shield	Eliminate shielded objects outside of tire/strong electromagnetic radio interference
	Four sensors are not installed or all of them are damaged (very rare)	Reinstall or replace
Certain tire pressure information cannot be displayed (certain tire pressure information displays as "-")	Tire pressure sensor function is disabled	Replace, perform configuration and learning
	Incorrect sensor configuration and learning when replacing with new wheel (spare tire included)	Perform configuration and learning
	Electromagnetic interference/shield	Eliminate shielded objects outside of tire/strong electromagnetic radio interference
	Body Control Module (BCM) damage	Replace
	Tire pressure system set	Check and repair

Diagnostic Help

1. Connect diagnostic tester X-431 3G (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
2. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
3. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
4. Only use a digital multimeter to measure voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to this malfunction.
6. Visually check related wire harness and connector.
7. Check and clean all CD system grounds related to the latest DTCs.
8. If numerous trouble codes are set, refer to circuit diagram and look for any common ground circuit or power supply circuit applied to DTC.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Monitor diagnostic tester (the latest software) data that is related to this circuit.
- Wiggle related wire harnesses and connectors and observe if signal is interrupt in related circuit.
- If possible, try to duplicate the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggling test.