

AIR CONDITIONING SYSTEM

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9.1 AIR CONDITIONING SYSTEM

1 Warnings and Precautions

1.1 Precautions

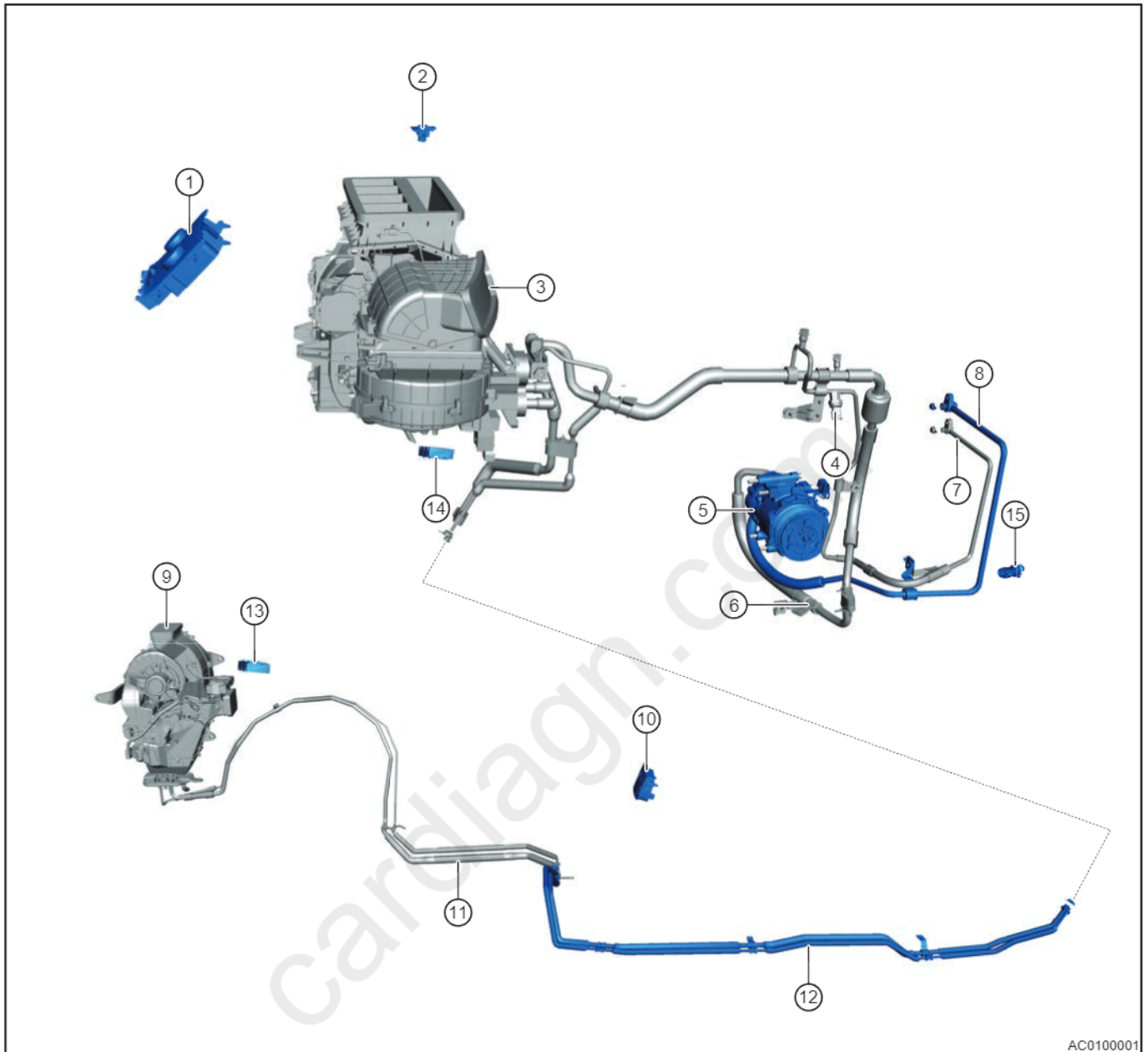
- (1) The connector of negative ion generator must be disconnected when cleaning the air conditioning line after sale to avoid fire.
- (2) To prevent battery is depleted, turn off A/C system after engine stopping if it is not necessary.
- (3) Do not insert or stick anything to each vent, or use the spray 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.

2 System Overview

2.1 System Description

This model adopts an integrated heating and cooling air conditioning, which way with external control variable displacement compressor + expansion valve control method, and uses environment-friendly refrigerant R134a. This system consists of basic components: compressor, condenser, HVAC, lines, AIPM (front A/C control panel), CLM (A/C control module), CLMR (rear A/C control module), CCPR (rear A/C control panel, not equipped with low configuration model) as well as other accessories such as pressure switch, O-ring, etc.

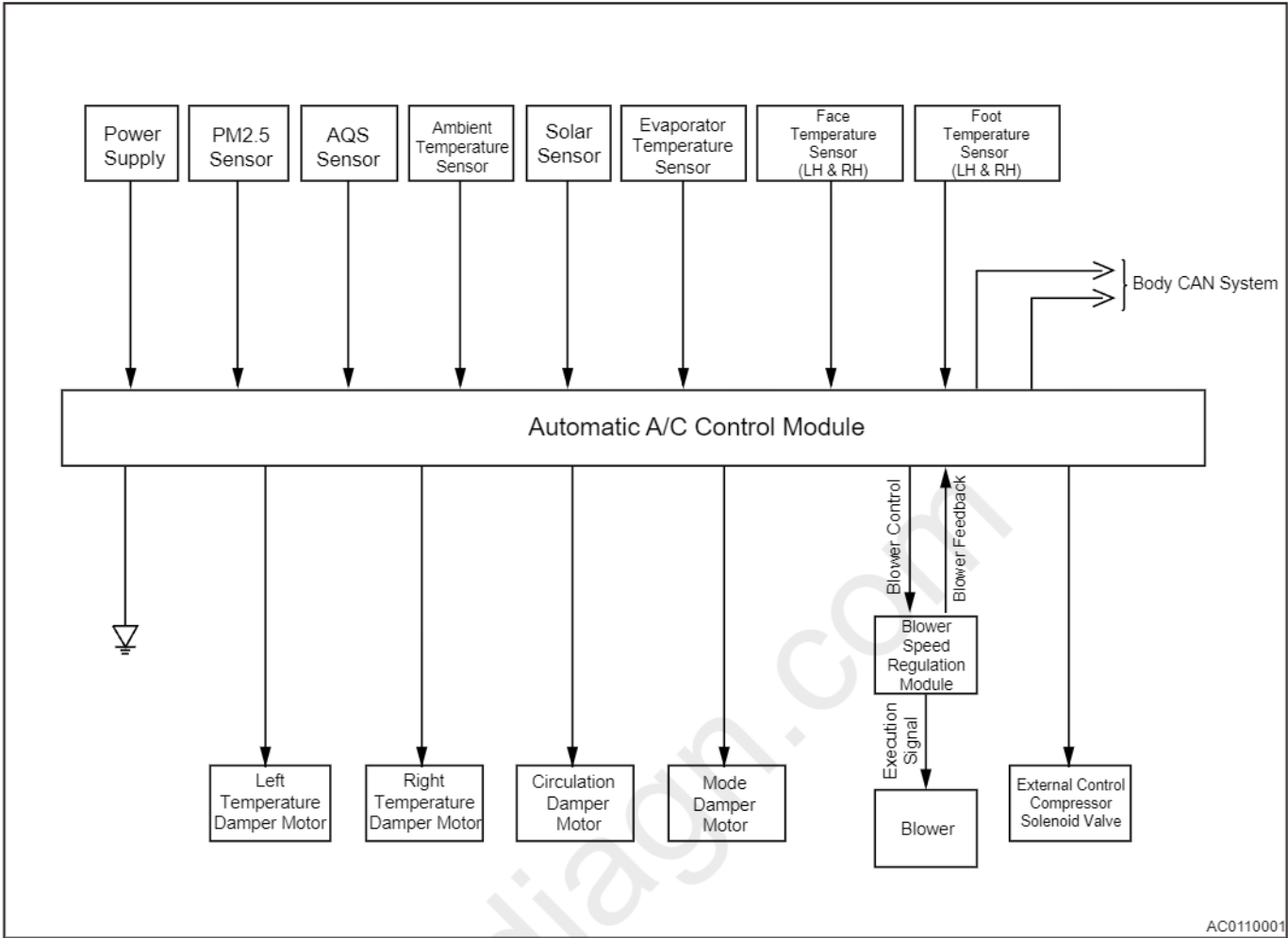
2.2 System Components Diagram

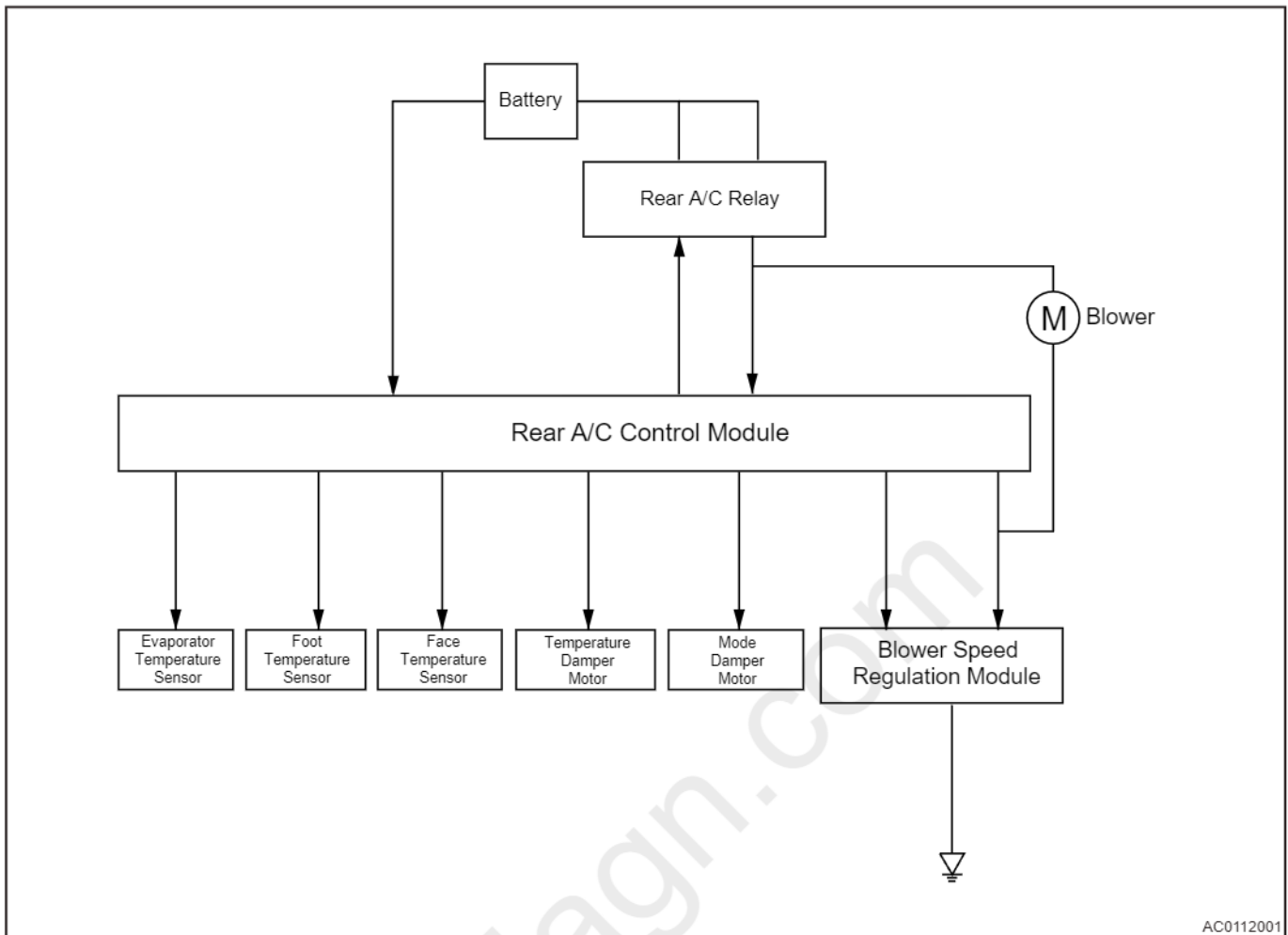


AC0100001

1	Auto A/C Control Panel Assembly	9	Rear HVAC Assembly Single Refrigeration
2	Solar Sensor Assembly	10	Rear A/C Control Panel Assembly
3	Auto Double Zone A/C HVAC Assembly	11	Condenser to Rear Evaporator Line Assembly II
4	A/C Pressure Sensor	12	Condenser to Rear Evaporator Line Assembly I
5	A/C Compressor Assembly	13	CLMR (Rear A/C Control Module)
6	Evaporator to Compressor Line Assembly	14	CLM (A/C Control Module)
7	A/C Coaxial Line Assembly	15	Ambient Temperature Sensor
8	Compressor to Condenser Line Assembly		

2.3 System Schematic Diagram





AC0112001

2.4 Function Description for Combination Button of Front A/C Control Panel

■ Functional definition requirements:

- (1) The control panel sends function requests for A/C self-learning, clearing DTCs, and self-diagnosis functions to A/C controller CLM by operating the combination button;
- (2) After pressing the combination button, the commands of combination button are transmitted to CLM through CAN network, and CLM completes the related functions;
- (3) The combination button is defined as:
 - 1) A/C self-learning function: Press AC button, REC button and rear defrosting button at the same time for more than 5 seconds, AIPM_1REQ_SelfStudy_FrontCLM sends the current status of the combination button. After the front A/C controller receives the self-learning request, the front A/C enters self-learning status.
 - 2) After the self-learning is completed, all the indicated status returns to the status before self-learning.
 - 3) Clearing DTCs function: Press A/C button, REC button and front defrosting button at the same time for more than 5 seconds, AIPM_1 REQ_ClearDTC_FrontCLM sends the current status of the combination button. After front A/C controller CLM receives the request, front A/C control panel enters the function status of clearing history DTC.
 - 4) After clearing DTC for 1s, all indicated status return to normal working status.
 - 5) Self-diagnosis function: Press A/C button, front defrosting button and rear defrosting button at the same time for more than 5 seconds, AIPM_1 REQ_SelfDiag_FrontCLM sends the current status of combination button. After front A/C controller CLM receives the request, the front A/C enters self-diagnostic status; If front A/C has no fault information, the screen of front CCU left and right knobs continues to display "00" for 2 seconds, and "00" will disappear automatically.
 - 6) If there are more than one set of DTCs, it is displayed in turn, switching once per second, and the self-diagnosis mode automatically exits after the display completes.

- 7) Exit Self-diagnosis: During self-diagnosis, pressing ON/OFF button, bus power off or CCU power off can immediately exit self-diagnosis. Other buttons and knobs operations are invalid and self-diagnosis does not exit. Indicator light status, blower air volume, temperature damper, mode damper, inner and outer circulation and AC return to the normal conditions before diagnosing.

2.5 Functional Definition of Combination Button

■ Self-learning function of step motor

- (1) Press AC button, REC button and rear defrosting button at the same time for more than 5 seconds, front A/C step motor enters the self-learning status.
- (2) Indicator lights of all front CCU buttons come on.
- (3) PM2.5 appears in blue.
- (4) After the self-learning is completed, all the indicated status return to the status before self-learning.

■ Clearing history DTC function

- (1) Press AC button, REC button and front defrosting button at the same time for more than 5 seconds, front CCU enters function status of clearing history DTC.
- (2) Indicator lights of all front CCU buttons come on.
- (3) PM2.5 appears in blue.
- (4) After clearing DTC for 1s, all indicated status return to normal working status.

■ Self-diagnostic function

- (1) Display self-diagnostic.
- (2) Press AC button, front defrosting button and rear defrosting button at the same time for more than 5 seconds, front A/C enters the self-diagnostic status.
- (3) Indicator lights of all front CCU buttons come on.
- (4) PM2.5 appears in blue.
- (5) LCD or TFT screen displays the DTC information.
- (6) After the self-diagnostic is completed, all the indicated status return to the status before self-diagnostic.
- (7) If front A/C has no fault information, the screen of front CCU left and right knobs continues to display "00" for 2 seconds, and "00" will disappear automatically.
- (8) If there are more than one set of DTCs, it is displayed in turn, switching once per second, and the self-diagnosis mode automatically exits after the display completes.
- (9) Self-diagnostic exits.
- (10) During self-diagnosis, pressing ON/OFF button, bus power off or CCU power off can immediately exit self-diagnosis. Other buttons and knobs operations are invalid and self-diagnosis will not exit. Indicator light status, blower air volume, temperature damper, mode damper, inner and outer circulation and AC return to normal conditions before diagnosing.

2.6 Function Description for Combination Button of Rear A/C Control Panel

■ Functional definition requirements

- (1) Combination button function includes: Self-learning function of step motor, clearing history DTC function and self-diagnostic function.

■ Trigger of combination button

- (1) When rear CCU is working, press 3 buttons at the same time for more than 5 seconds, and rear CCU enters the combination button function. Combination button function includes: Self-learning function of step motor, clearing history DTC function and self-diagnostic function.

2.7 Functional Definition of Combination Button

■ Self-learning function of step motor

- (1) Press AC button, AUTO button and mode button at the same time for more than 5 seconds, rear A/C step motor enters the self-learning status.
- (2) Indicator lights of all rear CCU buttons come on.
- (3) Display all contents on the LCD.
- (4) After the self-learning is completed for 1 second, all the indicated status and all displayed contents on LCD return to the status before self-learning.

■ Clearing history DTC function

- (1) While pressing AUTO button, press and hold the mode selection button 3 times within 5 seconds, and rear CCU enters clearing history DTC function status.
- (2) Indicator lights of all rear CCU buttons come on.
- (3) Display all contents on the LCD.
- (4) After clearing DTC for 1s, all the indicated status and all contents displayed on the LCD return to normal working status.

■ Self-diagnostic function

- (1) Display self-diagnostic.
- (2) Press AC button, front defrosting button and rear defrosting button at the same time for more than 5 seconds, front A/C enters the self-diagnostic status.
- (3) Indicator lights of all front CCU buttons come on.
- (4) PM2.5 appears in blue.
- (5) LCD or TFT screen displays the DTC information.
- (6) After the self-diagnostic is completed, all the indicated status return to the status before self-diagnostic.
- (7) If front A/C has no fault information, the screen of front CCU left and right knobs continues to display "00" for 2 seconds, and "00" disappears automatically.
- (8) If there are more than one set of DTCs, it is displayed in turn, switching once per second, and the self-diagnosis mode automatically exits after the display completes.
- (9) Self-diagnostic exits.
- (10) During self-diagnosis, pressing ON/OFF button, bus power off or CCU power off can immediately exit self-diagnosis. Other buttons and knobs operations are invalid and self-diagnosis will not exit. Indicator light status, blower air volume, temperature damper, mode damper, inner and outer circulation and AC return to normal conditions before diagnosing.

2.8 System Components Description

■ Dual-zone solar sensor

Solar sensor is installed on instrument panel and used to detect light intensity in the area where the vehicle is located and control the automatic mode of air conditioning. The sensor is a photoresistor (including left solar sensor and right solar sensor), which is connected to the sensor power supply via a 4.7K pull-up resistor to calculate the solar intensity.



Item	Description	Note
Operating voltage range	0.07 ~ 2.19 V	
Measurement range	80 ~ 2000 W	
Accuracy	1W	
Fault diagnosis	Short to power supply/open: Collecting voltage is 4.9 V	
Invalid default	0W/m2	

■ Air duct temperature sensor

The sensor is NTC resistance (including right face air outlet temperature sensor, left face air outlet temperature sensor, right foot air outlet temperature sensor, left foot air outlet temperature sensor, ambient temperature sensor and evaporator sensor), which is connected to the sensor power supply via the pull-up resistor. Different temperatures will result in different resistance values. Different voltage values are generated by NTC resistor and pull-up resistor at the sensor terminal and input it to MCU to calculate the temperature.

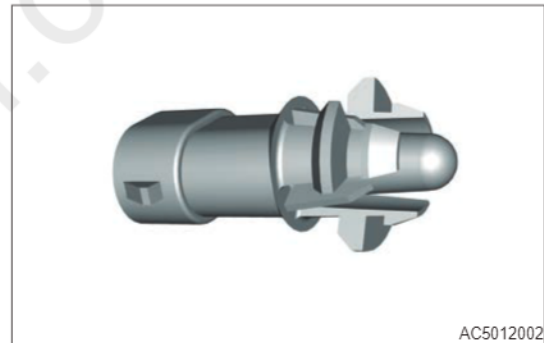


AC5011002

No.	Function	Function Description	Note
1.	Left and right face and foot air outlet temperature collecting (air duct temperature sensor)	Collect the local air duct sensor signal and convert it into a temperature signal via RT meter.	
2.	Air duct temperature signal abnormal handling	22°C	

■ Outside temperature sensor

Outside temperature sensor is installed at lower left of front impact beam and used to detect the outside temperature and control the automatic mode of air conditioning. The sensor sends signal to automatic A/C module. The resistance of outside temperature sensor changes with the change of ambient temperature. Resistance increases as temperature decreases. Resistance decreases as temperature increases.



AC5012002

No.	Function	Function Description	Note
1.	Outside temperature collecting	Obtain the bus temperature value according to RT table, and obtain the actual outside temperature after updating bus outside temperature value (filtered value of outside temperature).	
2.	Outside temperature signal abnormal handling	1. When PowerMode is OFF, the outside temperature maintains the previous value; 2. When the outside temperature diagnosis status is not valid, the outside temperature maintains the previous value. When the outside temperature diagnosis status is valid, the software outside temperature continues to update normally at a maximum of 2°C every 5 seconds.	
3.	Read outside temperature value	The ambient temperature signal is the collected value of outside temperature	The maximum outside temperature is $86 \pm 1^{\circ}\text{C}$

No.	Function	Function Description	Note
		The ambient temperature signal is the filtered value of outside temperature	
4.	Initial value of outside temperature	When power-on or waking up for the first time, if the power mode is not in OFF and the outside temperature is valid, the software outside temperature is immediately updated according to bus outside temperature resistance value; otherwise, the outside temperature filtered value uses the default value of 22°C, after the power mode is not in OFF and the outside temperature is valid, it will be updated to the current outside temperature filtered value immediately according to the outside temperature resistance value.	
5.	The format of outside temperature diagnostic signal is ambient temperature diagnostic		
6.	Signal sending	When power-on for the first time, the outside temperature will first send the initial value of 1 second (86°C), then send a frame of default value (22°C), and then update to the current sensor temperature; After waking up from sleep, the outside temperature will first send the initial value of 1 second (86°C), then update to the current sensor temperature.	

■ Evaporator temperature sensor

Item	Description	Note
Component property	Thermistor	
Quantity	One	
Operating voltage range	1 ~ 4V	
Measurement range	-20 ~ 75°C	
Nominal resistance	R0°C = 6.194 KΩ ± 1%	
Accuracy	0.1°C	
Error	± 1°C	
Fault diagnosis	Short to power supply/open: Collecting voltage is 4.9 V Short to ground: Collecting voltage is lower than 0.1V	
Invalid default	-1°C	

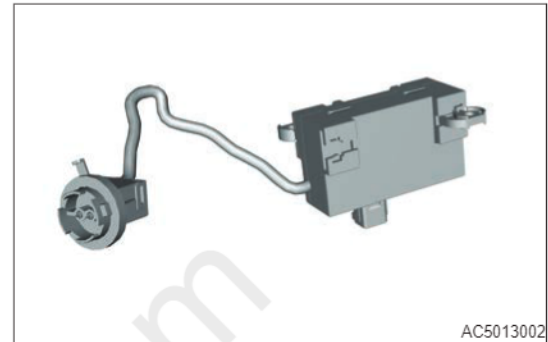
No.	Function	Function Description
1.	Evaporator temperature signal collecting	Collect the local evaporator signal and convert it into a temperature signal via RT meter
2.	Invalid default	-2°C

■ Anion generator

Anion generator is installed on air duct on left side of instrument panel. The anion generator boosts the low voltage into positive high voltage and negative high voltage by booster circuit, and ionizes the air under the action of positive high voltage electric field and negative high voltage electric field to generate a large number of positive and negative ions.

Hint:

The connector of negative ion generator must be disconnected when cleaning the air conditioning line after sale to avoid fire.



■ AQS sensor

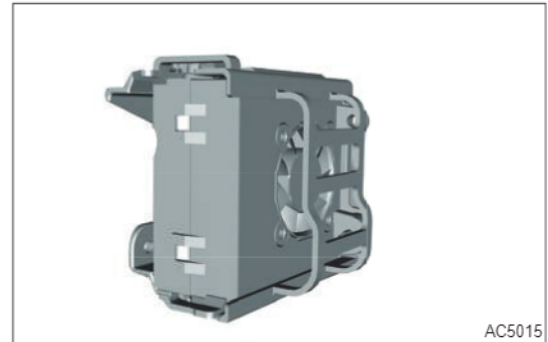
For OC output type, AQS PWM signal is connected to VPP_sleep power supply via a pull-up resistor. After transistor arrives at MCU capture port, the signal is transmitted in the opposite direction. MCU judges the air quality by duty ratio of signal.



No.	Function	Function Description	Note
1	PM2.5 air quality sensor signal collecting	Collect the corresponding duty ratio of local input and convert it into the corresponding S sensor value.	

■ PM2.5 sensor

PM2.5 sensor is also called dust sensor or dust sensor, which can be used to detect the concentration of dust in the air around people, that is, the value of PM2.5. Develop based on the principle of light scattering, particles and molecules will scatter light under the irradiation of light, and at the same time, they also absorb part of the irradiated light energy. When a beam of parallel monochromatic light is incident on the particle field under test, it will be affected by the scattering and absorption around the particle, and the light intensity will be attenuated. In this way, the relative attenuation rate of incident light passing through the concentration field to be measured can be obtained. The relative attenuation rate can basically linearly reflect the relative concentration of dust in the field to be measured. The intensity of light is proportional to the intensity of the electrical signal converted by photoelectricity. The relative attenuation rate can be obtained by measuring the electrical signal, and then the concentration of dust in the field to be measured can be determined.



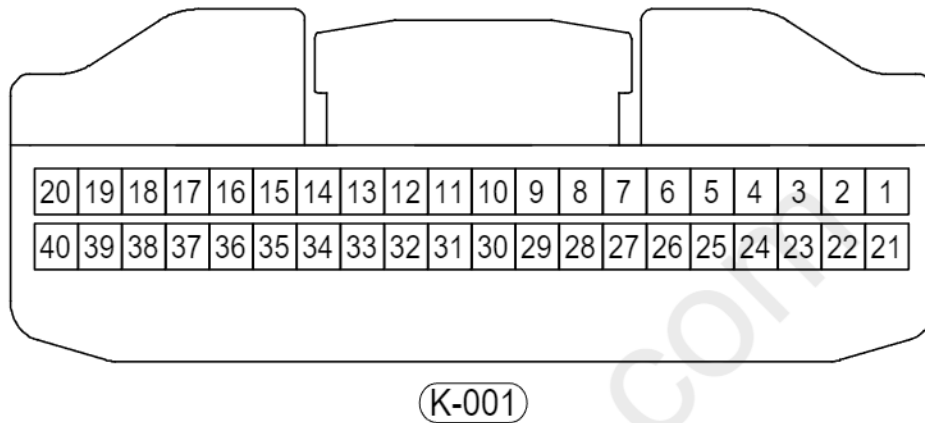
AC5015

Item	Description	Note
Component property	Laser type, equipped with fan	
Quantity	One	
Operating voltage range	9 ~ 16V	
Operating current	< 150 mA	
Frequency	1 Hz	
Measurement range	Max: 1~999 $\mu\text{g}/\text{m}^3$ converted to Pwm recognition Low pulse time/detection period*1000 = dust concentration ($\mu\text{g}/\text{m}^3$)	
Resolution	1 $\mu\text{g}/\text{m}^3$	
Fault diagnosis	Short to ground (0%) Short to power supply or open (100%)	Pwm of component and Pwm sampled by MCU are inverse
Invalid default	0 $\mu\text{g}/\text{m}^3$	

3 System Circuit Diagram

3.1 Module Terminal Definition

■ Automatic A/C module (CLM) - A



AC0130

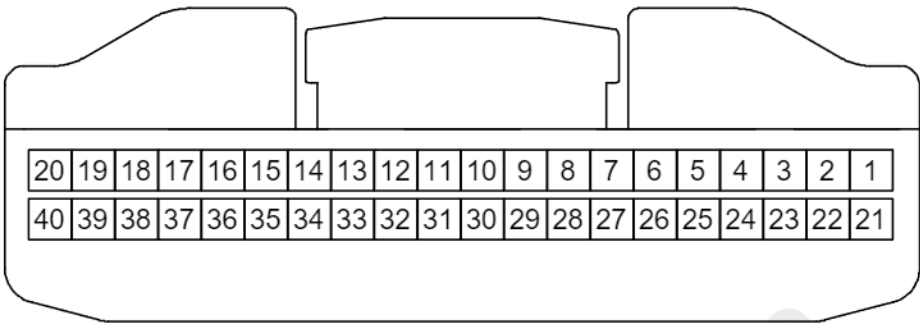
Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
1	Body ground	CAN_L	Power supply "ON"	2.4V
2	Body ground	Circulation damper motor drive +	Power supply "ACC"	Constant voltage is 11 V; when inner circulation turns to outer circulation, voltage becomes 0 V and then rises to 11 V
3	Body ground	Mode damper motor drive -	Power supply "ON"	Voltage is 11 V when not operating; Voltage is 0 V when operating
4	Body ground	Right temperature damper motor drive +	Power supply "ON"	Constant voltage is 11 V; when right temperature is adjusted to "LO" position, voltage

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
				becomes 0 V and then rises to 11 V
5	Body ground	Mode damper motor drive +	Power supply "ON"	11V
6	Body ground	Left temperature damper motor drive -	Power supply "ON"	Constant voltage is 11 V; when left temperature is adjusted to "LO" position, voltage becomes 0 V and then rises to 11 V
7	Body ground	Left temperature damper motor drive +	Power supply "ON"	Voltage is 11 V when A/C switch is not turned on, after A/C switch is turned on, instantaneous voltage is 0 V and then to 11 V
8	Body ground	Right temperature damper motor drive -	Power supply "ON"	Constant voltage is 11 V; when right temperature is adjusted to other position from "LO" position, voltage becomes 0 V and then rises to 11 V
9	Body ground	Circulation damper motor drive -	Power supply "ON"	Constant voltage is 11 V; when outer circulation turns to inner circulation, voltage becomes 0 V and then rises to 11 V
10	/	/	/	/
11	Body ground	IGN	Power supply "ON"	12V
12	Body ground	Damper motor position sensor total power supply	Power supply "ON"	5 V
13	Body ground	Circulation damper motor position information feedback	Power supply "ON"	Voltage is 1.5 V and turns to 3.5 V when inner circulation is turned on
14	Body ground	Mode damper motor position information feedback	Power supply "ON"	Foot 2.5 V; Face 4 V; Front defrosting 1 V; Face and foot 3.3 V; Defrosting and foot 1.6 V.

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
15	Body ground	Left temperature damper motor position information feedback	Power supply "ON"	"LO" 3.5 V; Others 1.5 V
16	Body ground	Right temperature damper motor position information feedback	Power supply "ON"	"LO" 1.5V; Others 3.5V
17	Body ground	Ground	Power supply "ON"	0V
18	Body ground	Ground	Power supply "ON"	0V
19	Body ground	Power supply	Power supply "ON"	12V
20	Body ground	Power supply	Power supply "ON"	12V
21	Body ground	CAN_H	Power supply "ON"	2.7V
22	/	/	/	/
23	/	/	/	/
24	Body ground	Evaporator temperature sensor	Power supply "ON"	8 °C 1.7 V
25	Body ground	Ambient temperature sensor	Power supply "ON"	8 °C 3.2V
26	/	/	/	/
27	Body ground	PM2.5 sensor signal	Power supply "ON"	8 °C 0.4V
28	/	/	/	/
29	/	/	/	/
30	/	/	/	/
31	/	/	/	/
32	Body ground	Blower positive terminal voltage feedback	Power supply "ON"	OFF: 0 V; ON: 12 V
33	/	/	/	/
34	Body ground	Blower speed control signal	Power supply "ON"	OFF: 8.9 V; level 1: 3.6 V; level 2: 4 V; level 3: 5 V; level 4: 6 V; level 5: 7.5 V; level 6: 9 V; level 7: 11 V; others 11.5 V. (Measured value in real vehicle) the

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
				voltage is 0 V with OFF, when it is in other levels, the voltage value is uncertain (it will fluctuate according to power supply voltage).
35	Body ground	Blower negative terminal voltage feedback	Power supply "ON"	OFF: 0 V
36	Body ground	Damper motor position sensor ground	Power supply "ON"	0V
37	Body ground	Temperature sensor ground	Power supply "ON"	0V
38	Body ground	PM2.5 AQS sensor power supply	Power supply "ON"	12V
39	Body ground	Compressor solenoid valve drive +	Power supply "ON"	0V
40	Body ground	Compressor solenoid valve drive -	Power supply "ON"	0V

■ Automatic A/C module (CLM) - B



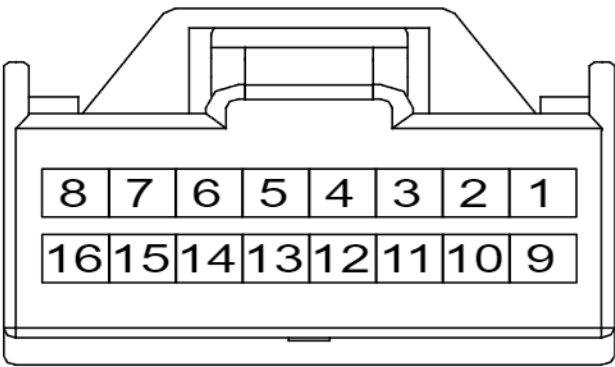
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AC0140

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
1	Body ground	PM2.5 sensor switch (enabling)	Power supply "ON"	0.2V
2	Body ground	AQS sensor signal	Power supply "ON"	2.1V
3	/	/	/	/
4	/	/	/	/
5	/	/	/	/
6	/	/	/	/
7	/	/	/	/
8	/	/	/	/
9	/	/	/	/
10	/	/	/	/
11	/	/	/	/
12	/	/	/	/
13	/	/	/	/
14	/	/	/	/

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
15	/	/	/	/
16	/	/	/	/
17	/	/	/	/
18	/	/	/	/
19	/	/	/	/
20	/	/	/	/
21	/	/	/	/
22	/	/	/	/
23	/	/	/	/
24	Body ground	Left face temperature sensor signal	Power supply "ON"	8°C: 3 V
25	Body ground	Right face temperature sensor signal	Power supply "ON"	8°C: 3 V
26	Body ground	Left foot temperature sensor signal	Power supply "ON"	8°C: 3 V
27	Body ground	Right foot temperature sensor signal	Power supply "ON"	8°C: 3 V
28	/	/	/	/
29	Body ground	Micro light sensor signal	Power supply "ON"	5 V
30	Body ground	Left solar sensor signal	Power supply "ON"	5 V
31	Body ground	Right solar sensor signal	Power supply "ON"	5 V
32	/	/	/	/
33	/	/	/	/
34	Body ground	Blower relay control signal	Power supply "ON"	OFF: 12 V; Blower ON: 0.2 V
35	/	/	/	/
36	/	/	/	/
37	/	/	/	/
38	/	/	/	/
39	/	/	/	/
40	/	/	/	/

■ Front A/C control panel



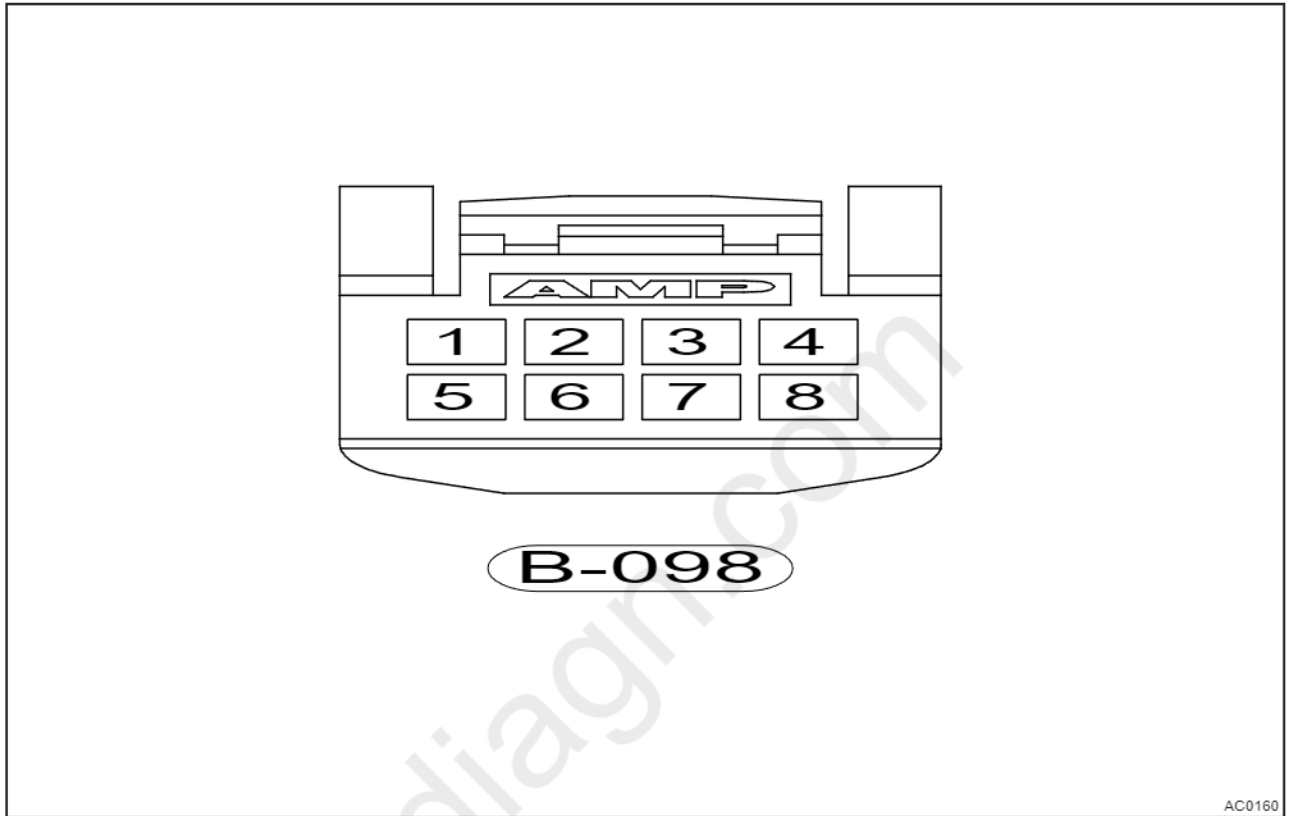
I-037

AC0150

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
1	\	\	\	\
2	\	\	\	\
3	\	\	\	\
4	Body ground	CAN-H	Power supply “ON”	2.6V
5	Body ground	CAN-L	Power supply “ON”	2.4V
6	\	\	\	\
7	Body ground	GND	Power supply “ON”	0V
8	Body ground	\	Power supply “ON”	-
9	Body ground	\	Power supply “ON”	-
10	\	\	\	\
11	\	\	\	\
12	\	\	\	\
13	\	\	\	\

14	\	\	\	\
15	\	\	\	\
16	Body ground	KL30	Power supply "ON"	12V

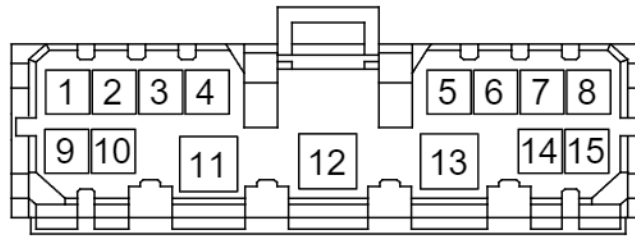
■ Rear A/C panel (CCPR)



AC0160

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
1	\	\	\	\
2	Body ground	KL30	\	12V
3	\	\	\	\
4	\	\	\	\
5	Body ground	GND	Power supply "ON"	0V
6	\	\	\	\
7	Body ground	CAN-L	Power supply "ON"	2.4V
8	Body ground	CAN-H	Power supply "ON"	2.6V

■ Automatic A/C rear module (CLMR)



(B-170)

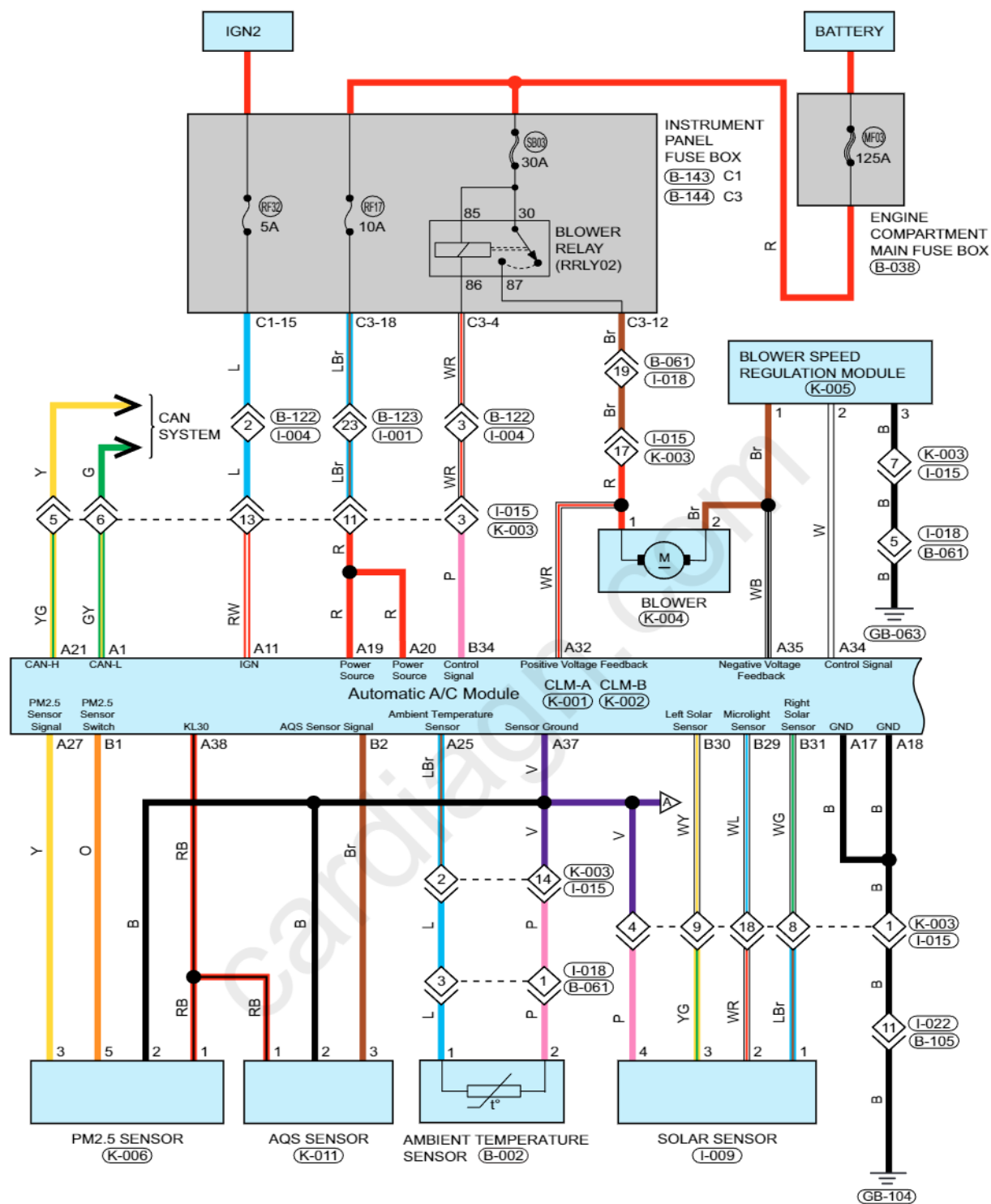
AC0170

Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
1	Body ground	\	Power supply "ON"	-
2	Body ground	\	Power supply "ON"	-
3	Body ground	\	Power supply "ON"	-
4	Body ground	Temperature damper motor drive 1	Power supply "ON"	LO gear 7.6 V; Other gears 13 V\
5	Body ground	Temperature damper motor drive 2	Power supply "ON"	LO gear 7.6 V; Other gears 13 V
6	Body ground	Temperature damper motor drive 3	Power supply "ON"	LO gear 7.6 V; Other gears 13 V
7	Body ground	Temperature damper motor drive 4	Power supply "ON"	LO gear 7.6 V; Other gears 13 V
8	\	\	\	\
9	\	\	\	\
10	Body ground	CAN high	Power supply "ON"	2.7V
11	Body ground	CAN low	Power supply "ON"	2.3V
12	Body ground	IGN (ignition power supply)	Power supply "ON"	12V

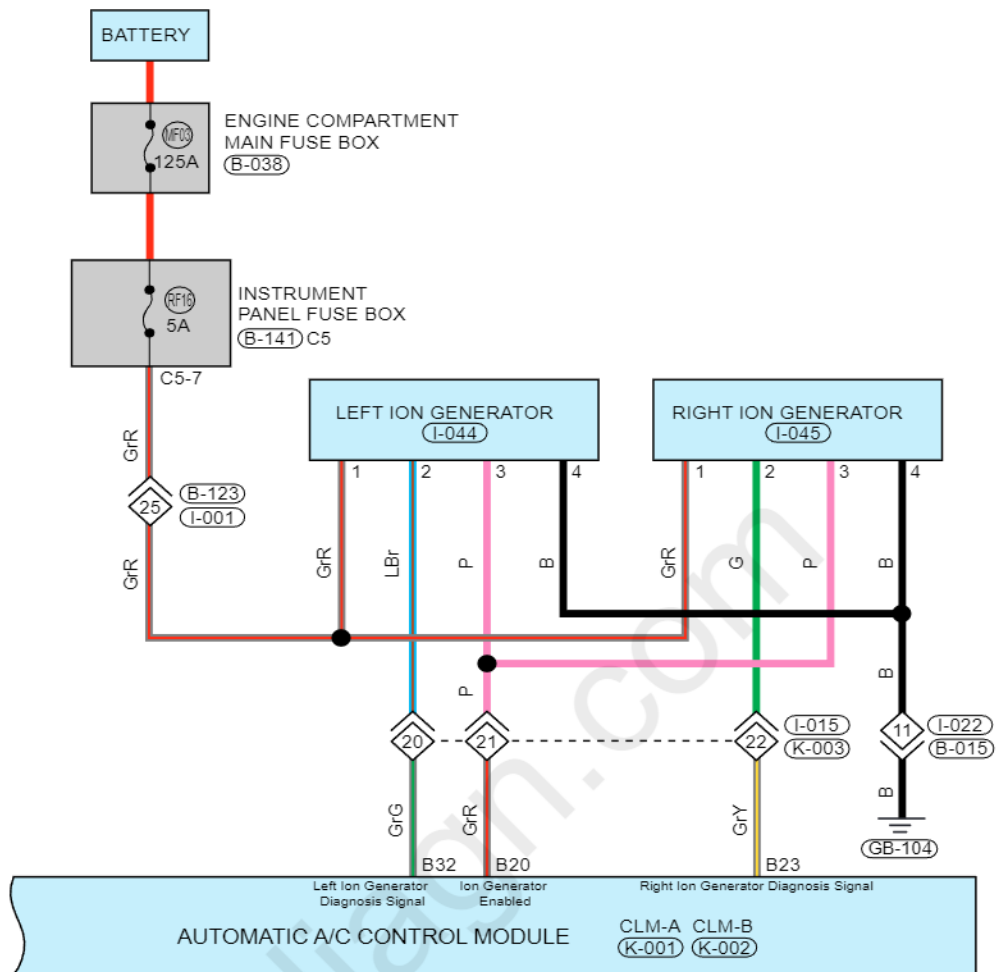
Terminal Inspection		Terminal Definition	Detection Condition	Measured Value
Multimeter Positive	Multimeter Negative			
13	Body ground	Mode damper motor drive 1	Power supply "ON"	7.6 V at pressing moment, and then return to 13 V
14	Body ground	Mode damper motor drive 2	Power supply "ON"	7.6 V at pressing moment, and then return to 13 V
15	Body ground	Mode damper motor drive 3	Power supply "ON"	7.6 V at pressing moment, and then return to 13 V

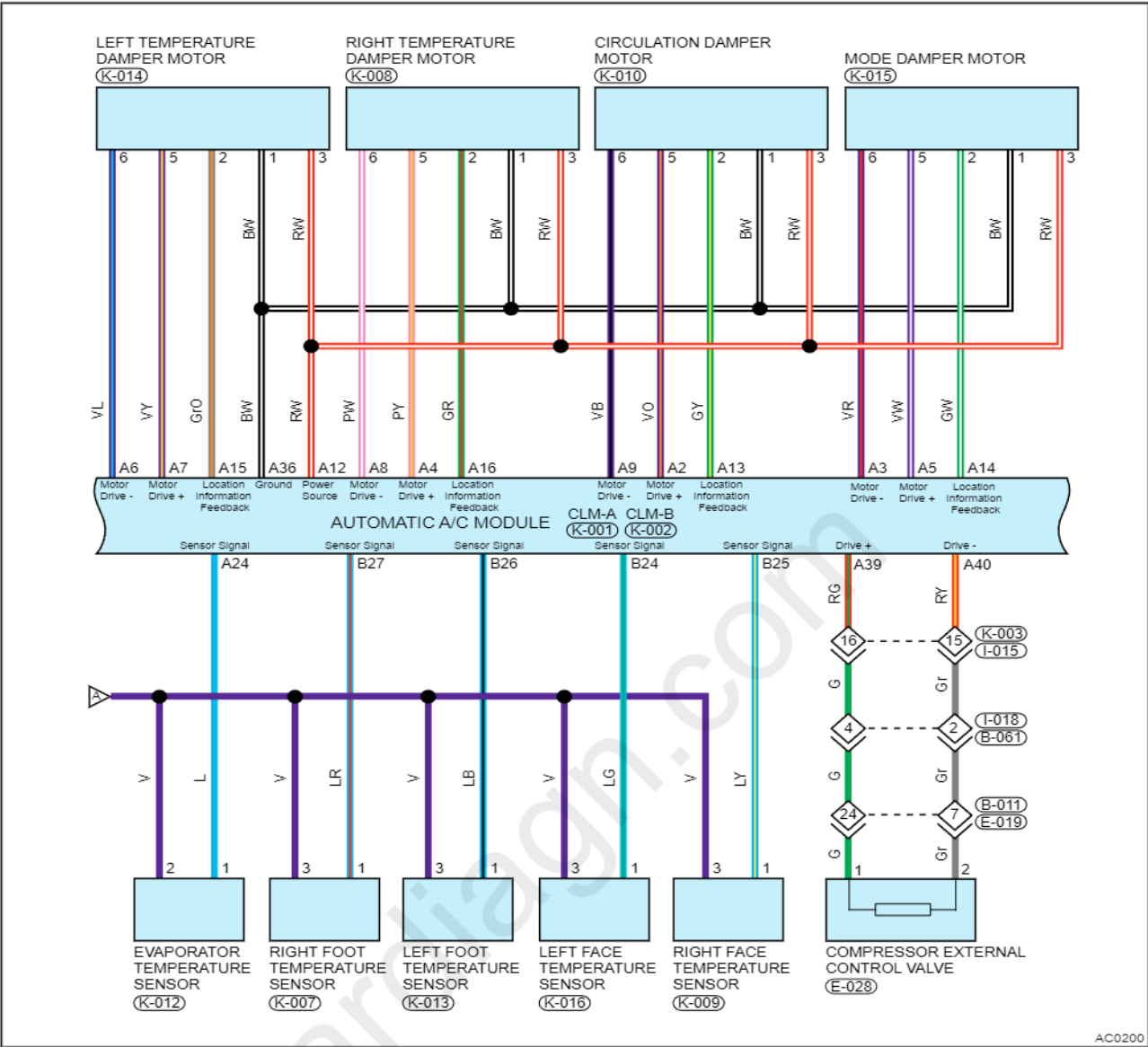
3.2 Circuit Diagram

Circuit diagram



AC0180





4 DIAGNOSIS & TEST

4.1 Problem Symptoms Table

 Caution Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.	
Symptom	Possible Cause
A/C no heating	Blower fuse (damaged)
	Blower relay (damaged)
	Blower speed regulation switch (damaged)
	Blower motor (damaged)
	Mix damper control mechanism (stuck or damaged)
	Mix damper control knob (stuck or damaged)

Symptom	Possible Cause
	Heating pipe (blocked or damaged)
	Heater core assembly (blocked or damaged)
	Wire harness or connector (open or short)
A/C no cooling	Leak in system
	Refrigerant (overcharged)
	A/C pressure sensor (damaged)
	Evaporator temperature sensor (damaged)
	A/C switch (damaged)
	Compressor assembly fuse (damaged)
	Compressor assembly relay (damaged)
	Compressor assembly belt (loose)
	Compressor assembly (damaged)
	Condenser assembly (blocked or damaged)
	Expansion valve (blocked or frosted)
	Evaporator core assembly (blocked or damaged)
	Wire harness or connector (open or short)
A/C intermittent cooling	Moisture in system
	Refrigerant (overcharged)
A/C insufficient cooling	Leak in system
	Refrigerant (insufficient)
	Refrigerant (overcharged)
	Air in refrigerant
	Moisture in refrigerant
	Condenser (dirty or blocked)
	Expansion valve (dirty or blocked)
	Condenser core (dirty or blocked)
	A/C high/low pressure line (dirty or blocked)
	Blower speed regulation switch (damaged)
	Blower motor (damaged)
	Compressor assembly belt (loose)
Too much noise in system	Compressor assembly belt (slip)
	Compressor assembly clutch bearing (worn or excessive clearance)

Symptom	Possible Cause
	Compressor assembly solenoid coil (faulty or loose connector)
	Compressor assembly belt (over tightened)
	Compressor assembly mounting bolt (loose)
	Cooling fan blade (distorted)
	Refrigerant oil (insufficient)
During operation, pressure on low pressure side switches between normal and vacuum	Moisture in refrigerant (excessive)
Pressure is too low for low pressure side and high pressure side, cooling performance is insufficient	A/C system (leaked)
	Refrigerant (insufficient)
Pressures at low pressure side and high pressure side are low, frost exists on line from condenser to A/C unit	Condenser (dirty or blocked)
Vacuum occurs at low pressure side, and pressure at high pressure side is too low, frost exists on lines on both sides of condenser or expansion valve	Moisture in refrigerant (excessive)
	Expansion valve (dirty or blocked)
	A/C line (leaked)
	Condenser (dirty or blocked)
Pressure at low pressure side and pressure at high pressure side is too high	Expansion valve (faulty)
	Refrigerant oil (excessive)
Pressure at low pressure side is normal or slightly low, and pressure at high pressure side is too high	Condenser surface (dirty)
	Cooling fan (not operating)
	Refrigerant (overcharged)
	Air in refrigerant
	Engine (overheating)
Pressure at low pressure side is too high, and pressure at high pressure side is too low	Compressor assembly belt (slip)
	Compressor assembly (faulty)
Pressure at low pressure side is too low, and pressure at high pressure side is too high	A/C high pressure line (blocked)
	Expansion valve (faulty)

4.2 Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the control system.

1	Vehicle brought to workshop
---	-----------------------------

NEXT

2	Examine vehicle and check basic items
---	---------------------------------------

Check system power supply voltage, and check that fuse, wire harness and connector are connected normally.

OK

Standard voltage: Not less than 12 V.

Result

NG

Check and replace malfunctioning parts

OK

3

Using a diagnostic tester, read related DTC and data stream information

Result

Result	Go to
No DTC	A
DTC	B

A

Perform troubleshooting procedure without DTCs according to malfunction symptom

B

4

Troubleshoot according to DTCs troubleshooting procedure

Result

Result	Go to
Problem is not resolved	A
Problem is resolved	B

A

Return to procedure 1 and troubleshoot the process again

B

5

According to system malfunction repair completion inspection and delivery, confirm if malfunction is resolved.

Result

Result	Go to
Delivery inspection is failed	A
Delivery inspection is qualified	B

A

Return to procedure 1 and troubleshoot the process again

B

6

Finished

4.3 DTC Confirmation Procedure

Confirm that battery voltage is normal before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software) to Data Link Connector (DLC).
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in supplemental restraint system.
- Turn the ENGINE START STOP switch to OFF and wait for several seconds.
- Turn ENGINE START STOP switch to ON, and then select Read DTC.
- If DTC is detected, it indicates current malfunction. Go to inspection procedure - Step 1.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

4.4 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 wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect components and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

4.5 Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit operates. Circuits are very sensitive to proper grounding. A loose or corroded ground can seriously affect the control circuit. Check the ground points as follows:

- (1) Remove ground bolt or nut.
- (2) Check all contact surfaces for tarnish, dirt and rust, etc.
- (3) Clean as necessary to ensure that contact is in good condition.
- (4) Reinstall ground bolt or nut securely.
- (5) Check if any additional accessories interfere with ground circuit.
- (6) If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

4.6 Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B14E011	Left Solar Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if left solar sensor signal is short to ground; 2. Replace solar sensor.
B14E015	Left Solar Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if solar sensor connector or lead falls off; 2. Check if left solar sensor signal is short to power supply; 3. Replace solar sensor.
B14E111	Right Solar Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if right solar sensor signal is short to ground; 2. Replace solar sensor.
B14E115	Right Solar Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if solar sensor connector or lead falls off; 2. Check if right solar sensor signal is short to power supply; 3. Replace solar sensor.
B14E211	Micro Light Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if micro light sensor signal is short to ground; 2. Replace solar sensor.
B14E215	Micro Light Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if solar sensor connector or lead falls off; 2. Check if micro light sensor signal is short to power supply; 3. Replace solar sensor.
B14E329	Internal Temperature Sensor Signal Invalid	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that inside temperature signal from AIPM has an invalid value.	Inside temperature sensor on AIPM is abnormal.	1. Check if inside temperature sensor on AIPM is abnormal (open or short); 2. Replace AIPM.
B14E411	Evaporator Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if evaporator temperature sensor wire harness is short to ground; 2. Replace evaporator temperature sensor.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B14E415	Evaporator Temperature Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if evaporator temperature sensor connector or lead falls off;. 2. Check the evaporator temperature sensor is short to power supply; 3. Replace evaporator temperature sensor.
B14E511	Left Foot Air Outlet Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if left foot air outlet temperature sensor wire harness is short to ground; 2. Replace left foot air outlet temperature sensor.
B14E515	Left Foot Air Outlet Temperature Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if left foot air outlet temperature sensor connector or lead falls off;. 2. Check if left foot air outlet temperature sensor signal is short to power supply; 3. Replace left foot air outlet temperature sensor.
B14E611	Right Foot Air Outlet Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if right foot air outlet temperature sensor wire harness is short to ground; 2. Replace right foot air outlet temperature sensor.
B14E615	Right Foot Air Outlet Temperature Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if right foot air outlet temperature sensor connector or lead falls off;. 2. Check if right foot air outlet temperature sensor signal is short to power supply; 3. Replace right foot air outlet temperature sensor.
B14E911	PM2.5 Sensor Short to Ground (Pulse Width Modulation = 0%)	Meet CLM normal operating condition. Meet PM2.5 sensor normal operating condition, turn on PM2.5 function after power-on for 3 seconds, it is detected that PWM input of PM2.5 is 0% for more than 2 seconds.	Sensor is damaged, wire harness is short or PWM frequency is abnormal.	1. Check if PM2.5 sensor signal circuit is short to ground; 2. Replace PM2.5 sensor.
B14E915	PM2.5 Sensor Short to Power Supply or Open (- Pulse Width Modulation = 0%)	Meet CLM normal operating condition. Meet PM2.5 sensor normal operating condition, turn on PM2.5 function after power-on for 3 seconds, it is detected that	Sensor is damaged, wire harness is short or PWM frequency is abnormal.	1. Check if PM2.5 sensor wire harness or lead falls off;.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		PWM input of PM2.5 is 100% for more than 2 seconds.		2. Check if PM2.5 sensor signal circuit is short to power supply; 3. Replace PM2.5 sensor.
B14EA12	PM2.5 Enable Short To Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, and when CLM output is low level, it is detected that the feedback voltage exceeds 1.0 V for more than 2 seconds.	Sensor is damaged, wire harness is short or PWM frequency is abnormal.	1. Check if PM2.5 enable signal is short to power supply; 2. Replace PM2.5 sensor.
B14EA14	PM2.5 Enable Short To Ground Or Open	Meet CLM normal operating condition. After power-on for 3 seconds, and when CLM output is high level, it is detected that the feedback voltage is lower than 0.5 V for more than 2 seconds.	Sensor is damaged, wire harness is open, short or PWM frequency is abnormal.	1. Check if PM2.5 sensor wire harness or lead falls off; 2. Check if PM2.5 enable signal circuit is short to ground; 3. Replace PM2.5 sensor.
B14EB11	Air Quality Sensor Short to Ground (Pulse Width Modulation = 0%)	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that AQS input PWM signal is 0 for more than 2 seconds.	Sensor is damaged, wire harness is short or PWM frequency is abnormal.	1. Check if AQS signal is short to ground; 2. Replace AQS sensor.
B14EB15	Air Quality Sensor Short to Power Supply or Open (Pulse Width Modulation = 100%)	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that AQS input PWM signal is 100% for more than 2 seconds.	Sensor is damaged, wire harness is open, short or PWM frequency is abnormal.	1. Check if AQS sensor wire harness or lead falls off; 2. Check if AQS sensor signal circuit is short to ground; 3. Replace AQS sensor.
B14EC10	Mode Motor Blocked (Except Calibration Procedure)	Meet CLM normal operating condition. After power-on for 3 seconds, the motor has no open fault. At this time, there is a demand for mode damper adjustment, but within continuous 2 seconds, motor feedback voltage change rate cannot reach 100 mV/100 ms.	Foreign matter will block motor, damage motor, and damage CLM drive circuit.	1. Check if motor is blocked by foreign matter; 2. Replace mode damper motor; 3. Replace CLM.
B14EC11	Mode Motor Control Circuit Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, and when mode motor drive output of CLM is high level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged	1. Check if mode motor drive circuit is short to ground; 2. Replace CLM; 3. Replace mode motor.
B14EC12	Mode Motor Control Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, and when mode motor drive output of CLM is low level, an overcurrent	Wire harness is short or drive chip is damaged	1. Check if mode motor drive circuit is short to power supply; 2. Replace CLM;

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		signal is detected for more than 2 seconds.		3. Replace mode motor.
B14EC13	Mode Motor Control Circuit Open	Meet CLM normal operating condition. After power-on for 3 seconds, and when mode motor drive is available, drive current is too small for more than 2 seconds.	Wire harness is open, drive chip is damaged or drive circuit is open	1. Check if mode motor wire harness connector or lead falls off; 2. Replace CLM; 3. Replace mode motor.
B14ED12	Mode Motor Control Feedback Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that mode motor feedback voltage is higher than 4.9 V for more than 2 seconds.	Wire harness is short or motor is damaged.	1. Check if mode motor feedback wire harness is short to power supply; 2. Replace mode motor; 3. Replace CLM.
B14ED14	Mode Motor Control Feedback Circuit Short to Ground or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that mode motor feedback voltage is lower than 0.1 V for more than 2 seconds.	Wire harness is open, short or motor is damaged.	1. Check if mode motor wire harness connector or lead falls off; 2. Check if mode motor feedback wire harness is short to ground; 3. Replace mode motor; 4. Replace CLM.
B14EE10	Left Temperature Motor Blocked (- Except Calibration Procedure)	Meet CLM normal operating condition. After power-on for 3 seconds, the motor has no open fault. At this time, there is a demand for left temperature damper adjustment, but within continuous 2 seconds, motor feedback voltage change rate cannot reach 100 mV/ 100 ms.	Foreign matter will block motor, damage motor, and damage CLM drive circuit.	1. Check if motor is blocked by foreign matter; 2. Replace left temperature damper motor; 3. Replace CLM.
B14EE11	Left Temperature Motor Control Circuit Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, and when left temperature motor drive output of CLM is high level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if left temperature motor drive circuit is short to ground; 2. Replace CLM; 3. Replace left temperature motor.
B14EE12	Left Temperature Motor Control Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, and when left temperature motor drive output of CLM is low level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if left temperature motor drive circuit is short to power supply; 2. Replace CLM; 3. Replace left temperature motor.
B14EE13	Left Temperature Motor Control Circuit Open	Meet CLM normal operating condition. After power-on for 3 seconds, and when left temperature motor drive is available, drive current is too	Wire harness is open, drive chip is damaged or drive circuit is open	1. Check if left temperature motor wire harness connector or lead falls off; 2. Replace CLM;

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		small for more than 2 seconds.		3. Replace left temperature motor.
B14EF12	Left Temperature Motor Control Feedback Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that left temperature motor feedback voltage is higher than 4.9 V for more than 2 seconds.	Wire harness is short or motor is damaged.	1. Check if left temperature motor feedback wire harness is short to power supply; 2. Replace left temperature motor; 3. Replace CLM.
B14EF14	Left Temperature Motor Control Feedback Circuit Short to Ground or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that left temperature motor feedback voltage is lower than 0.1 V for more than 2 seconds.	Wire harness is open, short or motor is damaged.	1. Check if left temperature motor wire harness connector or lead falls off; 2. Check if left temperature motor feedback wire harness is short to ground; 3. Replace left temperature motor; 4. Replace CLM.
B14F010	Right Temperature Motor Blocked (- Except Calibration Procedure)	Meet CLM normal operating condition. After power-on for 3 seconds, the motor has no open fault. At this time, there is a demand for right temperature damper adjustment, but within continuous 2 seconds, motor feedback voltage change rate cannot reach 100 mV/ 100 ms.	Foreign matter will block motor, damage motor, and damage CLM drive circuit.	1. Check if motor is blocked by foreign matter; 2. Replace right temperature damper motor; 3. Replace CLM.
B14F011	Right Temperature Motor Control Circuit Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, and when right temperature motor drive output of CLM is high level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if right temperature motor drive circuit is short to ground; 2. Replace CLM; 3. Replace right temperature motor.
B14F012	Right Temperature Motor Control Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, and when right temperature motor drive output of CLM is low level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if right temperature motor drive circuit is short to power supply; 2. Replace CLM; 3. Replace right temperature motor.
B14F013	Right Temperature Motor Control Circuit Open	Meet CLM normal operating condition. After power-on for 3 seconds, and when right temperature motor drive is available, drive current is too small for more than 2 seconds.	Wire harness is open, drive chip is damaged or drive circuit is open	1. Check if right temperature motor wire harness connector or lead falls off; 2. Replace CLM; 3. Replace right temperature motor.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B14F112	Right Temperature Motor Control Feedback Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that right temperature motor feedback voltage is higher than 4.9 V for more than 2 seconds.	Wire harness is short or motor is damaged.	1. Check if right temperature motor feedback wire harness is short to power supply; 2. Replace right temperature motor; 3. Replace CLM.
B14F114	Right Temperature Motor Control Feedback Circuit Short to Ground or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that right temperature motor feedback voltage is lower than 0.1 V for more than 2 seconds.	Wire harness is open, short or motor is damaged.	1. Check if right temperature motor wire harness connector or lead falls off; 2. Check if right temperature motor feedback wire harness is short to ground; 3. Replace right temperature motor; 4. Replace CLM.
B14F210	Intake Motor Blocked (Except Calibration Procedure)	Meet CLM normal operating condition. After power-on for 3 seconds, the motor has no open fault. At this time, there is a demand for circulation damper adjustment, but within continuous 2 seconds, motor feedback voltage change rate cannot reach 100 mV/100 ms.	Foreign matter will block motor, damage motor, and damage CLM drive circuit.	1. Check if motor is blocked by foreign matter; 2. Replace circulation damper motor; 3. Replace CLM.
B14F211	Intake Motor Control Circuit Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, and when circulation motor drive output of CLM is high level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if circulation motor drive circuit is short to ground; 2. Replace CLM.
B14F212	Intake Motor Control Circuit Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, and when circulation motor drive output of CLM is low level, an overcurrent signal is detected for more than 2 seconds.	Wire harness is short or drive chip is damaged.	1. Check if circulation motor drive circuit is short to power supply; 2. Replace CLM.
B14F213	Intake Motor Control Circuit Open	Meet CLM normal operating condition. After power-on for 3 seconds, and when circulation motor drive is available, drive current is too small for more than 2 seconds.	Wire harness is open, drive chip is damaged or drive circuit is open	1. Check if circulation motor wire harness connector or lead falls off; 2. Replace CLM.
B14F312	Intake Motor Control Feedback Circuit	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that	Wire harness is short or motor is damaged.	1. Check if circulation motor feedback wire

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Short to Power Supply	circulation motor feedback voltage is higher than 4.9 V for more than 2 seconds.		harness is short to power supply; 2. Replace circulation motor; 3. Replace CLM.
B14F314	Intake Motor Control Feedback Circuit Short to Ground or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that circulation motor feedback voltage is lower than 0.1 V for more than 2 seconds.	Wire harness is open, short or motor is damaged.	1. Check if circulation motor wire harness connector or lead falls off; 2. Check if circulation motor feedback wire harness is short to ground; 3. Replace circulation motor; 4. Replace CLM.
B14F412	Blower Relay Output Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, relay control output is low level, but it is detected that feedback voltage is high level for more than 2 seconds.	Wire harness is short or relay is short.	1. Check if relay control circuit wire harness is short to power supply; 2. Replace blower relay.
B14F414	Blower Relay Output Short to Ground or Open	Meet CLM normal operating condition. After power-on for 3 seconds, relay control output is high level, but it is detected that feedback voltage is high level or has open fault for more than 2 seconds.	Relay fuse is damaged, wire harness is open, short, relay is damaged.	1. Check if relay fuse is damaged. 2. Check if relay control circuit wire harness is open or short to ground; 3. Replace blower relay.
B14F529	Blower Signal Invalid Control Failed	Meet CLM normal operating condition. After power-on for 3 seconds, blower is turned on, feedback voltage is higher than 2 V, but it cannot change with gear change for more than 2 seconds.	Wire harness is short or speed regulation module is damaged.	1. Check if blower control signal is short; 2. Check if blower negative terminal circuit is short; 3. Replace blower speed regulation module.
B14F531	Blower Control Failed	Meet CLM normal operating condition. After power-on for 3 seconds, when blower is in the range of 1 to 5, blower negative terminal feedback voltage is lower than 2 V	Wire harness is short or speed regulation module is damaged.	1. Check if blower control signal is short; 2. Check if blower negative terminal circuit is short; 3. Replace blower speed regulation module.
B14F611	Sensor PM2.5, AQS + 12 V Output Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, turn on 12 V power supply output, IS pin feedback voltage of 5180 chip is higher than 4.9 V.	Wire harness is short, sensor is short, and 5180 chip of CLM is damaged.	1. Check if 12 V sensor supply circuit is short to ground; 2. Check if AQS and PM2.5 is short; 3. Replace CLM.
B14F612	Sensor PM2.5, AQS + 12 V Output Short to Power Supply	Meet CLM normal operating condition. After power-on for 3 seconds, turn off 12 V power supply output, IS pin	Wire harness is short, 5180 chip of CLM is damaged.	1. Check if 12 V sensor supply circuit is a short to power supply;

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		feedback voltage of 5180 chip is higher than 4.9 V		2. Replace CLM.
B14F711	ECV Control Circuit Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, turn on external control valve and it is detected that IS pin feedback voltage of 5180 chip is higher than 4.9 V (- short or over current).	Wire harness is short, 5180 chip of CLM is damaged.	1. Check if positive drive wire harness of external control valve is short to ground; 2. Replace CLM.
B14F715	ECV Control Circuit Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, turn on external control valve and it is detected that IS pin feedback voltage of 5180 chip is higher than 4.9 V (- short or over current). Turn on external control valve, it is detected that the IS pin feedback voltage of 5180 chip is lower than 0.1 V (open).	Wire harness is short, 5180 chip of CLM is damaged.	1. Check if external control valve wire harness connector or lead falls off, check external control valve wire harness from CLM to HVAC for continuity; 2. Replace CLM; 3. Replace compressor external control valve.
B14FB11	External Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if ambient temperature sensor wire harness is short to ground; 2. Replace ambient temperature sensor.
B14FB15	External Temperature Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if ambient temperature sensor connector or lead falls off; 2. Check if ambient temperature sensor signal is short to power supply; 3. Replace ambient temperature sensor.
B14FC1C	Abnormal Power Supply Voltage	Network is waked up, IG is powered on, CLM can operate, it is detected that battery voltage is 8.5 V or higher than 16.5 V.	Battery or alternator fails.	1. Check if battery is normal; 2. Check if alternator is normal.
B14E711	Left Face Air Outlet Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if left face air outlet temperature sensor wire harness is short to ground; 2. Replace left face air outlet temperature sensor.
B14E715	Left Face Air Outlet Temperature Sensor Short to	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if left face air outlet temperature sensor connector or lead falls off; 2. Check if left face air outlet temperature sensor

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Power Supply or Open	higher than 4.9 V for more than 2 seconds.		signal is short to power supply; 3. Replace left face air outlet temperature sensor.
B14E811	Right Face Air Outlet Temperature Sensor Short to Ground	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if right face air outlet temperature sensor wire harness is short to ground; 2. Replace right face air outlet temperature sensor.
B14E815	Right Face Air Outlet Temperature Sensor Short to Power Supply or Open	Meet CLM normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if right face air outlet temperature sensor connector or lead falls off; 2. Check if right face air outlet temperature sensor signal is short to power supply; 3. Replace right face air outlet temperature sensor.
B14FD10	Humidity Sensor Failure	Received humidity value signal from BCM node is error.	Received humidity value from BCM node is invalid; Received humidity value from BCM node is lost;	1. Check that received humidity signal value from BCM is valid; 2. Check if BCM node loses the signal.

■ Automatic A/C rear module (CLMR) DTC summary

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B15461C	Abnormal Power Supply Voltage	Network is waked up, IG is powered on, CLMR can operate, it is detected that battery voltage is 8.5 V or higher than 16.5 V.	Battery or alternator fails.	1. Check if battery is normal; 2. Check if alternator is normal.
B154011	Evaporator Temperature Sensor Short to Ground	Meet CLMR normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if rear evaporator temperature sensor wire harness is short to ground; 2. Replace rear evaporator temperature sensor.
B154015	Evaporator Temperature Sensor Short to Power Supply or Open	Meet CLMR normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if rear evaporator temperature sensor connector or lead falls off; 2. Check if rear evaporator temperature sensor signal is short to power supply; 3. Replace rear evaporator temperature sensor.
B154111	Foot Air Outlet Temperature	Meet CLMR normal operating condition. After power-on for 3 seconds, it is	Sensor is damaged or wire harness is short.	1. Check if rear foot air outlet temperature sensor

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Sensor Short to Ground	detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.		wire harness is short to ground; 2. Replace left foot air outlet temperature sensor.
B154115	Foot Air Outlet Temperature Sensor Short to Power Supply or Open	Meet CLMR normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if rear foot air outlet temperature sensor connector or lead falls off; 2. Check if rear foot air outlet temperature sensor signal is short to power supply; . 3. Replace rear foot air outlet temperature sensor.
B154211	Face Air Outlet Temperature Sensor Short to Ground	Meet CLMR normal operating condition. After power-on for 3 seconds, it is detected that the signal input voltage is lower than 0.1 V for more than 2 seconds.	Sensor is damaged or wire harness is short.	1. Check if rear face air outlet temperature sensor wire harness is short to ground; 2. Replace rear face air outlet temperature sensor.
B154215	Face Air Outlet Temperature Sensor Short to Power Supply or Open	Meet CLMR normal operating condition turn on power-on for 3 seconds, it is detected that the signal input voltage is higher than 4.9 V for more than 2 seconds.	Sensor is not connected, sensor is damaged or wire harness is short.	1. Check if rear face air outlet temperature sensor connector or lead falls off; 2. Check if rear face air outlet temperature sensor signal is short to power supply; 3. Replace rear face air outlet temperature sensor.
B154311	Mode Motor Control Circuit Short to Ground	Meet CLMR normal operating condition. After power-on for 3 seconds, and when mode motor drive output of CLMR is high level, but it is detected that feedback voltage is low level.	Wire harness is open, short or drive chip is damaged.	1. Check if rear mode motor drive circuit is short to ground; 2. Check if rear mode motor drive circuit is open; 3. Replace CLMR; 4. Replace the rear mode motor.
B154312	Mode Motor Control Circuit Short to Power Supply	Meet CLMR normal operating condition. After power-on for 3 seconds, when mode motor drive output of CLMR is low level, but it is detected that feedback voltage is high level.	Wire harness is short or drive chip is damaged.	1. Check if rear mode motor drive circuit is short to power supply; 2. Replace CLMR; 3. Replace the rear mode motor.
B154411	Temperature Motor Control Circuit Short to Ground	Meet CLMR normal operating condition. After power-on for 3 seconds, when temperature motor drive output of CLMR is high level, but it is detected that feedback voltage is low level.	Wire harness is open, short or drive chip is damaged.	1. Check if rear temperature motor drive circuit is short to ground; 2. Check rear temperature motor drive circuit is open; 3. Replace CLMR;

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
				4. Replace rear temperature motor.
B154412	Temperature Motor Control Circuit Short to Power Supply	Meet CLMR normal operating condition. After power-on for 3 seconds, when temperature motor drive output of CLMR is low level, but it is detected that feedback voltage is high level.	Wire harness is short or drive chip is damaged.	1. Check if rear temperature motor drive circuit is short to power supply; 2. Replace CLMR; 3. Replace rear temperature motor.
B154512	Blower Relay Output Short to Power Supply	Meet CLMR normal operating condition. After power-on for 3 seconds, relay control output is low level, but it is detected that feedback voltage is high level for more than 2 seconds.	Wire harness is short or relay is short.	1. Check if relay control circuit wire harness is short to power supply; 2. Replace rear blower relay.
B154514	Blower Relay Output Short to Ground or Open	Meet CLMR normal operating condition. After power-on for 3 seconds, relay control output is high level, but it is detected that feedback voltage is low level or has open fault for more than 2 seconds.	Relay fuse is damaged, wire harness is open, short, relay is damaged.	1. Check if relay fuse is damaged. 2. Check if relay control circuit wire harness is open or short to ground; 3. Replace rear blower relay.
B154529	Blower Signal Invalid Control Failed	Meet CLMR normal operating condition. After power-on for 3 seconds, blower is turned on, feedback voltage is higher than 2 V, but it cannot change with gear change for more than 2 seconds.	Wire harness is short or speed regulation module is damaged.	1. Check if rear blower control signal is short; 2. Check if rear blower negative terminal circuit is short; 3. Replace rear blower speed regulation module.
B154531	Blower Control Failed	Meet CLMR normal operating condition. After power-on for 3 seconds, when blower is in the range of 1 to 5, blower negative terminal feedback voltage is lower than 2 V	Wire harness is short or speed regulation module is damaged.	1. Check if rear blower control signal is short; 2. Check if rear blower negative terminal circuit is short; 3. Replace rear blower speed regulation module.

■ Front A/C control panel (APIM) DTC summary

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B137016	System Power Supply Voltage - Voltage Below Threshold	Detected power supply voltage is lower than threshold.	- Power supply fault; - Line connection fault.	Check if supply voltage is lower than 9 V.
B137017	System Power Supply Voltage - Voltage Above Threshold	Detected power supply voltage is higher than threshold		Check if supply voltage is higher than 16 V.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B137101	AIPM Auto Button Stuck	/	- Button is faulty; - Circuit is faulty.	1. After any button is pressed, check if it works normally. 2. Check if supply voltage is normal.
B137201	AIPM Synchronization Button Stuck	/		

■ Rear A/C control panel (CCPR) DTC summary

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B137016	System Power Supply Voltage - Voltage Below Threshold	Detected power supply voltage is lower than threshold.	- Power supply fault; - Line connection fault.	Check if supply voltage is less than normal voltage.
B137017	System Power Supply Voltage - Voltage Above Threshold	Detected power supply voltage is higher than threshold.		Check if supply voltage is higher than normal voltage.

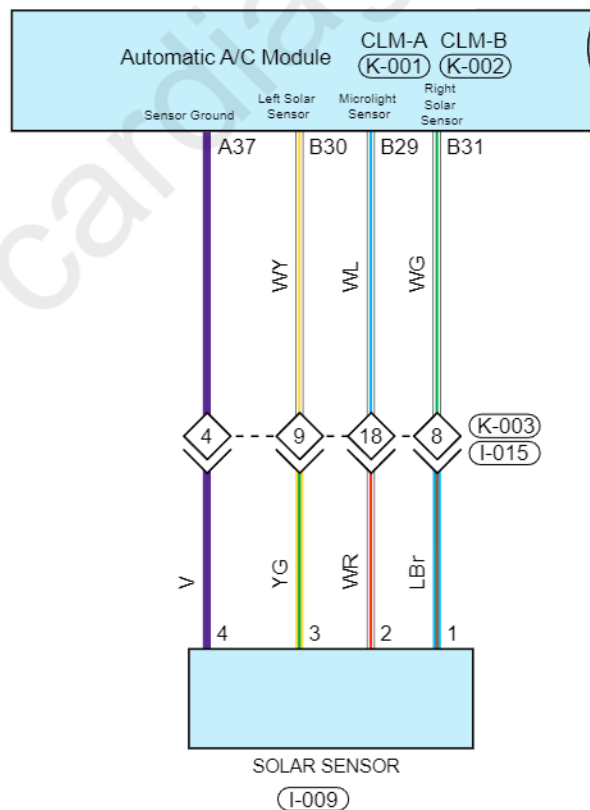
4.7 DTC Diagnosis Procedure

■ Left solar sensor short malfunction

DTC	B14E011	Left Solar Sensor Short to Ground
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■ Description

Control schematic diagram



AC0111

■ DTC confirmation procedure

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

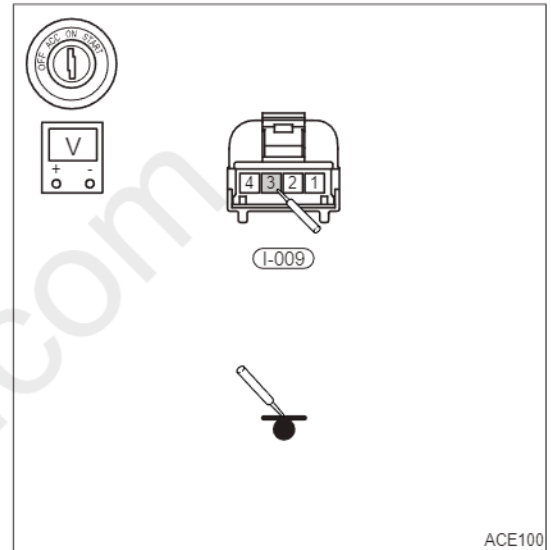
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1 Check left solar sensor signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of solar sensor signal I-009(3). Use a flashlight to light the solar sensor, and the voltage normally changes with the light intensity.



NG

Repair wire harness or replace solar sensor.

OK

2 Check automatic A/C control module

- (a) Remove automatic A/C control module from malfunctioning vehicle.
- (b) Install a new automatic A/C control module to malfunctioning vehicle.

OK

Repair or replace new module.

NG

3 Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

OK

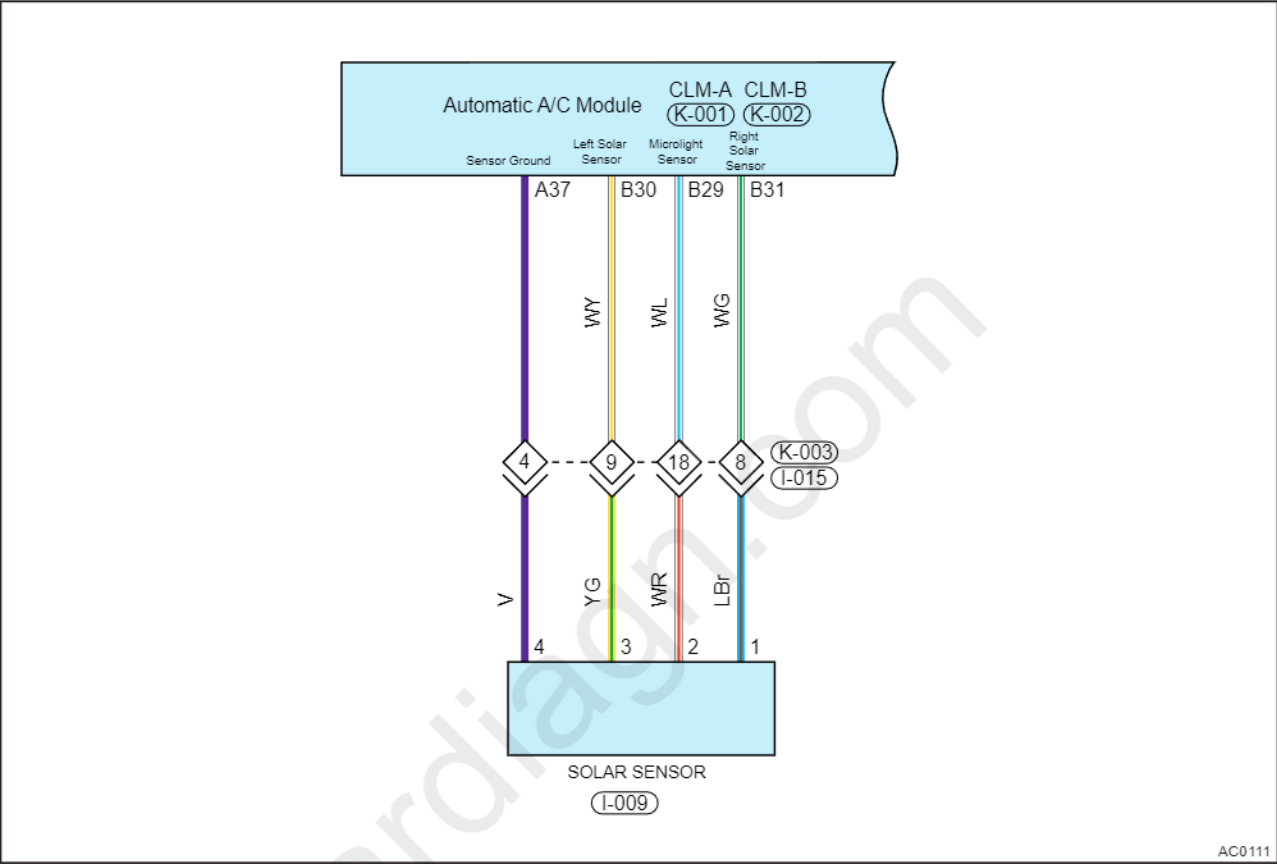
Conduct test and confirm malfunction has been repaired.

■ Left solar sensor short to power supply malfunction

DTC	B14E015	Left Solar Sensor Short to Power Supply or Open
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Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

■ Circuit diagram



1	Check wire harness connector
---	------------------------------

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Check if solar sensor connector or lead falls off.

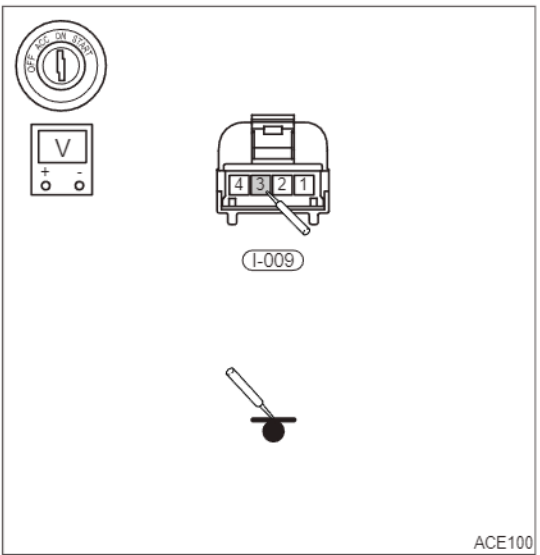
NG

Repair or replace wire harness.

OK

2	Check left solar sensor signal voltage
---	--

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of solar sensor signal I-009(3). Use a flashlight to light the solar sensor, and the voltage normally changes with the light intensity.



NG

Check if left solar sensor signal is short to power supply or replace solar sensor.

OK

3

Check automatic A/C control module

- (a) Remove automatic A/C control module from malfunctioning vehicle.
- (b) Install a new automatic A/C control module to malfunctioning vehicle.
- (c) System operates normally.

■ Right solar sensor short malfunction

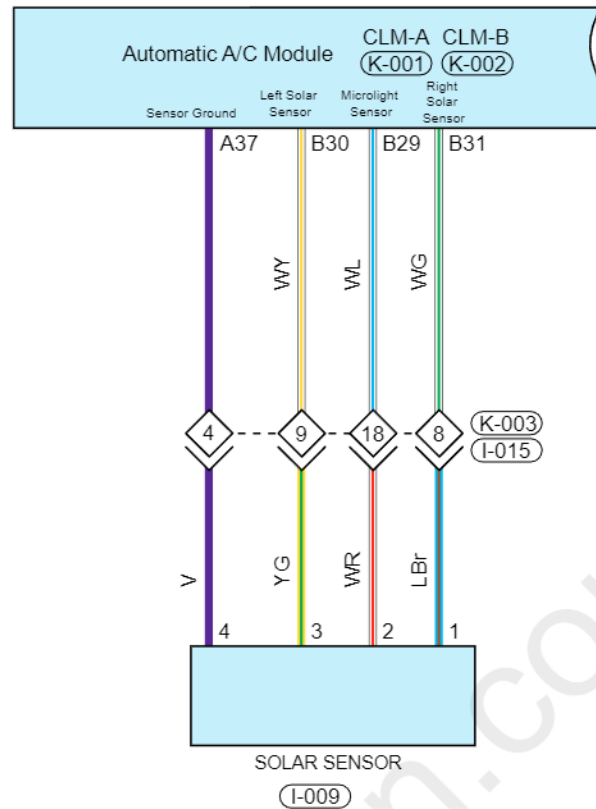
DTC

B14E111

Right Solar Sensor Short to Ground

■ Description

Control schematic diagram



AC0111

■ DTC confirmation procedure

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

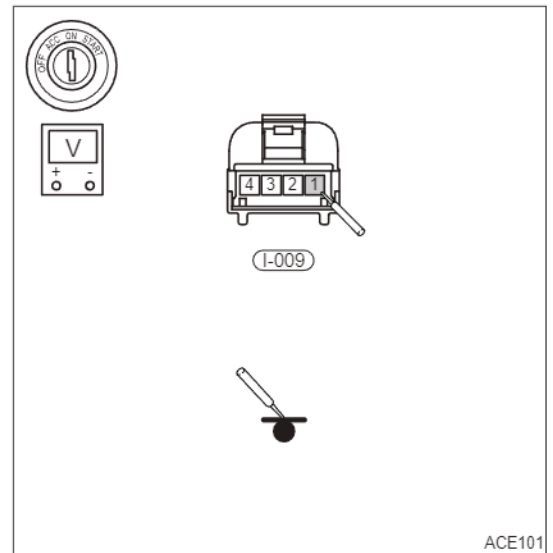
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1	Check right solar sensor signal voltage
---	---

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of solar sensor signal I-009(1). Use a flashlight to light the solar sensor, and the voltage normally changes with the light intensity.



NG

Repair wire harness or replace solar sensor.

OK

2

Reconfirm DTCs

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

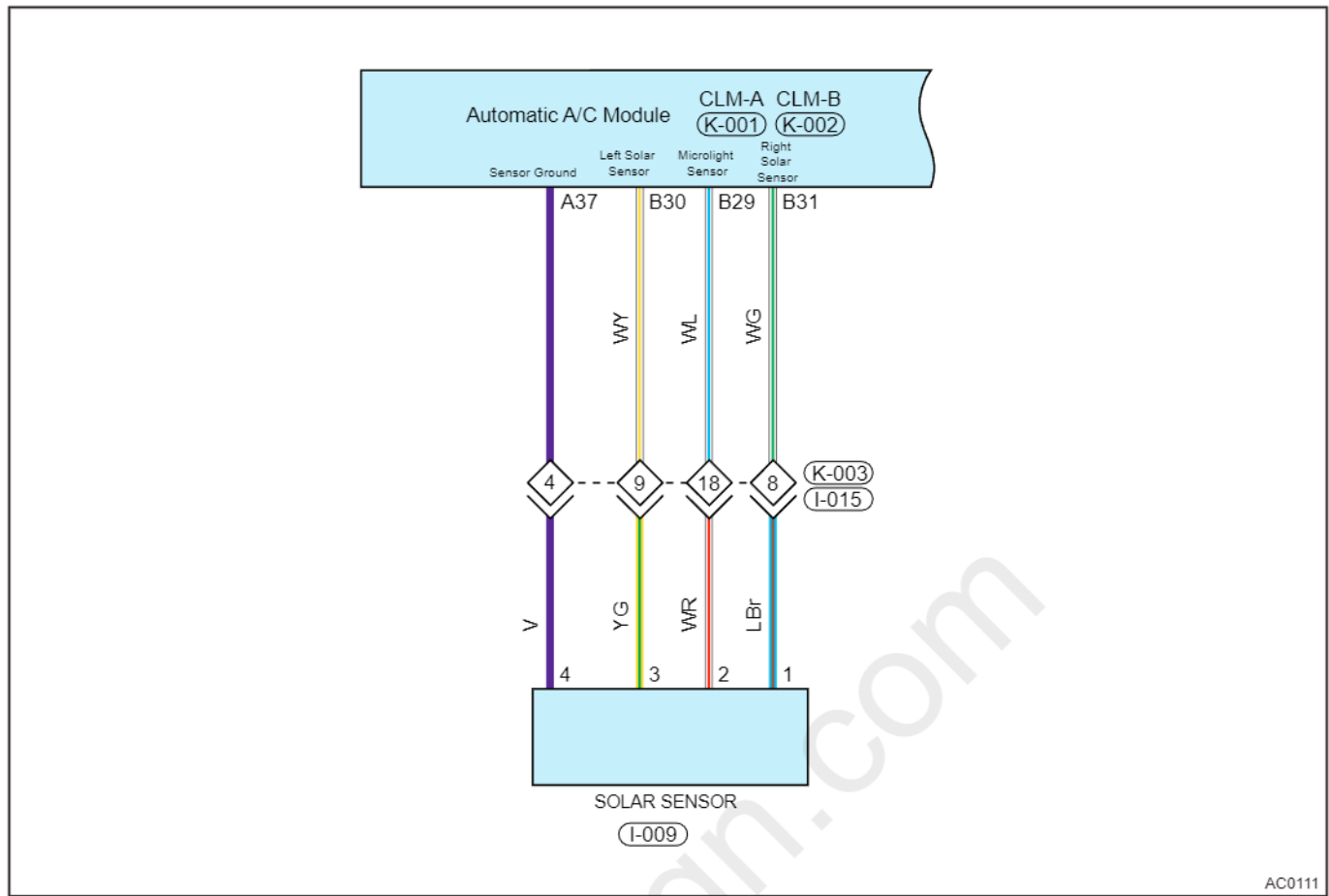
Conduct test and confirm malfunction has been repaired.

■ Right solar sensor short to power supply malfunction

DTC	B14E115	Right Solar Sensor Short to Power Supply or Open
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■ Description

Control schematic diagram



AC0111

■ 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 if solar sensor connector or lead falls off.

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Check whether the connector is in bad contact, bending, distortion, poor contact etc.

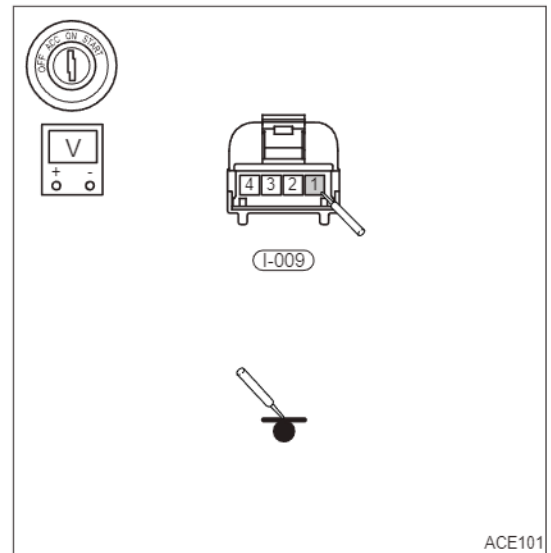
NG Repair or replace wire harness connector.

OK

2 Check right solar sensor signal voltage

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of solar sensor signal I-009(1). Use a flashlight to light the solar sensor, and the voltage normally changes with the light intensity.



NG

Check if right solar sensor signal is short to power supply or replace solar sensor.

OK

3

Reconfirm DTCs

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

Conduct test and confirm malfunction has been repaired.

■ Inside temperature sensor malfunction

DTC	B14E329	Internal Temperature Sensor Signal Invalid
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■ Description

■ 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 AIPM

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Remove AIPM from malfunctioning vehicle.
- (c) Install a new AIPM to malfunctioning vehicle.

OK

Replace AIPM with a new one.

NG

2 Reconfirm DTCs

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

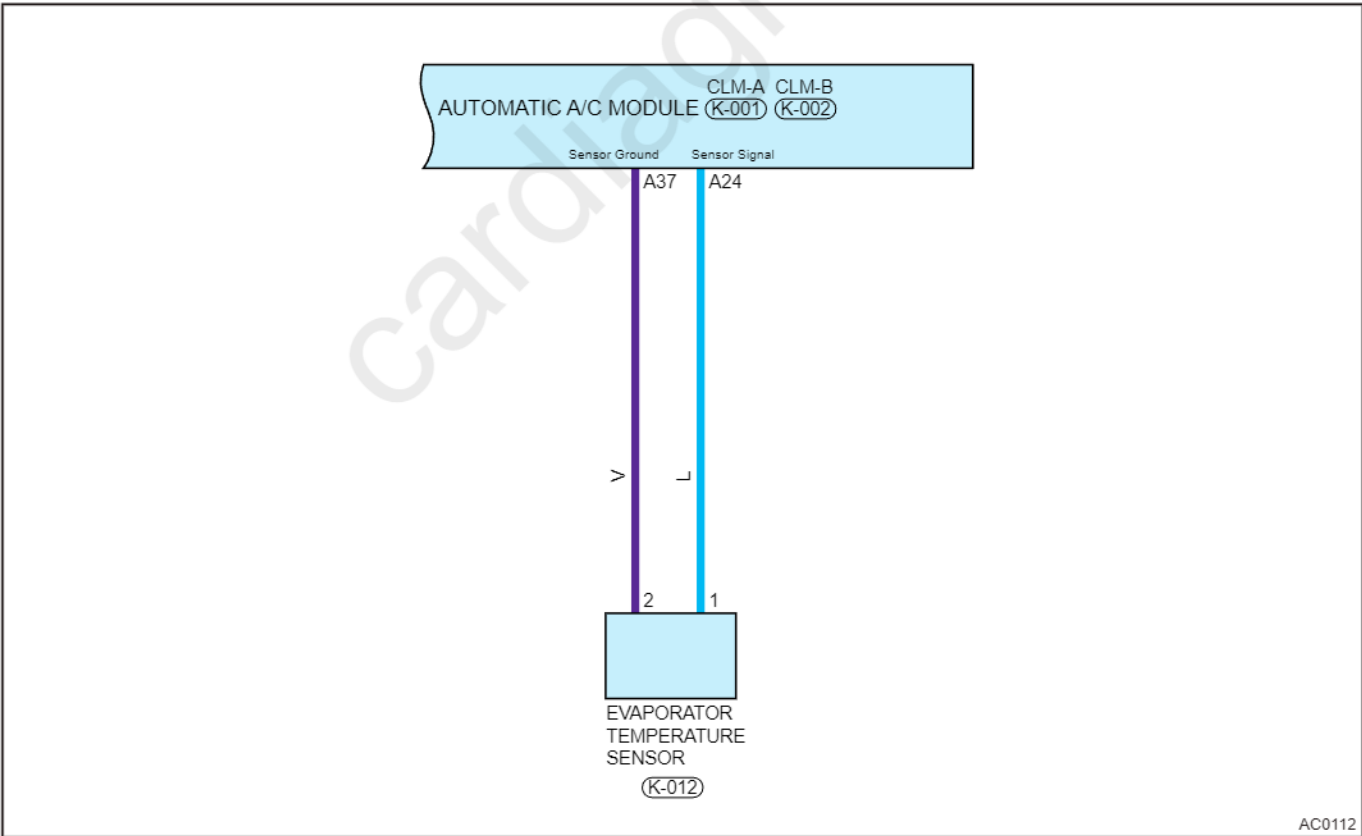
Replace with a new ECM to check if fault reoccurs.

OK

Conduct test and confirm malfunction has been repaired.

DTC	B14E411	Evaporator Temperature Sensor Short to Ground
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■ Description
Control schematic diagram



- 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.

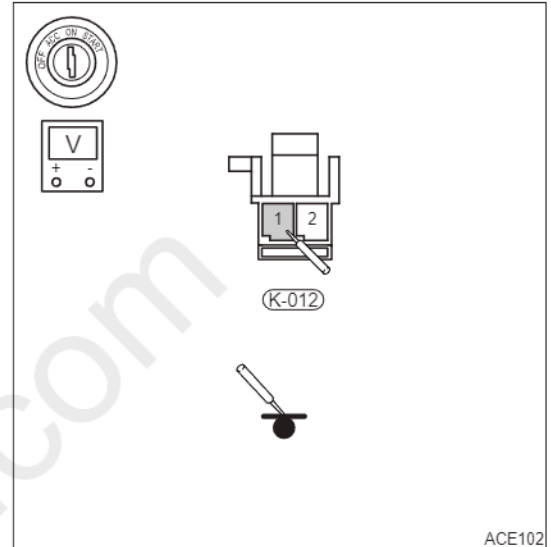
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

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 signal voltage**

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of evaporator temperature sensor signal K-012 (1). Normal signal voltage changes with A/C temperature.

**NG**

Check if evaporator temperature sensor wire harness or replace evaporator temperature sensor.

OK**2****Reconfirm DTCs**

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

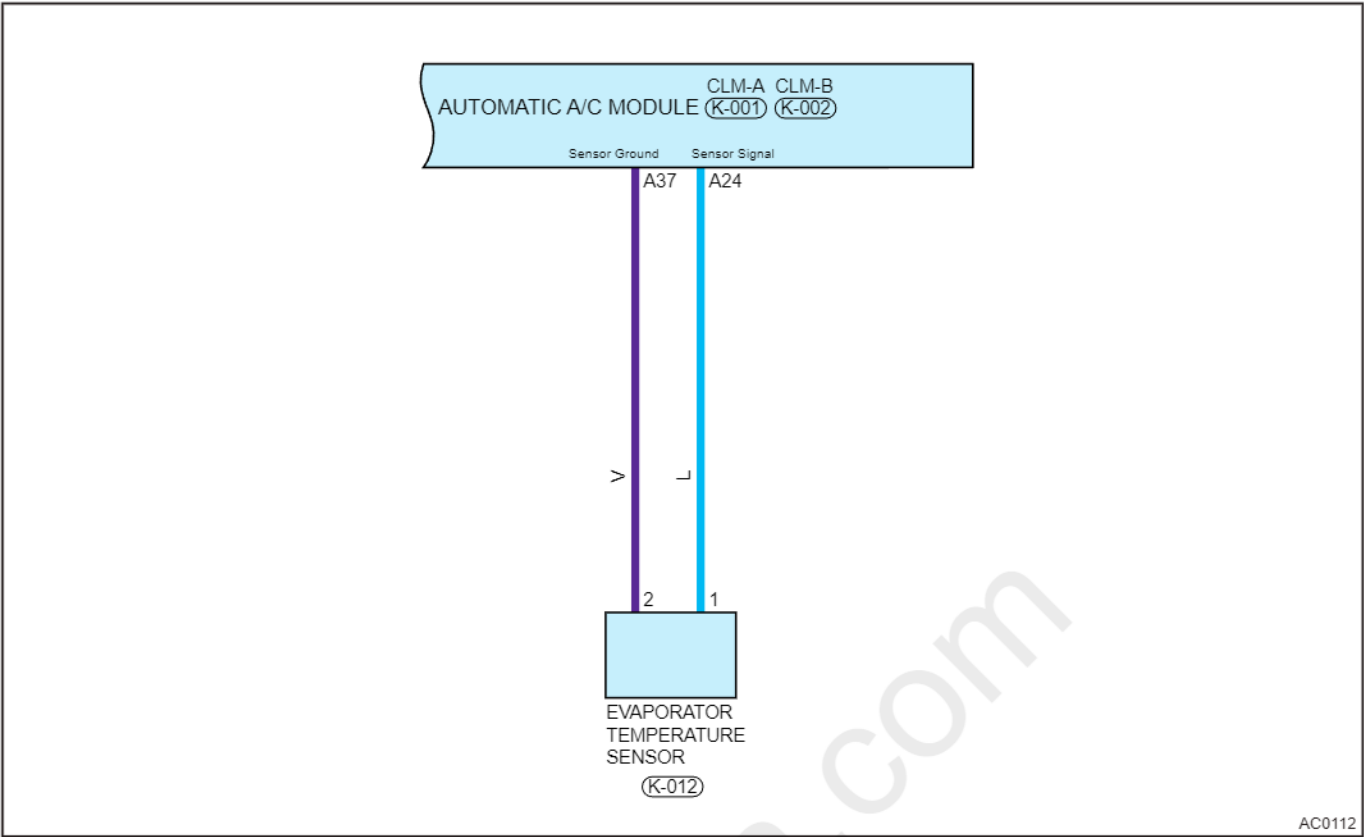
Conduct test and confirm malfunction has been repaired.

■ **Evaporator temperature sensor short to power supply malfunction**

DTC	B14E415	Evaporator Temperature Sensor Short to Power Supply or Open
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■ **Description**

Control schematic diagram



■ 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.

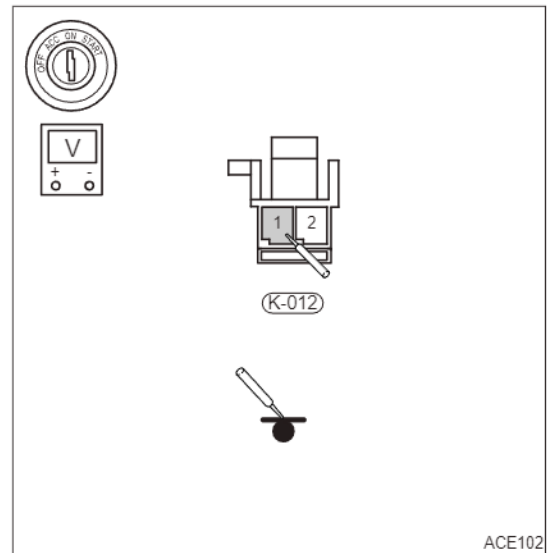
Hint:

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

1	Check wire harness connector
(a) Use circuit diagram as a guide to perform the following inspection procedures: (b) Turn ENGINE START STOP switch to OFF. (c) Check whether the connector is in bad contact, bending, distortion, poor contact etc. NG Repair or replace wire harness. OK	
2	Check the evaporator temperature sensor signal voltage

(a) Use circuit diagram as a guide to perform the following inspection procedures:

- (i) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (ii) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of evaporator temperature sensor signal K-012 (1). Normal signal voltage changes with A/C temperature.



NG

Check evaporator temperature sensor wire harness or replace evaporator temperature sensor.

OK

3

Reconfirm DTCs

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

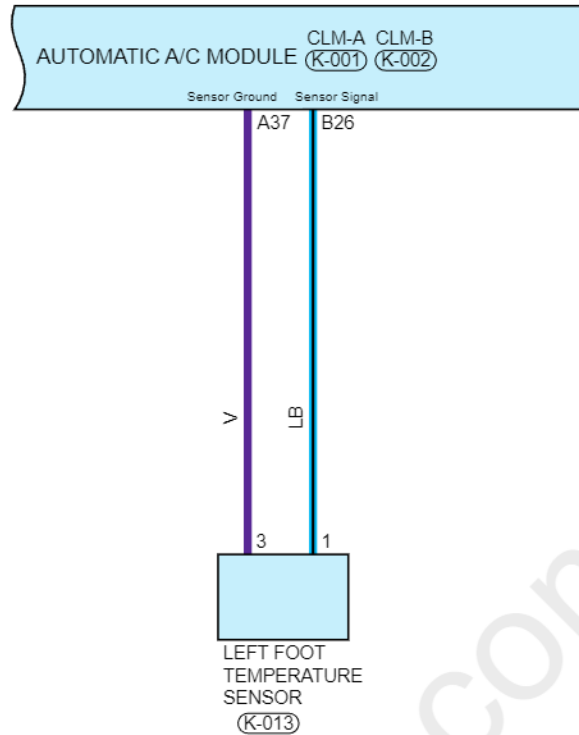
Conduct test and confirm malfunction has been repaired.

■ Left foot air outlet temperature sensor short to ground malfunction

DTC	B14E511	Left Foot Air Outlet Temperature Sensor Short to Ground
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■ Description

Control schematic diagram



AC0113

■ DTC confirmation procedure

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

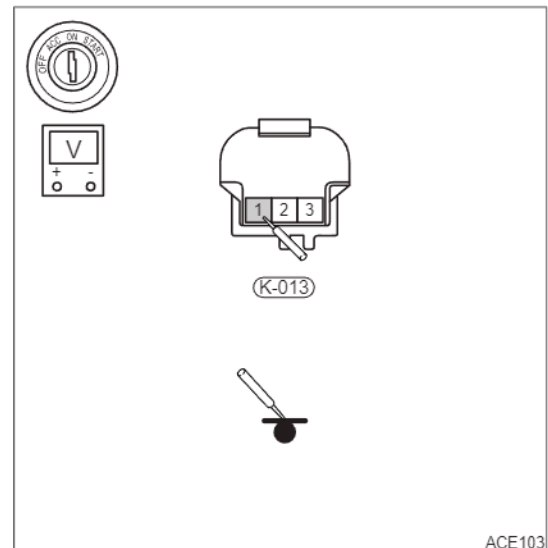
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1 Check left foot air outlet temperature sensor signal voltage

- Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of left foot air outlet temperature sensor signal K-013 (1). Normal signal voltage changes with A/C temperature.



NG

Check left foot air outlet temperature sensor wire harness or replace left foot air outlet temperature sensor.

OK

2

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
 (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
 (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

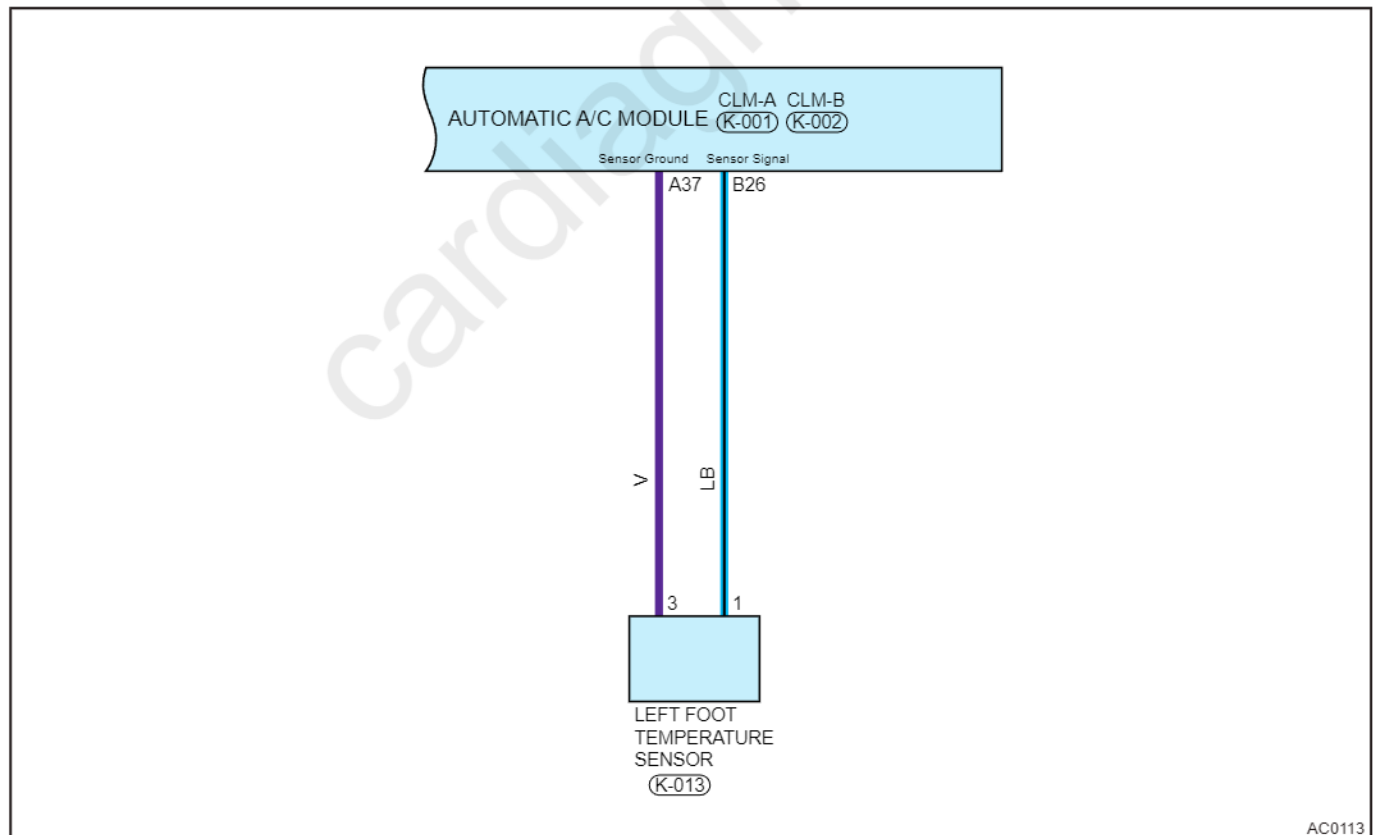
Conduct test and confirm malfunction has been repaired.

■ Left foot air outlet temperature sensor short to power supply or open malfunction

DTC	B14E515	Left Foot Air Outlet Temperature Sensor Short to Power Supply or Open
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■ Description

Control schematic diagram



AC0113

■ 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 if left foot air outlet temperature sensor connector or lead falls off

- Turn ENGINE START STOP switch to OFF.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

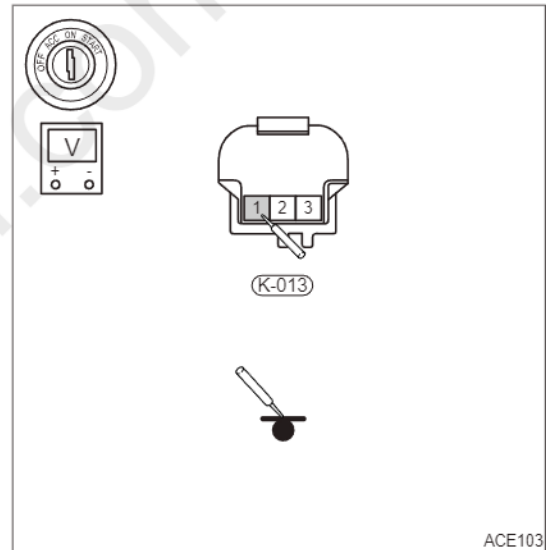
NG

Repair or replace wire harness.

OK

2 Check left foot air outlet temperature sensor signal voltage.

- Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of left foot air outlet temperature sensor signal K-013 (1). Normal signal voltage changes with A/C temperature.



NG

Check if left foot air outlet temperature sensor wire harness or replace left foot air outlet temperature sensor.

OK

3 Reconfirm DTCs

- Connect diagnostic tester and clear DTCs.
- Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

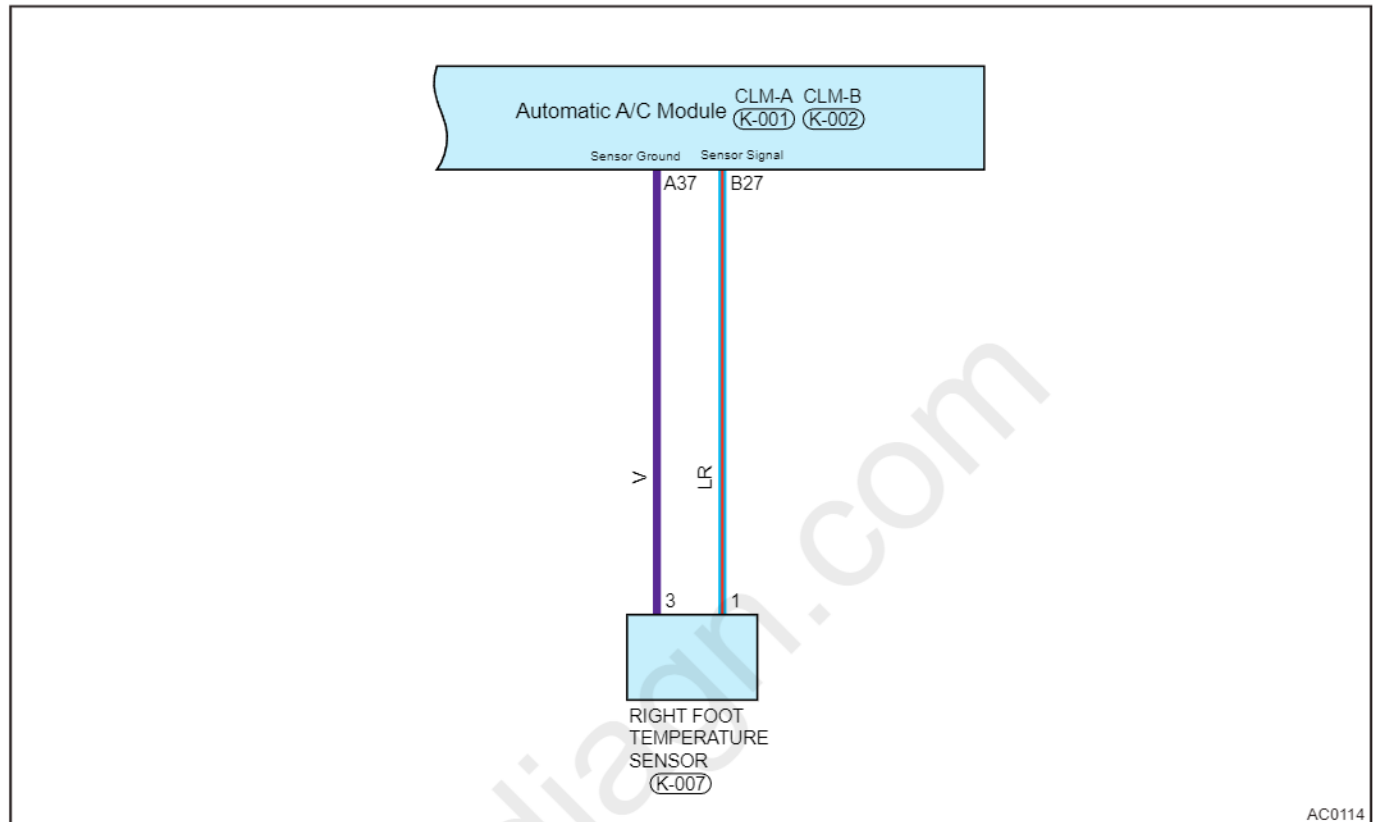
Conduct test and confirm malfunction has been repaired.

■ Right foot air outlet temperature sensor short to ground

DTC	B14E611	Right Foot Air Outlet Temperature Sensor Short to Ground
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■ Description

Control schematic diagram



■ DTC confirmation procedure

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

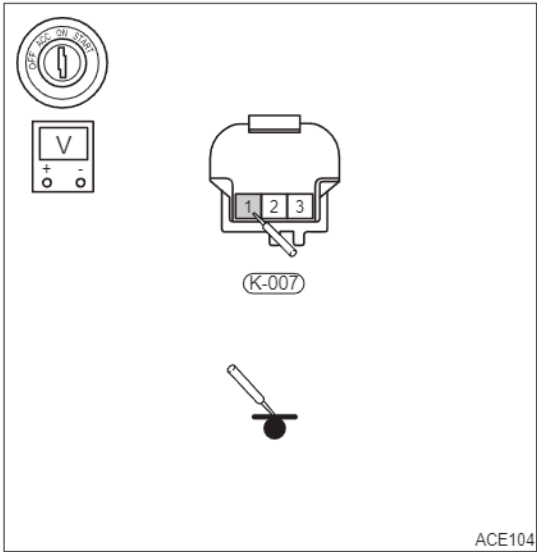
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1	Check right foot air outlet temperature sensor signal voltage
---	---

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of right foot air outlet temperature sensor signal K-007 (1). Normal signal voltage changes with A/C temperature.



NG

Check right foot air outlet temperature sensor wire harness or replace right foot air outlet temperature sensor.

OK

2	Reconfirm DTCs
---	----------------

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

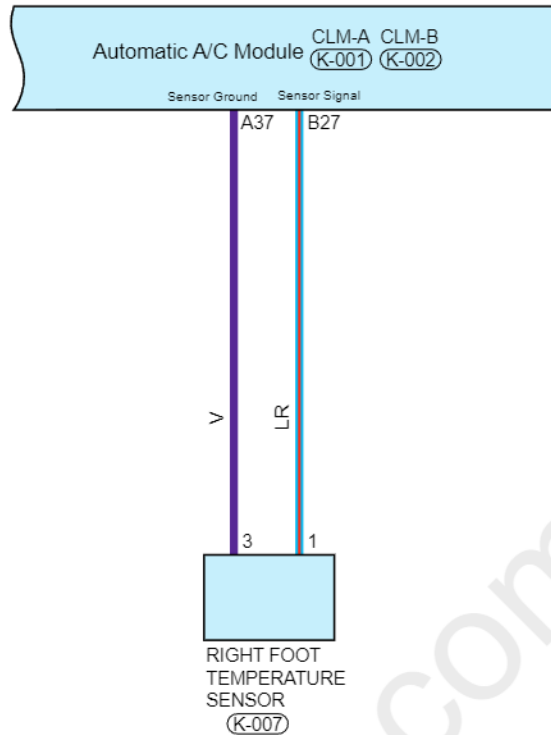
OK

Conduct test and confirm malfunction has been repaired.

DTC	B14E615	Right Foot Air Outlet Temperature Sensor Short to Power Supply or Open
-----	---------	--

■ Description

Control schematic diagram



AC0114

■ 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 if right foot air outlet temperature sensor connector or lead falls off

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Check whether the connector is in bad contact, bending, distortion, poor contact etc.

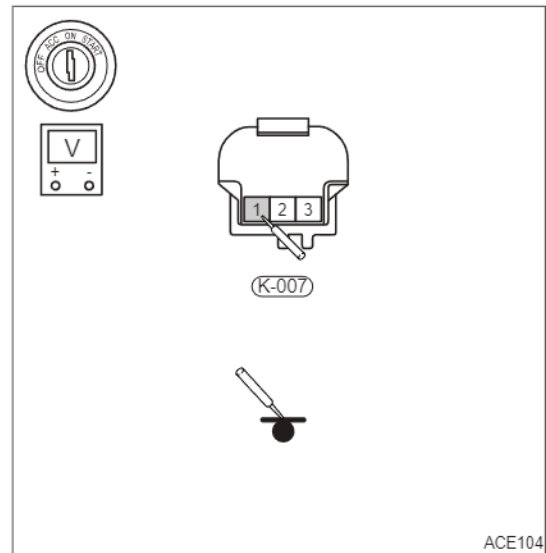
NG

Repair or replace wire harness connector.

OK

2 Check right foot air outlet temperature sensor signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of right foot air outlet temperature sensor signal K-007 (1). Normal signal voltage changes with A/C temperature.



NG

Check right foot air outlet temperature sensor wire harness or replace right foot air outlet temperature sensor.

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

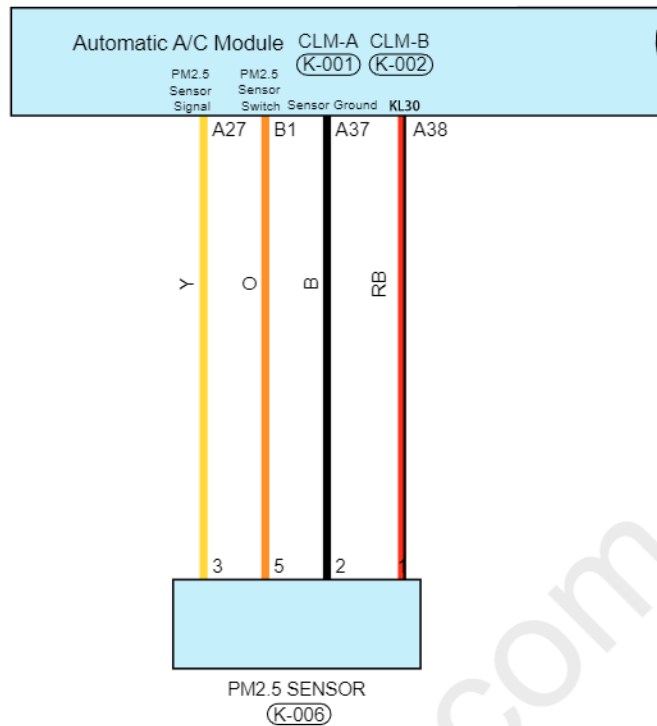
Conduct test and confirm malfunction has been repaired.

■ PM2.5 sensor malfunction

DTC	B14E911	PM2.5 Sensor Short to Ground (Pulse Width Modulation = 0%)
DTC	B14E915	PM2.5 Sensor Short to Power Supply or Open (Pulse Width Modulation = 0%)
DTC	B14EA12	PM2.5 Enable Short To Power Supply
DTC	B14EA14	PM2.5 Enable Short To Ground Or Open

■ Description

Control schematic diagram



AC0115

■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect PM2.5 sensor K-006 and automatic A/C module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

NG

Repair or replace wire harness.

OK

2 Check PM2.5 sensor

- Turn ENGINE START STOP switch to OFF.
- Remove PM2.5 sensor from malfunctioning vehicle.
- Install new PM2.5 sensor to malfunctioning vehicle.
- Check if DTC exists.

OK

Repair or replace PM2.5 sensor ground wire harness

NG

3

Check wire harness (automatic A/C control module - PM2.5 sensor)

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Disconnect PM2.5 sensor connector K-006 and automatic A/C module connector K-001.
- (d) Using a digital multimeter, measure the wire harness between PM2.5 sensor connector K-006 and automatic A/C module connector K-001 according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-006 (1) - K-001 (38)	ENGINE START STOP switch "OFF"	$< 1 \Omega$
K-006 (2) - K-001 (37)	ENGINE START STOP switch "OFF"	$< 1 \Omega$
K-006 (5) - K-002 (1)	ENGINE START STOP switch "OFF"	$< 1 \Omega$
K-006 (3) - K-001 (27)	ENGINE START STOP switch "OFF"	$< 1 \Omega$

NG

Repair or replace related wire harness.

OK

4

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

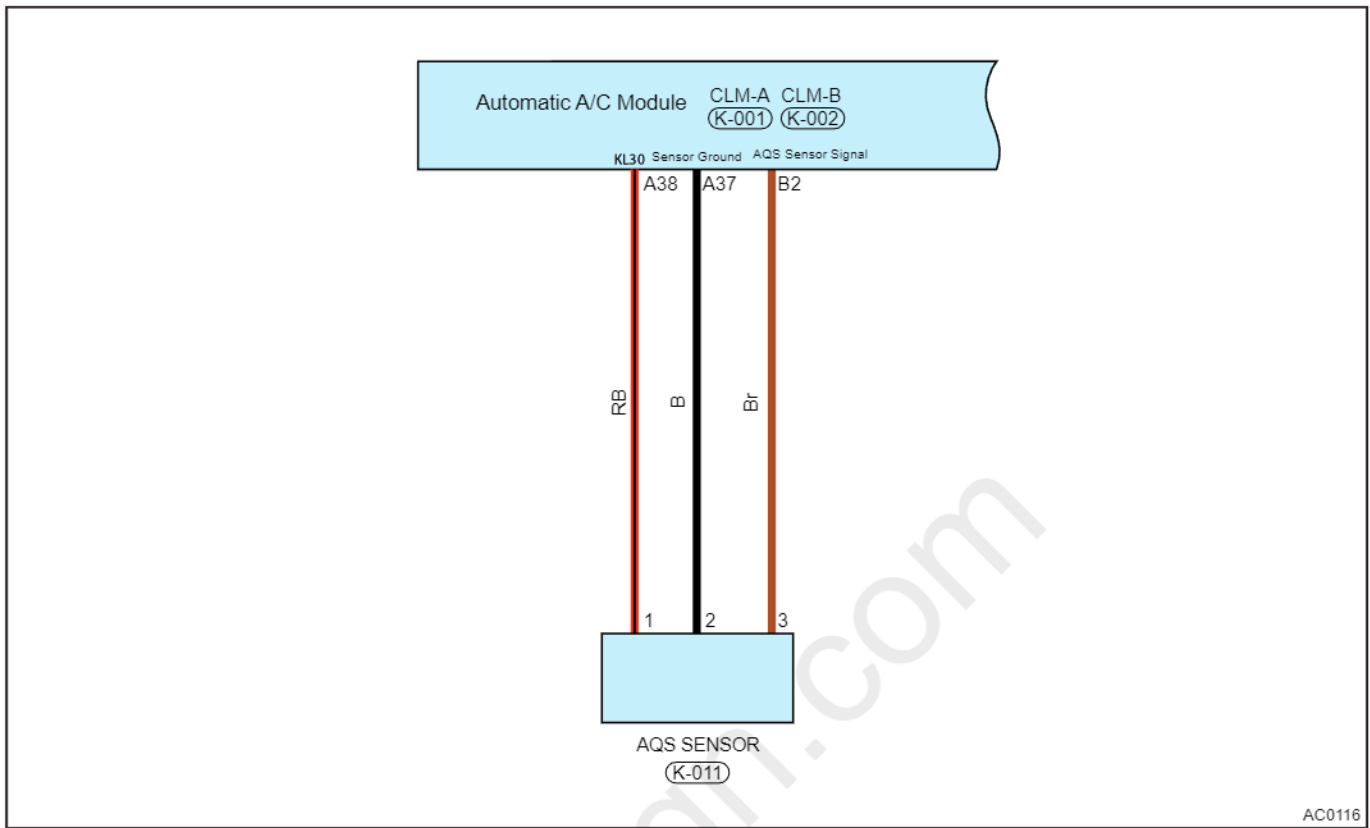
Conduct test and confirm malfunction has been repaired.

■ Air quality sensor malfunction

DTC	B14EB11	Air Quality Sensor Short to Ground (Pulse Width Modulation = 0%)
DTC	B14EB15	Air Quality Sensor Short to Power Supply or Open (Pulse Width Modulation = 100%)

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect air quality sensor K-011 and automatic A/C module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

NG

Repair or replace wire harness.

OK

2 Check air quality sensor

- Turn ENGINE START STOP switch to OFF.
- Remove air quality sensor from malfunctioning vehicle.
- Install new air quality sensor to malfunctioning vehicle.
- Check if DTC exists.

OK

Repair or replace air quality sensor ground wire harness.

NG

3

Check wire harness (automatic A/C control module - air quality sensor)

- Turn off all electrical equipment and ENGINE START STOP switch.
- Disconnect the negative battery cable.
- Disconnect air quality sensor connector K-009 and automatic A/C module connector K-001.
- Using a digital multimeter, measure the wire harness between air quality sensor connector K-009 and automatic A/C module connector K-001 according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-011 (1) - K-001 (38)	ENGINE START STOP switch "OFF"	< 1 Ω
K-011 (2) - K-001 (37)	ENGINE START STOP switch "OFF"	< 1 Ω
K-011 (3) - K-002 (2)	ENGINE START STOP switch "OFF"	< 1 Ω

NG

Repair or replace related wire harness.

OK

4

Reconfirm DTCs

- Connect diagnostic tester and clear DTCs.
- Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

Conduct test and confirm malfunction has been repaired.

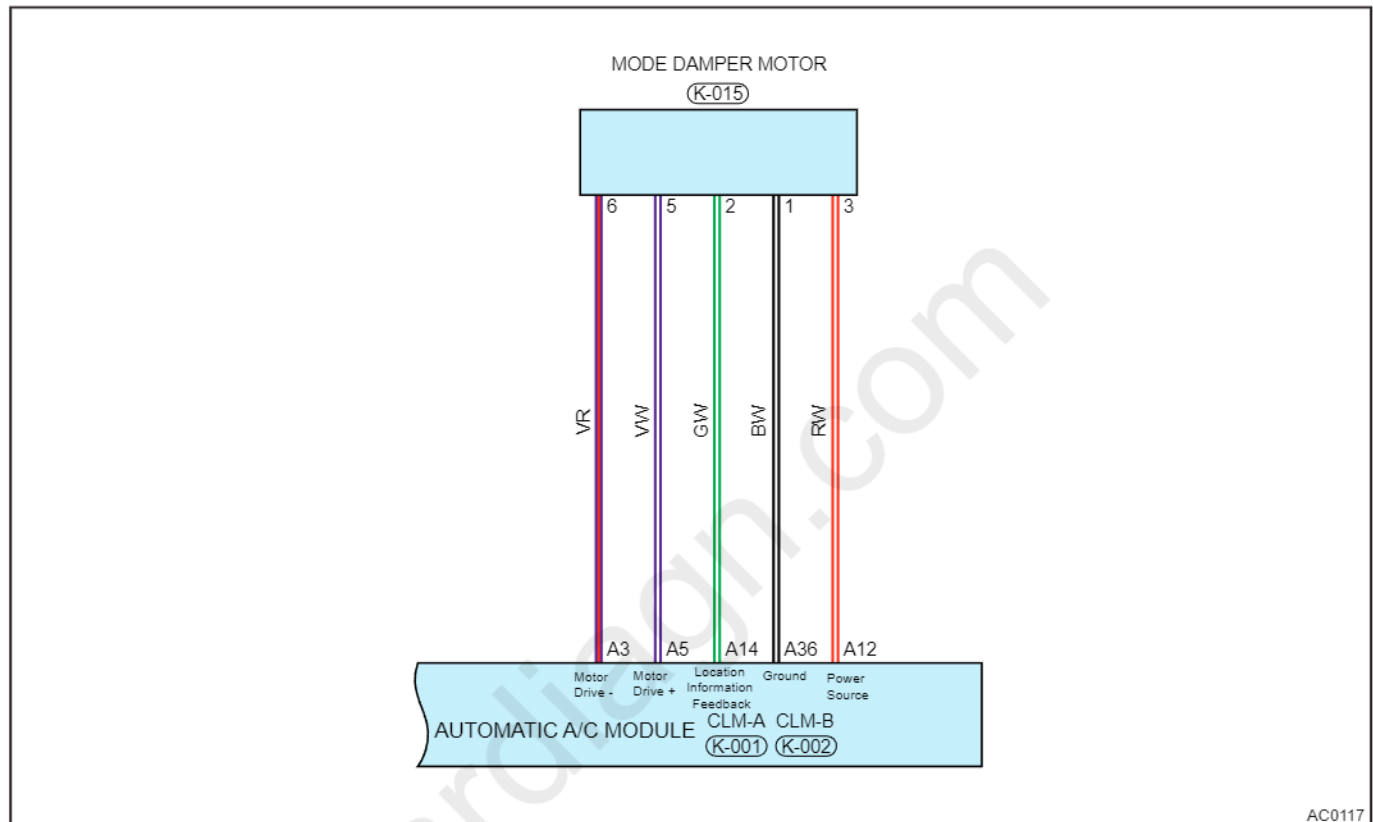
Mode motor malfunction

DTC	B14EC10	Mode Motor Blocked (Except Calibration Procedure)
DTC	B14EC11	Mode Motor Control Circuit Short to Ground

DTC	B14EC12	Mode Motor Control Circuit Short to Power Supply
DTC	B14EC13	Mode Motor Control Circuit Open
DTC	B14ED12	Mode Motor Control Feedback Circuit Short to Power Supply
DTC	B14ED14	Mode Motor Control Feedback Circuit Short to Ground or Open

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect mode damper motor connector K-015 and automatic A/C control module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

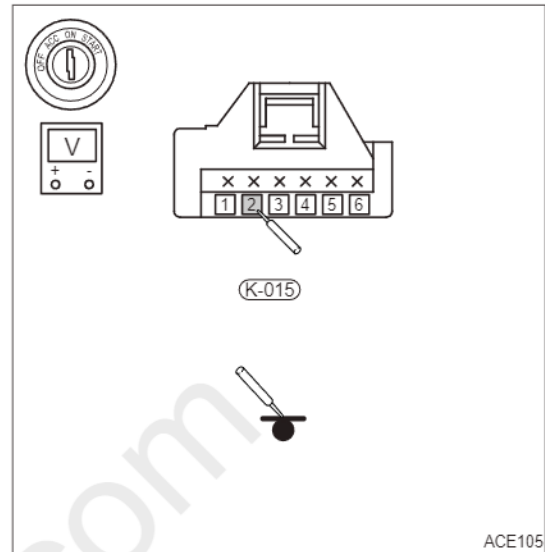
NG

Repair or replace wire harness.

OK

2 Check mode damper motor operating signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of mode damper motor signal K-015 (2). Normal signal voltage changes with A/C mode adjustment



NG

Check mode damper motor wire harness or replace mode damper motor.

OK

3 Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

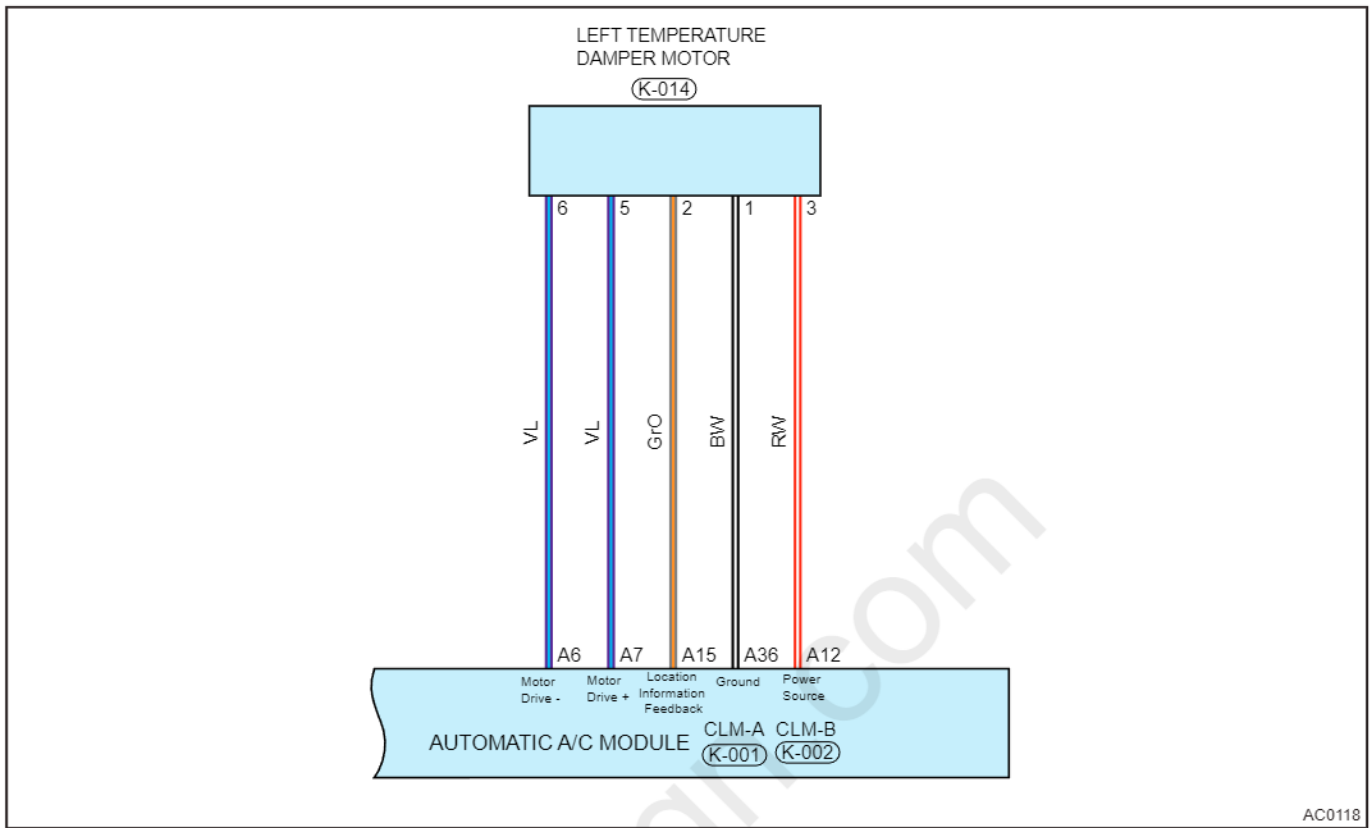
Conduct test and confirm malfunction has been repaired.

■ Left temperature motor malfunction

DTC	B14EE10	Left Temperature Motor Blocked (Except Calibration Procedure)
DTC	B14EE11	Left Temperature Motor Control Circuit Short to Ground
DTC	B14EE12	Left Temperature Motor Control Circuit Short to Power Supply
DTC	B14EE13	Left Temperature Motor Control Circuit Open
DTC	B14EF12	Left Temperature Motor Control Feedback Circuit Short to Power Supply
DTC	B14EF14	Left Temperature Motor Control Feedback Circuit Short to Ground or Open

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect left temperature adjustment motor connector K-014 and automatic A/C control module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

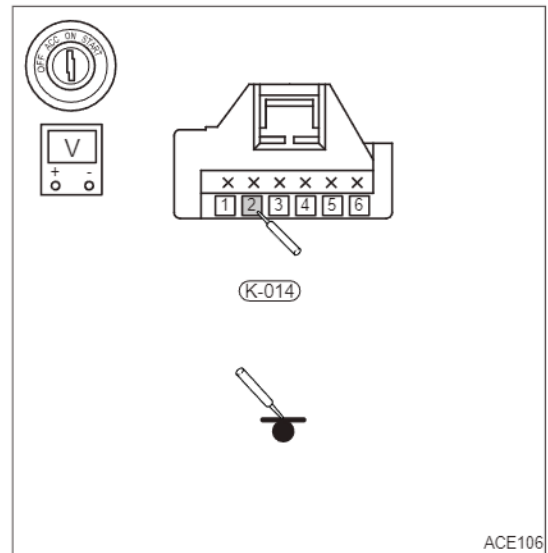
NG

Repair or replace wire harness.

OK

2 Check temperature adjustment motor (left) operating signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of temperature adjustment motor (left) signal K-014 (2). Normal signal voltage changes with A/C left temperature adjustment



NG

Check temperature adjustment motor (left) wire harness or replace temperature adjustment motor (left).

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

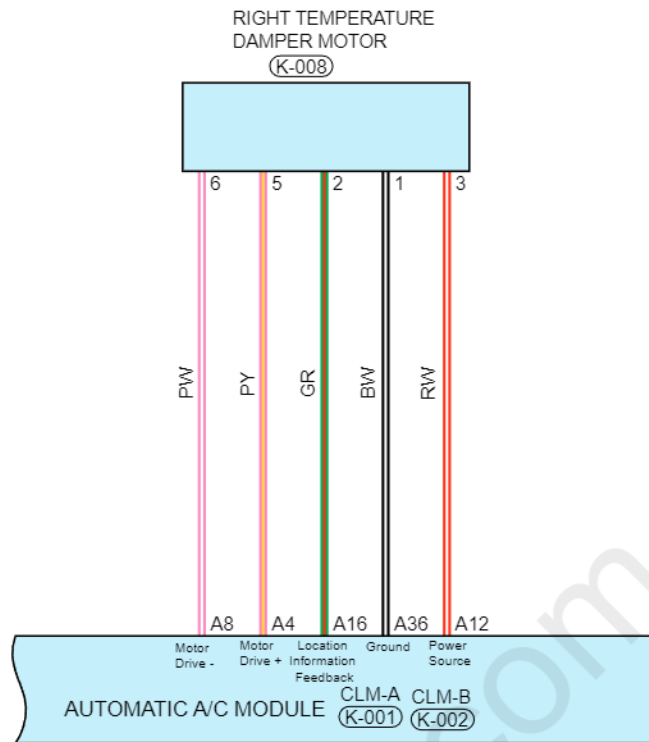
Conduct test and confirm malfunction has been repaired.

■ Right temperature motor malfunction

DTC	B14F010	Right Temperature Motor Blocked (Except Calibration Procedure)
DTC	B14F011	Right Temperature Motor Control Circuit Short to Ground
DTC	B14F013	Right Temperature Motor Control Circuit Open
DTC	B14F013	Right Temperature Motor Control Circuit Open
DTC	B14F112	Right Temperature Motor Control Feedback Circuit Short to Power Supply
DTC	B14F114	Right Temperature Motor Control Feedback Circuit Short to Ground or Open

■ Description

Control schematic diagram



AC0119

■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect right temperature adjustment motor connector K-008 and automatic A/C control module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

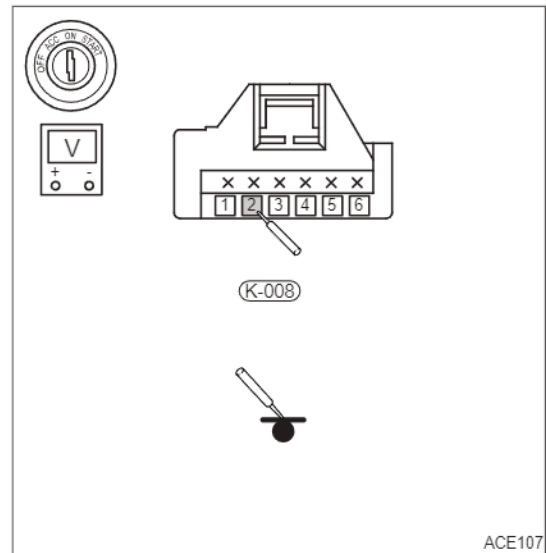
NG

Repair or replace wire harness.

OK

2 Check temperature adjustment motor (right) operating signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of temperature adjustment motor (right) signal K-008 (2). Normal signal voltage changes with A/C right temperature adjustment



NG

Check temperature adjustment motor (right) wire harness or replace temperature adjustment motor (right).

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

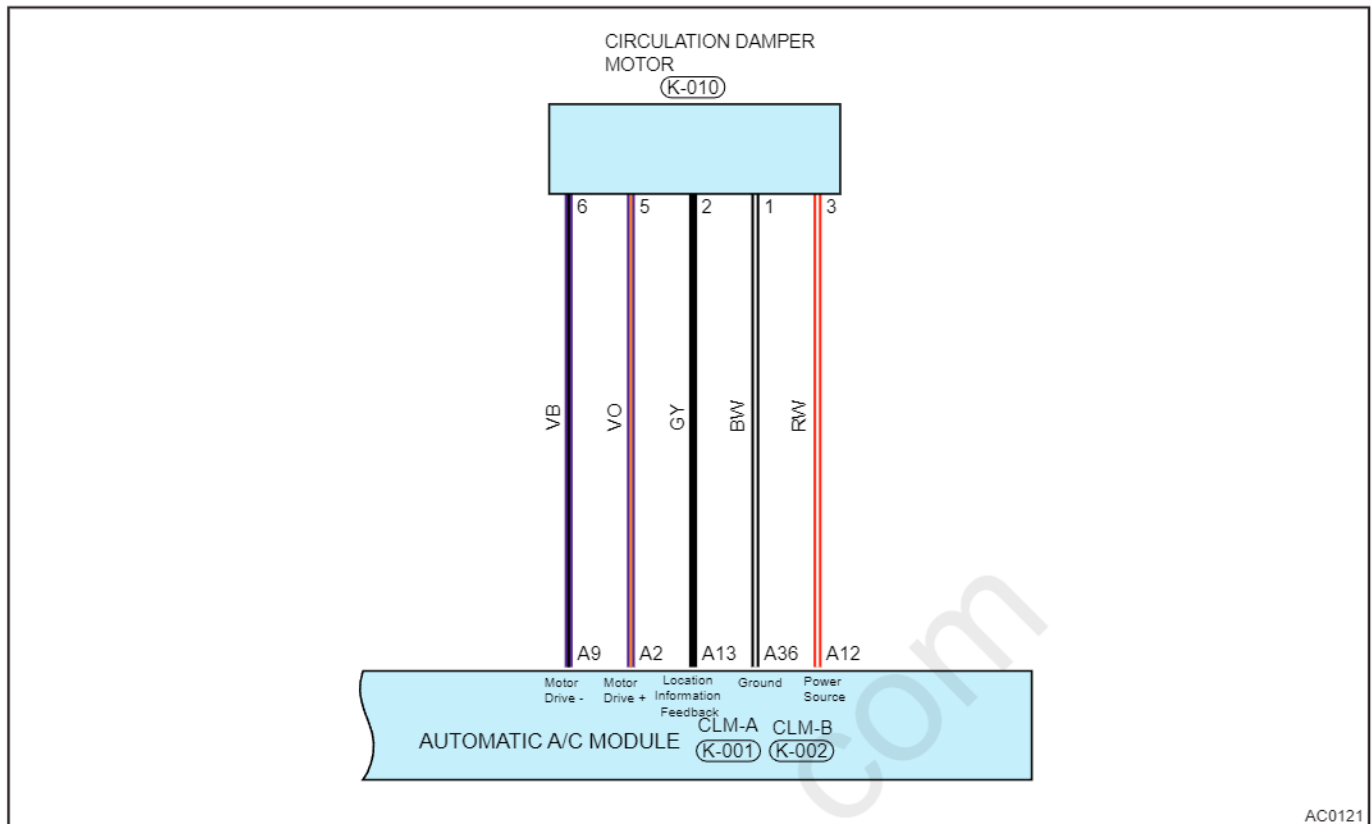
Conduct test and confirm malfunction has been repaired.

■ Intake motor malfunction

DTC	B14F210	Intake Motor Blocked (Except Calibration Procedure)
DTC	B14F211	Intake Motor Control Circuit Short to Ground
DTC	B14F212	Intake Motor Control Circuit Short to Power Supply
DTC	B14F213	Intake Motor Control Circuit Open
DTC	B14F312	Intake Motor Control Feedback Circuit Short to Power Supply
DTC	B14F314	Intake Motor Control Feedback Circuit Short to Ground or Open

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Disconnect inner/outer circulation motor connector K-010 and automatic A/C control module connector K-001.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.

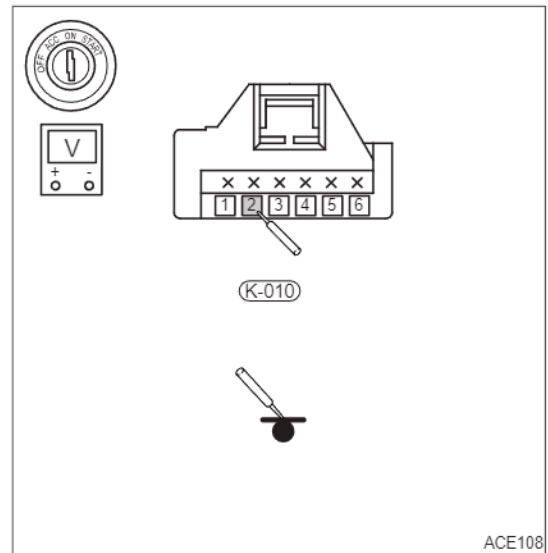
NG

Repair or replace wire harness.

OK

2 Check inner/outer circulation motor operating signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of inner/outer circulation motor signal K-010 (2). Normal signal voltage changes with A/C inner/outer circulation adjustment



NG

Check inner/outer circulation motor wire harness or replace inner/outer circulation motor.

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

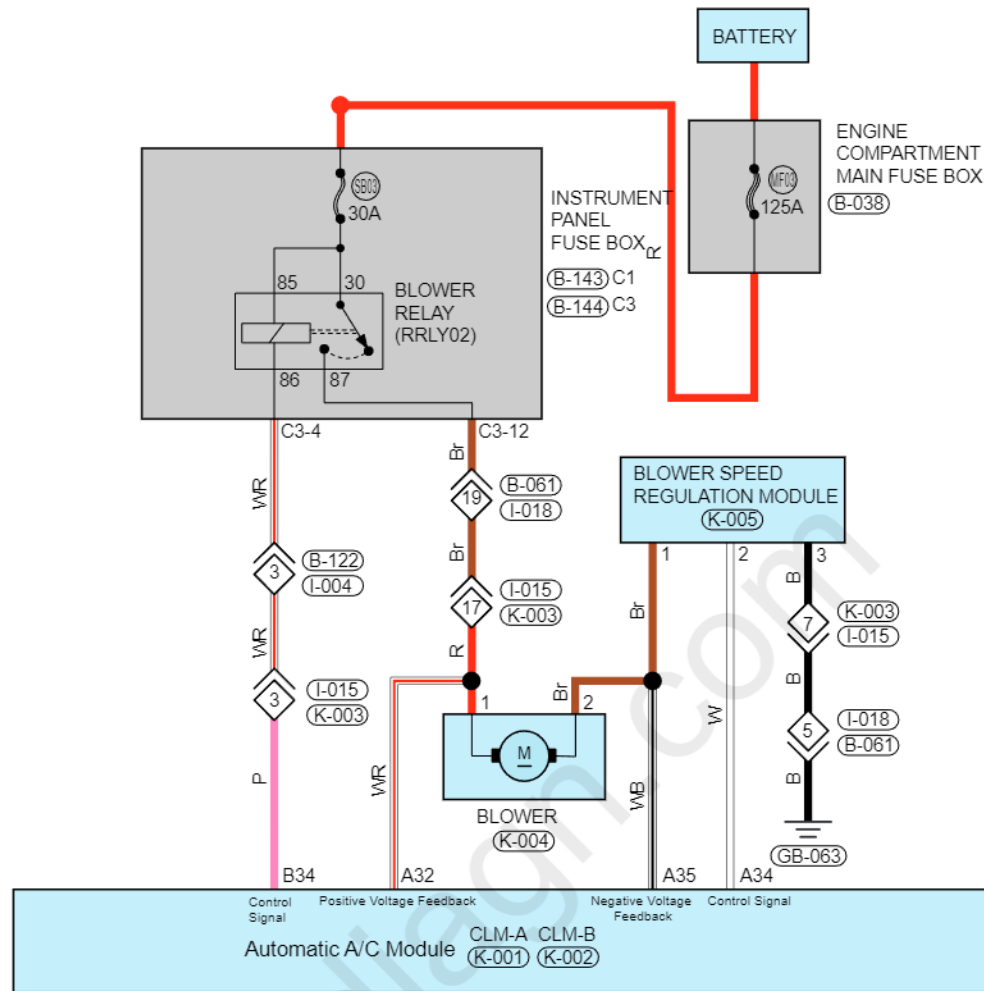
Conduct test and confirm malfunction has been repaired.

Blower malfunction

DTC	B14F412	Blower Relay Output Short to Power Supply
DTC	B14F414	Blower Relay Output Short to Ground or Open
DTC	B14F529	Blower Signal Invalid Control Failed
DTC	B14F531	Blower Control Failed

Description

Control schematic diagram



AC0122

■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- Disconnect blower connector K-004 and blower speed regulation module connector K-005.

NG

Repair or replace wire harness.

OK

2 Check blower

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Remove the blower from malfunctioning vehicle.
- (c) Install a new blower to malfunctioning vehicle.
- (d) Check if DTC exists.

OK

Replace the blower.

NG

3 Check wire harness connector

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Disconnect blower connector K-005 and speed regulation module connector K-004.
- (d) Using a digital multimeter, measure the wire harness between speed regulation module connector K-004 and blower connector K-005 according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-005 (1) - K-004 (2)	ENGINE START STOP switch "OFF"	$< 1 \Omega$
K-004(1)- B-144 (12)	ENGINE START STOP switch "OFF"	$< 1 \Omega$

- (e) Using a digital multimeter, measure the wire harness between blower connector K-004 and automatic A/C control module connector K-001 according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-004 (1) - K-001 (32)	ENGINE START STOP switch "OFF"	$< 1 \Omega$
K-004 (2) - K-001 (35)	ENGINE START STOP switch "OFF"	$< 1 \Omega$

NG

Repair or replace related wire harness.

OK

4 Check blower speed regulation module circuit

- (a) Use circuit diagram as a guide to perform the following inspection procedures:
- (b) Using a digital multimeter, measure the wire harness between blower speed regulation module connector K-004 and automatic A/C module according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-005 (2) - K-001 (34)	ENGINE START STOP switch "OFF"	$< 1 \Omega$

- (c) Using a digital multimeter, measure the wire harness between blower speed regulation module connector K-004 and body ground according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-005 (3) - GB-137	ENGINE START STOP switch "OFF"	$< 1 \Omega$

NG

Repair or replace related wire harness.

OK

5

Check power circuit of blower

- (a) Connect all connectors and disconnect A/C speed regulation module connector.
- (b) Connect the negative battery cable.
- (c) Turn ENGINE START STOP switch to ON.
- (d) Using a digital multimeter, measure the voltage between terminal 1 of blower connector K-005 and body ground according to value(s) in table below.

Multimeter Test Terminal	Condition	Normal Condition
K-004 (1) - Body ground	ENGINE START STOP switch "ON"	Not less than 12 V

NG

Repair or replace related wire harness.

OK

6

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

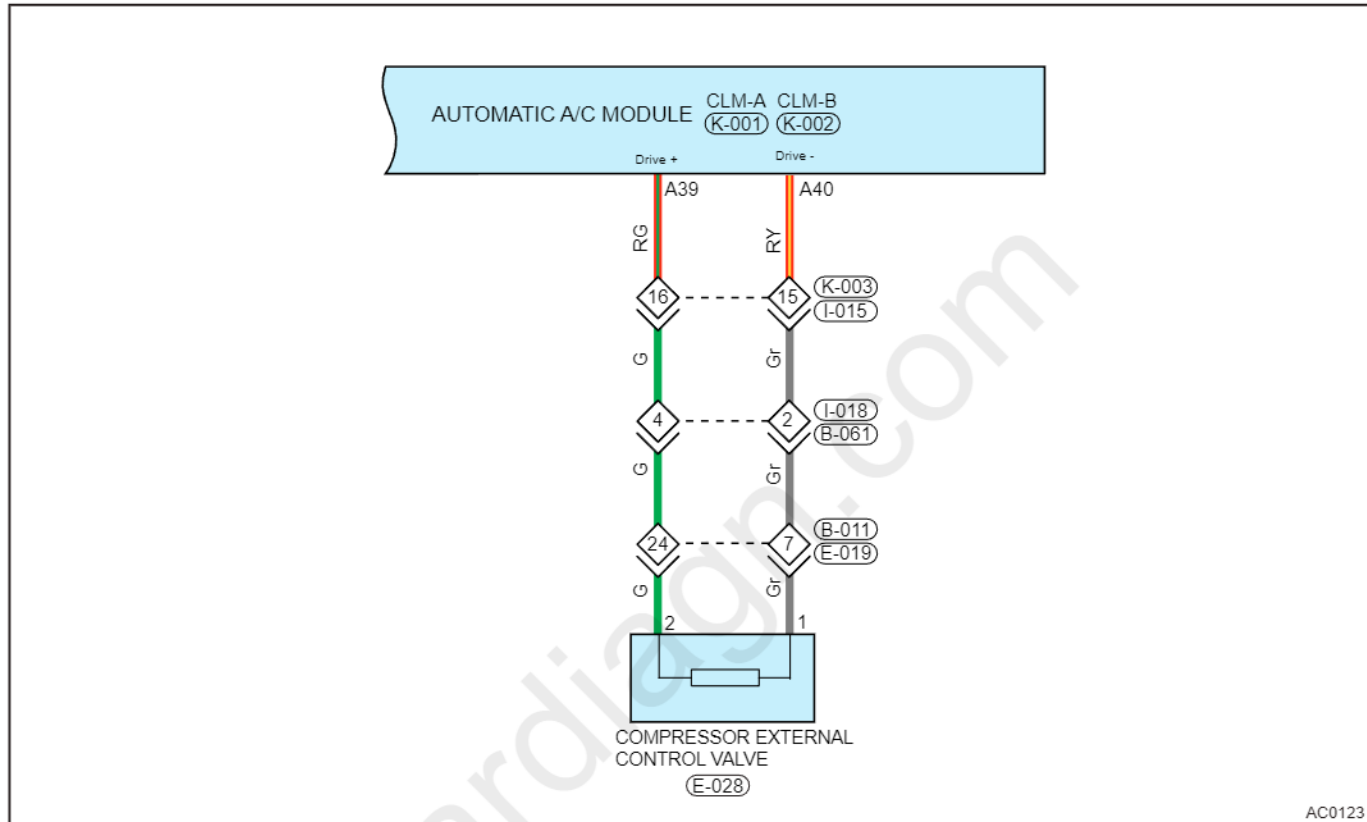
Conduct test and confirm malfunction has been repaired.

■ Compressor external control valve malfunction

DTC	B14F711	ECV Control Circuit Short to Ground
DTC	B14F715	ECV Control Circuit Short to Power Supply or Open

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- Turn ENGINE START STOP switch to OFF.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- Disconnect external control compressor solenoid valve connector E-028 and automatic A/C control module connector K-001.

NG

Repair or replace wire harness.

OK

2 Check external control compressor solenoid valve operating signal

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using an oscilloscope, connect black probe to battery negative terminal (or body ground) and use red probe to measure the external control compressor solenoid valve K-001 (40). Duty ratio signal is output normally according to compressor operation.

NG

Check external control compressor solenoid valve wire harness or replace external control compressor solenoid valve.

NG

3 Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

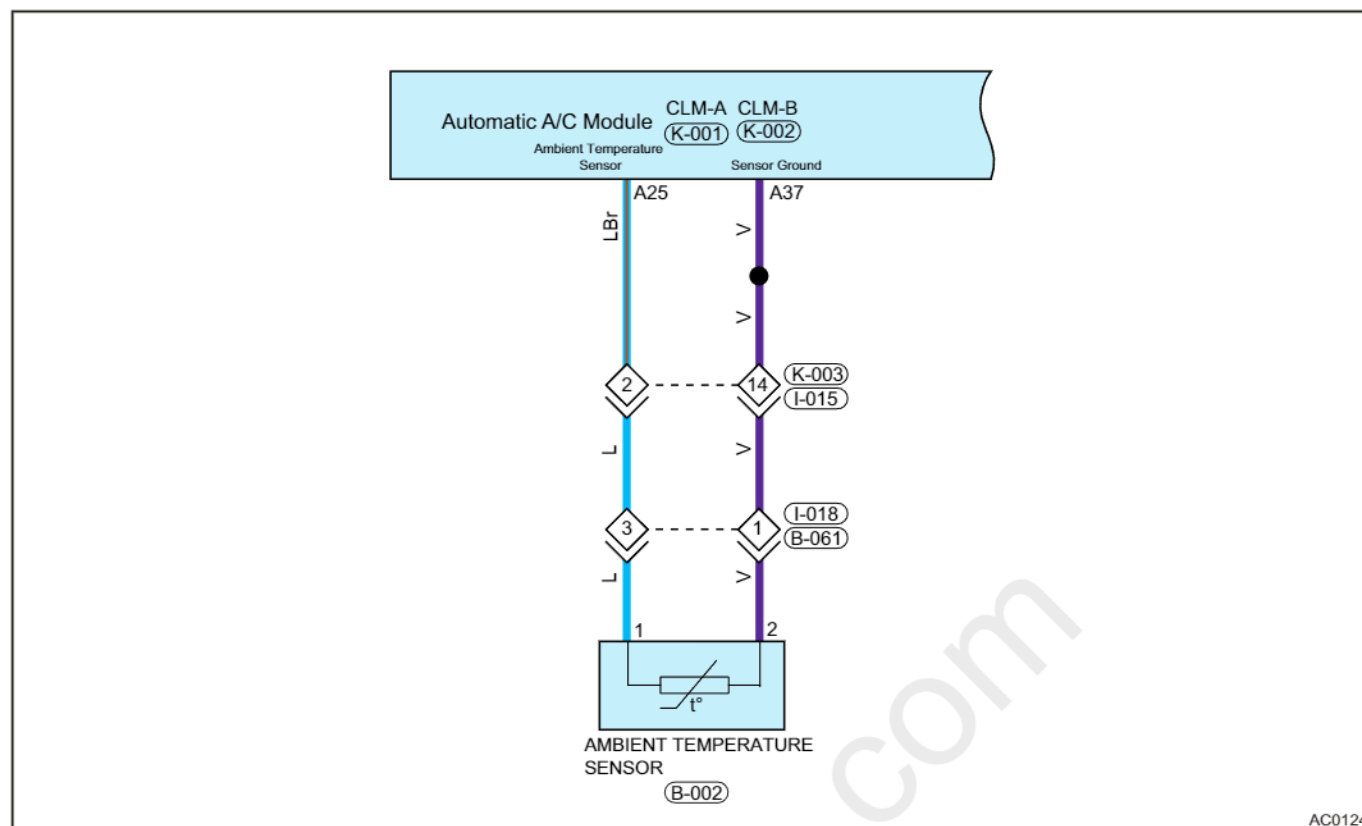
Conduct test and confirm malfunction has been repaired.

■ **External temperature sensor malfunction**

DTC	B14FB11	External Temperature Sensor Short to Ground
DTC	B14FB15	External Temperature Sensor Short to Power Supply or Open

■ **Description**

Control schematic diagram



■ 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 wire harness connector.

- Turn ENGINE START STOP switch to OFF.
- Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- Check if ambient temperature sensor connector or lead falls off.

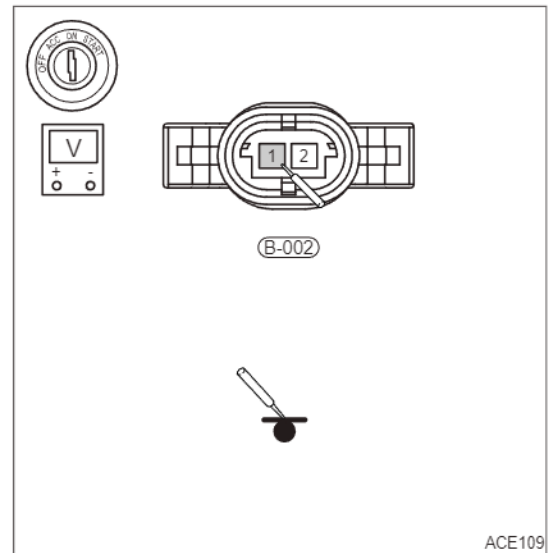
NG

Repair or replace wire harness.

OK

2 Check ambient temperature sensor signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of ambient temperature sensor signal B-002 (1). Turn on blower to blow ambient temperature sensor, and the voltage normally changes with air temperature.



NG

Check if ambient temperature sensor wire harness or replace ambient temperature sensor.

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

Conduct test and confirm malfunction has been repaired.

■ Power supply voltage abnormal malfunction

DTC	B14FC1C	Abnormal Power Supply Voltage
DTC	B15461C	Abnormal Power Supply Voltage

■ Description

Control schematic diagram

■ 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 wire harness and connector.

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- (c) Check if wire harness between battery to alternator is aging or are connected poorly.

NG

Repair or replace wire harness.

OK

2

Check battery voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Measure battery voltage with multimeter voltage band. Under unloaded status, the normal voltage of the vehicle battery is about 13 V, and the normal load voltage is no less than 11 V. If the voltage is lower than 11 V, it may be difficult to start the next time. After starting, because alternator starts to generate electricity, the normal voltage of the vehicle battery should be between 13.5 V - 14.5 V.

NG

Replace battery.

OK

3

Check alternator

- (a) Remove alternator from malfunctioning vehicle.
- (b) Install a new alternator to malfunctioning vehicle.
- (c) System operates normally.

NG

Repair or replace the corresponding components.

OK

4

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

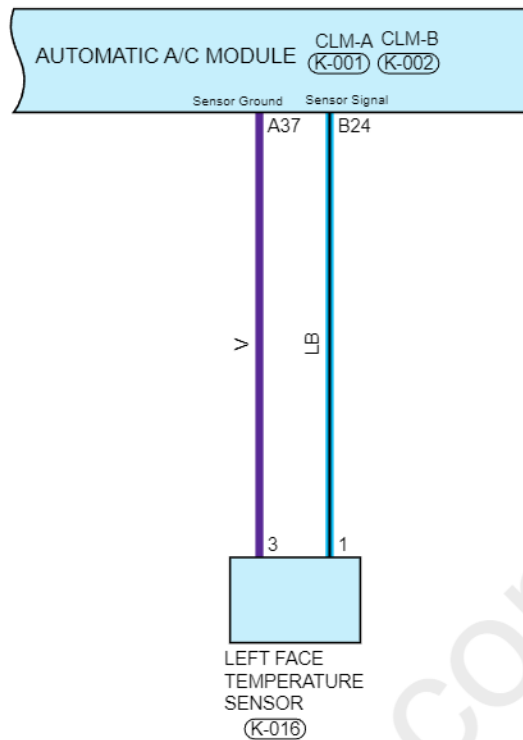
Conduct test and confirm malfunction has been repaired.

■ Left face air outlet temperature sensor short to ground malfunction

DTC	B14E711	Left Face Air Outlet Temperature Sensor Short to Ground
-----	---------	---

■ Description

Control schematic diagram



AC0125

■ DTC confirmation procedure

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

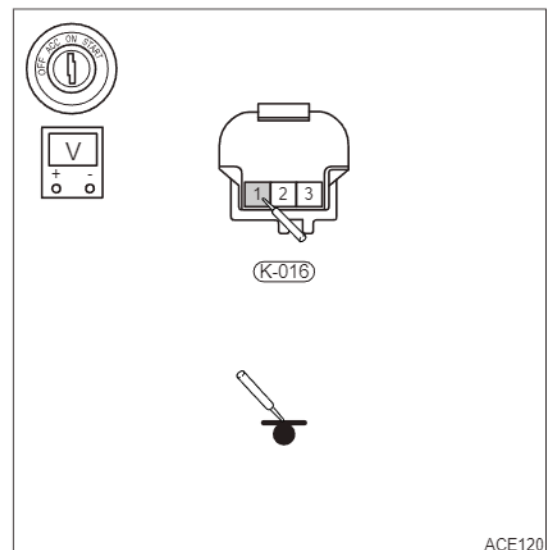
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1 Check left face air outlet temperature sensor signal voltage.

- Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of left face air outlet temperature sensor signal K-016 (1). Normal signal voltage changes with A/C temperature.



ACE120

NG

Check if left face air outlet temperature sensor wire harness or replace left face air outlet temperature sensor.

OK

2 Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
(b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
(c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

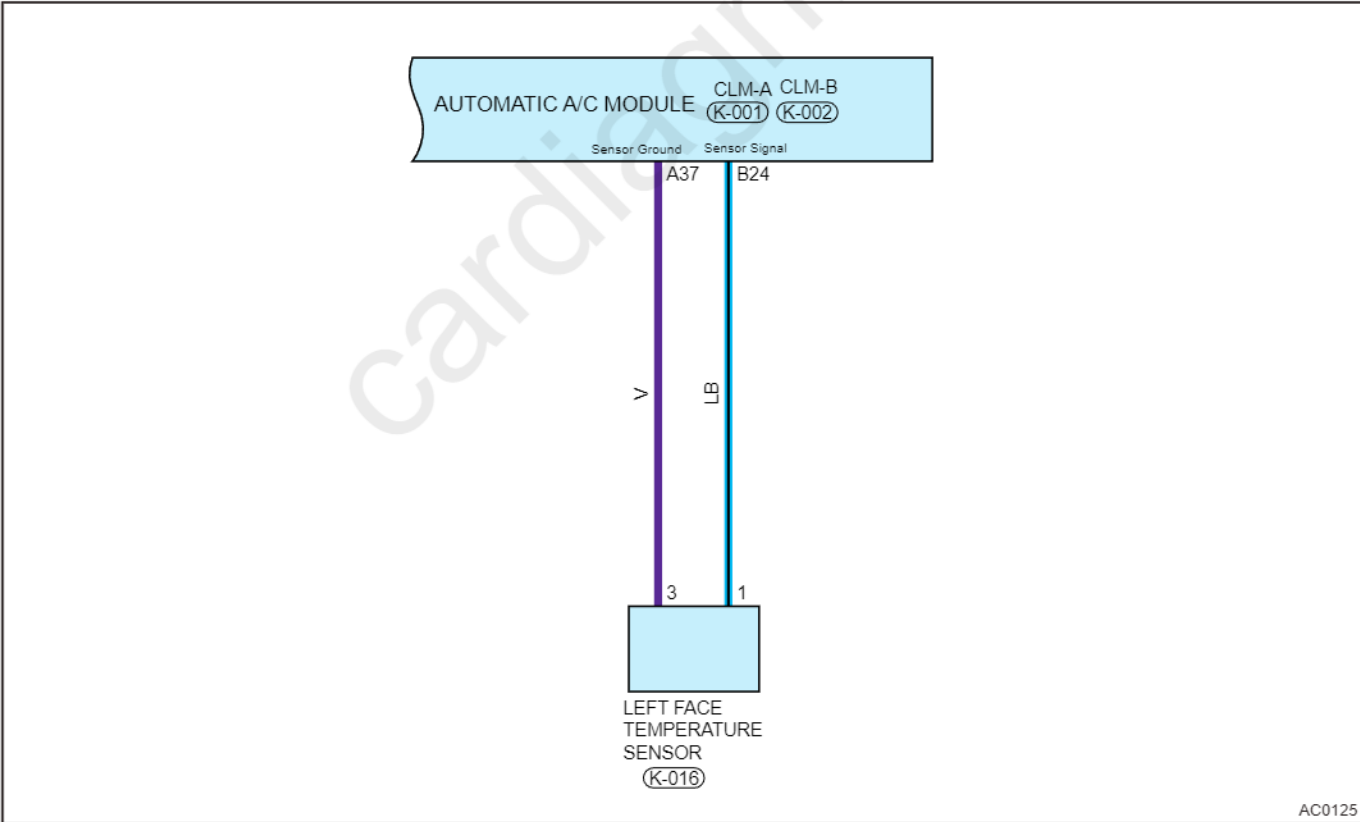
Conduct test and confirm malfunction has been repaired.

■ Left face air outlet temperature sensor short to power supply or open malfunction

DTC	B14E715	Left Face Air Outlet Temperature Sensor Short to Power Supply or Open
-----	---------	---

■ Description

Control schematic diagram



■ 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 wire harness and connector.
----------	--

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- (c) Check if left face air outlet temperature sensor connector or lead falls off.

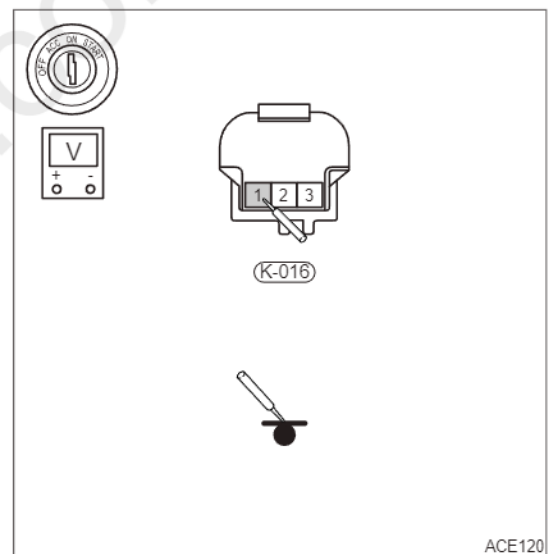
NG

Repair or replace wire harness.

OK

2	Check left face air outlet temperature sensor signal voltage
----------	---

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of left face air outlet temperature sensor signal K-016 (1). Normal signal voltage changes with A/C temperature.



OK

Check if left face air outlet temperature sensor signal is short to power supply or replace left face air outlet temperature sensor.

NG

3	Reconfirm DTCs
----------	-----------------------

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

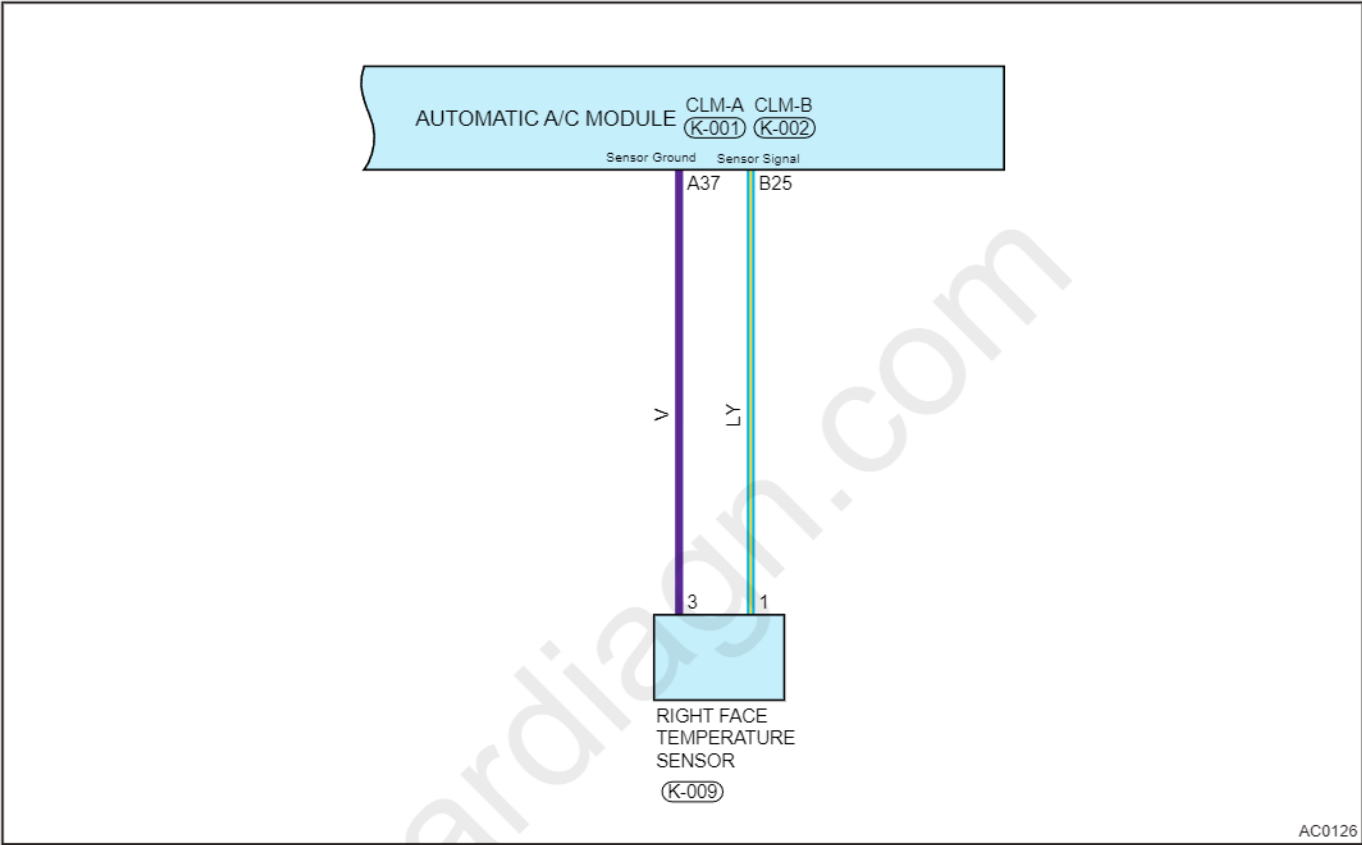
Conduct test and confirm malfunction has been repaired.

■ Right face air outlet temperature sensor short to ground

DTC	B14E811	Right Face Air Outlet Temperature Sensor Short to Ground
-----	---------	--

■ Description

Control schematic diagram



■ DTC confirmation procedure

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

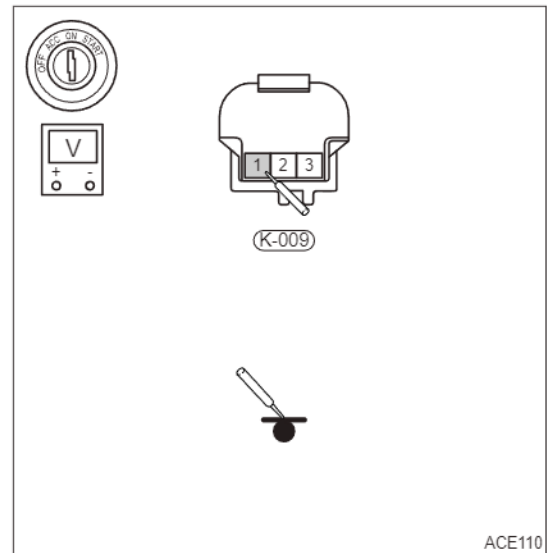
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1	Check right face air outlet temperature sensor signal voltage.
---	--

- (a) Turn ENGINE START STOP switch to ON, start the vehicle and turn on A/C.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of right face temperature sensor signal K-009 (1). Signal voltage also changes with A/C temperature.



NG

Repair wire harness or replace right face temperature sensor.

OK

2

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

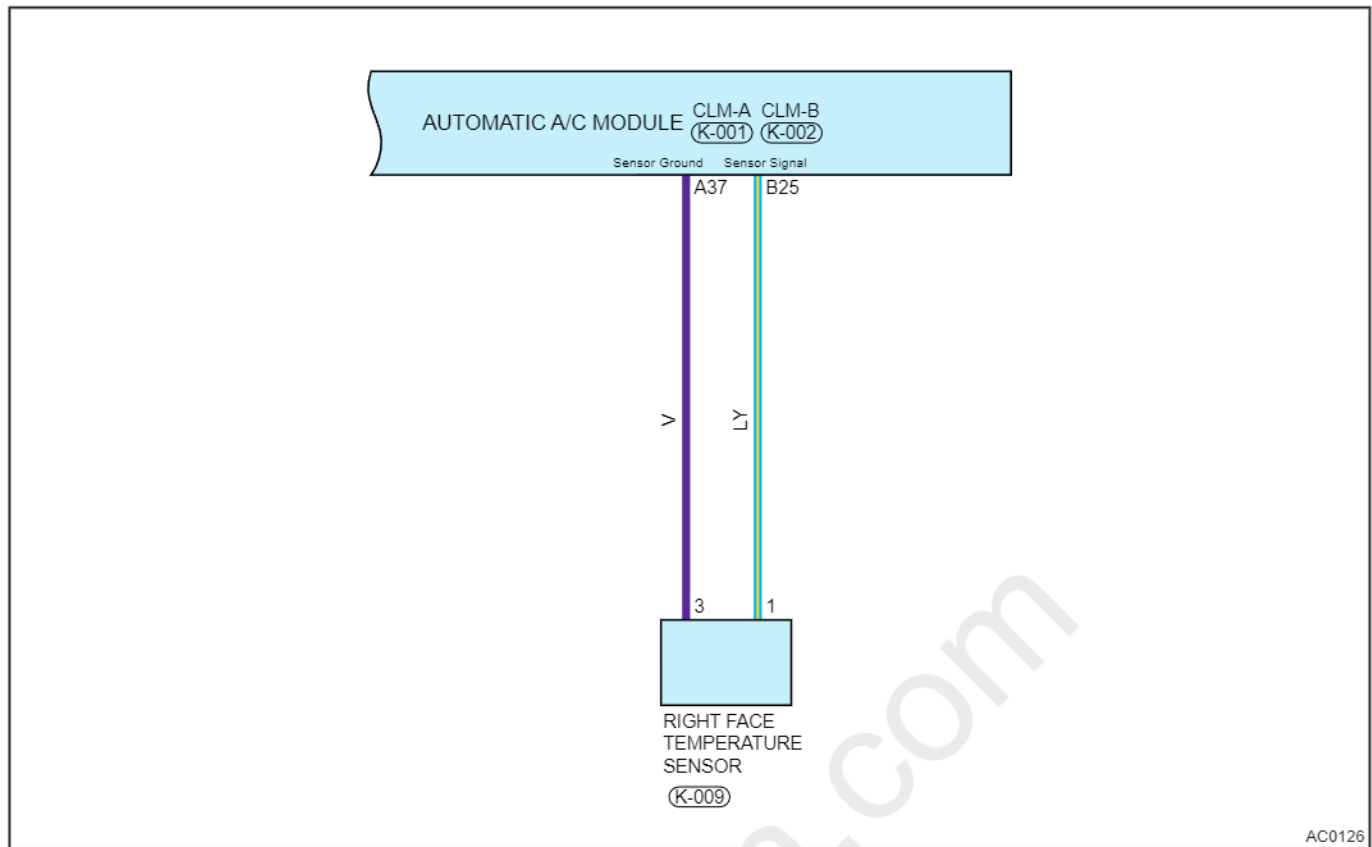
Conduct test and confirm malfunction has been repaired.

■ Right face air outlet temperature sensor short to power supply or open

DTC	B14E815	Right Face Air Outlet Temperature Sensor Short to Power Supply or Open
-----	---------	--

■ Description

Control schematic diagram



■ 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 wire harness and connector.

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Check whether the connector is in bad contact, bending, distortion, poor contact etc.
- (c) Check if right face air outlet temperature sensor connector or lead falls off.

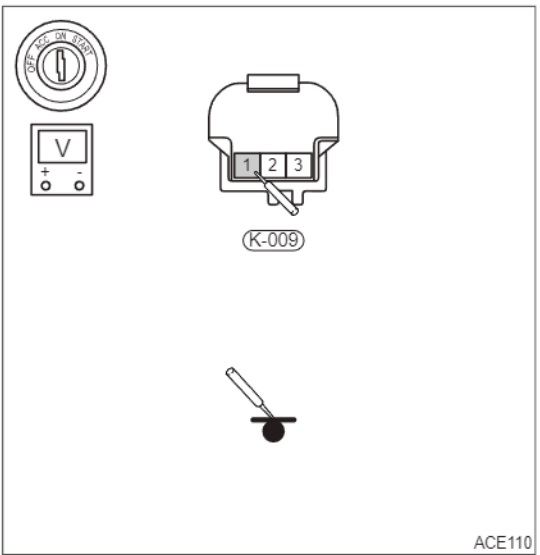
NG

Repair or replace wire harness.

OK

2 Check right face air outlet temperature sensor signal voltage

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of right face air outlet temperature sensor signal K-009 (1). Normal signal voltage changes with A/C temperature.



NG

Check if right face temperature sensor signal is short to power supply or replace right face temperature sensor.

OK

3

Reconfirm DTCs

- (a) Connect diagnostic tester and clear DTCs.
- (b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
- (c) Read the fault information and confirm that the fault has been solved.

NG

Replace with a new ECM to check if fault reoccurs.

OK

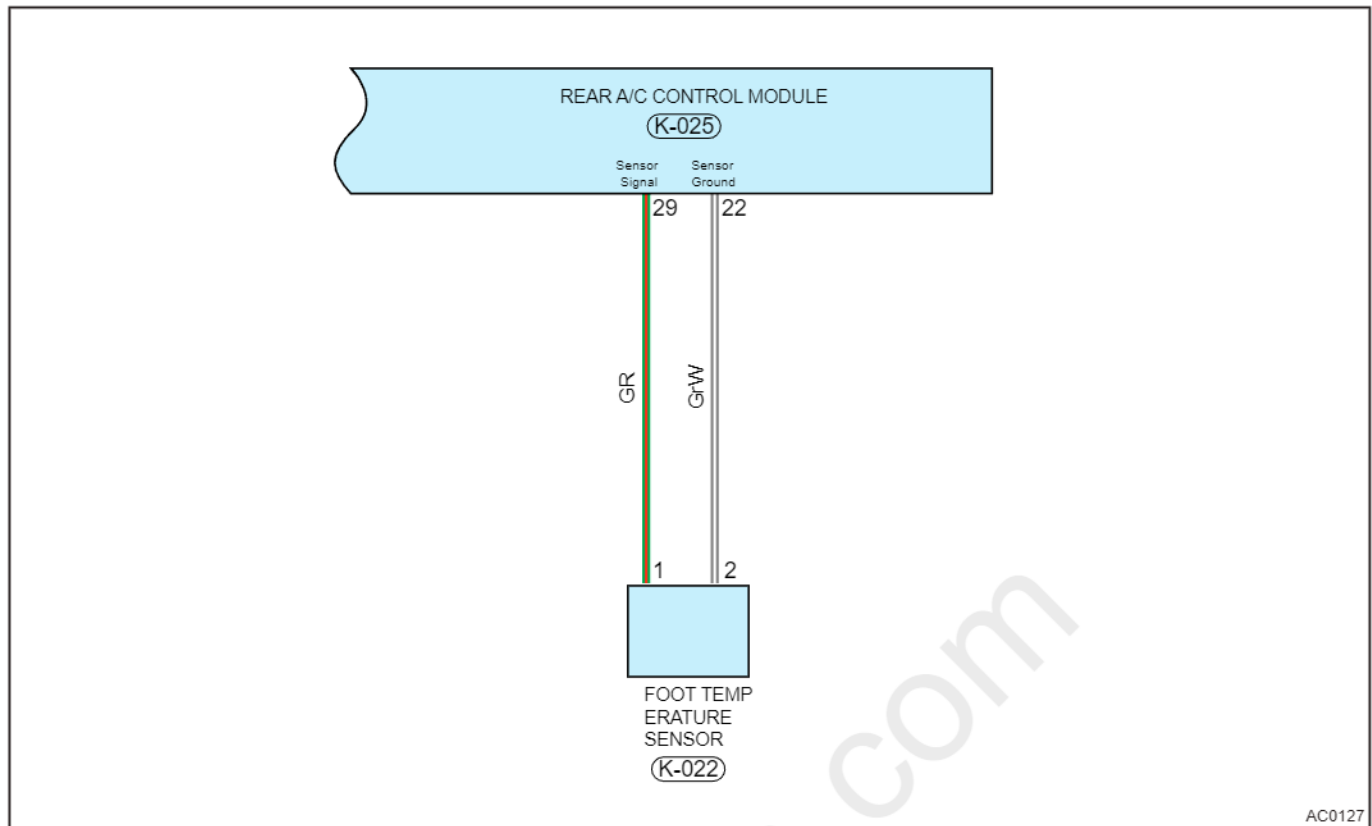
Conduct test and confirm malfunction has been repaired.

■ Foot air outlet temperature sensor short to ground malfunction

DTC	B154111	Foot Air Outlet Temperature Sensor Short to Ground
-----	---------	--

■ Description

Control schematic diagram



■ DTC confirmation procedure

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

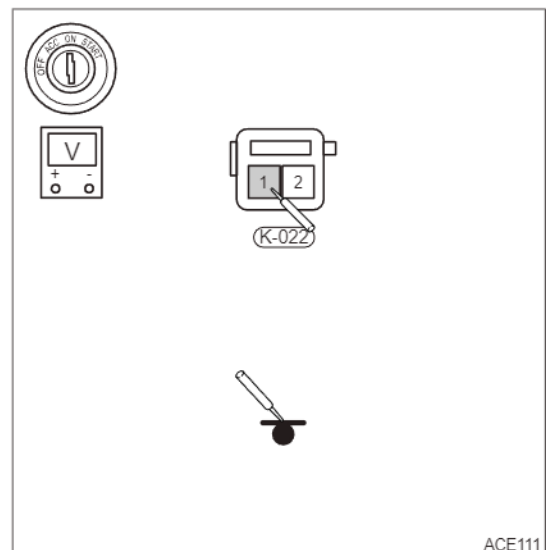
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1 Check foot air outlet temperature sensor signal voltage

- Turn ENGINE START STOP switch to ON, start the vehicle.
- Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of foot air outlet temperature sensor signal K-022 (1). Normal signal voltage changes with A/C temperature.



NG

Check foot air outlet temperature sensor wire harness or replace foot air outlet temperature sensor.

OK

2

Check automatic A/C control module

Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Remove automatic A/C control module from malfunctioning vehicle.
- (b) Install a new automatic A/C control module to malfunctioning vehicle.
- (c) System operates normally.

■ **Foot air outlet temperature sensor short to power supply or open**

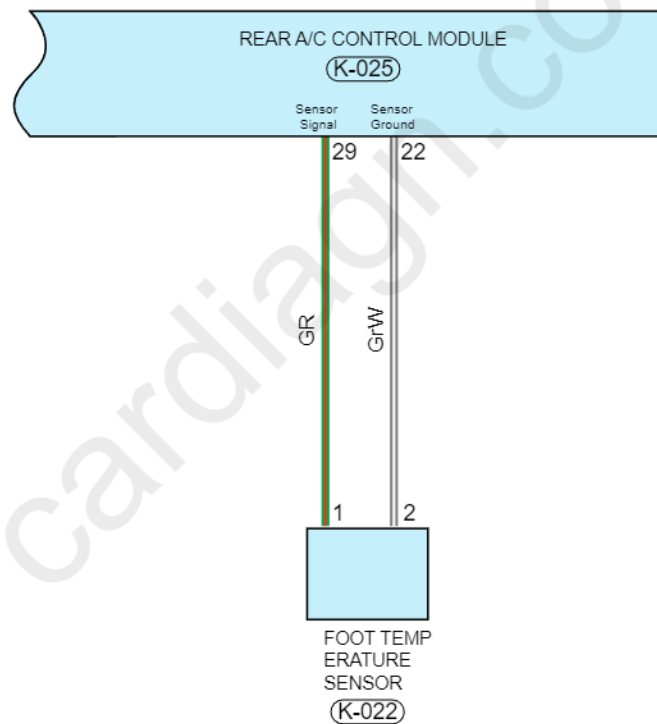
DTC

B154115

Foot Air Outlet Temperature Sensor Short to Power Supply or Open

■ **Description**

Control schematic diagram



AC0127

■ **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 wire harness and connector.
---	-----------------------------------

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Check if foot air outlet temperature sensor connector or lead falls off.

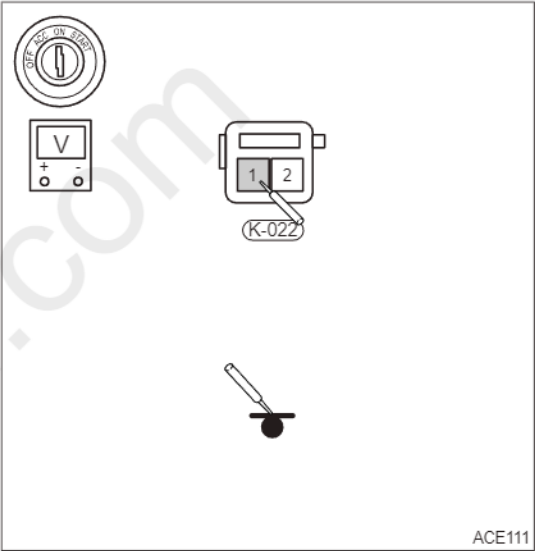
NG

Repair or replace wire harness.

OK

2	Check foot air outlet temperature sensor signal voltage
---	---

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of foot air outlet temperature sensor signal K-022 (1). Normal signal voltage changes with A/C temperature.



NG

Check if foot air outlet temperature sensor signal is short to power supply or replace foot air outlet temperature sensor.

OK

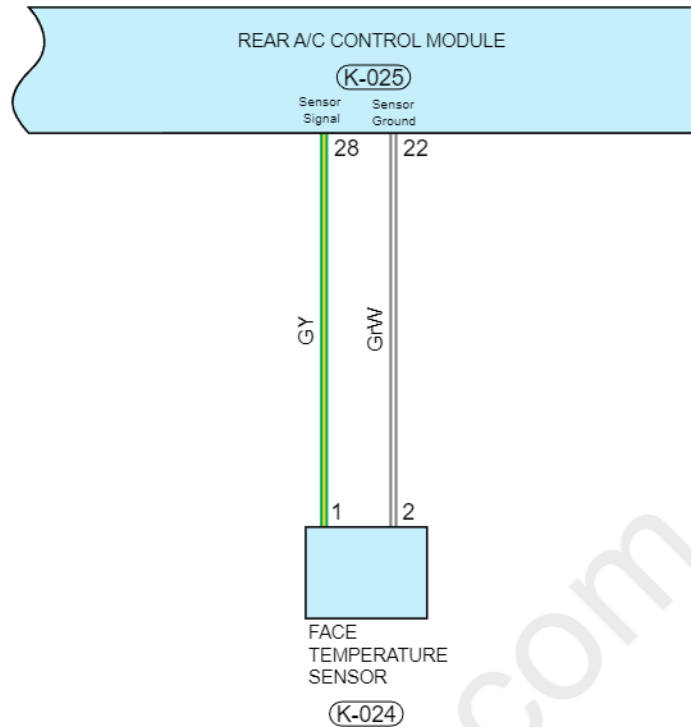
3	Check automatic A/C control module
---	------------------------------------

- Use circuit diagram as a guide to perform the following inspection procedures:
- (a) Remove automatic A/C control module from malfunctioning vehicle.
 - (b) Install a new automatic A/C control module to malfunctioning vehicle.
 - (c) System operates normally.

■ Face air outlet temperature sensor short to ground malfunction

DTC	B154211	Fae Air Outlet Temperature Sensor Short to Ground
-----	---------	---

Control schematic diagram



AC0128

■ DTC confirmation procedure

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

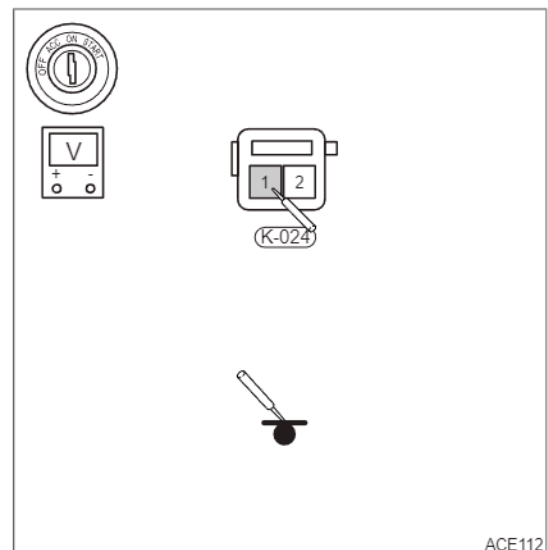
- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

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

1 Check face air outlet temperature sensor signal voltage

- Turn ENGINE START STOP switch to ON, start the vehicle.
- Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground)
- and use red probe to measure the voltage of face air outlet temperature sensor signal K-024(1). Normal signal voltage changes with A/C temperature.



ACE112

NG

Check face air outlet temperature sensor wire harness or replace face air outlet temperature sensor.

OK

2 Check automatic A/C control module

Use circuit diagram as a guide to perform the following inspection procedures:

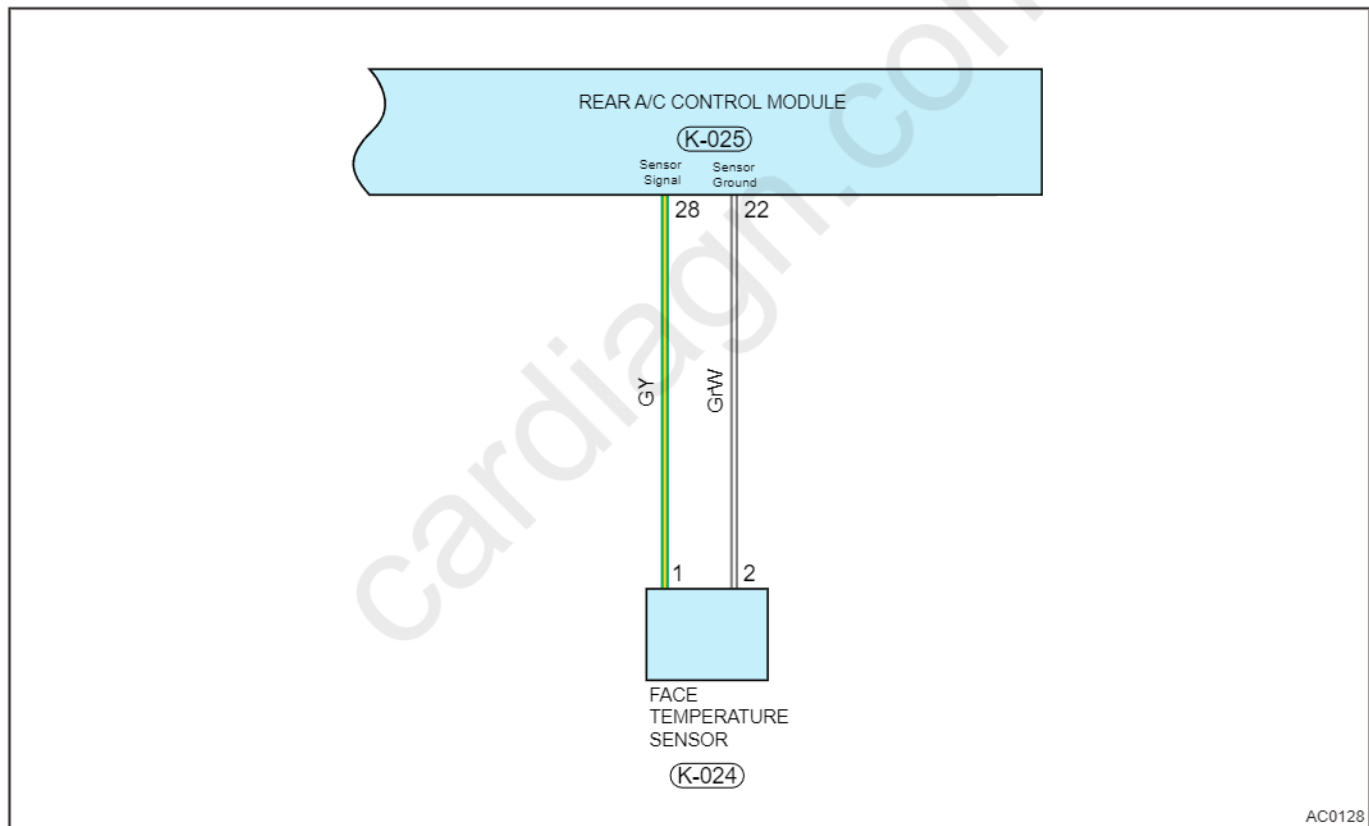
- Remove automatic A/C control module from malfunctioning vehicle.
- Install a new automatic A/C control module to malfunctioning vehicle.
- System operates normally.

■ Face air outlet temperature sensor short to power supply or open malfunction

DTC	B154215	Face Air Outlet Temperature Sensor Short to Power Supply or Open
-----	---------	--

■ Description

Control schematic diagram



AC0128

■ 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:

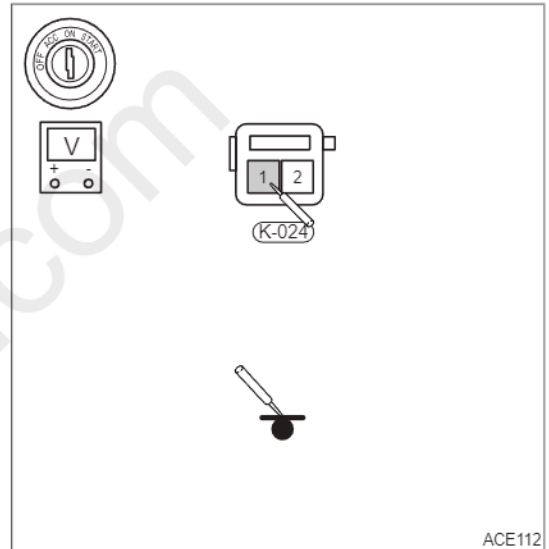
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1 Check wire harness and connector.

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Check if face air outlet temperature sensor connector or lead falls off.

NG**Repair or replace wire harness.****OK****2 Check foot air outlet temperature sensor signal voltage**

- (a) Turn ENGINE START STOP switch to ON, start the vehicle.
- (b) Using voltage band of multimeter, connect black probe to battery negative terminal (or body ground) and use red probe to measure the voltage of foot air outlet temperature sensor signal K-024 (1). Normal signal voltage changes with A/C temperature.

**NG****Check if foot air outlet temperature sensor signal is short to power supply or replace foot air outlet temperature sensor.****OK****3 Check automatic A/C control module**

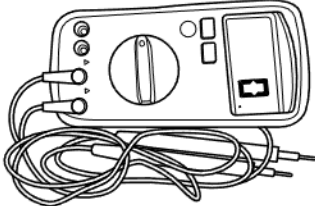
Use circuit diagram as a guide to perform the following inspection procedures:

- (a) Remove automatic A/C control module from malfunctioning vehicle.
- (b) Install a new automatic A/C control module to malfunctioning vehicle.
- (c) System operates normally.

5 ON-VEHICLE SERVICE

5.1 Tools

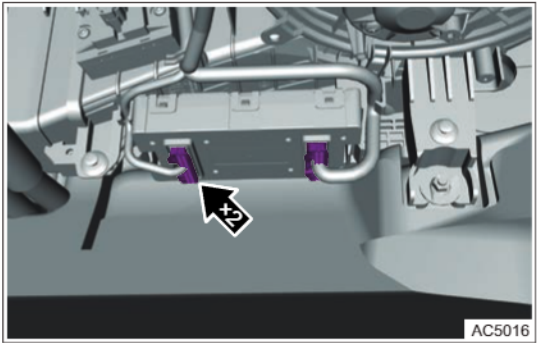
■ General Tools

Tool Name	Tool Drawing
Digital Multimeter	 AC0000
Diagnostic Tester	 AC0002

5.2 Removal of A/C Control Module

■ Removal

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the automatic A/C control module.
 - 1) Disconnect the automatic A/C control module connector.
 - 2) Loosen 2 fixing clips (arrow) and remove automatic A/C control module.



■ Installation

- (1) Installation is in the reverse order of removal.

■ Write automatic A/C module (CLM) configuration data

- (1) Store the configuration data.
- (2) Connect the diagnostic tester, turn ENGINE START STOP switch to ON and select “EXEED New TXL” model.

- (3) Click “CLM (Automatic A/C Module)” .

Show Menu

EXEED V10.61 > New TXL > System Selection

EMS (Engine Management System)	TCU (Transmission Control Unit)
BCM (Body Control Module)	ESP(IEPB)(Electronic Stability Program (Integration Electrical Park Brake))
EPS (Electronic Power Steering)	AIPM (Integrated Panel Module)
CLM (Climate Module)	DMC (Infotainment Domain Controller)
AVM (Around View Monitor Module)	PDC (Parking Distance Control)
BSDL (Blind Spot Detection Left)	BSDR (Blind Spot Detection Right)
PEPS (Passive Entry And Passive Start System)	FCM (Front Camera Module)
Exeed New TXL	

AC0129

- (4) Click “Special Function” .

Show Menu







EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)

Version Information	Read Fault Code
Clear Fault Memory	Read Data Stream
Special Function	

Exeed New TXL

AC0131

- (5) Click “Write Automatic A/C Module (CLM) Configuration Data” .

Show Menu

EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)

Write VIN Code

Write Climate Module (CLM) Configuration Data

Exeed New TXL

AC0132

- (6) Click “Save And Paste (Transfer The Configuration Data In The Old Controller To The New Controller)” .

Show Menu

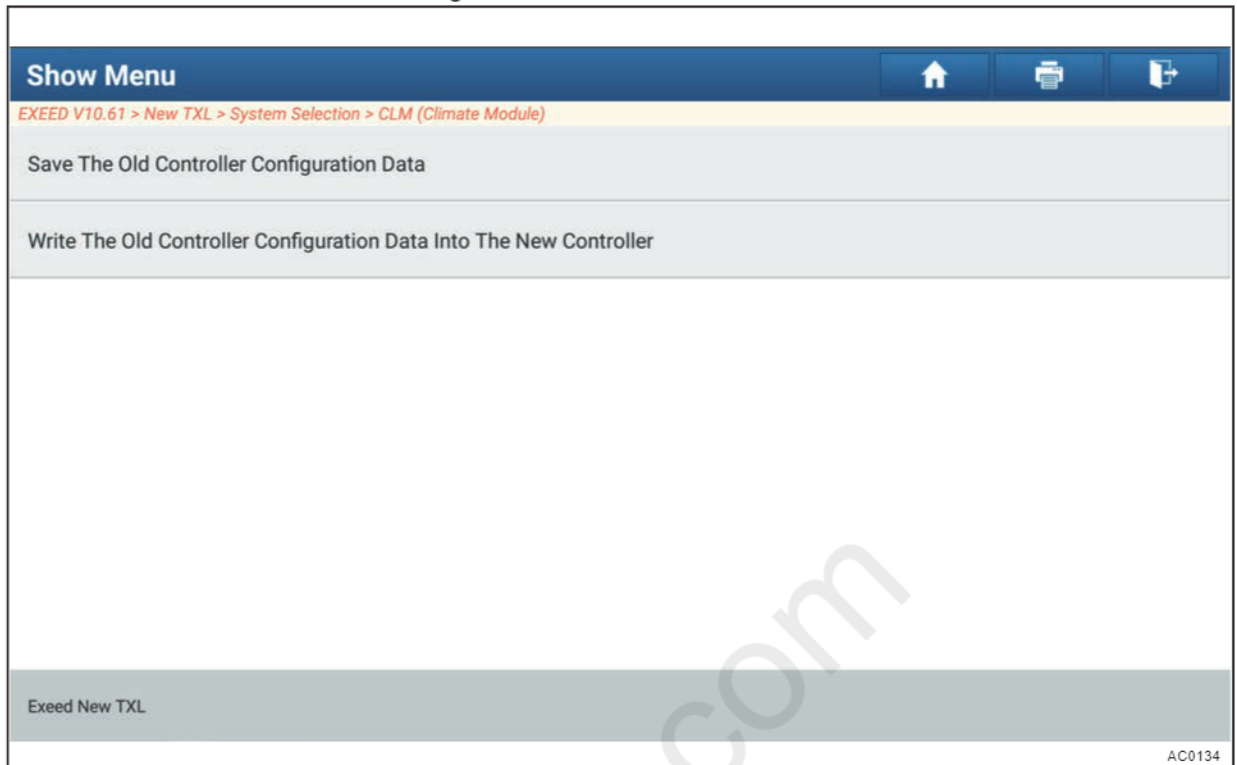
EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)

Read And Display QR Code Of Current Software Configuration	Manual Write-In
Save And Paste(Transfer The Configuration Data In The Old Controller To The New Controller)	Scan To Write In
Import XML File And Automatically Write In	

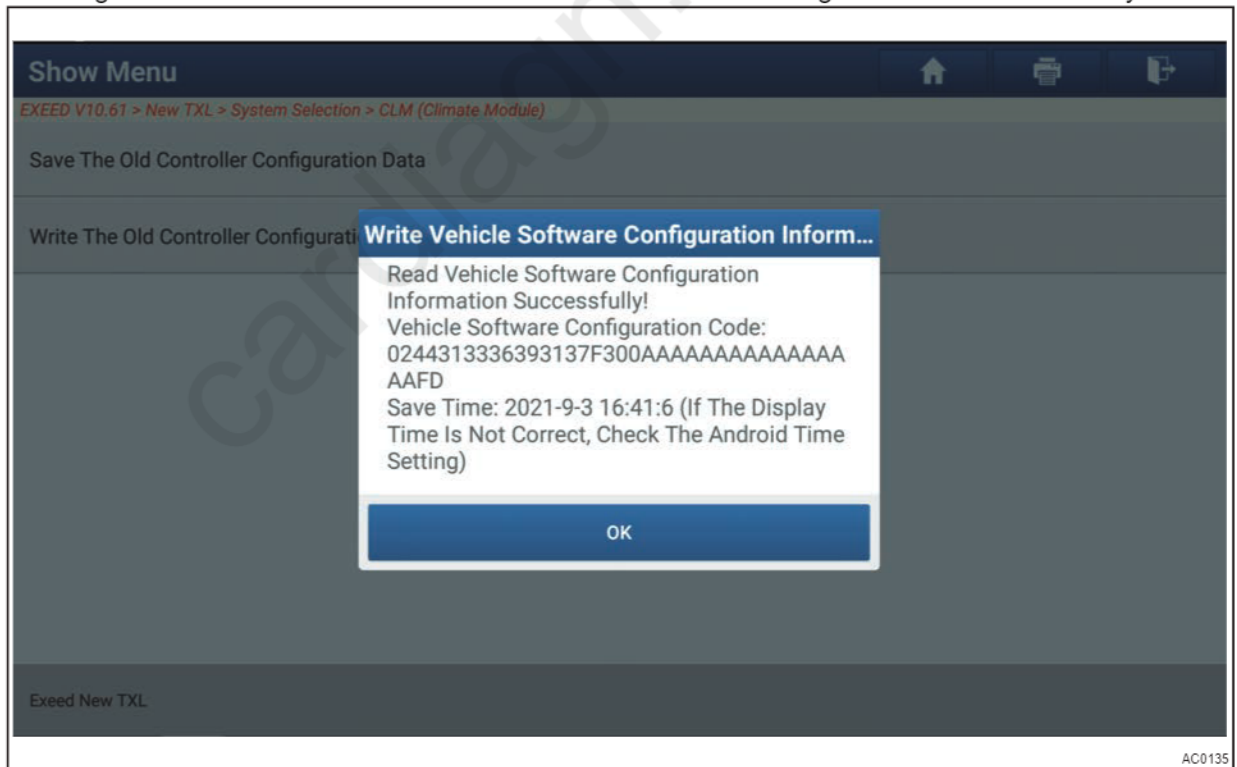
Exeed New TXL

AC0133

- (7) Click “Save The Old Controller Configuration Data” .



- (8) The diagnostic tester interface shows “Read and Save Vehicle Configuration Code Successfully” .



Click “OK” to return.

Caution

If module is damaged, the configuration code of module can be applied to the company by DMS system when it can not be read out with diagnostic tester.

- (9) Write automatic A/C module (CLM) configuration data.

(10) Click “CLM (Automatic A/C Module)” .

Show Menu

EXEED V10.61 > New TXL > System Selection

EMS (Engine Management System)	TCU (Transmission Control Unit)
BCM (Body Control Module)	ESP(IEPB)(Electronic Stability Program (Integration Electrical Park Brake))
EPS (Electronic Power Steering)	AIPM (Integrated Panel Module)
CLM (Climate Module)	DMC (Infotainment Domain Controller)
AVM (Around View Monitor Module)	PDC (Parking Distance Control)
BSDL (Blind Spot Detection Left)	BSDR (Blind Spot Detection Right)
PEPS (Passive Entry And Passive Start System)	FCM (Front Camera Module)
Exeed New TXL	

AC0129

(11) Click “Special Function” .

Show Menu				
EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)				
Version Information	Read Fault Code			
Clear Fault Memory	Read Data Stream			
Special Function				
Exeed New TXL				

(12) Click “Write Automatic A/C Module (CLM) Configuration Data” .

Show Menu

EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)

Write VIN Code

Write Climate Module (CLM) Configuration Data

Exeed New TXL

AC0132

(13) Click “Save And Paste (Transfer The Configuration Data In The Old Controller To The New Controller)” .

Show Menu

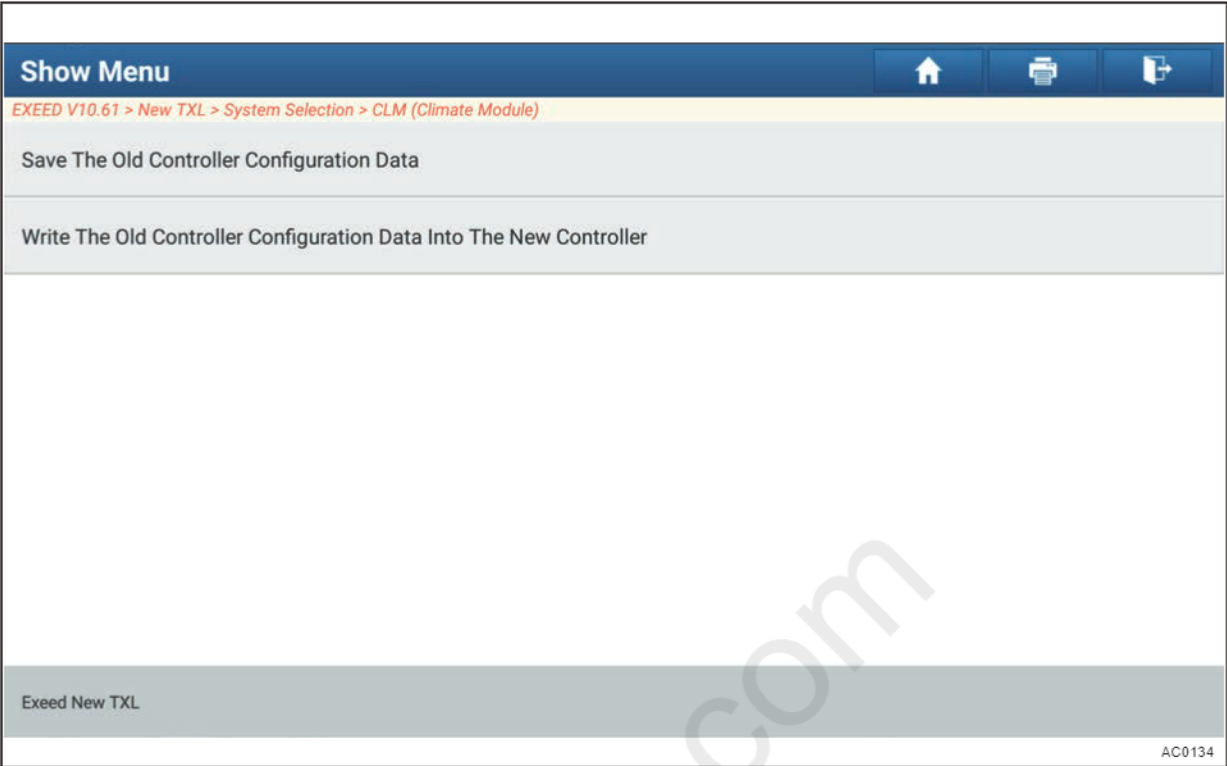
EXEED V10.61 > New TXL > System Selection > CLM (Climate Module)

Read And Display QR Code Of Current Software Configuration	Manual Write-In
Save And Paste(Transfer The Configuration Data In The Old Controller To The New Controller)	Scan To Write In
Import XML File And Automatically Write In	

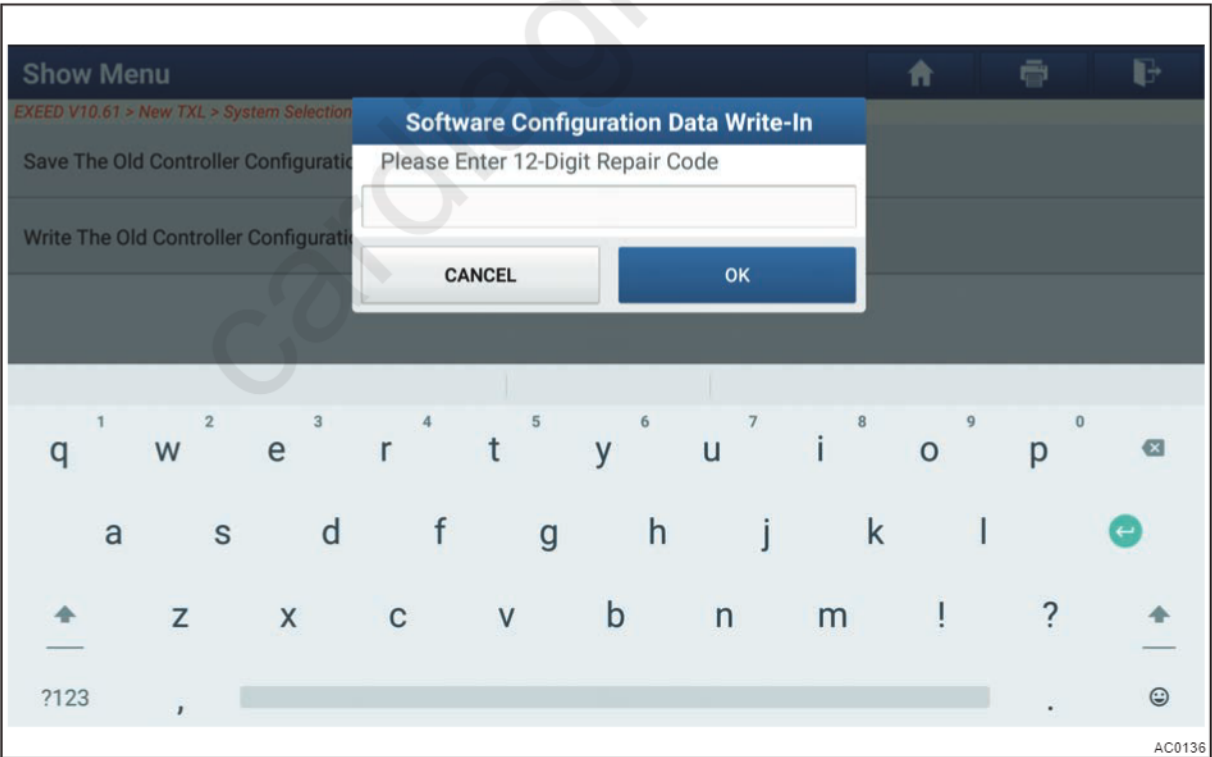
Exeed New TXL

AC0133

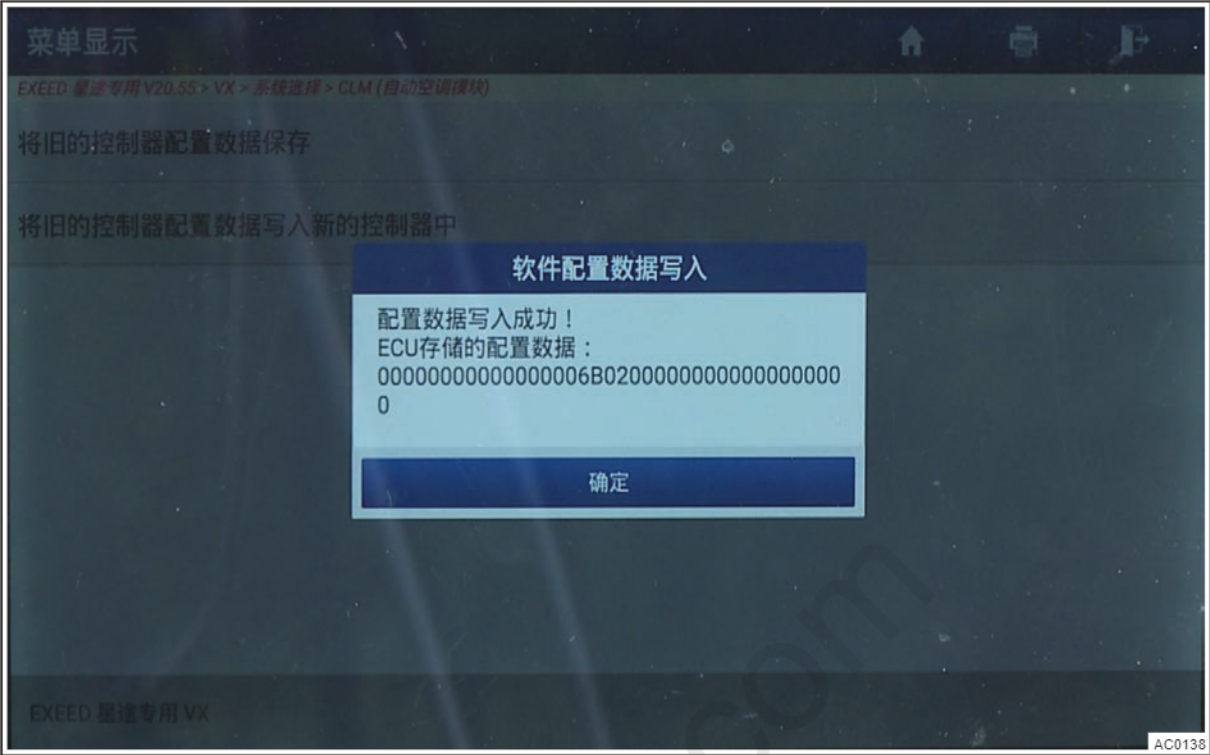
(14) Click “Write The Old Controller Configuration Data Into The New Controller” .



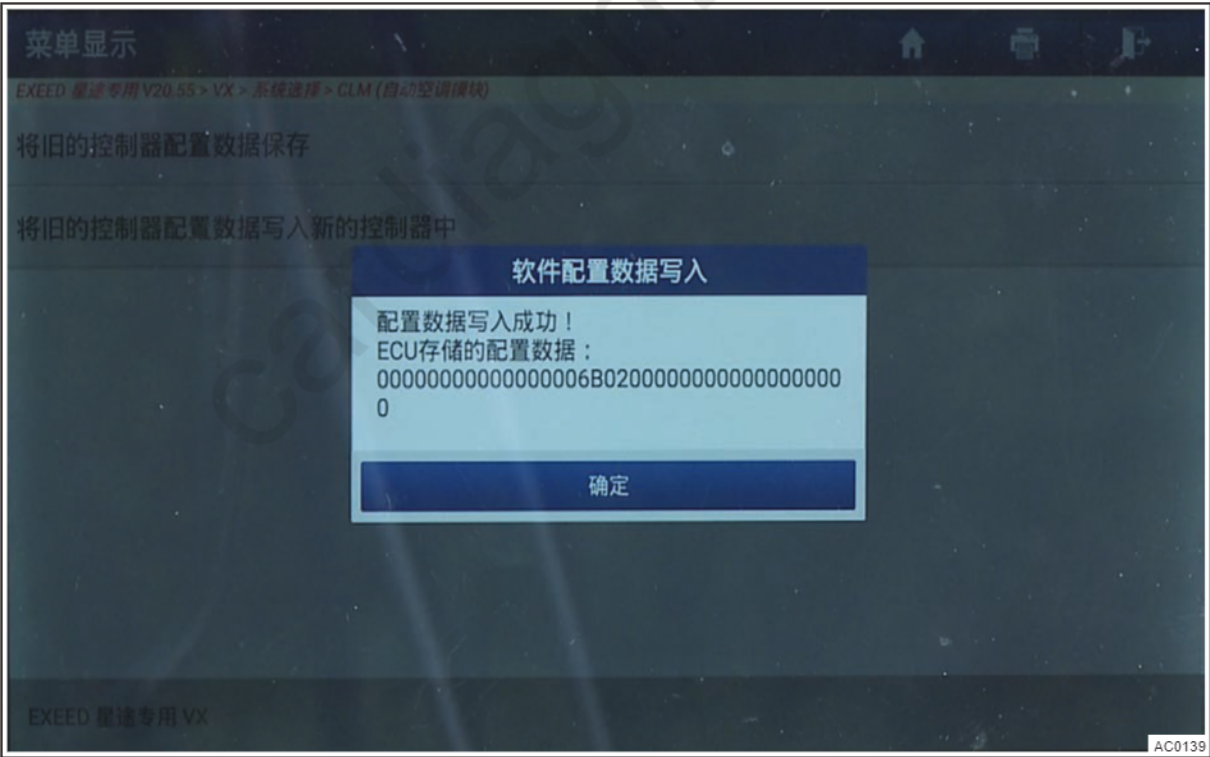
(15) The diagnostic tester interface shows “Enter 12-digit Repair Shop Code” .
Click “OK” after input is completed.



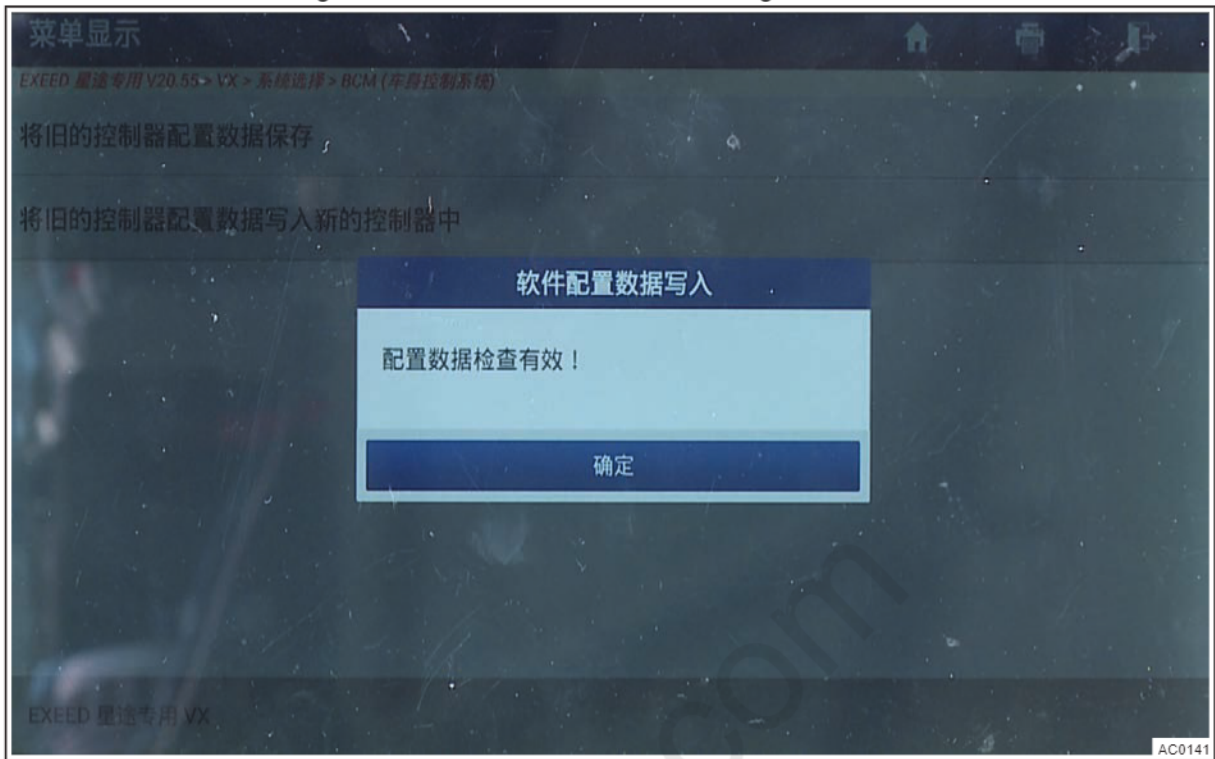
Click “OK” .



(19) Click “OK” when the diagnostic tester interface shows “Configuration Data Back Up is Successful”.



(20) Click “OK” when the diagnostic tester interface shows “Configuration data Check is Valid”.



⚠ Caution

- The first 5 digits of repair shop code are the dealer code (ERP), and the last 7 digits can be entered at will.
- The correct vehicle configuration code must be entered, otherwise the normal functions of the vehicle will be affected, so please check again after entering it.

5.3 Replacement of A/C control panel

■ Removal

Refer to Auxiliary Fascia Console.

■ Installation

Refer to Auxiliary Fascia Console.

⚠ Caution

- When replacing the A/C control panel, it is not necessary to write VIN. A/C control panel does not have a coding configuration function. The software can be refreshed with the diagnostic tester.

9.2 A/C COOLING

1 Warnings and Precautions

1.1 Warnings

In order to avoid possible property loss, personal injury or death, always follow the instructions below before repair.

- (1) Take extra care when servicing A/C system under high pressure.
- (2) Because there is refrigerant under high pressure in A/C system. It must be serviced by professional technician. Otherwise, a wrong service procedure may cause a serious danger or fatal injury.
- (3) If A/C system pressure is released unexpectedly, ventilate work area before servicing. In a closed work place, if a large amount of refrigerant is discharged, it may cause oxygen reduction and result in smothering, causing a serious or fatal injury.
- (4) Never drain refrigerant in A/C system into the atmosphere directly, and avoid environmental contamination.

1.2 Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

- (1) Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- (2) Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

2 System Overview

2.1 System Description

This model adopts an integrated heating and cooling air conditioning, which way with external control variable displacement compressor + expansion valve control method, and uses environment-friendly refrigerant R134a. This system consists of basic components: compressor, condenser, HVAC, lines, AIPM (Front A/C Control Panel), CLM (A/C Control Module), CLMR (Rear A/C Control Module), CCPR (Rear A/C control Panel, Not Equipped with Low Configuration Model) as well as other accessories such as pressure switch, O-ring, etc.

■ Refrigerant Charging Specification

Refrigerant Type	Charging Capacity (g)
R134a refrigerant	950 ± 10

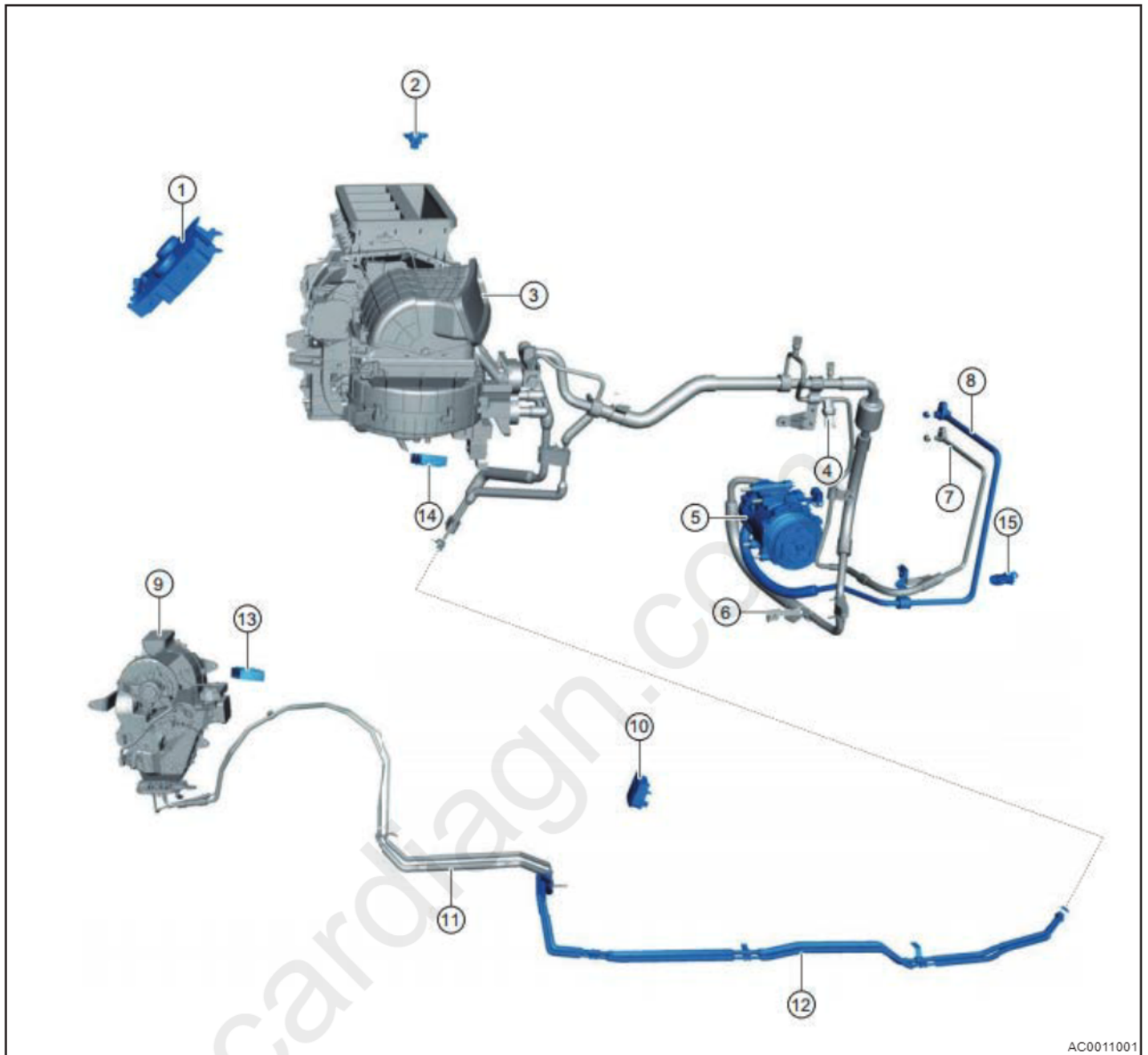
■ Refrigerant Oil Charging Specifications

Refrigerant Oil Type	Charging Capacity (ml)
PAG	150

Hint:

Newly installed air conditioning system refrigeration oil does not need to be refilled. Refill when repairing a part or after driving a certain distance. The reference quantity of oil to be added when replacing parts: Evaporator, condenser, rear evaporator: 30ml each; Line: 10ml; Rear evaporator line: 10ml.

2.2 System Components Diagram



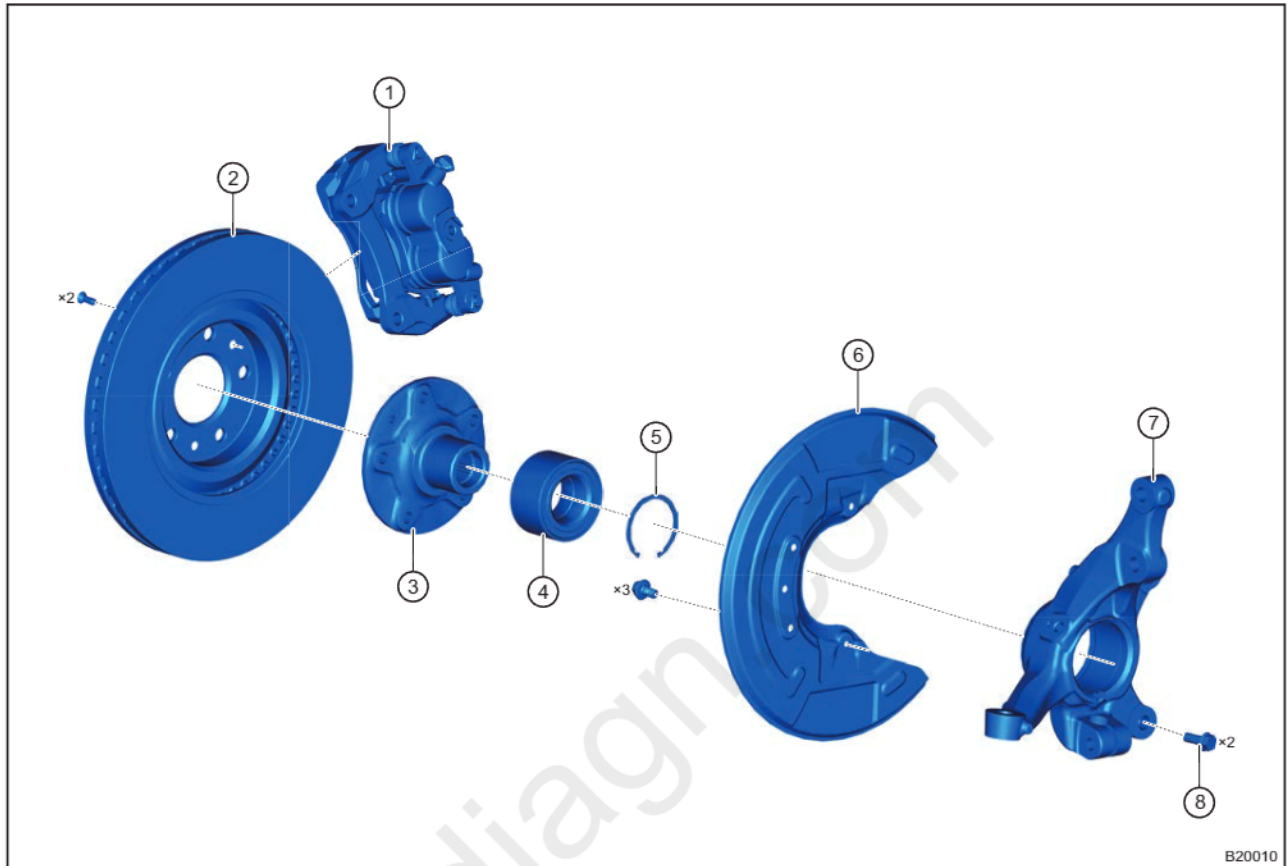
AC0011001

1	Auto A/C Control Panel Assembly	9	Rear HVAC Assembly Single Refrigeration
2	Solar Sensor Assembly	10	Rear A/C Control Panel Assembly
3	Auto Double Zone A/C HVAC Assembly	11	Condenser to Rear Evaporator Line Assembly II
4	A/C Pressure Sensor	12	Condenser to Rear Evaporator Line Assembly I
5	A/C Compressor Assembly	13	CLMR (Rear A/C Control Module)
6	Evaporator to Compressor Line Assembly	14	CLM (A/C Control Module)
7	A/C Coaxial Line Assembly	15	Ambient Temperature Sensor
8	Compressor to Condenser Line Assembly		

CHERY M36T+1.6TGDI model adopts an integrated heating and cooling air conditioning, which way with external control variable displacement compressor + expansion valve control method, and uses environment-

friendly refrigerant R134a. This system consists of basic components: compressor, condenser, HVAC, lines, AIPM (Front A/C Control Panel), CLM (A/C Control Module), CLMR (Rear A/C Control Module), CCPR (Rear A/C control Panel, Not Equipped with Low Configuration Model) as well as other accessories such as pressure switch, O-ring, etc.

2.3 System Schematic Diagram



- (1) A/C cooling system of vehicle is mainly composed of compressor, expansion valve, condenser, evaporator and blower. The various components are connected by high pressure rubber pipes and steel pipes to form a closed system. When the refrigeration system is operating, the refrigerant circulates in this space in different states. And this cycle is divided into four processes:
 - 1) Compression process: The compressor sucks the low temperature/pressure refrigerant gas at the outlet of evaporator, then compresses it to high temperature/pressure gas and discharges it from compressor.
 - 2) Cooling process: High temperature/pressure superheated refrigerant gas enters the condenser. Due to the decrease in pressure and temperature, the refrigerant gas condenses into liquid and discharges a large amount of heat.
 - 3) Throttling process: The refrigerant liquid with higher temperature and pressure becomes larger after passing through the expansion device, the pressure and temperature drop sharply, and it is discharged from expansion device with mist (small droplets).
 - 4) Heat absorption process: The mist refrigerant liquid enters the evaporator. At this time, the boiling point of the refrigerant is much lower than the temperature in the evaporator, so the refrigerant liquid evaporates into gas. In the evaporation process, a large amount of surrounding heat is absorbed, and then the low temperature/pressure refrigerant vapor enters the compressor again. The above process is operated cyclically, so as to achieve the purpose of reducing the air temperature around the evaporator.

2.4 Component Operation Description

■ A/C Compressor

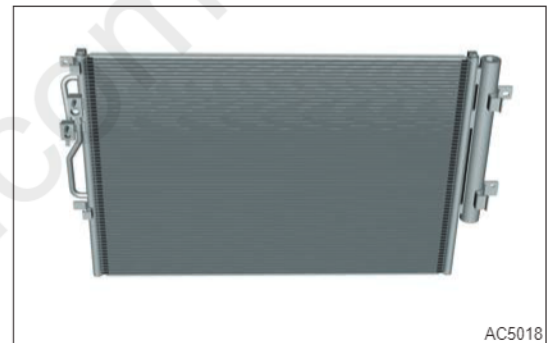
Compressor is an important element of refrigeration system. It compresses the low temperature/pressure refrigerant vapor from evaporator and makes it become high temperature/pressure refrigerant vapor.

M36T model uses a variable capacity compressor. When refrigeration system is operating, the electromagnetic clutch of variable capacity compressor is always in the engaged status. It can change the piston displacement continuously and steadily within a certain range by external control valve according to the change of refrigeration load and engine speed, so as to realize the regulation of system flow.



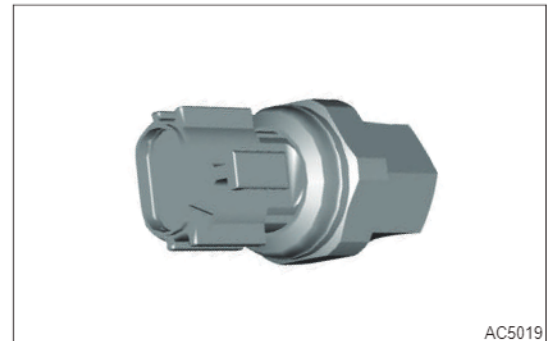
■ Condenser

Condenser contains desiccant that is used to remove water from the refrigerant in line. Compressor compresses the refrigerant into high temperature/pressure refrigerant gas, which is then discharged into the condenser, in which heat is released to the cooling medium air and condensed into high pressure liquid.



■ A/C Pressure Sensor

A/C pressure sensor is installed on high pressure pipe and used to monitor the refrigerant pressure and output the refrigerant pressure signal to ECM. ECM controls compressor based on the signal transmitted from A/C pressure sensor.



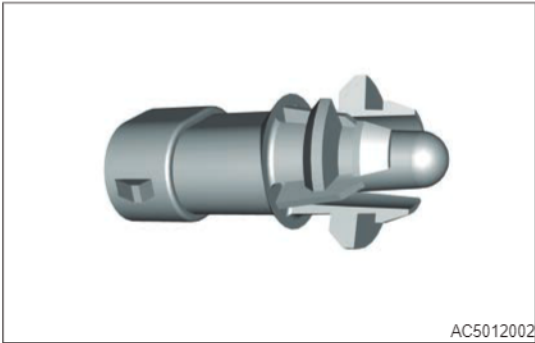
■ Solar Sensor

Solar sensor is installed on instrument panel and used to detect light intensity in the area where the vehicle is located and control the automatic mode of air conditioning.



■ Ambient Temperature Sensor

Ambient temperature sensor is installed at lower left of front impact beam and used to detect the ambient temperature and control the automatic mode of air conditioning. The sensor sends signal to automatic A/C module. The resistance of ambient temperature sensor changes with the change of ambient temperature. Resistance increases as temperature decreases. Resistance decreases as temperature increases.

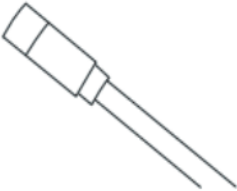


■ Evaporator

The function of evaporator is to boil and vaporize the low temperature/pressure liquid refrigerant in the evaporator line after throttling and depressurization. Absorb the heat of the air around evaporator surface to cool down. Then fan blows the cold air into the cabin to achieve the purpose of cooling down. At the same time, it can dehumidify the air. There are condensed water droplets discharged from the outlet pipe under the evaporator.

3 Tools

3.1 General Tools

Tool Name	Tool Drawing
Refrigerant Recycling Machine	 AC4010
Refrigerant Recycling Machine	 AC4011

4 On-Vehicle Service

4.1 Inspection

■ On-Vehicle Inspection

- A/C refrigerant lines and hoses are used to transfer refrigerant among A/C system components. Any twist or bend in refrigerant lines and hoses will reduce performance of A/C system and refrigerant flow in system.

- There remains high pressure in refrigerant when A/C compressor assembly is operating. It is necessary to ensure that each connecting part in A/C system is sealed well. Check all system lines at least once a year to ensure that they are in good condition and properly routed. Refrigerant lines and hoses cannot be repaired and must be replaced if leakage or damage exists.

■ General Inspection

- Check if there exists any oil or dust in each joint of A/C line. If this occurs, there may exist leak.
- Check if condenser surface is dirty and if fins are deformed.
- Check if there are harsh noises while compressor assembly is operating normally.
- Temperature difference should be noticeable by touching intake line and exhaust line of compressor assembly with hand. Normally, temperature of low pressure line is relatively low and that of high pressure line is relatively hot. Feel the temperature difference between condenser inlet pipe and outlet pipe, under normal conditions, temperature of inlet pipe is higher than that of outlet pipe. If you feel the temperature difference between expansion valve inlet and outlet line with hand, under normal conditions, temperature of expansion valve inlet line is relatively hot and that of outlet line is relatively cool, and the temperature difference between them is noticeable.

■ Using pressure gauge set, check the refrigerant pressure.

Connect pressure gauge set. After following conditions are met, read pressure values on pressure gauge. Measurement Condition:

- Inner/outer circulation switch is in outer circulation position.
- Engine runs at approximately 2000 rpm.
- Adjust temperature knob to Max. Cool.
- Set blower speed control switch to highest band.
- Turn on A/C switch.

Hint:

Observe the pressure value on pressure gauge, under normal condition, low pressure is 0.15-0.20 Mpa, high pressure is 1.3-1.7 Mpa.

■ Refrigerant Leakage Inspection

Warning

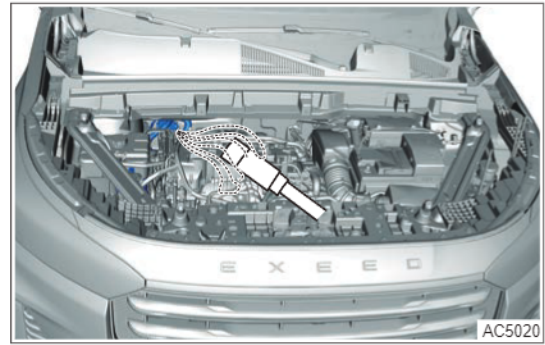
- **DO NOT perform a pressure test or a leakage test to R134a service device or vehicle A/C system with compressed air. Mixture of air and R134a is inflammable at high pressure. This mixture has potential danger, and it may cause a fire or explosion, resulting in vehicle damage, personal injury or death.**
- **Avoid inhaling vapor or moisture from the A/C refrigerant and refrigerant oil.**
- **Only use technical service device to discharge R134a system. If system discharges unexpectedly, ventilate work place before servicing.**
- **If A/C refrigerant filling amount is empty or low, A/C system may have leak. Check all A/C lines, joints and parts for remaining oil. The remaining oil is indication mark of A/C system leaking position.**

(1) After recharging refrigerant, use gas leak detector to check refrigerant gas for leakage.

(2) Perform operations under following conditions:

- ENGINE START STOP switch is in OFF.
- Ensure the ventilation is well (gas leak detector may react to volatile gases which are not from refrigerant, such as gasoline vapor or exhaust gas).
- Repeat the test for 2 or 3 times.
- Make sure that there is some refrigerant remaining in the refrigeration system.

- (3) Place gas leak detector near the joint of A/C line, and check the A/C line for leakage. If gas leak detector makes a sound, it indicates that a leakage exists. Repair or replace the leakage A/C line as necessary.



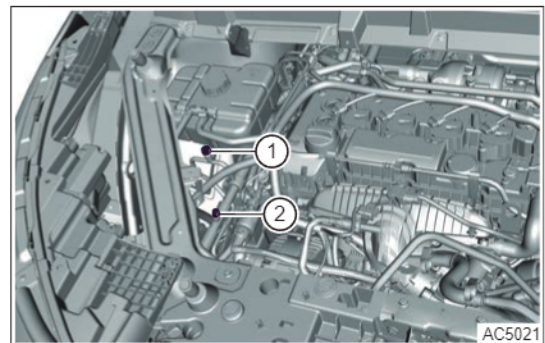
- (4) Disconnect A/C pressure sensor connector, and use same procedures to check A/C pressure sensor for leakage. Replace the A/C pressure sensor as necessary.
- (5) Insert gas leak detector into evaporator tank assembly, and use same procedures to check evaporator for leakage. Clean or replace the evaporator core assembly as necessary.
- (6) Use same procedures to check condenser for leakage. Clean or replace the condenser assembly as necessary.

4.2 Refrigerant Recovering/Draining

Warning

- Take extra care when servicing A/C system under high pressure.
- Because there is refrigerant under high pressure in A/C system. It must be serviced by professional technician. Otherwise, a wrong service procedure may cause a serious danger or fatal injury.
- If A/C system pressure is released unexpectedly, ventilate work area before servicing. In a closed work place, if a large amount of refrigerant is discharged, it may cause oxygen reduction and result in smothering, causing a serious or fatal injury.
- Never drain refrigerant in A/C system into the atmosphere directly, and avoid environmental contamination.
- It is necessary to recover refrigerant with R134a refrigerant special recycling machine.
- DO NOT work near open flames.
- Always dispose of recovered refrigerant as specified.
- Never charge R-12 to refrigerant system which is designed to use R134a. This refrigerant is incompatible, which could damage the A/C system.
- DO NOT race engine when vacuum pump operates or vacuum exists in A/C system. Otherwise, A/C compressor assembly will be damaged seriously.

- (1) Open the engine hood and remove the engine compartment trim cover assembly.
- (2) Loosen the joint cover of A/C high/low pressure line.
- (3) Connect the red connector to A/C high pressure line joint (1), and connect the blue connector to A/C low pressure line joint (2).

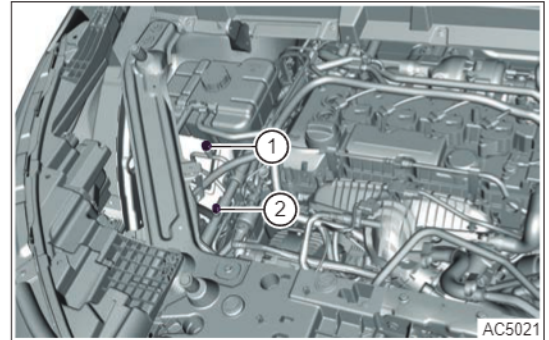


- (4) Open the high pressure valve and low pressure valve of refrigerant recycling machine.
- (5) Choose "recovering" item on machine and make it start to operate.
- (6) Check the low pressure value on pressure gauge to ensure that recycling is completed, and then turn off machine.

- (7) Disconnect the connection between refrigerant recycling machine and A/C line joint.
- (8) Reinstall the cover onto refrigerant line joint.

4.3 Vacuum Pumping

- (1) Open the engine hood and remove the engine compartment trim cover assembly.
- (2) Loosen the joint cover of A/C high/low pressure line.
- (3) Connect the red connector to A/C high pressure line joint (1), and connect the blue connector to A/C low pressure line joint (2).



- (4) Open the high pressure valve and low pressure valve of refrigerant recycling machine.
- (5) Choose "vacuum pumping" item on machine and the time setting is 15 minutes, then choose OK and make it start to operate.
- (6) Wait for 10 minutes after completing operation, check if there is any change in A/C system vacuum. 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 charging procedures.

4.4 Refrigerant Recharging

Warning

- **A small amount of refrigerant oil in A/C system will be discharged when recovering and draining refrigerant. When filling A/C system, be sure to supplement refrigerant oil, as some amount of refrigerant oil are lost during recovering.**
- **DO NOT fill excessive refrigerant. Otherwise, it will cause excessive pressure to compressor assembly, resulting in compressor assembly noise and A/C system failure.**
- **Always perform vacuum pumping before recharging refrigerant.**

- (1) Perform vacuum pumping with a vacuum pump.
- (2) Add refrigerant oil after checking that there is no leakage in A/C system.
- (3) Perform vacuum pumping for 3 minutes again after adding refrigerant oil, then charge refrigerant.
- (4) Choose "charging" item on machine and set the amount of charging to specified value, then choose "OK" and make it start to operate.
- (5) Open the suction valve and close the discharging valve, and then open the charging valve to allow refrigerant to flow into the system.
- (6) When the delivery of refrigerant has stopped, close the charging valve.
- (7) If charged refrigerant is not delivered to specified position, start the engine to operate the A/C compressor assembly.
- (8) Open the charging valve to deliver the remaining refrigerant to A/C system.

Warning

At this time, do not open exhaust (high pressure) valve. Failure to do so may result in personal injury or even death.

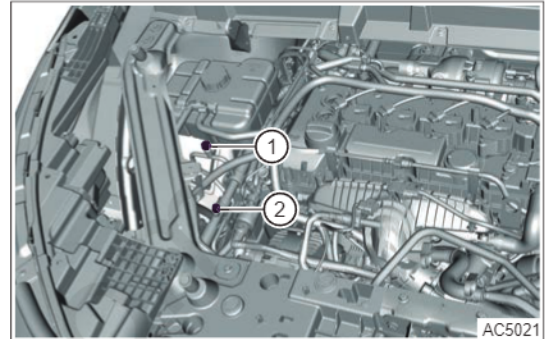
- (9) Perform A/C system pressure test after charging.
- (10) Remove the connecting pipe for refrigerant charging after the test is completed.
- (11) Reinstall the cover onto A/C line joint.

4.5 Refrigerant Oil Recovering

Warning

- **Special service equipment for R134a refrigerant must be used.**
- **Always keep work area in good ventilation, because A/C system is easy to leak.**
- **Always dispose of recovered refrigerant as specified.**
- **Refrigerant oil must be charged after replacing A/C system components or recovering refrigerant.**

- (1) Open the engine hood and remove the engine compartment trim cover assembly.
- (2) Loosen the joint cover of A/C high/low pressure line.
- (3) Connect the red connector to A/C high pressure line joint (1), and connect the blue connector to A/C low pressure line joint (2).



- (4) Open the high pressure valve and low pressure valve of refrigerant recycling machine.
- (5) Recover refrigerant oil according to instructions on the machine.
- (6) Record amount of recovered refrigerant oil.
- (7) Disconnect the connection between refrigerant recycling machine and A/C line joint.
- (8) Reinstall the joint cover onto refrigerant line joint.

4.6 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 Specifications

Refrigerant Oil Charging Type	Charging Capacity (ml)
PAG	150

Hint:

Newly installed air conditioning system refrigeration oil does not need to be refilled. Refill when repairing a part or after driving a certain distance. The reference quantity of oil to be added when replacing parts: Evaporator, condenser, rear evaporator: 30ml each; Line: 10ml; Rear evaporator line: 10ml.

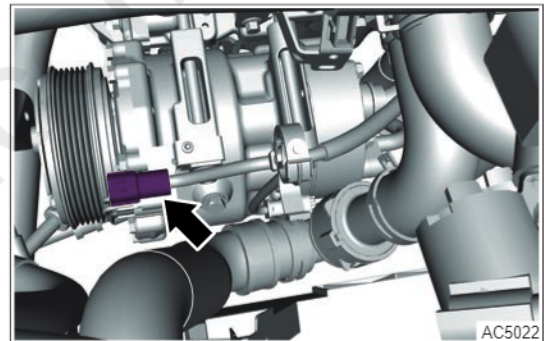
4.7 Replacement of Compressor Assembly

■ Removal

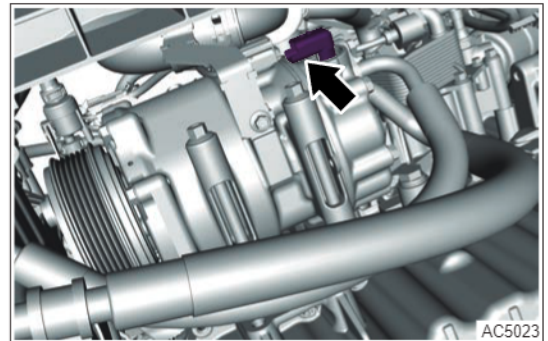
⚠ Warning

- Be sure to follow safety precautions before performing this procedure. Failure to do so may result in serious personal injury or even death.
- Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.
- When replacing compressor assembly, it is necessary to measure the refrigerant oil amount removed from new A/C compressor assembly.

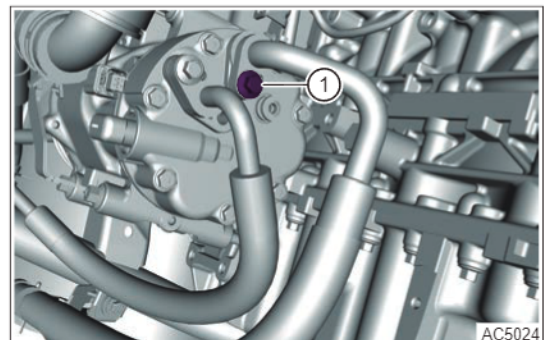
- (1) Recover the refrigerant from A/C system.
- (2) Turn off all electrical equipment and ENGINE START STOP switch.
- (3) Disconnect the negative battery cable.
- (4) Remove the engine left and right lower protectors.
- (5) Remove the intercooler outlet pipe.
- (6) Remove the accessory drive belt.
- (7) Disconnect compressor clutch connector.



- (8) Disconnect the external control compressor solenoid valve connector.



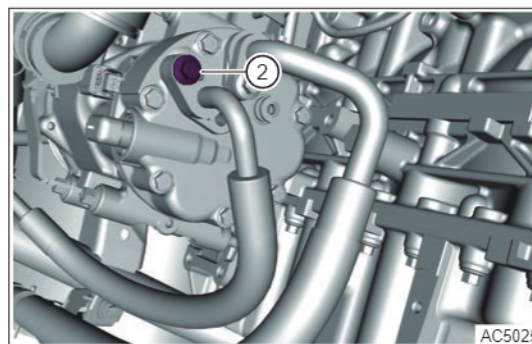
- (9) Remove 1 fixing bolt (1) between A/C low pressure line and compressor assembly, disengage A/C low pressure line from compressor assembly.



Hint:

Use the plugs to seal line joint and compressor joint.

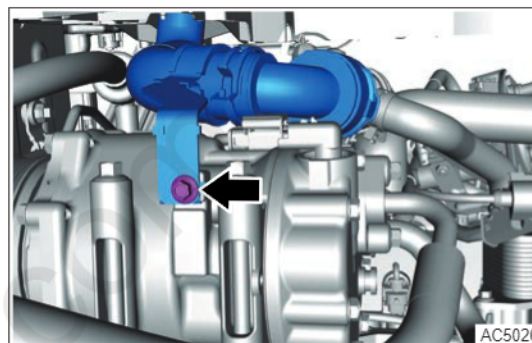
- (10) Remove 1 fixing bolt (2) between A/C high pressure line and compressor assembly, disengage A/C high pressure line from compressor assembly.



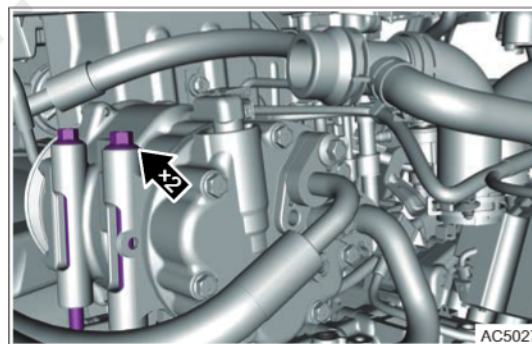
Hint:

Use the plugs to seal line joint and compressor joint.

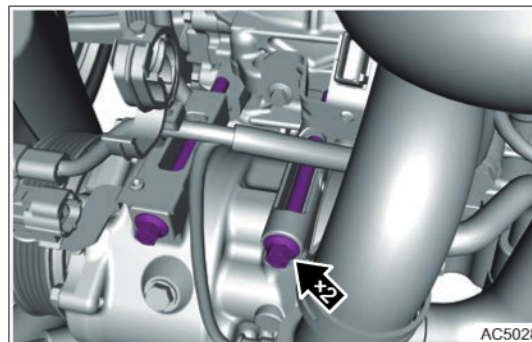
- (11) Remove the engine outlet pipe assembly front bracket fixing bolt.



- (12) Remove 2 fixing bolts between lower part of compressor assembly and mounting bracket.



- (13) Remove 2 fixing bolts between upper part of compressor assembly and mounting bracket.



- (14) Remove the compressor carefully.

■ Inspection

Hint:

- When checking noise related to A/C system, you must first know the conditions under which the noise occurs. These conditions include: Weather, vehicle speed, engine speed, engine temperature and any other special conditions. Loud noises during A/C operation can often mislead someone. For example, some sounds, like a failed bearing, may be caused by loose bolts, mounting brackets or a loose compressor assembly.
 - A/C compressor assembly must be replaced if any abnormal noise is heard from compressor assembly.
 - Noise may occur from drive belt at different engine speeds, and you may mistake it for a noise from A/C compressor assembly.
- (1) Select a quiet place for testing.
 - (2) Listen to customer's feedback information as much as possible.
 - (3) Turn on and off A/C several times to identify compressor assembly noise clearly.
 - (4) Check the condition of compressor assembly belt.
 - (5) Check the hub, pulley, bearing assembly of compressor assembly. Make sure that hub and pulley are aligned correctly, and pulley bearing is securely installed to A/C compressor assembly.
 - (6) Check if refrigerant line routes incorrectly, and if it is damaged or has an interference that could result in an abnormal noise. Also, check the refrigerant line for twist or bend, otherwise the refrigerant will be limited to flow, which will cause a noise.
 - (7) Loosen all compressor assembly tightening bolts and retighten them.
 - (8) If noise occurs when liquid refrigerant in A/C suction line is under a slugging condition, replace the condenser and check refrigerant oil level and charging condition for refrigerant.
 - (9) If the slugging condition still exists after replacing condenser, replace the A/C compressor assembly.

Caution

DO NOT race engine when vacuum pump operates or vacuum exists in A/C system. Otherwise, A/C compressor assembly will be damaged seriously.

■ Installation

Caution

- Tighten fixing bolts and nuts to specified torques.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- When installing a new compressor assembly, always remove a certain amount of refrigerant oil from new A/C compressor assembly as specified.
- Perform recharging for A/C system and check for refrigerant leakage.

- (1) Install the compressor on the correct position of the compressor bracket.
- (2) Install 2 fixing bolts between upper part of compressor assembly and mounting bracket.

Torque: 23 ± 4N·m

- (3) Install 2 fixing bolts between lower part of compressor assembly and mounting bracket.

Torque: 23 ± 4N·m

- (4) Install the engine outlet pipe assembly front bracket fixing bolt.
- (5) Install compressor assembly high pressure line, and install 1 fixing bolt between A/C high pressure line and compressor assembly.

Torque: 23 ± 4N·m

- (6) Install compressor assembly low pressure line, and install 1 fixing bolt between A/C low pressure line and compressor assembly.

Torque: $23 \pm 4 \text{ N}\cdot\text{m}$

- (7) Connect the compressor assembly wire harness connector.
- (8) Install the accessory drive belt.
- (9) Install the intercooler outlet pipe.
- (10) Install the engine lower protector assembly.
- (11) Check system for leakage.
- (12) Pump vacuum and recharge refrigerant.
- (13) Connect the negative battery cable.
- (14) Turn the ENGINE START STOP switch to ON, .and test compressor operation.

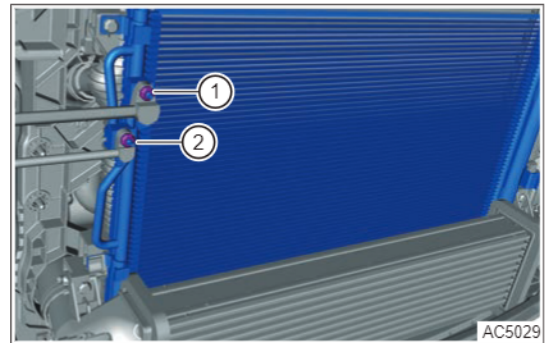
4.8 Replacement of Condenser Assembly

■ Removal

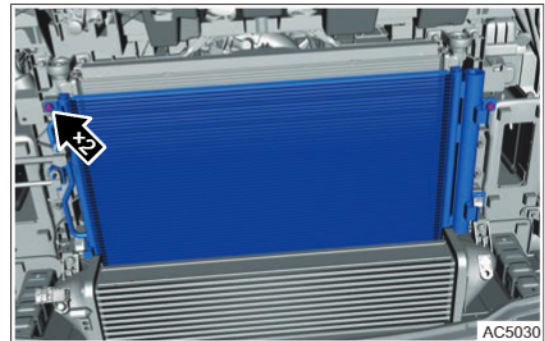
Warning

- **Be sure to follow safety precautions before performing this procedure. Failure to do so may result in serious personal injury or even death.**
- **Always keep work area in good ventilation.**
- **Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.**

- (1) Remove the engine compartment trim cover assembly.
- (2) Recover the refrigerant from A/C system.
- (3) Turn off all electrical equipment and ENGINE START STOP switch.
- (4) Disconnect the negative battery cable.
- (5) Remove the front bumper assembly.
- (6) Remove the front impact beam assembly.
- (7) Remove the air deflector assembly.
- (8) Remove fixing nut (1) from compressor - condenser line assembly, and detach line from condenser assembly.
- (9) Remove fixing nut (2) from condenser - evaporator line assembly, and detach line from condenser assembly.



- (10) Remove 2 fixing bolts between radiator assembly and condenser assembly.



(11) Carefully remove the condenser assembly.

■ Installation

Caution

- Tighten fixing bolts and nuts to specified torques.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- Perform recharging for A/C system and check for refrigerant leakage.

(1) Clamp condenser assembly mounting bracket into radiator assembly bracket, and adjust position.

(2) Install 2 fixing bolts between radiator assembly and condenser assembly.

Torque: 5 ± 1 N·m

(3) Install condenser - evaporator line assembly, and install 1 fixing bolt.

Torque: 9 ± 1 N·m

(4) Install compressor - condenser line assembly, and install 1 fixing bolt.

Torque: 9 ± 1 N·m

(5) Install the air deflector assembly.

(6) Install the front impact beam assembly.

(7) Install the front bumper assembly.

(8) Check system for leakage.

(9) Pump vacuum and recharge refrigerant.

(10) Install the engine compartment trim cover assembly.

(11) Connect the negative battery cable.

4.9 Replacement of Outside Temperature Sensor

■ Removal

Warning

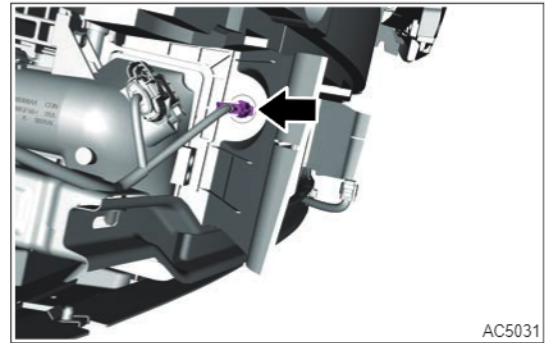
- Be sure to wear necessary safety equipment to prevent accidents, when removing front bumper assembly.
- Appropriate force should be applied, when removing front bumper assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing front bumper assembly.

(1) Turn off all electrical equipment and ENGINE START STOP switch.

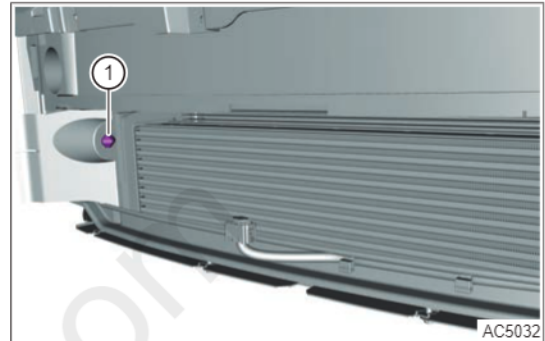
(2) Disconnect the negative battery cable.

(3) Remove the front bumper assembly.

- (4) Disconnect the outside temperature sensor connector.

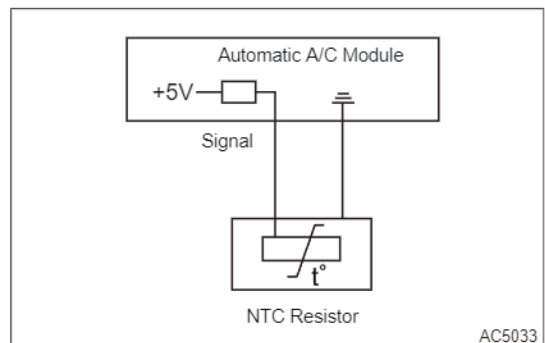


- (5) Remove the outside temperature sensor (1).



■ Inspection

- (1) The sensor is NTC resistance (including right face air outlet temperature sensor, left face air outlet temperature sensor, right foot air outlet temperature sensor, left foot air outlet temperature sensor, ambient temperature sensor and evaporator sensor), which is connected to the sensor power supply via the pull-up resistor. Different temperatures will result in different resistance values. Different voltage values are generated by NTC resistor and pull-up resistor at the sensor terminal and input it to A/C module to calculate the temperature.
- (2) Insert the outside temperature sensor connector.
- (3) Turn ignition switch to ON.
- (4) Start the Engine.
- (5) Using voltage band of multimeter, measure terminal signal voltage. As the outside temperature changes, the signal voltage changes.



■ Installation

- (1) Install the outside temperature sensor to a proper position on body, and connect the connector.
- (2) Install the front bumper assembly.
- (3) Connect the negative battery cable.

4.10 Replacement of Solar Sensor

Refer to Instrument Panel section for removal & installation.

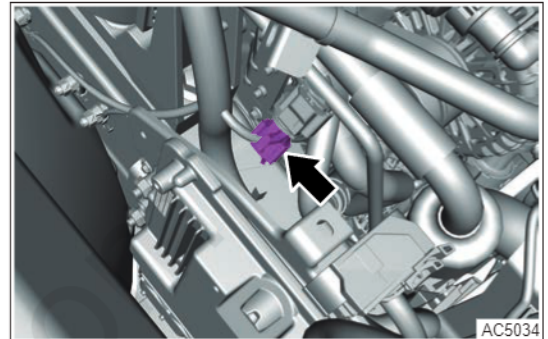
4.11 Replacement of Pressure Sensor

■ Removal

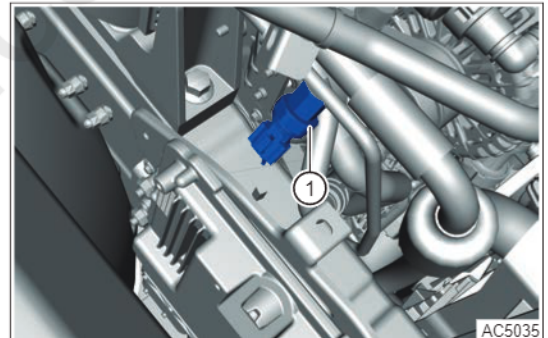
Warning

Appropriate force should be applied when removing pressure sensor. Be careful not to operate roughly.

- (1) Remove the engine compartment trim cover assembly.
- (2) Recover the refrigerant from A/C system assembly.
- (3) Turn off all electrical equipment and ENGINE START STOP switch.
- (4) Disconnect the negative battery cable.
- (5) Disconnect the pressure sensor connector.



- (6) Use wrench to remove the pressure sensor (1).



■ Installation

- (1) Install the pressure sensor.
- (2) Connect the pressure sensor connector.
- (3) Check system for leakage.
- (4) Pump vacuum and recharge refrigerant.
- (5) Install the engine compartment trim cover assembly.
- (6) Connect the negative battery cable.

4.12 Replacement of Compressor - Condenser Line Assembly

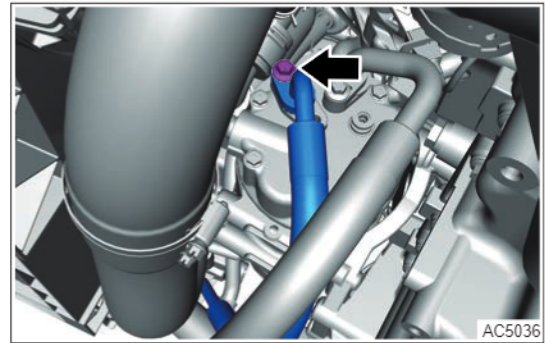
■ Removal

Warning

Appropriate force should be applied, when removing compressor - condenser line 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 engine lower protector assembly.
- (4) Remove the engine compartment trim cover assembly.
- (5) Remove the front bumper assembly.
- (6) Recover the refrigerant from A/C system assembly.

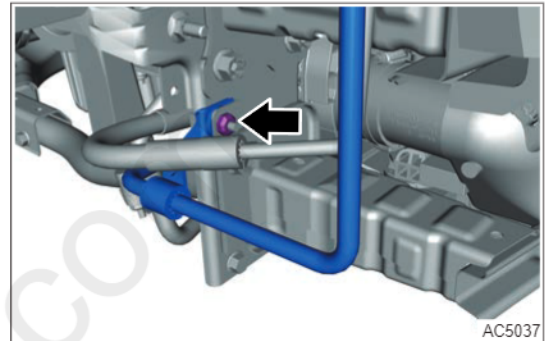
- (7) Remove 1 fixing bolt between A/C high pressure line and compressor assembly, disengage A/C high pressure line from compressor assembly.



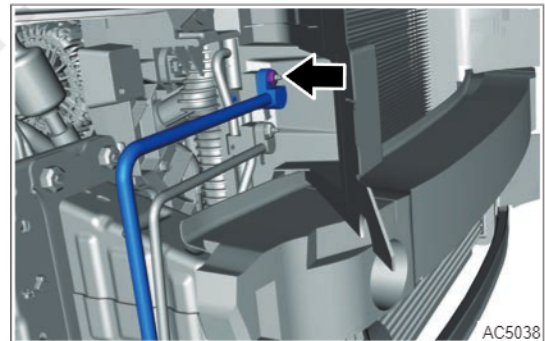
Hint:

Use the plugs to seal line joint and compressor joint.

- (8) Remove 1 fixing nut from compressor - condenser line bracket.



- (9) Remove fixing nut from compressor - condenser line assembly, and disengage line from condenser assembly.



Hint:

Use the plugs to seal line joint and compressor joint.

- (10) Remove the compressor - condenser line assembly.

■ Installation

- (1) Install compressor - condenser line and install fixing nut.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (2) Install 1 fixing nut on compressor - condenser line bracket.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (3) Install A/C high pressure line and compressor assembly line, and install fixing bolt.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (4) Check system for leakage.
- (5) Pump vacuum and recharge refrigerant.
- (6) Install the front bumper assembly.
- (7) Install the engine compartment trim cover assembly.

- (8) Install the engine lower protector assembly.
- (9) Connect the negative battery cable.

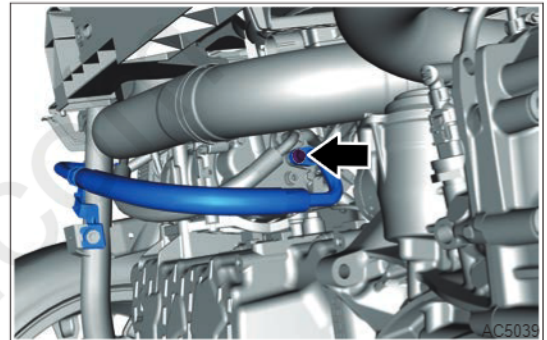
4.13 Replacement of Evaporator- Compressor Line Assembly

■ Removal

Warning

Appropriate force should be applied, when removing evaporator- compressor line assembly. Be careful not to operate roughly.

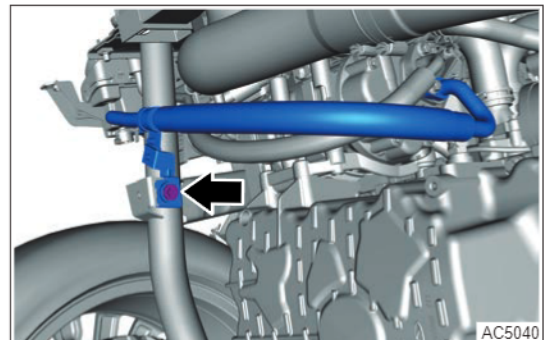
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the engine lower protector assembly.
- (4) Remove the engine compartment trim cover assembly.
- (5) Remove the front bumper assembly.
- (6) Recover the refrigerant from A/C system assembly.
- (7) Remove 1 fixing bolt between A/C low pressure line and compressor assembly, disengage A/C low pressure line from compressor assembly.



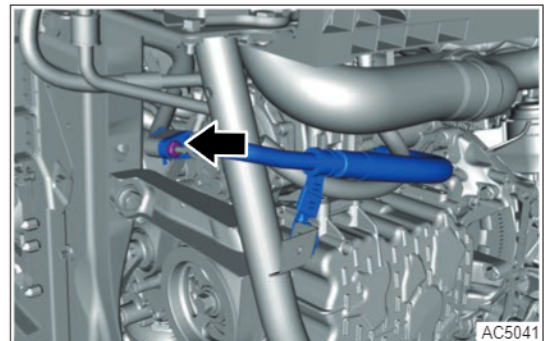
Hint:

Use the plugs to seal line joint and compressor joint.

- (8) Remove 1 fixing bolt from evaporator - compressor line bracket.



- (9) Remove fixing nut between evaporator - compressor line assembly and A/C coaxial line assembly.



Hint:

Use the plugs to seal line joint and compressor joint.

- (10) Remove the evaporator - compressor line assembly.

■ Installation

- (1) Install fixing nut between evaporator - compressor line assembly and A/C coaxial line assembly.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (2) Install 1 fixing bolt on evaporator - compressor line bracket.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (3) Install compressor low pressure line and fixing bolt.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

- (4) Check system for leakage.
- (5) Pump vacuum and recharge refrigerant.
- (6) Install the front bumper assembly.
- (7) Install the engine compartment trim cover assembly.
- (8) Install the engine lower protector assembly.
- (9) Connect the negative battery cable.

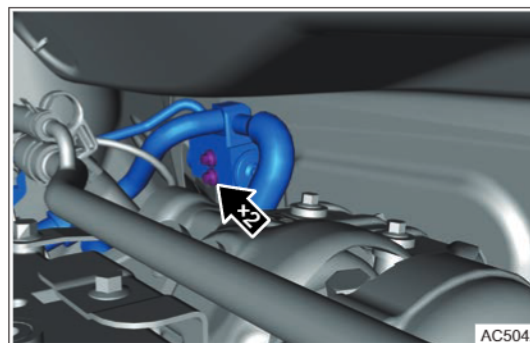
4.14 Replacement of A/C Coaxial Line Assembly

■ Removal

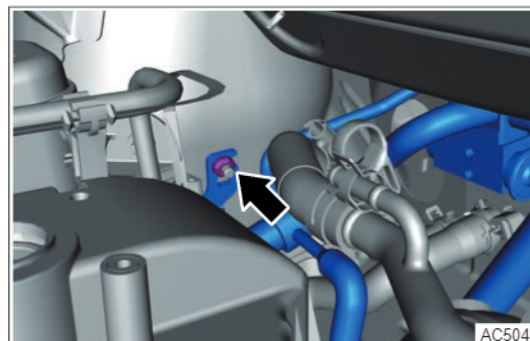
Warning

Appropriate force should be applied, when removing A/C coaxial line assembly. Be careful not to operate roughly.

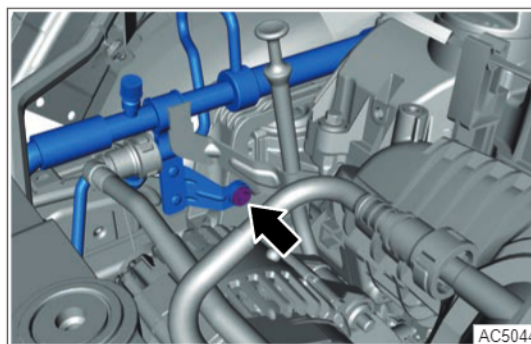
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the engine lower protector assembly.
- (4) Remove the engine compartment trim cover assembly.
- (5) Remove the front bumper assembly.
- (6) Recover the refrigerant from A/C system assembly.
- (7) Remove the pressure sensor.
- (8) Remove 2 fixing bolts from expansion valve.



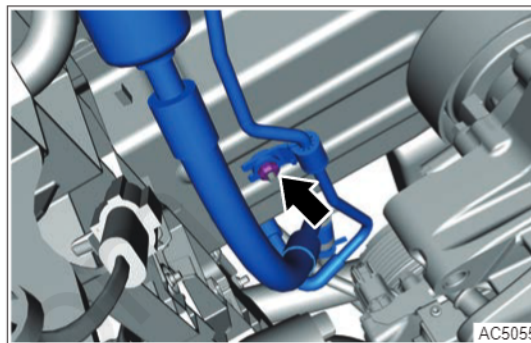
- (9) Remove fixing nuts from A/C coaxial line assembly.



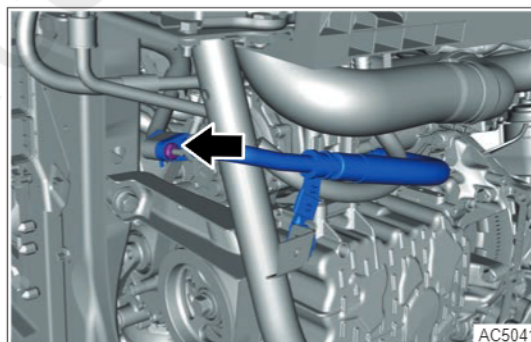
(10) Remove fixing bolts from A/C coaxial line assembly.



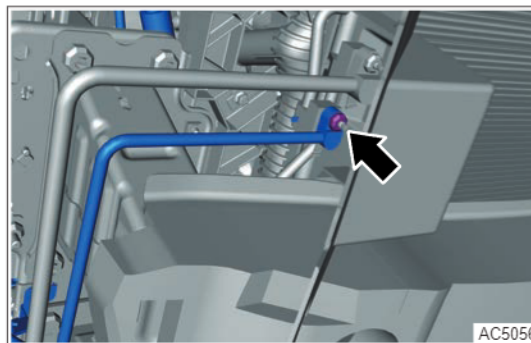
(11) Remove fixing nuts from A/C coaxial line assembly.



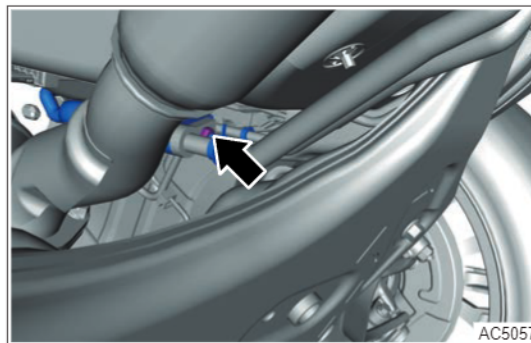
(12) Remove fixing nut between evaporator - compressor line assembly and A/C coaxial line assembly.



(13) Remove fixing nut between A/C coaxial line assembly and condenser.



(14) Remove fixing nut between A/C coaxial line assembly and condenser to rear evaporator line assembly.



(15) Remove the A/C coaxial line assembly.

■ Installation

(1) Install the A/C coaxial line assembly to a proper position on body.

(2) Install fixing nut between A/C coaxial line assembly and condenser to rear evaporator line assembly | .

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(3) Install fixing nut between A/C coaxial line assembly and condenser.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(4) Install fixing nut between evaporator - compressor line assembly and A/C coaxial line assembly.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(5) Install fixing nut to A/C coaxial line assembly.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(6) Install fixing bolt to A/C coaxial line assembly.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(7) Install fixing nut to A/C coaxial line assembly.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(8) Install 2 fixing bolts to expansion valve.

Torque: $9 \pm 1 \text{ N}\cdot\text{m}$

(9) Check system for leakage.

(10) Pump vacuum and recharge refrigerant.

(11) Install the front bumper assembly.

(12) Install the engine compartment trim cover assembly.

(13) Install the engine lower protector assembly.

(14) Connect the negative battery cable.

4.15 Replacement of Condenser - Rear Evaporator Line Assembly | |

■ Removal

Warning

Appropriate force should be applied when removing condenser - rear evaporator line assembly | | . Be careful not to operate roughly.

(1) Turn off all electrical equipment and ENGINE START STOP switch.

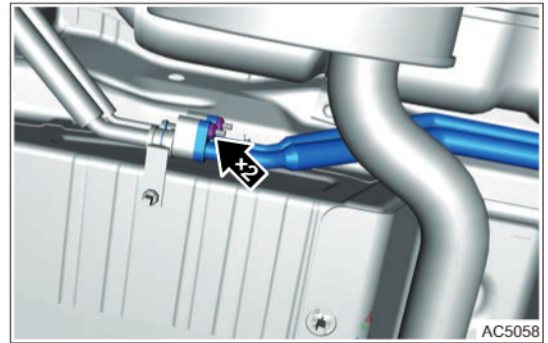
(2) Disconnect the negative battery cable.

(3) Remove the engine compartment trim cover assembly.

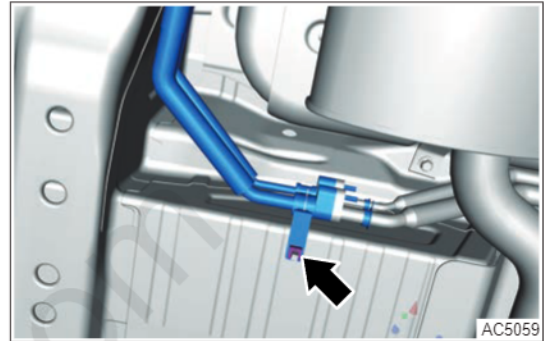
(4) Recover the refrigerant from A/C system assembly.

(5) Remove the rear wheel house protector.

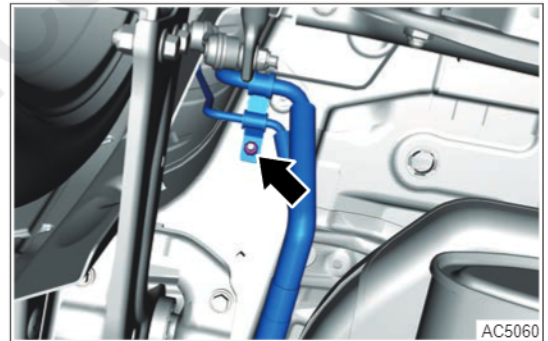
- (6) Remove 2 fixing nuts between condenser - rear evaporator line assembly | and condenser - rear evaporator line assembly | |.



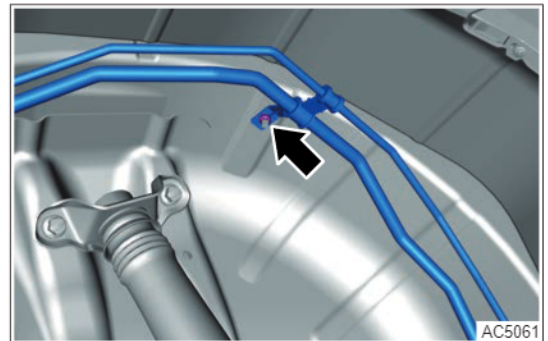
- (7) Remove fixing nut between condenser - rear evaporator line assembly | | and body.



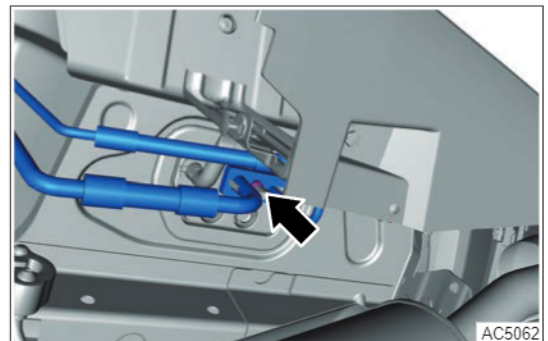
- (8) Remove fixing nut between condenser - rear evaporator line assembly | | and body.



- (9) Remove fixing nut between condenser - rear evaporator line assembly | | and body.



- (10) Remove fixing nut between condenser - rear evaporator line assembly | | and body.



- (11) Remove the condenser - rear evaporator line assembly

| | .

■ Installation

- (1) Install condenser - rear evaporator line assembly | | to a proper position of body.
(2) Install fixing nut between condenser - rear evaporator line assembly | | and body.

Torque: 9 ± 1 N·m

- (3) Install fixing nut between condenser - rear evaporator line assembly | | and body.

Torque: 9 ± 1 N·m

- (4) Install fixing nut between condenser - rear evaporator line assembly | | and body.

Torque: 9 ± 1 N·m

- (5) Install fixing nut between condenser - rear evaporator line assembly | | and body.

Torque: 9 ± 1 N·m

- (6) Install fixing nut between condenser - rear evaporator line assembly | | and body.

Torque: 9 ± 1 N·m

- (7) Install the rear wheel house protector.
(8) Check system for leakage.
(9) Pump vacuum and recharge refrigerant.
(10) Install the engine compartment trim cover assembly.
(11) Connect the negative battery cable.

9.3 A/C FAN BODY AND AIR DUCT

1 Warnings and Precautions

1.1 Warnings

In order to avoid possible property loss, personal injury or death, always follow the instructions below before repair.

- (1) Take extra care when servicing A/C system under high pressure.
- (2) Because there is refrigerant under high pressure in A/C system. It must be serviced by professional technician. Otherwise, a wrong service procedure may cause a serious danger or fatal injury.
- (3) If A/C system pressure is released unexpectedly, ventilate work area before servicing. In a closed work place, if a large amount of refrigerant is discharged, it may cause oxygen reduction and result in smothering, causing a serious or fatal injury.
- (4) Never drain refrigerant in A/C system into the atmosphere directly, and avoid environmental contamination.

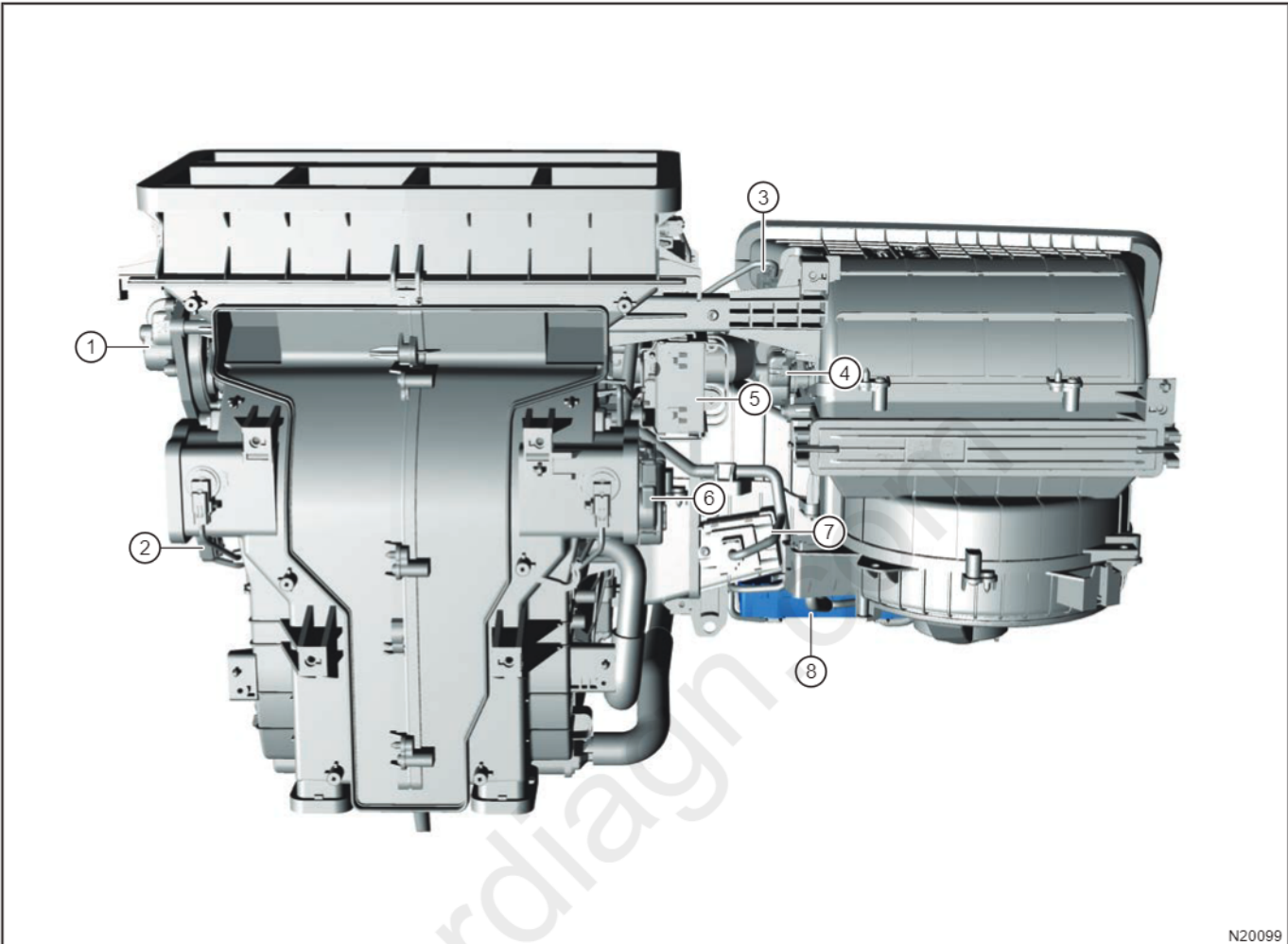
1.2 Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

- (1) Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- (2) Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

2 System Overview

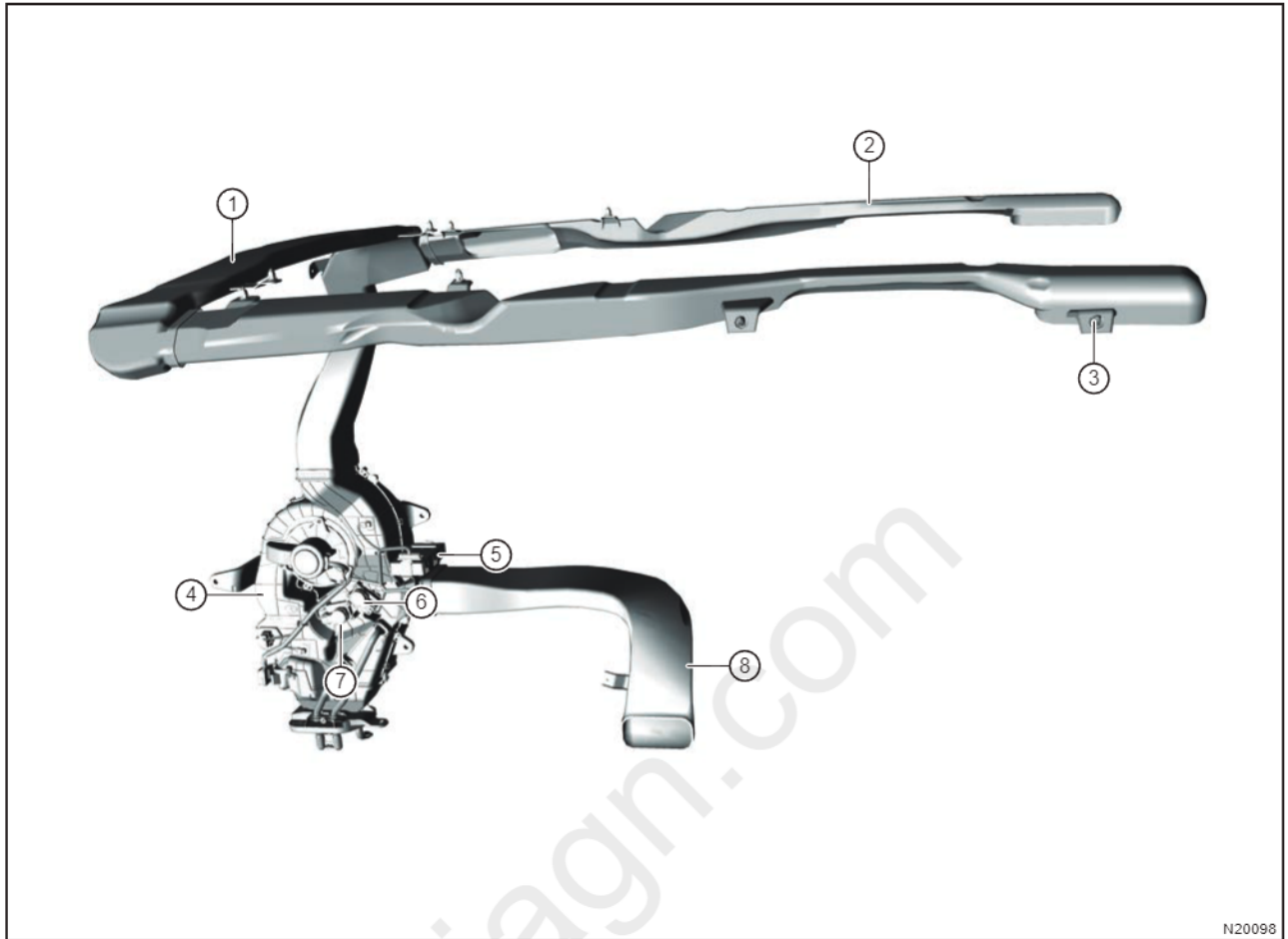
2.1 Front HVAC Assembly



N20099

1	Mode Damper Motor	5	PM2.5 Sensor
2	Left Mix Damper Motor	6	Right Mix Damper Motor
3	Air Quality Sensor	7	Speed Regulation Module
4	Inner/Outer Circulation Damper Motor		

2.2 Rear HVAC Assembly

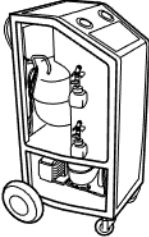
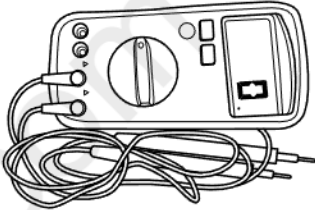


N20098

1	Roof Air Duct Assembly - Middle	5	Rear A/C Controller Assembly
2	Roof Left Duct Assembly	6	Rear A/C Mode Damper Motor
3	Roof Right Air Duct Assembly	7	Rear A/C Temperature Adjustment Motor
4	Rear HVAC Assembly	8	Third Row Left Air Duct

3 Tools

3.1 General Tools

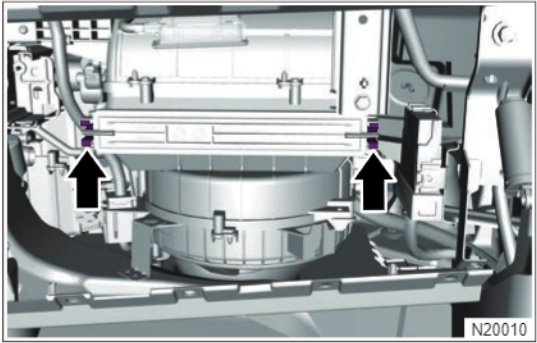
Tool Name	Tool Drawing
Refrigerant Recycling Machine	 RCH004606
Digital Multimeter	 RCH0002006

4 On-Vehicle Service

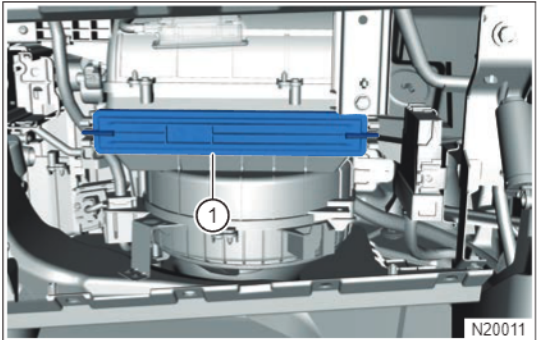
4.1 Replacement of A/C Element

■ Removal

- (1) Remove the glove box assembly.
- (2) Press and hold 2 clips on A/C element protector cover.



- (3) Remove the A/C element protector cover (1).



- (4) Remove the A/C element assembly from air inlet position on upper side of blower.

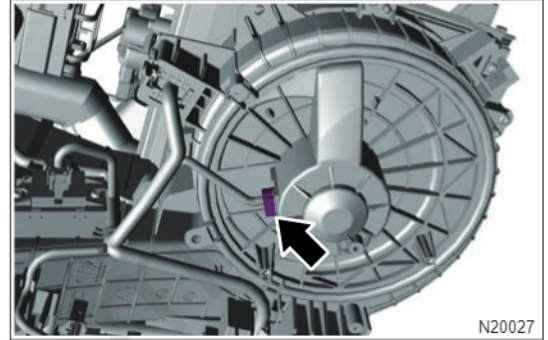
■ Installation

- (1) Install the A/C element assembly to air inlet position on upper side of blower.
- (2) Install the A/C element protector cover.
- (3) Install the glove box assembly.

4.2 Replacement of Front Blower Assembly

■ Removal

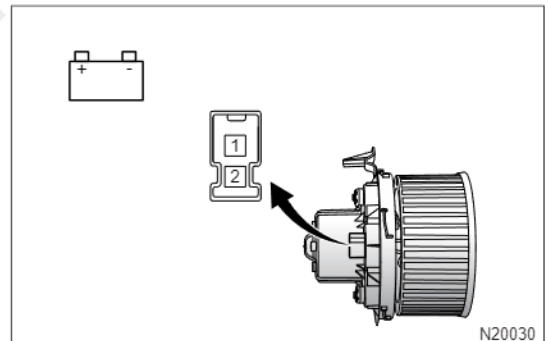
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Disconnect the blower assembly connector.



- (4) Disengage the clip.
- (5) Rotate and remove the blower assembly.

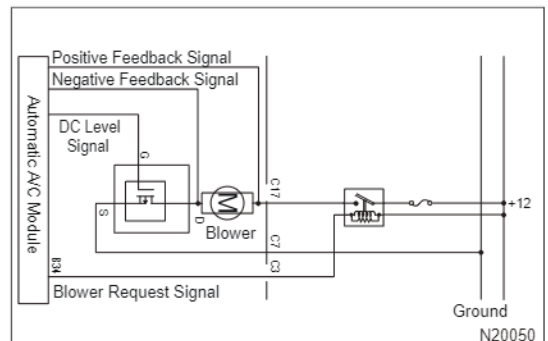
■ Inspection

- (1) Remove the blower assembly.
- (2) Connect the positive (+) battery lead to terminal 1 and negative (-) battery lead to terminal 2. Check that the blower motor operates smoothly.



■ Signal Inspection

- (1) Check if relay is damaged.



- (2) Check for 12 V power supply.
- (3) Check for blower request signals.
- (4) Check for DC level signal.

■ Installation

- (1) Rotate and install blower assembly, and install clips in place.
- (2) Connect the negative battery cable.

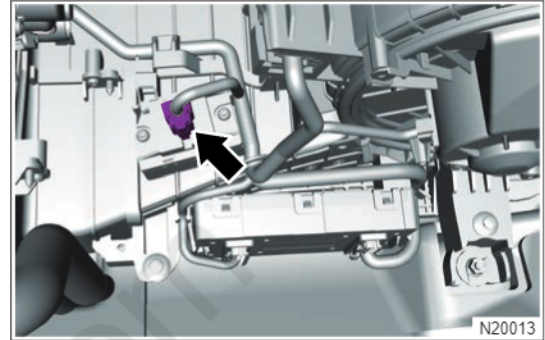
4.3 Replacement of Front Blower Speed Regulation Module

■ Removal

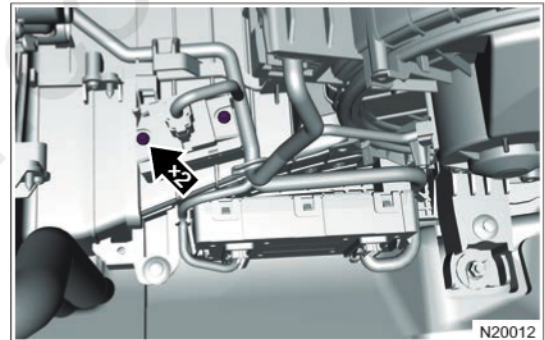
Warning

- During normal operation, blower speed regulation module may be very hot. Turn off blower and wait for a few minutes to cool it before diagnosing or servicing, in order to avoid burns.
- **DO NOT** operate blower assembly when removing the blower speed regulation module from vehicle. Failure to do so may result in damage to the blower assembly.

- (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 blower speed regulation module connector.



- (5) Remove 2 fixing screws from blower speed regulation module.
- (6) Remove the blower speed regulation module assembly.



■ Installation

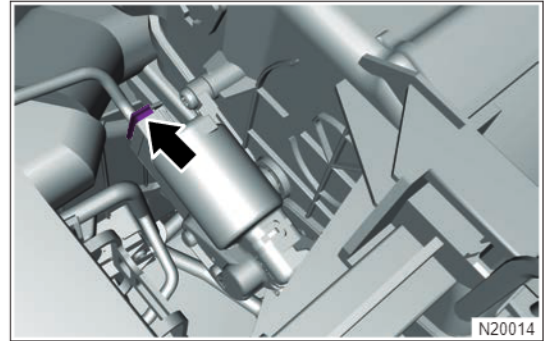
- (1) Install the blower speed regulation module assembly to a proper position of HVAC.
- (2) Install 2 fixing screws to blower speed regulation module.
- (3) Install the blower speed regulation module connector.
- (4) Install the glove box assembly.
- (5) Connect the negative battery cable.
- (6) Connect diagnostic tester, read and clear DTCs.

4.4 Replacement of Inner/Outer Circulation Damper Motor

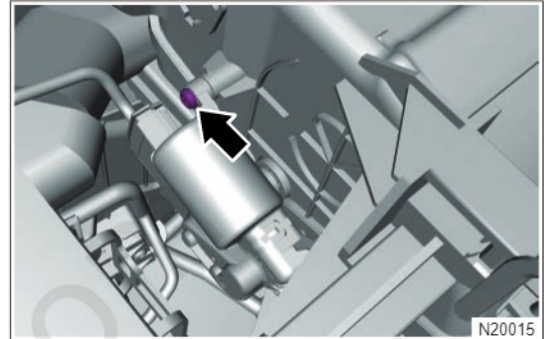
■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.

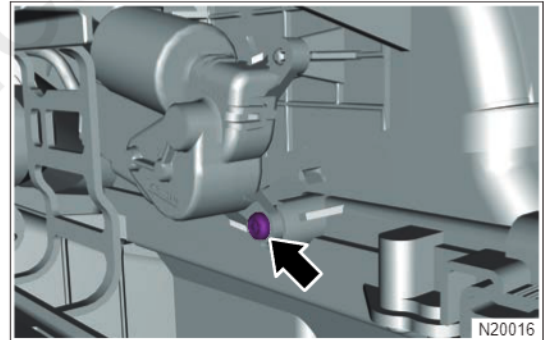
- (4) Disconnect the inner/outer circulation damper motor connector.



- (5) Remove 1 fixing screw above inner/outer circulation damper motor.



- (6) Remove 1 fixing screw under inner/outer circulation damper motor.



- (7) Remove the inner/outer circulation damper motor.

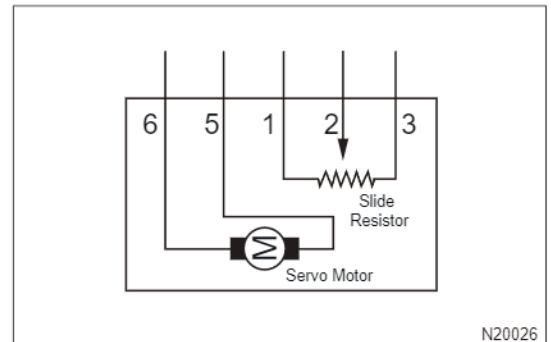
■ Inspection

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

- (1) Use ohm band of digital multimeter.

Terminal 1 - Terminal 2	3.83 K Ω
Terminal 2 - Terminal 3	1.79 K Ω
Terminal 1 - Terminal 3	Terminal 1 - Terminal 2 Resistance + Terminal 2 - Terminal 3 Resistance = 4.6 K Ω
Terminal 5 - Terminal 6	50 Ω



- (2) Signal inspection.
 - 1) Insert the inner/outer circulation damper motor connector.
 - 2) Turn ignition switch to ON.
 - 3) Start the engine, turn on A/C inner/outer circulation adjustment button.
 - 4) Using voltage band of multimeter, measure terminal 2 signal voltage. As the inner/outer circulation adjust button operates, the signal voltage changes.

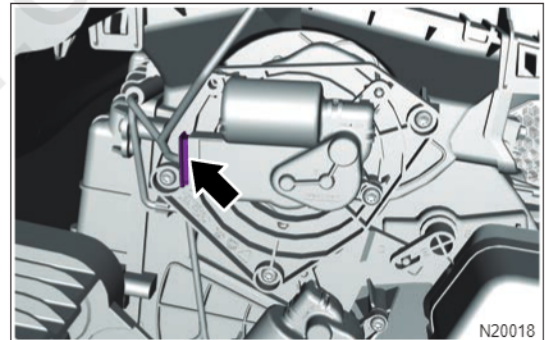
■ Installation

- (1) Install inner/outer circulation damper motor to a proper position of HVAC.
- (2) Install 1 fixing screw under inner/outer circulation damper motor.
- (3) Install 1 fixing screw above inner/outer circulation damper motor.
- (4) Install the inner/outer circulation damper motor connector.
- (5) Install the instrument panel assembly.
- (6) Connect the negative battery cable.

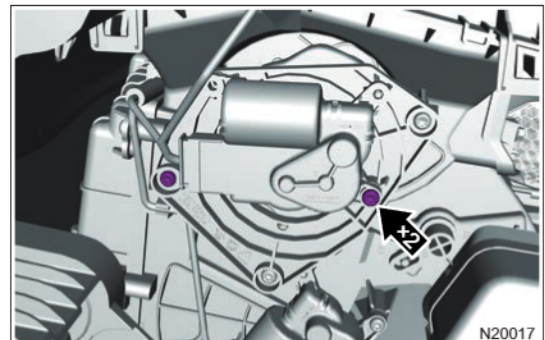
4.5 Replacement of Mode Damper Motor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Disconnect the mode damper motor connector.



- (5) Remove 2 fixing screws from mode damper motor assembly.



- (6) Remove the mode damper motor.

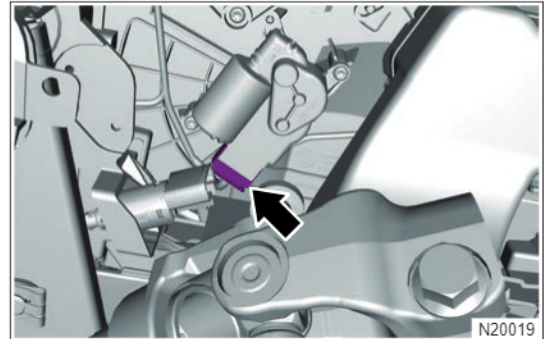
■ Installation

- (1) Install mode damper motor to a proper position of HVAC.
- (2) Install 2 fixing screws to mode damper motor assembly.
- (3) Connect the mode damper motor connector.
- (4) Install the instrument panel assembly.
- (5) Connect the negative battery cable.

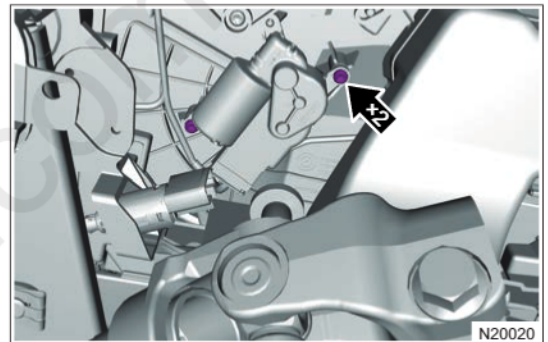
4.6 Replacement of Left Mix Damper Motor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Disconnect the left mix damper motor connector.



- (5) Remove 2 fixing screws from left mix damper motor assembly.



- (6) Remove the left mix damper motor.

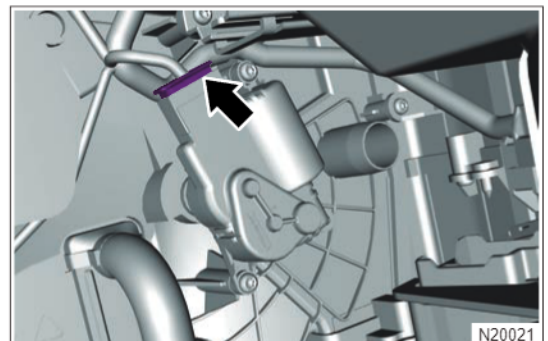
■ Installation

- (1) Install left mix damper motor to a proper position of HVAC.
- (2) Install 2 fixing screws to left mix damper motor.
- (3) Install the left mix damper motor connector.
- (4) Install the instrument panel assembly.
- (5) Connect the negative battery cable.

4.7 Replacement of Right Mix Damper Motor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Disconnect the right mix damper motor connector.
- (5) Remove 2 fixing screws from right mix damper motor.



- (6) Remove the right mix damper motor.

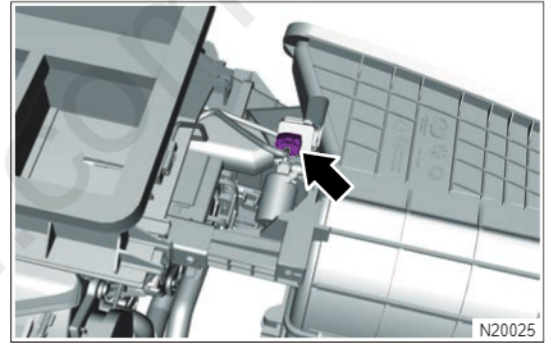
■ Installation

- (1) Install right mix damper motor to a proper position of HVAC.
- (2) Install 2 fixing screws to right mix damper motor.
- (3) Connect the right mix damper motor connector.
- (4) Install the instrument panel assembly.
- (5) Connect the negative battery cable.

4.8 Replacement of Air Quality Sensor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Disconnect air quality sensor connector, and rotate and remove air quality sensor.



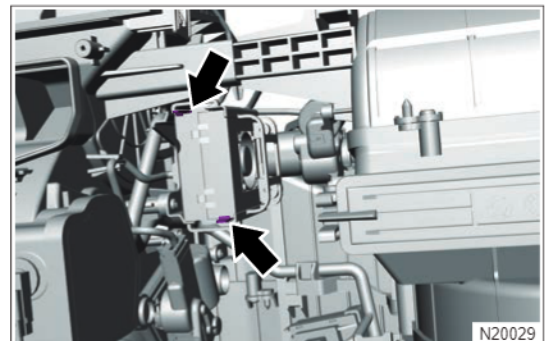
■ Installation

- (1) Rotate and install the air quality sensor.
- (2) Connect the air quality sensor.
- (3) Install the instrument panel assembly.

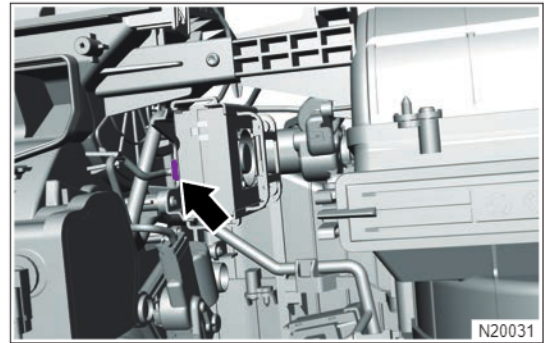
4.9 Replacement of Inside and Outside PM2.5 Sensor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the instrument panel assembly.
- (4) Detach outside PM2.5 sensor fixing clip and remove outside PM2.5 sensor.



- (5) Disconnect inside PM2.5 sensor connector, and remove PM2.5 sensor.



■ Installation

- (1) Connect the PM2.5 sensor connector.
- (2) Install inside and outside PM2.5 sensor and secure clip.
- (3) Install the instrument panel assembly.
- (4) Connect the negative battery cable.

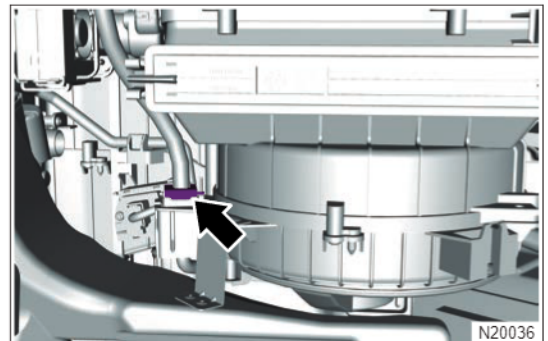
4.10 Replacement of HVAC Assembly

■ Removal

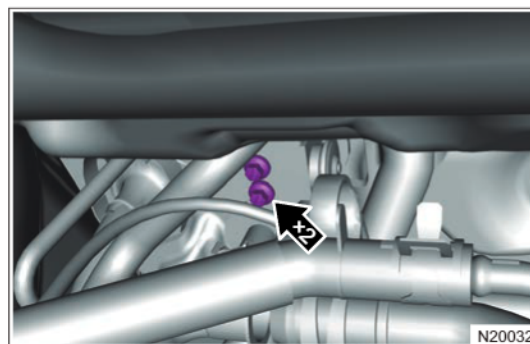
⚠ Warning

- **Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.**
- **Be careful not to damage hoses during removal and installation.**
- **Always keep work area in good ventilation.**
- **Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.**

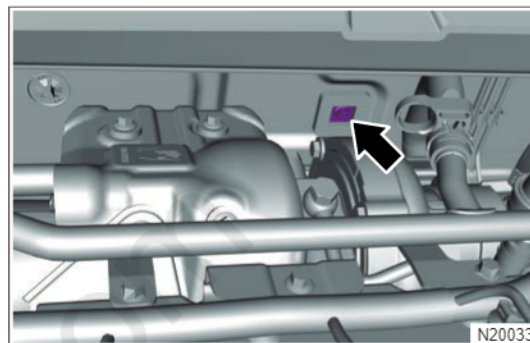
- (1) Recover the refrigerant from A/C system.
- (2) Turn off all electrical equipment and ENGINE START STOP switch.
- (3) Disconnect the negative battery cable.
- (4) Remove the driver airbag.
- (5) Remove the steering wheel assembly.
- (6) Remove the auxiliary fascia console assembly.
- (7) Remove the instrument panel body assembly.
- (8) Remove the instrument panel crossmember assembly.
- (9) Disconnect HVAC wire harness and interior wire harness.



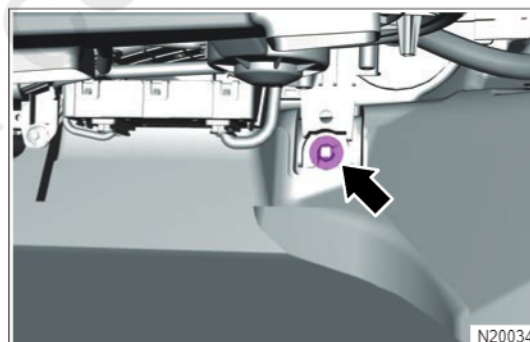
- (10) Remove fixing bolt between A/C high/low pressure line and expansion valve.



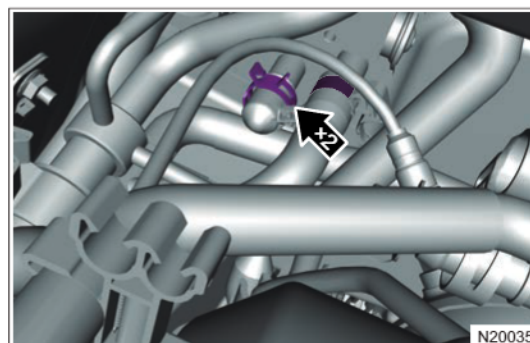
- (11) Remove fixing bolt from HVAC engine compartment.



- (12) Remove fixing bolt from HVAC assembly.



- (13) Using snap spring pliers, disengage fixing clamp from heating inlet and outlet hoses to detach the inlet and outlet hoses.

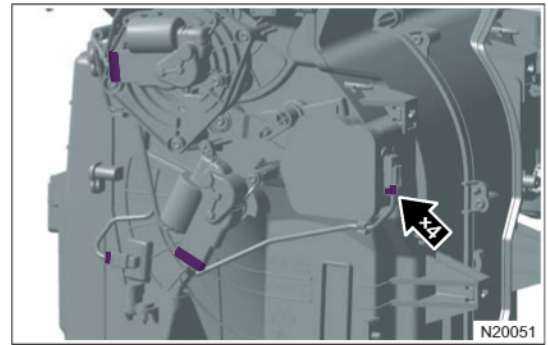


- (14) Carefully remove HVAC assembly from cabin.

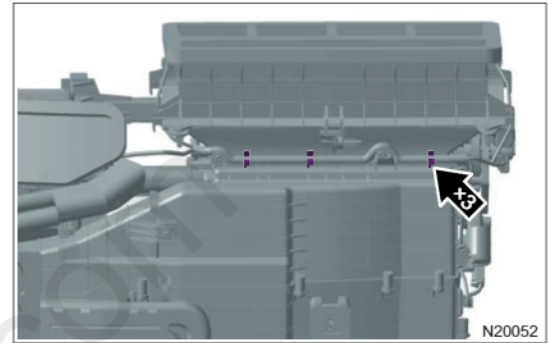
■ Disassembly

- (1) Remove the blower assembly.
- (2) Remove the blower speed regulation module.
- (3) Remove the inner/outer circulation damper motor.
- (4) Remove the left mix damper servo motor.
- (5) Remove the mode damper motor.
- (6) Remove the right mix damper motor.
- (7) Remove the A/C element assembly.

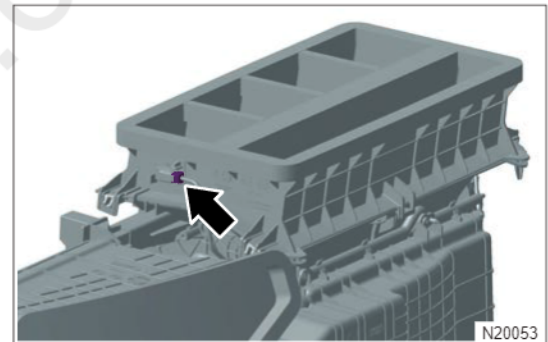
- (8) Remove the inner/outer damper set.
- (1) Disconnect the A/C wire harness connectors.



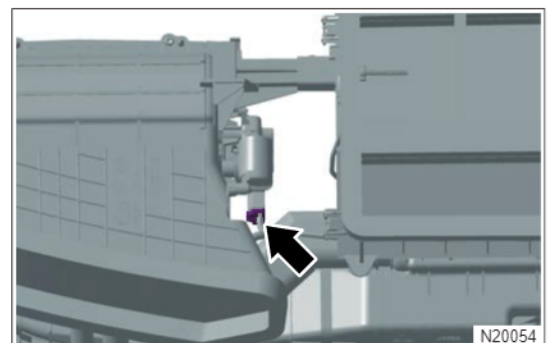
- (2) Disengage the wire harness clips.



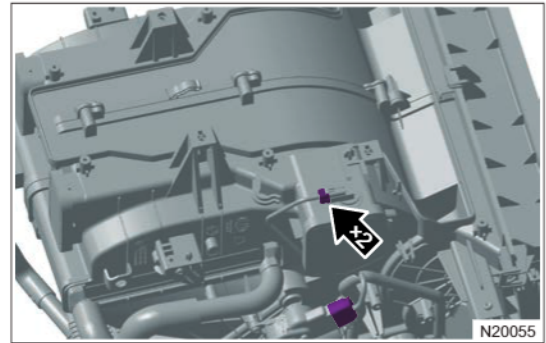
- (3) Disconnect the A/C wire harness connector.



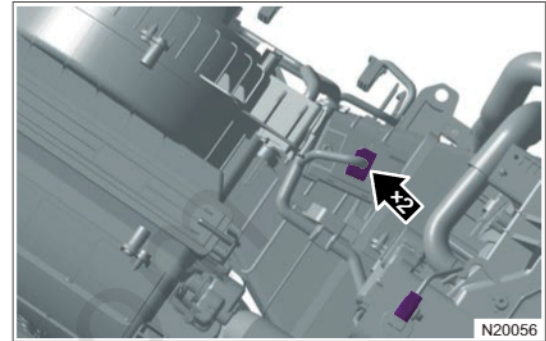
- (4) Disconnect the A/C wire harness connector.



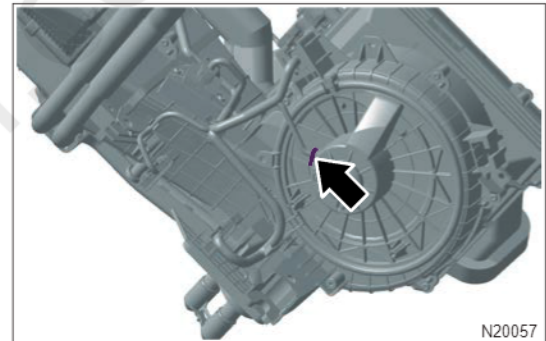
- (5) Disconnect the A/C wire harness connectors.



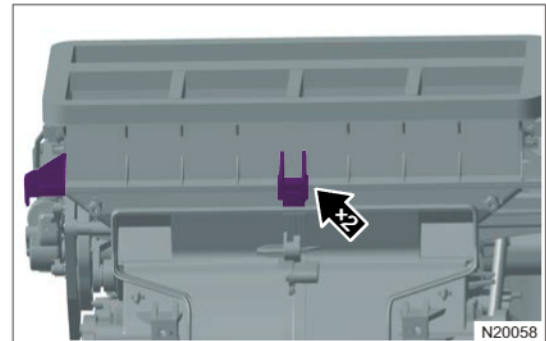
- (6) Disconnect the A/C wire harness connectors.



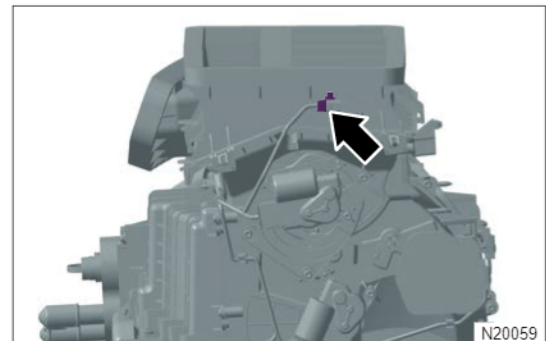
- (7) Disconnect the A/C wire harness connector.



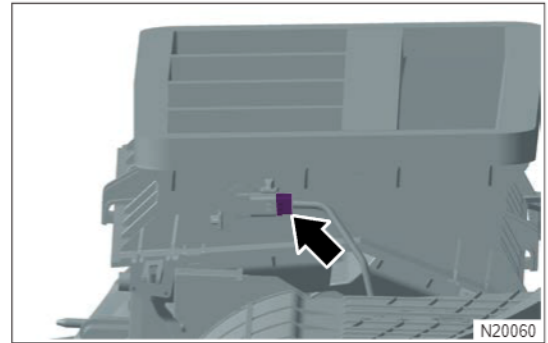
- (8) Disengage the air duct clips.



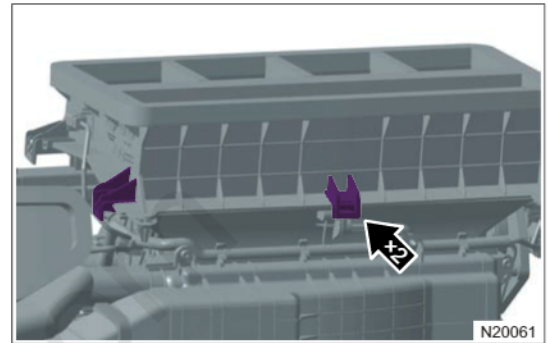
- (9) Disconnect the air duct temperature sensor connector.



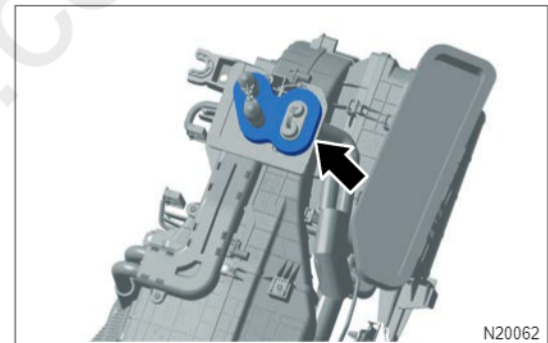
(10) Disconnect the air duct temperature sensor connector.



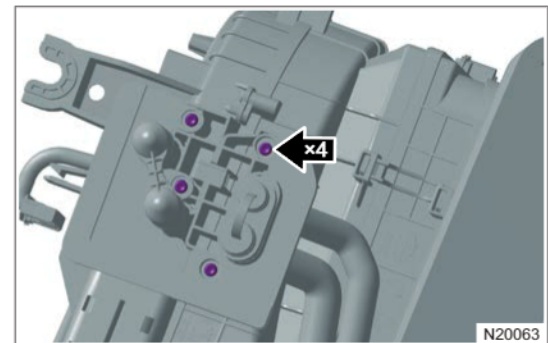
(11) Disengage the air duct clips.



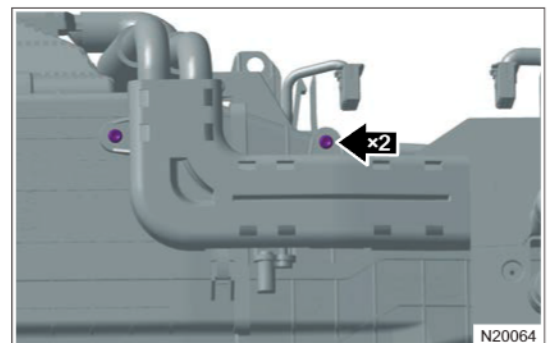
(12) Disengage the sponge.



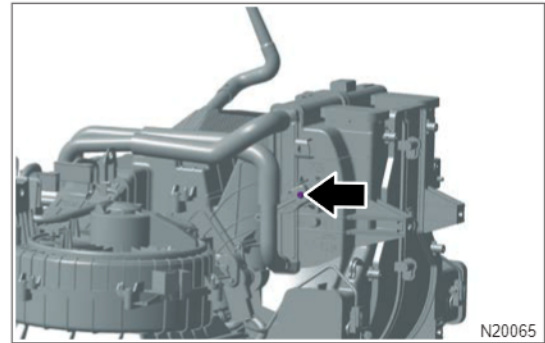
(13) Remove 4 fixing screws.



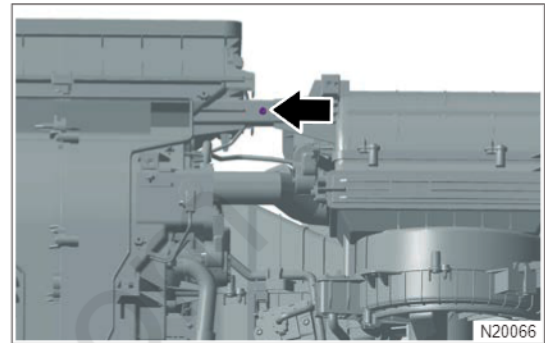
(14) Remove 2 fixing screws.



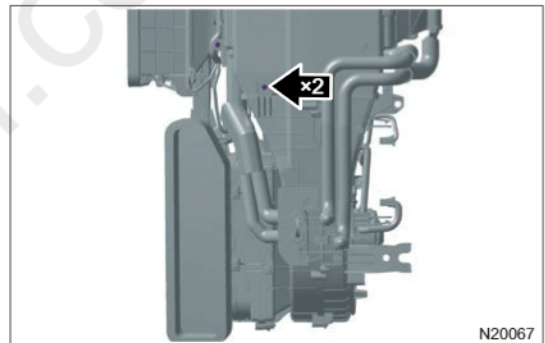
(15) Remove 1 fixing screw.



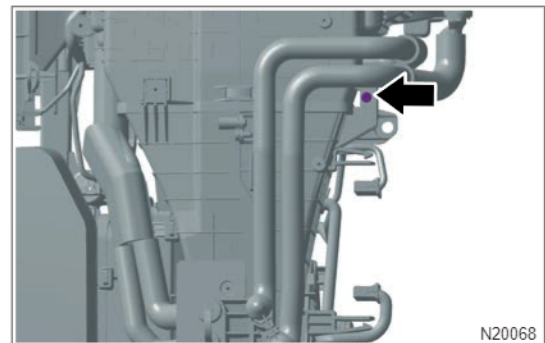
(16) Remove 1 fixing screw.



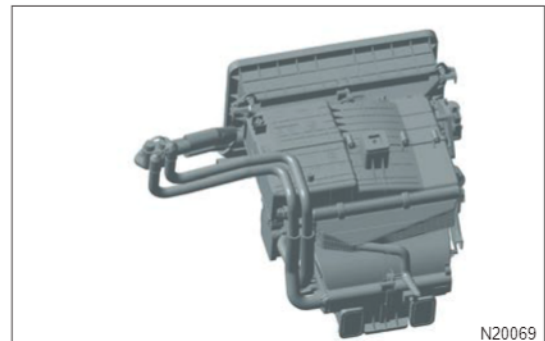
(17) Remove 2 fixing screws.



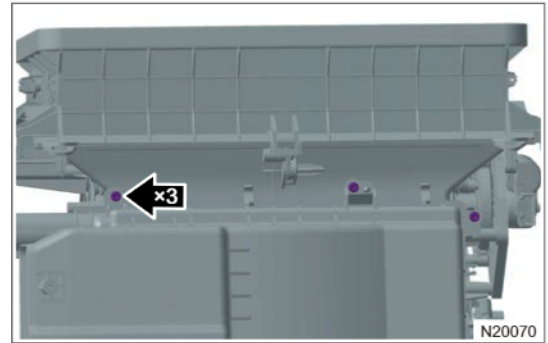
(18) Remove 1 fixing screw.



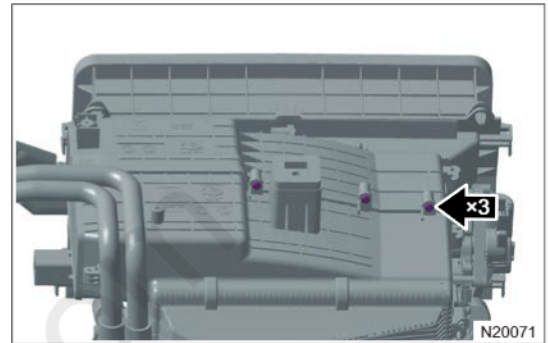
(19) Separate the evaporator assembly.



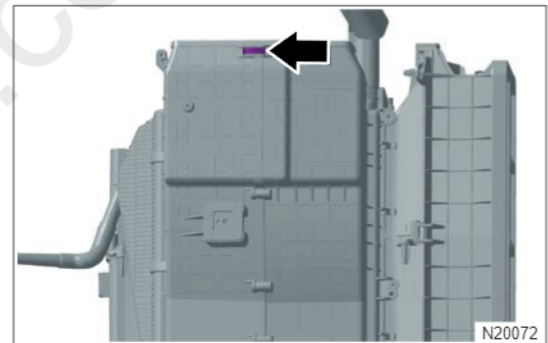
(20) Remove 3 fixing screws.



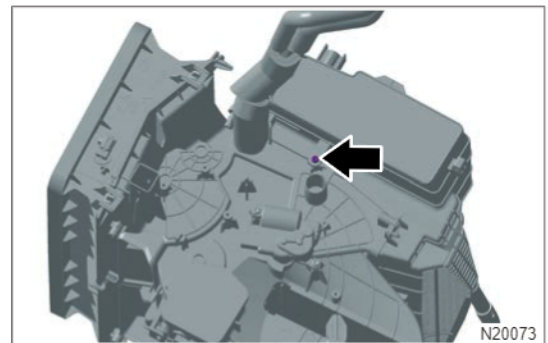
(21) Remove 3 fixing screws.



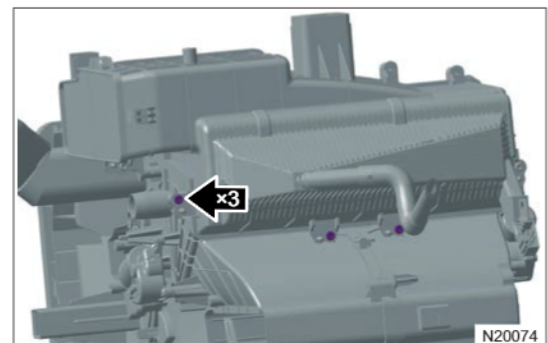
(22) Remove the spring clip.



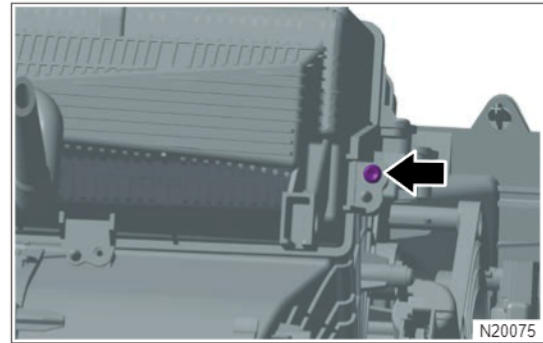
(23) Remove 1 fixing screw.



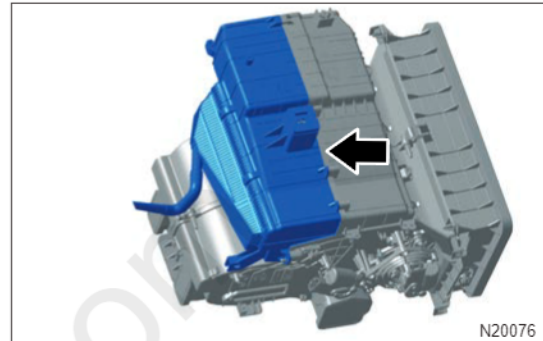
(24) Remove 3 fixing screws.



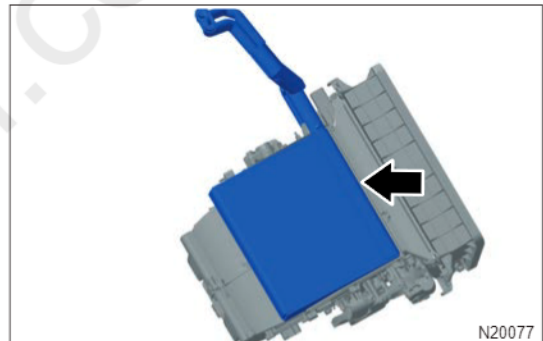
(25) Remove 1 fixing screw.



(26) Remove the evaporator cover.



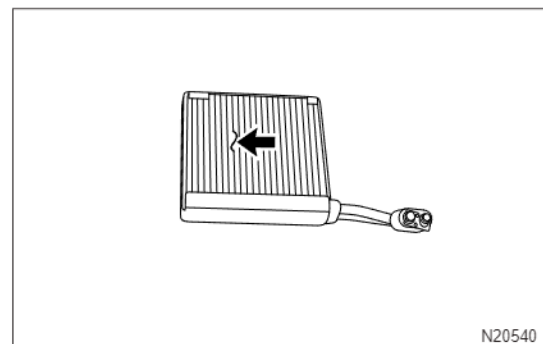
(27) Remove the evaporator assembly.



■ Inspection

Inspection of Evaporator Core Assembly

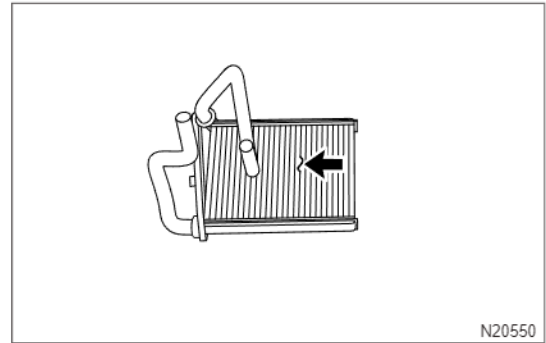
- (1) Check if evaporator core assembly is cracked, damaged and leaked. If any problem is found, replace the evaporator core assembly.
- (2) Check fin for bends.
- (1) If any fin is bent, carefully straighten it with a screwdriver or pliers.



Inspection of Heater Core Assembly

- (1) Check if heater core assembly is cracked, damaged or leaked. Check if heater core assembly is cracked, damaged or leaked.
- (2) Check fin for bends.

- (1) If any fin is bent, carefully straighten it with a screwdriver or pliers.



Inspection of Damper Control Mechanism Assembly

- (1) Check if inner/outer circulation damper adjustment mechanism is stuck, deformed, damaged or if it has fallen out. Replace as necessary.
- (2) Check if mode damper adjustment mechanism is stuck, deformed, damaged or if it has fallen out. Replace as necessary.
- (3) Check if face/defrost damper set is stuck, deformed, damaged or if it has fallen out. Replace as necessary.

■ Assembly of HVAC Assembly

⚠ Caution

- If evaporator core is reused, do not insert evaporator temperature sensor into its original position. Insert it to a location that is 1 fin to the right or left of its previous location.
- During installation, apply a small amount of grease to contact surface of the inner/outer circulation damper adjustment mechanism to ensure that it can operate smoothly.
- During installation, apply a small amount of grease to contact surface of the mix damper adjustment mechanism set to ensure that it can operate smoothly.
- During installation, apply a small amount of grease to contact surface of the face damper adjustment mechanism to ensure that it can operate smoothly.
- During installation, apply a small amount of grease to contact surface of the defrost damper adjustment mechanism to ensure that it can operate smoothly.
- Always check that inner/outer circulation damper mechanism assembly operates normally after installation.
- Always check that mix damper mechanism assembly operates normally after installation.
- Always check that face damper mechanism assembly operates normally after installation.
- Always check that defrost damper mechanism assembly operates normally after installation.
- Tighten fixing bolts and nuts to specified torques.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- Be sure to recharge refrigerant and check for refrigerant leakage after installation.
- Be sure to recharge engine cooling system and check for coolant leakage after installation.

- (1) Install evaporator assembly to a proper position of HVAC.
- (2) Install the evaporator cover plate.
- (3) Install 1 fixing screw.
- (4) Install 3 fixing screws.
- (5) Install 1 fixing screw.
- (6) Install the spring clip.

- (7) Install 3 fixing screws.
- (8) Install 3 fixing screws.
- (9) Assemble the evaporator assembly.
- (10) Install 1 fixing screw.
- (11) Install 2 fixing screws.
- (12) Install 1 fixing screw.
- (13) Install 1 fixing screw.
- (14) Install 2 fixing screws.
- (15) Install 4 fixing screws.
- (16) Install the sponge.
- (17) Install the air duct clip.
- (18) Install the air duct temperature sensor connector.
- (19) Connect the air duct temperature sensor connector.
- (20) Install the air duct clip.
- (21) Connect the A/C wire harness connector.
- (22) Connect the wire harness clip.
- (23) Install the inner/outer damper set.
- (24) Install the A/C filter assembly.
- (25) Install the right mix damper motor.
- (26) Install the mode damper motor.
- (27) Install the left mix damper servo motor.
- (28) Install the inner/outer circulation damper motor.
- (29) Install the blower speed regulation module.
- (30) Install the blower assembly.

■ Installation

- (1) Install HVAC assembly into cabin and secure bolts.
- (2) Install heating inlet and outlet hoses and fixing clamp.
- (3) Install fixing bolt to HVAC assembly.

Torque: 9 ± 1 N m

- (4) Install fixing bolt to HVAC engine compartment.

Torque: 9 ± 1 N m

- (5) Install fixing bolt between A/C high/low pressure line and expansion valve.

Torque: 9 ± 1 N m

- (6) Connect HVAC wire harness and interior wire harness.
- (7) Install the instrument panel crossmember assembly.
- (8) Install the instrument panel body assembly.
- (9) Install the auxiliary fascia console assembly.
- (10) Install the steering wheel assembly.
- (11) Install the driver airbag.
- (12) Connect the negative battery cable.

4.11 Replacement of Roof Right Air Duct Assembly

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the roof assembly.

- (4) Remove 2 fixing screws from roof right air duct assembly.



- (5) Remove 2 fixing screws from roof right air duct assembly.



- (6) Remove the roof right air duct assembly.

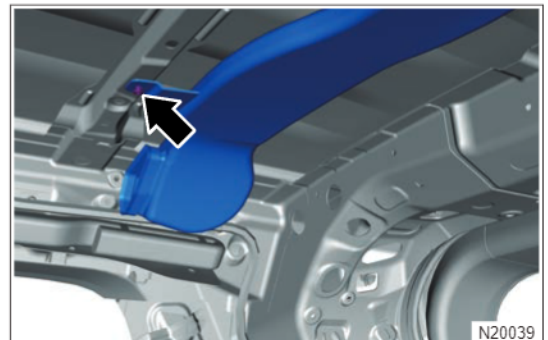
■ Installation

- (1) Install the roof right air duct assembly to a proper position of body.
- (2) Install 2 fixing screws to roof right air duct assembly.
- (3) Install 2 fixing screws to roof right air duct assembly.
- (4) Install the roof assembly.
- (5) Connect the negative battery cable.

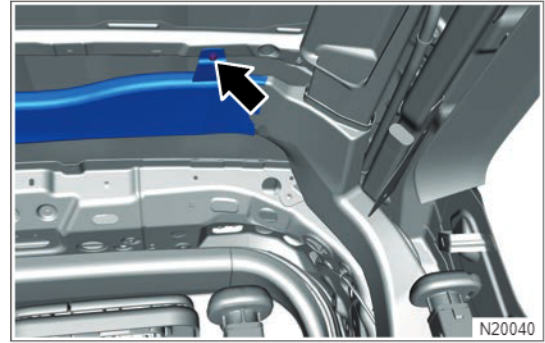
4.12 Replacement of Roof Air Duct Assembly - Middle

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the roof assembly.
- (4) Remove roof right air duct assembly.
- (5) Remove 1 fixing screw from roof air duct assembly - middle assembly.



- (6) Remove 1 fixing screw from roof air duct assembly - middle assembly.



- (7) Remove the roof air duct assembly - middle.

■ Installation

- (1) Install the roof air duct assembly - middle to a proper position of body.
- (2) Install 1 fixing screw to roof air duct assembly - middle assembly.
- (3) Install 1 fixing screw to roof air duct assembly - middle assembly.
- (4) Install the roof right air duct assembly.
- (5) Install the roof assembly.
- (6) Connect the negative battery cable.

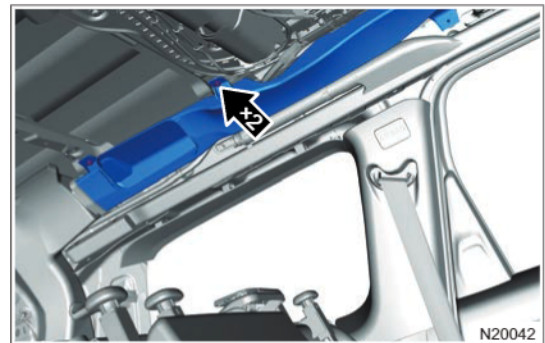
4.13 Replacement of Roof Left Air Duct Assembly

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the roof assembly.
- (4) Remove 2 fixing screws from roof left air duct assembly.



- (5) Remove 2 fixing screws from roof left air duct assembly.



- (6) Remove the roof left air duct assembly.

■ Installation

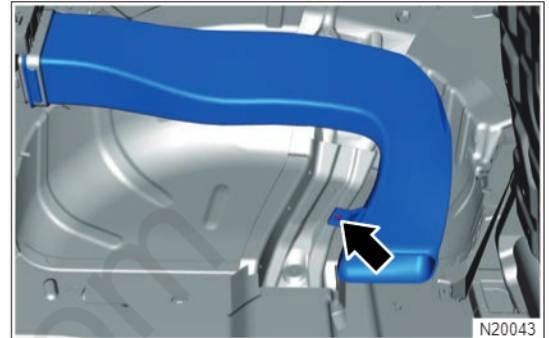
- (1) Install the roof left air duct assembly to a proper position of body.
- (2) Install 2 fixing screws to roof left air duct assembly.

- (3) Install the roof assembly.
- (4) Connect the negative battery cable.

4.14 Replacement of Third Row Left Air Duct

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the rear seat cushion assembly.
- (4) Remove 1 fixing screw from third row left air duct assembly.



- (5) Remove the third row left air duct assembly.

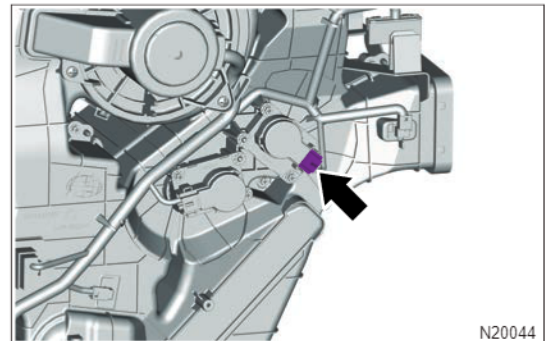
■ Installation

- (1) Install the third row left air duct assembly to a proper position of body.
- (2) Install 1 fixing screw to third row left air duct assembly.
- (3) Install the rear seat cushion assembly.
- (4) Connect the negative battery cable.

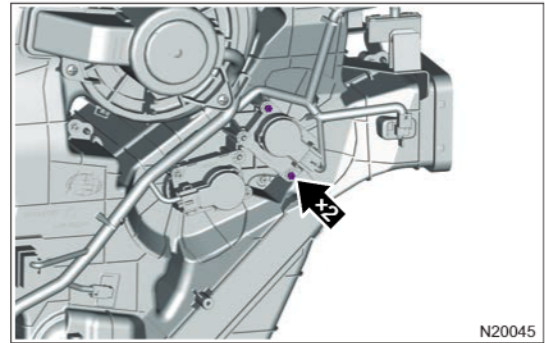
4.15 Replacement of Rear A/C Mode Damper Motor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the left luggage compartment protector body.
- (4) Disconnect the rear A/C mode damper motor wire harness connector.



- (5) Remove 2 fixing screws from rear A/C mode damper motor assembly.



- (6) Remove the rear A/C mode damper motor.

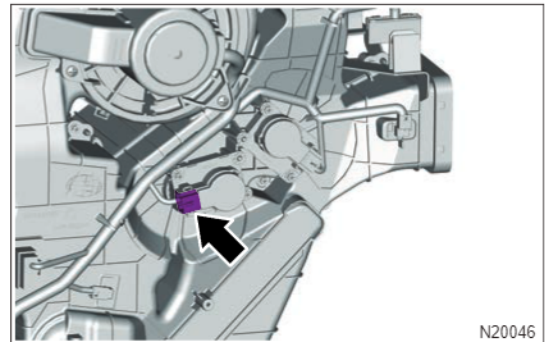
■ Installation

- (1) Install rear A/C mode damper motor to a proper position of rear HVAC.
- (2) Install 2 fixing screws to rear A/C mode damper motor assembly.
- (3) Connect the rear A/C mode damper motor wire harness connector.
- (4) Install the left luggage compartment protector body.
- (5) Connect the negative battery cable.

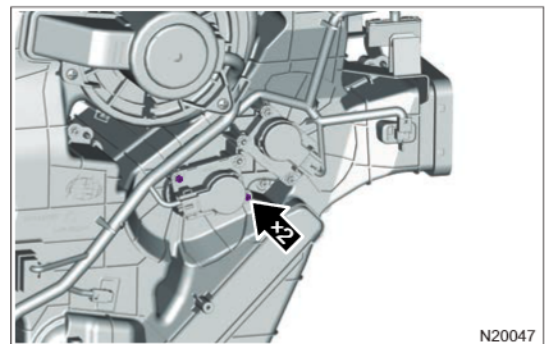
4.16 Rear A/C Temperature Adjustment Motor

■ Removal

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the left luggage compartment protector body.
- (4) Disconnect the rear A/C temperature adjustment motor wire harness connector.



- (5) Remove 2 fixing screws from rear A/C temperature adjustment motor assembly.



- (6) Remove the rear A/C temperature adjustment motor.

■ Installation

- (1) Install rear A/C temperature adjustment motor to a proper position of rear HVAC.
- (2) Install 2 fixing screws to rear A/C temperature adjustment motor assembly.
- (3) Connect the rear A/C temperature adjustment motor wire harness connector.
- (4) Install the left luggage compartment protector body.
- (5) Connect the negative battery cable.

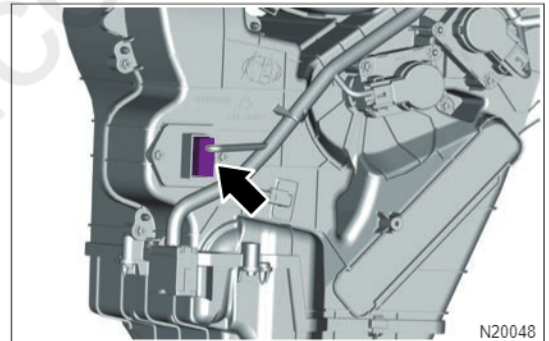
4.17 Rear Blower Speed Regulation Module

■ Removal

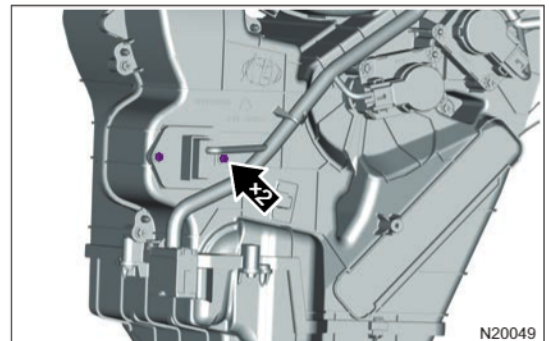
⚠ Warning

- During normal operation, blower speed regulation module may be very hot. Turn off blower and wait for a few minutes to cool it before diagnosing or servicing, in order to avoid burns.
- **DO NOT** operate blower assembly when removing the blower speed regulation module from vehicle. Failure to do so may result in damage to the blower assembly.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the left luggage compartment protector body.
- (4) Disconnect the rear blower speed regulation module wire harness connector.



- (5) Remove 2 fixing screws from rear blower speed regulation module.



- (6) Remove the rear blower speed regulation module.

■ Installation

- (1) Install the rear blower speed regulation module to a proper position of HVAC.
- (2) Install 2 fixing screws to rear blower speed regulation module.
- (3) Connect the rear blower speed regulation module wire harness connector.
- (4) Install the left luggage compartment protector body.
- (5) Connect the negative battery cable.

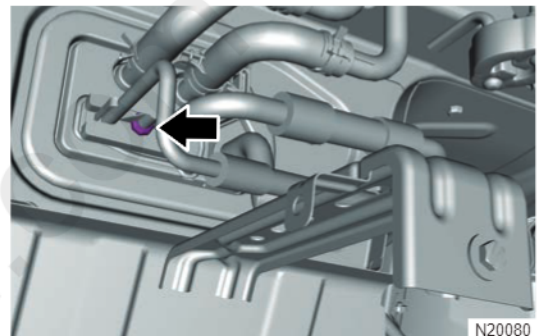
4.18 Rear HVAC Assembly

■ Removal

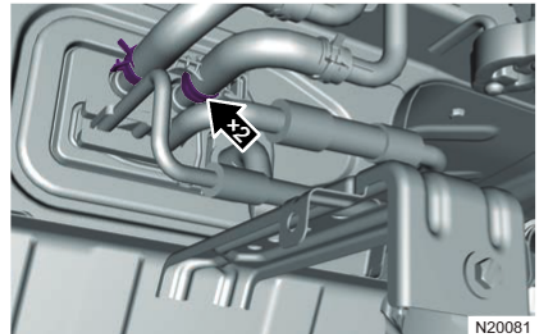
⚠ Warning

- **Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.**
- **Be careful not to damage hoses during removal and installation.**
- **Always keep work area in good ventilation.**
- **Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.**

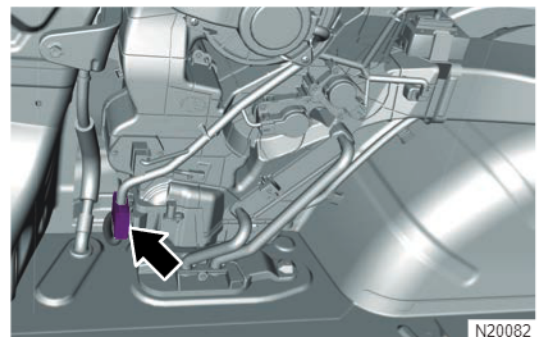
- (1) Recover the refrigerant from A/C system.
- (2) Turn off all electrical equipment and ENGINE START STOP switch.
- (3) Disconnect the negative battery cable.
- (4) Remove the left luggage compartment protector body.
- (5) Remove the C-pillar upper protector.
- (6) Remove fixing nut from expansion valve.



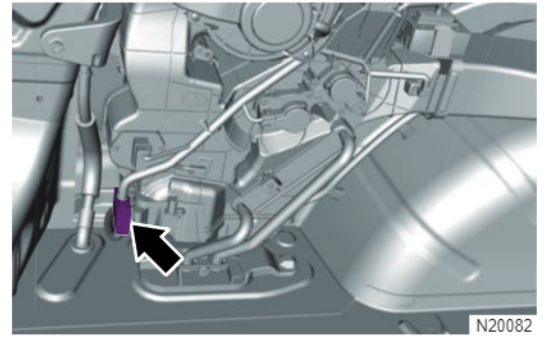
- (7) Using snap spring pliers, disengage fixing clamp from heating inlet and outlet hoses to detach the inlet and outlet hoses.



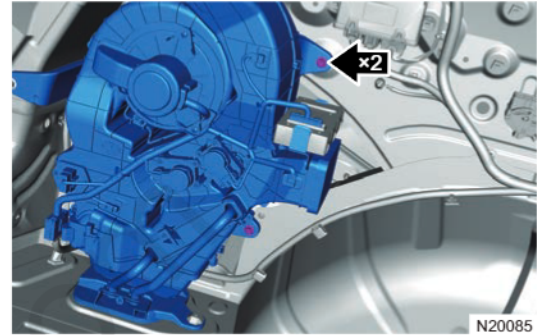
- (8) Disconnect the rear A/C wire harness connector.



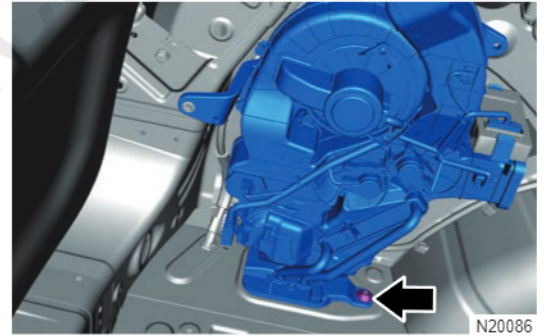
- (9) Remove fixing nut from the upper part of rear HVAC assembly.



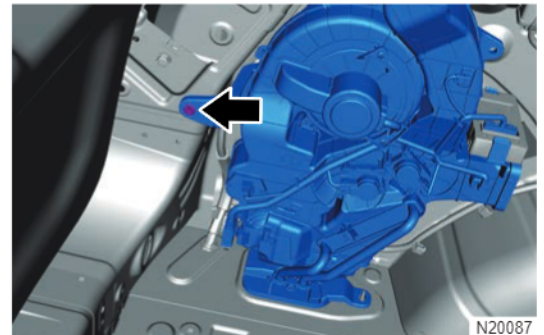
- (10) Remove fixing bolt from the right side of rear HVAC assembly.



- (11) Remove fixing nut from the lower part of rear HVAC assembly.



- (12) Remove fixing bolt from the left side of rear HVAC assembly.



- (13) Carefully remove rear HVAC assembly from back door.

■ Installation

- (1) Install the rear HVAC assembly to a proper position of body.
(2) Install fixing bolt on the left side of rear HVAC assembly.

Torque: 5 ± 1 N m

- (3) Install fixing nut to the lower part of rear HVAC assembly.

Torque: 5 ± 1 N m

- (4) Install fixing bolt on the right side of rear HVAC assembly.

Torque: 5 ± 1 N m

- (5) Install fixing nut to the upper part of rear HVAC assembly.

Torque: 5 ± 1 N m

- (6) Connect the rear A/C wire harness connector.

- (7) Connect the hose fixing clamp.

- (8) Install fixing nut to expansion valve.

- (9) Install the C-pillar upper protector.

- (10) Install the left luggage compartment protector body.

- (11) Install the negative battery cable.

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