General Information

SPECIFICATIONS

A/CON

ITEM		DIESEL	GASOLINE	
		2.5D	2.4G	3.5G
COMPRESSOR	TYPE	10 PA17C	←	←
	Oil type & Capacity	ND-OIL8 200cc	←	←
COMP.PULLEY	TYPE	7PK-TYPE	5PK-TYPE	4PK-TYPE
	PULLELY	Ø123	Ø125	Ø110
CONDENSER	TYPE	Corrugated	←	←
TRIPLE S/W (Dual pressure S/W)	High (Kg/cm²G)	32.0 ± 2.0	32.0 ± 2.0	←
	Medium (Kg/cm²G)	-	15.5 ± 1.3	←
	Low (Kg/cm²G)	2.0 ± 0.2	$2.3 \pm \begin{matrix}0.25\\0.30\end{matrix}$	←
EXPANSION Valve	TYPE	BLOCK	←	←
Refrigerant	TYPE	R-134a	←	←
	Capacity (g)	600 ± 25	←	←

Blower and Evaporator Unit

ITEM		MANUAL	AUTO
Fresh and Recirculation	Operating method	ACTUATOR	←
BLOWER	Rotating direction	Clockwise	←
	SPEED step	1 - 4 Speed	AUTO + 6 Speed
	SPEED control	RESISTOR	POWER TR & HI-RELAY
EVAPORATOR	TYPE	DRAWN CUP	←
	Temp. control type	THERMISTER	←
	A/C ON/OFF	OFF : 0±0.5°C, ON : 2.5±0.5°C	←

Heater unit

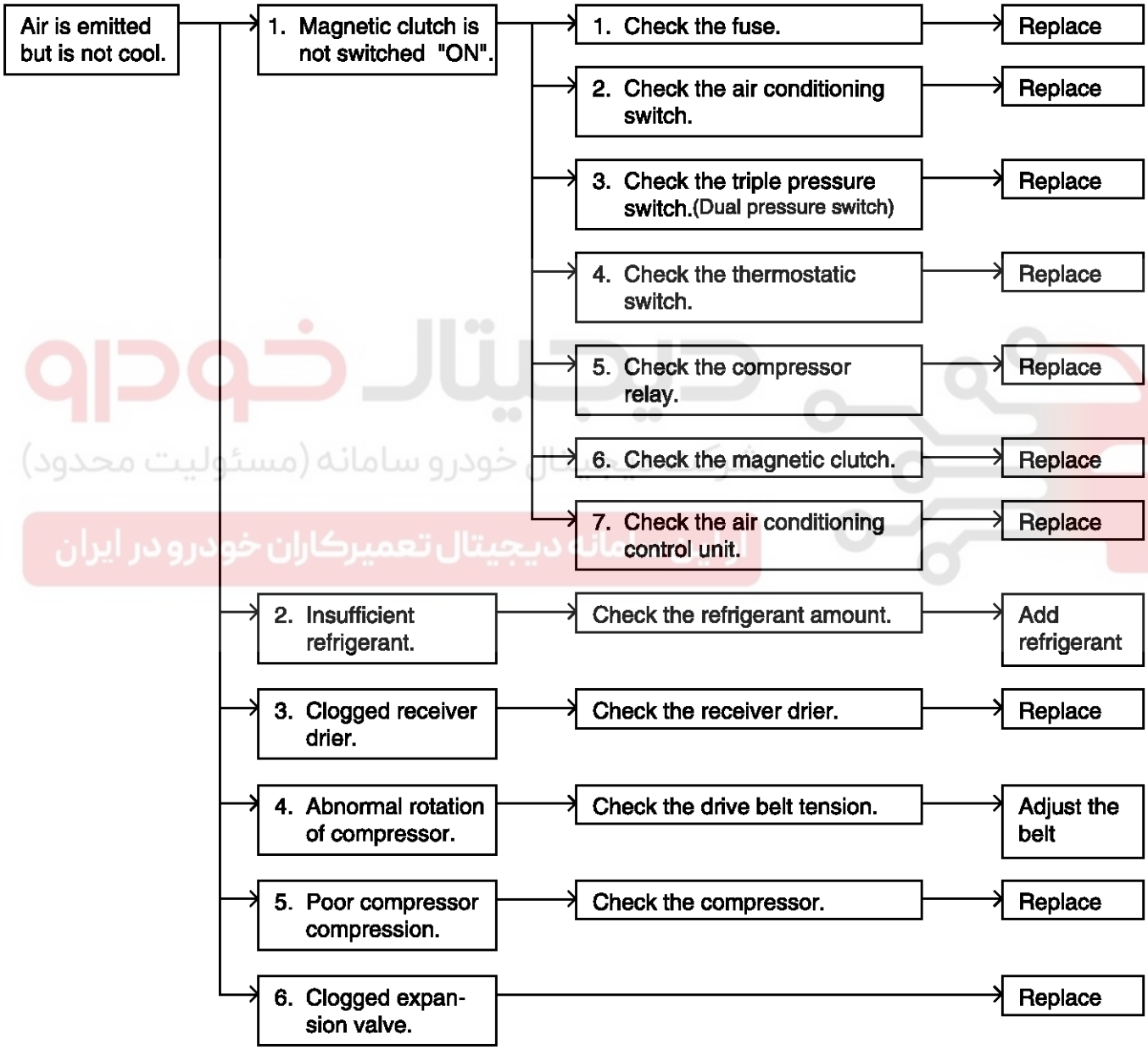
ITEM		MANUAL	AUTO
HEATER MODE Selection	TYPE	DIMPLED	←
	HEATING efficient area	325.4cm²	←
	Operating method	ACTUATOR	←
TEMP selection	Operating method	ACTUATOR	←

Control unit

ITEM	MANUAL	AUTO
INCAR SENSOR	X	O
AMBIENT SENSOR	X	O
PHOTO SENSOR	X	O
HUMIDITY SENSOR	X	O

TROUBLESHOOTING

MALFUNCTION CAUSES AND REMEDIES (Numbers Indicate checking/inspection order.)



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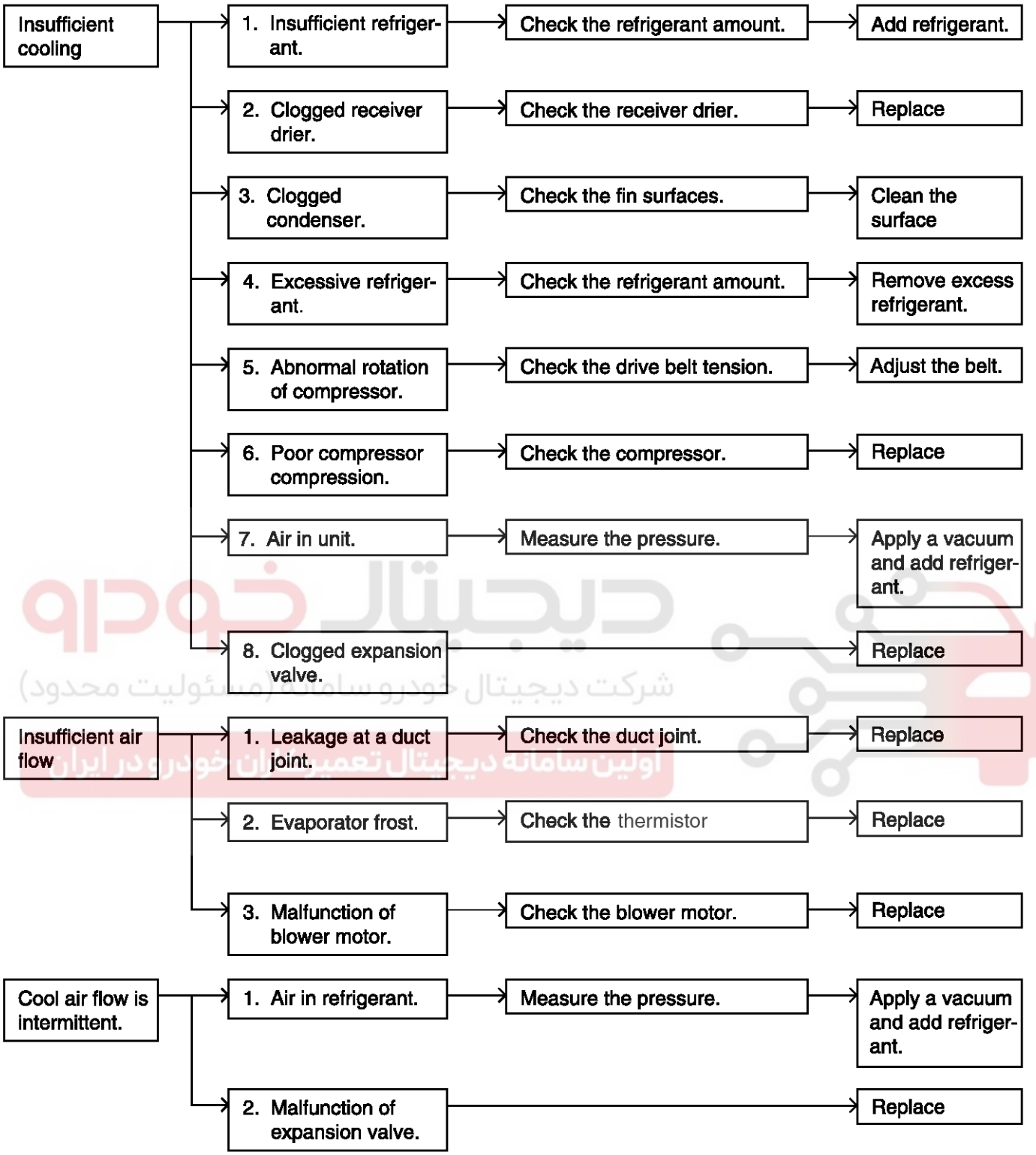

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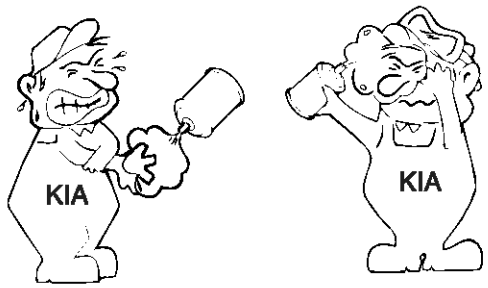
Air conditioning System

INSTRUCTIONS

WHEN HANDLING REFRIGERANT

1. R-134a liquid refrigerant is highly volatile. A drop on the skin of your hand could result in localized frostbite. When handling the refrigerant, be sure to wear gloves.
2. It is standard practice to wear goggles or glasses to protect your eyes, and gloves to protect your hands. If the refrigerant splashes into your eyes, wash them with clean water immediately.
3. The R-134a container is highly pressurized. Never leave it in a hot place, and check that the storage temperature is below 52℃ (126˚F)
4. An electronic leak detector should be used to check the system for refrigerant leakage. Bear in mind that the R-134a, upon coming into contact with flame, produces phosgene, a highly toxic gas.
5. Use only recommended the lubricant for R-134a systems. If lubricants other than the recommended one used, system failure may occur.
6. PAG lubricant absorbs moisture from the atmosphere at a rapid rate, therefore the following precautions must be observed:
   - When removing refrigerant components from a vehicle, cap immediately the components to prevent from the entry of moisture.
   - When installing refrigerant components to a vehicle, do not remove the cap until just before connecting the components.
   - Complete the connection of all refrigerant tubes and hoses without delay to prevent the A/C system from taking on moisture.
   - Use the recommended lubricant from a sealed container only.
7. If an accidental discharge in the system occurs, ventilate the work area before resuming service.



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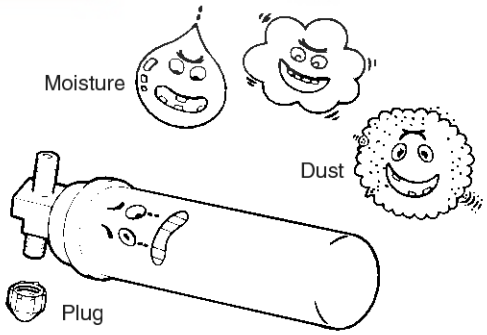
WHEN REPLACING PARTS ON A/C SYSTEM

1. Never open or loosen a connection before discharging the system.
2. Seal the open fittings of components with a cap or plug immediately to prevent intrusion of moisture or dust.
3. Do not remove the sealing caps from a replacement component until it is ready to be installed.
4. Before connecting an open fitting, always install a new sealing ring. Coat the fitting and seal with refrigerant oil before making the connection.

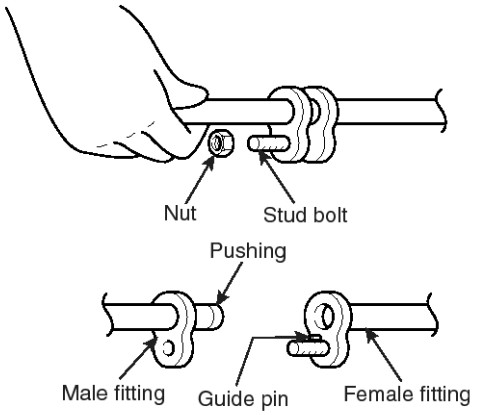


LQAC003B

WHEN INSTALLING CONNECTING PARTS

FLANGE WITH GUIDE PIN

Check the new O-ring for damage (use only the specified) and lubricate it using compressor oil. Tighten the nut to specified torque.



LQAC003C

Size	Tightening torque [N.m (kg.m, lbf .ft)]	
	General bolt, nut	
	4T	7T
M6	5-6 (0.5 - 0.6, 3.6 - 4. 3)	9-11 (0.9 - 1.1, 6.5 - 7. 9)a
M8	12-14 (1.2 - 1.4, 8.7 - 1 0)	20 - 26 (2.0 - 2.6, 14 - 18)
M10	25 - 28 (2.5 - 2.8, 18 - 20)	45 - 55 (4.5 - 5.5, 32 - 39)
Size	Flange bolt, nut	
	4T	7T
M6	5-7 (0.5 - 0.7, 3.6 - 5. 0)	8-12 (0.8 - 1.2, 5.8 - 8. 6)
M8	10-15 (1.0 - 1.5, 7 - 10)	19 - 28 (1.9 - 2.8, 14 - 20)
M10	21 - 31 (2.1 - 3.1, 15 - 22)	39 - 60 (3.9 - 6.0, 28 - 43)

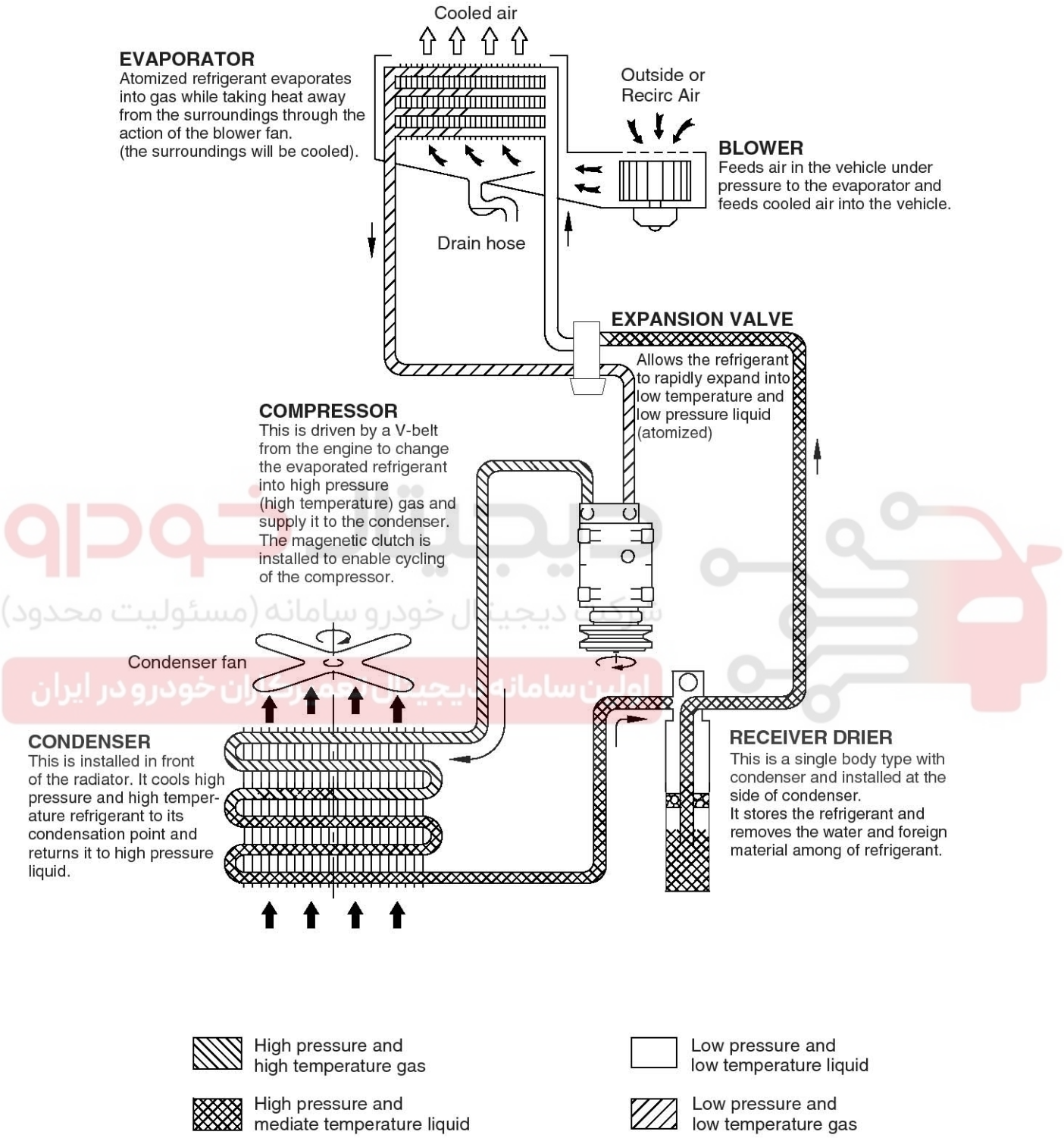
HANDLING TUBING AND FITTINGS

The internal parts of the refrigeration system will remain in a state of chemical stability as long as pure moisture-free refrigerant and refrigerant oil are used. Abnormal amounts of dirt, moisture or air can upset the chemical stability and cause problems or serious damage.

THE FOLLOWING PRECAUTIONS MUST BE OBSERVED

1. When it is necessary to open the refrigeration system, have everything you will need to service the system ready so the system will not be left open any longer than necessary.
2. Cap or plug all lines and fittings as soon as they are opened to prevent the entrance of dirt and moisture.
3. All lines and components in parts stock should be capped or sealed until they are ready to be used.
4. Never attempt to rebind formed lines to fit. Use the correct line for the installation you are servicing.
5. All tools, including the refrigerant dispensing manifold, the gauge set manifold and test hoses, should be kept clean and dry.

REFRIGERATION CYCLE



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REFRIGERANT SYSTEM SERVICE BASICS

REFRIGERANT RECOVERY

Use only service equipment that is U.L-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a(R-134a) from the air conditioning system.

⚠CAUTION

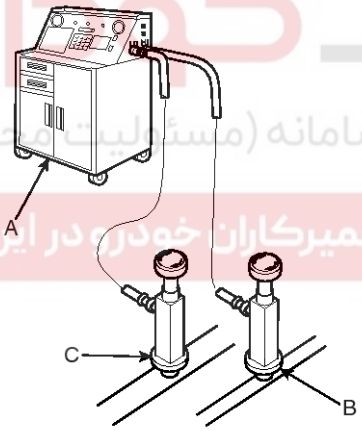
- **Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.**
- **Be careful when connecting service equipment.**
- **Do not breathe refrigerant or vapor.**

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant

   Recovery/Recycling/Charging System (A) to the high-pressure service port (B) and the low-pressure service port (C) as shown, following the equipment manufacturer's instructions.



EQKE004A

2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

SYSTEM EVACUATION

Use only service equipment that is U.L-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a(R-134a) from the air conditioning system.

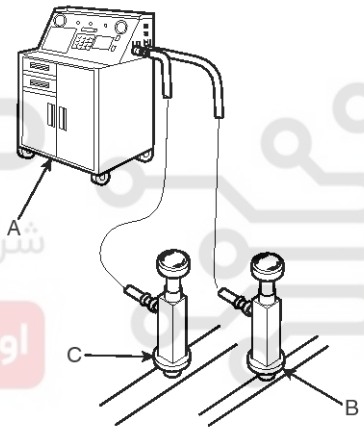
⚠CAUTION

- **Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.**
- **Be careful when connecting service equipment.**
- **Do not breathe refrigerant or vapor.**

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using an R-134a refrigerant Recovery/Recycling/Charging System. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect an R-134a refrigerant Recovery/Recycling/Charging System (A) to the high-pressure service port (B) and the low-pressure service port (C) as shown, following the equipment manufacturer's instructions.



EQKE004A

3. If the low-pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 10 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see Leak Test.).
4. Remove the low pressure valve from the low-pressure service port.

SYSTEM CHARGING

Use only service equipment that is U.L-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a(R-134a) from the air conditioning system.

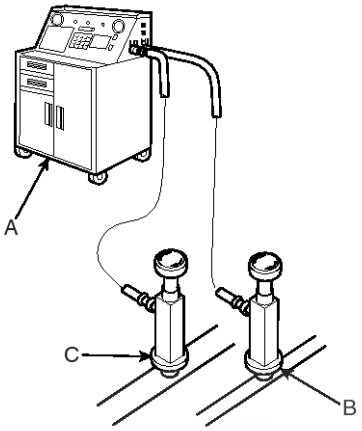
⚠CAUTION

- **Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.**
- **Be careful when connecting service equipment.**
- **Do not breathe refrigerant or vapor.**

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant Recovery/Recycling/Charging System (A) to the high-pressure service port (B) as shown, following the equipment manufacturer's instructions.



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2. Add the same amount of new refrigerant oil to system that was removed during recovery. Use only specified refrigerant oil. Charge the system with 21.16 ± 0.85oz (600 ± 25g) of R-134a refrigerant. Do not overcharge the system the compressor will be damaged.

REFRIGERANT LEAK TEST

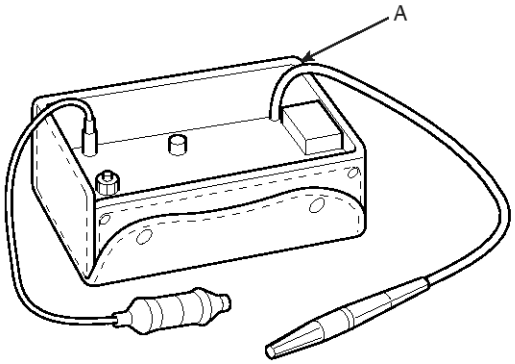
Always conduct a leak test with an electronic leak detector whenever leakage or refrigerant is suspected and when conducting service operations which are accompanied by disassembly or loosening or connection fittings.

NOTICE

In order to use the leak detector properly, read the manual supplied by the manufacturer.

If a gas leak is detected, proceed as follows:

1. Check the torque on the connection fittings and, if too loose, tighten to the proper torque. Check for gas leakage with a leak detector (A).
2. If leakage continues even after the fitting has been tightened, discharge the refrigerant from the system, disconnect the fittings, and check their seating faces for damage. Always replace, even if the damage is slight.
3. Check the compressor oil and add oil if required.
4. Charge the system and recheck for gas leaks. If no leaks are found, evacuate and charge the system again.



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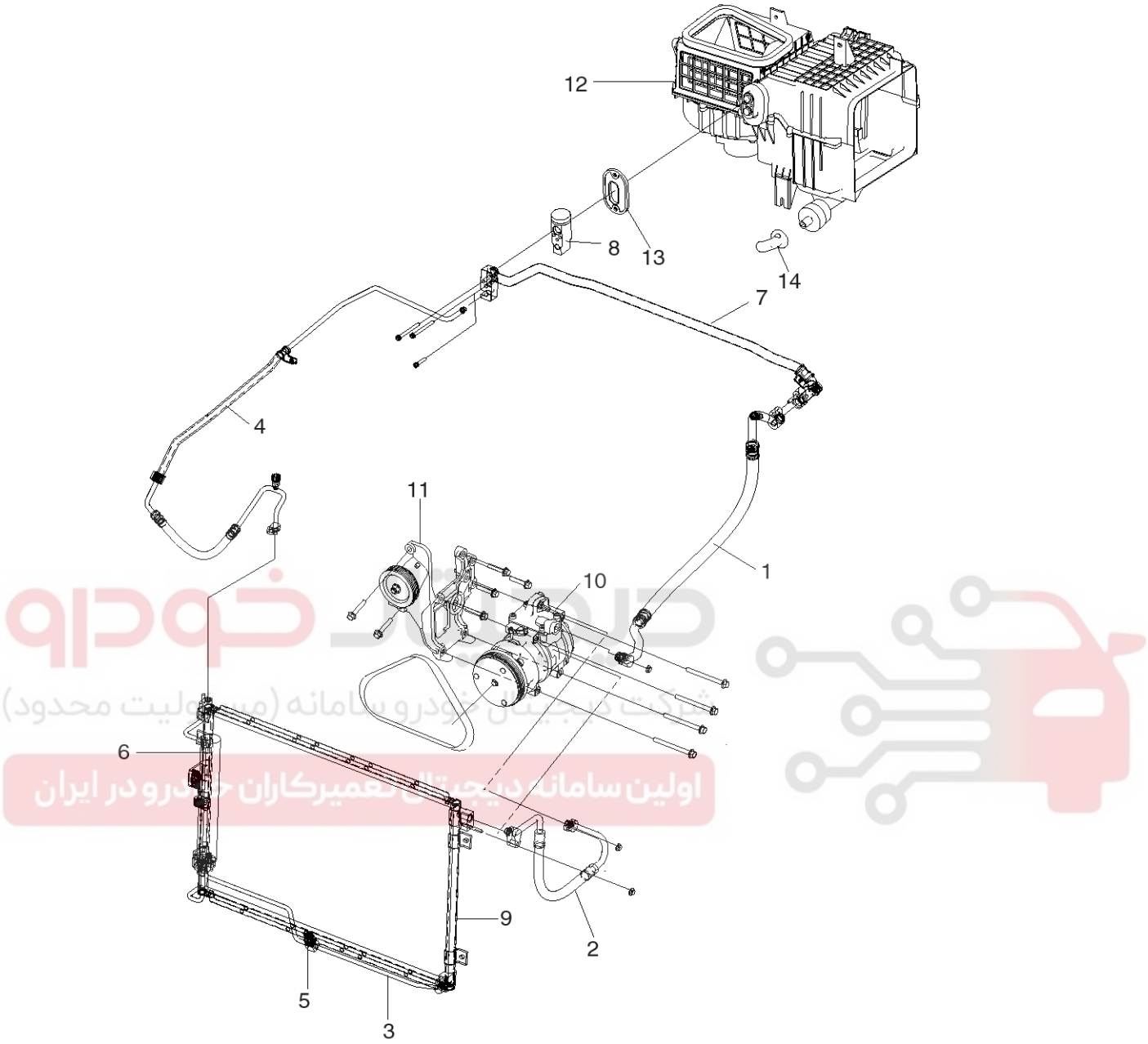
REFRIGERATION LINE



1. Suction hose
2. Discharge hose
3. Liquid pipe, A
4. Liquid pipe, B
5. Triple pressure switch (2.4G, 3.5G)
   Dual pressure switch (2.5D)
6. Receiver drier
7. Suction pipe
8. Expansion valve
9. Condenser
10. Compressor
11. Compressor mounting bracket (Except 2.5D)
12. Blower & Evaporator
13. Evaporator pipe seal
14. Drain hose

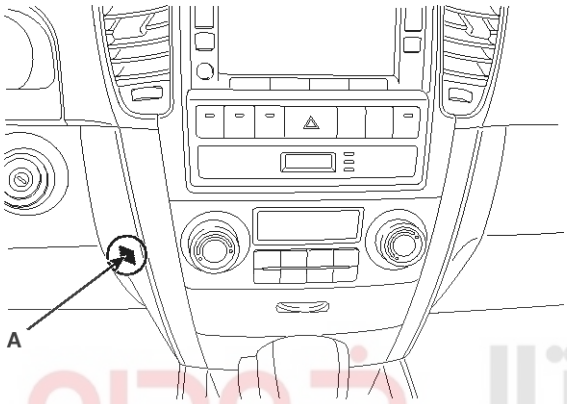
LQAC016A

Humidity Sensor

DESCRIPTION

1. Humidity sensor is located at the lower crush pad and detected in-car humidity for in-car humidity control.
2. If ambient air temperature or in-car humidity is outside certain range, it will turn on A/C to control in-car humidity preventing in car fogging.

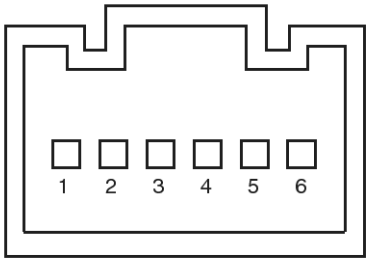
   Air conditioner operation depends on ambient temperature and humidity.



SBLHA6002D

INSPECTION

1. Ignition "ON"
2. Using the scan tool.
3. Check the frequency of humidity sensor between terminals 2 and 3.



1. Motor (-)
2. Sensor ground (-)
3. Humidity sensor signal
4. In-car sensor temp.signal
5. Sensor power (+)
6. Motor (+)

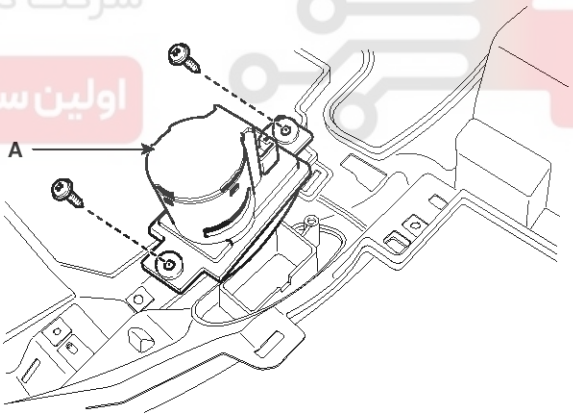
EQRF201B

Humidity (%)	Frequency between terminals 2and 3 (Hz)
30	6976 ± 5%
50	6728 ± 5%
60	6600 ± 5%
70	6468 ± 5%
80	6330 ± 5%
90	6186 ± 5%

4. If the measured resistance is not specification, substitute with a known-good humidity sensor and check for proper operation.
5. If the problem is corrected, replace the Humidity sensor.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the cresh pad (Refer to BD group-crash pad)
3. Loosen 2 screws and then remove the humidity sensor (A).



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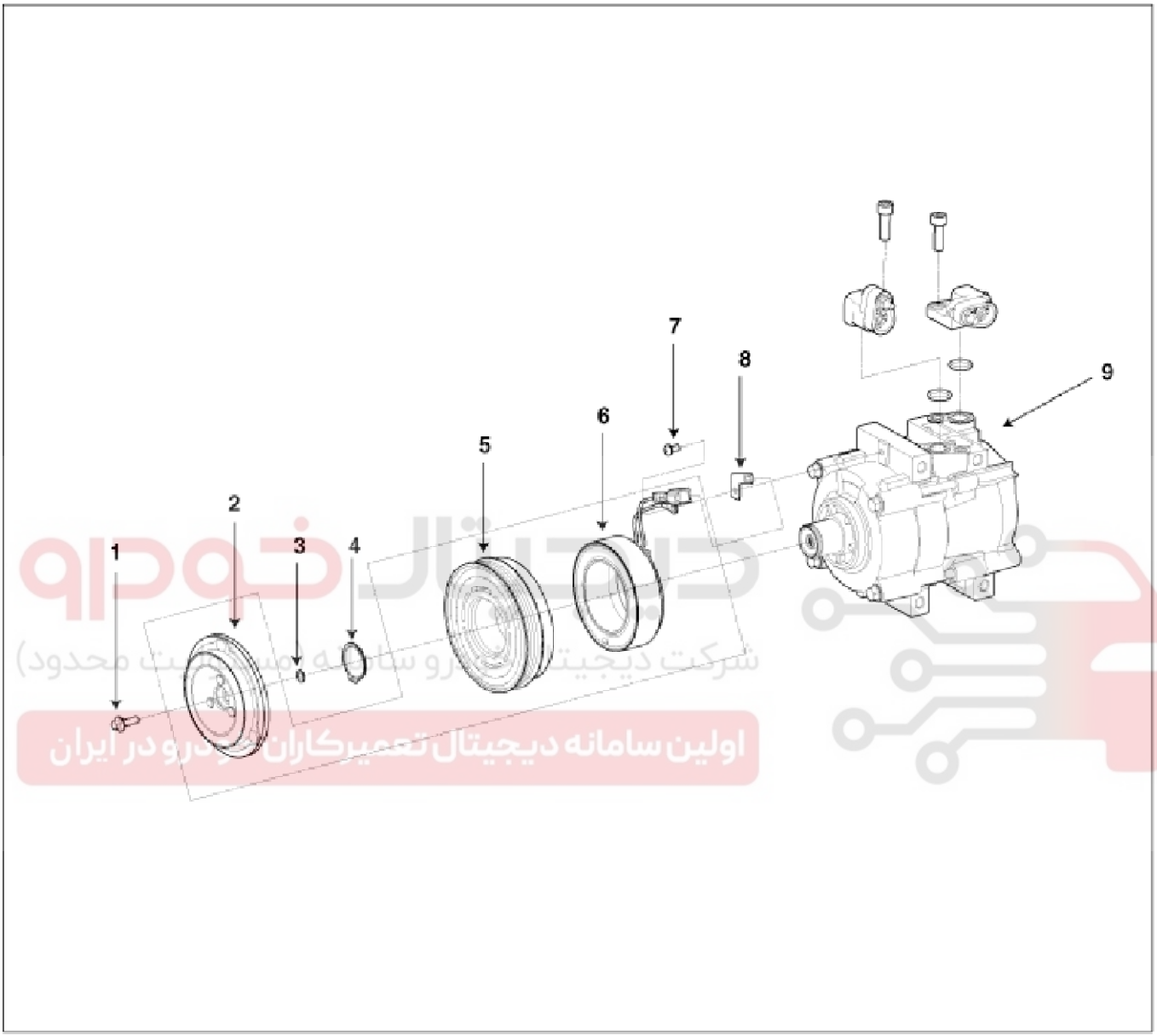
4. Installation is the reverse order of removal.

Compressor

COMPONENTS



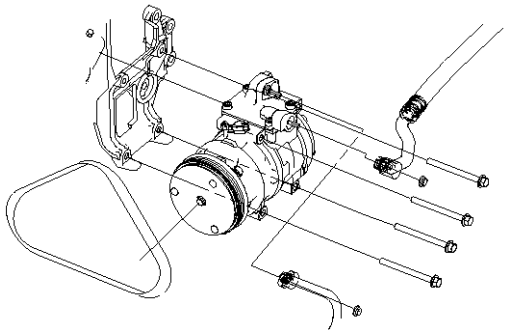
1. Bolt
2. Disc & hub assemble
3. Shim (Gap washer)bracket
4. Retainer ring (Pulley)
5. Pulley
6. Field coil
7. Screw
8. Connector bracket
9. Compressor assembly

SBLHA6700L

REMOVAL

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/charging station.
4. Loosen the drive belt.

5. Remove the discharge and suction hoses.
6. Disconnect the compressor clutch connector (A), and then remove 4 mounting bolts and the compressor.



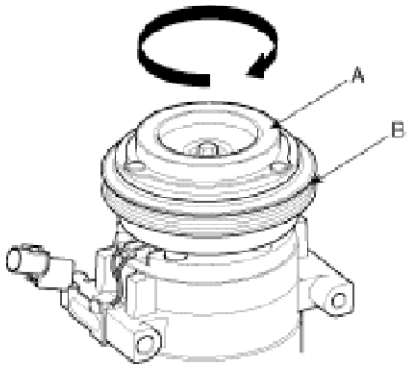
LQAC020A

Tightening torque :
20 - 25 N•m (2.0 - 2.5 kg-m, 14 - 18 lb-ft)

7. Install in the reverse order of removal, and note these items.
   - If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume, Subtract the volume of drained oil from 200cc the result is the amount of oil you should drain from the new compressor (through the suction fitting).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for R-134a to avoid leakage.
   - To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
   - Immediately after using the oil, replace the cap on the container and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Adjust the drive belt.
   - Charge the system and test its performance.

INSPECTION

1. Check the plated parts of the disc & hub assembly (A) for color changes, peeling or other damage. If there is damage, replace the clutch set.
2. Check the pulley (B) bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



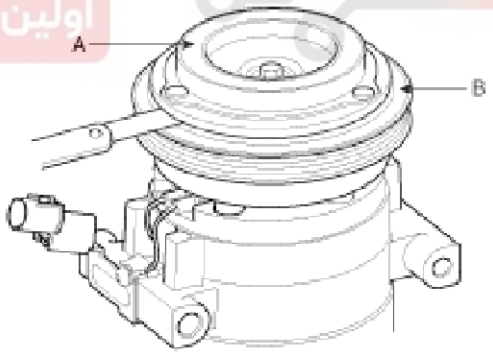
AQJF106A

3. Measure the clearance between the pulley (B) and the disc & hub assembly (A) all the way around. If the clearance is not within specified limits, remove the disc & hub assembly and add or remove shim (gap washer) as needed to increase or decrease clearance.

Clearance : 0.45 ± 0.1mm (0.018 ± 0.004 in.)

NOTICE

The shims (gap washers) are available in seven thicknesses: 0.7mm, 0.8mm, 0.9mm, 1.0mm, 1.1mm, 1.2mm and 1.3mm.

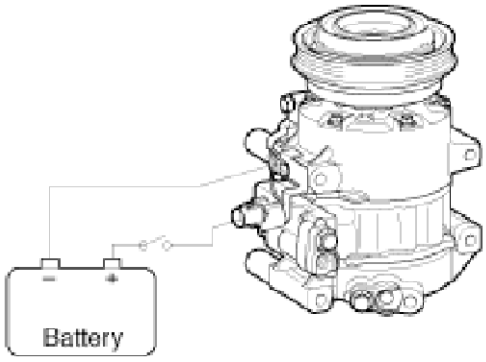


AQJF106B

4. Check operation of the magnetic clutch.

   Connect the compressor side terminals to the battery (+) terminal and the ground battery (-) terminal to the compressor body.

   Check the magnetic clutch operating noise to determine the condition.

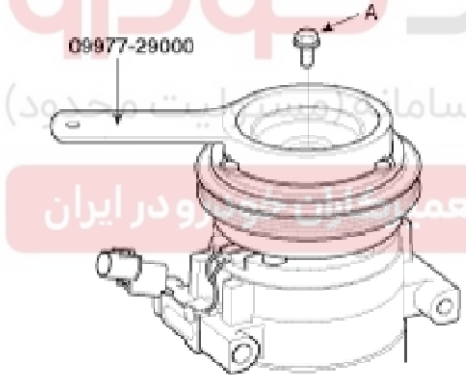


AQJF106C

DISASSEMBLY

1. Remove the center bolt (A) while holding the disc & hub assembly with a commercially available disc & hub assembly bolt remover; Special tool number 09977-29000.

TORQUE : 10~15N.m (1.02~1.53kgf.m, 7.37~11lb.ft)



LQJF106D

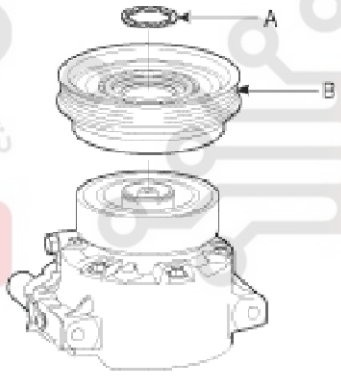
2. Remove the disc & hub assembly (A) and shim (gap washer) (B), taking care not to lose the shims. If the clutch needs adjustment, increase or decrease the number and thickness of shims as necessary, then reinstall the disc & hub assembly, and recheck its clearance (Refer to HA-20).

AQJF106E

3. If you remove the field coil, remove retainer ring (A) with retainer ring pliers.

NOTICE

- *Be careful not to damage the pulley (B) and compressor during removal/installation.*
- *Once retainer ring (A) is removed, replace it with a new one.*



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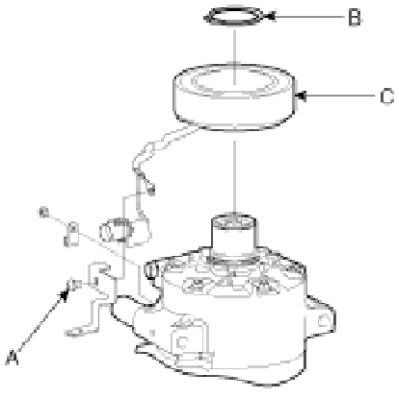
4. Remove the screw (A) from the field coil ground terminal. Remove the retainer ring (B) and then remove the field coil (C) from the shaft with a puller. Be careful not to damage the coil and compressor.



AQJF106G

5. Reassemble the compressor clutch in the reverse order of disassembly, and note these items :
   - Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
   - Install new retainer rings, and make sure they are fully seated in the groove.
   - Make sure that the pulley turns smoothly after its reassembled.

Compressor oil

DESCRIPTION

Oil lubricates the compressor and circulates in the system while the compressor is operating. Whenever replacing any component of the system, or when a large amount of gas leakage occurs, add oil to maintain the original total amount of oil.

HANDLING OF OIL

1. The oil should be free from moisture, dust, metal filings, etc.
2. Do not mix oils.
3. The moisture content in the oil increases when exposed to the air for prolonged periods. After use, seal the container immediately.

OIL RETURN OPERATION

To check the oil level or add the oil, idle the engine for 20-30 minutes with the controls set to maximum cooling and blower level, to return the lubricant to compressor.

CHECKING FOR REFRIGERANT LEAKS

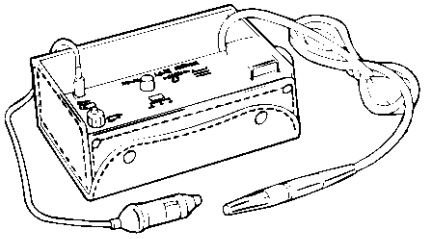
Always conduct a leak test with an electronic leak detector whenever leakage or refrigerant is suspected and when conducting service operations which are accompanied by disassembly or loosening or connection fittings.

NOTICE

In order to use the leak detector properly, read the manual supplied by the manufacturer.

If a gas leak is detected, proceed as follows:

1. Check the torque on the connection fittings and, if too loose, tighten to the proper torque. Check for gas leakage with a leak detector.
2. If leakage continues even after the fitting has been tightened, discharge the refrigerant from the system, disconnect the fittings, and check their seating faces for damage. Always replace, even if the damage is slight.
3. Check the compressor oil and add oil if required.
4. Charge the system and recheck for gas leaks. If no leaks are found, evacuate and charge the system again.



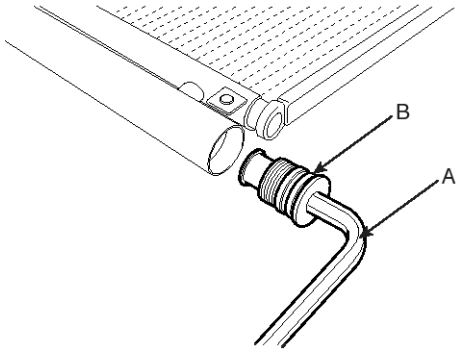
LQAC013A

Receiver-Drier

REPLACEMENT

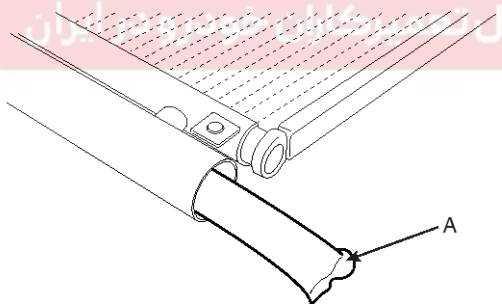
1. Remove the condenser, and then remove the bottom cap (B) with L wrench (A) from the condenser.

TORQUE: 2.76~3.25N.m (0.28~0.33kgf.m, 2.03~2.4lb-ft)



KQRE108D

2. Remove the desiccant (A) from condenser using a long nose plier. Check for crumbled desiccant and clogged bottom cap filter.



KQRE108E

3. Apply air conditioning compressor oil along the O-rings and threads of the new bottom cap.
4. Insert the new desiccant into the receiver drier tank. The desiccant must be sealed in vacuum before it is exposed to air for use.
5. Install the new bottom cap to the condenser.

NOTICE

- *Always replace the desiccant and bottom cap at the same time.*
- *Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for R-134a to avoid leakage.*
- *Be careful not to damage the radiator and condenser fins when installing the condenser.*
- *Be sure to install the lower mount cushions of condenser securely into the holes.*
- *Charge the system, and test its performance.*

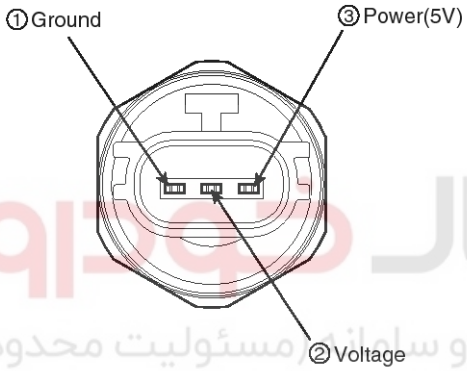
A/C pressure transducer

DESCRIPTION

A/C pressure transducer convert the pressure value of high pressure line into voltage value after measure it. By converted voltage value, engine ECU controls cooling fan by operating it high speed or low speed. Engine ECU stop the operation of compressor when the temperature of refrigerant line is so high or so low irregularly to optimize air conditioning system.

INSPECTION

1. Measure the pressure of high pressure line by measuring voltage output between NO.1 and NO.2 terminals.



EQRF116B

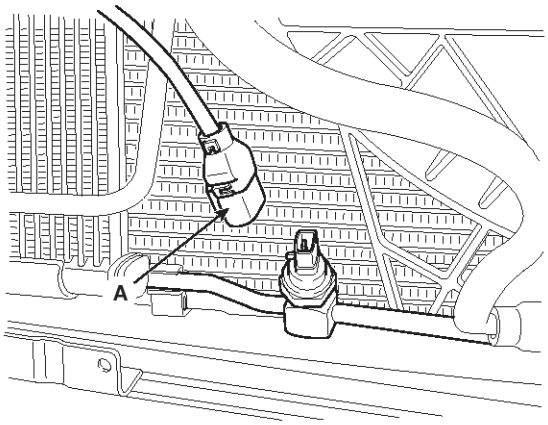
2. Inspect the voltage value whether it is sufficient to be regular value or not.

Voltage = Vdd*(0.025*P+0.1) [Kgf/cm2]
Voltage = Vdd*(0.254929*P+0.1) [Mpa]
Voltage = Vdd*(0.001758*P+0.074162 [PSIA]

3. If the measured voltage value is not specification, replace the A/C pressure transducer.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Recover the refrigerant with a recovery/charging station.
3. Remove the front bumper(Refer to BD group-front bumper).
4. Disconnect A/C pressure transducer connector (3P) (A).



SBLHA6001D

5. Remove the A/C pressure transducer.

⚠CAUTION
Take care that liquid & suction pipe are not bent.

6. Installation is the reverse order of removal.

TORQUE: 10~12N.m (1.0~1.2kgf.m, 7.4~8.8lbf.ft)

Evaporator temperature sensor

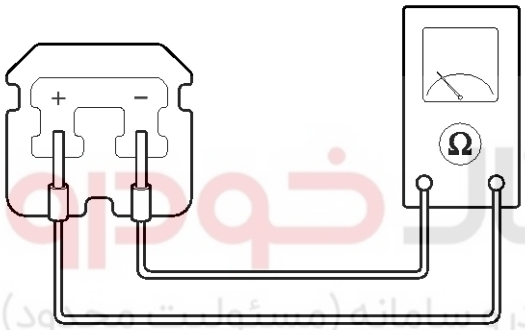
DESCRIPTION

The evaporator temperature sensor will detect the evaporator core temperature and interrupt compressor relay power in order to prevent evaporator freezing by excessive cooling.

It is a negative type thermistor whose resistance is inversely proportional to temperature.

INSPECTION

1. Engine "ON", Aircon s/w "ON"
2. Using the multi-tester, Measure resistance between terminal "1" and "2" of evaporator temperature sensor.



AQJF206B

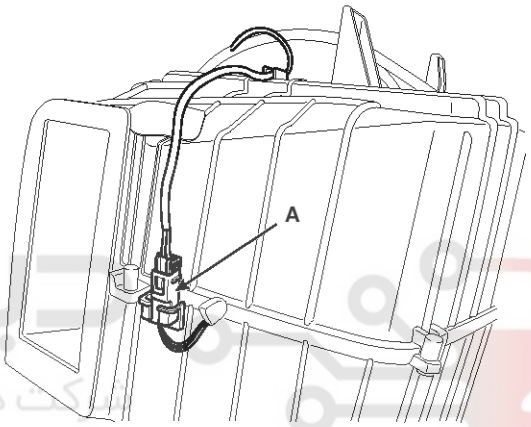
[Specification]

Evaporator core temperature [˚C (˚F)]	Resistance [kΩ]
-10(14)	18.01
-5(23)	14.25
0(32)	11.36
5(41)	9.12
10(50)	7.37
15(59)	5.99
20(68)	4.9
25(77)	4.03
30(86)	3.33
35(95)	2.77
40(104)	2.31

3. If the measured resistance is not specification, substitute with a known-good evaporator temperature sensor and check for proper operation.
4. If the problem is corrected, replace the evaporator temperature sensor.

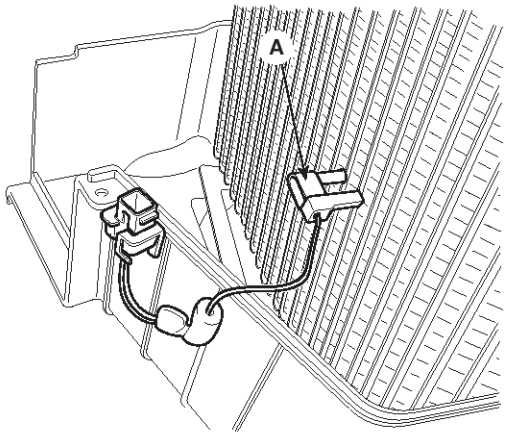
REPLACEMENT

1. Remove cresh pad(Refer to BD group-creshpad).
2. Remove the cowl cross bar(Refer to BD group-cresh pad).
3. Remove the blower unit.
4. Disconnect the evaporator connector(A).



SBLHA6007D

5. Remov the blower unit case(Refer to blower unit)
6. Remove the evaporator sensor(A).



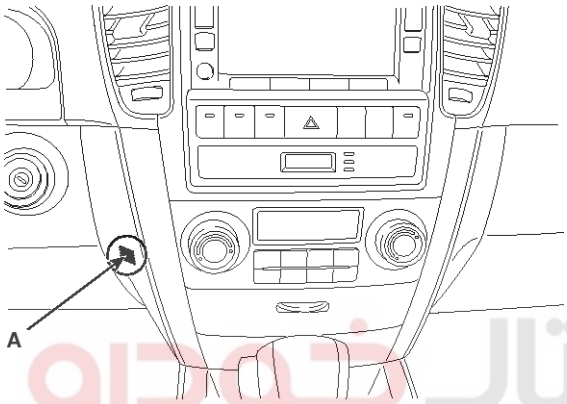
SBLHA6008D

7. Installation is the reverse order of removal.

In-car sensor

DESCRIPTION

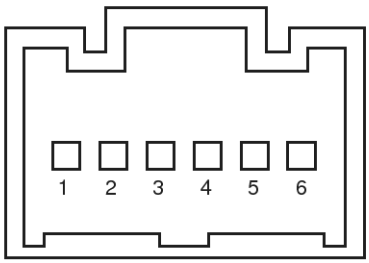
1. In-car air temperature sensor is located at the center facia lower panel.
2. The sensor contains a thermistor which measures the temperature of the inside. The signal decided by the resistance value which changes in accordance with perceived inside temperature, is delivered to heater control unit and according to this signal the control unit regulates incar temperature to intended value.



SBLHA6002D

INSPECTION

1. Ignition "ON"
2. Blow air with changing temperature to the in car sensor air inlet. Measure sensor resistance between 2 and 4 terminals.



1. Motor (-)
2. Sensor ground (-)
3. Humidity sensor signal
4. In-car sensor signal
5. Sensor power (+)
6. Motor (+)

SBLHA6309L

[Specification]

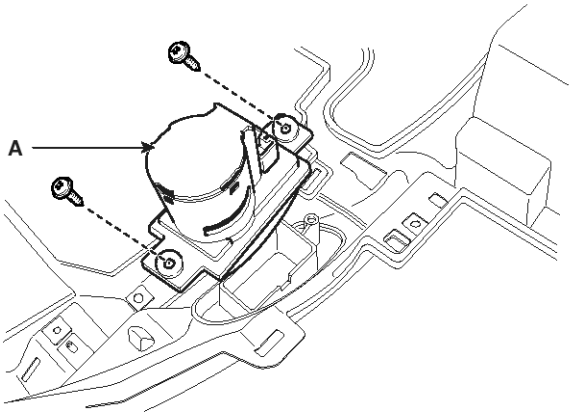
Temperature[˚C (˚F)]	Resistance between terminals 2and 4 (kΩ)
-35(-31)	723.44
-30(-22)	258.174
-15(5)	218.237
0(32)	97.83
15(59)	47.117
25(77)	30
35(95)	19.61
45(113)	13.116
55(131)	8.972

NOTICE

In car sensor is negative type thermistor that resistance will rise with lower temperature, and reduce with higher temperature.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the cresh pad (Refer to BD group-cresh pad).
3. Disconnect the connector of in-car sensor .Loosen the mounting 2 screws and then remove the in-car sensor (A).



SBLHA6003D

4. Installation is the reverse order of removal.

Photo sensor

DESCRIPTION

1. The photo sensor (A) is located at the center of defrost nozzle.
2. The photo sensor contains a photovoltaic (sensitive to sunlight) diode. The solar radiation received by its light receiving portion, generates an electromotive force in proportion to the amount of radiation received which is transferred to the automatic temperature control module so that the solar radiation compensation will be performed.

INSPECTION

1. Ignition "ON"
2. Emit intensive light toward photo sensor using a lamp, and check the output voltage change between terminal 2 and 1.
3. Check the output voltage change between terminal 2 and 3.
4. The voltage will rise with higher intensive light and reduce with lower intensive light.

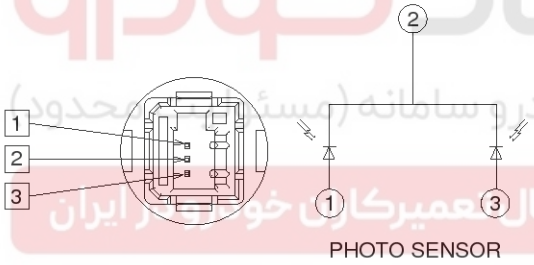


PHOTO SENSOR

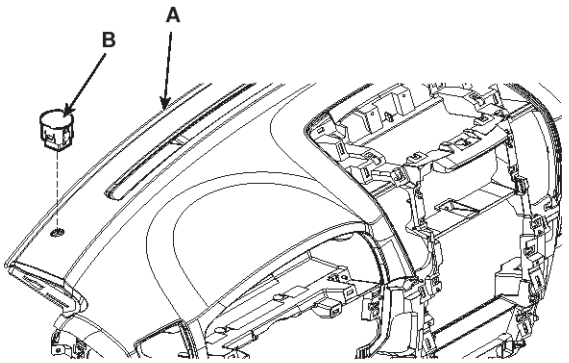
* CONNECTOR PIN.

TERMINAL NO.	FUNCTION
1	PHOTO DR (-)
2	PHOTO (+)
3	PHOTO PS (-)

SBLHA6100D

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. With the (-) driver, remove the photo sensor (B) from the left of defrost nozzle (A).



SBLHA6101D

3. Install in the reverse order of removal.

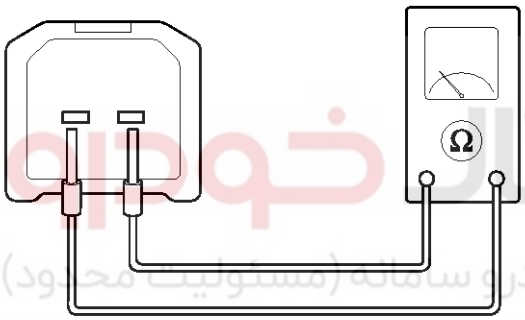
Water temperature sensor

DESCRIPTION

1. Water temperature sensor is located at the heater unit.
2. It detects coolant temperature. Its signal is used for cold engine lockout control. When the driver operates the heater before the engine is warmed up, the signal from sensor causes the heater control unit to reduce blower motor speed until coolant temperature reaches the threshold value.

INSPECTION

1. Ignition "ON"
2. Using the multi-tester, Measure resistance between terminal "1" and "2" of water temperature sensor.



AQIE203D

[Specification]

Coolant temperature[˚C(F˚)]	Resistance (kΩ)
-30(-22)	176.3
-20(-4)	96.44
-10(14)	54.99
0(32)	32.51
10(50)	19.85
20(68)	12.48
30(86)	8.061
40(104)	5.334

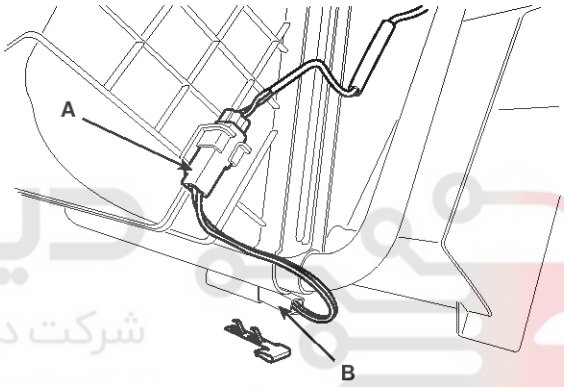
3. If the measured resistance is not specification, substitute with a known-good water temperature sensor and check for proper operation.
4. If the problem is corrected, replace the water temperature sensor.

NOTICE

Negative type thermistor that resistance will rise with lower temperature, and reduce with higher temperature.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the grove box. (Refer to BD group)
3. Disconnect the connector (A) of water temperature sensor (B) and then remove the water temperature sensor by pulling out.



SBLHA6005D

4. Installation is the reverse order of removal.

NOTICE

Take care that wire of water temperature sensor is not to be damaged

Ambient sensor

DESCRIPTION

1. The ambient temperature sensor is located at the front of the condenser and detects ambient air temperature. It is a negative type thermistor; resistance will increase with lower temperature, and decrease with higher temperatures.
2. The sensor output will be used for discharge temperature control, temperature regulation door control, blower motor level control, mix mode control and in-car humidity control.

NOTICE

If the ambient temperature is below 2.0℃ (35.6˚F), the A/C compressor will be stopped.

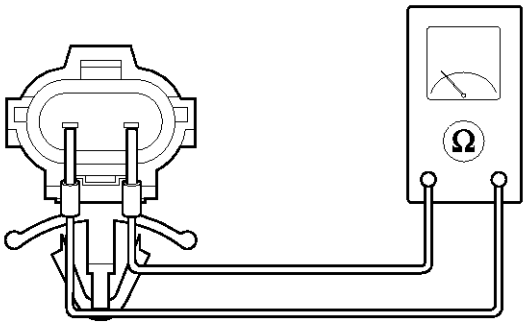
The compressor will be operated by manual operating.

INSPECTION

1. Ignition "OFF"
2. Disconnect ambient temperature sensor.
3. Check the resistance of ambient temperature sensor between terminals 1 and 2 whether it is changed by changing of the ambient temperature.

[Specification]

Ambient temperature[˚C(˚F)]	Resistance between terminals 1and 2 (kΩ)
-30(-22)	507
-20(-4)	284.5
-10(14)	164.2
0(32)	97.5
10(50)	59.6
20(68)	37.46
30(86)	24.18
40(104)	16
50(122)	10.83
60(140)	7.481

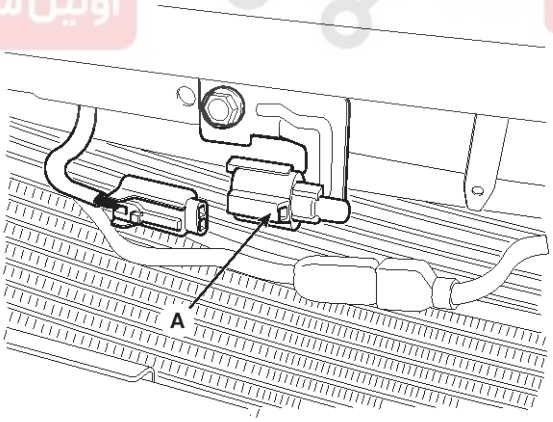


AQJF204B

4. If the measured resistance is not specification, substitute with a known-good ambient temperature sensor and check for proper operation.
5. If the problem is corrected, replace the ambient temperature sensor.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the front bumper. (Refer to BD group - Front bumper)
3. Remove the ambient temperature sensor (A).



SBLHA6006D

4. Installation is the reverse order of removal.

Air Quality Sensor(AQS)

DESCRIPTION

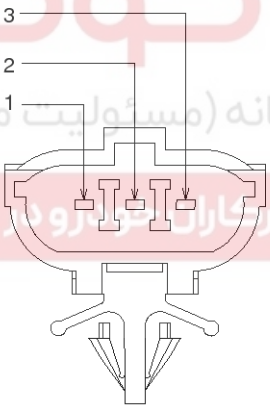
1. A.Q.S is located at center support in front of the engine radiator, and detects hazardous elements in ambient air providing output signal to control.
2. It will detect sulfurous acid gas, carbon dioxide, carbon monoxide, hydrocarbon and allergen.

INSPECTION

1. Ignition "ON"
2. Using the scan tool.
3. Check the output voltage of AQS between terminals 2 and 3.

[Specification]

Condition	Output signal(2-3)	Fresh/recirculation
Normal condition	4 ~ 5V	Fresh
Hazardous gas detection	0 ~ 1V	Recirculation



TERMINAL NO.	WIRE COLOR	FUNCTION
1	B/R	DC 12V (IGN)
2	BLACK	GND
3	B/R	SIGNAL OUTPUT

SBLHA6102D

4. AQS diagnosis and fail safe

   Detect the open of signal for 7 seconds without choosing the AQS switch when IG on.

   If 2.5V or more is detected for 3.5 seconds or more among 7 seconds, be judged the open of AQS signal.

   Operate as below fail safe function, while choosing AQS.

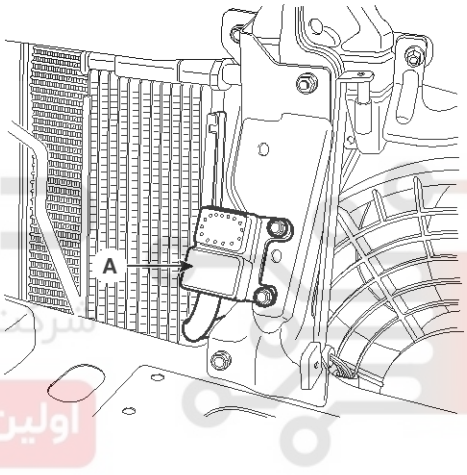
   Fail safe: Release the AQS (AQS cannot be selected), Fresh/recirculation maintains previous situation of AQS selection.

NOTICE

When IG is turned ON, AQS heats for 34±5 seconds, it will output below 1.0 voltage during this time.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the front bumper (Refer to BD group - Front bumper).
3. Remove the AQS (A) after loosening the mounting screws.



SBLHA6009D

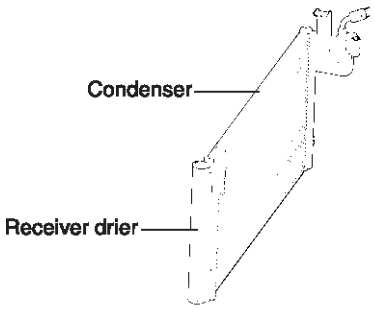
4. Installation is the reverse order of removal.

Condenser fan & relay

CHECKING

CONDENSER

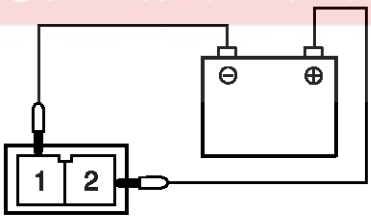
1. Check the condenser fins for clogging and damage. If clogged, clean them with water, and blow them with compressed air. If bent, gently bend them using a screwdriver or a pliers.
2. Check the condenser connections for leakage, and repair or replace it, if required.



LQAC023A

CONDENSER FAN

1. Check the condenser fan for proper operation.
2. Check the harness connector.
3. Check the condenser fan motor using battery voltage as shown below.

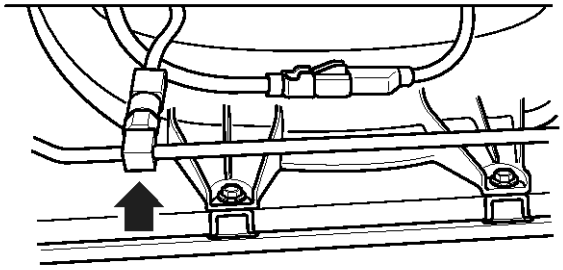


LQAC022A

Dual pressure switch

DESCRIPTION (2.5D)

The dual swith is composed a low pressure and high pressure switches. The low pressure switch will be turned off to stop compressor operation if refrigerant pressure is low. The high pressure switch will be turned off to stop compressor operation if refrigerant pressure is too high.



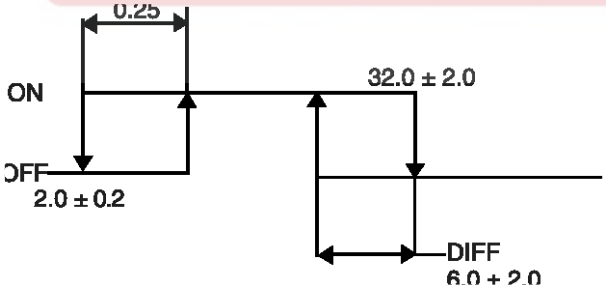
LQAC025C

Operating characteristic

kg/cm²

Pressure	ON	DIFF
High	32.0 ± 2.0	6.0 ± 2.0
Low	2.0 ± 0.2	Max 0.25

LQAC025A

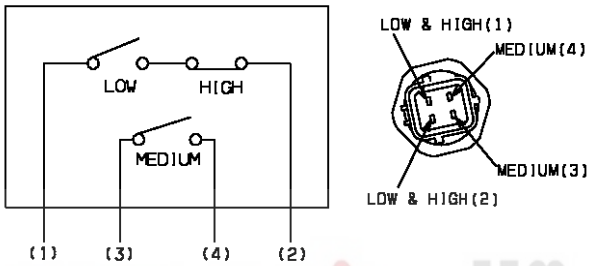


LQAC025B

Triple pressure switch

DESCRIPTION(2.4G, 3.5G)

The triple switch is a combination of a medium switch as well as conventional low pressure and high pressure switches. The low pressure switch will be turned off to stop compressor operation if refrigerant pressure is low. The high pressure switch will be turned off to stop compressor operation if refrigerant pressure is too high. The medium switch will be turned on at medium level pressure to cool the A/C system operating radiator fan and condenser fan at high speed.



LQAC024D

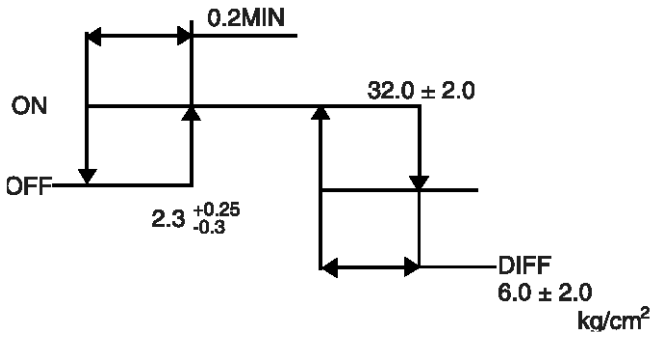
Operating characteristic

kg/cm²

Pressure	ON	OFF(DIFF)
High	32.0 ± 2.0	6.0 ± 2.0
Low	2.3 $\pm^{0.25}_{0.30}$	0.2
Medium	15.5 ± 1.3	11.5 ± 1.5

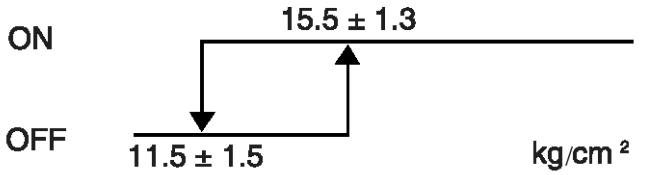
LQAC024A

LOW & HIGH



LQAC024B

MEDIUM



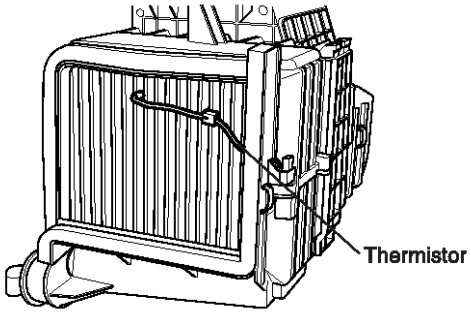
LQAC024C

Thermistor

SENSOR CHECKING

The thermistor will detect the core temperature and interrupt compressor relay power, in order to prevent evaporator freezing by excessive cooling.

The thermistor is an NTC device.

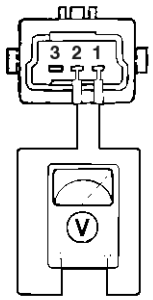


LQAC030A

Thermistor check

1. Remove the glove box.
2. Start the engine.
3. Turn on the air conditioner.
4. Using the multi-tester, check the output voltage between terminals 2 and 3 in the thermistor.

Thermistor	Operating temperature	Output voltage
ON	2.5 ±0.5˚C	12V
OFF	0 ±0.5˚C	0V



LQAC030B

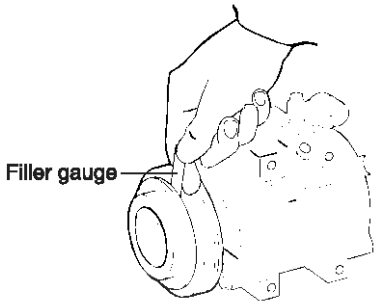
Magnetic Clutch

CHECKING THE CLUTCH AIR GAP

1. Check the air gap between the clutch hub and pulley contact surface using a filler gauge.

Clutch air gap :
0.35 - 0.65mm (0.0138 - 0.0256 in)

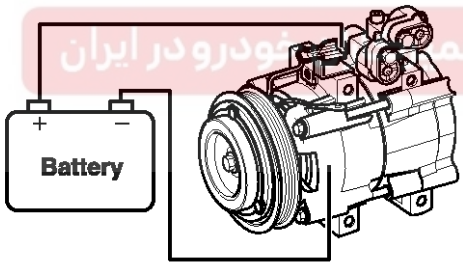
2. Check the gap around the pulley at 3 points.
3. If the clutch air gap is outside the normal range, correct it using a shim of proper size.



LQAC017A

MAGNETIC CLUTCH OPERATION

Connect the compressor terminal to battery(+) and the battery(-) terminal to the compressor body. Verify magnetic clutch operation by a clicking noise.

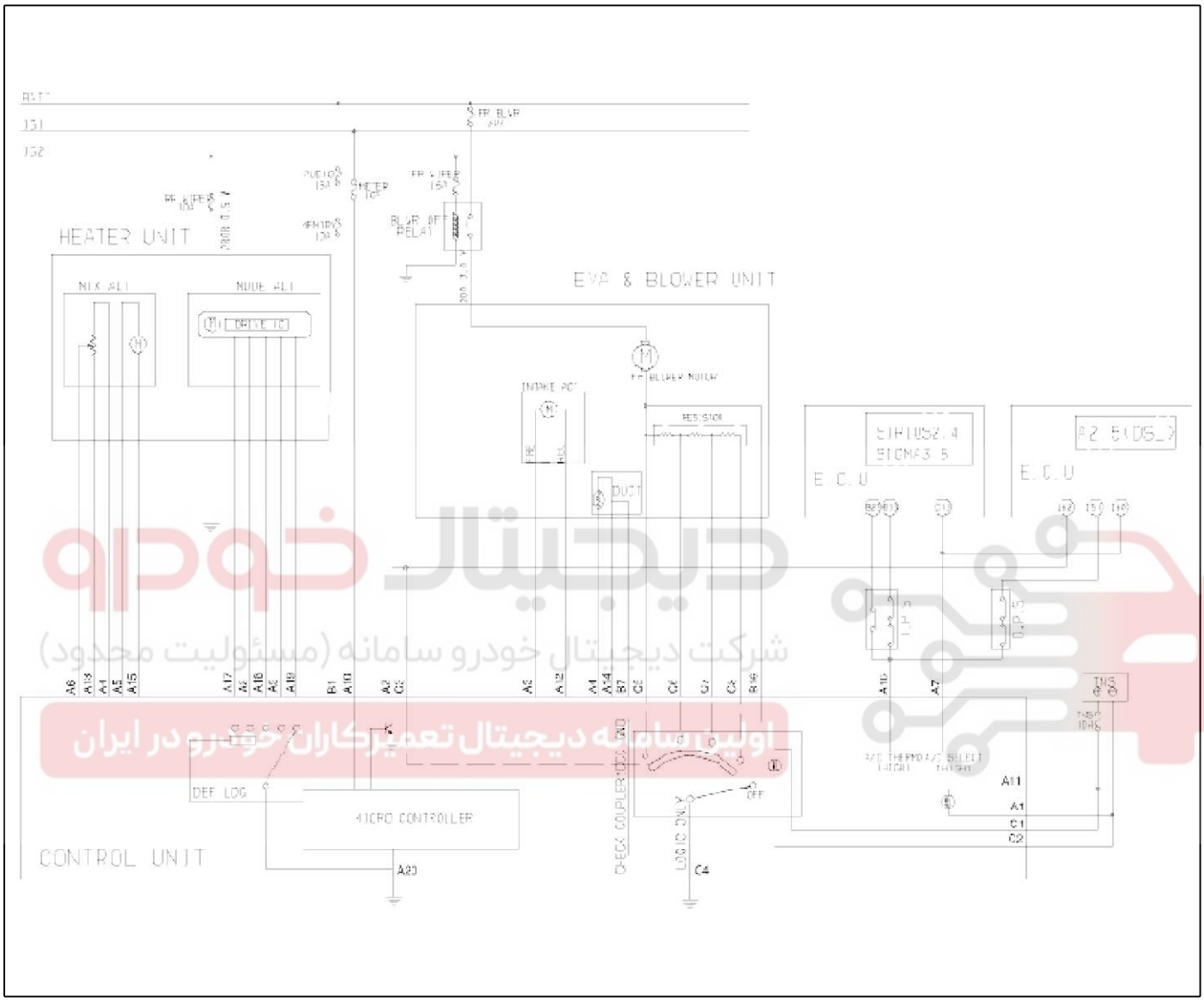


LQAC018A

Air Conditioning Switch

SCHEMATIC DIAGRAM (FULL AUTO)

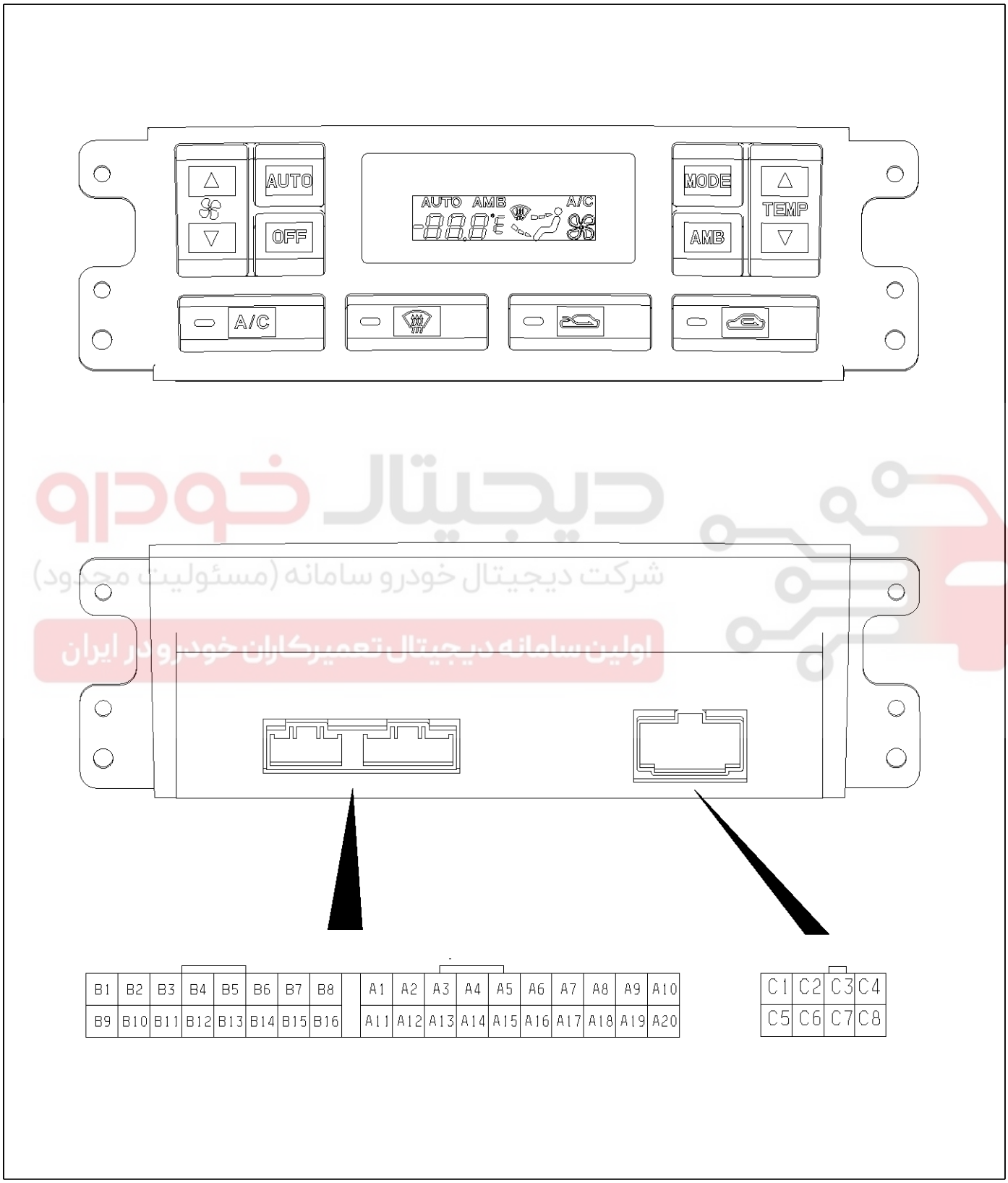
BLOWER AND A/C CONTROLS (FULL AUTO)



LQAE041A

FULL AUTOMATIC AIR CONDITIONER (FATC)

CONTROL PANEL



LQAC051A

Connector Pin Description

Item	PIN NO.	PIN Name	Item	PIN NO.	PIN Name
Main Connector (A)	A1	IG1 (METER 10A)	Main Connector (B)	B1	MAX HI RELAY
	A2	MODE BI/L		B2	CHECKER COUPLER(DCC : GND)
	A3	MODE D/H		B3	N.C
	A4	A/C SELECT HIGH		B4	N.C
	A5	MIX PBR		B5	N.C
	A6	MIX HOT		B6	AQS SENSOR
	A7	SENSOR GND		B7	AMB SENSOR
	A8	INTAKE FRE		B8	BATT
	A9	3B JOINT (BLWR COMM)		B9	BLOWER MOTOR FEEDBACK
	A10	ILL-		B10	P/TR-BASE
	A11	GND		B11	N.C
	A12	MODE VENT		B12	N.C
	A13	MODE HEAT		B13	N.C
	A14	MODE DEF		B14	HUMIDITY SENSOR
	A15	A/C THERMO HIGH		B15	INCAR SENSOR
	A16	MIX COOL		B16	SUN SENSOR
	A17	DUCT SENSOR	Main Connector (C)	C1	N.C
	A18	VCC (5V) : SENSOR		C2	N.C
	A19	INTAKE REC		C3	N.C
	A20	ILL+		C4	N.C
				C5	N.C
				C6	N.C
				C7	N.C
				C8	N.C

SWITCH OPERATION AND FEATURES

1. Full auto air conditioning system: One-touch button type.
2. Manual air conditioning system: Combination of dial switch and one-touch button.

CONTROL PANEL SWITCHES WILL GENERATE BUZZER SOUND ON OPERATION

Button	Function	Display	System operation	Replacing switch and system operation
TEMP	Setting temp.	• Setting temperature indication (17˚C → 32˚C Scale: 0.5˚C) (62˚F → 90˚F Scale: 1˚F) • User may chose the temperature indication between ˚C/˚F. • 17˚C=62˚F • 32˚C=90˚F • 25˚C=77˚F • ˚C/ ˚F transfer press the temp down button for 3 seconds during pressing AMB button.	1. The switch will operate temperature door to regulate cool/warm air ratio and resultingly control discharge air control. 2. The switch will raise up or lower down the temperature by unit of 0.5. 3. Setting at 17˚C (62˚F) will provide max. cooling, and setting at 32˚C (90˚F) will provide max. heating. 4. Switching off→on, it will be displayed the temperature setting just before the previous switching-off. 5. In shifting 17.5˚C(63˚F)→17˚C (62˚F) or 31.5˚C(89˚F)→32˚(90˚F)C, raising temperature setting will generate buzzer sound 3 times at interval of 0.1seconds. 6. Lowering temperature setting at 17˚C(62˚F) or raising temperature setting at 32˚C(90˚F), it will generate buzzer sound 3 times at interval of 0.1 sec. 7. Pressing repeatly on: Shift one unit every 0.7 second. Holding down: First shift in 0.7 seconds and than shift every 0.3 seconds (buzzer sound for 0.1 second upon each shift)	• When the switch is off, the system will be off. • When the temp. s/w is on , the setting temperature will be up/down.

Button	Function	Display	System operation	Replacing switch and system operation
AUTO (Auto control)	Auto control of air conditioning system	"AUTO" will be displayed on control panel.	1. The system will provide auto control of the below features on the basis of temperature setting: • Temperature door • Mode door • Intake door(Shift between fresh air/recirculation) • Blower speed • Compressor. 2. "AUTO" will be disappeared upon releasing AUTO switch. 3. Features except manually selected switches will be controlled automatically upon releasing auto switch.	• Off→System Off • Blower switch : Manually control blower • MODE : Manually control discharge mode • A/C : Manually control compressor on/off. • Fresh air : Manually control fresh air • Recirculation : Manually control recirculation • Defroster : Manually control defroster (when air conditioning system is on and recirculation selected)
AMB	Indicate ambient air temperature	• "AMB" lamp will be indicated. • Ambient air temperature indication. • Other lamps will go out.	1. Pressing AMB switch, any previous indication will go out and "AMB" lamp and ambient air temperature will come on 5 seconds, and then it will return to the previous indication just before pressing AMB switch.	• AMB: Pressing the AMB switch when ambient air temperature is indicated, ambient air temperature indication will be extinguished. • Other switches: Pressing another switch when the ambient air temperature is indicated, ambient air temperature indication will be extinguished and selected.
INTAKE	Recirculation	• Recirculation lamp will come on. • "AUTO" lamp will go out.	Fix intake door at the circulation position.	• INTAKE : REC. Control • OFF S/W : FRE. Fix • AUTO : Auto Control
	Fresh air	• Fresh air lamp will come on. • "AUTO" lamp will go out.	Fix intake door at the fresh air position.	

Button	Function	Display	System operation	Replacing switch and system operation
Blower fan speed UP/DOWN	Blower fan speed, UP/DOWN control	Fan indication : on/off	1. The speed will shift up/down based on the current fan level. 2. Switching on a switch except fan switch at "off" condition, the speed will rise steadily from LOW to the target speed. (Require 6 seconds from LOW to HI). 3. Shifting a step will take 0.7 seconds when pressing the switch once. Holding on the switch, a shift will occur every 0.3 seconds and buzzer sounds for 0.1 second. 4. Pressing UP switch at HI position or DOWN switch at LOW position, buzzer sound will occur 5 times at 0.15 second interval.	• AUTO: Auto control • OFF : System off • Fan speed control: Manually control blower fan speed.
	Output increment step by step			
	Fan speed levels and voltages - Auto heating: No level(4.5V~B+) - Auto heating: No level(4.5V~B+) - Manual control : 6 levels (4.0V~B+)			
A/C Air conditioning switch	Compressor on/off control	• A/C lamp (on/off) • AUTO lamp off	Airconditioning on/off	• A/C: A/C on/off, manual control. • OFF: System off. • AUTO: Auto control. • DEF: Defroster, manual control.
MODE (Discharge mode)	Mode door control VENT, FLOOR, B/L, MIX	MODE indication (on/off) AUTO lamp off	1. Fix mode door at B/L or MIX 2. Manual operating mode switch, the switch will shift in the order of VENT-B/L-FLOOR-MIX	• MODE: Shift control in order of Vent-B/L-Floor-Mix-Vent. • DEF: Defroster, manual control. • AUTO: Auto control
DEF (Defroster) • Remove moisture/ frost on windshield.	DEF control	• DEF indicator lamp on • DEF indication on • A/C lamp on • INTAKE indicator lamp off • AUTO indicator lamp off	1. Mode door: Fixed at defroster. 2. Intake door: Fresh air control (Selecting recirculation is enabled). 3. A/C: on (Compressor will be controlled on/off based on detected ambient temperature). 4. Prevails over max. cooling and max. heating. 5. Prevails over mix mode control	• AUTO: System auto control. • MODE: Discharge mode, manual control (release the defroster control). • A/C: A/C on/off, manual control • DEF: Return to the previous condition before selecting DEF switch.

<table>
<tr><th>Button</th><th>Function</th><th>Display</th><th>System operation</th><th>Replacing switch and system operation</th></tr>
<tr><td rowspan="4">OFF</td><td rowspan="4">Blower off</td><td rowspan="2">• VFD on
• Indicator lamps on</td><td rowspan="2">1. Blower fan speed off.
2. Compressor off.
3. Intake door: Fixed at the fresh.
4. Temperature door: Auto control.
5. Mode door : Auto control
6. AMB :
Pressing AMB switch after system off, "AMB" lamp/ambient air temperature will come on for 5 seconds and then go out.</td><td>• AUTO: Auto control.
• Blower speed: Return to MANUAL LOW.
• Others: Return to the previous condition before system off</td></tr>
<tr><td>• A/C: Airconditioning on.
• Others: Return to the previous condition before system off.</td></tr>
<tr><td colspan="2">• INTAKE(recirculation/fresh air) control at the system off condition
1. Selecting the fresh air switch at the recirculation position after system off: It will shift to the fresh air position and turn on the fresh indicator lamp. The VFD will be held on.
2. Sther switches will be held off at the above condition.
3. Other switches will be held off at the above condition.</td><td>• MODE: Hold at the previous condition before system off. (Auto control is released).
• Others: Return to the previous condition before system off.</td></tr>
<tr><td colspan="2">• DEF: Shift to defroster mode
• A/C : Air conditioning on
• Intake : Fresh air
• Others: Return to the previous condition before system off</td></tr>
<tr><td colspan="2"></td><td>• TEMP: Auto control.
• Others: Return to the previous condition before system off.</td></tr>
</table>

AUTO A/CON OPERATION TABLE

Previous condition before operating switch / Operate switch		TEMPERATURE CONTROL	COMPRESSOR CONTROL		INTAKE CONTROL		BLOW CONTROL		MODE CONTROL	
		AUTO	AUTO	MANUAL	AUTO	MANUAL	AUTO	MANUAL	AUTO	MANUAL
AUTO SW		AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
OFF SW		AUTO	OFF	OFF	FRE	FRE	OFF	OFF	FIX	MAINTENANCE
BLOWER SW		AUTO	AUTO	MAINTENANCE	AUTO	MAINTENANCE	INCREASE/REDUCE BY 1 STEP	INCREASE/REDUCE BY 1 STEP	AUTO	MAINTENANCE
A/C SW		AUTO	ON -> OFF OFF -> ON	ON -> OFF OFF -> ON	AUTO	MAINTENA-NCE	AUTO	MAINTENA-NCE	AUTO	MAINTENA-NCE
MODE SW	VENT B/L FLOOR	AUTO	MAINTENA-NCE	MAINTENA-NCE	AUTO	MAINTENA-NCE	AUTO	MAINTENA-NCE	VENT -> B/L B/L -> FLOOR FLOOR -> MIX MIX -> VENT	VENT -> B/L B/L -> FLOOR FLOOR -> MIX MIX -> VENT DEF -> FLOOR
	MIX	AUTO	FORCIBLE TURN ON	FORCIBLE TURN ON	FRE	FRE	AUTO	MAINTENANCE	MIX	MIX
DEF SW		AUTO	FORCIBLE TURN ON	FORCIBLE TURN ON	FRE	FRE	AUTO	MAINTENANCE	DEF	DEF
REC SW		AUTO	MAINTENA-NCE	MAINTENA-NCE	FRE -> REC REC -> FRE	FRE -> REC	AUTO	MAINTENA-NCE	MAINTENA-NCE	MAINTENA-NCE
FRE SW		AUTO	MAINTENANCE	MAINTENANCE	REC -> FRE	REC -> FRE	AUTO	MAINTENANCE	MAINTENANCE	MAINTENANCE
REC SW (AQS)		AUTO	MAINTENA-NCE	MAINTENA-NCE	FRE -> REC REC -> FRE	REC -> FRE FRE -> REC	AUTO	MAINTENA-NCE	MAINTENA-NCE	MAINTENA-NCE
AQS SW		AUTO	MAINTENANCE	MAINTENANCE	REC -> FRE FRE -> REC	REC -> FRE FRE -> REC	AUTO	MAINTENANCE	MAINTENANCE	MAINTENANCE
TEMP SW	17	MAX COLD	FORCIBLE TURN ON	MAINTENANCE	REC	MAINTENANCE	MAX HI	MAINTENANCE	VENT	MAINTENANCE
	17.5 - 31.5	AUTO	AUTO	MAINTENANCE	AUTO	MAINTENANCE	AUTO	MAINTENANCE	AUTO	MAINTENANCE
	32	MAX HOT	OFF	MAINTENANCE	FRE	MAINTENANCE	AUTO HI	MAINTENANCE	HEAT	MAINTENANCE

LQAC053A

DEFROST LOGIC

1. Defrost logic

Mode	A/C		Intake
	IG ON	System ON	
Vent, B/L, Floor	Previou-s	Previou-s	Fresh (Except auto)
Mix, Defrost	ON	Previou-s	Fresh

NOTICE

- *At initial the battery on, the A/C is off and the intake is changed to fresh status.*
- *At blower switch off, the intake is changed to fresh status.*

2. Dissolution & Reinstatement of logic
   1) Turn off the blower switch
   2) Move to defrost mode
   3) Press the recirculation button 5 times within 3 seconds. On keeping A/C button selected.
   4) Indicator of recirculation button is flashed 3 times.
   5) Dissolution & reinstatement of logic is completed.
   6) A/C and intake status is initialized to "A/C off" and "fresh status"

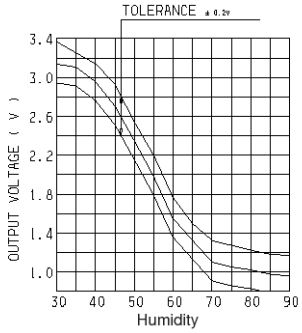
NOTICE

When the battery happens to be disconnected or discharged, the logic is reinstated.

The Other Air conditioning System Component

HUMIDITY SENSOR

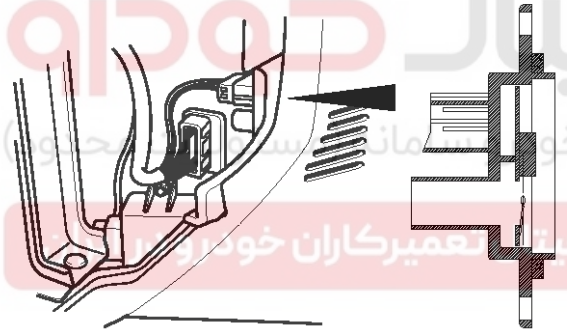
1. Humidity sensor is located at crush pad and detected in-car humidity for in-car humidity control.



LQAC033A

2. If ambient air temperature or in-car humidity is outside certain range, it will turn on A/C to control incar humidity preventing incar fogging.

   Air conditioner operation depending on ambient temperature and humidity

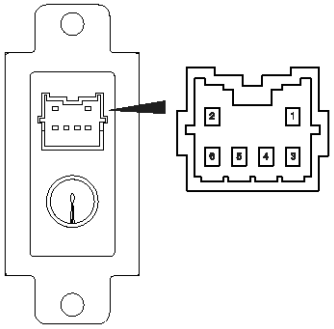


LQAC032C

SENSOR OUTPUT

Humidity (%)	Voltage between 5 and 6(V)
30	3.13
35	3.07
40	2.94
45	2.67
50	2.35
55	2.01
60	1.54
65	1.29
70	1.12
75	1.05

Humidity (%)	Voltage between 5 and 6(V)
80	1.01
85	0.98
90	0.94

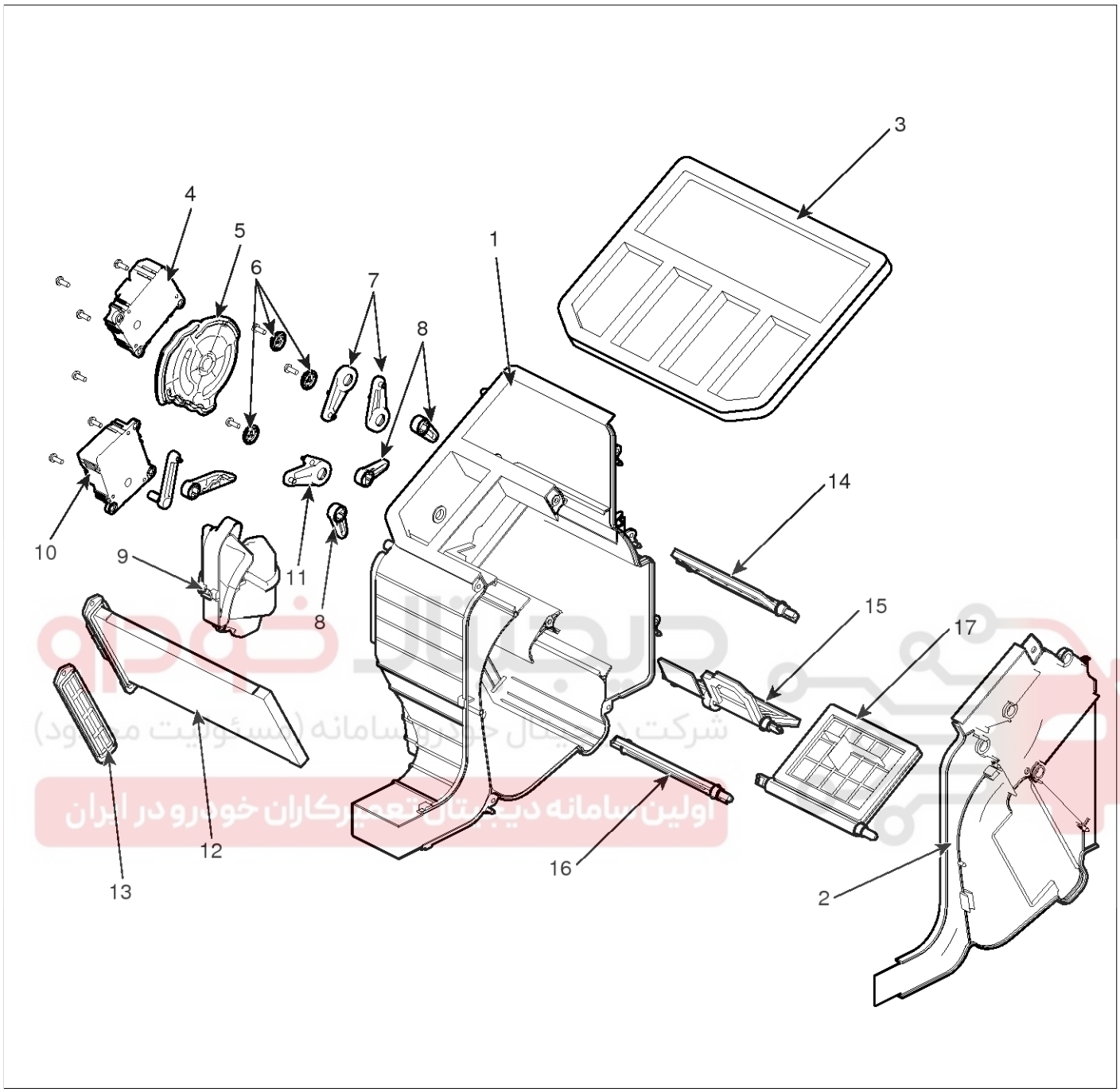


LQAC032B

Heater

Heater Unit

COMPONENTS



1. Heater case (L)
2. Heater separator (Dual type)
3. Heater seal
4. Mode actuator
5. Mode actuator lever
6. Washer
7. Vent / Def sub lever
8. Vent / Foot Def lever
9. Shower duct (L)
10. Temp actuator
11. Foot sub lever
12. PTC heater core
13. PTC cover
14. Def door
15. Vent door
16. Foot door
17. Temp door

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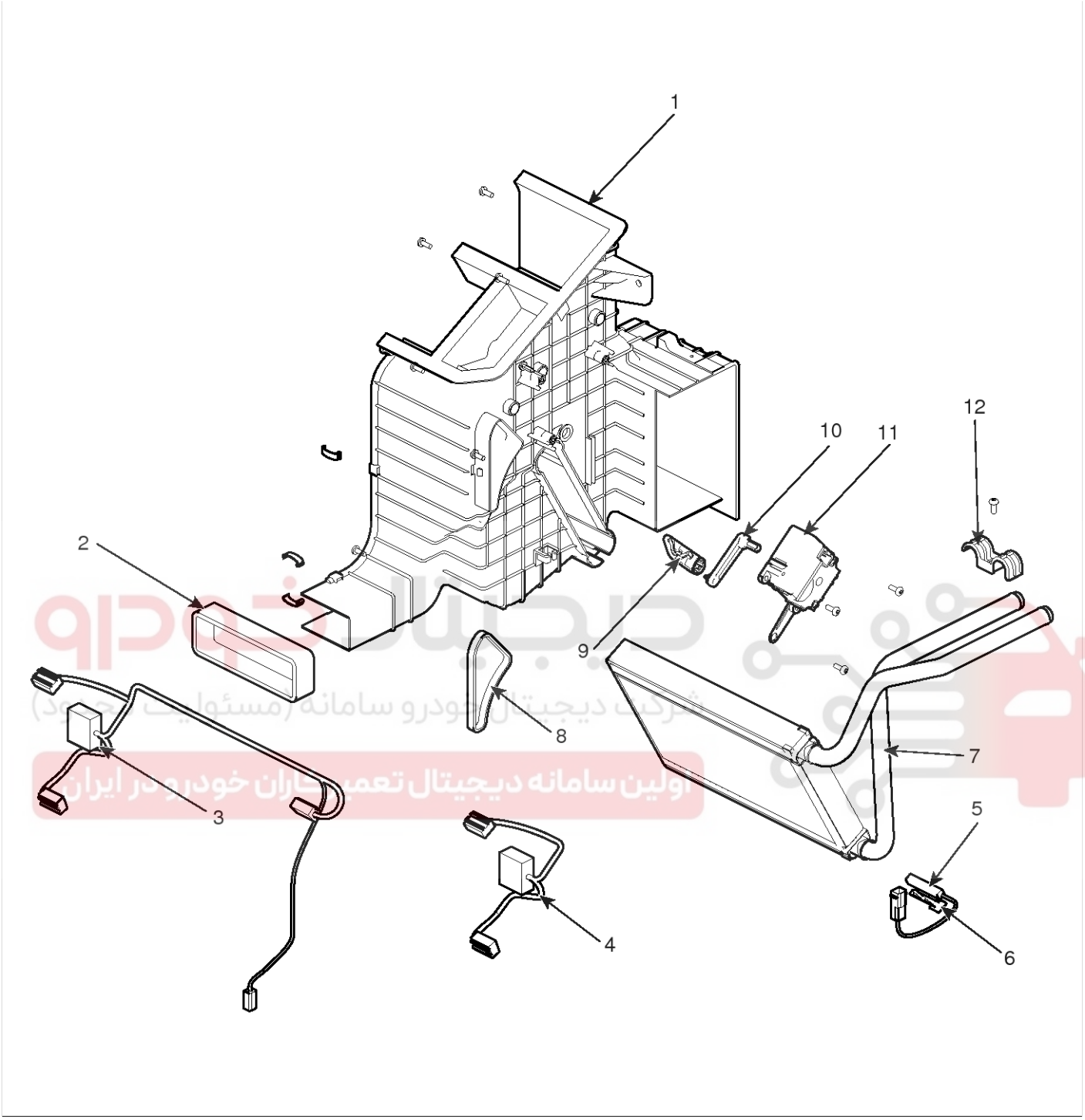


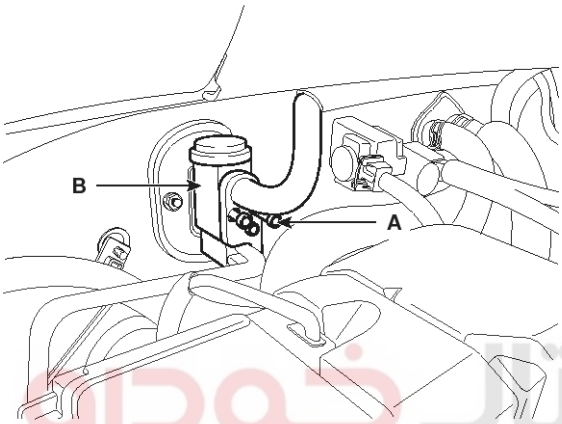
1. Heater case(R)
2. Foot seal
3. Wire haness
4. Wire haness
5. Water temperature sensor
6. Water temperature sensor stopper
7. Heater core
8. Foot lining seal
9. Temp actuator door
10. Temp actuator door lever
11. Temp actuator
12. Heater core cover

SBLHA6105L

REPLACEMENT

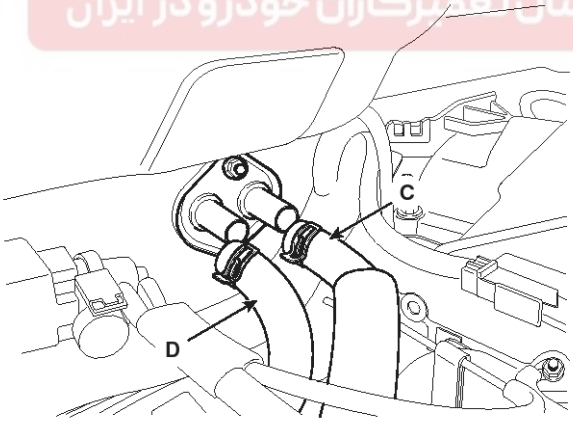
1. Disconnect the negative (-) battery terminal.
2. Recover the refrigerant with a recovery/ recycling/ charging station.
3. When the engine is cool, drain the engine coolant from the radiator.
4. Remove the bolts (A) and the expansion valve (B) from the evaporator core.

   Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



SBLHA6010D

5. Disconnect the inlet (C) and outlet (D) heater hoses from the heater unit.

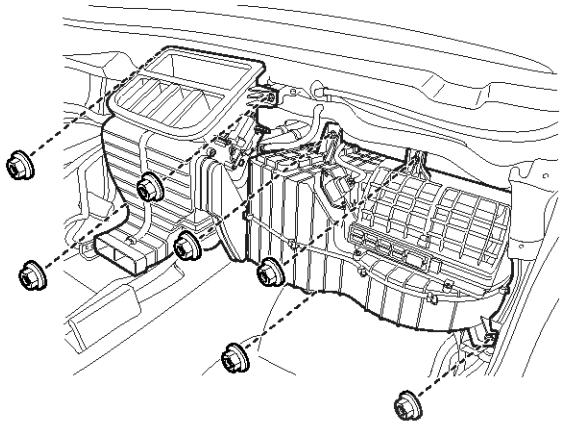


SBLHA6011D

⚠CAUTION

Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on electrical parts or painted surfaces. If any coolant spills, rinse it off immediately.

6. Remove the crash pad (Refer to BD group-cresh pad).
7. Remove the cowl cross bar assembly. (Refer to BD group-cresh pad)
8. Disconnect the connectors from the temperature control actuator, the mode control actuator and the evaporator temperature sensor.
9. Remove the heater & blower unit after loosening 7 mounting nuts.



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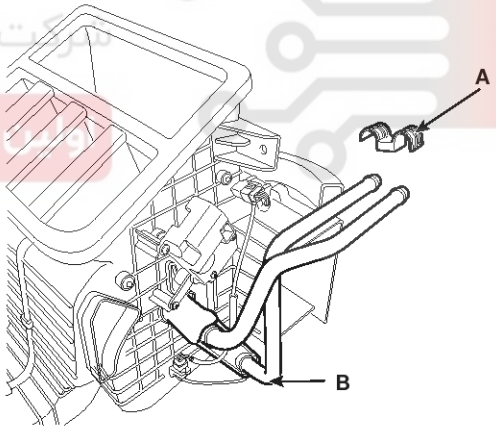
10. Remove the heater core (B) after remove the cover (A).



SBLHA6013D

11. Installation is the reverse order of removal, and note these items :
    - If you're installing a new evaporator, add refrigerant oil (ND-OIL8).
    - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for R-134a to avoid leakage.
    - Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.

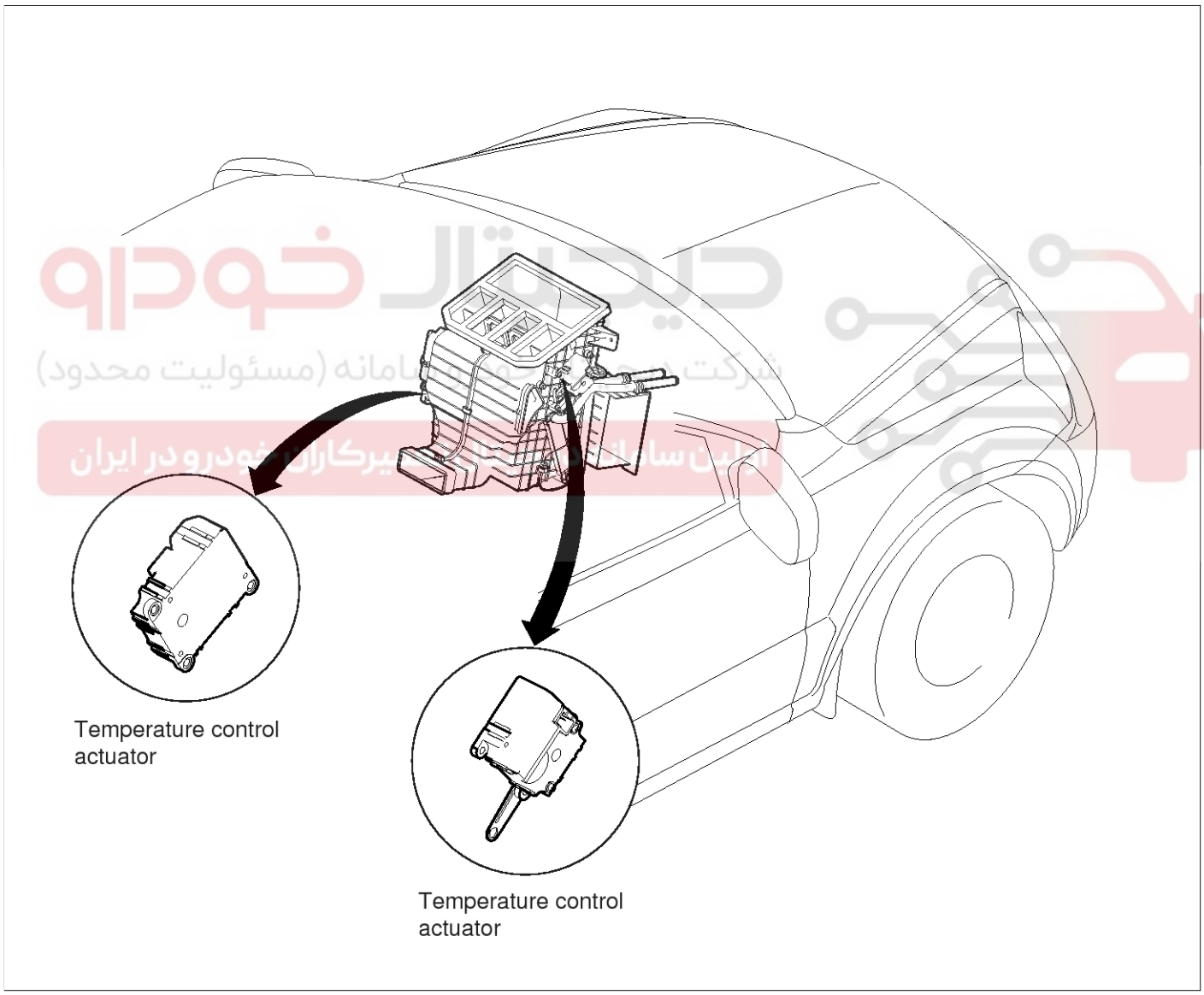
- Do not spill the refrigerant oil on the vehicle ; it may damage the paint ; if the refrigerant oil contacts the paint, wash it off immediately
- Apply sealant to the grommets.
- Make sure that there is no air leakage.
- Charge the system and test its performance.
- Do not interchange the inlet and outlet heater hoses and install the hose clamps securely.
- Refill the cooling system with engine coolant.

Temperature Control Actuator

DESCRIPTION

1. Heater unit includes mode control actuator and temperature control actuator.
2. Temperature control actuator is located at the heater unit. It regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temperature door by operating temperature switch and then temperature will be regulated by the hot/cold air ratio decided by position of temperature door.

COMPONENT LOCATION



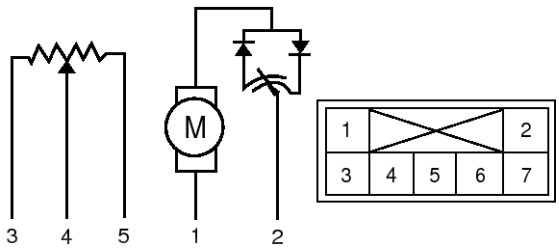
SBLHA6110L

INSPECTION

1. Ignition "OFF"
2. Disconnect the connector of temperature control actuator.
3. Verify that the temperature control actuator operates to the hot position when connecting 12V to the terminal 1 and grounding terminal 2.

   Verify that the temperature control actuator operates to the cool position when connecting in the reverse.

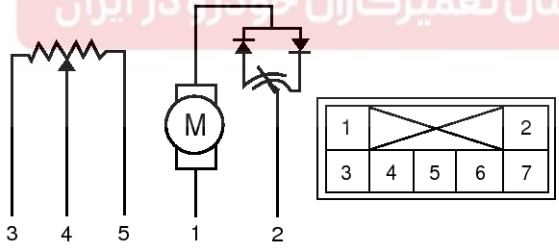
[DRIVE]



1. Cool position
2. Hot position
3. 5V (Vcc)
4. Feedback signal
5. Sensor ground
6. -
7. -

SBLHA6300L

[PASSENGER]



1. Hot position
2. Cool position
3. Sensor ground
4. Feedback signal
5. 5V (Vcc)
6. -
7. -

SBLHA6301L

4. Check the voltage between terminals 3 and 4.

[Specification]

Door position	Voltage (3-4)	Error detecting
Max. cooling	0.3 ± 0.15V	Low voltage : 0.1 V or less
Max. heating	4.7 ± 0.15V	High voltage : 4.9 V or more

It will feedback current position of actuator to controls.

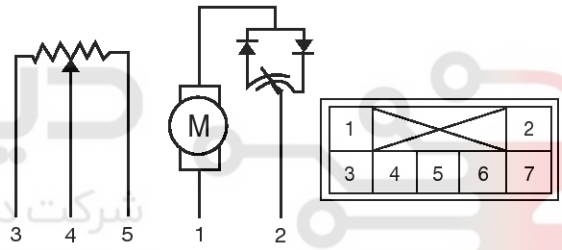
5. If the measured voltage is not specification, substitute with a known-good temperature control actuator and check for proper operation.
6. If the problem is corrected, replace the temperature control actuator.

[RHD]

1. Ignition "OFF"
2. Disconnect the connector of temperature control actuator.
3. Verify that the temperature control actuator operates to the hot position when connecting 12V to the terminal 3 and grounding terminal 4.

   Verify that the temperature control actuator operates to the cool position when connecting in the reverse.

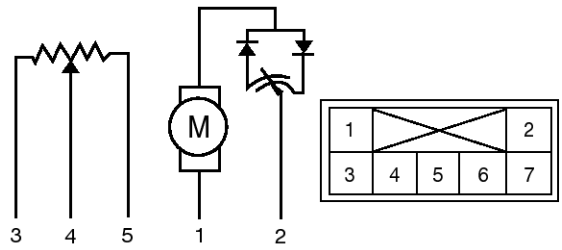
[DRIVE]



1. -
2. -
3. Hot position
4. Cool position
5. Sensor GND
6. Feed back signal
7. 5V (VCC)

SBLHA6300N

[PASSENGER]



1. -
2. -
3. Hot position
4. Cool position
5. Sensor GND
6. Feed back signal
7. 5V (VCC)

SBLHA6301N

4. Check the voltage between terminals 5 and 6.

[Specification]

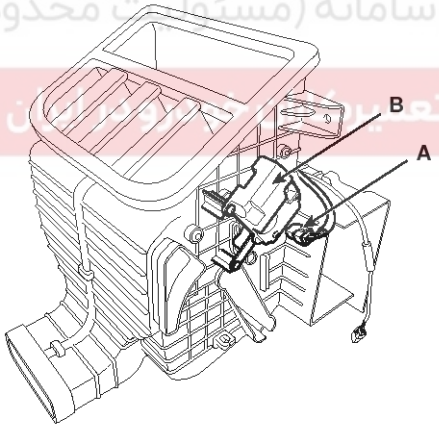
Door position	Voltage (5-6)	Error detecting
Max. cooling	0.3 ± 0.15V	Low voltage : 0.1 V or less
Max. heating	4.7 ± 0.15V	High voltage : 4.9 V or more

5. It will feedback current position of actuator to controls.
6. If the measured voltage is not specification, substitute with a known-good temperature control actuator and check for proper operation.
7. If the problem is corrected, replace the temperature control actuator.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the driver's crush pad lower panel (Refer to BD group).
3. Disconnect the temperature control actuator connector (A) after removing the air duct.
4. Loosen the mounting screw and then remove the temperature control actuator (B).

[DRIVE]



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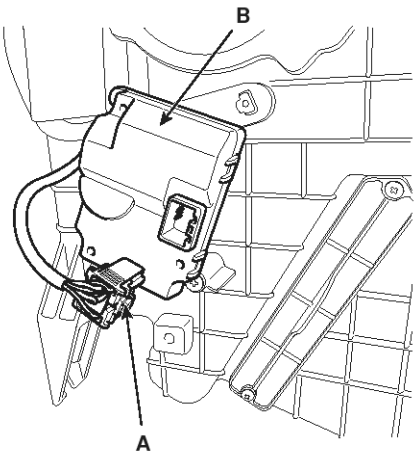
[PASSENGER]



SBLHA6015D

5. Installation is the reverse order of removal.

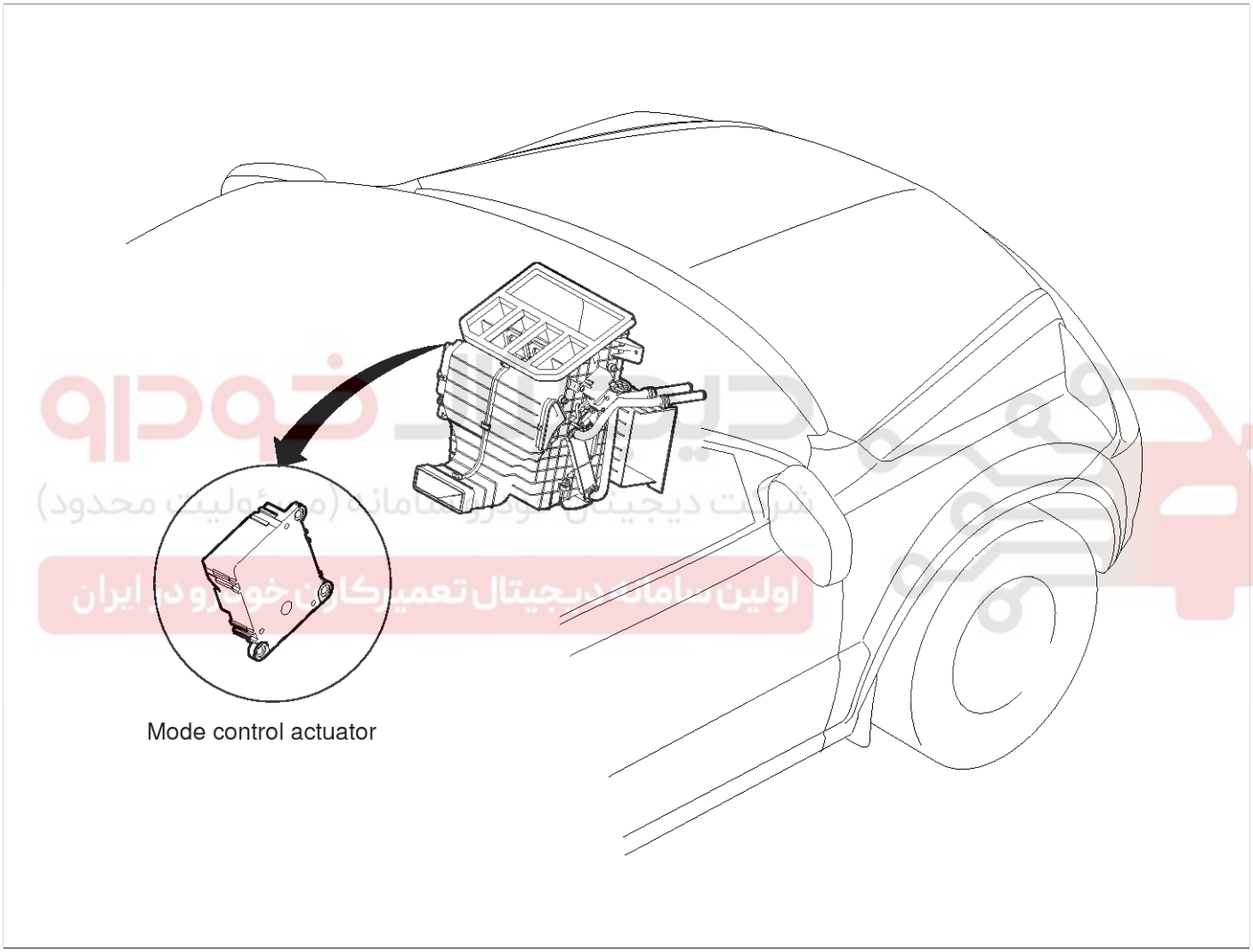
Mode Control Actuator

DESCRIPTION

The mode control actuator is located at the heater unit.

It adjusts position of mode door by operating mode control actuator based on signal of A/C control unit. Pressing mode select switch makes the mode control actuator shift in order of vent→ B/L → floor → mix.

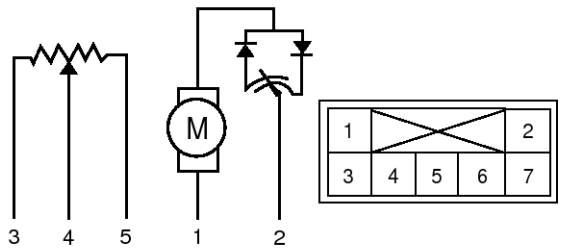
COMPONENT LOCATION



SBLHA6111L

INSPECTION

1. Ignition "OFF"
2. Disconnect the connector of mode control actuator.
3. Verify that the mode control actuator operates to the defrost mode when connecting 12V to the terminal 1 and grounding terminal 2.
4. Verify that the mode control actuator operates to the vent mode when connecting in the reverse.



1. Vent mode
2. Defrost mode
3. 5V(VCC)
4. Feedback signal
5. Sensor ground
6. -
7. -

SBLHA6306L

5. Check the voltage between terminals 4 and 5.

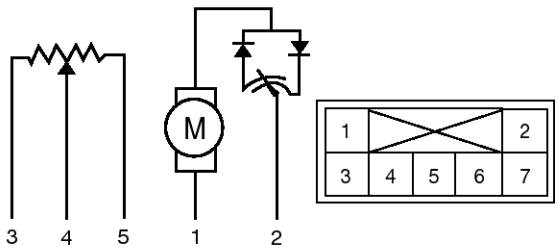
Door position	Voltage (4-5)	Error detecting
Vent	0.3 ± 0.15V	Low voltage : 0.1 V or less
Defrost	4.7 ± 0.15V	High voltage : 4.9 V or more

It will feedback current position of actuator to controls.

6. If the measured voltage is not specification, substitute with a known-good mode control actuator and check for proper operation.
7. If the problem is corrected, replace the mode control actuator.

[RHD]

1. Ignition "OFF"
2. Disconnect the connector of mode control actuator.
3. Verify that the mode control actuator operates to the defrost mode when connecting 12V to the terminal 3 and grounding terminal 4.
4. Verify that the mode control actuator operates to the vent mode when connecting in the reverse.



1. -
2. -
3. Defrost mode
4. Vent mode
5. Sensor GND
6. Feed back signal
7. 5V (VCC)

SBLHA6306N

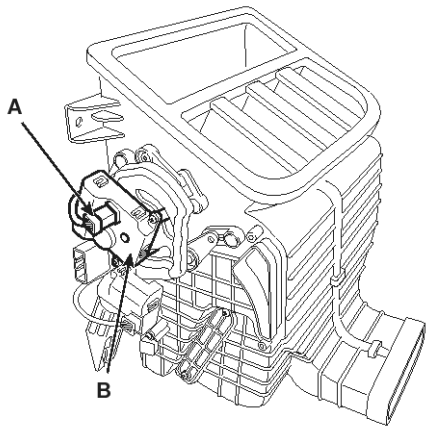
5. Check the voltage between terminals 5 and 6.

Door position	Voltage (5-6)	Error detecting
Vent	0.3 ± 0.15V	Low voltage : 0.1 V or less
Defrost	4.7 ± 0.15V	High voltage : 4.9 V or more

6. It will feedback current position of actuator to controls.
7. If the measured voltage is not specification, substitute with a known-good mode control actuator and check for proper operation.
8. If the problem is corrected, replace the mode control actuator.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the driver's crush pad lower panel. (Refer to BD group -Cresh pad).
3. Disconnect the mode control actuator connector(A) after removing the air duct.
4. Loosen the mounting screws and then remove the mode control actuator (B).



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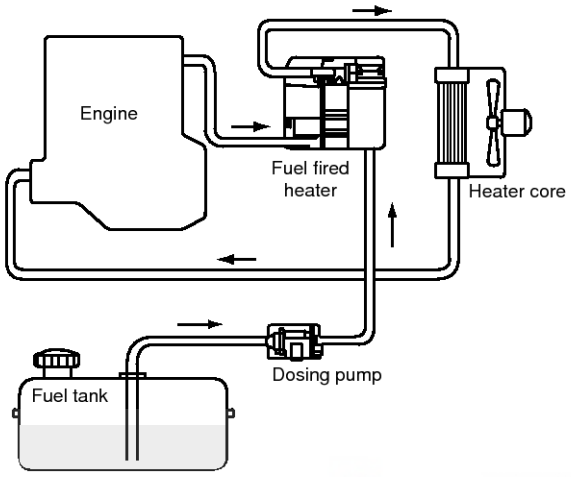
5. Installation is the reverse order of removal.

Fuel Fired Heater

DESCRIPTION

The fuel fired heater has been applied to the diesel engine (CRDi) to increase heating capability by using diesel only in cold weather



▷Coolant route : Engine → Heating burner → Heating core → Engine
▷Fuel route : Fuel tank → Dosing pump → Heating burner → Combustion

LQKG051N

⚠CAUTION

- **Follow the procedures specified in this bulletin during service or it may cause personal injury.**
- **Be sure to turn the fuel fired heater off when refueling at station.**
- **The fuel fired heater must be mounted at designated position, never in the passenger compartment.**
- **The fuel fired heater must be kept below 120˚C or a permanent failure on the components may occur.**
- **Operational principle : The following 3 conditions should be met at the same time for automatic operation of the fuel fired heater.**
  - **Engine runs.**
  - **Ambient temperature is lower than 2˚C (Winter)**
  - **Coolant temperature is lower than 68˚C**
- **Cleaning process**
  - **A cleaning process of the fuel fired heater will be performed automatically when the heater is not operated due to increase of coolant temperature and ignition off.**
  - **During cleaning process, supplied fuel in the heater will be burnt completely and any smoke will be expelled.**

    It is a necessary process for next operation and durability of the heater and takes about 3 minutes.
- **Others**

  The following symptoms should be explained to customers or technicians as a normal occurrence.
  - **A white smoke may come out from the fuel fired heater exhaust pipe installed at the front side of the right front tire during operation of the heater.**

    This is not an exhaust fumes.

    When moisture in the fuel and air is discharged from the heater and is met cold ambient air, it is condensed and looks like a white smoke however, when an excessive black smoke is discharged, the fuel fired heater should be inspected.
  - **A "buk-buk" noise from the heater is a noise to form flame for combustion. This is a normal operation.**
  - **When the heater is operated at full load, a "Wooing" noise is occurred.**
  - **When shutting off the engine during heater operation, a "Wing" noise is occurred to perform the cleaning process.**

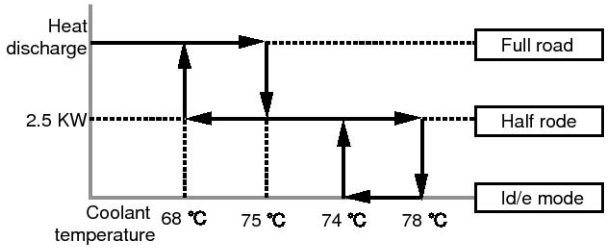
OVERVIEW

1. This fuel fired heater supplies additional heat to the interior compartment with a low fuel consumption to compensate the heat provided by engine alone.
2. The fuel fired heater has been adopted to warm up the interior compartment in a short time.
3. The two coolant temperature sensors are installed to the heater inner. The sensor valves determine heater operation.
4. One of the temperature sensors functions to prevent the heater from overheating.

   If the sensor temperature valve exceeds 125˚C, the fuel will be cut and the heater will be deactivated by the determination of the overheating of the heater.

   The other temperature sensor determines the operation mode of the fuel fired heater.The temperature of this sensor enables to activate the heater at full load(5kw) or half load(2.5kw).

• The coolant temperature shown on the above Figure is the value of the inner sensor and the actual coolant temperature is higher about 5˚C ~7˚C than the above value.



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OPERATION

Switch on/ Operation start

The fuel fired heater is operated when the coolant temperature is below 68˚C and the ambient temperature is below 2˚C after starting the engine.

At this time, the glow plug and combustion air fan are operated first and after 30 seconds, the dosing pump is operated with stopping the combustion fan for 3 seconds.

After that, the operation of the fan increases continuously until it approaches to full load within 56 seconds. If fuel supply reaches to full load the glow plug does not operate and the operation of the fan reaches to full load.

After that the glow plug monitors ignition condition as a flame sensor for 45 seconds.

The above operation procedure is done automatically and in case the ignition fails, the above operation will be done again automatically.

If the condition of ignition failure sustains continuously, fuel supply and fan operation will be stopped and error codes will be stored to find cause of failure.

Generally, the cause of ignition failure during combustion is caused by the automatic re-operation of the above procedure.

Operation for heating

The fuel fired heater operates at full load when the coolant temperature is below 68˚C and the ambient temperature is below 2˚C after starting the engine.

It operates at half load when the coolant temperature is 74˚C and it operates at idle mode when the coolant temperature is 78˚C.

The fuel fired heater during the transformation process does a cleaning function from the half mode to the idle mode.

At idle mode, all components do not work.

The fuel fired heater operating at idle mode turns into the half load when the coolant temperature is 74˚C. At this time, if the coolant temperature drops again below 68˚C, the heater operates with full load and turns into the idle mode if the temperature is 78˚C.

This serial operating process is performed automatically.

Key switch off / Operation stop

The fuel fired heater ECU stops the operation of the fuel pump and cuts fuel supply when shutting off the engine during the heater operation.

The heater conducts cleaning operation at this time.

This is a process of burning the fuel completely supplied in the heater inner.

In this process, the glow plug and combustion air fan are operated.

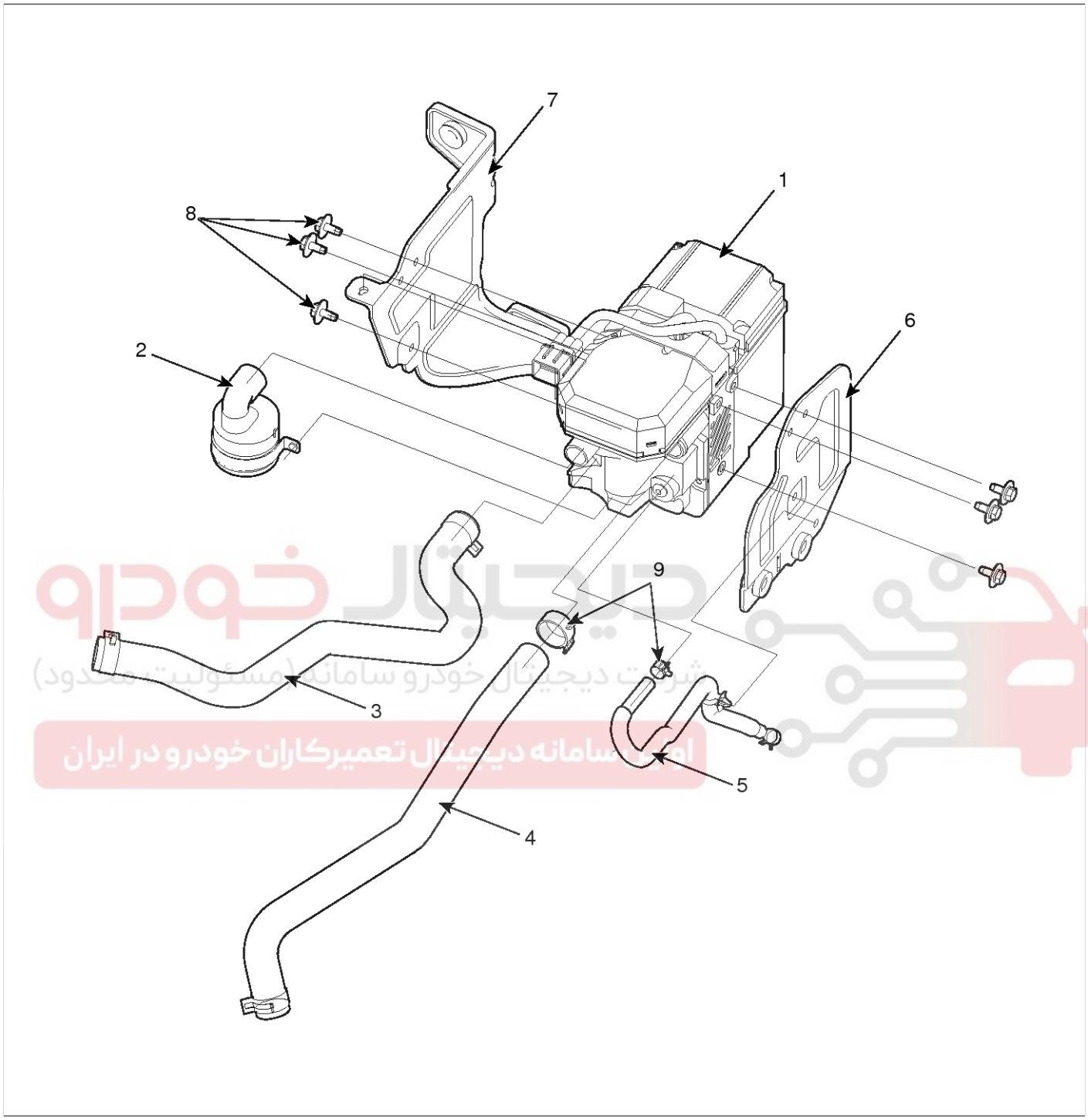
When the cleaning process is over, the operation of the heater is stopped.

The time for cleaning when the engine is turned off during the operation of the heater at full load is about 175 seconds.

About 100 seconds are required to conduct the cleaning of the heater at half load condition.

The operating sound of cleaning the heater is heard from the outside of the heater after turning the engine off and this is a normal process of operation

COMPONENT



1. Fuel fired heater assembly
2. Intake air silencer
3. Water hose(Inlet)
4. Water hose(Outlet)
5. Fuel hose
6. Braket(No.1)
7. Braket(No.2)
8. Bolt
9. Clamp

LQKG333C

TROUBLESHOOTING

SYMPTOM	REMEDY
Fuel smell	Check fuel system on vehicle.
	Check the fuel supply line in the fuel fired heater for fuel leaking and fuel hose for twisting or clogging.
	If none of above is affected, there is likelihood of fuel leaking from the heater inner. Repair the heater after removing it.
Heater does not work at full load	Repair the heater after removing it.
White smoke occurs continuously during operation	Repair the heater after removing it.
Shortage of coolant Smoke occurs during operation Excessive exhaust gas smell	Check coolant hose for leaking, twisting and hose clamp for looseness.
	If above items are normal, leaks from the heater inner may cause these symptoms. Repair the heater after removing it.
Loss of fuel	Check fuel system on vehicle.
	Check the fuel supply line in the fuel fired heater for fuel leaking and fuel hose for twisting or clogging.
	If above items are normal, there is likelihood of fuel leaking from the heater inner. Repair the heater after removing it.

INSPECTION

OPERATION TEST

Fuel-fired heater operation test by force using Hi-Scan

1. Start the engine.
2. Connect the Hi-Scan to the vehicle.
3. Select "SORENTO" and then select "FUEL FIRED HEATER".
4. Select "04. ACTUATION TEST" mode.
5. Select "PREFILLING + HEATING" to conduct the performance test after replacing the fuel fired heater system.

   Fuel supply and heating will be initiated if the "F1 key STRT" is pressed.

   However, a repair or replacement of the components related to the fuel line system in the fuel-fired heater were not done, operate the component by force after selecting the appropriate item from the menu screen.

1.4 ACTUATOR TEST

PREFILLING +HEATING	
DURATION	UNUIL STOP KET
METHOD	ACTIVATION
CONDITION	ENGINE RUNNING NO FUEL

PRESS [START] IF YOU ARE READY

START STOP

LQKG051L

NOTICE

Do not operate the system by force with selecting the " PREFILLING + HEATING " option if no repair for the fuel line relating components has been done.

This means the fuel is in the fuel line.If an excessive fuel is supplied, it may cause smoke and abnormal "Banging" noise when the fuel is burned.

If the "F2 KEY STOP" is pressed, operation test is stopped.

For self-diagnosis test and sensors outputs during compulsory operation test, press "ESC KEY".

When a self-diagnosis test is completed, disconnect the self-diagnosis connector or press "F2 KEY

STOP" from the "PREFILLING + HEATING" menu to stop the compulsory operation.

In case of selecting the individual part (ex. Combustion air fan, water pump,), press "ESC KEY" to stop the test.

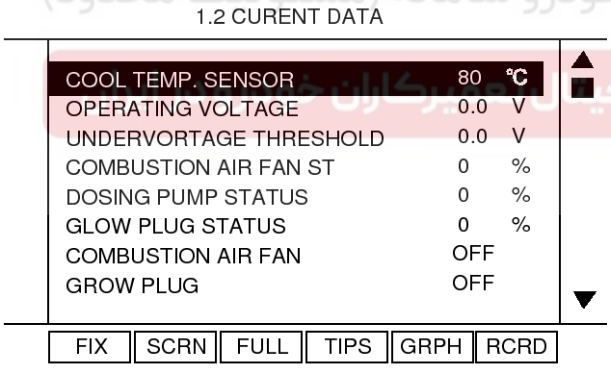
In case of selecting the "PREFILLING + HEATING" option, about 2 minutes are required to conduct cleaning process after pressing the "F2 KEY STOP".

It is a normal process to burn the fuel left in the fuel line.

6. To conduct self diagnosis test, press "ESC" and then "01. DIAGNOSTIC TROUBLE CODES" option.

LQKG051O

7. Select "02. CURRENT DATA" to view the current status of the components.



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Component test

1. Using the Hi-Scan, conduct component test after selecting "FUEL FIRED HEATER" and "ACTUATION TEST" mode.
2. After conducting component test, perform self-diagnosis test.
3. It is recommended to conduct the fuel fired heater system test after completing the component test.
4. Test values for glow plug.

Resistance : 0.324 W ~ 0.360 W
Current : Below 5mA

Heater HA-55

SPECIFICATIONS

ITEM		OPERATION STATE	SPECIFICATION
Fuel fired heater body	Heater discharge	Full load	5.0kw
		Half load	2.5kw
	Full load		Diesel
	Fuel consumption	Full load	0.63 l/h
		Half load	0.32 l/h
	Rated voltage		12.0V
	Operation voltage range		9.5V~15.0V
	Power consumption	Full load	37w(Normal)
		Half load	13w(Normal)
	Permissible ambient temperature	At operation	-40˚C~80˚C
		At storage	-40˚C~120˚C
	Permissible operation pressure		0.4bar ~ 2.5bar
	Minimum coolant flow volume		250 l/h
	Permissible CO_2 value		8~13 vol %

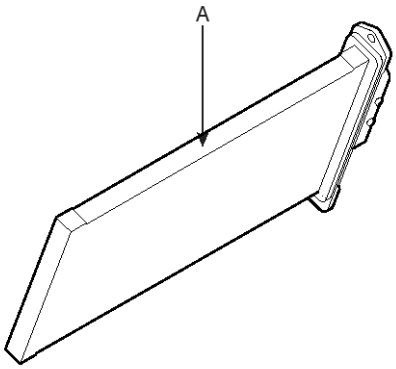
ITEM		SPECIFICATION
Dosing pump	Rated voltage	12.0V
	Operation voltage range	9.0V ~ 15.0V
	Maximum power consumption	4w(Normal)

ITEM		SPECIFICATION
Ambient switch	Rated voltage	12.0V
	Temperature of ON/OFF	ON : 2˚C(Tolerance : + 3˚C, -2˚C)
		OFF : 8˚C(Tolerance : + 2˚C, -3˚C)

Positive Temperature coefficient)heater

DESCRIPTION

PTC (Positive Temperature Coefficient) heater (A) is an electric heater using a PTC element as an auxiliary heating device that supplements deficiency of interior heat source in highly effective diesel engine.

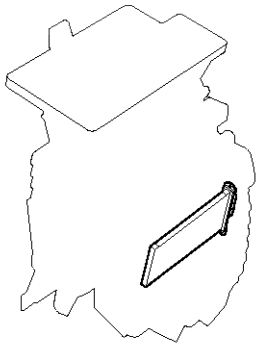


AQJF301B

An electric heater heats up the interior by directly heating the air that passes through the heater.

PTC = positive Temperature Coefficient

The name itself implies that the element has a proportional resistance change sensitive to temperature. PTC heater is installed at the exit or the backside of heater core.



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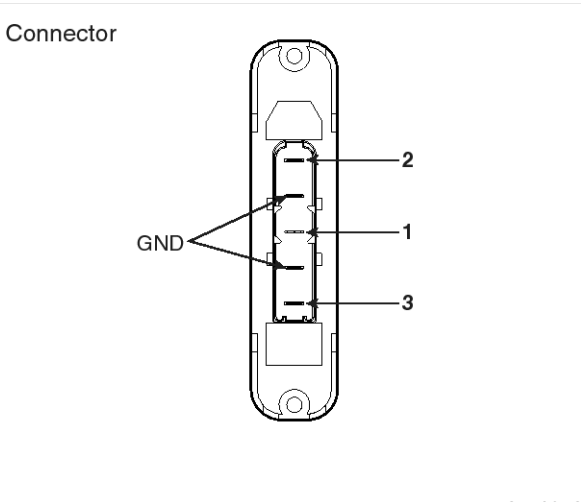
OPERATION PRINCIPLE

ECM outputs a PTC on signal. Operate PTC from 1st setting to 3rd setting with an interval of 15 seconds.

Heat up the air, which passes through a heater core.



LQJF301C

OPERATION CONDITION

Judge the condition by ambient temperature is below 5˚C, coolant temperature is below 70˚C, and battery voltage is above 11V and engine RPM is above 700RPM.

INSPECTION

Inspect the PTC operation by confirmation logic as below.

1. Entering method
   1) Set the floor mode, maximum heating
   2) Turn off the blower switch
   3) Press the intake button more than 5 times.
   4) Indicator of entire button is flashed with an interval of 0.5 seconds continuously (Manual).

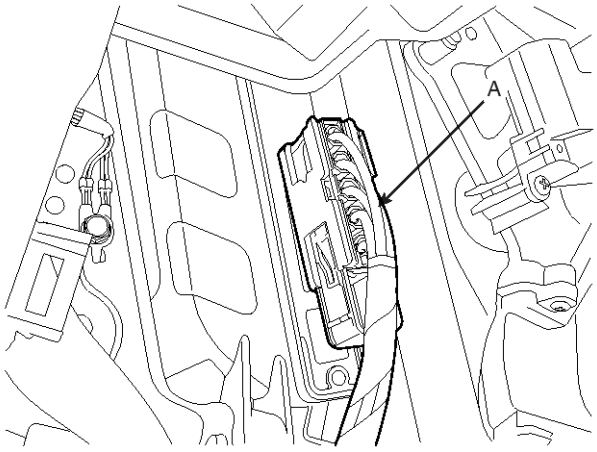
      Graphics of the entire LCD display switch on and off with an interval of 0.5 seconds continuously (Automatic)
   5) Confirm the PTC operation by operating the blower switch

      Manual: 1~4 step, Automatic: 1~8step.
   6) Each PTC relay is operated with an interval of 3 seconds.
   7) Execute the PTC operation by confirmation logic for 30 seconds.
2. Cancellation method
   1) Select the A/C button or intake button.
   2) IG "OFF"
   3) Cancel the logic after 30 seconds automatically.
3. If the PTC operation is not operated, substitute with a known-good PTC and check for proper operation.

   If the problem is corrected, replace the PTC.

REPLACEMENT

1. Remove the cresh pad(Refer to BD group -Crash pad)
2. Disconnect the connector from the PTC heater.



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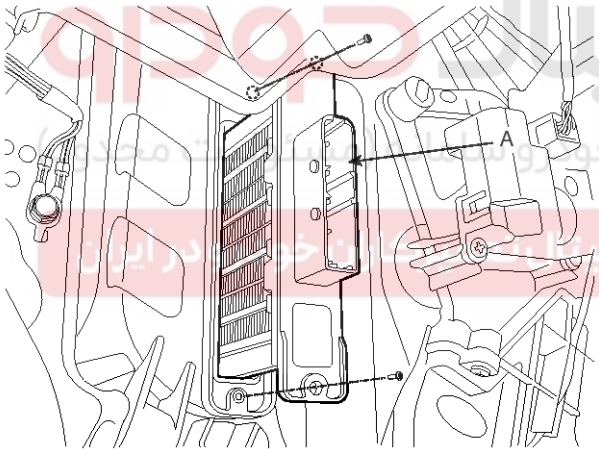
3. Remove the self-tapping screws (A) and the PTC heater (A).



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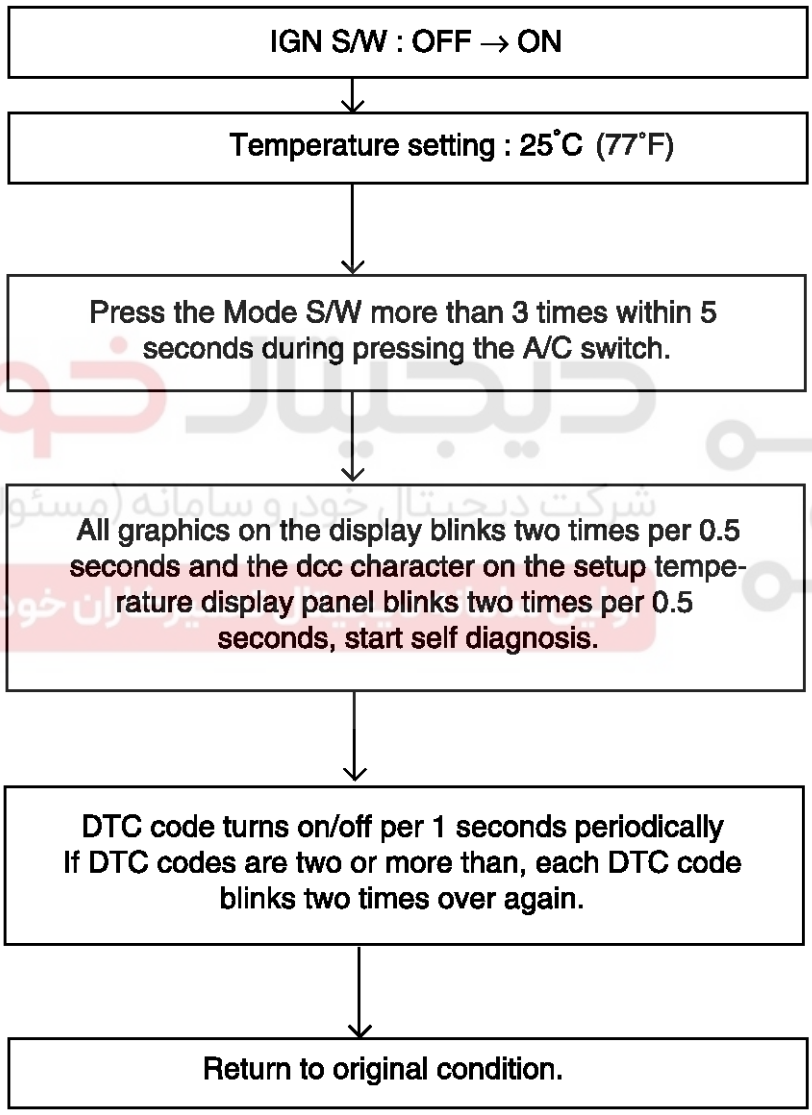
4. Install the PTC heater in the reverse order of removal.

Blower

DIAGNOSIS SYSTEM

OPERATION METHOD (SELF-DIAGNOSIS)

The F.A.T.C. module self test feature will detect electrical malfunction and provide error codes for system components with suspected failures.



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FAIL SAFE FUNCTION

No.	Item	Failure	FAIL SAFE Function
E1	In-car temperature sensor	Open/Short	25˚C (77˚F) alternate value control
E2	Ambient temperature sensor	Open/Short	25˚C (77˚F) alternate value control
E3	Thermistor		-2˚C (28.4˚F) alternate value control
E5	Photo sensor (Sun sensor)	Open/Short	-
E6	Temperature door potentiometer	Open/Short setup temperature	For 17˚C (62˚F) to 24.5˚C (76˚F), Set to maximum cooling position. For 25˚C (77˚F) to 32˚C (90˚F), Set to maximum heating position.

HOW TO READ SELF-DIAGNOSTIC CODE

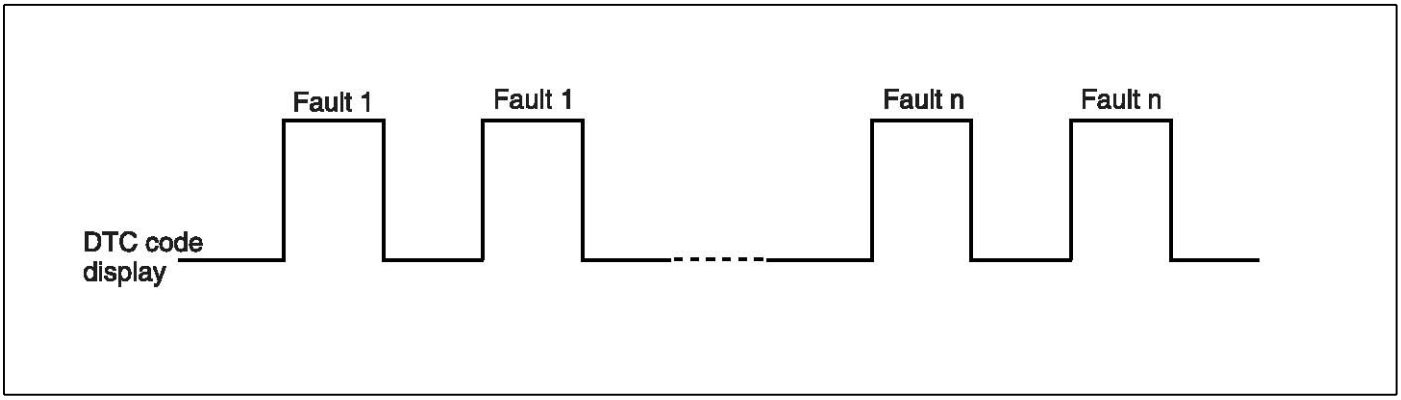
1. After the display panel flickers three times every 0.5 second, the corresponding error code flickers on the setup temperature display panel every 0.5 second and will show two figures.
2. If error code is more than two, each code flickers 2 times in sequence.

FAULT CODE DISPLAY

1. DTC code is one

LQAC042B

2. DTC code is more than two



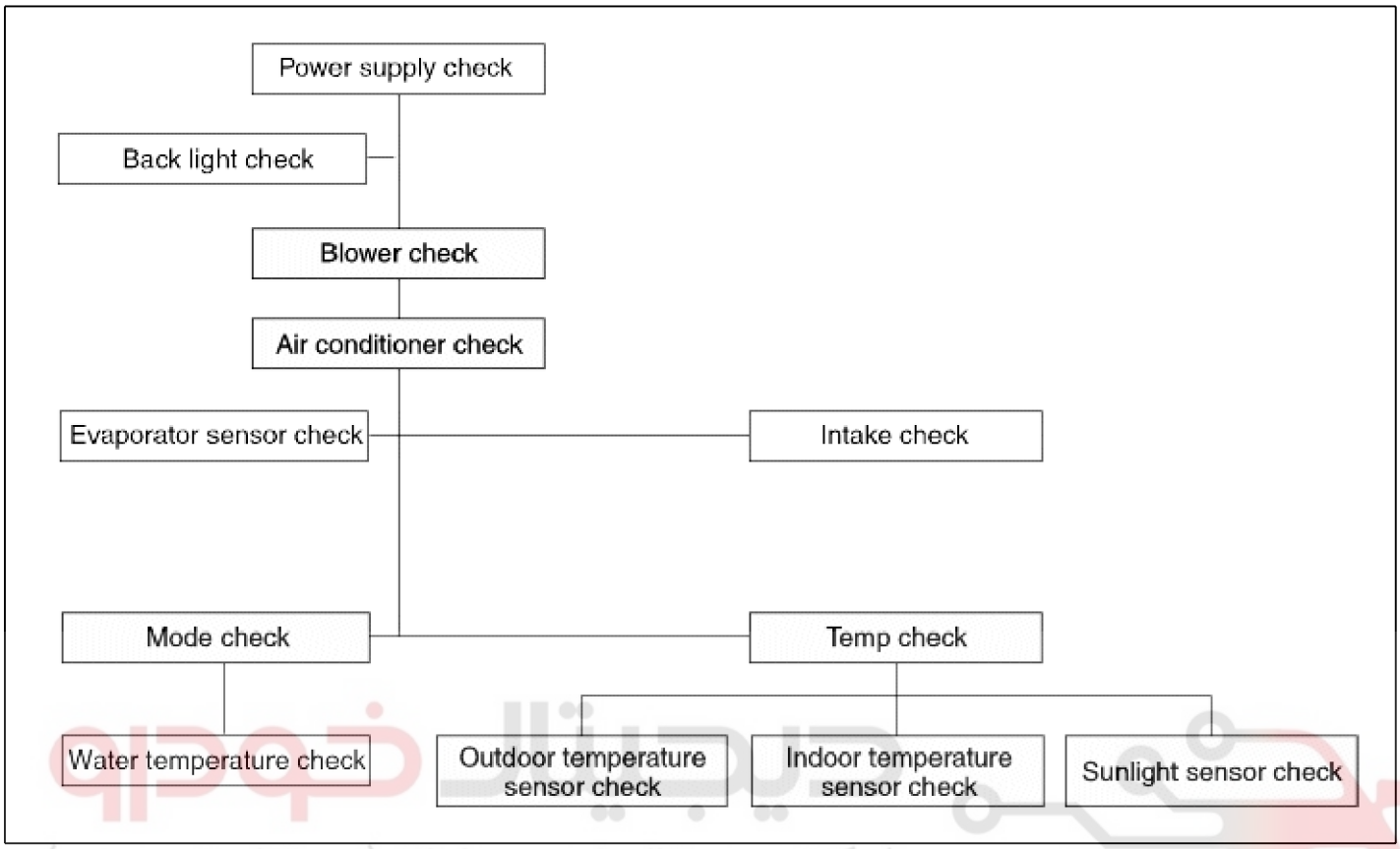
LQAC042C

DTC CHART

1. Set the temp door at the center position and turn off the A/C system during the DTC check.
2. If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below.

DTC code	Detection item	Trouble area
E0	Normal	-
E1	Open/Shorted incar sensor circuit.	• Incar sensor • Harness or connector between incar sensor and A/C control assembly • A/C control assembly
E2	Open/Shorted Ambient sensor circuit.	• Ambient sensor • Harness or connector between ambient sensor and A/C control assembly. • A/C control assembly.
E3	Open/Shorted Thermistor sensor.	• Thermistor sensor • Harness or connector between evap. sensor and A/C control assembly • A/C control assembly
E5	Open/Shorted photo sensor.	• Photo sensor • Harness or connector between photo sensor and A/C control assembly. • A/C control assembly.
E6	Open or shorted temp. door potentiometer. Defective temp. door potentiometer.	• Harness or connector between temp. door potentiometer and A/C control assembly • Temp. door potentiometer

CHECKPOINT



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Since FATC controller is complicated in functions as shown in the above chart, it is impossible to conclude its reason at the occurrence of failure. All possibilities of failure shall be considered for the purpose of efficient How to check.

1. Power supply check
2. Back light check
3. Blower check
4. Air conditioner check
5. Intake check
6. Mode check
7. Temp check
8. Each sensor check

POWER SUPPLY CHECK

In turning off IGN, battery supplies power for ordinary power, FATC connector B-8 through Audio fuse. FATC performs memory function by means of battery power supplied as described below. In turning on IGN, alternator is driven. At this time, IG2 power generated in alternator FATC connector A-1 terminal through IG1 fuse and meter fuse (10A). FATC carried out actual system operation by means of IG2 power supplied as described below.

Error diagnostics

Symptoms	Causes	How to check
When IF is ON, memory function error occurs	Battery power supply error	Check voltage of battery after turning off IG. If 10V and more, check FATC connector and if no problem, check the inside of controller. If 10V and less, check fuse or wiring state of battery power source.
When IG is ON, system running error occurs.	IG1 power supply error	Check voltage of IG1 after turning on IG. If 10V and more, check FATC connector and if no problem, check the inside of controller. If 10V and less, check fuse or wiring state of IG2 power source.

BACK LIGHT CHECK

In turning on IG and then light switch, battery power is supplied for FATC connector A-20 terminal through wiring.

The supplied power passes connector A-10 terminal through light bulb in FATC and flows into rheostat as shown in the below figure. The brightness is adjusted according to resistance value of rheostat.

ERROR DIAGNOSTICS

Symptoms	Causes	How to check
When light switch is ON, partial error occurs in back light .	Light bulb lighting error in FATC	
When light switch is ON, entire error occurs in back light.	Light power supply error	Measure voltage of tail light shown in the below figure after switching on light. If 10V and more, check FATC connector and if no problem, measure signal voltage of rheostat shown in the below figure. If 8V and more, check rheostat wiring and rheostat.
		If tail light is below 1V, check tail light wiring.

BLOWER CHECK

Perform the blower check in manual blower running state because it is difficult to check blower at automatic control. Blower is controlled from level l to level 6 equally as in button operation and running logic. In turning on IG, blower relay is ON and voltage of 0.1 to 1.4V is transferred from FATC connector B-10 terminal to base source of power TR according to FATC control (selectable from level 1 to level 6). At this time, voltage of blower motor's both ends is determined according to collector voltage of FATC connector B-9 terminal. If FATC is controlled in level 6, GND(0V) is supplied for FATC connector B-1 terminal and high blower relay is driven.

ERROR DIAGNOSTICS

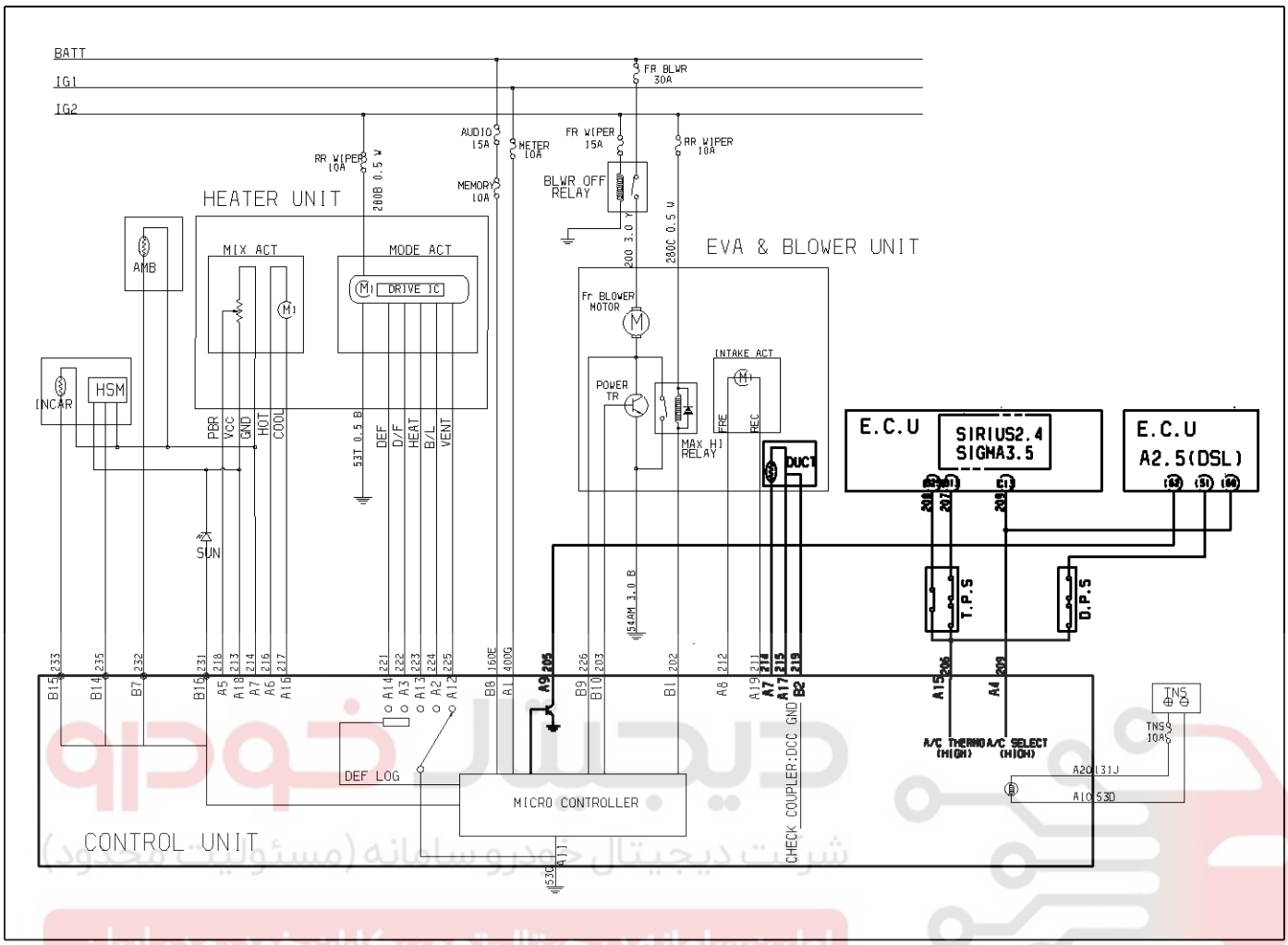
Symptoms	Causes	How to check
Amount of wind is wrong at manual selection of blower.	Power TR error	Check voltage of blower motor's both ends.(Level 1 : 4.0V, Level 2 : 5.6V, Level 3 : 7.3V, Level 4 : 9.0V, Level 5 : 10.5V, Level 6 :12.0V [high-relay operation]) Measure voltage of each terminal and if there is difference more than ± 0.6V, check power TR.
Blower wind is discharged despite pressing OFF switch.	Power TR error	Power TR change

AIR CONDITIONER CHECK

11V is outputted from connector A-15 terminal in turning on IG and pressing air conditioner switch. However, although 11V is outputted from FATC connector A-15 terminal, compressor clutch isn't driven. Wind of air conditioner is discharged if only compressor clutch works. Output signal from air conditioner is inputted in engine computer through triple switch or dual switch. Then, the engine computer considers several conditions and when output of air conditioner is judged to be practical, it gives GND to signal terminal of air conditioner relay. Accordingly, relay of air conditioner is ON and compressor clutch works. Triple switch checks pressure of refrigerant flowing through pipe and turns on/off switches in it according to standard. So, it controls that output signal of air conditioner outputted from FATC is inputted into engine computer, and also speed of condenser fan according to pressure level. (For high pressure, high-speed and for low pressure, low-speed)

ERROR DIAGNOSTICS

Symptoms	Causes	How to check
Wind of air conditioner isn't discharged into vehicle despite switching on air conditioner.	Signal output error of air conditioner	Switch on air conditioner and measure voltage of FATC connector A-15 terminal as shown in the below figure. If 9V and more, check triple switch, air conditioner relay and ECM.
		Switch on air conditioner and measure voltage of FATC connector A-15 terminal as shown in the below figure. If 1V and less, check input value of evaporator sensor.
	Input error of evaporator sensor	If evaporator sensor is disconnected or short or voltage of its input source is more than 3.0V (below 0.5˚C), output of air conditioner isn't made.



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INTAKE CHECK

In turning on IG and selecting outdoor mode with indoor switch, 12V is outputted from FATC connector A-8 terminal, 0V is supplied for A-19 terminal and motor works in direction of outdoor. In selecting indoor mode with indo or switch, 12V is outputted from FATC connector A-19 terminal, 0V is supplied for A-8 terminal and motor works in direction of indoor.

ERROR DIAGNOSTICS

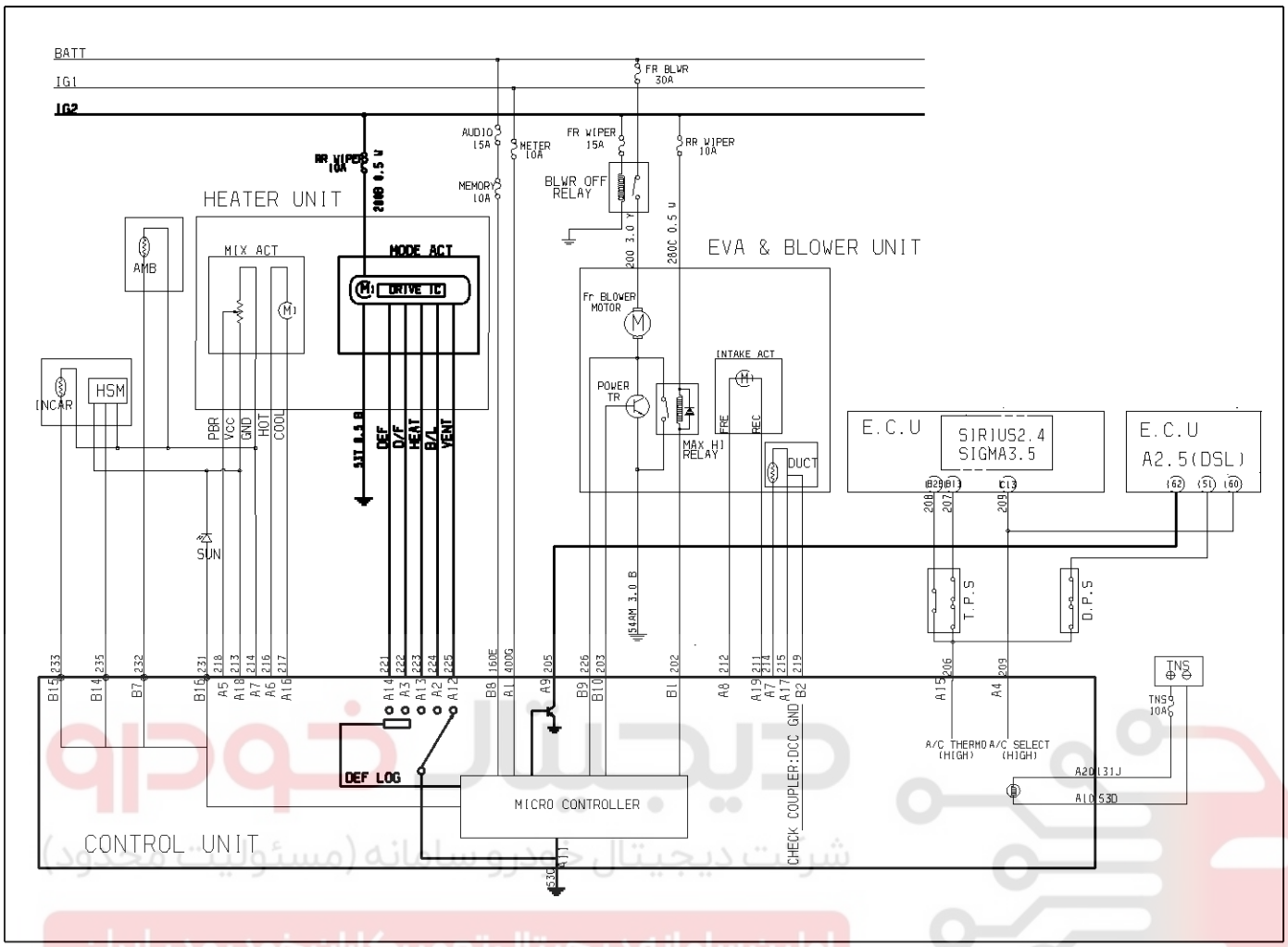
Symptoms	Causes	How to check
Outdoor mode running error	Power supply error in actuator	Separate connector linked with actuator, select outdoor mode with indoor switch and measure voltage of FATC connector A-8 terminal. If 8V and more, check actuator or wiring state and if 9V and less, check the inside of controller.
Indoor mode running error	Power supply error in actuator	Select indoor mode in the above method and measure voltage of FATC connector A-19 terminal. If 8V and more, check actuator or wiring state and if 9V and less, check the inside of controller.

MODE CHECK

In turning on IG and selecting mode switch, sequential operation begins in order of Vent→Bi-level→Blower→Mix. DEF mode works regardless of order at selecting it. In selecting Vent mode as mode switch, GND(0V) is supplied for FATC connector A-12(Vent) terminal. Voltage of 9V and more is set in the rest terminals A-2, A-13, A-3, A-14 and motor drive IC in mode actuator which receives the signal, works in direction of vent mode setup. Vent, Built-in-level, Blower, Mix and Defrost mode can be selected in the method described below.

ERROR DIAGNOSTICS

Symptoms	Causes	How to check
Specific mode isn't selected.	Signal transmission error of selected mode	Measure voltage of selected mode wiring without separating connector linked with actuator. If 8V and more, check the inside of controller.
	Mode actuator running error	If 1V and less at measuring in the above method, check mode actuator and wiring state.
Mode selection is impossible	Internal error of mode actuator	If motor driver IC built in mode actuator is bad, mode selection is impossible. When mode isn't selected though GND(0V) is supplied for selected mode wiring after selecting mode in controller, its cause is internal failure of mode actuator.



LQAC049A

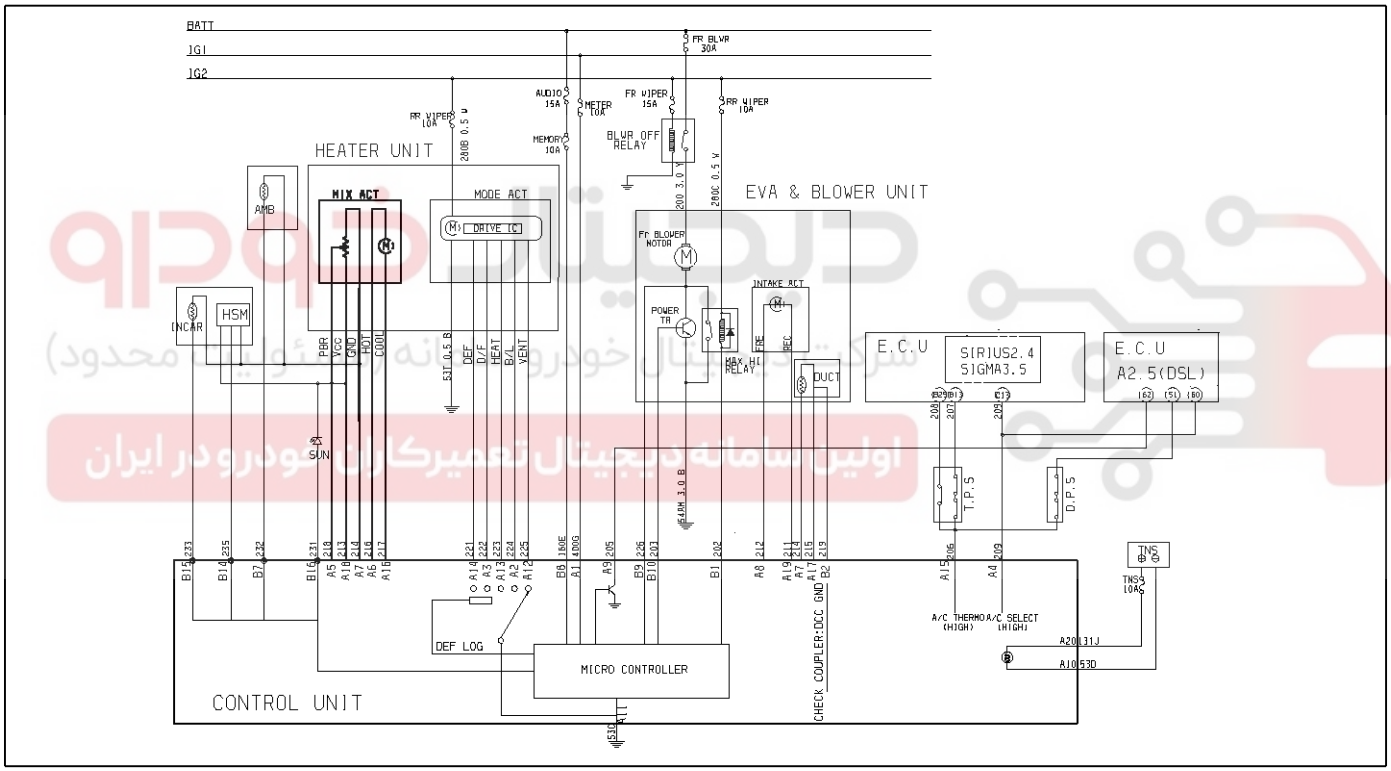
TEMP CHECK

In adjusting temp switch from 32˚C(90˚F) to 17˚C(62˚F), 11V is outputted from FATC connector A-16 terminal, 0V is supplied for A-6 terminal and temp motor works in direction of COOL. In adjusting temp switch from 17˚C(62˚F) to 32˚C(90˚F), 11V is outputted from FATC connector A-6 terminal, 0V is supplied for A-16 terminal and temp motor works in direction of WARM. When temp actuator has to move to a certain location for its automatic control, temp feedback signal terminal moves equally in temp actuator and informs controller of location of temp actuator through FATC connector A-5 terminal. Comparing original value with inputted value, it works until they are same. If 4.9V and more is inputted in A-5 terminal, it is regarded as disconnection. If 0.1V and less is inputted in A-5 terminal, it is regarded as short-circuit. In the case of disconnection or short-circuit as a result of self-diagnostic, substitute control is carried out as follows.

- If setup temperature is 17˚C(62˚F) to 24.5˚C(76˚F), set to MAX COOL.
- If setup temperature is 25˚C(77˚F) to 32.0˚C(90˚F), set to MAX WAR.

ERROR DIAGNOSTICS

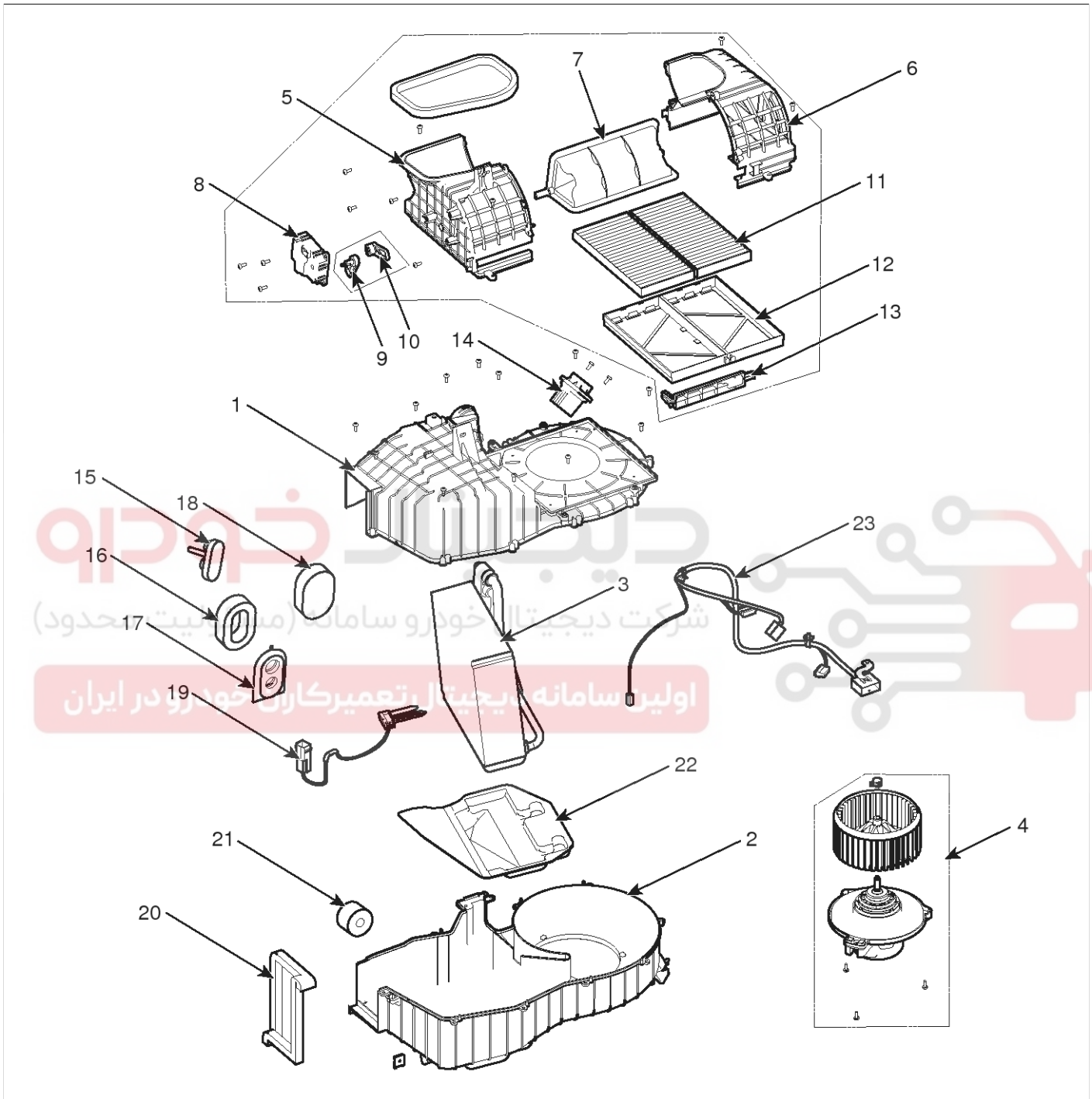
Symptoms	Causes	How to check
Temp actuator running error	Power supply error in temp actuator	After altering 17°C(62°F) to 32°C(90°F) and adversely, measure voltage of A-6 terminal. If both of them are 9V and more, check temp actuator and peripheral wiring state and if one or both of them are 5V and less, its cause is internal failure of FATC.
	Sensor (+5) power supply error	If automatic control isn't operated smoothly, measure voltage of FATC connector A-18 terminal. If under 4.8V or over 5.2V, its cause is internal failure of FATC.
	Driver error of temp actuator	If No. E6 is outputted as a result of self-diagnostic, check temp actuator driver.



LQAC050A

Blower Unit

COMPONENTS

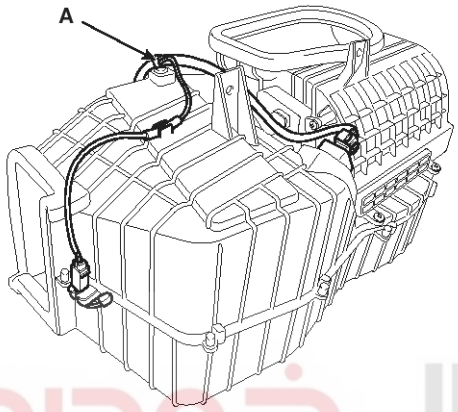


1. Evaporator & Blower upper case
2. Evaporator & Blower lower case
3. Evaporator core
4. Blower motor
5. Intake case (L)
6. Intake case (R)
7. Intake door
8. Intake actuator
9. Intake actuator
10. Intake door lever
11. Climate control air filter
12. Filter case
13. Climate control air filter cover
14. Power mosfet
15. Flange cap
16. Flange seal
17. Evaporator pipe seal
18. Flange seal
19. Evaporator sensor
20. Matching lining
21. Drain seal
22. Lower lining case
23. Wire haness

SBLHA6112L

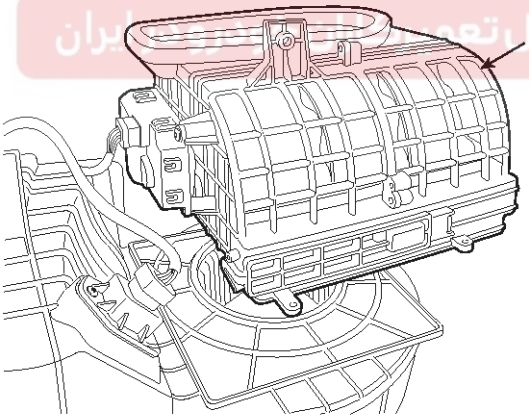
REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the crush pad.(Refer to BD group-cresh pad)
3. Remove the cowl cross bar assembly.(Refer to BD group-Cresh pad)
4. Remove the evaporator & blower unit.
5. Disconnect the connectors from the intake actuator, the blower motor and power mosfet.



SBLHA6017D

6. Remove the intake duct assemble (A) from the heater unit after loosening a mounting bolt and 4 screws.

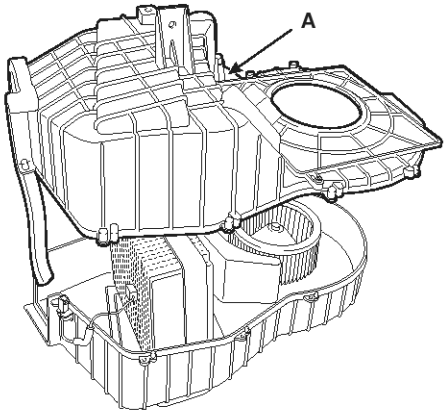


SBLHA6018D

NOTICE

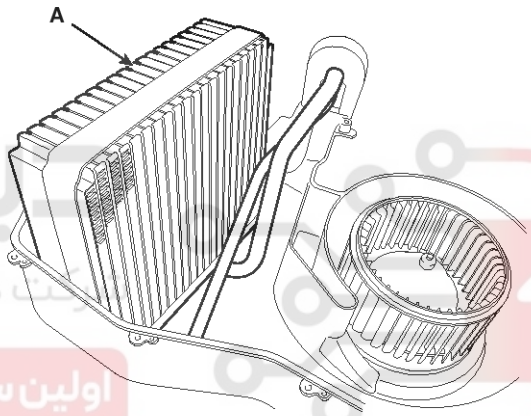
Make sure that there is no air leaking out of the blower and duct joints.

7. Remove the lower case(A) from the evaporator & blower unit assembly arfer unscrewing 8screws.



SBLHA6019D

8. Remove the evaporator core(A).



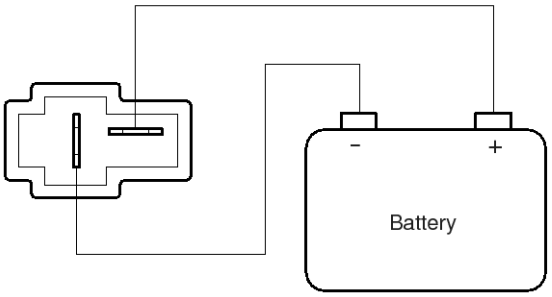
SBLHA6020D

9. Installation is the reverse order of removal.

Blower Motor

INSPECTION

1. Connect the battery voltage and check the blower motor rotation.

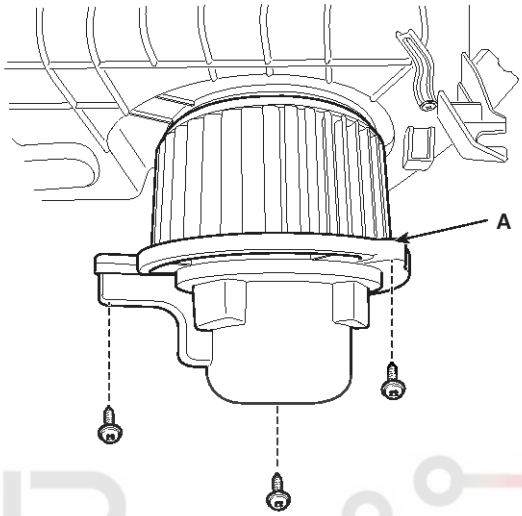


SBLHA6308D

2. If the blower motor voltage is not operated well, substitute with a known-good blower motor and check for proper operation.
3. If the problem is corrected, replace the blower motor.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Disconnect the connector of the blower motor.
3. Remove the blower motor (A) after loosening the mounting screws.



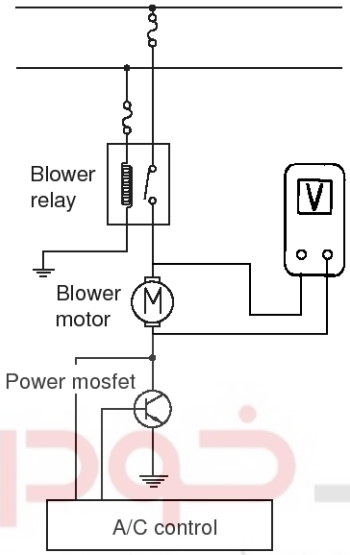
SBLHA6021L

4. Installation is the reverse order of removal.

Power Mosfet

INSPECTION

1. Ignition "ON"
2. Manually operate the control switch and measure the voltage of blower motor.
3. Select the control switch to raise voltage until high speed.



BQKF355B

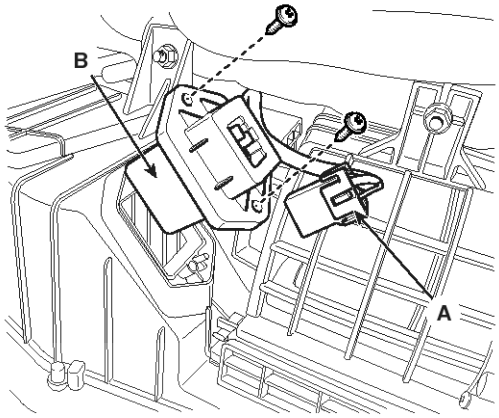
[Specification]

Fan	Motor Voltage	
	Manual	AUTO
First speed	4.0 ± 0.5	4.50~4.79
Second speed	5.0 ± 0.5	4.80~5.79
Third speed	6.2 ± 0.5	5.80~6.89
Fourth speed	7.4 ± 0.5	6.90~8.09
Fifth speed	8.6 ± 0.5	8.10~9.29
Sixth speed	9.8 ± 0.5	9.30~10.49
Seventh speed	11.0 ± 0.5	10.50~11.99
eighth speed	Battery(+)	Battery(+)

4. If the measured voltage is not specification, substitute with a known-good power mosfet and check for proper operation.
5. If the problem is corrected, replace the power mosfet.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the cresh pad.
3. Disconnect the power mosfet connector (A).
4. Remove the power mosfet (B) after loosening the mounting screws.



SBLHA6022L

5. Installation is the reverse order of removal.

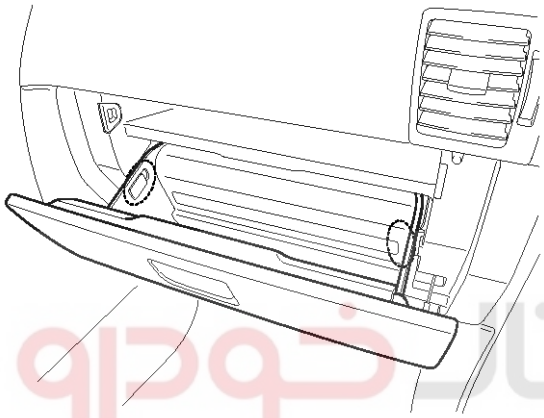
Climate control air filtar

DESCRIPTION

This has particle filter which eliminates foreign materials and odor. The particle filter includes odor filter as well as conventional dust filter to ensure comfortable interior environment.

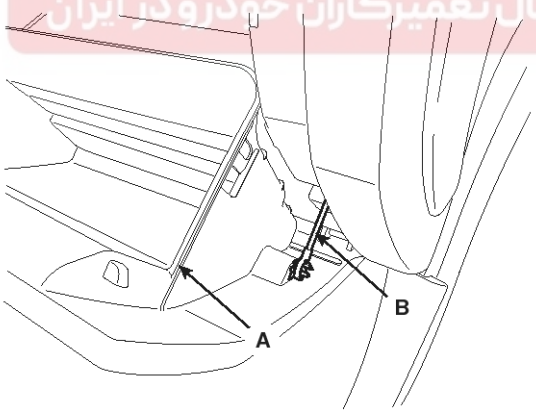
REPLACEMENT

1. Open the glove box (B). Lower the glove box down completely by removing the glove box stopper (A) to the glove box.



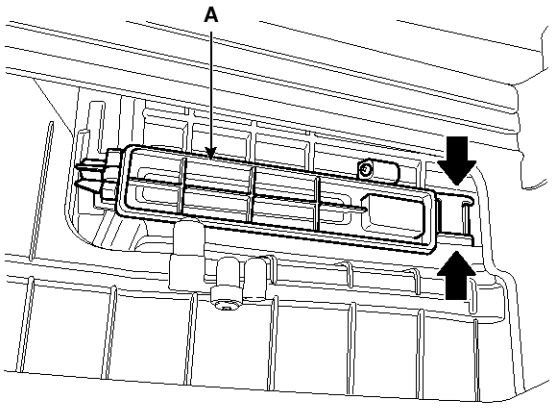
SBLHA6305D

2. Remove the glove box(A) from the lift(B).



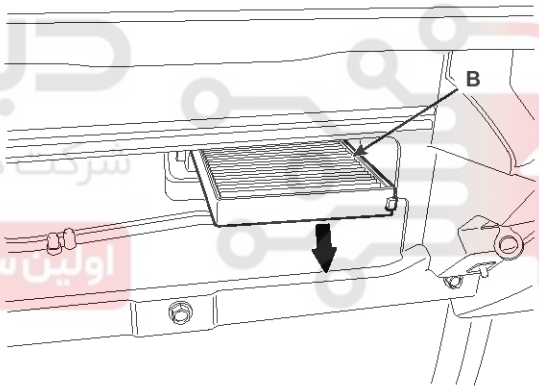
SBLHA6302D

3. Remove the filter cover (A) with pushing the knob.



SBLHA6023D

4. Replace the air filter (B), install it after making sure of the direction of air filter.



SBLHA6024L

NOTICE

In case of driving in an air-polluted area or rugged terrain, check and replace the air filter as frequently as possible.

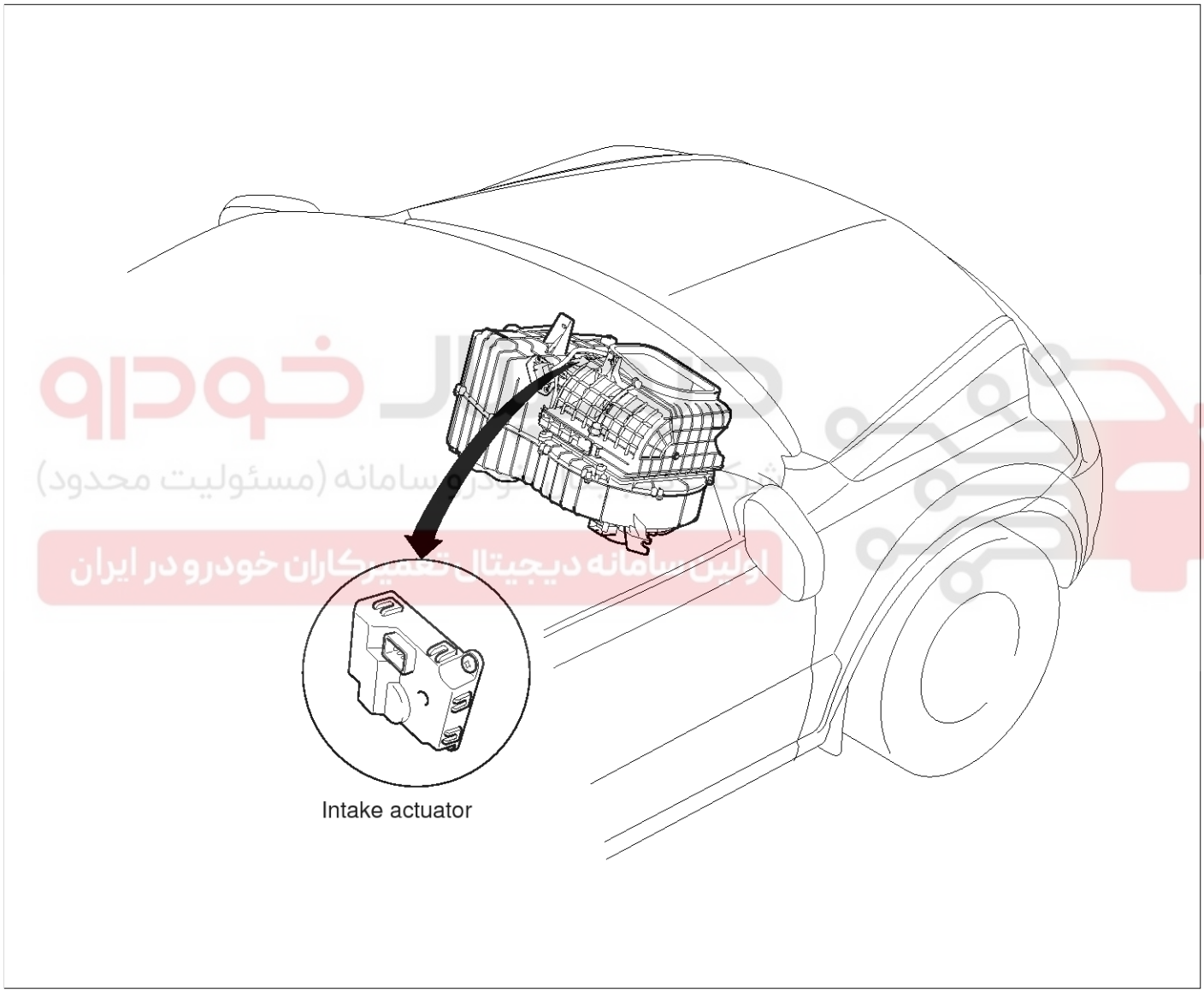
Replacement period: 15,000 km (9320 mile)

Intake Actuator

DESCRIPTION

1. The intake actuator is located at the blower unit.
2. It regulates the intake door by signal from control unit.
3. Pressing the intake selection switch will shift between recirculation and fresh air modes.

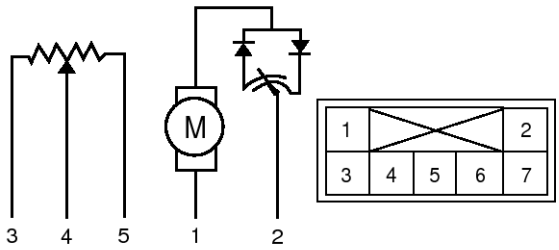
COMPONENT LOCATION



SBLHA6113L

INSPECTION

1. Ignition "OFF"
2. Disconnect the intake actuator connector.
3. Verify that the actuator operates to the recirculation position when connecting 12V to the terminal 1 and grounding terminal 2.
4. Verify that the intake actuator operates to the fresh position when connecting in the reverse.



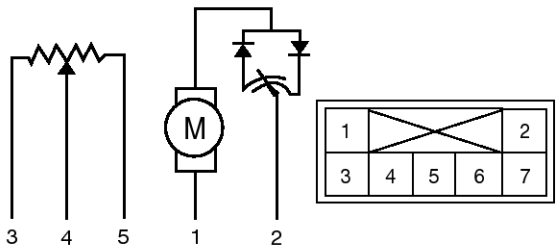
1. Recirculation
2. Fresh
3. Sensor ground
4. Feed back signal
5. Vcc(+5v)
6. -
7. -

SBLHA6304L

5. If the intake actuator is not operated well, substitute with a known-good intake actuator and check for proper operation.
6. If the problem is corrected, replace the intake actuator.

[RHD]

1. Ignition "OFF"
2. Disconnect the intake actuator connector.
3. Verify that the actuator operates to the recirculation position when connecting 12V to the terminal 3 and grounding terminal 4.
4. Verify that the intake actuator operates to the fresh position when connecting in the reverse.



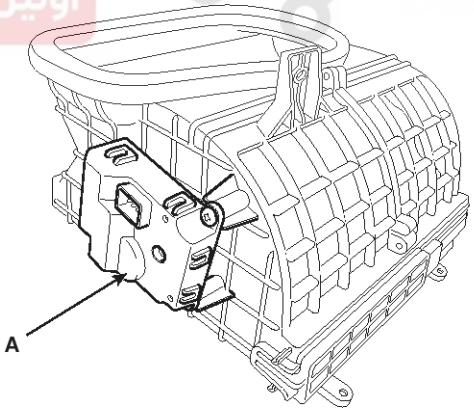
1. -
2. -
3. REC mode
4. FRE mode
5. Sensor GND
6. Feed back signal
7. 5V (VCC)

SBLHA6304N

5. If the intake actuator is not operated well, substitute with a known-good intake actuator and check for proper operation.
6. If the problem is corrected, replace the intake actuator.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the cresh pad (Refer to BD group-cresh pad).
3. Disconnect the intake actuator connector.
4. Loosen the mounting screw and then remove the intake actuator (A) from the blower unit.

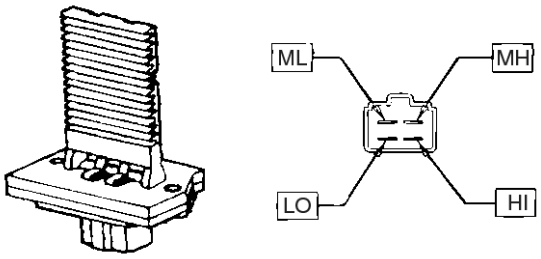


SBLHA6025D

5. Installation is the reverse order of removal.

Blower Speed Controller

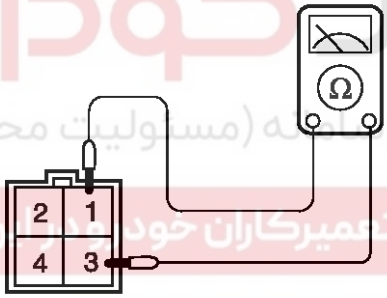
CHECK (MANUAL CONTROL)



AQAC037A

1. Check for continuity and resistance between terminals.

Terminal	Resistance (Ω ± 10%)
3 - 1	0.33
3 - 2	0.85
3 - 4	2.07

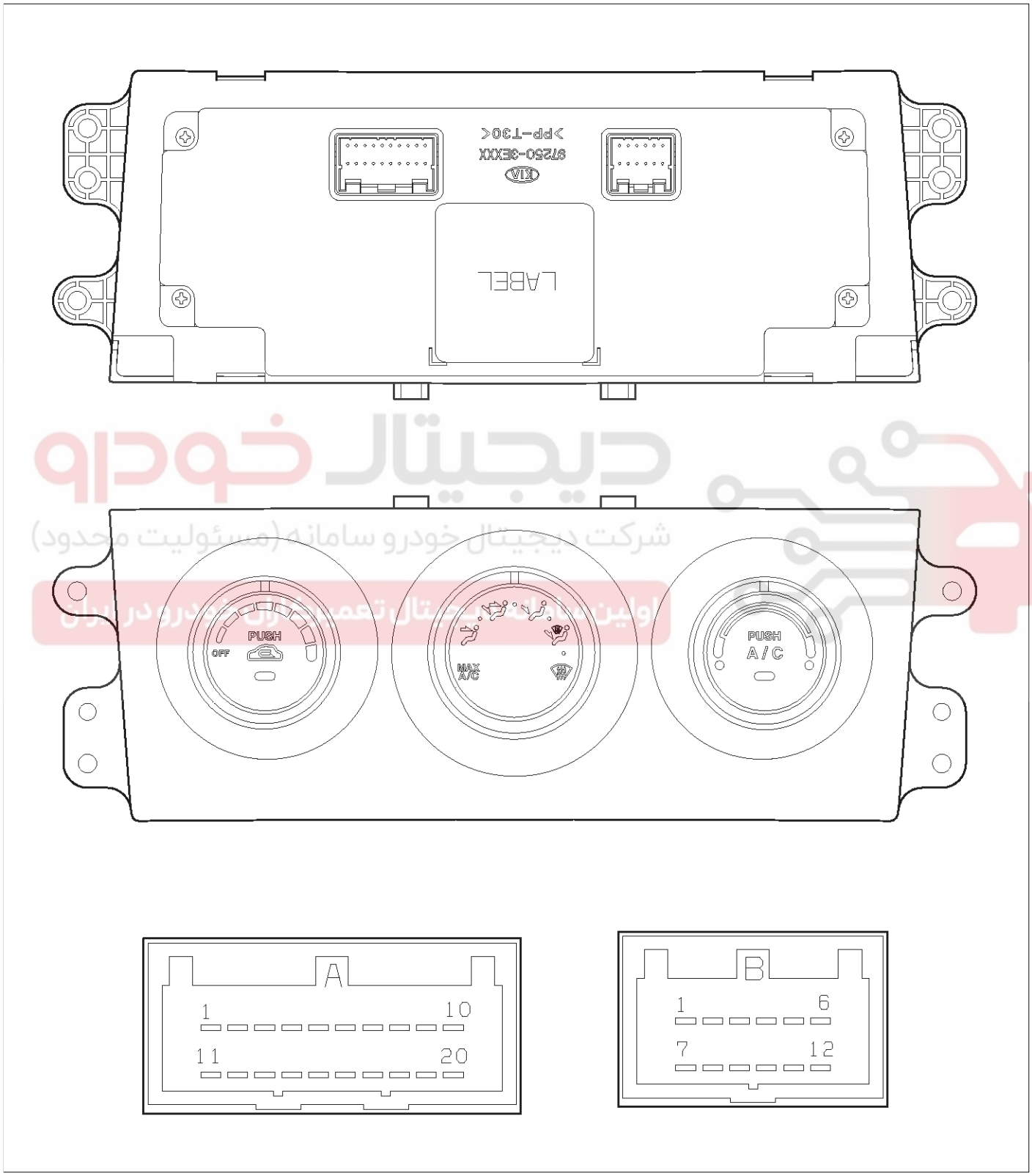


LQAC037B

Controller

Heater & A/C Control Unit(Manual)

COMPONENT



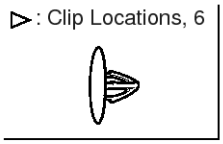
SBLHA6120D

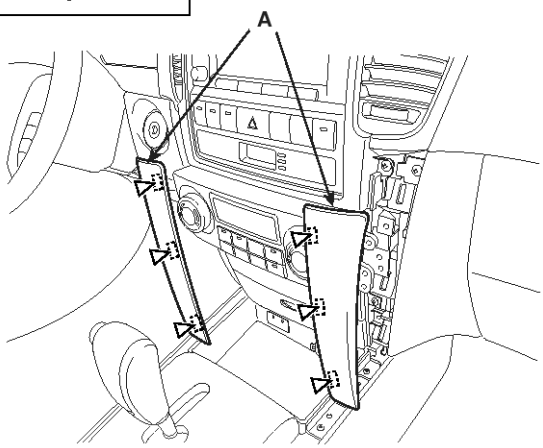
[CONNECTOR PIN FUNCTION]

CONNECTOR	PIN	FUNCTION	CONNECTOR	PIN	FUNCTION
Connector (A)	1	IGN2	Connector (B)	1	Vref(5V)
	2	TAIL LAMP		2	A/C SELECTOR (HIGH)
	3	BATT(12V)		3	A/C OUTPUT(HIGH)
	4	FET(B)		4	TEMP ACTUATOR(F/BACK)
	5	BLOWER MOTOR		5	MODE ACTUATOR(F/BACK)
	6	-		6	INTAKE ACTUATOR(F/BACK)
	7	TEMP ACTUATOR(COOL)		7	IGN2
	8	INTAKE ACTUATOR(FRE)		8	-
	9	RHEOSTAT		9	-
	10	GND		10	EVAPORATOR SENSOR
	11	-		11	SENSOR GND
	12	MODE ACTUATOR(DEF)		12	GND
	13	FET(D)			
	14	PTC ON SIGNAL			
	15	PTC RELEY 2			
	16	PTC RELEY 3			
	17	MODE ACTUATOR(VENT)			
	18	TEMP ACTUATOR(WARM)			
	19	INTAKE ACTUATOR(REC)			
	20	BLOWER SELECTOR			

REPLACEMENT

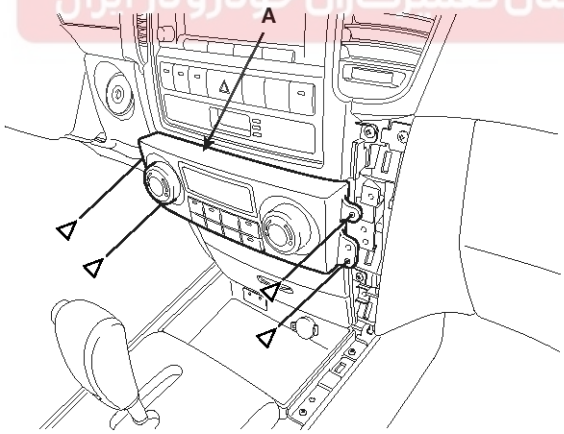
1. Disconnect the negative (-) battery terminal.
2. Remove the side garnish (A).





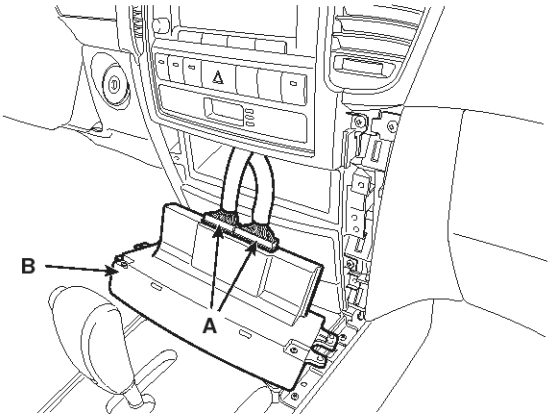
SBLHA6121L

3. After loosening the heater control mounting screw, remove the heater control unit(A).



SBLHA6122L

4. After disconnect the connector(A), remove the heater control unit(B).

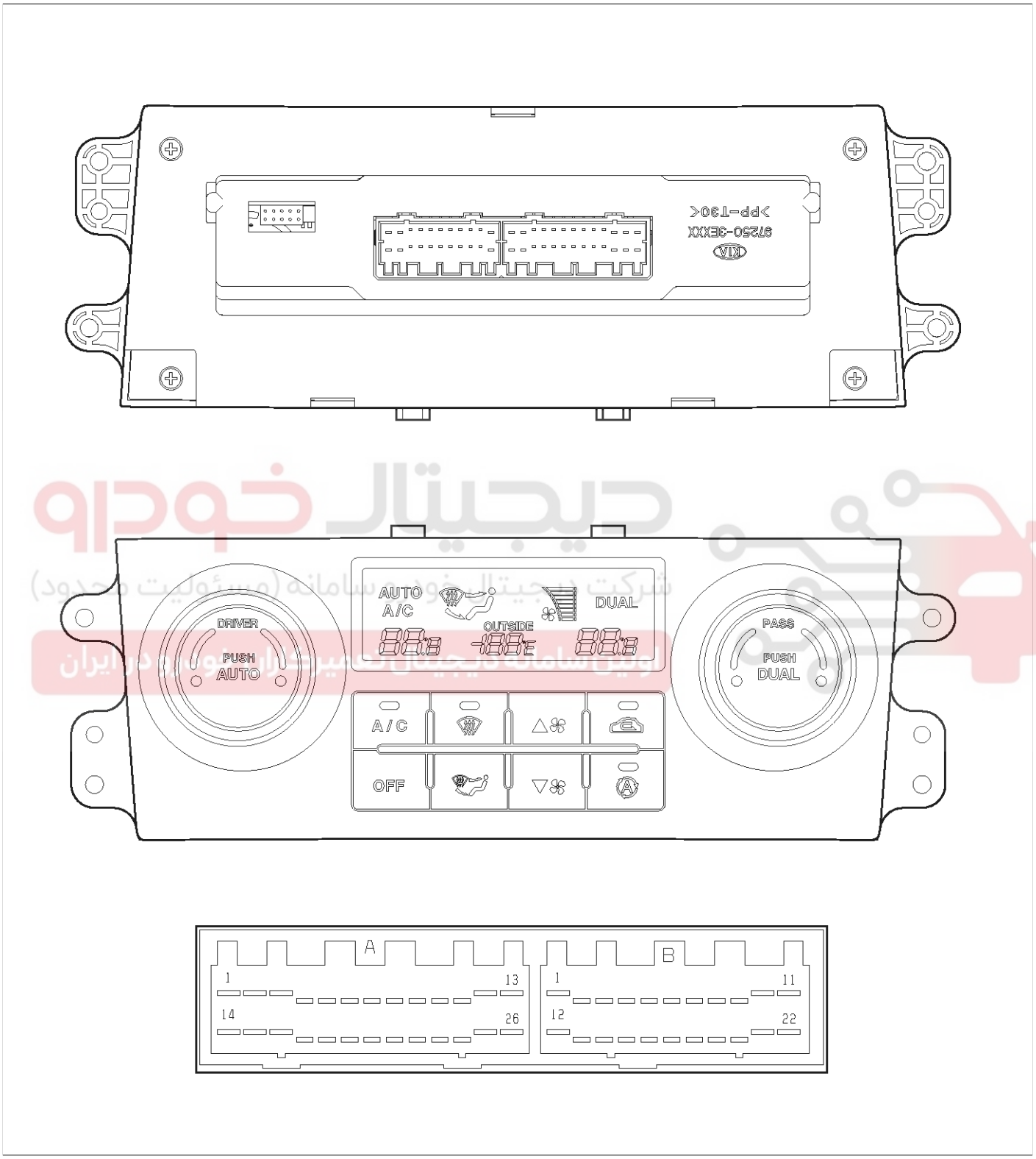


SBLHA6123L

5. Installation is the reverse order of removal.

Heater & A/C Control Unit(Full Automatic)

COMPONENT



SBLHA6124D

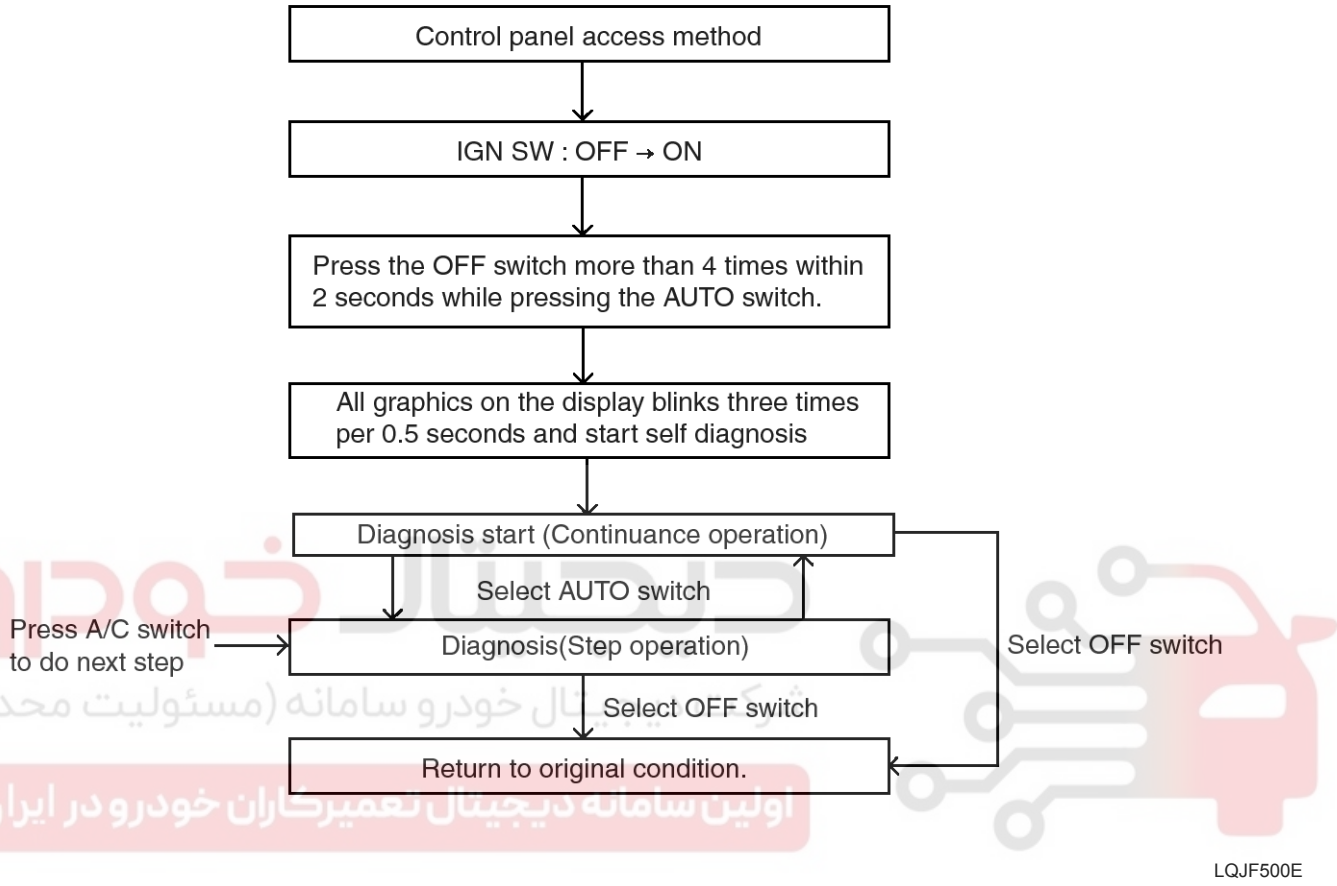
[CONNECTOR PIN FUNCTION]

CONNECTOR	PIN	FUNCTION	CONNECTOR	PIN	FUNCTION
CONNECTOR (A)	1	IGN2	CONNECTOR (B)	1	REF(+5V)
	2	TAIL LAMP		2	IG2
	3	Battery (+)		3	SUN SENSOR(-)
	4	Power mosfet (Gate)		4	EVAPORATOR SENSOR
	5	BLOWER MOTOR		5	SPEED SENSOR
	6	PTC ON SIGNAL(LOW)		6	K-LINE
	7	INCAR MOTOR(+)		7	HUMIDIT SENSOR
	8	PS TEMP ACTUATOR(COOL)		8	INCAR SENSOR
	9	DR TEMP ACTUATOR(COOL)		9	AQS SIGNAL
	10	INTAKE ACTUATOR(FRESH)		10	DR TEMP ACTUATOR F/B
	11	-		11	MODE ACTUATOR F/B
	12	RHEOSTAT		12	AMB SENSOR
	13	GND		13	DR SUN SENSOR(-)
	14	A/C SELECT(HIGH)		14	WATER TEMP SENSOR
	15	MOSE ACTUATOR(DEF)		15	INTAKE ACTUATOR F/B
	16	FET(DRAIN)		16	PS TEMP ACTUATOR F/B
	17	A/C THERMO(HIGH)		17	PS SUN SENSOR
	18	-		18	PS TEMP ACTUATOR(WARM)
	19	PTC RELAY2		19	-
	20	PTC RELAY3		20	-
	21	MODE ACTUATOR(VENT)		21	GND
	22	DR TEMP ACTUATOR(WARM)		22	SENSOR GND
	23	INTAKE ACTUATOR(REC)			
	24	BLOWER SELECT(LOW)			
	25	INCAR MOTOR(-)			
	26	-			

SELFDIAGNOSIS

1. Self-diagnosis process

   The F.A.T.C. module self test feature will detect electrical malfunction and provide error codes for system components with suspected failures.



NOTICE

DTC data can be retrieved from the control panel directly or from the DLC using the Hi-Scan Pro.

2. How to read self-diagnostic code

   After the display panel flickers three times every 0.5 second, the corresponding fault code flickers on the setup temperature display panel every 0.5 second and will show two figures. Codes are displayed in numerical format

Fault code

Fault code Control unit	Fail description
0	Normal
11	IN-COR TEMPERATURE SENSOR OPEN (High)
12	IN-COR TEMPERATURE SENSOR SHORT (Low)
13	AMBIENT TEMPERATURE SENSOR OPEN (High)
14	AMBIENT TEMPERATURE SENSOR SHORT (Low)
15	WATER TEMPERATURE SENSOR OPEN (High)
16	WATER TEMPERATURE SENSOR SHORT (Low)
17	EVAPORATOR TEMPERATURE SENSOR OPEN (High)
18	EVAPORATOR TEMPERATURE SENSOR SHORT (Low)
19	TEMP POTENTIOMETER OPEN or SHORT (Drive)
20	TEMP POTENTIOMETER FAULT (Drive)
21	MODE POTENTIOMETER OPEN or SHORT
22	MODE POTENTIOMETER FAULT
23	HUMIDITY SENSOR OPEN (Open)
24	HUMIDITY SENSOR SHORT (Short)
25	INTAKE POTENTIOMETER OPEN or SHORT
26	INTAKE POTENTIOMETER FAULT
32	TEMP POTENTIOMRTER OPEN or SHORT (Passenger)
33	TEMP POTENTIOMETER FAULT (Passenger)

3. Fault code display.

BQKF500C

4. If fault codes are displayed during the check, Inspect malfunction causes by referring to fault codes.
5. Fail safe
   1) In-car temperature sensor: Control with the value of 23℃ (73.4˚F)
   2) Ambient temperature sensor: Control with the value of 20℃ (67˚F)
   3) Evaporator temperature sensor: Control with the value of -2℃ (28.4˚F)
   4) Humidity sensor: Doesn't control.
   5) Photo sensor: None correction
   6) Temperature control actuator (Air mix potentiometer):
      - If temperature set 17℃-24.5℃, fix at maximum cooling position.
      - If temperature set 25℃-32℃, fix at maximum heating position.
   7) Mode control actuator (Direction potentiometer):

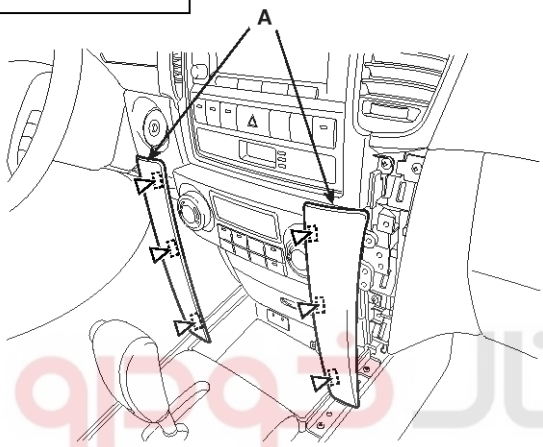
- Fix vent position, while selecting vent mode.
- Fix defrost position, while selecting all except vent mode.

8) A.Q.S sensor: Doesn't control.

REPLACEMENT

1. Disconnect the negative (-) battery terminal.
2. Remove the side garnish (A).

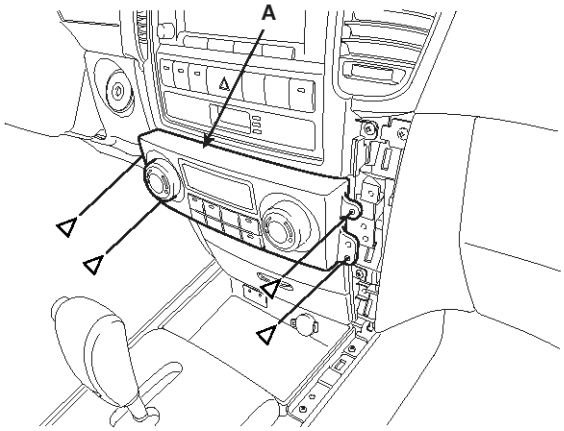
▷: Clip Locations, 6



SBLHA6121L

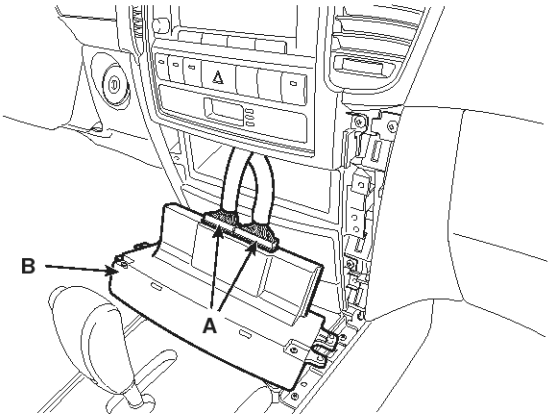
3. After loosening the heater control mounting screw, remove the heater control unit(A).

▷: Screw Locations, 4



SBLHA6122L

4. After disconnect the connector(A), remove the heater control unit(B).

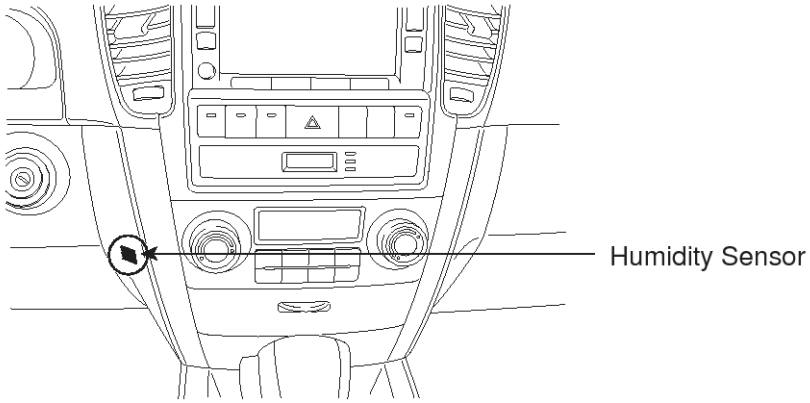


SBLHA6123L

5. Installation is the reverse order of removal.

B1200

COMPONENT LOCATION



SBLHA6500L

GENERAL DESCRIPTION

Humidity sensor located at crush pad, detects in-car humidity for in-car humidity control. If ambient air temperature or in-car humidity is outside certain range, it will turn on A/C to control in-car humidity for preventing in-car fogging. Air conditioner operation depends on ambient temperature and humidity.

DTC DESCRIPTION

The A/C controller sets DTC B1200 if there is an open circuit in humidity sensor signal harness or the measured frequency value of sensor is more than threshold value(about 7,100Hz)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Frequency check	• Open Circuit in signal harness • Faulty Humidity Sensor • Faulty A/C control unit
Threshold value	• > 7,100 Hz	
Detecting time	• 10msec	
FAIL SAFE	• Control with the value of 10%	

SPECIFICATION

Relative humidity(%)	Frequency(Hz)	Relative humidity(%)	Frequency(Hz)
20	7,100	60	6,600
30	6,976	70	6,468
40	6,853	80	6,330
50	6,728	90	6,186

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "Humidity Sensor" Parameter on the Scantool while drying the humidity sensor with a hair drier or heat gun adjusted to a low heat setting.

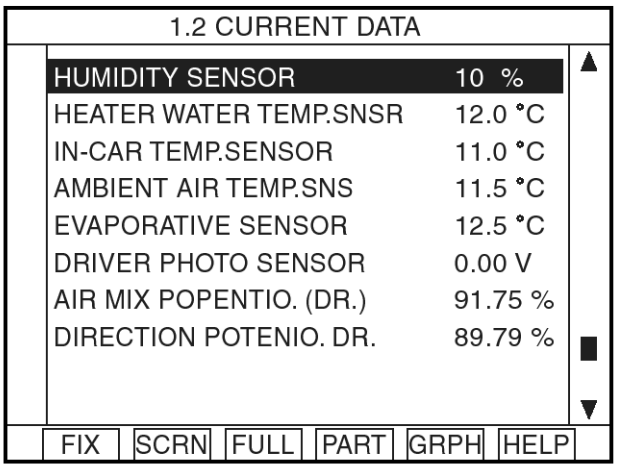


Fig. 1

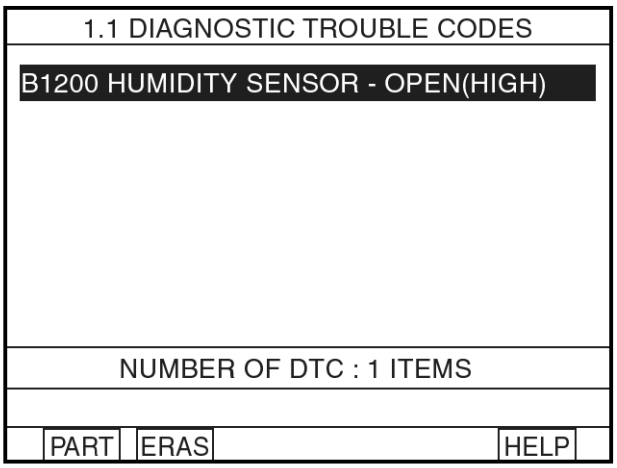


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1200.

EQBF510B

4. Are the DTC B1200 present and is parameter of "Humidity Sensor" fixed?

   ※ Parameter of "Humidity Sensor" will be fixed at 10%, if there is any fault in Humidity Sensor.

   YES

   Go to "Inspection" procedure.

   NO

   Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

   YES

   Repair as necessary and go to "Verification of Vehicle Repair" procedure.

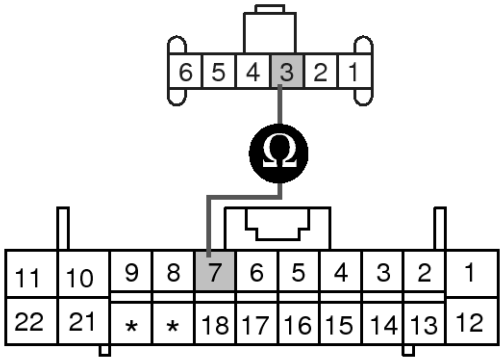
   NO

   Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Humidity Sensor.
   3) Measure resistance between terminal "3" of Humidity Sensor and terminal "7" of A/C Control Unit.

Specification : Approx. 0 Ω



1. Motor(-)
2. Sensor ground
3. **Humidity sensor signal**
4. In-car sensor temp. signal
5. Sensor power (5V)
6. Motor(+)

SBLHA6501L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection " procedure.

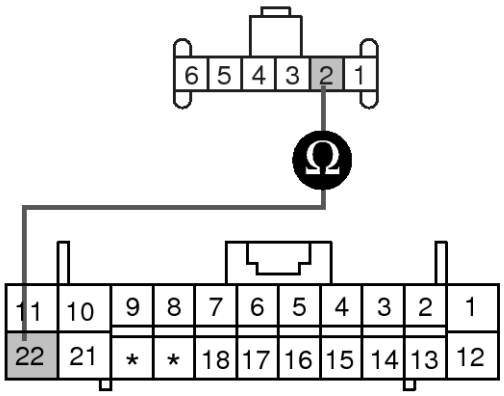
NO

Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harness.
   1) Ignition "OFF"
   2) Disconnect Humidity Sensor.
   3) Measure resistance between terminal "2" of Humidity Sensor and terminal "22" of A/C Control Unit.

Specification :Approx. 0 Ω



1. Motor(-)
2. **Sensor ground**
3. Humidity sensor signal
4. In-car sensor temp. signal
5. Sensor power (5V)
6. Motor(+)

SBLHA6502L

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

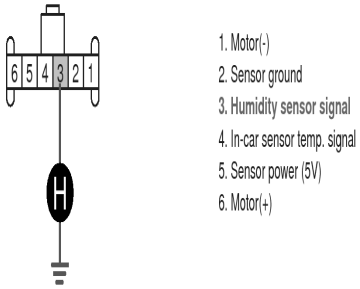
NO

Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check Humidity Sensor.
   1) Engine "ON"
   2) Connect Humidity Sensor.
   3) Measure Frequency between terminal "3" of Humidity sensor while increasing humidity.

Specification : Refer the specifications in fig 5.



SBLHA6503L

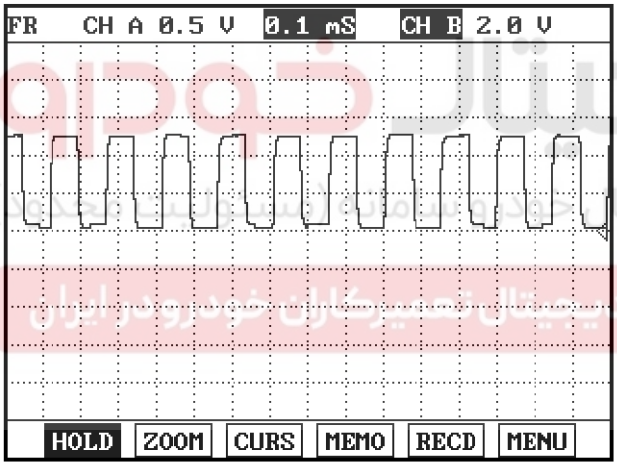


Fig. 3

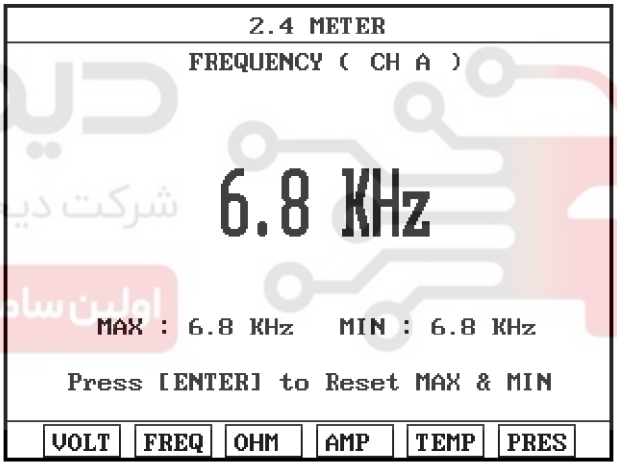


Fig. 4

Fig 3 : Signal waveform of Humidity sensor.
Fig 4 : Frequency of Humidity sensor Measured by scantool.

EQBF510F

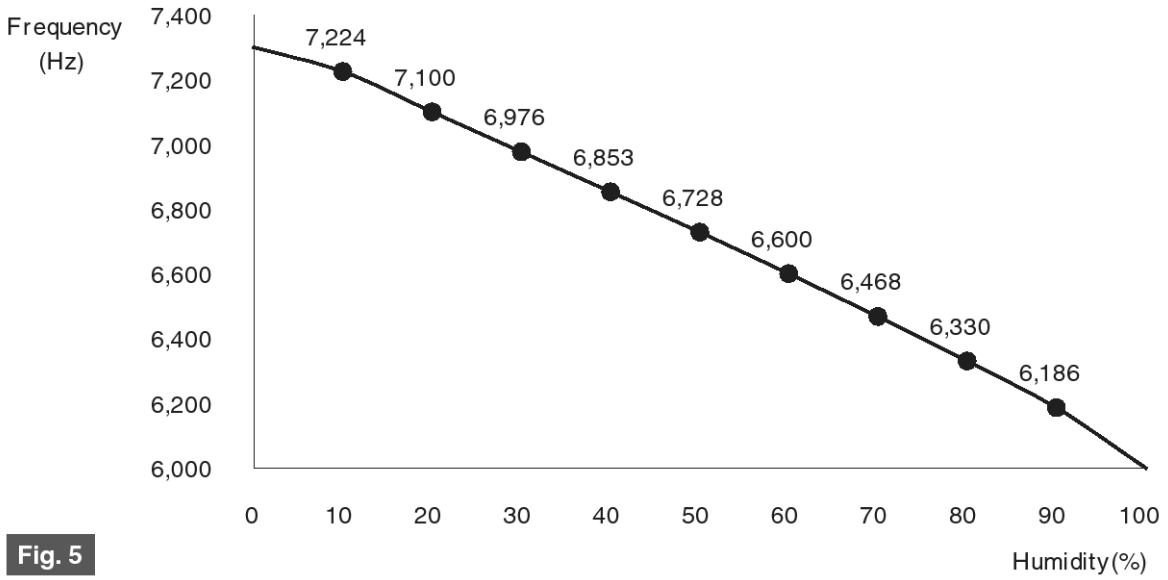


Fig. 5

Fig 5) Specifications : Frequency value of humidity sensor as a function of Relative humidity.

EQBF510Q

4) Is the measured frequency within specifications in fig 5? (tolerance limits ± 5%)

YES

Go to "Check A/C Control Unit" procedure.

NO

Substitute with a known-good Humidity sensor and check for proper operation.

If the problem is corrected, replace Humidity sensor and then go to "Verification of Vehicle Repair" procedure.

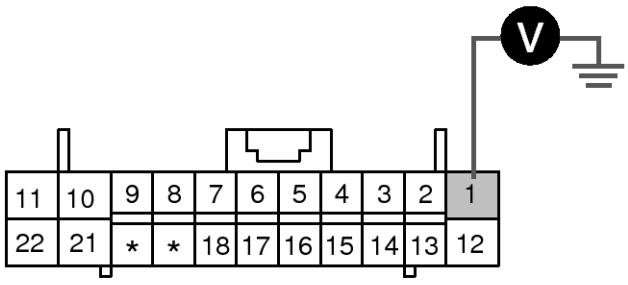
2. Check A/C Control Unit

1) Engine "ON"

2) Disconnect Humidity Sensor.

3) Measure voltage value between terminal "1" of A/C control unit and chassis ground.

Specification : 5V



1. Humidity sensor signal

SBLHA6504L

4) Is the measured voltage within specification?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

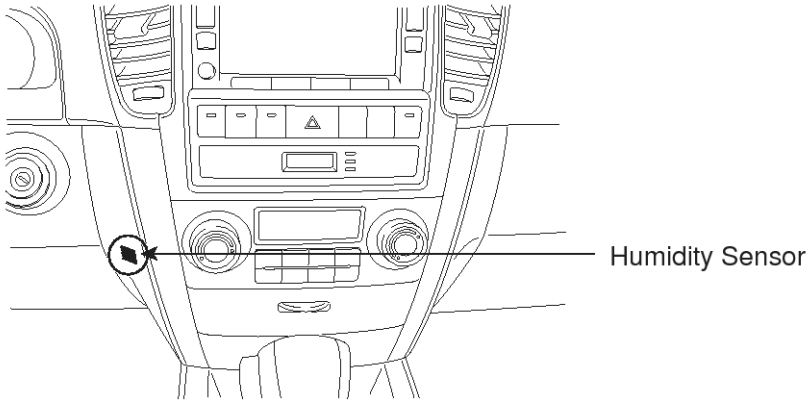
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1201

COMPONENT LOCATION



SBLHA6500L

GENERAL DESCRIPTION

Humidity sensor located at crush pad, detects in-car humidity for in-car humidity control. If ambient air temperature or in-car humidity is outside certain range, it will turn on A/C to control in-car humidity for preventing in-car fogging. Air conditioner operation depends on ambient temperature and humidity.

DTC DESCRIPTION

The A/C controller sets DTC B1201 if there is a short circuit in humidity sensor signal harness or the measured frequency value of sensor is less than threshold value(about 6,186Hz)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Frequency check	• Open Circuit in power harness • Short Circuit in signal harnes • Faulty Humidity Sensor • Faulty A/C control unit
Threshold value	• < 6,186 Hz	
Detecting time	• 10msec	
FAIL SAFE	• Control with the value of 10%	

SPECIFICATION

Relative humidity(%)	Frequency(Hz)	Relative humidity(%)	Frequency(Hz)
20	7,100	60	6,600
30	6,976	70	6,468
40	6,853	80	6,330
50	6,728	90	6,186

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).

2. Engine "ON"
3. Monitor the "Humidity Sensor" Parameter on the Scantool while drying the humidity sensor with a hair drier or heat gun adjusted to a low heat setting.

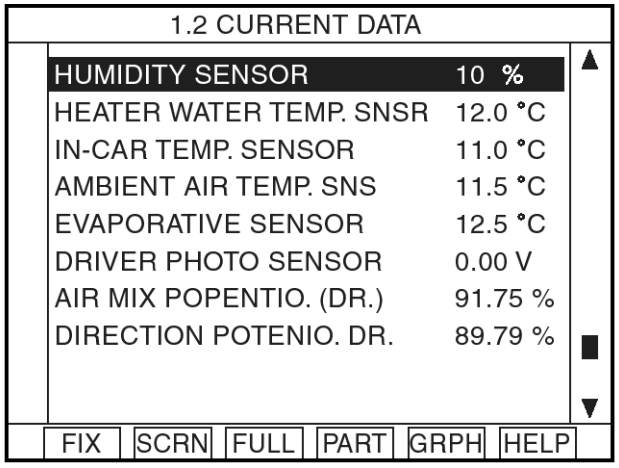


Fig. 1

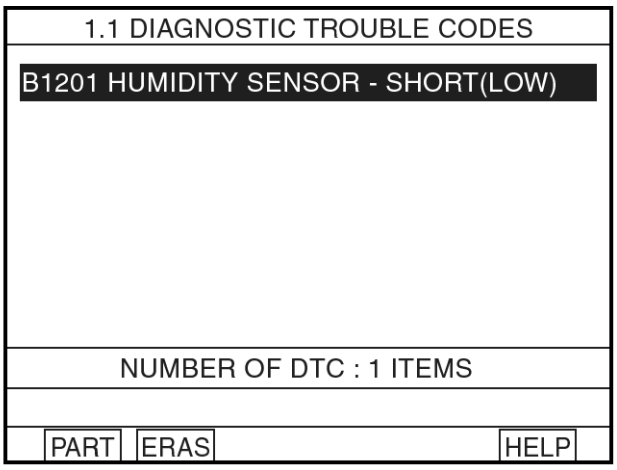


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1201.

EQBF511A

4. Are the DTC B1201 present and is parameter of "Humidity Sensor" fixed?

   ※ Parameter of "Humidity Sensor" will be fixed at 10%, if there is any fault in Humidity Sensor.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

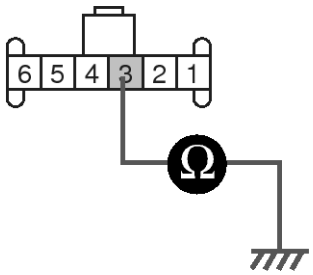
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect Humidity Sensor.
   3) Measure resistance between terminal "3" of Humidity Sensor and chassis ground.

Specification : Approx. ∞ Ω



1. Motor(-)
2. Sensor ground
3. **Humidity sensor signal**
4. In-car sensor temp. signal
5. Sensor power (5V)
6. Motor(+)

LQLG511B

4) Is the measured resistance within specifications?

YES

Go to "Power circuit Inspection " procedure.

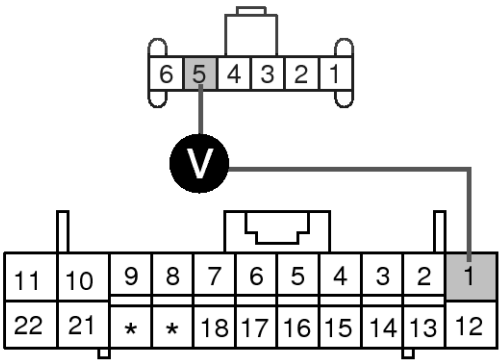
NO

Check for short to ground in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

POWER SUPPLY CIRCUIT INSPECTION

1. Check for open in power harness.
   1) Ignition "ON"
   2) Disconnect Humidity Sensor.
   3) Measure resistance value between terminal "5" of Humidity Sensor and terominal "1" of A/C control unit.

Specification : 0Ω



1. Motor(-)
2. Sensor ground
3. Humidity sensor signal
4. In-car sensor temp. signal
5. **Sensor power (5V)**
6. Motor(+)

SBLHA6505L

4) Is the measured voltage within specifications?

YES

Go to "Component Inspection " procedure.

NO

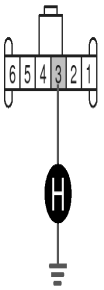
Check for open in power harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check Humidity Sensor.
   1) Engine "ON"
   2) Connect Humidity Sensor.
   3) Measure Frequency between terminal "3" of

Humidity sensor and chassis ground.

Specification : Refer the specifications in fig 5.



1. Motor(-)
2. Sensor ground
3. Humidity sensor signal
4. In-car sensor temp. signal
5. Sensor power (5V)
6. Motor(+)

SBLHA6506L

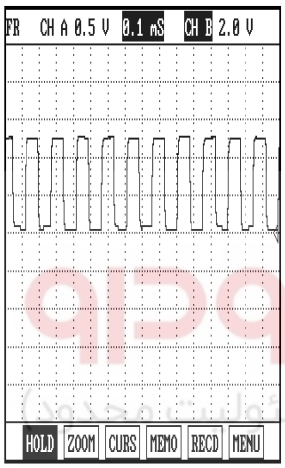


Fig. 3

Fig. 4

Fig 3 : Signal waveform of Humidity sensor.
Fig 4 : Frequency of Humidity sensor Measured by scantool.

EQBF510F

4) Is the measured frequency within specifications in fig 5? (tolerance limits ± 5%)

YES

Go to "Check A/C Control Unit" procedure.

NO

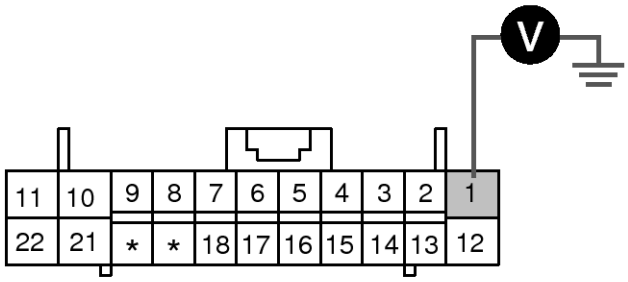
Substitute with a known-good Humidity sensor and check for proper operation.

If the problem is corrected, replace Humidity sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect Humidity Sensor.
   3) Measure voltage value between terminal "1" of

A/C control unit and chassis ground.

Specification : 5V



1. Humidity sensor signal

SBLHA6504L

4) Is the measured voltage within specification?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

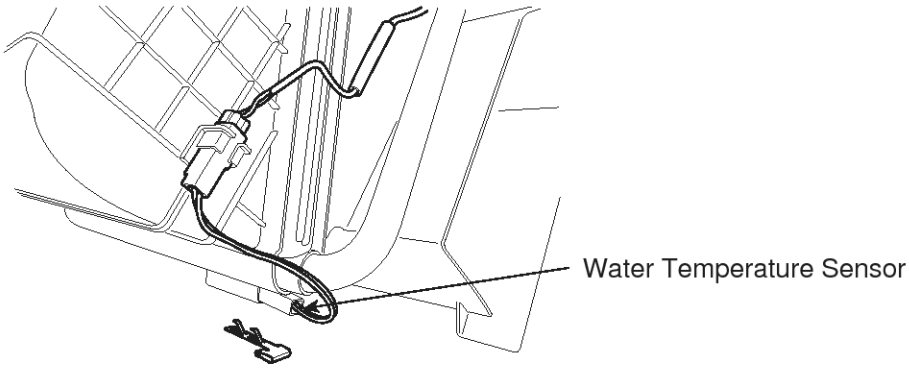
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1202

COMPONENT LOCATION



SBLHA6507L

GENERAL DESCRIPTION

A water temp. sensor located at heater unit, detects coolant temperature. Its signal is used for cold engine lockout control. When the driver operates the heater before the engine is warmed up, the signal from sensor causes the heater control unit to reduce blower motor speed until coolant temperature reaches the threshold value.

DTC DESCRIPTION

The A/C controller sets DTC B1202 if there is an open circuit in water temp. sensor signal harness or the measured resistance value of the sensor is more than the threshold value(about 176.3kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Open Circuit in harness • Faulty water temp. Sensor • Faulty A/C control unit
Threshold value	• ＞ 176.3 kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of -2˚C(28.4˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-30(-22)	176.3	10(50)	19.85
-20(-4)	96.44	20(68)	12.48
-10(14)	54.99	30(86)	8.06
0(32)	32.51	40(104)	5.33

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "WATER TEMP. SENSOR" Parameter on the Scantool.

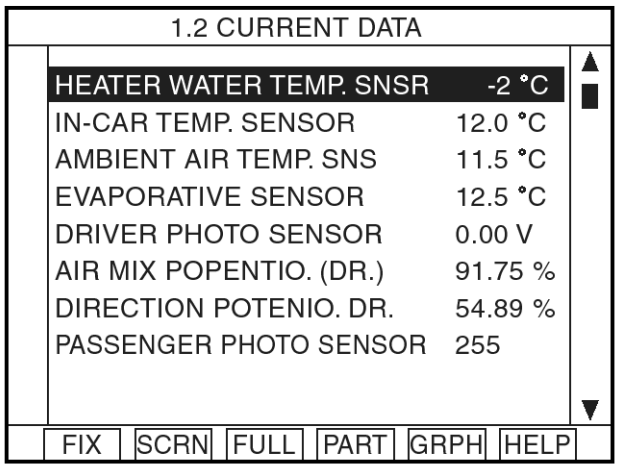


Fig. 1

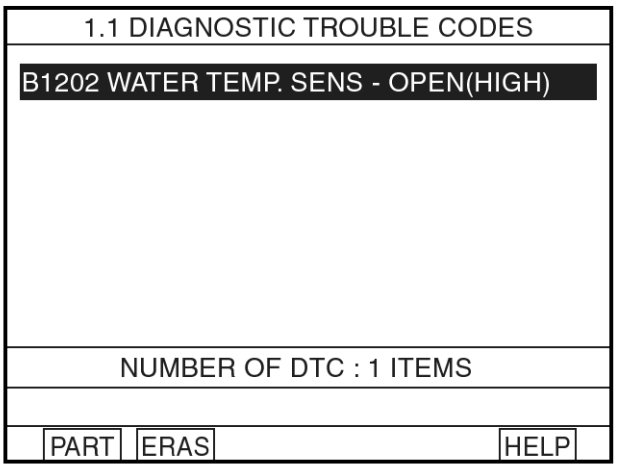


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1202.

EQBF512B

4. Are the DTC B1202 present and is parameter of "WATER TEMP. SENSOR" fixed?

   ※ Parameter of "WATER TEMP. SENSOR" will be fixed at -2℃(28.4°F), if there is any fault in WATER TEMP. SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

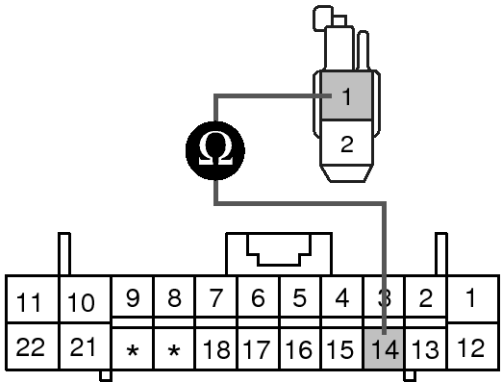
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect water temp. sensor.
   3) Measure resistance between terminal "1" of water temp. sensor and terminal "14" of A/C Control Unit.

Specification : Approx. 0 Ω



1. **Water temp. sensor signal**
2. Sensor ground

SBLHA6508L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection " procedure.

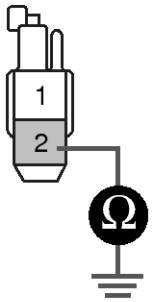
NO

Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harness.
   1) Ignition "OFF"
   2) Disconnect water temp. sensor.
   3) Measure resistance between terminal "2" of water temp. sensor and chassis ground.

Specification : Approx. 0 Ω



1. Water temp. sensor signal
2. **Sensor ground**

LQLG512D

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

NO

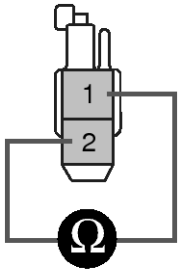
Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check water temp. sensor.
   1) Ignition "OFF"
   2) Disconnect water temp. sensor.
   3) Measure resistance between terminal "1" and "2"

of water temp. sensor.

Specification : Refer the specifications in fig 3.



1. Water temp. sensor signal
2. Sensor ground

LQLG512E

4) Is the measured resistance within specifications in fig 3)? (tolerance limits ± 3%)

YES

Go to "Check A/C Control Unit" procedure.

NO

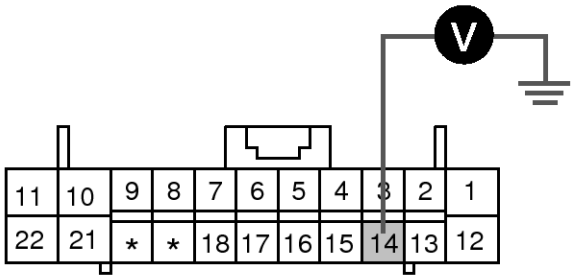
Substitute with a known-good water temp. sensor and check for proper operation.

If the problem is corrected, replace water temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit

1) Engine "ON"
2) Disconnect water temp. sensor.
3) Measure Voltage between terminal "14" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



14. Water temp. sensor signal

SBLHA6509L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control

Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

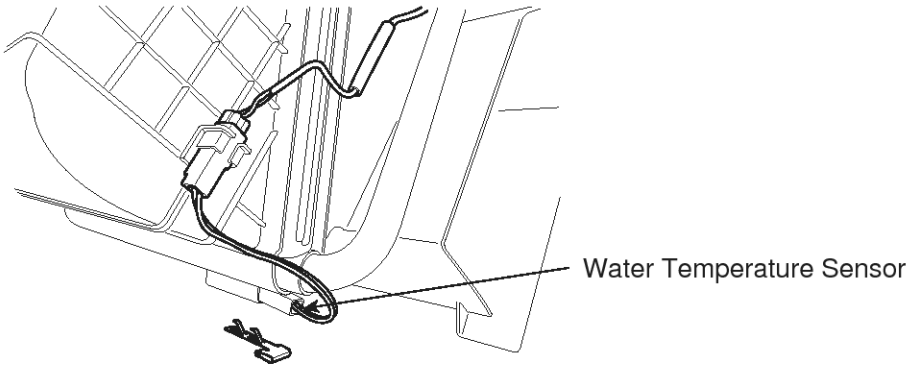
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1203

COMPONENT LOCATION



SBLHA6507L

GENERAL DESCRIPTION

A water temp. sensor located at heater unit, detects coolant temperature. Its signal is used for cold engine lockout control. When the driver operates the heater before the engine is warmed up, the signal from sensor causes the heater control unit to reduce blower motor speed until coolant temperature reaches the threshold value.

DTC DESCRIPTION

The A/C controller sets DTC B1203 if there is a short circuit in water temp. sensor signal harness or the measured resistance value of sensor is less than threshold value(about 1.2kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Short circuit in harness • Faulty water temp. Sensor • Faulty A/C control unit
Threshold value	• ＜ 1.2 kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of -2˚C(28.4˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-30(-22)	176.3	10(50)	19.85
-20(-4)	96.44	20(68)	12.48
-10(14)	54.99	30(86)	8.06
0(32)	32.51	40(104)	5.33

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "WATER TEMP. SENSOR" Parameter on the Scantool.

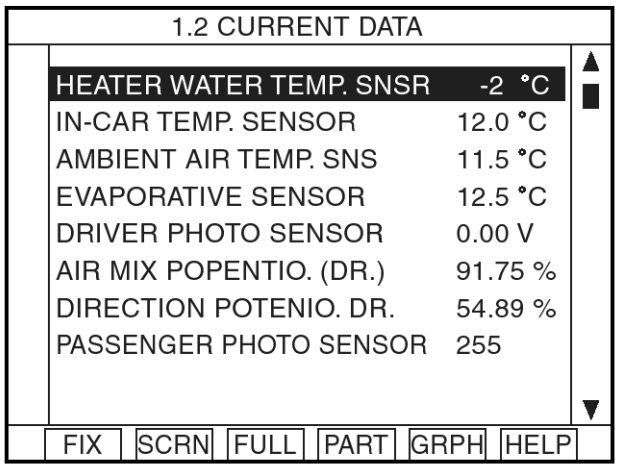


Fig. 1

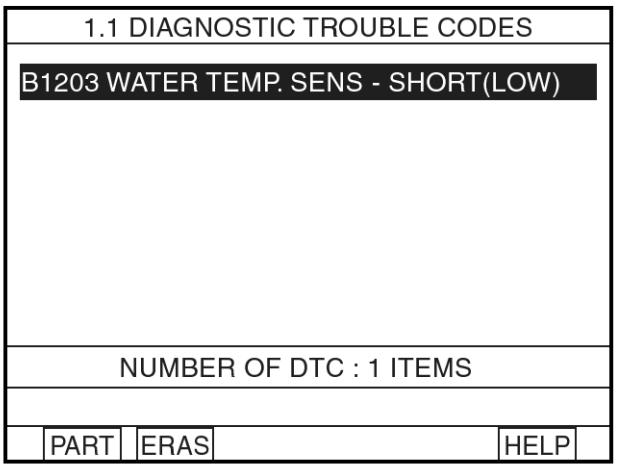


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1203.

EQBF513A

4. Are the DTC B1203 present and is parameter of "WATER TEMP. SENSOR" fixed?

   ※ Parameter of "WATER TEMP. SENSOR" will be fixed at -2℃(28.4°F), if there is any fault in WATER TEMP. SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

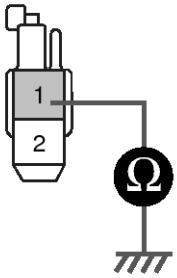
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect water temp. sensor.
   3) Measure resistance between terminal "1" of water temp. sensor and chassis ground.

Specification : Approx. ∞Ω



1. Water temp. sensor signal
2. Sensor ground

LQLG513B

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection" procedure.

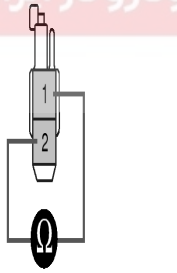
NO

Check for short to ground in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check water temp. sensor.
   1) Ignition "OFF"
   2) Disconnect water temp. sensor.
   3) Measure resistance between terminal "1" and "2" of water temp. sensor.

Specification : Refer the specifications in fig 3.



1. Water temp. sensor signal
2. Sensor ground

LQLG512E

4) Is the measured resistance within specifications in fig 3)? (tolerance limits ± 3%)

YES

Go to "Check A/C Control Unit" procedure.

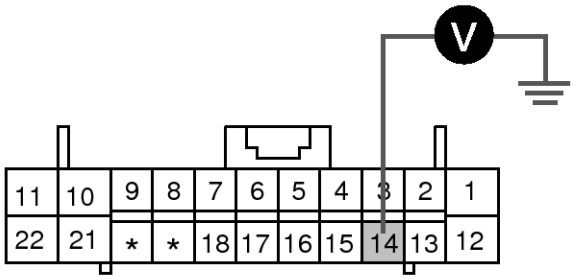
NO

Substitute with a known-good water temp. sensor and check for proper operation.

If the problem is corrected, replace water temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect water temp. sensor.
   3) Measure Voltage between terminal "14" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



14. Water temp. sensor signal

SBLHA6509L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

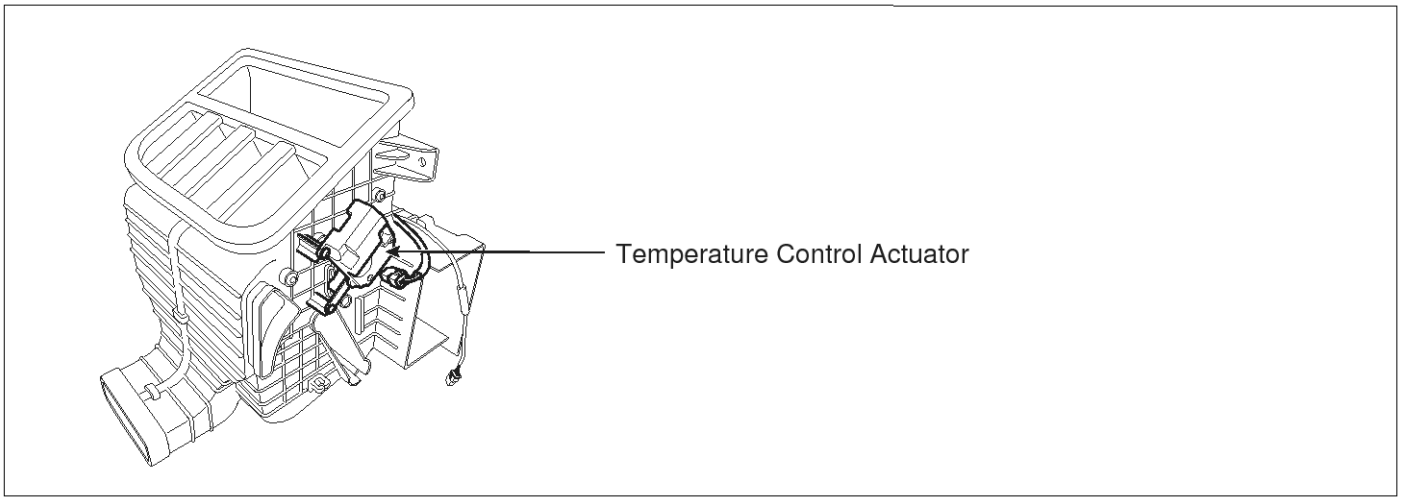
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1204

COMPONENT LOCATION



SBLHA6510L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

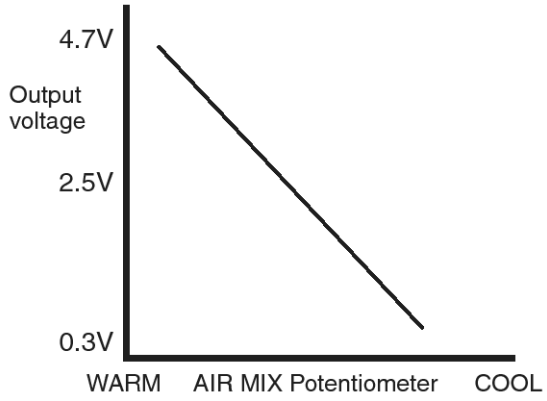
DTC DESCRIPTION

The A/C controller sets DTC B1204 if there is an open circuit or poor connection in the air mix potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver Air Mix potentiometer
Threshold value	• ＜ 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	• If temperature setting 17~24.5˚C(63~76˚F) fix at max. cooling position. • If temperature setting 25~32˚C(77~90˚F) fix at max. heating position.	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Passenger's Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

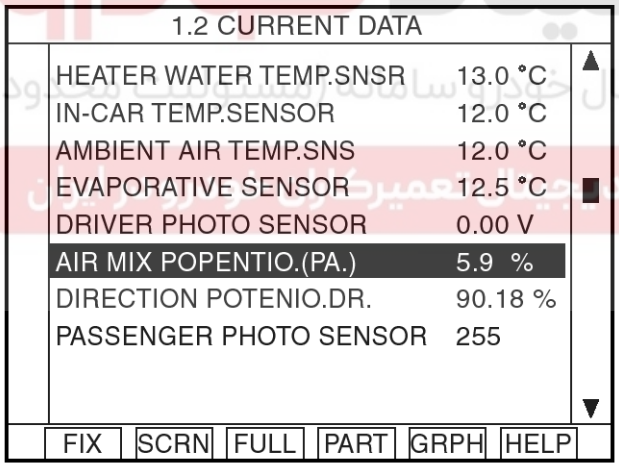


Fig. 1

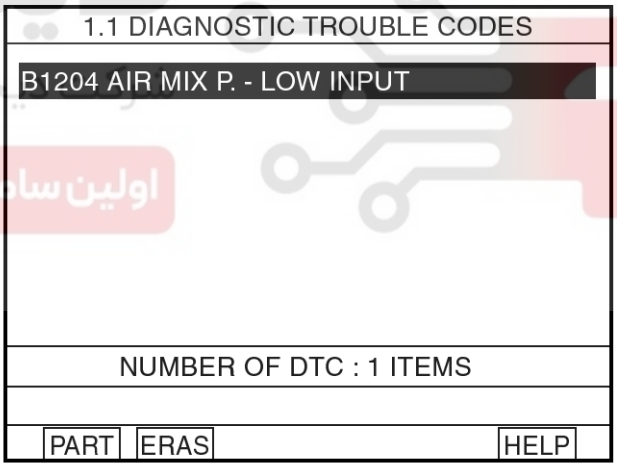


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1204.

EQBF521K

4. Are the DTC B1204 present and is parameter of "Passenger's Air Mix Potentiometer" fixed?

   ※ Parameter of "Passenger's Air Mix Potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Passenger's Air Mix potentiometer.

   YES

   Go to "Inspection" procedure.

   NO

   Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination,

deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

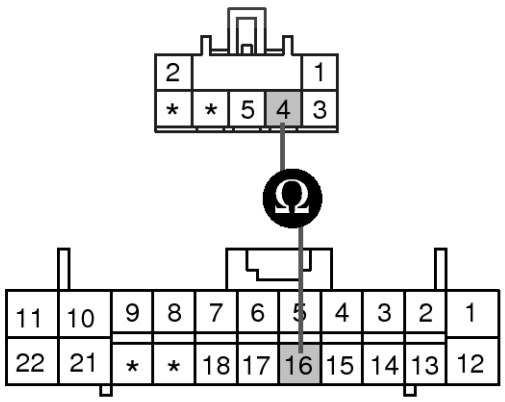
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Passenger's Air Mix potentiometer.
   3) Measure resistance between terminal "4" of Passenger's Air Mix Potentiometer and terminal "16" of A/C control unit.

Specification : Approx. 0 Ω



1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6511L

4) Is the measured resistance within specifications?

YES

Go to "Check for short to ground in harness" procedure.

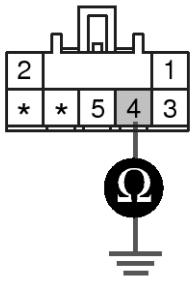
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.

1) Ignition "OFF"
2) Disconnect Passenger's Air Mix potentiometer.
3) Measure resistance between terminal "4" of Passenger's Air Mix Potentiometer and chassis ground.

Specification : Approx. ∞ Ω



1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6512L

4) Is the measured resistance within specifications?

YES

Go to "Power circuit Inspection" procedure.

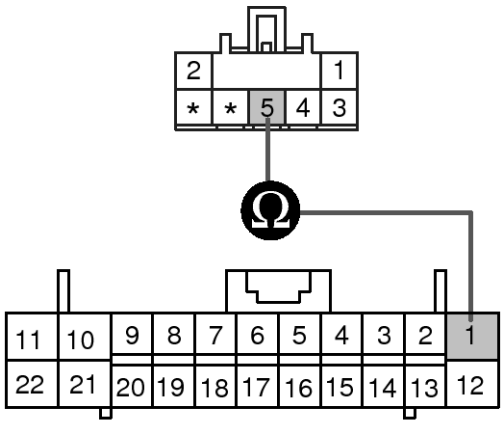
NO

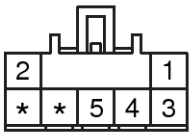
Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

POWER SUPPLY CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "ON"
   2) Connect Passenger's Air Mix Potentiometer.
   3) Measure resistance between terminal "5" of Passenger's Air Mix Potentiometer and terminal "1"A/C control unit.

Specification : 0Ω





1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. Potentiometer signal
5. **Sensor reference voltage(+5V)**

SBLHA6513L

4) Is the measured voltage within specifications?

YES

Go to "Component inspection" procedure.

NO

Check for short or open in power harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Passenger's Air Mix Potentiometer.
   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.

SBLHA6514L

   5) Does the actuator work properly?

YES

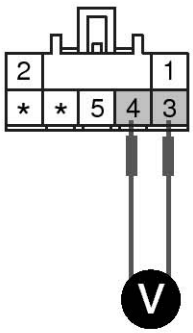
Go to "Check potentiometer" procedure.

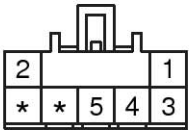
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Passenger's Air Mix potentiometer.
   3) Measure voltage between terminal "3" and "4" of Passenger's Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)





1. Motor (Warm)
2. Motor (Cool)
3. **Potentiometer ground**
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6515L

Door position	Voltage (3-4)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

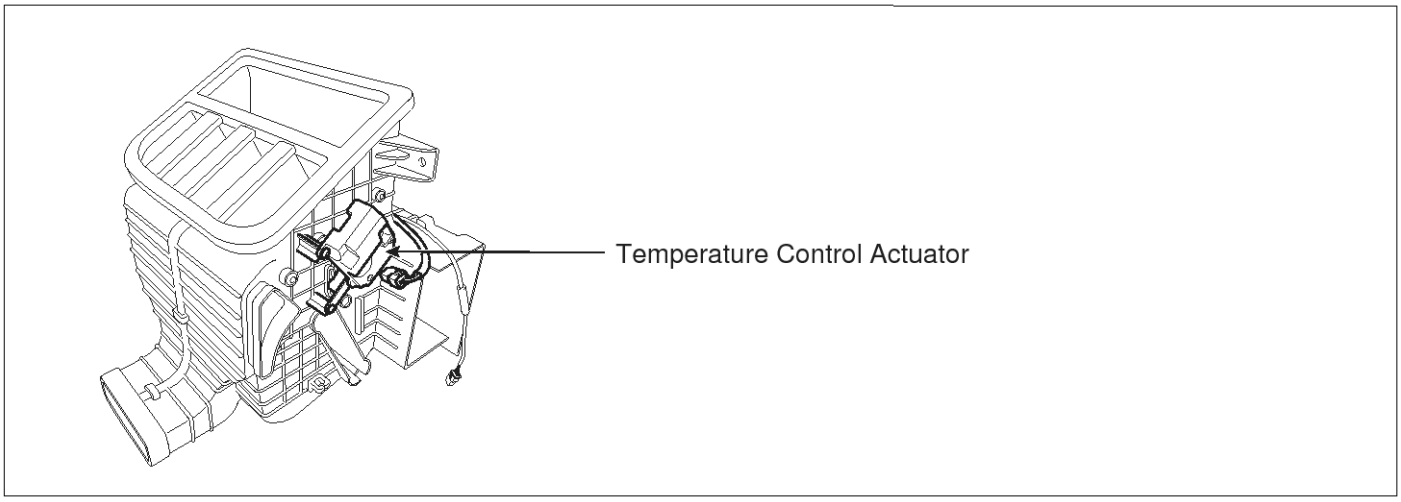
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1205

COMPONENT LOCATION



SBLHA6510L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

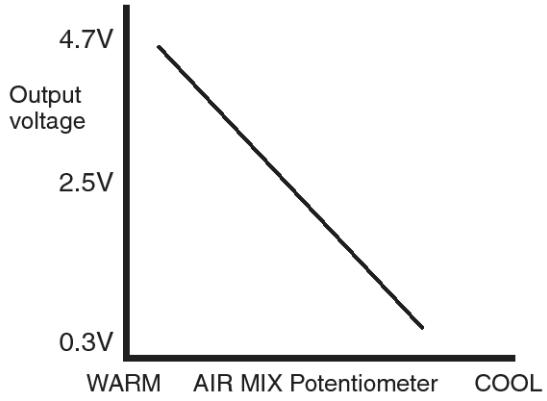
DTC DESCRIPTION

The A/C controller sets DTC B1205 if there is a short to power in the air mix potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Short circuit in harness • Faulty driver Air Mix potentiometer
Threshold value	• > 4.9V	
Detecting time	• 0.3 sec	
FAIL SAFE	• If temperature setting 17~24.5°C(63~76°F) fix at max. cooling position. • If temperature setting 25~32°C(77~90°F) fix at max. heating position.	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Passenger's Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

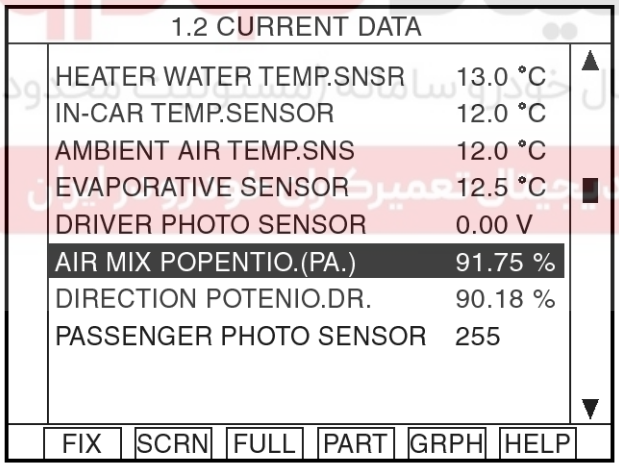


Fig. 1

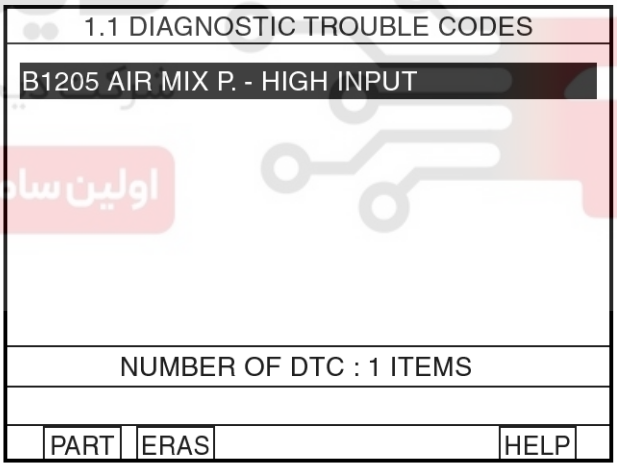


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1205.

EQBF522F

4. Are the DTC B1205 present and is parameter of "Passenger's Air Mix potentiometer" fixed?

   ※ Parameter of "Passenger's Air Mix potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Passenger's Air Mix potentiometer.

   YES

   Go to "Inspection" procedure.

   NO

   Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination,

deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

   YES

   Repair as necessary and go to "Verification of Vehicle Repair" procedure.

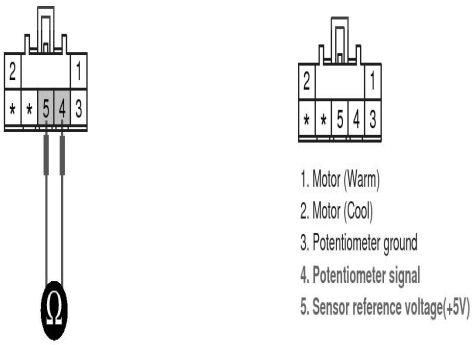
   NO

   Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short in harness.
   1) Ignition "OFF"
   2) Disconnect Passenger's Air Mix potentiometer.
   3) Measure resistance between terminal "4" and "5" of Passenger's Air Mix potentiometer.

Specification : Approx. ∞ Ω



SBLHA6516L

4) Is the measured resistance within specifications?

   YES

   Go to "Ground circuit Inspection" procedure.

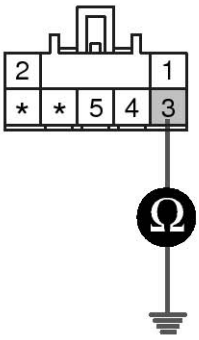
   NO

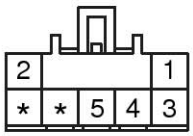
   Check for short to power harness in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Passenger's Air Mix Potentiometer.
   3) Measure resistance between terminal "3" of Passenger's Air Mix Potentiometer and chassis ground.

Specification : Approx. 0 Ω





1. Motor (Warm)
2. Motor (Cool)
3. **Potentiometer ground**
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6517L

4) Is the measured resistance within specifications?

YES

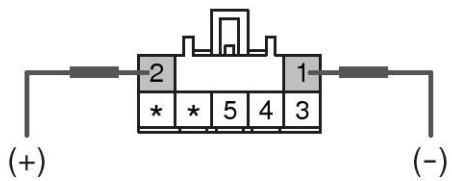
Go to "Component Inspection" procedure.

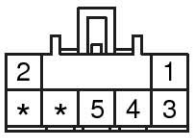
NO

Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Passenger's Air Mix Potentiometer.
   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.





1. **Motor (Warm)**
2. **Motor (Cool)**
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6514L

5) Does the actuator work properly?

YES

Go to "Check potentiometer" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

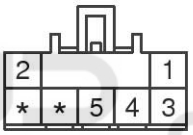
2. Check potentiometer

1) Ignition "ON"

2) Connect Passenger's Air Mix potentiometer.

3) Measure voltage between terminal "3" and "4" of Passenger's Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)



1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6515L

Door position	Voltage (3-4)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

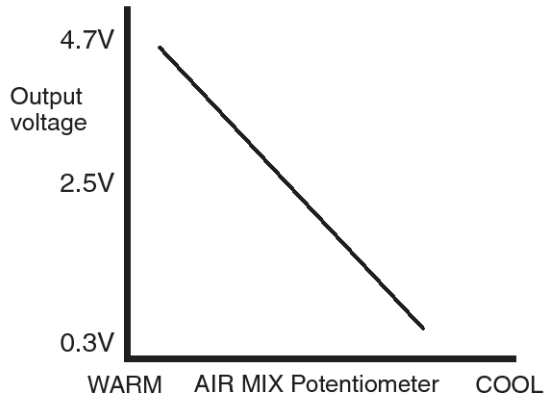


Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

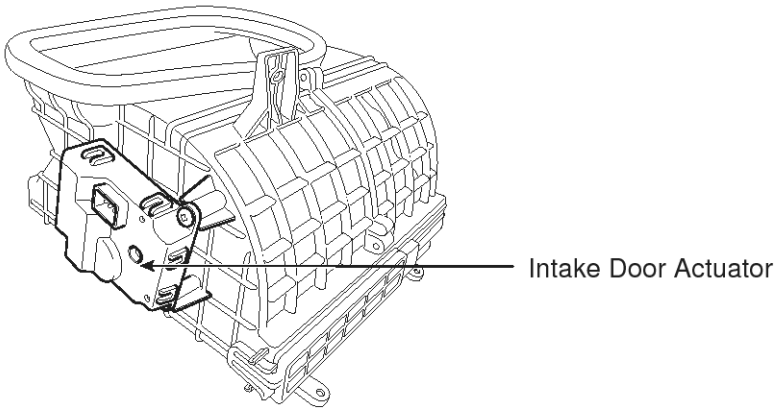
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1208

COMPONENT LOCATION



SBLHA6518L

GENERAL DESCRIPTION

Intake door located at heater unit controls the inlet of car. When driver operates the intake switch, A/C controller recirculationeives mode signal from intake switch and operates intake door actuator to turn intake door to intended position. (with fresh mode signal, intake door is closed and with fresh mode signal, intake door is opened).

DTC DESCRIPTION

The A/C controller sets DTC B1208 if there is an open circuit or poor connection in the intake potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver intake potentiom-eter
Threshold value	• ＜ 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	• If temperature setting 17~24.5°C(63~76°F) fix at max. cooling position. • Fix at fresh	

SPECIFICATION

※ Voltage value of Intake potentiometer as a function of position of Intake door

Door position	Voltage	Threshold value
Fresh	0.3±0.15V	Voltage value ＜ 0.08V
Recirculation	4.7±0.15V	Voltage value ＞ 4.9V

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Intake Potentiometer" Parameter on the Scantool while operating intake switch.

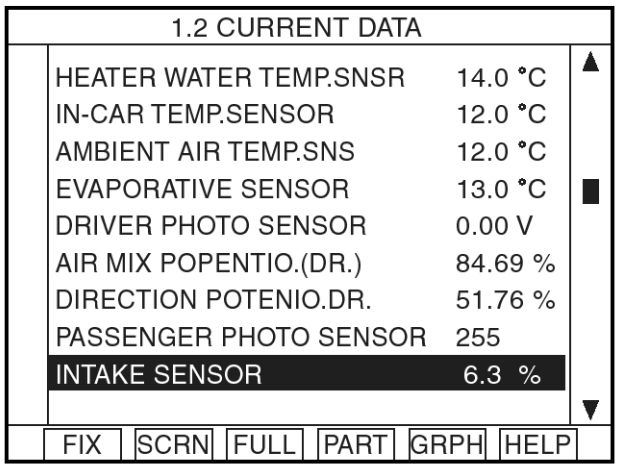


Fig. 1

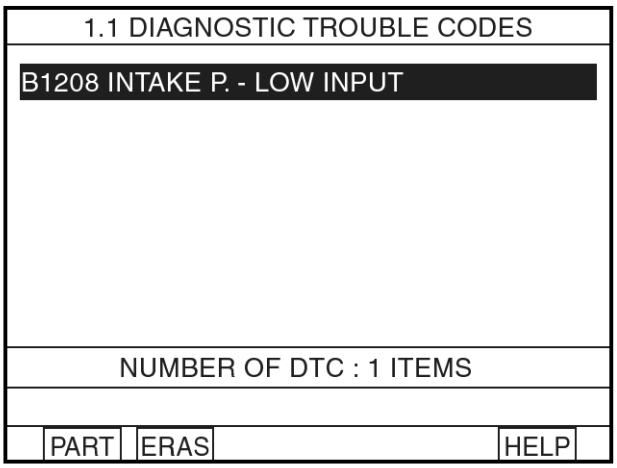


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1208.

EQBF590C

4. Are the DTC B1208 present and is parameter of "Intake Potentiometer" fixed?

   ※ Parameter of "Intake Potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Intake potentiometer.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

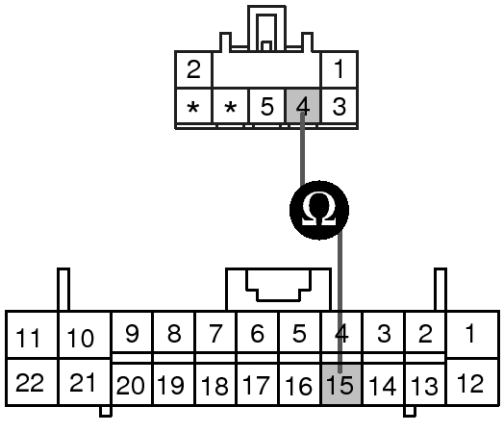
NO

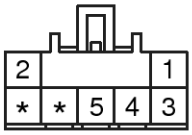
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Intake potentiometer.
   3) Measure resistance between terminal "4" of Intake Potentiometer and terminal "15" of A/C control unit.

Specification : Approx. 0 Ω





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6519L

4) Is the measured resistance within specifications?

YES

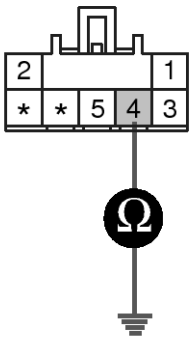
Go to "Check for short to ground in harness" procedure.

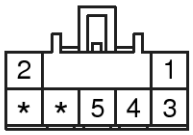
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect Intake potentiometer.
   3) Measure resistance between terminal "4" of Intake Potentiometer and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6520L

4) Is the measured resistance within specifications?

YES

Go to "Power circuit Inspection" procedure.

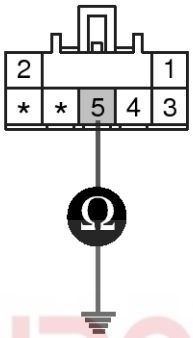
NO

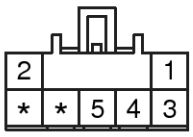
Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

POWER SUPPLY CIRCUIT INSPECTION

1. Check for short or open in harness.
   1) Ignition "ON"
   2) Connect Intake Potentiometer.
   3) Measure resistance between terminal "5" of Intake Potentiometer and chassis ground.

Specification : ∞Ω





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. **Sensor reference voltage(+5V)**

SBLHA6521L

4) Is the measured voltage within specifications?

YES

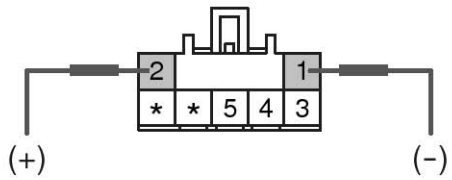
Go to "Component inspection" procedure.

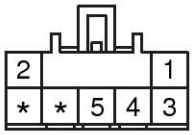
NO

Check for short or open in power harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Intake Potentiometer.
   3) Verify that the temperature actuator operates to the fresh position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the recirculation position when the connections are reversed.





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6522L

5) Does the actuator work properly?

YES

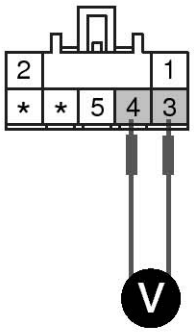
Go to "Check potentiometer" procedure.

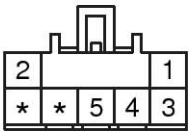
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Intake potentiometer.
   3) Measure voltage between terminal "3" and "4" of Intake potentiometer while operating Intake switch.

Specification : Refer to the specifications





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6523L

Door position	Voltage (3-4)	Error detecting
Fresh	0.3 ± 0.15V	Low voltage : 0.08V or less
Recirculation	4.7 ± 0.15V	High voltage : 4.9V or more

Specifications : Voltage value of Intake potentiometer as a function of position of Intake.

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

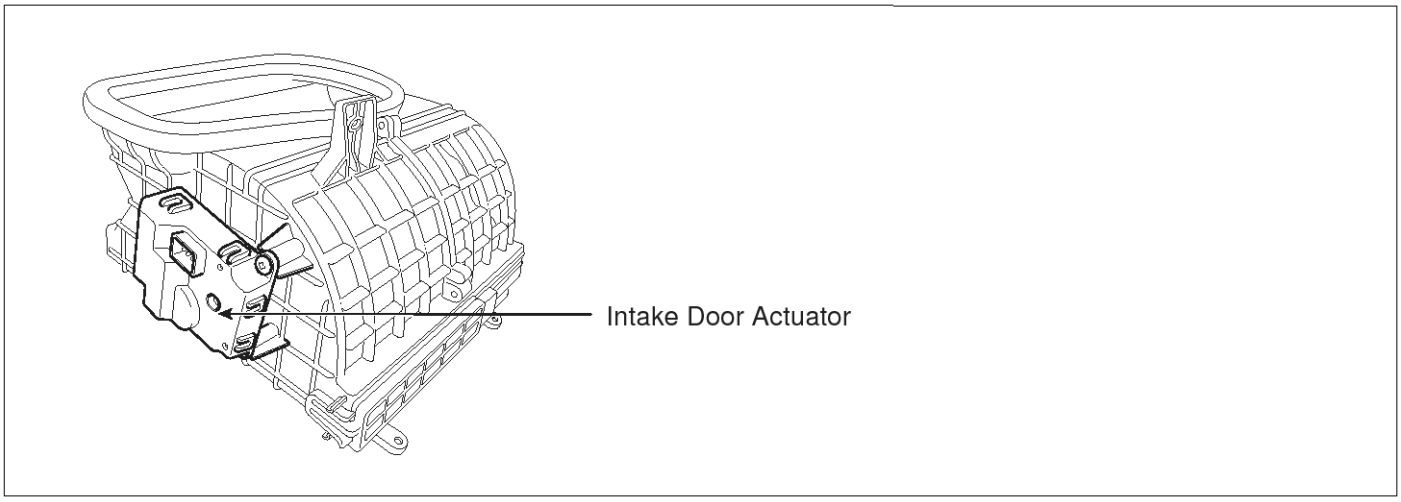
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1209

COMPONENT LOCATION



SBLHA6518L

GENERAL DESCRIPTION

Intake door located at heater unit controls the inlet of car. When driver operates the intake switch, A/C controller recirculationeives mode signal from intake switch and operates intake door actuator to turn intake door to intended position. (with fresh mode signal, intake door is closed and with fresh mode signal, intake door is opened).

DTC DESCRIPTION

The A/C controller sets DTC B1209 if there is a short to power in the Intake potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Short circuit in harness • Faulty Intake potentiometer • Open circuit in harness
Threshold value	• ＞ 4.9V	
Detecting time	• 0.3 sec	
FAIL SAFE	• Fix at fresh	

SPECIFICATION

※ Voltage value of Intake potentiometer as a function of position of Intake door

Door position	Voltage	Threshold value
Fresh	0.3 ± 0.15V	Voltage value ＜ 0.08V
Recirculation	4.7 ± 0.15V	Voltage value ＞ 4.9V

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Intake Potentiometer" Parameter on the Scantool while operating Intake switch.

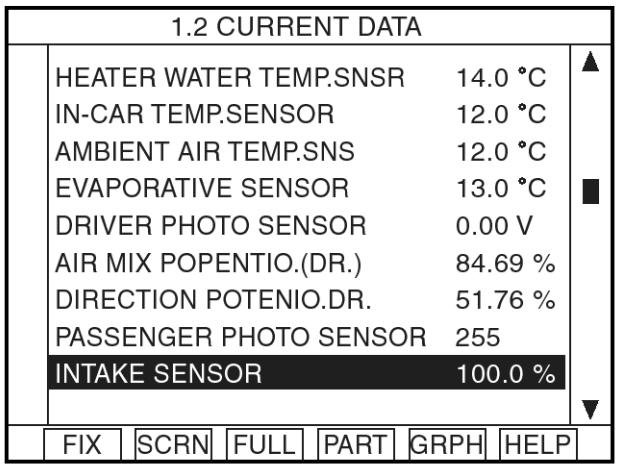


Fig. 1

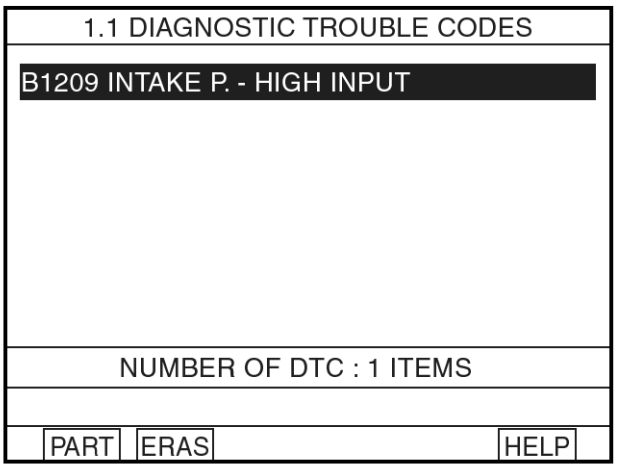


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1209.

EQBF590D

4. Are the DTC B1209 present and is parameter of "Intake potentiometer" fixed?

   ※ Parameter of "Intake potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Intake potentiometer.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

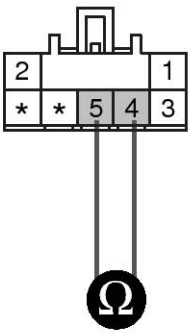
NO

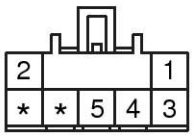
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short in harness.
   1) Ignition "OFF"
   2) Disconnect Intake potentiometer.
   3) Measure resistance between terminal "4" and "5" of Intake potentiometer.

Specification : Approx. ∞ Ω





1. Motor
2. Motor
3. Potentiometer ground
4. **Potentiometer signal**
5. **Sensor reference voltage(+5V)**

SBLHA6524L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection" procedure.

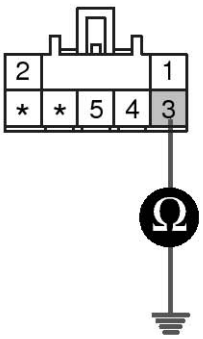
NO

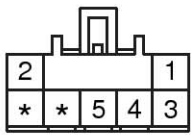
Check for short to power harness in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Intake Potentiometer.
   3) Measure resistance between terminal "3" of Intake Potentiometer and chassis ground.

Specification : Approx. 0 Ω





1. Motor (Rec)
2. Motor (Fre)
3. **Potentiometer ground**
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6525L

4) Is the measured resistance within specifications?

YES

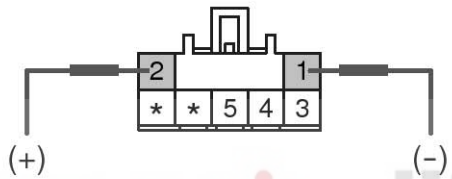
Go to "Component Inspection" procedure.

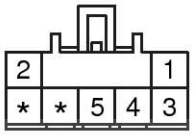
NO

Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Intake Potentiometer.
   3) Verify that the temperature actuator operates to the fresh position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the recirculation position when the connections are reversed.





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6522L

   5) Does the actuator work properly?

YES

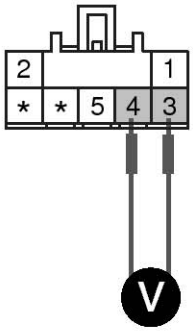
Go to "Check potentiometer" procedure.

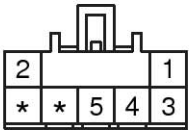
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Intake potentiometer.
   3) Measure voltage between terminal "3" and "4" of Intake potentiometer while operating Intake switch.

Specification : Refer to the specifications





1. Motor (Rec)
2. Motor (Fre)
3. **Potentiometer ground**
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6523L

Door position	Voltage (3-4)	Error detecting
Fresh	0.3 ± 0.15V	Low voltage : 0.08V or less
Recirculation	4.7 ± 0.15V	High voltage : 4.9V or more

Specifications : Voltage value of Intake potentiometer as a function of position of Intake.

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

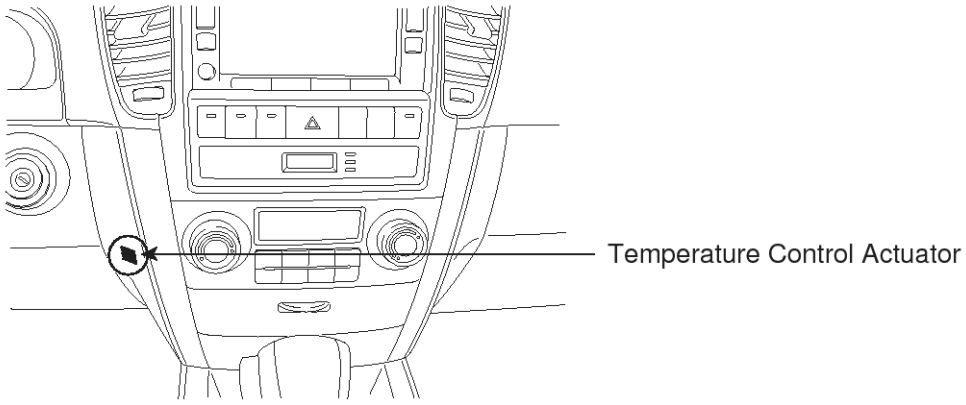
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1233

COMPONENT LOCATION



SBLHA6526L

GENERAL DESCRIPTION

The incar temperature sensor located at crush pad, control unit contains a thermistor which measures the temperature of the inside. The signal, decided by the resistance value which changes in accordance with perceived inside temperature, is delivered to heater control unit and according to this signal, the control unit regulates incar temperature to intended value.

DTC DESCRIPTION

The A/C controller sets DTC B1233 if there is a short circuit in incar temp. sensor signal harness or the measured resistance value of sensor is less than threshold value(about 7.46kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Short circuit in harness • Faulty incar temp. Sensor • Faulty A/C control unit
Threshold value	• ＜ 7.46 kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of 25˚C(77˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-30(-22)	528.17	25(77)	30
-15(5)	218.24	35(95)	19.61
0(32)	97.83	45(113)	13.12
15(59)	47.12	55(131)	8.97

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "INCAR TEMP. SENSOR" Parameter on the Scantool.

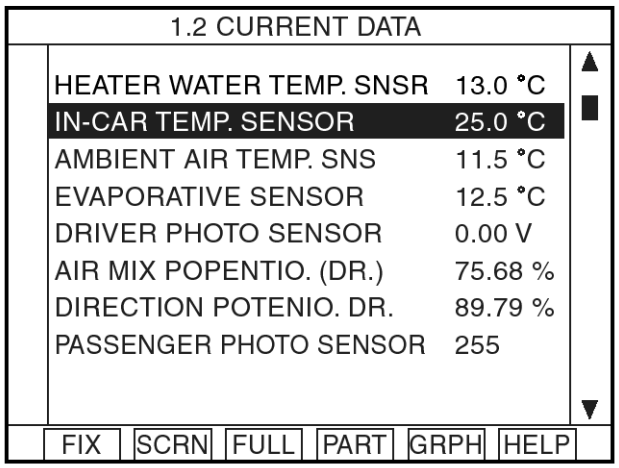


Fig. 1

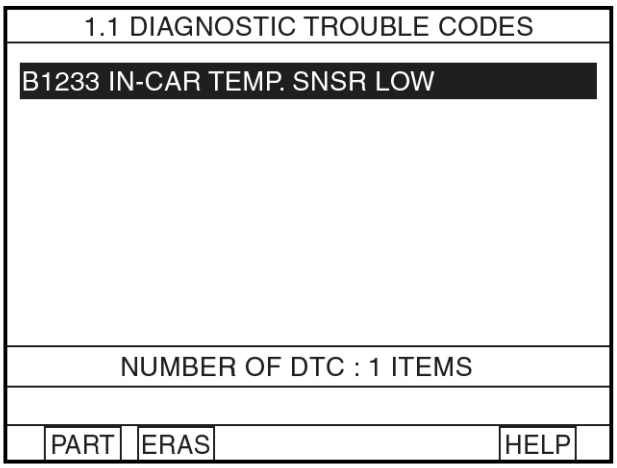


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1233.

EQBF514A

4. Are the DTC B1233 present and is parameter of "INCAR TEMP. SENSOR" fixed?

   ※ Parameter of "INCAR TEMP. SENSOR" will be fixed at 25℃(77°F), if there is any fault in INCAR TEMP. SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

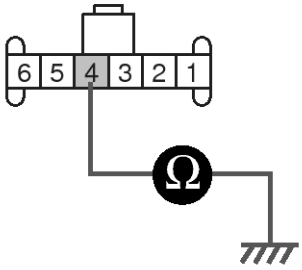
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect incar sensor.
   3) Measure resistance between terminal "4" of incar sensor and chassis ground.

Specification : Approx. ∞Ω



1. Motor(-)
2. Sensor ground
3. Humidity sensor signal
4. **In-car sensor temp. signal**
5. Sensor power (5V)
6. Motor(+)

LQLG514B

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection" procedure.

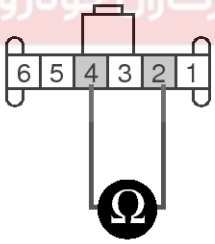
NO

Check for short to ground in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check incar temp. sensor.
   1) Ignition "OFF"
   2) Disconnect incar sensor.
   3) Measure resistance between terminal "4" and "2" of incar sensor.

Specification : Refer the specifications in fig 3.



1. Motor(-)
2. **Sensor ground**
3. Humidity sensor signal
4. **In-car sensor temp. signal**
5. Sensor power (5V)
6. Motor(+)

LQLG514F

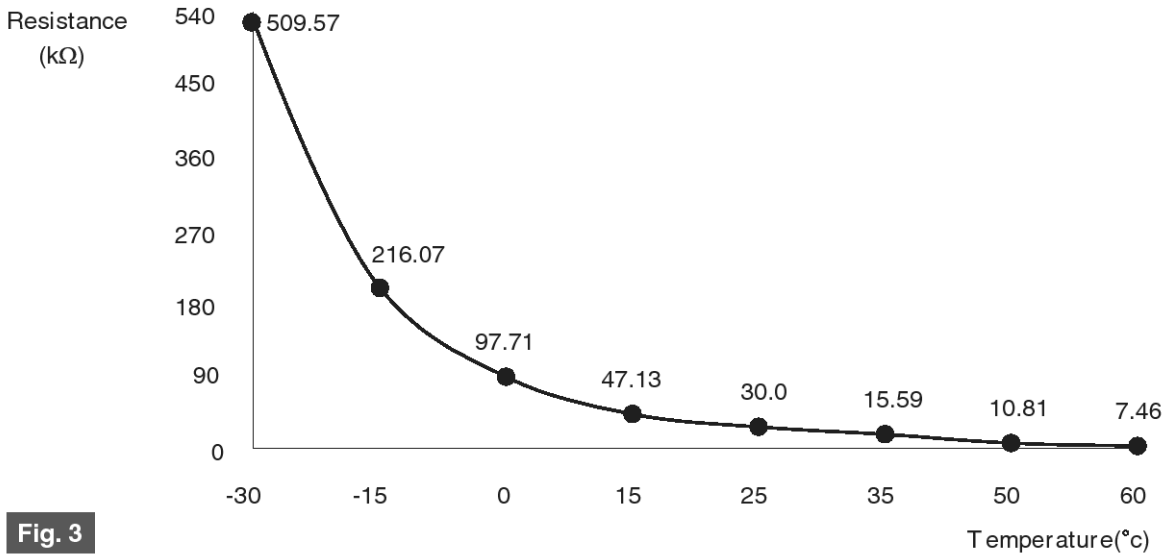


Fig. 3

Fig 3) Specifications : Resistance value of incar temp. sensor as a function of temperature.

EQBF514G

4) Is the measured resistance within specifications in fig3? (tolerance limits ± 3%)

YES

Go to "Check A/C Control Unit" procedure.

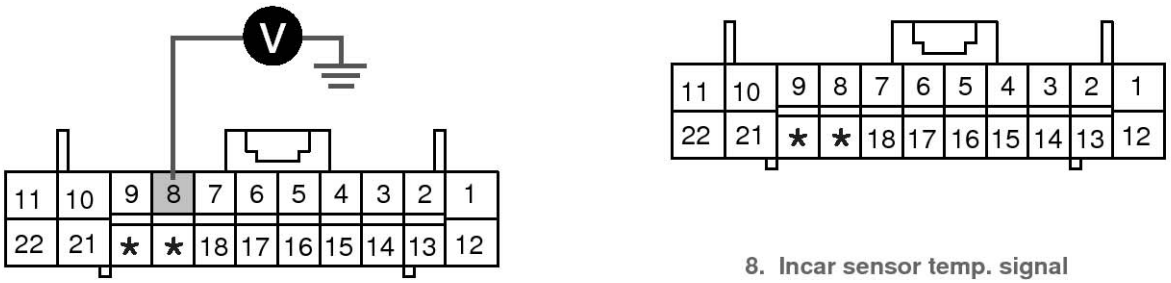
NO

Substitute with a known-good incar sensor and check for proper operation.

If the problem is corrected, replace incar sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect incar sensor.
   3) Measure Voltage between terminal "8" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



SBLHA6527L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

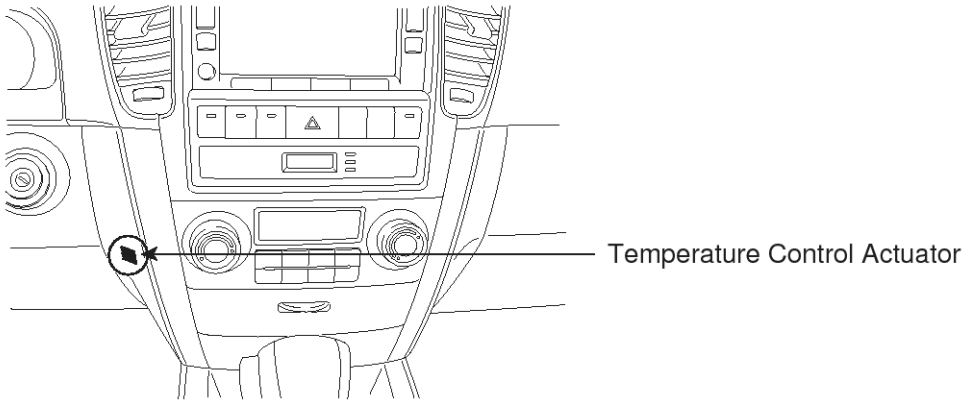
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1234

COMPONENT LOCATION



SBLHA6526L

GENERAL DESCRIPTION

The incar temperature sensor located at crush pad, control unit contains a thermistor which measures the temperature of the inside. The signal, decided by the resistance value which changes in accordance with perceived inside temperature, is delivered to heater control unit and according to this signal, the control unit regulates incar temperature to intended value.

DTC DESCRIPTION

The A/C controller sets DTC B1234 if there is an open circuit in incar temp. sensor signal harness or the measured resistance value of sensor is more than threshold value(about 509.57kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Open Circuit in harness • Faulty incar temp. Sensor • Faulty A/C control unit
Threshold value	• ＞ 509.57 kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of 25˚C(77˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-30(-22)	528.17	25(77)	30
-15(5)	218.24	35(95)	19.61
0(32)	97.83	45(113)	13.12
15(59)	47.12	55(131)	8.97

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "INCAR TEMP. SENSOR" Parameter on the Scantool.

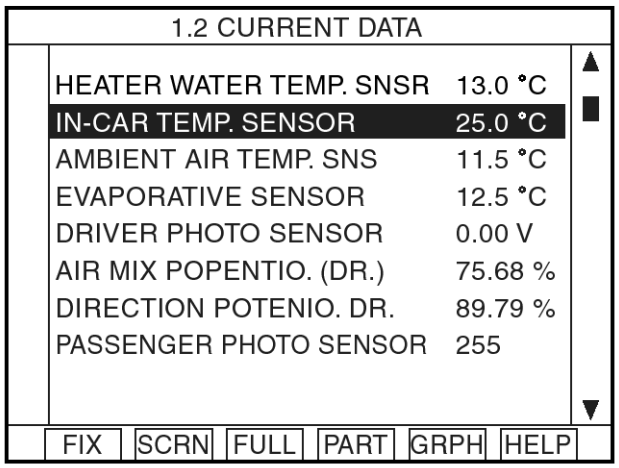


Fig. 1

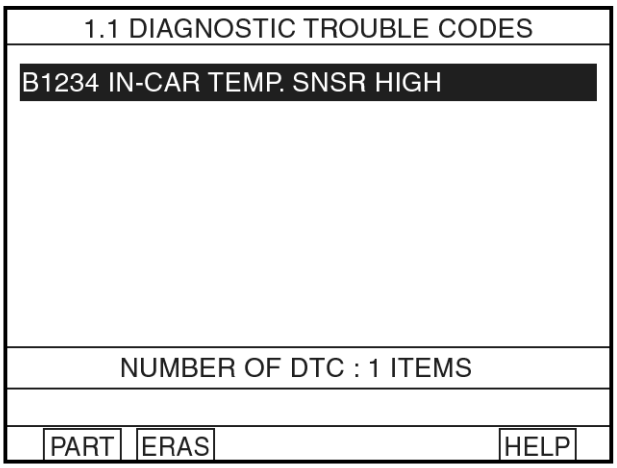


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1234.

EQBF515A

4. Are the DTC B1234 present and is parameter of "INCAR TEMP. SENSOR" fixed?

   ※ Parameter of "INCAR TEMP. SENSOR" will be fixed at 25℃(77°F), if there is any fault in INCAR TEMP. SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

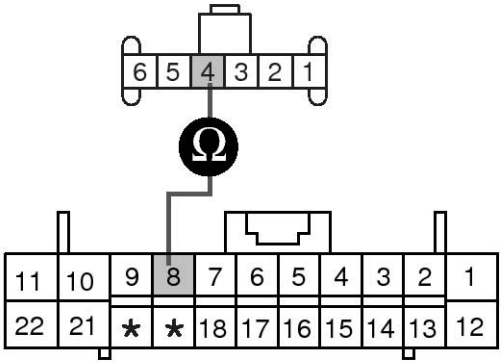
NO

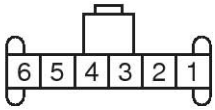
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect incar temp. sensor.
   3) Measure resistance between terminal "4" of incar temp. sensor and terminal "8" of A/C Control Unit..

Specification : Approx. 0 Ω





1. Motor(-)
2. Sensor ground
3. Humidity sensor signal
4. **In-car sensor temp. signal**
5. Sensor power (5V)
6. Motor(+)

SBLHA6528L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection " procedure.

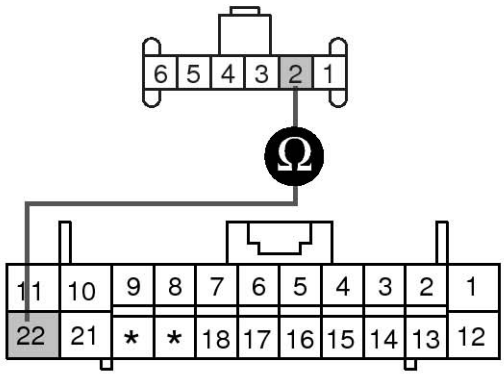
NO

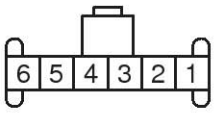
Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harness.
   1) Ignition "OFF"
   2) Disconnect incar temp. sensor.
   3) Measure resistance between terminal "2" of incar temp. sensor and terminal "22" of A/C Control Unit.

Specification : Approx. 0 Ω





1. Motor(-)
2. **Sensor ground**
3. Humidity sensor signal
4. In-car sensor temp. signal
5. Sensor power (5V)
6. Motor(+)

SBLHA6529L

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

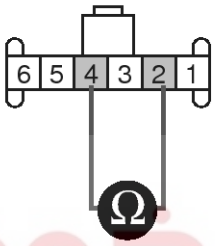
NO

Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check incar temp. sensor.
   1) Ignition "OFF"
   2) Disconnect incar sensor.
   3) Measure resistance between terminal "4" and "2" of incar sensor.

Specification : Refer the specifications in fig 3.



1. Motor(-)
2. **Sensor ground**
3. Humidity sensor signal
4. **In-car sensor temp. signal**
5. Sensor power (5V)
6. Motor(+)

LQLG514F

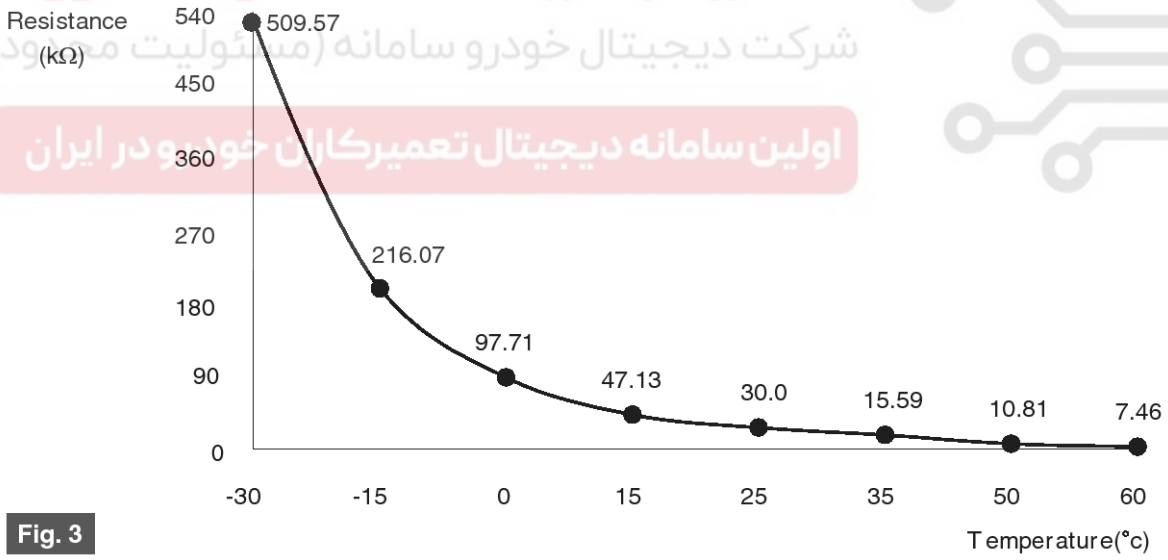


Fig. 3

Fig 3) Specifications : Resistance value of incar temp. sensor as a function of temperature.

EQBF514G

4) Is the measured resistance within specifications in fig3? (tolerance limits ± 3%)

YES

Go to "Check A/C Control Unit" procedure.

NO

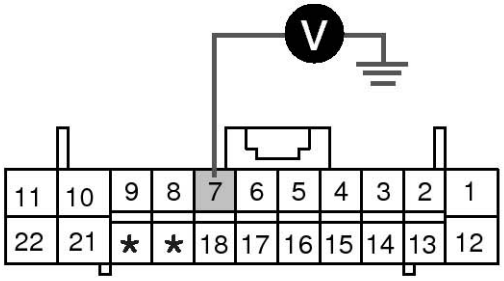
Substitute with a known-good incar sensor and check for proper operation.

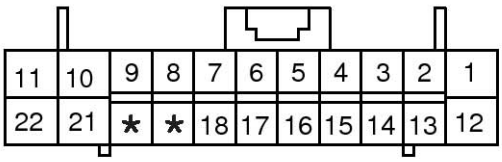
If the problem is corrected, replace incar sensor and then go to "Verification of Vehicle Repair"

procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect incar sensor.
   3) Measure Voltage between terminal "7" of A/C Control Unit and chassis ground.

Specification : Approx. 5V





7. Incar sensor temp. signal

SBLHA6530L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

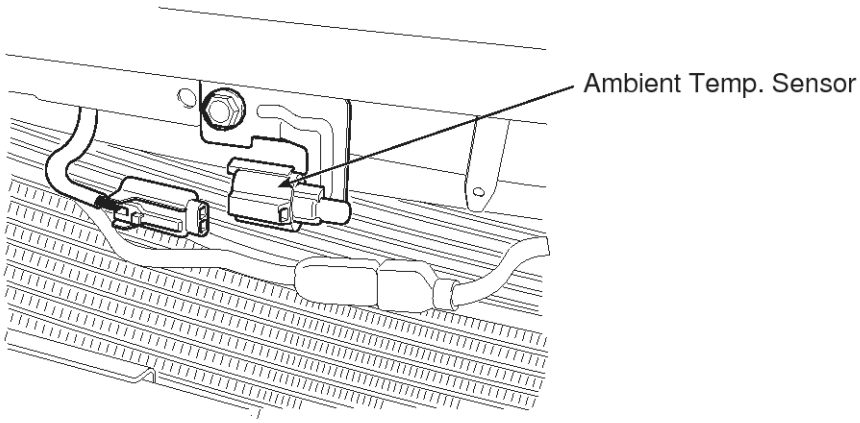
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1237

COMPONENT LOCATION



SBLHA6531L

GENERAL DESCRIPTION

The ambient temperature senor located at the center stay of the condenser, detects ambient air temperature. It is a negative type thermistor whose resistance is inversely proportional to temperature. Its output is used for discharge temperature sensor, sensor fail-safe, temperature regulation door lock, blower motor level control, mix mode control and in-car humidity control.

DTC DESCRIPTION

The A/C controller sets DTC B1237 if there is a short circuit in ambient temp. sensor signal harness or the measured resistance value of sensor is less than threshold value(about 7.48kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Short circuit in harness • Faulty ambient temp. Sensor • Faulty A/C control unit
Threshold value	• ＜ 7.48kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of 20˚C(68˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-40(-40)	927.5	20(68)	37.5
-20(-4)	284.5	40(104)	16.0
0(32)	97.5	60(140)	7.5

MONITOR SCANTOOL DATA

1. Connect scantool to data link connector(DLC).
2. Engine "ON"
3. Monitor the "AMBIENT TEMP. SENSOR" Parameter on the Scantool.

   ※ Parameter of "AMBIENT TEMP. SENSOR" will be fixed at 20˚C, if there is any fault in AMBIENT TEMP. SENSOR.

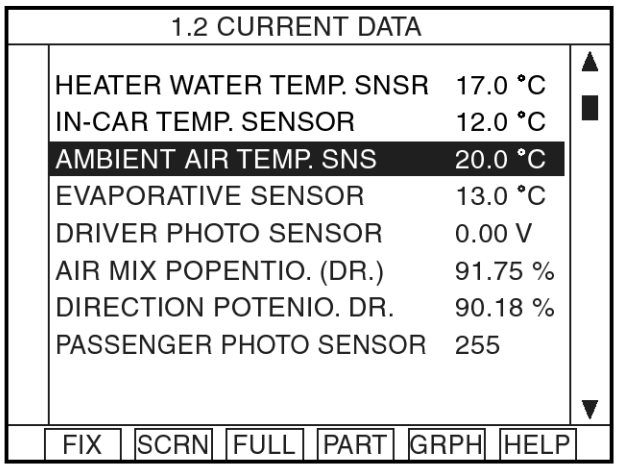


Fig. 1

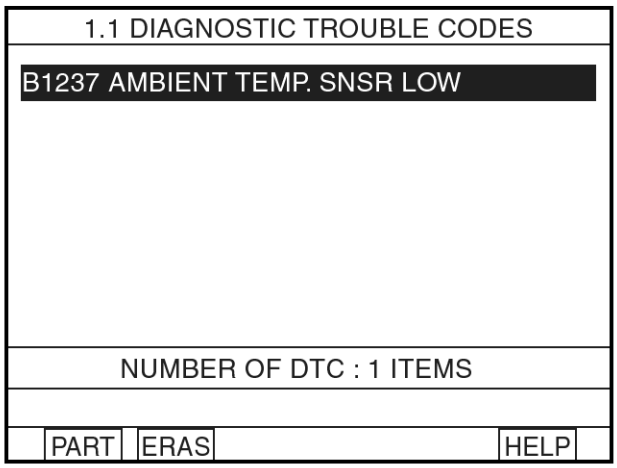


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1237.

EQBF516B

4. Are the DTC B1237 present and is parameter of "AMBIENT TEMP. SENSOR" fixed?

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

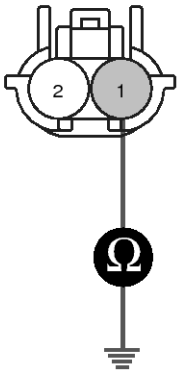
NO

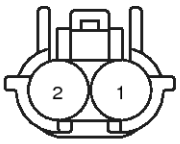
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect ambient temp. sensor.
   3) Measure resistance between terminal "1" of ambient temp. sensor and chassis ground.

Specification : Approx. ∞Ω





1. Ambient temp. sensor signal(+)
2. Ambient temp. sensor ground

LQLG516C

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection" procedure.

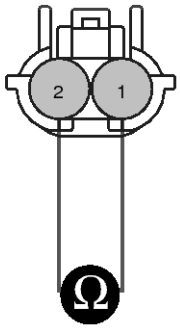
NO

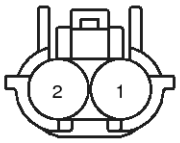
Check for short to ground in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check Ambient temp. sensor.
   1) Ignition "OFF"
   2) Disconnect ambient temp. sensor.
   3) Measure resistance between terminal "1" and "2" of ambient temp. sensor.

Specification : Refer the specifications in fig 3.





1. Ambient temp. sensor signal
2. Ambient temp. sensor ground

LQLG516D

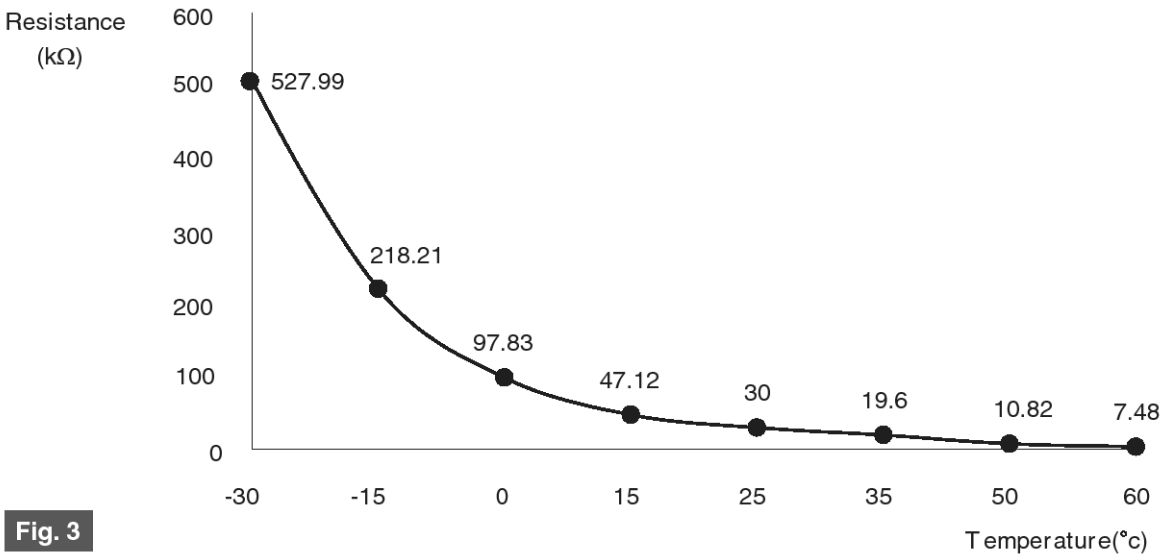


Fig. 3

Fig 3) Specifications : Resistance value of ambient temp. sensor as a function of temperature.

EQBF516F

4) Is the measured resistance within specifications in fig3? (tolerance limits ±3%)

YES

Go to "Check A/C Control Unit" procedure.

NO

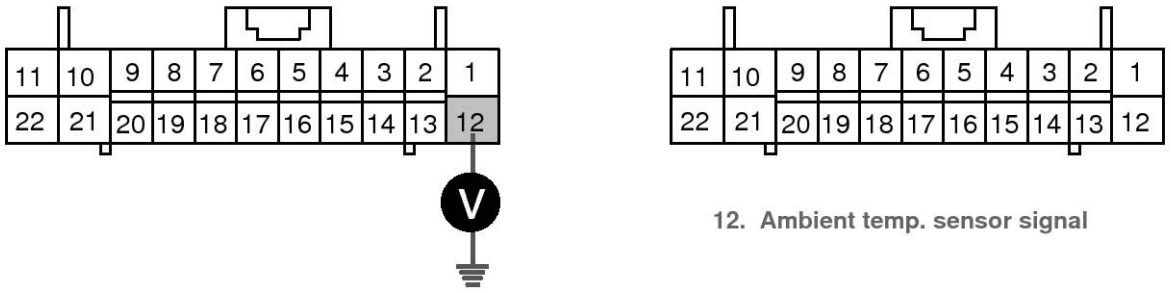
Substitute with a known-good ambient temp. sensor and check for proper operation.

If the problem is corrected, replace ambient temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit

1) Engine "ON"
2) Disconnect ambient temp. sensor.
3) Measure voltage between terminal "12" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



SBLHA6532L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

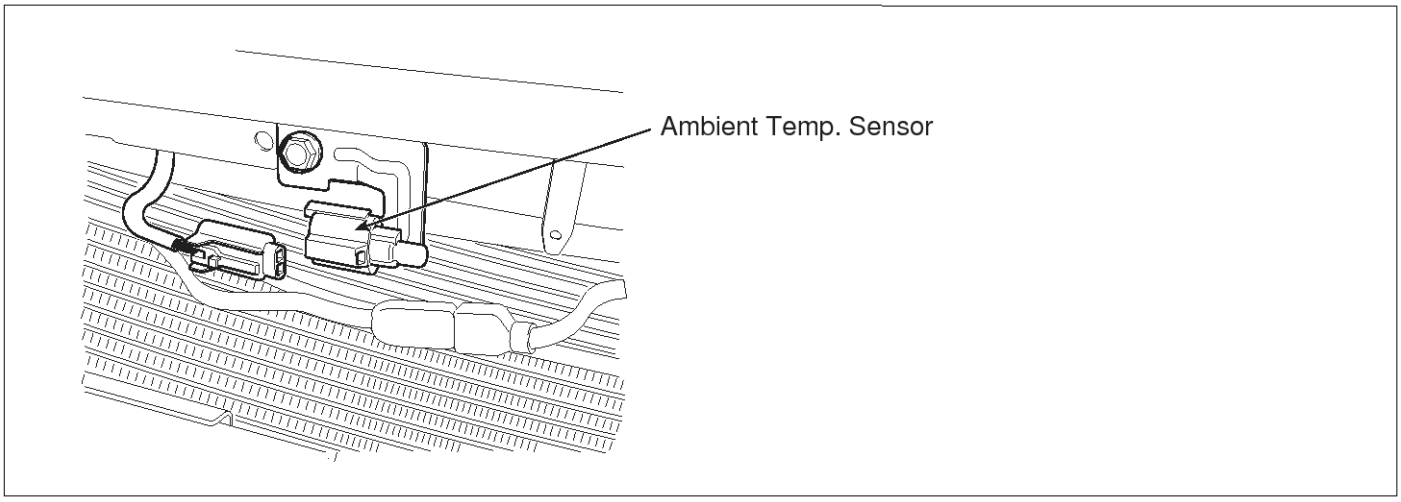
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1238

COMPONENT LOCATION



SBLHA6531L

GENERAL DESCRIPTION

The ambient temperature senor located at the center stay of the condenser, detects ambient air temperature. It is a negative type thermistor whose resistance is inversely proportional to temperature. Its output is used for discharge temperature sensor, sensor fail-safe, temperature regulation door lock, blower motor level control, mix mode control and in-car humidity control.

DTC DESCRIPTION

The A/C controller sets DTC B1238 if there is an open circuit in ambient temp. sensor signal harness or the measured resistance value of sensor is more than threshold value(about 527kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Open Circuit in harness • Faulty ambient temp. Sensor • Faulty A/C control unit
Threshold value	• ＞ 527kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of 20˚C(67˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-40(-40)	927.5	20(68)	37.5
-20(-4)	284.5	40(104)	16.0
0(32)	97.5	60(140)	7.5

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "AMBIENT TEMP. SENSOR" Parameter on the Scantool.

   ※ Parameter of "AMBIENT TEMP. SENSOR" will be fixed at 20℃(67˚F), if there is any fault in AMBIENT TEMP. SENSOR.

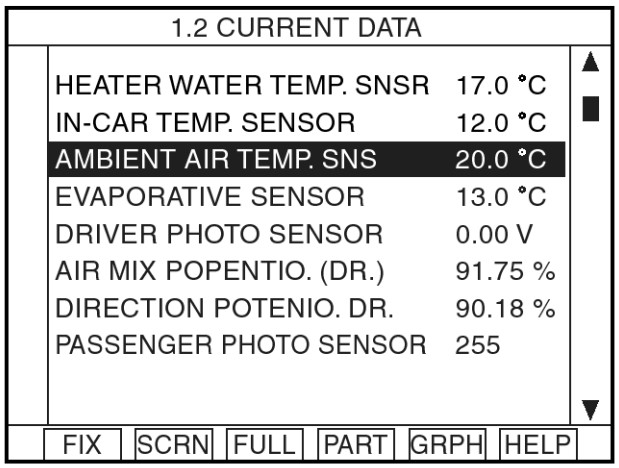


Fig. 1

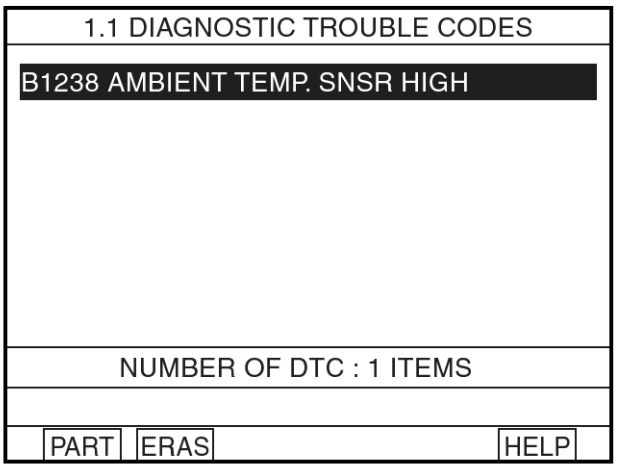


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1238.

EQBF517A

4. Are the DTC B1238 present and is parameter of "AMBIENT TEMP. SENSOR" fixed?

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

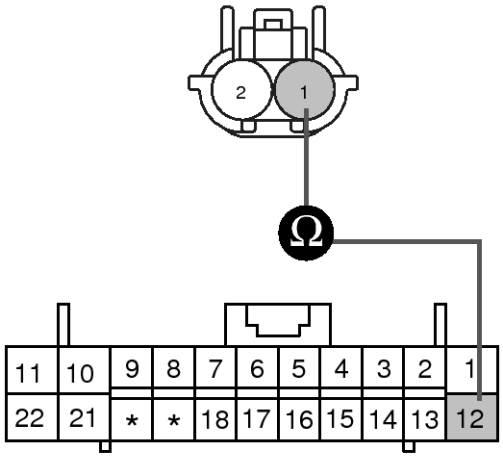
NO

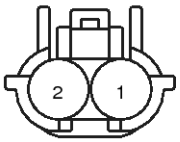
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect ambient temp. sensor.
   3) Measure resistance between terminal "1" of ambient temp. sensor and terminal "12" of A/C Control Unit.

Specification : Approx. 0 Ω





1. Ambient temp. sensor signal(+)
2. Ambient temp. sensor ground

SBLHA6533L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection " procedure.

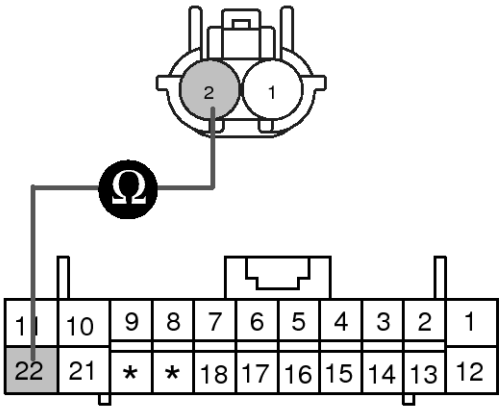
NO

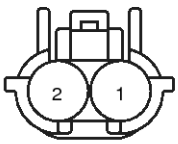
Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harness.
   1) Ignition "OFF"
   2) Disconnect ambient temp. sensor.
   3) Measure resistance between terminal "2" of ambient temp. sensor and terminal "22" of A/C contr unit.

Specification : Approx. 0 Ω





1. Ambient temp. sensor signal(+)
2. Ambient temp. sensor ground

SBLHA6534L

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

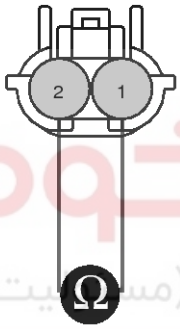
NO

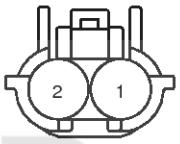
Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check Ambient temp. sensor.
   1) Ignition "OFF"
   2) Disconnect ambient temp. sensor.
   3) Measure resistance between terminal "1" and "2" of ambient temp. sensor.

Specification : Refer the specifications in fig 3.





1. Ambient temp. sensor signal
2. Ambient temp. sensor ground

LQLG516D

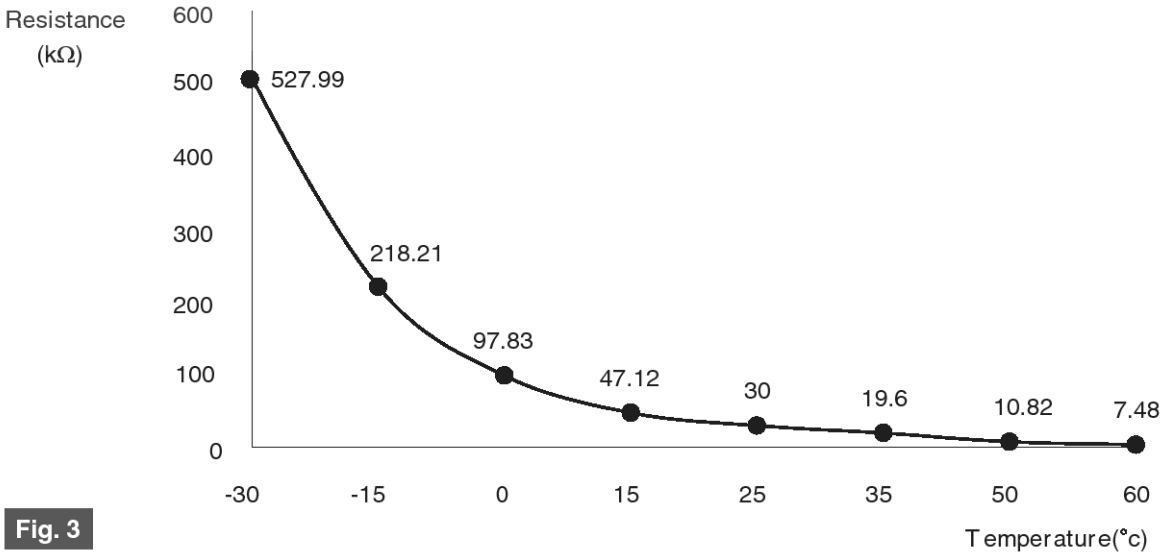


Fig. 3

Fig 3) Specifications : Resistance value of ambient temp. sensor as a function of temperature.

EQBF516F

4) Is the measured resistance within specifications in fig3? (tolerance limits ±3%)

YES

Go to "Check A/C Control Unit" procedure.

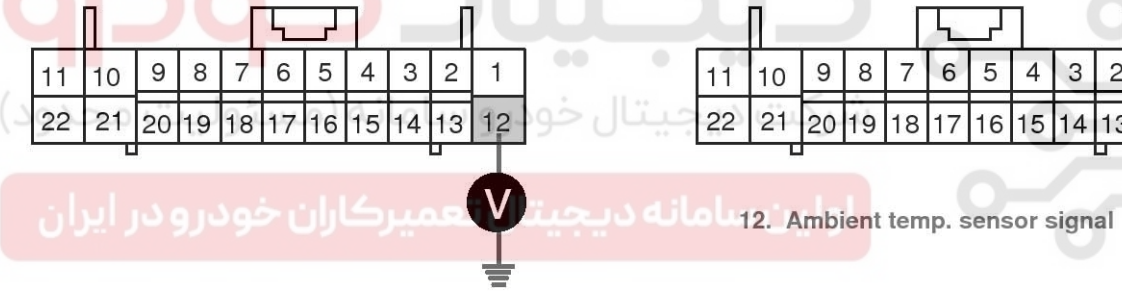
NO

Substitute with a known-good ambient temp. sensor and check for proper operation.

If the problem is corrected, replace ambient temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect ambient temp. sensor.
   3) Measure voltage between terminal "12" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



SBLHA6532L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

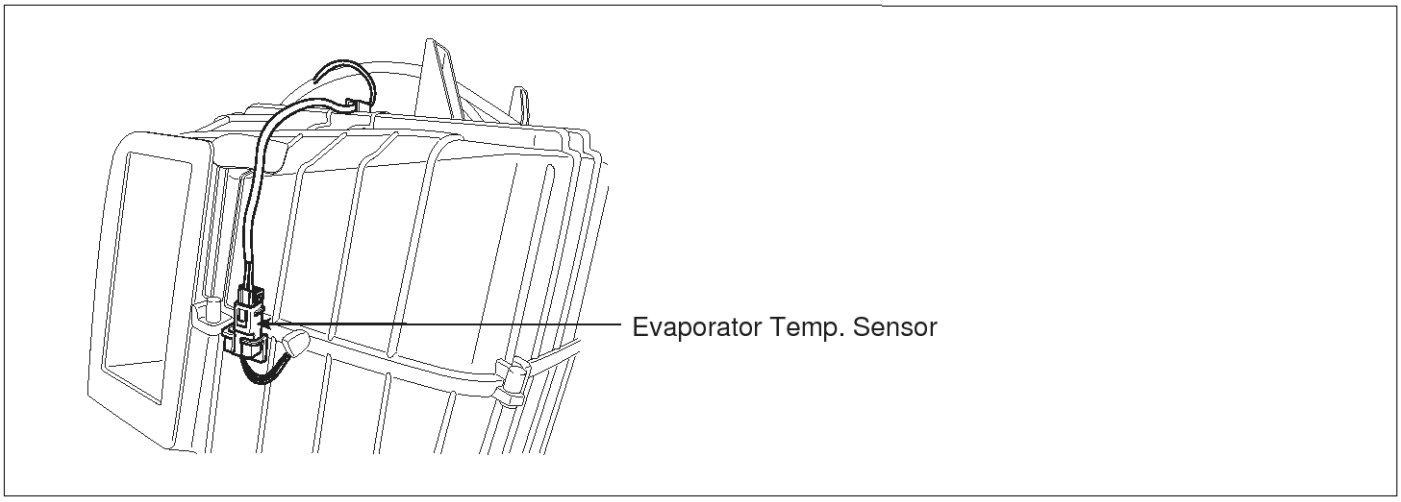
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1241

COMPONENT LOCATION



SBLHA6535L

GENERAL DESCRIPTION

The Evaporator temperature sensor located on heater unit, detects the core temperature and interrupts compressor relay power, in order to prevent evaporator freezing by excessive cooling. It is a negative type thermistor whose resistance is inversely proportional to temperature.

DTC DESCRIPTION

The A/C controller sets DTC B1241 if there is a short circuit in evaporator temp. sensor signal harness or the measured resistance value of sensor is less than threshold value(about 0.9kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Short circuit in harness • Faulty Evaporator temp. Sens-or • Faulty A/C control unit
Threshold value	• ＜ 0.9kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of -2˚C(28.4˚F)	

SPECIFICATION

※ Resistence value of evaporator sensor as a function of temperature.

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-10(14)	13.56	20(68)	3.06
0(32)	8	30(86)	1.97
10(50)	4.87	40(104)	1.31

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "EVAPORATIVE SENSOR" Parameter on the Scantool.

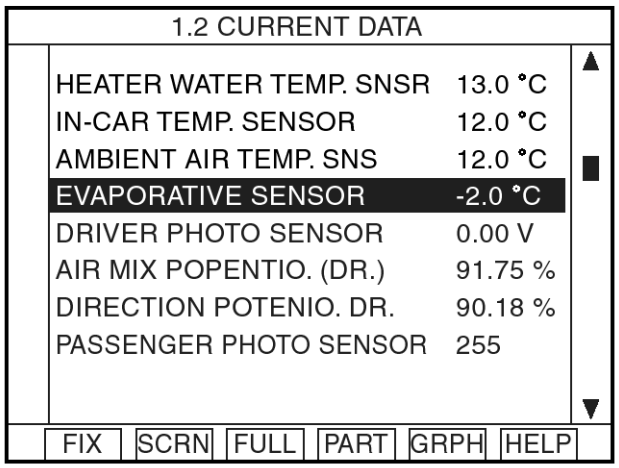


Fig. 1

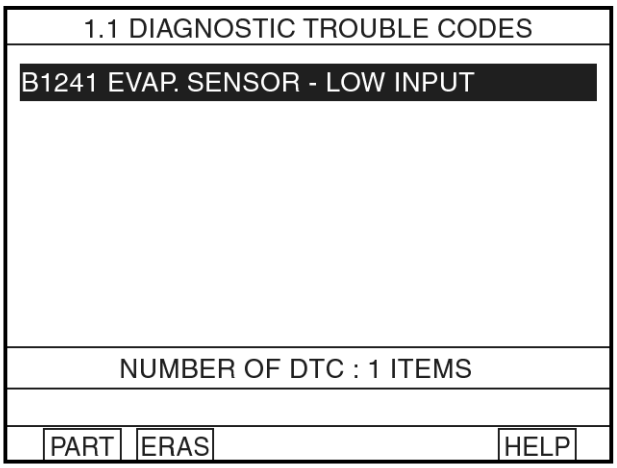


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1241.

EQBF519B

4. Are the DTC B1241 present and is parameter of "EVAPORATIVE SENSOR" fixed?

   ※ Parameter of "EVAPORATIVE SENSOR" will be fixed at -2℃(28.4˚F), if there is any fault in EVAPORATIVE SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

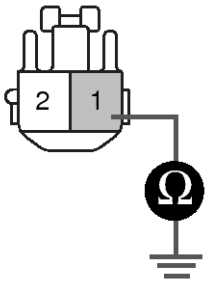
NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect evaporator temp. sensor.
   3) Measure resistance between terminal "1" of evaporator temp. sensor and chassis ground.

Specification : Approx. ∞Ω



1. Evaporator temp. sensor signal
2. Evaporator temp. sensor ground

LQLG519C

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection" procedure.

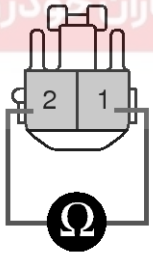
NO

Check for short to ground in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check evaporator temp. sensor.
   1) Ignition "OFF"
   2) Disconnect evaporator temp. sensor.
   3) Measure resistance between terminal "1" and "2" of evaporator temp. sensor.

Specification : Refer the specifications in fig 3.



1. Evaporator temp. sensor signal
2. Evaporator temp. sensor ground

LQLG519D

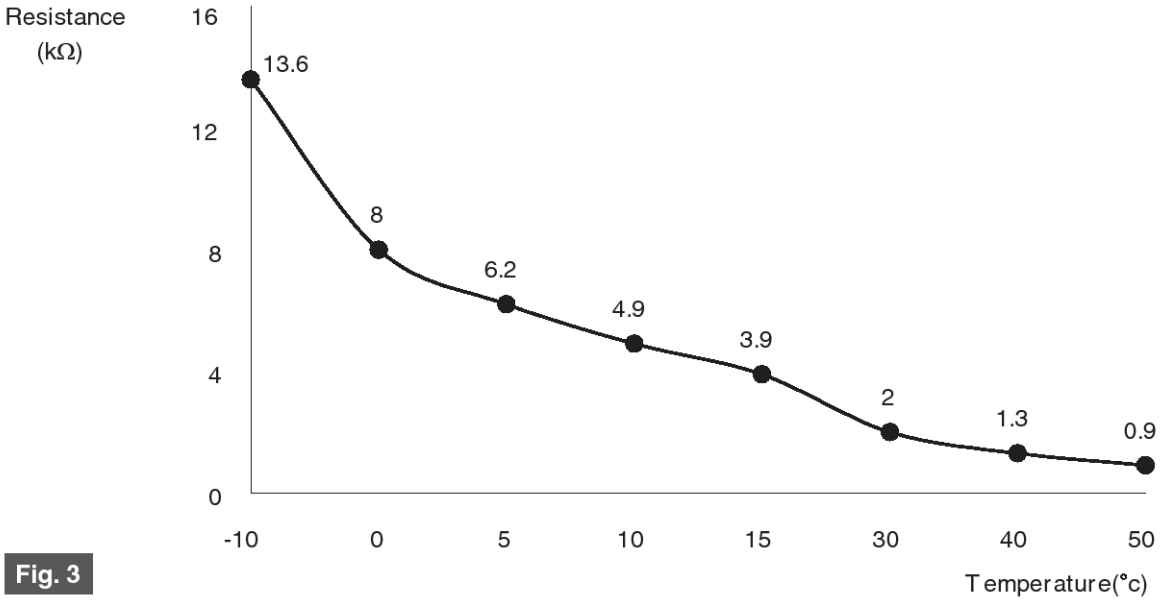


Fig. 3

Fig 3) Specifications : Resistance value of evaporator temp. sensor as a function of temperature.

EQBF519F

4) Is the measured resistance within specifications in fig3? (tolerance limits ±3%)

YES

Go to "Check A/C Control Unit" procedure.

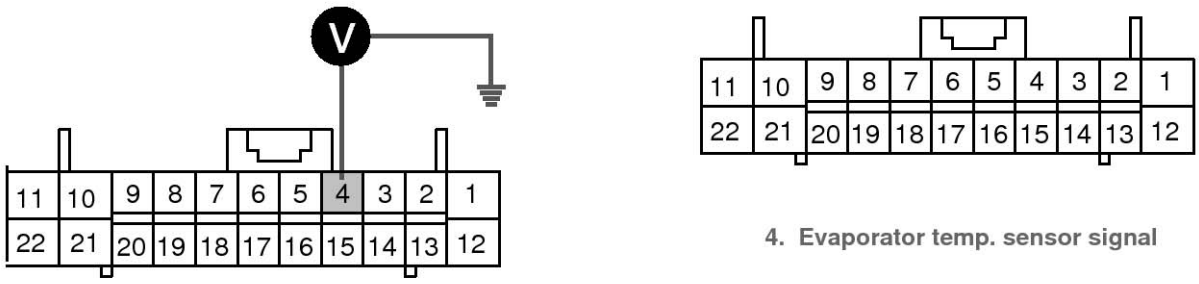
NO

Substitute with a known-good evaporator temp. sensor and check for proper operation.

If the problem is corrected, replace evaporator temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect evaporator temp. sensor.
   3) Measure voltage between terminal "4" of A/C Control Unit and chassis ground.

Specification : Approx. 5V



SBLHA6536L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

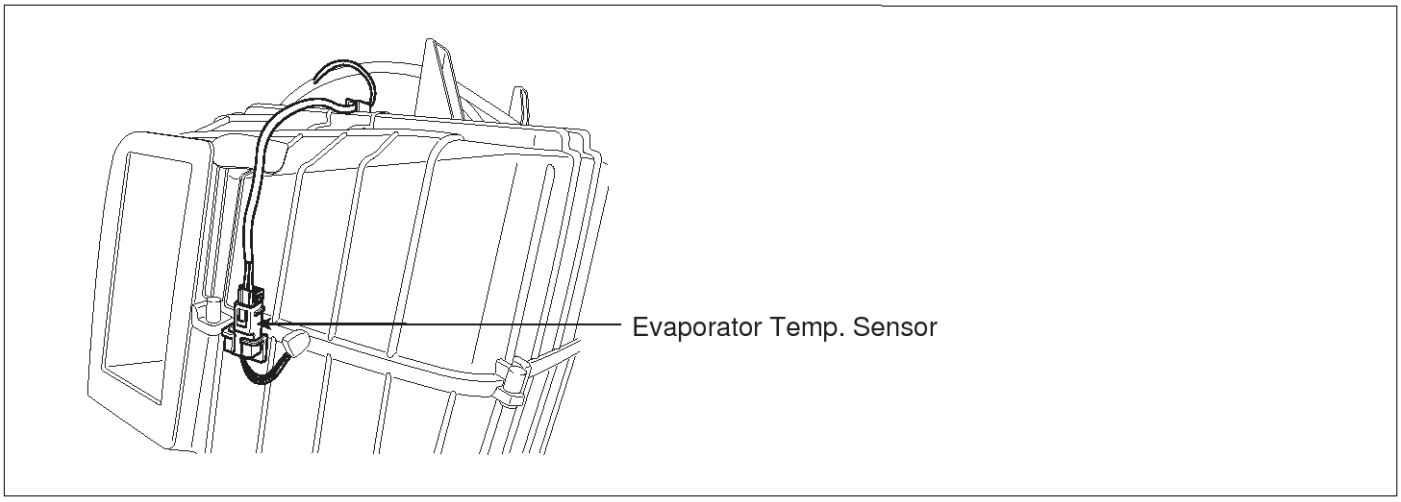
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1242

COMPONENT LOCATION



SBLHA6535L

GENERAL DESCRIPTION

The Evaporator temperature sensor located on heater unit, detects the core temperature and interrupts compressor relay power, in order to prevent evaporator freezing by excessive cooling. It is a negative type thermistor whose resistance is inversely proportional to temperature.

DTC DESCRIPTION

The A/C controller sets DTC B1242 if there is an open circuit in evaporator temp. sensor signal harness or the measured resistance value of sensor is more than threshold value(about 13.6kΩ)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Resistance check	• Open Circuit in harness • Faulty Evaporator temp. Sensor • Faulty A/C control unit
Threshold value	• ＞ 13.6kΩ	
Detecting time	• 0.3 sec	
FAIL SAFE	• Control with the value of -2˚C(28.4˚F)	

SPECIFICATION

Temperature[˚C(˚F)]	Resistance(kΩ)	Temperature[˚C(˚F)]	Resistance(kΩ)
-10(14)	13.56	20(68)	3.06
0(32)	8	30(86)	1.97
10(50)	4.87	40(104)	1.31

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "EVAPORATIVE SENSOR" Parameter on the Scantool.

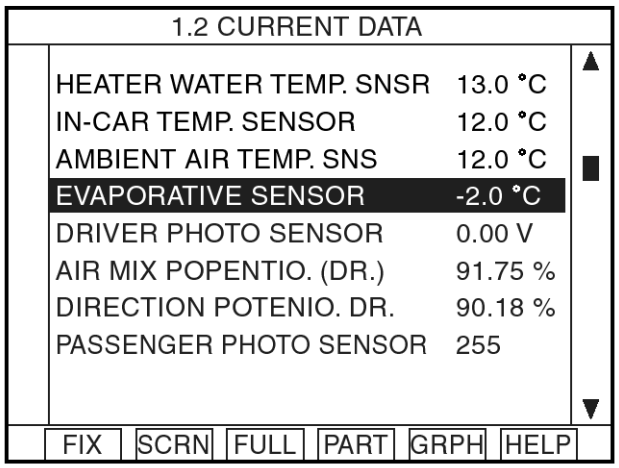


Fig. 1

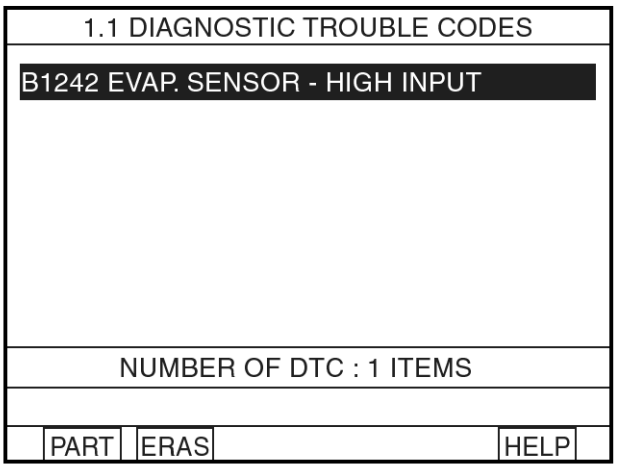


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1242.

EQBF520A

4. Are the DTC B1242 present and is parameter of "EVAPORATIVE SENSOR" fixed?

   ※ Parameter of "EVAPORATIVE SENSOR" will be fixed at -2℃(28.4˚F), if there is any fault in EVAPORATIVE SENSOR.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

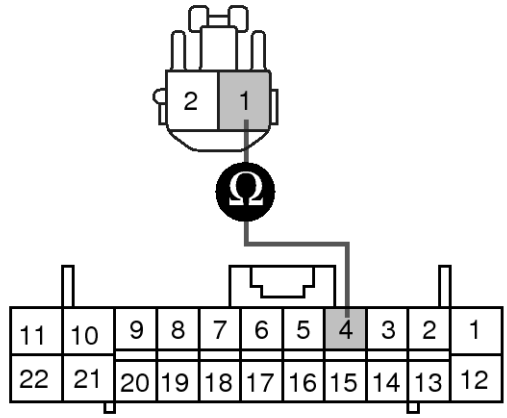
NO

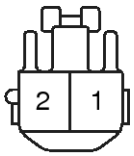
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect evaporator temp. sensor.
   3) Measure resistance between terminal "1" of evaporator temp. sensor and terminal "4" of A/C Control Unit.

Specification : Approx. 0 Ω





1. Evaporator temp. sensor signal
2. Evaporator temp. sensor ground

SBLHA6537L

4) Is the measured resistance within specifications?

YES

Go to "Ground circuit Inspection " procedure.

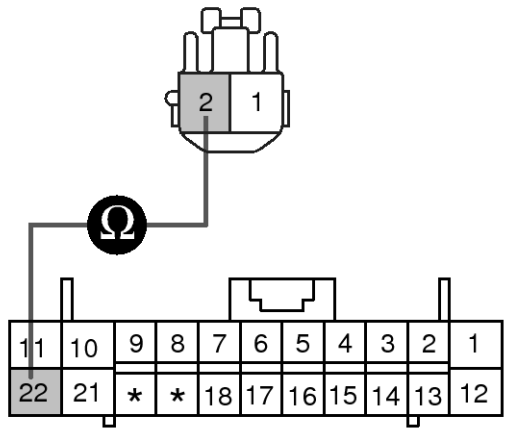
NO

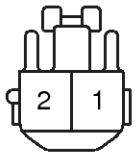
Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harness.
   1) Ignition "OFF"
   2) Disconnect evaporator temp. sensor.
   3) Measure resistance between terminal "2" of evaporator temp. sensor and terminal "22" A/C control unit.

Specification : Approx. 0 Ω





1. Evaporator temp. sensor signal
2. Evaporator temp. sensor ground

SBLHA6538L

4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

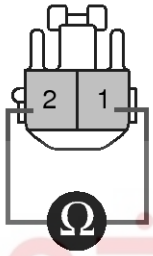
NO

Check for open in harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check evaporator temp. sensor.
   1) Ignition "OFF"
   2) Disconnect evaporator temp. sensor.
   3) Measure resistance between terminal "1" and "2" of evaporator temp. sensor.

Specification : Refer the specifications in fig 3.



1. Evaporator temp. sensor signal
2. Evaporator temp. sensor ground

LQLG519D

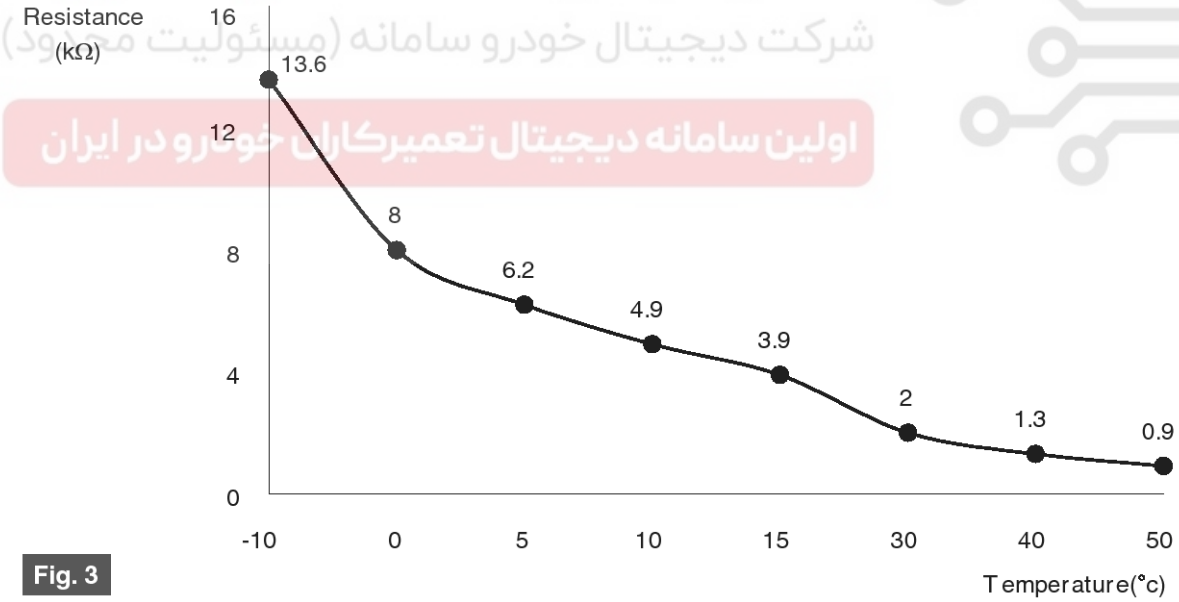


Fig. 3

Fig 3) Specifications : Resistance value of evaporator temp. sensor as a function of temperature.

EQBF519F

4) Is the measured resistance within specifications in fig3? (tolerance limits ±3%)

YES

Go to "Check A/C Control Unit" procedure.

NO

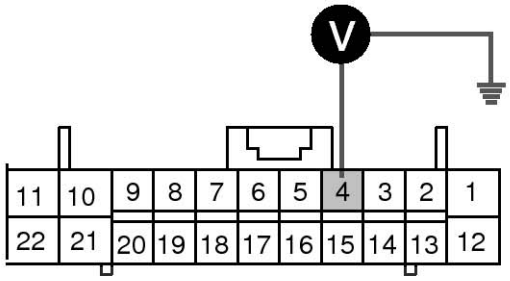
Substitute with a known-good evaporator temp. sensor and check for proper operation.

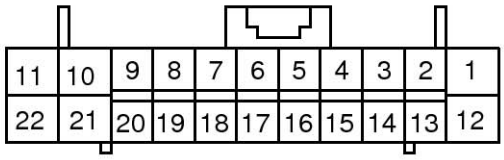
If the problem is corrected, replace evaporator

temp. sensor and then go to "Verification of Vehicle Repair" procedure.

2. Check A/C Control Unit
   1) Engine "ON"
   2) Disconnect evaporator temp. sensor.
   3) Measure voltage between terminal "4" of A/C Control Unit and chassis ground.

Specification : Approx. 5V





4. Evaporator temp. sensor signal

SBLHA6536L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

NO

Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

VERIFICATION OF VEHICLE REPAIR

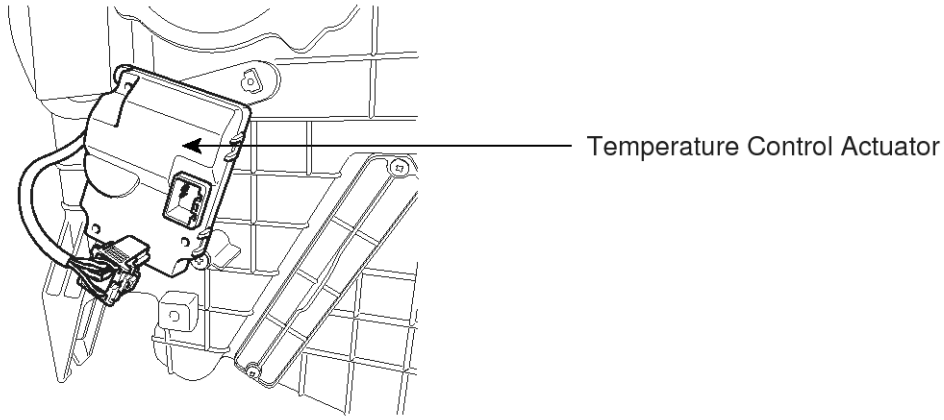
After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

B1245

COMPONENT LOCATION



SBLHA6539L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

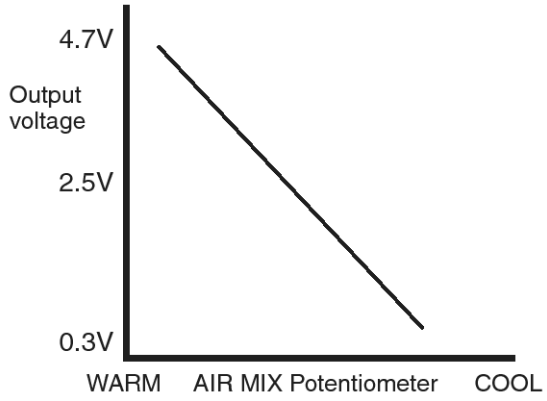
DTC DESCRIPTION

The A/C controller sets DTC B1245 if there is an open circuit or poor connection in the air mix potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver Air Mix potentiometer
Threshold value	• ＜ 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	• If temperature setting 17~24.5˚C(63~76˚F) fix at max. cooling position. • If temperature setting 25~32˚C(77~90˚F) fix at max. heating position.	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Driver Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

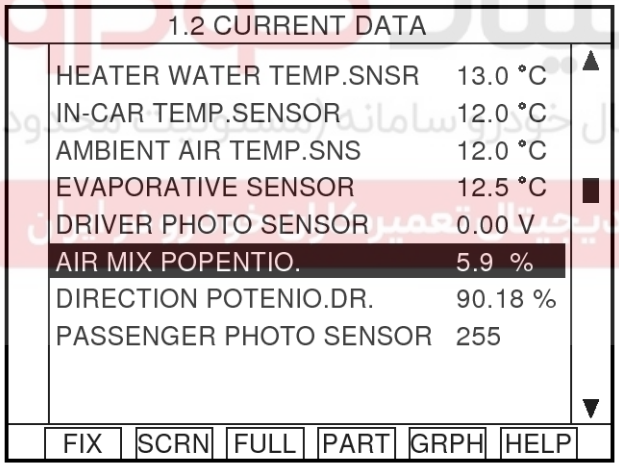


Fig. 1

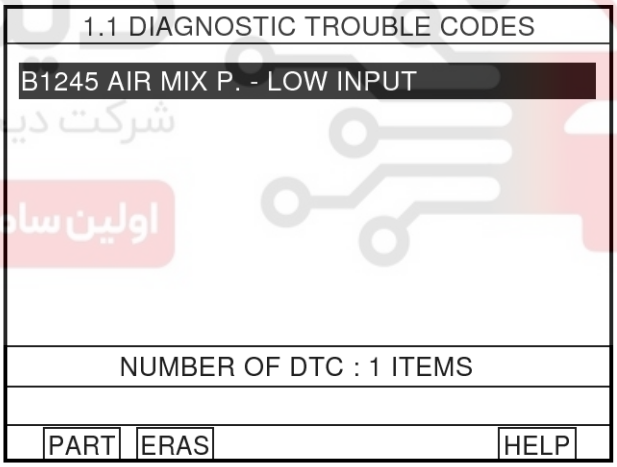


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1245.

LQLG521C

4. Are the DTC B1245 present and is parameter of "Driver Air Mix Potentiometer" fixed?

   ※ Parameter of "Driver Air Mix Potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Driver Air Mix potentiometer.

   YES

   Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle

Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

   YES

   Repair as necessary and go to "Verification of Vehicle Repair" procedure.

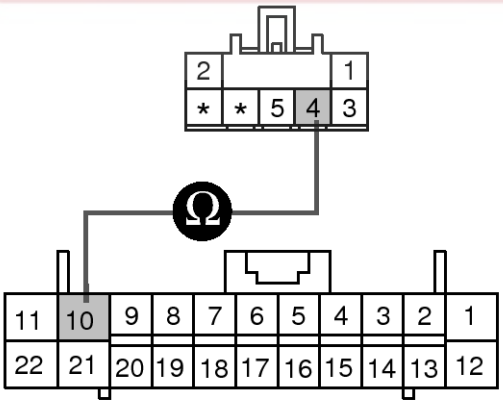
   NO

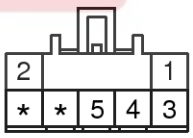
   Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix potentiometer.
   3) Measure resistance between terminal "4" of Driver Air Mix Potentiometer and terminal "10" of A/C control unit.

Specification : Approx. 0 Ω





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. **Potentiometer signal**
5. Potentiometer ground

SBLHA6540L

   4) Is the measured resistance within specifications?

   YES

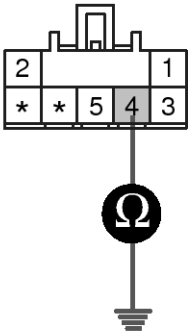
   Go to "Check for short to ground in harness" procedure.

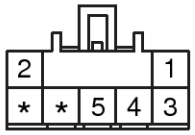
   NO

   Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.
2. Check for short to ground in harness.

1) Ignition "OFF"
2) Disconnect Driver Air Mix potentiometer.
3) Measure resistance between terminal "4" of Driver Air Mix Potentiometer and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. **Potentiometer signal**
5. Potentiometer ground

SBLHA6541L

4) Is the measured resistance within specifications?

YES

Go to "Power circuit Inspection" procedure.

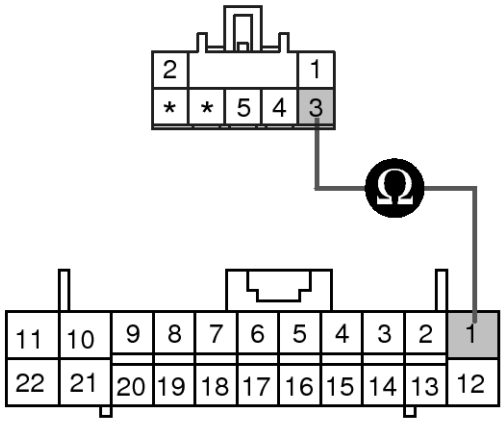
NO

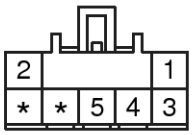
Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

POWER SUPPLY CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "ON"
   2) Connect Driver Air Mix Potentiometer.
   3) Measure resistance between terminal "3" of Driver Air Mix Potentiometer and terminal "1" of A/C control unit.

Specification : 0Ω





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. **Potentiometer ground**

SBLHA6542L

4) Is the measured voltage within specifications?

YES

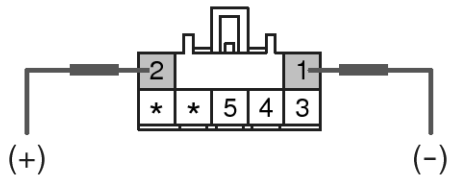
Go to "Component inspection" procedure.

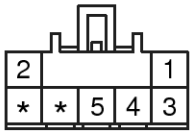
NO

Check for short or open in power harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Potentiometer.
   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.





1. **Motor (Cool)**
2. **Motor (Warm)**
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6543L

5) Does the actuator work properly?

YES

Go to "Check potentiometer" procedure.

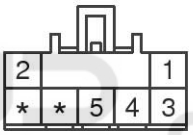
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer

1) Ignition "ON"
2) Connect Driver Air Mix potentiometer.
3) Measure voltage between terminal "4" and "5" of Driver Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)



1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6544L

Door position	Voltage (4-5)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

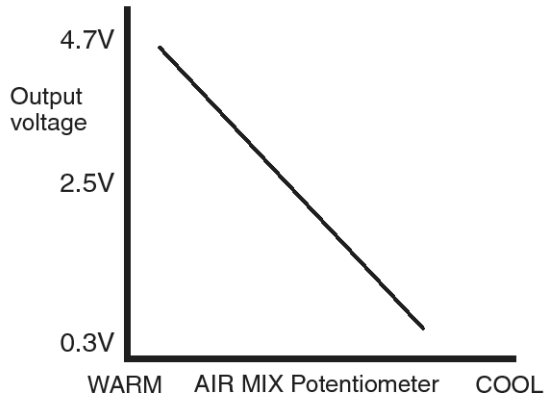


Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

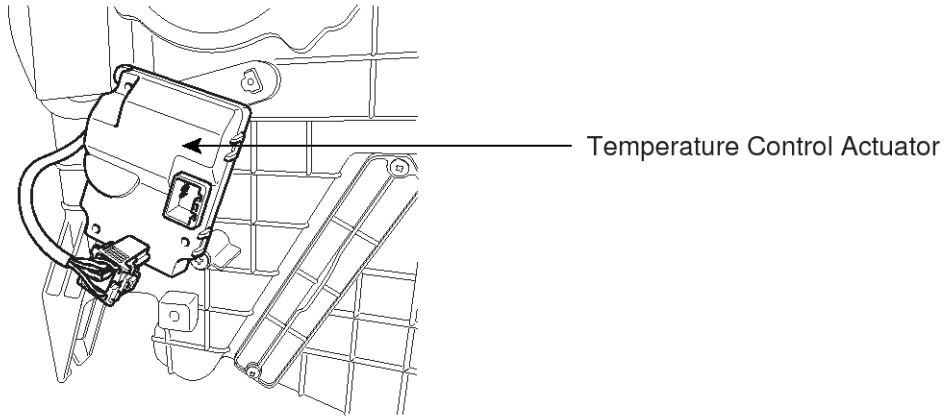
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1246

COMPONENT LOCATION



SBLHA6539L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

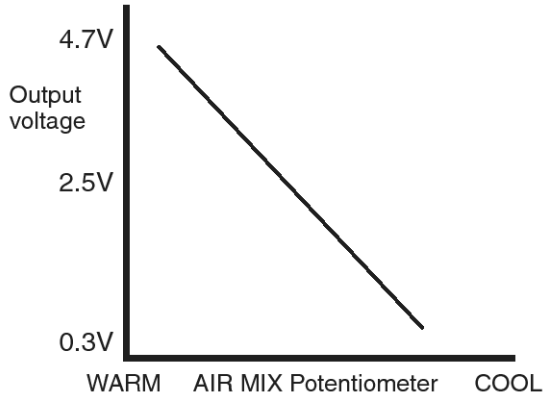
DTC DESCRIPTION

The A/C controller sets DTC B1246 if there is a short to power in the air mix potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Short circuit in harness • Faulty driver Air Mix potentiometer
Threshold value	• > 4.9V	
Detecting time	• 0.3 sec	
FAIL SAFE	• If temperature setting 17~24.5°C(63~76°F) fix at max. cooling position. • If temperature setting 25~32°C(77~90°F) fix at max. heating position.	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Driver Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

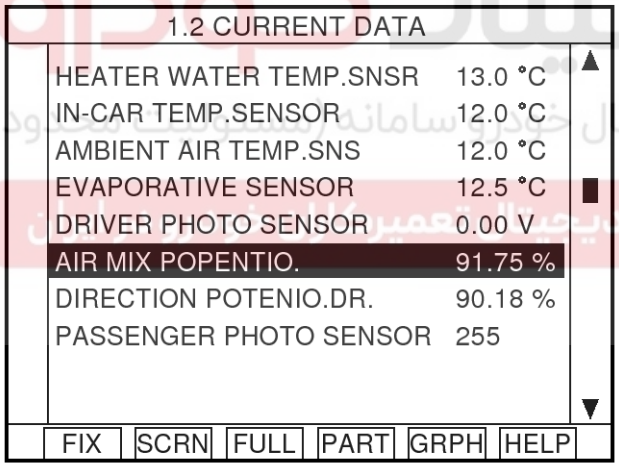


Fig. 1

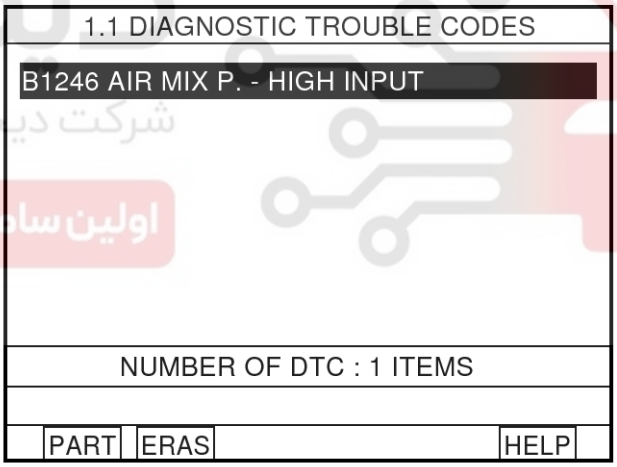


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1246.

LQLG522A

4. Are the DTC B1246 present and is parameter of "Driver Air Mix potentiometer" fixed?

※ Parameter of "Driver Air Mix potentiometer" will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Driver Air Mix potentiometer.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle

Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix potentiometer.
   3) Measure resistance between terminal "3" and "4" of Driver Air Mix potentiometer.

Specification : Approx. ∞ Ω

SBLHA6545L

4) Is the measured resistance within specifications?

YES

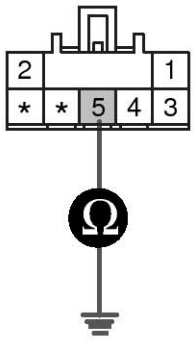
Go to "Ground circuit Inspection" procedure.

NO

Check for short to power harness in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

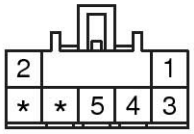
GROUND CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Potentiometer.



   3) Measure resistance between terminal "5" of Driver Air Mix Potentiometer and chassis ground.

Specification : Approx. 0 Ω



1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. **Potentiometer ground**

SBLHA6546L

   4) Is the measured resistance within specifications?

YES

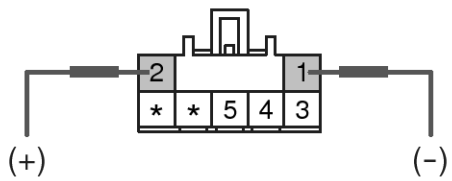
Go to "Component Inspection" procedure.

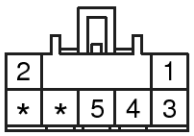
NO

Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Potentiometer.
   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.





1. **Motor (Cool)**
2. **Motor (Warm)**
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6543L

   5) Does the actuator work properly?

YES

Go to "Check potentiometer" procedure.

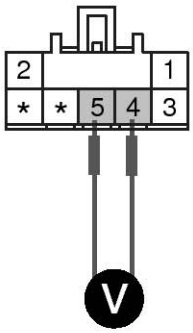
NO

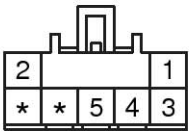
Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of

Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Driver Air Mix potentiometer.
   3) Measure voltage between terminal "4" and "5" of Driver Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. **Potentiometer signal**
5. **Potentiometer ground**

SBLHA6544L

Door position	Voltage (4-5)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

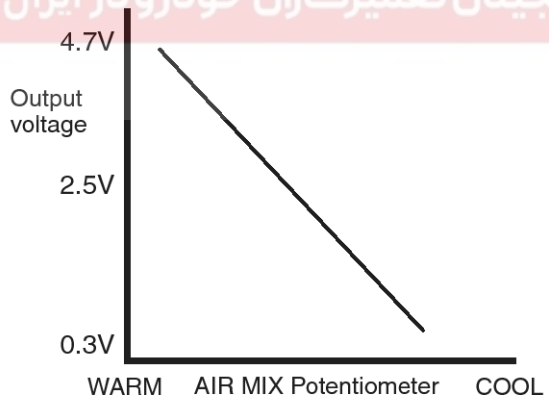


Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

   YES

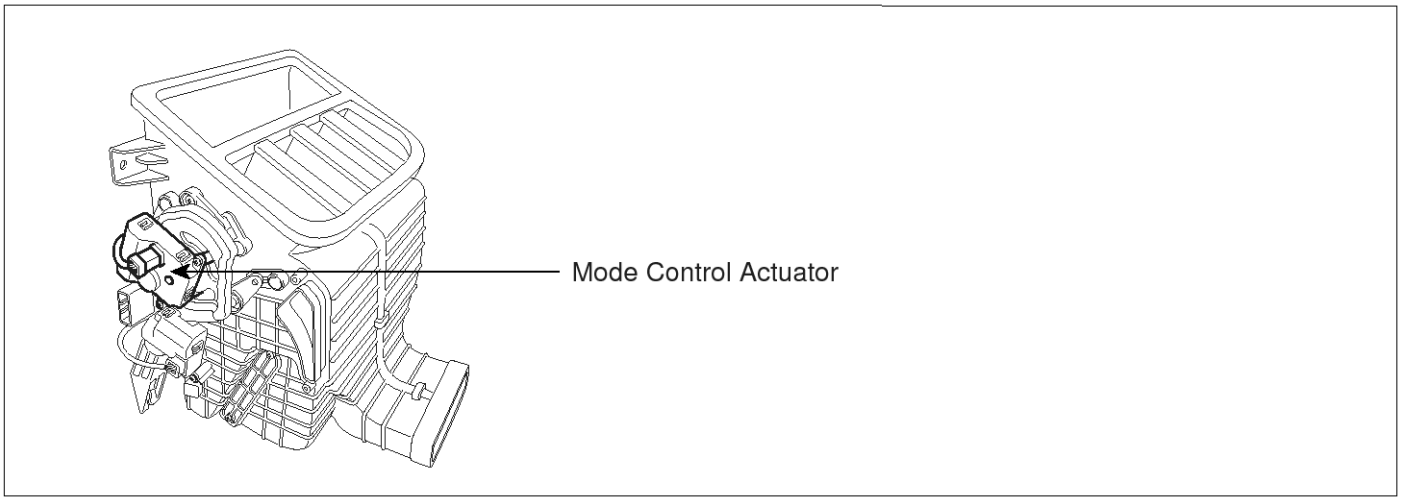
   Go to the applicable troubleshooting procedure.

   NO

   System is performing to specification at this time.

B1249

COMPONENT LOCATION



SBLHA6547L

GENERAL DESCRIPTION

The mode control actuator mounted on heater unit, adjusts position of mode door by operating Direction Motor based on signal of A/C control unit. Pressing mode select switch makes the mode control actuator shift in order of vent→ B/L → floor → mix.

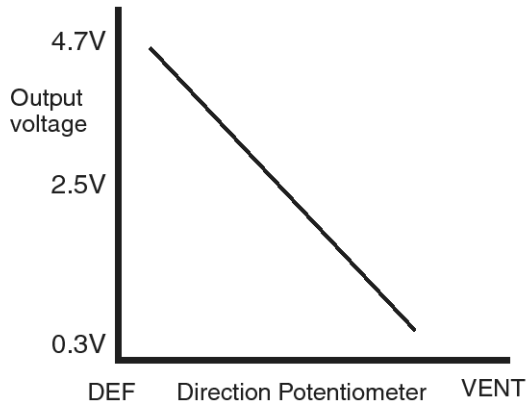
DTC DESCRIPTION

The A/C controller sets DTC B1249 if there is an open circuit or poor connection in the Direction potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver direction potentiometer
Threshold value	• < 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	• Fix vent position, while selecting vent mode. • Fix defrost position while selecting except vent mode.	

SPECIFICATION



EQBF523B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "DIRECTION POTENTIO." parameter on the scantool while operating mode switch.

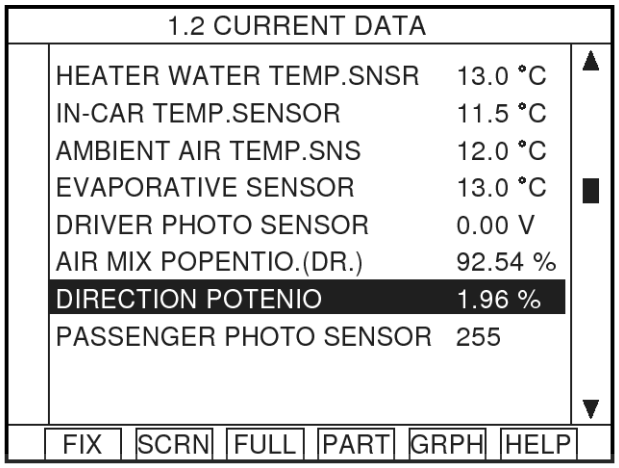


Fig. 1

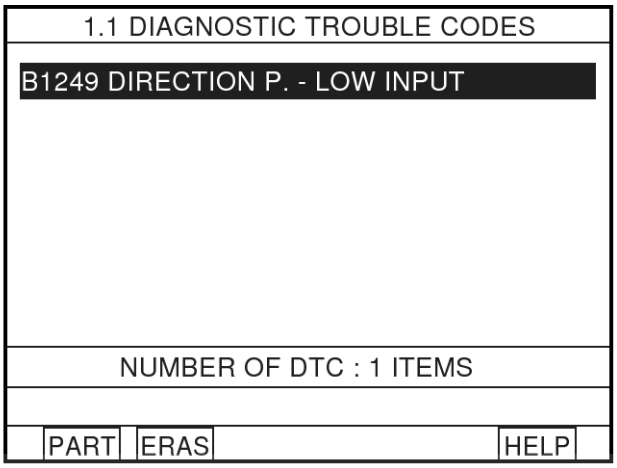


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1249.

SBLHA6570L

4. Are the DTC B1249 present and is parameter of "DR. DIRECTION POTENTIO." fixed?

※ Parameter of "DR. DIRECTION POTENTIO." will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Driver Direction potentiometer.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

   YES

   Repair as necessary and go to "Verification of Vehicle Repair" procedure.

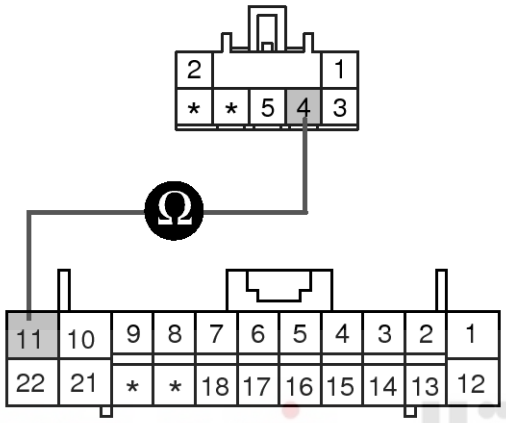
   NO

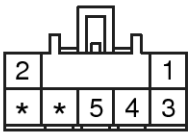
   Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.
   3) Measure resistance between terminal "4" of Direction potentiometer and terminal "11" of A/C control unit.

Specification : Approx. 0 Ω





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. **Potentiometer signal**
5. Potentiometer ground

SBLHA6548L

   4) Is the measured resistance within specifications?

YES

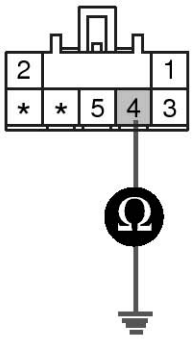
Go to "Check for short to ground in harness" procedure.

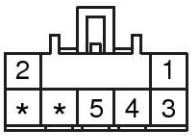
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.
   3) Measure resistance between terminal "4" of Direction potentiometer and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Vent)
2. Motor (Def)
3. Sensor REF +5V
4. **Potentiometer signal**
5. Potentiometer GND

SBLHA6549L

4) Is the measured resistance within specifications?

YES

Go to "Power circuit Inspection" procedure.

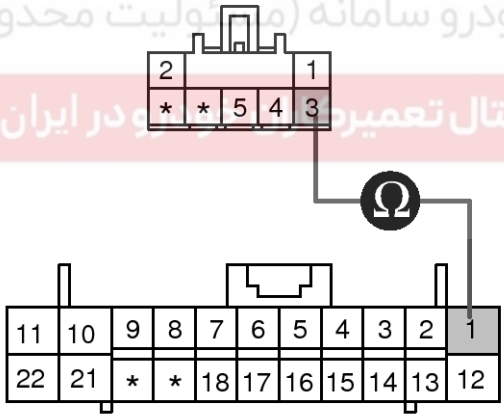
NO

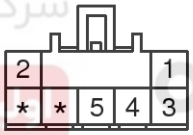
Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

POWER SUPPLY CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "ON"
   2) Connect Direction potentiometer.
   3) Measure resistance between terminal "3" of Direction potentiometer and terminal "1" of A/C control unit.

Specification : Approx. 5V





1. Motor (Vent)
2. Motor (Def)
3. **Sensor REF +5V**
4. Potentiometer signal
5. Potentiometer GND

SBLHA6550L

4) Is the measured voltage within specifications?

YES

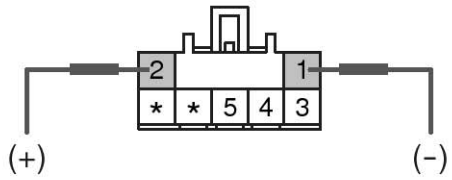
Go to "Component Inspection" procedure.

NO

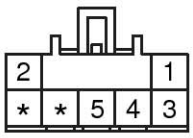
Check for short or open in power harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator.
   1) Ignition "OFF"
   2) Disconnect Direction potentiometer.



   3) Verify that the mode actuator operates to the vent mode when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the mode actuator operates to the def mode when the connections are reversed.



1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6551L

   5) Does the actuator work properly?

YES

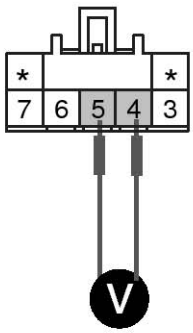
Go to "Check potentiometer" procedure.

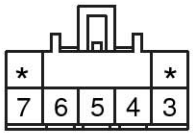
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Direction potentiometer.
   3) Measure voltage between terminal "4" and "5" of Direction potentiometer as the mode switch is operated.

Specification : Refer the specifications in fig 3





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6552L

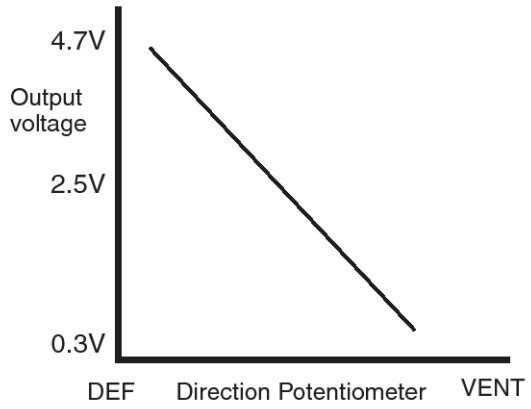


Fig. 3

Fig 3) Specifications : Voltage value as a function of position of direction potentiometer.

EQBF523J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

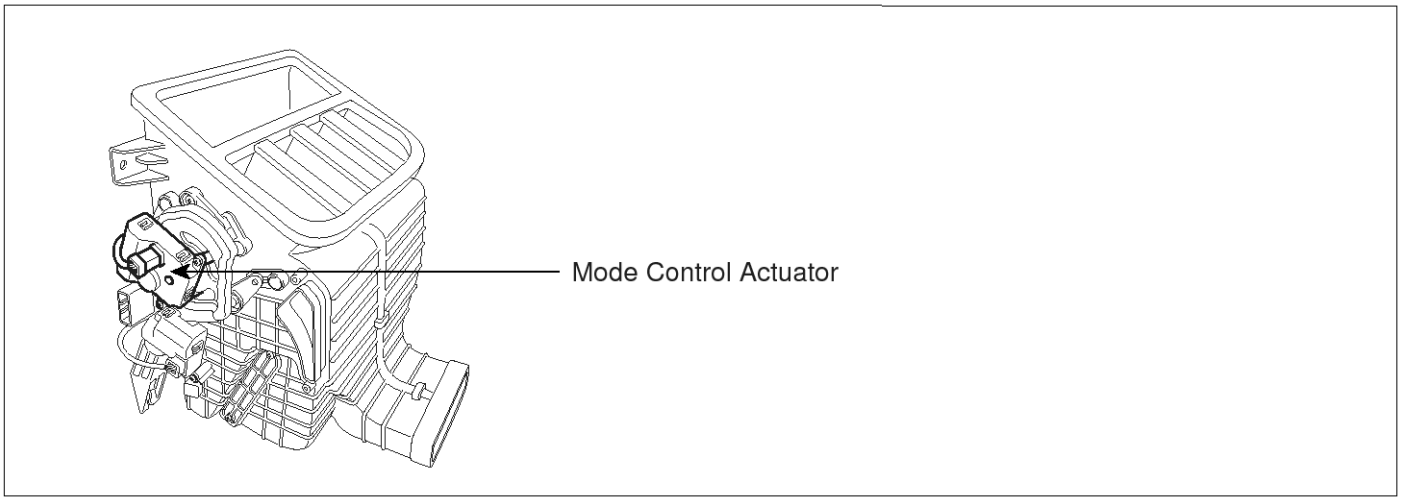
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B1250

COMPONENT LOCATION



SBLHA6547L

GENERAL DESCRIPTION

The mode control actuator mounted on heater unit, adjusts position of mode door by operating Direction Motor based on signal of A/C control unit. Pressing mode select switch makes the mode control actuator shift in order of vent→ B/L → floor → mix.

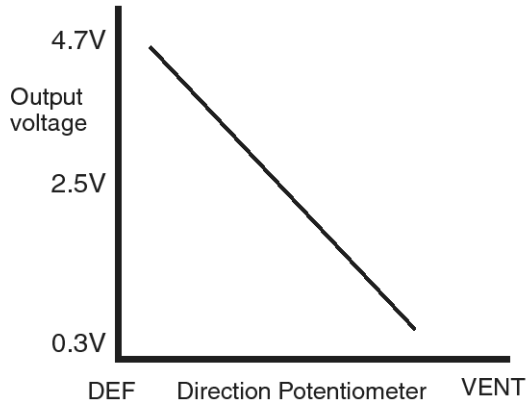
DTC DESCRIPTION

The A/C controller sets DTC B1250 if there is a short to power in the Direction potentiometer.

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Short circuit in harness • Faulty driver direction potentiometer • Open circuit in harness
Threshold value	• > 4.9V	
Detecting time	• 0.3 sec	
FAIL SAFE	• Fix vent position	

SPECIFICATION



EQBF523B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the " DIRECTION POTENTIO." parameter on the scantool while operating mode switch.

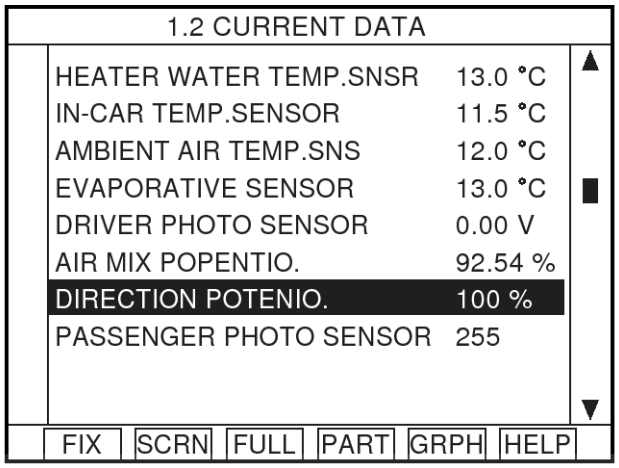


Fig. 1

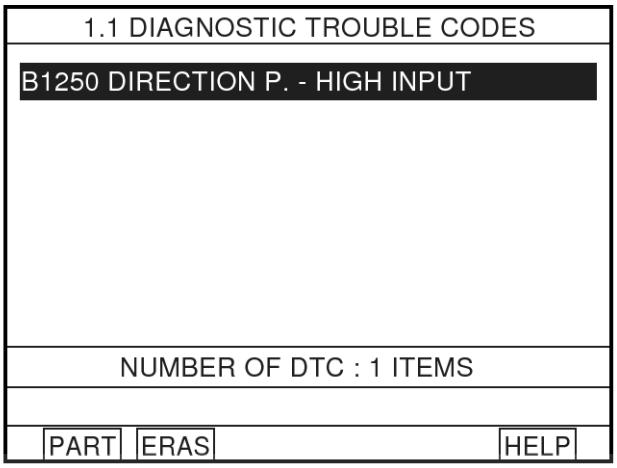


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B1250.

LQLG524A

4. Are the DTC B1250 present and is parameter of "DIRECTION POTENTIO." fixed?

※ Parameter of "DIRECTION POTENTIO." will be fixed at 100%(or any value above 90%), or 0% (or any value below 10%), if there is any fault in Driver Direction potentiometer.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

   YES

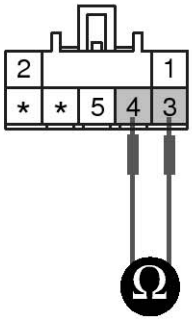
   Repair as necessary and go to "Verification of Vehicle Repair" procedure.

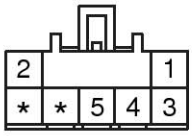
   NO

   Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for short in harness.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.





1. Motor (Vent)
2. Motor (Def)
3. **Sensor reference voltage(+5V)**
4. **Potentiometer signal**
5. Potentiometer ground

SBLHA6553L

   3) Measure resistance between terminal "3" and "4" of Direction potentiometer.

Specification : Approx. ∞ Ω

   4) Is the measured resistance within specifications?

YES

Go to "Ground circuit inspection" procedure.

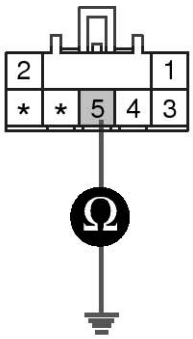
NO

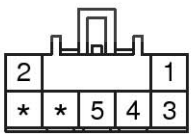
Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION

1. Check for open in ground harneS.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.
   3) Measure resistance between terminal "5" of evaporator sensor and chassis ground.

Specification :Approx. 0 Ω





1. Motor (Vent)
3. Motor (Def)
4. Sensor REF +5V
5. Potentiometer signal
6. **Potentiometer GND**

SBLHA6554L

   4) Is the measured resistance within specifications?

YES

Go to "Component Inspection " procedure.

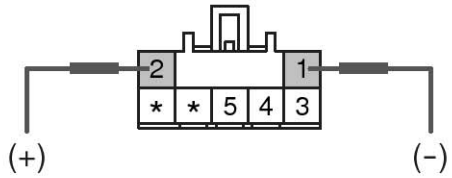
NO

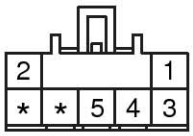
Check for open in ground harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator.
   1) Ignition "OFF"

2) Disconnect Direction potentiometer.
3) Verify that the mode actuator operates to the vent mode when connecting 12V to the terminal "1" and grounding terminal "2".
4) Verify that the mode actuator operates to the def mode when the connections are reversed.





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6551L

5) Does the actuator work properly?

YES

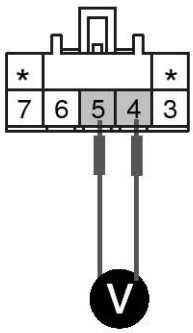
Go to "Check potentiometer" procedure.

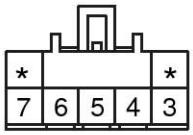
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Direction potentiometer.
   3) Measure voltage between terminal "4" and "5" of Direction potentiometer as the mode switch is operated.

Specification : Refer the specifications in fig 3





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. **Potentiometer signal**
5. Potentiometer ground

SBLHA6552L

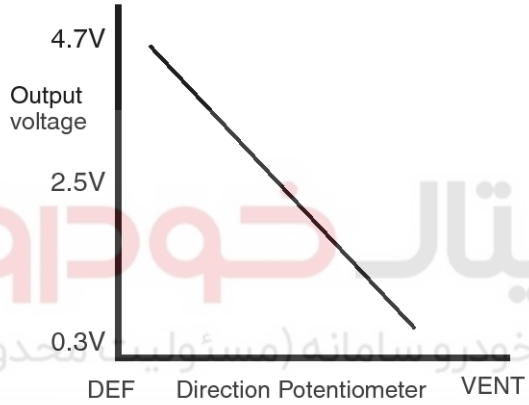


Fig. 3

Fig 3) Specifications : Voltage value as a function of position of direction potentiometer.

EQBF523J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

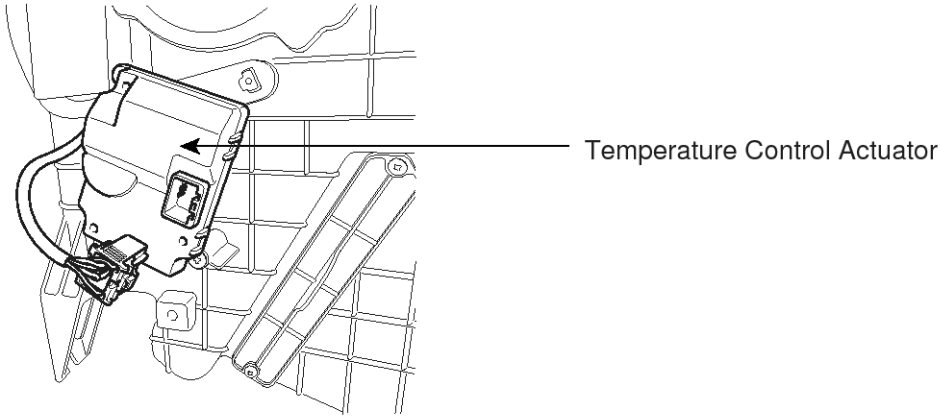
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B2406

COMPONENT LOCATION



SBLHA6555L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

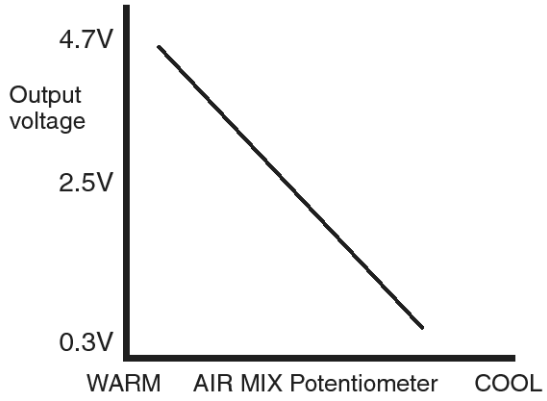
DTC DESCRIPTION

The A/C controller sets DTC B2406 if the air mix actuator doesn't move to intended position within 40sec (In this case, A/C controller try to move temp. door for 2sec. 3 times, every 20 sec. before setting DTC).

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver Air Mix potentiom-eter • Fault A/C Control Unit
Threshold value	• ＜ 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	-	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Driver Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

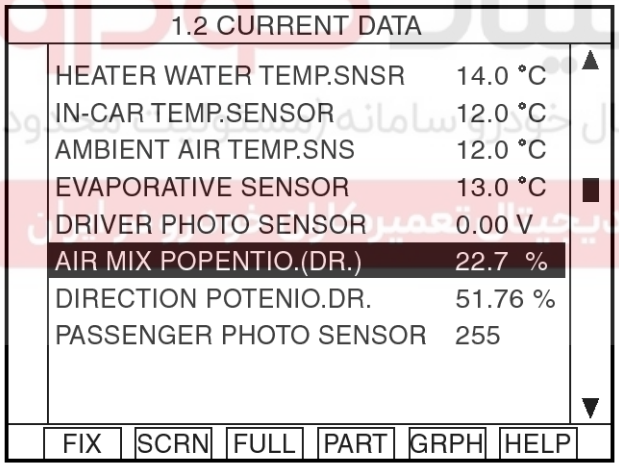


Fig. 1

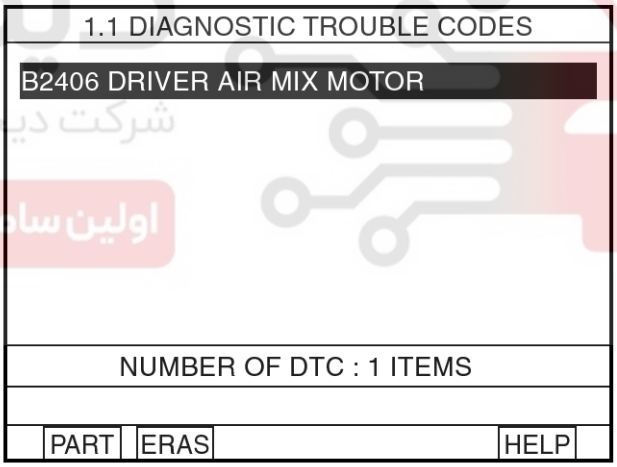


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B2406.

EQBF525A

4. Are the DTC B2406 present and is parameter of "Driver AIR MIX Potentiometer" fixed?

   ※ There is any fault in Driver AIR MIX Motor. If the parameter of "Driver AIR MIX DOOR" is 30% or less when the actuator operates to the hot position, or If the parameter is 60% and more when the actuator operates to the cold position.

   YES

   Go to "Inspection" procedure.

   NO

   Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as

necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

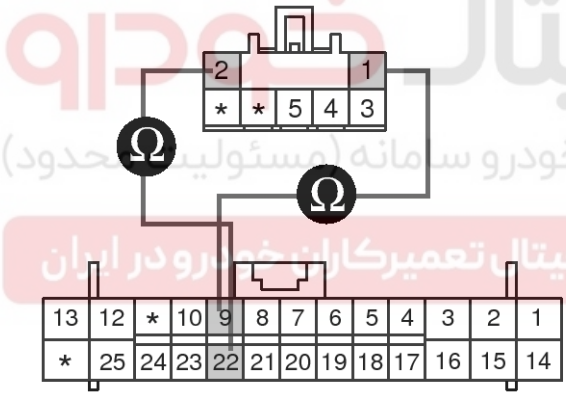
NO

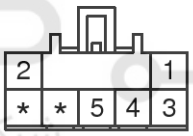
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix potentiometer.
   3) Measure resistance between terminal "1,2" of Driver Air Mix Motor and terminal "9,22" of A/C control unit.

Specification : Approx. 0 Ω





3. Motor (Cool)
4. Motor (Warm)
5. Sensor reference voltage(+5V)
6. Potentiometer signal
7. Potentiometer ground

SBLHA6556L

4) Is the measured resistance within specifications?

YES

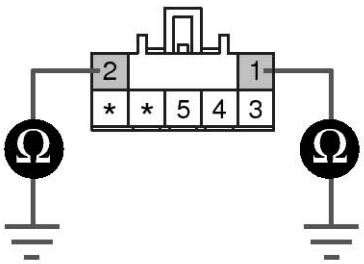
Go to "Check for short to ground in harness" procedure.

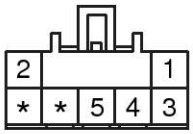
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Actuator.
   3) Measure resistance between terminal "1,2" of Driver Air Mix Motor and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6557L

4) Is the measured resistance within specifications?

YES

Go to "Visual/Physical Inspection " procedure.

NO

Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

1.3 ACTUATION TEST	
DRIVER AIR MIX DOOR - DRIVE 50%	
DURATION	UNTIL STOP KEY
METHOD	ACTIVATION
CONDITION	IG. KEY ON ENGINE RUNNING
PRESS [STRT], IF YOU ARE READY!	
STRT	STOP

Fig. 3

Fig 3 : Selecting "ACTUATION TEST" mode.

EQBF525D

3) Does Driver Air Mix Actuator work properly?

YES

Go to "Component Inspection" procedure.

NO

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

VISUAL/PHYSICAL INSPECTION

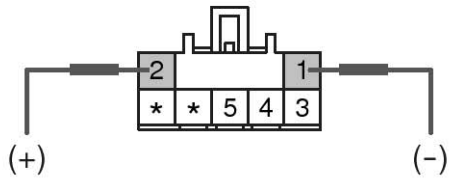
1. Check actuator.

※ Check if Driver Air Mix Actuator works properly through ACTUATION TEST.

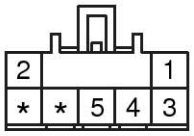
1) Ignition : ON
2) Connect Scantool and select " ACTUATION TEST" mode and press [F1]

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Potentiometer.



   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.



1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6558L

   5) Does the actuator work properly?

YES

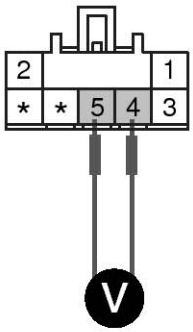
Go to "Check potentiometer" procedure.

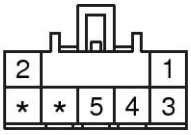
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Driver Air Mix potentiometer.
   3) Measure voltage between terminal "4" and "5" of Driver Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)





1. Motor (Cool)
2. Motor (Warm)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6559L

Door position	Voltage (4-5)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

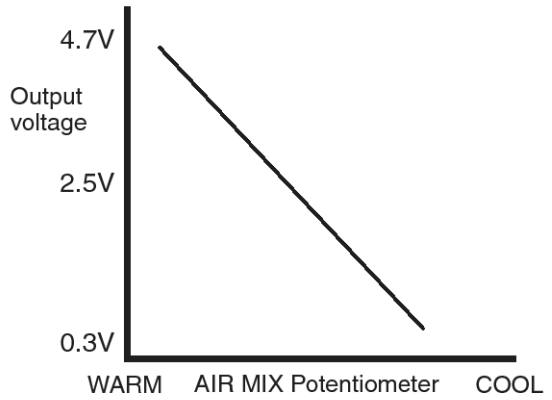


Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

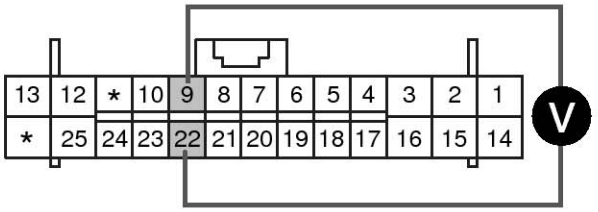
Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

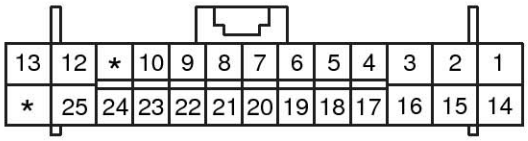
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

3. Check A/C Control Unit.
   1) Engine "ON"
   2) Connect A/C Control Unit.
   3) Measure voltage between terminal "9" and "22" of A/C Control Unit while operating the temp. switch.

Specification :Approx. 12V





9. Motor
22. Motor

SBLHA6560L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

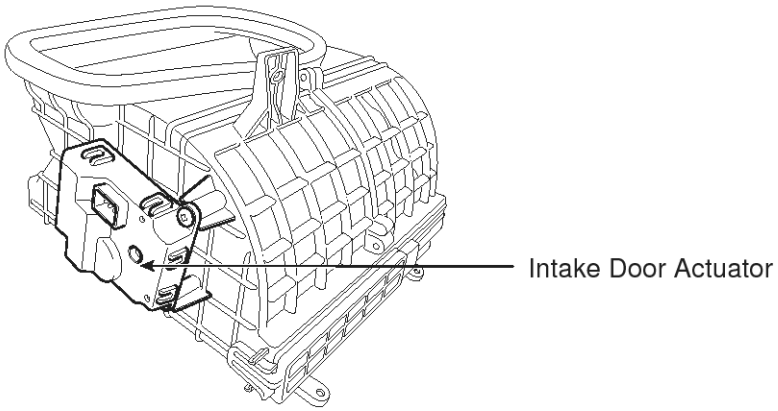
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B2408

COMPONENT LOCATION



SBLHA6518L

GENERAL DESCRIPTION

Intake door located at heater unit controls the inlet of car. When driver operates the intake switch, A/C controller recirculationeives mode signal from intake switch and operates intake door actuator to turn intake door to intended position. (with fresh mode signal, intake door is closed and with fresh mode signal, intake door is opened.

DTC DESCRIPTION

The A/C controller sets DTC B2408 if the intake motor Doesn't move to intended position within 40sec(The A/C controller attempts to move the intake door for a 2 second duration at a freshquency of 3 times every 20 seconds before storing a DTC.)

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty Intake potentiometer
Threshold value	• ＜ 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	-	

SPECIFICATION

※ Voltage value of Intake potentiometer as a function of position of Intake door

Door position	Voltage	Threshold value
Fresh	0.3±0.15V	Voltage value 0.08V or less
Recirculation	4.7±0.15V	Voltage value 4.9V or more

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Intake Potentiometer" Parameter on the Scantool while operating Intake switch.

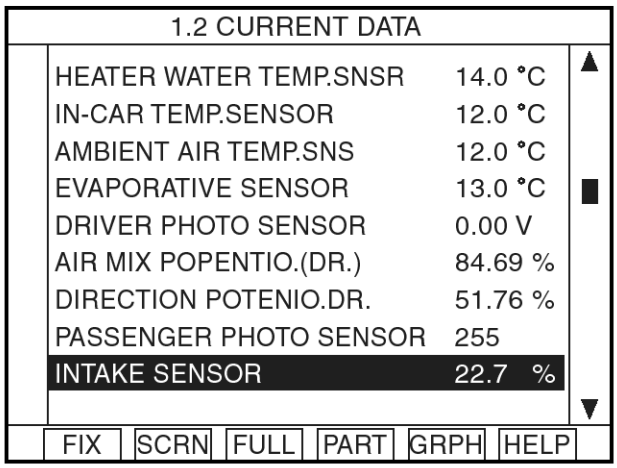


Fig. 1

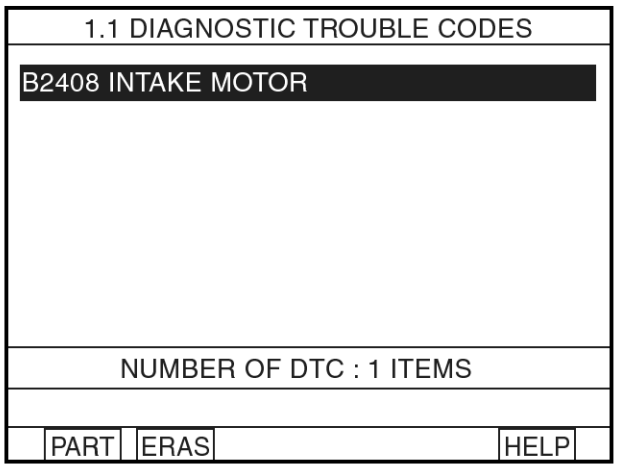


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B2408.

EQBF529A

4. Are the DTC B2408 present and is parameter of "Intake Potentiometer" fixed?

※ There is any fault in Intake potentiometer. If the parameter of "Intake potentiometer" is 30% or less when the actuator operates to the fresh position, or If the parameter is 60% and more when the actuator operates to the recirculation position.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

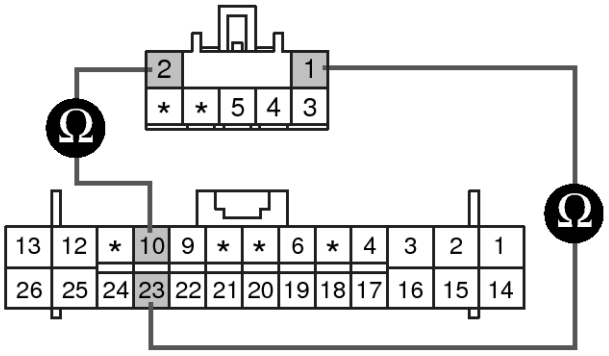
Repair as necessary and go to "Verification of Vehicle Repair" procedure.

NO

Go to "Signal circuit inspection" procedure.

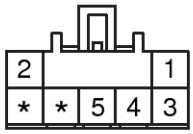
SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Intake potentiometer.



   3) Measure resistance between terminal "1,2" of Intake potentiometer and terminal "23,10" of A/C control unit.

Specification : Approx. 0 Ω



1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6561L

   4) Is the measured resistance within specifications?

YES

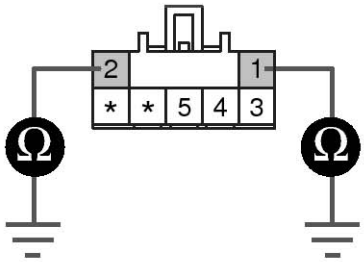
Go to "Check for short to ground in harness" procedure.

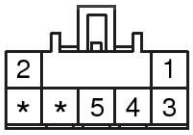
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect Driver Air Mix Actuator.
   3) Measure resistance between terminal "1,2" of Driver Air Mix Motor and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6562L

   4) Is the measured resistance within specifications?

YES

Go to "Visual/Physical Inspection " procedure.

NO

Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

VISUAL/PHYSICAL INSPECTION

1. Check actuator.

※ Check if Driver Air Mix Actuator works properly through ACTUATION TEST.

1) Ignition : ON
2) Connect Scantool and select " ACTUATION TEST" mode and press [F1]

1.3 ACTUATION TEST	
DRIVER AIR MIX DOOR - DRIVE 50%	
DURATION	UNTIL STOP KEY
METHOD	ACTIVATION
CONDITION	IG. KEY ON ENGINE RUNNING
PRESS [STRT], IF YOU ARE READY!	
STRT STOP	

Fig. 3

Fig 3 : Selecting "ACTUATION TEST" mode.

EQBF525D

3) Does Intake Actuator work properly?

YES

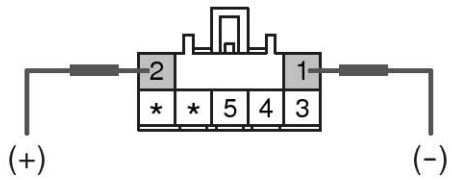
Go to "Component Inspection" procedure.

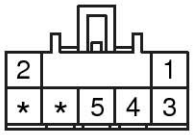
NO

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Intake Potentiometer.
   3) Verify that the temperature actuator operates to the fresh position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the recirculation position when the connections are reversed.





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6522L

5) Does the actuator work properly?

YES

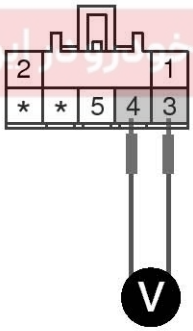
Go to "Check potentiometer" procedure.

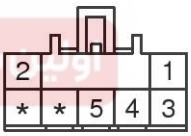
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Intake potentiometer.
   3) Measure voltage between terminal "3" and "4" of Intake potentiometer while operating Intake switch.

Specification : Refer the specifications





1. Motor (Rec)
2. Motor (Fre)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6523L

Door position	Voltage (3-4)	Error detecting
Fresh	0.3 ± 0.15V	Low voltage : 0.08V or less
Recirculation	4.7 ± 0.15V	High voltage : 4.9V or more

Specifications : Voltage value of Intake potentiometer as a function of position of Intake.

4) Is the measured voltage within specifications?

YES

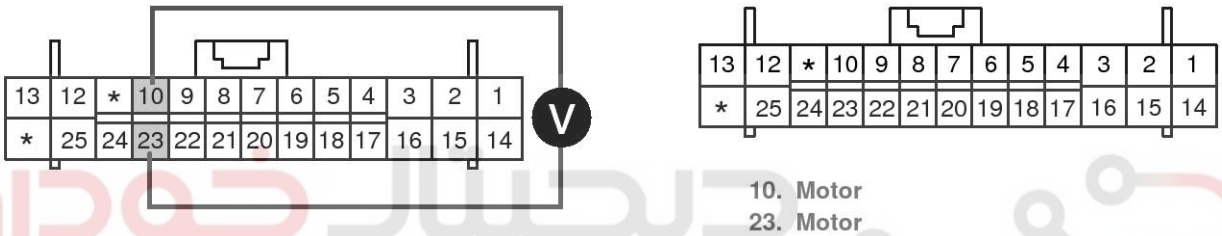
Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

3. Check A/C Control Unit.
   1) Engine "ON"
   2) Connect A/C Control Unit.
   3) Measure voltage between terminal "10" and "23" of A/C Control Unit while operating the Intake switch.

Specification :Approx. 12V



SBLHA6569L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

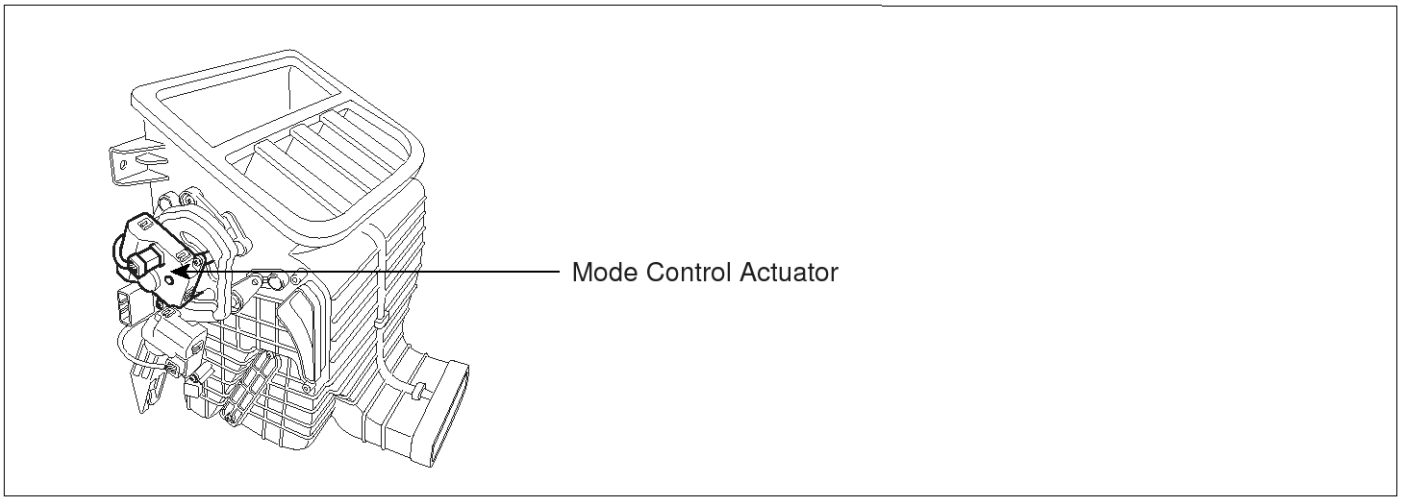
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B2409

COMPONENT LOCATION



SBLHA6547L

GENERAL DESCRIPTION

The mode control actuator mounted on heater unit, adjusts position of mode door by operating Direction Motor based on signal of A/C control unit. Pressing mode select switch makes the mode control actuator shift in order of vent→ B/L → floor → mix.

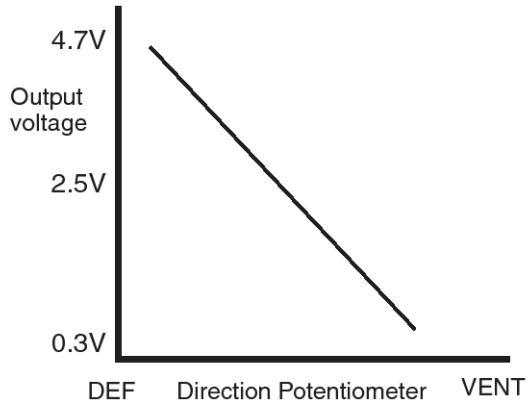
DTC DESCRIPTION

The A/C controller sets DTC B2409 if the direction motor doesn't move to intended position within 40sec(In this case, A/C controller try to move mode door for 2sec. 3 times, every 20 sec. before setting DTC).

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver direction potentio-meter • Fault A/C Control Unit.
Threshold value	• < 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	-	

SPECIFICATION



EQBF523B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "DIRECTION POTENTIO" parameter on the scantool while operating mode switch.

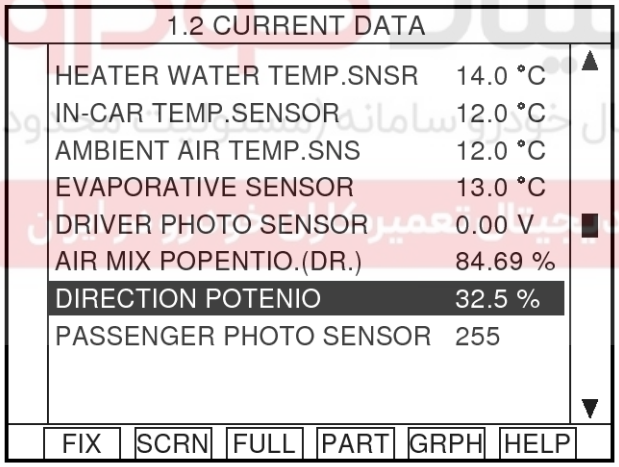


Fig. 1

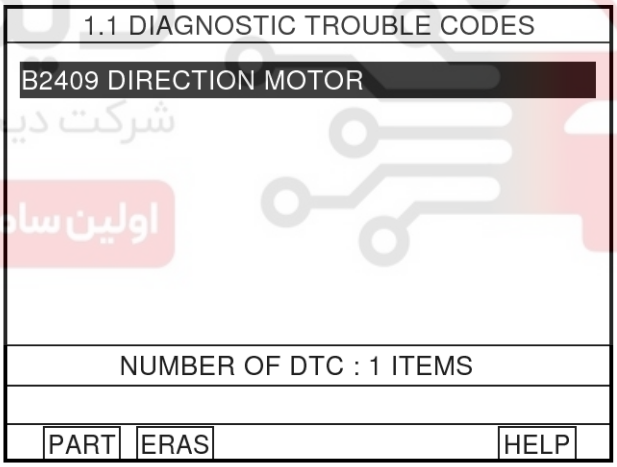


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B2409.

SBLHA6571L

4. Are the DTC B2409 present and is parameter of "DIRECTION POTENTIO." fixed?

※ There is any fault in Driver Direction Motor. If the parameter of "Driver DIRECTION POTENTIO." is 10% or less on "VENT" mode, or If the parameter is 90% or more on "DEF" mode.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle

Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

NO

Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.
   3) Measure resistance between terminal "1,2" of Direction Motor and terminal "21,15" of A/C control unit.

Specification : Approx. 0 Ω

SBLHA6563L

4) Is the measured resistance within specifications?

YES

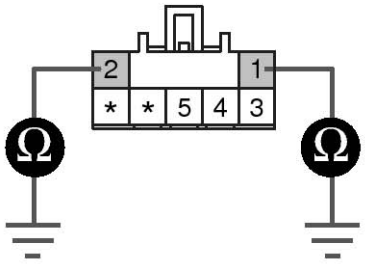
Go to "Check for short to ground in harness" procedure.

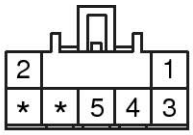
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect mode Actuator.
   3) Measure resistance between terminal "1,2" of Direction Motor and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6564L

4) Is the measured resistance within specifications?

YES

Go to "Visual/Physical Inspection " procedure.

NO

Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

VISUAL/PHYSICAL INSPECTION

1. Check actuator.

※ Check if Direction Actuator works properly through ACTUATION TEST.

1) Ignition : ON

2) Connect Scantool and select " ACTUATION TEST" mode and press [F1]

1.3 ACTUATION TEST	
DRIVER AIR OUTLET MODE-DRIVE FOOT	
DURATION	UNTIL STOP KEY
METHOD	ACTIVATION
CONDITION	IG. KEY ON ENGINE RUNNING
PRESS [STRT], IF YOU ARE READY!	
STRT STOP	

Fig. 3

Fig 3 : Selecting "ACTUATION TEST" mode.

EQBF526D

3) Does Direction Actuator work properly?

YES

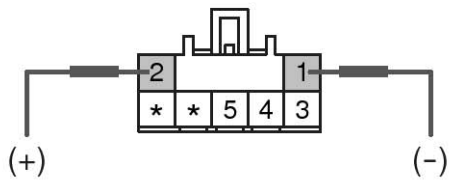
Go to "Component Inspection" procedure.

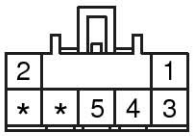
NO

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator.
   1) Ignition "OFF"
   2) Disconnect Direction potentiometer.
   3) Verify that the mode actuator operates to the vent mode when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the mode actuator operates to the def mode when the connections are reversed.





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6551L

5) Does the actuator work properly?

YES

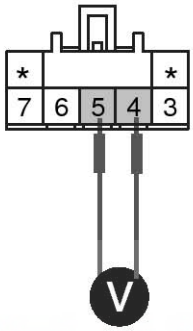
Go to "Check potentiometer" procedure.

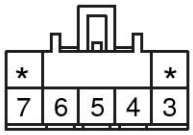
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Direction potentiometer.
   3) Measure voltage between terminal "4" and "5" of Direction potentiometer as the mode switch is operated.

Specification : Refer the specifications in fig 3





1. Motor (Vent)
2. Motor (Def)
3. Sensor reference voltage(+5V)
4. Potentiometer signal
5. Potentiometer ground

SBLHA6552L

Door position	Voltage (4-5)	Error detecting
VENT	0.3 ± 0.15V	Under voltage : 0.08V or less Over voltage : 4.92V or more
BI-LEVEL(1)	1.35 ± 0.4V	
BI-LEVEL(2)	2.25 ± 0.4V	
FLOOR	3.0 ± 0.4V	
MIX	3.6 ± 0.4V	
DEF	4.7 ± 0.15V	

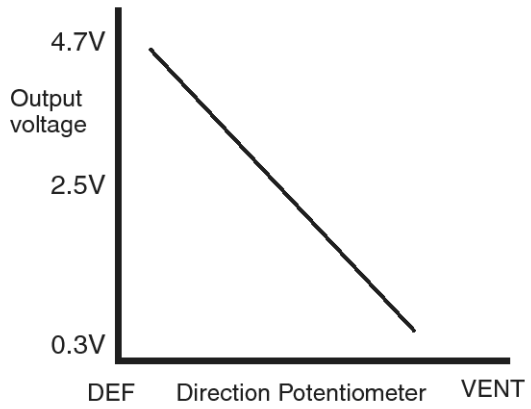


Fig. 3

Fig 3) Specifications : Voltage value as a function of position of direction potentiometer.

EQBF523J

4) Is the measured voltage within specifications in fig3?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

3. Check A/C Control Unit.
   1) Engine : "ON"
   2) Connect A/C Control Unit.
   3) Measure voltage between terminal "15" and "21" of A/C Control Unit while operating the mode switch.

Specification :Approx. 12V

SBLHA6565L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.

If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

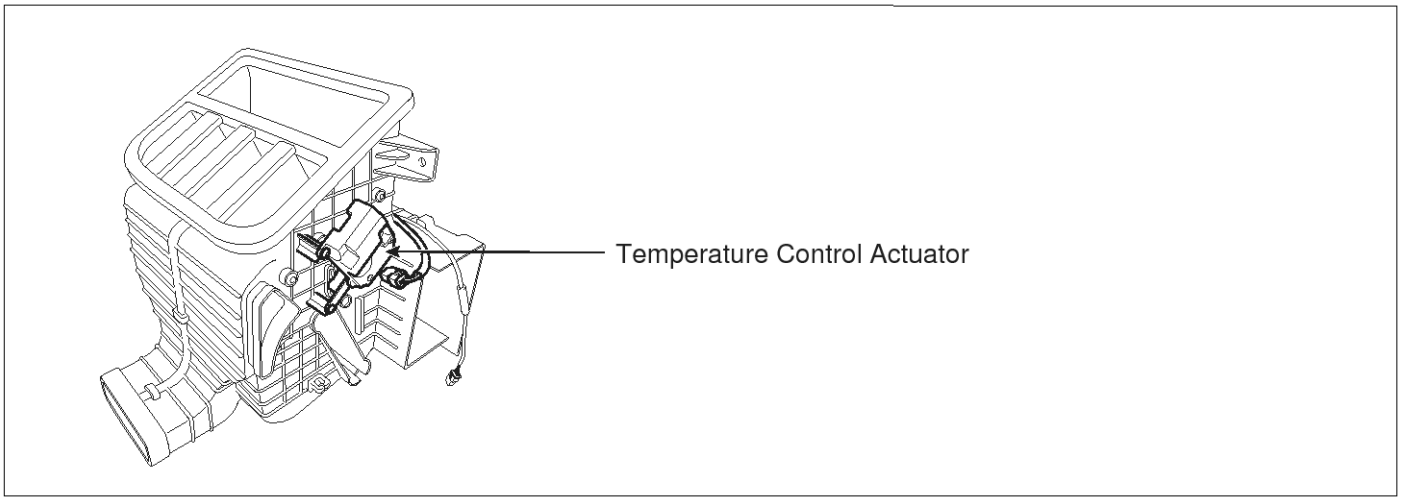
Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.

B2415

COMPONENT LOCATION



SBLHA6510L

GENERAL DESCRIPTION

Temperature control actuator located at heater unit, regulates the temperature by the procedure as follows. Signal from control unit adjusts position of temp. door by operating temp. motor and then temperature will be regulated by the hot/cold air ratio decided by position of temp. door.

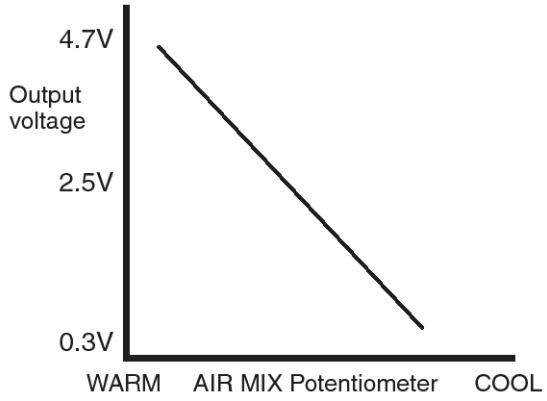
DTC DESCRIPTION

The A/C controller sets DTC B2415 if the air mix actuator doesn't move to intended position within 40sec (In this case, A/C controller try to move temp. door for 2sec. 3 times, every 20 sec. before setting DTC).

DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage check	• Poor connection of connected part • Open circuit in harness • Short circuit in harness • Faulty driver Air Mix potentiom-eter • Fault A/C Control Unit
Threshold value	• < 0.1V	
Detecting time	• 0.3 sec	
FAIL SAFE	-	

SPECIFICATION



EQBF521B

MONITOR SCANTOOL DATA

1. Connect scantool to Data Link Connector(DLC).
2. Engine "ON"
3. Monitor the "Passenger Air Mix Potentiometer" Parameter on the Scantool while operating temp. switch.

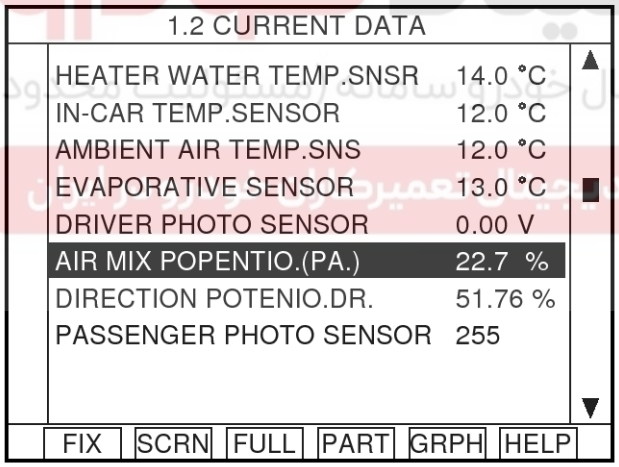


Fig. 1

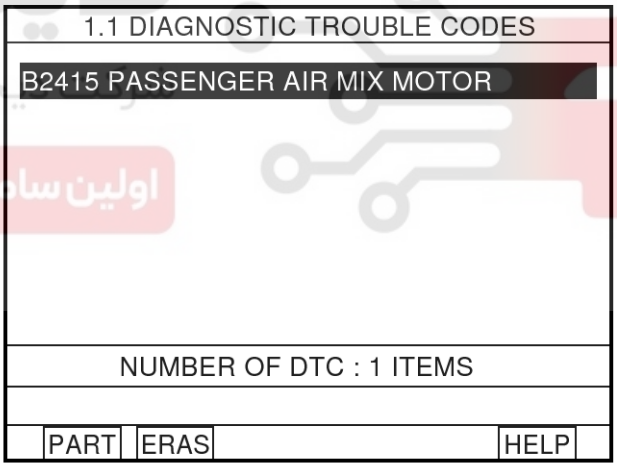


Fig. 2

Fig 1 : The current data in abnormal state.
Fig 2 : DTC B2415.

LQKG990J

4. Are the DTC B2415 present and is parameter of "Passenger AIR MIX Potentiometer" fixed?

※ There is any fault in Passenger AIR MIX Motor. If the parameter of "Passenger AIR MIX DOOR" is 30% or less when the actuator operates to the hot position, or If the parameter is 60% and more when the actuator operates to the cold position.

YES

Go to "Inspection" procedure.

NO

Fault is intermittent caused by poor contact in the sensor's and/or A/C controller's connector or was repaired and A/C controller memory was not cleared.

Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

TERMINAL AND CONNECTOR INSPECTION

1. Many malfunctions in the electrical system are caused by poor harness and terminals.

   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES

Repair as necessary and go to "Verification of Vehicle Repair" procedure.

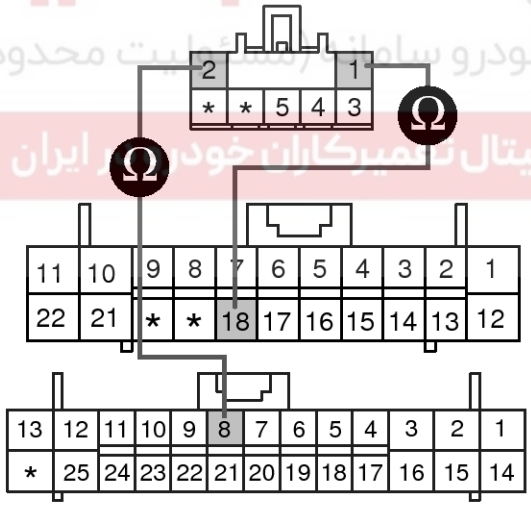
NO

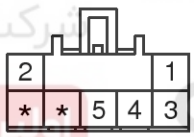
Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1. Check for open in harness.
   1) Ignition "OFF"
   2) Disconnect Passenger Air Mix potentiometer.
   3) Measure resistance between terminal "1,2" of Passenger Air Mix Motor and terminal "18,8" of A/C control unit.

Specification : Approx. 0 Ω





1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6566L

4) Is the measured resistance within specifications?

YES

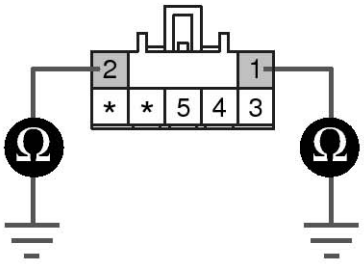
Go to "Check for short to ground in harness" procedure.

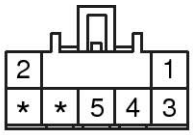
NO

Check for open in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

2. Check for short to ground in harness.
   1) Ignition "OFF"
   2) Disconnect Passenger Air Mix Actuator.
   3) Measure resistance between terminal "1,2" of Passenger Air Mix Motor and chassis ground.

Specification : Approx. ∞ Ω





1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6567L

4) Is the measured resistance within specifications?

YES

Go to "Visual/Physical Inspection " procedure.

NO

Check for short to ground in signal harness. Repair as necessary and go to "Verification of Vehicle Repair" procedure.

VISUAL/PHYSICAL INSPECTION

1. Check actuator.

※ Check if Passenger Air Mix Actuator works properly through ACTUATION TEST.

1) Ignition : ON
2) Connect Scantool and select " ACTUATION TEST" mode and press [F1]

1.3 ACTUATION TEST	
PASSENGER AIR MIX DOOR - PASSENGER 50%	
DURATION	UNTIL STOP KEY
METHOD	ACTIVATION
CONDITION	IG. KEY ON ENGINE RUNNING
PRESS [STRT], IF YOU ARE READY!	
STRT STOP	

Fig. 3

Fig 3 : Selecting "ACTUATION TEST" mode.

LQKG525D

3) Does Passenger Air Mix Actuator work properly?

YES

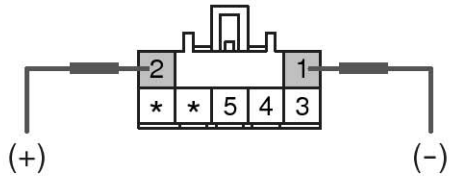
Go to "Component Inspection" procedure.

NO

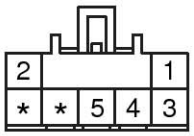
Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION

1. Check actuator motor.
   1) Ignition "OFF"
   2) Disconnect Passenger Air Mix Potentiometer.



   3) Verify that the temperature actuator operates to the hot position when connecting 12V to the terminal "1" and grounding terminal "2".
   4) Verify that the temperature actuator operates to the cool position when the connections are reversed.



1. Motor (Warm)
2. Motor (Cool)
3. Potentiometer ground
4. Potentiometer signal
5. Sensor reference voltage(+5V)

SBLHA6514L

   5) Does the actuator work properly?

YES

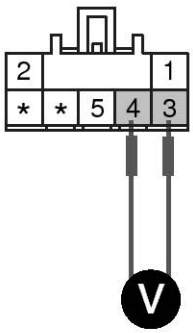
Go to "Check potentiometer" procedure.

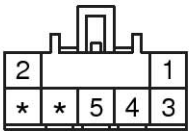
NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

2. Check potentiometer
   1) Ignition "ON"
   2) Connect Passenger Air Mix potentiometer.
   3) Measure voltage between terminal "3" and "4" of Passenger Air Mix potentiometer while operating the temp. switch.

Specification : Refer the specifications in fig 3)





1. Motor (Warm)
2. Motor (Cool)
3. **Potentiometer ground**
4. **Potentiometer signal**
5. Sensor reference voltage(+5V)

SBLHA6515L

Door position	Voltage (3-4)	Error detecting
MAX. Cooling	0.3 ± 0.15V	Low voltage : 0.08V or less
MAX. Heating	4.7 ± 0.15V	High voltage : 4.9V or more

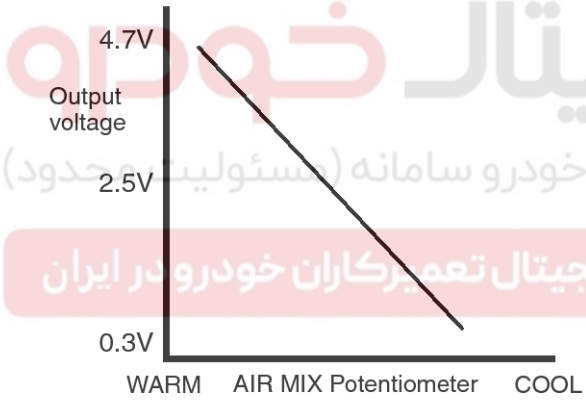


Fig. 3

Fig 3) Specifications : Voltage value of air mix potentiometer as a function of position of setting temperature.

EQBF521J

4) Is the measured voltage within specifications in fig3?

YES

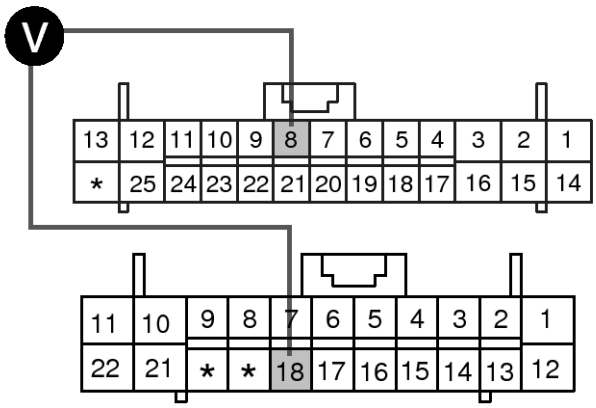
Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good actuator and check for proper operation. If the problem is corrected, replace actuator and then go to "Verification of Vehicle Repair" procedure.

3. Check A/C Control Unit.
   1) Engine "ON"
   2) Connect A/C Control Unit.
   3) Measure voltage between terminal "8" and "18" of A/C Control Unit while operating the temp. switch.

Specification :Approx. 12V



5 : Motor
18 : Motor

SBLHA6568L

4) Is the measured voltage within specifications?

YES

Check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

NO

Substitute with a known-good A/C Control Unit and check for proper operation.
If the problem is corrected, replace A/C Control Unit and then go to "Verification of Vehicle Repair" procedure.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode and then clear DTC.
2. Operate the vehicle and monitor the DTC on the scantool.
3. Are any DTCs present?

YES

Go to the applicable troubleshooting procedure.

NO

System is performing to specification at this time.