

GENERAL

HA -3

GENERAL

AIR CONDITIONER EB10D9B9

Item		Specification			
		1.6,2.0 Engine (Gasoline)		1.6, 2.0 Engine (Diesel)	
Compressor	Type	VS16M(Variable Displacement Swashplate)			
	Oil type & Capacity	FD46XG (PAG), 150 ± 10cc			
	Pulley type	1.6	2.0	1.6	2.0
		6PK type	4PK type	5PK type	6PK type
Displacement	160cc/rev				
Condenser	Heat rejection	13,400 - 5% kcal/hr		12,300 -5% kcal/hr	
	Dessicant specification & weight	XH-9 , 37g			
APT(A/C pressure transducer)	The method to measure the pressure	Voltage = 0.00878835 * Pressure + 0.37081095 [PSIA]			
Expansion valve	Type	Block			
Refrigerant	Type	HFC-134a(R-134a)			
	Capacity [oz.(g)]	17.6 ± 0.88 (500 ± 25)			

BLOWER UNIT

Item		Specification
Fresh and recirculation	Operating method	Actuator
Blower	Type	Sirocco
	Speed step	Auto + 8 speed (Automatic), 1-4 speed (Manual)
	Speed control	Power mosfet
Air filter	Type	Particle filter

HA -4

HEATING, VENTILATION AND AIR CONDITIONING

HEATER AND EVAPORATOR UNIT

Item		Specification
Heater	Type	Pin & Tube type
	Heating capacity	4300 ± 5% kcal/hr
	PTC heater capacity	1000W + 5%/-10%
	Mode operating method	Actuator
	Temperature operating method	Actuator
Evaporator	Temperature control type	Evaporator temperature sensor
	A/C ON/OFF [°C(°F)]	ON : 1.7 ± 0.3 (35 ± 32.5), OFF: 0.2 ± 0.3 (32.3 ± 32.5)

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL

HA -5

TROUBLESHOOTING E9BA1B26

PROBLEM SYMPTOMS TABLE

Before replacing or repairing air conditioning components, first determine if the malfunction is due to the refrigerant charge, air flow or compressor.

STANDARD:

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

After correcting the malfunction, check the complete system to ensure that performance is satisfactory.

Symptom	Suspect Area	See page
No blower operation	1. Blower fuse	-
	2. Blower relay	HA - 52
	3. Blower motor	HA - 51
	4. Power mosfet	HA - 53
	5. Blower speed control switch	HA - 57,60
	6. Wire harness	-
No air temperature control	1. Engine coolant capacity	-
	2. Heater control assembly	HA - 57,60
No compressor operation	1. Refrigerant capacity	HA - 3
	2. A/C Fuse	-
	3. Magnetic clutch	HA - 20
	4. Compressor	HA - 17
	5. A/C pressure transducer	HA - 25
	6. A/C switch	-
	7. Evaporator temperature sensor	HA - 27
	8. Wire harness	-
No cool comes out	1. Refrigerant capacity	HA - 3
	2. Refrigerant pressure	HA - 3
	3. Drive belt	-
	4. Magnetic clutch	HA - 20
	5. Compressor	HA - 17
	6. A/C pressure transducer	HA - 25
	7. Evaporator temperature sensor	HA - 27
	8. A/C switch	-
	9. Heater control assembly	HA - 57,60
	10. Wire harness	-

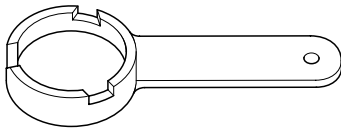
HA -6

HEATING, VENTILATION AND AIR CONDITIONING

Symptom	Suspect Area	See page
Insufficient cooling	1. Refrigerant capacity	HA - 3
	2. Drive belt	-
	3. Magnetic clutch	HA - 20
	4. Compressor	HA - 17
	5. Condenser	HA - 22
	6. Expansion valve	HA - 38
	7. Evaporator	HA - 39
	8. Refrigerant lines	HA - 15
	9. A/C pressure transducer	HA - 25
	10. Heater control assembly	HA - 57, 60
No engine idle-up when A/C switch ON	1. Engine ECM	-
	2. Wire harness	-
No air inlet control	1. Heater control assembly	HA - 57,60
No mode control	1. Heater control assembly	HA - 57.60
	2. Control actuator	HA - 45
No cooling fan operation	1. Cooling fan	-
	2. Fan motor	-
	3. Engine ECM	-
	4. Wire harness	-

SPECIAL SERVICE TOOLS

E5A4AEF1

Tool (Number and name)	Illustration	Use
09977-29000 Disc & hub assembly bolt remover	 <p style="text-align: right;">EQA9002A</p>	Removal and installation of the disc & hub assembly bolt

AIR CONDITIONING SYSTEM

HA -7

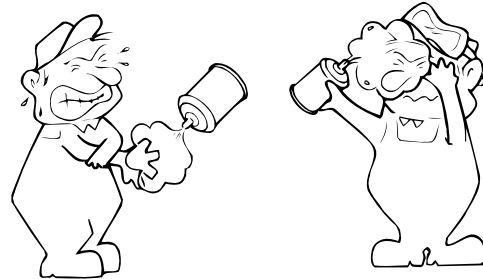
AIR CONDITIONING SYSTEM

INSTRUCTIONS E4FFF794

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°C (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.

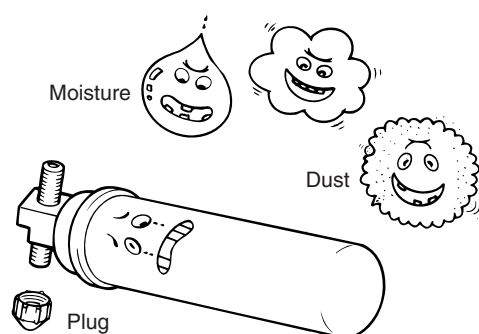
7. If an accidental discharge in the system occurs, ventilate the work area before resuming service.



LQAC003A

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

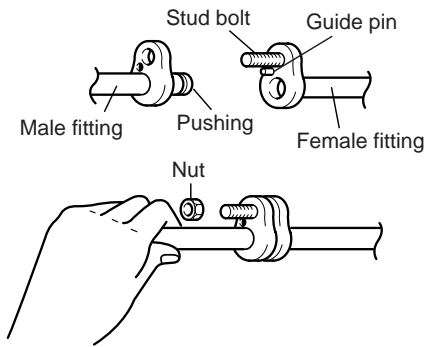
HA -8

HEATING, VENTILATION AND AIR CONDITIONING

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

Tightening torque [N.m (kg.m, lbf.ft)]		
Size	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)
M8	12 - 14 (1.2 - 1.4, 8.7 - 10)	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)

NOTE

T means tensile intensity, which is stamped on the head of bolt only numeral.

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.

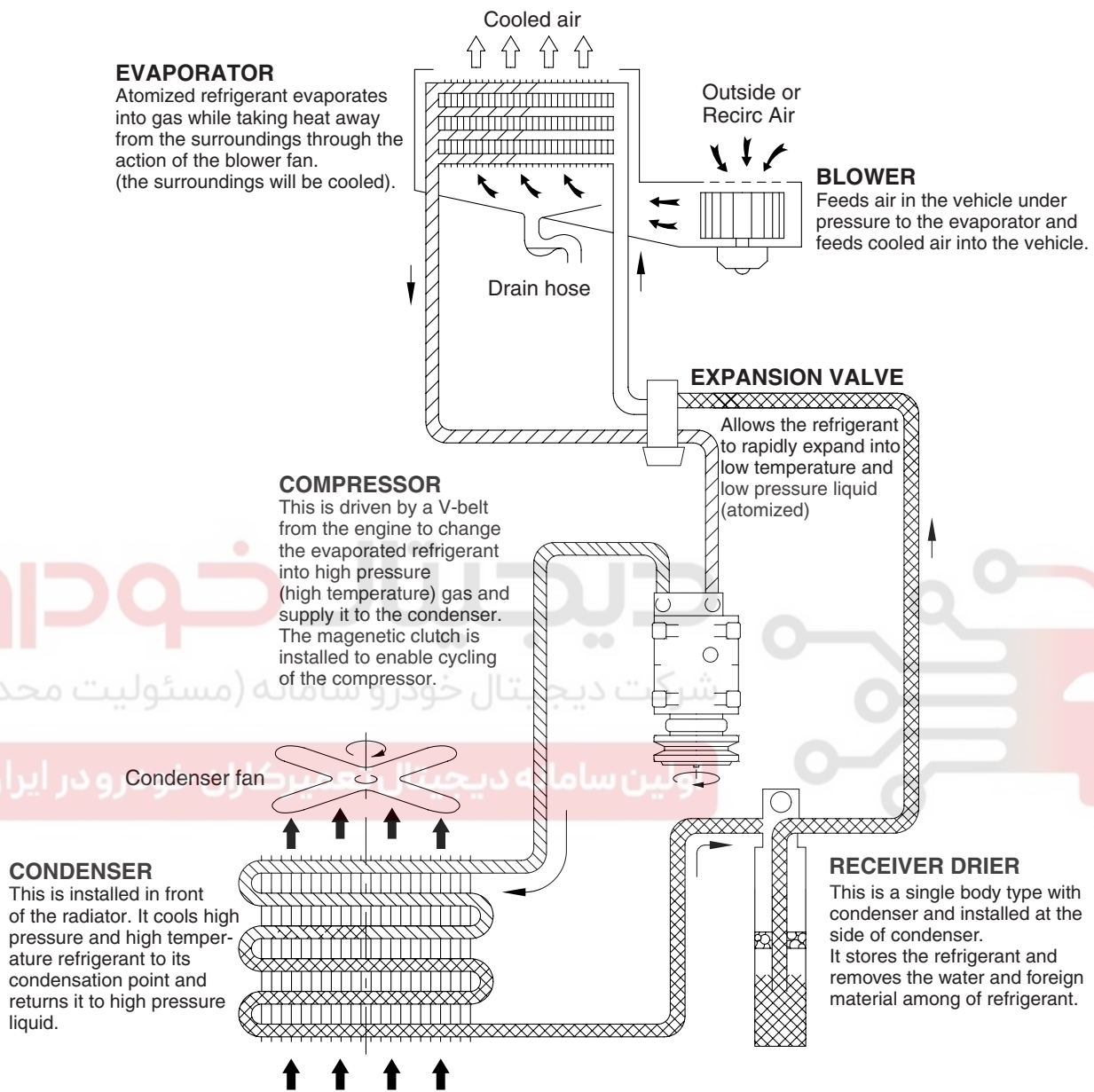
THE FOLLOWING PRECAUTIONS MUST BE OBSERVED

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.

AIR CONDITIONING SYSTEM

HA -9

REFRIGERATION CYCLE EC536F8B



- | | | | |
|---|--|--|---|
|  | High pressure and high temperature gas |  | Low pressure and low temperature liquid |
|  | High pressure and mediate temperature liquid |  | Low pressure and low temperature gas |

EQR004A

HA -10

HEATING, VENTILATION AND AIR CONDITIONING

REFRIGERANT SYSTEM SERVICE

BASICS E28911D7

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.

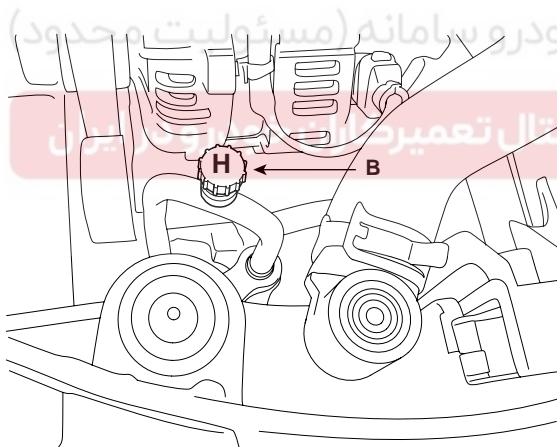
CAUTION

- 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.

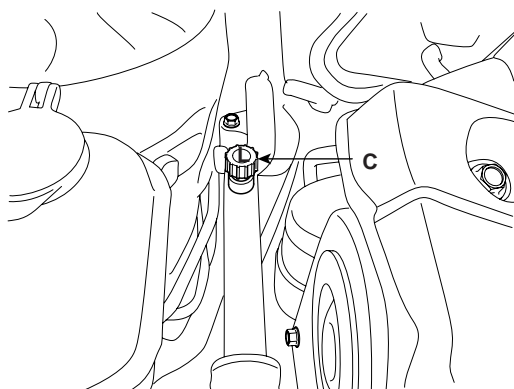
If accidental system discharge occurs, ventilate work area before resuming service.

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.



SFDHA7001D



SFDHA7002D

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.

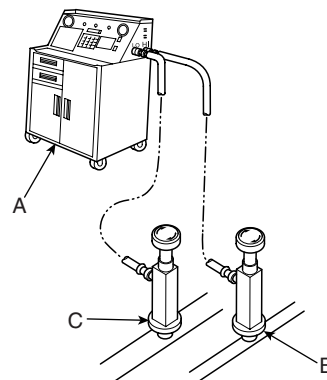
CAUTION

- 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.).

AIR CONDITIONING SYSTEM

HA -11

- 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.

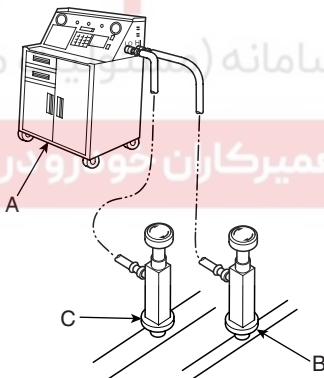
CAUTION

- **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.

- 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.



EQKE004A

- Add the same amount of new refrigerant oil to system that was removed during recovery. Use only specified refrigerant oil. Charge the system with 17.6 ± 0.88 (500 \pm 25) of R-134a refrigerant. Do not overcharge the system the compressor will be damaged.

REFRIGERANT LEAK TEST

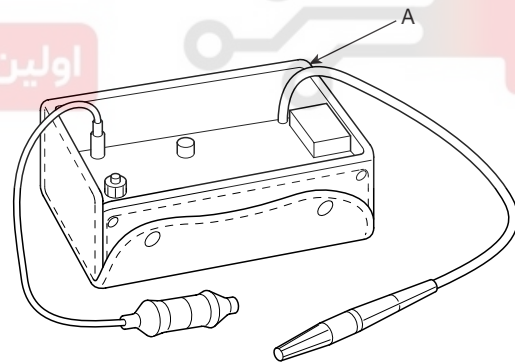
Always conduct a leak test with an electronic leak detector whenever leakage or refrigerant is suspected and when conducting service operations which are accompanied by disassembly or loosening or connection fittings.

NOTE

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

If a gas leak is detected, proceed as follows:

- 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).
- 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.
- Check the compressor oil and add oil if required.
- Charge the system and recheck for gas leaks. If no leaks are found, evacuate and charge the system again.



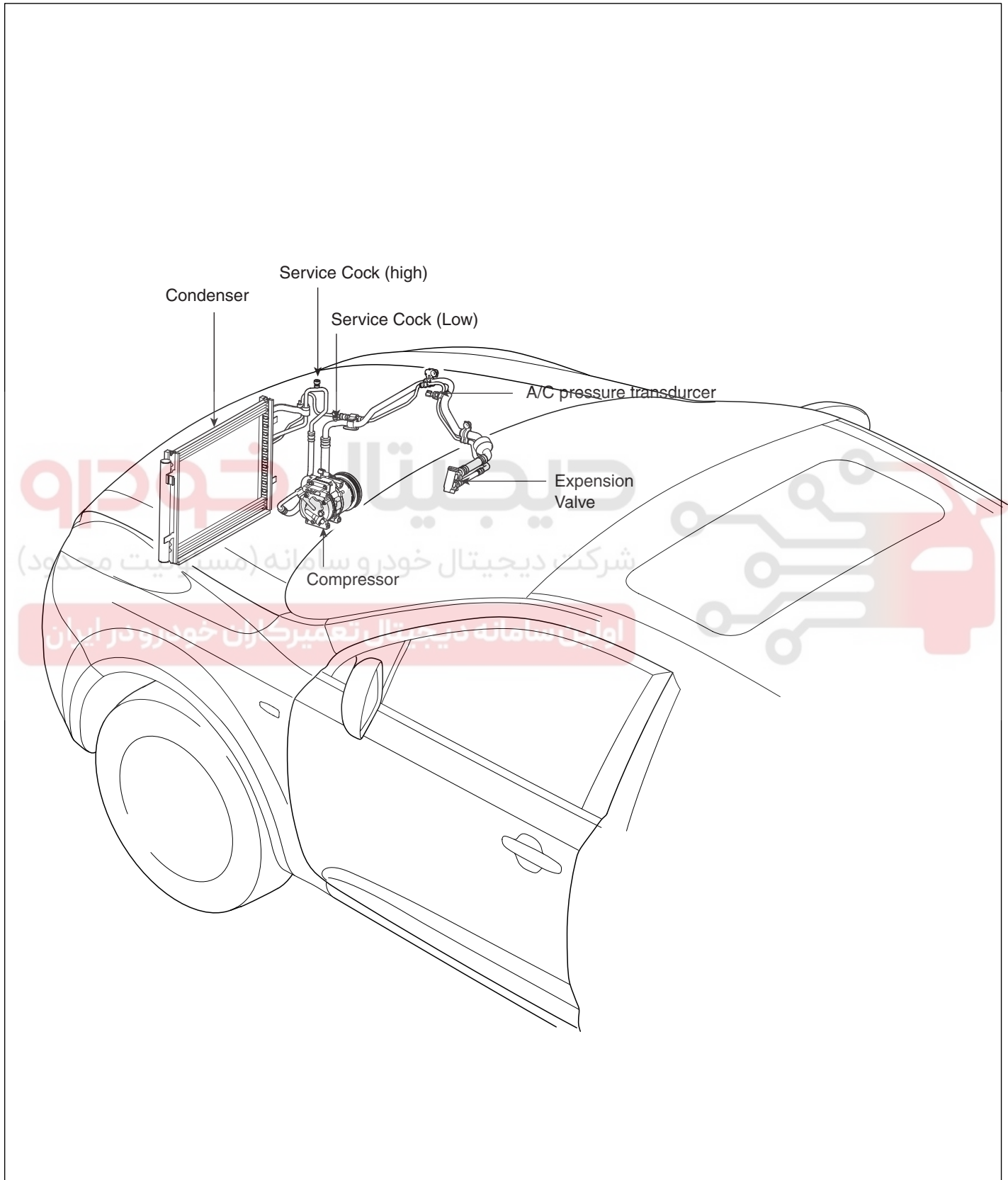
EQKE007A

HA -12

HEATING, VENTILATION AND AIR CONDITIONING

COMPONENT LOCATION INDEX E1219D4C

ENGINE ROOM

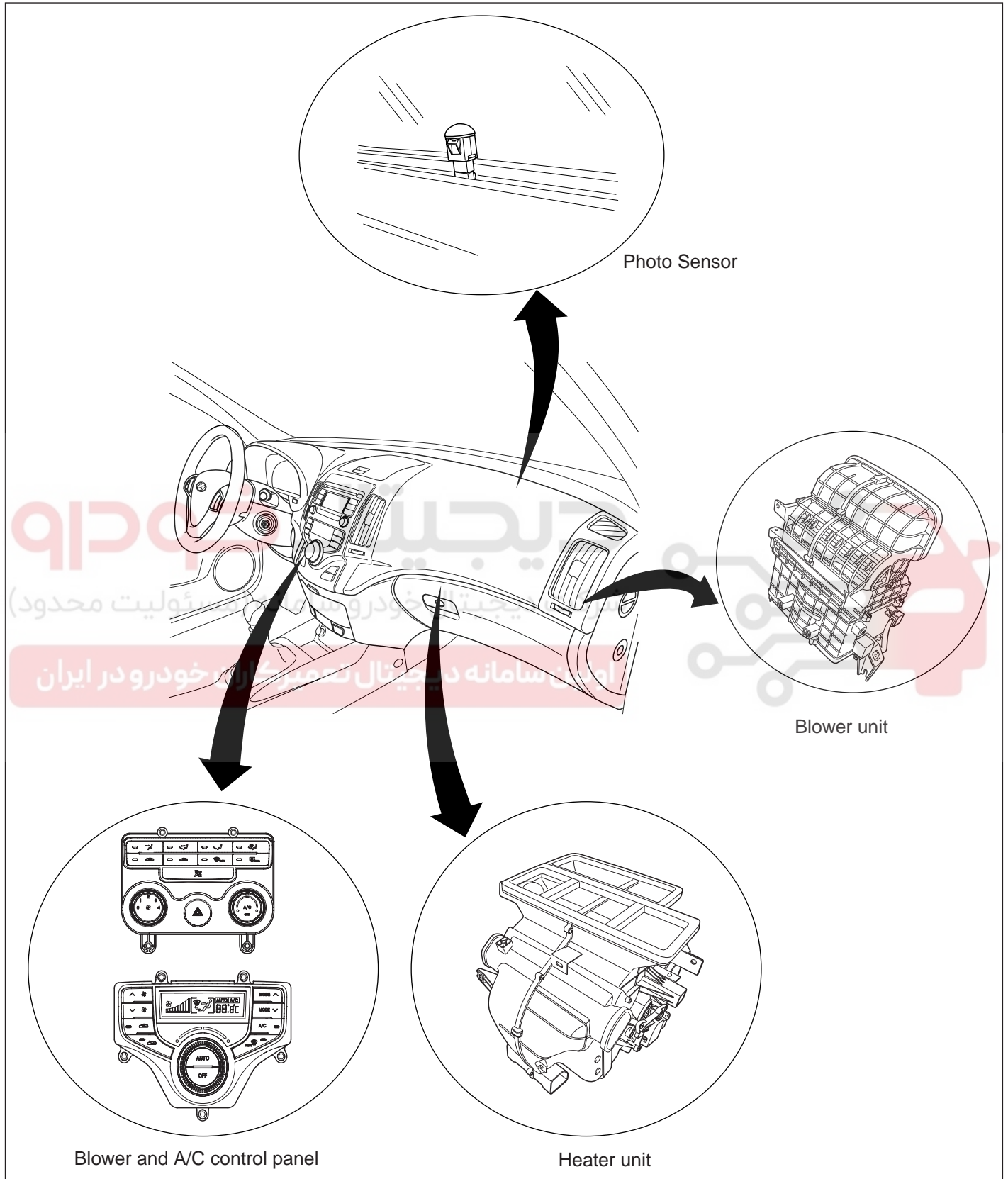


SFDHA7003L

AIR CONDITIONING SYSTEM

HA -13

INTERIOR



SFDHA7004L

HA -14

HEATING, VENTILATION AND AIR CONDITIONING

COMPRESSOR OIL

OIL SPECIFICATION EDEF374D

1. The HFC-134a system requires synthetic (PAG) compressor oil whereas the R-12 system requires mineral compressor oil. The two oils must never be mixed.
2. Compressor (PAG) oil varies according to compressor model. Be sure to use oil specified for the model of compressor.

HANDLING OF OIL

1. The oil should be free from moisture, dust, metal powder, etc.
2. Do not mix with other oil.
3. The water content in the oil increases when exposed to the air. After use, seal oil from air immediately. (HFC-134a Compressor Oil absorbs moisture very easily.)
4. The compressor oil must be stored in steel containers, not in plastic containers.

COMPRESSOR OIL CHECK

The oil used to lubricate the compressor is circulating with the refrigerant.

Whenever replacing any component of the system or a large amount of gas leakage occurs, add oil to maintain the original amount of oil.

Oil total volume in system:
150 ± 10cc (5.07 ± 0.34 fl.oz)

OIL RETURN OPERATION

There is close affinity between the oil and the refrigerant. During normal operation, part of the oil recirculates with the refrigerant in the system. When checking the amount of oil in the system, or replacing any component of the system, the compressor must be run in advance for oil return operation. The procedure is as follows:

1. Open all the doors and the engine hood.
2. Start the engine and air conditioning switch to "ON" and set the blower motor control knob at its highest position.
3. Run the compressor for more than 20 minutes between 800 and 1,000 rpm in order to operate the system.
4. Stop the engine.

REPLACEMENT OF COMPONENT PARTS

When replacing the system component parts, supply the following amount of oil to the component parts to be installed.

Component parts to be installed	Amount of Oil
Evaporator	50 cc (1.70 fl.oz)
Condenser	30 cc (1.02 fl.oz)
Receiver/dryer	30 cc (1.02 fl.oz)
Refrigerant line (One piece)	10 cc (0.34 fl.oz)

For compressor replacement, subtract the volume of oil drained from the removed compressor from the specified volume, and drain the calculated volume of oil from the new compressor:

The specified volume - volume of removed compressor = volume to drain from the new compressor.

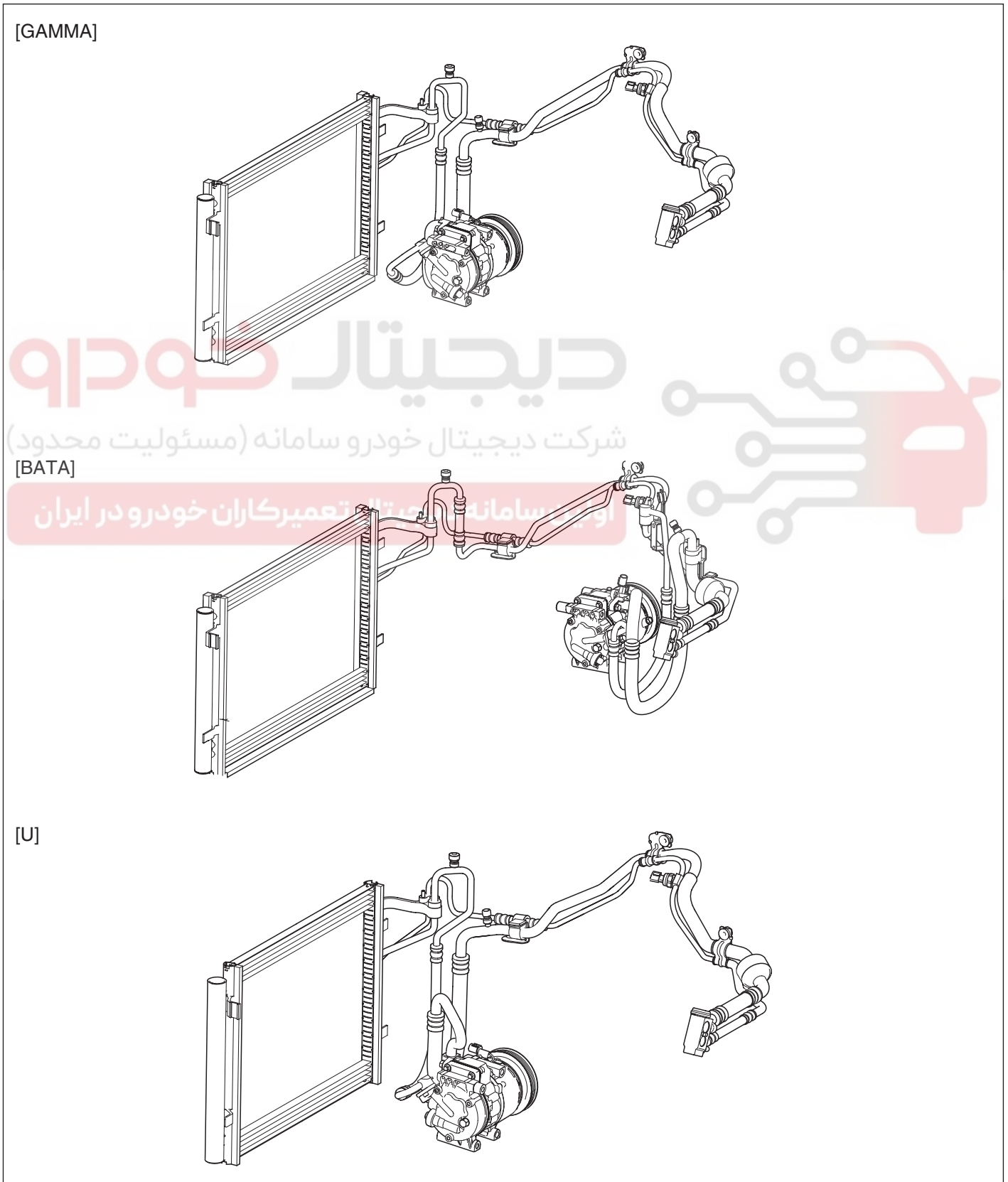
NOTE

Even if no oil is drained from the removed compressor, don't drain more than 50cc from new compressor.

A/C COMPRESSOR CONTROLS (MANUAL)

REFRIGERANT LINE

COMPONENT LOCATION E649D366



HA -16

HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT E778A350

1. Discharge refrigerant from refrigeration system.
2. Replace faulty tube or hose.

CAUTION

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. Tighten joint of bolt or nut to specified torque.

CAUTION

Connections should not be torque tighter than the specified torque.

Part tightened	kg.m (N.m, lbf.ft)
Condenser - Discharge hose	0.5~0.5
Condenser - Liquid tube	
Compressor - Discharge hose	0.5~0.6
Compressor - Suction hose	
Expansion valve - Evaporator	1.2~1.5

4. Evacuate air in refrigeration system and charge system with refrigerant.

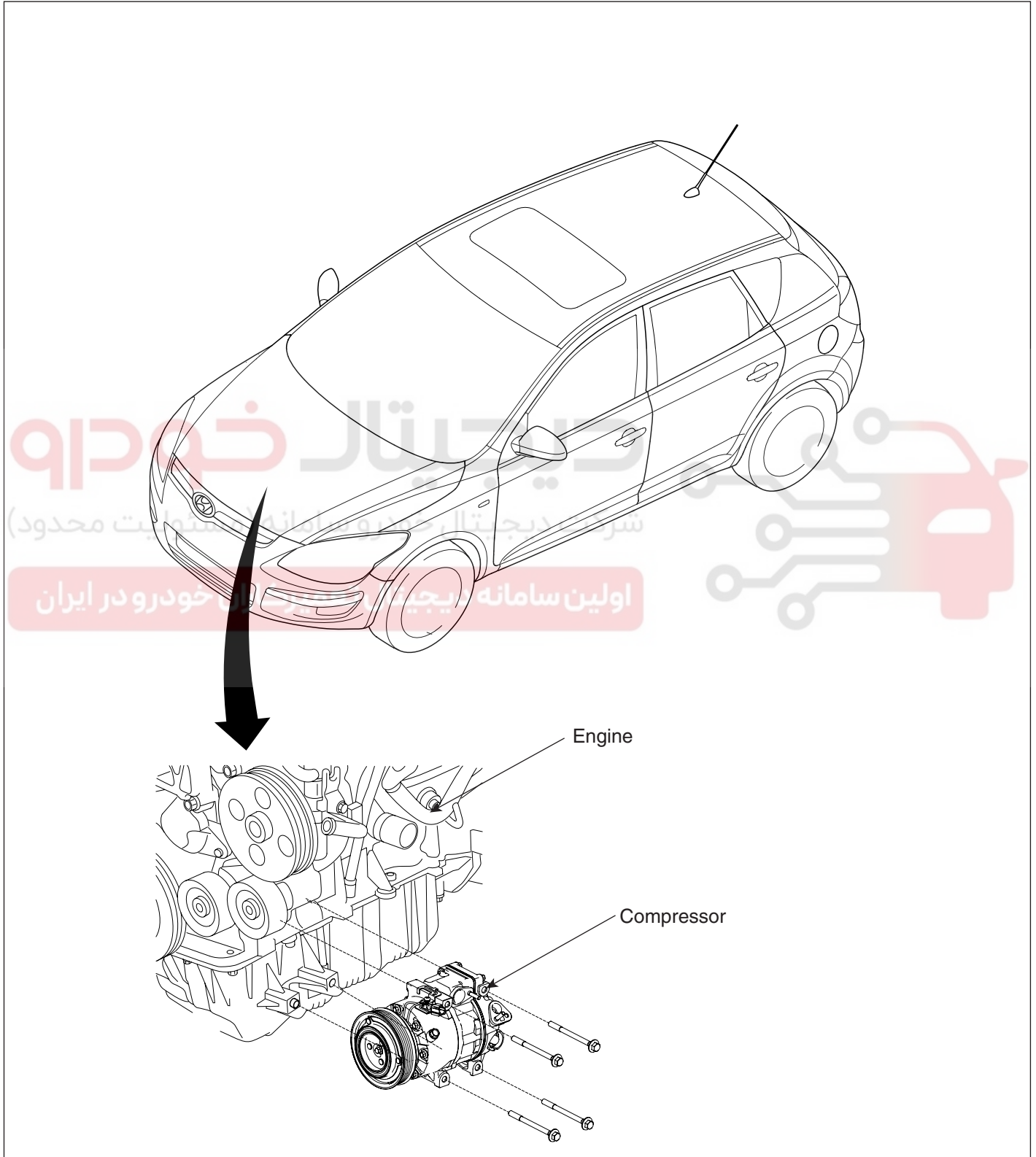
Specified amount : 500 ± 25g (17.6 ± 0.88)

5. Inspect for leakage of refrigerant.
Using a gas leak detector, check for leakage of refrigerant.
6. Inspect A/C operation.



AIR CONDITIONING COMPRESSOR

COMPONENT LOCATION EA654CB1

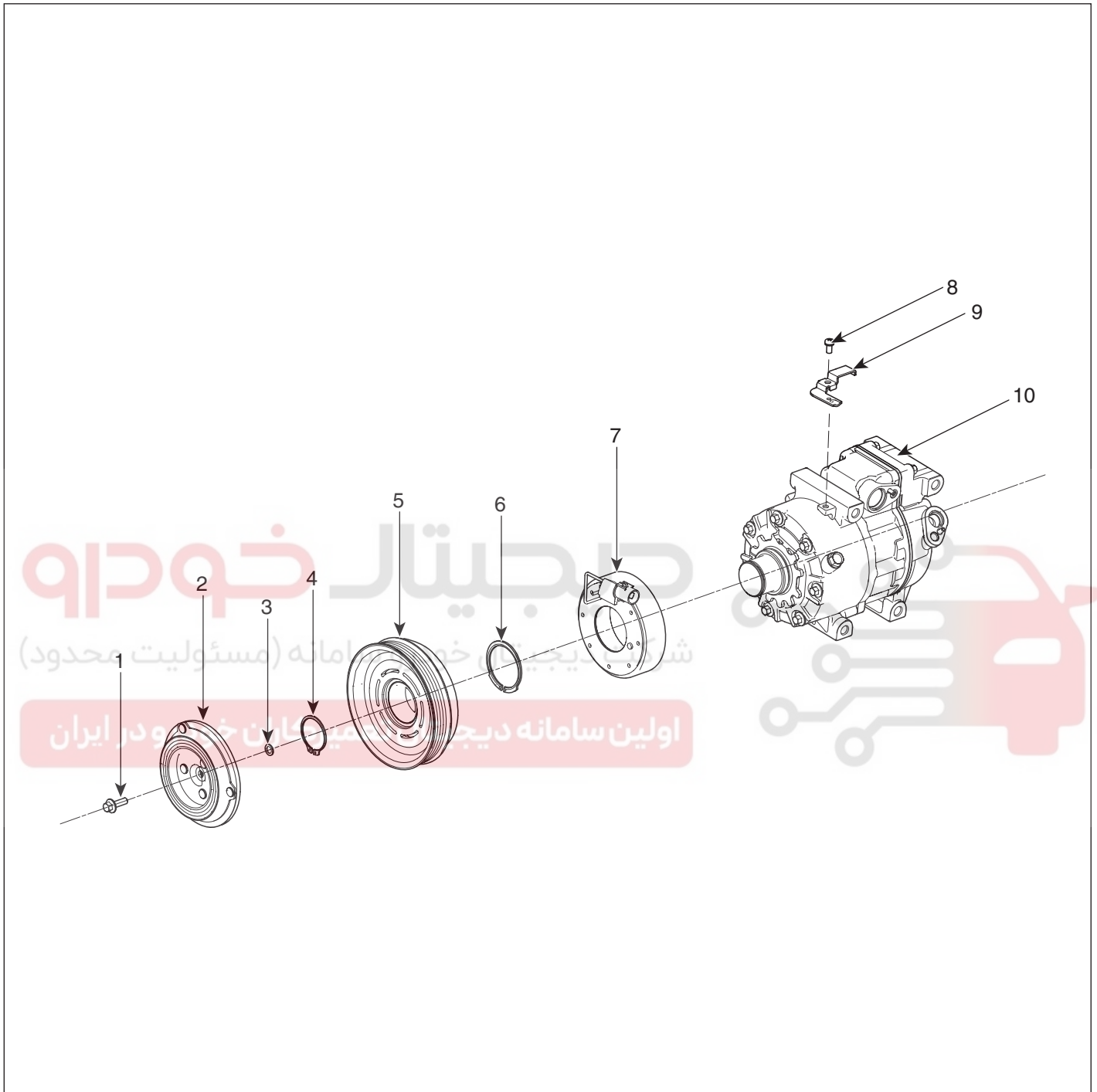


SFDHA7006D

HA -18

HEATING, VENTILATION AND AIR CONDITIONING

COMPONENTS E7ABB359



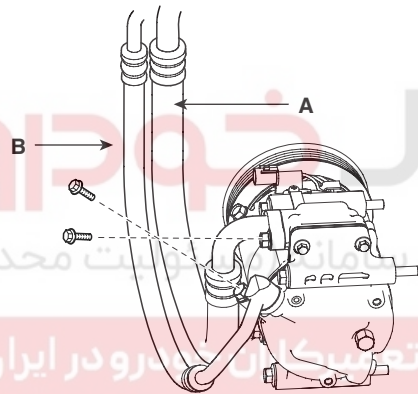
- | | |
|---------------------------|-------------------------------|
| 1. Bolt | 6. Retainer ring (Field coil) |
| 2. Disc & hub assembly | 7. Field coil |
| 3. Shim (Gap washer) | 8. Screw |
| 4. Retainer ring (Pulley) | 9. Connector bracket |
| 5. Pulley | 10. Compressor assembly |

SFDHA7101L

COMPRESSOR

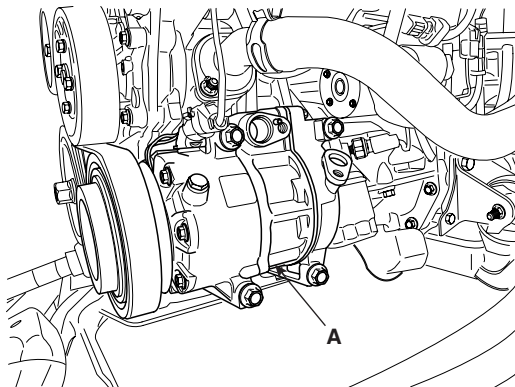
REMOVAL EBF6916B

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 bolts, then disconnect the suction line (A) and discharge line (B) from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



SFDHA7008L

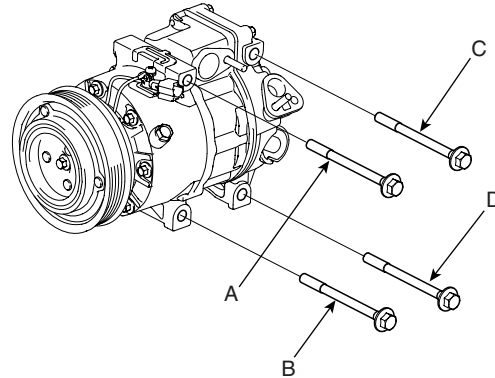
6. Disconnect the compressor clutch connector, and then remove 4 mounting bolts and the compressor (A).



SFDHA7009L

INSTALLATION E108E1A5

1. Make sure of the length of compressor mounting bolts, and then tighten it A→B→C→D order.



SFDHA7010L

TIGHTENING TORQUE : 2.04~3.36 kg/f

Bolt	γ ,U,D Engine	β Engine
A	100 mm (3.93 in.)	125 mm (4.92in.)
B	100 mm (3.93in.)	109 mm (4.29in.)
C	109 mm (4.29in.)	125 mm (4.92in.)
D	100 mm (3.93in.)	109 mm (4.29in.)

2. 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 150cc(5.07 oz.) 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.

HA -20

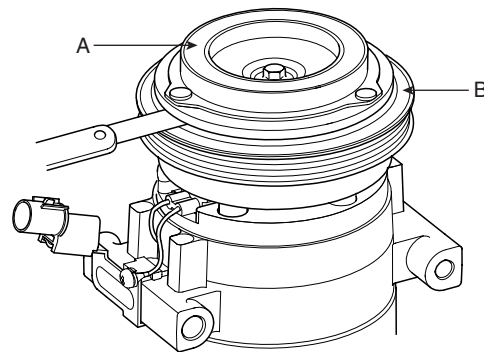
HEATING, VENTILATION AND AIR CONDITIONING

- Adjust the drive belt.
- Charge the system and test its performance.

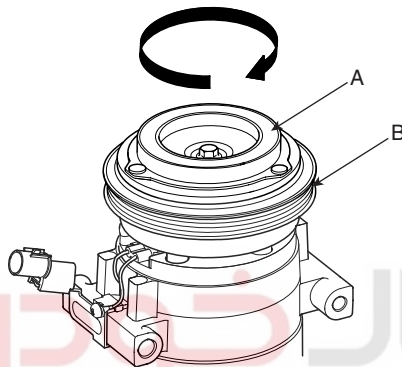
INSPECTION

E4AA9E01

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.



AQJF106B



AQJF106A

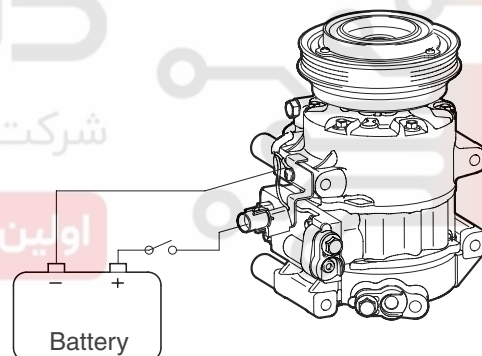
3. Measure the clearance between the pulley (B) and the disc & hub assembly (A) all the way around. If the clearance is not within specified limits, remove the disc & hub assembly and add or remove shim (gap washer) as needed to increase or decrease clearance.

Clearance : $0.45 \pm 0.1\text{mm}$ (0.018 ± 0.004 in.)

NOTE

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

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.



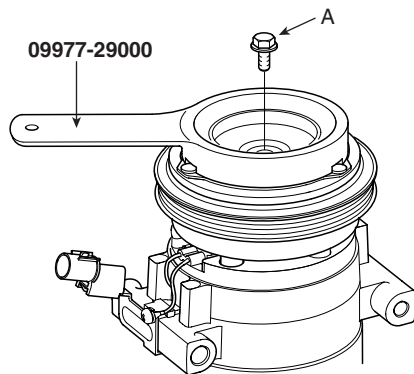
AQJF106C

DISASSEMBLY

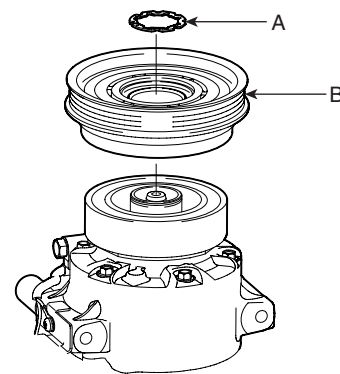
E4A26033

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)



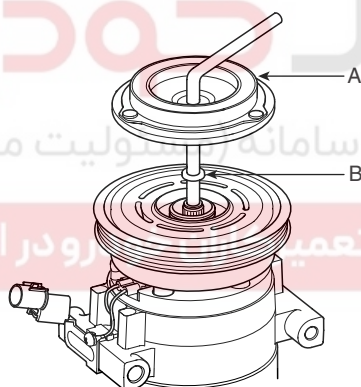
LQJF106D



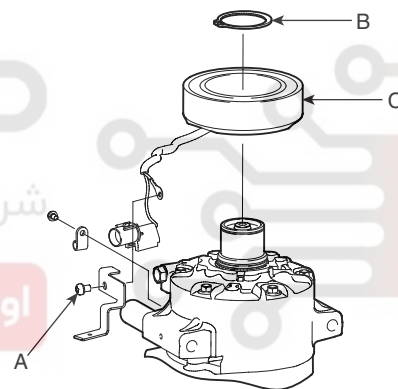
AQJF106F

- 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).

- 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.



AQJF106E



AQJF106G

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

NOTE

- 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.

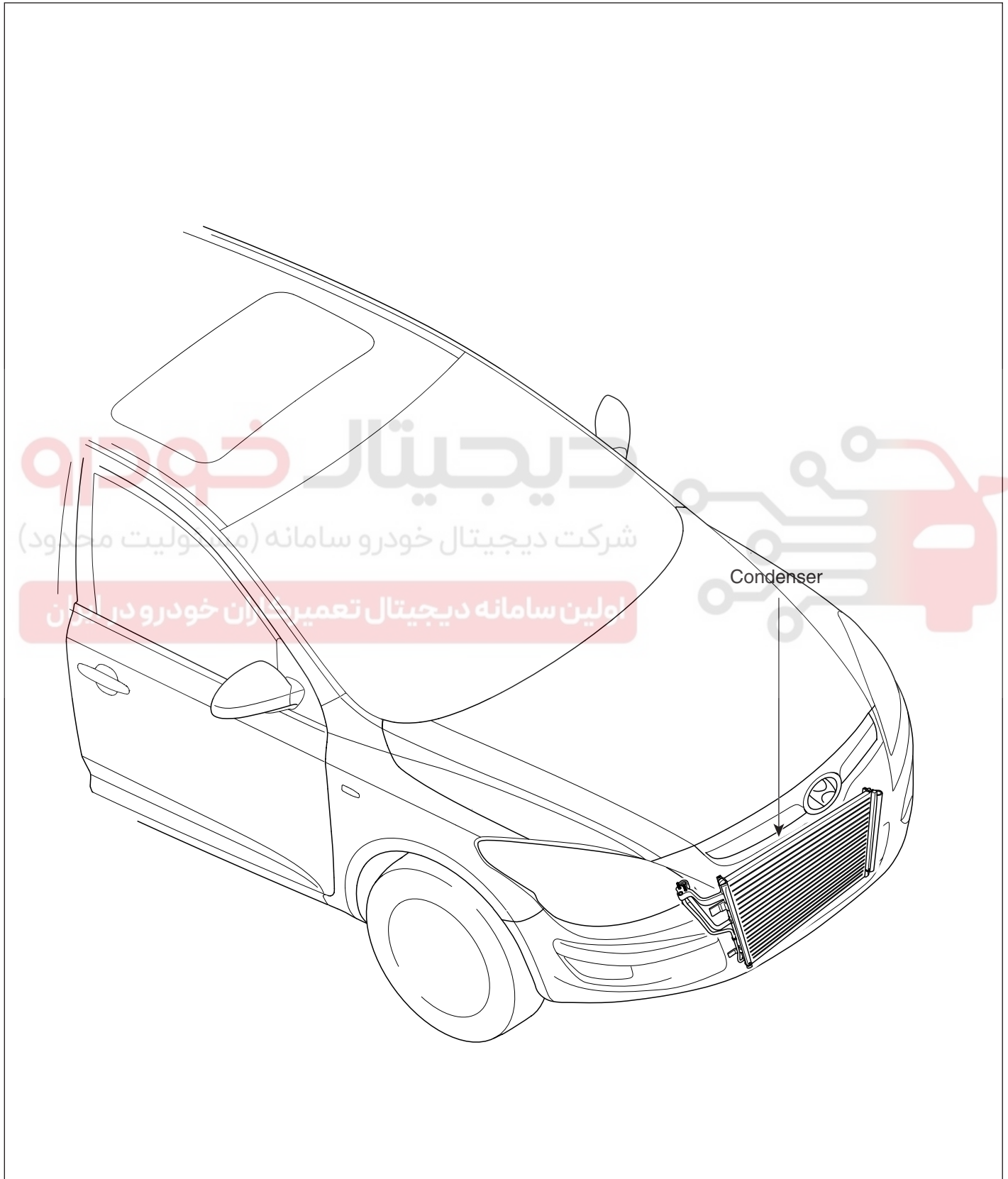
- Reassemble the compressor clutch in the reverse order of disassembly, and note these items :
 - Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
 - Install new retainer rings, and make sure they are fully seated in the groove.
 - Make sure that the pulley turns smoothly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

HA -22

HEATING, VENTILATION AND AIR CONDITIONING

CONDENSER

COMPONENT LOCATION E8E48010



SFDHA7011L

A/C COMPRESSOR CONTROLS (MANUAL)

HA -23

INSPECTION

E74F4A2B

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 pliers.
2. Check the condenser connections for leakage, and repair or replace it, if required.

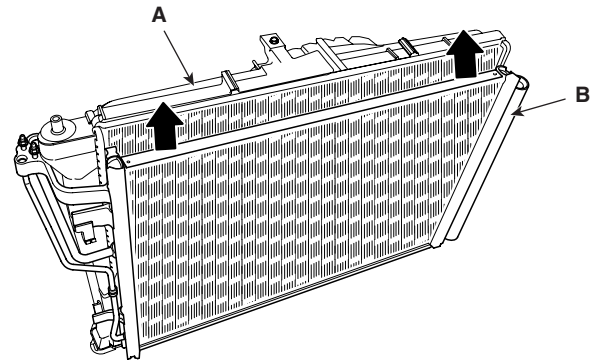
REPLACEMENT

E6D246A1

CONDENSER ASSEMBLY

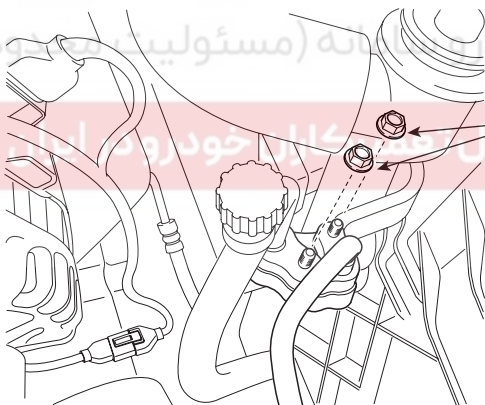
1. Recover the refrigerant with a recovery/ recycling/ charging station.
2. Disconnect the negative (-) battery terminal.
3. Remove 2 nuts (A), and then disconnect the discharge line and liquid line from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

TORQUE: 7.8~11.7N.m (0.8~1.2kgf.m, 5.9~8.7lb.ft)



SFDHA7013L

6. Install in the reverse order of removal, and note these items :
 - If you're installing a new condenser, 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.
 - Be careful not to damage the radiator and condenser fins when installing the condenser.
 - Charge the system, and test its performance.



SFDHA7012L

4. Remove the radiator (A). (Refer to EM group - Radiator)
5. Remove 2 bolts, and then remove the condenser by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser (B).

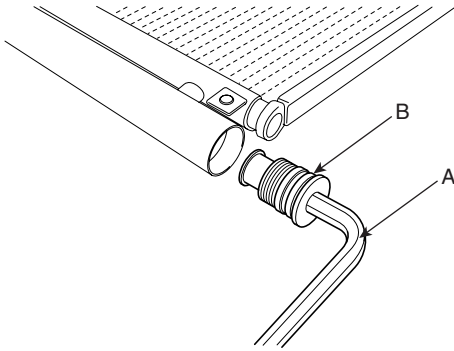
HA -24

HEATING, VENTILATION AND AIR CONDITIONING

DESICCANT

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

TORQUE: 20~25 N.m (2.0~2.5 kgf.m, 14.5~18.2 lb.ft)

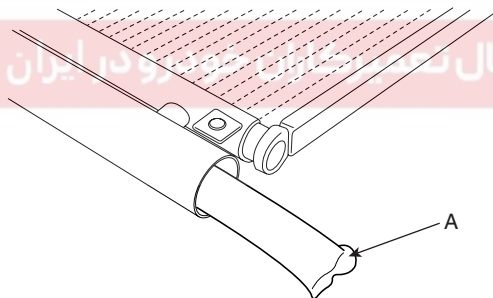


KQRE108D

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



شرکت دیجیتال خودرو سامانه (مسئولیت محدود)



KQRE108E

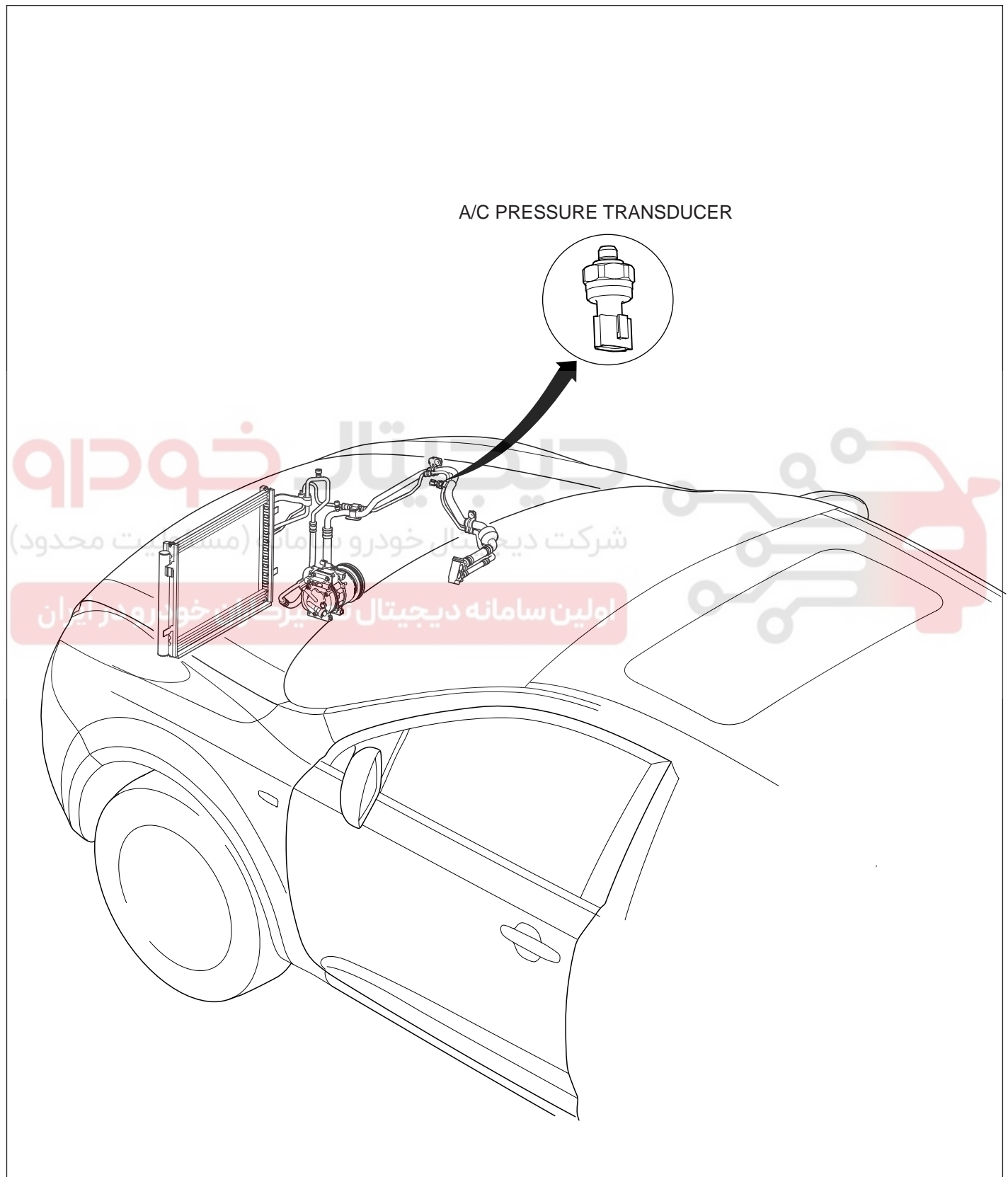
3. Apply air conditioning compressor oil along the O-rings and threads of the new bottom cap.
4. Insert the new desiccant into the receiver drier tank. The desiccant must be sealed in vacuum before it is exposed to air for use.
5. Install the new bottom cap to the condenser.

NOTE

- 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

A/C PRESSURE TRANSDUCER

COMPONENT LOCATION E0681BF5



SFDHA7014L

HA -26

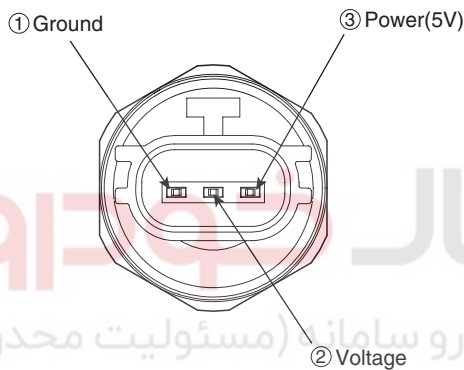
HEATING, VENTILATION AND AIR CONDITIONING

DESCRIPTION EA54D2B9

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

INSPECTION E77C9AFC

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



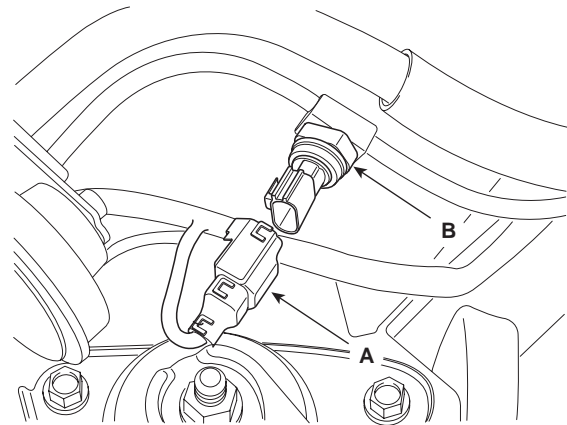
2. Inspect the voltage value whether it is sufficient to be regular value or not.

$$\text{Voltage} = 0.00878835 * \text{Pressure} + 0.37081095 \text{ [PSIA]}$$

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

REPLACEMENT E44C4D60

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



SFDHA7015L

CAUTION

Take care that liquid & suction pipe are not bent.

5. Installation is the reverse order of removal.

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

A/C COMPRESSOR CONTROLS (MANUAL)

HA -27

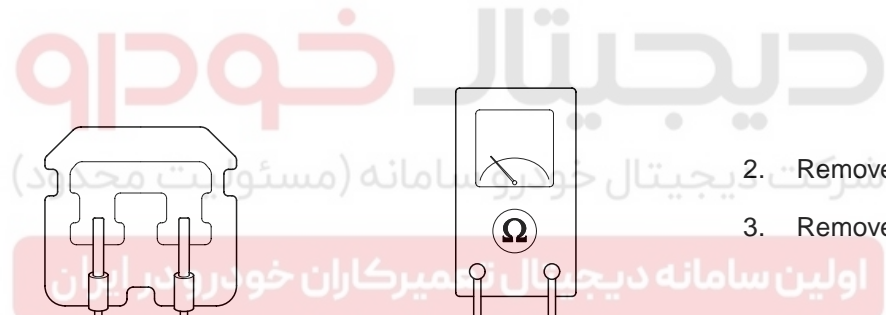
EVAPORATOR TEMPERATURE SENSOR

DESCRIPTION E705F2B3

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 E259946A

1. Ignition "OFF"
2. Disconnect evaporator temperature sensor.
3. Using the multi-tester, Measure resistance between terminal "1" and "2" of evaporator temperature sensor.



KQQE280B

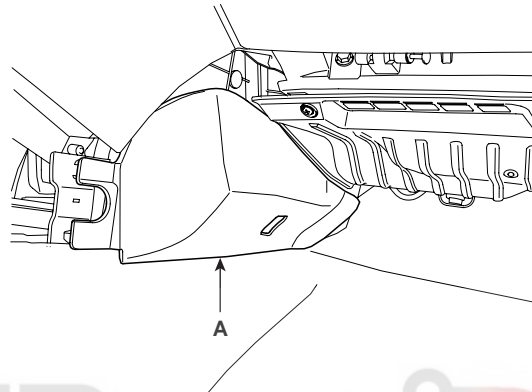
[SPECIFICATION]

Evaporator core temperature [°C(°F)]	Resistance [kΩ]
-10(14)	43.35
0(32)	27.62
10(50)	18.07
20 (68)	12.11
30(86)	8.30
40(104)	5.81
50(122)	4.15

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

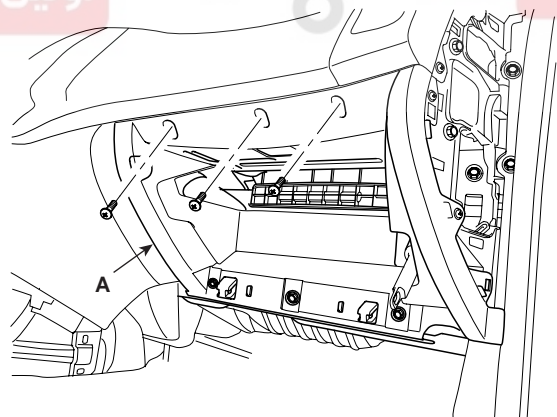
REPLACEMENT E4BFCE93

1. Remove the crash pad lower panel (A).



SFDHA7016L

2. Remove the glove box.
3. Remove the Glove box housing (A).

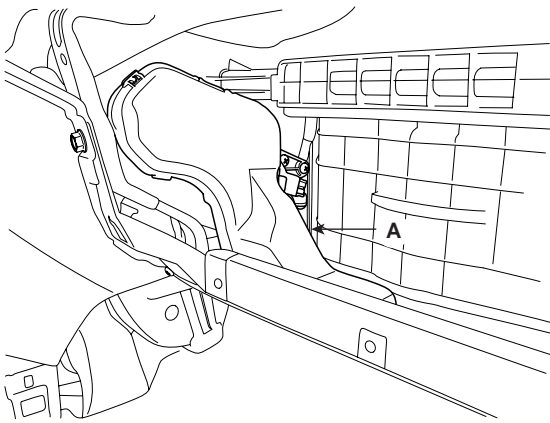


SFDHA7017L

4. Remove the shower duct (A).

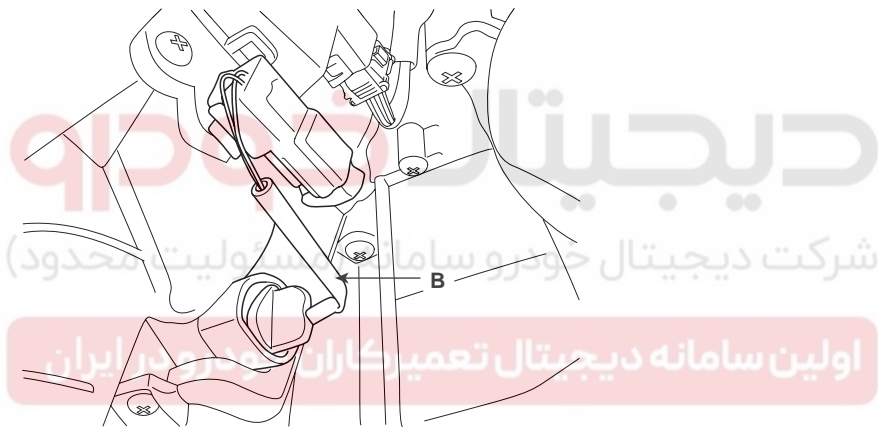
HA -28

HEATING, VENTILATION AND AIR CONDITIONING



SFDHA7018D

5. Remove the evaporator temperature sensor (B), by pulling it after rotating 90° in a counter clock wise direction.



SFDHA7019D

6. Installation is the reverse order of removal

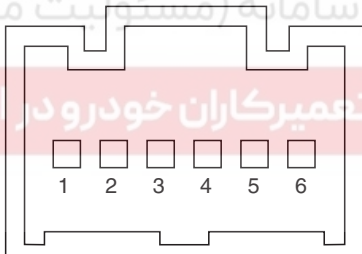


A/C COMPRESSOR CONTROLS (FULL AUTO)

HA -29

A/C COMPRESSOR CONTROLS (FULL AUTO)**IN CAR SENSOR****DESCRIPTION** EF78EDAA

1. In-car air temperature sensor is located at the crash pad.
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.
3. It perceives the inside temperature, changes the resistance value, and enters the corresponding voltage into the automatic temperature control module.
4. It will used for discharge temperature control, sensor failsafe, temperature door control, blower motor level control, and A/C auto control.



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

INSPECTION EEAC5C97

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

[SPECIFICATION]

Temperature [°C (°F)]	Resistance between terminals 2and 4 (kΩ)
-30	509.600 ± 4.0%
-15	216.100 ± 3.2%
0	97.710 ± 2.4%
15	47.130 ± 1.7%
25	30.000 ± 1.2%
35	19.590 ± 1.6%
50	10.810 ± 2.2%

NOTE

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

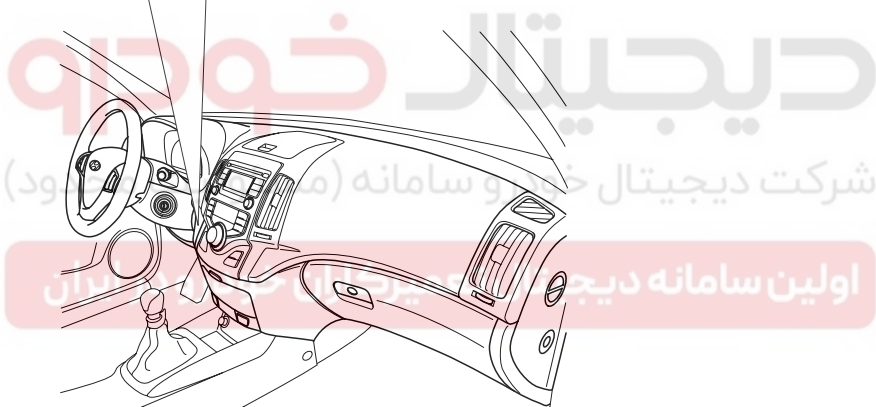
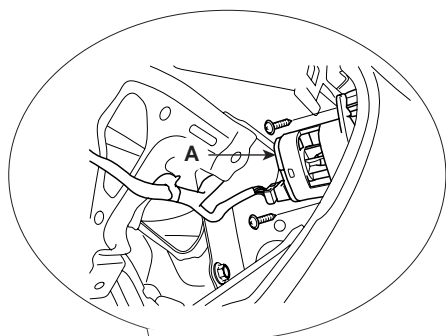
LQJF201C

HA -30

HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT E8CE8EAB

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



SFDHA7022L

4. Installation is the reverse order of removal.

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA -31

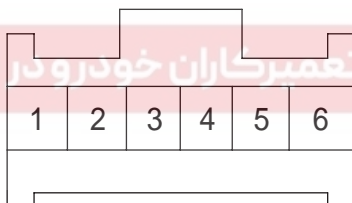
PHOTO SENSOR

DESCRIPTION E540B892

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 E8F6BB95

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

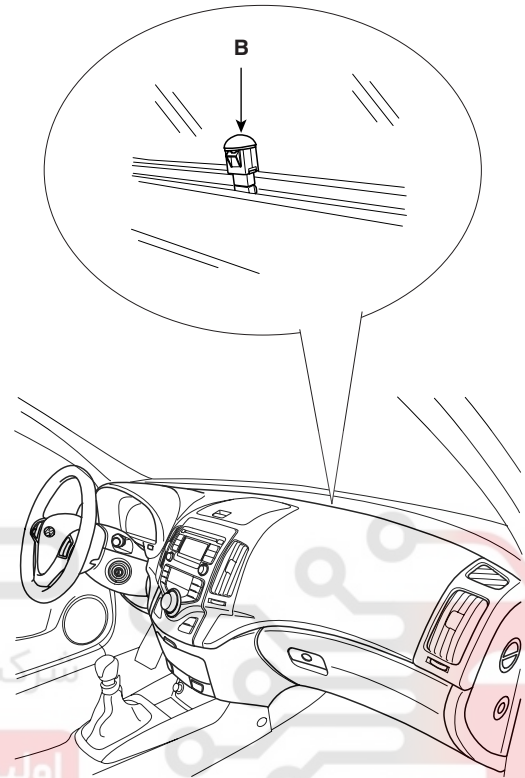


- | | |
|-------------|---------------------|
| 1. Ground | 4. - |
| 2. 5V (VCC) | 5. Photo sensor (+) |
| 3. Signal | 6. Photo sensor (-) |

LQLG202B

REPLACEMENT E7286B5D

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



SFDHA7200L

3. Install in the reverse order of removal.

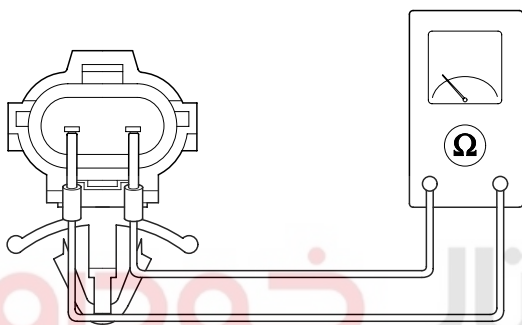
HA -32

HEATING, VENTILATION AND AIR CONDITIONING

AMBIENT TEMPERATURE SENSOR

INSPECTION EC50AC79

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.



AQJF204B

[SPECIFICATION]

Ambient Temperature [°C (°F)]	Resistance (kΩ ± 3%)
-20	290.17
-10	165.79
0	97.83
10	59.67
20	37.47
30	24.17
40	15.99
50	10.82

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.

DESCRIPTION E5D073F5

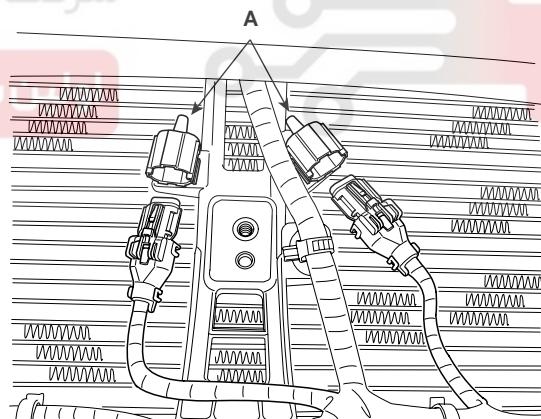
1. The ambient temperature sensor is located at the front of the condenser and detects ambient air temperature. It is a negative type thermistor; resistance will increase with lower temperature, and decrease with higher temperatures.
2. The sensor output will be used for discharge temperature control,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

NOTE

If the ambient temperature is below 2.0°C (35.6°F), the A/C compressor will be stopped. The compressor will be operated by manual operating.

REPLACEMENT E631DA8D

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



SFDHA7029L

4. Installation is the reverse order of removal.

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA -33

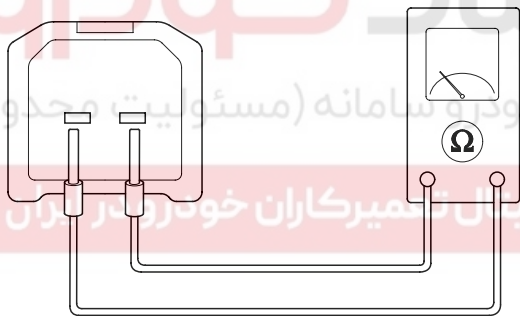
WATER TEMPERATURE SENSOR

DESCRIPTION E444B00E

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 ED909079

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)	Voltage (V)
-10(14)	55.85 ± 3%	4.24 ± 3%
0(32)	32.91 ± 3%	3.83 ± 3%
10(50)	19.99 ± 3%	3.33 ± 3%
20(68)	12.51 ± 3%	2.78 ± 3%
30(86)	8.047 ± 3%	2.23 ± 3%
40(104)	5.311 ± 3%	1.73 ± 3%
50(122)	3.588 ± 3%	1.32 ± 3%
60(140)	2.476 ± 3%	0.99 ± 3%
70(158)	1.742 ± 3%	0.74 ± 3%
80(176)	1.246 ± 3%	0.55 ± 3%

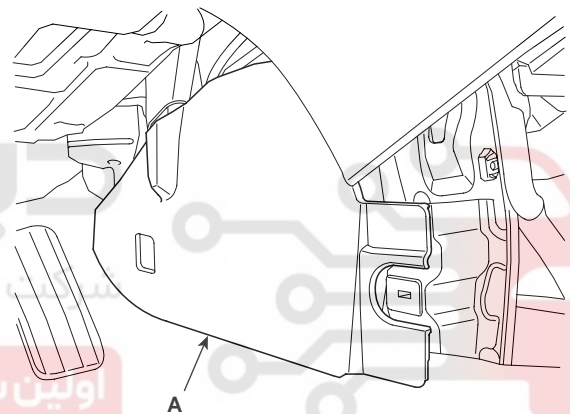
3. If the measured resistance is not specification, substitute with a known-good water temperature sensor and check for proper operation.
4. If the problem is corrected, replace the water temperature sensor.

NOTE

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

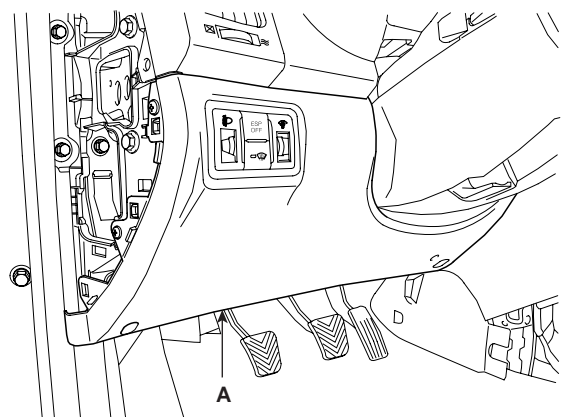
REPLACEMENT EB8F5723

1. Disconnect the negative (-) battery terminal.
2. Remove the crashpad lower cover (A).



SFDHA7024L

3. Remove the crashpad lower panel(A).

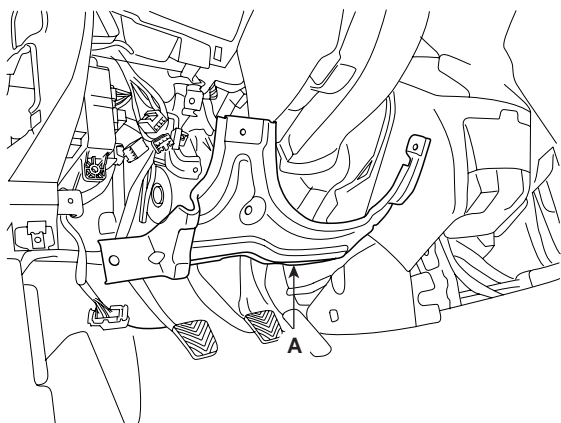


SFDHA7025L

4. After loosening the mounting bolts, then the reinforcing panel (A).

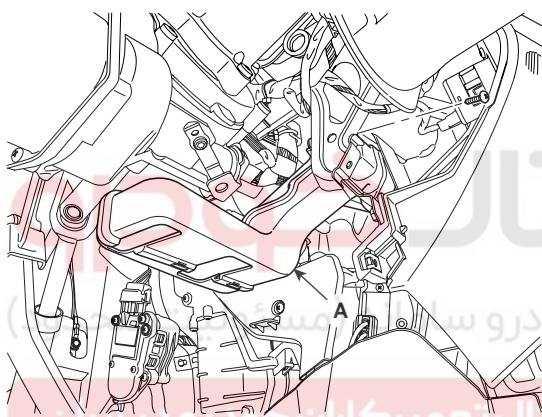
HA -34

HEATING, VENTILATION AND AIR CONDITIONING



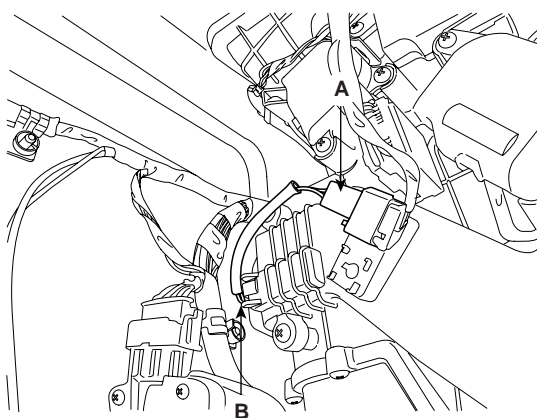
SFDHA7026L

5. Remove the shower duct (A).



SFDHA7027L

6. Disconnect the connector (A) of water temperature sensor and then remove the water temperature sensor (B) by pulling out.



SFDHA7028L

NOTE

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

7. Installation is the reverse order of removal.

NOTE

Apply caulk to the water temperature sensor.
Make sure that there is no air leakage

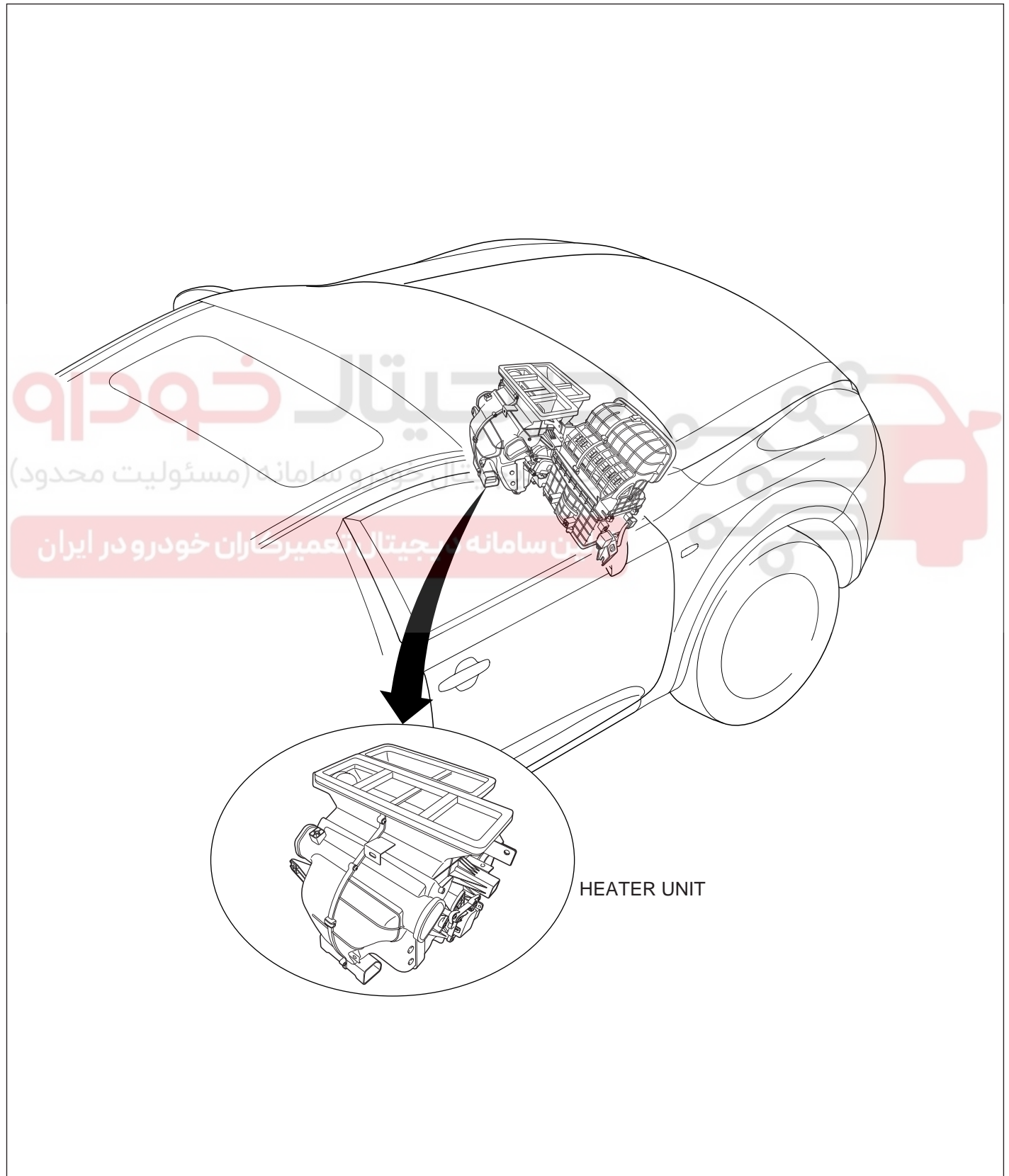
HEATER

HA -35

HEATER

HEATER UNIT

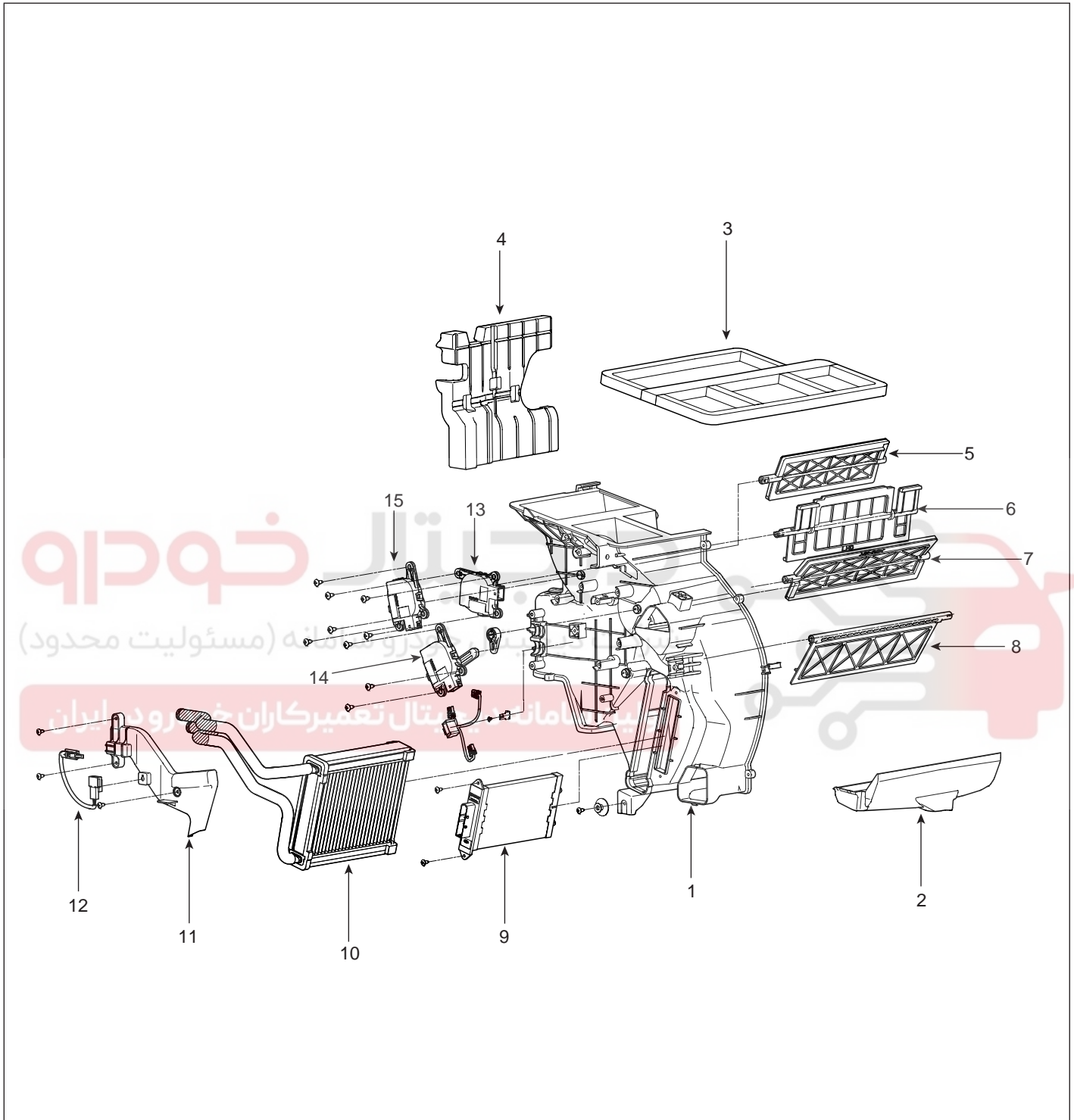
COMPONENT LOCATION EE381CC4



HA -36

HEATING, VENTILATION AND AIR CONDITIONING

COMPONENTS EF113617

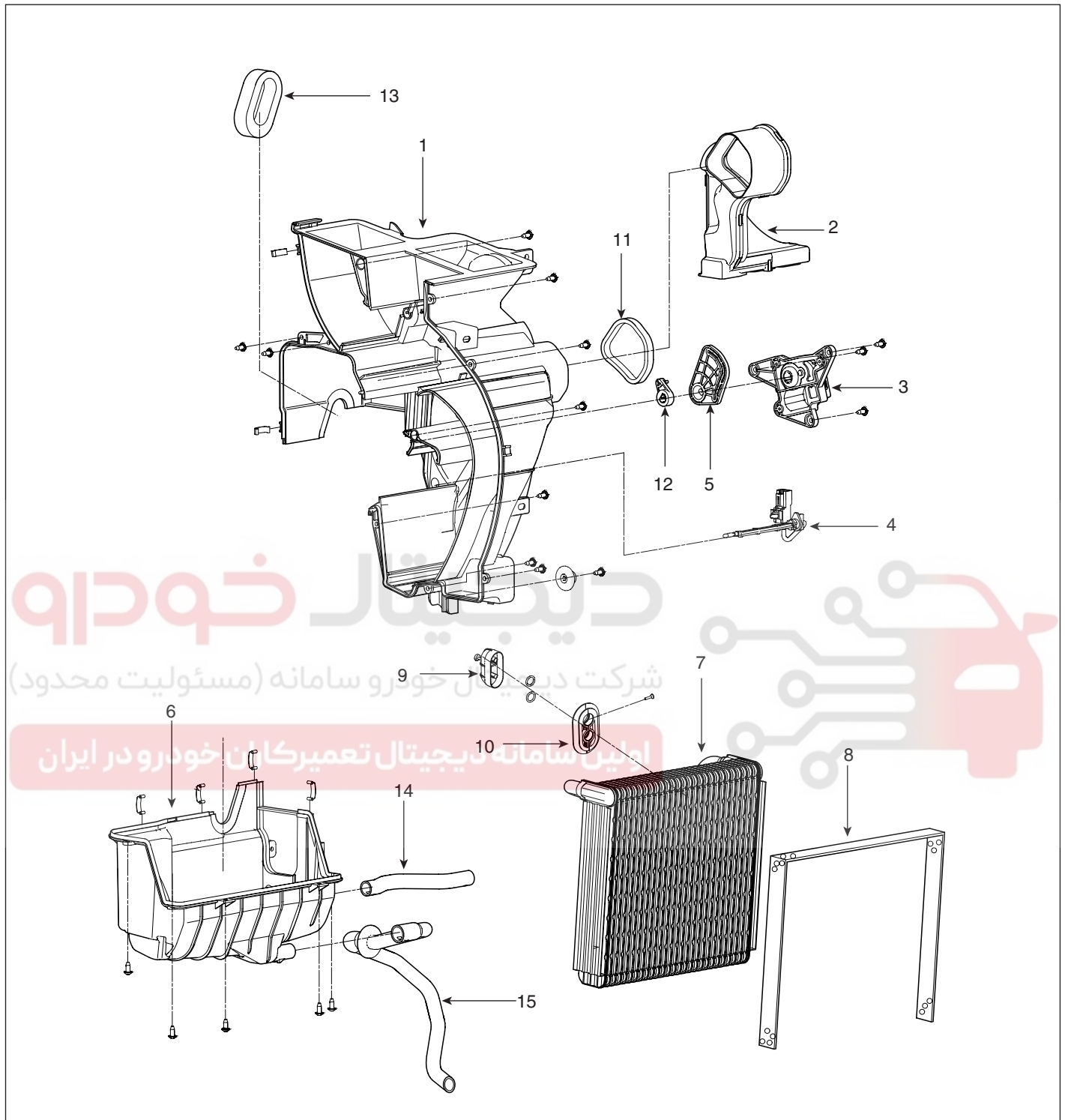


- | | | |
|----------------------------|----------------------|-----------------------|
| 1. Heater case (L) | 6. Door assy - Vent | 11. Heater core cover |
| 2. Heater Insulation lower | 7. Door assy - Floor | 12. Water temp sensor |
| 3. Seal duct No.1 | 8. Door assy - Temp | 13. Vent actuator |
| 4. Pad | 9. Core - PTC heater | 14. Floor actuator |
| 5. Door asy-Def | 10. Heater core | 15. Def actuator |

SEDHA7033L

HEATER

HA -37



- 1. Heater case (R)
- 2. Sub duct (R)
- 3. Temp actutor
- 4. Evaporator temp sensor
- 5. Temp door lever

- 6. Evaporator case
- 7. Evaporator core
- 8. Evaporator seul
- 9. Evaporator cap
- 10. Evaporator fix braket

- 11. Seal
- 12. Temp door arm
- 13. Evaporator seal
- 14. Drain hose-blower
- 15. Drain hose

SEDHA7034L

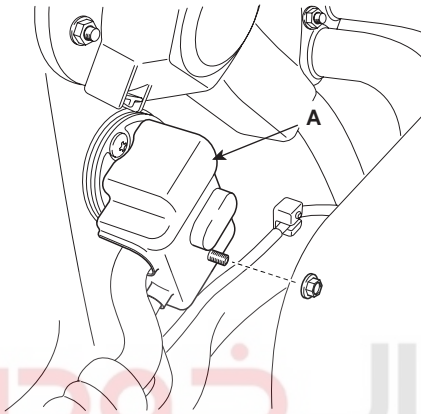
HA -38

HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT

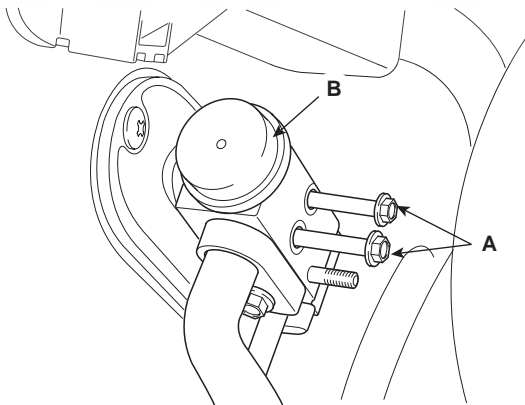
E4197950

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 expansion valve cover(A).



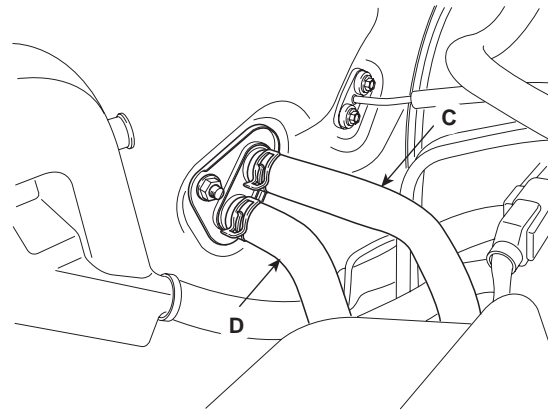
SFDHA7033L

5. 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.



SFDHA7034L

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

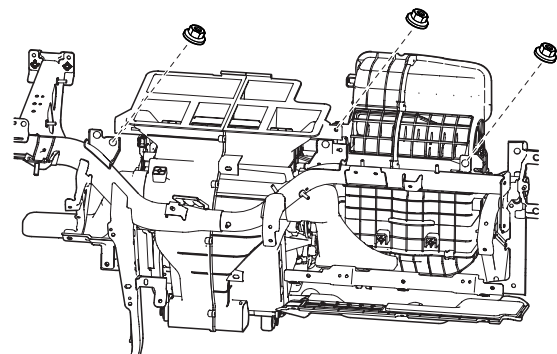


SFDHA7035L

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.

7. Remove the crash pad (Refer to BD group-crash pad).
8. Remove the cowl cross bar assembly. (Refer to BD group-crash pad)
9. Disconnect the connectors from the temperature control actuator, the mode control actuator and the evaporator temperature sensor.
10. Remove the heater & blower unit after loosening 3 mounting nuts.

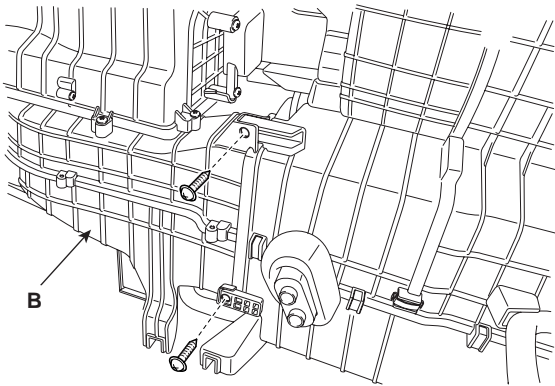


SEDHA7038L

HEATER

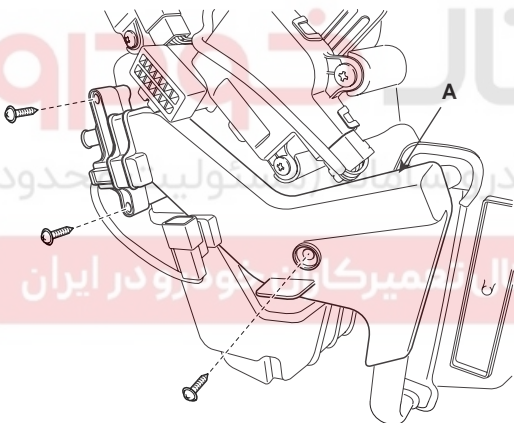
HA -39

11. Remove the blower unit (B) from heater unit after loosening 3 screws.



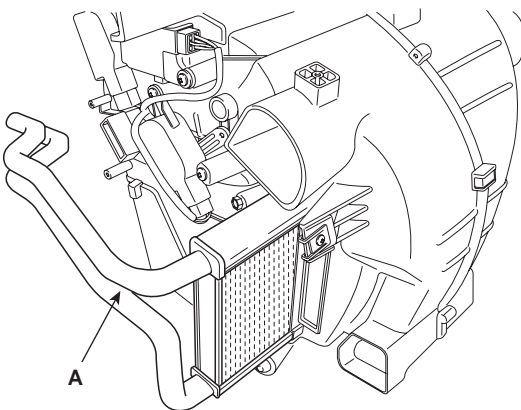
SFDHA7037L

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



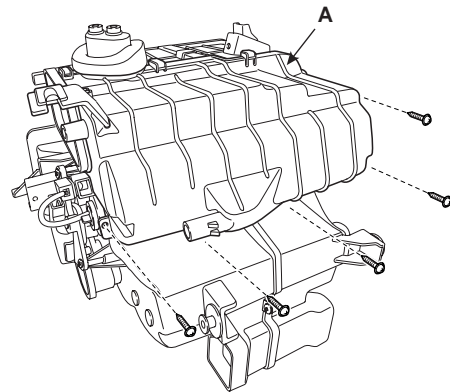
SFDHA7038L

13. Be careful that the inlet and outlet pipe are not bent during heater core removal, and pull out the heater core.



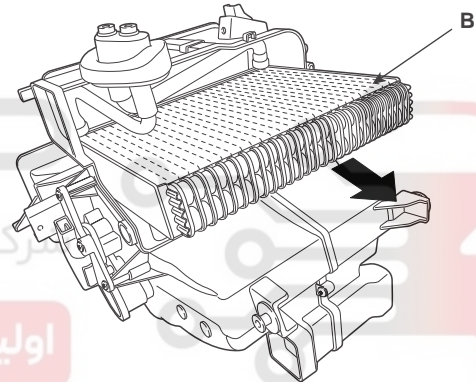
SFDHA7039L

14. Remove the heater unit lower case(A).



SFDHA7040L

15. Remove the evaporator core(A).



SEDHA7043L

HA -40

HEATING, VENTILATION AND AIR CONDITIONING

16. Install the heater core in the reverse order of removal.
17. 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.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



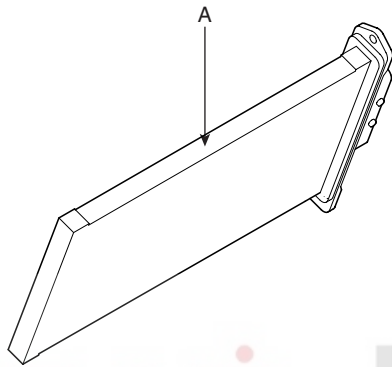
HEATER

HA -41

PTC (POSITIVE TEMPERATURE COEFFICIENT) HEATER

DESCRIPTION E38CDF38

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 (U engine).

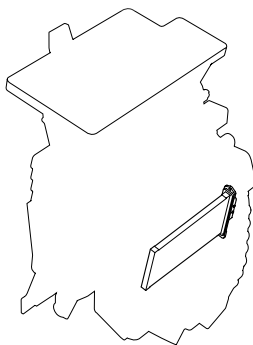


AQJF301B

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.



AQJF301A

OPERATION PRINCIPLE E6289B82

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.

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 EB3A9C6A

Inspect the PTC operation by confirmation logic as below.

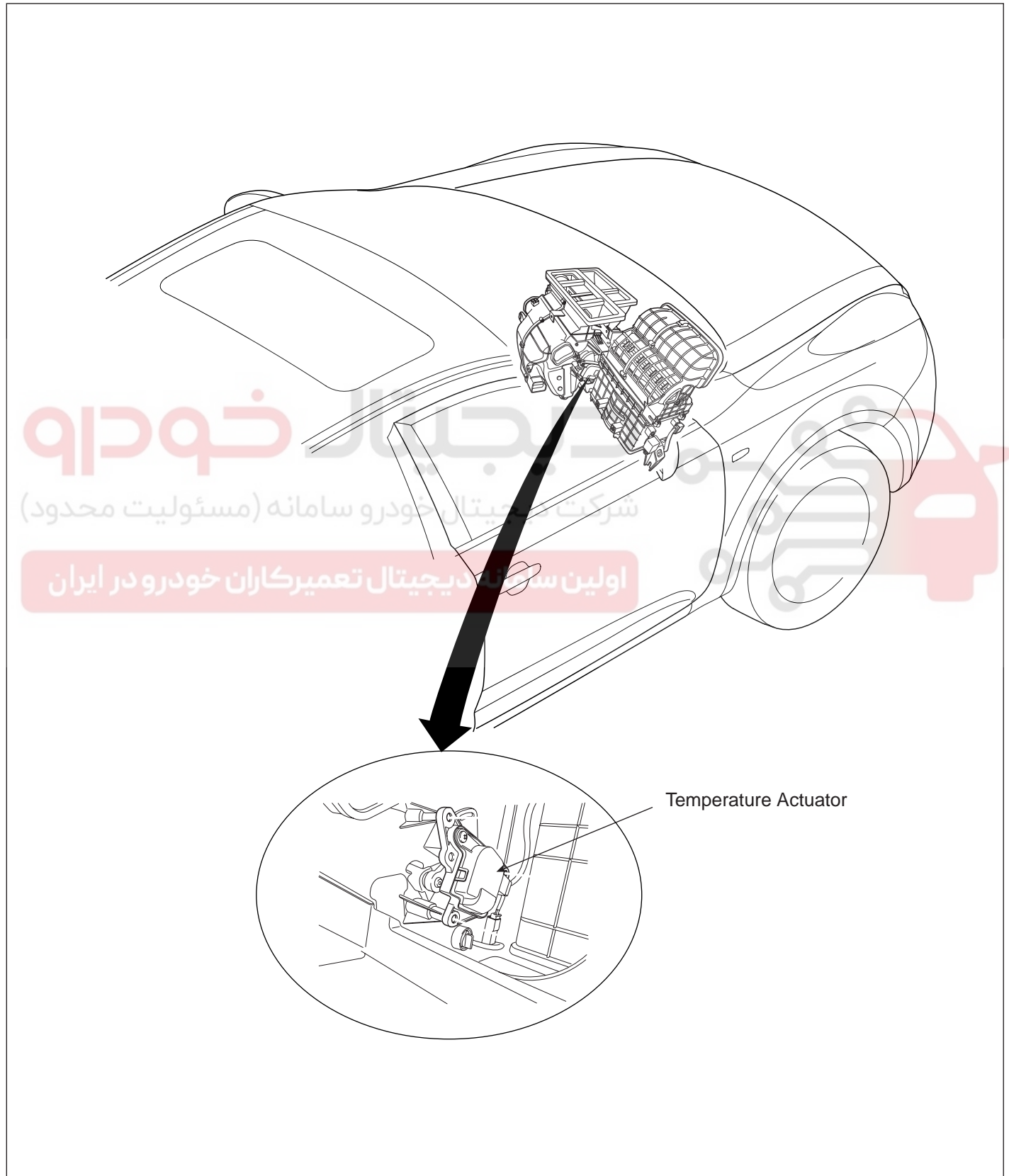
1. Entering method
 - 1) Set the floor mode, maximum heating.
 - 2) Turn off the blower switch
 - 3) Press the intake button more than 5 times.
 - 4) Indicator of entire button is flashed with an interval of 0.5 seconds continuously (Manual). Graphics of the entire LCD display switch on and off with 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.
 - 1) If the problem is corrected, replace the PTC.

HA -42

HEATING, VENTILATION AND AIR CONDITIONING

TEMPERATURE CONTROL ACTUATOR

COMPONENT LOCATION E869017A



SFDHA7042L

HEATER

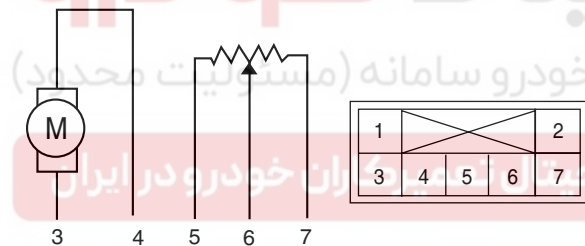
HA -43

DESCRIPTION EB00FBC0

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.

INSPECTION E7E06CF0

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 4 and grounding terminal 3. Verify that the temperature control actuator operates to the cool position when connecting in the reverse.



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

SEDHA7075L

4. Check the voltage between terminals 6 and 7.

[SPECIFICATION]

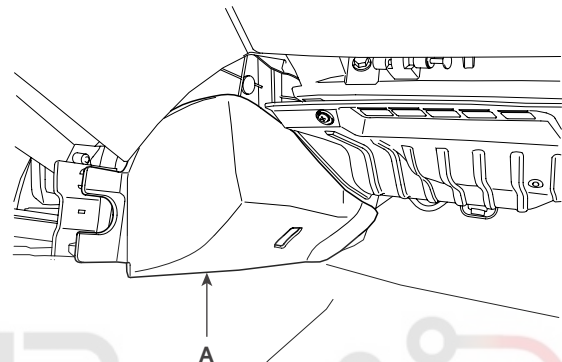
Door position	Voltage (6-7)	Error detecting
Max. cooling	0.3 ± 0.15V	Low voltage : 0.1V or less
Max. heating	4.7 ± 0.15V	High voltage : 4.9V or more

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.

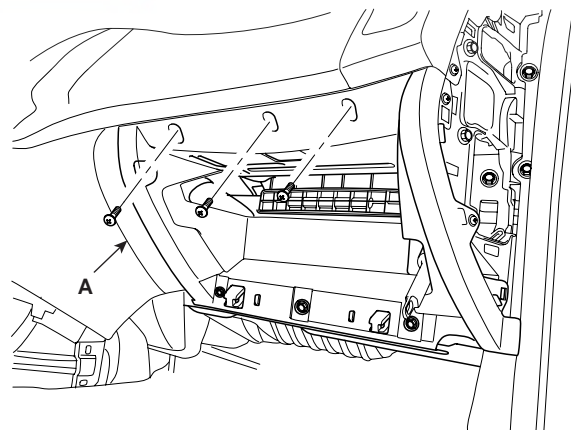
REPLACEMENT ECFDC046

1. Disconnect the negative (-) battery terminal.
2. Remove the driver's crush pad lower panel.



SFDHA7043L

3. Remove the glove box(Refer to BD group-crashpad)
4. Remove the glove box housing(A)

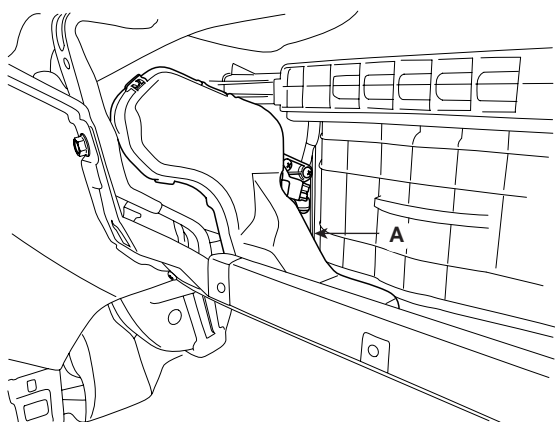


SFDHA7044L

HA -44

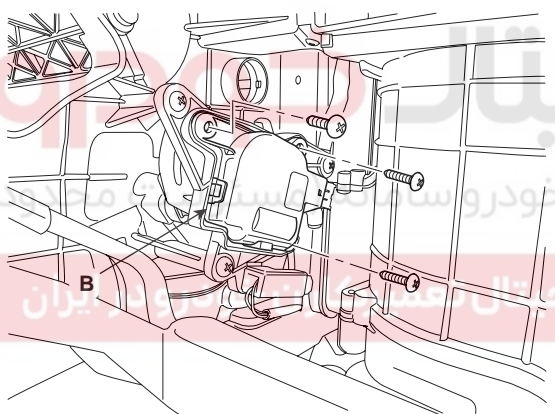
HEATING, VENTILATION AND AIR CONDITIONING

5. Disconnect the temperature control actuator connector (A) after removing the air duct.



SFDHA7018D

6. Loosen the mounting screw and then remove the temperature control actuator (B).



SFDHA7046L

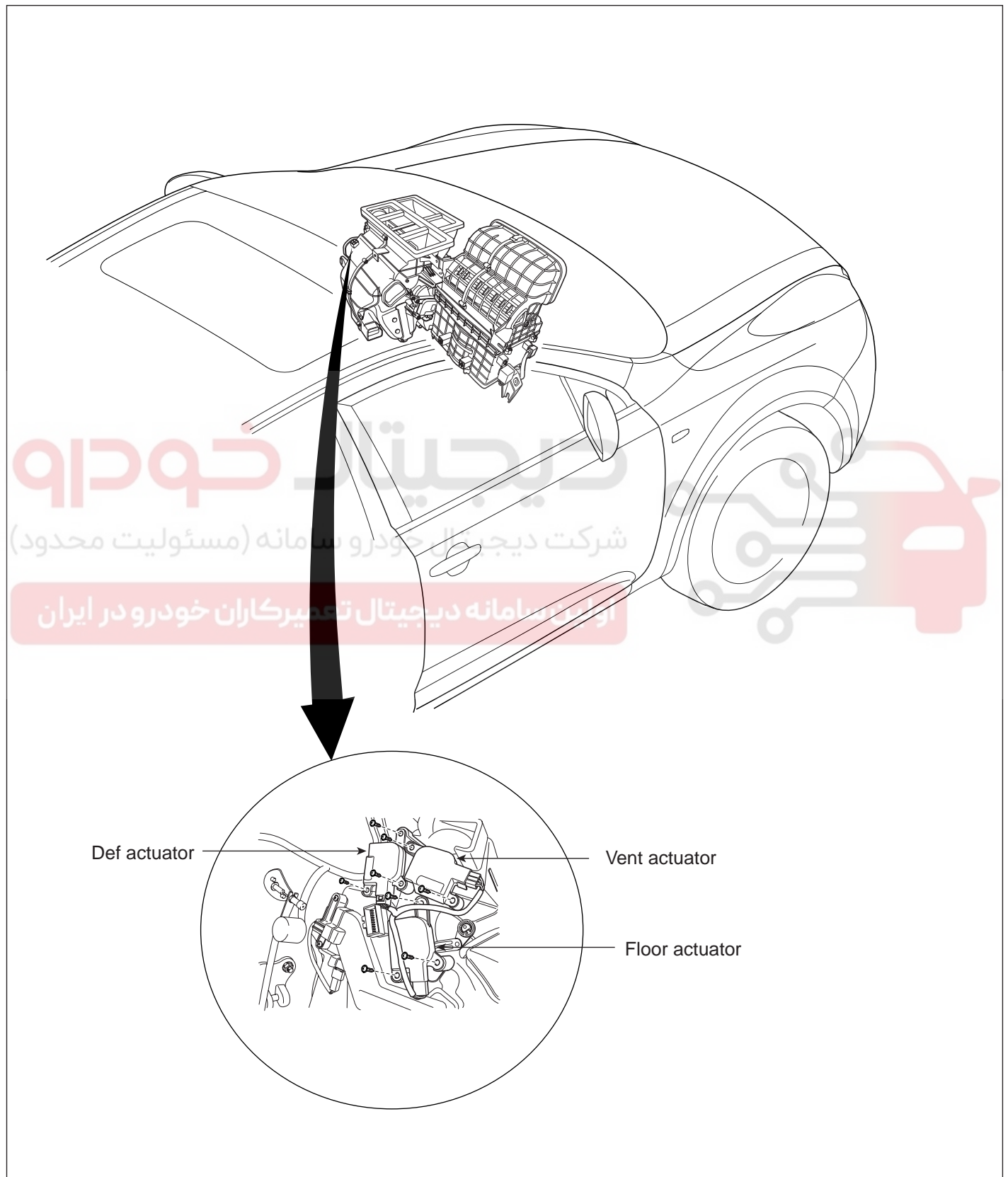
7. Installation is the reverse order of removal.

HEATER

HA -45

MODE CONTROL ACTUATOR

COMPONENT LOCATION EEBF37A4



SFDHA7047L

HA -46

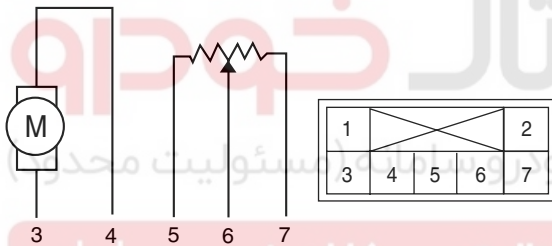
HEATING, VENTILATION AND AIR CONDITIONING

DESCRIPTION E0AD8E9A

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.

INSPECTION E0E66937

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. -
2. -
3. Vent. Def. Floor Close
4. Vent. Def. Floor Open
5. Sensor ground
6. Feedback signal
7. 5V (Vcc)

LQJF316B

5. Check the voltage between terminals 5 and 6.

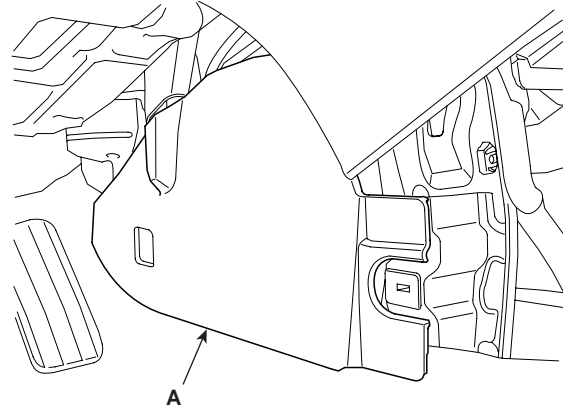
Door position	Voltage (5-6)	Error detecting
Vent	0.3 ± 0.15V	Low voltage : 0.1V or less
Defrost	4.7 ± 0.15V	High voltage : 4.9V or more

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.

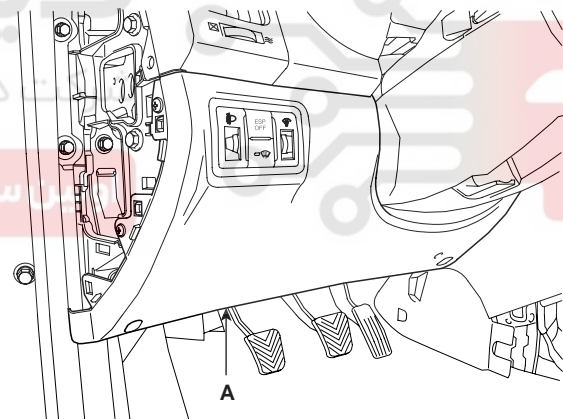
REPLACEMENT E49511B8

1. Disconnect the negative (-) battery terminal.
2. Remove the driver's crush pad lower cover (A). (Refer to BD group - Crash pad)



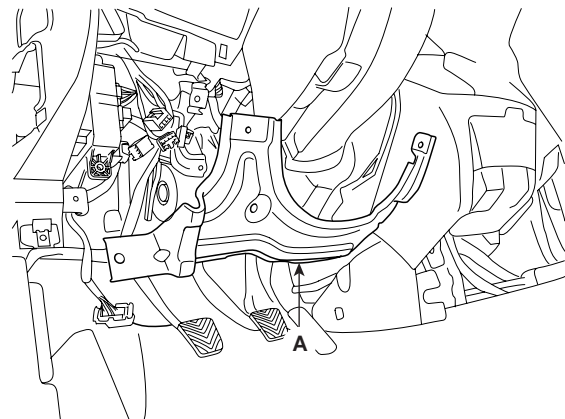
SFDHA7024L

3. Remove the crashpad lower panel (A).



SFDHA7025L

4. After loosening the mounting bolts, then the reinforcing panel (A).

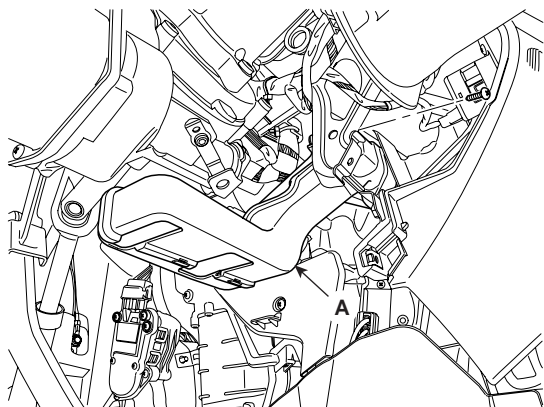


SFDHA7026L

HEATER

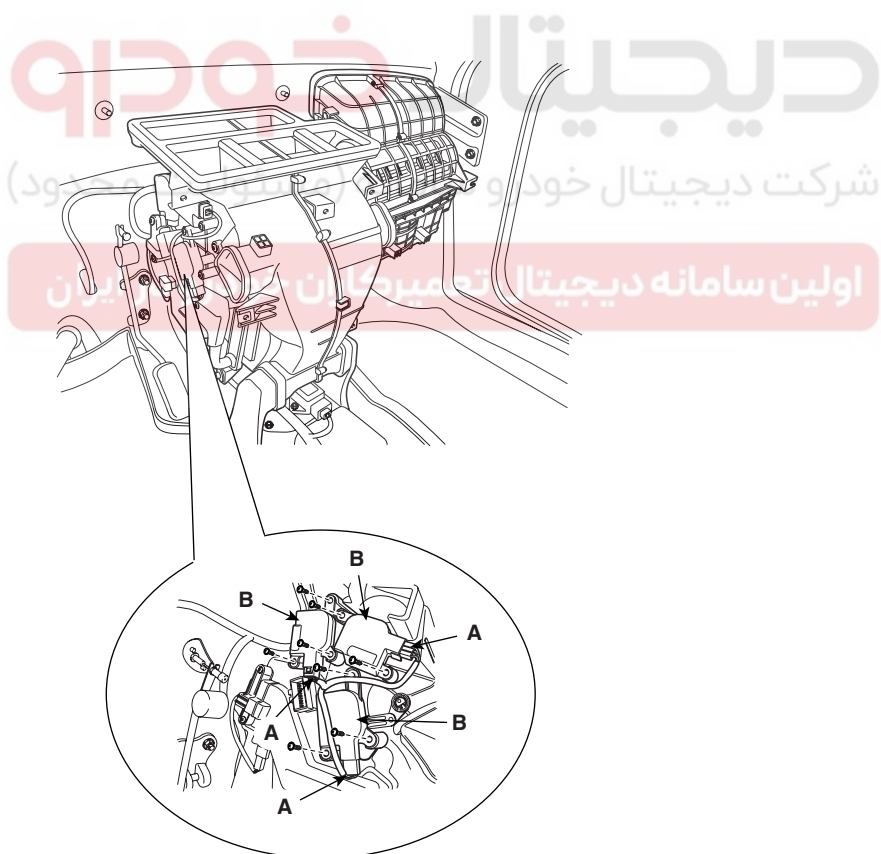
HA -47

5. Remove the shower duct (A).



SFDHA7027L

6. Disconnect the mode control actuator connector (A).
7. Loosen the mounting screws and then remove the mode control actuator (B).



SFDHA7048L

8. Installation is the reverse order of removal.

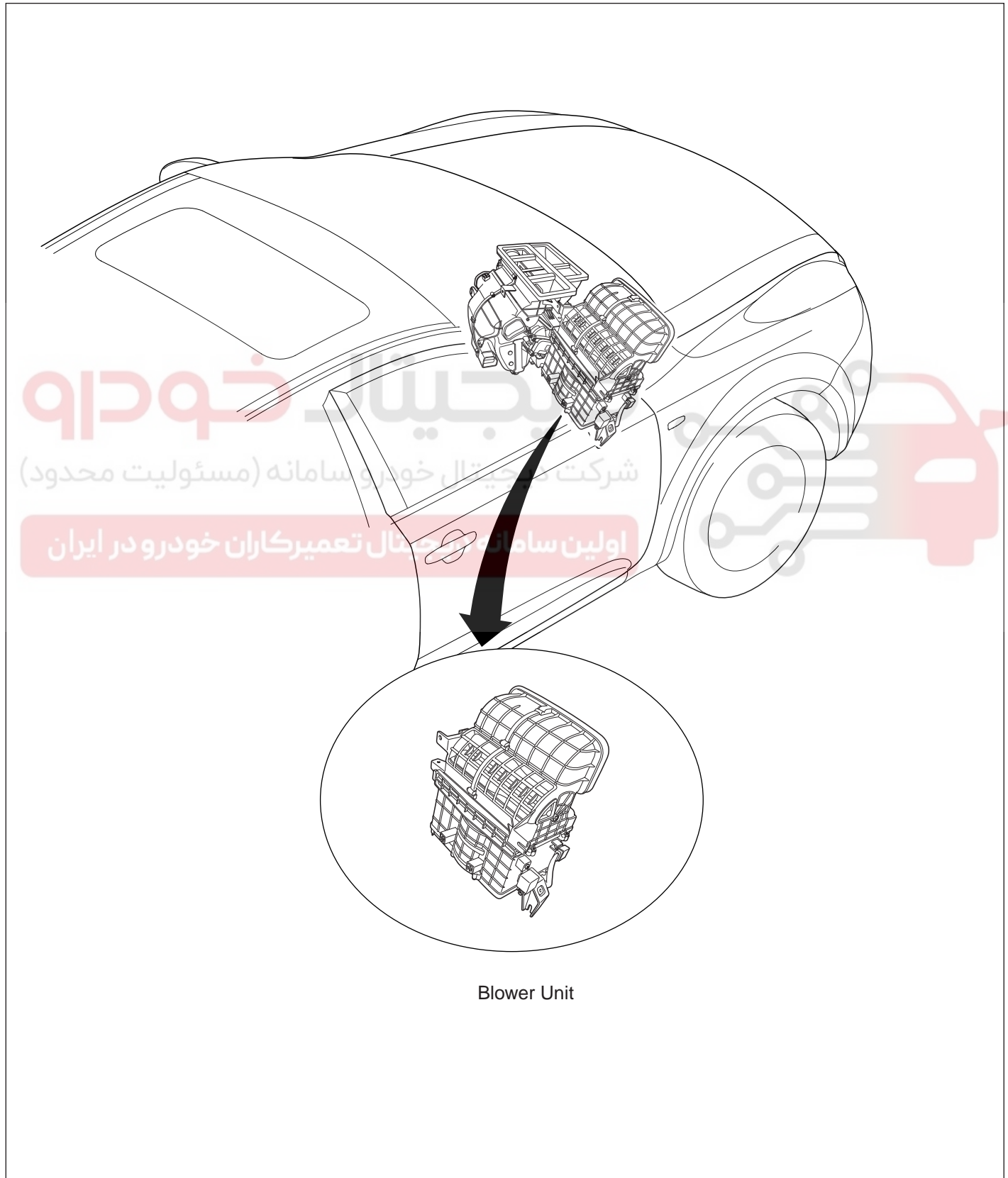
HA -48

HEATING, VENTILATION AND AIR CONDITIONING

BLOWER CONTROLS

BLOWER UNIT

COMPONENT LOCATION E19A8A89

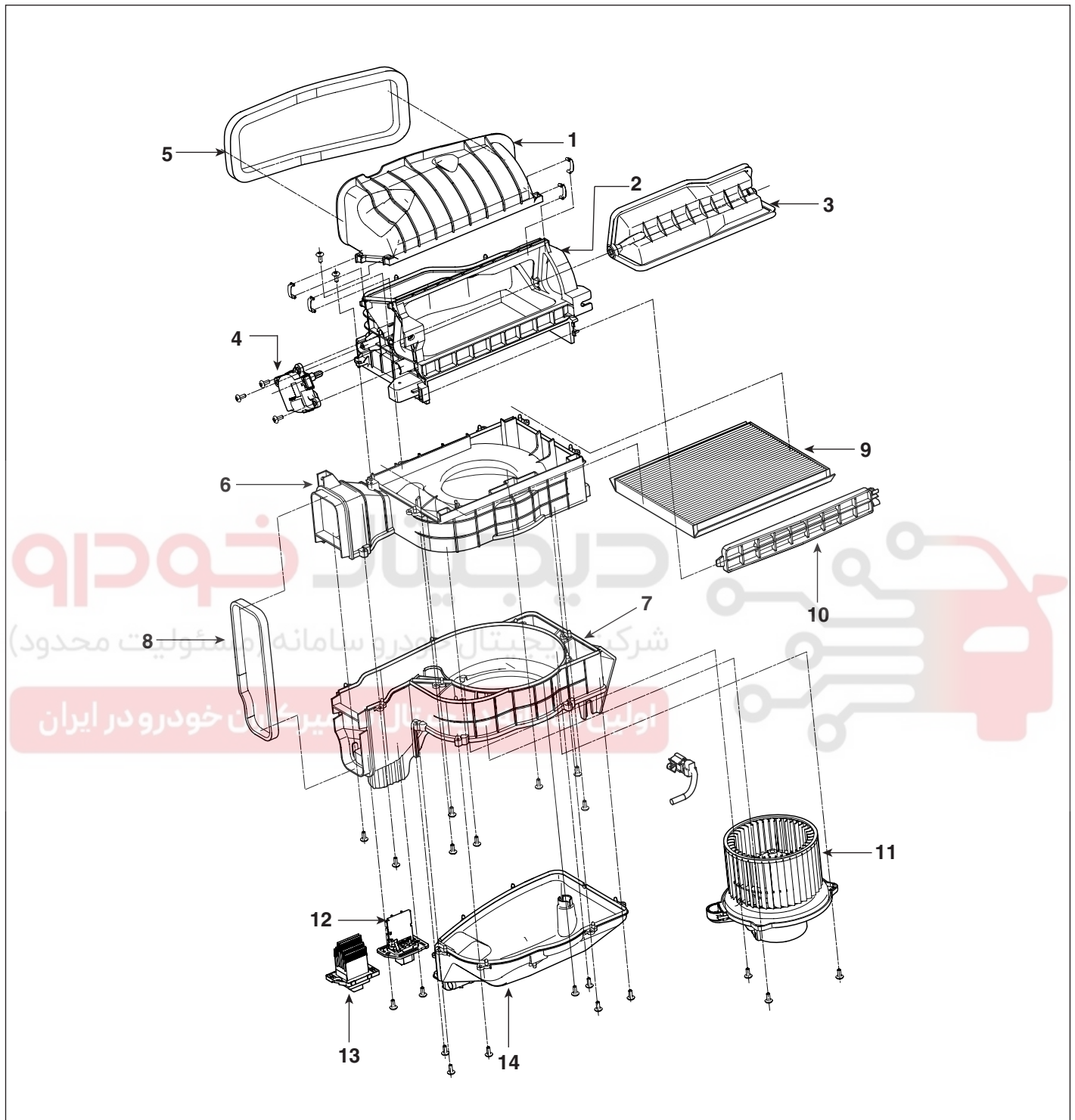


Blower Unit

BLOWER CONTROLS

HA -49

COMPONENTS EFD9273B



1. Intake duct case (A)

2. Inlet duct case

3. Air inlet door

4. Intake actuator

5. Inlet seal

6. Blower case (upper)

7. Blower case (Lower)

8. Heater seal

9. Climate control air filter

10. Filter cover

11. Blower motor

12. Resistor

13. Power mosfet

14. Under cover

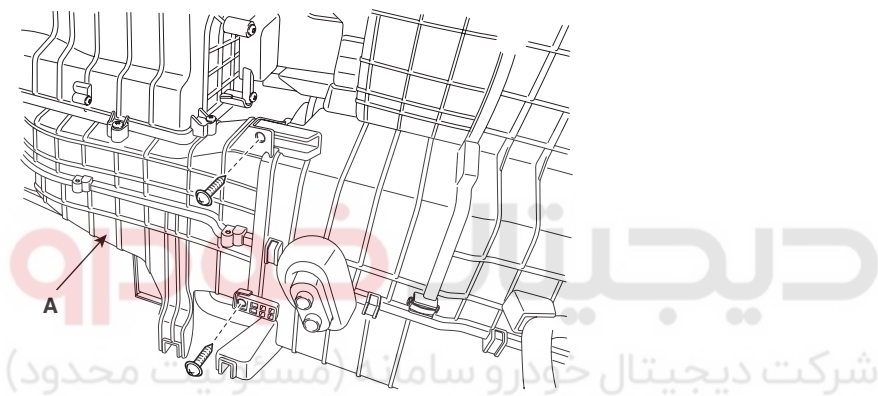
SFDHA7050L

HA -50

HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT EDBF9185

1. Disconnect the negative (-) battery terminal.
2. Remove the crash pad.(Refer to BD group - Crash pad)
3. Disconnect the connectors from the intake actuator, the blower motor and power mosfet.
4. Remove the cowl cross bar assembly.(Refer to BD group - Crash pad)
5. Remove the blower unit (A) from the heater unit after loosening a mounting bolt and 3 screws.



SFDHA7051L

NOTE

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

6. Installation is the reverse order of removal.



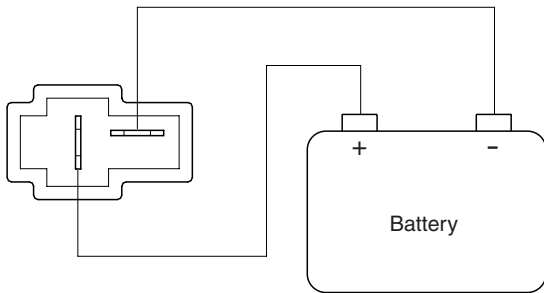
BLOWER CONTROLS

HA -51

BLOWER MOTOR

INSPECTION E7425EC9

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

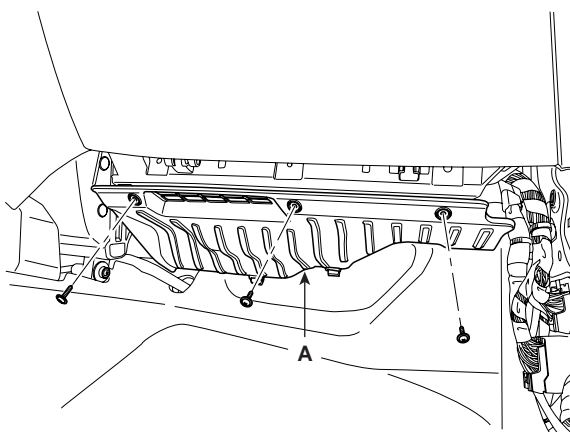


AQIE352C

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.

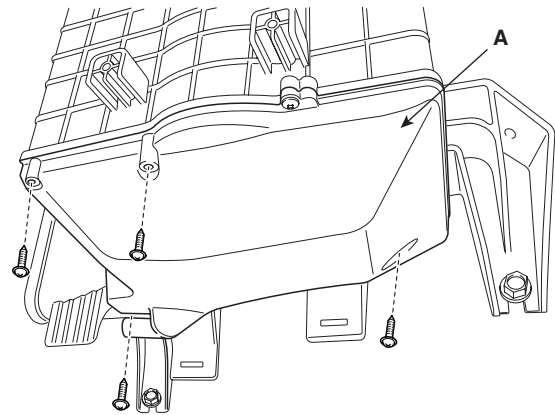
REPLACEMENT E444E8EE

1. Disconnect the negative (-) battery terminal.
2. Remove the blower motor cover(A).



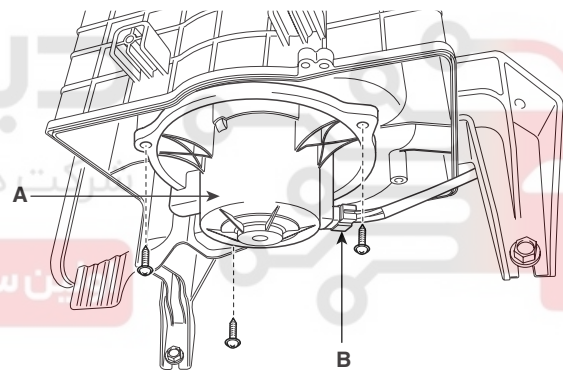
SFDHA7052L

3. Remove the blower motor cover (A).



SFDHA7053L

4. Disconnect the connector (A) of the blower motor and then remove the blower motor (A) after loosening the mounting screws



SFDHA7054L

5. Installation is the reverse order of removal.

HA -52

HEATING, VENTILATION AND AIR CONDITIONING

BLOWER RELAY

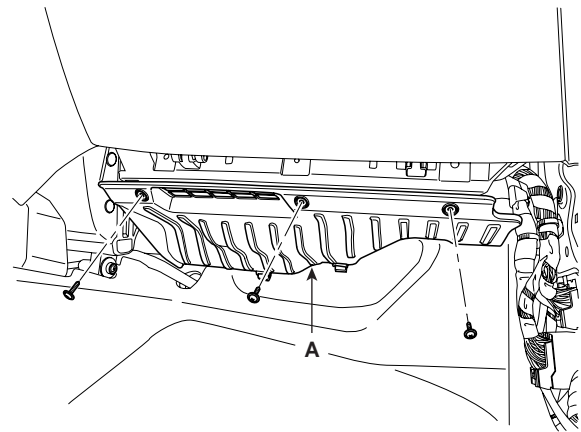
INSPECTION E5BBC303

Check for continuity between the terminals.

1. There should be continuity between No.1 and No.4 terminals when power and ground are connected to No.2 and No.3 terminals.
2. There should be no continuity between No.1 and No.4 terminals when power is disconnected.

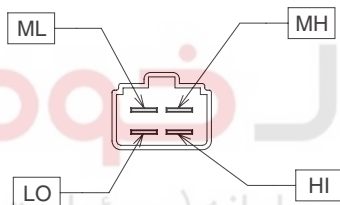
Terminal Position	2	3	1	4
Disconnected	○ — ○			
Connected	⊖ — ⊕		○ — ○	

LQJF201D



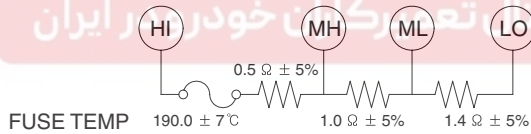
SFDHA7052L

3. Disconnect the connector of the blower relay at the below blower unit.
4. Remove the blower relay (A) after loosening the mounting screw.



دیجیتال خودرو سامانه (مستولیک محدود)

این سامانه دیجیتال تعریکات خود را در ایران



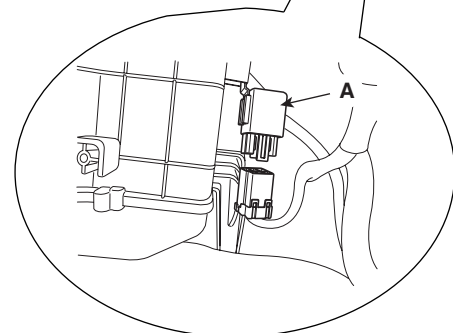
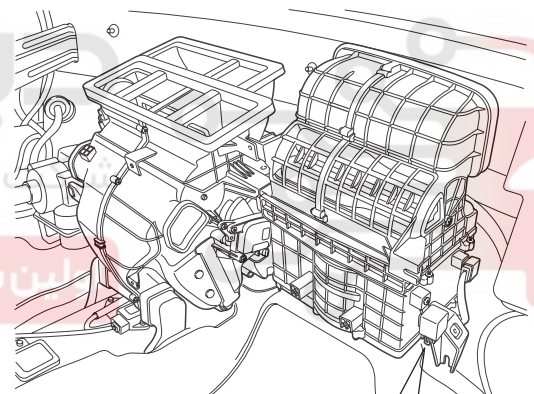
SFDHA7056L

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

REPLACEMENT E452EC67

Check for continuity between the terminals.

1. Disconnect the negative (-) battery terminal.
2. Remove the crashpad lower cover(A)



SFDHA7057L

5. Install in the reverse order of removal.

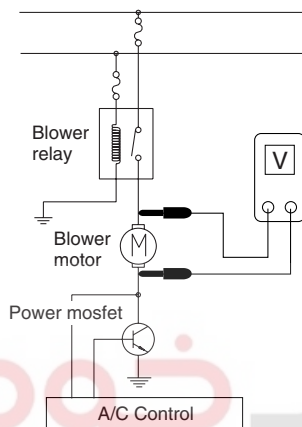
BLOWER CONTROLS

HA -53

POWER MOSFET

INSPECTION E57E1170

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



EQRF355C

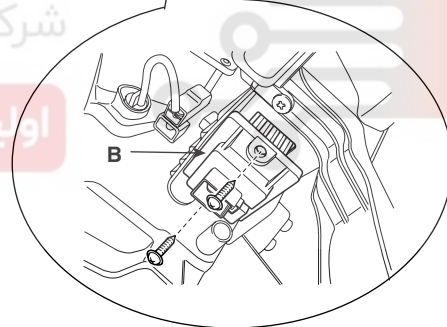
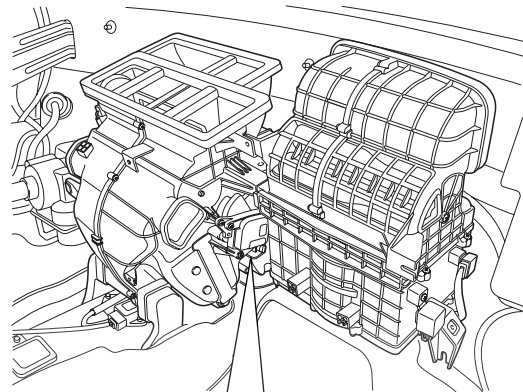
[SPECIFICATION]

Fan	Motor Voltage
	Auto
First speed	3.8±0.5
Second speed	4.9±0.5
Third speed	6.1±0.5
Forth speed	7.2±0.5
Fifth speed	8.3±0.5
Sixth speed	9.5±0.5
Seventh speed	10.6±0.5
Eighth speed	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 EE54BA96

1. Disconnect the negative (-) battery terminal.
2. Disconnect the power mosfet connector (A) at the connecting part between heater and blower unit.
3. Remove the power mosfet (B) after loosening the mounting screws.



SFDHA7058L

4. Installation is the reverse order of removal.

HA -54

HEATING, VENTILATION AND AIR CONDITIONING

CLIMATE CONTROL AIR FILTER

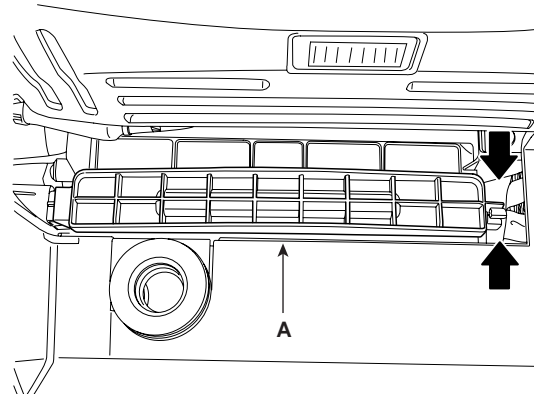
DESCRIPTION E66996D3

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 EAEEEF78

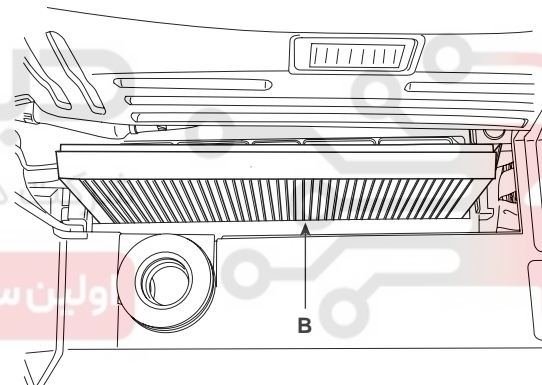
1. Disconnect the damper (B) from the glove box (A).

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



SFDHA7060L

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



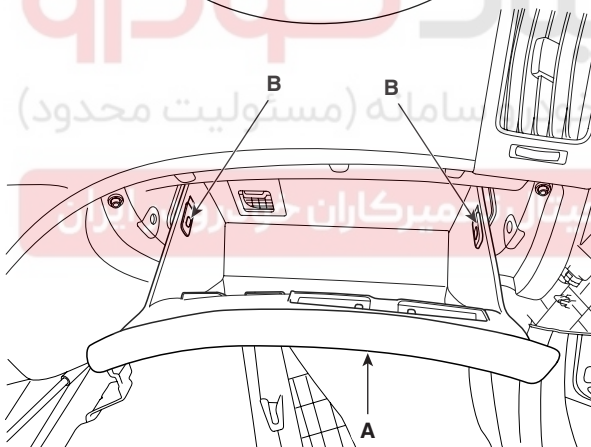
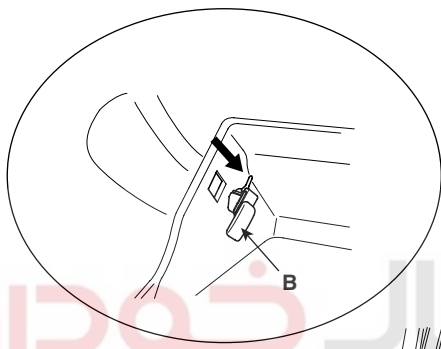
SFDHA7061L

NOTE

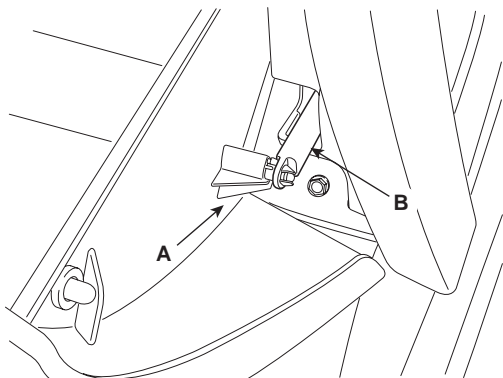
In case of driving in an air-polluted area or rugged terrain, check and replace the air filter as frequently as possible.

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

5. Installation is the reverse order of removal.



SFDHA7202L



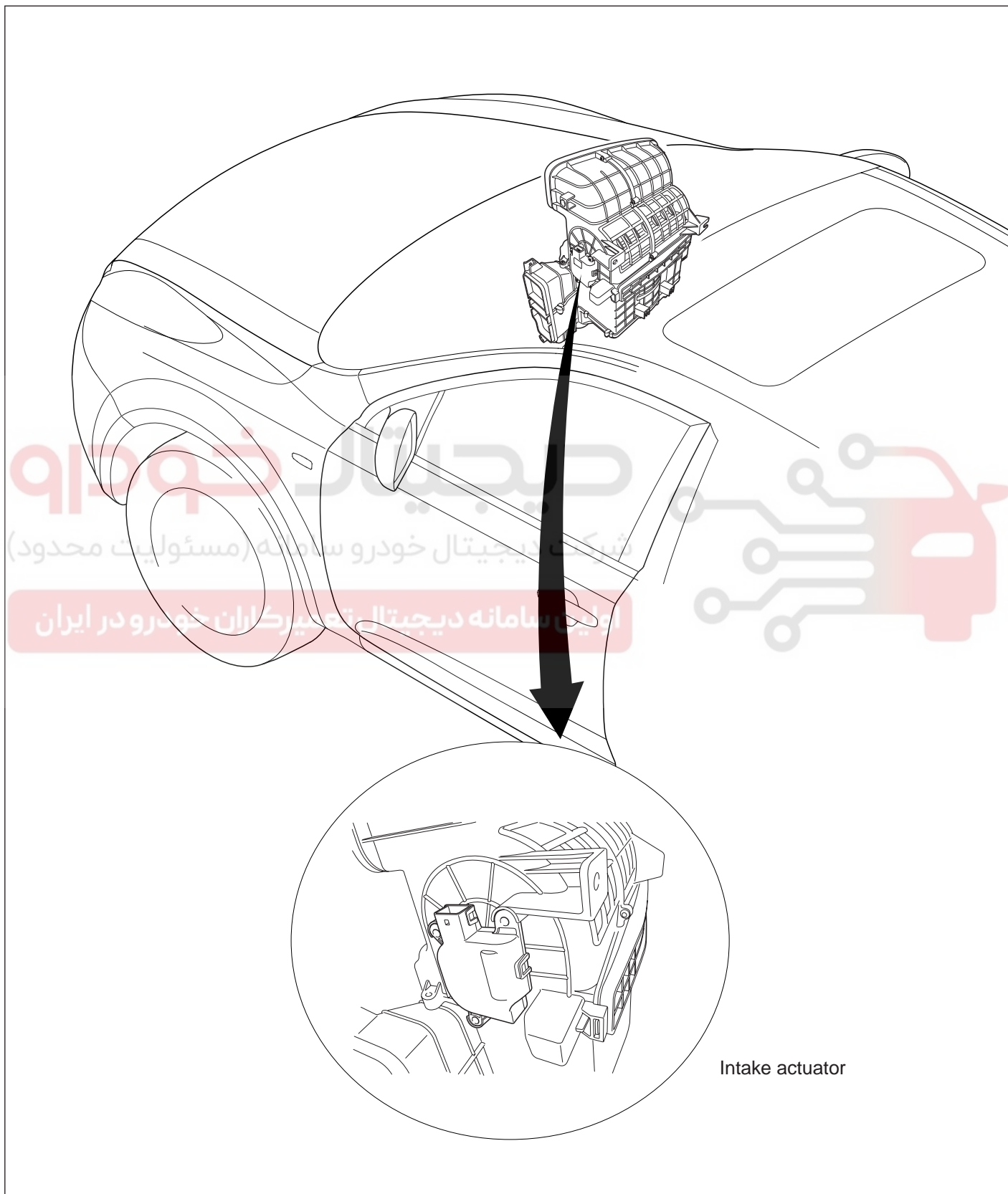
SFDHA7203L

BLOWER CONTROLS

HA -55

INTAKE ACTUATOR

COMPONENT LOCATION E9F32771



SFDHA7062L

HA -56

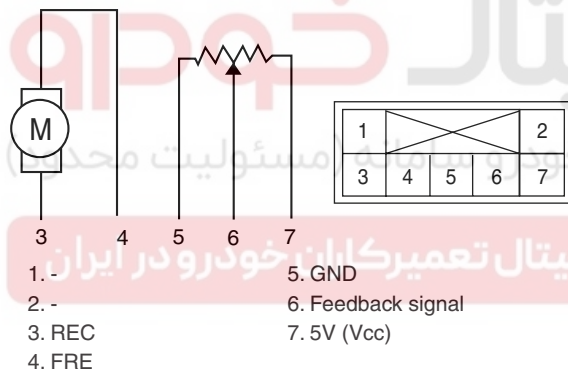
HEATING, VENTILATION AND AIR CONDITIONING

DESCRIPTION EF75CC9D

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.

INSPECTION E7E0E219

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.



SFDHA7063L

5. Check the voltage between terminals 5 and 6.

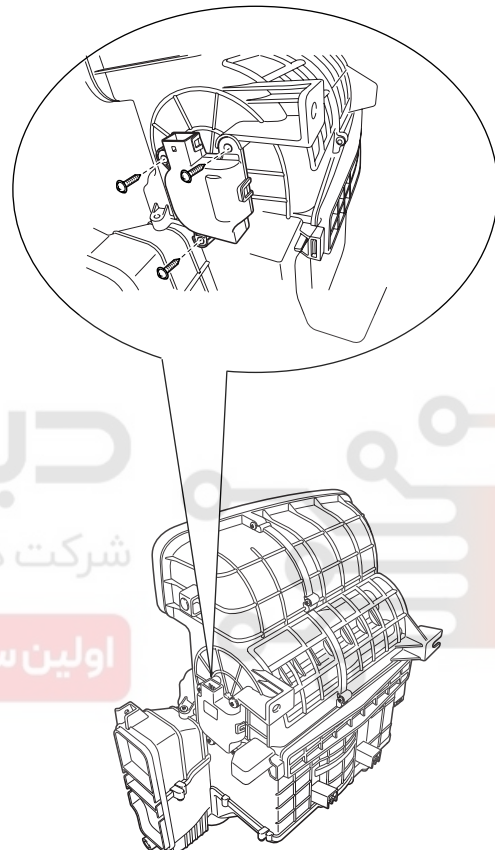
Door position	Voltage (5-6)	Error detecting
Fresh	0.3 ± 0.15V	Low voltage : 0.1V or less
Recirculation	4.7 ± 0.15V	High voltage : 4.9V or more

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 EB20B668

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



SFDHA7064L

5. Installation is the reverse order of removal.

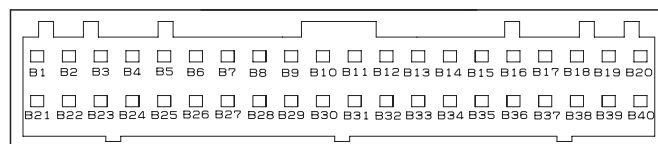
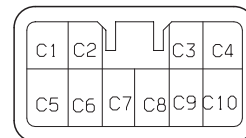
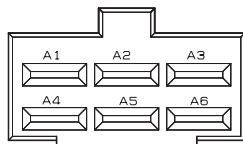
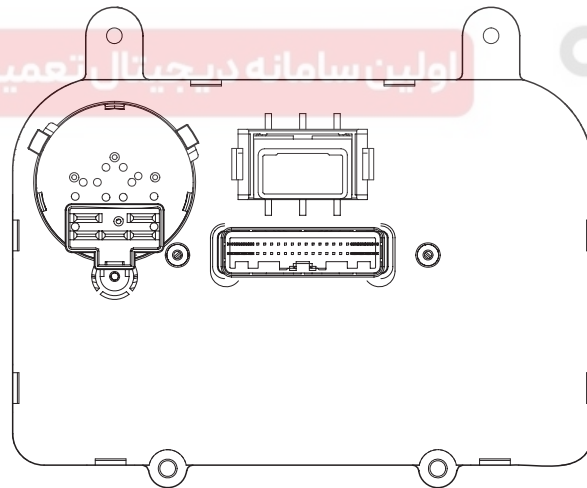
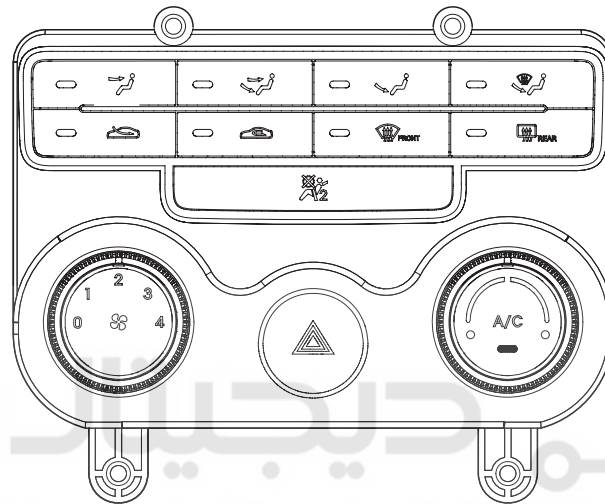
BLOWER AND A/C CONTROLS (MANUAL)

HA -57

BLOWER AND A/C CONTROLS (MANUAL)

CONTROL PANEL

COMPONENT EB45E4B7



HA -58

HEATING, VENTILATION AND AIR CONDITIONING

CONNECTOR PIN FUNCTION

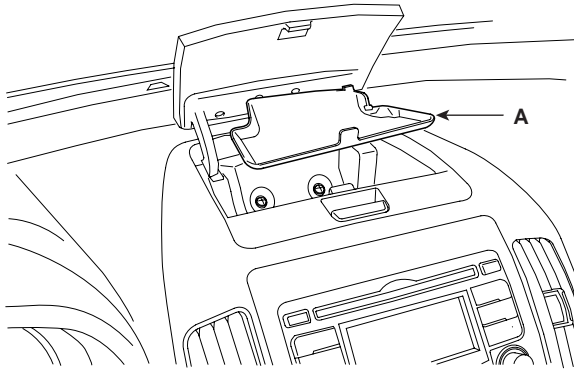
CONNECTOR	PIN	FUNCTION	CONNECTOR	PIN	FUNCTION
Connector (A) BLOWER S/W	1	HIGH	Connector (B) MAIN	24	PTC3
	2	M/LOW		25	A/C OUTPUT
	3	GND		26	A/C SELECT SIGNAL
	4	M/HIGH		27	-
	5	-		28	-
	6	LOW		29	-
Connector (B) MAIN	1	IGN2		30	RH REAR GREEN
	2	HTD		31	MID REAR GREEN
	3	SW(REAR DEFOG)		32	LH REAR GREEN
	4	P/AIR BAG CUT OFF IGN1		33	MODE ACTUATOR(VENT)
	5	P/AIR BAG CUT OFF SIG		34	MODE ACTUATOR(DEF)
	6	P/AIR BAG CUT OFF GND		35	TEMP ACTUATOR(COOL)
	7	BLOWER ON SIGNAL		36	TEMP ACTUATOR(WARM)
	8	BLOWER ON SIGNAL TO ECU		37	INTAKE ACTUATOR(FRE)
	9	SBR BCM		38	INTAKE ACTUATOR(REC)
	10	LH REAR RED		39	SENSOR GND
	11	MID REAR RED		40	RHEOSTAT (ILL-)
	12	RH REAR RED		1	-
	13	SBR_IGN1		2	TAIL LAMP(ILL+)
	14	SENSOR REF (+5)		3	RHEOSTAT (ILL-)
	15	INTAKE ACTUATOR F/B		4	-
	16	MODR ACTUATOR F/B		5	IGN2
	17	TEMP ACTUATOR F/B		6	F BAT
	18	EVAPORATOR SENSOR(+)	7	BATTERY	
	19	PTC ON SIGNAL	8	COMMON	
	20	GND	9	LH	
	21	BATTERY	10	RH	
	22	TAIL LAMP (ILL +)			
	23	PTC2			
			Connector (C) HAZARD S/W		

BLOWER AND A/C CONTROLS (MANUAL)

HA -59

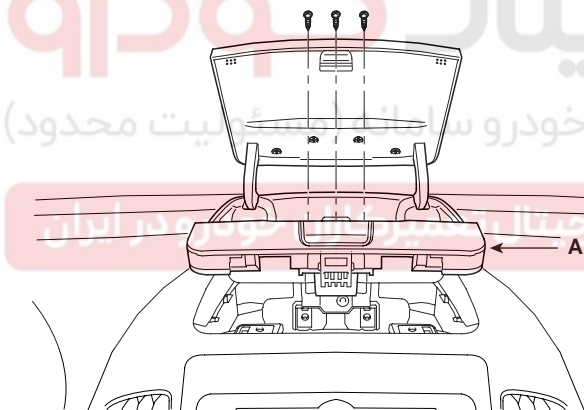
REPLACEMENT E8D2AB72

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



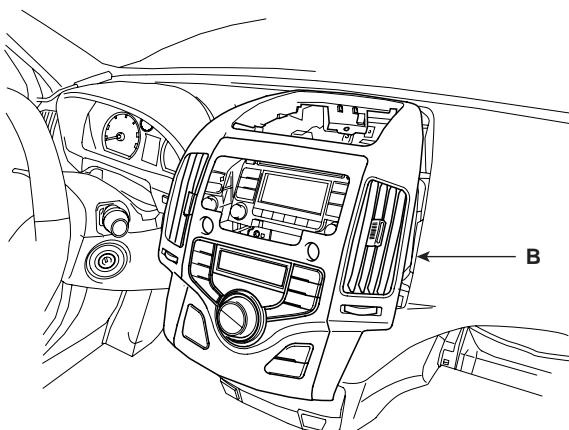
SFDHA7066L

3. Remove the upper tray (A).



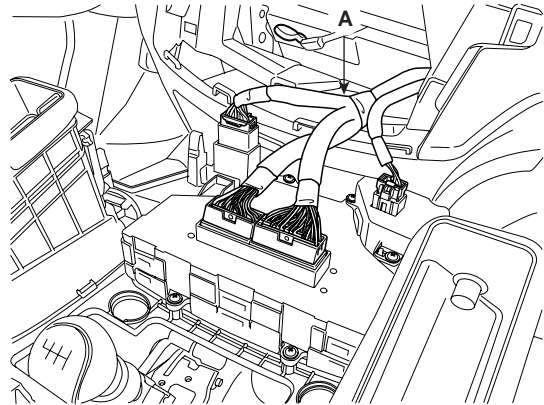
SFDHA7067L

4. Remove the center facia lower panel (B) by pulling it using a screw driver (-) after loosening a screw. Take care of fixing clips.



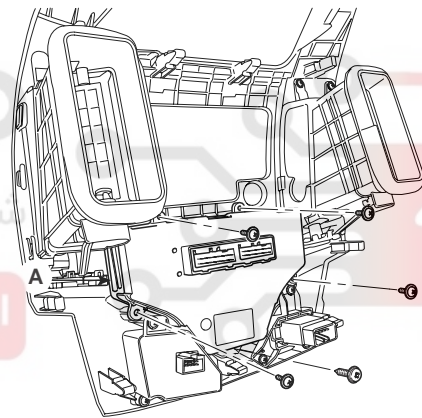
SFDHA7068L

5. Disconnect the connectors (A) from the center facia.



SFDHA7069L

6. Remove the heater & A/C controller (A) after loosening the screw.



SFDHA7070L

7. Installation is the reverse order of removal.

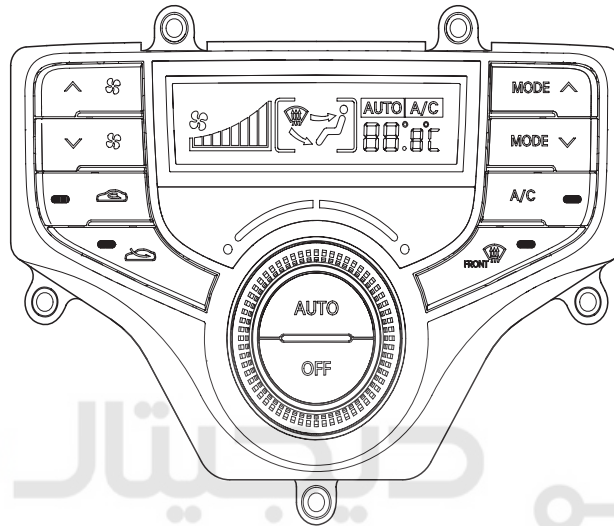
HA -60

HEATING, VENTILATION AND AIR CONDITIONING

BLOWER AND A/C CONTROLS (AUTOMATIC)

CONTROL PANEL

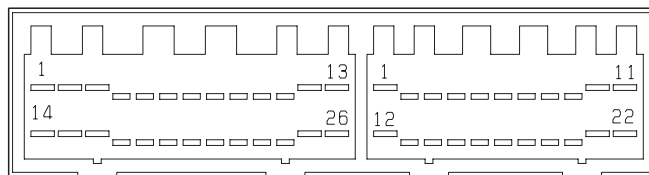
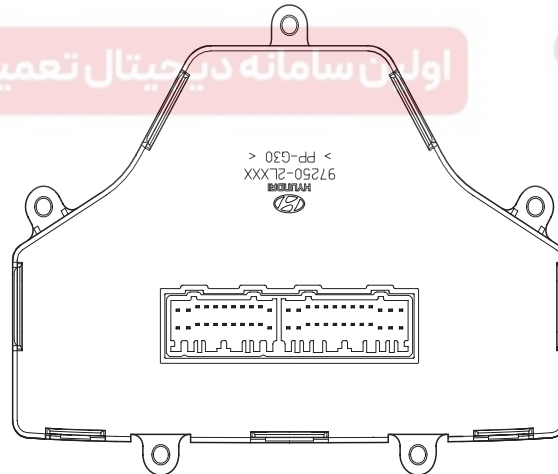
COMPONENT EC24E2D8



دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)



اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



BLOWER AND A/C CONTROLS (AUTOMATIC)

HA -61

CONNECTOR PIN FUNCTION

CONNECTOR	PIN	FUNCTION	CONNECTOR	PIN	FUNCTION
CONNECTOR (A)	1	Tail lamp (+)	CONNECTOR (B)	1	Sensor REF (+5V)
	2	Battery (+)		2	-
	3	A/C Output		3	AMBsensor signal
	4	A/C Select Signal		4	-
	5	-		5	Incar sensor (+)
	6	K-line		6	Evaporator temperature sensor (+)
	7	-		7	Water temperature sensor (+)
	8	-		8	Vehicle speed signal
	9	HTD		9	FET (G)
	10	-		10	FET (D)
	11	-		11	Blower motor (+)
	12	-		12	Sensor GND
	13	Rheostat		13	-
	14	ING2		14	-
	15	ING2		15	Photo sensor (-)
	16	Temp actuator (cool)		16	-
	17	Temp actuator (warm)		17	Incar motor (-)
	18	Temp actuator (F/B)		18	-
	19	Mode actuator (vent)		19	Blower on signal
	20	Mode actuator (def)		20	PTC on signal
	21	Mode actuator (F/B)		21	PTC RLY 2
	22	Intake actuator (fre)		22	PTC RLY 3
	23	Intake actuator (rec)			
	24	Intake actuator (rec)			
	25	GND			
	26	GND			

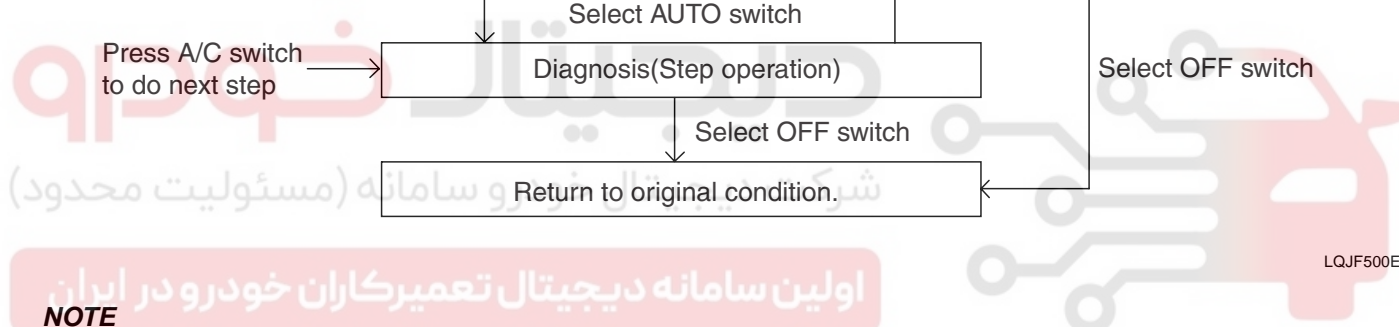
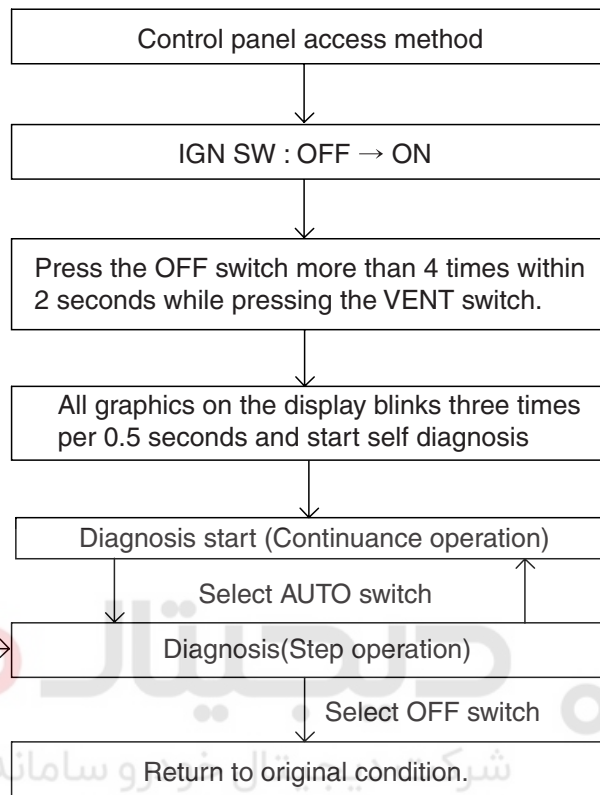
HA -62

HEATING, VENTILATION AND AIR CONDITIONING

SELF-DIAGNOSIS EAD809A3

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

1. Self-diagnosis process



اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

NOTE

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

BLOWER AND A/C CONTROLS (AUTOMATIC)**HA -63**

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	Fail description
Control unit	
00	Normal
11	In-car temperature sensor open (High)
12	In-car 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 door potentiometer open/short
20	Temp door motor
21	Vent mode door potentiometer open/short
22	Vent mode door control motor
25	Intake door potentiometer open/short
26	Intake door potentiometer motor
27	AQS sensor open
28	AQS sensor short
31	AQS sensor fault
34	Floor mode door potentiometer open/short
35	Floor mode door potentiometer motor
36	Def mode door potentiometer open/short
37	Def mode door potentiometer motor

HA -64

HEATING, VENTILATION AND AIR CONDITIONING

3. Fault code display

1) Continuance operation : DTC code is one



BQKF500C

2) Continuance operation : DTC code is more two



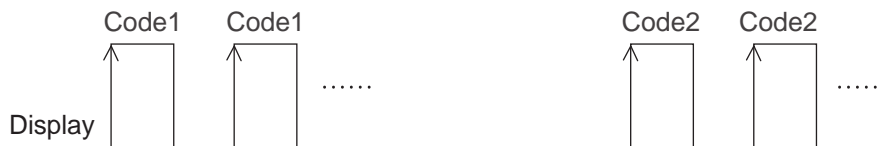
BQKF500D

(3) Step operation شرکت دیجیتال خودرو سامانه (مسئولیت پذیر)

A. Nomal or one fault code is same a continu-
ance

B. DTC code is more two

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



A/C SW
Select

BQKF500E

BLOWER AND A/C CONTROLS (AUTOMATIC)

HA -65

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°C (73.4°F)
 - 2) Ambient temperature sensor: Control with the value of 20°C (67°F)
 - 3) Evaporator temperature sensor: Control with the value of -2°C (28.4°F)
 - 4) Photo sensor: Control with the value of 10 W/m
 - 5) Temperature control actuator (Air mix potentiometer):
 - If temperature set 15°C-22.5°C, fix at maximum cooling position.
 - If temperature set 23°C-30°C, fix at maximum heating position.
 - 6) Mode control actuator (Direction potentiometer):
 - INDICATOR OFF : Door close position
 - INDICATOR ON : Door open position
 - 7) Intake control actuator
 - Fix fresh position, while selecting fresh mode.
 - Fix recirculation position, while selecting recirculation mode.



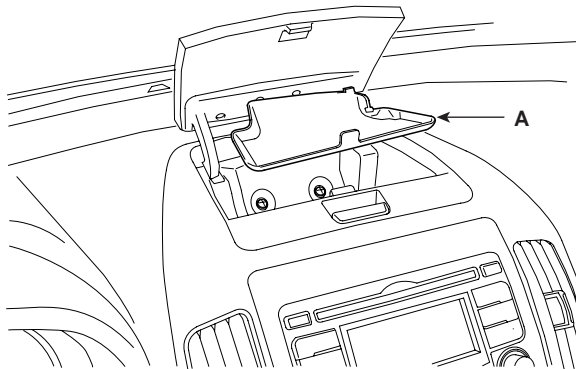
HA -66

HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT

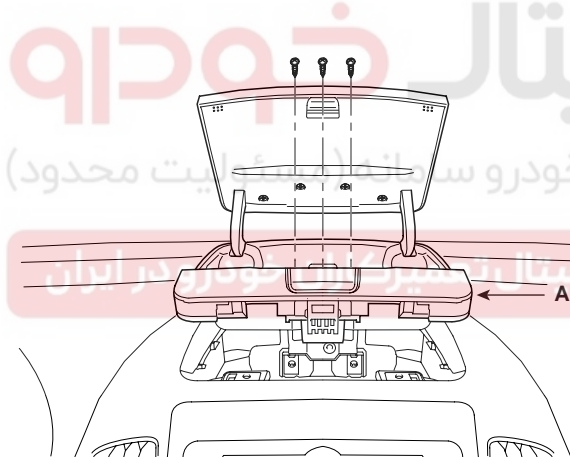
E4B601F0

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



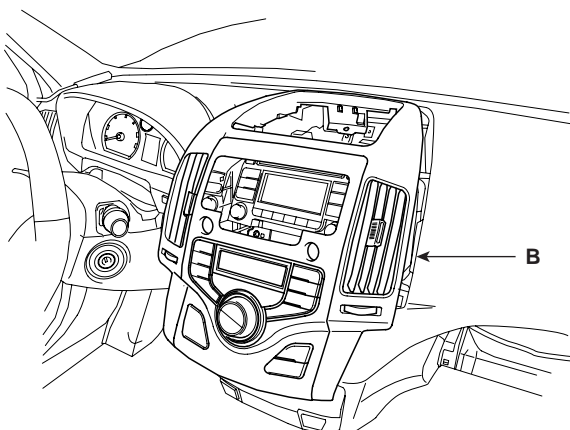
SFDHA7066L

3. Remove the upper tray (A).



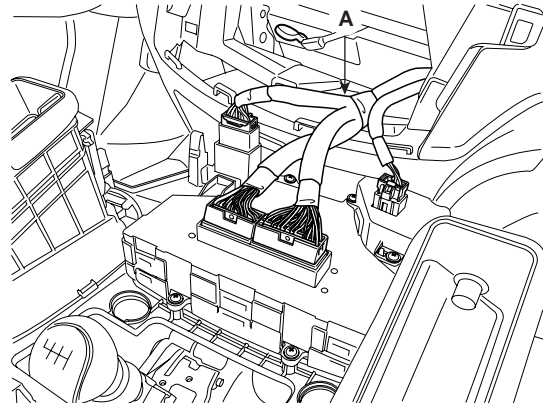
SFDHA7067L

4. Remove the center facia lower panel (B) by pulling it using a screw driver (-) after loosening a screw. Take care of fixing clips.



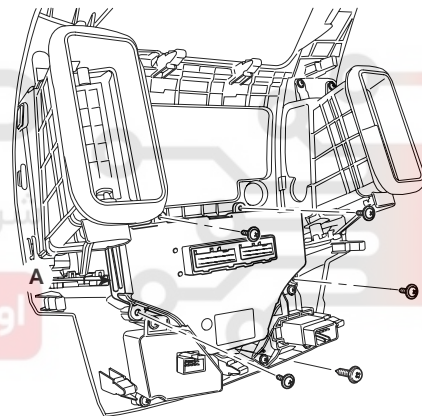
SFDHA7068L

5. Disconnect the connectors (A) from the center facia.



SFDHA7069L

6. Remove the heater & A/C controller (A) after loosening the screw.



SFDHA7070L

7. Installation is the reverse order of removal.