

## HA-2

## Heating, Ventilation, Air Conditioning

## General Information

## Specification

## Air Conditioner

	Item	Specification
Compressor	Type	6VSX16 (External variable displacement)
	Oil type & Capacity	FD46XG(PAG) 100±10cc
	Pulley type	6PK-TYPE
	Displacement	160cc/rev
Condenser	Heat rejection	14,400 ± 5% kcal/hr
A/C Pressure transducer	The method to measure the pressure	Voltage = 0.00878835 * Pressure (psig) + 0.5
Expansion valve	Type	Block type
Refrigerant	Type	R-134a
	Capacity [oz.(g)]	19.4 ± 0.88 (550 ± 25)

## Blower Unit

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

## Heater And Evaporator Unit

	Item	Specification
Heater	Type	Pin & Tube type
	Heating capacity	4,850 - 5% kcal/hr
	Mode operating method	Actuator
	Temperature operating method	Actuator
Evaporator	Temperature control type	Evaporator temperature sensor
	A/C ON/OFF [°C(°F)]	ON : 2.1 ± 0.5 (35.7 ± 32.9) OFF: 0.6 ± 0.5 (33.0 ± 32.9)

# General Information

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## Troubleshooting

### 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.

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.

### Standard:

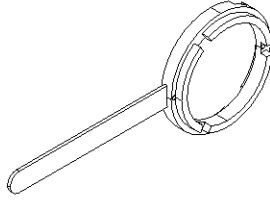
Symptom	Suspect Area
No blower operation	<ol style="list-style-type: none"> <li>1. Blower fuse</li> <li>2. Blower motor</li> <li>3. Power mosfet</li> <li>4. Blower speed control switch</li> <li>5. Wire harness</li> </ol>
No air temperature control	<ol style="list-style-type: none"> <li>1. Engine coolant capacity</li> <li>2. Heater control assembly</li> </ol>
No compressor operation	<ol style="list-style-type: none"> <li>1. Refrigerant capacity</li> <li>2. A/C Fuse</li> <li>3. Compressor</li> <li>4. A/C pressure transducer</li> <li>5. A/C switch</li> <li>6. Evaporator temperature sensor</li> <li>7. Wire harness</li> </ol>
No cool comes out	<ol style="list-style-type: none"> <li>1. Refrigerant capacity</li> <li>2. Refrigerant pressure</li> <li>3. Drive belt.</li> <li>4. Compressor</li> <li>5. A/C pressure transducer</li> <li>6. Evaporator temperature sensor.</li> <li>7. A/C switch.</li> <li>8. Heater control assembly</li> <li>9. Wire harness</li> </ol>
Insufficient cooling	<ol style="list-style-type: none"> <li>1. Refrigerant capacity</li> <li>2. Drive belt</li> <li>3. Compressor.</li> <li>4. Condenser.</li> <li>5. Expansion valve.</li> <li>6. Evaporator.</li> <li>7. Refrigerant lines</li> <li>8. A/C pressure transducer</li> <li>9. Heater control assembly</li> </ol>
No engine idle-up when A/C switch ON	<ol style="list-style-type: none"> <li>1. Engine ECM</li> <li>2. Wire harness</li> </ol>

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## Heating, Ventilation, Air Conditioning

Symptom	Suspect Area
No air inlet control	1. Heater control assembly
No mode control	1. Heater control assembly 2. Mode actuator
No cooling fan operation	1. Cooling fan fuse 2. Fan motor 3. Engine ECM 4. Wire harness

## Special Service Tools

Tool (Number and name)	Illustration	Use
09977-3R000 Disc & hub assembly bolt remover	 <p>SYFHA0020L</p>	Removal and installation of disc & hub assembly

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



# Air Conditioning System

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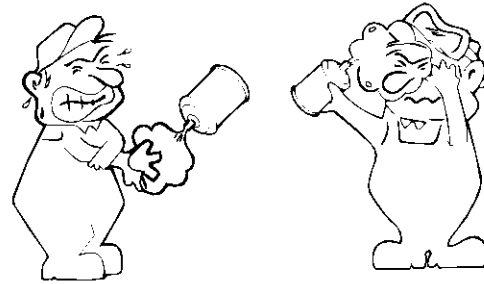
## Air Conditioning System

### 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 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 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 the components immediately to prevent 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.

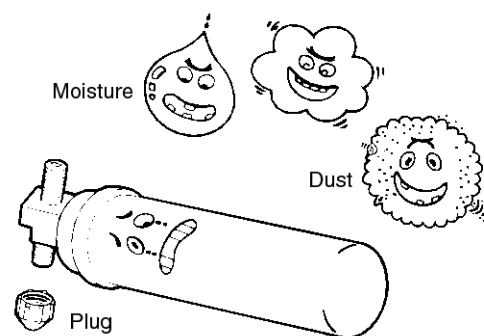
7. If an accidental discharge in the system occurs, ventilate the work area before resumption of service.



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.



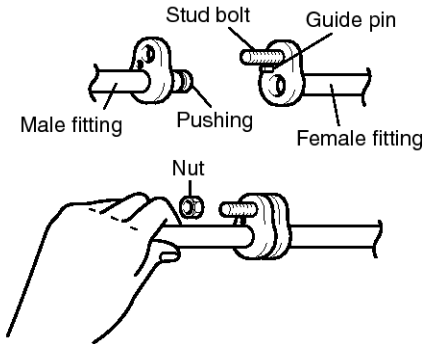
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# HA-6 Heating, Ventilation, Air Conditioning

## When Installing Connecting Parts

### Flange With Guide Pin

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



LQJF003C

Size	Tightening torque [ N.m (kgf.m, lb.ft) ]	
	General bolt, nut	
	Bolt(4T),Nut(4T)	Bolt(8T), Nut(6T)
M6	4 - 6(0.4 - 0.6, 2.9 - 4.3)	8 - 12(0.8 - 1.2, 5.7 - 8.6)
M8	9 - 14 (0.9 - 1.4, 6.5 - 10)	20 - 30 (2.0 - 3.0, 14 - 21.6)
M10	19 - 28 (1.9 - 2.8, 13.7 - 20)	45 - 60 (4.5 - 6.0, 32 - 43.3)
Size	Flange bolt, nut	
	Bolt(4T), Nut(4T)	Bolt(8T), Nut(6T)
	M6	4 - 6(0.4 - 0.6, 2.9 - 4.3)
M8	10 - 15 (1.0 - 1.5, 7 - 10)	22 - 33 (2.2 - 3.3, 15.9 - 23.8)
M10	21 - 31 (2.1 - 3.1, 15 - 22)	50 - 65 (5.0 - 6.5, 36.1 - 7.0)

### NOTICE

- 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.

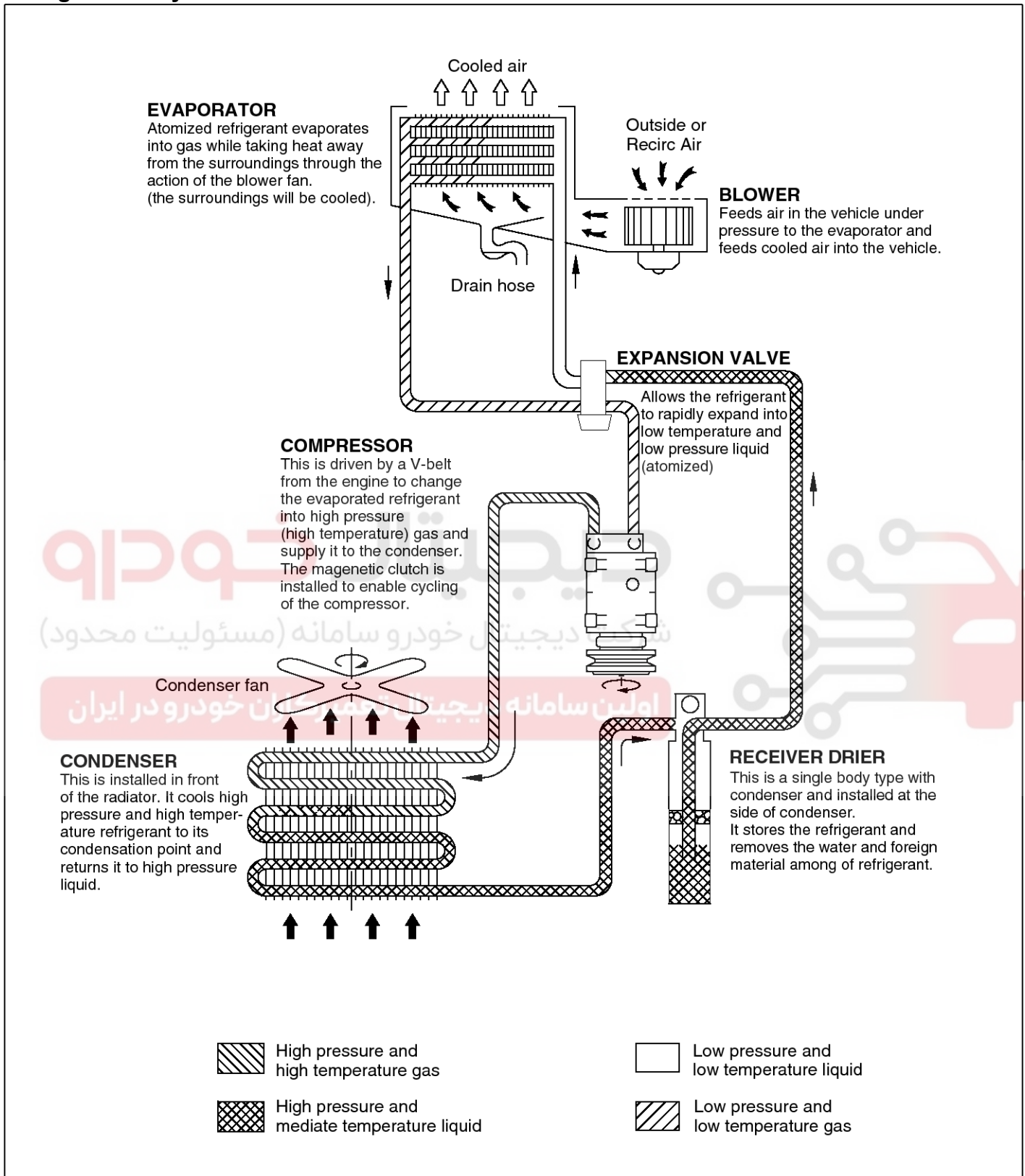
### The Following precautions must be observed

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

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## Refrigeration Cycle



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# HA-8

# Heating, Ventilation, Air Conditioning

## 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**

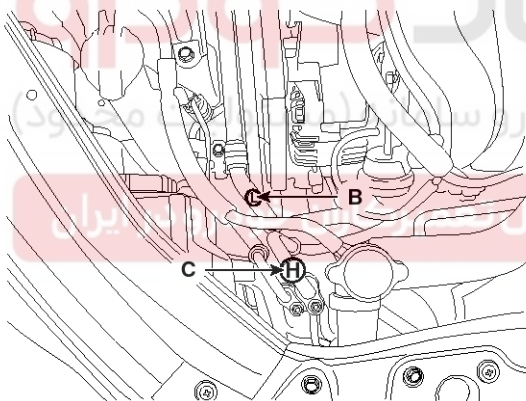
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

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

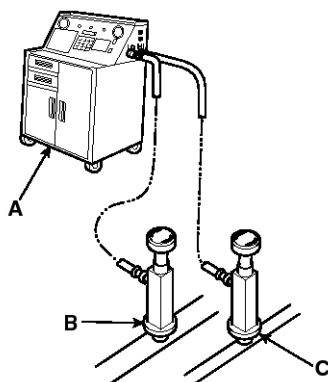
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

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.



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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.

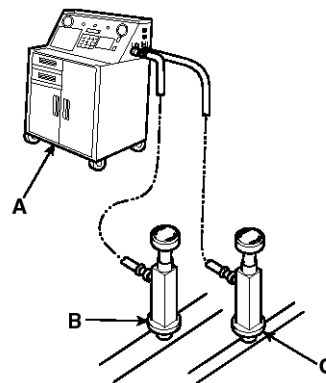
If accidental system discharge occurs, ventilate work area before resume of service.

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

# Air Conditioning System

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- 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.).
- 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**

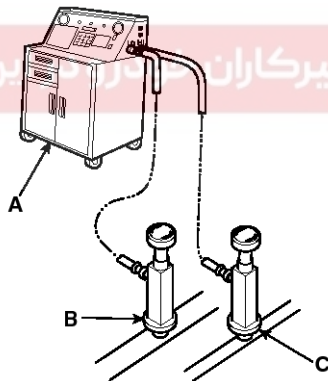
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

If accidental system discharge occurs, ventilate work area before resume of 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.



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- Add the same amount of new refrigerant oil to system that was removed during recovery. Use only specified refrigerant oil. Charge the system with  $19.4 \pm 0.88$  oz. ( $550 \pm 25$ g) of R-134a refrigerant. Do not overcharge the system the compressor will be damaged.

### Refrigerant Leak Test

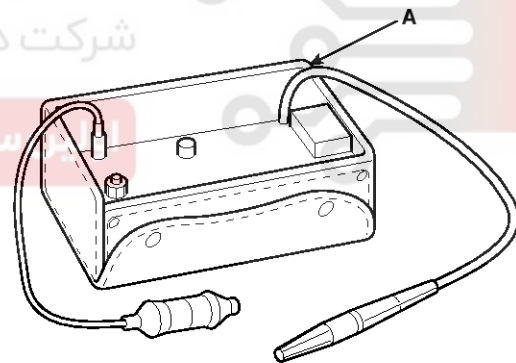
Always conduct a leak test with an electronic leak detector whenever leakage or refrigerant is suspected and when conducting service operations which are accompanied by disassembly or loosening or connection fittings.

#### **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:

- 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.



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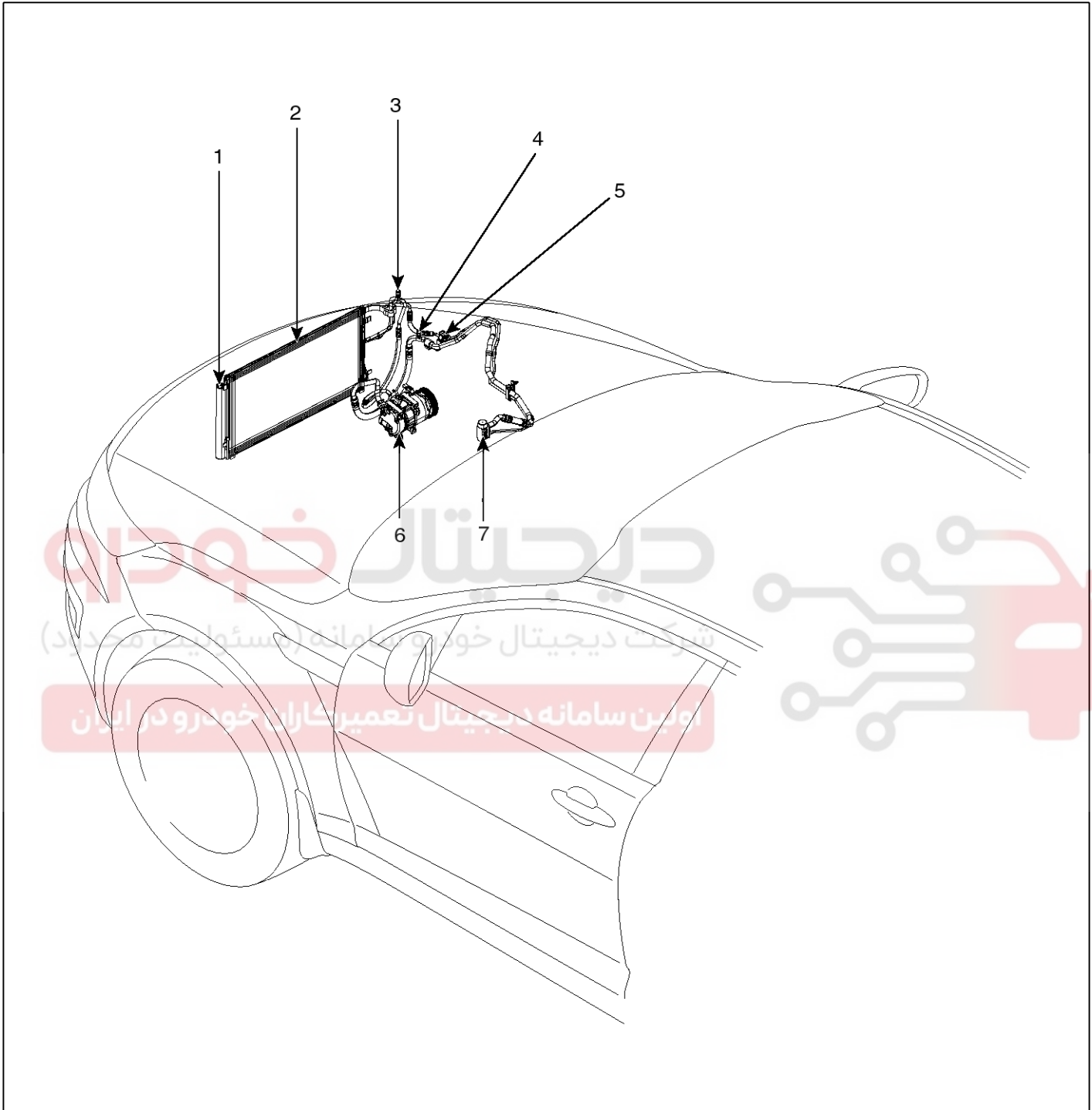


# HA-10

# Heating, Ventilation, Air Conditioning

## Component Location Index

### Engine Room



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- |                        |                            |
|------------------------|----------------------------|
| 1. Receiver Drier      | 5. A/C Pressure Transducer |
| 2. Condenser           | 6. Compressor              |
| 3. Service Port (High) | 7. Expansion Valve         |
| 4. Service Port (Low)  |                            |

# Air Conditioning System

# HA-11

## Interior

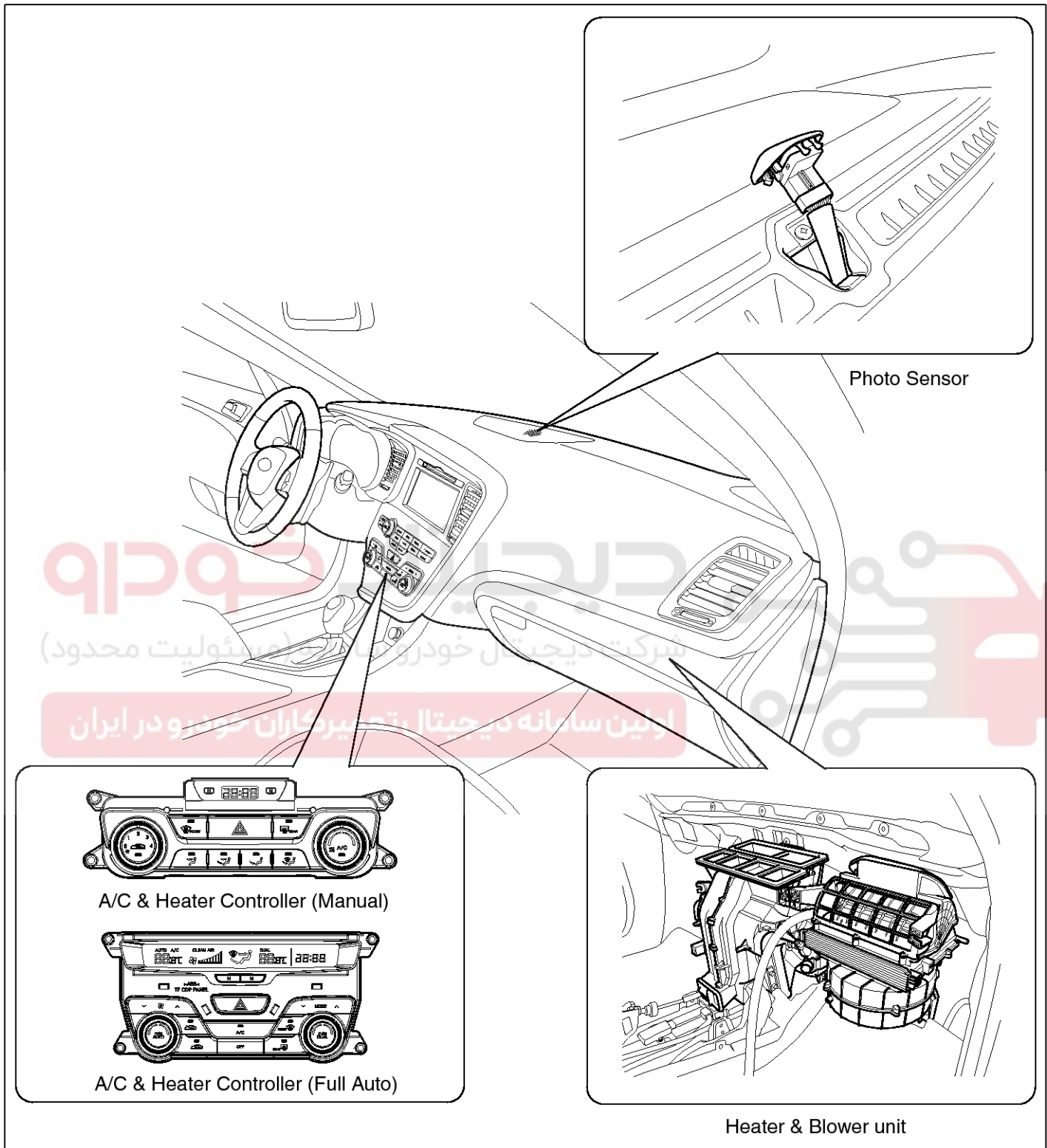
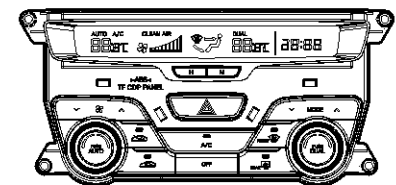


Photo Sensor

A/C & Heater Controller (Manual)



A/C & Heater Controller (Full Auto)

Heater & Blower unit

STFHA1001N

# HA-12 Heating, Ventilation, Air Conditioning

## Compressor Oil

### Oil Specification

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

PAG OIL :  $100 \pm 10$

### Oil Return Operation

There is close affinity between the oil and the refrigerant.

During normal operation, part of the oil recirculation 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.

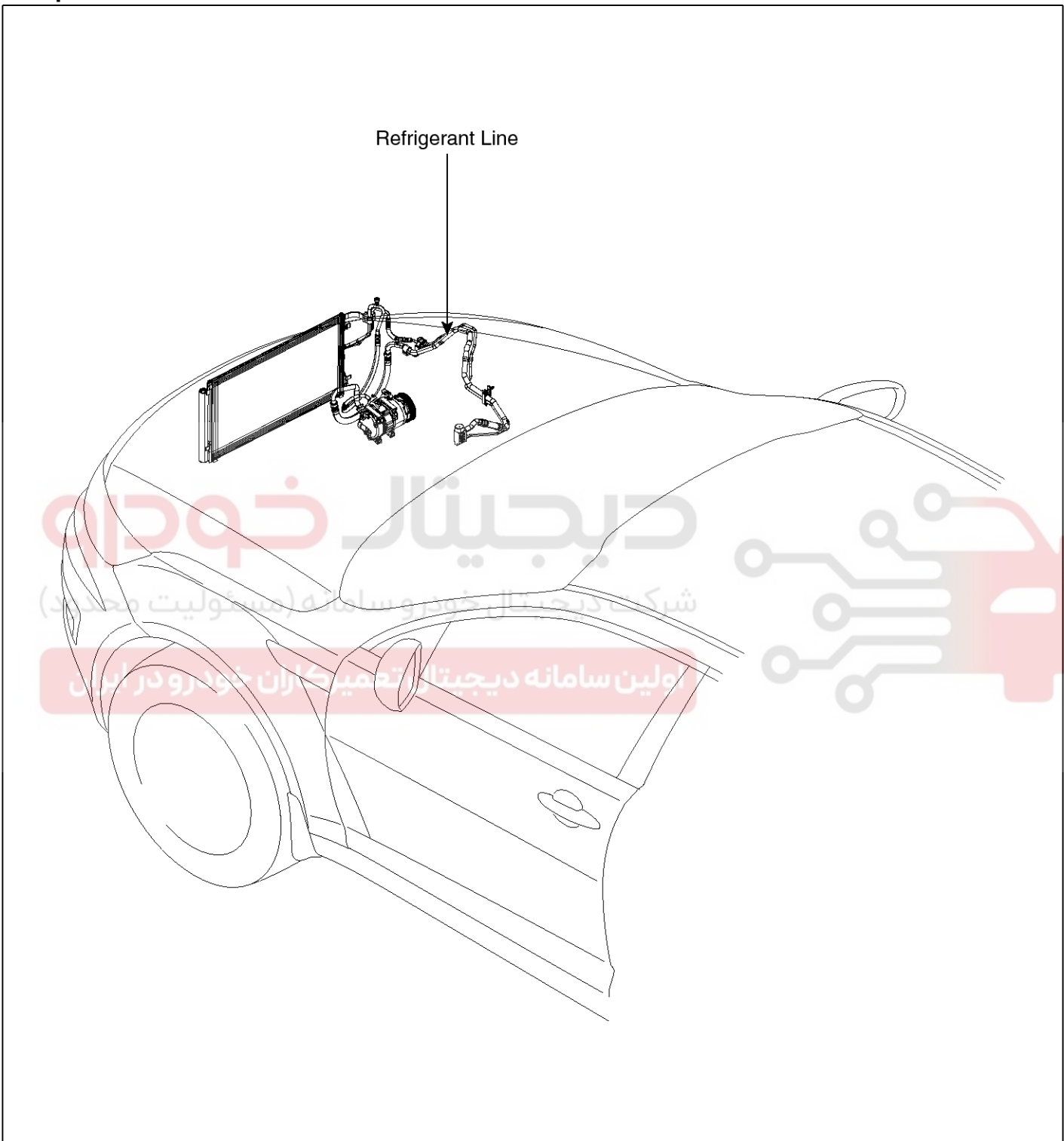


# Air Conditioning System

# HA-13

## Refrigerant line

### Component Location



STFHA1002N

# HA-14

# Heating, Ventilation, Air Conditioning

## Replacement

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	N.m	kgf.m	lb-ft
Condenser - Discharge hose	3.9~5.9	0.4~0.6	2.9~4.3
Condenser - Liquid tube			
Compressor - Discharge hose	3.9~5.9	0.4~0.6	2.9~4.3
Compressor - Suction hose			
Expansion valve - Evaporator	7.8~11.7	0.8~1.2	5.7~8.6

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

**Specified amount** 550 ± 25g (19.4 ± 0.88 oz.)

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

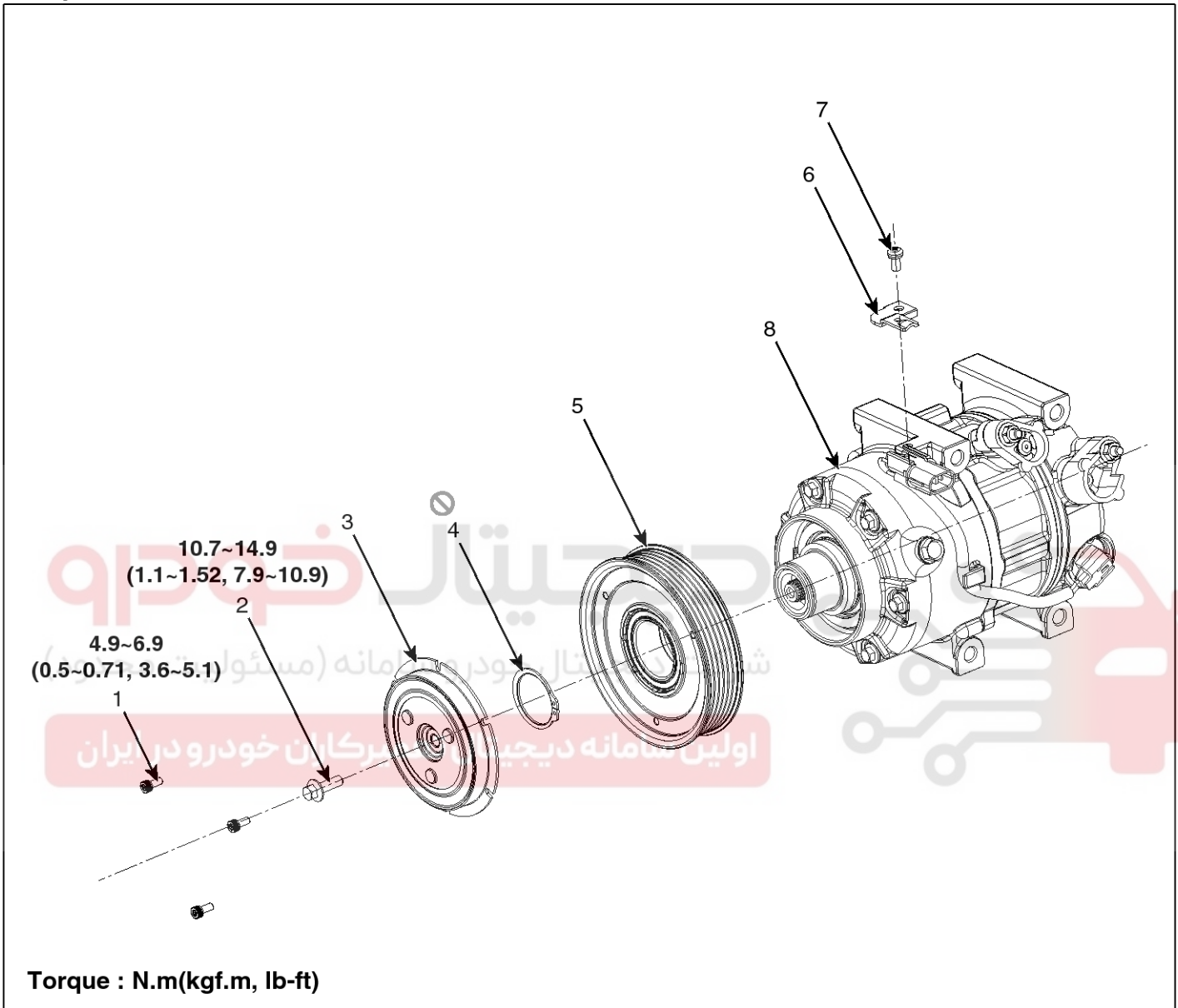


# Air Conditioning System

# HA-15

## Compressor

### Components



STFHA1003N

- 1. Screw
- 2. Bolt
- 3. Disc & Hub Assembly
- 4. Retainer Ring

- 5. Pulley
- 6. Connector Bracket
- 7. Screw
- 8. Compressor Assembly



## HA-16

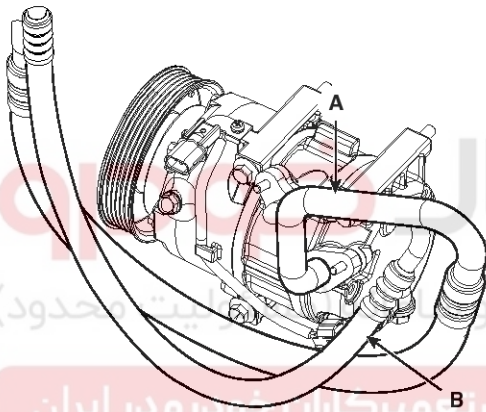
## Heating, Ventilation, Air Conditioning

## 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.  
(Refer to EM group - "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.

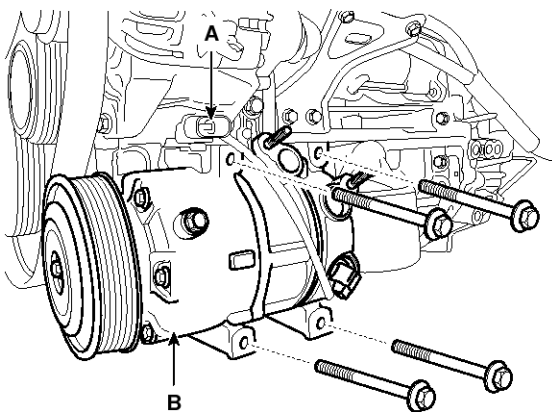
## Tightening torque :

3.9~5.8 N.m(0.4 ~ 0.6 kgf.m, 2.9~4.3 lb-ft)



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



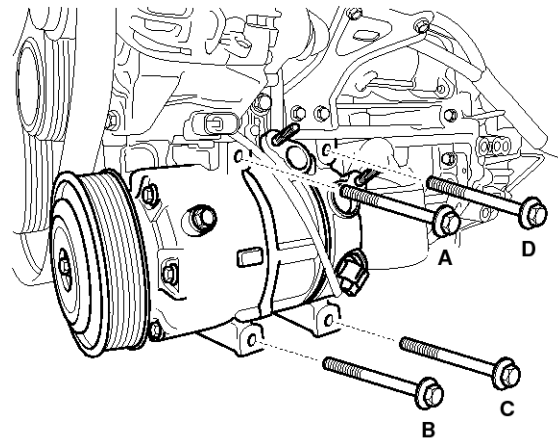
STFHA1007D

## Installation

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

## Tightening torque :

20.0~32.9N.m (2.04~3.36kgf.m, 14.7~24.3lb.ft)



STFHA1008D

2. Install in the reverse order of removal, and note these items

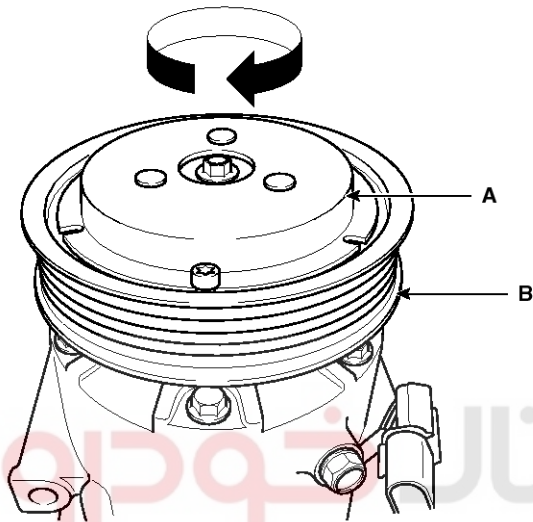
- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume, Subtract the volume of drained oil from 100cc(3.5 oz.) the result is the amount of oil you should drain from the new compressor (through the suction fitting).
- Replace the O-rings 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.
- Adjust the drive belt.
- Charge the system and test its performance.

# Air Conditioning System

## HA-17

### 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.

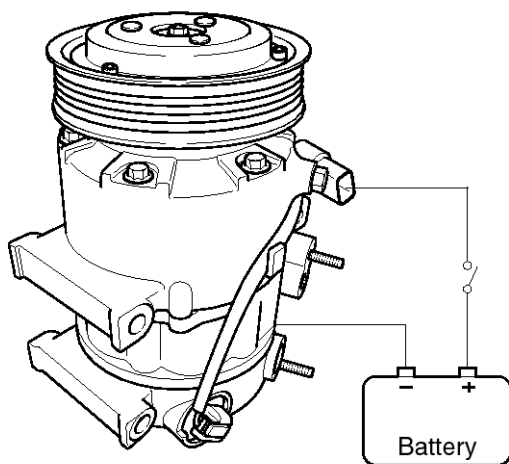


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3. Check operation of the magnetic clutch.

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.



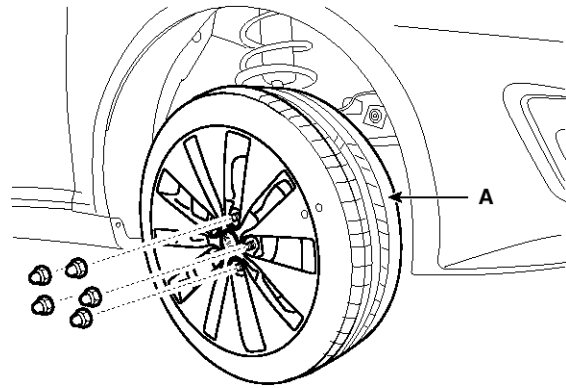
STFHA1016N

### Disassembly

1. Disconnect the negative (-) battery terminal.
2. Remove the front tire (A) from hub assembly.

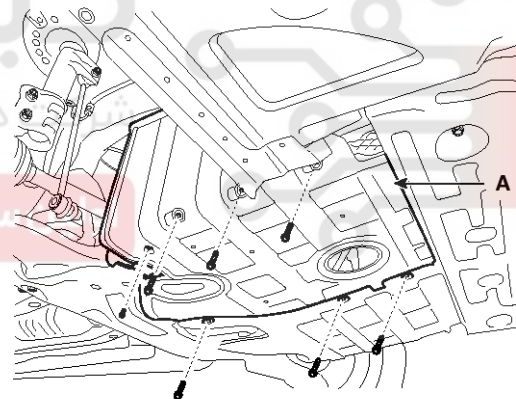
### Tightening torque :

10~15N.m (9~11kgf.m, 7.37~11lb.ft)



STFHA1011D

3. Loosen the mounting bolts and then remove the under cover (A).

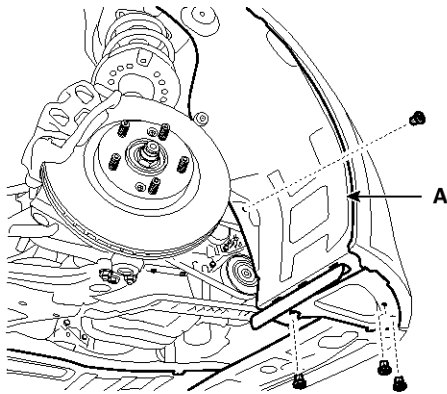


STFHA1012D

# HA-18

# Heating, Ventilation, Air Conditioning

- Loosen the mounting bolts and clip then remove the wheel house (A).

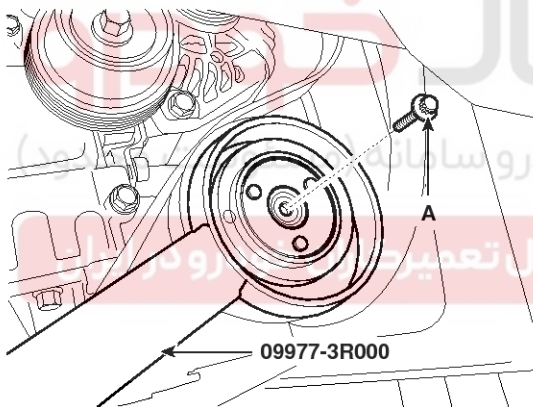


STFHA1013D

- Remove the center bolt (A) while holding the disc & hub assembly with SST( 09977-3R000).

**Tightening torque :**

10.7~14.9N.m (1.1~1.52kgf.m, 7.9~10.9lbf.ft)

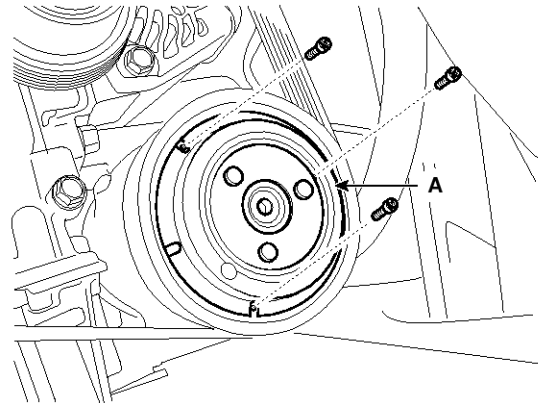


STFHA1014D

- Loosen the mounting screws and then remove the disc & hub assembly (A).

**Tightening torque :**

4.9~6.9 N.m(0.5~0.71Kgf.m, 3.6~5.1 lb-ft)

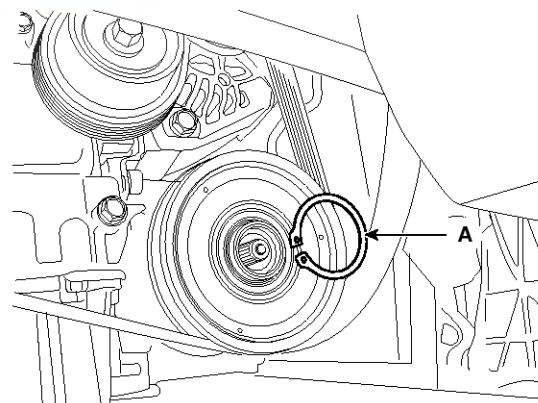


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- Loosen the drive belt.
- (Refer to EM group - "Drive Belt")
- Disconnect the retainer ring (A) and then remove the pulley(B).

**NOTICE**

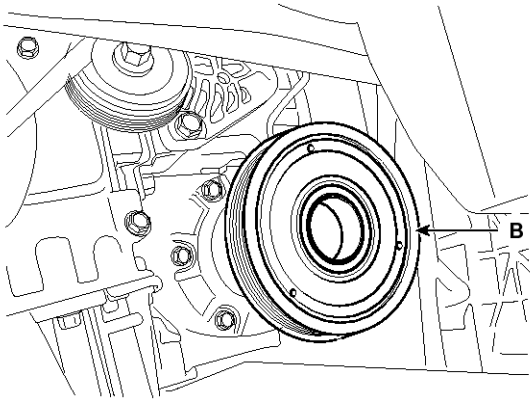
- Be careful not to damage the pulley (B) and compressor during removal/installation.
- Once retainer ring (A) is removed, replace it with a new one.



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# Air Conditioning System

## HA-19



STFHA1017D

9. 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.



شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

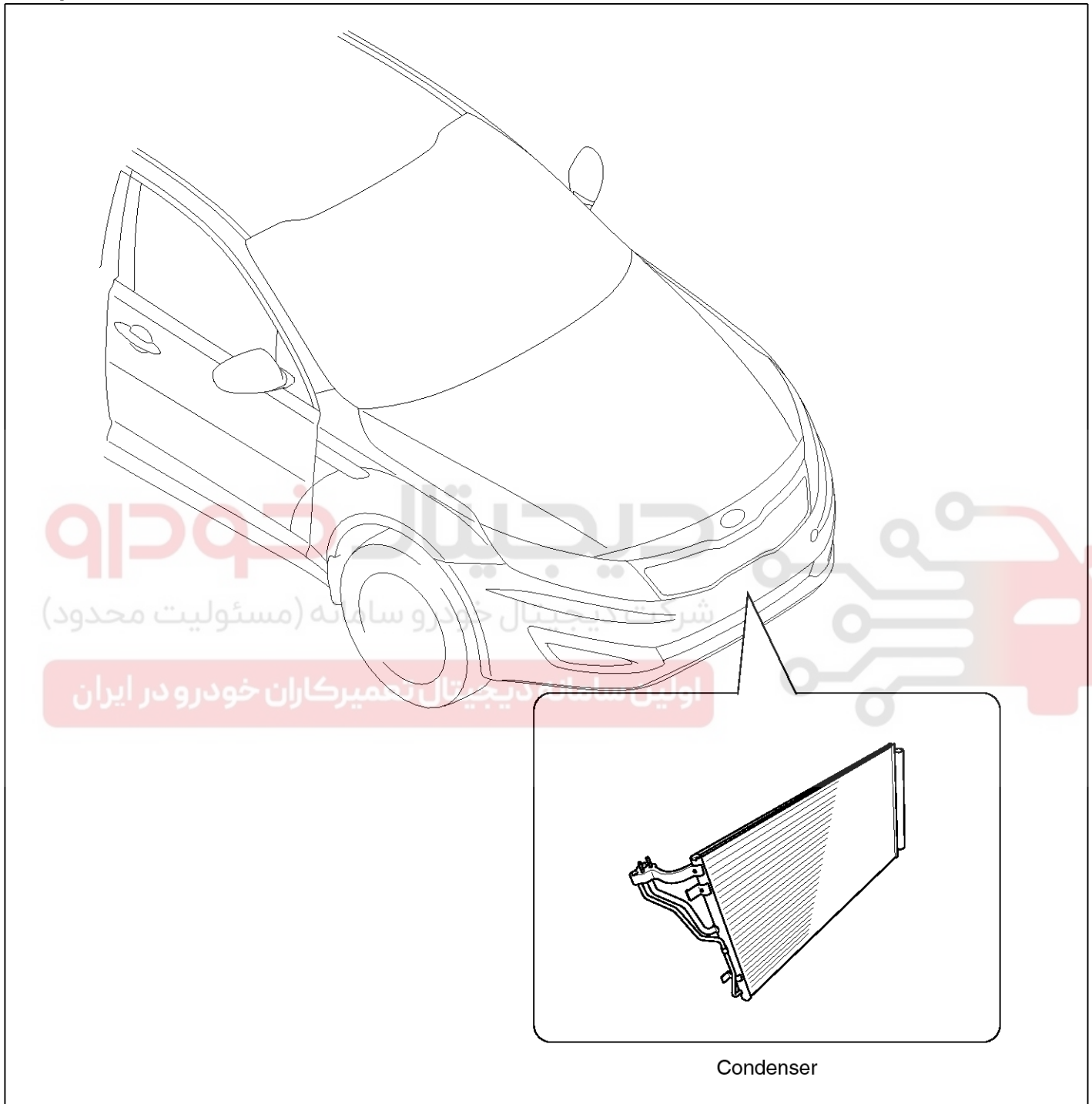
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

# HA-20

# Heating, Ventilation, Air Conditioning

## Condenser

### Component Location



STFHA1004N



# Air Conditioning System

# HA-21

## Inspection

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.

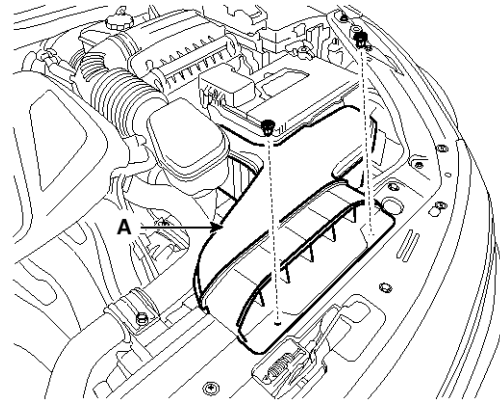
## Replacement

1. Recover the refrigerant with a recovery/ recycling/ charging station.
2. Disconnect the negative (-) battery terminal.
3. Remove the discharge line and liquid line (A) from the condenser.

## Tightening torque :

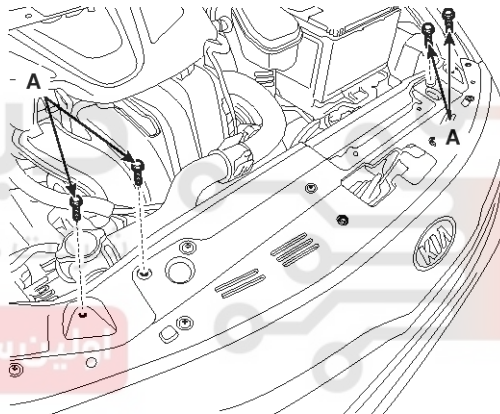
3.9~5.8 N.m(0.4~0.6Kgf.m, 2.9~4.3 lb-ft)

4. Disconnect the mounting clip, and then remove the air duct hose assembly (A).

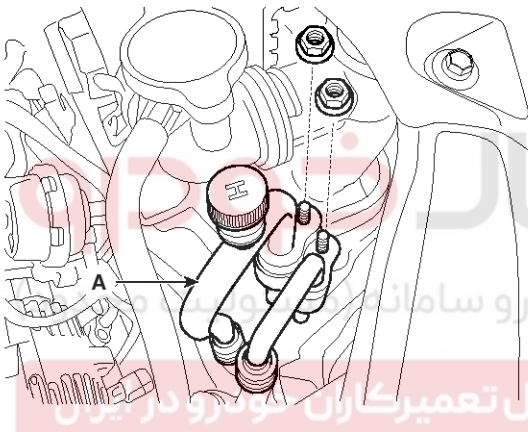


STFHA1020D

5. Loosen the radiator bracket mounting bolts (A).



STFHA1021D



STFHA1019D

## NOTICE

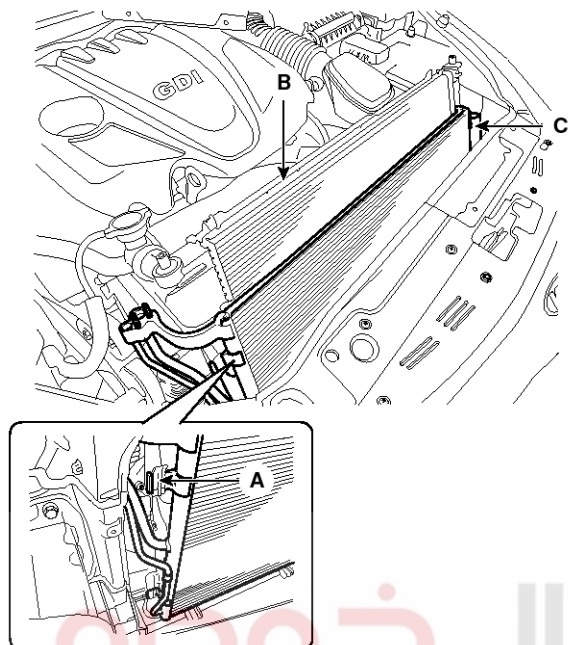
Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



## HA-22

## Heating, Ventilation, Air Conditioning

6. Remove the radiator fan.  
(Refer to EM group - "Radiator")
7. Disconnect the pin (A) and then remove the condenser (C) from radiator (B).



STFHA1022D

8. 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.
- Be sure to install the lower mount cushions of condenser securely into the holes.
- Charge the system, and test its performance.



# Air Conditioning System

## HA-23

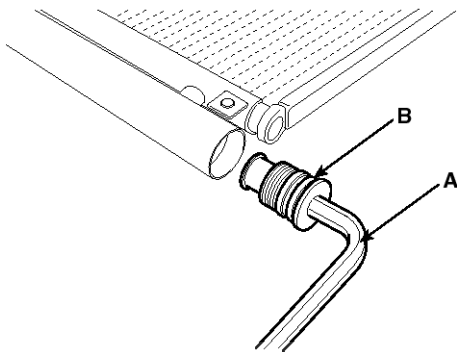
### Receiver-Drier

#### Replacement

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

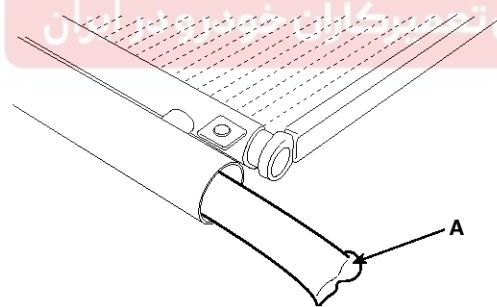
#### Tightening torque :

20~25N.m (2.0~2.5kgf.m, 14.5~18.2lb-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.

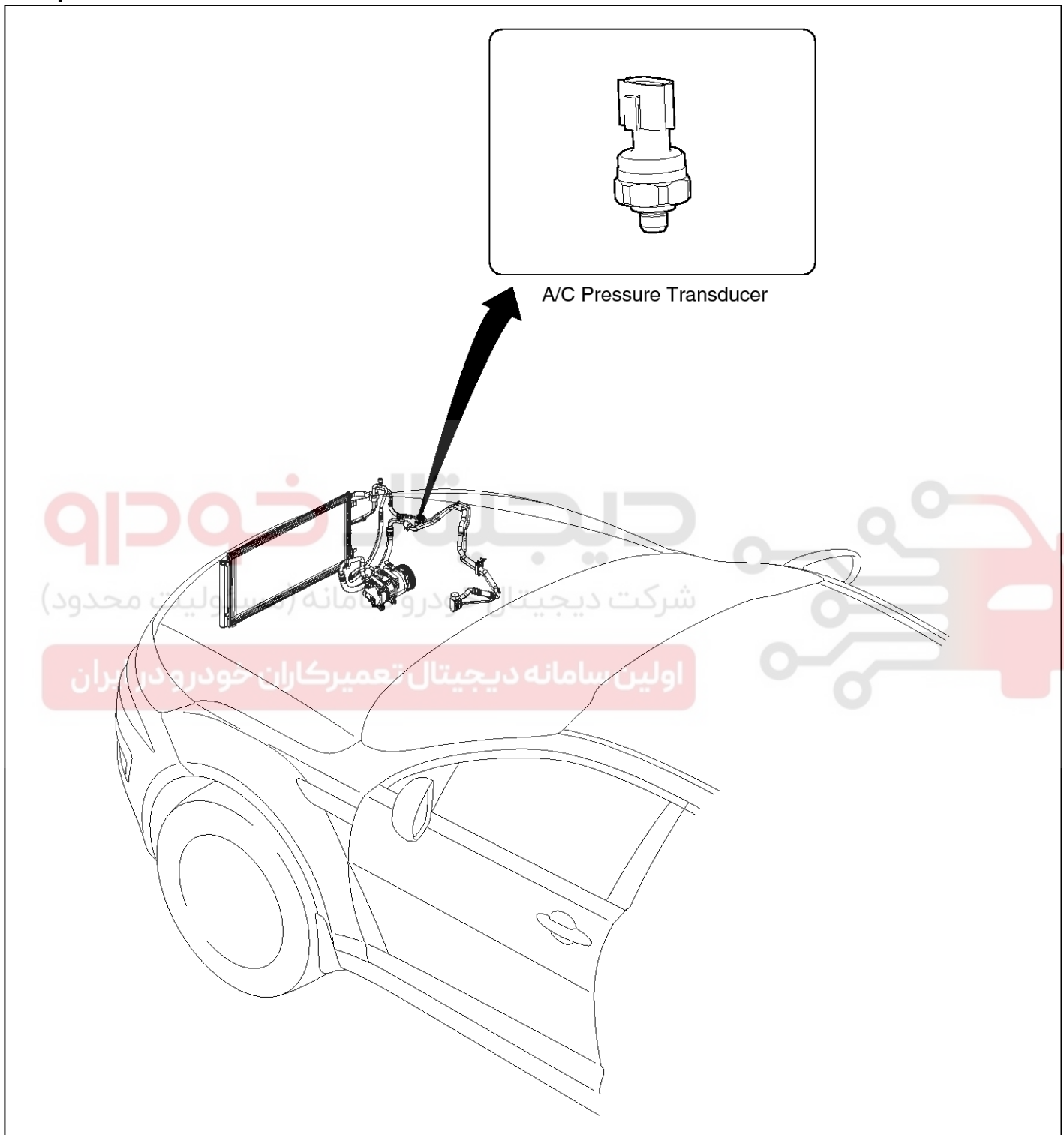


# HA-24

# Heating, Ventilation, Air Conditioning

## A/C Pressure Transducer

### Component Location



STFHA1005N

# Air Conditioning System

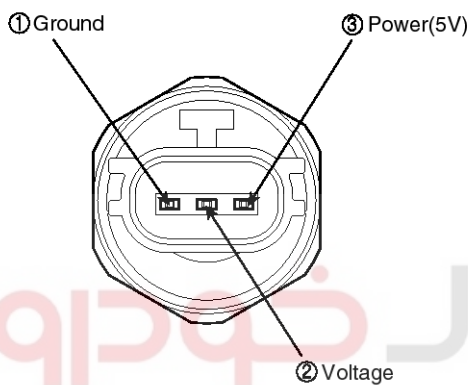
# HA-25

## 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.

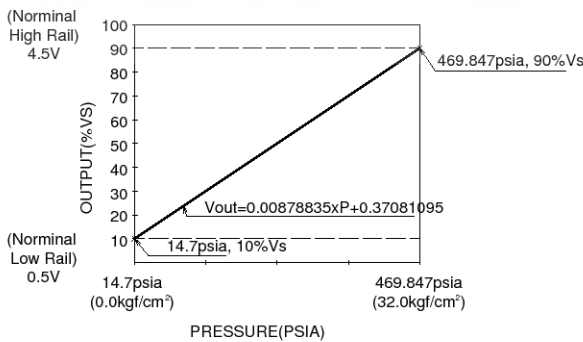
## Inspection

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.



SYFHA0020D

$$\text{Voltage} = 0.00878835 * \text{Pressure} + 0.5[\text{PSIA}]$$

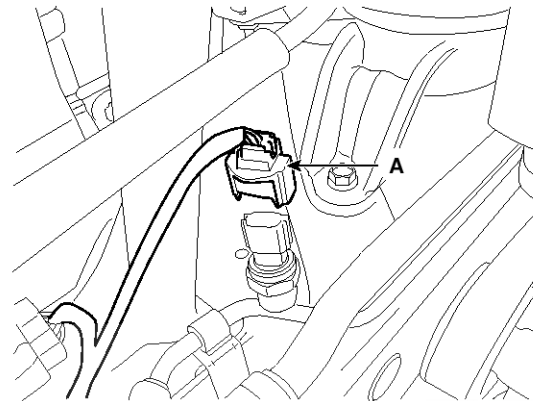
3. If the measured voltage value is not specification, replace the A/C pressure transducer.

## Replacement

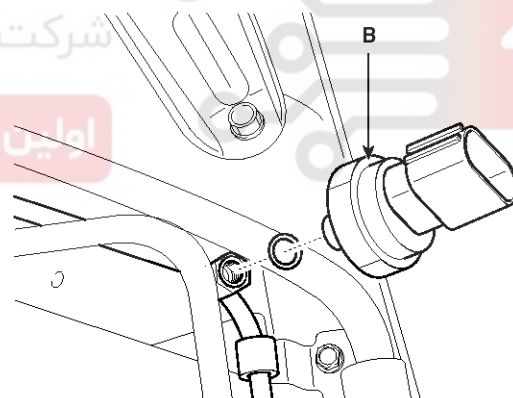
1. Disconnect the negative (-) battery terminal.
2. Recover the refrigerant with a recovery/charging station.
3. Disconnect the A/C pressure transducer connector (3P) (A).

## Tightening torque :

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



STFHA1027D



STFHA1028D

## CAUTION

Take care that liquid & suction pipe are not bent.

4. Installation is the reverse order of removal.

# HA-26

# Heating, Ventilation, Air Conditioning

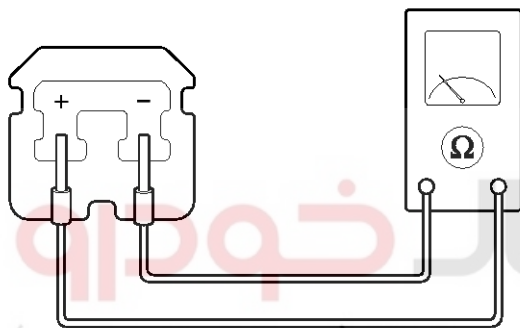
## Evaporator Temperature Sensor

### 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

### Inspection

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



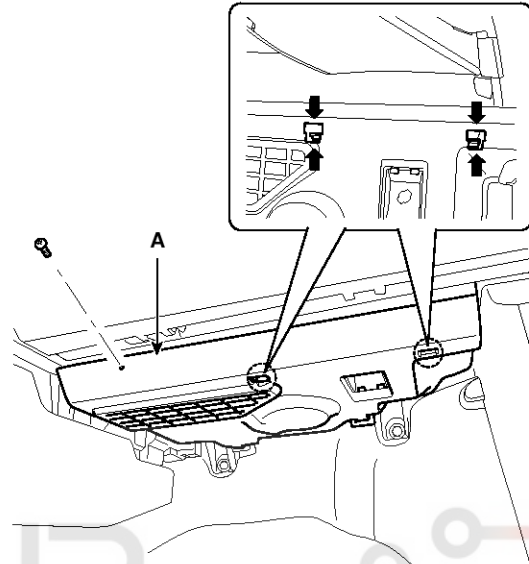
AQJF206B

### Specification

Evaporator core temperature [°C (°F)]	Resistance [KΩ]
-10	18.31
0	11.60
10	7.55
20	5.04
30	3.44
40	2.40

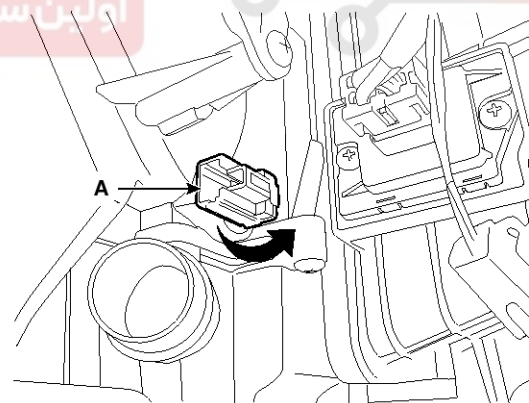
### Replacement

1. Disconnect the negative (-) battery terminal.
2. Loosen the mounting screw and then remove the crash pad lower cover (A).



STFBD1138D

3. Remove the evaporator temperature sensor (A), by pulling it after rotating 90° in a counterclockwise direction.



STFHA1031D

4. Installation is the reverse order of removal.

# Air Conditioning System

## HA-27

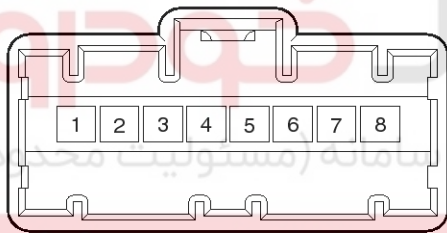
### Photo Sensor

#### Description

1. The photo sensor is located at the right 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. 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.

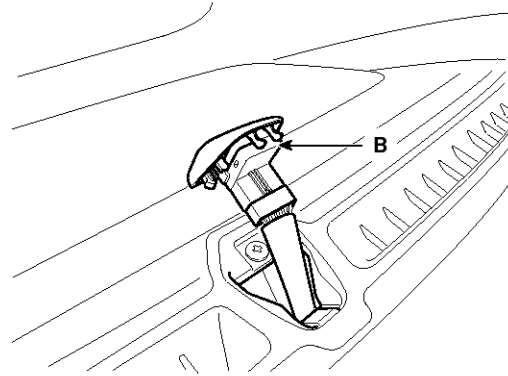


STFHA1034D

- |                             |                      |
|-----------------------------|----------------------|
| 1. Auto Light Signal        | 5. Led GND (To BCM)  |
| 2. Auto Light Signal Signal | 6. Photo Signal (LH) |
| 3. Photo Signal (RH)        | 7. Photo Power (SW)  |
| 4. Led power (BAT)          | 8. 5V (Vcc)          |

#### Replacement

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



STFHA1035D

3. Install in the reverse order of removal.



# HA-28 Heating, Ventilation, Air Conditioning

## 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.

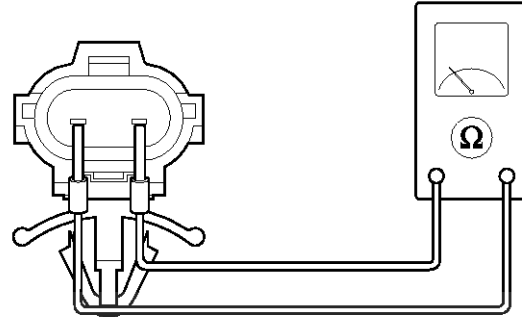
### NOTICE

If the ambient temperature is below 0°C (32.0°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.



AQJF204B

1. Sensor Ground

2. Ambient Sensor Signal

### Specification

Ambient temperature [°C (°F)]	Resistance between terminals 1 and 2 (kΩ)
-30(-22)	480.41
-20(-4)	271.21
-10(14)	158.18
0 (32)	95.10
10 (50)	58.80
20 (68)	37.32
30(86)	23.76
40(104)	16.13
50(122)	10.95

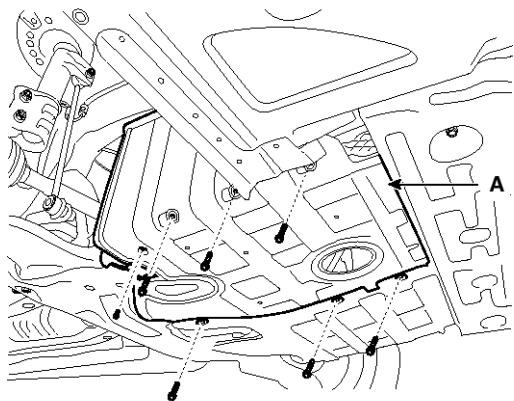
4. If the measured resistance is not specification, substitute with a known-good ambient temperature sensor and check for proper operation.
5. If the problem is corrected, replace the ambient temperature sensor.

# Air Conditioning System

HA-29

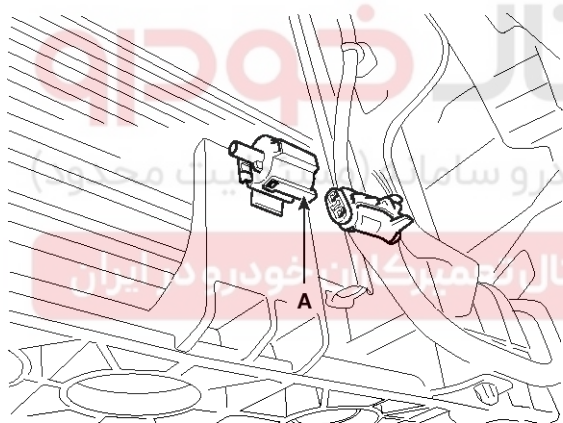
## Replacement

1. Disconnect the negative (-) battery terminal.
2. Loosen the mounting bolts and then remove the under cover (A).



STFHA1012D

3. Disconnect the connector and then remove the ambient temperature sensor (A).



STFHA1037D

4. Installation is the reverse order of removal.

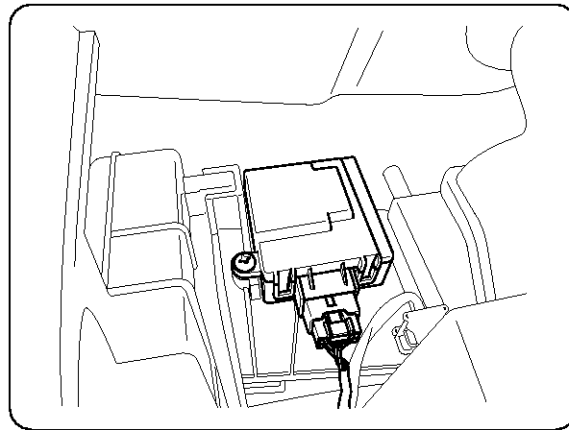


# HA-30

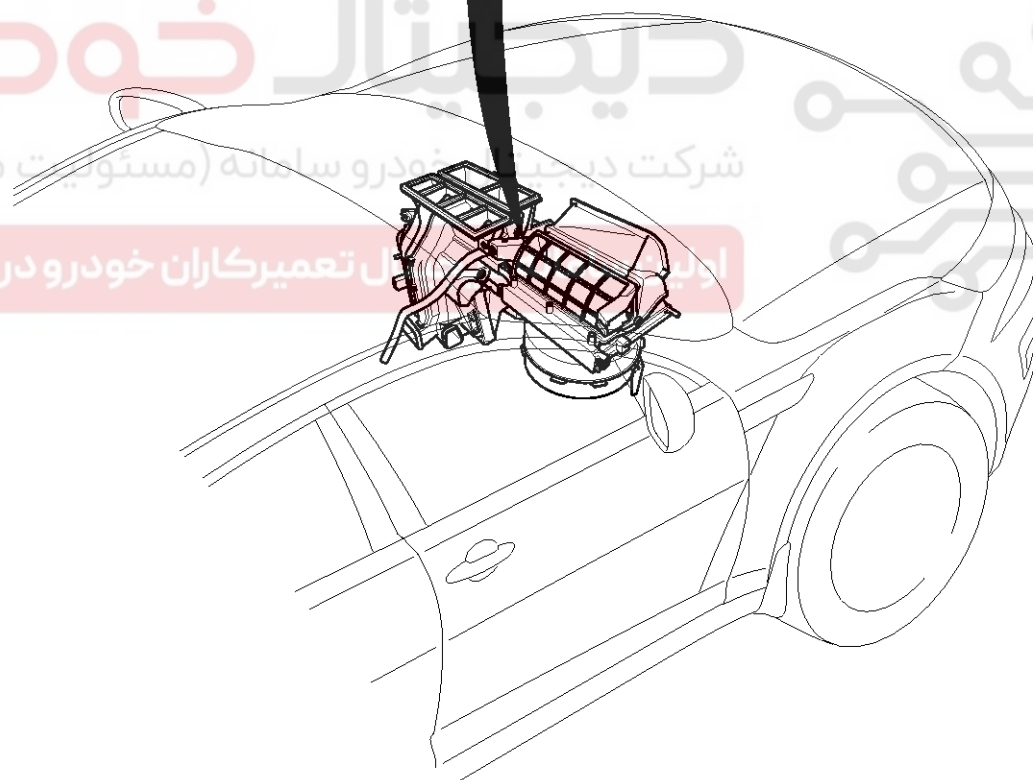
# Heating, Ventilation, Air Conditioning

## Cluster ionizer

### Component Location



Cluster Ionizer



دیجیتال خودرو  
شرکت دیجیتال خودرو سامانه (مستویات محدود)  
ادبیات تعمیرکاران خودرو در ایران

STFHA1006N

# Air Conditioning System

## HA-31

### Description

1. The function of cluster ion generator is cleaning air by sterilizing and dissolving of air conditioner.
2. The function of cluster ion generator is controlling mold caused by stench of air conditioner and external inflow of air.

### Inspection

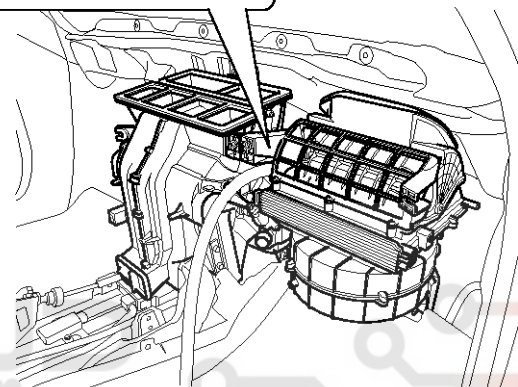
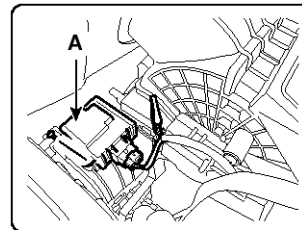
1. Press the MODE switch more than 4 times within 2 seconds while pressing the OFF switch.

Display	Fail description
00	Normal
50	Cluster ion generator fault

\* Diagnostic procedure refer to DTC code.

### Replacement

1. Disconnect the negative (-) battery terminal.
2. Remove the crash pad.  
(Refer to BD group - "Crash Pad")
3. Loosen the screws and then remove the cluster ionizer (A).



STFHA1039D

4. Installation is the reverse order of removal.

دیجیتال خودرو  
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

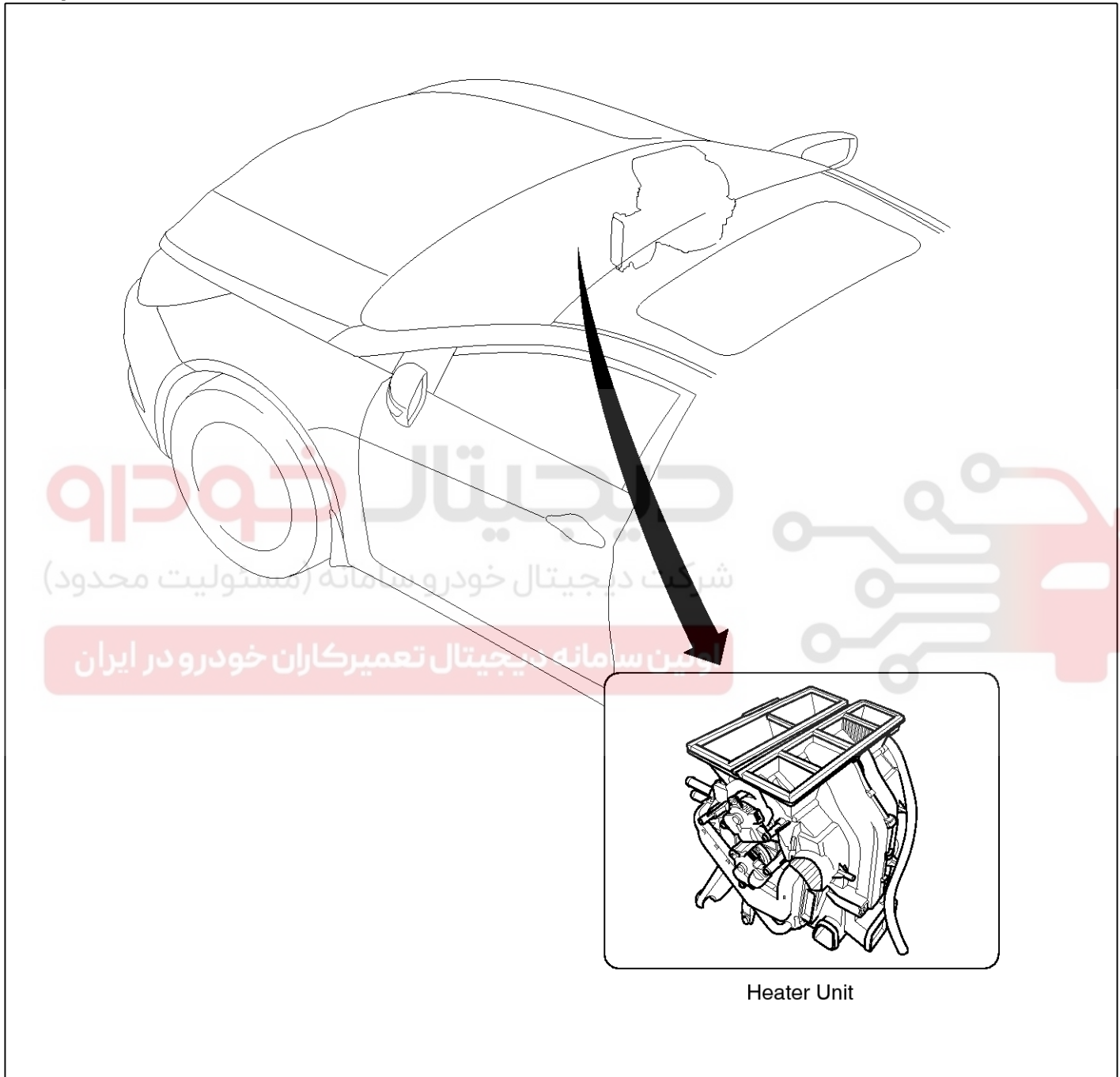
# HA-32

# Heating, Ventilation, Air Conditioning

## Heater

### Heater Unit

#### Component Location

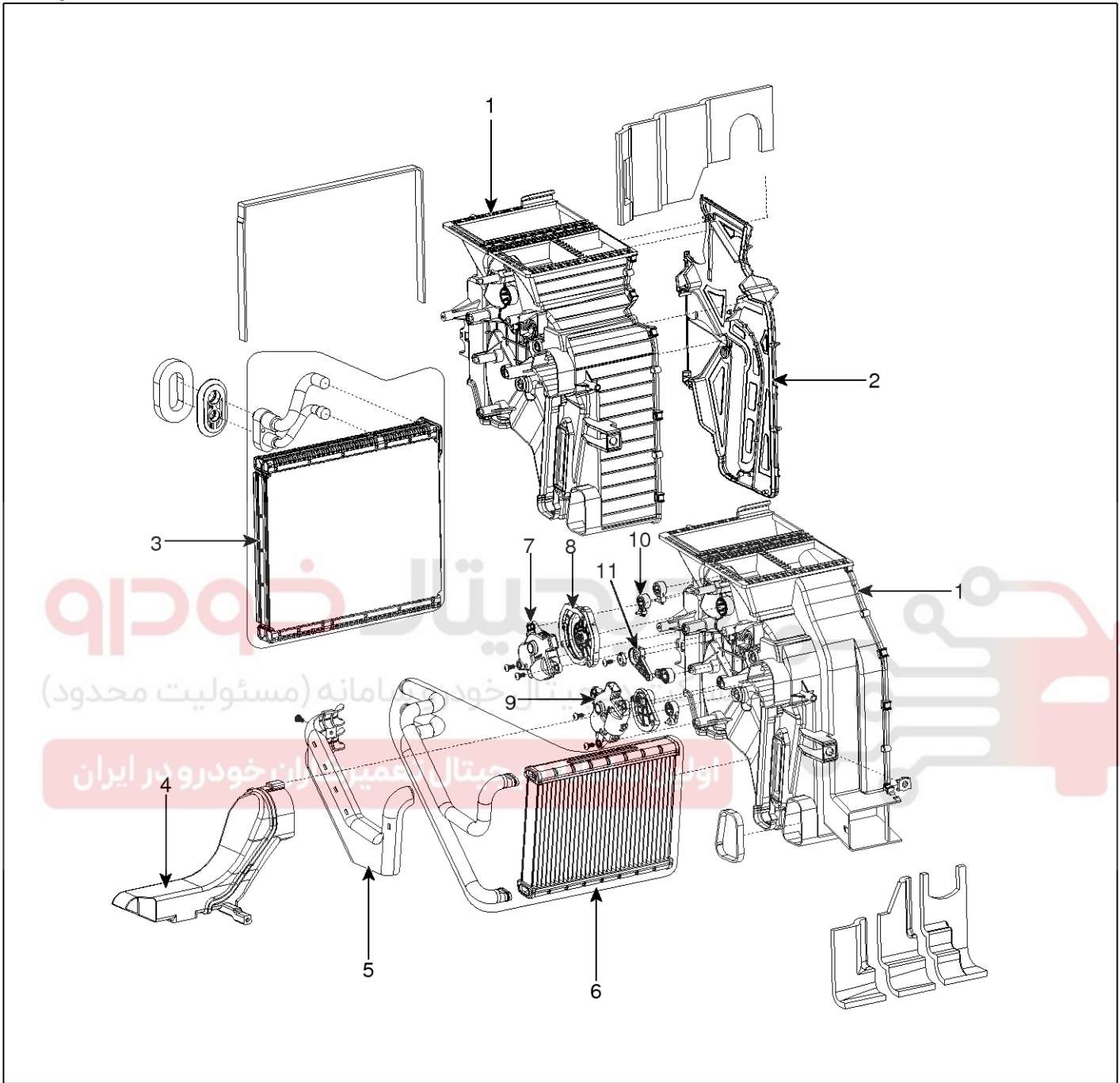


STFHA1007N

# Heater

# HA-33

## Components



STFHA1041D

- 1. Heater Case (LH)
- 2. Separator
- 3. Evaporator Core
- 4. Shower Duct

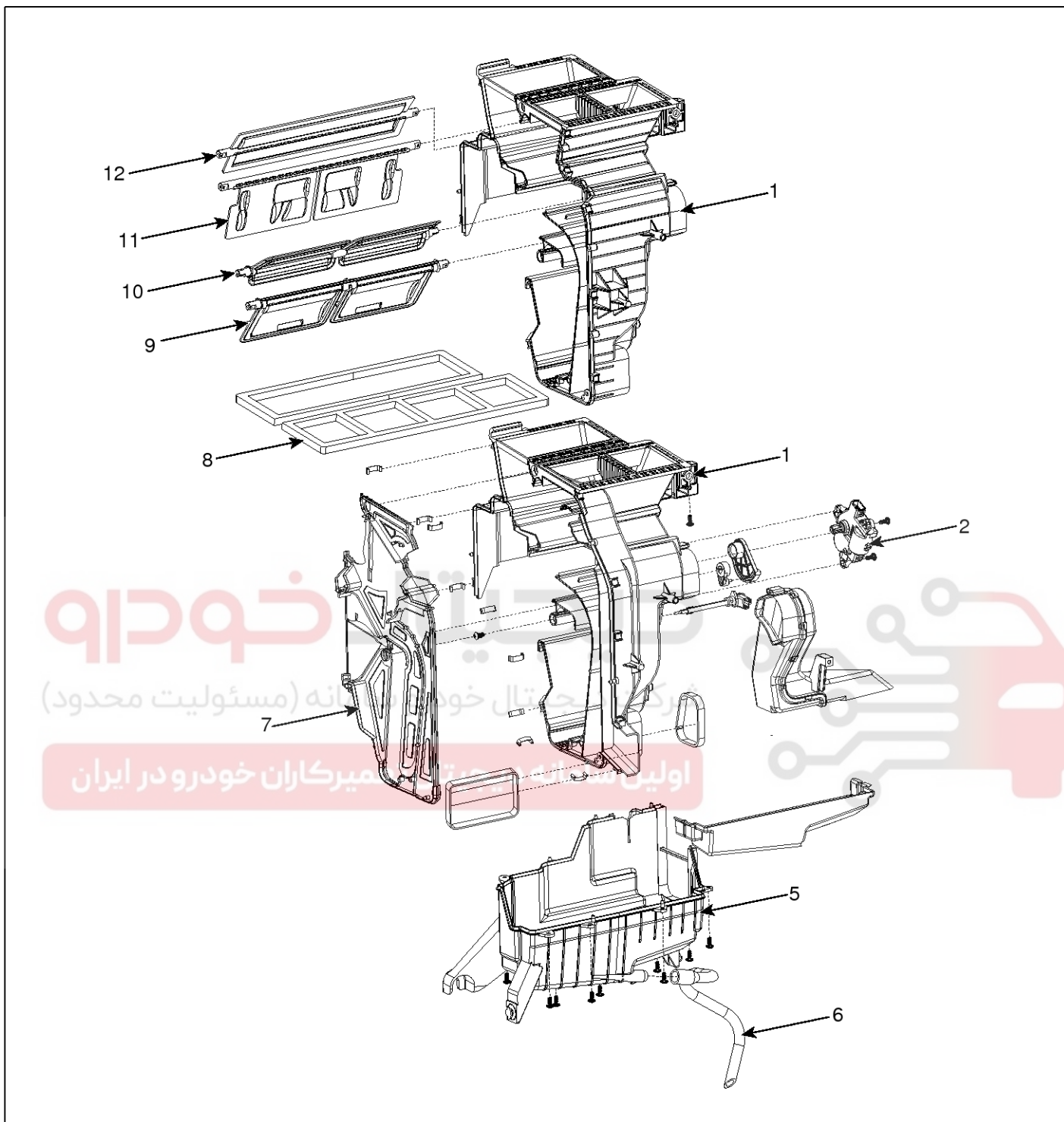
- 5. Heater Core Cover
- 6. Heater Core
- 7. Mode Actuator
- 8. Mode Cam

- 9. Temp Actuator
- 10. Vent Door Arm
- 11. Floor Door Arm



# HA-34

# Heating, Ventilation, Air Conditioning



STFHA1042D

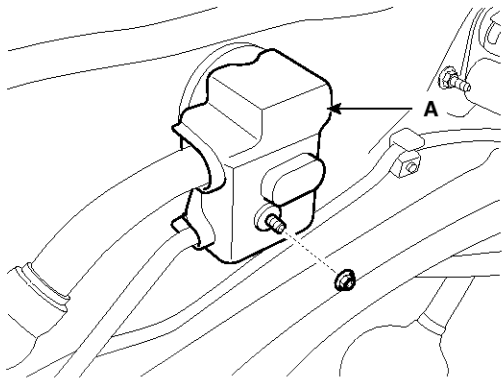
- |                           |                       |                      |
|---------------------------|-----------------------|----------------------|
| 1. Heater Case (RH)       | 5. Heater Lower Cover | 9. Temp Control Door |
| 2. Temp Actuator (PA)     | 6. Drain Hose         | 10. Floor Door       |
| 3. Temp Door Lever        | 7. separator          | 11. Vent Door        |
| 4. Evaporator Temp Sensor | 8. Insulator          | 12. Def Door         |

# Heater

# HA-35

## Replacement

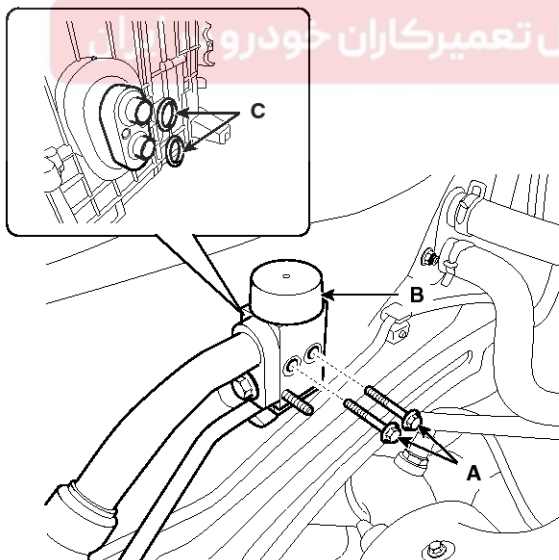
1. Disconnect the negative (-) battery terminal.
2. Recover the refrigerant with a recovery/ recycling/ charging station.
3. When the engine is cool, drain the engine coolant from the radiator.
4. Remove the expansion valve cover (A).



STFHA1043D

5. Remove the bolts (A) and the expansion valve (B) from the evaporator core.

**Tightening torque :**  
7.8 ~ 11.7 N.m ( 0.8 ~ 1.2 kgf.m, 5.7 ~ 8.6 lb-ft)

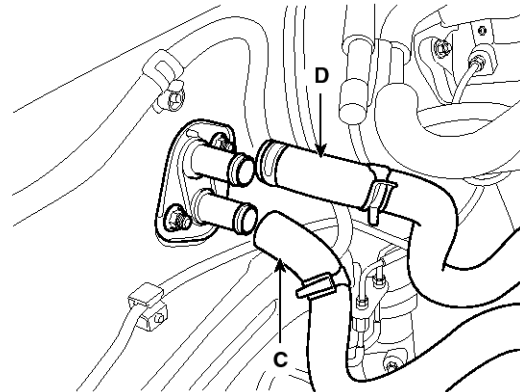


STFHA1044D

### ⚠ CAUTION

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

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

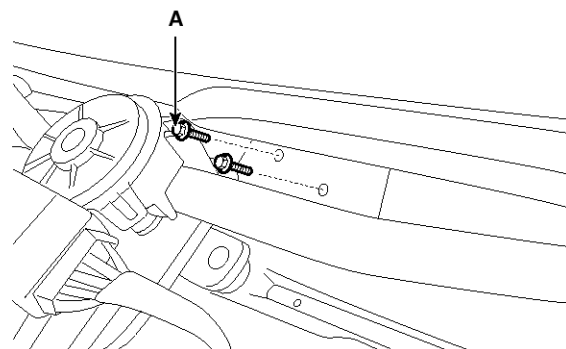


STFHA1045D

### ⚠ 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 center console.  
(Refer to BD group - "Center Console")
8. Remove the shift lever housing assembly.  
(Refer to TR grou - "Shift Lever")
9. Remove the steering handle and column.  
(Refer to ST group - "Steering Column")
10. Loosen the cowl cross member mounting bolts (A).

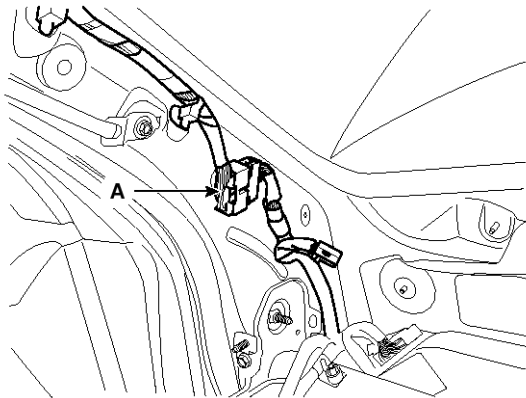


STFHA1013N

# HA-36

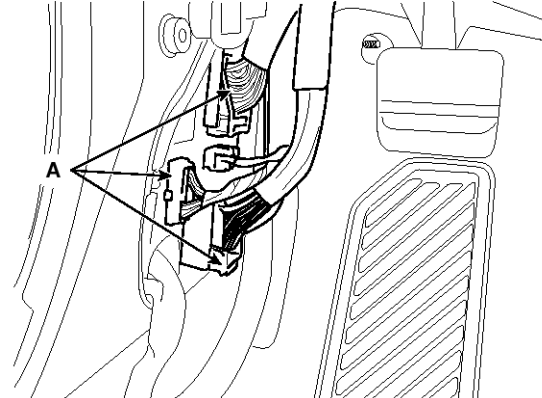
# Heating, Ventilation, Air Conditioning

11. Remove the front pillar trim and then disconnect the connector (A).

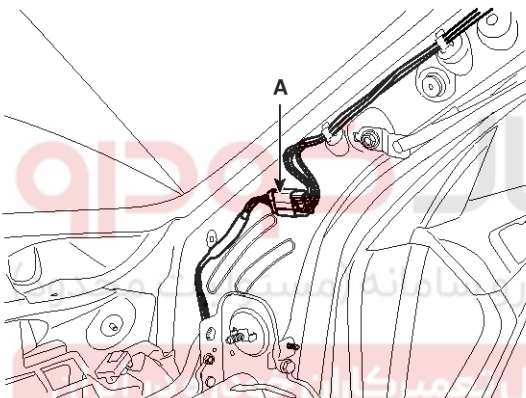


STFHA1046D

13. Remove the cowl side trim and then disconnect the connectors (A).

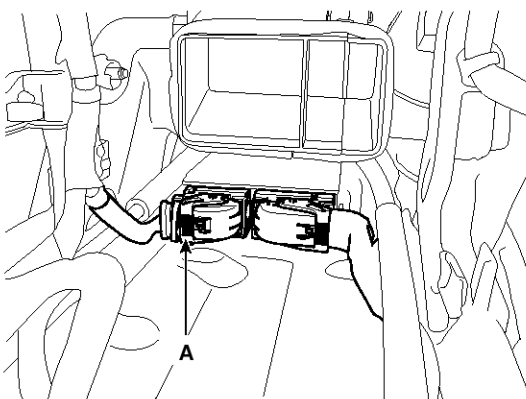


STFHA1048D

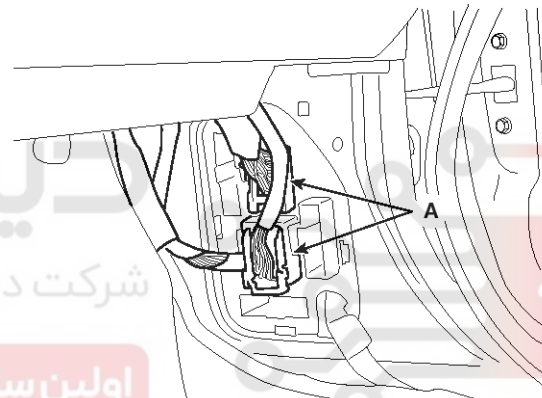


STFHA1047D

12. Disconnect the air bag connector (A).

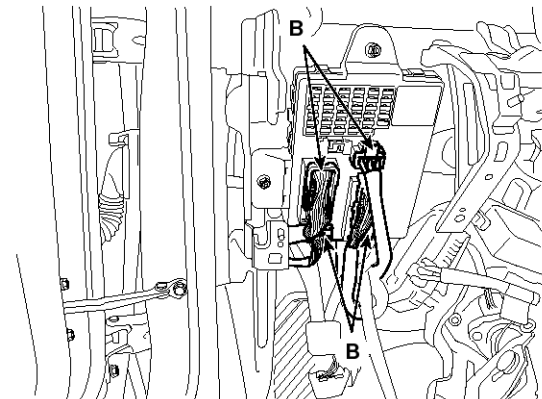


STFHA1014N



STFHA1050D

14. Disconnect the fuse box connector (B).

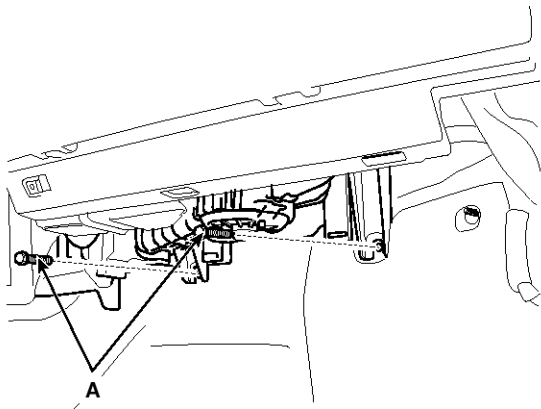


STFHA1049D

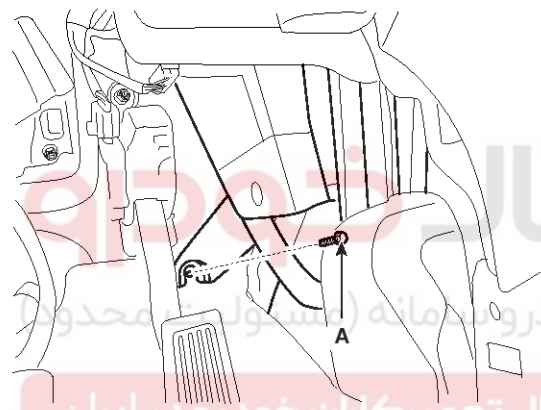
# Heater

# HA-37

15. Loosen the heater & blower unit mounting bolts.

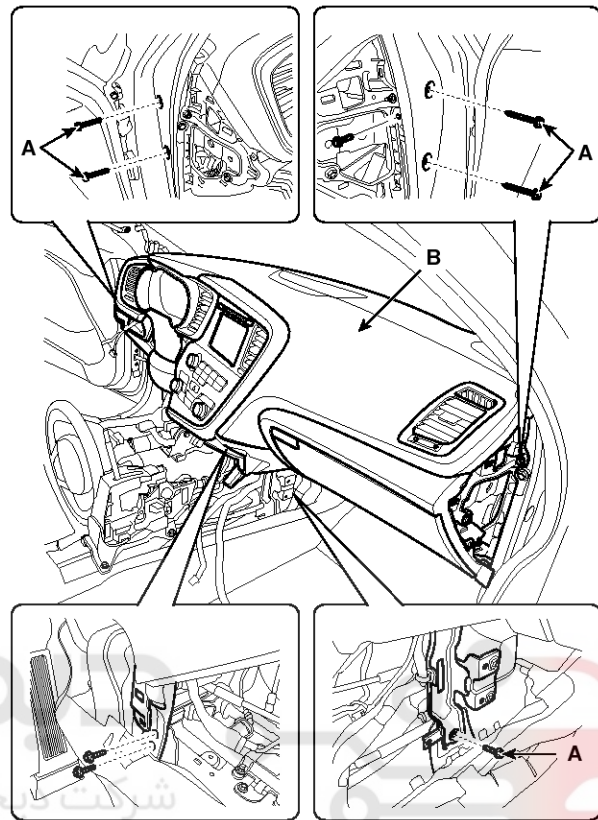


STFHA1051D



STFHA1052D

16. Loosen the cowl cross member mounting bolts (A) and then remove the crash pad and heater blower unit (B).

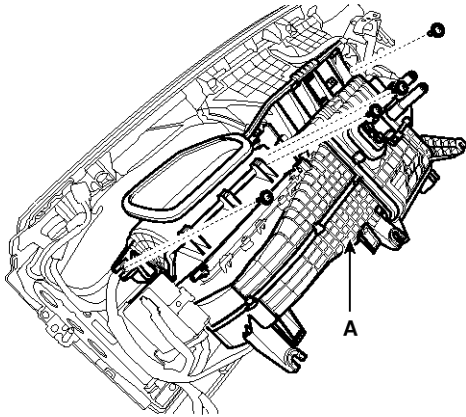


STFHA1055D

# HA-38

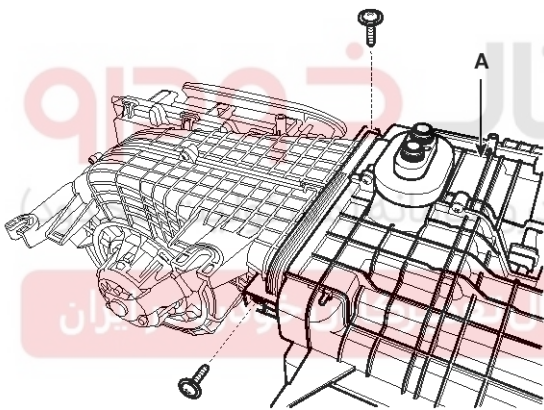
# Heating, Ventilation, Air Conditioning

17. Disconnect the connectors and then remove the heater blower unit (A) from crash pad.



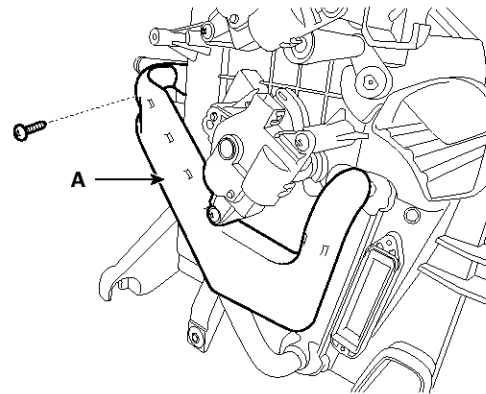
STFHA1058D

18. Remove the blower unit (A) from heater unit after loosening screws.



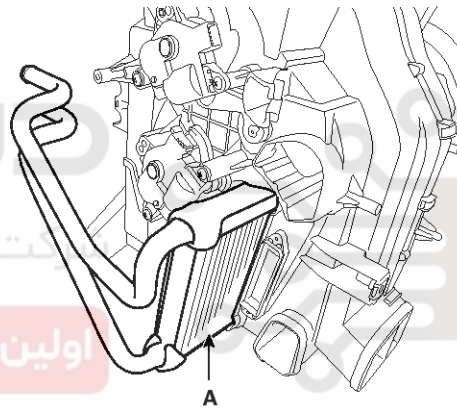
STFHA1059D

19. Loosen the mounting screw and then remove the heater core cover (A).



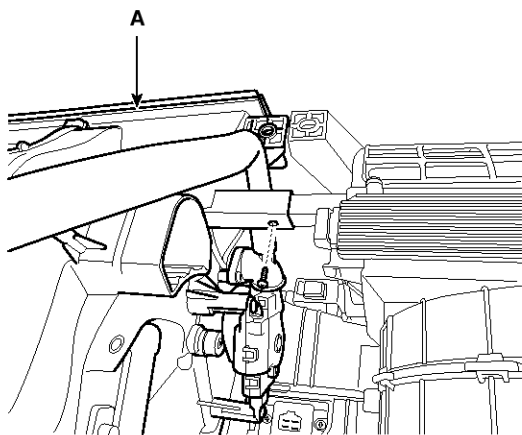
STFHA1061D

20. Disconnect the heater core (A) from heater unit.

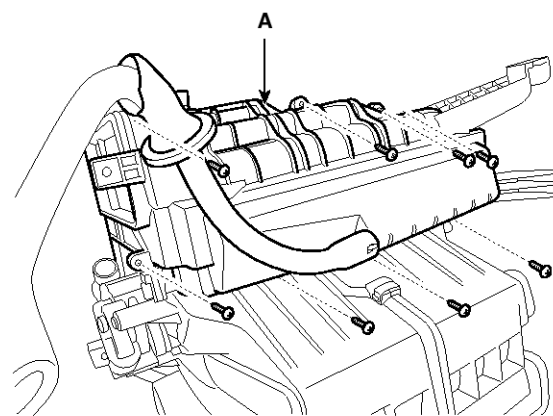


STFHA1062D

21. Loosen the mounting screws and then remove the heater unit lower case (A).



STFHA1060D



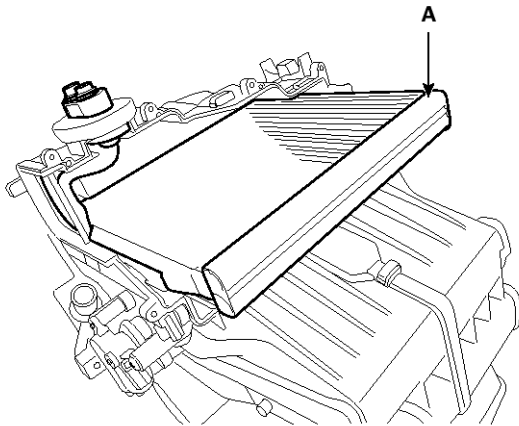
SYFHA0048D



# Heater

# HA-39

22. Remove the evaporator core (A).



STFHA1064D

23. Installation is the reverse order of removal.

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



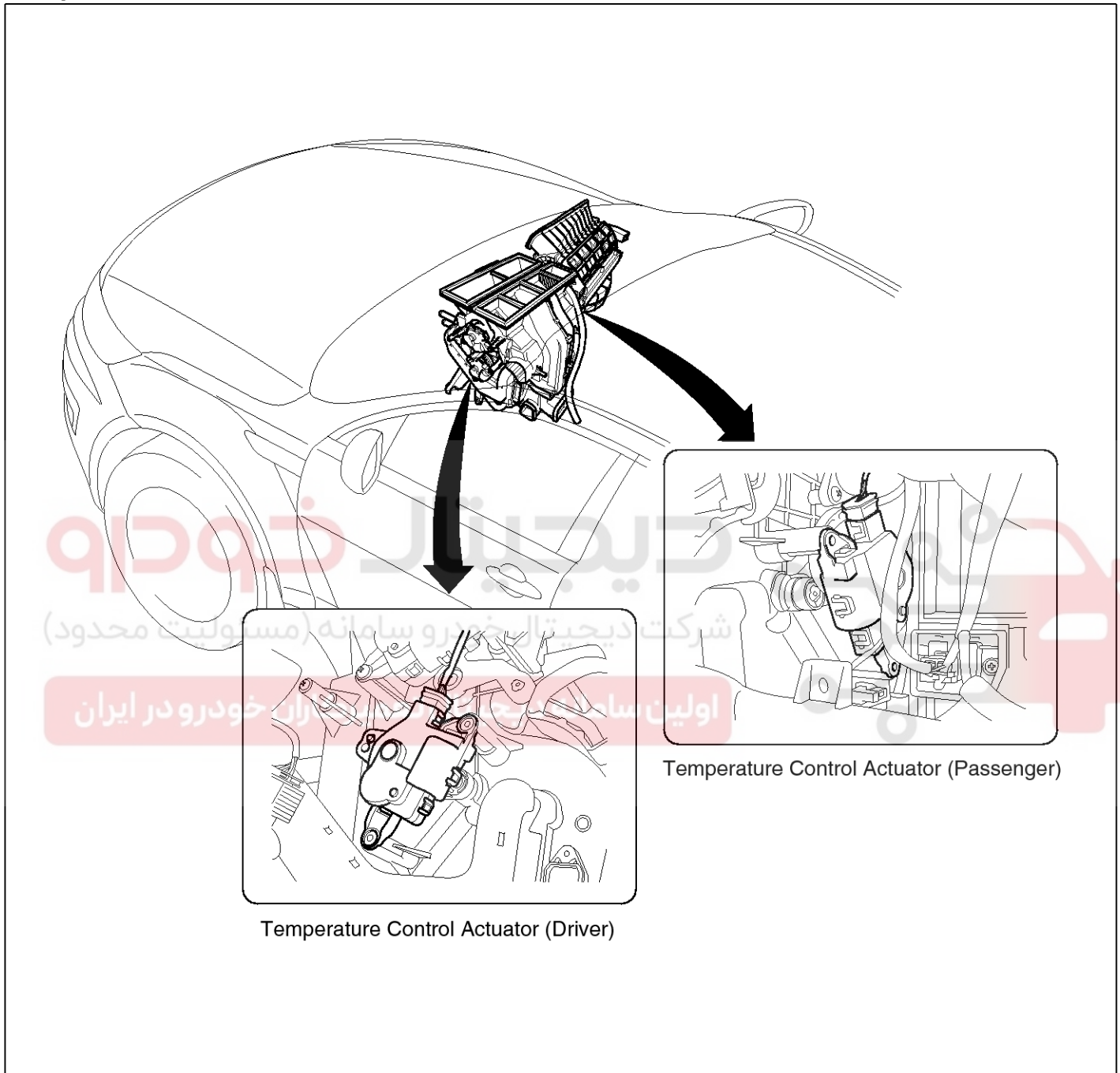


# HA-40

# Heating, Ventilation, Air Conditioning

## Temperature Control Actuator

### Component Location



STFHA1008N

# Heater

# HA-41

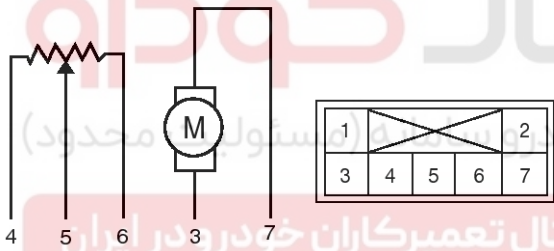
## Description

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

## 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 3 and grounding terminal 7.
- Verify that the temperature control actuator operates to the cool position when connecting in the reverse.

## [Drive]



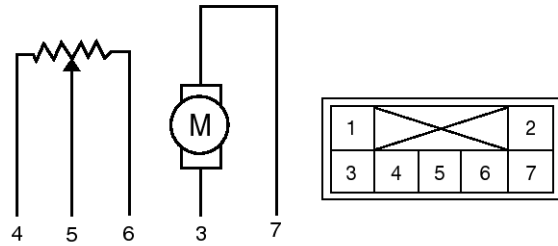
STFHA1066D

1. -
  2. -
  3. Cool position
  4. Sensor ground
  5. Feedback signal
  6. 5V (Vcc)
  7. Hot position
4. Check the voltage between terminals 4 and 5 (Drive).

## Specification

Door position	Voltage(4-5)	Error detecting
Max. cooling	$0.3 \pm 0.15V$	Low voltage :0.1 V or less
Max. heating	$4.7 \pm 0.15V$	High voltage :4.9 V or more

## [Passenger]



STFHA1067D

1. -
  2. -
  3. Cool position
  4. Sensor ground
  5. Feedback signal
  6. 5V (Vcc)
  7. Hot position
5. Check the voltage between terminals 4 and 5 (Passenger).

## Specification

Door position	Voltage(4-5)	Error detecting
Max. cooling	$0.3 \pm 0.15V$	Low voltage :0.1 V or less
Max. heating	$4.7 \pm 0.15V$	High voltage :4.9 V or more

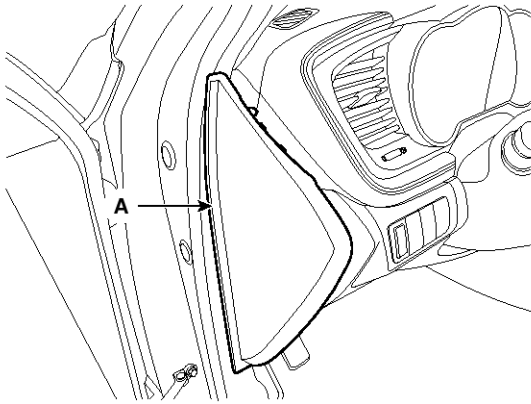
- It will feedback current position of actuator to controls.
6. If the measured voltage is not specification, substitute with a known-good temperature control actuator and check for proper operation.
  7. If the problem is corrected, replace the temperature control actuator.

# HA-42

# Heating, Ventilation, Air Conditioning

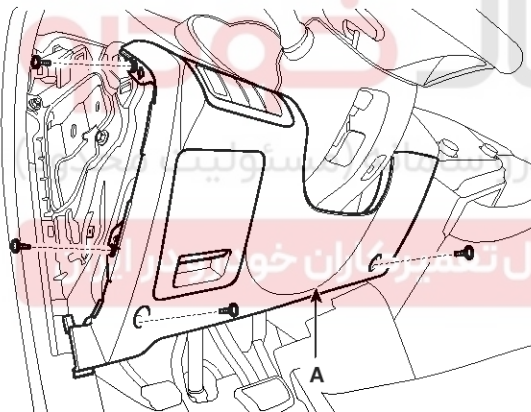
## Replacement

1. Disconnect the negative (-) battery terminal.
2. Using the screwdriver, remove the side cover (A).



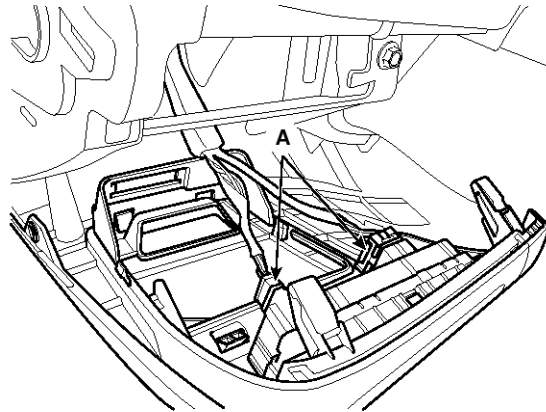
STFHA1068D

3. Loosen the mounting screws and then remove the crash pad lower cover (A)

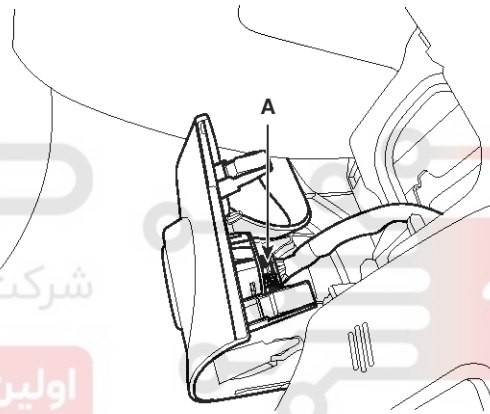


STFHA1069D

4. Disconnect the connector (A), and then remove the crash pad lower cover.

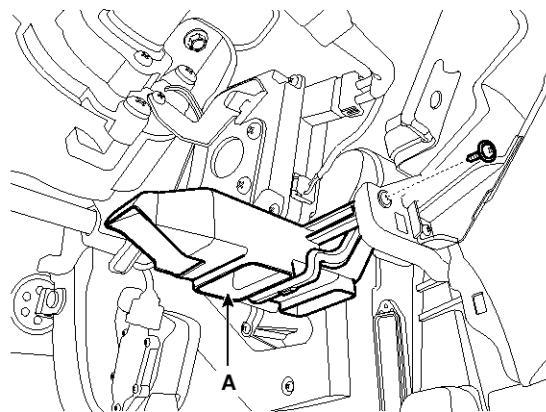


STFHA1070D



STFHA1071D

5. Remove the shower duct (A).

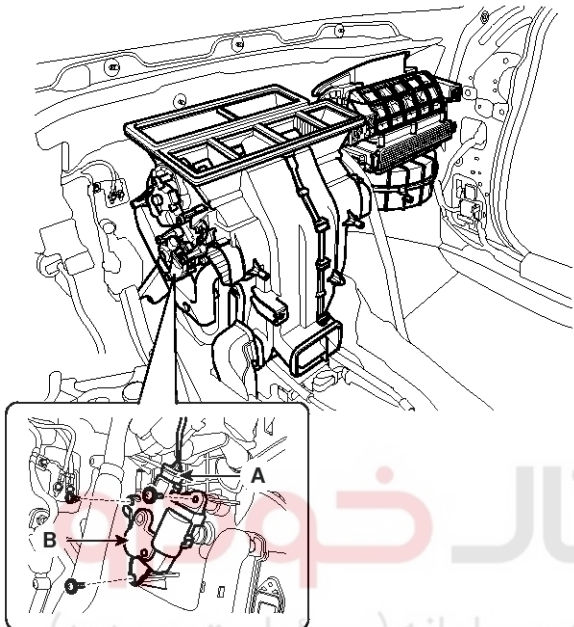


STFHA1072D

# Heater

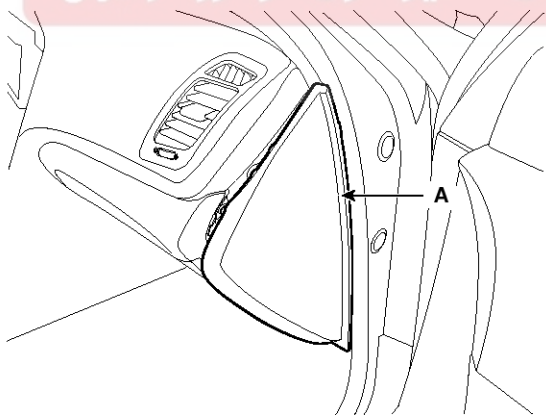
# HA-43

6. Loosen the mounting bolts and then remove the BCM.  
(Refer to BE group - "BCM")
7. Disconnect the temperature control actuator connector (A)
8. Loosen the mounting screw and then remove the temperature control actuator (B).



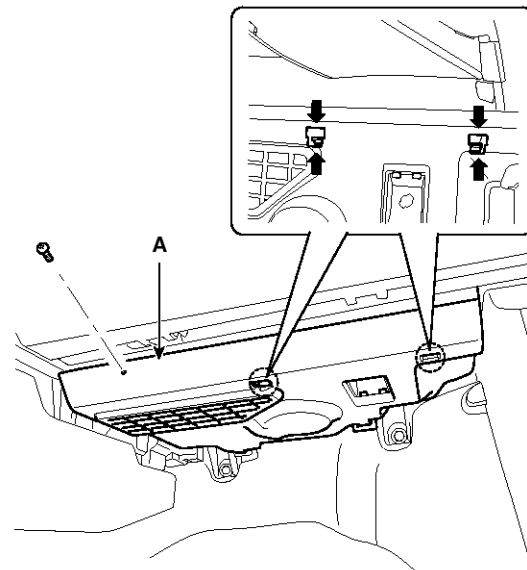
STFHA1074D

9. Using the screw driver, remove the side cover (A).



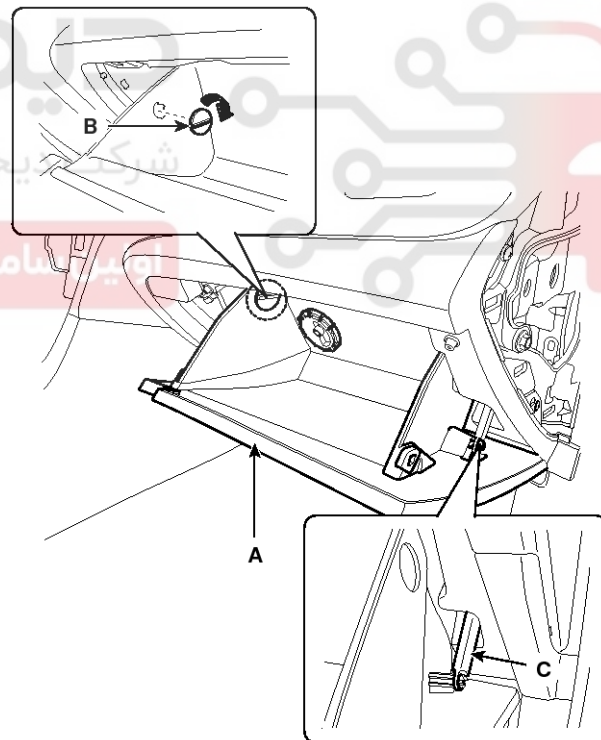
STFHA1075D

10. Remove the main crash pad lower cover (A).



STFBD1138D

11. Disconnect the damper (B) and glove box lift (C) from the glove box (A).

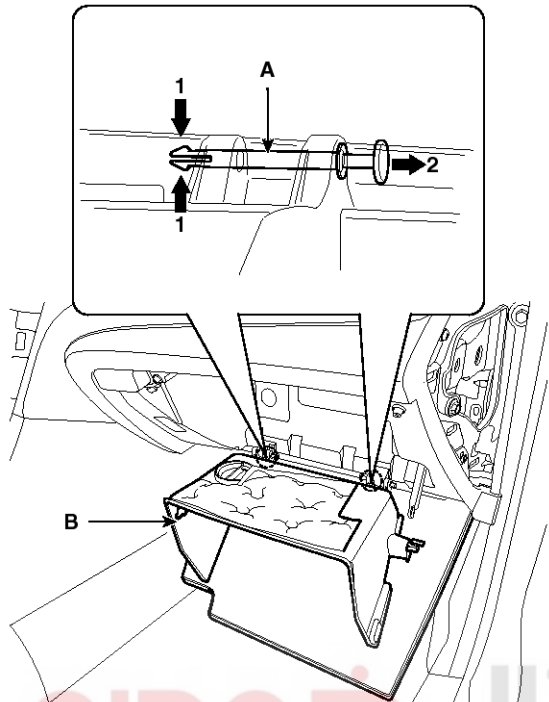


STFHA1077D

# HA-44

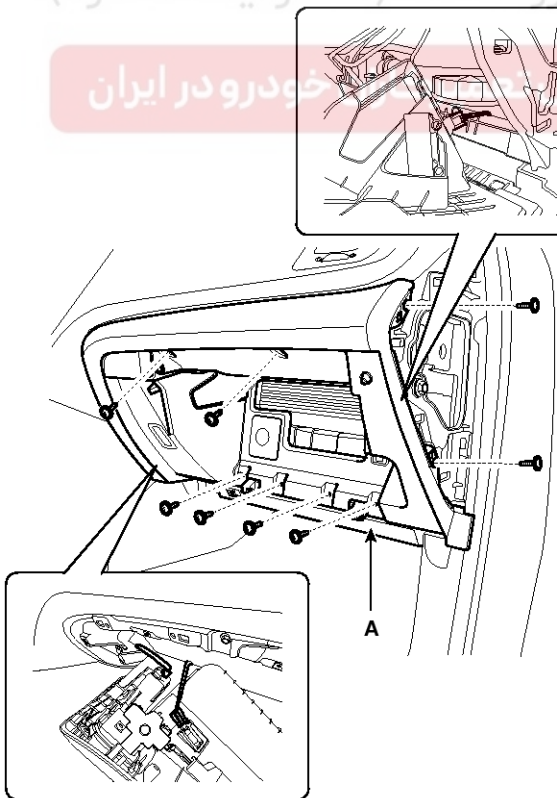
# Heating, Ventilation, Air Conditioning

12. Disconnect the pin (A) and then remove the glove box (B).



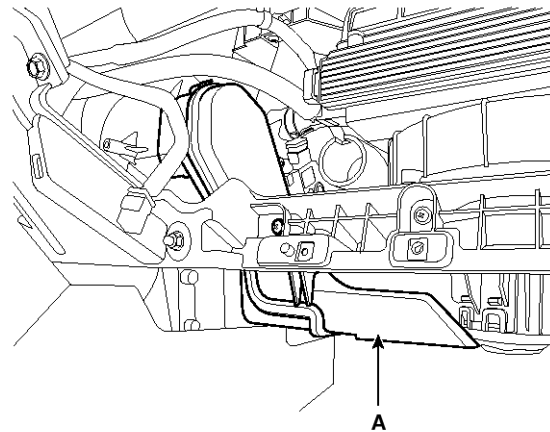
STFBD1137D

13. Loosen the mounting screw and bolts and then remove the glove box housing (A).



STFHA1079D

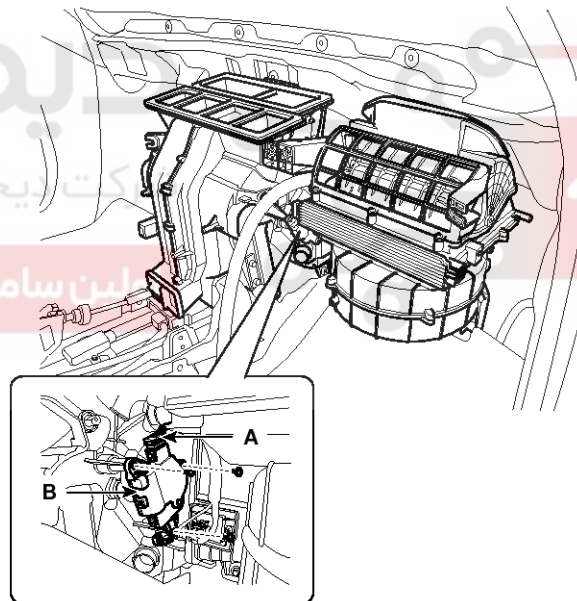
14. Remove the shower duct (A).



STFHA1082D

15. Disconnect the temperature control actuator connector (A).

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



STFHA1084D

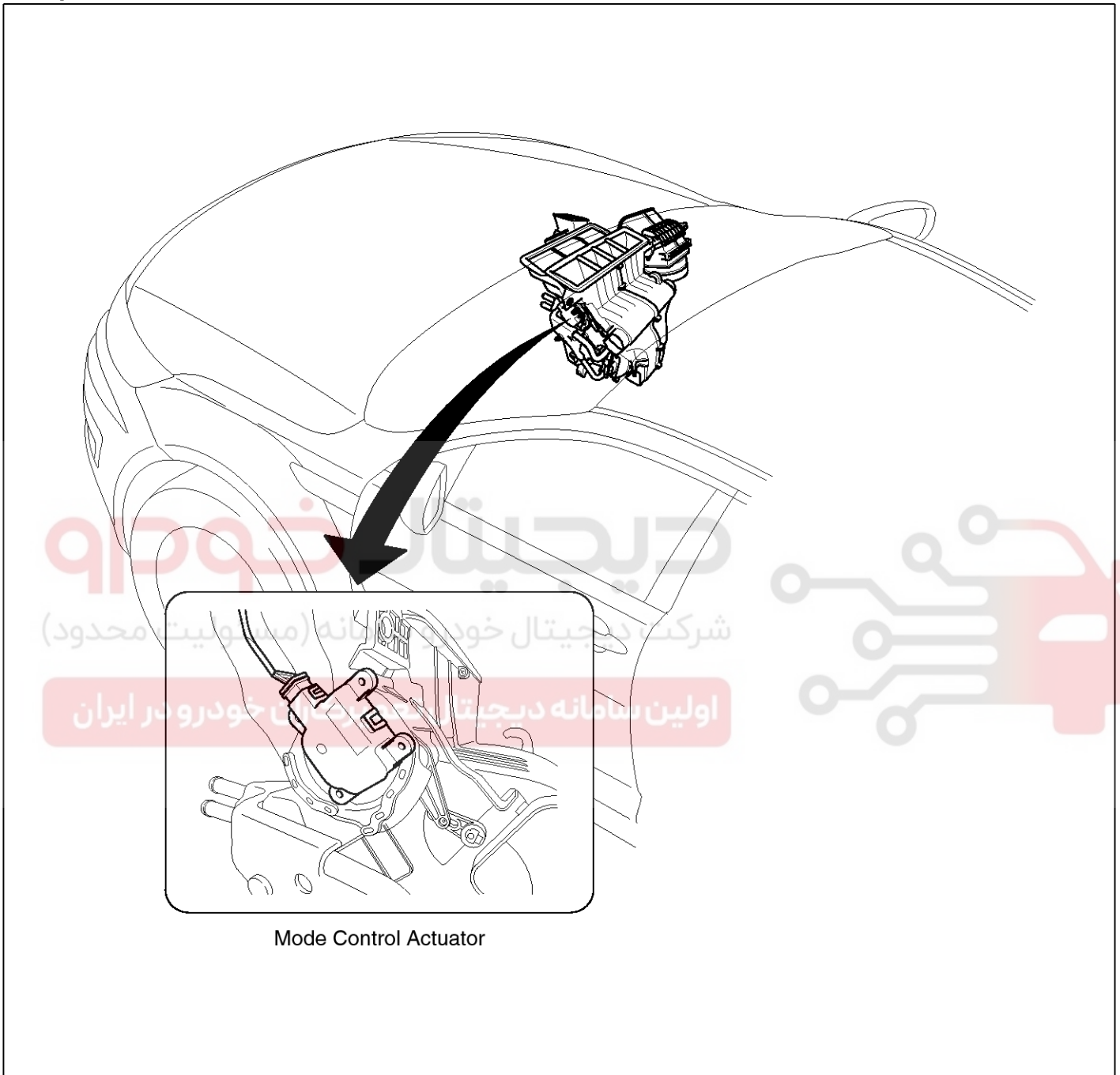
17. Installation is the reverse order of removal.

# Heater

# HA-45

## Mode Control Actuator

### Component Location



Mode Control Actuator

STFHA1009N



# HA-46

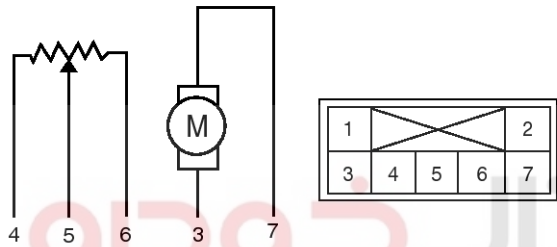
# Heating, Ventilation, Air Conditioning

## 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.

## 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 3 and grounding terminal 7.
4. Verify that the mode control actuator operates to the vent mode when connecting in the reverse.



STFHA1086D

1. -
  2. -
  3. Defrost mode
  4. Sensor ground
  5. Feedback signal
  6. 5V(Vcc)
  7. Vent mode
5. Check the voltage between terminals 5 and 6.

## Specification

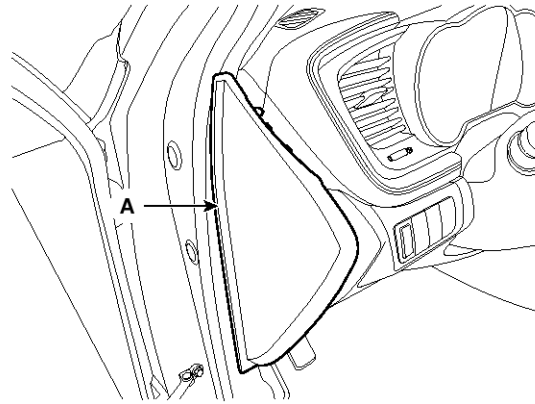
Door position	Voltage(4-5)	Error detecting
Max. cooling	0.3 ± 0.15V	Low voltage :0.1 V or less
Max. heating	4.7 ± 0.15V	High voltage :4.9 V or more

It will feedback current position of actuator to controls.

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.

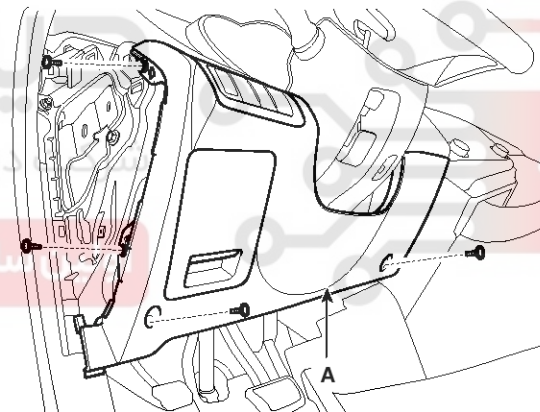
## Replacement

1. Disconnect the negative (-) battery terminal.
2. Using the screwdriver, remove the side cover (A).



STFHA1068D

3. Loosen the mounting screw and then remove the crash pad lower cover (A).

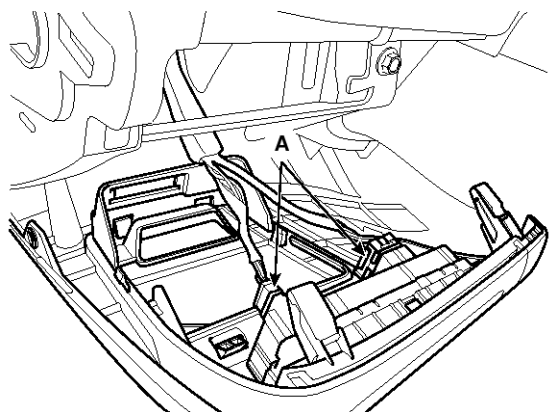


STFHA1069D

# Heater

# HA-47

4. Disconnect the connector (A), and then remove the crash pad lower cover.

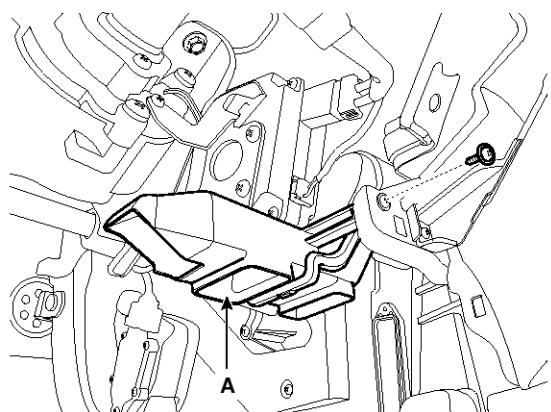


STFHA1070D



STFHA1071D

5. Remove the shower duct (A).

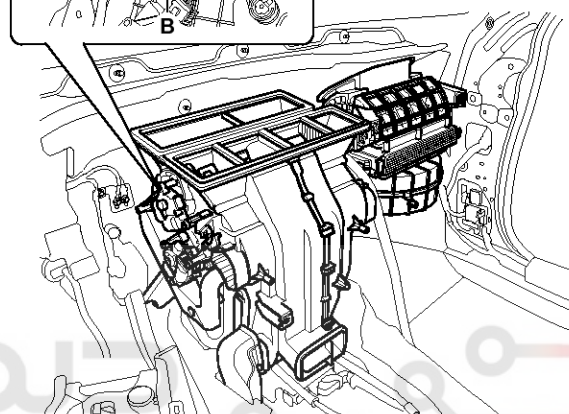
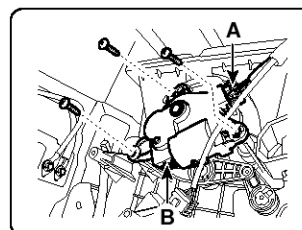


STFHA1072D

6. Loosen the mounting bolts and then remove the BCM.

(Refer to BE group - "BCM")

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



STFHA1088D

9. Installation is the reverse order of removal.

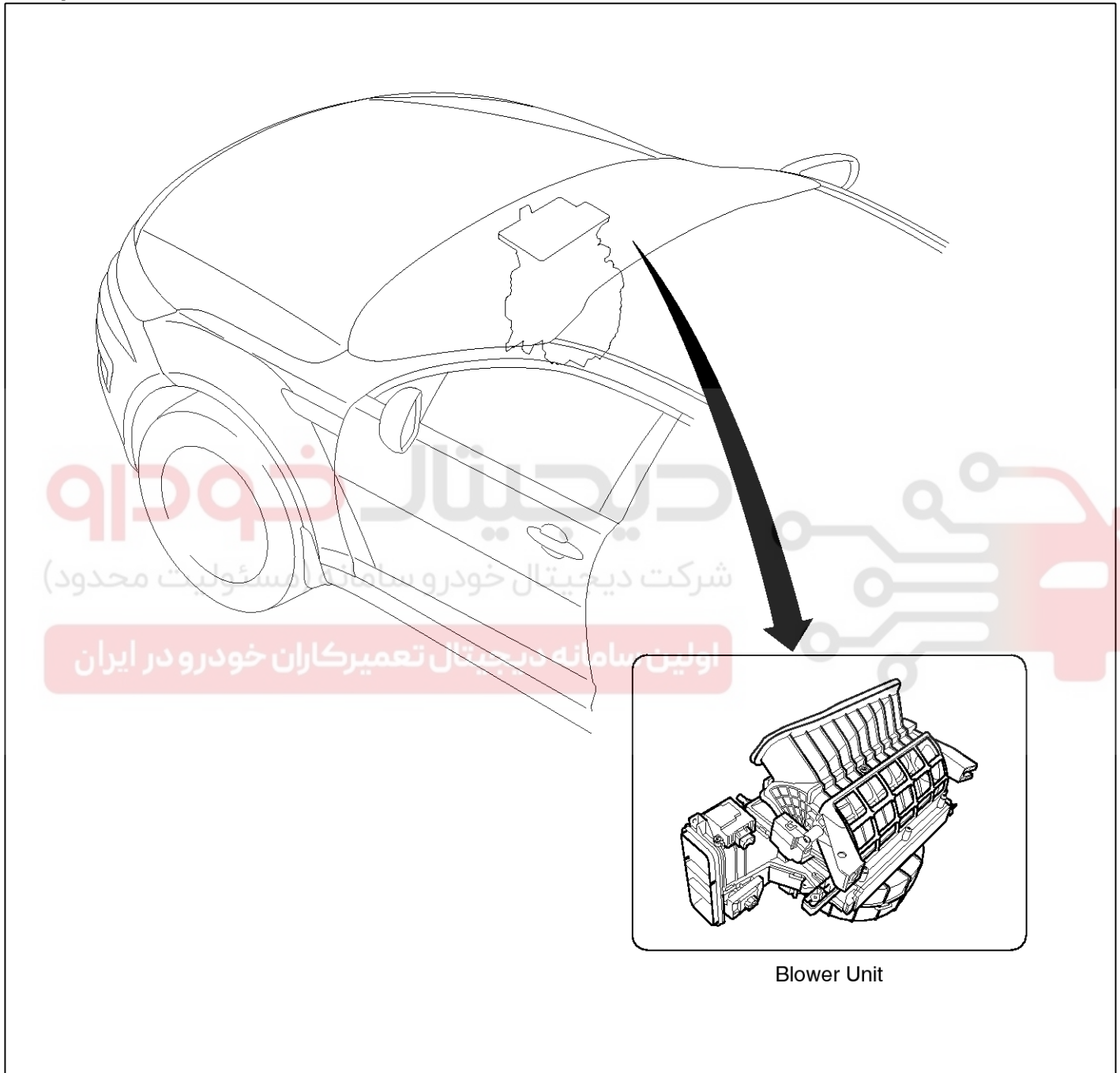
# HA-48

# Heating, Ventilation, Air Conditioning

## Blower

### Blower Unit

#### Component Location

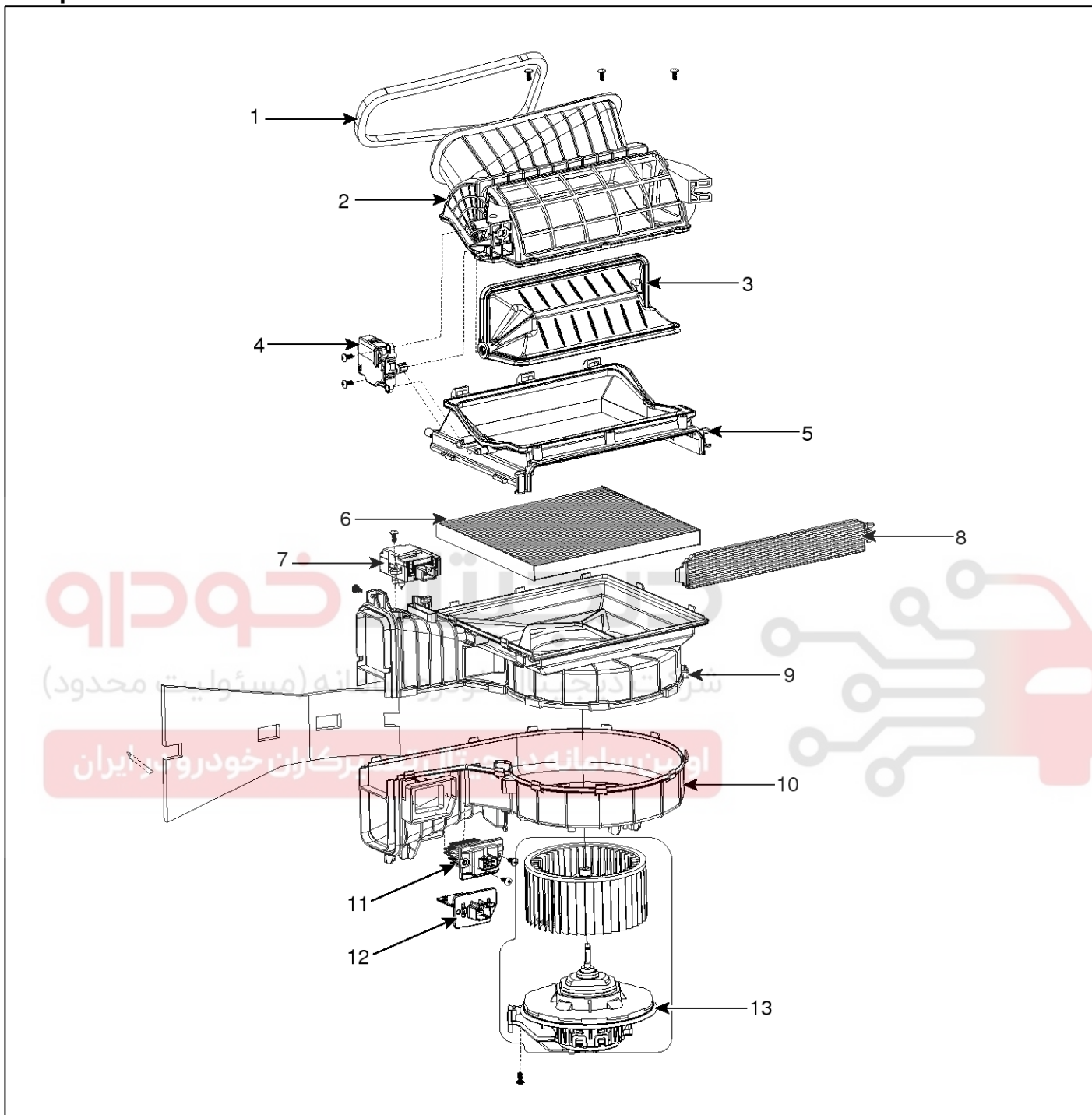


STFHA1010N

# Blower

# HA-49

## Components



STFHA1090D

- 1. Duct Seal
- 2. Duct Case
- 3. Inlet Door
- 4. Intake Actuator
- 5. Inlet Duct Case (A)

- 6. Climate control air filter
- 7. Cluster ionizer
- 8. Climate control air filter Cover
- 9. Blower Upper Case
- 10. Blower Lower Case

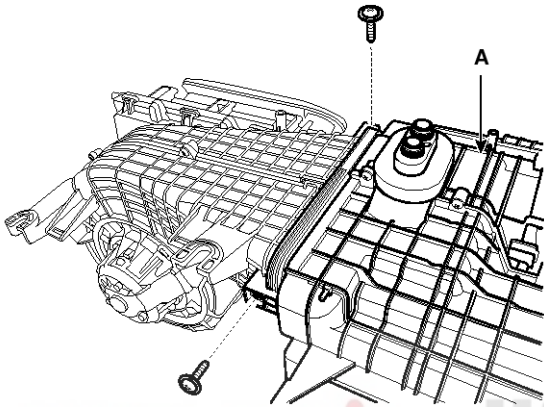
- 11. FET
- 12. Resistor
- 13. Blower Motor

# HA-50

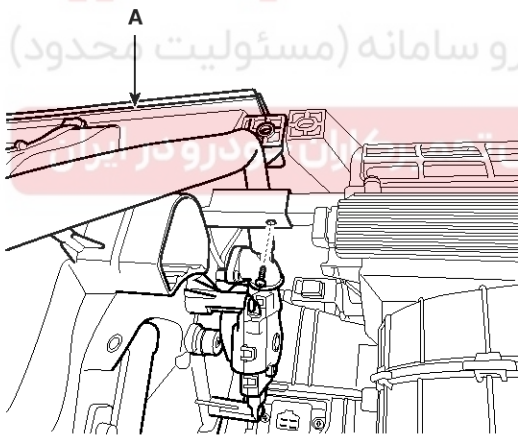
# Heating, Ventilation, Air Conditioning

## Replacement

1. Disconnect the negative (-) battery terminal.
2. Remove the crash pad and heater blower unit.  
(Refer to HA group-heater unit)
3. Remove the heater blower unit from crash pad.  
(Refer to HA group - "Heater Unit")
4. Remove the blower unit (A) from the heater unit after loosening a mounting bolt and screws.



STFHA1059D



STFHA1060D

### NOTICE

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

5. Installation is the reverse order of removal.



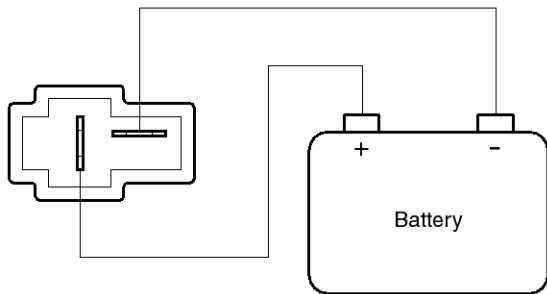
# Blower

# HA-51

## Blower Motor

### Inspection

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

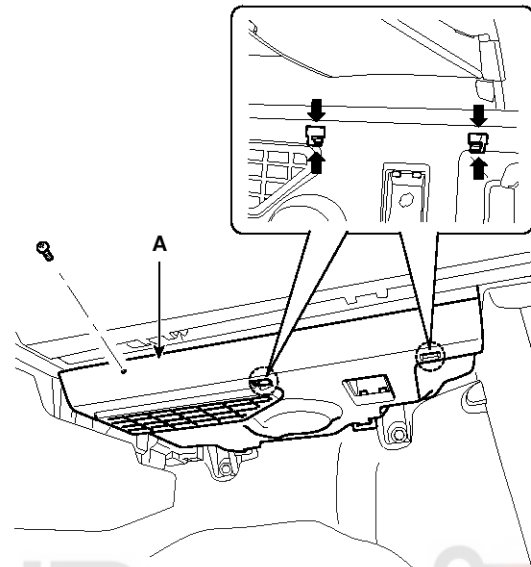


AQIE352C

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.

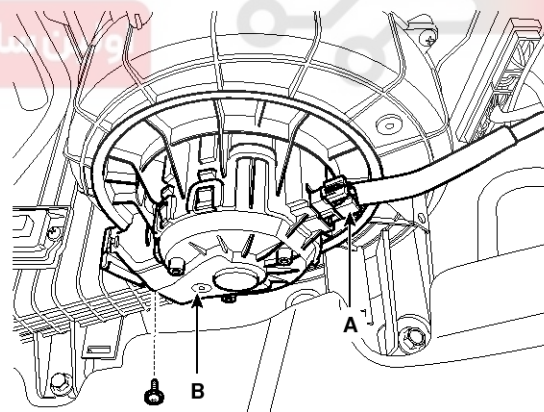
### Replacement

1. Disconnect the negative (-) battery terminal.
2. Remove the main crash pad lower cover (A).



STFBD1138D

3. Disconnect the connector (A) of the blower motor.
4. Remove the blower motor (B) after loosening the mounting screws.



STFHA1092D

5. Installation is the reverse order of removal.



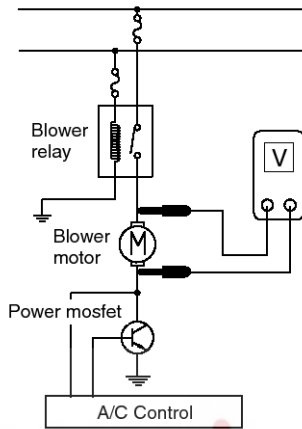
# HA-52

# Heating, Ventilation, Air Conditioning

## 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.



EQRF355C

### Specification

Fan	Motor Voltage
	Manual
First speed	3.8 ±0.5V
Second speed	5.0 ±0.5V
Third speed	6.2 ±0.5V
Fourth speed	7.4 ±0.5V
Fifth speed	8.6 ±0.5V
Sixth speed	9.8 ±0.5V
Seventh speed	11.0 ±0.5V
eighth speed	Battery

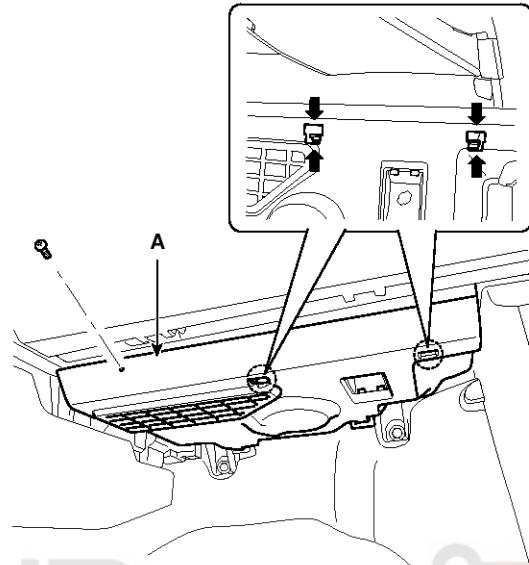
\*AUTO COOLING: Auto speed (4.5V~B+)

\*AUTO HEATING: Auto speed (4.5V~11.0V)

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.

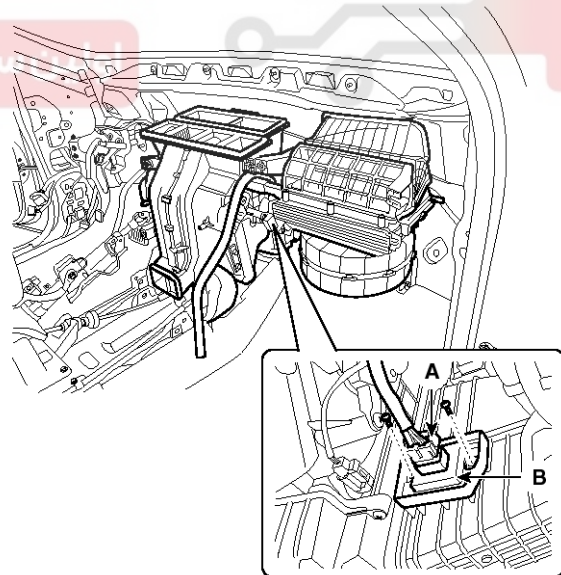
### Replacement

1. Disconnect the negative (-) battery terminal.
2. Remove the main crash pad lower cover (A).



STFBD1138D

3. Disconnect the power mosfet connector (A) and then remove the power mosfet (B) after loosening the mounting screws.



STFHA1094D

4. Installation is the reverse order of removal.

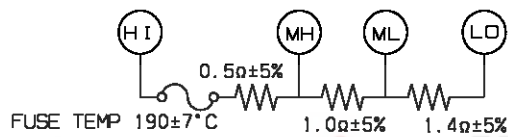
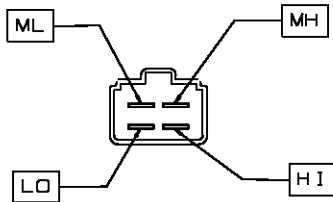
# Blower

# HA-53

## Blower Resistor

### Inspection

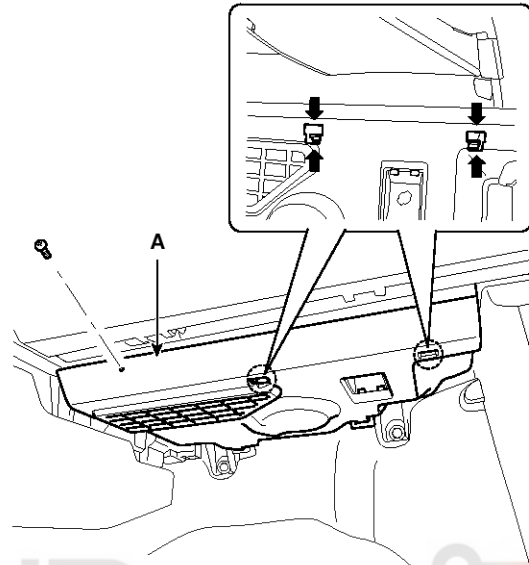
1. Measure terminal-to-terminal resistance of the blower resistor.
2. measured resistance is not within specification, the blower resistor must be replaced. (After removing the resistor)



STFHA1119D

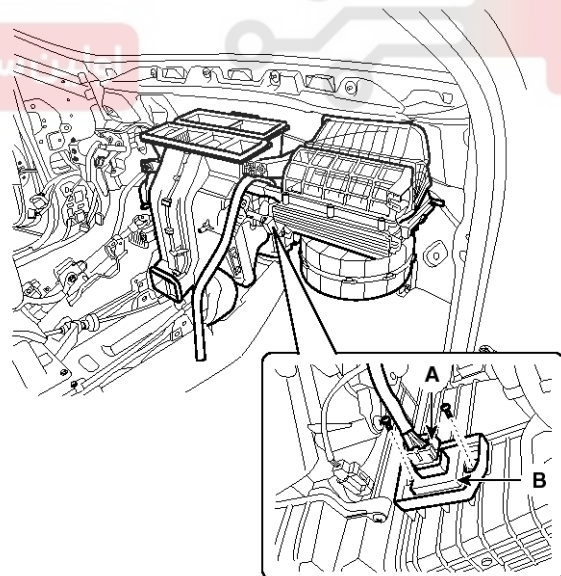
### Replacement

1. Disconnect the negative (-) battery terminal.
2. Remove the main crash pad lower cover (A).



STFBD1138D

3. Disconnect the blower resistor connector (A) and then remove the blower resistor (B) after loosening the mounting screws.



STFHA1094D

4. Installation is the reverse order of removal.

# HA-54 Heating, Ventilation, Air Conditioning

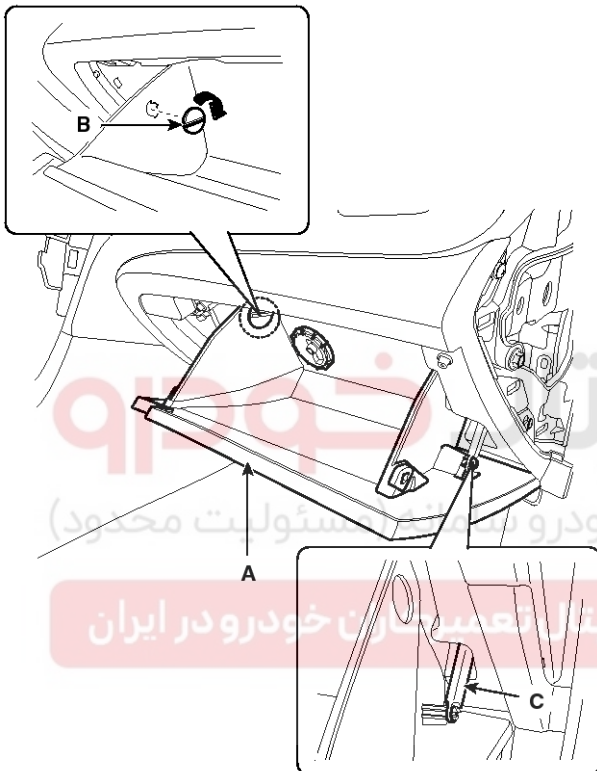
## Climate Control Air Filter

### 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.

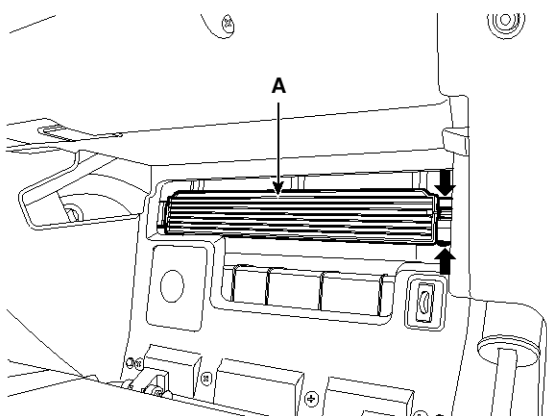
### Replacement

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



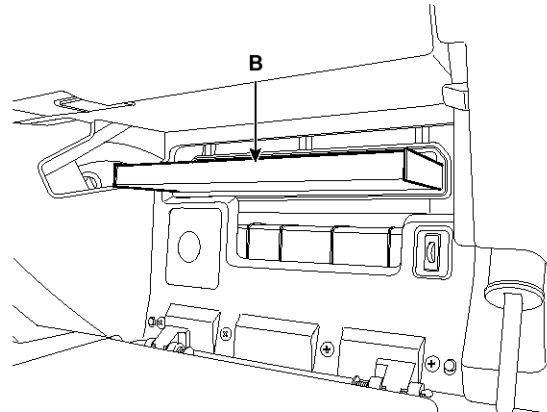
STFHA1095D

2. Remove the filter cover with pushing the knob.



STFHA1096D

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



STFHA1097D

### NOTICE

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

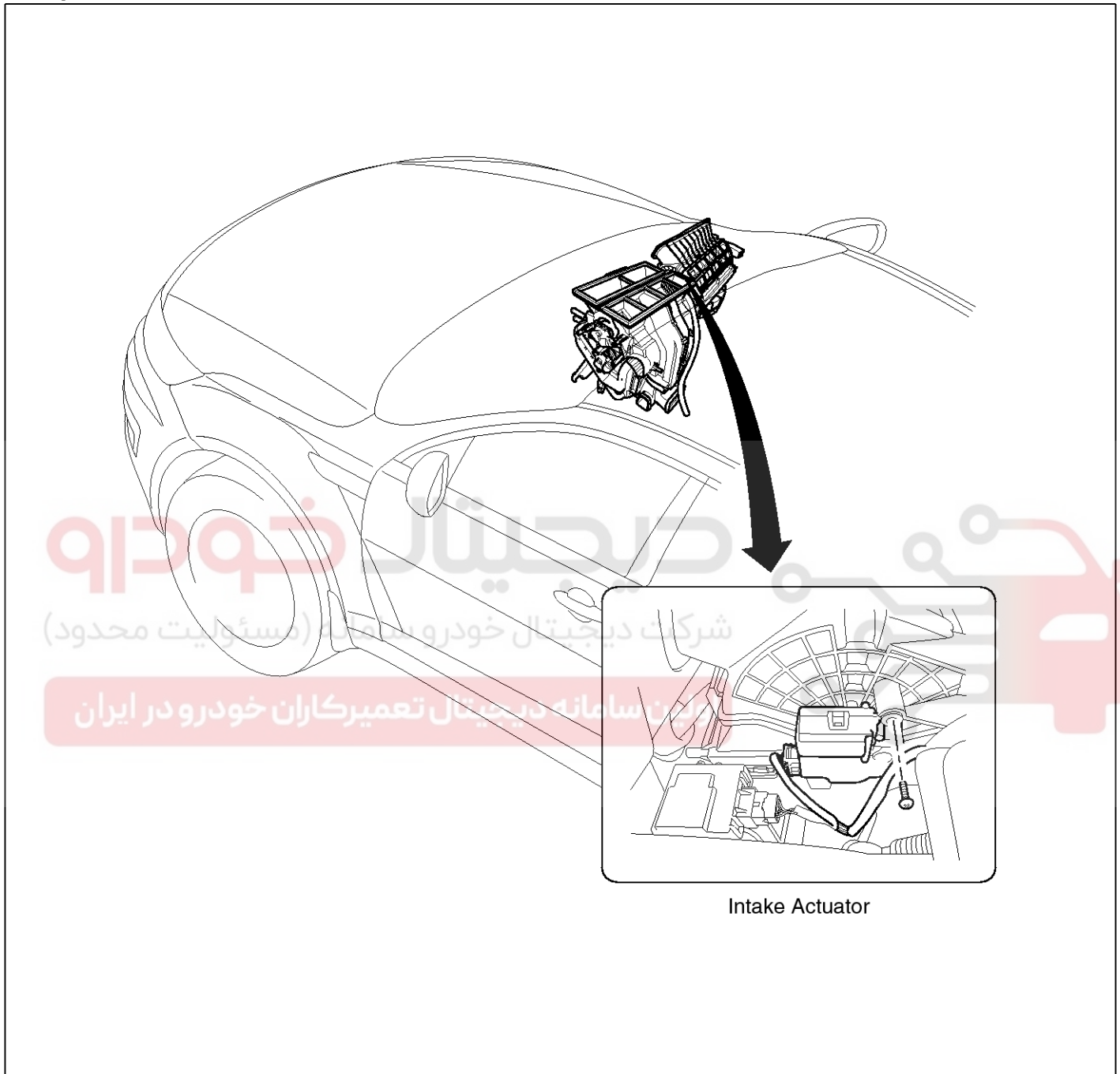
4. Installation is the reverse order of removal.

# Blower

# HA-55

## Intake Actuator

### Component Location



Intake Actuator

STFHA1011N

## HA-56

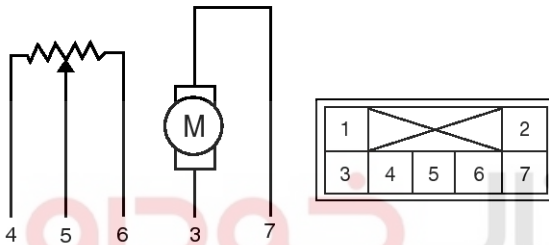
## Heating, Ventilation, Air Conditioning

## 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.

## 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 3 and grounding terminal 7.
4. Verify that the intake actuator operates to the fresh position when connecting in the reverse.

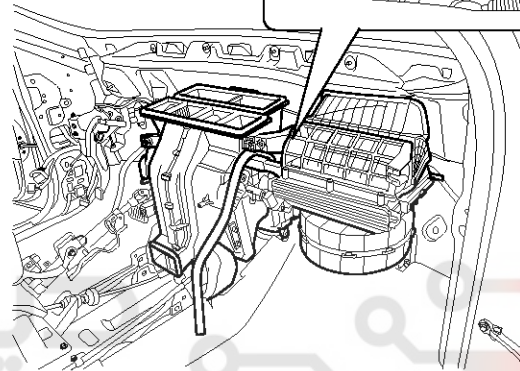
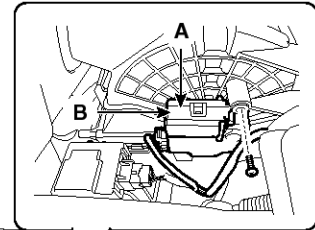


STFHA1099D

1. -
  2. -
  3. Fresh
  4. 5V (Vcc)
  5. Feedback Signal
  6. Sensor Ground
  7. Recirculation
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 crash pad.  
(Refer to BD group - "Crash Pad")
3. Disconnect the Intake actuator connector (A)
4. Loosen the mounting screw and then remove the intake actuator (B).



STFHA1100D

5. Installation is the reverse order of removal.

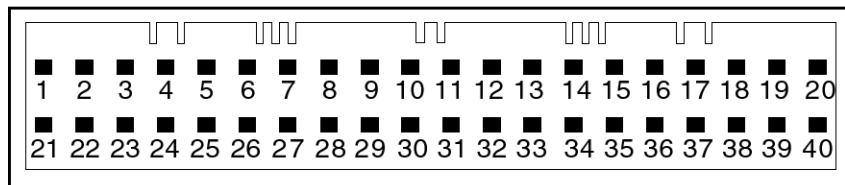
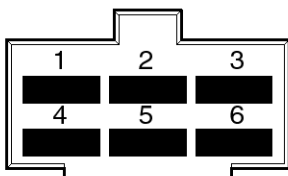
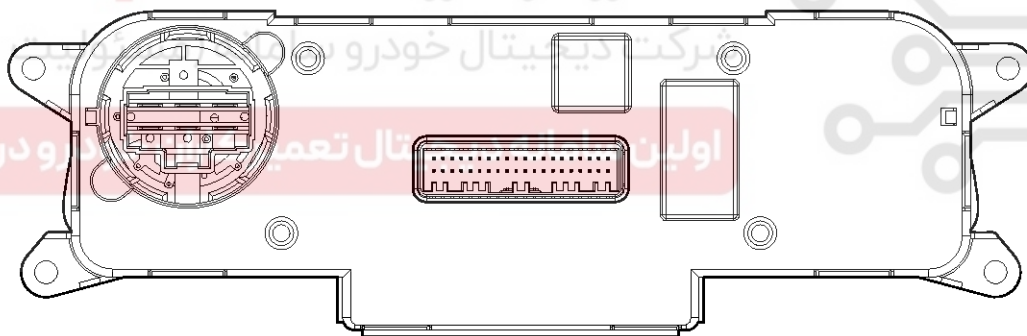
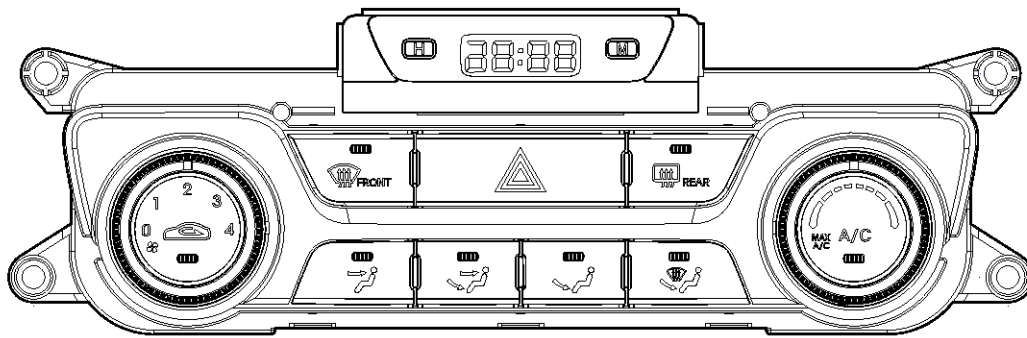
# Controller

# HA-57

## Controller

## Heater & A/C Control Unit(Manual)

### Components



STFHA1101D



## HA-58

## Heating, Ventilation, Air Conditioning

## Connector pin function

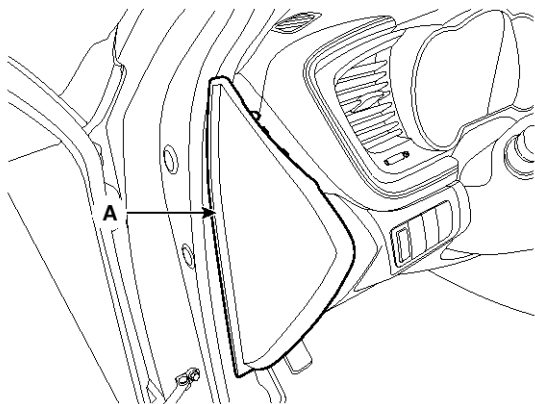
Connector	PIN NO.	Function	Connector	PIN No.	Function
Connector(A)	1	GND	Connector(B)	18	Hazard Signal
	2	Middle High		19	-
	3	Middle Low		20	Rheostat (ILL -)
	4	High		21	IGN2
	5	Common		22	IGN1
	6	Low		23	ACC
Connector(B)	1	BAttery		24	-
	2	Tail Lamp (ILL+)		25	-
	3	Sensor REF (+5V)		26	Rear Defog S/W
	4	Mode Actuator (F/B)		27	-
	5	Temp Actuator (F/B)		28	-
	6	Intake Actuator (F/B)		29	Detent Out (+)
	7	Evaporator Sensor (+)		30	Blower F/B
	8	Ambient Sensor (+)		31	Sensor GND
	9	-		32	-
	10	Blower Common		33	C – Can HIGH
	11	HTD		34	C – Can LOW
	12	Mode Actuator (VENT)		35	ECV +
	13	Mode Actuator (DEF)		36	ECV – (GND)
	14	Temp Actuator (COOL)		37	-
	15	Temp Actuator (WARM)		38	Sensor GND
	16	Intake Actuator (FRE)		39	GND
	17	Intake Actuator (REC)		40	GND

# Controller

# HA-59

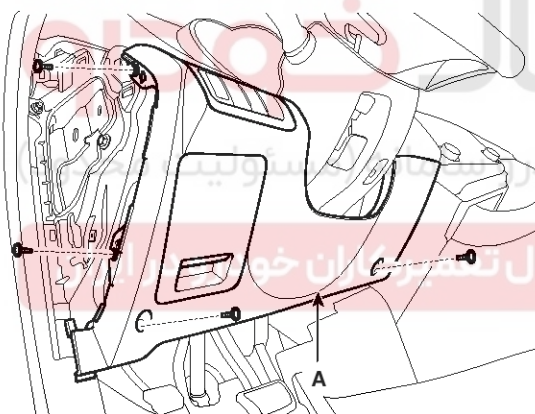
## Replacement

1. Disconnect the negative (-) battery terminal.
2. Using the screwdriver, remove the side cover (A).



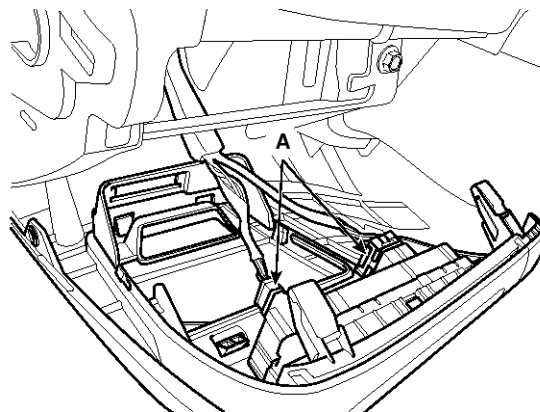
STFHA1104D

3. Loosen the mounting screw and then remove the crash pad lower cover (A).



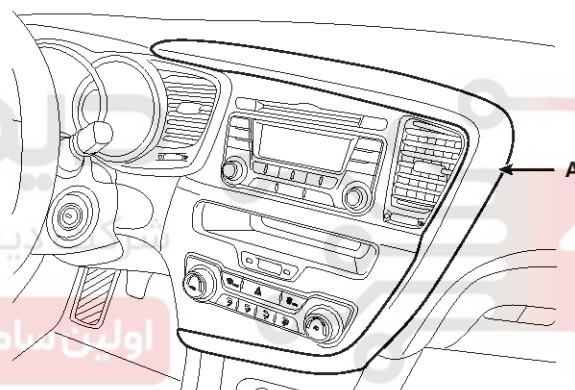
STFHA1069D

4. Disconnect the connector (A), and then remove the crash pad lower cover.



STFHA1070D

5. Using the screwdriver, remove the center garnish (A).

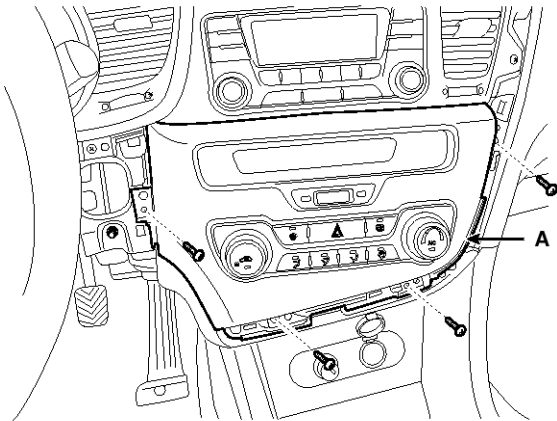


STFHA1103D

# HA-60

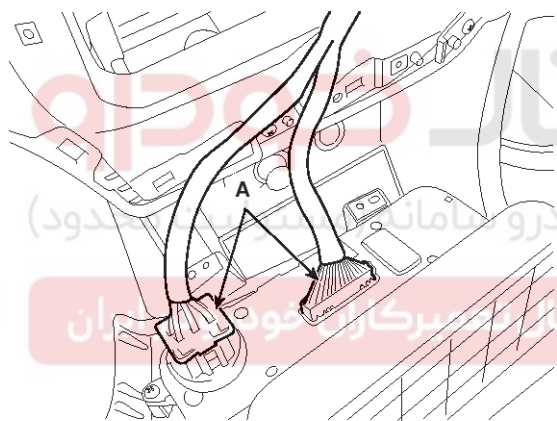
# Heating, Ventilation, Air Conditioning

6. Loosen the mounting screw and then remove the blower & A/C controller (A).



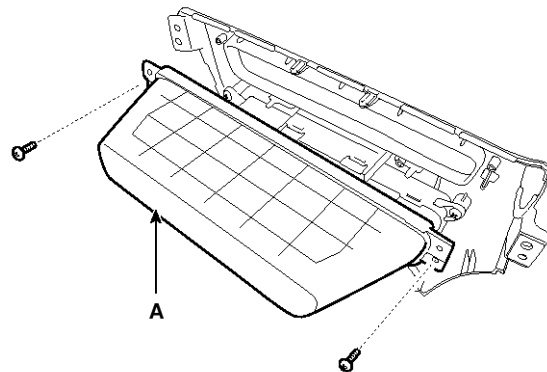
STFHA1108D

7. Disconnect the center connectors and then remove the blower & A/C controller (A).



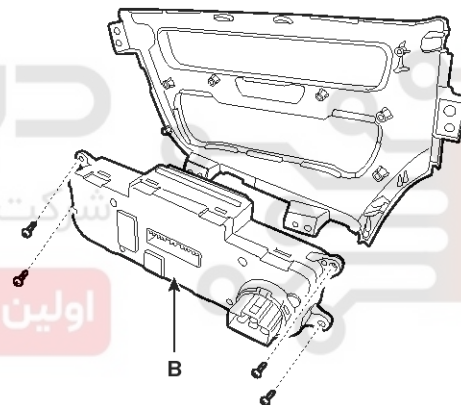
STFHA1109D

8. Loosen the mounting and then remove the center fascia box (A).



STFHA1110D

9. Loosen the mounting screws and then remove the blower & A/C controller (A).



STFHA1111D

10. Installation is the reverse order of removal.

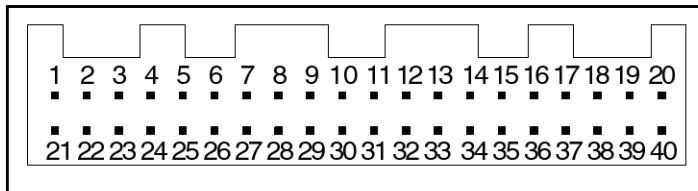
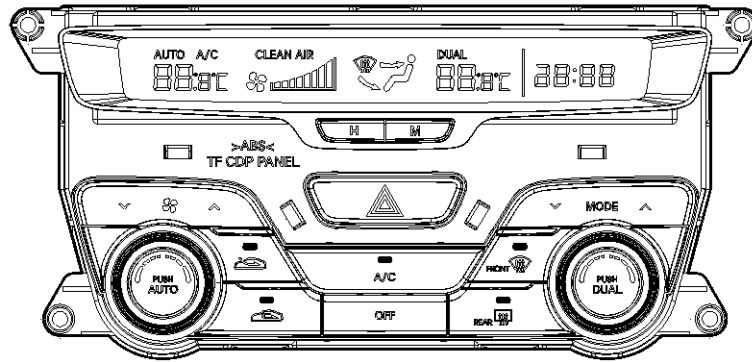
# Controller

# HA-61

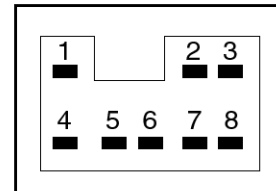
## Heater & A/C Control Unit(Dual)

### Components

#### Control Panel



Connector A



Connector B

STFHA1012N

## HA-62

## Heating, Ventilation, Air Conditioning

## Connector pin function

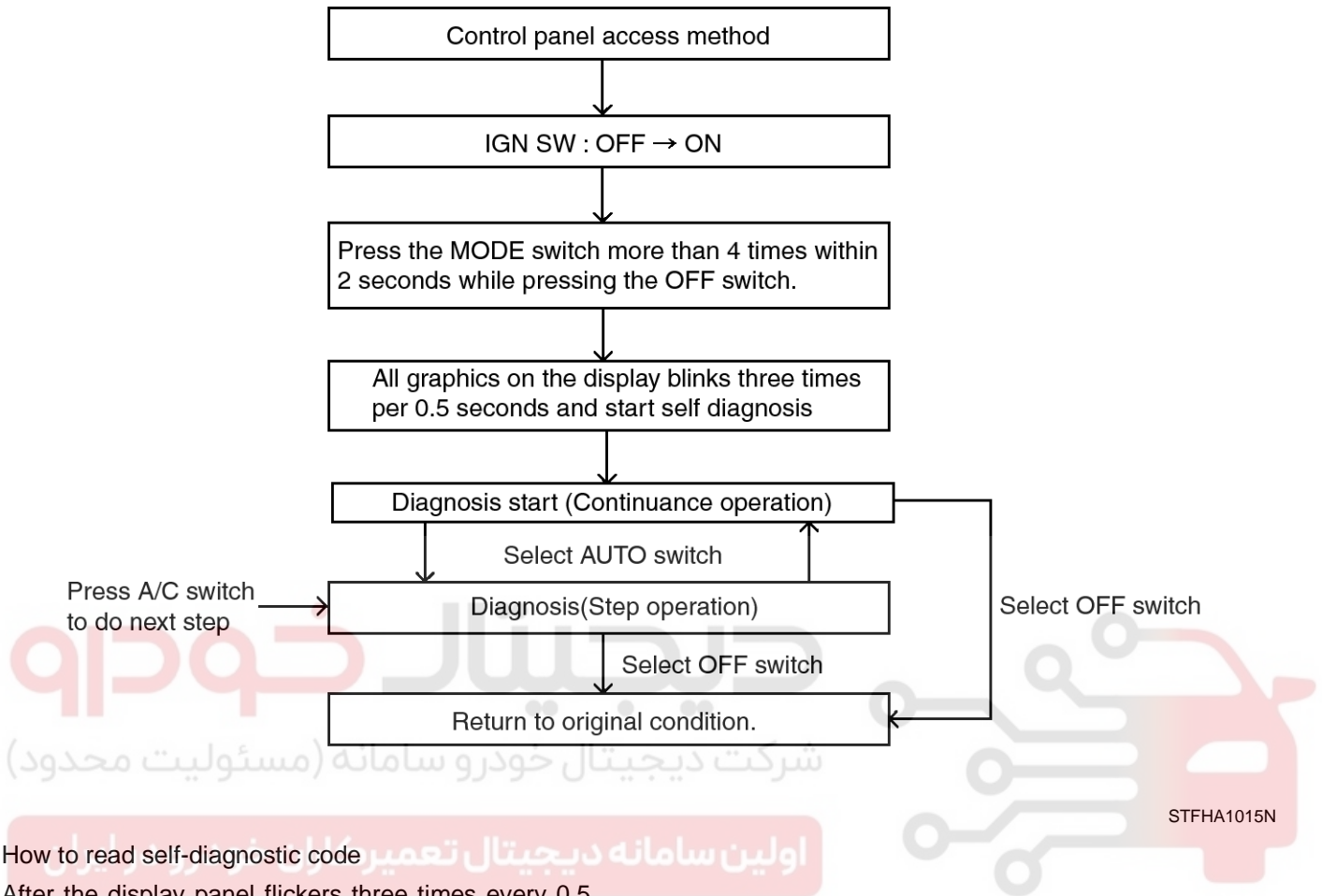
Connector	PIN NO.	Function	Connector	PIN NO.	Function
Connector(A)	1	Tail (+)	Connector(A)	25	-
	2	Sensor REF (+5V)		26	Ambient Sensor (+)
	3	Hazard Signal		27	Incar Sensor (+)
	4	ACC		28	Evaporator Sensor (+)
	5	Mode Actuator (VENT)		29	ECV (+)
	6	Mode Actuator (DEF)		30	ECV (-)
	7	Mode Actuator (F/B)		31	Photo Sensor left (-)
	8	Intake Actuator (REC)		32	Photo Sensor right (-)
	9	Intake Actuator (FRE)		33	HTD
	10	Intake Actuator (F/B)		34	Rear Defog S/W
	11	Temp Actuator DR (COOL)		35	K - Line
	12	Temp Actuator DR (WARM)		36	-
	13	Temp Actuator DR (F/B)		37	-
	14	Temp Actuator PS (COOL)		38	-
	15	Temp Actuator PS (WARM)		39	-
	16	Temp Actuator PS (F/B)		40	GND
17	C_Can HIGH	1	GND		
18	C_Can LOW	2	IGN2		
19	Detent OUT(-) Signal	3	Blower Motor (+)		
20	Rheostat	4	GND		
21	Ion Signal	5	FET (GATE)		
22	Clean Signal	6	FET (DRAIN F/B)		
23	Ionizer Diagnosis	7	IGN1		
24	-	8	Battery		

# Controller

# HA-63

## Self Diagnosis

### 1. Self-diagnosis process



### 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

Display	Fail description
00	Normal
11	In-car sensor open
12	In-car sensor short
13	Ambient sensor open
14	Ambient sensor short
17	Evaporator sensor open
18	Evaporator sensor short
19	Temp door potentiometer open/short- Drive
20	Temp door potentiometer fault- Drive
21	Mode door potentiometer open/short

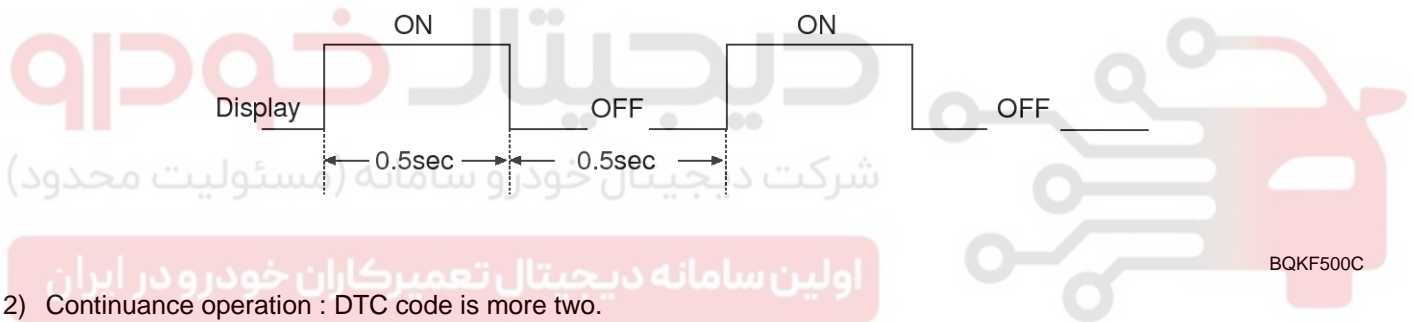


# HA-64 Heating, Ventilation, Air Conditioning

Display	Fail description
22	Mode door potentiometer fault
25	Intake door potentiometer open
26	Intake door potentiometer short
32	Temp door potentiometer open/short - Passenger
33	Temp door potentiometer fault - Passenger
45	APT CAN signal fault
46	-
47	RPM CAN signal fault
48	Vehicle speed CAN signal fault
49	Engine coolant temp CAN signal fault
50	Cluster ion generator fault

### 3. Fault code display

1) Continuance operation : DTC code is one.



2) Continuance operation : DTC code is more two.

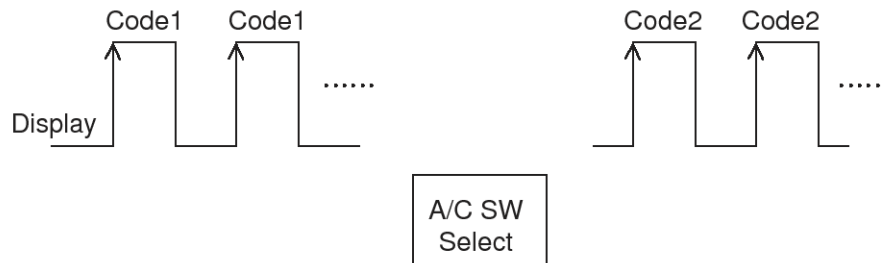


BQKF500D

# Controller

# HA-65

- 3) STEP operation
  - A. Normal or one fault code is same as a continuance operation.
  - B. DTC code as more two.



BQKF500E

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) Water temperature sensor: Control with the value of 85°C(185°F)
- 5) Temperature control actuator (Air mix potentiometer):

If temperature setting 17°C-24.5°C, fix at maximum cooling position.

If temperature setting 25°C-32°C, fix at maximum heating position.

- 6) Mode control actuator (Direction potentiometer):
  - Fix vent position, while selecting vent mode.
  - Fix defrost position, while selecting all except vent mode.
- 7) Intake control actuator :
  - Fix fresh position, while selecting fresh mode.
  - Fix recirculation position, while selecting recirculation mode.

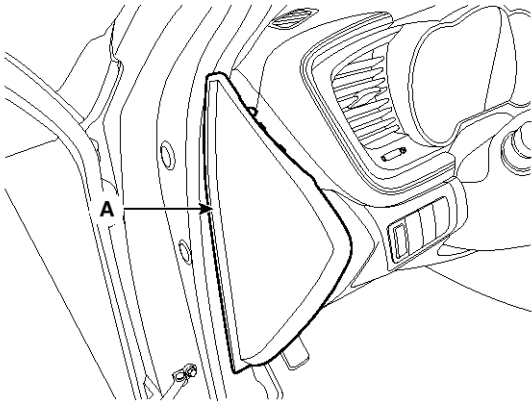


# HA-66

# Heating, Ventilation, Air Conditioning

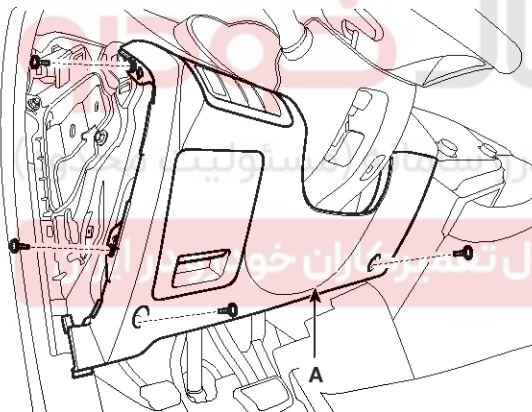
## Replacement

1. Disconnect the negative (-) battery terminal.
2. Using the screwdriver, remove the side cover (A).



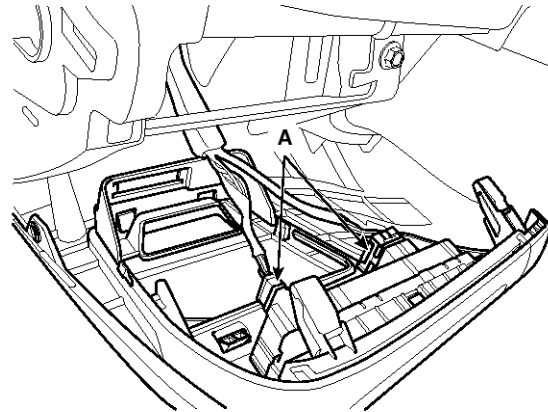
STFHA1104D

3. Loosen the mounting screw and then remove the crash pad lower cover (A).



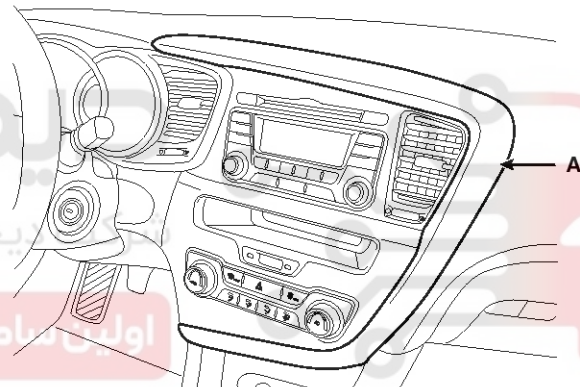
STFHA1069D

4. Disconnect the connector (A), and then remove the crash pad lower cover.



STFHA1070D

5. Using the screwdriver, remove the center garnish (A).

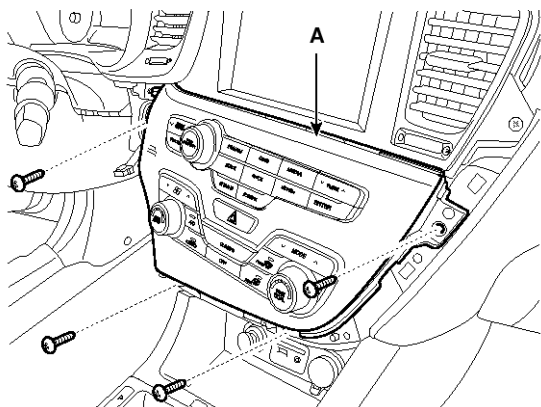


STFHA1103D

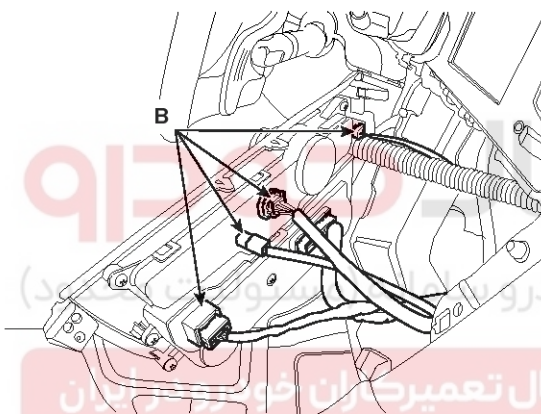
# Controller

# HA-67

6. Disconnect the connector and then remove the blower & A/C controller (A).

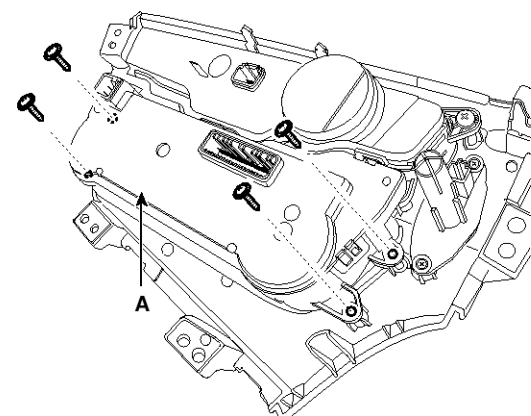


STFHA1116D



STFHA1117D

7. Loosen the control panel mounting screws and then remove the control panel (A).



STFHA1118D

8. Installation is the reverse order of removal.