Heating, Ventilation and Air Conditioning









GENERAL

SPECIFICATIONS EBEE798F

	Item		Specifi	cation
Heating	Heater	Туре	Air mi	x type
		Capacity (Kcal/h)	4,500 ± 5%	
	PTC heater	Capacity (W)	900+5%	%/-10%
Air conditioning	Evaporator	Cooling capacity (Kcal/h)	4,500 ± 10%	
	Refrigerant	Туре	R-1	34a
		Capacity (g)	510	± 25
	Compressor	Engine	BETA ENG.	DELTA, D-ENG.
		Model	10PA15C	10PA17C
		Туре	Swash plate	←
		Displacement (cm³/rev)	155.3	177.7
		Lubricating oil	ND-OIL8	←
	•	Oil capacity (cc)	120 ~ 135	200 ~ 215
	لاحو	Pressure relief valve (Kg/cm²)	Working pressure : 35.2 ~ 42.2 Resealed pressure : Min. 28.1	
	Magnetic clutch	Туре	L50 (4K)	←
	و سامانه (مسئول تعمیرکاران خود	Rated voltage (V)	DC 12	←
		Consumed current (W)	40	Max. 48
		Operating voltage Min. (A)	Max. 2.2	Max. 2.66
		Torque (N⋅m)	Min. 53	←
		Pulley pitch dia.	ø125	DELTA : ø125 D-ENG. : ø120
	Condenser	Heat rejection (Kcal/h)	13,500	± 5%
	Thermistor (manual)	ON	2.5 ±	0.5°C
		OFF	0.5 ± 0.5°C	
	Triple pressure switch	High pressure (kg/cm²)	ON 32.0 ± 2.0 OFF 26.0 ± 2.0	
		Middle pressure (kg/cm²)	ON 18.0 ± 0.8 OFF 14.0 ± 1.2	
		Low pressure (kg/cm²)	ON 2.3+0.25, -0.29 OFF 2.0 ± 0.2	
Heater control a	ssembly	MANUAL type, AUTOMATIC	type	

HEATING, VENTILATION AND AIR CONDITIONING

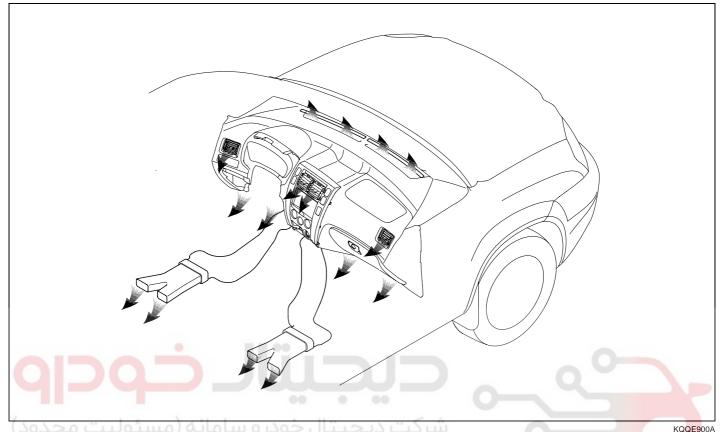
SPECIAL TOOLS E7FB079E

Tool (Number and name)	Illustration	Use
09977-29000 Pressure plate bolt remover		Removal and installation of pressure plate
	EQA9002A	





AIR FLOW DESCRIPTION E20B549B

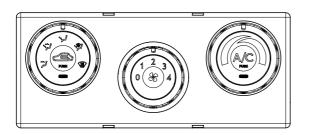


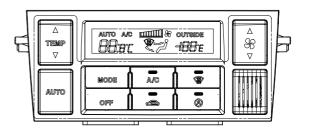
KQQE900A

MANUAL AIR CONDITION CONTROL PANEL

AUTOMATIC AIR CONDITION CONTROL PANEL

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KQQE902A KQQE903A

HEATING, VENTILATION AND AIR CONDITIONING

AIR FLOW DISTRIBUTION OF MODE (%)

MODE	REC		FRE	ESH	
OUTLET	COOL	1/2 WARM	WARM		
POSITION	VENT	BI/LEVEL	FLOOR	MIX	DEF
VENT	100	65 ± 10	-	-	-
FLOOR	-	35 ± 10	65 ± 5	45 ± 5	-
DEF	-	-	20 ± 5	40 ± 5	85 ± 10
SIDE VENT	-	-	15 ± 5	15 ± 5	15 ± 10

EQQE900C

LEFT-RIGHT DISTRIBUTION OF VENT & FLOOR (%)

OUTLET	LH	LH - CTR	RH - CTR	RH
VENT	24 ± 5	26 ± 5	26 ± 5	24 ± 5
FLOOR	41 ± 5	18 ± 5		41 ± 5

EQSE900D

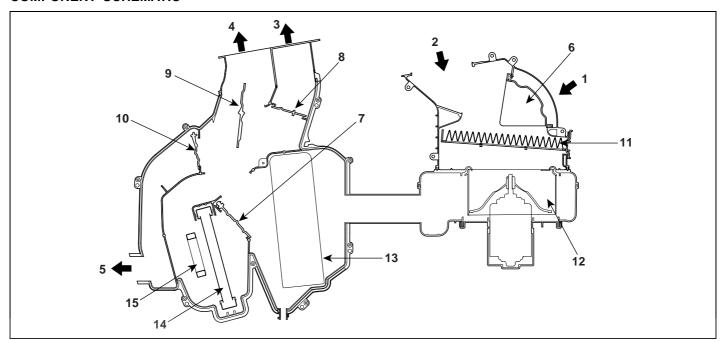
COOL WARM AIR FLOW VOLUME CHANGE RATE 23% Max

- TEST MODE : RED - VENT

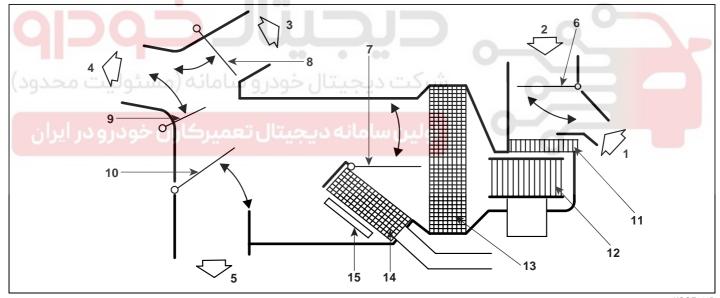
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

ولین سامانه دیجیتال تعمیرکاران خودرو در ایران

COMPONENT SCHEMATIC



KQQE910A



KQQE910B

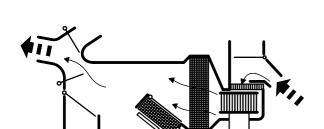
Item	Description	Item	Description
1	Recirculating air port	9	Panel airflow door
2	Outside air port	10	Floor airflow door
3	Defrost air vent	11	Air filter
4	Panel air vent	12	Blower unit
5	Floor air vent	13	Evaporator core
6	Air inlet blend door	14	Heater core
7	Air temperature control door	15	PTC heater
8	Defrost airflow door		

HA-8

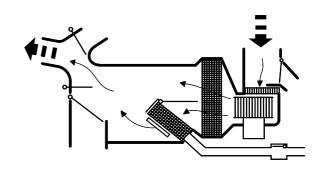
HEATING, VENTILATION AND AIR CONDITIONING

SYSTEM AIR FLOW DESCRIPTION

MAX A/C



PANEL



KQQE911B

KQQE911A

When MAX A/C is selected:

Air inlet blend door : Recirc

- Air temperature control door : Max. cold

Defrost airflow door : ClosePanel airflow door : OpenFloor airflow door : Close

- A/C compressor : ON

- Blower motor : ON

When PANEL is selected:

Air inlet blend door : Fresh

- Air temperature control door : Enable to select

Defrost airflow door : ClosePanel airflow door : Open

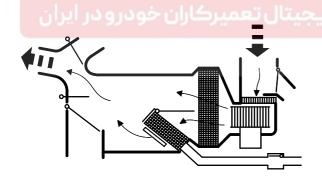
- Floor airflow door : Close

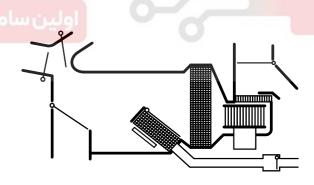
A/C compressor : Enable to select

- Blower motor : ON

جيتال خودرو سامانه (مسئوليت محدوم

OFF





KQQE911B

KQQE911C

When A/C is selected:

Air inlet blend door : Fresh

- Air temperature control door : Enable to select

Defrost airflow door : Enable to select
 Panel airflow door : Enable to select
 Floor airflow door : Enable to select

A/C compressor : ONBlower motor : ON

When OFF is selected:

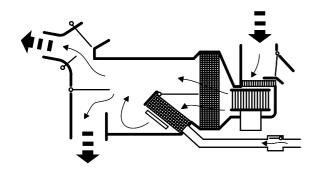
- Air inlet blend door : Recirc

Air temperature control door : Enable to select

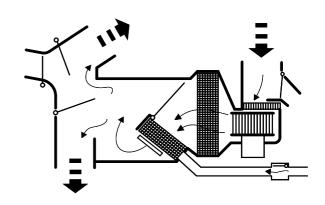
Defrost airflow door : Open
Panel airflow door : Close
Floor airflow door : Close
A/C compressor : OFF
Blower motor : OFF

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PANEL/FLOOR



FLOOR/DEFROST



KQQE911D

When PANEL/FLOOR is selected:

- Air inlet blend door : Fresh
- Air temperature control door : Enable to select
- Defrost airflow door : Close
- Panel airflow door : Open
- Floor airflow door : Open
- A/C compressor : Enable to select
- Blower motor : ON

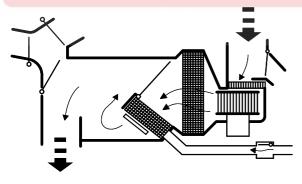
When FLOOR/DEFROST is selected:

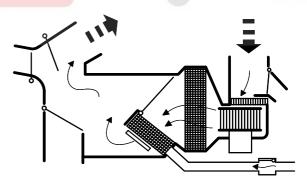
- Air inlet blend door : Fresh
- Air temperature control door : Enable to select
- Defrost airflow door : Open
- Panel airflow door : Close
- Floor airflow door : Open
- A/C compressor : ON
- Blower motor : ON

FLOOR

DEFROST

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KQQE911E

KQQE911G

KQQE911F

When FLOOR is selected:

- Air inlet blend door : Fresh
- Air temperature control door : Enable to select
- Defrost airflow door : ClosePanel airflow door : CloseFloor airflow door : Open
- A/C compressor : Enable to select
- Blower motor : ON

When DEFROST is selected:

- Air inlet blend door : Fresh
- Air temperature control door : Enable to select
- Defrost airflow door : OpenPanel airflow door : Close
- Floor airflow door : Close
- A/C compressor : ON
- Blower motor : ON

HA-10

PRECAUTIONS

The air conditioning system uses R-134a refrigerant and ND-OIL8 refrigerant oil, which are not compatible with R-12 refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.



(1) 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.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.



WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

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

- · Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
- · Keep moisture and dirt out of the system, When disconnecting any lines, plug or cap the fittings immediately; don t remove the caps or plugs until just before vou reconnect each line.
- Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
- When tightening or loosening a fitting, use a second wrench to support the matching fitting.
- When discharging the system, use a R-134a refrigerant recovery/recycling/charging station; don t release refrigerant into the atmosphere.



TROUBLESHOOTING E58CAFAF

of the problem. Check each part in order. If necessary, replace these parts.

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause

STANDARD:

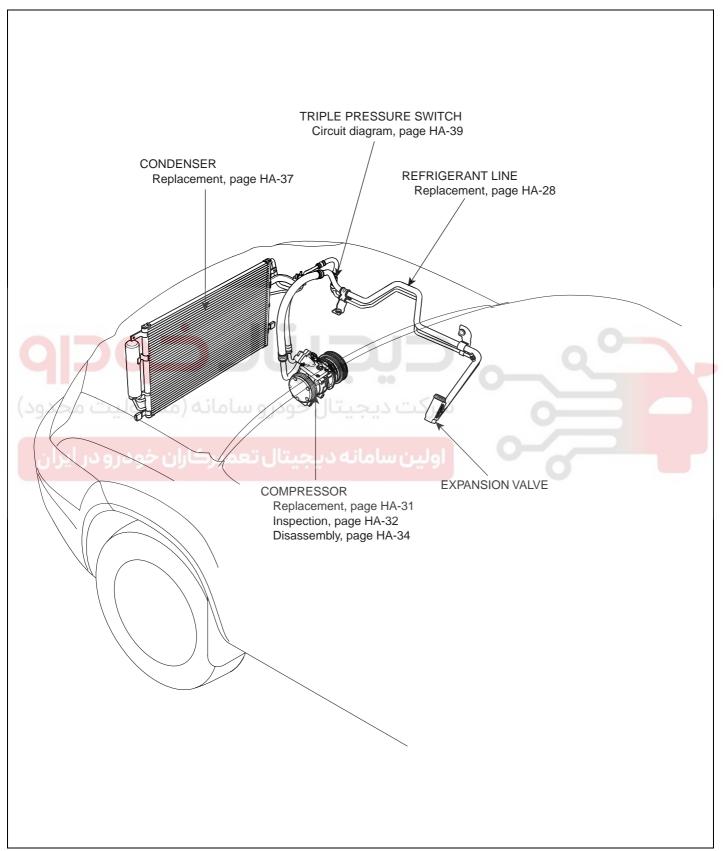
Symptom	Suspect Area	See page
No blower operation	 HTR Fuse Blower relay Blower motor Blower resistor Blower speed control switch Wire harness 	- HA-71 HA-69 HA-74 HA-81, 93
No air temperature control	Engine coolant capacity Heater control assembly	- HA-81, 93
No compressor operation	 Refrigerant capacity A/C Fuse Magnetic clutch Compressor Triple pressure switch A/C switch Thermistor, evaporator temp.sensor Wire harness 	HA-3, 24, 28 - HA-30 HA-29 HA-38 HA-81, 93 HA-40, 44
No cool comes out	 Refrigerant capacity Refrigerant pressure Drive belt Magnetic clutch Compressor Triple pressure switch Thermistor, evaporator temp. sensor A/C switch Heater control assembly Wire harness 	HA-3, 24, 28 HA-17 HA-26 HA-30 HA-29 HA-38 HA-40, 44 HA-81, 93 HA-81, 93
Insufficient cooling	 Refrigerant capacity Drive belt Magnetic clutch Compressor Condenser Expansion valve Evaporator Refrigerant lines Triple pressure switch Heater control assembly 	HA-3, 24, 28 HA-26 HA-30 HA-29 HA-36 HA-12 HA-56 HA-27 HA-38 HA-81, 93
No engine idle-up when A/C switch ON	 Engine (and ECT) ECU Wire harness 	-
No air inlet control	Heater control assembly	HA-81, 93
No mode control	Heater control assembly	HA-81, 93
No condenser fan operation	 ECU-IG Fuse Fan motor Engine (and ECT) ECU Wire harness 	- - - -

HEATING, VENTILATION AND AIR CONDITIONING

COMPONENT LOCATION INDEX EF0E47BE

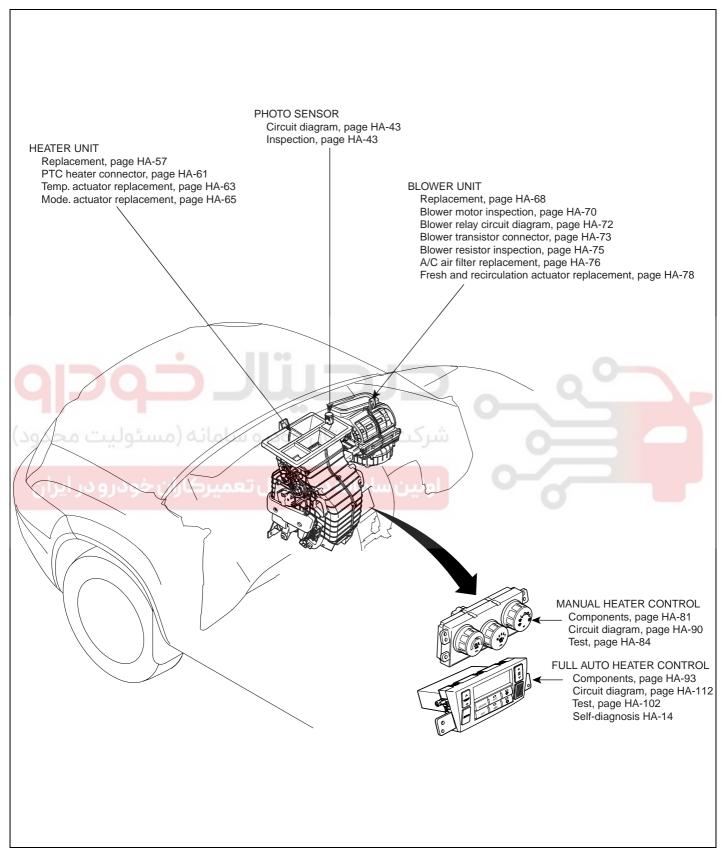
ENGINE ROOM

HA-12



EQQE001A

INTERIOR

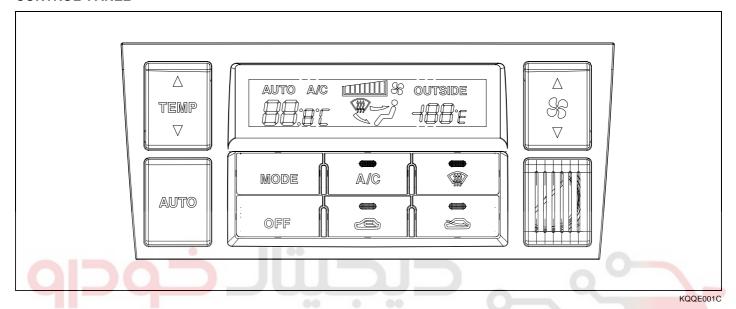


EQQE001B

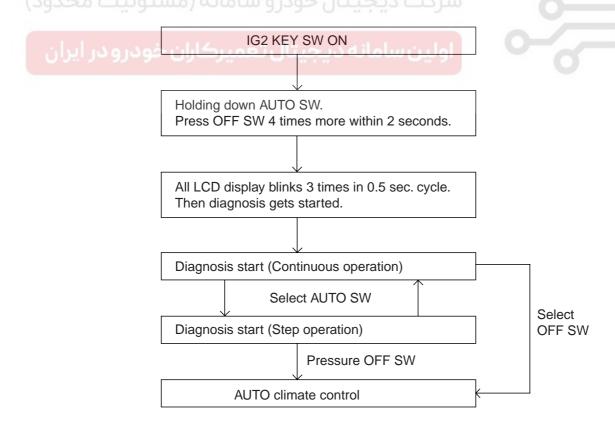
SELF-DIAGNOSIS E

The Full Automatic Temperature Control (F.A.T.C) module self test feature will detect electrical malfunctions and provide error code for system components with suspected failures.

CONTROL PANEL



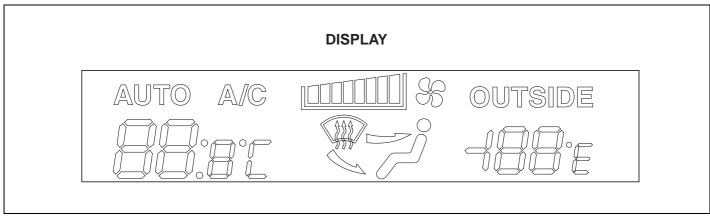
SELF-DIAGNOSIS METHOD



EQQE001D

HOW TO READ SELF-DIAGNOSTIC CODE

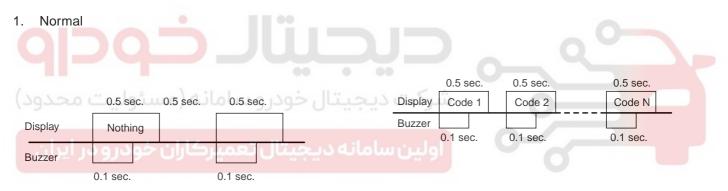
- After the display panel flickers three times every 0.5 second, the corresponding error code flickers on the setup temperature display panel every 0.5 second and will show two figures.
- 2. If error code is more than two, each code flicker 2 times in sequence.



KQQE001E

FAULT CODE DISPLAY

More error codes than two

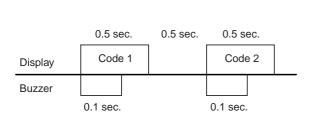


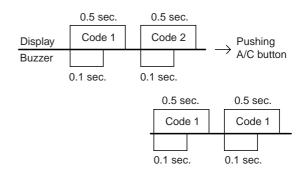
EQKE002D

EQKE002B

Checking each error code

2. One error code





EQKE002C

EQKE002E

HEATING, VENTILATION AND AIR CONDITIONING

DTC CHART

HA -16

If malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below.

DTC code	Detection item	Trouble area
00	Normal	-
11	Open INCAR Sensor circuit	Incar sensor
12	Shorted INCAR Sensor circuit	 Harness or connector between incar sensor and A/C control assembly A/C control assembly
13	Open Ambient sensor circuit	Ambient sensor
14	Shorted Ambient sensor circuit	 Harness or connector between ambient sensor and A/C control assembly A/C control assembly
15	Open water temp. sensor	Water temp. sensor
16	Shorted water temp. sensor	 Harness or connector between water temp. sensor and A/C control assembly A/C control assembly
17	Open evap. sensor	Evap. sensor
18	Shorted evap. sensor	 Harness or connector between evap. sensor and A/C control assembly A/C control assembly
19	Open or shorted temp. door potentiometer	Harness or connector between temp. door potentiometer and A/C control assembly
ت م20دود)	Defective temp. door potentiometer	Temp. door potentiometer
21	Open or shorted mode door potentiometer	 Harness or connector between mode door potentiometer and A/C control assembly
22	Defective mode door potentiometer	Mode door potentiometer
23	Open Humidity sensor circuit	Humidity sensor
24	Shorted Humidity sensor circuit	 Harness or connector between humidity sensor and A/C control assembly A/C control assembly

FAIL SAFE FUNCTION

No.	Item	Failure	FAIL SAFE Function
1	IN-CAR temperature sensor	Open/Short	25°C alternate value control
2	Ambient temperature sensor	Open/Short	20°C alternate value control
3	Evaporator sensor	Open/Short	-2°C alternate value control
4	Water temperature sensor	Open/Short	-20°C alternate value control
5	Temperature door potentiometer	Open/Short setup temperature	For 17°C to 24.5°C, set to maximum cooling position. For 25°C to 32°C, set to maximum heating position.
6	Mode door potentimeter	Open/Short setup mode	Vent mode, at vent mode Def mode, at except vent mode

ON-VEHICLE INSPECTION E6CC595I

This is a method in which the trouble is located by using a gauge set. Read the gauge pressure when these conditions are established.

TEST CONDITIONS

- Temperature at the air inlet with the switch set at RE-CIRC is 30~35°C (86~95°F)
- Engine running at 1,500rpm
- Blower speed control knob on "4" position
- Temperature control knob on "COOL" position

NOTE

It should be noted that the gauge indications may vary slightly due to ambient temperature conditions

1. Normally functioning refrigeration system.

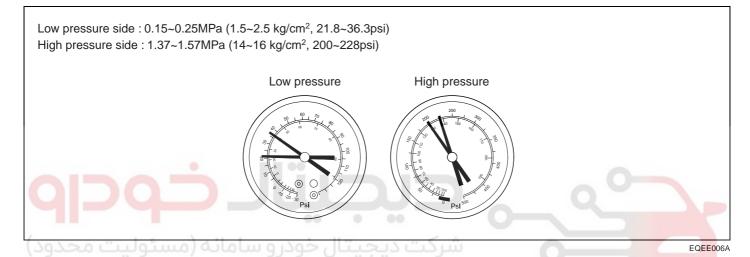
Gauge reading:

Low pressure side:

0.15~0.25 MPa (21.8~36.3 psi, 1.5~2.5 kgf/cm²)

High pressure side :

1.37~1.57 MPa (199~228 psi, 14~16 kgf/cm²)



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HEATING, VENTILATION AND AIR CONDITIONING

HA-18

2. Moisture present in refrigeration system.

Condition: Periodically cools and then fails to cool

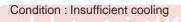




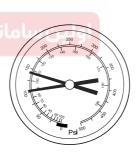
EQKE006B

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	 Drier in oversaturated state Moisture in refrigeration system freezes at expansion valve orifice and block circulation of refrigerant 	 Raplace drier Remove moisture in cycle through repeatedly evacuating air Evacuate the system and charge new refrigerant to specified amount.

3. Insufficient cooling



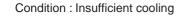




EQKE006C

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
 Pressure low on both low and high pressure sides Insufficient cooling performance 	Gas leakage at some place in refrigeration system	 Insufficient refrigerant in system Refrigerant leaking 	 Check for gas leakage with gas leak detector and repair if necessary Charge proper amount of refrigerant If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak

4. Poor circulation of refrigerant







EQKE006D

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
 Pressure low in both low and high pressure sides Frost on tube from receiver to unit 	Refrigerant flow obstructed by dirt in drier	Condenser clogged	Replace drier

5. Refrigerant does not circulate

Condition : Does not cool (Cools from time to time in some cases)







EQKE006E

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Vacuum indicated on low pressure side, very low pressure indicated on high pressure side Frost or dew seen on piping before and after receiver/drier or expansion valve	 Refrigerant flow obstructed by moisture or dirt in refrigeration system Refrigerant flow obstructed by gas leakage from expansion valve 	Refrigerant does not circulate	 Check expansion valve Clean out dirt in expansion valve by blowing with air Replace drier Evacuate the system and charge new refrigerant to specified amount. For gas leakage from expansion valve, replace expansion valve

HA-20

HEATING, VENTILATION AND AIR CONDITIONING

6. Refrigerant overcharged or insufficient cooling of condenser

Condition: Insufficient cooling





EQKE006F

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressure too high on both low and high pressure sides	Unable to develop sufficient performance due to excessive Insufficient cooling of condenser	 Excessive refrigerant in cycle refrigerant overcharged Condenser cooling condenser fins clogged or condenser fan faulty 	 (1) Clean condenser (2) Check cooling fan with fluid coupling operation. (3) If (1) and (2) are in normal state, check amount of refrigerant. Evacuate the system and charge new refrigerant to specified amount.

7. Air present in refrigeration system

Condition: Insufficient cooling





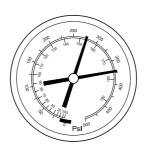
EQKE006G

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
 Pressure too high on both low and high pressure sides The low pressure piping hot to the touch 	Air entered in refrigeration system	 Air present in refrigeration system Insufficient vacuum purging 	 Check compressor oil to see if it is see if it is dirty or insufficient Evacuate the system and charge new refrigerant to specified amount.

8. Expansion valve improperly

Condition: Insufficient cooling





EQKE006G

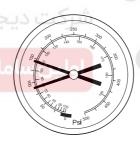
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
 Pressure too high on both low and high pressure sides Frost or large amount of dew on piping on low pressure side 	Trouble in expansion valve	 Excessive refrigerant in low pressure piping Expansion valve opened too wide 	 Check expansion valve Replace if defective

9. Defective compression compressor

Condition : Does not cool







EQKE006H

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
 Pressure too high on low and high pressure sides Pressure too low to on high pressure side 	Internal leak in compressor	Compression defectiveValve leaking or broken sliding parts	Repair or replace compressor

INSPECT FOR LEAKAGE OF REFRIGERANT

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.
- 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. again.

∴ CAUTION

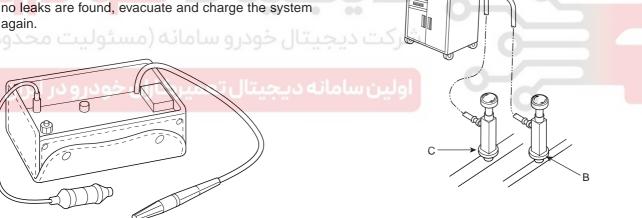
REFRIGERANT RECOVERY

- · 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 a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instruction.



EQKE007A

EQKE004A

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

SYSTEM EVACUATION

- · Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- · Be careful when connecting service equip-
- 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.

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

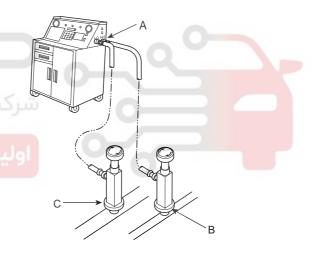
SYSTEM CHARGING

∴ 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.

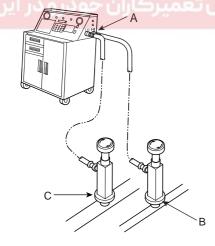
Connect R-134a refrigerant recover/recyа cling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacture's instructions.



EQKE004A

- Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only ND-OIL8 refrigerant oil.
- Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the compressor will be damaged.

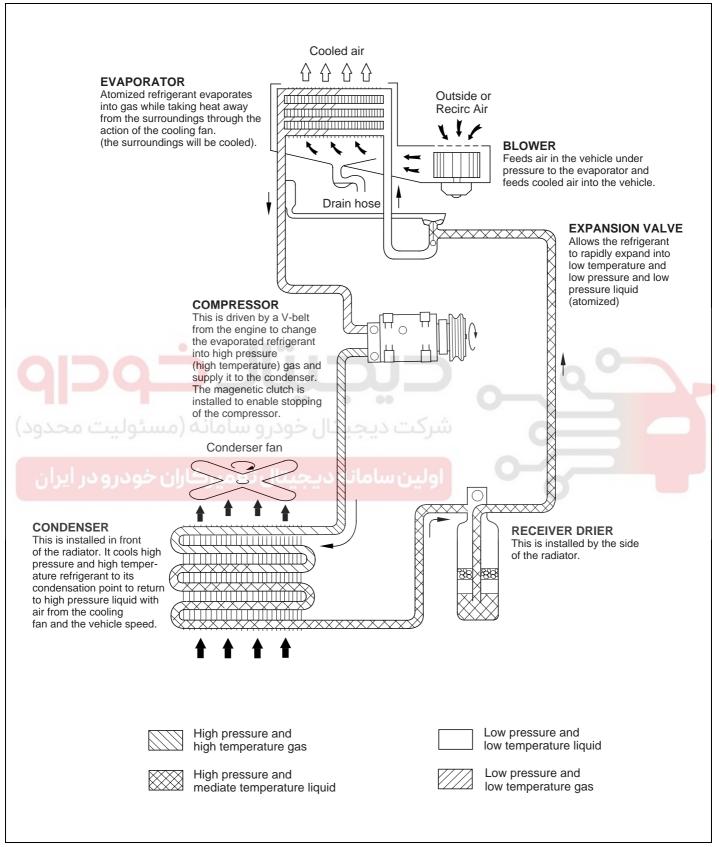
Refrigerant capacity: 510 ± 25g



FOKE004A

If the low-pressure does not reach more than 93.3 kPa(700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system (see page HA-24), and check for leaks (see page HA-22).

REFRIGERATION CYCLE E98A7EDF



EQDE008A

AIR CONDITIONING SYSTEM

HA -25

AIR CONDITIONING SYSTEM

DRIVE BELT

INSPECTION EFAAC8A7

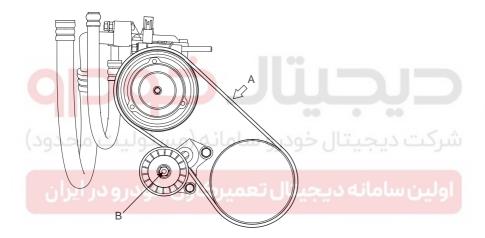
Only BETA ENG. Apply a force of 98N(10kgf, 22lbf), and measure the deflection at the mid point(A) between the air condition compressor and crankshaft pulley.

Deflection

Used belt: 6.0~7.0mm (0.24~0.28 in.) New belt: 5.0~5.5mm (0.20~0.22 in.)

ADJUSTMENT E7AD59AA

- 1. Loosen the tension mounting bolt(B).
- 2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the mounting bolt.
- 3. Recheck the deflection of the drive belt.





EQQE005A

NOTE

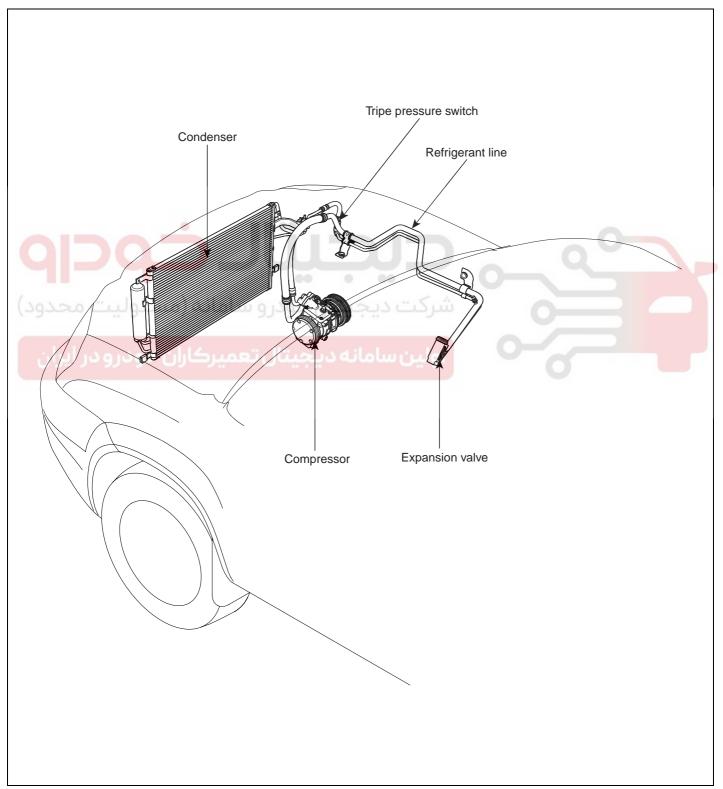
These items when adjusting belt tension:

- If there are cracks or any damage evident on the belt, replace it with a new one.
- "Used belt" means a belt which has been used for five minutes or more.
- "New belt" means a belt which has been used for less than five minutes.

A/C COMPRESSOR CONTROLS (MANUAL)

REFRIGERANT LINE

COMPONENT LOCATION E9BCDB6C



EQQE009A

A/C COMPRESSOR CONTROLS (MANUAL)

HA -27

REPLACEMENT

- Discharge refrigerant from refrigeration system (see page HA-23).
- Replace faulty tube or hose.



CAUTION

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

Tighten joint of bolt or nut to specified torque



(1) CAUTION

Connections should no be torqued tighter than the specified torqued.

Evacuate air in refrigeration system and charge system with refrigerant (see page HA-24).

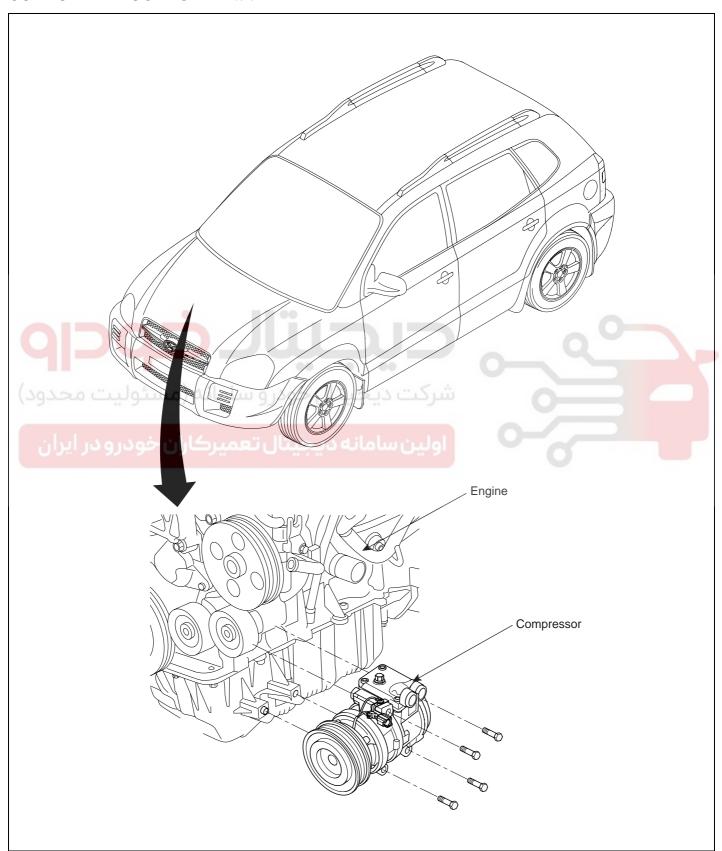
Specified amount: 510 ± 25g

- 5. Inspect for leakage of refrigerant. Using a gas leak detector, check for leakage of refrigerant (see page HA-22).
- Inspect A/C operation.

Part tightened	N⋅m	kgf⋅cm	lbf-ft
Condenser x Discharge hose	5 ~ 7	50 ~ 70	3.7 ~ 5.2
Condenser x Liquid tube	5 ~ 7	50 ~ 70	3.7 ~ 5.2
Compressor x Discharge hose	5 ~ 7	50 ~ 70	3.7 ~ 5.2
Compressor x Suction hose	5 ~ 7	50 ~ 70	3.7 ~ 5.2
Expansion valve x Evaporator	5 ~ 7	50 ~ 70	3.7 ~ 5.2

COMPRESSOR

COMPONENT LOCATION EED8CE87



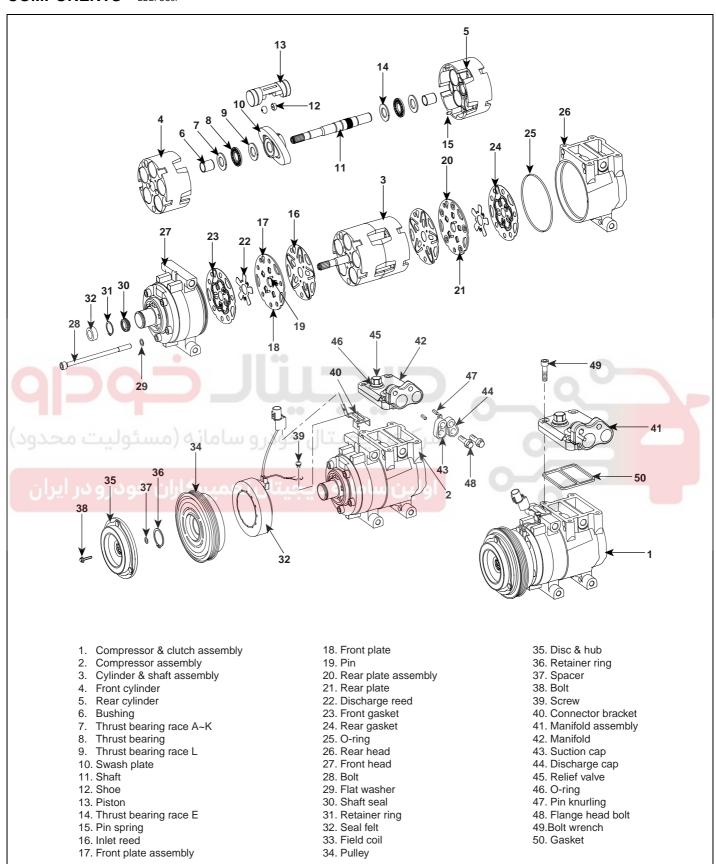
EQQE100A

A/C COMPRESSOR CONTROLS (MANUAL)

HA -29

COMPONENTS

EDBFCC9F



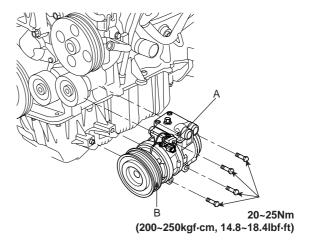
EQQE100B

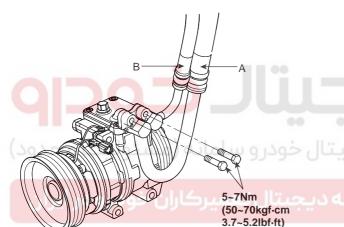
HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT E

- 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 (see page HA-23).
- 4. Loosen the drive belt (see page HA-26).
- Remove the nuts, then disconnect the suction line (A) and discharge (B) line from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

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



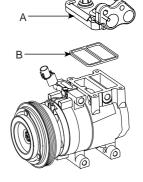


EQQE101B

Using a hexagon wrench (6mm) remove the bolts, the manifold assembly (A) and the gasket (B) from the compressor.

17.8~23.5Nm (178~235kgf·cm, 13.1~17.3lbf·ft)

EQQE101A



EQQE101C

A/C COMPRESSOR CONTROLS (MANUAL)

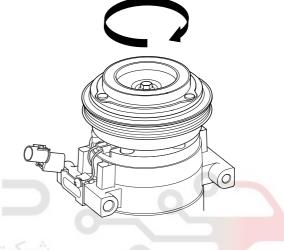
HA-31

FOKE102A

- 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 200ml 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 (see page HA-26).
 - Charge the system (see page HA-24), and test its performance (see page HA-22).

INSPECTION E30A99

- Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the pulley 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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HEATING, VENTILATION AND AIR CONDITIONING

 Measure the clearance between the pulley (A) and the pressure plate (B) all the way around. If the clearance is not within specified limits, remove the pressure plate (see page HA-34) and add or remove shims as needed to increase or decrease clearance.

Clearance : 0.5 ± 0.15 mm $(0.020 \pm 0.006 in.)$

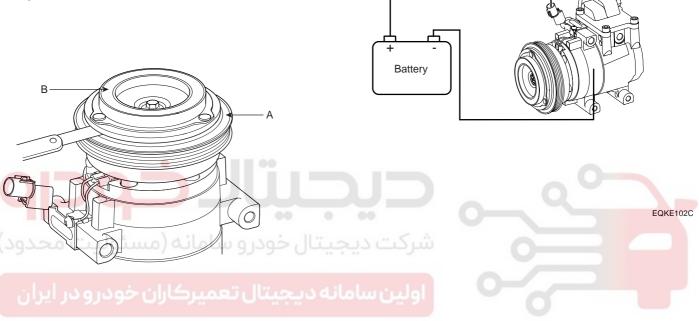
Check operating of the magnetic clutch.
 Connect the compressor side terminals to the battery

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

Check the magnetic clutch operating noise to determine the condition.



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



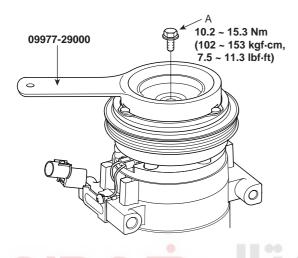
A/C COMPRESSOR CONTROLS (MANUAL)

HA -33

DISASSEMBLY

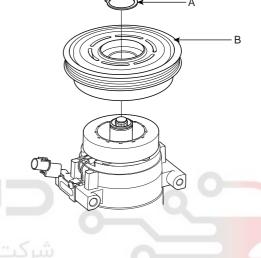
■**T** E074E607

 Remove the center bolt (A) while holding the pressure plate with a commercially available pressure plate bolt remover; Special tool number 09977-29000.



EQKE103A

 Remove the pressure plate (A) and shim (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 pressure plate, and recheck its clearance (see page HA-33).



If you replacing the field coil, remove snap ring (A)

· Be careful not to damage the pulley (B) and com-

• Once snap ring (A) is removed, replace it with a

pressor during remove/installation.

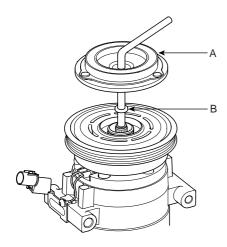
with snap ring pliers.

new one.

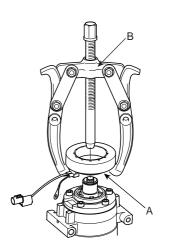
NOTE

EQKE103C

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



EQKE103B



EQKE103D

HEATING, VENTILATION AND AIR CONDITIONING

- HA -34
- 5. Reassemble the compressor clutch in the reverse order of disassembly, and note these items:
 - Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
 - Install new snap rings, and make sure they are fully seated in the groove.
 - Make sure that the pulley turns smoothly after it's reassembled.



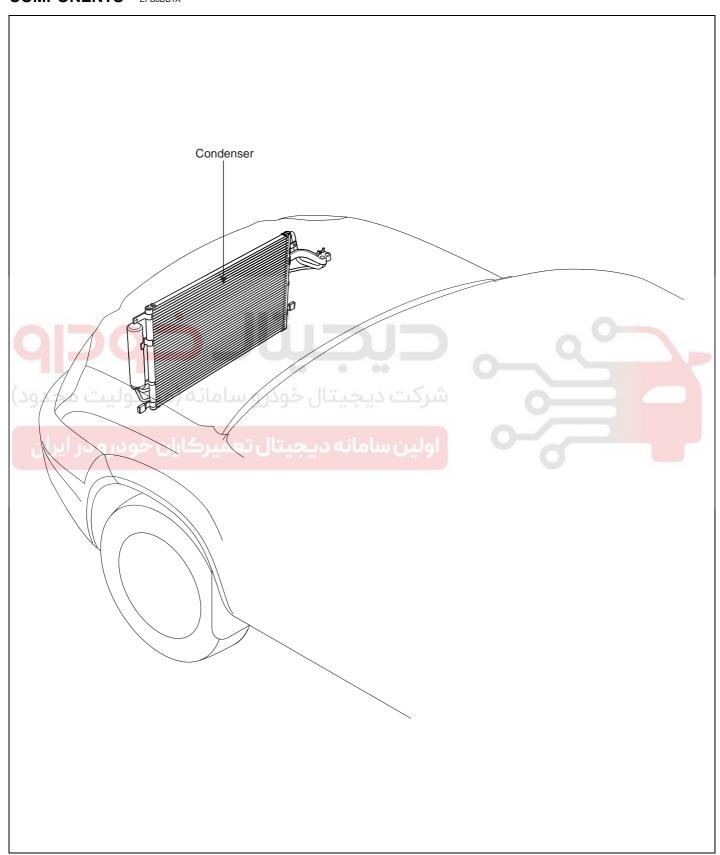


A/C COMPRESSOR CONTROLS (MANUAL)

HA -35

CONDENSER

COMPONENTS EFB8DB1A

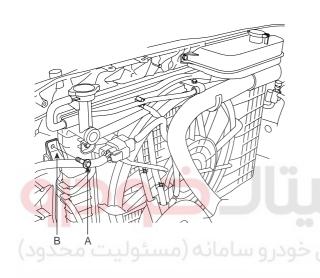


EQQE120B

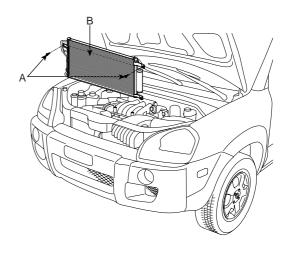
HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT E

- 1. Recover the refrigerant with a recovery/recycling/charging station (see page HA-23).
- 2. Remove the coolant reservoir, but do not disconnect the reservoir hose from the coolant reservoir and the radiator.
- 3. Remove the bolt(A), then remove the radiator bracket(B) from the radiator.



5. Remove the bolts(A), then remove the condenser(B) by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser.



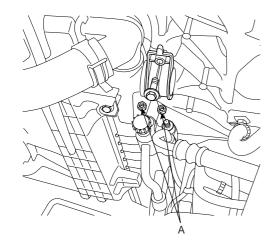
KQQE121C

- Install in the reverse order of removal, and note these items:
 - If you're installing a new condenser, add refrigerant oil.
 - 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 (see page HA-24), and test its performance (see page HA-22).

KQQE121A

4. Remove the bolts(A), then disconnect the discharge line and condenser line from the condenser.

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



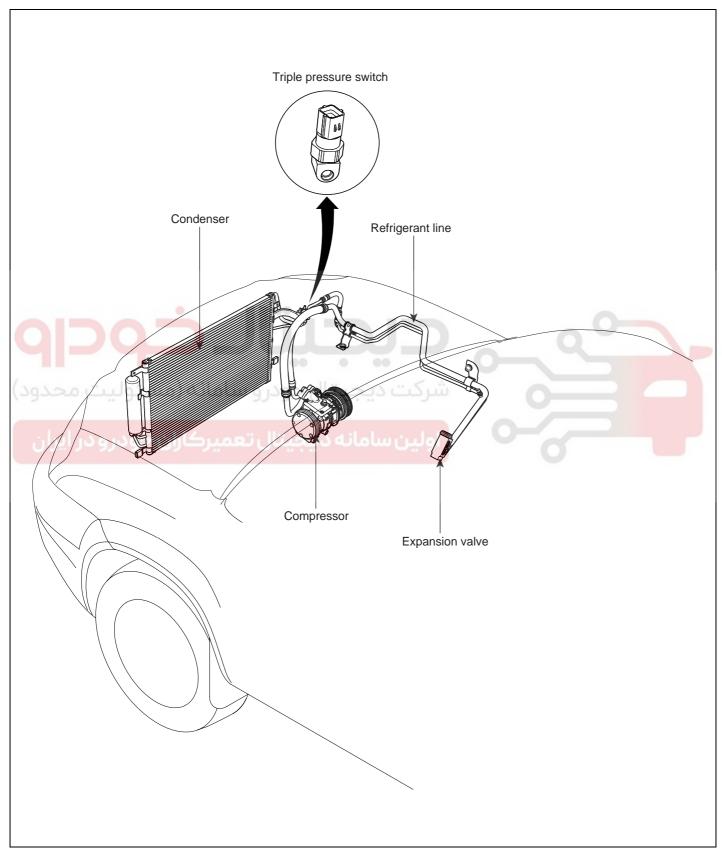
KQQE121B

A/C COMPRESSOR CONTROLS (MANUAL)

HA -37

TRIPLE PRESSURE SWITCH

COMPONENT LOCATION E85B5EBC



EQQE130A

E123A14B

CONNECTOR

DESCRIPTION E6B3D4CE

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

- Rating load : Inductive loacl DC 12V, 10~250mA
- Applicable voltage range : DC 8V ~ DC 16V
- Applicable temperature range : -30 °C ~ 120 °C
- Applicable refrigerant : R-134a
- Insulation resistance : Min. 100M

 at DC 500V

Operating characteristics (kg/cm²)

Pressure	ON	OFF
High	32.0 ± 2.0	26.0 ± 2.0
Low	2.3 + 0.25 / -0.29	2.0 ± 0.2
Medium	18.0 ± 0.8	14.0 ± 1.2

Pin No.	1	2	3	4
Circuit	High &	High &	Medium	Medium
	Low	Low		

LOW & HIGH

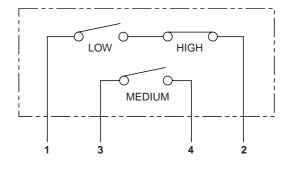
CIRCUIT DIAGRAM

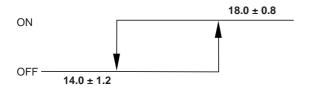
E39309D9



EQKE130B

MEDIUM





EQKE130E

KOOF131C

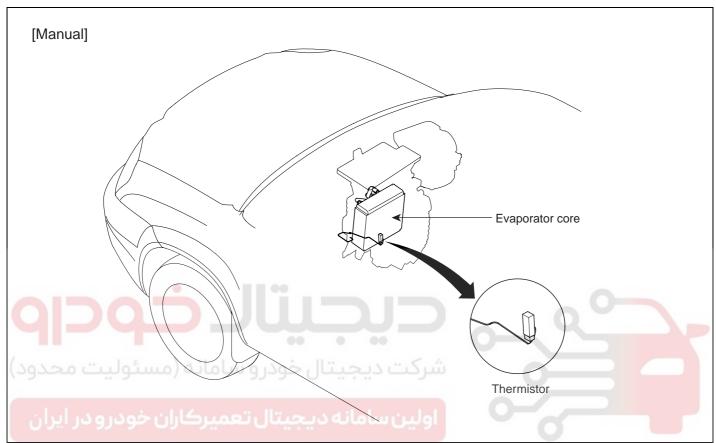
KQQE131B

A/C COMPRESSOR CONTROLS (MANUAL)

HA -39

THERMOSTATIC SWITCH (THERMISTOR)

COMPONENT LOCATION EAREF65D



EQQE203A

DESCRIPTION E4FA2C6C

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

The thermistor will use the thermal negative characteristic.

Rated voltage : DC 12V

- Operating voltage : 9V ~ 16V

- Reserved temp. range : -40 ~ 90 °C

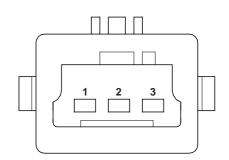
- Using temp. range: -30 ~ 85 °C

- Electric load : ECU

ELECTRIC CHARACTERISTICS ACCORDING TO TEMP

Mode	Operating temperature
A/C ON	2.5 ± 0.5 C
A/C OFF	0.8 ± 0.5 C

CONNECTOR E00B72E9

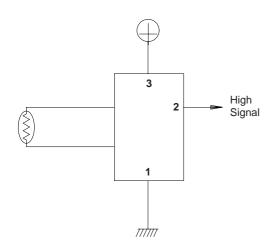


KQQE203B

HEATING, VENTILATION AND AIR CONDITIONING

HA -40

CIRCUIT DIAGRAM









A/C COMPRESSOR CONTROLS (FULL AUTO)

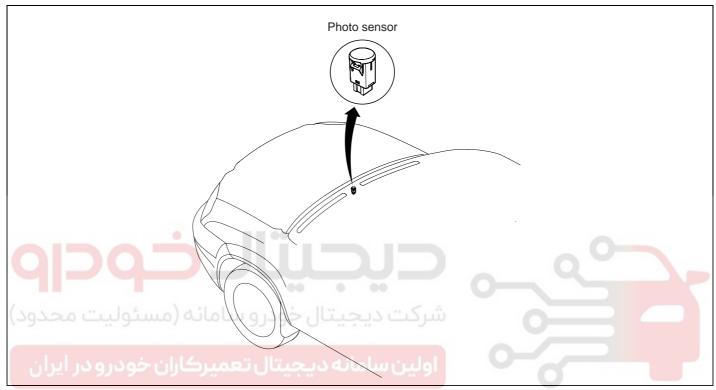
HA -41

A/C COMPRESSOR CONTROLS (FULL AUTO)

PHOTO SENSOR

COMPONENT LOCATION

E69B5FB7

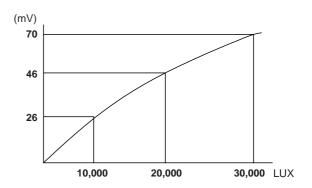


EQQE207A

DESCRIPTION EFCF673A

The photo sensor is located by the driver side defrost nozzle. In response to the photo intensity level in the vehicle, the sensor will send signals to control module to control the blower level and discharge temperature.

CHARACTERISTICS

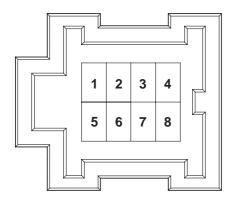


KQQE207B

HEATING, VENTILATION AND AIR CONDITIONING

CONNECTOR

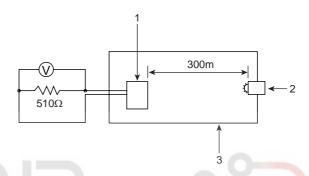
3FBAC3F



INSPECTION E4E0BF5D

Install the lamp and the photo sensor in the dark room. Then measure the output current.

LUX	10000	20000	30000
Voltage (mV)	26	46	70

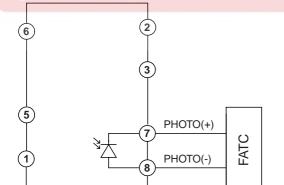


KQQE207C

Pin No.	1	7	8
Circuit	GND	Photo (+)	Photo (-)

CIRCUIT DIAGRAM

E8EBD244



- 1. Photo sensor
- 2. Lamp
- 3. Dark room

KQQE207D

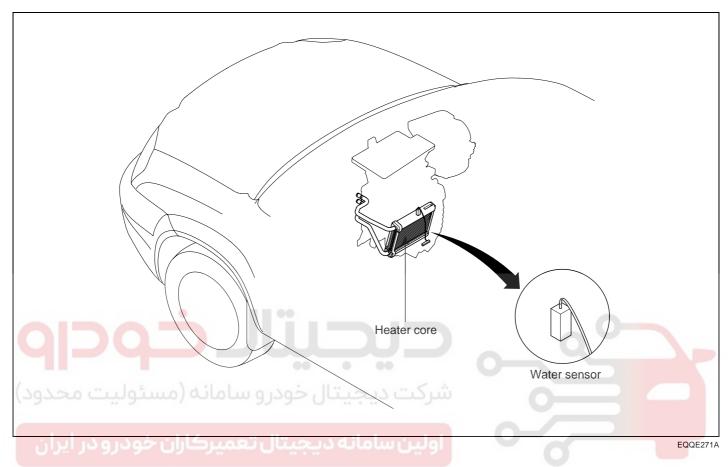
KQQE207E

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA-43

WATER TEMPERATURE SENSOR

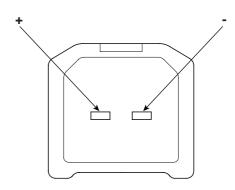
COMPONENT LOCATION EBED1C52



DESCRIPTION EB414E90

CONNECTOR EE4AADC8

- The water sensor, located at the heater core.
- 2. It will detect water temperature, the sensor will send signal to control module.



KQQE270A

HEATING, VENTILATION AND AIR CONDITIONING

INSPECTION

B6FE290

MEASURE THE RESISTANCE

Temp [*C]	Resistance [K∏]	Voltage [V]
-40	327.2	4.88
-30	176.3	4.78
-30	97.75	4.62
-10	55.85	4.37
0	32.91	4.02
10	19.99	3.56
20	12.51	3.04
30	8.047	2.50
40	5.311	1.99
50	3.588	1.54
60	2.476	1.18
70	1.742	0.89
80	1.246	0.67





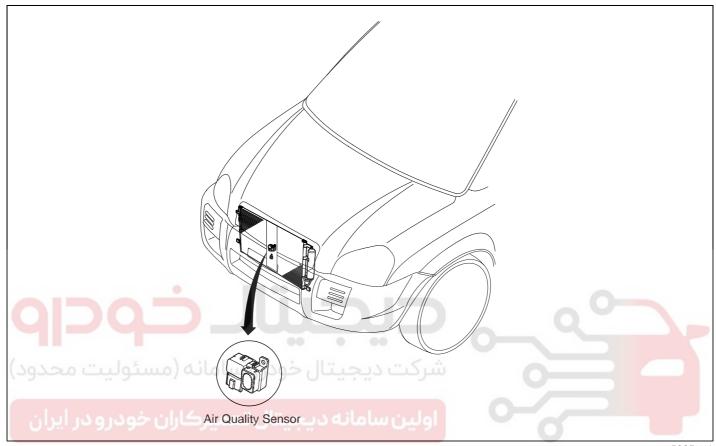
KQQE270B

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA-45

A.Q.S (AIR QUALITY SENSOR)

COMPONENT LOCATION E15C0ED



EQQE208A

DESCRIPTION ED8EC4D0

- The A.Q.S. sensor, located at the center support in front of the engine radiator, detects hazardous elements in ambient air and provides output signals to the control module.
- 2. Detectable cases

Diesel engine exhaust gases : NO, NO , SOGasoline/LPG engine exhaust gases : CxHy, CO

3. Electrical specification

Operating voltage : DC 9 ~ 16V

Rated voltage : DC 12V

Consumed current : less than 200mA
 Operating temperature : -30 ~ 105 C
 Storage temperature : -40 ~ 125 C

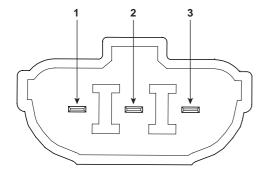
SENSOR OUTPUT

Condition	Voltage
Normal condition	5V
Hazardous gas detection	0V (GND)

HEATING, VENTILATION AND AIR CONDITIONING

CONNECTOR

FAF89B75



INSPECTION EBDF99EB

CHECKING METHOD OF GAS DETECTING BENCH

- 1. Put the sensor part of AQS(A) toward the air inflow (intake) direction.
- Connect all of the power supply line and output line to AQS(A).
- 3. Close the chamber(B) lid after putting the lines in order.
- 4. Connect the air outlet part of vacuum pump(C) with the air inlet door of chamber(B) by using air hose.

Pin No. 1 2 3

Circuit DC 12V GND SIGNAL OUTPUT

KQQE208C

- 5. Turn on the power of vacuum pump(B).
- 6. Supply the power to the AQS(A). (DC 12V)
- LED of AQS(A) is kept "ON" for the first 35 ± 2 seconds after supplying the power.

F

- Wait until all of the LEDs are "OFF". Put the diesel engine exhaust gas into the chamber. Then check the LEDs of number 1 to 10 are "ON".
- 9. After check LEDs are "ON". Put the clean air into the chamber. Then check LEDs are "OFF".
- 10. Wait until all of the LEDs are "OFF".
- 11. And then put the gasoline engine exhaust gas into the chamber, then check the LEDs of number 1 to 10 are "ON".
- 12. After check LEDs are "ON". Put the clean air into the chamber. Then check LEDs are "OFF".

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA-47

Sensitivity of used gas sensor

Sensitivity at NO 0.3ppm : More than 2.8Sensitivity at Gasoline 10ppm : Less than 0.45

Delay time

ON TIME (T on): 5 sec.OFF TIME (T off): 0 sec.

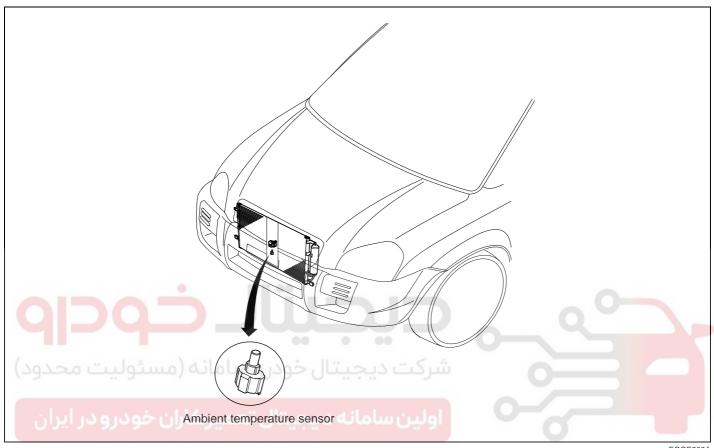




AMBIENT TEMPERATURE SENSOR

COMPONENT LOCATION

E0B2E78F



EQQE209A

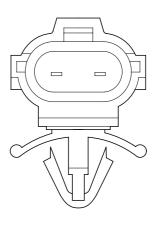
DESCRIPTION ECD6A48E

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

- R25 C: 30K ± 3% - B(0/25): 3754K ± 2%

Operation Temp. range : -30¹C ~ 80¹C

CONNECTOR E56CBFA2



EQKE209C

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA-49

INSPECTION

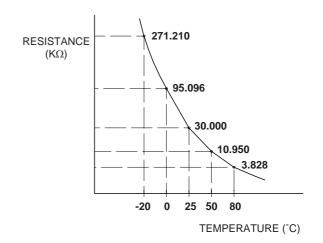
CHARACTERISTICS

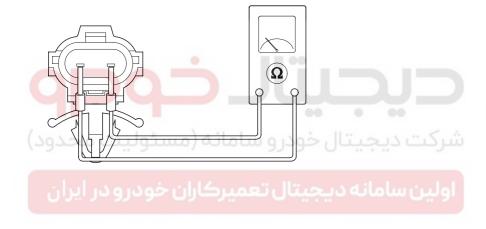
Measure the resistance.

RESISTANCE-TEMP. CHARACTERISIC TABLE

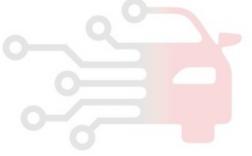
EF7DD2FB

Temp (*C)	Rmin (kជ)	R (k☆)	Rmax (kជ)
-20	251.740	271.210	291.920
0	90.139	95.096	100.240
25	29.100	30.000	30.900
50	10.410	10.950	11.508
80	3.563	3.828	4.109





EQKE209B



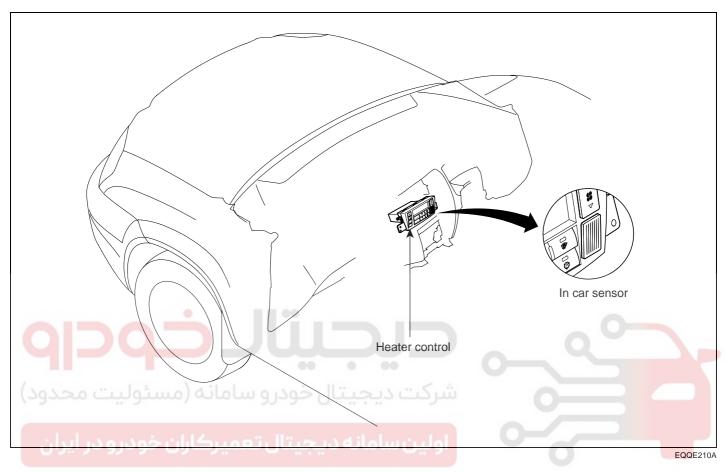
EQKE209D

HEATING, VENTILATION AND AIR CONDITIONING

HA -50

IN CAR SENSOR

COMPONENT LOCATION E8AAC70D

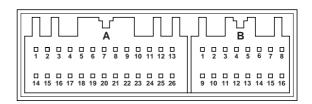


DESCRIPTION E2FA4A31

- The incar sensor, located at the heater control module.
- 2. It will detect interior temperature, the sensor will send signal to control module.

Pin No.	B1	В9
Circuit	Sensor IN	Sensor OUT

CONNECTOR EAB1E8C0



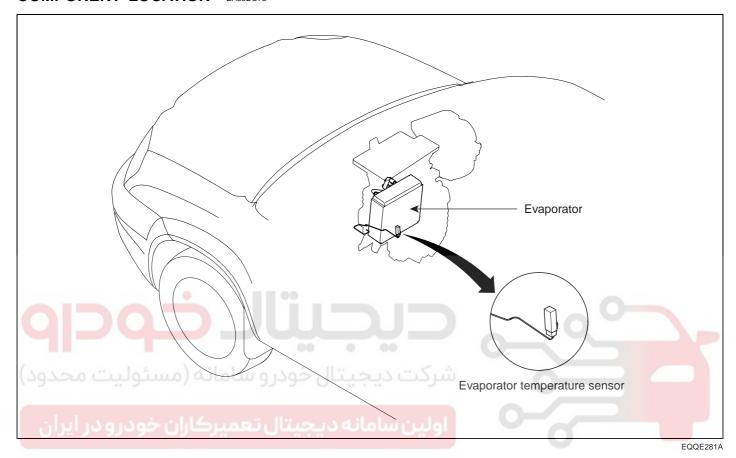
KQQE210B

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA -51

EVAPORATOR TEMPERATURE SENSOR

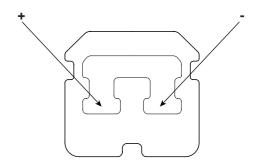
COMPONENT LOCATION EA89DC7



DESCRIPTION EFD2B0DB

- 1. The evaporator temp. sensor, located at the evaporator core.
- 2. It will detect evaporator temperature, the sensor will send signal to control module.

CONNECTOR EC40F7D7



KQQE280A

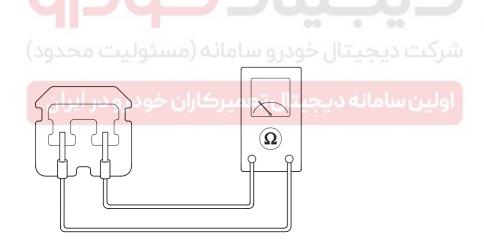
HEATING, VENTILATION AND AIR CONDITIONING

INSPECTION

D6AAB0I

MEASURE THE RESISTANCE

Temp [*C]	Resistance [K☆]	Voltage [V]
-10	13.56	3.14
-5	10.37	2.81
0	8.000	2.49
5	6.222	2.18
10	4.877	1.88
15	3.851	1.62
20	3.063	1.38
25	2.453	1.17
30	1.978	0.99
35	1.605	0.83
40	1.310	0.70
45	1.075	0.59
50	0.888	0.50





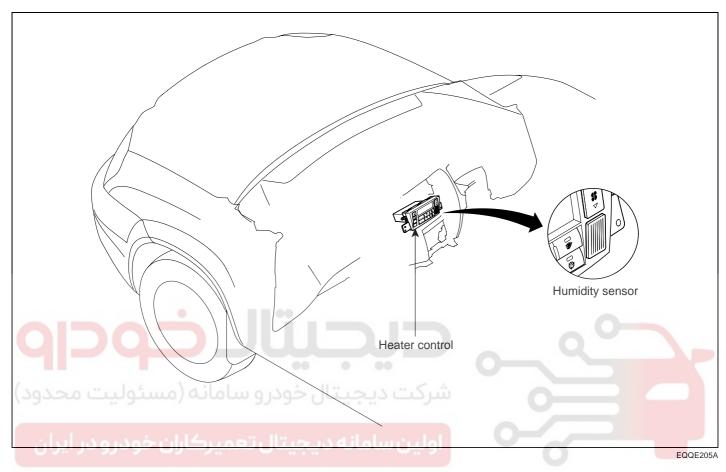
KQQE280B

A/C COMPRESSOR CONTROLS (FULL AUTO)

HA-53

HUMIDITY SENSOR

COMPONENT LOCATION EB09B0B

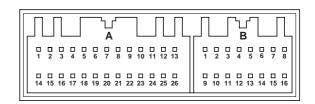


DESCRIPTION EC54E17A

- The humidity sensor, located at the heater control module.
- It will detect interior humidity, the sensor will send signal to control module.

Pin No.	A7	B14
Circuit	Sensor IN	Sensor OUT

CONNECTOR E9AE96C6



KQQE210B

HEATING, VENTILATION AND AIR CONDITIONING

HA -54

HEATER

HEATER UNIT

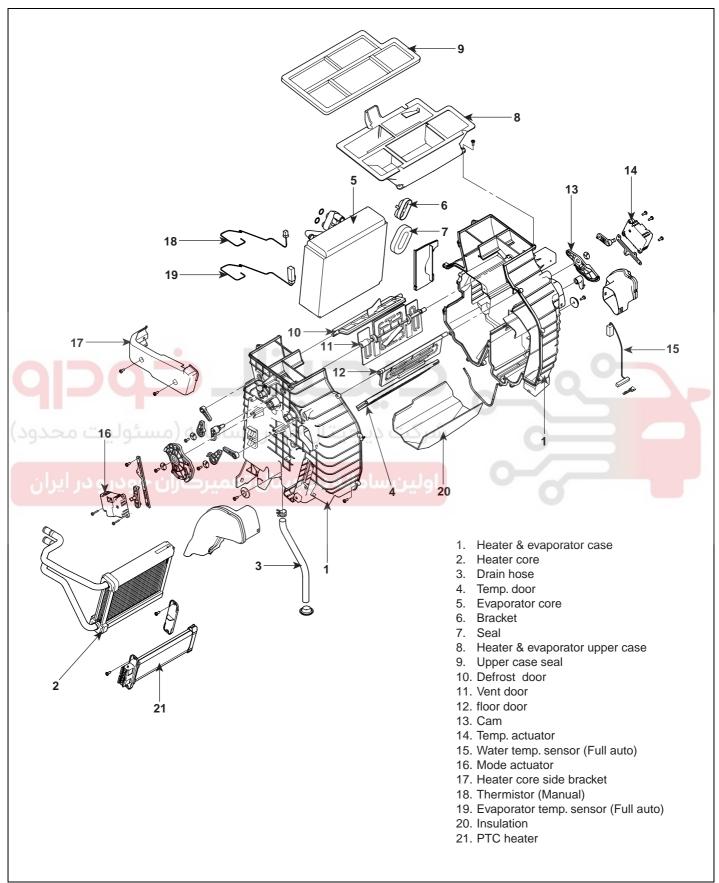
COMPONENT LOCATION EBD5B15C



KQQE300A

HEATER HA -55

COMPONENTS EE7DE9D9



EQQE300B

HA-56

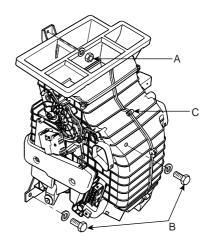
HEATING, VENTILATION AND AIR CONDITIONING

REPLACEMENT

- 1. Recover the refrigerant with a recovery/recycling/charging station (see page HA-23).
- 2. When the engine is cool, drain the engine coolant from the radiator.
- 3. Disconnect the negative cable from the battery.
- 4. Remove the bolts(A) and the expansion valve(B) from the evaporator core.

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

8. Remove the mounting nut(A), the mounting bolts(B) and heater & evaporator unit(C).



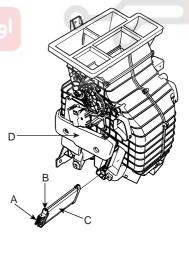
KQQE301C

Remove the connector(A). (Only PTC heater type)
Remove the self-tapping screws(B) and the PTC
unit(C) or cover.



KQQE301A

- Disconnect the inlet(C) and outlet(D) heater hoses from the heater unit.
 - Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on electrical parts or painted surfaces. If any coolant spills, rinse it off immediately.
- 6. Remove the crash pad (see BD group crash pad).
- 7. Remove the cross member.



KQQE301D

10. Remove the side bracket(D).

HEATER HA -57

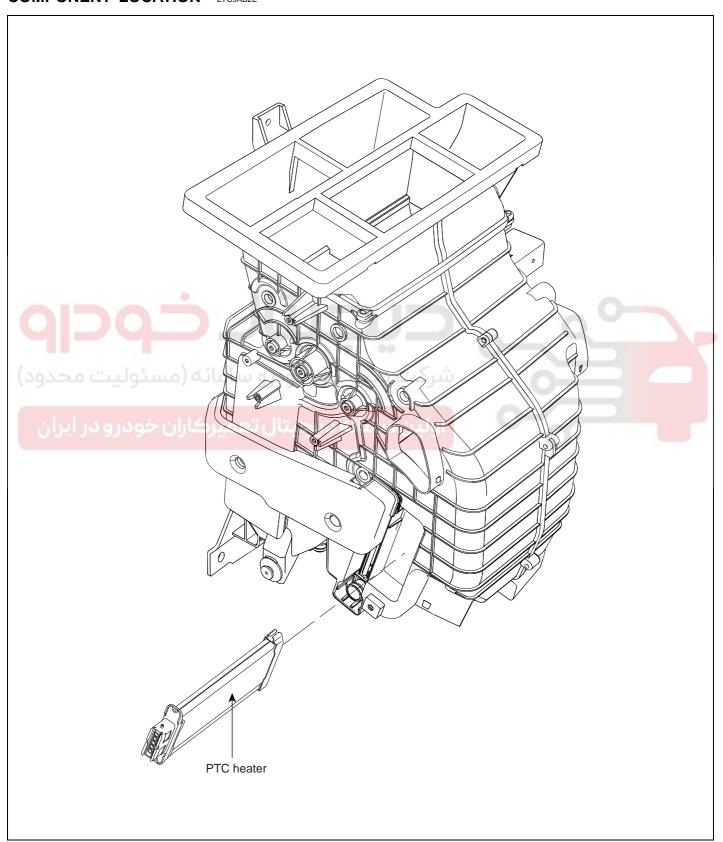
- Remove the clip and lower cover.
 Be careful not to bend the inlet and outlet pipes during heater core and evaporator core removal.
- 12. Install the heater core and evaporator core in the reverse order of removal.
- 13. Install in the reverse order of removal, and note these items :
 - If you're installing a new evaporator, add refrigerant oil.
 - 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 (see page HA-24), and test its performance (see page HA-22).
 - Do not interchange the inlet and outlet heater hoses and install the hose clamps securely.
 - Refill the cooling system with engine coolant.

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PTC (POSITIVE TEMPERATURE COEFFICIENT) HEATER

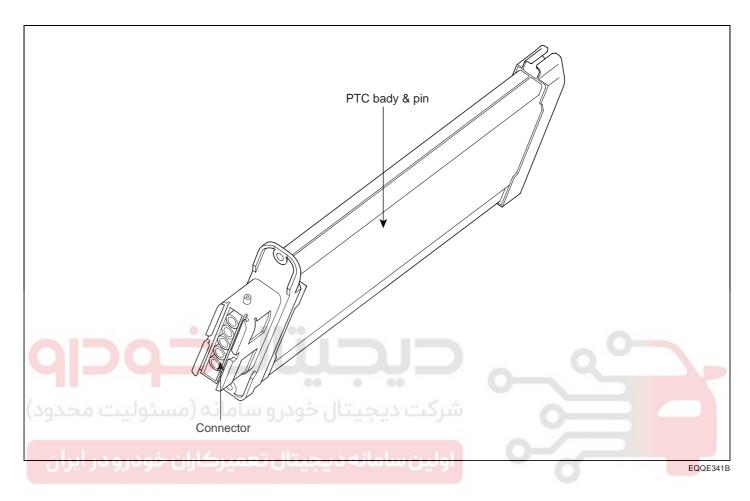
COMPONENT LOCATION E7C9AB2E



EQQE341A

HEATER HA -59

COMPONENTS E76FEDE



DESCRIPTION E12666CB

Voltage range : 9 ~ 16VNormal voltage : 13.5

Max. surface temperature : 165 C (Max.)

- Power: 900w +5%/-10%

< Condition of working >

Temperature of ambient air : below 5¹C
Temperature of cooling water : up to 70¹C

• Blower motor : ON

Core size : 180.5L x 73.6W x 16.6T

Durability

POWER IN RATE (P) = VOLTAGE X CURRENT

	I (A)	P (W)
Total	90 ± 10%	900 ± 10%
1	30 ± 10%	300 ± 10%
2	30 ± 10%	300 ± 10%
3	30 ± 10%	300 ± 10%

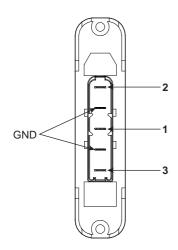
< Test condition >

Voltage: 13.5 ± 0.1V
T (ambient): 23 ± 3 C
Humidity: 25 ~ 75%
T (air intake): 0 ± 2 C

HEATING, VENTILATION AND AIR CONDITIONING

HA -60

CONNECTOR ETACEAFF



KQQE340A

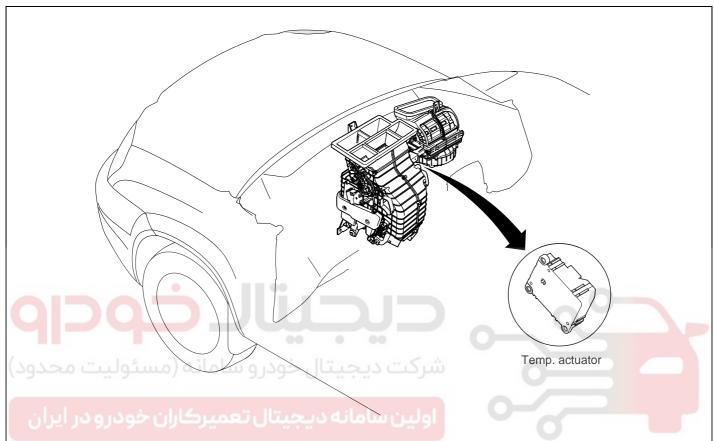




HEATER HA -61

TEMPERATURE CONTROL ACTUATOR

COMPONENT LOCATION EEA2A3B4



EQQE213A

DESCRIPTION E9FA7177

Rate voltage: DC 12V
Rate load: 1.5 kgf·cm
Operating time: 4 + 1.0 sec.
Rate current: Max. 0.1A
Lock current: Max. 0.55A
Locked torque: Max. 6kgf·cm

Noise: Max. 43dB
 Use voltage: DC 10 ~ 15V
 Use temp.: -40 ~ 80 C

CONNECTOR E33BDD4A

2				1
7	6	5	4	3

KQSE211D

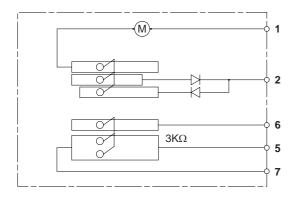
HEATING, VENTILATION AND AIR CONDITIONING

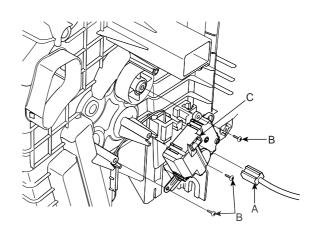
CIRCUIT DIAGRAM

CEF6BDD

REPLACEMENT EE7F6DED

Disconnect the 7P connector(A) from the temp. actuator(C). Remove the self-tapping screws(B) and the temp. actuator(C) from the heater unit.





KQQE213B

ديجيتال خودرو

KQQE213C

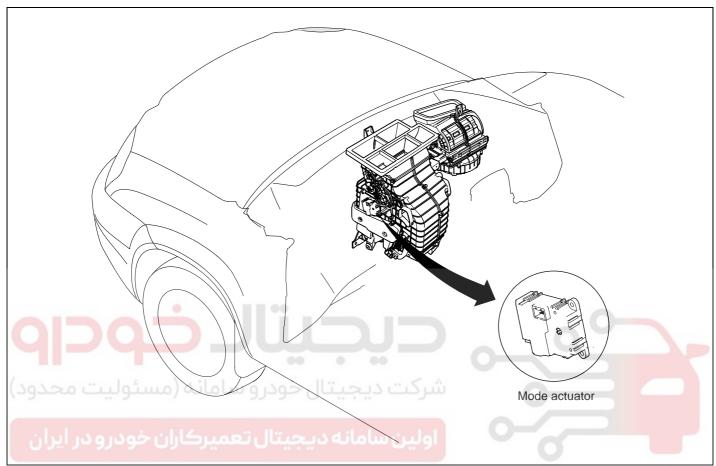
2. Install in the reverse order of removal. After installation, make sure temp. actuator(C) runs smoothly.

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HEATER HA -63

MODE CONTROL ACTUATOR

COMPONENT LOCATION ECCC054E



EQQE211A

DISCRIPTION E6F9A564

Rate voltage: DC 12V
Rate load: 1.5 kgf·cm
Operating time: 4 + 1.0 sec.
Rate current: Max. 0.1A
Lock current: Max. 0.55A
Locked torque: Max. 6kgf·cm

Noise: Max. 43dB
 Use voltage: DC 10 ~ 15V
 Use temp.: -40 ~ 80 C

CONNECTOR E228DD3D

2				1
7	6	5	4	3

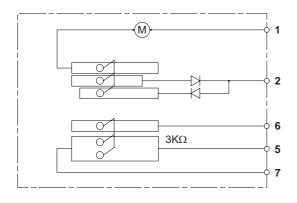
KQSE211D

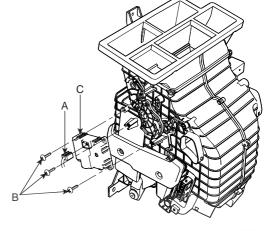
HEATING, VENTILATION AND AIR CONDITIONING

CIRCUIT DIAGRAM

REPLACEMENT

Remove the 7P connector(A) from the mode actuator(C). Remove the self-tapping screw(B) and the mode actuator(C) from the heater unit.





KQQE213B

ديجيتال خودرو

KQQE211E

2. Install in the reverse order of removal. After installation, make sure the mode actuator(C) runs smoothly.

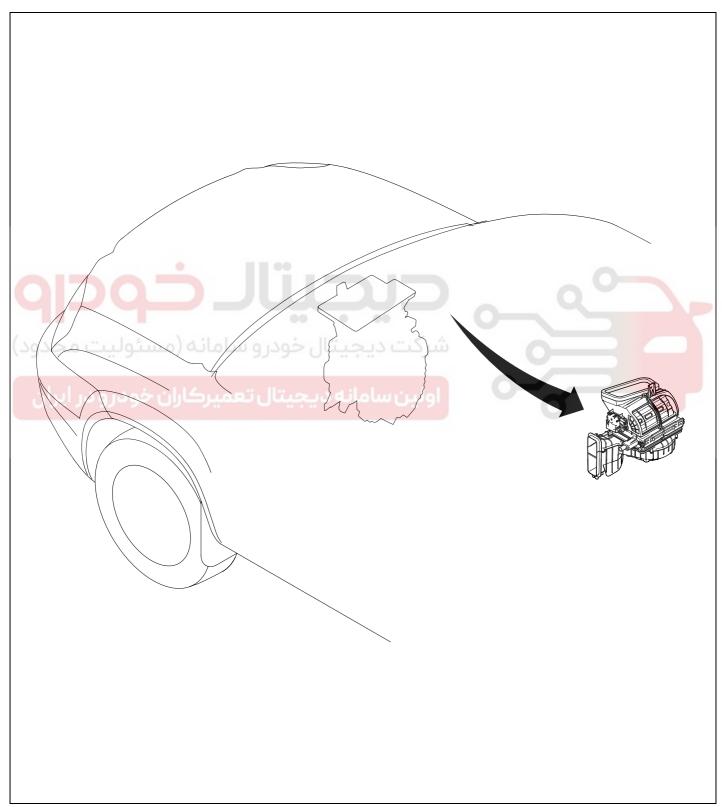
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BLOWER CONTROLS HA -65

BLOWER CONTROLS

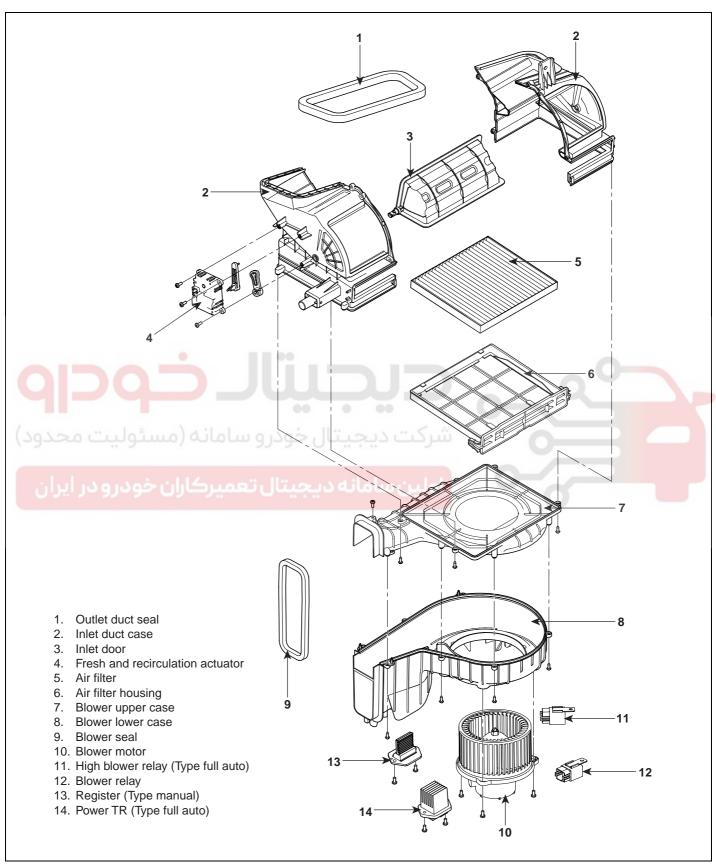
BLOWER UNIT

COMPONENT LOCATION E6AAD472



KQQE400A

COMPONENTS E0CC9B81



EQQE400B

BLOWER CONTROLS HA -67

REPLACEMENT E5D4

- 1. Disconnect the negative cable from the battery.
- 2. Remove the crash pad (see BD group crash pad).
- Disconnect the connectors from the blower relay the blower motor, the blower resistor (or power transistor) and the fresh and recirculation actuator. Remove the self-tapping screws(A), the mounting nut(B), the mounting bolt(C) and the blower unit(D).



4. Install in the reverse order of removal.

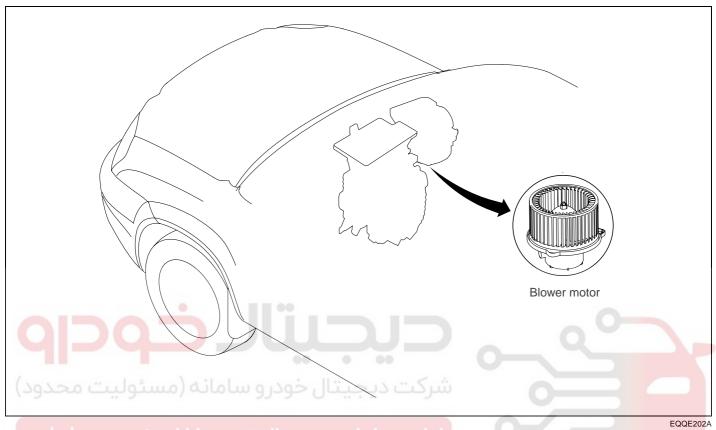
and duct joints.

HEATING, VENTILATION AND AIR CONDITIONING

HA -68

BLOWER MOTOR

COMPONENT LOCATION E6A3E42A



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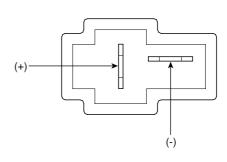
DESCRIPTION EAB7013F

CONNECTOR

ED4E59C4

Moter: Magnet ø68.2

Item	Specifications	
Time rating	Continuous	
Rated voltage	DC 12V	
Speed in rated load	3,000 ± 10% RPM	
Power in rated	250W grade	
Rotation direction	CCW	

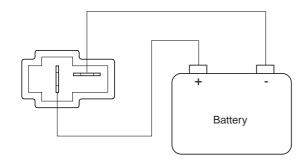


EQKE202B

BLOWER CONTROLS HA -69

INSPECTION E1CC2EC

Connect the battery voltage and check the blower motor rotation.





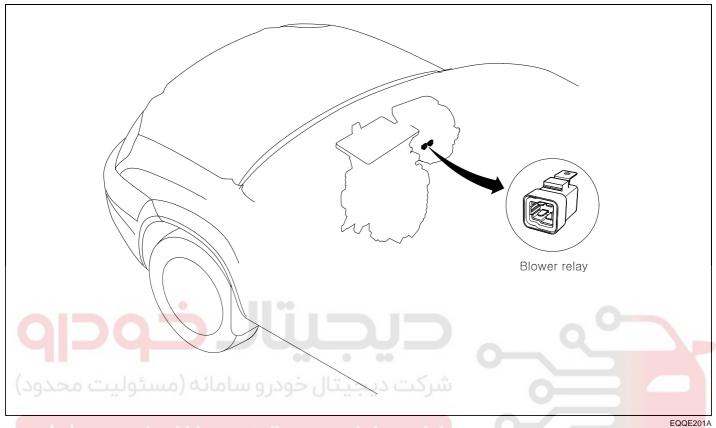


HEATING, VENTILATION AND AIR CONDITIONING

HA-70

BLOWER RELAY

COMPONENT LOCATION EC983CFA



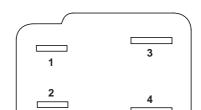
CONNECTOR

DESCRIPTION

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

Rated voltage: DC 12V

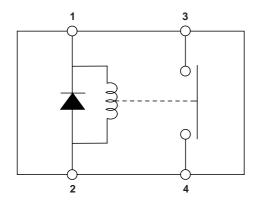
Rated load current: DC 12V, 25A (Motor lord)



EQKE201B

BLOWER CONTROLS HA -71

CIRCUIT DIAGRAM EF2F87B4



EQKE201C



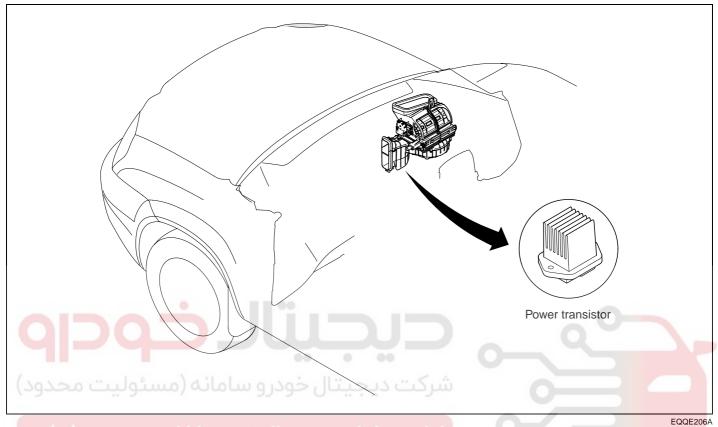


HEATING, VENTILATION AND AIR CONDITIONING

HA -72

POWER TRANSISTOR

COMPONENT LOCATION E1B011E7



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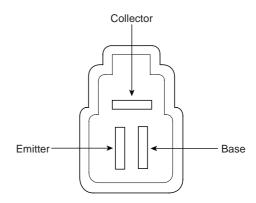
DESCRIPTION E630698B

Rated voltage : DC 12VWorking voltage range : DC 9 ~ 16V

Working temp. range: -30 ~ 60 °C
Resistance temp. range: -40 ~ 85 °C

CONNECTOR

EFDEB31D

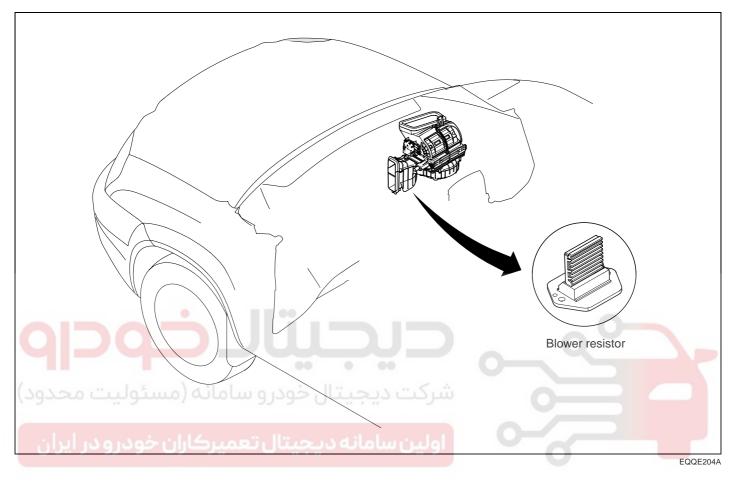


EQKE206C

BLOWER CONTROLS HA -73

BLOWER RESISTOR

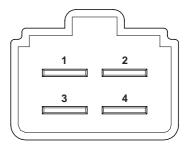
COMPONENT LOCATION E48A4448



DESCRIPTION E34B4A50

Rated voltage: DC 12V
Rated load: Blower motor
Standard test Temp.: 20 C
Operation Temp.: -30 ~ +70 C

CONNECTOR E8DBFF64



EQKE204C

 0.35Ω

HA -74

HEATING, VENTILATION AND AIR CONDITIONING

CIRCUIT DIAGRAM

Fuse temp 183 ± 5°C

0B2FE6B

 0.65Ω

INSPECTION EE9E8CE8

Measure terminal-to-terminal resistance of the blower resistor.

If measured resistance is not within specification, the blower resistor must be replaced. (After removing the resistor)

Terminal	' '	2	3	4	Resistance
Ohmmeter Speed indication	ML	МН	LO	н	(Ω)
Continuity is			0-	-	2.30%
indicated	\bigcirc			-	1.00%
		0		-	0.35%

Note

: Indicates that there is continuity between points.

EQQE204E

EQQE204D



 1.30Ω

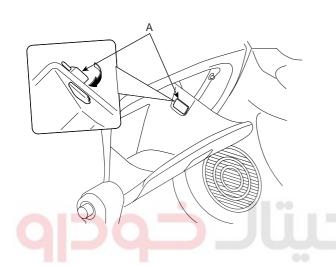


BLOWER CONTROLS HA -75

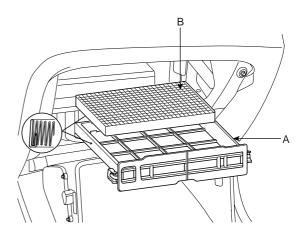
A/C AIR FILTER

REPLACEMENT E05F4BBE

 Open the glove box, remove the glove box stopper(A) in the lower crash pad(assist seat side), and completely lower the glove box.



Remove the A/C air filter(B) from the filter housing(A).
 Replace the A/C air filter according to the maintenance schedule in the owner's manual.



KQQE411C

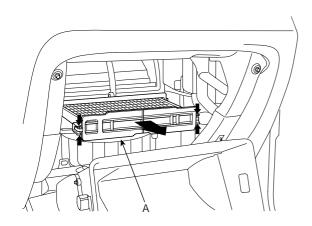
Install in the reverse order of removal.

Make sure that there is no air leaking out of the blower unit.

(Sg. KQQE411A

2. Remove the A/C air filter assembly(A).

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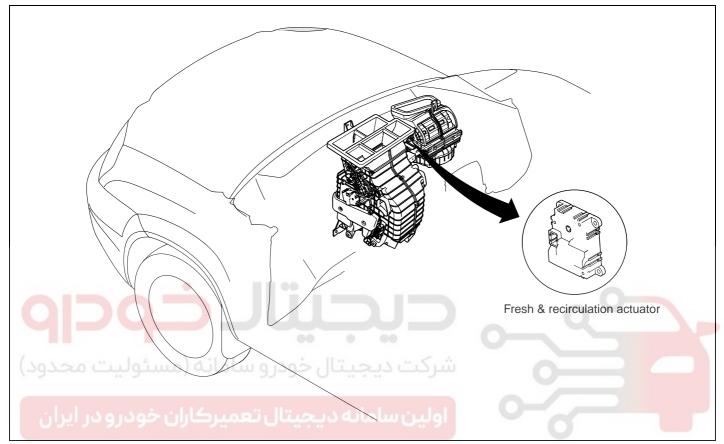
KQQE411B

HEATING, VENTILATION AND AIR CONDITIONING

HA -76

FRESH AND RECIRCULATION ACTUATOR

COMPONENT LOCATION EACBOC6D



EQQE214A

DESCRIPTION E9FD434A

General performance

Rate voltage : DC 12VRate load : 1.5kgf·cm

Operating time: 3.5 + 1.0 sec.
Rate current: Max. 0.1A
Lock current: Max. 0.55A
Locked torque: Max. 6kgf·cm

Noise: Max. 43dB
 Use voltage: DC 10 ~ 15V
 Use temp.: -40 ~ 80 C

CONNECTOR E9396EE5

2		><		1
7	6	5	4	3

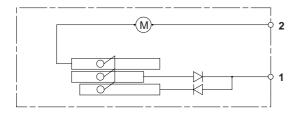
KQSE211D

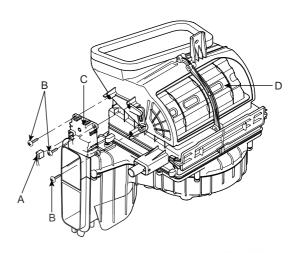
BLOWER CONTROLS HA -77

CIRCUIT DIAGRAM

REPLACEMENT EA9ADC2

Disconnect the 7P connector(A) from the inlet actuator(C). Remove the self-tapping screws(B) and the inlet actuator(C) from the blower unit(D).





KQQE214B

ديجيتال خودرو

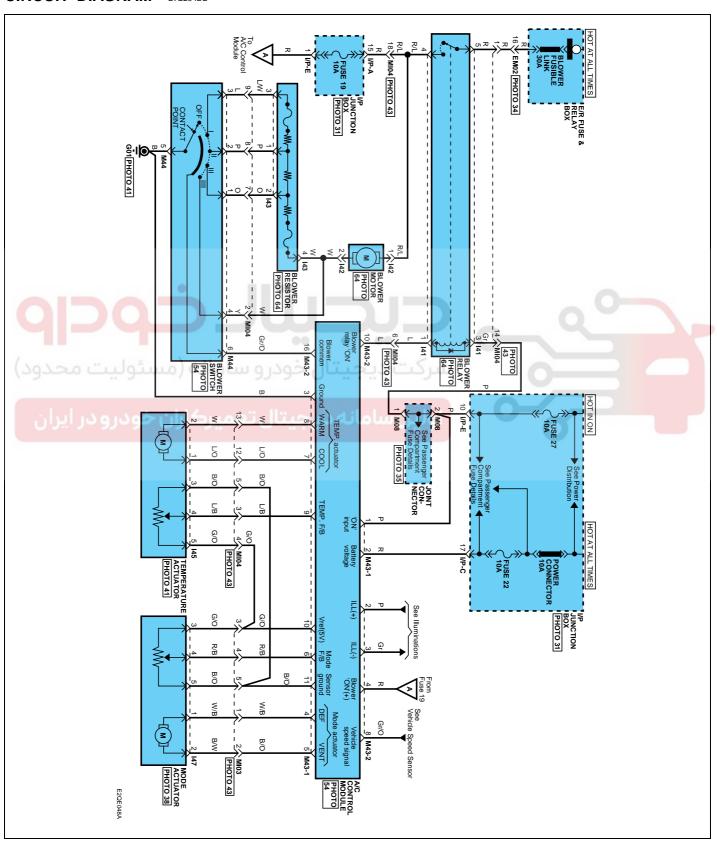
KQQE214E

2. Install in the reverse order of removal. After installation, make sure the inlet actuator(C) runs smoothly.

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BLOWER AND A/C CONTROLS (MANUAL)

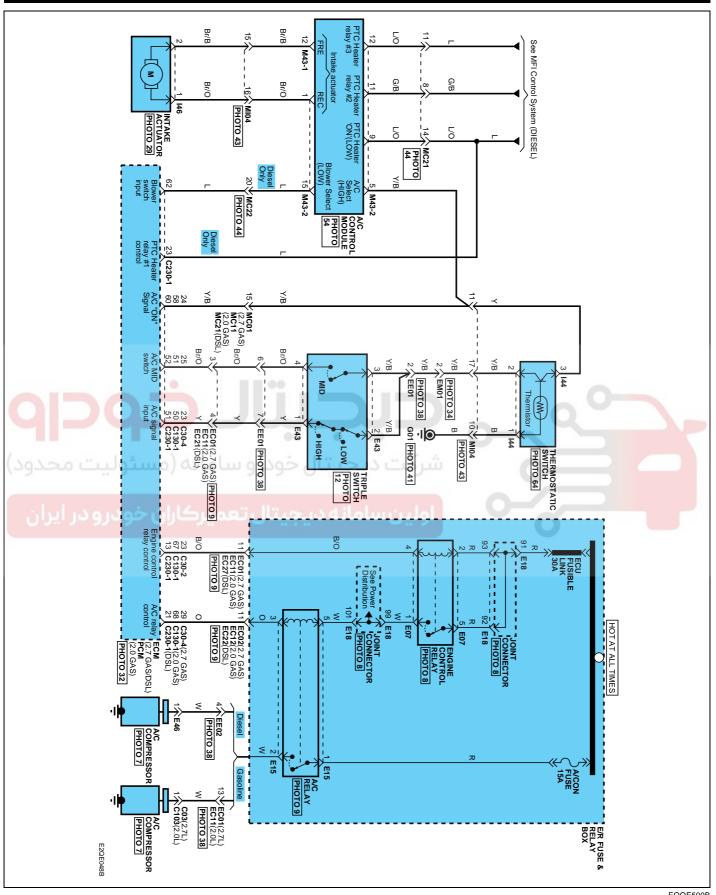
CIRCUIT DIAGRAM E7B294



EQQE500A

BLOWER AND A/C CONTROLS (MANUAL)

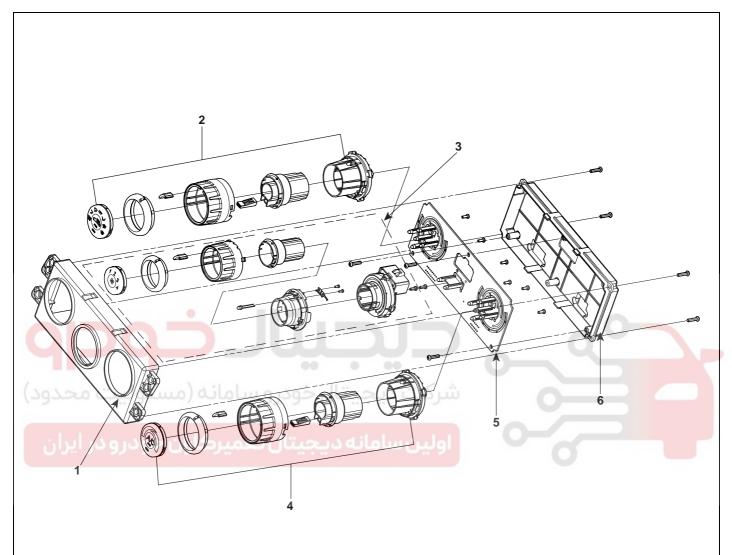
HA -79



EQQE500B

CONTROL PANEL

COMPONENTS E4D0CF3F



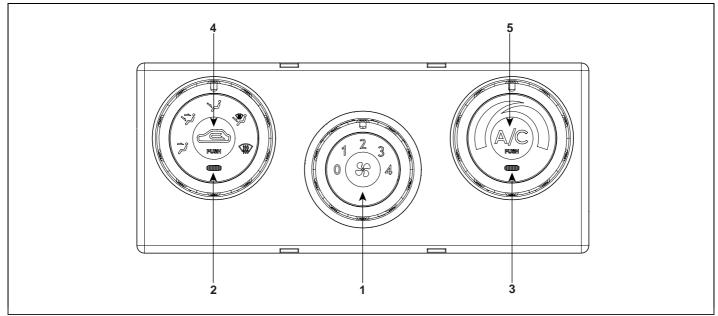
- 1. Panel
- 2. Mode select knob & intake switch
- 3. Blower speed knob
- 4. Temperature select knob & A/C switch
- 5. Inlet panel
- 6. Housing

EQQE501A

BLOWER AND A/C CONTROLS (MANUAL)

HA-81

DESCRIPTION EADEA649



KQQE501B

1. BLOWER SWITCH

The blower switch controls the blowing level of the air conditioning system by controlling blower motor speed. The switch has an electrical circuit containing a resister that will regulate blower motor input voltage to control the motor speed.

2. MODE SWITCH

The mode switch controls air conditioning system discharge location. The switch contains an electrical circuit to control an actuator that is connected to the mode door for discharge control.

3. TEMPERATURE SWITCH

The temperature switch controls the temperature door position that will be used to regulate the air conditioning system's discharge air temperature. The switch includes a rack & pinion and a cable.

4. INTAKE SWITCH

The intake switch controls the intake door used to regulate the intake air flow of the air conditioning system. The switch contains an electrical circuit used to control the actuator that is connected to the intake door.

5. AIR CONDITIONING SWITCH

The air conditioning switch controls the on/off position of the air conditioning system compressor. The switch contains an electrical circuit that will switch on/off the power supply to the relay that is connected to the compressor.



HEATING, VENTILATION AND AIR CONDITIONING

SWITCH OPERATION AND FEATURES

Switch	Feature	Switch selection	Function
A/C switch		A/C switch pushing	Indicator ON A/C operate
	KQQE590A	A/C switch pushing with A/C ON	Indicator OFFA/C non-operate
Fresh and recirculation		Switch pushing	Indicator ON Shift to recirculation mode
switch	PURH TO THE PURH T	Switch pushing with switch ON	Indicator OFF Shift to fresh mode
	KQQE590B		





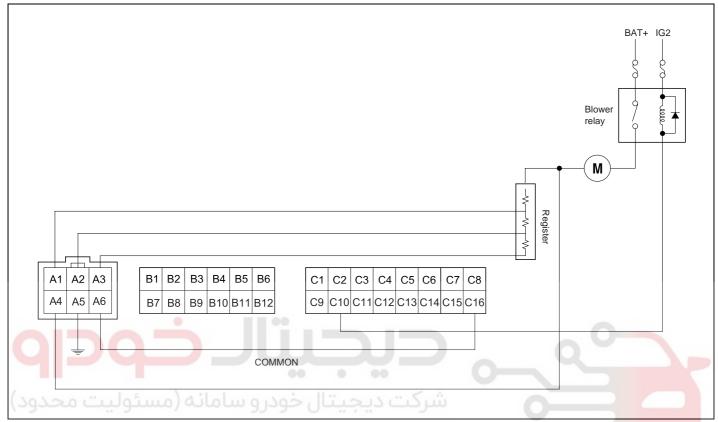


BLOWER AND A/C CONTROLS (MANUAL)

HA -83

CHECK POINT BY TYPE EBCAA3EE

BLOWER CHECK



EQQE595A

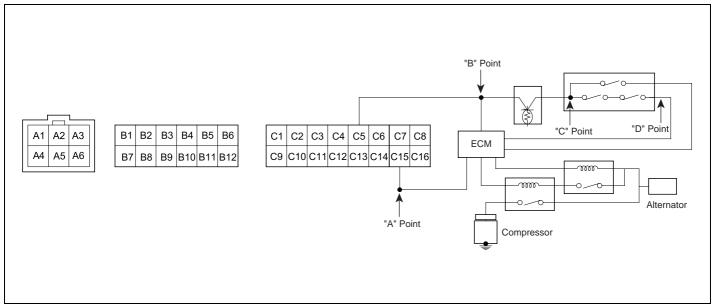
When the blower is turned ON, blower relay becomes turned ON and battery voltage is supplied to the blower motor upper part. The current determined by the supplied

battery voltage, blower motor, and register ground runs to GND through the blower motor and the selected blower single resister.

Symptoms Possible causes		How to check	
Blower malfunction	Short wire of register		
Blower wind is discharged despite switching OFF	Open circuit of blower switch	With switch OFF, check the connection between each terminal and GND/COMMON terminal	

HEATING, VENTILATION AND AIR CONDITIONING

A/C CHECK



EQQE595B

For A/CON output, blower must be basically operated. When blower speed 1 is selected, blower relay is turned ON and voltage is supplied to point "A".

When the supplied voltage at point "A" is entered into control connector C15 and at this moment when A/CON switch is turned ON, voltage is supplied to connector C5 at 9V or more.

Thermistor value determines whether the input power at point "B" is supplied to point "C".

The state of ON/OFF of triple switch determines whether the input power at point "C" is supplied to point "D". Finally when the voltage is supplied to point "D", engine ECU determines whether A/CON and CONDENSER FAN

TROUBLESHOOTING

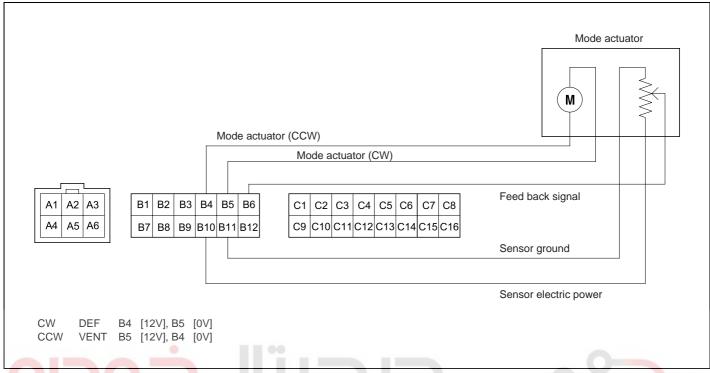
Symptoms	Possible causes	How to check
Wind of A/CON isn't discharged into in-car despite switching OFF of A/CON	Signal output error of A/CON	With switch OFF of A/CON, and measure voltage of connector C5 as shown in the above figure. If the voltage is 9V or more, check the triple switch, ENG ECU, and wires.

turned ON/OFF.

BLOWER AND A/C CONTROLS (MANUAL)

HA -85

MODE CHECK



EQQE595D

As shown in the above figure, in adjusting mode switch from VENT to DEF, 12V is outputted from connector B4, 0V is supplied for B5 and mode motor works in direction of DEF. In adjusting mode switch from DEF to VENT, 12V is outputted from connector B5, 0V is supplied for B4 and mode motor works in direction of VENT. When mode actuator has to move to a certain location for its automatic control, mode feedback signal terminal moves equally in

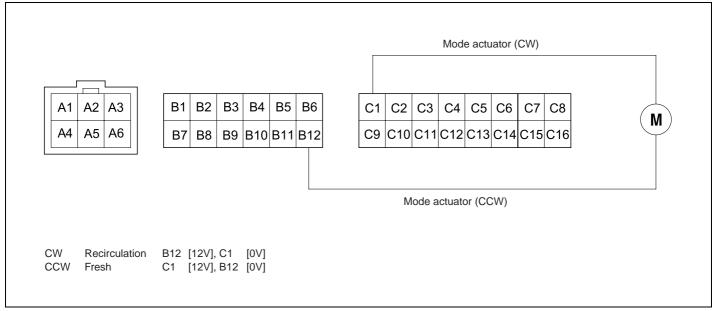
mode actuator and informs controller of location of mode actuator through mode connector B6. Comparing original value with the inputted value, it works until they are same.

Symptoms	Causes	How to check
Mode actuator running error	Power supply error in mode actuator	After altering VENT to DEF, measure voltage of connector B4, and after altering DEF to VENT, measure voltage of connector B5. If both of them are 9V and more, check mode actuator and peripheral wiring state and if one or both of them are 9V and less, its cause is internal failure of control.

HA-86

HEATING, VENTILATION AND AIR CONDITIONING

INTAKE CHECK



EQQE595C

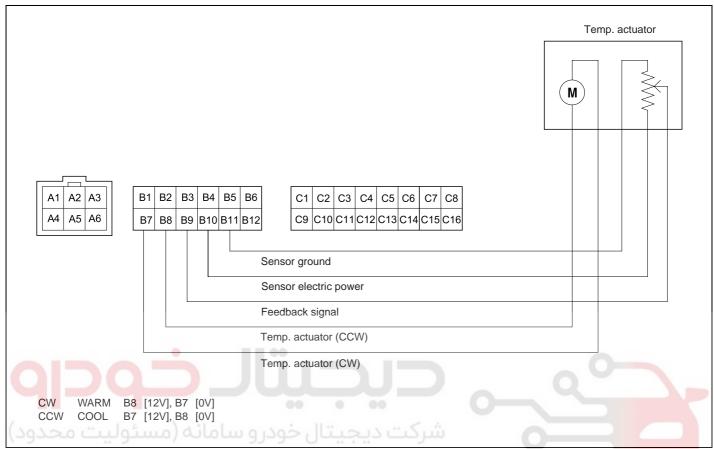
In turning on IG and selecting indoor mode with indoor switch, 12V is outputted from connector B12, 0V is supplied for C1 and motor works in direction of indoor. In selecting outdoor mode with indoor switch, 12V is outputted from connector C1, 0V is supplied for B12 and motor works in direction of outdoor.

Symptoms	لین سامان Causes یتال تعمیا	How to check
Indoor mode running error	Power supply error in actuator	Separate connector linked with actuator, select indoor mode with indoor switch and measure voltage of connector B12. If 9V and more, check actuator or wiring state and if 9V and less, check the inside of controller.
Outdoor mode running error	Power supply error in actuator	Select outdoor mode in the above method and measure voltage of connector C1. If 9V and more, check actuator or wiring state and if 9V and less, check the inside of controller.

BLOWER AND A/C CONTROLS (MANUAL)

HA-87

TEMP.CHECK



EQQE595E

As shown in the above figure, in adjusting temp. switch from WARM to COOL, 12V is outputted from temp. connector B7, 0V is supplied for B8 and temp. motor works in direction of COOL. In adjusting temp. switch from COOL to WARM, 12V is outputted from temp. connector B8, 0V is supplied for B7 and temp. motor works in direction of

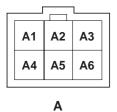
WARM. When temp. actuator has to move to a certain location for its automatic control, temp. feedback signal terminal moves equally in temp. actuator and informs controller of location of temp. actuator through temp. connector B9. Comparing original value with the inputted value, it works until they are same

Symptoms	Causes	How to check
Temp actuator running error	Power supply error in temp actuator	After altering COOL to WARM, measure voltage of B7, and after altering WARM to COOL, measure voltage of B8. If Both of them are 9V and more, check temp actuator and peripheral wiring state and if one or both of them are 9V and less, its cause is internal failure of control.

HEATING, VENTILATION AND AIR CONDITIONING

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CONNECTOR E2E93DBB



B1	B2	В3	B4	B5	В6
B7	B8	B9	B10	B11	B12

C1	C2	С3	C4	C5	C6	C7	C8
C9	C10	C11	C12	C13	C14	C15	C16

В С

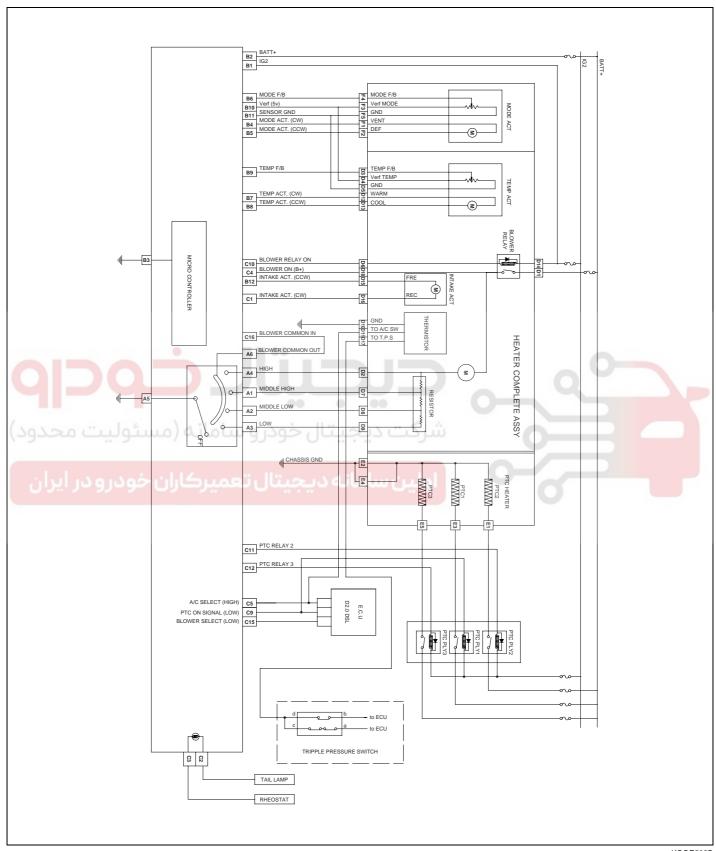
KQQE501C

Connec- tor	Pin No.	Circuit	Connec- tor	Pin NO.	Circuit
	1	MIDDLE HIGH		1	REC
	2	MIDDLE LOW		2	ILL +
A	3	LOW		3	ILL -
A	4	HIGH		4	BLOWER ON (+)
	5	GND		5	A/C OUTPUT
	6	BLOWER COMMON OUT		6	
	1	IGN		7	0
	2	BAT +		8	
(1010)	3	GND	- 11	9	PTC ON SIGNAL
(39320	4	MODE ACTUATOR (VENT)		10	BLOWER RELAY ON
. []	5	MODE ACTUATOR (DEF)	الماسام	11	PTC RELAY 2
B	6	MODE F/BACK	ىيں سام	12	PTC RELAY 3
В	7	TEMP ACTUATOR (WARM)		13	-
	8	TEMP ACTUATOR (COOL)		14	-
	9	TEMP F/BACK		15	BLOWER SELECT SIGNAL
	10	VCC		16	BLOWER COMMON IN
	11	SENSOR GND			
	12	FRE	_		

BLOWER AND A/C CONTROLS (MANUAL)

HA-89

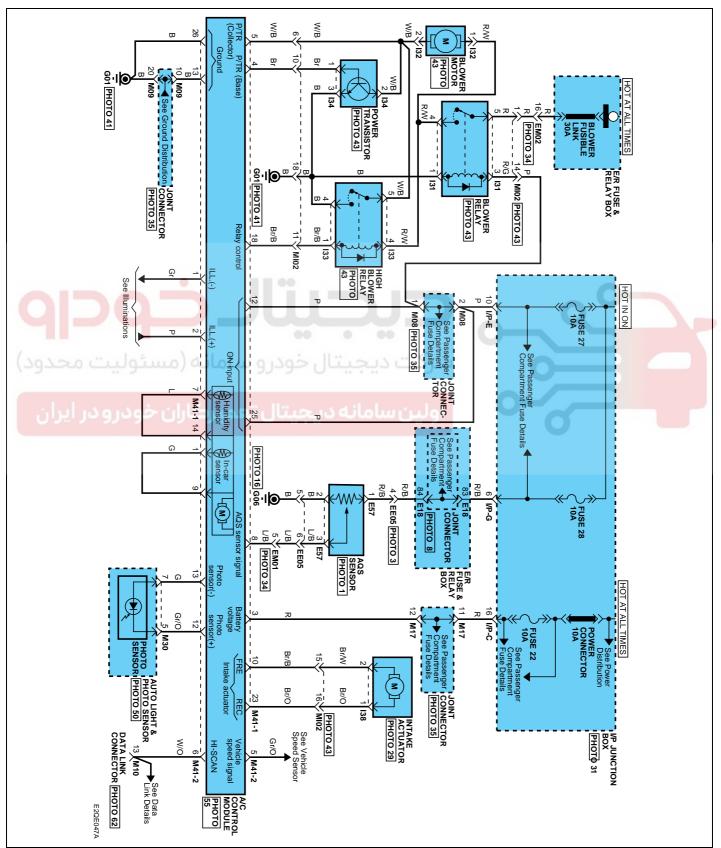
CIRCUIT DIAGRAM E940FBBC



KQQE502B

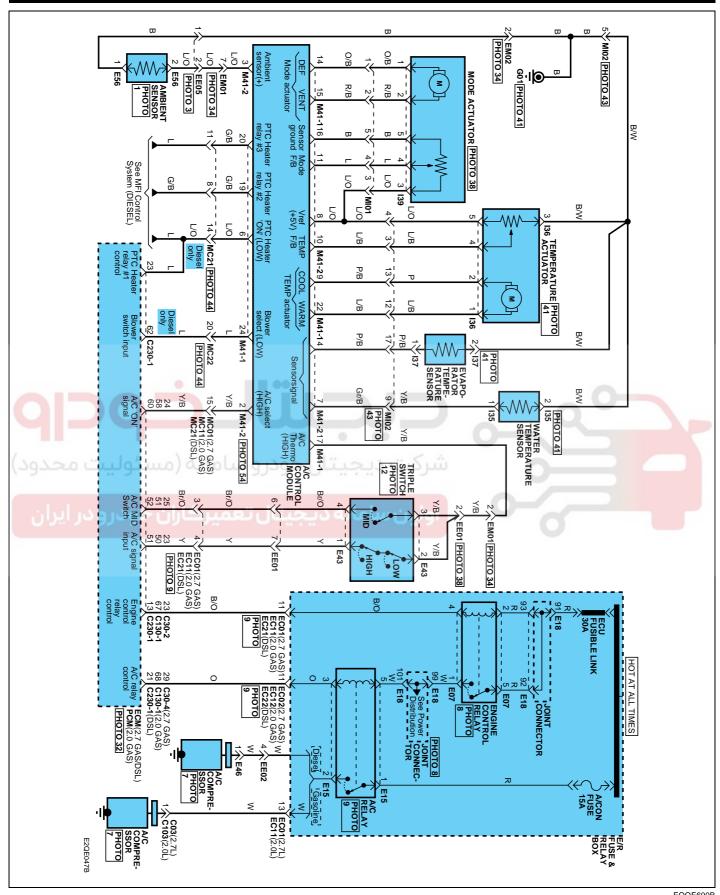
CIRCUIT DIAGRAM

A0581BF



EQQE600A

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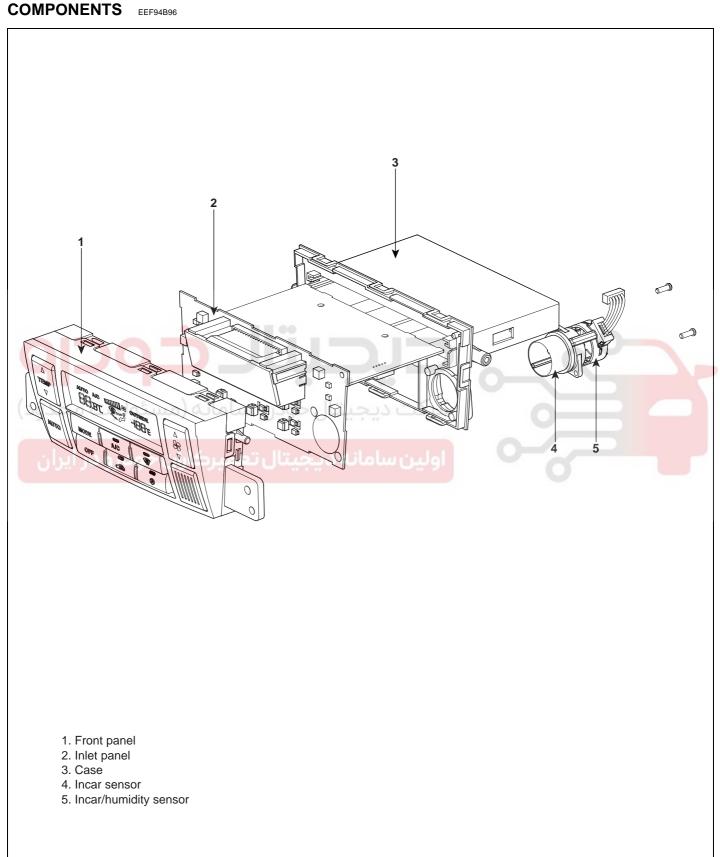


EQQE600B

HEATING, VENTILATION AND AIR CONDITIONING

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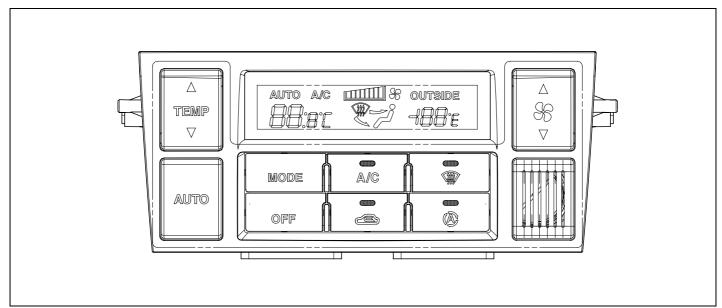
CONTROL PANEL



EQQE601A

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DESCRIPTION EB79FCF1



KQQE601B

SWITCH OPERATION AND FEATURES

Switch	Feature	Switch selection	Function
Temp switch		Push DOWN button at set temperature of 25 [°] C while operating	Select at intervals of 0.5 C from 17 C to 25 C
		Indication screen	
			KQQE693A
		Push DOWN button at set temperature of 25 ¹ C while operating	Selecte at intervals 0.5 C from 17 C to 25 C
		Indication screen	
			KQQE693B

HEATING, VENTILATION AND AIR CONDITIONING

Switch	Feature	Switch selection	Function
AUTO switch	AUTO	Push AUTO switch under system OFF or manual opeation	Control automatically all outlet by input value of each sensor
		Indication screen	
	KQQE690B		AUTO
			KQBC026E
		Push AUTO switch under automatic operation	Unchanged
		Indication screen	
			AUTO
			KQBC026E
MODE switch		Push MODE switch while operating	Indicate the followings repeatedly wheneverpushing the switch under
ت محدود)	MODE	شرکت دیجیتال خو	set condition. Vent By level Floor Mix
مدر ایران	кдде690C قال تعميركاران خودر	Indication screen	
و در ایران	ىن قىمىيرىت ران خودار	اوین سامه دیجیا	
			Vent → By level → Floor → Mix
			EQQE692A
		Push MODE switch under system OFF	Release AUTO mode and keep system OFF
OFF switch	OFF	Push OFF switch while operating	System OFF (keep TEMP and MODE intake in original condition and turn OFF blower and compressor
	KQQE690D	Indication screen	
			outside 201
			EQQE693C

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Switch	Feature	Switch selection	Function
A/C switch	A/C	When air conditioner is OFF, push A/C switch under system OFF or operating	Turn ON air conditioner outlet
	KQQE690E	A/C	A/C
		KQQE690E	KQQE691B
		Push A/C switch under air conditioner ON	Turn OFF air conditioner outlet
		A/C	
		KQQE691A	KQBC026G
Air intake switch		When system is OFF, push intake switch under air outlet condition	Keep system OFF na intake door turn to air intake mode
یت محدود)	KQQE690F	When system OFF, push intake switch under air intake condition	Keep ststem OFF and intake door turn to air outlet mode
		Push intake switch under air outlet when operating	Air intake mode
		When operating, push intake switch under air intake condition	Air outlet mode
		Air outlet mode indicator condition	
		Air intake mode indicator condition	KQQE690F
			KQQE691F

HEATING, VENTILATION AND AIR CONDITIONING

Switch	Feature	Switch selection	Function
DEF switch	KQQE690H	Push DEF switch when operating DEF mode or system OFF	Mode door : to DEF mode A/C : ON Intake : Outlet mode Others : Condition before OFF
	Indicator and indication screen		A/C
		Push DEF switch when	Return to the condition before
		operating DEF mode	DEF mode
			KQQE691H
AQS switch		Push AQS switch under AQS stopped	Control intake door by AQS signal while turning on AQS indicator
41-		Push AQS switch when operating AQS	Return to the state before selecting AQS while turning off AQS indicator
ت محدود)	кодеб90G پدرو سامانه (مسئولیا	Push OFF switch when operating	Turn off indication screen and AQS indicator, and intake door fixes to air intake mode
و در ایران	تال تعميركاران خودر	اولین سامانه دیجی	Able to select AQS, air intake, and air outlet when system OFF
		Indicator condition while operating AQS	
			KQQE690G
		Indicator condition under AQS stopped	
			KQQE691I

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Switch	Feature	Switch selection	Function
Blower switch		Push blower switch while operating	Voltage between both edges of blower motor goes down to 3.8V
	\$6 ∇	Indication screen	######################################
	KQQE690I		Level 8,7 Level 6,5 Level 4,3 Level 2,1
			EQQE691C
		Push blower switch while operating	Votage between both edges of blower motor goes up to Max high
		Indication screen	Level 1,2 Level 3,4 Level 5,6 Level 7,8
	11**		EQQE691D
912	بالرحو	Push blower switch under system OFF	Operate with 3.8V between both edges of blower motor
یت محدود)	ودرو سامانه (مسئول	Indication screen	111111 %
رو در ایران	یتال تعمیرکاران خود	اولین سامانه دیج	
			KQQE691E

HEATING, VENTILATION AND AIR CONDITIONING

CONTROL SPECIFICATION

Control item	Control features	Remarks
Required discharge temperature	Required temperature determined by the set temperature and the inputted sensor value.	
Auto control	Required discharge temperature is determined by the set temperature and the inputted sensor value. The feature will use the required discharge temperature to perform the auto control of temp. actuator, mode actuator, intake actuator, blower motor and compressor, and maintain the set temperature stably.	
IN-CAR temperature correction	Upon detecting rapid changes of temperature from the INCAR sensor, it will gradually correct the incar temperature value.	- 1'C UP/4sec delay - 1'C DOWN/4sec delay
AMB temperature correction	Upon detecting rapid changes of temperature from the AMB sensor, it will gradually correct the ambient temperature value.	Logic of the correction speed sensor
Photo correction	Upon detecting rapid changes of photo intensity from the PHOTO sensor, it will gradually correct the photo intensity value.	- 350 1000(W/m²)/1min delay - 350 1000(W/m²)/5min delay
TEMP door control	It does the automatic control to maintain the optimum TEMP door opening (0%-100%). It will be computed by the temperature set and the input signal from each sensor.	The set temperature range 17 ¹ C 32 ¹ C, 0.5 ¹ C step (62 ¹ F 90 ¹ F, 1 ¹ F step)
Blower speed	Automatic control of the blower speed. The target value will be computed by the set temperature and the input signal from each sensor. (8 levels may be selected in case of manual selection.)	 Auto mode blower low voltage (Manual low voltage: 3.8) Auto mode heater blower HI speed: 10.6V
Electro-motive mode control	During auto control, it will raise the permitted voltage of blower motor gradually in order to improve comfortability.	12 seconds for shifting LO MAX HI
Photo compensation	During auto control, it will compensate the blower level and the discharge temperature according to the photo intensity detected from the PHOTO sensor. PHOTO compensation will begin after 5 seconds when ignition on.	
Mode door control	Automatic control of air discharge based on the required discharge temperature. It will be computed by the temperature setting and the input signal from each sensor. (VENT B/L FLOOR VENT) In case of manual selection (VENT B/L FLOOR MIX VENT)	 At OFF, MODE door will fix the current condition. At OFF in manual mode, MODE door will maintain the manual control condition.
MIX mode control (in auto control)	If the ambient temperature is -13 °C or less in AUTO mode, discharge mode will be controlled at MIX. (When front window glass is defogged.)	Entering MIX mode, A/C will operate.
INTAKE door control	Auto control of intake mode based on the required discharge temperature that will be computed by the temperature setting and the input signal from each sensor.	 Shift to REC when selecting REC button at FRE condition (LED on). Shift to FRE when selecting FRE button at REC condition (LED off).

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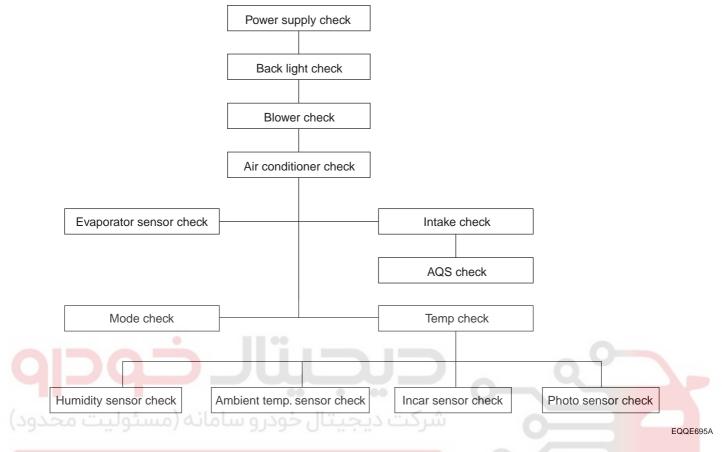
Control item	Control features	Remarks
INTAKE control at OFF	The intake door will fix to the FRE. position when switching the system off.	 FRE./REC. manual selection will be enabled at OFF REC indicator will come out at OFF.
Compressor auto control	Control automatically the compressor on/off state corresponding to the set temperature and the input signal from each sensor.	 When selection the AUTO SW, the compressor is controlled to ON/OFF. When selection the DEF SW, the compressor is controlled to "ON".
Compressor clutch on/off control based on refrigerant temperature	If EVAP sensor temperature is below than 0.5°C, the compressor will be ON and the temperature is 3°C, or higher, with the compressor OFF.	
MAX HOT	When selecting the set temperature HI at AUTO mode, MAX HOT will be performed. It will prevail over MIX mode control.	 TEMP door: MAX HOT MODE door: FLOOR mode INTAKE door: FRE mode Compressor: OFF Blower speed: AUTO HI(10.6V)
MAX COOL	When selecting the set temperature LO at AUTO mode, MAX COOL will be performed.	- TEMP door: MAX COOL - MODE door: FLOOR mode - INTAKE door: REC mode - Compressor: ON - Blower speed: MAX HI
Electromotive heating control	If the ambient temperature is 5°C or more and the in-car temperature is 10°C or less than the ambient temperature at B/L or FLOOR in AUTO mode, it will effect the electromotive heating control to prevent outside cold air from flowing toward the feet of passengers.	- Blower speed: Controlled at AUTO LOW (4.5V)
	As the coolant temperature rises, the MODE door will shift to DEF AUTO.	Operation release • In-car temp. > ambient
	MODE: Manual selection is enabled. INTAKE door: At AUTO control or at manual selection mode.	+10 ¹ C • Max cool • In pressing MODE switch. • In pressing DEF switch.
	Blower speed: Manual selection is enabled (No re-entry).	in processing BEI owners
Electromotive cooling control	In order to prevent hot air from the VENT or B/L in AUTO mode (A/C on mode blower auto), the blower speed will be operated at LOW for approx. 9 seconds before entering the AUTO control if the EVAP sensor detection is temperature 30 °C or higher.	
MAX HOT	If the above condition is satisfied, electromotive cooling control will operate at any time.	

HEATING, VENTILATION AND AIR CONDITIONING

Control item	Control	features		Remarks
Air Quality System (AQS)	The AQS system will detect the hazardous elements and odors contained in the air. If the harmful element concentration is higher than standard, the system will output a LOW signal (1.0V or less) to the FATC.		-	When the initial battery connection and ignition is ON, it will operate at AUTO mode. (AQS will not operate.)
	If the concentration is within system will output a HI signa		-	When IGN 2 ON, the AQS assembly will be preheated for 34.5±5seconds.
	Corresponding to the signal from the AQS, it will control the INTAKE door as follows to prevent the inflow of harmful gas in FATC:		-	IGN2 ON: It will check circuit break on the AQS assembly's signal line for approx. 7 seconds during the preheating, irrespective to the AQS switch condition.
	Condition	INTAKE door position	-	When AQS is selected prior
	LOW	REC		to IGN2 OFF and IGN2 is turned OFF ON: AQS
	н	FRE		indicator will come on, and the system will operate at AQS mode. (Store the previous condition before IGN 2 OFF)
Initialization Upon battery-on	When supplying the initial power, it will operate in the initial condition.		-	When the initial ignition ON after battery connection, the system will operate at the set temperature 25 °C and at AUTO mode.
Memory	When removing ignition key, it will store FATC'S operating condition.		0	When IGN ON after IGN OFF during FATC operation, the system will operate at the previous before the ignition off.

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CHECK POINT BY TYPE E5F4341B

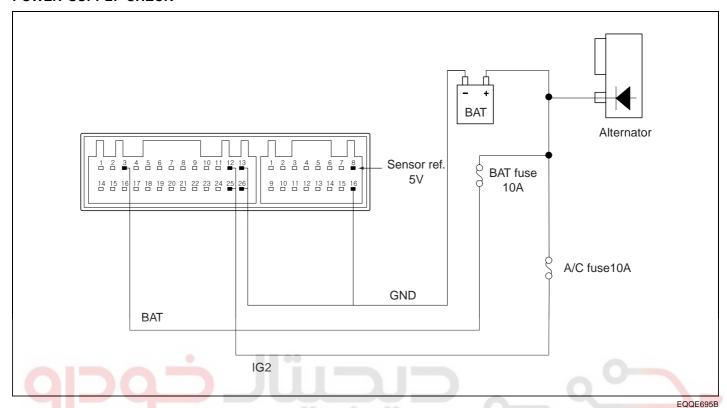


Since FATC controller is complicated in functions as shown in the above chart, it is impossible to conclude its reason at the occurrence of failure. All possibilities of failure shall be considered for the purpose of efficient. How to check.

- 1. Power supply check
- 2. Back light check
- 3. Blower check
- 4. Air conditioner check
- 5. Intake check and AQS check
- 6. Mode check
- 7. Temp check
- 8. Sensor check

HEATING, VENTILATION AND AIR CONDITIONING

POWER SUPPLY CHECK



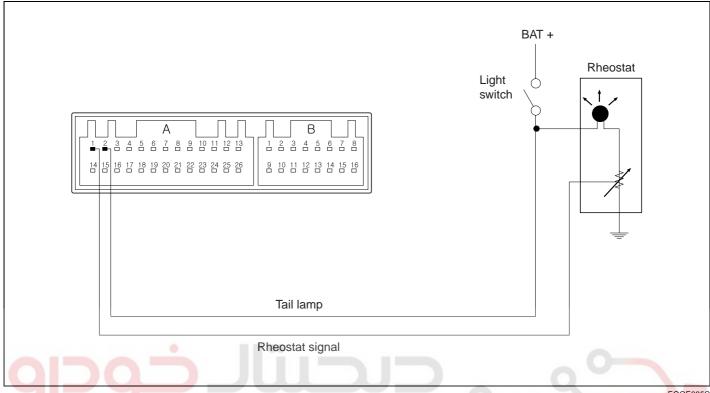
In turning off IGN, battery supplies power for ordinary power, FATC connector A3 through battery fuse. FATC performs memory function by means of battery power supplied as described above. In turning on IGN, alternator is driven. At this time, IG2 power generated in alternator FATC connector A12 and A25 terminal through IG2 fuse and air conditioner fuse 10A. FAT carried out actual

system operation by means of IG2 power supplied as described above.

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

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BACK LIGHT CHECK



EQQE695C

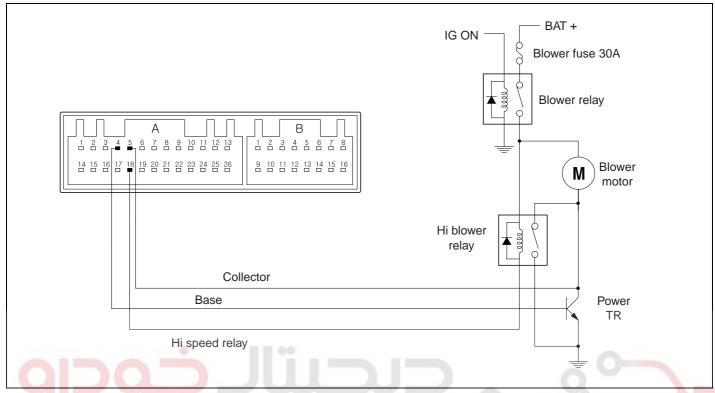
In turning on IG and then light switch, battery power is supplied for FATC connector A2 terminal through wiring. The supplied power passes connector A1 terminal through light

bulb in FATC and flows into reostart as shown in the above figure. The brightness is adjusted according to resistance value of reostart.

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

HEATING, VENTILATION AND AIR CONDITIONING

BLOWER CHECK



EQQE695D

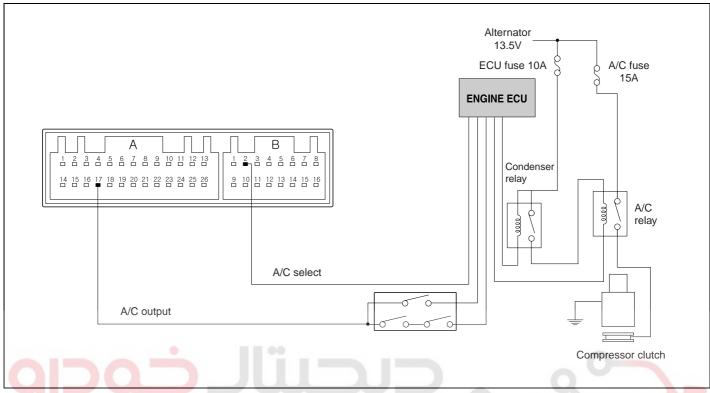
Perform the blower check in manual blower running state because it is difficult to check blower at automatic control. Blower is controlled from level I to level 8 equally as in button operation and running logic. In turning on IG, blower relay is ON and voltage of 0.1 to 1.4V is transferred from FATC connector A4 terminal to base source of power TR

according to FATC control (selectable from level 1 to level 8). At this time, voltage of blower motor's both ends is determined according to collector voltage of FATC connector A5 terminal. If FATC is controlled in level 8, GND(0V) is supplied for FATC connector A18 terminal and high blower relay is driven.

Symptoms	Causes	How to check
Amount of wind is wrong at manual selection of blower	Power TR error	Check voltage of blower motor's both ends. (Level 1: 3.8V, Level 2: 5.2V, Level 3: 6.5V, Level 4: 7.9V, Level 5: 9.2V, Level 6: 10.6V, Level 7: 12.0V, Level 8: 13.5V [high-relay operation]) Measure voltage of each terminal and if there is difference more than ±0.6V, check power TR.
Blower wind is discharged despite pressing OFF switch	Power TR error	Power TR change

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AIR CONDITIONER CHECK



EQQE695E

11V is outputted from connector A17 terminal in turning on INSULATING and pressing air conditioner switch. However, although 11V is outputted from FATC connector A17 terminal, compressor clutch isn't driven. Wind of air conditioner is discharged if only compressor clutch works. Output signal from air conditioner is inputted in engine computer through triple switch. Then, the engine computer considers several conditions and when output of air conditioneris judged to be practical, it gives GND to signal terminal of air conditioner relay. Accordingly, relay of air conditioner is ON and compressor clutch works. Triple switch

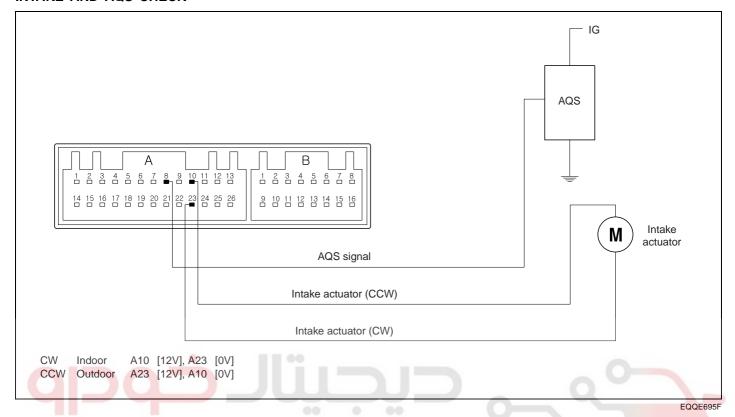
checks pressure of refrigerant flowing through pipe and turns on/off switches in it according to standard. So, it controls that output signalof air conditioner outputted from FATC is inputted into engine computer, and also speed of condenser fan according to pressure level. (For high pressure, high-speed and for low pressure, low-speed.

Symptoms	Causes	How to check	
Wind of air conditioner isn't discharged into vehicle despite switching on air conditioner.	Signal output error of air conditioner	Switch on air conditioner and measure voltage of FATC connector A17 terminal as shown in the above figure. If 9V and more, check triple switch, air conditioner relay and ECM.	
		Switch on air conditioner and measure voltage of FATC connector A17 terminal as shown in the above figure. If 1V and less, check input value of evaporator sensor.	
	Input error of evaporator sensor	If evaporator sensor is disconnected or short or voltage of its inputsource is more than 3.0V (below 0.5 °C), output of air conditioner isn't made.	

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HEATING, VENTILATION AND AIR CONDITIONING

INTAKE AND AQS CHECK

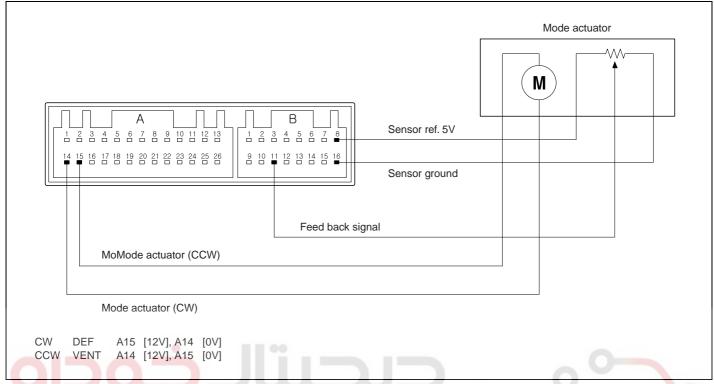


In turning on IG and selecting indoor mode with indoor switch, 12V is outputted from FATC connector A23 terminal, 0V is supplied for A10 terminaland motor works in direction of outdoor. In selecting outdoor mode with indoorswitch, 12V is outputted from FATC connector A10 terminal, 0V is supplied for A23 terminal and motor works in direction of indoor.

Symptoms	Causes	How to check
Indoor mode running error	Power supply error in actuator	Separate connector linked with actuator, select indoor mode with indoor switch and measure voltage of FATC connector A23 terminal. If 8V and more, check actuator or wiring state and if 9V and less, check the inside of controller.
Outdoor mode running error	Power supply error in actuator	Select outdoor mode in the above method and measure voltage of FATC connector A10 terminal. If 8V and more, check actuator or wiring state and if 9V andless, check the inside of controller
Fixed in outdoor or indoor mode at AQS selection	AQS signal terminal output error	Select AQS switch and measure AQS signal terminal as shown in the above figure. If there is no change of voltage over 10 min, check AQS.

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MODE CHECK



EQQE695G

In turning on IG and selecting mode switch, sequential operation begins in order of Vent Bi-level Blower Mix. DIP mode works regardless of order at selecting it. As shown in the above figure, in adjusting mode switch from VENT to DEF, 12V is outputted from connector B4, 0V is supplied for B5 and mode motor works in direction of DEF. In adjusting mode switch from DEF to VENT, 12V

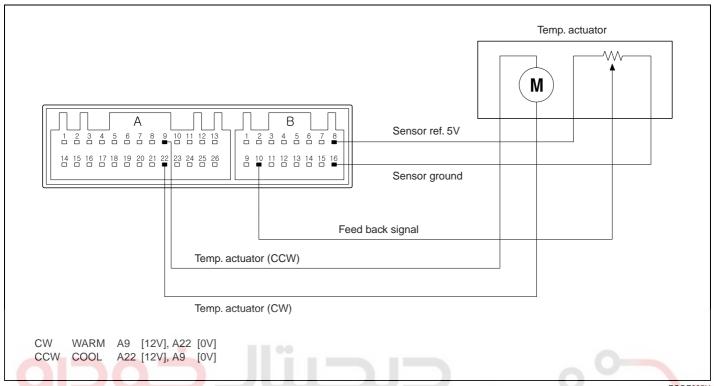
is outputted from connector B5, 0V is supplied for B4 and mode motor works in direction of VENT. When mode actuator has to move to a certain location for its automatic control, mode feedback signal terminal moves equally in mode actuator and informs controller of location of mode actuator through mode connector B6. Comparing original value with the inputted value, it works until they are same.

Symptoms	Causes	How to check	
Mode actuator running error	Power supply error in mode actuator	After altering VENT to DEF, measure voltage of connector A15, and after altering DEF to VENT, measure voltage of connector A14. It both of them are 9V and move, check mode actuator an peripheral wiring state and if one or both of them are 9V and less, its cause is internal failure of control.	
	Sensor(+5) power supply error	If automatic control isn't operated smoothly, measure voltage of FATC connector B8 terminal, If under 4.8V or over 5.2V, its cause is internal failure of FATC.	
	Driver error of mode actuator	If NO.22 is outputted as result of self-diagnostic, check mode actuator driver.	

HEATING, VENTILATION AND AIR CONDITIONING

TEMP CHECK

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EQQE695H

In adjusting temp switch from 32°C to 17°C, 12V is outputted from FATC connector A22 terminal, 0V is supplied for A9 terminal and temp motor works in direction of COOL. In adjusting temp switch from 17°C to 32°C, 11V is outputted from FATC connector A9 terminal, 0V is supplied for A22 terminal and temp motor works in direction of WARM. When temp actuator has to move to a certain location for its automatic control, temp feedback signal terminal moves equally in temp actuator and informs controller of location of temp actuator through FATC connector B10 terminal. Comparing original value with inputted value, it works until they are same. If 4.9V and more is inputted in B10 terminal, it is regarded as

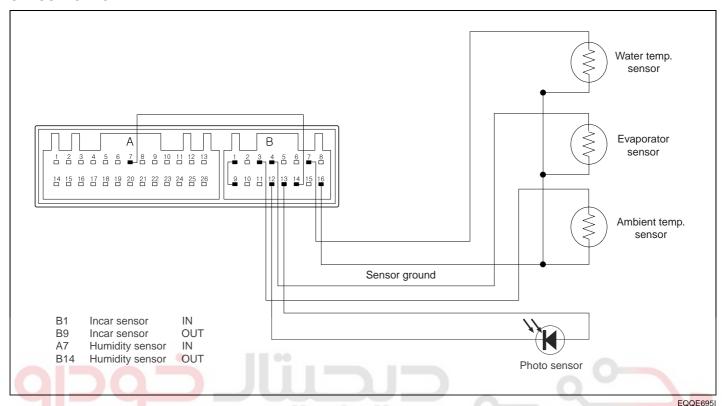
disconnection. If 0.1V and less is inputted in B10 terminal, it is regarded as short-circuit. In the case of disconnection or short-circuit as a result of self-diagnostic, substitute control is carried out as follows.

- If setup temperature is 17°C to 24.5°C, set to MAX COOL.
- If setup temperature is 25^IC to 32.0^IC, set to MAX WARM.

Symptoms	Causes	How to check
Temp actuator running error	Power supply error in temp actuator	After altering 17 ^I C to 32 ^I C and adversely, measure voltage of A9 and after altering 32 ^I C to 17 ^I C and adversely, measure voltage of A22. If Both of them are 9V and more, check temp actuator and peripheral wiring state and if one or both of them are 5V and less, its cause is internal failure of FATC.
	Sensor (+5) power supply error	If automatic control isn't operated smoothly, measure voltage of FATC connector B8 terminal. If under 4.8V or over 5.2V, its cause is internal failure of FATC.
	Driver error of temp actuator	If No. 20 is outputted as a result of self-diagnostic, check temp actuatordriver.

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SENSOR CHECK



Resistance value set according to temperature of each part is inputted in FATC controller.

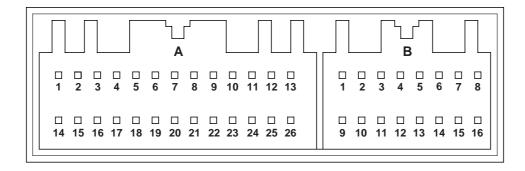
Internal temperature of vehic is automatically controlled by operating the inputted values.

It is recommended to refer to resistance value and voltage value corresponding to each temperature and the followings explains essential functions of each sensor required for repair and self-diagnostics and substitute functions at disconnection or short-circuit.

- If 4.9V and more is inputted in connectors B1, B3, B4, B7, B12 terminal, it is regarded as disconnection.
- If 0.1V and less is inputted in connectors B1, B3, B4, B7, B12 terminal, it is regarded as short-circuit.

HEATING, VENTILATION AND AIR CONDITIONING

CONNECTOR ECFEA90E

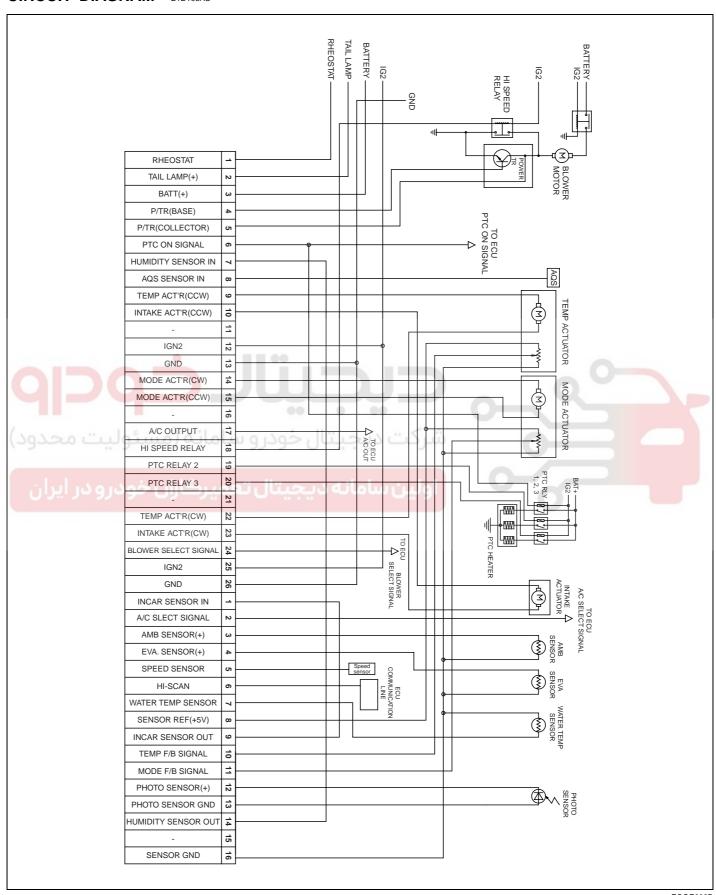


KQQE601C

Connec- tor	Pin No.	Circuit	Connec- tor	Pin No.	Circuit
	1	RHEOSTAT	ΔΞ	1	INCAR SENSOR IN
	2	TAIL LAMP (+)		2	A/C SELECT SIGNAL
	3	BATT (+)		3	AMB SENSOR (+)
	4	P/TR (BASE)		4	EVA SENSOR (+)
	5	P/TR (COLLECTOR)		5	SPEED SENSOR
	6	PTC ON SIGNAL		6	HI SCAN
(1010)	7.105	HUMIDITY SNR IN	511,5	. 7	WATER TEMP SENSOR(+)
(39320	8	AQS	دت دیج B لین سام	8	SENSOR REF. (+5V)
ايران	9	TEMP ACT'R (CCW)		9	INCAR SENSOR OUT
	10	INTAKE ACT'R (CCW)		10	TEMP F/B SIGNAL
	11	-		11	MODE F/B SIGNAL
А	12	IGN2		12	PHOTO SENSOR (+)
	13	GND		13	PHOTO SENSOR (+)
	14	MODE ACT'R (CW)		14	HUMIDITY SENSOR OUT
	15	MODE ACT'R (CCW)		15	-
	16	-		16	SENSOR GND
	17	A/C OUTPUT			
	18	HIGH SPEED RELAY			
	19	PTC RELAY 2			
	20	PTC RELAY 3			
	21	-			
	22	TEMP ACT'R (CW)			
	23	INTAKE ACT'R (CW)			
	24	BLOWER SELECT SIGNAL			
	25	IGN2			
	26	GND			

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CIRCUIT DIAGRAM E1D106AC



EQQE602B