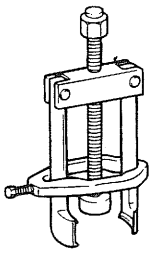
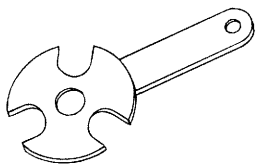
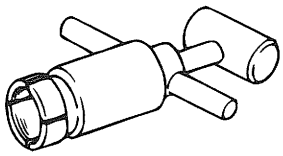
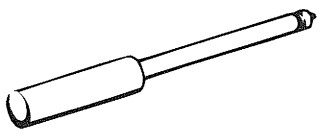
Heating, Ventilation & Air Conditioning

GENERAL

SPECIFICATIONS EQNB0010

Item		Specification
Heater	Type	Air mix type
	Capacity	4,500 ± 10%
Air conditioning	Evaporator Cooling capacity	 4,100 ± 10%
	Compressor Type Oil capacity Pressure relief valve Voltage	 Swash plate (HS-15) 154cc Operating pressure : 35-42.2kg/cm² D.C 12.8 ± 0.2V
	Magnetic clutch Voltage & wattage Torque	 D.C 12.8 ± 0.2V, Max. 54W Min. 4.4 kg·m
	Refrigerant & capacity	R-134a (570g)
	Triple pressure switch	High pressure OFF 32kgf/cm² ON 26kgf/cm²
		Middle pressure OFF 14kgf/cm² ON 18kgf/cm²
		Low pressure OFF 2.0kgf/cm² ON 2.25kgf/cm²
	Thermostat	OFF 1.5 ± 0.6°C ON 3.0 ± 0.6°C
Heater control assembly		MANUAL Type

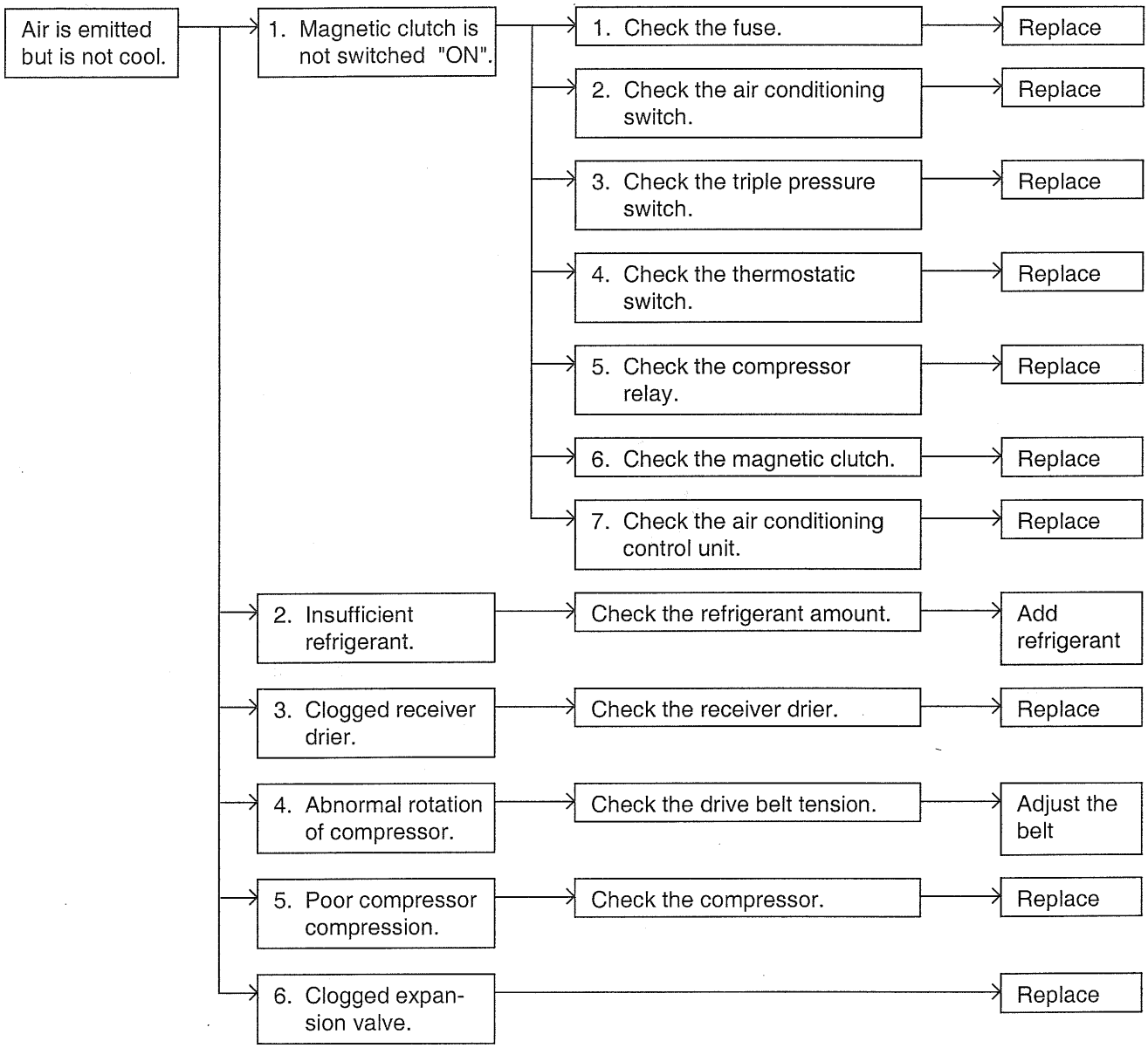
SPECIAL TOOLS EQKA0050

Tool (Number and name)	Illustration	Use
09455-34000 Bearing and gear puller	 EQA9002B	Removal of field coil
09977-34000 Pressure plate bolt remover	 EQDA002A	Removal of pressure plate
09977-33700 Shaft seal remover and installer	 EQDA002B	Removal and installation of shaft seal
09977-33800 Snap ring remover	 EQDA002C	Removal of snap ring

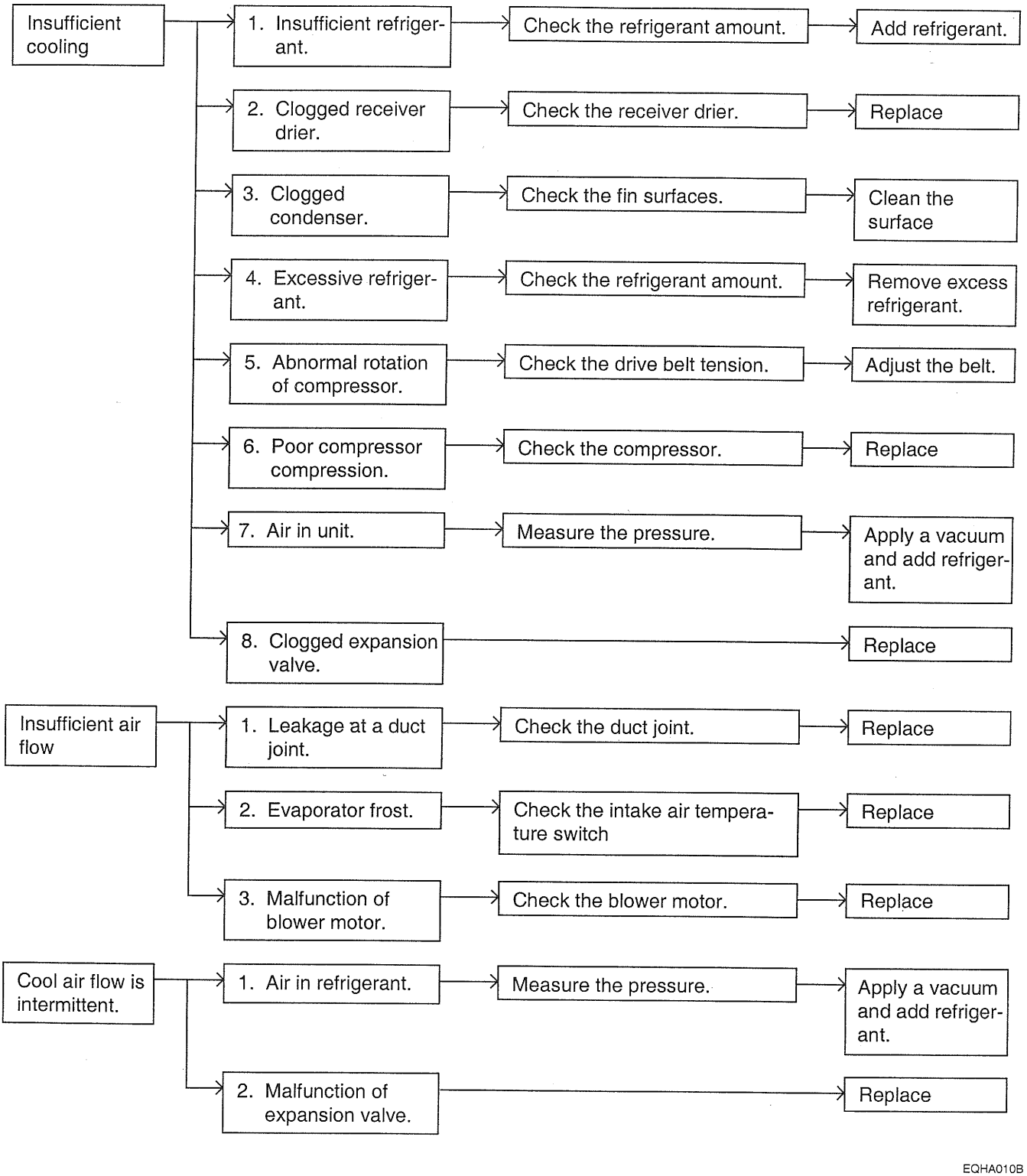
TROUBLESHOOTING EQHA0100

Before replacing or repairing air conditioning components, first determine if the malfunction is due to the refrigerant charge, air flow or compressor. The following diagnostic charts have been developed as a quick reference for determining the cause of the malfunction. If these charts do not satisfactorily describe the problem, refer to the appropriate section for a more detailed explanation. After correcting the malfunction, check the complete system to ensure that performance is satisfactory.

MALFUNCTION CAUSES AND REMEDIES (NUMBERS INDICATE CHECKING/INSPECTION ORDER.)



EQHA010A


Insufficient cooling
1. Insufficient refrigerant.
Check the refrigerant amount.
Add refrigerant.
2. Clogged receiver drier.
Check the receiver drier.
Replace
3. Clogged condenser.
Check the fin surfaces.
Clean the surface
4. Excessive refrigerant.
Check the refrigerant amount.
Remove excess refrigerant.
5. Abnormal rotation of compressor.
Check the drive belt tension.
Adjust the belt.
6. Poor compressor compression.
Check the compressor.
Replace
7. Air in unit.
Measure the pressure.
Apply a vacuum and add refrigerant.
8. Clogged expansion valve.
Replace
Insufficient air flow
1. Leakage at a duct joint.
Check the duct joint.
Replace
2. Evaporator frost.
Check the intake air temperature switch
Replace
3. Malfunction of blower motor.
Check the blower motor.
Replace
Cool air flow is intermittent.
1. Air in refrigerant.
Measure the pressure.
Apply a vacuum and add refrigerant.
2. Malfunction of expansion valve.
Replace

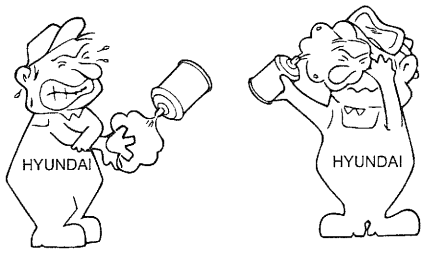
EQHA010B

AIR CONDITIONING SYSTEM

INSTRUCTIONS EQDA0100

WHEN HANDLING REFRIGERANT

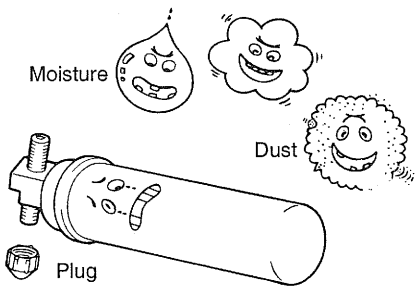
1. R-134a liquid refrigerant is highly volatile. A drop on the skin of your hand could result in localized frostbite. When handling the refrigerant, be sure to wear gloves.
2. It is standard practice to wear goggles or glasses to protect your eyes, and gloves to protect your hands. If the refrigerant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



EQDA010A

WHEN REPLACING PARTS ON A/C SYSTEM

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

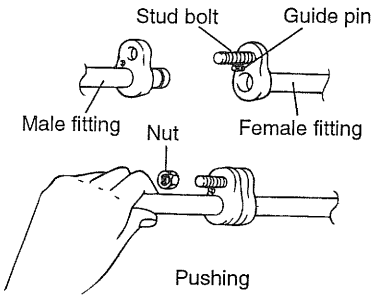


EQDA010B

WHEN INSTALLING CONNECTING PARTS

FLANGE WITH GUIDE PIN

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



EQDA010C

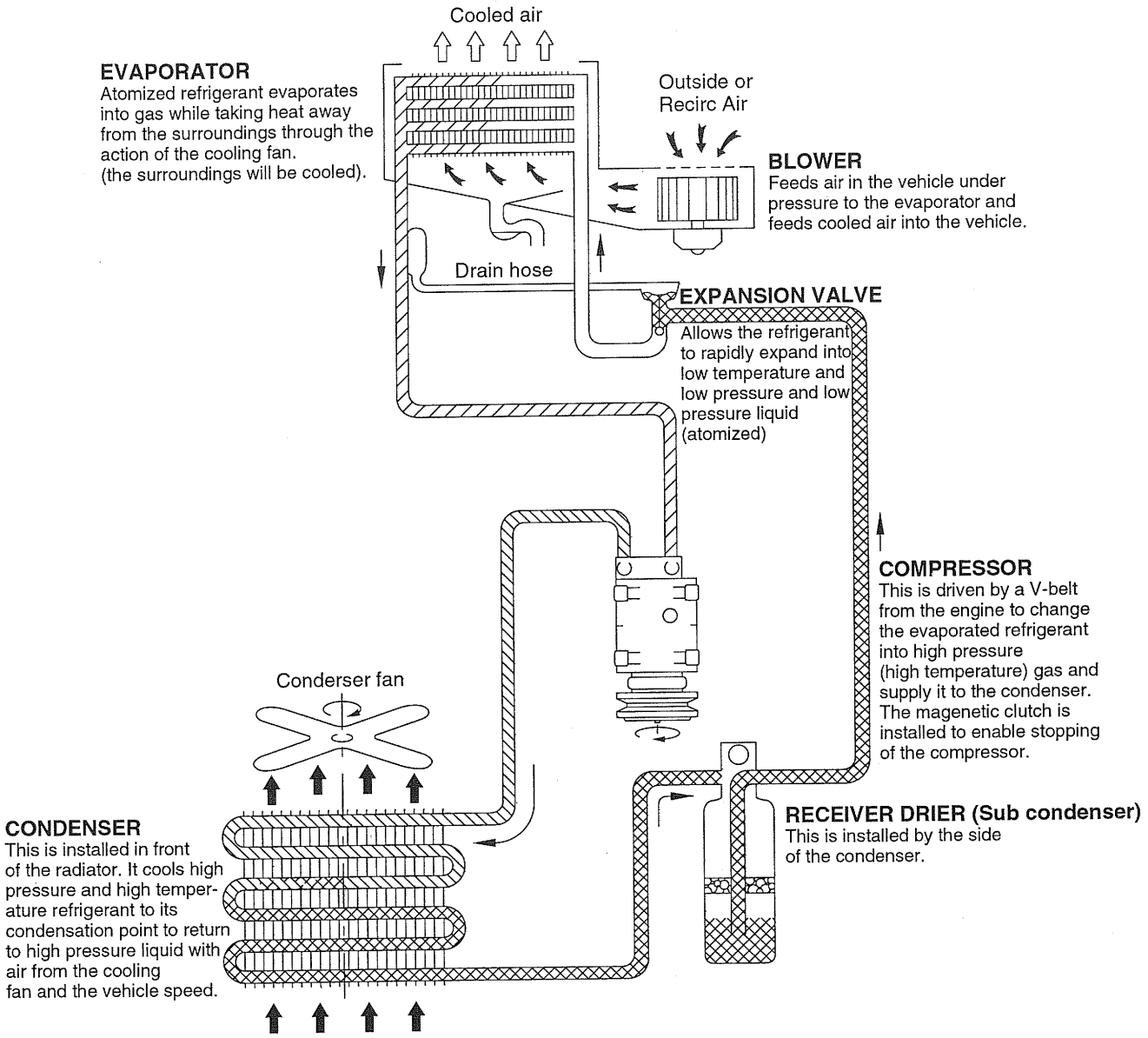
HANDLING TUBING AND FITTINGS

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

THE FOLLOWING PRECAUTIONS MUST BE OBSERVED

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

REFRIGERATION CYCLE EQNB0200



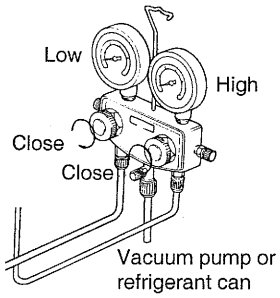
EQNB020A

INSTALLATION OF MANIFOLD GAUGE SET EQNB0300

CAUTION

When connecting the manifold gauge set, be sure to observe all safety precautions.

1. Close both hand valves of the manifold gauge fittings.
2. Install the charging hoses of the gauge set to the fittings. Connect the low-pressure hose to the low-pressure service port, and the high-pressure hose to the high-pressure service port. Tighten the hose nuts by hand.



EQHA030A

NOTE

When charging the refrigerant, do it after removing the engine cover and the air intake hose.

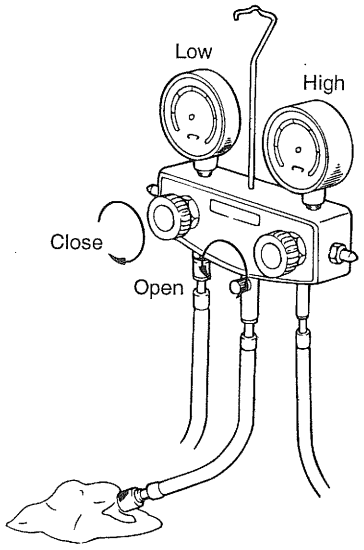
REFRIGERANT DISCHARGING PROCEDURE EQHA0350

1. Connect the manifold gauge set to the system.
2. Put a towel under the open end of the center hose.
3. Open the high pressure valve slowly to discharge the refrigerant.

CAUTION

If discharging the refrigerant too fast, compressor oil may drain from the system.

4. Check if the towel is stained with oil. If so, gently close the valve.
5. If the manifold gauge reading drops below 3.5kg/cm², open the low pressure valve slowly.
6. Open the high and low pressure valves slowly in order to drop the system pressure until the gauge indicates 0kg/cm².



EQHA035A

EVACUATING REFRIGERANT EQNB0400

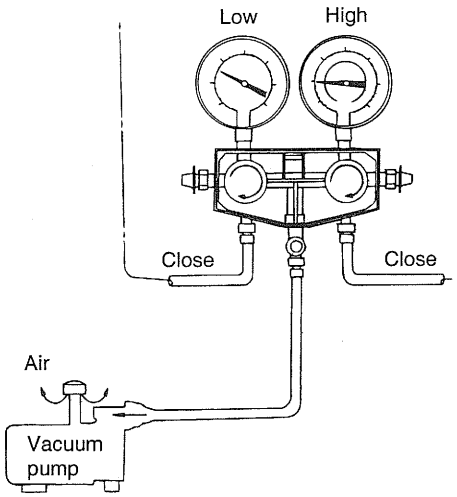
NOTE

It is necessary to evacuate the air conditioning system any time the system has been opened. Evacuation is necessary to rid the system of all air and moisture that may have been allowed to enter the unit. After installation of a component, the system should be evacuated for approximately 15 minutes. A component in service that has been opened for repair should be evacuated for 30 minutes.

1. Engine should be off.
2. Connect a manifold gauge set to the compressor gauge fittings. Close both high and low pressure valves.
3. Make sure the refrigerant has been discharged from the system.
4. Connect the center hose of the gauge set to the vacuum pump inlet.
5. Start the vacuum pump and then open the high and low manifold pressure valves.
6. After about ten minutes, check that the low pressure gauge reads more than 94,39 kPa (0.96 kg/cm², 13.7 psi) of vacuum. If negative pressure can not be obtained, there is a leak in the system. In this case, repair the leak as follows:

a. Close both manifold valves and stop the vacuum pump.
b. Charge the system with a can of refrigerant [about 0.4 kg (0.9 lb)]. Refer to Charging Refrigerant.
c. Check for refrigerant leakage with a leak detector. Repair any leakage found. Refer to Checking Refrigerant Leak.
d. Discharge refrigerant again, and then evacuate the system. If no leaks are found, continue evacuating the system.

7. Start the vacuum pump.

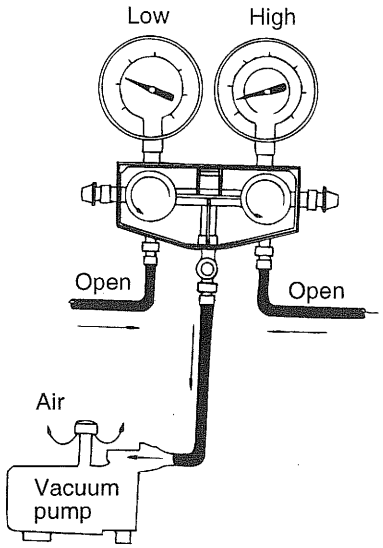


EQA9007A

8. Open both manifold pressure valves to obtain 94.39 kPa (0.96 kg/cm², 13.7 psi) of vacuum.

9. After the low pressure manifold gauge indicates close to 94.39 kPa (0.96 kg/cm², 13.7 psi), continue evacuating for 15 minutes.

10. After evacuating for 15 minutes, close both manifold pressure valves and stop the vacuum pump. Disconnect the hose from the vacuum pump. The system is now ready for charging.



EQA9007B

HANDLING THE REFRIGERANT SERVICE TAP VALVE EQNB0450

1. Before connecting the valve to the refrigerant container, turn the handle fully counterclockwise.

2. Turn the disc counterclockwise until it reaches its highest position.

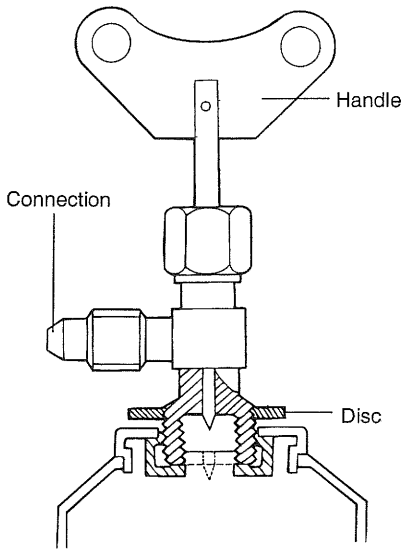
3. Connect the center hose to the valve fitting. Turn the disc fully clockwise by hand.

4. Turn the handle clockwise to make a hole in the sealed top.

5. Turn the handle fully counterclockwise to fill the center hose with air. Do not open the high and low-pressure hand valves.

6. Loosen the center hose nut connected to the center fitting of the manifold gauge.

7. Allow air to escape for a few seconds, and then tighten the nut.



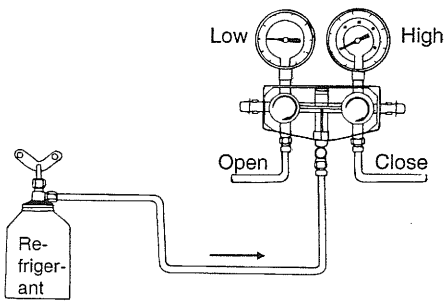
EQA9008A

CHARGING REFRIGERANT SYSTEM (VAPOR) EQNB0500

NOTE

This step is to charge the system through the low pressure side with the refrigerant in a vapor state. When the refrigerant container is placed right side up, refrigerant will enter the system as a vapor.

1. Install the refrigerant can tap valve as described in Handling the Refrigerant Service Tap Valve section.
2. Open the low pressure valve. Adjust the valve so that the low pressure gauge does not read over 412 kPa (4.2 kg/cm², 60 psi).

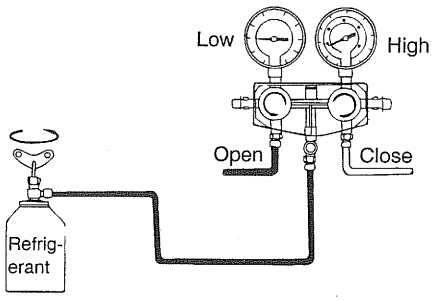


EQA9009A

3. Put the refrigerant in a pan of warm water (maximum temperature 40°C or 104°F) to keep vapor pressure in the container slightly higher than vapor pressure in the system.
4. Run the engine at fast idle and operate the air conditioning.

NOTE

Be sure to keep the container upright to prevent liquid refrigerant from being charged into the system through the suction side, resulting in possible damage to the compressor.



EQA9009B

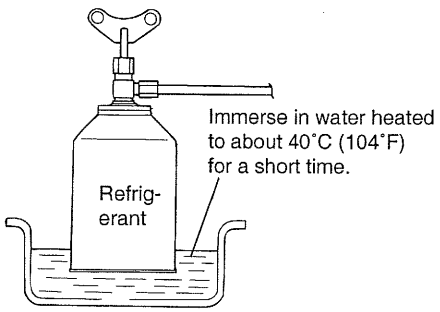
5. Charge the system to the specified amount. Then close the low pressure valve.

Specified amount : 570g

When refrigerant charging speed is slow, immerse the refrigerant can in heated water. (a temperature of approx. 40°C (104°F)).

WARNING

- **Under any circumstances, the refrigerant must not be warmed in water heated to a temperature of over 52°C (126°F).**
- **A blow torch or stove must never be used to warm up the can.**



EQA9009C

CHARGING THE REFRIGERANT SYSTEM (LIQUID)

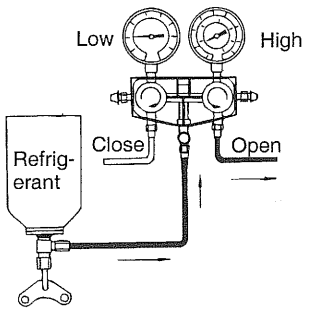
NOTE

This step is to charge an empty system through the high pressure side with refrigerant in a liquid state.

When the refrigerant container is held upside down, refrigerant will enter the system as a liquid.

CAUTION

Never run the engine when charging the system through the high pressure side. Do not open the low pressure valve when the system is being charged with liquid refrigerant.



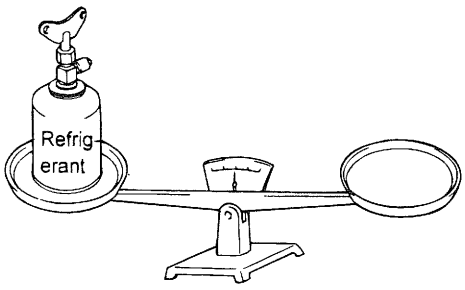
EQA9010A

1. Close both high and low pressure valves completely after the system is evacuated.
2. Install the refrigerant can tap valve as described in "Handling the Refrigerant Service Tap Valve" section.
3. Open the high pressure valve fully and keep the container upside down.
4. Charge the system to the specified amount by weighing the refrigerant with a scale. Overcharging will cause discharge pressure (high side) to rise. Then, close the high pressure valve.

Specified amount : 570g

NOTE

If the low pressure gauge does not show a reading, the system is restricted and must be repaired.



EQA9010B

5. After the specified amount of refrigerant has been charged into the system, close the manifold gauge valve.
6. Confirm that there are no leaks in the system by checking with a leak detector. Refer to Checking Refrigerant Leak.

NOTE

Conducting a performance test prior to removing the manifold gauge is good service practice.

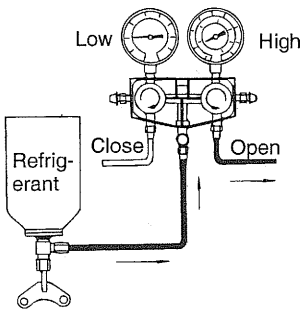
CHARGING THE REFRIGERANT SYSTEM (LIQUID) EQNB0510

NOTE

This step is to charge an empty system through the high pressure side with refrigerant in a liquid state. When the refrigerant container is held upside down, refrigerant will enter the system as a liquid.

CAUTION

Never run the engine when charging the system through the high pressure side. Do not open the low pressure valve when the system is being charged with liquid refrigerant.



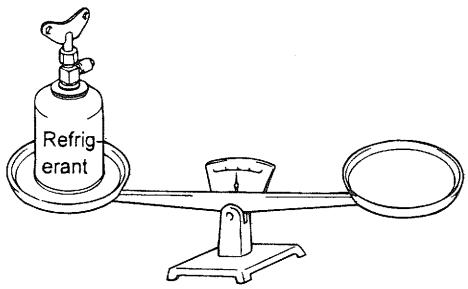
EQA9010A

1. Close both high and low pressure valves completely after the system is evacuated.
2. Install the refrigerant can tap valve as described in "Handling the Refrigerant Service Tap Valve" section.
3. Open the high pressure valve fully and keep the container upside down.
4. Charge the system to the specified amount by weighing the refrigerant with a scale. Overcharging will cause discharge pressure (high side) to rise. Then, close the high pressure valve.

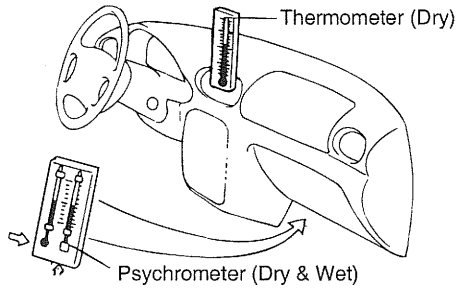
Specified amount : 570g

NOTE

If the low pressure gauge does not show a reading, the system is restricted and must be repaired.



EQA9010B



EQA9019A

5. After the specified amount of refrigerant has been charged into the system, close the manifold gauge valve.

6. Confirm that there are no leaks in the system by checking with a leak detector. Refer to Checking Refrigerant Leak.

NOTE

Conducting a performance test prior to removing the manifold gauge is good service practice.

PERFORMANCE TEST EQNB0550

1. Install the manifold gauge set.

2. Run the engine at 2,000 rpm and set the controls for maximum cooling and high blower speed.

3. Keep all windows and doors open.

4. Place a dry-bulb thermometer in the cool air outlet.

5. Place a psychrometer close to the inlet of the cooling unit.

6. Check that the reading on the high pressure gauge is 1,373-1,575 kPa (14-16 kg/cm², 199-228 psi). If the reading is too high, pour water on the condenser. If the reading to too low, cover the front of the condenser.

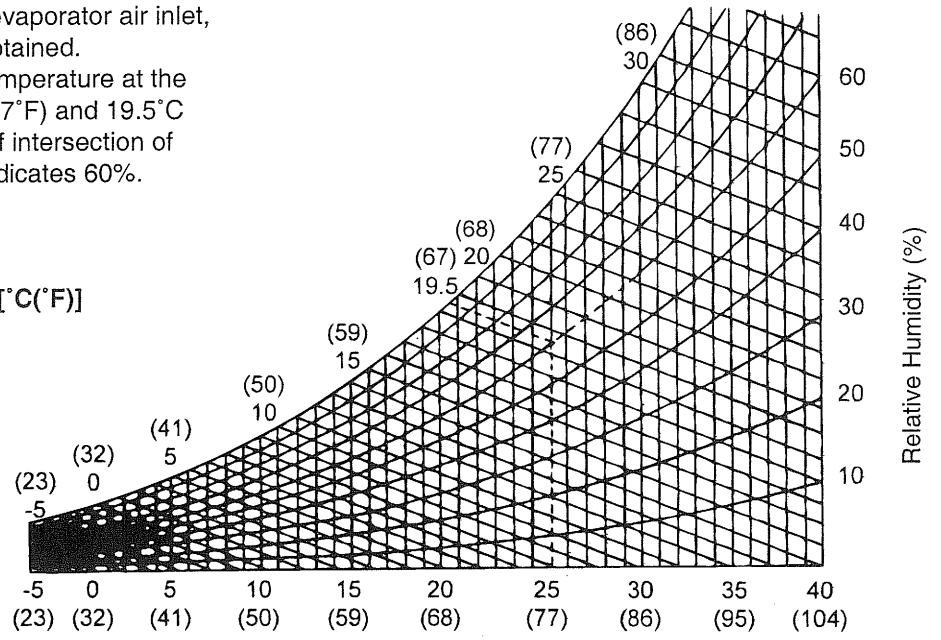
7. Check that the reading on the dry-bulb thermometer at the air inlet is 25-35°C (77-95°F).

8. Calculate the relative humidity from the psychrometric graph by comparing the wet-and dry-bulb reading of the psychrometer at the air inlet.

HOW TO READ THE GRAPH :
After measuring the temperatures of the wet and dry-bulb thermometers at the evaporator air inlet, relative humidity (%) can be obtained.
Example : Dry-and wet-bulb temperature at the evaporator air inlet are 25°C (77°F) and 19.5°C (67°F) respectively, the point of intersection of the dotted lines in the graph indicates 60%.

WET-BULB TEMPERATURE [°C(°F)]

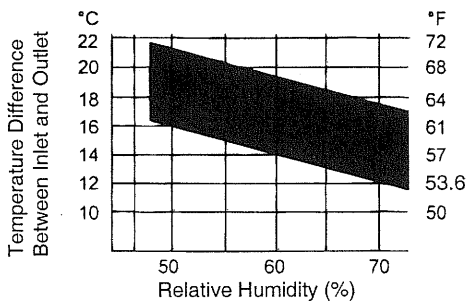
100	(212)
90	(194)
80	(176)
70	(158)
60	(140)
50	(122)
40	(104)
30	(86)
20	(68)
10	(50)



EQA9019B

9. Measure the dry-bulb temperature at the cool air outlet, and calculate the difference between the inlet dry-bulb and outlet dry-bulb temperatures.

10. Check that the intersection of the relative humidity and temperature difference is within the block hard line. If the intersection is within the block hard line, cooling performance is satisfactory.



EQA9019C

COMPRESSOR OIL EQNB0600

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

Single : 140 - 160g

HANDLING OF OIL

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

OIL RETURN OPERATION

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

CHECKING AND ADDING COMPRESSOR OIL

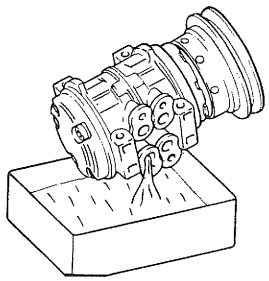
In order to add oil to an operating compressor, check the compressor oil using the following procedure:

1. Perform the oil return operation, stop the engine, discharge the refrigerant, and dismantle the compressor from vehicle.

2. Discharge oil from the system line outlet.

NOTE

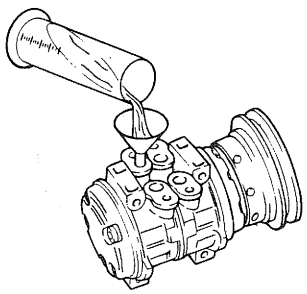
If compressor is cold, sometimes it can be hard to drain the oil. Warm up the compressor (approx. 40–50°C) to drain the oil.



EQHA060A

3. Check the amount of the discharged oil. If it is less than 70cc, it means there is a little leak of oil. Perform the leakage test on each system connection, and repair or replace faulty parts if necessary.

4. Check oil for contamination and set the oil level in the following procedure:



EQHA060B

a. When oil is clean

Discharge	Setting
Above 70cc	Oil level is normal, add equal amount of discharged oil.
Below 70cc	Oil level is low add 70cc of oil.

b. If oil is contaminated with metal fragments or other material, clean the receiver drier before charging the refrigerant into the air conditioning system.

CHECKING REFRIGERANT LEAKS EQNB0650

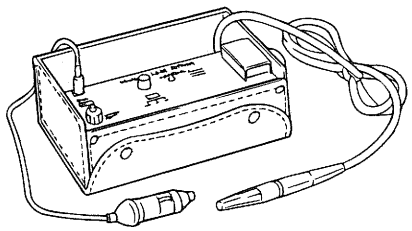
Conduct a leak test with an electronic leak detector whenever leakage of refrigerant is suspected and when conducting service operations that are accompanied by disassembly or loosening of connection fittings.

NOTE

In order to use the device properly, read the manuals supplied by the manufacturer to perform the specified maintenance and inspections.

If a gas leak is detected, proceed as follows:

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



EQHA065A

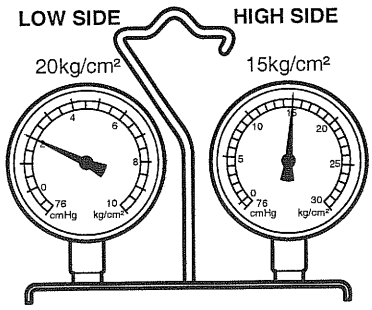
AMOUNT OF DEFLECTION OF BELT EQNB0700

Item	Deflection (mm)
New one	5 - 5.5
Used one	6 - 7
After driving	8

PERFORMANCE TEST DIAGNOSIS USING MANIFOLD GAUGE EQNB0800

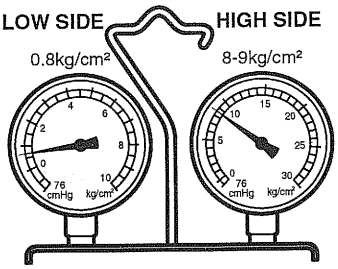
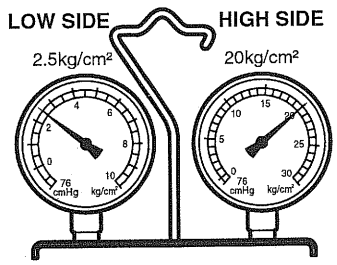
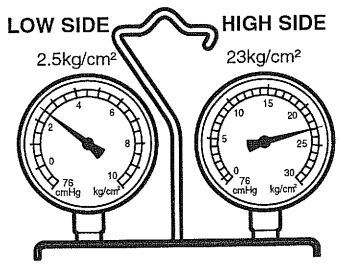
STANDARD VALUE

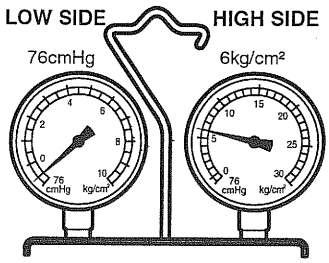
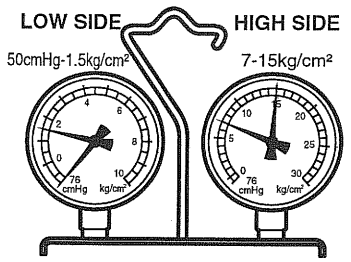
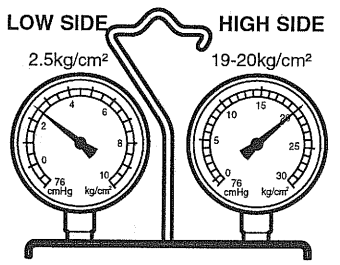
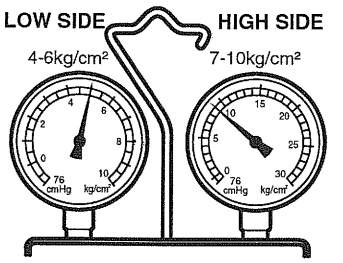
If the cooling cycle is operating normally, the manifold gauge reading will be approx. 1.5-2.0kg/cm² for the low pressure side and approx. 14.5-15kg/cm² for high the pressure side, when inlet temperature is 30-35°C, engine rpm is 2,000, max. the cooling, and the blower is at the highest level.



KFWD001A

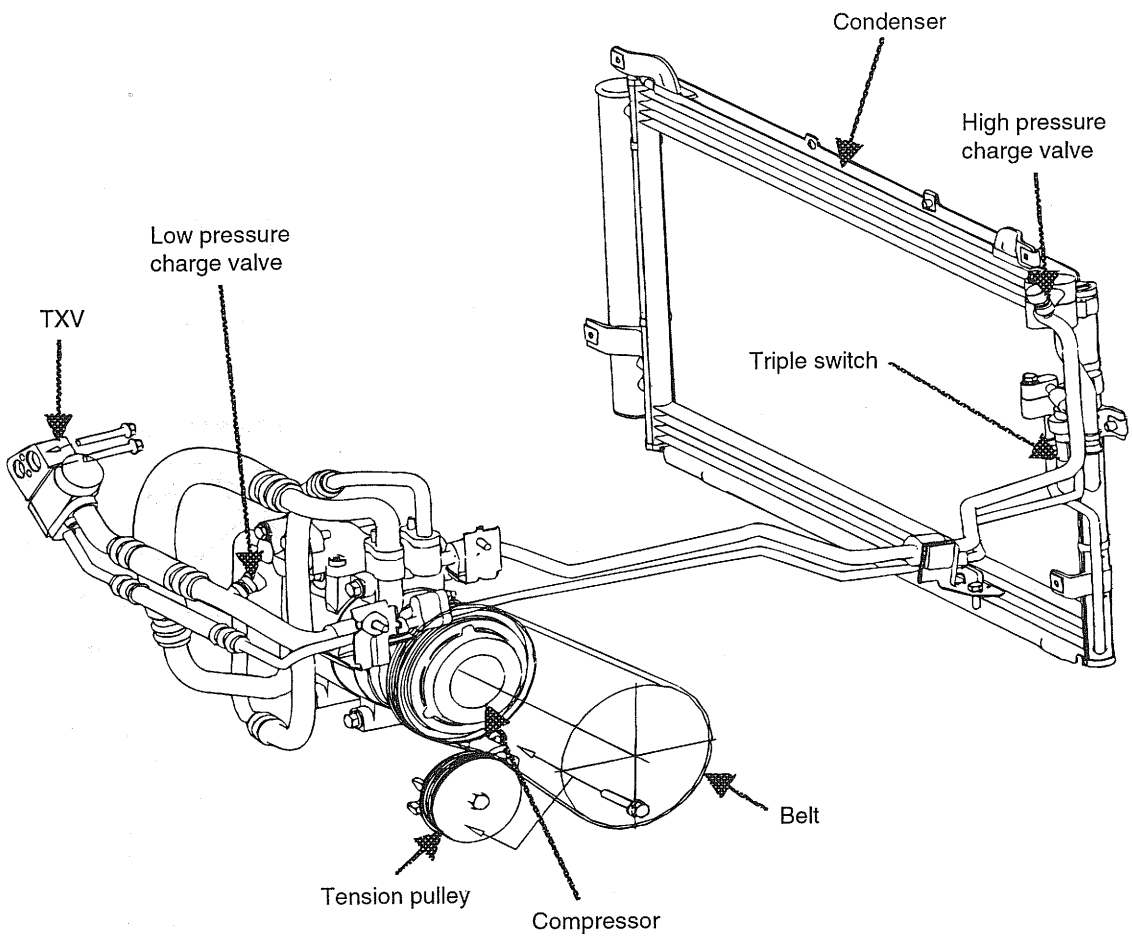
DIAGNOSIS

SYMPTOMS	PROBABLE CAUSES	REMEDY	MANIFOLD GAUGE READINGS
1. Low pressure and high pressure are low. 2. Cooler outlet air is a little cooler.	• Gas leak in freezing cycle.	• Check and repair. • Add refrigerant.	 KFWD002A
1. Low pressure and high pressure are high.	• Faulty cooling or faulty condenser freezing. • Belt slipping.	• Maintain the proper level of refrigerant. Clean the condenser. • Repair the belt.	 KFWD003A
1. Low pressure and high pressure are high. 2. Low pressure pipe is not cold.	• Air intake in freezing cycle.	• Clean or repair the receiver drier. • Check for oil contamination.	 KFWD004A

SYMPTOMS	PROBABLE CAUSES	REMEDY	MANIFOLD GAUGE READINGS
1. Low pressure side indicates negative pressure and high pressure side indicates low pressure. 2. Frost or dew on pipes connected to receiver or expansion valve.	• Dust or moisture frozen at expansion valve hole. • Gas leak at cooling vessel.	• Repair the receiver drier and replace the expansion valve. • Replace the expansion valve if the cooling vessel is faulty.	 KFWD005A
1. Low pressure side sometimes goes negative pressure or normal.	• Intaken moisture is frozen at expansion valve hole.	• Repair and bleed receiver drier	 KFWD006A
1. Low pressure and high pressure are high. 2. Much frost or dew sticks on low pressure side piping.	• Expansion valve failure. Cooling vessel inlet faulty. • Flow control faulty.	• Repair receiver drier. • Check oil contamination.	 KFWD007A
1. Low pressure side is high and high pressure side is low.	• Leak inside compressor.	• Replace compressor.	 KFWD008A

REFRIGERANT LINE

COMPONENTS EQNB0250



<Refrigerant line>

Compressor → Discharge line → Condenser → Liquid line

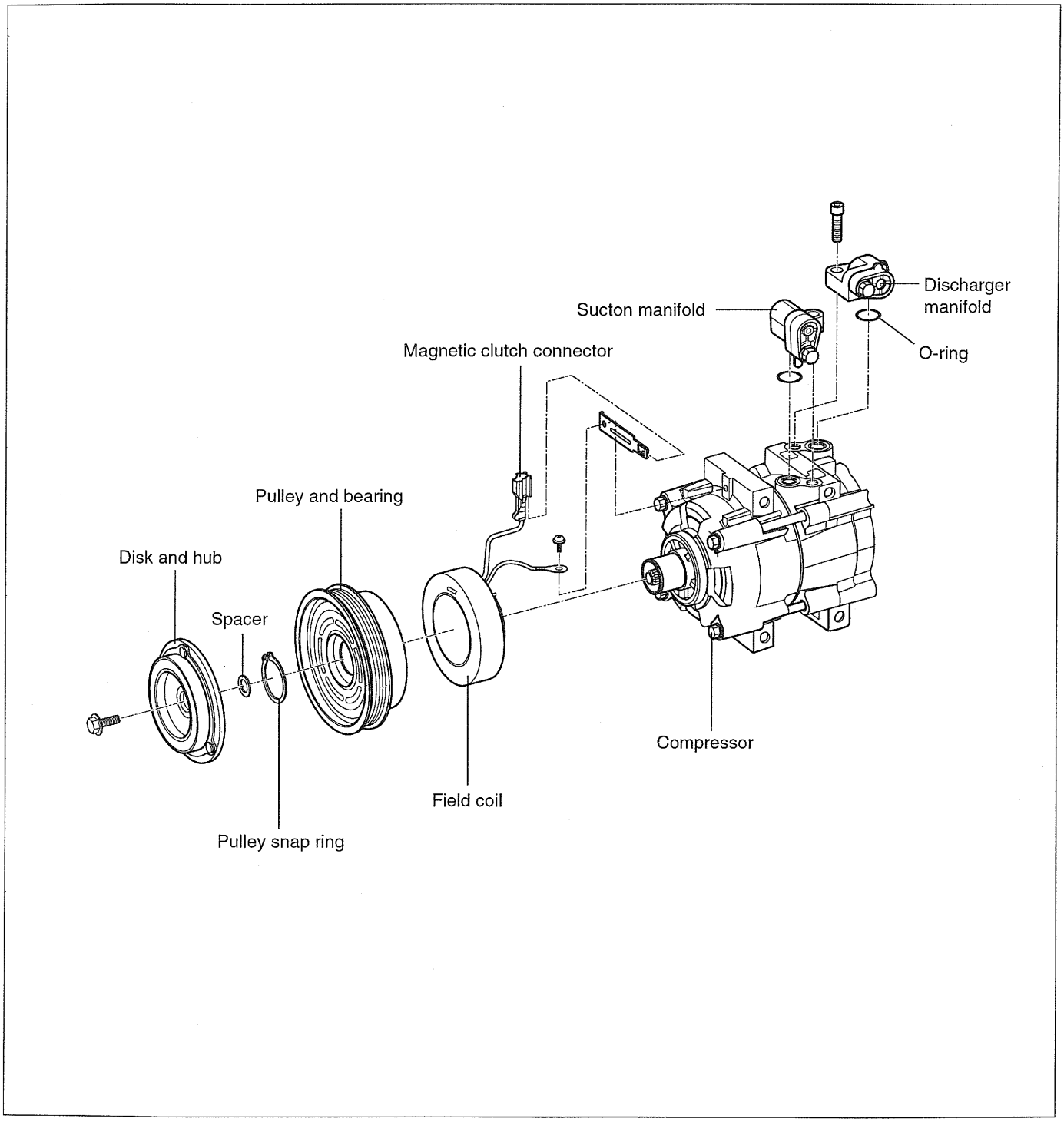
Compressor ← Suction line ← Evaporator ←

EQNB025A

MANUAL A/C COMPRESSOR CONTROLS

COMPRESSOR

COMPONENTS EQHA1250

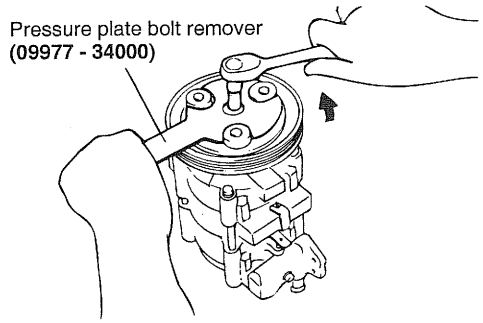


EQDA125A

CLUTCH HUB AND PULLEY

DISASSEMBLY EQNB1300

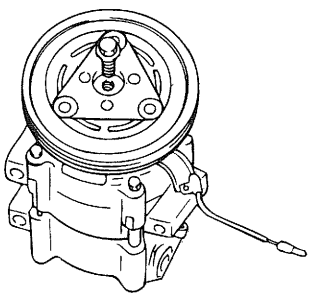
1. Remove the clutch hub supporting bolt using a spanner wrench.
2. Pull out the clutch hub and shim from the compressor shaft. If it an hard to pull out, insert 8mm bolt into the shaft hole to remove the hub from the shaft.
3. Remove the pulley supporting the snap ring.
4. Remove the pulley and bearing assembly from the compressor.



EQDA028B

REASSEMBLY EQKA1310

1. Clean the pulley bearing surface of the compressor head and remove dirt and rust.
2. Install the pulley and bearing on the compressor.
3. Install the snap ring with the bevelled side facing outward.
4. Place shim of specified side at the hub spline opening inside and slide the hub onto the compressor shaft end.
5. Install a new hub supporting bolt on the compressor shaft end. Tighten the bolt to the specified torque.

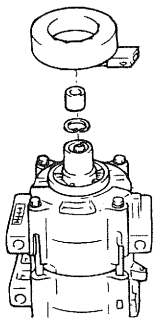


EQDA028C

Tightening torque : 110-140kg·cm

CAUTION

Do not use air tools.



EQHA130A

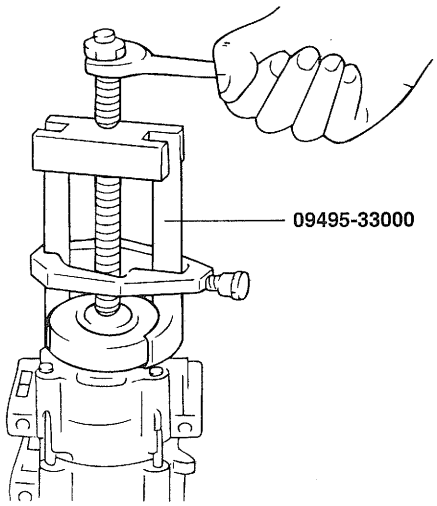
CLUTCH FIELD COIL

DISASSEMBLY EQNB1320

1. Remove the clutch hub and pulley.
2. Install a shaft protection tool at the compressor opening.
3. Install the pulley at the compressor.
   Place the puller screw end at the shaft protectors center concave and the puller projection around the rear side field coil.
4. Turn the puller screw using a wrench and remove the coil.

CAUTION

Do not use air tools.



EQHA130B

THERMAL FUSE

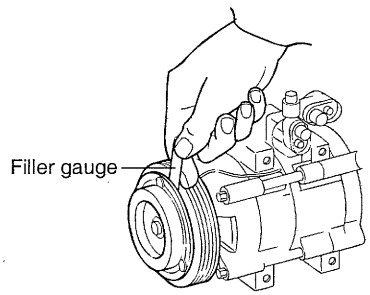
1. The thermal fuse is located on the compressor clutch coil.
2. Outline
   The thermal fuse will detect clutch slip heat (184°C off) generated by faulty compressor operation, then interrupt the coil's power supply to stop the clutch operation. Therefore, clutch bearing and pulley bearing damage will not continue in order, to protect the belt and engine. Once the thermal fuse operates, vehicle power supply will be interrupted and the compressor will not operate. Then, check the clutch coil resistance (3.0-3.2Ω) to find the thermal fuse condition, and replace the clutch coil if required.

CHECKING CLUTCH AIR GAP

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

Clutch air gap : 0.05-0.08mm

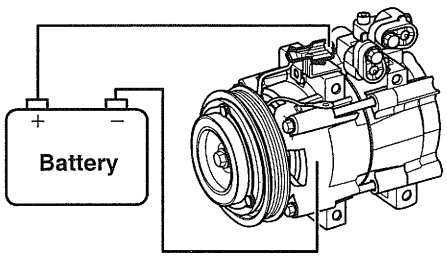
2. Check gaps around the pulley at 3 points.
3. If the clutch air gap is outside the normal range, correct the air gap into the normal range using a shim of the proper size.



KFWD052A

MAGNETIC CLUTCH OPERATION CHECK

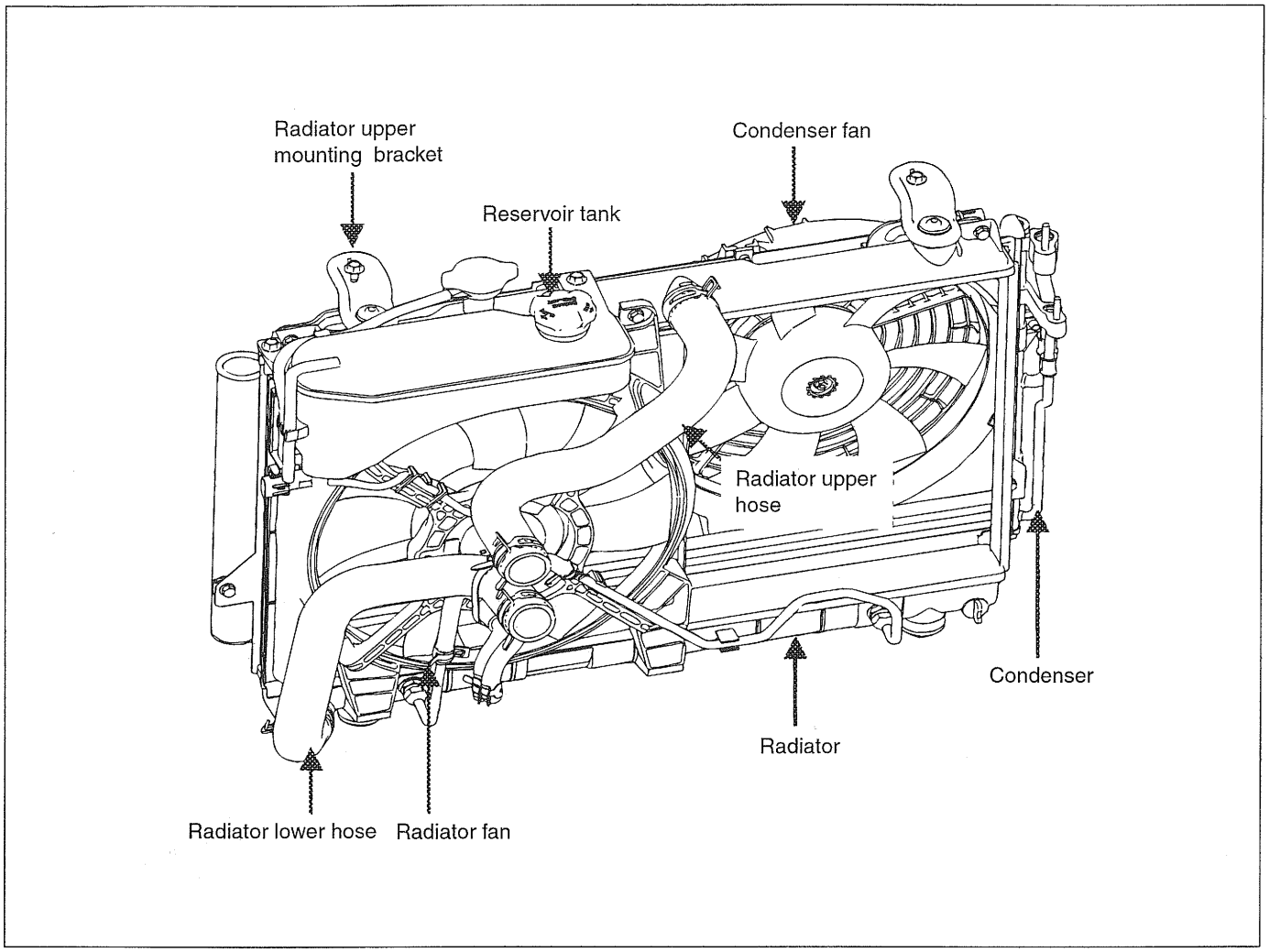
Connect the compressor side terminal to the battery (+) terminal and the ground battery (-) terminal to the compressor body. Check the magnetic clutch operating noise to determine the condition.



KFWD053A

CONDENSER

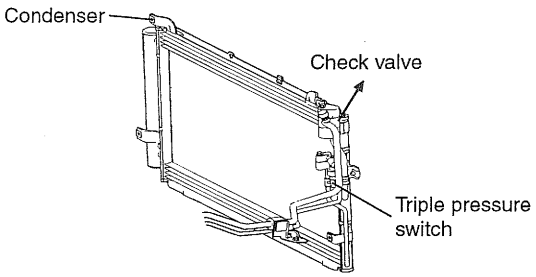
COMPONENTS EQNB1350



EQNB135A

REMOVAL EQNB1450

1. Discharge refrigerant from the refrigeration system.
2. Discharge engine coolant from the radiator.
3. Remove the bolts which hold the radiator upper mounting brackets and the radiator hoses.
4. Remove the radiator.
5. Separate the discharge pipe and the liquid tube.



EQNB237A

6. Remove the condenser assembly.

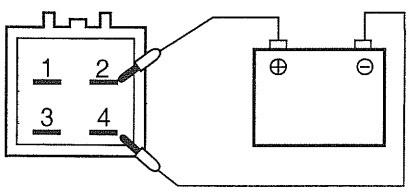
CHECKING EQKA1400

CONDENSER

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

CONDENSER FAN

1. Check the connector for connection condition.
2. Check the condenser fan motor using battery voltage.



EQKA140A

TRIPLE PRESSURE SWITCH

TRIPLE SWITCH EQKA1500

The triple switch is a combination of a middle 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 middle 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.

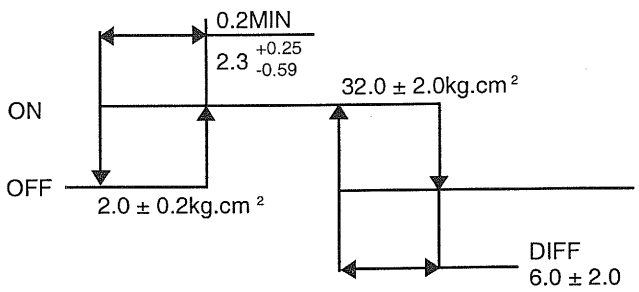
OPERATING CHARACTERISTIC

kg·cm²

Pressure	ON	OFF
High	32.0 ± 2.0	26.0 ± 2.0
Low	2.3 ± 0.25	2.0 ± 0.2
Middle	18.0 ± 0.8	14 ± 1.2

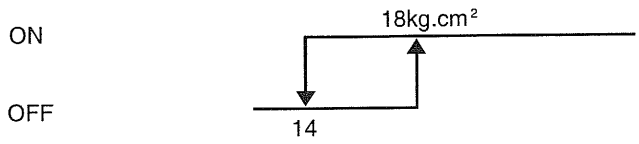
EQKA150B

LOW & HIGH



EQHA150A

MIDDLE

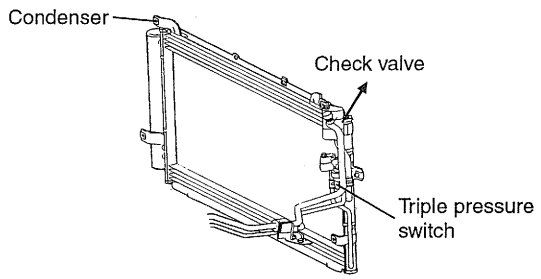


EQKA150C

CHECK VALVE

CHECK VALVE EQNB2370

When parking the vehicle for a long time, temperature difference between night and day will affect coolant to shift from evaporator and condenser to compressor. At this time when air conditioner is on, coolant in the compressor will be able to be compressed with noise.
So, this is installed on the flange of the discharge line connected with the condenser to reduce the operating noise of the compressor.

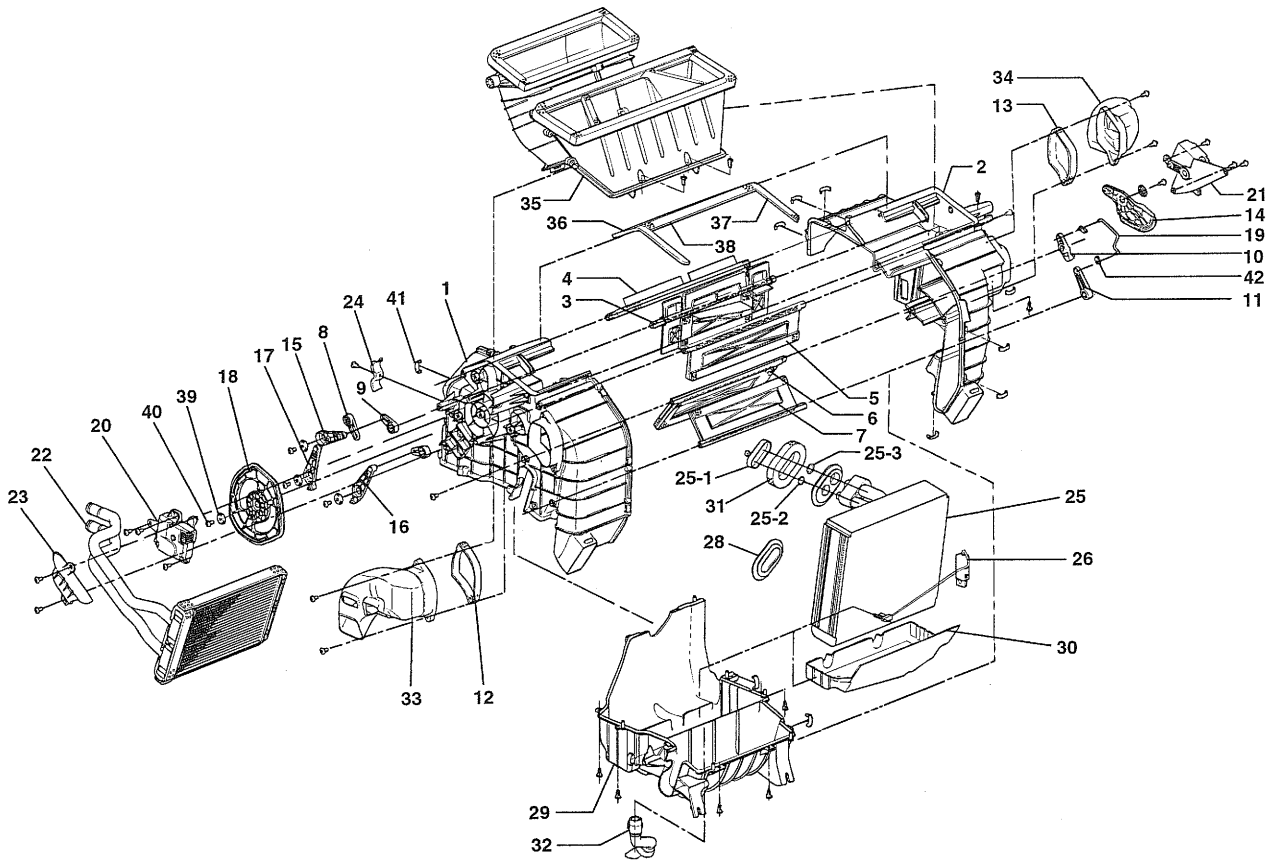


EQNB237A

HEATER

HEATER UNIT

COMPONENTS EQNB1600

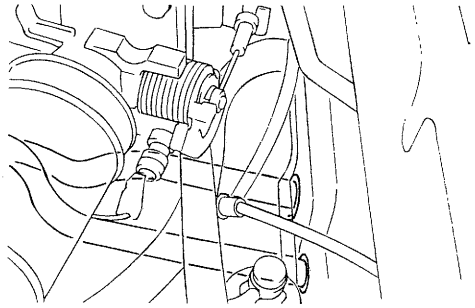


1. Case - heater & evaporator left
2. Case - heater & evaporator right
3. Door assembly - vent
4. Door assembly - def
5. Door assembly - floor
6. Door assembly - temp
7. Door assembly (A) - temp
8. Arm - def door
9. Arm - vent door
10. Arm - temp door
11. Arm (A) - temp door
12. Seal - shower duct left
13. Seal - shower duct right
14. Lever - temp door
15. Lever - vent door
16. Lever - floor door
17. Lever - def door
18. Cam - mode
19. Rod - link (temp)
20. Actuator motor assembly - mode
21. Actuator motor assembly - temp
22. Heater core & seal assembly
23. Cover-heater pipe
24. Clamp - heater water tube
25. Core complete assembly - evaporator
25-1. Cap(D) - joint flange
25-2. O - ring
25-3. O - ring
26. Thermister assembly A/C evaporator
27. Bracket - A/C evaporator core tube fix
28. Grommet (A) A/C evaporator tube
29. Case - heater & evaporator lower
30. Insulation heater lower
31. Seal - evaporator grommet
32. Drain hose assembly - A/C evaporator
33. Left shower floor duct
34. Right shower floor duct
35. Plenum duct assembly
36. Seal - heater to plenum duct
37. Seal(A) - heater to plenum duct
38. Seal(B) - heater to plenum duct
39. Spring washer
40. Tap screw ratchet
41. Clip - case to case
42. Holder - link rod

EQNB160A

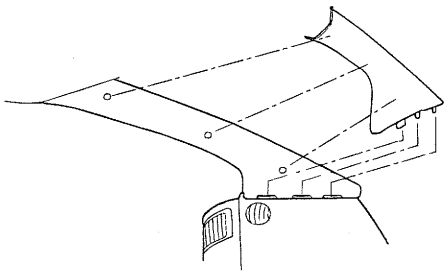
REMOVAL EQNB1610

1. Disconnect the negative (-) battery.
2. Drain the cooling water of the radiator.
3. Remove the heater hose and the drain hose.
4. Drain the refrigerant.
5. Disconnect the air conditioning suction hose and the liquid tube.



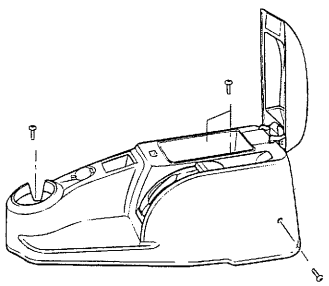
EQDA046A

6. Remove the front pillar trim.



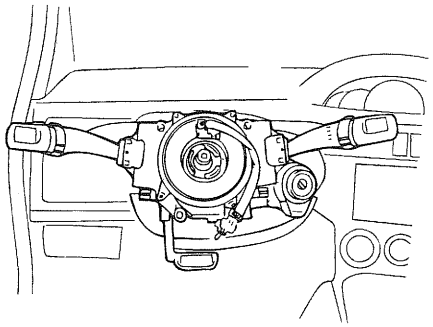
KSNB001E

7. Remove the rear console.



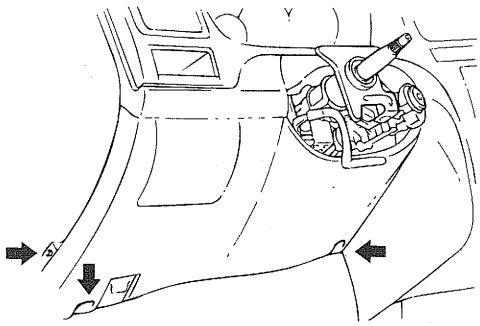
KSNB008A

8. Remove the steering wheel and the multifunction switch.



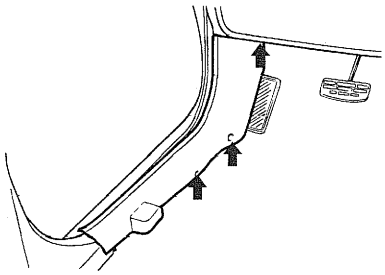
KPNB160F

9. Remove the lower crash pad.



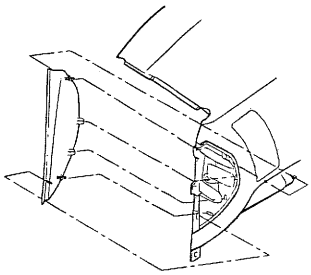
KPNB160G

10. Remove the cowl side trim.



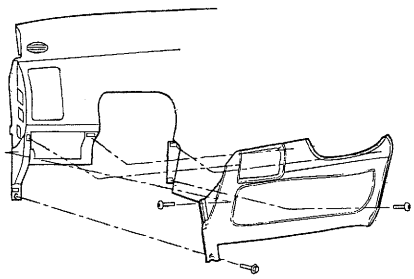
KSNB008B

11. Remove the side cover of the crash pad.



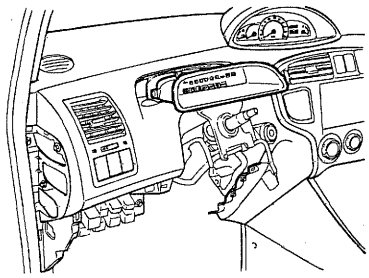
KSNB008C

12. Remove the crash pad lower panel. (screw : 2EA, bolt : 1EA)



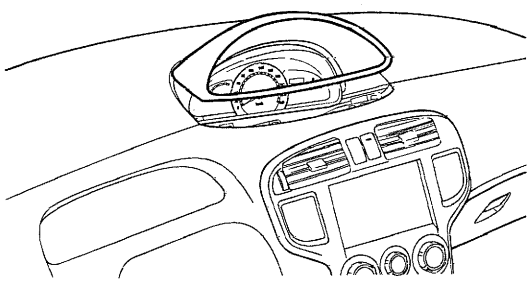
KSNB008D

13. After removing tail lamp assembly, disconnect the connector.



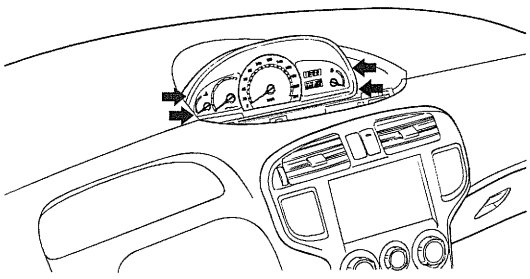
KSNB008E

14. Remove the cluster facia panel.



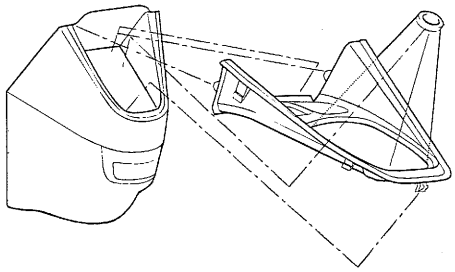
KSNB008R

15. Remove the cluster assembly.



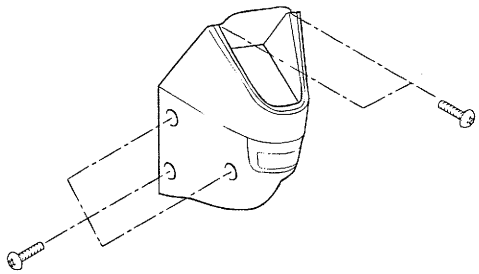
KSNB008F

16. Remove the console upper cover.



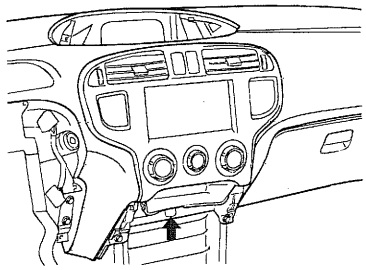
KSNB008G

17. Remove the console assembly. (screw : 8EA)



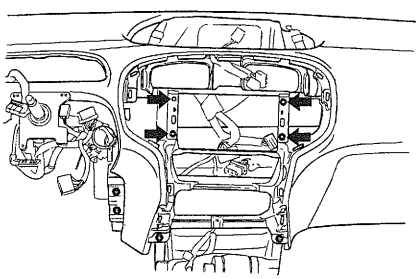
KSNB008H

18. Remove the switch connector and the center facia panel.



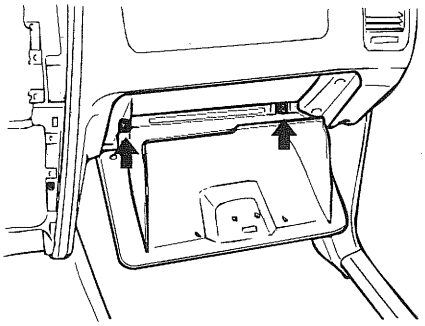
KSNB008J

19. Remove the audio component assembly.



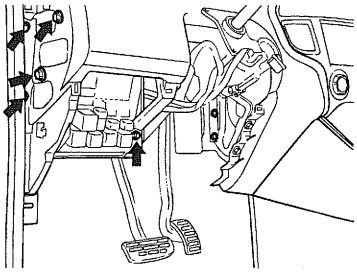
KSNB008I

20. Remove the glove box hinge pin and the glove box.



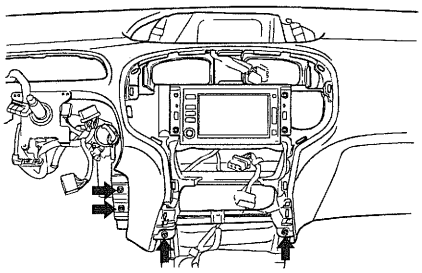
KSMB008Q

21. Remove the main crash pad mounting bolts (5EA) of the driver side.



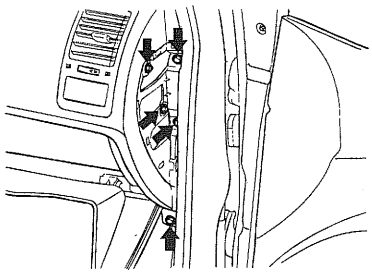
KSNB008K

22. Remove the center main crash pad mounting bolts (4EA).



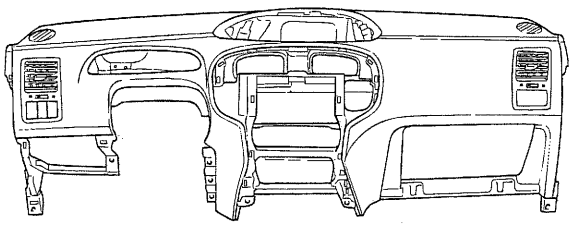
KSNB008L

23. Remove the main crash pad mounting bolts (7EA) of the passenger side.



KSNB008M

24. Remove the main crash pad.



KSNB008N

25. Remove the heater assembly.

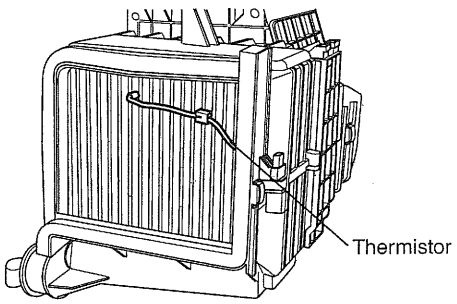
INSTALLATION EQKA1620

Installation is the reverse of removal.

BLOWER CONTROLS

THERMISTOR EQNB1950

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.



KFWD049A

1. Remove the glove box.
2. Start the engine.
3. Turn on the air conditioner.
4. Using the multitester, check the output voltage at terminals 2 and 3 of the thermistor.

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

WATER TEMPERATURE SENSOR EQNB2000

1. The water temperature sensor, located at the heater core, detects coolant temperature flowing through heater core. It is a negative type thermistor; resistance will increase with lower temperatures, and decrease with higher temperatures.

2. The sensor will compare temperature settings with the incar air temperature or the ambient air temperature for motive heating control.

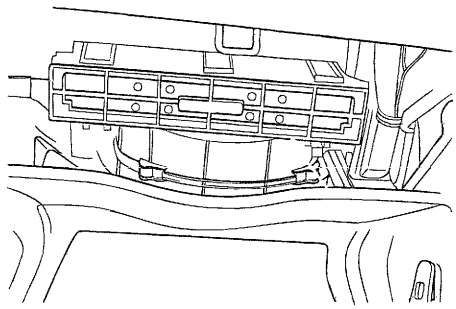
CHECK

Water temperature	Resistance
25°C	10KΩ
60°C	2.50KΩ

A/C AIR FILTER

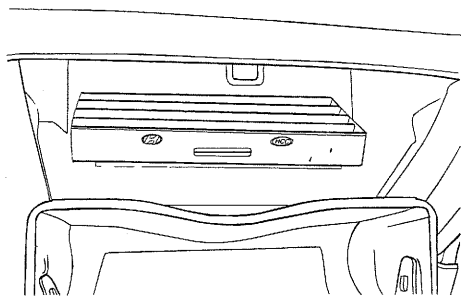
AIR FILTER REPLACEMENT EQNB1840

1. Remove the fixing pin of the glove box.
2. Remove the filter cover.



KQNA020A

3. Replace the filter.



KQNA020B

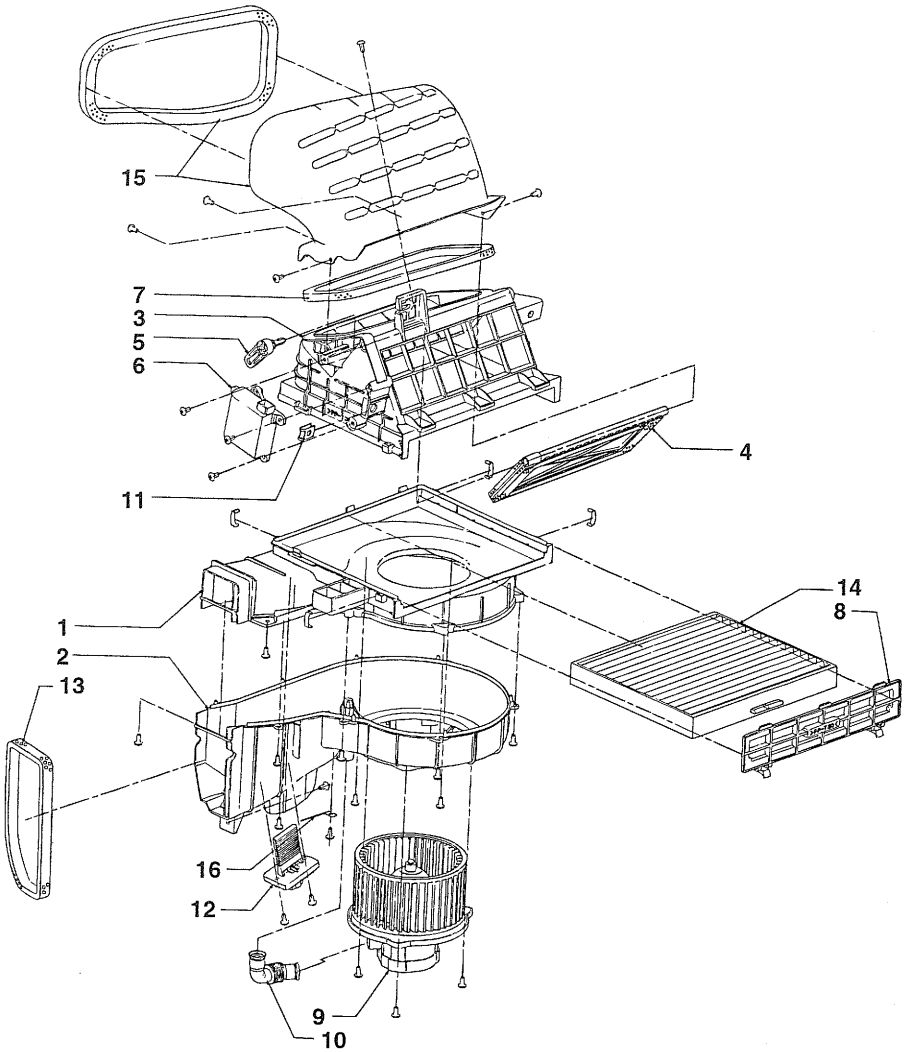
4. Installation is the reverse of removal.

CAUTION

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

BLOWER UNIT

COMPONENTS EQNB1800



1. Case - Blower upper
2. Case - Blower lower
3. Case - Air inlet duct
4. Door assembly - Air inlet
5. Arm - Air inlet door
6. Actuator motor assembly - Inlet
7. Seal - Blower inlet to C/Panel
8. Cover assembly - Filter
9. Motor & Wheel assembly
10. Cooling tube Blower motor
11. U - Clip
12. Resistor assembly
13. Seal - Blower to heater evaporator
14. Filter - Air cleaner assembly
15. Cowl duct assembly
16. Holer - Lead wire

EQNB180A

REMOVAL EQNB1810

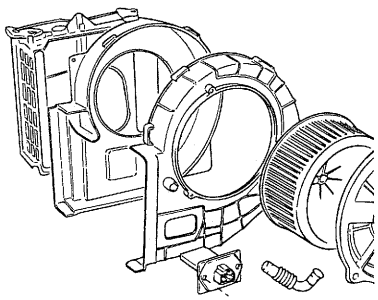
1. Remove the main crash pad.
2. Disconnect the register and the blower motor connector.
3. Loosen the blower mounting nuts.
4. Remove the blower assembly.

INSTALLATION EQKA1820

Installation is the reverse of removal.

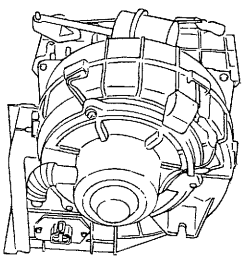
DISASSEMBLY EQKA1830

1. Disconnect the motor cooling tube.
2. Loosen the motor mounting screw.
3. Loosen the screw of the duct and the blower case.



EQDA051B

4. Remove the duct.
5. Disconnect the case.



EQDA051C

6. Remove the blower register.

REASSEMBLY EQNA1840

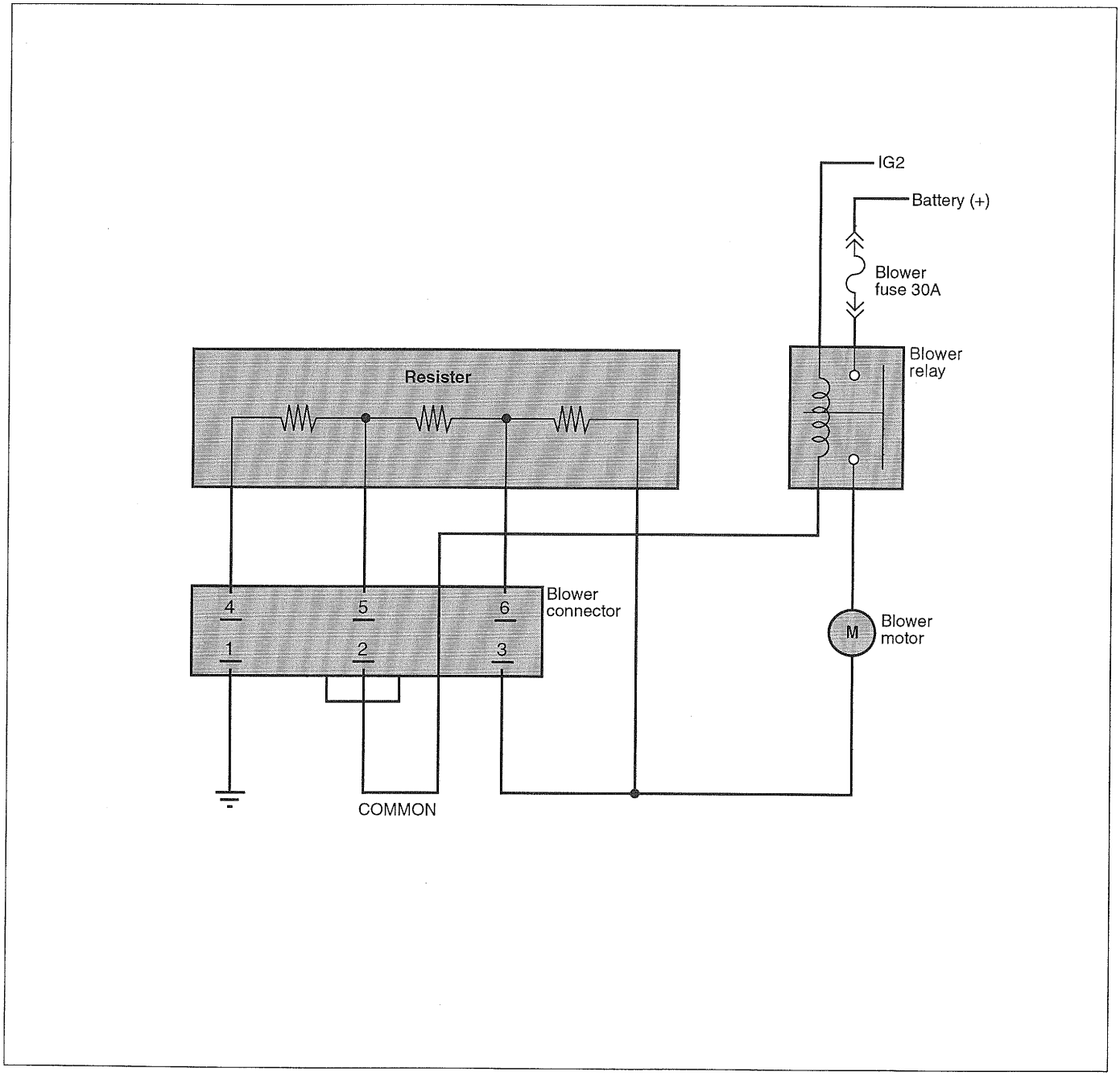
Reassembly is the reverse of removal.

BLOWER MOTOR

BLOWER MOTOR EQNB2250

When blower is turned on, blower relay becomes turned on and voltage is supplied to blower motor. Current determined by register runs through the selected blower register and blower motor.

BLOWER MOTOR CHECK



EQMB023A

VENTS/AIR DISTRIBUTION

Mode / Position	Recirculation		Fresh		
	COOL	1/2 COOL	WARM		
	VENT	BI/LEVEL	FLOOR	MIX	DEF
VENT	100 - 5	67.5 ± 5			
FLOOR	-	32.5 ± 5	50 ± 5	35 ± 5	-
DEF	-	-	25 ± 5	45 ± 5	80 ± 5
S/VENT			25 ± 5	20 ± 5	20 ± 5

Unit : %

BLOWER RESISTOR

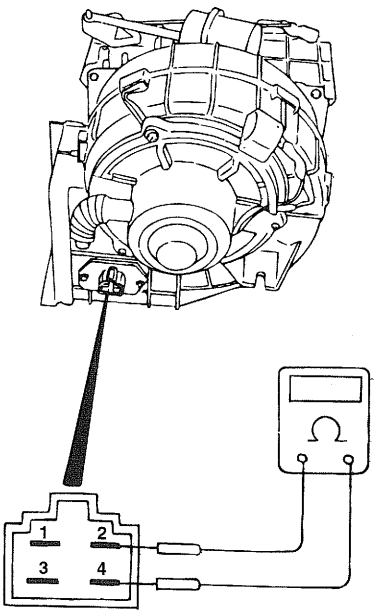
BLOWER RESISTOR EQNB2350

Measure the resistance of the terminals.

If not within the standard value, replace the register.

Pin / Speed	1 ML	2 MH	3 LO	4 HI	Resistance (Ω)
Continuity	○		○		1.3
	○	○			0.65
		○		○	0.35±5%

EQNB235A

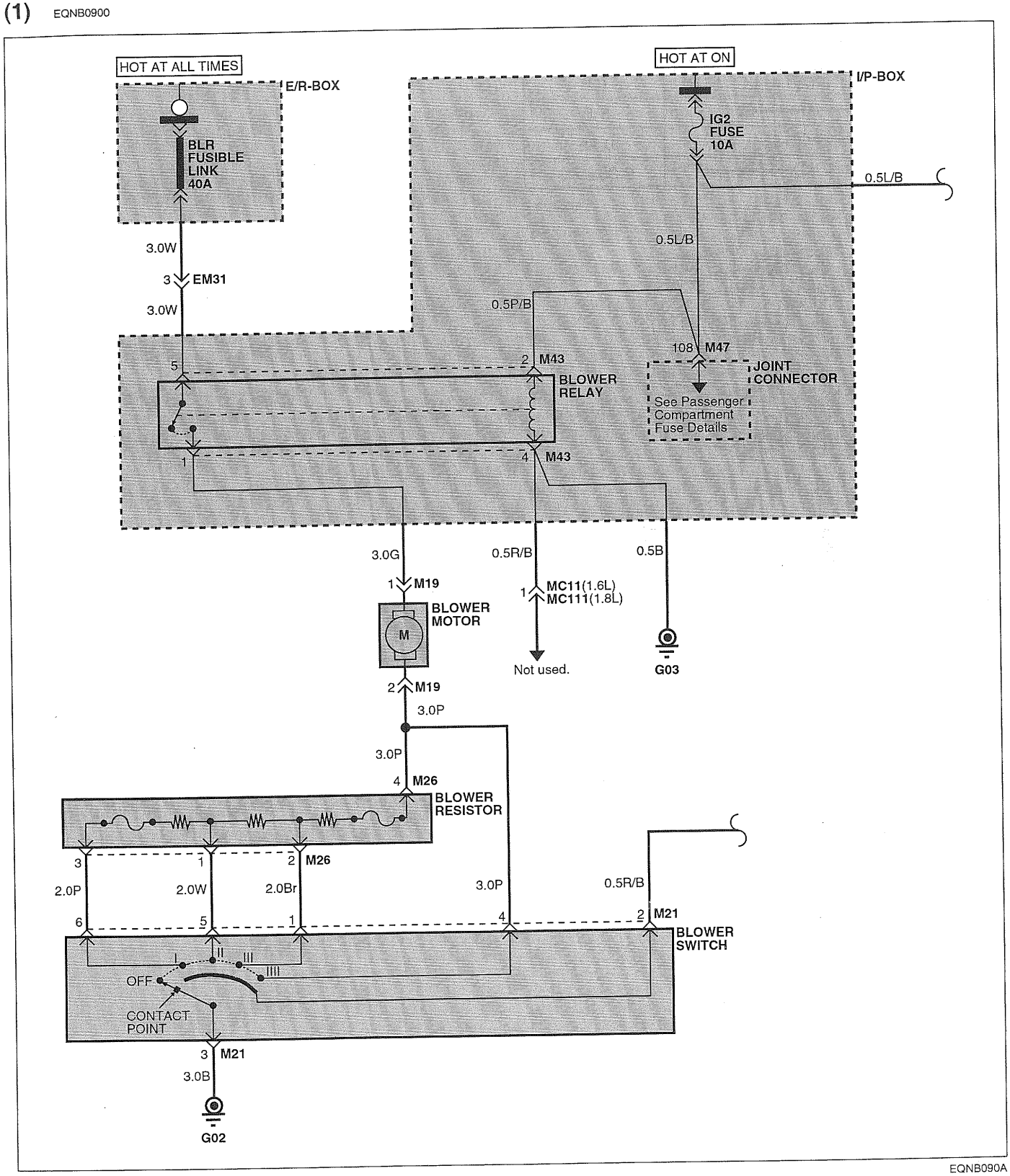


KQNB235B

BLOWER AND A/C CONTROLS (MANUAL)

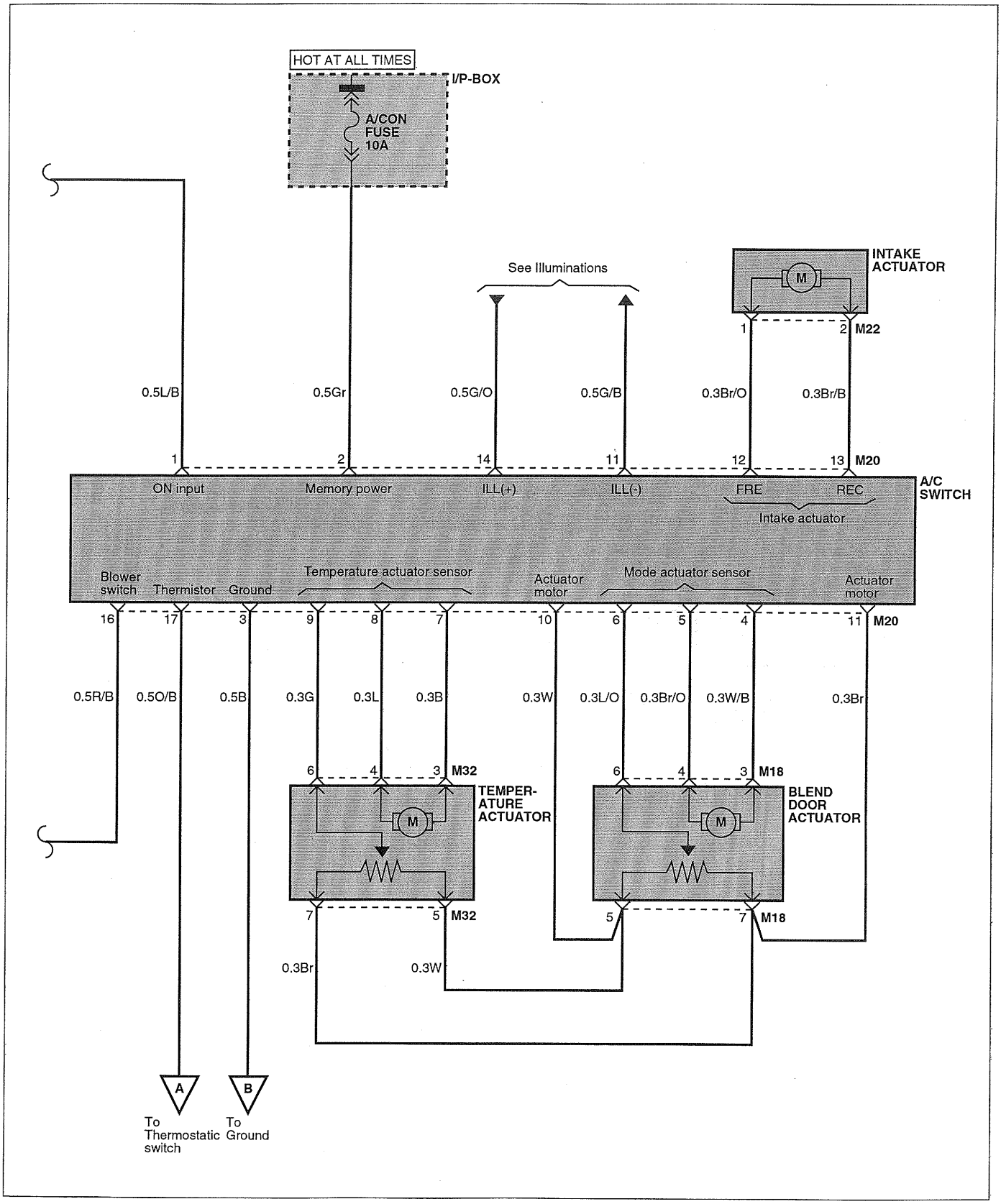
SCHEMATIC DIAGRAM (MANUAL)

(1) EQNB0900



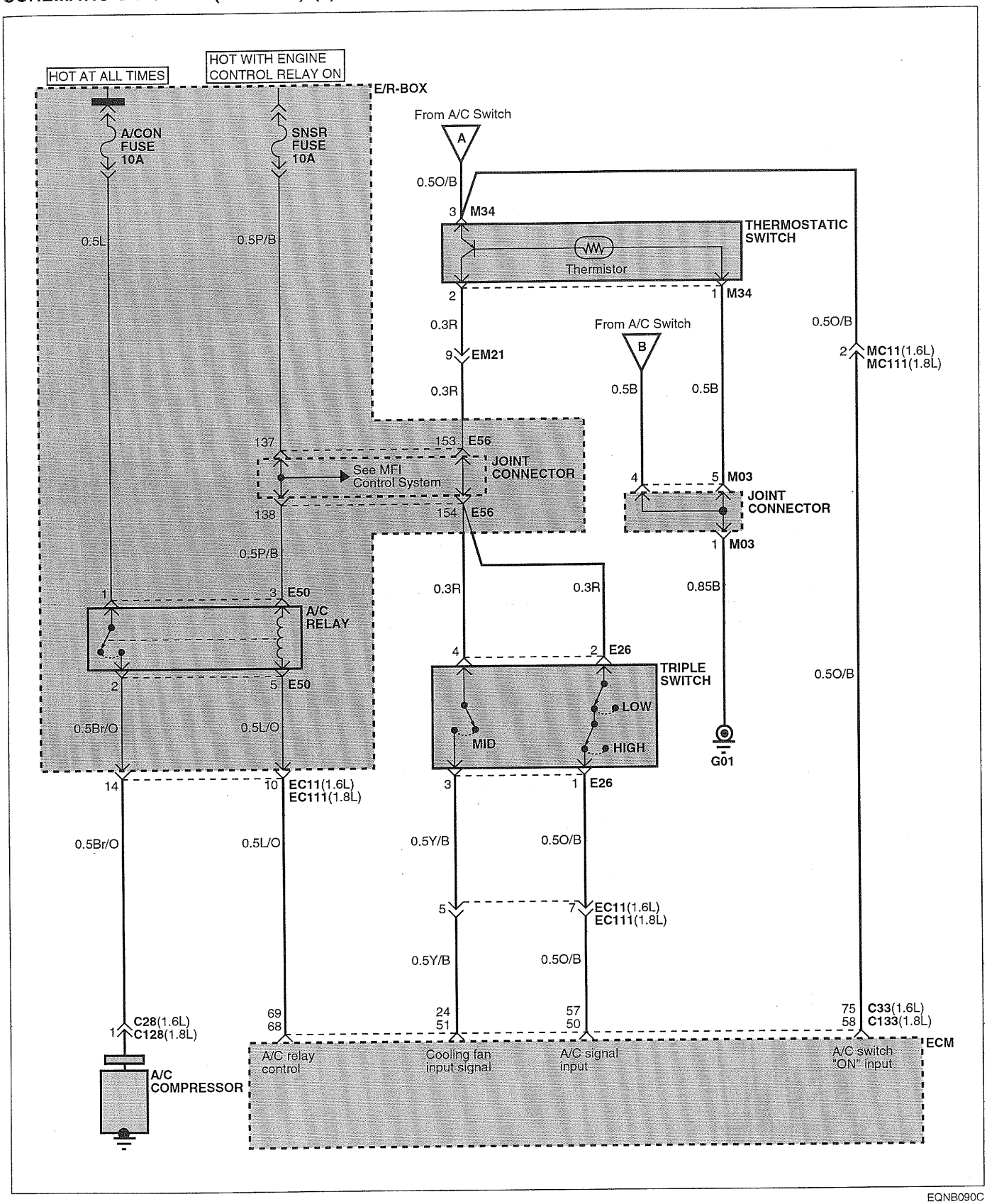
EQNB090A

SCHEMATIC DIAGRAM (MANUAL) (2)



EQNB090B

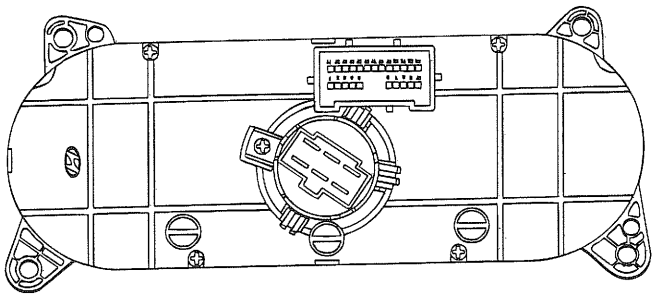
SCHEMATIC DIAGRAM (MANUAL) (3)



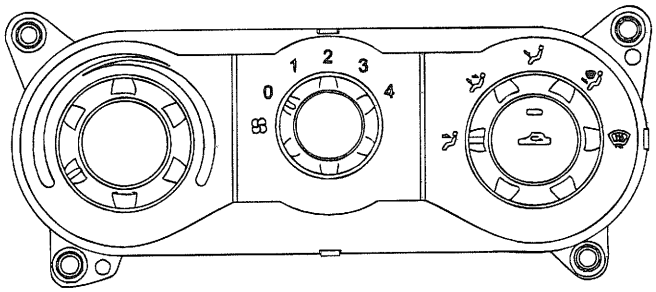
EQNB090C

CONTROL PANEL

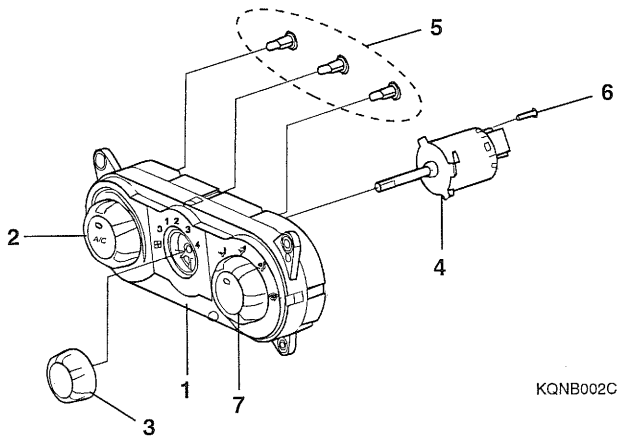
EQNB0860



KQNB002A



KQNB002B



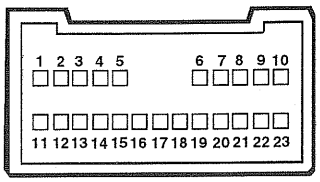
KQNB002C

1. Panel and housing assembly
2. Temperature control knob
3. Blower knob
4. Blower switch
5. Socket and bulb
6. Screw
7. Mode control knob

EQNB086A

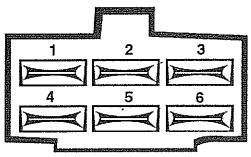
CONTROL UNIT CONNECTOR

<Main connector>



KQNB003A

<Blower switch>



KQNB003B

EQNB086B

Connector	Pin No.	Name	Connector	Pin No.	Name
Main Connector	1	IGN	Blower S/W	1	MIDDLE HIGH
	2	B+		2	COMMON
	3	GROUND		3	GROUND
	4	Mode actuator (VENT)		4	HIGH
	5	Mode actuator (DEFROST)		5	MIDDLE LOW
	6	Mode F/B		6	LOW
	7	Temperature actuator (WARM)			
	8	Temperature actuator (COOL)			
	9	Temperature F/B			
	10	VCC			
	11	SENSOR/GROUND			
	12	FRE.			
	13	REC.			
	14	ILL+			
	15	ILL-			
	16	COMMON			
	17	A/C OUTPUT			
	18	-			
	19	-			
	20	-			
	21	-			
	22	-			
	23	-			