

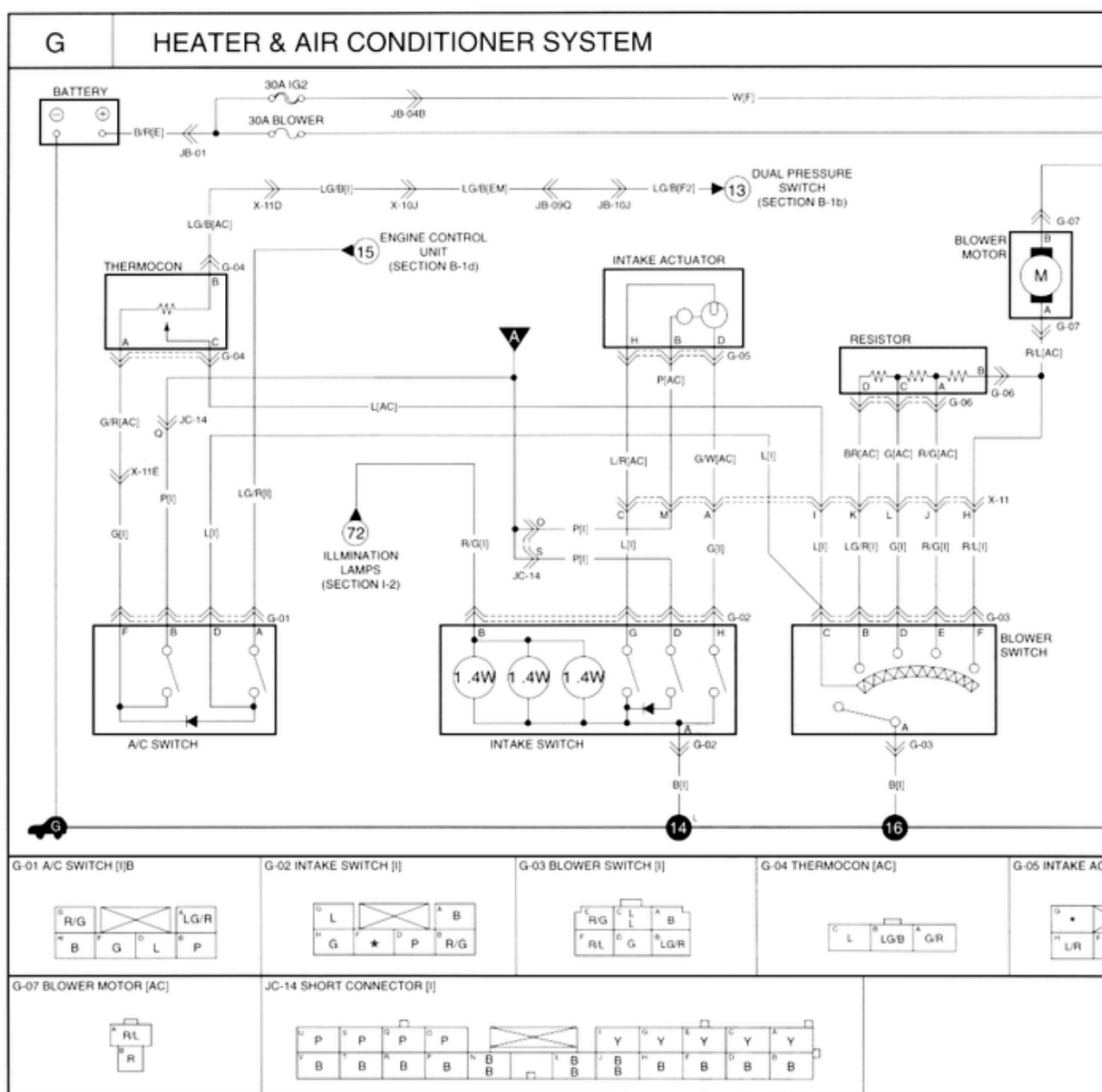


Heating,Ventilation, Air Conditioning

General Information

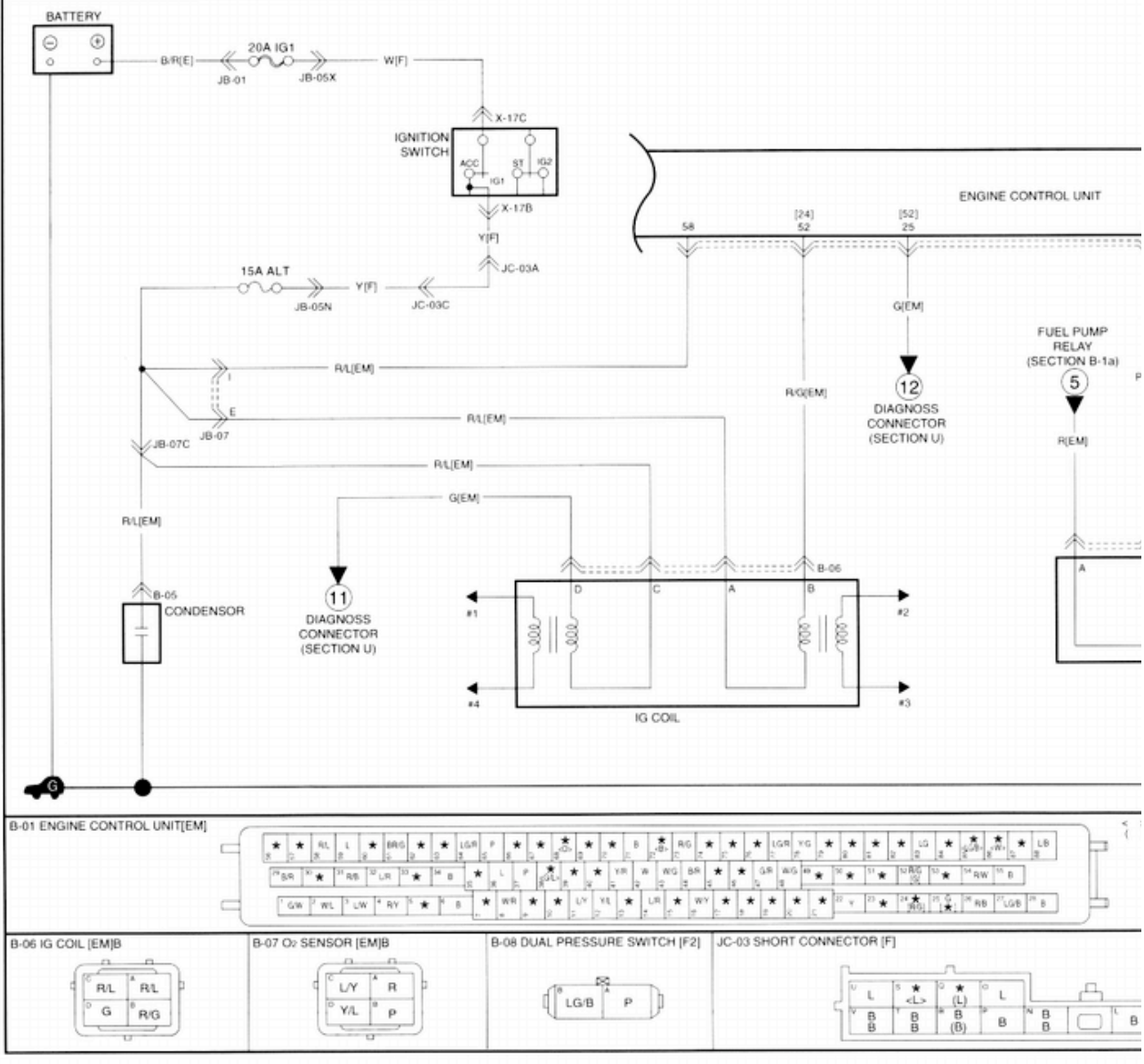


CIRCUIT DIAGRAM



B-1b

ENGINE CONTROL SYSTEM



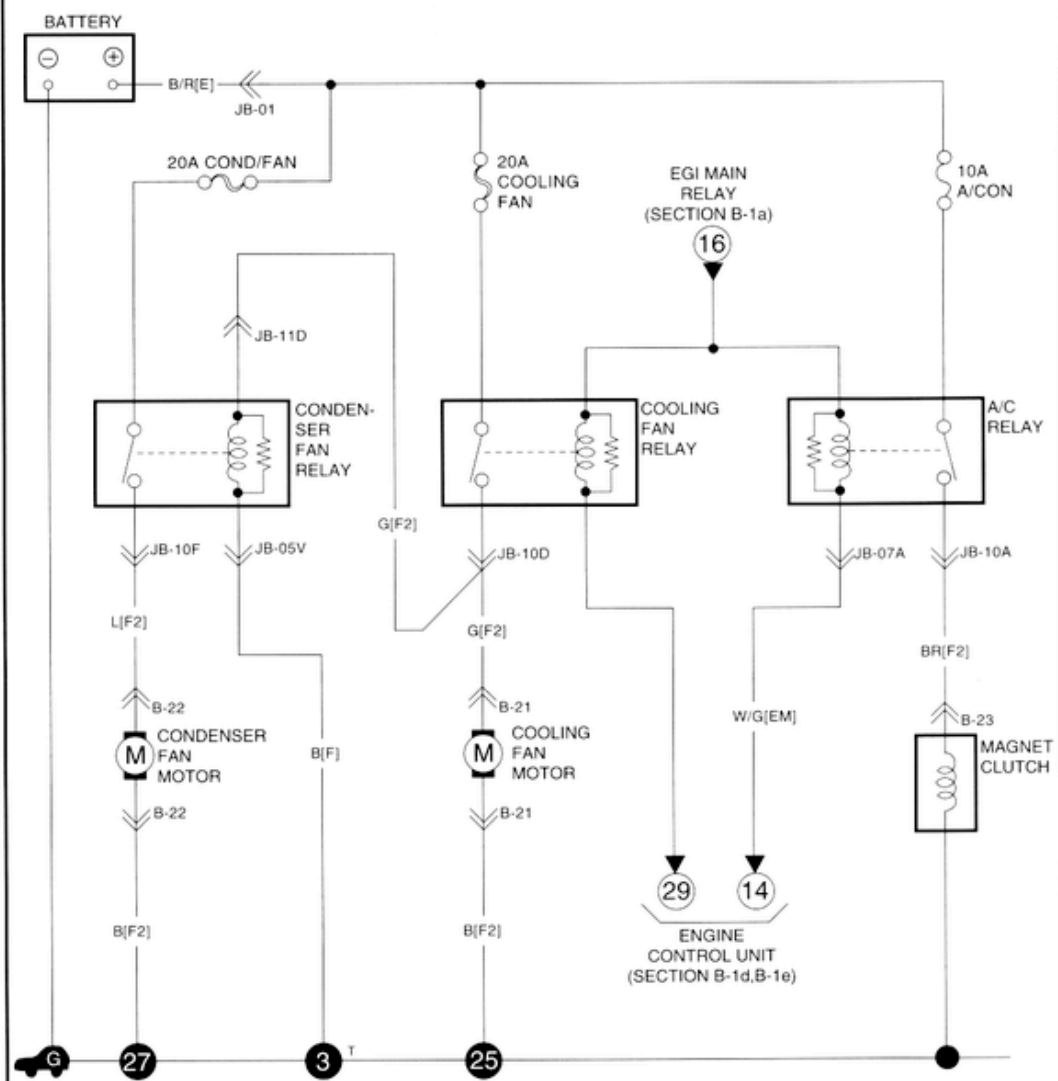
ENGINE CONTROL SYSTEM



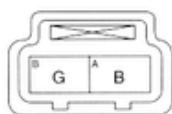
A schematic diagram of a two-chambered battery. It consists of two rectangular chambers connected by a central vertical tube. The left chamber is labeled 'B' and the right chamber is labeled 'A LG/R'. The entire assembly is enclosed in a larger rectangular frame with a central vertical line separating the two chambers.

B-2

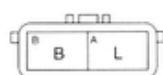
COOLING SYSTEM



B-21 COOLING FAN MOTOR [F2]B



B-22 CONDENSER FAN MOTOR [F2]B



B-23 MAGNET CLUTCH [F2]B





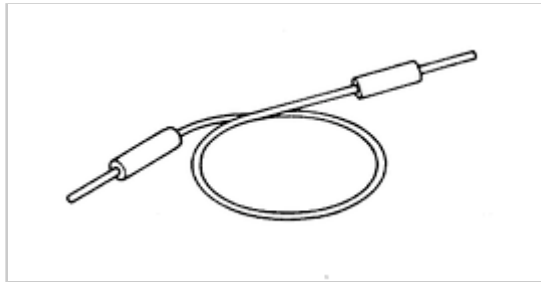
ELECTRICAL TROUBLESHOOTING TOOLS

1. Jumper wire

The jumper wire is used for testing by short-circuiting switch terminals and to verify condition of ground connections.

CAUTION

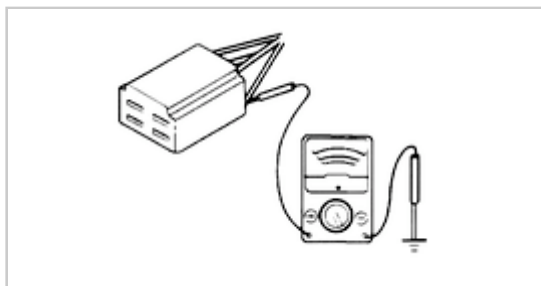
Do not connect jumper wire between a power source and a body ground. This may cause burning or other damage to harnesses and electronic components.



2. Voltmeter

The DC voltmeter a range of 15V or more must be used.

If is used by connecting positive (+) probe (red lead) to point where voltage is to be measured and connecting negative (-) probe (black lead) to a body ground.

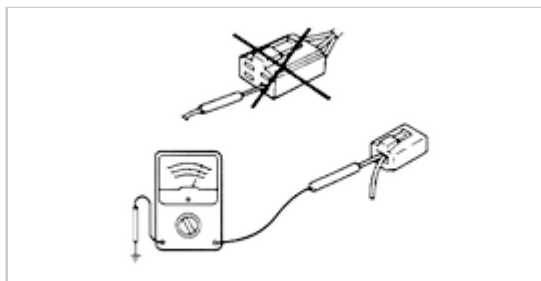


3. Ohmmeter

Ohmmeter is used measure resistance two points in a circuit, to check for continuity, and to diagnose short circuits.

CAUTION

Never connect ohmmeter to any circuit to which voltage is applied. Doing so may burn or otherwise damage ohmmeter.



4. Test light

The test as shown light as shown in figure uses a 12V bulb. Two leads should be connected to probes. Test light is used for simple voltage checks and to check for open circuit.

CAUTION

When checking control unit never use a bulb over 3.4W.





DESCRIPTION AND OPERATION

Air conditioning (A/C) system

The A/C system uses principals of thermodynamics to cool passenger compartment of vehicle. Using engine power, compressor compresses gaseous refrigerant into high temperature/high pressure gas. It then pumps this gas into a condenser unit built onto vehicle's radiator.

Condenser cools gas, changing it into high pressure, low temperature liquid refrigerant. Liquid then goes to receiver/drier, which first removes any liquid water and then sends liquid to an evaporator in heater unit inside passenger compartment. Evaporator then uses passenger compartment temperature to turn liquid back into a gas, extracting heat from passenger compartment.

Gas is then sent back to compressor, and cycle begins again.

A/C relay

A/C relay is an electrical switching box that closes circuit to condenser fan relay and compressor clutch. Relay is controlled by engine control module (ECM) only. If engine coolant exceeds a certain temperature, engine control module (ECM) sends a signal triggering A/C relay and shutting off A/C system.

At starting or light acceleration, engine control module (ECM) sends a signal triggering A/C relay and shutting off A/C system for five seconds. It is a replaceable item.

Blower

The blower draws in hot passenger compartment air and sends it through evaporator coil. It consists of a blower fan and an electric motor.

Blower motor

Blower motor speed is controlled by blower switch and a resistor assembly in blower unit. When blower switch is in OFF position, motor ground circuit is open and blower motor does not operate. When switch is in first (LO) position, current flow to blower motor is restricted by three resistors in resistor assembly, and blower motor turns at a low speed. Changing blower switch to second (M1), third (M2), or fourth (HI) positions causes successive decreases of circuit resistance, resulting in blower motor speed becoming correspondingly faster.

Compressor assembly

The compressor assembly is primary moving part of air conditioning system. If it fails, there is no compression of refrigerant, and no movement of refrigerant through system. It is located on left side of engine and is connected to engine crankshaft by a drive belt. It consists of compressor, manifold assembly, compressor clutch, and drive pulley.

Compressor clutch

The compressor clutch engages compressor. It is a magnetic unit operated from air conditioning switch in passenger compartment. It is a serviceable, replaceable item.

Condenser

The condenser is mounted in front of radiator. It consists of a series of coils which cool refrigerant. It is a serviceable and replaceable item.

Condenser fan

The condenser fan improves air flow through condenser. Condenser will still have a high volume of air flowing through it even if vehicle is standing still. It is powered by an electric motor connected to condenser fan relay. Condenser fan relay is an electrical switching box that closes circuit to condenser fan.

Evaporator assembly

The blower/evaporator assembly houses blower fan, blower motor, and A/C relay for air conditioner system. It consists of evaporator core and expansion valve.

Evaporator core

The evaporator core is an air cooler and a dehumidifier.

As refrigerant enters, it boils, absorbing heat from air being blown through core by heater blower motor. This cools air, which is then directed to passengers through air ducts. As air is cooled, moisture in air condenses on core and is drained off. Result is cold, dry air. Evaporator core is a serviceable, replaceable item.

Expansion valve

The expansion valve allows high pressure liquid to expand as it enters evaporator. By allowing liquid to expand, it will absorb more heat in evaporator. Valve also meters amount of refrigerant entering system to prevent evaporator core from flooding.

Fresh/Recirculation actuator

When fresh/recirculation switch in heater and A/C control panel is pushed, motor in fresh/recirculation actuator assembly moves and its position is not fed back to fresh/recirculation switch.

When desired air fresh/recirculation door position is reached, motor stops.

Heater

Dehumidified air is reheated as it passes through heater core in heater unit. Heater is warmed by engine coolant passing through tubes of heater core. Heat is transferred to core fins and passed off to air flowing past fins.

Position of air temperature valve in air conditioning module determines how much of total airflow is permitted to pass through heater. This determines warmth of overall air flow that is sent into passenger compartment.

Hoses and lines

Hoses and lines carry refrigerant between major components of A/C system. Lines are made of metal and are rigid. Hoses are made of flexible rubber and are designed for either high or low pressure. They are replaceable items.

Receiver/Drier

The receiver/drier is located at front power steering oil tank. It receives liquid refrigerant from condenser, removes any water in it, and then sends refrigerant to evaporator. It is a replaceable item.

Service ports

Service ports allow injection or recovery of refrigerant to A/C system. High-pressure service port is mounted in high pressure line coming from receiver/drier. Low-pressure service port is in section of flexible hose that connects evaporator return line to compressor.

Refrigerant

- Refrigerant 134a (R-134a) systems

In an effort to avoid use of ozone-depleting CFC refrigerants, Kia Motor Company has introduced a new refrigerant system for this vehicle. This system uses non-CFC-based refrigerant R-134a.

This new type of refrigerant has many of same properties as R-12 and is similar in form and function.

R-134a is a hydrofluorocarbon (HFC)-based refrigerant, however, R-12 is a chlorofluorocarbon (CFC). With no chlorine atoms in its molecular structure, use of R-134a refrigerant will not have any harmful effects on atmosphere's ozone layer.

- Identifying R-134a and R-12 A/C systems

To determine which types of A/C system a particular vehicle has, inspect A/C system's major components and refrigerant lines for special tags. If system has yellow R-134a "NON-CFC" tags, it is an R-134a system and uses R-134a refrigerant. If there are no special R-134a "NON-CFC" tags on A/C system components or lines, system uses R-12. R-134a systems can also be identified by brown-colored O-rings (HNBR) used throughout A/C system.

CAUTION

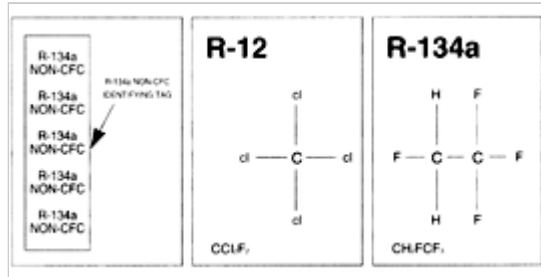
- Do not add R-12 refrigerant to an A/C system that requires use of R-134a refrigerant. Do not add R-134a refrigerant to an A/C system that requires use of R-12 refrigerant. These two types of refrigerant should never be mixed. Doing so may cause damage to A/C system.
- R-12 and R-134a components are not interchangeable. Do not replace components from an

R-134a system with components for an R-12 system and vice versa. Mixing components from these two types of systems may cause component failure and damage to A/C system

- R-134a system components

The major components of R-134a A/C system are similar to those used previously on R-12 systems. R-12 and R-134a components are similar in design and function. As a result, all Removal and Installation procedures outlined for R-12 components can be used for R-134a components.

(Refer to operating instruction of your refrigerant recovery/recycling/charging station for proper procedures.)





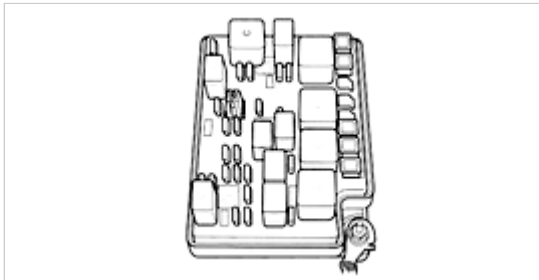
INSPECTION

Blower motor does not operate

1. Check "BLOWER fuse/Relay"
 - (1) Check "BLOWER" fuse.

Fuse	Amperage	Location
BLOWER	30A	Engine compartment fuse box

- (2) If fuse is open check for a short-circuit in wiring harness before replacing "BLOWER" fuse.
- (3) If fuse is OK proceed to inspection.



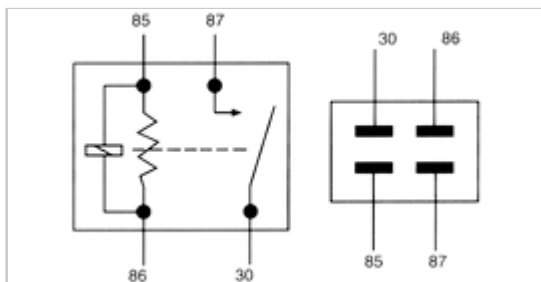
Blower relay

1. Disconnect blower relay.
2. Check continuity between terminals of relay.

Terminals	Continuity
85-86	Yes
87-30	No

3. If not as specified, replace relay.
4. If correct go to next step.
5. Apply 12V to terminal 85 and ground terminal 86.
6. Check for continuity between terminals 87 and 30.

Terminals	Continuity
87-30	Yes

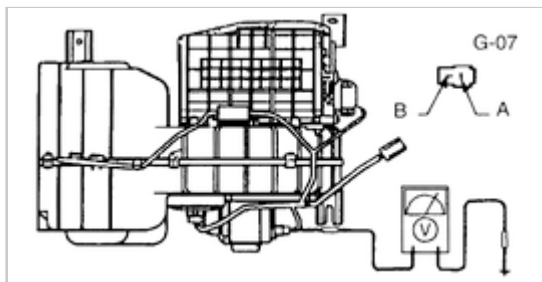


7. If not as specified, replace relay.
8. If correct, go to step 2.

Check voltage at blower motor.

1. Turn ignition switch ON.
2. Turn blower switch to OFF.
3. Measure voltage at following pin of blower motor connector G-07.

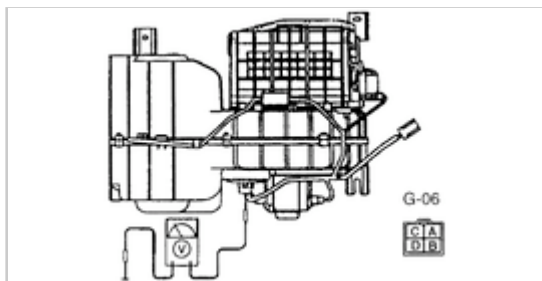
Pin	Voltage	Action
B (R)	12V	Go to step 3
	0V	Repair or replace blower motor and wiring harness. (fuse box-blower motor)



Check voltage at blower motor resistor assembly

1. Turn ignition switch ON.
2. Turn blower switch OFF and verify that A/C switch is OFF.
3. Measure voltage at following pins of resistor assembly connector G-06.

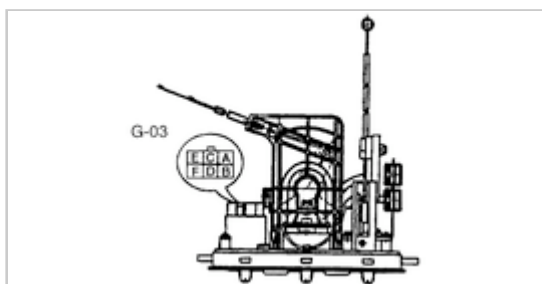
Pin	Voltage	Action
B (R/L)	12V	Proceed to pin A (R/G)
	0V	Repair R/L wire
A (R/G)	12V	Proceed to pin C (G)
	0V	Replace resister assembly
C (G)	12V	Proceed to pin D (BR)
	0V	Replace resistor assembly
D (BR)	12V	Go to Step 4
	0V	Replace resistor assembly



Check voltage at blower switch

1. Turn ignition switch ON.
2. Turn blower switch to OFF.
3. Measure voltage at following pins of blower switch connector G-03.

Pin	Voltage	Action
F (R/L)	12V	Proceed to pin E (R/G)
	0V	Repair R/L wire
E (R/G)	12V	Proceed to pin D (G)
	0V	Repair R/G wires
D (G)	12V	Proceed to pin B (BR)
	0V	Repair G wire
R (BR)	12V	Proceed to step 5
	0V	Repair BR wire



Check ground at blower switch

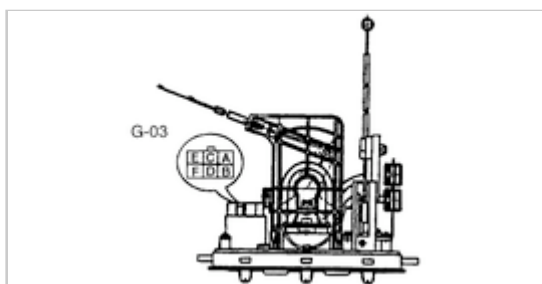
1. Turn blower switch OFF.
2. Use ohmmeter to check continuity from ground to indicated pin of blower switch connector G-03.

Pin	Voltage	Action
A (B)	0	Proceed to Step 6
	OPEN	Repair B wire

Check voltage at blower switch

1. Turn ignition switch ON.
2. Turn blower switch to indicated position and A/C switch to OFF.
3. Measure voltage between battery voltage (pin B of G-07) and following pins of blower switch connector G-02.

Pin	Blower Switch Position	Voltage	Action
B (BR)	LO	12V	Proceed to pin D (G)
		0V	Replace blower switch
D (G)	M1	12V	Proceed to pin E (R/G)
		0V	Replace blower switch
E (R/G)	M2	12V	Proceed to pin F (R/L)
		0V	Replace blower switch
F (R/L)	HI	12V	Proceed to inspection
		0V	Replace blower switch



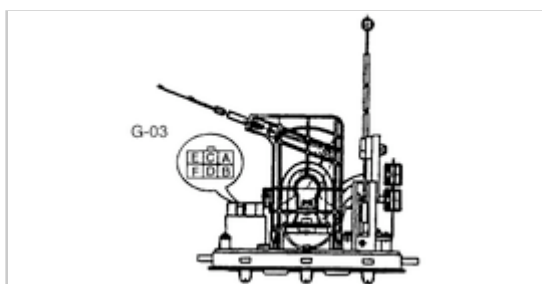
Blower switch

1. Check continuity between terminal of blower switch.

Switch position	Terminal					
	E	C	A	F	D	B
OFF						
LO		O	O			O
M1 (ML)		O	O		O	
M2 (MH)	O	O	O			
HI		O	O	O		

O—O : Indicates continuity

2. If not as specified, replace blower switch.



Insufficient cooling, No cooling, Intermittent cooling

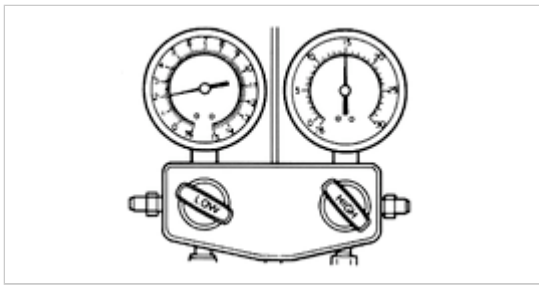
1. Checking refrigerant charge.
 - (1) Run engine at a fast idle.
 - (2) Operate air conditioner at maximum cooling for a few minutes, go to Step 2.
2. Checking refrigerant pressure.
 - (1) Connect A/C manifold gauge set.
 - (2) Operate engine at 2,000 rpm and set air conditioner to maximum cooling.
 - (3) Measure low-and high-pressure sides.

Normal pressure

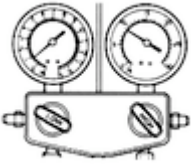
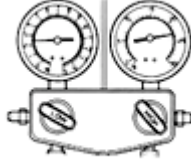
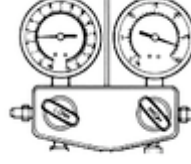
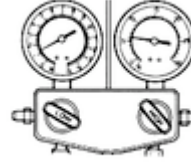
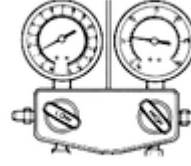
Low-pressure side : 20~41 psi (137~284 kPa, 1.40~2.90 kg/cm²)

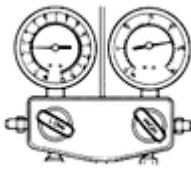
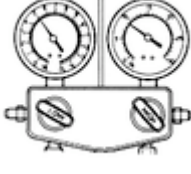
High-pressure side : 185~263 psi (1,275~1,814 kPa, 12.0~18.5 kg/cm²)

- (4) If pressures are not as specified, refer to following chart and check system.



Troubleshooting

Measured pressure	Possible causes
	<p>Low-side: 8.5~14.2 psi (98.9~98.1kPa, 0.59~1kg/cm²)</p> <p>High-side: 119~136 psi (824~942kPa, 8.40~9.60kg/cm²)</p> <p>Insufficient refrigerant</p>
	<p>Low-side: Above 34.1 psi (235kPa, 2.40kg/cm²)</p> <p>High-side: Above 327 psi (2,256kPa, 23.0kg/cm²)</p> <p>Excessive refrigerant or insufficient condenser cooling</p>
	<p>Low-side: Above 34.1 psi (235kPa, 2.40kg/cm²)</p> <p>High-side: Above 377 psi (2,600kPa, 26.5kg/cm²)</p> <p>Air in system</p>
	<p>Low-side: Below 20 psi (137kPa, 1.40kg/cm²)</p> <p>High-side: Below 88 psi (608kPa, 6.20kg/cm²)</p> <p>Moisture in system</p>
	<p>Low-side: Below 20 psi (137kPa, 1.40kg/cm²)</p> <p>High-side: Below 88 psi (608kPa, 6.20kg/cm²)</p> <p>No refrigerant circulation</p>

	<p>Low-side: 35.6 psi (245kPa, 2.50kg/cm²) High-side: 307~326 psi (2,119~2,247kPa, 21.6~22.9kg/cm²)</p>	<p>Expansion valve stuck open</p>
	<p>Low-side: 57~85 psi (392~608kPa, 4.0~6.20kg/cm²) High-side: 107~152 psi (736~1,050kPa, 7.50~10.7kg/cm²)</p>	<p>Faulty compressor</p>

Insufficient refrigerant

Measured pressure

Low-pressure side : 8.5~14.2 psi (58.9~98.1 kPa, 0.6~1.0 kg/cm²)

High-pressure side : 119~136 psi (824~942 kPa, 8.4~9.6 kg/cm²)

1. Step 1

- (1) Check for oil stains on pipes, hoses and other parts.
- (2) If oil staining is found at connection of pipes or hoses, replace O-ring ; then, evacuate, charge, and test system.
Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
- (3) If oil staining is not found, go to Step 2.

2. Step 2

- (1) Check for leakage from following connection with a gas leak tester.
 - A. Inlet and outlet of condenser
 - B. Inlet and outlet of receiver/drier
 - C. Inlet and outlet of compressor
 - D. Inlet and outlet of cooling unit
- (2) If leakage is evident, go to Step 3.
- (3) If leakage cannot be found, evacuate, charge and test system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.

3. Step 3

- (1) Check tightening torque of connection where leak was detected.
- (2) If connection is loose, tighten connection to specified torque ; then evacuate, charge, and test system.
Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
- (3) If connection is properly tightened, replace O-ring; ten evacuate, charge, and test system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.

Excessive refrigerant or insufficient condenser cooling

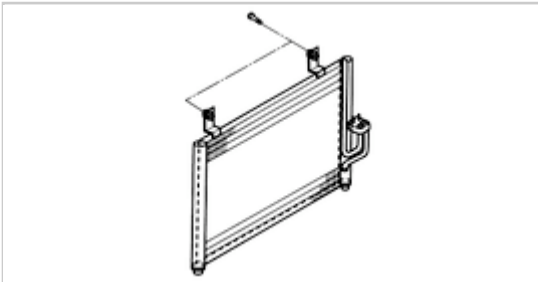
Measured pressure

Low-pressure side : 34.1 psi (235 kPa, 2.40 kg/cm²)

High-pressure side : 327 psi (2,256 kPa, 23.0 kg/cm²)

NOTICE

If condenser fan does not operate when air conditioner is operating, refer to “Condenser Fan Does Not Operate” before proceeding.



1. Step 1

- (1) Check condenser for bent fins or damage.
- (2) If condenser is OK, discharge excess refrigerant.
Refer to operating instructions of your refrigerant recover/recycling/charging station for proper procedures.

CAUTION

Always wear gloves and eye protection when discharge refrigerant.

- (3) Verify that refrigerant pressure is normal.

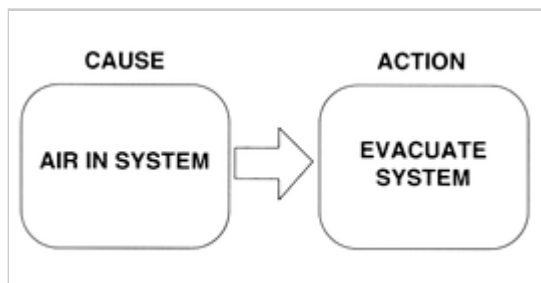
Air in system

Measured pressure

Low-pressure : Above 34.1 psi (235 kPa, 2.40 kg/cm²)

High-pressure : Above 377 psi (2,600 kPa, 26.5 kg/cm²)

- Condition - Insufficient cooling



1. Discharge refrigeration system. Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.
2. Evacuate system to remove all air from it. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
3. Charge system with refrigerant. Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.
4. After charging, measure refrigerant pressure. Refer to “Checking Refrigerant Pressure”.
5. If low-and high-pressure sides air still too high, replace receiver/drier.

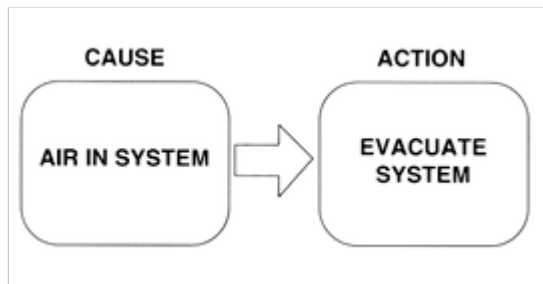
Moisture in system

Measured pressure

Low-pressure : Below 20 psi (137 kPa, 1.40 kg/cm²)

High-pressure : Below 88 psi (608 kPa, 6.20 kg/cm²)

- Condition - Intermittent cooling



1. Discharge refrigeration system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
2. Evacuate system to remove all air and moisture from it. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
3. Charge system with refrigerant. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
4. After charging, measure refrigerant pressure. Refer to "Checking Refrigerant Pressure".
5. If low-and high-pressure sides are still too high, replace receiver/drier.

No refrigerant circulation

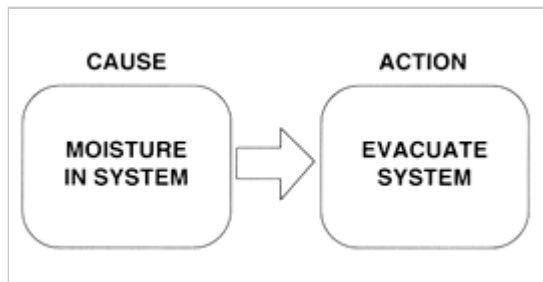
Measurement pressure

Low-pressure : Below 20 psi (137 kPa, 1.40 kg/cm²)

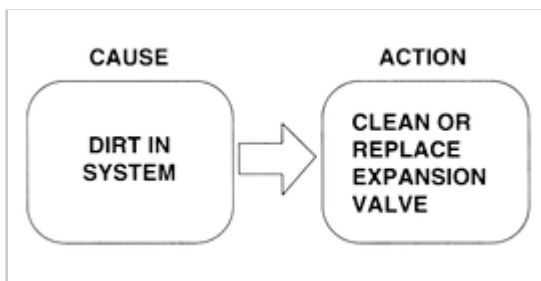
High-pressure : Below 88 psi (608 kPa, 6.20 kg/cm²)

- Condition -

Refrigerant flow obstructed by moisture or dirt, causing freezing or blockage of expansion valve.



1. Step 1
Turn air conditioner OFF for about 10 minutes. Turn air conditioner ON to determine whether blockage is due to moisture or dirt.
 - A. If caused by moisture : System will operate normally after being OFF for 10 minutes. (Ice melts and relieves blockage.).
 - B. If caused by dirt : System remains abnormal after being OFF 10 minutes. Go to Step 2.



2. Step 2
 - (1) Remove expansion valve.
 - (2) Blow out dirt with compressed air.
 - (3) If unable to remove dirt, replace expansion valve.

- (4) Evacuate, charge, and test system. Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.

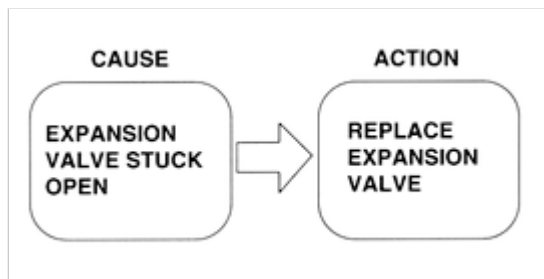
Expansion valve stuck open

Measured pressure

Low-pressure : Above 35.6 psi (2445 kPa, 2.50 kg/cm²)

High-pressure : Below 88 psi (608 kPa, 6.20 kg/cm²)

- Condition - Insufficient cooling



1. Check whether there is frost or heavy dew on suction pipe (between cooling unit compressor).
2. If neither is found, refer to "Excessive Refrigerant or Insufficient Condenser Cooling".
3. If either is found, replace expansion valve.

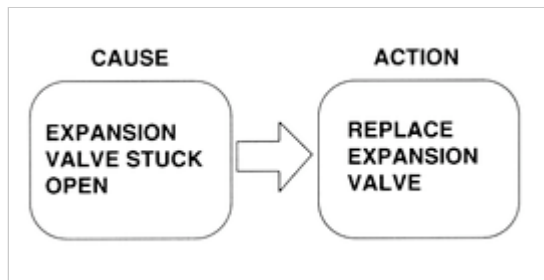
Faulty compressor

Measured pressure

Low-pressure : 57~88 psi (392~608 kPa, 4.0~6.20 kg/cm²)

High-pressure : 107~152 psi (736~1,050 kPa, 7.50~10.7 kg/cm²)

- Condition - No cooling



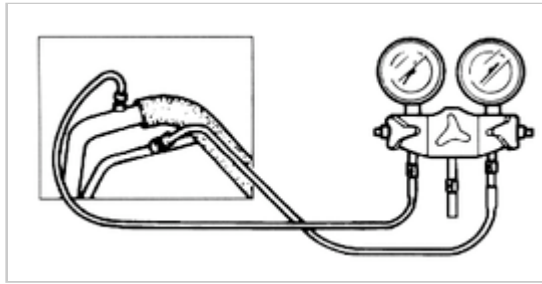
1. Run engine at a fast idle.
2. Verify that A/C compressor clutch is ON when A/C switch and blower switch are ON.
3. If A/C compressor clutch remains OFF, refer to "A/C Compressor Clutch does not Operate".

Manifold gauge set

NOTICE

Fittings for attaching manifold gauge set are on the high-and low-pressure pipes.

1. Close both hand valves of manifold gauge set.
2. Connect the low-pressure hose to high-pressure gauge fitting.
3. Tighten hose nuts by hand only.



Leak test

After evacuating system, refer to operating instructions of your refrigerant recovery/recycling charging station for proper procedures. Check for leaks.

1. Connect a full refrigerant container to the service valve.
2. Open the high-pressure manual valve to charge system with refrigerant gas.
3. When low-pressure gauge reads 14 psi (98 kPa), close high-pressure manual valve.
4. Use a gas leak detector to check the system for leaks. If a leak is found, repair faulty component or connection, then evacuate system again. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.



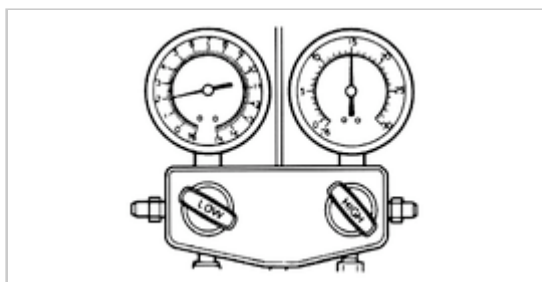
Checking refrigerant pressure

1. Connect manifold gauge set.
2. Operate engine at 2000 rpm and set air conditioner to maximum cooling.
3. Measure low-and high-pressure sides

Normal pressure

Low-pressure side: 20~41 psi (137~285 kPa, 1.40~2.91 kg-cm²)

High-pressure side: 185~263 psi (1.275~1.815 kPa, 13.0~18.5 kg-cm²)





SPECIFICATIONS

Mechanical specifications

Item	Description
	Tightening torque
Blower/Evaporator assembly mounting nuts	70~96lb-in (8~11N·m, 80~110kg-cm)
Compressor mounting bracket bolts (Front side)	23~35lb-in(31~47N·m, 3.2~4.8kg-cm)
Compressor mounting bracket bolts (Left side)	12~17lb-in(16~23N·m 1.6~2.3kg-cm)
Compressor mounting bolts	18~23lb-in(24~31N·m 2.4~3.2kg-cm)
Condenser fan mounting bolts	70~96lb-in(8~11N·m 80~110kg-cm)
Condenser mounting bolts	70~96lb-in(8~11N·m 80~110kg-cm)
Heater unit mounting nuts	70~96lb-in(8~11N·m 82~110kg-cm)
Receiver/Drier mounting bolts	44~52lb-in(5~6N·m 50~60kg-cm)
Receiver/Drier mounting bracket bolts	87~131lb-in(10~15N·m 1.0~1.5kg-cm)

Others specifications

Item		Description
		Specifications
Cooling	Maximum cooling capacity (450m³/h)	4500 ± 10% kcal/h
	Air volume	305 CFM (500CMH)
	Power consumption	252W-12V
Heating	Maximum heating capacity (350m³/h)	4700 ± 10%kcal/h
	Air volume	213CFM (350CMH)
	Power consumption	252W-12V
Compressor	Outlet flow	155.3 cc/rev.
	Number of cylinder	10
	Maximum speed	9000 rpm
	Oil (Capacity)	120 cc
Receiver/Drier	Desiccant used	ZEOLITE
Dual pressure switch	High-pressure control	OFF : 455psi (32kg/cm²) DIFF : 85psi (6kg/cm²)
	Low-pressure control	OFF : 28psi (2kg/cm²) DIFF : 4psi (0.25kg/cm²)
Service ports	High pressure side	M10 × 1.25
	Low pressure side	M9 × 1.0
Air filter	Replacement period	12,000km or 6months
Refrigerant (Charged amount)		R-134a (800 ± 50g)

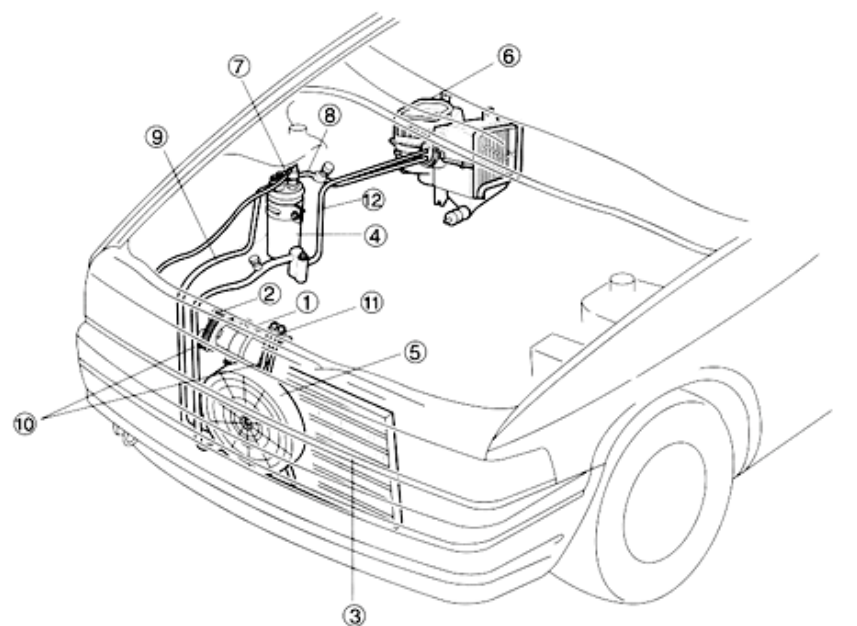


Heating, Ventilation, Air Conditioning

Air Conditioning System



COMPONENT



- (1) Compressor
- (2) Compressor clutch
- (3) Condenser
- (4) Receiver/Drier
- (5) Condenser fan
- (6) Blower & Evaporator unit

- (7) A/C dual pressure switch
- (8) Cooler pipe No.1
- (9) Cooler pipe No.2
- (10) Low-pressure hose
- (11) High-pressure hose
- (12) Suction pipe



Heating,Ventilation, Air Conditioning

Air Conditioning System - Drive Belt

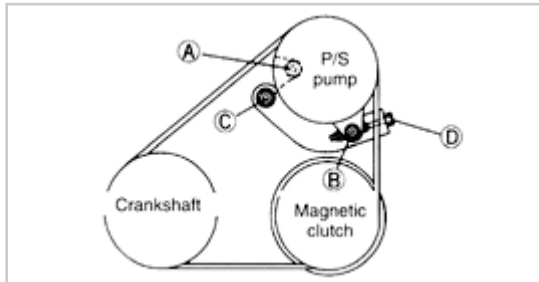


REMOVAL

1. Remove drive belt as follows.

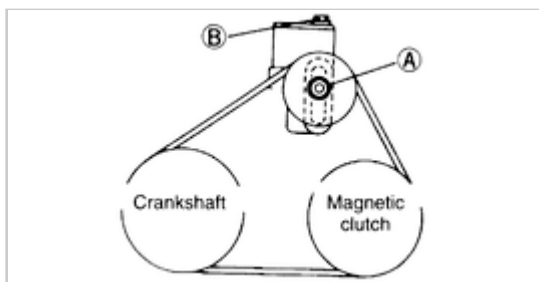
Vehicle with power steering

1. Loosen bolt A.
2. Loosen nut C.
3. Loosen nut B.
4. Loosen bolt D.
5. Remove drive belt.



Vehicle without power steering

1. Loosen nut A.
2. Loosen bolt B.
3. Remove drive belt.



INSTALLATION

Vehicle without power steering

NOTICE

Adjust deflection of drive belt as follows.

Vehicle with power steering

1. Loosen bolt A and nuts B and C.
2. Turn adjusting bolt D and adjust deflection of drive belt to with specification.

Belt	Deflection : When applying moderate pressure 22lb (98N)
New	0.31~0.35in (8~9mm)
Used	0.35~0.39in (9~10mm)

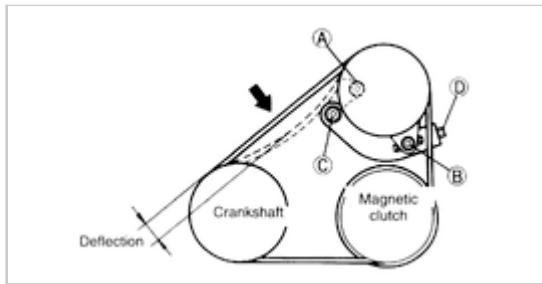
3. Tighten bolt A and nuts B and C.

Tightening torque :

Bolt A : 27~39lb·ft (37~53N·m 3.8~5.4kg·m)

Nut B : 14~19lb·ft (19~25N·m 2.0~2.6kg·m)

Nut C : 24~34lb·ft (32~46N·m 3.3~4.7kg·m)

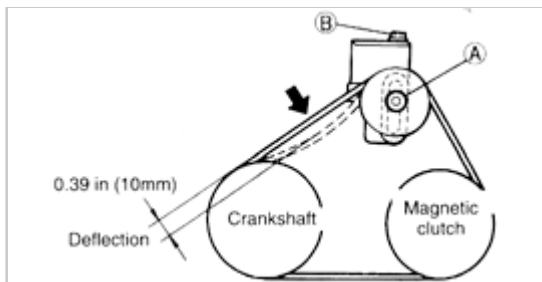


Vehicle without power steering

1. Loosen nut A.
2. Turn adjusting bolt B and adjust deflection of drive belt to within specification.
3. Tighten nut A.

Belt	Deflection : When applying moderate pressure 22lb (98N)
New	0.31~0.35in (8~9mm)
Used	0.35~0.39in (9~10mm)

Tightening torque : Bolt A : 23~25lb·ft (31~34N·m 3.2~3.5kg·m)



ADJUSTMENT

NOTICE

Adjust deflection of drive belt as follows.

VEHICLE WITH POWER STEERING

1. Loosen bolt A and nuts B and C.
2. Turn adjusting bolt D and adjust deflection of drive belt to within specification.

Belt	Deflection: When applying moderate pressure 22 lb (98 N)
New	0.31~0.35 in (8~9 mm)
Used	0.35~0.39 in (9~10 mm)

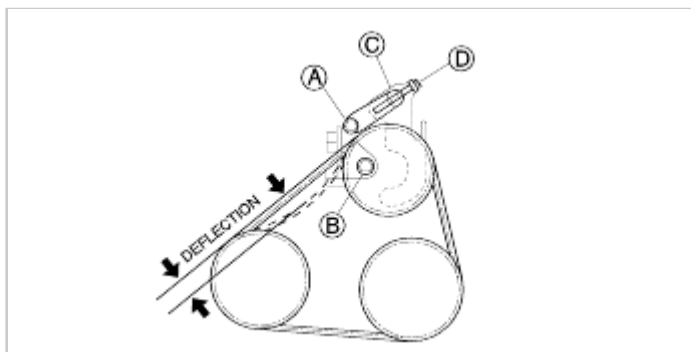
3. Tighten bolt A and nuts B and C.

Tightening torque:

Bolt A: 27~39 lb·ft (37~53 N·m, 3.8~5.4 kg·m)

Nut B: 14~19 lb·ft (19~25 N·m, 2.0~2.6 kg·m)

Nut C: 24~34 lb·ft (32~46 N·m, 3.3~4.7 kg·m)



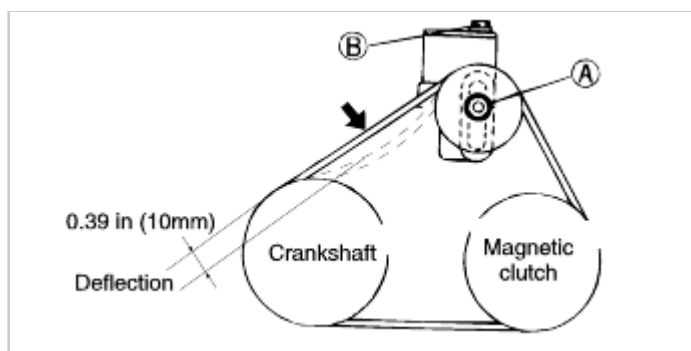
VEHICLE WITHOUT POWER STEERING

1. Loosen nut A.
2. Turn adjusting bolt B and adjust deflection of drive belt to within specification.
3. Tighten nut A.

Belt	Deflection: When applying moderate pressure 22 lb (98 N)
New	0.31~0.35 in (8~9 mm)
Used	0.35~0.39 in (9~10 mm)

Tightening torque:

Bolt A: 23~25 lb·ft (31~34 N·m, 3.2~3.5 kg·m)



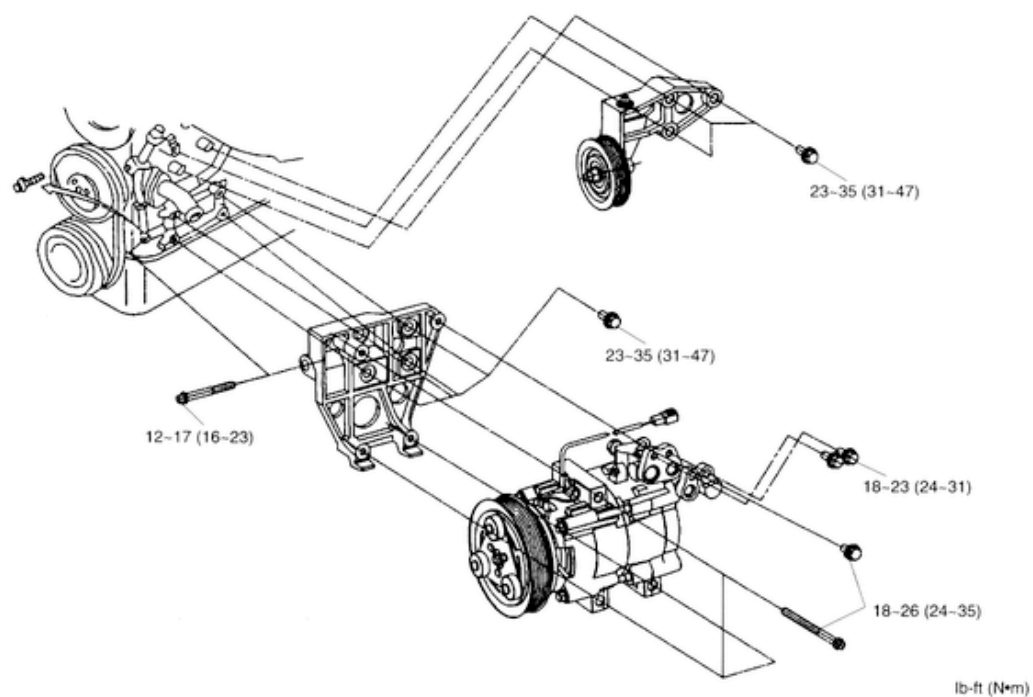


Heating, Ventilation, Air Conditioning

Air Conditioning System - Compressor



COMPONENT





Removal

1. Discharge refrigeration system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.
2. Remove undercover.
3. Remove compressor as shown in figure, referring to removal note.

Installation

1. Install compressor as shown in figure, referring to installation note.
2. Install undercover.
3. Charge refrigeration system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.

NOTICE

- 1) Immediately plug any open fittings to keep moisture out of system.
- 2) Apply clean compressor oil to O-rings before connecting fittings.
- 3) Do not apply compressor oil to fitting nuts.
- 4) Tightening torque :compressor inlet and outlet: 18~23 lb-ft (24~31 N-m, 2.4~3.2 kg-m)
- 5) Adjust belt tension to specification.

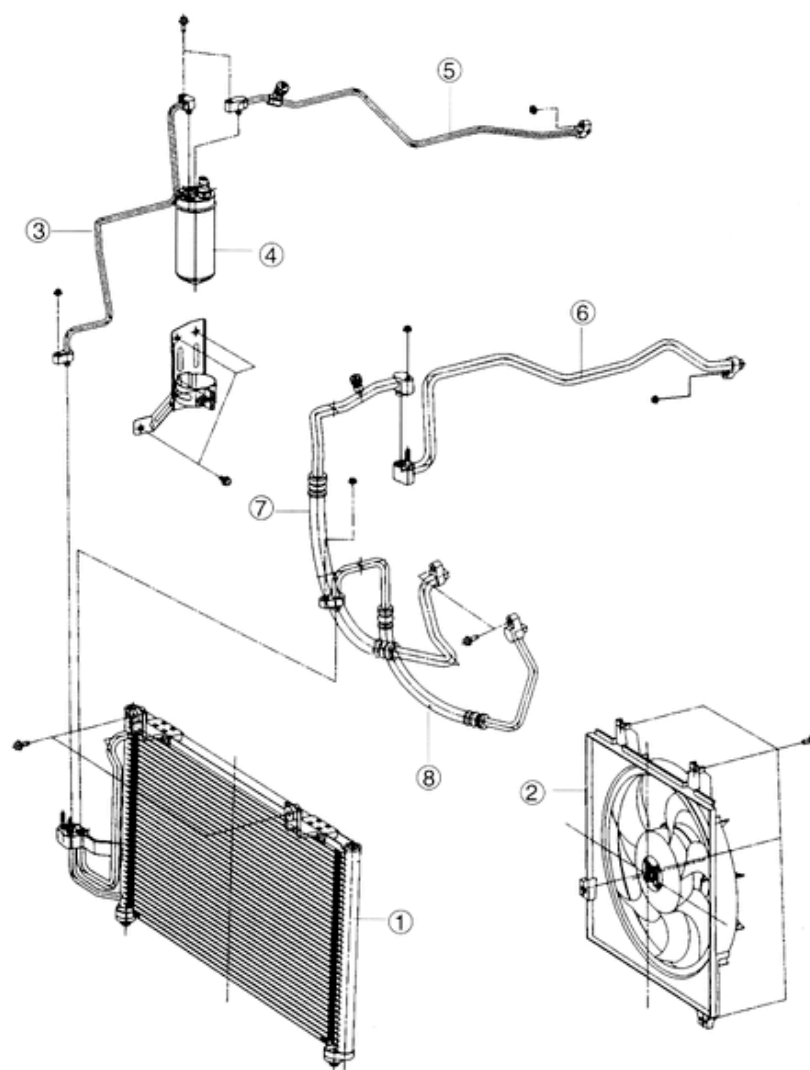


Heating, Ventilation, Air Conditioning

Air Conditioning System - Condenser



COMPONENT



- (1) Condenser
- (2) Condenser fan
- (3) Cooler pipe No.2
- (4) Receiver & Drier

- (5) Cooler pipe No.1
- (6) Suction pipe
- (7) Low-pressure hose
- (8) High-pressure hose



REMOVAL

1. Discharge refrigeration system. (Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.)
2. Remove liquid pipes.
3. Remove condenser as shown in figure.

NOTICE

- Insert protector such as cardboard between condenser and radiator.
- Immediately plug open fittings to keep moisture out of system.

INSTALLATION

1. Install condenser in reverse order of removal.

NOTICE

- Apply clean compressor oil to O-rings before connecting fittings.
- Do not apply compressor oil to fitting nuts.
- Remove protector before installing radiator brackets.
- When installing a new condenser, add compressor oil through high-pressure pipe port of compressor. Compressor oil: 1.22 cu in (20 cc)

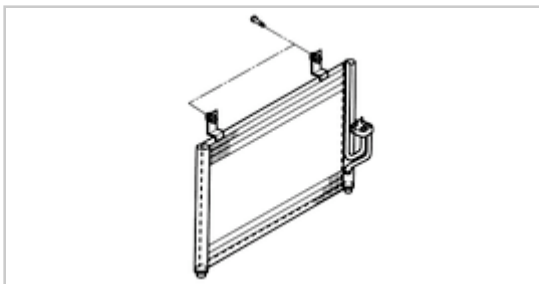
Tightening torque:

Condenser inlet : 87~174 lb·in (9.8 ~19.6 N·m, 1.0~2.0 kg·m)

INSPECTION

Check for following and repair or replace condenser as necessary.

1. Cracks damage, or refrigerant leakage.
2. Bent fins.
3. Distorted or damaged condenser inlet or outlet.





Heating,Ventilation, Air Conditioning

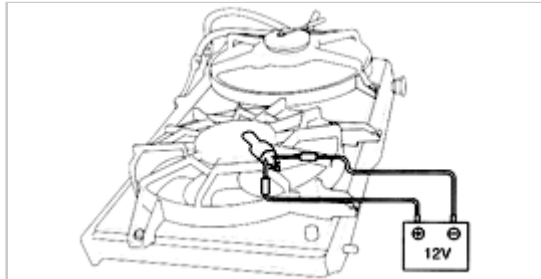
Air Conditioning System - Condenser Fan & Relay



INSPECTION

Check condenser fan operation

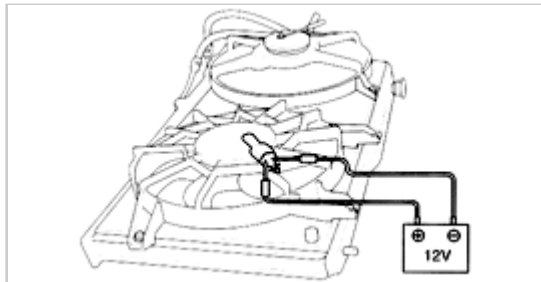
1. Disconnect condenser fan connector.
2. Apply 12V to terminal A (L) and ground terminal B (B) and verify that condenser fan operates.
3. If condenser fan does not operate, replace condenser fan.



4. If condenser fan operates, go to "Measure voltage at condenser fan".

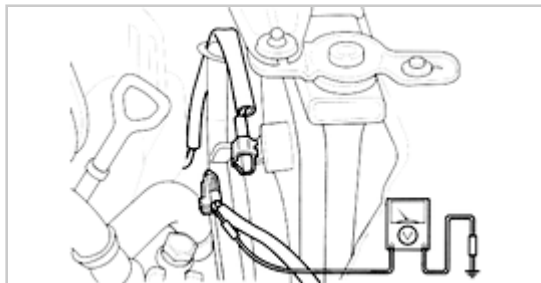
Measure voltage at condenser fan

1. Disconnect condenser fan connector.



2. Run engine at idle.
3. Turn A/C and blower switches ON.
4. Measure voltage at following terminal wire of condenser fan connector.

Wire	Voltage	Action
A (L)	0V	Proceed to inspection
	12V	Replace condenser fan



Condenser fan relay

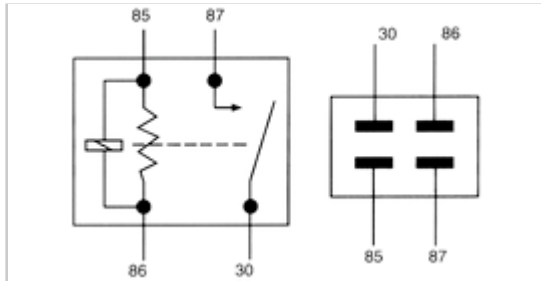
1. Disconnect condenser fan relay from fuse box in engine compartment.
2. Check continuity between terminals as relay.

Terminals	Continuity
-----------	------------

85-86	Yes
87-30	No

3. If not as specified, replace relay.

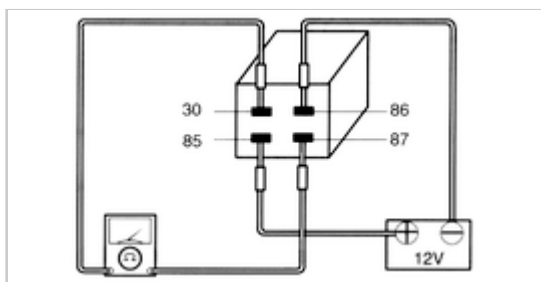
4. If correct, go to next step.



5. Apply 12V to terminal 85 and ground terminal 86.

6. Check for continuity between terminals 87 and 30.

Terminals	Continuity
87-30	Yes

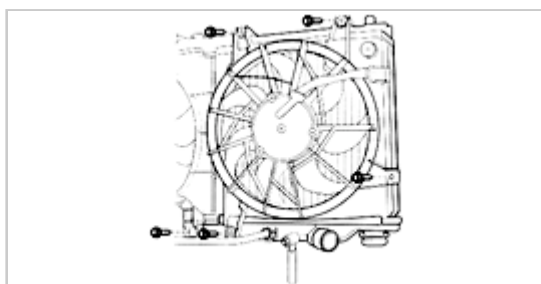


7. If not as specified, replace relay.

REMOVAL

Condenser fan

1. Disconnect condenser fan connector.
2. Remove bolts and remove condenser fan.



INSTALLATION

Condenser fan

Install in reverse order of removal.



Heating, Ventilation, Air Conditioning

Air Conditioning System - Receiver/Drier



REMOVAL

1. Discharge refrigeration system. (Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.)
2. Remove receiver/drier as shown in figure.

NOTICE

Immediately plug open fittings to keep moisture out of system

INSTALLATION

Install receiver/drier in reverse order of removal.

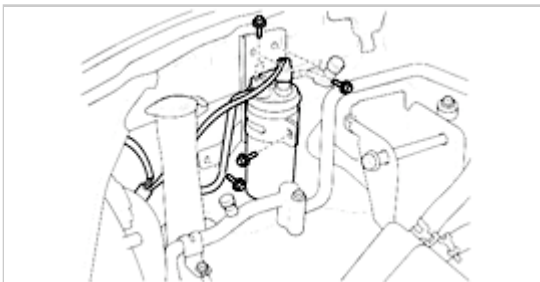
NOTICE

- 1) Apply clean compressor oil to O-rings before connecting fittings.
- 2) Do not apply compressor oil to fitting nuts.
- 3) When installing a new receiver/drier, add compressor oil through high-pressure pipe port of compressor.
Compressor oil: 0.61 cu in (10 cc)

Tightening torque

Receiver/drier inlet: 43~61 lb-in (4.9~6.9 N·m, 50~70 kg-cm)

Receiver/drier outlet: 43~61 lb-in (4.9~6.9 N·m, 50~70 kg-cm)





Heating, Ventilation, Air Conditioning

Air Conditioning System - A/C Control Relay



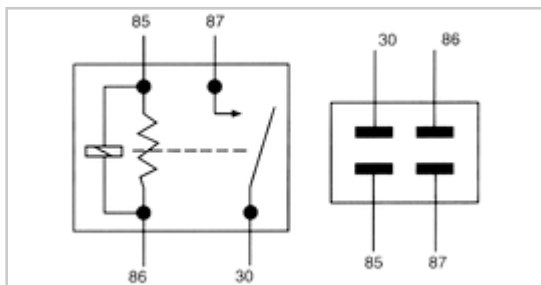
INSPECTION

A/C relay

1. Disconnect A/C relay connector.
2. Check continuity between terminals.

Terminals		Continuity
Tester probe: +	Tester probe: -	
85	86	Yes
85	87	No
85	30	No
87	86	No
87	30	No

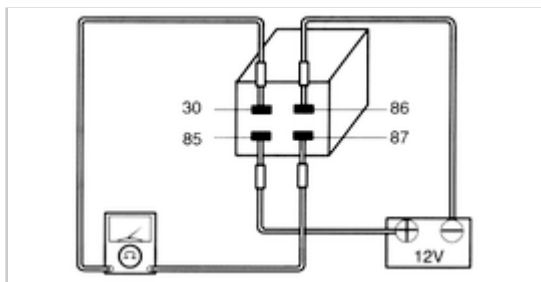
3. If not as specified, replace relay.
4. If correct, go to next step.



5. Apply 12V to terminal 85 and ground terminal 86.
6. Check for continuity between terminals 87 and 30.

Terminals	Continuity
87-30	Yes

7. If not as specified, replace relay.





Heating, Ventilation, Air Conditioning

Air Conditioning System - Refrigerant Line



INSPECTION

Check for leakage at connections by using a gas leak tester.
Refer or replace as necessary.

REPLACEMENT

1. Discharge refrigeration system. Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.
2. Replace faulty pipe or hose.

NOTICE

- 1) Immediately plug open fittings to keep moisture out of system.
- 2) Apply clean compressor oil to O-rings before connecting fittings.
- 3) Do not apply compressor oil to fitting nuts.

3. Evacuate, charge, and test refrigeration system.

DISASSEMBLY

Disassembly A/C compressor clutch as shown in figure.



Heating,Ventilation, Air Conditioning

Air Conditioning System - Dual Pressure Switch

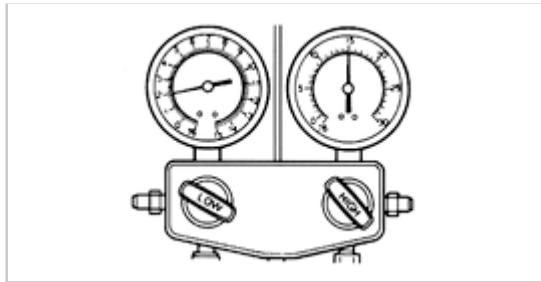


INSPECTION

1. Turn ignition switch OFF.
2. Connect manifold gauge set and measure high-pressure side refrigerant pressure.

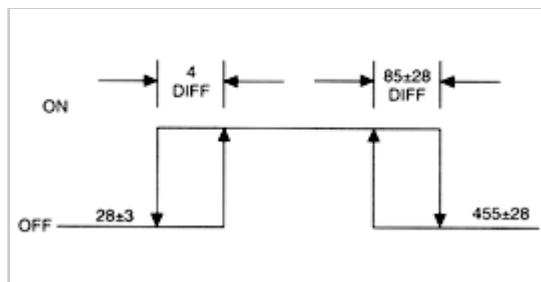
High-pressure side: Above 88 psi (608 kPa)

3. If not as specified, check refrigerant system. (refer to troubleshooting information)
4. If correct, go to next step.

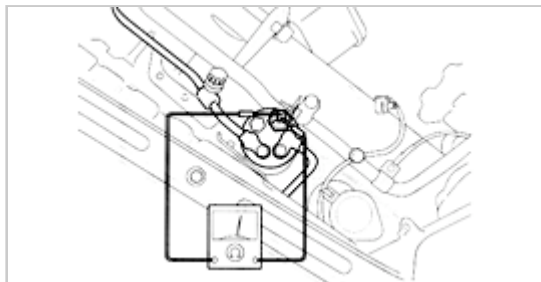


5. Disconnect A/C dual pressure switch connector.
6. Check for continuity of switch.

Terminals	Continuity
A-B	Yes



7. If not as specified, replace switch.





Heating,Ventilation, Air Conditioning

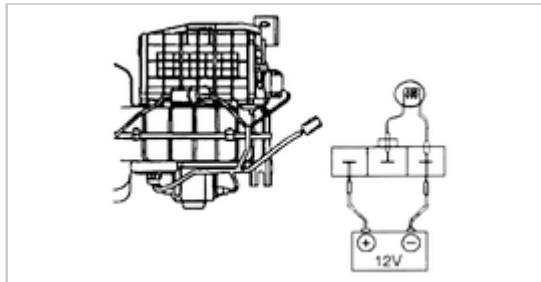
Air Conditioning System - Thermistor



INSPECTION

1. Remove glove box.
2. Run engine at idle.
3. Turn A/C switch OFF and set blower switch to highest position to operate blower fan for a few minutes
4. After a few minutes, turn blower switch OFF and stop engine.
5. Disconnect A/C thermocon connector.
6. Apply 12V to terminal A (G/R) of A/C thermocon and ground terminal C (L). Connect a test light between terminal B (LG/B) and terminal C (L).

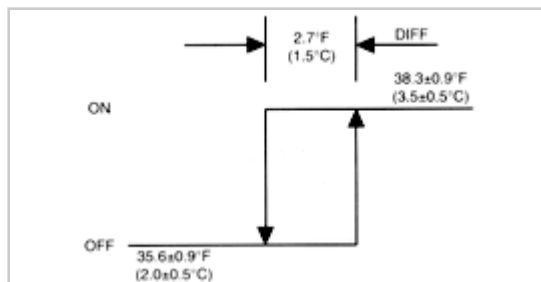
Temperature	Test light	Remark
Above 39.2°F (4°C)	ON	OK
	OFF	NG
Below 34.7°F (1.5°C)	ON	NG
	OFF	OK



7. If not as specified, replace A/C thermocon.

NOTICE

The A/C thermocon contacts will be open if evaporator temperature is below $34.7 \pm 0.9^\circ\text{F}$





Heating, Ventilation, Air Conditioning

Air Conditioning System - Magnetic Clutch



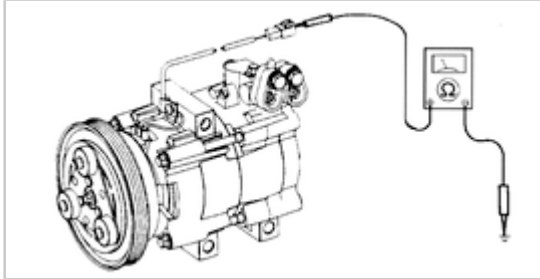
INSPECTION

1. Verify continuity between field coil terminals.

NOTICE

Set ohmmeter to $\times 1,000$ range.

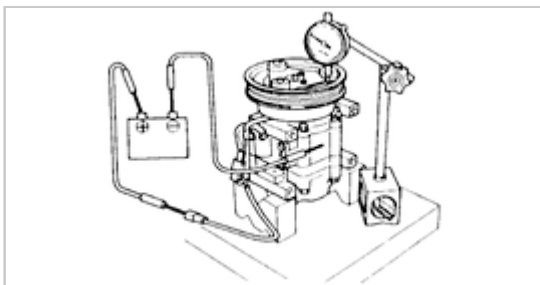
2. If there is no continuity, replace field coil.



ADJUSTMENT

1. Adjust clearance between pressure plate and rotor pulley by selecting and installing proper shim(s).

Clearance: 0.020~0.028 in (0.5~0.7 mm)



REASSEMBLY

Re-assembly A/C compressor clutch in reverse order of removal.

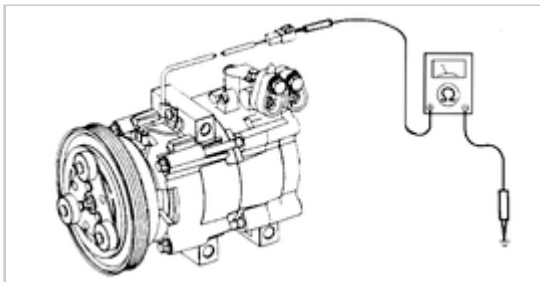
INSPECTION

1. Verify continuity between field coil terminals.

NOTICE

Set ohmmeter to $\times 1,000$ range.

2. If there is no continuity, replace field coil.





Heating, Ventilation, Air Conditioning

Air Conditioning System - Evaporator Unit



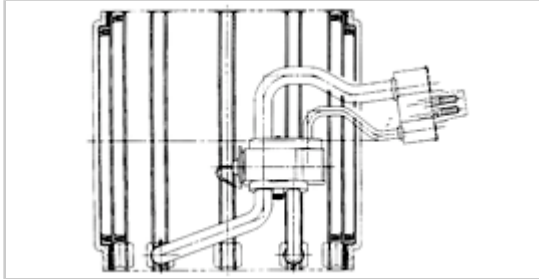
INSPECTION

1. Check evaporator fins for blockage. If fins are clogged, clean them with compressed air.

NOTICE

Never use water to clean evaporator.

2. Check fittings for cracks and other damage. Replace evaporator if necessary.



REPLACEMENT

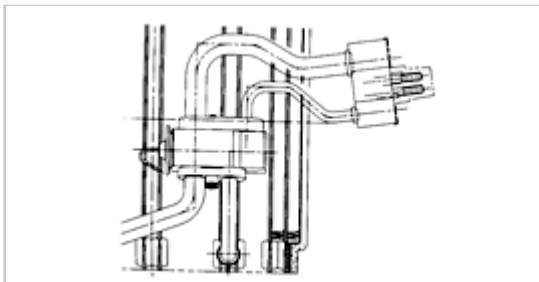
NOTICE

Before replacement of expansion valve, carefully check refrigeration system. Refer to troubleshooting information.

1. Remove cooling unit.
2. Disassemble cooling unit. Remove evaporator and expansion valve as an assembly.
3. Remove expansion valve.
4. Install in reverse order of removal.

NOTICE

Apply clean compressor oil to O-rings before connecting fittings.





Heating,Ventilation, Air Conditioning

Air Conditioning System - Air Conditioning Switch



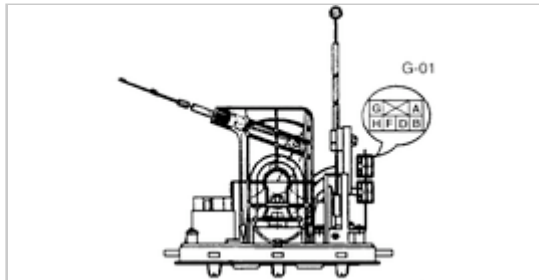
INSPECTION

1. Remove A/C switch and check continuity between terminals.

Switch	Terminal					
	A	B	D	F	G	H
OFF			○ — ○	○ — ○	○ — ○	○ — ○
ON	○ — ○	○ — ○	○ — ○	○ — ○	○ — ○	○ — ○

○ — ○ : Indicates continuity
 ○ —>○ : Indicates one-way continuity (at supply Voltage)

2. If not as specified, replace A/C switch.





Heating, Ventilation, Air Conditioning

Heater - Heater Unit



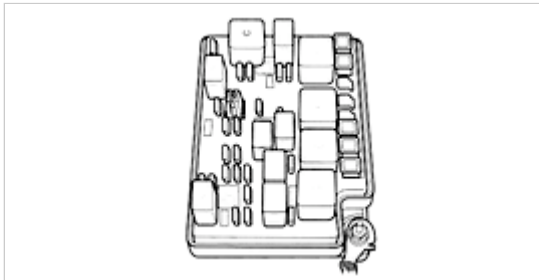
INSPECTION

Blower motor does not operate

1. Check "BLOWER fuse/Relay"
 - (1) Check "BLOWER" fuse.

Fuse	Amperage	Location
BLOWER	30A	Engine compartment fuse box

- (2) If fuse is open check for a short-circuit in wiring harness before replacing "BLOWER" fuse.
- (3) If fuse is OK proceed to inspection.



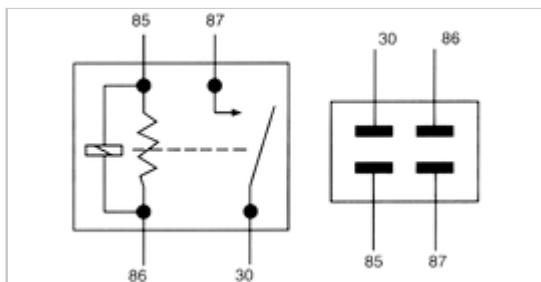
Blower relay

1. Disconnect blower relay.
2. Check continuity between terminals of relay.

Terminals	Continuity
85-86	Yes
87-30	No

3. If not as specified, replace relay.
4. If correct go to next step.
5. Apply 12V to terminal 85 and ground terminal 86.
6. Check for continuity between terminals 87 and 30.

Terminals	Continuity
87-30	Yes

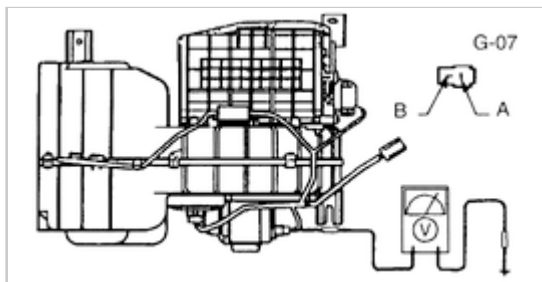


7. If not as specified, replace relay.
8. If correct, go to step 2.

Check voltage at blower motor.

1. Turn ignition switch ON.
2. Turn blower switch to OFF.
3. Measure voltage at following pin of blower motor connector G-07.

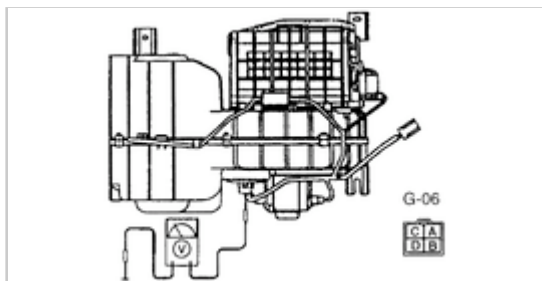
Pin	Voltage	Action
B (R)	12V	Go to step 3
	0V	Repair or replace blower motor and wiring harness. (fuse box-blower motor)



Check voltage at blower motor resistor assembly

1. Turn ignition switch ON.
2. Turn blower switch OFF and verify that A/C switch is OFF.
3. Measure voltage at following pins of resistor assembly connector G-06.

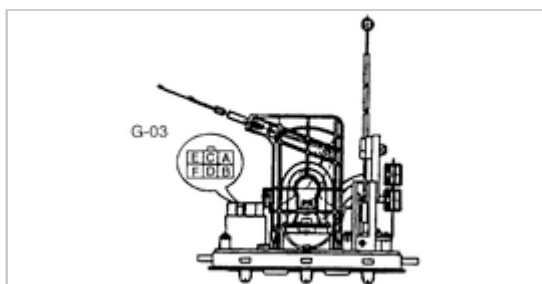
Pin	Voltage	Action
B (R/L)	12V	Proceed to pin A (R/G)
	0V	Repair R/L wire
A (R/G)	12V	Proceed to pin C (G)
	0V	Replace resistor assembly
C (G)	12V	Proceed to pin D (BR)
	0V	Replace resistor assembly
D (BR)	12V	Go to Step 4
	0V	Replace resistor assembly



Check voltage at blower switch

1. Turn ignition switch ON.
2. Turn blower switch to OFF.
3. Measure voltage at following pins of blower switch connector G-03.

Pin	Voltage	Action
F (R/L)	12V	Proceed to pin E (R/G)
	0V	Repair R/L wire
E (R/G)	12V	Proceed to pin D (G)
	0V	Repair R/G wires
D (G)	12V	Proceed to pin B (BR)
	0V	Repair G wire
R (BR)	12V	Proceed to step 5
	0V	Repair BR wire



Check ground at blower switch

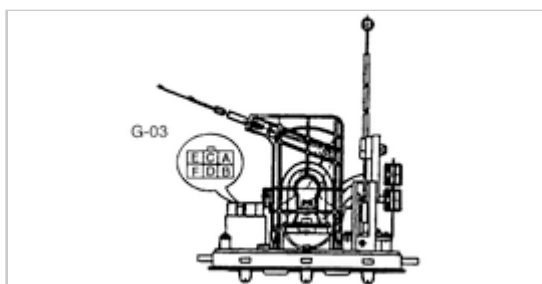
1. Turn blower switch OFF.
2. Use ohmmeter to check continuity from ground to indicated pin of blower switch connector G-03.

Pin	Voltage	Action
A (B)	0	Proceed to Step 6
	OPEN	Repair B wire

Check voltage at blower switch

1. Turn ignition switch ON.
2. Turn blower switch to indicated position and A/C switch to OFF.
3. Measure voltage between battery voltage (pin B of G-07) and following pins of blower switch connector G-02.

Pin	Blower Switch Position	Voltage	Action
B (BR)	LO	12V	Proceed to pin D (G)
		0V	Replace blower switch
D (G)	M1	12V	Proceed to pin E (R/G)
		0V	Replace blower switch
E (R/G)	M2	12V	Proceed to pin F (R/L)
		0V	Replace blower switch
F (R/L)	HI	12V	Proceed to inspection
		0V	Replace blower switch



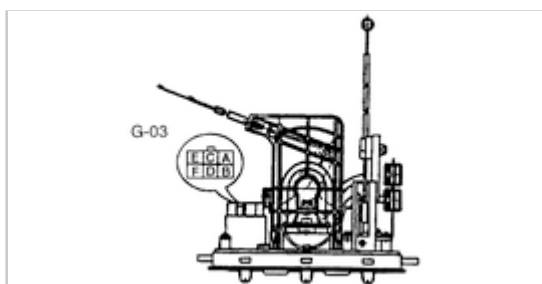
Blower switch

1. Check continuity between terminals of blower switch.

Switch position	Terminal					
	E	C	A	F	D	B
OFF						
LO		O	O			O
M1 (ML)		O	O		O	
M2 (MH)	O	O	O			
HI		O	O	O		

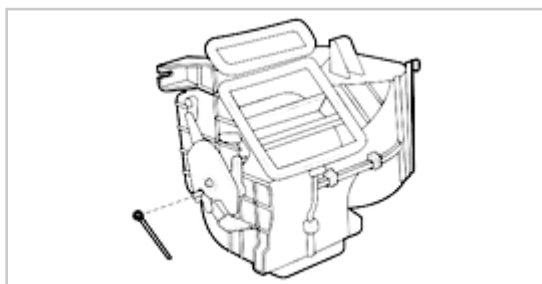
O—O : Indicates continuity

2. If not as specified, replace blower switch.

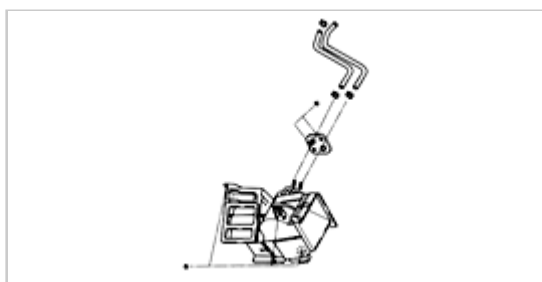


REMOVAL

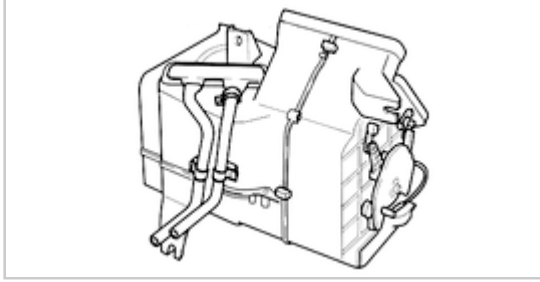
1. Drain engine coolant, (refer to Engine Cooling System.)
2. Remove instrument panel, (refer to Body).
3. Remove control cable.



4. Disconnect heater hose from heater unit.



5. Remove heater unit.



INSTALLATION

Install in reverse order of removal.



Heating,Ventilation, Air Conditioning

Heater - Heater Control Assembly



REMOVAL

1. Disconnect negative battery cable.
2. Remove ash tray.
3. Remove center panel trim.
4. Remove instrument cluster trim.
5. Remove glove box.
6. Remove heater control unit.

INSTALLATION

Install in reverse order of removal.



Heating, Ventilation, Air Conditioning

Blower



Heating, Ventilation, Air Conditioning

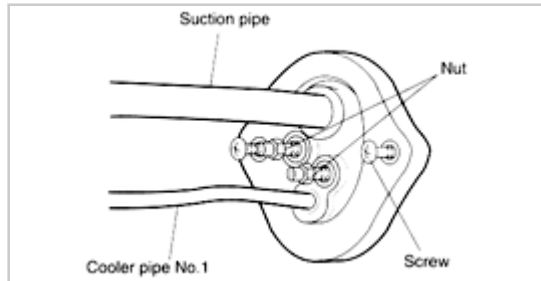
Blower - Blower Unit



REMOVAL

BLOWER/EVAPORATOR

1. Discharge refrigerant from A/C system. (Refer to operating instructions of your refrigerant recovery/recycling /charging station for proper procedures.)

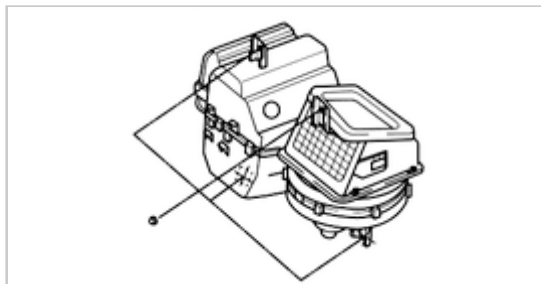


2. Disconnect inlet and outlet pipe from evaporator.

NOTICE

Immediately plug all open fittings to keep moisture out of system.

3. Remove cover and drain hose.
4. Remove instrument panel and disconnect wiring harness connector.
5. Remove blower unit.



INSTALLATION

1. Install in reverse order of removal.
2. Evacuate refrigerant system. Refer to operating instructions of your refrigerant recovery/recycling/ charging station for proper procedures.
3. Charge A/C system. Refer to operating instructions of your refrigerant recovery/recycling/charging station for proper procedures.



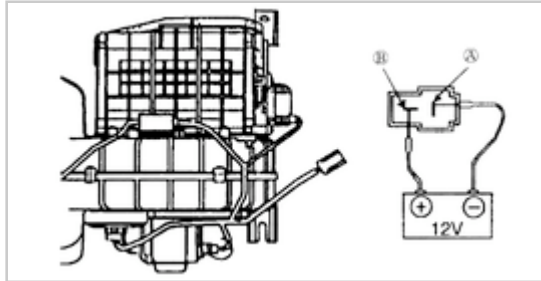
Heating,Ventilation, Air Conditioning

Blower - Blower Motor



INSPECTION

1. Disconnect blower motor connectors.
2. Verify that blower motor runs when connecting 12V to terminal B (R) and grounding terminal A (R/L).
3. If not as specified, replace blower motor.





Heating, Ventilation, Air Conditioning

Blower - Blower Resistor



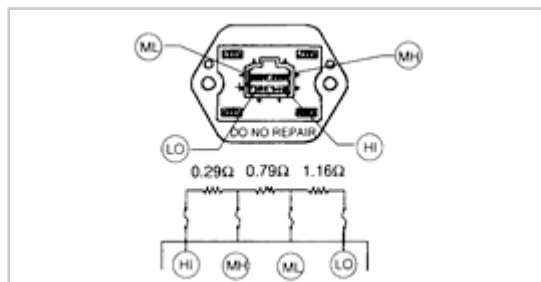
Inspection

1. Disconnect resistor assembly connector. Check continuity between terminals.

Terminals			
B (HI)	A (MH)	C (ML)	D (LO)
O	O		
O		O	
O			O

O—O : Indicates continuity

2. If not as specified, replace resistor assembly.
3. Measure resistance between terminals.



4. If not as specified, replace resistor assembly.



Heating, Ventilation, Air Conditioning

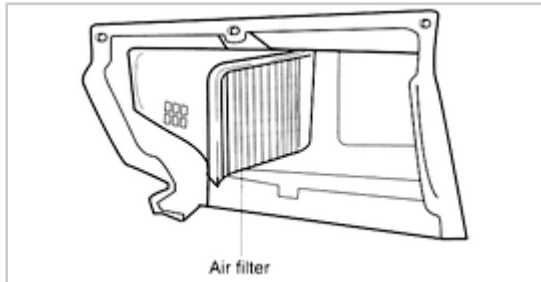
Blower - A/C Air Filter



REMOVAL

Air filter

1. Remove glove box.
2. Remove air filter cvoer by pressing the top end of cover.
3. Remove upper air fliter through holes.
4. Remove lower air filter.



INSTALLATION

Install two air filter in reverse of removal.



Heating, Ventilation, Air Conditioning

Blower - Intake Actuator



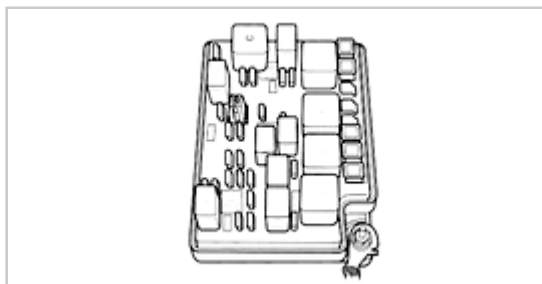
INSPECTION

Check fuses

1. Check "A/C" fuse.

Fuse	Amperage	Location
A/C	10A	Engine compartment fuse box

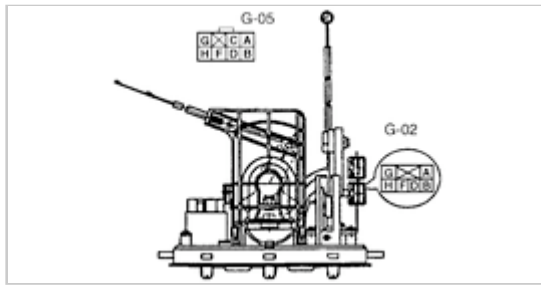
2. If a fuse is open, check for a short-circuit in wiring harness before replacing fuse.
3. If a fuse is OK, go to Step 2.



Check voltage at fresh/recirculation actuator

1. Turn the ignition switch to ON.
2. Set fresh/recirculation (FRE/REC) switch (i.e. FRE/REC actuator position) to position indicated.
3. Measure voltage at following pins in FRE/REC circuit (do not disconnect connector).
4. If FRE/REC actuator does not work after following check, replace FRE/REC actuator.

Pin/Connector	F/R Switch (or actuator) Position	Voltage	Action
D(P) G-02, power	FRE OR REC	12V	Check pin B (PG-05)
		0V	Repair P wire
B(P) G-05, power	FRE OR REC	12V	Check pin H(L/R, G-05)
		0V	Repair P wire
H (L/R) G-05, REC	FRE	12V	Check pin G (L, G-02)
		0V	Inspect FRE/REC actuator and replace actuator as necessary.
G (L) G-02, REC	FRE	12V	Check pin D (G/W, G-05)
		0V	Repair L wire
D(G/W) G-05, FRE	REC	12V	Check pin H (G-G-02)
		0V	Repair G/W wire
H(G) G-02, FRE	REC	12V	
		0V	Repair G wire.



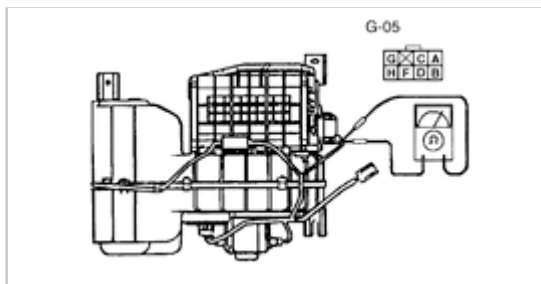
Fresh/Recirculation actuator

1. Check continuity between terminals of actuator.

Terminals		
B	D	H
O	O	O

O—O : Indicates continuity

2. If not as specified, replace actuator.
3. Proceed to "Check ground at fresh/recirculation"



Check ground at fresh/recirculation switch

1. Turn ignition switch to OFF.
2. Disconnect G-02.
3. Use ohmmeter to check continuity between ground and indicated pin of Fresh/Recirculation Switch C282.

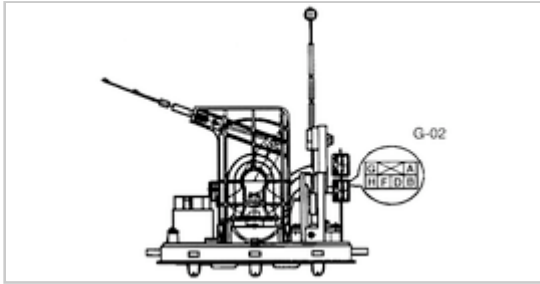
Pin	Resistance	Action
A	0	Go to Check voltage at fresh/recirculation switch
(B)	OPEN	Repair B wire

Check voltage at fresh/recirculation switch

1. Turn ignition switch to ON.
2. Set Fresh/Recirculation (F/R) switch to position indicated.
3. Measure voltage between battery voltage (pin D of G-02) and following pins of fresh/recirculation switch connector G-02.

Pin	F/R Switch Position	Voltage	Action
H (G)	FRE	12V	Check pin G(L)
		0V	Replace fresh/recirculation switch

G (L)	REC	12V	Proceed to inspection
		0V	Replce fresh/recirculation switch



Fresh/Recirculation switch

1. Check continuity between pins of switch connector.

Pin	Terminal				
	A	B	D	G	H
REC	○ — ○				
	○ —			○	
	○ —		○		
FRE	○ — ○				
	○ —				○
	○ —		○		

○—○ : Indicates continuity

2. If not as specified, replace switch.

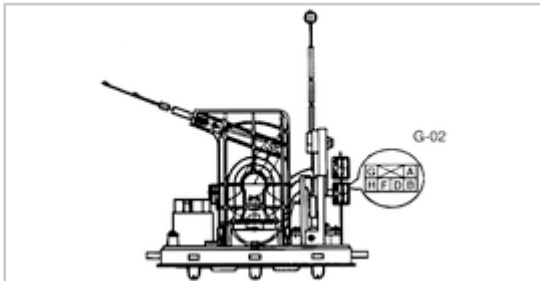
Inspection

1. Remove intake/recirculation switch and check continuity between terminals (G-02).

Switch	Terminal				
	A	B	G	D	H
Recirculation	○ — ○				
	○ —		○		
	○ —			○	
Fresh	○ — ○				
	○ —				○
	○ —			○	

○—○ : Indicates continuity

2. If not as specified, replace fresh/recirculation switch.





Heating, Ventilation, Air Conditioning

Blower - Blower Speed Controller



Inspection

1. Check continuity between terminals of blower switch connector G-03.

Switch	Terminal					
	A	B	C	D	E	F
OFF						
LO	○	○	○			
M1	○		○	○		
M2	○		○		○	
HI	○		○			○

○—○ : Indicates continuity

2. If not as specified, replace blower switch.

