

SPORTAGE(AL) > 1998 > G 2.0 DOHC > Heating,Ventilation, Air Conditioning

Heating,Ventilation, Air Conditioning > General Information > Description and Operation

GENERAL DESCRIPTION

AIR CONDITIONING (A / C) SYSTEM

The A / C system removes heat from the passenger compartment to lower the temperature. Using engine power, the compressor compresses gaseous refrigerant into high temperature / high pressure gas. It then pumps this gas into a condenser unit built onto the vehicle's radiator. The condenser cools the gas, changing it into high pressure / low temperature liquid refrigerant. The liquid then goes to the receiver / drier which first removes any liquid water and then sends the liquid to an evaporator in the heater unit, inside the passenger compartment. The evaporator then uses passenger compartment temperature to turn the liquid back into a gas, extracting heat from the passenger compartment. The gas is then sent back to the compressor, and the cycle begins again.

A / C RELAY

The A / C relay is an electrical switching box that closes the circuit to the condenser fan. It is a replaceable item.

BLOWER

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

COMPRESSOR ASSEMBLY

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

COMPRESSOR CLUTCH

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

CONDENSER

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

CONDENSER FAN

The condenser fan improves the air flow through the condenser. Thus, the condenser will still have a high volume of air flowing through it even if the vehicle is standing still. It is powered by an electric motor connected to the air conditioner control switch.

CUT RELAY

The cut relay is in the passenger compartment. If the engine coolant exceeds a certain temperature, the engine control module (ECM) sends a signal triggering the cut relay, shutting off the A / C system. It is found in the blower evaporator assembly. It is a replaceable item.

EVAPORATOR ASSEMBLY

The blower / evaporator assembly houses the blower fan, the blower motor, and the cut relay air conditioner system. It consists of the evaporator core and the 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 the core by the heater blower motor. This cools the air, which is then directed to the passengers through air ducts. As the air is cooled, moisture in the air condenses on the core and is drained off. The result is cold, dry air. The evaporator core is a serviceable, replaceable item.

EXPANSION VALVE

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

HEATER SYSTEM

Dehumidified air is reheated as it passes through the heater core in the heater unit. The heater is warmed by the engine coolant passing through the tubes of the heater core. Heat is transferred to the core fins and passed off to the air flowing past the fins. The position of the air temperature valve in the air conditioning module determines how much of the total airflow is permitted to pass through the heater. This determines the warmth of the overall air flow that is sent into the passenger compartment.

HOSES AND LINES

Hoses and lines carry the refrigerant between the major components of the 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 the front left corner of the engine compartment. It receives liquid refrigerant from the condenser, removes any water in it, and then sends the refrigerant to the evaporator.

SERVICE PORTS

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

Heating, Ventilation, Air Conditioning > General Information > Troubleshooting

DIAGNOSIS

Problem	Possible Cause	Action
A / C does not cool the air	No refrigerant in the system	Recharge with R-134A. Check for leaks in system
	Drive belt failure	Replace drive belt
	Compressor clutch failed to engage	Check / repair / replace clutch
	Blower motor failure	Check / repair / replace motor
A / C system does not operate	10 amp rear wiper fuse has opened	Check / replace fuse; Check for over—load
	Engine overheating	Check cooling system
	Cut relay failed "ON"	Replace cut relay
	ECM malfunction	Replace ECM
	A/C system pressure too low	Check / replace expansion valve
	A/C system pressure too high	Check / replace compressor
	Moisture/debris in the refrigerant	Discharge / change system; Flush system
Water in the passenger compartment	Drain hose plugged or lost	Check / replace drain hose; replace water sensor
Compressor noise	Loose mounting bolts	Tighten bolts
	Loose clutch	Check / replace clutch
	Low oil level in system	Check level / recharge if needed
	30 amp ADD fuse has opened	Check / replace fuse; Check for over—load

A / C low on cooling	Low refrigerant level	Recharge with R-134A
	Refrigerant level too high	Discharge / recharge the system
	Drive belt loose	Check / tighten drive belt
	Condenser failure	Check / replace condenser
	Condenser fan motor failure	Check / replace fan motor
	Faulty ambient temperature sensor	Check / replace sensor
A / C intermittently shuts off	Faulty cut relay	Check / replace relay
	Faulty engine thermostat	Check / replace thermostat
	Faulty ECM unit	Check / replace ECM
	Engine overheating; Check refrigerant level	Check cooling system
Engine light is "ON"		Inspect ECM and repair as indicated

TROUBLE CODES

There are two engine trouble codes that are A/C system related.

Code Number	unit	Condition
46	Air conditioner cut relay	Open or short circuit
57	Air conditioner relay	Short circuit

Heating, Ventilation, Air Conditioning > General Information > Repair procedures

REFRIGERANT LEAK TEST

1. Connect the recovery/recycling/charging (RRC) station to the A/C system.
2. Follow RRC station operating instructions for charging the A/C system.
3. Charge the system until the low pressure gauge reads 14 psi (98 kPa).
4. Check for leakage using an electronic leak tester.
Follow tester operating instructions.

VACUUM TEST

1. Connect the recovery/recycling/charging (RRC) station to the A/C system.
2. Follow RRC station operating instructions for evacuating the A/C system.
3. Check if low pressure gauge indicates loss of vacuum.



Heating, Ventilation, Air Conditioning > General Information > Specifications

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATION	
A / C Cut Relay Mounting Screw	62 lb-in (7 N·m)
A / C Relay Mounting Screw	62 lb-in (7 N·m)
Belt Tensioner Pulley Lock Nut	24 lb-ft (32 N·m)
Blower Housing Mounting Nut and Bolt	80 lb-in (9 N·m)
Blower Inlet Duct Mounting Screw	62 lb-in (7 N·m)
Blower Motor Mounting Screw	62 lb-in (7 N·m)
Blower Motor Resistor Mounting Screw	62 lb-in (7 N·m)
Center Stay Mounting Screw	80 lb-in (9 N·m)
Compressor Line Bolt	18 lb-ft (24 N·m)
Compressor Mounting Bolt	18 lb-ft (24 N·m)
Condenser Pan Mounting Bolt	80 lb-in (9 N·m)
Condenser Lower Refrigerant Hose Flare Nut	10 lb-ft (13 N·m)
Condenser Retaining Nut	80 lb-in (9 N·m)
Condenser Upper Refrigerant Hose Flare Nut	16 lb-ft (22 N·m)
Engine Undercover Bolt	71 lb-in (8 N·m)
Glove Box Mounting Screw	80 lb-in (9 N·m)
Heater Core Mounting Screw	53 lb-in (6 N·m)
Heater Unit Retaining Nut	80 lb-in (9 N·m)
Instrument Panel Cover Screw	80 lb-in (9 N·m)
Receiver / Drier Flare Nut	10 lb-ft (13 N·m)
Receiver / Drier Mounting Nut	80 lb-in (9 N·m)
Refrigerant Line to-Bulkhead Connector Mounting Bolt	18 lb-ft (24 N·m)
Refrigerant Line to-Flexible Hose Connection	24 lb-ft (32 N·m)
Cover Plate Mounting Nut	80 lb-in (9 N·m)

Wiring Harness Mounting Screw	53 lb-in (6 N·m)
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GENERAL SPECIFICATION				
Air Conditioning	Additional	Dual Pressure Switch	High-Pressure Control	OFF : 32 kg/cm ² G
			Differential	5 kg/cm ² G
			Low-Pressure Control	OFF : 2.0 kg/cm ² G
			Differential	0.25 kg/cm ² G
	Compressor	Type	Swash-panel	
		Number of Vanes	5 cylinder	
		Refrigerant Type	R-134a	
		Lubricating Oil	ZXL 200 PG	
		Clutch	Magnetic	
	Condenser	Type	Aluminum fin and tube	
	Evaporator	Type	Laminated	
		Expansion Valve	External equalizing plug type	
	Receiver / Drier	Desiccant Used	ZELITE (XH-9)	
Heater	Heater Core	Type	Aluminum fin and tube (resin tank)	
	Water Temperature sensor	CELO		
Ventilation	Air Volume	87-175 CFM(150-300 m ³ /h)		
	Blower Type	Cylinder fan		
	Power Consumption	45 wattw (12 volts)		

Heating,Ventilation, Air Conditioning > Air conditioning System > Troubleshooting

A / C Cut Relay Open or Short Circuit

Engine trouble code 46

Check For	Steps	Result	Action
1) Faulty connector	· Check connection at relay.	Faulty	Repair or replace
		Good	Go to check 2
2) Open circuit in relay coil	1. Disconnect cut relay connector.	No continuity	Replace cut relay
	2. Check for continuity between green wire terminal and B / G wire terminal on relay.	Continuity	Go to check 3
3) Closed circuit in relay switch	· Check for continuity between blue (L) wire terminal and R / W wire terminal.	Continuity	Replace relay
		No continuity	Go to check 4
	1. Turn ignition key to	No voltage	Repair/replace harness.

4) Open circuit from main relay	“ON.”		
	2. Check for voltage at green wire on connector.	Voltage	Go to check 5
5) Open circuit to ECM	1. Disconnect ECM harness.	No voltage	Repair harness.
	2. Turn ignition key to “ON.”	Voltage	Replace ECM
	3. Check for voltage at terminal 32 (G / B wire) on ECM harness connector.		

A / C Relay Input Signal Malfunction

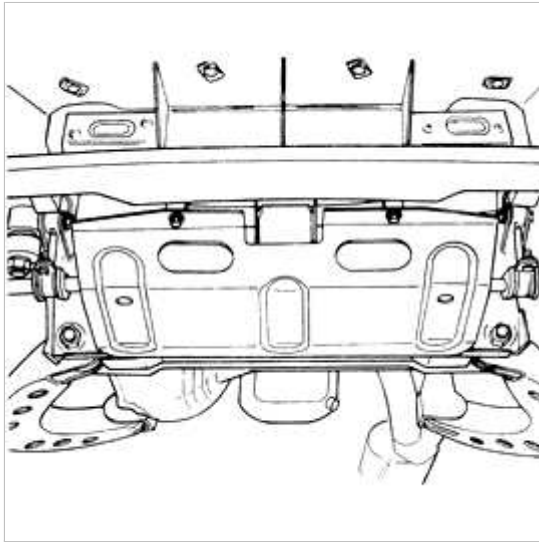
Engine trouble code 57

Check For	Steps	Result	Action
1) Faulty connector	·Check connector at relay.	Faulty	Repair or replace
		Good	Go to check 2
2) Fault in A / C pressure switch or thermostat	1. Turn engine off and disconnect ECM connector.	No continuity	Check/replace switches or wire harness.
	2. Check for continuity between ECM harness terminal 40 (L) and 41(B / W).	Continuity	Go to check 3
3) Fault A / C relay	1. Turn engine off and disconnect ECM connector.	Voltage	Replace ECM
	2. Turn ignition switch, A / C switch and blower switch to “ON”.	No voltage	Repair B/W wire of wire harness
	3. Check for voltage at terminal 41 (B / W) of ECM or replace A/C relay.		

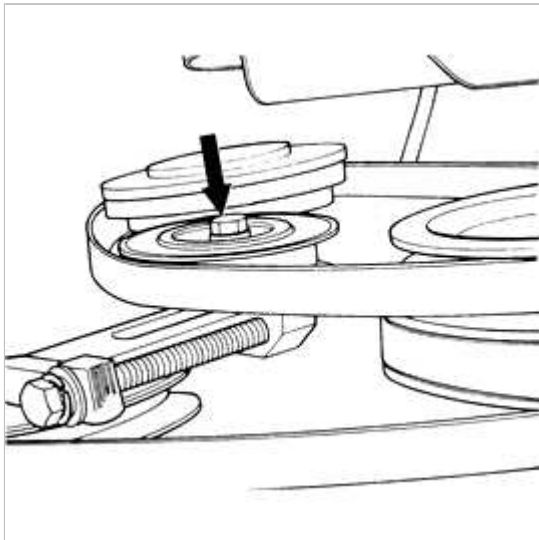
Heating, Ventilation, Air Conditioning > Air conditioning System > Drive belt > Repair procedures

REMOVAL

1. Chock wheels.
2. Remove the four engine undercover mounting bolts and the engine undercover.



3. Loosen the tensioner pulley lock nut.
4. Turn the tensioner adjusting bolt counterclockwise to loosen the drive belt.
5. Remove the drive belt.



INSTALLATION

1. Install the drive belt on the pulleys.
2. Turn the tensioner adjusting bolt clockwise to tighten the drive belt.

Specified deflection : 0.35 inch (9.0mm) at 22 lb (98 N) of pressure

3. Tighten the tensioner pulley lock nut.

Tighten lock nut to 24 lb-ft (32 N·m).

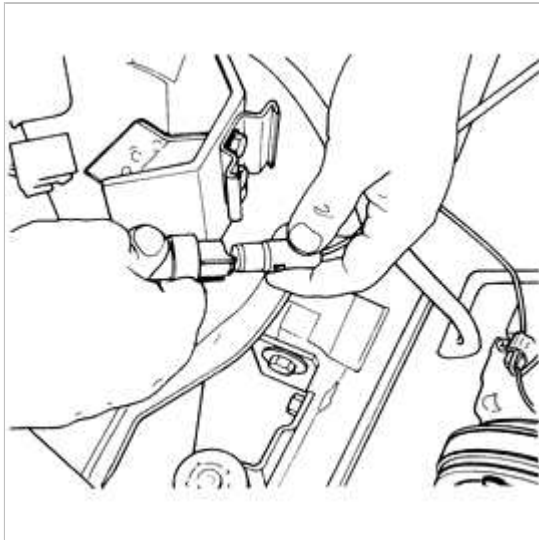
4. Install the bottom plate and the four mounting bolts.
5. Remove wheel chocks.



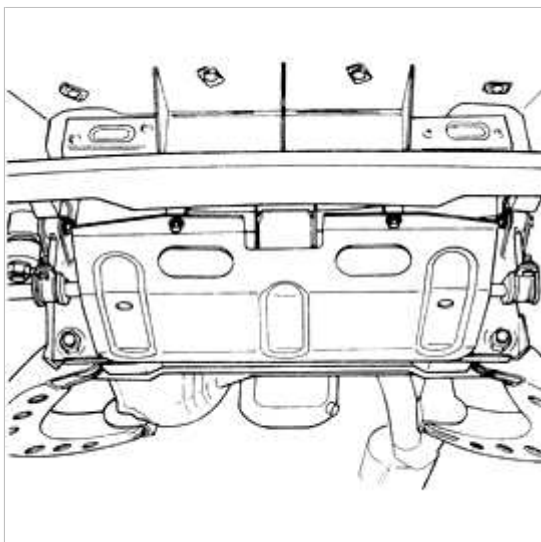
Heating, Ventilation, Air Conditioning > Air conditioning System > Compressor > Repair procedures

Removal

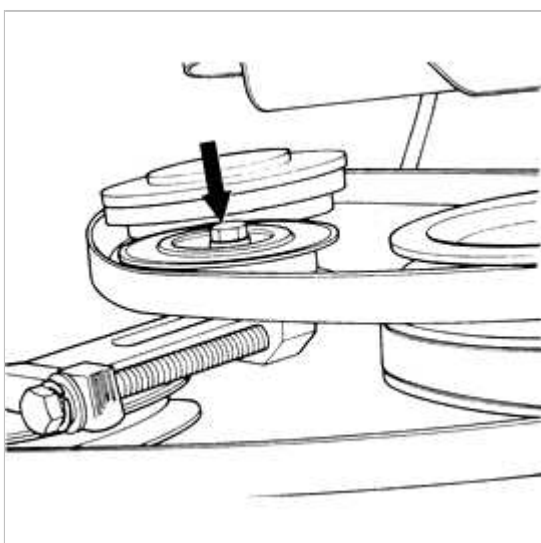
1. Disconnect the negative battery cable.
2. Discharge the air conditioning system. Refer to "Recovery / Evacuating / Charging" in this section.
3. Remove the air conditioner lines from the compressor.
4. Disconnect the compressor clutch electrical connector.



5. Raise vehicle and suitably support.
6. Remove the four engine undercover mounting bolts and remove the undercover.



7. Loosen the compressor drive belt tensioner pulley nut.

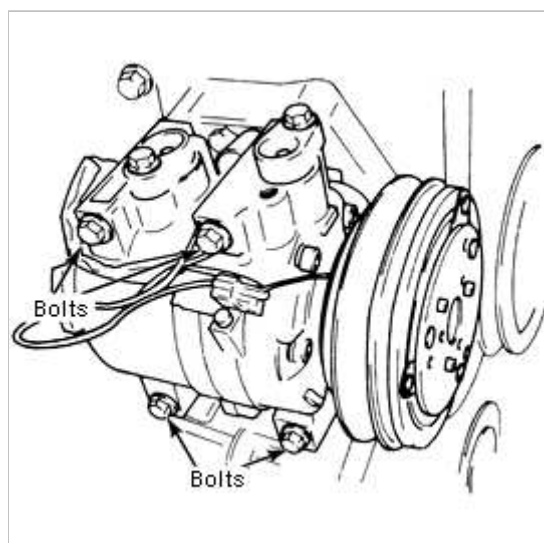


8. Turn the tensioner adjusting bolt counterclockwise to relieve tension on the belt.

9. Remove the drive belt.

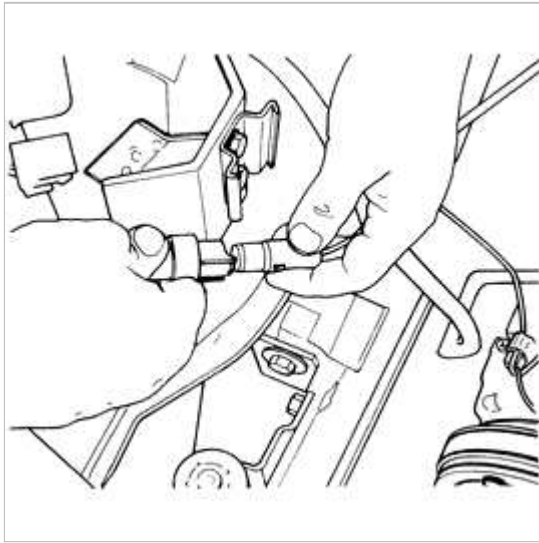
10. Lower vehicle.

11. Remove the four compressor mounting bolts and remove the compressor.

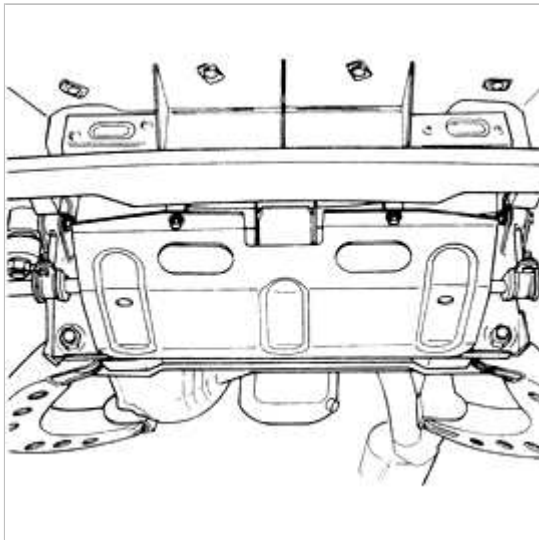


Removal

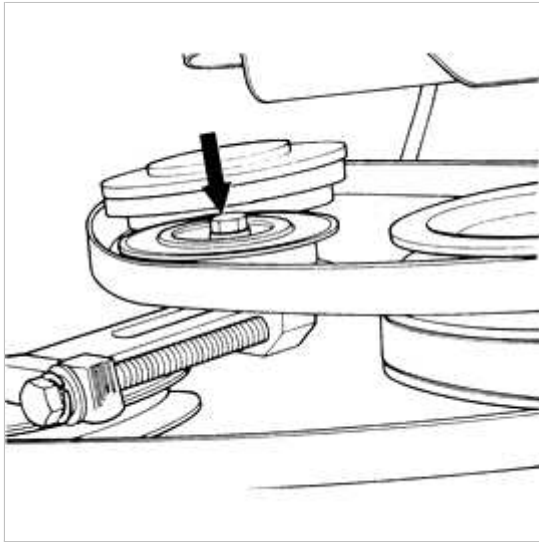
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2. Discharge the air conditioning system. Refer to "Recovery / Evacuating / Charging" in this section.
3. Remove the air conditioner lines from the compressor.
4. Disconnect the compressor clutch electrical connector.



5. Raise vehicle and suitably support.
6. Remove the four engine undercover mounting bolts and remove the undercover.

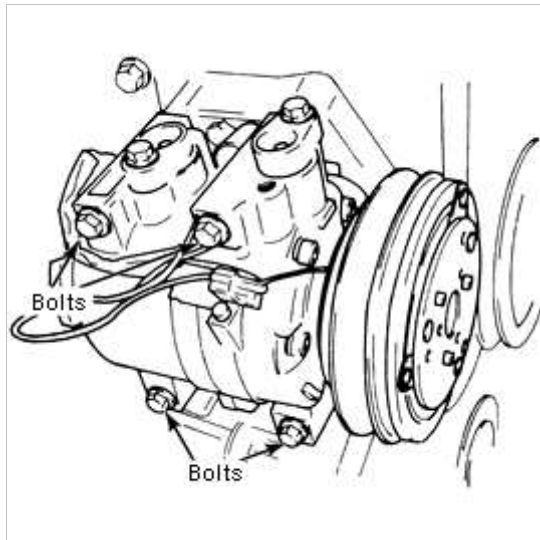


7. Loosen the compressor drive belt tensioner pulley nut.
8. Turn the tensioner adjusting bolt counterclockwise to relieve tension on the belt.
9. Remove the drive belt.



10. Lower vehicle.

11. Remove the four compressor mounting bolts and remove the compressor.



Installation

1. Install the compressor using four bolts.

Tighten compressor mounting bolts to 18 lb-ft (24N·m).

2. Raise and suitably support the vehicle.

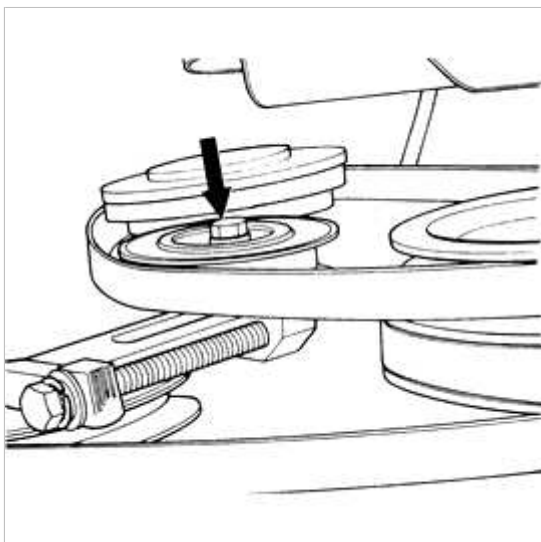
3. Install the drive belt.

4. Adjust the air conditioner drive belt to specification.

Specification : 0.35 inch (9.0 mm) at 22 lb (98 N) of pressure.

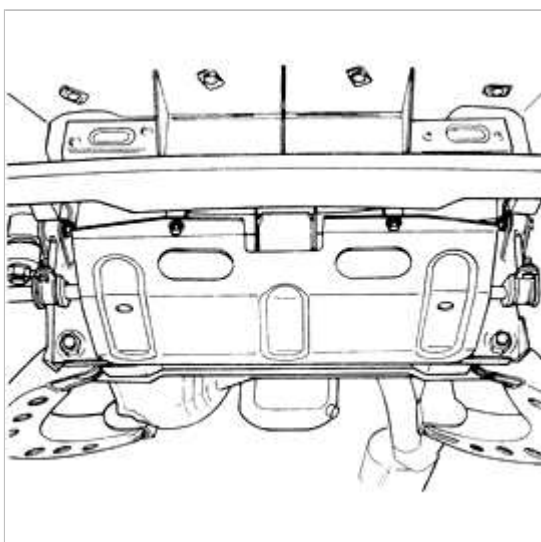
5. Tighten the compressor drive belt tensioner pulley nut.

Tighten the tensioner pulley nut to 24 lb-ft (32 N·m).



6. Install the engine undercover using four bolts.

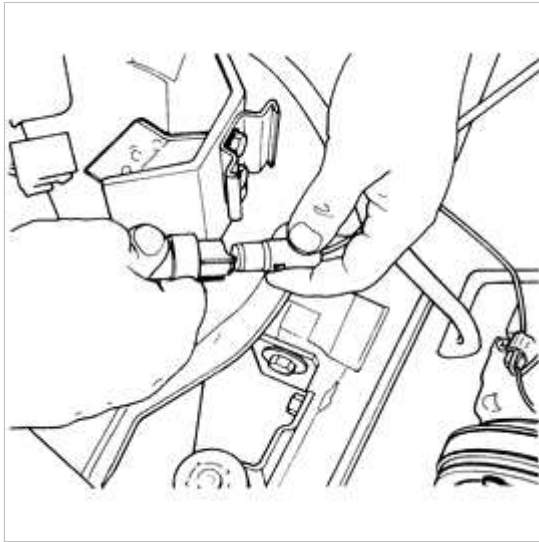
Tighten the four undercover bolts to 71 lb-in (8 N·m).



7. Lower the vehicle.
8. Install the air conditioner lines to the compressor.

Tighten the air conditioner compressor line fittings to 18 lb-ft (24 N·m).

9. Connect the compressor clutch electrical connector.



10. Evacuate and charge the air conditioner system.



11. Connect the negative battery cable.

INSTALLATION

1. Install the compressor using four bolts.

Tighten compressor mounting bolts to 18 lb-ft (24N·m).

2. Raise and suitably support the vehicle.

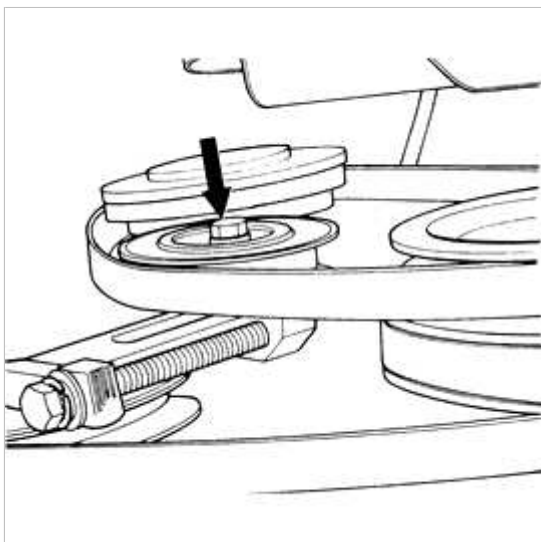
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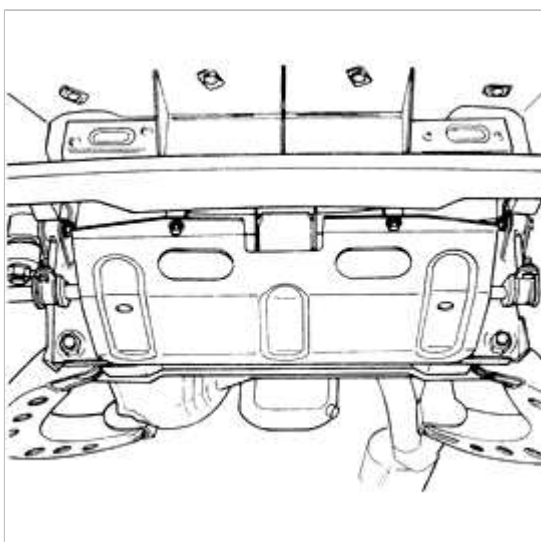
5. Tighten the compressor drive belt tensioner pulley nut.

Tighten the tensioner pulley nut to 24 lb-ft (32 N·m).



6. Install the engine undercover using four bolts.

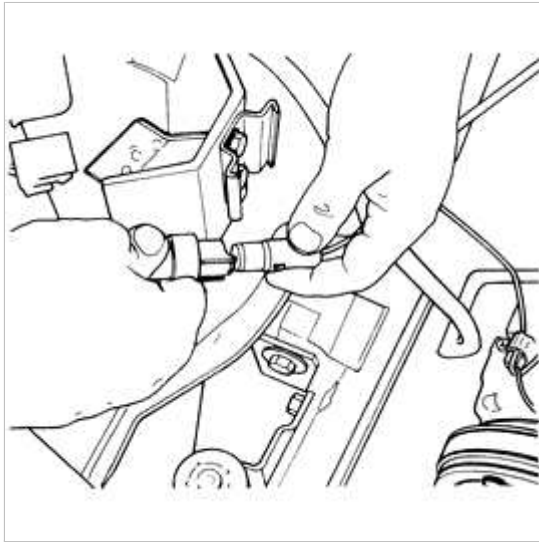
Tighten the four undercover bolts to 71 lb-in (8 N·m).



7. Lower the vehicle.
8. Install the air conditioner lines to the compressor.

Tighten the air conditioner compressor line fittings to 18 lb-ft (24 N·m).

9. Connect the compressor clutch electrical connector.



10. Evacuate and charge the air conditioner system.
11. Connect the negative battery cable.
12. Start engine and run A / C system. Check for leaks at compressor.



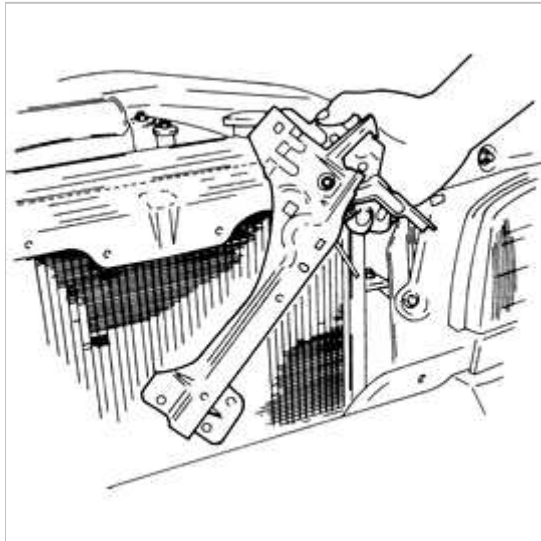
Heating, Ventilation, Air Conditioning > Air conditioning System > Condenser > Repair procedures

Removal

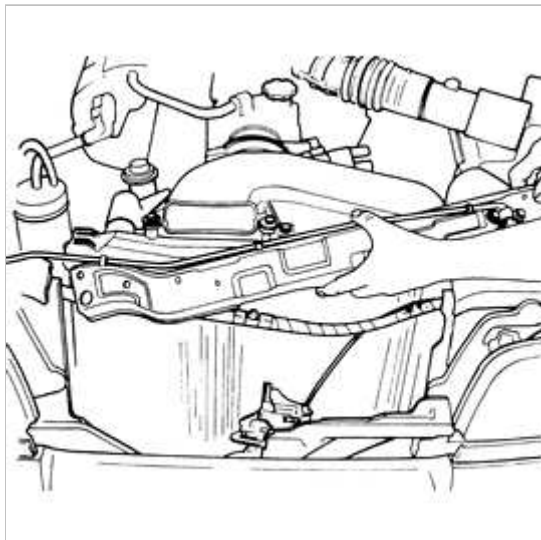
1. Chock wheels.
2. Disconnect negative battery cable.
3. Discharge the air conditioning system. Refer to "Recovery / Evacuating / Charging" in this section.
4. Disconnect refrigerant hoses at the condenser.
5. Remove the three plastic retainers attaching the trim panel to the upper shroud panel.
6. Remove the screw retaining the radiator grille to the hood stay.
7. Carefully depress the four tabs on the radiator grille and remove the grille from the vehicle.
8. Remove the radiator grille retaining clips from the side shroud panels and attach them to the radiator grille.
9. Disconnect the condenser fan connector.
10. Remove the three condenser fan assembly bolts and remove the condenser fan assembly.
11. Remove the four hood latch mounting bolts.

NOTE

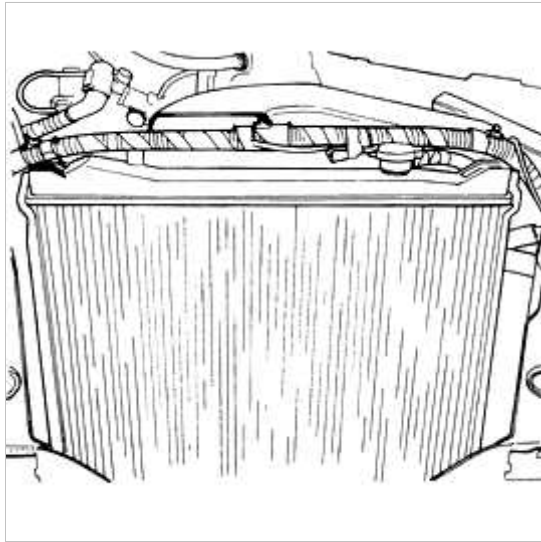
Carefully lay the center stay on the lower shroud panel to avoid damage to the radiator.



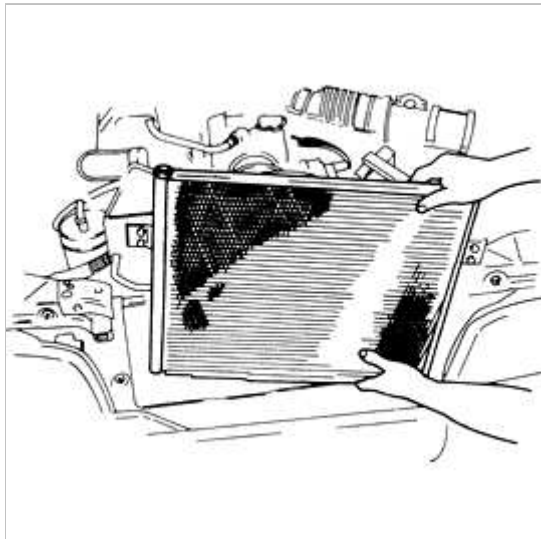
12. Install a Snap-On® Hood Prop Rod Tool #YA4590 or equivalent to support the hood.
13. Remove the upper shroud panel and hood support rod.



14. Disconnect the wire harness clips and separate the wire harness from the shroud panel.
15. Lift the wire harness out from under the right and left shroud panels.



16. Place a piece of cardboard between the radiator and the condenser.
17. Remove the nuts retaining the condenser.
18. Remove the condenser by pulling upward; lifting the radiator off the mounting studs and pulling the condenser forward and out of the vehicle.



Installation

1. Gently place the condenser into position on the mounting studs, in front of the radiator.
2. Place the radiator on the mounting studs.
3. Install the condenser retaining nuts.

Tighten nuts to 80 lb-in (9 N·m).

4. Remove the cardboard.
5. Insert the wire harness under the right and left shroud panels.
6. Place the wire harness in position and connect the wire harness clips.
7. Install the upper shroud panel and hood support rod.
8. Support the hood with the hood support rod and remove the hood prop rod tool.
9. Install the center stay and the four mounting bolts.

Tighten bolts to 80 lb-in (9 N·m).

-
10. Install the condenser fan assembly and the three condenser fan assembly bolts.
-

Tighten bolts to 80 lb-in (9 N·m).

11. Connect the condenser fan connector.
 12. Carefully snap the radiator grille into place in front of the condenser fan assembly.
 13. Install the one screw retaining the radiator grille to the hood stay.
 14. Install the three plastic retainers attaching the trim panel to the upper shroud panel.
 15. Connect the refrigerant hoses to the condenser.
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Tighten lower refrigerant hose nuts to 10 lb-ft (13 N·m).

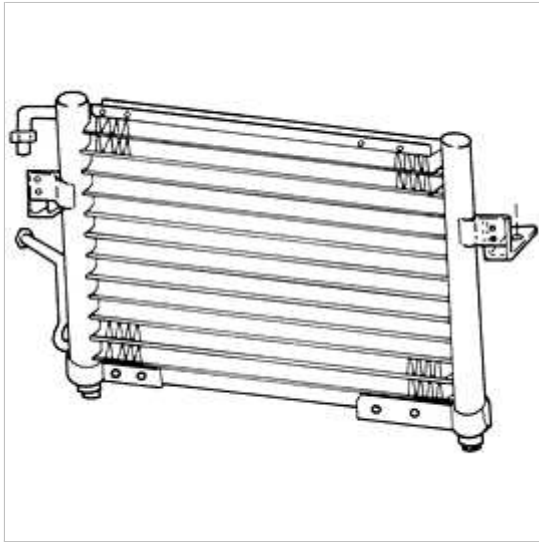
Tighten upper refrigerant hose nuts to 16 lb-ft (22 N·m).

16. Evacuate the A / C system. Refer to “Recovery / Evacuating / Charging” in this section. Perform vacuum test.
17. Charge the A / C system. Refer to “Recovery / Evacuating / Charging” in this section. Add 1.0 oz (30cc) or refrigerant oil if the condenser has been replaced with a new unit. Perform a leak test.
18. Connect the negative battery cable.
19. Start engine and run the A / C system. Check for leaks at the condenser.



INSPECTION

1. Visually check the condenser for cracks or damage.
2. Repair fin damage with a radiator fin tool.
3. Wear eye protection and back flush the condenser with a blast of air.
4. Remove any rocks or solid objects from between the condenser coils.



Heating, Ventilation, Air Conditioning > Air conditioning System > Condenser fan & relay > Repair procedures

REMOVAL

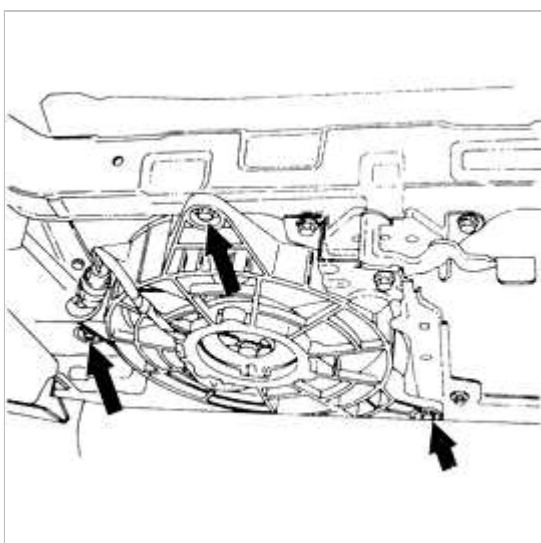
1. Chock wheels.
2. Disconnect negative battery cable.
3. Remove the three clips attaching the trim panel to the upper shroud panel.
4. Remove the screw retaining the radiator grille to the hood stay.
5. Carefully depress the four tabs on the radiator grille and remove the grille from the vehicle.
6. Remove the radiator grille clips from the side shroud panels and attach them to the grille.



7. Disconnect the condenser fan assembly electrical connector.



8. Remove the three condenser fan bolts and remove the condenser fan assembly.



INSTALLATION

1. Position the condenser fan in front of the radiator.
2. Install the three mounting bolts.

Tighten bolts to 80 lb-in (9 N·m).



3. Connect the condenser fan assembly electrical connector.
4. Carefully snap the radiator grille into place in front of the radiator and condenser, then secure using the previously removed screws.



5. Connect the negative battery cable.
6. Remove wheel chocks.

Inspection

1. Connect an ohmmeter to the condenser fan wire harness terminals and check for continuity, if there is no continuity, replace the fan motor.
2. Connect a 12V DC source (battery) to the fan motor terminals. If the fan does not turn, replace the fan motor.

Heating, Ventilation, Air Conditioning > Air conditioning System > Receiver/Drier > Training Information

RECOVERY / EVACUATING / CHARGING

NOTE

- Do not add R-12 refrigerant to an A/C system designed for R-134a or vice versa. Never mix these two types refrigerants, or the A / C system could be damaged.

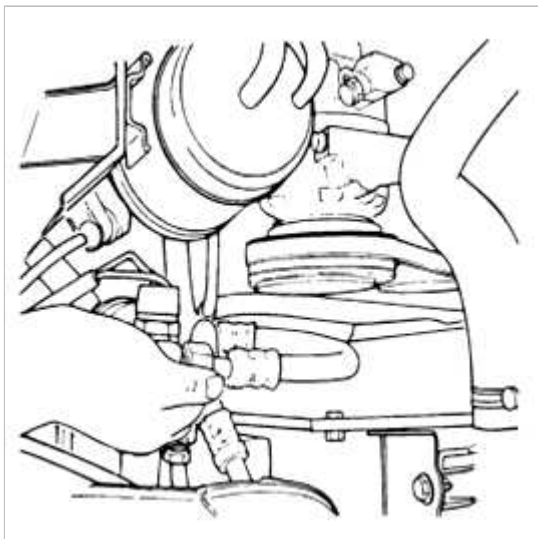
- R-12 and R-134a components are not interchangeable. Do not replace components of an R-134a system with components for an R-12 system or vice versa. Mixing components will cause damage to the A/C system.
- Follow the procedures on the refrigerant recovery / recycling / charging station to be used. If the condenser of the receiver / drier is replaced, add 1.0 oz (30 cc) of compressor oil during charging.



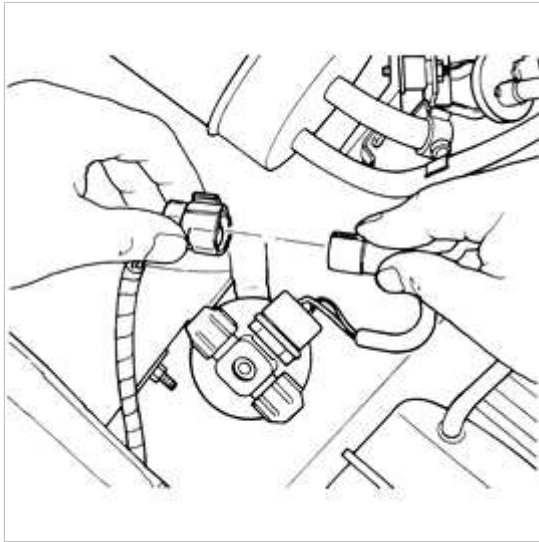
Heating, Ventilation, Air Conditioning > Air conditioning System > Receiver/Drier > Repair procedures

REMOVAL

1. Disconnect negative battery cable.
2. Discharge the air conditioning system. Refer to "Recovery / Evacuating / Charging" in this section.
3. Remove the refrigerant lines to and from the receiver / drier (cap the ports).
4. Pull the evaporative emissions canister from its mount and lay it on the inner fender.



5. Remove the wire harness connector.



6. Remove the three mounting nuts.
7. Remove the receiver / drier.

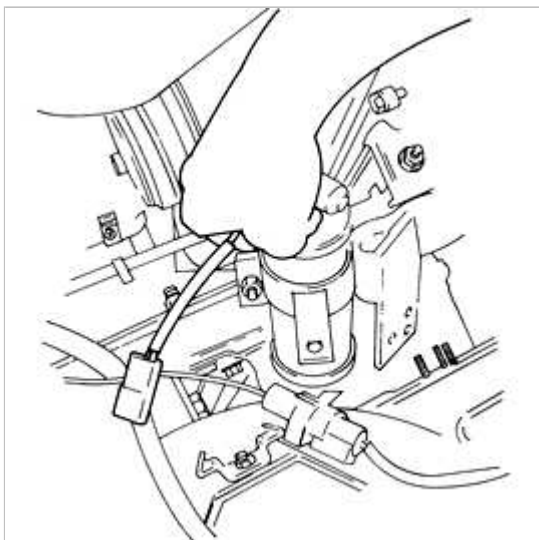
INSTALLATION

1. Install the receiver / drier on its mounting studs.
2. Install the three mounting nuts.

Tighten nuts to 80 lb-in (9 N·m).

3. Connect the receiver / drier wire harness.
4. Place the evaporative emissions canister onto its mount.
5. Connect the refrigerant lines to the receiver/drier.

Tighten line flare nuts to 10 lb-ft (13 N·m).



6. Evacuate the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform vacuum test.
7. Charge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Add 1.0 oz (30 cc) of refrigerant oil if the receiver/drier has been replaced with a new unit.
Perform a leak test.

8. Connect the negative battery cable.
9. Start engine and run the A / C system. Check for leaks at the receiver / drier.
10. Remove wheel chocks.

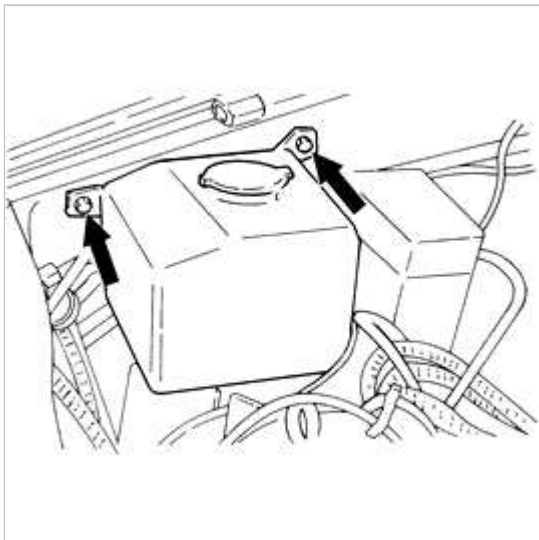


Heating, Ventilation, Air Conditioning > Air conditioning System > Refrigerant line > Repair procedures

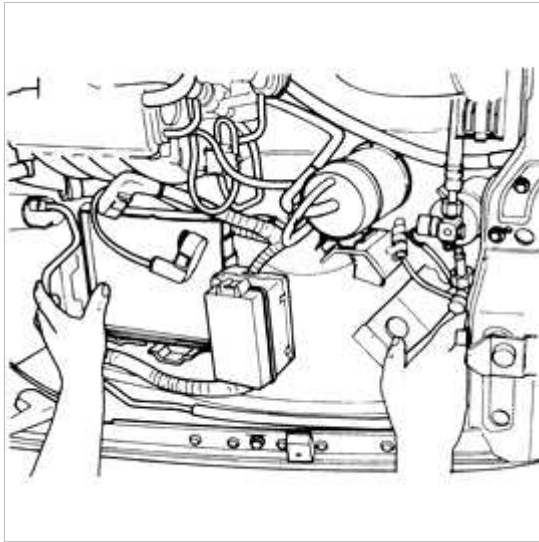
HOSES AND LINES (Evaporator Lines)

Removal

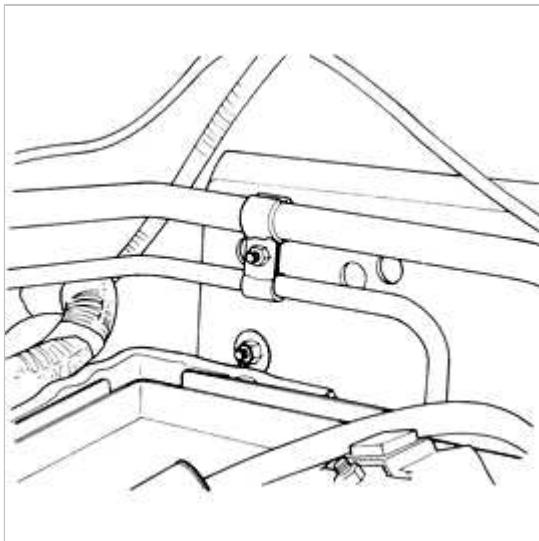
1. Discharge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
2. Disconnect and remove the battery.
3. Remove the windshield washer bottle from the vehicle. Refer to Body.



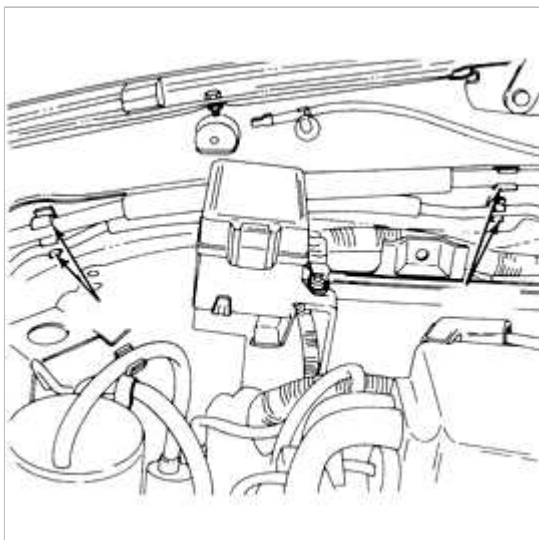
4. Loosen line nuts and the connector bolts at both ends of the line.



5. Remove the mounting nuts.



6. Unclip and remove the lines.

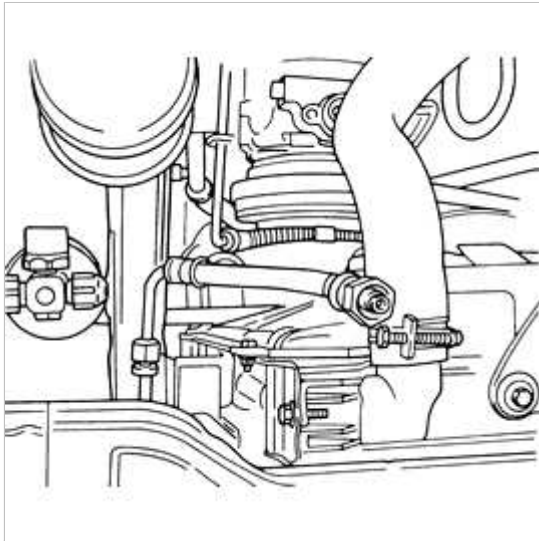


Flexible Hose

Removal

1. Discharge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.

2. Loosen the hose line nuts.
3. Disconnect the flexible hose.



Installation

1. Clip the line in place.
2. Hand start the first two threads of both line nuts.
3. Tighten the line nuts.

Tighten receiver/drier line nut to 10 lb-ft (13 N·m).
Tighten flexible hose line nut to 24 lb-ft (32 N·m).

4. Install the bulkhead connector mounting bolts and tighten.

Tighten bolts to 18 lb-ft (24 N·m).



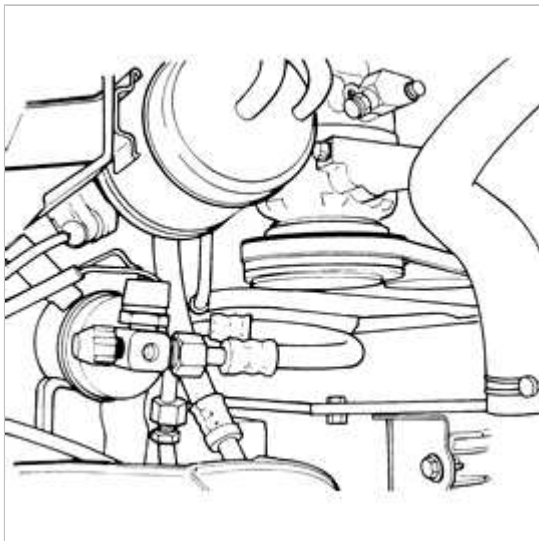
5. Install and tighten the small mounting nut.
6. Evacuate the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform vacuum test.
7. Charge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform leak test.



8. Install battery and reconnect battery cables (negative cable last).
9. Start engine and run the A / C system. Check for leaks at the line connections.

Installation

1. Place hose in position.
2. Place the hose clamps in position.
3. Tighten the hose nuts (look under component being connected to for tightness specifications).

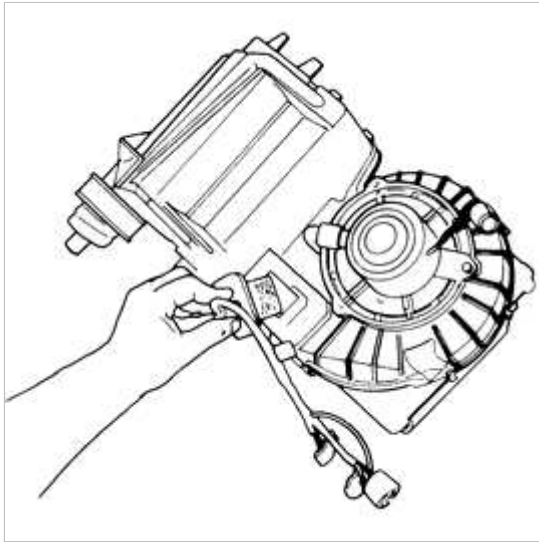


4. Evacuate the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform vacuum test.
5. Charge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform leak test.

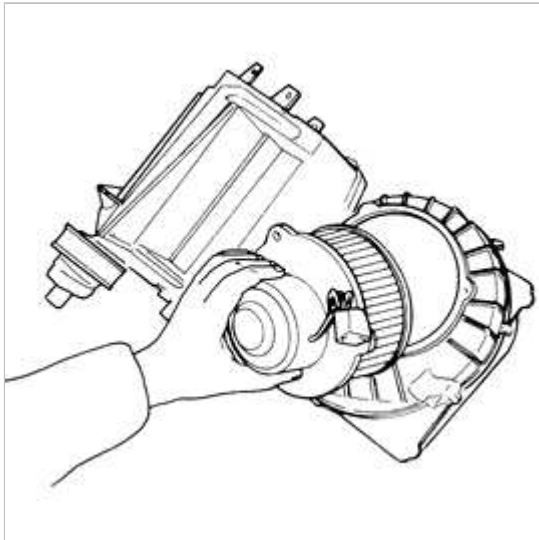
Heating, Ventilation, Air Conditioning > Air conditioning System > Evaporator unit > Repair procedures

Disassembly

1. Remove blower unit. Refer to Blower/Evaporator Unit in this section.
2. Disconnect the blower motor resistor connector.
3. Remove two screws retaining the blower motor resistor.
4. Remove the blower motor resistor.



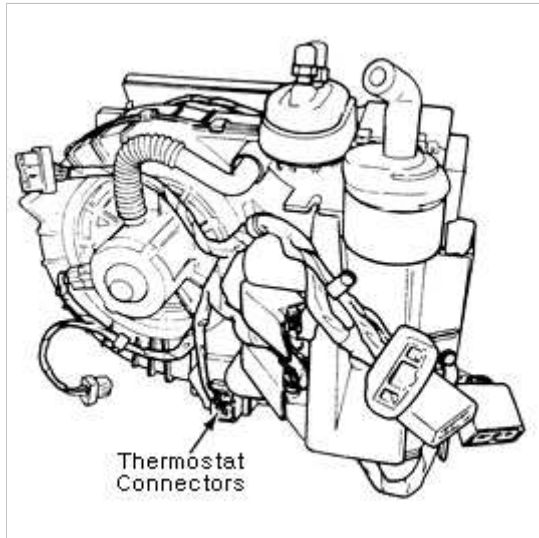
5. Disconnect the blower motor connector.
6. Remove three screws at the top of the blower motor.
7. Remove the blower motor vent tubing.
8. Remove the blower motor with the fan wheel attached.



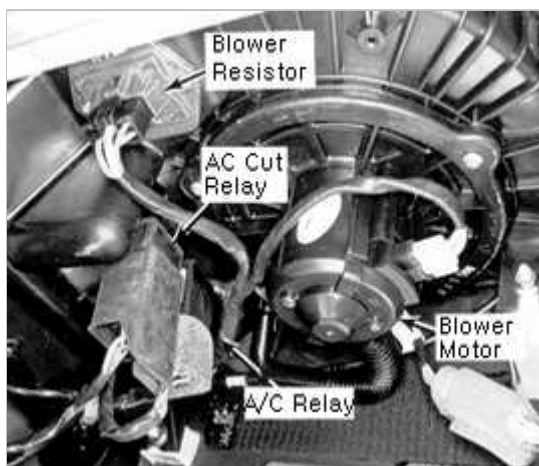
9. Remove the four blower inlet duct screws.
10. Remove the blower inlet duct.



11. Remove the two wire connectors to the thermostat. (BRN wire on the left, BLU/WHT wire on the right.)



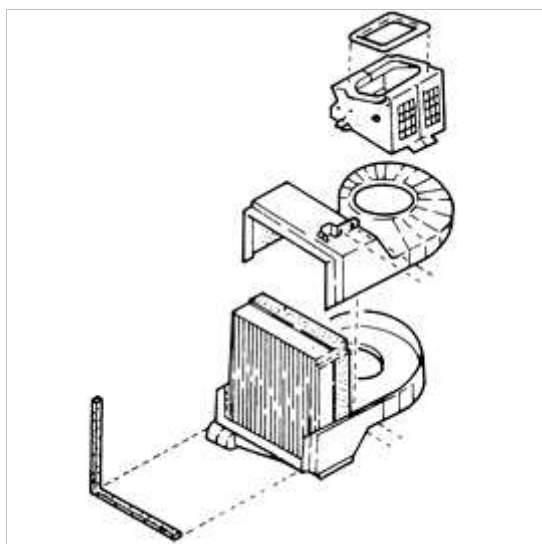
12. Disconnect the connector to the A/C relay.
 13. Remove two screws and remove the A/C relay.
 14. Disconnect the connector to the A/C cut relay.
 15. Remove two screws and remove the A/C cut relay.



16. Remove the dash seal from around the evaporator core tube connections.
 17. Detach eleven retaining clips holding the two halves of the blower housing unit together.

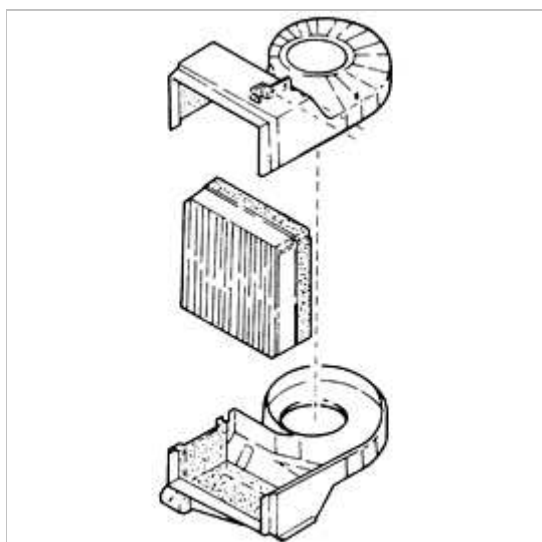


18. Separate the two halves of the blower housing unit, exposing the evaporator and blower motor.



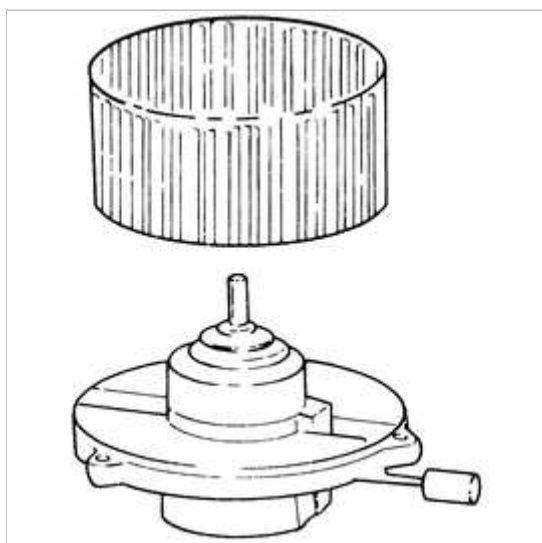
19. Remove the thermostat probe clips from the evaporation core and remove the thermostat probe from the evaporator core.

20. Remove the evaporator core from the bottom section of the blower housing unit.



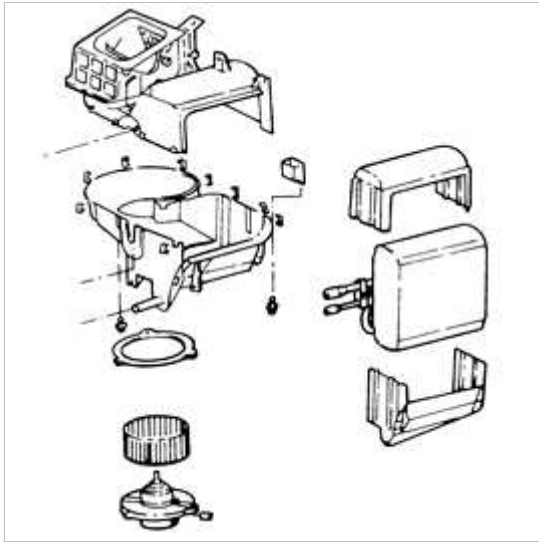
21. Remove the C-clip retaining the fan wheel on the blower motor shaft.

22. Remove the fan wheel from the blower motor.



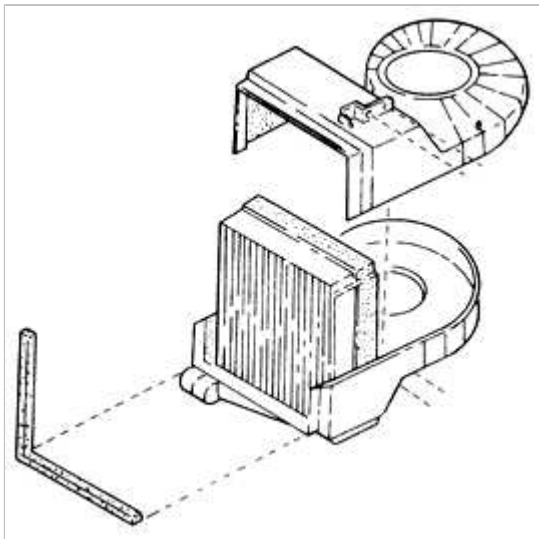
INSPECTION

1. Inspect the blower housing unit for cracks, damage and water leakage.
2. Inspect the evaporator for distorted or bent inlet or outlet.
3. Inspect the fan wheel for bent fins.

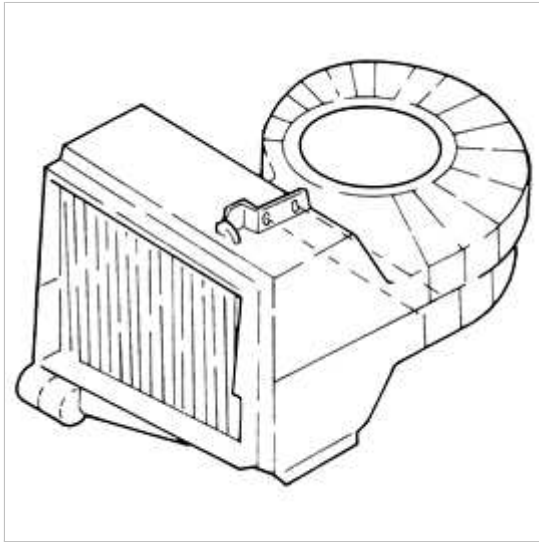


ASSEMBLY

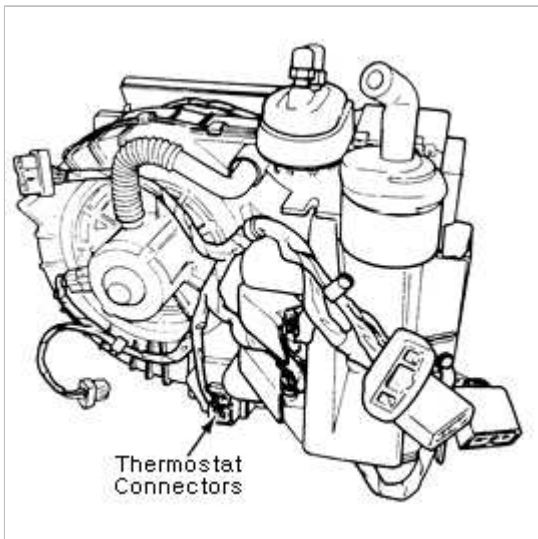
1. Position the evaporator into the bottom half of the blower housing unit.
2. Install the seal around the evaporator.
3. Assemble the two halves of the blower housing unit together.
4. Fasten the two halves in place with eleven retaining clips.



5. Install the fan wheel on the blower motor shaft.
6. Insert the C-clip to retain the fan wheel on the blower motor shaft.



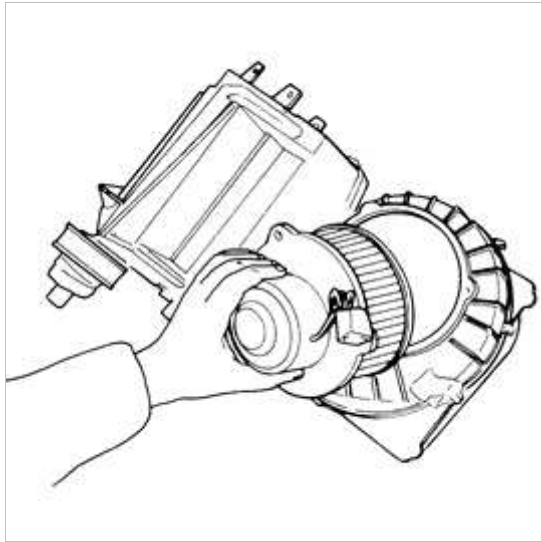
7. Attach the two wire connectors to the thermostat.
(BRN wire on the left, BLU / WHT wire on the right.)



8. Install the blower motor into the blower housing unit.
9. Insert three screws to hold the blower motor in place.

Tighten the three screws to 62 lb-in (7 N·m).

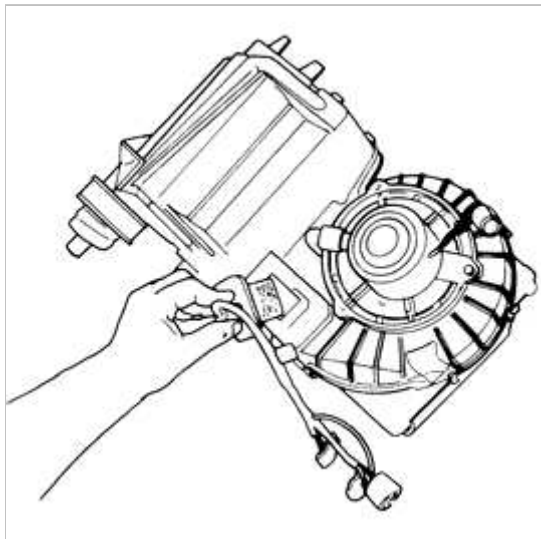
10. Attach the connector to the blower motor.
11. Install the blower motor vent tubing.



12. Install the blower motor resistor.
13. Insert two screws to hold the blower motor resistor in place.

Tighten the two screws to 62 lb-in (7 N·m).

14. Attach the blower motor resistor connector to the resistor assembly.



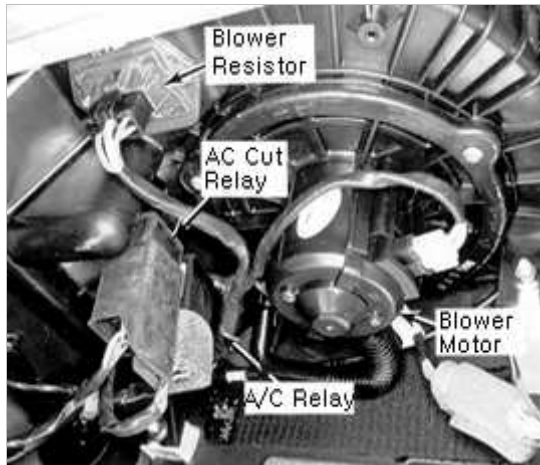
15. Position the A/C relay in place.
16. Insert two screws to hold the A/C relay in place.

Tighten the two screws to 62 lb-in (7 N·m).

17. Attach the connector to the A/C relay.
18. Position the A/C cut relay in place.
19. Insert two screws to hold the A/C cut relay in place.

Tighten the two screws to 62 lb-in (7 N·m).

20. Attach the connector to the A/C cut relay.



21. Install the dash seal on the evaporator core tube connections.



22. Position the blower inlet duct in place.

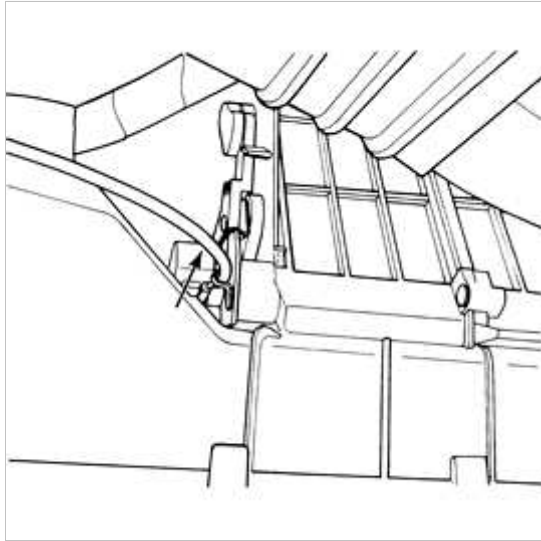
NOTE
Use one screw to install the thermostat wire harness tab to the assembly.

23. Insert four screws to hold the blower inlet duct in place.

Tighten the four screws to 62 lb-in (7 N·m).



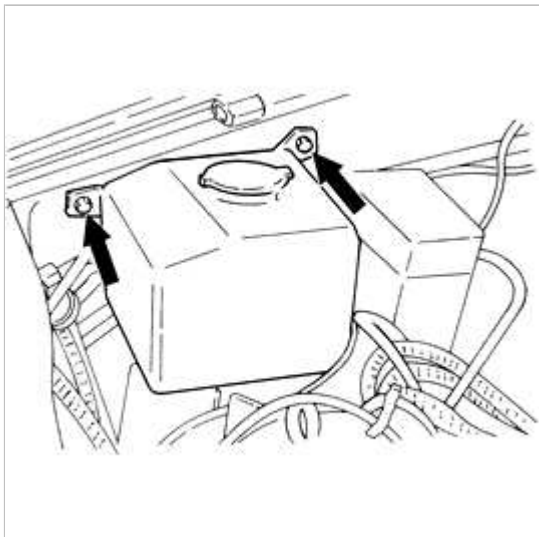
24. Install the dash seal on the evaporator core tube connections.
25. Connect the servo control cable to the inlet duct servo.
26. Install the blower/evaporator unit. Refer to Blower/ Evaporator Unit in this section.
27. Connect the drain hose.
28. Connect the A/C pressure and suction lines to the evaporator core.



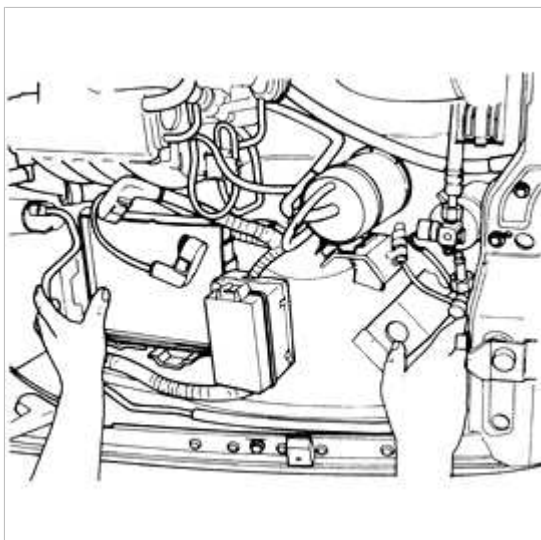
29. Install the battery.
30. Attach the battery retaining bracket.
31. Attach the battery cables.
32. Evacuate and charge the A/C system. Refer to Recovery/Evacuating/Charging in this section.
33. Check for leaks.

HOSES AND LINES (Evaporator Lines)

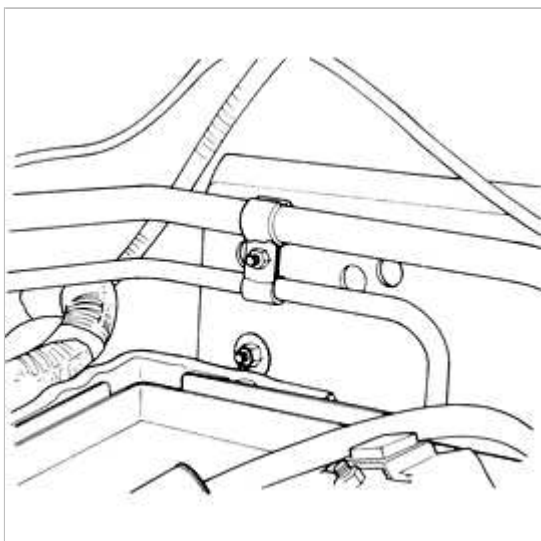
1. Chock wheels.
2. Discharge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
3. Check for coolant leaks.
4. Remove wheel chocks.
5. Disconnect and remove the battery.
6. Remove the windshield washer bottle from the vehicle. Refer to Body.



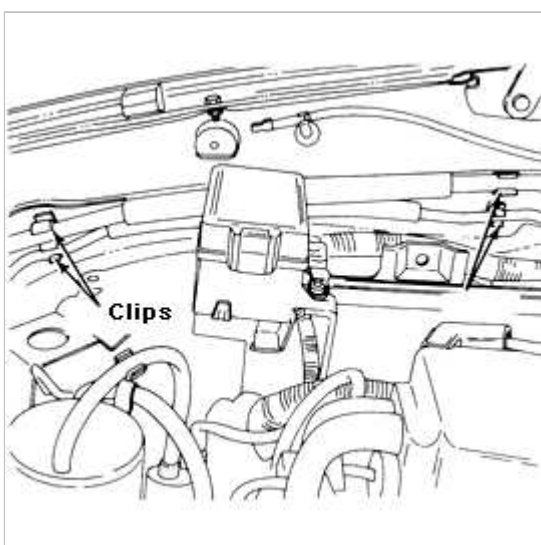
7. Loosen line nuts and the connector bolts at both ends of the line.



8. Remove the mounting nuts.



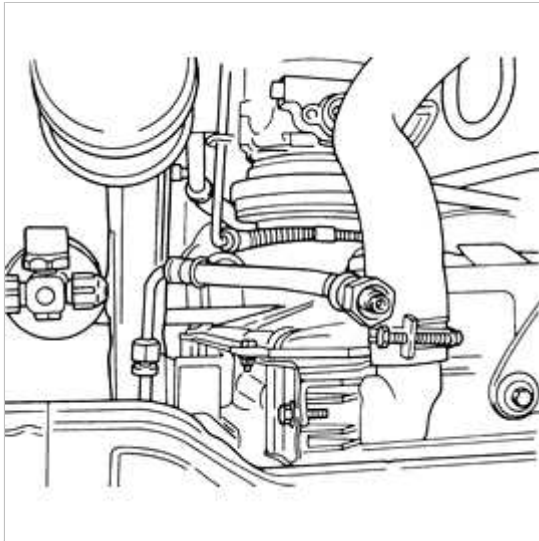
9. Unclip and remove the lines.



Removal (Flexible Hose)

1. Chock wheels.
2. Discharge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.

3. Loosen the hose line nuts.
4. Disconnect the flexible hose.



Installation

1. Clip the line in place.
2. Hand start the first two threads of both line nuts.
3. Tighten the line nuts.

Tighten receiver/drier line nut to 10 lb-ft (13 N·m).
Tighten flexible hose line nut to 24 lb-ft (32 N·m).

4. Install the bulkhead connector mounting bolts and tighten.

Tighten bolts to 18 lb-ft (24 N·m).



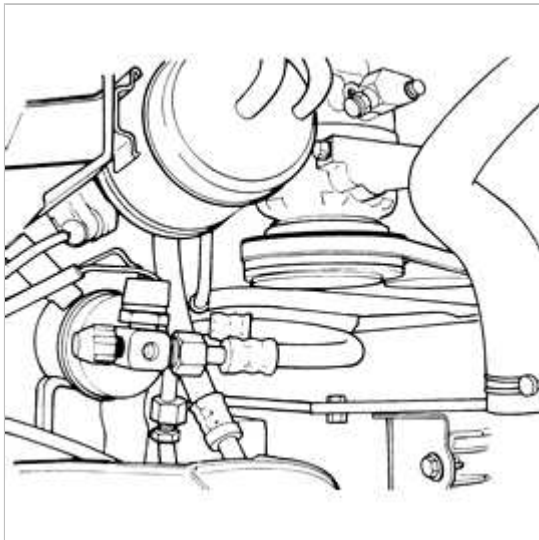
5. Install and tighten the small mounting nut.
6. Evacuate the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform vacuum test.
7. Charge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
Perform leak test.
8. Install battery and reconnect battery cables (negative cable last).

9. Start engine and run the A / C system. Check for leaks at the line connections.
10. Remove wheel chocks.



Installation (Flexible Hose)

1. Place hose in position.
2. Place the hose clamps in position.
3. Tighten the hose nuts (look under component being connected to for tightness specifications).
4. Evacuate the A / C system. Refer to "Recovery / Evacuating / Charging" in this section. Perform vacuum test.
5. Charge the A / C system. Refer to "Recovery / Evacuating / Charging" in this section. Perform leak test.



Heating,Ventilation, Air Conditioning > Heater > Heater Unit > Repair procedures

REMOVAL

CAUTION

Never remove the radiator cap while the engine is hot.

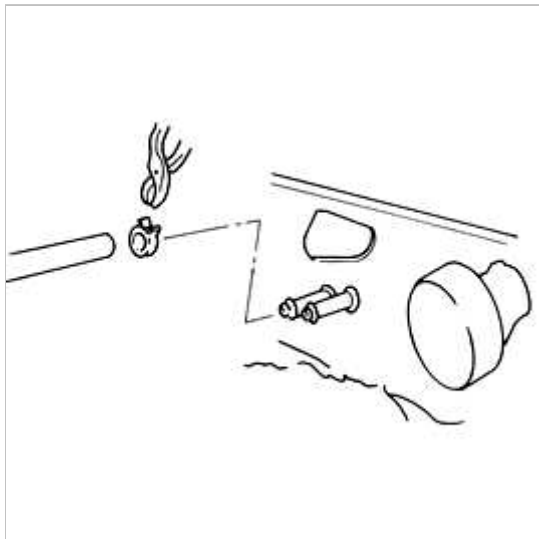
1. Chock wheels.
2. Drain the engine coolant. Refer to Engine Cooling System.

3. Discharge and recover the refrigerant from the A/C system. Refer to Recovery/Evacuating/Charging in this section.
4. Remove the dash panel. Refer to Body.
5. Remove the Blower/Evaporator unit. Refer to Blower/Evaporator Unit in this section.
6. Disconnect the low pressure line from the evaporator outlet on the bulkhead.
7. Disconnect the high pressure line from the evaporator inlet on the bulkhead.

NOTE

Cap open ports.
Do not use tape.

8. Disconnect the heater return hose from the heater core outlet tube connection.
9. Disconnect the heater inlet hose from the heater core inlet tube connection.
10. Disconnect the fresh air/recirculation control cable from the blower housing unit inlet duct.
11. Disconnect five connectors at the bottom of the blower housing unit.
12. Pull carpeting away from bulkhead to gain access to the hole cover plate.
13. Remove the four nuts retaining the hole cover plate.
14. Remove the hole cover plate.
15. Remove two mounting bolts at the top of the blower housing unit.



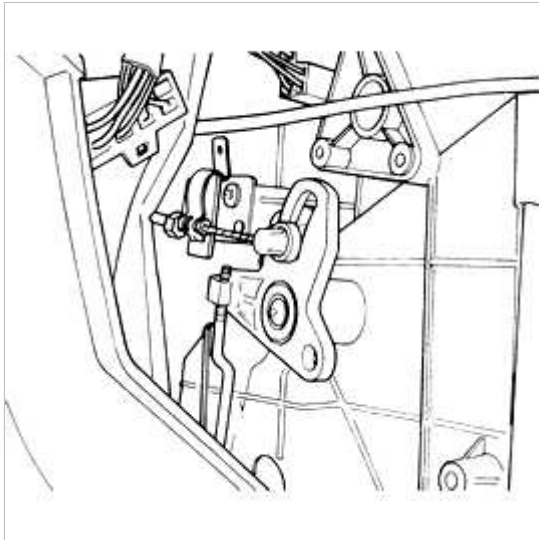
16. Remove two nuts attaching the bottom of the blower housing unit to the bulkhead mounting studs.
17. Remove the blower unit from the vehicle.
18. Remove the temperature control cable from the heater unit servo.
19. Remove the two nuts from the mounting studs at the bottom of the heater unit.
20. Remove the top nut holding the heater unit to the bulkhead to the bulkhead mounting stud.
21. Remove the heater unit.

INSTALLATION

1. Guide the heater core tube lines through the bulkhead.
2. Mount the heater unit in position and loosely screw a nut on the mounting stud at the top of the heater unit.
3. Loosely attach the two retaining nuts to the mounting studs at the bottom the heater unit.
4. Tighten both the top and bottom retaining nuts.

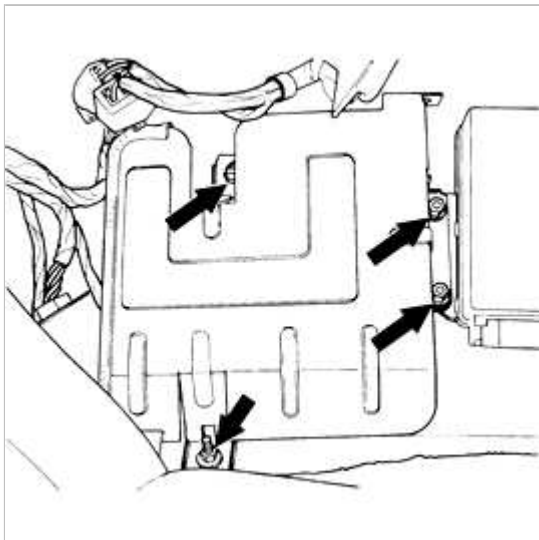
Tighten the nuts to 80 lb-in (9 N·m).

5. Connect the temperature control cable to the heater.

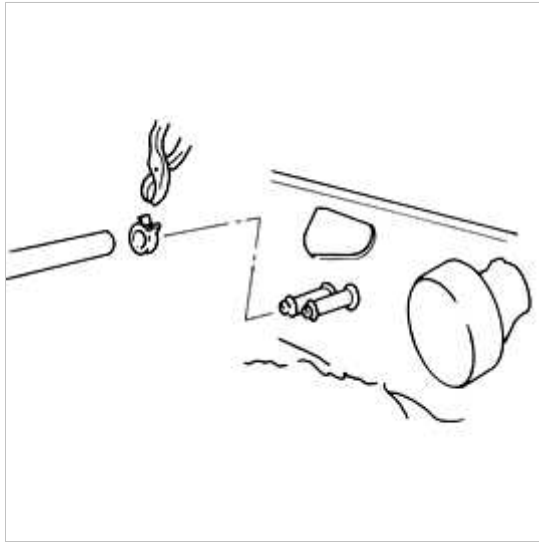


6. Install the Blower/Evaporator unit. Refer to Blower/Evaporator Unit in this section.
7. Install the cover plate in place.
8. Insert four nuts to retain the cover plate in place.

Tighten the nuts to 80 lb-in (9 N·m).



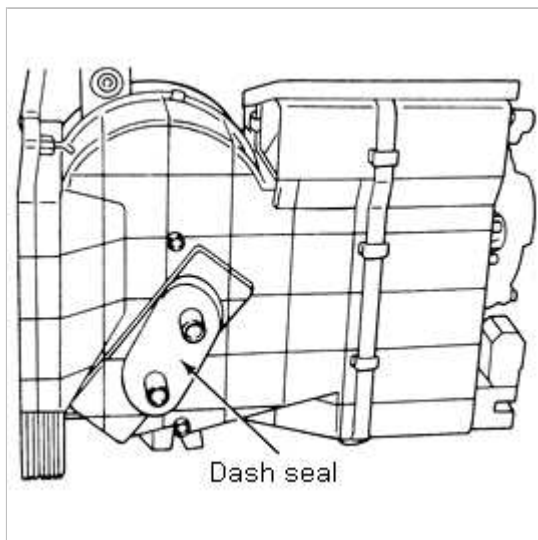
9. Reconnect the five connectors.
10. Reinstall carpet.
11. Replace the dash panel. Refer to Group BD, Body.
12. Connect the pressure hose to the evaporator core tube connection.
13. Connect the suction hose to the evaporator core tube connection.
14. Connect the heater return hose to the heater core outlet tube connection.
15. Connect the heater inlet hose to the heater core inlet tube connection.



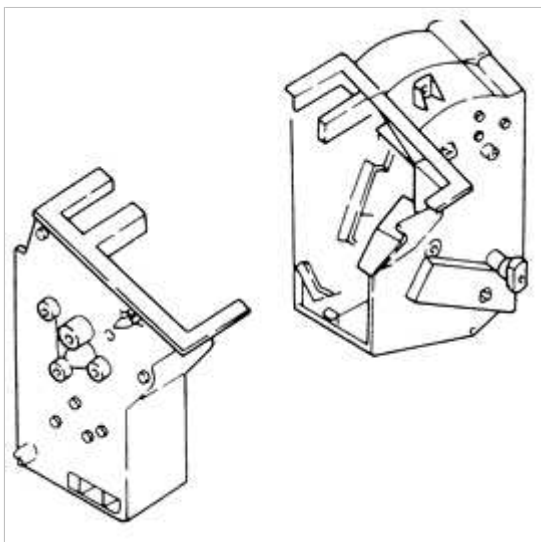
16. Install the battery.
17. Install the battery bracket.
18. Connect the battery cables.
19. Replace the engine coolant. Refer to Engine Cooling System.
20. Charge the A/C system with refrigerant. Refer to Recovery/Evacuating/Charging in this section.

DISASSEMBLY

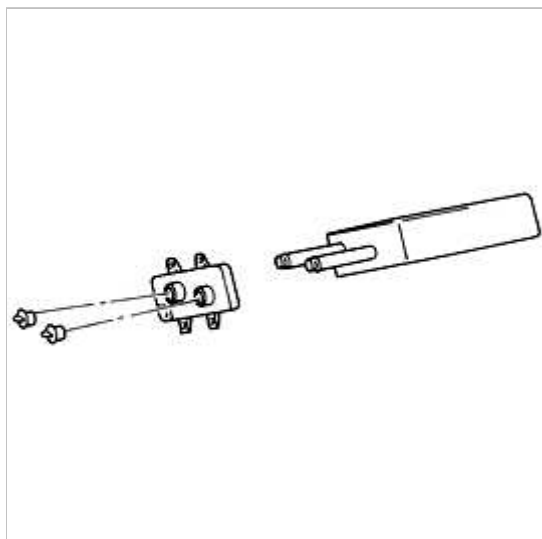
1. Chock wheels.
2. Drain engine coolant and remove heat unit. Refer to Heater Unit/Removal in this Section.
3. Detach dash seal from the heater core tube connections.
4. Remove the vent seal.



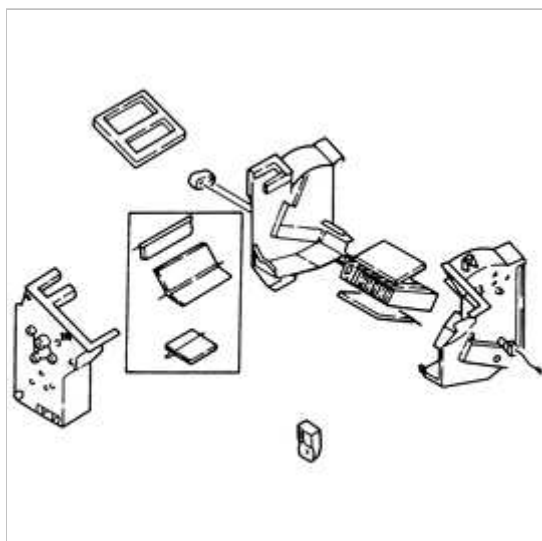
5. Remove two screws attaching wire harness to the heater servo mechanism.
6. Remove eight retaining clips from the servo side (left side) of the heater unit.
7. Remove the left side of the heater unit.



8. Remove six retaining clips holding the remaining two sections of the heater unit together.
9. Remove four screws retaining the heater core tube mounting bracket.
10. Take off the core tube mounting bracket.



11. Disassemble the heater unit by removing the eight remaining retaining clips.
12. Remove the heater core from the unit assembly.

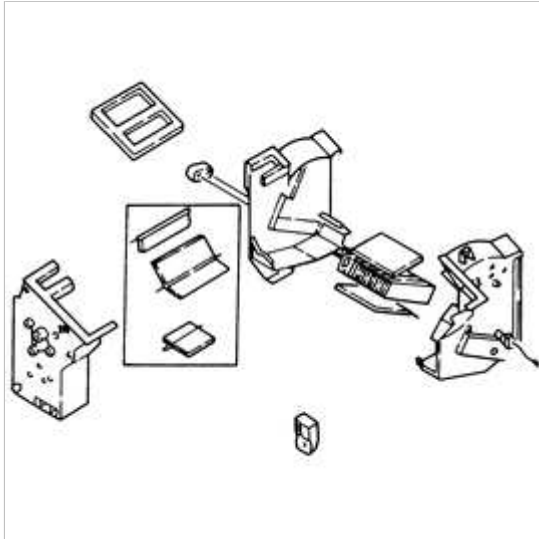


ASSEMBLY

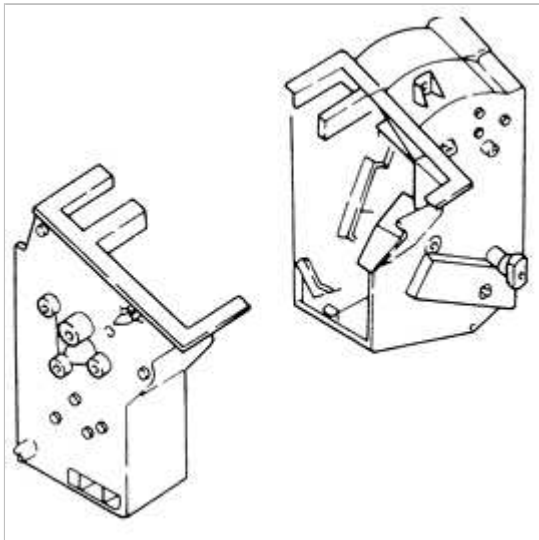
1. Insert the heater core assembly into the heater unit assembly.
2. Attach the core tube mounting bracket to the housing with four screws.

Tighten the four screws to 53 lb-in (6 N·m).

3. Assemble the heater unit assembly around the heater core.
4. Attach the six retaining clips to keep the heater core housing assembled.



5. Assemble the three sections of the heater unit together.
6. Attach eight retaining clips to hold the sections together.



7. Replace the dash seal on the heater core tube connections.
8. Insert two screws to retain the wiring harness.

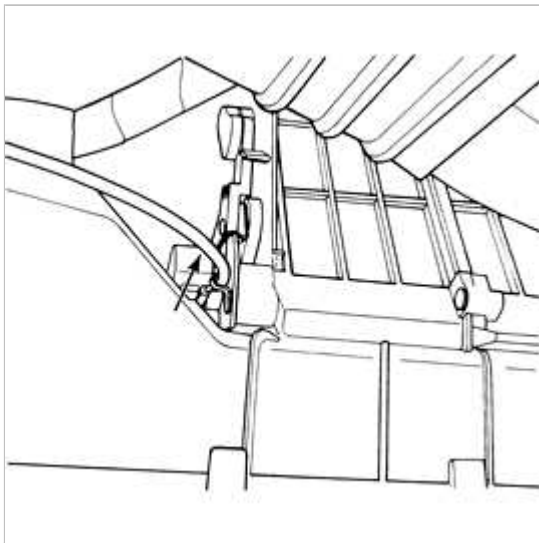
Tighten the two screws to 53 lb-in (6 N·m).



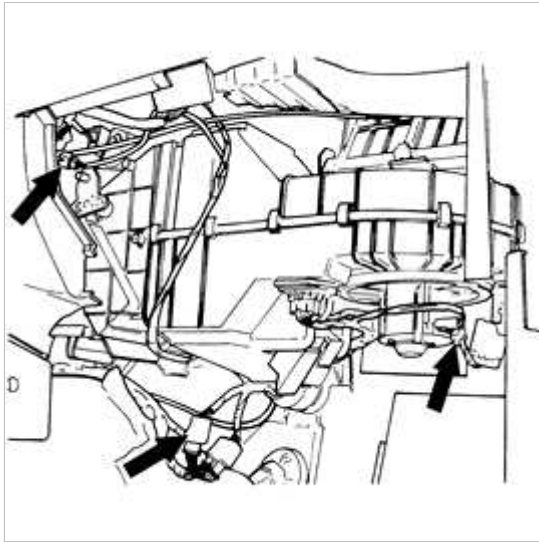
Heating, Ventilation, Air Conditioning > Blower > Blower Unit > Repair procedures

REMOVAL

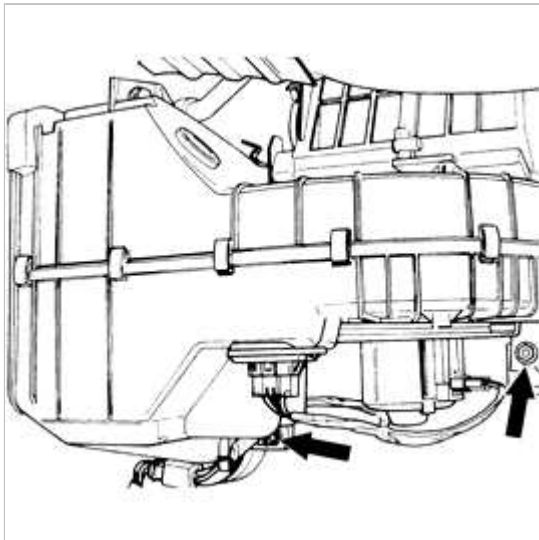
1. Chock wheels.
2. Disconnect the fresh air/recirculation control cable from the blower housing unit inlet duct.



3. Disconnect five connectors at the bottom of the blower housing unit.
4. Pull carpeting away from bulkhead to gain access.
5. Remove the four nuts retaining the cover plate.
6. Remove the cover plate.



7. Remove two mounting bolts at the top of the blower housing unit.
8. Remove two nuts attaching the bottom of the blower housing unit to the bulkhead mounting studs.
9. Detach the blower unit from the vehicle.



INSTALLATION

1. Clear the mounting area of any wiring, connectors or cables.
2. Guide the evaporator core tubes through the bulkhead and mount the blower housing unit by inserting two mounting bolts at the top of the unit.
3. Loosely install two nuts on the mounting studs at the bottom of the blower housing unit.
4. Insert two mounting bolts at the top of the blower housing unit.

NOTE

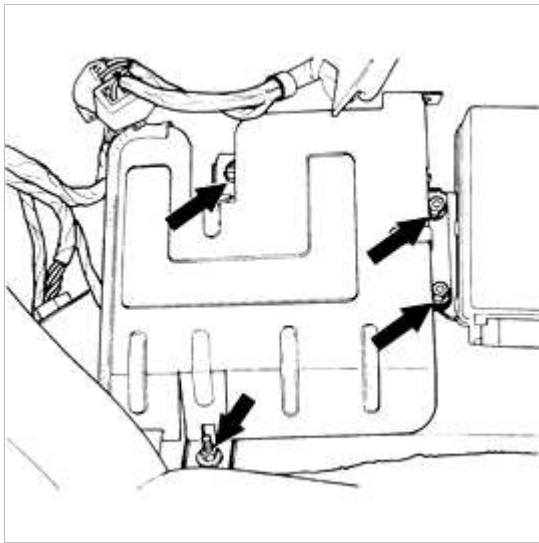
Over-tightening may cause the fresh air/recirculation door to bind.

5. Tighten the nuts and bolts to retain the blower housing unit to the bulkhead.

Tighten the nuts and bolts to 80 lb-in (9 N·m).

6. Install the cover in place.
7. Insert four nuts to retain the cover plate in place.

Tighten the four nuts to 80 lb-in (9 N·m).



8. Attach the five connectors.
9. Replace carpet over the flooring.
10. Remove wheel chocks.



Heating, Ventilation, Air Conditioning > Blower > Blower Motor > Troubleshooting

TROUBLESHOOTING

Blower Motor Does Not operate

Check For	Steps	Result	Action
1) Open 20A heater fuse	· Check 20A heater fuse in passenger compartment fuse box.	Open	Replace fuse
		Good	Go to check 2
2) Internal failure in motor	1. Disconnect blower motor connector.	No continuity	Check internal fuse; replace fuse or motor as required
	2. Check for continuity between blue wire and	Continuity	Go to check 3

	white wire.		
3) Open circuit between battery and motor	1. Turn ignition switch to "ON."	Voltage	Go to check 4
	2. Check for voltage between blue wire and ground.	No voltage	Open circuit ; see Electrical Troubleshooting Manual
4) Open circuit at blower control switch	1. Turn ignition switch to "ON."	Voltage	Check ground wire
	2. Turn blower switch to "HI."		
	3. From the harness side, check for voltage between black wire terminal of the blower switch harness control switch connector and ground.	No voltage	Replace blower

Blower Motor Only Operates On "HI" Setting

Check For	Steps	Result	Action
1) Open circuit in motor	1. Disconnect blower motor wire harness.	No continuity	Replace blower motor
	2. At motor, check for continuity between "G / W" terminal and "L" terminal.	Continuity	Go to check 2
2) Open circuit in blower control switch	1. Disconnect blower control switch harness.	No continuity	Replace blower switch
	2. Turn switch to "LO."	Continuity	Replace harness
	3. Check continuity between "B" and "G/W" terminal.		

Blower Motor Does Not Operate On "HI" Setting

Check For	Steps	Result	Action
Open circuit in blower control switch	1. Disconnect blower control switch harness.	No continuity	Replace blower switch
	2. Turn switch to "HI."	Continuity	Replace harness
	3. Check continuity between "W" and "G/W" terminal.		

Compressor Clutch Failure

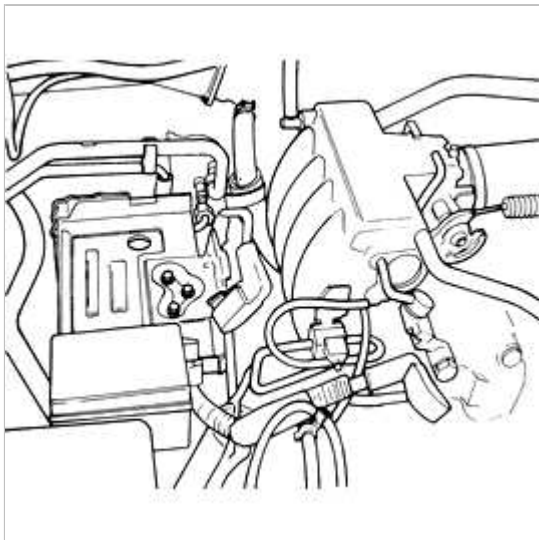
Check For	Steps	Result	Action
	1. Disconnect the compressor clutch terminal wire.	No voltage	Check wire harness

1) Faulty wire harness	2. Turn ignition key to "ON."		
	3. Turn A/C and blower switches "ON."	Voltage	Go to check 2
	4. At the wire harness, check voltage between the compressor terminal wire and ground.		
2) Lost ground wire	· Check that the ground wire is connected.	Faulty	Repair / replace
		Good	Go to check 3
3) Clutch failure		Yes	Replace clutch

Heating, Ventilation, Air Conditioning > Blower > Blower Motor > Repair procedures

REMOVAL

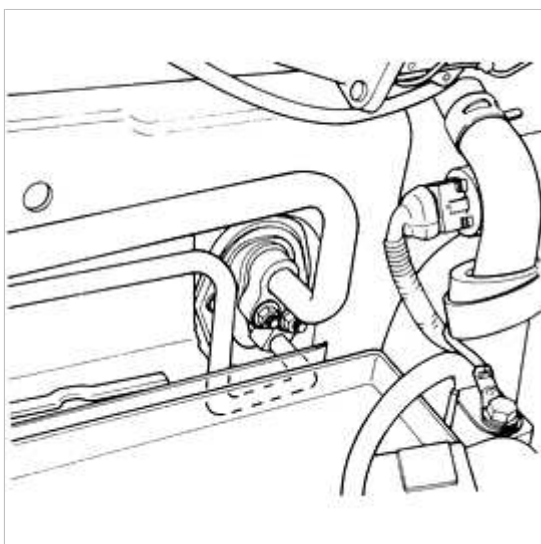
1. Chock wheels.
2. Discharge and recover the refrigerant from the A / C system. Refer to "Recovery / Evacuating / Charging" in this section.
3. Disconnect the battery cables.
4. Remove the battery retaining bracket.
5. Remove the battery.



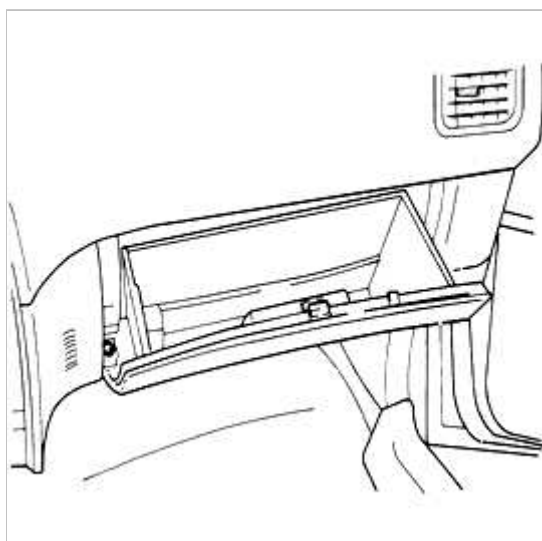
6. Disconnect the A / C outlet line from the evaporator outlet.
7. Disconnect the A / C inlet line from the evaporator inlet.

NOTE

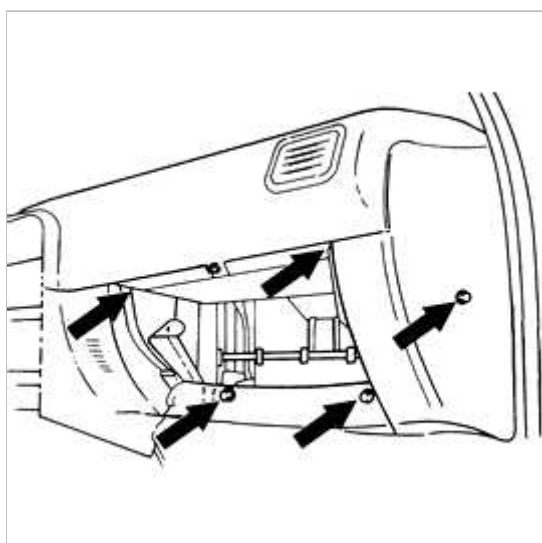
Immediately plug all open line fittings to prevent moisture from entering the system.
Do not use tape.



8. Remove the blower motor assembly drain hose.
9. Open glove box and remove two glove box mounting screws.
10. Remove glove box.

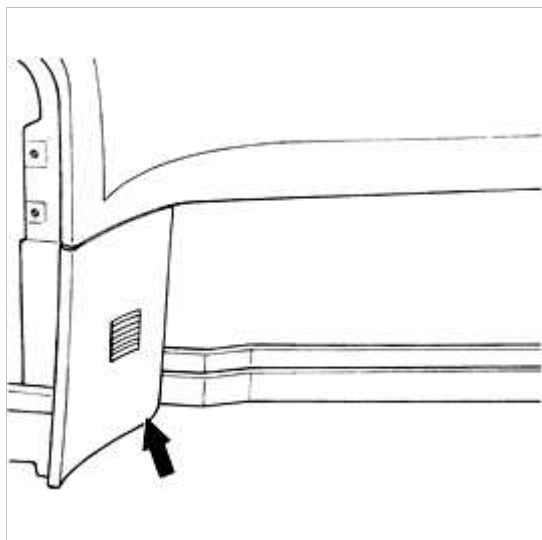


11. Remove five screws holding the right hand instrument panel lower trim panel.
12. Remove the right instrument panel lower trim panel.



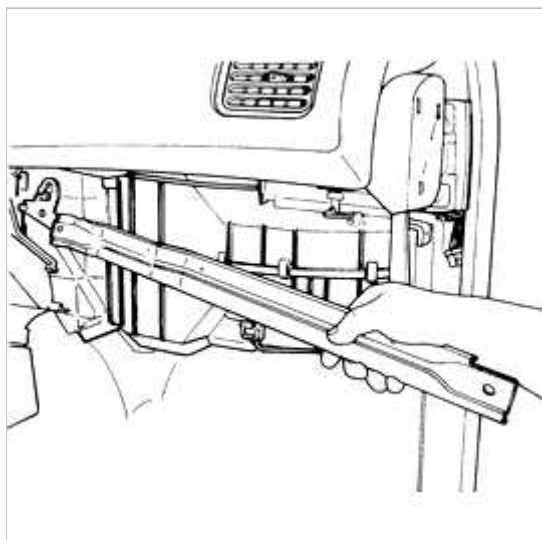
13. Remove the screw attaching the upper center console side cover to allow access to the left instrument panel

lower support.

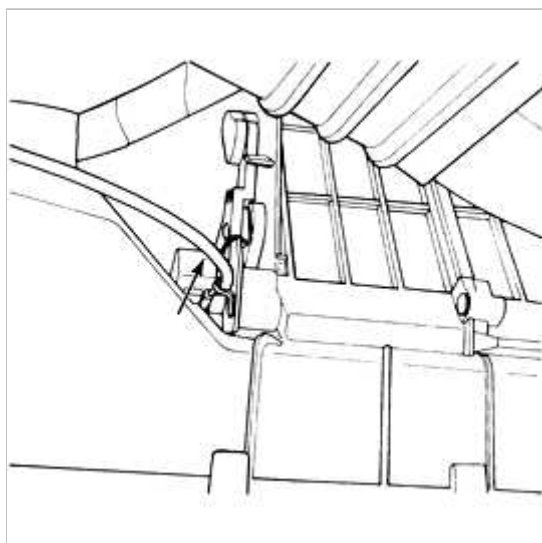


14. Remove the left bolt attaching the lower left side of the instrument panel lower support.

15. Remove the right bolt attaching the lower right side of the instrument panel lower support and remove the support.

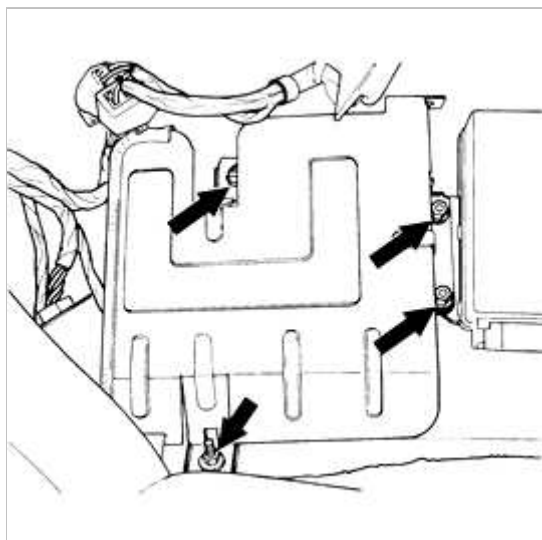


16. Disconnect the fresh / recirculation cable from the inlet duct.

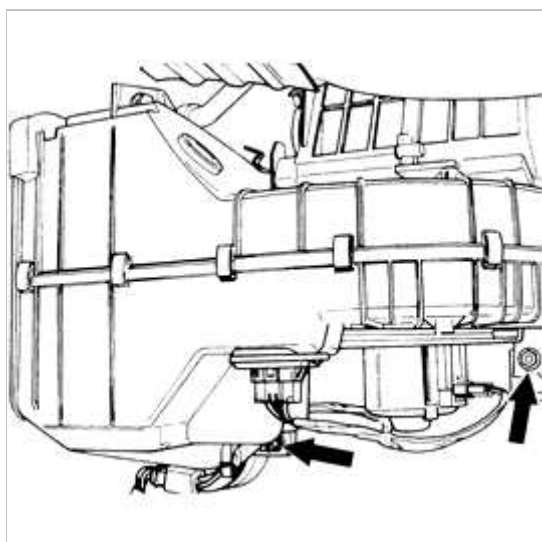


17. Disconnect the blower motor assembly electrical connectors.

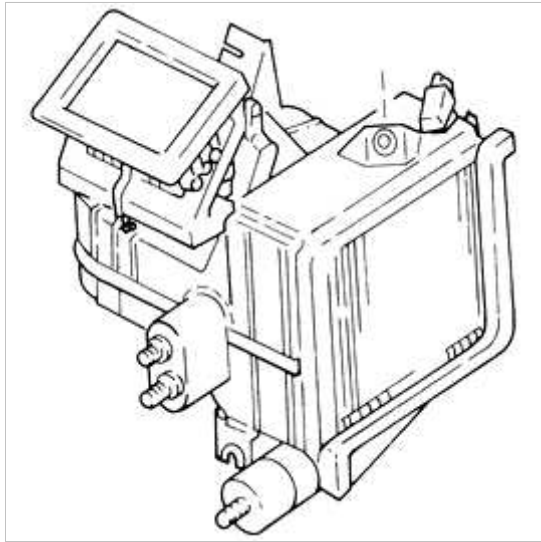
18. Pull carpeting away from floor board to gain access to the TCU cover.
19. Remove the four nuts holding the TCU cover to the bulkhead.
20. Remove the cover.



21. Remove the top two mounting bolts attaching the blower motor assembly to the bulkhead.
22. Remove the bottom two nuts attaching the bottom of the blower motor assembly to the bulkhead mounting studs.



23. Remove the blower motor assembly from the vehicle.



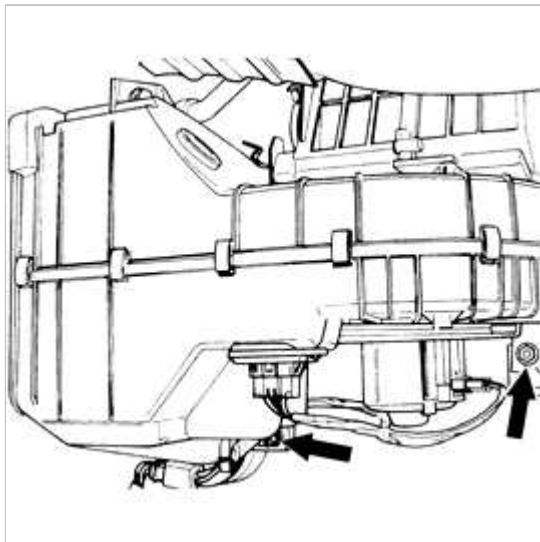
INSTALLATION

1. Check the mounting area for the blower motor assembly to make sure there are no wiring harness, connectors or cables that would prevent proper installation.
2. Position the blower motor assembly on the bulkhead and retain with two nuts and two bolts.

NOTE

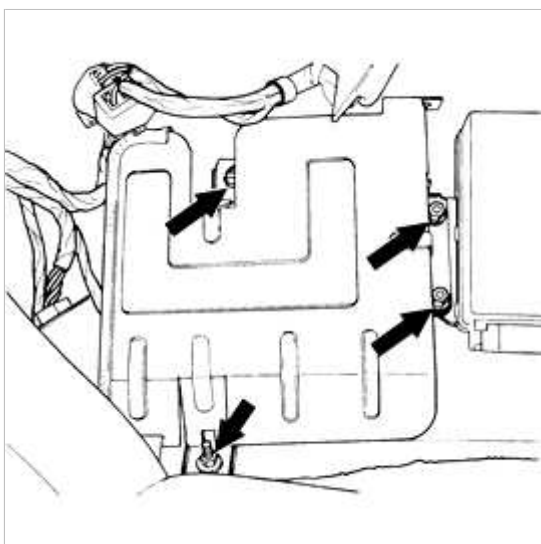
Over-tightening may cause the fresh air / recirculation door to bind.

Tighten nuts and bolts to 80 lb-in (9 N·m).

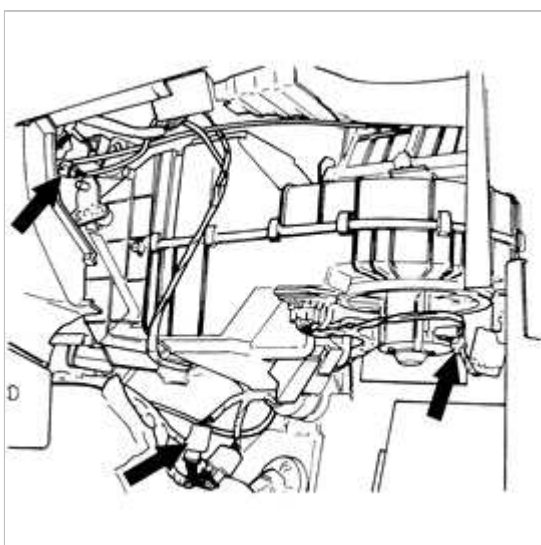


3. Install the cover using four nuts.

Tighten the four nuts to 80 lb-in (9 N·m).

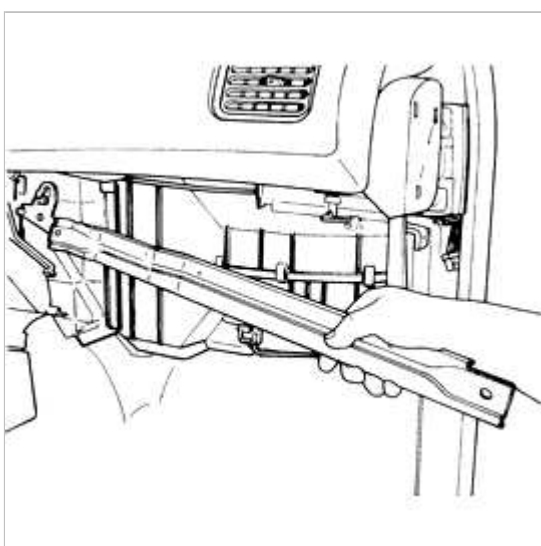


4. Connect the electrical connectors to the blower motor assembly.



5. Position the lower right hand section of the instrument panel lower support in place and attach using two bolts.

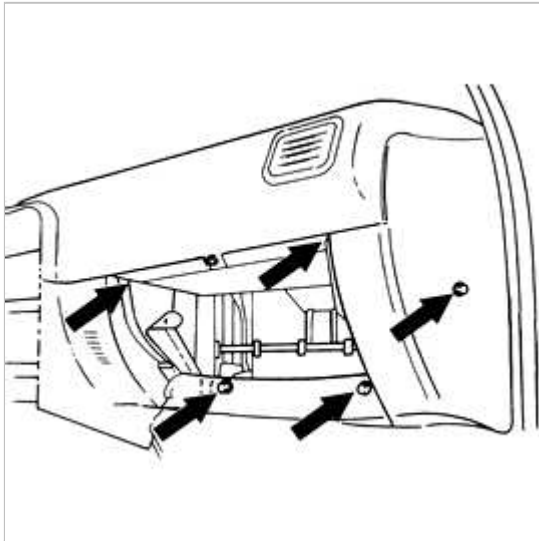
Tighten the two bolts to 80 lb-in (9 N·m).



6. Install the lower right hand instrument panel cover and secure the trim panel with five screws.

Tighten the five screws to 80 lb-in (9 N·m).

Do not over-tighten screws.

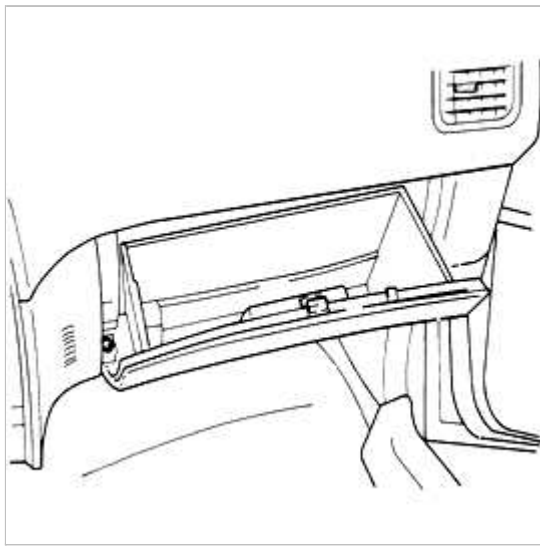


7. Position the glove box and secure using two screws.

Tighten the two screws to 80 lb-in (9 N·m).

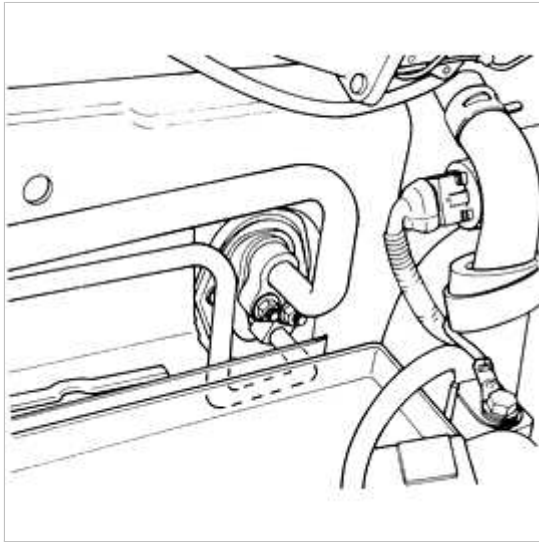
NOTE

Make sure there are no wires, connectors, or components pinched or pressured between the glove box and the dash panel.

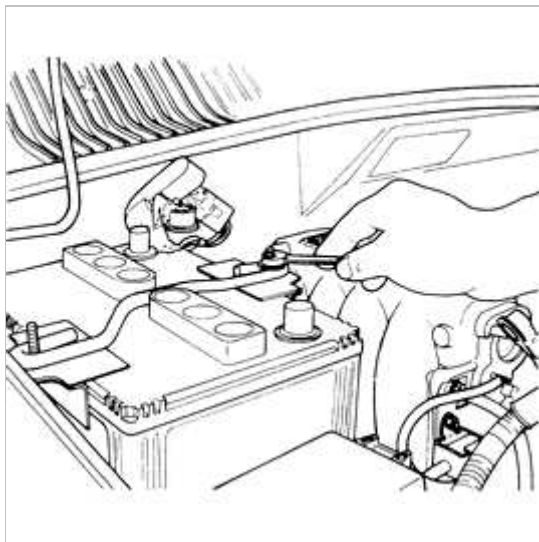


8. Install the evaporator / blower motor assembly drain hose.

9. Connect the A / C pressure and suction lines to the evaporator core.



10. Charge the A / C system with refrigerant in accordance with the charging instructions in this section.
11. Install the battery.
12. Attach the battery hold down.
13. Connect the positive and negative battery cables.
14. Remove wheel chocks.



Inspection

1. Inspect the blower / evaporator unit for wear or damage.
2. Evaluate the system with the following diagnostic guides.

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