

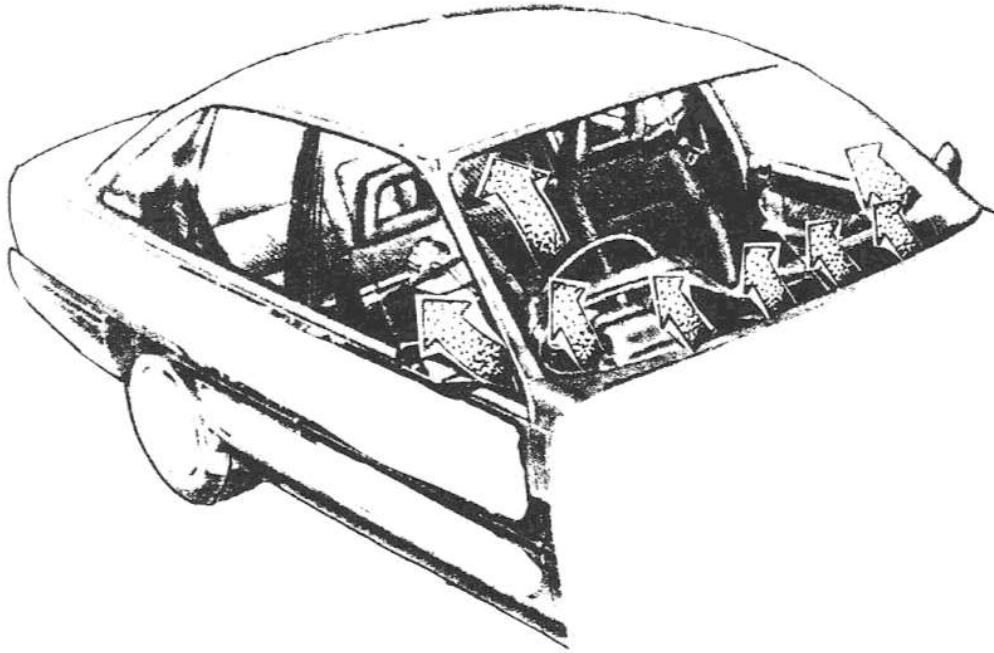
HEATING & AIR CONDITIONING

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HEATING

Air Flow

Cabin Air Flow



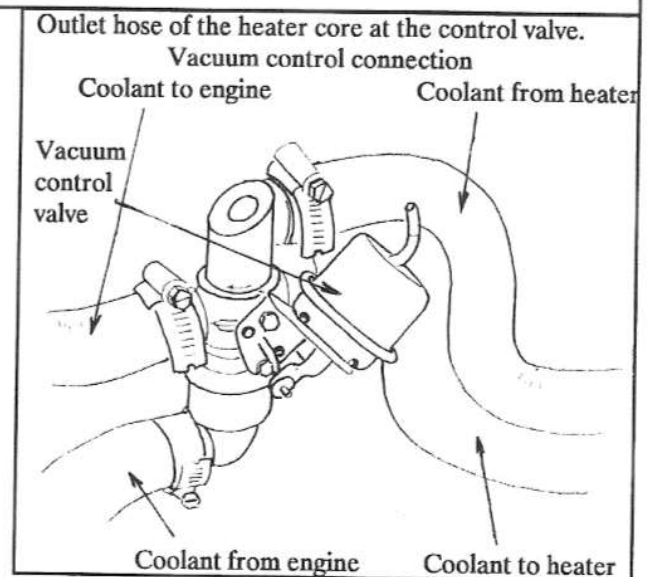
HEATER WATER VALVE

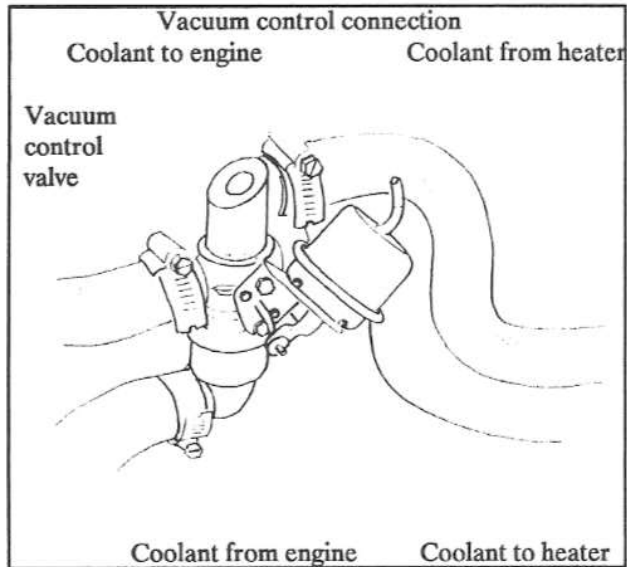
Remove

1. Remove the water hose from the engine block and allow the water to drain, remove radiator cap to help drain.
2. Remove the other heater valve hoses.
3. Remove the vacuum hose from the heater water valve.
4. Remove the water valve attaching bolt, remove the water valve.

Install

1. Replace the water valve attaching bolt securing the water valve to engine panel.
2. Replace the heater hoses and vacuum line to the water valve assembly.



BLEEDING AIR FROM HEATER CORE

1. Disconnect the heater core outlet hose at the heater control valve connection (top hose that leads to the heater control valve).
2. Any trapped air should be allowed to flow out.
3. Connect the hose to the heater control valve, when a continuous flow of coolant is obtained from the hose.

VACUUM TANK

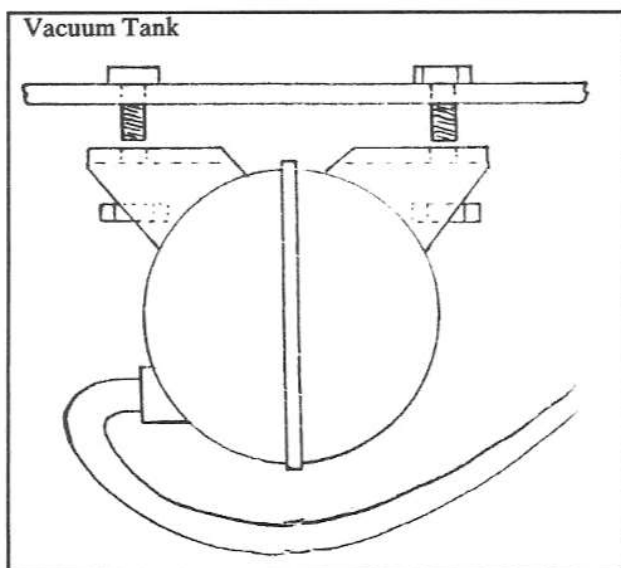
Located under the very front of the left side front fender.

Remove

1. Disconnect the vacuum hose to the vacuum tank.
2. Remove the 2 attaching bolts of the vacuum tank to the body panel.
3. Remove the vacuum tank, taking care not to allow dust or mud to enter the tank outlet or vacuum hose.

Install

1. Install the vacuum tank, taking care not to allow dust or mud to enter the tank outlet or vacuum hose.



2. Replace the 2 attaching bolts of the vacuum tank to the body panel.
3. Connect the vacuum hose to the vacuum tank.

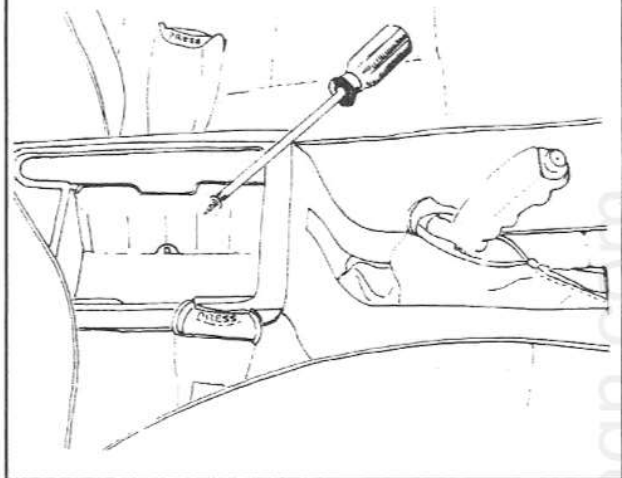
HEATER & AIRCONDITIONING CONTROL SWITCH**Remove.**

1. Remove the console attaching screws in the console storage compartment (under the carpet) with a phillips screw driver.

2. Automatic Transmissions:

With a screw driver unclip the top selector panel from under the centre dash panel and console, lift the

Remove the console attaching screws.



selector panel, twist around the gear lever "T" and remove.

Manual Transmission:

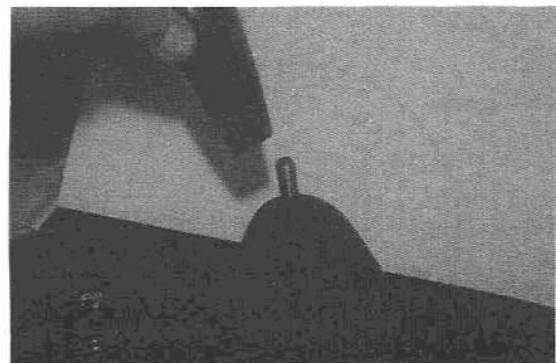
Unscrew the gear knob from the gear lever.

3. Pull the hand brake up as far as it will go, slide zip down.

4. Prise the console top section and attaching screws at the front of the console with a phillips head screw driver.

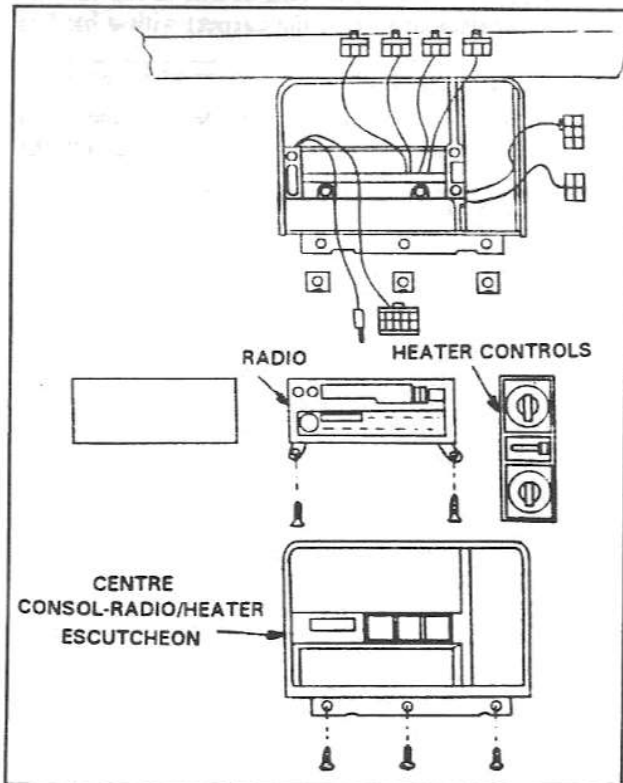
5. Disconnect any electrical connections that may be present for accessories and lights.

Manual Transmission: Unscrew the gear knob.



6. Carefully remove the centre console by lifting up at the rear to help clear the hand brake handle, then slide back and up to free console.

7. Remove the radio escutcheon (3 screws), remove the heater / airconditioner controls (1 screw) lift the escutcheon out enough to allow the wiring connectors to be removed from the controls.



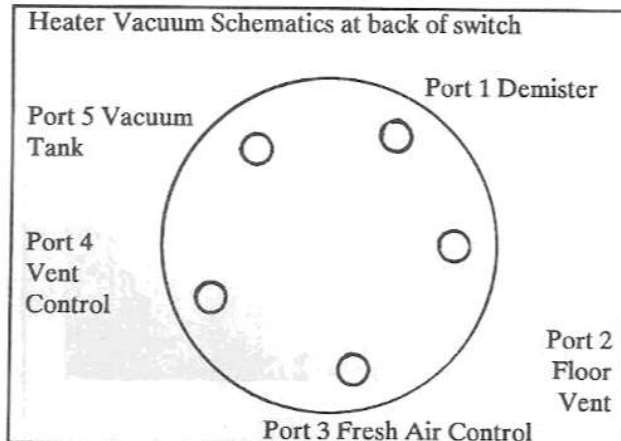
Remove the radio escutcheon by unclipping the side clip with a narrow blade screwdriver (slide the screw driver along the side of the escutcheon clip).

8. Remove the heater / airconditioner control panel by juggling it around the radio escutcheon.

9. Remove the vacuum hoses, label hoses and identify the vacuum ports which the particular hoses belong too. This is to help during installation of the heater control switch.

Install

Heater Vacuum Schematics at back of switch



1. Connect the heater / airconditioner wiring loom connectors and connect vacuum hoses, use the labels made during removal to identify the correct hoses for the ports.

2. Replace the radio escutcheon fitting the wiring connectors to the controls if removed. Replace the radio escutcheon by sliding the side clips into place. Replace the heater / airconditioner (1 screw) controls, radio escutcheon (3 screws) to the dash assembly.

3. Carefully lower and move the centre console forward over the handbrake handle.

4. Connect any electrical connections that are present.

5. Ensure the console is correctly positioned and insert the four attaching screws.

6. Install the carpet sections that were removed.

7. Automatic Transmission:

Fit the selector top panel over the gear lever "T" handle and clip into position.

Manual Transmission:

Ensure the plastic boot is properly located in the console moulding, fit the boot on the gear lever and screw the knob into place making sure that the writing is facing the correct way.

DASH PANEL ASSEMBLY

**** WARNING: De-activate air bag system before carrying out any work on steering column or dash - Page 317**

Remove

1. Disconnect the battery.

2. Remove the console attaching screws in the console storage compartment (under the carpet) with a phillips screw driver.

3. Automatic Transmissions:

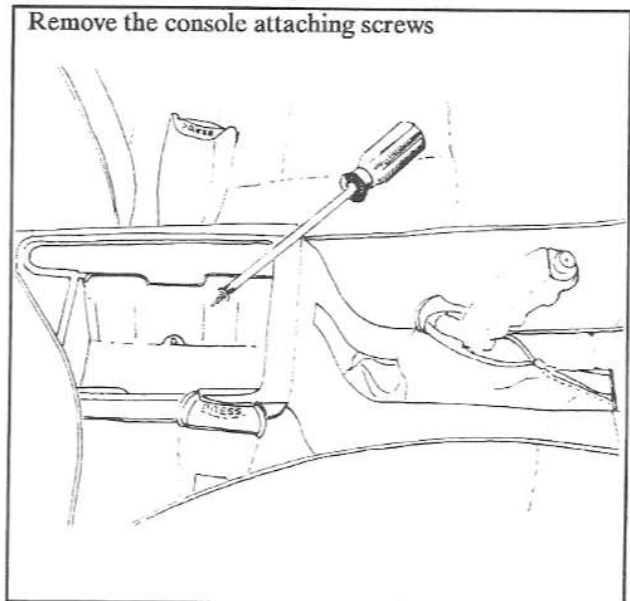
With a screw driver unclip the top selector panel from the under the centre dash panel and console, lift the selector panel, twist around the gear lever "T" and remove.

Manual Transmission:

Unscrew the gear knob from the gear lever.

4. Pull hand brake up as far as it will go, slide zip down.

Remove the console attaching screws



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5. Prise the console top section and attaching screws at the front of the console with a phillips head screw driver.

6. Disconnect any electrical connections that may be present for accessories and lights.

7. Carefully remove the centre console by lifting up at the rear to help clear the hand brake handle, then slide back and up to free console.

8. Remove radio escutcheon (3 screws), remove heater / airconditioner controls (1 screw) lift escutcheon out enough to allow wiring connectors to be removed from controls.

Remove the radio escutcheon by unclipping the side clip with a narrow blade screwdriver (slide the screw driver along the side of the escutcheon clip).

9. Remove the radio screws (2) securing the radio to the dash centre fascia then remove the radio and disconnect the radio wiring loom connector and antennai from radio.

10. Remove the lower right dash trim, remove the clips and studs securing the trim assembly to the instrument panel lower, from under the dash.

11. Remove the fuse panel.

12. Remove the steering column.

(a) Pull back steering shaft clamp boot and remove steering shaft clamp bolt, upper universal joint and coupling shaft.

(b) Detach column wiring at the multi-pin plugs, unscrew fuse panel and tie up out of way. Unplug stop light connectors from pedal assembly and tie out of way.

(c) Remove steering wheel and remove lower column cover screws and cover.

(d) i. Remove screw just above steering column, from dash panel to steering column mounting bracket.

ii. Remove 3 nuts securing the steering column.

(e) Remove the nuts securing the column support bracket to the pedal support bracket. Pull back on column to:

- remove column from pedal assembly.

- remove the top column cover.

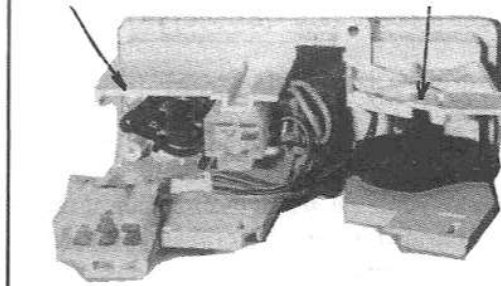
(f) Lower steering column on to seat.

14. Remove the screw attaching the dash panel to the sub assembly to the heater.

Back of heater control switch

Vacuum control

Fan switch



15. Remove the screw attaching the dash panel to the floor pan.

16. (a) Remove the demister moulding 2 piece, held by 4 screws (If vehicle has Electronic Climate Control it will be necessary to unplug the sun sensor that is in the demister panel).

(b) Remove the seal under the demister panels.

(c) Remove 4 plastic plugs into top of dash panel which held 4 demister moulding screws.

(d) Remove the seven screws from the top of the dash panel, into front of the windscreen.

17. (a) Remove air duct moulding from each end of the dash panel, 3 screws (2 at end, 1 lower) lift moulding up and remove.

(b) Remove screw in middle of dash end moulding.

(c) Remove the bolt into firewall panel at each end.

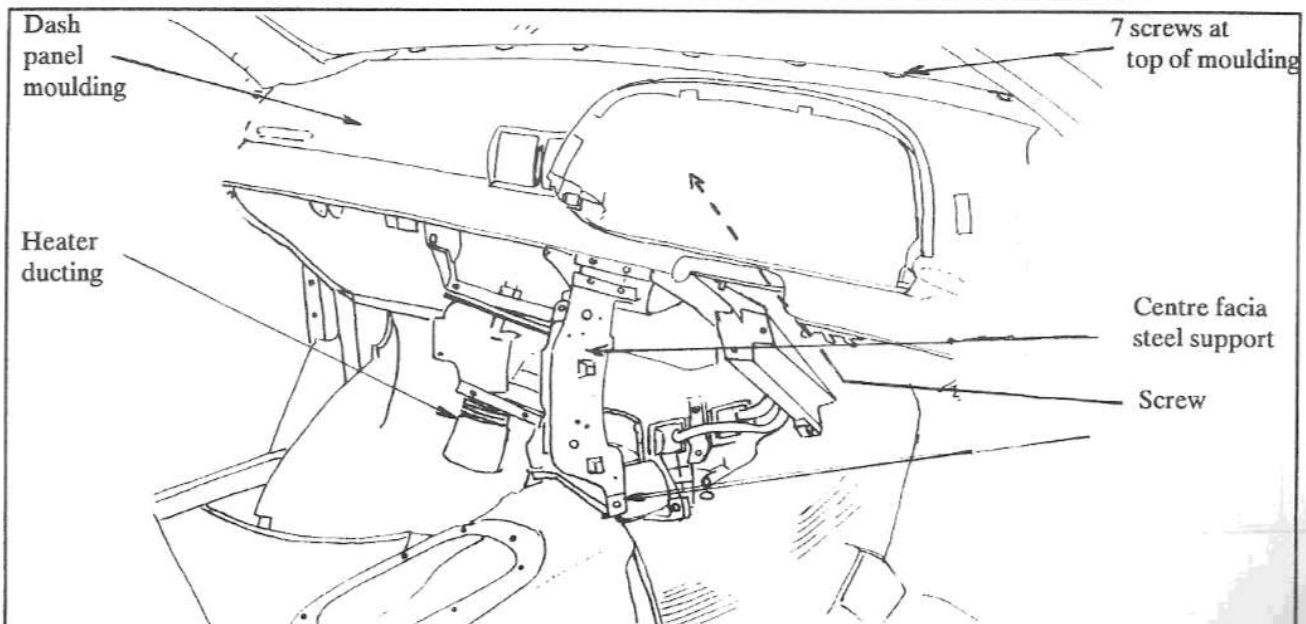
18. Remove the 2 screws attaching the instrument facia to the dash panel, pull out facia enough to disconnect the wiring looms, label to help installation of facia.

19. Remove the instrument cluster (2) attaching screws. Carefully withdraw the cluster as the cluster has slide in electrical connectors at the rear of the cluster, some clusters have one electrical push-in plug at rear of cluster.

20. At each end of the dash panel disconnect the heater ducts from the dash panel.

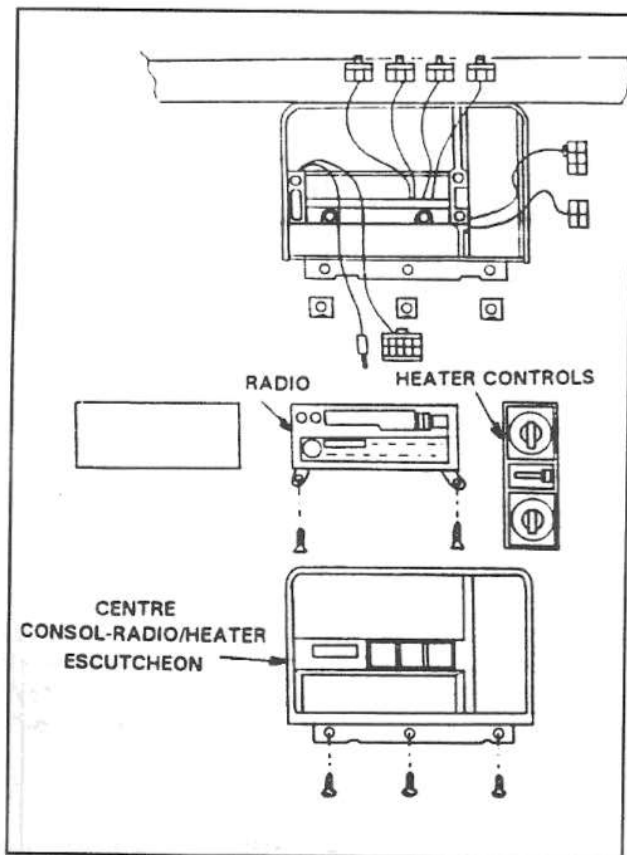
21. Pull the dash panel away from the body section to allow the disconnection of the wiring loom connections.

22. Lift the dash panel out of the vehicle.



Install

1. Position the dash panel into the vehicle.
 2. Lift the dash panel forward to the body section to allow the connection of the wiring loom connections.
 3. At each end of the dash panel connect the heater ducts to the dash panel.
 4. Carefully slide the instrument cluster into position as the cluster has slide in electrical connectors at the rear, some clusters have one electrical push-in plug at rear of cluster. Install the instrument cluster (2) attaching screws.
 5. Replace the instrument cluster facia, connecting the wiring looms, take note of removal labels. Install the 2 screws attaching the instrument facia to the dash panel.
 6. (a) Install the seven screws to the top of the dash panel, into front of the windscreen.
 - (b) Replace 4 plastic plugs into top of dash panel which hold the 4 demister moulding screws.
 - (c) Replace the seal which is under the demister panels.
 - (d) Install the demister moulding 2 piece, and 4 screws (If vehicle has Electronic Climate Control it will be necessary to plug in the sun sensor that is in the demister panel).
 7. (a) Install the bolt into firewall panel at each end.
 - (b) Replace screw in middle of dash end moulding.
 - (c) Replace air duct moulding to each end of the dash panel, 3 screws (2 at end, 1 lower) position moulding and push down to fit lower lug in.
- * Earth straps must be correctly located under the left hand side instrument panel mounting bolt.**
8. Install the screw attaching dash panel to the floor pan.



9. Install screw attaching dash panel to sub assembly to heater.

10. Install steering column assembly to the dash panel:
 - refit column to pedal assembly.
 - replace the top column cover.

(a) Replace the nuts securing the column support bracket to the pedal support bracket, tighten to specification.

Steering Column to Pedal Assembly Nut specified torque: 12-16Nm

(b) i. Replace screw just above steering column, dash panel to steering column mounting bracket.

ii. Replace 3 nuts securing the steering column tighten to specification.

Steering Column Securing Nuts spec torque: 12-16Nm

(c) Replace steering wheel and lower column cover and screws. Tighten steering wheel nut to specification.

Steering Wheel Nut specified torque: 20-22Nm

(d) - Plug stop light connectors to pedal assembly.

- Untie fuse panel and screw into position.

- Reconnect column wiring at the multi-pin plugs.

(e) Pull back steering shaft clamp boot and replace steering shaft clamp bolt, upper universal joint to coupling shaft if removed.

Steering Shaft Upper Coupling Bolt specified torque:

23-30Nm

11. Replace the fuse panel and any relays removed.

12. Install the lower right dash trim, replace the clips and studs securing the trim assembly to the instrument panel.

13. Connect the radio wiring loom connector and antenna to radio. Replace radio install the radio screws (2) securing the radio to the dash centre facia.

14. Replace the radio escutcheon fitting the wiring connectors to the controls. Replace the radio escutcheon by sliding the side clips into place. Replace the heater / airconditioner (1 screw) controls, radio escutcheon (3 screws) to the dash assembly.

15. Carefully lower and move the centre console forward over the handbrake handle.

16. Connect any electrical connections that are present.

17. Ensure the console is correctly positioned and insert the four attaching screws.

18. Install the carpet sections that were removed.

19. **Automatic Transmission:**

Fit the selector top panel over the gear lever "T" handle and clip into position.

Manual Transmission:

Ensure the plastic boot is properly located in console moulding, fit boot over gear lever and screw the knob into place making sure that the writing is correctly positioned.

20. Connect the battery earth cable.

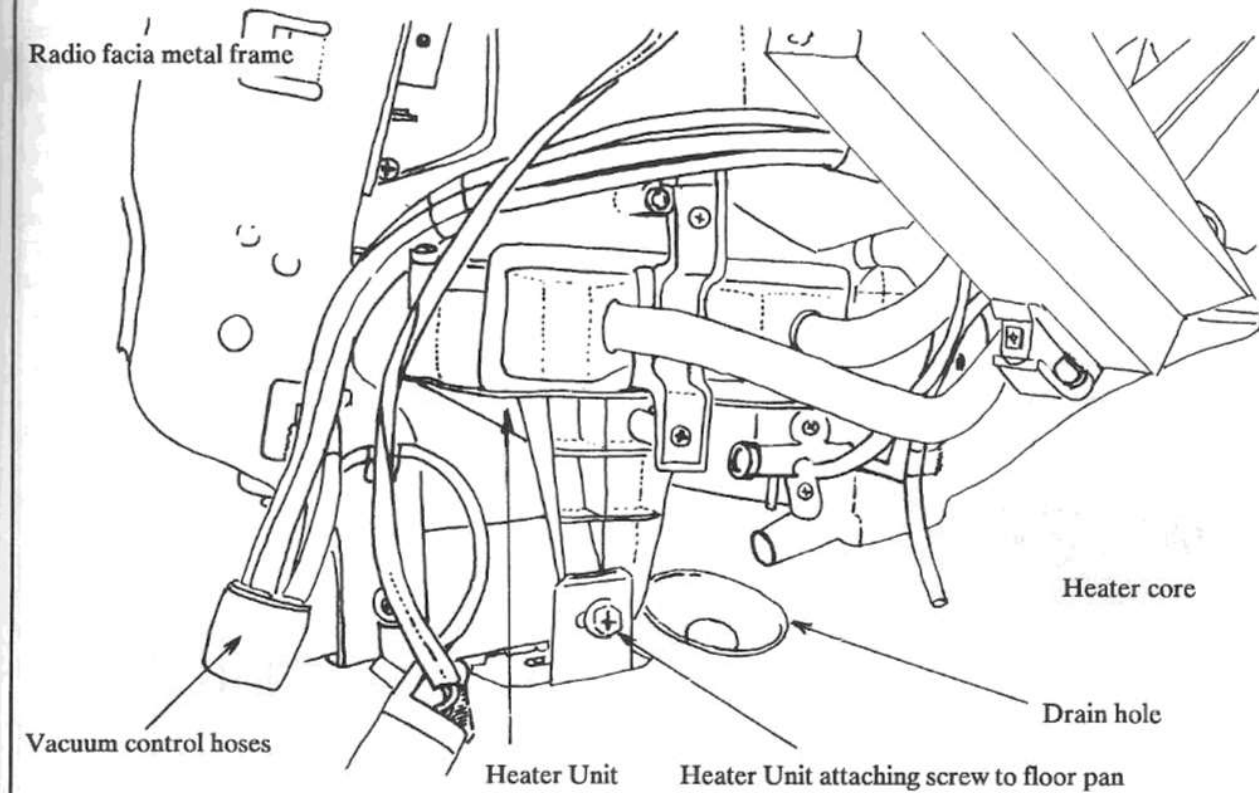
HEATER UNIT**Remove**

1. Drain sufficient coolant from radiator so as coolant will not flow into the vehicle.

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Heater unit in dash panel shell as seen from drivers side



2. Remove the instrument panel as previously described in this chapter.

3. Disconnect both coolant hoses from the heater core.

4. Disconnect electrical wiring connectors to the fan etc.

5. Remove the vacuum hoses, label hoses and identify the vacuum ports which the particular hoses belong too. This is to help during installation of the heater control switch.

6. Remove the screws attaching the vents and demister ducting, and remove these items.

7. Remove the four (4) screws securing the heater case.

8. Remove the heater assembly from the dash panel and vehicle.

Install

1. Position the heater assembly into the vehicle and up to the front panel and fasten the heater with the four washers and screws.

2. Connect the heater / airconditioner wiring loom connectors and connect vacuum hoses, use the labels made during removal to identify the correct hoses for the ports.

3. Connect the water hoses.

4. Install the instrument panel as described earlier in this chapter.

6. Top up radiator with specified coolant.

Specified Coolant:

V6 Engines: HN2043 eg. Tectaloy VPlus +

V8 Engines: HN2043 eg. Tectaloy VPlus +

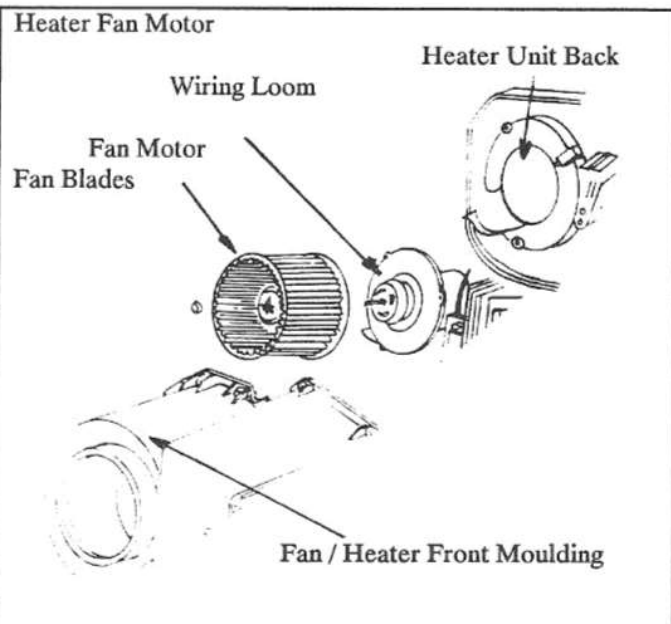
7. Bleed the heater system of any air locks, as described earlier in this chapter.

8. Check the operation of the heater.

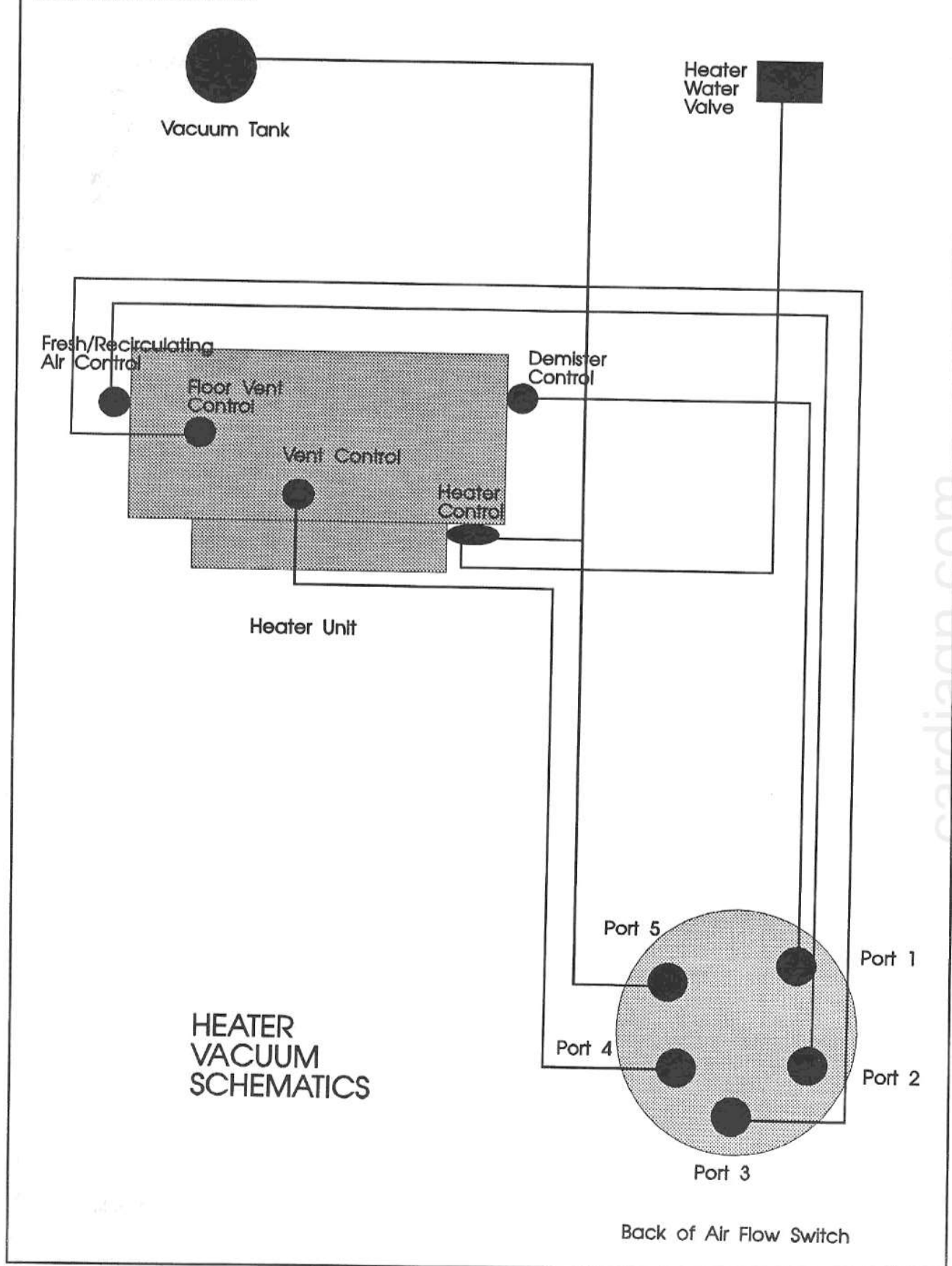
FAN MOTOR ASSEMBLY**Remove**

1. Drain sufficient coolant from the the radiator so as coolant will not flow into the vehicle.

2. Remove the instrument panel and move back for access to heater assembly as described in this chapter.



VACUUM SCHEMATICS



3. Label wiring connectors and vacuum fitting to assist in assembly. Detach the fan motor wiring connectors and detach the hoses from the vacuum motor on the footwell.

4. Remove the screws attaching the vents and demister ducting, and remove these items.

5. Remove the four (4) screws securing the heater case to the front panel.

6. Remove the heater assembly back into the vehicle to enable access to the heater.

7. Remove the 3 screws securing the fan and fan motor to the heater case.

Install

1. Secure the motor to the heater case. Push the fan fully onto the motor shaft and install the 3 securing screws.

2. Install the heater assembly back into the vehicle up to the front panel.

3. Replace the four (4) screws securing the heater case to the front panel.

4. Install the vents and demister ducting.

5. Connect the heater / airconditioner wiring loom connectors and connect vacuum hoses, use the labels made during removal to identify the correct hoses for the ports.

6. Connect the water hoses.

7. Install the instrument panel as described earlier in this chapter.

8. Top up radiator with specified coolant.

Specified Coolant:

V6 Engines: HN2043 eg. Tectaloy VPlus +

V8 Engines: HN2043 eg. Tectaloy VPlus +

9. Connect the earth cable to the battery and check operation of heater and fan assembly.

HEATER CORE AND PIPE

Remove

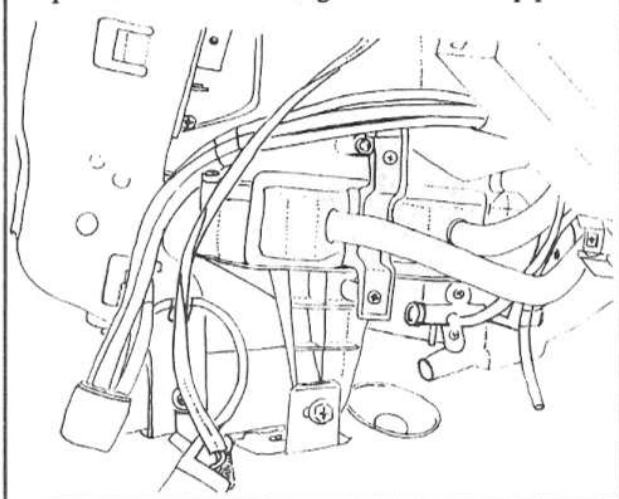
1. Remove the dash assembly as described above.

2. Remove the heater assembly as described above.

3. Disconnect the heater ducting and remove from vehicle.

4. To remove the heater core and pipes the screws holding the heater core pipes to the heater case assembly must be removed.

Replace the screws securing the heater core pipes



Install

1. Install heater core and pipes taking care not to damage the sealing strips and heater core.

2. Connect the heater ducting to the heater assembly.

3. Replace the heater assembly as described above.

4. Install dash assembly as described above.

PROBLEM SOLVING AND DIAGNOSIS

HEATING TROUBLE DIAGNOSIS GUIDE

Condition - Insufficient, Erratic, No Heat or Demist

CAUSE: Low radiator coolant due to coolant leaks.

ACTION: Check supply tank cap pressure. Replace if below minimum pressure. Fill to level. Pressure test for engine cooling system and heater system leaks. Service as required.

CAUSE: Low radiator coolant due to engine overheating.

ACTION: Remove bugs, leaves, etc. from radiator or condenser fins. Check for: Loose drive belt, sticking thermostat, incorrect ignition timing, water pump impeller damage, and restricted cooling system. Service as required.

CAUSE: Loose drive belt.

ACTION

Replace if cracked or worn and/or adjust belt tension.

CAUSE: Thermostat.

ACTION: Check coolant temperature at supply tank. If under 77 degrees celsius replace thermostat.

CAUSE: Plugged or partially plugged heater core.

ACTION: Clean and backflush engine cooling system and heater core.

CAUSE: Loosely or improperly adjusted control cables.

ACTION: Adjust to specifications.

CAUSE: Vacuum hoses crossed, collapsed, or kinked.

ACTION: Check to see if door vacuum motors respond properly to movements of the Control Knobs. Visually check vacuum hoses, and service as required.

CAUSE: Air flow control doors sticking or blinding.

ACTION: Check if door vacuum motors or cable operated blend door respond properly to movements of Control Knobs. Detach vacuum motor arm from door crank arm and move crank arm by hand, if hesitation in movement is noticed. Repair sticking or binding door as required.

CAUSE: Vacuum motor diaphragm or hose leaks.

ACTION: Detach each multiple vacuum connection from the switch and check each connector opening with hand operated vacuum pump. If one line leaks vacuum, test motor by itself prior to replacing. Service vacuum hose(s), or replace vacuum motor as required.

***It is normal for the orange line not to hold vacuum unless the engine temperature is greater than 101°C.**

Turquoise and black lines have multiple terminations.

CAUSE: Ticking heater water valve.

ACTION: Vacuum check with hand vacuum pump. Replace if required.

CAUSE: Kinked, clogged, collapsed, soft, swollen, or decomposed engine cooling system or heater system hoses.

ACTION: Replace damaged hoses and backflush engine cooling system, then heater system, until all particles have been removed.

CAUSE: Blocked air inlet.

ACTION: Check cowl air inlet for leaves, foreign material, etc. Remove as required.

Condition - Too Much Heat

CAUSE: Loose or improperly adjusted control cables.

ACTION: Adjust as specified.

CAUSE: Sticking water valve.

ACTION: Vacuum check with hand vacuum pump. Replace if required.

CAUSE: Vacuum not available to close water valve.

ACTION: Check vacuum system with hand vacuum pump from control connector (turquoise line). Service tubing, or replace damaged component as required.

Condition - Air Flow Changes Direction When Vehicle is Accelerated

CAUSE: Vacuum system leak.

ACTION: Check vacuum system with hand vacuum pump for the switch connector. Service tubing, or replace damaged components as required.

CAUSE: Faulty vacuum check valve.

ACTION: Replace.

TEST

LOOSE MOTOR FAN TEST

Turn on the fan switch, if only a hum is heard, the fan is loose on the motor.

BLOWER SWITCH TEST

Substitute a blower switch for the suspected switch.

PLUGGED HEATER CORE TEST

Make certain the control knob is set at 'HOT'. Temporarily remove the outlet hose from the heater core (the hose may be detached from the heater in engine compartment), whilst the engine is running.

HEATER WATER VALVE TESTS

Prior to testing, check for proper coolant level, coolant temperature, and drive belt tension. Also check for coolant leaks or plugged hoses or heater core. Correct any defects before proceeding with the tests.

VACUUM TESTS

1. Disconnect the vacuum line and attach a vacuum pump to the vacuum switch connection.

2. The arm of the vacuum motor should move freely in both directions without sticking, when the vacuum is applied and released.

3. Make sure there is full travel of the arm. This can be checked by pushing the arm manually to make sure the valve is fully seated.

4. Check for any possible leak of the vacuum diaphragm.

5. The motor should be replaced if it does not operate as described.

VACUUM HOSE & CONNECTION TESTS

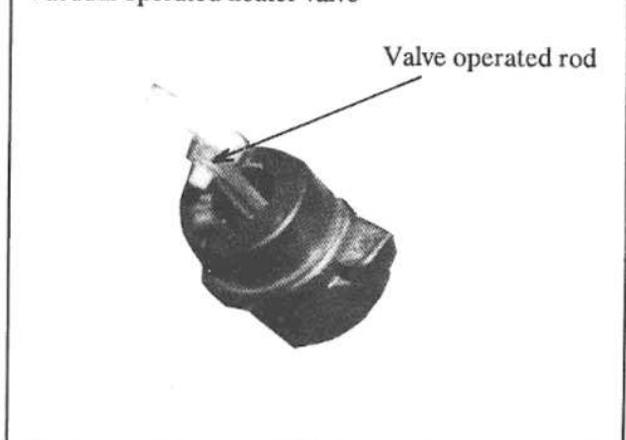
Start the engine and move the control knobs slowly from one position to another, to test the A/C-heater control system. As a control knob is moved from one position to another a momentary hiss should be heard indicating that vacuum is available at the switch assembly. A continuous hiss indicates that there is a leak somewhere in the system. This does not necessarily indicate that the leak is at the switch assembly.

Check for a kinked, pinched or disconnected vacuum supply hose, if a momentary hiss cannot be heard when a control knob is moved from one position to another. **Inspect the check valve between the intake manifold and the vacuum reservoir to be sure it is working properly.**

Vacuum is available at the switch assembly, if a momentary hiss can be heard when a control knob is moved from one position to another. With the blower on HI, cycle the switch through each position and check the location(s) of the discharge air. The air flow schematic and vacuum control chart gives the vacuum motors applied for each position of a control switch along an air flow system. The air flow diagram shows the position of each door when vacuum is applied and, their "no" vacuum position. The air flow for each position of a control switch can be determined with the chart. If a vacuum motor fails to operate, the motor can be readily found because the air flow will be incorrect.

Check the operation of the motor with a vacuum pump, if the vacuum motor is inoperative. The vacuum hose is probably pinched, kinked, disconnected or has a hole in it if the vacuum motor operates properly.

Vacuum operated heater valve



AIR CONDITIONING

GENERAL INFORMATION

The following information provides basic service operations for the air conditioning system, including the compressor.

REFRIGERANT CIRCUIT

The refrigerant circuit below is schematic of the major components.

A compressor, condenser, expansion tube, evaporator, and an accumulator.

The engine RPM is higher on air conditioned models so as not to drop to low at idle during system operation. When the ignition is turned off and the air conditioning has been operating, a faint sound of liquid flowing for 30-60 seconds maybe heard. This is the refrigerant in the system continuing to flow until high side and low side pressures equalize.

SERVICE OPERATIONS

COMPRESSOR BELT TENSION & ADJUSTMENT

V8 Engine

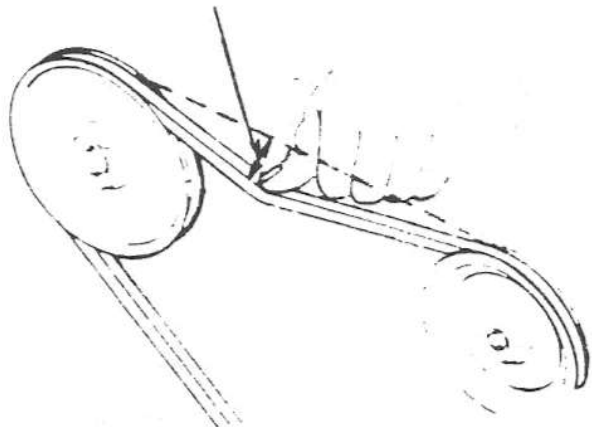
Inspect the condition of the air compressor belt.

COMPRESSOR DRIVE BELT TENSION

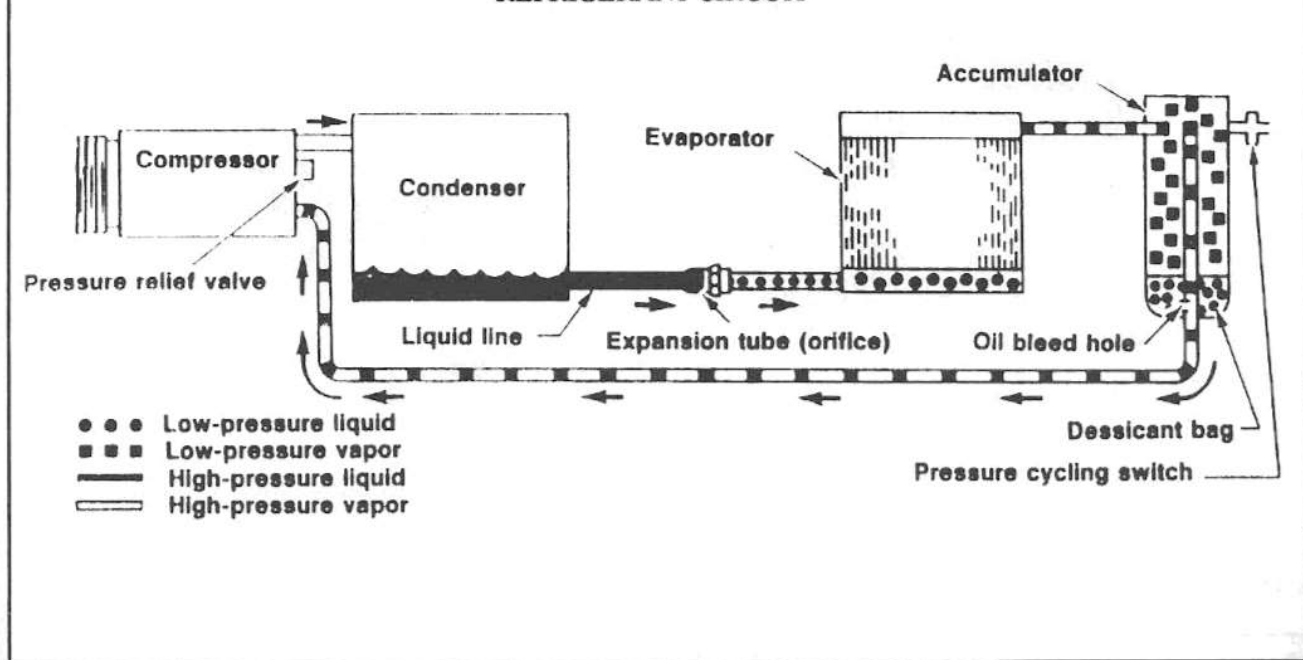
NEW		USED	
*8-10 MM	64kg	*9-11 MM	43kg

* Belt deflection in mm when a force is applied in the area shown in diagram.

Apply a thumb pressure of 100n (10kg) to the mid point of the longest convenient span of the belt.
Belt Deflection

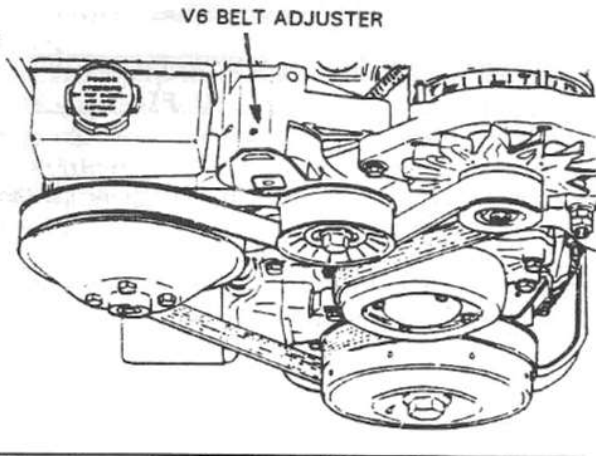


REFRIGERANT CIRCUIT



ADJUST.**V6 Engine:**

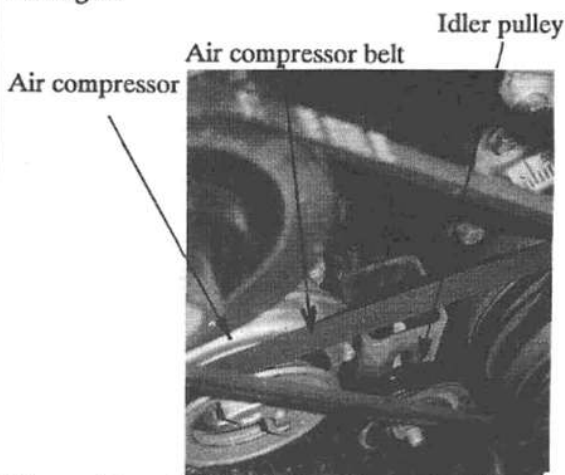
Automatic tensioner should take into consideration belt wear.

VR - V6 Engine:

Turn the automatic adjuster idler pulley mounting stud to adjust tension. Check belt wear reference marks on tensioner. Install a new belt if tension is not within reference marks.

V8 Engine:

Using a ring spanner or socket, loosen off the compressor idler pulley assembly. Pull on the idler pulley to tighten the belt, tighten the compressor idler pulley nut.

V8 Engine

Idler pulley adjusting bolt at bottom of idler pulley bracket.

Torque idler pulley nut to 25-35 Nm when the correct tension has been achieved.

COMPRESSOR

* Where a failure has occurred that may have resulted in foreign material in the system, the system must be flushed using Refrigerant R-11.

* All compressor removal and install operations, except belt replacement, can be performed only after the unit has been discharged.

Storage of compressor

The port protection plate should be fitted to keep compressor free from moisture and foreign material if it is necessary to store a serviced compressor.

Remove

1. Discharge the air conditioning service system, and remove refrigerant lines from compressor.
2. Loosen compressor mounting bolts, belt adjuster, remove drive belt and disconnect electrical connector.
3. Remove compressor mounting bolts and remove compressor from the vehicle.

Install

1. Install new compressor and fit drive belt. Torque compressor mounting bolts to specification.
2. Adjust drive belt to specification with idler pulley. Install refrigerant hoses, and connect clutch wire.
3. Charge the air conditioning system.

COMPRESSOR OIL LEVEL

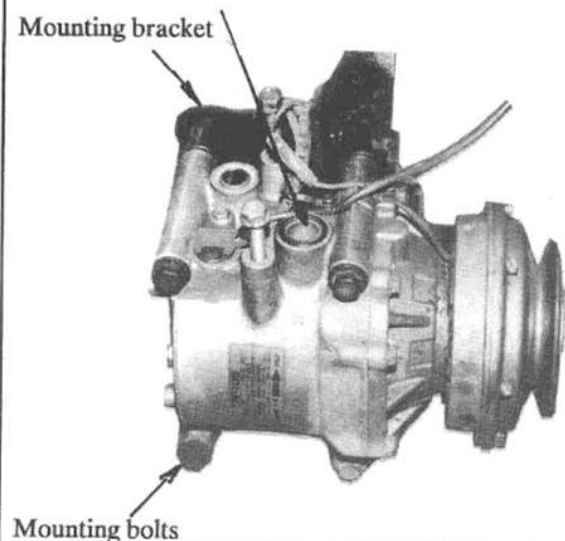
The compressor has a specified oil and only this oil should be used when adding or changing oil.

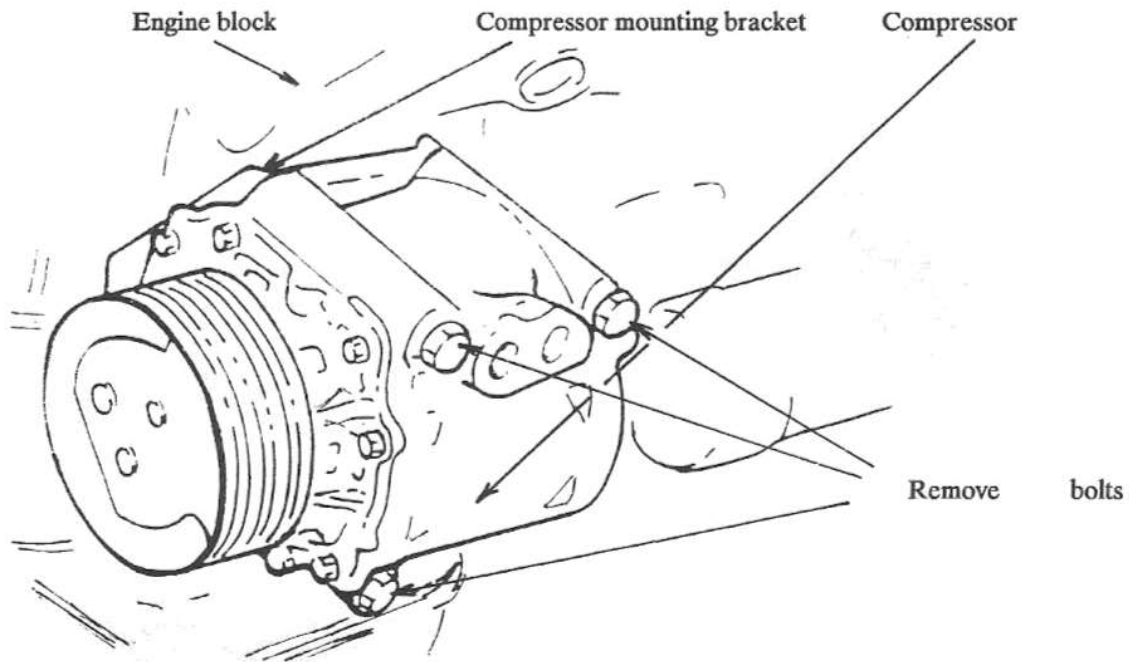
Compressor Specified oil: Suniso 5GS

Compressor Specified oil capacity: 200cc **

Compressor oil level is not a routine type of maintenance check and this would only occur when a break down of the air conditioning system has occurred, thus resulting in oil spillage from broken component or hose fracture.

1. The compressor must be removed to allow a through inspection.
2. Remove the compressor oil return hose, allow all oil to drain into a container. Measure the amount of oil drained, this will help in determining the possible fault of the air conditioning unit.

Check compressor oil level

Remove Compressor

3. Once all oil has drained from the compressor flush any excess oil using a commercial air compressor flushing fluid.

4. Add oil to the compressor as detailed below.

5. Replace O ring seals to the suction hose. Tighten the hose connections to specification.

Hose Connections specified torque: 20-30 Nm.

6. Install the compressor.

COMPRESSOR OIL REPLACEMENT

Some oil is lost whenever air conditioning system components are replaced.

Sanden Compressor:

**** If the oil drained from the compressor measures less than 110ml replace 120ml of new oil in the replacement compressor.**

Do not replace more than 120ml of new oil even if more than 120ml was removed from the compressor.

Compressor Specified oil: Suniso 5GS

Compressor Specified oil capacity: 200cc **

REFRIGERANT (A/C) LINES**Removal**

1. Discharge the refrigerant from A/C system following recommended EPA procedure, observing safety precautions.

2. Remove the A/C line using a back-up spanner on each fitting.

Install

1. Install new A/C line with protective caps installed.

2. Using new O-rings lubricated with clean refrigerant oil, connect the A/C line into the system. Use two wrenches when tightening the fittings to specification.

3. To check for leaks, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

COMPRESSOR CLUTCH PULLEY & CLUTCH**Remove**

1. Place compressor into a vice and secure.

2. *V6 only*

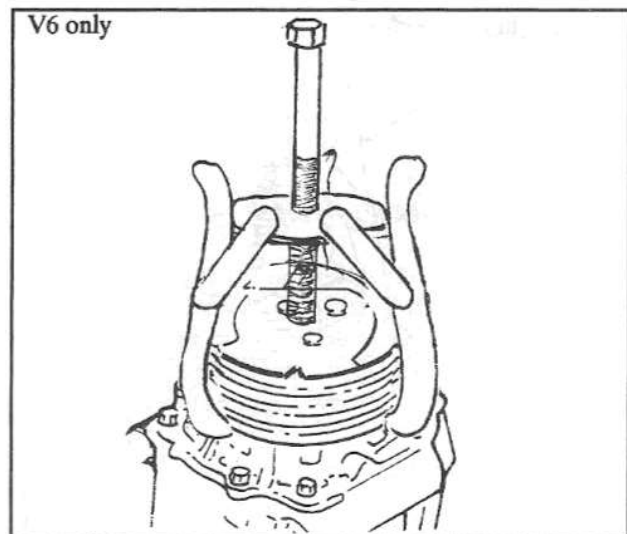
Secure clutch with 3 prongs of pulley securing tool, remove the clutch bolt with 8mm ring spanner.

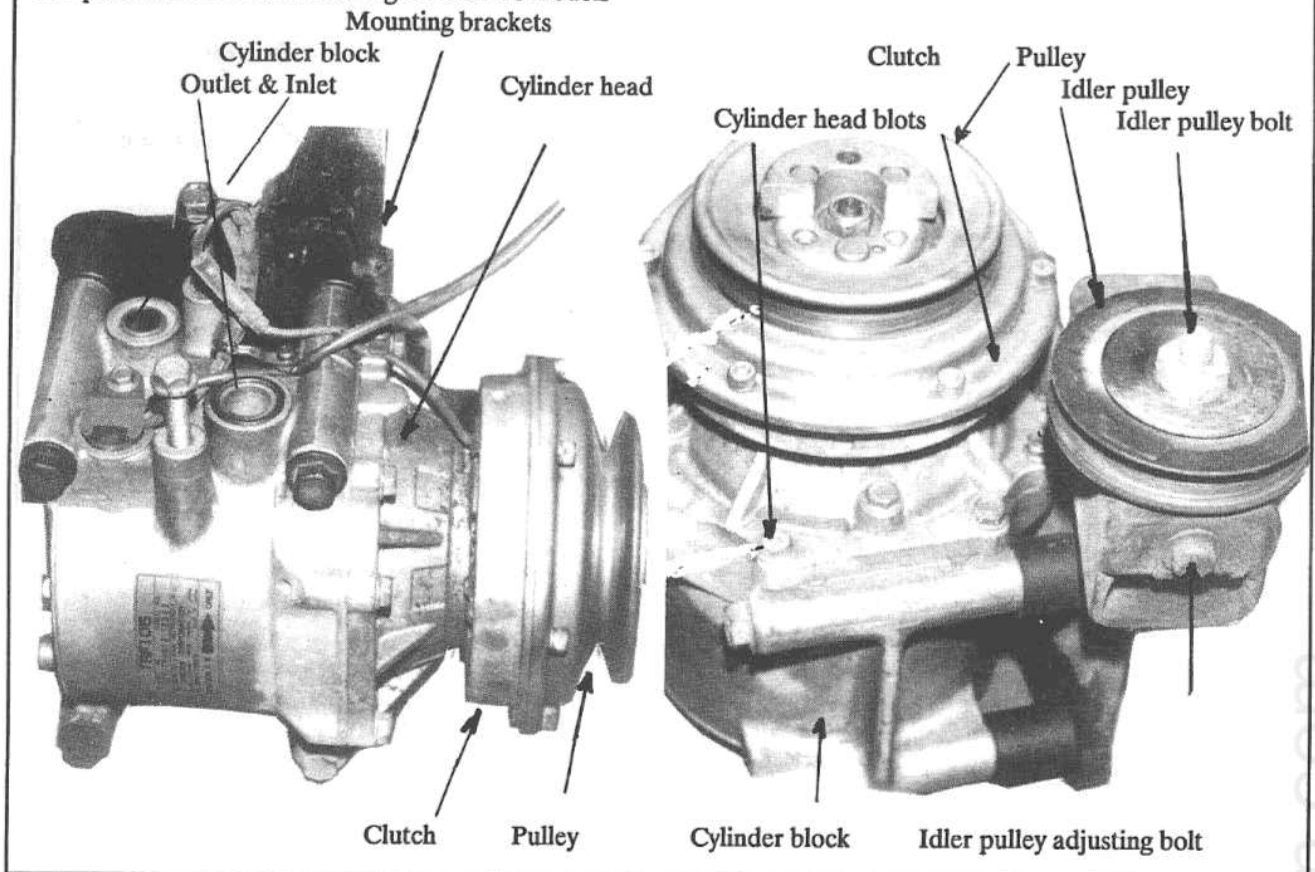
V8 only

- Secure the clutch with a prong of pulley securing tool into the hole in the clutch.

- Remove the 6 clutch pulley screws with a 4mm Allenkey.

V6 only



Compressor for Air Conditioning Unit on V8 models

- Secure clutch with 3 prongs of pulley securing tool, remove the clutch bolt with 14mm ring spanner.
- 3. Use a pulley remover to remove the clutch pulley.
- 4. Remove adjusting shims, remove the clutch rotor circlip.

5. Remove the clutch rotor, use a pulley remover if necessary.

6. Remove the clutch coil if required.

Install

1. Install the clutch coil if the coil was removed, tighten wire with a phillips screw driver.

2. Replace the clutch rotor and the securing circlip.

3. Install the clutch pulley, however there must be an air gap between the pulley and rotor, use adjusting shims between the circlip and pulley to achieve specified air gap.

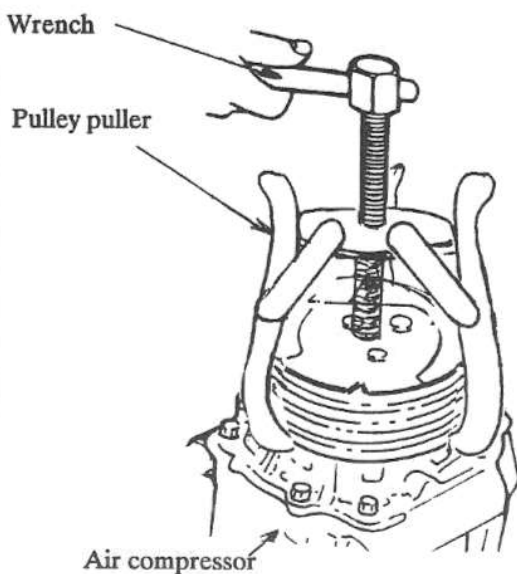
Clutch Pulley air gap specification: 0.40-0.65mm

4. Secure clutch with 3 prongs of pulley securing tool, tighten the [V6 clutch bolt with 8mm] [V8 clutch nut with 14mm] ring spanner to specification.

V8 Clutch Pulley nut specified torque: 1.8 kgm

V6 Clutch bolt specified torque: 1.0 kgm

5. V8 Replace the 6 clutch pulley screws with a 4mm Allen key.

Compressor Clutch Removal**HEATER UNIT - EVAPORATOR CORE****Remove**

1. Discharge refrigerant from air conditioning system.
2. Remove the dash assembly as described in heater section.
3. Disconnect the heater ducting and remove from vehicle.

4. Remove the air conditioner/heater assembly as described in heater section. Taking care not to damage the thermostat (held by 2 screws) and thermostat capillary tube.

5. Heater Core

To remove the heater core and pipes the screws holding the heater core pipes to the heater case assembly must be removed.

Air Conditioner Evaporative Core

Remove the 8 screws holding the fan to the heater case, remove the fan assembly.

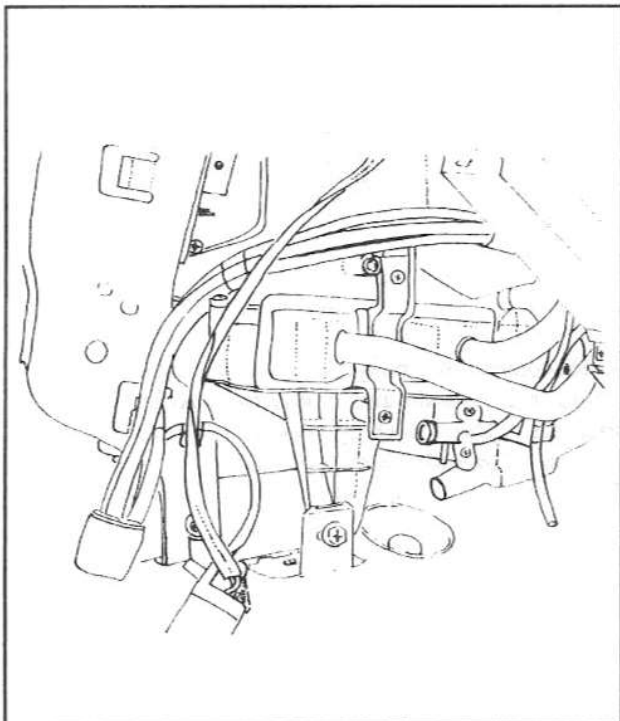
Remove the heat shield that is screwed to the heater / evaporator case.

Remove the evaporator core.

Install

1. Heater Core

Install heater core and pipes taking care not to damage the sealing strips and heater core.



Air Conditioner Evaporative Core

Install the evaporator core.

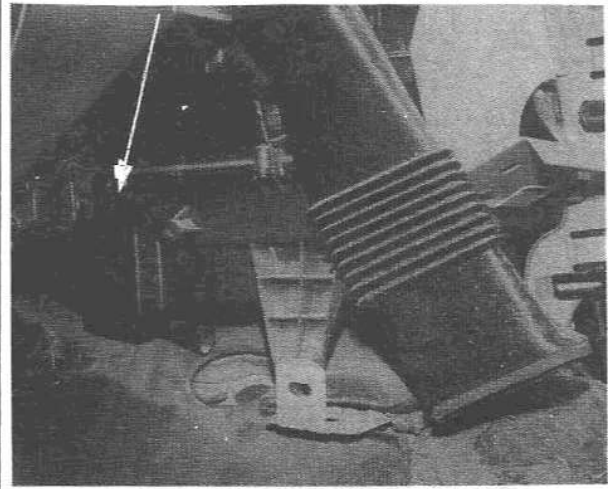
Replace the heat shield that is screwed to the heater / evaporator case.

Install the fan assembly, replace the 8 screws holding the fan to the heater case.

2. Connect the heater ducting to the heater assembly.
3. Replace the heater assembly as described in the heater section. Taking care not to damage the thermostat (held by 2 screws) and thermostat capillary tube.
4. Install dash assembly as described in heater section.

THERMOSTAT

The thermostat sensor or capillary tube is attached to the evaporative core.



* The position of the thermostat capillary tube determines the temperature setting of the air conditioning system.

Remove

1. The thermostat sensor or capillary tube is attached to the evaporative core.

2. Remove the 2 screws attaching the thermostat, detach the wiring and remove the thermostat, gently pull the thermostat and capillary tube from the evaporator core and the case.

Install

* The position of the thermostat capillary tube determines the temperature setting of the air conditioning system.

1. Locate the capillary tube in the heater / air conditioner case, ideally through the evaporative core.

* The capillary tube loop should be in a horizontal plane, at an angle of 45 degrees to the centre line of the vehicle and a minimum of 60 mm through the hole in the case. Seal the capillary tube to the case with the body sealer.

2. Replace the 2 screws attaching the thermostat, and connect the wiring.

VACUUM TANK

Located under the very front of the left side front fender.

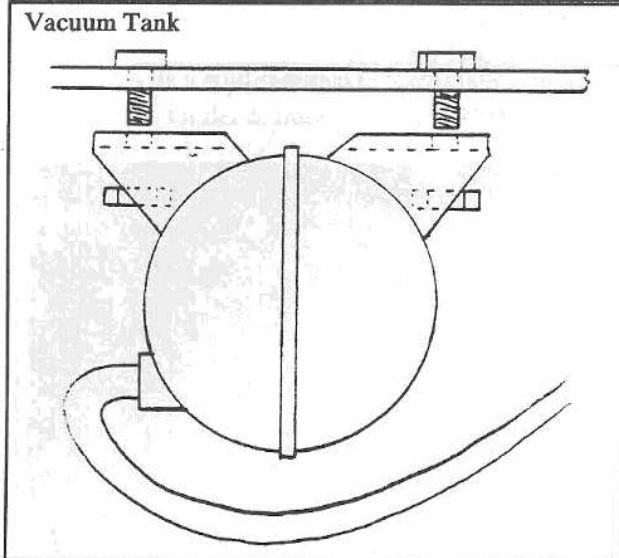
Remove

1. Disconnect the vacuum hose to the vacuum tank.
2. Remove the 2 attaching bolts of the vacuum tank to the body panel.
3. Remove the vacuum tank, taking care not to allow dust or mud to enter the tank outlet or vacuum hose.

Install

1. Remove the vacuum tank, taking care not to allow dust or mud to enter the tank outlet or vacuum hose.

Vacuum Tank



2. Remove the 2 attaching bolts of the vacuum tank to the body panel.
3. Disconnect the vacuum hose to the vacuum tank.

CONDENSER

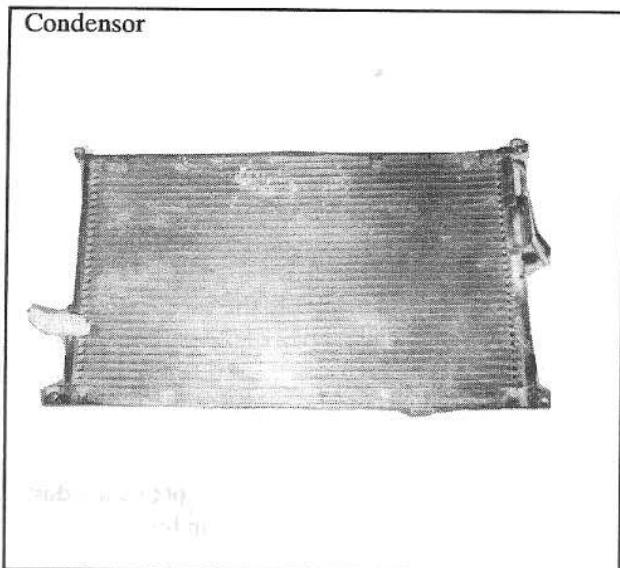
Remove

1. Discharge the refrigerant system and remove the radiator grille and front bumper bar as described in Body chapter.
2. On vehicles fitted with a transmission cooler, remove transmission oil cooler. Remove the attaching bolts and position the transmission oil cooler clear of working area.
3. Disconnect the refrigerant lines from the condenser and upper and lower connections at side of condenser. (Use a back up spanner to prevent damage when loosening and tightening fittings).
4. Remove the two attaching bolts, pull down and out to detach the condenser.

Install

1. Install the condenser to the vehicle.

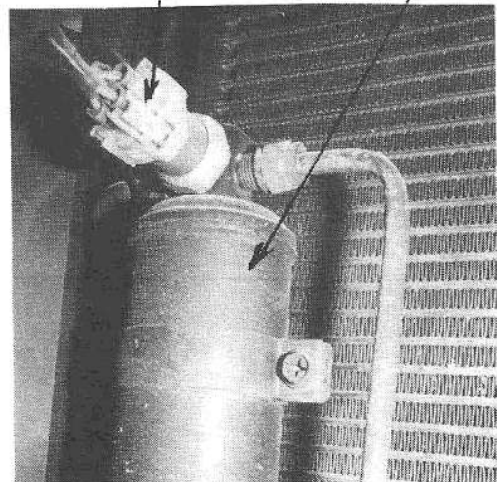
Condensor



2. Oil condenser line 'O' rings and fittings with refrigerant oil and torque nuts to specifications.
3. Install the transmission oil cooler (where fitted).
4. Evacuate and charge the system with refrigerant.
5. Install the radiator grille and front bumper as described in Body chapter.

FILTER / ACCUMULATOR

Filter / Accumulator attached by bracket to radiator support panel



Remove

1. Discharge the refrigerant system.
2. Disconnect the wiring connection from the top of the filter / accumulator.
3. Disconnect the refrigerant lines from the filter / accumulator inlet and outlet connections at the top of accumulator. (Use a back up spanner to prevent damage when loosening and tightening fittings).
4. Remove filter / accumulator bracket attached to fire wall.

The filter / accumulator should be sealed immediately otherwise the filter / accumulator will need replacing as it will absorb moisture from the atmosphere.

Install

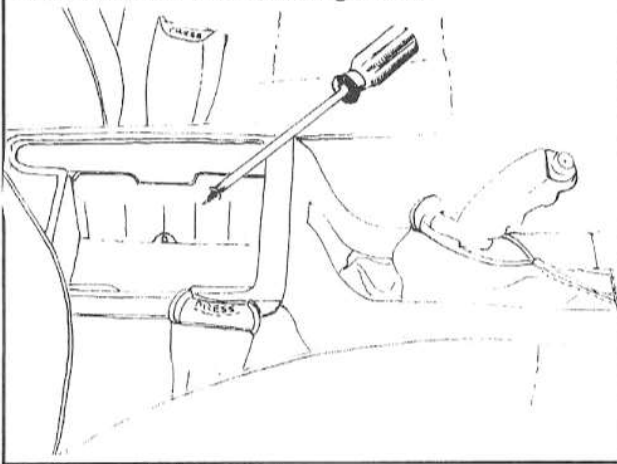
1. Install the filter / accumulator to the bracket attached to the fire wall.
2. Connect the refrigerant lines to the filter / accumulator inlet and outlet connections at the top of accumulator. (Use a back up spanner to prevent damage when loosening and tightening fittings).
3. Reconnect the wiring connection to the filter / accumulator.
4. Evacuate and charge the system with refrigerant.

HEATER & AIRCONDITIONING SWITCH

Remove.

1. Remove the console attaching screws in the console storage compartment (under the carpet) with a phillips screw driver.

Remove the console attaching screws

**2. Automatic Transmissions:**

With a screw driver unclip the top selector panel from the under the centre dash panel and console, lift the selector panel, twist around the gear lever "T" and remove.

Manual Transmission:

Unscrew the gear knob from the gear lever.

3. Pull the hand brake up, slide zip down.

4. Prise the console top section and attaching screws at the front of the console with a phillips head screw driver.

5. Disconnect any electrical connections that may be present for accessories and lights.

6. Carefully remove the centre console by lifting up at the rear to help clear the hand brake handle, then slide back and up to free console.

7. Remove the radio escutcheon (3 screws), remove the heater / airconditioner controls (1 screw) lift the escutcheon out enough to allow the wiring connectors to be removed from the controls.

Remove the radio escutcheon by unclipping the side clip with a narrow blade screwdriver (slide the screw driver along the side of the escutcheon clip).

8. Remove the heater / airconditioner control panel by juggling it around the radio escutcheon.

9. Remove the vacuum hoses, label hoses and identify the vacuum ports which the particular hoses belong too. This is to help during installation of the heater control switch.

Install

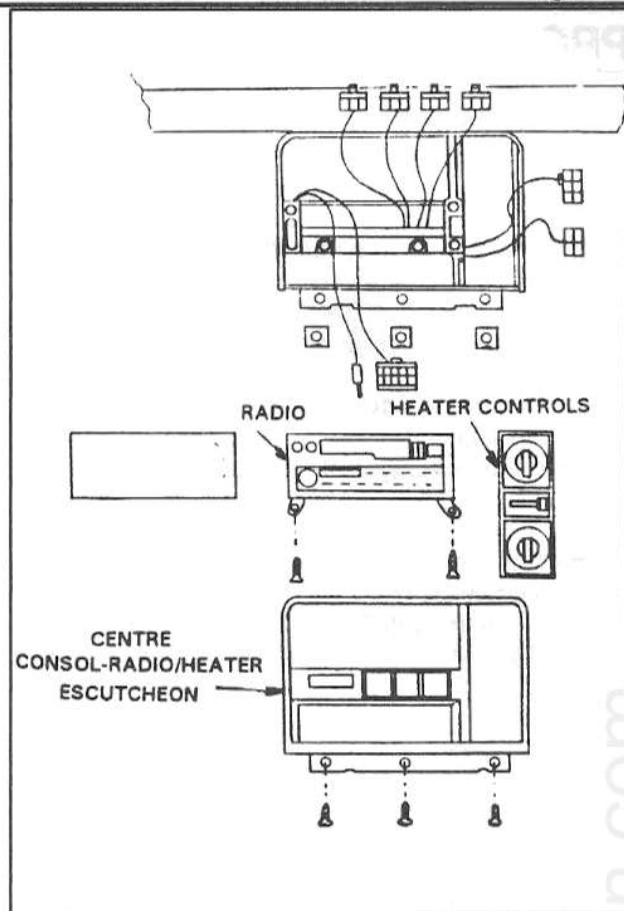
1. Connect the heater / airconditioner wiring loom connectors and connect vacuum hoses, use the labels made during removal to identify the correct hoses for the ports.

2. Replace the radio escutcheon fitting the wiring connectors to the controls if removed. Replace the radio escutcheon by sliding the side clips into place. Replace the heater / airconditioner (1 screw) controls, radio escutcheon (3 screws) to the dash assembly.

3. Carefully lower and move the centre console forward over the handbrake handle.

4. Connect any electrical connections that are present.

5. Ensure the console is correctly positioned and insert the four attaching screws.



6. Install the carpet sections that were removed.

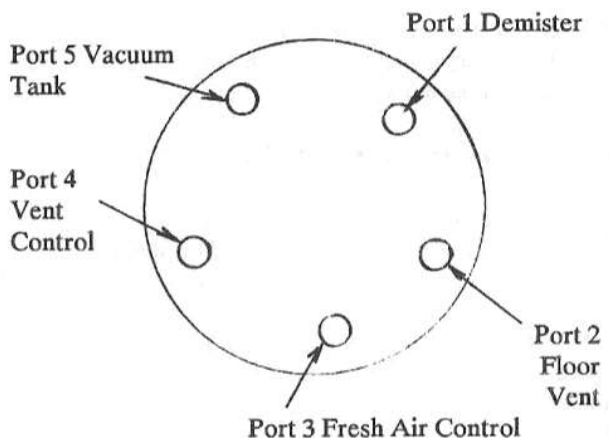
7. Automatic Transmission:

Fit the selector top panel over the gear lever "T" handle and clip into position.

Manual Transmission:

Ensure the plastic boot is properly located in the console moulding, fit the boot on the gear lever and screw the knob into place making sure that the writing is facing the correct way. Replace the gear shift lever knob.

8. Connect the battery earth cable.

Connect vacuum hoses**Heater Vacuum Schematics at back of switch**

PROBLEM DIAGNOSIS

REFRIGERANT SYSTEM PRESSURE EVALUATION

*Normal system conditional requirements must be maintained to properly evaluate refrigerant pressures.

HIGH Pressure at Accumulator Inlet

Suction pressure: Normal to High:

Problem component: Heater water valve - Insufficient Closure/ Evaporator - Expansion Valve - Sticking Open.

HIGH Pressure at Accumulator Inlet

Suction pressure: Normal:

Problem: Air in refrigerant system. Refrigerant - Over-charge.

HIGH Pressure at Accumulator Inlet

Suction pressure: Low

Problem component: Receiver/drier, Liquid line, TX Valve - Restriction after high pressure service access valve.

HIGH Pressure at Accumulator Inlet

Suction pressure: Low

Problem component: Receiver/Dryer - Restriction. A/C Liquid Line - Restriction.

NORMAL to HIGH Pressure at Accumulator Inlet

Suction pressure: High

Problem component: CONDENSER - Inadequate Air Flow (Bent Fins, Debris, Loose Radiator Drive Belt, Slipping Fan Clutch).

NORMAL to HIGH Pressure at Accumulator Inlet

Suction pressure: Normal to High

Problem : Humidity well above normal.

NORMAL to HIGH Pressure at Accumulator Inlet

Suction pressure: Normal

Problem component: Excessive Refrigerant Oil.

NORMAL - ERRATIC Pressure at Accumulator

Suction pressure: Normal to Erratic:

Problem component: Moisture in Refrigerant system - Affects Expansion Valve.

NORMAL - LOW Pressure at Accumulator Inlet

Suction pressure: Normal

Problem component : Evaporator - Restriction, Inadequate Air Flow - Reset Blower to Conditional Requirement and/or Confirm Blower Condition.

LOW Pressure at Accumulator Inlet

Suction pressure: High

Problem component: Compressor - Damaged

LOW Pressure at Accumulator Inlet

Suction pressure: Low

Problem component: Evaporator - Iced up, Expansion Valve - Sticking open, Refrigerant Leak and/or Under-charge, Compressor-to-Condenser A/C Line - Restriction.

COMPRESSOR DIAGNOSIS

Problem: Oil Leaks

Remedy: Inspect for leaks.

Oil leaks do not necessarily indicate leaking refrigerant, check for oil leaks around the following components:

- Shaft seal, leak test see area between clutch and compressor.

- Hose fittings.

- Compressor housing.

Thoroughly clean around compressor and components with detergent and hot water, starting detection procedures. Follow supplier instructions for the proper techniques to be used for 'ELECTRONIC' Leak Detectors.

Another usefull test is a soap bubble test. Apply a soapy mixture around all joints or possible leak areas, start air conditioner and turn on to high operation, check for bubbles. If bubbles are found at any section or joint where the soapy solution was applied it will indicate a leak requiring repair.

Problem: Bearing Noise

Remedy: Carry out the following proceedure: Remove belt. Disengage clutch. Rotate rotor pulley by hand. Listen for bearing noise. Feel for hard spots. If excessive, repair or replace compressor.

* All compressors have operating noise, this should not be mistaken for a faulty compressor.

Problem: Suspect bearing or seal failure.

Remedy: Discharge the system, disengage clutch, rotate front plate by hand. While rotating, if severe rough spots or 'catches' are felt, repair or replace the compressor.

Problem: Compressor noise.

Remedy: Visual inspection of:

Broken or loose bolts at compressor and engine fixing points - replace and/or torque bolts to specifications.

Loose or bent engine crankshaft pulley - repair or replace.

Broken bracket and/or compressor body mounting - replace broken component.

Oil level - insufficient oil can cause unusual noise.

Drive belt not at correct tension.

Generator bearing noisy - replace.

Water pump bearing noisy - replace.

Loose engine mounting bolts - re-torque.

Low refrigerant charge. Low charge can be determined by low suction pressure together with low head pressure.