

Chapter 3

Cooling, heating and air conditioning systems

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Specifications

Cap relief pressure	9 to 14 psi	
Leakage test pressure	23 psi	
Thermostat opening temperature	170°F	
Coolant capacity		
non-turbo model	11-1/8 qt	
turbo model	11-5/8 qt	
reservoir	7/8 qt	
Torque specifications	Kg-m	Ft-lbs
Water pump bolts	1.6 to 2.0	12 to 15
Thermostat housing bolts	1.6 to 2.0	12 to 15
Water inlet bolts	1.6 to 2.0	12 to 15
Water outlet bolts	1.6 to 2.0	12 to 15
Coolant filler housing bolt	0.3 to 0.4	2.2 to 2.9
Radiator bolts	0.3 to 0.4	2.2 to 2.9
Radiator hose clamps	0.3 to 0.4	2.2 to 3.6
Midway pipe to body bolt	0.3 to 0.4	2.2 to 2.9
Water suction pipe bolt	0.8 to 1.1	5.8 to 8.0
Cooling fan bolts	0.6 to 1.0	4.3 to 7.2
Fan coupling bolts	0.6 to 1.0	4.3 to 7.2
Electric cooling fan bolts and nuts	0.3 to 0.4	2.2 to 2.9
Coolant delivery tube	3.2 to 4.1	23 to 30

1 General information

Refer to illustration 1.1

The components of the cooling system are the radiator, top and bottom water hoses, water pump, thermostat, radiator cap with pressure relief valve and heater hoses (see illustration).

The principle of the system is that cold water in the bottom of the radiator circulates upwards through the lower radiator hose to the water pump, where the pump impeller pushes the water around the cylinder block and heads through the various cast-in passages to cool the cylinder bores, combustion surfaces and valve seats. When sufficient heat has been absorbed by the cooling water, and the engine has reached an efficient working temperature, the water moves from the cylinder head past the now open thermostat into the top radiator hose and into the radiator header tank. The water then travels down the radiator tubes where it is rapidly cooled by the natural flow of air as the vehicle moves down the road. A multi-blade fan, mounted on the

water pump pulley, assists this cooling action. The water, now cooled, reaches the bottom of the radiator and the cycle is repeated.

When the engine is cold the thermostat remains closed until the coolant reaches a pre-determined temperature (see the Specifications). This assists rapid warming-up.

The system is pressurized by means of a spring-loaded radiator filler cap, which prevents premature boiling by increasing the boiling point of the coolant. If the coolant temperature goes above this increased boiling point, the extra pressure in the system forces the radiator cap internal spring-loaded valve off its seat and exposes the overflow pipe, down which displaced coolant escapes into the coolant recovery reservoir.

The coolant recovery system consists of a plastic reservoir into which the overflow coolant from the radiator flows when the engine is hot. When the engine cools, coolant is drawn back into the radiator from the reservoir and thus maintains the system at full capacity.

Aside from cooling the engine during operation, the cooling system also provides the heat for the car interior heater and heats the inlet manifold. On vehicles equipped with an automatic transmission, the

transmission fluid is cooled by a cooler attached to the base of the radiator.

On cars equipped with air conditioning systems, a condenser is placed ahead of the radiator. On turbo models the condenser has an electric fan for additional cooling.

The radiator cooling fan incorporates either a fluid coupling or a fluid/temperature controlled coupling. The latter device comprises an oil-operated clutch and is a coiled bi-metallic thermostat which functions to permit the fan to slip when the engine is below normal operating temperature level and does not require the supplementary air flow provided by the fan at normal running speed. At higher engine operating temperature, the fan is locked and rotates at the speed of the water pump pulley. The fan coupling is a sealed unit and requires no periodic maintenance.

Turbo equipped models have electric cooling fans which are controlled by the water temperature sending unit. The unit acts as a switch to turn the fan on or off as needed to maintain a proper operating temperature. **Warning:** The radiator cap should not be removed while the engine is hot. The proper way to remove the cap is to wrap a thick cloth around it, rotate the cap slowly counterclockwise to the detent and allow any residual pressure to escape. Do not press the cap down until all hissing has stopped, then push down and twist off.

2 Antifreeze

1 It is recommended that the cooling system be filled with a water/ethylene glycol based antifreeze solution which will give protection down to at least -20°F . This provides protection against corrosion and increases the coolant boiling point. When handling antifreeze, take care that it is not spilled on the vehicle paint, since it will cause damage if not removed immediately.

2 The cooling system should be drained, flushed and refilled at least every alternate Fall. The use of antifreeze solutions for periods of longer than two years is likely to cause damage and encourage the formation of rust and scale due to the corrosion inhibitors gradually losing their efficiency.

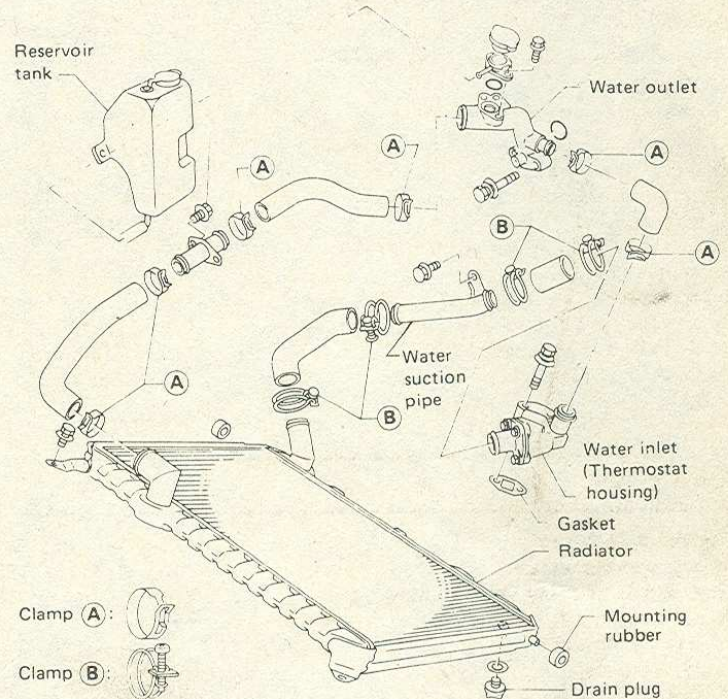
3 The exact mixture of antifreeze to water which you should use depends upon the relative weather conditions. The mixture should contain at least 50 percent antifreeze, but under no circumstances should the mixture contain more than 70 percent antifreeze.

3 Thermostat — removal and installation

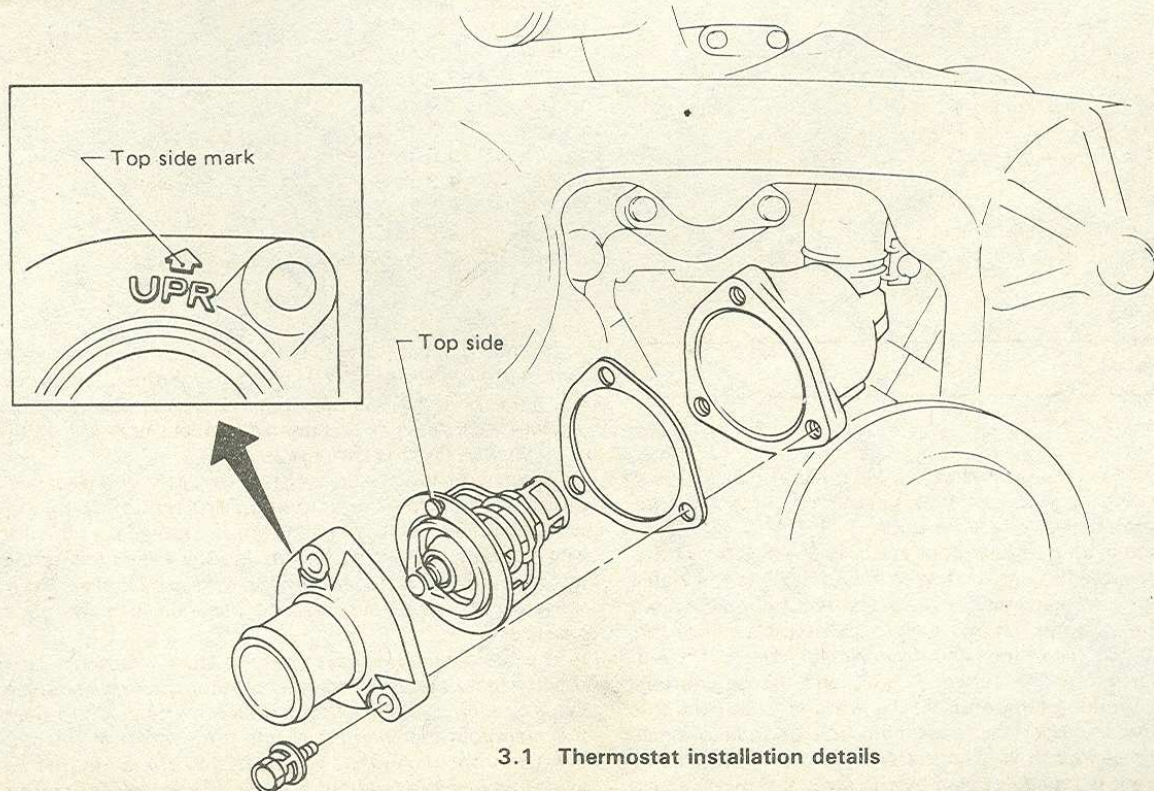
Refer to illustrations 3.1, 3.6, 3.12, and 3.14

1 The thermostat is a restriction valve which is actuated by a heat sensitive element. It is mounted inside a housing on the right-front side of the engine (see illustration) and is designed to open and close at predetermined temperatures to allow coolant to warm up or cool the engine.

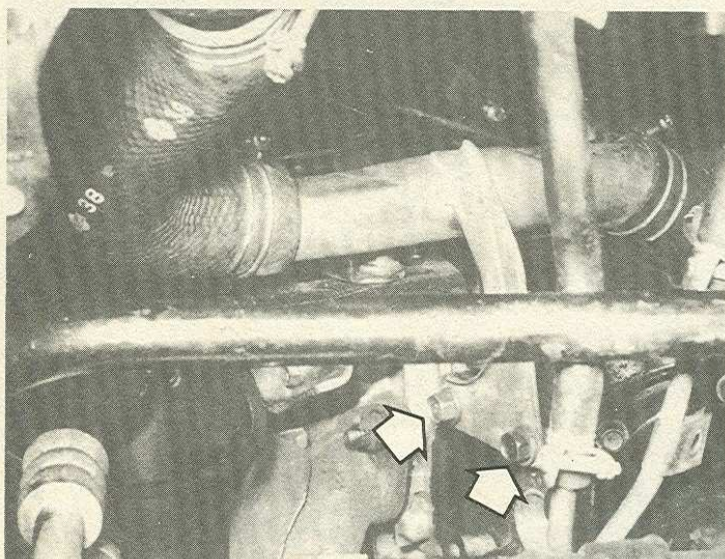
2 To remove the thermostat for replacement or testing, begin by draining the cooling system (refer to Chapter 1).



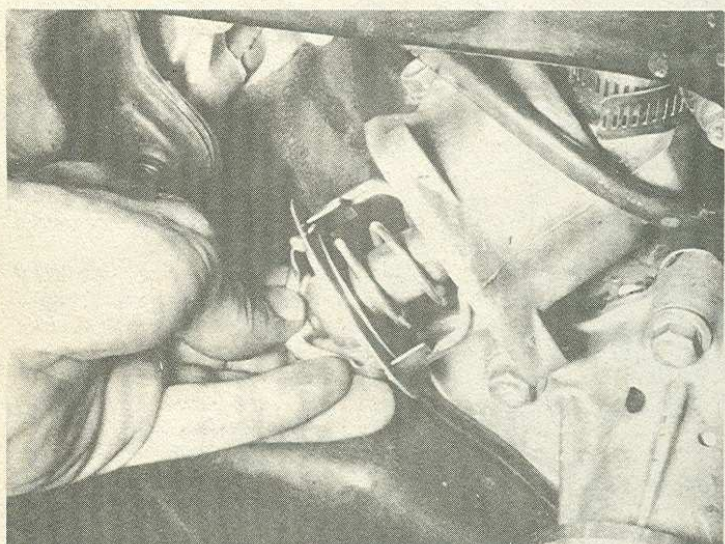
1.1 Exploded view of the cooling system



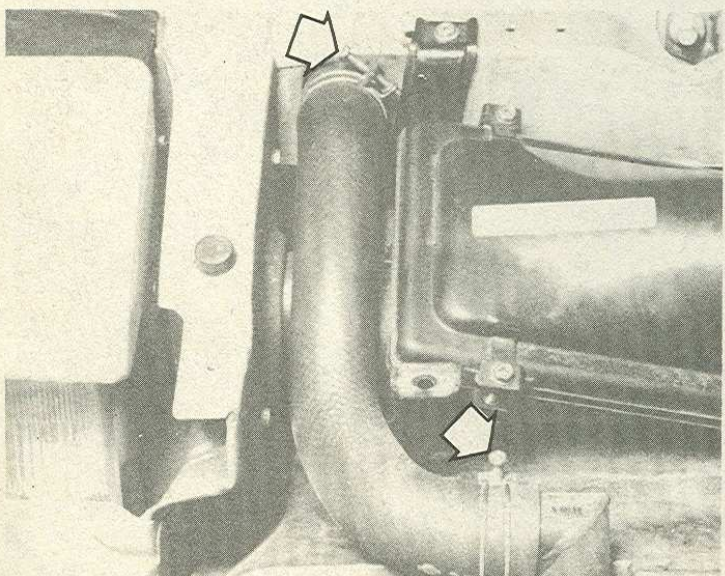
3.1 Thermostat installation details



3.6 Remove the two bolts (arrows) and hose clamps from the metal water suction tube and remove the tube from the vehicle

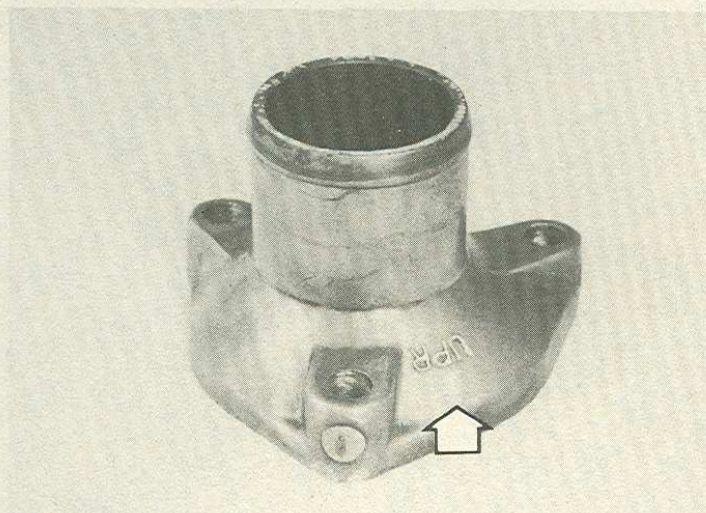


3.12 Install the new thermostat with the spring side inside the engine

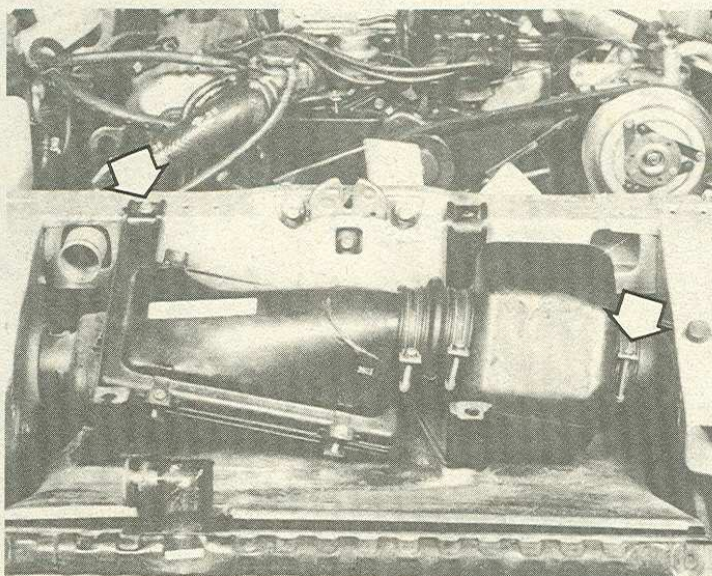


4.6 Remove the upper radiator hose by loosening the hose clamps at the radiator and at the mid-way pipe connection

- 3 Remove the fan and shroud as described in Section 11.
- 4 Remove the drivebelts, referring to Chapter 1.
- 5 Jack up the vehicle and support it securely on jackstands.
- 6 Remove the lower radiator hose from the metal water suction tube by loosening the hose clamps and support bracket bolts (see illustration).
- 7 Loosen the remaining hose clamp and remove the water suction tube from the vehicle.
- 8 Remove the three thermostat housing retaining bolts.
- 9 Remove the housing from the engine. If necessary, use a soft-face hammer to tap the housing in order to break the gasket seal.
- 10 Lift the thermostat from its recessed cavity, carefully noting which end is up.
- 11 Scrape off all traces of gasket and sealant from the gasket mounting surfaces.
- 12 Insert the new thermostat into the housing with the spring side in the block. The thermostat should seat into the recessed cavity (see illustration).
- 13 Apply gasket sealer to both sides of the new gasket and install the gasket onto the thermostat housing.
- 14 Install the thermostat housing onto the block, making sure the arrow on the cover is pointing up (see illustration).
- 15 Tighten the housing retaining bolts to the proper specification.
- 16 Reverse the remaining removal procedures, installing new hose clamps if necessary.



3.14 Note the arrow on the housing which points up for installation



4.7 Remove the air intake assembly by loosening and removing the fasteners indicated by the arrows

4 Radiator — removal and installation

Refer to illustrations 4.6 and 4.7

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Jack up the vehicle and support it securely on jackstands.
- 3 Drain the cooling system (Chapter 1).
- 4 Remove the front bumper fascia (Chapter 11).
- 5 Remove the fan shroud (Section 11).
- 6 Disconnect the upper radiator hose from the radiator and from the mid-way pipe connection (see illustration).
- 7 Remove the air intake assembly by removing the bolt securing it to the upper crossmember and loosening the large clamp securing the assembly to the air flow meter tube (see illustration).
- 8 Loosen the large retaining clamp and remove the flexible hose connected to the air flow meter inlet tube.
- 9 From underneath the vehicle, disconnect the lower radiator hose by loosening the clamp and pulling the hose from the radiator.

10 If equipped with an automatic transmission, disconnect the transmission cooling lines from the radiator by loosening the small hose clamps and pulling both the hoses from the bottom of the radiator. Plug the hoses to prevent fluid from draining out of the transmission and to prevent contamination.

- 11 Remove the two top radiator retaining bolts.
- 12 Pull the radiator out through the front of the vehicle.
- 13 Installation of the radiator is the reverse of the removal procedure. However, note that the radiator rubber mounting grommets must seat in their original positions.

5 Electric cooling fan — removal and installation

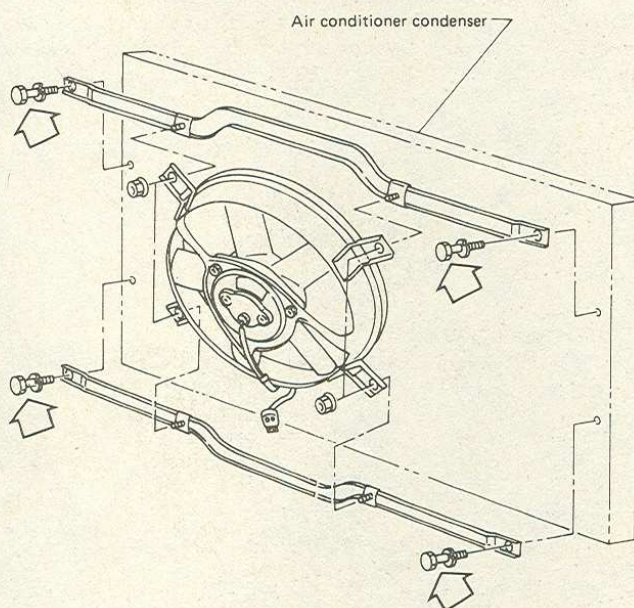
Refer to illustration 5.4

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Remove the front bumper fascia (Chapter 11).
- 3 Disconnect the cooling fan electrical connector.
- 4 Remove the four nuts retaining the electric fan to the mounting bars and lift the fan and shroud off as an assembly (see illustration).
- 5 Reverse the removal procedure for installation.

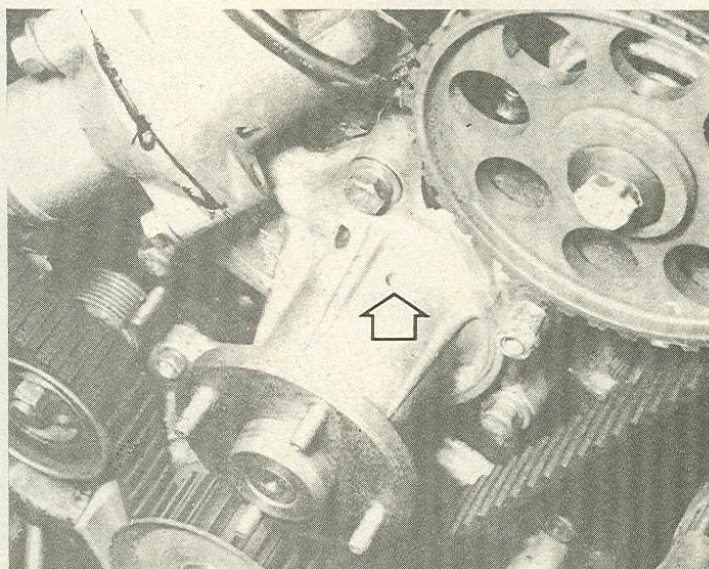
6 Water pump — check

Refer to illustrations 6.4 and 6.5

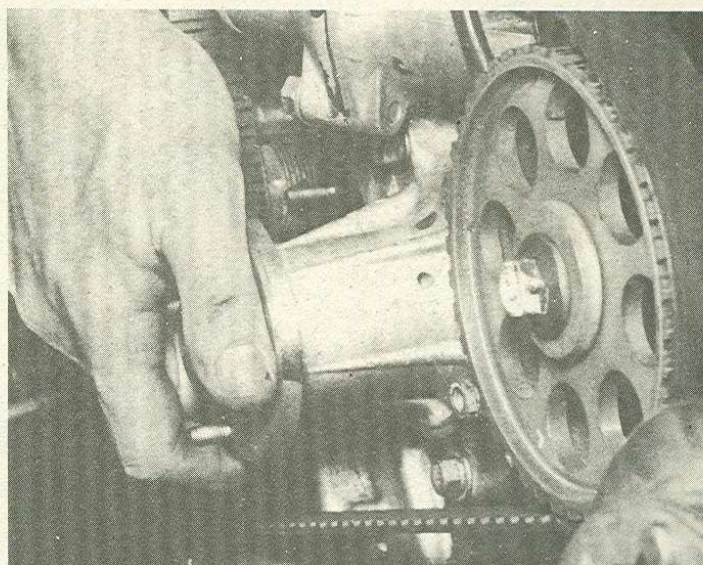
- 1 A failure in the water pump can cause serious engine damage due to overheating.
- 2 There are three ways to check the operation of the water pump while it is installed on the engine. If the pump is suspect, it should be replaced with a new or rebuilt unit.
- 3 With the engine running and warmed to normal operating temperature, squeeze the upper radiator hose. If the water pump is working properly, a pressure surge should be felt as the hose is released.
- 4 Water pumps are equipped with weep or vent holes. If a failure occurs in the pump seal, small amounts of water will leak from this hole. In most cases it will be necessary to use a flashlight to find the hole on top of the water pump by looking through the space just below the timing belt covers to see evidence of leakage (see illustration).
- 5 If the water pump shaft bearings fail there may be a squealing sound at the front of the engine while it is running. Shaft wear can be felt if the water pump pulley is forced up and down (see illustration). Do not mistake drivebelt slippage, which also causes a squealing sound, for water pump failure.



5.4 Remove the four bolts securing the fan to the condenser mounting brackets (arrows)



6.4 If water is seeping through the weep hole it is an indication that the water pump seal is leaking and the pump will have to be replaced

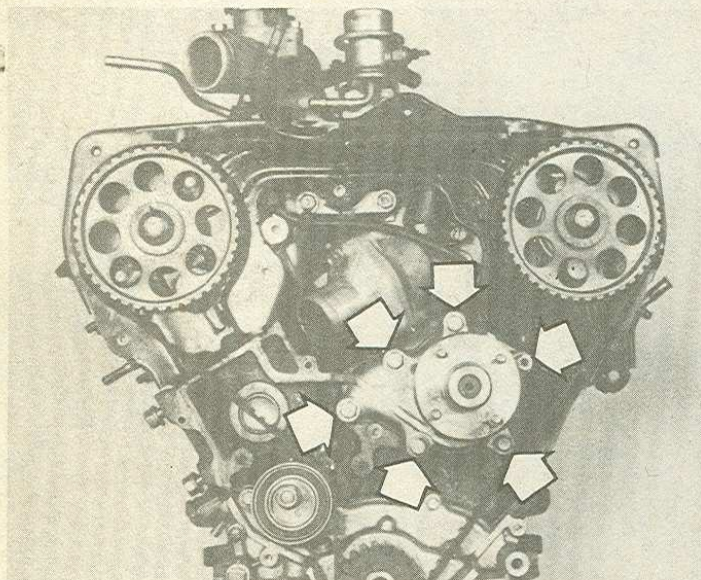


6.5 Check the water pump for excessive play and rough operation. The pump should turn smoothly with no play in the shaft

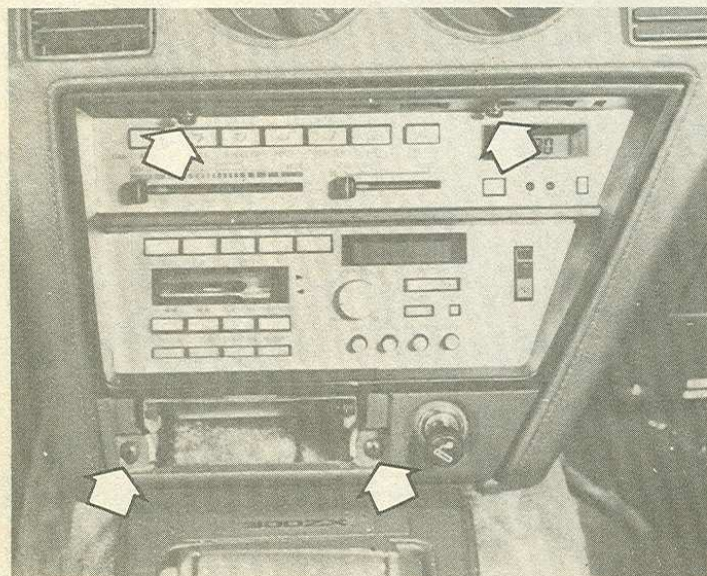
7 Water pump — removal and installation

Refer to illustration 7.9

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Jack up the vehicle and support it securely on jackstands.
- 3 Drain the cooling system, including both cylinder block petcocks (Chapter 1).
- 4 Refer to Section 11 to remove the fan and shroud.
- 5 Refer to Chapter 1 and remove the drivebelts.
- 6 Remove the water pump pulley.
- 7 Refer to Chapter 2A and remove the vibration damper from the crankshaft.
- 8 Remove the upper and lower timing belt covers (refer to Chapter 2A).
- 9 Remove the six water pump retaining bolts (see illustration).
- 10 Remove the water pump from the engine block and scrape all gasket and sealant material from the mounting surfaces.
- 11 Upon installation, apply gasket sealant to both sides of the new gasket and install it and the water pump to the engine block.



7.9 Remove the six bolts retaining the water pump to the engine block (arrows)



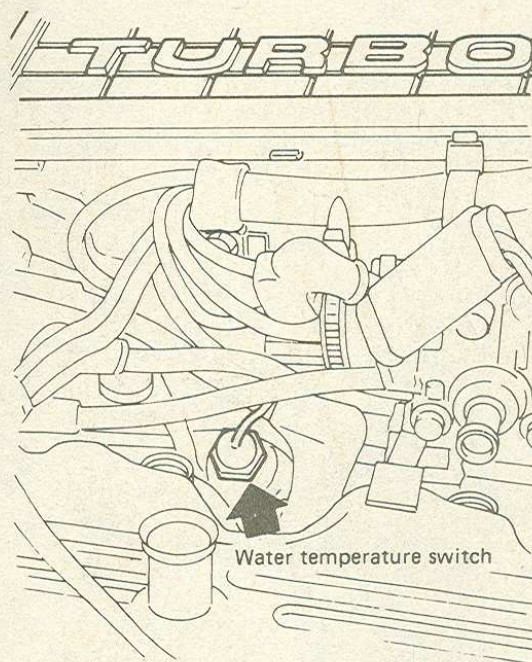
9.3 Remove the ashtray and remove the facia plate retaining screws (arrows)

- 12 Tighten all the water pump bolts, a little at a time, to specification.
- 13 After running the engine for a short time, check carefully for leaks around the water pump.

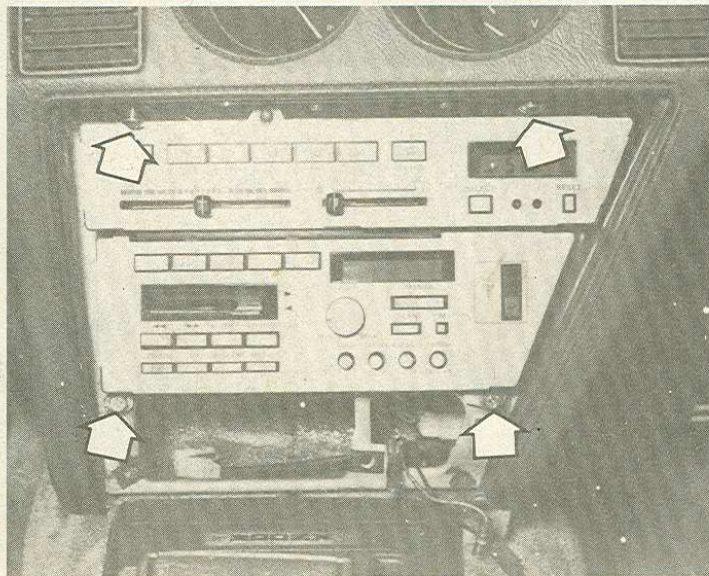
8 Coolant temperature sending unit — check and replace

Refer to illustration 8.1

- 1 On turbo models a water temperature switch is located on the left cylinder head. This unit controls the electric cooling fan (see illustration).
- 2 To remove the switch, unplug the electrical connector.
- 3 Use the correct size socket and remove the switch from the head.
- 4 Installation is the reverse of the removal procedure.
- 5 To check the switch, use an ohmmeter and connect one of the leads to the switch wire and the other grounded to the metal head of the switch.
- 6 Place the switch in a pan of water heated to 212 °F (boiling) and the switch should activate the ohmmeter. If the ohmmeter doesn't move, replace the switch.



8.1 The water temperature switch is located on the top of the left cylinder head

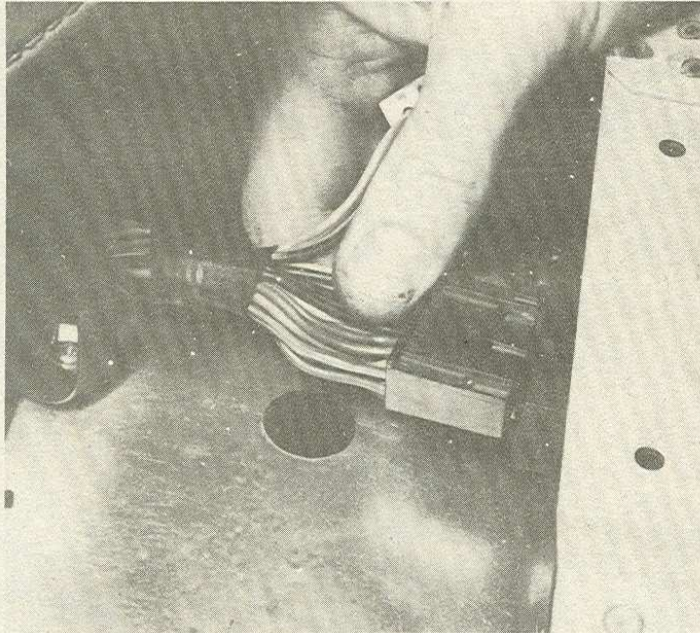


9.4 Remove the radio-air conditioner/heater control assembly retaining screws (arrows)

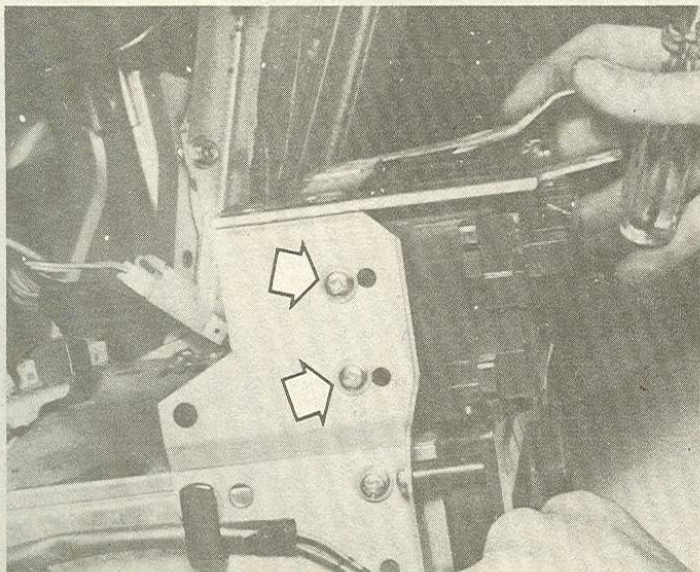
9 Heater and A/C control assembly — removal and installation

Refer to illustrations 9.3, 9.4, 9.5, 9.7, and 9.9

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Pull the ashtray out and let the front tilt down to remove it from the dash.
- 3 Remove the four screws retaining the fascia plate to the dash (see illustration).
- 4 Remove the four screws retaining the radio/air conditioner/heater assembly to the dash (see illustration).
- 5 Pull the assembly forward and disconnect the electrical connector by pressing down on the connector tab, then pulling the connector apart (see illustration).
- 6 Gently pry the a/c-heater temperature control and fan buttons off the levers.
- 7 Remove the air conditioning/heater fascia attaching screws from the back side of the assembly (see illustration).



9.5 Reach behind the radio and press down on the electrical connector tab, then pull the connector apart



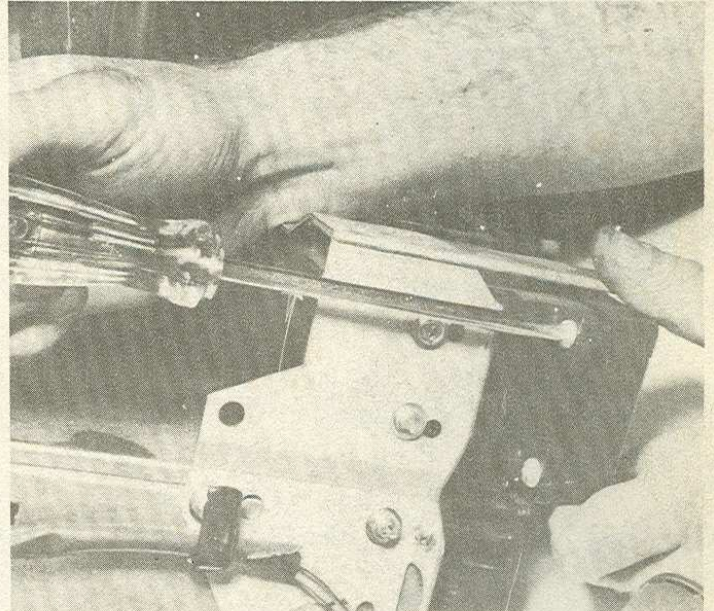
9.9 Remove the two retaining screws on each side to remove the assembly from its bracket

- 8 Remove the two screws from the back of the clock.
- 9 Remove the two screws on each side and pull the air conditioning/heater assembly from the case (see illustration).
- 10 Reverse the removal procedure for installation. Do not overtighten the various fascia screws, as the material can crack easily.

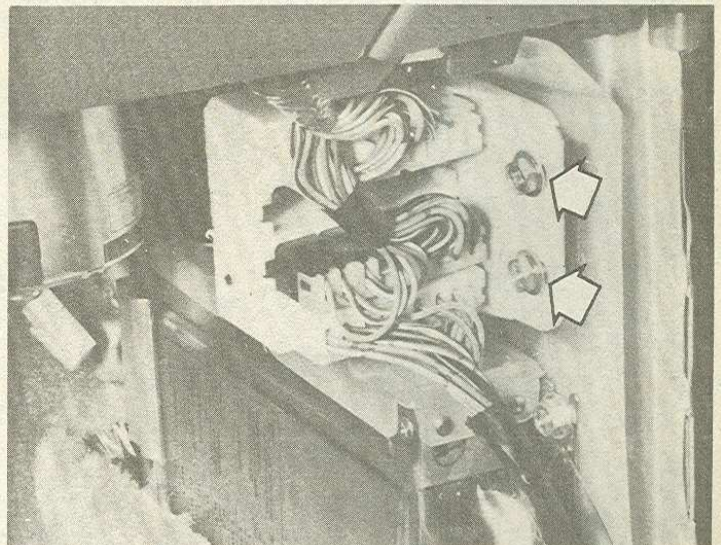
10 Blower motor — removal and installation

Refer to illustrations 10.3, 10.5, and 10.6

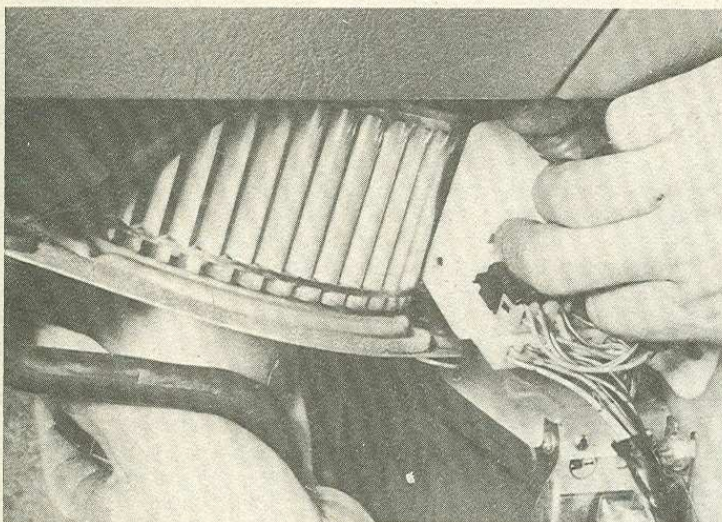
- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 From inside the vehicle, on the right side, remove the fascia/kick panel (Chapter 11).
- 3 Remove the two retaining bolts securing the computer electrical connector to the kick panel (see illustration) and let the connector hang loose.
- 4 Remove the three blower motor retaining screws.



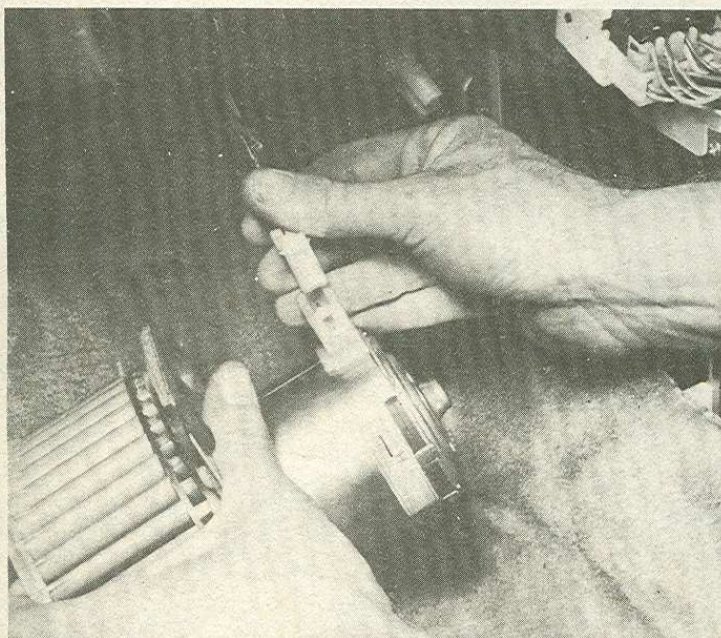
9.7 Working from the backside of the air conditioner/heater assembly, remove the fascia plate retaining screws



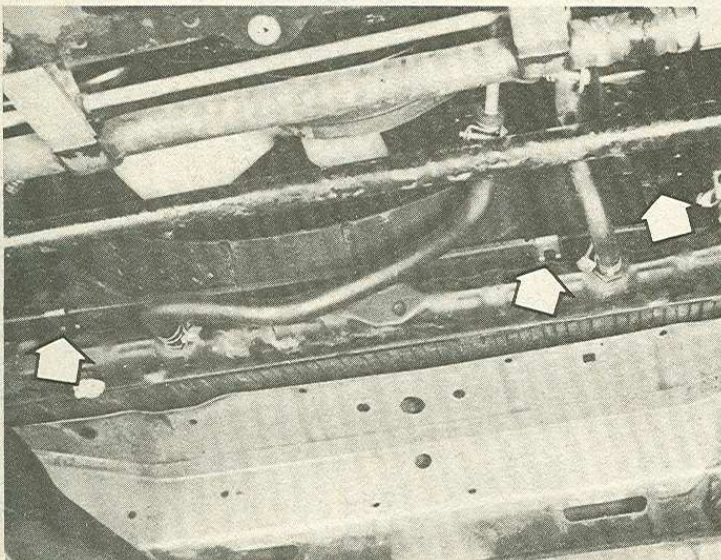
10.3 To gain clearance to remove the blower motor, first remove the two bolts (arrows) retaining the computer module electrical connector from the kick panel



10.5 After the retaining bolts have been removed the blower motor can be removed by working it down around the components attached next to it



10.6 Disconnect the electrical connector



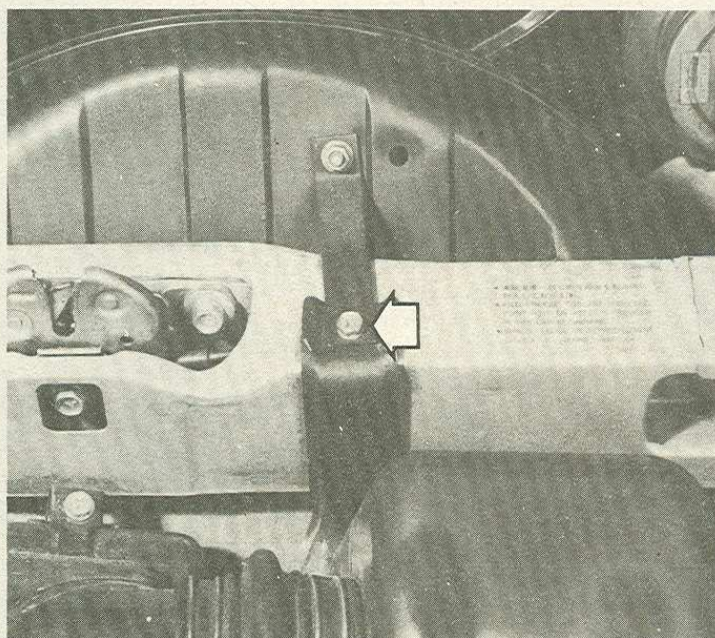
11.3a Pry off the three clips that attach the shroud to the radiator

- 5 Work the blower motor out around the computer electrical connector and heater box (see illustration).
- 6 Disconnect the blower motor electrical connector (see illustration).
- 7 If the motor is being replaced with a new one, remove the cage from the blower motor shaft and reinstall on the new motor.
- 8 Install the blower motor assembly in the reverse order of removal.

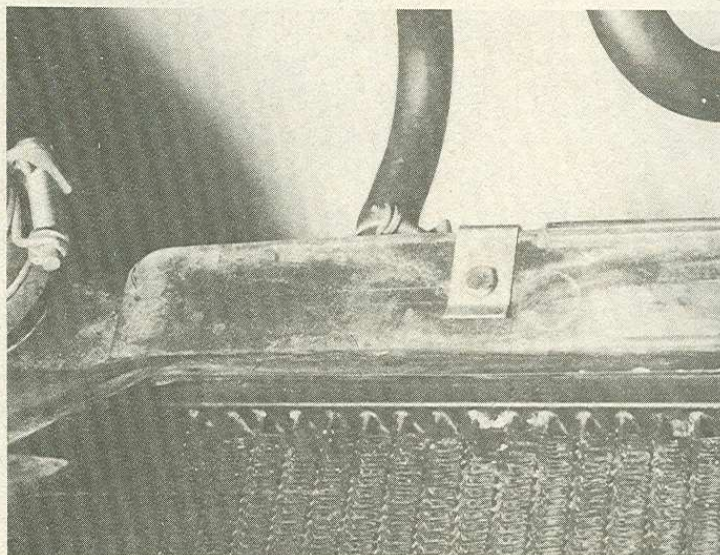
11 Fan and fan shroud — removal and installation

Refer to illustrations 11.2, 11.3a, 11.3b, 11.4, and 11.5

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Remove the radiator shroud retaining bolt securing the shroud to the upper crossmember (see illustration).
- 3 From under the vehicle, use a small screwdriver to remove the three retaining clips attaching the shroud to the radiator. Remove the clips by prying up on the retaining clip until the clip can be pried over its plastic retaining tab (see illustrations). At this point the shroud can be lifted out of the engine compartment.



11.2 Remove the radiator shroud retaining bolt securing the shroud to the upper crossmember (arrow)



11.3b Once the clip is raised over its retaining tab it can be pried off

- 4 Remove the fan and fan coupling from the water pump by removing the four retaining nuts (see illustration).
- 5 To separate the fan from the fluid coupling, remove the four retaining bolts (see illustration).
- 6 The fan assembly is installed by reversing the above steps. Tighten all fasteners to the proper torque.

12 Air conditioning system — general information

The air conditioning system used in the Nissan 300ZX maintains proper temperature by cycling the compressor on and off according to the pressure within the system, and by maintaining a mix of cooled, ambient and heated air, using basically the same blower, heater core and outlet duct system that the heating system uses.

In addition, the system is sensitive to the temperature of the air being taken in. If the intake air is below approximately 32 °F, the compressor will not operate.

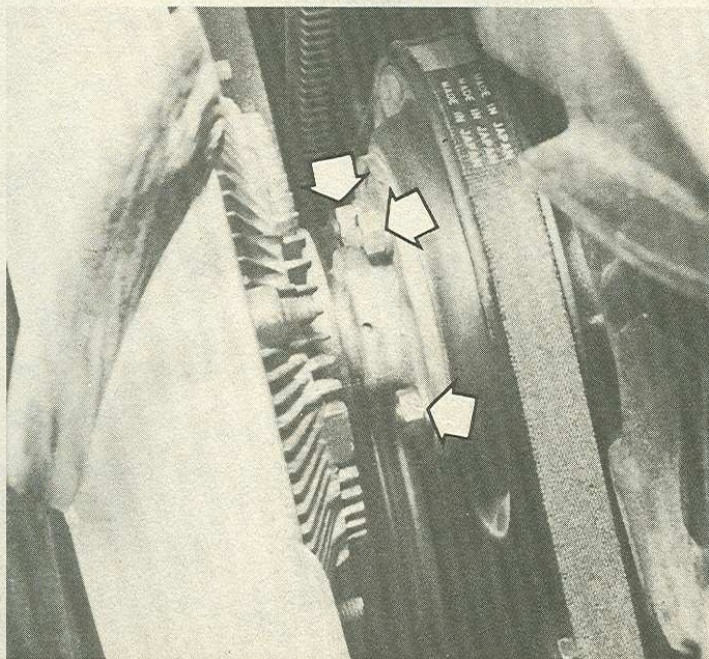
The main components of the system include a belt-driven compressor, a condenser (mounted in front of the radiator), a receiver, drier and an evaporator.

The system operates by air (outside or recirculated) entering the evaporator core by the action of the blower, where it receives maximum cooling if the controls are set for cooling. When the air leaves the evaporator, it enters the heater/air conditioner duct assembly and, by means of a manually controlled deflector, it either passes through or bypasses the heater core in the correct proportions to provide the desired vehicle temperature.

Distribution of this air into the car is regulated by a manually-operated deflector, and is directed either to the floor vents, dash vents or defroster vents according to the settings.

Some models have an automatic air temperature control system which uses a variety of electrical and vacuum-linked sensors, switches and amplifiers that automatically control all the functions of the A/C and heating systems so the interior temperature is kept at a constant level. Once the control lever is set to a desired temperature range, this system automatically selects the optimum combination of air flow, air temperature and outlet location. Because of the complexity of this system, we recommend that you allow a Nissan dealer or other qualified mechanic to diagnose and repair any malfunctions of the system.

Warning: No part of the pressure system should be disconnected by the home mechanic. Due to the need for the specialized evacuating and charging equipment, such work should be left to your dealer or a refrigeration specialist.



11.4 Remove the fan from the water pump by removing the retaining bolts (arrows)

13 Air conditioning system — checks and maintenance

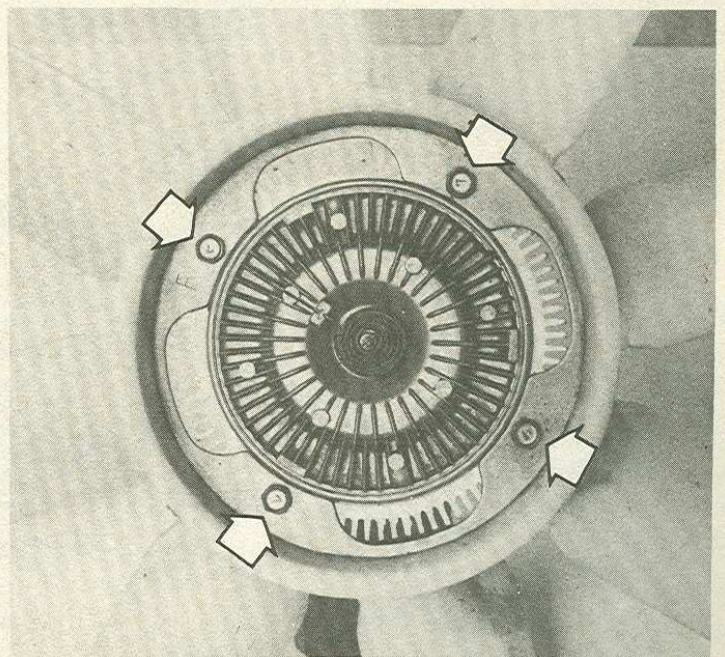
1 The following maintenance steps should be performed on a regular basis to ensure that the air conditioner continues to operate at peak efficiency.

- a) Check the tension of the A/C compressor drivebelt and adjust if necessary. Refer to Chapter 1.
- b) Visually inspect the condition of the hoses, checking for any cracking, hardening or other deterioration. **Warning:** Do not replace hoses without first having the system discharged by a Nissan dealer or a qualified specialist.
- c) Check that the fins of the condenser are not covered with foreign material, such as leaves or bugs. A soft brush and compressed air can be used to remove them.

2 The A/C compressor should be run for about 10 minutes at least once every month. This is especially important to remember during the winter months because long-term non-use can cause hardening of the internal seals.

3 Due to the complexity of the air conditioning system and the special equipment required to effectively work on it, accurate troubleshooting and repair of the system should be left to a professional mechanic. If the system should lose its cooling action, some causes can be diagnosed by the home mechanic. Look for other symptoms of trouble, such as those in the following list. In all cases, it's a good idea to have the system serviced by a professional.

- a) If bubbles appear in the sight glass (located on top of the receiver-drier) this is an indication of either a small refrigerant leak or air in the refrigerant. If air is in the refrigerant, the receiver-drier is suspect and should be replaced.
- b) If the sight glass takes on a mist-like appearance or shows many bubbles, this indicates a large refrigerant leak. In such a case, do not operate the compressor at all until the fault has been corrected.
- c) Sweating or frosting of the expansion valve inlet indicates that the expansion valve is clogged or defective. It should be cleaned or replaced as necessary.
- d) Sweating or frosting of the suction line (which runs between the suction throttle valve and the compressor) indicates that the expansion valve is stuck open or defective. It should be corrected or replaced as necessary.
- e) Frosting on the evaporator indicates a defective suction throttle valve, requiring replacement of the valve.
- f) Frosting of the high pressure liquid line (which runs between the condenser, receiver-drier and expansion valve) indicates that either the drier or the high pressure line is restricted. The



11.5 If the fan coupling is to be replaced, remove the four bolts that attach the fan and coupling (arrows)

line will have to be cleared or the receiver-drier replaced.

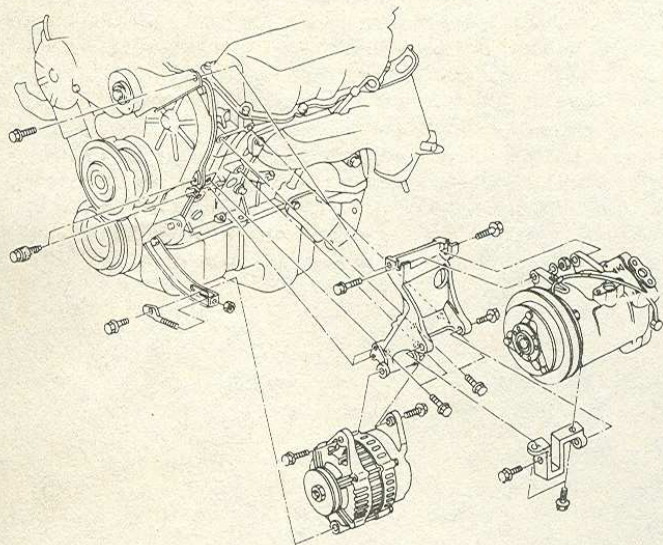
- g) The combination of bubbles in the sight glass, a very hot suction line and, possibly, overheating of the engine is an indication that either the condenser is not operating properly or the refrigerant is overcharged. Check the tension of the drivebelt and adjust if necessary (Chapter 1). Check for foreign matter covering the fins of the condenser and clean if necessary. If no fault can be found in these checks, the condenser may need to be replaced.

14 Air conditioning compressor — removal and installation

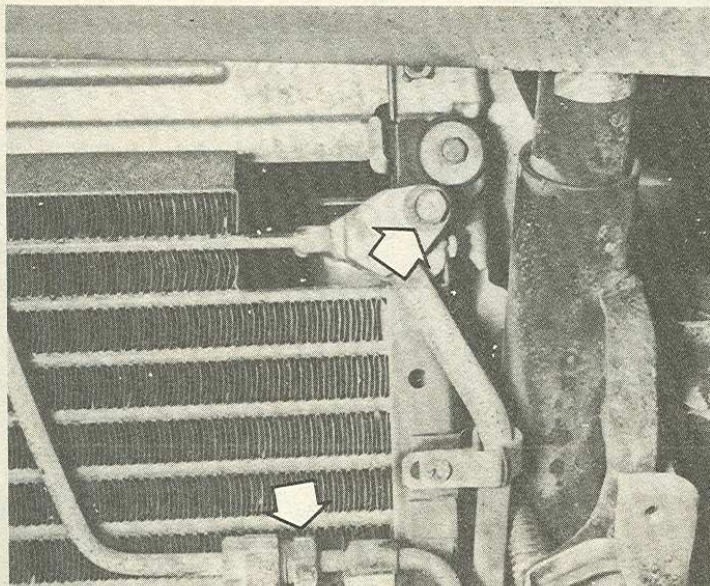
Refer to illustration 14.7

Warning: Prior to disconnecting any air conditioning lines anywhere in the system the car should be taken to a Nissan dealer or another qualified automotive air conditioning repair shop to have the system depressurized.

- 1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.
- 2 Disconnect the coil wire from the distributor and move it out of the work area.



14.7 Air conditioning compressor and mounting bracket — exploded view



15.3 Disconnect the refrigerant lines shown by arrows. Use a back up wrench to avoid damaging the metal lines

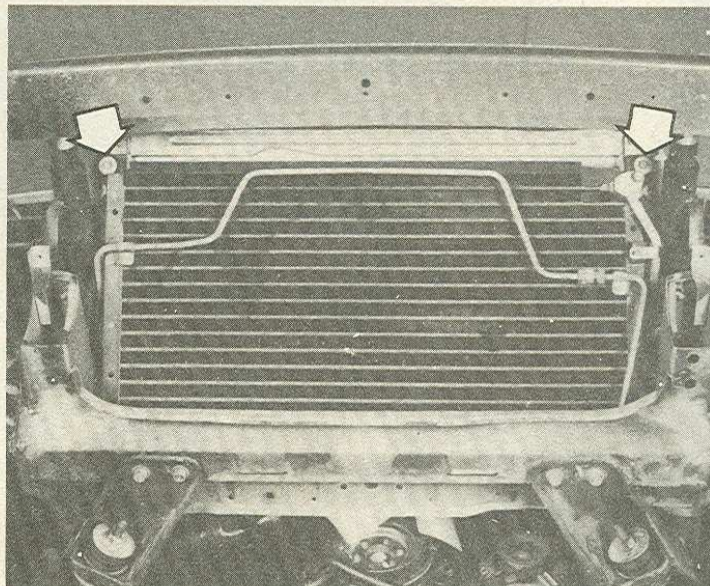
- 3 Jack up the front of the car and support it securely on jackstands. Remove the splash shield.
- 4 Remove the drivebelt from the compressor (Chapter 1).
- 5 Disconnect both hoses leading to the compressor, and immediately plug all openings.
- 6 Disconnect the electrical connector to the compressor by pressing down on the tab and pulling the connector apart.
- 7 Remove the four nuts and bolts retaining the compressor to its bracket and lift off the compressor (see illustration).
- 8 Turn the compressor so the clutch is facing up and remove the compressor from the engine compartment. **Caution:** The compressor should not be left on its side or upside down for more than 10 minutes at a time, as compressor oil could enter the low pressure chambers and cause internal damage. If this should happen, the oil can be expelled from the chambers by positioning the compressor right side up and hand cranking it several times.
- 9 Installation is the reverse of removal with the following notes:
 - a) When reconnecting the hoses to the compressor, be sure to use new O-rings at each connection.
 - b) Check the tightness of the A/C compressor bracket bolts while the compressor is removed, to be sure that none are loose.
 - c) After installing the compressor, turn the compressor clutch a few times by hand.
 - d) Adjust the compressor drivebelt tension. Refer to Chapter 1, if necessary.
- 10 Once the compressor and all A/C lines have been securely connected, the car must be taken to a Nissan dealer or other qualified shop to have the system charged.

15 Condenser — removal and installation

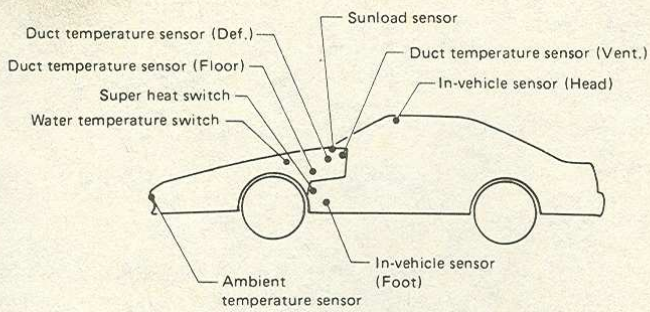
Refer to illustrations 15.3 and 15.4

Warning: Prior to disconnecting any air conditioning lines anywhere in the system the car should be taken to a Nissan dealer or other qualified automotive air conditioning repair shop to have the system depressurized.

- 1 Raise the vehicle and support it securely on jackstands.
- 2 Remove the front bumper fascia (Chapter 11).
- 3 Disconnect the refrigerant lines from the condenser (see illustration). Be sure to use two wrenches when loosening the flare nuts so as not to damage the lines. Immediately after disconnection, plug all openings in the lines and condenser to prevent dirt and moisture from entering. It may be necessary to disconnect the refrigerant line at its connection located near the water suction pipe attached to the engine.
- 4 Disconnect the refrigerant line brackets from the condenser and then remove the two condenser mounting bolts (see illustration).
- 5 Lower the condenser out of the vehicle.



15.4 Disconnect the condenser hold-down bolts as indicated by arrows (non-turbo model shown)



16.1 Automatic air sensor and switch locations

6 If the condenser fins or air passages are clogged with foreign material, such as dirt, insects or leaves, use compressed air or cold water and a soft brush to clean the condenser. If the condenser is in need of other repairs, have a professional radiator shop or Nissan dealer perform the work.

7 Installation is the reverse of the removal procedure. When connecting the refrigerant lines, always use new O-rings at each connection.

8 Once all A/C lines have been securely connected, the car must be taken to a Nissan dealer or other qualified shop to have the system charged.

16 Automatic Temperature Control system — component description

Refer to illustration 16.1

The Automatic Temperature Control system works in conjunction with both the heating and air-conditioning system to maintain the interior temperature of the car at a desired level.

This section is to familiarize you with the basic function of the system and the location of its components.

Because of the complexity of the system, we recommend that any malfunctioning of the system be diagnosed and repaired by a Nissan dealer or other qualified mechanic.

The Automatic Temperature Control system is divided into nine sub-systems.

System Starting Control

Automatic amplifier (with microcomputer)

The amplifier has a built-in microcomputer, which enables it to deal with the data given to it by sensors and to provide precise control, which is necessary for operating the automatic air conditioning.

Temperature setting switch

This switch is used for initially setting the in-vehicle temperature and for memorizing the setting by the microcomputer in the automatic amplifier.

In-vehicle sensor (head and foot)

This sensor converts the temperature value of the inside air, which is drawn through the aspirator fan, into a resistance value, which is then input into the automatic amplifier. The sensors are used to detect the typical temperature at either head or feet and sends the information to the microcomputer to compensate for the differences.

Ambient temperature sensor

This sensor transforms the value of ambient temperature into a resistance value that the automatic amplifier can read and compensate for. From this value and the values that the automatic amplifier receives from the defroster, ventilator and floor duct sensors, the amplifier knows how hard to work to correct for the temperature outside.

Sunload sensor (photo diode)

This sensor transforms sunload into current value, which is put into the automatic amplifier. The sensor is located on the defroster grill.

All the sensors send signals to the auto amplifier, and when the amplifier receives the input signals it calculates the desirable air mix door position and causes the air mix door to move to the calculated position.