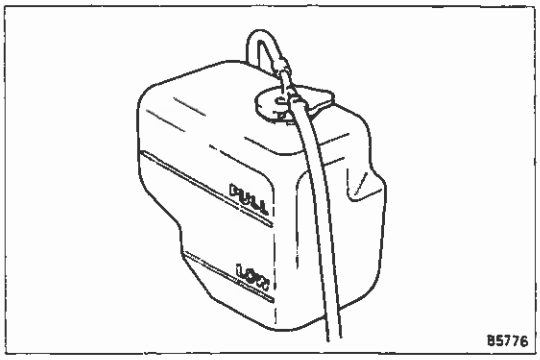
COOLING SYSTEM

TROUBLESHOOTING

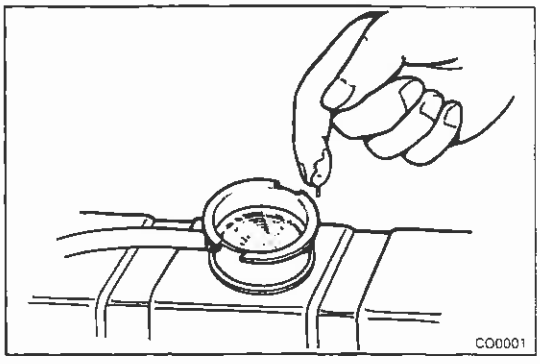
Problem	Possible cause	Remedy	Page
Engine overheats	Radiator plugged or cap faulty	Check radiator	CO-7
	Fan belt loose or missing	Adjust or replace belt	
	Dirt, leaves or insects on radiator or condenser	Clean radiator or condenser	CO-7
	Hoses, water pump, thermostat housing, radiator, heater, core plugs or head gasket leakage	Repair as necessary	
	Thermostat faulty	Check thermostat	CO-6
	Ignition timing retarded	Reset timing	IG-8
	Fluid coupling faulty	Replace fluid coupling	CO-3
	Radiator hose plugged or rotted	Replace hose	CO-7
	Water pump faulty	Replace water pump	CO-3
	Cylinder head or block cracked or plugged	Repair as necessary	



CHECK AND REPLACEMENT OF ENGINE COOLANT

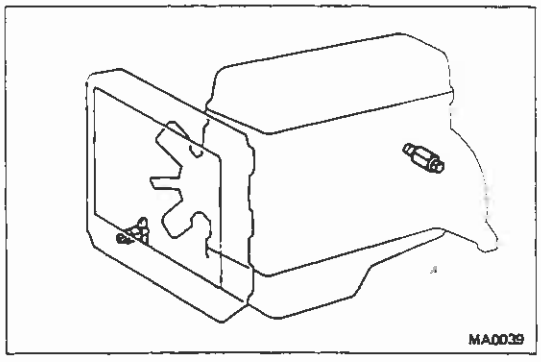
1. CHECK COOLANT LEVEL

The coolant level should be between the LOW and FULL lines. If low, check for leakage and add coolant up to the FULL line.



2. CHECK COOLANT QUALITY

There should not be any excessive deposit of rust or scales around the radiator cap or radiator filler hole, and the coolant should also be free from oil. Replace the coolant if excessively dirty.



3. REPLACE ENGINE COOLANT

(a) Drain the coolant from radiator and engine drain cocks.

(b) Close the drain cocks.

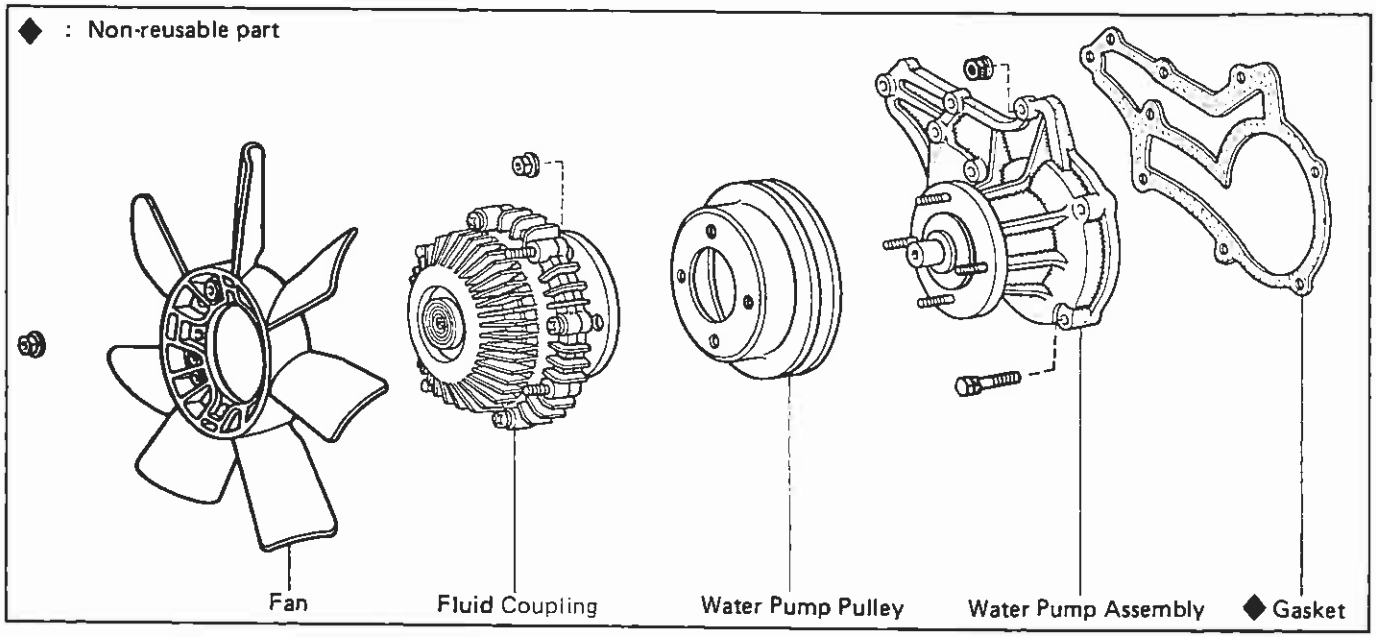
(c) Fill system with coolant.

Use a good brand of ethylene-glycol base coolant, mixed according to the manufacturer's directions.

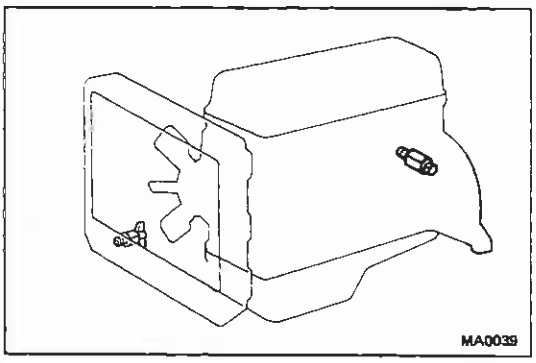
Coolant capacity: w/heater or A/C
8.4 liters (8.9 US qts, 7.4 Imp. qts)

WATER PUMP

COMPONENTS

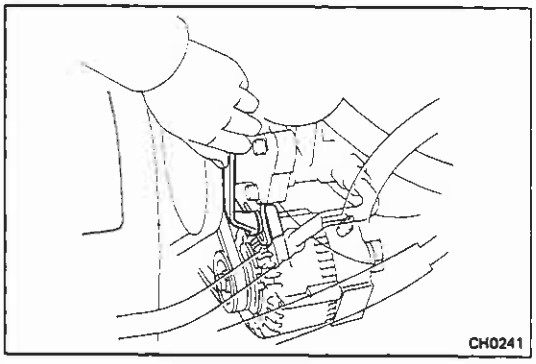


REMOVAL OF WATER PUMP



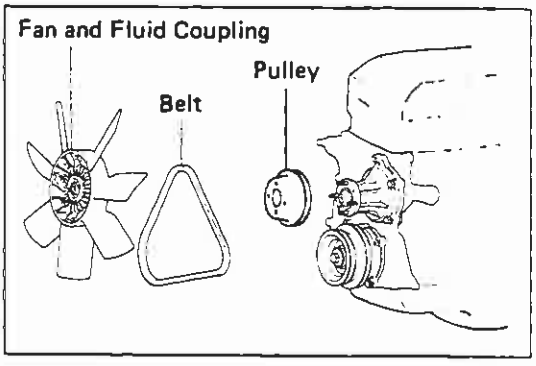
1. DRAIN COOLANT

Open the radiator and engine drain cocks, and allow the coolant to drain into a suitable container.



2. LOOSEN FAN BELT

Loosen alternator pivot and adjusting bolts. Swing the alternator toward the engine.

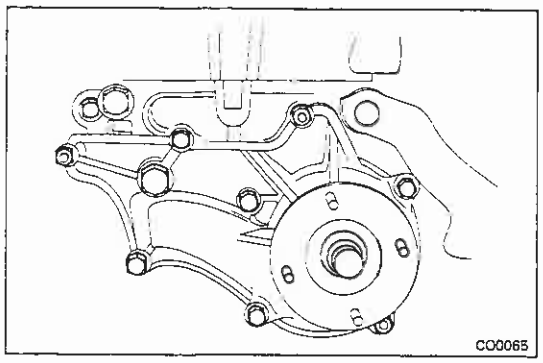


3. REMOVE FLUID COUPLING, FAN AND WATER PUMP PULLEY

(a) Remove the four nuts from the fluid coupling flange.

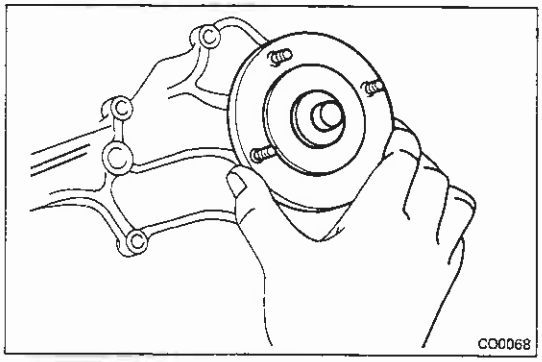
(b) Remove the fluid coupling, water pump pulley and fan belt.

(c) Remove the fan from the fluid coupling.



4. REMOVE WATER PUMP

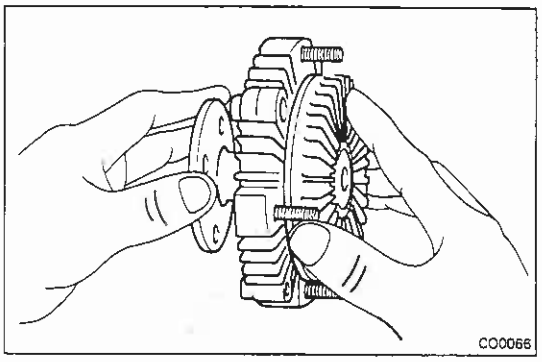
Remove the six bolts, three nuts, water pump and gasket.



INSPECTION OF WATER PUMP

1. INSPECT WATER PUMP BEARING

Check that water pump bearing operation is not rough or noisy.



2. INSPECT FLUID COUPLING

Check the fluid coupling for damage and silicone oil leakage.

INSTALLATION OF WATER PUMP

(See page CO-3)

1. INSTALL WATER PUMP OVER NEW GASKET

Install the water pump and a new gasket with the six bolts and three nuts.

2. INSTALL FAN BELT AND PULLEY

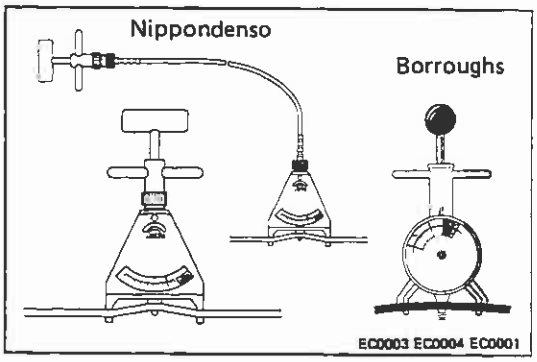
(a) Check the fan belt for cracks or damage.

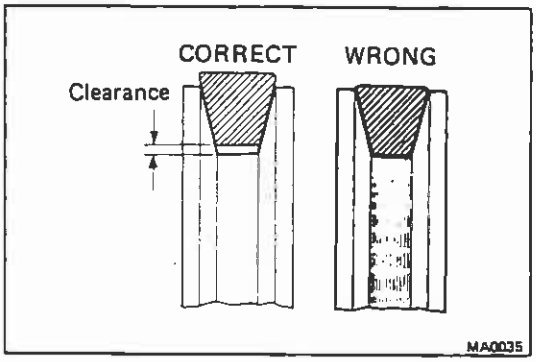
(b) Place the fan belt on the pulley and place the pulley on the water pump bolts.

3. INSTALL FAN ON FLUID COUPLING

4. INSTALL FLUID COUPLING

Install the fluid coupling on the pulley with the four nuts.





5. ADJUST FAN BELT TENSION

Using a belt tension gauge, adjust the drive belt tension.

Belt tension gauge:
Nippondenso BTG-20 (95506-00020) or
Borroughs No. BT-33-73F

Drive belt tension: New belt 125 ± 25 lb
Used belt 80 ± 20 lb

NOTE:

- "New belt" refers to a brand new belt which has never before been used.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After replacing the drive belt, check that it fits properly in the ribbed grooves, especially in the places difficult to see.

6. REFILL COOLANT

Close the radiator and engine drain cocks. Fill with a good brand of ethylene-glycol coolant.

Total capacity: 8.4 liters (8.9 US qts, 7.4 Imp. qts)

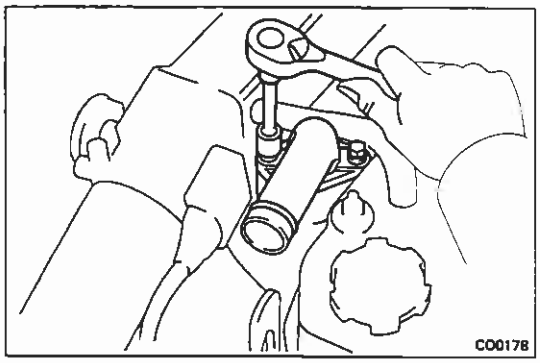
7. START ENGINE AND CHECK FOR LEAKS

THERMOSTAT

REMOVAL OF THERMOSTAT

1. DRAIN COOLANT

Drain the coolant from the radiator into a clean container. The coolant may be reused if specific gravity is within specifications.

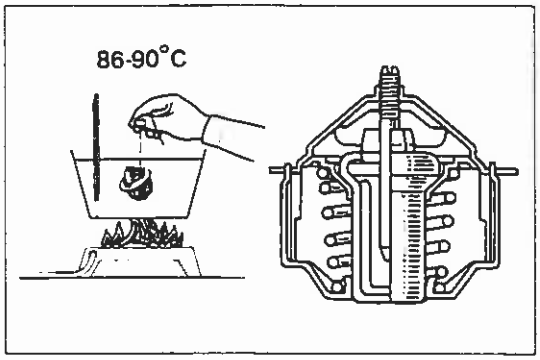


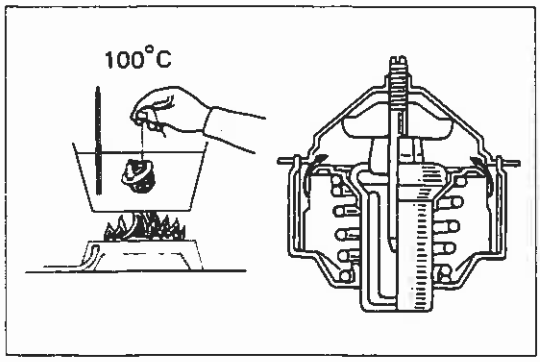
2. REMOVE WATER OUTLET

Remove the two bolts and water outlet from the intake manifold.

3. REMOVE THERMOSTAT AND GASKET

INSPECTION OF THERMOSTAT





NOTE: The thermostat is marked with the valve opening temperature.

(a) Immerse the thermostat in water and heat the water gradually.

(b) Check the valve opening temperature and valve lift. If the valve opening temperature and valve lift are out of following specifications, replace the thermostat.

Valve opening temperature: 86 – 90°C (187 – 194°F)

Valve lift: More than 8 mm (0.31 in.) at 100°C (212°F)

(c) Check that the valve spring is tight when the thermostat is fully closed, and replace if necessary.

INSTALLATION OF THERMOSTAT

1. PLACE THERMOSTAT IN INTAKE MANIFOLD

2. INSTALL WATER OUTLET

Install the water outlet on a new gasket with two bolts.

3. REFILL COOLANT

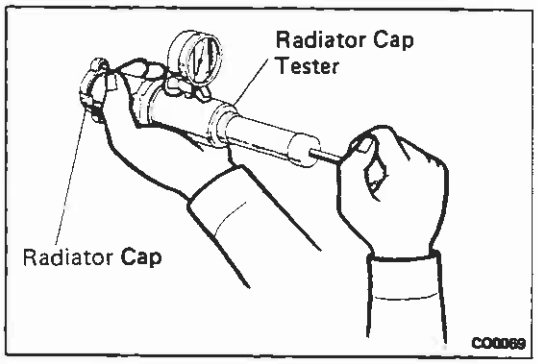
Close the radiator drain cock. Fill with a good brand of ethylene-glycol coolant.

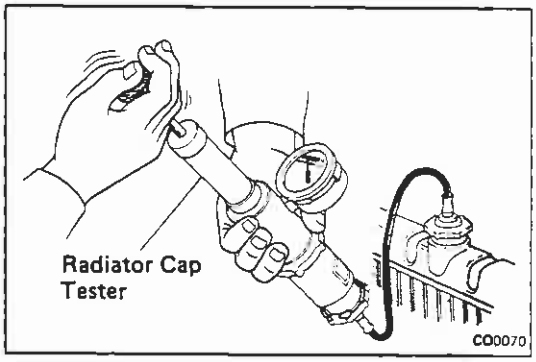
RADIATOR

CLEANING OF RADIATOR

Using water or a steam cleaner, remove mud and dust from radiator core.

CAUTION: If using high pressure type cleaner, be careful not to deform the radiator core fins. For example, keep a distance of at least 40 – 50 cm (15.75 – 19.69 in.) between the radiator core and cleaner nozzle when the cleaner nozzle pressure is 30 – 35 kg/cm² (427 – 498 psi, 2,942 – 3,432 kPa).





INSPECTION OF RADIATOR

1. CHECK RADIATOR CAP

Using a pressure tester, pump the tester until the relief valve opens.
Check that the valve opens between 0.75 kg/cm² (10.7 psi, 74 kPa) and 1.05 kg/cm² (14.9 psi, 103 kPa).

Check that the pressure gauge does not drop rapidly when pressure on the cap is below 0.6 kg/cm² (8.5 psi, 59 kPa).

If either check is not within limits, replace the cap.

2. CHECK COOLING SYSTEM FOR LEAKS

Attach the pressure tester to the radiator and pump the tester to 0.9 kg/cm² (12.8 psi, 88 kPa). Check that pressure does not drop.

If the pressure drops, check for leaks from the hoses, radiator or water pump. If no external leaks are found, check the heater core, block and intake manifold.

REMOVAL OF RADIATOR

1. DRAIN COOLANT

Open radiator drain and engine drain cocks (located on the left of engine block). Drain the fluid into a suitable container.

2. DISCONNECT TWO RADIATOR HOSES

3. REMOVE FAN SHROUD

4. DISCONNECT TWO COOLER HOSES (A/T only)

NOTE:

(1) Be careful as some oil will leak out. Catch it in a suitable container.

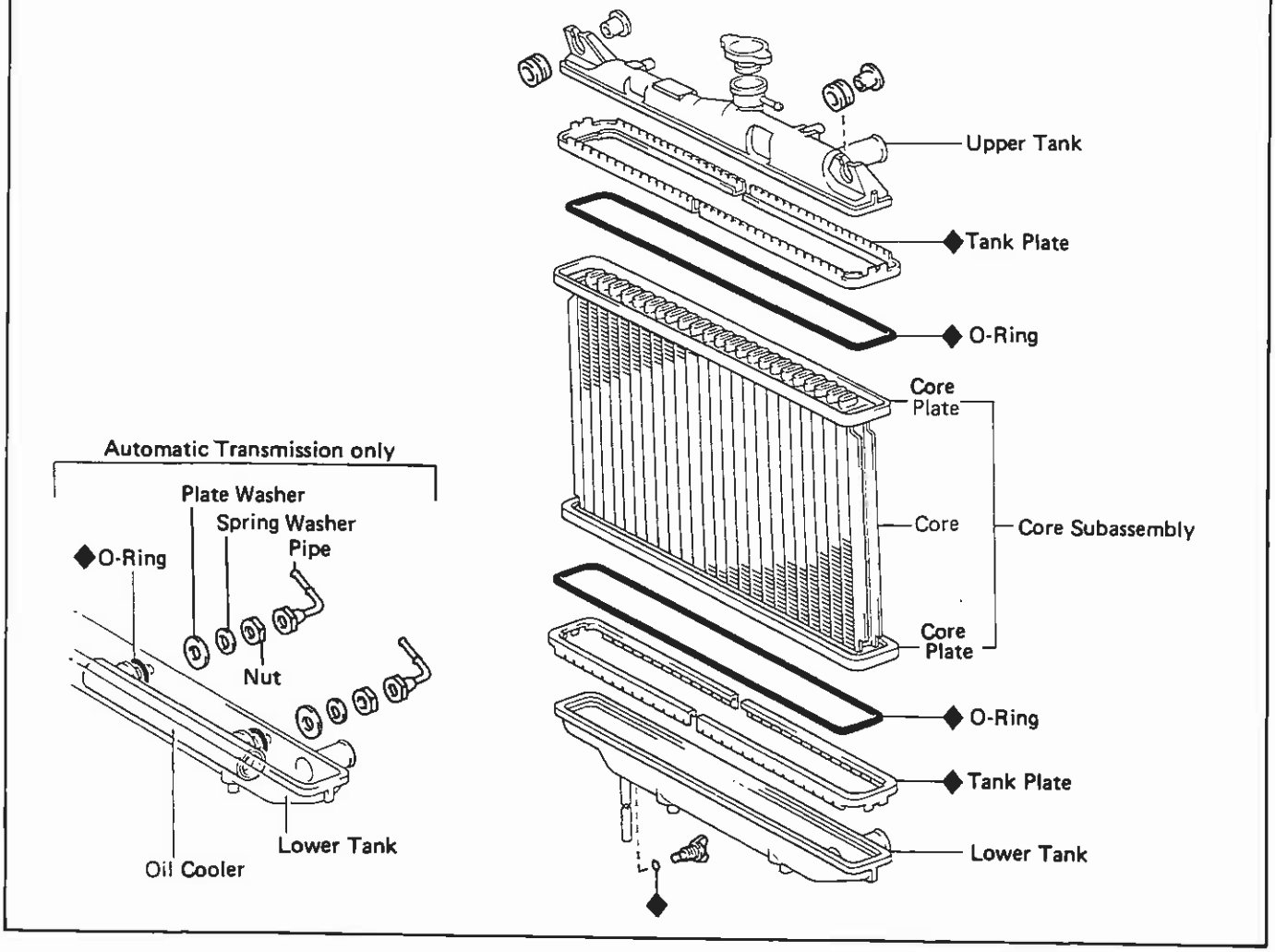
(2) Plug the hose to prevent oil from escaping.

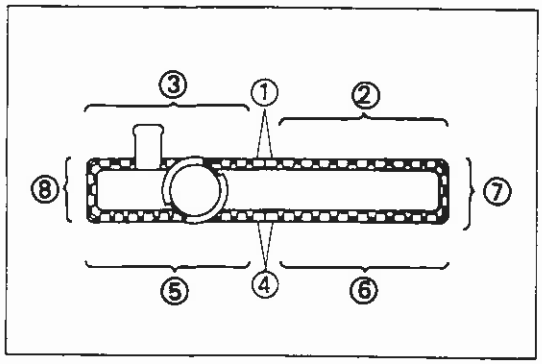
5. DISCONNECT COOLANT RESERVOIR TUBE

6. REMOVE FOUR RADIATOR MOUNTING BOLTS AND RADIATOR

COMPONENTS

◆ : Non-reusable part





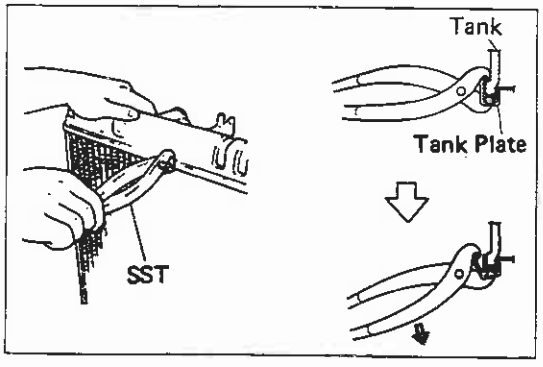
DISASSEMBLY OF RADIATOR

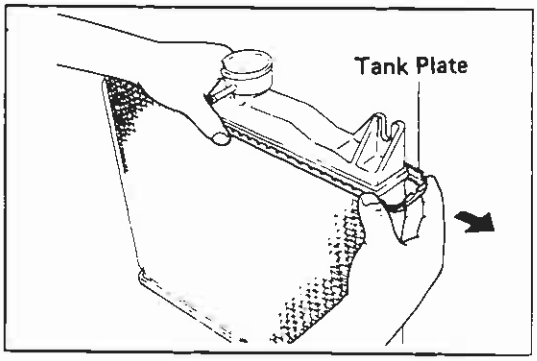
1. REMOVE TANK PLATE

(a) Raise the claws of the tank plates with SST in the numerical order shown in the figure.

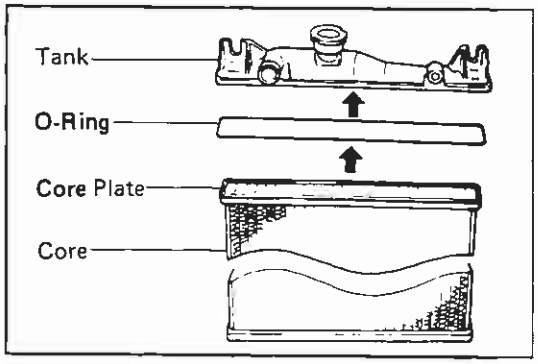
SST 09230-00010

NOTE: Be careful not to damage the core plate.

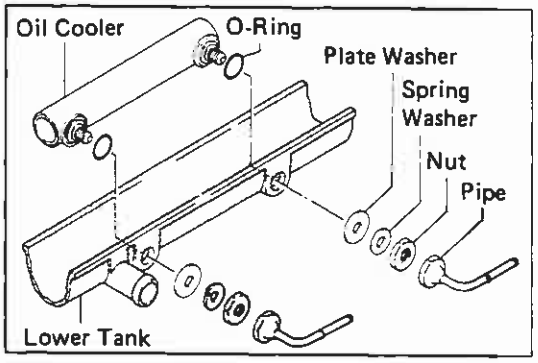




(b) Pull the tank plates outward.



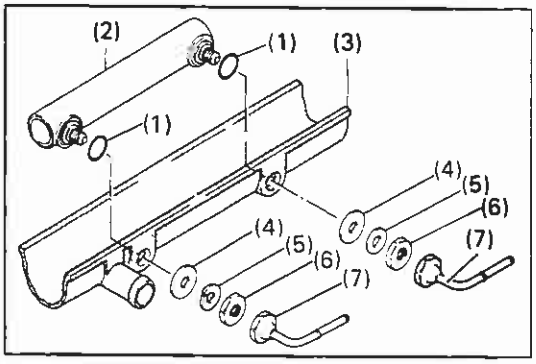
2. REMOVE TANK AND O-RING
   (a) Pull the tank upward.
   (b) Remove the O-ring.



3. IF NECESSARY, REMOVE OIL COOLER FROM LOWER TANK (A/T only)
   (a) Remove the pipes.

   NOTE: Make a note of the direction the pipes face.

   (b) Remove the nuts, spring washers and plate washers.
   (c) Remove the oil cooler and O-rings.



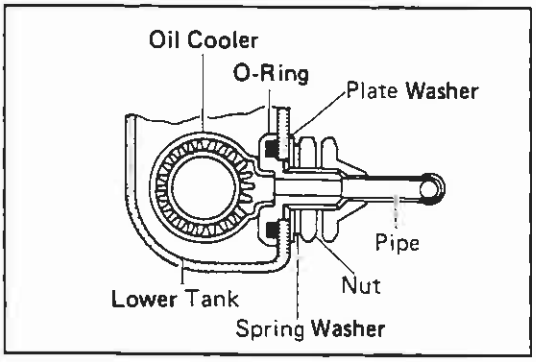
ASSEMBLY OF RADIATOR

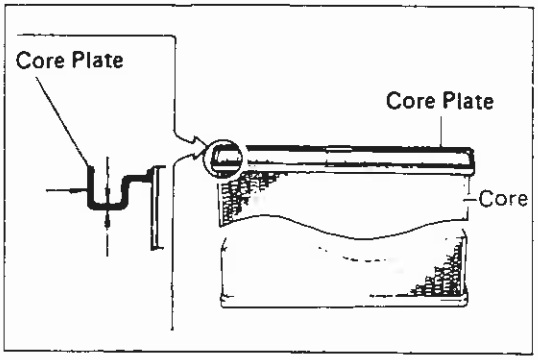
(See page CO-8)

1. IF NECESSARY, INSTALL OIL COOLER TO LOWER TANK (A/T only)
   (a) Clean the O-ring contact surface of the lower tank and oil cooler.
   (b) Install new O-rings (1) to the oil cooler (2).
   (c) Install the oil cooler (2) with O-rings (1) to the lower tank (3).
   (d) Install the plate washers (4), spring washers (5) and nuts (6). Torque the nuts (6).

   Torque: 225 kg-cm (16 ft-lb, 22 N·m)

   (e) Temporarily install the pipes (7).





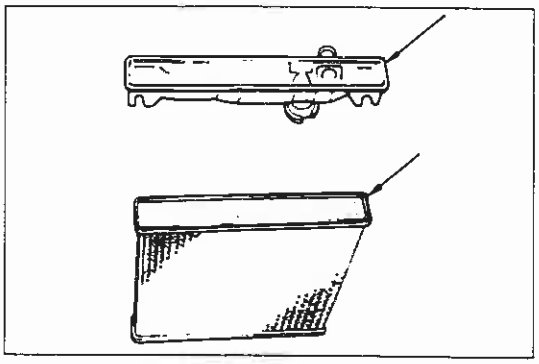
2. INSPECT CORE PLATE

Inspect the core plate for damage.

NOTE:

(1) If the sides of the core plate groove are deformed, reassembly of the tank will be impossible. Therefore, first correct any deformation with a pliers or such.

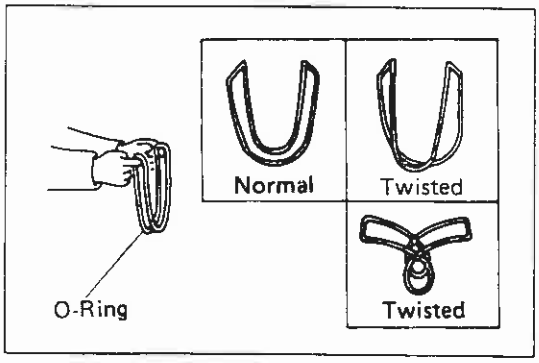
(2) Water leakage will result if the bottom of the core plate groove is damaged or dented. Therefore, repair or replace if damaged.



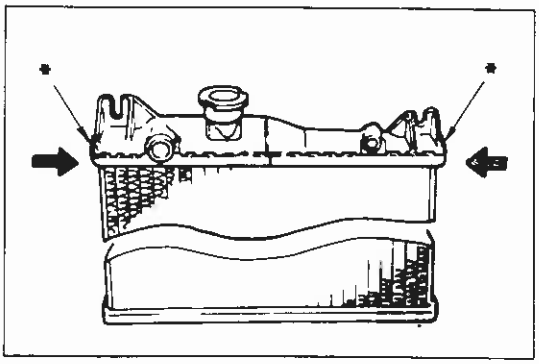
3. INSTALL NEW O-RING AND TANK

NOTE:

(1) Clean the tank and core plate.

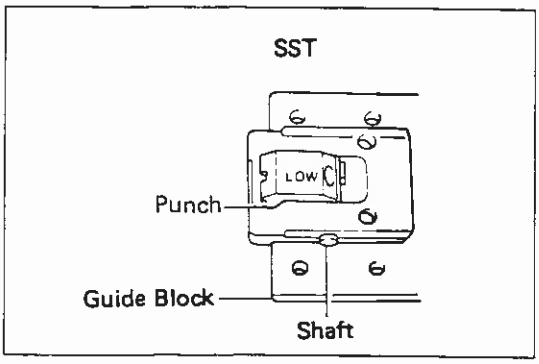


(2) Inspect the O-ring for twists.



4. INSTALL TANK PLATE

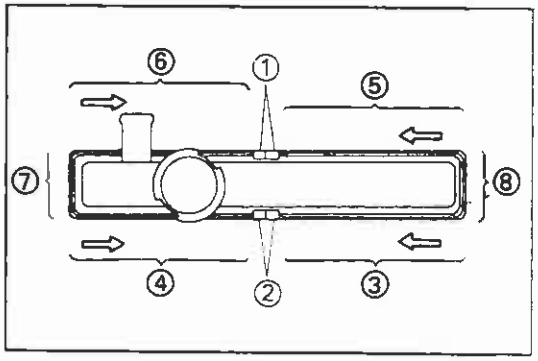
Insert the tank plates from both ends in the direction of the arrows. Insert to where the portions marked "*" make contact with the tank.



5. STAKE CLAW OF TANK PLATE

Set the punch of SST to "LOW".

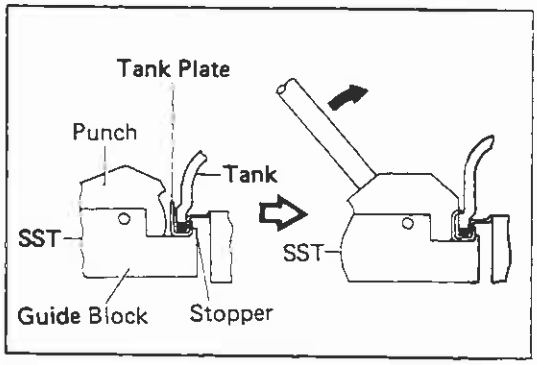
SST 09230-00010



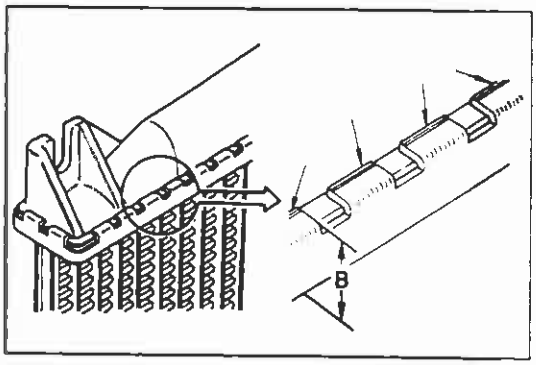
6. STAKE CLAW OF TANK PLATE

Stake the claws of the tank plates with SST in the numerical order shown in the figure.

SST 09230-00010



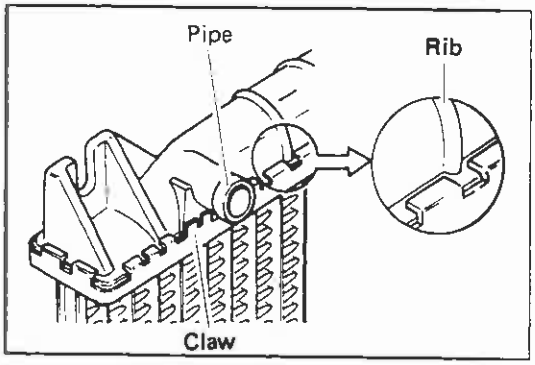
CAUTION: If the bottom of the core plate is staked with the SST on the guide block stopper, it may result in water leakage.



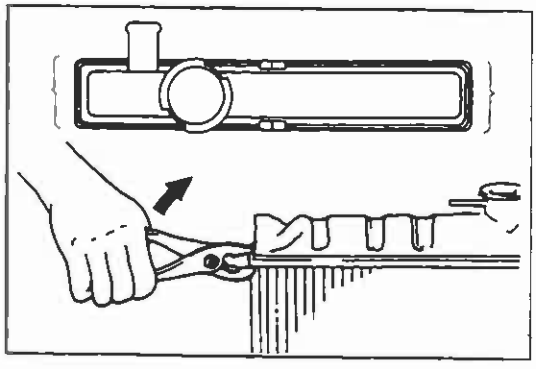
NOTE:

(1) Stake with just enough pressure to leave a mark on the claw. The staked plate height "B" should be as follows:

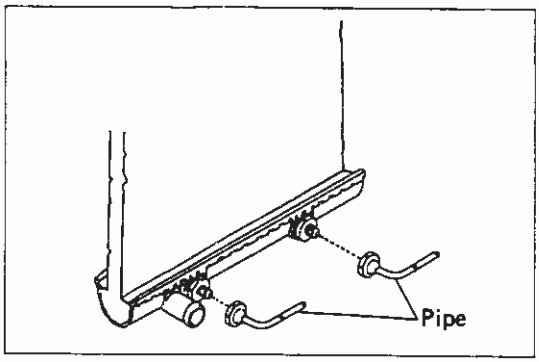
LOW punch : 9.08 – 9.43 mm (0.3575 – 0.3713 in.)



(2) Do not stake the areas protruding around the pipes, brackets or tank ribs.



(3) The points shown in the illustration cannot be staked with the SST. Use a pliers or such and be careful not to damage the core plate.



7. IF NECESSARY, INSTALL PIPE TO OIL COOLER (A/T only)

Install and torque the pipes to the oil cooler.

Torque: 150 kg-cm (11 ft-lb, 15 N·m)

NOTE: Face the pipes in the same direction they were before disassembly.

8. INSPECT FOR WATER LEAKS

(a) Tighten the drain plug.

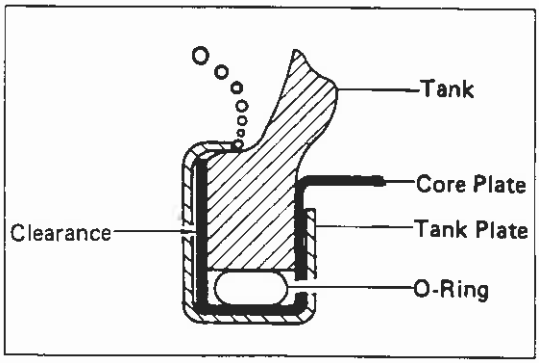
(b) Plug the oil cooler pipes to prevent any water leakage into the oil cooler.

(c) Plug the inlet and outlet pipes of the radiator with SST.

SST 09230-00010

(d) Inspect for water leaks.

Test pressure: 1.5 kg/cm² (21 psi, 147 kPa)



NOTE: On radiators with resin tanks, there is a clearance between the core plate and tank plate where a minute amount of air will remain, causing an appearance of an air leak when the radiator is submerged in water. Therefore, before performing the water leak test, first swish the radiator around in the water until all air bubbles disappear.

9. PAINT TANK PLATES

NOTE: If the water leak test checks out okay, allow the radiator to completely dry and then paint the tank plate.

INSTALLATION OF RADIATOR

1. INSTALL RADIATOR

Place the radiator in installed position and install the four mounting bolts.

2. CONNECT TWO COOLER HOSES (A/T only)

3. INSTALL FAN SHROUD

4. CONNECT TWO RADIATOR HOSES

5. CONNECT COOLANT RESERVOIR TUBE

6. REFILL COOLANT

Close radiator and engine drain cock. Fill with a good brand of ethylene-glycol coolant.

Total capacity: 8.4 liters (8.9 US qts, 7.4 Imp. qts)

7. START ENGINE AND CHECK FOR LEAKS

8. CHECK AUTOMATIC TRANSMISSION FLUID LEVEL