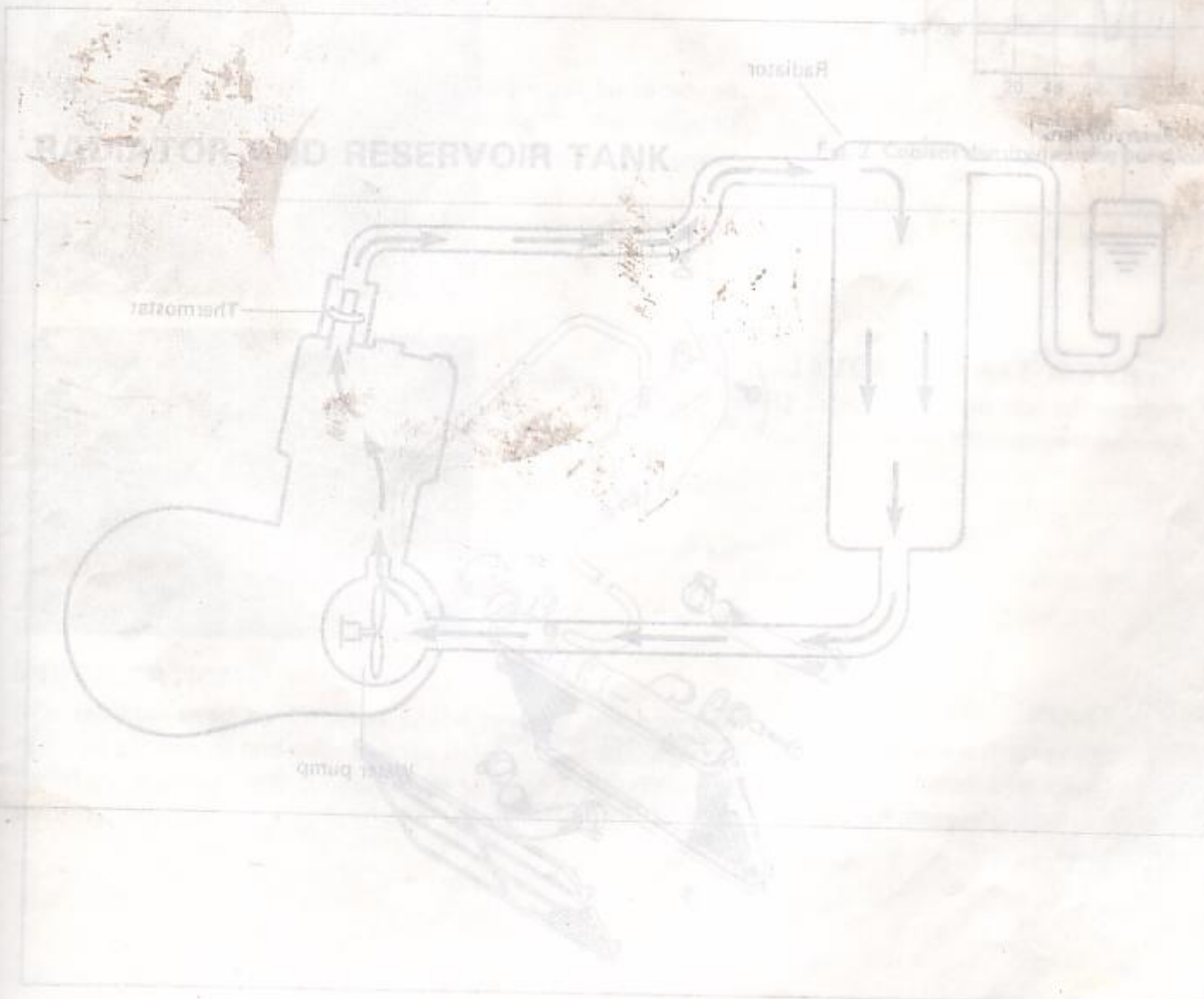


# COOLING SYSTEM

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## COOLING SYSTEM

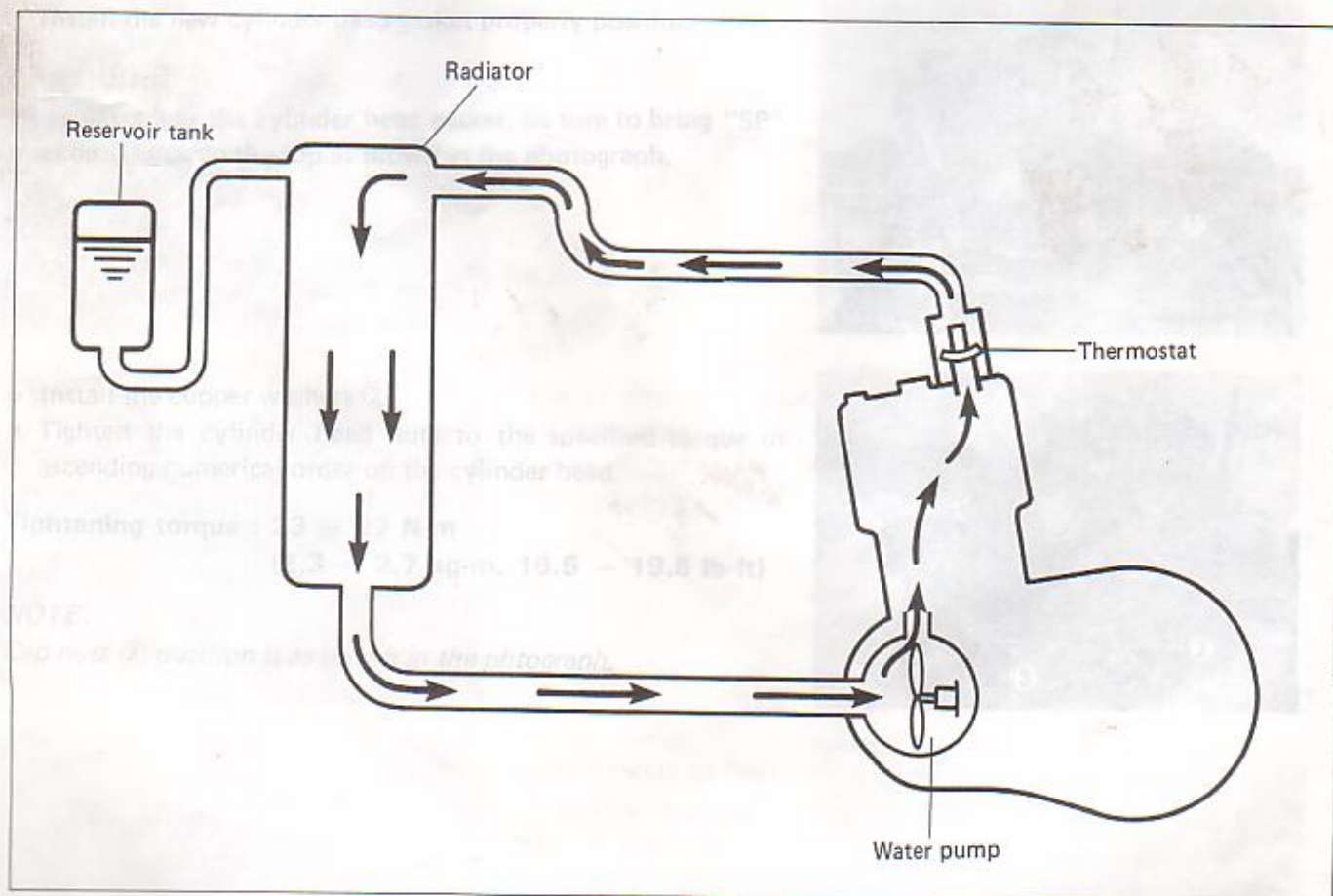
### DESCRIPTION

The engine is cooled by coolant set in forced recirculation through jackets formed in the cylinder and head, and through the radiator. For the water pump, a high-capacity centrifugal pump is used. The radiator is tube and fin type made aluminum material, which is characterized by lightness in weight and good heat dissipation.

The thermostat is of wax pellet type, complete with a valve as the means of temperature-dependent control over the flow of coolant through the radiator. The valve is actuated by the temperature-sensitive wax contained in the pellet.

Referring to the following illustration, the thermostat is in the closed condition, so that water recirculates through the route comprising pump, engine, by-pass holes of the thermostat and radiator in the regulated condition.

As the coolant temperature rises to  $50^{\circ}\text{C}$  and the thermostat valve unseats, the normal coolant flow is established. At about  $65^{\circ}\text{C}$  of coolant temperature, the thermostat becomes completely open and the most of heat is released to the atmosphere through the radiator core.





## COOLING SOLUTION

At the time of manufacture, the cooling system is filled with a 50 : 50 solution of distilled water and anti-freeze/summer coolant. This 50 : 50 mixture will provide excellent heat protection, and will protect the cooling system from freezing at temperatures above  $-31^{\circ}\text{C}$  ( $-24^{\circ}\text{F}$ ).

If the motorcycle is to be exposed to temperatures below  $-31^{\circ}\text{C}$  ( $-24^{\circ}\text{F}$ ), this mixing ratio could be increased up to 55% or 60% according to the Fig. 2.

### NOTE:

The characteristics of different anti-freezes vary. Read the label to know the protection you will have.

### CAUTION:

Do not put in more than 60% anti-freeze or less than 50%.

Do not mix different brands of anti-freeze.

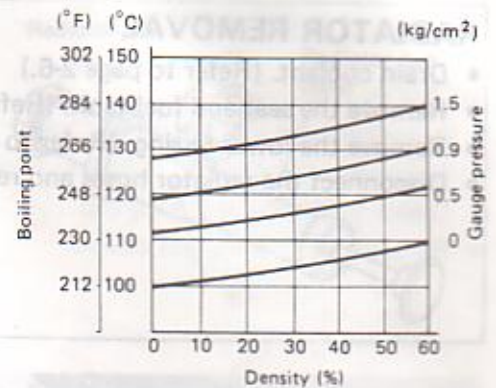


Fig. 1 Coolant density-boiling point curve

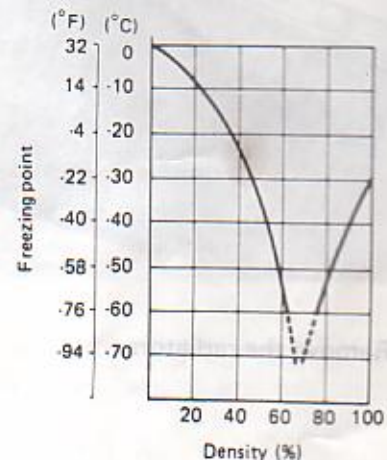
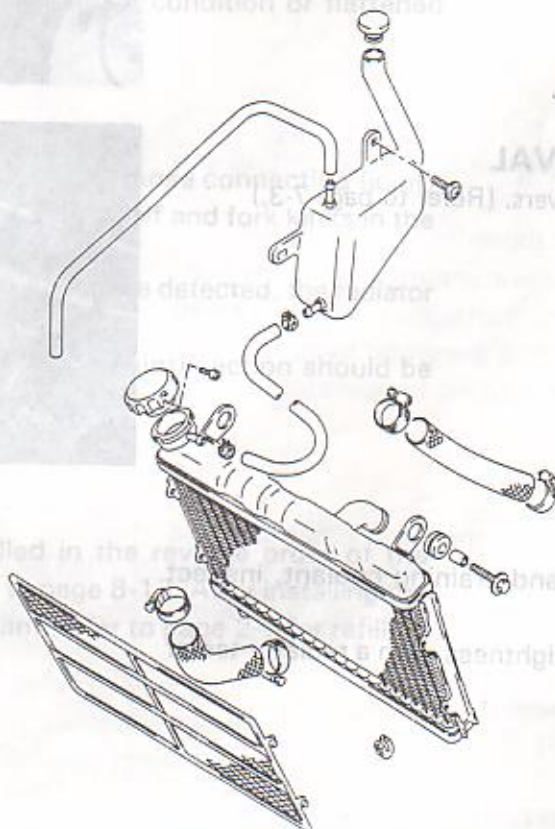


Fig. 2 Coolant density-freezing point curve

## RADIATOR AND RESERVOIR TANK



### INSTALLATION

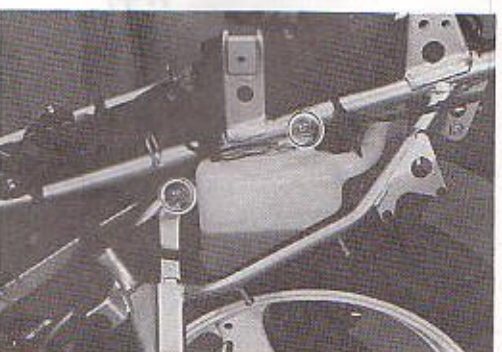
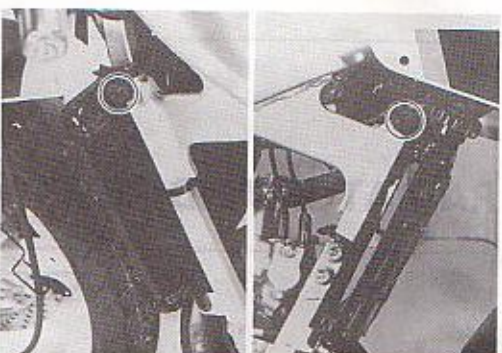
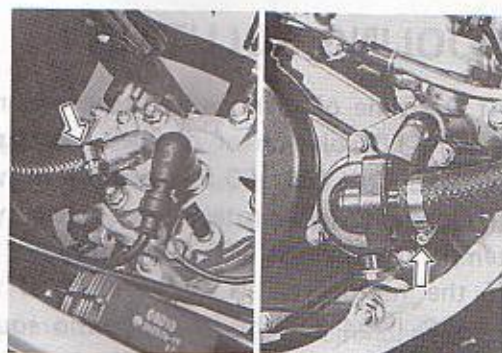
The radiator is to be installed in the engine compartment. Before removing the radiator and hoses, refer to the following two items:

1. Test the cooling system for tightness.  
2. Test the cooling system for tightness.



## RADIATOR REMOVAL

- Drain coolant. (Refer to page 2-6.)
- Remove the seat and fuel tank. (Refer to page 3-2.)
- Remove the lower fairing. (Refer to page 7-1.)
- Disconnect the radiator hoses and reservoir hose.



- Remove the radiators.

## RESERVOIR TANK REMOVAL

- Remove the seat and frame covers. (Refer to page 7-3.)
- Remove the reservoir tank.

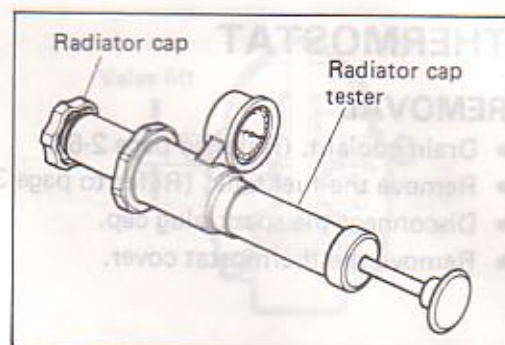
## INSPECTION

Before removing the radiator and draining coolant, inspect the following two items.

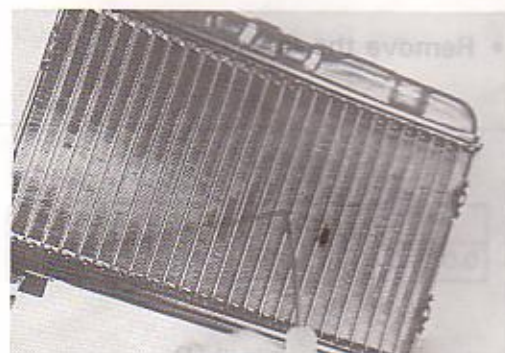
1. Test the cooling system for tightness with a radiator tester as follows:



Remove the radiator cap, and connect the tester to the filter. Give a pressure of about  $1 \text{ kg/cm}^2$  ( $14.2 \text{ psi}$ ) and see if the system holds this pressure for 10 seconds. If the pressure should fall during this 10-second interval, it means that there is a leaking point in the system; In such a case, inspect the entire system and replace the leaking component or part.



2. Test the radiator cap for relieving pressure by using the radiator tester in the following manner: Fit the cap to the tester, as shown, and build up pressure slowly by operating the tester. Make sure that the pressure build-up stops at  $1.10 \pm 0.15 \text{ kg/cm}^2$  and that, with the tester held at a standstill, the cap is capable of that pressure for at least 10 seconds. Replace the cap if it is found not to satisfy either of these two requirements.



**Radiator cap valve release pressure :**

**$110 \pm 15 \text{ kPa}$  ( $1.10 \pm 0.15 \text{ kg/cm}^2$  ,  $15.6 \pm 2.1 \text{ psi}$ )**

3. Road dirt or trashes stuck to the fins must be removed. Use of compressed air is recommended for this cleaning. Fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.
4. Any water hose found in cracked condition or flattened must be replaced.

### RADIATOR HOSE

Inspect for leakage from the radiator hose connecting (joint) section and from the radiator hose itself and fork kinks in the radiator hose.

If any leakage from the radiator hose are detected, the radiator hose should be replaced.

Any leakages from the connecting (joint) section should be corrected by proper tightening.

### INSTALLATION

The radiator is to be installed in the reverse order of the removal procedure and refer to page 8-13. After installing the radiator, be sure to add coolant: refer to page 2-7 for refilling information.





## THERMOSTAT

### REMOVAL

- Drain coolant. (Refer to page 2-6.)
- Remove the fuel tank. (Refer to page 3-2.)
- Disconnect the spark plug cap.
- Remove the thermostat cover.

- Remove the thermostat.

### INSPECTION

Inspect the thermostat pellet for signs of cracking.

Test the thermostat at the bench for control action, in the following manner.

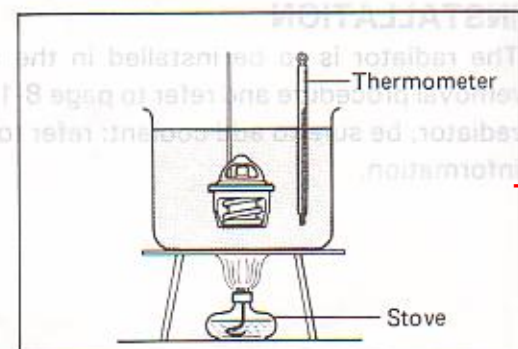
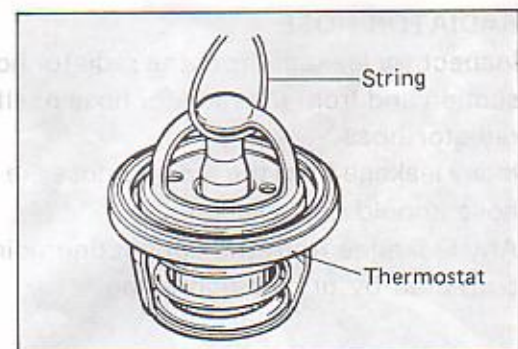
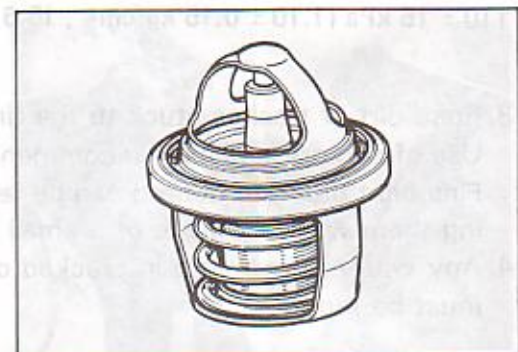
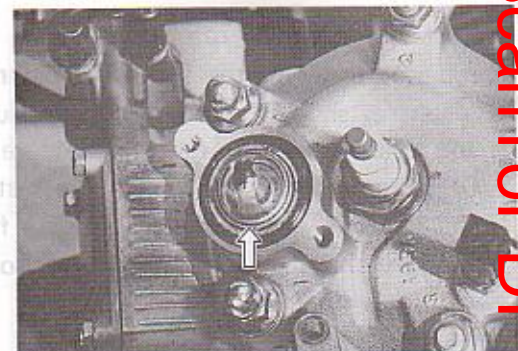
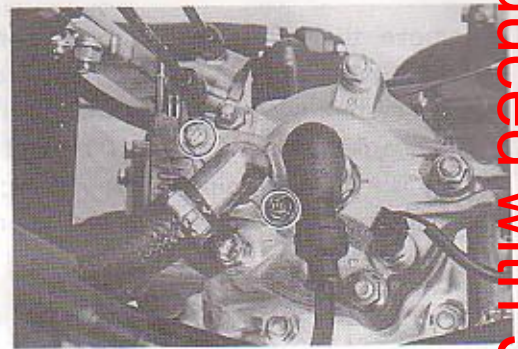
- Pass a string between flange, as shown in the illustration.
- Immerse the thermostat in the water contained in the pan, as shown in the illustration. Note that the immersed thermostat is in suspension. Heat the water by placing the pan on a stove and observe the rising temperature on the thermometer.

- Read the thermometer just when the thermostat drops to the bottom of the pan. This reading, which is the temperature level at which the thermostat valve begins to open, should be anywhere between  $48.5^{\circ}\text{C}$  and  $51.5^{\circ}\text{C}$ .

**Thermostat valve opening temperature :**

$48.5 - 51.5^{\circ}\text{C}$  ( $119.3 - 124.7^{\circ}\text{F}$ )

- Keep on heating the water to raise its temperature to and beyond  $65^{\circ}\text{C}$  ( $149^{\circ}\text{F}$ ).

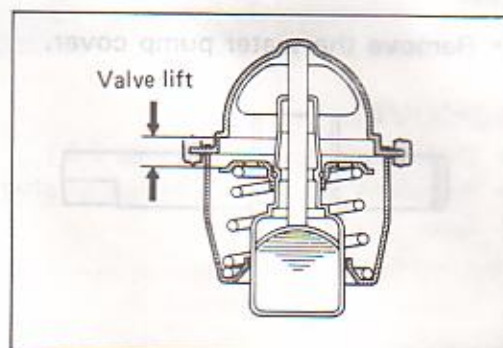




- Just when the water reaches 65°C, the thermostat valve should have lifted by at least 3.0 mm.

Thermostat valve lift : Over 3.0 mm (0.12 in)  
at 65°C (149°F)

- A thermostat failing to satisfy either of the two requirements (start-to-open temperature and valve lift) must be replaced.

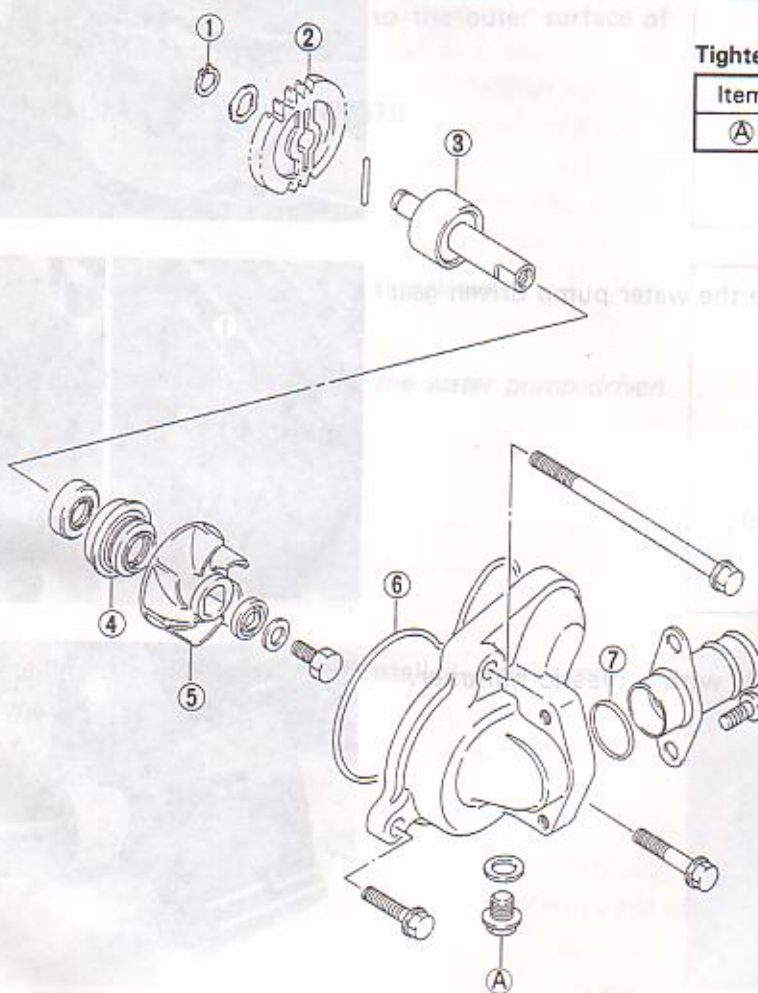


## WATER PUMP

Tightening torque

Item	N·m	kg-m	lb-ft
(A)	11-14	1.1-1.4	8.0-10.0

- ① Circlip
- ② Water pump driven gear
- ③ Water pump shaft
- ④ Mechanical seal
- ⑤ Impeller
- ⑥ O-ring
- ⑦ O-ring



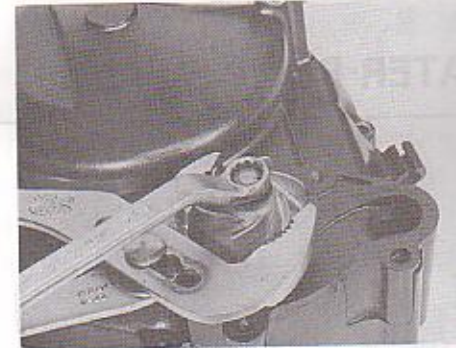
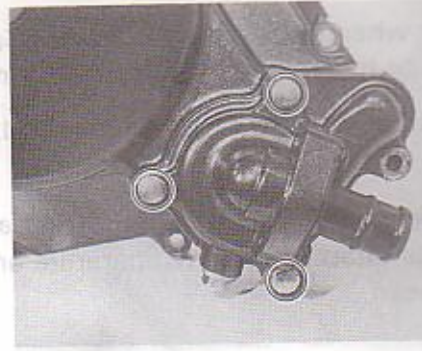
## REMOVAL AND DISASSEMBLY

- Drain transmission oil. (Refer to page 2-6.)
- Drain coolant. (Refer to page 2-6.)
- Remove the lower fairing. (Refer to page 7-1.)
- Remove the clutch release arm. (Refer to page 3-3.)
- Remove the clutch cover. (Refer to page 3-10.)

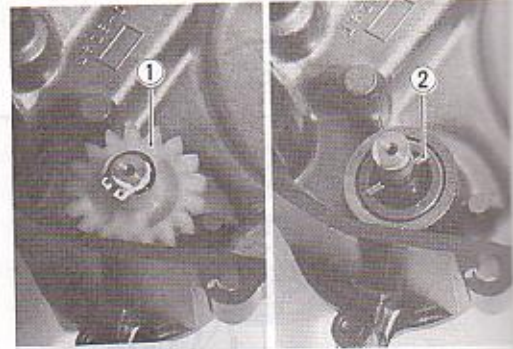
- Remove the water pump cover.



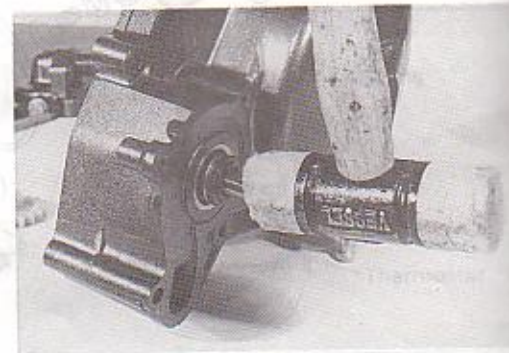
- Remove the impeller with a water pump plier.



- Remove the circlip, and remove the water pump driven gear ① and pin ②.



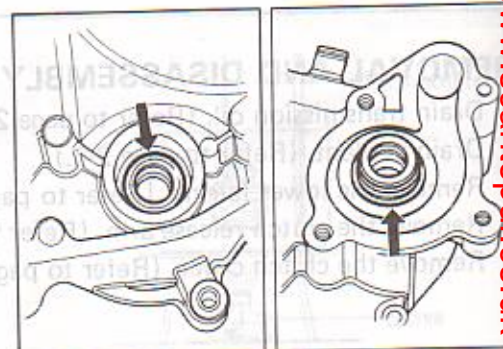
- Remove the water pump shaft with a plastic hammer.



- Remove the oil seal and mechanical seal.

## CAUTION:

The removed oil seal and mechanical seal should be replaced with a new one.

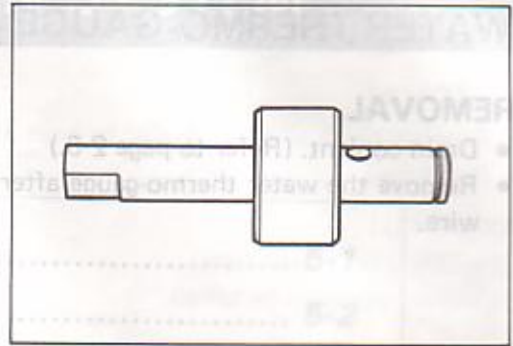




## INSPECTION

Rotate the water pump shaft by hand inspect if any abnormal noise occurs or rotating smoothly.

Replace the water pump shaft if there is anything unusual.

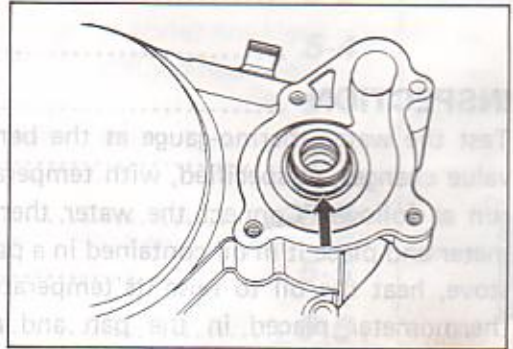


## REASSEMBLY

Reassemble and remount the water pump in the reverse order of removal and disassembly.

- Apply SUZUKI BOND NO. 1207B to the outer surface of mechanical seal and install it.

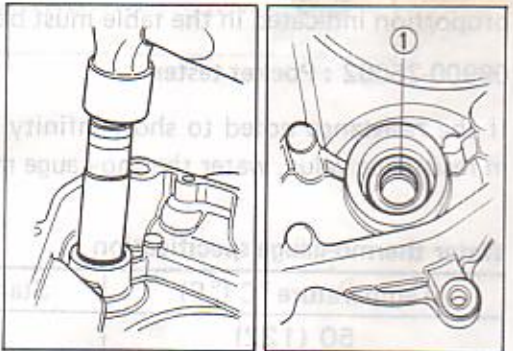
99000-31140 : SUZUKI BOND No. 1207B



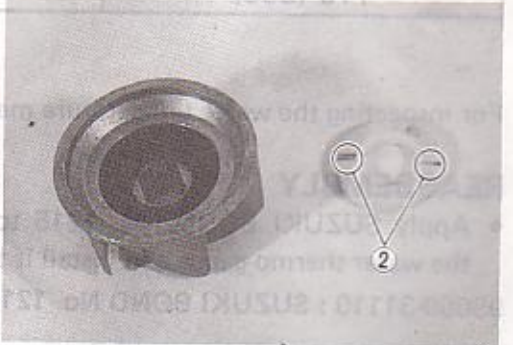
- Install the new oil seal with a suitable size sleeve.

### NOTE:

Oil seal lip ① must be installed toward the water pump driven gear.



- When installing the ring, it must be installed with its mark ② facing toward the impeller.

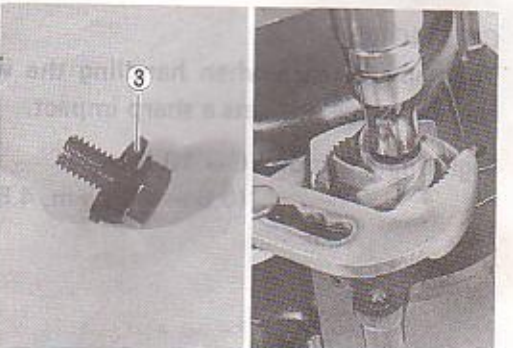


- Use a new gasket ③ for impeller center bolt. When installing the gasket, face the iron side to the spring washer and bolthead.
- Tighten the impeller mounting bolt to the specified torque with a water pump plier.

Tightening torque : 7 — 9 N·m

(0.7 — 0.9 kg-m, 5.0 — 6.5 lb-ft)

- Fill the specified coolant. (Refer to page 2-7.)





## WATER THERMO-GAUGE

### REMOVAL

- Drain coolant. (Refer to page 2-6.)
- Remove the water thermo-gauge after disconnecting the lead wire.

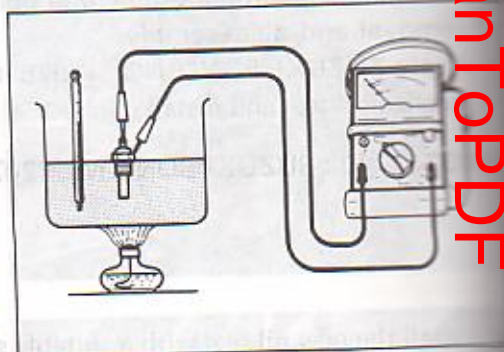


### INSPECTION

Test the water thermo-gauge at the bench to see if its ohmic value changes, as specified, with temperature. The test is to be run as follows: Connect the water thermo-gauge to the ohmmeter and place it in oil contained in a pan, which is placed on a stove, heat the oil to raise its temperature slowly, reading the thermometer placed in the pan and also the ohmmeter. A water thermo-gauge whose ohmic value does not change in the proportion indicated in the table must be replaced.

09900-25002 : Pocket tester

If the resistance noted to show infinity or too much difference in resistance value, water thermo-gauge must be replaced.



Water thermo-gauge specification

Temperature °C (°F)	Standard resistance (Ω)
50 (122)	190 – 260
115 (239)	23 – 30

For inspecting the water temperature meter, refer to page 6-11.

### REASSEMBLY

- Apply SUZUKI BOND NO. 1215 to the thread portion of the water thermo-gauge and install it to the cylinder head.

99000-31110 : SUZUKI BOND No. 1215

- Fill the specified coolant. (Refer to page 2-7.)

### CAUTION:

Take special care when handling the water thermo-gauge may cause damage if it gets a sharp impact.

Tightening torque : 6 – 10 N·m  
(0.6 – 1.0 kg·m, 4.5 – 7.0 lb·ft)