

# 12.COOLING SYSTEM

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## COOLING SYSTEM

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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The cooling system service can be done with the engine installed in the frame.
- The engine must be cool before servicing the cooling system.  
When the coolant temperature is over 100°C, never remove the radiator cap to release the pressure because the boiling coolant may cause danger.
- Avoid spilling coolant on painted surfaces because the coolant will corrode the painted surfaces.  
Wash off any spilled coolant with fresh water as soon as possible.
- After servicing the system, check for leaks with a cooling system tester.

### SPECIAL TOOL

Mechanical seal driver

### TORQUE VALUES

Water pump impeller	120 kfg-cm ( 12Nm, 8.6 lbf-ft )
Water pump cover bolt	100 kfg-cm ( 10Nm, 7.2 lbf-ft )

## TROUBLESHOOTING

### Engine temperature too high

- Faulty temperature gauge or thermosensor
- Faulty radiator cap
- Faulty thermostat
- Insufficient coolant
- Passages blocked in hoses or water jacket
- Clogged radiator fins
- Passages blocked in radiator
- Faulty water pump
- Faulty pump mechanical ( water ) seal
- Deteriorated O-rings
- Damaged or deteriorated water hoses

### Temperature gauge pointer does not register the correct coolant temperature.

- Faulty temperature gauge or thermosensor
- Faulty thermostat

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## SPECIFICATIONS

Radiator cap relief pressure		0.75~1.05 kgf/cm <sup>2</sup> (75~105 kPa, 10.65~14.91 psi)	
Thermostat temperature	Begins to open	72±2°C	
	Full-open	85°C	
	Valve lift	7.3~7.8 mm (0.29~0.31 in)	
Coolant capacity		Total system 1100±20 cc	Radiator:800±20 cc Reserve tank:300±20 cc

### Cautions for Using Coolant:

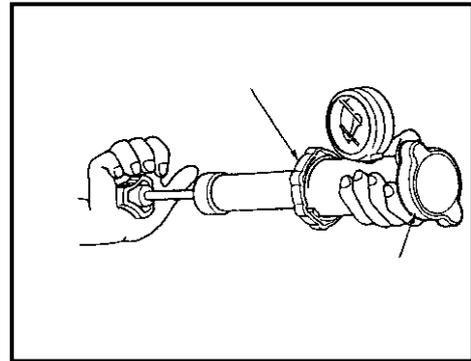
- Do not mix coolant concentrate of different brands.
- Do not drink the coolant which is poisonous.
- The freezing point of coolant mixture shall be 5°C lower than the freezing point of the riding area.

## COOLING SYSTEM TESTING

### RADIATOR CAP INSPECTION

Install the radiator cap onto the radiator tester and apply specified pressure to it . It must hold specified pressure for at least six seconds.

- \* Apply water to the cap sealing surface before testing.



### Radiator Cap Relief Pressure:

0.75~1.05 kgf/cm<sup>2</sup>  
(75~105 kpa, 10.65~14.91 psi)

Install the radiator tester onto the radiator and apply specified pressure to it. It must hold specified pressure for at least six seconds.

Check the water hoses and connectors for leaks.

- \* The test pressure should not exceed 1.05 kg/ cm<sup>2</sup> (105kpa, 14.91 psi).Excessive pressure can damage the radiator and its hose connectors.

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## RADIATOR

### RADIATOR INSPECTION

Inspect the radiator soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air. If insects, etc., are clogging the radiator, wash them off.

Carefully straighten any bent fins.

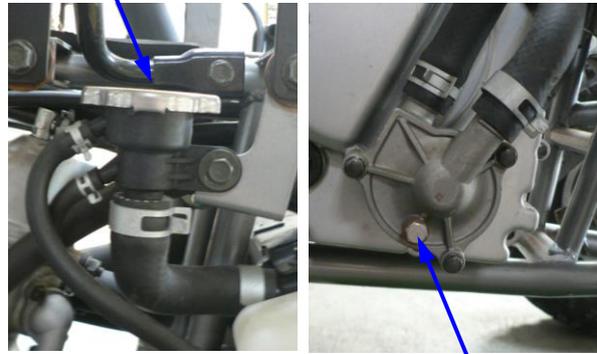


Radiator  
Radiator Cap

### RADIATOR REMOVAL

Remove the radiator cap.

Remove the drain bolt and drain the coolant from the system.



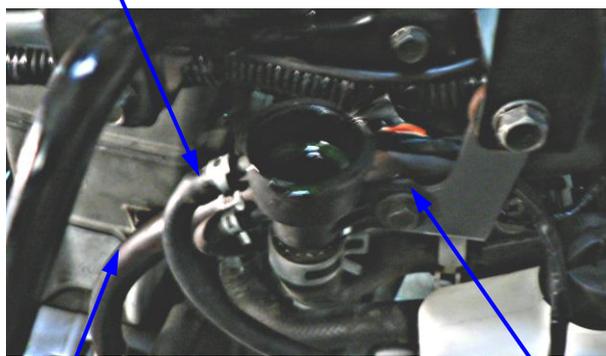
Coolant Drain Bolt

Disconnect the air bleed hose from the radiator filler.

Remove the siphon hose clamp and disconnect the siphon hose.

Remove the two bolts from filler neck hold plate.

Siphon Hose



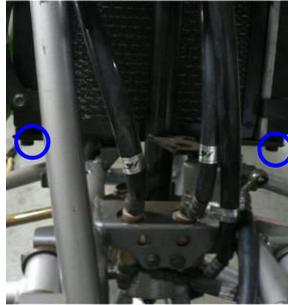
Air Bleed Hose

Bolt

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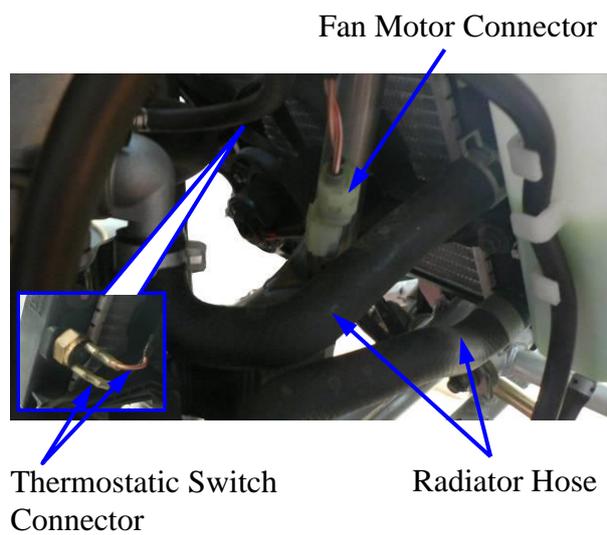
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Remove the two bolts on the radiator.  
Pull radiator forward and raise the radiator  
from frame.



Bolts

Disconnect the thermostatic switch wire  
connectors.  
Disconnect the fan motor connector.  
Loosen the hose bands and disconnect the  
coolant hoses from the radiator.



Fan Motor Connector

Thermostatic Switch  
Connector

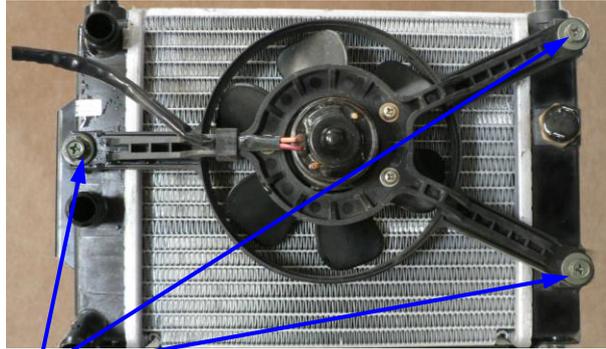
Radiator Hose  
Connector

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## RADIATOR DISASSEMBLY

Remove the three bolts and then remove the fan shroud from the radiator.  
Check fan motor by battery.



Bolts

## CHECK THERMOSTATIC SWITCH

When coolant temperature lower then  $85\sim 90^{\circ}\text{C}$  the thermostatic switch OFF.  
When coolant temperature over  $85\sim 90^{\circ}\text{C}$  the thermostatic switch ON.

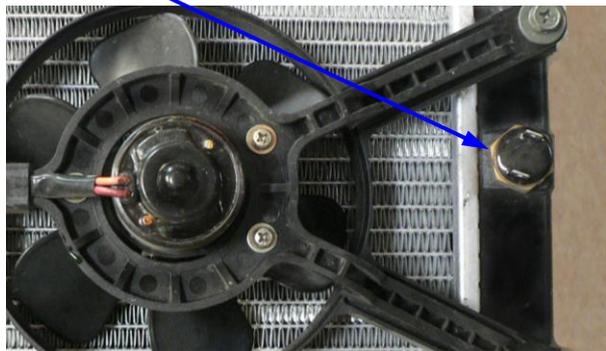
## RADIATOR ASSEMBLY

Install the fan shroud on the radiator with the three bolts.

## RADIATOR INSTALLATION

Reverse the “RADIATOR REMOVAL” procedures.

Thermostatic Switch



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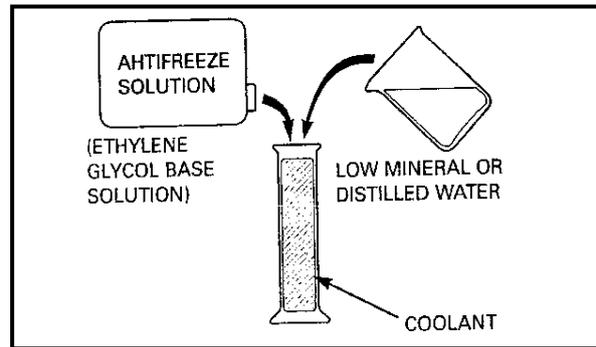
## COOLANT REPLACEMENT PREPARATION

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

Mix only distilled, low mineral water with the antifreeze.

### Recommended mixture:

1:1 ( Distilled water and antifreeze )

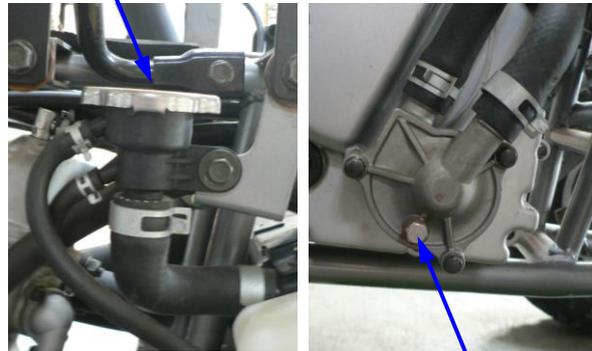


## REPLACEMENT/AIR BLEEDING

- \* When filling the system or reserve tank with coolant (checking the coolant level), place the vehicle in a vertical position on a flat, level surface.

Remove the radiator cap.  
Remove the drain bolt and drain the coolant from the system.

Radiator Cap



Coolant Drain Bolt

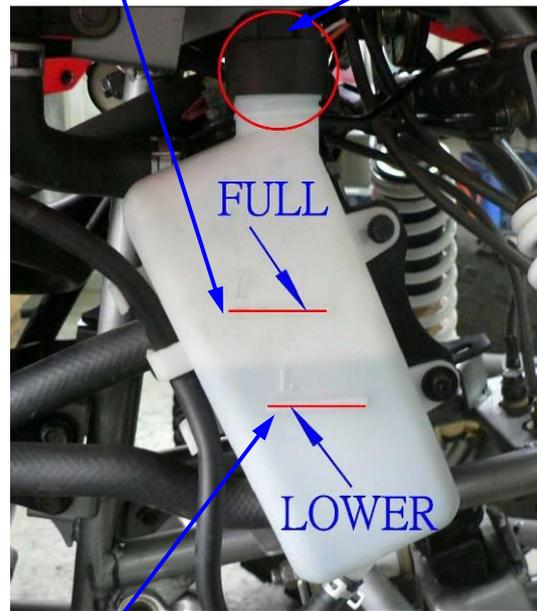
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Remove the reserve tank cap and drain the coolant from the reserve tank.  
Remove the drain bolt with the new sealing washer securely.

Place the vehicle on a flat, level surface.  
Fill the reserve tank to the upper level line.

Maximum Mark    Coolant Reservoir Cap



Minimum Mark

Fill the system with the recommended coolant through the filler opening up to the filler neck.

Filler Neck



Bleed air from the system as follow:

1. Start the engine and let it idle for 2-3 minutes.
2. Snap the throttle three to four times to bleed air from the system.
3. Stop the engine and add coolant to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

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## WATER PUMP

### MECHANICAL SEAL ( WATER SEAL ) INSPECTION

Inspect the telltale hole for signs of mechanical seal coolant leakage.  
If the mechanical seal is leaking, remove the water pump and replace the mechanical seal.



Water Pump

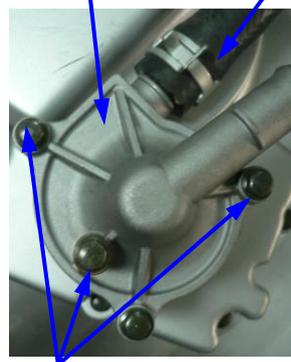


Telltale Hole

### WATER PUMP ASSEMBLY REMOVAL

Drain the coolant. (⇒ 12-7)  
Loosen the screw and disconnect the coolant inlet hose.  
Remove the three bolts and the water pump assembly.

Water Pump    Inlet Hose



Bolts



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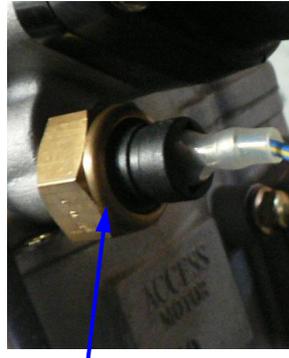
## THERMOSENSOR

### THERMOSENSOR REMOVAL

Drain the coolant. (⇒12-7)

Disconnect the thermo sensor wire.

Remove the thermo sensor from the cylinder head .



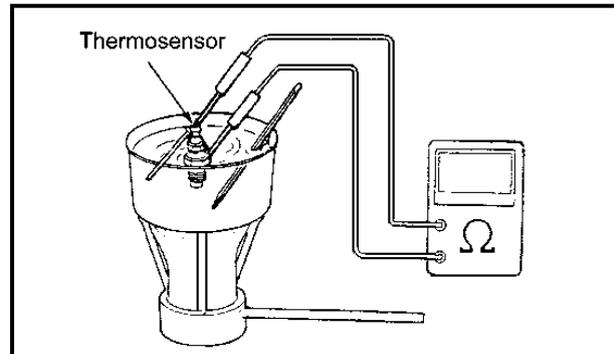
Thermosensor

### THERMO SENSOR INSPECTION

Suspend the thermosensor in a pan of water over a burner and measure the resistance through the sensor as the water heats up.

ON : Temperature  $\geq 115^{\circ}\text{C}$

OFF : Temperature  $< 115^{\circ}\text{C}$



### THERMO SENSOR INSTALLATION

Apply 3-BOND No. 1212 sealant or equivalent to the thermo sensor threads and install it into the cylinder head.

Connect the thermo sensor wire.

Fill the radiator with coolant. (⇒12-7)

\* Be sure to bleed air from the cooling system.

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## THERMOSTAT

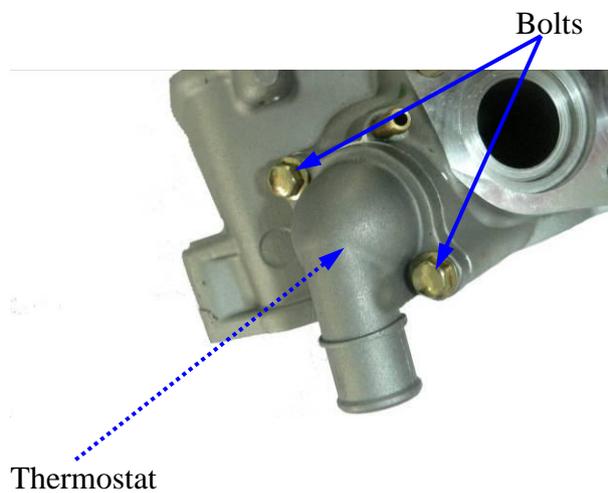
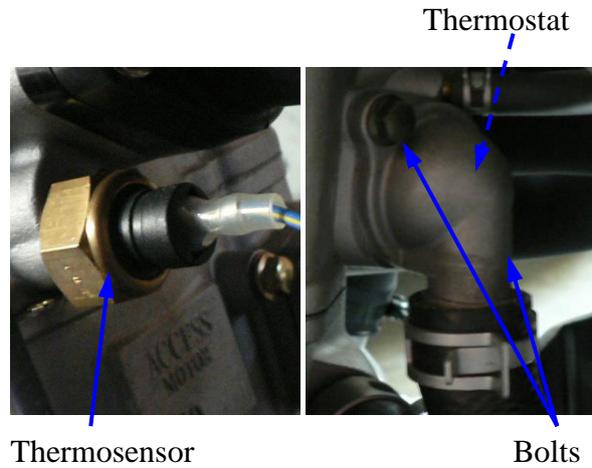
### THERMOSTAT REMOVAL

Drain the coolant

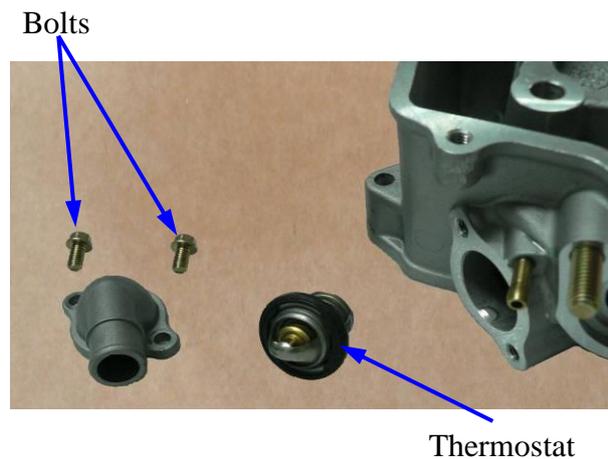
Disconnect the water hose from the thermostat cover.

Disconnect the air vent tube from the thermostat cover.

Remove the mounting bolt and the thermostat cover from the cylinder head.



Remove the thermostat from the thermostat cover.



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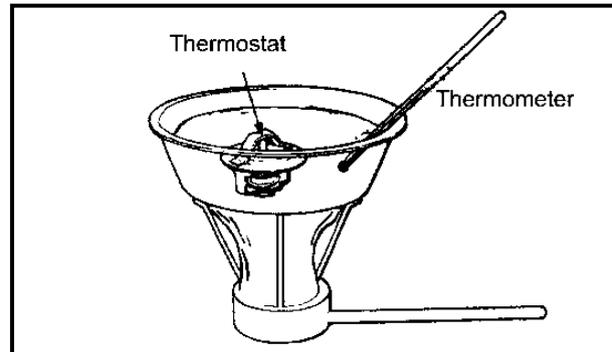
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## THERMOSTAT INSPECTION

Suspend the thermostat in a pan of water over a burner and gradually raise the water temperature to check its operation.

### Technical Data

Begins to open	$72\pm 2^{\circ}\text{C}$
Full-open	$85^{\circ}\text{C}$
Valve lift	7.3-7.8 mm



- \* Do not let the thermostat touch the pan as it will give a false reading.
- Replace the thermostat if the valve stays open at room temperature.
- Test the thermostat after it is opened for about 5 minutes and holds the temperature at  $70^{\circ}\text{C}$ .

## THERMOSTAT INSTALLATION

The installation sequence is the reverse of removal.

Fill the cooling system with the specified coolant. ( $\Rightarrow$  12-7)