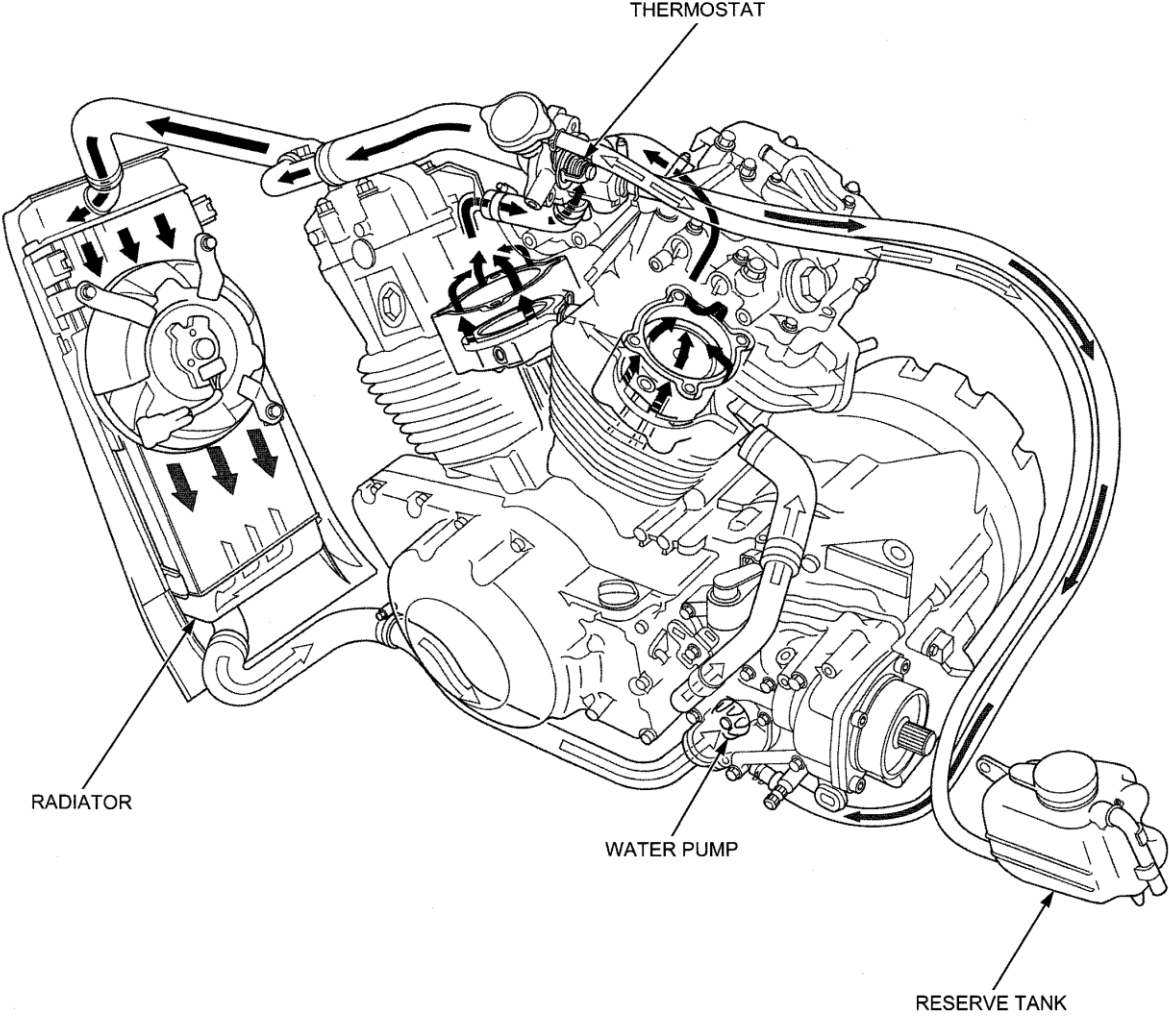


7. COOLING SYSTEM

SYSTEM FLOW PATTERN.....	7-2	THERMOSTAT HOUSING	7-10
SERVICE INFORMATION	7-3	RADIATOR/COOLING FAN.....	7-10
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THERMOSTAT	7-8		

COOLING SYSTEM

SYSTEM FLOW PATTERN



SERVICE INFORMATION

GENERAL

⚠ WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For ECT sensor inspection (page 22-17).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.30 liters (2.43 US qt, 2.02 Imp qt)
	Reserve tank	0.24 liter (0.25 US qt, 0.21 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	95 °C (203 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 (mixture with distilled water)

TORQUE VALUES

Water pump cover bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	See page 7-18
Water pump stud bolt	–	
Water hose band screw	–	See page 7-15
Cooling fan mounting nut	2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)	Apply locking agent to the threads.
Fan motor mounting nut	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)	
Fan motor assembly mounting bolt	8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)	
Thermostat housing cover bolt	13 N·m (1.3 kgf·m, 1.0 lbf·ft)	

COOLING SYSTEM

TROUBLESHOOTING

Engine temperature too high

- Faulty temperature indicator or ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Radiator air passage clogged with dirt
- Faulty water pump

Engine temperature too low

- Thermostat stuck open
- Faulty temperature indicator or ECT sensor
- Faulty fan control relay

Coolant leaks

- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose water hose connection or clamp
- Damaged or deteriorated water hoses
- Damaged radiator

SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Remove the ignition switch case (page 3-10).

Remove the radiator cap.

⚠ CAUTION

The engine must be cool before removing the radiator cap, or severe scalding may result.



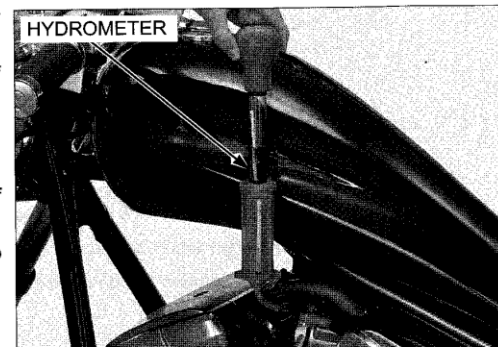
Test the coolant specific gravity using a hydrometer (see below for "COOLANT GRAVITY CHART").

For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 7-6).

STANDARD COOLANT CONCENTRATION: 1:1

Look for contamination and replace the coolant if necessary.

After checking the gravity, install the radiator cap securely.



COOLANT GRAVITY CHART

		Coolant temperature °C (°F)										
		0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
Coolant ratio %	5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
	10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
	15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
	20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
	25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
	30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
	35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
	40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
	45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
	50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
	55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071	

COOLING SYSTEM

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (page 7-5).

Wet the sealing surfaces of the cap, then install the cap onto tester.

TOOLS:

Cooling system pressure tester SVTS4AH
Cooling system adaptor OTCJ33984A

Pressurize the radiator cap using the tester.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.
It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

Pressurize the radiator, engine and water hoses using the tester, and check for leaks.

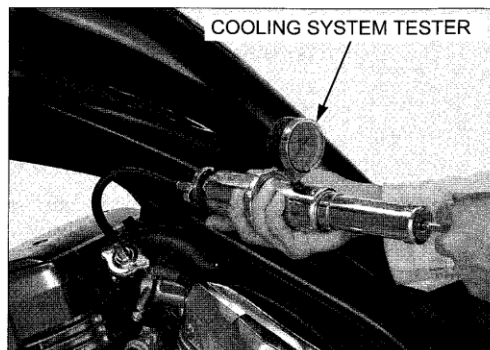
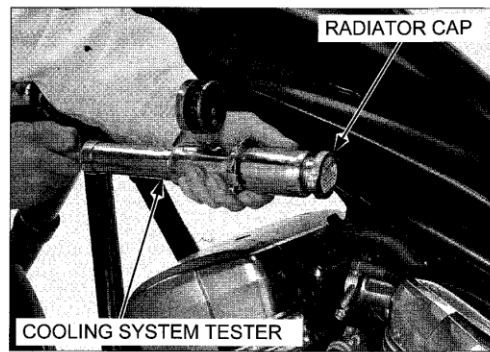
NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold the specified pressure for at least 6 seconds.

Remove the tester and install the radiator cap securely.

Install the ignition switch case (page 3-10).



COOLANT REPLACEMENT

PREPARATION

NOTE:

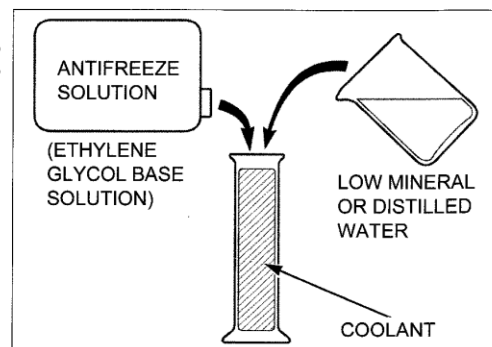
- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the recommended antifreeze.

RECOMMENDED ANTIFREEZE:

Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

RECOMMENDED MIXTURE:

1:1 (mixture with distilled water)



REPLACEMENT/AIR BLEEDING

NOTE:

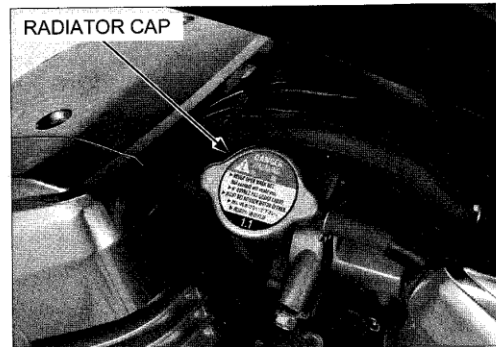
- When filling the system or reserve tank with coolant or checking the coolant level, place the motorcycle in an upright position on a flat, level surface.

Remove the ignition switch case (page 3-10).

Remove the radiator cap.

CAUTION

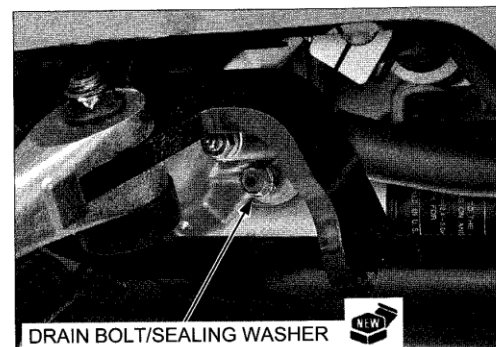
The engine must be cool before removing the radiator cap, or severe scalding may result.



Place the suitable container to catch the coolant, then remove the coolant drain bolt and sealing washer. Drain the coolant completely.

Reinstall the drain bolt (water pump cover bolt) with a new sealing washer and tighten it to the specified torque.

TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)

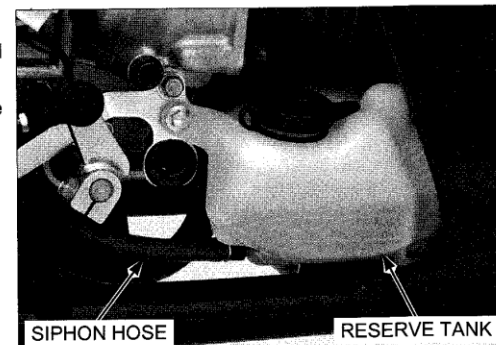


Remove the left crankcase rear cover (page 3-7).

Disconnect the siphon hose from the reserve tank and drain the reserve coolant.

Empty the coolant and rinse the inside of the reserve tank with water.

Reconnect the siphon hose.



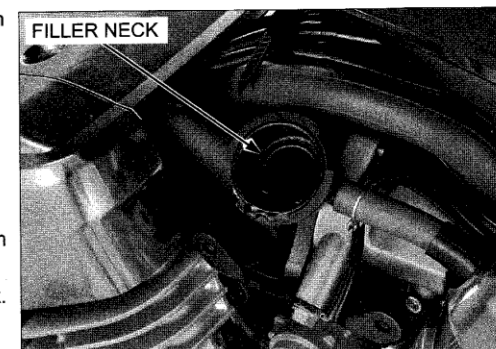
Fill the system with the recommended coolant through the filler opening up to the filler neck.

CAPACITY:

2.30 liters (2.43 US qt, 2.02 Imp qt)

Bleed air from the system as follows:

1. Shift the transmission into neutral. 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 up to the filler neck.
4. Install the radiator cap securely.



COOLING SYSTEM

Remove the reserve tank cap.

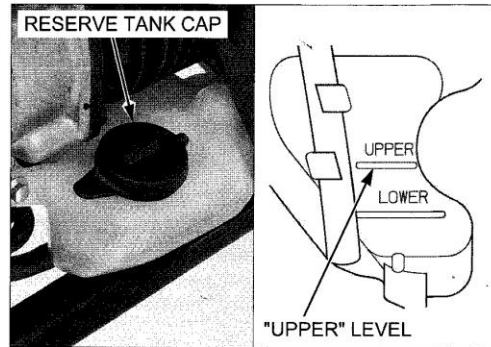
Fill the reserve tank with the recommended coolant to the "UPPER" level line and install the reserve tank cap.

CAPACITY:

0.24 liter (0.25 US qt, 0.21 Imp qt)

Install the following:

- Left crankcase rear cover (page 3-7)
- Ignition switch case (page 3-10)



THERMOSTAT

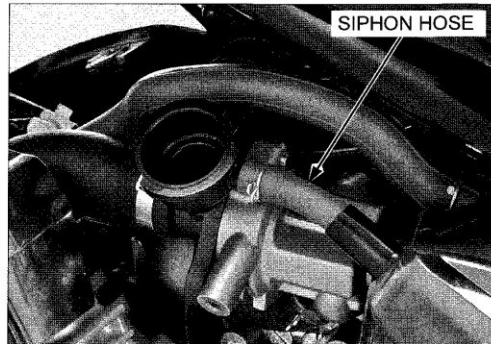
REMOVAL

Drain the coolant from the system (page 7-7).

Remove the following:

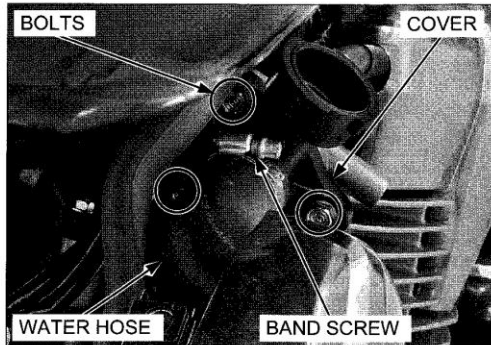
- Ignition switch (page 22-20)
- Front center over head cover (page 3-5)

Disconnect the siphon hose.

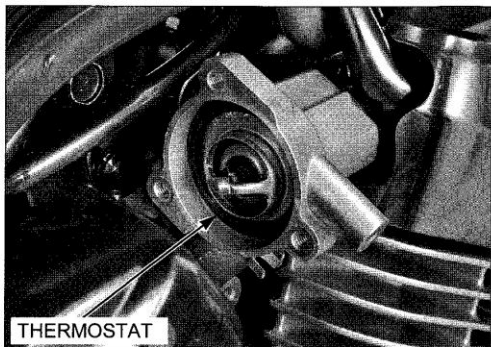


Loosen the water hose band screw and disconnect the water hose from the thermostat housing cover.

Remove the bolts and thermostat housing cover.



Remove the thermostat.



INSPECTION

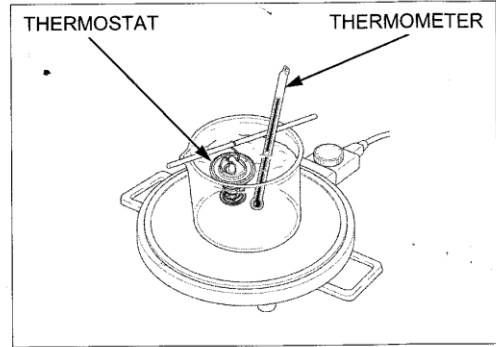
Visually inspect the thermostat for damage.
 Replace the thermostat if the valve stays open at room temperature.

Wear insulated gloves and adequate eye protection.
 Heat a container of water with an electric heating element for 5 minutes.
 Suspend the thermostat in the heated water to check its operation.

THERMOSTAT BEGINS TO OPEN:
80 – 84°C (176 – 183°F)

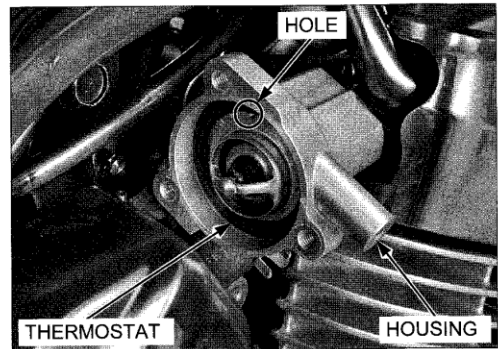
VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

Do not let the thermostat or thermometer touch the pan, or you will get false readings.



INSTALLATION

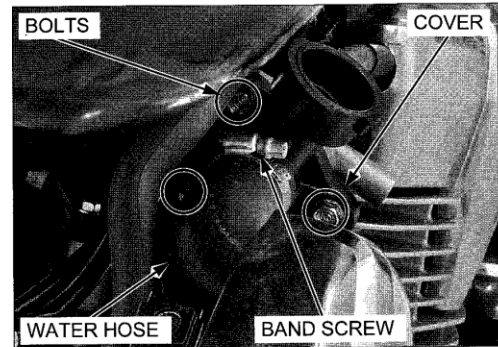
Install the thermostat into the thermostat housing with the hole facing up.



Install the thermostat housing cover and bolts.
 Tighten the bolts to the specified torque.

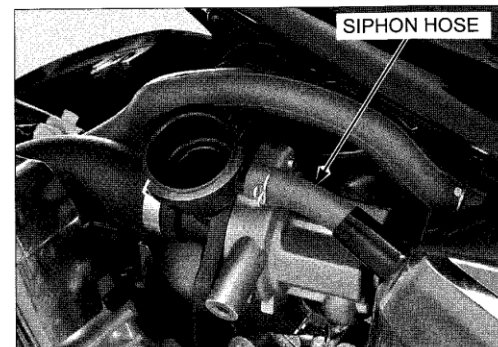
TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)

Connect the water hose and tighten the water hose band screw (page 7-15).



Connect the siphon hose.

Fill and bleed the cooling system (page 7-6).



COOLING SYSTEM

THERMOSTAT HOUSING

REMOVAL/INSTALLATION

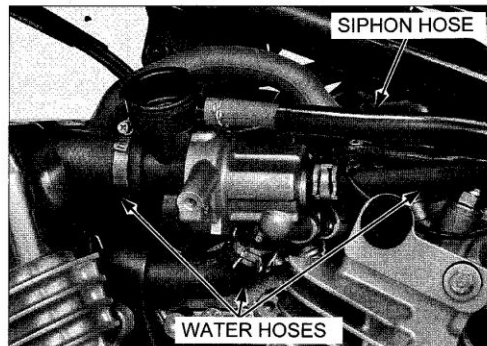
Drain the coolant from the system (page 7-7).

Remove the following:

- Ignition switch (page 22-20)
- Rear left over head cover (page 3-5)

Loosen the water hose band screw.

Disconnect the siphon hose and water hoses.

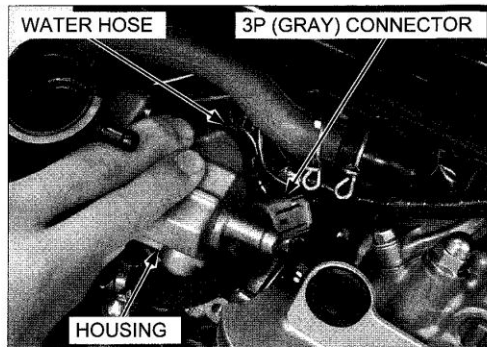


Disconnect the water hose and ECT sensor 3P (Gray) connector and remove the thermostat housing.

Installation is in the reverse order of removal.

Tighten the water hose band screw (page 7-15).

Fill and bleed the cooling system (page 7-6).



RADIATOR/COOLING FAN

REMOVAL

NOTE:

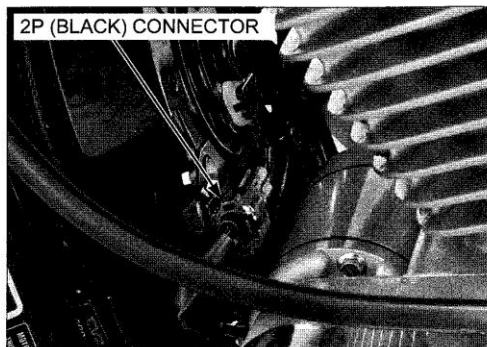
- Be careful not to damage the radiator fins while servicing the radiator and fan motor.

Drain the coolant from the system (page 7-7).

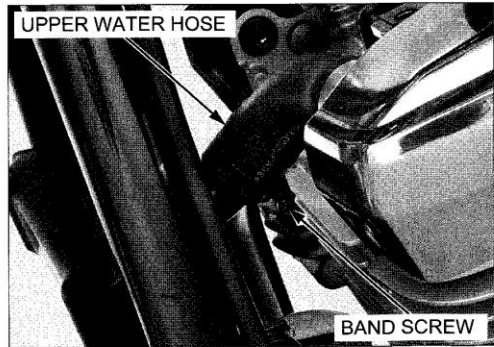
Remove the following:

- Front center over head cover (page 3-5)
- Left main step (page 3-4)

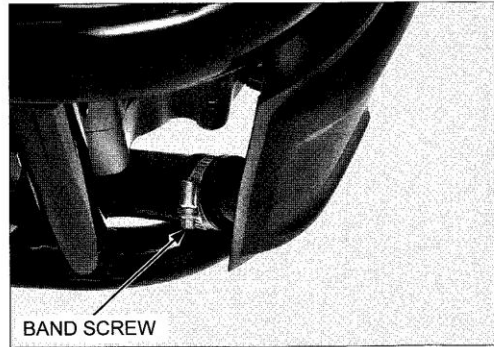
Disconnect the fan motor 2P (Black) connector.



Loosen the water hose band screw and disconnect the upper water hose from the radiator.



Loosen the water hose band screw.

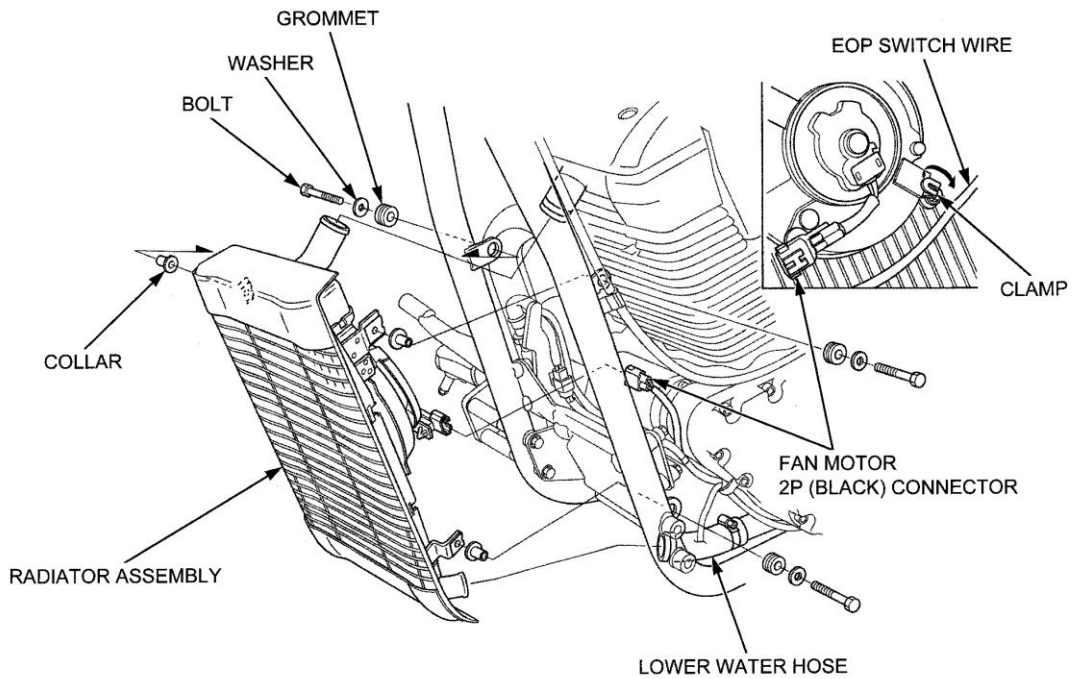


Release the EOP switch wire from the clamp.

Remove the bolts and washers.

Remove the radiator assembly while disconnecting the lower water hose.

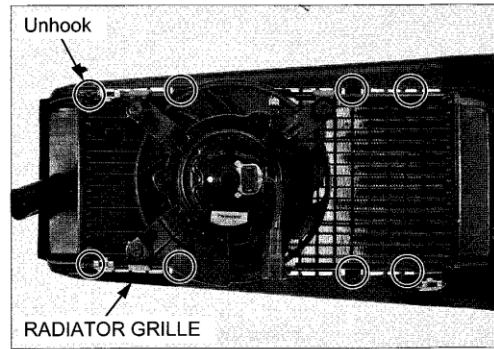
Remove the collars and grommets from the frame.



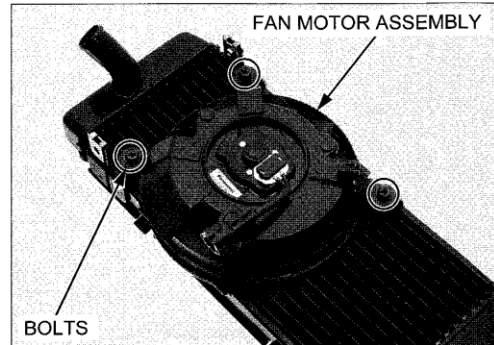
COOLING SYSTEM

DISASSEMBLY

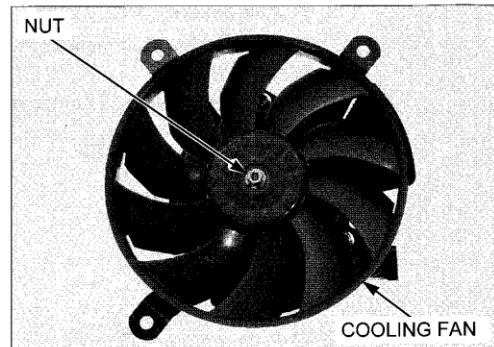
Remove the radiator grille while unhooking the tabs of the radiator grille from the bosses of the radiator.



Remove the bolts and fan motor assembly.

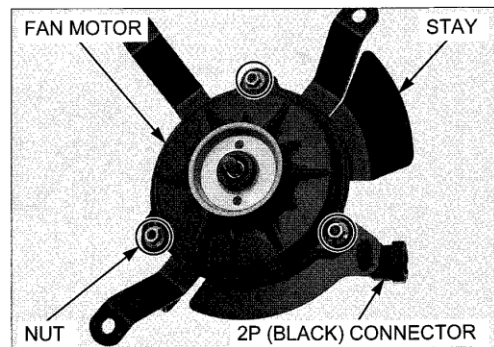


Remove the nut and cooling fan.

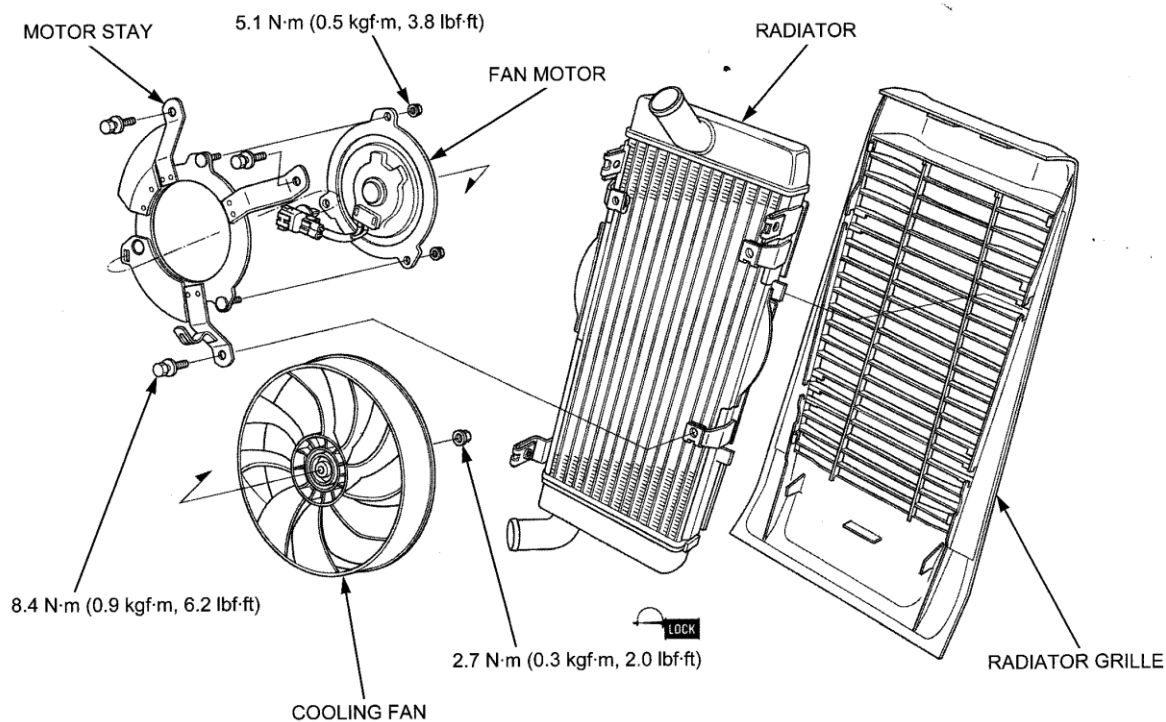


Remove the fan motor 2P (Black) connector from the motor stay.

Remove the nuts and fan motor.



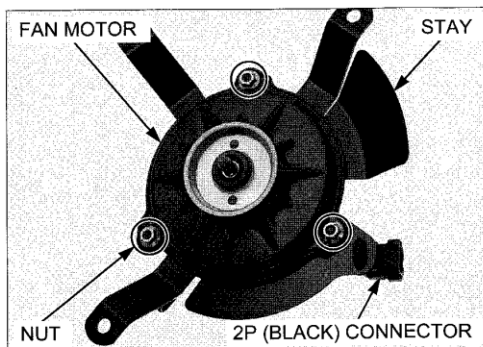
ASSEMBLY



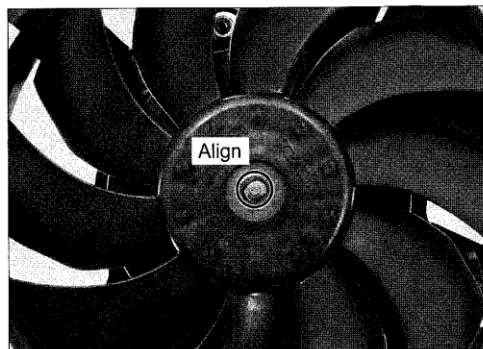
Install the fan motor onto the motor stay in the direction as shown.
Install and tighten the nuts to the specified torque.

TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)

Install the fan motor 2P (Black) connector to the motor stay.



Install the cooling fan onto the motor shaft by aligning the flat surfaces.

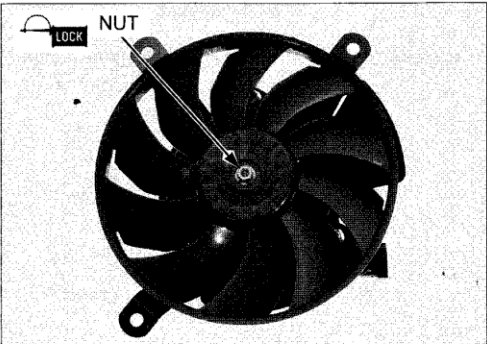


COOLING SYSTEM

Apply locking agent to the cooling fan mounting nut threads.

Install and tighten the fan motor mounting nut to the specified torque

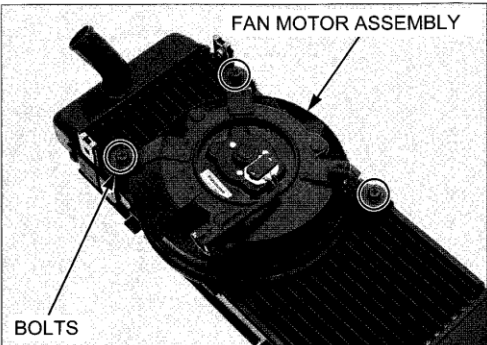
TORQUE: 2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)



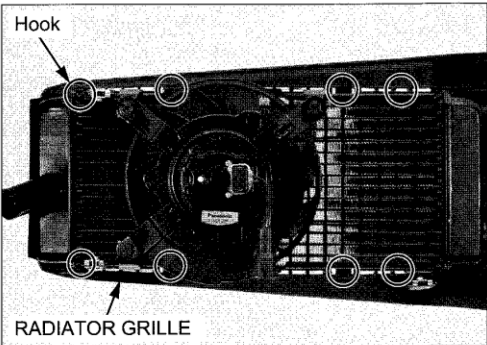
Install the fan motor assembly.

Install and tighten the fan motor assembly mounting bolts to the specified torque.

TORQUE: 8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)



Install the radiator grille while hooking the tabs of the radiator grille to the bosses of the radiator.



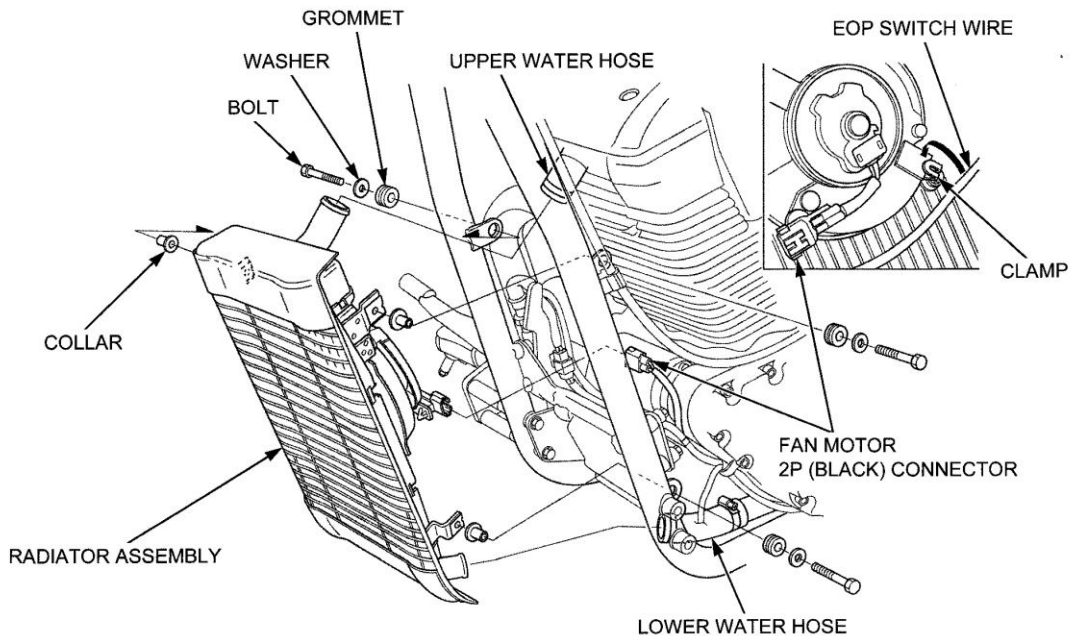
INSTALLATION

Install the grommets and collars to the frame.

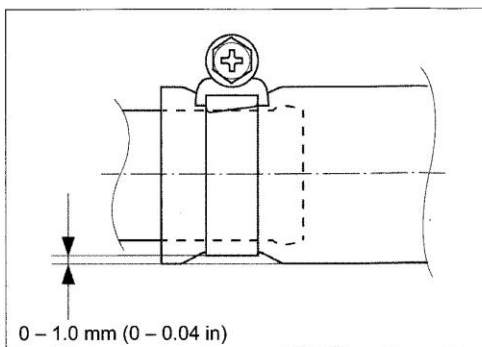
Install the radiator assembly while connecting the lower and upper water hoses.

Install the bolts and washers.
Tighten the bolts.

Secure the EOP switch wire to the clamp.



Tighten the water hose band screws to the specified range as shown.



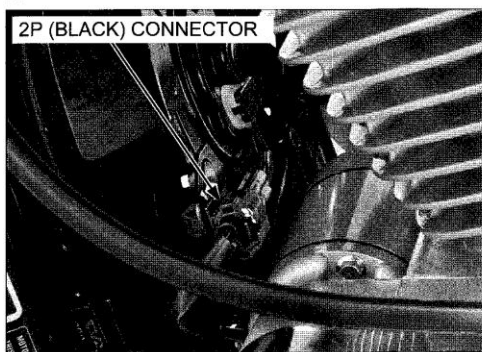
Route the wires properly (page 1-22).

Connect the fan motor 2P (Black) connector.

Install the following:

- Left main step (page 3-4)
- Front center over head cover (page 3-5)

Fill and bleed the cooling system (page 7-6).



COOLING SYSTEM

WATER PUMP

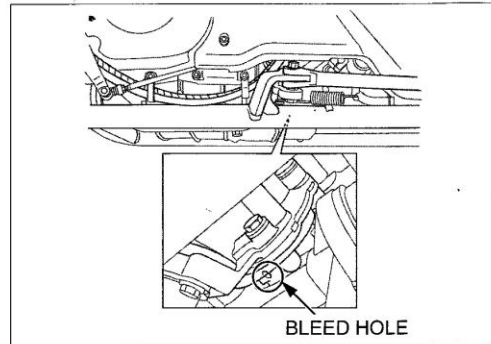
MECHANICAL SEAL INSPECTION

Check the bleed hole of the water pump for signs of coolant leakage.

NOTE:

- A small amount of coolant weeping from the bleed hole is normal.
- Make sure that there is no continuous coolant leakage from the bleed hole while operating the engine.

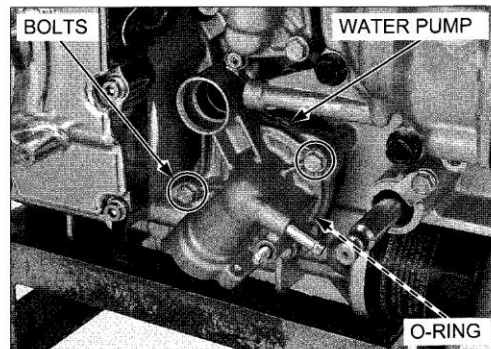
Replace the water pump as an assembly if necessary.



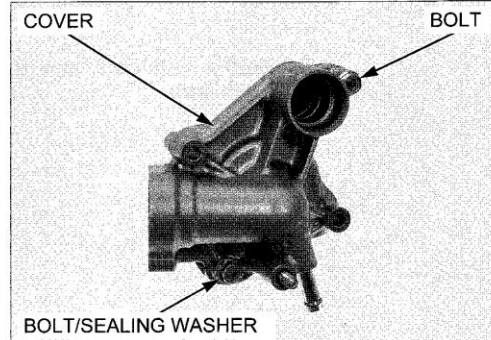
REMOVAL

Remove the engine (page 8-4).

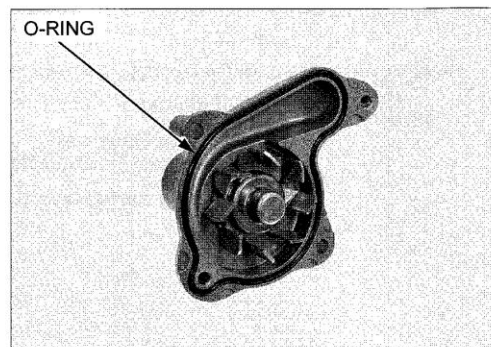
Remove the bolts and water pump.
Remove the O-ring from the water pump.



Remove the bolts, sealing washer and water pump cover.

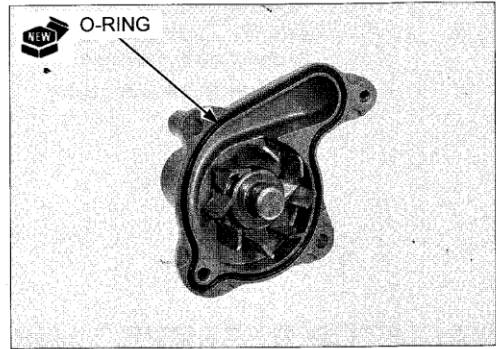


Remove the O-ring from the water pump body.



INSTALLATION

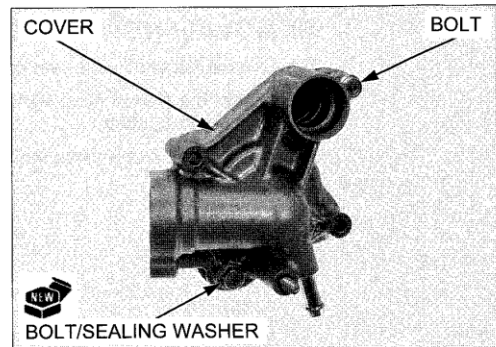
Install a new O-ring to the water pump body groove.



Install the water pump cover, bolts and a new sealing washer.

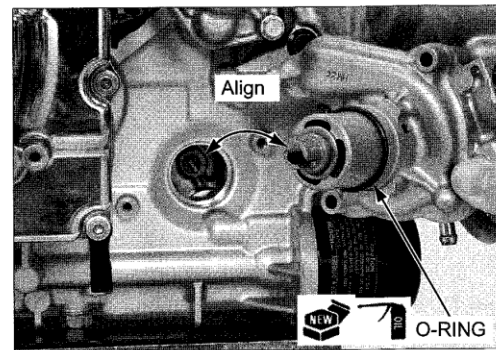
Tighten the bolts to the specified torque.

TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)

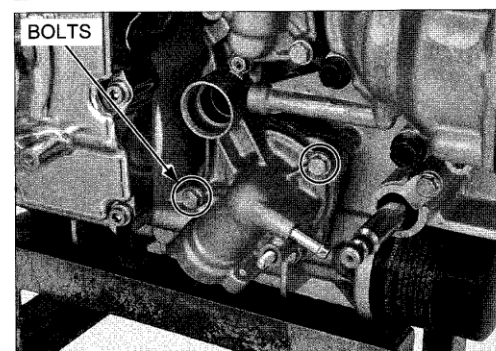


Apply engine oil to a new O-ring and install it to the stepped section of the water pump.

Install the water pump while aligning the groove with the projection of the oil pump shaft.



Install and tighten the bolts.

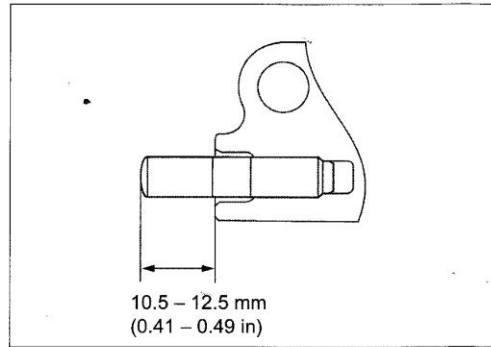


COOLING SYSTEM

If the water pump was replaced, install the stud bolt into the pump cover.

Be sure to verify the distance from the top of the stud to the pump cover as shown.

Install the engine (page 8-10).



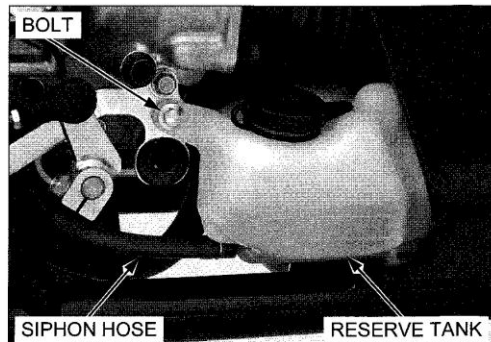
RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

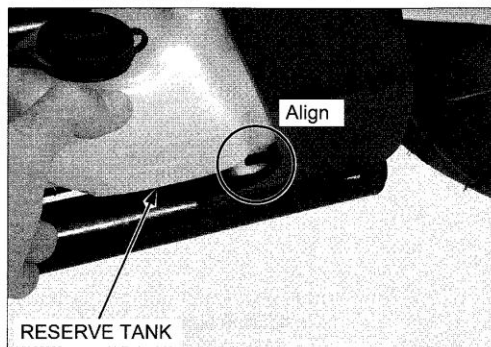
Remove the left crankcase rear cover (page 3-7).

Disconnect the siphon hose from the reserve tank and drain the reserve coolant.

Remove the bolt and reserve tank.

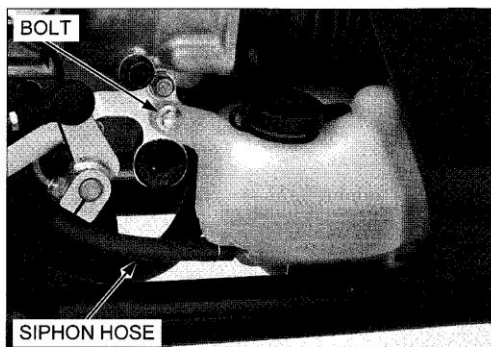


Install the reserve tank while aligning its hook with the frame flange.



Install and tighten the bolt.

Connect the siphon hose to the reserve tank.



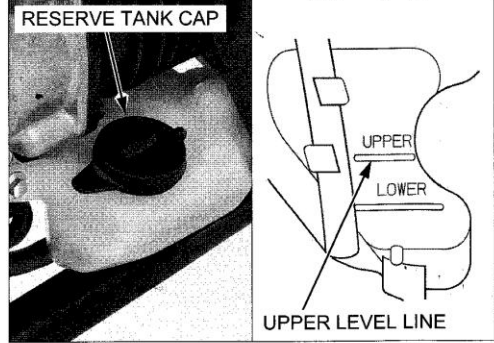
Remove the reserve tank cap.

Fill the reserve tank with the recommended coolant to the "UPPER" level line and install the reserve tank cap.

CAPACITY:

0.24 liter (0.25 US qt, 0.21 Imp qt)

Install the left crankcase rear cover (page 3-7).

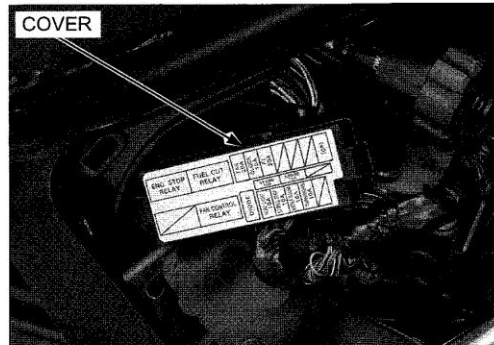


FAN CONTROL RELAY

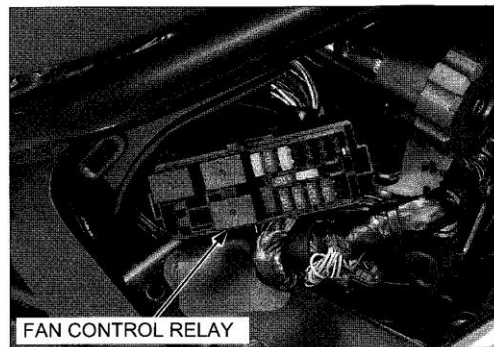
INSPECTION

Remove the right side cover (page 3-6).

Open the power box cover.



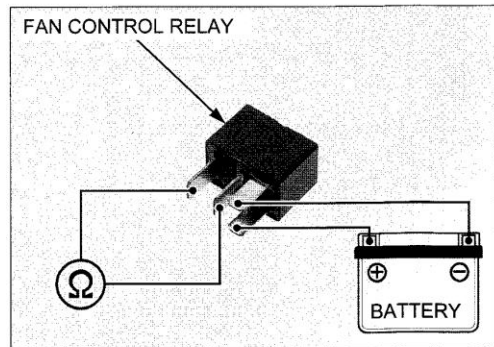
Disconnect the fan control relay.



Connect an ohmmeter and 12 V battery to the fan control relay terminals as shown.

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the fan control relay.



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