

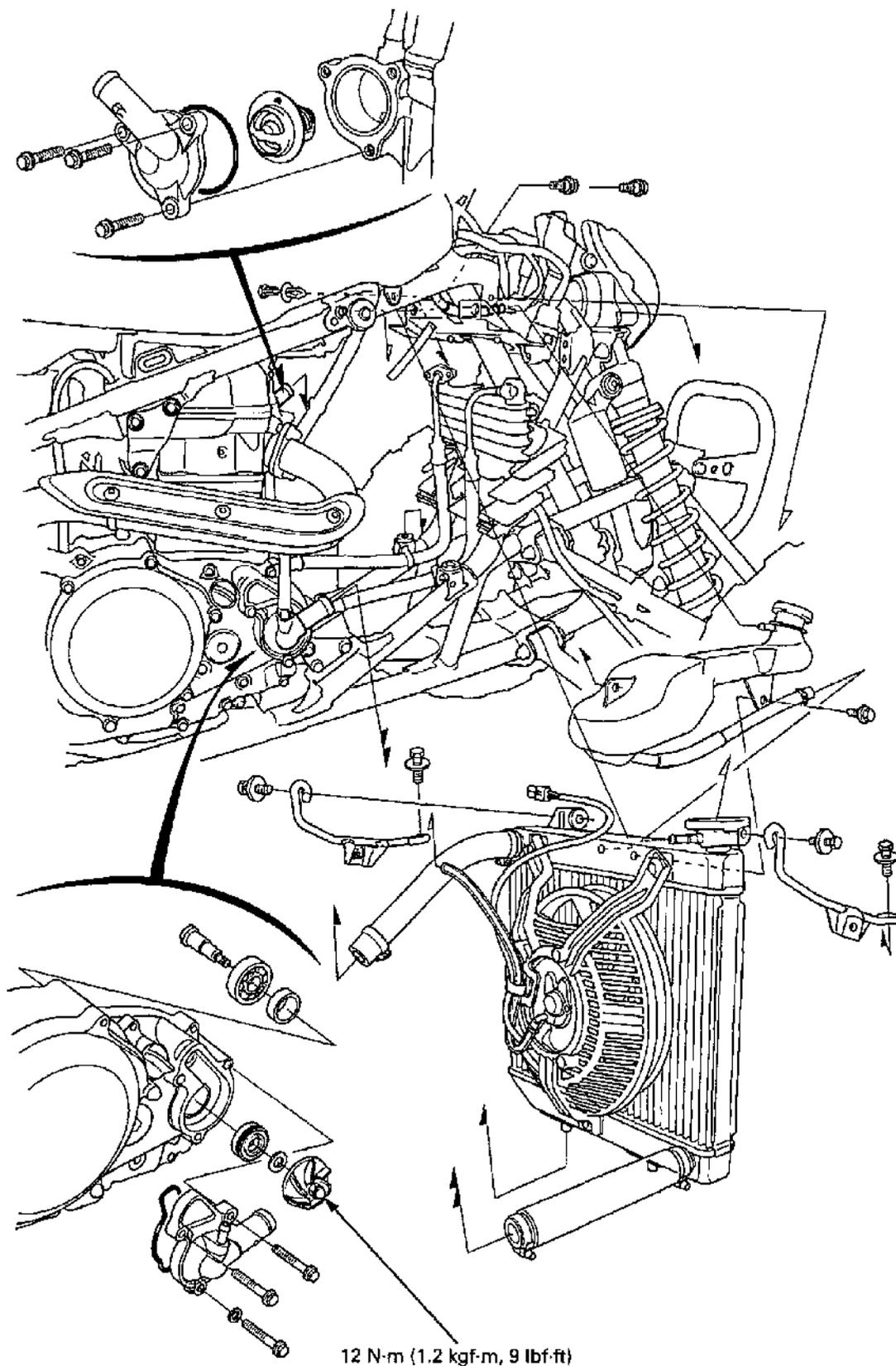
9. COOLING SYSTEM

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COOLING SYSTEM

SYSTEM COMPONENTS

'04 - '05 model shown; After '05 similar



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.

▲ CAUTION

Radiator coolant is toxic. Keep it away from eyes and mouth.

- If any coolant gets in your eyes, rinse them with water and consult a physician immediately.
- If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
- If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.

NOTICE

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

- Add coolant to the system 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 coolant temperature indicator inspection ('04 - '05: page 20-22, After '05: page 24-11).
- For engine coolant temperature sensor inspection ('04 - '05: page 20-24, After '05: page 24-13).

SPECIFICATIONS

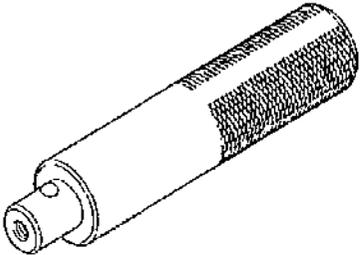
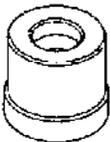
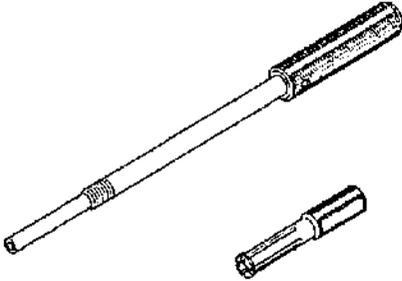
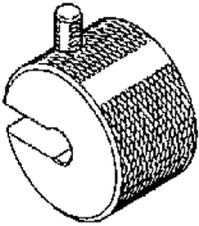
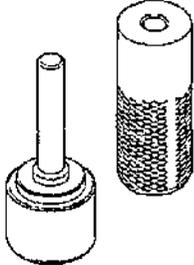
ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.5 liters (1.6 US qt, 1.3 Imp qt)
	Reserve tank	0.34 liter (0.36 US qt, 0.30 Imp qt)
Radiator cap relief pressure		108 - 137 kPa (1.1 - 1.4 kgf/cm ² , 16 - 20 psi)
Thermostat	Begin to open	80 - 84°C (176 - 183°F)
	Fully open	95°C (203°F)
	Valve 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 VALUE

Water pump impeller 12 N·m (1.2 kgf·m, 9 lbf·ft)

COOLING SYSTEM

TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 28 x 30 mm 07946-1870100</p> 	<p>Pilot, 12 mm 07746-0040200</p> 
<p>Bearing remover set, 12 mm 07936-1660101</p>  <p>or 07936-166010A and 07936-3710100 (U.S.A. only)</p>	<p>Bearing remover weight 07741-0010201</p>  <p>or 07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Oil seal driver 07945-KA30000</p>  <p>or 07965-415000A (U.S.A. only)</p>

TROUBLESHOOTING

Engine temperature too high

- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty cooling fan motor drive circuit ('04 - '05: page 20-23, After '05: page 24-12)
- Faulty water pump

Coolant leaks

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

SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Remove the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

Remove the radiator cap.



Test the coolant gravity using a hydrometer. (See "coolant gravity chart" below.)

For maximum corrosion protection, a 50 – 50% solution of ethylene glycol and distilled water is recommended (page 9-6).

Look for contamination and replace the coolant if necessary.



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 9-5).

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)

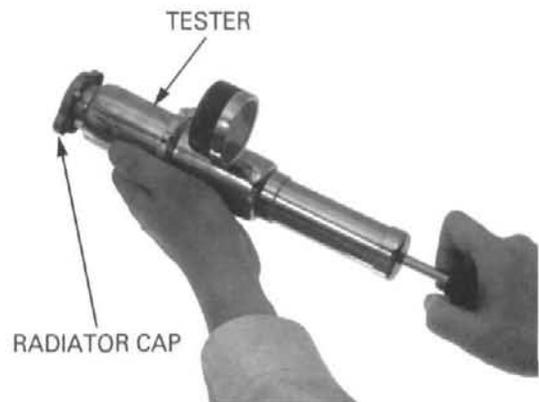
Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Pressure test the radiator, engine and hoses, and check for leaks.

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.

Install the right front fender ('04 – '05: page 3-6, After '05: page 3-6).



COOLANT REPLACEMENT

PREPARATION

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.

NOTE:

- The effectiveness of coolant decreases with the accumulation of rust 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.

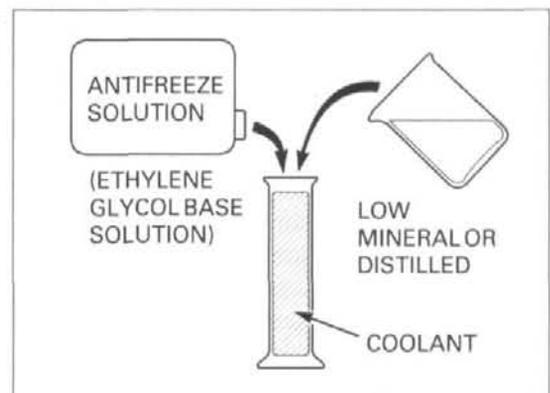
Mix only distilled, low mineral water with the recommended antifreeze.

RECOMMENDED ANTIFREEZE:

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

RECOMMENDED MIXTURE:

1:1 (distilled water and the recommended antifreeze)



REPLACEMENT/AIR BLEEDING

NOTE:

- When filling the system or reserve tank with a coolant, place the vehicle on a flat, level surface.

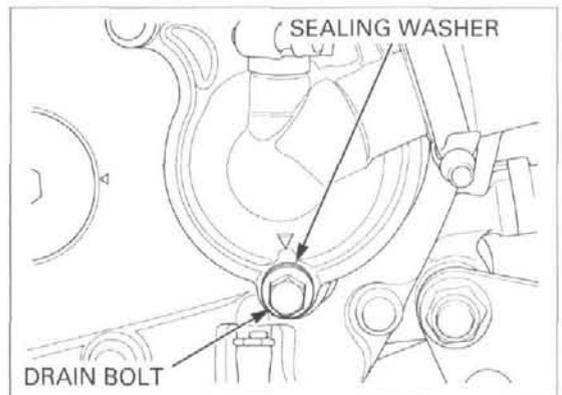
Remove the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

Remove the radiator cap.



Remove the drain bolt and sealing washer, and drain the coolant from the system.

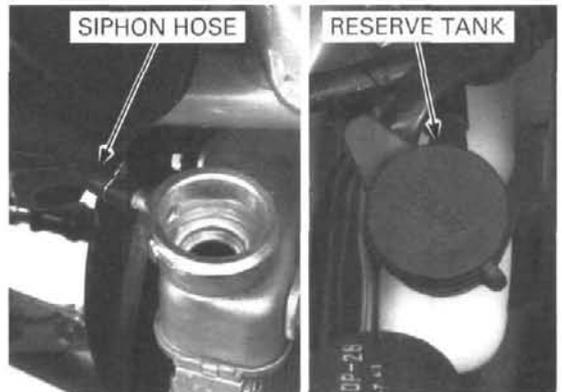
Reinstall the drain bolt with a new sealing washer and tighten it securely.



Disconnect the siphon hose from the radiator filler neck and drain the coolant from the reserve tank.

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

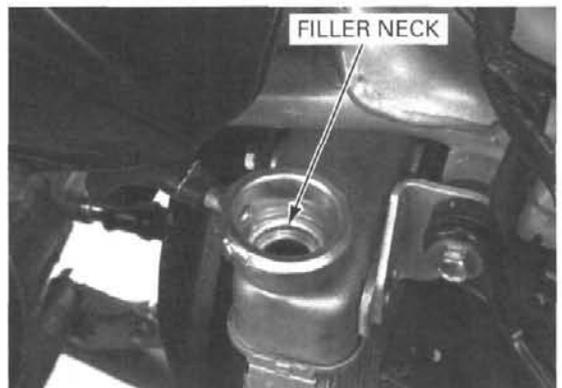
Reconnect the siphon hose.



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

Bleed air from the system as follows:

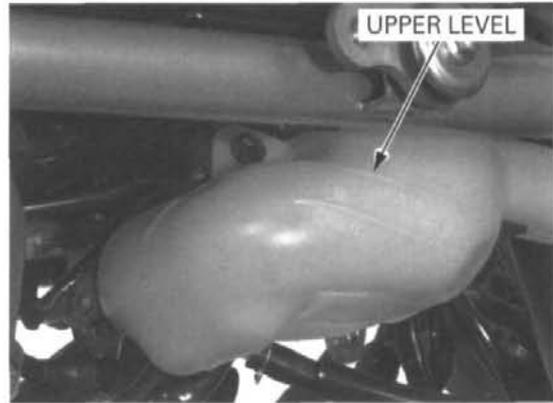
1. Shift the transmission into neutral. Start the engine and let it idle for 2 - 3 minutes.
2. Snap the throttle 3 - 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck.
4. Install the radiator cap.



COOLING SYSTEM

Fill the reserve tank to the upper level line and install the tank cap.

Install the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

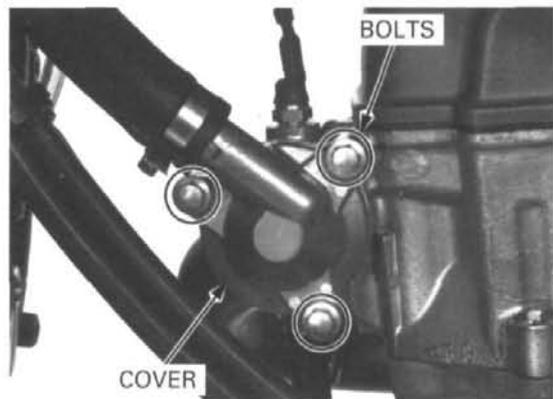


THERMOSTAT

REMOVAL

Drain the coolant from the system (page 9-7).

Remove the three bolts and thermostat cover.



Remove the thermostat from the cylinder head.



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 heated water to check its operation.

THERMOSTAT BEGIN TO OPEN:

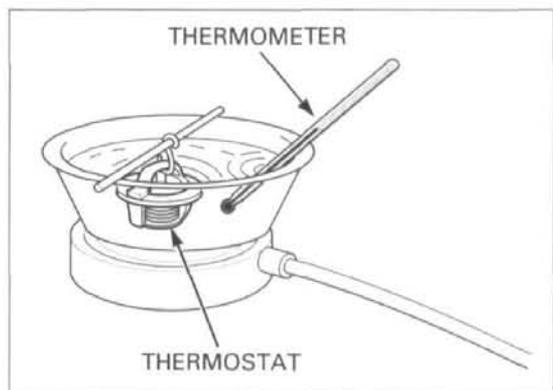
80 - 84°C (176 - 183°F)

VALVE LIFT:

8 mm (0.3 in) minimum at 95°C (203°F)

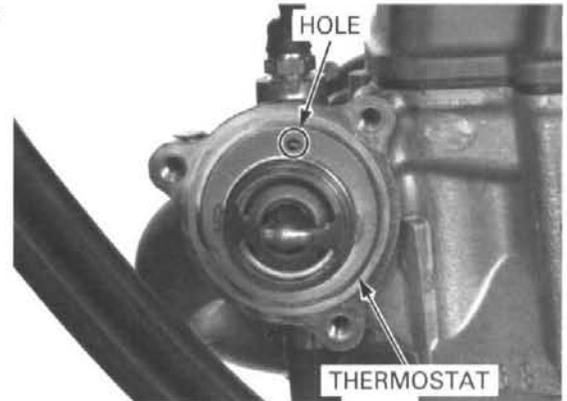
Replace the thermostat if the valve opens at a temperature other than those specified.

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



INSTALLATION

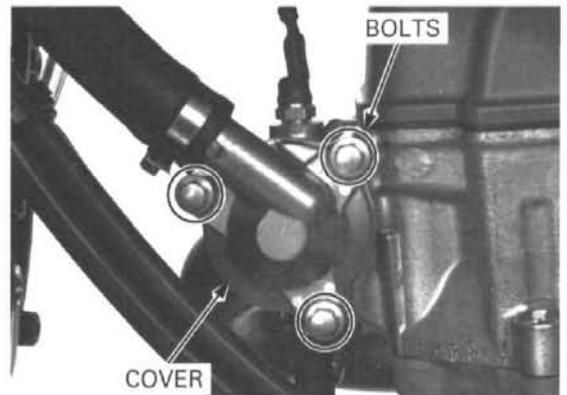
Install the thermostat into the cylinder head with the bleed hole facing up.



Install a new O-ring into the groove in the thermostat cover.



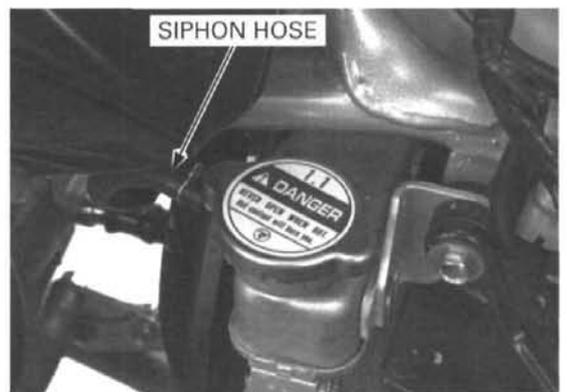
Install the thermostat cover onto the cylinder head and tighten the three bolts securely.
Fill and bleed the cooling system (page 9-7).

**RADIATOR/COOLING FAN****REMOVAL**

Remove both front fenders ('04 – '05: page 3-6, After '05: page 3-6).

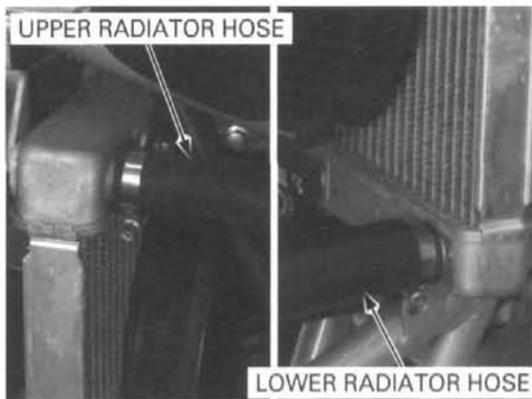
Drain the coolant from the system (page 9-7).

Disconnect the siphon hose from the radiator filler neck.

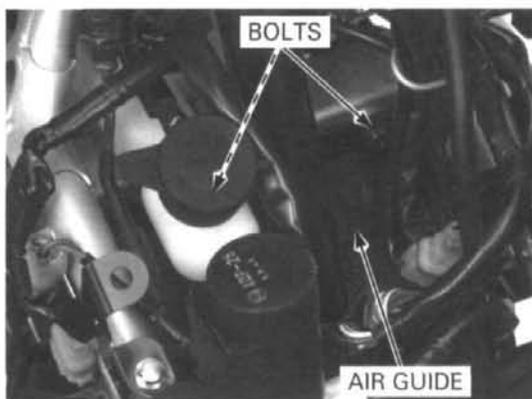


COOLING SYSTEM

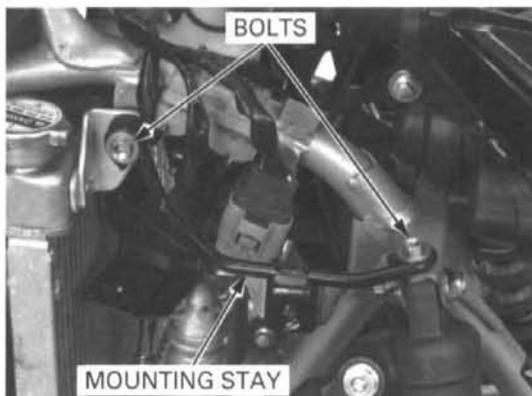
Loosen the band screws and disconnect the upper and lower radiator hoses from the radiator.



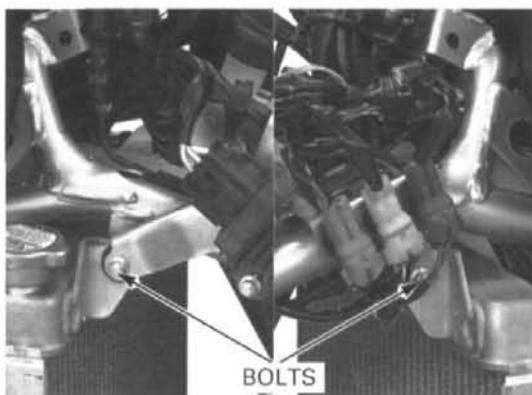
'04 - '05: Remove the handlebar switch 3P and 4P connectors from the stays on the frame. Remove the two bolts and air guide from the radiator.



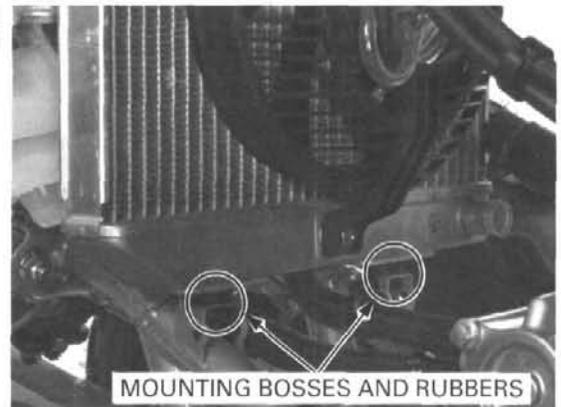
'04 - '05: Remove the four bolts and two fender mounting stays from both sides.



After '05: Remove the mounting bolt from both sides.

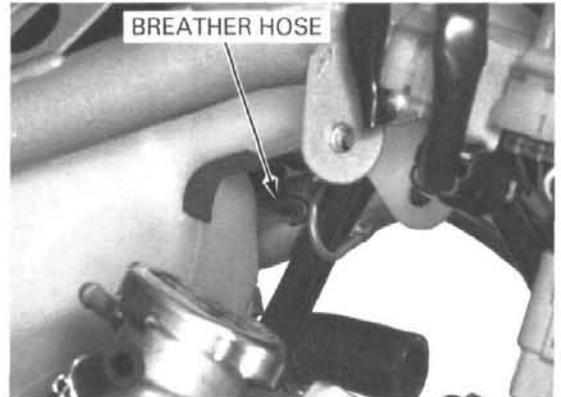


Remove the radiator mounting bosses from the mounting rubbers and slide the lower side of the radiator rearward.



Disconnect the fan motor breather hose from the joint pipe of the frame.

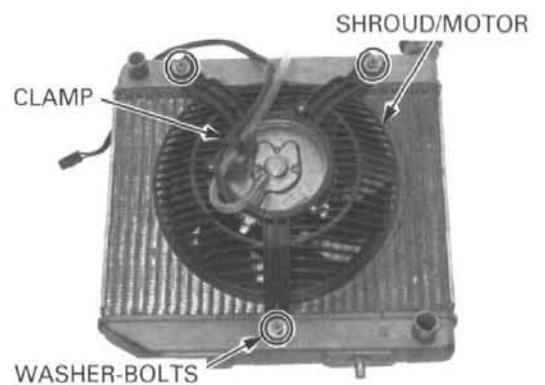
Remove the radiator out of the frame to the right side.



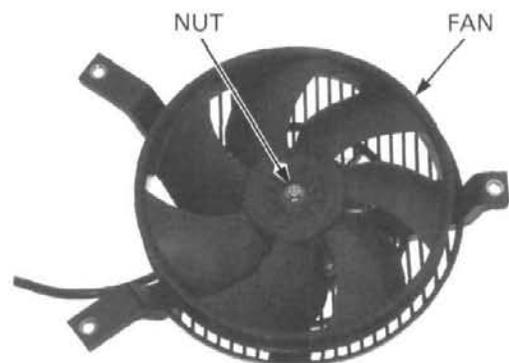
DISASSEMBLY

Release the fan motor wire and breather hose from the clamp of the shroud.

Remove the three washer-bolts and shroud/motor assembly from the radiator.

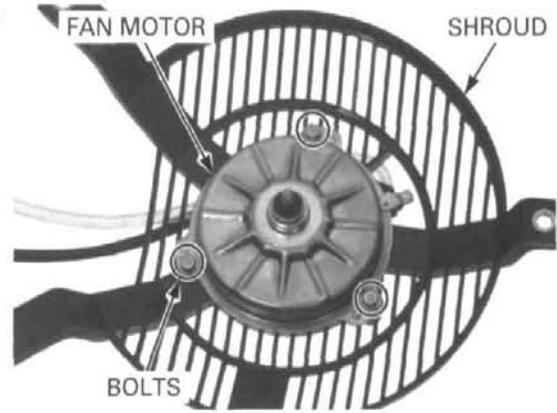


Remove the nut and cooling fan.



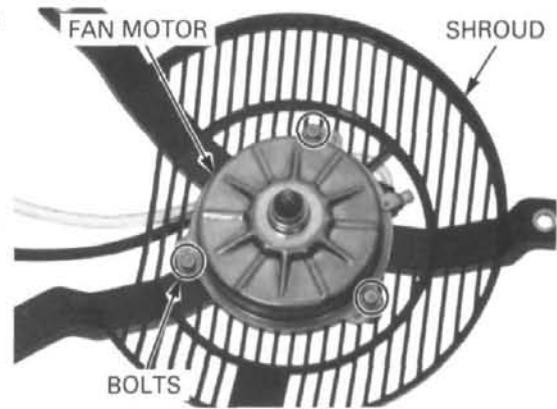
COOLING SYSTEM

Remove the three bolts and fan motor from the shroud.

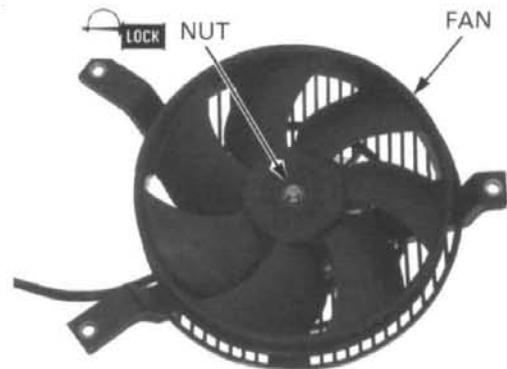


ASSEMBLY

Install the fan motor on the shroud in the direction as shown and tighten the three bolts securely.

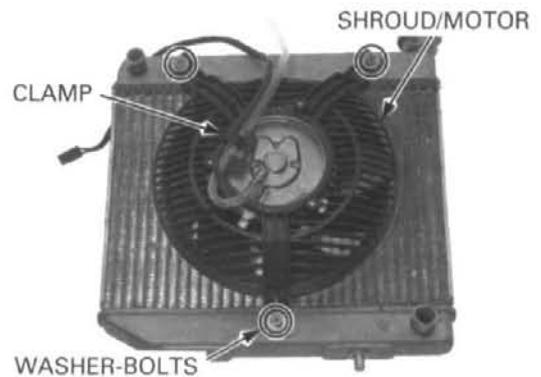


Install the cooling fan on the fan motor shaft, aligning the flat surfaces. Apply locking agent to the motor nut threads. Install the nut and tighten it.



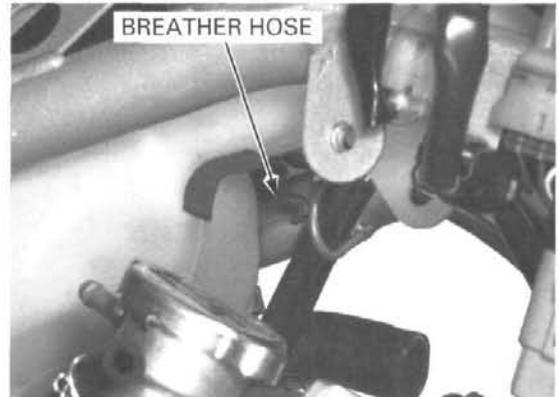
Install the shroud/motor assembly onto the radiator and tighten the three washer-bolts securely.

Route the fan motor wire and breather hose through the clamp as shown.

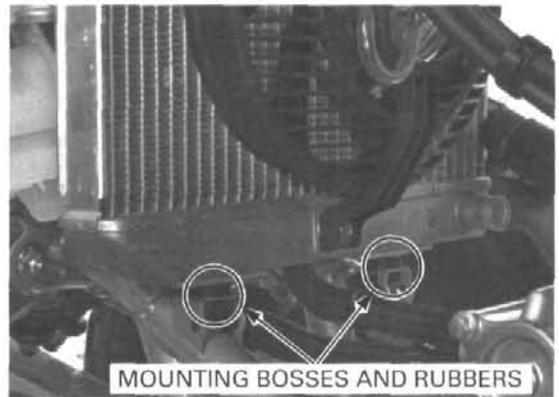


INSTALLATION

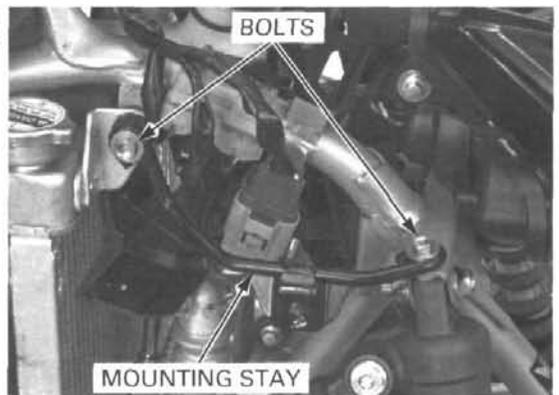
Install the radiator in the frame from the right side.
Connect the fan motor breather hose to the joint pipe of the frame.



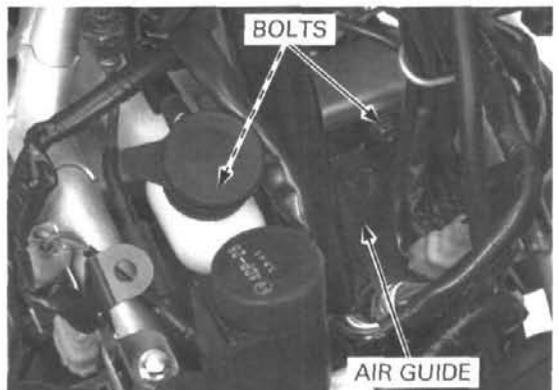
Insert the radiator mounting bosses into the mounting rubbers.



'04 - '05: Set the radiator onto the frame properly, install the two fender mounting stays and tighten the four bolts securely.

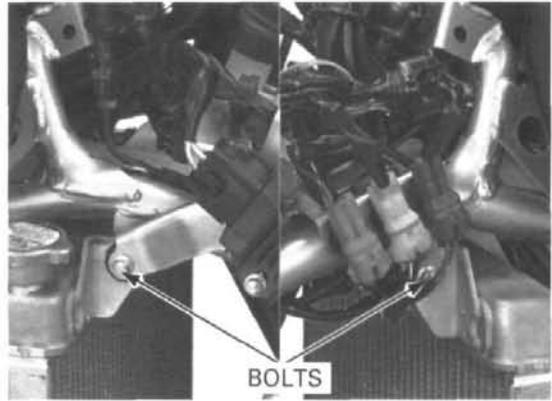


'04 - '05: Install the air guide onto the radiator and tighten the two bolt securely.
Install the handlebar switch 3P and 4P connectors onto the stays on the frame.

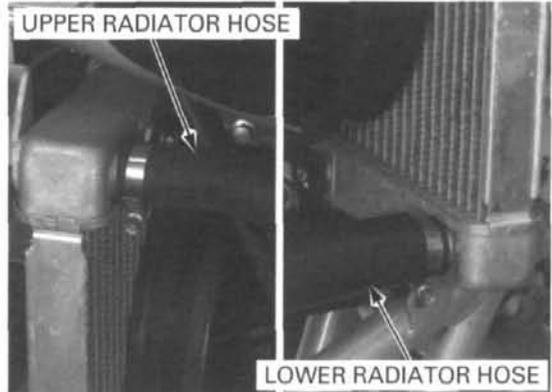


COOLING SYSTEM

After '05: Set the radiator onto the frame and tighten the mounting bolt from both sides.



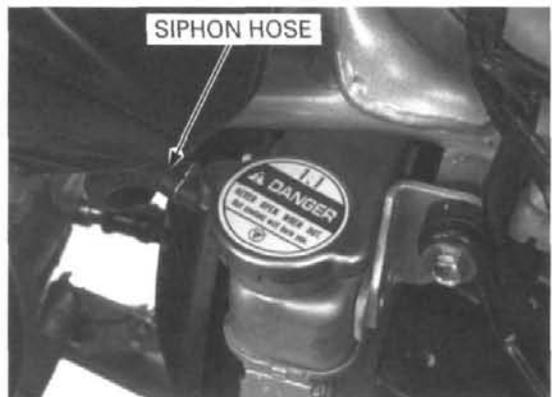
Connect the upper and lower radiator hoses to the radiator and tighten the hose band screws.



Connect the siphon hose to the radiator filler neck.

Fill and bleed the cooling system (page 9-7).

After bleeding, install both front fenders ('04 - '05: page 3-6, After '05: page 3-6).

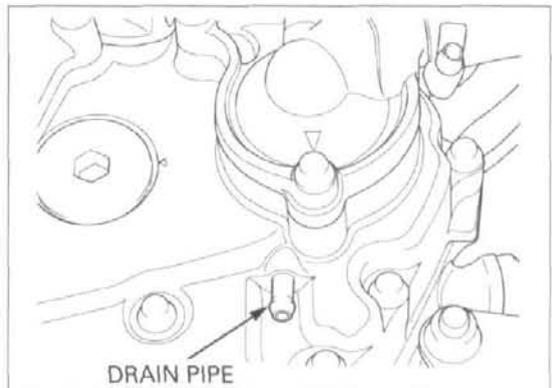


WATER PUMP

MECHANICAL SEAL INSPECTION

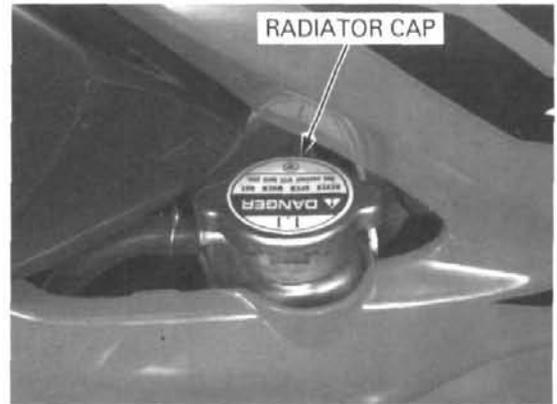
Disconnect the drain hose from the drain pipe of the right crankcase cover.

Check the drain pipe for signs of coolant leakage. If there is leakage, the mechanical seal is defective and it must be replaced.



REMOVAL

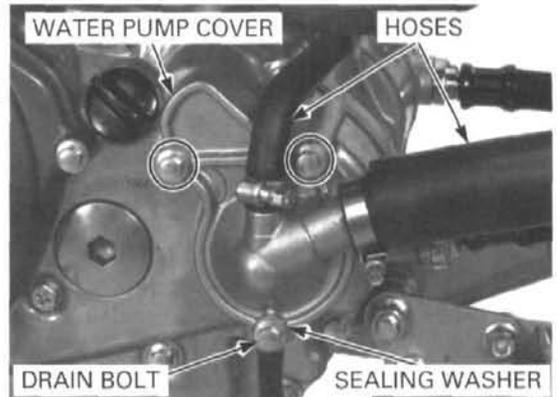
Remove the radiator cap.



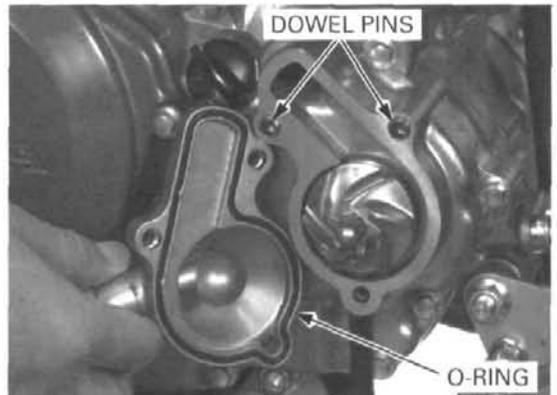
Remove the drain bolt and sealing washer, and drain the coolant from the system.

Loosen the hose band screws and disconnect the bypass hose and radiator lower hose from the water pump cover.

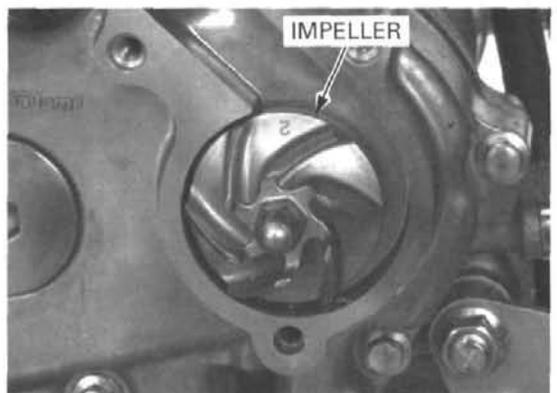
Remove the two bolts and water pump cover.



Remove the dowel pins and O-ring.



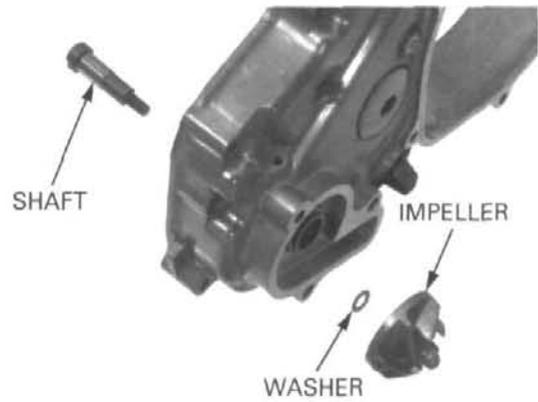
Loosen the water pump impeller.



COOLING SYSTEM

Remove the right crankcase cover ('04 - '05: page 13-5, After '05: page 14-5).

Remove the impeller and washer from the water pump shaft.
Remove the water pump shaft from the right crankcase cover.



MECHANICAL SEAL REPLACEMENT

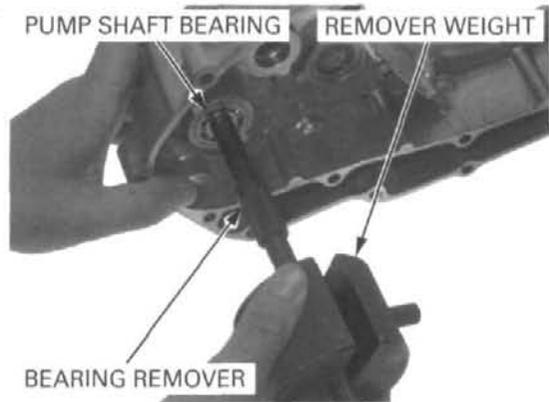
Remove the water pump shaft bearing using the special tools.

TOOLS:

Bearing remover set, 12 mm 07936-1660101
- Remover head, 12 mm 07936-1660110
- Remover shaft 07936-1660120
Remover weight 07741-0010201
(not available in U.S.A)

U.S.A only:

Bearing remover, 12 mm 07936-166010A
Remover handle 07936-3710100
Remover weight 07936-371020A or
07936-3710200



Remove the oil seal.



Remove the mechanical seal.



Drive in a new mechanical seal using the special tool until it is fully seated.

TOOL:

Oil seal driver attachment 07945-KA30000 or
07965-415000A
(U.S.A. only)



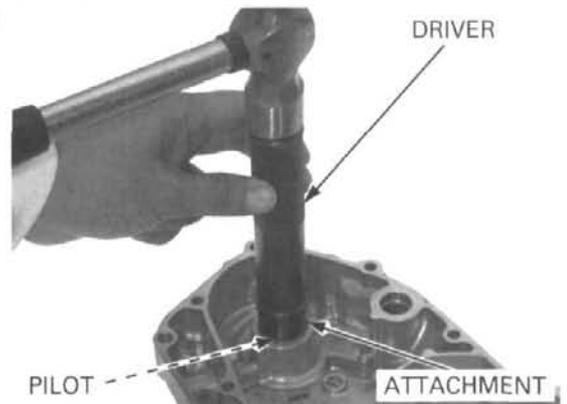
Apply oil to a new oil seal lip and install it until it is flush with the right crankcase cover.



Drive in a new water pump shaft bearing until it is fully seated using the special tools.

TOOL:

Driver 07749-0010000
Attachment, 28 x 30 mm 07946-1870100
Pilot, 12 mm 07746-0040200

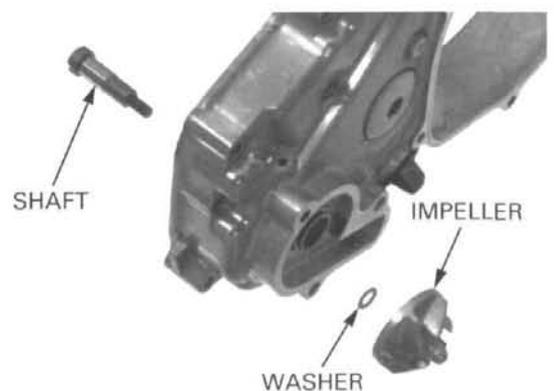


INSTALLATION

Install the water pump shaft into the right crankcase cover.

Install the washer and impeller onto the water pump shaft.

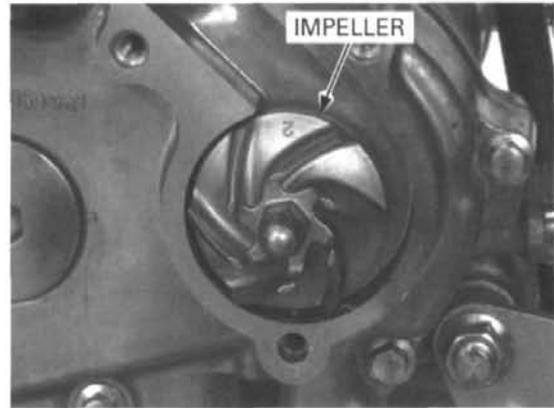
Install the right crankcase cover ('04 - '05: page 13-22, After '05: page 14-28).



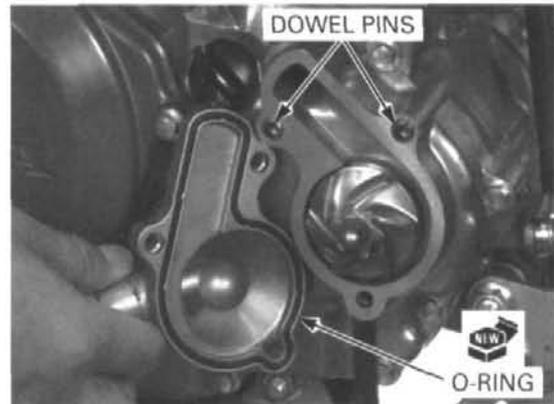
COOLING SYSTEM

Tighten the water pump impeller.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install a new O-ring into the water pump cover groove.
Remove the dowel pins into the right crankcase cover.



Install the water pump cover and tighten the two bolt securely.
Install the drain bolt with a new sealing washer and tighten it securely.
Connect the bypass hose and radiator lower hose to the water pump cover, and tighten the hose band screws securely.

Fill and bleed the cooling system (page 9-7).

