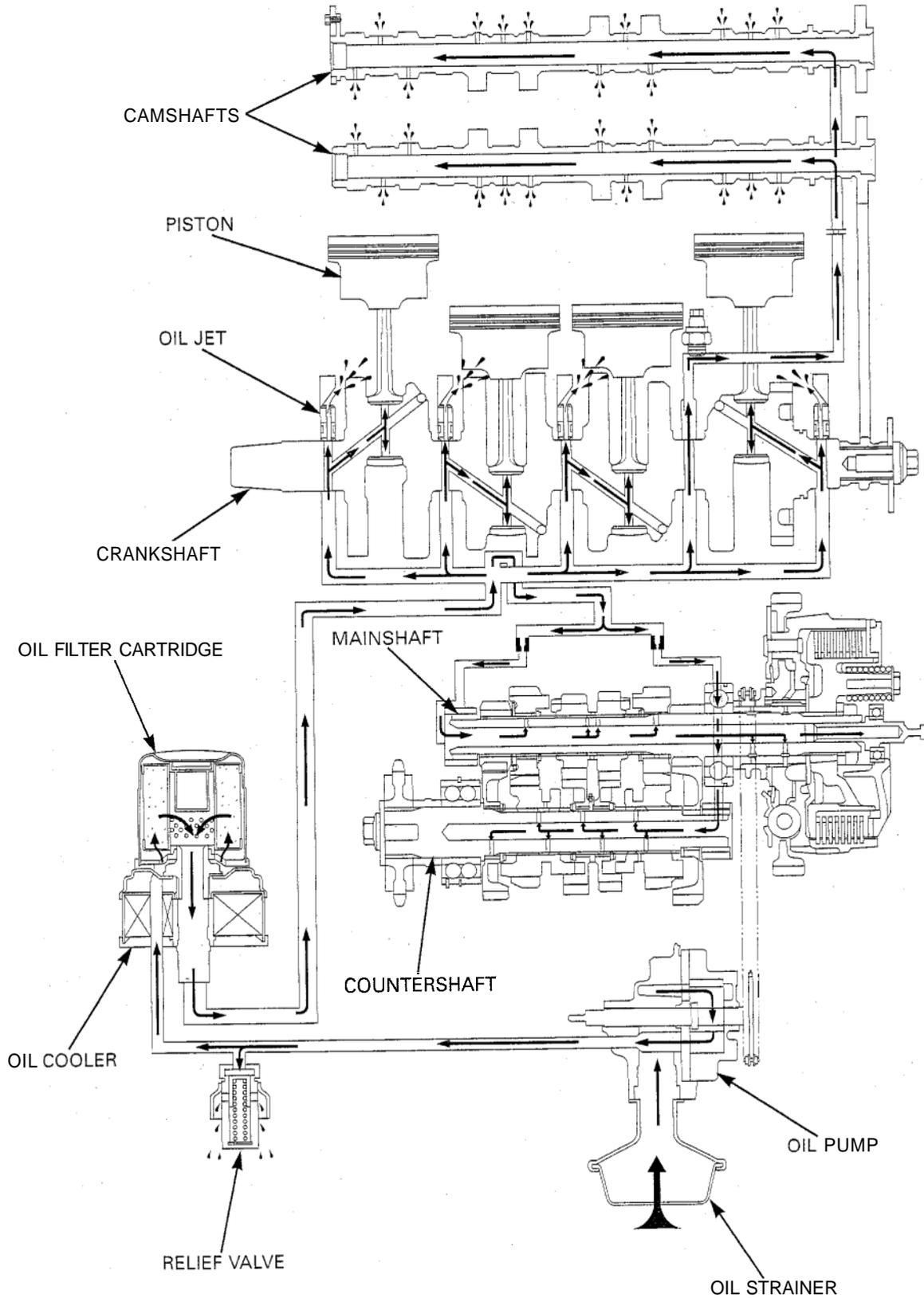


LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-0	OIL STRAINER/PRESSURE RELIEF VALVE	4-3
SERVICE INFORMATION	4-1	OIL PUMP	4-5
TROUBLESHOOTING	4-2	OIL COOLER	4-9
OIL PRESSURE INSPECTION	4-3		

SERVICE INFORMATION

4

GENERAL

⚠ CAUTION

Repeated, prolonged exposure to used motor oil may cause skin cancer.

Wash your hands thoroughly with strong soap as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS

Unit: mm (

		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3.5 liter (3.7 US qt, 3.1 Imp qt)	—
	At oil filter change	3.7 liter (3.9 US qt, 3.3 Imp qt)	
	At disassembly	4.0 liter (4.2 US qt, 3.5 Imp qt)	
Recommended engine oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-40	
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm ² , 71 psi) at 5,400 rpm/(80°C/176°F)	—
Oil pump rotor	Tip clearance	0.15 (0.006) max.	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)

TORQUE VALUES

Oil drain bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	
Oil cooler mounting bolt	74 N•m (7.5 kgf•m, 54 lbf•ft)	
Oil pump assembly flange bolt	8 N•m (0.8 kgf•m, 5.8 lbf•ft)	CT bolt
Oil pump driven sprocket bolt	15 N•m (1.5 kgf•m, 11 lbf•ft)	Apply a locking agent to the threads.
Oil filter cartridge	26 N•m (2.7 kgf•m, 20 lbf•ft)	Apply clean engine oil to the O-ring.
Lower crankcase 20 mm sealing bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	Apply a locking agent to the threads.

TOOLS

Oil pressure gauge set	07506-3000001	Equivalent commercially available in U.S.A.
Oil pressure gauge attachment	07510-MA70000	
Oil filter wrench	07HAA-PJ70101	or 07HAA-PJ70100

TROUBLESHOOTING

Engine oil level too low

- Oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

Low or no oil pressure

- Clogged oil orifice
- Incorrect oil being used

No oil pressure

- Oil level too low
- Oil pump drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

Low oil pressure

- Clogged oil strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Low oil level

High oil pressure

- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

Oil contamination

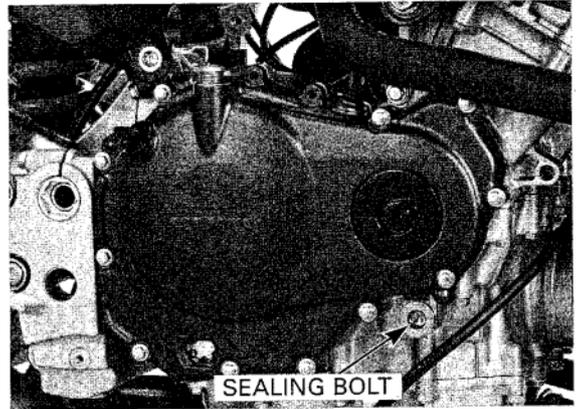
- From coolant mixing with oil
 - Faulty water pump mechanical seal
 - Faulty cylinder head gasket
 - Water leak in crankcase
 - Faulty oil cooler

OIL PRESSURE INSPECTION

If the oil pressure indicator light remains on a few seconds, check the indicator system before checking the oil pressure.

Check the oil level (page 3-15).

Warm up the engine to normal operating temperature (approximately 80°C/176°F). Stop the engine and remove the crankcase sealing bolt.



Connect an oil pressure gauge and attachment to the crankcase.

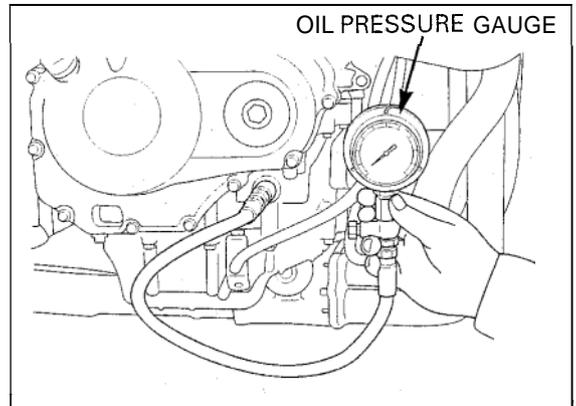
TOOLS:

Oil pressure gauge set

07506-300001
(Equivalent commercially available in U.S.A.)

Oil pressure gauge attachment

07510-MA70000
(Equivalent commercially available in U.S.A.)



Start the engine and increase the rpm to 5,400 rpm and read the oil pressure.

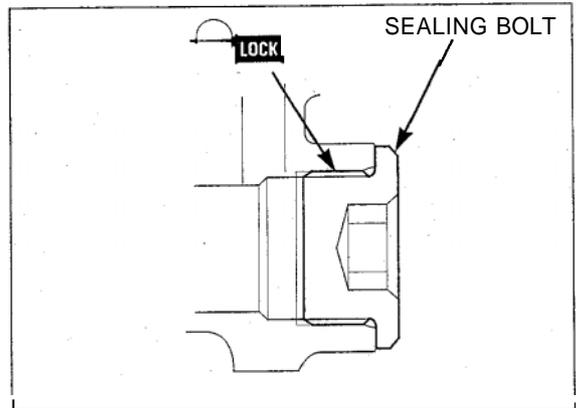
OIL PRESSURE:

490 kPa (5.0 kgf/cm², 71 psi) at 5,400 rpm/
(80°C/176°F)

Stop the engine and remove the tools. Apply a locking agent to the sealing bolt threads.

Install and tighten the sealing bolt to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

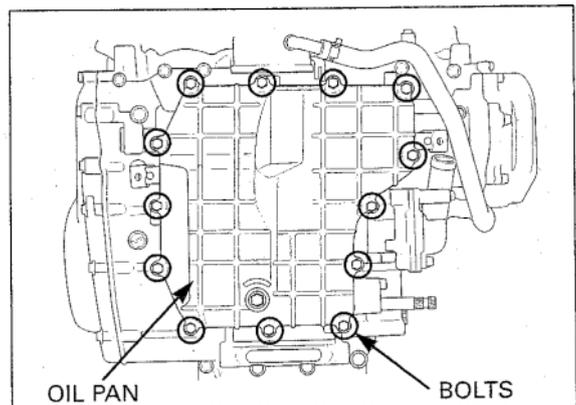


OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

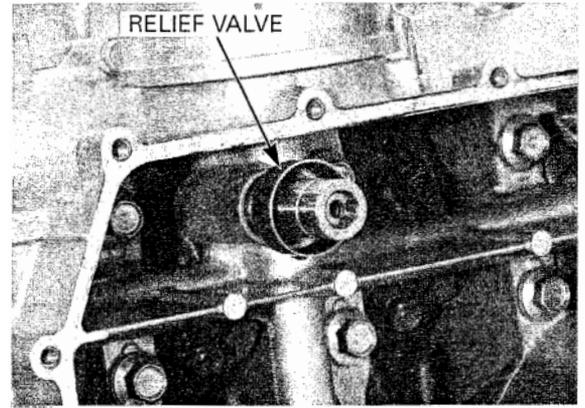
Drain the engine oil (page 3-15).
Remove the exhaust pipe (page 2-13)

Remove the oil pan flange bolts and oil pan.



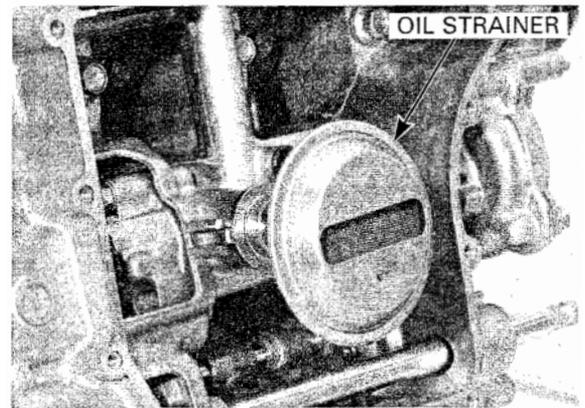
LUBRICATION SYSTEM

Remove the pressure relief valve and O-ring.



Remove the oil strainer and gasket.

Clean the oil strainer screen.

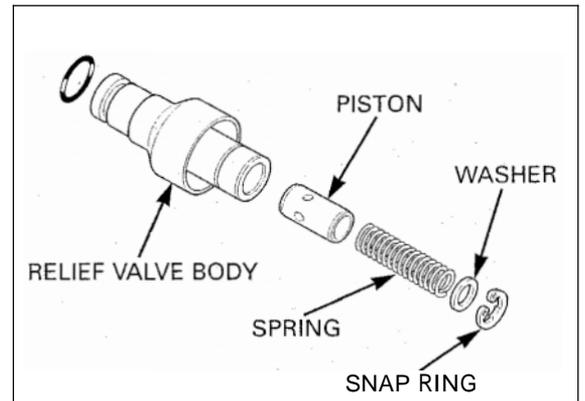


INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the relief valve by removing the snap ring.

Inspect the piston for wear, unsmooth movement or damage.
Inspect the spring for fatigue or damage.

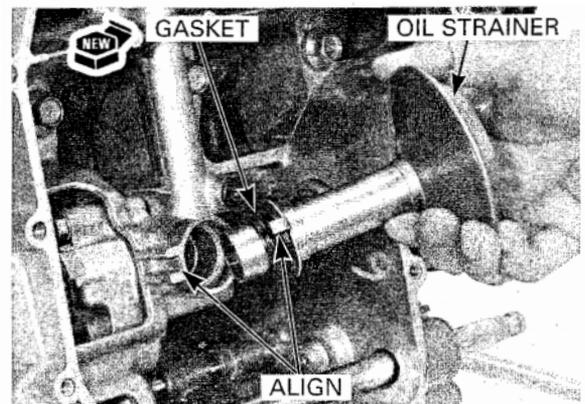
Assemble the relief valve in the reverse order of disassembly.



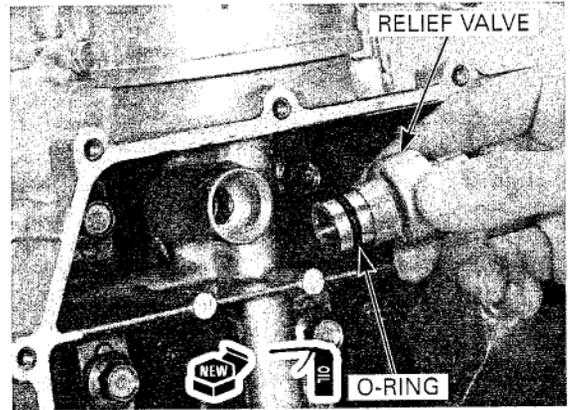
INSTALLATION

Apply oil to the new gasket and install it onto the oil strainer.

Install the oil strainer into the crankcase while aligning its boss with the groove in the crankcase.

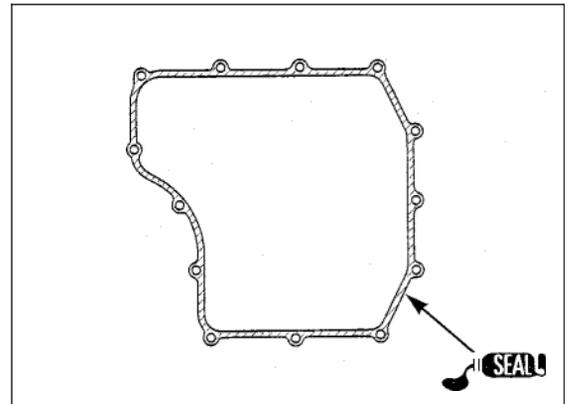


Apply oil to the new O-ring and install it onto the relief valve.
Install the relief valve into the crankcase.



Clean the oil pan mating surface thoroughly.
Apply Three Bond 1207B or an equivalent to the mating surface.

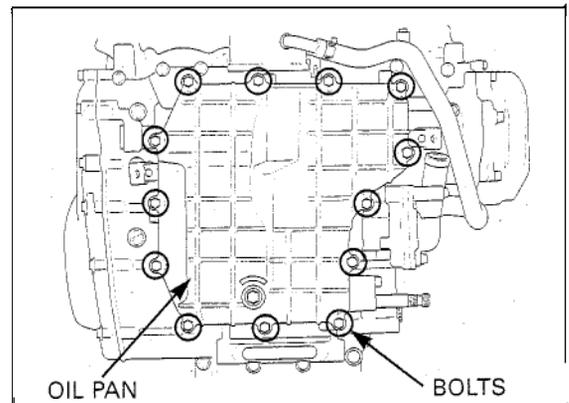
Do not apply sealant more than necessary



Install the oil pan onto the lower crankcase.
Install the oil pan mounting bolts.
Temporarily tighten the two bolts first, then tighten all the bolts in a crisscross pattern in 2 – 3 steps.

Install the exhaust pipe (page 2-16).
Fill the crankcase with the recommended oil (page 3-16).

After installation, check that there are no oil leaks.

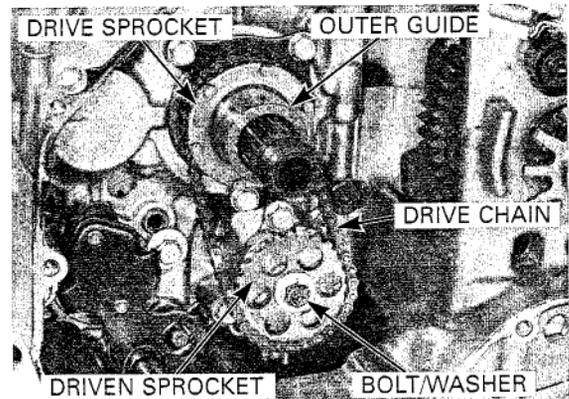


OIL PUMP

REMOVAL

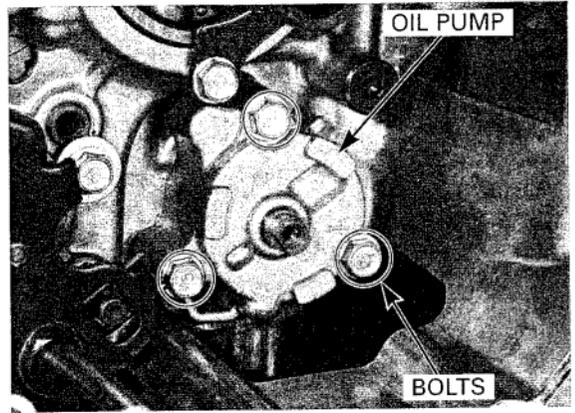
- Remove the following:
- Clutch assembly (page 9-4)
 - Oil strainer and pressure relief valve (page 4-3)

Remove the bolt/washer, then remove the oil pump drive/driven sprocket, clutch outer guide and drive chain as an assembly.



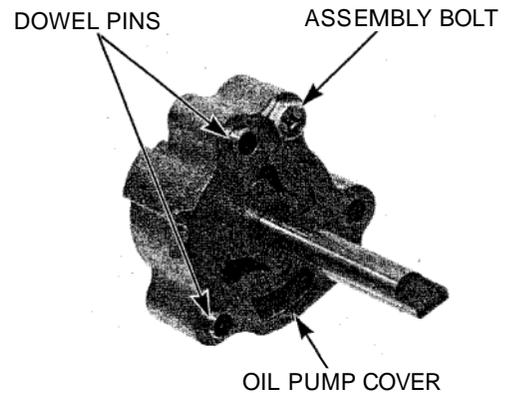
LUBRICATION SYSTEM

Remove the three flange bolts and oil pump assembly.

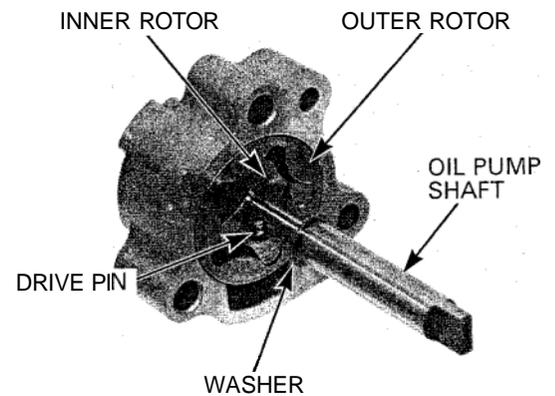


DISASSEMBLY

Remove the dowel pins.
Remove the oil pump assembly bolt and oil pump cover.



Remove the thrust washer, drive pin, oil pump shaft, outer rotor and inner rotor from the oil pump body.

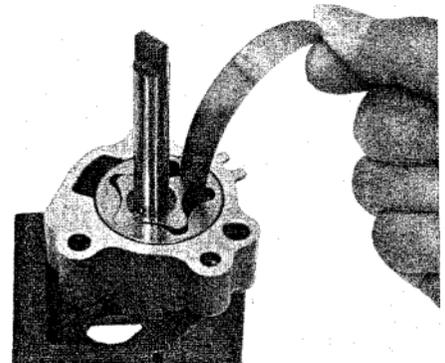


INSPECTION

Temporarily install the oil pump shaft.
Install the outer and inner rotors into the oil pump body.

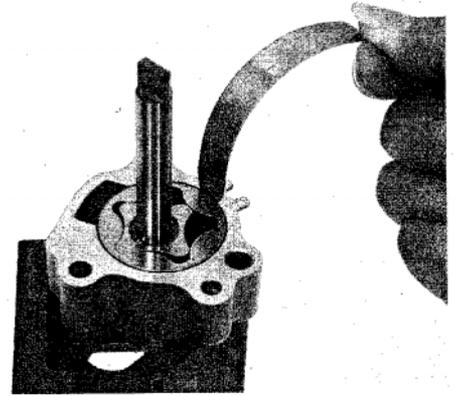
Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



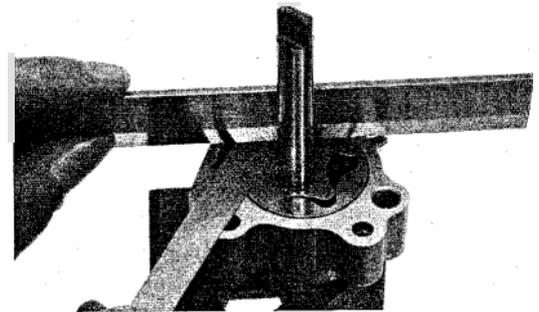
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

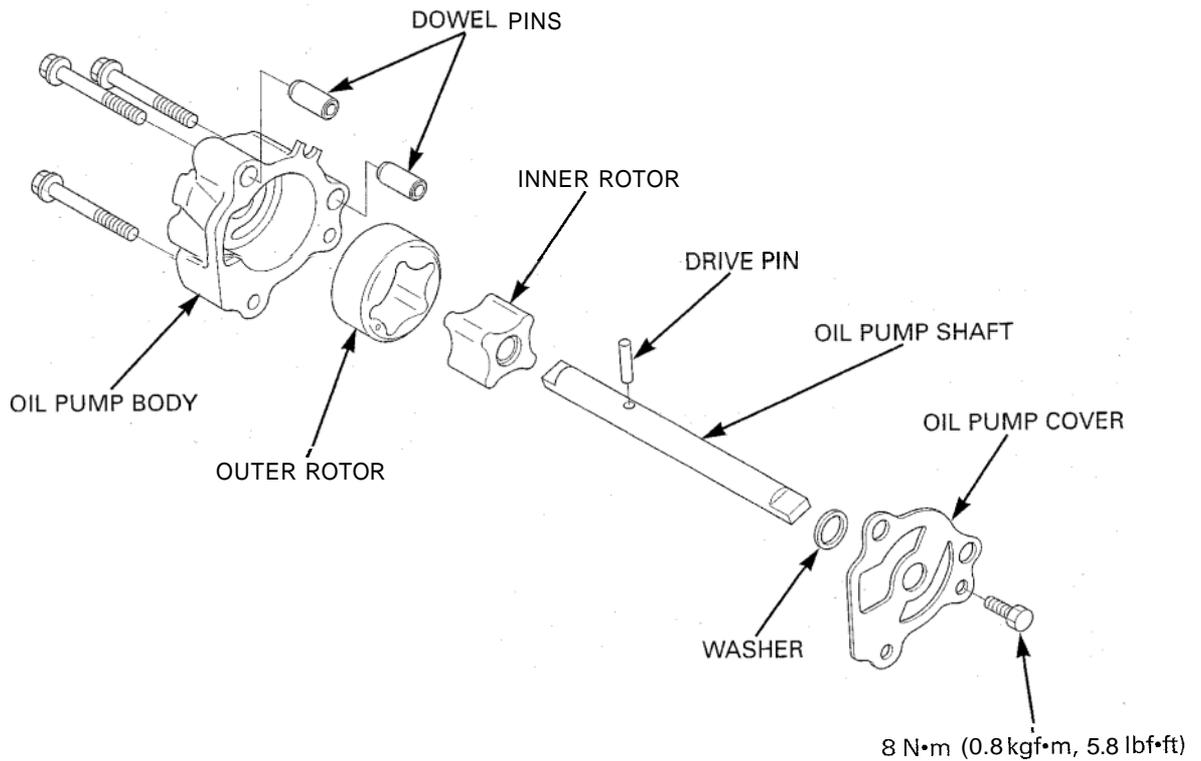


Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



ASSEMBLY



LUBRICATION SYSTEM

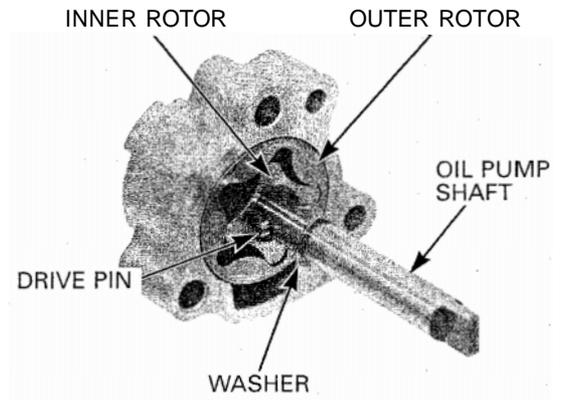
Install the outer rotor with its punch mark facing the oil pump cover.

Install the outer and inner rotors into the oil pump body.

Install the oil pump shaft through the inner rotor and oil pump body.

Install the drive pin into the hole in the pump shaft and align the pin with the groove in the inner rotor as shown.

Install the thrust washer.



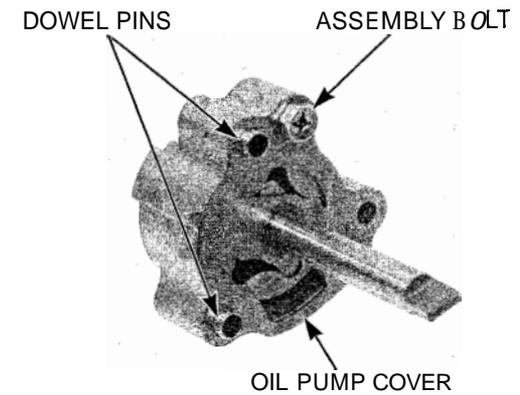
Install the dowel pins.

Install the oil pump cover and tighten the assembly bolt to the specified torque.

TORQUE: 8 N·m (0.8kgf·m, 5.8lbf·ft)

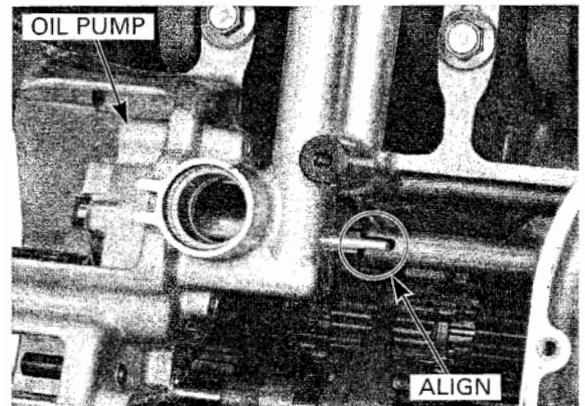
Check the oil pump operation by turning the pump shaft.

If necessary, reassemble the oil pump.

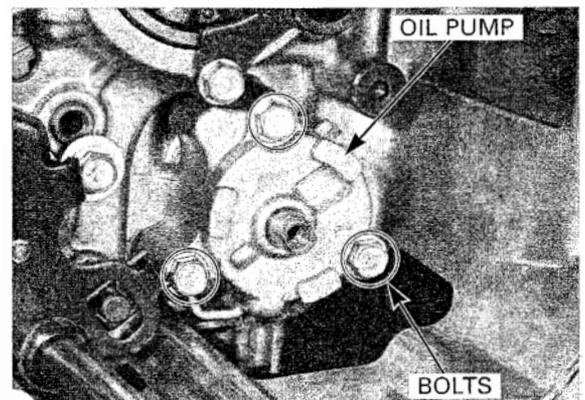


INSTALLATION

Install the oil pump into the crankcase while aligning the pump shaft lug with the water pump shaft groove.



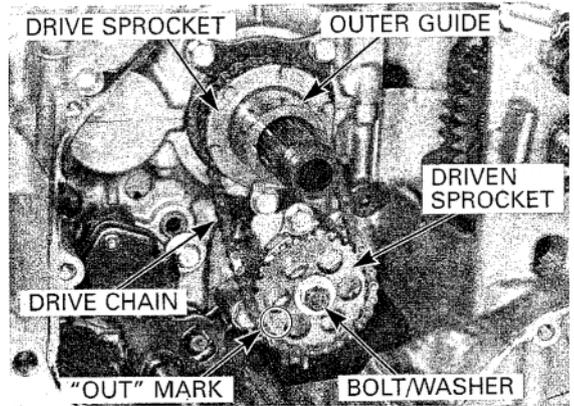
Install and tighten the three flange bolts securely.



Apply oil to the clutch outer guide, oil pump drive sprocket, driven sprocket and drive chain.

Install the oil pump driven sprocket with its "OUT" mark facing outward

Install the clutch outer guide, drive/driven sprocket and drive chain as an assembly.



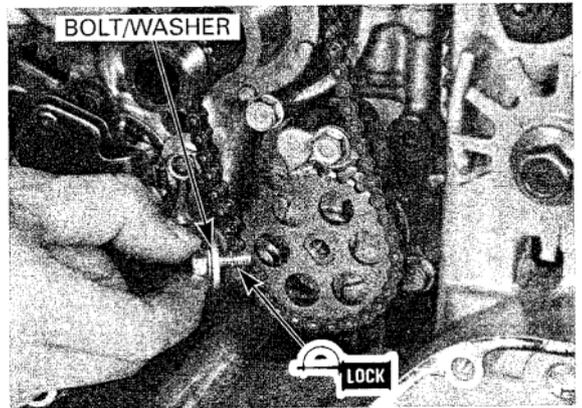
Apply a locking agent to the oil pump driven sprocket bolt threads.
Install and tighten the driven sprocket bolt/washer to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the following:

- Oil strainer/pressure relief valve/oil pan (page 4-41)
- Clutch assembly (page 9-9)

After installation, fill the crankcase with the recommended oil and check that there is no oil leaks.
Check the oil pressure (page 4-31).

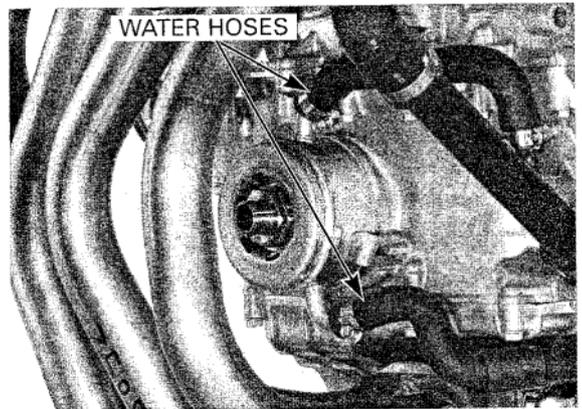


OIL COOLER

REMOVAL

Drain the engine oil and remove the oil filter cartridge (page 3-15).
Drain the coolant from the system (page 6-41).
Remove the radiator reserve tank (page 6-16).

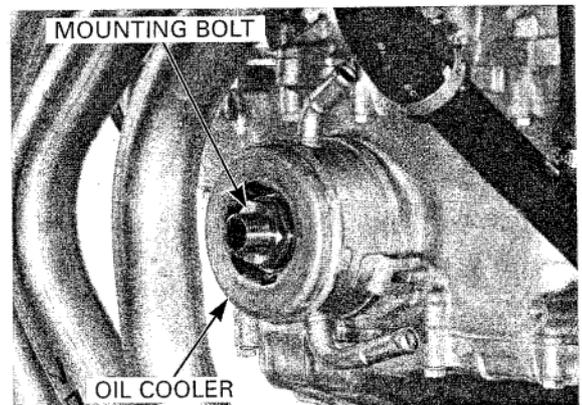
Loosen the hose bands and disconnect the oil cooler water hoses from the cooler.



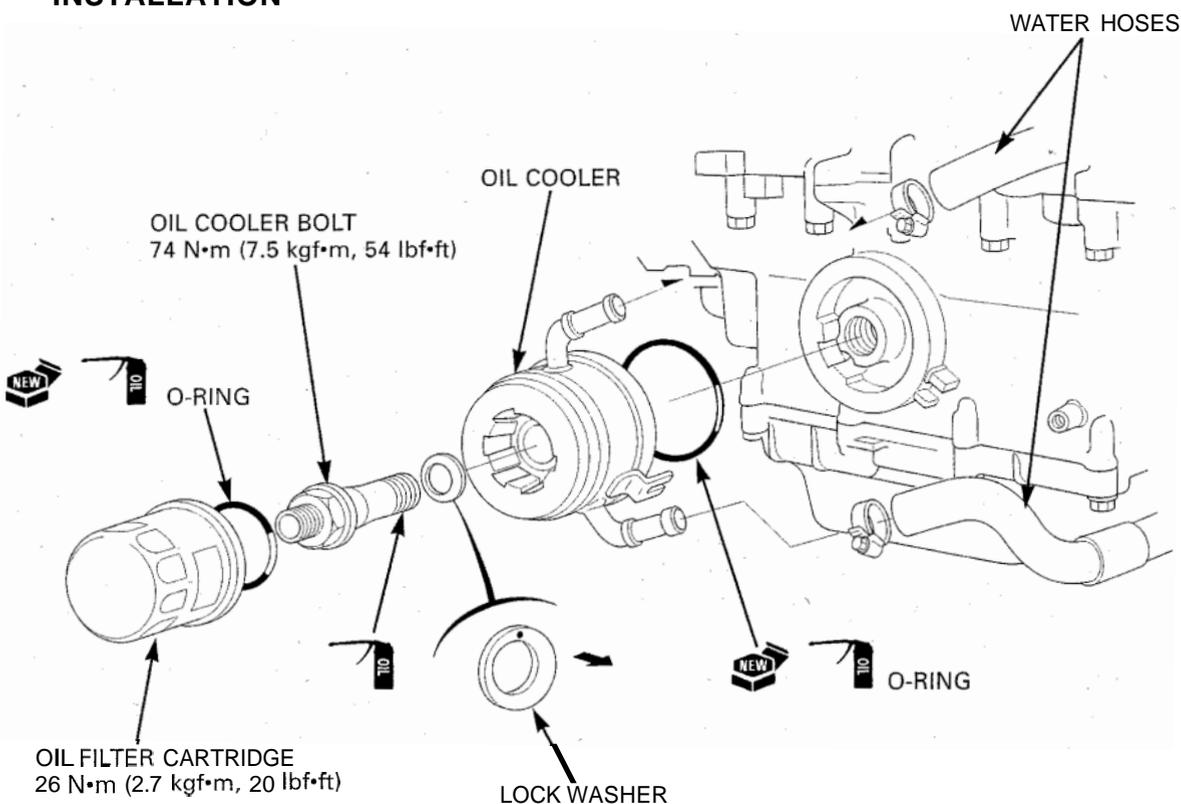
Remove the oil cooler mounting bolt, lock washer and oil cooler.
Remove the O-ring.

INSPECTION

Check the oil cooler for damage.

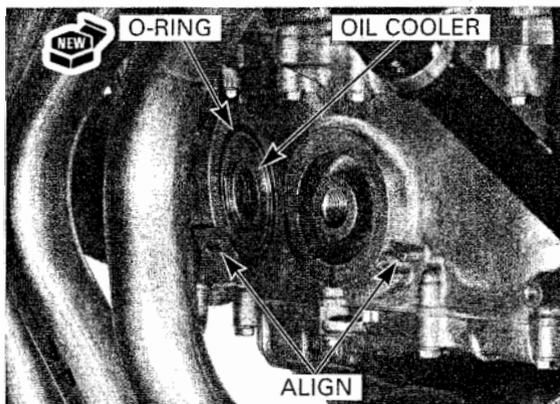


INSTALLATION



Coat a new O-ring with engine oil and install it into the oil cooler groove.

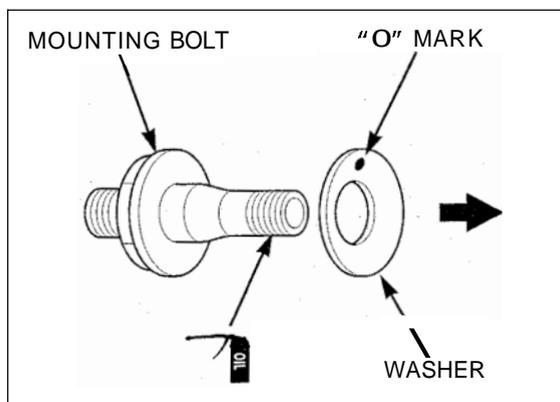
Install the oil cooler aligning its guide groove with the projection on the crankcase.



Apply oil to the oil cooler mounting bolt threads and seating surface.

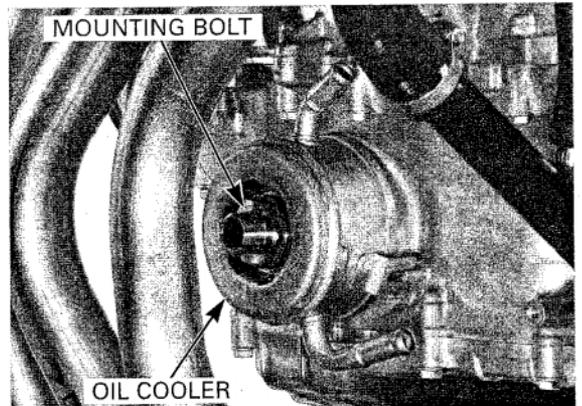
Install the lock washer and oil cooler bolt.

Install the lock washer with its concave side ("O" mark) facing the oil cooler.



Tighten the oil cooler mounting bolt to the specified torque.

TORQUE: 74 N·m (7.5kgf·m, 54 lbf·ft)



Connect the oil cooler water hoses, and tighten the hose bands securely.

Install the oil filter cartridge and fill the crankcase with the recommended oil (page 3-16).
Fill the cooling system and bleed any air (page 6-5).

