

4. LUBRICATION SYSTEM

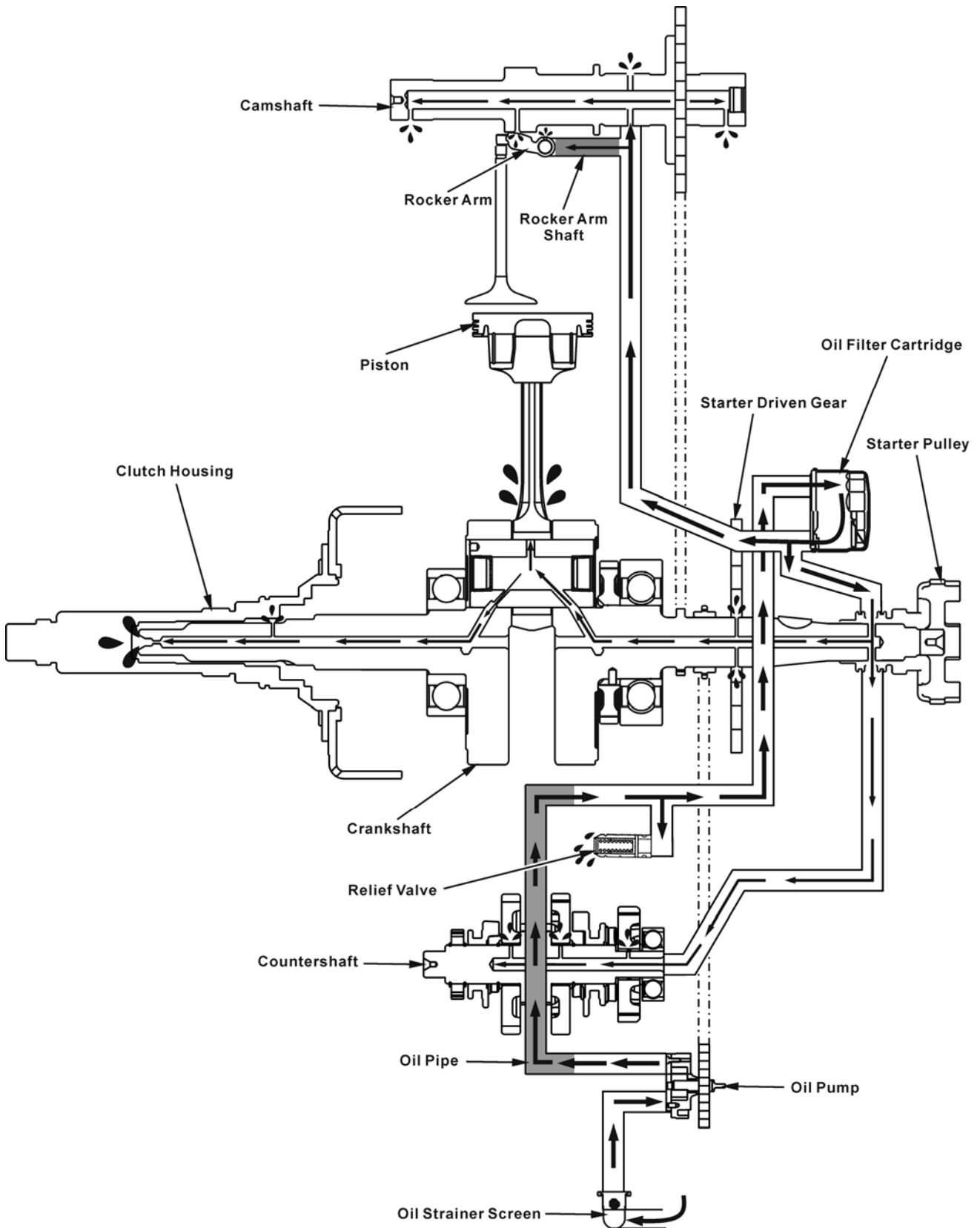
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LUBRICATION SYSTEM

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LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The oil pump service may be done with the engine installed in the frame.
- 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 engine has been installed check that there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3 liter (2.64 Imp qt, 3.18 Us qt)	—
	At disassembly	3.6 liter (3.17 Imp qt, 3.82 Us qt)	—
	At draining and oil filter cartridge change	3.2 liter (2.82 Imp qt, 3.39 Us qt)	—
Recommended engine oil		KYMCO 4-stroke oil or equivalent motor oil API service classification SJ Viscosity: SAE 5W-50	—
Oil pump rotor	Tip clearance	0.15 (0.006) max	0.2 (0.008)
	Body clearance	0.15 – 0.2 (0.006 – 0.008)	0.25 (0.01)
	Side clearance	0.04 – 0.09 (0.0016 – 0.0036)	0.12 (0.0048)

TORQUE VALUES

Oil pump screw	0.3 kgf-m (3 N-m, 2 lbf-ft)	
Oil strainer screen cap	1.5 kgf-m (15 N-m, 11 lbf-ft)	Apply oil to the threads and seating surface.
Oil filter cartridge	1 kgf-m (10 N-m, 7 lbf-ft)	Apply oil to the threads and seating surface.
Oil pipe bolt	3.5 kgf-m (35 N-m, 25.2 lbf•ft)	Apply oil to the threads and seating surface.

Special tool:

Oil seal & bearing drive A120E00014

4. LUBRICATION SYSTEM

TROUBLESHOOTING

Oil level low

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

Oil contamination (White appearance)

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

No oil pressure

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

Low oil pressure

- Pressure relief valve stuck open
- Clogged oil filter and strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Oil level too low

High oil pressure

- Pressure relief valve stuck closed
- Plugged oil filter, gallery, or metering orifice
- Faulty oil pump

Seized engine

- No or low oil pressure
- Clogged oil orifice/passage
- Internal oil leak
- Non-recommended oil used

Oil contamination

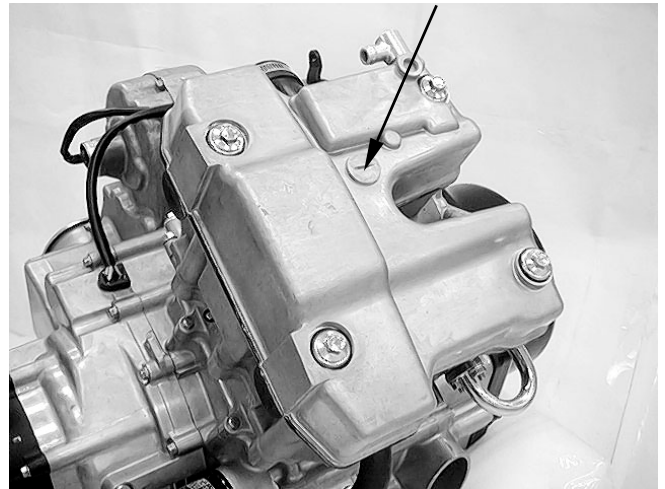
- Deteriorated oil
- Faulty oil filter
- Worn piston ring (White appearance with water or moisture)
 - Damaged water pump mechanical seal
 - Damaged head gasket
 - Oil relief not frequent enough

4. LUBRICATION SYSTEM

LUBRICATION CHECK HOLE

Remove the check hole plug/O-ring.
Start the engine.
Check the oil gushed from the hole. If not,
stop the engine immediately and determine
the cause.

Check Hole Plug/O-ring



4. LUBRICATION SYSTEM

OIL PUMP REMOVAL/INSPECTION/ INSTALLATION

REMOVAL

Remove the flywheel and driven gear (refer to the “**STARTER CLUTCH REMOVAL/INSPECTION/INSTALLATION**” section in the chapter 19).

Remove the two bolts and oil pump drive chain guide.

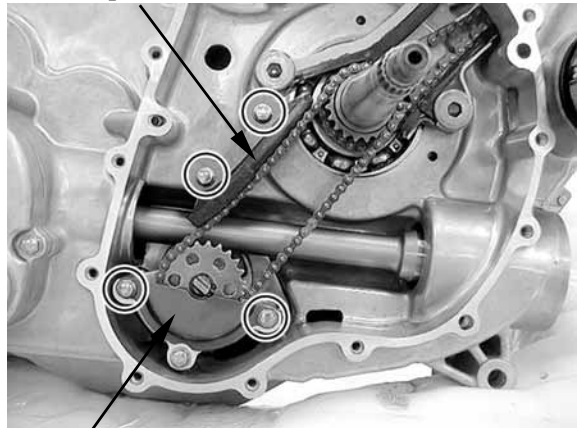
Remove the two bolts and oil separator cover.

* When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine..

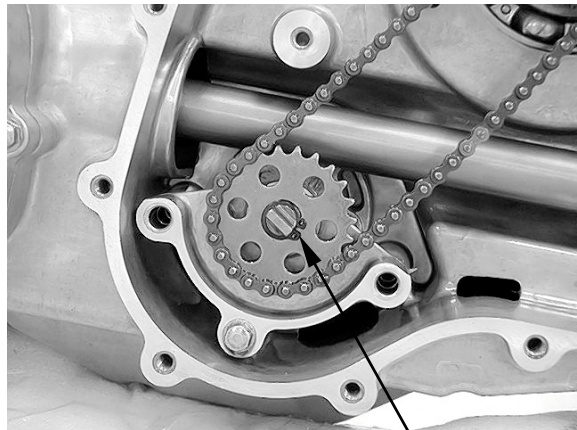
Remove snap ring.

Remove the oil pump driven gear, then remove the oil pump drive chain.

Oil Pump Drive Chain Guide

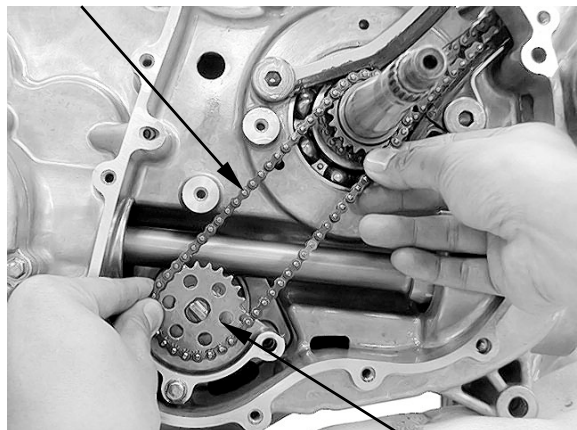


Oil Separator Cover



Snap Ring

Drive Chain



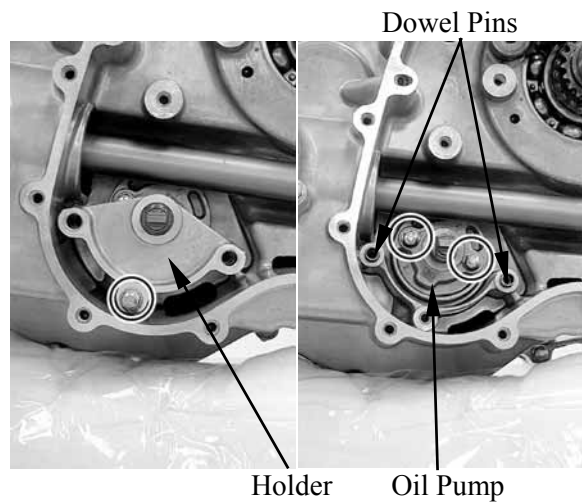
Driven Gear

4. LUBRICATION SYSTEM

Remove a bolt and then remove the oil pump holder.

Remove the two dowel pins.

Remove the two bolts and then remove the oil pump.



INSPECTION

Oil pump drive chain guide

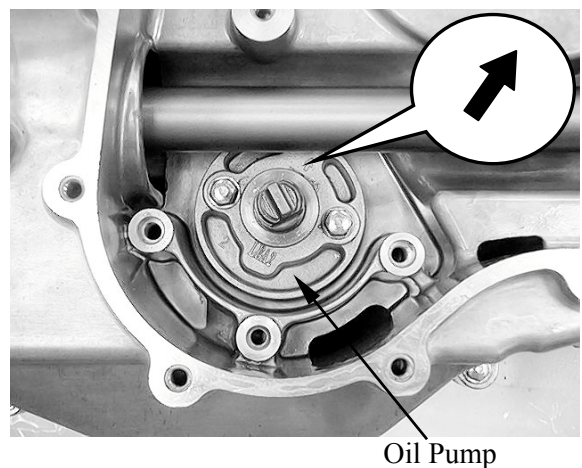
Inspect the drive chain slipper surface of the drive chain guide for wear or damage.



INSTALLATION

Install the oil pump.

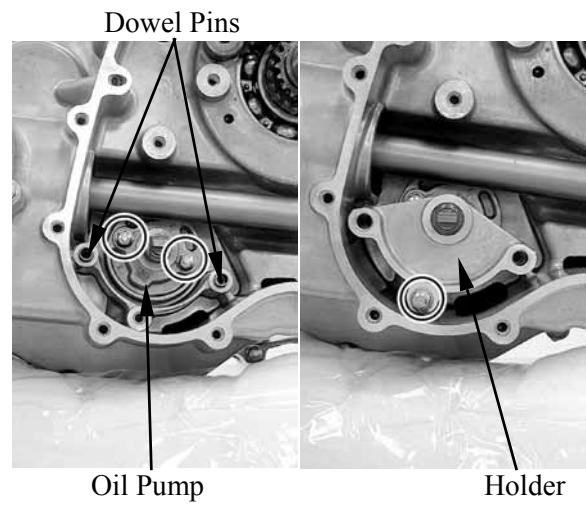
- * Make sure the pump shaft rotates freely and arrow on the oil pump is upside.



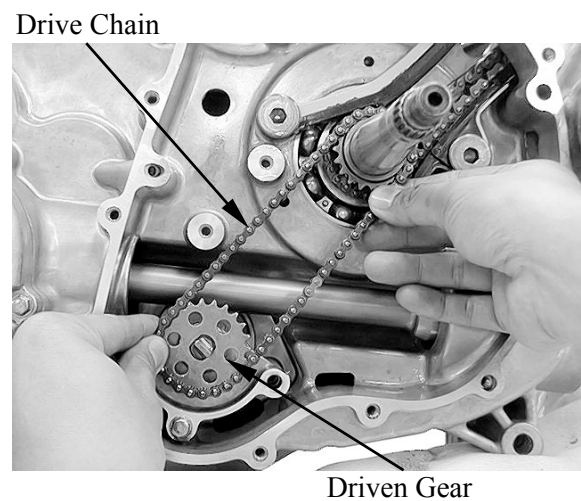
4. LUBRICATION SYSTEM

Install and tighten the two bolts securely.
Install two dowel pins

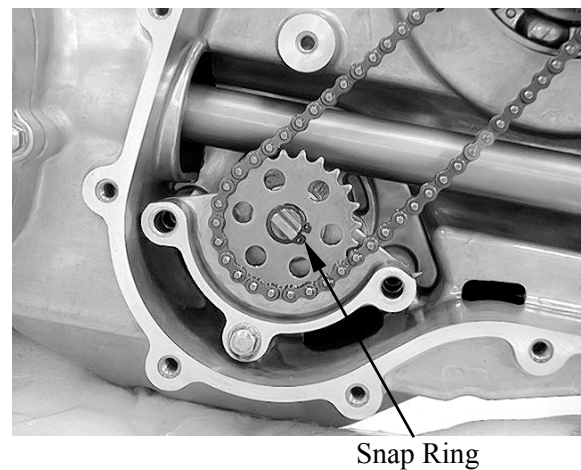
Install the holder, then install a bolt but do not tighten.



Install the driven gear and drive chain.



Install the snap ring.

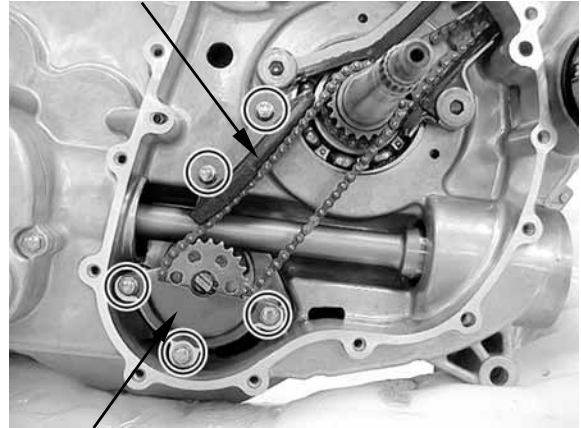


4. LUBRICATION SYSTEM

Install the chain guide, then install and tighten the two bolts securely.

Install the oil separator cover, then install and tighten the three bolts in a crisscross pattern in 2 or 3 steps.

Oil Pump Drive Chain Guide



Oil Separator Cover

4. LUBRICATION SYSTEM

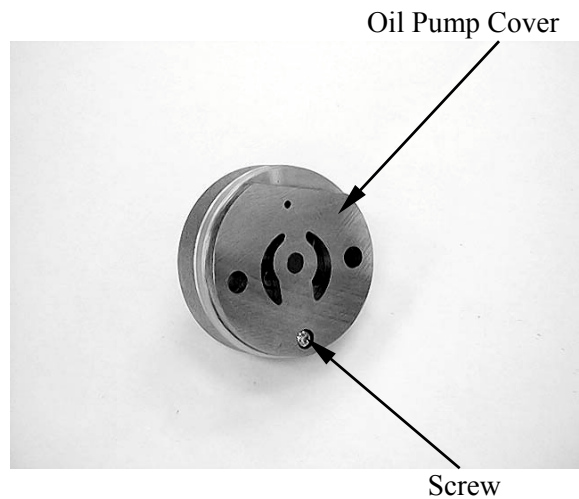
OIL PUMP DISASSEMBLY/INSPECTION/ ASSEMBLY

DISASSEMBLY

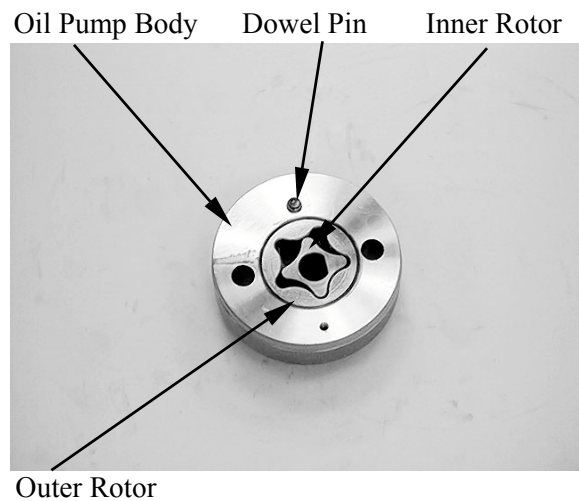
Remove the oil pump shaft.



Remove the screw and oil pump cover.



Remove the dowel pin, oil pump outer rotor and inner rotor.



4. LUBRICATION SYSTEM

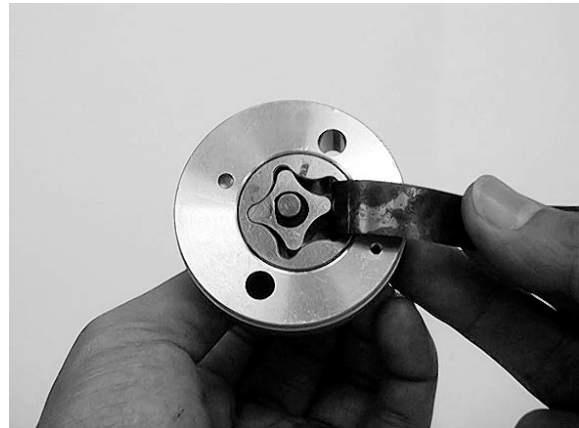
INSPECTION

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

Measure the tip clearance.

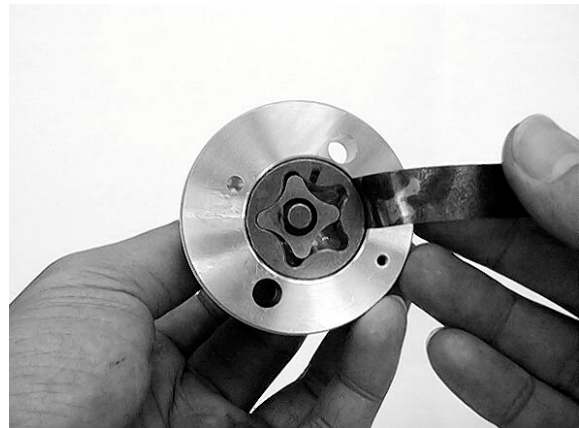
Service limit: 0.2 mm (0.008 in)

* Measure at several points and use the largest reading to compare the service limit.



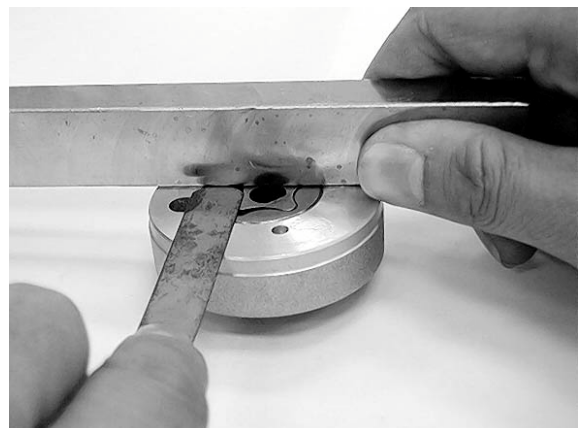
Measure the pump body clearance.

Service limit: 0.25 mm (0.01 in)



Measure the side clearance with the straight edge and feeler gauge.

Service limit: 0.12 mm (0.0048 in)



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ASSEMBLY

Dip all parts in clean engine oil.

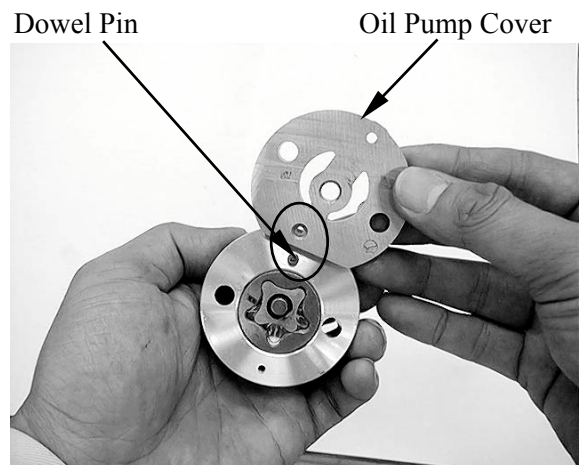
Install the outer rotor into the oil pump body.

Install the inner rotor into the outer rotor.

Install the oil pump shaft.

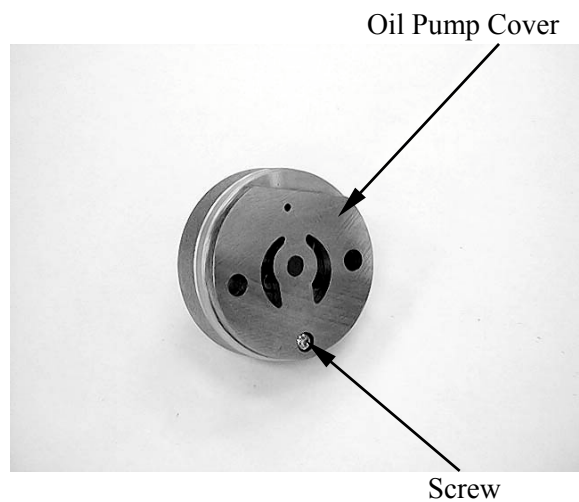
Install the dowel pin onto the oil pump body.

Install the oil pump cover onto the oil pump body by aligning the dowel pin.



Install and tighten the screw to the specified torque.

Torqur: 3 N•m (0.3kgf•m, 2 lbf•ft)

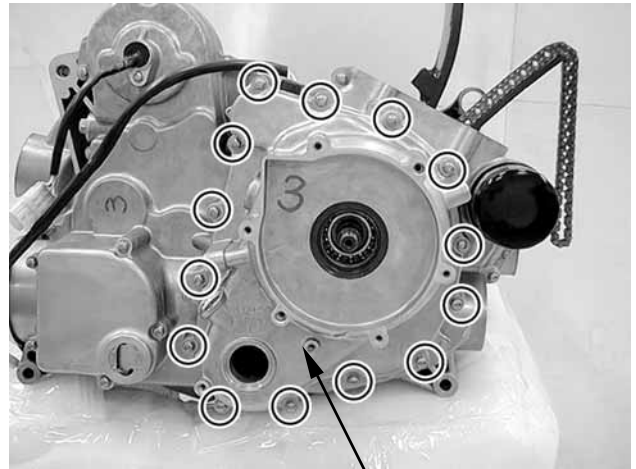


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RIGHT CRANKCASE COVER DISASSEMBLY/ASSEMBLY

DISASSEMBLY

Remove the right crankcase cover (refer to the “ALTERNATOR STATOR REMOVAL/INSPECTION/INSTALLATION” in the chapter 17)



Right Crankcase Cover

Remove the oil seal.



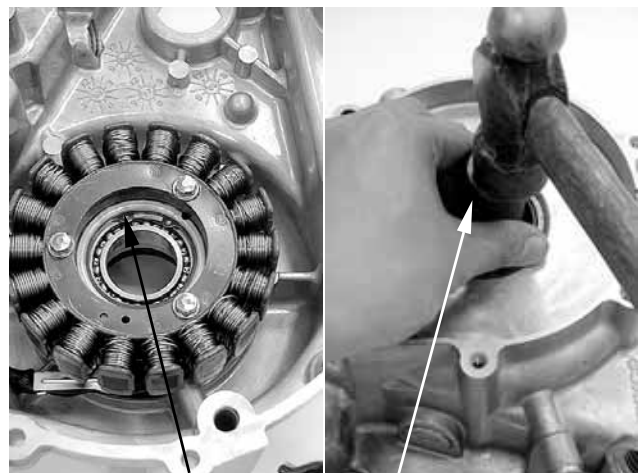
Oil Seal

Remove the snap ring.

Remove the bearing by using the special tool.

Special tool:

Oil seal & bearing drive A120E00014



Snap Ring

Bearing Drive

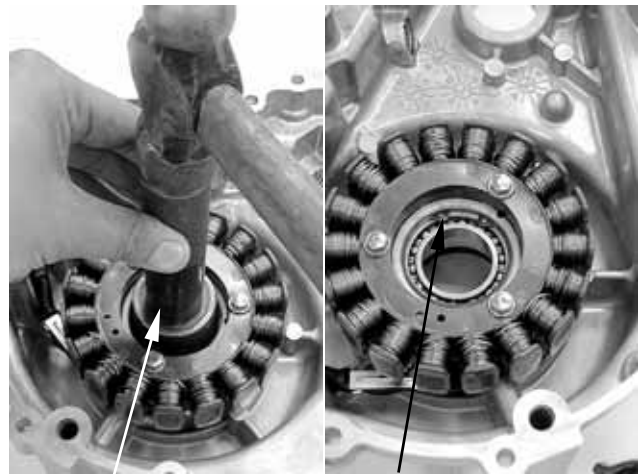
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ASSEMBLY

Install a new bearing by using the special tool.

Special tool:

Oil seal & bearing drive A120E00014



Bearing Drive

Snap Ring

Install a new oil seal.



Oil Seal

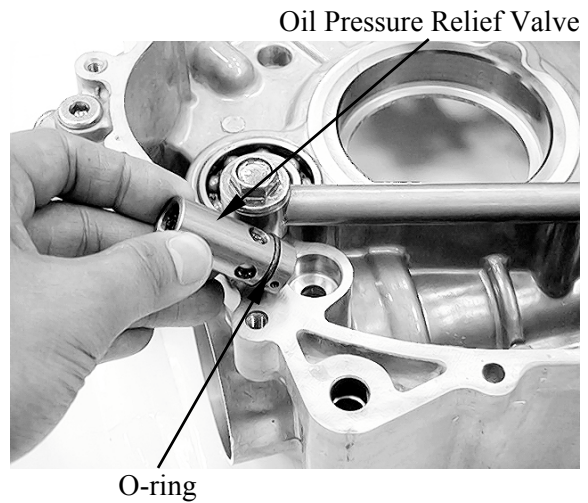
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OIL PRESSURE RELIEF VALVE

REMOVAL

Remove the right crankcase (refer to the “**RIGHT CRANKCASE REMOVAL/INSTALLATION**” section in the chapter 11).

Remove the pressure relief valve and O-ring from the right crankcase.

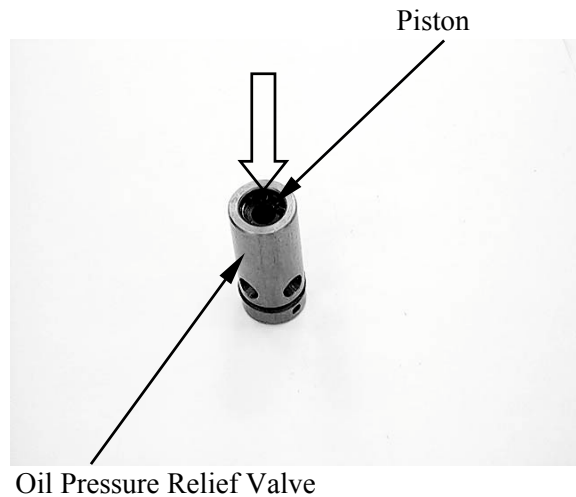


INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.

INSTALLATION

Apply oil to a new O-ring and install the pressure relief valve groove, and install the relief valve to the right crankcase.



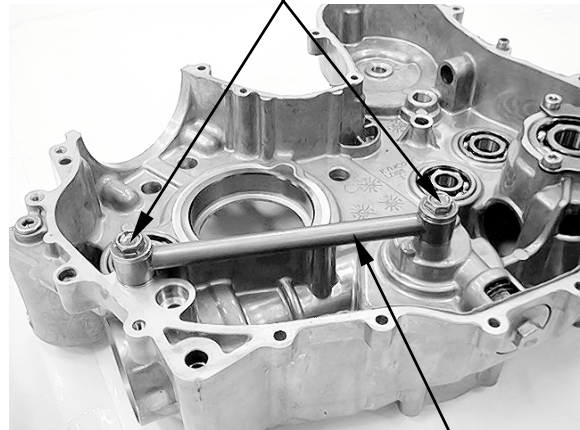
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OIL PIPE REMOVAL/INSTALLATION

REMOVAL

Remove the two bolts, washers (on the oil pipe), oil pipe and washers (under oil pipe).

Bolts/Washers (on the oil pipe)

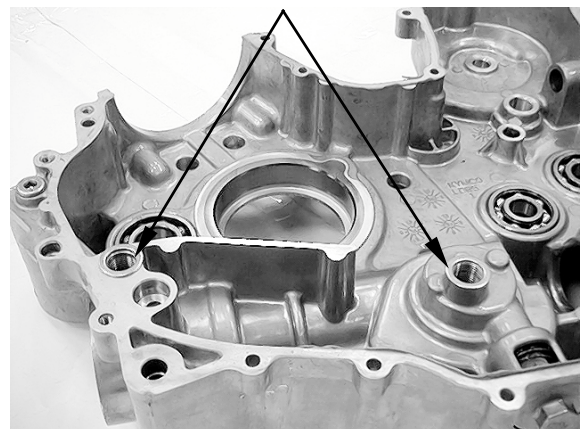


Oil Pipe/Washer (under oil pipe)

INSTALLATION

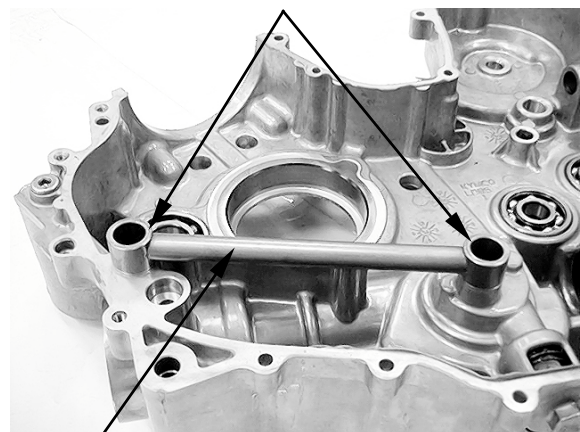
Install the inner washers on the right crankcase.

Washers



Install the oil pipe with the thick side face upward.

Thick Side



Oil Pipe

4. LUBRICATION SYSTEM

Apply clean engine oil to the bolts, then install the outer washers and two bolts. Tighten the two bolts to the specified torque.

Torque: 3.5 kgf-m (35 N-m, 25.2 lbf·ft)

