Engine Lubrication System

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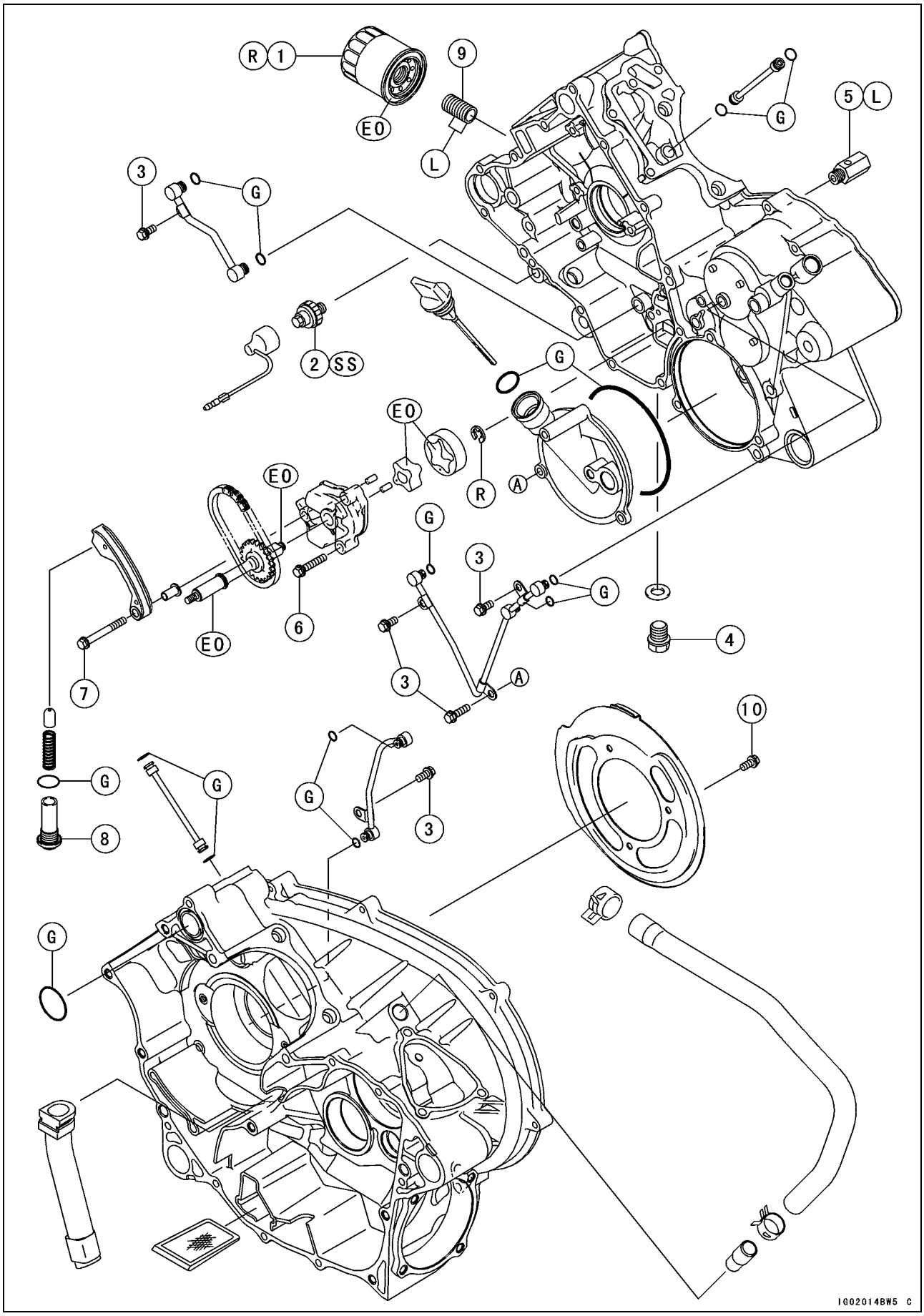
Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Oil Filter	17.5	1.8	13	R
2	Oil Pressure Switch	15	1.5	11	SS
3	Oil Pipe Bolts	8.8	0.90	78 in·lb	
4	Engine Oil Drain Plug	20	2.0	14	
5	Oil Pressure Relief Valve	15	1.5	11	L
6	Oil Pump Bolts	8.8	0.90	78 in·lb	
7	Chain Guide Bolts	8.8	0.90	78 in·lb	
8	Oil Pump Drive Chain Tensioner Bolt	25	2.5	18	
9	Oil Filter Mounting Bolt	25	2.5	18	L (15 mm)
10	Plate Bolts	8.8	0.90	78 in·lb	

EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
SS: Apply silicone sealant (Kawasaki Bond: 56019-120).

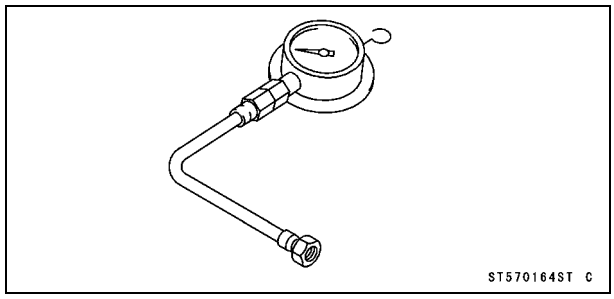
7-4 ENGINE LUBRICATION SYSTEM

Specifications

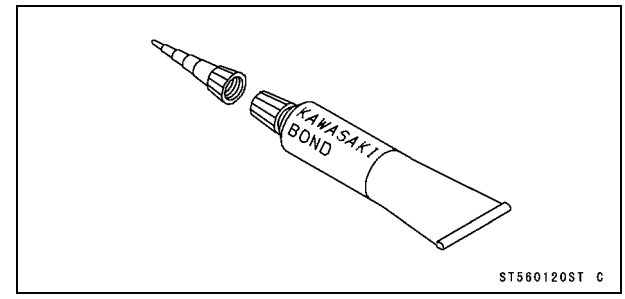
Item	Standard
Engine Oil	
Type	API SF or SG
	API SH, SJ or SL with JASO MA
Viscosity	SAE 10W-40
Capacity	2.1 L (2.2 US qt) (when filter is not removed)
	2.2 L (2.3 US qt) (when filter is removed)
	2.3 L (2.4 US qt) (when engine is completely dry)
Oil Pressure Measurement	
Oil Pressure	430 kPa (4.4 kgf/cm², 62.4 psi) @4 000 r/min (rpm), Oil Temperature 120°C (248°F)

Special Tools & Sealant

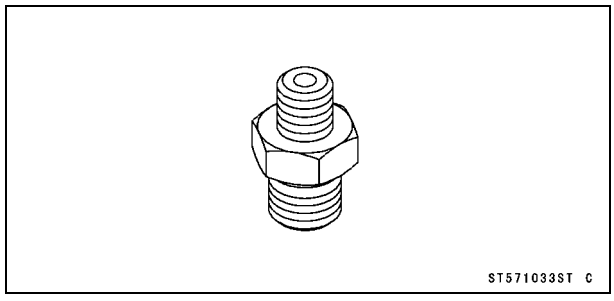
Oil Pressure Gauge, 10 kgf/cm²:
57001-164



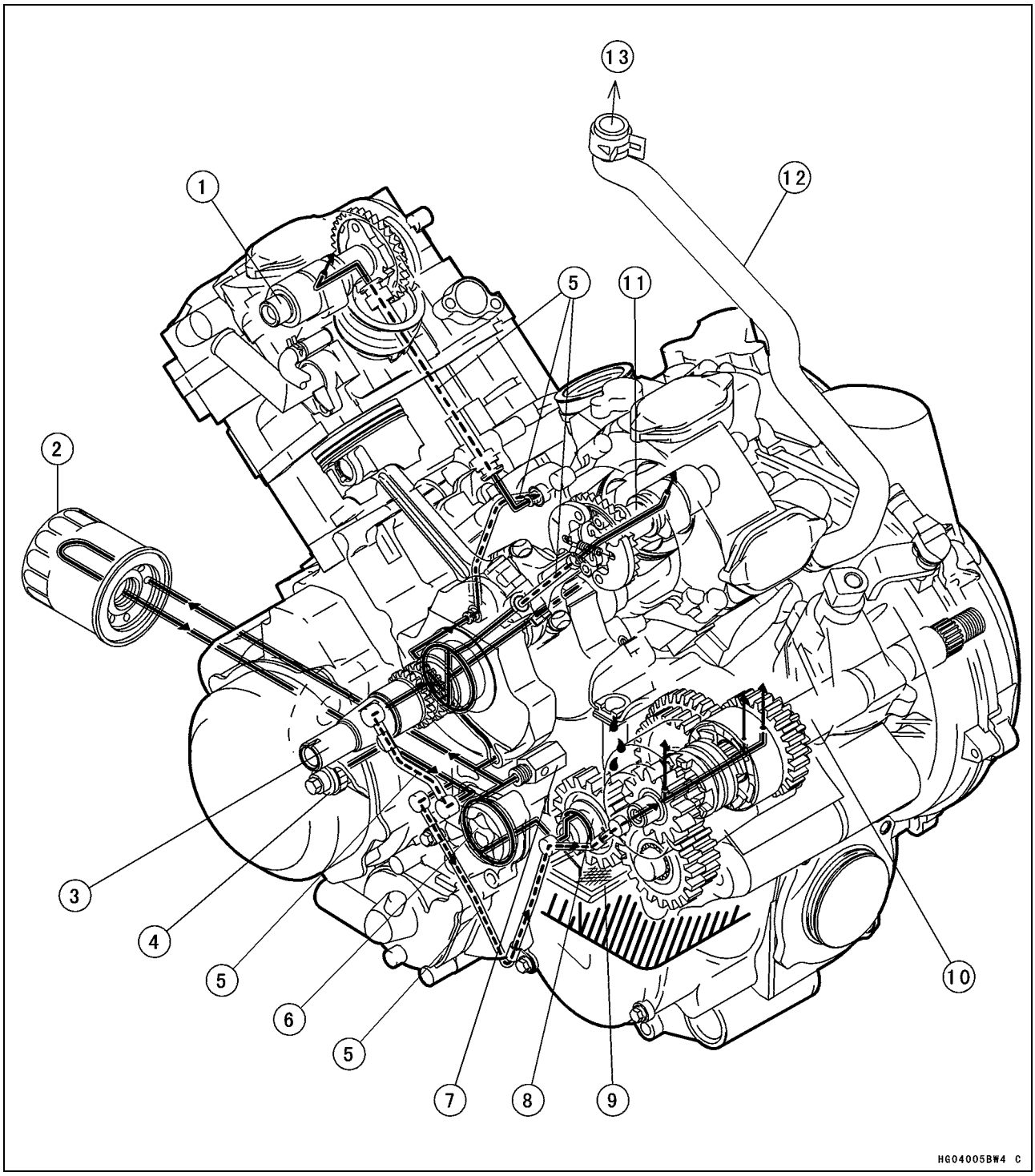
Kawasaki Bond (Silicone Sealant):
56019-120



Oil Pressure Gauge Adapter, PT 1/8:
57001-1033



Engine Oil Flow Chart



1. Front Camshaft
2. Oil Filter
3. Crankshaft
4. Oil Pressure Switch
5. Oil Pipes
6. Oil Pump
7. Relief Valve
8. Transmission Idle Shaft
9. Oil Screen
10. Transmission Driven Shaft
11. Rear Camshaft
12. Breather Hose
13. To Air Cleaner

Engine Oil and Oil Filter

⚠ WARNING

Vehicle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

Oil Level Inspection

- Park the vehicle so that it is level, both side-to-side and front-to-rear.

★If the oil has just been changed, start the engine, and run it for several minutes to fill the oil filter.

CAUTION

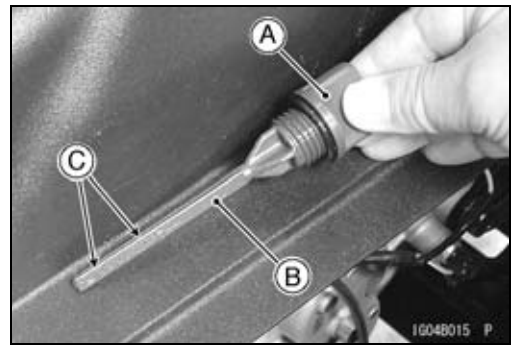
Allow the engine to idle for several minutes so that oil may reach all parts of the engine. Racing a "dry" engine may cause severe damage.

- Stop the engine and wait several minutes for all the oil to drain back to the sump.

- Unscrew the oil filler cap [A], wipe its dipstick [B] dry, and tighten it into the filler opening.
- Unscrew the oil filler cap and check the oil level. The oil level should be between the upper (H) and lower (L) level lines [C].

★If the level is too high, suck the excess oil out the filler hole with a syringe or other suitable device.

★If the level is too low, add oil through the filler hole. Use the same type and make of oil that is already in the engine.



Engine Oil Change

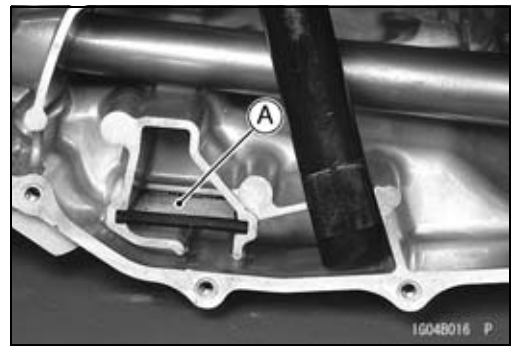
- Refer to the Engine Oil Change in the Periodic Maintenance chapter.

Oil Filter Change

- Refer to the Oil Filter Change in the Periodic Maintenance chapter.

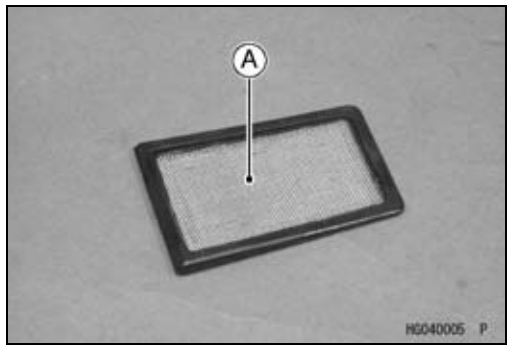
Oil Screen Removal

- Split the crankcase (see Crankcase Disassembly in the Crankshaft/Transmission chapter).
- Pull the oil screen [A] out of the crankcase.



Engine Oil and Oil Filter

Oil Screen Cleaning



- Clean the oil screen [A] thoroughly whenever it is removed for any reason.
- Clean the oil screen with a high-flash point solvent and remove any particles stuck to it.

⚠ WARNING

Clean the screen in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.

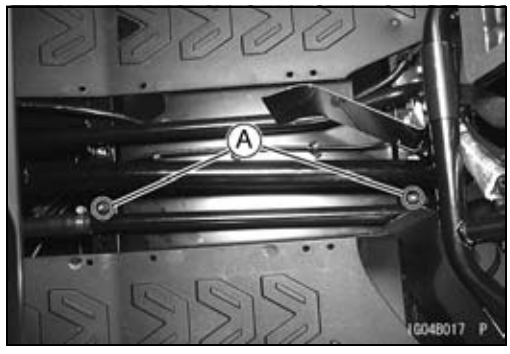
NOTE

○*While cleaning the screen, check for any metal particles that might indicate internal engine damage.*

- Check the screen carefully for any damage, holes, broken wires, or gasket pulling off.

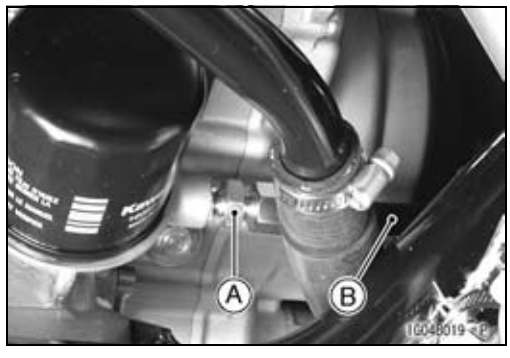
★If the screen is damaged, replace it.

Oil Pressure Measurement



- Remove:
  Engine Upper Cover (see Engine Upper Cover Removal in the Frame chapter)
  Engine Bottom Guard (see Engine Bottom Guard Removal in the Frame chapter)
  Water Pipe Bolts [A]

- Remove:
  Oil Pressure Switch Lead [A] (disconnect)
  Oil Pressure Switch [B]



- Attach the oil pressure gauge adapter [A] and gauge hose [B] to the engine.

Special Tools - Oil Pressure Gauge, 10 kgf/cm²: 57001-164
Oil Pressure Gauge Adapter, PT 1/8: 57001-1033

Engine Oil and Oil Filter

- Start the engine and warm up the engine.
- Run the engine at the specified speed, and read the oil pressure gauge [A].

Oil Pressure
Standard: 430 kPa (4.4 kgf/cm², 62.4 psi) @4 000 r/min (rpm), Oil Temperature 120°C (248°F)

★If the oil pressure is much lower than the standard, inspect the relief valve, oil pump, and/or crankshaft bearing insert wear.

★If the oil pressure is much higher than the standard, inspect the oil filter, oil screen, and other areas of the lubrication system for clogging.

- Stop the engine.
- Remove the oil pressure gauge and adapter.

⚠ WARNING

Take care against burns from hot engine oil that will drain through the oil passage when the gauge adapter is removed.

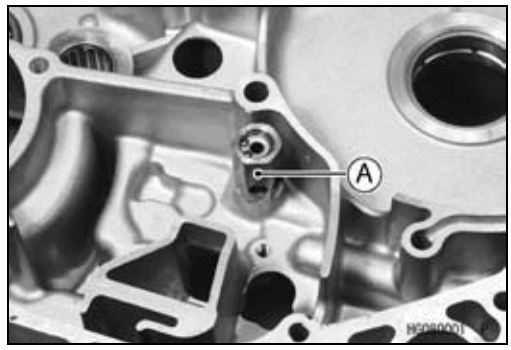
- Apply silicone sealant to the oil pressure switch, and tighten it.

Sealant - Kawasaki Bond (Silicone Sealant): 56019-120

Torque - Oil Pressure Switch: 15 N·m (1.5 kgf·m, 11 ft·lb)

Oil Pressure Relief Valve

Oil Pressure Relief Valve Removal



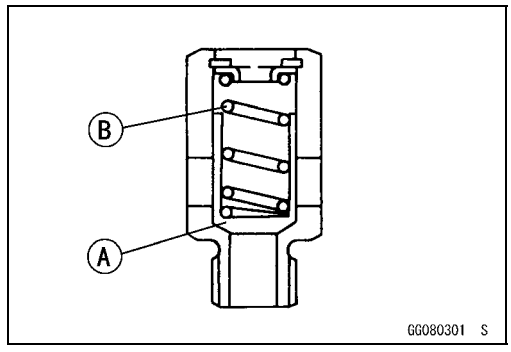
- Split the crankcase (see Crankcase Disassembly in the Crankshaft/Transmission chapter).
- Remove the oil pressure relief valve [A].

Oil Pressure Relief Valve Installation

- See crankcase assembly (see Crankcase Assembly in the Crankshaft/Transmission chapter).
- Apply a non-permanent locking agent to the threads of oil pressure relief valve, and tighten it.

Torque - Oil Pressure Relief Valve: 15 N·m (1.5 kgf·m, 11 ft·lb)

Oil Pressure Relief Valve Inspection



- Remove the relief valve.
- Using a wooden stick, push the inner valve to make sure that the valve [A] moves smoothly and that it returns to its original position by the force of the spring [B].

NOTE

○*The relief valve cannot be disassembled and it must be inspected in the assembled state.*

★If the valve movement is not smooth, wash the relief valve with high-flash point solvent, and use compressed air to remove any foreign particles from it.

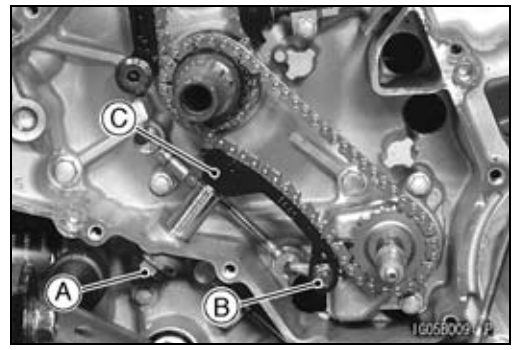
⚠ WARNING

Clean the oil pressure relief valve in a well -ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.

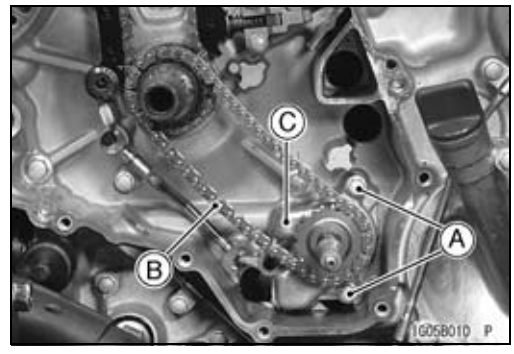
★If the valve does not move smoothly even after washing it, replace the relief valve. The oil pressure relief valve is precision made with no allowance for replacement of individual parts.

Oil Pump

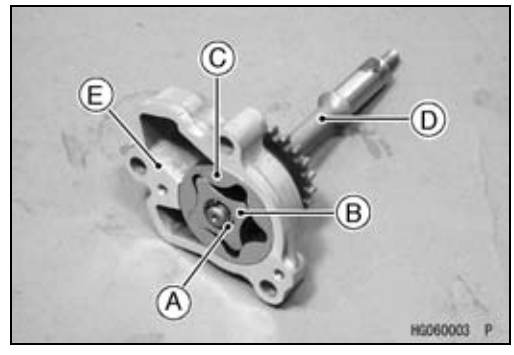
Oil Pump Removal



- Remove:
  Alternator Rotor and Starter Clutch Gear (see Alternator Rotor Removal in the Electrical System chapter)
  Oil Pump Drive Chain Tensioner Bolt [A]
  Chain Guide Bolt [B] and Collar
  Chain Guide [C]



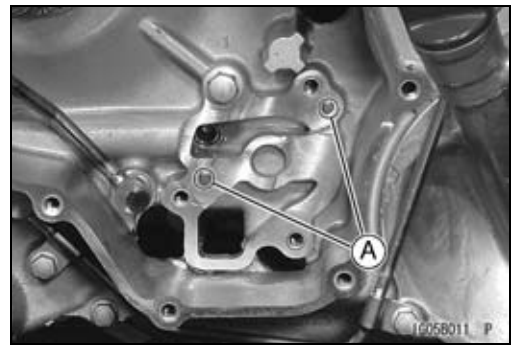
- Remove:
  Oil Pump Bolts [A]
  Oil Pump Drive Chain [B] and Oil Pump Assembly [C]



- Remove:
  Circlip [A]
  Inner Rotor [B]
  Outer Rotor [C]
  Oil Pump Drive Shaft [D]
  Oil Pump Cover [E]

Oil Pump Installation

- Apply engine oil:
  Oil Pump Drive Shaft
  Inner and Outer Rotors
- Install:
  Oil Pump Drive Shaft
  Oil Pump Cover
  Inner Rotor
  Outer Rotor
  New Circlip

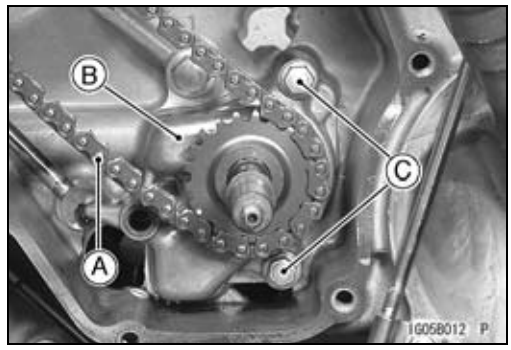


- Check to see that the dowel pins [A] are in place.
- Apply engine oil in the oil pump housing.

Oil Pump

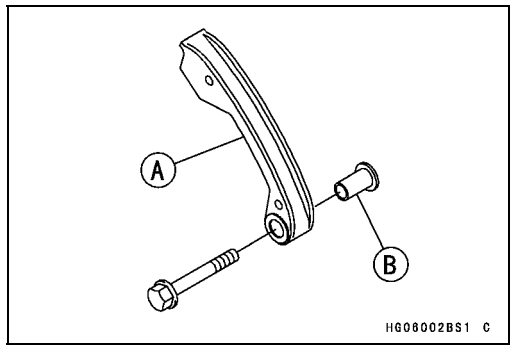
- Install the oil pump drive chain [A] with the oil pump assembly [B].
- Tighten:

Torque - Oil Pump Bolts [C]: 8.8 N·m (0.90 kgf·m, 78 in·lb)



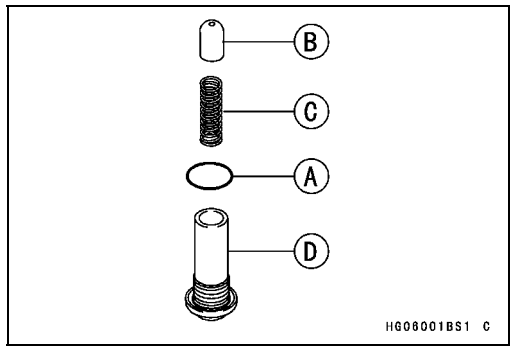
- Install:
  Chain Guide [A] and Collar [B]
- Tighten:

Torque - Chain Guide Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)



- Apply grease to the O-ring [A].
- Install:
  Pin [B]
  Spring [C]
  O-ring
  Oil Pump Drive Chain Tensioner Bolt [D]
- Tighten:

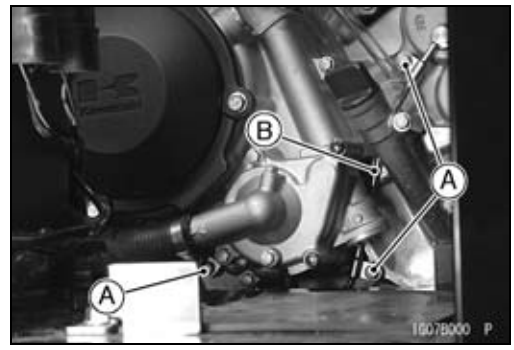
Torque - Oil Pump Drive Chain Tensioner Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)



Oil Pipe

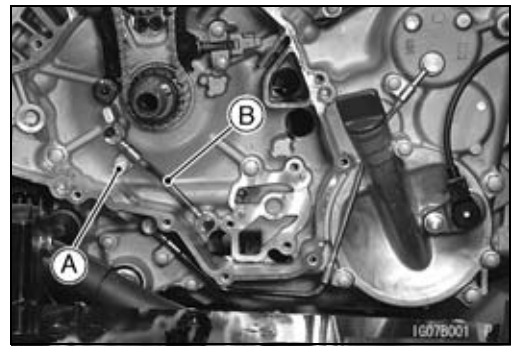
Oil Pipe Removal

Engine Left Side Oil Pipe (Engine Outside)



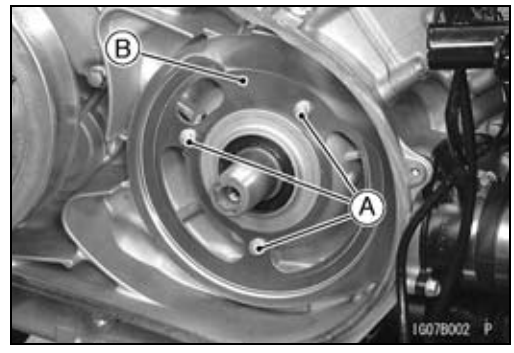
- Drain:
  Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
- Remove:
  Left Cover (see Left Cover Removal in the Frame chapter)
  Engine Bottom Cover (see Engine Bottom Cover Removal in the Frame chapter)
  Oil Pipe Bolts [A]
  Oil Pipe [B]

Engine Left Side Oil Pipe (Engine Inside)

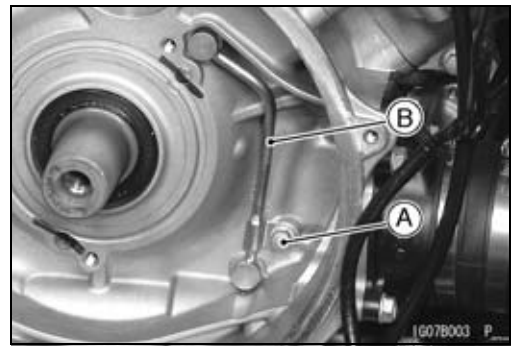


- Remove:
  Alternator Cover (see Alternator Cover Removal in the Electrical System chapter)
  Oil Pump (see Oil Pump Removal)
  Oil Pipe Bolts [A]
  Oil Pipe [B]

Engine Right Side Oil Pipe



- Remove:
  Drive Pulley (see Drive Pulley Removal in the Converter System chapter)
  Plate Bolts [A]
  Plate [B]

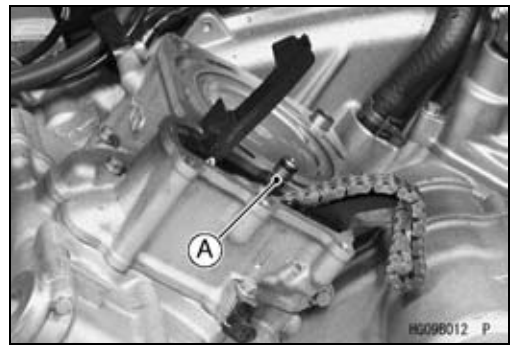


- Remove:
  Oil Pipe Bolt [A]
  Oil Pipe [B]

Oil Pipe

Engine Inside Oil Pipe

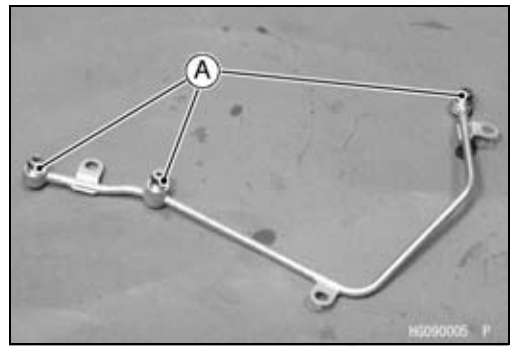
- Remove:
  Cylinder Head (see Cylinder Head Removal in the Engine Top End chapter)
  Oil Pipe [A]



Oil Pipe Installation

- Replace the O-ring [A] with new ones if they are damaged.
- Apply engine oil to the O-rings before installation.
- Tighten:

Torque - Oil Pipe Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)



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