

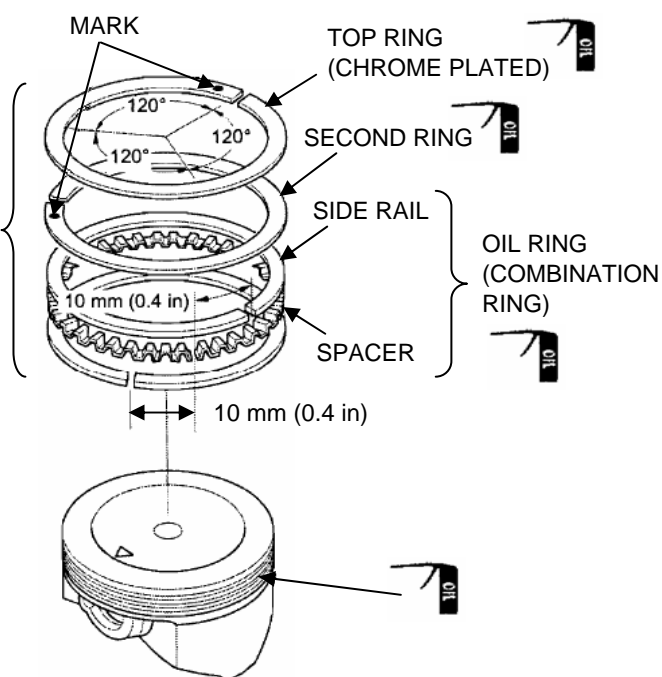
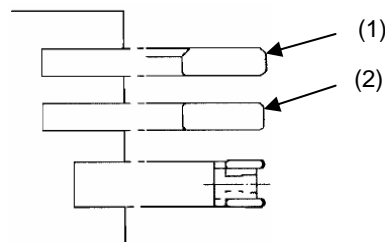


## PISTON

### PISTON RING SET

#### ASSEMBLY:

The top ring (1) and second ring (2) are not interchangeable. Install the top and second ring on the piston with the mark side facing up. Check that the piston rings rotate smoothly after installing them. Space the piston ring end gaps 120 degrees apart, and do not align the ring end gaps with the piston pin bore.



### PISTON

#### INSTALLATION:

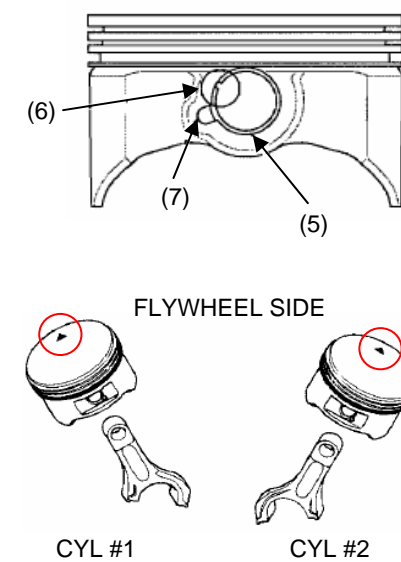
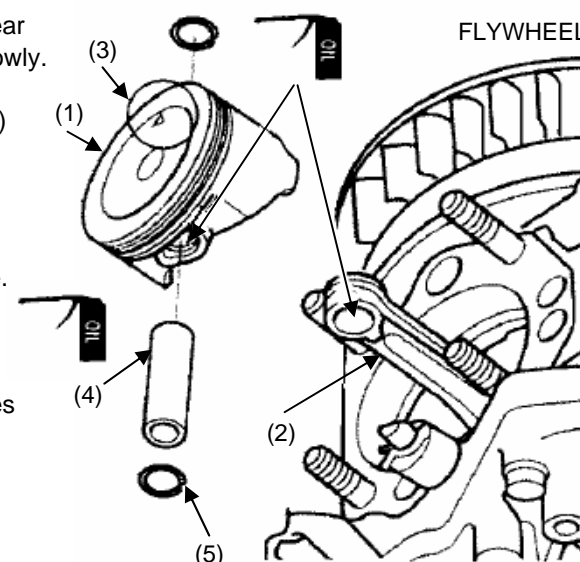
Position the connecting rod of the cylinder near top dead center by rotating the crankshaft slowly.

Install the piston (1) on the connecting rod (2) with triangle mark (3) of the piston pointing toward the flywheel side as shown.

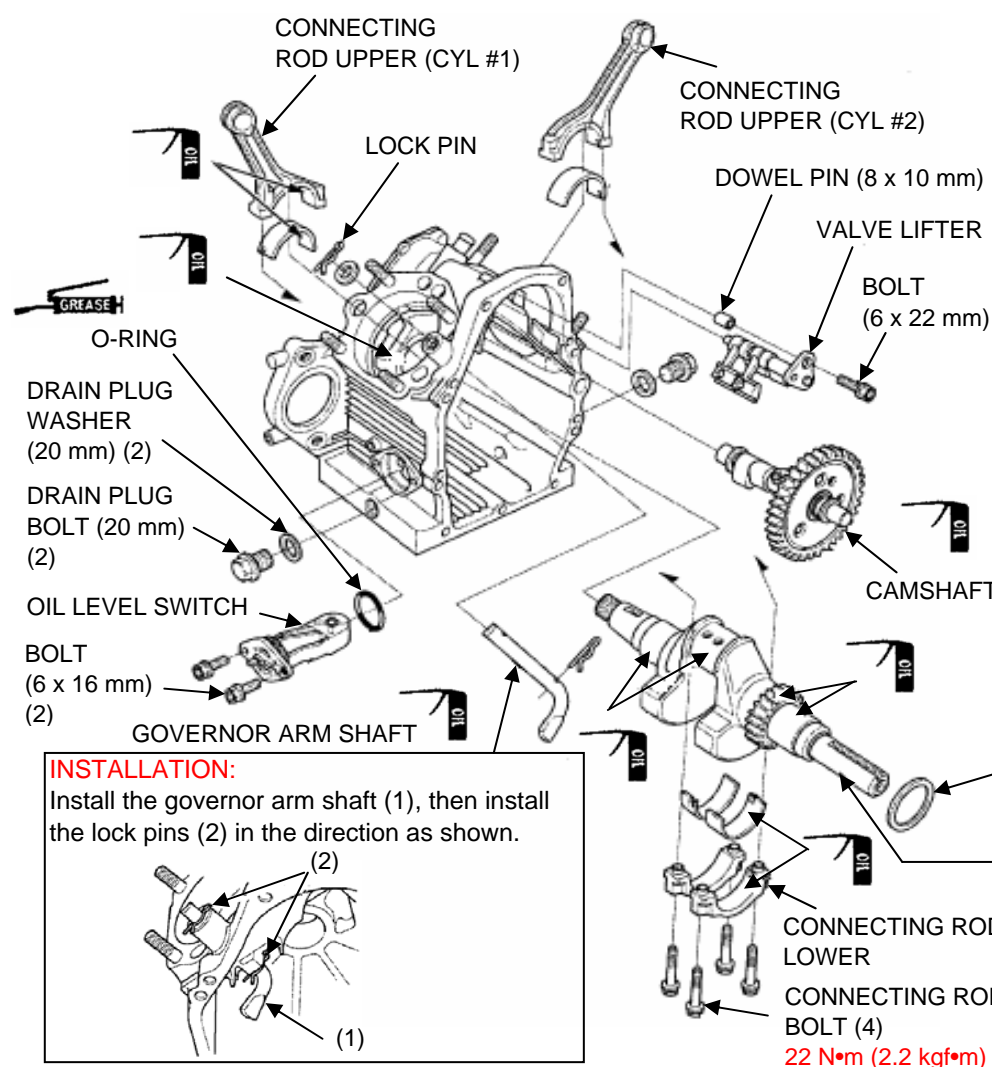
Apply oil to the piston pin (4) outer surface, connecting rod small end and piston pin bore. Install the piston pin through the piston and connecting rod.

Install new piston pin clips (5) into the grooves in the piston pin hole.

- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip and gap (6) with the piston cutout (7).

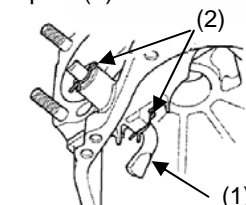


## CRANKSHAFT/CONNECTING ROD/CAMSHAFT



#### INSTALLATION:

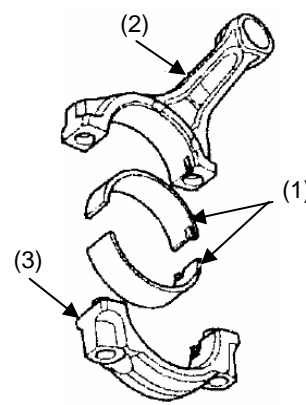
Install the governor arm shaft (1), then install the lock pins (2) in the direction as shown.



### CONNECTING ROD BEARING

#### INSTALLATION:

Install the connecting rod bearing (1) on the connecting rod upper (2) and lower (3) in the direction as shown. Each connecting rod upper and lower are not interchangeable.



### CRANKSHAFT

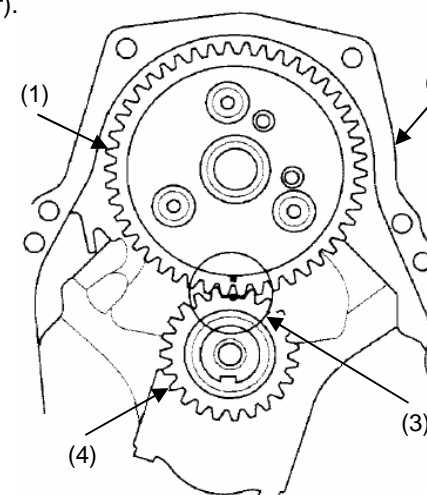
#### INSTALLATION:

Before installing the crankshaft, check the crankcase oil seal for damage or hardening. Be careful not to damage the oil seal when installing the crankshaft.

### CAMSHAFT

#### INSTALLATION:

Open the valve lifters in the crankcase. Install the camshaft (1) into the crankcase (2) by aligning the punch marks (3) on the camshaft and the crankshaft (4) (marked on the timing gear).



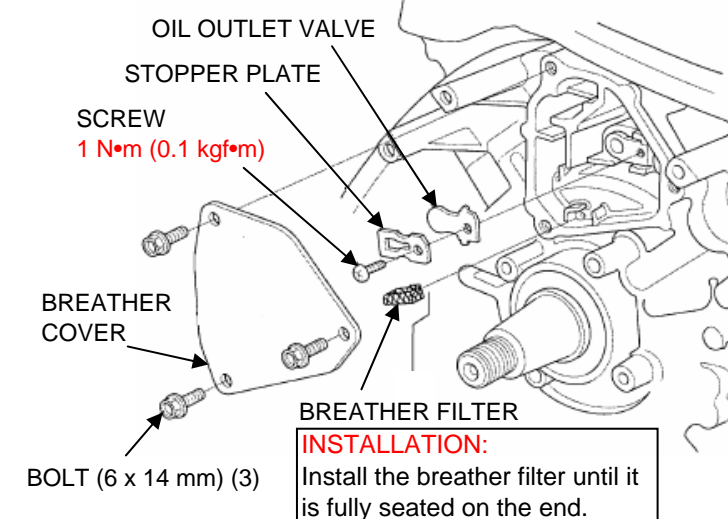
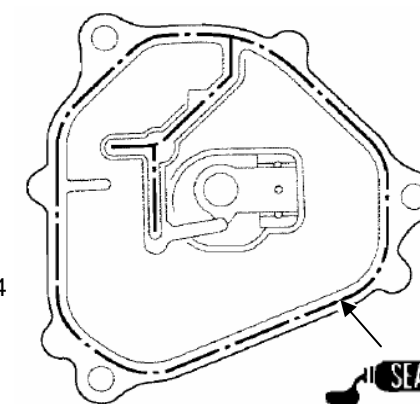
Install the breather cover and tighten the three flange bolts securely.

- Be sure not to catch the breather filter between the breather cover and crankcase.
- Assemble the breather cover **within 3 minutes** after applying liquid gasket.
- Wait for **30 minutes** after assembly before filling with oil and starting the engine.

## BREATHER

Clean the mating surfaces of the breather cover and crankcase of old liquid gasket, oil and other foreign material.

Apply a bead ( $\varnothing 1.0 - 1.5 \text{ mm}$  ( $\varnothing 0.04 - 0.06 \text{ in}$ )) of liquid gasket (Threebond TB1207B, Hondabond HT, Hondabond 4 or equivalent) to the mating surface of the crankcase as shown.



### BREATHER FILTER

#### INSTALLATION:

Install the breather filter until it is fully seated on the end.



## GOVERNOR/PUMP/OIL FILTER/CRANKCASE COVER

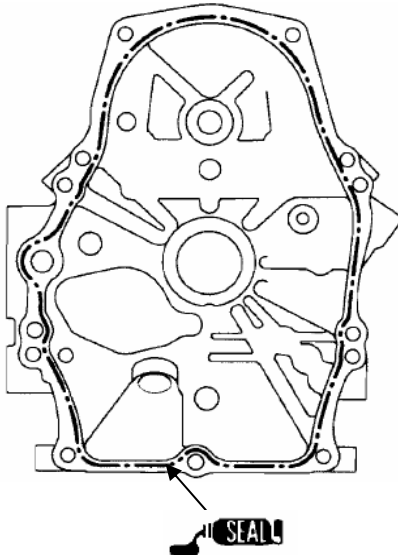
**BOLT (6 x 90 mm) (2)**  
**(O-ring)**  
**OIL PUMP GEAR**  
**OIL PUMP COVER**  
**BOLT (6 x 20 mm) (3)**  
**GOVERNOR SLIDER**  
**GOVERNOR WEIGHT**  
**GOVERNOR HOLDER CLIP**  
**GOVERNOR WEIGHT PIN**  
**GOVERNOR WEIGHT HOLDER**  
**GOVERNOR WEIGHT**  
**DOWEL PIN (8 x 10 mm) (2)**  
**OIL PUMP SHAFT**  
**RELIEF VALVE SPRING**  
**STEEL BALL**  
**WASHER (6 x 16 mm)**  
**CRANKCASE COVER**  
**OIL PUMP O-RING**  
**OIL PUMP INNER ROTOR**  
**OIL PUMP OUTER ROTOR**  
**OIL FILTER**  
**BOLT (6 x 35 mm) (2)**  
**BOLT (6 x 28 mm)**  
**OIL FILTER BASE (SIDE MOUNT TYPE)**  
**BOLT (6 x 28 mm)**  
**OIL FILTER BASE (FRONT MOUNT TYPE)**  
**BOLT (6 x 20 mm)**  
**OIL STRAINER**  
**O-RING**  
**GREASE**

**INSTALLATION:**  
Install the inner rotor with the punch mark side facing up.

**INSTALLATION:**  
Install the outer rotor with the punch mark side facing up.

Clean the mating surface of the crankcase cover and crankcase of old liquid gasket, oil and other foreign material.

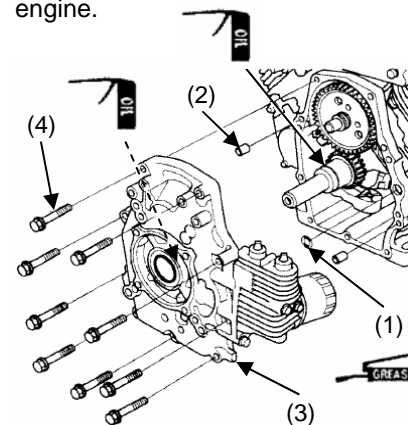
Apply a bead ( $\phi 1.0 - 1.5 \text{ mm}$  ( $\phi 0.04 - 0.06 \text{ in}$ )) of liquid gasket (Threebond TB1207B, Hondabond HT, Hondabond 4 or equivalent) to the mating surface of the crankcase cover as shown.



Apply grease to the O-ring (1). Install the two dowel pins (2) and O-ring to the crankcase.

Apply a light coat of oil to the main journal part of the crankshaft and crankcase cover (3). Install the crankcase cover and tighten the nine flange bolts (4) securely.

- Assemble the crankcase cover **within 3 minutes** after applying liquid gasket.
- Wait for **30 minutes** after assembly before filling with oil and starting the engine.



## COOLING FAN/FLYWHEEL

**SPECIAL WOODRUFF KEY**  
**FLYWHEEL**  
**REMOVAL:**  
Hold the flywheel (1) with a commercially available strap wrench (2) and use a commercially available flywheel puller (3) to remove the flywheel.

**COOLING FAN SETTING PLATE**  
**COOLING FAN**  
**SPECIAL NUT**  
**FLYWHEEL HOLDER (07APB-Z6LA100)**  
**SPECIAL NUT**  
**TORQUE: 235 N·m (24 kgf·m)**  
**8 x 20 mm BOLT (3)**

## CYLINDER/VALVES/CRANKCASE

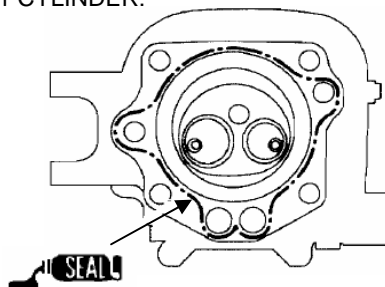
**VALVE SPRING RETAINER**  
**DISASSEMBLY:**  
Push down and slide the valve spring retainer (1) to the side so that the valve stem (2) slips through the hole at the side of the valve spring retainer. Do not remove the valve spring retainer while the cylinder is installed to the crankcase, or the valve will drop into the cylinder.

**INLET VALVE**  
**ASSEMBLY:**  
Do not interchange with the exhaust valve. The inlet valve is larger than the exhaust valve.

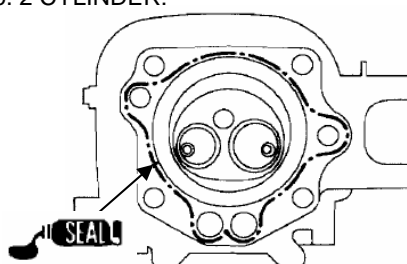
**ENGINE HANGER**  
**BOLT (8 x 16 mm)**  
**VALVE SPRING**  
**VALVE STEM SEAL (Seal lip)**  
**VALVE GUIDE CLIP**  
**CYLINDER**  
**EXHAUST VALVE**  
**(Seal lip)**

Apply a bead ( $\phi 1.0 - 1.5 \text{ mm}$  ( $\phi 0.04 - 0.06 \text{ in}$ )) of liquid gasket (Threebond TB1207B, Hondabond HT, Hondabond 4 or equivalent) to the mating surface of the cylinder as shown.

No. 1 CYLINDER:



No. 2 CYLINDER:



Apply grease to the oil passage packing (1). Install the dowel pins (2) and oil passage packing on the crankcase.

Apply oil to the cylinder inner surface, piston outer surface and piston rings.

Install the cylinder (3) over the piston (4) while compressing the piston rings with your fingers.

Apply a light coat of oil to the threads and the seating surface of the four flange nuts (5) and tighten them to the specified torque.

- TORQUE: 37 N·m (3.8 kgf·m)**
- Assemble the cylinder **within 3 minutes** after applying liquid gasket.
  - Wait for **30 minutes** after assembly before filling with oil and starting the engine.

Apply oil to the both end of the two push rods (6) and insert them into the cylinder.

Apply oil to the bearing and slipper of the rocker arms and install them to the cylinder. Apply oil to the rocker arm shaft and insert into the cylinder in the direction as shown. Install the valve cover.

