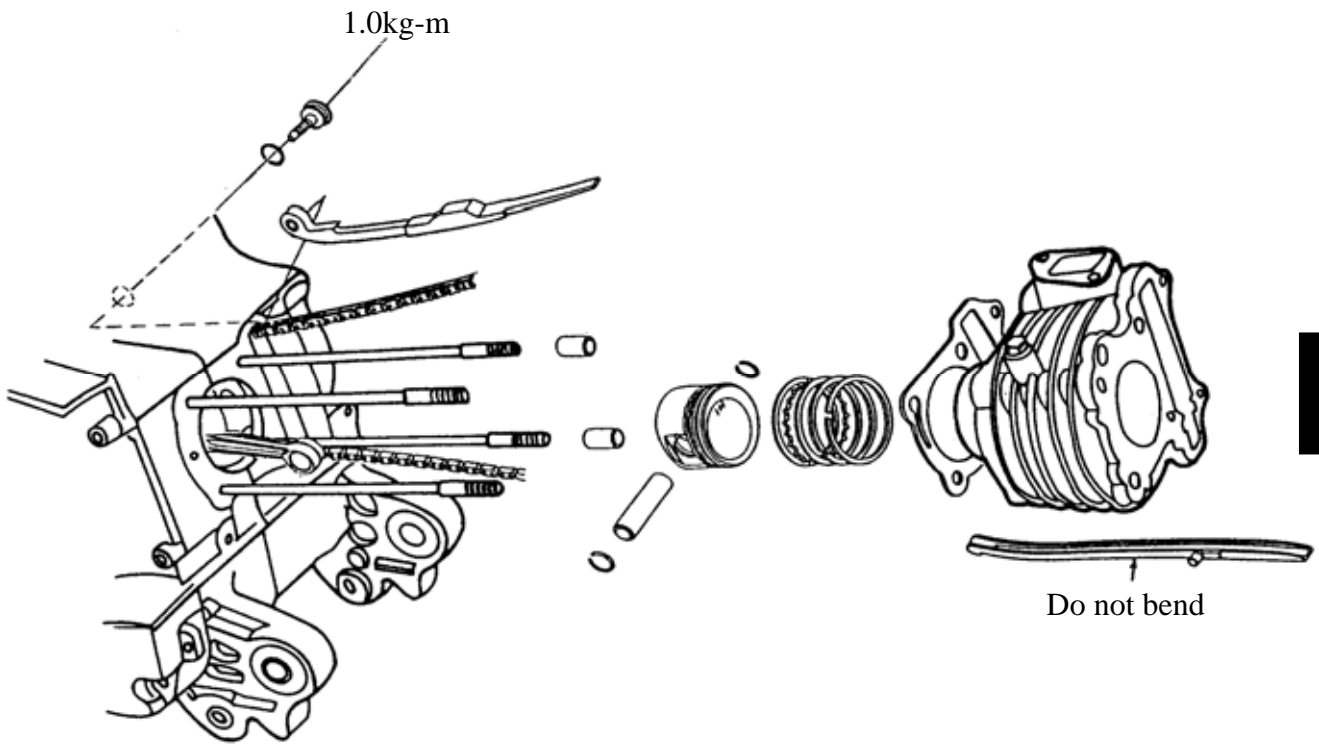


# 8. CYLINDER/PISTON



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### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- The cylinder and piston can be serviced with the engine installed in the frame.
- After disassembly, clean the removed parts and dry them with compressed air before inspection.

#### SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)	
Cylinder	I.D.	50.00-50.01		
	Warpage	—	0.05	
	Cylindricity	—	0.05	
	True roundness	—	0.05	
Piston, piston ring	Ring-to-clearance	Top	0.015-0.050	0.09
		Second	0.015-0.050	0.09
	Ring end gap	Top	0.08-0.20	0.45
		Second	0.05-0.20	0.45
		Oil side rail	0.20-0.70	—
	Piston O.D.		49.97-49.990	49.9
	Piston O.D. measuring		9mm from bottom of skirt	—
	Piston-to-cylinder clearance		0.010-0.040	0.1
Piston pin hole I.D.		13.002-13.008	13.04	
Piston pin O.D		12.994-13.000	12.96	
Piston-to-piston pin clearance		0.002-0.014	—	
Connecting rod small end I.D. bore		13.016-13.034	13.06	

### TROUBLESHOOTING

- When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

#### Compression too low or uneven compression

- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston

#### Excessive smoke from exhaust muffler

- Worn or damaged piston rings
- Worn or damaged cylinder and piston

#### Compression too high

- Excessive carbon build-up in combustion chamber or on piston head

#### Abnormal noisy piston

- Worn cylinder, piston and piston rings
- Worn piston pin hole and piston pin

## 8. CYLINDER/PISTON

### CYLINDER REMOVAL

Remove the cylinder head. (⇒7-6)  
Remove the cam chain guide.  
Remove the cylinder.

Cylinder



Remove the cylinder gasket and dowel pins.  
Clean any gasket material from the cylinder surface.

Dowel Pins



Gasket

Piston Pin

### PISTON REMOVAL

Remove the piston pin clip.

\* Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.

Press the piston pin out of the piston and remove the piston.



Piston Rings

Piston

## 8. CYLINDER/PISTON

Inspect the piston, piston pin and piston rings.  
Remove the piston rings.

- \* Take care not to damage or break the piston rings during removal.

Clean carbon deposits from the piston ring grooves.



Install the piston rings onto the piston and measure the piston ring-to-groove clearance.

**Service Limits:** **Top:** 0.09mm replace if over  
**2nd:** 0.09mm replace if over

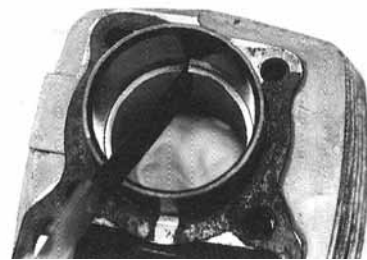


Remove the piston rings and insert each piston ring into the cylinder bottom.

- \* Use the piston head to push each piston ring into the cylinder.

Measure the piston ring end gap.

**Service Limit:** 0.45mm replace if over



Measure the piston pin hole I.D.

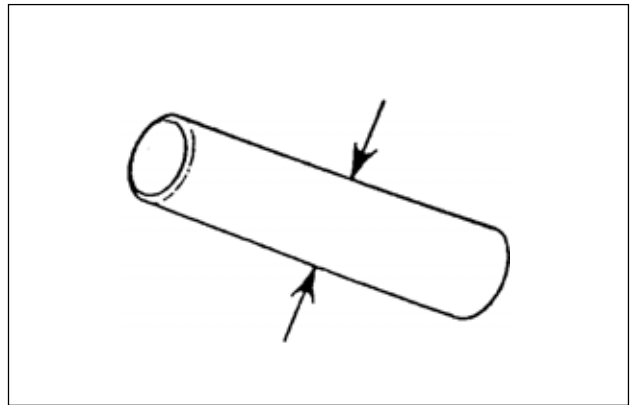
**Service Limit:** 13.04mm replace if below



## 8. CYLINDER/PISTON

Measure the piston pin O.D.

**Service Limit:** 12.96mm replace if below

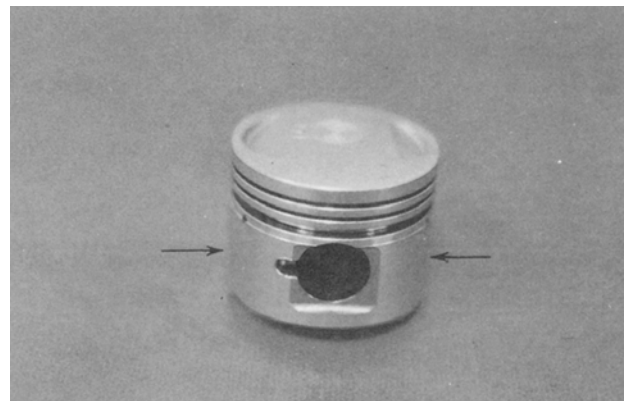


Measure the piston O.D.

\* Take measurement at 9mm from the bottom and 90° to the piston pin hole.

**Service Limit:** 38.9mm replace if below  
Measure the piston-to-piston pin clearance.

**Service Limit:** 0.02mm replace if over



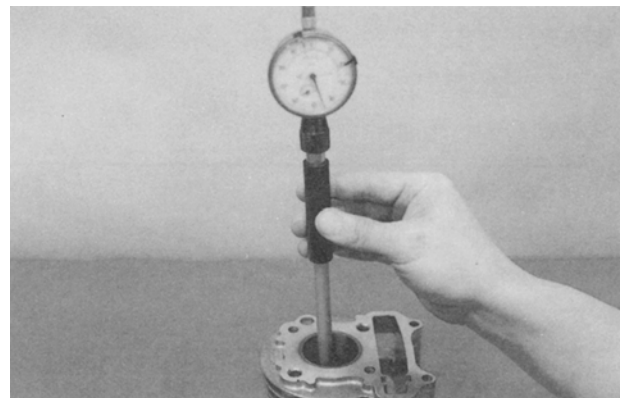
### CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage. Measure the cylinder I.D. at three levels of top, middle and bottom at 90° to the piston pin (in both X and Y directions).

**Service Limit:** 39.10mm repair or replace if over

Measure the cylinder-to-piston clearance.

**Service Limit:** 0.1mm repair or replace if over

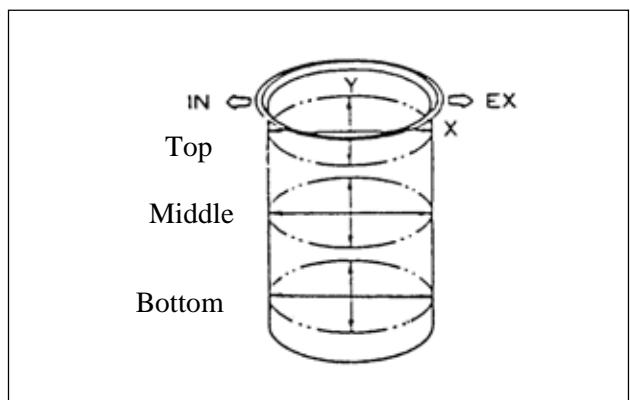


The true roundness is the difference between the values measured in X and Y directions. The cylindricity (difference between the values measured at the three levels) is subject to the maximum value calculated.

**Service Limits:**

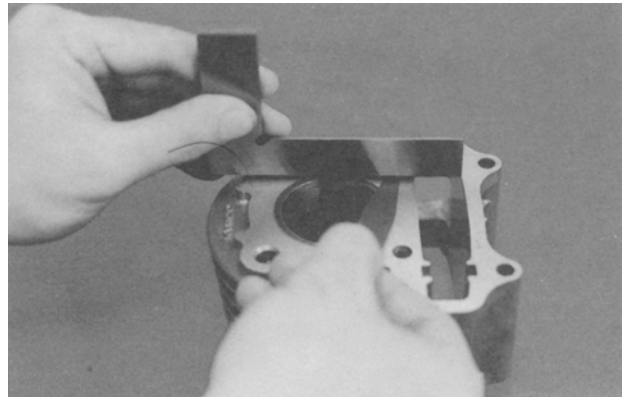
**True Roundness:** 0.05mm repair or replace if over

**Cylindricity:** 0.05mm repair or replace if over



## 8. CYLINDER/PISTON

Inspect the top of the cylinder for warpage.  
**Service Limit:** 0.05mm repair or replace if over



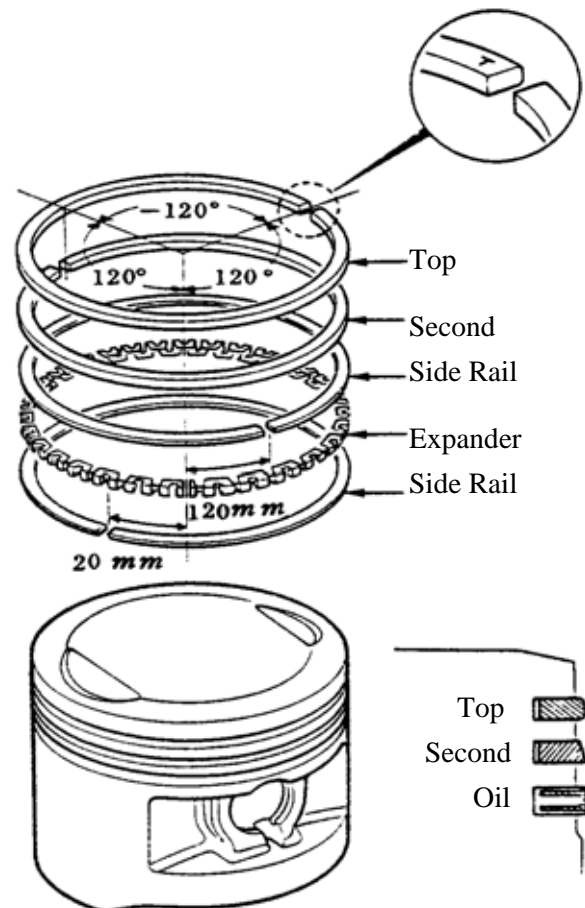
Measure the connecting rod small end I.D.  
**Service Limit:** 13.06mm replace if over



### PISTON RING INSTALLATION

Install the piston rings onto the piston.  
 Apply engine oil to each piston ring.

- \* \_\_\_\_\_
- Be careful not to damage or break the piston and piston rings.
  - All rings should be installed with the markings facing up.
  - After installing the rings, they should rotate freely without sticking.

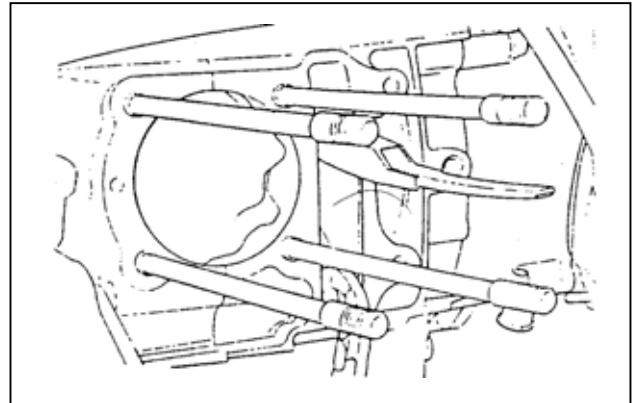


## 8. CYLINDER/PISTON

### PISTON INSTALLATION

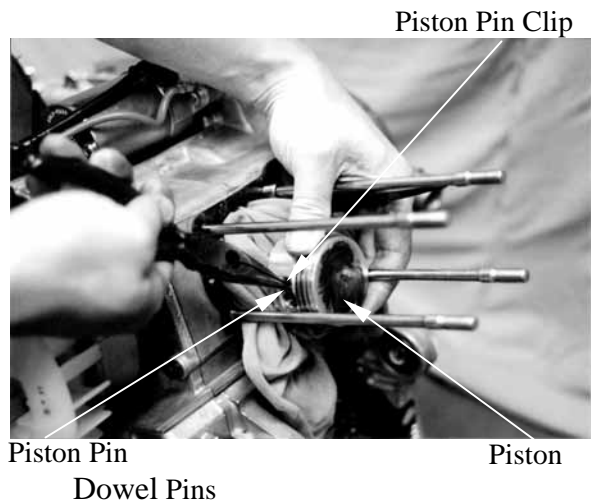
Remove any gasket material from the crankcase surface.

- \* Be careful not to drop foreign matters into the crankcase.



Install the piston, piston pin and a new piston pin clip.

- \* 
  - Position the piston “IN” mark on the intake valve side.
  - Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.



### CYLINDER INSTALLATION

Install the dowel pins and a new cylinder gasket on the crankcase.



Coat the cylinder bore, piston and piston rings with clean engine oil. Carefully lower the cylinder over the piston by compressing the piston rings.

- \* 
  - Be careful not to damage or break the piston rings.
  - Do not align the ring end gaps with the intake/exhaust valve and piston pin.



## 8. CYLINDER/PISTON

Install the cam chain guide.

- \* 

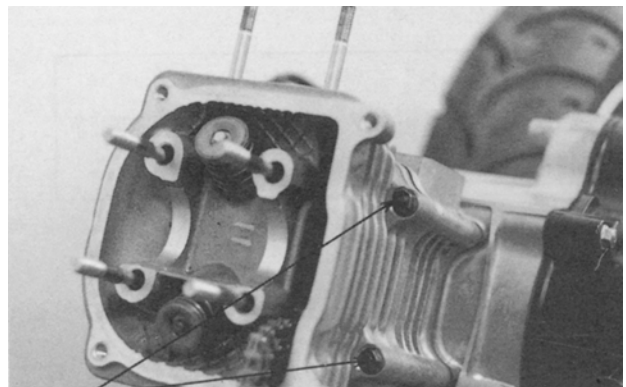
Insert the tab on the cam chain guide into the cylinder groove.
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Install the cylinder head. (⇒7-8)  
Loosely install the cylinder base bolts.



Cam Chain Guide

Tighten the cylinder base bolts.



Cylinder Base Bolts