

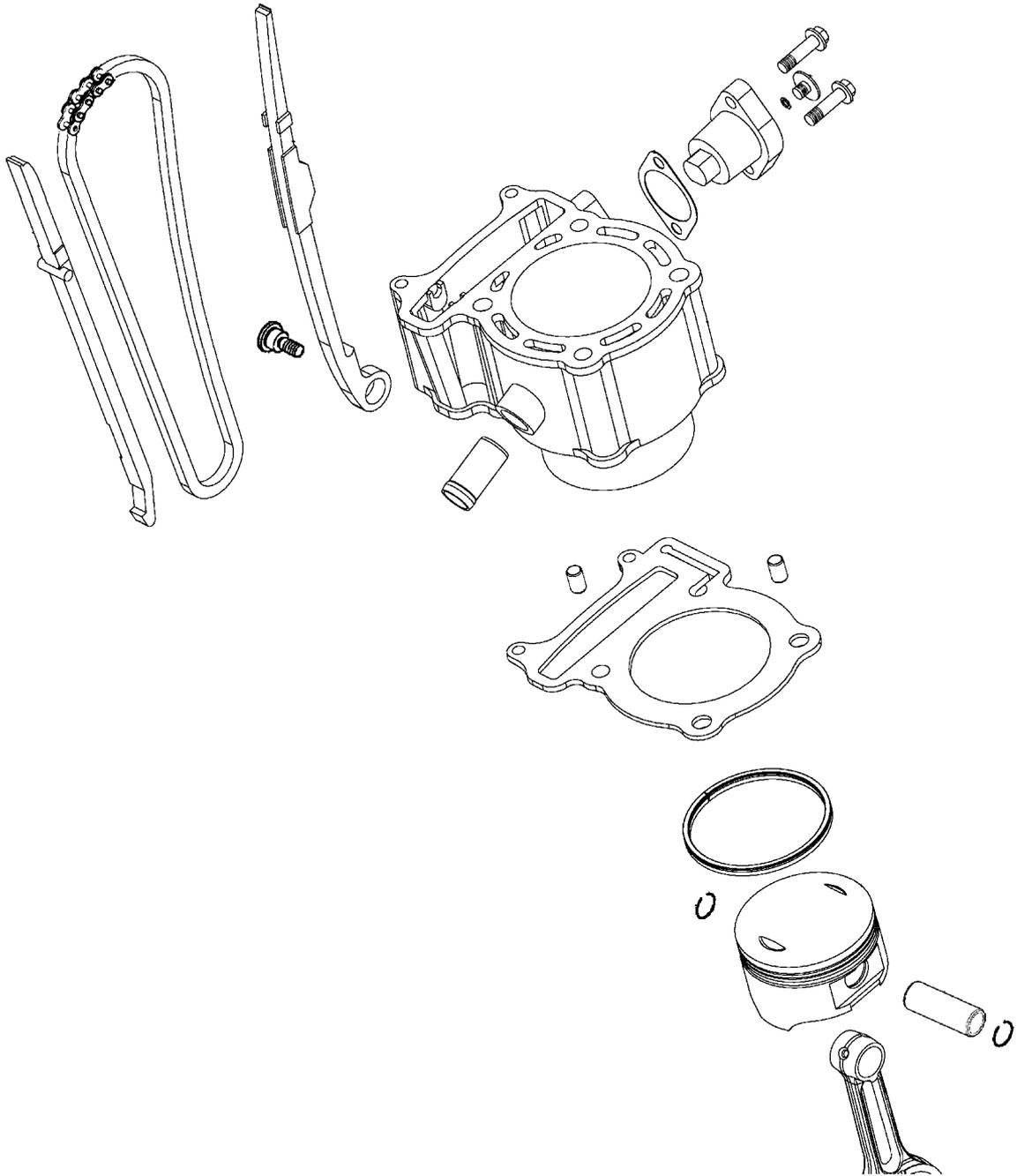
8. CYLINDER/PISTON

CYLINDER /PISTON

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8. CYLINDER/PISTON



8. CYLINDER/PISTON

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.

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

Compression too high

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

Excessive smoke from exhaust muffler

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

Abnormal noisy piston

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

8. CYLINDER/PISTON

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit	
Cylinder	I.D.	72.705~72.715 (2.9082~2.9086)	72.8 (2.912)	
	Warpage	—	0.05 (0.002)	
	Cylindricity	—	0.05 (0.002)	
	True roundness	—	0.05 (0.002)	
Piston, piston ring	Ring-to-groove clearance	Top	0.015~0.055 (0.0006~0.0022)	0.09 (0.0036)
		Second	0.015~0.055 (0.0006~0.0022)	0.09 (0.0036)
	Ring end gap	Top	0.15~0.3 (0.006~0.012)	0.5 (0.02)
		Second	0.3~0.45 (0.012~0.018)	0.65 (0.026)
		Oil ring	0.2~0.7 (0.008~0.028)	0.9 (0.036)
	Piston O.D.	72.67~72.69 (2.9068~2.9076)	72.6 (2.904)	
	Piston O.D. measuring position	10mm from bottom of skirt	—	
	Piston-to-cylinder clearance	0.01~0.04 (0.0004~0.0016)	0.1 (0.004)	
Piston pin hole I.D.	17.002~17.008 (0.68008~0.68032)	17.04 (0.6816)		
Piston pin O.D		16.994~17 (0.67976~0.68)	16.96 (0.6784)	
Piston-to-piston pin clearance		0.002~0.014 (0.00008~0.00056)	0.02 (0.0008)	
Connecting rod small end I.D. bore		17.016~17.034 (0.68064~0.68136)	17.06 (0.6824)	

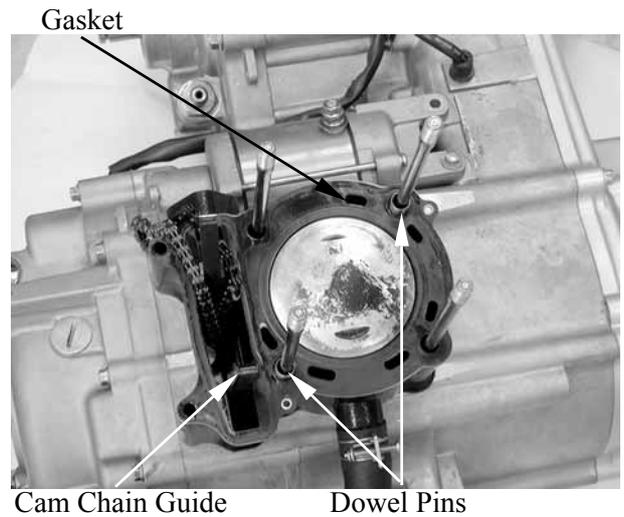
8. CYLINDER/PISTON

CYLINDER/PISTON

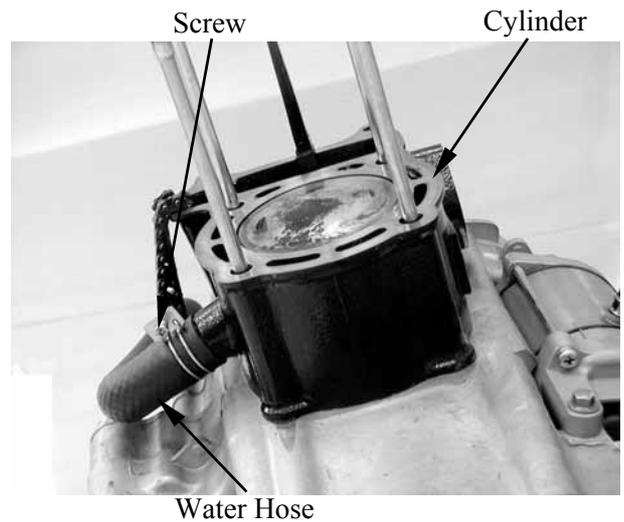
REMOVAL

Remove the cylinder head. (Refer to the chapter 7)

Remove the two dowel pins, cylinder head gasket and cam chain guide.

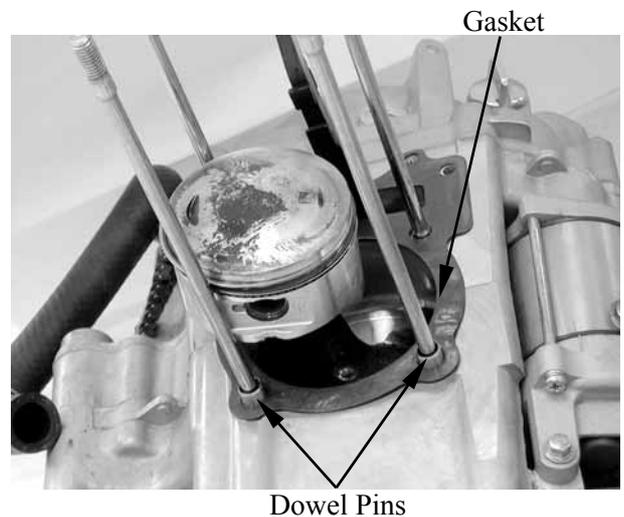


Unscrew the clamp and disconnect the water hose.
Remove the cylinder.



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

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

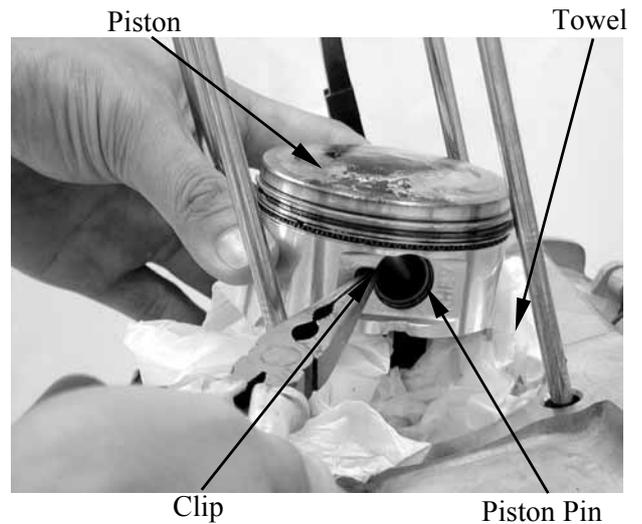


8. CYLINDER/PISTON

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.



INSPECTION

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.



Inspect the piston wall for wear/scratches/damage.

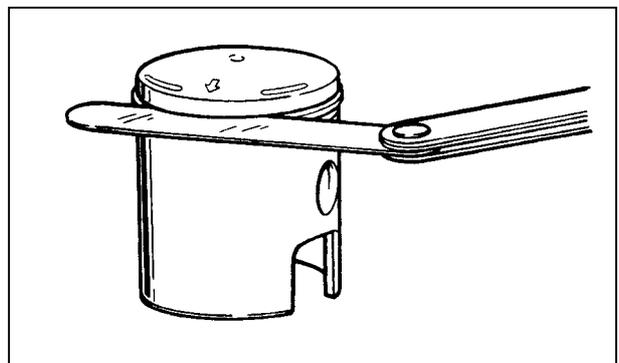
If any defects are found, replace the piston with a new one.

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

Service Limits (replace if over):

Top: 0.09 mm (0.0036 in)

2nd: 0.09 mm (0.0036 in)



8. CYLINDER/PISTON

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.

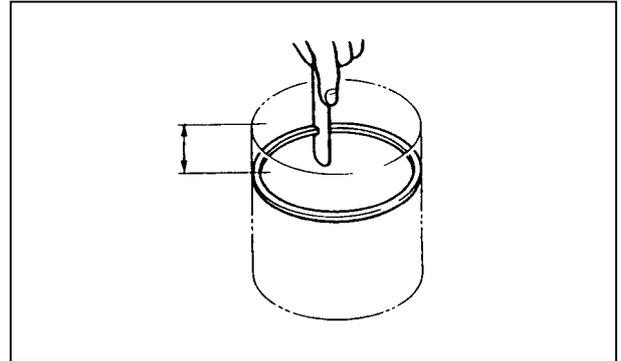
Measure the piston ring end gap.

Service Limit (replace if over):

Top: 0.5 mm (0.02 in)

2nd: 0.65 mm (0.026 in)

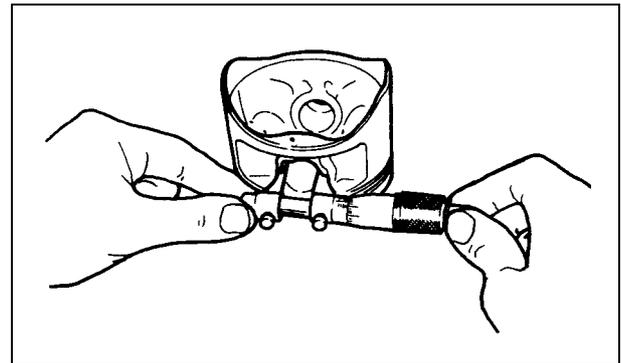
Oil ring: 0.9 mm (0.036 in)



Measure the piston pin hole I.D.

Service Limit (replace if over):

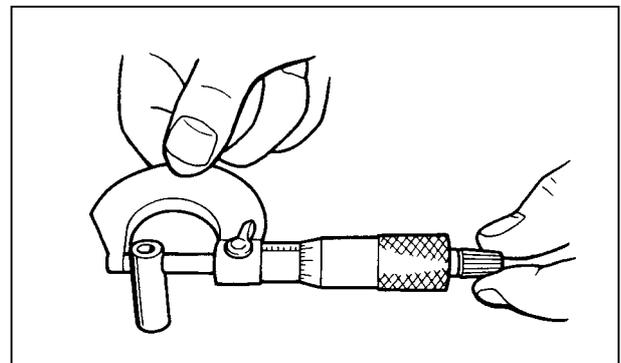
17.04 mm (0.6816 in)



Measure the piston pin O.D.

Service Limit (replace if below):

16.96 mm (0.6784 in)



8. CYLINDER/PISTON

Measure the piston O.D.

* Take measurement at 10mm from the bottom and 90° to the piston pin hole.

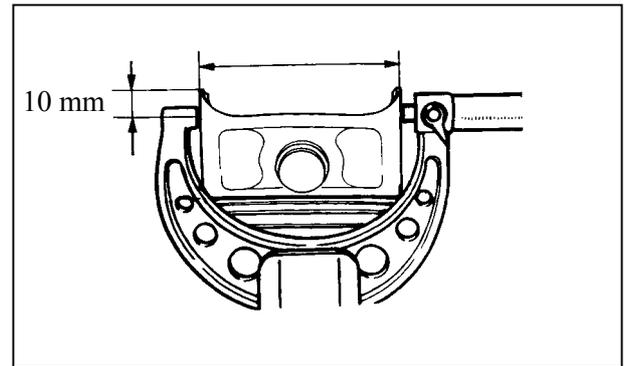
Service Limit (replace if below):

72.6 mm (2.904 in)

Measure the piston-to-piston pin clearance.

Service Limit (replace if over):

0.02 mm (0.0008 in)



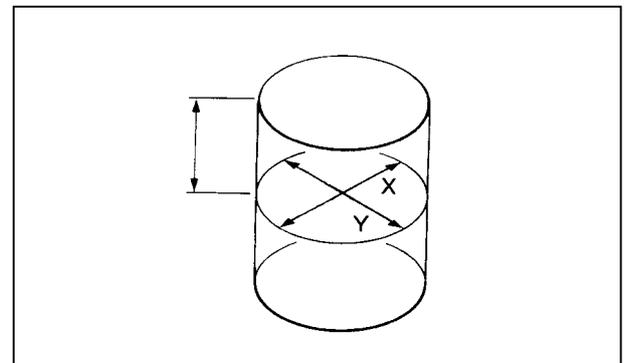
CYLINDER INSPECTION

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).

Cylinder I.D.:

Service Limit (replace if over):

72.8 mm (2.912 in)



Measure the cylinder-to-piston clearance.

Service Limit (repair or replace if over):

0.1 mm (0.004 in)

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 (repair or replace if over):

True Roundness: 0.05 mm (0.002 in)

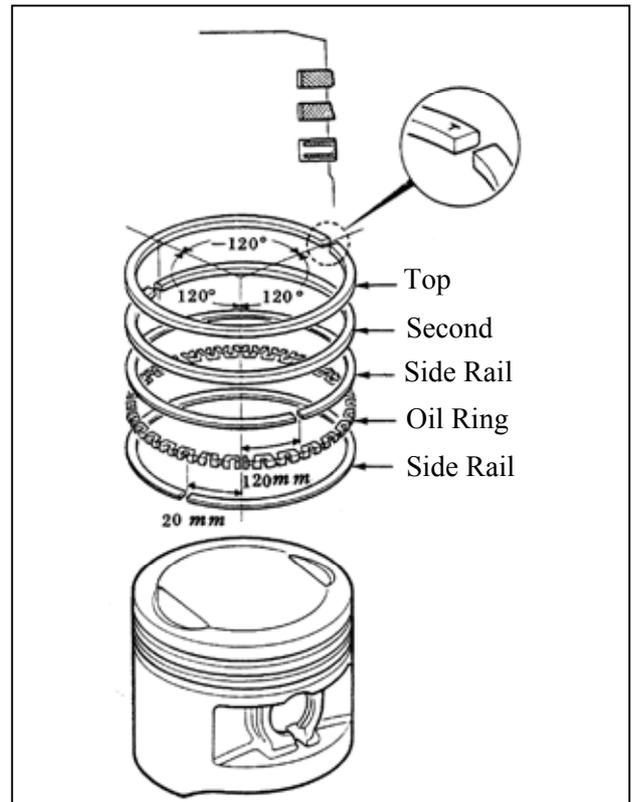
Cylindricity: 0.05 mm (0.002 in)

8. CYLINDER/PISTON

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.



Measure the connecting rod small end I.D.

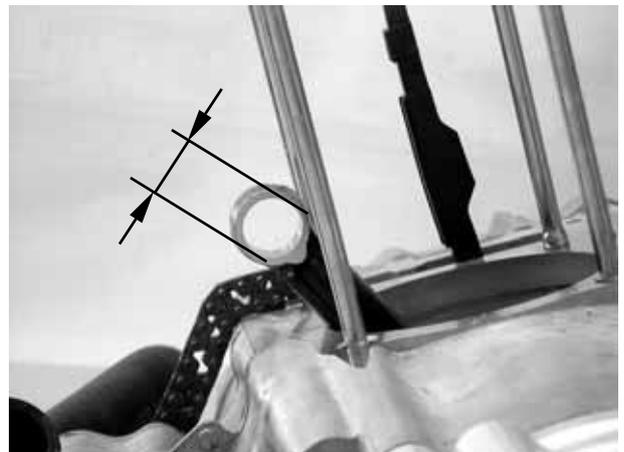
Service Limit (replace if over):

17.06 mm (0.6824 in)

Measure the connecting rod to piston pin clearance.

Service Limit (replace if over):

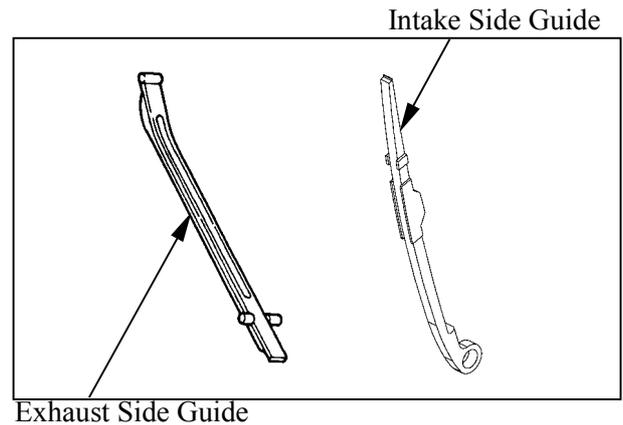
0.06 mm (0.0024 in)



8. CYLINDER/PISTON

Inspect the exhaust side and intake side chain guides.

Wear/Damage → Replace.



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.

- *
 - Apply proper clean engine oil around cylinder wall.
 - Be careful not to damage or break the piston rings.
 - Stagger the ring end gaps at 120° to the piston pin.