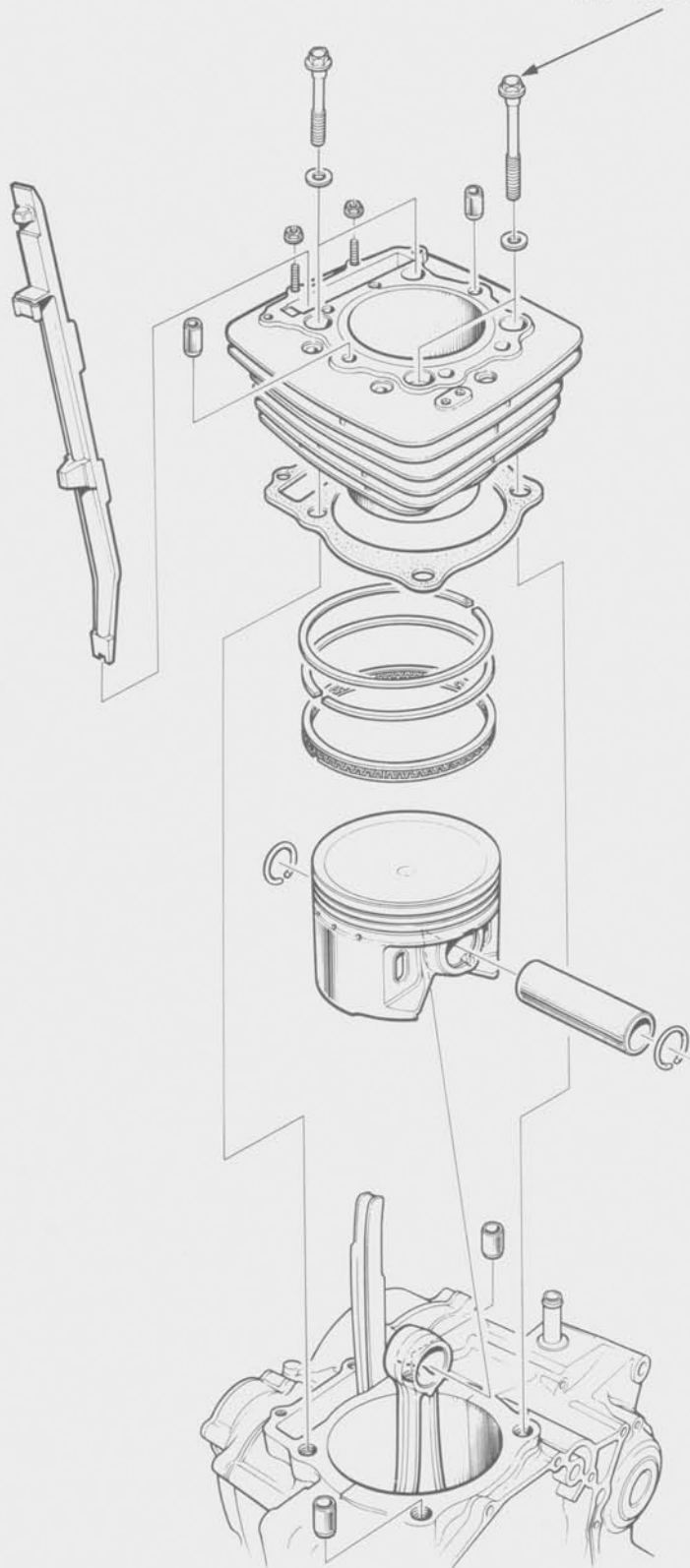




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47–53 N·m  
(4.7–5.3 kg·m, 34–38 ft·lb)





# 7. CYLINDER/PISTON

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## SERVICE INFORMATION

### SPECIFICATIONS

**7**

ITEM	STANDARD	SERVICE LIMIT	
Cylinder	I.D.	100.00–100.01 mm (3.937–3.9375 in)	100.12 mm (3.942 in)
	Taper	—	0.05 mm (0.002 in)
	Out of round	—	0.05 mm (0.002 in)
	Warping across top	—	0.10 mm (0.004 in)
Piston, piston rings and piston pin	O.D. at skirt	99.95–99.98 mm (3.935–3.936 in)	99.85 mm (3.93 in)
	Piston pin bore	24.002–24.008 mm (0.9450–0.9452 in)	24.03 mm (0.946 in)
	Piston pin O.D.	23.989–23.995 mm (0.9446–0.9447 in)	23.96 mm (0.943 in)
	Piston pin-to-piston clearance	0.002–0.014 mm (0.0001–0.0006 in)	0.07 mm (0.003 in)
Piston ring end gap	Top/second	0.20–0.40 mm (0.0079–0.0157 in)	0.5 mm (0.02 in)
	Oil (Side Rail)	0.2–0.9 mm (0.007–0.035 in)	—
Piston ring-to-groove clearance	Top	0.030–0.065 mm (0.0012–0.0026 in)	0.12 mm (0.006 in)
	Second	0.015–0.045 mm (0.0006–0.0018 in)	0.12 mm (0.006 in)
Cylinder-to-piston Clearance		0.010–0.040 mm (0.0004–0.0016 in)	0.10 mm (0.004 in)

### TORQUE VALUE

Cylinder bolt 47–53 N·m (4.7–5.3 kg·m, 34–38 ft·lb)



## TROUBLESHOOTING

### Low or Unstable Compression

1. Worn cylinder or piston rings

### Excessive Smoke

1. Worn cylinder, piston, or piston rings
2. Improper installation of piston rings
3. Scored or scratched piston or cylinder wall

### Overheating

1. Excessive carbon build-up on piston crown or combustion chamber

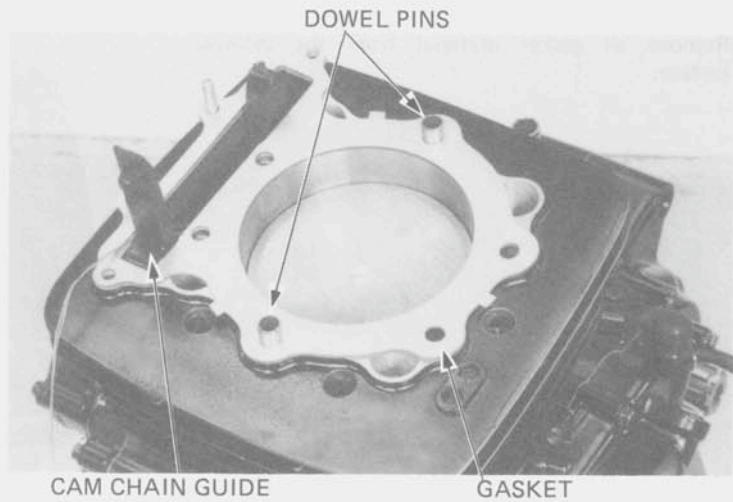
### Knocking or Abnormal Noise

1. Worn piston and cylinder
2. Excessive carbon build-up on piston crown or combustion chamber

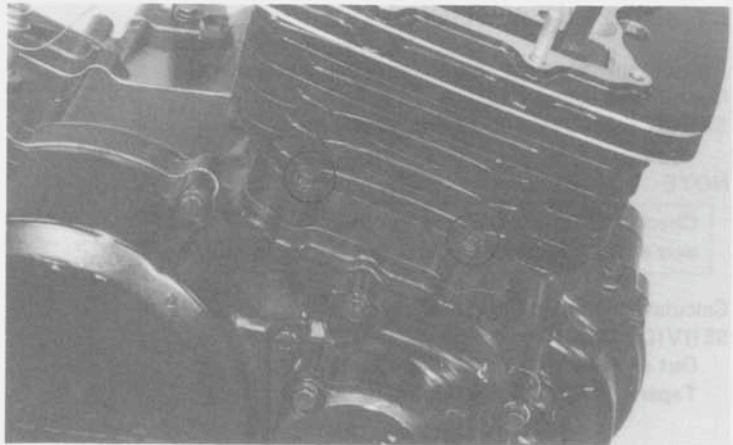


## CYLINDER REMOVAL

Remove the cylinder head (Section 6).  
Remove the cylinder head gasket and dowel pins.  
Remove the cam chain guide.



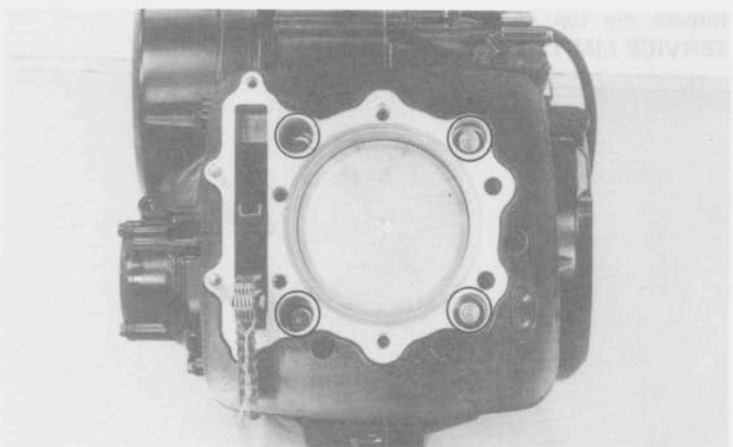
Remove the two bolts on the right side of the cylinder.



Remove the four cylinder mounting bolts, then remove the cylinder.

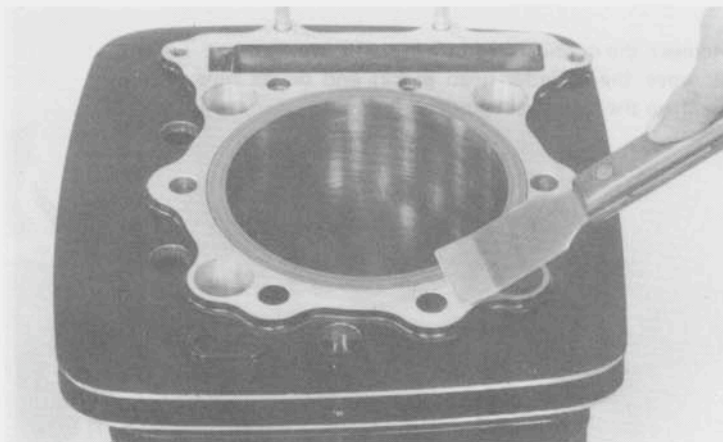
### NOTE

Loosen the bolts in crisscross pattern in two or more steps.





Remove all gasket material from the cylinder surface.



### CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage.  
Measure the cylinder I.D.

**SERVICE LIMIT: 100.12 mm (3.942 in)**

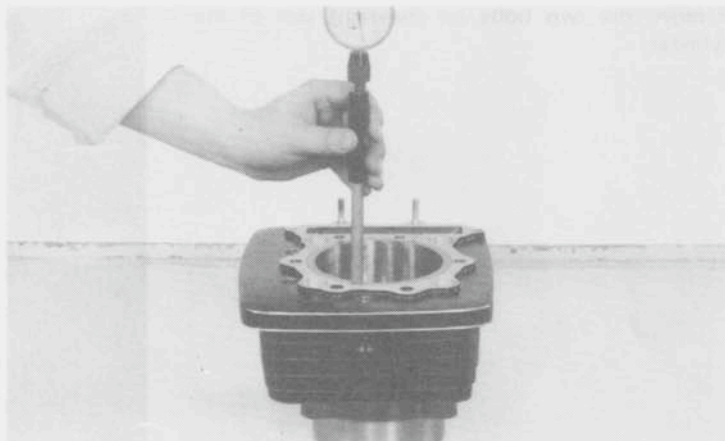
#### NOTE

Check for out of round on the X and Y axis at three locations.

Calculate the taper and out of round.

#### SERVICE LIMITS:

Out of round: 0.05 mm (0.002 in)  
Taper: 0.05 mm (0.002 in)

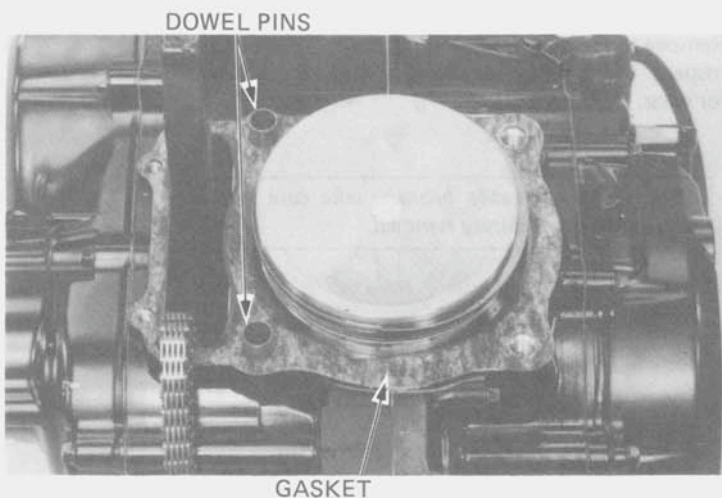


Inspect the top of the cylinder for warpage.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



Remove the base gasket and dowel pins.

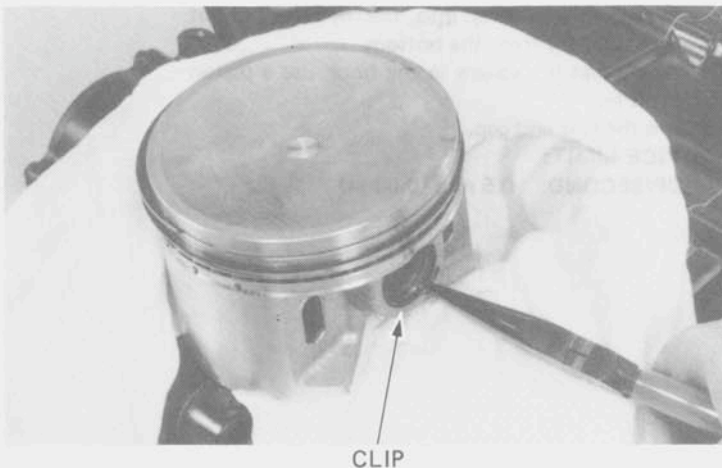


## PISTON REMOVAL

Place clean shop towels in the crankcase to keep the piston pin clips, or other parts, from falling into the crankcase.

Remove the piston pin clips with pliers.

Press the piston pin out of the piston.



## PISTON/PISTON RING INSPECTION

Measure the piston ring-to-groove clearance.

### SERVICE LIMIT:

TOP/SECOND: 0.12 mm (0.006 in)

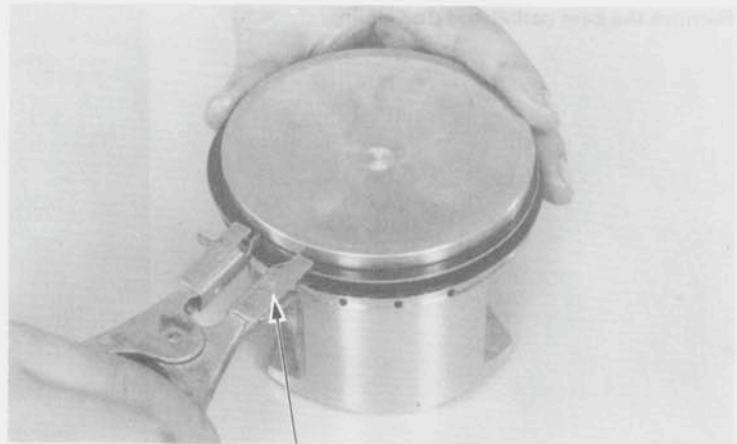




Remove the piston rings.  
Inspect the pistons for damage and ring grooves for wear.

**CAUTION**

*Piston rings are easily broken; take care not to damage them during removal.*



PISTON RING PLIERS

Insert each piston ring into the cylinder, about 20 mm (0.750 in) from the bottom.

To ensure that it's square in the bore, use a piston to push it in.

Measure the ring end gap.

**SERVICE LIMIT:**

**TOP/SECOND: 0.5 mm (0.02 in)**

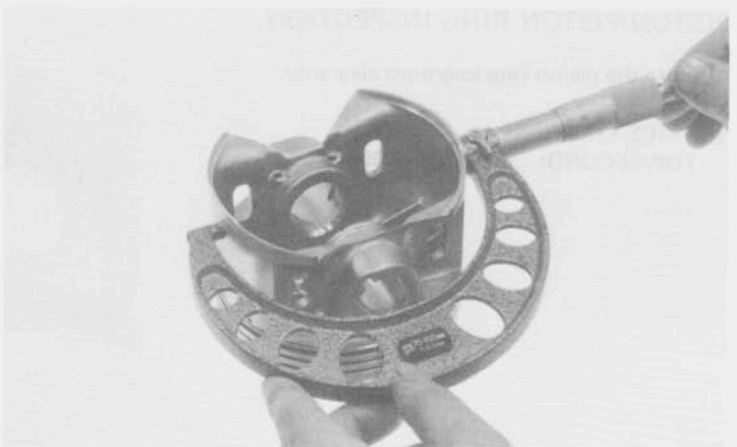


Measure the piston diameter 10 mm from the bottom.

**SERVICE LIMIT: 99.85 mm (3.93 in)**

Calculate the piston-to-cylinder clearance, by subtracting the piston O.D. from the cylinder I.D. (Page 7-4).

**SERVICE LIMIT: 0.10 mm (0.004 in)**





Measure the piston pin hole I.D.  
**SERVICE LIMIT: 24.03 mm (0.946 in)**



Measure the piston pin O.D.  
**SERVICE LIMIT: 23.96 mm (0.943 in)**

Calculate the piston-to-piston pin clearance.  
**SERVICE LIMIT: 0.07 mm (0.003 in)**



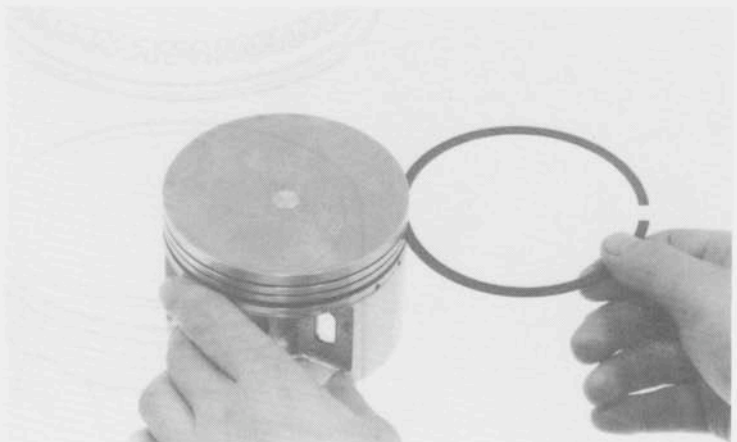
## PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly.

Check for cleanliness by holding a ring in the grooves while turning the piston.

### CAUTION

*Do not use a wire brush to clean ring lands, or cut lands deeper with a cleaning tool.*







**CYLINDER/PISTON**

Install the piston rings with the marks facing up.

**CAUTION**

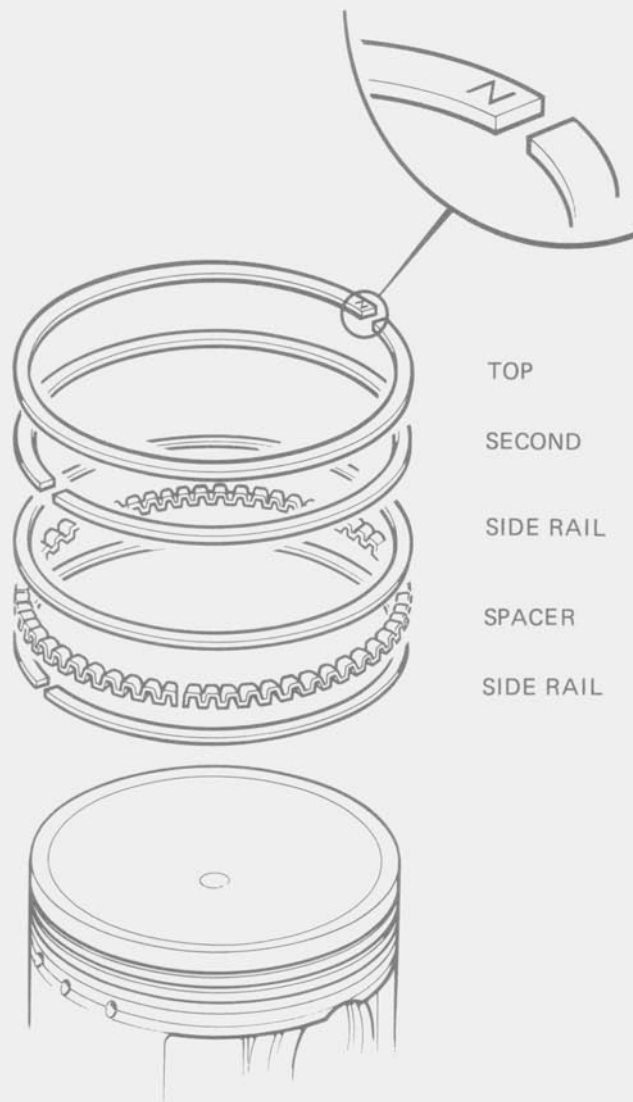
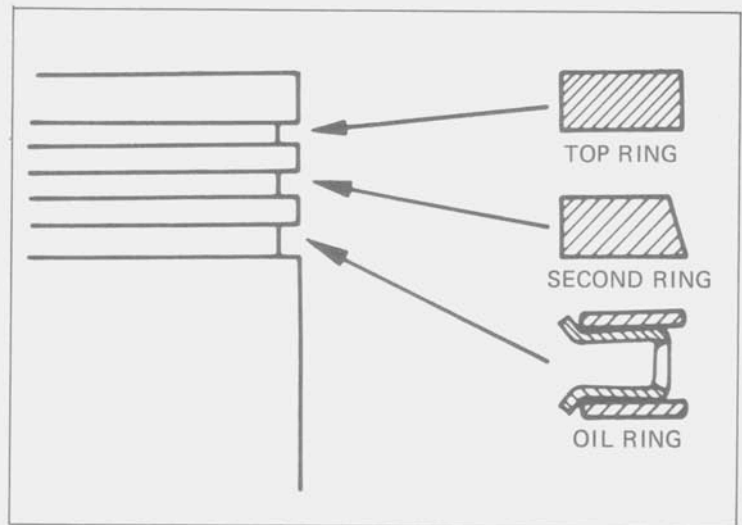
*Avoid piston and piston ring damage during installation.*

Stagger the compression (1st and 2nd) and oil rings (side rails) 180 degrees apart as shown.

**NOTE**

Install the oil ring spacer first, then install the side rails.

After installation, rings should be free to rotate in the grooves.





## PISTON INSTALLATION

Install the piston and piston pin.  
Install new piston pin clips.

### NOTE

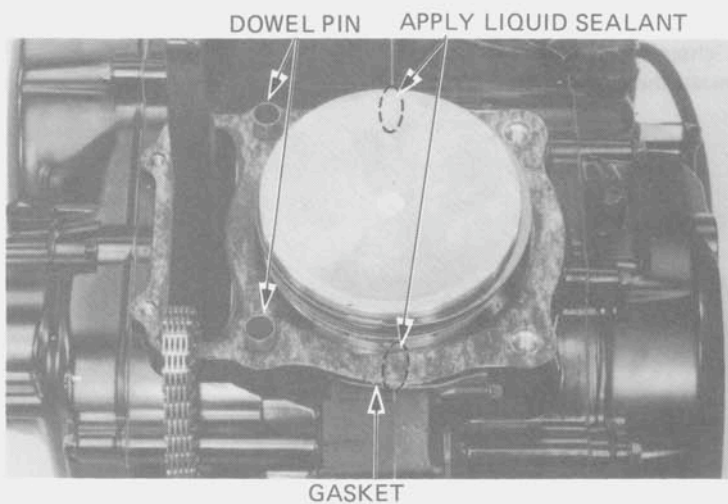
- Position the piston "IN" mark on the intake valve side.
- Do not align the piston pin clip end gap with the piston cut-out.
- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.



## CYLINDER INSTALLATION

Apply a liquid sealant to the crankcase mating area to prevent oil leaks.

Install the new cylinder base gasket and dowel pins.  
Place the piston at bottom dead center.

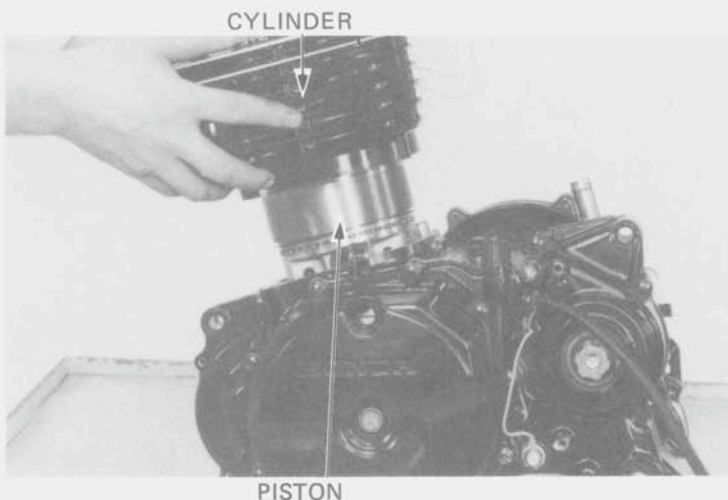


Coat the cylinder bore and piston rings with fresh engine oil.

Carefully lower the cylinder over the piston by compressing the piston rings one at a time.

### CAUTION

*Do not force the cylinder over a ring; you may damage the piston ring.*





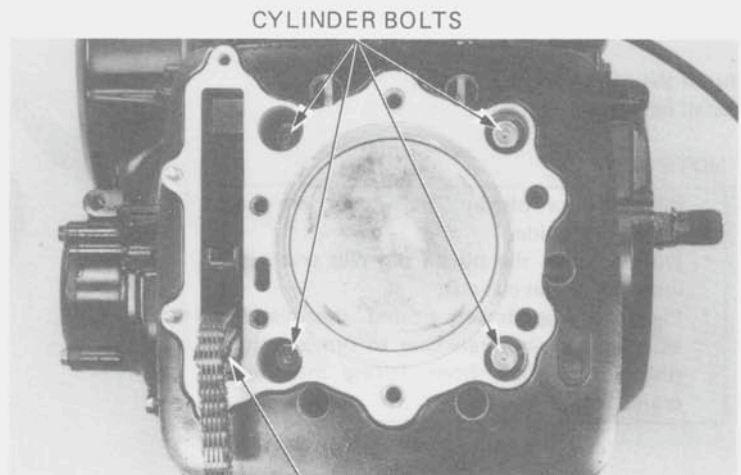
Apply engine oil to the cylinder bolts and tighten the cylinder bolts in a crisscross pattern in two or more steps.

**TORQUE: 47–53 N·m (4.7–5.3 kg·m, 34–38 ft·lb)**

Install the cam chain guide.

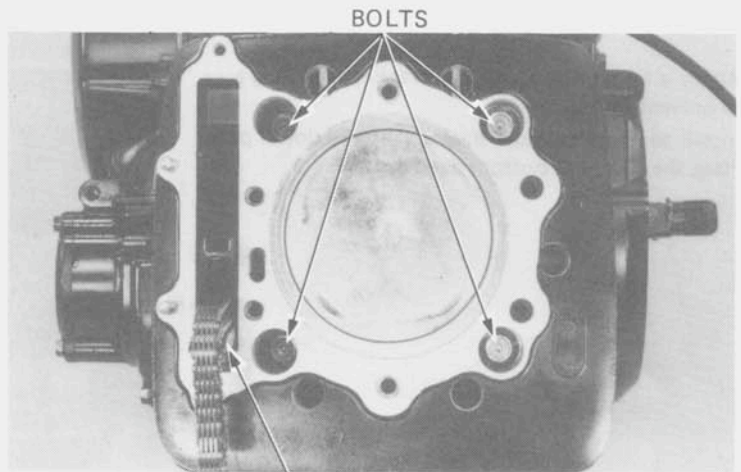
**NOTE**

- Fit the cam chain guide tab in the cylinder cutout.
- Push the guide in until it bottoms in the crankcase guide hole.



CAM CHAIN GUIDE

Tighten the cylinder base bolts.  
Install the cylinder head (Page 6-22).



CAM CHAIN GUIDE



**HONDA**  
**XL600R**

CYLINDER/PISTON

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MEMO