



10. CYLINDER/PISTON

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SERVICE INFORMATION

GENERAL

- The engine must be removed to perform cylinder/piston maintenance and inspection.

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Cylinder	I.D.	70.000–70.010 mm (2.7559–2.7563 in)	70.10 mm (2.760 in)
	Warpage	—	0.10 mm (0.0039 in)
Piston, piston rings and piston pin	Piston ring-to-ring groove clearance	TOP	0.025–0.055 mm (0.0009–0.0021 in)
		SECOND	0.015–0.045 mm (0.0006–0.0018 in)
	Ring end gap	TOP	0.15–0.35 mm (0.0059–0.0138 in)
		SECOND	0.15–0.35 mm (0.0059–0.0138 in)
		OIL (SIDE RAIL)	0.30–0.90 mm (0.018–0.0354 in)
	Piston O.D.	69.970–69.990 mm (2.7547–2.7555 in)	69.91 mm (2.7524 in)
	Piston pin bore	17.002–17.008 mm (0.6693–0.6696 in)	17.03 mm (0.6704 in)
	Connecting rod small end I.D.	17.016–17.034 mm (0.6699–0.6706 in)	17.05 mm (0.6712 in)
Piston pin O.D.	16.994–17.000 mm (0.6690–0.6692 in)	16.98 mm (0.6685 in)	
Piston-to-piston pin clearance	—	0.04 mm (0.0016 in)	
Cylinder-to-piston clearance	—	0.10 mm (0.0039 in)	
Piston pin-to-connecting rod clearance	0.016–0.040 mm (0.0006–0.0016 in)	0.060 mm (0.0024 in)	

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TOOLS

Special

- Piston Base (2 required) 07958–300000
- Piston Ring Compressor (2 required) 07954–2830000

TROUBLESHOOTING

Compression low

1. Worn cylinder
2. Worn piston rings

Excessive smoke

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

Overheating

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

Knocking or abnormal noise

1. Worn piston and cylinder
2. Excessive carbon build-up

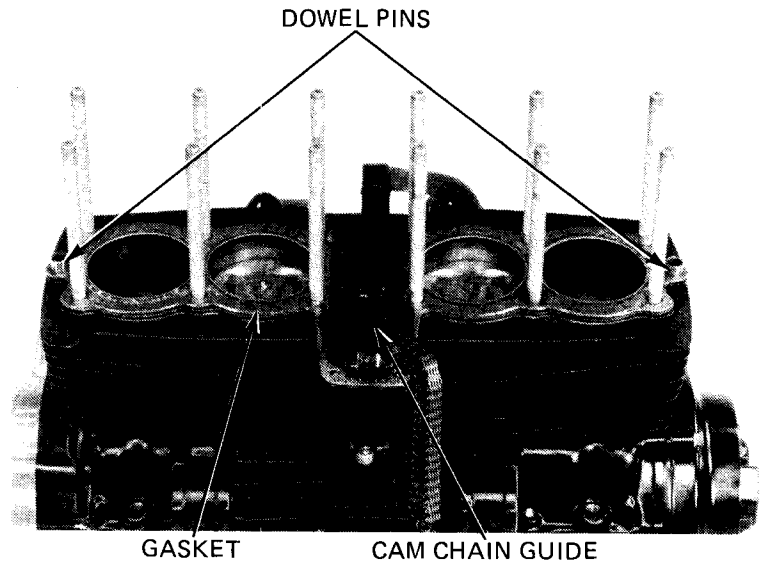


CYLINDER/PISTON

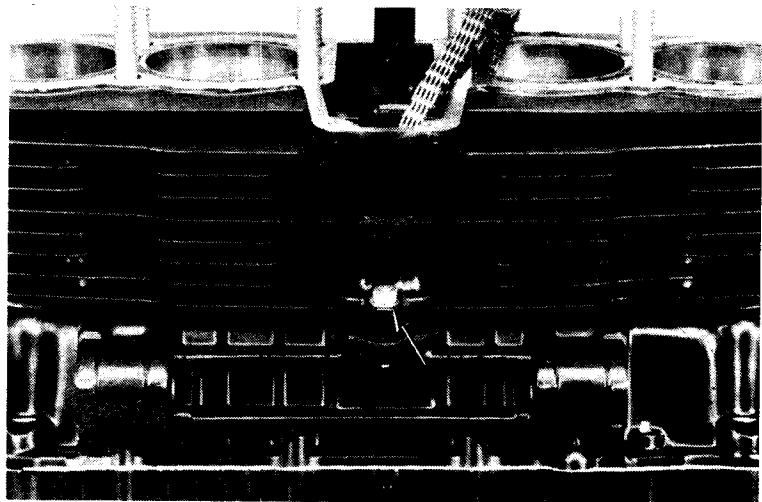
CYLINDER REMOVAL

Remove the cylinder head (Section 9).
Remove the cylinder gasket and dowel pins.

Remove the cam chain guide from the cylinder.



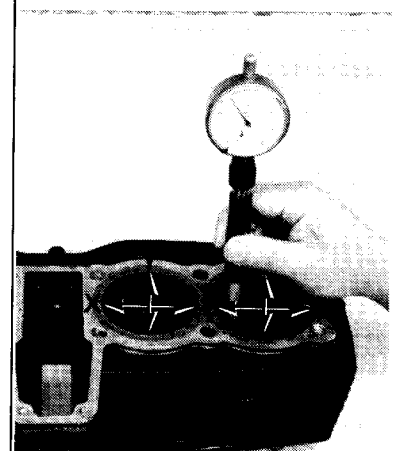
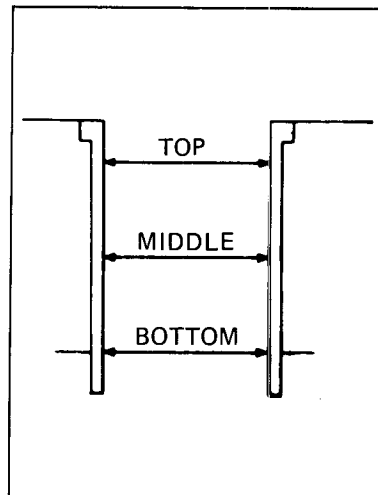
Remove the bolt at the middle of the front cylinder base.
Remove the cylinder.
Remove the cam chain tensioner lock nuts and tensioner.



INSPECTION CYLINDER

Inspect the cylinder bores for wear or damage.
Measure the cylinder I.D. at three levels in an X and Y axis.

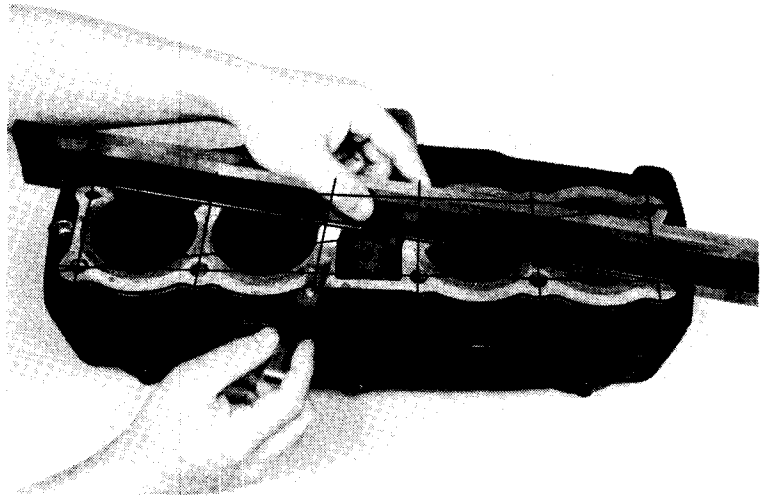
SERVICE LIMIT: 70.10 mm (2.760 in)





Inspect the top of the cylinder for warpage. Check in an X pattern as shown.

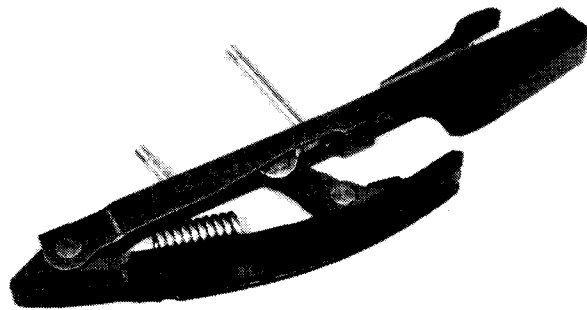
SERVICE LIMIT: 0.10 mm (0.0039 in)



CAM CHAIN TENSIONER

Inspect the slipper of the cam chain tensioner for damage or excessive wear.

Inspect the tension of the spring.



PISTON REMOVAL

Remove each piston pin clip with needle nose pliers.

NOTE:

Do not allow clips to fall into the crankcase.
Place a shop towel into the crankcase holes.

Press the piston pin out.

NOTE:

Mark the pistons to indicate their cylinder positions for correct reassembly.

PISTON PIN



PISTON PIN CLIP



CYLINDER/PISTON

PISTON/PISTON RING INSPECTION

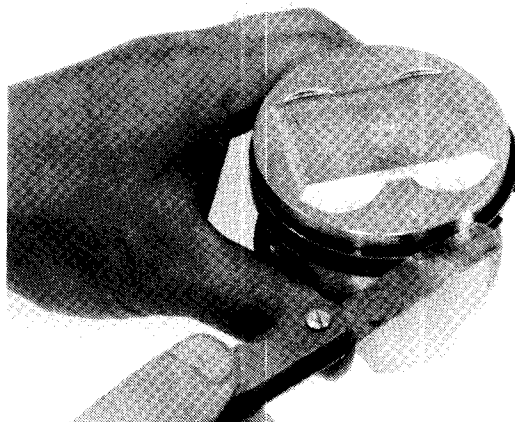
Inspect the piston ring-to-groove clearances.

SERVICE LIMIT: TOP 0.09 mm (0.0035 in)
SECOND 0.09 mm (0.0035 in)

NOTE:

Mark the rings so that they can be returned to their original locations.

Inspect the pistons for damage and ring grooves for wear.

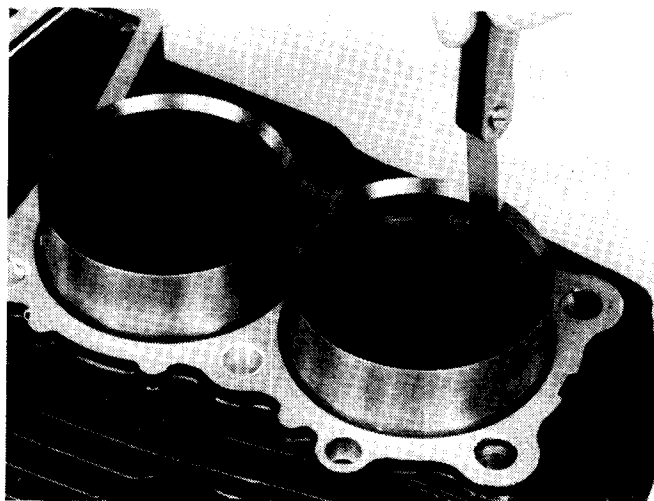


Insert each piston ring into the cylinder, and measure the end gap.

SERVICE LIMITS:

TOP: 0.5 mm (0.02 in)
SECOND: 0.5 mm (0.02 in)
OIL (Side rail): 1.1 mm (0.043 in)

Replace the rings if the gaps are larger than the service limits.

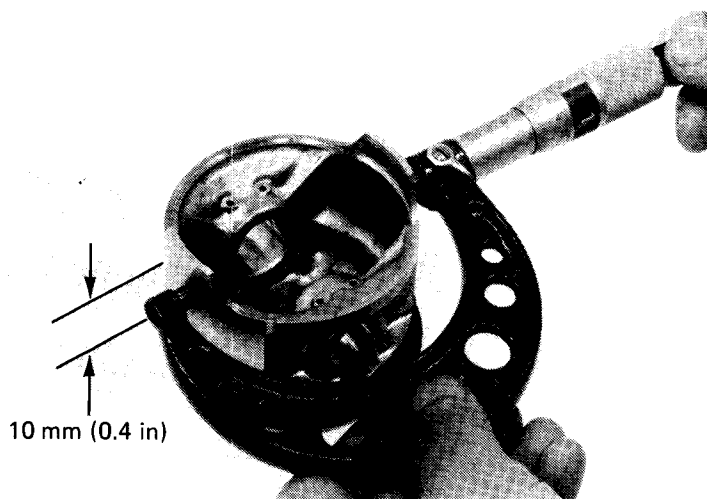


Measure the piston O.D. 90° to the piston pin hole and 10 mm (0.4 in) from the bottom.

SERVICE LIMIT: 69.91 mm (2.7524 in)

Calculate the cylinder-to-piston clearance.

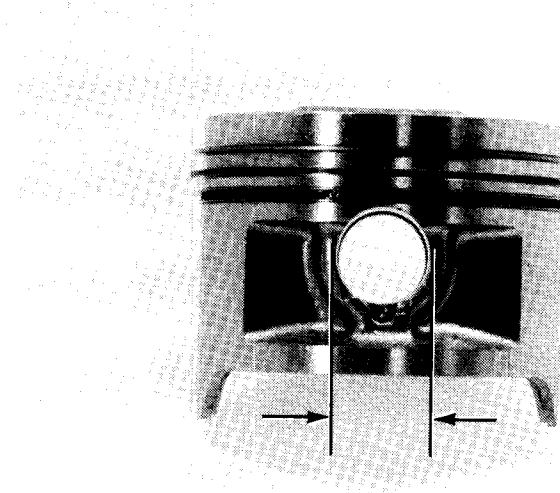
SERVICE LIMIT: 0.10 mm (0.0039 in)





Measure the piston pin hole I.D.

SERVICE LIMIT: 17.03 mm (0.6704 in)

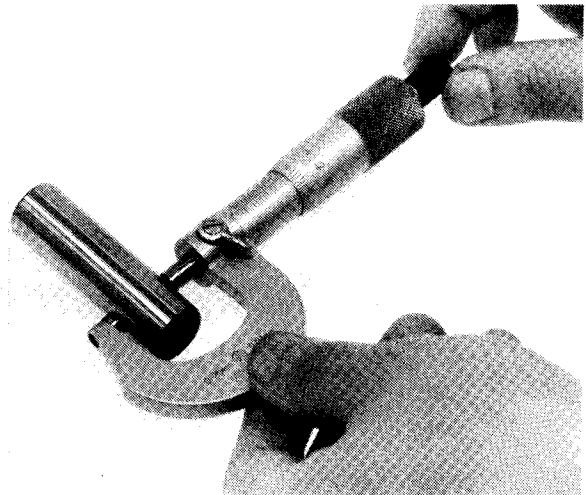


Measure the piston pin O.D.

SERVICE LIMIT: 16.98 mm (0.6685 in)

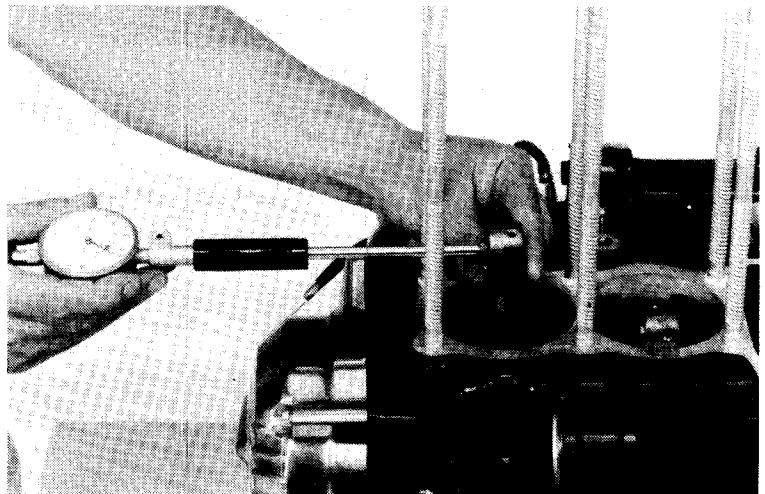
Determine the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.0016 in)



Measure the connecting rod small end I.D.

SERVICE LIMIT: 17.050 mm (0.6712 in)

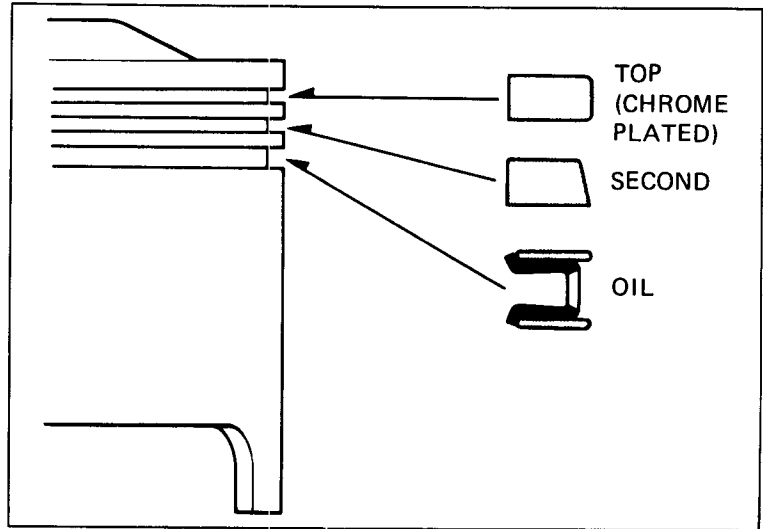




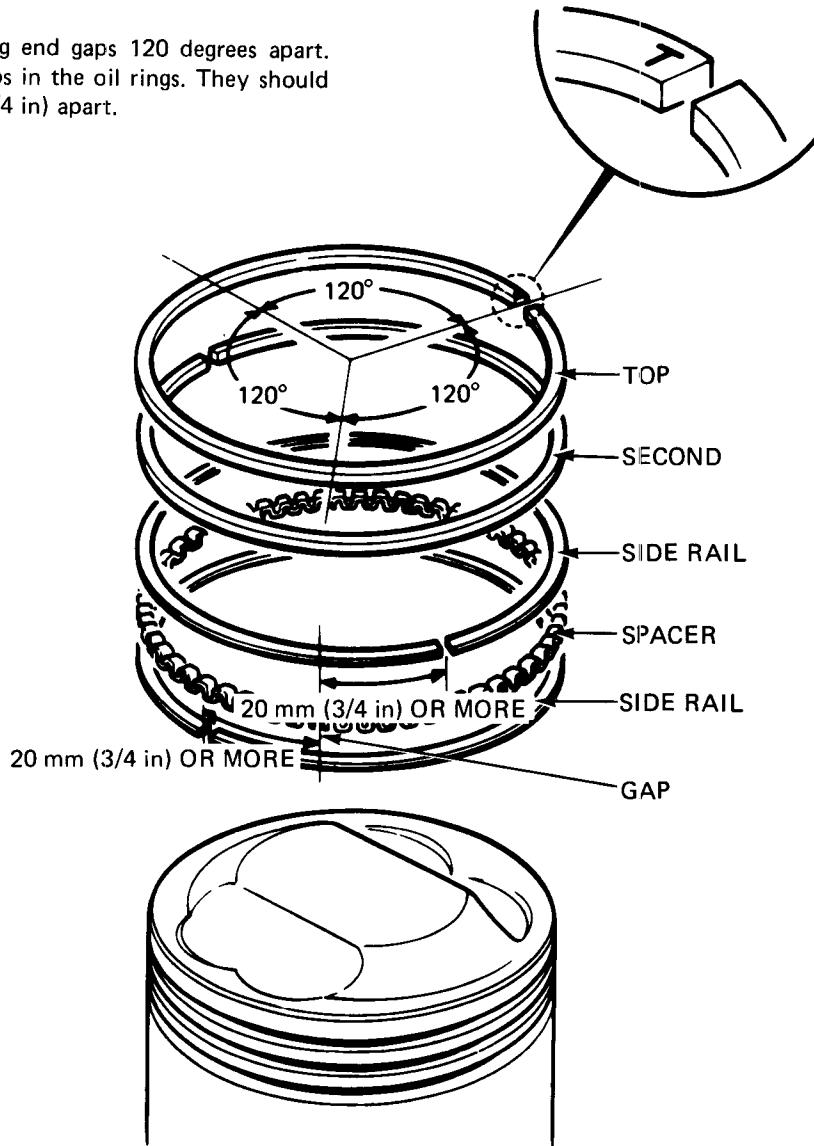
PISTON RING INSTALLATION

NOTE:

- Install the piston rings with the markings facing up.
- After installation, the rings should rotate freely.



Space the piston ring end gaps 120 degrees apart. Do not align the gaps in the oil rings. They should be at least 20 mm (3/4 in) apart.





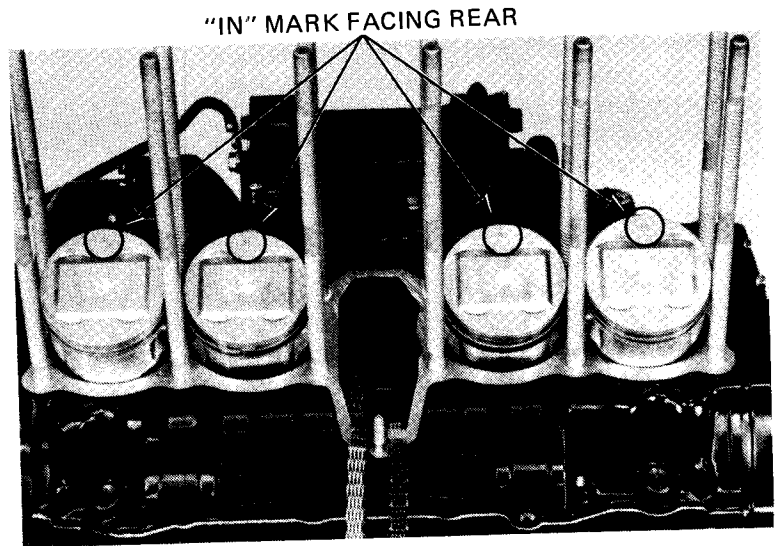
PISTON INSTALLATION

Apply molybdenum disulfide grease to the connecting rod small ends.

Install the pistons, piston pins and clips.

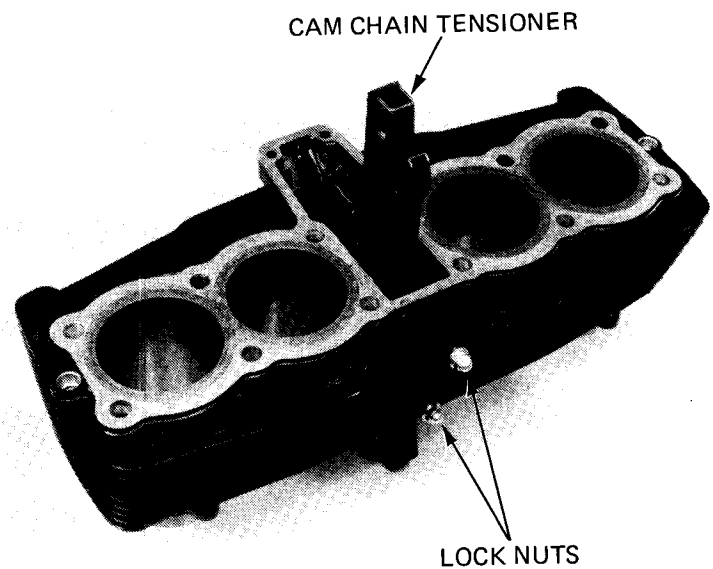
NOTE:

- Position the mark "IN" on the piston to the intake side.
- Install the pistons in their original positions.
- Do not allow piston pin clips to fall into the crankcase.

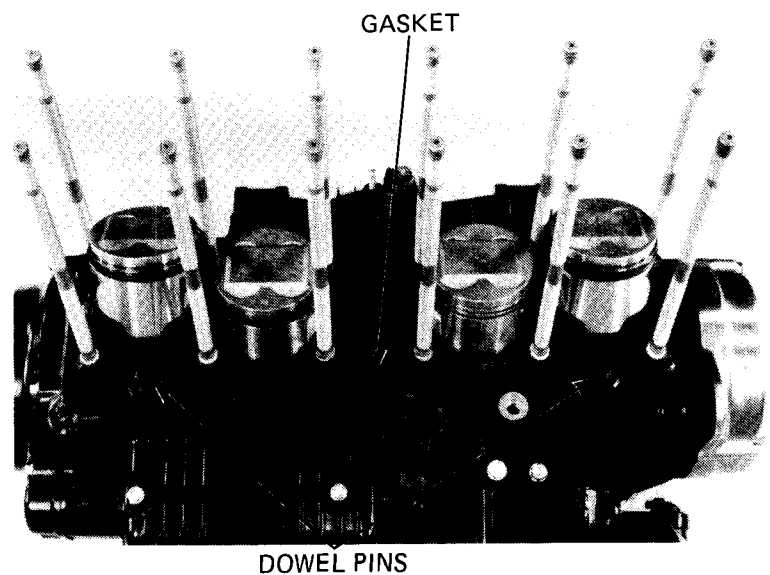


CYLINDER INSTALLATION

Install the cam chain tensioner and lock nuts.



Install the dowel pins and gasket.

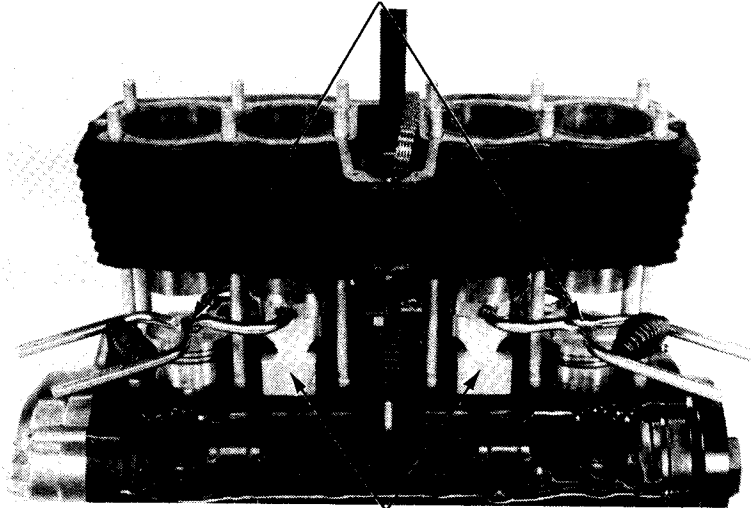




CYLINDER/PISTON

Place the No. 2 and 3 pistons at Top Dead Center. Attach the piston ring compressors to the No. 2 and 3 pistons and install the cylinder. After the cylinder is over the No. 2 and 3 pistons, attach the compressors onto the No. 1 and 4 pistons.

PISTON RING COMPRESSOR
07954-2830000



PISTON BASE
07958-3000000

Tighten the cylinder base bolt securely after installation.

Install a new cylinder head gasket, dowel pins and cam chain guide.

Install the cylinder head (page 9-19).

