6. CYLINDER HEAD / CYLINDER / PISTON

SERVICE INFORMATION

GENERAL

- All cylinder head, cylinder and piston maintenance and inspection can be done with the engine installed.
- Before disassembly, clean the engine to prevent dirt and dust from entering the cylinder and crankcase.
- Remove all gasket material from the mating surfaces of the cylinder head, cylinder and crankcase.

SPECIFICATIONS

ITEM	STANDARD mm (in)		SERVICE LIMIT mm (in)	
Cylinder head warpage			0.10	(0.004)
Cylinder bore	40.000–40.015	(1.5748–1.5754)	40.050	(1.5768)
Piston O.D. (4 mm from bottom of piston skirt)	39.950–39.960	(1.5728–1.5732)	39.900	(1.5709)
Cylinder-to-piston clearance	0.040–0.055	(0.0016–0.0022)	0.100	(0.0039)
Piston pin hole I.D.	10.002–10.008	(0.3938–0.3940)	10.030	(0.3949)
Piston pin O.D.	9.994–10.000	(0.3935–0.3937)	9.970	(0.3925)
Piston-to-piston pin clearance	0.002–0.012	(0.0001–0.0005)	0.040	(0.0016)
Piston ring end gap (top, second)	0.15–0.35	(0.006–0.014)	0.60	(0.024)
Connecting rod small end I.D.	14.005–14.017	(0.5514–0.5519)	14.030	(0.5524)

TORQUE

Cylinder head bolt: 8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

1. Blown cylinder head gasket
2. Loose spark plug
3. Worn, stuck or broken piston rings
4. Worn or damaged cylinder and piston
5. Faulty reed valve

Compression too high, overheating or knocking

1. Excessive carbon buildup in cylinder head or on piston top

Abnormal noise-piston

1. Worn cylinder and piston
2. Worn piston pin or piston pin hole
3. Worn connecting rod small end bearing

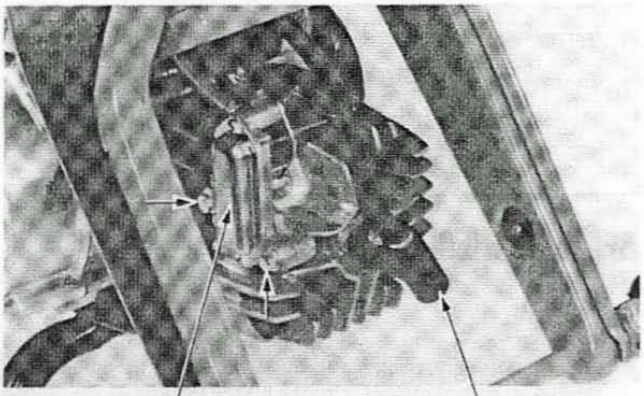
Abnormal noise

1. Worn, stuck or broken piston rings
2. Worn or damaged cylinder

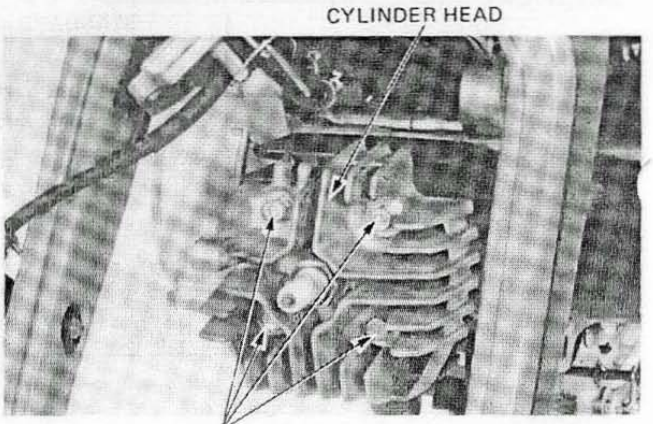
CYLINDER HEAD

CYLINDER HEAD REMOVAL

Remove the spark plug cap.
Remove the bolts attaching the choke control box and remove the control box.



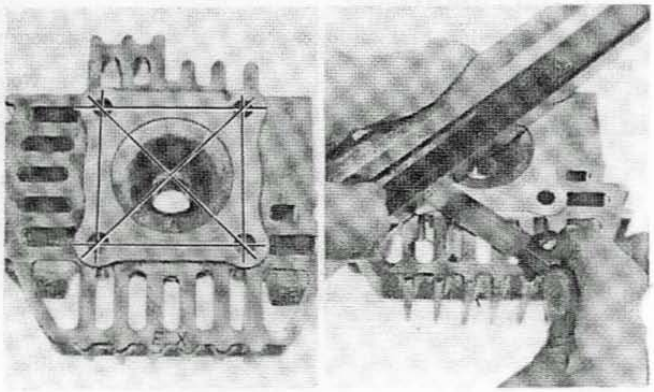
Remove the four cylinder head bolts, and the cylinder head.



CYLINDER HEAD INSPECTION

Check the cylinder head for warpage with a straight edge and a feeler gauge in the directions shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



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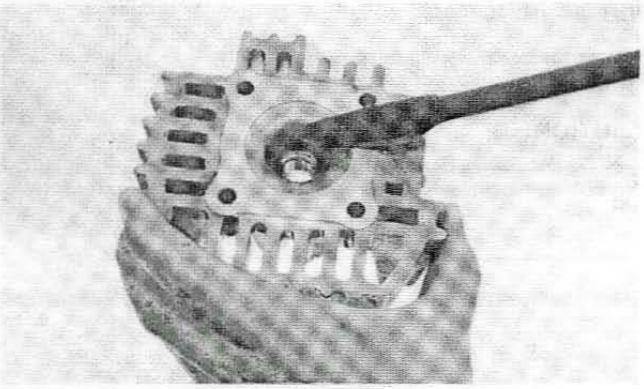
CYLINDER HEAD DECARBONIZING

Remove the carbon deposits from the combustion chamber.
Clean the head gasket surface of any gasket material.

CAUTION:

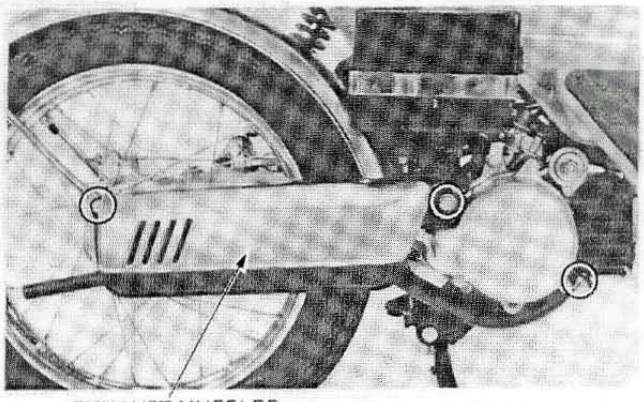
- *Avoid damaging the combustion chamber wall and gasket surfaces.*
- *Remove carbon deposits from the piston head.*



CYLINDER/PISTON

CYLINDER REMOVAL

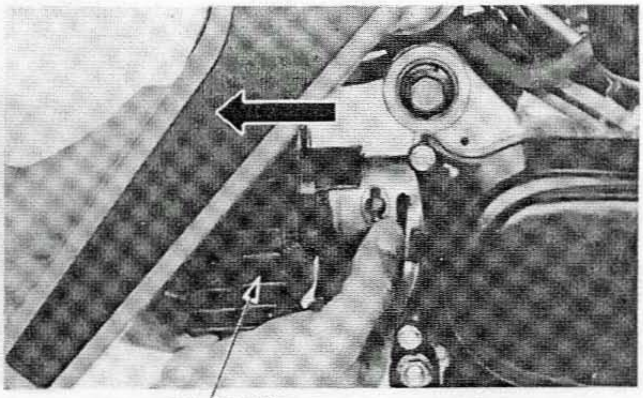
Remove the exhaust muffler by removing the attaching bolts and nuts.



Remove the cylinder.

CAUTION:

Do not pry between the cylinder and crankcase or strike the fins.



PISTON REMOVAL

Remove the piston pin clip using a pair of pliers.
Press the piston pin out of the piston.

CAUTION:

- *Do not damage or scratch the piston.*
- *Do not apply side force to the connecting rod.*
- *Do not let the fall into the crankcase.*

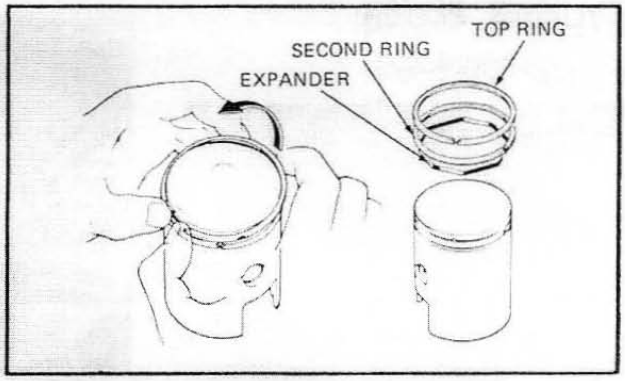
PISTON RING/EXPANDER REMOVAL

Remove the piston rings.

NOTE

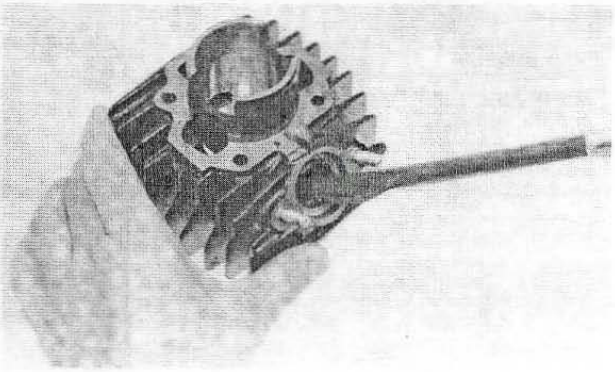
Spread each piston ring and remove by lifting it up at a point just opposite the gap.

Remove the expander.



CYLINDER/PISTON INSPECTION

Check the cylinder and piston for wear or damage.
Clean carbon deposits from the exhaust port area.



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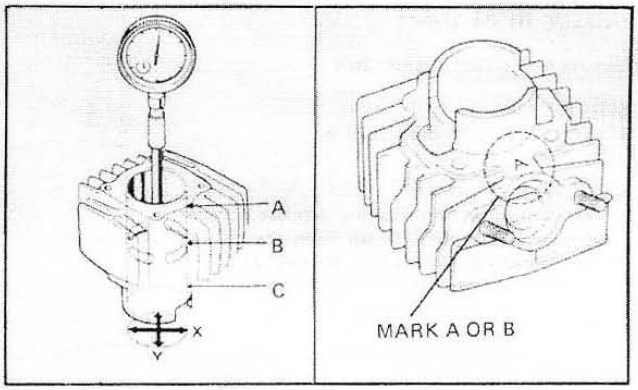
Inspect the cylinder bore for wear at three levels in X and Y directions. Take the minimum figure measured to determine the cylinder wear.
Avoid the port area.

SERVICE LIMIT: 40.050 mm (1.5768 in)

CAUTION

The cylinder has an A or B mark on the crankcase mating surface as shown. When the cylinder is to be replaced with a new one, use a cylinder having the same mark as the old one.

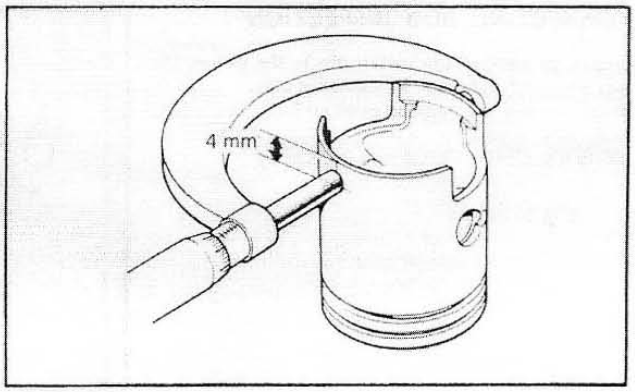


Measure the piston O.D. at a point 4 mm from the bottom of the skirt and 90° to the piston pin hole.

SERVICE LIMIT: 39.900 mm (1.5709 in)

Calculate the piston-to-cylinder clearance.

SERVICE LIMIT: 0.100 mm (0.0039 in)

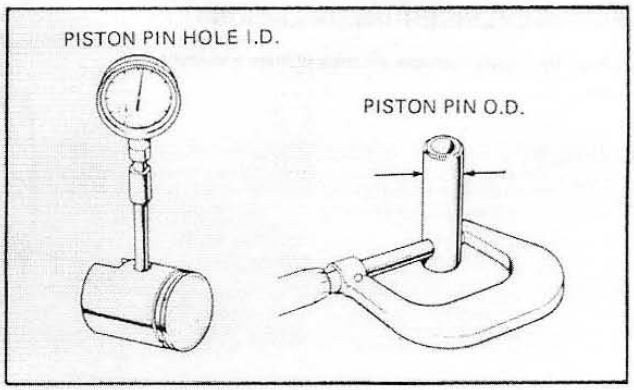


Measure the piston pin hole I.D.

SERVICE LIMIT: 10.030 mm (0.3949 in)

Measure the piston pin O.D.

SERVICE LIMIT: 9.970 mm (0.3925 in)



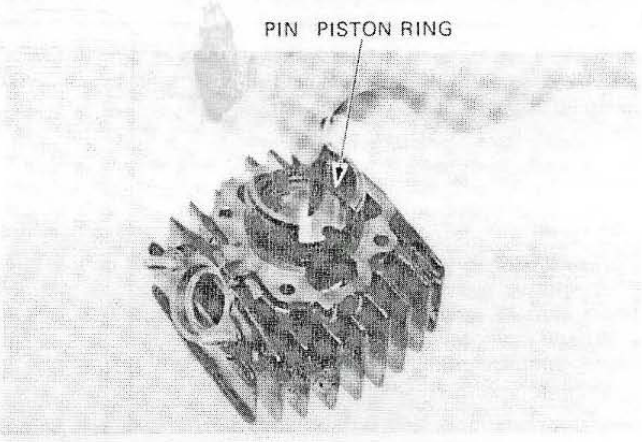
PISTON RING INSPECTION

Measure each piston ring end gap.

SERVICE LIMITS:
TOP/SECOND: 0.60 mm (0.024 in)

NOTE

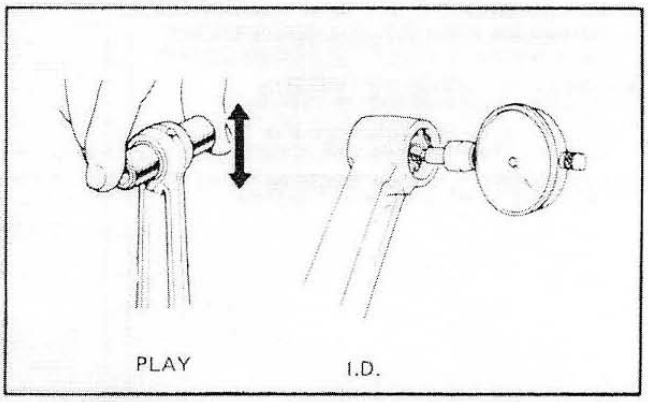
> Set each piston ring squarely into the cylinder at a point 30 mm (1-¼ in) from the bottom using the piston and measure the end gap.



CONNECTING ROD INSPECTION

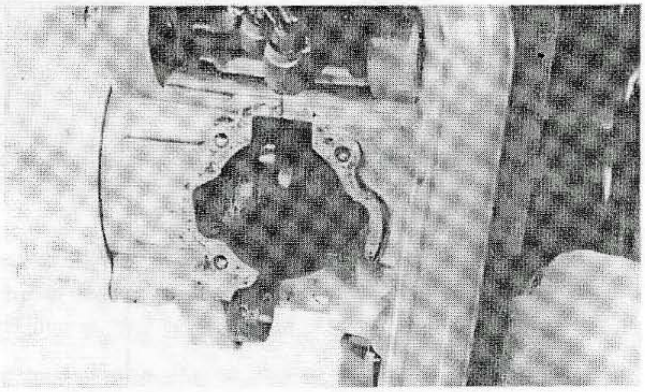
Install the bearing and piston pin in the connecting rod small end and check for excessive play.
Measure the connecting rod small end I.D.

SERVICE LIMIT: 14.030 mm (0.5524 in)



PISTON/CYLINDER INSTALLATION

Clean the gasket surfaces of the cylinder and crankcase.



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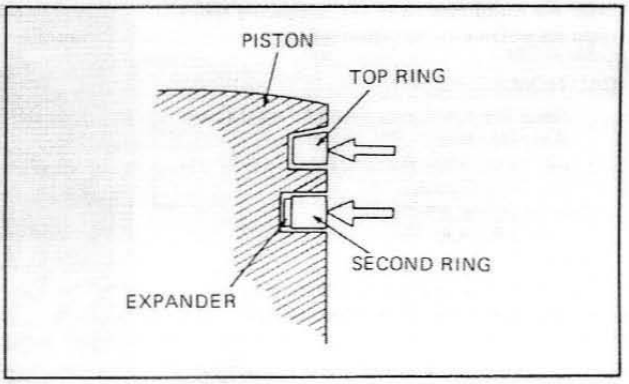
Install the expander in the second ring groove.
Align the ring ends with the locating pins in the ring grooves.

Install the top and second rings in their respective ring grooves with the markings facing up.

CAUTION:

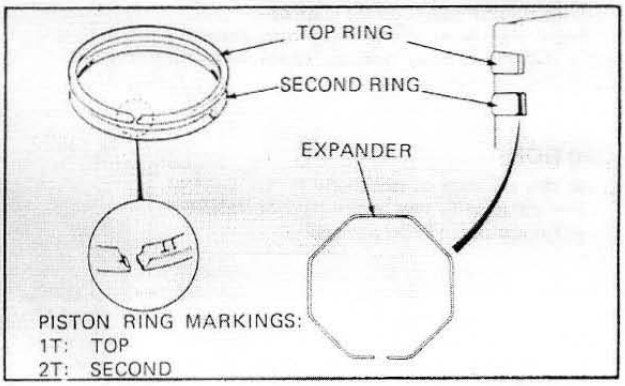
The top ring is a keystone ring and is not interchangeable with the square second ring.

Check the fit of each ring in its groove by pressing the ring into the groove to make sure that it is flush with the piston at several points around the ring.
A ring that will not compress means that the ring groove is dirty and it should be cleaned.

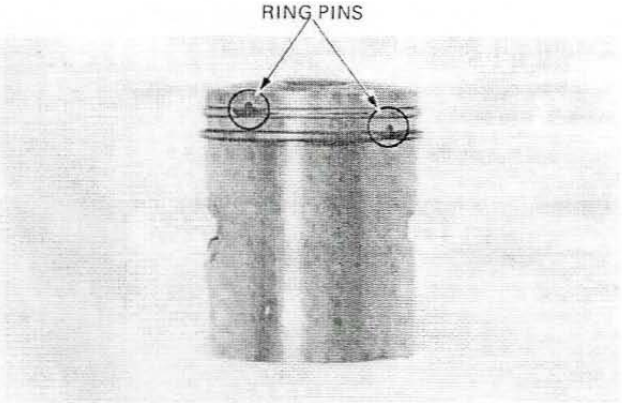


CAUTION:

Do not replace one ring without replacing the other.



Be sure the ring end gaps are aligned with the piston ring pins in the ring grooves.



Install the needle bearing in the connecting rod, and install the piston with the piston pin.

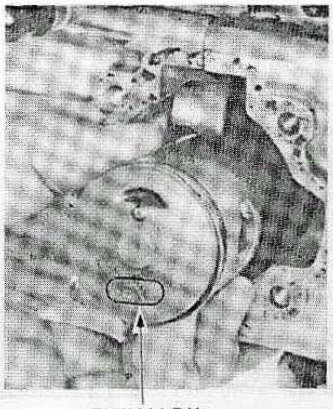
CAUTION:

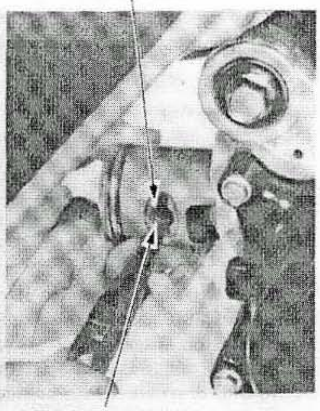
- *Install the piston with the "EX" mark facing the exhaust side.*
- *Dip the piston pin in clean 2-stroke oil before installation.*

Install new piston pin clips.

NOTE

Do not let the clips fall into the crankcase.

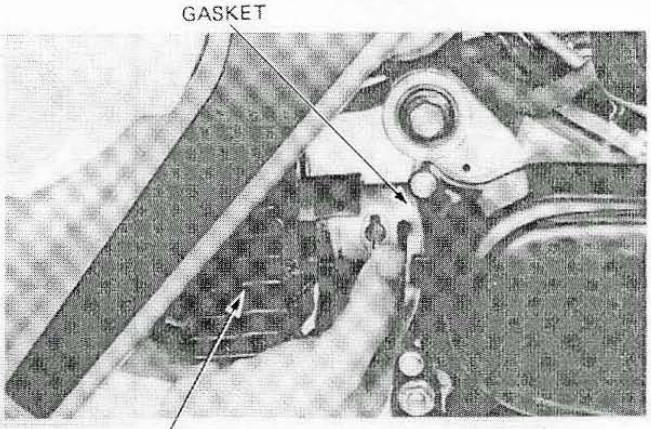




Place the cylinder gasket on the crankcase.
Lubricate the piston and cylinder with 2-stroke oil and install the cylinder over the piston while compressing the piston rings.

CAUTION:

Be sure the rings do not rotate in their grooves over the locating pins to prevent ring breakage and piston and cylinder damage.



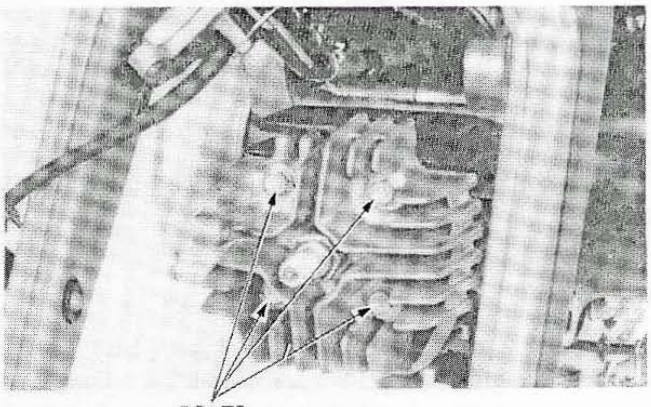
CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder using a new cylinder head gasket.

Install and tighten the four cylinder head bolts.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

Install the spark plug and spark plug cap.



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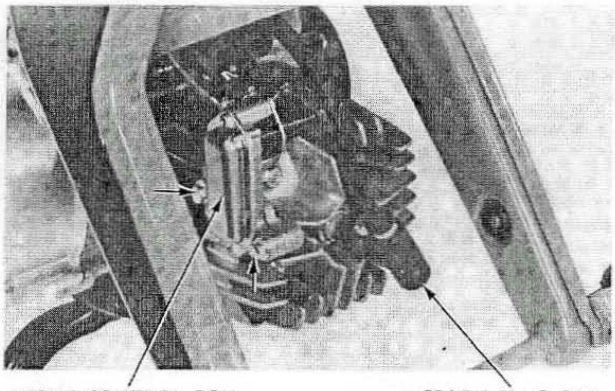
Install the choke control box.

CAUTION:

Before installing the control box, clean the cylinder head mating surface thoroughly.



Install the muffler.
Perform the following inspections:
- Compression test (Page 3-7)
- Check for abnormal engine noise.
- Check for cylinder air leaks.