CYLINDER HEAD/CYLINDER/PISTON

6

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The cylinder head, cylinder and piston can be serviced with the engine installed in the frame.
- Before disassembly, clean the engine to prevent dust from entering the engine.
- Remove all gasket material from the mating surfaces.
- Do not use a driver to pry between the cylinder and cylinder head, cylinder and crankcase.
- Do not damage the cylinder inside and the piston surface.
- After disassembly, clean the removed parts before inspection. When assembling, apply the specified engine oil to movable parts.

SPECIFICATIONS	Standard (mm)	Service Limit (mm)
Item	B&W50	B&W50
Cylinder head warpage	—	0.10
Piston O.D.(5mm from bottom of piston	38.970_ 38.955	38.90
Cylinder-to- piston clearance	0.03_ 0.07	0.10
Piston pin hole I.D.	12.002_ 12.008	12.03
Piston pin O.D.	11.994_ 12.0	11.98
Piston-to-piston pin clearance	0.002_ 0.014	0.03
Piston ring end gap (top/second)	0.10_ 0.25	0.40
Connecting rod small end I.D.	17.005_ 17.017	17.03
Cylinder bore	39.0_ 39.025	39.05

TORQUE VALUES

Cylinder head bolt	14.7_ 16.66N-m
Exhaust muffler joint lock nut	9.8_ 13.72N-m
Exhaust muffler lock bolt	29.4_ 35.28N-m
Spark plug	10.78_ 16.66N-m

TROUBLESHOOTING

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

- Leaking cylinder head gasket
- Loose spark plug
- Worn, stuck or broken piston and piston rings
- Worn or damaged cylinder and piston

Compression too high, overheating or knocking

- Excessive carbon build-up in cylinder head or on piston head

Abnormal noisy piston

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end bearing

Abnormal noisy piston rings

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

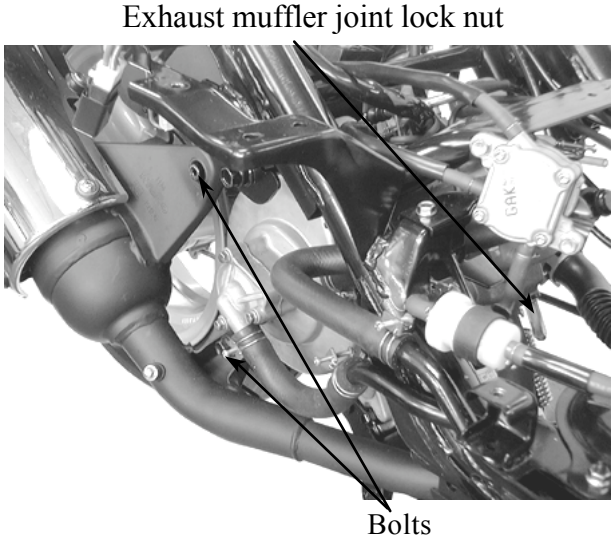
CYLINDER HEAD

REMOVAL

Remove the rear carrier.
Remove the frame body cover. (⇨2-2)
Drain the coolant.
Disconnect the thermosensor wire from the thermosensor.
Disconnect the water hose from the thermostat housing.

Remove the spark plug cap.
Remove the two joint lock nuts on the front of the exhaust muffler and then remove the two exhaust muffler lock bolts.
The installation sequence is the reverse of removal.

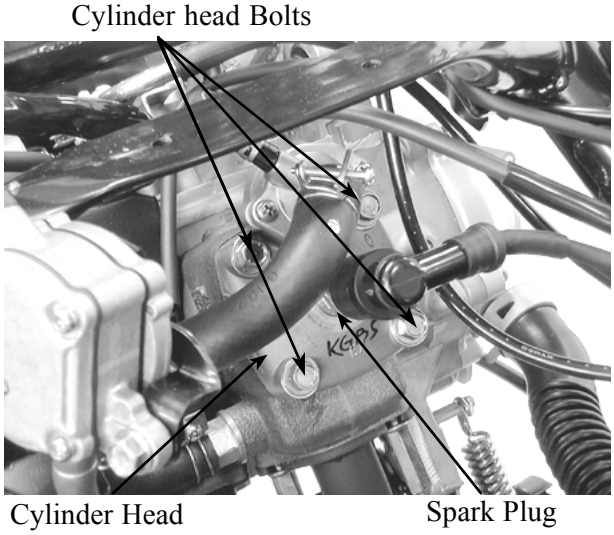
When installing the exhaust muffler, first tighten the two nuts on the front and then tighten the two bolts.



Remove the spark plug.
Remove the cylinder head bolts and the cylinder head.

Loosen the bolts diagonally in 2 or 3 times.

Remove the cylinder head gasket.

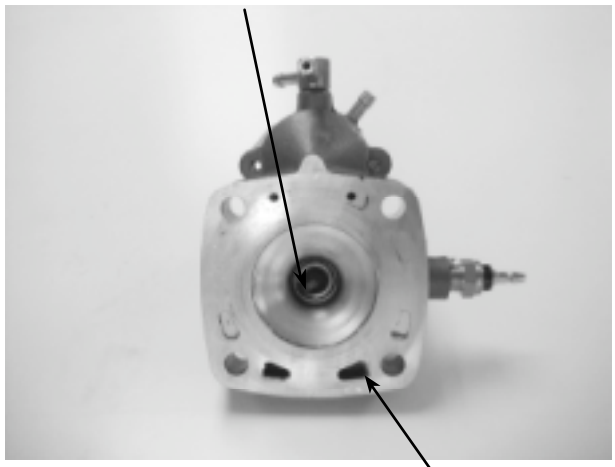


COMBUSTION CHAMBER DECABONIZING

Remove the carbon deposits from the combustion chamber

Avoid damaging the combustion chamber wall and cylinder mating surface.

Combustion Chamber

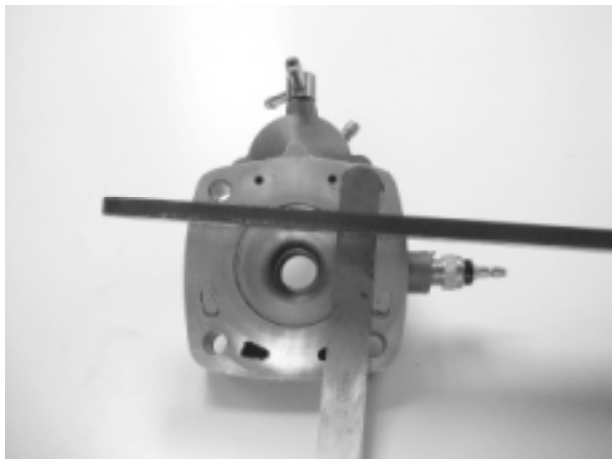


Mating Surface

CYLINDER HEAD INSPECTION

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

Service Limit: 0.10mm replace if over



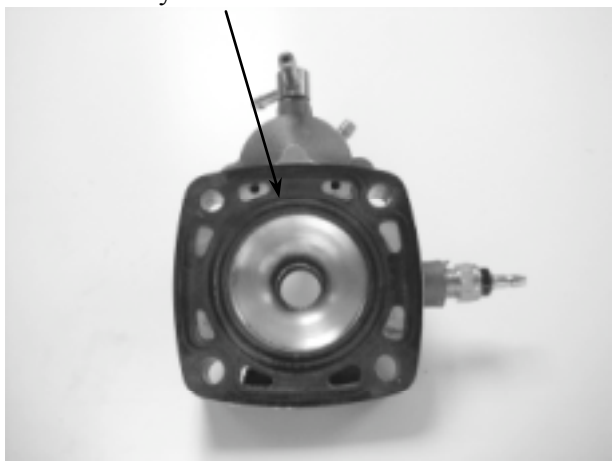
CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder properly.

Be careful not to damage the mating surfaces.

Install a new cylinder head gasket onto the cylinder.

Cylinder head Gasket



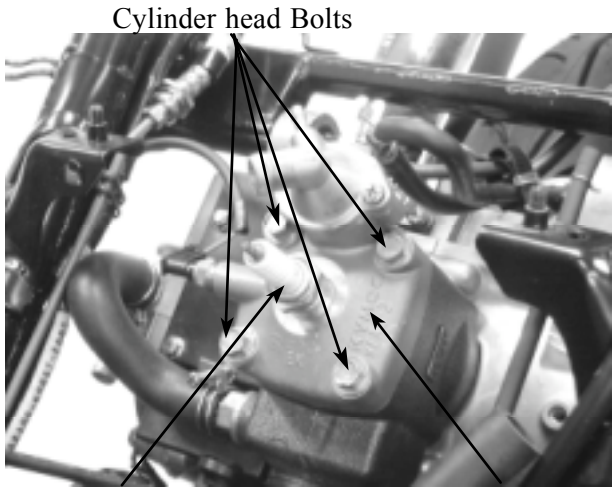
Cylinder Head Bolts Installation

Install and tighten the cylinder head bolts diagonally in 2 or 3 times.

Torque: 14.7_ 16.66N-m

Install the spark plug.

Torque: 10.78_ 16.66N-m

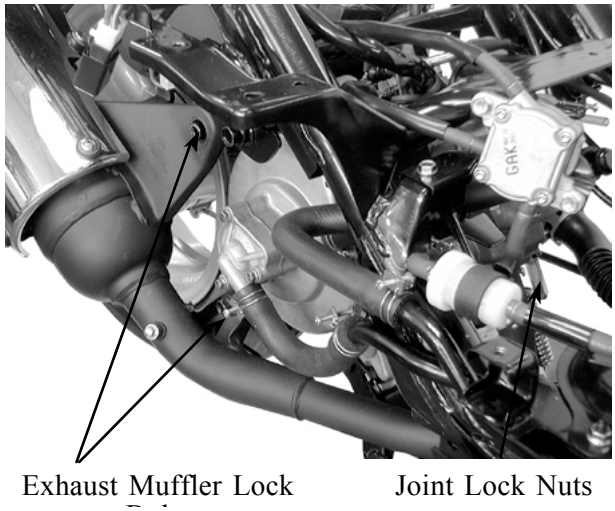


CYLINDER/PISTON

CYLINDER REMOVAL

Remove the met-in box and seat.
Remove the frame body cover.
Remove the cylinder head. (6-3)
Remove the two exhaust muffler joint lock nuts and two exhaust muffler lock bolts.
Remove the exhaust muffler.
Remove the cylinder.
Remove the cylinder gasket.

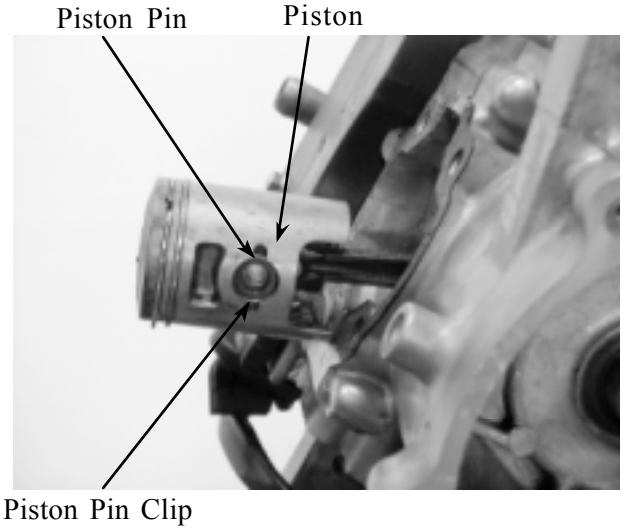
Do not pry between the cylinder and crankcase or strike the fins.



PISTON REMOVAL

Remove the piston pin clip to remove the piston pin and piston.

- Do not damage or scratch the piston.
- Do not apply side force to the connect-ing rod when removing the piston pin.
- Place clean shop towels in the crank-case to keep the piston pin clip from falling into the crankcase.



6. CYLINDER HEAD/CYLINDER/PISTON

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

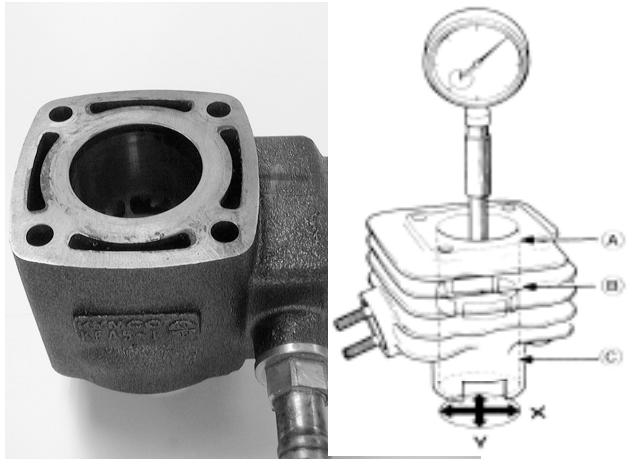
CYLINDER/PISTON INSPECTION

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

Be careful not to damage the cylinder inside wall.

Measure the cylinder bore at three levels of A, B and C in both X and Y directions. Avoid the port area. Take the maximum figure measured to determine the cylinder bore.

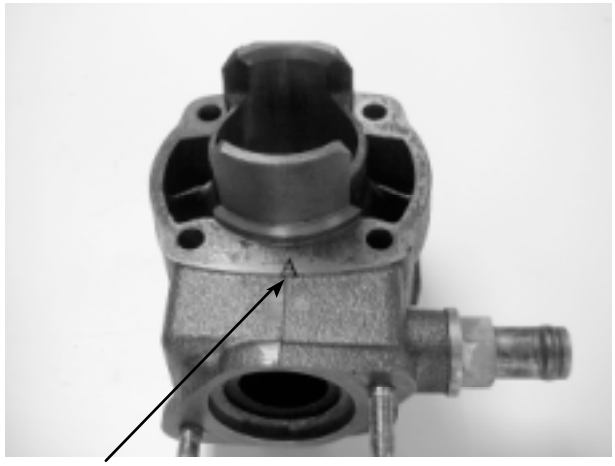
Service Limit: 39.05mm replace if over



6. CYLINDER HEAD/CYLINDER/PISTON

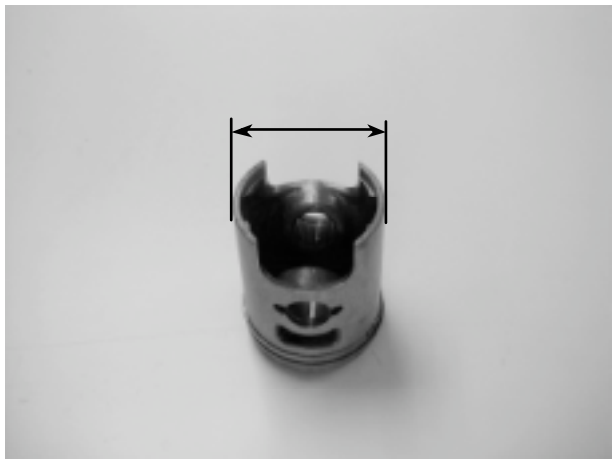
Inspect the top of the cylinder for warpage.
Service Limit: 0.10mm replace if over

°¢ The cylinder has an A mark or no mark on it. When replacing the cylinder with a new one, use a cylinder having the same mark as the old one.



A Mark

Measure the piston O.D. at a point 5mm from the bottom of the piston skirt.
Service Limit: 38.90mm replace if below

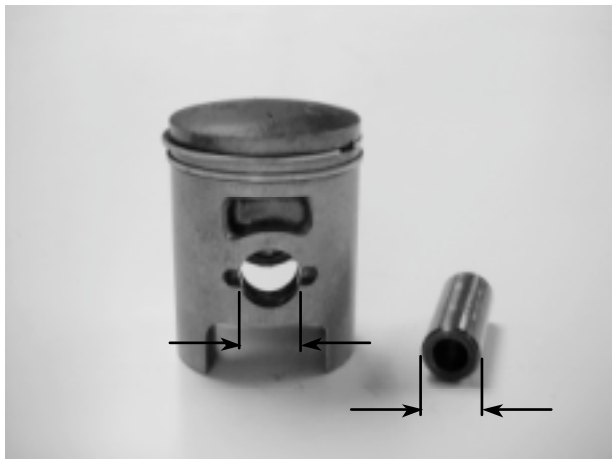


Measure the piston-to-cylinder clearance.
Service Limit: 0.10mm replace if over

Measure the piston pin hole I.D.
Service Limit: 12.03mm replace if over

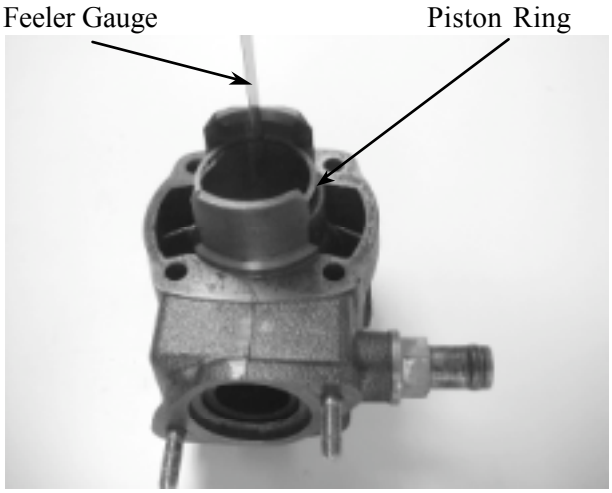
Measure the piston pin O.D.
Service Limit: 11.98mm replace if below

Measure the piston-to-piston pin clearance.
Service Limit: 0.03mm replace if over

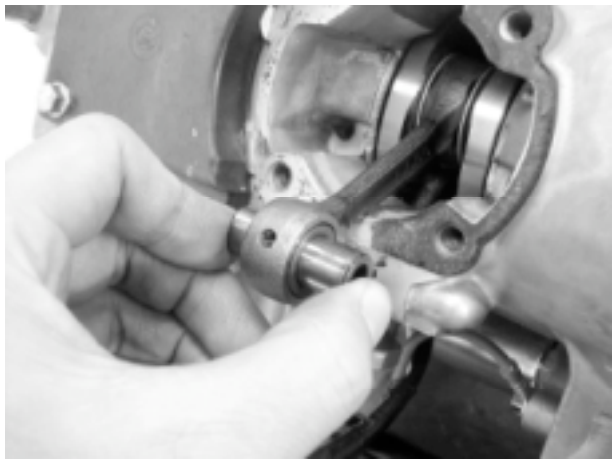


PISTON RING INSPECTION
Measure each piston ring end gap.
Service Limits: Top/Second
0.40mm replace if over

Set each piston ring squarely into the cylinder using the piston and measure the end gap.



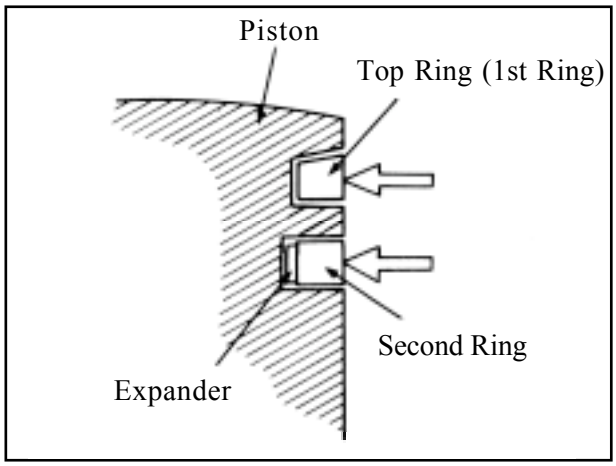
CONNECTING ROD SMALL END INSPECTION
Install the piston pin and bearing in the connecting rod small end and check for excessive play.
Measure the connecting road small end I.D.
Service Limit: 17.03mm replace if over



Install the frame covers.

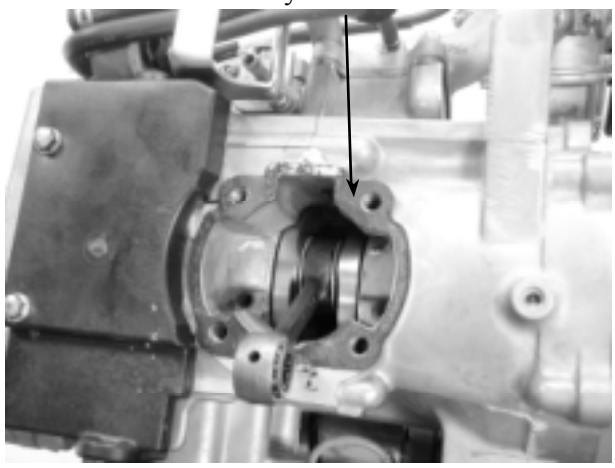
PISTON/CYLINDER INSTALLATION

First install the expander in the second ring groove.
Then install the top and second rings in their respective ring grooves.
The piston rings should be pressed into the grooves with even force.
After installation, check and make sure that each ring is flush with the piston at several points around the ring.
A ring that will not compress means that the ring groove has carbon deposits in it and should be cleaned.



Install a new cylinder gasket on the mating surface between the cylinder and crankcase.

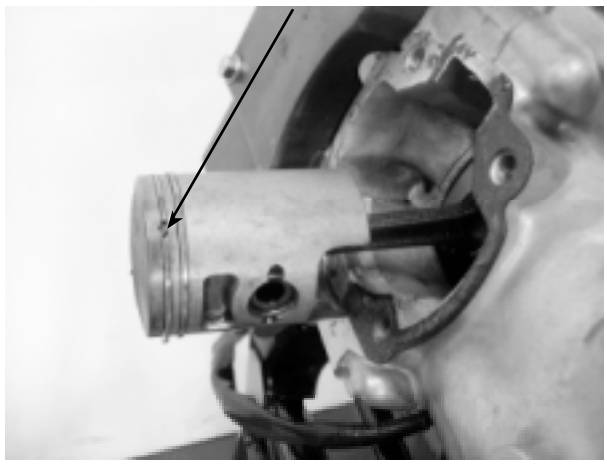
Cylinder Gasket



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

Lubricate the cylinder inside and piston rings with engine oil and install the piston into the cylinder while compressing the piston rings.

Ring Pins



Be careful not to damage the piston.

Install the cylinder head.

Torque: 14.7_ 16.66N-m

Install the exhaust muffler and tighten the exhaust muffler joint lock nuts.

Torque: 9.8_ 13.72N-m

Tighten the exhaust muffler lock bolts.

Torque: 29.4_ 35.28N-m