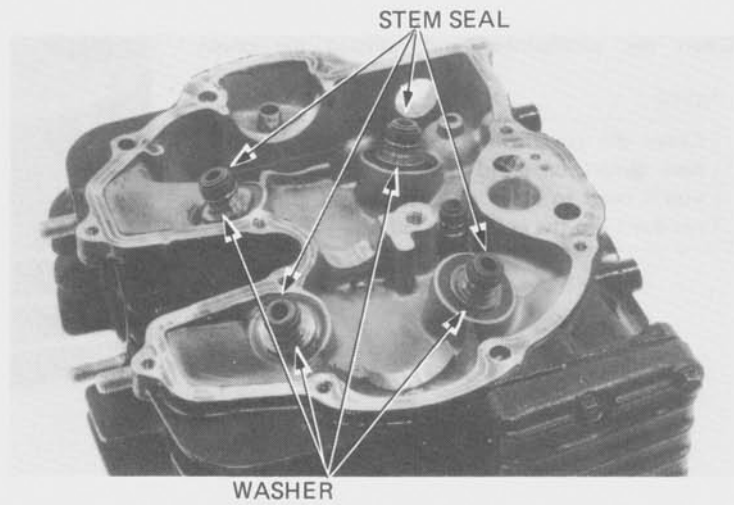
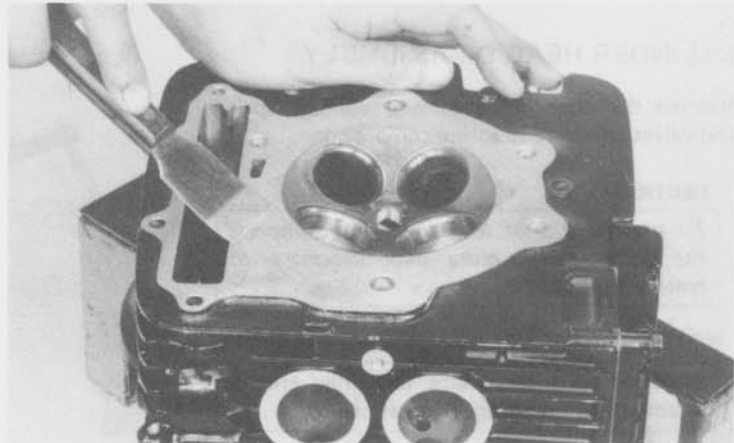




Remove the valve stem seals and washers.



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

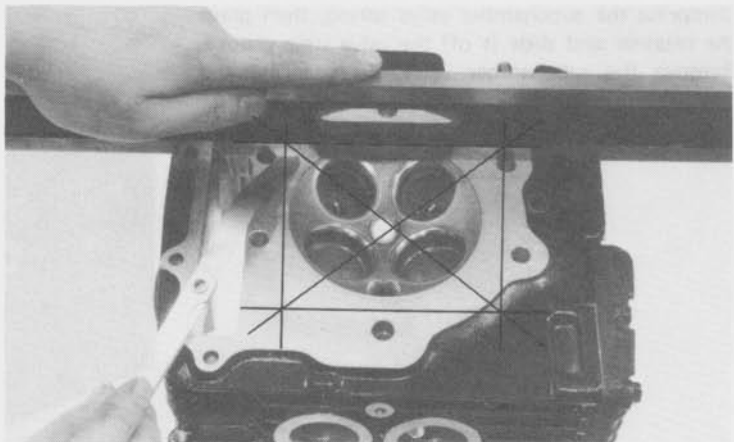


CYLINDER HEAD INSPECTION

Check the spark plug hole and valve areas for cracks.

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

SERVICE LIMIT: 0.1 mm (0.004 in)



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VALVE SPRING INSPECTION

Measure the free length of the inner and outer valve springs and subchamber valve spring.

SERVICE LIMITS:

Inner: 34.1 mm (1.34 in)

Outer: 35.0 mm (1.38 in)

SUBCHAMBER VALVE SPRING: 39.3 mm (1.55 in)

VALVE/VALVE GUIDE INSPECTION

Inspect each valve for trueness, burning, scratches or abnormal stem wear.

Check the valve movement in the guide.

Measure and record each valve stem O.D.

SERVICE LIMITS:

Intake: 6.56 mm (0.257 in)

Exhaust: 6.55 mm (0.258 in)

SUBCHAMBER: 4.96 mm (0.195 in)

Measure and record each valve guide I.D. using a ball gauge or inside micrometer.

SERVICE LIMITS:

Intake: 6.63 mm (0.261 in)

Exhaust: 6.63 mm (0.261 in)

SUBCHAMBER VALVE: 4.96 mm (0.195 in)

NOTE

Ream the guides to remove any carbon build-up before checking the valve guide I.D.

Calculate the stem-to-guide clearance.

VALVE STEM-TO-GUIDE CLEARANCE

SERVICE LIMITS:

Intake: 0.065 mm (0.0026 in)

Exhaust: 0.08 mm (0.0031 in)

SUBCHAMBER VALVE STEM-TO-GUIDE

CLEARANCE: 0.06 mm (0.0023 in)

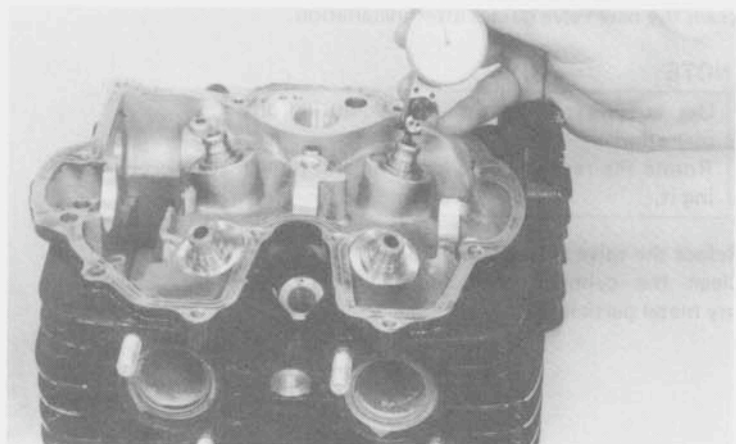
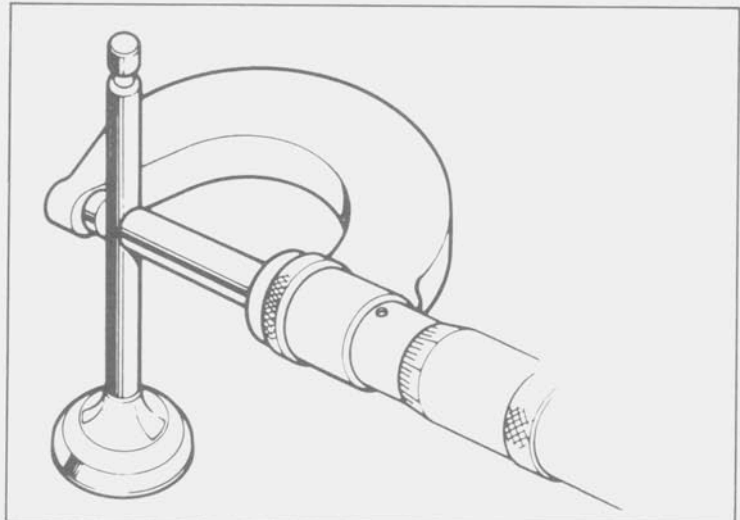
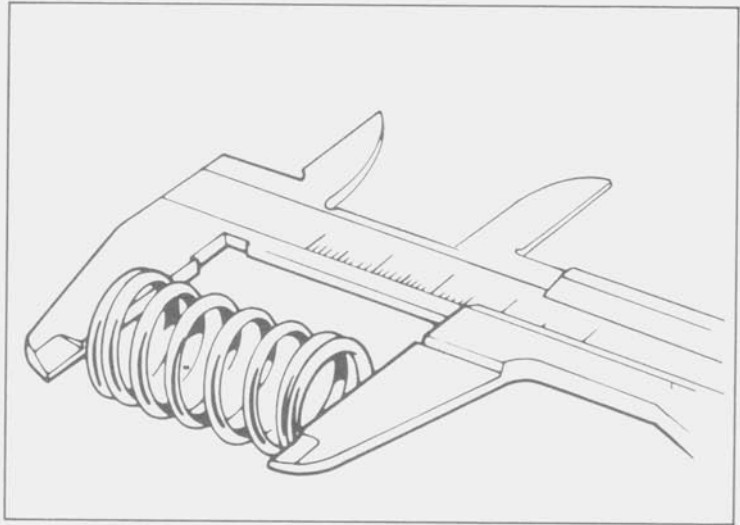
NOTE

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace guides as necessary and ream to fit.

If stem-to-guide clearance still exceeds the service limit when new guides are installed, replace the valves.

NOTE

Reface valve seats whenever new valve guides are installed.



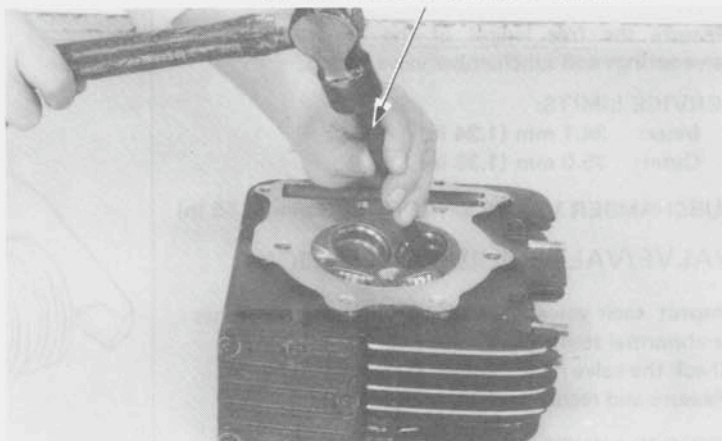
VALVE GUIDE REPLACEMENT

Support the cylinder head and drive out the guide from combustion chamber side.

CAUTION

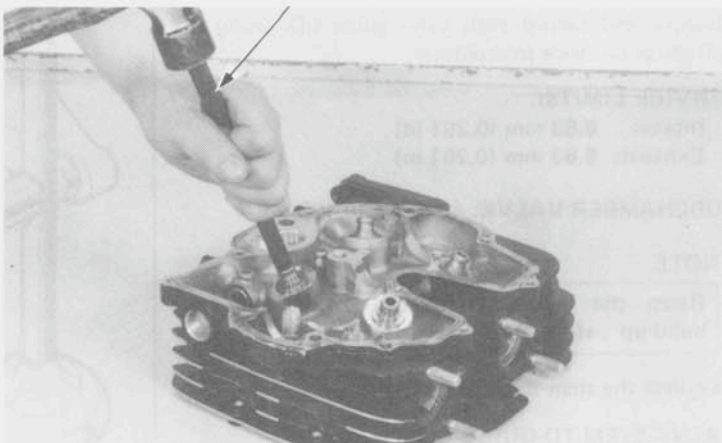
Do not damage the cylinder head during guide removal.

VALVE GUIDE DRIVER
07742-0010200 or 07946-6570100



Install a new valve guide from the top of the head, then check that it wasn't damaged during installation.

VALVE GUIDE DRIVER
07742-0010200 or 07942-6570100



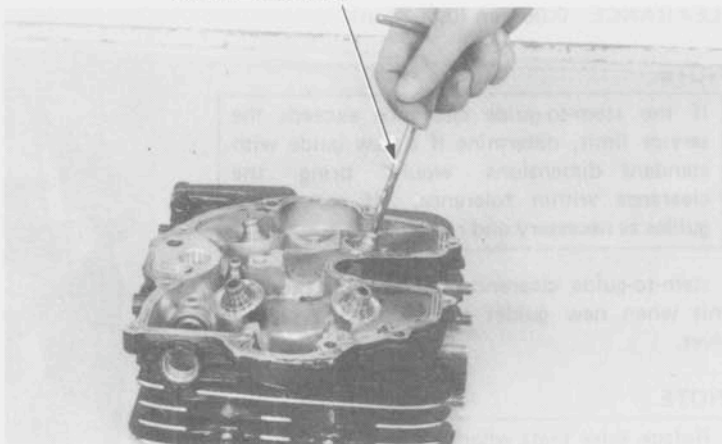
Ream the new valve guides after installation.

NOTE

Use cutting oil on the reamer during this operation.
Rotate the reamer while inserting and removing it.

Reface the valve seats (Page 6-18).
Clean the cylinder head thoroughly to remove any metal particles.

VALVE GUIDE REAMER, 6.6 mm
07984-6570100





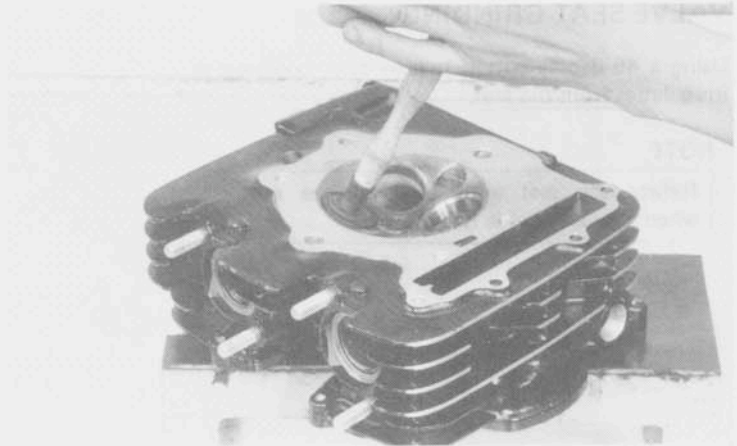
VALVE SEAT INSPECTION AND REFACING

Clean all intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of Prussian Blue to each valve face. Lap each valve and seat using a rubber hose or other hand-lapping tool.

CAUTION

The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

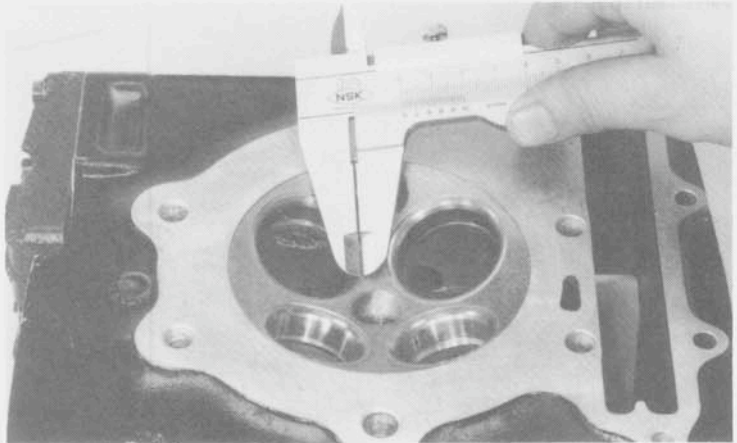


Inspect the width of each valve seat.
STANDARD: 1.2–1.4 mm (0.05–0.06 in)
SERVICE LIMIT: 2.0 mm (0.08 in)
SUBCHAMBER VALVE SEAT:
SERVICE LIMIT: 1.5 mm (0.059 in)

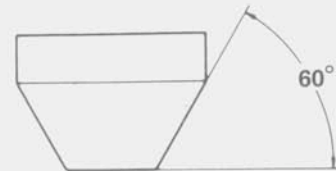
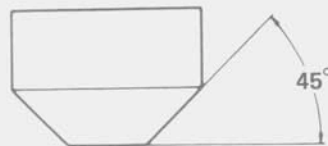
If the seat is too wide, too narrow, or has low spots, the seat must be refinished for good sealing.

NOTE

Follow the refacer manufacturer's operating instructions.



VALVE SEAT CUTTERS





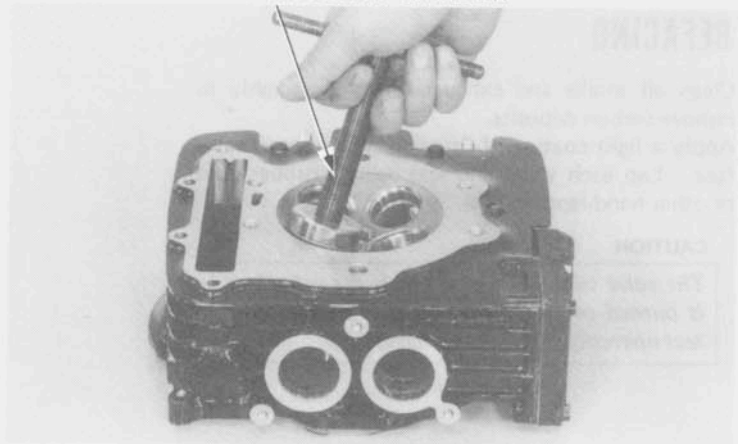
VALVE SEAT GRINDING

Using a 45 degree cutter, remove any roughness or irregularities from the seat.

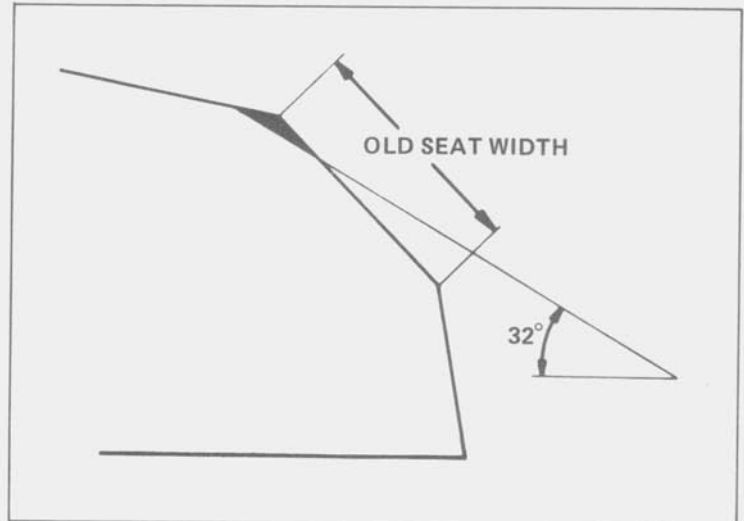
NOTE

Reface the seat with a 45 degree cutter when the valve guide is replaced.

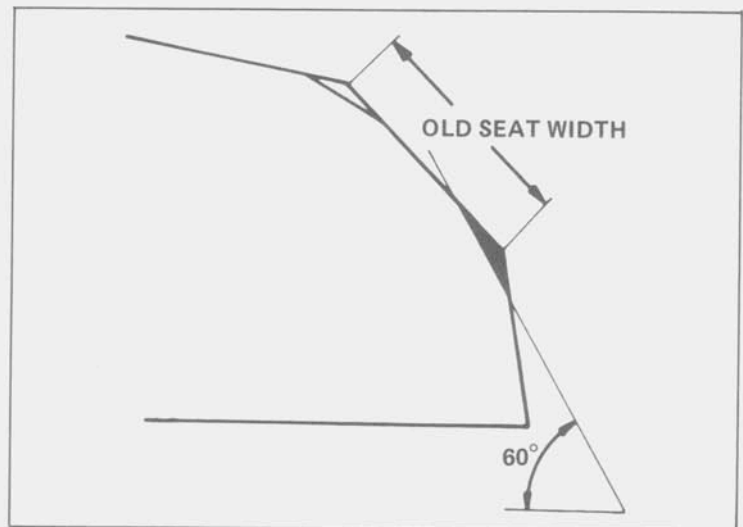
VALVE SEAT GRINDER



Using a 32 degree cutter, remove 1/4 of the existing valve seat material.



Use a 60 degree cutter and remove the bottom 1/4 of the old seat.

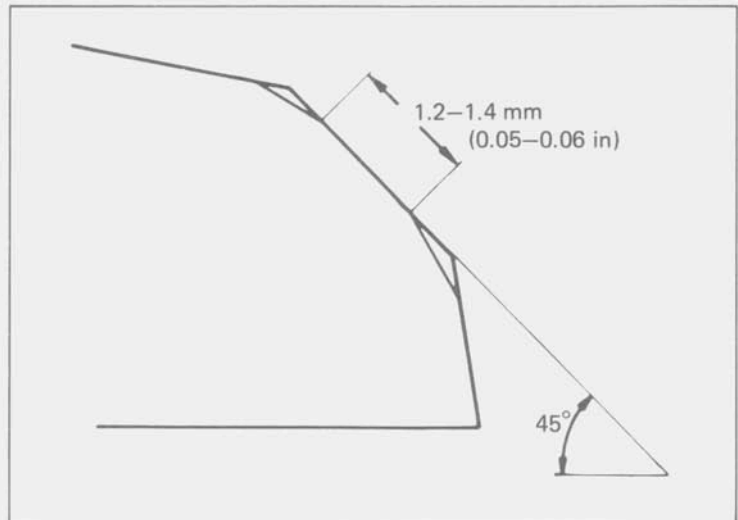




Use a 45 degree finish cutter and cut the seat to the proper width.

NOTE

Make sure that all pitting and irregularities are removed. Refinish if necessary.



NOTE

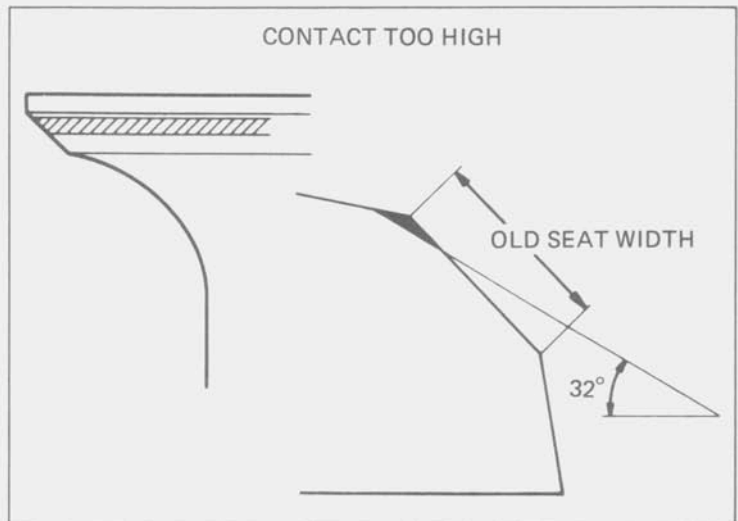
The location of the valve seat in relation to the valve face is very important for good sealing and maximum valve service.

Apply a thin coating of Prussian Blue to the valve seat.

Press the valve through the valve guide and onto the seat to make a clear pattern.

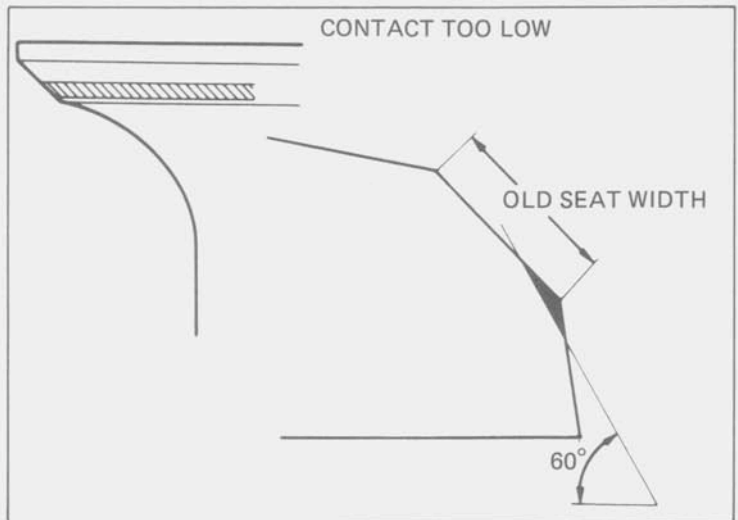
Remove to inspect the valve.

If the contact area is too high on the valve, the seat must be lowered using a 32 degree flat cutter. Refinish the seat to the correct width using a 45 degree finish cutter.



If the contact area is too low on the valve, the seat must be raised using a 60 degree inner cutter.

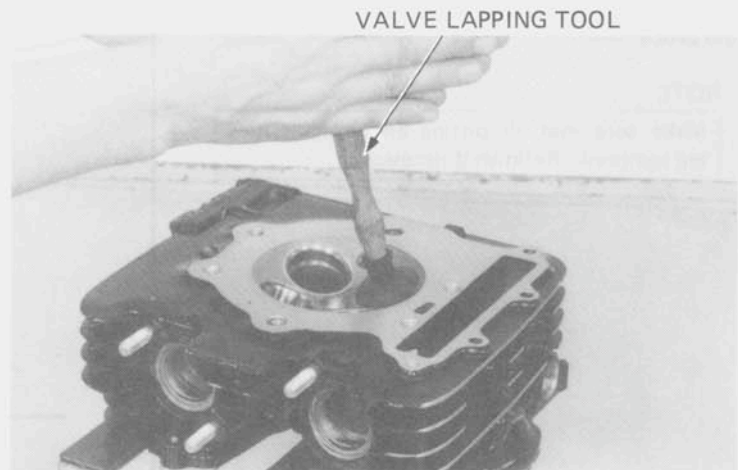
Refinish the seat to the correct width, using a 45 degree finish cutter.





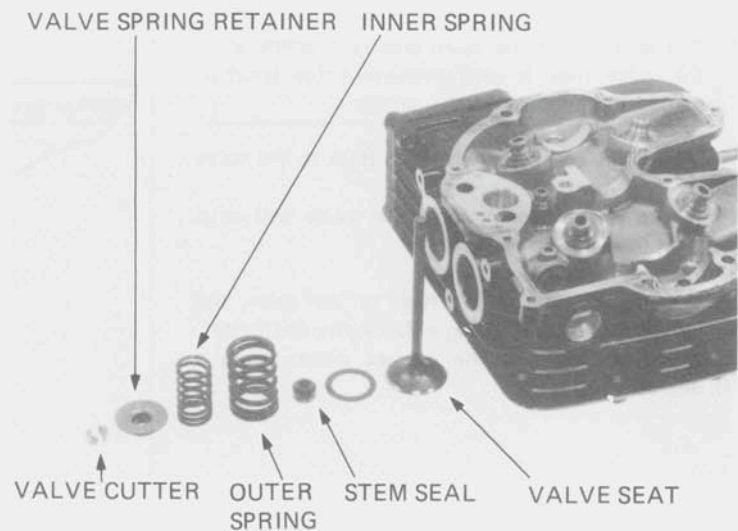
CYLINDER HEAD/VALVES

After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure. After lapping, wash all residual compound off the cylinder head, valve, and valve guide.



CYLINDER HEAD ASSEMBLY

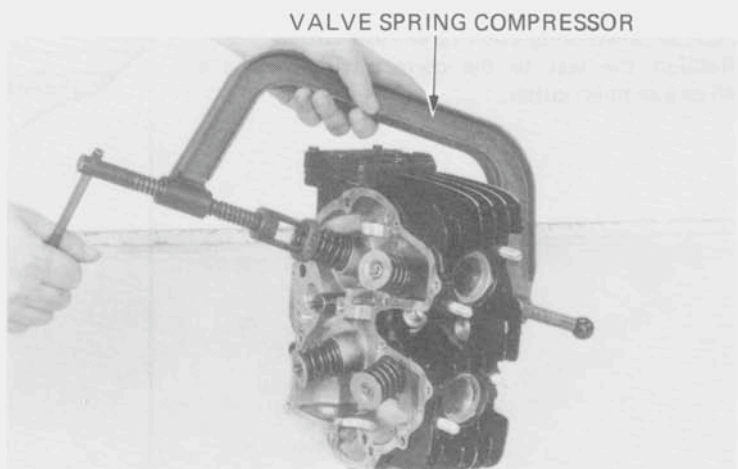
Lubricate each valve stem with oil.
Insert the valves into the valve guides.
Install new valve stem seals.
Install the valve spring seat, springs, and retainers.
The springs tightly wound coils should face in toward the combustion chamber.



Compress the valve springs using the valve spring compressor and install the valve coppers.

CAUTION

To prevent loss of valve spring tension, do not compress the valve spring more than necessary.

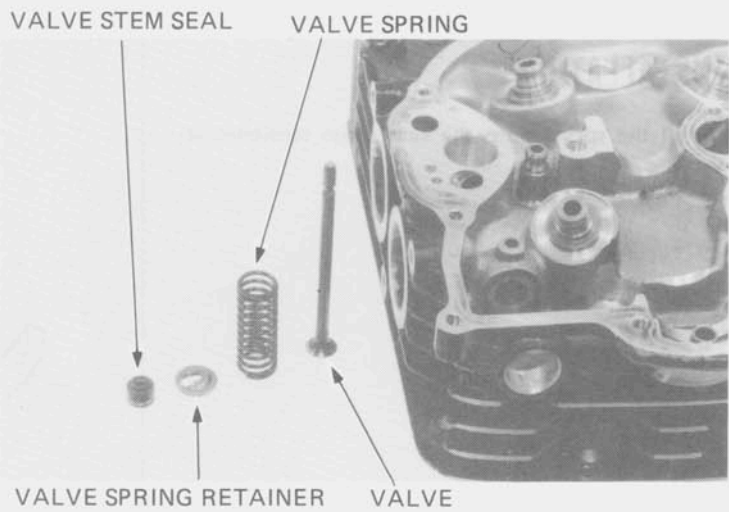




CYLINDER HEAD/VALVES

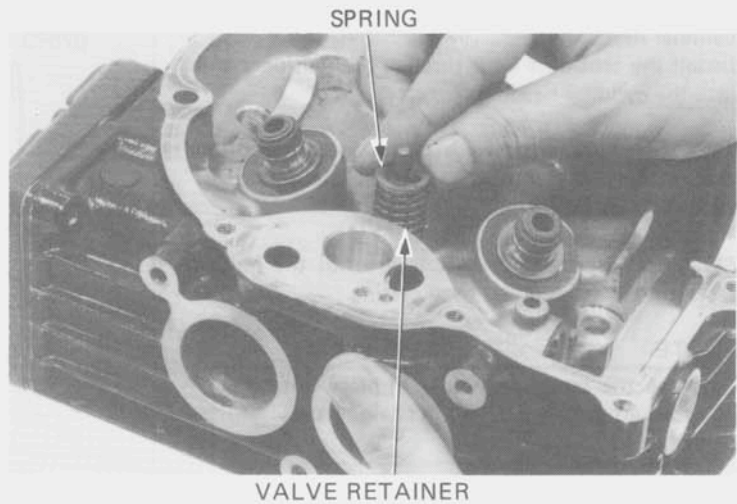
SUB CHAMBER VALVE INSTALLATION

Lubricate the valve stem with oil.
Insert the valve into the valve guide.



Install the new valve stem seal.
Install the valve spring and retainer.

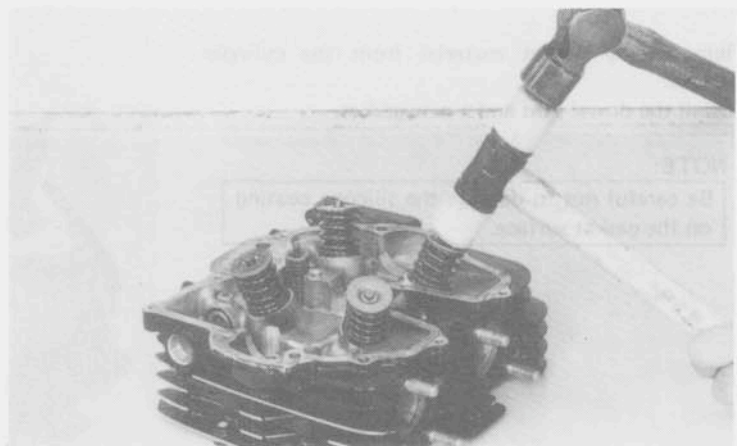
Compress the subchamber valve spring, slip the
retainer onto the groove on the valve stem.



CAUTION

*Support the cylinderhead above the working
bench surface to prevent bending the valve
stems.*

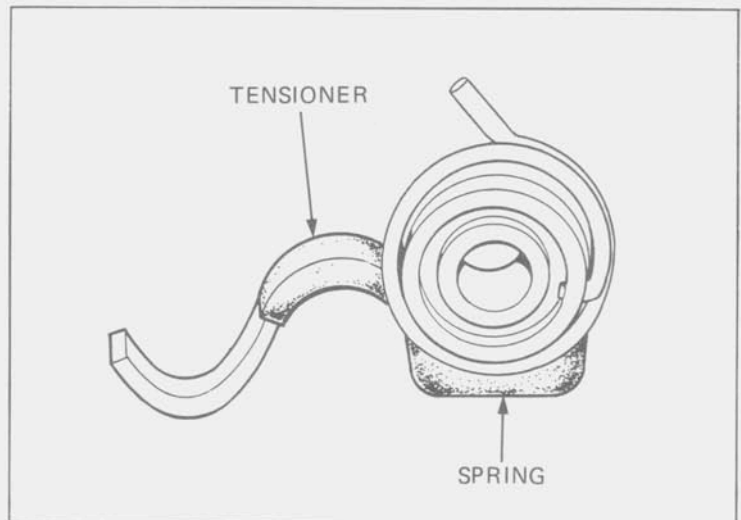
Tap the valve stems gently with a plastic hammer
to firmly seat the cotters.





CAM CHAIN TENSIONER INSTALLATION

Install the spring onto the cam chain tensioner as shown.



Place the cam chain tensioner and spring into the cylinder head.

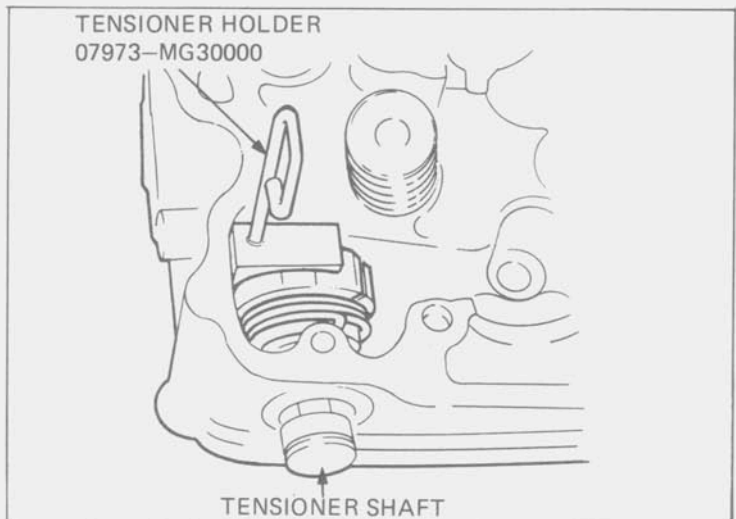
Install the tensioner shaft through the tensioner and into the cylinder head.

Push the tensioner's lever straight down and place the holder's pin into the hole in the tensioner, which will be facing up.

Slowly release the tensioner lever until the holder rests against the cylinder head casting.

NOTE

Leave the tensioner holder in place until the camshaft, sprocket, and chain have been installed.



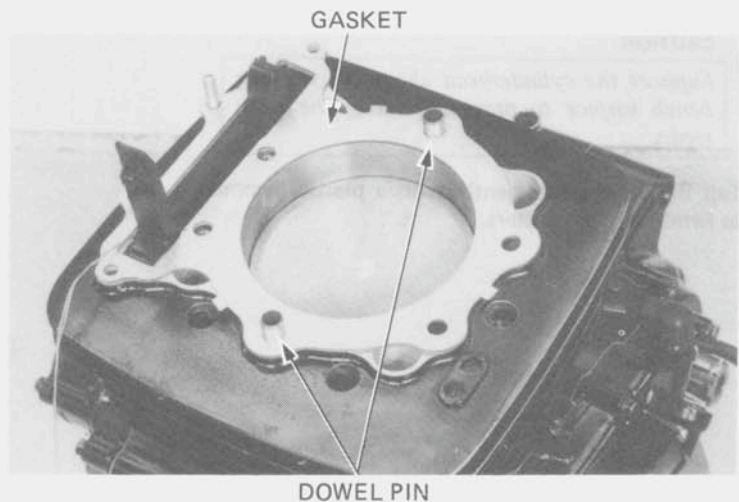
CYLINDER HEAD INSTALLATION

Remove any gasket material from the cylinder surface.

Install the dowel pins and a new gasket.

NOTE:

Be careful not to damage the silicone coating on the gasket surface.



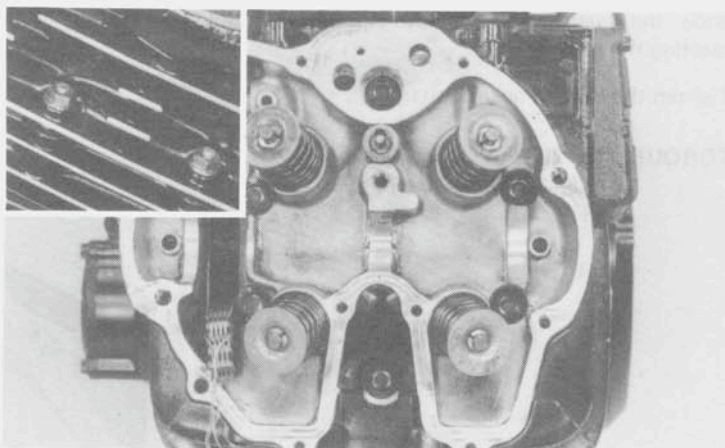


Install the cylinder head.

Tighten the six cylinder head bolts in a crisscross pattern in two or more steps.

TORQUE: 28–32 N·m
(2.8–3.2 kg·m, 20–23 ft·lb)

Tighten the two cylinder head nuts.



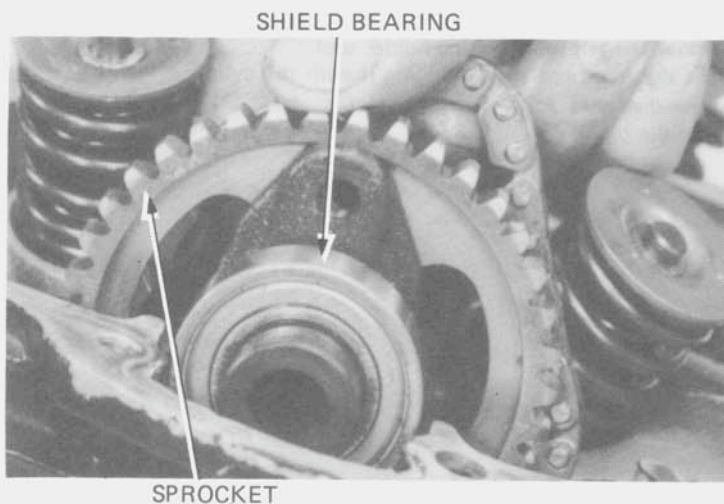
CAMSHAFT INSTALLATION

Install the cam bearings; the shielded bearing goes on the sprocket side with the shield facing out. Coat the camshaft journals with molybdenum disulfide grease.

Route the camshaft through the cam chain. Install the cam sprocket on the camshaft.

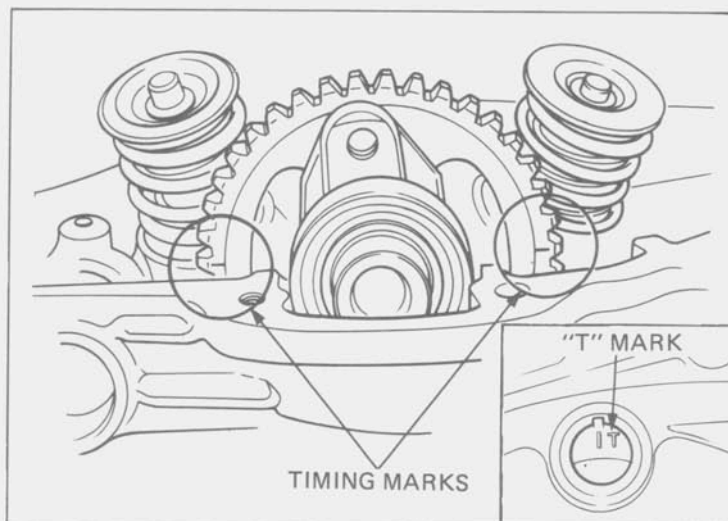
NOTE

Install the cam sprocket so that the timing marks face outside.



Turn the crankshaft and align the "T" mark on the generator rotor with the index notch on the left crankcase cover.

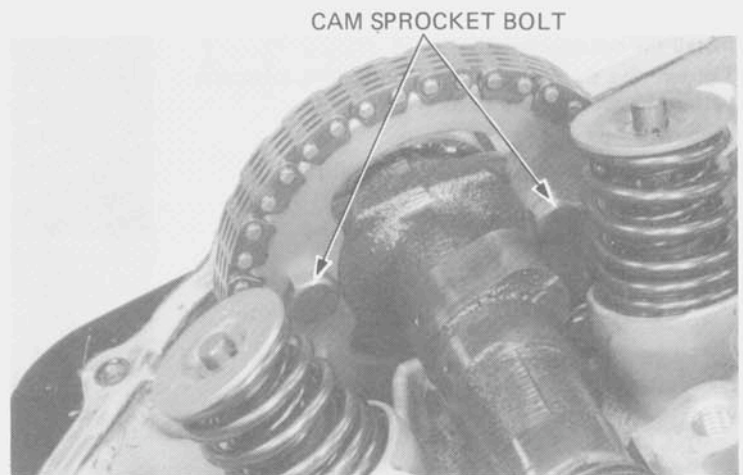
Align the timing marks on the cam sprocket with the top of the cylinder head.



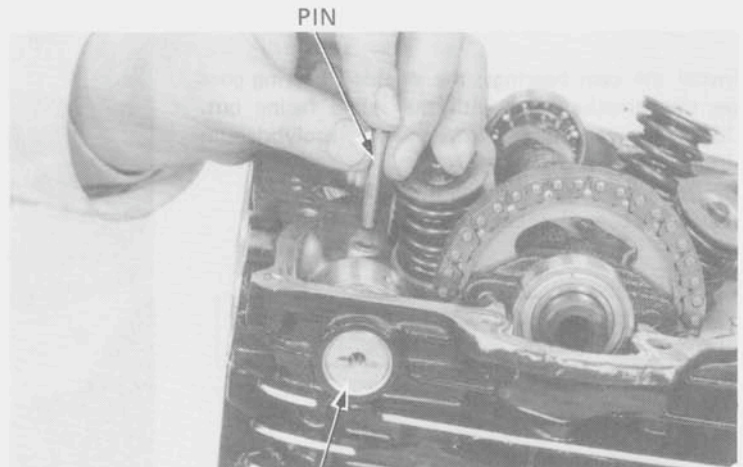
Slide the chain over the cam sprocket without rotating the sprocket.

Tighten the cam sprocket bolts.

TORQUE: 18–22 N·m
(1.8–2.2 kg·m, 13–16 ft·lb)

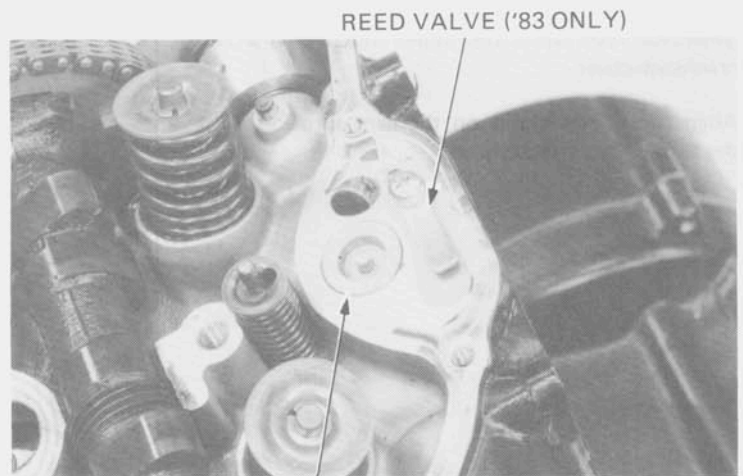


Remove the tensioner setting holder tool.
Turn the tensioner shaft, aligning it with the cylinder head edge as shown.
Insert the pin.



TENSIONER SHAFT

Make sure that O-ring on the cylinder head bolt hole plug is in good condition, then install the plug.
Install the reed valve and reed valve stopper ('83 only).



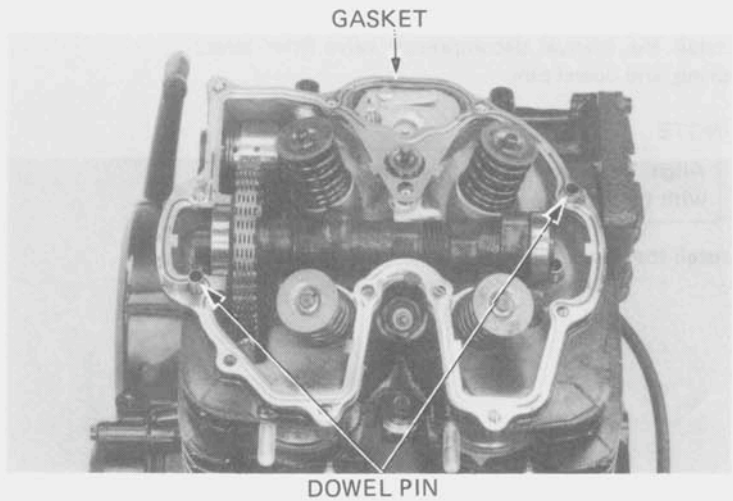
CYLINDER HEAD BOLT HOLE PLUG



Install a new cylinder head cover gasket and dowel pins.

NOTE:

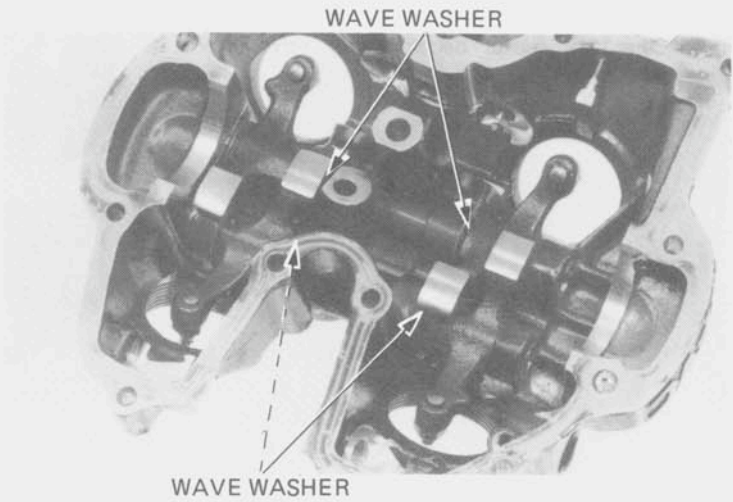
Be careful not to damage the silicone coating on the gasket surfaces.



CYLINDER HEAD COVER ASSEMBLY

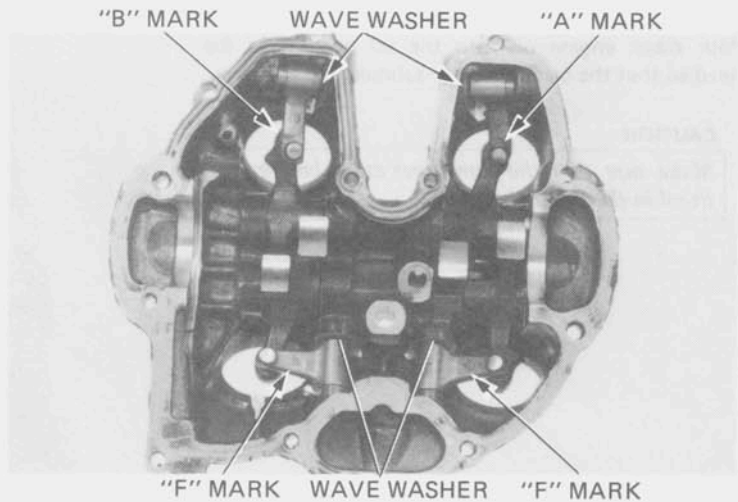
Apply engine oil to the rocker arm shafts. Install the rocker arms, rocker arm shafts, washers and wave washers. Tighten the rocker arm shafts to the specified torque.

TORQUE: 20–30 N·m
(2.0–3.0 kg-m, 14–22 ft-lb)



Apply engine oil to the subrocker arms shafts. Install the subrocker arms, subrocker arm shafts, washers and wave washers. Tighten the subrocker arm shafts.

IN: 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
EX: 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)





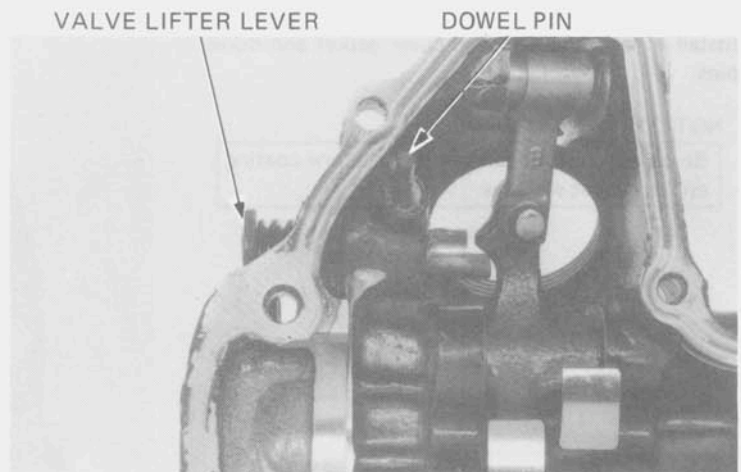
CYLINDER HEAD/VALVES

Install the manual decompressor valve lifter lever, spring, and dowel pins.

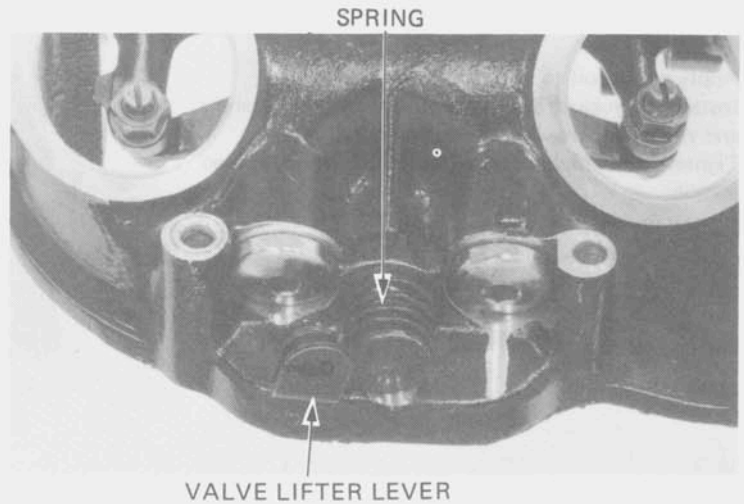
NOTE

Align the cut-out in the valve lifter shaft with the pin hole shown.

Install the dowel pin.



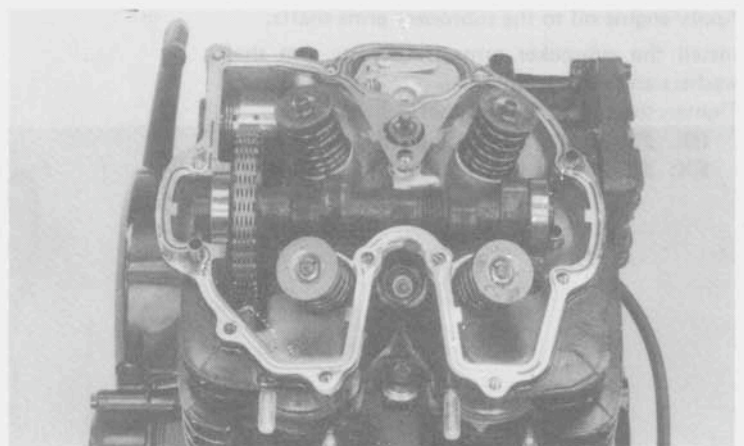
Install the kick starter decompressor valve lifter lever and spring.



Pour clean engine oil into the oil pockets in the head so that the cam lobes are submerged.

CAUTION

Make sure that the cam lobes are submerged in oil in the oil pockets.

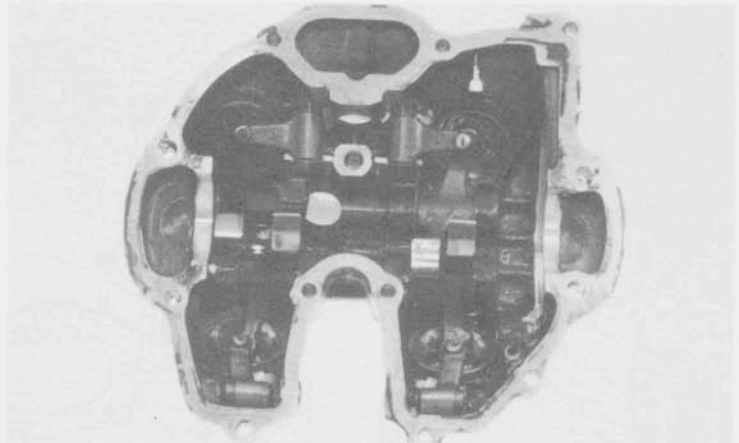




CYLINDER HEAD COVER INSTALLATION

Clean the cylinder head mating surface of the cylinder head cover.

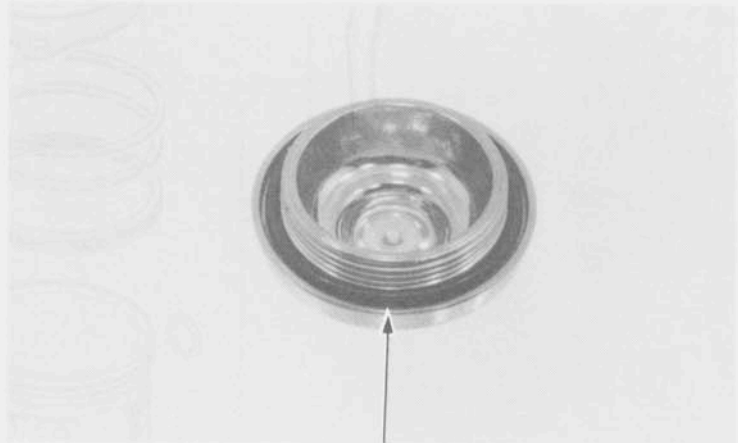
Loosen the valve adjusting screws and then install the cylinder head cover.



Install the valve adjuster covers.

NOTE

Make sure the cover O-ring is properly seated in the groove.



O-RING

Tighten the cylinder head cover bolts to the specified torque.

TORQUE:

8 mm bolt:	20–26 N·m (2.0–2.6 kg·m, 15–19 ft·lb)
6 mm bolt:	10–14 N·m (1.0–1.4 kg·m, 7–10 ft·lb)
6 mm SH bolt:	8–12 N·m (0.8–1.2 kg·m, 6–9 ft·lb)

NOTE

- Tighten the head cover bolts in a criss-cross pattern in two or more steps.
- Clean excessive sealant from the head.

Adjust the valve clearance (Page 3-7).

Connect the decompression cables.

Install the oil pipe with four sealing washers and oil bolts.

Adjust the manual starter decompressor (Page 3-8).

Adjust the kick starter decompressor (Page 3-9).

