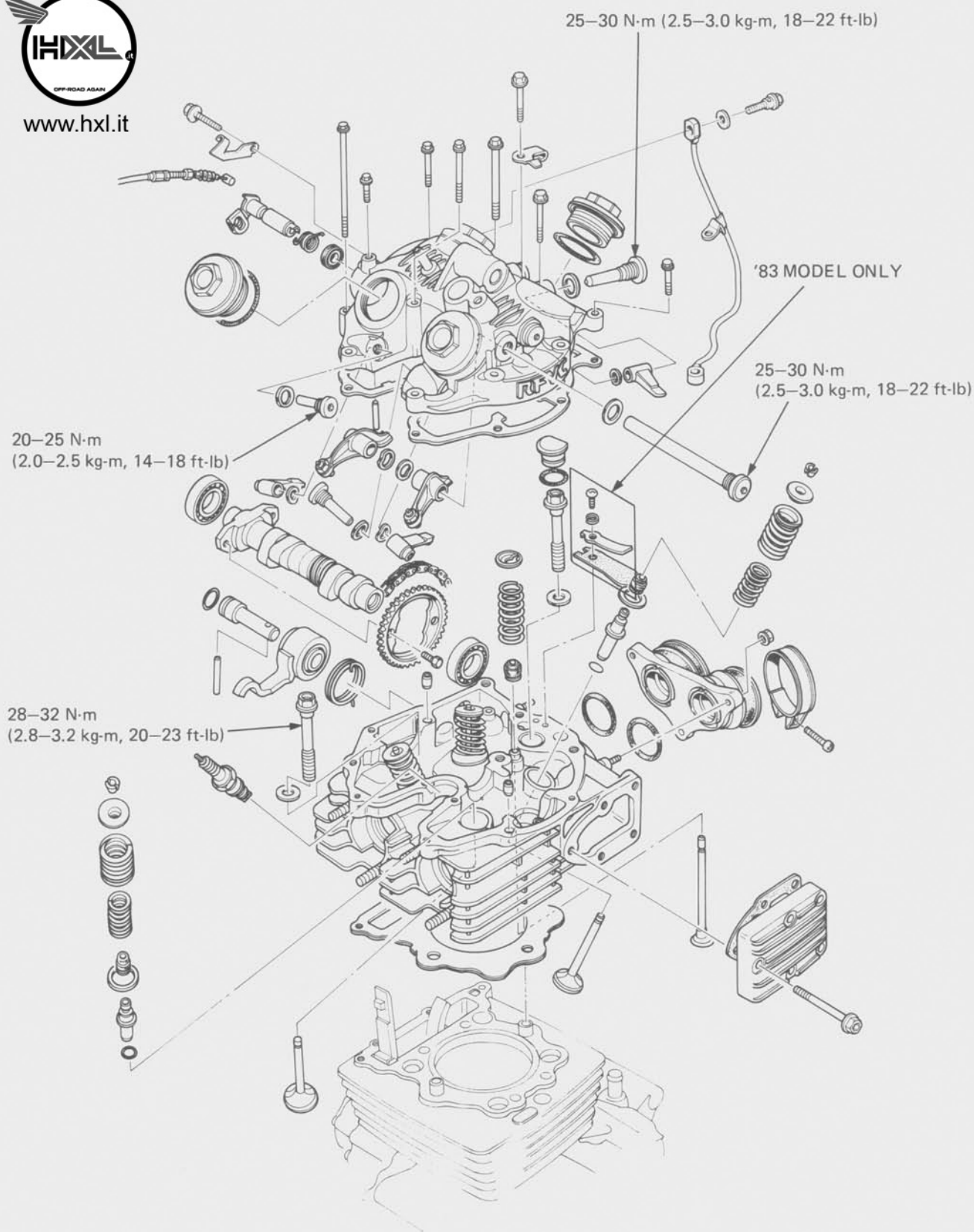




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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- This section covers maintenance of the cylinder head, valves, camshaft, rocker arms and subrocker arms.
- The engine must be removed from the frame for top-end service.
- Before assembly, apply molybdenum disulfide grease to the camshaft journal to provide initial lubrication.
- Pour clean engine oil into the oil pockets in the cylinder head to lubricate the cams.

TOOLS

SPECIAL TOOL

Camchain tensioner holder	07973-MG30001
Valve guide reamer, 6.6 mm	07984-6570100

COMMON TOOLS

Valve guide driver, 6.6 mm	07742-0010200 (Not available in U.S.A.) or 07942-6570100
Valve spring compressor	07757-0010000

TORQUE VALUES

Cylinder head bolt	28-32 N·m (28-32 kg-m, 20-23 ft-lb)
Cam sprocket bolt	18-22 N·m (1.8-2.2 kg-m, 13-16 ft-lb)
Rocker arm adjuster lock nut	18-22 N·m (1.8-2.2 kg-m, 13-16 ft-lb)
Rocker arm shaft	25-30 N·m (2.5-3.0 kg-m, 14-22 ft-lb)
Subrocker arm shaft (IN)	25-30 N·m (2.5-3.0 kg-m, 18-22 ft-lb)
Subrocker arm shaft (EX)	20-25 N·m (2.0-2.5 kg-m, 14-18 ft-lb)
Cylinder head cover (6 mm SH)	8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)
Cylinder head cover (6 mm)	10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)
Cylinder head cover (8 mm)	20-26 N·m (2.0-2.6 kg-m, 14-19 ft-lb)
Spark plug	15-20 N·m (1.5-2.0 kg-m, 11-14 ft-lb)



SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT	
Compression			12.5 kg/cm ² (175 psi)		
Camshaft	Cam lift	IN	31.023 mm (1.2214 in)	30.85 mm (1.215 in)	
		EX	30.976 mm (1.2195 in)	30.81 mm (1.213 in)	
	Runout			0.04 mm (0.002 in)	
	Side clearance		0.05–0.25 mm (0.002–0.010 in)	0.40 mm (0.016 in)	
Rocker arm	I.D.		11.50–11.518 mm (0.4528–0.4535 in)	11.55 mm (0.455 in)	
Subrocker arm	I.D.	IN	8.00–8.015 mm (0.3150–0.3155 in)	8.05 mm (0.317 in)	
		EX	7.00–7.015 mm (0.2756–0.2761 in)	7.05 mm (0.277 in)	
Rocker arm shaft	O.D.		11.466–11.484 mm (0.4514–0.4521 in)	11.41 mm (0.449 in)	
Subrocker arm shaft	O.D.	IN	7.972–7.969 mm (0.3137–0.3139 in)	7.92 mm (0.312 in)	
		EX	6.972–6.969 mm (0.2744–0.2745 in)	6.92 mm (0.272 in)	
Rocker arm shaft-to-arm clearance			0.016–0.052 mm (0.0006–0.0020 in)	0.14 mm (0.006 in)	
Valve spring	Free length	Inner	35.1 mm (1.240 in)	34.1 mm (1.34 in)	
		Outer	36 mm (1.417 in)	35.0 mm (1.38 in)	
	Preload/length	Inner	6.14 ± 0.4 kg/28 mm		
		Outer	11.8 ± 1.0 kg/31.5 mm		
Sub chamber valve spring free length			40.5 mm (1.594 in)	39.3 mm (1.55 in)	
Sub chamber valve spring preload/length			4.1 ± 0.4 kg/		
Valve	Stem O.D.	IN	6.575–6.59 mm (0.2589–0.2594 in)	6.56 mm (0.257 in)	
		EX	6.565–6.575 mm (0.2585–0.2589 in)	6.55 mm (0.258 in)	
	Stem-to-guide clearance	IN	0.010–0.040 mm (0.0004–0.0016 in)		
		EX	0.030–0.055 mm (0.0012–0.0022 in)	0.080 mm (0.0031 in)	
	Valve seat width	IN/EX	1.2–1.4 mm (0.05–0.06 in)	2.0 mm (0.08 in)	
	Valve face	IN	1.20–1.85 mm (0.047–0.071 in)	2.6 mm (0.10 in)	
	Width	EX	0.9–1.7 mm (0.04–0.67 in)	2.4 mm (0.09 in)	
Valve guide	I.D.	IN	6.600–6.615 mm (0.2598–0.2421 in)	6.63 mm (0.261 in)	
		EX	6.600–6.615 mm (0.2598–0.2421 in)	6.63 mm (0.261 in)	
Sub chamber valve stem O.D.			4.97–4.985 mm (0.1957–0.1963 in)	4.96 mm (0.195 in)	
Guide I.D.			IN	5.010–5.028 mm (0.1972–0.1980 in)	5.02 mm (0.199 in)
Sub chamber valve face width			1.00–1.40 mm (0.039–0.551 in)	2.0 mm (0.08 in)	
Cylinder head	Warpage			0.1 mm (0.004 in)	
Sub chamber valve seat width				1.5 mm (0.059 in)	



TROUBLESHOOTING

Engine top-end problems are usually performance-related and can usually be diagnosed by a compression test. Engine noises can usually be traced to the top-end with a sounding rod or stethoscope.

Low Compression

1. Valves
 - Incorrect valve adjustment
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
2. Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
3. Cylinder and piston (Refer to Section 7)
4. Decompressor adjustment incorrect

High Compression

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

Excessive Noise

1. Incorrect valve adjustment
2. Sticking valve or broken valve spring
3. Damaged or worn rocker arm or camshaft
4. Loose or worn cam chain
5. Worn or damaged cam chain tensioner
6. Worn cam sprocket teeth

Poor Idling

1. Compression too low
2. Decompressor adjustment incorrect
3. Subchamber valve stuck open.

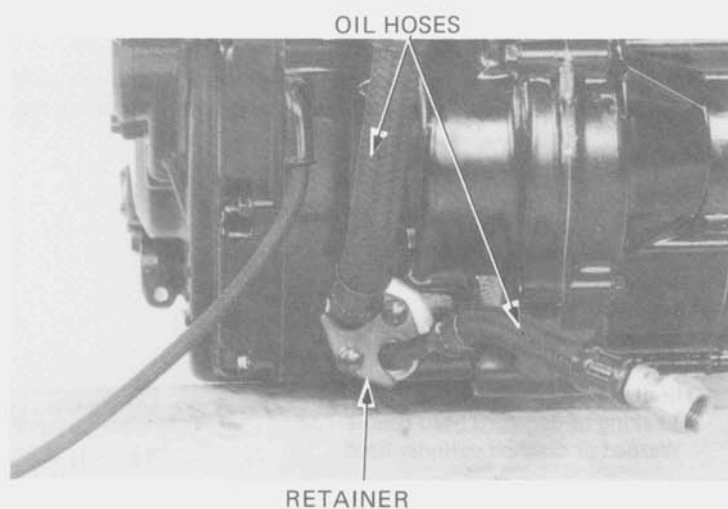
Kick Starting Difficult

1. Decompressor adjustment incorrect

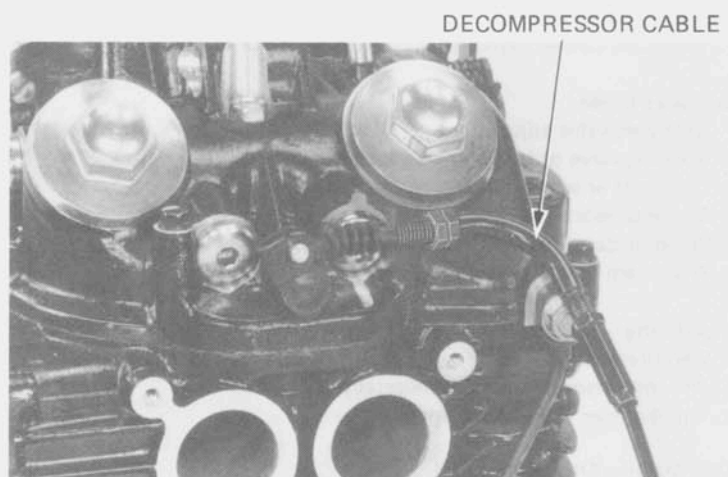


CYLINDER HEAD COVER REMOVAL

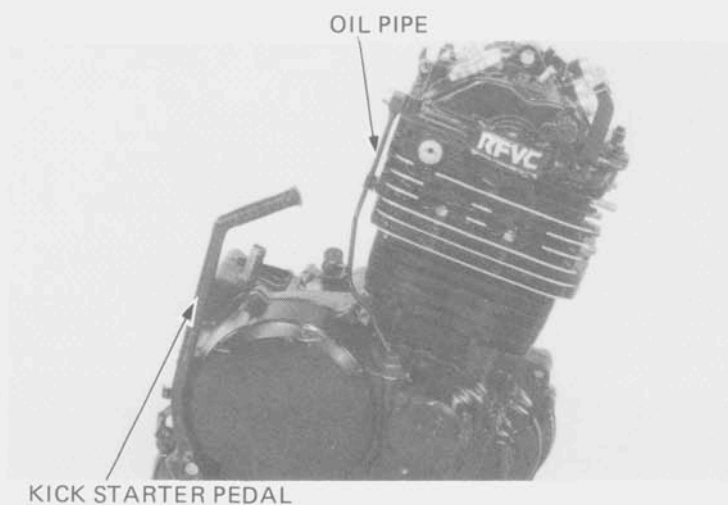
Remove the engine from the frame (See Section 5).
Remove the oil hoses by removing the retainer.



Loosen the kick starter decompressor cable lock nut and remove the cable from the holder.
Disconnect the cable from the valve lifter lever.

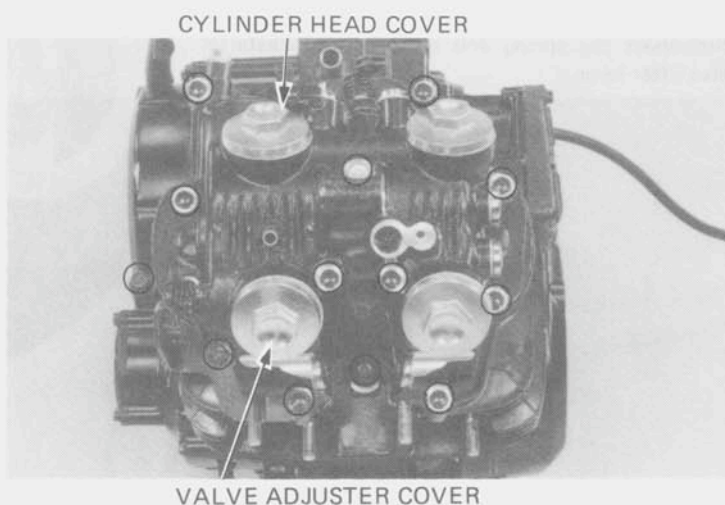


Remove the oil pipe.
Remove the kick starter pedal.



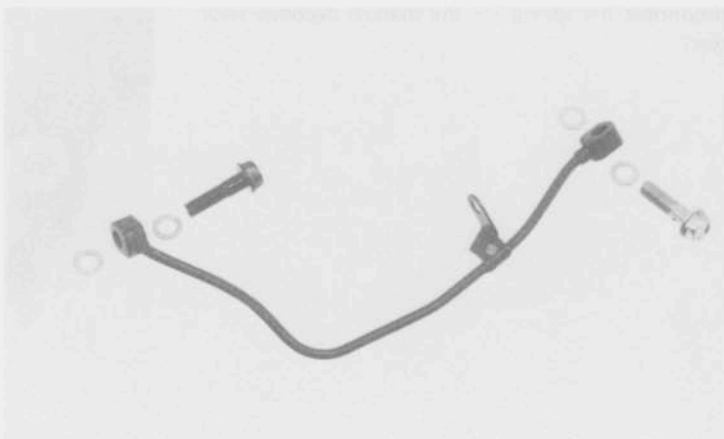


Remove the valve adjuster covers.
Remove the cylinder head cover bolts.
Removes the cylinder head cover.



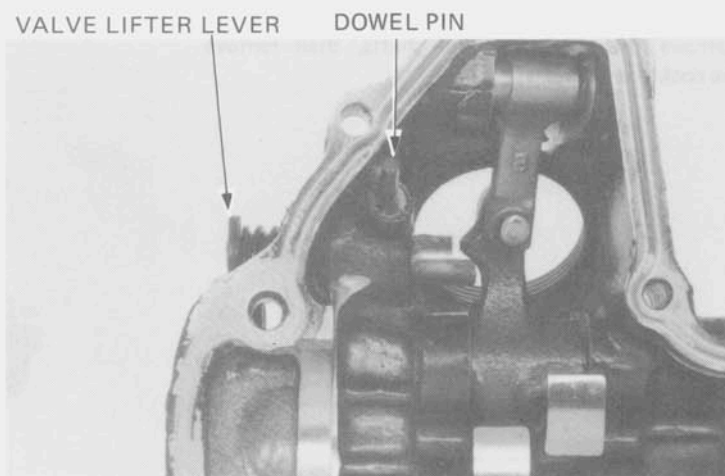
OIL PIPE INSPECTION

Inspect the oil pipe and bolts for clogging.
Inspect the condition of the sealing washers.



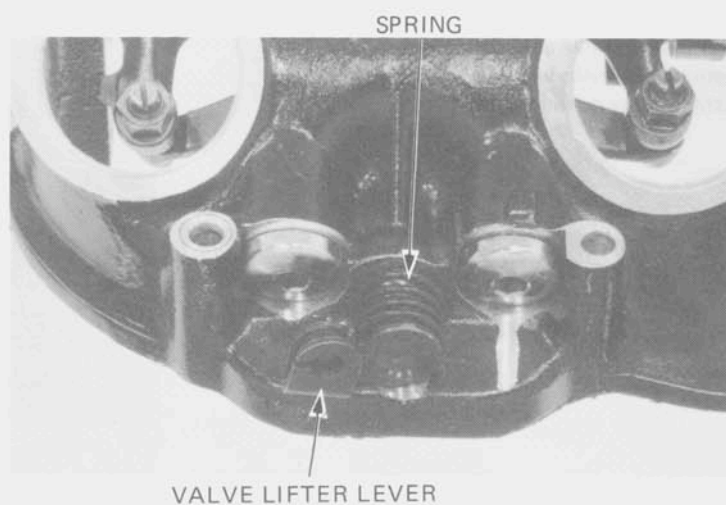
CYLINDER HEAD COVER DISASSEMBLY

Hold the cylinder head cover securely and remove the dowel pin holding the valve lifter lever.

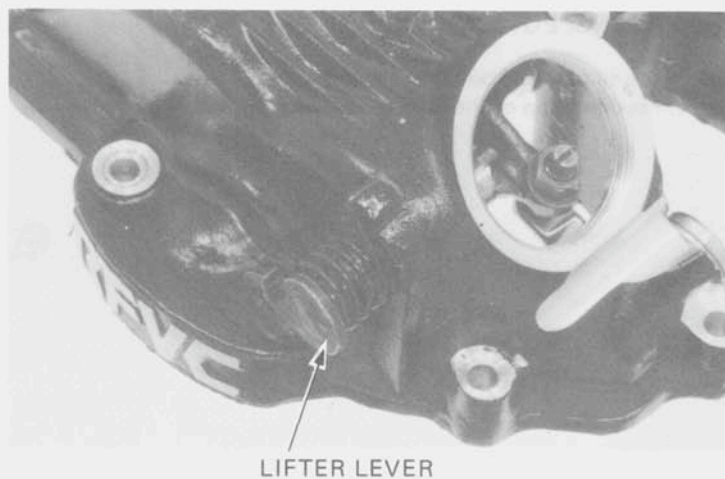




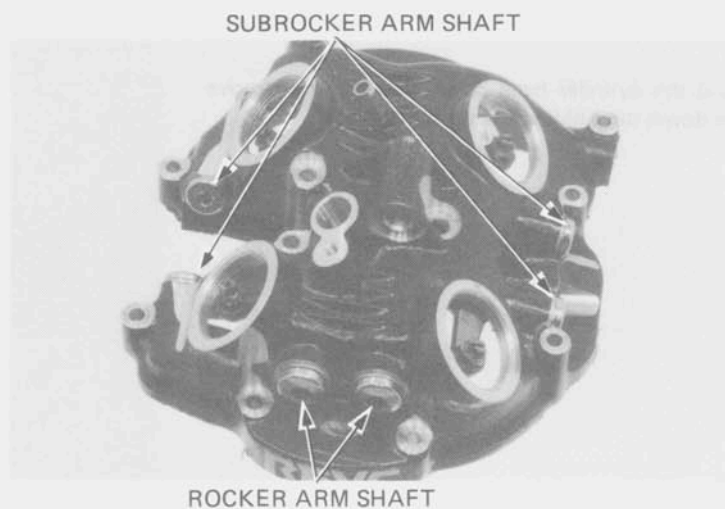
Disconnect the spring and remove the kickstarter valve lifter lever.



Disconnect the spring for the manual decompressor lever.

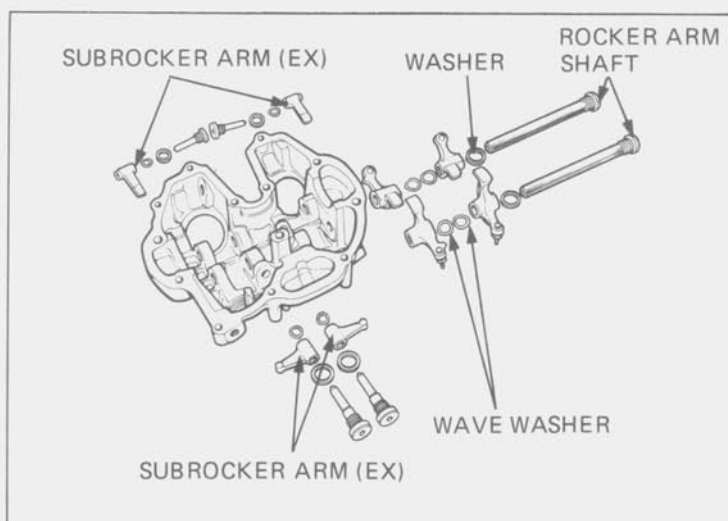


Remove the subrocker arm shafts, then remove the rocker arm shafts.





Remove the subrocker arms, rocker arms and wave washers from their shafts.

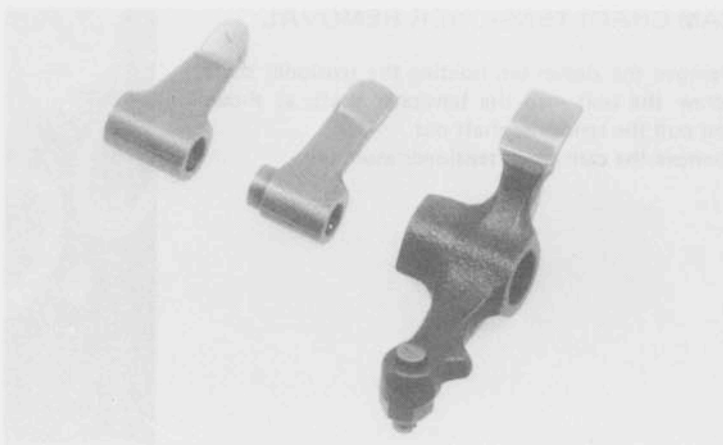


ROCKER ARM AND SUBROCKER ARMS INSPECTION

Inspect the rocker arms and subrocker arms sub-rocker arm requires for damage, wear or clogged oil holes.

NOTE

If any rocker arm or require servicing or replacement, inspect the corresponding cam lobe for scoring, chipping or flat spots.



[Rocker arm and rocker arm shaft]

Measure the I.D. of each rocker arm.

SERVICE LIMIT: 11.55 mm (0.455 in)

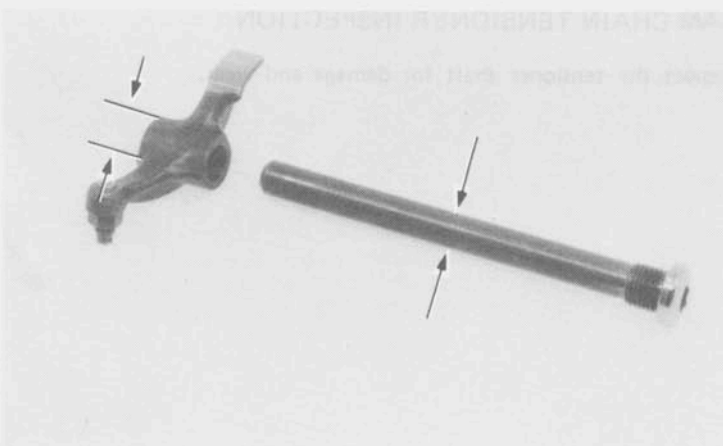
Inspect rocker arm shafts for wear or damage.

Measure the O.D.

SERVICE LIMIT: 11.41 mm (0.449 in)

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.14 mm (0.006 in)




[Subrocker arm and subrocker armshaft]

Measure the I.D. of each subrocker arm EX and IN.

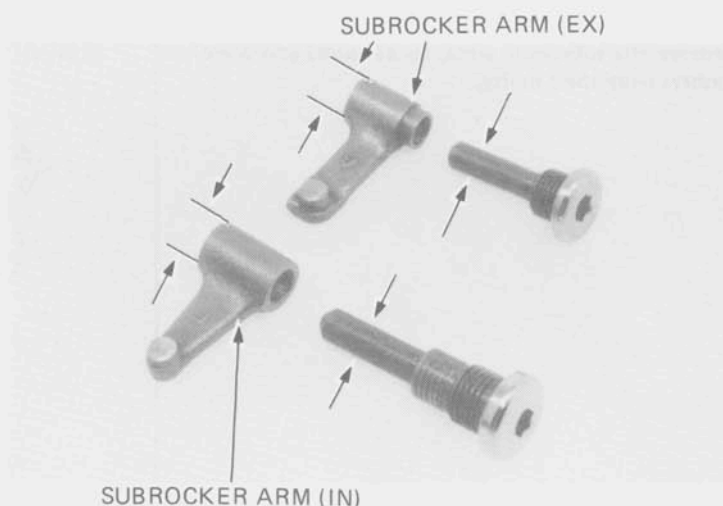
SERVICE LIMIT: EX 7.05 mm (0.277 in)
 IN 8.05 mm (0.317 in)

Inspect subrocker arm shafts for wear or damage.
 Measure the O.D.

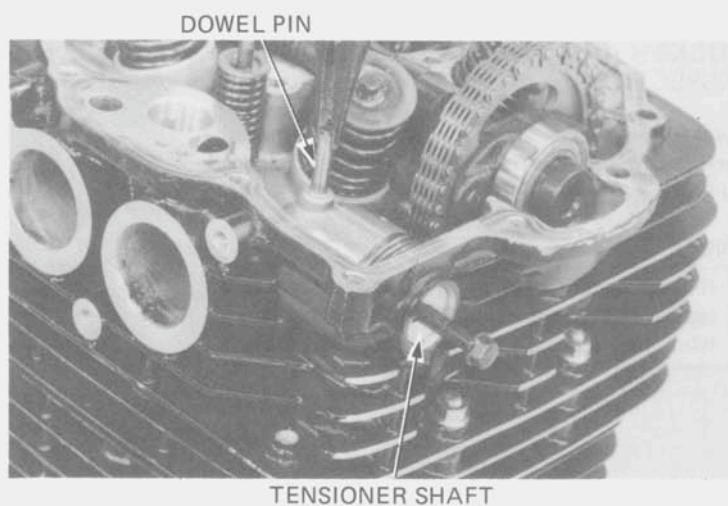
SERVICE LIMIT: EX 6.92 mm (0.272 in)
 IN 7.92 mm (0.312 in)

Calculate the subrocker arms to shafts clearance.

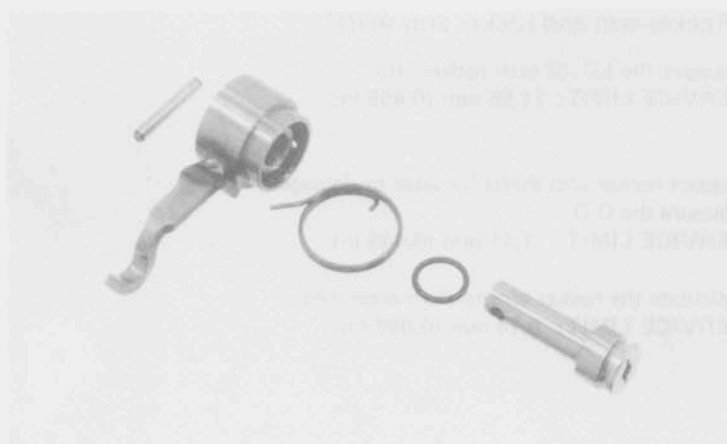
SERVICE LIMIT: 0.13 mm (0.005 in)


CAM CHAIN TENSIONER REMOVAL

Remove the dowel pin holding the tensioner shaft.
 Screw the bolt into the tensioner shaft, as shown
 and pull the tensioner shaft out.
 Remove the cam chain tensioner assembly.

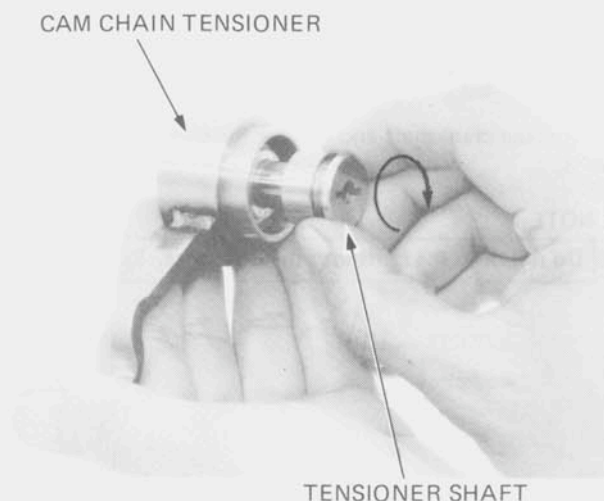

CAM CHAIN TENSIONER INSPECTION

Inspect the tensioner shaft for damage and wear.





Insert the tensioner shaft into the tensioner and inspect the tensioner by turning the shaft. The tensioner shaft should turn clockwise freely and should not turn counter-clockwise.



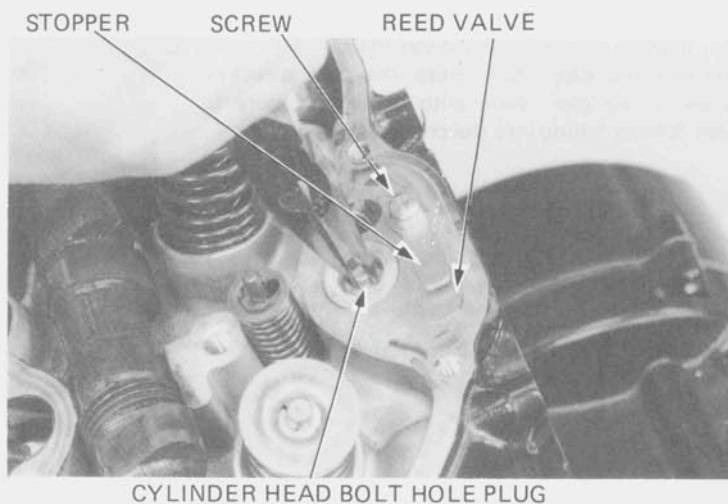
'83: REED VALVE REMOVAL

Remove the reed valve and stopper by removing the attaching screw.

NOTE:

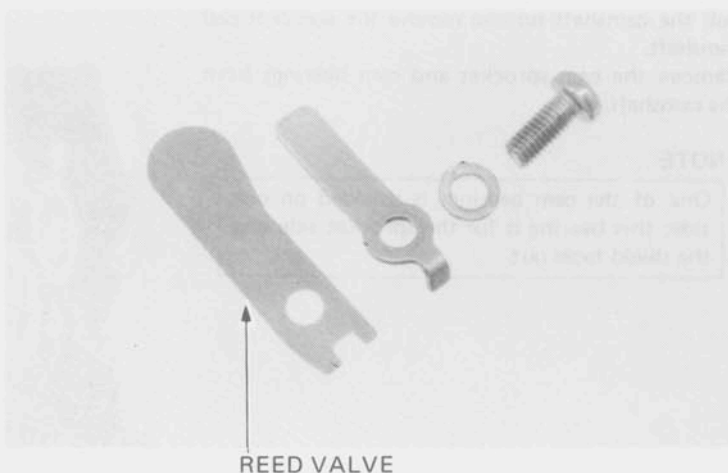
Do not bend or distort the reed valve stopper.

Remove the cylinder head bolt hole plug.



'83: REED VALVE INSPECTION

Inspect the reed valve for damage or distortion.





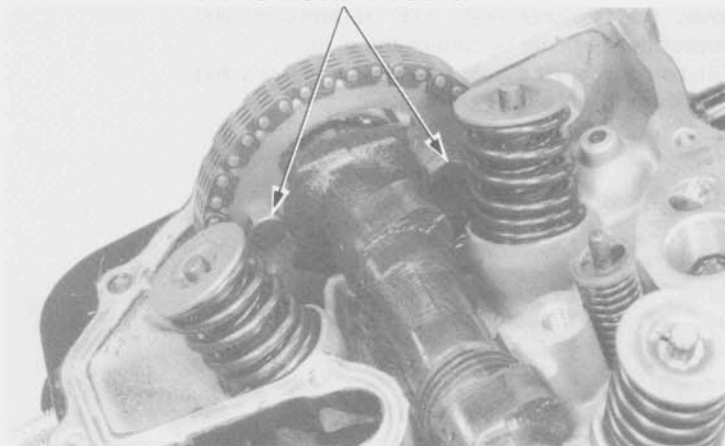
CAMSHAFT REMOVAL

Remove the crankshaft hole cap and timing hole cap.
Rotate the crankshaft and remove the cam sprocket bolts.

NOTE

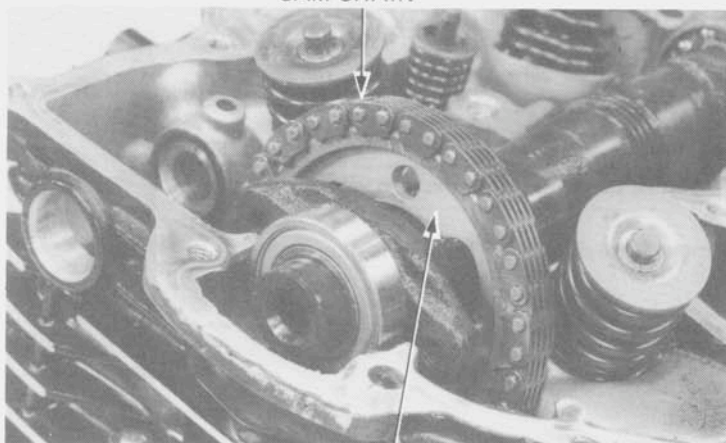
Do not drop the bolts into the crankcase.

CAM SPROCKET BOLTS



Pull the cam sprocket off the camshaft.
Remove the cam chain from the cam sprocket.
Suspend the cam chain with a piece of wire to keep it from falling into the crankcase.

CAM CHAIN



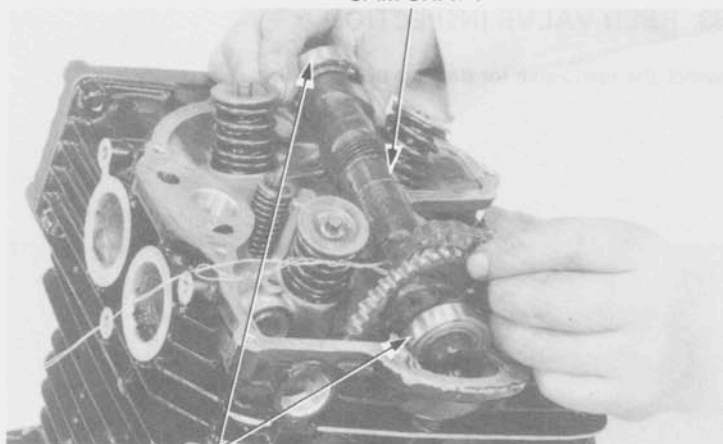
CAM SPROCKET

Pull the camshaft up and remove the sprocket and camshaft.
Remove the cam sprocket and cam bearings from the camshaft.

NOTE

One of the cam bearings is shielded on one side; this bearing is for the sprocket side and the shield faces out.

CAM SHAFT



CAM SHAFT BEARINGS



CAMSHAFT INSPECTION

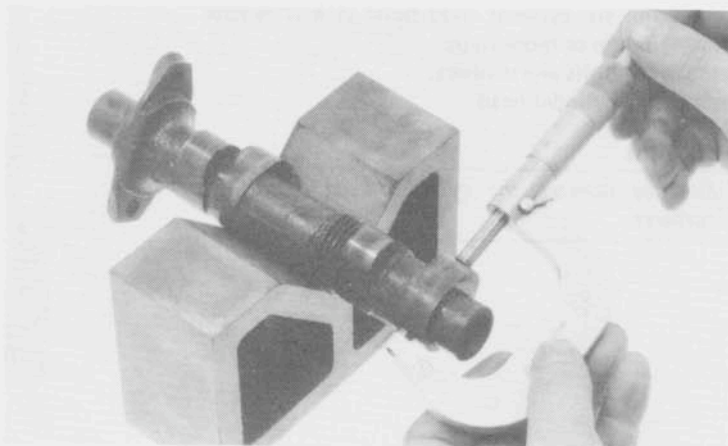
Check the camshaft journals for wear or damage.



Check each cam lobe for wear or damage.
Measure the cam lobe height.

SERVICE LIMITS:

Intake: 30.85 mm (1.215 in)
Exhaust: 30.81 mm (1.213 in)

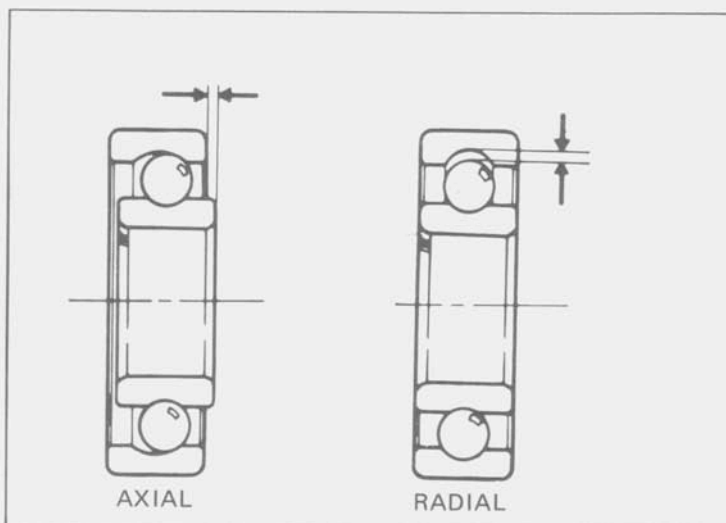


CAMSHAFT BEARING INSPECTION

Spin the camshaft bearings by hand check for play.
Replace a bearing with a new one if it is noisy or
has excessive play.

SERVICE LIMITS

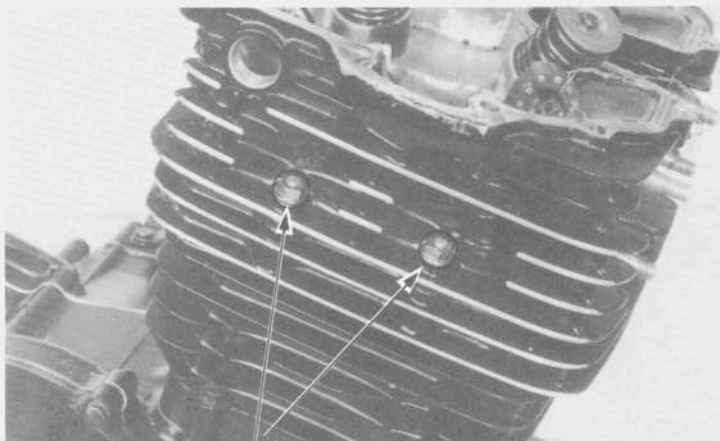
AXIAL: 0.10 mm (0.004 in)
RADIAL: 0.05 mm (0.002 in)





CYLINDER HEAD REMOVAL

Remove the cylinder head cover.
Remove the camshaft (Page 6-10)
Remove the cam chain tensioner (Page 6-8)
Remove the read valve and cap (Page 6-9)
Remove the cylinder head nuts.

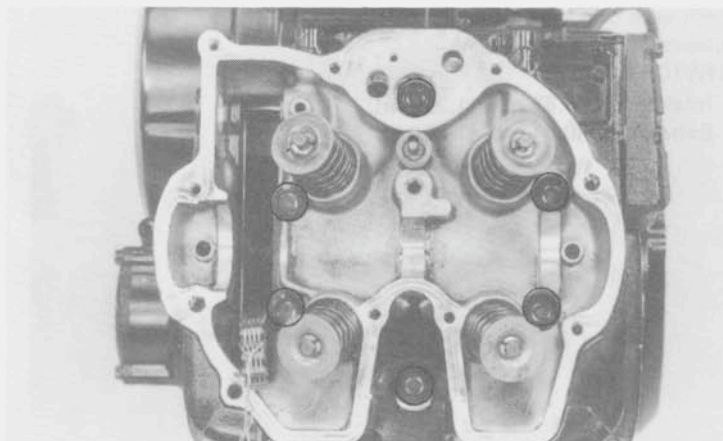


NUTS

Loosen the six cylinder head bolts in a crisscross pattern, in two or more steps.
Remove the bolts and washers.
Remove the cylinder head.

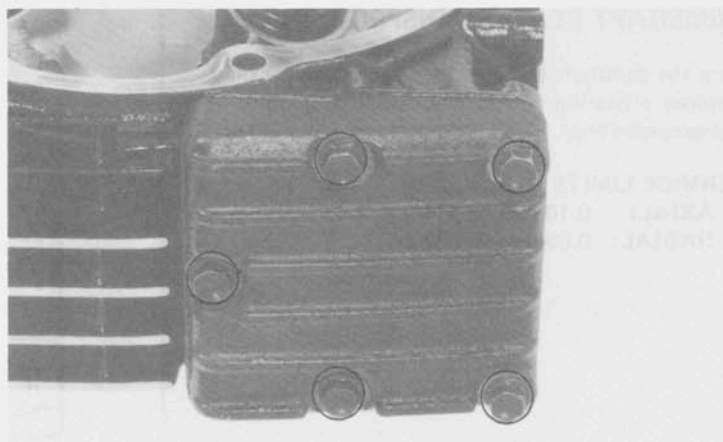
CAUTION

Do not damage the cylinder head mating surfaces.



SUBCHAMBER INSPECTION

Remove the bolts and subchamber cover.

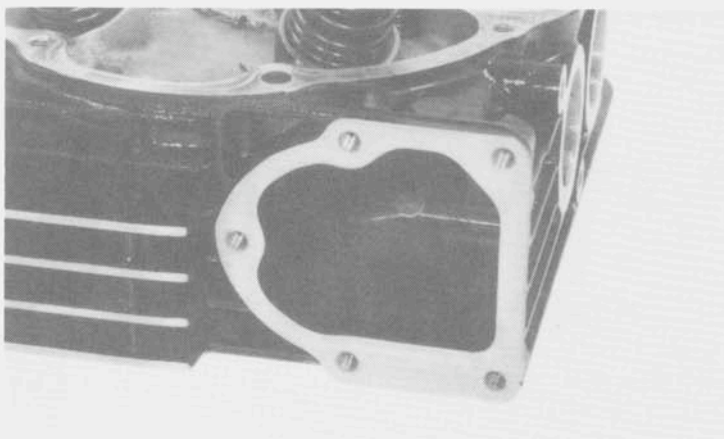




Clean the subchamber and reinstall the cover.

NOTE

Leave the cover off if you intend to install new guides or grind new valve seat, since you'll need to clean all cutting and grinding residue from the cylinder head.



CYLINDER HEAD DISASSEMBLY

CYLINDER HEAD DISASSEMBLY

Remove the valve spring cotters, retainers, springs, and valves with a valve spring compressor.

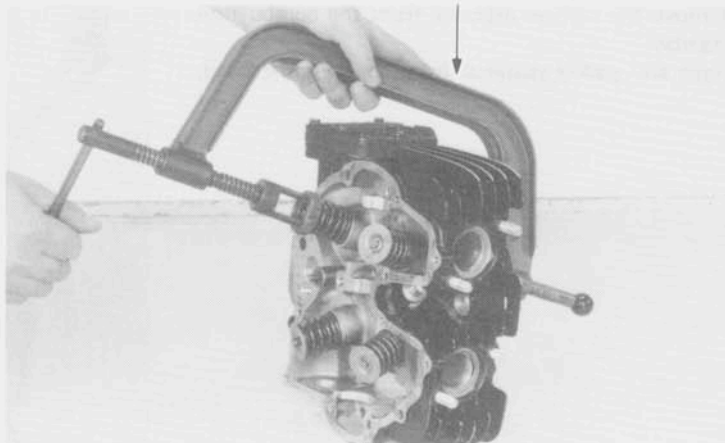
CAUTION

To prevent loss of tension do not compress the valve springs more than necessary to remove the cotters.

NOTE

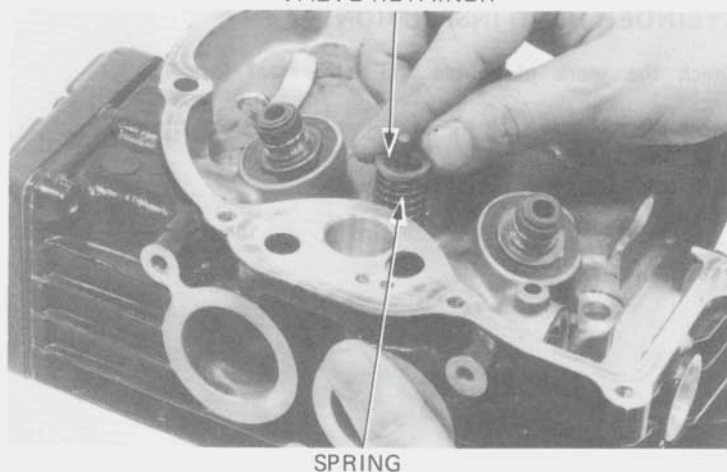
Mark all parts to ensure that they are re-assembled in their original locations.

VALVE SPRING COMPRESSOR
07757-0010000



VALVE RETAINER

Compress the subchamber valve spring, then grasp the retainer and slide it off the valve stem groove. Remove the subchamber valve, valve spring and retainer.



SPRING