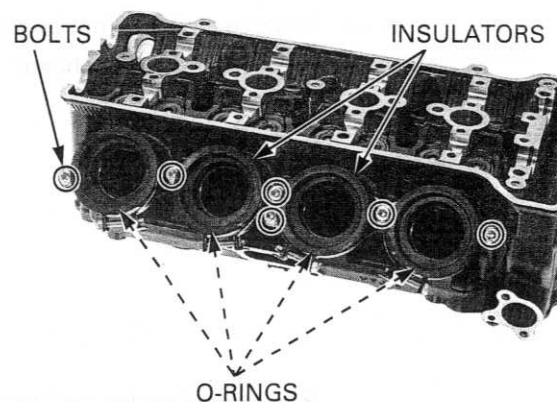


## CYLINDER HEAD/VALVES

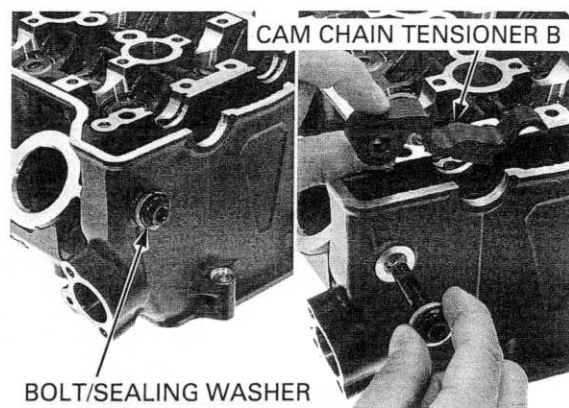
### CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 9-14).

Remove the bolts, insulators and O-rings.



Remove the bolt, sealing washer and cam chain tensioner B from the cylinder head.



Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

#### TOOLS:

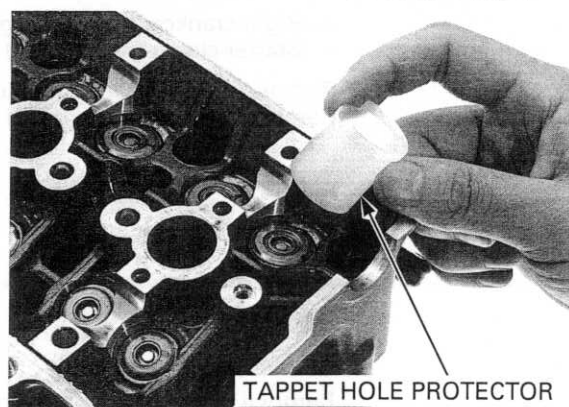
Tappet hole protector (IN)

Tappet hole protector (EX)

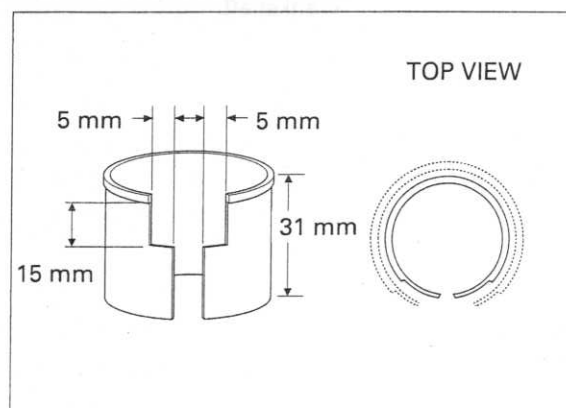
07HMG-MR70002

07JMG-KY20100

Not available in  
U.S.A.



An equivalent tool can easily be made from a plastic 35 mm film container as shown.



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

Remove the valve spring cotters using the special tools as shown.

## TOOLS:

Valve spring compressor

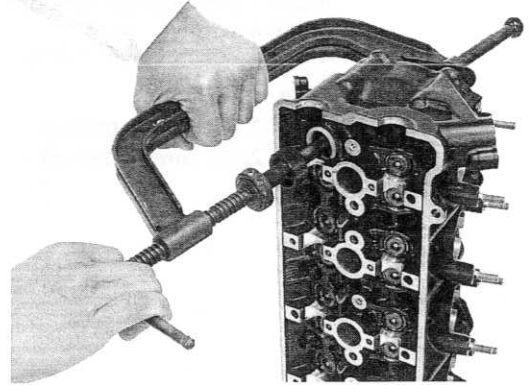
07757-0010000

Valve spring compressor attachment (IN)

07959-KM30101

Valve spring compressor attachment (EX)

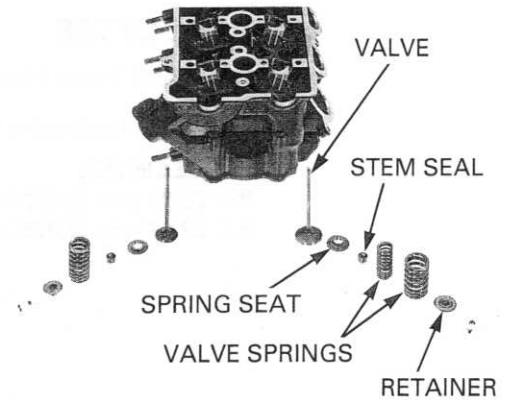
07JME-KY20100



Mark all parts during disassembly so they can be placed back in their original locations.

Remove the following:

- Spring retainer
- Inner/outer valve springs (IN)
- Valve spring (EX)
- Valve
- Stem seal
- Valve spring seat



## CYLINDER HEAD INSPECTION

### CYLINDER HEAD

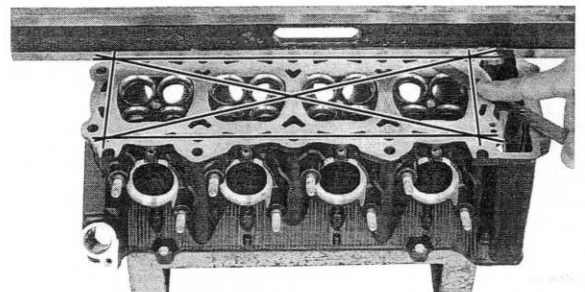
Avoid damaging the gasket surface.

Remove carbon deposits from the combustion chambers. Check the spark plug hole and valve areas for cracks.



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

**SERVICE LIMIT: 0.10 mm (0.004 in)**



## CYLINDER HEAD/VALVES

### VALVE LIFTER BORE

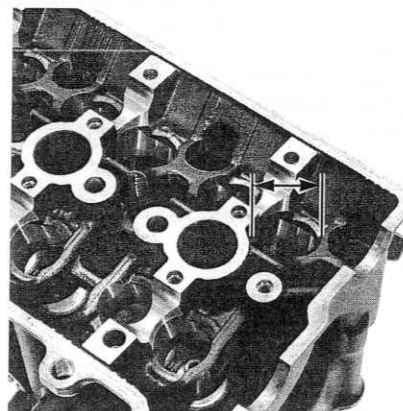
Inspect each valve lifter bore for scratches or abnormal wear.

Measure each valve lifter bore I.D.

#### SERVICE LIMITS:

IN: 26.04 mm (1.025 in)

EX: 22.54 mm (0.887 in)



### VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear.

Measure the each valve lifter O.D.

#### SERVICE LIMITS:

IN: 25.97 mm (1.022 in)

EX: 22.47 mm (0.885 in)



### VALVE SPRING

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

IN:

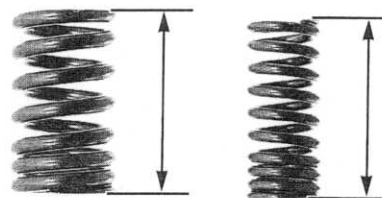
#### SERVICE LIMITS:

IN: Inner: 35.1 mm (1.38 in)

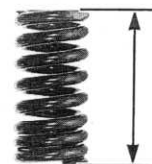
Outer: 39.2 mm (1.54 in)

EX: 39.6 mm (1.56 in)

Replace the springs if they are shorter than the service limits.



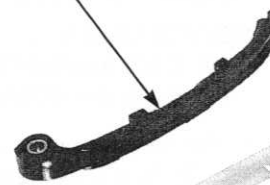
EX:



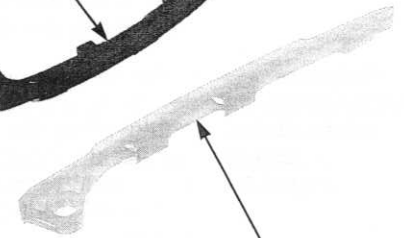
## CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner A and cam chain guide A for excessive wear or damage, replace them if necessary.

CAM CHAIN TENSIONER A

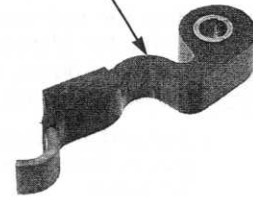


CAM CHAIN GUIDE A



Inspect the cam chain tensioner B for excessive wear or damage, replace it if necessary.

CAM CHAIN TENSIONER B



## VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide. Inspect each valve for bending, burning or abnormal stem wear.

Measure and record each valve stem O.D.

### SERVICE LIMITS:

**IN:** 3.965 mm (0.1561 in)

**EX:** 3.955 mm (0.1557 in)

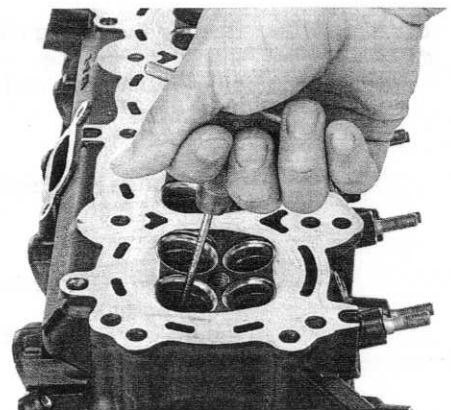


Ream the guides to remove any carbon deposits before checking clearances.

Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

### TOOL:

Valve guide reamer, 4.008 mm 07MMH-MV90100 or 07MMH-MV9010A (U.S.A. only)



## CYLINDER HEAD/VALVES

Measure and record each valve guide I.D.

**SERVICE LIMIT: IN/EX: 4.04 mm (0.159 in)**

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

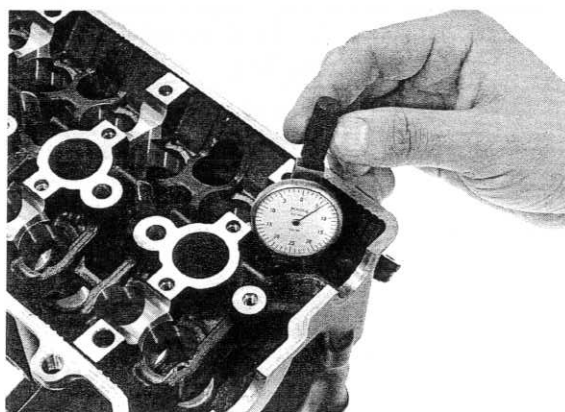
**SERVICE LIMITS:**

**IN: 0.075 mm (0.0030 in)**

**EX: 0.085 mm (0.0033 in)**

*Reface the valve seats whenever the valve guides are replaced (page 9-22).*

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



## VALVE GUIDE REPLACEMENT

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

*Do not use a torch to heat the cylinder head; it may cause warping.*

Heat the cylinder head to 100 – 150°C (212 – 302°F) with a hot plate or oven.

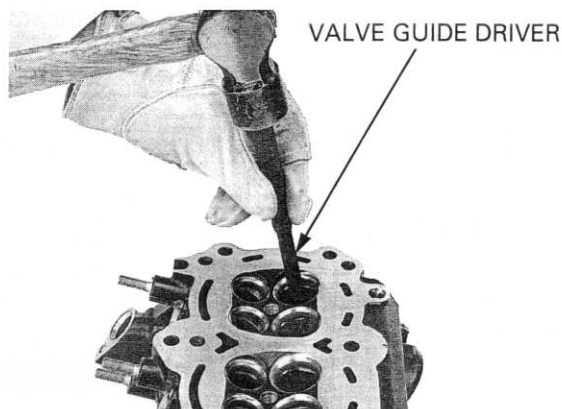
To avoid burns, wear heavy gloves when handling the heated cylinder head.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

**TOOL:**

**Valve guide driver**

**07JMD-KY20100**



Drive in the valve guides to the specified depth from the top of the cylinder head.

**SPECIFIED DEPTH:**

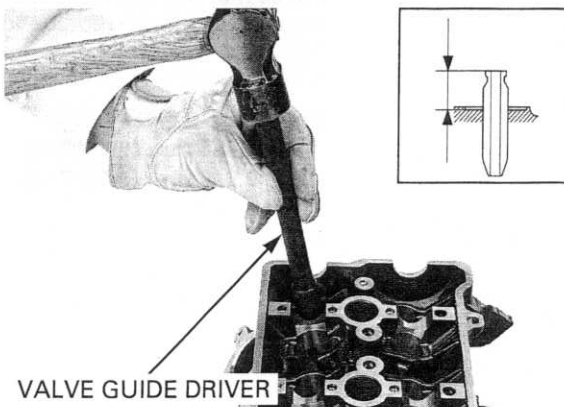
**IN: 17.1 – 17.4 mm (0.67 – 0.69 in)**

**EX: 15.8 – 16.1 mm (0.62 – 0.63 in)**

**TOOL:**

**Valve guide driver**

**07743-0020000**  
**Not available in U.S.A.**



Let the cylinder head cool to room temperature.

*Use cutting oil on the reamer during this operation.*

Ream new valve guides after installation.

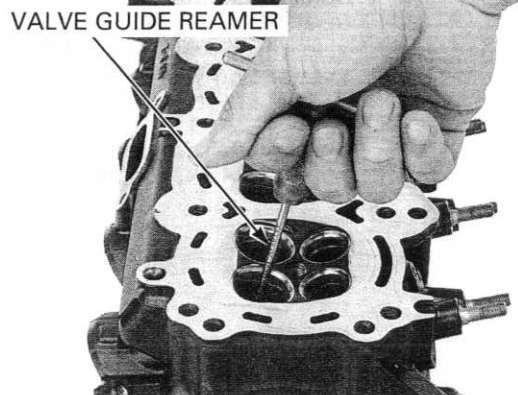
Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

**TOOL:**

**Valve guide reamer, 4.008 mm 07MMH-MV90100 or 07MMH-MV9010A (U.S.A. only)**

Clean the cylinder head thoroughly to remove any metal particles.

Reface the valve seat (page 9-22).

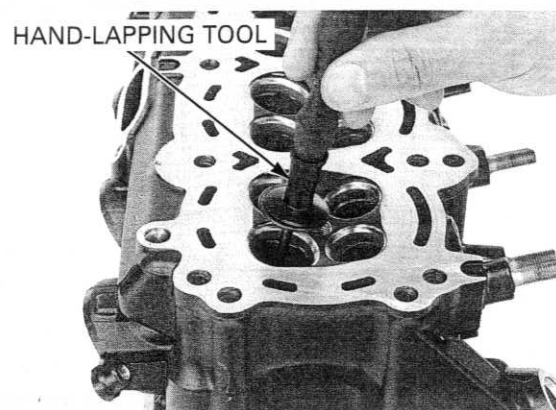


## VALVE SEAT INSPECTION/REFACING

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

Apply a light coating of Prussian Blue to the valve seats.

Tap the valves and seats using a rubber hose or other hand-lapping tool.



Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

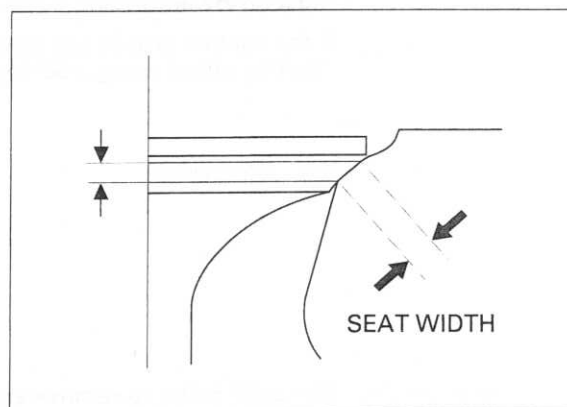
**Standard:**

**IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)**

**SERVICE LIMIT:**

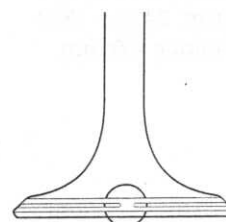
**IN/EX: 1.5 mm (0.06 in)**

If the seat width is not within specification, reface the valve seat (page 9-22).

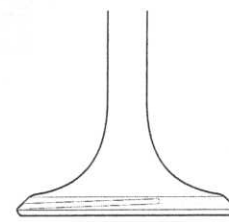


Inspect the valve seat face for:

- Uneven seat width:
  - Replace the valve and reface the valve seat.
- Damaged face:
  - Replace the valve and reface the valve seat.



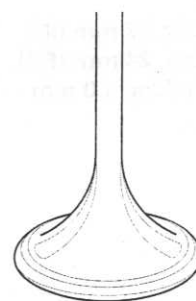
DAMAGED FACE



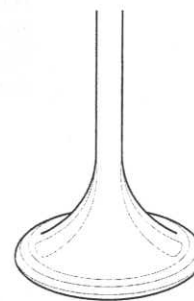
UNEVEN SEAT WIDTH

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

- Contact area (too high or too low)
  - Reface the valve seat.



TOO LOW



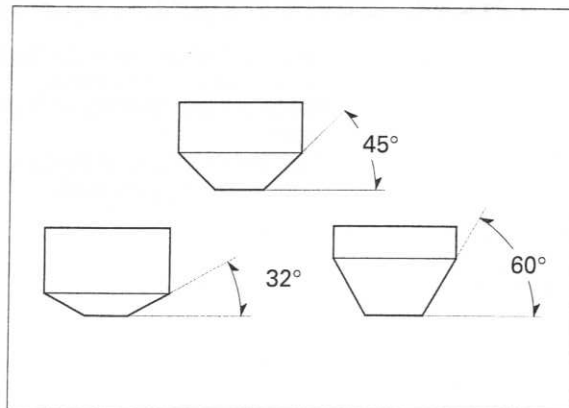
TOO HIGH

## CYLINDER HEAD/VALVES

### VALVE SEAT REFACING

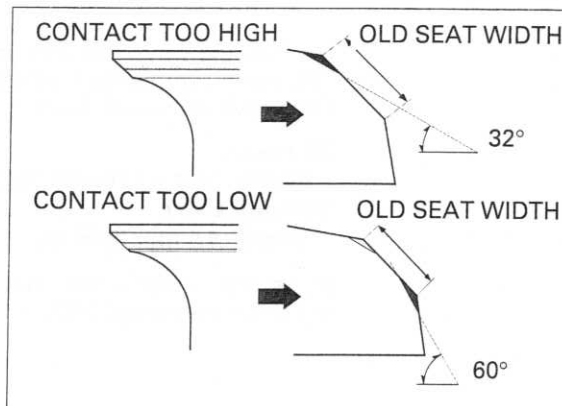
Follow the refacing manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

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



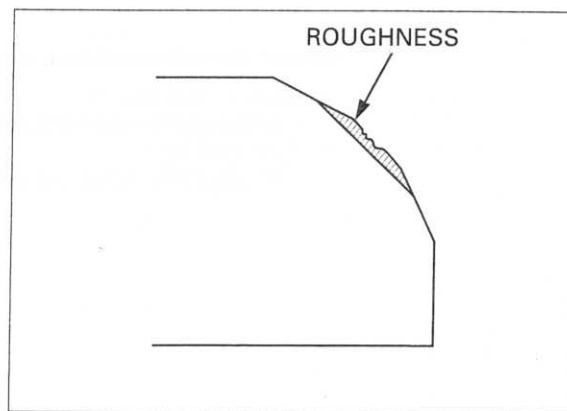
Reface the seat with a 45° cutter whenever a valve guide is replaced.

Use a 45° cutter to remove any roughness or irregularities from the seat.

#### TOOLS:

Seat cutter, 29 mm (IN)  
Seat cutter, 24 mm (EX)  
Cutter holder, 4.0 mm

07780-0010300  
07780-0010600  
07781-0010500  
or equivalent commercially available in U.S.A.



Use a 32° cutter to remove the top 1/4 of the existing valve seat material.

#### TOOLS:

Flat cutter, 29 mm (IN)  
Flat cutter, 24 mm (EX)  
Cutter holder, 4.0 mm

07780-0013400  
07780-0012500  
07781-0010500  
or equivalent commercially available in U.S.A.

