

# Valves

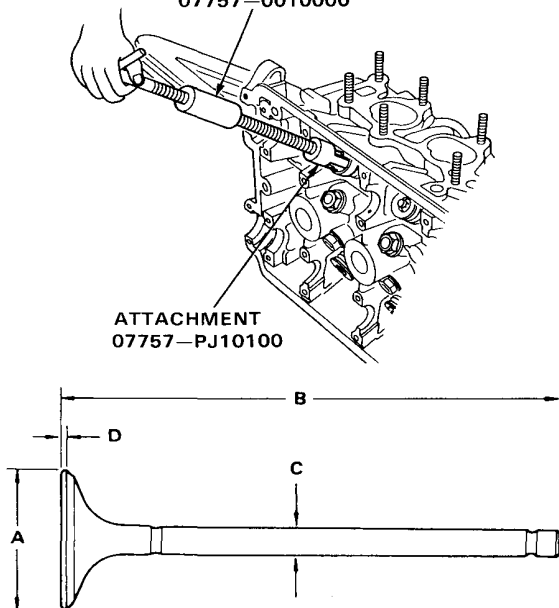
## Replacement

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing spring compressor.
2. Install spring compressor. Compress spring and remove valve keepers.

VALVE SPRING COMPRESSOR  
07757-0010000

ATTACHMENT  
07757-PJ10100



### Intake Valve Dimensions

- A Standard(New): 29.9—30.1mm  
(1.177—1.185 in.)
- B Standard(New): 105.18—105.48mm  
(4.141—4.153 in.)
- C Standard(New): 6.58—6.59mm  
(0.2591—0.2594 in.)
- C Service Limit: 6.55mm (0.258 in.)
- D Standard(New): 1.05—1.35mm  
(0.041—0.053 in.)
- D Service Limit: 1.00mm (0.039 in.)

### Exhaust Valve Dimensions

- A Standard(New): 26.9—27.1mm  
(1.059—1.067 in.)
- B Standard(New): 104.47—104.77mm  
(4.113—4.125 in.)
- C Standard(New): 6.55—6.56mm  
(0.2579—0.2583 in.)
- C Service Limit: 6.52mm (0.257 in.)
- D Standard(New): 1.65—1.95mm  
(0.065—0.077 in.)
- D Service Limit: 1.45mm (0.057 in.)

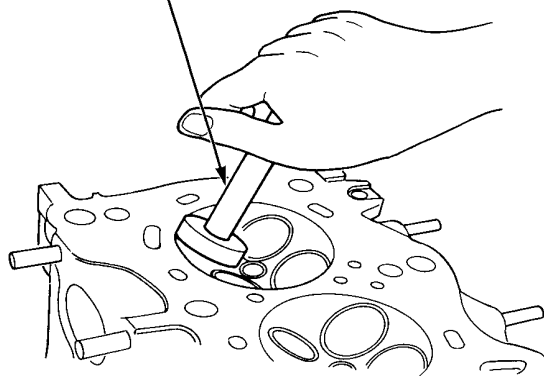
# Valve Seat

## Reconditioning

1. Renew the valve seats in cylinder head using a valve seat cutter.

NOTE: If guides are worn (page 6-8), replace them (page 6-9) before cutting valve seats.

VALVE SEAT CUTTER

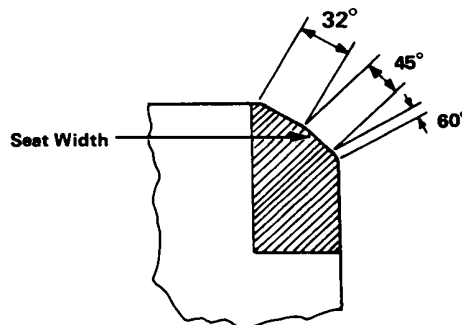


CUTTER	INTAKE	EXHAUST
32°	07780-0012200	07780-0012200
60°	07780-0014000	07780-0014000
45°	07780-0010800	07780-0010300
HOLDER	07781-0010201 and 07781-0010301	

2. Bevel the upper edge of seat with the 32° cutter until required seat width is obtained.
3. Bevel the inner edge of seat slightly with the 60° cutter.
4. Carefully center 45° cutter. Remove as little material as possible. (See measurement after reconditioning shown below.)

### Valve Seat Width:

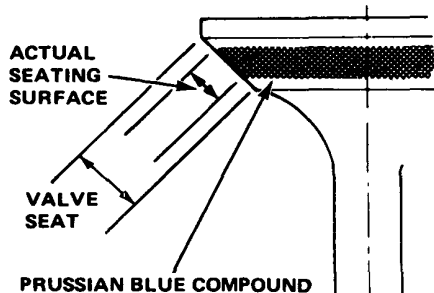
- Standard: 1.25—1.55 mm (0.049—0.061 in.)
- Service Limit: 2.0 mm (0.08 in.)



# Valve Seat

## Reconditioning (cont'd)

5. After resurfacing seat, inspect for even valve seating: Apply Prussian blue compound to valve face, and insert valve in original location in head, then lift it and snap it closed against seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
  - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
  - If it is too low (closer to valve edge), you must make a second cut with the 32° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

**NOTE:** The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in head and measure valve stem installed height.

### Intake Valve Stem Installed Height:

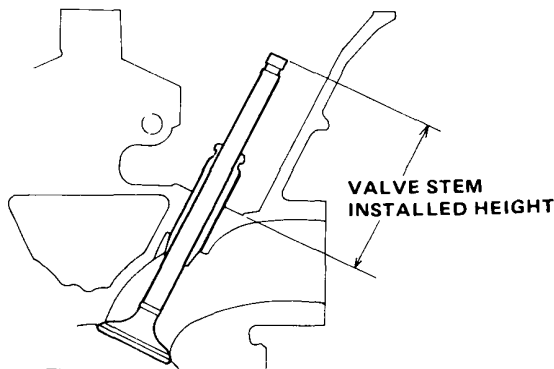
Standard(New): 45.78mm (1.802 in.)

Service Limit: 46.57mm (1.833 in.)

### Exhaust Valve Stem Installed Height:

Standard(New): 44.97mm (1.770 in.)

Service Limit: 45.76mm (1.802 in.)



8. If valve stem installed height is over service limit, replace valve and recheck. If still over service limit, replace cylinder head; the valve seat in the head is too deep.

## Valve Guide-to-Valve Stem Clearance

1. Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

### Intake Valve Stem-to-Guide Clearance

Standard (New): 0.04—0.10 mm

(0.0015—0.004 in.)

Service Limit: 0.16 mm (0.006 in.)

### Exhaust Valve Stem-to-Guide Clearance

Standard (New): 0.10—0.16 mm

(0.004—0.006 in.)

Service Limit: 0.22 mm (0.008 in.)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using new valve.
- If measurement is now within service limit, reassemble using new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

**NOTE:** An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.

Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit

### Intake Valve Stem-to Guide Clearance

Standard(New): 0.02—0.05mm

(0.001—0.002 in.)

Service Limit: 0.08—(0.003 in.)

### Exhaust Valve Stem-to-Guide Clearance

Standard(New): 0.05—0.08mm

(0.002—0.003 in.)

Service Limit: 0.11mm (0.004 in.)