

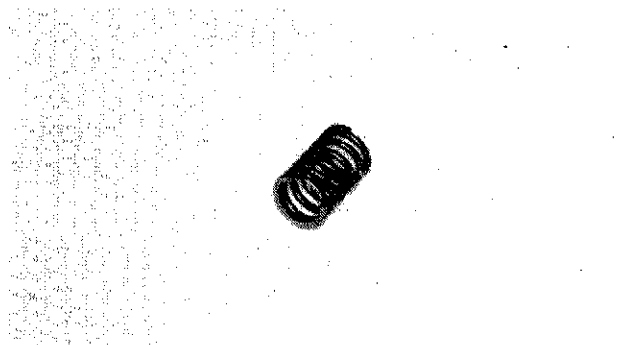
INSPECT VALVE SPRINGS

1. Inspect valve springs for alignment, wear and damage.
2. Place springs on a flat surface to see that they are square and parallel.
3. Check valve spring tension using D-01168AA Spring Compression Tester.

NOTE: Free length of springs differ slightly, but compressed height must be the same.

VALVE SPRING SPECIFICATIONS

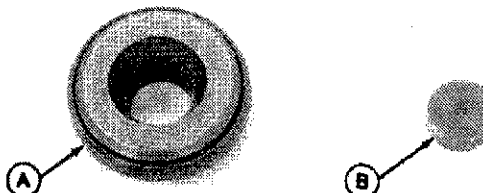
Compression	Height
240 - 276 N	46 mm
(54 - 62 lb force)	(1.81 in.)
591 - 680 N	34.5 mm
(133 - 153 lb force)	(1.36 in.)



A77/RG2732 S11/0401 S 131083

INSPECT VALVES ROTATORS AND WEAR CAPS

1. Insure that valve rotators (A) will turn freely. Replace if defective.
2. Replace valve wear caps (B) if pitted or worn.
3. Visually check valve face and stem for wear or damage.



A77/RG3491 S11/0401 T 170582

CLEAN VALVES

1. Hold each valve firmly against a soft wire wheel on a bench grinder.
2. Make sure all carbon is removed from valve head, face and unplated portion of stem.

IMPORTANT: Any carbon left on the stem will affect alignment in valve refacer if valves need to be refaced.

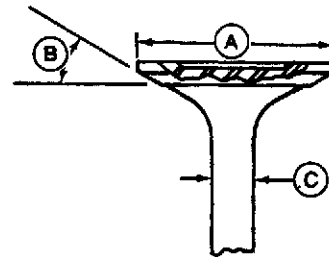
A77; S110401 U 231182

MEASURE VALVES

1. Compare valve stem O.D. with guide I.D. to determine stem-to-guide clearance.

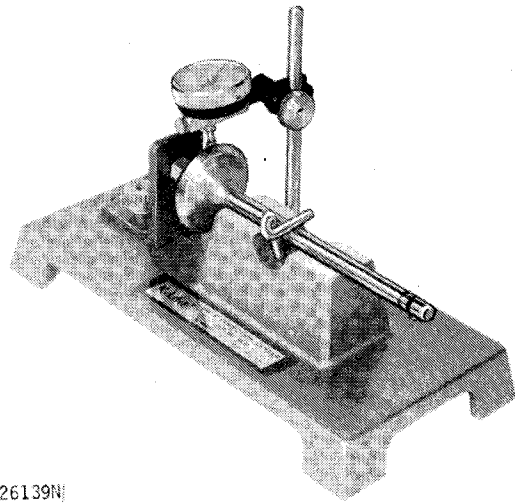
A—43.43-43.69 mm
(1.710-1.720 in.)
B—29.5°

C—9.436-9.462 mm
(0.3715-0.3725 in.)



A77;R63311 S11;2005 ER 270482

2. Use D-05058ST Valve Inspection Center to determine if valves are out of round, bent or warped.



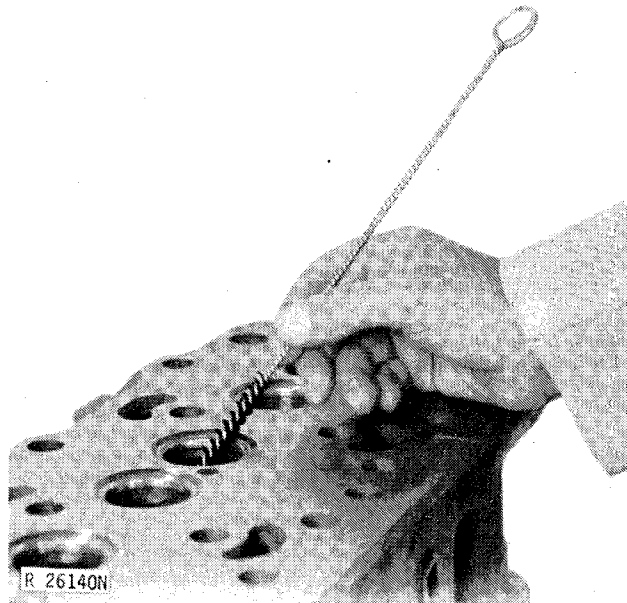
R 26139N

A77/R26139 N 511:0401 W 151281

CLEAN VALVE GUIDES

1. Use a D-17011BR Valve Guide Cleaning Brush to clean valve guides before inspection or repair.

NOTE: A few drops of light oil or kerosene will help to fully clean the guide.



R 26140N

A77/R26140N 511:0401 X 101180

MEASURE VALVE GUIDES

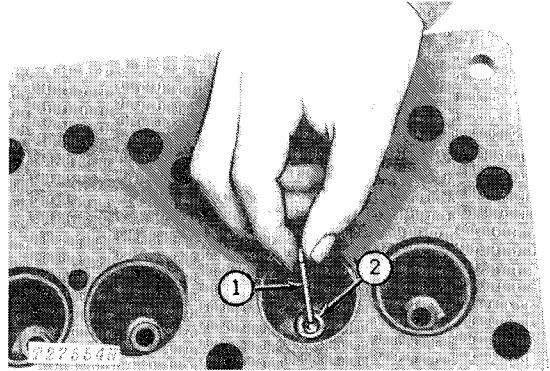
1. Measure valve guides (2) for wear using a telescope gauge (1).

VALVE GUIDE SPECIFICATIONS

I.D. Guide in a New Head (9.51 to 9.54 mm)
0.3745 to 0.3755 in.

New Guide-to-Valve Stem
Clearance (0.051 to 0.102 mm)
0.0020 to 0.0040 in.

NOTE: Worn guides can allow a clearance of (0.15 mm) 0.006 in. and still be acceptable. Worn guides may be knurled to return them to specified clearance if valve-to-guide clearance is (0.25 mm) 0.010 in. or less. If clearance exceeds (0.25 mm) 0.010 in., install oversize valves.



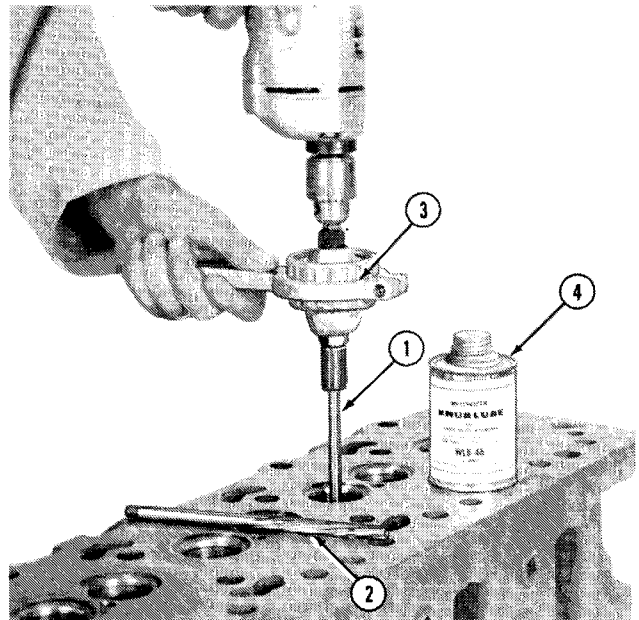
A77;T27554N S11;0401 Y 101180

KNURL GUIDES

1. Use No. D-20002WI Knurling Tool Set to knurl valve guides.

NOTE: Use tool set exactly as directed by the manufacturer.

1—Knurler
2—Reamer
3—Speed Reducer
4—Lubricant



A77;RG2734 S11;0401 Z 101180

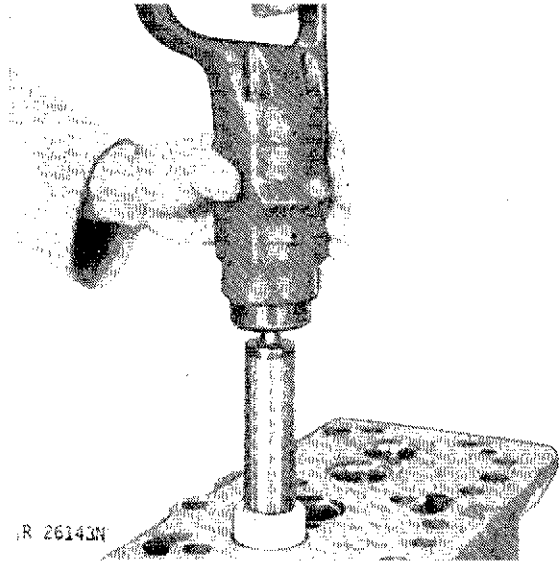
GRIND VALVE SEATS

1. If valve seats need grinding, do not grind too long. Only a few seconds are required to recondition the average valve seat. Avoid the tendency to grind off too much.

2. Do not use too much pressure. While grinding, support the weight of the driver to avoid excessive pressure on the stone.

NOTE: Keep the work area clean.

Check the seat width and contact pattern between the seat and valve with bluing.



A77/R26143N S11/0401 AC 101180

CHECK VALVE HEIGHT

1. Install valves after grinding.

2. Use a dial indicator to check valve height.

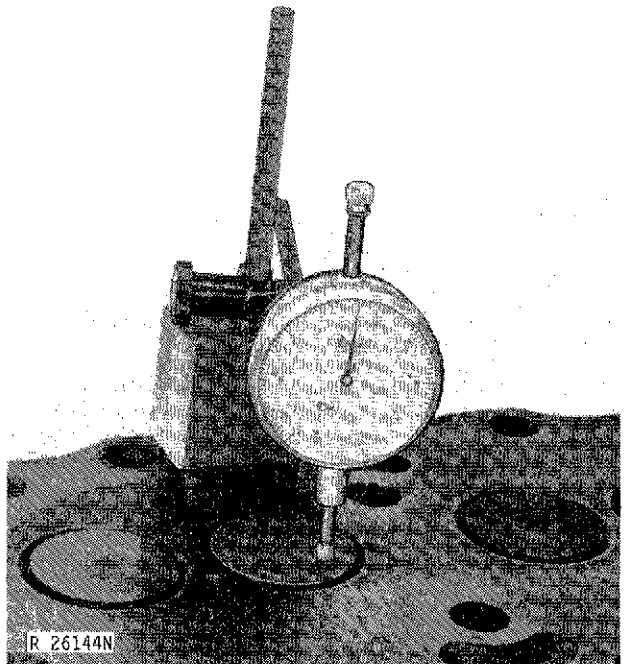
VALVE HEIGHT SPECIFICATIONS

Valve Height Above Cylinder Head

Surface (0.61 to 0.97 mm)
0.024 to 0.038 in.

Maximum Valve Recess (0.15 mm)
0.006 in.

NOTE: If measurement does not meet specifications, install either new valves, inserts, or both to obtain proper valve height.

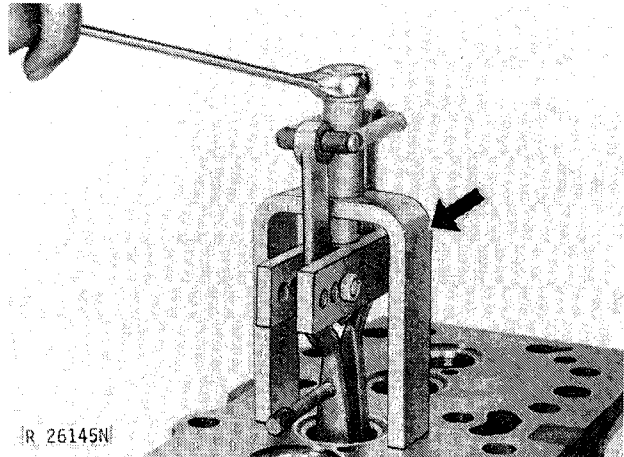


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REPLACE VALVE INSERTS

1. Remove valve seat (if needed) with JDE-41296 Valve Seat Puller (arrow).

NOTE: Be careful not to damage cylinder head when removing seats.



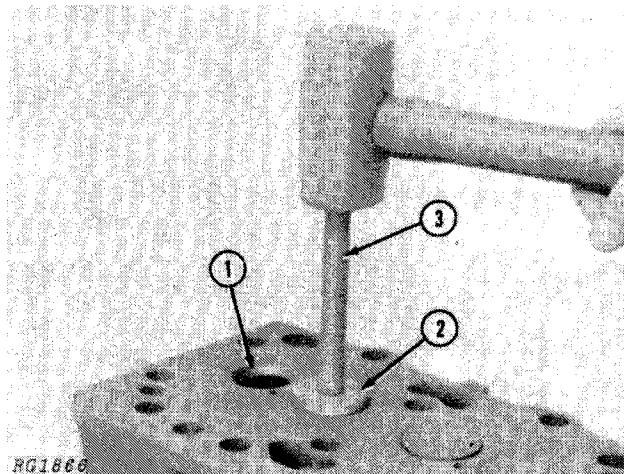
A77/R26145N S11;0401 AE 101180

2. Chill both new seat insert (1) replacement ring (2), and JDE-7 Driver (3) to (-29°C) -20°F in dry ice before installing.

NOTE: Use JDE-66 Replacement Ring on intake valve seats, and JDE-79 Replacement Ring on exhaust valve seats.

Use JDE-7 Driver (3) and Replacement Ring to drive inserts into place.

3. Grind valve seats. Do not over-grind valve seat.



A77/RG1866 S11;0401 AF 101180

INSTALL OVERSIZE INSERTS

In some cases the inside diameter of the valve seat bore may become damaged and require machining. In this case, oversize inserts are available in 0.25 mm (0.010 in.) oversize only.

1. Remove valve seats with JDE-41296 Valve Seat Puller.
2. Machine both intake and exhaust valve seat bores to 44.67-44.69 mm (1.7585-1.7595 in.).
3. Replace inserts as previously indicated.

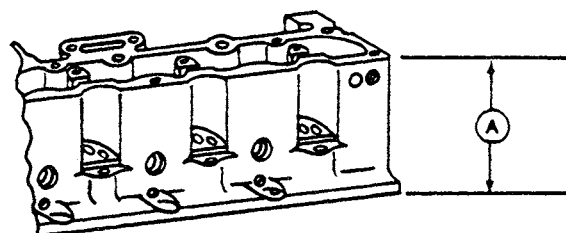
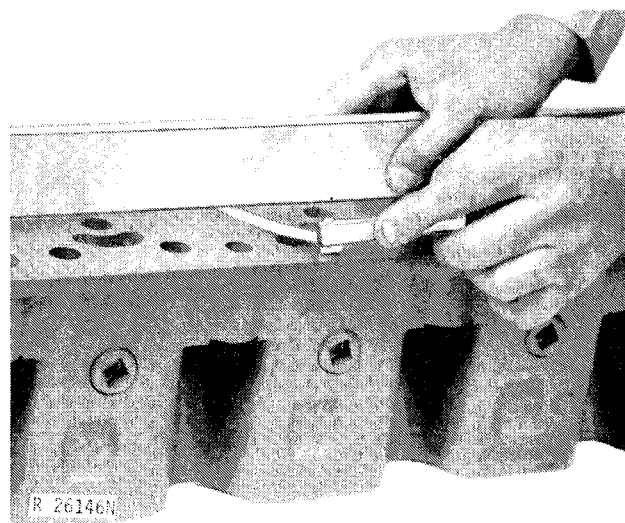
A77; S11;0401 AG 080383

INSPECT AND CLEAN CYLINDER HEAD

1. Thoroughly clean cylinder head in clean solvent. Clean all valve guides with valve guide cleaning brush.
2. Dry with compressed air.
3. Use a straight edge to check the head for flatness.

Warpage should not exceed 0.02 mm (0.001 in.) for every 127 mm (5 in.) of head length. If necessary to resurface head, a maximum of 0.762 mm (0.030 in.) can be removed from new part dimension (A).

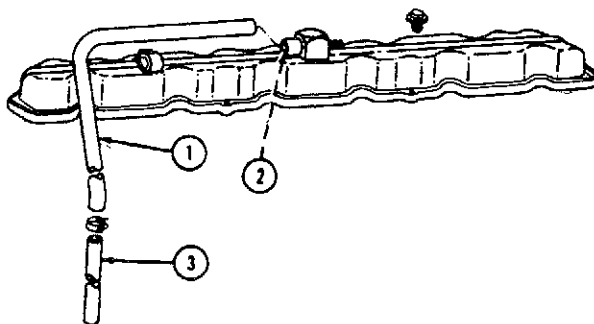
NOTE: To determine if head has been resurfaced previously, measure distance from valve cover gasket rail-to-combustion face (A). The new part dimension is 155.45—155.71 mm (6.120—6.130 in.)



A77;R26146 N. RG4421 S11;0401 AH 040184

INSPECT AND CLEAN VENTILATOR OUTLET HOSE

1. Check ventilator outlet hose (1) on rocker arm cover for bent or damaged condition. Replace if necessary.
2. Clean ventilator hose and tube (3) if they are restricted.
3. Check condition of O-ring (2) in rocker arm cover. If any damage or deterioration is noted, replace the O-ring.



A77/RG2436 S11;P3:0 D 100981

INSPECT AND CLEAN EXHAUST MANIFOLD

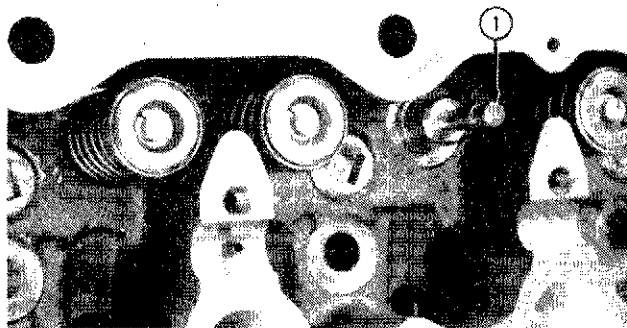
1. Remove all residue and gasket material from gasket surfaces.
2. Thoroughly clean passages in exhaust manifold and exhaust elbow.
3. Inspect entire exhaust manifold for cracks or damage and replace parts as necessary.

A77: S11:0401 A7 101180

ASSEMBLE VALVE ASSEMBLY

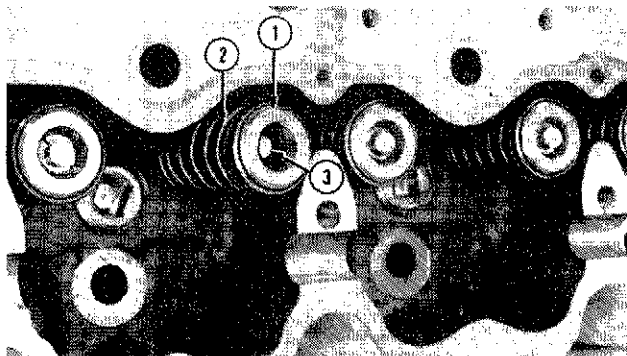
1. Apply AR44402 Valve Stem Lubricant or its equivalent to valve stems and guides.
2. Install valves (1) in guides from which they were removed.

NOTE: Valves must move freely and seat properly.



A77/RG2715 S11;P4:01 A7 101180

3. Install valve springs (2) making certain that cylinder head end of spring is located correctly in machined counterbore of head.
4. Install valve rotators (1) on springs and valves (3).



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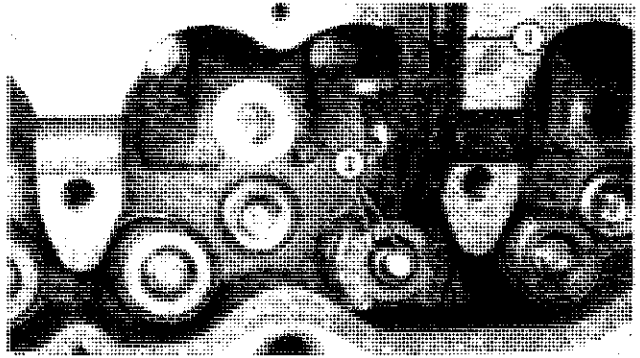
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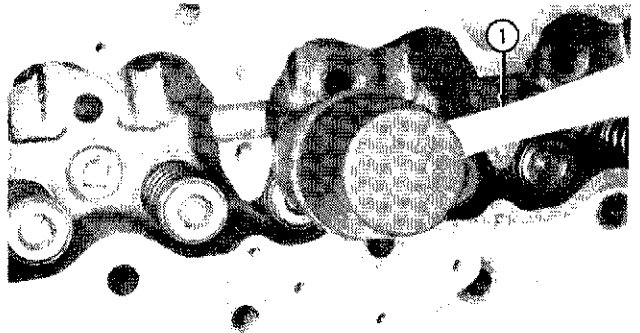
Thank you so much for reading

5. Compress valve springs with valve spring compressor (1).
6. Install retainer locks (2).
7. Release valve spring compressor.



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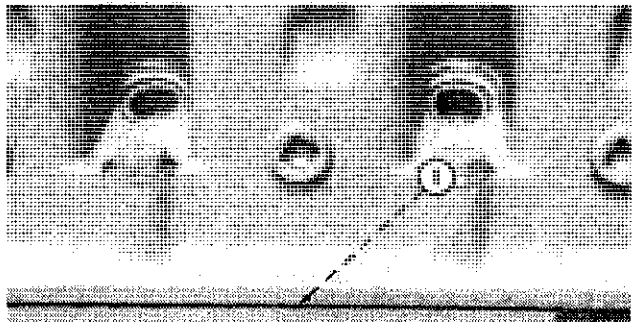
8. Strike end of each valve with a soft mallet (1) three or four times to insure proper seating of the retainer locks.



A77/R62736 S11:0401 AM 101189

INSTALL CYLINDER HEAD

1. Install cylinder head gasket (1) dry.
2. Place cylinder head in correct position on block with appropriate lifting equipment.

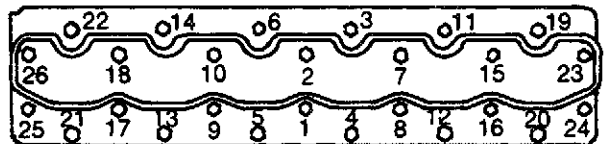


A77/R62077 S11:2010 E 100281

3. Dip cap screws and washers in clean engine oil.

CAP SCREW LENGTH
 (85.9 mm) 3.38 in.
 (136.7 mm) 5.38 in.
 (162.1 mm) 6.38 in.
 (190.5 mm) 7.50 in.

LOCATION ON CYLINDER HEAD
 22, 14, 6, 3, 11, 19
 18, 10, 2, 7, 15
 26, 21, 13, 5, 4, 12, 20, 23
 25, 17, 9, 1, 8, 16, 24



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