

480 LOADER

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CYLINDER HEAD ASSEMBLY

(Refer to Figure 9)

Disassembly

1. Using a valve spring compressor, compress the spring (1) enough to remove the valve retainer locks (2). Release the spring compressor and remove the valve spring retainer (3). Remove the valve spring (1), valve stem oil seals (4) and valve spring seats (5). Remove any carbon from the valve stems before they are removed from the cylinder head.
2. Remove the intake valves (6) and the exhaust valves (7) from the cylinder head (13) and set them in a rack or holder. **NOTE:** Mark them on removal so they may be installed in their original location.
3. Drive the intake valve guide (8) and exhaust valve guide (9) down through the head using an arbor.
4. The exhaust valve seats (10) can be removed with a special seat removing tool, Inset B. **NOTE:** Never attempt to remove a valve seat with a center punch, cold chisel or pry bar.
5. To remove the cup plugs (11) or expansion plug (12) they must be drilled and pryed out.

NOTE: Refer to Inspection and Servicing on Pages 12,13,14 and 15 prior to assembly.

Assembly

1. If the valve guides have been replaced, install the new guides (8 & 9) using an arbor. Press the guides into the head from the top of the cylinder head. The guides must protrude above the cylinder head (intake and exhaust) .875", Inset A.
2. To install new exhaust valve seats (10) clean the recess in the cylinder head. Place the valve seats in dry ice to shrink them. Insert the valve seats in the head and press them in place, using a suitable press.
3. Lubricate the intake valves (6) and exhaust valves (7) with clean engine oil and install them in their original locations.
4. Install the valve spring seats (5), valve springs (1), the valve retainers (3). Compress the valve springs so the valve stem seals (4) can be installed in the lower grooves of the valve stems. Install the valve retainer locks (2). Remove the spring compressor carefully.
5. Install new plugs (11 & 12) if they were removed. **NOTE:** The cup plug (11) lip must be flush with the top of the cylinder head. The expansion plug (12) must be firmly seated against the ridge in the cylinder head.

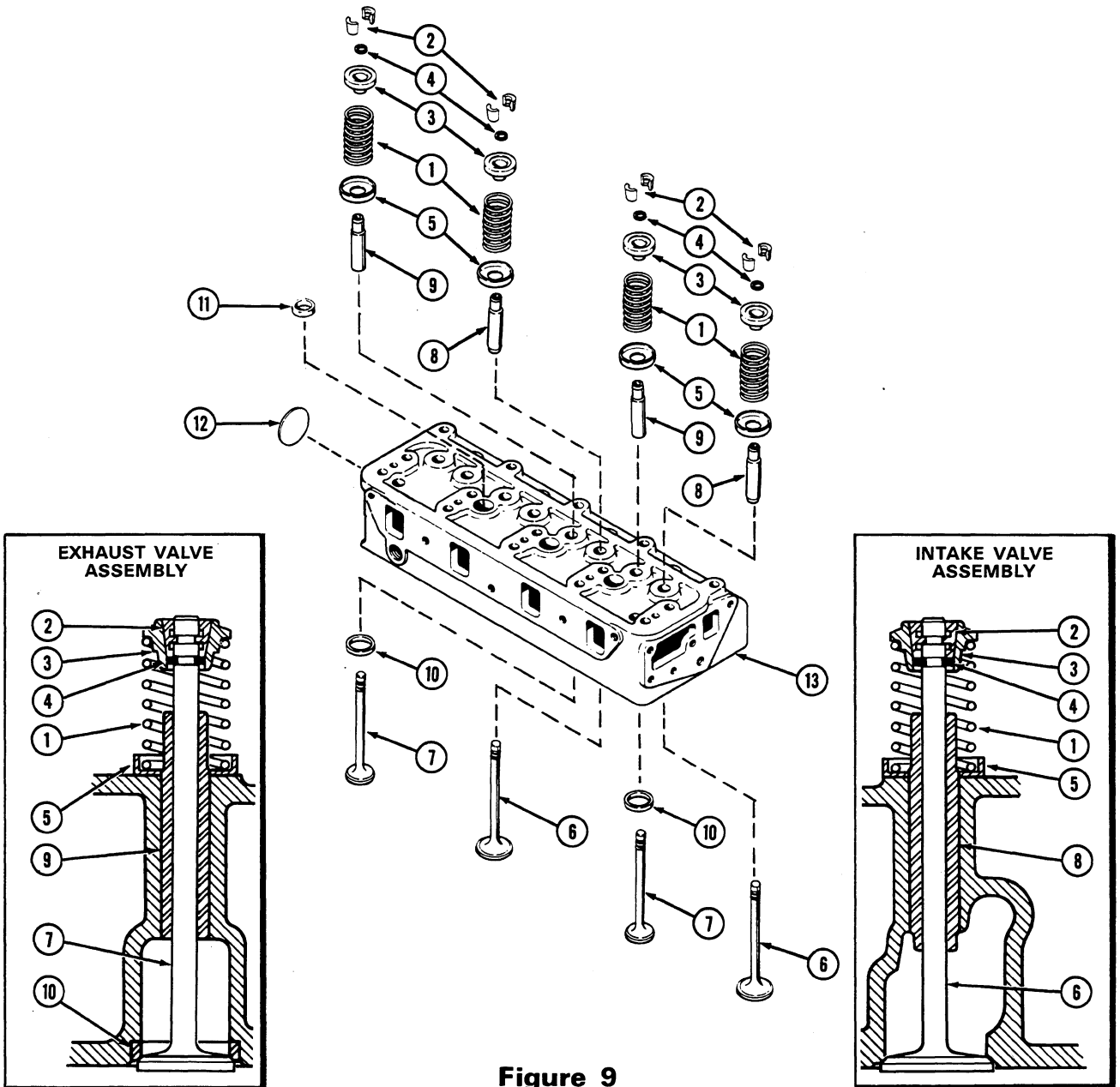
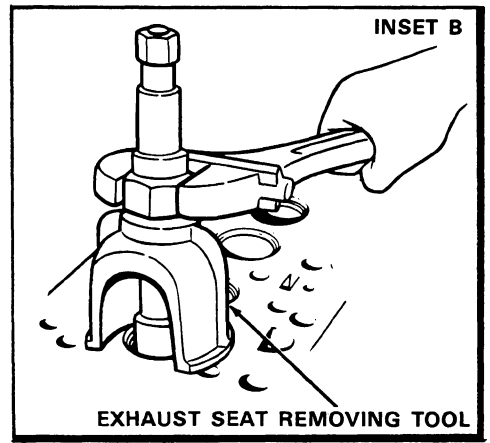
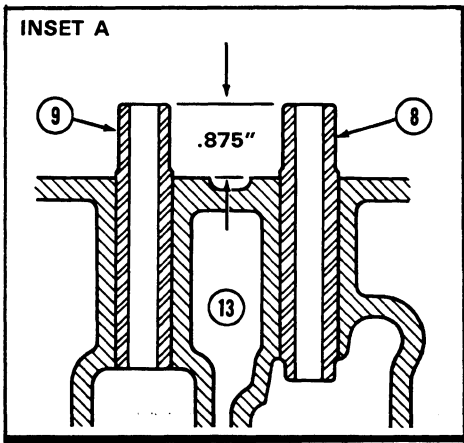


Figure 9

INSPECTION OF VALVES, GUIDES, HEAD AND SPRINGS

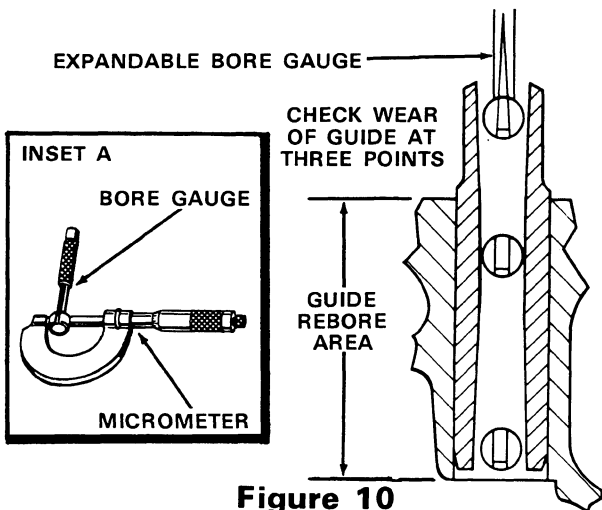
Clean the cylinder head completely. Remove all traces of carbon and other deposits. Check for cracks and any evidence of fretting or erosion existing in the area of fire ring contact. Check the head for evidence of warpage. If warpage exists and is more than .006", the cylinder head must be resurfaced or replaced.

Valve springs should be checked for flat squared ends, broken coils and correct spring pressure. Use a Valve Spring Tester referring to the spring specifications below:

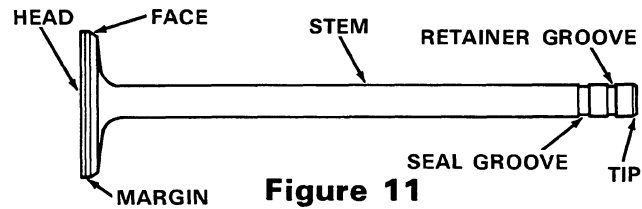
Free Length ----- 2.375"
 Total Coils ----- 8.25"
 Wire Diameter ----- .162"

Valve Position	Compressed Height	Spring Pressure	Replace if Less than
Valve Open	1.521"	114 lbs.	110 lbs.
Valve Closed	1.875"	56 lbs.	53 lbs.

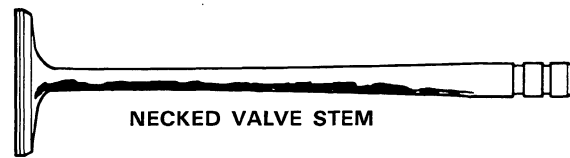
Remove all carbon from the bore of the valve guides with a fine wire brush and blow clean with compressed air. Valve guides can be checked for wear by using a bore gauge and micrometer, refer to Figure 10, Inset A. The valve guides should be checked at the top, middle and bottom of the guide bore for wear, Figure 10. If the diameter is greater than .3440" at any point along the bore, the guide must be replaced. Use an arbor equal to the inside diameter of the valve guide to keep the guide from collapsing when pressed into place. Press in from the top of the head until the guide (Intake and Exhaust) protrudes a distance of .875" above the head, refer to Figure 9, Inset A, Page 11. Replacement guides must be reamed after installation. Ream the guide .3429" to .3439" diameter.



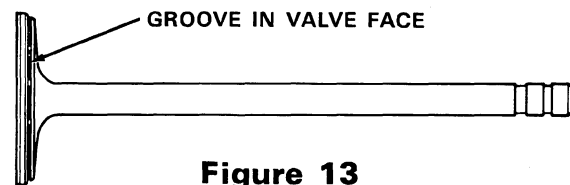
Clean the valves with a power driven fine wire brush, being very careful not to scratch the valve stems. Refer to Figure 11 for valve nomenclature.



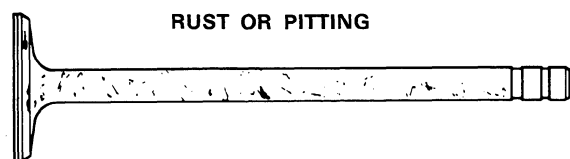
Inspect the valves for excessive wear or necked stems, Figure 12. This can be caused by lack of lubrication, plugged water passages or operating the engine under continuous overload at excessive engine RPM. Replace valves if this condition exists.



Inspect the valves for deep grooves in the face, Figure 13. This can be caused by abrasives entering the engine through the intake system or not servicing the air cleaner regularly. If grinding the valve face will not correct this condition, replace the valve.



Inspect the valve face and stem for rust or pitting, Figure 14. Rust or pitting can usually be removed by grinding the valve face. If rust or pitting on the valve stem exists, replace the valve. These conditions can be caused by using poor quality engine oil or fuel that does not meet the specification given in Section 11 and by improper storing of the engine.



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