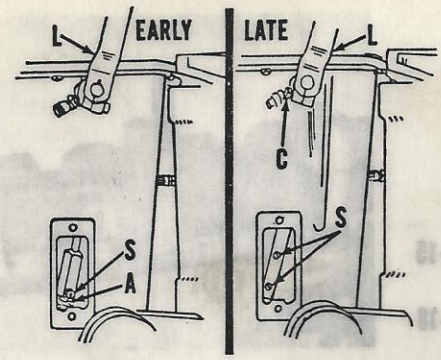

Fig. H15—Upper motor leg with shift linkage access plate removed. Models before Serial Number 1,400,000 are shown on left.

A. Adjusting nuts
C. Clamp screw
L. Shift lever
S. Clamp screws

POWER HEAD R&R. To remove the complete power head, first remove the engine cover and rear shroud. Disconnect the carburetor linkage at the bellcrank, the fuel line at the fuel pump inlet, and the remote control electrical cable at the junction block.

Th power head is secured to lower unit and adapter plate by two socket head cap screws on each side of mounting plate, two hex head cap screws on underneath front of mounting plate, and two long socket head cap screws which extend through front flange of upper leg and mounting plate into engine block.

Attach a hoist to power head lifting eye and raise the hoist to remove the slack. Remove the eight screws and lift power head from lower unit. Be sure that oil pump inlet strainer is not damaged as power head is removed.

All "O" rings and seals should be renewed when installing power head. Coat crankshaft splines liberally with grease and install coupling well up in crankshaft seal retainer to hold it in place. Install tapered drive shaft spring with large coils toward crankshaft. Make sure clutch dogs are engaged and turn propeller as power head is lowered, until shaft splines mesh.

Install all retaining cap screws finger tight, then tighten the long socket head cap screws entering from underneath to a torque of 140 inch pounds before tightening remainder of screws. Tighten the two lower, hex head screws to 260 inch pounds and the four side, socket head screws to 285 inch pounds. Complete the assembly by reversing the disassembly procedure.

NOTE: On early Homelite motors where oil pan flange is secured with a clamp, shift linkage should be disconnected and shaft held with padded pliers while power head is being removed. Water pump can be damaged if drive shaft hangs in crankshaft splines.

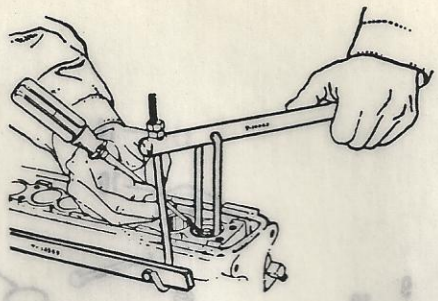

Fig. H16—Special tools are provided for removing the valve spring retainers as shown. Refer to text.

VALVES AND SEATS. The cylinder head is an integral part of the cylinder block, and the valves can only be removed for service after removing the complete power head from lower unit; then, removing the crankshaft and the piston assemblies as outlined in the appropriate following paragraphs.

Special tools are required to efficiently remove and install the valves. These tools are available under the following tool part numbers:

T-14043—Valve Spring Compressor

23802-A—Valve Seal Installer

T-14569—Compressor Strap

200H—Valve Support Fixture

To remove the valves after pistons are out, remove the camshaft cover, camshaft, cam followers and spacers. Keep the cam spacers and followers together in their proper order as they are removed, to avoid unnecessary work in tappet adjustment when unit is assembled. Place the support fixture (200H) in No. 1 cylinder and attach the compressor strap (T-14569) on the threaded bosses on spark plug (port) side of block as shown in Fig. H16. With the support fixture in place, compress the spring and remove keepers on both valves in No. 1 cylinder. Exhaust valves are equipped with positive type valve rotators (7—Fig. H13) which are located between the spring and cylinder block at HEAD end of valve. Intake valves use a valve spacer (4). All valves use "O" ring stem seal (6) and a retainer (8) which are also located at cylinder end of spring. The retainer is a drive fit over end of valve guide. Keep the valves, springs and retainers identified so they can be installed in the proper order in the cylinder from which removed. Check for red paint marking on cylinder end of each valve spring which marks the close coiled end. Mark any springs not so marked, as they are removed. Remove the valves from the other cylinders by changing the position of the support fixture.

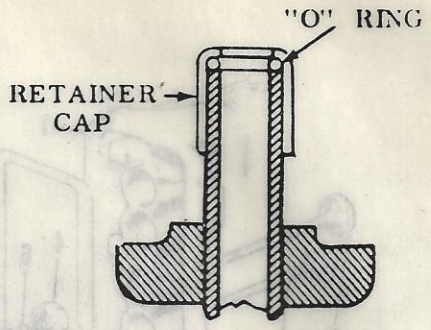

Fig. H17 — Cross section of valve guide showing installation of "O" ring stem seal and retainer. The "O" ring should have 0.020-0.060 clearance with retainer cap installed. Make certain that "O" ring is free and not compressed.

On 460A1E, 460A2E and later models, the inlet valve face and seat angle is 30 degrees and exhaust valve face and seat angle is 45 degrees. On all earlier models, valve face and seat angle is 45 degrees for all valves. On Models 460 A1F and 460A2F or models serviced using the latest type parts stock, hardened valve seats and coated valves are used. Face and seat angles are 30° for intake valves and 45° for exhaust valves. The latest replacement block can be identified by the oil filler port located between the distributor and lifting bracket.

The exhaust valves to be used with the latest blocks are stellite faced, the intake valves aluminized. The coated valves must not be refaced or lapped. On earlier valves refacing is recommended and the manufacturer recommends finish lapping using valve grinding compound. Lap until there is a uniform smooth gray band around edge of the seat, then thoroughly clean valves and seats with hot, soapy water until all valve grinding compound is removed. Valve heads must have at least $\frac{1}{32}$-inch of margin after refacing, and any valve which fails to meet this test must be renewed. After valves have been refaced, grind approximately 0.005 from end of stem so that cam follower spacers of approximately the same thickness may be used.

Renew inlet valve if stem diameter is less than 0.3125. Renew exhaust valve if stem diameter is less than 0.312.

NOTE: Under no circumstances must enough material be removed from tip of valve stem; or a thin enough cam follower spacer used, so that cam follower will contact the edge of valve spring retainer. After the recommended tappet clearance has been obtained, if spacer does not extend 0.002 above rim of retainer, renew or rework the parts concerned.

Reassemble by reversing the disassembly procedure, and adjust tappet clearance as outlined in the appropriate preceding paragraphs.