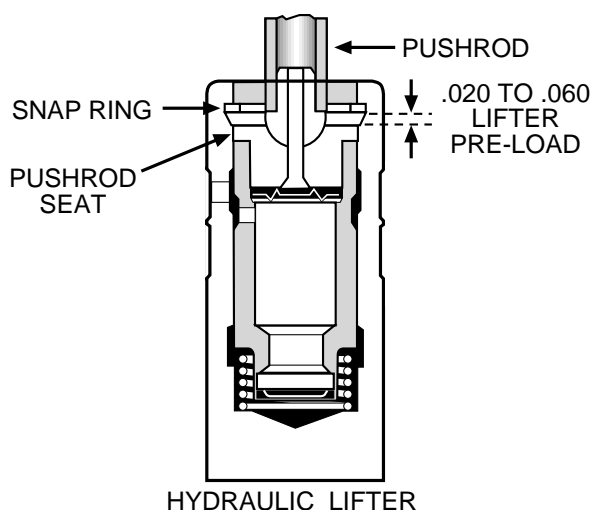


For more information, see www.cranecams.com

Lifter Preload Must Be Checked In All Hydraulic Lifter Applications.

Lifter preload is the distance between the pushrod seat in the lifter and the snap ring, when the lifter is on the heel of the cam and the valve is closed.



There can be many variations in the same kind of new engine from the factory, or if it has been rebuilt or repaired over which we have no control. Below is a list of things to check that could have changed the height of the plunger in the hydraulic lifter:

1. Camshaft diameter
2. Pushrod length
3. Milling or resurfacing heads and/or block
4. Facing off end of valve stem
5. Different thickness head gaskets
6. Number of valve jobs done on cylinder heads
7. Lifter height due to different manufacturer

Install lifters using Moly Assembly Lube or equivalent, except for Roller Lifters which only require engine oil. Lifter adjustment should be made before intake manifold installation whenever possible.

On engines with separate adjustable rocker arms such as small-block Chevrolet, we recommend installing the pushrods and rocker arms on one cylinder at a time and adjusting the valves on that particular cylinder. Do not tighten the adjusting nut down before adjusting the valves. If the adjustment is too tight, this will cause the valve to hit the piston when you turn the engine over, resulting in bent valves, bent or broken pushrods, rocker arm studs being pulled out of the head, and premature cam wear. On engines with shaft mounted adjustable rocker arms, back off all adjusters all the way before installing the rocker arm assembly.

Make sure the pushrod is in the tappet and in the rocker arm seat when making valve adjustments.

To adjust preload on hydraulic lifter camshafts with adjustable rocker arms, turn the engine in the normal direction of rotation until the exhaust lifter starts to move up, then adjust the intake valve to zero lash with no preload, then 1/2 to 1 turn more. Turn the engine over again until the intake opens completely and then is almost all the way back down. Now, set the exhaust valve to zero lash, then 1/2 to 1 turn more. Continue the above procedure for each cylinder until all valves are adjusted to the same amount of preload. This procedure will give you the correct lifter preload for any hydraulic lifter cam with adjustable rocker arms.

If your engine has non-adjustable rocker arms, a lifter preload of .020 to .060 must be maintained. To check preload on engines with non-adjustable rocker arms that have bolts or bottleneck studs, i.e. some Ford, Oldsmobile, Pontiac, and AMC. Turn the engine until the engine is at top dead center firing on the cylinder you are adjusting. At this time, both lifters will be on the base circle of the cam lobe and both valves will be closed. Install the rocker arms, or loosen the rocker arms if that is the case. Turn down the bolt or nut until it makes contact with the fulcrum of the rocker arm with no airspace between the rocker arm and the pushrod or valve and no preload in the lifter.

Using a torque wrench on the bolt or nut, torque the bolt or nut to factory specifications, counting the torque wrench movement after zero lash. For the correct preload, the torque wrench movement must be between 1/2 and 1 turn. If you have less than 1/2 turn, you will need to purchase longer pushrods. If the torque wrench movement was more than one turn, you will be able to use shims as shown in Figure 1 or 2.

Use the adjusting sequence as above to insure that the lifter is on the heel of the cam when preload is measured. Generally, pushrods for each cylinder should be the same unless valve stem heights are not correctly matched. When checking lifter preload, make sure the valve is not open on the one you are checking. You may need to wait a few minutes for the lifter to bleed down.

It may be necessary to change pushrod length, use adjustable pushrods, shim rocker stands or shafts, install straight screw-in studs in place of stock bottleneck type, use allen set adjusting nuts, or machine heads for adjustable rocker arms, studs and guide plates. Figures 1 & 2 show one method of decreasing lifter preload on some engines by using shims. We offer these shim kits. See your local dealer.

If the adjustment procedures are followed correctly for hydraulic lifter cams, no further adjustment is necessary for the life of the cam.

The same adjustment procedure should be used for mechanical lifter cams. Instead of lifter preload, you must use the clearance specs on the cam card for your cam. Mechanical lifter cams require a second adjustment after break-in, then periodically at tune-up time for the life of the cam.

If these instructions are not followed, or you are not able to get the proper distance between the rocker arm and lifter, do not start the engine because invariably something will break.

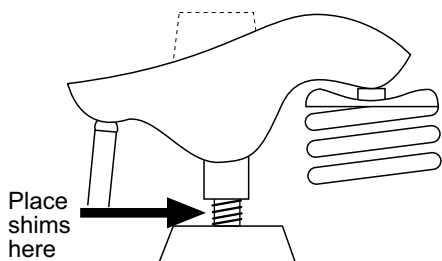


Figure 1. Typical installation for V-8 engines such as Olds V-8, some AMC V-8 and 6 cylinder and '81 and up 151 cu. in. Pontiac 4 cylinder engines.

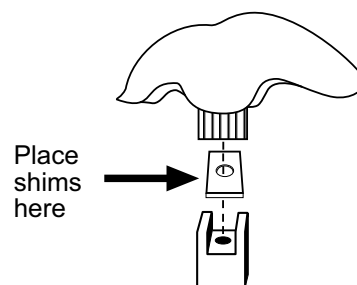


Figure 2. Typical installation for most late model Ford V-8, 6 cylinder and 4 cylinder engines.

The shims will decrease lifter preload approximately .030", .060" or .090" depending on the shims used. Maintain a recommended lifter preload of between .020" minimum and .060" maximum for proper lifter operation.