

**Off Set Roller Lifters:** A .210 offset intake roller lifter is available from Indy Cylinder Head to help correct push rod angle on the 440-1, 440-C, 572-13 and 600-13X heads. Sold with complete intake and exhaust sets.

**Valve Cover Venting:** Before final assembly and starting, the engine must be vented. Because of many different ways to vent the engine, the Indy valve covers are not drilled. The engine builder must choose between a vac system, vacuum pump, or simple venting to atmosphere. The latter is the most simple and can be used for an oil fill. A baffle may be needed inside. They should be toward the front, ideally between cylinders 1 & 3 and 2 & 4 in the valve cover. Vent, oil fill and baffle kit is available (Part # 440-8V).

**Push Rod Length Checking:** The last thing the engine builder should check is push rod length. Head milling, block milling, head gasket thickness, valve length, lifter and cam grind all effect the very important length of the push rod. For this reason, push rod length must be checked in final assembly with your parts.

With all parts assembled as the engine will run, have no threads of the rocker arm adjuster showing on the bottom side of the Indy Exhaust rocker arm. Position lifter down, on heel of cam, with rocker shaft, exhaust rocker and adjuster bolted on head. You are now ready to check length with an adjustable push rod (Part #380). Simply place adjustable push rod between lifter and exhaust rocker arm, adjust out and lock push rod nuts. Remove rocker shaft, take adjustable push rod out and measure overall length from bottom of ball to top rim of cup. This is your push rod length. **NOTE:** Pump up hydraulic lifter, check as solid.

Indy heads (440-SR, 440-EZ, 440-1 and 440-C) with Indy valves use the following push rod lengths if all dimensions and milling are stock.

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| 9.750 solid lifter 440 block     | 9.00 Solid lifter 400 block       |
| 9.500 Hydraulic lifter 440 block | 8.750 Hydraulic lifter 400- block |

Roller lifters have different height push rod seats, for this reason push rod length must be checked with all roller cams

**Head Milling:** In general, milling the Indy head .006" will result in a one (1) cc reduction in combustion chamber volume. Except for certain special applications, a 62 cc minimum is recommended. Either flat top or domed pistons work well, however it's good to use the lighter flat top piston, but it's easier to achieve a higher compression ratio, with a domed piston. Remember, check spark plug clearance and two degrees more timing may be needed with dome pistons.

We recommend a ratio of 1 to 1 on cuts, i.e.: if you cut .065 off the chamber side of the head, cut the same off the intake manifold side of head.

**Rocker Arm, Spacers and Shaft Set up:** When installing the stock shaft rocker arms (440-4) on a 440 (RB) engine, the wide spacer (.250) must be between the intake and exhaust rockers with the thin spacers on the outside of the rockers. On a 400 (B) engine the wide spacer (.250) is placed outside the intake rocker with a thin spacer (.150) in the middle and outside the exhaust rocker. All SR rockers have the wide spacer (1.750) between the intake and exhaust rockers. Rocker shafts are placed on the heads with the oil holes down and toward the valve. Always lubricate shafts and rockers with cam lube before starting. It's important to note that there are two different rocker stud lengths in the cylinder heads. The two outer are 3-5/8" long and go on each end of the head, and the three shorter 2-5/8" studs go on the center 3 holes. In the event you decided not to use the stud kit and opt instead for the factory style bolt arrangement, make sure to use good quality *grade eight* 3/8-16 bolts, making sure that you take advantage of all the threads in the head. Longer bolts in the end holes, shorter in the middle 3 holes.

Be careful not to over-torque the rocker shaft! Factory specs are 25-30 foot-pounds, and too much torque can easily crush the end of the shaft. Even as little as 35 foot-pounds of torque can start to bend the shaft.

## Legend Hemi Technical Information

**Lubrication:** When assembling the rocker system always use Comp Cam Lube, molly grease or extreme pressure lube on shaft, inside rockers and push rod ends. The lubricants will stick to the parts longer than oil during run in period. All are available from Indy Cylinder Head.

**Rocker Shafts:** The intake rocker shaft is 19 1/2" long, the exhaust is longer at 20 1/2". On the intake rocker shaft the oil holes go up and away from the intake valve (grooves will be down) on the exhaust rocker shaft the oil holes go up and away from the exhaust valve (grooves will be down).

**Rocker Arms and Shims:** Always lubricate the rockers before installing on the intake rocker use the .120 shim between the stand and rocker. On the exhaust rocker use the .060 shim between the stand and rocker. Use the normal Hemi side springs on the other side of the rockers.

**Oil Restrictors (Part # 426-27R):** Includes; 4 brass .050 drilled set screws, 4 black steel set screws not drilled. With the heads installed put the brass .050 restrictors in the rear rocker stands (4<sup>th</sup> back from front). Install them in the pre drilled 1/4-20 holes, 2 per stand. Install black steel non-drilled set screws in the front rocker stands (2<sup>nd</sup> back) install them in the pre drilled 1/4-20 holes, 2 per stand.

## General Technical Information

**Adjusting Valve Lash on Mechanical Camshafts:** First consult your cam spec card for the correct hot lash specification (operating temperature) that will work for initial start up. By hand rotate the crank shaft (in the running direction) until the exhaust pushrod begins to move upward, opening the valve. You can now adjust the intake lash by tightening the rocker nut while the proper thickness feeler gauge is inserted between the valve stem and the tip of the rocker. Tighten the rocker nut until there is a slight drag when moving the feeler gauge. To adjust the exhaust valve, rotate the crankshaft until the intake pushrod moves all the way up and goes past the "top" until it is one-half to two-thirds of the way back down. Adjust the exhaust rocker nut (with the proper feeler gauge) using the same procedures as with the intake rocker above. Repeat for all cylinders. Note: You may find it easier to set and maintain valve lash using polylocks. (Comp Cams)

**Simply Stated:**

1. Just as the exhaust valve opens adjust the intake valve
2. Just before the intake valve closes adjust the exhaust valve
3. With an aluminum head engine the cold setting should be approximately .010 tighter than is written on your cam card. Upon running and building heat in the engine, the lash will loosen up to the approximate cam card setting. Recheck after engine is hot.

