M P G

PRECISION VALVE-TRAINS

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PUB 050206PF

INSTALLATION INSTRUCTIONS
MID-LIFT® PF Series™

PF30 & PF35 Series Stud Mounted 4130 Chromoly Steel Roller Tip Rocker Arms

The PVS PF Series™ Chromoly steel roller rocker arms are designed to directly replace factory OEM stud mounted, shoe design rocker arms, but in use where "roller tip" rocker arms allowed. They have numerous "un-factory" design features that are available nowhere else, many of which are Patented or Patent Pending. These features, in addition to their special design and chromoly steel make these the best choice on the planet for competition engines which are required to use "stock type" rocker arms.

These rocker arms are the benefit of *Jim Miller's* *25 plus years* in designing high-end professional level shaft and stud mount roller rocker arms which have pioneered many innovations that other "big" companies have adopted or tried to take credit for. Although the PF Series™ rocker arms cater to an "more affordable" high performance option never before offered, they are the product of 3 years of development in precision forming die technology, that PVS is the first and only company to introduce in a chromoly steel. They are the result of leading edge innovation *by an engine builder for engine builders*. The PVS PF Series™ rocker arms have the very same essence of "correct rocker arm design" which has eluded every single "big-name" (and no-name) cam and rocker arm company since the dawn of time! No brag...just fact. Except for the more expensive *MILLER MID-LIFT® PRO-SHAFT® & PRO-STUD™ billet roller rocker arms*, you won't find such precision anywhere else.

NOTES: . . . . . *ESPECIALLY "E thru G"*

A. This Roller Tip, ball fulcrum rocker arm is designed for high strength but "moderate" valve lifts (usually under .525"), which require careful attention by the installer of checking for adequate clearance between the "cross bar" in front of the valve tip's roller and the valve stem tip at PEAK VALVE LIFT. On some combinations of higher valve lifts and "stock length" valves, this may need to be carefully ground for additional clearance.

B. *These instructions assume and require that the engine builder/mechanic has experience and a working knowledge of internal combustion over head valve engines, and specifically, valve train operation and modification. If you do not, please consult with your distributor of these products for additional information before doing it "wrong". We can't warranty your mistakes.*

C. If this is a newly assembled engine be sure you have installed a generous amount of cam break-in grease under the ball during rocker arm assembly to the engine. Another recommendation is to "prime" the engine before operating, to be sure there is no "dry time" during these first critical moments of operation.

D. *It is typical that these rocker arms will require .150" to more than .200" longer than stock pushrods in providing the correct 90 degree* MID-LIFT® *geometry.* ***Do all checks with full pressure springs****.*

E. Use of HYDRAULIC LIFTERS require a SOLID lifter of equal LENGTH to your hydraulic lifter be used for setup. A Patent Pending adjustable **Test-Tappet™** is available from **Miller**, if your cam supplier does not have what's needed. ***Or you may purchase the Miller G-TooL™ for setting from CLOSED valve, which alleviates preload compression on hydraulic tappet.***

F The following TECHNIQUE requires that your studs be accurately placed at OEM specifications. If you have modified the heads from "pressed" to "screw-in" studs, then you must check that rocker stud centerline with the valve centerline angle is 11-1/3 degrees for the **SB Chevrolet**; and 10 degrees (even) for the **SB Ford**. (The **BB Chevy** is *trickier.*)

G. **Some studs require replacement because they are too short. Allow threads 1.5X the Diameter of your stud**.

INSTALLATION

The top of the *PRECISION FORMED "PF SERIES™"* rocker arms, like all PVS rocker arms, is designed to be its own installation tool. This Patent Pending feature sets the machined flat surface at exactly 90 degrees with the STUD centerline when the VALVE is at the HAL-LIFT position. The CAM/LIFTER will also be at their HALF-LIFT position at this same time.

To find out what pushrod length you need, you must have (1) an ADJUSTABLE PUSHROD and (2) preferably a long shank ADJUSTER (as supplied with stud girdles) or the 12-Point Miller adjuster (supplied with PVS aluminum roller rocker arms). You will also need a DIAL INDICATOR, or at least a set of DIAL CALIPERS for measuring exact LIFTER RISE on the CAM, and exact VALVE LIFT at the retainer. A simple, but revolutionary **Geometry Tool Kit** is available from **Miller** (*see reverse side*).

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METHOD

1. With a dial indicator or dial caliper, rotate your engine over in turning over the cam lobe 1 full revolution from its base circle (closed position) to measure the NET LOBE LIFT of your CAMSHAFT in making sure the cam card is accurate.

2. Rotate the same cam lobe through again up to exactly the 1/2 LOBE LIFT POSITION (i.e., .380" TOTAL LOBE LIFT= .190"). This is of course the cam lobe's HALF-LIFT position.

3. Install your dial indicator carefully upon a non-sliding point atop the valve spring retainer, and in-line with valve stem. Be sure to depress the gauge down close enough to allow the indicator's stem to fully follow the valve lift, and stay clear of the rocker arm during this opening cycle.

4. Using an adjustable pushrod set to approximately .100" longer than stock, install the rocker arm while being careful to watch the dial indicator as the valve begins to open through to the estimated NET VALVE HALF-LIFT height. This "estimated" amount is the TOTAL CAM LOBE LIFT multiplied by the RATIO of your particular rocker arms, then DIVIDED by HALF. (i.e., If the LOBE LIFT is .340" and you have a 1.5:1 ratio [Part #PF3515], your VALVE LIFT will be .510" @ ZERO LASH.)

NOTE: *It's important to note that MID-LIFT® rocker arms are ratio set for ZERO LASH. If you have a mechanical cam, your true NET VALVE LIFT will be MINUS the lash figure, so you will want to use that as your intercept figure when adjusting the next step (#5).*

5. As you install the rocker arms on an already half open cam lobe, you will need to turn the adjusting nut down to begin opening the valve. You will need to STOP at the HALF-LIFT figure that your ratio and cam lift dictate. In our example, this would be half of .510", or .255".

NOTE: *If you have a mechanical cam with .020" lash, you would use.490" as your NET valve lift, and accordingly, you would stop rotating the adjuster when the valve lift reached .245".*

6. Once you have stopped the valve at your prescribed HALF-LIFT position, check to see if the TOP SURFACE "Measuring Face™" is now 90 degrees with the side of the adjusting nut or stud. As easy as this sounds (and it is), anything with a square edge can be laid across the top of this machined surface and up against the side of the stud, to "eyeball" very accurately (within .010" or less) if this 90 degree relationship is true. Odds are - it won't be. Odds are, you will have to lengthen the pushrod (unless you started with an overly long pushrod in the first place).

7. Turn your adjustable pushrod as required in the appropriate direction to level the top of the rocker arm until reaching this 90 degree relationship. The VALVE LIFT shown on your dial indicator will reflect a change, depending on which way you go. You must correct this by simply rotating the adjusting nut in the appropriate counter-direction to offset this and maintain your valve at the HALF-LIFT position. This technique is "quick" and "simple" once you've done it. It's simply a back-and-forth game between the two, the pushrod and the adjusting nut while watching the dial indicator. Keep the HALF-LIFT position of the valve fixed in place and adjust the other two against each other until the top of the rocker is SQUARE with the STUD. *ROTATE the engine all the way through to confirm the NET valve lift has been accurately duplicated for your cam and final pushrod length*.

8. Once you've accomplished this, remove the rocker arm by undoing the adjusting nut and being careful to keep the pushrod you've just set in its final length. MEASURE this final length, ORDER NEW PUSHRODS... *then throw away those "closed valve" little toy pushrod checkers.*

Now go and enjoy the precision and harmony in valve train motion, CUSTOM MADE just for YOU by YOU. You will now transfer to the valve as close as possible to 100% of the cam's LIFT, DURATION and RATE of acceleration information that's at the top of the pushrod, *which only MID-LIFT® rocker arms can do!*

OPTIONAL MPG PRODUCTS

MILLER ENGINEERING INC offers a 3-piece Geometry Tool Kit.
The Patent Pending **Miller G-Tool™** *makes precision geometry rocker arm setup "painless" and quick.* **Hydraulic Tappet setup is easy with the Miller Test-Tappet™.**

For **your G-Tool™, Test-Tappet™**, or custom length **Pushrods,** contact **MPG:**

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