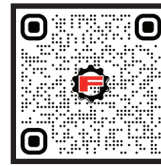




FEULING®
FEULINGPARTS.COM

**INSTALLATION INSTRUCTIONS FOR
QUICK INSTALL ADJUSTABLE PUSHRODS
FOR M8 & TWIN CAM**



**PART #s 4095, 4096,
4097, 4193, 4194, 4195,
4196, 4197, 4198, 4199,
4297, 4298, 4299**



FEULING Quick Install Adjustable pushrods are the strongest 'Quick' install pushrods on the market!

The strength and rigidity of this quick install pushrod design is second only to heavy duty one piece pushrods. Our tube material starts out as 7/16" rod OD, gets turned down to 3/8" OD leaving 0.134" wall thickness and heavy duty 7/16" – 20 threads for the base and jam nut. These will accommodate engines with taller cylinders, smaller camshaft base circles and short travel lifters.

IMPORTANT NOTICE

This installation should be done by an experienced mechanic who has access to a factory service manual and all required tools. Measure flywheel pinion shaft run out. Excessive pinion shaft runout will cause camplate and oil pump damage and/or failure. Excessive pinion shaft run out will void manufacturer's warranty.

CAUTION

Incorrect installation can cause engine damage not covered under warranty. Failure to install components correctly can cause engine seizure. Engine seizure may result in serious injury to motorcycle, operator, passenger, and/or others. Removal of the rocker arms and/or pushrods with the valve train loaded can damage rocker arms, pushrods, bushings, and/or camplate. Rotate engine to TDC of compression stroke on the servicing cylinder.

REQUIRED TOOLS

(x1) 3/8" open end wrench; (x2) 1/2" open end wrenches (x1 being thin is advised).

INSTRUCTIONS

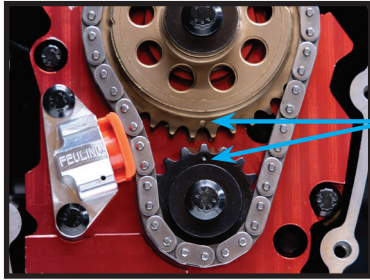
1. Refer to the proper factory service manual for your model and year of engine, for removal of existing pushrods.
2. The FEULING Quick Install pushrods are designed to install without removing the rocker box covers, rocker arms, lifter blocks, etc. These pushrods require FEULING quick install pushrod tubes.
3. Clean and inspect each new FEULING pushrod, including center oil hole.
4. Clean and inspect pushrod tubes. Remove any and all debris from the inside. Inspect sealing surfaces.
5. FEULING recommends using new O-rings and gaskets where applicable to prevent oil leaks.
6. Always verify lifters are fully pumped up before install.
Use an oil squirt can (#9005) to fill the lifter with oil through the feed hole on the side of the lifter, push oil through the feed hole until the air bubbles are gone. If needed, work the oil back and forth through the feed hole and pushrod seat with the squirt can. Light weight oil can be helpful.
7. Assemble and adjust one cylinder at a time, the servicing cylinder needs to be on TDC of compression stroke so the cam lobes and lifters are at their lowest point.



Note: If using FEULING lifter cuffs #4030 or factory units, firmly push down on lifters to ensure they are on the camshaft lobe. Lifters may hang upward after camshaft rotation.

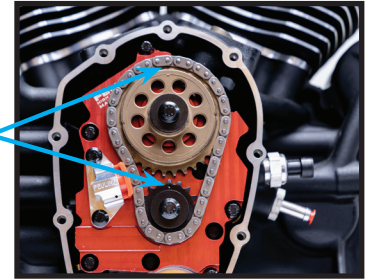
FINDING FRONT & REAR CAM BASE CIRCLES M-EIGHT

REAR CYLINDER BASE CIRCLES



With the timing marks aligned, the rear cylinder is ready for assembly.

FRONT CYLINDER BASE CIRCLES

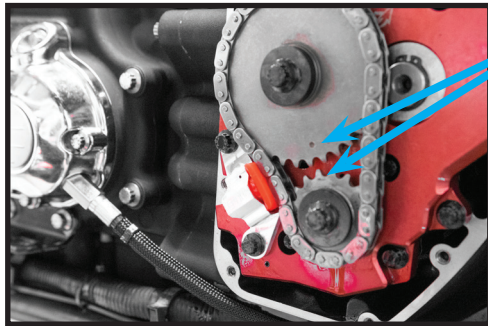


With the timing marks in this position, the front cylinder is ready for assembly.

Note: With the cam cover off during top end assembly, you can easily rotate the engine and determine the stroke of the engine. This is a simple and precise way to determine which cylinder is ready for assembly.

FINDING FRONT & REAR CAM BASE CIRCLES TWIN CAM

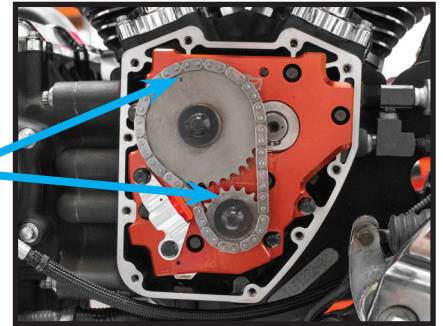
REAR CYLINDER BASE CIRCLES



With the timing marks aligned, the rear cylinder is ready for assembly.

With the timing marks in this position, the front cylinder is ready for assembly.

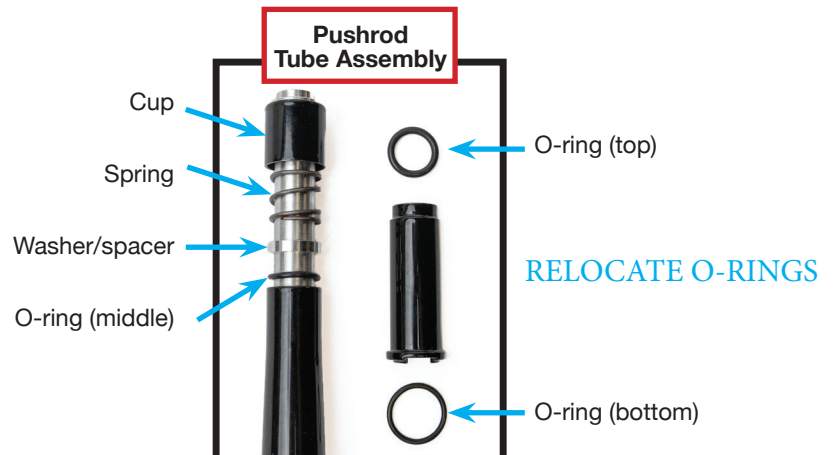
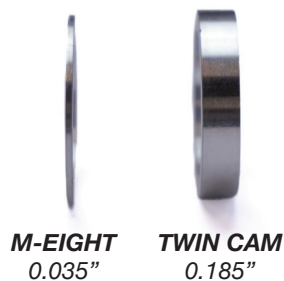
FRONT CYLINDER BASE CIRCLES



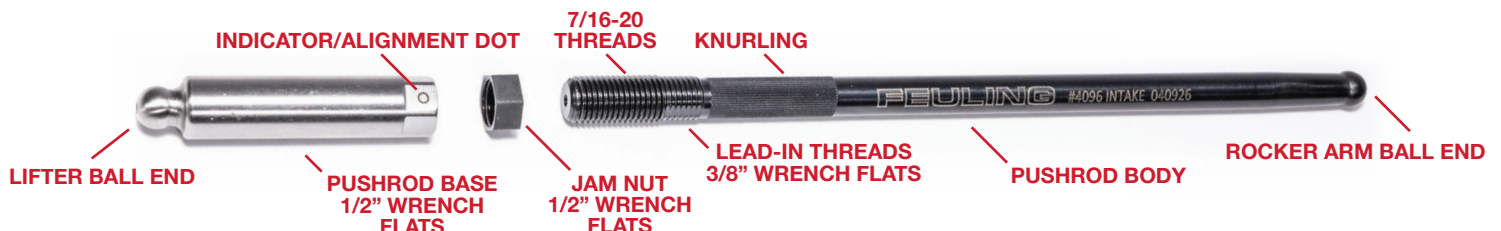
Note: With the cam cover off during top end assembly you can easily rotate the engine and determine the stroke of the engine. This is a simple and precise way to determine which cylinder is ready for assembly.

8. Assemble pushrod tubes. Apply small amount of oil to O-rings and on outside of inner tube.

NOTE: M8 = THIN WASHER, TC = THICK WASHER, #4095/#4097 KITS = USE FACTORY WASHER



9. To collapse pushrods for installation, screw the jam nut up towards the rocker end side of rod until it disengages from the threads. Screw the base up towards the same direction and it will disengage and slide up after the last thread.



THREADS PER INCH	DISTANCE PER 1 FULL TURN	TURNS TO 0.065"	FLATS TO 0.065"
20	0.050"	1.3	8

FEULING pushrods are marked 'INTAKE' & 'EXHAUST.'
Shorter pushrods are *INTAKE* and the longer pushrods are *EXHAUST*.

10. -PREPPING PUSHRODS, COLLAPSED IN INSTALL POSITION-



11. -PUSHROD INSIDE TUBE ASSY READY FOR INSTALL -- 2 PICS AND SHOW WHERE O-RINGS GO-

12. Slide the pushrods through the QUICK INSTALL tube covers. Hold the tube assembly as low on the pushrod as possible. Swing up into the rocker housing and into rocker arm cup and set the pushrod base on the seat of the lifter. Recommended to fill pushrods with oil prior to install.



FIG. A

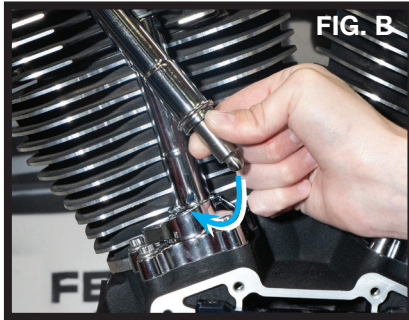


FIG. B

FIG. A INTAKE: Install intake pushrod and tube from outside of engine and swing inward (toward manifold) after you insert the ball end up into the rocker arm cup.

FIG. B EXHAUST: Install exhaust pushrod and tube inside of the engine and swing outward (toward exhaust port) after you insert the ball end up into the rocker arm cup.

13. With the tubes held upward, hold the pushrod body in place while turning the pushrod base clockwise (looking down) until there is not up and down play (zero lash). Ensure pushrod is seated in rocker arm and lifter cup.

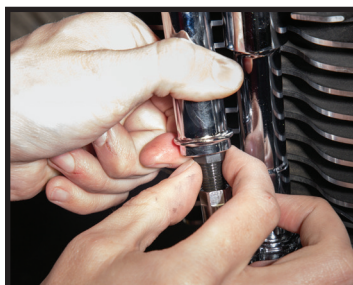


Note: If using FEULING lifter cuffs #4030 or factory units, firmly push down on lifters to ensure they are on the camshaft lobe. Lifters may hang upward after camshaft rotation.

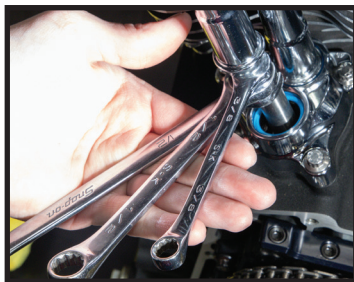
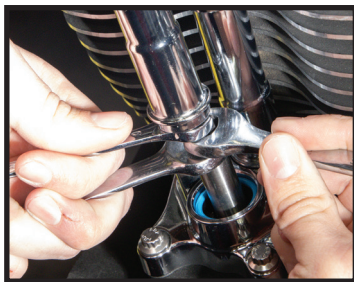
14. Thread the jam nut down until it touches the base and is out of the way of the flats on pushrod body. Place 3/8" open end wrench on the flats near the top of the threads to keep the body from spinning. Place a 1/2" (thin) open end wrench on the hex of the base. Spin base to proper preload.

7/16-20 TPI (Each turn = 0.050" preload, 2 full turns = 0.100" preload)

Note: We DO NOT recommend bottoming the lifter and adjusting backwards. This can damage the internal components.



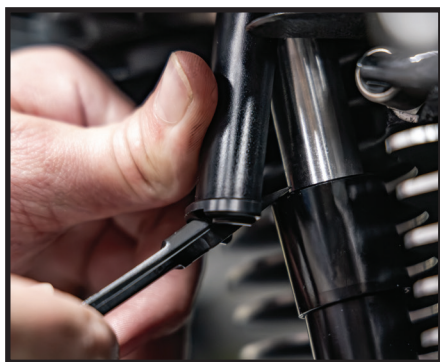
15. Once the preload has been set, screw the jam nut down against the base. Use a 3/8" wrench on the pushrod body and a 1/2" (thin) wrench on the base to prevent both from spinning, then use another 1/2" wrench to tighten jam nut (if you start to round the corners of the jam nut, you're overtightening).



Once the lifters have bled down, you will be able to spin the pushrods with your fingers.

Now you can rotate the engine over to start install on the other cylinder.

16. Install pushrod retaining clips. Slide inner tube up into cylinder head with O-ring, then slide lower tube into O-ring in lifter block. Install clip between cylinder head and pushrod cup using pry tool (preferably plastic material). Spin pushrod tube/cup if any install marks are created. If clip will not install, check if O-rings in cylinder head are doubled up or if incorrect washer/spacer was used.



TROUBLE SHOOTING NOISY VALVE TRAIN

1. Lifter adjustment - Starting with a fully pumped up lifter, from zero lash put 0.90" - 0.100" of pre-load on Feuling hydraulic lifters
2. Lifter to lifter bore clearance out of spec, Feuling recommends a clearance of 0.001" - 0.0015" for proper oil psi at lifter
3. Pushrods flexing and hitting pushrod tubes - look for a shiny ring witness mark around pushrod normally seen up towards the cylinder head
4. Low oil pressure - inspect pressure relief valve in camplate, oil pump/camplate wear
5. Pushrod center oil hole plugged
6. Clearance for roller rocker arms on under side of rocker box covers
7. Steep ramped camshafts, valves closing so fast the valves bounce off valve seats - see Feuling Beehive® valve springs
8. Excessive crankshaft runout
9. Gear drive camshafts, excessive gear drive backlash or excessive crankshaft runout
10. Rocker arms/bushings out of tolerance
11. Valve spring clearance to lower rocker box housing
12. Valve spring coil bind and or valve spring harmonics - match up valve spring open height with camshaft peak lift
13. Leaky/broken piston cooling jets

*** STANDARD 1 YEAR WARRANTY:**

- Warranty covers manufacture defects.
- Does not cover parts that have failed due to improper installation, maintenance, excessive crankshaft runout, or misuse.
- Does not cover any consequential damage resulting from a failure of a feuling product.

*** OPTIONAL 2 YEAR WARRANTY:**

- Additional year warranty is only available if parts are installed by a professional installer.
- The online warranty form must be completed by the dealer prior to bike delivery.
- Oil tank must be dropped & cleaned.
- Crankshaft runout must be below 0.005"

NOTE: FOR FULL WARRANTY INFORMATION VISIT www.FEULINGPARTS.com/WARRANTY



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