



FEULING[®]
FEULINGPARTS.COM

LIFTER INSTALLATION INSTRUCTIONS

FULL TRAVEL HYDRAULIC LIFTERS #s: 4000, 4025, 4050, 4051, 4052, 4061, 4062
SOLID LIFTERS #4055



FEULING performance lifters, when installed with proper lifter to lifter bore clearances, proper rocker arm/shaft/support clearances and a high volume oil pump will provide optimized oil flow to the top end of your engine extending valve train component life and minimizing valvetrain noise.



IMPORTANT NOTICE

This installation should be done by an experienced mechanic who has access to a factory service manual and all required tools.



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, push rods, bushings and or camplate. Rotate engine to TDC of compression stroke on the servicing cylinder.

WARRANTY NOTE

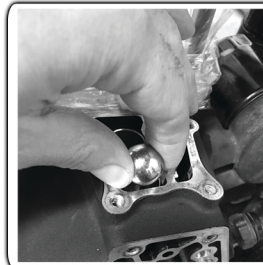
Feuling offers an additional 12 month warranty for a total of 2 years if product is installed by a professional V-Twin installer, oil tank is dropped and cleaned at time of install and the WARRANTY REGISTRATION form is filled out - form can be found on www.Feulingparts.com

SOLID LIFTER NOTE

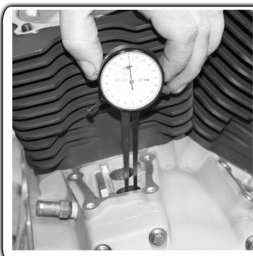
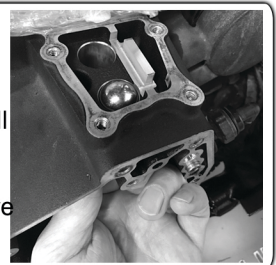
Feuling recommends starting with zero lash cold, then finding the sweet spot for your engine combination

1. For removal of lifters & inspection of lifter bores, refer to the factory service manual for your model & year engine.
2. Clean, inspect and measure lifter bores to make sure the tolerances are within specification. For maximum lifter performance Feuling® recommends a lifter to lifter bore clearance of 0.001"-0.0015". Feuling® offers oversized lifters part #'s 4051 & 4052.

There are multiple methods to measure lifter to lifter bore clearance. Easy an accurate method is to use Feuling tool #9004, set of precision ground balls to accurately measure lifter bore diameter & roundness



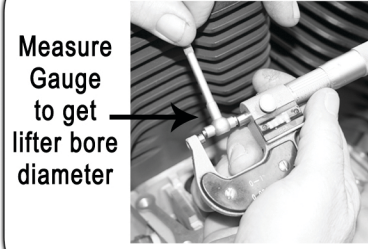
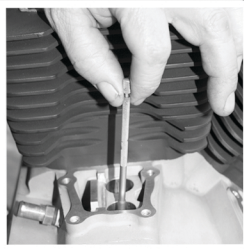
#9004 The correct size ball will pass through the lifter bore 'snugly', this will give you the correct bore size taking roundness of the bore into account



Measure Lifter Bore's

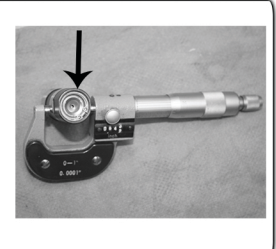
← Internal Dial Calipers

Snap Gauge →



Measure Gauge to get lifter bore diameter

Measure lifter O.D. & Subtract from Bore size to get clearance



3. Thoroughly clean and inspect each new Feuling® lifter, clean your pushrods and make sure the center oil through hole is open and free of debris.

4. Pump up each lifter before installing. Use an oil squirt can 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 of the lifter with the oil squirt can. Light weight oil can be helpful.



5. Apply engine assembly lube or liberal amounts of engine oil to the lifters, rollers and lifter bores.

6. We recommend that you fill the pushrod oil holes and rocker arms with engine oil before final installation.

7. Install lifters in the lifter bores of the crankcase, with the lifter flats facing forward and rearward. Avoid cam damage! Do not drop lifters onto cam lobes. We recommend facing the side feed hole in all the same direction

8. Check all clearances - lifter to camshaft lobe clearance, lifter to lifter blocks, lifter flats to roll pin, pushrod to pushrod tubes and if using one piece pushrods check length for proper pre load on lifters.

9. Assemble and adjust one cylinder at a time, the servicing cylinder needs to be on TDC of compression stroke so the cam lobes are at their lowest point.

10. Feuling® full travel hydraulic lifters run best at .090" - .100" of pre-load. If using adjustable pushrods, from zero lash adjust the pushrod longer .090" - .100". If using one piece pushrods make sure you have the correct lengths to get 0.090"-0.100" of pre-load.

11. If using adjustable pushrods we recommend adjusting Feuling® lifters starting with a fully pumped up lifter from zero lash and adjusting the pushrod .090"- .100" longer crushing the lifter. We **DO NOT** recommend bottoming the lifter and adjusting back upwards.

12. When using adjustable pushrods it is helpful to have the rocker arm in hand to feel for zero lash and it is a must to start with a fully pumped up lifter.

13. Feuling® full travel hydraulic lifters have a total travel of 0.200", correct pre load is at 1/2" travel = 0.100"

14. Know your adjustable pushrod thread pitch! Feuling® adjustable pushrods have changed throughout the years, Feuling has produced rods with 32, 24 & 20 threads per inch. Our current line up (1/30/19) HP+ and RS have 24TPI, QUICK install have 20TPI and FAST instal have 32TPI. - See adjustment chart below.

15. If adjusting valve lash with solid lifters see your camshaft recommendation or ask your camshaft manufacturer. Feuling recommends starting with zero lash cold, knowing you will need to find the sweet spot for your engine combination

16. Refer to your factory service manual for final assembly.

ADJUSTABLE PUSHRODS – REFERENCE ONLY – SEE THE INSTRUCTIONS THAT CAME WITH YOUR PUSHRODS

**CORRECT ADJUSTMENT
REQUIRES STARTING
WITH FULLY
PUMPED UP LIFTERS**

<u>Threads per Inch</u>	<u>Distance per 1 Full Turn</u>	<u>Turns to .100"</u>
20	0.050"	2
24	0.0417"	2.39
28	0.0357"	2.80
32	0.0313"	3.19
36	0.0275"	3.63
40	0.0250"	4

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

WARRANTY:

All parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at FOP's option if the parts are returned to FOP by the purchaser within the (12) month warranty period. In the event warranty service is required, the original purchaser must notify FOP of the problem immediately. Some problems may be rectified by a telephone call and need no further action. A part that is suspect of being defective must not be replaced without prior authorization from FOP. If it is deemed necessary for FOP to make an evaluation to determine whether the part was defective, it must be packaged properly to avoid further damage, and be returned prepaid to FOP with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. After an evaluation has been made by FOP and the part was found to be defective, repair, replacement or refund will be granted. Excessive flywheel pinion shaft run out will damage camplate and oil pump and or cause engine damage and or failure. Damage to Feuling oil pump corporation products from excessive pinion shaft run out will void manufacturer's warranty.

ADDITIONAL WARRANTY NOTE

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ADDITIONAL WARRANTY PROVISIONS:

FOP shall have no obligation in the event an FOP part is modified by any other person or organization, or if another manufacturer's part is substituted for one provided by FOP. FOP shall have no obligation if an FOP part becomes defective in whole or in part as a result of improper installation, improper break-in or maintenance, improper use, abnormal operation, or any other misuse or mistreatment. FOP shall not be liable for any consequential or incidental damages resulting from the failure of an FOP part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or any other breach of contract or duty between FOP and the customer. The installation of parts may void or otherwise adversely affect your factory warranty. In addition, such installation and use may violate certain federal, state and local laws, rules and ordinances as well as other laws when used on motor vehicles operated on public highways, especially in states where pollution laws may apply. Always check with federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his/her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties and risks associated therewith. Our high performance parts, engines and motorcycles are intended for experienced riders only. Feuling Oil Pump Corporation reserves the right to change prices and/or discounts without notice and to bill at the prevailing prices at the time of shipments. The words Harley®, Harley-Davidson® and H-D® and all H-D® part numbers and model designations are used in reference only. Feuling Oil Pump Corporation is in no way associated with, or authorized by Harley-Davidson Motor Co®. To manufacture and sell any of the engine parts described in this instruction sheet.