FEULING® OILING SYSTEM COMPONENTS INSTALLATION FOR MILWAUKEE EIGHT ENGINES



NOTE

- **FEULING OE+ CAMPLATE #8037 IS ONLY FOR USE WITH THE FACTORY HD® OIL PUMP AND IS DESIGNED TO USE THE FACTORY OIL PUMP BOLTS OR FEULING X ARP BOLT KIT WITH WASHERS SEE #8023**
- **FEULING HIGHFLOW CAMPLATES REQUIRE A FEULING HP+ #7018 OR RACE SERIES #7020 OIL PUMP, FOR FEULING X ARP BOLT KIT SEE #8022**

- **FEULING RECOMMENDS THE FOLLOWING INSTALLATION PROCEDURES FOR ALL OILING SYSTEM COMBINATIONS ON M-EIGHT ENGINES**

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 run out will cause damage and or failure. Excessive pinion shaft run out will void manufacturer's warranty. Feuling recommends ideal crankshaft runout at or below 0.003" but our warranty will cover up to 0.0045".

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

FEULING® DOES NOT RECOMMEND TUNING BEYOND STOCK EMISSIONS STANDARDS.

1. Refer to the proper factory service manual for your model and year of engine, for removal and installation of camchest.

2. Clean and inspect new camplate, oil pump and all related components

3. If using 1 piece pushrods which is highly recommend by FEULING - see FEULING #4087. Remove fuel tank, oil/water lines and engine rocker box top covers and rocker arms to access the pushrods. SEE TECH TIP ON PAGE 4

4. Remove lifters, cam cover, sprockets, cam chain, camplate and cam. Feuling recommends replacing the inner cam bearing see FEULING part #2080

5. If installing a high lift cam inspect camshaft for rotating clearance on engine case etc. Also verify correct valvespring to camshaft combination and clearance from coil bind. Feuling highly recommends Beehive valvespring kit #1107 or 1108 for cams up to .565" lift.

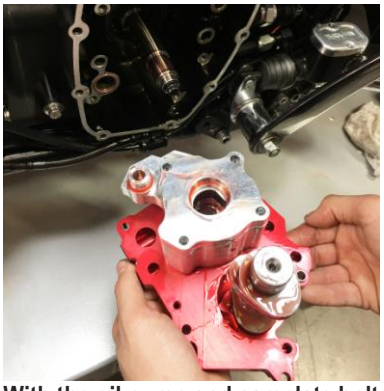
6. **Install new O-rings into engine case using assemble lube on O-rings to aid in installation. Rotate crankshaft so flats are vertical**

7. **Use proper engine assemble lube on camplate, camshaft, crankshaft, inner cam bearing, oil pump, scavenge port hole/oil pump o-ring and lifters.**



8. **Rotate oil pump gears so gear flats are vertical to match the crankshaft per step 6. We found having the crank and gear flats vertical make for the easiest install of the oil pump and camplate assembly.**

9. **Feuling recommends installing the oil pump and camshaft into the camplate while on the bench, fasten oil pump finger tight line the oil pump gear flats up with the crankshaft flats and slide assembly onto the crankshaft. Once the camplate assembly is in position we recommend pressing firmly on the oil pump with your left thumb to press back of oil pump into the scavenge port O-ring. Feuling recommends this procedure so the components are always going in towards the crankshaft, this procedure produces the best seal on the oil pump scavenge port hole.**

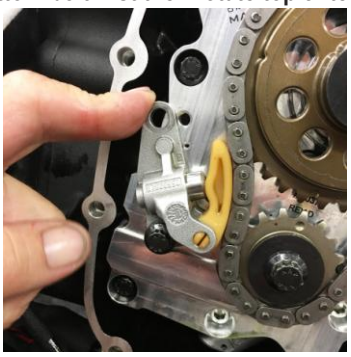


10. **With the oil pump and camplate bolts finger tight rotate the engine over by hand, tighten and torque the camplate bolts first then the oil pump bolts, this process will center the camplate and pump as best as possible to the engine and crankshaft runout. Alternately step torque camplate and oil pump bolts up to a final 120 inch pounds.**
<u>NOTE:</u> FEULING X ARP OPTIONAL BOLT KITS: OE+ CAMPLATES REQUIRE #8023 WHICH INCLUDE WASHERS FOR THE OIL PUMP BOLTS. HIGHFLOW CAMPLATES REQUIRE #8022 WHICH DOES NOT USE OIL PUMP BOLT WASHERS.

11. It is advisable to have clean fresh oil in the oil tank, and while rotating the engine over to center the oil pump and camplate the system will start to prime and you should see oil coming out the tensioner feed hole and around the pinion shaft. This aids in initial start up oil psi.

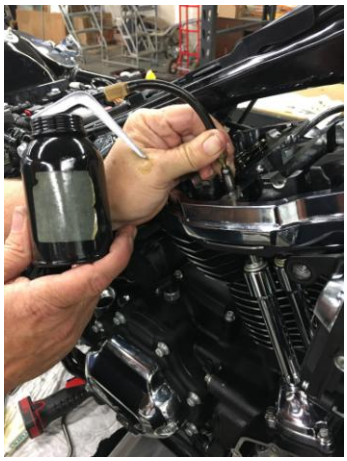
12. Install sprockets, lining up timing marks. Check sprocket alignment with a straight edge, use correct thrust washer thickness to achieve proper sprocket alignment. See Feuling #8041 for spacer thickness selection/options. Sprocket alignment is critical for wear and longevity of tensioner pad.

13. Install chain tensioner/housing by installing bottom bolt first then rotate top of tensioner to line up the top bolt



14. Install lifters, pushrods and rocker arms, Feuling recommends using an oil squirt can to manually pump up the lifters, pushrods and rocker arms during assembly. This will aid in lubrication for initial start up and will provide a quiet engine with immediate oil psi.

15. It is recommended that you rotate the engine over with the lifter 'cuffs' or holders finger tight to center the holders on the lifters before final torque



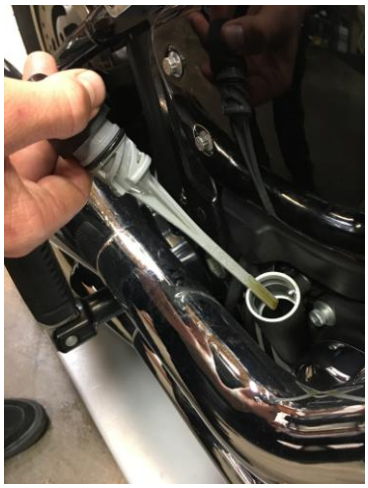
16. With engine on TDC of adjusting cylinder tighten the rocker arm shaft bolts evenly until they are seated with estimated 10 Ft. Lbs, then loosen the bolts or nuts to allow the shafts to settle in, then re-tighten evenly and step to final torque. If using Feuling stud/nut kit final torque is 24 Ft. Lbs. Wait estimated 15-20 minutes for the lifters to bleed down before rotating the engine to tighten the other cylinder rocker arms. Following this procedure will eliminate any chance of valve/piston interference during installation. Feuling recommends the installation of #3047 rocker arm studs and nuts to prevent cylinder head cracking.

***FEULING Rocker Stud/Nut kit #3047 will reduce stress on the rocker arm head stand offs. The rocker arm 'stand offs' are a weak link and prone to cracking.**

17. **New lifters are recommended by Feuling® but not required. See Feuling HP+® series lifters #4000 or RACE SERIES lifters #4017, RACE SERIES lifters have a slower bleed down and will operate quieter than factory HD® or HP+® lifters.**

TECH TIP FOR USING 1 PIECE PUSHRODS WITH CAM/OILING SYSTEM INSTALL:

1.) Remove gas tank, spark plug wires from plugs, left side spark plugs, fuel injector plug ins, compression release plug ins etc.
2.) Remove voltage regulator bracket bolts qty. 2
3.) Remove front top engine mount, from frame first then cylinder heads
4.) Remove exhaust
5.) Remove oil line 'oil cooled models' small catch tray on top of trans cover, wad of rags in the front to catch oil
6.) Remove cam cover, rotate engine to timing marks
7.) Remove top rocker covers, rocker arms, pushrods, pushrod tubes, lifter covers



OIL LEVEL - DO NOT OVERFILL OIL TANK

It is important to get the correct hot oil level in your bike. Feuling recommends running the oil level 90%-99% full when hot.

Note: The oil pick up port is on the right side of the engine. Letting the bike idle or warm up on the kickstand will naturally fill the engine case and skew the oil level in the tank.
We recommend the following steps to achieve proper oil level:

1. Check cold oil level.
2. Ride the bike until operating temperature is reached.
3. Shut the bike off while still in the upright position. (This insures an accurate reading)
4. Once the bike is on the kickstand check oil level.
5. Add or remove oil as needed

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