

INSTRUCTION SHEET FOR TP PRO-SERIES® SMART PUMP

Thank you for purchasing TP Engineering's award-winning billet aluminum oil pump that filters your oil before it enters the engine, has the ability to use 10-micron oil filters, and features TP's patented three-valve technology. Please take a moment to verify you have received the parts listed in the following parts list:

1 – Oil Pump Body	1 – Drive Gear, 5/8"	2 – 1/8" X 1/2" Chrome Elbow	4 – 1/4-20 X 2 1/4 Bolt
1 – Oil Pump Cover	1 – Drive Gear, 1/2"	2 – 1/8" X 9/16" Chrome Elbow	2 – Oil Pump Bolt
1 – Oil Pump Body Gasket	1 – Idler Gear, 5/8"	4 – 3/8" Hose Chrome Fitting	4– 7/16 X 1/4 Chrome Washer
1 – Oil Pump Cover Gasket	1 – Idler Gear, 1/2"	1 – Retaining Ring, Pinion Drive Gear	2 – 1/4" Lock Washer
1 – Oil Pump Drive Shaft		1– Retaining Ring, Pump Feed Gear	

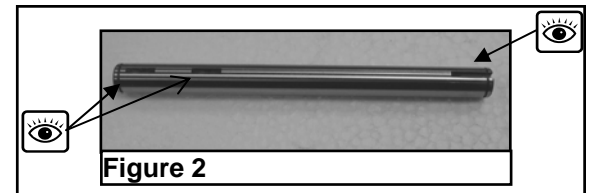
CRITICAL: Do not use any type of plumbing tape (such as Teflon) for this installation! Catastrophic engine failure will result. We recommend Permatex High-Temp Thread Sealant, Part No. 59235 for pipe fitting assembly.

CRITICAL: The oil lines connecting the Smart Pump to the oil filter operate under high pressure. Use SAE J1019 3/8" 400psi WP hose only.

CRITICAL: All oil lines and fittings must have an inside diameter of no less than 0.300 inches.

CRITICAL: IF OIL PUMP IS INSTALLED INCORRECTLY, OR ANY KEYS ARE FORGOTTEN, CATASTROPHIC ENGINE FAILURE WILL OCCUR. ALWAYS REFER TO YOUR SHOP MANUAL OR CALL TP ENGINEERING FOR ASSISTANCE.

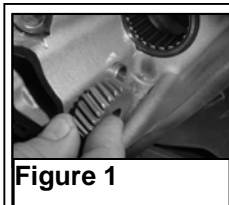
Note: Lightly lubricate all internal parts during assembly process. Use Torco Engine Assembly Lube, Part No. A550055K or equiv.



Removal of Old Oil Pump

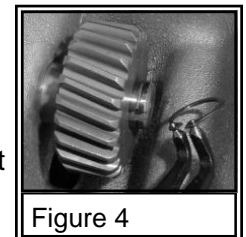
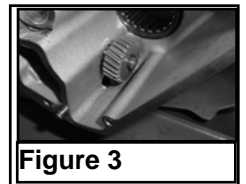
1. Remove oil lines from oil pump. Plug and drain oil from feed line.
2. Remove oil pump cover bolts, cover and gasket.
3. Remove lock clip from the end of the oil pump drive shaft. Pull both gears from pump body and remove the oil pump drive shaft key from the drive shaft.
4. Remove two top bolts from the oil pump main body.
5. Slide pump body off of oil pump drive shaft.
6. Slide the remaining return gear off the oil pump drive shaft and remove the drive shaft key.

There is no need to remove the existing oil pump drive shaft unless it is damaged. Proceed to step 12 unless you intend to replace the drive shaft.

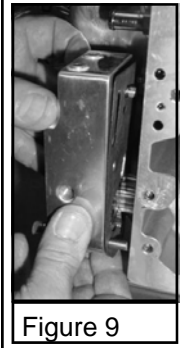
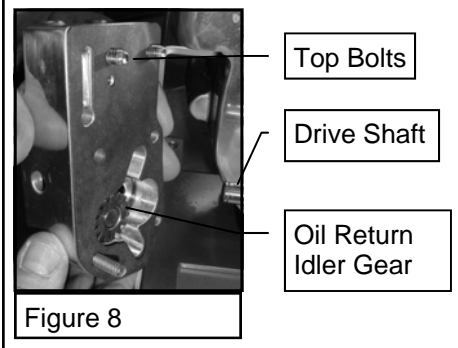
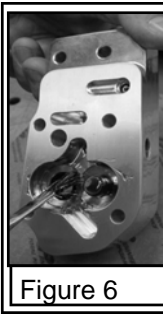
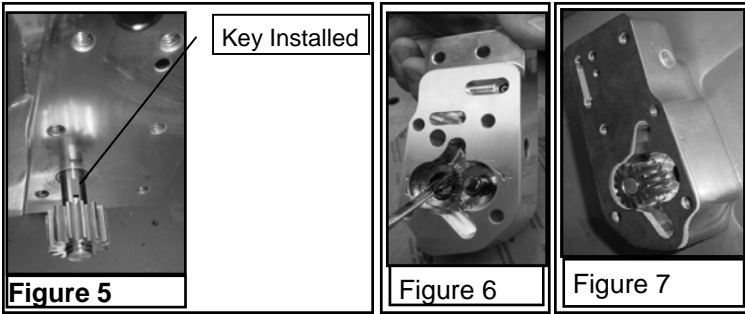


7. Remove cam cover.
8. Remove snap ring from end of oil pump drive shaft holding on the drive gear inside the cam chest. Slide drive gear from the end of the drive shaft and remove drive shaft key from keyway.

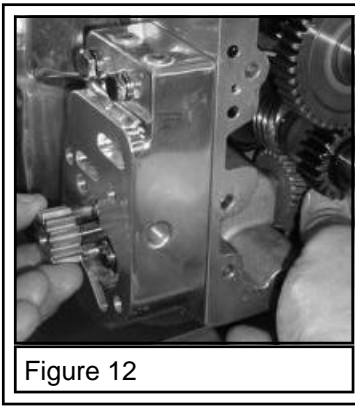
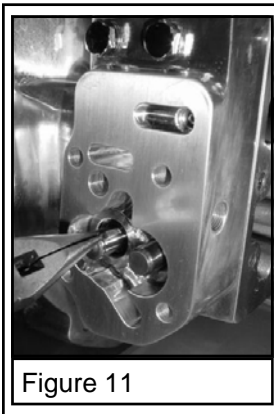
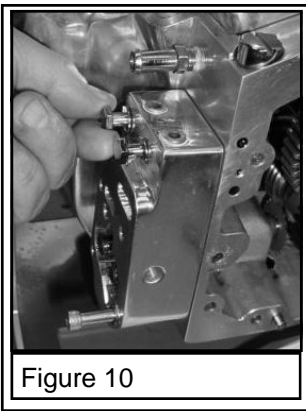
9. Slide drive shaft out of engine case.
10. Hold the oil pump drive gear against drive shaft bushing inside cam chest, as shown in Figure 1. Make sure the keyway in the drive gear is positioned so that it is visible (for later key installation.) Slide the oil pump drive shaft into the engine case drive-gear-end first (Identify the drive gear end using Figure 2 – it has a single open-ended keyway) through the drive gear you are holding (see Figure 3)
11. Hold the drive gear key with a pair of needle-nose pliers and work the key into the keyway of the drive shaft and drive gear. Key must be inserted past the retaining groove for the snap ring.
12. Install the snap ring on the end of the oil pump drive shaft (Figure 4).



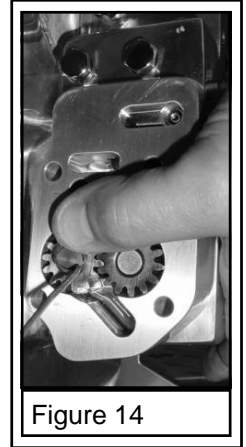
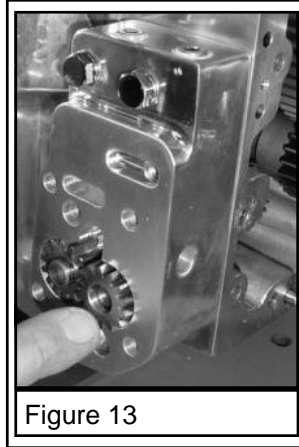
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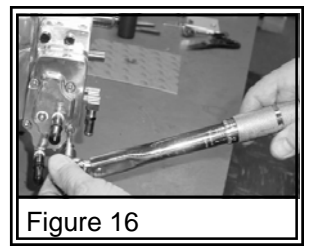
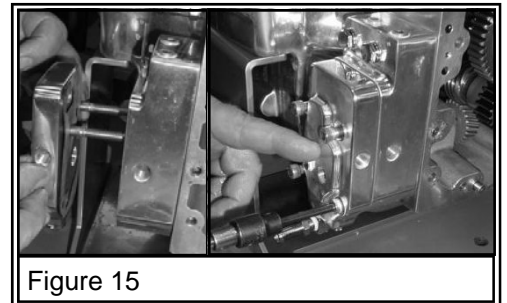
13. Install new key in drive shaft for return drive gear. This key fits in the slot nearest the engine case.
14. Slide the 0.625" oil return drive gear (larger of the set) on drive shaft and over key (Figure 5.) Make sure key stays in place and locks gear to shaft.
15. Lubricate idler shafts in both sides of the oil pump body with assembly lube (Figure 6.)
16. Install new 0.625" return idler gear onto idle shaft in



17. Apply one drop of Loctite Blue thread locker to each of the supplied bolts prior to assembly.
18. Install new gasket making sure all holes line up with pump. Use two hex-head top bolts to hold gasket in place on pump body. Slide pump down drive shaft while meshing two return gears together (Figure 8 & 9)
19. Lightly snug top two bolts to hold pump in place (Figure 10)



20. Install new key in drive shaft for feed drive gear (Figure 11)
21. While holding end of drive shaft on the inside of the cam chest, slide 0.500" feed drive gear (thinner of set) on drive shaft aligning the key with the cutout in the gear (Figure 12)
22. Install 0.500" pump feed idler gear onto idle shaft in pump body (see Figure 13).
23. Install retaining clip on end of drive shaft (Figure 14)
24. Clean gasket surface of oil pump cover. Install cover gasket and cover using 4 allen head bolts. Lightly snug bolts (see Figure 15).



(Continued on page 3)

25. Torque bolts to 110 in lbs using criss-cross pattern (Figure 16)
26. Install cam cover (if removed)

Connections

The Smart Pump is the first oil pump to route motor oil to the oil filter before allowing it into the engine.

Oil is pumped out through the oil filter feed line under pressure by the feed side of the pump. Once filtered, oil re-enters the pump through the oil filter return line and proceeds to lubricate the engine. Oil is then returned directly to the oil tank via the return side of the oil pump.

Some oil filters have a check valve that allows oil to flow in only one direction, so it is absolutely critical that the pump is properly connected before running the engine or catastrophic engine failure will result. CLEAN OIL LEAVES THE OIL FILTER THROUGH THE CENTER. If you reverse the connections on the oil filter housing, NO OIL WILL FLOW THROUGH THE FILTER.

IMPROPER INSTALLATION OF OIL PUMP WILL VOID ANY ENGINE WARRANTY, AND MAY RESULT IN SEVERE INJURY OR DEATH.

Use the “Smart Pump Connections” diagram to determine the correct oil line connections. Oil lines running to and from the oil filter operate under high pressure and require the use of SAE J1019 3/8" 400psi WP grade hose.

27. Fill oil tank to recommended capacity.
28. Verify all fittings and clamps are properly tightened.
29. Immediately before initial startup, connect a section of 3/8" hose to the feed line inlet fitting on the oil pump cover (Figure 17.) TP oil pumps are not self-priming and will not gravity bleed.

FAILURE TO PROPERLY PRIME YOUR OIL PUMP WILL RESULT IN CATASTROPHIC ENGINE FAILURE.

To prime the pump, you must fill it's supply-side using a squirt can. Insert the squirt can's spout into the hose and pump motor oil into the oil pump until resistance is felt (see attached “Smart Pump Connections” diagram to identify proper fitting.) Connect the feed line from the oil tank to the oil pump.

Next, connect the section of 3/8" hose to the oil filter

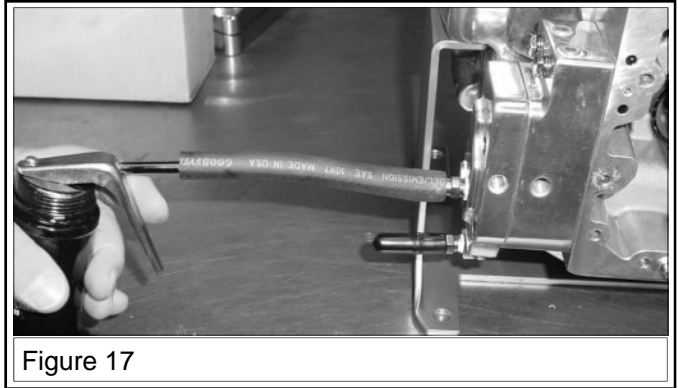


Figure 17

return fitting (Figure 18.) Insert the squirt can's spout into the hose and pump approximately 2 to 3 ounces (about 20 pumps from the squirt can) of oil into the

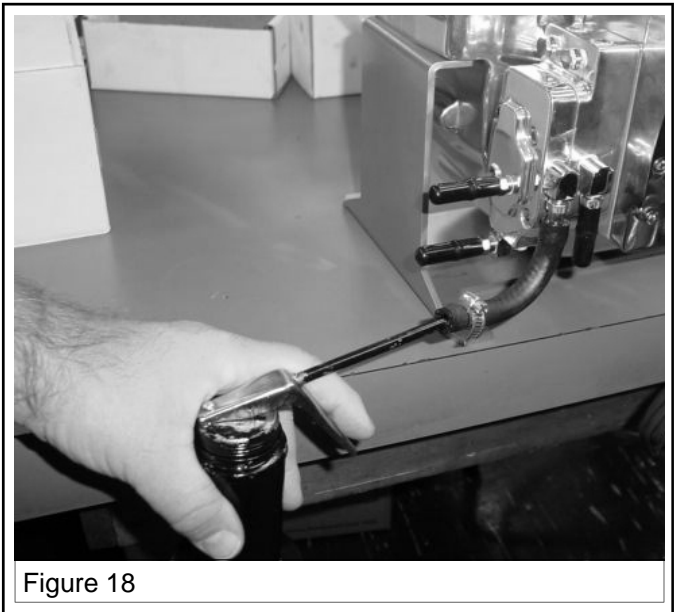


Figure 18

- engine. This will lubricate the engine bearings while oil pressure is building the first time.
30. Start engine. Allow the engine to run at idle speed only while developing oil pressure — this may take up to 25 seconds. If normal oil pressure is not developed within 25 seconds, shut off engine and verify the proper connection of oil lines. Call TP Engineering for assistance, if necessary. **DO NOT** run engine longer than a total of 60 seconds without oil pressure, or serious damage will occur and will not be eligible for any warranty coverage.
 31. Check for oil leaks. Any oil leaks are extremely dangerous and if not immediately corrected may result in severe injury or death.