

Melling Low Pressure Oil Pump 1994-2003 INSTALL INSTRUCTIONS



IMPORTANT: Before starting installation, please be sure that all items which were supplied with the kit are accounted for.

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Parts Required:

1. Melling M208 Low Pressure Oil Pump:
Part# M208

Tools Required:

1. Fan pulley holding wrench 303-478 (2 1/8")*
2. Fan clutch nut wrench 303-214 (1 7/8" or 47 mm)*
3. Harmonic balancer puller*
4. Harmonic balancer install tool*
5. Flywheel holding tool 303-103*
6. Metric and SAE wrenches and sockets
7. Drive breaker bar (1/2")
8. 27" x 27" cardboard

*Available to rent at most auto part stores

INSTRUCTIONS

NOTE: THESE INSTRUCTIONS ARE ONLY FOR INSTALLING THE MELLING LPOP, NOT THE OEM PUMP.

1. Disconnect the ground cable on both batteries.
2. Making sure engine is cold, remove DEGAS bottle cap and drain about one (1) gallon of coolant out of the radiator drain valve.
3. Remove the upper hose from the DEGAS bottle.
4. Remove the lug nut wrench from the radiator support by removing the wing nut and hold down bracket.
5. Remove the three (3) 8 mm bolts from the DEGAS bottle. (**fig. 1**)
6. Lift the DEGAS bottle up and place to the side. The lower hose will remain attached.
7. Remove the clamp from the upper radiator hose. Coolant can still be in this hose, so be careful. Place hose out of the way with a wire or bungee cord.
8. Remove the two (2) 8mm bolts holding the fan shroud to the radiator support. (**fig. 2**)



- 9 Slide a piece of cardboard in between the radiator and the shroud. This will protect the fragile radiator fins from damage during this install. (fig. 3)
 - 10 Using the fan pulley holding wrench, place it around the water pump pulley bolts.
 - 11 Using the fan clutch nut wrench, place it on the fan clutch nut. To break the torque you will need to apply a counter clockwise force to the fan clutch nut wrench while holding the fan pulley holding wrench. **OBS AND F450/550 TURN CLOCKWISE TO LOOSEN.** This is best accomplished using two people. (fig. 4)
 - 12 Once the fan clutch nut is loose, spin the fan counter clockwise to remove it from the spindle. The fan is heavy and when free, will fall into the radiator. Be careful when backing it off.
 - 13 Once the fan is off the spindle, you can lift the fan and shroud out of the truck. The cardboard will help protect the radiator.
 - 14 Using a 1/2" drive breaker bar or long ratchet, release the serpentine belt tensioner spring pressure by applying a counter clockwise force. While applying the force, reach below the tensioner and lift the tensioner holding clip to engage the lock to keep the tension off of the belt. When engaged, slowly release the force on the breaker bar. (fig. 5, fig. 6)
 - 15 Remove the serpentine belt off of the pulleys and remove from the truck.
 - 16 **Automatic trucks:** Remove the four bolts from the transmission torque converter cover and install a flywheel holding tool or have a helper hold the flywheel. (fig. 7)
- Manual trucks:** Make sure the truck is in a low gear with the emergency brake set.
- 17 Using a 15/16" socket, remove the harmonic damper retaining bolt (torqued to 212 ft-lb) by turning counter clockwise. (fig. 8)



18 Install the harmonic balancer removal tool onto the harmonic balancer. Use the 3/8"-16 bolts and install them fully into the balancer. Make sure the jackscrew centering cone is installed and large enough to engage in the bevel of the crankshaft. **(fig. 9)**

19 Apply sufficient torque to the jackscrew to pull the balancer off of the crankshaft. **CAUTION: THE BALANCER IS HEAVY AND WHEN PULLED FREE CAN DROP AND CAUSE DAMAGE/INJURY.**

20 Verify the crankshaft keyway remains on the crankshaft. **(fig. 10)**

21 Remove the four (4) 10mm bolts holding the LPOP onto the front cover. **(fig. 11)**

22 Lightly tap the oil pump housing with a rubber mallet to break the seal loose. Pull the housing off of the alignment pins. Ensure the alignment pins remain with the engine and not with the pump housing. If they come out, simply re-install them into the front cover again.

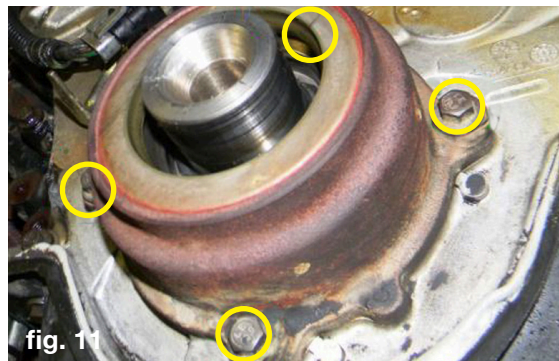
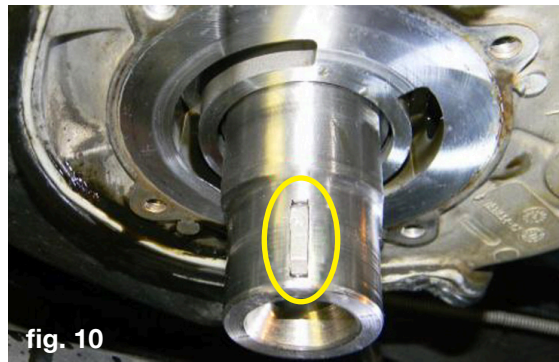
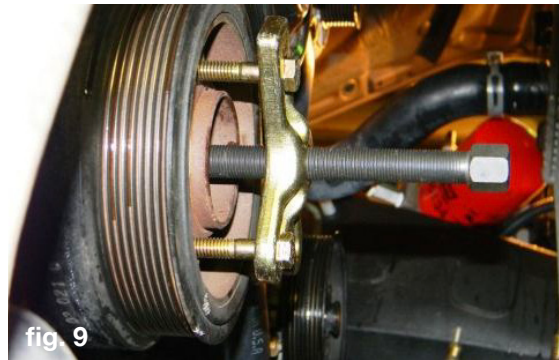
23 Remove the outer gerotor.

24 Remove the inner gerotor off of the crankshaft.

25 Place the Melling gerotors in clean motor oil prior to installing. **NOTE: THE MELLING GEROTORS ARE SHORTER THAN THE OEM GEROTORS, THE NEW PUMP HOUSING WILL COMPENSATE FOR THIS. YOU MUST USE THE SUPPLIED HOUSING WITH THE NEW GEROTORS.**

26 Install the inner Gerotor onto the crankshaft, followed by the outer gerotor. **DO NOT FORCE THESE ONTO EACH OTHER!** They are precision machined parts and fit well when aligned correctly. **(fig. 12)**

27 Install the oil pump housing seal onto the housing. A dab of RTV or grease may be used to hold this in place while installing the housing.



- 28** Install the housing onto the front cover using the alignment pins to ensure the pump is correctly installed. Install the four (4) 10mm bolts and torque to 15 ft-lb. **(fig. 13)**
- 29** Clean the harmonic balancer inner bore to ensure no contamination. Lightly apply a small amount of engine oil to the bore.
- 30** Align the harmonic balancer with the crankshaft and keyway. The balancer should slide onto the crankshaft easily for an inch or so when aligned properly.
- 31** Now install the harmonic balancer installation tooling. Use the M16 x 2.0 adapter on the jackscrew into the crankshaft. Install the pressure roller bearing and then the jackscrew nut. Apply sufficient torque to the nut to press the damper back onto the crankshaft fully. **(fig. 14, fig. 15)**
- 32** Reposition the flywheel holding tool or helper to hold the flywheel while tightening. **(fig. 16)**
- 33** Remove the harmonic balancer installation tooling and install the bolt and retaining washer using a 15/16" socket and torque to 212 ft-lb. **(fig. 17)**
- 34** Remove the flywheel holding tool and reinstall the torque converter cover plate and four (4) bolts and torque to 15 ft-lb.



fig. 13



fig. 14

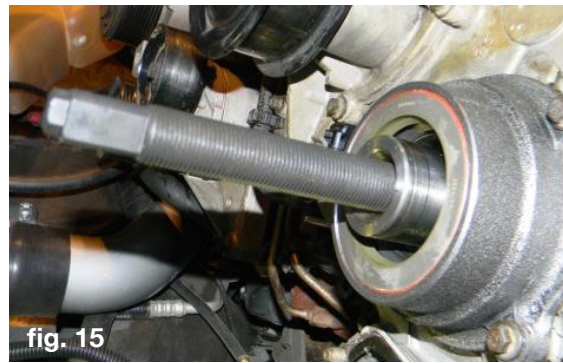


fig. 15



fig. 16



fig. 17

- 35** Reinstall the serpentine belt following the routing diagram. Once installed apply counter clockwise torque to the tensioner to release the tensioner lock clip. **(fig. 18)**
- 36** Install the fan and shroud from the top of the engine. Make sure the fan shroud lower tabs engage the lower slots. **(fig. 19)**
- 37** Thread the fan onto the water pump pulley spindle. Tighten using the fan pulley holding wrench and the fan clutch nut wrench. Torque to 84-112 ft-lb.
- 38** Remove the protective cardboard.
- 39** Reinstall the two (2) 8mm bolts into the fan shroud and torque to 80 in-lb (6 ft-lb). **(fig. 2)**
- 40** Install the upper radiator hose onto the radiator and install the clamp.
- 41** Move the DEGAS bottle back into position and install the three (3) 8 mm bolts, torque to 80 in-lb (6 ft-lb) **(fig. 20)**. Shorter bolt is for front mounting tab. **(fig. 21)**
- 42** Reinstall the upper hose to the DEGAS bottle and reinstall the clamp.
- 43** Top-off the coolant and install the DEGAS bottle cap.
- 44** Reinstall the lug wrench and hold down clamp/wing nut assembly.
- 45** Reinstall the battery ground cables.
- 46** Ensure the engine oil is topped off from any loss.
- 47** Start up the engine and check for leaks.
- 48** Get the engine and coolant up to operating temperatures and recheck the coolant level. Add as necessary.

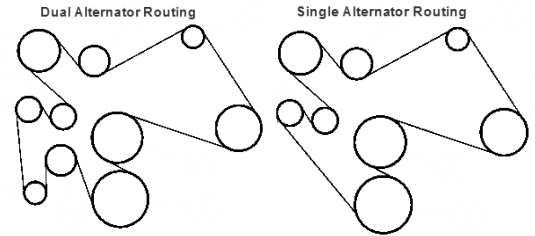


fig.18



fig. 19

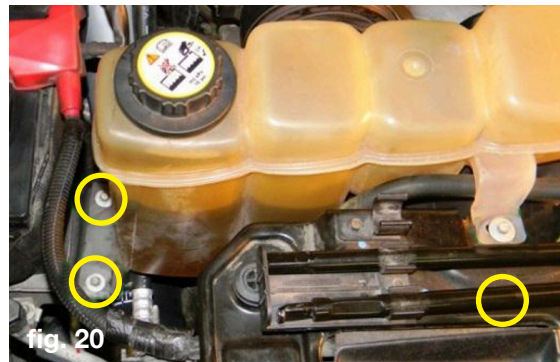
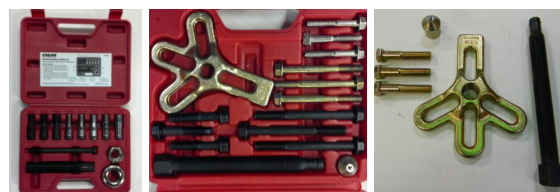


fig. 20



fig. 21



Harmonic balancer removal and installation tooling can be rented from local auto parts stores

Instructions and pictures provided by Ken (Woodnthings on FTE)