

## LS OIL PUMP INSTALLATION INSTRUCTIONS FOR #LS/AL/TL

**CAUTION:** LS Oil Pumps must be accurately centered to crank center line!

**DO NOT** Bolt oil pump on at random hit/miss location on the four movement prone mounting bolts!

**STEP ONE:** Remove "7" cover plate attachment bolts and note or mark the location pattern to housing or store for reassembly in cover plate holes.

**STEP TWO:** With cover plate removed, carefully extract crank-driven gear and outer ring rotor gear.

**STEP THREE:** Install the bare gear housing with factory or upgrade (4) bolts to finger tight status to front engine block with O-Ring seal greased in placement groove.

**STEP FOUR:** Crank driven pump (A) gear is first centered to crank timing gear! Start with qty. "3" of the .0015 center shim strips with placement on the positive / high spline of the crank timing gear and between the machined slot of the driven pump gear. If the driven pump gear is loose and wiggles, remove the qty. "3" .0015 center shims and try to install qty. "3" of .003 might be required due to manufacturing + or - tolerances if component pats. The qty."3" center shim strips must always be the same thickness .0015/.002/.003! **DO NOT MIX SIZES.**

**STEP FIVE:** Carefully install the outer ring rotor gear (B). Some crank rotation movement may be required to align gears. If outer ring rotor gear champher radius is not even at outside diameter install with larger radius inward and smaller radius out towards cover plate!

**STEP SIX:** Using qty. "3" .0015 center shim strips center O.D. of gear to I.D. of pump housing bore in triangular spacing pattern. If .0015 is loose, repeat with qty. "3" .002 center shim strips or qty. "3" .003 thickness.

**STEP SEVEN:** Tighten four pump mounting bolts in even slow overlapping pattern.

**STEP EIGHT:** Double check your center shim strips (qty. 3 on crank and qty. 3 housing) for repeatability. Remove all qty. 6 center shims.

**STEP NINE:** Lightly lubricate all exposed gear surfaces with engine bearing assembly lube of heavy viscosity.

**STEP TEN:** Reinstall the cover plate with the 7 bolts in original locations. Carefully start bolts by hand! **DO NOT** cross thread! Use 2 drops of Loctite total, 180 degree apart at mid depth thread location. Tighten slowly and evenly in over lapping pattern. **DO NOT** coat 100% exposed threads with Loctite as disassembly may pull threads from the pump housing.

\* If your part number includes color coded (Black, 60 psi; Red, 70 psi; yellow, 80 psi) springs. Rotate the engine on engine stand with pan rail surface up. Remove the threaded retainer plug and install oil pressure spring of choice. **NEVER** clamp oil pump in vise jaws to change spring!