

## Update on Motor Oil Changes and Collector Cadillacs

***“The oil we bought in the ‘60s and ‘70s is not what’s out there for sale nowadays!”*** We’re all trying to keep up with the changes. They can be complicated. Peach State member Bob Winchell sent in technical updates on motor oil and its effects on collector cars with “flat tappet” engines, so in this update I’m going to try to interpret for our non-oil-savvy members (such as myself)... Here goes!

New oil specifications are placing greater emphasis on protecting catalytic converters in modern cars. **In 2010 General Motors announced its new dexos 1 global engine oil specification for 2011 vehicles.** Something called *“API SN – ILSAC GF-5 licensed oil”* also hit the shelves in 2010. This may be good news for emissions, but improving catalytic converter life is proving to be detrimental to flat-tappet engines. *See box for some background!*

New oil standards require the use of a new type of “Phosphorus Retention” ZDP. ZDP (Zinc Dithiophosphate) provides protection for engine components by creating a phosphate film. But this phosphate film also reduces performance in catalytic converters. The new “Phosphorus Retention” ZDP is less reactive, so it is less detrimental to catalytic converter performance. **It is unknown how this new “Phosphorus Retention” ZDP will perform in flat-tappet and high performance engines.** Another change associated with API SN/ILSAC GF-5 oils is greater fuel economy. They use polymers called *viscosity modifiers* to help a “thin” oil act “thicker” under low stress conditions. Again, while the liberal use of polymers helps improve fuel economy in *modern* passenger car engines, the older style push-rod engines in our classics produce greater shear stresses that can “tear” these polymers. When these polymers are sheared, oil loses its viscosity, and that can lead to increased engine wear. More than ever before, classic car owners and hot rodders need to be aware that the new oil products are compromises that increase catalytic converter life, fuel economy, and engine cleanliness in modern engines – but may hurt our older engines.

When it comes to motor oil, less phosphorus, sulfur and zinc, and more aggressive polymers and detergents, are good for your Camry’s low rpm, overhead cam engine. But your Cadillac’s older push-rod engine needs lubricants with higher levels of phosphorus, sulfur and zinc – and lower levels of polymers and detergents.

Engine builders and hot rodders have found high performance oils. These oils use the “old school” ZDP for flat-tappet camshaft protection. For example, Joe Gibbs Racing uses these oils for breaking-in and racing their flat-tappet engines. These oils cost a little more per quart than premium passenger car and diesel oils, but they provide greater value and protection. **The bottom line? A small investment in the right oil for your flat-tappet cam will save you big money and heartache in the long run.**

### Why do our tappets

**matter?** There are two basic camshaft designs: flat tappet lifters and roller tappets. A flat tappet has a flat base that follows the camshaft lobe; a roller lifter has a wheel at the base. Flat-tappet cams were replaced by more efficient roller-tappet cams in production engines beginning in the mid-1980s. Flat-tappet cams were used in our Cadillacs before the mid-’80s, and are *still* popular in aftermarket engine builds due to their simplicity and low expense.

**Function:** The purpose of a lifter is to translate the rotating motion of the camshaft into the reciprocating motion - up and down - of the valve train. The lifter imparts motion to the pushrod which, in turn, transfers that action to the rest of the valve components (rocker arm & valves).

**Design and Performance:** Flat tappets are not perfectly flat. They have a very slight radius on the bottom that causes them to rotate within the lifter bore. This keeps the base of the lifter and the lobe of the cam lubricated.

**Usage and Applications:** Changing oil compositions, based on stricter emission standards, have resulted in an increase in flat-tappet cam and lifter failures. But, with proper oil additives, flat tappets can still offer meaningful performance and reliability.

**BELOW: That’s roller tappet on the left, a flat tappet on the right.**



Questions? Call Bob or Doug