

# Selecting Crankcase Oil



Not All Oils Are Alike

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# Selecting Crankcase Oil

- We have a lot of options when it comes to lubricants.
- We have mineral based (oils that come from the ground), blends, a combination mineral and synthetic, and full synthetic.
- We use these lubricants in engines, transmissions, gear cases, and hydraulics

# The Weighting Game

- Anyone who has ever purchased motor oil is familiar with those numbers on the front of the container such as **10W-30**
- Most of us may have some idea what they stand for, and how that knowledge relates to the oil that you buy for your particular engine but still, there remains some puzzlement.

# The Weighting Game

- The numbers on oil refer to the oil **viscosity**
- The viscosity of an oil refers to its thickness or how easily it will pour.
- The syrup you pour over your pancakes is much thicker and pours more slowly than your morning coffee, so the syrup has a higher viscosity
- As it relates to oil, the viscosity is an indicator of how well the oil will lubricate your engine at a certain temperature

# The Weighting Game

- In general terms, the higher the viscosity, the better the oil is suited to work at higher temperatures because as the oil gets hotter it also gets thinner (just as your syrup will) and it will fail to provide sufficient protection if it gets too thin
- However thicker oil won't lubricate properly at colder temperatures because it's too thick to flow and reach all the vital engine parts

# The Weighting Game

- In the old days oils were what was called single viscosity, which meant there would only be one number on the can.... For example 30 weight.
- With single weight oils it was important that people changed their oil with the change of seasons. Thinner in winter, thicker in summer.
- Today oil producers make ***multi-viscosity oils***.

# The Weighting Game

- An example of a multi-viscosity oil would be something like 10W-30.
- In simple terms, the 10W-30 oil would pour like a 10 weight oil at lower temperatures yet hang in there like a 30 weight at higher temperatures. When they were first introduced multi-viscosity oils were called “***all-season oils***”

# The Weighting Game

- The advent of emissions controls means that modern engines tend to run hotter, and this places an additional burden on the oil.
- In an effort to reduce emissions and improve fuel economy, modern engines are manufactured with much closer tolerances, and operate with tighter clearances between moving parts.
- For this reason today's engine manufactures recommend a multi-viscosity oil rated at 5W-20



# The Weighting Game



- Stamped on all oils is a symbol referred to as the API Donut or API Starburst. API stands for American Petroleum Institute.
- The API Donut is divided into three parts;

# The Weighting Game



- The top half-circle lists the API service rating, or performance level.
- The center of the circle shows the oils viscosity
- The lower half-circle indicates whether the oil has demonstrated certain energy-conserving properties.

# The Weighting Game



- The first letter in the top half-circle indicates vehicle type that the oil was designed for. Ratings that begin with “S” are intended for Gasoline engines while those that begin with a “C” are intended for diesel engines.
- The second letter designates the quality level of the oil, the higher the letter the more advanced the oil and more protection it offers.

# Oil Properties

- Newer oils both natural and synthetic have improved properties and additives such as;
- ***Anti-Foam Protection:*** when an oil foams it can lead to oxidation and the inability to create a protective film
- ***Anti-Wear Agents:*** These additives decrease wear of heavily stressed components like valve train pieces
- ***Corrosion Protection:*** short driving intervals and slow warm ups create acid in engine oil. Chemical additives are used to neutralize these acids

# Oil Properties

- ***Detergency/Dispersant:*** To prevent the build up of lacquer (from high temperature) and sludge
- ***Evaporation Rates:*** The point at which the oil will boil determines its evaporation rate, synthetic oils have a lower evaporation rate.
- ***Film Strength:*** Refers to the strength of an oil, its ability to keep metal parts apart. This is critical to engine survival.
- ***Lubricity:*** the slipperiness of the oil. It determines its ability to reach parts and stay in place to prevent wear.

# Oil Properties

- ***Pour Point:*** An oil's ability to pour at ultra-low temperatures solely by gravity
- ***Resistance to Combustion Chamber Deposits:*** An oil's resistance to finding its way into the combustion chamber where harmful deposits can form.
- ***Thermal Stability:*** Ability to handle high temperatures without breaking down or forming carbon deposits.

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