

# ENGINE OIL MATTERS...

OR THE OLD SLIP & SLIDE...

When I was a kid, my first brand new car was a '68 Road Runner, 383-4 speed. Shortly after purchase I was drafted with a monthly paycheck, as private E-1, of \$72 and car payment of \$68. Other than giving rides to the NCO Club and working second shift at a hamburger stand, there wasn't much time or finances to do much more than wash, wax and change oil.

This story is about oil. In those days it was Pennzoil-pure Pennsylvania grade crude-until Joe Amato-"Joe knows oil" Valvoline became the oil to use. It wasn't for several years before I used my first synthetic, as synthetics were there but too scary or pricey to take a shot at... Finally, many years later, I took the plunge buying the cheaper Mobil 1 at Wal Mart. While making more than \$68/month today, I still keep a very tight budget but make sure I don't skimp on oil... I step up to the plate and buy Royal Purple because friends like many time NHRA National Record Holder Dan Dvorak say it's well worth the investment in horsepower, fuel economy and equipment life expectancy.

Many people don't know how to select a motor oil that will help them get optimum performance out of their cars. There is a tendency for consumers to often select the oil that their father used, or to take the suggestion of a counter person at an auto parts store who may not know any more about cars than they do.

However, there are meaningful differences in motor oil. Upgrading lubricants is often the quickest and cheapest way to improve a car's performance and reliability.

Two components determine how well motor oil will perform in your car. One determining factor in a lubricant's performance is the base oil used, and the other is the combination of chemicals (additives) that are added to the base oil.

## BASE OILS

The two primary types of base oils used in motor oils are mineral and synthetic. Mineral oils are by-products of refined crude oil. Refining helps reduce impurities, but leaves oil molecules of all shapes and sizes. Synthetic oils are manmade compounds with molecules that are all the same size and shape; consequently, synthetic base oil has a lower coefficient of friction, is more stable and has a lower pour point than mineral oils.

## ADDITIVES

Regardless of the base oil used, chemicals must be added to give a motor oil the characteristics needed to do the job. Typical additives that may be added to base oil include detergents to reduce the formation of residue, defoamants to deter absorption of air, anti-wear agents, and antioxidants among others.

Although additives are typically only 15 to 25 percent of the makeup of motor oil, they can impact a lubricant's performance much more than the base oil. For instance, mineral based motor oil with a very good additive package can easily outperform certain synthetic motor oils with mediocre additive packages.

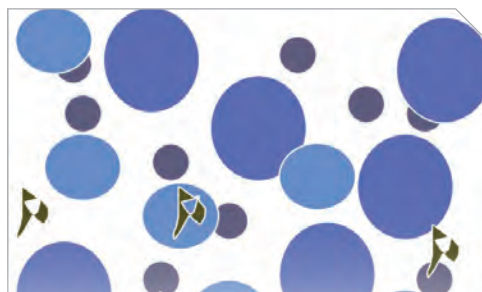
There is no easy way for a consumer to determine the quality of a motor oil's additive package. Price is often an indicator of quality since advanced additive technologies tend to cost more to produce. In fact, investing a little early on, can create big savings later; improving fuel economy by as much as five-percent, doubling or even tripling oil change intervals and returning increased power-1-3%. Ultimately, the best measure of quality for an oil and its additive package is how it performs.

## ADVANCES IN LUBRICATION

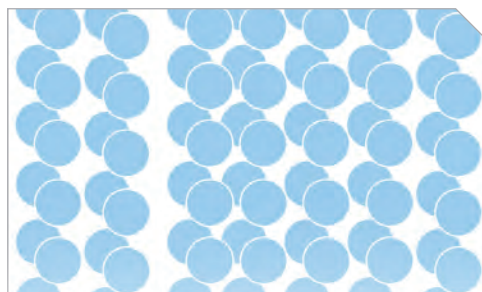
Some of the biggest technological advances in lubrication are now coming from the development of better chemical additives. For instance, Royal Purple developed unique additive chemistries such as its Synerlec additive compound that dramatically increases oil film strength.

The film strength of a lubricant is its ability to withstand the effects of load, speed and temperature, without breaking down. Put another way, film strength is an indicator of an oil's ability to figuratively and literally keep everything running smoothly by allowing it to maintain an unbroken film between the moving lubricated surfaces within an engine.

COURTESY OF



Mineral oil.



Synthesized hydrocarbon.

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Synerlec-enhanced products provide exceptional film strength which helps to optimize compression inside the combustion chamber. This frees up power, maximizes fuel economy and helps reduce emissions. The higher film strength also dramatically reduces wear on the internal moving structures of an engine; see Engine Bearings Magnified photo examples.

## IMPROVEMENTS IN FUEL ECONOMY AND LONGER SERVICE INTERVALS

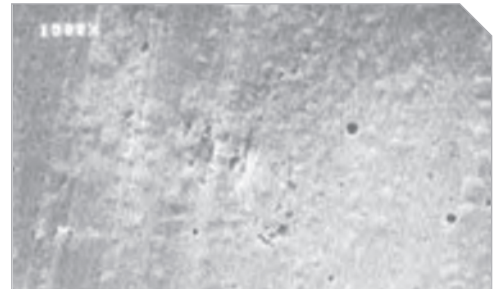
Improved lubrication frequently translates into improved gas mileage. Individual results will vary, but many consumers report as much as a five-percent increase in fuel economy by upgrading lubricants. Based upon an average fuel price of \$3.76 per gallon, someone driving 20,000 miles per year, averaging 22 miles per gallon, could see an annual savings of as much as \$160 in fuel costs by making the switch.

High-quality motor oils are also better equipped to resist heat related breakdown and oxidation over their mineral-based cousins because of the increased stability inherent in synthetic base oils as well as the introduction of the right choice of additives. As a result, the number of miles between oil changes can often be doubled or even tripled. Extended service intervals, sometimes as much as 12,000 miles between oil changes, keep vehicles out of the shop and saves consumers considerable money.

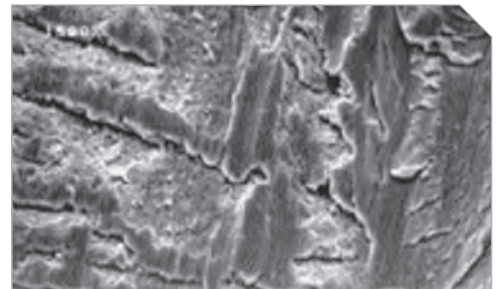
Though there is an initial cost investment in upgrading lubricants, the switch to synthetic can help save owners in the long run. The increased time between oil changes coupled with improvements in fuel economy and the increased performance users may see, more than makes up for the difference in cost.

In a race engine situation you could see improvements of as much as 10hp in a garden variety 440 and 75hp in a prostock type motor. Coupled with a top quality oil pan and windage tray, you can look to see significant return on investment by choosing lubrications and equipments wisely.

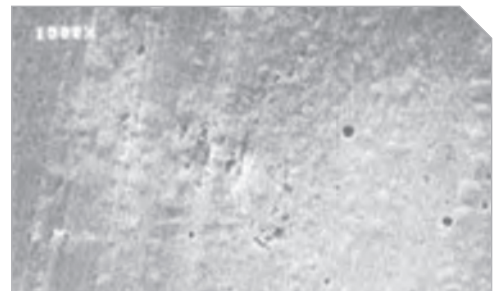
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A new bearing surface appears smooth until magnified 1500x.



The bearing is scuffed after using the leading synthetic motor oil.



This bearing is visibly smoother after using Royal Purple HPS motor oil.



Coupled with a top quality oil pan and windage tray, you will see a significant increase in return on investment by choosing lubricants and equipments wisely.