



VINTAGE VETERAN AND CLASSIC TECH NOTE

Number V-6

Synthetically Speaking

When it comes to synthetic engine oils one gets the impression that this technology was discovered in the last 10-15 years judging by the advertisements seen on television. This is not the case, and it may be of interest to look firstly at the history of synthetic lubricants and then follow their development through to modern times.

Synthetic type oils go back to the Second World War, the Germans using the properties of synthetic oils to combat the extreme temperatures found during their winter invasion of Russia. Such was the coldness encountered that the mineral based oils used became viscous often even solidifying thus crippling their Panzer divisions and halting their progress. The use of synthetic oils with their low temperature fluidity provided the means to combat the cold and keep the army on the move once more.

With the introduction of the jet turbine engines used in aircraft, the need arose to provide a lubricant that could withstand high oil temperatures and above all provide the means of controlling the two major by-products of a mineral oil of the day, that being oxidation and carbon deposit formation. Synthetic oils with high temperature synthetic esters provided the solution.

Again with lubricants used in aircraft undercarriages the need arose for a lubricant that would remain fluid particularly in aircraft flying high altitudes over arctic landmasses. A synthetic oil based around phosphate esters solved this particular problem.

Into the 1970's, and synthetic oils became widely used as lubricants for truck gearbox and rear axle applications. This then led to synthetic type engine oils being used in diesel trucks the aim being to exploit longer drain intervals and fuel savings.

At about the same time, Mobil introduced "Mobil 1" a SAE 5W-20 grade engine oil suitable for passenger vehicles. Mobil claimed an increase in fuel economy based on reduced friction and increased oil drain intervals based on field test data developed by Mobil. This viscosity was later raised to a 5W-30. Towards the end of the seventies the outrageous claims and the marketing bandwagon associated with synthetic oils was such that the U.S automobile industry took it upon themselves to make it well known that the use of synthetic oils could not be justified in providing long drain intervals. As this was the biggest benefit synthetic engine oils had to offer interest soon waned and mineral oils were back in favour once more.

During the 1980's the U.S. continued to ignore synthetic oil technology although in Europe and in particularly Germany, synthetics started to take off in a big way. Rather than going down the long drain interval road, the Europeans looked into performance levels those of synthetics being in their eyes far superior to petroleum based oils. This was the beginning of a huge marketing ploy throughout Europe to further enhance the benefits of synthetic as opposed to mineral oil technology. It didn't take very long before America came back in line with General Motors nominating the use of synthetics oils and European companies such as Volvo and Mercedes Benz endorsing the use of synthetics through their U.S service divisions.

Today synthetic oils are recommended in many vehicle transmissions and final drives, but in regards to engine requirements most manufacturers are still sticking with mineral type oils with very few outwardly recommending synthetics. What then is a synthetic oil and what are the benefits of using synthetic oils in this country?

A synthetic oil is one that has been developed in a laboratory utilising chemical reaction to produce tailor-made molecular structures of a similar type.

Mineral oil on the other hand is produced from crude oil put through a process of distillation and refining to which a number of lubricant performance additives are blended. The crude oil used can play a significant part in the performance qualities of the oil a number of by-products such as wax, sulphur and naphtha being undesirable elements of the distillation and refining process. Similar performance enhancers to those used in mineral oils are added to synthetics, however in this instance the base stocks are absolutely pure and physically and chemically stable.



Obsession with oil



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Having said that, it may be the moment to suggest that synthetic oils although basically "man made" are in the true sense produced from a mineral base. Ethylene is extrapolated from the crude in the refining process and is then passed through catalysts and hydrogen to form the chemical structures and esters that go to make a synthetic oil.

These days, a group of severely refined base oils called API group 3 are also considered to be synthetic. This is because during the refining process, the molecules are ripped apart and put back together again in the process. The end result is a water-white product, 99% plus free of impurity.

Some synthetic components are compatible with mineral oils and can be blended together to produce the various forms we see on the packs such as "part", "semi", and "fortified" however the Society of Automobile Engineers states that to be a full synthetic requires at least 90 percent of the base stock to be synthetic.

What then are the benefits of synthetic oils over mineral oils?

If you own a veteran, vintage or classic road car, the benefits it is safe to say are none.

If you have a historic racing car which is used at club level, again probably none. In this case you will never get to the full operating temperature of a synthetic as most of these track events are of only a few laps. In terms of high performance road cars engaged in continual high speed driving, then a synthetic may be of benefit if viscosity drop is an issue. Synthetics have a naturally high viscosity index without the need for viscosity improvers. In layperson terms, they thin out less when hot and thicken less when cold. This last point can be a benefit for vehicles engaged in high altitude competition events.

Synthetics have a wider operating temperature band over mineral oils 55°C to 290°C for synthetics as opposed to 30°C to 160°C for mineral oils.

Another suggested benefit is a reduction in drag, providing an increase in horsepower and providing more efficient fuel economy.

In regards to longer drain oil intervals, this benefit doesn't have a lot going for it in relation to high performance vehicles using synthetics, although it might have a bearing on large truck fleets with truck companies trying to save on down time servicing. Most people change their oil every five to ten thousand kms, which is the most basic and compulsive discipline of regular servicing. As well the oil change process allows for any water or dirt that has accumulated to be drained out. The benefit of long drain intervals in this case is negligible.

What then are the disadvantages?

The first would no doubt be the price. For this form of technology the price isn't cheap, and for those other than the serious racing enthusiast and perhaps the person towing his caravan behind the V8 to Ayers Rock in the middle of summer there would be no necessity to use a synthetic oil. No benefits would be gained in using synthetics in the family car, which is subjected to city traffic conditions.

Most of the synthetic oils on the market are of a low viscosity. A car consuming oil will definitely not benefit from a synthetic oil, nor would a synthetic oil normally be used in an engine requiring running-in (although in Europe the group 3 products are used successfully). Apart from price, synthetic oil doesn't have the ability to seal rings as well as a mineral oil does in this purpose. Penrite Oil Company markets a wide variety of synthetic, semi synthetic, synthetic fortified and synthetic performance products, tailor-made for specific applications. Plus of course, the engine oils are not always thin. Penrite make a point of offering higher viscosity grades that overcome the problem of oil consumption that can occur with lighter grades in not so new cars.



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