

Engine Oils

Classification of engine oils started in 1905 when a group of US dignitaries, including Henry Ford, established the SAE. The "Society of Automotive Engineers, is a U.S.-based, globally active professional association and standards developing organization for engineering professionals in various industries", Wikipedia.

Then, in 1970 the American Petroleum Institute (API), the SAE (Society of Automotive Engineers), and the ASTM (American Society for Testing and Materials), established the API Service Classification System to define the performance level of oils. The "System" specifies oil properties such as viscosity, high temperature deposit protection for pistons, seal compatibility, and better sludge control. It also certifies that the engine oil meets Original Equipment Manufacturer (OEM) quality and performance standards like turbocharger compatibility.

The service rating, "S", is shown in the API "Service Symbol Donut" on the product label. The illustration below indicates which oils are current and which are obsolete. The most current API Service Classification is SN.

API SERVICE CLASSIFICATION FOR PASSENGER CAR ENGINE OIL



Look for the "API Donut" and the two letter Code on the back of the bottle. If the label says API SERVICE "SA," it's engine oil made for use in cars built prior to 1930. API SA through SH motor oils are classified by the API as "OBSOLETE."



Read the Label!



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Look for the API* "Donut" on the Label

* American Petroleum Institute Service Classification

The label includes two important pieces of information to determine if an engine oil is appropriate for use in your classic. Oils with 10W-30 and other similar designations are referred to as multigrade oils. The "W" designates "Winter", and is important for oil performance in low engine temperature conditions, for example when cold starting. The lower the prefix 0W, 5W, 10W, 15W and 25W, the easier the oil will flow when cranking the engine, offering more instant wear protection on bearings, etc.

As oil viscosity is inversely proportional to temperature, as temperature increases its viscosity decreases. So, with 10W-30, the oil behaves like a less viscous liquid (10) when cold, but like a higher viscous liquid (30) when at operating temperature. It does not mean that when the oil is hot it is thicker than when it is cold. Thanks to the synthetic base oils and the viscosity modifier additives, nowadays most motor oils are so-called multigrade oils that don't change their viscosity with temperature that much, so they meet the limits of a winter and that of a summer viscosity grade at the same time. These oils can be used regardless of season.

So, thinking of changing the gearbox oil yourself? Here is Graeme Oxley's experience:

*"Recently I renewed the gearbox oil in my manual overdrive 1975 Triumph 2.5PI. I asked Richard of Triumph Spares in Fairfield as to what oil they use in gearboxes. He said to use 80W90 that was GL4 and GL5 compatible. He said that it **HAD TO HAVE** the GL4 component.*

REPCO had a 30% off sale so I bought Castrol 80W90 oil that was GL4/5 compatible. Further investigation showed that Penrite make a 75W85 grade gearbox oil that is dedicated GL4 standard. This would be the oil to buy, but the REPCO store at Hoppers Crossing didn't stock it.

Before adding to the new oil to the gearbox, I mixed in some Nulon Teflon gearbox treatment, which I have done to many of my gearboxes over the last 30 years. I used to use Slick 50 but couldn't find any. The Nulon

treatment is also excellent in the differential and perfect with all overdrive gearboxes. Those with automatic transmissions are advised NOT TO use any gearbox additives as they may damage them”.

“GL4” is API’s Gear Lubricant version “4” standard.

Properties are Medium EP, MIL-L-2105 quality, suitable for moderate severity of hypoid gears, and all manual transmissions.

GL5 has high EP, MIL-L-2105D quality, suitable for all hypoid axles and some manual transmissions.

EP means extreme pressure and refers to the additive used in gear oils. This additive is designed to stop metal-to-metal contact taking place between transmission components. The EP additives are usually based on sulphur and phosphorous. These elements bond to the metal surfaces where there are points of extreme pressure and temperature, forming a sacrificial chemical layer. The sulphur gives gear oils their characteristic smell.

MIL-L-2105D is a military specification for gear oil lubricants. To be MIL-L-2105 compliant, the gear lubricant must have low temperature operating characteristics. The gear oils normally meeting this classification are suitable for automotive applications, both on-highway and off-highway. Under normal operating conditions, gearbox temperatures do not exceed 230°F. (110°C.).

Hypoid relates to the geometry of gears such as the crown wheel and pinion arrangement usually on rear wheel drive cars. The pinion is usually highly offset to reduce prop-shaft intrusion into the passenger compartment.

References:

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Alan Andrews with technical critique by Dave McLean.