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Porsche Classic

Glossary Porsche Classic Motoroil

Additives:
Additional chemical substances that are mixed into the oil to enhance desirable properties or to suppress unwanted properties. Additives may be surface-active agents for fulfilling specialised tasks (corrosion protection, friction value optimisation, wear protection) or they may directly influence the properties of the oil (e.g. prevent foam formation, improve the viscosity-temperature performance).

Alkaline reserve/base number:
This indicator describes how much acid resulting from the combustion process can be neutralised by an engine oil. A high TBN (Total Base Number) indicates a good level of corrosion protection. The higher the TBN, the more acidity the oil can neutralise, thus protecting the engine parts from corrosion.

Activities performed by the engine oil:
Lubricate
Cool
Protect (against corrosion)
Seal (for example on piston rings, radial shaft seals etc.)
Clean (collect abrasion debris, pollutants, accumulated oil carbon)
Transfer force (for example through a hydraulic tappet)

Detergents:
These additives improve the cleaning effect of the engine oil.

Dispersants:
These additives influence the ability of the engine oil to bind dirt particles and to prevent settling. The objective is to transport these dirt particles within the oil circuit to the oil filter.

Gasket compatibility:
Modern engine oils refined through additives, which are based on fully synthetic base oils, can react aggressively with old sealing materials, causing these old seals to become brittle. There is also a risk that these oils can dislodge deposits in the engine that have accumulated over the decades. Both scenarios can lead to leaks, and in the worst cases to engine damage.

The engine oils from Porsche Classic are specifically tailored to work with the materials used in Porsche vehicles, such as lead bearing shells or cork gaskets. They do not react with any of the gasket materials in use. These oils far exceed simple mineral oils in terms of performance and provide optimum protection for the engine.

HC oil (hydrocracked oil):

Hydrocracked oils are manufactured from crude oil but are enhanced through complex processes in refineries. Hydrocracked oils are characterised by a high natural viscosity index (see "Viscosity"), a very low sulphur content and high saturation level for optimum ageing and oxidation stability. The performance of these oils is similar to that of fully synthetic base oils but without disadvantages such as poor gasket compatibility and poor additive solvency.

Lateral piston force:
The force with which the piston impacts against the cylinder wall.

Multigrade oil:
The viscosity of the oil depends significantly on the temperature. As a general rule, the hotter the oil, the thinner it is; the colder the oil, the more viscous it is. Single-grade oils were used previously, i.e., one oil for winter and one for summer. Modern oils are less dependent on temperature thanks to the use of additives (see "Additives"). Multigrade oils are suitable for use in both summer and winter.

Mineral oil:
Mineral oils are manufactured by distilling natural crude oil. Hydrocarbon molecules are extracted during the refining process. This cost-effective manufacturing process results in the oil containing a relatively broad mix of different long-chained hydrocarbons. The disadvantage of this is the fact that the existing, unwanted short or long-chain hydrocarbon molecules have a negative impact on the performance of the oil during operation.

Oil ageing:
Engine oil ages during use and storage. The ageing process is accelerated by reactions with oxygen (formation of peroxides, hydrocarbon radicals), heat and light, and the catalytic effects of metals and other contaminants. Anti-ageing substances known as "antioxidants" slow down the ageing process.

Rod to stroke ratio:
The connecting rods transmit the piston stroke to the crankshaft. The lateral deflection of the connecting rod is greater the shorter the connecting rod is in relation to the length of the piston stroke. A short connecting rod has a high deflection and therefore results in high lateral piston forces. A short connecting rod also reduces the cylinder length and thus the weight and space required for the engine.

Friction conditions in the engine:
Fluid friction: Fluid friction occurs when the friction partners (for example the camshaft or bearing shell) are separated by a continuous oil film.
Mixed friction: The metallic friction partners come into contact with the metal surface during individual roughness peaks.
Dry friction: The metallic friction partners come into contact fully – for example when the engine is started (there is no hydrostatic lubricating film in the engine when it is stopped) or when the oil film breaks as a result of the viscosity of the oil being too low.

Shear stability:
Viscosity index improvers (oil-soluble polymers) are added to the engine oil to improve its viscosity-temperature performance. A high shear stability refers to a stable and wear-resistant polymer structure. This structure prevents the polymers from breaking as a result of shear forces, such as those acting on the oil between the cylinder and the piston wall. At a low shear stability, wear can quickly transform a 20W-50 oil into a 20W-30 oil, the high-temperature properties of which are greatly reduced.

Special additives:
Special additives change the performance range of high-quality engine oils and are therefore not recommended. A special additive can be compared in terms of its performance within the engine oil to existing additives (see “Additives”) in the sense that a special additive changes the additive composition in an undefined manner – i.e. in certain circumstances, a special additive restricts the efficacy of the additives already contained in the engine oil.

Semi-synthetic engine oil:
Semi-synthetic engine oils are a mixture of fully synthetic base oils and mineral and/or hydrocracked oils. The proportion of synthetic base oils is not defined, making it impossible to come to a conclusion regarding the quality of the oil.

Dry-sump lubrication:
With this arrangement, the deep oil sump used for wet sump lubrication in conventional engines is replaced by a separate oil tank. The main oil pump draws the engine oil out of this oil tank and feeds it to the various lubrication points under pressure. A second oil pump pumps the drained oil back into the tank. At high centrifugal forces – for example when cornering at speed – this arrangement ensures that the oil supply is not stopped.

Viscosity:
Viscosity is the measure of the internal friction of a fluid. Viscosity largely depends on the temperature and for engine oils is classified by the SAE (Society of Automotive Engineers) with a number and letter combination (in line with the SAE J300 standard) – 20W-50 for instance. The reference number before the “W” (20W = Winter) provides information about performance at low temperatures, while the reference number after the "W" (50 in this case) is a measure of the flow performance at high temperatures (100°C). As a general rule, a low number = low viscosity and a high number = high viscosity.
The service life of an engine essentially depends on the base oil used as well as the viscosity.

CCS viscosity (cold cranking simulator viscosity):
The CCS viscosity is used as the basis for classifying an oil in the appropriate low temperature SAE class (e.g. SAE 10W). The cold-cranking simulator is used to test the low-temperature performance

of engine oils at low shear forces. This process involves simulating the rotation of an engine at the starting speed at very low temperatures.

HTHS viscosity (high temperature, high shear viscosity):
The HTHS viscosity describes the performance of the oil in the lubrication gap at high temperatures (150°C) and a high shear rate (speeds). While the second viscosity index (for 10W-60 this is the "60"; see also "Viscosity") indicates the performance of the oil at 100°C, the oil temperature in an air-cooled engine can reach 150°C or more depending on the operating state.

Fully synthetic engine oil:
Synthetic base oils (API group IV and V oils, e.g. polyalphaolefins [PAO] and synthetic esters) are synthesised via a complex and costly refining process and are characterised by a precisely defined molecular structure and chemical-physical properties. Synthetic base oils form the basis of especially high-performance engine oils. When tailored to modern engines, fully synthetic engine oils offer optimum wear protection and excellent cold start properties. The smooth running characteristics of these oils also reduce fuel consumption and keep the engine clean.