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Engine Oil

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Engine oil is almost the same age as the internal combustion engine. The first mention of it dates back to the 60s of the XIX century, when an American scientist who conducted experiments with oil for medical purposes discovered that this "black liquid" has good lubricating properties. He created a simple lubricating fluid based on it, designed for use in steam installations, and a little later registered the Valvoline brand. By the end of that century and the beginning of the next, that is, in the era of the beginning of the active development of oil production, several companies were already engaged in the production of oil — Standard Oil, BP, Castrol, Shell and others. There was even a gradation of oils — for automobile engines, for motorcycle and especially forced. However, it is difficult to assume that then there were correct ideas about what kind of oil is needed for specific conditions.

So what is engine oil for? Well, firstly, the oil lubricates the moving parts of the engine and reduces the friction between them. Secondly, engine oil helps to cool engine parts and prevents rust and corrosion, and also helps to neutralize acids created by the by-products of combustion. And what are its properties? The most important engine oil property is its thickness or viscosity: as oil is cooled, it gets thicker and as oil is heated, it gets thinner. Therefore, its viscosity changes with temperature. The oil must not be too thick at low temperatures to allow the engine to start. Also, the oils must be miscible, which means that they are able to mix with other oils (e.g.

grades and viscosity) without causing any problems such as sediment.

Engine oils are sold with a Society of Automotive Engineers (SAE) grade number, which indicates the viscosity range into which the oil fits. Oils tested at 212°F (100°C) have a number with no letter following. For example, SAE 30 indicates that the oil has only been checked at 212°F (100°C). This oil's viscosity falls within the SAE 30 grade number range when the oil is hot. Oils tested at 0°F (18°C) are rated with a number and the letter W, which means winter and indicates that the viscosity was tested at 0°F, such as SAE 20W. Oil with a high viscosity has a higher resistance to flow and is thicker than lower viscosity oil. Thick oil is not necessarily good oil and thin oil is not necessarily bad oil. Generally, the following items can be considered in the selection of engine oil within the recommended viscosity range: improved cold engine starting, improved fuel economy, improved protection at higher temperatures.

The American Petroleum Institute (API), working with the engine manufacturers and oil companies, has established an engine oil performance classification. Oils are tested and rated in production automotive engines. The oil container is printed with the API classification of the oil. The API performance or service classification and the SAE grade marking are the only information available to help determine which oil is satisfactory for use in an engine. For example, in gasoline engine ratings, the letter S means service, but can also indicate spark ignition engines. The rating system is open ended so that newer, improved ratings can be readily added as necessary (the letter I is skipped to avoid confusion with the number one).

The International Lubricant Standardization and Approval Committee (ILSAC) developed an oil rating that consolidates the SAE viscosity rating and the API quality rating. If an engine oil meets the standards, a starburst symbol

is displayed on the front of the oil container. If the starburst is present, the vehicle owner and technician know that the oil is suitable for use in almost any gasoline engine.

There are various additives to engine oil. Oil producers are careful to check the compatibility of the oil additives they use. A number of chemicals that will help each other can be used for each of the additive requirements. The balanced additives are called an additive package. For example, there are additives to improve the basic oil: viscosity index improver (Modifies the viscosity of the base fluid so that it changes less as the temperature rises; allows the lubricant to operate over a wider temperature range), pour point depressant (Keeps the lubricant flowing at low temperatures), antifoam agents (Foam reduces the effectiveness of a lubricant. The antifoam agents reduce/stop foaming when the oil is agitated or aerated). Additives to protect the base oil: antioxidants (Slow the breakdown of the base fluid caused by oxygen (air) and heat), oxidants (Prevent acid formation (corrosion) in the form of sludges, varnishes). And also additives to protect the engine: rust inhibitor (Inhibits the action of water on ferrous metal such as steel), corrosion inhibitor (Protects nonferrous metals such as copper), antiwear additive (Forms a protective layer on metal surfaces to reduce friction and prevent wear when no lubricant film is present).

There is also a synthetic oil. Synthetic engine oils have been available for years for military, commercial, and general public use. The term synthetic means that it is a manufactured product and not refined from a naturally occurring substance, as engine oil (petroleum base) is refined from crude oil. Synthetic oil is processed from several different base stocks using several different methods. Synthetic oil has both advantages and disadvantages. The major advantage of using synthetic engine oil is its ability to remain fluid at very low

temperatures. This characteristic of synthetic oil makes it popular in colder climates where cold-engine cranking is important. The major disadvantage is cost. The cost of synthetic engine oils can be four to five times the cost of petroleum-based engine oils. There are also synthetic blends. A synthetic blend indicates that some synthetic oil is mixed with petroleum base engine oil. However, the percentage of synthetic used in the blend is unknown.

In addition to all of the above oils, there is a high mileage oil. A high mileage oil is sold for use in vehicles that have over 75,000 miles and are, therefore, nearing the eight-year, 80,000-mile catalytic converter warranty period. Usually higher viscosity and lack of friction-reducing additives mean that most high mileage oils cannot meet ILSAC GF-4 rating and are, therefore, not recommended for use in most engines.

Most experts agree that the oil changes are the most important regularly scheduled maintenance for an engine. It is also wise to check the oil level regularly and add oil when needed. The right choice and timely oil change will help your engine to last much longer.