

Engine Oil in Your Porsche

by scott mcilvain and greg mannion

The purpose of engine oil is to cool and lubricate the engine's moving parts. The oil should be checked regularly and kept at the required level. Modern engine oils contain a base oil with additives to keep the engine clean, neutralize the combustion soot and protect against corrosion. Other additives reduce the amount of oil foaming, decrease the pour point and modify the viscosity of the engine oil at various temperatures to maintain proper lubrication. Current engine oils meet stringent emission guidelines and improve mileage by keeping friction to a minimum.

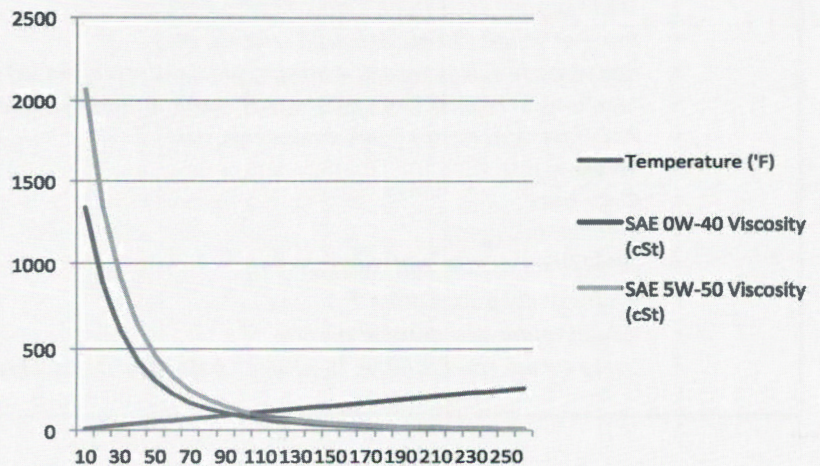
All current engine oils must meet industry specific test requirements which include: rust inhibition, oxidation control, sludge and varnish control, wear control, bearing corrosion resistance, fuel economy, low temperature oil thickening and oxidation control. The International Lubricant Standardization and Approval Committee (ILSAC) is responsible for the creation of passenger car engine oil specifications. ACEA is the European Automobile Manufacturers' Association which sets European specifications. The American Petroleum Institute (API) licenses and monitors the quality of engine oils in the marketplace.

Engine oils are generally identified by viscosity expressed in a SAE (Society of Automotive Engineers) classification. SAE measures oil viscosity at 0°F and 212°F. A year-round engine oil will have a multi-grade designation such as "0W-40". All motor oils meeting this designation will have the same viscosity curve over the engine operating temperature range and are interchangeable. Mobil 1 0W-40 is currently the factory fill oil for the Porsche 911. One should use the oil viscosity recommended in the owner's manual for optimal performance. Please note that single grade oils are not recommended for use in current Porsche engines.

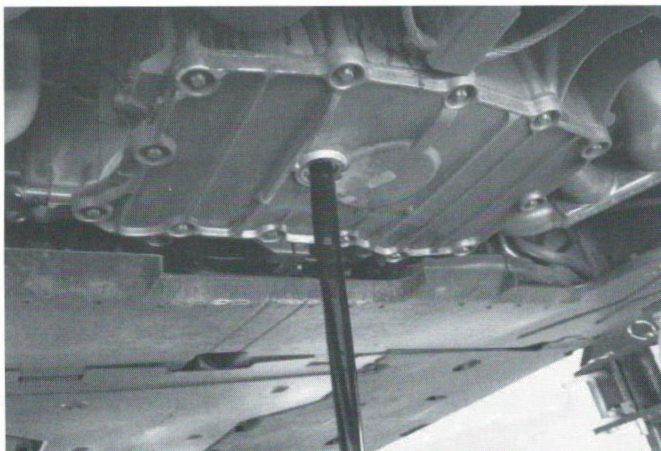
Motor oil is thickest (most viscous) at lower temperatures. The lowest temperature the engine will face is at start up. The greatest wear on the engine occurs at startup when frictional forces are the greatest. Frictional forces then heat the engine

oil and cause it to reduce its viscosity (become thinner) as the engine warms up. Engine design and oil cooling radiators (if used) will allow an engine oil to only reach a safe maximum operating temperature. This is why it is critical that the proper viscosity engine oil as specified in the owner's manual is used.

Here is a chart that shows the viscosity (thickness) of the oil at



various operating temperatures of the engine. Once the engine is at operating temperature the viscosity of the engine oil remains constant. This is due to the viscosity modifier additive content of the engine oil. Viscosity modifiers are generally olefin copolymers. This is a rubber-like substance that is used in very low quantities. This substance functions like a coiled spring in the sense that the molecule is small at colder temperatures and larger at higher temperatures. The viscosity modifier allows the engine oil to flow at colder temperatures and to not get too thin at higher temperatures.



The question of "Should I use a synthetic oil in my engine?" is frequently asked. The chances are that if you have a vehicle produced within the last ten years and you are using a multi-grade engine oil, you are already using a synthetic oil. Synthetic merely refers to something

that does not naturally occur. A regular base oil is simply distilled from crude oil and is graded by viscosity. A synthetic base oil can be derived from crude oil but then has an additional refining process that makes it into a product with very specific properties which could not occur naturally. These products are referred to as Group III base oils. Other products used as synthetic base oils are poly alpha olefins (PAO) and diester fluids. Synthetic based engine oils will outperform traditional base oils by reducing friction and staying "in grade" for a longer period of time.

The question of "Should I routinely test my engine oil?" is often asked. The answer is if one changes the oil as recommended by the manufacturer, then no. Generally the cost of the engine oil monitoring service quickly exceeds the cost of a new oil change. The exception to this would be if one is experiencing engine wear or if one is looking to trouble shoot a specific engine wear issue, then the cost may be justified as a problem solving tool.

Aftermarket engine oil additives can void the Porsche warranty. A good quality name brand engine oil is manufactured to meet the auto manufacturer's requirements. Additional chemical treatment is not necessary. The engine oils marketed for high mileage engines (over 75,000 miles) contain additional additives to compensate for possible engine wear due to high mileage.

Current US engine oil designations are SN/GF-5. Additional ACEA and Porsche designations may also be listed.

What does the future of engine oils look like? Engine oils are constantly being improved upon to help reduce emissions and increase mileage. Europe tends to focus on emission reduction while the USA tends to focus on mileage improvement. The next industry wide change for engine oil is scheduled to occur after January 1, 2017. These oils will have an SAE designation of "OW-16". Whereas many years ago engine oil wear reduction was primarily controlled by viscosity, that is no longer the case. Modern engine oils control wear reduction by use of specific chemical additives, thus allowing the reduction in viscosity which leads to a reduction in friction, which provides improved mileage. Engine oils will become less viscous (thinner) with improved additive technology.

This article dealt with engine oils for Porsche gasoline engines. Diesel engine oil requirements are fundamentally the same but there is a difference in viscosity requirements and product labeling. Diesel engines need to use the designated oil as specified in the owner's manual.

Greg Mannion has spent his professional career in the petrochemical industry. Early in his career he worked for a major

oil company and then an independent oil blender. Most of his career has been marketing performance additives for fuels and various industrial lubricants including automotive and diesel engine oils.

If you have any questions about oil or any technical question about your Porsche or if you would like to co-author an article please email scott@mcilvainmotors.com

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