

# The Importance of Using the Right Motor Oil



*Changing the oil on a vehicle is one of the basics of car care maintenance. However, with the growing complexity of cars, the type of motor oil required is also changing. Technicians and shops must be well educated and equipped to know which type of oil to use to avoid damage to a car's engine.*

*Provide better service on routine oil changes by knowing your motor oils.*

*By Rachael J. Mercer*

**A**s automotive service and repair professionals, we all understand why having oil in a vehicle's engine is important, but who really understands the labeling and codes and such that are found on motor oil packaging? Truthfully, there are many different characteristics that certain oils possess. To provide your customers with the best service possible, it's important that you understand the differences and similarities, as well as the labeling system for motor oil.

## **Knowing the Basics**

Basically, engine oil keeps the engine parts lubricated in both low and high temperatures and it helps protect the emission system and provides enhanced fuel economy. Different components that are added to the oil can aid it in performing certain other

tasks, such as reconditioning seals in older engines or increasing the fuel efficiency of the vehicle. What makes one type of motor oil different from another? To begin with, one must understand that there are three main types of motor oil that can be used in most popular car models.

The first of these three types is conventional oil, which is composed of refined crude oil. Refined crude oil makes up between 75 percent to 80 percent of the composition, and ingredients added to the formulation are what distinguish one type of conventional motor oil from another. Full synthetic oil is a popular alternative to conventional oil. Full synthetic oil is formulated using a standard base that is then combined with different additives to provide advanced engine protection. In full synthetic motor oil, molecules have been manipulated so that they will maintain good viscosity at all temperatures, although it also has characteristics that prevent solidification at lower temperatures. A third type of motor oil is

synthetic blends, which have a combination of both conventional and synthetic base stocks.

Additives are ingredients combined with a formulation to improve engine performance, and can include detergents, antioxidants, viscosity index improvers and others. Antioxidants stop oil oxidation, and keep motor oil in the engine from becoming too thick for optimal operation. Detergents are used as additives in motor oils to help keep high-temperature surfaces clean. Dispersant additives grab dirt and other contaminants and hold them in a suspension that prevents buildups on engine parts. Motor oils designed for high mileage vehicles contain special seal conditioning ingredients that rejuvenate internal seals, preventing internal oil leaks and returning seals to a soft, pliable state.

### Interpreting the Signs

Because there are so many types of oil out there, many shop owners and managers can experience confusion and frustration when selecting oil to keep on hand.

“My concern with the differences [in motor oil] is knowing whether it is the truth when an aftermarket provider says I can use it on all vehicles,” says Betty Jo Young, AAM, of Young’s Automotive Center in Houston, Texas. “What if [the motor oil] is not OK for every vehicle? I can’t take chances, so there are many situations where I will use the dealer fluids so that I’m very sure I’m getting the right fluid for the vehicle.”

The American Petroleum Institute (API) is the main source for classification of motor oil in the United States. To avoid confusion, API has developed a “donut” for labeling that indicates information to help technicians and shop managers make good decisions. On the top of the donut, the oil should indicate that it is

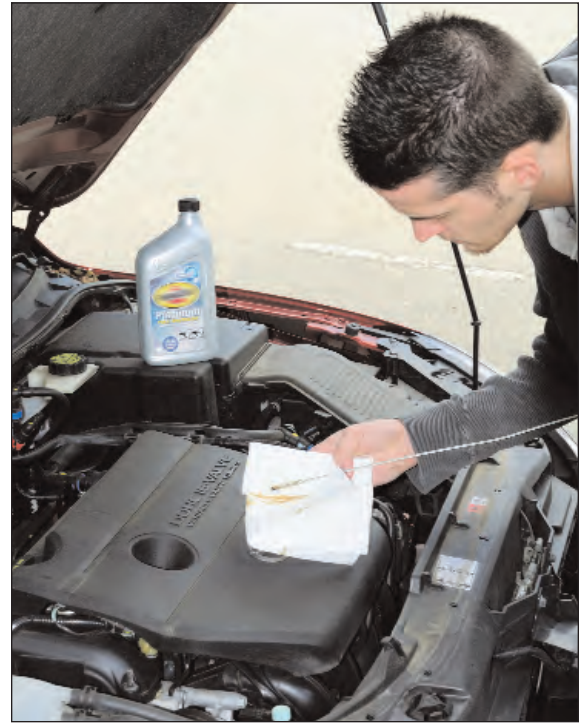
“API Service GF4,” which means that this motor oil has met the requirements of the latest round of tests by API, and is approved for use in most gasoline engines. The middle of the donut should say “SAE,” and is followed by a code such as 5W-30. SAE stands for Society of Automotive Engineers, and the number code refers to the motor oil’s viscosity.

Viscosity measures the oil’s flow characteristics at different temperatures. Viscosity is also referred to as the motor oil’s weight, which is indicated by the “W” in the code. The first number indicates how well an engine will start in cold weather. The lower the number, the more likely it is to start up in winter weather, and also indicates how well engine parts will be lubricated in these cold temperatures. People who live in northern states may require a lower number viscosity oil than people living in warmer areas. Likewise, people living in warmer areas may want a higher second number in the 5W-30 equation. This second number indicates the high-temperature viscosity. The number tells drivers how much thickness or body the oil has at high temperatures. The bottom half of the donut tells consumers whether the oil has met or exceeded certain standards that are considered to be “energy-conserving.”

### Getting It Right

How can you know that the motor oil you’re getting from your provider is really intended for use in all vehicles? According to API, the “Engine Oil Licensing and Certification System [EOLCS] is a voluntary licensing and certification program that authorizes

engine oil marketers who meet specified requirements to use the API Engine Oil Quality Marks—the API Service Symbol “donut”



*Technicians should not overlook consulting the owner’s manual of a particular car to determine the type of motor oil to use in an oil change.*

and Certification Mark “Starburst.” When you purchase oil from your aftermarket provider, you should look for these two markings. These marks ensure that the motor oil and its components are continually monitored by API so that technical specifications are met.

“If a shop is purchasing their motor oil in bulk, quite often there will be notation on the invoice that will list the specifications the oil meets such as the GF-4 rating,” says Mark Ferner, lead product engineer, Pennzoil Research and Development. “If they buy oil by the case, there should be a starburst on the front label of the cardboard case, but each bottle label will have the starburst and donuts.”

Ferner stressed that, as with all rules, there are exceptions. “For example, a Corvette is an exception to the rule. It runs hotter and

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needs an oil that will meet this added specification, in this case GM 4718M” he said.

Individuals changing the motor oil in their own car should know this by reading their owner’s manual and checking the label on the oil. Technicians and shop managers, who see hundreds of cars a week for oil changes and other services, must rely on a data provider to clue them in to the differences.

Bob Wills, owner/technician of Wills Auto Service in Battle Creek, Mich., says, “The first thing we do in servicing a car for an oil change is to go to Mitchell On Demand, AllData or an OE source to look and see what [oil] it calls for. If there’s a discrepancy, we go to the owner’s manual.”

Wills also commented that the relationship with a supplier should be a strong one – so that shop managers know what a supplier can offer in the way of motor oil types and brands. This will eliminate confusion when ordering and may help speed the process of oil changes when a particular oil is needed from the supplier.

### **Bad Choices, Bad Consequences**

Sometimes the wrong motor oil gets used in a vehicle, and despite the imaginative illustration that pictures an engine immediately seizing up, the likelihood of that is small. But, even though an engine doesn’t completely seize up from using the wrong motor oil doesn’t mean damage doesn’t occur. “If a Corvette was given starburst oil because someone didn’t read to know it needed a special oil, there wouldn’t be immediate failure,” said Ferner. “But over time, problems would likely develop.”

According to Ferner, small mistakes toward big damage can be made in all vehicles. “The right

oil will have the right balance of base oil and additives for a given engine. If an oil lacks the right components or the right balance, bad things may happen. Depending on which additive is missing, you can have metal-on-metal contact in the valve train.” He continued, “A motor oil lacking certain antioxidants could see heat damage since local hot spots in the engine spike to 400-600 degrees F. Over time this buildup of varnish can keep parts from moving properly.” Using the correct type of oil, which you can ensure by checking with your information provider on a case-

## Summary of Motor Oil Terms

**Conventional Oil:** A liquid made from adding additives to crude oil.

The additives are mixed with the crude oil to change the viscosity, protection properties and heat breakdown levels of the oil.

**Crude Oil:** A naturally occurring liquid found in formations in the earth consisting of a complex mixture of hydrocarbons of various lengths. ([www.opec.org](http://www.opec.org))

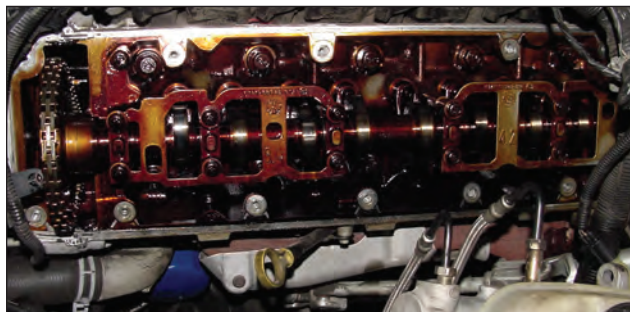
**Full Synthetic:** Created using a base oil combined with a series of additives. Instead of making motor oil with the conventional petroleum base, “true” synthetic oil base stocks are artificially synthesized.

**Society of Automotive Engineers (SAE):** SAE is the professional association of transportation-industry engineers. The SAE sets most auto-industry standards for the testing, measuring, and designing of automobiles and their components. ([www.sae.org](http://www.sae.org))

**Synthetic Blends:** A mix of synthetically created base oils in combination with conventional oil.

**Tribology:** Tribology is the study of the design, friction, wear and lubrication of interacting surfaces in relative motion (as in bearings or gears). ([www.dictionary.com](http://www.dictionary.com))

For more information about motor oils, their specifications and ongoing development, go to [www.api.org](http://www.api.org), [www.sae.org](http://www.sae.org).



Poor quality motor oil, improper use of motor oil or neglected maintenance can all be to blame for the dirty valve deck above. Notice the difference with a clean valve deck if the proper oil is used and regular maintenance is followed.

by-case basis, is the best way to promote healthy operation of your customers’ vehicles. **ai**

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