

Tech Article
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Changing the oil in our Miatas is something near and dear to most of us. Many of us do our own oil changes while others depend on the dealership or the local Wal-Mart to do the work. I have spent many hours reading and researching the subject and have found it almost impossible to find reliable information on the subject. Each brand will give reasons to use its oil but none present any hard facts on what exactly makes it better. I did find that because of a court ruling in Mobil-1 vs Castrol, synthetic oils do not have to be truly synthetic any longer and most are not. I found that, due to the extreme cost of certification, most oil companies do not formulate the additive packages used in their oil. There are only about four companies that specialize in the additive packages and provide them to all of the major oil brands. Basically, I find that there is not a whole lot of difference in any of the major brands that are API/SAE certified or certified by their European or Asian equivalent. I also found that while Racing Oil can be found, the additive package in it is designed to last for one race at very high RPMs and temperatures and is never meant to be used in day-to-day, start-and-stop driving. The main thing you have to watch for are "off brands" that do not display the API or equivalent certifications but say something like "meets all manufacturers warranty requirements".

With that said, I found an article from EDMUNDS.com that sums up everything that the average owner needs to know about oil and have copied it for your use.

Choosing (and Using) the Right Engine Oil
Synthetics? Additives? And How Long Between Oil Changes?

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API

Look for the API "starburst" and "donut." The center of the donut tells the thickness and temperature range of the oil: In this case 5W-30. Be careful of knock-offs that look similar.

Novice do-it-yourselfers are regularly overwhelmed by auto parts store shelves stocked to the ceiling with a rainbow of colored engine oil bottles. Even experienced folks can be confused by boastful but carefully hedged claims, newfangled certifications and confusing specifications. Also called motor oil, engine oil is one of the most complex, extensively tested and continuously improved components for your car. But it's also among the least understood. Here's the information to help you make the best choice.

The Short Story

For most, here's all you need to know: Buy a brand-name oil that exactly matches your vehicle manufacturer's specifications and certification requirements, and change your oil according to the carmaker's recommendations. That will allow your engine to offer maximum performance and last as long as possible. Disastrous consequences await those who deviate from the manufacturer's recommendations. Those who want more, read on.

Weight and Oil Viscosity

Oil is like pancake syrup. Without blending and additives, on cool days oil would be as thick (viscous) as Mrs. Butterworth's stored in the refrigerator. At high temperature, though, it would get uselessly thin, like micro waved syrup. Long ago, the Society of Automotive Engineers (SAE) developed a rating system for oil viscosity, the most basic of characteristics, which is often called weight. It's expressed by four or five characters, such as 10W-30. The lower the number before the W (for "winter"), the better it flows in cold temperatures. The number after the dash indicates how well the oil flows when it's warm. Higher numbers mean the oil is "heavier," or more viscous. Multi-viscosity oils developed several decades ago mean you don't have to worry about using different oils for winter and summer.

Don't select heavier-than-recommended oil in the mistaken belief it'll provide better protection. Old-timers are used to heavier oils, but many manufacturers currently specify light oil, such as 5W-20. One reason is that some modern engines have incredibly tight clearances between parts. Especially when the engine is cold, a heavier oil may not reach into these tight areas. The lighter oil also helps provide better fuel economy.

Certifications

Quality oils carry up to three certifications from three different organizations. Your owner's manual will say which standard is required. These certifications indicate that the oil met the testing and content requirements of these organizations. The most well-known is the American Petroleum Institute's (API) "starburst" and "donut." In the center of the API circle is the SAE weight (e.g. 10W-30). The outer ring will say "API SERVICE" followed by two letters: "SM" has been the top API rating since 2004, and API says it'll work in all automotive gasoline engines. The previous standard "SJ" was for 2004 and earlier model years. If the service rating starts with a "C," it's for diesel engines.

American and Japanese automakers combined to create the International Lubricant Standardization and Approval Committee (ILSAC). Its current standard is GF-5. Finally, some European cars require oil certified by the European Automobile Manufacturers' Association (ACEA).

Why Oil Additives?

Without a myriad of additives, motor oil could not meet the demands of modern engines. Detergents in oil trap impurities. Polymers increase high-temperature performance. Molybdenum is now used instead of sulfur to decrease wear at high-friction points. Oil designed for high-mileage engines has seal conditioners to reduce oil leaks. And these are but a few of the engine oil additives.

Synthetic: Worth It?

The short answer: Modern synthetic engine oil offers more protection than conventional oil, can be safely mixed or interchanged with conventional oil and can extend oil-change intervals. However, unless you subject your vehicle to extreme conditions, synthetic may not be worth the extra cost: That makes blends of synthetic and conventional oil an attractive option.

Synthetic oil was first mass-produced during World War II by Germany, which had plenty of coal and methane gas but no petroleum. Since molecule chains can be made uniform and tailored for specific needs, synthetic oil proved ideal for jet aircraft engines. Recently, improved refining processes and a court decision have essentially eliminated the line between what some call "full synthetic" (polyalphaolifin or PAO), which is often made from ethylene, and oil synthesized from crude. If there is a difference in protection between the two, it's small.

How Long Between Changes?

Even the automakers can't agree on the correct oil-change interval. While 3,000 miles between oil changes has long been promoted as cheap insurance, some auto manufacturers and environmentalists are recommending 10,000 miles or longer. The full answer lies with how you drive. If you rarely drive farther than 10 miles at a time (which doesn't get the oil hot enough to boil off moisture condensation) or you start your car frequently when the oil isn't hot (which is when most engine wear occurs), you need to change oil more often: at least twice a year, even if that's every 1,000 miles. But if your daily commute is 20-plus miles of steady flatland freeway, don't be afraid to go as far as your vehicle maker recommends.

If you change your own oil, it's important to take the old oil to a recycling center - used motor oil is a significant contaminant to the ecosystem.

If you don't change your own oil, make sure the technician removes the oil through the drain plug hole rather than sucking it out through the dipstick hole. Many believe the

former removes more contaminants. The bottom line: Use the correct weight, properly certified motor oil and change it appropriately, and you can save your worries for something else.