Motor Oil Discussion

The SAE Rating System

In order to discuss motor oils, you must know that about 1968 the Society of Automotive Engineers (SAE) and the American Petroleum Inst (API) set up a simplified oil rating system. The code for gasoline engines started with an "S", and diesels with a "C". Ultra light-duty oils were rated "A", and extreme-duty oils were rated "E". So, class "SE" used to be the toughest oil you could buy for your car or motorcycle. As oil technology advanced, more ratings were tacked on, such as SF, SG, et cetera. The latest rating is now somewhere around "SM".

However, at about SG, oils started to be formulated precisely to get higher mileage from cars, the major consumer of automotive oils. Part of this was the addition of "friction modifiers" that are so very slick that they were actually detrimental to motorcycle clutches and electric starter mechanisms. Another part was the reduction of zinc and phosphorous (ZDDP) which had been put in to protect cams and lifters. It was found that the zinc fouled the catalytic converters on cars. So it was removed and replaced with molybdenum, which works OK in cars, but is not as good in extreme conditions like motorcycles. Another concern is "rust inhibitors" which have also been reduced. So what we have is a case of what went in is just as important as what came out!

Therefore, at the very least, motorcyclist need to look for products labeled "Motorcycle Oil" as these will be SF or SG rated and give the greatest protection without having an adverse reaction. Motorcyclist should NOT use any oils labeled "Energy Saving" as those are car oils with the most "friction modifiers" and therefore have the fewest advantages for motorcycles.

Complicating the issue is the fact that oil-wise, motorcycles seem to have more in common with 4-stroke diesel engines than with car engines. Harley-Davidson brand motor oil is rated CJ-4 (J rated oil for 4-stroke diesel engines). A lot of people find that they can avoid the whole "friction modifier" mess by simply using 15W40 diesel oil. Others feel this is too thin for summer use in air-cooled engines.

Dino vs. Synthetic

The above discussion applies to oils made from dead dinosaurs only, and not to synthetics. When synthetics first appeared there were numerous problems and the synthetic could not be mixed with "dino" oils. All that is now fixed, and synthetics are now the top rated oil. Synthetics are so good that they meet every spec for the modified "dino" oils without the troublesome "friction modifiers". So Mobile-1 rated SL is great for motorcycles, whereas Havoline rated SL would cause problems. The higher price of synthetics is usually offset by the fact that you can run them longer in plain bearing engines, such as a car. However, there is evidence that the ball and roller bearings found in motorcycle engines actually chew up the huge molecules of all these engineered lubricants. So the bottom line is this, whether you spend $3 or $100 per quart, you may still have to change your oil just as often.

And that's why there is hot debate on the subject of oil for motorcycles.

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Additional Notes

From Spectro's Web page: http://www.spectro-oils.com/faqs.htm
FAQ #6. I've noticed a new API rating on automotive oils called SJ that I do not see on Spectro products. Why is this?

"Because the API (American Petroleum Institute) quality assurance system is driven by the automobile manufacturers. When API had SG as its highest quality level, it was good for both motorcycles and automobiles. However, when the API went to SH quality levels, changes occurred. Lubricant manufacturers added friction modifiers to increase fuel efficiency and decreased the allowed levels of zinc and phosphorous in these oils. These were concessions to the automobile manufacturers and were a step backward as far as lubricant performance in motorcycles and, in particular, Japanese models are concerned. Increased levels of friction modifiers can detrimentally affect the back torque limiter, clutch and starter systems in some Japanese motorcycles. Decreased levels of zinc and phosphorous are not advised for high RPM, high-output motorcycle engines which run hotter and have small lubricant reservoirs compared to automobiles. The API SJ GF-4 rating further increased friction modifier treat levels to improve automobile fuel efficiency. Zinc and phosphorous were further limited, as well. All of these steps are in the opposite direction of how a premium-motorcycle lubricant should be formulated. Therefore, Spectro oils do not have the SH or SJ rating on them for the reasons stated above. Spectro bypassed SH and SJ and went from SG to SL. Our oils are SL technology with increased ZDDP treatment. We are now following the JASO T-903 tests and JASO 'MA' ratings guidelines since these are motorcycle specific and have a more direct application to our products."

The “Bob is the Oil Guy” http://www.bobistheoilguy.com/ site is a source of some very interesting information and oil analysis that would be handy for anyone interested in modern oils. But there are few specific recommendations or information for oils for older British motorcycles.

There is as much about, what has been left out of modern automotive oil, as what was added. In the first place cars use catalytic converters, which are sensitive to the zinc and phosphorous added to older oils (SG or lower). Putting SAE "SG" or earlier rated oil in a modern car that contains high levels of zinc or phosphorous can ruin the catalytic converter.

Zinc and phosphorous are important to our motorcycles because they improve the oil’s lubricating qualities, especially in the area of the camshafts and tappets. If there’s one thing I want lubricating my old British camshafts, is oil that has a good zinc (ZDDP) and phosphorous package. You won’t find a good ZDDP or phosphorous package in modern SH and later oil.