

Not all oils are the same. Automatic start-stop

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Engines with automatic start-stop have become a de-facto standard in passenger cars and light-duty vehicles. At the same time, the majority of present-day crankcase lubricant specifications largely overlook the impact of start-stop technology on engine health. There is a widespread belief that engines with automatic start-stop systems do not require any special lubricant and will run well with any motor oil. We asked BIZOL Head R&D, Prof. Dr. Boris Zhmud, to clarify the situation.

What does automatic start-stop do?

Well, if you drive a newer car manufactured during the last five-six years, you have certainly experienced that your engine stops if you stop at a traffic light, and starts again as soon as you press the gas pedal. I remember in early days of automatic start-stop technology, I was a couple of times mistakenly alerted that my engine “stalled”. A start-stop system automatically shuts down and restarts the engine to reduce the amount of time the engine spends idling.

It sounds like a useful feature. If the engine runs less, it does not only emit less CO2 but it should also endure longer, right?

Not quite. It's true that emissions are reduced. Automatic start-stop does indeed help improve fuel efficiency – this is the primary purpose of this technology. It is most advantageous in the stop-and-go city traffic where typical fuel economy gains range from 3 to 10 percent. However, one unfortunate consequence of frequent start-stops is that the tribological stress upon some critical engine components, first of all bearings, increases significantly. While starting the engine corresponds to only a negligibly small fraction of the engine service life, it accounts for up to 75% of engine wear and wear-related failures! I can tell you, for example, that the lifetime of bearings in engines with automatic start-stop may be halved as compared to equivalent engine configurations without start-stop.

Really? Are car manufacturers aware of that?

Of course, they are, and together with lubricant companies, they work hard to address

the longevity issues, often inherited from the pre-start-stop era engine design. The most intense wear occurs at camshaft bearings, though balancing shaft bearings, main bearings, and connecting rod/gudgeon pin systems are all affected as well. The situation is further aggravated by use of ultralow viscosity motor oils which often compromise wear protection for the sake of fuel economy. This topic got a lot of attention in many professional conferences I attended over past years.

Nowadays, some lube companies offer special oils, referring to Start-Stop applications, while other claiming that no special oil is required. What is your take on this?

BIZOL is one of the pioneers in this field. We have started to develop our special BIZOL Oil Green+ line of motor oil for city traffic and automatic start-stop systems already five years ago, and after intense testing, this product has been officially launched at the Automechanika Frankfurt 2016 Trade Show and Exhibition. Of course, BIZOL is a rather small company, so this launch might have come unnoticed unless Castrol offered their own solution for start-stop systems. The claims that no special oil is required for engines with automatic start-stop systems are based on the deficiencies of the existing official API and ACEA oil performance evaluation sequences. Since any new test development is both prohibitively expensive and time consuming, the official test sequences are always lagging behind time. Therefore, if you compare performance claims listed, for instance, on cans of Castrol Magnatec Stop-Start ACEA ACEA C3 and regular Castrol Magnatec ACEA C3 of the same SAE viscosity grade, you may discover they are almost identical. However, this doesn't necessarily mean that the contents of the cans are the same. Performance claims just say that both products are at least as good as claimed, but say nothing if, how much, and in what respect one is better than the other. In the car owner manual, also only such standard lubricant performance categories are usually listed for general guidance, while the requirement for extra wear protection, for instance, may be hidden in OEM-specific approvals, explicitly or implicitly reflecting the fact a given engine comes with a start-stop function.

Now I'm even more confused. Can you tell me in short – do I need a special Start-Stop oil or not?

If you use an OEM-recommended engine oil, you should be safe over the warranty period. The oil is not likely to wear down you engine too badly too quickly. The question is what do you prefer – good enough or the best? Start-stop enabled motor oils

features a number of special technical solutions aiming to boost wear engine protection beyond the “minimum sufficient” level foreseen by the engine manufacturer. For instance, BIZOL COMB LubriBoost™ technology featured in our Green Oil+ allows a twofold increase in lubricant film strength and prevents lubricant film collapse even if there is no relative motion between the mating surfaces. So, my answer is, if you spent a lot of time in stop-and-go traffic and you want to keep your engine in top-notch condition past its warranty period, it is indeed recommended – though not required – to use a special start-stop enabled motor oil. It is very much as to the question if you should eat a healthy food – it's recommended, it's good for your health, but it's not really required, is it? In the end of the day, the choice is yours.