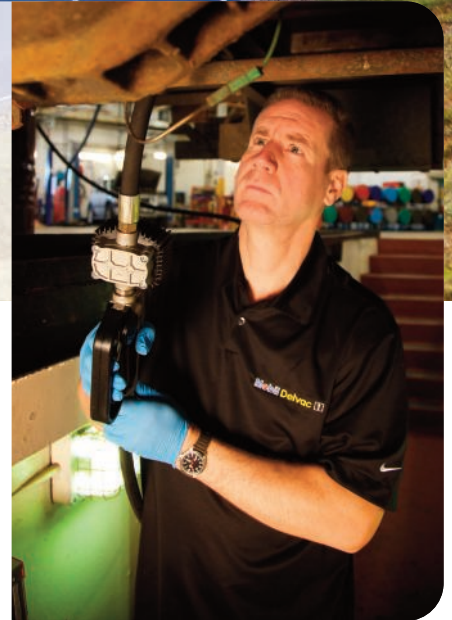


DROP OF THE GOOD STUFF

Saving money, in terms of operations, maintenance and repair, is among all operators' priorities. Brian Tinham examines roles for modern lubricants and fuels in cutting costs



If you want to protect your truck, bus or coach drivelines for the long term – particularly, but not only, at Euro 6 – and achieve consistently good fuel efficiencies and even longer drain intervals, then you need higher performing lubricants. That's the unsurprising advice from premium oil processors, such as Castrol, ExxonMobil, Petro-Canada, Shell and Total, as well as the major additive pack manufacturers. And it's a similar story when it comes to diesel: ongoing engine health and fuel efficiency are the rewards of paying more for premium brands.

No one argues with most of that, and indeed all of the truck manufacturers issue their own high-end HDDEO (heavy duty diesel engine oil) specifications for each vehicle and engine. Examples include Daimler MB 228.51 and MAN 3477, both of which focus on bore surface polish, soot handling and piston cleaning, as well as corrosion and wear protection – including for the exhaust after treatment. All are variants of the E6 and E9 oil classifications defined by ACEA (Association des Constructeurs Européens d'Automobiles) in Europe, and/or API/SAE (American Petroleum Institute/Society of Automotive Engineers) CJ-4 in North America.

For Euro 6 engines, all require low SAPS (sulphated ash, phosphorus and sulphur), low viscosity (typically now 5W-30) and good HTHS (high temperature, high shear) performance, almost exclusively demanding fully-synthetic base oils – although that's a moot point – and advanced additive packs. Fail to fill your truck engines with premium oils that meet these specifications and, at the very least, you risk your vehicle warranty. Since that's expensive – certainly compared to the price difference between premium and regular fuels and lubes – few do it.

COST SAVING?

However, for fleets on tight margins, when vehicles go out of warranty there's a temptation to go for lower-cost options. Additionally, anyone with a mixed fleet that includes at least some ageing vehicles (and who hasn't got those) will want to rationalise their oils, both to keep workshop costs down and to minimise the chance of the wrong fluid being put in the wrong vehicle.

So, given the open scepticism among so many fleet engineers, particularly around claimed fuel savings, it makes sense to examine the suppliers' technical justifications for advanced

lubricants and fuels. It's also worth taking stock of independent trials, especially those involving other operators with no axe to grind.

Technologist first, and Shell technical specialist Maarten Beckers points to several factors governing lubricant formulations. For engine protection, he cites oil film retention under all load conditions, and soot and acid handling, using high-quality base oils, dispersants, detergents and anti-oxidants. "It's very important to keep the engine and the after treatment system as clean and as wear-free as possible throughout the life of the vehicle," he explains. "So we have to use low SAPS oils, and for Euro 6 we're also almost obliged to use fully synthetic 5W-30."

But that's not all. He concedes that several oil processors meet OEM lab and engine test specifications, but argues it's one thing to meet minimum requirements, quite another to exceed them. "Ultimate performance is underpinned by the detail of the formulation. Think about evaporation rates at high engine temperatures. To

prevent oil mist combustion and fouling of the exhaust system, a very low evaporation number is critical."

He also notes that fuel economy isn't captured in many of the ACEA/API specs, and suggests that bearing down on friction is not just about going for a low-viscosity oil. Beckers doesn't give details, but says: "When Shell promotes its top-tier lubricant as offering a 2–2.5% fuel consumption improvement, those are conservative figures."

All the big boys argue much the same. Petro-Canada, for example, claims fuel savings, alongside uptime and reliability improvements for its latest Duron-E UHP 5W-30 premium HDDEO, which, by the way, is also fully synthetic. Similarly, Exol Lubricants claims near 2% fuel savings for its Taurus Euro FE 5W-30 and points to trials on a Cummins ISB4.5-powered Wrightbus StreetLite and a Volvo D7-powered B7RLE.

Incidentally, Beckers also states that Shell's ongoing investment in GTL (gas-to-liquid) fully synthetic base oil technology, as used in Shell Helix Ultra for cars under the Shell Pure Plus brand,

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Maarten Beckers

is set to deliver further improvements. "It's very promising. Benefits include excellent cold flow properties, very good evaporation factor and a very stable viscosity index."

All well and good but, as a rule of thumb, advanced 5W-30 oils are double the price of 10W-30 and three times 15W-40 lubes. To those wondering about paying such premiums on slightly older vehicles, ExxonMobil field engineer Thorleif Bache says there are paybacks. Not only can you expect clean, efficient, healthy engines, but also circa 2% better fuel economy and potentially also extended drain intervals.

He points to a trial with Mertz Transport, in Malmö, Sweden, on Euro 5

Mercedes-Benz Actros trucks, factory filled with Mobil Delvac XHP LE 10W-40 fully-synthetic engine oil, as per Daimler's 228.51 specification. "We switched one of the trucks to our newer Mobil Delvac 1 LE 5W-30," he says. "We then monitored the trucks for several months covering the same routes, with the same payloads, identical tyre pressures, etc, using their FleetBoard telematics. The result was a consistent 1.99% fuel improvement throughout the trial period, whatever the weather." And, for Mertz, that equates to £625 saving per truck per year, on modest mileage.

Bache concedes that this trial did not go on to assess engine wear variance, but argues that Mobil Delvac 1 LE also meets or exceeds 228.51. Furthermore, he suggests that other trials, also conducted with Mobil Delvac oils, demonstrate that drain intervals can be extended. In one, on a Deutz industrial engine, oil analysis proved they could be tripled against OEM recommendation. And clearly, if you're prepared to invest in routine oil analysis, there are vehicle uptime and consumable cost savings for the taking.

Which brings us to mixed fleets and, for Beckers, rationalising down to a single engine oil that meets all specifications is all about assessing cross-spec commonality. "Top tier lubricants, such as Shell Rimula R6 LME 5W-30 meet Euro 6 approvals for almost all European OEMs and are fully backwards compatible all the way to most Euro 3 engines."

He accepts that fleet engineers might worry about thinner oils in engines with several hundred thousand miles on the clock, but insists it's not a problem, even when 15W-40 was the preferred grade, "provided engines are in good technical condition". The same will apply to the upcoming classes of so-called extra fuel efficient lubricants on the run up to next year's ACEA and API specifications. **TE**

Fuel sense

Engine protection and fuel efficiency are not just about using the right lubricants. Fuels, which in Europe conform to EN590, have a part to play too, according to fuel firms. And, giving the example of FuelSave diesel – claimed to deliver 3% fuel economy improvement over baseline alternatives – Shell fuel scientist Emma Wyatt explains that the issues are much the same.

"For example, Shell FuelSave diesel is formulated with special detergent chemistry to maintain the performance of the injectors by preventing deposits inside and around the injector tips," she says. And she points to the importance of ensuring spray symmetry for combustion efficiency, particularly as pressures and temperatures increase.

Then there's corrosion prevention. "We formulate the additives to deliver a protective surface that shields it from water droplets. It's only a few molecules thick and it needs replenishment, but if it's in every fuel injection, it offers that protection." And it's a similar story with anti-foaming to speed up fill rates, and de-hazing, for operators that bunker bulk fuel and need to keep it fresh.

What about the future? Wyatt says that, just as with lubricants, fuels are under constant development. "We are already working on the next generation of Shell FuelSave diesel. We're also keeping a close eye on what's coming in terms of alternative engine technologies and the fuels they require. And we're working on refinements that take account of the increasing bio content in diesel."