

Getting TECHNICAL

The IRTE Conference afternoon technology sessions covered braking and stability systems, tyre husbandry and novel gas-to-liquid fuels and lubricants. Ian Norwell reports

BRAKING AND STABILITY SYSTEMS

Looking first at braking and stability systems, John Stroud, technical sales engineer from Knorr-Bremse, and John Comer, from Volvo Group, used this session to brief conference delegates on the latest technical and legislative developments, and their implications. Both speakers started by pointing out that the laws of adhesion and physics cannot be beaten by any systems. They are also not designed to be fully autonomous: these systems are intended to support the driver who remains in control.

Concentrating on AEBs (advanced emergency braking systems) and LDW (lane departure warning), delegates heard that today's heavy truck has overtaken the average new car in terms of safety, since both of these systems are now legal requirements. But, as with many legislative introductions, implementation is being phased. Furthermore, there are different criteria for detecting and reacting to static versus moving objects.

In fact, the regulatory demands are modest, compared with the performance that truck makers have universally delivered. Step 1 (which came into force in November 2015) requires the system to deliver a reduction in speed of 10kph (from 80kph) when advancing on a stationary object. Step 2 (which comes into force in November 2018) demands a cut of 20kph. In practice, most truck makers have gone straight to Step 2 and have exceeded the above demands by a large margin.

That said, Stroud and Comer pointed out that the legal requirements when approaching a moving vehicle are more ambitious. Step 1 requires speed to be reduced from 80kph to 32kph. Step 2 cuts



that final speed to just 12kph, with no impact. Worth a note is the fact that four-axle trucks and off-road trucks are today exempt.

A few premium truck makers also offer a notional Step 3 (although this legislation has yet to be framed), and it's this that has been the subject of so much publicity, chiefly through video clips. These typically show a 44-tonner under cruise control at 56mph, automatically instigating a full-pressure AEBs stop, and avoiding a collision with stationary traffic. And all with no driver intervention.

Yes, this level of protection is available, but many drivers mistakenly believe their new truck will be fitted with this level of automation. Except in rare cases, this is not the case. Firstly, as Volvo's Comer (above) explained, a combination of cameras and radar sensors is used, meaning windcreens must be kept clean, and sensors

unpainted if these are to function correctly. Secondly, traffic accidents are rarely as simple as those replicated on test tracks: AEBs does not detect cyclists or pedestrians; nor will it pick up oncoming traffic, or vehicles not travelling in the same direction – at junctions for example. These exclusions can't take the shine off a very impressive device, but they are significant.

As for LDW, it may appear to offer less, but this is not the case. Knorr-Bremse's Stroud said that measuring its effect at preventing accidents is not easy, but the hard shoulder has long been known as the killing field of the motorway. So, if errant vehicles can be kept from inadvertently straying on to it, so much the better.

He also pointed out that LDW is ultimately a vital piece of the autonomous driving jigsaw, and more sophisticated versions will be taking full intervention

FACTS

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- Ryder is now recording 46% less roadside assistance deployments



“Accurate measurement of tread depth is fundamental to getting full life from a tyre ”

Andy Pryce

over steering in the future. However, currently, LDW has limitations. “Poor road markings, bad weather and imperfect installation can all prevent correct system operation,” he told delegates.

TYRES AND FLEET HUSBANDRY

Moving on to tyres and fleet husbandry, five speakers from Michelin, Sigmavision, Ryder and Pirelli tackled the topic. And they started by stating that, apart from the purchase price of tyres, the impact on costs of poor husbandry can be significant. Running under pressure or with poor alignment, for example, is an expensive game. Indeed, Michelin commercial director Guy Heywood had a crisp message for delegates with some pretty shaming figures. “Despite the certain knowledge that pressures are crucial to economical operation, our audit data for non-managed fleets

shows that only 31% of tyres are within 5% of the correct pressure.”

Michelin’s audit also revealed waste caused by poor management. The biggest issue is not illegal tyres, he explained – operators are not generally that cavalier – but premature replacement. Average tread depth on removed tyres is more than twice the legal limit, he said. This smacks of standard replacement cycles either being applied across vehicles with vastly different duty cycles, or against outdated wear rates.

Heywood’s other revelation was that less than 18% of tyres are retreads. For those who imagined retreads’ second-rate image had long been consigned to history, that was a surprise. But the figures are there, and Heywood also cited an industry survey that suggested only 25% of fleets monitor their tyre pressures to improve fuel

efficiency. Given readily available information that points up the fuel-saving benefits of tyre pressure monitoring, that was a dispiriting statistic.

Organisation is the key here. Chris Bull, tyre and trailer operations manager at commercial vehicle hire giant Ryder, gave an operational view. “Controlling life cost and ensuring that the product performs reliably are paramount to how your budget is managed... Make sure you have your fleet covered by a set of tyre management procedures in partnership with your tyre supplier, where you jointly review usage. It will repay your time and investment.”

With a growing fleet, Ryder found itself having to move from a disparate set of agreements and processes, he explained, in order to get tyre husbandry under central control. But the results were spectacular. “Benefits were immediate. We



now fit a new tyre on the fleet every 14 minutes. In 2012 it was every nine." Tyre breakdown performance – and therefore customer service – have improved, too, with 46% less roadside assistance deployments and 29% fewer events caused by worn tyres.

Echoing Heywood's comments on premature removal, though, was Andy Pryce, managing director of Sigmavision, which manufactures the hand-held or driver-over TreadReader device. "Accurate measurement of tread depth is fundamental to getting full life from a tyre," he insisted. And he reminded delegates that shallower tread depth delivers lower rolling resistance, in turn leading to improved fuel economy. Premature replacement, then, is the worst possible folly. His message: sweat that asset.

Incidentally, compared to traditional tyre wear measurement methods, Pryce claimed that his company's 3D scanner is faster and improves opportunities for fault diagnosis. For example, the root cause of uneven wear can be rectified and the tyre enabled to run full distance, he claimed.

For Dave Adamson, of Michelin Solutions, the bottom line is that proper tyre management is complicated, but essential. "Tyres are one factor among many that impact on fuel economy. However, they are in the top three, along with driving style and aerodynamics. So you can't afford to ignore them."

Differences between urban, regional and highway operations all alter the emphasis operators should give to rolling resistance and other key tyre attributes. "The correct formula is hard to track down, even for a fleet engineer," conceded Adamson. But getting this right has the potential to save operators small fortunes.

GAS TO LIQUID

Dr Richard Clark (above), senior scientist covering alternative fuels at Shell Global Solutions, and colleague Maarten Beckers, Shell lubricants technical specialist, laid out the case for GTL (gas-to-liquid) fuels and lubes in the final technology stream session. Setting the scene, they made the point that GTL is not new: Shell started production in Holland back in 1973. Derived from natural gas, the result is a colourless, odourless liquid that works well as a fuel in unmodified diesel engines at any fuel blend ratio from 0% to 100%.

Billed as a cleaner-burning synthetic diesel alternative, GTL is easy to integrate with new and older on-road diesel engines, not least because there is no infrastructure investment requirement, said Clark. There's no shortage of supply, with Shell's Pearl GTL plant in Qatar, started in 2012, now producing 140,000 barrels per day, nearly five million gallons.

From an emissions perspective, GTL fuel also offers significant improvements in PM (particulate matter), NO_x, hydrocarbons and CO when used with all engines up to and including Euro 5, he said. So this fuel is likely to appeal to markets where such engines still operate widely. Meanwhile, the argument for GTL fuel in Euro 6 markets is all about improved fuel economy (aided by GTL lubes) and Clark observed that, with CO₂ next in the sights of EC emissions legislators, it will deliver.

As for applications, Clark asserted that GTL fuel

can be used in rail, offshore, heavy construction and power generation, as well as road freight and public transport. Its cleaner burning nature makes it attractive for heavy duty machines, where another advantage concerns reduced filter replacement and maintenance.

On the lubricants front, Beckers told IRTE Conference delegates that fully synthetic GTL base oil has virtually none of the impurities found in crude oil. He also explained that lower evaporation rates lead to reduced oil consumption, while lower viscosity means easier cold starts and reduced internal frictions losses in engines and transmissions – again resulting in fuel consumption and maintenance benefits.

Beckers also said that GTL lubricants are better at keeping engines cleaner, all the way from the combustion chamber to the after-treatment. And he pointed to their good HTHS (high temperature, high shear) characteristics, which mean they retain their lubricating properties in real-world environments – although they carry the caveat that not all are backwards compatible for use in older engines.

With tougher OEM engine oil specifications on the horizon, Beckers forecast that GTL will shine. Furthermore, new API, ACEA and OEM specifications will all be predicated on achieving higher fuel economy benefits, and hence also lower CO₂ – again favouring GTL.

Finally, Shell asserted that policy support for GTL is strong. Both men cited the alternative fuels infrastructure directive (Afid), which asked EU member states to submit a report of measures to promote alternative fuels adoption. Included are synthetic and paraffinic fuels, such as GTL and HVO (hydrotreated vegetable oil) as fuels that should be supported.

GTL's biggest promise then – now that Euro 6 has levelled the playing field on noxious emissions – is a fuel economy gain. It has a double-barrelled approach: the fuel itself is claimed to be more efficient; while GTL lubricants will be super-slippery, cutting internal losses and improving rolling resistance. ■

FACT

GTL lubricants are better at keeping engines cleaner, all the way from the combustion chamber to the after-treatment package