

Think tyres are tyres are tyres? Think again, as Steve Banner highlights developments that could have a significant impact on what boots your truck and van fleets should be sporting

# Rubber revolution

For an instant demonstration of the impact that tyre choices can have on trailer stability and safety, look no farther than tests carried out recently by engineering organisation QinetiQ at its Chobham site.

It took a Kel-Berg tri-axle tipper trailer, shod with low-profile Michelin 455/45 R22.5 X One MaxiTrailer tyres and coupled to an MAN 6x2 tractor unit, and put the 44-tonner on a tilt table. The combination is operated by Parsons Nationwide Distribution, which has been trialling the tyres for the last six months.

Impressively, the tyres started to lose contact with the surface at 26.2 degrees. They were then removed, replaced with standard 385/65 R22.5 XTE3 rubber and the exercise repeated. This time, contact was lost at 24.6 degrees.

It's an interesting development. A wide tyre, the X One MaxiTrailer's construction has been made easier by what Michelin refers to as Infinicoil. "That's a layer of steel cord wrapped continuously around the crown plies that allows tread width to be increased, without running the risk that the tyre will fail to maintain its stability, and it also ensures a consistent footprint throughout the tyre's working life," explains Michelin's UK truck product marketing manager, Paul Kendrick.



But there's more: for example, using such low-profile tyres allows a trailer's deck height to be lowered and its load cube to be increased by anywhere from 5–9m<sup>3</sup>, without increasing overall height. And Kendrick also suggests that reducing deck height lessens the risk of serious injury, if somebody tumbles off.

"Additionally, the extra tyre width gives you more mileage, because you're spreading the load more widely. Longevity should go up by as much as 50%, compared with a 385/65 – and the rolling resistance is almost identical to the 385/65, thanks to changes made to the rubber compound," claims Kendrick. Those changes include an increased use of silica.

## Design for life

Moving on to tyre design, engineers in the business say it's a bit like chess: improve one characteristic and you may be doing so at the expense of others.

That was a challenge faced by Goodyear when developing its Marathon Long Haul Trailer II tyre (LHT II). As its name suggests, LHT II is targeted at operators on long-distance work, and joins the Marathon Long Haul Steer II (LHS II) steer-axle tyre and LHD II drive-axle tyre.

LHT II is promising up to 5% more mileage than its

## Tyres for coaches and buses

Looking at passenger vehicles, unless they needed additional traction, coach operators have traditionally fitted steer-pattern tyres to both drive- and steer-axes, because of concerns that drive-pattern tyres might generate too much noise.

There are signs that this stance might be changing, however, according to Michelin's UK truck product marketing manager, Paul Kendrick, as quieter drive tyres become available.

He cites Michelin's X Coach XZ as an example. Launched around two years ago, it is produced in both drive and steer patterns. The former should last longer than the latter, given its tread depth of 22mm, compared with the latter's 16mm.

Kendrick also points out that drive tyres are constructed to cope with all the stresses and strains of life on a drive axle. Steer tyres are not; and can suffer accordingly.



predecessor, but not at the expense of either wet braking performance or noise levels. Rolling resistance is better, too, according to the company.

As proof, Goodyear cites a trial with Austrian operator Zeller Transporte. It has been using a set of LHT IIs alongside LHS IIs and LHD IIs on distance work at 40 tonnes. The operator says that diesel consumption improved by 3.7%, when compared with an identical 40-tonner on the same work in approximately the same conditions. The latter truck was shod with the same types of drive- and steer-axle tyre as its stable-mate, but the previous LHT+ trailer tyres. While one such trial cannot be viewed as conclusive, it is indicative of a worthwhile performance improvement from the LHT II, at least in terms of lowering fuel bills.

### Compounding results

Silica in the tread compound has again helped cut rolling resistance, while a compact tread design results in low energy dissipation. It is also interesting to note that LHT II has been made 7.5kg lighter than its predecessor, but without, Goodyear insists, compromising durability. As well as being good news for fuel usage and payload, the lighter a tyre is, the less the risk of injury to technicians – notwithstanding the widespread use of handling aids.

But these benefits come at a price. "LHT II is 10% more expensive than its predecessor," concedes Henry Johnson, Goodyear vice president, commercial tyres. Available in September, LHT II will initially be marketed in the UK in 385/55 R22.5, 385/65 R22.5 and 435/50 R19.5 guises.

Returning to Michelin, Kendrick says a number of operators are starting to use low-rolling-resistance long-haul tyres on shorter-haul

regional work. "While they may reduce tyre life by, say, 20%, they could also cut their diesel bills by 3%," he advises. "Depending on the nature of their business, it could mean they're better off financially."

Recognising the potential demand here, Continental is one that has developed what it refers to as a hybrid drive-axle tyre. "It's a cross between a regional and a long-distance product, with the bias towards regional, and we plan to trial it with one or two fleets," states Roger Sanders, Continental's UK general manager, technical services – although it has yet to go into volume production.

Another way of cutting rolling resistance would be to switch to super-single drive tyres. "They can reduce [rolling resistance] by 20%, compared with a twin-tyre set-up," claims Sanders. "They weigh 20% less than twin tyres, too." Unfortunately, super-single drive tyres can only be fitted at up to 41 tonnes in the UK. "The British Tyre Manufacturers Association is in talks with the DfT in a bid to get the regulations changed," confirms Sanders.

Meanwhile, one concern about super-single drive tyres is the effect of a sudden loss of pressure. Bridgestone's Greatec Mega Drive deals with that, using something called Aircept. Working along the same lines as an airbag, and made from non-woven aramid fabric, it is effectively a sheath that fits around the rim, inside the tyre. If the tyre pressure begins to fall rapidly, Aircept expands to stop it deflating.

At the same time as introducing its LHT II, Goodyear has unveiled the latest version of its Omnitrac mixed-service tyres. MSS II is intended for steer axles, while MSD II is for drive axles. Developed with the requirements of hauliers that regularly have to access quarries and landfill sites in mind, the tyres are available with DuraSeal as an option. That adds 15% to the price, but the sealant stops a tyre deflating, if punctured by any object up to 6mm in diameter. Air won't rush out, even when the foreign body is removed, says Kendrick.



Sudden deflations are not only bad news from the safety viewpoint, but also their impact on productivity. So, given that nails, wires, etc. are just the kind of junk that trucks encounter all the time when they venture off-road, the extra cost could be worth it.

However, not everybody believes that sealants always make sense with tyres. "They're so effective at sealing holes that the driver may not be aware that a tyre has been damaged," warns Continental's Sanders. "As a consequence, moisture may work its way into the hole and result in corrosion inside the tyre." Goodyear states that its sealant will keep out any moisture. But beware: some types of sealant can also impact on a tyre's retreadability – although Goodyear insists this is not the case with DuraSeal.

Another approach to avoiding being brought to a halt by a puncture, where light vehicles are concerned, is Goodyear's RunOnFlat. These tyres keep rolling, even after all pressure has been lost, because they are fitted with reinforced sidewalls that can support the vehicle's weight, while a bead prevents detachment from the wheel. The drawback, admits Goodyear, is that they are 8–15% more expensive than standard tyres.

### Road legal?

In the meantime, by 2012 truck tyre makers will have to comply with tougher legislation governing wet grip – a key indicator of safety – as well as noise and rolling resistance. "Nobody is 100% sure what the wet grip level will be, because the test procedure has yet to be finalised," maintains Sanders. "But the new noise regulations will involve cutting the current level by 3dBA, while rolling resistance will have to be a minimum of 8.1kg of rolling force per tonne of wheel load. And, by 2016, authorities say that number will fall to 6.5kg per tonne," he continues.

A system of tyre labelling, rather like those found on domestic fridges, will arrive in 2012 as well, covering each of the above parameters. Again, the wet grip scale has yet to be decided. "Where noise is concerned, however, three levels will be shown – the legal limit, three decibels below the legal limit and more than three decibels below that," explains Sanders. A pictogram will also be included, with lines emanating from a loudspeaker symbol.

"As far as rolling resistance is concerned, tyres will be categorised in seven classes, from A through to G," Sanders continues. "Tyres falling into category A will have the lowest rolling resistance, at 4kg per tonne or lower. Those in category B will be in the range 4.1–5kg per tonne, and so on down the scale," he advises.

Tyre makers appear to be reasonably relaxed about the regulations and labelling. Goodyear, for example, is confident that LHT II will comply with all the requirements. And retreaders can make their contribution to cutting rolling resistance, too, according to Vacu-Lug. Most recently, the company

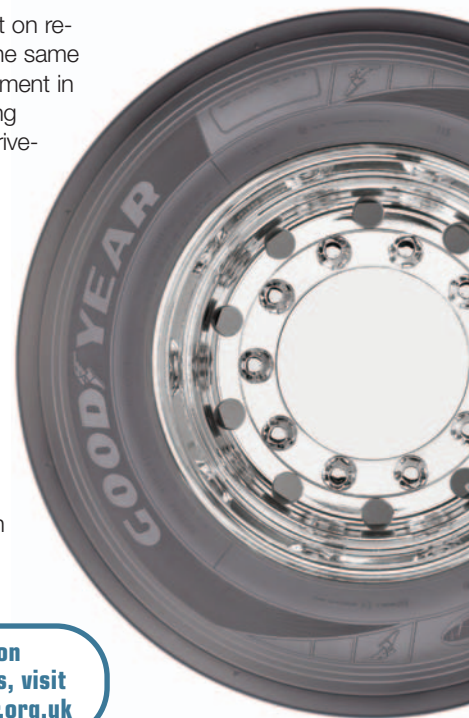


has come up with a set of green-coloured Duramold 215/75 R17.5 tyres for use on an electric 7.5-tonner, operated in central London by The Delivery Co.

These tyres boast a rolling resistance that is 18% lower than the standard Vacu-Lug 215/75 radials, according to independent drum tests conducted by Brickendonbury, Hertford-based Tun Abdul Razak Research Centre (the UK-based research centre of the Malaysian Rubber Board). That improvement has, in part, been achieved through extensive use of silicates. And, while new tyre manufacturers point out that silicates can affect wet grip, with these tyres that has proved not to be the case, insists Vacu-Lug fleet sales director Dave Alsop. "If anything, wet grip is slightly better," he insists.

He also says that drum tests carried out on re-treaded 385/65 R22.5 trailer tyres, using the same compound, have recorded a 30% improvement in rolling resistance. These tyres are now being trialled with an unnamed fleet, along with drive-axle tyres produced to the same design.

One final thought concerns the British weather – and at the lighter end of the vehicle scale, tyre manufacturers are attempting to persuade UK van fleets to copy the trend in central and northern Europe and fit cold weather tyres during the winter. Last September Michelin launched just such a tyre in Britain – the Agilis Alpin. Claims made by the manufacturer include braking distances on wet and icy roads shortened by almost 2m, plus 25% better traction on snow than its Agilis 81 Snow Ice predecessor, along with 20% better mileage. 



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