

Where the rubber meets the cloud

Onboard monitoring systems can already trigger an alert to the driver and the transport manager if tyre pressures are starting to drop to critical levels and temperatures are rising. Bridgestone offers just such a facility under the Webfleet TPMS banner, and plans to take things further.

As well as keeping count of the number of times the wheel on which the tyre is mounted has gone round, and thus the likely tread wear rate, sensors will soon be able to tell if a tyre has been involved in an incident that may have resulted in damage, says Bridgestone technical manager, Gary Powell.

The sort of incident he has in mind is the tyre hitting a pothole hard, and the shock that will be transmitted to the sensor by its vertical deflection. A tyre that has experienced such a trauma may be at risk of deflating, and a warning needs to be triggered. Even if it holds its pressure, a technician will need to take a close look at it the next time the vehicle is in the workshop.

Onboard telematics and GPS positioning will also be able to determine when the incident

Truck tyres will shortly be able to volunteer an extraordinary amount of data about their state of health.

Operational costs will fall as a consequence, and highway safety will improve, reports Steve Banner

occurred, says Powell, and which pothole was the culprit. Armed with this data, the haulier concerned should be able to lodge a compensation claim with the highway authority.

"Tyres will also be able to tell you the rates of acceleration and deceleration they are having to cope with and the load being imposed on them," he says. They are all factors that have implications for tyre life.

Continental is working along similar lines to Bridgestone. Its latest ContiConnect Advanced onboard monitoring package is now on trial with a number of fleets worldwide, says digital and fleet solutions manager, Ian Jackson. The data its next-generation sensors should be able to capture includes tread depth.

SECRETS REVEALED

He makes the point that monitoring rises in temperature can reveal more about tyres and the wheels wearing them than whether the pressure is too low and failure is imminent. "A temperature increase could for example mean that the wheels are out of alignment," he says. "When that happens, the tyres start fighting each other, and the temperature goes up.

"We've also been developing algorithms that will determine if tyres have been badly twinned," Jackson adds. That is something that can occur where there are two wheels positioned next to one another; on the drive axle of a tractor unit, for example.

If a new tyre is mounted on one wheel and its companion is fitted with a tyre with its circumference reduced



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Matt Childs



because it has seen some wear, then the new tyre will end up shouldering most of the burden. For that reason, it may suffer excessive heat build-up, leading to internal damage to the casing, and potential failure.

A rise in temperature can also suggest that the brakes are binding, and need attention.

Operators will have access to this data through a web portal. If they happen to use them, third-party service providers could be granted access too, and tyre manufacturers themselves will be eager to review it; especially if they are facing a warranty claim.

Fleets that claim a tyre has failed due to a product defect may find the claim is rejected because the manufacturer can see that it was the consequence of a failure to maintain the correct pressure.

The risk with all these developments is that the operator will end up drowning in tyre-related data; so much so that vital nuggets of information could be missed. What are required are exception reports. Says Jackson: “So far as the pressures are concerned, as things stand we suggest an advisory alert if the pressure has fallen by 10%, and a red alert if it has dropped by 20%,” he says. “The sensors we fit pulse every 16 seconds, but if the tyre has got a big hole in it because the driver has run over something, then it will pulse every second.”

If a red alert flashes up, then the truck needs to proceed to a safe location so that a technician can deal with the problem rather than have the tyre fail and the driver being forced to stop at the roadside.

“Where temperature is concerned, we’d advise an alert if it goes above 115°C,” he observes. That is not a cast-iron rule however, and operators can have the trigger point set lower – at 70°C for example – if they wish.

The sensor Continental favours is mounted underneath the tread rather than on a tyre valve or the wheel. Putting



it on the wheel can be preferable, however, says Matt Childs, operational marketing manager, UK and France, at Michelin Connected Fleet. “It’s the most robust part of the assembly, and means the onboard monitoring system is agnostic so far as tyre brands are concerned,” he observes. Fleets may run on two or three different makes.

Launched last year at the Solutrans show in France, Michelin Connected Fleet brings all of Michelin’s fleet management services and solutions together under the same banner.

SMARTWATCH APPROACH

Not to be outdone by its rivals, Goodyear has been developing SightLine. Aimed initially at operators with vans used by mobile technicians, construction industry workers and home delivery drivers, it uses sensors in conjunction with cloud-based algorithms to communicate with fleet managers.

Says Chris Helsel, Goodyear’s senior vice president, global operations, and chief technology officer: “Much like smartwatches that monitor vitals like heart rates and oxygen levels, SightLine monitors the health of a tyre.”

In its initial form it monitors tyre pressures and detects leaks. Likely future features include the ability to say how many miles a tyre has covered, estimate how much weight it is shouldering, and monitor the rate of tread wear.

Says Goodyear SightLine new venture specialist, Sosia Causeret Josten: “If an alert is received saying that a tyre will be worn out after the next 500km, then an app would schedule a booking with a preferred tyre dealer. This means that on the day the vehicle arrives, the replacement tyre would be available.”

The same system could be used to alert the fleet’s own workshop if it prefers to maintain its tyres in-house.

SightLine will be able to communicate with the vehicle’s safety systems.

“Typically no matter what tyres you have, the ABS will always react in the same way,” Causeret Josten says. “However, if it can tell that the vehicle is driving on half-worn tyres, then it can respond quicker, and reduce stopping distances.

“This advantage could play an important role in an autonomous future where the vehicle has to react on its own,” she adds. Initial testing has shown that integrating SightLine into a vehicle’s control system can reduce stopping distances by 30%, says Goodyear.

The global tyre giant aims to provide this type of intelligence in all its new products by 2027.

For operators who cannot wait, Goodyear already offers FleetHub. It integrates the company’s tyre pressure monitoring systems with CheckPoint, a reader set into the ground that collects pressure and tread depth data using cameras, lasers and sensors as a truck passes over it.

The availability of more and more information from all the packages currently under development does not mean that tyre technicians will no longer need to carry out fleet inspections. What it does mean, however, says Powell, is that inspections will be carried out more quickly and efficiently because technicians will be able to identify those tyres that most need attention by looking at the messages the sensors send to their tablets; and will act accordingly. [IE](#)