



Securing the

Wheel security is a perennial and frightening problem that seems to divide operators – between those in denial and the rest who believe they're taking it seriously. Steve Banner and Brian Tinham examine the issues



Truck and trailer operators should take a far closer look at their wheel hubs. John Ellis, managing director Motor Wheel Service

Truck and trailer operators should take a far closer look at wheel hubs fitted to their vehicles – and do so with some urgency. So says John Ellis, managing director of independent truck and trailer wheel distributor Motor Wheel Service. While the vast majority of vehicles have conventional circumferential hubs, some may have been equipped with non-circumferential spider- or star-type hubs in a bid to save weight, he asserts.

Unfortunately, such hubs only give partial contact between the hub and the type of wheel typically sold throughout the EU. As a consequence, the wheel can experience excessive localised stress, resulting in damage that can halve its life, he contends.

"The stresses set up are almost twice as high as they are with a full-contact hub, so the wheel may begin to crack and suffer fatigue at less than 50,000km," insists Ellis. If that occurs, it will have to be replaced. But even if no cracking is found, the wheel should be inspected every 50,000km, advises the AEWT (Association of European Wheel Manufacturers). The hub should be examined for cracks and replaced, if necessary, too, it says.

While wheels that are suitable for spider/star type hubs are available, Ellis points out that all quality commercial vehicle wheels in the EU are tested to ETRTO (European Tyre and Rim Technical

Organisation) standards on a circumferential hub, with a continuous contact diameter.

He's not alone in worrying. Wheel manufacturer Maxion points out that all standards relating to fixing wheels, which manufacturers and operators must adhere to (including ISO 4107 Commercial Vehicles: Wheel Hub Attachment Dimensions) are based on outer hub shapes with a continuous diameter. So, if you fit a standard wheel to a spider/star hub, you could end up invalidating your warranty. Ellis has alerted the DfT (Department for Transport), which, he says, is currently investigating just how widespread the problem might be.

Wheel countermeasures

Not everybody is convinced that British operators need be concerned, however, with some industry executives suggesting that the difficulty is minor at worst. "Spider-type hubs are common in the Middle East, for example, but we don't really see them here," comments Derek Skinner, technical director at trailer manufacturer Schmitz Cargobull. "It's not a major issue in the UK," agrees Andy Richardson, his counterpart at Lawrence David.

Of more pressing concern, they say, is avoiding wheel loss by focusing on countermeasures. "The golden rule is cleanliness," insists Simon Tattersall, head of national accounts at tyre services specialist ATS Euromaster. "All the mating surfaces have got to be clean and free from rust, dirt, grit, paint and oil." And Iveco product director Martin Flach adds: "The studs have got to be cleaned thoroughly, not just wiped over quickly with a bit of rag."

"The studs, nuts and washers have got to be in



future

tip-top condition and the same goes for the wheel itself," agrees Tattersall. "The studs must not be stretched as a result of being over-torqued, and each nut must run easily up each stud. Any damaged studs should be replaced." The stud should also be lubricated before the nut is tightened. "And use a light lubricant, not a thick, heavy oil or grease. Use it sparingly, and use it solely on the stud," he warns – not the nut.

Additionally, he advises, when the nut is torqued up, it should be to the manufacturer's recommended setting. "Remember that may be different, depending on which manufacturer we're talking about," comments Tattersall, adding that thereafter ATS Euromaster's practice is to let the vehicle stand for 30 minutes, in line with BS AU 50, then re-

torque. Some operators follow different approaches, he agrees, noting that they are not necessarily wrong. "There are fleets that say a vehicle should stand for 30 minutes, its wheels should then be re-torqued, and re-torqued again at the end of the driver's shift," he observes.

Prudent businesses wanting a belt and braces approach often fit locking devices to prevent wheels from coming adrift. Prolock clamps, for example, supplied by Parma, lock across a pair of adjacent nuts to stop them turning. Sales manager Marc Pittcock says three are sufficient to secure a wheel. Each clamp costs £1.32 and re-use is not recommended after removal. "We've been selling them in the UK for seven years now and in that time no vehicle fitted has ever lost a wheel," he claims,



Above: Simon Tattersall, head of national accounts at tyre services specialist ATS Euromaster. "All the mating surfaces have got to be clean and free of rust, dirt, grit, paint and oil."



Check your suppliers' procedures, warns Carlsberg

According to a report for Andrew Davis, national fleet engineer with Carlsberg UK, it might be advisable to check that the procedures promised and indeed signed off by your service providers are those they actually adhere to. His report, seen by this journal, indicates clearly that procedures are not always followed and service sheets often have errors.

Tyres, for example, may be fitted in place, and service sheets completed stating that wheel nuts have been re-torqued, with the appropriate 30 minute wait prior to re-torquing – even though the procedures were not followed. The report cites one supplier's technician who failed to use the correct torque method when re-torquing wheels – using 'round the clock', instead of 'across the clock'.

The report makes several recommendations:

Given that wheels deteriorate rapidly around four to five years, wheel condition needs to be carefully

inspected and mounting faces cleaned thoroughly.

During that process, all studs and nuts should be examined, in accordance with procedures, and replaced if required.

When wheels are removed for remedial work (such as brakes and or tyre replacement), with the exception of road side repairs, wheels should be both pressure washed and cleaned with a proprietary brake dust removing cleaner.

Only DIN fitting wheels should be used and not universal rims.

Carlsberg UK now insists that all wheel mounting and hub faces are photographed to prove they have been properly cleaned – the photos being uploaded into Carlsberg UK's fleet tracker system so an audit trail can be captured.



Safety-critical lifed items

Examining a wheel regularly for cracks, dents and other damage is sound workshop practice, whether or not it is fitted to a spider/star-shaped hub, says John Ellis, managing director of Motor Wheel Service. His 10-point check list covers everything from looking for rust and cracks to checking for roundness of the stud holes.

“On average, wheels have a service life of five years and, unfortunately, are not always replaced when they are fatigued,” he asserts. “Also, they are sometimes replaced with inferior products that have not been properly tested.”

Ellis believes that wheels should be treated as safety-critical items, an argument he took to the European Parliament’s Committee on Transport and Tourism, in January this year, in his capacity as a director of the Northwest Automotive Alliance. As well as alerting the committee to concerns over non-circumferential hubs, citing research carried out by Wheels India, he argued that all wheels and axles should be tested to ETRTO standards.

Will he be listened to? ATS Euromaster’s Tattersall believes that operators are starting to realise that a service life limit needs to be placed on wheels. “We’re now getting customers saying that they have got to be changed after a certain number of years,” he observes. “Awareness is growing, albeit slowly.”

adding that Parma also markets Propoint visual warning markers.

Bob Hope, chairman of Disc-Lock Europe, makes the bold claim that operators using his firm’s safety wheel nuts will never have a wheel come off. “I can say that because we’ve been selling them for 15 years and our customers have never suffered wheel loss,” he states. His safety wheel nut is a one-piece assembly comprising a nut, a hexagon-flanged washer and a flat-faced cup washer. The nut and the hexagon washer feature interlocking cams that rise against each other when subjected to vibration and/or shock. And, as the angle of the cams is greater than the stud thread’s pitch angle, there’s a wedging effect, which locks the assembly.

At £4.75 apiece, however, and with 10 required per wheel, they’re not cheap – although standard nuts sold by some manufacturers cost even more. Also, Hope advises that Disc-Lock prices should be compared with the price of a wheel loss, which might kill another motorist, rendering the operator potentially liable for corporate manslaughter. Even if that does not happen, the business is likely to be prosecuted, fined on conviction and face an early appearance before the traffic commissioner. **TE**

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