

IRTE best practice guides, which range from tyre maintenance to testing fuel economy interventions, were devised to help improve safety across industry. They consolidate common sense and in some cases break new ground

# LEARNING FROM THE BEST



Picture: Tim Gander

Since its formation after the war, the Institute of Road Transport Engineers (IRTE), now an SOE professional sector, has brought together members to discuss technical topics of general interest. Starting in the 1970s, the IRTE would set up an ad hoc working group of experts from operators and OEMs to investigate those issues that were deemed to be particularly important. Naturally, those results were published in *Transport Engineer* for dissemination to members. But to fulfil the organisation's charitable mission to improve best practice across industry, they were also published in a different format as the best practice guides, of which more than a dozen have since been produced (see box, p40).

One of the most significant related to what was known then as the 'lost wheels mystery'; why wheels became detached from commercial vehicles. Past chairman of the IRTE technical committee John Taylor pointed out that IRTE tests in the early 1970s established the rules for wheel torquing, and retorquing after 30 minutes to compensate for stud elongation.

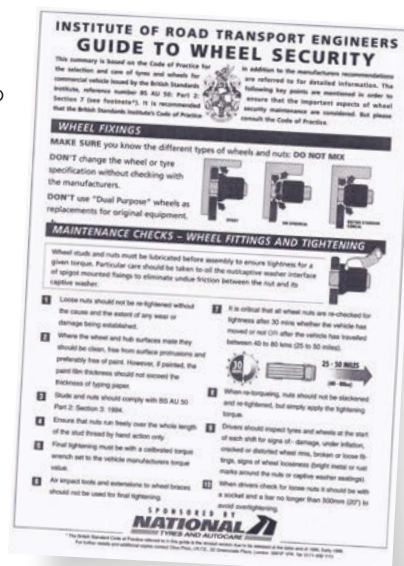
Nearly 30 years later, IRTE returned to the topic. Recalls Taylor: "Having driven BSI and industry to adopt the wheel code of practice, and wheel/nut quality standards, we felt that we should have the standards tested by an independent test house."

Terry Graham, who served as chairman of the council, as well as the wheel security group, takes up the story. Having raised some money, tests were carried at the laboratories of what was then the Leyland Technical Centre, in 1998. Technicians tested wheel bolts and nuts from various manufacturers against the BSI standard, and then subjected them to 100 retorques. It also did fleet trials with haulier Pandora, a subsidiary of P&O.

Although the results confirmed that most products met those standards, they flagged up the vital importance of lubrication (for which a poster

was published, pictured below). Graham explains: "The nuts experience high friction build-up in the nut/captive washer interface on spigot fixings. It was remarkable what a difference oil made to the actual clamping force generated. Therefore, wheel studs and nuts must be lubricated before assembly to ensure tightness for a given torque. Particular care should be taken to oil the nut/captive washer interface."

Another hot topic in industry has been tipper stability. Following a spate of overturning tippers in the early 1990s, particularly on waste sites, static physical tests of raised tippers mounted on a tilt ramp were organised, this time with help from FTA (Freight Transport Association). Its then head of vehicle engineering, Ron Rider, recalls that the tests involved strapping down a tipper chassis to the ramp platform, and then increasing the tilt angle slowly, watching



for indications of sideways movement, such as a reduction in deflection on the tyres of the upper side. Once the back wheels raised off the ramp, they knew they were close. Finding the maximum side angle was determined by pulling on a tether anchored to the top of the load, rocking the truck back and forth using only body weight.

"From those results, we were able to determine a lot of things, including the forces and rigidity of some of the bodies," Rider continues. Sticky bulk loads such as flour can also destabilise a tipper, he points out; for example, when several tonnes stuck to the front bulkhead of a raised tank suddenly cascades down one side.

In any case, those tests set the standard for stability: a maximum side slope of seven degrees, or five degrees in certain conditions. "Although we carried out and worked on computer algorithms, there was nothing like the real thing," he states.

### HOW IT WORKS

Members continue to look out for safety issues where a guide might prove useful – up to the present day. For example, IRTE council chairman John Eastman says: "I've worked in the refuse industry, among others. And there are



a lot of incidents happening with refuse trucks. Safety devices aren't being tested according to the maintenance schedule." A best practice guide that addresses how to improve safety is in the final stages of preparation, and is expected to be published next year.

In this case, he explains that he solicited interest from potential experts across industry who might contribute their advice. The experts meet and collaborate on a draft, which is then reviewed by the council before being published. These days the guides are based less on testing and more on operational expertise.

The time taken to produce a guide varies, but as Eastman points out, "Nothing happens overnight. These people are volunteers, and they have to get together over a three-month period [between meetings]." When it has been published, the RCV best practice guide is expected to have taken 18 months.

Once published, best practice guides

## IRTE BEST PRACTICE GUIDES: THE LIST

Published guides are listed below in date order; all are available for free to members via [www.is.gd/amotiy](http://www.is.gd/amotiy)

- Mobile Off-site Working Guide (2016)
- Safe Coupling & Uncoupling Guide (2016; IRTE guide 2006). The 2016 version was produced by the Transportation and Logistics Forum, including IRTE.
- Bus and Coach Tyre Maintenance Best Practice Guide (rev 2015)
- Wheel Security – An FTA/IRTE best practice guide (rev 2015)
- Vehicle Roll-over (2011)
- Improving Fuel Efficiency (2010)
- Preventing Falls and Falling Loads from Tail Lifts (2009)
- Tachograph Systems Compliance Best Practice Guide (2008). Author: tachograph consultant Gordon J F Humphreys
- Maintenance Supplier Assessment (2008)
- Safe Working Practice for Open Top Tipping Bodies (2009)
- Roadworthiness: Industry Best Practice for PCV (2008)
- Roadworthiness: Industry Best Practice (rev 2007)
- Tail Lift Operators – a simple guide (2007)
- Tail Lift – Specification Guide for Road Vehicles (undated)
- Tipper Stability Guide (2004)

are also revised; the wheel security guide is currently under review. Eastman adds that best practice guides remain a standing item on the agenda of every quarterly IRTE council meeting.

Also now in preparation is a guide on the stability of concrete mixer trucks; as they can have a relatively high centre of gravity when full, there have been some instances of tipping at roundabouts. **TE**

## CREDIT TO THE VOLUNTEERS

Like most of the SOE's industry experts, those who contribute to the best practice guides are unpaid. When asked why he devoted so much of his personal time to wheel security, beyond professional duties as a representative of National Tyres, Terry Graham replies: "I found it

very interesting. It was just really fulfilling that we could find a reason. People used to say it was a mystery. It wasn't; we knew why."

But few others did. Graham explains that he acted as an expert witness in many cases of wheel loss, educating judges about the crucial

nature of the retorque 30 minutes after the wheels had been changed. "If the wheel came off, you could walk backward and pick up all the wheel nuts. [The failure] was not two days later. It could happen 500 yards from where the first wheel nut came off; it was remarkable."