

Rollover revolution

While the industry and legislators alike work to reduce truck rollovers, this type of accident remains doggedly resistant to improvement. Keith Read finds out why

Road traffic accidents, and the resultant deaths, injuries and damage, have shown a welcome decline in recent years, but the number of truck rollovers has remained surprisingly consistent. This scenario leads to the worrying statistic that, as a percentage of all accidents, truck rollovers are on the increase – 5% in 2008, the last year for which we have accurate figures.

And while 5% may not sound very much, it represents 450 incidents where a truck has ended up on its side or roof, with the associated carnage. Add to that the five PSVs and 474 LCVs that met a similar fate in 2008 – along with the 8,992 cars that overturned – and it's easy to see why rollovers remain a serious cause for concern.

Indeed, the problem is of sufficient proportions that, as part of the latest General Safety Regulations, fitment of electronic stability control (ESC) systems to new trucks will become mandatory within a couple of years, while ESC for cars is likely to be mandatory by 2014. However, as well intentioned as the legislators doubtless are – and as effective as ESC is in minimising the chances of a rollover – the problem for truck operators is not going to go away any time soon. Think 2030, or thereabouts, before the majority of trucks on our roads are ESC-equipped. And even then, these systems are not foolproof.

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Safety Laboratory, an HSE Agency, has no doubts about what should be done to reduce rollover numbers. "Education is

fundamental to preventing rollover accidents," she says. "As an engineer, it is instinctive for me to consider a vehicle's centre of gravity. But it's not necessarily the first thing a driver, or a person loading the lorry, will consider.

"I remember one conversation I had with the driver of a skip lorry during one of the roadside spot checks that HSL was undertaking with VOSA," Day continues. "He had three full skips on his truck – and they were loaded on top of each other! I think he took the point when I explained about the raised centre of gravity. But he hadn't considered that before he was stopped and we talked to him."

Of the various factors that can contribute to a rollover accident, Day believes that hanging loads – garments or meat, for example – are not always considered risky. However, the pendulum





**“The three key factors in rollover accidents are: speed, centre of gravity (influenced by loading) and security of the load.”
Andy Mair, FTA**

effect that such loads can impose might just be sufficient to cause a rollover, if the vehicle encounters an adverse camber or when the driver brakes while making a turn. Often these could happen at low speeds and in locations where the driver would not normally anticipate any problems.

Day's view is supported by Andy Mair, head of engineering policy at the Freight Transport Association (FTA). “Although I accept that, in this day and age, drivers wouldn't necessarily load their own vehicles, they still need to be aware that loading affects the centre of gravity,” he says. “And whoever loads the vehicle, the drivers are ultimately responsible when they're travelling up the highway.” Mair's view: ideally, education about the dangers and potential causes of rollovers should be rolled out to depot and yard staff, as well as to truck and van drivers.

As well as the horrific consequences that a serious rollover accident can bring, in terms of

death, injury, damage and disruption, Mair highlights the negative effect such incidents can have on corporate image when a liveried truck is involved. “These accidents are highlighted in the news and companies don't want their name all over the media [in a negative context]. In any accident, corporate image is a big issue.” And it doesn't help that rollovers tend to happen at relatively low speeds, meaning that drivers often escape serious injury. A truck rollover can contribute to brand damage in a big way and its effect on other road users can also be dramatic.

Not safe at any speed

So, accepting the centre of gravity point, what about low-speed truck rollovers? Years ago, such incidents – particularly those at roundabouts – were blamed upon an unexplained phenomenon. But Iain Knight, head of integrated systems at the transport research laboratory TRL, who has considerable experience in analysing rollovers



and methods of preventing them, says low-speed rollover is a bit of a myth. "It stems from the thought, held many years ago, that a combination of bends in opposite directions might induce a rollover at a speed that is much lower than would have otherwise been expected," he explains. "However, research undertaken by TRL found that not to be the case. It would require movements in an unbaffled liquids tanker to produce the sort of incident once referred to as a low-speed rollover."

Nevertheless, HGVs are fundamentally unstable, explains Knight. "They will roll before they slide and you can roll them over at pretty low speeds. If you are going round a roundabout with a diameter of 40m, you can roll a truck over at maybe 20 or 25mph." Indeed, the lowest recorded rollover speed was 17mph, he reveals.

The role of the fifth wheel

Additionally, one of the problems faced by an articulated truck driver is that his trailer is likely to be well on its way to rolling over long before he gets any warning through the seat of his pants – as he would in a rigid truck, where the inside driven wheel would lift and drive would be lost. With articulated trucks, the fifth wheel coupling allows several degrees of freedom in roll, enabling the trailer to tip several degrees before it engages and then starts to give the driver an indication that all is not well behind him.

"The fifth wheel effectively isolates the truck driver from the feel of the trailer," explains Knight. "A driver simply cannot drive an artic by the seat of his pants. He can't feel what is happening

to the trailer – only what is happening to the tractor unit and that's almost irrelevant, in relation to rollover."

However, that is not to say that fundamental design features of a vehicle cannot help to prevent rollovers, because they most certainly can. Trailers that have a very low centre of gravity are much less likely to roll over, as are those with wider track widths. Hence, in part, the move to super-singles in place of twin wheels. Suspension systems that minimise the amount of roll – especially those with anti-roll bars – also contribute to reducing the risk of rollover. Such arrangements, coupled with the use of super-singles, also facilitate wider spacing of the springs.

These, and other similar factors, should all be considered when purchasing vehicles, new or previously owned, says Roger Bibbings, occupational safety adviser at RoSPA (the Royal Society for the Prevention of Accidents). In the final analysis, exceeding a vehicle's performance limits is one of the key causes of rollovers, he contends. "So the buzz word for

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reducing the chances of a rollover is risk assessment," insists Bibbings. "This assessment needs to happen at all stages, starting with design of the vehicle."

His advice: "When it comes to selection of the right vehicle for the tasks, there is a risk-assessment process to work out whether it is fit for purpose. You have to consider what loads you are going to carry... How they will be carried... And what adverse conditions might arise when deliveries are made."

But he also raises an important question: "When you've done all that, how do you train your drivers not to exceed the safe envelope of their vehicles and the loads they are carrying? All these things have got to be wrapped up in a proper safety management regime." For assistance, he recommends readers to the FTA's free advice line on road transport safety, commenting correctly that it provides excellent content.

For him, ESC systems are a welcome introduction, particularly those that have the ability to 'learn' about the changes in a vehicle's centre of gravity during a journey. He points to the many LGVs already sold with such adaptive ESP systems that take into account changes in stability criteria caused, for example, by delivery drops and pick-ups. However, Bibbings warns transport managers about becoming complacent over rollovers on vehicles fitted with ESC systems. "[ESC systems] must not deflect people from getting the basics right," he advises. **TE**



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