

A stable environment

Overloading is acknowledged as one of the prime causes of vehicle instability, which can cause accidents – often serious. Yet legislation designed to prevent overloading is being flouted every day on our roads, discovers Keith Read

Statistics taken from VOSA's (Vehicle and Operator Services Agency) annual Effectiveness Report show just how serious the problem of overloading has become. In 2008/09, VOSA weighed 29,218 commercial vehicles at the roadside and 8,770 – 30% – were prohibited for overloading. Three years earlier, out of 25,271 vehicles weighed, 5,945 – some 23.5% – were prohibited.

Of the total number of vehicles weighed in 2008/09, 1,066 were reported to the Traffic Commissioner, with all but 55 resulting in fines or convictions. Some 36 vehicles were impounded – and remained so after the appeal period had passed and any challenges been dismissed.

The figures are quite shocking, says Colin Smith, northern area sales manager of specialist weighing equipment manufacturer Central Weighing. "VOSA's enforcement is getting tougher and we're seeing more incidents of overloading, more so on the smaller end of the vehicle range. You'd do very well to overload a 44-tonner, for example, because that's a lot of weight you've got to put on. But in

terms of the small 3.5-tonne, 5-tonne, 7.5-tonne and 11-tonne vehicles, it's becoming an increasing problem. When you look at small vans, you're talking one in three being overloaded."

Loads better

Smith highlights performance limitations as just one of the disadvantages of a vehicle overloaded beyond the permissible axle weights. Conversely, he adds, the loading technique employed on some vehicles leaves a lot to be desired. "You can have a vehicle that is unstable as a result of poor loading, yet is not overloaded," Smith explains. It all depends upon what the vehicle is loaded with, how it's loaded and, critically, how the load is restrained.

Alarmingly, Smith says: "The worst scenario is a vehicle whose load is not secure and is not restrained, and the vehicle is also overloaded and exceeding the maximum permissible axle weights. This is something that tends to happen a lot."

Central Weighing manufactures and supplies specialist equipment to fleet operators, so that they can weigh their vehicles to make sure they are not



Vehicle stability can be influenced by drivers and also controlled by electronic systems



steps to stability

Safe and secure loading is essential to prevent instability. Nina Day, a senior engineer with the Health & Safety Laboratory, an HSE Agency, has seen just about every vehicle-loading sin during her career, which involves assisting at roadside inspections. She has produced a six-point guide for drivers, depot managers and everyone associated with transporting loads.

- 1 Loads should be secured so that they do not move relative to the trailer bed during transit.
- 2 Loads should be placed against the trailer headboard. If this is not possible, the gap to the headboard should be filled with blocking, or an intermediate bulkhead could be used.
- 3 The curtains and weather-protection structure of a curtain-sided trailer are generally not suitable for load restraint. The load should be secured as if it is being transported on a flatbed.
- 4 Rope hooks are not suitable attachment points for load restraint equipment.
- 5 Load restraint equipment should be appropriately rated for the load it has to restrain and be in good condition.
- 6 The key to load security is adequate risk assessment by someone competent to do so. She adds to this guide some logical – but often overlooked – rules:
 Heavier items at the bottom, lighter items at the top
 Weight distributed evenly across the width of the bed
 Tall, narrow items to be supported, or in a transport frame
 Loads should never be stacked higher than the headboard
 Finally, she warns: “Shrinkwrap is not load restraint equipment.”

running overloaded. And it is not, Smith stresses, expensive, particularly considering the alternative is a fine of up to £5,000 for each offence.

“If you’ve got a front axle overload, a rear axle overload and a gross overload, that’s three offences and a fine of up to £15,000. You can get a pair of scales for as little as £2,000 – or up to £8,000 or £9,000 at the top end – that would show the vehicle as overloaded, allowing something to be done before the vehicle hits the public roads.”

Vehicle stability can also be influenced by drivers, both in the depot while loading and on the road. Some trucks come equipped with systems to prevent instability resulting in disaster when the driver has made a mistake. Andrew Lumley, trailer sales account manager for the UK wing of German braking company Knorr-Bremse, says the availability of lateral accelerometers allowed Knorr-Bremse to perfect its technology, which is known as RSP, or roll stability programme.

Easy as RSP

Applicable to semi-trailers, tractor units and rigids, the active system detects imminent roll-over through the lateral accelerometers. “When we see a pre-determined value, the brakes are applied to slow the rig down,” explains Lumley. “Several different systems have been tried in the past, including sensing wheel speeds. However, it was the availability of lateral accelerometers that allowed us to perfect RSP.”

The system has been well received, with little or no reluctance. Where drivers showed reluctance, Lumley says that a simple demonstration to the fleet manager was all that was required to get everyone on board. When ESP (electronic stability

program) becomes mandatory on new trucks and trailers, in a couple of years’ time, he expects demand for RSP to increase further. And that is likely to mean a reduction in the cost, currently at around £150.


Some trucks are already coming equipped with ESP. Volvo was among the first to introduce it on vehicles in 2002. Through its safety team – which monitors accidents involving its vehicles – Volvo has been able to show that, since 2002, ESP-equipped vehicles have not been involved in accidents as frequently as non-ESP trucks. “It’s not just a small percentage drop – it’s dramatic,” exclaims Martin Palming, product manager at Volvo Truck Corporation in Sweden. “I believe ESP is the best safety system for trucks and mandatory ESP will mean accident numbers go down,” he adds.

His view: “A high number of accidents involve vehicle instability. There will still be accidents, but ESP will correct driver mistakes.” However, Palming warns against the danger of drivers thinking they can get away with being less careful, just because their vehicle has ESP. “Drivers still need to drive safely, otherwise accident rates will go up.”

Volvo undertakes a huge amount of research into vehicle stability and offers operators almost bespoke vehicles to optimise stability. “We have a huge portfolio of stabiliser bars and shock absorbers, so that we can design the vehicle for its use,” he explains. “We optimise the vehicle for its application and for the operator’s transport cycle. That contributes to the stability and comfort of the vehicle.”

Traditionally, Volvo has offered two frame heights – 266mm and 300mm – with the higher, stiffer, chassis designed for heavier vehicles operating on rougher roads. However, a year ago Volvo started to offer the 266mm-high chassis, with its lower centre of gravity, on rough-road trucks. At the same time, tyre profiles have been getting lower, adding to inherent stability. Operators seem to appreciate the development, says Palming.

There is another important contributory factor, however: although not always associated with enhancing vehicle stability, aerodynamics can also play an important part in keeping vehicles upright. Cab deflectors and other add-on streamlining – much lauded mainly for the improvement in fuel economy they produce – improve vehicle stability.

Kevin Hawes, co-founder in 1991 of Ecotek Design & Mouldings, recalls an incident in the early 1980s. “In strong winds, the only vehicle to cross the Humber Bridge without coming to grief was a fully aerodynamic vehicle, first built in this country by our team,” he says. “All the others literally fell by the wayside. A well-designed vehicle, planned to be the correct height in relation to its aerodynamics, will always result in a better [stability] performance.” 

Below: Bosch’s ESP has revolutionised vehicle stability
 Bottom: The consequences of overloading a truck

