

PAYLOAD PENALTY

Individual axle load and gross vehicle weight limits are there for a reason. John Kendall explains the issues arising from overloading and some of the equipment available to ensure prevention

Axles and their associated suspension mounts, brakes, shock absorbing and anti-roll systems are designed to operate in specific weight ranges, and for certain vehicle types and gross carrying capacities. We also know that wheels and tyres introduce variables, and that the fabric of tyres, wheel materials and fixings are designed to operate effectively and safely up to weight limits.

Exceeding those for a vehicle or individual axles can result in serious – even fatal – consequences because of the adverse effect on braking and steering. Vehicle stability is also likely to be affected, while overstepping the weight rating of the tyre could lead to accelerated wear and overheating, which in turn could lead to tyre failure.

Backtrack a minute: axle load ratings are calculated according to the design gross weight of the vehicle. They also include a loading tolerance. Adding the axle load ratings for a vehicle should total more than the permitted gross weight. This is not about accommodating casual overloading, but taking account of loadings on individual axles as weight distributions vary.

Without loading tolerances, there

would be a risk of individual axles becoming overloaded, either due to incorrect payload distribution on a vehicle, or as a result of load removals or additions during its daily rounds. The risk of axle overloading towards the front of a vehicle as weight is removed from the rear is familiar to all transport engineers.

LEGAL LIMITS

This matters. First, an overloaded vehicle involved in an accident could have its insurance declared void if it is deemed to be unroadworthy. Second, operators' OCRS (Operator Compliance Risk Score) can be adversely affected. As Andrew Freeman, managing director of on-board weighing systems supplier Red Forge, says: "Should an operator's vehicle be stopped, checked for safety and found to be non-compliant, this will affect their points rating."

The problem is not isolated to

HGV operators either. Volkswagen commissioned some research in 2015, which found that more than 50% of light commercials on UK roads run overloaded. Statistics from DVSA (Driver and Vehicle Standards Agency) suggest the problem could be considerably worse. In 2015, the agency weighed 2,381 vans and, of these, fully 88.5% were overloaded.

Luckily, operators have a range of options for checking individual axle and overall vehicle weights. These include portable weigh pads, static and dynamic weighbridges, and on-board vehicle weighing systems.

"I would guess that 90% of enquiries we receive are from people wanting to buy portable weigh pads," says Derek Hack of Axtec (Axle Weight Technology). "But they are probably the most widely misunderstood axle weighing system on the market," he continues, adding that



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most engineers and managers do not know how difficult they are to use.

They also don't realise their accuracy constraints, vehicle applicability limitations, or their potentially relatively short lifespans. "It's perhaps natural to assume that something you can pick up in your hand is going to be quite cheap. A good set of weigh pads is actually quite expensive and they are still limited to weighing two-axle rigid vehicles," explains Hack.

The fact is quality weigh pads could set you back £6,000. If you go this route, Hack's advice is to set them up on a properly prepared, level surface. Also, use a third party to ensure that vehicles are being properly weighed.

One problem with any external weighing system - weigh pads and static or dynamic weighbridges - is they cannot keep track of vehicle weight once it is on the road. This is where on-board weighing systems have the edge. As loads are removed or picked up on a distribution route, the driver can keep a running check on axle weights and

overall gross vehicle weight, redistributing the load if required to avoid an overload.

Such systems are available from several suppliers. One such is WWS, with its VOPS II system. "We developed a system that could be retrofitted or fitted during build, and that gives drivers a graphical representation of vehicle loading weights," states the firm's Julian Glasspool. An in-cab display shows individual axle weights, so enabling drivers to redistribute the payload to ensure that vehicles are operated safely and legally.

"The display gives an audible warning," continues Glasspool, "and that can also be linked to a tracking system. So, if you're a big fleet operator, it could alert the transport manager that a particular vehicle was overloaded at, say, four o'clock in the afternoon."

Glasspool gives an example of a Salvation Army emergency response unit - a well-equipped vehicle with a mobile kitchen. "Once the mobile kitchen had been fitted, there wasn't a huge amount of capacity left for carrying

food. You could very easily overload the vehicle." WWS fitted its VOPS II to help prevent such problems.

Most on-board weighing system suppliers offer a telematics interface so that load information can be transmitted easily to specified recipients. Alternatively, data can be displayed on mobile phones. Most suppliers claim accuracies to within +/- 3.0%.

That said, fixed weighing systems arguably offer the greatest potential for accuracy because they can be installed in controlled conditions on level ground. Probably the best and most flexible are dynamic axle weighbridges. Here, vehicles are driven at slow speed over the weighing plate, which records the weight of each axle and so provides individual axle and gross weight information.

A static weighbridge provides a less expensive solution, particularly for two-axle rigid. "Because two-axle vehicles are much simpler to weigh than articulated vehicles, you don't need a sophisticated dynamic system," explains Hack. Either way, though, the installation of fixed equipment is critical for both dynamic and static weighbridges. That's why Axtec and others employ their own teams of specialists. [TE](#)