1.6.2. IN-MOTION VEHICLE WEIGHING

The weighing of vehicles on an axle-by-axle basis is vital to ensure correct weight distribution, as well as compliance with the maximum gross vehicle weight limits permitted in the UK.

Each overloaded axle is considered by the enforcement authorities as a separate offence in law, as is the gross weight and operators, and drivers of commercial vehicles therefore have an obligation to ensure that the maximum allowed axle weights for their vehicle are not exceeded. Operators may be liable for significant fines for overloading, and persistent overloaders may also have their operating licence curtailed or suspended at the discretion of the traffic commissioners. Vehicle prohibition is also being routinely used to prevent overloaded vehicles from moving until the load is redistributed or removed.

This is particularly costly for companies working to 'just in time' delivery schedules, as contracts may be cancelled as a result of this significant delay.

Conventional platform weighbridges, particularly surface mounted systems, are obviously perfect for producing accurate gross weights, but are frequently unsuitable for obtaining axle weight information and so other technologies have to be considered.

Axle weighing systems are available in both static and in-motion versions the latter being particularly suited to weighing long multi-axle combinations where correct positioning of an individual axle for static weighing may be difficult and time-consuming.

With in-motion systems, vehicles can be driven over the weighing platform at speeds normally restricted to 5 kph and a display and print out of each axle weight and the accumulated gross weight is readily available. On the latest systems, the legally permitted weights for each vehicle type are stored in memory and an instant overload warning is produced when appropriate.

These systems were first available in the early 1960's and quickly found a niche as front line law enforcement tools with over 70 systems being installed at strategic locations around the country by the then Department of Transport.

The systems were designed strictly for Law Enforcement and Non-Trade weighing applications and a typical weighing accuracy was ±100 kg per axle.

Developments in loadcell technology and faster processing speeds of modern instrumentation have dramatically improved the accuracy of these systems to the point where a few manufacturers have achieved the 0.5% accuracy needed for O.I.M.L and EC approval Class III for trade use, as an In-Motion Road Vehicle Weighbridge. In-motion weighbridges cannot be Type Approved and Verified for use for trade as there are no regulations covering them as such, they are often however, Type Approved and verified as "static" weighbridges.

These systems are being increasingly used for commercial weighing of low value products such as waste and building materials, whilst also ensuring these vehicles do not contravene the Road Traffic Act in respect of weight distribution.

Many thousands of systems have been installed world-wide as law enforcement agencies and fleet operators alike take advantage of this low cost technology to weigh vehicles of any size and weight in a matter of seconds. Unlike the conventional platform weighbridge, the axle weigher cannot be outgrown and with a capacity of up to 40,000 kg per axle, vehicles of upwards of 240,000 kg can be weighed with ease.

The conventional weighbridge still has its place where high accuracy is demanded but the axle weigher fills an important gap for fleet operators who need to resolve a security or overloading problem quickly and cost effectively.

In recent years, there has also been a substantial growth in the demand for portable weighing systems for fleets of all sizes.

A wide choice of systems is now available and unlike their earlier relations, portability is no longer a problem. New aircraft specification aluminium is now used to great effect to produce systems, which can be easily transported and installed by one man in a matter of minutes. The systems usually consisting of two weighing platforms are placed on a level surface and again, a choice of static or in-motion technology is readily available. The later models may also incorporate cable free RF technology, which allows the user to read the axle weights at a distance of up to 40 metres from the weighing devices. This is particularly important in inclement weather where the weighing console can be located in a vehicle adjacent to the weighing area and the system operated from internal batteries or the vehicle battery system.

Site levels do play a vital role in the performance of both static and in-motion, fixed and portable axle weighing systems. This is largely overcome by careful site construction or the provision of roll out levellers for the portable systems, which remove much of the weight transfer created within mechanical suspension systems as vehicle wheels are driven up on to the weighing platforms.

In the case of permanent axle weighing installations, a distance of 4m before and after the weighing equipment is required to be constructed in concrete to a surface tolerance of +/- 3mm. The balance of the approaches for a vehicle's length before and after the weigher needs to be on a consistent gradient, but the surface levels are not as vital, and in most cases do not need any additional reconstruction. (Except in the case of enforcement installations where a strict Code of Practice for the construction of the site applies.)

These systems provide a valuable cost effective alternative to the conventional platform weighbridge and their size and weight dramatically reduces transportation, installation and maintenance costs.

References

OIML Recommendation R134 "Automatic instruments for weighing road vehicles in motion. Total vehicle weighing."