

POSITION PAPER

GERMAN INSURERS ACCIDENT RESEARCH

Truck Safety

No. 02

Trucks are different...

Given their high average annual mileage, goods vehicles with a gross vehicle weight of over 7.5 tonnes are involved in serious accidents quite rarely. However, their dimensions, considerable weight and geometric incompatibility represent concept-related disadvantages. Firstly, as a result of the sheer size of these vehicles, their drivers' ability to maintain a good overview is impaired by their need to focus on their own vehicle. In addition, the difficulty of maneuvering such vehicles increases the risk of collisions with other road users. Secondly, in the event of a collision, the huge mismatch in terms of weight between these vehicles and other road users (pedestrians, cyclists, riders of two-wheel motor vehicles and cars), their geometric incompatibility and the stiff and rigid structure of heavy trucks means that the risk of other road users suffering serious or fatal injuries is significantly higher. Truck occupants, on the other hand, are generally only at risk in collisions with other large vehicles, in simple vehicle accidents or when they are not wearing a seat belt.

Accident victims in trucks

Around 100 truck occupants killed annually

Since 2003, the number of fatalities among occupants of trucks with a gross vehicle weight of over 3.5 tonnes has fallen by 34% (with 95 fatalities in 2011), although the number of heavy goods vehicles on the roads has increased in

this period. The accident types that cause most fatal injuries to the occupants of trucks and tractor units with semitrailers are collisions with moving or stationary vehicles in front of them (35 fatalities in 2003 and 40 in 2011) and accidents in which the vehicle comes off the road to the nearside (20 fatalities each in 2003 and 2011). The number of fatalities and serious injuries among occupants of tractor units with semitrailers has fallen only slightly in this period (from 536 in 2003 to 450 in 2011) [2], although the percentage of seat belt use among drivers of trucks of over 3.5 tonnes and tractor units with semitrailers has doubled from a good 40% in 2003 to around 83% in 2011. Efforts should be made to bring this percentage up to the level of car drivers, around 98% of whom wear seat belts.

Vehicles

Prevention of accidents involving trucks

In order to prevent accidents for which truck drivers are primarily responsible, there needs to be a focus on improving active safety. Advanced driver assistance systems have the greatest potential for preventing collisions or substantially reducing their severity. An analysis of the accident data of German insurers indicated that up to 12% of truck accidents involving injuries could be prevented by emergency brake assist systems that are able to detect stationary vehicles in front of the truck. Almost 8% of such accidents could be prevented by blind spot warning systems, which have considerable potential to prevent lane-changing collisions. Regulation (EC)

No. 661/09 makes emergency brake assist systems, lane departure warning systems and ESC systems mandatory for trucks of categories N2 and N3 and buses and coaches of categories M2 and M3. Any exemptions are subject to a rigorous analysis of all aspects and must not prevent these systems from being used universally in the medium term.

Better protection for truck occupants

There is also still unexploited potential for implementing passive truck safety measures designed to prevent injuries in the event of an accident. Airbags are rarely ordered for truck drivers, and some manufacturers have now withdrawn them from their product range. However, given the frequency of serious leg injuries among truck drivers, it is particularly important to protect this region of the body. The situation could be improved by increasing the structural strength of the driver's cab and introducing knee airbags. There has so far been little investigation of the injury patterns and mechanisms of truck drivers, unlike those of car drivers.

Danger posed to pedestrians and cyclists by trucks

In 2003, 99 pedestrians, 114 cyclists and 99 riders of two-wheel motor vehicles were killed in accidents involving goods vehicles (including light goods vehicles). In 2011, 90 pedestrians, 76 cyclists and 62 riders of two-wheel motor vehicles were killed. A large proportion of these accidents occurred when heavy trucks and semitrailer combinations were tur-

ning off and the driver failed to notice the unprotected road user.

New mirror systems are no substitute for careful driving and assistance systems

To reduce the size of the blind spot for truck drivers, trucks are equipped with multiple mirrors, as required by Directive 2003/97/EC (or 2007/38/EC for retrofitted mirrors). However, in order to be able to see a pedestrian or cyclist, the driver has to be looking at the appropriate mirror at the right time. In addition, the wide-angle mirrors significantly reduce the size of the object and give a distorted picture. Sensors that detect a road user positioned right next to or in front of the truck can therefore be effective in preventing such accidents. Collisions in which the other road user is run over generally happen around the front part of the truck where the driver's cab is and at low speeds. The conditions are thus favorable for the reliable operation of such warning systems, which may even intervene automatically. Turning assistants and reverse assist systems, which may automatically intervene in critical situations following a warning, have the potential to prevent around 43% and 27%, respectively, of accidents between trucks and unprotected road users. These systems should be made mandatory as well in order to achieve the required level of market penetration.

Underrun protection the best means of protecting other road users

The number of fatal accidents involving trucks and tractor units with semitrailers fell by 25% to 763 from 2003 to 2011. Serious consequences of collisions between trucks and cars are often the result of the geometric incompatibility of the crash structures - as well as the huge differences in weight involved. Directive 2000/40/EC on front underrun protection was a key step toward improving the compatibility of trucks at the front. These underrun protective devices are large and strong enough to provide a car with effective support for its own crash structure in a frontal collision.

Underrun protection inadequate despite new laws

The rear underrun protection on trucks and trailers is inadequate despite the fact that the most recent amendment to the directive (2006/20/EC) requires the devices to be tested to withstand increased force levels. The rear underrun protective device is generally attached too high and does not provide a sufficiently large support surface or sufficient resistance to effectively prevent a car from ending up under the vehicle or trailer in a collision. The test requirements should be fundamentally revised in order to better reflect real conditions in collisions. Lateral underrun protective devices on trucks and trailers, as required by Directive 89/297/EEC, are designed only for pedestrians or cyclists. However, they are hardly fit even for this purpose because the legislation permits large portions of the sides of a truck to remain uncovered by them. Continuous, flat underrun protection devices are required instead of simple rail guards with an open structure.

Road users

Improvement of driver training

Irrespective of all the potential offered by active safety systems, other aspects must not be neglected: general demo-

graphic trends are also applicable to truck drivers. The design of the driver's workplace in the vehicle and driving routes as well as further training schemes, for example, should also take into account older truck drivers. Professional driving is a recognized occupation requiring formal training, and consequently this training can be started at a young age. After successfully completing a three-year apprenticeship, by which time they are around 18 or 19 years old, young people can thus apply for jobs as professional drivers. However, just like car drivers of the same age, young truck drivers are subject to the typical risks associated with their age and inexperience.

Roads

Creation of a suitable infrastructure

The road infrastructure - and the trunk road network, in particular - should make it possible for drivers to meet statutory requirements (for example, by providing sufficient roadside rest areas to allow them to take the required rest periods). Overtaking bans for trucks as well as sections of roads designed to allow trucks to overtake safely can also improve safety on the roads. In the end, however, rules and regulations are of no use unless compliance is adequately monitored and enforced, where appropriate, through penalties.

Links

www.udv.de/en/vehicles/trucks

YouTube-Video

www.youtube.com/watch?v=vtM_Q0foQXM&list=TLnNrOSNUbetPo6x7R5KniW2t6L_v3QNI9

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