

Steady state

Truck rollovers can have a serious impact on operators and the travelling public, but new technologies are promising to improve the situation. John Challen discovers some of the latest developments

High winds experienced by much of the UK at the start of 2012 highlighted the dangers of vehicle rollovers – with images of arctic strewn across carriageways. Nature ensures that such incidents will never be eliminated, but recent vehicle component and system improvements may well help minimise them.

One technology is Knorr-Bremse's RSP (roll stability program), an active safety system that can be configured as an option in the company's TEBS brake module. Carl Dibble, technical trainer at Knorr-Bremse, states that this protects against trailer rollover during driving by automatically applying the trailer service brakes. RSP provides a major advantage, he says, because critical factors influencing rollover are continuously monitored by the TEBS brake module, so it can react before the condition becomes critical.

"Rollover accidents normally occur when the lateral acceleration acting upon a vehicle exceeds a vehicle-specific critical limit," explains Dibble. "The upper limit depends on the height of the centre of gravity, which can vary not only from one vehicle to the next, but also on the same vehicle, depending on the load and loading state.

"Moreover, the vehicle speed and its geometric data have an effect on the lateral acceleration limit value," he adds. "For example, in vehicles with a fairly high centre of gravity, such as some tankers, the critical rollover lateral acceleration is lower than with a flatbed trailer transporting steel plates."

Dibble cites vehicle speed when cornering as a critical element, because the developed lateral acceleration varies with the square of the vehicle speed. That means small changes in speed have a major impact on lateral acceleration.

"Often in semi-trailer combinations, it is difficult, if not impossible, for the driver to be aware of how close the trailer is to rollover," he comments. "This is relevant when considering the characteristics of modern towing vehicles that provide high levels of driver comfort. Even if the driver did become aware

of a potential rollover, it is very likely that it would be too late for him to intervene in time to reduce the vehicle speed enough to avoid an accident."

End-user experience

Gary Bulley, managing director of Bullwell Trailer Solutions, has seen, first hand, the benefits of roll stability systems. "Being in the repair and maintenance industry, I am a huge advocate of safety features that really do save lives," he states. "According to statistics prior to the enforcement,



mandating stability systems on all HGVs could prevent nearly 3,500 truck rollover accidents a year. At least 106 lives could be saved in such accidents."

He rates roll stability systems that allow electronic control units in both the truck and trailer to co-operate. For him, what matters is applying the relevant brakes fast enough – both to control the degree of pitch and to slow the vehicle down, if a potential roll situation is detected. Systems that can also take control of the engine and retard the vehicle

Rollover guide

For more information on this subject, consult the IRTE/SOE Rollover Guide. Contact ian.chisholm@soe.org.uk or call 0207 630 1111 for a copy



Flat-out deliveries

It is not just on the road that rollovers can cause problems. Discharging loads when stationary presents another danger situation. Hence the value of Keith's walking floor technology, which is used to horizontally discharge bulk materials, without the need to lift the body into the air. This enables the trailer to be safely unloaded, even on unstable ground, under adverse weather conditions or inside a building.

The walking floor uses three hydraulic cylinders, located underneath the floor, which operate in a sequence of motion to convey the load. The company claims it offers greater versatility for the operators and is also a safer means of unloading bulk materials, because the body remains on the ground.



– particularly on combinations involving double deck trailers – are even more effective, he adds.

Bulley says a visit to Wabco's German test facility left him impressed with the capabilities of such systems. "In my opinion, all transport managers should see the system in action, as it clearly demonstrates how effective it is against vehicle rollover," advises Bulley. "However, the system is there to prevent rollovers and not to allow the driver to take corners at even higher speeds."

Another area that has seen stability improvements, courtesy of Edbro, has been in hydraulic tipping cylinders, especially when drivers encounter sticky loads – those that refuse to slide from the body once the tipper is raised. In many cases, the driver's reaction is to 'shunt' the load: that is, to drive the vehicle forward with the body fully raised and then brake suddenly to provide inertia to release the load. However, this process can cause a tipping cylinder to buckle, sometimes with disastrous results – potentially piercing the cab of the vehicle.

The second problem for tipping cylinders in these situations is that sticky loads can adhere to just one side of the trailer as the body is raised. The result is that the body tips to the load side, rapidly moving the centre of gravity outside the vehicle's centreline. This, in turn, can cause the vehicle to roll over and usually destroys the cylinders in the process.

Proper maintenance can help here. A contributory factor to sticky loads is the failure to regularly re-grease hinge points, both on the tipping cylinder and body. Many operators use power wash equipment that blasts under body areas of a trailer, in the process often removing grease from hinge points.

What can result from this approach is the hinge points on one side of the body becoming looser than those opposite, itself causing an imbalance. To avoid this problem, Edbro advises regularly greasing the brackets that fix the tipping cylinder and also checking them for any signs of excess wear. **TE**

Clockwise from left: The effects of vehicle rollover can prove costly; Knorr-Bremse's RSP technology; Keith's walking floor solution