Missing **link**

Although the advanced braking and electrical systems on today's articulated heavy vehicles are a huge step forward compared to previous technology, none of them can function without reliable 'suzie' connections between truck and trailer, reports Lucy Radley

There are many sources of information out there which talk about safe coupling and uncoupling of large goods vehicle trailers; a good place to start being IRTE's own code of practice (see also pp39-40). This covers the entire process, looking at potential safety issues as well as advising on ways of avoiding the more common mishaps. Some of these are particularly relevant to the connection of the service lines, and one of the biggest can occur before the driver even leaves the cab – forgetting to apply the tractor park brake, which can result in the vehicle rolling away when the air supply is attached.

Audible warnings have long been available to help with this, but the electronic parking brakes now offered by many manufacturers have taken things a step on again. Renault Trucks has offered its Anti-Runaway Automated Park Brake, which applies whenever the driver's door is opened at speeds below 3kph, since 2016, and it is no longer alone.

The new Mercedes-Benz Actros is equipped with a standard-fit electronic parking brake, according to product and sales technical manager Bob Gowans. He points out that the brake was originally engineered to automatically activate when the driver switches off the engine. But following customer feedback, a recent software update now means the parking brake is triggered as soon as the driver opens the door.

Catwalks are another black spot for potential accidents, particularly in the case of very close-coupled combinations. The IRTE code of practice talks about ensuring three points of contact when climbing up on the tractor chassis and precautions needed around split couplings. It also draws attention to innovations made by trailer companies in an attempt to reduce the need to do this at all. These mostly involve some kind of arm or rail which lowers the coupling plate within reach of the driver.

ALTERNATIVES

The first of these, released back in 1996, was the MAVIS rail – Montracon Articulated Vehicle Interconnection System. Other examples include Don-Bur's LowGlide Safe Ground Coupling System, the second generation of which has been improved to lower the height at which the suzies are connected (pictured above), and Lawrence David's Curved Ground Coupling. SDC also offers several sliding couplings (pictured, right), and points out an added advantage to using them. "As the truck turns 90° relative to the trailer, the coupling position on the trailer moves to the side, as opposed to the suzies stretching from the coupling point on the centre of the truck to the coupling point on the centre of the trailer," explains SDC's engineering manager Jimmy Dorrian. "This shortens the span the suzie has to reach, and therefore reduces the risk of it being over-stretched and broken."

Careful and regular inspection of suzies is a must. DVSA's Guide to Maintaining Roadworthiness (*www.is.gd/nofine*) lists air and electrical lines on its sample lists for both full safety inspections and drivers' walkaround checks. But operators must ensure they fit the right equipment in the first place. "When replacing any suzie, it's important to ensure the quality of the product, particularly with regard to where the plastic coil interfaces with the union," says John Comer, head of product management at Volvo Trucks. "It's definitely worth paying extra for quality – a cheap red line is a poor saving when you consider the cost, safety implications and inconvenience of blocking a road."

Roger Thorpe, engineering manager at trailer axle and suspension unit supplier BPW, takes up the theme. "We don't see many issues with air connections nowadays," he says. "But where we do, it is normally down to leaking at the ends where the unions

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attach, or crushing of the pipe itself, which can lead to a slow release of air, and can cause brake dragging and overheating."

Jim Crawley, homologation engineer at Haldex Brake Products, prefers to use recognised brands for supply of braking system parts. "For suzie coils, look for plastic pipe standards DIN74323 and DIN73388," he says. According to him, palm couplings should be tested to DIN1728, and C / CA couplings to BS AU 138b 2000. Air coils with plastic colour-coded tails satisfy DIN74323 safety parameters as tested by accreditation body TÜV. The coils have been tested to 10,000 articulations (ISO 7375) and the tube has been approved in accordance with DIN74324 (black) or DIN73378 (colour). Black plastic lines are usually trimmed with red or yellow as appropriate, though it shouldn't be possible to mis-connect these lines with UK C couplings, thanks to the differing connection types.

Crawley accepts, however, that many fleets don't have the time to check every part they buy has been made to the correct standard. "Haldex and its braking system competitors have teams of engineers around the world whose job is to audit suppliers; this ensures quality is maintained so type-approved parts still comply with the original requirements," he reminds us. "If you buy from the internet, just take care to buy from a recognised original equipment manufacturer or its authorised distributor."

There have been relatively few innovations where air lines are concerned, but one such example is the Bessie spannerless system developed by engineer Colin Morris. This involves the use of a lock to attach the lines to the tractor rather than any kind of tool being needed, enabling broken lines to be removed and replacements fitted by drivers out on the road using simply a key. This is important from a legal perspective – simply having C couplings on both ends would not be permissible. The system won the Motor Transport Innovation Award in 2012, and has since been adopted by several major operators, including Nagel Langdon, Culina Logistics and Bibby Distribution.

ELECTRICAL LINES

Last but by no means least come the electrical lines: 24N which powers the 'normal' lighting system, 24S for additional equipment such as reversing lights, battery charging and a common ground, and – of particular importance – the seven-pin ISO7638 lead. This last carries the ABS, the electronic stability program (ESP) and advanced emergency brake (AEB), and it is a legal requirement that it is connected at all times. Connection failures can cause overbraking, as the EBS system goes into emergency braking mode.

Because it is both mandatory and safety-critical that the ISO7638 line is connected, failure to do so will usually cause an ABS/EBS fault to show on the dashboard of the tractor unit. There are also ABS warning lamps fitted to the vast majority of trailer headboards. They will show one of three sequences: ON/OFF with the vehicle at a standstill; ON until the vehicle is driven over 7kph; or ON/OFF/ON, then remaining on until the vehicle is driven over 7kph.

In addition to the above, there is now additional equipment on the market to alert drivers to a problem, a good example of which is Don-Bur's EBS-Safe. This consists of both a larger-than-standard EBS warning lamp and, perhaps more importantly, a 90dB siren which sounds if the ISO7638 line is not connected. One scenario where this could be particularly useful is when the driver has accidentally connected the wrong end of the lead to the trailer, so the tractor end is actually left sitting in its dummy holder. At first glance, all looks present and correct, but in fact the system won't function at all.

In summary, where suzies of all kinds are concerned: if in doubt, check. TE