

Combination lock

Couplings for drawbars and semi-trailers tend to be out of sight and out of mind. Robin Dickeson reviews these lowly devices and suggests that new technology is set to improve safety and operations

It's a full year since *Transport Engineer* highlighted what some see as safety lapses with both drawbar and fifth wheel couplings (January 2013, page 23). Problems identified included inadequate inspection and maintenance by operators, workshops and, perhaps most worryingly, even VOSA (the Vehicle and Operator Services Agency) itself.

Drawbar couplings manufacturer VBG first flagged worries five years ago and it seems that custom and practice have changed little since. However, there are signs that technology is now intervening and ready to dramatically reduce the risks around both drawbar and fifth wheel couplings.

Looking at the former, VBG already offers its MFC (multi-function coupling) to enable trailer connection and confirmation by the driver directly from the cab – including air, electrics and, in the future, also hydraulics. Its system employs remote sensors around the coupling connected to dash-mounted driver controls that manage picking up and dropping drawbar trailers. Howard Ostle, UK sales manager for VBG, points out that this brings both safety and efficiency benefits. Not only are accidental damage and personal injury claims likely to be reduced, but so are turnaround times.

Safety systems

Connecting a semi-trailer is mostly still somewhat different. Notwithstanding ground-level trailer coupling developments – by Don-Bur and Lafarge, for example (and the back-of-cab camera system by the latter, working with Brigade Electronics) – for the vast majority it's still a matter of scrabbling around the mucky bits of tractor and trailer. On promotional videos it all looks fine, but on a wet, windy winter's night, the reality of fighting air and electric lines is often uncomfortably different – and potentially unsafe.

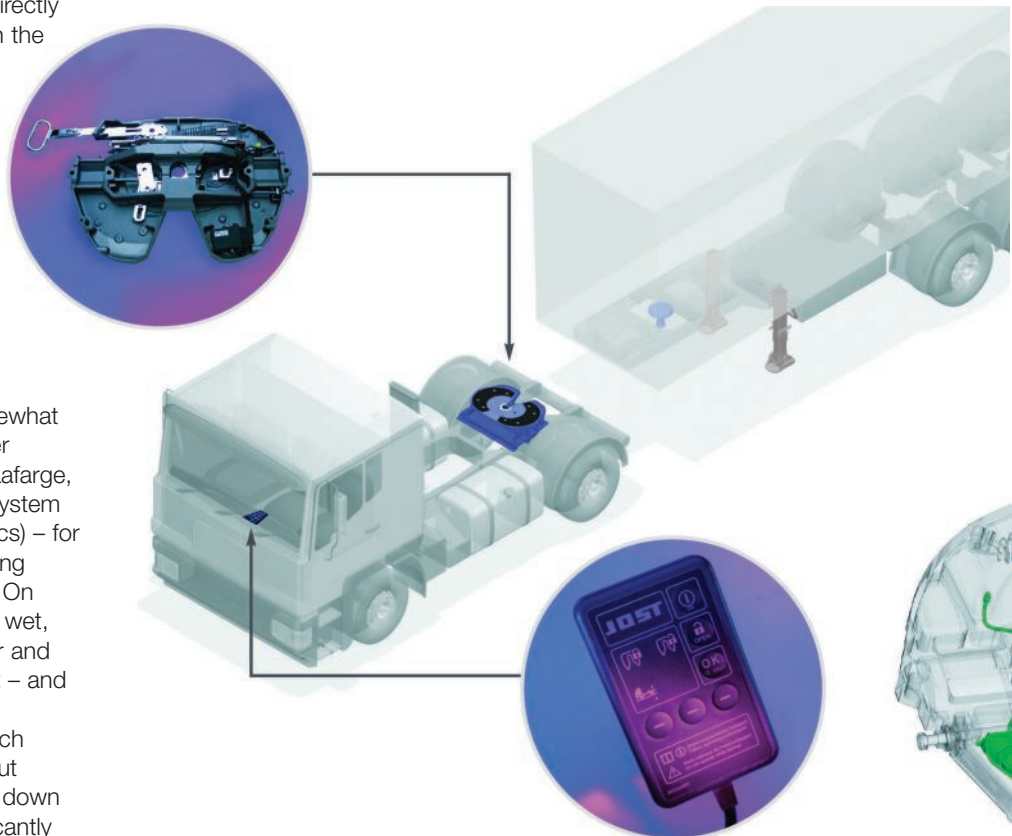
Hence these articulating Suzie arms, which rotate vertically or horizontally, with or without power assistance, to bring the connections down to the side. Users state that safety is significantly

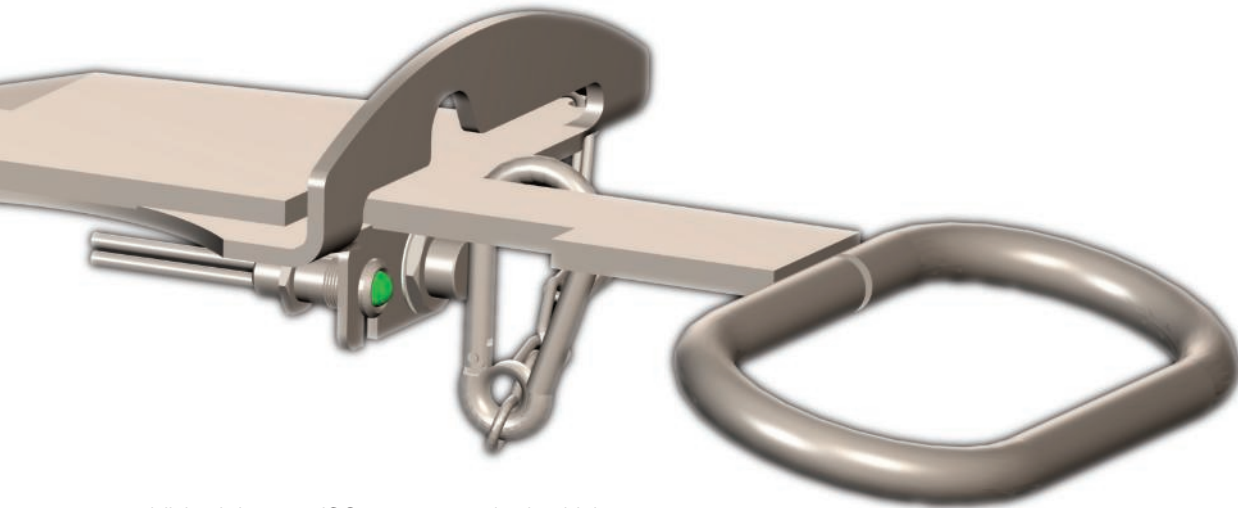
improved and that, while there is a cost to the additional fitment, for most the financial saving – in terms of tractor catwalks and ladders, payload and maintenance – is a strong net positive.

Beyond these, low- or no-lube fifth wheel plates cut or even eliminate the grease that seems to be everywhere except where you want it. And fifth wheel makers have also now added correct closure sensors and warning lights. These safety systems tap into the tractor unit's electronics to confirm that the trailer is properly connected or warn if something is amiss. The only snag: operators need to specify such goodies and most don't.

All that may change, however, with the culmination of years of work behind the scenes. The International Standards Organisation recently

Clockwise from top: Fontaine's green LED safety clip sensor; VBG's MFC drawbar coupling system; Jost's fifth wheel Lubtronic equipment; and Jost's in-cab KKS automated coupling system, due for launch soon






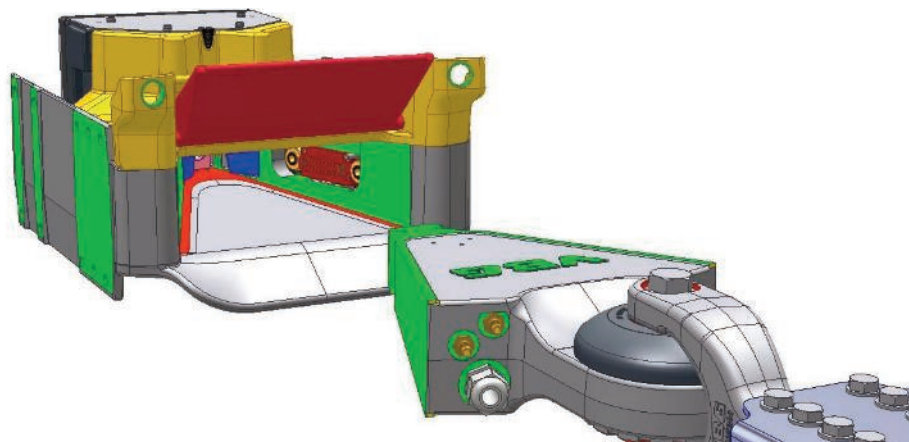
published the new ISO 13044 standard, which covers a fully automated fifth wheel coupling system for articulated vehicles, with integrated electrical and pneumatic connections. That will give added impetus to developers already conscious of the potentially serious advantages – and not just in terms of safety – in the increasingly competitive road transport industry.

Automatic coupling

And it's happening. Jost's website shows video clips of the firm's KKS (Komfort Kupplungs System) automated coupling system working on a five-axle, 40-tonne artic. These demonstrate that a driver can pick up or drop a semi-trailer without leaving the cab for anything more taxing than dealing with the chocks on a trailer's rear axle. Word is that the firm may launch the system at the Hannover IIA 2014 commercial vehicle show this autumn.

Next up will be coupling sensor arrays that also pick up wear on kingpin, damaged jaws and locking mechanisms – delivering status reports and helping operators to keep safely on top of the job. While the first question may be around price, if such systems live up to their promises, the second may be can you afford not to use them.

Automatic coupling was a game changer in 1934 (see panel) and it could be again. At the same time, automation may give these Cinderella components a chance to come out of the shadows. 



Historical perspective

We've towed trailers for years and hitching a normal trailer to its wagon used to be simple – using just a drawbar, towing eye and pin. Then came semi-trailers, with one end resting on the back of the wagon, and coupling became more complicated, leading over time to the precursor of today's fifth wheel.

For the UK, Scammell set a milestone in 1922, with its articulated six-wheeler. The six-wheel rig had much lower axle weights than a comparable rigid. That mattered: the traffic regulations of the time meant the higher the axle weight, the lower the speed limit. As early Scammell publicity boasted, with its new artic a haulier could carry '7.5 tons at 3 tonne speed and cost'. Artics had arrived and semi-trailer usage started to grow – to the point where, now, semi-trailers represent 80% of all European trailer registrations.

Fifth wheels, as we know them, arrived in the 1930s. In 1934, Scammell launched its Mechanical Horse, a three-wheeled tractor unit offering automatic coupling to a matched single-axle semi-trailer. The tractor's front wheel could steer through 360 degrees, turning the little artic virtually in its own length. More importantly, the coupling gear allowed a driver to reverse the rear of the tractor unit under the front of a semi-trailer, then couple and release the trailer brake, before driving off safely.

For an urban delivery vehicle, manoeuvrability and automatic coupling were huge advantages and the Mechanical Horse, its trailers and coupling system sold in record numbers. In the late 1960s, UK Construction and Use legislation killed the Mechanical Horse's three-wheeled successors, the Scarab and Townsman. The front wheel had no brakes and Scammell failed to find an efficient solution.

But the automatic coupling system was a more lasting success and the firm sold kits to several other truck makers. They fitted them to a wide range of light, two-axle tractors around the world and many were in regular use until the 1970s. Although Scammell tried and failed to develop a heavy-duty automatic coupling in the 1950s, its earlier development set standards of convenience and safety that we look likely to see again in the not too distant future.

