

TURNING AWAY

Today, the steering wheel may not be the best way to deliver a load to its destination. Alternative steering arrangements can help out in certain cases, reports Steve Banner

Slowly manoeuvring a long heavy haulage trailer burdened with an indivisible load – a huge air-conditioner destined for the top of an office block, for example – through congested city streets is always challenging. It is likely to be less testing, however, if the trailer is equipped with axles which can be steered remotely by a second individual working in concert with the truck's driver. Having such a possibility makes it easier to nurse the combination around tight turns at low speeds, and lessens the risk that both it and its cargo will come to grief.

Linked to the trailer by wireless or cable, Tridec's Tritonic management system can take charge of its steerable axles remotely by means of a hand-held control box.

"The steering is usually hydraulic, so it's a case of using the remote to add more oil to the hydraulic unit, or reduce it," explains Tridec technical sales director, Carlo Dobbelaar. "It controls the valve and pump electronically. The remote can be used to operate as many as seven axles at a time," he continues. "If pendular axles are fitted, then they can be turned through up to 70° depending on the amount of space available to them."

Tritonic realigns the axles automatically with the tractor unit's own axles, once there is no further need to steer them.

Any system installed should comply with ECE R-79, Dobbelaar adds, the European regulation which governs the principles for steering technology approval.

Why bother with a cable? "Because there are locations such as airfields where radio controls cannot be used," says Clive Jones, sales director of UK agent Andover Trailers. And attaching the cable automatically disables the radio signal, says Dobbelaar.

Not all operators require the axles to turn as far as 70°, and not all of the steerable axles are compelled to move through the same angle.

Observes Jones: "If you have a four-axle low-loader for example, then the front axle might be fixed, the next might turn through 10°, the next through 14° and the next through 18°." Alternatively, all four might be steerable: it all depends on what the customer requires.

The axles themselves are typically sourced from SAF, BPW or Gigant.

Tridec's remote package is the most popular one in his experience; and Dobbelaar makes the point that it can do

a lot more than steer. Other potential functions include the ability to raise and lower the trailer's loading ramps, suspension and landing legs.

Installing Tritonic does not result in any extra maintenance requirements, says Dobbelaar. Training in its use is available, but heavy haulage specialists rarely take it, he says, because their employees are invariably already familiar with remote steering.

Says Jones: "Bear in mind that businesses like these are often capable of building up trailers from different modules depending on the specific job they are tackling." One or more of these modules may be steerable.

YARD SHUNTING

Over seven years ago, ZF unveiled a concept driverless tractor unit married to a tri-axle semi-trailer coupled to a tandem-axle trailer that could be steered around a yard remotely by somebody using a tablet computer.

The 25.25m ZF Innovation Truck combination employed a TraXon Hybrid automatic transmission with a 120kW/1,000Nm electric motor integrated into the bell housing. Also installed was a Servotwin superimposed steering system with an electric



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Clive Jones



motor as well as a hydraulic pump. An Openmatics telematics package was fitted along with BLE - Bluetooth Low-Energy - tags with a range of around 25m. They linked the tablet with an onboard control package.

Since then, the technology employed has evolved in a number of areas. Improvements include the development of ZF's Automated Coupling Assist (pictured above left), with the aim of making trailer collection quicker and safer. When a tractor unit enters a haulage yard, the driver keys the reference number of the semi-trailer he or she is looking for into a tablet mounted in the cab. A camera mounted on the rear of the cab starts to look for it. When the semi-trailer is located, a signal is sent to the driver who initiates the automatic coupling process.

The truck steers itself up to the semi-trailer concerned without any input from the individual behind the wheel, couples up to it, lifts the landing legs and releases the trailer parking brake. The driver takes command again and the unit and trailer can be driven away.

Before this can happen, all of those semi-trailers have to be manoeuvred into their parking

slots. For that, ZF has demonstrated an autonomous yard tractor.

UK manufacturer Bradshaw is now marketing an electric depot shunter which is steered remotely by a pedestrian with a Magnetek MLTX2 bellybox wireless transmitter using left/right paddles. Capable of towing semi-trailers grossing at up to 25 tonnes, and powered by 80V, 210Ah lead-acid batteries, the PT2500 (pictured below) has a Jost fifth-wheel coupling with a lift capacity of up to 6,000kg. An onboard compressor operates the trailer brakes via the trailer's air lines.

Bradshaw Electric Vehicles has been marketing industrial tractors capable of hauling semi-trailers for some 20 years, explains marketing manager, Ramsy Labassi. "Initially we built them for trailer manufacturers who wanted something that could tow chassis around their



factories," he says. "Then the distribution companies wanted something that could pull a fully laden trailer, so we developed our product accordingly."

Devising a tractor which could be steered remotely was the next evolutionary step. "We've built one and we're demonstrating it now," Labassi says. Zero-emission and running silently, PT2500 can be reversed, go up and down inclines, and execute hill starts. "It can tackle some really tight turns, which makes it especially useful if you're operating out of a small yard," he says. PT2500's driven rear axle is equipped with a limited-slip differential.

That plus its environmental credentials give it a distinct advantage over the sort of yard shunter employed by many family-owned hauliers on a tight budget, typically an elderly Euro II or Euro III tractor unit that has long been retired from frontline work.

The remote has a range of around 25m. "We'll probably shorten that to closer to 10m on safety grounds," Labassi remarks. If the trailer is too far away then there is always the risk that the operator will accidentally steer it into an unseen obstacle. PT2500's speed can be pre-set to a maximum 6kph.

Fitted with regenerative braking to help extend its range between recharges, PT2500 costs just under £55,000; more if you specify lithium-ion rather than lead-acid batteries. "You can typically get from three to seven days' work out of the latter before they need recharging," he says. Their level of charge should drop to approximately 10% before they are plugged in, he adds, and they have to be topped up with electrolyte, too.

"Look after them and they should last for from five to eight years," says Labassi. P2500 operators can be trained in a day. "And they don't have to be truck drivers." 