



BOXING CLEVER

Getting trailer specifications right is about focusing on the operation. But optimising them for efficiency and lifecycle costs requires a fresh look at technology, says Brian Tinham

Anyone having more than a passing familiarity with semi-trailers knows that specifying the right vehicle for the job starts with understanding what it's for. New technologies might play a part in the final choice, but they're virtually never among upfront considerations, no matter how apparently compelling. Quite simply, to experienced eyes, the detail of the haulage operation dictates so much about what will work and what won't.

The danger, however, is that taking this approach can miss novel solutions. So there's much to be said for standing on the shoulders of metaphorical giants such as TIP Trailer Services, which trades on its ability to get trailers right for customers – technically, operationally and financially. Yes, it's a rental firm, so

unlikely to push the boundaries, but – with a fleet of 8,000, plus 7,000 more under maintenance support – there are valuable lessons in its processes.

European marketing director Karl Davies states that getting trailers right is about adding experience to constantly refreshed market knowledge, in its case backed by an engineering database covering fleets past and present. That's why, he says, TIP is ready to take advantage of engineering innovations capable of impacting operations and cutting costs.

"It's not just about having trailers on our fleet that are all things to all men," explains Davies. "For example, we recently delivered a large number of box vans to a blue chip on a rental contract with a specification based on what they needed to service their customer. They were going to be heavy on floor usage, so, drawing on our market relationships, we were quickly able to engineer appropriate trailers and put together the warranties, etc."

What does he value most? Davies is coy about specifics, but confirms that aerodynamics have



Distribution specialist Canute says it has solved access problems at loading bays by specifying Tridec steering systems on 13.7m semi-trailers. "I've worked in the industry for a long time, but I've never seen a trailer configured in this way," comments Glenn Marshall, engineering director. "We have found that it gives a 45ft trailer a turning circle similar to that of a 30ft trailer."



Transport operator TJ Hammond has taken delivery of a 13.6m, multiple-access box van. The Ekeri semi-trailer features a sophisticated door system, with central locking, allowing the load bed to be accessed along the length of the trailer on both sides and through the rear barn doors.

proven fuel-saving advances in recent years – although the premiums charged by suppliers mean that box van and curtainsider rental customers “are not banging on the door for them”. That said, he likes corner cappings and curved profile reefer front ends, designed to smooth the airflow over the roof. And TIP’s latest £19 million 900-trailer order includes some teardrop style trailers, too.

Electronics intervention

Beyond that, he points to telematics – in TIP’s case the Traileromatics system developed under its joint venture with Novacom Europe. “We’re fitting the hardware at the OE stage and switching it on as required by customers.” And he notes that full EBS (electronic braking systems) is also now standard fare. “In the UK, we specify Haldex. But this year we’re taking some from Wabco. In Europe, we also use Knorr-Bremse. Some of the new functions on all these systems have fantastic potential, but, for rental, the numbers have to make sense.”

Back on aerodynamics, one company working on its offerings is Cartwright. Its latest Fastback came out of research with Manchester Metropolitan University and a Knowledge Transfer Partnership project. Cartwright R&D manager Andrew Bukowski says the goal was to develop trailers capable of

delivering the best results most consistently.

“Almost all aerodynamic modifications provide a benefit in all conditions – but some more than others,” states Bukowski. “So finding the right combination was the issue, and then tailoring that for specific operators. For example, side skirts offer much greater benefits in cross winds than head winds, so operators running predominantly north-south are likely to see greater benefits than those travelling east-west.”

That’s why Fastback (which builds on Cartwright’s earlier Cheetah) has full side skirts, a curved bulkhead and curved cant rail, but a roofline that slopes only at the rear. “The design has a sloped chassis to retain the rear aperture, but the point is it doesn’t raise the side profile and risk reduced benefits in side-wind conditions.”

Bukowski reckons the package can deliver 12% fuel saving. That may sound low, but savings from individual interventions are rarely additive. He also warns that fuel savings can be undone simply by running mismatched tractor cabs. “Even a 20mm mismatch can see 3% wiped off. And a cab matched for a 4.2 metre trailer swapped to a 4.88 metre flat-front double-deck can result in a 25% fuel penalty.”

Looking to the future, he points to the introduction of boat tails as the next big aerodynamic intervention. For him, though, there are two issues. One concerns the current maximum dimension of 500mm on the trailer rear, which limits the benefit. The other is just how quickly European freight firms will be able to implement them, given the difficulties – particularly with depot infrastructure and staff training – experienced to date in the US.

“The larger the boat tail, the larger the fuel savings, but also the greater the risks, in terms of accidents and maintenance,” he observes. So draft legislation, due late 2014 (modified Directive 96 53 EC), allowing longer fins, could present a double-edged sword. “The legislation will control designs to make them as safe as possible, but boat tails will have to be operated correctly, folded back at dock doors, etc. It will be interesting to see how UK operators get on.”

That said, Bukowski claims that Cartwright is ready, having done its homework and developed optimal angles, positioning and materials.

Wabco sales manager Andy Chapman says his company is similarly prepared. “We’re close to launching a collapsible tail fin,” he says, indicating that availability will be early in 2015, although not for curtainsiders. However, he agrees that, for now, side wings offer the biggest bang for operators’ bucks –



Andover stepframe trailers are feats of engineering, which debunk the myth that all trailers are the same

pointing to the firm's OptiFlow system, developed following Wabco's acquisition of Dutch Ephicas. He concedes that they're not for everyone, suggesting that box vans, refrigerated vehicles and some curtainsiders are most likely to benefit – although the concern for the latter is damage caused by forklifts. "They are ideal for one-, two- and three-axle semi-trailers and rear steers, as long as the operation involves at least 60% motorway or highway driving at 70kph. We've seen 1.6 litres fuel saving per 100km."

The devil, however, is in the detail. Chapman suggests operators avoid wraparound rear skirts, which can cause drag, but also highlights OptiFlow's flow conductor on the inside leading edge – claimed to improve airflow down the trailer underside. "We also believe in enclosing the wheels. Ephicas' wind tunnel tests proved the benefit, compared to open wheels. And there are no issues, in terms of maintenance and drivers' walkaround checks – the flaps simply lift up and off."

That leads us neatly on to running gear. And, while there have been few mechanical advances – aside from CVDC's (Cambridge Vehicle Dynamics Consortium) fast braking valve – electronics are now the big news. Wabco is a case in point, with its latest EBS options enabling better manoeuvring, fuel savings, axle overload prevention, brake safety interlocks and even safer tipping.

Chapman cites the EBS's ability to lift trailer axles, where fitted. "The system can lift and drop them automatically, according to load, both to save fuel and to reduce the wheelbase for manoeuvres. And it can assist with traction by lifting axles to temporarily impose more load on the kingpin. But, just as

importantly, where lifting axles aren't fitted, our EBS can dump air out of the rear axle suspension, which again reduces the turning circle and saves on scrub."

The latter is impressive: you get some of the functionality of a steered axle, without the cost, weight or maintenance. Chapman explains that it's controlled automatically – triggering on tight corners by sensing wheel speed delta side to side.

As for the rest, axle overloading can be prevented by pressure sensor inputs to EBS. "Morrisons has about 50 trailers with that system and Schmitz Cargobull is now offering it," says Chapman. And he points to Wabco's OptiLoad, which extends the functionality to deal with multi-drop trailer overloads (more common in Europe, which favours 4x2 tractors) by again controlling axle airbag pressures.

And it's a similar story with: rear steer on-off control (with EBS using speed data to enable-disable accordingly); safety interlocks (for example, applying foundation brakes when tanker pump locker doors are open); and tipping trailer safety management (EBS warns the driver and/or disables tipper gear, using inclinometer data from its roll stability program).

Improving safety, cutting costs

Incidentally, Wabco also offers TrailerGuard and TailGuard. The former provides remote telematics on brake pad wear, tyre pressures, coupling integrity, door sensor and EBS itself. TailGuard is about sensing objects behind the trailer during reversing. TrailerGuard is being used by Turners of Soham, while among big users of TailGuard is Martin Brower, which handles transport for McDonalds. "TailGuard has been specified on all their [Montracon and Grey & Adams] trailers for the last two years," he confirms.

We've covered a lot of ground, but before closing spare a thought for some additional safety measures, light-weighting opportunities and choices that can cut costs. For the first, it's interesting to note Sainsbury's latest developments (initially on rigid), in terms of roof-mounted, 360-degree birds' eye view camera systems, ultrasonic side sensors and puddle lights. It's all about protecting vulnerable road users – and trailers go into urban and city environments, too.

On light-weighting, the focus has largely moved beyond running gear and trailer chassis. So it's worth revisiting trailer body constructions. Andy Richardson, engineering director at Lawrence David, advises that plastic and sandwich panels, with solid, foam or honeycomb cores, have moved on from the old days. Durability is good; they don't saturate over time; and there's a capacity as well as weight improvement. "They may cost more, but they also last longer and look better," he asserts.

And finally, just remember tyres. Richardson suggests low rolling resistance for fuel saving, but also mini-singles for low deck height applications. "You get more stability and better wear – almost double the life of conventional twins." TE



Owner-driver Kevin Brown is running an S.KO Cool FP45 reefer, the third new trailer he has acquired from Schmitz Cargobull