

# Body pump

The trend towards aerodynamic truck and trailer body designs has been evident for a number of years, but what are the benefits for fleets and what else does the future hold? Keith Read investigates

Over the years, trucks and vans have changed shape to meet a variety of requirements, ranging from purely aesthetic to legislative. Add to this the moves towards aerodynamically efficient and lighter vehicles that reduce fuel consumption and emissions, and the task of bodybuilders needing to maintain practicality and functionality has become increasingly challenging.

Look, for example, at some of Bevan Group's vehicles. Compared to the rectangular and sharp-edged shapes hitherto associated with commercial vehicle bodies, this body builder's trend-setting designs look curved and contemporary. Typically, you see curved roof profiles, tapering body sides and rear air diffusers for aerodynamics, as well as specially moulded air deflectors and cab collars to deal with cross winds.

"The styling of modern vehicles made us look at the design of aerodynamic aids to get the airflow over and around the body," explains Simon Lake, business development manager. But its designs don't compromise cargo capacity, he insists. And, by using lighter materials, weights have been reduced to improve fuel economy further and reduce carbon footprints.

One of the new-generation materials used by Bevan is made from recycled hay bale wrappers, while traditional plywood panels have been superseded by polypropylene. As a result, weight is down, but construction techniques have also changed, with welding and bonding of plastics replacing the mechanical fixings associated with earlier timber bodywork.

Among those operations opting for the Bevan21 are Argos and Halfords, with the former taking



delivery of the first Bevan21 built. David Rose, general manager for home delivery for Argos, says: "Despite the fact that ours is a multi-drop operation, the Bevan21 is producing average fuel cost savings of around 4.5%, compared to our standard box bodies. This was beyond our expectations."

## Computer-aided designs

As for the details of its rigid and trailer body curves, Bevan is increasingly using CFD (computational fluid dynamics) to optimise aerodynamics, although Lake says the company still continues to video smoke trails over scale models in wind tunnels to visualise the effects. The company also works closely with Hatcher Components, one of Europe's leading producers of air management kits for vehicles. Hatcher, in turn, works with Cranfield University to optimise profiles for its commercial vehicle kits, which cover everything from LCVs to the biggest HGVs.

The Freddie (Fuel REDucing DevicE) for Mercedes' Axor trucks, for example, is a result of CFD and aerodynamic testing under a joint Hatcher-Cranfield-Mercedes project. According to Hatcher, Freddie can improve fuel consumption by 6% over standard, factory-fitted equipment and by 11% over an Axor without any deflector.

Freddie comprises a fixed spoiler, forward-opening side collars and cab sides. Nick Blake, truck marketing and sales engineering manager for Mercedes-Benz Commercial Vehicles, is delighted



## A Super idea?

Supertrucks – which specialises in bodies for the glass and window trades – has come up with a design based on Citroen's Relay 35 HDi 120 cab unit for low-weight and high-volume operators.

The Space Van is designed for walk-in loading with a load deck height of 550mm and a step height of just 370mm. And with the option of Citroen's rear air suspension, these can be further reduced to 370mm and 190mm respectively.

According to Peter Wright, chairman of the St Helens-based company, a combination of the bespoke alloy and steel drop frame, and wide track rear chassis, offers the additional benefit of stability, as well as a 20.4m<sup>3</sup> cargo load volume and up to 1,300kg carrying capacity.



at MIRA also show it to be fractionally more fuel efficient than a standard identical trailer.

As for other improvements, this bodywork specialist also owns Somers Refrigeration, which has produced a patented refrigeration unit for LCVs that takes ram air from the vehicle windscreen to create a low-pressure area above the condenser, thereby sucking extra air through. This, claims the firm, increases fridge efficiency by 15% – meaning a smaller unit can do the same job, which, in turn, reduces load on the vehicle engine, saves weight and improves fuel economy.

Although compliance with European ATP (Agreement for the Transportation of Perishable goods) regulations for refrigerated vehicles is not necessary for the UK domestic market, Paneltex undertakes ATP testing to demonstrate the levels of thermal insulation achieved in its conversions. According to Berridge, attention to detail is the key to achieving high values, as well as using high-density insulation materials in all cavities. And although the construction of one-piece, vacuum-bonded composite panels hasn't changed much, Paneltex has used new-technology resins and glass-reinforcing systems to cut weight and also enhance impact resistance.

"We're having to drive weight out all the time, just to stand still," comments Berridge. "There is even a danger that 3.5-tonne [refrigerated] vehicles could become impractical, simply because you won't be able to get enough [payload] in. We've done a lot to reduce weight and we've still got some more up our sleeves – but it all comes at a price. Fancy materials aren't cheap."

The point is that, with additional equipment under the bonnet to make engines cleaner, and more driver aids and comfort features all adding weight to vehicles, many bodybuilders find that, even after taking weight out of their components, the van's weight stands still. However, by avoiding fitment of heavy equipment – such as tail lifts – reduced bodywork weight can still be restored at this lower gvw range. **TE**

with the outcome: "In any operation, this sort of saving quickly adds up to a real commercial benefit. And for big, high-mileage fleets, it could be a very large figure."

For Chris Berridge, managing director of Hull-based insulated vehicle and container specialist Paneltex, getting more into a truck has always seemed the best way of improving efficiency and reducing carbon footprint.

"At the trailer end of the spectrum, we've got double-deckers, which we build at very nearly 5m high, and we've got very low-floor trailers, with low profile tyres on special axles," he says. "These allow us to increase the internal height. What we've found is that, although you might make the vehicle slightly less fuel efficient, if you get 50% more cargo in then it's far more efficient overall."

Paneltex has also collaborated with a vehicle lift mechanism manufacturer on a trailer, producing an unusual design that runs at 4m high and uses the well space between the landing legs and the rear bogie to carry an additional eight pallets. These can be lowered into the well space on a pneumatic platform. The result is a trailer capable of carrying 34 pallets, instead of 26, giving rise to the name SOMI, standing for 'Same Outside More Inside'.

"We worked on the bodywork and running gear, moving the bogie back and adding steering gear, as well as developing a monocoque, chassis-less body construction for them to put their lifts in," explains Berridge. "And, because the trailer is not over 4m high, it can go anywhere in Europe." Tests