

THE SPACE RACE

DAF was the first vehicle manufacturer to reveal new cab designs based on the EU's updated regulations that allow longer lengths for improved aerodynamics. John Challen looks at the development process and explains why the changes are evolutionary, rather than revolutionary

Discussions over the length and height of tractor units and trailers have been ongoing for many years. Vehicle manufacturers have always had the freedom to tinker within the parameters they've been given – the main priority being maximising fuel efficiency. But restrictions have prevented any radical redesigns to the front end or possible inclusion of a 'nose' on the currently flat front.

The latest round of discussions can be traced back nearly a decade when the EU came up with new rules enabling safer truck design, and the subsequent legislation was agreed in 2014. Back then, permission for the development of longer cabs was granted, but only from 2022. Fast forward to 2019 and an earlier introduction date of September 2020 was signed off by the EU, paving the way for the redesigns to move into production.

Despite the UK leaving the EU during this period, independence isn't expected to be an issue. Cab length proposals are due to go before parliament in October and there is currently a live consultation about the plans. However, the DfT has written to the DVSA to advise not to take any action against manufacturers of vehicles built to the new specifications.

DAF Trucks was first to play its hand in the new cab game as it revealed an updated XF and also introduced a new range-topping model – the XG (and

XG+), pictured above. DAF aligned its own priorities for the project with the EU: reduce fuel consumption; improve air quality and increase road safety efforts for vulnerable road users. A more favourable operating environment for drivers was also a key consideration.

"The degree of freedom allows manufacturers to look at improvements in aerodynamics and safety, one measure being the Direct Vision Standard," explains Phil Moon, marketing manager at DAF Trucks. "It has allowed us to move the old XF from a zero-star rating to well into the three-star range, for example."

Moon explains that updating the cab length involved looking at two different areas. "Firstly, we looked at the section ahead of the front axle. All of our New Generation trucks are 160mm longer, which not only boosts aerodynamics, but also helps create more space to allow more adjustments of the seats and the steering column.

"On the longest vehicles, there is an additional 330mm at the rear of the

cab, meaning a total of 490mm of extra space," he said. "Those dimensions still allow the same turning corridor and manoeuvrability as before."

DESIGN SHIFT

Many experts were predicting that the new legislation would bring an end to the 'brick-shaped' front end that were uniform across the vast majority of European trucks. Longer noses, some suggested, would lead to better overall vision for drivers. DAF did explore them, but the results threw up some interesting results. "Our design engineers wanted to find the ideal aerodynamic shape for the truck," recalls Moon. "There are still constraints in width and height but also the need to carry spare wheels and to incorporate the best window layout.

"There is a school of thought that a bullet-train design is the most aerodynamic, but there is more to it than that," says Moon. "Those shapes are more important for higher-speed vehicles – such as those trains or fighter jets – because the air needs to move





around the vehicle, not pass through it. What we found is that we could get a lot of those benefits by working on the corner elements."

One of the most important factors was to ensure that the corners were all perfectly aligned with the sides of the truck. A smooth transition between the cab and the windscreen was essential, so the screen in the New Generation cabs goes around the corner, enabling the air to flow smoothly from the front and down the side. It's a concept that DAF has also integrated with the roof design, as the windscreen is also slightly curved at the top.

"Those rounded edges are not a continuous radius - they are actually elliptical, so the radius changes as you go from the centre of the vehicle to the outside," says Moon. "The front of the vehicle isn't flat either; from the centre it's a continuous curve outwards."

DAF engineers calculated that by adopting the 'elongated nose' aerodynamic design, drag could be reduced by 20% over the current XF.



However, they also realised that the eventual production design, as described above, delivers pretty much the same savings (with a marginal compromise).

The benefit being it would avoid the penalties of a more 'awkward-looking vehicle', as Moon describes it. "For example, it would have a protruding nose, which would mean vision restrictions for the driver at junctions because they would be placed further back away from the front," he reasons. "The driver would be sitting too far back to see left and right." And there were other disadvantages in terms of weight and manoeuvrability. Following all the CAD work, the DAF team created prototypes (pictured, p34). "The end product looks quite angular, but it isn't," says Moon. "There are a lot of progressive curves and, when the sides are aligned, the air speeds up in such a way that there is negative pressure, which helps to counter-balance the resistance on the front."

THE CHASING PACK

The DAF announcement was quickly followed by a whole host of others from various manufacturers. June also saw Mercedes-Benz introduce the Actros L - the 'largest and most luxurious production model in the series', according to the OEM. While the emphasis was predominantly on driver comfort, the Actros L (pictured



far left, p34) also features numerous technologies to improve safety. Examples include high-intensity LED headlamps, second-generation Active Drive Assist and Active Brake Assist 5.

Meanwhile, MAN, which only updated its truck range in 2020, has made further changes in light of the new legalisation. It has adopted a camera-based mirror replacement system (as first seen on the Mercedes-Benz Actros), a technology that is claiming to help save up to a further 3.7% in fuel.

In July, Renault Trucks released images and more information about upgrades to its T, C and K model ranges (pictured, near left). Again, driver comfort was a priority, with larger storage areas and dedicated spaces for smartphones and tablets (with integrated USB ports). Lighting systems have also been upgraded, with more LED technology to improve safety and also reduce the height of the headlamp unit, in order to - in Renault's words - 'fit more features into a smaller area'.

Renault said that it had been working on the redesign since 2018, with close cooperation with customers and the dealer network to ensure the optimum improvements were made to the trucks. 