

Launching its latest generation heavy-haulage trucks, Mercedes-Benz opened the doors on its hand-build operation. Ian Norwell reports from both sides of the French-German border

HEAVY HANDED



Mercedes-Benz's truck factory in Karlsruhe, south-west Germany, produces more than 100,000 trucks a year, and the proportion of those that requires modification is steadily growing. According to the company, that's partly because customer demands are becoming more diverse, but it's also the result of an increasing ability to tailor chassis.

Making a standard truck fit the job with a few compromises may once have been acceptable. But the heavy haulage fraternity has always needed its own special types. So construction of the Actros SLT (Schwer Last Transport) super-heavy haulers was initially contracted out in 1996 when Actros MP1 arrived. It was too specialised to be built on-line, and the volumes were also too low.

So, with the niche too important to miss, independent heavy industrial vehicles specialist Titan was appointed to build for Mercedes under licence, and has done so since – until now. The arrival of Euro 6 marks the point where SLT comes home to a Mercedes factory.

"Titan has done a great job for us. They developed

the heavy haulage version of our tractor product extremely well," comments Ulrich Bastert, head of truck sales for Europe and Latin America at Mercedes-Benz. "But we've always said that, as our custom tailored trucks operation in Molsheim developed, the SLT would come back to us... Titan inevitably used a lot of non-Mercedes parts, which was all fine, but our custom process can now do it more efficiently and exploit our own parts basket."

Hand crafted

Niche markets are expensive to service. But to ignore them is unwise – and increasing specialisation of truck manufacture makes this progressively truer. So in 2000, Mercedes set up its Custom Tailored Trucks (CTT) operation in Molsheim, Alsace, 100km from the Wörth factory and over the border in eastern France. It's here that all those niches are drawn together to form an operation that genuinely hand builds.

The decision as to whether a truck will be completed on the conventional (highly automated and robotic) assembly lines of Wörth, or have its base unit shipped to CTT, at Molsheim, is a fiscal balancing act for production engineers. The creep of specialisation



now means that 20% of Wörth's production is modified in some way – and that's outside the myriad possibilities of specification sheet variants. But, if the modification work involved exceeds a threshold of 15 hours, a truck will get a ticket to CTT. So, of that 20%, 12,000 chassis modifications are accommodated on the line in Wörth, while 8,000 take the trip to Molsheim.

Walking into CTT feels like stepping back in time to an era of craft construction. There is currently no formal production line, with temporary lines being set up when volumes justify them. If a model sees volumes climb further, it loses niche status and Wörth takes over, with CTT staff supervising its integration into line operations. It's a well-oiled machine and the variety it can cope with is impressive.

Seven hundred staff and 500,000 square metres makes CTT a substantial operation, and it forms part of a production engineering system that includes the Aksaray plant in Turkey, as well as the main event in Wörth. Standing in one production area, I see modifications underway on trucks destined for China, Korea, Australia, Holland and Hong Kong. "The extraordinary is our everyday business," remarks Klaus Fischinger, head of CTT. And, it works. Such has been its success that plans are underway to set up another similar factory in Brazil, where Daimler has long-established production facilities.

Fatboy trim

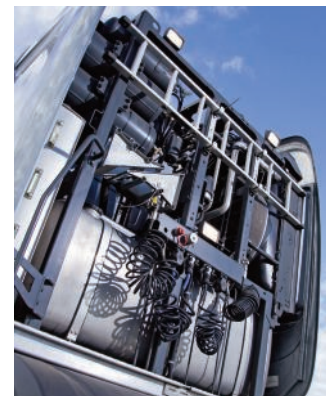
New Actros and Arocs in Euro 6 form now top out with the SLT heavy-haulage versions at up to 250 tonnes gcw. Stefan Buchner, head of Mercedes-Benz Trucks, is hard to pin down on prices or production volumes for these chassis. However, other managers estimate around 100 units – although in a growing market. Two significant drivers are expanding oil exploration and production in China, and, as if in green atonement, the growth of wind turbine manufacturing around the world.

CTT Molsheim works on base four-axle rigid chassis, produced at Wörth, as Actros and Arocs SLTs. The model division serves to allow two cab sizes and to separate the steel-sprung Arocs SLT

from the air-suspended Actros. Drive axles are Mercedes' own planetary units from its Kassell plant, with a design capacity of 16 tonnes. Actros SLT comes as a 6x4 or 8x4, with three wheelbases, but the Arocs offers more variety with six wheelbases and five chassis layouts, including 6x6 and 8x8. Electrical and hydraulic specification requests almost make no two the same, but the cooling, retardation and transmission modifications are common.

Mercedes-Benz's OM473 in-line six was the last Euro 6 engine to launch, and is the standard fit here. Three power ratings deliver 517, 578 and 625bhp and up to 3,000Nm at 1,100 rpm. "A dry clutch is not sufficient above 100 tonnes gcw," states Bastert. "So a turbo retarder clutch [Voith] is used for wear-free moving away, and to provide powerful braking."

Using the 16-speed version of its G-280 PowerShift, Mercedes has upgraded the automated



manual transmission to cope with that scale of torque. Ratios spread from 11.7:1 in first, to 0.69:1 in top, and a 'heavy' driving mode has been added to the PowerShift3 box software.

Moving away at maximum gcw

needs around 1,100 to 1,300 rpm. So when the driver accelerates, compressed air pumps fluid into the turbo retarder clutch, establishing a frictional connection between engine and transmission input shaft. This gives a fast yet gentle and wear-free transmission with high slip at full engine torque. As soon as the truck is underway, the transmission fluid is discharged, bypassing the turbo retarder clutch and transferring the connection between engine and transmission to a conventional friction clutch. Depending on the load, gradient and selected programme, a laden heavy-duty tractor then operates in first or second gear.

The flip side is the retardation this mechanism develops. During braking, the turbine wheel is fixed and fluid is pumped into the housing to act as an engine-speed retarder. The standard engine brake, rated at 646bhp, can then call on an additional 476bhp of retardation from the turbo retarder clutch.

But this kind of friction-free stopping generates a lot of heat. Hence the eye-catching cooling tower behind the cab, designed to stash a number of large components that would otherwise live on the chassis. These include a 900-litre diesel tank, the cooling system for the engine and turbo retarder clutch (a water-based unit), air tanks, hydraulic reservoirs, AdBlue tank and the fuel and hydraulics coolers. **TE**

Clockwise from top:
Mercedes-Benz's eye-catching
Arocs heavy haulage

Modifications underway at CTT
in Molsheim, Alsace

The multi-function cooling
tower behind the cab