TRI-OUT

A new model of DAF 8x4 rigid with three back axles, the 'tridem' configuration, is the latest development in an expanding niche for high-performance rigids. Bob Beech is in the driver's seat

Recently, 8x4 tridem rigid vehicles have become quite a popular choice in the UK market. Almost all of the main heavy truck manufacturers offer this chassis layout; some also have alternative 8x2 tridem configurations with a single driven axle and hydraulically-steered axles on either side of it. This layout is obviously more popular where the vehicle rarely leaves hard surfaces. DAF has offered this in the UK for a number of years with the FAQ chassis designation and selling it as an alternative to its standard-layout 8x4 and 8x2 rigids.

DAF introduced the 8x4 FAW tridem chassis last year, with a variety of driveline, chassis and cab options to suit various applications; the majority of buyers specify them as tippers. They offer much improved manoeuvrability due to the shorter wheelbase and the rear steering axle, giving similar characteristics to a short wheelbase 6x4 with slightly more rear overhang. Other benefits include reduced tyre wear, less roll because of the inherent stability of the three air-suspended axles, and lower centre of gravity compared with a conventional steel-suspended eight-wheeler. The downsides are increased unladen weight, increased capital cost, additional maintenance requirements and reduced ground clearance in off-road situations.

The added complexity of the rear bogie adds weight. Fortunately, specifying DAF's optional high-tensile chassis removes the need to have a sub-frame with a tipping body, reducing weight and keeping the centre of gravity lower. The DAF tridem is roughly 300-350kg heavier than a conventional 8x4. But keep in mind its additional payload of up to 6,290kg compared with a normal 6x4 chassis.

The combination of rear air suspension and a hydraulically-steered rear axle brings other advantages. Obviously the smoother ride transmits less shock loading to the chassis and body. This reduces noise when unladen, an important environmental benefit which could be further enhanced if a positive body locking system was included in the specification.

Also, axle loadings are better regulated because of the effective compensation between the individual axles. Third, rear spring failure can be a major issue with a laden steel suspended bogie; with air, it is generally a simple matter of replacing an air bag.

The ability to raise the unladen rear axle and transfer weight on to the drive axles when laden invariably improves traction. DAF modified its hydraulic steering system a while ago after issues with sensors. The current system, unlike

WARNING

Contrary to appearances, this tipper is parked on a level surface. Prior to discharging a load, a tipper must be stationed on firm flat ground (see also the IRTE guide 'Safe Working Practice for Open Top Tipping Bodies').

some competitors', is well-protected with steering arms tucked out of harm's way. This, along with the position of the rear air bags, makes it possible to tip into an asphalt paving machine without fouling, an important consideration for tippers.

Volvo has recently introduced a modified rear steer axle, giving better steering angles and improved clearance, demonstrating manufacturers' keenness to promote alternative axle layouts for rigid vehicles. As mentioned, the relative lack of ground clearance under the main suspension brackets can be an issue with many air suspension systems when venturing off-road. The DAF design is not too bad in this respect, although it is not as good as the revised system Volvo uses on its heavy-duty air suspension bogies.

As with a conventional 8x4, tridem rigids are limited to 32 tonnes gvw in the UK at present. That limitation may be holding back demand for this advanced layout. The DAF XF has a design weight of 44 tonnes, which includes the optional 10-tonne front axle on steel suspension. The rear bogie has a design weight of 34 tonnes, with two 13-tonne drive axles and an eight-tonne rear steer axle, but it is limited to just 24 tonnes in the UK, under the same legislation that limits a tri-axle trailer bogie to eight tonnes per axle. This seems at odds with the 19-tonne steel-suspended tandem rear bogie on an eight-wheeler with 9.5 tonnes per axle, given the relatively crude nature of the suspension system. A small uplift to nine tonnes for each of the drive axles on the tridem would give a potential gvw of 34 tonnes, allowing operators to carry a decent payload while operating a far more manoeuvrable and road-friendly vehicle. TE

THE REVIEW

A high-spec 8x4 tridem was provided for detailed scrutiny. The majority of tridem rigid tippers regardless of make, tend to be based upon manufacturers' lower-mounted cab range, to both save weight and reduce height, which in the case of DAF would be the CF, but the flexibility of the DAF range means that the bigger XF cab in its numerous forms can be fitted to this chassis. In this instance it was the standard-height, single-bunk option, which matched the height of the PPG Fabrications aluminium insulated tipping body quite well. This version was no lightweight, at 13,260kgs with steel wheels, 430 litres of fuel and a driver in the seat. However, choosing the lower-profile CF sleeper cab, a smaller power unit, less fuel capacity and aluminium wheels would reduce the weight by at least 650kg.

Modern DAF engines such as the top-spec 380bhp 12.9-litre MX13 fitted are electronically tailored to give a boost to torque output in top gear, which translates to 2,500Nm between 900-1,125rpm, dropping back to 2,350Nm in all other ratios. The full 483bhp is generated at 1,600rpm, a generous amount for 32-tonne operation. One really impressive feature of the DAF's larger engines is a very effective multi-stage engine brake that provides first-rate braking power throughout the rev range. One of the negative effects of very high axle ratios has been the blunting of engine brake performance. DAF has overcome this by utilising the variable geometry turbo during engine braking, allowing it to increase gas flow through the engine, giving very effective retardation right down to 900rpm.

The majority of buyers choose the ZF Traxon 12 speed automated transmission. It is very smooth in operation, with first-rate clutch control, and invariably picks the correct ratio for every situation. As tipper operators tend to favour a more responsive drive, the default economy setting could be overridden for extended periods, which probably suits the application better, rather than the sometimes ponderous performance delivered by the full economy package. -Bob Beech