

TRACTIVE FORCE

Specifying tractor units should be a science, not an art - starting with a full and frank analysis of the application. Brian Tingham reviews considerations in light of recent truck developments

Some things don't change: fuel efficiency is still king for the vast majority of operators running tractors on general haulage. Fact. However, that measure of performance is not the only one. For some it may share the top slot with the combination's potential payload and/or flexibility (hence in part the popularity of 6x2s).

For others, it may be manoeuvrability or performance, particularly where operations involve timed deliveries. Or

even cab size, equipment and trim, given today's driver recruitment and retention challenges. And no one can afford to ignore package price and RV (residual value): financial considerations frequently trump technical merit.

That's a lot of parameters. So whatever matters to you, if you haven't specified tractors in the last 12–18 months, it shouldn't be surprising that what's available has changed. Quite simply, today's Euro 6 tractors optimised for your operation may well share little

with the configuration you chose for yesterday's Euro 5. And note: in that timeframe most Euro 6 units have moved on, too.

What's new? Well, it's not just about the choice of Euro 6 engine emissions management, important though that may be. Nor is it only the growing numbers of downsized engines (mostly nine and 11 litre) claiming improved kpl, dependent on application. Nor even the fact that, across the board, peak torque is increasingly delivered some 100 rpm



Chassis and drivelines offer immense choice today - but so too do engines, with Paccar's 11-litre offering significant fuel savings



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lower in the band - meaning it's time to revisit preferred power, transmission software and axle ratios.

All these need consideration, but so do newer chassis and driveline variants, intelligent AMTs (automated manual transmissions), smarter telematics packages and, of course, the latest generations of tyres. We might also list: better safety systems (and not just the now mandatory AEBS emergency brake assist and lane departure warning systems); and small mid-lifts - hitherto the preserve of bulk carriers but, at some 375kg reduced tare, worthy contenders for fuel saving.

So let's examine the detail, starting with the power plant. Most operators running up to 44 tonnes still select larger (typically 13 litre), lazier engines, not least because they're proven over many years. But most tractor OEMs have at least a two-engine strategy that shouldn't be dismissed.

SMALL BUT SERIOUS

As DAF Trucks marketing manager Phil Moon says: “11-litre engines may not deliver the same grunt, but there are benefits in terms of payload [180kg] and fuel efficiency [up to 3%], particularly for high-mileage operations up to 40 tonnes.” And Iveco product director Martin Flach agrees: “Modern VGTs [variable geometry turbos], etc, make smaller engines entirely viable. We offer 9-litre engines for Stralis from 310–400bhp [1,300–1,700Nm], 11 litres from 420–480bhp [1,900–2,500Nm] and 13 litres above that.”

Which brings us on to what, for many, really matters: peak torque and hence also gearing. The vast majority of today's truck engines deliver flatter torque curves than at Euro 5 and with more resilience at the bottom end. For operators tramping up and down the UK's motorway network, that probably makes taller, fuel-saving final drives

Volvo's 6x4/2 double-drive lifting tag features clutched operation, delivering 4x2 economy



Specification process

So how should you start the process? Scania presales technical manager Phil Rootham says don't just ask for what you had last time. “We need to know operational aspects - journey types, speeds, terrain, etc - but also what's being carried. And what matters, including whether they're paid by load, pallet, etc.”

Only when all relevant data has been discussed should the process move on to engines, drivelines, cab size, chassis configuration, etc. “Understanding the worst case scenario enables us to start dimensioning engine power and torque, for example. But we also need to consider commercial realities - and not only total cost of ownership and RV [residual value].”

The process throughout is one of balancing the package to best match the transport objective at lowest upfront and operational cost.

more attractive - taking advantage of lower sweet spot cruising revs.

DAF typically suggests 2.64 rear axle ratio on modern 70 series tyres, as opposed to, say, 2.80 for Euro 5 or 2.93 on 80 series tyres. MAN talks of 2.53 for its 12.4-litre D26 in the workhorse 440–480bhp range, compared to 2.875 at Euro 5 or 2.71 on low-profile tyres. However, for hauling tipping trailers you might be better off with lower gearing: what you lose in fuel on the long haul, you'll gain in efficiency and performance around the quarry.

Talking of tyres, Nick Handy, MAN's sales engineering manager, makes the point that moving over from 295/80 to 315/70 not only increases axle weight capacity - meaning simpler stocking and fitting - but also futureproofs the investment. He concedes that low rolling resistance options tend to be softer (so wear faster), but adds that the fuel benefits far outweigh the costs, certainly for long haul.

“But making the right choice even among low rolling resistance tyres can yield 2–3% fuel savings, depending on

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the compound, tread pattern and construction,” he advises. “We fit Goodyear regionals because they’re good value, multi-purpose tyres. But for our EfficientLine2 TGX, we use Michelin X Line Energy tyres.” Other OEMs offer other preferences, but the thinking remains the same.

What about chassis and driveline? Volvo is upbeat about two introductions: a 6x4/2 double-drive lifting tag and its dual-clutch option. The former gives operators running, say, 44-tonne tipper trailers but also STGO Cat 2 heavy haulage, a very flexible choice. Yes, the tandem drive costs £3,000, but since the inter-axle lock has been replaced with a dog clutch, you get 4x2 fuel economy on part loads with the axle lifted and drive disengaged.

ADVANCED ENGINEERING

Meanwhile, the dual clutch – available on 460, 500 and 540bhp units – is worth considering for hilly terrains. Volvo marketing manager John Comer says, with no break in torque between changes, it makes for a truck “that’s always on top of the job”. That means stress-free drivers when the going gets tough on timed deliveries.

Beyond these, two-pedal AMTs are standard list almost everywhere now, with software selections covering most operations, on- and off-road (think of DAF’s liquid transport and heavy haulage). Crawler gears are also increasingly common and Volvo has just launched an ultra-low crawler, too.

That industry acceptance isn’t yet here for advanced engine brakes and retarders, despite their advantages, not only in terms of safety but also wear, maintenance and RVs. For those who see them as not applicable, consider this: Scania’s latest delivers 4,100Nm of retardation and, importantly, with clutched operation eliminating drag.

Meanwhile, small midlifts are in the

ADDITIONAL POINTS

SAFETY KIT: Consider side scan sensors, 360-degree and reversing cameras, and additional nearside door glazing (OEM and aftermarket), particularly if CLOCS matters to you.

TELEMATICS: Whether OEM or third party, just do it. But make sure you do the analysis, engage drivers and trainers to reap the fuel, safety and insurance rewards.

AERODYNAMICS: Specify the kit, particularly if trunking circa 200,000km a year in top, but match it to your combinations – and review regularly. Cab gaps (siding fifth wheel adjustment) and poorly (or not) adjusted air deflector height undo all the good.

4/6X2 AND TAG/STEER: Yes, there are applications running sub-40 tonnes where 4x2s are adequate – and there are short wheelbase manoeuvrability and cost benefits. However, the flexibility argument in favour of 6x2s is undeniable. Similarly, tags – especially rear steer – can offer off-road advantages but RV can be an issue. As for double or single steer: personal preference rules.

CHASSIS HEIGHT AND WEIGHT: It’s not just about small midlifts: with air suspension, consider omitting adjustable fifth wheels and lead-up ramps.

ascendancy and still developing. Volvo, for example, last month introduced a low-height, light-weight 6x2 pusher, with a 17.5 inch midlift taking 600kg off the ‘standard’ configuration. The small wheeled axle is plated at 4.5 tonnes (instead of 7.5), meaning a 16-tonne bogie. However, for bulk loads that’s not a problem, and Comer makes the point that it leaves space for hydraulics. The lower deck height also means flexibility for trunking curtainsiders in and out of continental Europe. Worth a thought – particularly if you know your pin load?

SMART SYSTEMS

But tractor developments haven’t stopped at the ‘mechanical’ level. As Moon says, most OEMs introduced subtle, but important, driveline control improvements alongside Euro 6. “Acceleration limiters, predictive cruise control [automatically selecting gears,

power and speed to suit terrain, mostly using GPS] and adaptive cruise control [moderating speed to match traffic] can all make a significant difference to fuel economy.”

And there’s more. MAN’s Handy points to vehicle air pressure management (based on smart compressors with clutch actuation), while Scania’s presales technical manager Phil Rootham adds Eco-roll (intelligent AMT-controlled free rolling) to the list of energy-saving measures. Both are again automated, but everyone I spoke to agrees that drivers need to know how to get the best out of them. Hence the importance of driver training packages on new tractors.

So, no matter how well informed you think you are, perhaps it’s time to talk to your dealerships? Best advice: start by explaining your operation and let their sales engineers help you. [TE](#)