

Reach for the sky

Selecting cranes and loaders for vehicle mounting may not be rocket science, but there's more to it than meets the eye. Brian Tinham looks at the issues and recent developments

If variety is the spice of life then, for transport enthusiasts, trucks mounted with cranes and loaders are surely about as hot as it gets. There are thousands of permutations when specifying cranes – designs, capacities, controls, etc – as well as vehicles (tractors, rigids, specialist heavies and trailers), mounting frames and stabilising mechanisms. Also their technologies are evolving, and not

just in terms of sophistication.

Engineering developments are mostly geared to satisfying the industry's threefold thirst for increased reach and lift capacity, yet maximised truck payload. And there's the drive for improved safety (page 24), focused primarily on working at height legislation and the dictates of LOLER (Lifting Operations and Lifting Equipment Regulations 1998).

Lifeboat boom: new meaning with Galt Transport

Using a Scania R420 eight-wheeler with a front-mounted Palfinger PK60002 boom crane, Galt Transport recently lifted two refurbished lifeboats on to the tall ship *Glenlee*, permanently docked outside the Riverside Museum in Glasgow, on the Clyde.

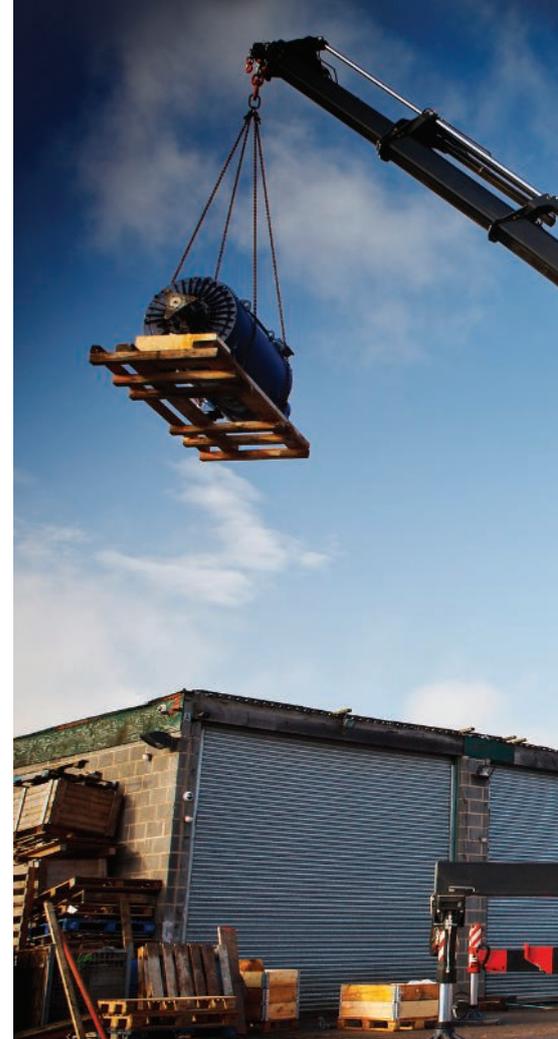
"We originally purchased this truck-mounted crane to lift roof trusses for jobs in the house building industry but, due to its capacity and capability, it is proving a good choice for more challenging jobs," comments the Dumbarton company director Linda Galt. "The extra-long boom length [7 metres greater than standard] has proved itself to be very useful," she adds.

The 1-tonne boats were lifted to a distance of 19 metres from the crane centre from the dockside. They

were then lowered on to the *Glenlee*.

Galt explains that the truck itself is a 420bhp '07 plate unit, with a capacity of 32 tonnes without a trailer and up to 44 gtw when pulling a drawbar.

The PK60002 crane has 20.4 metre hydraulic outreach and a lifting moment of 58.3 tonne-metres.



Looking first at mechanical improvements, Les Drage, technical head at Palfinger cranes distributor TH White, makes the point that lightweighting, using higher-tensile steels, has been among key enablers. "That and increases in hydraulic system pressures [from 310–330bar a decade ago to 350–365bar today] mean much greater power-to-weight ratios," he says. It's all about incremental improvements alongside, for example, updated variable displacement pumps, designed to minimise fuel consumption by matching engine output to demand.

ADVANCED ELECTRONICS

However, electronics are also playing their part, in the form of advanced wireless remote controls. Many are now capable of detecting heavier lift and boom operations, and respond by automatically slowing operational speeds. That not only improves safety but also reduces cranes' and loaders' vulnerability to dynamic shock loads – allowing designers to rein back on heavy engineering.

Additionally, some larger units are now offered with programmable



facilities to restrict slewing angles and/or to fold and unfold truck cranes. The former can be used to eliminate any potential for incidents involving impacts with adjacent infrastructure. Meanwhile, auto park and deploy systems protect against human error, preventing damage to cranes and cabs – again allowing lighter designs. And, given that crane ECUs capture running hours' data, operators can also move vehicle fleets around depots to optimise usage.

Much the same goes for stability systems. EN 12999 (the European standard for loader cranes) has, since 2010, mandated that stabiliser legs be monitored by the rated capacity limiter. However, with sensors now built into stabiliser legs and/or crane/loader platforms (integrated with the vehicle CANbus), matching lift and reach performance to vehicle stability is more sophisticated.

As Fassi UK product support manager Steve Weavers says, even tight spots can now be accommodated. "We were the first to integrate a vehicle tilt sensor with the leg extension proximity units. Now, where space is limited and legs can only be deployed so far, the

control system can respond dynamically to the truck counterbalance weight, rather than restricting loader performance according to leg deployment alone."

FRONT VERSUS REAR

That said, some things change little – among them the trade-offs around front versus rear cranes. As ever, front-mounted cranes enable greater load lift and reach, because of the stability afforded by the weight of the cab and engine. Equally, they leave the body length unrestricted for longer loads, enabling vehicles to run with overhangs within the bounds. Against that, until recently lifts over the cab have been restricted because of stability issues.

Meanwhile, rear mounts enable better site access and lifts closer to the product – including from attached drawbars – making them attractive for builders merchants and machinery movers. However, crane and loader lift/reach is generally reduced and payload lengths restricted, not least because they must be mounted close to the rear axle(s) so that chassis structures aren't compromised and front axles

don't run too light in the unladen state.

And talking of the chassis, rear mounts generally require stronger structures – cruciform subframes being common, with double flitched chassis preferred for plant applications. They also need strong subframes to withstand twisting moments and maintain truck drivability. As TH White's Drage puts it: "You get to the point at around 60 tonne-metres where rear mounting is no longer viable."

So much for the generalisations. What do industry operators see? JA Mackenzie Haulage specialises in high-value and awkward lifts, and managing director Jimmy Mackenzie prides himself on specifying only the highest performance equipment. "We run from 7.5- up to 44-tonne trucks, with cranes up to 80 tonne-metre. The larger trucks are used on art, sculptures and long-reach work. For example, it was one of our trucks that moved Charlie Chaplin's piano from a fourth storey window in the centre of London. We're talking priceless pieces, so we need millimetre precision and control."

As a result, Mackenzie says he specifies trucks with caution – preferring Volvo, Scania and DAF tractors and chassis cabs (the latter all drawbar), and examining details ranging from front axle and cab weights to wheelbase and chassis dimensions and structures, to get what he wants. As for the cranes,



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Steve Weavers

however, these are exclusively Palfinger.

“With our work, most are front-mounted, but we also run rear mounts for machinery and, for example, lifting swim spas over the tops of houses and down the other side.” He concedes that, given the potential for chassis stability issues, his are heavy trucks mounted with strong – but lightweight – subframes. “You have to weigh everything up to get the right capabilities. Our largest unit gives a 12-tonne payload and 21-metre reach with 1,580kg. That’s a fair old lift.”

Turning to his heaviest front-mounts, one is a DAF eight-wheeler drawbar with a Palfinger SH 78002 80 tonne-metre crane. That sits on the two 9-tonne front steer axles while the chassis cab itself was specified with a short wheelbase and rear-steer. “Each of our vehicles is different. We also run six-wheelers and artics that double as wagon-and-drag. Obviously, this eight-wheeler is good for access and heavy lifts. It sits squat and stout, like a bulldog, and we run it with an array of trailers carrying forklifts, skates and lifting kit. So we can match it to most projects.”

What about advanced features?

Mackenzie says all his latest trucks were fitted with Palfinger’s restricted slew system. “You think you’ll rarely use it, but it’s been great – for example, when working next to railways or power lines. Just press the button and you’re limited to a 180 degree arc. So if the driver falls, there’s no way the crane can cause an incident. That helps with method statements and shows professionalism.”

SMARTER SYSTEMS

For him, other useful features include stabiliser feet pressure mats (which reduce point loads), and its crane capacity controls, which allow for continuously variable leg deployment, not just presets. “We haven’t got their new auto-stowage and deployment system, but I’ll be specifying it next.”

Meanwhile, David Watson, managing director of David Watson Transport, says he moved over to Fassi four years ago – through Walker Crane Services and Collier Truck Builders. Why? He likes these cranes’ functionality, but also the integrated approach offered by crane installer and bodybuilder.

“Fassi has one of the best systems going. Even when you can’t deploy the

legs much, the crane will work [with derated performance] as long as the vehicle doesn’t tilt. That can be very useful with light loads in tight situations – such as lifting a GRP cabin over a transformer in a narrow road. With other systems, unless the legs are out and down, the crane won’t work at all.”

As for that installer-bodybuilder relationship, he explains that, whereas chassis usually go to the crane installer first for fitting the subframe, etc, before heading on to the bodybuilder, here it’s different. “In our case, that means the bodybuilder doesn’t have to undo some of the crane installer’s work – for example, to fit our hydraulically extending body platforms.”

He also cites one Scania 8x2 rigid mounted with an 80 tonne-metre Fassi crane, which first saw action for the 2012 London Olympics. “That was engineered to enable full duty crane performance through 360 degrees, including over the cab,” explains Watson. “The bodybuilder fitted retractable stabiliser legs to the front of the special chassis, as well as conventional side and rear auxiliary legs.” And he points to similar bespoke engineering around his lifting tackle storage boxes, which are sited beside the crane and tilt outwards to minimise manual handling.

As for the future, well inevitably size matters in this game. Mackenzie says his next truck crane will be around twice the capacity of his largest unit. “We’ve been working on the design, based on the massive Palfinger 165 tonne-metre crane, for a couple of years now. But while it can run in Europe, frustratingly it looks like we’ll need to go for IVA (Individual Vehicle Approval) for the UK. Palfinger can get it on an eight-wheeler chassis at 32 tonnes, which is fine, but then it can’t carry anything. So we’ll always need a trailer. And that means we’ll probably have to run under special types, too.” 

A Rhodes raises fleet flexibility

Portable accommodation transport business A Rhodes (Haulage) recently took delivery of this 8x4 Mercedes-Benz Arocs mounted with an 85 tonne-metre Effer crane. Supplied by dealer Roanza Truck & Van, the York-based operator’s first Arocs is a 3243L with the StreamSpace cab and Mercedes’ 428bhp engine driving through a 12-speed PowerShift 3 AMT (automated manual transmission).

According to managing director John Rhodes, the new addition was required to fill a gap in the fleet.



“The smaller rigids are typically equipped with 50 tonne-metre cranes, while the tractors start at 70 tonne-metres and go up to 150 tonne-metres,” he explains.

As with A Rhodes’ other trucks, the crane was supplied and fitted by ACB Cranes, of Stoke-on-Trent. A Rhodes has now ordered two more vehicles from Roanza: one based on an 8x4 Arocs tipper, which will undergo conversion and strengthening so it can be fitted with a 140 tonne-metre crane.