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A crane for everybody

The 60 to 80 tonne All Terrain crane class forms the core of many crane rental fleets. The three and four axle cranes are designed with a close eye on roadability and flexible use. Will North reports.

Cranes in the 60 to 80 tonne capacity range are like opinions: everyone has one. Andrew Snow, business development manager at Tadano UK, says: "It's the bread and butter market, the 60 tonners, it is where the volume of machine sales are. All crane rental customers run that size of crane, but not all run 200 tonners. It's a very, very important market for us."

But while almost every rental fleet around the world will have a fair few cranes of this size in their fleets, not all are All Terrains. In fact, the market for this size of All Terrain is largely concentrated in Europe.

Andreas Cremer, product manager for Manitowoc which builds the mobile crane Grove range, sums it up when he says: "If you look at the smaller 40, 60 and 80 tonne segments, you will find that every market has different products to cover this part of the market. For example, if you go to South America, you will most likely find a lot of Chinese truck mounted cranes, while in other markets, like Italy, Rough Terrains were used for many, many years, although not so much anymore. But also in Africa, you see a lot of Rough Terrains as well as in the Middle East."

The same is true in the USA, but when it comes to day to day rental where road going cranes are required, truck cranes remain the dominant force in the sector - a point we'll return to later - due to axle spacing and bridging formulas etc… all of which are tightly regulated and vary from state to state. Once on site there is often more space to work than on typically congested European sites, so the longer overall lengths of truck cranes is not a problem.

So, what do most customers in Europe look for from cranes in this class? Essentially, to be able to send the crane out on its own, to take on as many short jobs as possible - in other words classic taxi crane work. So, a long boom which can reach most jobs without an extension, a compact carrier which can fit into the tightest of job sites and handle the roads with ease, and the ability to carry as much counterweight on board as possible.

Booming out

As we saw when we looked at the 100 to 180 tonne All Terrain market last year *(see: Cranes & Access, October 2020 and November 2020)* boom lengths have increased markedly in recent years. This has been spurred in part by the availability of higher strength steels and the increasing experience crane engineers have in how to use the thinner, higher tensile material to create booms that are not only stronger but that also retain the rigidity of the previously used thicker, less flexible, lower tensile steels. The benefits are lighter weight and improved capacities.

Crane Maier used its new Liebherr LTM 1070-4.2 to replace aging high voltage pylons for Deutsche Bahn

In this class, we see boom lengths in the region of 50 metres, in fact, seven of the nine cranes in the class have boom lengths of between 48 metres - on the Tadano ATF 60G-3, Liebherr LTM 1060-3.1, and Grove GMK3060L-1 - and 51 metres on the Grove GMK4080-3. There are two outliers in the class of crane, the Grove GMK3060-2 with its 40 metre main boom, and the Tadano (Demag) AC 80-4, announced earlier this year with its seven section 60 metre boom.

The benefits of a longer main boom are obvious, helping carry out more jobs without having to install a swingaway extension. Avoiding the

The new Tadano AC 4.070L-1 carries more counterweight within 12 tonne axle loads than any other 60 to 80 tonne AT

The latest Grove cranes, such as the new long boom GMK3060L-1 feature new carrier cabs, which meet the latest crash test requirements, and offer operators improved visibility and comfort

challenges, time and exertion of rigging them. It also means that the extension can be left in the yard, enabling the crane to travel with lower axle weights or with more counterweight on board.

That was the thinking behind Grove's GMK 3060L-1, which adds eight metres of boom to its smaller sister crane, the GMK3060-2, matching the 48 metres that is now the norm for cranes in this class. For those who still prefer the shorter five section boom, it can be extended, when necessary, with the bi-fold swingaway extension, taking the maximum tip height to 58 metres, bringing it up above the main booms of the 48 metre models which typically achieve a maximum main boom tip height of around 53 metres.

The question for buyers is how often do you need the longer reach? Even if the answer to that question is "only occasionally", which would seem to point towards taking the shorter boom plus the full extension, it would be wise to also take resale value into consideration. In five or 10 years time, might the short boomed model be tough to sell on? Or might it remain the preferred option for less developed markets where many used cranes end up? Some of the interviewees and other contacts I have spoken to have expressed the belief that there will remain a market for compact cranes with short booms; but my guess is that in Europe, at least, there will be little scope for sales of these cranes.

All on board

There's not much point having a 'turn up and lift' crane like this, if the actual reality is more turn up, wait for the counterweight to arrive, then set up, and lift. Being able to access as much of the load chart as possible, with the on board counterweight is key requirement.

In most mainland European markets, the 12 tonne per axle rule holds sway. In most of Europe this allows cranes to run either without permits, or with ones that are routine and relatively easy to obtain. Meeting this criteria while carrying as much counterweight as possible is a challenge. As a result, there is considerable variation across the nine cranes in the class.

Two Tadano cranes bracket the class in terms of lower and upper limits of on-board counterweight. The 'legacy' Demag AC60-3 crane can carry a mere 4.7 tonnes of counterweight within the 12 tonne axle limit. However, this crane also has the longest boom among the three axle cranes, at 50 metres.

At the other end of the scale, and newest crane on the market, the four axle, 70 tonne Tadano/Demag AC 4.070L-1 can carry up to 12.2 tonnes of counterweight without exceeding the 12 tonne limit.

Manitowoc's Cremer says: "All too often the additional counterweight that cannot travel onboard with the crane is very seldomly used. And it is not uncommon to find the original counterweight stack that's transported separately, left untouched at the back of a customer's yard waiting there until the time comes to resell the crane."

Tadano's Snow points out: "In the UK market, where the rules allow such cranes to run with axle loads of up to 16.5 tonnes, on STGO rules, the 60 tonners run fully counterweighted as do the 80 tonners. It's only with four axle cranes over 100 tonnes, that we see regular use of a separately transported counterweight."

Richard Everist of Liebherr GB points out that in the UK sales of Liebherr's 60 tonne, 48 metre boom, three axle LTM 1060-3.1, which can carry 14.8 tonnes of counterweight under local regulations, far outstrip sales of the four axle 70 tonne, LTM 1070-4.2, which has a 50 metre boom, but can only manage the same 14.5 tonnes of counterweight in spite of the extra axle. The four axle crane is of course less compact with a carrier length of 10.11 metres compared to the 9.44 metre carrier on the three axle unit.

"Prior to the launch of the 60 tonner we had the LTM 1055," says Everist. "This had a shorter boom, so the 70 tonner was then the bigger seller in the UK, but once the 60 tonner arrived with the capacity it has as well as the longer boom, it really took the work away from 70. It's a more compact and manoeuvrable crane on three axles rather than four."

An LTM 3060-3.1 from the BKL fleet travels by ferry to the Herrenchiemsee Palace, on an island in the Bavarian lake Chiemsee

At the palace, it was used to erect frost protection for the palace's fountains

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Mobile and crawler cranes

The importance of making the most of these two different axle load limits can be seen on the newest crane in this market sector, the Tadano AC 4.070L-1. It carries more counterweight – 12.2 tonnes of it – within the 12 tonne axle loads than any other crane in the 60 to 80 tonne class. On UK roads however it can manage 16.5 tonnes, while featuring the longest boom at 52 metres of any crane at this capacity or lower.

Across the pond

As noted above, a key consideration for buyers in the UK and EU is axle loadings. The same applies across the Atlantic, but here restrictions are different and more variable, with axle spacing being at the forefront of roading concerns, thanks to complex bridging formulas which generally speaking are much more strictly checked and enforced than most countries in Europe. Andrew Soper, product manager at Link-Belt, explains: "In North America, the name of the game is 'How much counterweight can you carry on the crane and still road it?' While that might not be so different to other markets, we have to be able to do it across 50 states and seven Canadian provinces. With cranes in this class, we aim to be able to pretty much move anywhere, with all its counterweight on board."

The axle spacing requirements tend to rule out All Terrains from operating in this size range, although they are of course increasingly popular the further up the capacity range you go. There are a few exceptions, Manitowoc's Cremer says: "There are some areas where you can also run with 12 tonnes an axle. Through the New England area for example, where the three axle crane is actually quite popular."

But as a rule, the smaller All Terrains are too heavy, and have the wrong axle spacings, to be easily roadable with onboard

Manufacturer	60-80t All Terrain Models	Lifting characteristics			Dimensions				Axle load / counterweight					
		Max cap.	Boom length	Max tip ht.	Axles	Carrier length	O/A length	O/A height	10t	12t	13t	14t	15.5	16.5t
Grove	GMK3060-2	60t	40m	58m	3	8.67m	12.19m	3.8m	-	8.5t	11.5t	13.5t	13.5t	13.5t
Tadano	ATF 60G-3	60t	48m	55m	3	9.73m	11.18m	3.68m	-	5.1t	7.2t	-	-	13t
Liebherr	LTM 1060-3.1	60t	48m	63m	3	9.44m	11.53m	3.75m	-	5.5t	-	-	12.8t	-
Grove	GMK3060L-1	60t	48m	65m	3	8.66m	11.59m	3.94m	-	7.5t	10.5t	13.5t	13.5t	13.5t
Tadano (Demag)	AC 60-3	60t	50m	64m	3	9.33m	11.67m	3.61m	-	4.7t	5.6t	-	12.1t	-
Liebherr	LTM 1070-4.2	70t	50m	65m	4	10.11m	12.51m	3.9m	3.8t	10.7t	-	14.5t	-	-
Tadano	AC 4.070L-1	70t	52m	70m	4	10.36m	12.55m	3.85m	4.4t	12.2t	-	-	-	16.5t
Grove	GMK4080-3	80t	51m	75m	4	11.1m	12.78m	3.8m	-	10.2t	12.5t	14.8t	14.8t	14.8t
Tadano (Demag)	AC 80-4	80t	60m	70m	4	10.6m	12.15m	3.95m	3.3t	9.3t	-	-	-	17.7t

The new Link-Belt 65|HT

counterweight across North America. One alternative is the boom truck, the larger models being a truck crane superstructure mounted on a standard commercial truck chassis. More optimised than these are the classic truck cranes, which used to rule the roost in Europe until the All Terrain took over. They are still the preferred mobile crane choice in many parts of Asia, particularly China where the 25 tonne truck cranes are still mass produced. The classic truck crane employs a purpose built crane chassis frame but utilises standard truck running gear in terms of axles, transmissions and suspension. All of which costs a great deal less than the specialist axles, transmissions and hydrogas suspension systems employed on All Terrains. They are also a good deal simpler and less costly to repair and maintain. Traditionally, these canes have a single person cab, with the boom stowing alongside.

There are three main manufacturers of the traditional truck crane in the USA: Manitowoc/ Grove, Link-Belt, and LoadKing - the Custom Truck One Source subsidiary that acquired Terex's boom truck, crossover, and truck crane product lines in 2019. Tadano also offers a range of cranes in this class, designed for the American market but built in Japan, which it also sells internationally.

Link-Belt recently launched a new truck crane in the 60 to 80 tonne class with its 65 ton (60 tonne) 65|HT. Soper says: "The predecessor to this crane was the HTC 8660 Series II, which was a very successful crane for us for over the past 15 years. The main changes are a longer boom and improved capacities, while maintaining the efficient and flexible roadability of the 8660."

The new crane makes use of Link-Belt's boom forming capabilities at its Lexington facility, replacing the diamond box boom of its predecessor with a formed boom. Soper says: "There are significant capacity gains throughout the chart. The diamond box booms are strong up to about 110ft/33 metres. Beyond that, they lose out on weight to length ratio. So, the 115ft/35 metre formed boom on the new crane is both longer, stronger,

and actually weighs less than the older shorter boom."

Cranes like this face competition from boom trucks on one side and All Terrains on the other. Soper says: "There are advantages to a truck crane. It has lower operating costs, and higher travel speeds, than an All Terrain in the same class. We also compete against commercial chassis boom trucks in this class as well as three axle ATs and smaller four axle models. So, we have to have a really competitive offering, with an attractive price point, and we have to have attractive features to go against both concepts."

"The carrier is optimised, you're not bolting or welding on an upper structure to the truck chassis or mounting a superstructure to a commercial chassis that's not designed for the longevity of a crane. Our customers expect to get 20 or 25 years out of these cranes. I don't think you're going to get that type of robustness and durability out of a commercial chassis boom truck."

A European truck crane

Tadano has also unveiled a new commercial chassis mounted truck crane in this class, the HK 4.070-1. It has a five section 41 metre boom, to which a bi-fold swingaway extension, offsetable by up to 40 degrees, can be added to achieve a maximum tip height of 60 metres. The crane can lift up to 55.6 tonnes at a radius of three metres with a counterweight of 10.1 tonnes, and at eight metres it still manages 19.2 tonnes.

The 70 tonne crane is part of a two model line-up that includes the 50 tonne HK 4.050-1. "We use standard truck chassis from well-known manufacturers for our truck mounted cranes. This means that the drivetrain is less expensive and easier to maintain for our customers." says Tadano product manager Michael Klein.

Both cranes can be configured within 10 tonne axle loads and 32 tonne gross vehicle weights, in most European countries this allows them to travel as freely as any road haulage truck without permits or restrictions. This means that if a crane needs to get to a work site for an urgent job, it can get going right away. Otherwise, the 70 tonne model can carry 10.1 tonnes of counterweight, while both models can be supplied with a trailer to tow behind the crane with the additional counterweight required.

Tadano HK 4.070-1 Castell - The VERY first Tadano HK 4.070-1 was sold to Castell-Autokran of Koblenz

Waiting times

All of these cranes are designed to get to work shortly after arrival on site, so that the customer does not have to wait for extended set up times, but if you want to buy one, you may be in for a long wait. Tadano's Alec Bell says: "Supply chains are a problem at the moment. Right through the automotive industry and in our industry as well. We were finding problems sourcing microchips and steel."

Manitowoc's Cremer adds: "We do have quite an extensive order backlog. This year is pretty much gone, and deliveries are all already moving further into next year."

Liebherr's Everist says he hasn't seen too many supply problems with Liebherr's plant in Ehingen. But there are limits to how many cranes even this facility can build, and demand has pushed it to the limit. "If I'm talking to customers about new orders, we are looking as far out as 2023 in some cases."

The latest boom truck/truck crane, the 60 ton (55 tonne) National Crane NBT 60XL with its 46 metre main boom

Tadano's new HK 4.070-1 truck crane is mounted on a commercial chassis

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Quick and nimble

The replacement of a rooftop glazing panel in central Edinburgh, Scotland by Johnston Rigging Fife perfectly illustrates the versatility of the latest small All Terrain cranes.

The crane had to set up in the parking bay

The crane used its full boom at a 14 metre radius

Established as a steel erector in 2001, the Kirkaldy based company now runs a small rental fleet of Liebherr All Terrain cranes from 40 to 70 tonnes for steel erection and contract hires. When local glazier Nu-Cairn - a regular contract lift client - consulted Johnston about the tricky window replacement in the city centre, director Guy Johnston decided to operate the crane himself: "I ended up on the job myself purely because we were busy, I had also planned it and like to be on hands with these sorts of jobs."

The job involved first removing the old unit, before lifting the new one into place along with various materials and equipment. Planned on a Saturday, to ensure the building was clear as the work took place, additional consideration had to be given to ensure critical access to the car park remained open. Johnson decided to use his latest addition, a 60 tonne three axle Liebherr LTM 1060-3.1, with the new crane's VarioBase outrigger system making it ideal for the job.

The outriggers were short rigged on both sides, while 1.2 metre square mats helped spread the outrigger loadings. The glazing unit was located at a height of 25 metres and at a radius of around 14 metres. This required the crane's fully extended six section 48 metre boom and 7.8 tonnes of counterweight, all of which was carried on board.

A 300kg four pad battery powered vacuum lifter, supplied by Nu-Cairn, was used to handle the panels. The road remained open, the lift went well and in the shortest of time, without drama or incident.

Coming soon - two new All Terrains

At the start of October Tadano informed visitors at its Zweibrücken facility that it plans to launch a new two axle All Terrain at the end of the year, while Grove's new four axle 100 tonner made its debut at GIS in Italy.

Debut of 100t Grove

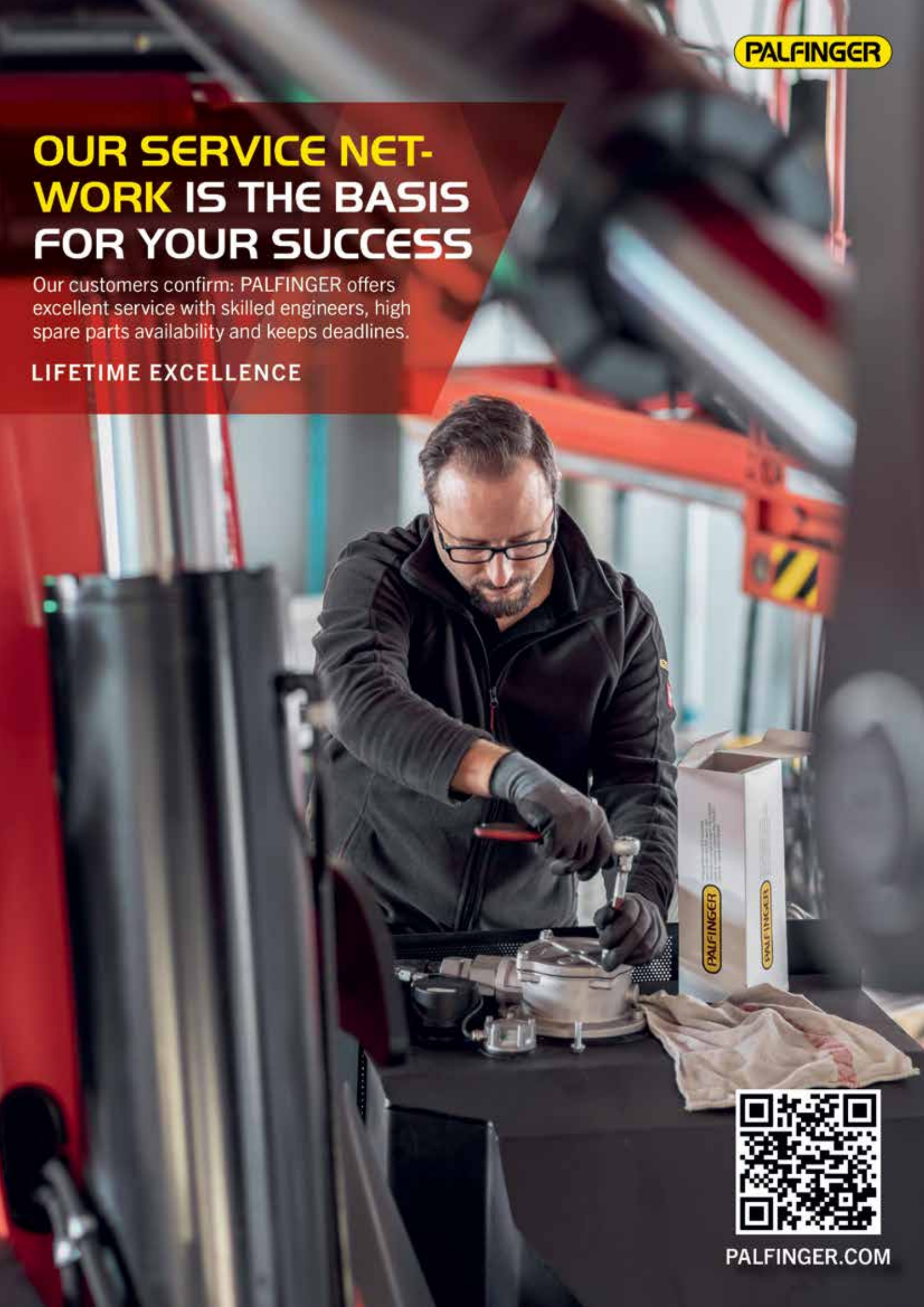
As we went to press, Manitowoc confirmed that its upgraded 100 tonne four axle Grove GMK 4100L-2 All Terrain crane would make its debut at the GIS in Italy. The lower weight GMK4100L-2 offers a 60 metre main boom and can carry up to 6.8 tonnes of counterweight within 12 tonne axle load limits. It also features a Euromot 5/Tier 4 final engine and the new Grove carrier cab.

The new Grove GMK4100L-2 made its debut at GIS

Tadano gave visitors to its plant a sneak preview of a new two axle AT

Sneak preview of new Tadano

Tadano gave visitors to its series of open days in late September a glimpse of a new two axle All Terrain, the AC 2.040-1. While we have no details, we know that it will have a four section 35.2 metre main boom and nine metre extension, along with a proper 40 tonne rating. Details are due in December.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