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Kranlyft and Maeda launched their new knuckleboom-style spidercrane, the 2.8t MK3053C at Bauma



With almost three times the lifting power of its predecessor, the new Maeda MK crane could be a gamechanger

FLIES AND SPIDERS

With their origins in monument lifting and more recent success in glass handling applications, spider cranes have demonstrated how a compact, go anywhere machine can get close to a load to match the performance of a far bigger crane working from a distance. However new jib and stabiliser configurations together with sophisticated control systems allow these cranes to take on heavier and more complex work. Will North reports.

To a Westerner speeding across Japan on the bullet train, small town graveyards stand out in the scrolling countryside. Compact and crowded with square column funerary markers, they suggest communities with deep roots and tight bonds.

It was in placing these markers that the first spider cranes - tracked mini cranes with spider leg outriggers from manufacturers including Unic and Maeda - found their original use. Their tracks allowed them to travel across uneven ground and manoeuvre in the cramped environment, while their stabilisers allowed them to set up on rough ground without disturbing it. With a hook on the end of the boom, they could lift and place relatively light loads in their final resting place.

The same characteristics have proved invaluable in their next big market, glass handling, which has helped power their international growth. With the hook replaced with a vacuum attachment, they can be used to place glass and façade panels or complete window assemblies.

Their narrow dimensions - generally small enough to fit through a single doorway - make them ideal for work indoors or in an enclosed rear yard. In high rise construction, they can work from inside the building, placing curtain walling as tower cranes and concrete pumps work on the floors above them. With non-marking white tracks and plug in or battery power, they can also trundle around retail malls, installing shop fronts or escalators etc...

The use of battery electric power was pioneered by Unic in collaboration with European distributor GGR, and its Eco line has allowed these machines to work in new environments such as poorly ventilated spaces, where emissions are not permitted.

In the 50 years since the death of German

American architect Ludwig Mies van der Rohe, and with global climate change causing temperatures to rise, designers have begun to understand that working in a building cloaked entirely in glass is not entirely comfortable. At the same time, construction technology has changed, making more use of modular techniques.

On glass-handling jobs, this means that windowpanes must often be installed beneath soffits, under louvres, or between shade fins which can limit headroom and require more outreach than can be provided with a main boom alone. Short, fixed jibs and searcher hooks enable these jobs to be carried out. We take a look at some of the tools available for this work elsewhere in this issue.

DUTCH DISRUPTOR

Larger construction and industrial installation jobs require more powerful jibs in new configurations. A company in the Netherlands has focussed on this requirement developing spider cranes with hydraulically extending and hydraulic luffing jibs, with stepless outriggers and extendable ballasts. They are supplied with a control system which, like those on much larger All Terrain cranes, considers all of these factors when calculating the crane's load chart and working range.

Hoeflon sold its first crane in 2006 and before too long began to receive requests for a crane with a jib. It launched the three tonne C6 with a luffing jib in 2014. The company now has a range of three luffing jib spider cranes with capacities up to four tonnes. It also offers a 550kg mini crawler crane - the C1 - and the nine tonne C30e spider crane with pick & carry capability.

Hoeflon has not been alone in this approach, companies outside of the spider crane market, have also been working on compact cranes able to work in restricted spaces, Palfinger, for



Hoeflon's variable outrigger angle and extension allow the crane to set up in constricted environments



Luffing jibs, like that on this Hoeflon, allow spider cranes to reach under roofs

example, has a pair of large knuckleboom cranes mounted on tracks with extendable outriggers. A closer comparison perhaps, is JMG's MC50000 RE, a pick & carry crane fitted with a Cormach knuckleboom.



Various views of the new Jekko, and its new remote control

All the main spider crane manufacturers now offer luffing jibs as attachments for their traditional spider cranes. Maeda launched a 995kg capacity knuckleboom model in 2014, the same year as Hoeflon's larger C6. While Unic's URW-2, with its manually extended 700kg hydraulic luffing jib, was launched in 2015. In 2016, Jekko started a partnership with Fassi, which has seen it launch a number of cranes in its JF range.

All three companies had new cranes ready for Bauma 2022. Both of the Japanese manufacturers,

Maeda and Unic, planned to launch cranes with higher capacity jibs. While Jekko has a 2.8 tonne crane, the SPX328 with an all new control system, with 10" interactive touchscreen - featuring an IP67 Protection Rating, and an innovative 500kg electric (rather than hydraulic) luffing jib, as far as we are aware, the first electric jib on a crane. It may well set a new trend as manufacturers look to fully electrify their cranes.

Hoeflon chose not to participate in Bauma this year, instead offering to demonstrate its range to

customers directly. Other developments include electric power for its C10, the last crane in its range currently offered with only diesel power. The new crane, when it launches next year, will be the C10e.

**"LIKE A LIEBHERR"
AN OPERATORS PERSONAL VIEW**

How does this new generation of European machines differ from those originally offered by the Japanese inventors of these cranes? Asa Wilkinson is an experienced independent crane



**Kranlyft
Group**

BREAKING NEWS!

The new Maeda MK3053 as arrived

A Knuckle Boom crane with hydraulic jib



MK3053C

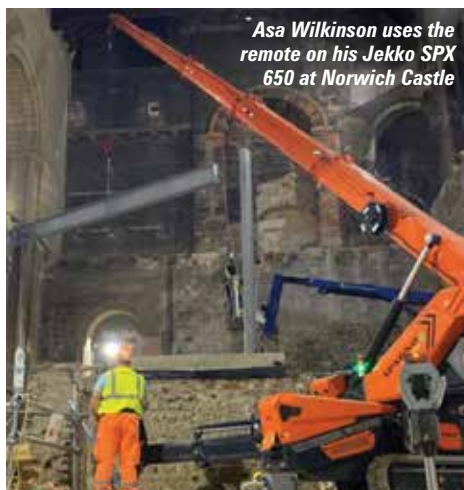





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Asa Wilkinson uses the remote on his Jekko SPX 650 at Norwich Castle



The crane set up inside the castle



The crane at work at Norwich Castle



Fixing the steel beams in place at Norwich Castle



A tower crane was used to lift materials up to Norwich Castle

operator, supervisor and slinger based in the UK, who, through his company A W Lifting Specialists, has worked with both All Terrains and spider cranes. This summer, he has been working on a project at Norwich Castle.

The castle dates back to the Norman invasion of England and is built on top of a steep mound and surrounded by busy city streets. The current project will see a new internal steel frame built inside the mediaeval keep, restoring the internal appearance of the structure and improving access, which has for many years been a mere shell. Outside, a tower crane is delivering materials to the top of the castle mound.

On the project, Wilkinson is subcontracted to Jekko's UK distributor JT Cranes, operating a Jekko SPX650. The crane is from Jekko's standard spider lift range (its knuckleboom models are designated JF for Jekko Fassi) it has a maximum capacity of five tonnes or 4,800kg on the winch. It has a 15.4 metre five section main boom with a maximum tip height of more than 17.5 metres. With its four section 5.9 metre hydraulically luffing and telescoping jib attached, it offers a tip height of up to 23.6 metres and radius of up to 20 metres at which it can handle 150kg. It features X-type stabilisers, which can be used at any angle or extension, and a control system that calculates the safe working load at any position or configuration. Wilkinson is using it on this job to raise steel beams up through the internal structure as it is built and

positioning them into pockets in the main walls. "I specialise in any sort of lifting that requires a bit of thought," he says. "On this project, there are a lot of tight spaces to get the boom into, and they've got bits of steel coming in that need to be lifted through the existing steel work. It's what spider cranes are ideal for."

The machine may bring the capabilities to do the job, but it's the skill and experience of an operator like Wilkinson that unleashes its potential. It takes care and thought to work in such a constricted environment. "I've got 12.4 metres of space below the existing roof trusswork," he says, "so everything - all the slings and chains - have to be kept short enough for me to be able to work underneath that."

"While all lifting on the project is planned with method statements, it still takes the operator to decide where to set the crane up," says Wilkinson. "The machine is sitting under the beams we're lifting, but as we're using a remote control, I'm out of the way."

It is the remote control system on the Jekko and similar machines from Hoeflon, that really sells them to operators like Wilkinson. "These new style machines, like the Hoeflon C10 or the new Jekkos, are all remote controlled. You can be down where they are hooking the load on, or you can be where they are taking the load off. It is a lot better for an operator, you've got more insight into what is going on."

On this job, Wilkinson is working with just the 15.4 metre main boom. But he has regularly used these cranes with luffers on similar steel erecting jobs. "The luffer's good, because you can boom up, and then set the luffer to go across the existing steel," he says. "It's a brilliant piece of kit. From when I started operating spider cranes 18 years ago, they've moved on so much it's unbelievable. It's almost as if they are like robots."

This crane can be used with a foldaway luffer, which fits under the main boom for transport. "You just retract the main boom in, swing the connecting bar over, and pin it to the main boom, which will pick the luffer up itself. It's plug-and-play, you just connect the electrical leads, and it changes everything over on the remote control as well, bringing up a new set of buttons. When you plug in a jib or attachment, it knows exactly what it's got plugged into it."

While Jekko and Hoeflon might have led the way in bringing modern remote control systems to the segment, Unic and Maeda have also brought their own systems to the market. And, as Wilkinson notes, this is part of a larger trend which has seen remote control available to differing extents, on many All Terrain cranes.

At Bauma, Jekko will launch a new control system on its new crane the SPX328. But the existing version already marks the cranes out, according to Wilkinson. "It tells you exactly what angle the crane's legs are set and varies the limit depending on that. It will give you better duties over one side or the other, over the back or front. You can set all the outriggers to 45 percent or splay them out more on one side to get in a tight space or up against a wall. Or you can set them with the outriggers half way in on one side. They are just like the Liebherr mobile cranes with VarioBase."

The new Jekko SPX328 boom extended



FOCUSED ON RENTAL

Spider cranes are becoming more like the latest mobile cranes in other ways. In many markets they have often been offered for sale or rent directly by the local distributor, rather than all rental companies. However, as their potential becomes more apparent, crane rental companies are adding more of them to their fleets, and start up companies are considering establishing a business that focuses solely on spider crane rental.

An example of a new entrant in the UK is Kelly Ann McPhilbin, with her new company, NXgen Lifting, which she manages as a co-owner. The business launched in April 2022 offering Hoeflon spider cranes and JMG pick & carry cranes, as well as glass handling robots and vacuum attachments. She has been busy getting the company running and struggling to find the time to actively promote the cranes. But she is seeing a growing level of repeat business, thanks to word of mouth from happy customers.

She likes the luffing jib options on the Hoeflon cranes. "With the standard spider crane, you're bound by the boom," she says. "With the luffing jib, you can get up and over obstacles." In glass handling, traditional spider cranes can make use of counterbalance beams to get under obstacles like soffits but," she says, "that adds extra costs and adds to the load on the hook."

That reach can come in equally handy on construction projects, where variable, stepless, outrigger systems are also a boon. "Standard spider crane outriggers are pinned at each corner.

With the Hoeflon, they're not fixed so they can be set narrow at the front, wide at the back, for example, to get them in where they are needed."

She also appreciates they're lighter allowing them to be towed on a standard two axle plant trailer and the standard remote controls, which she says helps keep their size down, and reduces the footprint needed when setting the machine up.

Another point she makes is the growing demand for electric power options. She likes the fact that Hoeflon now offers it on all of its cranes, or it will once the C10e is launched next year. There is a choice though, between single or twin battery versions of each crane.

McPhilbin wanted to ensure that her machines can make it comfortably through a shift without needing to recharge, so has gone for the dual battery versions. That has paid off, she says, with one customer working in London on a glass and

steel project telling her that they have been able to go as long as three shifts without needing to recharge.

HYDRAULIC UNDERSLUNG JIB

As well as being an established player Maeda was the first spider crane manufacturer to enter the European market and it now claims to be the first to introduce a standard hydraulically telescoping and stowing jib on the MK1033CW-1. The crane has a three section main boom, topped by the three section jib for a maximum tip height



Hoeflon cranes can often be towed on a plant trailer without a HGV licence

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Maeda's MK1033 was one of the first spidercranes to use a fully hydraulic luffing jib, with a geometry similar to a knuckleboom loader crane



Fixed jibs and searcher hooks on Maeda cranes help Lift Ltd work in low headroom environments

of almost 12 metres, and a capacity of 995kg at 1.3 metres. In Europe, master distributor Kranlyft is pitching it as a smaller alternative to the larger knuckle boom spider cranes.

A NEW MK

At Bauma, the company has a new crane, the MK3053C which aims to win back customers lost to the new competitors. "This model has been long-awaited," says Simon Marnock, UK operations director for Kranlyft, "It's going to be a gamechanger for us."

Exact capacities are to be confirmed but the provisional load charts show a marked improvement, with the new crane having almost

three times as much as the previous model, with a main boom capacity of 2.8 tonnes at 1.8 metres. With jib, the crane takes one tonne at 4.7 metres. "It's got a detachable jib," says Marnock, "so customers have the option to work on the main boom, making it more like the MC285s, with up to four falls of rope, or pin the jib on for around five metres of extra height.

The power options available are diesel, diesel and electric or pure battery power. The crane has variable, stepless outriggers and radio remote control.

"It's a crane designed for easy transport," adds Marnock. "The total weight of the machine is

2,900 kg, and this weight includes the hydraulic luffing, hydraulic extending jib as well as the base machine so it can be transported on a plant trailer by a vehicle with a 3,500 kg towing capacity.

On the MC285s and other Maeda machines, the outriggers can be set in a series of fixed positions. On the new MK3053C they are stepless and controlled by the remote. "You press a button, and you can place the outrigger anywhere you like. It reduces the set-up area dramatically," he says.

Making the most of these stepless variable outriggers has - as we've seen elsewhere - prompted Maeda to make improvements to

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In buildings old and new, Lift Ltd has used its Maeda MC 285 to reach into tricky spaces



its control system. "On the MC285s, you have variable positions, but they are pinned, when you are working with one side's outriggers only half way extended you can't work over that area," Marnock explains. "On the MK3035C you will still be able to carry on working over it, but your duties will be reduced."

HIRD IT THROUGH THE GRAPEVINE

Even before its launch the company had already received two orders. One came from UK company Hird, which already has 60 Maeda cranes in its fleet. He was ready to order as soon as rumours of the new machine reached him.

"We have always been impressed with Maeda's build quality and reliability, they are also very user friendly," says Phil Hird. "We have recently invested in the Eco range of Maedas and now have a large fleet of MC285CB-3 and MC305CB-3 100 percent electric machines. These environmentally friendly cranes are powered by lithium-ion batteries and can run for around a day between charges. They can also be charged while

in use which is extremely popular with teams on site.

"We heard that a new model was on the horizon and that it would be a development of the MK crane with a large reach and increased capacity. I placed the first order for one on this information alone and look forward to its arrival. Ordering the crane was an easy decision and we look forward to promoting this crane within the UK very shortly."

ADAPTABLE CONTROLS

Graeme and Gill Riley's company GGR has, since its launch in 1995, established a dominant position in the glass handling market in the UK. GGR offers a wide range of equipment, including spider cranes, telehandlers, pick & carry cranes and glass handling robots. It is also the European master distributor, for Japanese manufacturer Unic and trades as Unic Cranes Europe.

In the early 2010s, the company and its local dealers had begun to see the need to reach under soffits to place window panes. That led to the

development of a luffing jib attachment for Unic's URW-706, and ultimately to the new products on show at this year's Bauma. GGR technical support director, Scott Ainsworth, explains: "Adding reach started with smaller cranes and ran into limits. We needed to get the lifting point slightly higher up, with no restrictions. The first attachment was designed by our German dealer, Mini & Mobile. They developed their own offsettable searcher hook which could be set at minus five degrees, 20, 40, or 60 degrees. That wasn't extendable. At that time, we could only permit this to be used on the 095, because we weren't in a position to extend the software in our safe load indicator to incorporate it into our larger cranes like the 295s, 376s, or 506s."

That changed when Unic adopted Rayco-Wylie's i4500 safe load indicator, replacing the previous 2245 version. "With the 2245, we could put a basic jib, or searcher hook, on the crane, but we couldn't elaborate on it any more than that," adds Ainsworth.

"With the 4500 system we're using now, we can attach jibs, searcher hooks, glass manipulation units, and even steel beam grabs. We can also incorporate slew restriction and variable outriggers."

The change shows again just how central control systems have developed in recent years to cope with new attachments and capabilities on spider cranes. This can be traced in part to changes in European loader crane standards, which, in line with the Machinery Directive, require manufacturers to consider the stability function of the entire machine: both the crane, and the vehicle on which it is mounted. Sensors and load monitoring approaches in the loader crane sector preceded, and arguably led the development of advanced control systems in both roadgoing cranes, and now on spider cranes.



A GGR Unic URW-706 works with a tracked carrier, to position a two tonne circuit breaker at a power station



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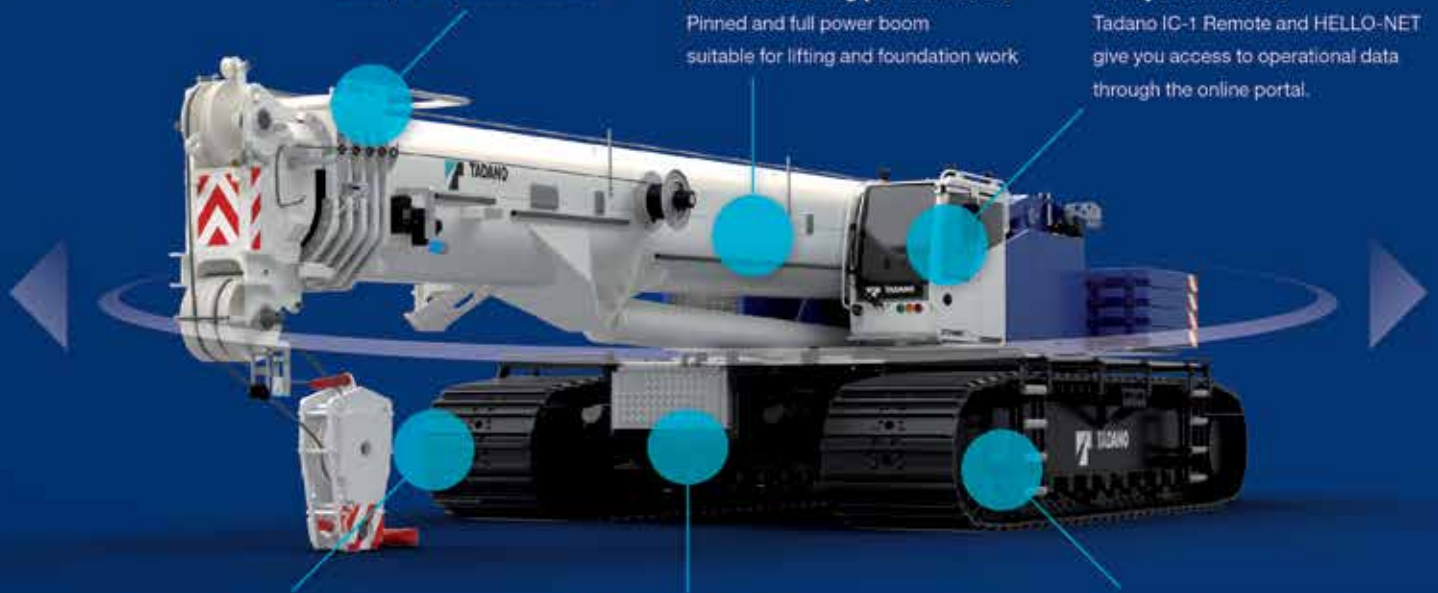
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MANUAL OR HYDRAULIC JIB EXTENSION?

For Unic and GGR, the new RCI allowed for the development of tools like the 700kg luffing jib on the URW 706-2. This is telescoped manually into three set positions but luffs hydraulically. "Generally, in mobile crane operation, you'll set offset and leave it at that," says Ainsworth. "With spider cranes, because of the restricted environment they work in, we still tend to telescope the main boom under load. "With the luffing jib, you can gain altitude without moving to a larger crane, and you've got the option to luff the jib down to increase radius over the structure. It means that once you've cleared the top of a building or structure, and in most cases our customers are working inside, you don't need to add boom length to reach across it. You can telescope out with the main boom, and luff down with the jib."

Unic and GGR now offer jibs with manual extension and manual luffing on all of its cranes, with hydraulic luffing on the URW 706, and larger 10 tonne URW 1006.

For the Japanese manufacturer, the decision

not to offer hydraulic telescoping was based on the need to optimise the crane's capacity. "The added mass of the hydraulic telescoping cylinder in effect takes away from capacity and its luffing capacity," says Ainsworth. "If you can just lock the jib to a set length, and work with it that way, then you've got higher capacity than with a telescoping cylinder inside."

While this approach seems to fit the needs of Unic and GGR customers, the company is well aware of the success competitors have had with their fully hydraulic jibs.

GGR was revealing very little on new machines ahead of Bauma. But Ainsworth was able to explain what to expect. "We have noted the hydraulic telescoping capability on competitor's jibs and that will be the next step forward for us."

The goal of the new machines is to compete on both simplicity and capability. Business development manager Daniel Ezzatvar said: "We've got competitive products, but they're not necessarily like-for-like. We see ourselves more in line with Maeda, than Jekko or Hoeflon. Our cranes are arguably simpler to operate, making them ideal for a rental business. The other cranes

are more technical, more complex, making them more of an end user crane. We're not introducing another Hoeflon, or another Jekko, but we will have an answer to the sorts of application that those units are best suited to."

CLASS DIVISION

Spider cranes were originally developed as simple, compact, machines, able to lift light loads into tight environments. Over the years they have evolved, with the arrival of sophisticated control systems, variable outrigger extensions, new attachments and even variable ballast weights, making it possible to optimise these cranes for more challenging lifts.

This may also require more planning and more experienced operators. The task for manufacturers and distributors will be to offer crane ranges that cope with the different needs, including smaller simpler machines, which can be used safely by less experienced operators, alongside larger or more complex machines that skilled operators can work to their limits. With such operators in short supply, expect further control system evolution, making them simpler to operate as well as quicker and easier to set up.

A NEW PLAYER IN THE MARKET

In September German vacuum lifter company and ex Maeda crane distributor Uplifter was appointed as an SPT spider crane distributor for western Europe. As part of its plan, it immediately announced that while its home market is critical, it also sees the UK market as a key priority, and as reported in the last issue appointed spider and mini crawler crane sales veteran Alan Peck, as UK sales manager.

Peck confirmed at Bauma that he will initially focus on three models - the 2.95 tonne SPT 299, the five tonne SPT 499 and the 10 tonne SPT 1009 - all of which feature a hydraulic telescopic luffing jib.

"The entry model SPT 299 has a 12.5 metre lift height and is priced to sell with radio remote controls as standard," said Peck. "We anticipate the biggest seller will be the five tonne SPT 499 with a lift height of 22 metres which is operated from just two joystick controls. Top of the current three model range is the 10 tonne SPT 1009, however there will be the addition of a seven tonne model in the near future which should give us a good coverage of the sector. When people see them in the metal they will be impressed." ■

Manufacturer	Model	Hook (kg)	Winch (kg)	Boom/with jib (m)	Power	Length (m)	Width (m)	Height (m)	Weight (kg)
Hoeflon	C1e	550	460	4.40/5.60	B	1.86	0.94	1.40	960
Maeda	MC 104C	995	995	5.50	E	2.16	0.60	1.31	1,150
Unic	URW-094	995	995	5.60	P	1.87	0.59	1.29	1,000
Jekko	JF 30	995	500	6.50/8.0	P/E	2.18	0.78	1.75	1,440
Unic	ECO-UNIC 095 CBE (WBE)†	995	995	8.90/10.40	B	2.72	0.69	1.56	2,425
Maeda	MK 1033CW-1	995	820	9.42/11.30	D/E	2.90	0.75	1.96	2,000
Unic	URW-095	995	995	8.80/10.47	P/D/E	2.69	0.60	1.37	1,850
Jekko	SPX 312	1,200	600	7.30/9.80	P/B	2.79	0.78	1.60	1,800
Maeda	MC 174C	1,720	1,720	5.50	P	2.16	0.59	1.30	1,290
Hoeflon	C4(e)	2,350	2,350	9.70/14.60	B	2.95	0.75	1.75	1,900
Unic	URW-245	2,400	2,400	6.30	P	2.15	0.60	1.32	1,500
Jekko	SPX 424	2,400	800	8.50/13.85	D/B	3.17	0.78	1.96	2,080
Jekko	JF 40	2,500	995	7.60/8.50	P/E	2.38	0.78	1.82	1,550
Jekko	SPX 328	2,800	500	10.50/12.80	B	2.95	0.73	1.61	2,300
Maeda	MK3053C	2,800	-	12.0/16.95	D/E/B	3.20	0.78	1.95	-
Maeda	MC 285C-3 (MC 285CB-3)	2,820	2,820	8.70	D/E (B)	2.80	1.47	0.75	1,990
Unic	ECO-UNIC 295 CBE (WBE)	2,900	2,900	8.90/10.40	B	2.72	0.69	1.56	2,425
Jekko	SPX 429	2,900	980	10.50/15.85	D/B	3.56	0.78	1.96	2,080
Unic	URW-295-2	2,900	2,900	10.91/11.70	P/D/E	2.69	0.60	1.38	1,850
Unic	URW-376 (B)	2,900	2,900	16.63/17.33	D/E (B)	4.34	1.30	1.80	3,850
SPT	299	2,950	-	9.50/12.50	E/D	3.50	0.90	1.61	2,810
Maeda	MC 305CB-3	2,980	2,980	12.50	B	4.20	1.28	1.70	3,295
Hoeflon	C6(e)	3,000	3,000	11.50/16.40	B	2.94	0.76	1.86	2,850
Jekko	SPX 532	3,200	800	12.10/17.30	D/B	3.26	0.77	1.96	2,520
Maeda	MC 405C-3	3,830	3,780	16.80/20.70	D/E	4.98	1.38	1.98	5,600
Hoeflon	C10(e)	4,000	4,000	16.30/21.30	D/B	3.93	0.80	1.97	4,400
Unic	URW-547	4,000	4,000	18.20	D/E	4.96	1.40	1.98	5,010
Unic	URW-506-1	4,000	3,000	18.46	D/E	4.87	1.40	2.04	4,840
SPT	499	5,000	-	17.50/22.00	E/D	5.48	1.40	2.00	6,450
Jekko	SPX 650	5,000	4,800	15.40/23.60	D/B	4.48	1.02	2.06	6,430
Unic	URW 706	6,000	6,000	19.50/22.70	D/E	5.62	1.67	2.19	7,920
Unic	URW 706-2	6,000	6,000	19.50/25.90	D/E	5.62	1.67	2.19	8,220
Jekko	SPX 1280	8,000	1,500	19.70/26.70	D	5.85	1.45	2.05	6,900
Maeda	MC 815C	8,090	8,000	19.60/25.50	D/E	5.90	1.67	2.49	9,460
Hoeflon	C30e	9,000	8,000	14.50/22.00	B	3.85	1.20	2.00	5,600
Unic	URW-1006	10,000	10,000	22.80/30.70	D/E	6.06	2.00	2.46	14,000
SPT	1009	10,000	-	22.20/25.00	E/D	6.38	1.78	2.55	12,150
Jekko	JF 365	11,500	6,000	19.00/29.50	D/E	5.30	1.80	2.80	12,300
Jekko	JF 545	15,500	6,000	19.00/32.50	D/E	5.63	1.84	2.90	13,500
Jekko	JF 990	21,000	9,000	23.00/34.20	D/E	6.82	2.15	3.09	21,500

Power E=Plug-in electric, B=Battery, D=Diesel, P=Petrol. † CBE and WBE designate crawlers or wheels.



(L-R) Alan Peck with Uplifter owner Martin Lobinger and Matthias Minich, head of international sales at Bauma