

INTERNATIONAL CRANES AND SPECIALIZED TRANSPORT

Volume 25 ■ Number 6
MARCH 2017

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MARKETPLACE

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I have seen a fair bit of sunshine recently, in the USA, in the UK, and in the industry. At the ConExpo show in Las Vegas, USA, the weather was great and with it so was the mood. An overall positive feeling permeated the year's largest industry gathering. It was great to be there. I was excited to see more new products than I had expected following what I had been led to believe in the run up to the show.

In addition to the proliferation of new products, there were more deals being signed and handover ceremonies at this year's ConExpo than I have seen anywhere else in my 30 years of attending capital equipment trade shows. Coupled with the positive way people were talking about prospects for upcoming projects, it all made for a great show. A short pictorial review of some highlights from the event appears on page 15. More news will follow next month.

While the mood, of course, has the potential to change like the wind, or like the weather in the UK has done in the time it has taken me to write this, some even clearer positivity stands out in this month's news. Rarely, if ever, does this section have so many reports of buyers placing big orders. Both the value and the number of units being sold are impressive here: more than \$30 million in one order for crawler cranes; two lots of 18 units each of all terrain cranes; and more than 100 orders for both hydraulic loader cranes and wind turbine service cranes. News starts on page 6. More similar stories are also appearing in the news section of our web site www.khl.com/cranes

As if all this wasn't enough, there are a couple of calendar dates to look forward to: the SC&RA Annual Conference in the USA and the ESTA Awards of Excellence dinner in the Netherlands. If you are quick there may still be time to sign up for one (or both) of these spectacular events. See: www.scranet.org and www.khl.com/esta for details. An update on the ESTA event appears on page 47.

For those of you interested in tower cranes there is one event that you should still have time to sign up for: the International Tower Cranes conference. It will take place this year in London, UK, on 10 and 11 May. Take a look at www.khl.com/itc for more details.

ALEX DAHM

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ON THE COVER



Specialist contractor Bohnet in Germany using its expertise, plus a Scheuerler trailer and an MAN tractor, to get a 30 metre luxury yacht to a boat show near Düsseldorf. See page 19.

SUBSCRIPTIONS

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HIGHLIGHTS

■ Sales at Terex Cranes for the last quarter of 2016 and for the full year were down by nearly 20 % and further decline is forecast for 2017. Sales were down in 2016 by 19.5 per cent to US\$ 1,274.5 million on the \$ 1,566.5 million figure for 2015. In the fourth quarter of 2016 sales were \$ 327 million, down more than 18 per cent on the \$ 406 million of the same period a year earlier. In outlook John Garrison, Terex Corporation president and CEO, said that he expects the global crane market to remain challenging with a further decline in 2017.

■ Industrial pick and carry crane manufacturer JMG Cranes has launched a new flagship product: the MC580 with battery-electric power. Capable of lifting up to 58 tonnes, the Italian company describes its new MC580 as being both "compact with great performance".

■ Mammoet USA has launched a new Crane Services Division and expanded its fleet to better serve the Gulf Coast region. Mammoet USA's new division, based in St. Gabriel, Louisiana, will focus on plant maintenance, turnarounds, and day market rental projects. To support this, 23 cranes have been added to the company's portfolio.

Large Demag and Grove orders from Sanghvi

Leading Indian crane rental company Sanghvi Movers has signed large orders for new Demag and Grove cranes.

From Terex, Chris Sanghvi, chairman and managing director of Sanghvi Movers, has agreed to buy seven units of the 650 tonne capacity Demag CC 3800-1 lattice boom crawler crane. Sanghvi told *ICST* that this order was worth more than €30 million (US\$ 31.5 million). The deal was signed on 21 February with Steve Filipov, president of Terex Cranes, and Norbert Dudek, who is responsible for Terex Cranes in Asia.

From Manitowoc Sanghvi

has ordered 18 new 300 tonne capacity Grove GMK6300L all terrains. He signed the deal with Jens Ennen, senior vice president of Manitowoc, mobile cranes Europe & Africa, and David Semple, Manitowoc senior vice president, mobile cranes Asia and the Middle East. Deliveries of the six-axle GMK6300L will start in May 2017, Sanghvi said. He said he chose Grove because of the price and good after sales service.

By the time the new Demags have been added to the fleet (between June and September 2017) Sanghvi said he will have the largest fleet of CC 3800-1 and

CC 2800-1 600 tonne capacity class crawler cranes in the world. He has 21 units of the latter model and it will be 12 of the former (five already in the fleet plus the seven new units on order).

Sanghvi Movers has a fleet of approximately 440 cranes, ranging from a capacity of 40 tonnes up to an 800 tonne capacity Liebherr LR 1800 crawler. Sanghvi said the average age of equipment in the fleet is 10 to 12 years. Its composition by manufacturer is roughly as follows: 30 % Liebherr, 30 % Terex, 15 % Kobelco, 15 % Sany, and 10 % Manitowoc.

Faymonville acquires Cometto

Specialized transport equipment manufacturer Faymonville from Luxembourg has acquired Italian manufacturer Cometto.

The deal was signed on 3 March and announced, by Alain Faymonville, proprietor,

on 7 March at the ConExpo construction equipment exhibition in Las Vegas, USA. The transaction value was not disclosed.

Faymonville said that he wants to invest a lot of money

in Cometto. He said he sees synergies between the two companies, for example, in the areas of purchasing and the commercial side. Another benefit will be Cometto's very strong dealer network, Faymonville added, which will greatly enhance the group's coverage as there is very little overlap.

Alain Faymonville, centre of picture, celebrates trailer manufacturer Faymonville's acquisition of Italian specialized transport equipment maker Cometto. Left and right of picture are Alessandro Giordano and Alberto de Stefano, respectively, of Cometto



SPARROWS WINS ORDER FOR 103 CRANES

Aberdeen, Scotland-based Sparrows Group has signed a contract to supply 103 cranes for installation at ScottishPower Renewables' 714 megawatt East Anglia ONE offshore wind farm.

Located off the coast of Suffolk, UK, the wind farm will have the capacity to produce enough electricity to power around 500,000 homes. It should be fully operational by 2020.

The cranes will be designed and manufactured at Sparrows facilities in Aberdeen for Granada Material Handling. A crane will be installed on each of the farm's 102 wind turbines with a further crane used for training purposes.

The contract is Sparrows' biggest ever renewables contract. The cranes, from the offshore wind WindMaster range, are designed for use on offshore wind turbine platforms, with 99 per cent of their parts procured in the UK. Final delivery is scheduled for mid-2018.



Sarens orders 18 Demag ATs

International heavy lift and transport specialist Sarens has ordered 18 new Demag all terrain cranes from Terex Cranes.

The order comprises eight 100 tonne capacity AC 100-4Ls, three 130 tonne AC 130-5s, and seven AC 220-5 models. Out of the 1,500 units in the Belgium-based

company's fleet, around 500 are Terex and Demag cranes.

Commenting on the deal, Ludo Sarens, Sarens president, said, "We already have a number of new Demag all terrain cranes in our fleet. So, from a standardisation point of view, this was a logical choice for us. Besides the operational cost-efficiency of these cranes, we are convinced that these new all terrain cranes provide a good mix of manoeuvrability, boom length, and capacity. Furthermore, the worldwide availability of spare

parts is a big advantage for our Group. Overall, the combination of these factors convinced us to place this significant order."

Steve Filipov, Terex Cranes president, said, "Sarens has been an outstanding customer and valued partner for product development for several decades. They have been involved with new product development on projects like the Boom Booster kit for the CC 8800-1 crawler crane. We are proud to serve them and have them working alongside our dedicated team."

HIGHLIGHT

■ Global manufacturer of lifting and material processing products and services, Terex Corporation, has announced it has completed the sale of 7.45 million Class A shares representing 9.5 % of the total shares outstanding of Finnish crane manufacturer Konecranes Plc, at a price of €34.50 per share. According to Terex Cranes, the total number of shares outstanding includes both Class A and Class B shares but does not include Konecranes' treasury shares. Following the offering, Terex will continue to hold approximately 12.15 million Class B shares, representing approximately 15.5 % of the total shares outstanding of Konecranes.

German crane contractor Ley-Krane chose a 90 tonne capacity Liebherr LTM 1090-4.1 wheeled mobile telescopic crane to install a sluice gate on a dam near Cologne.

A challenge was that the gate had to be reinstalled underwater, at a depth of 20 metres – around half the height of the dam. In addition, the gross load of around 11 tonnes had to be handled with half the available outrigger spread due to the narrow area available on top of the dam. There was a clearance of just two millimetres between the sluice gate and the vertical rails mounted on the dam wall. The sluice gate (measuring more than four metres) was positioned on the dam wall without any problems and let down into the water. The job demanded a high level of precision from the crane and its operator and the underwater installation work was monitored by divers. The Aggertal dam is 50 km east of Cologne and the work follows removal of the submersible sluice gate a year ago and its subsequent refurbishment.

Liebherr wins heavy lift crane contract



How the new 3,000 tonne capacity Liebherr HLC 295000 heavy lift offshore crane will look mounted on Deme's next generation offshore installation vessel, Orion

The maritime crane division of Liebherr, based in Rostock, Germany, has won a contract to supply a 3,000 tonne capacity offshore crane. It is for the Orion, a new wind farm installation and platform decommissioning vessel ordered by Deme from Cosco (QiDong) Offshore, a subsidiary of Cosco Shipping Heavy Industry in China.

The heavy lift HLC 295000 crane is rated to lift its maximum 3,000 tonnes to a radius of more than 50 metres and its lifting height will be more than 170 m, Liebherr said.

Gordon Clark, Liebherr Offshore Cranes sales director, commented, "It is a great honour to work with both Deme and Cosco on such a revolutionary project, and it fits well in to our company strategy. We see a promising future in the heavy lift sector, with growth in both the green energy sector and also offshore decommissioning."

In addition to the main crane, the order also includes two Liebherr RL-K 4200 knuckle boom cranes and an offshore crane simulator. Delivery will be in the first quarter of 2019.

HIAB WINS CRANE ORDER

Loader crane manufacturer Hiab, has signed a contract to supply a minimum of 100 Hiab light-range loader cranes for a leading wind turbine manufacturer in China. The order has a value of approximately €1.5 million (US\$1.6 million) and was received at the end of January 2017. The equipment will be delivered throughout this year.

The loader cranes will primarily be used for lifting service and maintenance parts up to the wind turbines. The agreement also includes training for operators and service personnel. According to Hiab, the offshore wind energy sector is booming, especially in Asia.

Hiab spokesperson, Peter Krimm, commented: "Our focus is to provide customers with a high-performing safe crane and winch concept... the challenge is to work with a winch with a lifting height of about 100 metres in tough and windy offshore conditions."



KHL.COM

With so many events and rapid developments, it is time for a roundup of news on KHL's crane and transport events this year. As programmes are developed and sponsors are added, it is worth checking www.khl.com/events for all the most up-to-date information.

ITC CONFERENCE

At the International Tower Cranes conference, in London on 10 and 11 May, Simon Marr, director of Marr Contracting in Australia, will use his keynote speech to urge the construction industry to think differently about how tower cranes are used on large projects, not just high-rise jobs. He will argue that heavy lift tower cranes can replace other types of lifting equipment traditionally used and drive productivity, cut costs and reduce risks. "In our industry the traditional approach is to build a project around the capabilities of a crane," Marr told *ICST*, "but we've flipped that and instead look at the needs of the project and build the crane solution to suit it. See the full ITC programme at: www.khl.com/itc

WORLD CRANE AND TRANSPORT SUMMIT

Looking ahead to the World Crane and Transport Summit in Amsterdam, Netherlands, on 7 and 8 November, the first speakers have been confirmed. They include senior executives and safety experts from Europe and the USA. A keynote speaker will be Mike Appling, CEO at TNT Crane & Rigging in the USA. The conference will include presentations and round-tables on safety and accident prevention, multi-crane lifts, alternative lifting techniques and wind-turbine projects. See www.khl-wcts.com for more information on this flagship event for the industry.

ALE turbine first in Saudi Arabia

International heavy lift and transport specialist ALE has installed what it claims is the first-ever wind turbine in Saudi Arabia.

Work on the turnkey project started in January 2017. ALE was contracted to transport, erect and install a 2.75 Megawatt wind turbine where the nacelle is 86 metres up and the highest point of a blade is 147 m above ground. The wind farm is in Huraymila, around 80 km north of Riyadh.

Components arrived on a vessel at the Jubail Industrial Port. From there ALE transported them more than 600 km to

Huraymila on conventional trailers and a blade trailer. A particular challenge was the 60 m length of the blades.

On arrival ALE used a 600 tonne capacity Demag CC 2800-1 lattice boom crawler crane assisted by a Terex AC 100-4 all terrain for offloading. ALE has a wind division from South Africa and its team of wind installation technicians erected the turbine and handled the mechanical and electrical installation.

Commenting on the project, Andrew Spink, general manager at ALE in Saudi Arabia, said, "We are proud to be responsible

for installing Saudi Arabia's first wind turbine. This is a major milestone, not only in the country's renewable involvement but it also showcases our capabilities in offering the full TCI package to internationally-recognised standards."

It is the first of three renewable energy contracts ALE has won in Saudi Arabia. The others are for component transport on solar energy power plants.



The 60 metre long wind turbine blades were transported more than 600km

Synthetic rope on Lambertsson AT

Lambertsson Kran is the first buyer of a Grove GMK4100L-1 all terrain mobile crane with Samson K-100 synthetic fibre hoist rope.

The Swedish company chose the 100 tonne capacity Grove for its compact footprint and reach, its "best-in-class" load charts, and narrow (2.55 metre) width. Its two hoists will have K-100 synthetic fibre hoist rope from Samson. Lambertsson Kran said it was intrigued by the rope's potential to increase return on investment, namely its lower

maintenance requirements (such as a lack of greasing or lubing), environmental benefits (such as a lack of oil usage) and its ease of handling in reeving.

Claes Jakobsson, region manager at Lambertsson Kran, said, "With K-100, we can reduce the weight of the crane and carry more counterweight, which will help us as we primarily use the Grove as a taxi crane performing lifts in the city of Malmö. K-100 will also make it easier for the operator to reeve the rope on the jib and hook blocks."

HIGHLIGHTS

■ The Palfinger Group has acquired its Danish dealer, Palfinger Danmark, from Stiholt Holding. The agreement sees retention of all employees and the continuation of the sales and service network. Jens Kristoffersen will continue as CEO of Palfinger Danmark, which employs around 20 staff at two locations.

■ The first of several Lift & Move USA events in 2017 saw All Crane Rental host around 250 high school and college students from the Tampa area of Florida. Lift & Move USA is organised by the Specialized Carriers & Rigging Association (SC&RA), crane operator certification body NCCCO, publisher KHL Group, and the SC&R Foundation. For details see www.liftandmoveUSA.com

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Integrated load cells from Modulift

UK-based lifting engineering specialist Modulift has launched Active Link - a new lifting beam end unit system with integrated



load cell. According to Modulift, Active Link measures the load at both ends of a spreader beam and the data is transmitted to a computer.

The company says Active Link is compatible with the existing range of Modulift spreader beams. The new link replaces the standard drop link component and offers time, cost and weight savings because measurement technology doesn't have to be sourced as an additional rigging tool. Integrating the load cell into the drop link minimises the rigging height and does not require more headroom than standard.

Modulift worked with UK load cell equipment specialist Straightpoint to integrate its strain gauge technology into the new link.

USED EQUIPMENT TEST DRIVE

Start-up company Equippo, an online marketplace for used heavy equipment from the USA and Europe, has launched a money-back guarantee and free return shipping for all construction equipment purchased through its website.

The company says the guarantee will give customers the opportunity to test machines extensively for five days on site. At the end of this time, if they are not satisfied, they can return the equipment, no matter where in the world they are located, and receive a full refund. Equippo hopes that this initiative will encourage more buyers to purchase used machinery without the fear of encountering hidden damage or dishonest sellers. Equippo says all machines are inspected by independent experts so potential buyers know exactly what technical shape the machine is in. According to Equippo-founder, Michael Rohmeder, "We are making online trade with used construction equipment transparent, simple and safe."



ICST welcomes new deputy editor Christian Shelton to the magazine. Christian brings with him almost 20 years of publishing and marketing experience. After attending ConExpo in just his first few weeks on the job, it may have been a baptism of fire but it has ignited a latent passion for cranes. Christian commented, "I am thrilled to

be part of this exciting industry. Everyone I've met so far has been very friendly and welcoming and to see all the cranes assembled at ConExpo was a spectacle to behold."



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It's been a solid
five weeks
for Chinese
companies, which
saw their share
prices rise.
JOE MALONE
reports on
weeks 4 to 9

Period of inconsistency

Six companies experienced a rise in their share prices, five saw decreases, and one remained the same between weeks 4 and 9 in the *IC* Share Index for March 2017.

Such inconsistencies were also seen in the exchange rates during the five week period, as the dollar was up against the British Pound (1.29 %) and the Chinese Yuan (0.41 %) but fell against the Euro (0.60 %) and Japanese Yen (2.05 %).

Things were more positive in the major stock markets, however, as the Dow Jones grew 4.05 %. The Dow has risen substantially since Trump was announced as President.

The FTSE 100 has also increased over the five weeks. A rise of 3.57 % continues its strong comeback. The Nikkei 225 also grew 0.28 % during the same period and, as a result of the stock market increase, the *IC* Share Index grew 3.7 %.

The largest change to a manufacturer's share price came from XCMG; its shares rose 19.05 % between weeks 4 and 9. XCMG announced it would invest US\$150 million to establish new production units in India. Also, the first of the so-called "intelligent manufacturing facilities" is expected to be in operation this year. The factory will produce machines for German firm, Schwing Stetter, in which XCMG

owns a majority stake.

Meanwhile, there was a healthy rise of 9.57 % to Palfinger's share price over the five-week period. The company recently acquired its Danish dealer, Palfinger Danmark, from Stiholt Holding. The purchase agreement includes the retention of all employees and the continuation of the sales and service network. It also confirmed that Jens Kristoffersen would continue as CEO at Palfinger Danmark.

Liugong's share price, meanwhile, rose 8.64 %. A new president was recently announced at the company. Huang Haibo succeeds Yu Chuanfen, who will take on the role of VP with LiuGong Group.

There was a fall of 11.46 % to Manitowoc Group's share price over the five weeks. It reported fourth-quarter 2016 net sales of \$378.2 million versus \$543.1 million in the fourth quarter of 2015. It also reported a net loss of \$33.4 million in the fourth quarter of 2016 compared with a net income of \$43.5 million the previous corresponding quarter.

Konecranes also saw a fall in its share price, this time by 8.02 %. Terex Corporation has recently completed the sale of 7.45 million Class A shares in Konecranes. It was 9.5 % of the total shares outstanding and they were sold at €34.50 per share, according to the company.

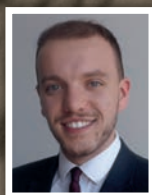
The five week period proved a mixed bag for companies in the *IC* Share Index, along with the exchange rates.

MARCH *IC* SHARE INDEX

STOCK	CURRENCY	PRICE AT START	PRICE AT END	PRICE CHANGE	% CHANGE	PRICE 12 MTHS AGO	12 MTH % CHANGE
<i>IC</i> Share Index*		51.74	53.65	1.92	3.70	46.66	14.98
Legacy <i>IC</i> Share Index**		323.89	321.66	-2.23	-0.69	253.38	26.95
Dow Jones Industrial Average		20101	20915	814	4.05	16514	26.65
FTSE 100		7157	7412	256	3.57	5993	23.68
Nikkei 225		19467	19522	54	0.28	17698	10.30
Hitachi Construction Machinery	YEN	2780	2910	130	4.68	1758	65.53
Konecranes	€	37.05	34.08	-2.97	-8.02	21.10	61.52
Kobe Steel	YEN	1136	1069	-67	-5.90	123	769.11
Liugong	CNY	8.10	8.80	0.70	8.64	7.50	17.33
Manitowoc Cranes	US\$	6.98	6.18	-0.80	-11.46	14.20	-56.48
Palfinger	€	31.98	35.04	3.06	9.57	25.35	38.22
Sany Heavy Industry	CNY	6.88	7.42	0.54	7.85	6.00	23.67
Tadano	YEN	1492	1477	-15	-1.01	1281	15.30
Terex	US\$	32.98	31.15	-1.83	-5.55	17.27	80.37
XCMG	CNY	3.36	4.00	0.64	19.05	3.73	7.24
Yongmao Holding	SGD	0.25	0.25	0.00	0.00	0.15	66.67
Zoomlion	CNY	4.55	4.84	0.29	6.37	5.04	-3.97

* *IC* Share Index, 1 Jan 2011 = 100

**Legacy *IC* Share Index, end April 2002 (week 17) = 100



ABOUT THE AUTHOR
JOE MALONE is editor of
ICST sister publication
International Rental News

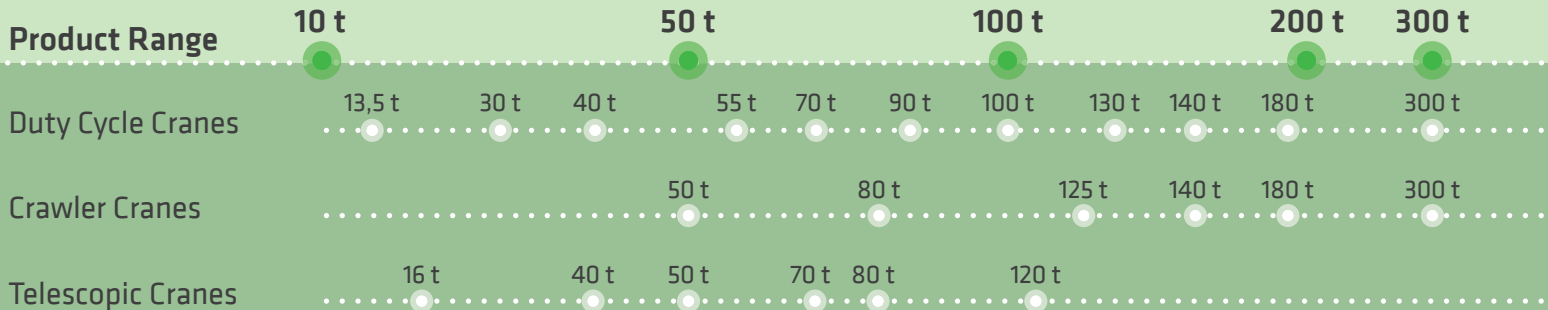
EXCHANGE RATES – VALUE OF US\$

CURRENCY	VALUE AT START	VALUE AT END	VALUE CHANGE	% CHANGE	VALUE 12 MTHS AGO	12 MTH % CHANGE
CNY	6.879	6.907	0.0284	0.41	6.06	13.97
€	0.9355	0.9299	-0.0056	-0.60	0.7376	26.08
Yen	115.11	112.74	-2.36	-2.05	102.51	9.99
UK£	0.7974	0.8077	0.0103	1.29	0.6119	32.01

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Going for gold



A positive mood was further boosted by the warm sunshine at this year's ConExpo construction equipment exhibition in Las Vegas, USA. ICST reports some initial highlights

Buyers from around world were attracted by a record number of exhibitors at this year's ConExpo construction equipment show in Las Vegas, USA, in early March.

The organisers of ConExpo 2017 reported that, over five days, a total of 128,000 people attended the construction equipment show which had a record number of (more than 2,800) exhibitors. Of the visitors 20 percent were international, from approximately 150 countries.

The general consensus among manufacturers and customers ICST spoke to was that the mood at the show was positive, with many reporting a tangible feeling of economic optimism. The Gold Lot was

the hub of the international crane activity. Manufacturers announced a good number of sales and potential new leads. This is backed up by the organiser's figures, which show that general US buyer attendance increased 16 percent (%) over the last show, in 2014, and total buyer attendance improved by almost 8 %.

"I think there was a noticeable difference in the attendees at this show, and the difference was their optimism," said Michael Haberman, 2017 Association of Equipment Manufacturers (AEM) chair. "Optimism was on display throughout the show, and the traffic was excellent."

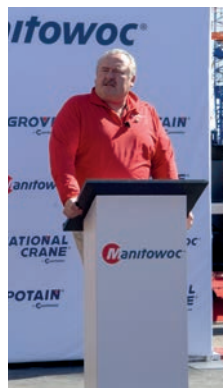
The following is a few of the highlights from the show and more will follow.



Liebherr's new LRT 1090-2.1 rough terrain crane. It is the 90 tonne capacity model, smaller brother to the 100 tonne LRT 1100-2.1. Both were on display and generated strong interest, especially with their Cummins engines



Is it a boom truck or is it a truck crane? It's both! The new National NTC55 combines the best of both worlds, manufacturer Manitowoc said

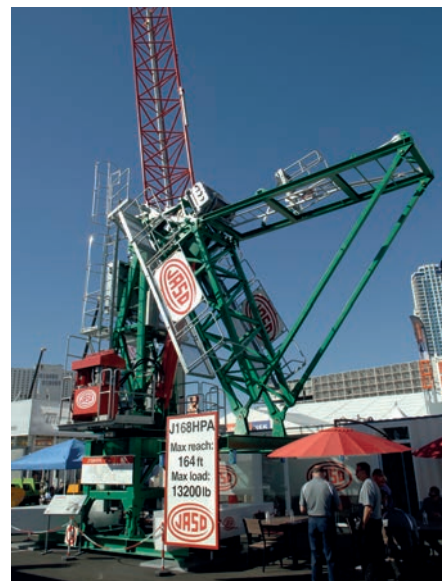


Among other things, Barry Pennypacker, Manitowoc Cranes president, said that Manitowoc is an independent company and that it will remain so



Elliott's model 1800 straight boom loader crane mounted behind the cab and ahead of the fifth wheel coupling on a three-axle tractor

The LCL310 luffing jib tower crane from Linden Comansa. The Spanish manufacturer said its crane helped raise awareness among North American customers who did not realise it offers this type of product



Jaso showed the interesting design of its J168HPA hydraulic luffing jib tower crane. With one of its target markets being the USA, talk at the booth soon turned towards the impending launch of a range-topping 700 tonne-metre class luffer, the J780PA. Capacity will be 75 tonnes and the maximum boom length will be 70 m. It will sit on a 2 metre mast. A 300 hp winch will give a hoisting speed of 310 m/min, the Spanish manufacturer said



Lift Systems was out in force with its hydraulic telescopic heavy lifting gantry systems



Link-Belt's new range-topping 250 tonne capacity TCC-2500 telescopic boom crawler crane was an imposing sight. This one was destined for leading US rental house All Crane Rental



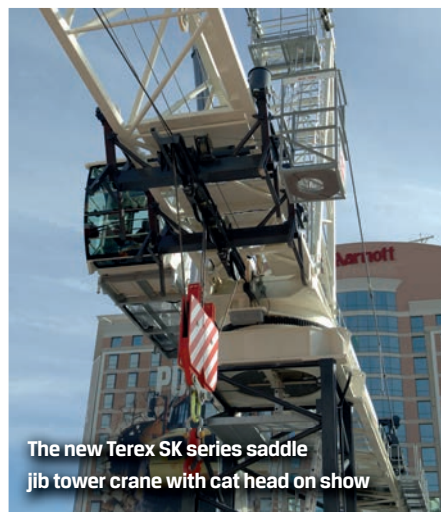
XCMG's 40 US ton (36 tonne) capacity model XCT40U truck-mounted crane has a 43 m, five section boom. Its maximum length is 59.6 m



Unveiling the 100 tonne capacity Grove TMS9000-2 truck crane, one of several on offer



Harrison Hipple, Manitowoc Cranes regional business manager, explained in detail the new 100 ton capacity Grove TMS9000-2 truck crane



The new Terex SK series saddle jib tower crane with cat head on show



Scheuerle's dual lane Highway Giant with Power Booster module can be folded and loaded up on a trailer for empty return legs



The new Maniowoc Grove GRT655L rough terrain crane was a surprise launch at ConExpo 2017



The Bigge Crane & Rigging team out in force at the Kobelco booth celebrating an order for 14 new crawler cranes from the Japanese manufacturer. The order included 110 US ton capacity CK1100G-2, 160 ton CK1600G-2 and 275 ton CK2750G-2 models. With this order Bigge has bought 111 new cranes from Kobelco since it became a dealer in 2007



An AT-style double cab for the driver is a distinctive feature of the new Terex T 110, a 100 tonne capacity truck crane

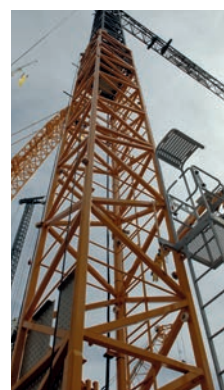


Tadano's new 120 US ton (110 tonne) capacity rough terrain on two axles, the GR-1200XL. It has a 56 metre boom and up to 17.7 metres of extensions can be added. Its (8.65 m long)

carrier is designed to be as short as possible for easy transport and good manoeuvrability



The fixed counterweight version of the Maniowoc MLC300 (as sold to Maxim Crane Works) generated a lot of interest at the show



Liebherr's new 81 K.1 fast erecting crane found an early adopter in buyer US tower crane specialist Morrow Equipment

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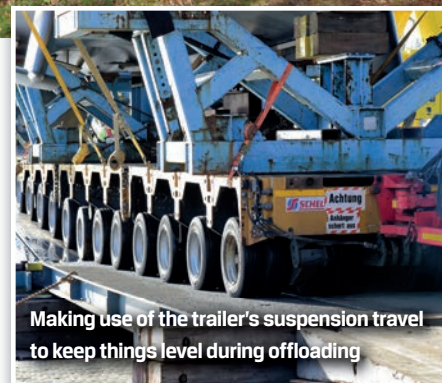
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Show boat

Bohnet's twelve-line Scheuerle Intercombi modular trailer and 6 x 4 MAN tractor



Each time the Boot Düsseldorf boat show is held in Germany many vessels, large and small, make a spectacular sight as they are transported over land for part of their journey to the exhibition. Specialist contractor Bohnet took up the challenge this year. STEFAN JUNG reports



Making use of the trailer's suspension travel to keep things level during offloading



Offloading smaller boats, right, before the Princess

Land Germany might not be the first place that comes to mind as a venue for a boat show but so it has been for many years and Boot 2017 in January was no exception. With so many large and ungainly loads to be brought in to the exhibition venue at Düsseldorf, near Cologne, preparations for the show start early.

This story follows the journey of a UK-built Princess 30M, a 30 metre motor yacht that is 7 metres wide and weighs around 100 tonnes. Engine options on this luxury vessel include a pair of MTU diesels each with a power output of more than 2,000 hp. The yacht arrived on a coaster at the port of Rotterdam in the Netherlands. On 30 December 2016 it was loaded by crane onto a 12-axle Scheuerle Intercombi modular trailer from German specialized transport company Bohnet.

Bohnet, working with Hebo Marine, loaded a Hebo pontoon with equipment and several »

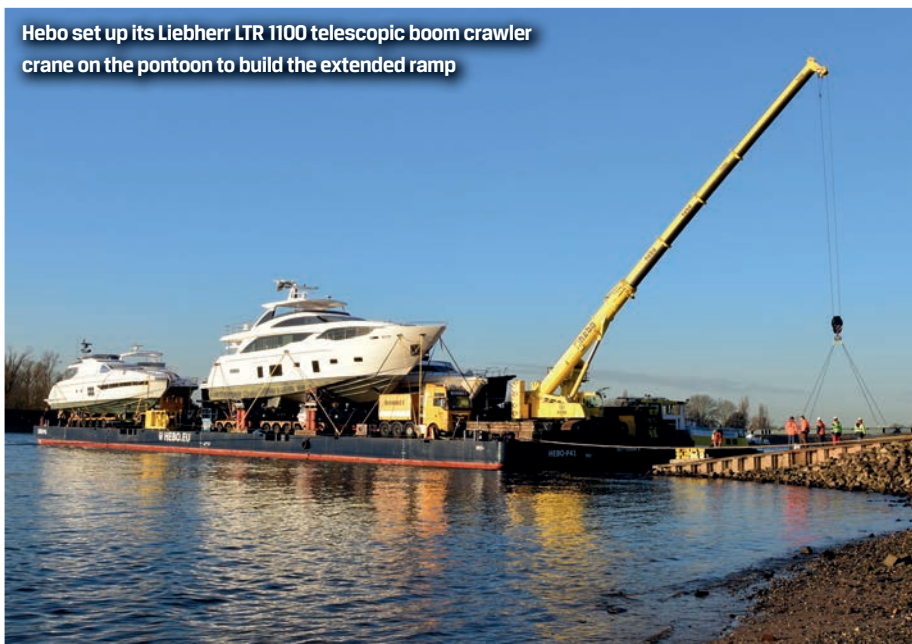
boats, all destined for the show. The pontoon sailed on the River Rhine from Rotterdam to Düsseldorf. In the morning of 5 January the pontoon reached the loading ramp in Düsseldorf near the exhibition grounds.

Low water meant that a longer ramp had to be built from the pontoon to the land. It was done with the help of a 100-tonne capacity Liebherr LTR 1100 crawler crane from Hebo Marine. After four hours the ramp was ready and the first two smaller yachts were taken off the pontoon by truck. After the pontoon was ballasted with water, Bohnet could begin its preparations.

Driver M. Schmucker from Bohnet started the engine of his new MAN 41.640 6 x 4 truck tractor with ballast box. He began slowly with the roll-off from the pontoon. The MAN had no problem pulling the 12 Scheuerle axle lines and its vast load. The loaded dimensions were 30.5 m long x 7 m wide x 9.37 m high. All-up weight was 110 tonnes.

Thanks to the axle adjustment on the Scheuerle modules the yacht always stayed in balance. In the course of the transport along the route, a gradient had to be overcome. To do that a Volvo truck was briefly employed to push. After a journey of about one kilometre the exhibition ground was reached without any problems and the Princess was unloaded inside the exhibition Hall using three cranes.

Hebo set up its Liebherr LTR 1100 telescopic boom crawler crane on the pontoon to build the extended ramp



Low water meant that an extended ramp was built to offload from the pontoon



Off the pontoon and on its way



MAN 41.640 6 x 4 truck tractor with ballast box

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Reality check

As technology progressively permeates all aspects of our professional lives, with cranes and all forms of specialized transport alike becoming ever more reliant on cutting-edge technology, effective operator training is imperative.

CHRISTIAN SHELTON reports

Although technology is usually designed to make the operator's job easier, it can add a level of complexity that never used to exist. Today's crane operators need to be tech-savvy in addition to having all the other traditional skills required. Technology also has the potential to psychologically remove the operator from the dangers that are inherent in operating large, complex machinery. Fortunately, it can also be used in our favour, opening up avenues of operator training that have never been possible before.

This brave new world of operator training was strikingly evident at the recent ConExpo construction machinery trade show in Las Vegas, USA, where major crane manufacturers and specialist tech companies were displaying their own crane simulators. Liebherr, for example, calls its simulator-based training LiSIM. Different versions are available for various Liebherr crawler and tower cranes. The company says these simulators are designed to train operators in using specific crane models under authentic work conditions, such as different weather conditions and different times of the day and night. Virtual environments from actual

construction sites can also be replicated. More than 20 simulators are already in use worldwide, Liebherr says. On the company's ConExpo stand, visitors could experience the 710 HC-L tower crane simulator. Using virtual reality goggles they could 'fly' around the crane, looking at parts of it close-up; this could potentially increase a trainee's understanding of how a crane works as a whole.

On Terex's stand at ConExpo another simulator was also attracting attention. Terex's Simulift system enabled users to 'operate' a Demag AC 250 using four screen displays that simulate the windows of the crane's cab. Terex says that by using the Simulift, students can train operating large-sized cranes in situations that would be too dangerous for a training exercise in a real crane, such as a hoist rope break. Simulift even requires the operator to set the crane's outriggers.

Working together

"Our simulator can provide training for operators and signal persons simultaneously. Because of that, we can evaluate the applicants for operator positions in a faster, cheaper, and safer manner," says Ricardo Neto, services manager for Terex Cranes in Latin America – a region in which Terex invested more than R\$1 million (US\$ 322,000) and six months of time rolling the system out.

Terex's system was developed by Swedish simulator specialist Oryx Simulations. Oryx claims its training simulators "replicate real world physics" to train new operators on how to use the machines or help experienced operators to increase their skills. The company has also developed a simulator management system. This lets instructors track operators' progress inside the simulator in detail,

making the entire training process more efficient. Instructors can create their own training programme and decide the order the operator should attempt certain exercises in and when it is time for them to advance to the next level. A continual stream of detailed statistics and information about their progress is provided.

The use of screen-centric simulator systems for training, however, is not without limitations, according to US crane, rigging and lift-planning training specialist, Industrial Training International (ITI). As a result of market research it conducted before investing in simulation-based training, ITI decided not to buy existing technology. Zack Parnell, ITI President, explains, "We didn't believe existing simulators would deliver enough value to our customers at the costs required mainly due to high price points and the inability to process enough trainees in a given year because of general immobility [of the simulators]."

In short, ITI found the high cost of crane simulators led to too few being purchased, resulting in too few trainees being able to access them. ITI also identified generally poor user experiences, such as unrealistic simulations, on the smaller, more mobile units. As a result, in August 2016, it embarked on developing its own crane and rigging simulations in partnership with advanced

simulator and game-based training specialist, Serious Labs.



Left: Terex's Simulift operator training system
Right: ITI's virtual reality mobile crane simulator



Liebherr says its new virtual reality application enables users to experience cranes in "a completely new dimension"

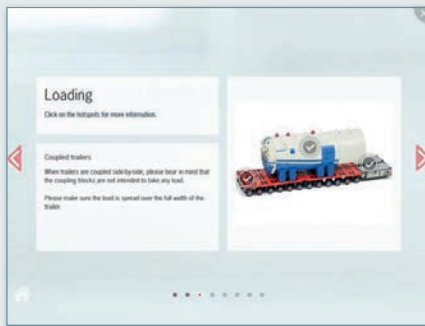
Virtual reality

The end result, the VR Mobile Crane Simulator, was launched at ConExpo. It utilises a virtual reality headset - the cost of which became commercially viable in 2016 with the rise of Oculus Rift and other headset manufacturers. ITI claims its system offers low up-front capital costs, a good user experience, and subscription pricing based on actual usage. Two versions of the virtual reality system are now available: one uses an operator seat on a motion base that simulates crane cab movement; the other is a mobile desktop crane simulator. ITI says both offer complete immersion in a lifelike virtual world.

SPMT SAFETY TRAINING AVAILABLE ANYTIME, ANYWHERE

Employees at Italian heavy-lift specialist Fagioli will benefit from a digital learning solution designed to improve safety when using self-propelled modular transporters (SPMTs).

Digital learning solutions company, BeOne Development from the Netherlands, has created a digital learning solution that enables Fagioli employees to learn whenever they want and wherever they want, accessible from all devices. The company says that no such training for the safe use of SPMT currently exists in the market, and its tech will ultimately be available to any operators active in the sector. By making the SPMT training programme accessible anywhere, anytime, BeOne Development says working and learning can be integrated and that it can help an organisation achieve a basic standardised level of awareness in the company.



It offers more than 400 scenarios and free updates for subscribers will be available as new content is added to ITI's simulator library. The Tadano GR-1000XL and the Link-Belt 218 HSL lattice boom crawler are two of the first crane models available on ITI's system.

Despite the ever-evolving advance of training technology, however, technophobes need not despair. Simulators need not be used at the expense of traditional teaching; rather they are being adopted as a

supplementary tool within a wider training context that embraces new and tried-and-tested techniques. For example, ITI's training solutions encompass traditional hands-on learning opportunities under the guidance of instructors. Books and reference materials remain popular. Then there's Terex's busy US training centre where new and established training techniques are employed. Thus the role of technology looks set not to take over training but rather to enrich it.



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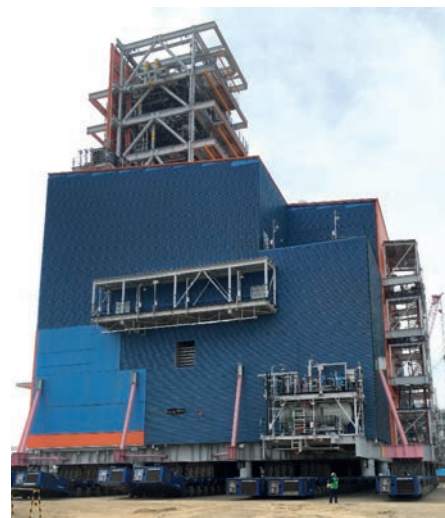
Moving 7,000 tonne loads on Tii SPMT

A total of 280 axle lines of self propelled modular transporter (SPMT) from Scheuerle, part of the Tii Group, were used by Chinese logistics service provider Zhejiang Lida to transport components weighing up to 7,000 tonnes. The components are being moved from their place of manufacture to barges a kilometre away. From there, they will be shipped to the Bowanenkovo gas condensate field on the Russian peninsula of Jamal.

A number of challenges are faced. The route between where the components were manufactured and the waiting barges is a dusty gravel track, while components themselves, due to their size, have a high

centre of gravity. Scheuerle claims a number of reasons why its SPMT is suitable for this job. First, thorough surface treatment, sealing and testing means that the modular transporters are resistant to salt-laden air, dust and moisture. Second, Scheuerle said, thanks to decades of development, the transporters' electronic steering system ensures safe transport of heavy loads, even ones with high centres of gravity.

"A smooth and trouble-free operation is absolute top priority," commented Ralf Grützmaier, Tii Sales area manager, "The clients err on the side of caution. For this transportation order, for example, there are very clear guidelines: only European equipment to be used under the load."



Scheuerle said this is because delays would be extremely costly as they would affect the overall project.

The next phase will involve components weighing up to 10,000 tonnes. This would not be a problem for Scheuerle's modular transporter, the company claims.

DEAD WEIGHT DITCHED ON NEW TRAILER



French transport and service provider, AltéAd, has taken ownership of the latest modular platform trailer from transportation specialist, the Tii Group, to assist it in the transportation of wind turbines.

According to the Tii Group, its new modular platform trailer, the Scheuerle-Kamag K 25 M, is a lightweight modular transport solution designed to offer more payload per axle. The vehicle manufacturer also says the new model facilitates approval processes, particularly in Europe, where axle load restrictions apply. "Less dead weight means more payload and a simplified approval process," said Bernd Schwengsbier, Tii Sales CEO.

The platform trailer can also be easily coupled with either Tii's heavy-duty Scheuerle-Kamag K25 H modular transporter or competitor vehicles. The two and six-axle modules can also be supplied as a 'split' version that can be separated.

"Growing competitive pressure, axle load limitations and infrastructure problems have led to an increased demand for lightweight modular transport solutions in all load ranges across Europe," said Tii.

New Volvo first for Blackmores

UK-based international haulage firm, Blackmores Machinery Haulage, has bought its first new truck in more than 30 years of business.

The new vehicle is a 500 hp Volvo FH 8 x 2 tridem rear-steer. Its 44 tonne drawbar is a custom solution to the firm's requirements for a highly manoeuvrable truck that comes in under four metres in height.

According to Volvo, the FH tridem has a chassis height of just 1,100 mm. This was key to achieving the four-metre overall height Blackmores needs for work in mainland Europe. A low chassis height and the tridem rear-steer configuration were equally important for some UK sites where tight access and low working heights present a major challenge for conventional multi-axle rigid trucks.

The vehicle's body superstructure, built by CCH of Helstering in the Netherlands,

is a 'cartridge system'. This means that the demountable curtain assembly can be removed in just 30 minutes. The curtains, made by NetCap, are mounted on a roller system that sits on a rail. The rail has been reduced in size from the standard 180 mm to just 100 mm.

The internal height of the curtainside body is 2.8 metres, allowing most machines to be carried within the four-metre height restriction. Further space-saving was achieved by using low-profile single tyres on all axles and a demountable headboard.

The body is mounted on a chassis-length superstructure extending from the back of the cab. This provides a rigid base for the whole body and crane. Lashing eyes are placed every metre. The crane, from Denmark, is a rear-mounted HMF 6020 with an electronic control system that allows the stabilisers to be used safely without fully extending them.



Goldhofer's winning combo

International construction company Vinci is using three split-combination PST/SL 18 (P1+1/2) heavy-duty transport modules from international transport equipment manufacturer Goldhofer in the construction of a new freeway on Réunion Island in the Indian Ocean.

The centrepiece of the project is a 5,600 metre-long viaduct, which is being built to replace having to negotiate dangerous sections of the existing coastal road. The viaduct will have a total of 36 main piers, each weighing 700 tonnes. These are being

transported one kilometre from the concrete plant to the port. From there they will be loaded onto the floating platform and taken to the construction site.

Vinci also needs to transport 1,386 precast viaduct segments, each weighing between 210 and 285 tonnes, approximately 15 km from the concrete plant onto the finished length of viaduct. It is estimated that by the end of the project 1,386 journeys will have been made over a three-year period for the viaduct segments alone.

According to Goldhofer, a key reason

why Vinci opted to use its heavy-duty split-combination modules was their flexibility. For example, the width of the decks of the modules can be increased by up to 50 percent. This means they can easily accommodate the 36 piers – which would normally call for two parallel modules – yet they also can be made narrow enough to deal with vehicle width restrictions encountered while transporting the viaduct segments.

Work will last several months and requires two of the four lanes of the existing highway to be shut at night so that the transporters can use the closed lanes to travel between the concrete plant and the viaduct. As such, the self-propelled hydrostatically driven vehicles have two 490 hp power packs to travel at high enough speed to complete the journey within the given time frame. The vehicles have also been fitted with fully-enclosed operator cabins.

A video showing an overview of the project (in French) is on Youtube, [\[link\]](#)



The flexibility of Goldhofer's split-combination PST/SL 18 heavy-duty modules was key to their appeal for Vinci

Faymonville offers new 250 tonne girder bridge trailer

GirderMax is European manufacturer Faymonville's new girder bridge for transporting super heavy cargo within legal axle load limits on public roads. Transformers, gas turbines and generators are typical loads for this type of beam system.

The 250 tonne capacity bridge can be combined with all Faymonville modular platform trailers; the DualMax, ModulMax and CombiMax, the manufacturer said. Its length can be adapted to the load and the number of axle lines needed. To raise and lower it there is a 2 metre hydraulic lift and the widening system allows adjustment from 2.75 to 7.9 m.

To run in the USA the GirderMax is designed for 2 x 12 dual lane trailers in West Coast design but it can be shortened with fewer axle lines. It has cross-pendulum

stabilisation and a self-tracking device for the steering system of the rear trailer, Faymonville said. Wireless remote control is another feature to help make it easier to use. [\[link\]](#)



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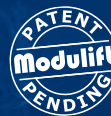
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Flexible friends

The popularity of telescopic crawler cranes is on the rise, as evidenced by the many new models on the market. The sector's not crawling, it's positively flying.

CHRISTIAN SHELTON reports

Telescopic crawler cranes are becoming an increasingly common sight. It's their versatility and flexibility that are making them such an attractive proposition. With telescopic booms that allow access to places barred to their bigger crane brethren, the ability to move with a load on the hook, fast setup times, a high degree of mobility, and a road-friendly nature, this adaptability is making them a prized piece of machinery.

This attribute is emphasised by Florian Attenhauser, spokesperson for German crane manufacturer Sennebogen. "Telescopic cranes offer excellent flexibility on site thanks to the fact they can travel and telescope while under load," he says. He specifically identifies four key benefits telecrawlers bring: ease of transportation; short rigging times; increased ease of access; and time-savings thanks to the efficiency of an extendable and retractable boom. "Thanks to their small dimensions, most of our telescopic crawler cranes can be transported using a normal flatbed trailer," Attenhauser adds.

"Short rigging times are the second benefit," he continues. "Telecrawlers can simply be unloaded and they are ready to go. They don't need flat, even ground or stabilising before the crane can be erected. Thanks to the robust crawler tracks, the cranes can stand safely on their own and work up to an inclination of four degrees. This makes them easy to move around a job site. Long assembly times due to boom erection, the use of auxiliary cranes, and extra ground stabilisation can all be negated.

"Thanks to their small dimensions, telescopic cranes can also be set up with little space requirements. Machines can even drive into buildings, underneath bridges, and in tunnels thanks to their flexible boom system, which can be varied quickly and easily."



From its central position the Liebherr telescopic crawler crane can reach every point of the 15 metre reinforced concrete wall. Once built, the telecrawler will be lifted out of the structure

Further flexibility is possible thanks to the various attachments available, enabling the crane to be used for a wide range of applications. Fly booms and boom extension are also available and, if desired, Sennebogen's own line of telecrawlers can carry a working platform.

Multiple applications

This flexibility means telecrawlers can be used for a host of applications in a range of environments around the world. For example, a Liebherr LTR 1220 is playing a key role in a cutting-edge energy generation

and storage facility construction project to the north-east of Baden-Württemberg in Germany. This project is being executed by international construction company Max Bögl Group and involves the construction of a pump accumulator power plant with four wind turbines, each planted in the centre of a circular water basin. Once complete the water basin will have a diameter of 63 metres and a height of around 15 metres.

Using some lateral thinking, the Max Bögl Group realised that the flexibility of Liebherr's LTR 1220 telecrawler made it particularly suitable for this job. The LTR 1220 has a telescopic boom with a reach of up to 60 metres, a maximum radius, with extensions, of 88 metres, a capacity of 220 tonnes, and a maximum hoist height of 101 m. This, combined with the crane's small footprint, meant that Max Bögl positioned it in the centre of the circular foundation from where it only needs to move a few metres to reach every point of the water basin. In addition, the LTR 1220 can move with 12-tonne reinforced concrete components attached to it, thus streamlining efficiency so that construction work can progress more quickly.

A key challenge to this approach, however, is that, once built, the LTR 1220 will be effectively trapped in the basin. Max Bögl Group's solution is to use another Liebherr mobile crane to lift the telecrawler out of the basin, after its tracks have been removed.

The popularity of this flexibility that telecrawlers bring has not gone unnoticed



Sennebogen says its telecrawlers are ready to work on slopes of up to 4 degrees, eliminating the need for time-consuming set-up procedures

The new Grove GHC30, launched by Manitowoc at the ConExpo show, is the smallest in the company's GHC line. It claims that its compact dimensions offer exceptional manoeuvrability and efficiency for a wide range of applications



by crane manufacturers. For example, crane manufacturer Manitowoc says that in response to customer feedback it has just launched its Grove GHC30 at the recent ConExpo trade show in Las Vegas. The new 30 ton-capacity model is the smallest in the GHC line and Manitowoc says its compact dimensions offer exceptional manoeuvrability and efficiency for a wide range of applications.

The new model will, as with previous models in the series, be offered exclusively in North and Latin America as part of a long-term strategic partnership between Manitowoc and Sennebogen.

According to John Bair, Manitowoc product manager for the GHC range, "Customers indicated that a crane with a smaller footprint would help them increase manoeuvrability and efficiency on many job sites."

The GHC30 offers the ability to pick-and-carry at 100 percent of its load chart on inclinations up to four degrees, and it can swing loads 360 degrees. It has a compact footprint of 10.6 x 3 x 3 metres, and a tail swing radius of 3.3 metres. This means that it can work on job sites with reduced access and in tighter working quarters that require precise movement.

Grove's GHC30 has a three-section 25.2 metre telescoping boom and operators can handle a wide range of lifts at various radii without setting up on outriggers in the way traditional hydraulic boom cranes have to, thus saving time.

Efficient working

For further efficiency, the crane can be transported in one load on the back of a truck and requires minimal setup. Attachments available include an offsettable, swing away boom extension in lengths from 6.5 to 13

metres. With this fitted the maximum tip height is 40.2 metres. In addition, a two-person work platform, a boom-mounted hydraulic auger attachment, and a pole claw are also available. According to Manitowoc, this will be particularly useful for companies working on power line projects, as they will be able to drill holes with the auger and then use the claw to lift and position the poles with only one crane. This helps contractors keep overall project costs to a minimum as they no longer need multiple pieces of equipment.

The company also says that the GHC30's crawler tracks mean it can easily navigate tough conditions, for example, swampy or mountainous terrain. The track side frames can be hydraulically extended and retracted to offer three track spans with lifting capabilities at each span. This, Manitowoc says, offers added versatility enabling users to find the best combination of crane width and lifting capacity.

This ability to tackle tough terrain is an important plus point for telecrawlers and one of the reasons why Manitowoc's more established models, for example, the Grove GHC75, have proved so popular. This is illustrated by a recent park restoration project in Rogers, Arkansas, USA. The work was carried out by site development and paving specialist Arco Excavation & Paving and involved building an elevated retaining wall. A Grove GHC75 was used, this time as a pile driver. According to Manitowoc, conditions were terrible, as the piles had to be driven into the wet, uneven soil of a creek bed with only a 10 m radius for contractors to work in. Mike Snook, who worked for Arco as the foreman on the project, had never worked with a telescoping crawler crane before. After discovering the GHC75, though, he says he was confident that he could handle the pile-driving without using a much larger crane, saving time and money on the job. "I've got 20 years of excavation experience," he says, "but driving piles with a telescoping crawler crane was relatively new to me. I went to the rental yard thinking I would be coming



This Grove GHC75 was used as a pile driver in tough conditions, driving piles into the wet, uneven soil of a creek bed with only a 30-foot (10 metre) radius for contractors to work in

back with a larger lattice boom crane but the Grove GHC75 was better-suited for this type of project. It had the crawler tracks to manoeuvre with and a compact footprint that could fit on this job site."

Snook reports that the GHC75's rated capacity limiter with graphical display was easy to use, providing all the necessary operating parameters and advanced, real-time diagnostics. When combined with the crane's load chart, Snook says he found that he could quickly set up his lifts with even more confidence than usual. "Even after reviewing the load chart to prepare for each lift, this crane had more to teach me as I went along," he explains. "It told me what I could and couldn't pick up in real-time and assisted me in making adjustments before each lift. I was trying to avoid lifting at 70 percent of my load, and the in-cab display made it easier for me to stay between 40 and 60 percent."

Snook claims the crane's manoeuvrability

»



Access under the bridge was one of the key reasons Malcolm Drilling opted to use a Link-Belt TCC-1100 in this bridge construction project across the Colorado River, in the USA


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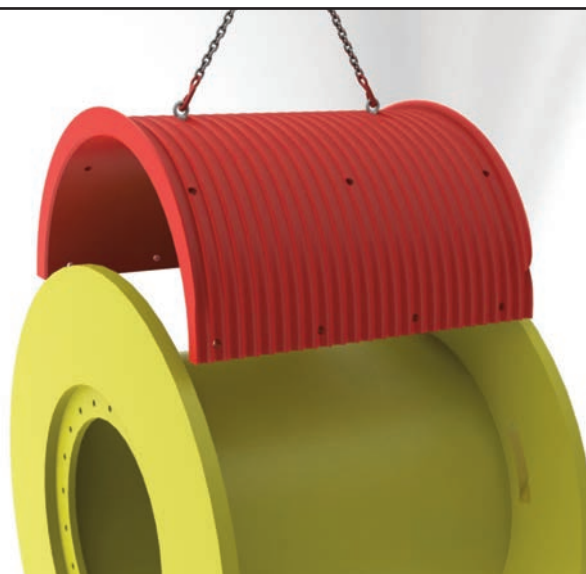
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played an equally important role as its controls. The three-position, hydraulically extendable undercarriage - which adjusts the width of the crawler's tracks by moving them inward or outward from the crane's centre - provided maximum flexibility on the job, enabling him to perform heavy lifts in a small, uneven space. In addition, the crane's pick-and-carry capabilities enabled the telecrawler to quickly move around on the job site since no outriggers were needed. "We were working in very tight quarters on that creek bed," Snook continues. "We also had to contend with cars driving past all day long so there was no room to set up the outriggers you find on a more traditional hydraulic crane. With the GHC75 I was able to drive right into place, spread the tracks out all the way and perform the lift."

Another US riverside project in which a site's tight clearances led to the use of a telecrawler is the construction of the new Grand Avenue Bridge in Glenwood Springs, Colorado, USA. Once completed the new bridge will cross the Colorado River, the Union Pacific Railroad, and four lanes of Interstate 70.

Washington-based Malcolm Drilling was responsible for drilling caissons for the new five-span welded steel box girder bridge, which will replace the previous bridge. This involved drilling a shaft, lowering a rebar cage into the shaft, and then filling it with concrete each day. In total, 26 caissons were drilled and filled to hold up pier caps for the new bridge. Concrete piers for the eventual bridge superstructure will eventually rest above the 16.4-metre-deep caissons.

Malcolm Drilling says it spent considerable time and effort studying various crane options before it decided to use a telecrawler. It opted for the TCC-1100 from US crane

manufacturer Link-Belt, to lift and manoeuvre a 56,000 pound (25,401.1 kg) oscillator underneath the 36 foot (11 m) clearance of the existing bridge.

Captivating capabilities

According to Link-Belt, the TCC-1100's boom tip, load capacity and height specifications were integral to the company's decision to use this crane. "We fell in love with the capabilities of the TCC-1100 and what it could do for this type of work," says Todd Williams, Malcolm Drilling superintendent. "It has the mobility to go where you need it to and is able to telescope the boom in and out. For what we do, it's perfect."

High praise indeed. Looking to the future, however, Link-Belt is not one to rest on its laurels. It launched the 250 US ton (230 tonne) capacity TCC-2500 this month. The company describes it as the highest capacity telecrawler available in the market. Yet, even on this scale, flexibility remains a key selling point. "The TCC-2500's job site flexibility is a huge benefit," Scott Knight, Link-Belt product manager, lattice and telescopic crawler cranes, says. "The TCC-2500 can lift, reach, and travel like a large fixed boom lattice crawler while also having the ability to retract the boom and reduce its overall profile as job site conditions and environment requires. It is well positioned to lead telecrawlers into a whole new arena of jobsite opportunities."

So there are exciting times ahead in the telecrawler sector as end users' appetite for these flexible friends continues apace, leading to crane manufacturers evolving more new variants to satisfy the market. And with the machines' ability to perform multiple roles in demanding environments, they will become an increasingly important weapon in the construction manager's arsenal. ■

BRITISH ANTARCTIC SURVEY SELECTS SENNEBOGEN DUO

UK-based equipment sales, servicing and rental company, AGD Equipment supplied two Sennebogen 643R telescopic crawler cranes to the British Antarctic Survey (BAS) for use at the South Pole. The high-profile project involves relocating the Halley Research Station so that it isn't cut-off from the ice shelf by a previously dormant ice chasm that has now opened up.

According to Robert Law, AGD managing director, BAS had seen a Sennebogen crane

being utilised by another research station in Antarctica and determined that it would be the perfect solution to help it uncouple and relocate the research station's modules to a new location 23 km away. Commenting on the project, AGD says, "We are proud to be associated with the relocation of Halley Research Station in the South Pole by way of supplying two brand-new Sennebogen 643R, 40 tonne telescopic crawler cranes to BAS for the project."



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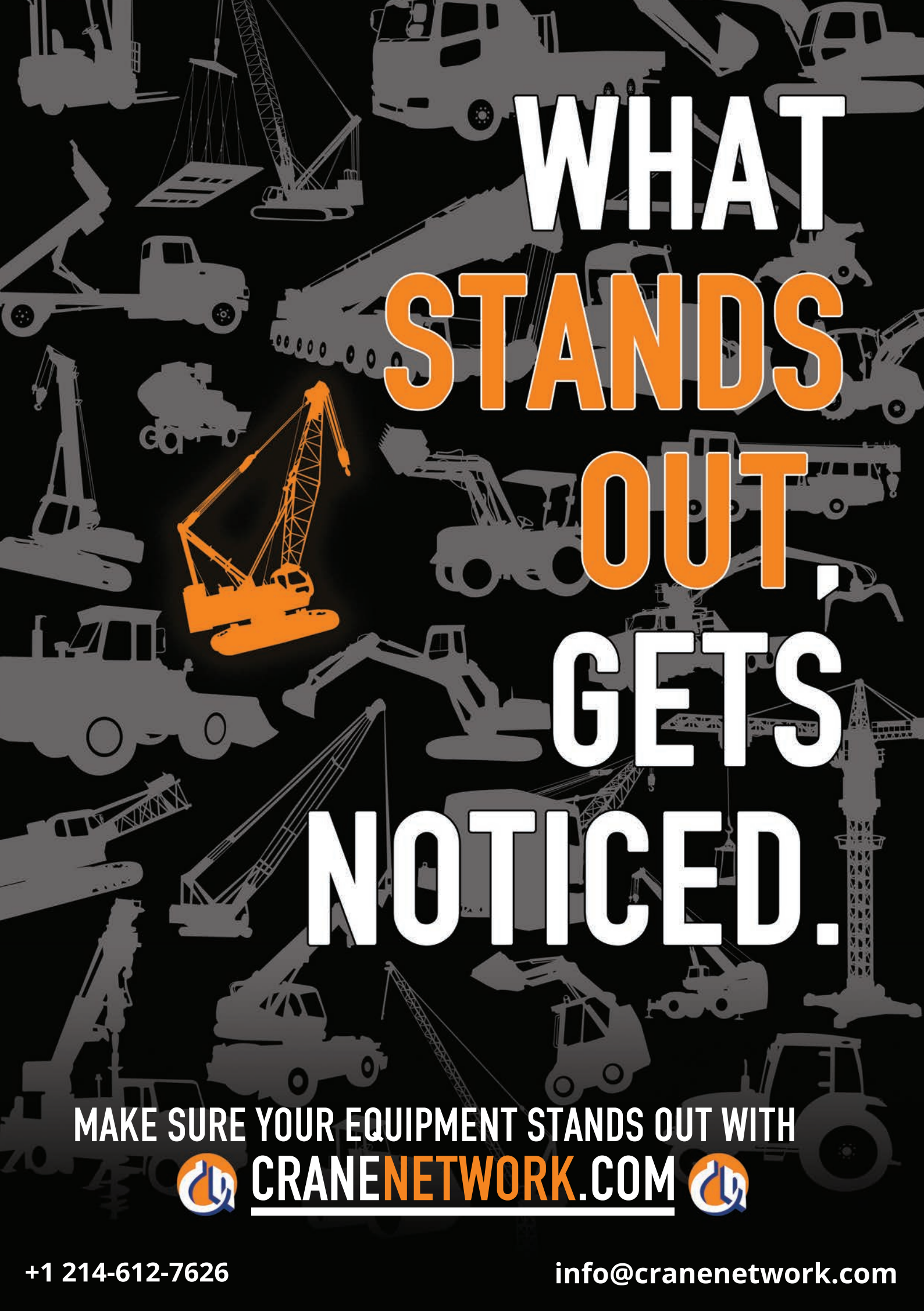
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The background is a dense collage of various construction equipment silhouettes in shades of gray. These include cranes of different types (tower, crawler, truck-mounted), trucks, excavators, and other heavy machinery. One crane in the center-left is highlighted in a bright orange color.

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Take the high road

Manufacturers of truck cranes explain to KATHERINE WEIR about their latest models and how they are striving to make them as cost-effective as possible

It is an exciting time in the truck crane market with two of the biggest manufacturers announcing new models ahead of the ConExpo show in Las Vegas, early March. Truck cranes are ideal for placing equipment, steel erection, equipment maintenance, concrete work and prefabricated building construction.

Crane giant Terex announced the release of its 100 tonne (110 US ton) capacity T 110, said by the manufacturer to be a "top-performing crane in the 100-110 tonne class". The crane has a 60 metre main boom and a 84 m maximum tip height with jib. The X-pattern outriggers provide a stiff lifting platform while reducing the crane's weight for easier transport.

The T 110 comes with the IC-1 control system – helpful during set up, making it safer and easier to use – as well as electro-proportional joysticks and 18 tonnes of self-removing counterweight.

Dave Frerking, truck crane engineering director at Terex Cranes, says, "A purpose-built chassis is designed to support the crane operation, from the ground up. This provides customers with excellent lifting capabilities while maintaining compactness and rigidity to handle heavier loads."

"Truck cranes with a purpose-built chassis allow integration of standard components, from the engine to the tyres, which facilitates maintenance and helps with maintenance costs, comparable with commercial carriers."

Terex says that the main market for its new model, as with the majority of its truck crane fleet, is North America – a solid, long-

Manitowoc has released the 100 tonne capacity TMS9000-2 truck crane to replace the TMS9000E



The new TMS series model from Manitowoc's Grove brand has a 51.6 m six-section Megaform boom that uses the company's twin-lock pinning system

term trend for Terex. The T 110 is said by Frerking to cater for customers who are looking for a strong load chart but do not need all terrain capabilities.

For USA-based Manitowoc, a 'next generation' truck crane has been announced for its Grove division. The TMS9000-2 follows the mantra of 'lighter, longer and stronger' and is a 100 tonne (115 US ton) capacity crane, similar to the new Terex model.

Improvements on previous models include a lighter chassis that "increases roadability" and helps the company's customers to meet North American gross vehicle weight requirements. It is 363 kilogrammes lighter than its predecessor, the TMS9000E, and its reduced gross vehicle weight gives a wider range of flexibility in carrying counterweight, cribbing and other items.

The Grove has a 51.6 metre six-section Megaform boom with twin-lock pinning system. Its improved reach is to allow customers to complete a wider range of applications, all from a compact chassis, with a width of 2.6 m and a length of 13.4 m. The TMS9000-2 has manual or hydraulic

swingaways, along with additional inserts, to provide further reach options.

Manitowoc says that the truck crane is the strongest four-axle truck crane on the market with the boom and chassis being stronger than on previous models.

To make sure Manitowoc designed a truck crane that met its customers' needs, the company involved them from the beginning of the design process, as Harrison Hipple, product manager for truck-mounted cranes at Manitowoc, explains, "The Grove TMS9000-2 represents a significant advance in truck crane power and flexibility. We know for a fact



that customers are eager to have this new crane join their fleets because they have been with us from the beginning, helping us design a crane that will have a real impact on their own profitability."

Also fitted on the new Grove is parent company Manitowoc's Crane Control System (CCS), now seen on many of the company's cranes of different types and supplied on all new models. A series of cameras is also mounted on the cranes to assist operators while driving and operating the crane.

Spoiled for choice

USA-based Link-Belt's newest addition is the HTC-86110, released at the end of 2015. The company says that this model has become one of its top sellers because of improvements made over the crane's predecessor – the HTC-86100.

The 110 US ton (100 tonne) capacity 86110 has a 50 metre boom that Link-Belt says "outreaches truck crane competition and challenges the European-built all terrain cranes in its class". Maximum main boom tip height is 52.6 metres. There is no greasing to do on this boom as the telescoping sections of the six-section pin and latch sections run on Teflon (polytetrafluoroethylene) impregnated wear pads.

The Link-Belt has a 17.6 m on-board fly that has four offset positions of 2°, 15°, 30° and 45°, and what the manufacturer

describes as an innovative approach for erecting and stowing. At the Bauma, Munich, exhibition in 2016, Link-Belt introduced an all-wheel steering version of the 86110 named the HTT-86110. Differences between the HTC and HTT are that it has rear steerable axles with super single tyres instead of conventional axles with dual tyres.

Regarding road regulations and engine exhaust emissions, Rick Curnutte, Link-Belt product manager, telescopic truck and all-terrain cranes, says, "Every emissions mandate poses a challenge of finding new ways to nullify the weight increases that result from additional components used to accomplish the emission standard. Since transportation regulations have changed very little, we have to find clever ways to maintain the gross weight, and maintain weight balance on the axles."

Link-Belt says that it holds the largest market share in the North American truck crane market, and for 2017 it expects to see a steady market with nominal growth.

Cutting costs

One of the most important factors when buying a new truck crane is how cost-effective it is during ownership and through its entire life cycle.

Frerking at Terex says, "Truck cranes typically have a simpler drive train and suspension layout compared to AT cranes. They do give up some off-road capability but the simpler design leads to reduced maintenance and operational costs over the life of the crane.

"Truck cranes are also designed for higher road speeds common in the United States. Terex truck cranes are designed to maintain a speed of 105 km/h.

The smaller classes of truck crane tend to have a much simpler design overall than similar sized AT cranes. As they approach the 100 tonne level, the

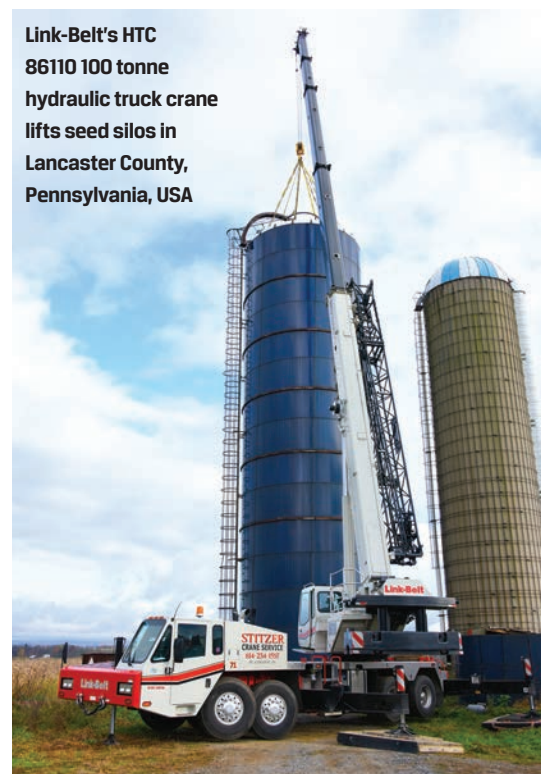


Terex's new 100 tonne T110 truck crane unveiled at the ConExpo show in Las Vegas in March 2017. Unlike other US-market truck cranes, the Terex T110 has a two-seat driver cabin for moving between jobs



Link-Belt HTC 86110 on show at ConExpo 2017 in Bragg colours

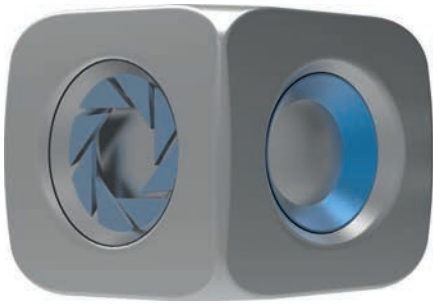
Link-Belt's HTC 86110 100 tonne hydraulic truck crane lifts seed silos in Lancaster County, Pennsylvania, USA



sophistication between truck cranes and ATs starts to become much more similar, but most of the running gear components are common with heavy Class 8 trucks, which also helps to reduce costs."

Truck cranes are best known for doing 'taxi crane' work, which means that they are expected to work on their own and without support vehicles to perform multiple jobs each day. Link-Belt believes that its product line lives up to that challenge.

Curnutte says, "The carrier engine intentionally delivers more than enough power to get to a job quickly. The transport configuration saves time and money getting to each job, and even during set up and tear down. The transmission, suspension, axles, wheels, and even tyres are all shared components from the commercial truck industry so replacement parts are readily available and cost-effective."



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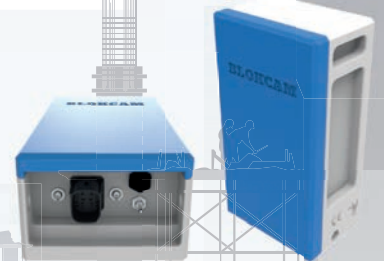
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We calculate the IC50 figure by adding together the maximum load moment rating, in tonne-metres, of all mobile and crawler cranes in your fleet on 1 May 2017. Simply fill out the IC50 form over the page. There is also a form available to download at www.khl.com. If you would like to send us a list of the cranes in your fleet, which would be helpful, please include the make, model, type, capacity and number of units.

If you have any questions regarding the form or require help with representing tonne-metres, please contact the editor, Alex Dahm, by telephone on: +44 (0)1892 786206 or, by e-mail at: alex.dahm@khl.com or deputy editor, Christian Shelton by telephone on: +44 (0)1892 786208 or, by email at: christian.shelton@khl.com

EDITOR'S IC50 NOTES

1. All IC Index figures should be given as a maximum load moment rating in tonne-metres.
2. Tower cranes are not included in the IC Index for crawler and wheeled mobile cranes. Please ensure that there are no figures for this equipment in your calculations – if you have tower cranes please request an IC Tower Index entry form.
3. Alternative lifting equipment is no longer included in the IC Index. Please ensure that there are no figures for this equipment in your calculations.
4. Figures in the IC Index for crawler and wheeled mobile cranes should include an allowance for any super lift attachments that you own.
5. The IC Index should include all cranes that are in your fleet as at 1 May this year. Do not include cranes that you have ordered but that have not yet been delivered.
6. To help illustrate the IC50 editorial in the magazine you could include some photographs, perhaps showing your cranes in action that will be considered for publication.

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IC50 CRANES 2017

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If you have any questions, please do not hesitate to contact the team at *International Cranes and Specialized Transport*.

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e-mail address

Company web site

IC50 MOBILE CRANES

Number of wheeled mobile cranes Total tonne-metre rating

Number of crawler cranes Total tonne-metre rating

Total IC Index * (tonne-metres)

Make and model of largest crane

Lifting capacity of largest crane in metric tonnes

Average age, in years, of the equipment in your fleet

Number of depots Number of employees

Scope of operation ☐ local ☐ national ☐ continental ☐ worldwide

Annual sales, in US\$, from crane-related activity

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Don't crack under pressure

In this, the last article for the time being on ground pressure,

MARCO VAN DAAL focuses on crawler cranes

This is the last article in the series about ground pressure. No other topic has been covered this extensively in *The Knowledge* series. Ground pressure is one of the most critical, undervalued, misunderstood and controversial topics in our industry. It is important to understand what ground pressure is, how it is developed and how its maximum value changes when the parameters of a lift, or transport, changes. And... in case not all parameters are known (and this happens more often than one realises), it is equally important to be able to make a justified judgement so that the ground can be prepared for, or protected against, excessive ground pressure loads.

After having covered ground pressure under hydraulic platform transporters and cranes on outriggers, this article covers ground pressure crawler cranes. As stated in last month's article, this article follows Method 2.

METHOD 1: Determine the weight distribution of each of the two centres of gravity (CoG) both for the fixed and rotating parts, and add up the results to arrive at the total weight per outrigger. This is the method used in last month's article.

METHOD 2: Determine the combined CoG of

the two CoGs (fixed and rotating part) before calculating the weight distribution. This method is used in this article.

At first glance one might think that the calculation of weight distribution is easier for crawler cranes than for cranes on outriggers as there are four outriggers and only two crawlers. This can be deceiving. Indeed, there are only two crawlers and determining the load on each of them, conveniently called the Heavy Crawler and the Light Crawler, is a straight forward calculation. However, the way this load dissipates into the soil below the crawlers is what makes it quite a bit more difficult as this is subjected to load moments due to the offset of the combined CoG of the carrier, upper part and load.

The best way to show this is with a few sample calculations. Consider Figure 1 which shows a crawler crane with the upper body rotated 90 degrees from the crawlers.

We recognise three CoGs in this example.

- 1 The one that is shown in the centre is the CoG of the fixed lower part or carrier. This one is located (for this exercise) exactly in the centre of rotation (i.e. the centre of the slew ring).
- 2 The one that is shown near the crawler (in the upper part of the figure) is the CoG of

FIGURE 2



the upper part and includes boom, rigging, load, hook block and so on.

- 3 The remaining one is the 'combined CoG' (CoG_{tot}) of the entire crane with load. As you can see, this CoG is 820 mm (2'-9.5") from the centre of rotation.

NOTE: When talking about crawler cranes the term 'fixed lower part' is less applicable as crawler cranes can 'walk' or 'crawl' with a load. The term 'carrier' is more applicable and will be used for the remainder of this article.

Other important information about the dimensions in Figure 1 is:

- The distance between the centrelines of the crawlers (TD) is 5,880 mm (19'-3.5")
- The length of the crawlers (TL) is 7,500 mm (24'-7.3")
- The width of the crawlers (w) is 1,220 mm (4'-0")

Information on weight is:

- Weight of the carrier is 47.6 tons
- Weight of the upper part is 141.6 tons
- Weight of the load is 36.3 tons
- Total weight is (47.6 + 141.6 + 36.3) 225.5 tons

Lift example 1

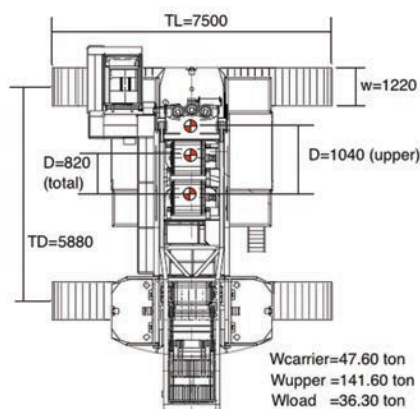
In this situation, with the upper part rotated 90 degrees (angle α) from the crawler direction, the crawler at the top of the figure is the Heavy Crawler, the other one is the Light Crawler.

ABOUT THE AUTHOR



MARCO VAN DAAL has been in the heavy lift and transport industry since 1993. He started at Mammoet and later with Fagioli from Italy, both leading companies in the industry. His 20-year-plus experience extends to five continents and more than 55 countries. His book *The Art of Heavy Transport*, is available at: www.khl-infostore.com/books. Van Daal has a passion for sharing knowledge and holds training seminars around the world.

FIGURE 1



The following formulae can now be applied:

$$\begin{aligned} \text{Load}_{\text{Heavy Crawler}} &= W_{\text{tot}} / 2 + (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 225.5 / 2 + (225.5 * 0.82 * \sin 90) / 5.88 \\ &= 144.2 \text{ ton} \end{aligned}$$

$$\begin{aligned} \text{Load}_{\text{Light Crawler}} &= W_{\text{tot}} / 2 - (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 225.5 / 2 - (225.5 * 0.82 * \sin 90) / 5.88 \\ &= 81.3 \text{ ton} \end{aligned}$$

A quick check shows that the Heavy Crawler + Light Crawler = 144.2 + 81.3 = 225.5 ton [OK!]

With the upper part rotated 90 degrees from the crawler direction, the shape of the ground pressure diagram underneath each of the crawlers is rectangular, see Figure 2, and the ground pressure can be determined by dividing each crawler load by the crawler foot print (length * width = TL * w).

The ground pressure is now:

$$\begin{aligned} \text{Ground pressure}_{\text{Heavy Crawler}} &= \text{Load}_{\text{Heavy Crawler}} / (\text{TL} * w) \\ &= 144.2 / (7.5 * 1.22) = 15.76 \text{ ton/m}^2 \end{aligned}$$

$$\begin{aligned} \text{Ground pressure}_{\text{Light Crawler}} &= \text{Load}_{\text{Light Crawler}} / (\text{TL} * w) \\ &= 81.3 / (7.5 * 1.22) = 8.88 \text{ ton/m}^2 \end{aligned}$$

The ground preparation or matting has to be such that it can withstand the loads as determined above.

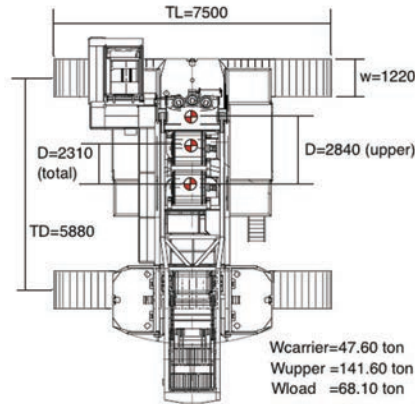
Lift example 2

For the second example it is assumed that angle $\alpha=0$ degrees. This load case is also called an 'over the front' lift.

$$\begin{aligned} \text{Load}_{\text{Heavy Crawler}} &= W_{\text{tot}} / 2 + (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 225.5 / 2 + (225.5 * 0.82 * \sin 0) / 5.88 \\ &= 112.8 \text{ ton} \end{aligned}$$

$$\begin{aligned} \text{Load}_{\text{Light Crawler}} &= W_{\text{tot}} / 2 - (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 225.5 / 2 - (225.5 * 0.82 * \sin 0) / 5.88 \\ &= 112.8 \text{ ton} \end{aligned}$$

FIGURE 4



A quick check shows that the Heavy Crawler + Light Crawler = 112.8 + 112.8 = 225.6 ton [OK!]

This result is not surprising, as the lift takes place over the front, so both crawlers are loaded equally. The shape of the ground pressure diagram, however, is no longer a rectangle, see Figure 3. It is no longer a matter of dividing the crawler load by the footprint. A new term has to be brought into the equation, the 'eccentricity' or 'e'. The eccentricity determines the length of the track that carries weight. The more load one lifts over the front (obviously within the capacity chart) the more load the front end of the crawlers carry and the less load the rear end of the tracks carry, to the extent that the rear end of the tracks carry no load at all.

The eccentricity 'e' is calculated as:

$$\begin{aligned} e &= (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \cos \alpha) / W_{\text{tot}} \\ &= (225.5 * 0.82 * \cos 0) / 225.5 \\ &= 0.82 \text{ metres (2'-9.5")} \end{aligned}$$

The bearing length 'L' of the crawlers can now be determined;

$$\begin{aligned} L &= 3 * (\text{TL}/2 - e) \\ &= 3 * (7.5/2 - 0.82) \\ &= 8.79 \text{ metre (28'-10")} \end{aligned}$$

The fact that 'L' is longer than the length of the crawlers means that the crawlers carry load over their full length and that the ground pressure diagram has a trapezium shape, see Figure 3.

Each crawler carries the highest load at the front end and the lowest load at the rear end.

Here is how to calculate the ground pressures caused by these loads.

$$\begin{aligned} \text{Ground pressure}_{\text{max load}} &= (\text{Load}_{\text{Heavy Crawler}} / (W * \text{TL})) * (1 + (6 * e) / \text{TL}) \\ &= (112.8 / (1.22 * 7.5)) * (1 + (6 * 0.82) / 7.5) \\ &= 20.4 \text{ ton/m}^2 \end{aligned}$$

$$\begin{aligned} \text{Ground pressure}_{\text{min load}} &= (\text{Load}_{\text{Heavy Crawler}} / (W * \text{TL})) * (1 - (6 * e) / \text{TL}) \\ &= (112.8 / (1.22 * 7.5)) * (1 - (6 * 0.82) / 7.5) \\ &= 4.2 \text{ ton/m}^2 \end{aligned}$$

NOTE: Since the lift is performed over the front these values apply to each crawler.

Lift example 3

For this example it is assumed that the load increases from 36.3 ton to 68.1 ton while lifting 'over the front'. Figure 4 indicates that the load has increased and that the location of the CoGs has been changed. The total weight is now (47.6 + 141.6 + 68.1) 257.3 ton.

What is the effect of this load increase on the ground pressure?

$$\begin{aligned} \text{Load}_{\text{Heavy Crawler}} &= W_{\text{tot}} / 2 + (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 257.3 / 2 + (257.3 * 2.31 * \sin 0) / 5.88 \\ &= 128.7 \text{ ton} \end{aligned}$$

$$\begin{aligned} \text{Load}_{\text{Light Crawler}} &= W_{\text{tot}} / 2 - (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD} \\ &= 257.3 / 2 - (257.3 * 2.31 * \sin 0) / 5.88 \\ &= 128.7 \text{ ton} \end{aligned}$$

A quick check shows that the Heavy Crawler + Light Crawler = 128.7 + 128.7 = 257.4 ton [OK!]

The eccentricity 'e' is calculated as:

$$\begin{aligned} e &= (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \cos \alpha) / W_{\text{tot}} \\ &= (257.3 * 2.31 * \cos 0) / 257.3 \\ &= 2.31 \text{ metre (7'-7")} \end{aligned}$$

The bearing length 'L' of the crawlers can now be determined:

$$\begin{aligned} L &= 3 * (\text{TL}/2 - e) \\ &= 3 * (7.5/2 - 2.31) \\ &= 4.32 \text{ metre (14'-2")} \end{aligned}$$

FIGURE 3



FIGURE 5



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The fact that 'L' is shorter than the length of the crawlers means that the crawlers carry load over less than their full length and that the ground pressure diagram now has a triangular shape, see Figure 5.

For this reason, there is no need to calculate the ground pressure at the rear end of the crawlers as this is zero. There is, however, a need to calculate the ground pressure at the front of the crawlers. Looking at the ground pressure diagram this load has increased considerably.

$$\text{Ground pressure}_{\text{max load}} = (2 * \text{Load}_{\text{Heavy Crawler}} / (w * L))$$

$$= (2 * 128.7 / (1.22 * 4.32))$$

$$= 48.9 \text{ ton/m}^2$$

Lift example 4

For the last example the crane slews to an angle of $\alpha=25$ degrees, see Figure 6. The calculation becomes a bit more extensive now. Figure 6 reveals that the Heavy Crawler is subjected to a higher loading at the front end. The calculations below will show this.

$$\text{Load}_{\text{Heavy Crawler}} = W_{\text{tot}} / 2 + (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD}$$

$$= 257.3 / 2 + (257.3 * 2.31 * \sin 25) / 5.88$$

$$= 171.4 \text{ ton}$$

$$\text{Load}_{\text{Light Crawler}} = W_{\text{tot}} / 2 - (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \sin \alpha) / \text{TD}$$

$$= 257.3 / 2 - (257.3 * 2.31 * \sin 25) / 5.88$$

$$= 85.9 \text{ ton}$$

A quick check shows that the Heavy Crawler + Light Crawler = 171.4 + 85.9 = 257.3 ton [OK!]

The eccentricity 'e' is calculated as:

$$e = (W_{\text{tot}} * \text{CoG}_{\text{tot}} * \cos \alpha) / W_{\text{tot}}$$

$$= (257.3 * 2.31 * \cos 25) / 257.3$$

$$= 2.1 \text{ metre (6'-10")}$$

The bearing length 'L' of the crawlers can now be determined:

$$L = 3 * (TL/2 - e)$$

$$= 3 * (7.5/2 - 2.1)$$

$$= 4.95 \text{ mtr (16'-2.9")}$$

As before, since 'L' is shorter than the length of the crawlers, the load is not carried over the full length of the crawlers but only over length 'L'. Figure 6 confirms this.

Below is the ground pressure at the front end of each crawler.

For the Heavy Crawler:

$$\text{Ground pressure}_{\text{max load}} = (2 * \text{Load}_{\text{Heavy Crawler}} / (w * L))$$

$$= (2 * 171.4 / (1.22 * 4.95))$$

$$= 56.6 \text{ ton/m}^2$$

For the Light Crawler:

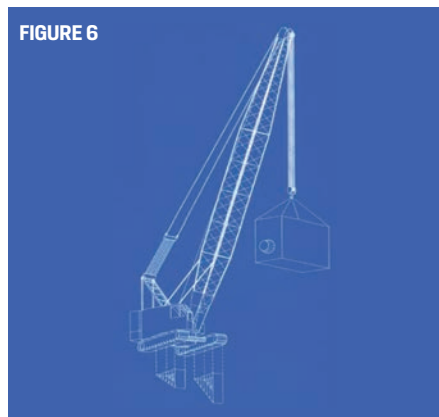
$$\text{Ground pressure}_{\text{max load}} = (2 * \text{Load}_{\text{Light Crawler}} / (w * L))$$

$$= (2 * 85.9 / (1.22 * 4.95))$$

$$= 28.4 \text{ ton/m}^2$$

The above four lift examples show that the ground pressure can increase considerably during the performance of a lift. It is not uncommon that the ground pressure can increase ten-fold between a best case scenario and a worst case scenario. This in itself does not necessarily pose a problem as long as it is known and the right precautions (compaction, matting, spreading) are taken. ■

FIGURE 6



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Drones to reshape construction

Big data, digital tagging, virtual reality, the internet and automation will all continue to impact the construction industry. One piece of technology in particular has burst onto the scene in recent years with a speed that has left almost everyone scrambling to measure its capability: the drone.

The photography space has already had its world turned upside down by the seemingly limitless range and functionality offered by drones. And most of us have likely been paying close attention to the looming delivery capability being fine-tuned by the retail industry. It stands to reason that, any day now, the sky will begin to fill with commercial drones delivering everything from mail to food to appliances, clothing, medical supplies and, eventually, people.

So the question on a lot of folks' minds in construction is: when will drone tech officially 'land' in our industry, and how will it evolve?

Well, it's already landed and, according to Clay Dillow in a recent 2016 Forbes piece, the construction industry has emerged as a key driver of this nascent commercial drone industry, which some analysts believe will top US\$5 billion by 2020.

Part of the reason drone technology has found firm footing on



profit and loss (P&L) sheets across the global industry, says the UK Green Building Council, is that an estimated 15 percent (%) of materials delivered to construction sites ends up in landfill – the result of mismanaged scheduling and purchasing.

In addition, Dillow explains that the American Institute of Architects believes building-related waste makes up anywhere from 25 to 40 % of America's solid-waste stream. With construction spending in the USA totalling \$1.13 trillion in 2016, those losses add up to more than \$160 billion in waste – and that's just in America. The global construction industry spends around \$8.5 trillion.

Surveying for efficiency

Obviously, gains in efficiency can profoundly impact savings in the construction industry. Drones provide at least part of a solution.

Blake Anderson recently pointed out in a piece for *Drone Enthusiast* that construction companies are finding more and more success using drones to survey jobsites and build maps. Instead of using human resources, heavy machinery and expensive surveying tools that produce complex data, companies can get the job done in a fraction of the time, and at enormous cost savings and greater accuracy, with drones. They also allow clients to get a glimpse of a jobsite without having to be there. Drones can cover just about every area of a project. In this way, drone monitoring allows company leaders, as well, to keep an eye on a project, or multiple projects, without having to shuttle back and forth.

Inspection is another area where drones now shine – easily reaching points of focus often hard to access otherwise. Similarly, a safety record can be dramatically enhanced with the added advantage of drone investigation – from vantage points that can locate an unstable pillar, a precariously balanced labourer, an excavation that's too-shallow and beyond.

Despite all the pros, however, engineers still struggle with building a working model at real-time construction scale. Drones capable of lifting large loads are still in the development stage. Cranes still have the best load capacity – and the ability to stay stable with large loads. Of note: the carrying capacity of drones may be ultimately limited forever by external influences other than the structure of the drones themselves.

Ultimately, the value of drone technology is easily found in keeping a project safe, on track and on budget. But experts around the world agree: don't look for drones to replace cranes as a primary load lifter anytime soon.

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The volunteer leadership at SC&RA is a key driver to success and is gaining results that benefit the members worldwide. MIKE CHALMERS reports



Ted Redmond, president and CEO at NCSG Crane & Heavy Haul Services based in Edmonton, Alberta, Canada

Committed to advocacy, education and providing networking opportunities that support the industry in operating safely, legally and profitably around the world, SC&RA offers dozens of committees and task forces upon which members can serve. By getting involved in one of these groups, Association members gain an opportunity to deepen their knowledge of the industry and sharpen their overall leadership skills, while at the same time shaping the direction of SC&RA's programmes and policies.

SC&RA is governed by a Board of Directors and four groups that report to the Board. Each Group has a Governing and Nominating Committee, as well as other sub-committees as needed. All Board and Committee members are individual volunteers from SC&RA member companies, possessing invaluable industry knowledge on how regulatory decisions and current industry issues will impact member companies.

Ted Redmond is president and CEO at NCSG Crane & Heavy Haul Services based in Edmonton, Alberta, Canada, and serves in a leadership role at SC&RA as the Crane & Rigging Group Chairman, as well as a

Fulfilling expectations

member of both the Board of Directors and Crane & Rigging Group Nominating Committee. He sees his role with the Association as a way to give back.

"The crane industry has been good to me and my company," Redmond says. "Being active in the SC&RA crane committees has been a two-way street. It has helped me to better learn the industry, and has given me the opportunity to make our industry safer while also endeavouring to find new products and new ways to better meet our customers' lifting needs."

While Redmond recognises the many positives reflected in both an Association membership as well as a leadership role, he understands that challenges are ongoing. "One of the key challenges, I feel, is in figuring out how quickly the industry will transition from a position of oversupply of cranes to a position of crane shortage," he notes. "We are seeing strong activity in major commercial centres, but that is being offset by slow activity in both the upstream oil and gas sectors."

As the price of oil continues to stabilise, however, Redmond points out that activity is picking up in the key oil and gas producing regions. "Texas, North Dakota and Western Canada are areas of activity – which means more crane usage by oil companies – which should get crane demand back to historical levels. We're also expecting overall industry demand to continue to strengthen throughout 2017."

Rafael de los Santos, managing director at Tradelossa in Mexico, is the upcoming Transportation Group Chair for 2017–2018 (effective in April). He's also on the Transportation Governing Committee. His main objective in his leadership role at SC&RA is duty-driven.

"I want to fulfil the expectations and the trust of the people who wanted me to take this position," De los Santos emphasises. "It's a very prominent organisation in terms of inclusion so, for me, it's very important to honour this position. I want to help in any possible way that the role requires to further enhance this sector of the industry."





Rafael de los Santos, second left, engrossed in a committee meeting

He can relate to Redmond in appreciating both the benefits of a role and relationship in SC&RA, as well as the challenges the industry faces. "For me, I think one of the things that the industry will need to learn is how to adapt and learn within the growth that is projected for US infrastructure – and make the most of what looks to be a very good opportunity. I think the Association is very well set to organise all of its member companies to move forward and respond to both the opportunities and the challenges on the horizon."

Being different

De los Santos also knows that each experience is unique for each company around the world. "Moving super-heavy loads is very challenging, whether it's in Europe, the USA or in Central and South America, and beyond," he says. "You need to have very good equipment, well-trained people and substantial preparation. What I see as unique challenges within different countries is the regulations. Each country presents its own challenges from a regulatory standpoint but, at the end of the day, it's up to the companies working in those countries to possess the type of internal infrastructure and overall

capability to understand the environment they're working in and operate successfully – regardless of the challenges."

Both men also understand that the emergence of a new US administration has sent a ripple through the global industry – cultivating a wealth of perspective. "The crane equipment industry is a global industry – with cranes being made in many places, including the USA, Germany, Japan and China – and shipped to users around the world," says Redmond. "Used cranes are often resold to buyers in many of the developing parts of the world. If the US administration adds tariffs to cranes or rigging, it could have the effect of driving up US crane prices, and thus it will ultimately cost American customers more to build and maintain their infrastructure."

As the leader of a company that does business in both Canada and the USA, Redmond frequently moves his equipment back and forth as customer needs dictate. "If the taxes or tariffs make it more expensive to share equipment back and forth between our operations in different countries, this could result in less asset sharing, which would lead to lower crane utilisation and ultimately higher crane rental prices," he adds.

De los Santos understands Redmond's recognition for potential tariff challenges but ultimately knows that, regardless of what emerges, adaptation will likely drive

success. "For me, anything that happens in the USA will always affect my country and/or business – because of geography," he explains. "But I like to remember a statement from someone I really respect: 'Success is a measure of how quickly you adapt to change.' Personally, I accept that there are things we can control and things we can't control. We need to see what changes emerge, and be mature enough, and responsible enough, to not point fingers at each other but look for opportunities that will demand greater professionalism from us and greater success for the industry overall. Within this type of thinking, I feel that it allows us to be better citizens and better leaders. Things change from one year to another; it is our responsibility to adapt and improve."

Safety is also a steady focus for both men. "As an industry, we are literally changing the world," affirms Redmond. "As projects get bigger and bigger, we are pushing the limits of engineering to lift and move the project pieces into place – and all of this must be done under ever-higher safety standards. SC&RA has led the way in bringing the industry together to find better ways to accomplish these amazing projects."

De los Santos agrees, and underscores the need for companies to remain true to their mission, vision and values. "Technology has helped us a lot to stay connected and make our processes more efficient and, hopefully, more successful but, at the end of the day, you still need to focus on having the right equipment for the job, and properly trained workers," he says. "When you're competing, you can't put the risk of your employees and anyone else near the project below the desire to finish the job. Safety-wise accidents happen but as companies we're responsible for having the right tools, the right people for the job, the right preparation and the ability to adapt to change."

Participation from Association members is encouraged at many committee meetings



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Philippe Cohet,
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"THIS IS A GREAT CHANCE FOR ME TO BE HERE AND MEET WITH ALL THE STAKEHOLDERS IN THE INDUSTRY"

Marco Gentilini,
Vice president,
Terex Cranes

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Bated breath

Excitement is growing as the annual ESTA Awards of Excellence event is nearly upon us. Here we reveal the companies shortlisted for those awards this year. *ICST* reports



ESTA is the pan-European association for national trade associations representing mobile crane rental, heavy haulage and abnormal load transport companies. Its annual awards evening is one of the industry's most prestigious events in Europe. The awards are open to companies that are members of ESTA national associations, ESTA special members, and ESTA affiliates. The ESTA Awards are designed to honour members that have performed an outstanding achievement in their field of operations.

A key reason why the awards are held in such high esteem by the industry is down to their strict, independent judging procedure. They are overseen by 12 independent jurors who judge several categories in line with their expertise. In addition, there are two chairmen: one crane- and one transport-related. The whole operation is managed by the juror co-ordinator. Once entries have been submitted the juror co-ordinator decides whether the entry should be accepted, refused or whether more information should be requested. All accepted entries are uploaded onto a secure website which can only be accessed by jury members.

The jury scores each entry

from 1 to 10 according to four key criteria, namely: quality of the entry; complexity; problem solving; and execution of the operation. All jobs and products submitted for an award must have been carried out in Europe (including Turkey).

Details of the required preparations, the commercial risks involved, the ingenuity and creativity of the solution, the cost effectiveness of the job/process, the professionalism shown in the execution of the project, and the safety criteria are all key pieces of information the judging panel looks for. On the basis of the scores submitted a committee, comprising the two chairmen and the juror co-ordinator, agree a maximum of four finalists in each category, one of which will be the ultimate winner.

ESTA's crane categories incorporate wheeled mobiles, crawlers, truck cranes, and truck-mounted access platforms. This year's awards have also been extended to include articulating (or knuckle boom) cranes for the first time, and ESTA has encouraged more small companies and projects to enter and to attend the event. Jobs can be carried out with either one of these types of crane or in combination.

Søren Jansen, ESTA director, said, "We want European specialized transport and mobile crane companies of all sizes to celebrate their successes by entering the awards and join us for what is one of the industry's biggest and most enjoyable events. Knuckle boom cranes are increasing in size and increasingly are replacing smaller mobile cranes, so we wanted to include them in the category below 120 tonnes. We are also hoping that this will encourage more smaller companies and projects to enter."

David Collett, ESTA president,

added, "The users' night and awards is a great party and a marvellous opportunity to meet old friends and make new contacts. If you have not been involved before, I strongly suggest you both enter the awards and come to the dinner in Amsterdam in April. I am sure you won't regret it."

The ESTA Awards of Excellence winners will be revealed at the awards dinner on Thursday 6 April at the Grand Hotel Krasnapolsky in Amsterdam, Netherlands. For more details on the event visit: www.khl.com/esta

AWARDS SHORTLIST

Cranes, telescopic, lifting capacity up to 120 tonnes

- Aertssen Kranen
- Mammoet Europe
- Skaks Special Transport
- Wagenborg Nedlift

Cranes, telescopic, lifting capacity more than 120 tonnes

- Koninklijke Saan
- Nordic Crane
- Sarens
- Wagenborg Nedlift

Cranes, lattice boom

- ALE
- Mammoet Europe
- Sarens
- Sarens

Combined techniques

- ALE
- Koninklijke Saan
- Mammoet Europe
- Sarens

Safety

- ALE
- Fagioli
- Mammoet Europe

Transport A. Trailer and load under 120 tonnes gross weight

- Mammoet Europe
- Peter Star
- Wagenborg Nedlift
- ZTE

Transport B. Trailer and load more than 120 tonnes gross weight

- ALE
- Collett and Sons
- Hareket
- MTD

Innovation, end user

- ALE
- Fagioli
- Mammoet Europe

Innovation, manufacturer

- Broshuis
- Enerpac
- Tii

SPMT

- ALE
- PZT
- Sarens
- Wagenborg



Winners of the 2016 ESTA awards



Static line logging

Load cell specialist Straightpoint has a new product for measuring tension on static lines: the Clamp On Line Tensionmeter (COLT).

COLT measures tension on wire rope up to 11,000 lbf (pound force) / 5,000 kgf (kg force) and up to 1 inch (25 mm) in diameter. According to the company, it clamps onto pre-tensioned wire ropes, eliminating the need for additional sheaves or tooling,

NEW HD LINE FROM DICA



DICA has launched its new Heavy Duty (HD) FiberMax crane pad product line. Comprising five new models, the company claims its crane pads fill a gap between the 175,000 pound and 325,000 pound rated capacity models.

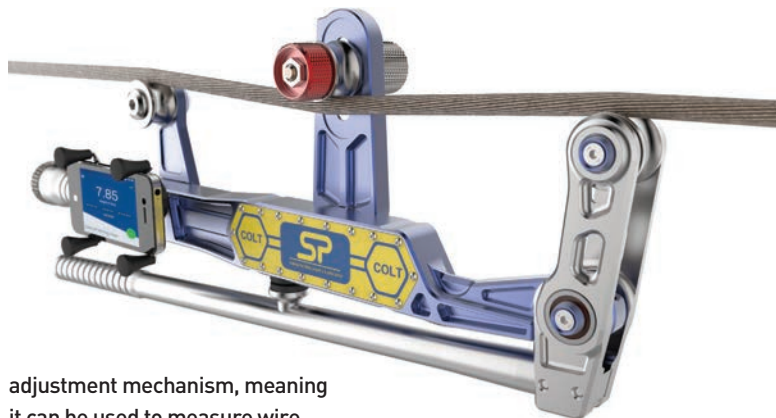
"The heavy-duty rating was achieved by increasing the overall thickness of the top surface layer which makes the pads stronger and stiffer, giving us the ability to support and distribute higher outrigger loads with an overall thinner and lighter solution," said Kris Koberg, DICA CEO. "The HD pads are only 6.75 inches thick and they are far lighter than steel crane pads."

The smallest in the series is the FM6x4x6-HD, providing a 24 square foot area and a maximum rated capacity of 250,000 pounds. The largest in the series is the FM8x6x6-HD, providing a 48 square foot area and a maximum rated capacity of 250,000 pounds.

■ For more information see: www.dicausa.com

as is the case with alternative solutions. An integral Bluetooth module transmits tension data wirelessly to any smart device running the Android or iOS app. Contained within the app is a 'wire rope library'.

The company claims tension in wire ropes can be measured and logged within seconds. David Ayling, Straightpoint managing director, said, "Measuring tension of differing wire rope diameters often requires different sheaves to be exchanged - requiring tools and other ancillary equipment. The COLT boasts an integral quick



adjustment mechanism, meaning it can be used to measure wire rope diameters ranging from 3/16 of an inch to 1 inch (or 5 mm to 25 mm).

"We'll launch the app with a library of around 20 different rope types but as our library here increases over time, the information will be forwarded to all app users via updates."

The COLT is machined from aluminium and has an IP67 / NEMA6 waterproofing rating. An auto-locking magnetic handle mechanism is fitted for security when installed. Claimed battery life is up to 1,000 hours.

■ For more information see: www.straightpoint.com

Jack-up system

Heavy lifting equipment specialist, Enerpac, has launched an incremental multi-point jack-up system designed for heavy lifting applications.

The company says its new JS-Series jack-up system is able to simultaneously lift and mechanically hold loads, offering operators a safe and efficient lifting method. Each lifting tower has a capacity of up to 750 tonnes and a lifting height between 6-20 metres. They have up to 5 percent side load capacity (depending on model and lifting

height). Lifting and lowering is done using a computer-controlled unit for greater precision, while the control unit's synchronous technology maintains the balance of the load, says Enerpac.

Self-contained hydraulics in each leg unit mean uncluttered work areas. Loads are lifted in increments as steel boxes, called barrels, are stacked together to form lifting towers to mechanically hold the load. A typical system setup includes four jack up units positioned under each corner of a load.

Target applications include: bridge construction and demolition; port crane lifting; mining shovel undocking; top side lifting; and ship hull block installation.

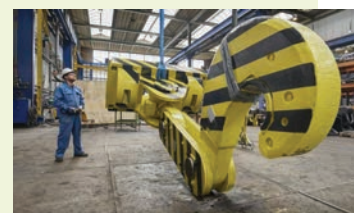
■ For more information see: www.enerpac.com



HEAVY LIFTING TECHNOLOGY

For 20 years the company's name has been Enerpac Integrated Solutions. To better represent the company today and what it does it has now been renamed Enerpac Heavy Lifting Technology

TATA HOOKS DAMEN IN REFURBISHMENT



Damen Anchor and Chain Factory (AKF) in the Dutch city of Schiedam has completed the refurbishment of 12 giant lifting hooks for Tata Steel, also based in the Netherlands. The hooks are used to lift the large crucibles that carry and pour out molten iron and steel in foundries.

AKF dismantled, inspected and repaired the hooks (where required). They were then reassembled, realigned and riveted - creating a single, solid structure. Manganese sleeve bearings were then pressed into the arms, Hardox steel plates welded on to the lifting areas and rubbing plates welded on to protect them from damage.

"Our ability to handle heavy-industry projects such as this demonstrates the capabilities that we have at AKF," said general manager Laurens van Gelder.

■ For more information see: www.damen.com

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EVENTS DIARY

ESTA AWARDS OF EXCELLENCE

6 April 2017

Amsterdam, Netherlands

www.khl.com/esta

(Organised with the ESTA association)

SC&RA ANNUAL CONFERENCE

18 – 22 April 2017

Arizona, USA

www.scranet.org

AWRF SPRING CONFERENCE
(Associated Wire Rope Fabricators)

23 – 26 April 2017

Georgia, USA

www.awrf.org

SMOPYC 2017

25 – 29 April 2017

Zaragoza, Spain

www.smopyc.es

INTERNATIONAL RENTAL EXHIBITION (IRE)

2 – 4 May 2017

Amsterdam, Netherlands

www.ireshow.com

LIFT & MOVE USA

3 May 2017

Lifting Gear Hire

Chicago, Illinois, USA

www.liftandmoveusa.com

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10 & 11 May 2017

London, UK

www.khl.com/itc

ACRP (Associated Crane And Rigging Professionals) GENERAL ASSEMBLY

11 – 14 May, 2017

Tulalip, Washington, USA

www.acrp.net

PLANTWORX 2017

6 – 8 June 2017

Bruntingthorpe, UK

www.plantworx.co.uk

CRAC (Crane Rental Association of Canada) ANNUAL CONFERENCE

7 – 10 June 2017

New Brunswick, Canada

www.crac-Canada.com

LIFT & MOVE USA

14 September 2017

Buchanan Hauling

Fort Wayne, Indiana, USA

www.liftandmoveusa.com

SC&RA CRANE & RIGGING WORKSHOP

20 – 23 September 2017

Kansas City, USA

www.scranet.org

GIS 2017 (Italian cranes & access and heavy transport show)

5 – 7 October 2017

Piacenza, Italy

www.gisexpo.it



PICTURE OF THE MONTH

New ICST deputy editor Christian Shelton stumbled across this 550 tonne capacity Liebherr LG 1550 lattice boom truck crane in his first week on the job. It was in a field in the English Midlands. Shelton was supposed to be at a friend's wedding but sneaked away to bag this shot – talk about dedication to the job! It doesn't take long to catch the crane bug.

PEOPLE NEWS

■ Manitowoc Cranes Brazil has appointed **RENE PORTO** as sales director.



Porto said he plans to achieve these goals by putting the customer at the centre of the company's operations, while increasing velocity and innovation across the business. With his leadership, Manitowoc hopes to help customers improve their own efficiency and earn a greater return on investment from their cranes.

With 18 years of extensive sales and marketing experience, Porto comes to the new role as an expert in strategic planning, business development and sales and marketing management.

Porto has an MBA degree from Fundação Dom Cabral and a post-graduate degree in marketing from Escola Superior de Propaganda e Marketing.

■ **GERHARD EISENKÖBL** has been promoted to managing director at Austrian crane and aerial lift company Prangl. He will join Christian Prangl, who has been running the company alone since the death of his father Josef in 2014.

Eisenköbl has been at Prangl since 2000. He will continue to be responsible for: sales; technology; health, safety, environment and quality (HSEQ); and the company's Slovakian operations.

The move follows the relocation of Prangl's headquarters back to Vienna in January 2017.



■ Terex Corporation has appointed **JOHN SHEEHAN** as its new senior vice



president and chief financial officer. Sheehan started on 27 February, replacing Kevin Bradley. Sheehan was executive vice president and chief financial officer at pharmaceutical company Mylan. He also held financial positions at industry supplier Delphi. His experience includes 20 years at KPMG.

■ All terrain and rough terrain crane manufacturer Tadano America has hired **LANCE RYDBOM** as regional business manager covering the East Coast of the United States.



Ken Butz, Tadano America general manager of sales, said, "We look forward to expanding and solidifying Tadano's presence and commitment to our customers in the Eastern region of the US."

■ Send picture of the month entries and all other back page-related information to *International Cranes and Specialized Transport*, KHL Group, Southfields, Southview Road, Wadhurst, East Sussex TN5 6TP, United Kingdom, or by e-mail to alex.dahm@khl.com. Picture caption entries should include: the month and year taken, the place, type of crane, owner and project, plus any other relevant information.

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- International Construction Turkey (Turkish)* ☐
- International Rental News* ☐
- Cranes & Project Transport Turkey (Turkish)* ☐

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- World Crane Week** ☐
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- Access International* ☐
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- Construction Latin America* ☐
- Demolition & Recycling International* ☐
- World Construction Week* ☐
- International Construction China (Chinese)* ☐
- International Rental News* ☐

3 ORGANISATION TYPE

- Construction Contractor/Consultant ☐
- Equipment Rental ☐
- Energy / Petrochemical ☐
- Specialized/Heavy Transport ☐
- Industrial Establishment ☐
- Airports / Ports / Docks / Offshore ☐
- Manufacturer of Lifting Equipment ☐
- Distributor / Agent / Equipment Sales ☐
- Government/Defence/International Authority ☐
- Public/Private Utilities ☐
- Windpower ☐
- Other (Please specify): _____

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MARKETPLACE

The Marketplace is divided into easy to read colour coded sections to help you quickly find what you need.



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55

Operational aids, communication systems, components, controls, software, crane mats and outrigger pads, crane repair, hydraulics, jacks, attachments, personnel baskets, rigging hardware, rollers, slings and chains, tires, winches, wire rope, batteries, braking systems, and new, used and refurbished parts.

SAFETY, TRAINING & INDUSTRY SERVICES

Training, insurance, inspections, financing, consulting and safety equipment.

SPECIALIZED TRANSPORT

Transportation permits, freight forwarding, heavy haul, pilot car services, trailers, wheels and tyres.

CRANES AND EQUIPMENT FOR SALE OR RENT

58

Crane, rigging and lifting equipment for sale or rent, new or used.

CAREER OPPORTUNITIES

Employee recruitment and job postings.

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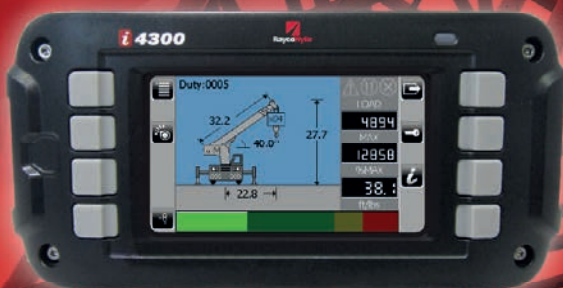


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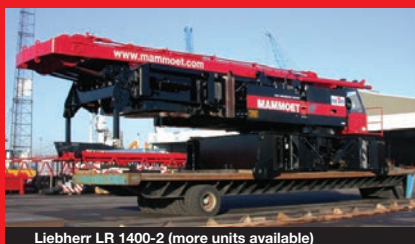
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Broderson IC-80-3G (more units available)



Tadano Faun ATF 65G-4 (more units available)



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Faun
ATF65G-4 2010
ATF100 1999

GMK5220 2013
GMK5250 2015
GMK6300L 2012
GMK6400 2013

Liebherr

LTM1060-3.1 2013
LTM1070 1992
LTM1070-4.1 2006
LTM1090 1990
LTM1070-4.1 2011
LTM1095-5.1 2006
LTM1100-4.2 2013
LTM1200-5.1 2007
LTM1200-5.1 2011
LTM1250-6.1 2006 coming
LTM1350-6.1
LTM1500-8.1 2014
LTM1750-9.1 2013
LTM11200-9.1 2010

Demag
AC200 2007
AC500-2 2006

PARTS FOR SALE

Liebherr Parts
LTM1090-1100-4.1 Winch 2
LT1120 Jib
LTM1130-5.1 Jib extension
LTM1160-5.1 Jib extension and winch 2
LTM1200-5.1 Jib 22 meter
LTM1160-2 jib inserts
LTM1160-2 Boom

Grove

GMK3055 2011
GMK4080 2009
GMK4080-1 2011
GMK4100L 2013
GMK5130 2012
GMK5130 2014
GMK5170 2015

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400 t	Liebherr	LTM 1400-7.1	2007	14 x 8 x 14	60/56/84	direct
400 t	Liebherr	LTM 1400	1988	16 x 8 x 12	50 / 61 / 84	direct ex Dubai
300 t	Liebherr	LTM 1300/1	2000	12 x 8 x 10	60 / 21/42/70	direct
250 t	Demag	AC 665 SL	1997	12 x 6 x 8	58 / 41 / 65	direct
200 t	Liebherr	LTM 1200-5.1	2009	10 x 8 x 10	72 / 22	direct
160 t	Faun	ATF 160 G-5	2009	10 x 8 x 8	60 / 37	direct
120 t	Grove	AT 9120 E	1995	10 x 8 x 8	48 / 17	direct
100 t	Grove	GMK 5100	2005	10 x 6 x 10	51/18/2,5/run.	direct
100 t	Grove	GMK 5100	2005	10 x 6 x 10	51 / 18	direct
100 t	Demag	AC 100	2004	10 x 8 x 8	50 / 17	direct
100 t	Liebherr	LTM 1100/2	2001	10 x 8 x 8	52 / 19	direct
100 t	Grove	GMK 5100	2001	10 x 8 x 10	51 / 18	direct
90 t	Liebherr	LTM 1090/2	1996	8 x 8 x 8	52 / 19	direct
80 t	Terex-Demag	AC 80-2	2004	8 x 8 x 8	50 / 17	direct
80 t	Terex-Demag	AC 80-2	2003	8 x 6 x 8	50 / 17+1,5	direct
80 t	Faun	ATF 80-4	2004	8 x 6 x 8	48,5 / 16	direct
75 t	Grove	GMK 4075/1	2005	8 x 6 x 8	43,2/17+2+run	direct
75 t	Grove	GMK 4075	2001	8 x 6 x 8	43,2 / 27	direct
60 t	Liebherr	LTM 1060/2	2000	8 x 4 x 8	42 / 17	direct
60 t	Faun	ATF 60-4	2000	8 x 6 x 8	40,2 / 16	direct
55 t	Grove	GMK 3055	2005	6 x 6 x 6	43 / 15+runner	direct
55 t	Liebherr	LTC 1055-3.1	2005	6 x 6 x 6	36 / 15	direct
55 t	Liebherr	LTM 1055/1 (2x)	2003	6 x 6 x 6	40 / 16	direct
50 t	Terex-Demag	AC 50-1 (2x)	2006	6 x 6 x 6	40 / 17,6	direct
50 t	Grove	GMK 3050	2003	6 x 6 x 6	38 / 15	direct
45 t	Faun	ATF 45-3	2006	6 x 6 x 6	34 / 15,2	direct
40 t	Demag	AC 40-1 City	1999	6 x 6 x 6	31,2	direct
35 t	Liebherr	LTM 1030-2.1	2006	4 x 4 x 4	30 / 15	direct
35 t	Liebherr	LTM 1030-2.1	2005	4 x 4 x 4	30 / 15	direct
35 t	Terex-Demag	AC 35 L	2004	4 x 4 x 4	37 / 8	direct
35 t	Liebherr	LTM 1030/2	2003	4 x 4 x 4	30 / 15	direct
30 t	Luna	AT 30/27	1989	4 x 4 x 4	27 / 7	direct
30 t	Luna	AT 30/27	1989	4 x 4 x 4	27 / -	direct
25 t	Demag	AC 25 City	1998	4 x 4 x 4	25 / 13	direct

ROUGH TERRAIN CRANES

80 t	Grove	RT 890 E	2008	4 x 4 x 4	43,2 / -	direct
70 t	Tadano	GR 700 EX	2008	4 x 4 x 4	44 / 17,7	direct
35 t	Grove	RT 540 E	2012	4 x 4 x 4	31 / 13,7	direct
30 t	Kato	KR 300	1998	4 x 4 x 4	28,4 / 12,1	direct
25 t	Kato	KR 250	1997	4 x 4 x 4	26,7 / 7	direct

TRUCK CRANES

200 t	Gottwald	AMK 200/83	1980	16 x 6 x 12	53 / 38	direct
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- LIEBHERR LTM1220, 265 tons, '13, 197' boom, 115' jib, **Call**
- LIEBHERR LTM1130, 155 tons, '13, 197' boom, 62' jib, **Call**
- (2) LIEBHERR LTM1100 120 tons, '13, 197' boom, 62' jib, **Call**

ROUGH TERRAIN

- TEREX QUADSTAR 1100, 110 tons, '16, 155' boom, 72' jib **Call**
- TADANO GR1000XL, 110 tons, '14, 154' boom 58' jib **Call**
- (4) TADANO GR750XL, 75 tons, '13, 141' boom 58' jib **Call**
- GROVE RT765E, 65 tons, Unused '13, 110' boom, 56' jib **Call**
- (2) TADANO GR550XL, 55 tons, '13, 114' boom 50' jib **Call**
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ALL TERRAIN-CRANES

Make / Type	y. o. m.	Drive	Boom / Fly Jib
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25 t Demag AC 25 City	1998	4x4x4	25,00m + 13,00m
35 t Liebherr LTM 1030-2.1	2005	4x4x4	30,00m + 15,00m
35 t Liebherr LTM 1030-2.1	2006	4x4x4	30,00m + 15,00m
40 t Terex-Demag AC40- City	2009	6x6x6	31,20m + 13,00 m + 1,20m
45 t Faun ATF 45-3	2006	6x6x6	34,00m + 15,20m
55 t Grove GMK 3055	2004	6x6x6	43,00m + 15,00m
60 t Faun ATF 60-3	2004	6x6x6	40,20m + 16,00m
60 t Faun ATF 60-4	2000	8x6x8	40,00m + 16,00m
75 t Grove GMK 4075-1	2005	8x6x8	43,20m + 17,00m + Runner
80 t Terex-Demag AC 80-2	2004	8x8x8	50,00m + 17,60m
80 t Terex-Demag AC 80-2	2003	8x6x6	50,00m + 17,60m + Runner
100 tGrove GMK 5100	2001	10x8x10	51,00m + 18,00m
160 tTadano Faun ATF 160G-5	2009	10x8x8	60,00m + 37,00m
200 tLiebherr LTM 1200-5.1	2009	10x8x10	72,00m + 22,00m
250 tDemag AC 665 SL	1997	12x6x8	58,00m + 41,00m + 65,00m+2,00m
400 tLiebherr LTM 1400-7.1	2007	14x8x12	60,00m + 56,00m + 84,00m

RT-TELESCOPIC-MOBILE CRANES

25 t	Kato KR 250 E	1997	4x4x4	26,70m + 7,00m
80 t	Grove RT 890 E	2008	4x4x4	43,00m

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SCX800

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Hitachi-Sumitomo SCX900-2	90t	2007
Hitachi-Sumitomo SCX900-2	90t	2008
Hitachi-Sumitomo SCX800-2HD	80t	2009



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1x 130 t	Grove GMK 5130-2	2014
1x 170 t	Grove GMK 5170-1	2016
1x 200 t	Liebherr LTM 1200-5.1	2009
2x 250 t	Grove GMK 5250L US Specs	2014
1x 300 t	Liebherr LTM 1300-6.2	2014/2015
1x 350 t	Demag AC 350-6	2010

CRAWLER CRANES

1x	250 t	Kobelco CKE 2500-2	2008
2x	250 t	Kobelco CKE 2500-2	2010
1x	400 t	Liebherr LR 1400-2	2002
1x	400 t	Demag CC 2400 SL	2009/2014
1x	500 t	Liebherr LR 1500	NEW!
1x	650 t	Demag CC 3800 SL	2013
1x	1250 t	Demag CC 6800 SL	2014

ROUGH TERRAIN CRANES

1x	40 t	Grove RT 540E CE	2011
2x	55 t	Terex RT 555	NEW!
2x	55 t	Tadano GR 550XL-2	2013
1x	65 t	Grove RT 765E	NEW!
4x	75 t	Tadano GR 750XL-2	2013
1x	90 t	Grove RT 890E	2012
1x	110 t	Terex Quadstar 1100	NEW!

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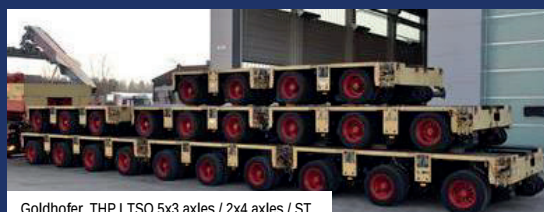
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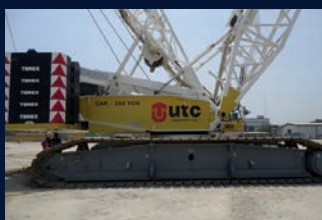
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Liebherr LTM 1220-5.1 (2005)



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