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A time of change

C&A all terrain cranes

The past year has certainly been very busy for the All Terrain crane sector, with new product launches, new concepts and more recently, the return of a very well-known brand.

The big discussion a year ago was the 'one engine or two' debate and while this has gathered pace - particularly for the single engine concept with many more large cranes following the concept - other product introductions and developments have rather put it in the shade.

The first major product launch was Tadano Faun with its largest and most innovative All Terrain crane to date - the 600 tonne ATF 600G-8 unveiled last June. The company says that it is currently building six units - without naming any company that has placed a firm order - but it will not be available until sometime next year so perhaps this is a wise move? We have looked at the ATF 600 in detail in previous issues, but to briefly recap, its main feature is the 56 metre triple boom design which does away with a



The 600 tonne Tadano ATF 600 has a 56 metre triple boom design which does away with a Sideways Superlift/Y Guy cable suspended boom system

Sideways Superlift/Y Guy cable suspended boom system, used by its competitors. Its advantage, according to Tadano, is that this type of boom is good in both compression and tension whereas the cable Y guy arrangement is only good in tension and so has benefits across the entire load chart.

The triple pinned boom can take a 90 metre luffing jib but its main advantage is faster installation coupled with a much reduced tailswing and working footprint. The ATF 600G-8 is undoubtedly a strong crane lifting its 600 tonne capacity at 3.5 metres, while its maximum system length of 147 metres is good. However its relatively short main boom could prove the limiting factor for some crane rental companies, as it would have to work with extensions or its luffer more often.

Maximum usability

Enter the new 450 tonne LTM 1450-8.1 from Liebherr which is similar to the Tadano in that it has eight axles, but has been designed not with maximum capacity but with "maximum usability" in mind - sounds a little bit like the XXX tonnes class crane argument? However Liebherr has gone about the design in a totally different way - using a new long chassis not a modified LTM 1500 chassis - to give its new crane a much longer 85 metre main boom which can handle 20 tonnes at full extension. This is the longest boom available on a crane with 12 tonne axle weight and should make it ideal for erecting large tower cranes as well as wind turbines. Liebherr says that the



The hydraulic operating mechanism on the new Liebherr LTM 1450-8.1

new 450 tonner can also compete with 500 tonne class work in many cases. The long main boom can be topped with a luffing jib ranging from 14 to 84 metres.

The prototype LTM 1450 was unveiled at Bauma and appears to have hit the spot with customers as Liebherr says it had 30 orders just days after its launch. In recent years

Liebherr has had a strong track record of having the right crane at the right time in terms of customer demand - its 750 tonne LTM 1750 has now sold over 100 units since its launch three years ago.

Like Tadano, Liebherr has focussed on economy and simple set-up when on site. The crane can travel with boom and all supports in place



The Tadano ATF 600 triple boom



The new 450 tonne LTM 1450-8.1 from Liebherr has been designed not with maximum capacity but with "maximum usability" in mind.

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within the 12 tonne axle loadings, meaning that it only needs one additional truck to carry extra ballast, blocks and outrigger mats etc.

One of the LTM 1450s distinctive features is its variable counterweight radius. Liebherr showed this variable concept off last year, however it has gone one step further on the LTM 1450-8.1 with the crane able to extend the counterweight radius - or tail swing - from five to seven metres by simply pivoting the two counterweight side cheeks. The main benefit, according to Liebherr will be on sites with limited space, where operating with the reduced five metre tail swing will give it similar long reach capacities as strong 200 tonne cranes. The LTM 1450 has a maximum counterweight of 135 tonnes which is compatible with the LTM 1350-6.1, the LTM 1400-7.1 and Liebherr nine axle cranes. The second winch - with its block for luffing jib operation - can be installed quickly as it is secured direct to the counterweight frame. All the rear axles on the LTM 1450 have active electro-hydraulic steering, depending on the vehicle speed. This increases manoeuvrability while reducing tyre wear. Five steering programmes can be selected and there is no need to raise the centre axles in crab mode.

Single engine

The LTM 1450-8.1 is the fourth and largest Liebherr All Terrain to feature its single engine concept. An eight-cylinder diesel in the chassis meets emission regulations for Stage IV/Tier 4f, but is also available in a Stage III version for threshold countries.



Terex has re-introduced the Demag brand

The superstructure is powered by a mechanical shaft system routed through the centre of the slew ring to the pumps in the superstructure. In ECO mode the complete pump drive disconnects automatically when the engine is idling and then reconnected by the intelligent controller when required, for improved fuel consumption.

The crane is designed for easy set-up, the cab remains in its working position during road travel, rather than having to be swung sideways as is common for this size of crane. Liebherr says it has deliberately not used a boom suspension in order to reduce set-up times and price.

The company also claims that many customers are now realising fuel savings from its the single engine concept, however the move mainly helps engineers in the constantly moving world of engine emissions. Manufacturers which follow the two engine concept, such as Tadano, maintain and convincingly argue that a smaller separate engine for the superstructure is more fuel efficient and reduces the hours on the large carrier engine, helping cut maintenance costs and benefiting residual values. Just as an aside, Tadano is set to launch a new 60 tonne ATF 60G-3 with 48.2 metre boom which has both engine and gearbox in the superstructure behind the cab allowing the carrier to be more rigid but lighter as it also works as counterweight.

Demag returns

Part of the big news at Bauma involved the reintroduction of the Demag brand for Terex All Terrain cranes over 100 tonnes and crawler cranes over 400



Most impressive new All Terrain at the show - the 450 tonne Liebherr LTM 1450-8.1

tonnes capacity. The name was long-associated with some of the best large crawler and All Terrain cranes on the market, as well as City type All Terrains. The company was acquired by Terex in 2002 from Siemens which was selling off the assets of Mannesman Dematic. Terex bought Demag Mobile Cranes, while KKR acquired the Demag overhead cranes and Gottwald port crane business. Over time Demag mobile cranes became Terex-Demag and then just Terex. The acquisition in 2011 of the Demag overhead and port crane business effectively gave Terex exclusive rights to the Demag name for crane purposes.

There does seem to be genuine delight over the change in name - particularly at the German plant where one employee said: "We have got our heart back today". The first cranes to be affected are the five axle Explorer models, which also use the AC nomenclature - eg AC130-5, AC160-5, AC220-5 and AC250-5. Every All Terrain rated at 100 tonnes or more will be branded Demag and although not finalised, the Demag City cranes will also make a come-back.

The AC range now comprises 11

All Terrains ranging from 100 to 1,000 tonnes - or is it 1,200 tonne 'capacity class'? - and seven lattice crawler cranes ranging from 400 to 3,200 tonnes. All other cranes will continue to be branded as Terex. At the moment all Demag cranes are made at the company's plant in Zweibrücken, Germany, however president of Terex Cranes Ken Lousberg was quick to point out that the Demag product is not dependant on any specific plant.

"We have a proud past and an exciting future and will be concentrating on quality, reliability and customer satisfaction," said Lousberg. "With regards to new product development Terex needs to be in front."

Three updates

Bauma also saw the launch of three updated five axle cranes Demag cranes including the 130 tonne AC130-5, the 220 tonne AC220-5 and the 250 tonne AC250-5. The 250 tonne, five axle All Terrain sector is hotting up nicely with all three of the major manufacturers claiming sector leading performance. Later we will compare them, together with Tadano's new 220 tonne - the closest crane the



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company has to 250 tonnes.

Terex claims the Demag AC 130-5 is now the most compact 130 tonne, five axle crane on the market, with a total length of 14.3 metres and carrier width of 2.75 metres. It has a 60 metre main boom - 86.5 metres with extensions - and a single engine with an intelligent motor management system that distributes the power for lifting and travel functions. The crane has all-wheel steering with independent rear axle steering and dynamic launch controls. When traveling, it

is designed to stay under 12 tonnes per axle with a payload of up to 450kg.

With a main boom length of 78 metres, the new 220 tonne Demag AC 220-5 claims the longest main boom reach of any five axle crane on the market and can be extended to 99 metres with extensions. With a chassis just larger than the AC 130-5 - 14.5 metres long and three metres wide - it also features a single engine with intelligent motor management system. It also has 600kg spare payload in 12 tonne axle mode. Both the AC130 and AC220 can have the optional IC-1 Plus control system, which



The new GMK4100L-1 uses a single engine and is 200mm narrower than the original GMK4100.



The Grove GMK5250L caught the eye of many visitors shopping for an AT at Bauma

calculates lifting capacities for every position of the boom, subject to the position of the superstructure. This enables operators to use maximum lifting capacity especially when lifting directly over the outriggers.

Apart from the increased capacity, the 250 tonne Demag AC250-5 has a 70 metre boom but the same dimensions, single engine concept and optional IC-1 Plus control system as the AC220-5.

New Grove ATs

Grove has also been busy over the past year in the mid capacity All Terrain sector. First it launched its 250 tonne GMK5250L and then announced an updated 100 tonne GMK4100L-1 with even more compact dimensions than the unit

it replaces. The final new unit to be unveiled was the new 150 tonne GMK5150L. All these cranes feature single engines with Fuel Saver function as well as features such as the Megadrive hydrostatic drive and the self-rigging MegaWingLift.

Jens Ennen senior vice president for Grove road-going cranes said: "We have focused strongly on bringing more reliability, ease of transportation, user friendliness and capacity to our cranes. The industry continues to evolve, and we want to lead the way in showing our customers what more they can achieve and how our innovative designs can deliver better financial returns. We want to bring new features to our cranes and also bring greater versatility to the features that are already there."

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The 250 tonne Demag AC250-5

100 tonner upgraded

Grove was the first manufacturer to produce a compact 100 tonne long boom crane on four axles with the original GMK4100L. The new GMK4100L-1 uses a single engine allowing more counterweight which Grove says gives it "the best load chart in this class whether rigged with its full counterweight, or as a taxi crane with 12 tonne axle loads and no support vehicle." The new GMK4100L-1 is 200mm narrower at 2.55 metres wide and half a metre shorter. The Fuel Saver function on the Tier IV Final/EUROMOT 4 engine helps with running costs, while the new Crane Control System (CCS) includes the intelligent Boom Configurator Mode. The crane was officially launched in February and deliveries are due to start imminently.

Grove GMK5250L

The Grove GMK5250L is the largest of three new five-axle Grove All Terrain cranes launched in 2015. The single engine design was introduced in April and was followed in July by the launch of the GMK5180-1 and the GMK5200-1. All three feature several notable innovations, perhaps the most striking of which is its inclusion of the VIAB turbo clutch and integrated retarder - the first ever mobile crane to feature the system. The VIAB module is said to eliminate both fluid overheating and clutch burning and delivers wear-free starting and braking, improved manoeuvrability and better fuel economy. Fuel usage for the GMK5250L is estimated to be around 30 percent lower than its predecessor, the GMK5220, and claims to be the strongest long-boom five-axle machine on the market with a maximum outrigger width of only 7.8 metres.

The 70 metre main boom is topped

installing counterweight sections - some of which are interchangeable with those of the GMK6300L. An optional self-rigging auxiliary hoist is also available. The GMK5250L was launched in the middle of last year, and the first units have already been delivered to customers.

New 150 tonners

Bauma also saw two new compact five axle 150 tonne Grove cranes, the GMK5150 and GMK5150L - replacing the GMK5110-1 and GMK5130-2

respectively. The GMK5150L has the longer 60 metre boom while the GMK5150 has a 51 metre boom. Maximum counterweight for both is 45 tonnes, helping to achieve an overall load chart increase of 20 percent over the GMK5130-2. Up to 10.2 tonnes of counterweight can be carried by the GMK5150 in its 12 tonnes per axle taxi crane set-up, while the GMK5150L manages 7.9 tonnes. The GMK5150L can lift 11.6 tonnes on its fully extended 60 metre boom, which Grove says makes it ideal for tower crane



Liebherr LTM 1250-5.1

by a 21 metre hydraulic swingaway extension that can be extended with one or two eight metre lattice inserts adding 37 metres to the main boom to make a total length of 107 metres. A significant benefit is the fact that the extension can luff by up to 50 degrees compared to 40 degrees on other Grove cranes. An optional integrated heavy duty jib is also available. Once on site, the crane can move with its full counterweight of 80 tonnes in situ, saving time removing and re-



Tadano ATF220G-5

How the new five axle 250 tonners compare

	Liebherr LTM1250-5.1	Grove GMK5250L	Demag AC250-5	Tadano ATF 220G-5
Maximum capacity	250 tonnes	250 tonnes	250 tonnes	220 tonnes
Max capacity @ 3 metres	250 tonnes	250 tonnes	250 tonnes	180 tonnes
Max lift at max boom length	3.6 tonnes @ 60m	3.7 tonnes @ 70m	1.9 tonnes @ 70m	3.2 tonnes @ 68m
Max system length	108m	110m	102m	106m
Max lift without additional equipment or position*	142 tonnes @ 3.5m 134.7 tonnes @ 5m	165 tonnes @ 3 m 121 tonnes @ 5m	130 tonnes @ 3m 119.5 tonnes @ 5m	See copy 127.5 tonnes @ 5m
Main boom	60m	70m	70m	68m
Max speed	85 km/hr	85 km/hr	85 km/hr	85 km/hr
Number of engines	1	1	1	2
L x W x H	15.87 x 3 x 3.95m	15.29 x 3 x 3.95m	14.43 x 3 x 4.0m	15.93 x 3 x 3.99m
Number of axles	5	5	5	5

*Such as additional boom nose sheaves or over rear only

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assembly. Boosting both cranes' overall reach is an 18 to 34 metre bi-fold swingaway extension which also offsets by up to 50 degrees. Both cranes are powered by a single engine and benefit from a new Mercedes carrier cab, Twin-Lock boom pinning system and Megatrak independent active suspension. Deliveries will start in the fourth quarter of 2016.

250 tonner comparison

The 250 tonne sector has become a lot more interesting with the introduction of new cranes from Liebherr, Demag and Grove. Tadano still does not have a crane with this capacity rating, but does have a new 220 tonner which we have

included.

The Tadano ATF220G-5 has the longest carrier and is the only crane here with two engines. While the load charts suggest that it can lift its maximum 220 tonnes capacity at 2.5 metres it only manages 180 tonnes at three metres radius. The Tadano does manage 3.2 tonnes at its maximum boom length, however the Grove is a particularly impressive with 3.7 tonnes on its 70 metre maximum boom. Surprisingly the Demag chart reveals a lift of 1.9 tonnes on its 70 metre boom although it has the most compact carrier - 1.5 metres shorter than the Tadano. Liebherr has the shortest main boom at 60 metres but lifts

the most at five metres radius. System lengths are all within a few metres and lifting capacities at five metres vary from 119.5 tonnes for the Demag to 134.7 tonnes for the Liebherr. For its smaller maximum capacity the Tadano achieves a good second with 127.5 tonnes. In the load charts the Tadano does not have maximum load at three metres without additional equipment that improves on the 127.5 tonnes at five metres. All four cranes are capable of 85kph maximum road speed.

A round up of the rest

Walking around Bauma there was an indication that other manufacturers are aiming to build All Terrain cranes to rival the four major producers. Turkish company Hidrokon displayed its new AT4100 - a four axle, 100 tonne capacity

All Terrain crane with a 51 metre main boom which manages 1.2 tonnes at a 46 metre radius. The Chinese manufacturers - Sany, Zoomlion and XCMG - were also out in force with products that on first glance look more sophisticated and more likely to appeal to a global audience. But having a good product is only half the battle to selling in Europe or North America. Good distribution and confidence is more important. Link-Belt's new 100 tonne HTT 86100 claims to have most of the advantages of an All Terrain, but without the high running costs and complexity. It features a 50 metre boom plus 17.6 metre bi-fold swingaway extension, with additional inserts leading to a 79.7 metre tip height.



Zoomlion's 150 tonne ZAT1500



Turkish company Hidrokon displayed its new AT4100 - a four axle, 100 tonne capacity All Terrain crane with a 51 metre main boom



Sinomach displayed this four axle AT at Bauma

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Lifting expectation, prioritising safety

King Lifting has been a prominent crane rental company in the UK for several decades. Formed in 1982 by Bob King the company has grown both organically and through acquisitions and is now the UK's third largest crane rental company, with eight depots, 95 cranes, more than 240 employees and revenues of £22 million. Mark Darwin visited Tristan King at the company's new, purpose-built headquarters in the Bristol area to find out more.

It is surprising that Cranes & Access has not profiled King Lifting before. After the two national companies - Ainscough and Hewden - King is the largest independently owned crane company in the UK operating from eight locations. It is made up of four divisions - Crane hire and contract lift, Plant and machinery movement, Telecoms and logistics and Heavy cranes (300 tonnes and over).

Until two years ago the crane fleet was primarily Terex, but more recently purchases have included Liebherr. "The products Liebherr and Terex supplies and their components are all to a high level - this does not mean better reliability, but longer durability and lifespan," says King. "Liebherr and Terex are our preferred suppliers. When I became more involved in the purchasing process I wanted to see how other manufacturers' machines performed. If we have a crane down it has to be repaired the same or next day. Liebherr and Terex both have the



Kieron and Tristan King



King Lifting's new head office

support structures to maintain a fleet of our size."

So what about the Liebherr's new 450 tonne AT?

"Of course it is of interest," says King. "It looks impressive but its duties are not as good as an LTM1500 with the Y-Guy installed. Working in a limited space the LTM1450 may have the advantage though. When I was out on the road looking at crane jobs I was



C&A all terrain cranes

King has bought two 500t and one 750t Liebherr over the past year



passionate about buying a specific crane because it had better capacities or features etc... In reality a client will hire by the capacity - there may be advantages from one crane to another but a client wants a certain size. One topic of focus in today's market is paperwork - method statements, lift plans, risk assessments etc - and what you stipulate on the lift plan you have to supply, so it is easier with a class of crane rather than a specific model."

Company history

King Lifting is a family business with Bob, wife Sandra and sons Tristan and Kieron all directors. Nathan and Hadyn, Bobs other sons are also involved in the business operationally. Most of the day to day management is now shared between Tristan and Kieron - Tristan looking after cranes, workshop and telecoms and Kieron looking after the Plant and machinery movement

division. Sandra King is in charge of HR, with John McLellan as financial director. When Bob King left the army he worked for various crane hire companies and when British Crane Hire Corporation went bust he bought the Bristol telephone number from the receiver, and started a managed crane service before purchasing his first crane - a 15 tonne Kato. The business grew from its Avonmouth facility with the acquisition of Swindon-based Collet Crane Hire, before further depots were added in Newbury and Banbury - via Banbury Crane hire. Arrow Lifting in Wales was taken over before setting up a depot in West London and Birmingham and finally acquiring Ace Crane and Engineering of Gravesend, Kent in 2008 to cover East London. The depots offer mobile cranes up to 200 tonnes as far north as Birmingham. However the heavy crane division offers national coverage.



Until two years ago the crane fleet was primarily Terex



Working at Bristol City FC

The company said it might look at a depot further north if it makes commercial sense. "Everything we buy has to generate profitable income," says King. "Historically crane companies have traded on a cycle of residual values - buying cranes over three, five or seven years and selling after 10 years when they get 30 percent of the purchase price back, putting 10 percent down as a deposit on another crane with 20 percent going back into cash flow etc. We took a serious look at the business following the recession and are not buying cranes to trade. We buy them to rent and generate a return and will only buy a crane that generates profitable income."

Revenues in the past year were £22 million, up from £14 million in 2012. "By 2020 we would like to reach £30 million, the increase coming from the expanding heavy cranes division, a new site in Heathrow airport - now being a BAA approved contractor - and organic growth from the rest of the business."

Family business

"As a family business we rarely have problems with staff - my door is always open to operators and office staff alike who are the face of the business. We employ just one full-time sales person, so it is remarkable that our staff have created the growth we have achieved. I believe that if you pay a good wage and look after people they will give a good service and then the customer will come back for more. We tend to order high specification cranes, allowing the crane operator to work in a safe comfortable manner. We can sell to a client until we are blue in the face but unless our operational staff deliver on site, we will not have a

successful business."

King Lifting has very little staff turnover and even during the last recession did not make any redundancies. "It was a tough few years but more recently we have been able to give good pay increases as the level of business has returned."

At the moment King is running at around 87 percent utilisation. "As a percentage of return on capital equipment 40 and 60 tonne cranes do not create the same profit as larger capacity machines. However we will always have 40 and 60 tonne size of cranes in the fleet to provide a full service.

"One of the worst cranes in the market for low rates is the 25 tonne truck mount. Most are now 20 to 25 years old and go out at between £250 and £300 a day, compared to our cheapest crane at £460. Rates overall have increased over the past three years but have stagnated over the last six months due to uncertainty in the market, with the EU referendum etc... There are lots of large projects on hold, awaiting approval/funding. However overall the market is still buoyant with good growth and good potential for the future."

MOTs

According to King the biggest topic that needs to be tackled in the industry is the introduction of road testing (MOTs) for cranes. It has installed a rolling road at its new Avonmouth facility, allowing it to carry out regular brake efficiency testing in house.

"If all the cranes in the UK were tested without notice I think the outcome would be very interesting" he says. "We need standardisation of equipment in the market so



The newly installed rolling road



Lifting operators near Clifton suspension Bridge

that everyone competes on a level playing field and testing would go some way to achieving that. We make sure that when one of our cranes goes down the road, it is in a fully maintained and in a safe condition. However the biggest obstacle for MOTs is the lack of infrastructure for testing larger cranes. If they do become mandatory we would sign up as an accredited test centre."

Investing heavily

King Lifting invests heavily in new equipment - the average age of its cranes is 4.8 years, one of the youngest fleets in the UK. This means less down time and a higher standard of equipment on the road which the company believes translates into better returns. Over the past year King has bought many new cranes including a 750 tonne Liebherr LTM 1750, and two 500 tonne LTM1500s. Other recent additions include a 300 tonne LTM1300 last year, LTM1200, six 40 tonners over the last 18 months, several 60 tonne LTM 1060s last year and two 80 tonne Terex AC80s. "We would never run a crane over 100 tonnes that was more than eight years old. With the larger cranes if they have a problem there are a lot of additional costs - ballast wagons etc - it just isn't worth it. When in the heavy crane market

you need to supply good quality, reliable, new equipment. Everything we have from 140 tonnes up is no more than four years old. Clients welcome new equipment as it creates less down time due to breakdowns."



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