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Strong activity in AT sector

This year has already seen some interesting activity across the small to mid-capacity All Terrain crane sector, with new models from many of the major manufacturers including Grove, Liebherr, Terex, Tadano and Kato. We take a look at some of the new introductions and developments and see how they compare against the competition.

Perhaps the most interesting All Terrain crane to be launched this year is the 60 tonne Tadano ATF60G-3. Details were originally unveiled at Bauma 2016, but deliveries have only just started. The delay in the launch has meant other manufacturers have had the time to bring out improved models of their own to counter some of the innovative features. Tadano is gaining somewhat of an unwelcome reputation for dragging its feet with new products - its 600 tonne ATF600G-8 still has not seen the light of day almost four years after its original 'launch'. Whatever the reasons - supply problems following the tsunami in Japan, technical/manufacturing problems or changes to the design - other companies do not seem to have the same issues, at least not to the same degree.

Tadano makes some very bold claims for its 'new' 60 tonner particularly as the original design concept now is almost five years old and other products have appeared

since then.

At the heart of the ATF60G-3 is a single superstructure mounted six cylinder Mercedes Euromot IV / EPA Tier 4f, diesel. Mounted at the rear of the superstructure it drives the carrier via a mechanical drive training that passes through the slew ring. Tadano has in the past famously defended the two engine concept but is now promoting the fact that placing the engine in the superstructure is better for the operator in terms of noise and exhaust fumes/heat, given that it is always well behind him compared to a carrier mounted engine.

10 tonne per axle

By positioning one axle to the rear of the slew ring and two towards the front of the carrier, Tadano has managed to achieve an even weight distribution of 10 tonnes per axle - even when carrying a 20 tonne hook block, but without the counterweight or extension. The axle loads can be increased up to a maximum of 16.5 tonnes for markets such as the UK or while moving around site, at which





point it can carry its full 13 tonnes of counterweight, the 7.5 metre swingaway extension and a 40 tonne hook block.

The seven section 48 metre main boom is five metres longer than the Grove but equalled by Liebherr, but both are two metres short compared to the 50 metre boom on the new Terex AC 60-3. Maximum radius is 44 metres, using full boom plus the extension at which it can lift 700kg. While this is good the Liebherr tops it by four metres, thanks to its longer extension. It is entirely possible that Tadano will add a longer extension at a later date.

Tadano claims that capacities on the ATF60G-3's main boom are up to 46 percent stronger than other 60 tonne/three axle cranes, and 62 percent stronger on the extension. Given that the crane is advertised as having 10 tonne axles loads, the load chart without counterweight is of keen interest, and it does not disappoint, lifting eight tonnes at 10 metres, three tonnes at 20 metres, or handling 6.3 tonnes on the fully extended main boom at a radius of up to 11 metres. The crane also as some decent pick & carry duties - up to 21 tonnes but at a 2.5 metre radius, more practically it can handle 10.3 tonnes at up to six metres.

Compact Tadano

The new Tadano is also compact, with an overall length of just under 11.2 metres and an overall height of 3.68 metres, however is a fraction wider than the Liebherr and Terex cranes at 2.66 metres.

The crane features Tadano's new AML crane control system, with variable asymmetrical outrigger set up, with the system calculating the maximum capacities for the set up

> selected and superstructure slew position.

Overall the latest three axle 60 tonners are quite similar, with Liebherr possibly coming out slightly stronger on paper, depending on your requirement or application. What is obvious is that over the past few years all of the manufacturers have

upped their game and can compete reasonably well with the Tadano.





At the heart of the ATF60G-3 is a single superstructure mounted six cylinder Mercedes Euromot IV/EPA Tier 4f diesel.



Larger ATs

Liebherr dominates the All Terrain market, with an overall market share in excess of 40 percent - in some markets this is even higher. The company gained ground when Grove lost share and Terex began having problems, but both companies have begun to bounce back, particularly Terex with its new Demag models,



which are starting to sell in larger numbers following its major effort to sort out the quality/performance and spares problems with some of its cranes - particularly the Challenger models.

One reason that Liebherr has been able to maintain its dominance. which dates back to the early days of the All Terrain market, is its regular upgrading or launching of

> new products which include the latest technology etc... and the speed that it can ship in serious volumes before competitors catch up. Its latest model - the 230 tonne LTM1230-5.1 - was unveiled during the summer at its Customer Days event at its mobile



The Tadano AFT60 G-3 compared against the competition

Make Model	Tadano AFT60 G-3	Liebherr LTM1060-3.1	Terex AC 60-3	Grove GMK3060
Max capacity	60 tonnes	60 tonnes	60 tonnes	60 tonnes
Max @ 3m	41.4 tonnes	42.3 tonnes	39.5 tonnes	48.5 tonnes
Main boom cap.				
@ 10m radius	14.5 tonnes	15.2 tonnes	15.0 tonnes	15.0 tonnes
@ 20m radius	5.6 tonnes	5.7 tonnes	5.4 tonnes	5.2 tonnes
@ 30m radius	2.2 tonnes	2.8 tonnes	2.5 tonnes	1.9 tonnes
Max @ full	6.3 tonnes	6.1 tonnes	6.1 tonnes@	7.6 tonnes@
main boom	@ 8 metres	@ 8 metres	10 metres	10 metres
Boom length	9.5 - 48m	10.3 - 48m	10.4 - 50m	9.6 - 43m
Extension	1.7 - 7.4m	9.5 - 16m	9.1 - 16m	8.7 - 14.9m
Max tip height	58.4m	67m	69m	60m
Max radius	44m	48m	40m	38m
Axles	3	3	3	3
Dimensions	11.18 x	11.18 x	11.67 x	11.41 x
LxWxHm	2.66 x 3.68	2.55 x 3.80	2.55 x 3.66	3.66 x 2.55
Engine location	superstructure	chassis	chassis	chassis
Steering standard	6 x 4 x 6	6 x 4 x 6	6 x 4 x 6	6 x 4 x 6
Steering option	No	6 x 6 x 6	6 x 6 x 6	No
Speed	85 kph	85 kph	85 kph	80 kph
Max counterweight	13t	12.8t	12.1t	13.6t
Outrigger spread	6.4m	6.3m	6.5m	6.2m
Chassis length	9.74m	9.4m	9.73m	9.1m
Min axle weights	10 tonnes	12 tonnes	9.1 tonnes	12 tonnes







crane facility in Ehingen, Germany.

The new five axle LTM1230-5.1 will replace the 200 tonne LTM1200-5.1 and features a 75 metre main boom - three metres longer than its predecessor - as well as having 20 percent greater capacities on average, partly due to the new VarioBallast system which adjusts the counterweight tail swing from 4.8 to 5.7 metres. The crane has an 11.5 to 22 metre bi-fold swingaway extension with up to 40 degrees offset and a hydraulic luffing option. Additional reach is available by inserting up to three, seven metre straight lattice sections between the boom nose and extension.

For the last three years, owners of the LTM1250-5.1 have been able to install a long fixed lattice jib - said to be the first of its kind in the five axle class - giving a maximum radius of 98 metres, ideal for working over buildings etc. This jib - up to 43 metres long - is also available for the new LTM1230-5.1, achieved with an additional TF adapter connection between the telescopic boom and the fixed jib, a reducer section and a head piece. Existing lattice extensions are used for this purpose. The jib is hydraulically adjustable up to 45

degrees and can - to some extent - be used like a luffing jib. The attachments can also be configured to produce a high capacity 39 metre fixed jib. Maximum tip height has been increased by 10 metres to 114 metres making it ideal for erecting tower cranes or maintaining wind turbines.

The crane follows Liebherr's single chassis mounted engine concept with a Stage V, six cylinder diesel, driving a 12 speed ZF Traxon transmission and superstructure pumps by a mechanical shaft system through the centre of the slew ring. Additional features include EcoMode and EcoDrive to maximise fuel efficiency while reducing noise and emissions and the 'Hill Holder' feature to assist with hill starts.

The LTM1230-5.1 is unusual in that it has an asymmetric maximum outrigger base with a front spread of 7.4 metres and wider rear of 8.1 metres which is said to provide additional capacity over the rear quadrant. It is also equipped with Liebherr's VarioBase outrigger set up system. The maximum counterweight on the LTM1230-5.1 is 72 tonnes - the same as its predecessor - but thanks to the VarioBallast





AT cranes



Demag AC300-6

Make Model	Terex AC300-6	Grove GMK6300L-1	Liebherr LTM 1300-6.2	
Capacity	300 tonnes	300 tonnes	300 tonnes	
Capacity @3m	155 tonnes	190 tonnes	135.5 tonnes	
Main boom	80m	80m	78m	
Max radius	86m	94m	94m	
Jib	42.4m	37m	70m	
Max system ht	119.9m	120m	120m	
Main boom capacity	15t @18m	14t @ 18m	13.3t @18m	
@ radius	14t @ 26m	14t @ 26m	11.8t @ 26m	
	10.9t @ 34m	12.2t @ 34m	10.0t @ 34m	
	2.2t @ 74m max	1.7t @ 74 max	1.9t @ 74m max	
Axles	6	6	6	
Dimensions	17.32m x 3.0m	18.5pm x 3.0m	17.45m x 3.0m	
LxWxH	x 4.0m	x 3.95m	x 3.95m	
Chassis length	15.59m	15.71m	15.44m	
Steering standard	12 x 6 x 10	12 x 6 x 12	12 x 6 x 12	
Steering option	12 x 8 x 12	12 x 8 x 12	12 x 8 x 12	
Speed	85 kph	85 kph	85 kph	
Total weight	93.8t	92.5t	96t	
Outrigger spread	8.48m	8.5m	8.53m	
Gradeability max	63%	53.6%	56.9%	
Engines	1	2	1	

system, the long reach capacities have been significantly increased.

New 300 tonners

Over the past year or so, two new 300 tonners have been introduced by Grove and Terex. The Liebherr LTM 1300-6.2 is slightly older with first deliveries starting at the beginning of 2015 following its launch at Bauma in 2013.

Grove has quietly been updating its AT range introducing models including the 90 tonne GMK4090, 100 tonne GMK4100-L and 150 tonne GMK5150L. The latest is the new version of the six axle 300 tonner, the GMK6300L-1. The original model - along with the 400 tonne GMK6400 - effectively kick-started the new era of Grove All Terrain cranes, quickly gaining a good reputation for specification and performance. To date more than 400 units of its 300 tonner have been delivered

The new GMK6300L-1 has significantly improved load charts with an average of seven percent overall, and more at longer boom



lengths. For example, the crane can lift an impressive 14 tonnes on full boom at up to 28 metres radius. Improved specifications including new engines are made possible by redesigning the structural fabrications. Maximum tip height is 120 metres comprising the fully extended 80 metre main boom and a 37 metre extension. The crane retains its two engine set up - both Mercedes Tier 4 final diesels - offering improved fuel economy, with the carrier engine matched to an Allison torque converter transmission. The steering and suspension systems remain unchanged while the counterweight slabs and auxiliary hoist are interchangeable with the GMK5180-1, GMK5200-1, GMK5250L and GMK6300L.

How it compares?

So how does the new Grove compare against the Terex AC300-6 and the Liebherr LTM 1300-6.2. Tadano does not have a model of this capacity for the moment.

Terex announced its new six axle 300 tonne AC300-6 in November 2016, officially launching the model in June 2017, with the first crane delivered to German crane rental company Eschbach at the end of last year. Replacing the AC 250-6, the new Demag AC 300-6 has an 80 metre main boom and can lift 15 tonnes to a height of 75 metres at a radius of between 18 and 22 metres making it ideal for tower

crane erection. The AC 300-6 will be the smallest Demag crane to be equipped with a new luffing jib, which provides a maximum system length of almost 120 metres. Other models with the luffing jib option include the AC 350-6 and AC 1000-9.

The new crane adopts all of the features and many of the same components of the other Demag five axle All Terrain cranes, including the 21 metre bi-fold swingaway extension, with up to 40 degrees of offset. It also features the Terex IC-1 Plus control system with real time calculation of lift capacities and can be customised to suit the actual outrigger set up employed, with enhanced capacities when lifting over an outrigger jack for example. It also features a single engine with stop/start function to reduce idle times and total engine hours. The carrier has three drive variants and active all wheel steering. On the road, axle weights range from below 12 tonnes to 16 tonnes with 800kg of extra payload for lifting



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accessories while the axle load monitor with dashboard display, helps operators keep an eye on the actual axle loads.

On paper these three cranes have very similar performance. Terex makes a point that its AC300-6 can lift a class leading 15 tonnes on a fully extended main boom between 18 to 22 metre radius. However, as the radius increases it is the Grove that is the strongest, capable of 12.2 tonnes at 34 metres - 2.2 tonnes more than the Liehherr On the other hand, the Terex has the highest capacity of 2.2 tonnes at its 74 metre maximum.

While all claim to be 300 tonne capacity cranes, none of the three can achieve this without either lifting over the rear or by using special equipment. Under normal conditions the Grove has the best capacity of 190 tonnes with Terex at 155 tonnes and Liebherr trailing at 135.5 tonnes.

All main booms are similar, with Liebherr two metres shorter at 78 metres although the maximum radius of the Terex is 86 metres, compared to 94 metres on the other two. The AC300 is the most compact however the Liebherr has the shortest tail swing, which helps when setting up in city centres for installing tower cranes for example.

City cranes

Although Terex relaunched its City type AT crane range at the end of 2016 with the new AC45 City - a sector it abandoned in 2014 - the smaller capacity road going cranes are still not a favoured sector among the major crane producers. The old AC 40 City which was introduced in 1998 went on to sell more than 1,000 units, becoming the most successful model in its class. While based on the old AC-40, more than 80 percent of the new AC45 City has been changed and improved, including a new engine and cab. Terex says that the range will be extended but indications suggest the next model with be the larger AC60 City rather than a lower capacity model.

The Japanese manufacturers -Kobelco, Tadano, Kato and Komatsu - developed and refined the City crane throughout the late 1970s and 1980s with Demag the first major European manufacturer to enter the market. For many years it was the only major crane manufacturer with a line of City cranes, probably

due to the maximum price buyers would pay for a crane of this size, compared to their high production costs.

The Japanese manufacturers pulled out of western markets as they struggled with adapting to the changing emissions regulations, in what was a low volume market. This, and the longer term strategies of independent carrier manufacturers also helped kill off exports of Japanese truck cranes to Europe. When Terex phased out its City models it left a void and pent up demand for the smaller City cranes. Some companies looked to source machines

through 'grey imports' while others focused on refurbishing older machines.

That all changed with Kato's reentry into the European market in 2015, more than 10 years after the company stopped homologating and selling its cranes in the region. The three model Ri range included 20 tonne CR-200Ri, the 35 tonne CR-350Ri and the 13 tonne CR-130Ri. The cranes were well received achieving good sales particularly to the established crane rental companies however one area that was lacking was the road speed of less than 50kph compared with at least 80kph of the other two axle AT cranes. This and other improvements were made when the new two model Rf range of cranes were launched at Vertikal Days this vear.

The new Rf cranes include the CR-130Rf and CR-200Rf and retain most of the structural elements of the Ri models, including the 24

metre six section boom and 5.5 metre telescopic offsetable jib on the CR-130, and the 28 metre boom and 5.8 metre jib on the CR-200. However, travel speed has been increased to 62 kph together with Hino/Cummins Stage IV diesels and completely redesigned operator cabs with greater glazed area, improved information displays and a raft of operator comfort features. Other features include automatic outrigger levelling with five extension widths, a standard Parking Distance Assist system with sensors front and rear, rear view cameras and standard two position three tonne searcher hooks.

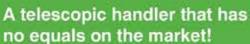
Given that every crane manufacturer is gearing up for product launches at next year's Bauma show in Munich, Germany, there has been a surprising amount of new models introduced over the past year. It will be interesting to see what new developments will be seen and if the other manufacturers can break Liebherr's dominance in this sector.















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Challenging hospital lift for McGovern

Restricted space turned a relatively simple lift into a challenge at the Birmingham Children's Hospital in the UK, with the tight conditions making it almost impossible to set up the size of crane needed to install a 21 tonne generator from the hospital driveway. Derbyshire-based McGovern Crane Hire managed it with its Demag AC 220-5 All Terrain and its IC-1 Plus control system, with one outrigger fully retracted.

Project manager Kieran McGovern said: "We knew that this lifting operation would be very tricky, so we made several advance site visits to measure the road and driveway spaces. We also carried out extensive lifting simulations with CAD based computer programmes as well as constructing a 3D model - helped by the Terex Lift Plan planning tool - to see whether we could slew the crane's superstructure completely, within the surrounding buildings.

Two lift plans were considered, the first using a 350 to 500 tonne crane but which would not have fitted the narrow driveway, so would have had to set up on the opposite side of the road. From there the crane would have to lift the generator at a radius of around 50 metres.

"We decided not to use this method as the site had concerns regarding larger cranes due to ground capacity and lifting loads over the hospital's nitrogen tanks," said McGovern. "So we opted



for a smaller crane - our new Demag AC 220-5 - set up in the driveway, however it only worked because of the IC-1 Plus control system taking advantage of the maximum available lifting capacity for each slewing position and crane configuration. The system is particularly useful when working with reduced outrigger settings and/or reduced counterweight allowing the crane to perform tasks of a larger crane. Because of the available space, we were only able to extend three of the outriggers to around three quarters of their maximum width. Using the IC-1 Plus we were able to configure the crane to carry out the lift using 84 per cent of the rated lifting capacity even with a reduced counterweight."







In order to lift the total 22 tonne load - the generator, hook block and lifting tackle - the AC 220-5 had 51 tonnes of counterweight. Working with a boom length of 33.3 metres at a radius of 15 metres, the generator was unloaded from a trailer parked in the driveway and lifted to a height of 10 metres, over the adjacent buildings by slewing the crane directly over the front right rigger which was completely retracted. The crane continued slewing until over the back right outrigger at 75 percent extension, and easily lowered to the desired position with a final radius of 19.7 metres.

"We know we can perform complex tasks safely and economically with the AC 220-5 and the IC-1 Plus. Using a smaller crane is more

cost effective for our customers while we use and transport less counterweight."



Super quick bank job

German crane company **BKL Baukran Logistik** used its 400 tonne Grove GMK6400 to lift parts of a 24 tonne derrick crane to the top of a 94 metre high bank in Eschborn, northwest Frankfurt. Poor weather conditions and a time frame of just 48 hours made the job more challenging. The derrick crane was needed for roof refurbishment work.

"Installations at this height are demanding, especially in wintery weather conditions," said Edwin Weidner, the mobile crane manager at BKL's Frankfurt depot. "Our customer only had a 48 hour time

slot to install the derrick crane and that included assembling and removing the mobile crane. We chose the GMK6400 due to its fast, self rigging Mega Wing Lift, light components and ease of operation." The GMK6400 lifted the derrick crane in sections which were then assembled on the building's roof. The GMK6400 was required to lift up to seven tonnes to a height of 131 metres and at a 43 metre radius.



Historic church

relocated

Australian crane rental company **Cranes Combined supplied a Grove GMK5150L All Terrain crane to** move a church in the state of Tasmania. Equipped with 5.6 tonne of counterweight and working at a radius of just under 12 metres, the crane took about seven hours to move the six tonne church which had been in position for more than 100 years.

"The church was built in the 1800s and therefore relatively delicate" said Chris Kolodzie, co-owner of Cranes Combined, "The GMK5150L is very smooth in its operation, so the whole lift was carried out without a hitch. Even the windows, which are thin and fragile, were undamaged in the move."

The GMK5150L has a maximum capacity of 150 tonnes, a 60 metre main boom and a maximum tip height of 88 metres.







Two Liebherr cranes from the Schmidbauer group - an LTM1350-6.1 from Rieger & Moser and LTM1400-7.1 from Fricke-Schmidbauer - helped replace a 20 year old tree debarking drum weighing 90 tonnes at the Sappi paper factory in Ehingen, Germany. The giant drum takes whole trunks of beech and spruce trees and rubs them against each other causing the bark to come

The factory roof had to be removed prior to the lift commencing, the old debarking drum was then removed in a tandem lift to make room for



the new 32 metre long, five metre diameter drum made up of several half shells, welded together over a

period of several weeks on the Sappi factory site.





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Max. Lifting Capacity	Boom	Boom Extension	Max. Sheave Height	Max. Badius	Engine (superstructure)	Gear
601	9.5 m - 48 m	1.7m - 7.4m	58.4m	44 m	260 kW (354 HP)	6 x 4 x 6 (6 x 6 x 6 off-road)