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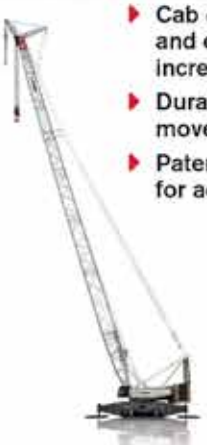

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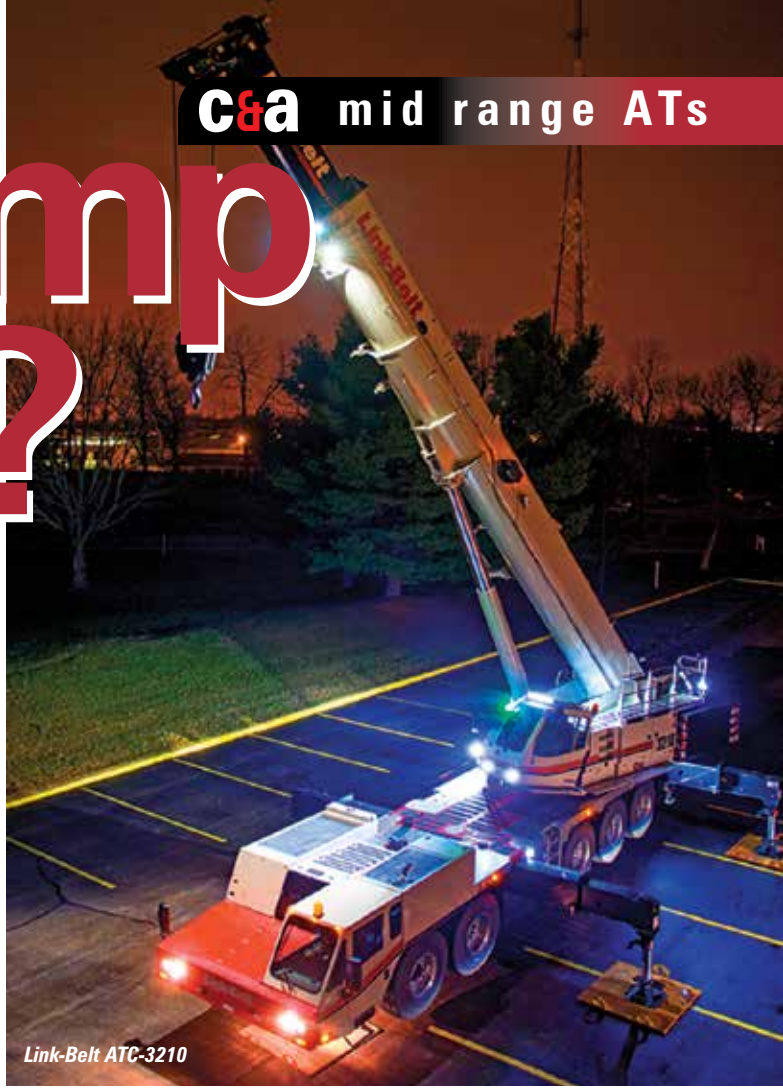
One lump or two?


Link-Belt ATC-3210

Like many things, size increases with age. Take modern cars such as the Mini and VW Golf and compare them with the originals of the1950s and 70s. The modern versions are significantly larger and more powerful. The same goes for All Terrain cranes. Three years ago we looked at the increase in the nominal capacity of All Terrain cranes and identified the 100 tonner as having almost become a taxi crane. Over the last few years the average capacity of AT deliveries has continued to grow, with an increasing number of rental companies topping out their fleets with 250 tonners, while the 90-130 tonne class has now become the most popular, at least in Europe.

There are various reasons for this shift, not all of it is down to larger load modules, or the move towards alternatives such as loader cranes at the bottom end of the capacity range. In many countries very poor rental rates, and therefore financial returns from smaller (up to 60 tonnes) cranes almost force rental companies towards higher capacity models for better returns on investment.

In this issue we take a look at the slightly larger capacity mid-range class - five and six axle cranes between 150 and 250 tonnes - where there have been several new additions, including two new single engine 160 tonners - the Terex Explorer 5600 and Liebherr LTM 1160-5.2 - both of which were launched at Conexpo.

We have written many times about Terex's move towards giving its new cranes a name, along with non-descript numbering (Challenger 3160, Quadstar 1100, Superlift 3800 etc…) the Explorer 5800 and now Explorer 5600 follow this policy. Given that Terex classifies its Explorer as 'capacity class' cranes - 220 tonnes for the 5800 and 160 tonnes for the 5600 - we have compared each against its major competitors to see how they stack up. For the Explorer 5800 this includes the Liebherr LTM 1220-5.1, the Grove GMK 5220 and Tadano ATF-220G-5. As well as the new Terex and Liebherr 160 tonners we take a look at the new 185 tonne Link-Belt ATC-3210 aimed primarily at the North American All Terrain market.


The new 160t Liebherr LTM 1160-5.2

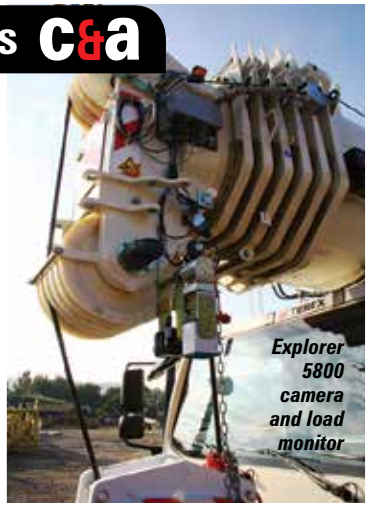
Single engine or two

Over the past year or so, the concept of a single engine 'large capacity' All Terrain has grown significantly, topped by the two new 160 tonners from Terex and Liebherr. Liebherr, Terex and Manitowoc all have even larger capacity single engine cranes, but not all manufacturers buy into the single engine concept for larger cranes. Tadano Faun maintains that there are greater benefits to customers from the traditional two engine design, claiming that it offers customers the best overall package.

Those manufacturers that have adopted the single engine concept usually cite advantages such as weight saving, lower overall cost of ownership and reduced working at height. However Tadano maintains that the smaller upper engine is much more efficient than powering the crane from the larger carrier engine, which is grossly oversized for the job. Other advantages of the twin set-up include less wear, tear and maintenance on the swivel connection/power transfer between carrier and superstructure. The use of two separate diesel tanks gives more capacity and reduces risk of the crane operation running out of fuel after longer drives to site. Another problem Tadano identifies with the single engine concept is that the engine/exhaust is in a fixed position so uncomfortable for the operator when he is alongside, while the superstructure engine is always behind him.

Tadano says that having two engines provides fuel savings and increased engine life resulting in better resale value and benefits for the second owner. Service intervals are reached later and it avoids excessive operational hours on the larger, more expensive carrier engine. For example crane work can add a further 1,500 hours to the carrier engine over and above its normal road duties. It also maintains that the weight saving is really marginal (perhaps as little as 100kg) as this is offset by the installation required to bring the power to the upper structure. Tadano suggests


Explorer 5800 rear storage box


Explorer 5800 camera and load monitor


Explorer 5800

that manufacturers benefit more than the customers from adopting a single engine - saving the cost of one engine as well as design and redesign costs when complying with new emission regulations.

"There are significant savings with twin engine cranes - fuel, engine replacement costs and other swivel maintenance issues over a typical ownership period - as well as an increased residual value," says Tadano's Thomas Schramm. "Manufacturers favour the single engine because new engines require a complete redesign of the engine compartment, saving a huge cost in design work every time the engine changes. We think having two engines is the best solution for the customer so that is what we will provide."

Explorers

Prior to last month's launch the Explorer 5600, the Explorer 5800 was the latest model in Terex's 17 model AT crane line-up, slotting between the 200 tonne AC200-1 and the 250 tonne AC250-1.
In a comparison with its direct competition, it is clear that Terex wanted the new crane to be best in class in terms of key specifications. It also claims that it is the "strongest All Terrain crane over the entire working range" and also that it is "the most compact crane" in its class and that its single engine concept provides "reduced operational and maintenance costs".

We compared it against the 220 tonne capacity cranes from Liebherr, Grove and Tadano. As the world's leading All Terrain crane producer, Liebherr has an extensive range of 21models with the 220 tonne LTM 1220-5.2 fitting between its five axle 200 and six axle 250 tonner.

Grove's GMK5220 dates back to 2006 but is still surprisingly competitive with its 68 metre main boom, 108.5 metre system length, 220 tonne maximum capacity (over the rear) and features such as Megatrak suspension and hydraulic luffing extensions.

Making up the quartet is the 68 metre boomed Tadano Faun ATF 220G-5. Prior to the 400 tonne ATF-400G-6 it was the largest in the company's nine model line-up, which the company says is in the process of being extended upwards.

Terex Explorer 5800

One of the main features Terex targeted with the Explorer is that it is a global model. It has variable axle load configurations from less than 9.1 tonnes to 16.5 tonnes at which it can carry 18.7 tonnes of counterweight along with boom extensions. For the USA it has eight foot (2,440mm) axle


Explorer 5800 Load monitor


Explorer 5800 external control panel for outriggers


Explorer 5800

How the new Explorer 5800 compares: *(figures in red are best in class)*

	Terex Explorer 5800	Liebherr LTM 1220-5.1	Grove GMK 5220	Tadano ATF-220G-5
Max capacity with full counterweight:	130t @4m	220t @3m over rear	220t @3m over rear	220t @2.5m w/extra equipment
Max unrestricted capacity no counterweight:	130t@ 3.0m	134t @ 3.5m	134t @3.0m	108t @4.5m
Main boom length:	70m	60m	68m	68m
Axles:	5	5	5	5
Swingaway extension :	21m	29m	21.3m	37.2m
Max. system length:	102m	103.3m	108.5m	109m
Max. load fully extended main boom:	12.7t	19.3t	14.0t	13.8t
Max. counterweight:	70.2t	74t	77t	71t
Max. load moment:	660mt	638mt	625mt	669mt
Total length:	14.45m	15.6m	15.08m	15.92m
Carrier length:	13.22m	13.38m	13.39m	13.45m
Front overhang (max):	1,230mm	1,980mm	1,690mm	1,605mm
Height (14.00 R25)	4.0m	3.95m	3.95m	3.94m
Outrigger width:	8.4m	8.3m	8.1m	8.3m
Carrier Engine:	405kW	370kW	420kW	405kW
Superstructure engine:	single engine	180kW	170kW	143kW

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Liebherr LTM 1220-5.2

spacings, 20.50" tyres for Australian road regulations, a boom off solution for Japan and dolly operation for lower axle load areas in Canada, USA and Norway. In the traditional12 tonne EU axle load configuration, the 5800 needs two additional trailers to deliver all the equipment required. The optional dash board mounted axle load indicator gives the operator the actual readings for compliance in the various countries. Terex has also included its new electronic disc brake system with ABS, exhaust brake and retarder. The system also includes its dynamic launch control aiding acceleration up-hill when moving the crane from standstill without rolling back. Routine maintenance and visual checks are accessible from the ground or cab and the crane features storage boxes at the side and rear for outrigger pads and timber and a tackle box on the deck. A good deal of attention has been paid to safety, with folding ladders and telescopic handles as well as cameras both on the carrier and on the hoist and jib tip and working lights all over.


Grove GMK 5220

How does the 5800 stack up?

As with all of Terex's new cranes, the 5800 is described as being in a 'capacity class' and as can be seen from the chart, it does not feature a maximum nominal capacity The problem of being a '220 tonne class' crane begs the question - is it a 220 tonne crane or not? As we saw a few months ago, its big brother, the AC1000 is described as a 1,200 tonne capacity crane but really has the performance of a 1,000


Tadano Faun ATF220G-5 2

Tadano ATF 220G-5

Tadano ATF 220G-5


Liebherr LTM 1220-5.1 working in Orkney

Grove GMK 5220

tonner. The same may be said for the Explorer 5800 in that it performs well against 220 tonne competition but is not a performance class leader. It does have the longest boom and is the most compact, but overall it is merely competitive, rather than class leading. It is currently the only crane in the group that features a single engine - a 405kW Euromot IV/Tier 4 - which as discussed above will appeal to some and not to others. It will be interesting to see the uptake of these single engine cranes against the traditional twin engine as customers have the opportunity to try them for themselves.

Terex says the Explorer 5800's control system automatically senses demand on the engine to offer power when required and fuel economy when not. The latest operator's cab has a variable tilt up to 20 degrees, helping improve load visibility at steep angles. It comes with the standard IC-1 control system which stores all load charts and offers easy configuration based on load and radius input and can be quickly configured by operators.

The Liebherr – despite having been around for several years – still has one of the strongest overall load charts but is a little short on main boom with 60 metres – 10 metres shorter than the new Terex. Certainly its extensions, all of which can be offset by up to 45 degrees, give it a competitive maximum tip height, but increasingly on this size of crane main boom length is important. The carrier is still one of the most refined with active rear-axle steering and a choice of six steering programmes.

The Tadano ATF 220G-5 dates back to 2006 and has proved a popular crane over the years, partly due to its specification, by also due to its bullet-proof reliability. It features a seven section 68 metre boom with single cylinder extension system, allowing partial telescoping of loads. The crane's nominal rating is at 2.5 metres over the rear, while at three metres 360 degrees it is rated at 182.5 tonnes. Examples of its load chart include 3.9 tonnes to 60 metres radius, over 34 tonnes at 20 metres and 10.6 tonnes at 40

metres. Extensions add 37 metres and include a 5.4 metre heavy duty section that can offset by up to 40 degrees. Size-wise it is the largest of the cranes although it is not significantly larger than the Grove or Liebherr. Drive steer configuration is 10x8x8, with the third axle lifting for crab steer, while the rear two axles feature Faun's electronic steering system that automatically shuts off at speeds of over 25kph. 16.00 tyres are standard with 20.5's as an option.

The Grove GMK 5220 also dates back to 2006 and like the Tadano has a 68 metre boom but is more compact and thanks to its class leading 77 tonnes of counterweight has a good load chart.

If Terex is pitching its Explorer against 220 tonne cranes it has picked some strong opposition. It is by far the most modern of the cranes but will its single engine win over or put off customers - only time will tell.

160 tonners shift to one engine

Conexpo saw the introduction of several new All Terrains in the 160-180 tonne category including the Terex Explorer 5600, Liebherr LTM1160-5.2 and the Link-Belt ATC-3210.

Liebherr LTM 1160-5.2 was launched at Conexpo

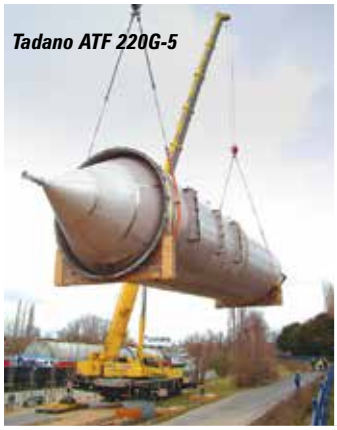
The new 160-tonne LTM 1160-5.2 is the successor to the LTM 1160-5.1. Liebherr has a long and successful history with 160 tonne ATs, the original six axle machine was a strong performer and this was superseded by the 1160/2 oval boom machine in 1996. Liebherr says that the LTM 1160-5.2 is completely new, from the ground up. While the crane was unveiled at Conexpo we still haven't seen full specification details yet. What we do know is the load chart has been increased by around 20 to 25 percent whilst the main boom has remains at 62 metres. Chassis width has been reduced from three metres to 2.75 metres, making it both easier to drive on public roads and easier to handle in congested areas on site. Being a single engine crane, the superstructure is powered by the 400kW chassis engine using a mechanical shaft transfer - similar to the company's first large single engine crane - the 300 tonne LTM 1300-6.2 launched at Bauma. Liebherr claims that this is most efficient form of power transfer - important when you are running that big engine to run the upperworks.

Grove GMK 5220

Tadano ATF 220G-5

The six section 62 metre boom uses the Telematik telescoping system and has a 10.8 to 19 metre swingaway extension with zero, 20 and 40 degree manual or hydraulic offset and additional extensions taking the maximum tip height to 93 metres, with a reach of up to 76 metres radius. A second hoist and a 2.9 metre assembly jib or auxiliary boom nose are also available. The maximum counterweight is 54 tonnes. Within its total 60 tonne gross vehicle weight - 12 tonnes per axle - the new crane can carry its bi-fold swingaway extension, a three sheave hook block and spare capacity for the storage box.

In order to keep fuel consumption down when used for crane work, the complete pump drive can be disconnected automatically when the engine is idling and then reconnected by the intelligent controller in a matter of seconds, when required. The ECO mode program allows the operator to set the required working



Tadano ATF 220G-5

Liebherr LTM 1160-5.2 single engine

A Liebherr AT installing the Semper Opera Ball

Grove GMK5170

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Terex Explorer 5600

The Explorer 5600 is the second member of the Explorer family, designed along the same lines as its bigger brother the 5800 with almost the same main features, such as a compact carrier at 12.6 metres long and all-axle steering. Featuring a 68 metre main boom, maximum 95 metre system length and a maximum load moment of 480 metre tonnes, the 5600 can telescope up to 35 tonnes, while the hoist boasts a 9.9 tonne line pull for less reeving and increased performance. Power is supplied by a single 405kW Scania Euromot IV/ Tier 4 final compliant diesel engine. The outrigger footprint is 8.14 x 7.5 metres - the largest in its class. Options include a xenon working lights package, pendulum load camera, tail swing camera and hoist and right-hand side cameras for improved visibility even at night. The crane also features the latest Terex cabs with electronics compartments moved to provide more inside space for operators. The 2.55 metre wide carrier cab has had the B-pillars removed for improved visibility.

185 tonne Link-Belt

The final crane in our review is the slightly larger capacity 185 tonne, five axle Link-Belt ATC-3210 aimed primarily at the North American market. It follows on from the 250 tonne five axle ATC-3275 introduced three years ago. Link-Belt says a fully equipped ATC-3210 can be moved anywhere in the USA in just three truckloads each weighing 20.5 tonnes or less. The crane's 10x6x10 drive/steer carrier boasts axle weights of under 10 tonnes and a high level of equipment including anti-lock (ABS) disc brakes, transmission retarder, engine compression brakes, cruise and traction control as standard. Extra steering cylinders are provided for manoeuvring on difficult terrain, while the traction control has a mud and snow setting.

The ATC-3210 meets Tier IV final and EPA 2013 on-highway requirements and uses Hydrogas suspension with inter-axle and cross-axle differential locks.

Moving up to the superstructure, the six section boom has seven boom telescope modes to maximise capacities. Boom extensions include a 3.7 metre heavy-lift fly and an optional three-piece bi-fold swingaway, which hydraulically offsets from two to 45 degrees. A manual version is also available. A new lighting package includes engine and storage compartments illuminated with internal LED lighting. The lights on the front of the operators cab and at the outriggers are high intensity LED lights and these can also be found in areas for fuel fills, ground control stations for outriggers and suspension and other various locations throughout the crane.

The superstructure cab tilts up to 20 degrees, while an engine-dependent warm water cab heating, a sun screen and a five-way-adjustable seat with headrest ensure a comfortable work environment. All connections and service points are centralised and easily accessible. Similarly, the pressure for every hydraulic system in the upper can be checked from a single location. Other features include Link-Belts 3D Lift Plan and ground bearing calculator, five carrier cameras, a watertight storage box, quick disconnect connections for trailer or boom dolly and variable speed on-highway steering. Another feature that impressed many visitors to the company's stand was its new Pulse integrated telematics and crane information and overload system.

Other cranes in the class

Competition also includes the 170 tonne Grove GMK 5170, while the closest Tadano to the new cranes is the 180 tonne AFT 180G-5. With both the new cranes supporting the single engine concept it will be interesting to see if Grove follows with its own single engine 170 tonner - you would certainly expect so, given that all of its new AT launches up to 400 tonnes have used a single engine. Tadano however has made it very clear that it is will not be changing over from its twin engine concept.

Explorer 5600 at Conexpo

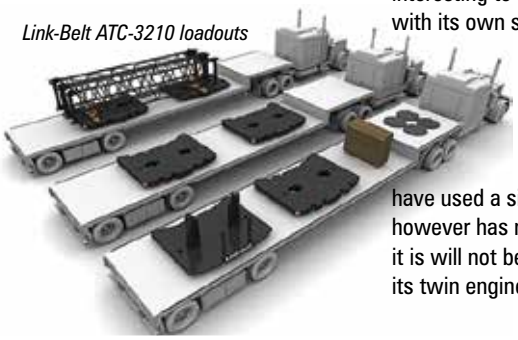
Explorer 5600 cameras and light


Explorer 5600 is quickly ready to work


Explorer 5600 dash

The 185 tonne Link-Belt STC-3210

Link-Belt ATC-3210 loadouts



Link-Belt ATC-3210 was launched at Conexpo

Explorer 5600

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