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Rough and tough

C&a

rough terrains



Grove RT765E

The Rough Terrain crane is very much a product of the Americas, so it is no accident that we tend to feature it within a month or so of Conexpo and this year is no exception. As usual the big American event looks set to encourage new product developments.

Conexpo is the best show for RT cranes primarily because of their historic popularity in North America and the resulting fact that over 75 percent of them are built locally. Over the last year or so several new models have been launched by the major manufacturers and as the exhibits will show, there are changes afoot on the market.

It is now almost six years since the global financial melt-down began, and although there were reports of impending financial doom and gloom, visitors to Conexpo 2008 were still in a surprisingly buoyant mood. That year around 1,600 Rough Terrain cranes were sold but following the onset of the economic crisis this figure dropped to 500. However globally the Rough Terrain crane sector held up better than most other types of equipment, thanks to its high usage in the oil & gas market. Sales had picked up by Conexpo 2011 and are on the rise again, with emerging markets such as South America, the Middle East

and Russia growing alongside a resurgent home market.

Simple, rugged and reliable

The RT has always been the construction site workhorse - simple, rugged and reliable. It has to be because on many sites the RT has numerous different operators and has to be able to take the punishment/abuse of site work. This is totally the opposite of All Terrain cranes which tend to have a dedicated operator, who lovingly cares and maintains 'his' own crane.

The fact that most Europeans would rather rent an operated crane for each lift rather than have a non-operated/bare lease crane on site for longer periods is also a major reason why the Americans prefer RTs rather than truck or All Terrain cranes. The RT is far more compact, and rugged and has decent pick&carry capabilities. The downside is that they cannot travel any distances on roads and therefore transportation tends to rule them out from short term operated rentals.

1950s beginnings

The first telescopic boomed RTs appeared in the early 1950s and were essentially pick&carry 'cab down' cranes that could deal with difficult ground conditions. These early RTs were used in a variety of construction projects taking the place of industrial and smaller crawler cranes and used in a variety of construction projects from road building to refinery contracts replacing industrial and smaller mechanical crawler cranes.

One early design development which helped its popularity was the positioning of the cab towards the front of the chassis rather than behind the boom. Even at this early stage the RT became the chosen lift in North America whereas Europe was leaning towards cranes that were easier to travel between jobs. Demand from the power distribution, steel erection and petrochemical sectors meant that over recent years, capacities and boom lengths have increased dramatically - a fact of life given that component sizes are getting larger and heavier.

While the Americas and the Middle East have been the largest markets for Rough Terrains, Southern Europe and Italy in particular, has been a major market in the past, probably related to the fact that Italian contractors tended to own their own equipment and take it from job to job rather than rent lift by lift. As a result it spawned a number of manufacturers, some of which continue such as Locatelli and Manotti. While Bendini became part of Terex Cranes, it continues to build RTs while Grove shifted

its European Rough Terrain crane production to Italy a few years back. Africa is also growing but more often than not takes machines from contractors working in Europe. At one time France and the UK were significant production centres with Coles and PPM being significant players in the market. Both markets are now All Terrain dominated.

Bigger and bigger

While Rough Terrain crane design has basically remained the same for more than 30 years, demand has shifted towards the larger models. In the 1960s the 15 tonne cab down crane made popular by Galion and Pettibone dominated. By the 1970s and 1980s it was the 18 to 22 tonne

Link-Belt RTC-80110



Grove RT9150E

'swing cab' crane, dominated by Grove and P&H. In recent years this has shifted dramatically with by far the largest sectors being in the 55 to 75 tonne region while a significant market for 80 to 110 tonne models has developed and continues to grow. Above 120 tonnes capacity we are still into a niche market, which although small is definitely growing. While Tadano may not be the RT market leader in term of sales volume (outside of Japan) - this is probably a close battle between Grove and Terex – its claim to be the leading RT manufacturer in terms of growth, and product development may well have some merit. Its latest new product, on show at Conexpo in March, is the three axle (more on that later) 145 tonne capacity GR-1600XL-2 the largest western RT on the market, taking over from the 135 tonne Grove RT9150E.



Tadano GR-1600XL-2

But the problem with increasing lift capacity to those levels is that the crane gets physically wider and heavier and is therefore more difficult to transport. In some cases outrigger boxes and even booms have to be removed to allow movement on the roads. It also means that on site its advantage over an All Terrain crane is diminished.

Three axles v two axles?

When Link Belt introduced its RTC- 80100 in 2002 it broke the traditional RT mode in that it was the first RT with three axles - although Grove was the first to break away from two axles with the four axle RT1650 back in the 1980's. Until the launch of the latest Tadano, Link Belt was the only manufacturer building three axle Rough Terrain cranes. Since its disastrous venture into multi axle RTs in the 1980s Grove has remained solidly in favour of two axles, and its largest model - the 135 tonne RT9150E - is built that way. Surprisingly in spite of the extra axle, the two machines have quite similar specifications with the Tadano being only 600 mm longer, but it does make up by being slightly narrower and lower. The Tadano GR-1600XL-2 will be known as the GR-1450EX-2 for markets outside North America and easily exceeds the company's previous largest model, the 80 tonne, 47 metre boom GR-800EX.

The rationale behind building these larger models is customer demand - specifically in the energy related sectors in North America and Middle East as well as mining sites in South America and Australia. Companies in these sectors are asking for larger lifting capacities and longer booms, to cope with a gradual growth in the size of components across all sectors. The need for a crane that can manoeuvre in tight spaces is also a major consideration coupled with good off-road capabilities.

The new Tadano features a 61



Link-Belt RTC-80130



Locatelli has a range of cranes from 12.5 to 75 tonnes



Terex RT670



Three axle Tadano GR-1600XL Vx Two axle Grove RT9150E

| | Tadano GR-1600XL | Grove RT9150E |
|------------------|------------------|------------------|
| Capacity | 145t @ 2.5m | 135t @ 2.2m |
| Axles | 3 | 2 |
| Weight | 79,697kg | 87,751kg |
| O/A Length | 16,190mm | 15,548mm |
| Chassis length | 10,155mm | 9,855mm |
| Width | 3,315mm | 3,557mm |
| Height | 3,785mm | 4,166mm |
| Main boom | 61m | 60m |
| Max tip height | 78m | 81.4m |
| Boom | 6 section | 6 section Pinned |
| Boom Extensions | 10.3-17.9m | 11-18 m |
| Outrigger spread | - | 8,484mm |
| Counterweight | 29.3 tonne | 28.6 tonne |

metre, six section main boom with a new rounded profile design and single telescopic lift cylinder. A two part 10.2 to 17.9 metre bi-fold offsettable swingaway extension takes the maximum tip height to 78 metres and a maximum radius of more than 60 metres. The crane cab also tilts for improved visibility and operator comfort.

The new 6x4x6 chassis boasts four mode all-wheel steer for a turning radius of 9.9 metres. The crane can self-install and remove its counterweight and outriggers for easy transportation. Overall length is just over 16 metres, with a 10.2 metre long by 3.3 metre wide chassis and an overall height of 3.78 metres.

The crane features Tadano's asymmetrical, multi-position outrigger setup with automatic

monitoring and load chart selection as well as a 'soft stop' function that brings the motion of the crane to a slow stop automatically before it reaches the limits of allowed capacity. Features incorporated from its latest series machines include the Hello-Net system that allows crane activity to be monitored from a computer or mobile device, Eco-mode and Positive control systems for reduced fuel consumption and a fuel monitoring system designed to minimise environmental impact and reduce CO2 emissions.

First three axle

When Link Belt launched the three axle RTC-80100 at Conexpo 2002 it employed a hydrostatic drive, a brave move given that the earlier four axle Grove RT1650, had experienced significant issues incorporating hydrostatic

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drive into a Rough Terrain crane. It would have been perfectly understandable for Link-Belt to have been more cautious and stay with a more traditional transmission. However since then Link-Belt has upgraded its original model with the introduction of the RTC-80110 Series II at the end of 20011 as well as adding the three axle 120 tonne RTC-80130 in 2008.

The new RTC-80110 Series II crane features a full power 45.7 metre boom with extension options of either two or three-piece lattice bi-fold swingaways offering up to 16.7 metres of extra height for a maximum tip height of 76.5 metres with manual offsets of two, 15, 30, and 45 degrees. A three metre stubby heavy lift swingaway extension offers 22.6 tonnes capacity. The crane retains the same 6x6 hydrostatic drive of the original 80100. Link Belt says it has delivered around 500 of its 80110 and 80130 three axle Rough Terrain cranes, which it says proves that the concept is a solid alternative to large two axle Rough Terrain cranes.

The 80110 can be transported in two loads with the main load being no more than 43 tonnes including boom, two winches, three-piece swingaway and tyres. The counterweights and outrigger boxes travel on the second trailer and it can re-rig itself in just over an hour. The tilting upper cab is a first for a Link-Belt Rough Terrain crane and tilts a full 20 degrees for better view of high angle lifts. Link Belt also launched a new mid-range RT crane - the 72.5 tonne RTC-8080 Series II - at the end of 2012. The crane replaces the RTC-8075 and fills the gap between the RTC-8065 and RTC-8090 Series II models. The RTC-8080 Series II is unusual for American type Rough Terrain cranes in that it uses an automotive style, four-link fully independent



Link-Belt
 RTC-80110
 Series II



Grove RT770E

rear suspension system to reduce bounce and improve handling both on and off the road. Link Belt's hydro-gas ride suspension is also available as an option.

100 tonnes plus?

While there are a handful of models over 100 tonnes they are still rare. Michael Herbert, director of product planning and marketing for Manitowoc says: "The core markets are in the 30 tonne to 100 tonne capacity classes. We have seen an increase in demand for the larger sizes which are a cost-effective way for customers to pick large loads previously carried out with other types of cranes. The RT's are versatile cranes that can be used for a wide array of projects as well as handling heavy lifts and difficult terrain. Companies in the



Grove RT550E

Terex's largest
the RT130 working
on a dam in Brazil



Link-Belt
RTC-8080

Terex Progress 55 at
work in the Amazon



natural resource and mining sectors have found that the Rough Terrain cranes are ideal for the maintenance of very large mining equipment. New models such as the Grove RT9150E and Grove RT770E which have good tip heights are now even more useful, taking the place of a small tower crane or an All Terrain crane."

Grove launched several new products at Bauma last year, including the RT550E and RT770E. The 45 tonne capacity RT550E has a 39 metre, five section main boom which can telescope loads between any two boom positions and is fitted with an eight metre swingaway, for a total length of 47 metres. The crane has an overall length of less than 12 metres is 2.55 metres wide and weighs less than 29 tonnes, making it easily transportable. The 65 tonne capacity RT770E has a

42 metre, five-section, full-power main boom on the same chassis. Grove says: "New technology and an improved design have made the RT770E a much more efficient crane. We use single cylinder technology that eliminates the need for a hydraulic hose reel for a lighter boom and crane. The RT770 gives customers reach without having to upgrade to larger 70 tonne to 80 tonne cranes, which are more difficult to transport.

Terex going global

Terex Cranes incorporates a number of classic RT brands, including Lorrain and P&H in North America and Bendini and PPM in Europe. It still runs two product lines although it is moving towards a global RT range with the same products produced in Europe, USA and Brazil. "The RT market has various focus

points, North America, Italy and the Middle East and then emerging markets such as South America, Russia and Asia," says Rüdiger Zollondz, product marketing director, Terex Cranes. "Contractors are a big influence on the equipment choice, Africa is an important market and is influenced by European contractors and their preferences for equipment. In the Middle East there quite a few of contractors from Turkey that also bring their own equipment. European users tend to go for European machines, America for American and in other markets it is a mix. Terex's vision is to have one global product range."

Currently Terex's largest RT is the 118 tonne RT130 which has a 47 metre main boom and 71.6 metre maximum tip height. "We think that the 80-120/130 tonne sector is the main growth market above this we still consider it a niche," adds Zollondz. "There is a global market for larger RTs but in some regions, where transport regulations are strict, the bigger the crane, the more you have to take off to transport it."

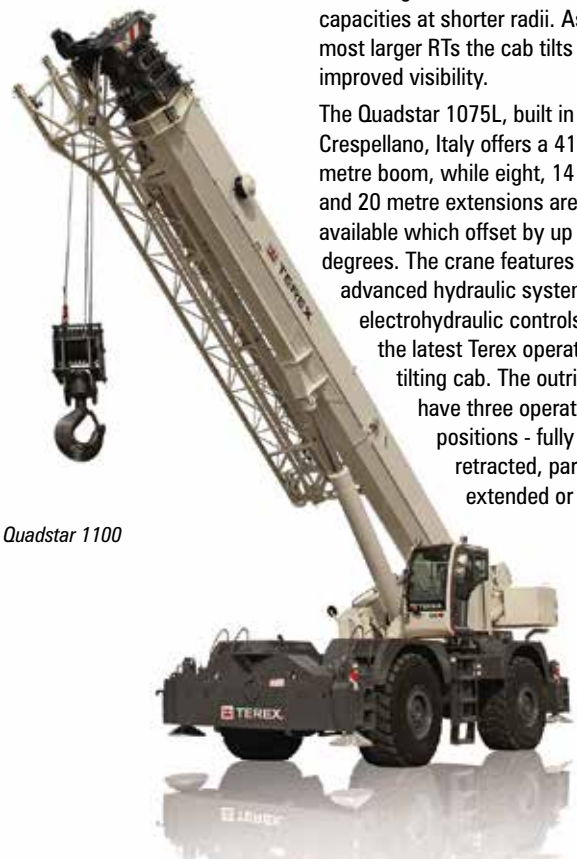
An example of a new Terex RT is the 100 tonne Quadstar 1100 RT launched last January - a new version with latest cab, improved access and other improvements will be unveiled at Conexpo. The 1100 was followed by the 75 tonne



Grove
RT765E

Quadstar 1075L at Bauma last year. The Quadstar 1100 features a 47.24 metre five section main boom plus 8.8 to 16.7 metre bi-fold swingaway extension with telescopic pull-out stinger section taking it to 22 metres, all three lengths are offsettable by up to 40 degrees. Terex says that the dual mode double keel boom allows either the lighter top sections to be extended for higher capacities at long radii or the stronger sections first for higher capacities at shorter radii. As with most larger RTs the cab tilts for improved visibility.

The Quadstar 1075L, built in Crespellano, Italy offers a 41.8 metre boom, while eight, 14 and 20 metre extensions are available which offset by up to 20 degrees. The crane features an advanced hydraulic system, electrohydraulic controls and the latest Terex operator's tilting cab. The outriggers have three operating positions - fully retracted, partially extended or fully



Terex Quadstar 1100



Terex Quadstar 1075 cab display

extended. "Traditionally RT crane booms have been fully hydraulic but as they get longer and longer manufacturers have launched cranes with pinned booms," says Zollondz.



Terex Quadstar 1075

The Italian way

Italy still has several RT manufacturers led by Locatelli which produces cranes from 12.5 to 75 tonnes. In addition to its home market which has suffered in the past year or two, it exports to the Middle East and South America. The company supplied a number of cranes for work on the Panama Canal upgrade for example.

Manotti, a more recent entrant, has a three model range which includes the ARM 350, ARM 600 and the ARM 850 with capacities from 35 to 85 tonnes.



Manotti ARM 350

New cab downs

In North America Badger is the oldest 'new' name in the business with a history dating back to the originator of the swing cab RT (Sargent) in the mid to late 1960s and Warner & Swasey. Now part of Manitex International, it has three cab down models – the CD4430 and the rail version CD4430R first shown at Conexpo three years ago. In 2012 it launched the 15 ton/13.6 tonne CD4415 with a 19 metre three section main boom plus a 6.1 metre three extension. The crane is similar in concept to the company's larger cranes but more compact at 9.1



Badger CD4415

metres overall length and 3.4 metres overall height.

Ed Samera, general manager of Badger Equipment said: "This new product is in direct response to customer demand and extends our offering to the energy sector, an industry which has been a huge driver of our growth in the last 12 to 18 months. We believe that there is an installed base of at least \$100 million in aging and underperforming equipment currently in service at US refineries, and our entry into this market with new equipment and replacement parts will be the initial focus of our marketing efforts."

Chinese Rough Terrains

The market for Rough Terrain cranes in China is almost non-existent, new products from Sany, Zoomlion and XCMG are therefore all designed for export markets. Sany in particular has made an enormous effort in North America since 2009. It now has four models topped by its latest model, the 77 tonne SRC885, with a five section 45 metre full power boom with a 9.2 to 16 metres two part extension. Like its smaller siblings it uses globally sourced key components, including a Cummins engine, Braden hoists, Dana transmission and Parker hydraulics. Sany says that the market is looking for a strong product that provides higher capacity than the more common 75 and 80 ton class machines without carrying the price tag of a 90 ton crane.

Zoomlion launched its range of RTs early in 2010 and with the



Sany RT200

introduction of its largest model - the 100 tonne RT100 - has a range of four cranes from 35 to 100 tonnes. Designed specifically for Western markets and using premium name

components such as AxleTech, Dana, PAT Hirschmann and Cummins. The cranes were developed in partnership with and are distributed by Texas-based Global Machinery & Equipment. The RT 100 was launched at Bauma China at the end of 2012 and has a 43 metre main boom and 11 to 19 metre long jib with 0, 20 and 40 degree offsets. It uses a 10.8 tonne counterweight and has an operating weight of 65 tonnes and an overall width of 3.62 metres.

At Conexpo it is showing the first of the 2014 RT models - the Zoomlion RT65. Designed in the US it has an 8.2 metre longer boom and a significantly better lifting chart than its RT55 and is available at a very competitive price.

XCMG caught everyone by surprise in 2012 when it unveiled a 200 tonne two axle Rough Terrain crane with a 60 metre main boom. However the company has not yet made a significant impact in this market. Overall Chinese manufacturers have made great strides in the RT market and the best do offer a product with appeal to western markets. Whether it can offer a large enough price differential in the western market to lure buyers away from the big three remains to be seen.



XCMG exhibiting at Bauma China



Sany SCC865



Zoomlion RT100

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