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Stopping the 'death wobble'

The popularity or not of some types of equipment in certain countries has always been a bit of a mystery. Why, for instance, does the UK prefer telehandlers and not the self-erecting tower crane so common in continental Europe? When it comes to pick & carry cranes we have several such cases. In North America the carry deck crane is king while in most of Europe the Italian deckless cranes carry the day. In Australia and New Zealand - and India for that matter - articulated pick & carry cranes rule the roost. The Indian cranes are probably popular for cost reasons while Australians go for more sophisticated and expensive road going products often referred to as Franna cranes named after the company that dominated the market for many years. However there are several other Australian manufacturers including Humma and TRT, both of which have recently launched new products.

The main feature of the 'Franna' crane is the central articulated frame and the absence of outriggers even on the larger models, which gives the crane the flexibility to get into tight spaces - even though they are quite long. This combined with a good road speed makes them popular particularly in areas where there may be many miles to travel

between jobs. They are similar to the Jones/Iron Fairy cranes that were hugely popular in the UK and a few other markets at one time.

The articulated crane while popular 'down under' has always had something of a reputation due to its instability, particularly when carrying a load and travelling on the road at speed. Many operators are able to share scary experiences



The chassis on the new 55 tonne Humma 55 can be adapted to various configurations



The articulated crane has gained a reputation due to its instability



about what they often refer to as a 'death wobble' that can occur following a high speed oversteer incident.

This was tragically highlighted around two years ago in a court case dealing with an incident in Toowoomba, Queensland in 2013 in which a mother and son died and two other children were injured when a new Terex Franna AT-20 travelling in the opposite direction fishtailed out of control and hit the car in which they were travelling. It turned out the crane had only been delivered just two weeks prior to the incident and was declared in perfect working order. However when travelling downhill at 80 to 95kph the crane began to 'wobble' or 'fishtail'. The driver tried to regain control, but it became increasingly unstable, swerving from side to side, before turning directly into traffic on the other side of the road, hitting the car. The coroner strongly recommended a new driving licence for articulated cranes, a 60kph maximum speed limit or 80kph if an automatic stability control system could be developed and greater training of operators.

"It is my view that these machines

need to be speed limited to 60kph and taken off high speed roads and highways," he said. "I am unable to make a finding as to whether an adapted electronic stability control system would have mitigated or prevented the incident, however I am of the view that further pursuit by Terex Australia into an electronic stability control device that can be retrofitted to their mobile articulated cranes is a worthwhile endeavour. I think the speeding limit is really important."

The more recent product introductions from Humma Cranes, TRT and Terex appear to have cured, or certainly improved the stability situation. Last year Humma launched a new chassis for the largest capacity articulating crane currently available - the 55 tonne Humma 55 - TRT's new 28 tonne Tidd PC28 includes the new Slew Safe feature and Terex's latest AT40 has a new hydro-pneumatic Intelligent Suspension.

New Humma chassis

Humma - part of the DRA Engineering group - has been manufacturing pick & carry cranes since 1996. For the new chassis it teamed up with specialist commercial and special vehicle suspension systems company Hemscheidt Fahrwerktechnik and reworked the chassis to incorporate a new modular hydro-pneumatic suspension and damping system which can be adapted to various vehicle configurations. The system

was already used on construction, mining and special vehicles including firefighting appliances. Peter Dalla Riva, divisional head of crane and engineering at Humma said: "There is strong interest in the crane from a number of industries outside the core markets of mining and heavy construction because of the improved use of the crane from the suspension and damping system. In contrast to steel suspension, the spring stiffness is not constant, but depends on the load on the gas spring. During loading and unloading, the hydro-pneumatic suspension system returns to its level position in fractions of a second. This provides safety and comfort for the driver, one of our key requirements for the suspension system. It is the beginning of a high-tech era in heavy duty pick & carry cranes. There is no technical reason why a 75 or 100 tonne model could not be built to meet market demand." The smallest in the four model Humma range is the 20 tonne 20-25, with a 20.5 metre boom, which can handle 1,050kg at its maximum 17.2 metre radius through its full 42 degree of chassis articulation. An optional five metre telescopic jib extends the reach further.

New 28 tonne Tidd

Australasian crane distributor and manufacturer TRT (Tidd Ross Todd) recently launched a new articulated pick & carry crane, the 28 tonne Tidd PC28. The crane was unveiled at the company's Murarrie, Brisbane manufacturing plant last month and features a 6.1 to 18.6 metre three section full power main boom which can handle a maximum 28

tonnes on the base section lug hook, 27.6 tonnes on the hoist line, and pick & carry up to 25 tonnes with loads suspended from the lug hook attached to the top of the boom's mid-section. Maximum radius with the boom horizontal is 16 metres, at which it can handle 2,150kg. The in cab LMI screen also shows the cranes articulation angle and calculates the side slope which is not only dependent on the ground but also the induced side slope which can be significant and includes tyre deflection and flex in the crane which increases as the boom lengthens. When moving on soft or uneven ground even a small pothole can cause a large increase in the side slope resulting in a possible overturn situation. The crane can operate on side slopes of up to eight degrees, although the capacities are significantly reduced as at that point the load is well outside the crane's footprint. According to TRT there are between 3,000 and 4,000 articulated cranes in Australia that do not have a dynamic load indicator which measures pitch and roll and then automatically reduce the available lift capacity. Most continue to use a 'firm level ground' load chart. The PC28 also has the option to engage the hold brake when lifting when stationary which increases the capacities by around 12 percent. A superlift type counterweight is also scheduled for introduction later in the year.

The crane's LMI also includes a new Slew Safe feature designed to minimise the risk of the crane toppling over when carrying a load on uneven surfaces. The system - which can also be retrofitted to the



The 25 tonne Humma UV25-25



The smaller 25 tonne TRT Tidd PC25 has a maximum tip height of 19.1 metres and is 2.5 metres wide

smaller 25 tonne Tidd PC25 - warns and restricts the operator before they get into trouble when lifting or carrying a load. The graphics on the dash mounted LMI screen informs them of the crane's situation using three colours - green, amber and red. When the crane is operated in the green and amber areas of the lifting chart, Slew Safe remains inactive. When the crane operation moves into red an overload notification activates the Slew Safe system. This drastically reduces the speed of steering, making it harder

to steer and with operator feedback through the wheel, the engine will 'load up' giving an audible sound change, an audible constant alarm both inside and outside the cab warns the operator and slinger/signaller and finally it will only allow the operator to move the steering wheel and machine back into the safe 'green' operation.

"There has been overwhelmingly positive feedback about the crane, with many commenting that the new level of safety available will



The Tidd PC28 features the new Slew Safe feature designed to minimise the risk of the crane toppling over when carrying a load on uneven surfaces



The Tidd PC28



Terex's largest articulated crane - the AT40



improve outcomes for operators and owners across construction, infrastructure and mining sites," says TRT country manager Stephen Dance. "The patented Slew Safe design is a significant new pick & carry safety feature. It is designed to minimise the risk of a crane rollover when lifting on uneven surfaces, a leading cause of articulating crane incidents. It provides the operator with feedback through the steering wheel that they can feel when the crane moves into an unsafe operating zone, and visually through the dynamic load moment indicator."

The PC28 weighs 23.9 tonnes including 2.3 tonnes of counterweight, with the weight distribution evenly split between the two axles. Overall width is 2.49 metres and height is just over three metres. The chassis is 7.5 metres long while the crane has an overall travel length from boom tip to rear bumper of 10.4 metres. Power is supplied by a six cylinder Mercedes diesel through an Allison six speed automatic transmission and Kessler high speed planetary axles with a differential lock on the front axle. Maximum road speed is 80kph.

Other safety features of the PC28 include a higher operator position

for better visibility, better stability with the front hydraulic suspension, dynamic LMI with a deadlock switch inside the cab and bridging switch outside the cab, a ROPS cab with FOPS option, ABS brakes and a 150kg rated air suspension seats with three point integrated seat belts.

The smaller 25 tonne TRT Tidd PC25 has a maximum tip height of 19.1 metres, a wheelbase of 4.4 metres and is 2.5 metres wide. Like its bigger brother it has three step articulation, with 42 degrees maximum either side of centre and features the new Slew Safe system for maximum operational safety, side slope and steering articulation de-rating. It can also carry its own counterweight, uses an LSI Robway LMI System, has power steering and ABS braking.

The original Franna

The original Franna articulated crane - named after founder Dave Francis and his daughter Anna - was developed in Brisbane in 1980. Terex acquired the company in 1999 and it continues to dominate the smaller end of the Australian crane rental market and in particular the pick & carry sector. The impending sale of Terex's Demag Crane division to Tadano should have little effect on

The popular 25 tonne MAC 25-4 has an 18 metre hook height and can lift 1.8 tonnes at 15.7 metre radius



Terex Franna in Australia as it will join the Terex Materials Processing business.

For many years the range comprised of three cranes from 10 to 25 tonnes however the current line-up has moved up the capacity range and now includes four models from 15 to 40 tonnes.

Its largest model - the 40 tonne AT40 - was launched in 2016 and unusually features a twin axle rear carrier rather than the single axle on most other articulated cranes. It has incorporated improved safety features such as unrestricted front visibility, a longer, lighter and stronger high tensile steel boom and a new hydro-pneumatic Intelligent Suspension for which the company has filed a patent application. It features a number of button-selectable settings such as a 'High Clearance' mode where the suspension is fully extended, increasing the rear ground clearance by 110mm, and 'Two axle' which during the crane mode the rear most axle can be raised to reduce turning circle and eliminate tyre drag.

The AT40 has a 19.8 metre main boom and can lift 40 tonnes at 1.2 metre radius on the base section

lug hook and 30 tonnes at two metres on the hook block. Despite its twin rear axles the crane is 10.7 metres long, 2.74 metres wide and 3.47 metres high. Articulation is 40 degrees either side of centre and road speed is 75 kph.

The smallest in the Terex AT range is now the 15 tonne AT 15-3 which can lift over a tonne at a 15.8 metres radius. Maximum hook height is 17 metres. The 22 tonne capacity AT 22 has the same hook height but can lift 1.7 tonnes at 15.8 metres radius, while the popular 25 tonne MAC 25-4 has an 18 metre hook height and can lift 1.8 tonnes at 15.7 metre radius. The crane also has a short three metre jib for a maximum tip height of 21.5 metres. Weighing just under 24 tonnes it has a maximum road speed of 75kph.

Other pick & carry cranes

The last year or two has seen the introduction of several new and different types of pick & carry cranes including larger pedestrian type models and a trend towards more sophisticated styling.

Valla V70R

Italian manufacturer Valla - now a division of Manitex - launched



The Valla V70R has a maximum lift capacity of seven tonnes or one tonne at its maximum forward reach of 5.5 metres



The compact Gruiverpal GB 300 working in a tight spot

the new front wheel electric drive, radio remote controlled V70R pick & carry crane at Bauma in April. In standard form and free on wheels the crane has a maximum lift capacity of seven tonnes or one tonne at its maximum forward reach of 5.5 metres. However the crane can carry an additional 1,800kg of counterweight, extend its wheelbase by 600mm and utilise a front stabiliser. When the longer wheelbase and stabiliser are used the maximum capacity increases 10 percent to 7.7 tonnes and the lift at maximum reach increases 40 percent to 1.45 tonnes. Using the maximum counterweight and stabiliser results in the same increased performance. The three section boom can also be lowered to 10 degrees below horizontal.

Overall weight of the pedestrian controlled crane is 7.2 tonnes. The hydraulic system is powered by an AC electric motor fed by a full duty cycle 80 volt 560Ah battery, which is fitted with an automatic water refill system. Options include hydraulic winch, manual and hydraulic jibs/extension, self-levelling forks and non-marking tyres.



GB 300

Gruiverpal adds two

If you attended Bauma this year might have spotted a more unusual range of pick & carry cranes from Italian company Gruiverpal Tranchero. Two new cranes were launched which may be of interest for those looking for something a bit different.

The GB 300 is a small, compact crane to lift and carry loads up to 300kg. Weighing just 950kg it uses a small electric motor to drive the single rear wheel. Measuring 1.4 metres long, 820mm wide and 1.6 metres high it has a maximum speed of 40 metres a minute and can travel up a three percent slope with its 300kg maximum load on the hook. Lifting heights range from as low as 200mm to 3.2 metres. It has a boom extension of just under two metres on which it can lift 180kg. An optional 150 degree boom slew feature is also available.



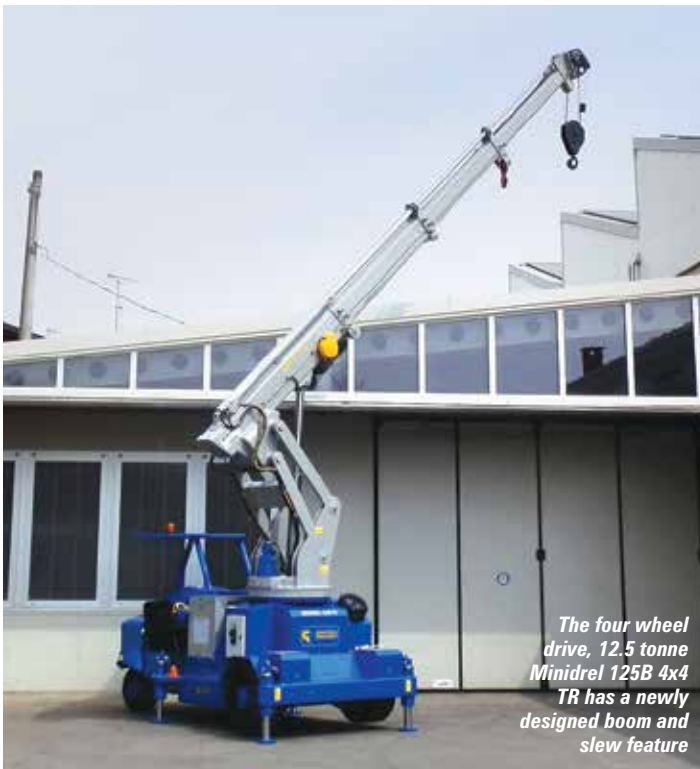
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The four wheel drive, 12.5 tonne Minidrel 125B 4x4 TR has a newly designed boom and slew feature

Its second new crane is the electric, four wheel drive 12.5 tonne Minidrel 125B 4x4 TR. With a newly designed boom and slew feature the company claims that it can lift 40 percent more than other cranes of a similar size. Overall weight is 12.6 tonnes and it has a footprint of 3.61 by 1.85 metres. Maximum lift height is 7.2 metres and maximum working radius is six metres.

Ormig 30 iE

Bauma also saw the introduction of the 30 tonne capacity electric

powered Ormig 30iE. The compact crane measures 2.1 metres wide, 2.29 metres high and 4.65 metres from front to rear of the chassis. Overall weight is 19 tonnes and four double wheels give additional stability. Maximum lift height is 12 metres and it can lift 4.8 tonnes at its maximum forward reach of eight metres.

JMG continues to expand

Italian manufacturer JMG has produced all electric pick & carry cranes for the past five years and



JMG sold County Lifting in the UK this 35 tonne MC350 with jib, winch, 16 tonne forks, radio remote and front stabilisers

has 25 models in three families - regular, cab or pedestrian operation via remote controls - with maximum capacities up to 70 tonnes. The company has enjoyed some strong growth since it was established in late 2009 by ex-Valla general manager Maurizio Manzini along with Emilio Berti.

The company has doubled its production over the past four years and now sells its products worldwide - it recently shipped a new 25 tonner to Australia while its 35 tonne MC350 has sold more than 20 units so far. Last year the company says it sold 124 cranes and had revenues of €18 million, up from €14 to €15 million in 2017.

India's tractor cranes under threat?

As mentioned at the beginning of the article, the popularity or not of some types of equipment in certain

countries has always been a bit of a mystery. We mentioned how Australia and New Zealand have a preference for the articulated crane, but India is another country that has several manufacturers of articulated tractor based cranes that are hugely popular, mainly due to their low price and simplicity. Notoriously dangerous, they were initially designed for simple pick & carry duties around factory yards and on small construction jobs but have increased in size and range of use. Even some of the most sophisticated projects such as massive new mass transit/metro systems being built all over India use dozens of these handy little cranes. However they are typically operated by unskilled, untrained operators and used for applications for which they are not totally suited. Rarely a week goes by when we do not hear of one tipping over



Ormig launched the 30 tonne electric 30iE at Bauma



The articulated tractor-based cranes are hugely popular in India



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during a lift or running off the road and killing people. JCB took a look at this market in the mid 2000s and introduced a product line in 2009 that it called the Liftall, with a range that included the 1202, the 1253 and 1554 offering a far better build quality and more safety features than many of the products sold at that time. Sales were largely limited to the Indian market at which it was aimed. JCB decided to stop manufacturing these cranes about four years ago.

However the thinking among some telehandler manufacturers such as Manitou is that with the right pricing and a simpler product many of the buyers of these smaller cranes might switch to telehandlers.

The use of telehandlers for pick & carry jobs previously carried out by industrial cranes has been growing steadily in both Europe and the USA, both for construction, mining, industrial plants and agriculture. Telehandler sales outside of these regions are minuscule and most of that will be to Australia and New Zealand. There is a feeling though that this might be about to change, with growing interest in emerging markets such as Asia, Africa and the Middle East.

Manitou, which acquired the Terex construction business and manufacturing plant in India in 2017, recently unveiled a new range of back to basics telehandlers at an event in Phuket, Thailand. Plans are that they will be manufactured in the region. It believes that the two new models will help change many customer's buying decisions away from tractor cranes towards

telehandlers. The fact that a range of high capacity and long reach 360 degree telehandlers is now available is also having an impact on the lower end of the crane market.

A new world order

Laurent Bonnaure, Manitou group executive vice president in charge of global sales and marketing spoke recently to Cranes & Access about the new back to basic telehandler range, Asian production and thoughts on the future of telehandlers in emerging markets.

"The world is changing with a progressive but rapid shift in economic power and none more so than in the emerging markets," he said. "India and China will soon have a combined population of more than three billion people. China - currently the second largest economic power in the world - will soon become the largest, while India is expected to become the third largest overtaking Japan by 2030 and is expected to become the second largest by 2050. India is also set to invest more in construction than the US over the next five years. It is clear these markets, coupled with the Middle East and Africa, are set to explode and this is going to result in huge potential for our products."

But are they ready to adopt telehandlers over more conventional methods of work such as small pick & carry cranes?

"The numbers of telehandlers we have sold up until this point have been to high-end or international customers with niche requirements. Where we have suffered is that even once we have convinced a customer of the benefits of the product the deal tends to fall down on price. The European made machines can be too sophisticated and costly for these markets - especially when compared to cranes, wheel loaders and direct labour."

Manitou's new telehandler basic models



Manitou believes that European made telehandlers are too sophisticated and costly when compared to the tractor cranes and direct labour



Manitou's new telehandler basic models have been specifically designed to be simple, robust and cost effective

have been specially designed to meet the local working environments and conditions encountered in Asia, Africa, the Middle East as well as parts of Eastern Europe. They have been specifically designed to be simple, robust and perhaps more importantly - cost effective.

"Our dealers have been asking for a simple and safe workhorse," says Bonnaure. "They want a robust machine for severe, intensive and demanding working conditions, one that can handle 1,500 to 2,500 hours a year - to put that in context machines in Europe and the US average around 300 to 600 hours! Built to a cost, everything was designed to ensure robustness, reliability and ease of use."

Manufactured at the company's production facility in Asia - most likely India - Manitou claims that the new models will cost up to 20 percent less than their western equivalents, with that gap possibly widening if production volumes exceed current forecasts.

"This is the first time we have designed, manufactured and launched a new product outside of Europe and the US. We wanted to get closer to the customers and having a localised product was crucial."

With the right product at

the right price, Bonnaure believes they are now in a position for the first time to compete with other products on the market.

"The addressable market for us is currently made up of cranes, wheel loaders and direct labour. It is virtually untapped for telehandlers which probably makes up less than one percent of the market of mobile lifting equipment. In the past, the price difference was putting us way out of this market, however we believe with a significant cost reduction we feel it will be much more acceptable and competitive with other machines. The global market for small mobile cranes in these emerging markets is worth around \$1.6 billion - in India and China alone it represents 25,000 machines. Clearly there is a market, one which is already captured, but one in which we have a strong card to play with the launch of our new telehandler range."



The new 17 metre/four tonne Manitou MXT 1740



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