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HEAVY DUTY KNUCKLE BOOMS

A common definition from the world's many knuckle boom crane producers as to what constitutes a 'heavy-duty' knuckle boom is not an easy thing to come by. C&A takes a look at the various interpretations.

Swollen knuckles

"IN THE past, a good rule was any crane above 50 tonne/metres," says Giancarlo Manzano, marketing manager at Italy-based producer, Effer. "This formula did, however, upset countries like France or North America, where a 20 tonne/metre crane was already considered a rather large crane.

"Then came the age of the Slewing System Radio." According to Manzano, the rule for a long time was that any crane using slewing systems with racks was still a medium-size crane. "Only those units with slewing systems utilising reduction gear units and slewing rings might dare to call themselves large," he says. "This formula was found acceptable by most of the Italian manufacturers, but not by those of Northern Europe that were using either continuous slewing on small cranes, or slewing racks on large cranes, thus, making the Italian rule totally wrong."

Looking at the various major manufacturers' knuckle boom product ranges, they are generally

split into three segments, those being light, mid and high capacity, but there doesn't seem to be any common logic across the board. "For Hiab," continues Manzano, "a large crane is any unit greater than 20 tonne/metres, for Palfinger and Effer, any crane greater larger than 30 tonne metres, for Fassi over 40 tonne metres and for HMF, any crane over 50 tonne/metres is deemed a large knuckle boom crane.

"At Effer, we still follow the continuous slewing rule in that we define large knuckle booms as those models that feature continuous slewing by a slewing motor.

EUROPEAN DEMAND

According to Manzano, the company has noticed a general increase in demand for its higher capacity cranes, which have shown an 11 per cent sales from 2002 to 2003. "Europe is still the biggest market in the world," he says, "counting for 70 per cent

Lift & shift

TH WHITE, UK distributor for Palfinger knuckle booms, teamed up The Netherlands-based Broshuis Trailers to produce what it has described as Europe's largest de-mountable knuckle boom mounted on a 4-axle extendible semi low loader for UK-based AET Transport Services.

The 90 tonne/metre PK 90002 mounted knuckle boom, the second largest capacity unit in Palfinger's heavy crane range, is rear mounted to maximise its 22 metre hydraulic reach and is detachable and position-located by double action hydraulic locking pins. The crane also features Palfinger's Power Link Plus system, which provides up to nine degrees reverse angle movement from the king post, and hydraulic front stabilisers integrated into the main beam.



The Broshuis extendible trailer is capable of transporting 20 foot (6.1 metre) and 30 foot (9.1 metre) containers and has a live hydraulic neck and suspension, which enables the trailer's ride height to be altered for the transportation of sensitive plant and equipment. ■



All new large Effer knuckle boom feature continuous slewing, which Effer says is how it defines its large knuckle boom cranes. Pictured here is its 135 tonne/metre 1350 model.

of total sales. Our biggest markets are Italy, Denmark, Greece, Spain and The Netherlands, which together account for 50 per cent of our total sales in this sector.

"In the UK, legislation in terms of a truck's GVW and weight distribution per axle still makes the concept of large knuckle boom cranes relatively unpopular. We have, however, recently sold two 100 tonne/metre models and are currently actively quoting half a dozen larger units in the 120 tonne/metre category."

All new large Effer knuckle booms feature slew rings for continuous rotation, Effer's DMU and DMUX Can-Bus audio/visual load sensing systems, fly-jibs that rotate through 180 degrees, and 'Wind and Drive' winch systems, which obviate the need to remove or de-rig a unit's winch components prior to folding the crane.

The company most recently boosted its larger knuckle boom range with the introduction of four

HMF's 72 tonne/metre knuckle boom, dubbed "Odin".



The booms and fly-jibs on all four models are manufactured from Weldom 1300 high-grade steel to produce the best lift capacity to weight ratios. According to Mark Rigby, director of TH White and manager of the Palfinger knuckle boom crane division, of which TH White is the UK distributor, this is a vital design element on higher capacity units.

Rigby says that the company has seen its sales of Palfinger knuckle booms in the 30 tonne/metre and above class double annually in the UK for the past three years. "More and more progressive plant and machinery operators are seeing the need to always specify above present requirements as lifts continue to get bigger," he explains. "A lot more building site operations now require longer reach capabilities for the delivery of materials, such as roof trusses, direct to the area of work. They require a big crane to give the long reach, say 20 to 25 metres, albeit that the actual lift may only be 1 to 2 tonnes."

The company offers Palfinger's heavy knuckle boom line, which is defined by, and starts at the 31.5 tonne/metre PK 32002, through to the 105.7 tonne/metre PK 120000. Two additional models are expected to be added later this year, with further additions scheduled from 2005 onwards.

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new models at the SAIE exhibition in Italy at the end of last year. Starting at 75 and 85 tonne/metres respectively, the 750 and 850 models offer boom lengths of over 20 metres with up to six-section, 12.68 metre fly jibs.

According to the company, sales of these larger cranes very quickly exceeded its market expectations, which prompted Effer to undertake an aggressive manufacturing programme to increase product volume to a customer base demanding these larger knuckle boom cranes.

Moving up the scale is the 1750, a 140 tonne/metre unit capable of a 24 metre horizontal outreach that can be extended up to 40 metres if fitted with a 6-section fly-jib. The telescoping speed of the extensions can also be increased through Effer's HSS (High Speed System), while any extension oscillation that could be potentially caused by a sudden stop at the end the extension stroke is prevented by Effer's Pro.Dec (Progressive Deceleration) system. The smaller 135 tonne/metre 1350 version features most of the specifications of the 1750 version and offers a 20 metre hydraulic outreach in its basic boom configuration, which is extendable up to 32 metres with a 6-section fly-jib.



This 150 tonne/metre F1500AXP from Fassi is available in three basic versions and is now company's largest knuckle boom unit.



Truck loader or crane?

MAIN CONTRACTOR, HBG Construction, called on the help of this new rig, owned by D & F Gorrett, for lifting duties as part of a £4.56 million contract to build a new three-storey office block for Mid-Devon District Council in the UK. The 70 tonne/metre F700XP.26 knuckle boom, fitted onto a 580 horsepower Scania truck, provides a 25 metre horizontal reach and a lifting height of 29 metres. Comprising six hydraulic booms and fly-jib with a further four extensions, the crane also utilises a substantial sub-frame fitted behind the truck's cab. The combined rig weighs in at 22 tonnes.

"When we couple up to the 40 foot flat bed trailer, we are normally moving site cabins which, even when they are pre-fitted welfare units, will not

weigh much more than 7 tonnes," explains Darren Gorrett. "This not only means that we are well within the gross weight limit, but it also gives us the lifting power to double-stack cabins and to position them at a much greater distance away from the trailer and site access roads.

"The rig is also used solo as a crane for which," claims Dorrett, "is much faster at travelling between sites than a conventional mobile crane and can be operational within minutes, and off site just as quickly. It is typically used for lifting steel beams, roof trusses and concrete bins weighing 500 kilograms and locating them at up to third or fourth floor level." According to Fassi, the rig is the only combination of its kind in the world. ■

HEAVY DUTY KNUCKLE BOOMS

Palfinger's 'heavy' knuckle boom line ranges from the 31.5 tonne/metre PK 32002 up to the 105.7 tonne/metre PK 120000. Picture is its second largest unit, the 90 tonne/metre PK 90002.



Italy-based knuckle boom producer, Fassi, also used the SAIE show to showcase a new knuckle boom model, which is now the firm's largest capacity unit. The 150 tonne/metre F1500AXP is available in three basic versions, plus two models that can be used with an extension with four or six telescopic extensions. The first unit was delivered to Vagn Poulsen of Denmark through Fassi Kraner based in Copenhagen. Fassi says its larger knuckle booms have been good sellers in the country, where the transportation of prefabricated components for the assembly of industrial warehouses, as well as for private housing, is a hugely active market sector, which also involves neighbouring Germany.

The knuckle boom market is expanding rapidly, claims Fassi, especially in Germany, France, Spain, the UK and Greece. The latter country specifically, although rather limited in terms of unit sales at present, is set for marked and constant growth in the larger knuckle boom sector due to an exceptional boom in construction caused by preparation for the upcoming Olympic Games, the need to align the country with the infrastructures of the European Union and tourism development. On the islands in particular its larger cranes are being used for a broad variety of applications from traditional construction applications, to the lowering of pleasure boats into the sea and their retrieval for storage during


the winter months. The company claims to have taken 12 per cent of the global knuckle boom market in 2002, accounting for 5,300 crane sales and a turnover of approximately €90 million (UK£62.6 million).

For Fassi and many of the world's knuckle boom producers, outside of Europe, it is the US that leads the rest of the world in terms of the larger capacity market expansion, a factor that lead US-based manufacturer, Iowa Mold Tool (IMT), to nearly double the rated capacity of its knuckle boom line. Although at the lower capacity end of the large knuckle boom sector, IMT launched its 11.8 tonne capacity 52/380 and 16.12 tonne capacity 72/516, recommended for use on a minimum 29.94 tonne GVW chassis, due to "growing needs in the field."



US-based IMT, almost doubled the rated capacity of its knuckle boom line with introduction of its 11.8 tonne capacity 52/380 and 16.12 tonne capacity 72/516. Pictured is the latter model.

"Because these cranes fold into the 'figure-four,' you don't have a crane boom that infringes on load-carrying capabilities," explains Jim Darr, IMT product specialist. Both units are designed for use with two to eight hydraulic extensions. With eight extensions, both models have a horizontal reach of 20.6 metres and a vertical reach of 23.47 metres. Optional hydraulic jibs provide an extra horizontal reach of 13.4 metres and 11.3 metres vertical reach on the larger 72/516, while both measurements are increased to 28.68 and 31.09 metres respectively on the smaller 52/380 version.

"The market is taking us there," continues Darr. "The requirements for handling heavy equipment components, such as dozer blades and loader buckets, had become heavy enough and were beyond our capabilities to handle them. Handling pre-cast concrete products also played a part in the addition of these models that can handle typical loads, which are getting heavier as applications evolve." 

Effer's recently launched 1750 model is a 140 tonne/metre unit capable of a 24 metre horizontal outreach.



Chart toppers

DANISH CRANE manufacturer HMF tipped the scales of its top-end knuckle boom range with the addition of two beefed-up models in the 52 and 72 tonne/metre category. Moving away from its standard model nomenclature, the two models are being marketed under the project names, Thor and Odin respectively.

Both versions are equipped with many standard features, including over-bending jib, HMF's oil regeneration system and integrated radio remote, through which all the cranes stabiliser beams and legs can be operated. The two versions are available with up to eight extensions giving Thor a maximum outreach 20.31 metres and a maximum capacity of 2.56 tonnes. An extra additional six extensions fitted to Thor via the fly-jib, taking its lift and reach capacities to 33.4 meters and 0.41 tonnes.

In terms of cost, "such specialised equipment can demand a premium price," explains Tony Biddlestone, product specialist at HMF UK. "Odin and Thor, for example, have many standard and unique features, which cannot be found in some of our competitors' ranges. Therefore, if it cannot be offered by the competitors, then it should demand more money.

Highlighting the more complex nature of operating of the larger capacity cranes, Biddlestone is also keen to point out that "the larger range of knuckle boom, i.e. above 50 tonne/metres, should only be used by fully trained personnel. Some of the larger knuckle booms can replace mobile cranes, whose drivers are certified and trained to high levels, the reason being that operating a 20 tonne/metre knuckle boom with two extensions is totally different to operating a Thor K5 72 tonne/metre unit with five extensions.

"Knuckle booms cranes are being used worldwide for a wide variety of different jobs, from delivering building materials to hoisting air conditioning units storeys up, the unique advantage being that loads can be both delivered and unloaded by the same vehicle." ■



HMF's "Thor"