

As part of its current investment program, Atlas-Terex is now focused on the phased introduction of its .2 Series knuckle booms built to BS EN 12999 standard



# Technology boom

'A SAFE, cost effective, flexible and efficient way of handling materials' would match the desires of almost any lifting industry professional and probably explains the increasing popularity of knuckle boom cranes throughout the UK and Ireland. At the same time, however, safety requirements have become more rigorous. Late 2002 saw the introduction of the amended European standard EN 12999 for loader cranes, which for most manufacturers has meant a re-design of its product lines.

Atlas-Terex for one says that it is currently focused on the phased introduction of its .2 Series range built to EN 12999 and incorporating its advanced crane management system (ACM). The line comprises 38 models ranging from 2 tonne/metres capacity to 60 tonne/metres. The company says that it has a strong order book in the UK and Ireland well into 2003 and believes that this can only be reinforced by the introduction of its .2 Series. Particularly strong areas for the company are the utilities, builders' merchants and brick and block sectors, while it is also the principal supplier to the ministry of defence.

Atlas-Terex's recently appointed managing director, Jim McManus comments: "As a UK-based company, we understand how our products are used here, what our customers' expectations are and, most importantly, how these are changing over time. Still the UK's only knuckle boom manufacturer in this highly

competitive sector, the acquisition of Atlas by Terex has delivered financial strength, achieved operational transformation and reinforced the company's strong tradition of product innovation".

It is clear that safe operation is high on the agenda in terms of the .2 Series design, which includes features such as stabilisers with adjustable plates to compensate for uneven ground, a second locking device for stabilisers when in the travelling position and a level

indicator to safely align the crane and vehicle before use. Load warning devices include an optical capacity indicator, a height warning system and the inclusion of the jib extension in the overload protection system.

The new ACM system, which incorporates Atlas' existing safe load control system, also provides special software for individual crane customisation and monitors in/out activities directly at the crane's main valve. ▶ 21



HMF's new 52 tonne/metre knuckle boom, dubbed Odin, features an over bending boom capable of reaching out to 20.46 metres

## KNUCKLE BOOMS

Knuckle boom technology is changing fast. C&A looks at the effect of new legislation.

## KNUCKLE BOOMS



This special low profile 70 tonne/metre Effer 680 was built for NATO forces and can be reduced to a horizontal position on the truck bed for air transportation.

# A viable alternative!!

Most people's vision of a truck crane would probably have either a Kato or Tadano badge on the front, lumbering down the road at around 30 mph. But there is another kid on the block and one seemingly overlooked as a viable alternative. **Bill Green** reports.

APPROXIMATELY TWENTY years ago, these cranes came into the UK market place with the unfortunate name of lorry loaders. This description, however, fails to recognise the full potential of these crane types. But, as manufacturers increased capacity sizes, extended boom lengths and applied the latest technology and materials, it has become more fitting in the 21st Century to call these lifters what they really are "knuckle boom cranes".

Knuckle boom manufacturers have increasingly searched for better materials to produce better crane designs to compete in the 30 tonne/metre and above class, as below this size the market is more than adequately served. Above this capacity size, however, the heavyweights of the knuckle boom industry have much to offer the crane



**Bill Green** is director of Effer UK, which has the UK distribution rights for Effer cranes into the UK and Ireland.

rental company which is looking to replace its ageing truck cranes.

Increasingly, knuckle boom manufacturers look to incorporate the highest grade steels available into their boom designs that one would more likely associate with the likes of Liebherr and Terex-Demag. By using the lightest, but strongest steel, booms become longer and capable of lifting greater loads.

A popular knuckle boom design on the market today is the hexagonal shape, but taking a step further is Italian knuckle boom manufacturer Effer, with its own latest offering, a decagonal 10 sided boom. Through the use of Weldox 1300 steel, the company has significantly reduced the boom's wall thickness, producing a 4 per cent overall weight reduction. This translates into improved load charts and greater operating radii. A further manufacturing advantage is that the boom is pressed into the decagonal shape from a single sheet of steel plate and welded both inside and out in one pass. This eliminates any deformation caused through heat transference, which is not uncommon when multi plate boom sections are joined together by several welding processes.

Effer currently offers 38 basic models in its range and is planning to launch several additional models later in the year. The existing line ranges from a 1.5 tonne/metre capacity machine, through to a mighty 200 plus tonne/metre unit that rivals a 70 tonne all terrain in capacity and reach.

The range is considerably extended by a choice of 200 boom and jib configurations and, in addition to the standard range, special

designs are often supplied for applications such as rail engineering works built to exact certification to meet width and height rail gauge requirements. Effer also produces special low profile air transportable cranes mounted on 6 x 6 or 8 x 8 special type trucks for military use.

### Reach out

In the 50 tonne/metre class Effer's boom and jib combinations can reach as far as 34 metres, generally outlifting most other machines across the board. But with the ever growing demand for even larger cranes the company has launched a range of even greater heavyweights in the 95, 105 and 125 tonne/metre categories with boom and jib combinations of almost 38 metres tip height with operating radii of 35 metres. These are further succeeded by the model 2200, which can lift over 500 kilograms at more than 48 metres and can place loads to a height of 50 metres and above.

These larger knuckle boom cranes offer much more than just lift and place. Loads can be telescoped through windows, onto deck spaces and through overhead structures. What can be lifted, can be telescoped, providing it is within the crane's limits. Both the main boom and jibs can be equipped with high capacity winches to increase the crane's versatility, while on some models, the jib can also be fitted with an extra angling jib to further increase the maximum reach.

### Safety in mind

Effer's DMU (Data Monitoring Unit) is a constant monitoring system that checks loads and radii to ensure that lifts are conducted safely at all times.



**Effer's 70 tonne/metre 720 knuckle boom crane models are available with capacities up to 220 tonne / metres. When mounted on a 3 or 4 axle truck, its 'city class' characteristics makes it a seriously viable alternative to truck cranes in the same class.**

The DMU provides an audio/visual warning when the maximum loading is approached. At the point of impending overload, a control lever lockout system prevents further lifting into an unsafe condition, while only allowing the lowering of the load or returning it to a safe position. Depending on the crane and truck configuration, it will also allow for working over the front of the truck by automatically de-rating the lift capacities to safe working conditions.

Constant level checks are also performed to ensure that the crane and truck maintains a level platform at all times. These checks take place eight times per second, while an in built data logger stores lift cycle figures and any overload conditions, which can be downloaded if required.

Radio remote control is available as standard on most models, enabling the operator to act as a banksman when allowed. The remote control

is enabled via radio remote or an umbilical cable with the addition of manual controls positioned on the crane's turret. Each crane features these three control systems to cover all contingencies.

### The sky's the limit

The only limit to knuckle booms is the users imagination. All trucks can be fitted with a knuckle boom crane, the size of which will depend on the buyer's needs. How much, if any, payload does he/she need? If the answer to this question is none, and the buyer wants an all singing and dancing truck crane, a 4 axle, 32 tonne truck will take a 220 tonne/metre crane, capable of competing in the 60 to 70 tonne all terrain crane class. A 4 axle tractor unit could take a 100 tonne/metre knuckle boom crane and still haul a trailer. Knuckle boom cranes can also be fitted to tracked vehicles for real off road performance and so, it goes on and on and on... C&A



**The Effer 140 Rail Road Crane will soon be replaced by the 2100 version, capable of lifting 31 tonnes at a 4 metre radius and 13.5 tonnes at a 12 metre radius. The new rail / road worthy model has been designed to meet the extremely stringent specification requirements of the UK rail network.**

### Precision control

Remote control is not new to knuckle boom cranes but it is increasingly seen as a way of significantly boosting safety. Steve Weavers of Fassi (UK) comments: "We are fitting radio controls to cranes as small as 8 tonne/metres and, taking all cranes supplied this year, 40 per cent have been fitted with remote control."

Fassi says that through its integrated machine control (IMC) – a system through which the remote control becomes just one part of the operation of the whole crane – it has taken electronic crane control one step further. Based on Controller Area Network (CAN) technology, the system uses a state-of-the-art FX electronic control system which, on cranes of 48 tonne/metres and above, integrates with three of the crane's vital functions.

The first of these is the IMC function mentioned above, the second is an automatic dynamic control (ADC) which automatically adjusts the

*"More than ever, the loader crane is being used as a working tool capable of delivering and positioning a load with pin-point accuracy, thus saving time, manpower and space."*

speed of the crane's movements within pre-determined safety parameters, while the third is the radio remote control of all the crane's functions. The Scanreco radio control which Fassi uses on its knuckle booms has also been integrated into the IMC to boost the system's capabilities.

A Micro function on the controller itself gives a progressive reduction in the speed of movement of the crane. Selecting from five speed reductions, ranging from 20 per cent to 60 per cent, the operator is helped with an 'inching' facility for accurate load placement. The remote control can also be fitted with a diode display that replicates all the information given on the display of the parent FX control system on the truck.

Fassi says that by putting all of the truck loader's functions under the control of the FX electronic control system and automatic dynamic control, the crane's performance will be significantly improved. "FX is an intelligent system that not only provides constant data and control of the whole crane, but it also dampens the load dynamics", explains Weavers.

"Expressed in simple terms it enables the crane to lift more so that it works nearer to its optimum design capacity and closer to its safety margins. And, because speed shock loads are more controlled, the strain on the crane superstructure is reduced, which will have the positive effect of increasing both its reliability and service life."

Improving crane control is also an area that Palfinger has recently been directing its efforts towards, culminating in the recent ▶ 22

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◀21 culminating in the recent introduction of its own radio remote control system. In addition to the standard functions of a conventional radio remote system, Palfinger's remote control panel incorporates a display showing the capacity loading level of the crane with an overload protector, while indicating the current loading level of the crane. Monitoring of the additional fly jib or winch is also monitored.

CAN technology between the crane and control panel means that the operator is continually informed of the crane's movements regardless of the distance between them.

Through the controller, a variety of crane functions can be triggered such as Palfinger's Active Oscillation Suppression (AOS) system which compensates for the jolts and sudden load changes which occur in crane operation.

### Onwards and Upwards

Late 2002 also saw Palfinger lend its upward stretching boom technology used on railway cranes to its truck mounted knuckle booms. Its 'Power Link' double linkage system allows the boom to stretch upwards through 15 degrees and is available as standard on its PK 1750, PK 20002, PK 21502, PK 23002, PK 26502, PK 29002, PK 32002, PK 36002, PK 40002, PK 44002 and PK 90002 models.

The company says that its knuckle boom crane sales into the UK increased by 35 per cent last year compared with 2001 with sales to



**Paul Hare of Hare Home Improvements says that the company has been able to abandon the use of fixed jib cranes and use a specially developed Mercedes/Fassi F420AXP.26 knuckle boom with the latest generation remote control**

Ireland increasing by about 21 per cent. The company also says that there has been a growth in sales to the UK rental market and that it expects to sell a lot more knuckle booms to this sector in 2003. And, it is what the company calls 'high end cranes' – with technologically advanced components – that the market seems to be demanding.

Boosting its own product portfolio for 2003 is HMF with the introduction of three new knuckle booms. At the lower end of the capacity chart is the Handy 330 Loader which falls in the 3 tonne/metre class. HMF says that it has brought the design techniques of its larger units to the Handy 330, available with up to three hydraulic extensions which give the unit a 7.1 metre outreach. With a dead weight of just 500 kilograms, it is targeted for lighter commercial vehicles.

Further up the capacity chart is HMF's new 52 and 72 tonne/metre units. Designated Odin and Thor respectively, both units are equipped with many standard features such as integrated remote control, over bending jib and HMF's oil regeneration system. Both units are available with up to eight extensions giving outreaches of 20.31 and 20.46 metres respectively and, in the case of Thor, an additional six extensions can be added via a fly jib, taking the lift and reach out to 33.4 metres. On the vertical lift a height of over 35 metres is achievable.

The company was also recently involved in a joint project with OTR Tyres, Europe's ▶ 24



**Palfinger's upward stretching boom technology allows its knuckle booms to stretch upwards through 15 degrees**

## KNUCKLE BOOMS

◀ **22** largest earthmover tyre specialist, to produce a tailor made knuckle boom for tyre-handling duties. The partnership produced what it called a 'hybrid' crane made from the base and column of a HMF 2000 series, the inner boom and extension derived from a 1720-T boom and the outer boom and extension from a FJ9 fly jib. Further modifications to the crane included fully hydraulic-out stabiliser beams, 8-function radio remote control and HMF's Electronic Vehicle Stability program.

Visitors to this year's UK Commercial Vehicle Show next month (see preview on page 26/27) will be introduced to three new crane models from Partek Cargotec's XS range, namely the Hiab XS066 in the 5 to 6 tonne/metre class, the Hiab XS077 in the 7 tonne/metre class and the Hiab XS088 in the 8 tonne/metre class.

The smaller XS066 weighs in as the smallest model in the XS range and features the new

Valve 80 system, which the company says has increased the unit's lifting capacity and effectiveness in daily use. The standard 'no-links' boom or the outer link version, with up to four hydraulic extensions, allow for an outreach of up to 11.85 metres. The bigger XS077 is available with no fewer than eight boom systems and offers an outreach of 13.7 metres, while the XS088 comprises five hydraulic extensions with an outreach up to 13.7 metres. The model also features the Valve 80 system which gives up to 5 per cent increased lifting capacity.

Also at the CV Show will be, Cormach, which also enters 2003 with an extended product line. Its 9.3 tonne capacity 22500E ASC line is available with one to six hydraulic extensions ranging from 5.72 to 15.84 metres. On the 4 hydraulic extension version, optional fly jibs with two, three and four extensions give an outreach of up to 21.72 metres.

### The Hiab/Vertikal challenge

To get a hands-on feel of the kind of technology that is being offered by today's knuckle boom manufacturers, a visit to this year's SED exhibition is just the ticket. Visitors will have the opportunity to test Partek Cargotec's latest knuckle boom technology in the Hiab/Vertikal challenge. The Vertikal Press has teamed up with Hiab, which will be supplying one of its 15 tonne/metre class XS 144 HI-PRO cranes for the challenge. The unit will be fitted with the CombiDrive 5000 radio remote control system, which also features a state-of-the-art slewing sector limitation system.

"This crane is one of our most modern and features the excellent CombiDrive control system. We offer two remote control systems and about 80 per cent of the cranes that we sell in Sweden are now fitted with remote control", says Ismo Leppanen, UK marketing and product



With three new knuckle boom additions, Partek Cargotec's Hiab XS range now comprises nine models including the Hiab XS 144, one of which will be supplied for the Hiab/Vertikal challenge at this year's SED exhibition.

## KNUCKLE BOOMS



The recent introduction of the amended European standard EN 12999 for loader cranes and its increasingly stringent safety regulation is doing well to keep the sector's manufacturers on their toes. Pictured is PM's series 47 P

manager with Partek Cargotec. "The Hiab/Vertikal challenge will give people a great opportunity to test this equipment, while allowing them to show off their skills with the crane."

Entrants to the Hiab/Vertikal Knuckle Boom Challenge will have to prove their skills by positioning loads against the clock. Each day the SED show organisers will present an engraved trophy to the winner while The Vertikal Press will give a £100 cash prize.

Also on display on Partek's demonstrator trailer will be the 80 tonne metre Hiab XS 800 E5 with five hydraulic extensions, the XS 166 E5 with Jib, the XS 077 and 088 B-2, and the XS 088 E5 with HiDRIVE remote control.

SED 2003 takes place from April 29th – May 1st on Fenn Farm, near Milton Keynes. The Cranes & Access village is held in association with *Cranes & Access* magazine. For more information please visit [www.Vertikal.net](http://www.Vertikal.net)

[C&A](http://www.Vertikal.net)



**An additional six extensions added via a fly jib on HMF's Thor knuckle boom takes its lift and reach out to 33.4 metres**