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Liebherr unveiled the prototype of its first flat top hydraulic luffer at Bauma



LIEBHERR HYDRAULIC LUFFERS

Liebherr revealed its late arrival into the hydraulic luffing jib tower crane market at Bauma. However, the company pioneered the concept in the late 1950s with its innovative HB cranes. Nick Johnson reports.

Amongst all the machines on Liebherr's vast Bauma stand this October was the prototype of the company's new hydraulic luffing jib tower crane, reported to be representing its entry into this growing market. The new model, the 195 HC-LH 6/12 is rated at 12 tonnes and can handle 2,550kg at its maximum radius of 55 metres.

Designed to EN 14439 it will have two 5.0kW FU slew motors, with a choice of 45kW FU or 65kW FU hoist gear. The crane can be erected on the slimline 16 EC tower system - with a 1.6 metre cross section - and it offers the choice of one or two fall operation. The machine features Litronic assistance systems including the Micromove operating range limiter.

Most Bauma preview reports I saw described the 195 HC-LH 6/12 as Liebherr's first hydraulic luffing jib tower crane. However, this is wrong, it actually only marks the company's belated entry into the flat top hydraulic luffing jib tower crane market pioneered by Franc Jost and his model JTL108 in November 2005.

By extending a triangular section lattice jib into a

rear counter jib carrying the counterweight, this design when horizontal effectively creates a flat top crane, with no upwardly protruding cathead or tie bars, looking very much like the flat tops developed in 1978 by Sweden's Linden (now Comansa) with its 8000 series.

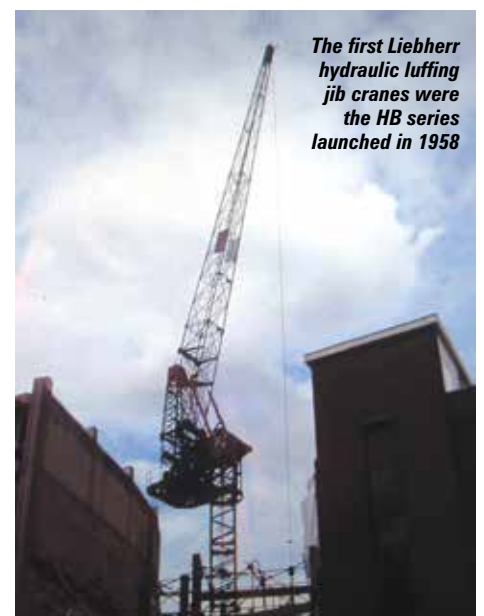
Since the Jost JTL108 launch, other manufacturers have introduced hydraulic luffing jib tower cranes including Comansa, Jaso, MTILux, Raimondi, Saez, Terex and Wolff. And now Liebherr is joining the 'club' with the introduction of the 195 HC-LH 6/12. However, the rear section of its counter jib and counterweight are slightly angled upwards in relation to the jib - so is it a true flat top?

SECOND TIME ROUND FOR LIEBHERR

Liebherr was ahead of the game in 1958 when it introduced the revolutionary HB series of hydraulic luffing jib tower cranes described back then as "all-purpose construction cranes". They featured a rectangular section luffing jib pivoted at the rear of the slew ring and luffed by two rearward facing hydraulic cylinders. Located



The rear of the jib and counterweight on the 195 HC-LH 6/12 are slightly angled upwards



The first Liebherr hydraulic luffing jib cranes were the HB series launched in 1958

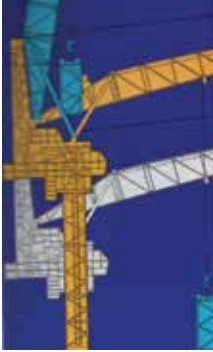
either side of the jib, their barrels were attached to the top of the superstructure at either side of the large diameter/slew ring, while the rods connected to each side of the jib.

The two most popular models were the 2.5 tonne 25HB with a 20 metre jib and 1,250kg jib tip capacity, and the four tonne 50HB with a 1,670kg capacity at 30 metres. Minimum working radius on the 50HB was 3.5 metres.

The HB cranes featured a rear mounted lattice 'A' frame/cathead with the jib's pivot point, winches and electrical control box at its base and the hoist feed sheaves at the top. The short rear structure provided a tail swing of just 5.5 metres on the 50 HB. Interestingly, the crane operated without counterweights.

The HB cranes could be utilised as an internal climber, installed on a static foundation or a rail chassis. A clever design feature allowed the crane to extend its own tower by adding the extra sections straight through the large diameter slew ring attached to a cylindrical upper support frame. To do this the crane's hoist was reeved over a deflection pulley positioned under the centre of the jib (see pic).

The HB cranes could self-install additional tower sections directly through the slew ring

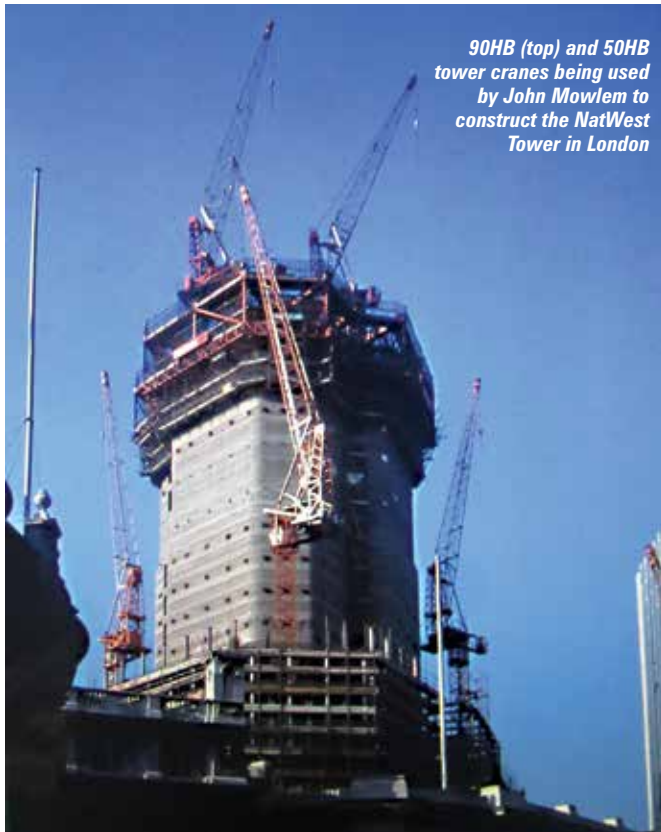


A REGULAR ON THE LONDON SKYLINE OF THE 1960S & 70S

The HB's innovative concept and potential were quickly spotted by several UK contractors including John Laing, which bought the first four 25HBs in 1958 with three employed as internal climbers on the 100 metre Empress State Building in Hammersmith, London. When completed in 1962, it was the tallest commercial building in London, surpassed a few months later by the 119 metre Millbank Tower in the City of Westminster, built by John Mowlem using two 50HB internal climbers.

Another notable London skyscraper at that time was the 127 metre Britannic House, a new HQ for BP built in 1964 by Laing using two 50HB

Three of Laing's 50HBs were used to build the Penta Hotel in Cromwell Road, London



90HB (top) and 50HB tower cranes being used by John Mowlem to construct the NatWest Tower in London

climbers. Higgs and Hill employed three 50HB cranes on the iconic Hayward Galley on London's South Bank, built during the late 1960s. Laing also used a 50HB internal climber on one of three 123 metre residential blocks in the Barbican - the highest residential towers in London at the time. This particular crane was dismantled using a special Elstree mini derrick crane designed and built by Laing itself.

PEAK PROMINENCE ON NATWEST

However, the most prominent use of HB tower cranes occurred when John Mowlem built the 183 metre NatWest Tower - now Tower 42 - designed by Richard Seifert which has three cantilever wings resembling the NatWest logo. Construction began in 1971 and, when completed in 1980 was the tallest office building in the UK. Building such a tower block on a small site surrounded by busy roads posed huge logistical problems for the contractor. Its solution was to make intensive use of eight HB hydraulic tower cranes, supplied by its subsidiary Welham Plant.

They included three 90 HB internal climbing cranes - uprated versions of the 50HB - positioned in lift shafts to construct the main slip-formed concrete core, while three static 50HBs were mounted on the outer edges of the cantilevers to construct the steelwork for the office floors. Two further 50HBs on short, static towers were used at ground level beside the tower block for general material handling and unloading.

To aid safe operation with so many cranes operating simultaneously on such a congested site, Mowlem made extensive use of closed-circuit TV and radio communications. Each tower crane operator was in radio contact with his own banksman as well as a chief banksman who could dictate the priorities for crane movements. One of the 90HB operators used closed-circuit TV to provide a direct view of his concrete skip when it was being placed under the discharge chute of

the on-site batching plant at ground level.

TANDEM LIFTING

Interestingly, towards the end of the job, two of the 90HBs still inside the 183 metre high core were used to tandem lift four 13 tonne boilers to the top of the building. They were raised from ground level with a specially-built gantry (which made use of Liebherr 130HC tower crane components) to a rail mounted bogey on the roof of one of the 167 metre high cantilever wings. The boiler was then moved towards the core and within reach of the two 90HBs which lifted them the last 15 metres to their installation position.

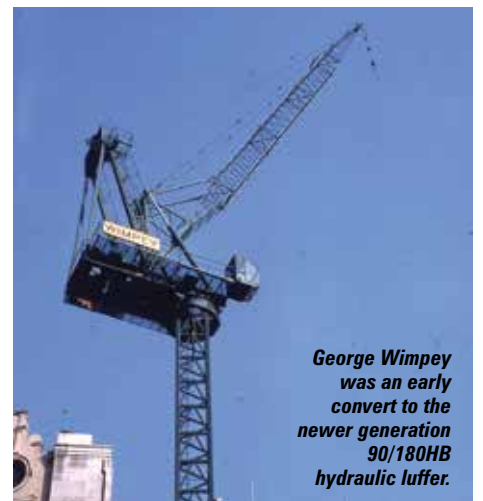
Laing also used three static 50HBs to build the 92 metre Penta Hotel - another Seifert design - (now the Kensington Forum) in Cromwell Road with three high-rise wings to

which the crane towers were tied.

A FINAL HB DEVELOPMENT

Following the success of the 50HB and 90HB, Liebherr engineers developed a new style Liebherr 90/180HB in the mid-1970s. One was bought by UK contractor George Wimpey for a new office development job in Bishopsgate, London in 1975. The new eight tonne 90/180HB featured a more slender square section 'needle' jib than the previous HB cranes. It retained the rear pivoted jib concept, providing a tight minimum working radius of 2.5 metres and boasted a 42 metre jib which could handle 2,200kg at the jib tip. Mounted on a 1.8 metre square tower, as with earlier models extra tower sections could be lowered through the slew ring when a cylindrical support frame was fitted, climbing the tower without re-reeving. A number of 90/180HB cranes were used on the construction of piers for the Thames Barrier, built between 1974 and 1983 by Costain, HBM and Tarmac.

Liebherr must be hoping that, when its new 195 HC-LH 6/12 is ready, it will prove as popular on high profile jobs as its HB machines of old. ■



George Wimpey was an early convert to the newer generation 90/180HB hydraulic luffer.