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Conexpo Magazine 2014

Meet Innovation. Discover Diversity.

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Extreme Liebherr Machines in Operation // p. 8

Strong Partner, Reliable Service Service Specialists at Work // p. 54

The family shareholders active in the Group (left to right): Patricia Rüf, Willi Liebherr, Isolde Liebherr, Stéfanie Wohlfarth, Sophie Albrecht and Jan Liebherr

Dear Guests,

Welcome to Liebherr at Conexpo Con/Agg 2014, the largest construction equipment trade show in North America. Once again the Conexpo Con/Agg show is a true forum for innovation and trends in construction machinery.

We welcome the opportunity to share our enthusiasm for high technical achievements with visitors from all over the world and to present our latest construction machinery products, components and other new technologies related to the construction industry.

There is no doubt that we will make your Conexpo visit a memorable one. Here in Las Vegas we are especially happy to meet our customers and friends from the Americas. We have been present in both North and South America since the 1970s already and doing business in these regions has always been a great experience for us.

Today almost 3,500 employees work in our 20 companies on the American continent, amongst them there are four production facilities – one in the USA, two in Brazil and one in Mexico.

Liebherr has been serving the construction equipment industry since 1949. Today, we are proud that our family name represents a global enterprise with more than 39,000 employees in over 130 companies around the world.

We look forward to interesting discussions and to working together on the projects you are about to begin. Although the business climate was again rather difficult in recent months, this trade fair is a chance for us to express an optimistic view of the future. Of one thing you can be sure: You can rely on the strong technological and customer-support partnership that the Liebherr Group as a family-owned enterprise offers you.

Wishing you an interesting and successful visit to the 2014 Conexpo Con/Agg Show,

Dr. h.c. Dipl.-Kfm. Isolde Liebherr Dr. h.c. Dipl.-Ing. (ETH) Willi Liebherr
Presidial Committee of the Liebherr-International AG Administrative Board

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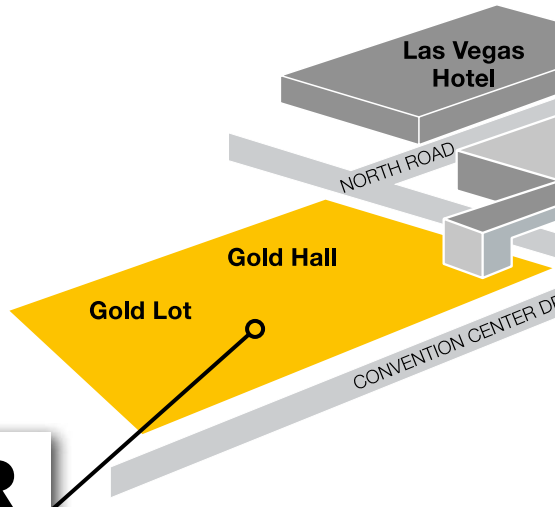
Meet Innovation. Discover Diversity.

Welcome to Liebherr at Conexpo Con/Agg

During Conexpo Con/Agg from March 4-8, 2014, Liebherr presents many new and further developed products from its vast range of construction equipment on about 50,000 ft² (4,600 m²) of display area.

Conexpo attendees can explore an extensive selection of Liebherr earthmoving, material handling and construction equipment at the Las Vegas Convention Center, Gold Lot 2155.

More than 20 machines and equipment simulators for multiple industries and job applications are showcased at the Liebherr booth. Also, for the first time at Conexpo, various innovative components from the mechanical, hydraulic and electronic drive systems are exhibited. Moreover, attendees can experience new trends in operator training technologies and try out the different equipment simulators available on site.



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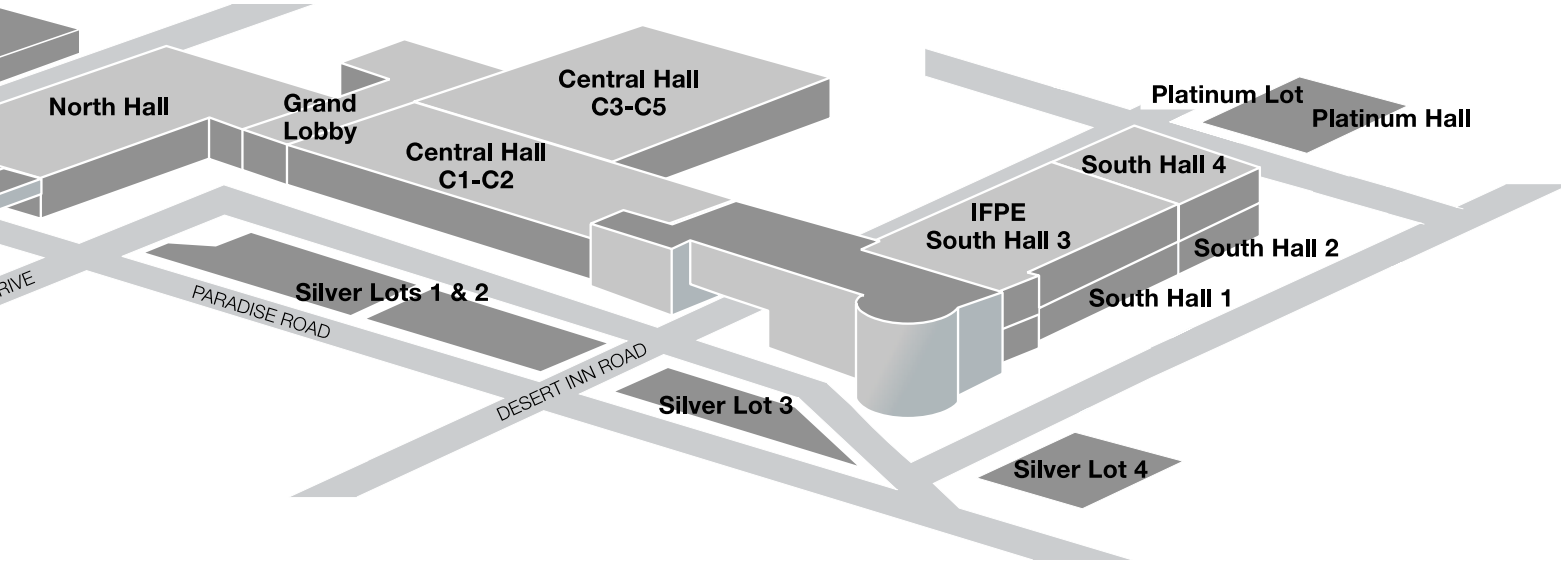
Gold Lot, Booth 2155



Visit Us at Conexpo: www.liebherr-conexpo.com

A Conexpo specific web site offers attendees the opportunity to plan their visit and navigate through the Liebherr booth in advance. Whether you are able to attend or not, you can experience Liebherr at Conexpo online.

Engage with Us

Interact with us during Conexpo through the various social media platforms: Facebook, YouTube, Twitter, Google+, Pinterest, Xing and LinkedIn.

Conexpo App: the Booth Navigator

With the Liebherr Conexpo App for smartphones you can access a news ticker on all product demonstrations and other breaking news on the Liebherr booth, including an overview of the exhibits. The App is also a navigator to bring you to the Liebherr booth and guide you around it. It is available free of charge from the App-Store (iOS), Marketplace (Windows Mobile) or Play Store (Android).

Conexpo Show Hours:

Tuesday to Friday
9.00 a.m. - 5.00 p.m.

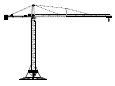
Saturday
9.00 a.m. - 3.00 p.m.

Outdoor Exhibit Area, Gold Lot, Booth #2155

Innovative Construction Machinery: the Exhibits

The construction machinery developed and built by Liebherr is unrivalled in its depth and width. The advanced technology and quality of these products ensure maximum user benefit. At the Liebherr booth, visitors have the opportunity to experience more than twenty pieces of the most innovative construction machinery. Additionally, visitors can discover the latest developments from the product area of components for drive and control technology.

1



Tower Cranes

542 HC-L 18/36 Litronic
380 EC-B 16 Litronic

2

Wheel Loaders

L 542 P Tier 4i/IIIB
L 556 Tier 4i/IIIB
L 580 Industrial Tier 4i/IIIB

3

Mobile Excavator

A 924 Litronic Tier 4i/IIIB

4

Crawler Tractors and Crawler Loaders

PR 736 LGP Litronic
PR 764 Litronic
LR 634 Litronic

5

Crawler Excavators

R 924 LC Litronic Tier 4i/IIIB
R 956 HD Litronic Tier 4i/IIIB

6

Material Handling

LH 60 C Litronic Tier 4i/IIIB
LH 40 M Litronic Tier 4i/IIIB

7

Deep Foundation Machines

LB 44
Deep Foundation Simulator

8

Concrete Technology

THS 110 D-K

9

Mobile Cranes

LTM 1750-9.1
LTM 1300-6.2
LTM 1160-5.2

10

Crawler Cranes

LR 11000
LTR 1220
LR 1250

11

Components

Diesel Engine V8 with SCRonly for Exhaust Emission Standard Tier 4

Splitter Boxes PVG 450 D

Axial Piston Pump DPVG 165 Variable Displacement Double Pump DPVD 108

Common-Rail-System

Roller Bearing Slewing Ring ROD 350 DJ

Ball Bearing Slewing Rings KUD 34 VJ

Travel Drives FAT 700, FAT 400, FAT 325

Slewing Drives DAT 225, DAT 450, DAT 600

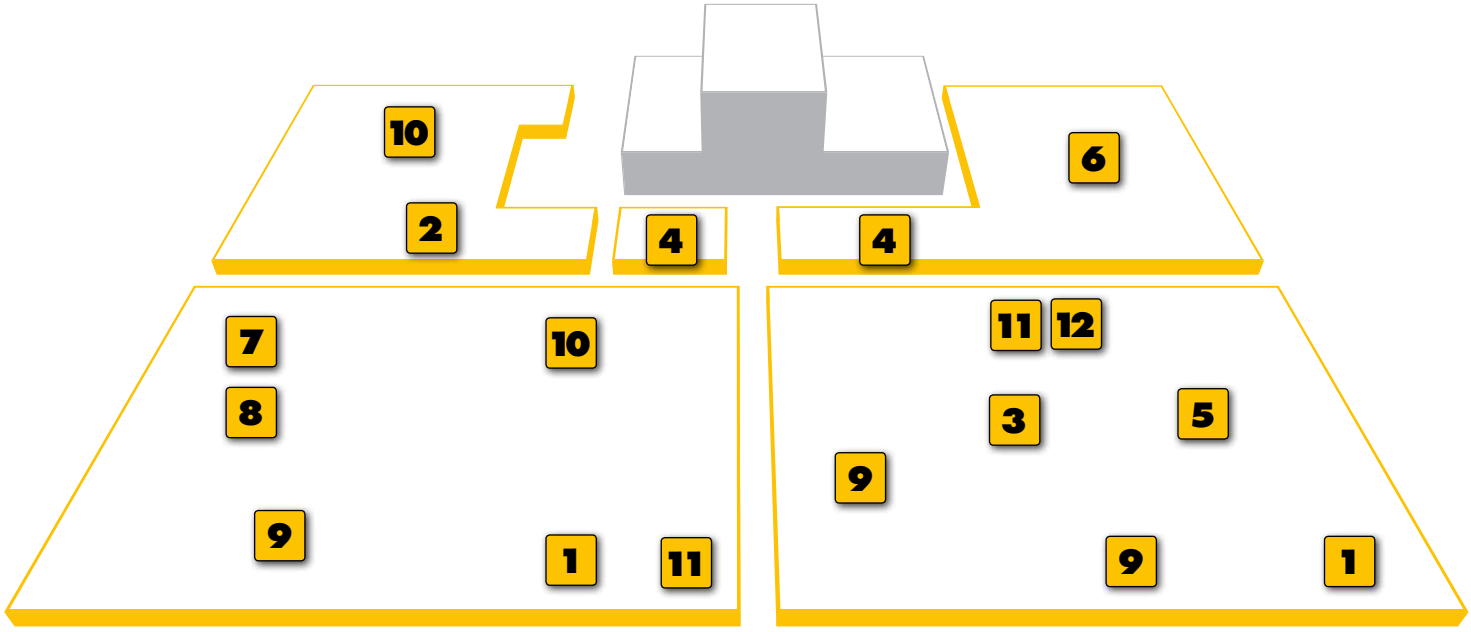
Reman diesel engine V8

12 **Product Support**

Take the Mr. Torque Challenge!

Are you stronger than 376,000 lbf-ft (510 kNm)?
Then take the challenge and test your power and strength against the new rotary drilling rig LB 44.

See you at the Liebherr booth!



For details of the exhibits, visit us at:

www.liebherr-conexpo.com

Extreme: Liebherr Machines in Operation

Arctic ice-cold temperatures, dizzying heights, extreme heat and the most severe imaginable loads. Construction machinery and mining equipment from Liebherr prove their worth day after day and all over the world in the most arduous conditions.

Lifting 660 Tons While 230 Feet Apart

Bremerhaven (Germany): at an offshore wind terminal, the jacket of the underlying substation platform structure was fitted by two LR 1750 crawler cranes. The 660-US-ton (600-tonne) upper section needed to be positioned on top of the 992-US-ton (900-tonne) lower section. The key issue was to move load with both cranes simultaneously while 230 ft (70 m) apart.

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764

24-Hour Operation on Demand

Port of Lake Charles (LA / USA): PR 764 dozers equipped with 48-yd³ (37-m³) coal blades are used at the Port of Lake Charles to move endless tons of petroleum-coke and other commodities to storage piles regardless of the climatic conditions.

Connecting Highways 900-Feet Above the Colorado River

Hoover Dam Bypass (AZ / NV, USA): a LTM 1400-7.1 mobile crane was involved when the 2000-ft-long (600-m-long) Colorado River Bridge spans the Black Canyon (about 1,500 ft (460 m) south of the Hoover Dam) and connecting the Arizona and Nevada Approach highways nearly 900 ft (270 m) above the Colorado River.

Climbing to a Height of 617 Feet

Hamm-Uentrop (Germany): the 280 EC-H 12 Litronic is working on a new coal-fired power station, and has to climb until the height under the hook is no less than 617 ft (188 m). The tower is anchored to the ground with guy ropes. When lowered, the crane's folding jib can pass through the narrow aperture of the cooling tower.

Quarrying 209,272 yd³ of Limestone

Veytaux (Switzerland): a Type R 924 Compact tunnel excavator at work on a cavern and the associated access and service routes for an underground pumped storage power station. The task: excavating about 209,272 yd³ (160,000 m³) of limestone. The challenges: humidity, dust and soil vibration.

LIEBHERR
924
COMPACT
924
COMPACT

Tower Cranes

3 Questions for David Griffin

Sales Director - North America, India, Australasia. Liebherr-Werk Biberach GmbH, Biberach an der Riss (Germany)

Which products are you responsible for in the US market?

My area of responsibility in the US is for sale of tower cranes produced at our European plants. These include saddle and flat top, luffing and fast erecting cranes. We offer one of the largest tower crane ranges in the world. We offer premium, technically and commercially attractive cranes for construction or special projects. We sell to rental companies and contractors seeking to own their machines. Together with our local Partner – Morrow – we are set up to handle any scale of tower crane project, whether via sale or rental.

What are the current challenges in these product areas in the market?

Project timelines, distances, time zones as well as performance characteristics all place demands on our products and operational structures. Mostly, we deal in North America with large cranes and ultra-modern features. There is a requirement to react quickly to market requirements and we are mastering this. When it comes to defining products, we utilize our product management team. For complex projects, we call on our Tower Crane Solutions team (TCS). This is a group of engineers which develops the solution for a project, together with the client & sales. In addition to all of this, our factories provide capacity to supply huge numbers of cranes whilst also ensuring top quality. To ensure maximum support for the customer, we place emphasis on our after-sales structures.

What innovations are you exhibiting at the 2014 ConExpo?

Two newly developed tower cranes manufactured at our German factory. The 542 HC-L 18/36 Litronic is an electric luffing crane with a 214 hp FU (160 kW) hoist unit for fast line speeds. It features a maximum lifting capability of 40 US-tons (36 tonnes). We have already sold several units locally. Secondly, the 380 EC-B 16 Litronic flat-top crane is a large “flat-top” also made at our German factory. As a highlight, we will launch details of the highly anticipated Liebherr 710 HC-L luffing crane. We are certain that this will be hugely successful. It is the largest luffing tower crane ever built by Liebherr. These cranes are engineered from the outset to cater for the most demanding conditions to be expected on jobsites anywhere.

Flat-Top Crane 380 EC-B

Efficiency and Safety in New Dimensions

The new 380 EC-B 16 Litronic provides a maximum radius of 246 ft (75 m), and can lift up to 7,500 lb (3,400 kg) at the end of the jib. The visually striking appearance of the 380 EC-B is marked in particular by the impressive crane superstructure. One characteristic feature is the four-chord counter-jib. The very compact crane superstructure, with a maximum radius of 246 ft (75 m), can be loaded onto only five trucks. Within the crane development, Liebherr paid particular attention to the design, ensuring that the dimensions of each individual part meet the requirements of container transport, a major advantage when it comes to loading onto ships. The whole EC-B head, including the IC slewing ring support and the 246-ft (75-m) jib, can be accommodated easily in 40-ft containers.

The flagship 380 EC-B is provided with powerful hoist gear with frequency converter control, which provide power outputs of between 60 hp FU (45 kW) and 148 hp FU (110 kW). And in this situation, the Micromove fine-positioning mode of the Liebherr hoist gear means that the positioning and holding of the load can be carried out with accuracy, with revolution speed of zero, without the brake engaging.

The FC slewing gear, with the convenience features such as rotation of the crane free of any jerks and jolts at micro-speeds, and the integrated anti-swing damping, which reduces crane oscillation and load swinging to an absolute minimum, have now become standard on almost all top-slewing cranes from Liebherr. The Liebherr FC trolley travel gear is particularly impressive, with its fine sensitivity movements and the high speed of the trolley. With the Litronic system, the 380 EC-B 16 Litronic flat-top crane can provide up to 20 % more load lift at the push of a button.

A new approach: using a tower crane to install a wind turbine

Focus on Construction-Site Planning: “Liebherr Tower Crane Solutions”

Liebherr’s tower crane division has appointed a special competence team in Biberach an der Riss (Germany). It will operate as “Liebherr Tower Crane Solutions” and consult with customers engaged on special projects, including power station and industrial plant construction or wind turbines.

For these projects, “Liebherr Tower Crane Solutions” will assemble know-how from the worldwide network of Liebherr companies and dealers, and coordinate the cooperative process between the design, stress analysis, production, sales or rental and after-sales service areas of the project. The aim is to give customers access to the full range of benefits available from Liebherr’s worldwide experience. From the planning phase onward, experts from the competence center will consult with the customer’s staff to develop efficient, cost-effective procedures. If necessary, special-purpose cranes or modified series-production models will be recommended in addition to cranes from the standard program.

The business areas of power-station and plant construction, wind turbine construction and special projects are now supported by project management departments that the division has established. For each of these business areas, customers are supported by a dedicated partner within the division, whose task it is to provide optimal support and the appropriate know-how for the relevant requirements.

The competence team has already recorded initial success with the project planning and commissioning of the 630 EC-H 70 Litronic tower crane for the construction of a wind turbine. For this task, Liebherr developed an entirely new, cost-effective solution for wind turbine installation with a tower crane, and one that avoids unnecessary consumption of valuable resources.

Liebherr Used and Rental Equipment Center

Central Access Point for Crane Rental and Used Cranes

In Biberach an der Riss (Germany), Liebherr is establishing a new center for used and rental tower cranes. Its task is to coordinate and activate worldwide trading in rental and used tower cranes.

The decentral rental equipment pools operated by Liebherr companies in Germany, Austria, Switzerland and France currently contain more than 1,500 machines for hire; between them, they are capable of performing every conceivable type of load lifting work. By networking the Group’s Europe-wide machine hire activities more closely, it is planned to achieve even better availability for tower cranes and accessories. In future, greater emphasis in equipment hire will also be placed on special accessories and attachments such as undercarriages, tower sections and guying frames.

The new center will also benefit the used crane business area. As a central forum for worldwide marketing of used tower cranes, it will enhance the availability of these cranes. The used crane center will be responsible for all purchases and sales of used Liebherr cranes anywhere in the world. When purchasing a new machine, customers can offer used tower cranes in part-exchange.

New 542 HC-L luffing jib cranes in operation

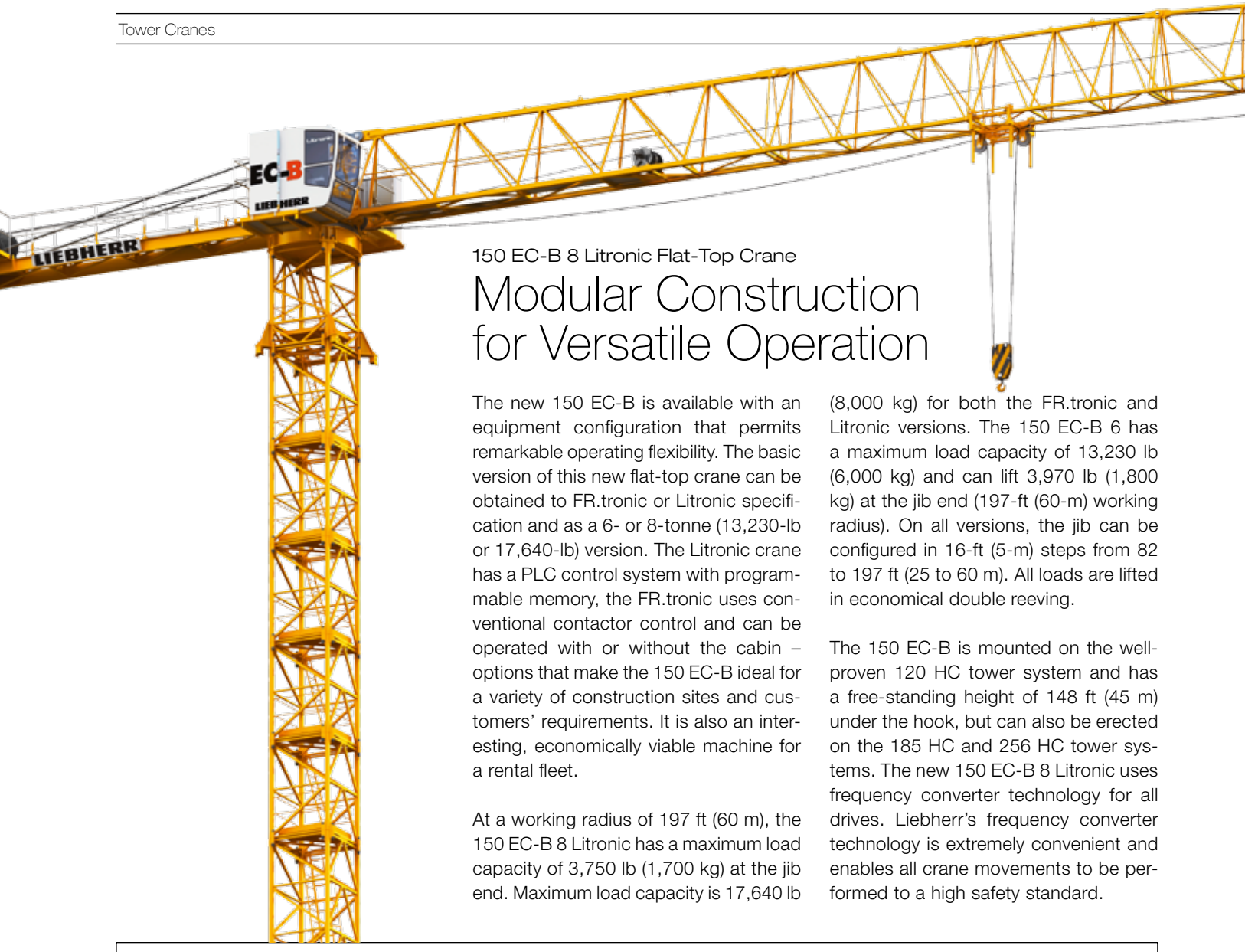
542 HC-L 18/36 Litronic Luffing Jib Crane

High-Precision Load Handling on Extremely Restricted Spaces

The new 542 HC-L 18/36 Litronic luffing jib crane has a maximum load capacity of 79,370 lb (36,000 kg). The luffing gear has been optimized dependent on lifting capacity so that shorter adjusting times are possible. At a high crane density, this can be a crucial factor.

The 542 HC-L has infinitely adjustable FC drive units exclusively. The entry-level model 542 HC-L 18/36 Litronic includes a 148 hp (110 kW) FC hoist unit, a 148 hp (110 kW) FC luffing gear unit with secondary brake, as well as two 15 hp (11 kW) FC slewing gear units as standard equipment for precise and targeted load handling.

The 542 HC-L is always supplied in the easy-to-use Litronic version. Using the programmable logic controller PLC, the load can be moved at the touch of a button in the same way as with a trolley jib top-slewing crane in a level luffing movement. Another component of the Litronic concept is the tried and trusted Micromove. It permits high-precision positioning of the load without the hoist gear brake engaging, offering a further benefit for safe and efficient crane operations.



150 EC-B 8 Litronic Flat-Top Crane

Modular Construction for Versatile Operation

The new 150 EC-B is available with an equipment configuration that permits remarkable operating flexibility. The basic version of this new flat-top crane can be obtained to FR.tronic or Litronic specification and as a 6- or 8-tonne (13,230-lb or 17,640-lb) version. The Litronic crane has a PLC control system with programmable memory, the FR.tronic uses conventional contactor control and can be operated with or without the cabin – options that make the 150 EC-B ideal for a variety of construction sites and customers' requirements. It is also an interesting, economically viable machine for a rental fleet.

At a working radius of 197 ft (60 m), the 150 EC-B 8 Litronic has a maximum load capacity of 3,750 lb (1,700 kg) at the jib end. Maximum load capacity is 17,640 lb (8,000 kg) for both the FR.tronic and Litronic versions. The 150 EC-B 6 has a maximum load capacity of 13,230 lb (6,000 kg) and can lift 3,970 lb (1,800 kg) at the jib end (197-ft (60-m) working radius). On all versions, the jib can be configured in 16-ft (5-m) steps from 82 to 197 ft (25 to 60 m). All loads are lifted in economical double reeving.

The 150 EC-B is mounted on the well-proven 120 HC tower system and has a free-standing height of 148 ft (45 m) under the hook, but can also be erected on the 185 HC and 256 HC tower systems. The new 150 EC-B 8 Litronic uses frequency converter technology for all drives. Liebherr's frequency converter technology is extremely convenient and enables all crane movements to be performed to a high safety standard.

Powerful: New Luffing Jib Crane in the 700-mt Class

Starting from 2015 Liebherr will be providing an absolute highlight in its range of luffing jib cranes. The new development in the 700 mt class delivers fantastic values in terms of lifting capacity and hoist speed. Hook speeds of up to 781 ft/min (238 m/min) are extremely persuasive during operation. Together with the powerful 295 hp (220 kW) SD.shift drive unit, its handling capacity for this size of crane is outstanding. The combination of high capacity and speed delivers twice the value for use on high buildings.

To match this large crane Liebherr will be designing a very slim tower system with a system dimension of just 7'-9" ft (2.42 m). This tower system will enable the crane to climb both in elevator shafts and on the outside of buildings. This newly developed system can be transported very easily in containers or on conventional semi-trailers.

The new HC-L crane is extremely adaptable in terms of installing the crane cab. Depending on what is required on the specific site, the cab can be installed on the left or right of the slewing platform for erection by climbing up the outside of a building – a massive bonus in terms of ease of use and flexibility.

Much thought has also been given to dismantling the luffing jib crane, above all if the 710 HC-L is used as an internally climbing crane. The components have been enhanced to ensure that every part can be dismantled from the roof using the existing Liebherr Derrick 200 DR 5/10 Litronic.

Two cranes have been already been sold whilst this largest luffing jib crane from the HC-L series was still at the development phase. At the start of 2015 these two cranes will celebrate their debut on the North American market.

Derrick 200 DR 5/10 Litronic Dismantling Crane Removes Luffing Jib Crane From Hotel Roof

The Liebherr Derrick 200 DR 5/10 Litronic carried out a job at an extreme altitude on the roof of the newly built Courtyard Marriot Hotel in Montreal (Canada). The crane operated in a very constricted space to remove the Liebherr 355 HC-L 12/24 Litronic luffing jib crane safely and reliably.

The 355 HC-L climbed with the IC tower system in the building to a final hook height of over 427 ft (130 m). After completing the hoisting work, the rigging team dismantled the 355 HC-L within four days from the hotel roof using the derrick crane. In contrast to conducting dismantling work from the ground, this job did not require any major roadblocks which would have adversely affected the other construction work. The heavy components of the luffing jib crane were lowered safely and at an adequate distance from the building since the 200 DR has a variable radius of up to 82 ft (25 m).

Subsequently, the derrick crane was used for a further two months on the hotel roof to help with the roofing work. Afterwards the Derrick 200 DR 5/10 Litronic was also dismantled. Its low package weights and compact dimensions meant that the crane components could be lowered to the ground using a load elevator.

The derrick crane can be used to dismantle tower cranes in 100 mt, 200 mt or 300 mt and more load capacity. The supports on the crane can be swivelled and adjusted to the static situation of the sub-structure on the surface to ensure excellent distribution of the support forces. Depending on the requirement, this special crane can be used with or without supports, its so-called stiff legs.

The safety PLC controller of the Derrick 200 DR 5/10 monitors all the movements with the time-tested functions of Liebherr luffing jib cranes. Sensors monitor the hoist height, load moment, jib angle and slewing gear and keep them to safe levels. The remote control enables the crane driver to operate the machine from the best possible location. So safety is guaranteed, even in heights of several hundred meters.

Earthmoving

3 Questions for Peter Mayr

President, Liebherr Construction Equipment Co., Newport News (VA / USA)

Which products are you responsible for in the US market?

I am responsible for the overall business strategy, company operations, and the sales and marketing of the Liebherr earthmoving and material handling equipment sold and serviced in the United States. Our product range is comprised of hydraulic excavators, crawler loaders, wheel loaders, and dozers.

What are the current challenges in these product areas in the market?

We are facing two major challenges in the US market. The global economic downturn dramatically slowed sales of construction and heavy equipment. Even though the economy is gradually recovering, companies and finance organizations are very cautious when evaluating new investments or loans for new projects and / or equipment. Moreover, public policy plays a big role. Large-scale infrastructure projects are a driver for equipment sales, and we have not seen as many of these projects due to budget constraints and funding shortages. We are working hard, however, to expand our distribution network so we are prepared to offer our customers innovative equipment that meets the higher standards. We will be well positioned to dramatically expand our sales as the economy continues to recover and fuels new investments in infrastructure projects.

What innovations are you exhibiting at the 2014 ConExpo?

We are proud to present an extensive selection of innovative construction and material handling equipment for multiple industries and applications, including: scrap, waste and recycling, forestry, and construction. We will be introducing the latest generation of crawler dozer – the PR 736. The LH series of material handlers will be represented by the LH 40 mobile and LH 60 crawler handlers. Also on display and featuring a waste and recycling configuration is the new R 924 crawler excavator. Representing the latest generation of wheel loaders in the medium and large range size are the L 542 waste build, L 556 standard and L 580 industrial / forestry. All these machines are Tier 4i/IIIB. New technologies will also be embedded in all new generation machines presented during Conexpo, for example the machine management system Liebherr Power Efficiency and LiDAT, Liebherr's data transmission and positioning system.

R 956 Crawler Excavator

Responsive and Productive – a New Development in the 50 t Class Excavator

The new R 956 hydraulic crawler excavator is suitable for tough and demanding operations such as earthmoving and quarrying. This machine weighs approximately 122,000 lb (55,338 kg) and presents improvements in comfort and reliability. The R 956 replaces the previous R 954 model.

The R 956 engine has been developed and manufactured by Liebherr at its own Diesel Engine Competence Center. A 6-cylinder Liebherr diesel engine with a rated output of 326 hp (240 kW) powers this new excavator. Among the features enabling this engine to comply with Tier 4i/IIIB exhaust emission standards are an external exhaust gas recirculation system and a diesel particulate filter with active regeneration.

Wide selections of factory equipment options are available for the R 956 model. These include different lengths of goose-neck booms as well as two-piece booms and front-shovel attachments. These attachments can be equipped with the new Liebherr tooth system - different innovative tooth patterns can be matched to various types of soil to provide improved penetration and increase efficiency.

Due to its kinematics and hydraulic power, the R 956 crawler excavator develops increased break-out and digging forces. Extra-large cylinders allow the operator to increase the break-out performance when working with hard materials.

The operator cab offers ample space and is equipped with numerous standard features to ensure the operator's comfort throughout the day. Air suspended seat, air conditioning and a 7" (17.8-cm) color display, in which the operator can monitor and adjust many of the machine functions are just some of them. The cab is ergonomically designed to provide the perfect arrangement of controls and joystick for ease of operation.

The steelwork for the new R 956's uppercarriage has been optimized for extended service life. A wide variety of undercarriages are available to suit any application. The LC is the typical undercarriage for earthmoving applications; two "heavy-duty" undercarriages, HD and S-HD are also available for quarry applications.

All crawler excavators in the latest Liebherr model series are equipped with the LiDAT data transmission system. This system provides remote access to specific machine data such as fuel consumption or service intervals.

The new R 956 features a rugged uppercarriage for extended service life

High-Tech Welding Robots

The precise and strict attention to detail along with the use of modern technology, enable Liebherr factories to manufacture the highest quality equipment and components for the global construction industry and increase their annual production of earthmoving equipment.

Welding robots ensure the precise positioning and clamping of work pieces. Steel pieces can weigh up to 44,093 lb (20 tonnes).

Worldwide Spare Parts Logistics for Earthmoving Machinery

Construction of the Group's New Logistics Center Has Begun

In July 2013, the Liebherr Group began construction of a new logistics center near Kirchdorf an der Iller (Germany). In future, this will be the point from which spare parts for Liebherr earthmoving machinery will be supplied around the world. In the long term, spare parts logistics for other construction machinery divisions will also find its home there.

It is currently anticipated that the first building extension phase will be completed in the third quarter of 2014. This phase covers, for example, site development, erection of a logistics warehouse over an area of approx. 505,903 ft² (47,000 m²) as well as the construction of a separate administrative building. The site should be operational within the first quarter of 2015.

In the final extension phase, Liebherr will have a warehouse area of about 1,829,864 ft² (170,000 m²) as well as an administrative building covering an area of 48,437 ft² (4,500 m²) on the 3,875,007 ft² (360,000 m²) site.

Several factors were decisive in selecting this location. Among these, for example, were the proximity of the A7 autobahn as well as the available area for further expansion. Another important factor was also the large number of Liebherr construction machinery plants in Southern Germany, Austria and France.

For efficient storage of the spare parts, a high-bay store with 60,000 spaces for pallets and a height of approx. 125' (38 m) will be built. In total, this warehouse will offer an area of 505,903 ft² (47,000 m²) to store spare parts. For logistics on the premises, there will also be an innovative 95'-high (29-m-high) container warehouse for 122,000 containers and a potential goods handling output of 3,500 containers per hour.

In the remaining, 65'-high (20-m-high) part of the building, provision is to be made for manual storage areas with 25,000 pallet spaces and a storage zone as well as workspaces for customer-specific consignment, packaging and dispatch.

Using 22 transport loading bridges, the spare parts are then loaded onto HGVs and vans and sent to customers and dealers via the quickest route possible.

The logistics center's construction site in fall 2013

R 924 Crawler Excavator

For Waste and Recycling Applications

Liebherr manufactures custom-made crawler excavators, with the world's most extensive range of machines and attachments. The R 924 crawler excavator for waste and recycling applications is designed to work in transfer stations and recycling centers. This machine is equipped with purpose built guards that protect key impact areas such as the undercarriage, hydraulic cylinders and operator's cab.

The engine and cab pre-cleaners are standard features. They reduce contamination of the engine oil and operator's cab. This machine is equipped with a reversible fan to expel debris from the radiator core to maintain efficient cooling.

The R 924 exhibited at Conexpo 2014 is equipped with a hydraulic cab, a 18'17" (46 cm) gooseneck boom, a 9'10" (23 cm) stick and a LC undercarriage with 30" (76 cm) track pads. It has an operating weight of 55,830 lb (25,324 kg), features a Liebherr diesel engine rated at 157 hp (115 kW) and it is fitted with a particulate filter with active regeneration for efficient exhaust gas purification in compliance with the Tier 4i/IIIB exhaust emission limits.

The R 924 features the integrated Liebherr excavator system technology for exceptionally smooth and quick operation. This technology is based on Positive Control hydraulics and a Liebherr electronic control system, making optimal use of the available energy for both individual and combined movements.

The high-strength steel structure of the new excavator has been optimized for exceptional performance and productivity. The X-shaped design improves stress distribution and promotes a long service life. The sloping design of the undercarriage from the center section reduces the time needed to clean debris from the undercarriage.

The R 924's operator cab sets new standards of operator comfort and ergonomic functionality with low noise levels, enlarged space and air conditioning as standard. Intuitively located, easy-to reach controls and a color touch-screen monitor create a productive work environment. The reinforced cab meets ROPS regulations and ensures maximum safety for the operator.

The uppercarriage layout is entirely new and makes maintenance work safer and more efficient. Maintenance points have been brought together and can be easily reached from ground level via "gull-wing" doors. This simplifies day-to-day maintenance and minimizes the need to climb on the superstructure for general servicing. Visual checks on fluid levels and other items have been optimized, clearly laid out and easy to understand.

For Canal, Heavy Earthmoving and Demolition Applications

A 924 Litronic Tier 4i

The new A 924 Litronic presented at Conexpo is an ideal wheel excavator for road construction, pipeline and trenching applications.

The A 924 Litronic combines outstanding performance with exceptional efficiency. The powerful Liebherr diesel engine in conjunction with the efficient Liebherr particle filter reduce emissions and operating costs while complying with Tier 4i/IIIB emissions standards. It has an operating weight of 58,400 lb (24 tonnes) and is powered by a Liebherr diesel engine rated at 173 hp (129 kW) (SAE J1349).

The new A 924 Litronic along with the A 928 Litronic replace the previous A 914 and A 924 Tier 3 models and round-up the Liebherr's successful wheel excavator product range. An improvement in the drivetrain ensures more acceleration when driving on the road and excellent performance, particularly on inclines.

Liebherr wheeled excavators offer maximum productivity and versatility. In addition to driving performance, the Liebherr hydraulic system has been improved. All main components are developed and manufactured by Liebherr to ensure the highest quality standards. The A 924 Litronic delivers exceptional digging power even in the most difficult operating conditions.

An optional angled mono boom with a length of 18.5 ft (5.7 m) and a two-piece boom with a length of 13.6 ft (4.2 m) are available for this machine. Different configurations make this machine ideal for a wide range of applications such as canal construction, demolition, road construction and load hoisting work. The A 924 Litronic can be equipped with Likufix which is a fully hydraulic quick-change system that allows the operator to exchange attachments and make all hydraulic connections within seconds without leaving the cab. This system increases the productivity of a wheeled excavator by 30 % on average.

Standard or wide undercarriage widths are available depending on the application. Additionally, a range of stabilizer options are available depending on the customer needs (blade support, 2-point outriggers, a blade and 2-point outriggers and 4-point outriggers). Maintenance tasks can be performed faster thanks to the machine design. All service points are designed for easier access to perform routine maintenance faster. Most components are easily accessible from ground level. The fully automated lubrication system is a standard feature and a true time-saver for the operator, with minimum machine downtime. Additionally, the stabilizer blade is maintenance free as it does not have any lubrication points.

Electric Hybrid Drivetrain Powers the R 9XX concept

Driven by the development of new technologies and conceptual breakthroughs, Liebherr presented the R 9XX concept electric hybrid prototype last April at the Bauma Show in Munich (Germany). This prototype demonstrated the energy recovery technologies that will be available in the future and which will distinctly enhance the economy and the sustainability of construction machinery.

The R 9XX concept embodied in the 40-US-ton (36.3-tonne) crawler excavator is powered by a Liebherr diesel engine that meets Tier 4i/IIIB exhaust emission requirements. Crawler excavators in this size category are used for high-volume earthmoving and for demanding tasks in quarries and opencast mining. The typical cyclical work that they do is especially suited for a hybrid energy application and a combination of different drive technologies.

The R 9XX concept's principal energy source is the standard internal combustion engine; this is combined with hydraulic and electrical energy storage. Liebherr designed the components used in this system, which include: the electric slew drive, the electrical energy storage device (known as "supercaps") and the electronic control unit. A pressure accumulator and the supercaps are used to recover stored energy. This patented drive concept integrates electrical and hydraulic technologies. The result is a reduction in fuel consumption and higher performance.

The potential energy of the boom is stored through an energy transformer, parallel to the hydraulic and electrical energy storage units that use supercaps. The slew drive is fully electric. When braking, kinetic energy is converted into electrical energy by the electronic drive and stored in the Liebherr supercaps. This energy is released when the superstructure speeds up at any stage in the work cycle.

The diesel engine's output can be supplied directly to the excavator's operating functions or input to the electrical energy store. From this storage unit, energy can be supplied directly to the slew drive or used to feed the hydraulic pump. The system is able to transfer energy between the various subsystems. This ensures that the diesel engine only supplies the amount of energy that is required for the application; keeping the load on the engine uniform and improving fuel efficiency and service life.

The hybrid system on the R 9XX concept can supply short-term peak power at up to twice the rated output of the diesel engine.

R 9XX concept: The hybrid energy storage system can provide peak power twice the diesel engines rated output.

Midsize Wheel Loaders

Higher Performance, Greater Efficiency

All Liebherr's midsize wheel loaders comply with Tier 4i/IIIB exhaust emission limits.

Liebherr redesigned its midsize range of wheel loaders, the L 524, L 528, L 538 and L 542 to conform with Tier 4i/IIIB emission standards. The redesign of these wheel loaders focused on innovative improvements in efficiency and safety – improving performance, stability, engine output and hydraulic system ratings. The tipping loads have been increased and the structural steelwork reinforced to make the machines even stronger.

Innovations for greater productivity: the Likufix hydraulic quick-change system that has proven so successful on Liebherr hydraulic excavators is now available for midsize Liebherr wheel loaders. Attachments can be changed directly from the cab in seconds. Even the hydraulic lines are remotely connected with no hydraulic fluid leakage.

Liebherr has retained its legendary hydrostatic driveline principle for the four new wheel loaders drive concept, and combined it with Liebherr Power Efficiency (LPE) to boost the machines' performance and economy. Compared with other wheel loaders in this size category, the innovative driveline concept cuts fuel consumption by as much as 25 %. In addition to the fuel savings this design also reduces tire and brake wear.

The LPE system, a Liebherr development, influences engine management pro-actively: the machine's software is supplied with the accelerator-pedal position signal and then computes the most efficient means of implementing the operator's instructions. LPE optimizes interaction of the driveline components.

The Liebherr hydrostatic design concept assures high tipping loads with low operating weight, increasing efficiency and economy while meeting performance and productivity requirements.

Wheel Loader Test Rig

Even the Smallest Detail is Checked

None of the wheel loaders built by Liebherr in Bischofshofen (Austria) leaves the factory until it has been run on one of the manufacturer's two roller test rigs. This ensures that all the components in the Liebherr driveline concept are optimally matched. The rig is configured automatically to suit the type of wheel loader that is to be tested. The test run takes about an hour and a half; only when it has been completed successfully is the machine approved for delivery to the customer.

Large Size Wheel Loaders

Designed for Higher Performance

The L 556 Z wheel loader has a tipping load of 29,870 lb (13,549 kg) with an operating weight of 39,460 lb (17,899 kg). The loader is equipped with a 4.7 yd³ (3.6 m³) bucket and is powered by a 188 hp (140 kW) diesel engine.

The engine compartment on the L 550 and L 556 has been redesigned so that the diesel engine is installed transversely, which is a unique configuration in this class. This allows for a more compact layout, and makes all critical maintenance points accessible from ground level.

The panoramic glass in the cab makes for excellent all-round visibility. These new-generation machines have an optimized tipping load limit that further improves productivity and stability.

The L 580 IND wheel loader features the industrial lift arm and has a tipping load of 29,125 lb (13,211 kg) with an operating weight of 61,685 lb (27,980 kg). The machine on display is equipped with a 17-yd³ (13-m³) light material bucket.

The industrial lift arms on the L 580 IND are designed to provide exceptionally high lift momentum retaining torque in the upper part of the lifting range. The precise parallel movement over the entire lifting range increases operational safety, as manual load-leveling by the operator is not necessary.

Designed to meet the demands of productivity and efficiency

Industrial linkage provides exceptional torque in the upper lifting envelope.

The industrial lift arm configuration is available for L 550 to L 580 wheel loaders. Cleaning and servicing is easier than ever before on the new Tier 4i/IIIB generation wheel loaders. The operator can reach the maintenance points for the main components from ground level. For more efficient cleaning and maintenance, the radiator assembly is installed directly behind the cab where air with low dust content can be drawn in.

An optional control lever with an additional miniature joystick is available for the new Tier 4i generation wheel loaders. This is especially useful for industrial tasks when hydraulic attachments such as high-dump buckets with hydraulic clamp require several working movements to be performed simultaneously. With the aid of the additional mini-joystick, the operator can control two additional hydraulic functions easily and safely with a thumb movement. This provides accurate, precise and safe operation for all working and travel functions, since the driver's left hand can remain on the steering wheel at all times.

LiDAT

Data Collection and Tracking System

LiDAT is a data transmission and positioning system for Liebherr machines and the machines of other manufacturers. Based on state-of-the-art data transmission technology, LiDAT provides information on the location and operation of your machines, enabling their efficient management, optimal operation scheduling and remote supervision.

With LiDAT, all the critical machine data can be viewed at any time. Depending on the type of subscription you select, data is updated several times a day and can be accessed at any time using a web browser. Critical alerts such as machine movement outside of a predefined area or user defined operating parameters can be set and monitored.

Liebherr Service – an Overview

Four Principles for Outstanding Service

The comprehensive service that Liebherr provides for its earthmoving and material handling machines, its mobile and crawler cranes, its maritime cranes and special deep foundation equipment is based on four principles.

Economy: Regular preventive maintenance keeps up both the availability and the value of the machine. Maintenance programs tailored to meet the customer's individual requirements reduce repair costs and ensure an excellent resale value.

Security: Liebherr offers optimum service and top availability. The service specialists are trained at the Liebherr plants – at the exact same place where the products are developed and produced. The result of this is quality, which pays during repair jobs on site and in the workshop. In combination with Liebherr genuine parts this results in reliable technology and guarantees high operational reliability.

Partnership: When buying a Liebherr machine the customer not only looks to a long-lived high-end product but also a solid long-term partnership. As a strong and independent group of companies, Liebherr has for over 60 years now guaranteed its customers a reliable prospect for their success – and will continue to do so in future.

Comfort: With Liebherr genuine parts, LiDAT, Liebherr-P@rts24 and competent support from the service partners, Liebherr offers the highest possible comfort to its customers. With the Liebherr service agreements on offer, Liebherr customers obtain an all-round carefree package tailored to their specific needs.

PR 736

New-Generation of Crawler Dozers More Economical and Extra Comfortable

The Liebherr PR 736 Litronic represents a new milestone in crawler tractor development – the first of the new Generation 6 models. Central development priorities were higher efficiency and reduced fuel consumption and CO_2 emissions. The new Eco-function system permits a choice between high performance and maximum economy. The system then adjusts all the elements in the stepless hydrostatic driveline automatically to the most fuel-efficient settings.

Special attention has been devoted to comfort and convenience: large-area panoramic windows in the new cab provide an optimal view of the working equipment.

The PR 736 cab is an entirely new design: the travel controls are ergonomically shaped and can be moved to the most convenient positions. Another new feature is the touch-screen system display that can be operated intuitively. It supplies information and warnings, and supports the operator when choosing specific travel settings.

For maximum safety and operating convenience, these crawler tractors can be equipped as an option with alternative control elements such as a detended joystick or a brake pedal.

Additional factors contributing to the cost efficiency of the PR 736 are: excellent access for maintenance, optimized track design, optional tracks with rotary bushings and the Liebherr fleet management system LiDAT which is a standard feature that provides an accurate, efficient overview of essential servicing work, warning messages, machine's position and actual consumption data and filling levels.

The newly developed six-way blade makes the PR 736 Litronic even more versatile.

Material Handling

The New Liebherr Handler 40 M

Versatile, Powerful and Economical

The LH 40 M displayed at Conexpo is a highly versatile material handler. Whether loading trucks or rail cars, supplying scrap to metal shreaders, sorting or stockpile management, this powerful material handler delivers top performance every time.

The LH 40 M features the Energy Recovery System (ERC) and is powered by a 4-cylinder engine developed and manufactured by Liebherr with an output of 188 hp (140 kW) at 1,700 rpm (SAE J1349). The engine meets new emissions regulations requirements of exhaust gas Tier 4i/IIIB. Like the rest of the LH series, multiple options and configurations are available to provide the best solution for every application; from undercarriages to cab options to attachments. The machine's maximum system performance is 226 kW.

The new operator's cab increases visibility and comes standard with an air suspension seat as well as air conditioning. Touchscreen display and multi-function joysticks are standard. Options include cab risers as well as a hydraulically adjustable cab.

The New Liebherr Handler 60 C

Efficiency and High Performance

The new LH series handlers incorporate a large number of new features and technical innovations that enhance their cost-effectiveness. The new Liebherr LH 60 C is powered by a 6-cylinder engine developed and manufactured by Liebherr with a powerful output of 241 hp (180 kW) (SAE J1349).The engine meets new emissions regulations requirements of exhaust gas Tier 4i/IIIB. The handler reaches a system performance of up to 288 kW.

A standard feature on the LH 60 C is the innovative Energy Recovery System (ERC) – a patented Liebherr development. The ERC is a nitrogen filled energy storage cylinder that works by partially compensating for the weight of the working attachment (boom, stick and load). When the equipment is raised, energy from the ERC system is supplied in addition to the power from the diesel engine. This Liebherr innovation increases the handling capacity of the machine and provides faster work cycles while reducing the diesel engine output and fuel consumption.

A wide range of options and configurations are available for the LH 60 C to provide the best solution for every application; from undercarriages to cab options to attachments. Extra Wide (EW) and Super Wide (SW) undercarriages are available to provide maximum stability when moving heavy loads.

A hydraulic-adjustable operator cab option is available for the new LH series machines. The cab can be positioned at the ideal height for the best possible view of the work area making the operation safer as well as faster.

Customers can also select from a variety of different attachments such as grapples, quick-change systems and special attachment tools designed by Liebherr specifically for the application. The LH 60 C ensures the efficient handling of materials such as scrap, wood or bulk materials.

L 566 and L 580 Wheel Loaders

Industrial Lift Arm for Timber Handling

The industrial lift arm for timber handling, which has proved highly successful on the L 550 and L 556 models, is now also available as an option on the L 566 and L 580. These models are also available with Z-bar linkage for standard operations.

The industrial lift arm uses specially developed geometry for exceptionally high torque and retention forces in the upper working area. Precisely parallel load movement over the entire lifting range is another feature, and avoids correction by the operator in mid-movement.

With these two lift arm versions Liebherr customers can be sure of obtaining the ideal solution to their individual needs. Attachments such as buckets for high-level dumping or light materials are available ex factory and Liebherr also supplies special machines such as the LogHandler.

The L 580 handling timber

Deep Foundation Machines

3 Questions for Gernot Schranz

President, Liebherr Nenzing Crane Co., Houston, (TX / USA)

Which products are you responsible for in the US market?

My area of responsibility covers crawler cranes with lifting capacities of up to 660,000 lb (300 tonnes), duty cycle crawler cranes and a wide range of deep foundation machinery for pile driving and drilling.

What are the current challenges in these product areas in the market?

We have to consider the particular needs of the US market in the overall design of our products. For example, transport weight and dimensions have to comply with US regulations. We also have to train our customers to optimally use our foundation machinery. In order to improve training possibilities we have developed a new simulator, which is available in many of our sales and service centers worldwide, but also as mobile solution. With these state-of-the-art training tools, both efficiency and safety on the jobsite can be further increased. Another challenge is that many customers do not yet know about the manifold applications of our machines for ground improvement. Thus, our specialists promote the various applications and make them more widely known in the market.

What innovations are you exhibiting at the 2014 ConExpo?

The LR 1250 crawler crane is based on the proven LR 1200 model and offers revised and optimized lifting capacities. It is equipped with a Tier 4i/IIIB diesel engine and the latest technology in terms of control system and load chart calculation. We display another innovation in the area of deep foundation machinery. The LB 44 rotary drilling rig is fitted with a very large and robust leader to manage the high torque of 376,000 lbf-ft (510 kNm) offered by our new rotary drive as well as a 110,230-lb (50-tonne) Kelly winch. It is exhibited together with a Liebherr mobile concrete pump.

LB 44

New Rotary Drilling Rig

The 381,000-lb (173-tonne) heavy LB 44 expands Liebherr's series of rotary drilling rigs at the upper end of the scale. It is driven by a V8 diesel engine offering 677 hp (505 kW); this engine complies with the exhaust certification Tier 4i/ IIIB. Possible applications are Kelly drilling, drilling with double rotary head, continuous flight auger and full displacement tool.

The innovative rotary drive offers a torque of 376,000 lbf-ft (510 kNm) and is thus one of the most powerful drilling rigs currently available. The main advantages of the hydraulic drive manufactured by Liebherr are automated torque adjustment, continuous speed optimization and four electronically adjustable speed ranges.

The high-performance rope crowd system with its pull force of 123,000 lb (56 tonnes) allows utilization of the entire length of the leader, and therefore ensures maximum performance and reliability even in the most difficult soil conditions and operating circumstances. Despite its size, the LB 44 can easily be moved from place to place and, if necessary, dismantled so that the weight of the heaviest element does not exceed 90,000 lb (41 tonnes).

The first two LB 44 are currently employed in the construction of a particle accelerator in Darmstadt (Germany) to stabilize the subsurface with cast-in-place drilled piles. These operations form the basis for the construction of the international particle accelerator FAIR. In total, some 1,400 foundation piles with a length between 131 and 203 ft (40 and 62 m) are being set in the ground since March 2013. All drilled piles are installed down to the final depth completely cased. That means that during the drilling process, the excavated material is removed under the protection of an advancing casing. The efficiency of the rotary drilling rigs working in the rotary drilling method means that the boreholes can be excavated down to the final depth completely cased, without the need for a casing oscillator.

After its planned completion in 2018, the FAIR particle accelerator will be one of the largest research facilities in the world. Some 3,000 researchers from around 50 countries will then use FAIR for their scientific projects.

New Simulator

LiSIM® – Simulator for Construction Machinery

The new Liebherr simulator for deep foundation and lifting applications offers a cost-effective and highly efficient operator training solution. Based on original software and hardware it increases both productivity and safety. The development of this training tool is driven by Liebherr's extensive experience in highly immersive crane operator training as well as in other simulations.

For the simulator, Liebherr's successful LB 28 rotary drilling rig with continuous flight auger (CFA), Kelly bar and casings as well as an LR 1300 crawler crane have been modelled. Additionally, a realistic construction site has been virtually created. The simulation replicates all aspects of the machine's real functions and offers several different training scenarios.

The simulator is available in three different configurations: the classroom solution has the advantage that it can easily be integrated into existing training centers; the easy-to-transport containerized solution houses the simulator in a 40-ft (12.2-m) container, featuring a training room, utility room and cab simulator; the space-saving cab solution ensures that the operator becomes familiar with controlling the crane in a real life environment.

Mobile Cranes

3 Questions for Georg Diesch

President, Liebherr Cranes, Inc., Newport News (VA / USA)

Which products are you responsible for in the US market?

Being a sole Sales and full After Sales Service Organization we are in charge for all products engineered, designed and manufactured at our factory Liebherr-Werk Ehingen GmbH in Ehingen (Germany). This includes the full range of all-terrain cranes starting from 40 US-tons (30 tonnes) all the way up to 1,500 US-tons (1,200 tonnes) as well as the entire crawler crane product line greater than 400 US-tons (350 tonnes).

What are the current challenges in these product areas in the market?

The most important and basic necessity as a sales and service organization is having the proper cranes available to satisfy the market demand and to make sure that our customers can do their jobs. Apart from providing the most innovative technical equipment, we need to have solutions to our customer's questions and concerns, such as changing safety and environmental requirements, assistance to particular job related issues as well as helping to keep the cost of ownership low. Our customer care concept offers the full package of service, parts, repair and training. This includes quick and professional response to any call and often starts with troubleshooting over the phone. Furthermore we consider ourselves to be the "voice of the customer" to the manufacturer.

What innovations are you exhibiting at the 2014 ConExpo?

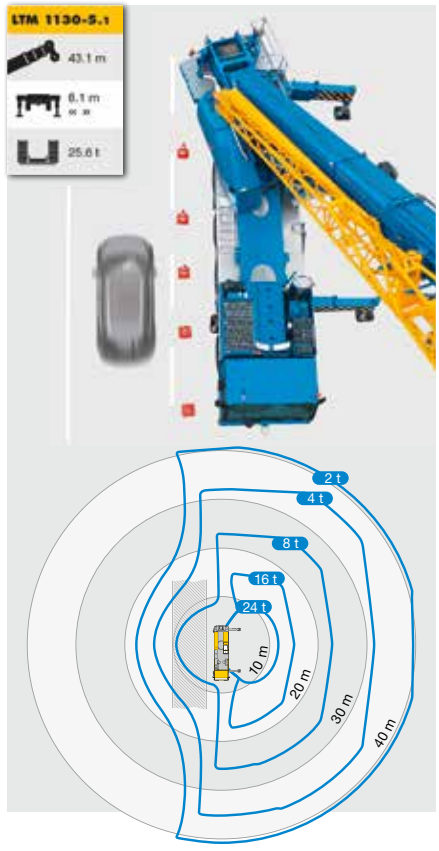
As a matter of fact, several new and innovative crane concepts are on display. To start with, Conexpo is going to be the launch pad for the most recent addition to Liebherr's mobile crane family, the LTM 1160-5.2. The 5-axle, 190-US-ton (160-tonne) rated crane comes with the new one single engine crane drive concept. This is the first exposure of this type to a wider public audience not only in the US. The LTM 1300-6.2, a 6-axle, 360-US-ton (300-tonne) mobile crane was the first crane built in this class with a single engine. The crane was first shown at Bauma 2013 and makes now its debut into the US market. One other crane is the LTM 1750-9.1, a 9-axle, 900-US-ton (750-tonne) classified crane. This heavy lift crane is equipped with a "power pack" located in the upper for all crane functions, but can also be driven with all functions from the lower engine in an emergency operation mode. As for the crawler crane segment, the first class LR 11000 is on display. At first introduced to the public at Bauma 2013, this versatile 1,200-US-ton (1,000-tonne) crane type is designed for quick assembly, easy transportation and comes with lots of boom combination variations.

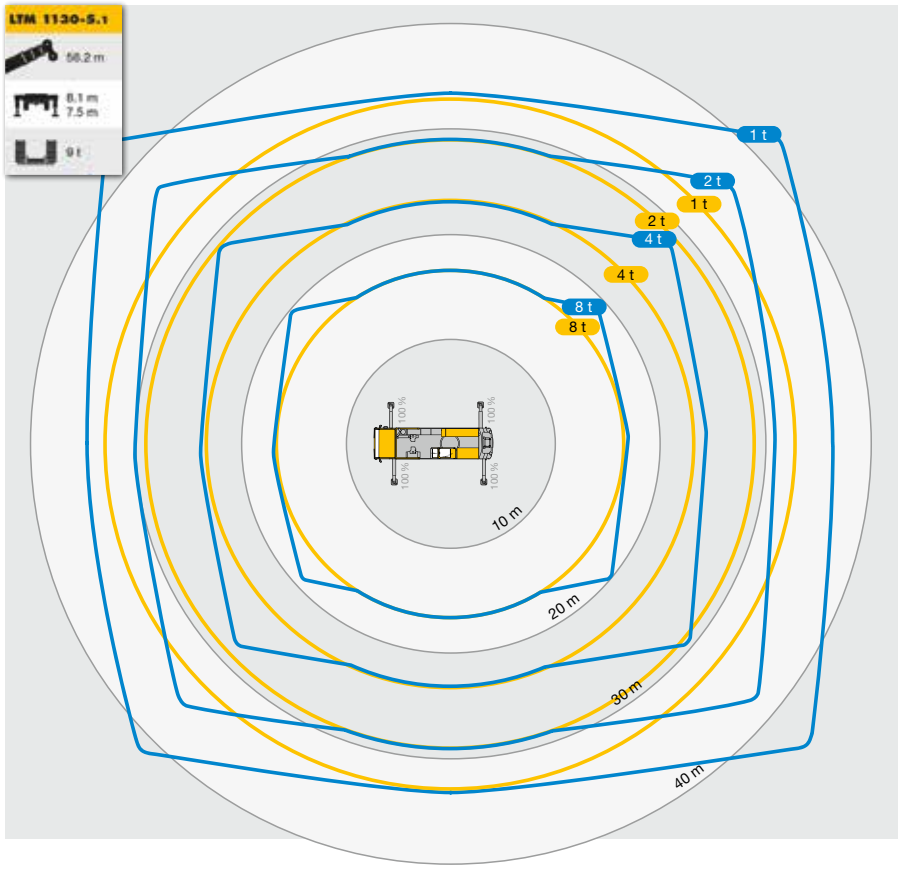
Variable Supporting Base

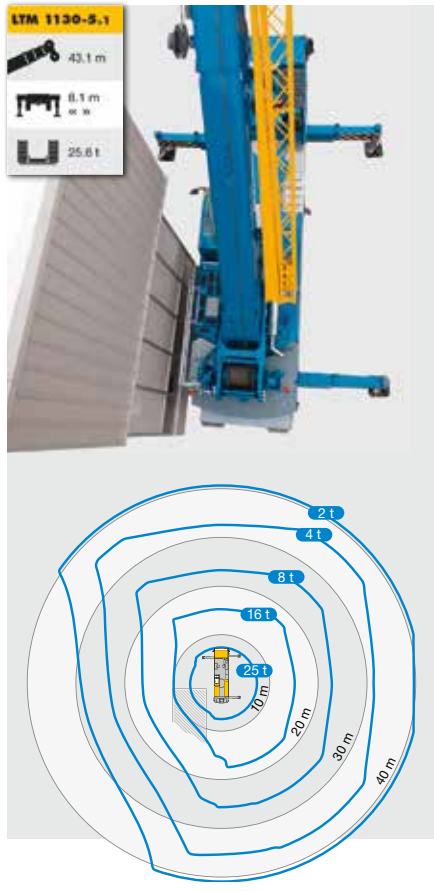
Improved Safety, More Lifting Capacity, Larger Working Range

Working on sites often means difficult, constricted conditions. It is often not possible to extend all the outriggers evenly in crane use locations. Liebherr has developed a unique new system with which every individual crane support can be extended to any length and the crane operation is then made safe by the load moment limiter within the LICCON control – this is called the Variable Supporting Base. The extension length and support force of every single outrigger is measured and the maximum lifting capacities for this situation are calculated by the crane control.

This ensures as well higher lifting capacities and a larger working range, even with a maximum support base. The largest increases are made in the operating ranges directly above the outriggers. The Variable Supporting Base system also makes improvements over the 360° lifting capacity tables for hoisting to the front and rear. When the crane is used with part ballast the increase in lifting capacity and the extension of the radius is even more pronounced with the new system than with full ballast. This means that there are less ballast transports needed for many crane jobs.







LTM 1300-6.2 Mobile Crane

360-US-Ton Crane with Highest Load Capacity

The LTM 1300-6.2 is a new mobile crane on a 6-axle chassis and the most powerful crane in its class. The 256-ft (78-m) telescopic boom represents an addition of 20 ft (6 m) compared to its predecessor, the LTM 1250-6.1. The LTM 1300-6.2 is ideal for erecting tower cranes.

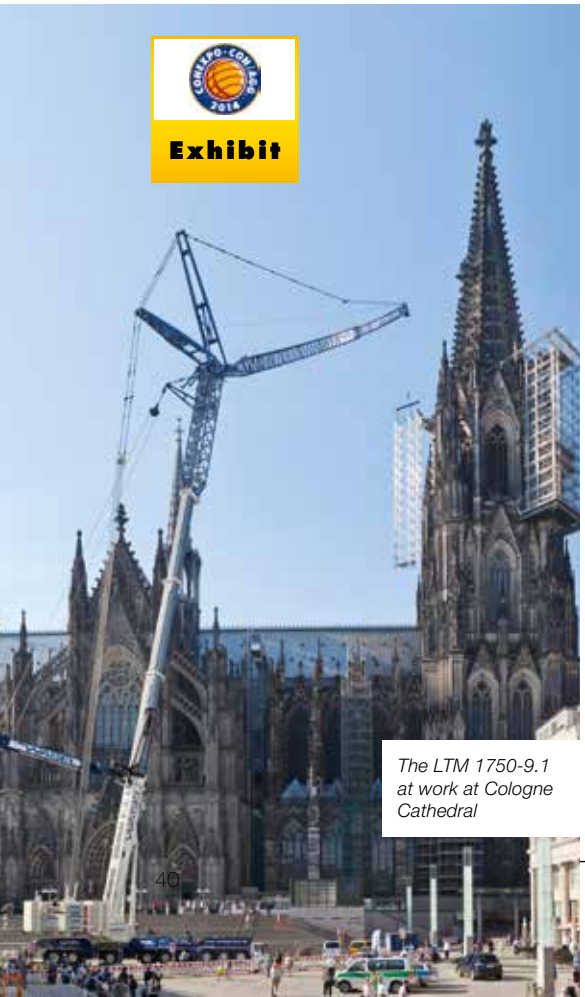
The 41-ft to 69-ft (12.5-m to 21-m) double folding jib can be extended by two additional 23-ft (7-m) sections to a total of 115 ft (35 m). The folding jib is erected at an angle of 0 degrees, 20 degrees or 40 degrees but can also be adjusted hydraulically under full load between 0 and 40 degrees as an option. The 18-ft (5.5-m) foot section of the folding jib can be used as a heavyweight erection jib and has a load capacity of 128,300 lb (58 tonnes).

Liebherr has designed its new 6-axle machine on the one hand as a simple, classic folding jib crane so that it can be used with the same speed and flexibility as a 5-axle model. The setup functions such as ballasting and lattice jib erection are designed to be particularly user-friendly.

On the other hand, the LTM 1300-6.2 is the only 360-US-ton (300-tonne) crane on the market and is therefore the smallest crane with a luffing lattice jib. This makes it an ideal entry model to the luffing jib class. The fixed jib can also be erected without an auxiliary crane. The LTM 1300-6.2 sees the twin-engine crane replaced by a single-engine crane with a mechanical shaft for the crane drive – a completely new concept for powering the superstructure.

LTM 1750-9.1 Mobile Crane

LTM 1750-9.1 Dismantles Hanging Scaffold on Cologne Cathedral



The LTM 1750-9.1 at work at Cologne Cathedral

A LTM 1750-9.1 impressed everyone during a difficult crane job with quite a few logistical and static engineering challenges on Cologne Cathedral in Cologne (Germany). The mobile crane dismantled one of the two enormous hanging scaffolds on the cathedral's north tower at a height of roughly 330 ft (100 m). To do this, the crane was erected to its maximum hook height of 505 ft (154 m).

Apart from the fact that the aluminium scaffold had to be removed in three sections from the cathedral tower at a height of 330 ft (100 m), the boom radius was almost the same for each section. This was the first time that the 9-axle mobile crane was to be used with full boom extension and 299-ft (91-m) luffing jib.

The area was much too small to assemble the lattice boom to its full length flat on the ground. The boom had to be assembled in a suspended position and optimum planning by the suppliers of the required parts was necessary. The area for the suspended assembly of the lattice jib was blocked off from 10 pm. Assembly of the lattice section with a LTM 1095-5.1 mobile crane required full deployment and intense concentration the whole night through. But by early morning the 522-ft (160-m) boom soared into the sky next to the cathedral towers.

The most protracted part of the action was fastening the elements to the special cross beam and separating the sections of scaffold from the basic construction. Through the precise interaction between the crane driver and the guides on the tower the roughly 23-ft (7-m) wide and 108-ft (33-m) high scaffold was moved carefully past century old finials and angel figures. When threading the rear scaffold out, in some cases there were just 6" (15 cm) between load and cathedral. The final lift was completed much earlier than planned. The actual crane job, watched by a large number of spectators, had taken just about four hours.

LTM 1160-5.2 Mobile Crane

Economical 5-Axle Mobile Crane

The new LTM 1160-5.2 is the most powerful 190-US-ton (160-tonne) mobile crane available on the market. Its load capacity has been increased by 20 to 25 % compared to its predecessor, the LTM 1160-5.1. Its 203-ft (62-m) telescopic boom and up to 118-ft (19-m) folding jib together with additional telescopic boom extensions enable it to achieve hoist heights of up to 305 ft (93 m) and outreaches of up to 249 ft (76 m).

The width of the vehicle has been reduced from 9'10" to 9' (3 m to 2.75 m), a massive benefit not only for driving on public roads but also on constricted sites. With a total weight of 132,000 lb (60 tonnes) and a 26,400-lb (12-tonne) axle load, the new crane can carry its double folding jib, a 3-sheave hook block and a storage box with a generous payload.

The mobile crane's superstructure is powered by the engine in the crane chassis using a mechanical shaft making it the second crane model from Liebherr to feature this innovative drive concept. A mechanical shaft ensures a particularly high efficiency level – the chassis engine provides plenty of power for crane work at low engine speeds. This ensures the economy of the new concept in terms of fuel consumption. The benefits of omitting a separate superstructure engine include a reduction in the amount of maintenance work and a reduction in weight. The omitted weight can be used for load-bearing components, thus increasing the crane's load capacity.

An add-on program has been developed for the new crane drive concept with just one engine and a mechanical shaft to allow the machine to be run with even lower fuel consumption. This enables the complete pump drive to be disconnected automatically when the engine is idling and then reconnected by the intelligent controller in a matter of seconds when it is required.

A 6-cylinder Liebherr diesel engine which develops 544 hp (400 kW) at 1,900 rpm and torque of 1,855 lb-ft (2,516 Nm) at 1,350 rpm provides the LTM 1160-5.2 with all the power it needs. The engine complies with the emission regulations of Directive 97/68/EC – Stage 4 and Regulation EPA/CARB – Tier 4f in the USA.

Crawler Cranes

LR 1250

New 550,000-lb Crawler Crane

The new LR 1250 is based on the proven previous model LR 1200 and offers optimized lifting capacities within the 550,000-lb (250-tonne) class. The improved lifting capacities are achieved through the reinforced main boom and especially become apparent in combination with luffing jibs. Moreover, the crane's high flexibility is due to the various boom / jib combinations and the large range of possible applications.

It is driven by a powerful 362 hp (270 kW) 6-cylinder diesel engine. Thanks to this optimized engine complying with the exhaust certification Tier 4i/IIIB the exhaust emission values were significantly improved. The crane is fitted with two crane winches each featuring 26,455-lb (12-tonne) line pull and offering high rope speeds for this line pull.

Travelling of the completely mounted crane, i.e. including boom and counterweight, is possible through retraction of the track width to 19 ft (5.8 m). This "taxi-crane" feature is especially beneficial for short-term work on jobsites.

The LR 1250 can optionally be equipped with pendants made from carbon fibre reinforced plastics (CFRP). Key advantages are less weight, thus easing assembly and resulting in longer boom-jib configurations as well as higher lifting capacities, no wear and lifelong corrosion resistance.

LTR 1220

Telescopic Crawler Crane Demonstrates its Ability

The telescopic crawler crane LTR 1220 had a successful premiere during the construction of a building in Villingen-Schwenningen (Germany). The first Liebherr LTR 1220 has been delivered to Albert Regel GmbH, a crane and heavy transport contractor. The 265-US-ton (220-tonne) crawler crane proved an immediate hit with its functionality and flexibility for handling prefabricated concrete components. The crane driver from Albert Regel GmbH was delighted with his new crane – particularly with the extraordinary precision of the LTR 1220 even with long boom. On the site the crane hoisted loads of up to 46,000 lb (21 tonnes) and positioned components with a radius of up to 180 ft (55 m).

The Max Bögl construction company is also using a brand-new LTR 1220 telescopic crawler crane. The construction site for one of the largest new schools to be built in Bavaria represents the ideal place of use for the LTR 1220, because there are countless precast concrete elements to be installed. A new school in Neumarkt (Germany) is being built, only a few hundred metres away from the old building. Here it becomes obvious, that the crawler travel gear guarantees outstanding off-road handling as well as manoeuvrability. The LTR 1220 also enables large loads to be telescoped using a 197-ft (60-m) telescopic boom. Elements weighing up to 200,000 lb (90 tonnes) are being installed by the LTR 1220 during construction of the sports hall next to the school.

The LTR 1220 on its very first job in Villingen-Schwenningen (Germany)

Robot Technology Builds Crane Boom Sections

From arrival of the raw material to dispatch of the finished item – since the new production building opened in 2010, Liebherr-Werk Nenzing GmbH (Austria) has fully automated the fabrication of crawler crane boom sections.

The work is performed by innovative robots and enables output to be matched optimally to delivery dates. Two robot cells, each with two manipulating and welding robots, maintain top quality standards while ensuring that throughput and processing times are kept short.

LR 1300

Crawler Crane Sets New World Record

In the US, an LR 1300 crawler crane lifted the widest tilt-up panel in history. With a total width of 89 ft (27 m) the old world record was beaten by 6.2 ft (1.9 m). This fantastic new world record was set in Rock Hill (SC / USA). The 89-ft (27-m) wide and more than 30-ft (9-m) tall panel had a weight of approximately 130,000 lb (59 tonnes).

The LR 1300 was the perfect crane to set this outstanding world record. This 660,000-lb (300-tonne) capacity crawler crane not only offers high productivity, but also quick and easy transport and assembly.

This panel will be part of a new high school building of the school complex York Preparatory Academy in Rock Hill.

LR 11000

New Crawler Crane in the 1,200-US-Ton Class

The new LR 11000 crawler crane supplements the crane range between the LR 1750 and the LR 11350. It is ideal for the growing demand for hoisting jobs in the 1,200-US-ton (1,000-tonne) segment for example for port handling of components for offshore wind turbines including their foundation structures.

The new crane features very high load capacity values. It is also available with the PowerBoom parallel boom system. In the design, particular care has been taken with optimized transport dimensions and weights. The new LR 11000 is designed for a transport width of 11.5 ft (3.5 m) and a transport height of 10.5 ft (3.2 m). The two crawler carriers and the central crawler section each weigh 132,300 lb (60 tonnes). This is also the maximum transport weight. With a variety of boom versions, including derrick systems and special wind power equipment, the new Liebherr crawler crane flexibly covers a large range of applications. The LR 11000 has been designed to be so compact that it can be used in constricted areas, for example in refineries. The basic crane is extremely compact and has a track width of just 30.2 ft (9.2 m). The suspended ballast can be placed within 39.4 ft (12 m) of the basic machine.

Roll-out of the LR 11000 out of the assembly building

Concrete Technology

3 Questions for Herbert Botzenhart

President, Liebherr Concrete Technology Co., Newport News (VA / USA)

Which products are you responsible for in the US market?

Our US division is selling and servicing mobile and stationary batch plants, twin shaft and ring pan mixers as well as concrete recycling systems. We recently added concrete pumps as a new product group to our product program.

What are the current challenges in these product areas in the market?

The biggest challenge for 2014 is to introduce Liebherr concrete pumps to the US market. The concrete pumping industry went through a significant contraction in the last five years resulting in consolidations and acquisitions worldwide. The market is now improving slowly with a stronger recovery forecasted for 2014. This is a good time to enter the market for a high quality concrete pump. From January 2014 on we are offering truck-mounted concrete pumps, trailer and crawler concrete pumps, rotary distributors and climbing masts for North America.

What innovations are you exhibiting at the 2014 ConExpo?

We are exhibiting a crawler concrete pump at the show. The THS 110 D-K is best used on construction sites with frequent relocations within the site. The concrete pump is mounted on a crawler unit and can easily be moved and operated via a radio remote control. A typical application supplies concrete for deep foundation drilling rigs. The crawler pump follows the drilling rig to different drilling positions, and supplies a special concrete mix when the drill head is pulled out of the ground. The THS 110 D-K is rated at an output of 133 yd^3/h (102 m^3/h) and provides a concrete pressure of 1,090 psi (75 bar).

THS 110 D-K

New Crawler Concrete Pump presented at Conexpo

At the 2014 Conexpo Liebherr unveils its new crawler concrete pump THS 110 D-K with a concrete output of 133 yd³/h (102 m³/h) and equipped with a 6-cylinder engine. The series of Liebherr crawler concrete pumps encompasses three different models – the THS 80 D-K, the THS 110 D-K and the THS 140 D-K providing maximum concrete outputs of 93 yd³/h (71 m³/h) to 177 yd³/h (135 m³/h).

Smooth running and outstanding suction performance are the hallmarks of a powerful pump unit in the crawler concrete pump THS 110 D-K, while an open hydraulic circuit guarantees reduced system maintenance requirements. Additional structural details also contribute to optimum serviceability. Utmost importance was afforded during the design phase to ensure that wear parts could be replaced quickly and easily. The smooth surfaces of the pump housing are easy to clean and the shape of the concrete hopper, devoid of edges and projections, minimizes the accumulation of concrete residue and soilings. An extensive standard scope of delivery for the crawler concrete pump includes for example, a 132-US-gallon (500-liter) capacity water tank with water pump, as well as a lockable toolbox.

The new Liebherr crawler concrete pump is particularly suited for applications in which pumping of the concrete is constantly being relocated around the building site. Manoeuvring and operation of the crawler track-mounted concrete pump is effected via remote control.

A typical application for crawler concrete pumps is the supply of concrete to drilling equipment for bored piling foundations. Deep holes are drilled into the earth and then filled with concrete following extraction of the drill. Crawler concrete pumps are employed alongside the drilling equipment at the various operation points, whereby the concrete hose remains permanently connected to the drilling equipment.

Modular-Design Mixing Plant Production

Faster Assembly, Easier Start-Up

Liebherr-Mischtechnik GmbH in Bad Schussenried (Germany) has been building concrete mixing plant and truck mixers for more than 50 years. Every year, up to 300 mixing plant are sold to customers all over the world. Unceasing development work and an in-house technical research facility are the key to the high level of innovation found on Liebherr mixing plant.

New production lines for assembly of the weigher modules recently went into operation. These are pre-assembled in special fixtures to a very high standard of accuracy. The galvanized units are then ready to be connected or bolted together so that they can be assembled accurately on the customer's operating site. The new module construction procedure creates optimal working conditions for staff and increases safety during assembly.

Materials are brought up "just in time" for use: only the items actually needed are present at the assembly point, so that the process can take place quickly and the risk of errors is avoided.

Customer benefits are enhanced too: quality is even higher, and a more flexible response to demand is possible. Throughput times are reduced, which make earlier delivery possible. In addition, the modules are assembled into basic units at the factory and every functional aspect thoroughly tested. This guarantees fast, trouble-free assembly later and reliable start up of the mixing plant when it goes into operation.

Concrete mixing plant production in Bad Schussenried (Germany): pre-assembly of modules

THP 140 H/41 M5 XXT and THP 160 H/36 R4 XXH

New Truck Concrete Pumps with High-Stability Mountings

The THP 140 H/41 M5 XXT truck concrete pump is notable for its compact layout, which permits a short wheelbase with no distributor boom overhang. It is equipped with the THP 140 H pump unit. The narrow XXT outrigger layout is a special feature. Despite the limited space available, the front outrigger system needs only a single telescopic arm. This is possible because the telescopic arm for the front support is partly concealed in a cutout in the rear outrigger when retracted. The swing-out front and rear feet are attached at the same pivot point directly against the boom mounting in the XXT outrigger layout. The force exerted by the boom is transmitted without deflection to the supports. This flexible version is extremely rigid and gives the concrete pump its high stability. This, together with uniform distribution of the pipes on the left and right sides of the boom ensure very smooth boom movement. No electrical system is needed to prevent undesirable boom vibration. Thanks to the flexibility of the front outrigger system, the machine can accommodate to available space conditions on the construction site without any compromises being needed.

The THP 160 H/36 R4 XXH truck concrete pump in the 98-ft (30-m) category features an optimized four-section 118-ft (36-m) boom of roll-and-fold design. Its kinematics have been optimised so that the last “flyer” distributing boom reaches a rotation range of 270 degrees.

Mobilmix 2.5

Easily Erected Mixing Plant for Large Construction Sites

The new Mobilmix 2.5 mixing plant is produced in containerized form and is primarily intended for mobile use on large construction sites such as airports, bridge, tunnels or highways. The Mobilmix 2.5 delivers a maximum of 145 yd³/h (110 m³/h) fresh compacted concrete. The integral DW 2.5 double-shaft mixer is from the Liebherr program for mixing systems.

The main components are installed in strongly built containers. The new mixing plant itself is designed for very easy assembly: all modules are prepared for plug-in connection, and the complete plant can be erected ready for operation in just a few days. The container modules can be supported on steel foundations; elaborate concrete foundations are unnecessary.

The Mobilmix 2.5 has been designed to permit two plants to be operated together from a single control point. The mixers are then run alternately and can deliver up to 190 yd³/h (220 m³/h) of concrete. As with all Liebherr mixing plant, various extensions such as additive weighers, dust filter systems and water tanks are available as options.

Components

3 Questions for Pietro Iemmi

Managing Director, Liebherr-Components AG, Nussbaumen (Switzerland)

Which products are you responsible for in the US market?

My scope of responsibility includes worldwide sales of components to original equipment manufacturer customers. The program of the components division extends from mechanical drivetrain components, e.g. diesel and gas engines, axial piston units, hydraulic cylinders, electric machines and switchgears to electronic components and systems. The North American market focuses on fuel injection systems, gearboxes and rope winches and large diameter bearings that are manufactured and distributed from our facility in Monterrey (Mexico).

What are the current challenges in these product areas in the market?

Our challenge now is to transfer the success we have experienced in the last decade into the North American markets and industries. We are currently in the market entry stage of construction machinery, mining equipment and maritime industry segments and are establishing a local sales network and service structure to be as close to the North American customers as possible. Another challenge is to increase the awareness level of Liebherr Components in the US.

What innovations are you exhibiting at the 2014 ConExpo?

The highlight amongst our exhibits is the 8-cylinder diesel engine, reflecting the USA EPA CARB Tier 4f stage. The entire system is developed by Liebherr and consists of the basic engine, an in-house designed fuel injection system and engine control unit. An SCR catalyst is employed to meet the emission regulations making it very compact and robust. Additional focus for our display will be on travel gears and slewing drives. By strategically investing in a new component manufacturing facility in Monterrey (Mexico). Liebherr is demonstrating a clear commitment to expanding our presence in the North American market. In the Mexico facility a variety of large diameter ball and roller bearings are produced for the North American market.

Same Basic Engine for All Emission Standards

Innovative SCRonly Concept by Liebherr for Diesel Engines of Tier 4f/Stage IV

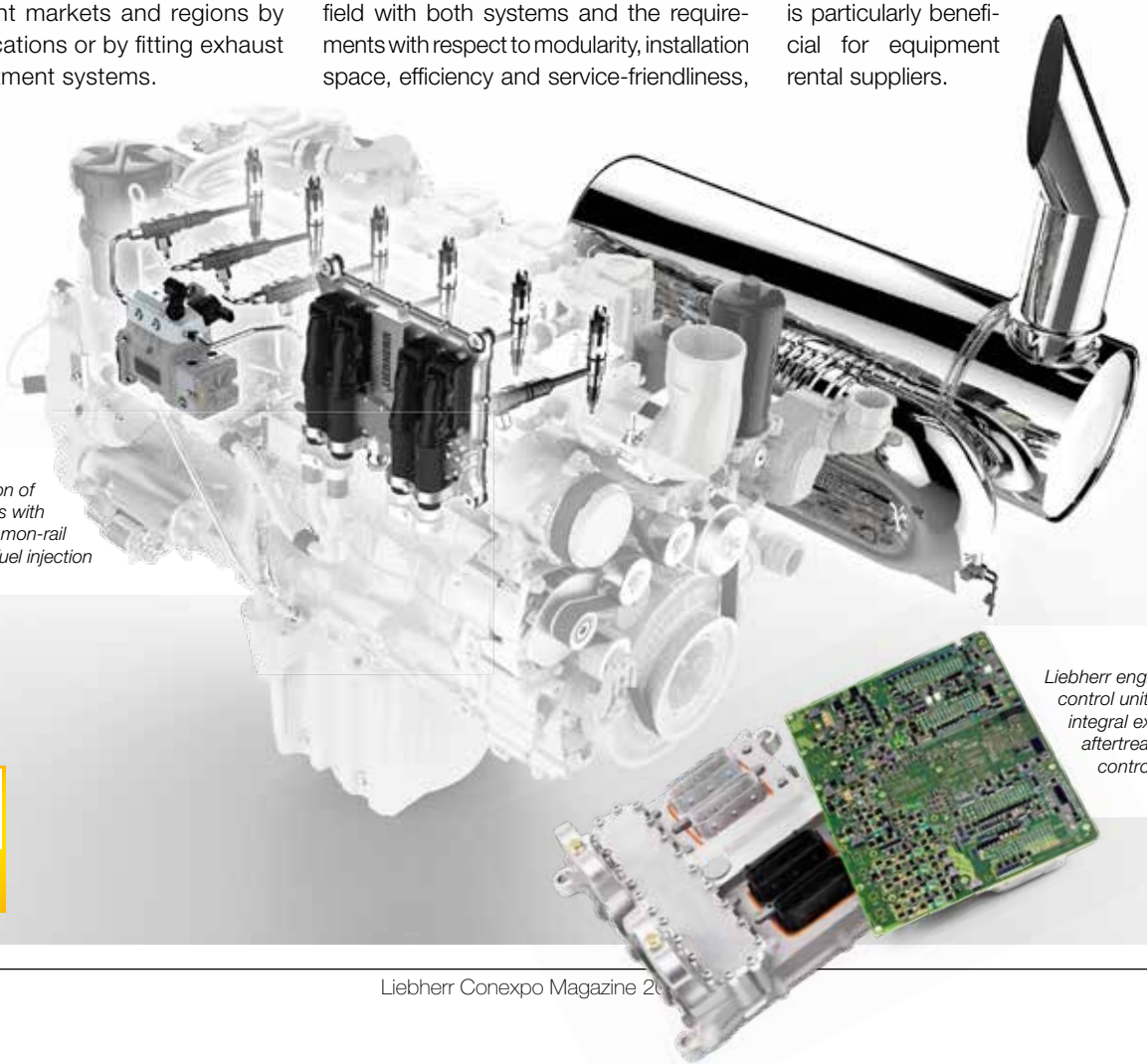
Liebherr offers diesel engines to comply with Tier 4f without a diesel oxidation catalyst (DOC), while showing excellent operating values, reasonable costs for exhaust gas aftertreatment and extremely reduced complexity of the engines. Essential for this is the combination of modern combustion engineering, optimized DEF (diesel exhaust fluid) processing and the complete integration of relevant software functions in a new control unit.

In order to comply with the emissions requirements the Liebherr engine modules have been fully revised and restructured. With Tier 4f, Liebherr offers a standardized basic engine that can be adapted to the emissions requirements in the different markets and regions by minor modifications or by fitting exhaust gas aftertreatment systems.

Specifically, that means that the engines in the emission standards Tier 2, Tier 3 or Tier 4 have the same performance, the same parameters for the cooling system and the same interfaces for installation. That enables customers to substantially simplify their machine design by allowing engines with different emission standards to be exchanged in the same machine. That is an important advantage for any equipment that is used all around the world.

For exhaust gas aftertreatment, Liebherr employs exclusively SCR technology for Tier 4f. For Tier 4i, both particulate filters and SCR catalytic converters, had been employed, depending on the application concerned. Based on experience from the field with both systems and the requirements with respect to modularity, installation space, efficiency and service-friendliness, Liebherr selected SCR technology for the Tier 4f standards.

Ideal system integration and intelligent development solutions have made it possible to reduce untreated particulate emissions within the engine to a level below the specified limit. Liebherr engines no longer need a diesel oxidation catalyst (DOC), particulate filter (DPF) or exhaust gas recycling (EGR). That means that Liebherr is currently the only diesel engine manufacturer who satisfies the requirements of Tier 4f without a diesel oxidation catalyst. With the “SCRonly” solution, no deterioration or destruction of the exhaust gas aftertreatment system is to be expected even if the machine is run on fuel with a higher sulphur content. This is particularly beneficial for equipment rental suppliers.



New generation of diesel engines with common-rail fuel injection

Liebherr engine control unit with integral exhaust aftertreatment control

Exhibit

Common-Rail Technology

Advanced Fuel Injection Technology

Exhibit

For inline engines, the Common-rail system features separate pressure pipe connectors for every cylinder instead of one pressure rail for all cylinders.

Common-rail technology, in conjunction with an engine-management control unit also developed and manufactured within the Liebherr Group, is an important precondition for Liebherr engines to comply with both current and future emission targets. This new fuel injection technology has been applied successfully since the beginning of 2012 to Liebherr engines and has also been integrated into the design of the next generation of Liebherr Diesel engines, which complies with EPA Tier 4f regulations. It is suitable for all Liebherr engine families, from 4-cylinder inline to V12. Liebherr also offers the new fuel injection system to other engine manufacturers, for on- and off-highway applications, in the medium and heavy duty range as well as for use on stationary engines. The Liebherr fuel injection system uses a 2-cylinder inline pump with an oil lubricated crankcase; it is capable of delivering up to 80 US gallons (300 liters) of fuel per hour at a pressure of 32,000 psi (2,200 bar).

Large Diameter Bearings for Construction Machinery

Large diameter bearings are key components in many types of construction machinery. They must work reliably and safely under constantly changing loads and in some instances under extremely arduous ambient conditions. To guarantee reliable operation throughout the service life of the large diameter bearing, Liebherr pays particular attention to three important factors regarding the production of components: the reliable design of the bearing, control of the production processes and systematic quality control using the very latest test methods.

Exhibit

The reliable design is guaranteed through conventional calculations using equations from technical mechanics and much more precisely by using the finite element method (FEM).

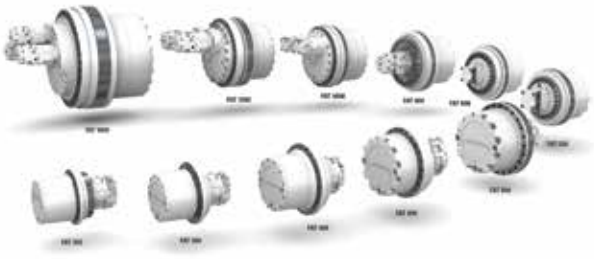
The control of the production processes is demonstrated by one core process, the hardening process, which is executed with state-of-the-art technology and with specially developed induction tools.

And the systematic quality control by Liebherr includes the certification in accordance with DIN EN ISO 9001 as the minimum standard as well as a computer-based quality management system.

New Series-Production Range of Travel Drives

Liebherr has developed a new travel drive (FAT) series consisting of eleven models in different sizes. These standardized coaxial travel drives can be installed flexibly and at reasonable cost in all types of crawler vehicles.

Liebherr travel drives are very robust and have proven their worth successfully in a wide variety of applications, for example crawler excavators and other earthmoving machines, crawler cranes, construction-industry and special-purpose cranes or mining equipment with crawler running gear. They can also be used in any type of tracked vehicles in the agricultural and forestry sector, for example harvesters, feller-bunchers, clearing machines, snow ploughs, combine harvesters or crawler tractors.



The new production series consists of Types FAT 325 to FAT 1600 – eleven sizes of transmission in all. The coaxial planetary gearboxes are manufactured in large quantities and can be of three- or four-stage pattern, with gear ratios extending from i=59 to i=497. Depending on the application and the relevant collective load value, maximum dynamic output torque can be as high as 352,000 kpm (3,450 kNm).

Notable features of these transmissions are use of a minimum number of individual or separate parts and well-planned design that ensures uniform load equalization in the various gear stages and therefore high power density. The main bearings are integral, so that optimal basic load ratings are achieved for all intended uses, despite the reduced number of individual parts.

Component Sales Effort in North America

North America is regarded as a target market within the global sales strategy of the Liebherr components division. Consequently Liebherr Components North America Co. has considerably increased its sales team, bringing it in line with the global strategy. The company, based in Saline (MI / USA) was founded in 2010 and is an integral part of the sales and service organization for components – Liebherr-Components AG, headquartered in Nussbaumen (Switzerland). It is responsible for the acquisition, liaison and support of North American original equipment manufacturer clients within the industry segments construction machinery, mining equipment, maritime industry, including the oil and gas segment and other industrial applications.

Liebherr Components North America Co. acts as the local contact point for all product lines from diesel and gas engines, gearboxes, rope winches and large diameter bearings, designed and manufactured by facilities of the components division.

This increase in personnel reflects the potential seen in the North American market for the Liebherr components. Of particular value to OEM clients is the wide range of components that are offered from a single source as well as the customer-specific engineered solutions meeting or exceeding the requirements of their various applications.

Liebherr Components North America Co. is based in Saline (MI / USA).

Strong Partner Reliable Service

Always ready to provide customer support and in-depth know-how – Liebherr's service specialists. Round the clock, and anywhere in the world.

Top priority for precision: installing a flat-top crane by helicopter on the 60,302-ft (1,838-m) high Wendelstein (Germany)

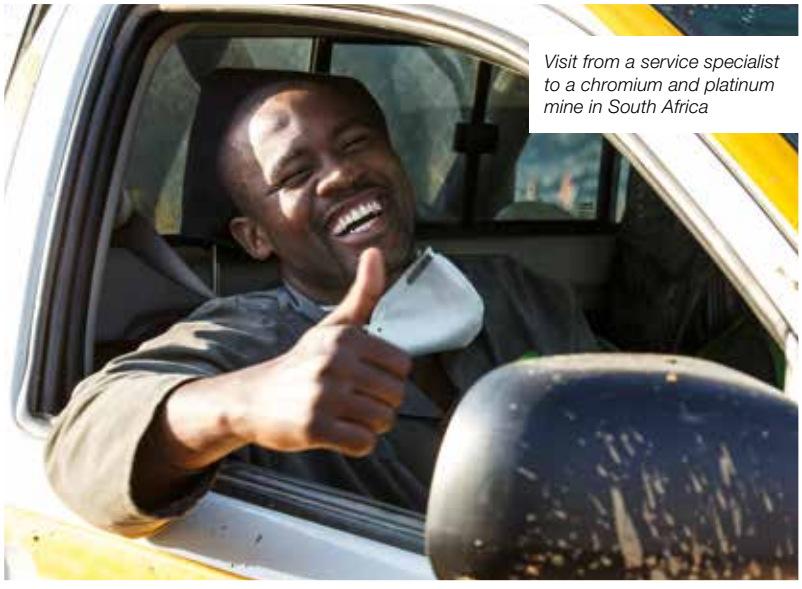
A training session on a R 9250 mining excavator in Colmar (France)

Testing and adjusting the hydraulics on deep foundation equipment in Nenzing (Austria)

Familiarization with a mobile crane in Dubai (United Arab Emirates)

The Collahuasi mine in Chile: working on a T 282 C mining truck's axle bearing

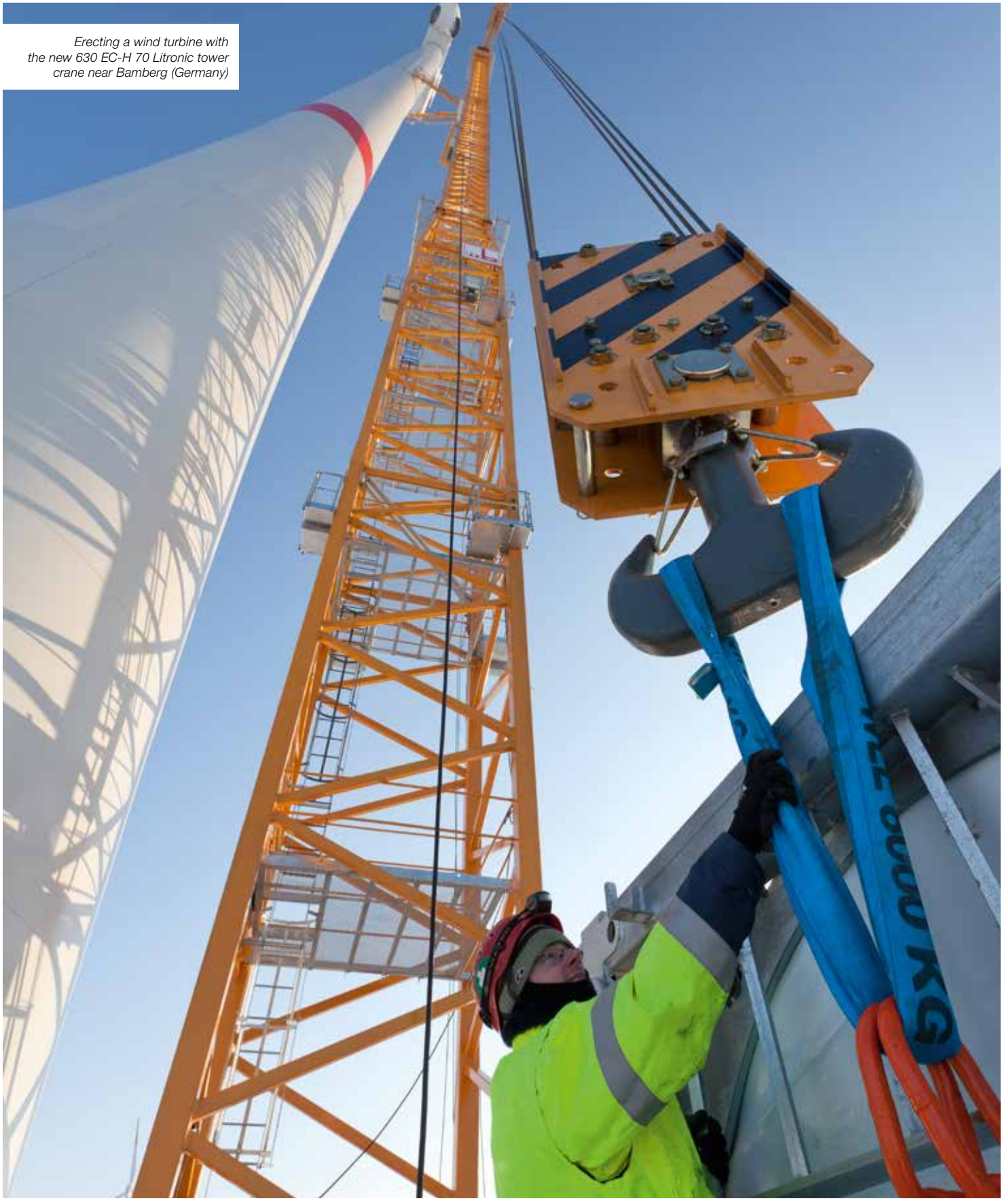
Up and away: a 355 HC-L luffing jib crane in Paris (France)



Visit from a service specialist to a chromium and platinum mine in South Africa

A service specialist at the Liebherr plant in Ehingen (Germany)

Task completed: a new type LH 120 C gantry material-handling machine after assembly in Sweden



Erecting a wind turbine with the new 630 EC-H 70 Litronic tower crane near Bamberg (Germany)

Erecting a derrick crane in Seattle, Washington (USA)

Reparing components for mining equipment in La Negra (Chile)

Servicing a crawler excavator in Newport News (VA / USA)

Mining

T 264 Truck for Increased Productivity and Reliability

In order to synergize with its line of hydraulic mining excavators, Liebherr has returned to the 240-US-ton (220-tonne) class with the premiere of the T 264 mining truck.

Backed by 30 years of proven design and operational experience, this fuel-efficient mining truck is built for safety and reliability, and is sized to match the Liebherr R 996 B and R 9800 hydraulic excavators.

The T 264 combines an efficient Litronic Plus AC drive system and a high power engine (up to 2,700 hp (2,013 kW)) to yield higher speeds on grade. For superior productivity, the T 264's hydraulic system offers efficient dump hoist performance that promotes fast cycle times.

The T 264's AC drive system delivers up to 4,425 hp (3,300 kW) of electric dynamic braking, reducing engine loading and fuel consumption. The T 264 is designed to operate for approximately 24 hours without refueling, dependent upon application.

The integrated electronic system monitors, records, and outputs vital truck health and performance data. Data is stored and available for download to perform detailed analysis. This system supports predictive maintenance strategies to minimize unscheduled downtime.

Machine Tools

New Profile Grinding Machine LFG

The innovative machine concept of the Liebherr LFG facilitates highly productive profile grinding for large workpieces. Customers in industrial gear unit manufacturing, wind power, and marine propulsion technology benefit from this solution. The LFG series utilizes five axes for twist-free profile grinding or, if needed, the manufacture of specific twist designs. Controlled handling of tooth flank twist opens new gear manufacturing doors.

LFG does not require a dressing axis, which rules out one potential source of inaccuracy. Additionally, the machine's directly-driven table contributes to high precision. By using the V, C and A-axes in addition to the X and Y-axes, the profile angle can be modified and the twist problem can be solved. In this way the operator can completely avoid tooth flank twist or even intentionally produce it. Due to the special setup of the axes (no dressing axis, inversion of the shift and swivel axes), the shift travel is significantly larger than usual. The measuring sensor uses this large shift travel (+/- 300 mm), which leads to an additional acceleration of the process.

Maritime Cranes

New Fixed Cargo Crane Lifts Passenger Tour Boats at Niagara Falls

The new Fixed Cargo Crane (FCC) from Liebherr completed its first job at a famous location. On 31st October 2013, the crane lifted passenger tour boats of the local company Maid of the Mist out of the water for winter storage at the foot of the Niagara Falls.

With a lifting capacity of 441,000 lb (200 tonnes) at a radius of 49 ft (15 m) this FCC is the first of its kind for the heavy lift crane segment.

A short time before the crane was installed on the new drydock facility on the US side of the river. Since this facility is located in a gorge below the water falls the FCC is the perfect crane for this site. It is fitted on a fixed pedestal and provides a space-saving solution for installation on narrow docks thanks to its slim design.

In the run-up to this lift especially the last part of the transportation proved to be challenging. Due to the gorge's limited road access the single parts of the FCC had to be lowered to the crane's final position with the help of a ring crane. The new heavy lift crane is part of a 32-million-dollar project for the construction of the new dockside. The facility is planned to be completed in summer 2014.

Liebherr Group

Maritime Cranes

New Sales and Service Center in Miami

In 2013 a new sales and service center was opened in Hialeah Gardens, Miami (FL / USA). It serves as a major hub for Liebherr's maritime cranes division and will further strengthen business relations to Central and South America and to the Caribbean region.

Approximately $20 million were invested in the newly built complex, which is situated on a total property area covering about 431,000 ft² (40,000 m²). The building has a total area of 41,000 ft² (3,800 m²).

In terms of logistics, the sales and service center is ideally located in close proximity to the port of Miami and Miami International Airport. This allows Liebherr to respond to customer enquiries within a short time and to accelerate the distribution of parts and services.

Domestic Appliances

HCB 2060 Refrigerator with GlassLine Shelving

Show off the materials and design of your custom kitchen to the fullest with the stylish fully integrated HCB 2060.

The new 36" (91-cm) single door model features strong hinges for a convenient closing of doors as well as LED lighting and elegant GlassLine shelving including door storage of gallon containers. The two BioFresh drawers are individually usable as HydroSafes with high humidity or as DrySafes with low humidity to enable versatile storage. In this way the ideal climate is provided for all varieties of food.

An automatic IceMaker featuring the most technically advanced water filter provides an ample supply of perfect ice cubes.

The HCB 2060 features two BioFresh drawers individually usable as HydroSafes or DrySafes.

© Bombardier

Aerospace

First Flight of Bombardier's CSeries CS100

Liebherr-Aerospace supplies two major systems, the complete landing gear system and the integrated air management system, for Bombardier's CSeries aircraft, which successfully made its historic, maiden flight on September 16, 2013, in Canada. These systems feature the latest technologies for the next generation of single-aisle aircraft, thus offering improved reliability and operational performance.

Liebherr took advantage of its vast experience in landing gears and air management systems for commercial aircraft to optimize the operating costs and the reliability of its systems for the CSeries aircraft. The systems are designed, developed and manufactured by Liebherr-Aerospace's German- and French-based OEM facilities: Liebherr-Aerospace Lindenberg GmbH, Lindenberg (Germany), is responsible for the CSeries landing gear, whereas Liebherr-Aerospace Toulouse SAS, Toulouse (France), is in charge of the air management system.

Transportation Systems

Liebherr Supplies Cooling System for Li-Ion Battery to Bombardier

Bombardier Transportation GmbH (Germany) selected Liebherr-Transportation Systems to develop a compact, highly efficient and reliable cooling system for an innovative li-ion battery used in next-generation electrical propulsion systems. These systems are designed to power urban transit buses and light-rail vehicles in the near future. The cooling system will ensure that the battery maintains optimal thermal conditions. Liebherr will manufacture prototype units that will be tested both in Liebherr's state-of-the art environmental testing facilities and on demonstrator vehicles in Mannheim (Germany).

The li-ion battery is an integral component of Bombardier's highly innovative inductive charging system PRIMOVE that allows charging the main battery of the electrical propulsion system without a trolley wire while the vehicle is in operation. Thus the vehicle does not need to interrupt operations to be recharged. The convenient charging system will contribute to significantly reducing the CO_2 footprint of urban mass transit. In addition, operators will be able to remove the trolley systems installed in the cities.

Liebherr-Transportation Systems is proud to develop technologies that contribute to more environmentally friendly commercial transportation. The contract for the cooling system consolidates Liebherr's long-standing partnership with Bombardier Transportation, the leading provider of passenger transport system solutions.

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Light-rail vehicle with inductive charging system PRIMOVE on board

LIEBHERR

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