

Liebherr Special Machines for the **Quarrying Industry**



LIEBHERR

Liebherr Special Machines for the Quarrying Industry





Liebherr has decades of experience in the development and production of class-leading machines for the quarrying industry, including crawler and mining excavators, wheel loaders, crawler dozers, dump trucks and duty cycle crawler cranes. With innovative design and major components all produced by Liebherr, the machines can be deployed with great efficiency and performance in the most challenging and difficult environments in the quarrying world. Quarry machines from Liebherr perform all tasks perfectly, and every component has been purpose-designed. They feed breakers, sifting systems and trucks, and transport the surface mine material. Liebherr machines work with immense power, and advanced technology reduces down fuel consumption – the perfect machines for economical use in the quarrying industry.

Large Hydraulic Excavators

Wheel Loaders

Articulated Dump Truck

Crawler Dozers

Duty Cycle Crawler Cranes

Customer Service



Large Hydraulic Excavators



Performance

Liebherr's large hydraulic excavators follow our principle of maximising machine performance by improving the efficiency of all of the individual parts. Each machine is designed for optimum serviceability and minimum downtimes. An ultra-modern engine management system maintains perfect performance, under the toughest of working conditions.

Economy

For Liebherr, protection of the environment is one of our guiding principles and the most important challenge for the present and future. Environmentally-configured power regulation of the hydraulic system and engine performance optimises the fuel efficiency of the machine to match the application. The automatic idling system reduces engine speed when the machine is stationary, and if less power is required, "eco mode" can be selected on the control panel to reduce the engine load, further improving the fuel efficiency and reducing CO₂ emissions.

Reliability

As an original equipment manufacturer, Liebherr has a leading and healthy reputation in the development and production of high quality major components. All large hydraulic excavators from Liebherr feature robust and reliable components that have been optimised for the unique conditions of mining and are designed and manufactured by Liebherr to ensure reliability, high performance and longevity. Liebherr excavator customers can expect lasting performance throughout the whole service life of the machine.

Comfort

Liebherr large hydraulic excavators provide the driver with ideal conditions for fatigue-free and effective working. All of the excavators feature large and spacious cabs that are comfortably equipped and comply with the latest ergonomic conventions. This maintains the driver's concentration and safety over many hours. Cab windows with impact-resistant reinforced glass enable safe working and an optimal view over the working space and surrounding area. For easy access during maintenance work, Liebherr large hydraulic excavators feature safe and comfortable catwalks as well as an innovative layout of the components and service points on the uppercarriage.

Maintainability

The Liebherr excavators offer perfect safety for the operator and maintenance team. As it is serviced from just one side, the machine offers trouble-free access to the main service points for fast and safe maintenance in the field. The cab has been designed with further reinforcement for the safety of the driver.

Overview of Large Hydraulic Excavators with Backhoe Attachment

Stick and Bucket Cylinders

- With increased diameter in combination with adapted kinematics
- Higher breakout and digging forces

Stick with Internal Protection

- For a longer service life
- Protection from bulky material in the bucket

Cab on Hydraulic Mountings

- For optimal vibration insulation

Standard HD Bucket

- For increased service life
- Other types available





Standard Reinforced Glass Window

- At front and in roof

Standard Automatic Air Conditioning

- With 13 diffusers

Standard Counterweight

- For greater stability and performance

Chamfered Track Pads

- For better manoeuvrability on difficult terrain

Overview of Large Hydraulic Excavators with Face Shovel Attachment

Built for Mining

- Liebherr GET
- Liebherr customised wear package
- Automatic central greasing system for all lubrication points
- Ram guard for the lift cylinder (optional)
- Protection for front swing gear (optional)

Sturdy Structure

- Heavy duty undercarriage
- Additional full length chain guide (optional)
- Rock protection for track wheels (optional)





Efficient Work

- Electronic control
- Rear- and side-view cameras
- Semi-automatic swing brake
- Operator Comfort Kit (optional)
- Various optional protective equipment (optional)
- Standard automatic air conditioning
- Cab pressurisation

Liebherr Vertical Integration

- Diesel engine US EPA Tier 4f/ EU Stage V
- Hydraulic pumps and motors
- Splitter box
- Hydraulic cylinders
- Swivel bearing
- Swing and travel drives

First Class Service

- Single side service access
- Wide catwalk and railings
- Hydraulically operated 45° access ladder (optional)
- Quick-release coupling for filling from ground level (optional)
- Quick fuel filling system (optional)

Technical Data

		R 945 Litronic	R 956 Litronic
Operating weight BH	kg	41,400–47,250	51,000–59,350
Bucket capacity*	m ³	2.0–3.0	1.25–3.5
Operating weight FS	kg	-	56,750–57,300
Shovel capacity*	m ³	-	2.5–3.1
Engine power	kW/HP	220/299	250/340
Emission standard		V/Tier 4f	V/Tier 4f

		R 960 SME Litronic	R 966 Litronic
Operating weight BH	kg	60,000–61,650	68,450–77,550
Bucket capacity*	m ³	3.0–3.7	1.65–5.5
Operating weight FS	kg	62,150–62,850	69,950–70,650
Shovel capacity*	m ³	3.5	3.5–5.0
Engine power	kW/HP	250/340	320/435
Emission standard		V/Tier 4f	V/Tier 4f

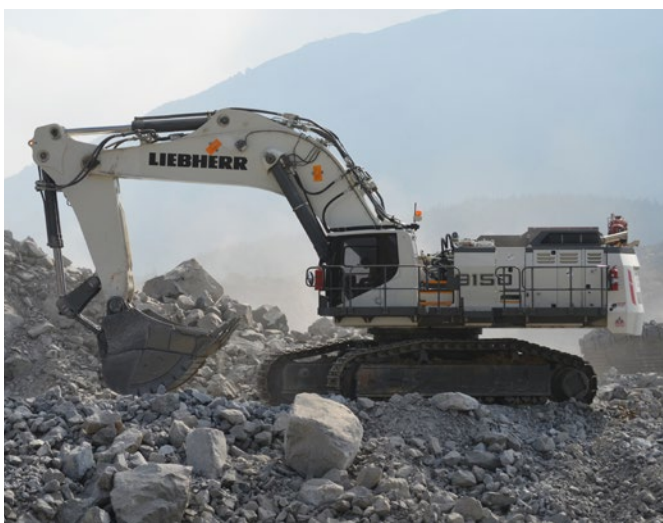
		R 970 SME Litronic	R 976 Litronic
Operating weight BH	kg	78,350–80,150	85,800–96,500
Bucket capacity*	m ³	3.0–5.0	2.0–6.8
Operating weight FS	kg	79,100–81,000	91,500–93,300
Shovel capacity*	m ³	3.5–5.0	5.1–6.0
Engine power	kW/HP	330/449	400/544
Emission standard		V/Tier 4f	V/Tier 4f

		R 980 SME Litronic	R 9100
Operating weight BH	kg	95,900–101,100	113,000
Bucket capacity*	m ³	5.2–7.2	7.0–7.5
Operating weight FS	kg	99,500–101,200	116,000
Shovel capacity*	m ³	4.4–6.5	7.3
Engine power	kW/HP	420/571	565/757
Emission standard		V/Tier 4f	V/Tier 4f

		R 9150
Operating weight BH	kg	130,000
Bucket capacity*	m ³	8.8–9.6
Operating weight FS	kg	130,000
Shovel capacity*	m ³	8.3
Engine power	kW/HP	565/757
Emission standard		V/Tier 4f

* HD backhoe and face shovel equipment at 1.8 t/m³

Examples of Use



Wheel Loaders



Performance

The powerful Liebherr L 550 XPower®–L 586 XPower® wheel loaders excel with their high handling capacity in quarrying operations. XPower® offers the greatest level of efficiency and maximum output in all areas, regardless of whether the distances are long or short, or whether the ground is level or even has an incline. This increases productivity in all work cycles and improves profit for the customer.

Economy

The Liebherr-XPower driveline with Liebherr-Power-Efficiency (LPE) achieves a reduction in fuel consumption of up to 30%. In addition there is minimal tyre wear and hardly any brake wear. At maximum handling capacity and efficiency, this reduces operating costs significantly, further increasing profitability.

Reliability

Liebherr wheel loaders provide maximum performance even under the toughest and most challenging conditions in surface mines. The components of the Liebherr-XPower wheel loaders are extremely rugged and low-wear. XPower® ensures a long machine life and reliability in use.

Comfort

The modern ergonomic cab design provides the operator with maximum comfort enabling him to concentrate on accurate operation without fatigue, which once again means more safety and productivity. The Liebherr control lever, which is built into the operator's seat as standard, allows precise and sensitive control of the machine. The generous glass surfaces and the design of the engine hood, which has been optimised for viewing, provide excellent all-round visibility. This ensures maximum safety for people, the machine and the load.

Maintainability

The most important points for daily maintenance can be seen at a glance in the access area of Liebherr-XPower wheel loaders. Quick and safe control saves time and money.

Wheel Loaders L 550 XPower® – L 586 XPower® Overview

Maximum Operator Comfort for Greater Productivity

- Automatic central lubrication system (L 550 – L 580 optional / L 586 as standard)
- Premiumdisplay (Touchscreen)
- Joystick steering or 2-in-1 steering (optional)
- 3-way continuously adjustable steering column
- Operator's cab without steering wheel / steering column – joystick steering only (optional)
- Liebherr weighing system with "Truck Payload Assist" (optional)
- Ride control

Ruggedness and Quality for Durable Machines

- Tilt cylinder protection (optional)
- Special buckets in HD or rock version (optional)
- Lamp carrier in steel design (optional)
- Guard for headlights (optional)
- Fuel tank steel version
- Integral tyre pressure monitoring system (optional)
- Special tyres for quarrying industry (optional)
- Tyre protection chains (optional)

Highest Level of Performance

- Powerful and efficient Liebherr-XPower® driveline
- Automatic self-locking differentials in both axles





Productive and Safe Working

- Soundproof ROPS/FOPS cab
- Safety roof over cab (optional)
- Additional working lights, rear (optional)
- Adaptive working lighting (optional)
- Skyview 360° (optional)
- Liebherr key with remote control incl. Coming Home/Leaving Home function (optional)
- Active personnel detection at the rear (optional)
- Safe, non-slip ladder access to cabin
- Folding windscreen guard for increased safety and easy access for cleaning (optional)

Short Service Times for Greater Productivity

- Important maintenance points visible in access area
- Radiator easy to maintain
- Reversible fan drive (optional)
- Air pre-cleaner TOP AIR (optional)

Ruggedness and Quality for Durable Machines

- Crash protection, rear (optional)
- Widening for fender and rear mudguard (optional)

Productive and Safe Working

- Anti-slip steps and sturdy handrails
- Rear space monitoring with camera via Liebherr display
- Headlights halogen (double design on engine hood)

Technical Data

L 550 XPower®

L 556 XPower®

Tipping load	kg	12,400–12,500	13,550–13,750
Bucket capacity	m ³	3.4–3.7	3.7–4.1
Operating weight	kg	18,550–18,650	19,600–19,700
Engine output	kW/HP	163/222	183/249
Emission standard		IV – only for select markets / V	IV – only for select markets / V

L 566 XPower®

L 576 XPower®

Tipping load	kg	15,650–15,900	17,400–17,600
Bucket capacity	m ³	4.2–4.7	4.7–5.2
Operating weight	kg	23,900–24,000	25,700–25,800
Engine output	kW/HP	203/276	218/296
Emission standard		IV – only for select markets / V	IV – only for select markets / V

L 580 XPower®

L 586 XPower®

Tipping load	kg	18,700–19,500	20,300–22,500
Bucket capacity	m ³	5.2–5.7	5.5–8.5
Operating weight	kg	27,650–28,800	32,600–33,700
Engine output	kW/HP	233/317	263/358
Emission standard		IV – only for select markets / V	IV – only for select markets / V

Examples of Use



Articulated Dump Truck



Performance

Powerful and robust – The new TA 230 was developed for tough offroad operations. The efficient yet powerful drivetrain, permanent 6x6 all-wheel drive, reliable traction control and solid axle suspension allow the new Liebherr dump truck to dig its way through any terrain. Even in tough quarry applications, the dumper impresses with very good driving properties and always moves safely thanks to its phenomenal retarder performance.

Economy

Invest in a successful future with the new Liebherr dump truck. It is the perfect combination of investment and yield. Short cycle times due to maximum efficiency in acceleration, transport and deceleration performance deliver enormous handling capacity and therefore maximum economy. Moreover, the modern Liebherr D956 construction machine engine marries power and efficiency for the sustainable protection of our environment.

Reliability

Liebherr has decades of experience in the development, design and production of components. When coordinated perfectly with each other, they guarantee maximum performance and reliability. The new TA 230 has been developed and designed on the back of extensive test trials to ensure the resilience and quality of the component parts time after time. Even in the most adverse of conditions, the TA 230 still satisfies Liebherr's high quality standards.

Comfort

The newly developed cab on the TA 230 with standard roll-over protection system (ROPS) provides the perfect environment for comfort, concentrated and productive work. Thanks to large all-round glass windows and the short, angled bonnet, the operator has perfect visibility of the machine's driving, working and articulation areas. The ergonomic control elements and touchscreen display with integral rear-view camera simplify operation and extend visibility at the rear of the machine.

Maintainability

The TA 230 is not only powerful, robust, precise and efficient, but also features fast, simple and safe maintenance. This minimises the construction machine's costs and down times.

Articulated Dump Truck Overview

Simplified Maintenance Concept for Maximum Productivity

- Service-based machine design with easy access to the maintenance points
- Smart machine check-up
- Central lubrication system sensor-controlled*
- Storage compartment for toolbox and grease cartridges
- Qualified, experienced specialists for competent advice
- 24/7 spare parts service with 24 hour deliveries

Superior Technology for Highest Economy

- 6-cylinder Liebherr construction machinery engine with emissions Stage V, Tier 4f, Stage IIIA (compliant) and non-regulated
- LiDAT – Liebherr's information system for efficient fleet management and evaluation

Perfect Combination for Highest Possible Performance

- Permanent 6x6 all-wheel drive
- Automatic 8-speed powershift transmission
- Continuous-operation brake (engine brake, hydrodynamic primary retarder), zero wear
- Power shifting inter-axle and lateral differential locks for permanent traction
- Innovative weighing system to show the current payload
- Optional loading traffic light system
- Large, solidly designed dump box
- Optional dump box flap
- Optional dump box cladding and heating

* country-dependent





Ergonomic Operator's Work Station for Maximum Comfort

- Cab with large glass areas for improved visibility
- Rear window heating
- Electrically adjusted and heated rear mirror, optional
- Sound-insulated cab
- Sealed pressurised ventilation
- 9" large colour touchscreen
- Rear monitor
- Convenient radio control with hands-free kit
- Mobile phone holder and USB charging sockets
- Additional DIN installation frame
- Automatic air-conditioning system
- High quality operator's seats in a range of versions
- Air-conditioned compartment
- LED dipped headlights with integral high-beam light
- Extra powerful LED headlights to illuminate the working area
- Manoeuvring lights for reversing
- Optional access ladder lighting

Excellent Machine Concept for Maximum Reliability

- Painstakingly developed structural components
- Robust construction made of high-tensile steel
- Partly autonomous long-term load tests at the only testing centre of its kind in Europe
- ROPS/FOPS cab structure
- Tinted safety glass
- Hill start assistant
- Speed maintenance assistant
- Activation and deactivation of limit position dampening on the dump box cylinders
- Height limitation

Examples of Use and Technical Data



TA 230 Litronic

Empty Vehicle Weight	kg	24,600
Payload	kg	28,000
Dump Body Capacity	m ³	18.1
Engine output	kW / HP	265 / 360
Emission standard		V / Tier 4f / IIIA (compliant) / non-regulated



Crawler Dozers



Power and innovative technology: These are the trademarks of the Liebherr crawler dozers. Whether in tough ripping operations or for pushing heavy material, the PR 756, PR 766 and PR 776 impress in every scenario with outstanding performance and economy.

Performance

To mechanically dig and break out hard rock, high penetration and pushing forces are required. The Liebherr crawler dozers PR 756, PR 766 and PR 776 offer the ideal performance capacities with operating weights of 40, 50 and 70 tonnes respectively in conjunction with the innovative hydrostatic drive concept. Engine power is constantly transmitted through a positive connection without slippage, which means that the material is worked loose evenly and efficiently pushed away.

Economy

The latest generation Liebherr diesel engines combine high performance with frugal operation. Thanks to the consistently low engine speed, fuel is saved and a high service life of the components is achieved. Additional clear economical advantages speak in favour of Liebherr: as with all Liebherr equipment, the PR 756, PR 766 and PR 776 models also benefit from being user-friendly. This reduces maintenance costs and downtime.

Reliability

Tough and sturdy: Liebherr crawler dozers are designed for a long operational lifetime with careful attention to construction and material quality. All parts that are subject to particularly heavy loads are made from the strongest materials available, whilst sensitive areas are optimally protected. All of these factors make Liebherr crawler dozers reliable machines with the highest level of availability.

Comfort

Liebherr crawler dozers offer operators a generously proportioned workspace, designed with the latest ergonomic aspects in mind. The spacious and comfortable cabin enables an optimal overview of the working area and the equipment. With the intuitive single joystick control, the machine can be controlled accurately and safely at all times.

Maintainability

Thanks to their minimal maintenance requirements, Liebherr crawler dozers make a reliable contribution to your economic success. A dense service network means short distances, efficient systems and fast response times for the user.

Overview of Crawler Dozers

LED-Lighting (optional)

- Guarantees best illumination of the working area
- Better working performance even in the dark/bad light conditions

Hydrostatically Driven Cooling Fan

- Fast engine warm-up and reliable cooling in each situation
- Laminar air flow facilitates a long radiator-life

Different Types of Blades with HD-Cutting Edge

- High flexibility for all kind of material
- High productivity

HD-Track Pads

- Highly wear-resistant in hard applications
- Longer uptime





Cab with Integrated ROPS/FOPS Protection

- Best all-around view for the operator
- Higher safety and productivity

Separate Hydraulic Oil Cooler

- Reliable cooling performance even in the hottest ambient temperatures
- Reduced fuel consumption due to demand-controlled fan

HD-Ripper

- Excellent ripping performance in hard underground conditions
- Robust design for longevity

Bogie Suspension (optional)

- Smoother operation
- Optimal traction

HD-Tilt Cylinder Cover and Wear-Plates on Push Arm and Blade (all optional)

- Best possible protection against large rocks
- Extended lifetime of components exposed to wear

Examples of Use and Technical Data



		PR 756 G8	PR 766 G8	PR 776	
Operating weight	kg	43,000	54,333	73,189	
Blade capacity semi U-blade	m ³	8.9	13.6	18.5	
Blade capacity U-blade	m ³	11.8	17.0	22.0	
Ground clearance	mm	635	604	703	
Max. ripping depth of ripper	mm	1,203	1,375	1,445	
Max. penetration force of ripper	kN	123.9	173	237	
Max. pryout force of ripper	kN	208.8	292	441	
Track shoe width	mm	560–711	610–710	610–762	
Engine output	kW/HP	260/353	310/422	440/598 Forward	565/768 Reverse
Emission standard		V/Tier 4f	V/Tier 4f	V/Tier 2	



Duty Cycle Crawler Crane HS 8300.1



Performance

With an operating weight of 350 tonnes the HS 8300.1 from Liebherr is one of the largest duty cycle crawler cranes. It can be equipped with various high-volume dragline buckets and grabs. The duty cycle crawler crane is suitable for various material handling and excavation applications, for example, dredging or surface excavation in opencast mines.

Economy

A modern drive system, consisting of a high performance diesel engine as well as an innovative hydraulic concept, ensures economic machine operation. As an option the duty cycle crawler crane can be fitted with Pactronic®, a hydraulic hybrid drive which provides both economical as well as ecological advantages. Through the storage and subsequent reactivation of surplus energy the turnover can be increased and, at the same time, the fuel consumption can be significantly reduced. Without Pactronic® the V12 diesel engine offers an output of 725 kW. Together with the hybrid drive, however, it achieves a system performance comparable to a conventional drive system with 1,250 kW. Quick set-up further contributes to the efficiency of the duty cycle crawler crane. A sophisticated design concept ensures that the machine is ready for operation within only one week.

Reliability

In the design phase of the HS 8300.1 Liebherr paid particular attention to an extended service life. The uppercarriage has a box design and is mounted on a large undercarriage. This composition ensures stability and is suitable for dynamic continuous performance. The service life of the HS 8300.1 has been doubled in comparison to that of the standard series.

Liebherr places great emphasis on safety. The walkways as well as the roof of the uppercarriage are fitted with railings to ensure safe and easy access for the operator as well as for maintenance staff.

Comfort

The cabin is designed for optimum operator comfort. This includes a clear field of vision as well as an ergonomic cabin concept. Furthermore, operators of the HS 8300.1 profit from an intelligent control system with diverse program and control functions. Service and machine functions are clearly displayed on colour monitors. All movements can be carried out simultaneously.

Maintainability

All components of the HS 8300.1 are designed for easy maintenance. Liebherr's worldwide service network offers quick availability of parts and therefore maximum productivity of the machine.

Overview of HS 8300.1 Duty Cycle Crawler Crane

Free-Fall Winches 2 x 50 t

- Enable the use of large grabs or dragline buckets and thus new dimensions in excavating depths

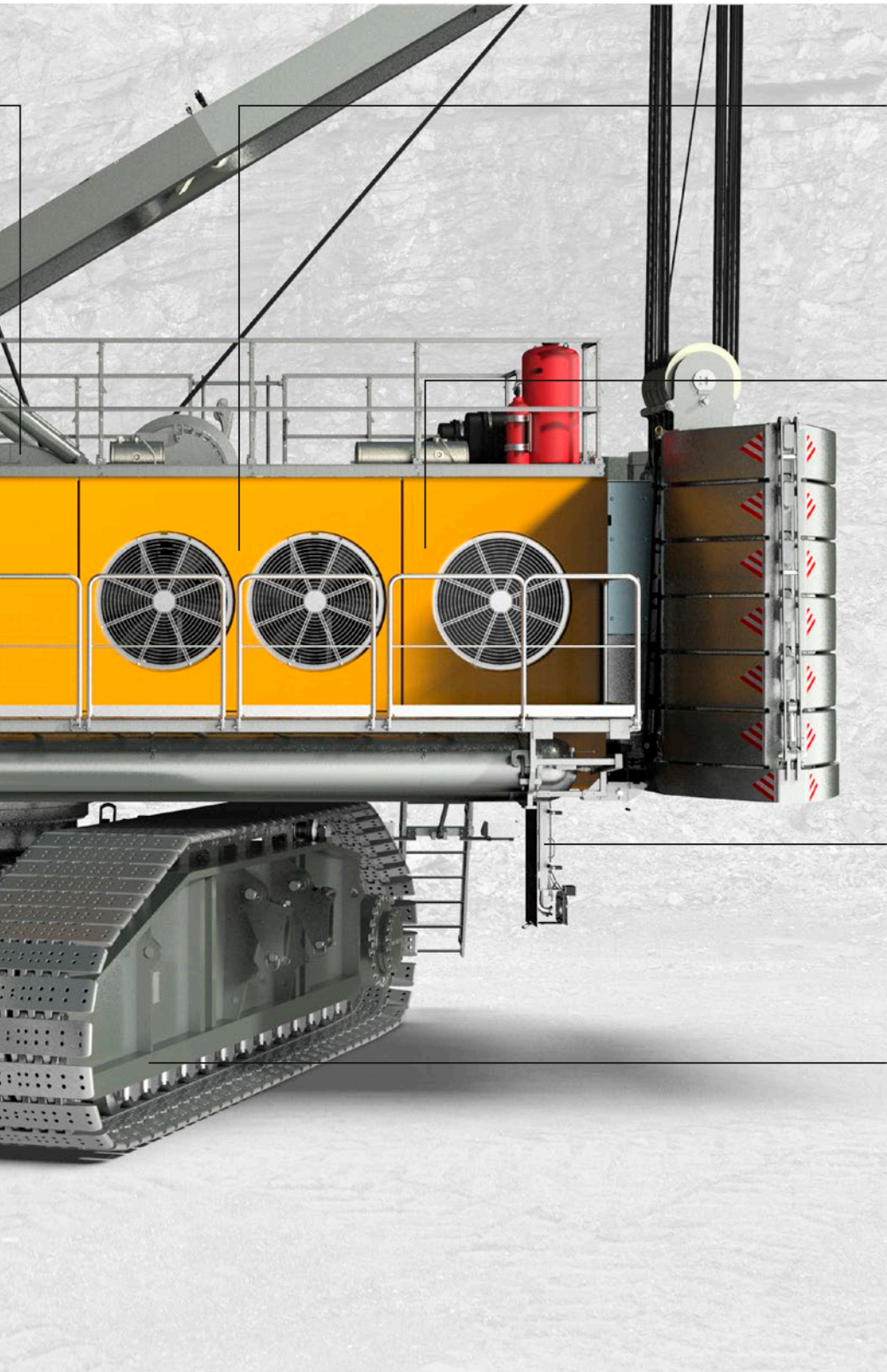
Comfortable Operator's Cabin

- Spacious cabin with generously sized windows for an unobstructed view of the working area
- Folding seat for a second driver
- Air suspension driver's seat, with heating, cooling and ventilation

Hydraulically Foldable Steps

- Easy and safe access





Drive Concept

- Choice of diesel or electro-hydraulic drive

Pactronic® Hybrid Drive (optional)

- Optimised drive concept
- High turnover with low diesel consumption
- System performance equivalent to 1,250 kW of a conventional drive system

Service Arm

- Facilitates quick and safe filling with necessary operating fluids

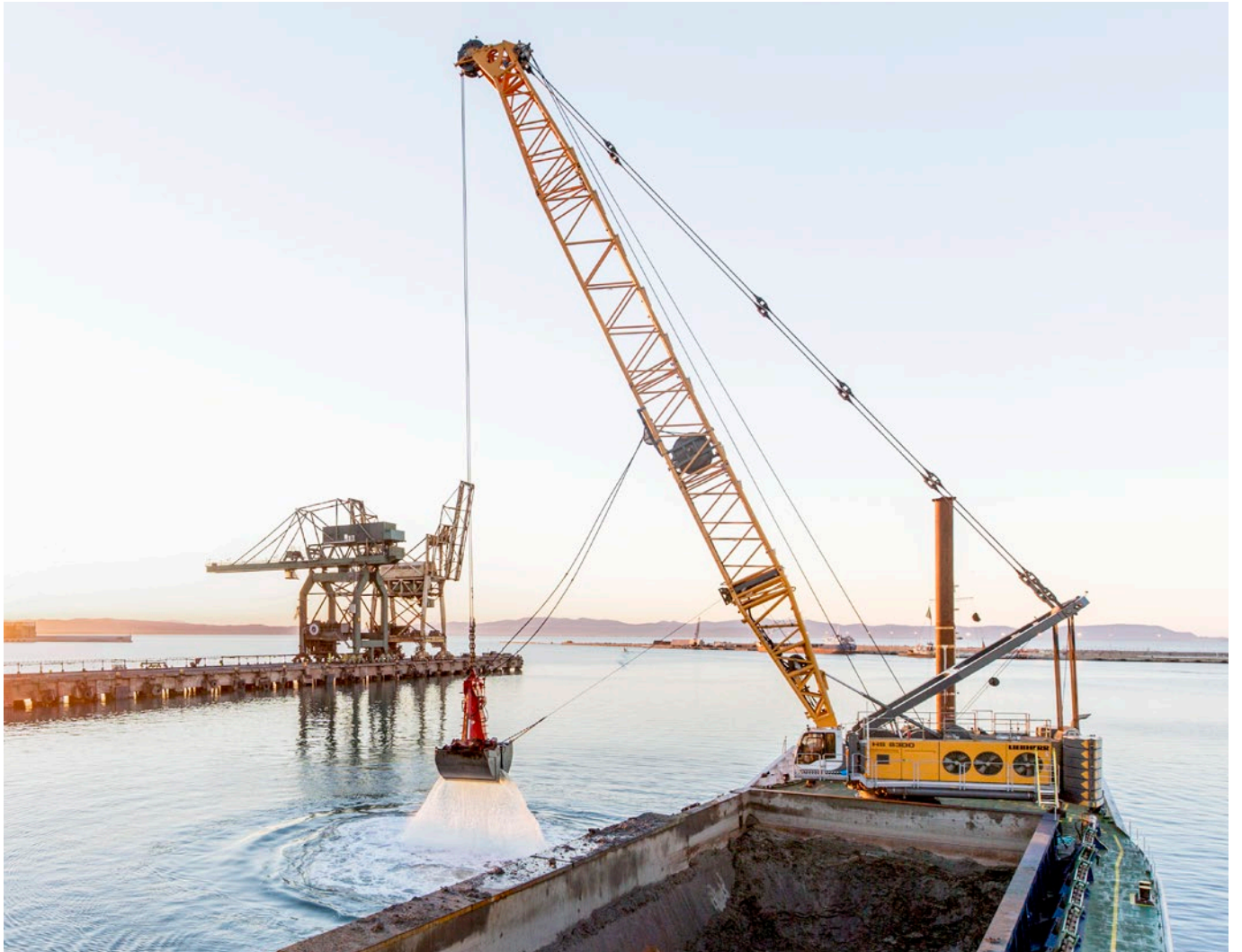
Robust Steel Structure

- Long service life
- Can absorb high dynamic forces

Examples of Use and Technical Data



		HS 8300.1	HS 8300.1 E
Max. capacity	t	300	300
Min. transport width	mm	3,980	3,980
Min. transport height	mm	3,260	3,260
Min. transport weight	t	69	69
Engine power	kW	725	2 x 295/245 (50/60 Hz)
Max. winch line pull	kN	2 x 500	2 x 500
Max. boom length	m	68.00	68.00
Max. boom length for duty cycle operation	m	68.00	68.00
Boom length in dragline operation	m	50.00	50.00
Operating weight	t	352	352
Max. depth in dragline operation	m	25.00	25.00
Max. capacity dragline bucket	m ³	10.80	10.80
Max. capacity grab	m ³	15.00	15.00



Customer Service - The Hidden Benefits

Our Services are Perfect for the Challenges you Face Every Day



For Experts

Would you like to maintain and care for your machines yourself? Quickly and flexibly get everything done in the evening for the next shift?

With the online documentation and spare parts shop in MyLiebherr, you can access all the necessary information with just a few clicks. Take advantage of the sophisticated logistics for fast delivery of the desired items, in original quality, of course. So you can work efficiently. And if you do get stuck, our experts are just a phone call away.

For Accountants

Are figures and their significance your profession? Do you always want to have an overview of machine operations and current investments and, ideally, be able to calculate clearly in advance what the use of the machine will cost?

Always know what's going on. LiDAT provides you with all relevant machine data, such as upcoming maintenance, machine workload and much more. With the modular CarePacks, you can optimise your maintenance package to your company and budget and accurately predict future costs.

For Decision-makers and Strategists

For you, it's not just short-term success that counts, you want to be successful in the long term? Success for you is not only your profit, but also ensures satisfied customers and contributes to the successful conservation of resources?

Our world-wide service network guarantees you reliable support and security based on partnership. If necessary, our experts are available for you around the clock. With original parts and thanks to our professional staff, we enable a high value retention of your machines. Our Reman program as well as the lubricant product range offer you the possibility to be economically successful and to conserve resources at the same time.



A Strong Partner

Thanks to our extensive service network, our service experts are close at hand. It is important to us that you have a personal contact, because if the worst comes to the worst, it is good to know who can provide reliable help and advice.

CarePacks

With the modular CarePacks, you can decide in advance what costs you will incur, so that your machine can continue to perform at full capacity tomorrow and you can concentrate fully on your work.



Reman Program

The same performance and quality as a new part, with cost savings at the same time – that's what the replacement parts we offer in our Reman program stand for. An ideal solution, especially for older machines, and at the same time you contribute to the conservation of resources.

Retrofit-Program

With its comprehensive Retrofit program, Liebherr offers an attractive range of products to increase the efficiency and comfort of your machines. Also for older machine types. Adaptations to new legal guidelines can be efficiently implemented.



The Liebherr Group of Companies



Wide Product Range

The Liebherr Group is one of the largest construction equipment manufacturers in the world. Liebherr's high-value products and services enjoy a high reputation in many other fields. The wide range includes domestic appliances, aerospace and transportation systems, machine tools and maritime cranes.

Exceptional Customer Benefit

Every product line provides a complete range of models in many different versions. With both their technical excellence and acknowledged quality, Liebherr products offer a maximum of customer benefits in practical applications.

State-of-the-art Technology

To provide consistent, top quality products, Liebherr attaches great importance to each product area, its components and core technologies. Important modules and components are developed and manufactured in-house, for instance the entire drive and control technology for construction equipment.

Worldwide and Independent

Hans Liebherr founded the Liebherr family company in 1949. Since then, the family business has steadily grown to a group of more than 140 companies with nearly 48,000 employees located on all continents. The corporate headquarters of the Group is Liebherr-International AG in Bulle, Switzerland. The Liebherr family is the sole owner of the company.

www.liebherr.com

WARNING

This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to www.P65warnings.ca.gov.

WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- ▶ Always start and operate the engine in a well-ventilated area.
- ▶ If in an enclosed area, vent the exhaust to the outside.
- ▶ Do not modify or tamper with exhaust system.
- ▶ Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

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