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Dragline Operation

Duty cycle crawler cranes from Liebherr are used for a wide variety of applications with dragline bucket, mostly for the excavation of sand and/or gravel. The dragline bucket is more or less cast as required through the swinging of the duty cycle crawler crane.

Numerous aids are available to the operator for this relatively complex type of application. One example is the electro-hydraulic continuous proportional control, which enables smooth and simultaneous movements. In addition, a second or third swing drive – if required – increases swing torque resulting in short swing cycles as well as fast loading cycles.

The hydrostatic winch drive adapts the rope speed to the soil conditions and always provides for optimum filling of the dragline bucket.

Earth Movement

Dragline buckets are used for topsoil stripping in duty cycle operation.
**Underwater Gravel Extraction**

Typical applications with dragline bucket include the excavation of various bulk goods, such as gravel and sand, from rivers or quarries for the production of construction materials.

**Recultivation**

After the excavation of raw materials in surface mining, duty cycle crawler cranes equipped with dragline buckets are used for land recultivation. In this respect, the duty cycle crawler cranes are also suitable for difficult terrain.
Grab Operation
Thanks to their robust design and the high line pull of the main winches, duty cycle crawler cranes from Liebherr are ideal for jobs using heavy grabs. Hydrostatically driven hoist winches automatically distribute the load on both winches and convert the installed engine power into maximum hoisting speed, even when working with intermediate load. They provide for optimum filling, as well as precise lowering and emptying of the grab.

During operation with material handling grabs, the stabilizing winch with constant tension and free-fall prevents swinging of the grab and ensures exact positioning of the material. In combination with the powerful swing drive this results in quick work cycles and excellent turnover in material handling.

- **Sand Extraction**
  Dredging of sand in surface mining: duty cycle crawler cranes are used when the outreach of hydraulic excavators and dump trucks is too restricted.

- **Stone-Laying**
  Stone blocks are positioned with the aid of a mechanical or hydraulic orange peel grab in the construction of breakwaters or harbour facilities.
Dredging

In recent times dredging has become an increasingly important application for Liebherr duty cycle crawler cranes. In this application the machines are either installed on ships or pontoons and/or operate from water banks or harbours.

Dredging is necessary when sediment settles and leads to shallow water, which impairs the shipping industry. This often occurs in estuaries. Excavation of sand from the seabed in the course of land reclamation is a further possible application. In doing so the duty cycle crawler cranes must endure high dynamic forces. Thanks to their robust design the duty cycle crawler cranes from Liebherr are perfectly suitable.

The machines are fitted with either mechanical or hydraulic clamshell grabs. While mechanical grabs convince with low operating costs, hydraulic models are especially recommendable for hard ground conditions.

- **Development of Riverbeds**
  The shipping channel is widened and the minimum depth increased.

- **Dredging of Sediment Deposits**
  The removal of sediments in order to maintain the necessary minimum depth is a constant task, particularly in estuaries or harbour areas.
Robust and Versatile

Liebherr duty cycle crawler cranes offer versatile application possibilities: they are suitable for typical dragline and material handling work such as the removal of soil and the production of bulk goods, the building of dams or embankments, as well as dredging operation for the removal of sediments.
Thanks to their robust design the HS series of machines is ideally suited to continuous operation in material handling. In addition to the dragline bucket, a typical attachment for material handling is a mechanical clamshell grab. The duty cycle crawler cranes can also be equipped with a hydraulic orange peel grab. The HS series convinces with large working radii (swing radius), great digging depths, and short working cycles for maximum handling performance.

### Proven in Continuous Operation

<table>
<thead>
<tr>
<th>Model</th>
<th>Max. capacity</th>
<th>Min. transport weight</th>
<th>Min. transport width</th>
<th>Dragline bucket max. depth</th>
<th>Dragline bucket max. capacity</th>
<th>Clamshell grab mechanical / hydraulic</th>
<th>Pull force winches (2 winches each)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS 8040.1</td>
<td>40 t (44 US t)</td>
<td>41 t (90,390 lbs)</td>
<td>3000 mm (9.8 ft)</td>
<td>13 m (42.7 ft)</td>
<td>1.9 m$^3$ (2.5 yd$^3$)</td>
<td>/</td>
<td>--</td>
</tr>
<tr>
<td>HS 8070</td>
<td>70 t (77 US t)</td>
<td>47 t (103,617 lbs)</td>
<td>3000 mm (9.8 ft)</td>
<td>14 m (45.9 ft)</td>
<td>3.1 m$^3$ (4.1 yd$^3$)</td>
<td>/</td>
<td>7 m$^3$ (9.2 yd$^3$)</td>
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<tr>
<td>HS 8100</td>
<td>100 t (110 US t)</td>
<td>40 t (88,185 lbs)</td>
<td>3500 mm (11.5 ft)</td>
<td>15 m (49.2 ft)</td>
<td>4.6 m$^3$ (6.0 yd$^3$)</td>
<td>/</td>
<td>8 m$^3$ (10.5 yd$^3$)</td>
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<tr>
<td>HS 8130</td>
<td>130 t (143 US t)</td>
<td>50 t (112,430 lbs)</td>
<td>3500 mm (11.5 ft)</td>
<td>17 m (55.8 ft)</td>
<td>5.4 m$^3$ (7.1 yd$^3$)</td>
<td>/</td>
<td>10 m$^3$ (13.1 yd$^3$)</td>
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<tr>
<td>HS 895</td>
<td>200 t (220 US t)</td>
<td>60 t (134,482 lbs)</td>
<td>3500 mm (11.5 ft)</td>
<td>22 m (72.2 ft)</td>
<td>6.9 m$^3$ (9.0 yd$^3$)</td>
<td>/</td>
<td>15 m$^3$ (19.6 yd$^3$)</td>
</tr>
<tr>
<td>HS 8200</td>
<td>200 t (220 US t)</td>
<td>47 t (103,617 lbs)</td>
<td>3500 mm (11.5 ft)</td>
<td>22 m (72.2 ft)</td>
<td>7.6 m$^3$ (10.0 yd$^3$)</td>
<td>/</td>
<td>17 m$^3$ (22.2 yd$^3$)</td>
</tr>
<tr>
<td>HS 8300.1</td>
<td>300 t (330 US t)</td>
<td>69 t (152,119 lbs)</td>
<td>3960 mm (13.1 ft)</td>
<td>25 m (82.0 ft)</td>
<td>10.8 m$^3$ (14.1 yd$^3$)</td>
<td>/</td>
<td>15 m$^3$ (19.6 yd$^3$)</td>
</tr>
</tbody>
</table>
Characteristics

Duty cycle crawler cranes are exposed to high stresses in their various fields of application. A high level of stability is a basic requirement for dynamic continuous operation in material handling applications. Thus, the uppercarriage of the machine has a robust box design and is mounted on a large undercarriage. Therefore, the operating demands on the duty cycle crawler crane are met and, at the same time, an extended service life of the machine is achieved.

Winches
The low-maintenance hydraulic free-fall winches are installed as complete units. Thanks to state-of-the-art variable flow hydraulic engines, the rope speed is automatically adapted for all working ranges without any output losses.

Self-Assembly System
No additional auxiliary crane is necessary for the assembly of duty cycle crawler cranes. All components, such as crawlers and counterweight, have a space-saving design. These can be autonomously assembled using the sophisticated self-assembly system.

Safety
The duty cycle crawler cranes meet highest safety standards. The uppercarriage can be transported with mounted railings, walkways and pedestals.
Control System
The duty cycle crawler crane is fitted with an intelligent control system which also includes a multitude of monitoring functions. Service and machine functions are clearly displayed on high contrast colour monitors. Depending on the requirements and the application, further assistance systems, such as the grab control, are available.

Crawlers
Depending on the machine’s size, the crawlers can be dismounted with the aid of the self-assembly system or, thanks to hydraulic cylinders, they can be retracted to transport width.

Hydraulic System
Thanks to the innovative hydraulic design with a closed circuit, the duty cycle crawler cranes are fuel-saving and therefore economic. The available hydraulic power is optimally split between the main winches, luffing gear or the external devices. Thus, parallel operation of all movements is possible.
During the design phase of the HS series Liebherr particularly focused on increasing the product service life. Therefore, the steel construction of the basic machine has an extremely solid design. Furthermore, special production methods including the use of automated welding robots, ensure an increased service life even under extreme operational conditions.

Since the HS 8300 HD must endure especially high dynamic stresses during dragline or dredging operation, the steel construction was strengthened considerably. This not only increases the performance but also doubles the service life in comparison to the standard series.

<table>
<thead>
<tr>
<th>Duty cycle crawler cranes</th>
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<tbody>
<tr>
<td>HS series</td>
<td>HS 8300 HD</td>
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</table>

Calculated service life in heavy-duty operation
Control and Assistance Systems

All control and assistance systems are user-friendly solutions from Liebherr - including the Litronic® control system, the core of the duty cycle crawler cranes. All information regarding service and machine is clearly displayed on a colour monitor. This also includes the electro-hydraulic proportional control for precise operation. A range of control assistance systems that facilitate machine operation and allow for short working cycles are available for material handling applications.

**Dredging Assistant**
The dredging assistance package supports the operator in his work and simplifies handling in grab operation. This increases safety, minimizes rope wear and improves the turnover.

**Dragline Control** (Interlock control System)
The Interlock control system allows for power regeneration in dragline operation. This reduces the fuel consumption as well as the wear of the free-fall winch.
**Duty Cycle Crawler Crane**
**HS 8300 HD**

With an operating weight of 350 tonnes, the HS 8300 HD from Liebherr is one of the largest duty cycle crawler cranes available. It can be equipped with various high-volume dragline buckets and grabs.

A modern drive system, consisting of a 725 kW V12 diesel engine and an innovative hydraulic concept, ensures economic machine operation. Optionally, the duty cycle crawler crane can be fitted with a hydraulic hybrid drive system. 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.

In the design phase of the HS 8300 HD 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 HD has been doubled in comparison to that of the standard series.

*Limestone Excavation*

HS 8300 HD excavating limestone for cement production.
Hybrid Technology Pactronic®

With the hydraulic hybrid drive Pactronic®, Liebherr has introduced an innovative technology onto the market, which has already proven itself for mobile harbour cranes. The HS 8300 HD is the first duty cycle crawler crane that can be installed with this innovative hybrid drive. The drive, which is based on hydraulics, offers both economic and environmental advantages. Surplus energy is stored and subsequently reactivated. Thereby, the handling performance is increased and, at the same time, the fuel consumption is reduced.

Advantages of Pactronic® at a Glance
• Increased efficiency through improved hoisting and lowering performance
• Higher hook capacity
• Higher winch speeds and shorter working cycles
• Reduced fuel consumption and therefore less CO₂ emissions
• Less noise emission
• Reduction in maintenance costs

HS 8300 HD Hybrid
• Revolutionary hydraulic hybrid drive - significant improvement in the hoisting and lowering speeds
• 725 kW diesel engine enables 800 kW on the hook as well as a system performance comparable to a conventional drive system with 1250 kW
• Enhanced turnover through improved hoisting and increased lowering performance
• Proven technology from the series of Liebherr mobile harbour cranes
Applications

The HS 8300 HD 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 topsoil excavation in surface mining.

**Dredging**

Typical dredging assignments include so-called "maintenance dredging", which involves the removal of sediment in estuaries or harbour areas using mechanical or hydraulic clamshell grabs.

**Mining**

Fitted with a dragline bucket or various clamshell grabs the HS 8300 HD is deployed for the removal of topsoil or for recultivation in surface mining.

**Extraction of Material**

The 300-tonne duty cycle crawler crane is deployed to excavate various bulk materials such as sand and gravel. In dragline operation the duty cycle crawler crane convinces with high performance turnover.
A Decisive Factor for the Purchase of a Liebherr Machine

The latest drive and control systems from Liebherr offer a variety of optional functions. They help to reduce fuel consumption and also to maximize the reliability and productivity of duty cycle crawler cranes.
Increased Power Through Engine Functions

**Downsizing of the Engine**
Thanks to the machine’s optimized hydraulic system the size of the primary source can be reduced without negative effects on the turnover. The efficiency is thus significantly increased while the fuel consumption is decreased.

In the new duty cycle crawler crane HS 8130 HD, for instance, the engine power has been reduced to 505 kW compared to 670 kW in the preceding model.

**Automatic Engine Stop Control**
The engine switches off automatically during longer work interruptions, after having checked certain system functions. These include the actual charge level of the battery, the operating temperature of the engine, and the control that all machine functions are deactivated. This saves fuel and reduces emissions. At the same time the machine has fewer operating hours, thus increasing its residual value, as well as extending both its warranty and the maintenance intervals.

**Engines of the Latest Generation**
Duty cycle crawler cranes are fitted with Liebherr’s own diesel engines. All diesel engines complying with Stage IV/TIER 4f have a limited maximum speed of only 1,700 rpm. This contributes to fuel savings of approximately 5% compared to previous engines.

**Eco-Silent Mode**
With the aid of this function the engine speed is reduced to a required predefined level. Hence, a notable reduction in diesel consumption can be achieved without any impact on operational output. As a further benefit, noise is also reduced by the Eco-Silent Mode.

**Lower Engine Speed While Idling**
Duty cycle crawler cranes are in idling mode for 45 % of their operating time. With the lowering of the engine speed from 950 rpm to 750 rpm while the machine is in idling mode, up to two litres of fuel can be saved per hour.
Transportation and Set-Up

Focus on Cost-Efficiency

Special attention was given to the uncomplicated and economic transportation of Liebherr’s duty cycle crawler cranes. Thanks to minimum set-up work, the machine can be quickly mobilized between jobsites so promoting economic deployment.
Efficient Transportation and Easy Set-Up

All components in Liebherr’s duty cycle crawler cranes have a space-saving design and weights are optimized so allowing for smooth transportation on all roads in accordance with current international transport regulations. Pendant straps and pins remain in the intended mountings during transportation so speeding up assembly.

The smaller duty cycle crawler cranes can be transported in one piece so reducing assembly and disassembly work to a minimum. By larger models the basic machines are transported without the crawlers. First of all, the uppercarriage is unloaded independently using a jack-up system, whereby the duty cycle crawler crane is supported by hydraulic jack-up cylinders. Subsequently, the uppercarriage unloads the crawlers, counterweight and boom sections using either its A-frame or boom foot. Hydraulically activated pins, quick connections and an auxiliary rope winch simplify and accelerate the assembly process.

### Intelligent Assembly
The self-assembly and self-loading systems provide for assembly and disassembly of the machines without the need of an additional auxiliary crane.

### Unloading of the Counterweight
With the aid of the boom foot the duty cycle crawler crane unloads and installs the counterweight autonomously.

### Quick Set-Up
All boom configurations can be erected by the duty cycle crawler cranes themselves within a very short time.
Operator Comfort

State-of-the-Art Cabin Equipment

The focus of Liebherr machines is on the operator. High operator comfort makes the handling of the duty cycle crawler cranes considerably easier. The innovative design of the cabin sets new standards in the construction industry regarding ergonomics, interior fittings and air conditioning. Furthermore, the optimum view from the cabin allows for precise and safe operation.
Ergonomic Cabin Design

An orthopaedic operator’s seat with automatic adjustment is installed in the cabin as a standard and is a health-conscious contribution to the daily routine of the operator. Furthermore, it can be heated or cooled as required.

All operating elements including redesigned joysticks and keyboards, as well as pedals, are ergonomically arranged and allow for precise control of all machine movements.

Modern Air Conditioning System

The new cabin distinguishes itself with a well-thought-out air conditioning system, which is fitted directly in the cabin and electrically powered. Therefore, it is no longer dependent on energy from the engine. The heat output is taken from the available warm water.

Thanks to an optimized circuit, the air conditioning is extremely energy-saving. The airflow of the air conditioning is also optimized: the airstreams run above the ceiling area and the windscreen and are, therefore, unnoticed by the operator.

Clear Field of Vision

Safety on site is Liebherr’s highest priority and an unobstructed view from the cabin is an important prerequisite. Through optimization of the field of vision, the new cabin ensures unobstructed views of all working areas.

A standard sliding window and sunshade serve as additional features for improving comfort.

Interior Equipment

Not only a cooler for provisions, but also storage space, work surfaces, a storage box for a cell phone and a USB connection are situated directly next to the operator.

Air Conditioning

The complete air conditioning is installed in the cabin and is electrically powered.

Unobstructed View

An unrestricted view from the cabin contributes to the safe operating of the machine.
Further Applications

Duty cycle crawler cranes from Liebherr offer versatile application possibilities: as an optimum basic machine for deep foundation applications, they can be fitted with a slurry wall grab or casing oscillator. With a fixed or swinging leader they can be deployed as piling rigs. Additionally, Liebherr duty cycle crawler cranes can be used as lifting cranes.

Versatile in Use
Deep Foundations

The duty cycle crawler cranes are deployed for deep foundation applications with appropriate attachments. Therefore they can be fitted with casing oscillators, slurry wall grabs or hydromills, vibrators and fixed leaders, as well as tamper weights for carrying out dynamic soil compaction.

Electronic control provides for the precise lowering of the attachment while working with slurry wall grabs or hydromills.

An automated free-fall control system, which automatically slows the winch when the tamper weight hits the ground and so avoids slacking of the ropes, is available for dynamic soil compaction. This allows for precise working cycles as well as reduced rope wear.

Demolition Work

Thanks to their robust design Liebherr duty cycle crawler cranes are perfectly suitable for extreme applications, as is often the case in demolition jobs. They have optimum stability, even with high boom lengths. The generous dimensions of the tubular booms enable lateral striking with the demolition ball even at great heights. Moreover, a stabilizing winch is available for the demolition grab. Furthermore, the operator’s cabin can be fitted with a solid stone protection grid and armoured glass.

Lifting Applications

When required on the jobsite, the duty cycle crawler crane can also be used for lifting jobs. Thanks to the flexible boom system they are able to meet the requirements of various jobsite conditions. Due to the integration of the load moment limitation in Liebherr’s own control system some additional components, which otherwise would have been necessary for lifting jobs, are no longer required. The boom configuration can be pre-selected quickly and easily on the monitor in the operator’s cab.

Grab Excavation

Grab excavation is a dry drilling application for loosening the soil either through cutting or impact driving, depending on the tools used.

Demolition with Wrecking Ball

Demolition jobs present a huge challenge to both the operator and the machine. The lateral striking with the demolition ball is mostly implemented for the demolition of especially high buildings.

Lifting Cranes

The duty cycle crawler crane can also be used for different lifting jobs. If necessary, the main boom can be easily extended with an auxiliary jib.
Customer Service and Application Technology

Technical Services for all Requirements

Liebherr Customer Service aims to effectively help in maintaining Liebherr equipment at its best, and at the same time to assist customers in making full use of the benefits of a Liebherr machine.
Service Solutions for Added Value

**Global Service Network**
A tight network of service stations with highly qualified personnel ensures quick assistance at any time throughout the world. Permanent readiness for operation is a prerequisite for smooth and efficient application on the jobsite.

**Preventive Measures**
Liebherr offers a wide range of services tailor-made for all requirements. These include inspection and preventive maintenance programmes, routine service calls or full service contracts.

**Practical Advice from Professionals for Professionals**
The application of sometimes very complex technologies and the correct choice of equipment require special knowledge and practical experience. With the appropriate training in daily operations Liebherr can help to achieve excellent results.

**Advice and Support**
Application specialists assist with the correct choice of application and the most suitable equipment in consideration of jobsite conditions. Ideal machine configuration and application planning save both time and fuel as well as reduce repairs and downtimes.

**Technical Support**
Liebherr’s support team provides quick and reliable advice regarding machines and equipment. Specially trained technical advisers are available worldwide in order to ensure the high efficiency and availability of Liebherr machinery.

**Reman Program and Retrofits**
Liebherr offers three-stage reconditioning of components: from repair to general overhaul and exchange. Retrofit packages are also available to improve economy and comfort, to adapt to new requirements or to further extend the machine’s service life.

**Applications Technology**
Practical advice from experienced specialists regarding machine configuration, operational requirements, and the communication of new technological features, aims at achieving optimum results and ensuring high operative safety for customers.

**Optimization on the Jobsite**

**Original Spare Parts**
Liebherr original spare parts (OEM) are optimally adapted to Liebherr machines and ensure high quality standards. A comprehensive parts stock is held by various service centres throughout the world and a standardized distribution service ensures fast delivery to the customer. Liebherr also recommends that a supply of critical spare parts be stored on-site. In combination with Liebherr technical training, this allows for minimum downtime of machines.

**High Quality and Availability**

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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 130 companies with nearly 44,000 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