

Drilling Rig **LB 20.1**

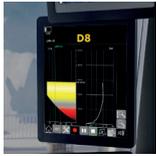
EN-US

LB 2001.07

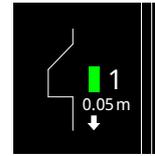


LIEBHERR

Concept and characteristics



PDE[®]
Process Data Recording



Kelly
Visualization



MyJobsite



Ground
Pressure
Visualization



LIPOS[®]
Positioning System



Radio remote
control



LiDAT[®]
Data Transmission



Concrete
pump



The robust universal machine for a wide variety of applications:

- Kelly drilling
- Continuous flight auger drilling
- Full displacement drilling
- Double rotary drilling
- Soil mixing

Assistance systems:

- Cruise Control for all main functions
- Joystick control for all machine functions
- Automatic shake-off function for working tools
- Kelly Visualization
- Ground Pressure Visualization
- Radio remote control
- Radio remote control for concrete pump
- Drilling assistant (single-pass process)
- Leader inclination memory
- Display of auger filling level
- Kelly winch with freewheeling and with slack rope monitoring and prevention

Technical description



Diesel engine

Power rating according to ISO 9249	230 kW (308 hp) at 1700 rpm
Engine type	Liebherr D 944 A7-05
Fuel tank capacity	124 gal with continuous level indicator and reserve warning
Exhaust certification	EU 2016/1628 Stage V EPA/CARB Tier 4f ECE-R.96 Power Band H non-certified emission standard



Hydraulic system

Hydraulic pumps	
for attachments	2x 72 gal
for kinematics	34 gal
Hydraulic oil tank capacity	132 gal
Max. working pressure	5,584 PSI
Hydraulic oil	electronic monitoring of all filters use of synthetic environmentally friendly oil possible



Crawlers

Drive system	with fixed axial piston hydraulic motors
Crawler side frames	maintenance-free, with hydraulic chain tensioning device
Brake	hydraulically released, spring-loaded multi-disc holding brake
Drive speed	0-1.12 mph
Track force	104,087 lbf
Grousers	Width 23.6 inch (option 31.5 inch)



Swing gear

Drive system	with fixed axial piston hydraulic motors, planetary gearbox, pinion
Swing ring	single row ball bearing with internal teeth and one swing drive
Brake	hydraulically released, spring-loaded multi-disc holding brake
Swing speed	0-3.3 rpm continuously variable



Kelly winch with freewheeling

Line pull effective	35,969 lbf (2nd layer)
Rope diameter	24 mm
Rope speed	0-246 ft/min



Kelly winch with freewheeling for Ultra Low Head

Line pull effective	24,729 lbf (3rd layer)
Rope diameter	20 mm
Rope speed	0-299 ft/min



Auxiliary winch

Line pull effective	11,240 lbf (1st layer)
Rope diameter	14 mm
Rope speed	0-279 ft/min



Crowd system

Crowd winch	
Crowd force	44,962/44,962 lbf (push/pull)
Line pull effective	22,481 lbf
Travel with standard leader between mechanical limit stops	39.7 ft
Rope speed	0-295 ft/min
Crowd cylinder for Ultra Low Head	
Crowd force	46,535/46,535 lbf (push/pull)
Travel	9.2 ft
Feed rate	54.1/42.7 ft/min



Noise emission / vibration

Noise emission	according to 2000/14/EC directive	
Emission sound pressure level L_{PA}	71.0 dB(A)	(in the cabin)
Guaranteed sound power level L_{WA}	105 dB(A)	(of the machine)
Vibration transmitted to the machine operator	< 8.2 ft/s ²	(to the hand-arm system)
	< 1.6 ft/s ²	(to the whole body)
Eco-Silent Mode (option)		
Guaranteed sound power level L_{WA}	-2 dB(A)	(of the machine)

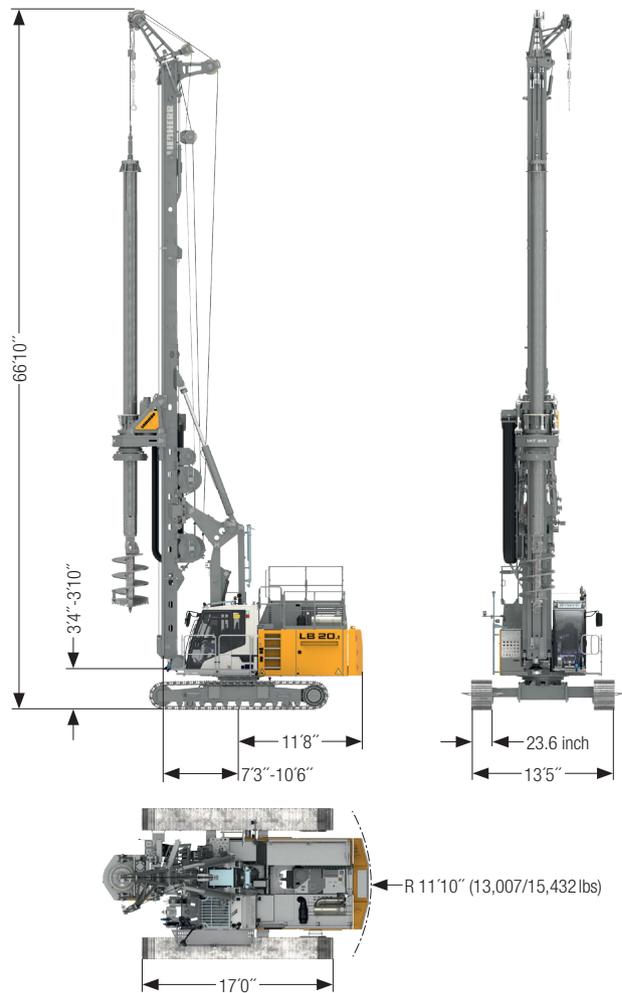
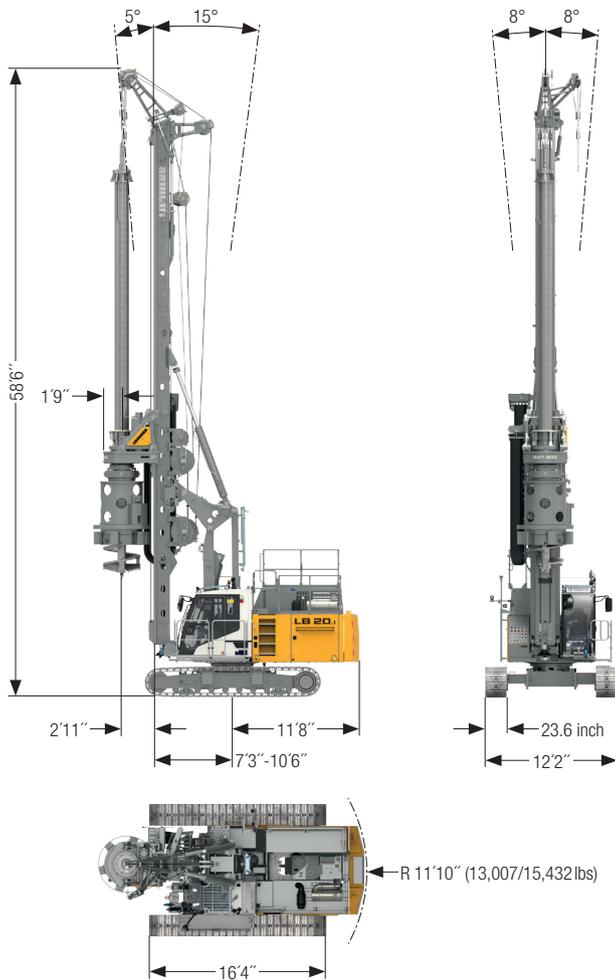
Remarks:

- Illustrations showing the types of application (e.g. Kelly drilling, continuous flight auger drilling etc.) are examples only.
- Weights can vary with the final configuration of the machine. The figures in this brochure may include options which are not within the standard scope of supply of the machine.

Dimensions

Standard

XL version



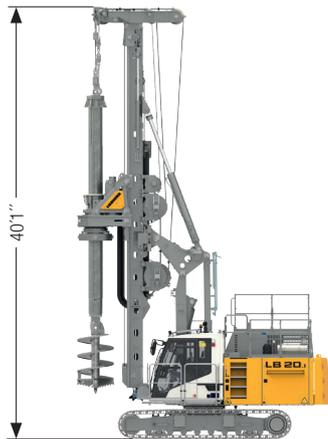
Operating weight

Total weight with undercarriage type 155 lbs 122,357
 The operating weight includes the basic machine LB 20.1 with rotary, Kelly bar 20/3/24, 13,007 lbs counterweight and equipment for casing oscillator.

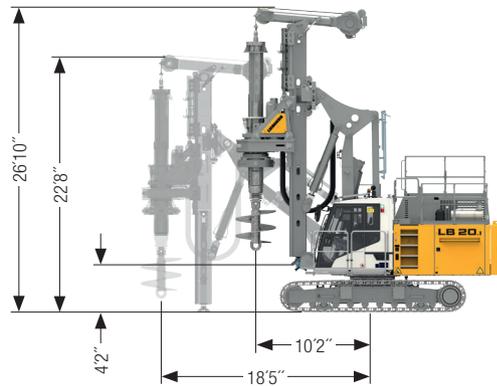
Operating weight

Total weight with undercarriage type 185 lbs 128,750
 The operating weight includes the basic machine LB 20.1 with rotary, Kelly bar 20/4/36 and 15,432 lbs counterweight. Equipment for casing oscillator not included.

Low Head



Ultra Low Head



Operating weight

Total weight with undercarriage type 155	lbs	115,963
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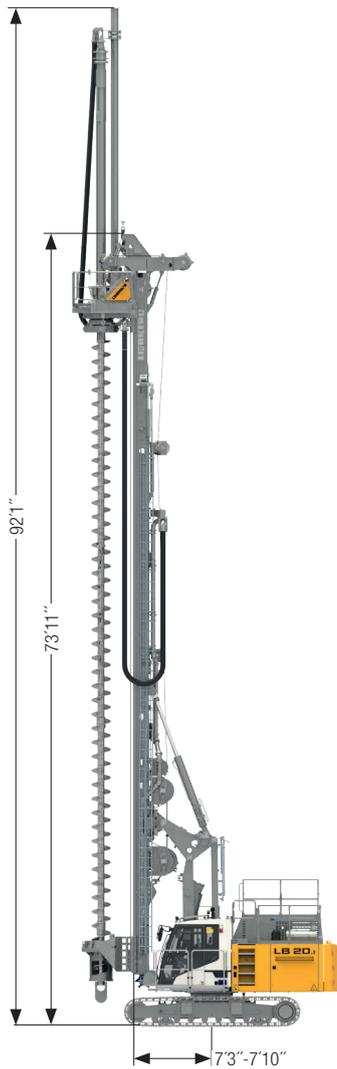
The operating weight includes the basic machine LB 20.1 with rotary, Kelly bar 20/3/15 and 13,007 lbs counterweight. Equipment for casing oscillator not included.

Operating weight

Total weight with undercarriage type 155	lbs	103,397
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The operating weight includes the basic machine LB 20.1 with rotary, Kelly bar 16/3/18 and 13,007 lbs counterweight. Equipment for casing oscillator not included.

Single-Pass

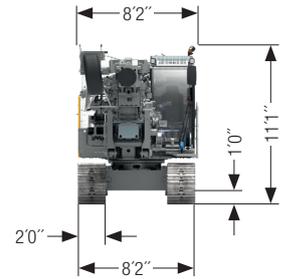
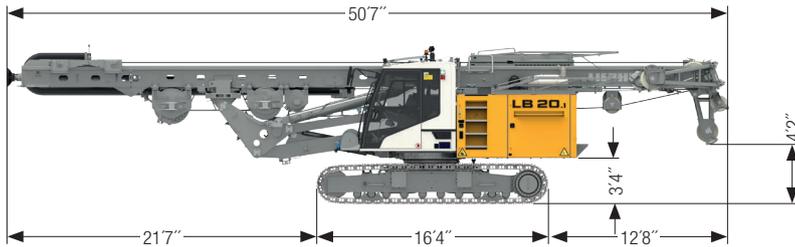


Operating weight

Total weight with undercarriage type 155	lbs	127,427
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The operating weight includes the basic machine LB 20.1 with rotary, 19.6 ft Kelly extension, drill rod 59.1 ft, auger cleaner \varnothing 1.8 ft and 13,007 ft counterweight. Equipment for casing oscillator not included.

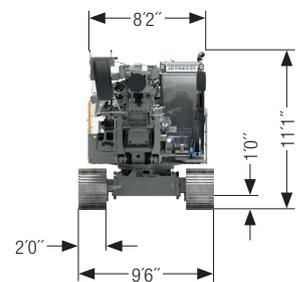
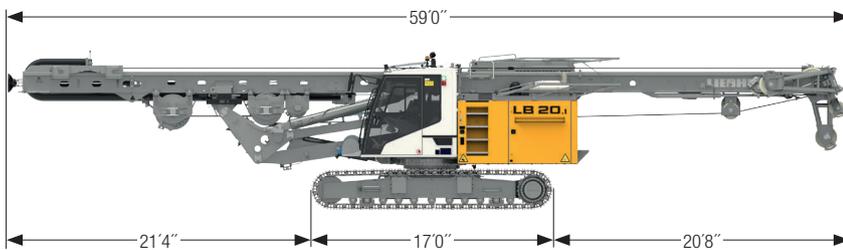
Transport dimensions and weights



Standard

includes the basic machine with undercarriage type 155 (fully tanked and ready for operation) with leader, without attachments (such as rotary, Kelly bar etc.), without counterweight and without adapter for casing oscillator

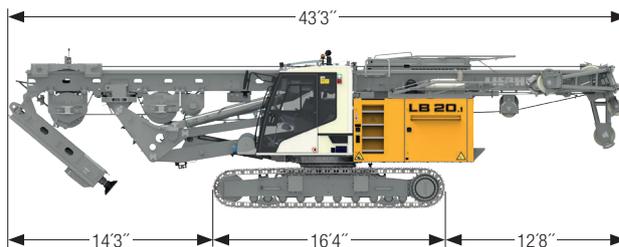
lbs 83,776



XL version

includes the basic machine with undercarriage type 185 (fully tanked and ready for operation) with leader, without counterweight, without BAT and without adapter for casing oscillator

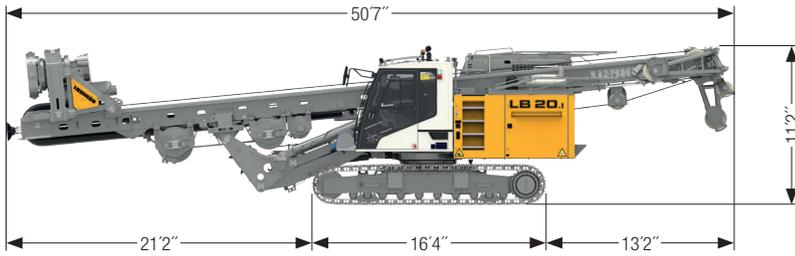
lbs 85,319



Leader lower part folded

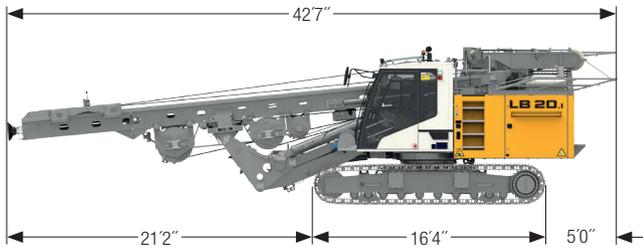
includes the basic machine (fully tanked and ready for operation) with leader, without attachments (such as rotary, Kelly bar etc.), without counterweight and without adapter for casing oscillator

lbs 83,776



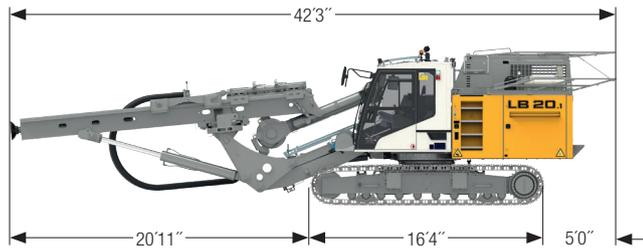
Standard with BAT

includes the basic machine (fully tanked and ready for operation) with leader, without attachments (such as Kelly bar etc.), without counterweight and without adapter for casing oscillator	lbs	94,799
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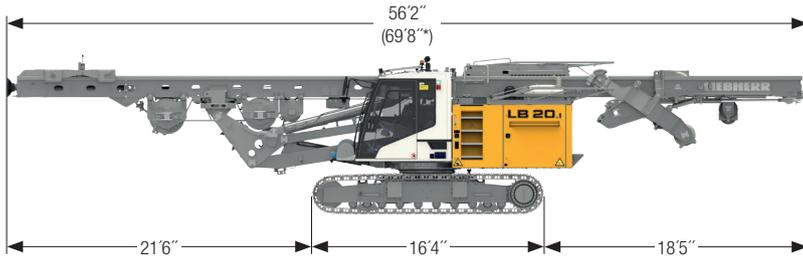
Low Head

includes the basic machine (fully tanked and ready for operation) with leader, without attachments (such as rotary, Kelly bar etc.), without counterweight and without adapter for casing oscillator	lbs	78,705
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Ultra Low Head

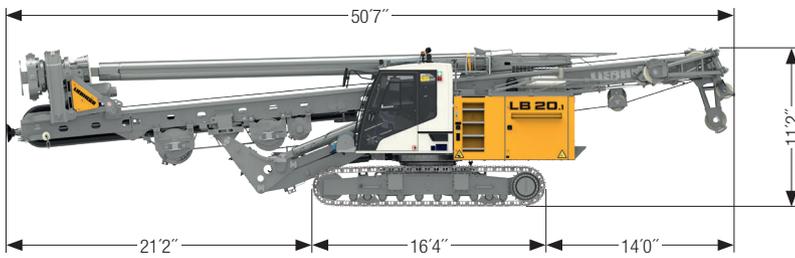
includes the basic machine (fully tanked and ready for operation) with leader, without attachments (such as rotary, Kelly bar etc.), without counterweight and without adapter for casing oscillator	lbs	71,209
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Single-Pass

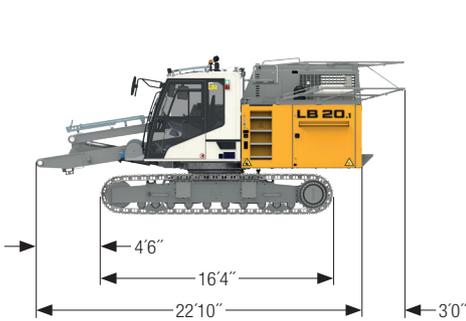
includes the basic machine (fully tanked and ready for operation) with leader, without attachments (such as rotary, Kelly bar etc.), without counterweight and without adapter for casing oscillator	lbs	86,642
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* Transport length leader not folded



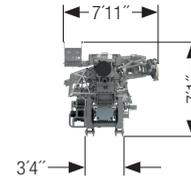
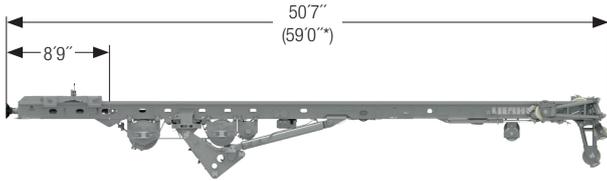
Standard with Kelly bar

includes the basic machine (fully tanked and ready for operation) with leader and Kelly bar 20/3/21, without counterweight and without adapter for casing oscillator	lbs	104,058
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Basic machine

with crawler side frames, without counterweight and without adapter for casing oscillator	lbs	54,675
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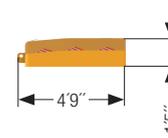
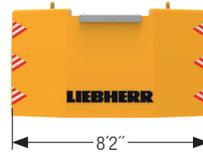
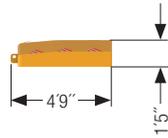
Leader versions

Standard leader	lbs	29,101
XL leader	lbs	30,644
Low Head	lbs	26,896
Ultra Low Head	lbs	16,535
Single-Pass	lbs	31,967

* Transport length XL leader

Options

Adapter for casing oscillator	lbs	1,543
Concrete supply line	lbs	1,323

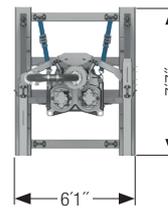
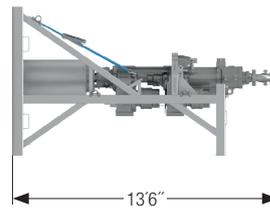
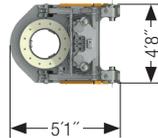
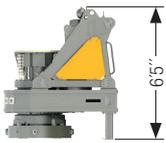


Rear counterweight

Weight	lbs	13,007
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Rear counterweight

Weight	lbs	15,432
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BAT 200

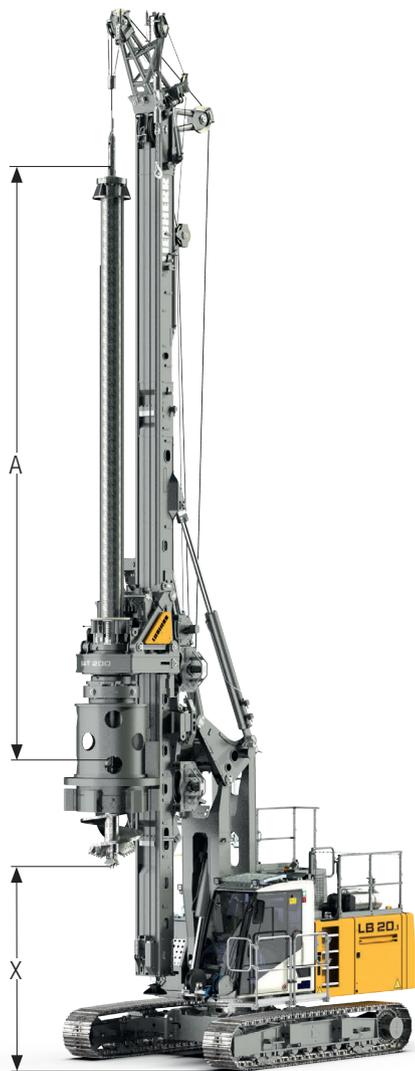
Transport weight	lbs	11,023
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DBA 90

Transport weight	lbs	12,566
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Kelly drilling

Standard



XL version



Performance data

Rotary drive - torque	lbf-ft	146,037
Rotary drive - speed	rpm	52
Max. drilling diameter cased*	ft	3.9
Max. drilling diameter uncased	ft	4.9

Above applications are sample illustrations. Other drilling diameters available on request.

* Depends on the design of the casing driver.

Drilling depths

Technical data Kelly bars

Model	Kelly bars		Drilling depths							
	Length A [ft]	Weight [lbs]	Ultra Low Head		Low Head		Standard		XL version	
			X [ft]	Depth [ft]	X [ft]	Depth [ft]	X [ft]	Depth [ft]	X [ft]	Depth [ft]
16/3/10	16.1	5,071	3.9 ¹	28.9 ¹	-	-	-	-	-	-
16/4/13	15.6	5,952	4.3	138.4	-	-	-	-	-	-
20/3/15	22.9	7,055	-	-	3.6	45.3	21.3	45.3	29.5	45.3
20/3/18	25.6	7,716	-	-	1.0 ¹	55.1 ¹	18.7	55.1	26.9	55.1
20/2/18	34.4	7,937	-	-	-	-	9.8	55.1	18.0	55.1
20/3/21	29.4	8,818	-	-	-	-	14.8	65.0	23.0	65.0
20/3/24	32.6	9,700	-	-	-	-	11.5	74.8	19.7	74.8
20/3/27	35.4	10,141	-	-	-	-	8.9	84.6	17.0	84.6
20/3/30	38.7	10,803	-	-	-	-	5.6	94.5	13.8	94.5
20/3/33	42.0	11,464	-	-	-	-	2.3 ¹	104.3 ¹	10.5	104.3
20/4/36	36.9	13,669	-	-	-	-	7.2	114.2	15.4	114.2
20/4/42	42.2	15,212	-	-	-	-	2.0 ¹	134.2 ¹	10.2	134.2
20/4/48	46.6	18,078	-	-	-	-	-	-	2.3	153.5

¹ Installation only possible using auxiliary equipment

Other Kelly bars available on request

When using a casing oscillator, value X must be reduced by 3.9 ft.

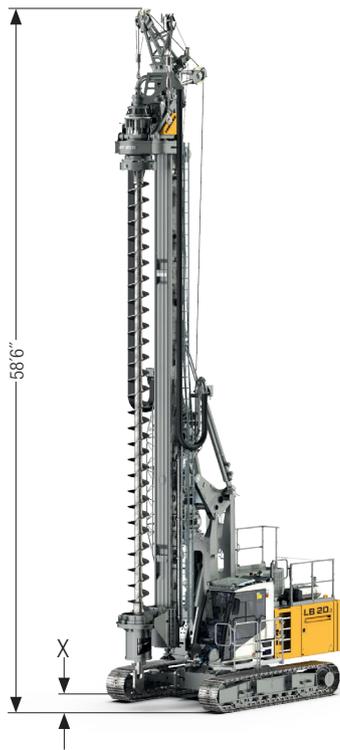
When using a Kelly bar guide, value X has to be reduced by 1.8 ft.

Length of drilling tool 6.2 ft

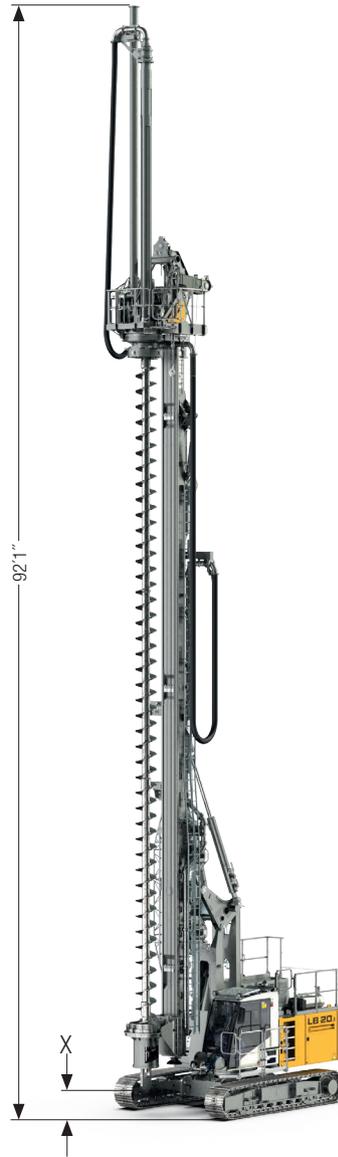
Length of drilling tool Ultra Low Head 3.9 ft

Continuous flight auger drilling

Standard



Single-Pass



Performance data

Rotary drive - torque	lbf-ft	132,761			
Rotary drive - speed	rpm	52			
Max. drilling diameter*	ft	2.6			
		Low Head	Standard	XL version	Single-Pass
Drilling depth without Kelly extension	ft	21.6	34.8	43.0	51.2
Drilling depth with 19.7 ft Kelly extension	ft	-	-	-	70.9
Max. pull force	lbf	80,931	80,931	80,931	116,901

Above drilling depths take into account that an auger cleaner is used and the cardan joint has been removed.

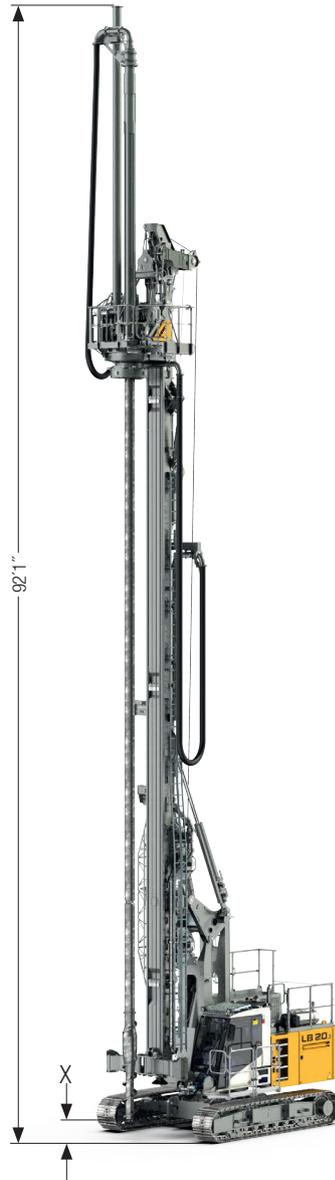
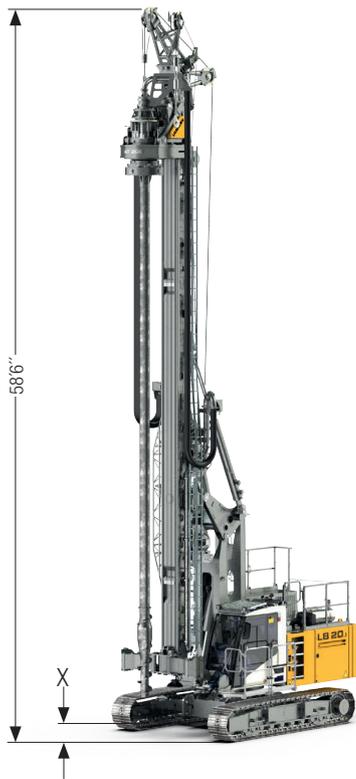
Above drilling depths are valid for the use of standard tools and for an X value of 1.5 ft (see above illustration).

* Other drilling diameters available on request

Full displacement drilling

Standard

Single-Pass



Performance data

Rotary drive - torque	lbf-ft	132,761			
Rotary drive - speed	rpm	52			
Max. drilling diameter*	ft	1.6			
		Low Head	Standard	XL version	Single-Pass
Drilling depth without Kelly extension	ft	22.6	35.8	44.0	50.9
Drilling depth with 19.7 ft Kelly extension	ft	-	-	-	70.5
Max. pull force	lbf	80,931	80,931	80,931	116,901

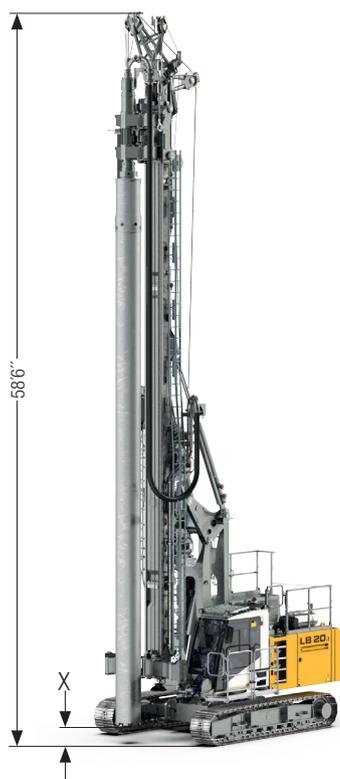
Above drilling depths take into account that an auger cleaner is used and the cardan joint has been removed.

Above drilling depths are valid for the use of standard tools and for an X value of 3.4 ft (see above illustration).

* Other drilling diameters available on request

Double rotary drilling

DBA 90



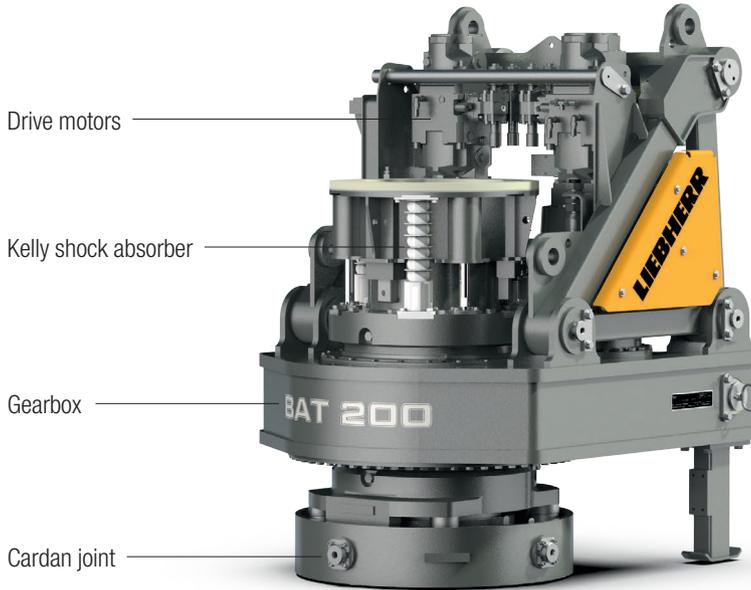
Performance data

Rotary drive I - torque	lbf-ft	0-66,381		
Rotary drive I - speed	rpm	0-32		
Rotary drive II - torque	lbf-ft	0-50,154		
Rotary drive II - speed	rpm	0-44		
Max. drilling diameter*	ft	1.7		
		Low Head	Standard	XL version
Drilling depth	ft	24.6	37.7	45.9
Max. pull force	lbf	80,931	80,931	80,931

Above drilling depths are valid for the use of standard tools and for an X value of 1.6 ft (see above illustration). Due to differences in the max. admissible load capacities, the combinations of drilling depth and drilling diameter may be limited.

* Other drilling diameters available on request

BAT 200



Kelly shock absorber:

- Newly developed Kelly shock absorber for highest demands
- Possibility of adjusting the strength of the Kelly shock absorber for different Kelly bar weights

Automatic gearbox for best operating comfort:

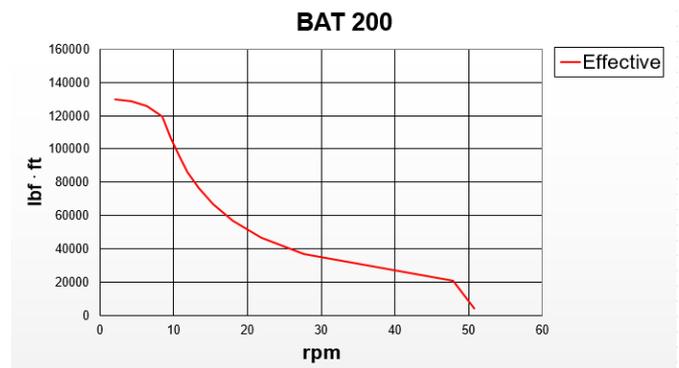
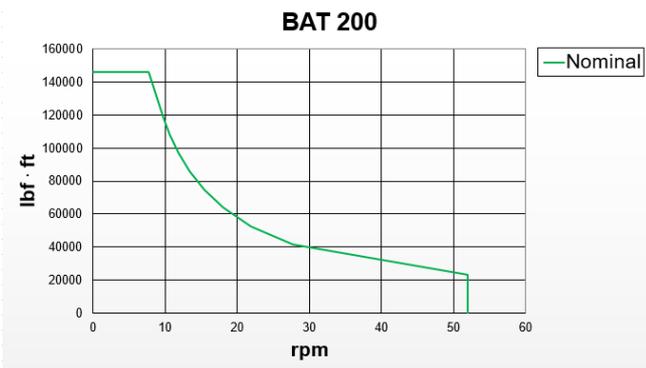
- No stopping required to change gears
- No interruption of the drilling process
- Continuous optimization of speed

Highest availability through easy set-up:

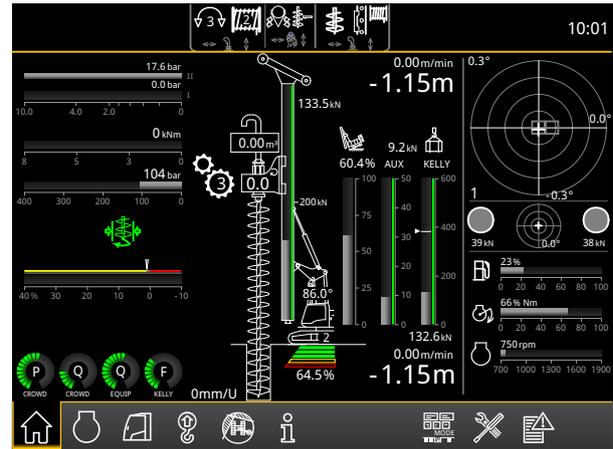
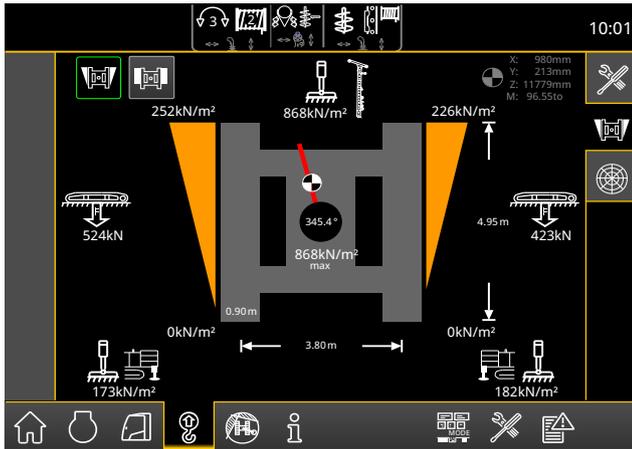
- No mechanical shift gearbox
- Low maintenance requirements

Flexibility through modular design:

- Exchangeable cardan joint for other casing drivers
- Exchangeable drive adapters for use of other Kelly bars
- Quickly exchangeable equipment for other methods of operation



Ground Pressure Visualization



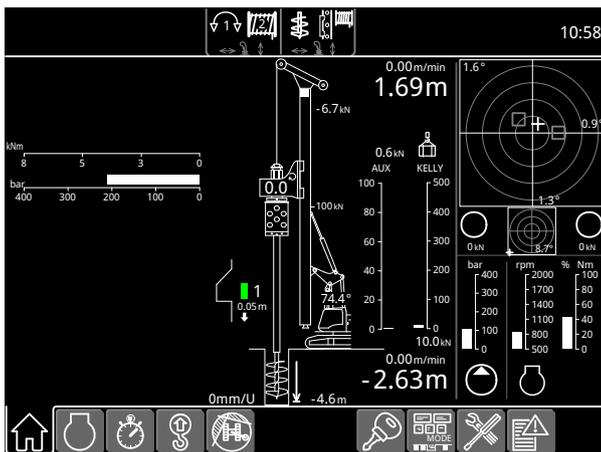
Features:

- The actual ground pressure is calculated in real time
- The maximum admissible ground pressure can be individually predefined
- The utilization is continuously calculated and displayed on the monitor in the operator's cab
- Audible and visual warnings when the predefined values are approached

Your benefits:

- Increased safety on the jobsite due to consideration of prevailing ground conditions
- Higher operator comfort thanks to clearly displayed information and warning signals
- Prevention of critical or stressful situations before they occur
- User-friendly and intuitive handling in the operator's cab

Kelly Visualization



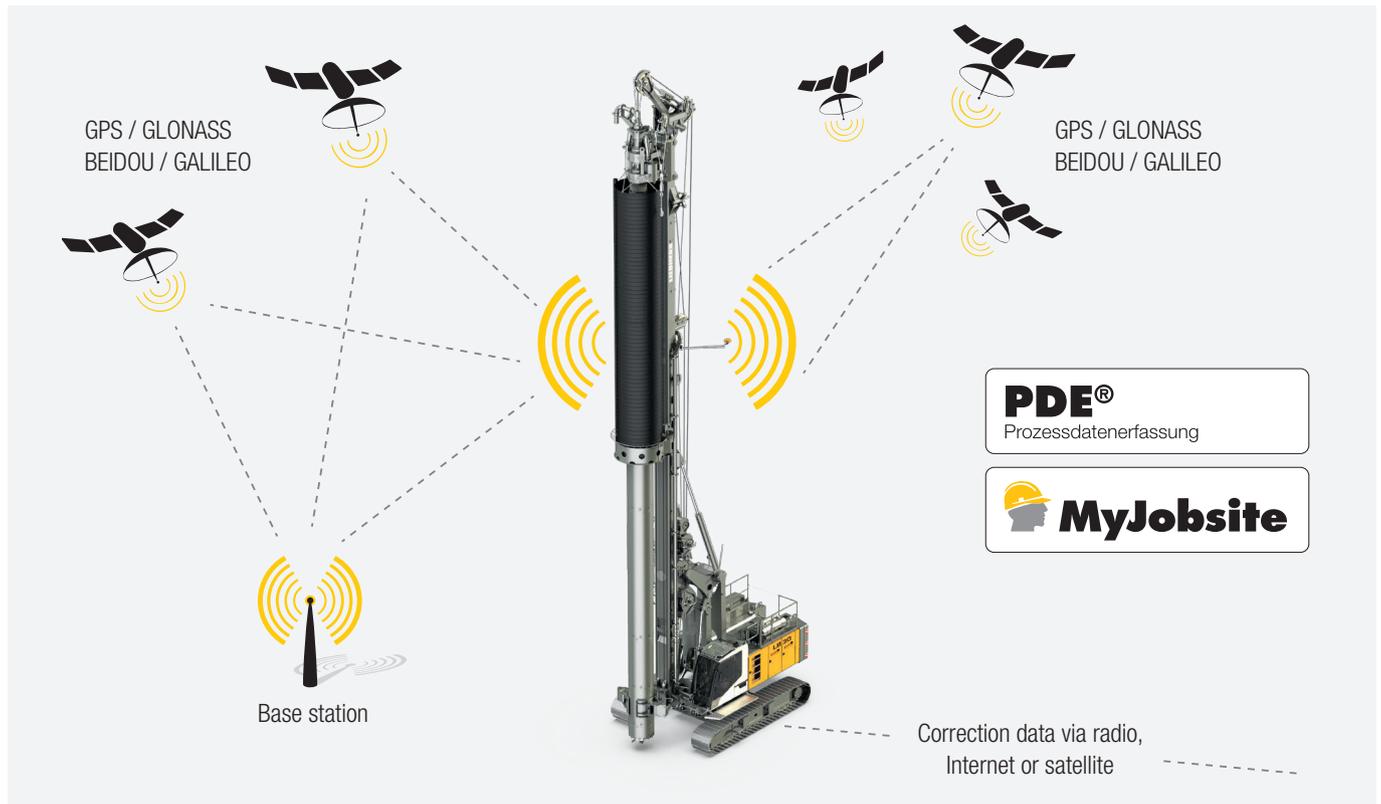
Your benefits:

- Time saving: the operator no longer needs to search for the interlocking recesses
- Higher availability: the machine needs less repair and maintenance work
- More safety: correct locking prevents damage to the Kelly bar
- Cost reduction: smooth operation results in higher performance and less wear

All measurements displayed on this page are metric.

LIPOS®

Liebherr Positioning System



DGNSS – Differential Global Navigation Satellite System

Via pre-installed components, LIPOS® enables the direct integration of machine control systems from Trimble or Leica in the process data recording PDE® and reporting of Liebherr deep foundation machines. These systems are based on modern DGNSS technology (Differential Global Navigation Satellite System) and so achieve the best possible conditions for a precise and efficient positioning of Liebherr machines and their attachment tools.

- Intelligent mounting bracket design for the antennae on the leader for optimum signal quality
- Pinpoint precision of the drilling and piling work in accordance with a digital drilling plan
- Recording of the drilling points and work processes through the process data recording system PDE®
- Automatic transmission of the data to MyJobsite for visualisation and analysis
- Generation of comprehensive and understandable jobsite reports

The positioning system LIPOS® is fully integrated in the existing IT solutions from Liebherr and compatible with a wide variety of deep foundation machines. The preparation for Trimble or Leica, as well as the machine-based complete system* from Trimble is obtainable from Liebherr.

* without correction data solution (e.g. base station, VRS, or similar), measuring devices and Cloud solutions of other manufacturers



Further info

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

Liebherr-Werk Nenzing GmbH

Dr. Hans Liebherr Str. 1, 6710 Nenzing/Austria
☎ +43 50809 41-473
www.liebherr.com, foundation.equipment@liebherr.com
[facebook.com/LiebherrConstruction](https://www.facebook.com/LiebherrConstruction)

Liebherr USA, Co.

7075 Bennington Street, Houston, TX 77028-5812
☎ (713) 636-4050, Fax: (713) 636-4051
www.liebherr.com, foundation.equipment.usa@liebherr.com
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