

Drilling Rig

LB 44-510

Litronic®

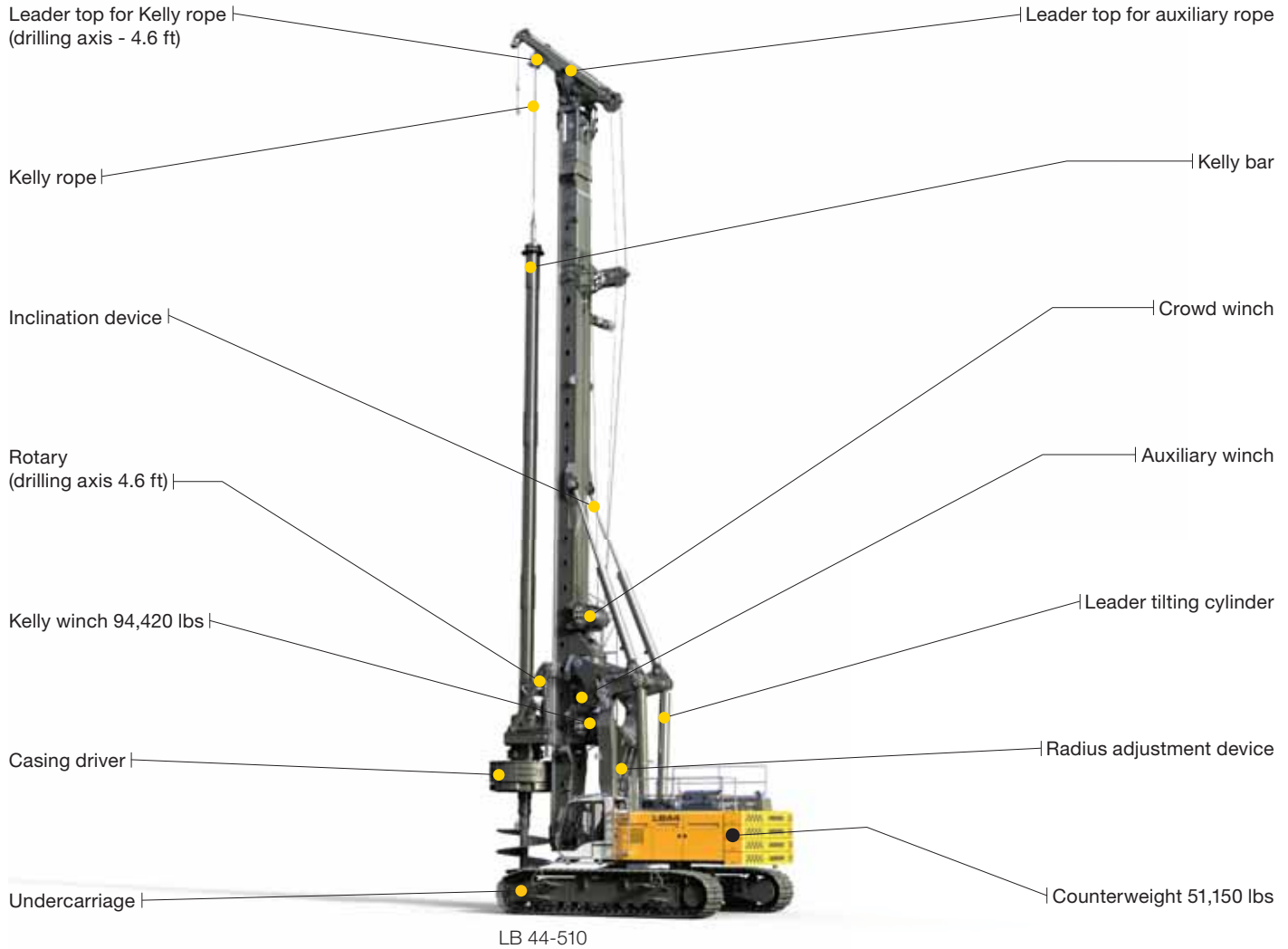
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LB 2006.05



LIEBHERR

Concept and characteristics



The robust universal machine for a wide variety of applications:

- Kelly drilling
- Auger drilling
- Full displacement drilling
- Double rotary drilling

The solid undercarriage offers excellent stability and low ground bearing pressure.

The uppercarriage with its small swing radius enables operation in restricted space.

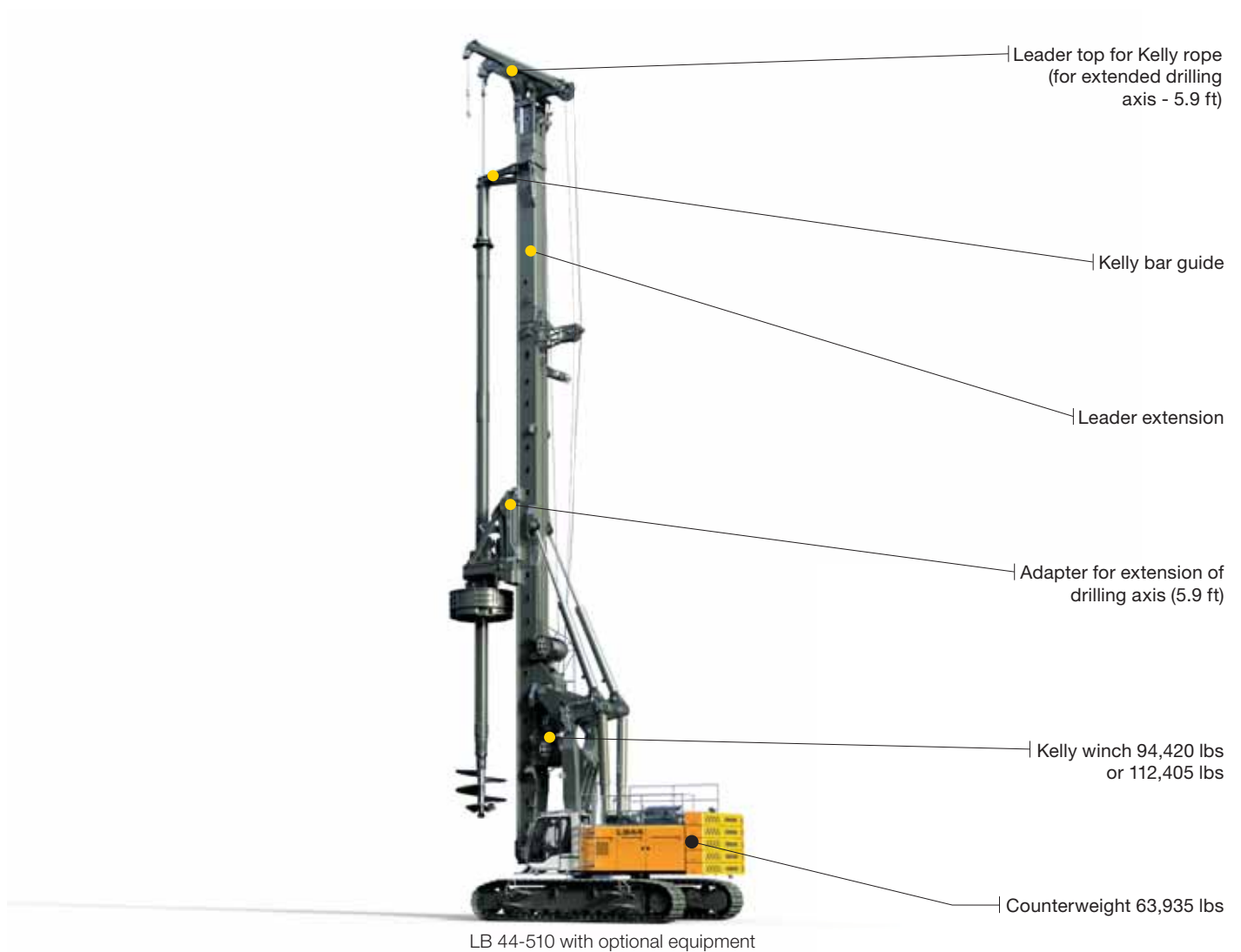
Parallel kinematics with a large working area allow to fold the leader back and, as an option, forward.

The rigid leader absorbs high torque and is fitted with a rope crowd system for high pull forces.

All winches are mounted on the leader, which provides a direct view of the main winch from the operator's cab.

The rotary drive of the BAT series combines exceptional torque with optimum operating comfort.

The powerful Liebherr diesel engine is low in emission and economical through SCR technology.



LB 44-510 with optional equipment

The Litronic control with assistance systems supports the operator:

- Cruise Control for the drilling process
- Joystick control for all machine functions
- Automatic shake-off function for working tools
- Leader inclination memory etc.

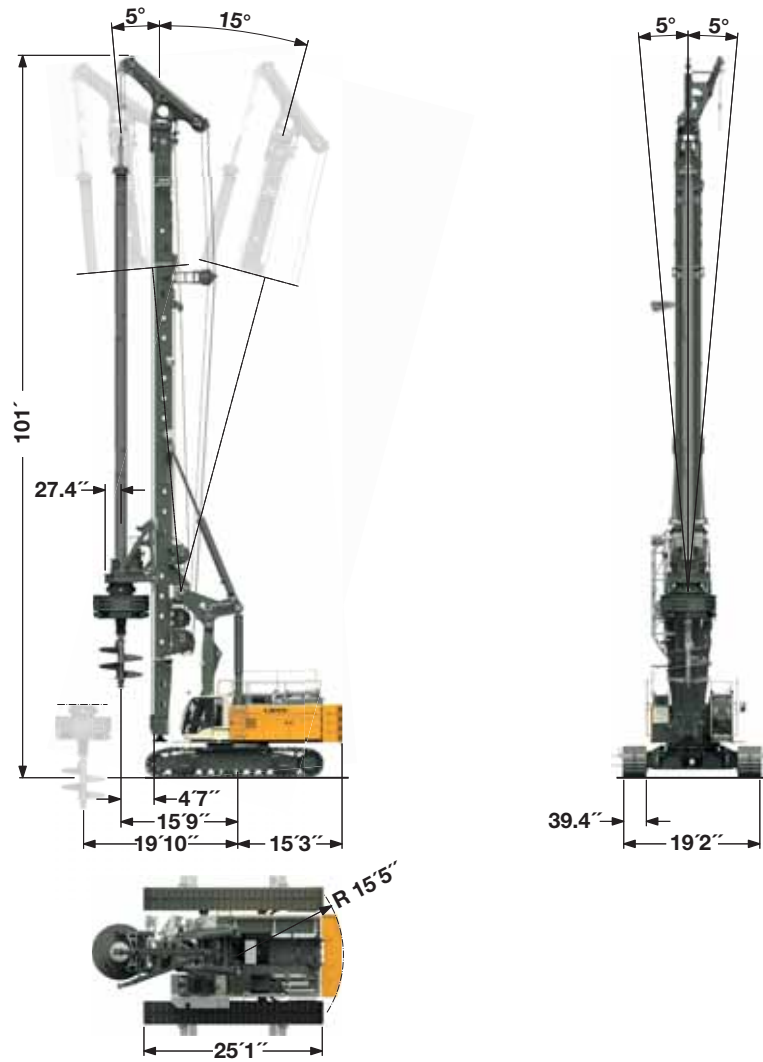
Sophisticated solutions provide safe operation and maintenance of the machine.

- Cab design for optimum visibility
- Acoustic and optic warning
- Walkways on the uppercarriage
- Safety rails on top of the uppercarriage
- Rear and side view cameras etc.

Liebherr Kelly bars feature strongly overlapping elements resulting in less wear.

Precise and robust Liebherr casings and drilling tools provide excellent drilling performance.

Dimensions

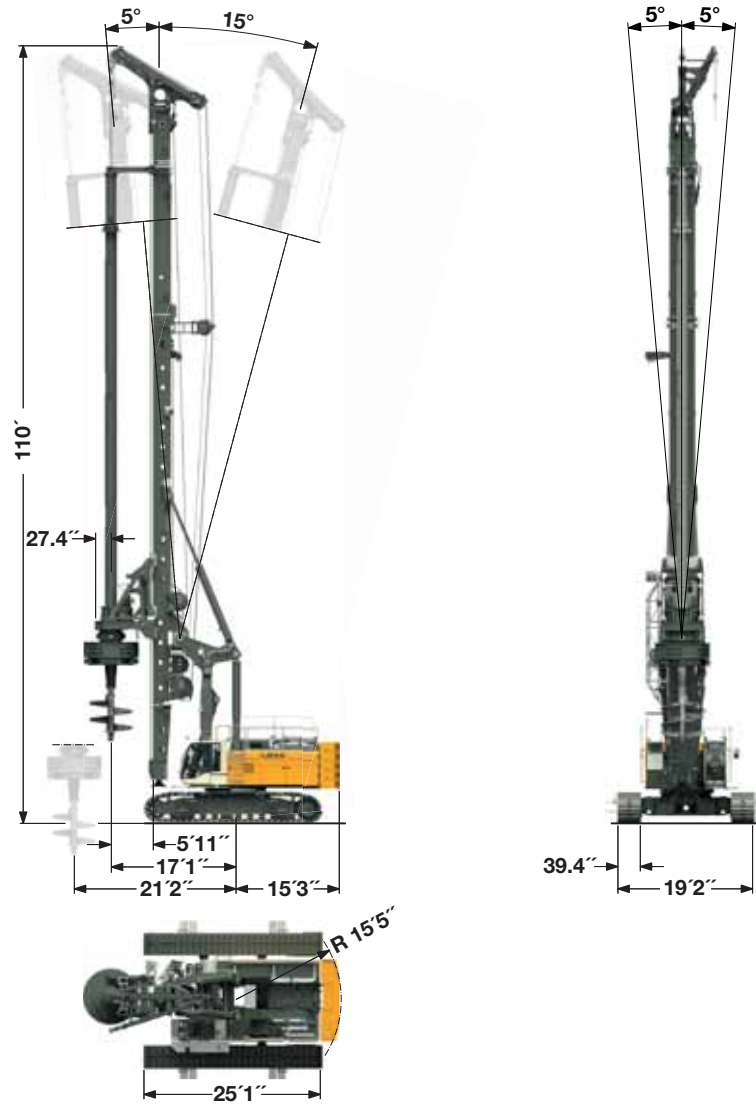


Technical data LB 44-510

Total height	101 ft
Rotary drilling axis	4.6 ft
Continuous rig inclination adjustment	
Lateral inclination	± 5°
Forward inclination	5°
Backward inclination	15°

Operating weight LB 44-510

Total weight with 39.4 inch 2-web shoes	341,720 lbs
The operating weight includes the basic machine LB 44-510 (with rotary and Kelly bar MD 36/3/30) and 51,150 lbs counterweight, without equipment for casing oscillator.	



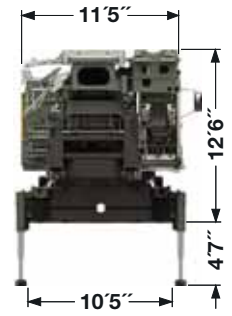
Technical data LB 44-510 with optional equipment

Total height	110 ft
Rotary drilling axis	5.9 ft
Continuous rig inclination adjustment	
Lateral inclination	± 5°
Forward inclination	5°
Backward inclination	15°

Operating weight LB 44-510 with optional equipment

Total weight with 39.4 inch 2-web shoes	381,400 lbs
The operating weight includes the basic machine LB 44-510 (with rotary and Kelly bar MD 36/4/72) and 63,950 lbs counterweight, without equipment for casing oscillator.	

Transport dimensions and weights

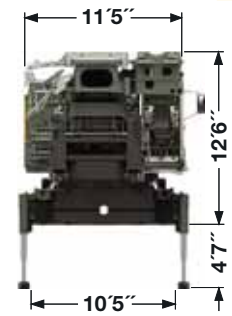
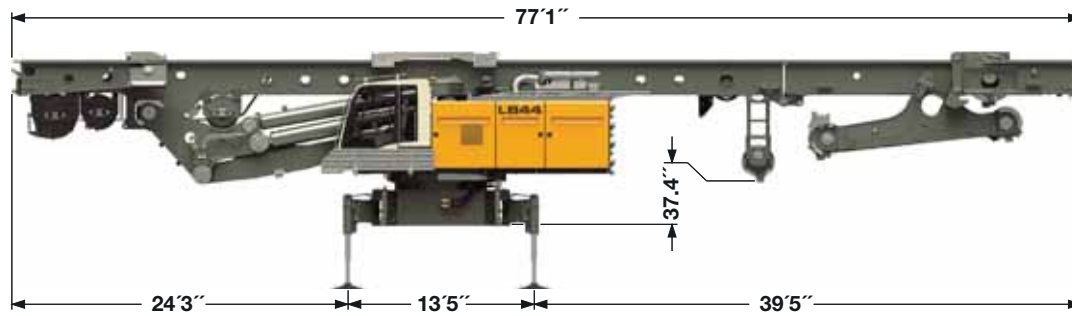


Transport standard

includes the basic machine (ready for operation) with leader, without working tools (such as rotary, Kelly bar etc.), without crawlers and without counterweight.

Dimensions and weights

Length	67.3 ft
Weight	181,880 lbs



Transport with optional equipment

includes the basic machine (ready for operation) with leader, without working tools (such as rotary, Kelly bar etc.), without crawlers and without counterweight.

Dimensions and weights

Length	77.1 ft
Weight	184,085 lbs

Rotary BAT 510 with shock absorber



Automatic gearbox for best operating comfort

- No stopping required to change gears
- No interruption of the drilling process
- Automatic torque adjustment
- Continuous optimization of speed
- Four electronically adjustable speed ranges

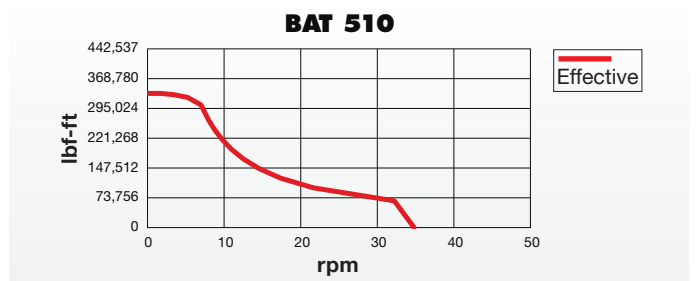
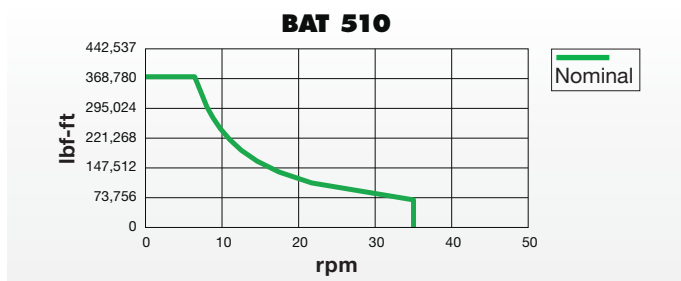
Highest availability through easy set-up

- No mechanical shift gearbox
- Higher availability thanks to less moving parts
- Less maintenance required

- No pressure lubrication necessary
- No interferences through defective lubrication pump
- Simplified hydraulics
- Lower risk of hydraulics leakages

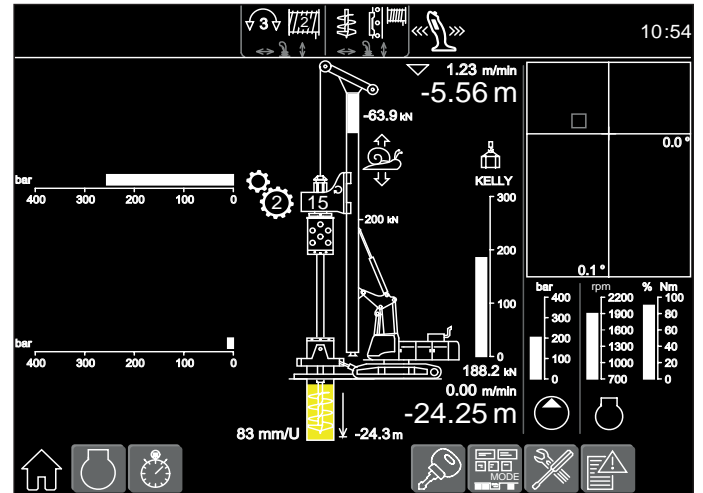
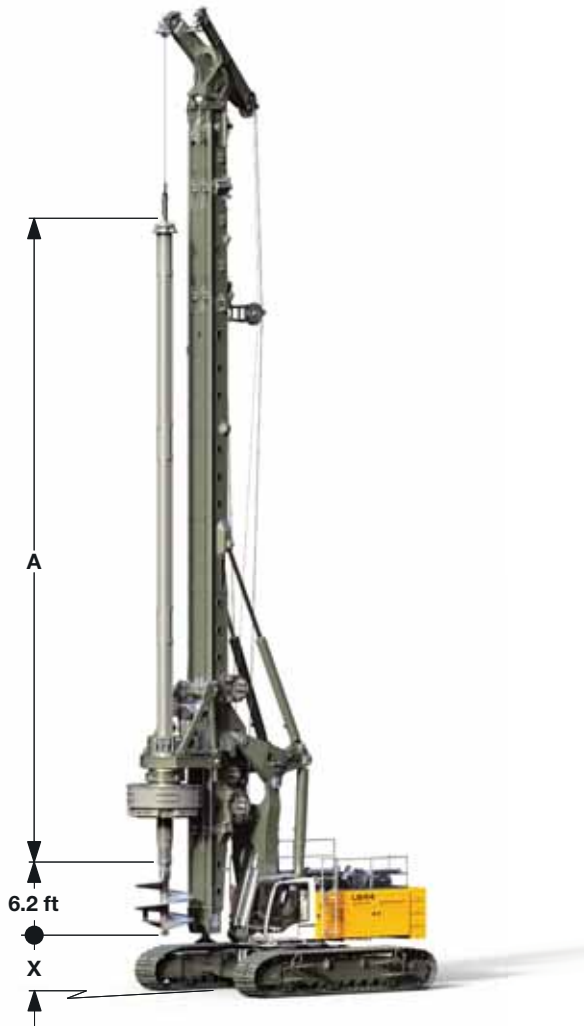
Flexibility through modular design

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



Kelly drilling

LB 44-510



Display for Kelly drilling

Kelly bars MD 36

	A	X ¹	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 36/3/30	39.0	43.6	91.5	16,755	18.5
MD 36/3/36	46.6	37.1	111.2	19,400	18.5
MD 36/4/42	42.5	40.4	131.2	22,710	18.5
MD 36/4/48	47.4	35.4	150.9	25,355	18.5
MD 36/4/54	52.3	30.5	170.6	28,000	18.5
MD 36/4/60	57.3	25.6	190.3	30,645	18.5
MD 36/4/66	62.2	20.7	210.0	33,280	18.5
MD 36/4/72	67.1	15.7	229.7	35,935	18.5
MD 36/4/78	72.0	10.8	249.3	38,580	18.5
MD 36/4/84	76.9	5.9	269.0	41,230	18.5
MD 36/4/90	81.9	1.0	288.7	44,315	18.5

Kelly bars MD 45

	A	X ¹	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 45/3/30	40.0	42.3	90.6	22,270	22
MD 45/3/36	46.6	35.8	110.2	25,355	22
MD 45/4/42	42.7	39.4	129.9	27,780	22
MD 45/4/48	47.6	34.4	149.6	30,644	22
MD 45/4/54	52.6	29.5	169.3	33,950	22
MD 45/4/60	57.5	24.6	189.0	36,820	22
MD 45/4/66	62.4	19.7	208.7	39,685	22
MD 45/4/72	67.3	14.8	228.3	42,770	22
MD 45/4/78	72.2	9.8	248.0	44,975	22
MD 45/4/84	77.2	4.9	267.7	48,725	22
MD 45/4/90	82.1	0	287.4	51,810	22

Technical data

Rotary drive - torque	0 – 376,156 lbf-ft
Rotary drive - speed	0 – 36 rpm
Rotary drilling axis	4.6 ft

Performance data

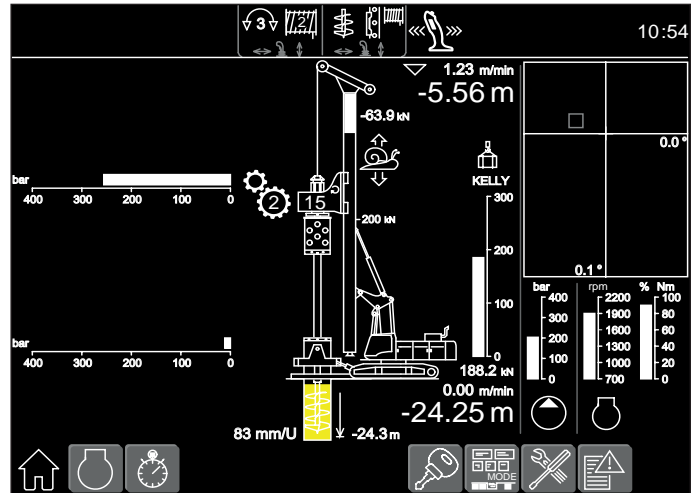
Max. drilling diameter*	8.2 ft uncased
Max. drilling diameter*	6.6 ft cased

*) Other drilling diameters available on request
 Other Kelly bars available on request
 When using a casing oscillator, value X has to be reduced by 4.9 ft.

1) Without kelly guide.
 When using a kelly guide, value X has to be reduced by
 8.04 ft for kelly bars MD 36 or
 6.05 ft for kelly bars MD 45.

Kelly drilling

LB 44-510 with optional equipment



Display for Kelly drilling

Kelly bars MD 36

	A	X ¹	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 36/3/30	39.0	54.5	93.5	16,755	18.5
MD 36/3/36	45.6	47.9	113.2	19,400	18.5
MD 36/4/42	42.5	51.2	133.2	22,710	18.5
MD 36/4/48	47.4	46.3	152.9	25,355	18.5
MD 36/4/54	52.3	41.3	172.6	28,000	18.5
MD 36/4/60	57.3	36.4	192.3	30,645	18.5
MD 36/4/66	62.2	31.5	211.9	33,290	18.5
MD 36/4/72	67.1	26.6	231.6	35,935	18.5
MD 36/4/78	72.0	21.7	251.3	38,580	18.5
MD 36/4/84	79.9	16.7	271.0	41,230	18.5
MD 36/4/90	81.8	11.8	290.7	43,875	18.5
MD 36/4/96	86.8	6.9	310.4	46,520	18.5

Kelly bars MD 45

	A	X ¹	Drilling depth	Weight	Kelly Ø
	(ft)	(ft)	(ft)	(lbs)	(inch)
MD 45/3/30	40.0	53.2	92.5	22,270	22
MD 45/3/36	46.6	46.6	112.2	25,355	22
MD 45/4/42	42.7	50.2	131.9	27,780	22
MD 45/4/48	47.6	45.3	151.6	30,644	22
MD 45/4/54	52.6	40.4	171.3	33,950	22
MD 45/4/60	57.5	35.4	190.9	36,820	22
MD 45/4/66	62.4	30.5	210.6	39,685	22
MD 45/4/72	67.3	25.6	230.3	42,770	22
MD 45/4/78	72.2	20.7	250.0	44,975	22
MD 45/4/84	77.2	15.7	269.7	48,725	22
MD 45/4/90	82.1	10.8	289.4	51,810	22
MD 45/4/96	87.0	5.9	309.1	55,115	22

Technical data

Rotary drive - torque	0 – 376,156 lbf-ft
Rotary drive - speed	0 – 36 rpm
Rotary drilling axis	5.9 ft

Performance data

Max. drilling diameter*	9.8 ft uncased
Max. drilling diameter*	8.2 ft cased

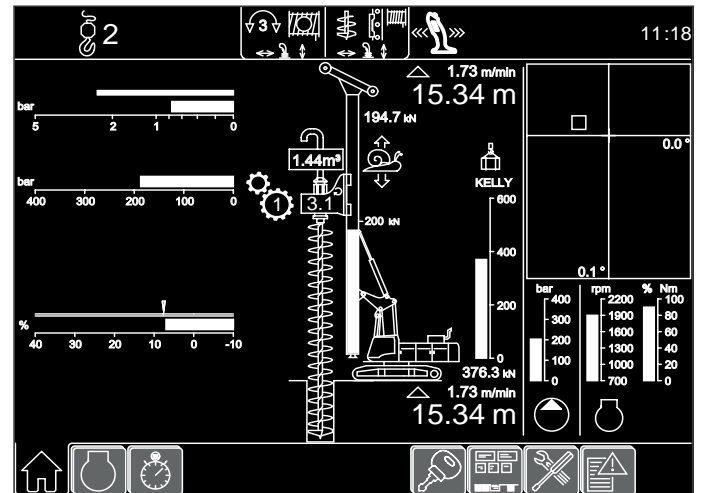
*) Other drilling diameters available on request
 Other Kelly bars available on request
 When using a casing oscillator, value X has to be reduced by 6.1 ft.

1) Without kelly guide.
 When using a kelly guide, value X has to be reduced by
 10.0 ft for kelly bars MD 36 or
 8.03 ft for kelly bars MD 45.

Continuous flight auger drilling



Auger with auger guide



Display for continuous flight auger drilling

Technical data

Rotary drive - torque	0 – 376,156 lbf-ft
Rotary drive - speed	0 – 36 rpm

Performance data

Drilling depth with auger cleaner*	64.0 ft
Drilling depth with 32.8 ft Kelly extension with auger cleaner	96.8 ft
Max. pull force (crowd winch and Kelly winch)	278,785 lbf
Max. drilling diameter**	4.6 ft

*) Without Kelly extension and without leader extension

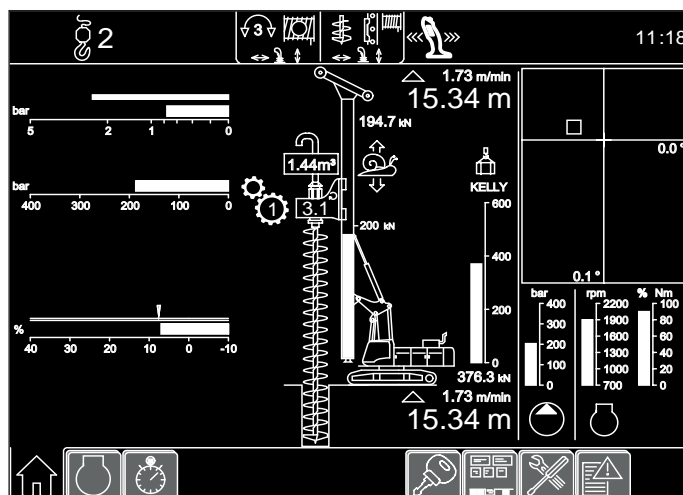
**) Other drilling diameters available on request

For machines with optional equipment (longer leader) the drilling depth increases by 9.8 ft.

Full displacement drilling



Full displacement tool with auger guide



Display for full displacement drilling

Technical data

Rotary drive - torque	0 – 376,156 lbf-ft
Rotary drive - speed	0 – 36 rpm

*) Without Kelly extension

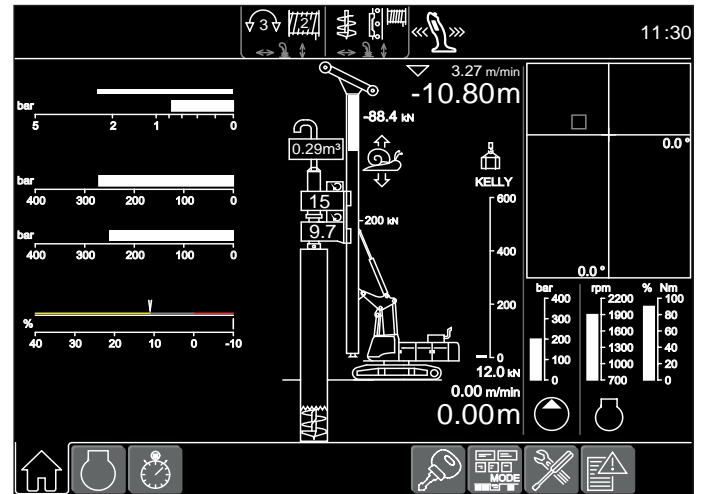
**) Other drilling diameters available on request

Performance data

Drilling depth*	65.6 ft
Drilling depth with optional equipment	75.5 ft
Drilling depth with 32.8 ft Kelly extension	98.4 ft
Drilling depth with 32.8 ft Kelly extension and optional equipment	108.3 ft
Max. pull force (crowd winch and Kelly winch)	278,763 lbf
Max. drilling diameter**	23.6 inch

Double rotary drilling

Model DBA 300



Display for double rotary drilling

Technical data

Rotary drive I - torque	0 – 221,270 lbf-ft
Rotary drive I - speed	0 – 26 rpm
Rotary drive II - torque	0 – 110,635 lbf-ft
Rotary drive II - speed	0 – 30 rpm

Performance data

Max. drilling diameter*	35.4 inch
Max. drilling depth**	65.6 ft
Max. drilling depth with optional equipment	75.5 ft
Max. pull force	202.328 lbf

*) Other drilling diameters available on request

**) Other drilling depths available on request

Technical description



Engine

Power rating according to ISO 9249, 505 kW (677 hp) at 1700 rpm
Engine type ————— Liebherr D 9508 A7-04
Fuel tank ————— 264 gal capacity with continuous level indicator and reserve warning
Engine complies with 97/68 EC Stage IV and NRMM exhaust certification EPA/CARB Tier 4f.



Hydraulic system

The main pumps are operated by a distributor gearbox. Axial piston displacement pumps work in open circuits supplying oil only when needed (flow control on demand).
The hydraulic pressure peaks are absorbed by the integrated automatic pressure compensation, which relieves the pump and saves fuel.

Pumps for working tools ————— 2x 128.1 gal/min
Separate pump for kinematics ————— 56.8 gal/min
Hydraulic oil tank ————— 369.8 gal
Max. working pressure ————— 5076 PSI

The cleaning of the hydraulic oils occurs via an electronically monitored pressure and return filter.
Any clogging is shown on the display in the cab.
The use of synthetic environmentally friendly oil is also possible.



Crawlers

Propulsion through axial piston motor, hydraulically released spring loaded multi-disc brake, maintenance-free crawler tracks, hydraulic chain tensioning device.

Drive speed ————— 0 – 0.9 mph
Track force ————— 261,902 lbf
Width of 2-web grouser ————— 39.4 inch



Swing

Consists of triple-row roller bearing with external teeth and two swing drives, fixed axial piston hydraulic motor, spring loaded and hydraulically released multi-disc holding brake, planetary gearbox and pinion.
Selector for 3 speed ranges to increase swing precision.
Swing speed from 0 – 2 rpm is continuously variable.



Noise emission

Noise emissions correspond with 2000/14/EC directive.
Guaranteed sound pressure level L_{PA} in the cabin ————— 76.8 dB(A)
Guaranteed sound power level L_{WA} ————— 112 dB(A)
Vibration transmitted to the hand-arm system of the machine operator ————— < 8.20 ft/s²
Vibration transmitted to the whole body of the machine operator ————— < 1.64 ft/s²



Control

The control system – developed and manufactured by Liebherr – is designed to withstand extreme temperatures and the many heavy-duty construction tasks for which this machine has been designed. Complete machine operating data are displayed on a high resolution monitor screen. A GSM/GPRS telematics module allows for remote inquiry of machine data and operational conditions. To ensure clarity of the information on display, different levels of data are shown in enlarged lettering and symbols.
Control and monitoring of the sensors are also handled by this high technology system. Error indications are automatically displayed on the monitor in clear text. The machine is equipped with proportional control for all movements, which can be carried out simultaneously.
Two joysticks are required for operation. Pedal control can be changed to hand control.
Option:
PDE®: Process data recording



Kelly winch with freewheeling

Line pull effective (1st layer) ————— 94,420 lbf
Rope diameter ————— 38 mm
Line speed ————— 0-213 ft/min

Option:
Line pull effective (2nd layer) ————— 112,405 lbf
Rope diameter ————— 42 mm
Line speed ————— 0-259 ft/min



Auxiliary winch

Line pull effective (1st layer) ————— 31,475 lbf
Rope diameter ————— 22 mm
Line speed ————— 0-233 ft/min



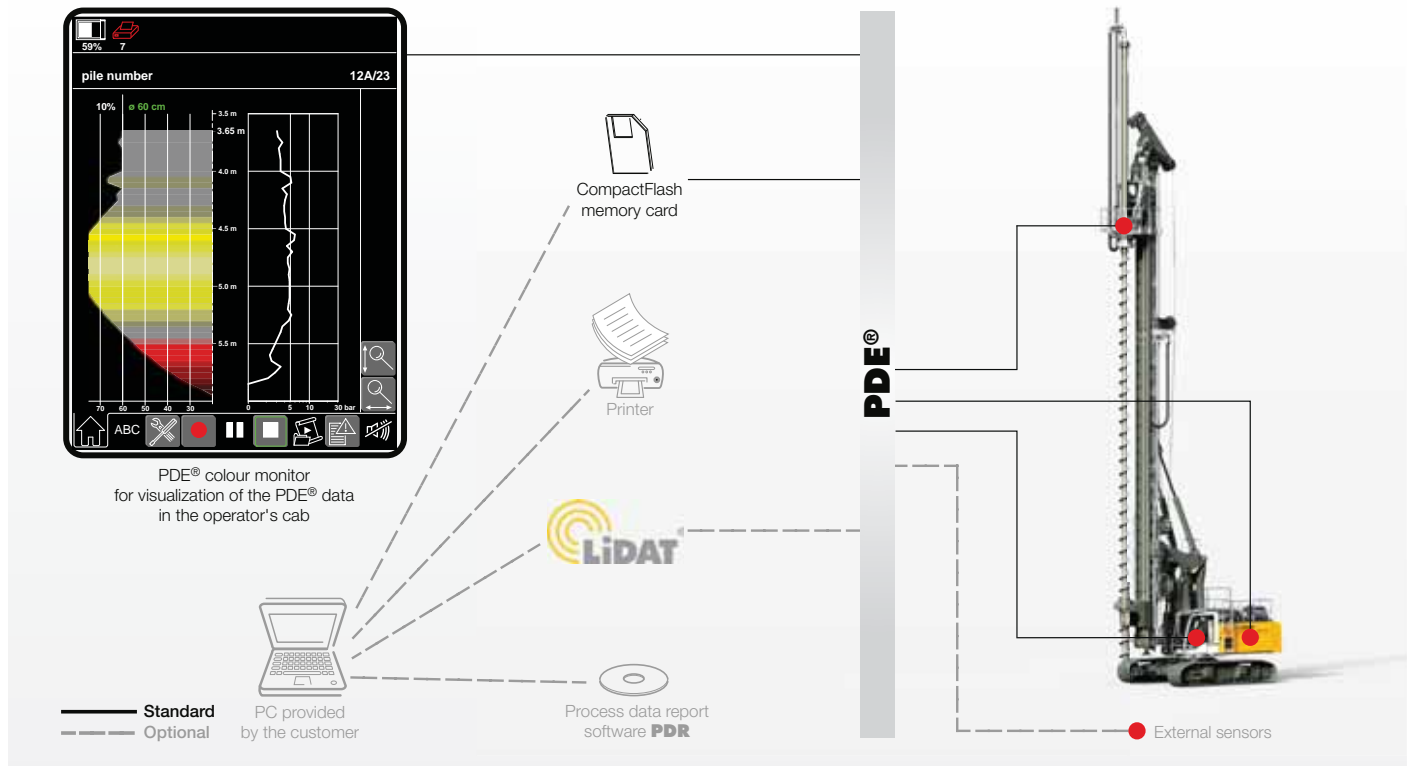
Rope crowd system

Crowd force push/pull ————— 125,895/125,895 lbf
Line pull (effective) ————— 62,950 lbf
Rope diameter ————— 30 mm
Travel ————— 65.6 ft
Travel with optional equipment ————— 75.5 ft
Line speed ————— 0-223 ft/min

The winches are noted for compact, easily mounted design. Propulsion is via a maintenance-free planetary gearbox in oil bath. Load support by the hydraulic system; additional safety factor by a spring-loaded, multi-disc holding brake. All line pull values are effective values. The efficiency factor of approx. 25% has already been deducted.

Process data recording system - PDE® (additional equipment)

The Liebherr process data recording system PDE® constantly records the relevant process data during the working process.



Depending on the application the recorded and processed data are displayed on the PDE® touchscreen in the operator's cab, e.g. in the form of an online cast-in-place pile.

At the same time the PDE® is operated using this touchscreen. The operator can enter various details (e.g. jobsite name, pile number, etc.) and start and stop recordings. A recording of every start-stop cycle carried out in the PDE® is established on a CompactFlash memory card.

The PDE® can be configured in a number of ways, e.g. for the connection of external sensors, for the generation of a simple protocol as graphic file and/or for a printout directly in the operator's cab.

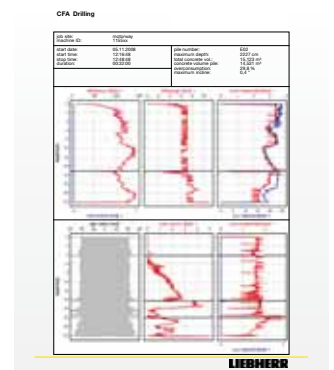
Process data reporting - PDR (additional equipment)

Comprehensive data evaluation and generation of reports on a PC is possible using the software PDR.

Recordings management - The recordings generated by the PDE® system can be imported and managed in PDR. The data can be imported directly from the CompactFlash card or via the Liebherr telematics system LiDAT. Certain recordings, e.g. for a particular day or jobsite, can be found using filter functions.

Viewing data - The data in each record is displayed tabularly. Combining several recordings provides results, for example, regarding the total concrete consumption or the average depth. Furthermore, a diagram editor is available for quick analysis.

Generating reports - A vital element of PDR is the report generator, which allows for the generation of individual reports. These can be printed out directly or stored as pdf files. In the process the size, colour, line thickness or even the desired logo can be configured. Moreover, the reports can be displayed in different languages, e.g. in English and in the national language.



Leader kinematics



Standard: Leader can be folded back.



Option: Leader can be folded forward (and back).

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