

Crawler Excavator

R 960 SME

Litronic®

Motor:
250 kW / 340 HP

Stage IV

Operating weight:

Backhoe: 60,000 – 61,650 kg

Shovel: 62,150 – 62,850 kg

Bucket Capacity:

Backhoe: 3.00 – 3.70 m³

Shovel: 3.50 m³



LIEBHERR

Crawler Excavator R 960 SME

Super Mass Excavation

Equipment and working tool

Equipment on the R 950 SME is designed to withstand the stresses and demands of a mass excavator. This equipment includes:

- Stick and bucket cylinders with increased diameter and purposely designed equipment result in higher breakout and digging forces
- Boom and stick with locking plate on internal side, increasing service life
- Optional equipment includes cylinder protection, cab front guards and much more
- HD bucket standard for increased service life and others types as option
- New short stick for strength force and a greater bucket

Undercarriage

To meet the requirements of a super mass excavator, the R 960 SME is equipped with the undercarriage of the next larger excavator. This undercarriage also features the following characteristics:

- Double grouser, beveled track pads as standard for better working and driving conditions in every types of ground
- Dual-pivot carrier rollers for increased reliability and long-term durability
- Molded two-tooth sprocket for a longer service life





Operator's cab

The new operator's cab features exceptional soundproofing, air conditioning and is standard equipped with a pneumatic seat with heating.

Other improvements equipped standard:

- 7" high resolution color touchscreen
- Fully automated A /C with 13 air vents
- Cab is mounted on viscoelastic studs
- One-piece impact resistant window (optional)
- LED headlights with adjustable current value
- Engine oil level visible on display

Uppercarriage

The uppercarriage has been designed to increase visibility to the rear of the machine.

- A new engine, that complies with stage IV/Tier 4f emissions standards
- Heavy counter-weight, for greater stability and performance
- Uppercarriage provides a wide view of the work area and the working equipment
- The fully-automatic central lubrication system, fitted as standard, allows for rapid maintenance: It saves time-consuming individual lubricating and downtime
- Rear space monitoring with camera, camera for side area monitoring or 360° SkyView camera (optional)

Technical Data



Engine

Rating per ISO 9249	250 kW (340 HP) at 1,800 RPM
Model	Liebherr D946 A7
Type	6 cylinder in-line
Bore/Stroke	130/150 mm
Displacement	11,946 l
Engine operation	4-stroke diesel Common-Rail, monoturbo
Exhaust gas treatment	SCR with urea injection emission standard stage IV/Tier 4f
Cooling system	water-cooled and integrated motor oil cooler, after-cooled and fuel cooled
Air cleaner	dry-type air cleaner with pre-cleaner, primary and safety elements
Fuel tank	770 l
Urea tank	96 l
Electrical system	
Voltage	24 V
Batteries	2 x 180 Ah/12 V
Starter	24 V/7.8 kW
Alternator	three phase current 28 V/100 A
Engine idling	sensor controlled
Motor management	connection to the integrated excavator system controlling via CAN-BUS to the economical utilisation of the service that is available



Hydraulic Controls

The controlling is conducted via the integrated excavator system technology, input and output modules, communicated via the CAN-BUS with the electronic central unit.

Power distribution	via control valves in single block with integrated safety valves
Flow summation	to boom and stick
Closed-loop circuit	for uppercarriage swing drive
Servo circuit	
Attachment and swing	proportional via joystick levers
Travel	– proportional via foot pedals or removable hand levers – speed pre-selection
Additional functions	proportional regulation via foot pedals or rocker



Hydraulic System

Hydraulic pump	for attachment and travel drive	Liebherr, variable displacement, swashplate double pump
Max. flow		2 x 380 l/min.
Max. pressure		350 bar
for swing drive		reversible, variable flow, swashplate pump, closed-loop circuit
Max. flow		201 l/min.
Max. pressure		375 bar
Pump regulation		electro-hydraulic with electronic engine speed sensing regulation, pressure compensation, flow compensation, automatic oil flow optimizer
Hydraulic tank		380 l
Hydraulic system		743 l
Hydraulic oil filter		2 full flow filters in return line with integrated fine filter area (5 µm)
Cooling system		compact cooler for water cooler, after-cooler, fuel cooler and transmission pump oil, sandwiched with cooler for oil and condenser of air-conditioning with hydrostatically controlled fan drives
MODE selection		adjustment of engine and hydraulic performance via a mode pre-selector to match application, e.g. for especially economical and environmentally friendly operation or for maximum digging performance and heavy-duty jobs
RPM adjustment		stepless adjustment of engine output via RPM at each selected mode
Tool Control		10 preadjustable pump flows and pressures for add-on tools



Swing Drive

Drive	Liebherr swash plate motor, shockless and antireaction
Transmission	Liebherr compact planetary reduction gear
Swing ring	Liebherr, sealed single race ball bearing swing ring, internal teeth
Swing speed	0 – 5.8 RPM stepless
Swing torque	160 kNm
Holding brake	wet multi-disc (spring applied, pressure released)



Operator's Cab

Cab	individual windscreens or featuring a slide-in subpart under the ceiling, work headlights integrated in the ceiling, a door with a side window (can be opened on both sides), large stowing and depositing possibilities, shock-absorbing suspension, sounddamping insulating, tinted laminated safety glass, separate window shades for the sunroof window and windscreen, 12 V plug, storage bins, lunchbox, cup holder
Operator's seat	Liebherr-Comfort seat, airsprung with automatic weight adjustment, vertical and horizontal seat damping including consoles and joysticks. Seat and armrests adjustable separately and in combination, seat heating as standard
Control system	arm consoles, swinging with the seat
Operation and displays	large high resolution colour display with selfexplanatory operation via touchscreen, video, versatile adjusting, control and monitoring facilities, e.g. climate control, implement and tool parameters
Air-conditioning	standard automatic air-conditioning, ambient air function, fast de-icing and demisting at the press of a button, air vents can be operated via a menu; ambient air and fresh air filters can be easily replaced and are accessible from the outside; heating-cooling unit, designed for extreme outside temperatures, sensors for solar radiation, inside and outside temperatures
Noise emission	
ISO 6396	L_{pA} (inside cab) = 72 dB(A)
2000/14/EC	L_{WA} (surround noise) = 106 dB(A)



Undercarriage

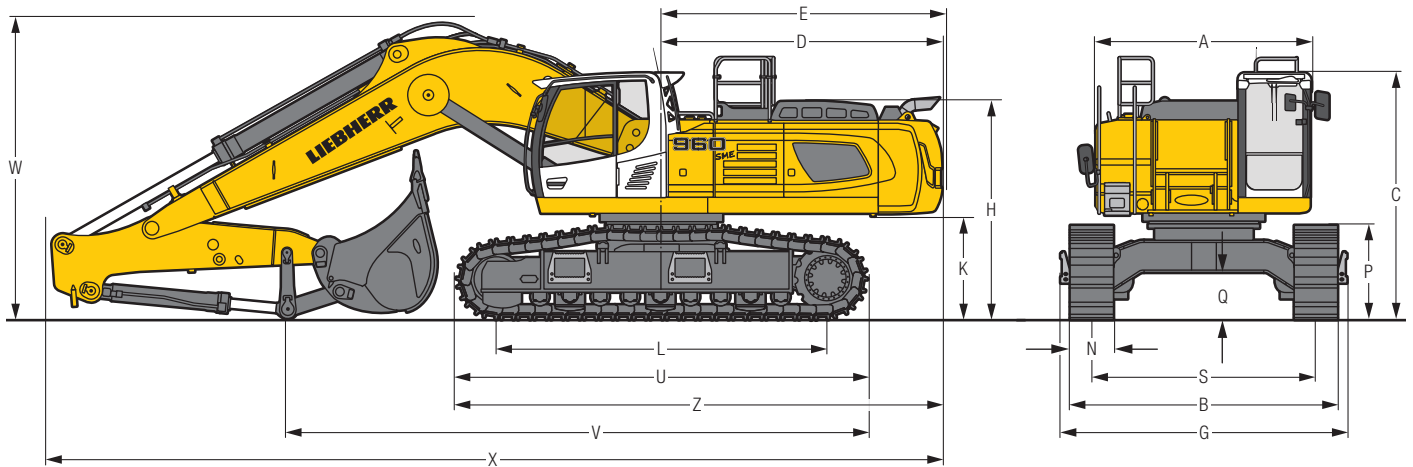
S-HD	gauge 3,100 mm
Drive	Liebherr swashplate motors with integrated brake valves on both sides
Transmission	Liebherr planetary reduction gears
Travel speed	low range – 3,0 km/h high range – 3,6 km/h
Net drawbar pull on crawler	478 kN
Track components	D 8 K, maintenance-free
Track rollers/Carrier rollers	9/2
Tracks	sealed and greased
Track pads	double grouser
Holding brake	wet multi-discs (spring applied, pressure released)
Brake valves	integrated into travel motor
Lashing eyes	integrated



Attachment

Type	combination of resistant steel plates and cast steel components
Hydraulic cylinders	Liebherr cylinders with special seal-system, shock protection
Bearings	sealed, low maintenance
Lubrication	automatic central lubrication system (except link and tilt geometry)
Hydraulic connections	pipes and hoses equipped with SAE split-flange connections
Bucket	standard equipped with Liebherr tooth system

Dimensions



	mm		
A*	2,970		
C	3,420/3,615**		
D	3,880		
E	3,900		
H	3,030		
K	1,440		
L	4,575		
P	1,315		
Q	655		
S	3,100		
U	5,695		
N	500	600	750
B	3,710	3,710	3,850
G	3,970	3,970	3,970
Z	6,730		

Mono boom SME 6.70 m		
Stick length SME 2.35 m		mm
V		8,050
W		4,200
X		12,400

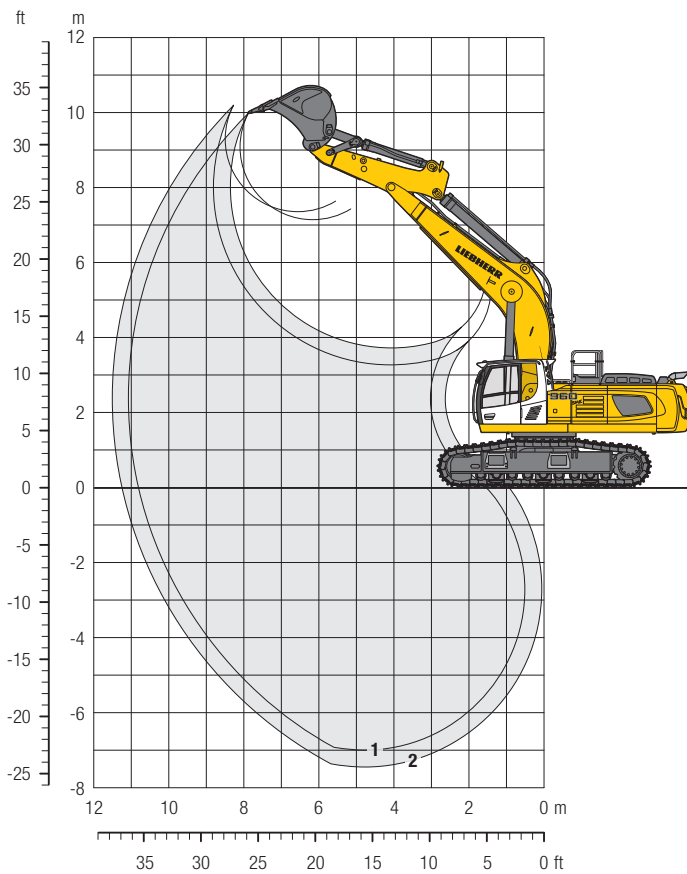
Mono boom SME 6.70 m		
Stick length SME 2.80 m		mm
V		7,500
W		4,200
X		12,400

* without door stop device and spacer

** with FOPS top guard

Backhoe Bucket

with Mono Boom SME 6.70 m



Digging Envelope

		1	2
Stick length	m	2.35	2.80
		SME	SME
Max. digging depth	m	7.00	7.45
Max. reach at ground level	m	10.80	11.25
Max. dumping height	m	7.15	7.35
Max. teeth height	m	10.00	10.20
Digging force ISO	kN	321	288
	t	32.7	29.4
Breakout force ISO	kN	350	350
	t	35.7	35.7

Operating Weight and Ground Pressure

The operating weight includes the basic machine with mono boom SME 6.70 m, stick SME 2.80 m and bucket HD 3.25 m³ (3,400 kg).

Undercarriage		S-HD		
Pad width	mm	500	600	750
Weight	kg	60,000	60,700	61,650
Ground pressure	kg/cm ²	1.21	1.02	0.83

Buckets Machine stability per ISO 10567* (75% of tipping capacity)

	Cutting width mm	Capacity ISO 7451 m ³	Weight kg	S-HD-Undercarriage SME-Attachment	
				Stick length (m)	
HD ¹⁾	2,100	3.25	3,400	2.35	2.80
	2,250	3.50	3,550	●	●
	2,100	3.70	3,500	■	▲
HDV ²⁾	1,950	3.00	3,800	●	●
	2,100	3.25	4,000	●	■
	2,100	3.50	4,200	■	▲

* Indicated loads are based on ISO 10567 max. stick length, lifted 360° on firm

¹⁾ HD bucket with teeth Z 70 (appropriate for materials above classification 6, according to VOB, Section C, DIN 18300)

²⁾ HDV bucket with teeth Z 70 (appropriate for materials above classification 6, according to VOB, Section C, DIN 18300)

Other backhoes available on request

Max. material weight ● = ≤ 2.0 t/m³, ■ = ≤ 1.8 t/m³, ▲ = ≤ 1.5 t/m³

Lift Capacities

with Mono Boom SME 6.70 m

Stick SME 2.35 m

↕ m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		↕ m		
9.0	S-HD											11.7*	11.7*	6.3
7.5	S-HD							11.0*	11.0*			11.0*	11.0*	7.6
6.0	S-HD					12.5*	12.5*	11.1*	11.1*			10.8*	10.8*	8.5
4.5	S-HD			20.5*	20.5*	14.4*	14.4*	11.9*	11.9*			10.2	10.8*	9.0
3.0	S-HD					16.3*	16.3*	12.9*	12.9*	9.9	11.1*	9.5	11.0*	9.2
1.5	S-HD					16.8	17.6*	12.4	13.6*	9.7	11.4*	9.4	11.2*	9.2
0	S-HD			20.2*	20.2*	16.5	17.8*	12.1	13.9*			9.7	11.4*	8.9
-1.5	S-HD	19.7*	19.7*	22.2*	22.2*	16.5	17.2*	12.1	13.5*			10.6	11.7*	8.4
-3.0	S-HD	24.3*	24.3*	19.7*	19.7*	15.4*	15.4*					11.7*	11.7*	7.4
-4.5	S-HD			15.0*	15.0*							11.0*	11.0*	6.0

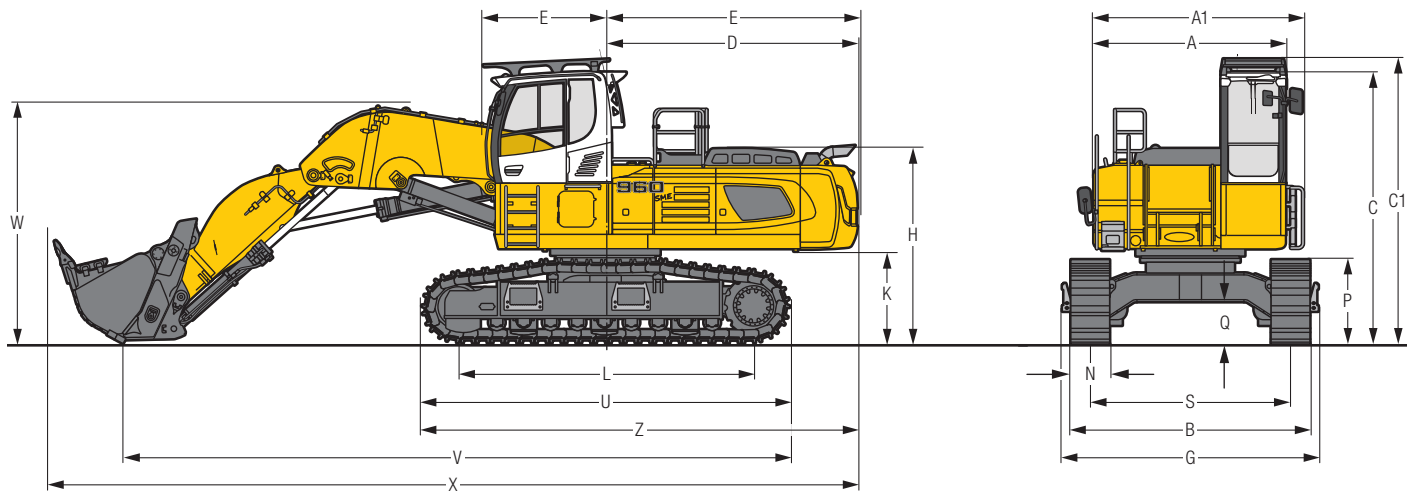
Stick SME 2.80 m

↕ m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		↕ m		
9.0	S-HD											10.1*	10.1*	6.9
7.5	S-HD							10.1*	10.1*			9.2*	9.2*	8.1
6.0	S-HD					10.5*	10.5*					8.9*	8.9*	8.9
4.5	S-HD			18.6*	18.6*	13.6*	13.6*	11.3*	11.3*	10.2*	10.2*	8.9*	8.9*	9.4
3.0	S-HD					15.6*	15.6*	12.4*	12.4*	9.9	10.7*	8.9	9.2*	9.7
1.5	S-HD			13.9*	13.9*	16.9	17.1*	12.4	13.3*	9.6	11.1*	8.8	9.8*	9.6
0	S-HD			23.3*	23.3*	16.4	17.7*	12.1	13.8*	9.5	11.3*	9.0	10.8*	9.4
-1.5	S-HD	20.2*	20.2*	23.0*	23.0*	16.3	17.4*	12.0	13.6*			9.7	11.0*	8.8
-3.0	S-HD	27.3*	27.3*	20.8*	20.8*	16.0*	16.0*	12.2	12.3*			11.2*	11.2*	7.9
-4.5	S-HD	21.6*	21.6*	16.8*	16.8*	12.7*	12.7*					10.9*	10.9*	6.6

↕ Height Can be slewed though 360° In longitudinal position of undercarriage Max. reach * Limited by hydr. capacity

The load values are quoted in tons (t) at stick end (without bucket), and may be swung 360° on firm and even ground. Adjacent values are valid for the undercarriage when in the longitudinal position. Capacities are valid for 600 mm wide track pads. Indicated loads are based on ISO 10567 standard and do not exceed 75% of tipping or 87% of hydraulic capacity (indicated via *). Without bucket cylinder, link and lever the lift capacities will increase by 950 kg. Lifting capacity of the excavator is limited by machine stability and hydraulic capacity. According to European Standard, EN 474-5: In the European Union excavators have to be equipped with an overload warning device, a load diagram and automatic safety check valves on hoist cylinders and stick cylinder(s), when they are used for lifting operations which require the use of lifting accessories.

Dimensions Front Shovel



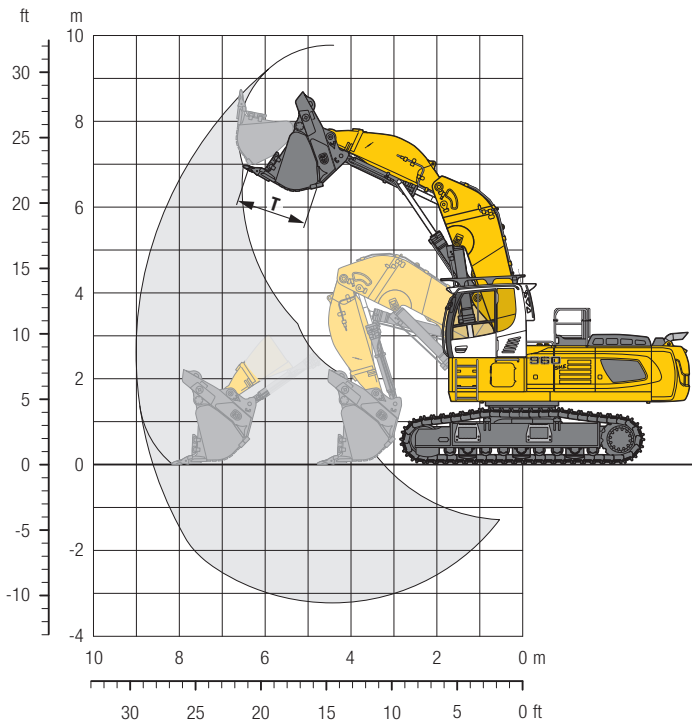
	mm
A*	2,970
A1	3,240
C	4,220/4,415**
C1	4,420
D	3,880
E	3,900
F	1,920
H	3,030
K	1,440
L	4,575
P	1,315

	mm
Q	655
S	3,100
U	5,695
N	500 600 750
B	3,710 3,710 3,850
G	3,970 3,970 3,970
Z	6,730
V	10,350
W	3,750
X	12,450

* without door stop device and spacer

** with FOPS top guard

Front Shovel



Digging Envelope

Max. reach at ground level	8.60 m
Max. dumping height	6.35 m
Max. crowd length	3.40 m
Bucket opening width T	1,650 mm

Max. crowd force	435 kN/44.3 t
Max. crowd force at ground level	275 kN/28.0 t
Max. breakout force	355 kN/36.2 t

Operating Weight and Ground Pressure

The operating weight includes the basic machine with cab elevation, shovel attachment and front shovel 3.50 m³ (6,150 kg), level II.

Undercarriage	S-HD	
	mm	600
Pad width	500	600
Weight	kg	62,150 62,850
Ground pressure	kg/cm ²	1.25 1.05

Front Shovels

Cutting width mm	Capacity ISO 7451 m ³	Weight kg	Wear kit level	S-HD-Undercarriage Shovel Attachment	
				■	■
2,450	3.50	5,650	I	■	■
2,450	3.50	6,150	II	■	■
2,450	3.50	6,600	III	■	■

Level I: For non-abrasive materials, such as limestone without flint inclusion, shot material or easily breakable rock, i.e., deteriorated rock, soft limestone, shale, etc.

Level II: For pre-blasted heavy rock, or deteriorated, cracked material (classification 3 to 4, according to DIN 18300)

Level III: For highly-abrasive materials such as rock with a high silica content, sandstone etc.

Max. material weight ■ = ≤ 1.8 t/m³

Standard Equipment

Undercarriage

Lashing eyelets
Lifetime-lubricated track rollers
Track guide at each track frame (three pieces)
Tracks sealed and greased

Uppercarriage

Engine hood with lift help
Extended tool kit
Fuel tank cap, lockable
Handrails, non slip surfaces
Heavy counterweight
Liebherr full-automatic central lubrication system
(except connecting link for bucket kinematics)
Maintenance-free swing brake lock
Rear view monitoring camera
Sound insulation
Toolbox lockable

Hydraulic System

Filter with integrated fine filter area
Hydraulic tank shut-off valve and pumps
Liebherr hydraulic oil
Pressure storage for controlled lowering of equipment with engine turned off
Pressure test ports for hydraulic
Stepless work mode selector

Engine

After-cooled
Common-Rail system injection
Conform with stage IV/Tier 4f emission standard
Dual-stage turbo charger
Fuel filter and water separator
SCR exhaust gas after-treatment system
Sensor controlled automatic engine idling

Operator's Cab

7" colour multifunction display with touchscreen
All tinted windows
Automatic air conditioning
Cigarette lighter and ashtray
Coat hook
Completely retractable windscreen
Cup holder
Dome light
Door with sliding windows
Emergency exit rear window
Engine oil level visible on display
Front windscreen (bottom) retractable
Fuel consumption indicator
Headlights (two pieces, Halogen)
Hydro mounts
LiDAT Plus (enhanced Liebherr data transfer system) *
Mechanical hour meters, readable from outside the cab
Operator seat Liebherr-Comfort
Preparation for radio installation
Rain hood over front window opening
Roll-down sun blind
Rubber floor mat
Seat belt
Storage bin
Storage space
Sunroof, right window and windshield with safety glass
Wiper/washer

Attachment

Bottom boom protection for stick
Headlights on boom (both-sided, Halogen)
Safety check valves hoist cylinder

* optionally extendable after one year

Options

Undercarriage

Protection plate for wrecking ball operation
Reinforced cover plate and base plate for centre section
Track guide at each track frame (four pieces)

Uppercarriage

360° SkyView camera
Camera for side area monitoring
Customized colors
Lighting engine compartment
Refuelling pump (electrical)
Reversible fan drive
Rock protection (swing gear and lubrication pipes)
Socket (24 V) for urea filling station
Wiggins diesel fuel

Hydraulic System

Bypass filter
Liebherr hydraulic oil, biodegradable
Liebherr hydraulic oil, specially for warm and cold regions
Preheating for hydraulic oil (240 V)

Engine

Air pre-filter with dust trap
Automatic engine shut-down (adjustable time-period)
Liebherr particle filter
Preheating for fuel, coolant or engine oil (240 V)

Operator's Cab

Additional headlights front or/and rear (Halogen or LED)
Amber beacon
Auxiliary heater (programmable timer)
Electric cool box (12 V)
Electronic drive away lock
Engine shut-down (emergency stop) in cab
Falling objects protection structure (FOPS)
Fire extinguisher
Follow me home (headlight cutoff delay)
Footrest
Front guard protection structure (FGPS)
Headlights (two pieces, LED)
Headlights with adjustable intensity (LED)
Impact resistant front window (one piece, fixed installation – can not be opened)
Impact resistant front window (two pieces, fixed installation – can not be opened)
Impact resistant glass panel in roof
Integral protection guard (FGPS + FOPS)
Operator seat Liebherr-Premium
Proportional controls Liebherr
Radio Comfort controllable from the display
Roof wiper
Seat belt 4 points
Sun visor
Travel alarm system
Windscreen wiper on bottom part

Attachment

Bottom boom protection for mono boom
Headlights on boom (LED)
High pressure circuit
Hydraulic or mechanical quick coupler
Liebherr automatic lubrication system for link geometry
Liebherr line of buckets
Liebherr tooth system
LIKUFIX
Middle pressure circuit
Overload warning device
Piston rod guard for bucket cylinders (backhoe + shovel)
Piston rod guard for crowd cylinder (shovel)
Piston rod guard for hoist cylinder (backhoe)
Safety check valves stick cylinder
Security for hoist cylinder in grab or hammer operation
Tool Control

Options and/or special attachments, supplied by vendors other than Liebherr, are only to be installed with the knowledge and approval of Liebherr in order to retain warranty.

Liebherr-France SAS

2 avenue Joseph Rey, B.P. 90287, FR-68005 Colmar Cedex
☎ +33 389 21 3030, Fax +33 389 21 3793
www.liebherr.com, E-Mail: info.lfr@liebherr.com
www.facebook.com/LiebherrConstruction