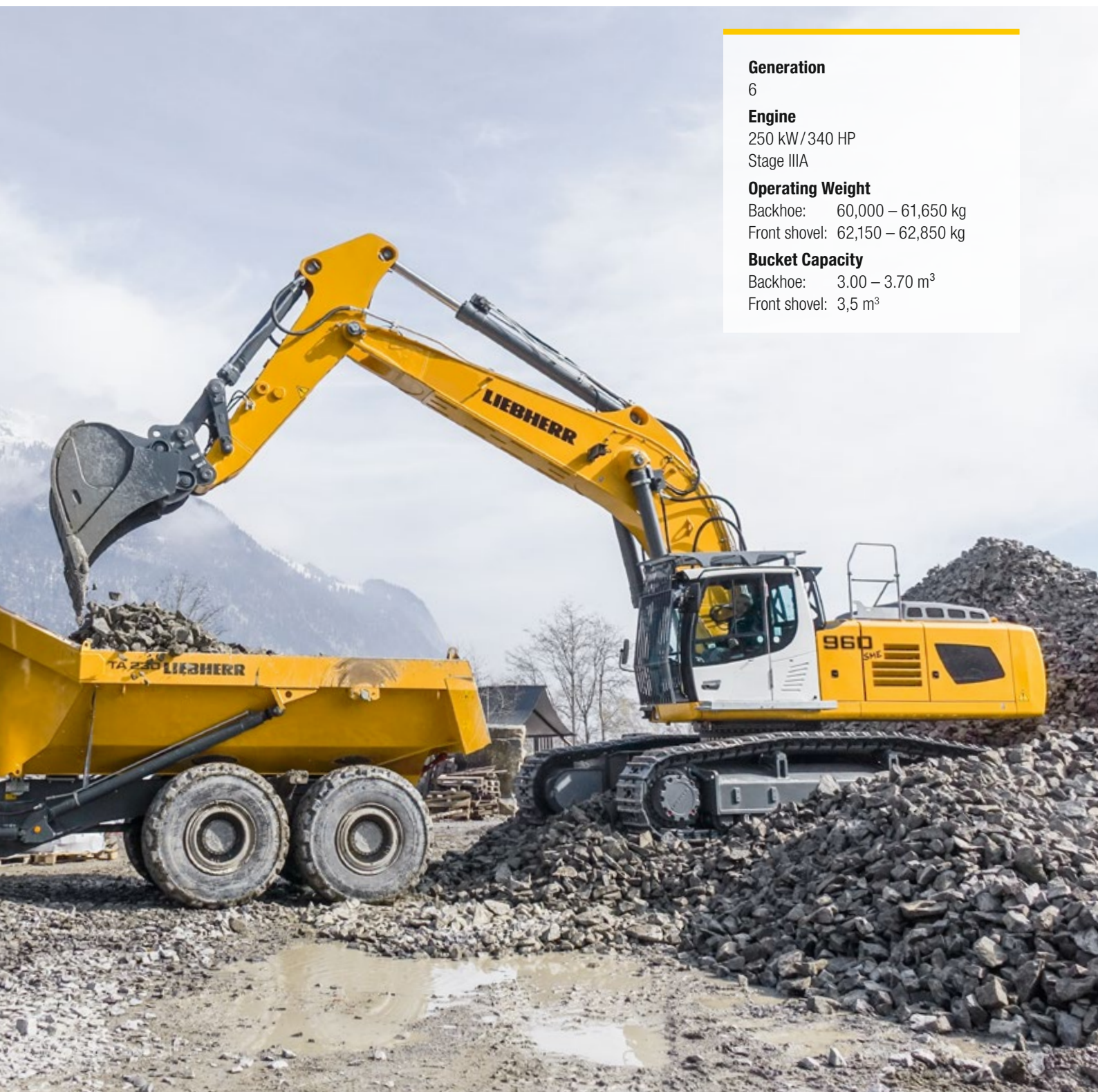


Product Information: Crawler Excavator

R 960 SME

Litronic®



Generation

6

Engine

250 kW/340 HP

Stage IIIA

Operating Weight

Backhoe: 60,000 – 61,650 kg

Front shovel: 62,150 – 62,850 kg

Bucket Capacity

Backhoe: 3.00 – 3.70 m³

Front shovel: 3,5 m³

LIEBHERR

Experience the Progress

R 960 SME – Super Mass Excavation

Safety

- Panoramic visibility with no obstructions, rear and side view monitoring cameras
- Retractable console for easy and safe access to the cab
- Emergency exit via the rear cab window, whatever the excavator's configuration
- Impact resistant windshield available as an option

Equipment

- Reinforced boom and sticks with protection on the inner face for a longer service life
- Larger diameter bucket and stick cylinders, with kinematic systems adapted to handle higher breakout and digging forces
- Different additional protection kits available as an option, for optimum adaptation to each specific application

Maintenance

- Maintenance points on the cool side of the engine
- Quick and easy cleaning and visual inspection
- Complementary radiators fitted on hinges
- Engine oil, hydraulic oil, fuel and urea (diesel exhaust fluid) levels visible on the display
- Shut-off valve to quickly and easily interrupt the circulation of oil between the tank and the hydraulic system





Comfort

- Spacious, air-conditioned work space
- Airsprung seat with vertical and longitudinal damping
- Userfriendly high resolution 7" colour touchscreen
- New LED lighting as standard

Engine

- New, more powerful Liebherr engine, with EGR valve, without diesel oxidation catalyst, and without particulate filter
- Automatic engine idling / speed increase, controlled via joystick sensors

Undercarriage

- Higher category excavator undercarriage
- Double grouser, chamfered track pads as standard for heavy duty applications
- Dual-pivot carrier rollers for increased reliability and long-term durability
- Two-tooth sprocket for a longer service life

Technical Data



Engine

Rating per ISO 9249	250 kW (340 HP) at 1,800 RPM
Torque	2,280 Nm at 1,000 RPM
Model	Liebherr D936 A7
Type	6 cylinder in-line
Bore	130 mm
Stroke	150 mm
Displacement	10,5 l
Engine operation	4-stroke diesel Common-Rail, monoturbo
Exhaust gas treatment	Engine Stage IIIA: with EGR
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	734 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/140 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	
Equipment and swing	Proportional via joystick levers
Travel	– Proportional control via foot pedals or removable levers – Speed pre-selection
Additional functions	Proportional regulation via foot pedals or mini-joystick



Hydraulic System

Hydraulic pumps	
For equipment 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 displacement, 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
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	20 pre-adjustable pump flows and pressures for add-on attachments



Swing Drive

Drive	Liebherr swashplate motor, shockless and anti-reaction
Transmission	Liebherr compact planetary reduction gears
Swing ring	Liebherr, sealed 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	Windscreen, totally or partially retractable (only upper part), under cab roof, LED work headlights integrated in the ceiling, a door with a sliding window (can be opened on both sides), large storing box and several stowing possibilities, shock-absorbing suspension, sound damping 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-Standard seat, airsprung with mechanical weight adjustment, vertical and longitudinal seat damping including consoles and joysticks. Seat and armrests adjustable separately and in combination, ventilated and antiperspirant seat
Arm consoles	Oscillating consoles with seat, tiltable console left
Operation and displays	Large high-resolution colour display with intuitive operation via touchscreen, video, versatile adjusting, control and monitoring facilities, e.g. climate control, implement and attachment 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) = 80 dB(A)
2000/14/EC	L_{WA} (surround noise) = 108 dB(A)



Undercarriage

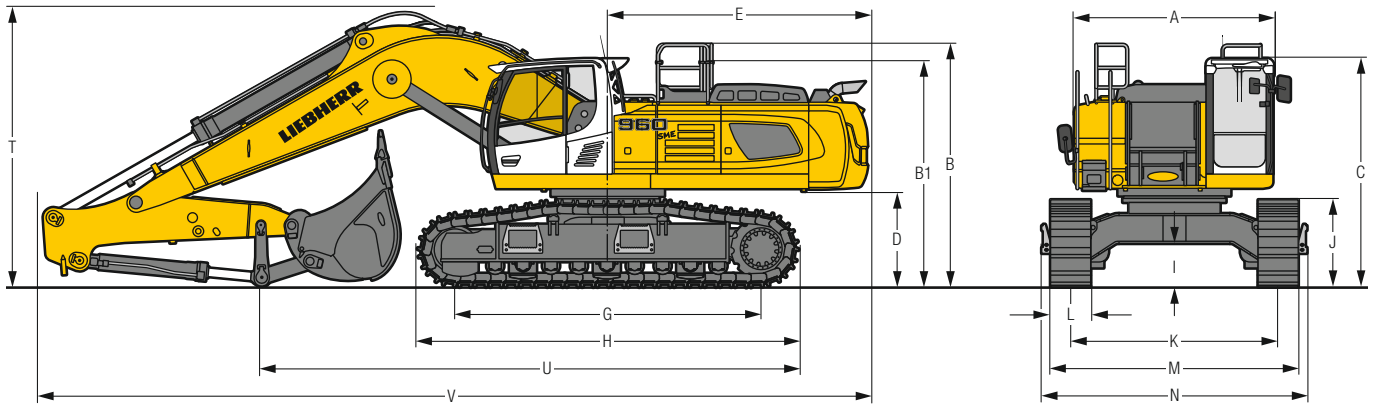
S-HD	Gauge 3,100 mm
Drive	Liebherr swashplate motor with integrated brake valve
Transmission	Liebherr compact planetary reduction gear
Maximum travel speed	Low range 3.0 km/h High range 3.6 km/h
Drawbar pull on crawler	478 kN
Track components	D8K, maintenance-free
Track rollers/ Carrier rollers	9/2
Tracks	Sealed and greased
Track pads	Double grouser
Holding brake	Wet multi-disc (spring applied, pressure released)
Brake valves	Integrated into travel motor
Lashing eyes	Integrated



Equipment

Type	Combination of resistant steel plates and cast steel components
Hydraulic cylinders	Liebherr cylinders with seal and guidance systems
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
Buckets	Standard equipped with Liebherr tooth system

Dimensions



		S-HD		mm
A	Upper-carriage width			2,970
B	Upper-carriage height			3,640
B1	Upper-carriage height (handrails folded)			3,390
C	Cab height			3,420/3,615*
D	Counterweight ground clearance			1,440
E	Rear-end length			3,900
G	Wheelbase			4,575
H	Undercarriage length			5,695
I	Undercarriage ground clearance			655
J	Track height			1,315
K	Track gauge			3,100
L	Track pad width	500	600	750
M	Width over tracks	3,710	3,710	3,850
N	Width over steps	3,970	3,970	3,970

* with FOPS top guard

		Stick length m	Mono boom SME 6.70 m direct mounting mm
T	Boom height	2.35 SME	4,200
		2.80 SME	4,200
U	Length on ground	2.35 SME	8,050
		2.80 SME	7,500
V	Overall length	2.35 SME	12,400
		2.80 SME	12,400
	Bucket		3.25 m ³

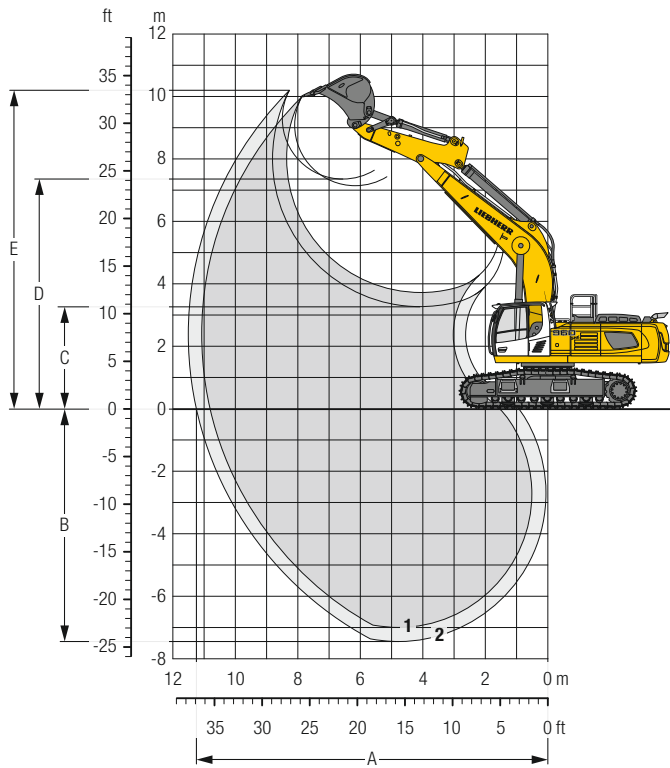
Transport Dimensions

removable elements disassembled

		Stick m	Mono boom SME 6.70 m mm		
	Pad width		500	600	750
	Transport width		3,970	3,970	3,970
	Transport length			12,400	
	Transport height	2.35 SME		4,200	
		2.80 SME		4,200	
	Bucket			3.25 m ³	

Backhoe Bucket

with Mono Boom SME 6.70 m and Counterweight 11.0 t



Digging Envelope

without quick coupler		1	2
Stick length	m	2.35	2.80
		SME	SME
A Max. reach at ground level	m	10.80	11.25
B Max. digging depth	m	7.00	7.45
C Min. dumping height	m	3.70	3.25
D Max. dumping height	m	7.15	7.35
E Max. cutting height	m	10.00	10.20

Forces

without quick coupler		1	2
Stick digging force (ISO 6015)	kN	321	288
Bucket digging force (ISO 6015)	kN	350	350
Stick digging force (SAE J1179)	kN	302	273
Bucket digging force (SAE J1179)	kN	304	304

Operating Weight and Ground Pressure

The operating weight includes the basic machine with counterweight 11.0 t, mono boom SME 6.70 m, stick SME 2.80 m and HD bucket 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-Equipment (with track pads 600 mm)	
				Stick length (m)	
				2.35	2.80
HD ¹⁾	2,100	3.25	3,400	▲	▲
	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, at maximum reach, and may be swung 360° on firm and even ground

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 buckets available upon 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, Counterweight 11.0 t and Track Pads 600 mm

Stick SME 2.35 m

Under-carriage m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		m
	Height	360°	Height	360°	Height	360°	Height	360°	Height	360°	
9.0									11.7*	11.7*	6.3
7.5							11.0*	11.0*	11.0*	11.0*	7.6
6.0					12.5*	12.5*	11.1*	11.1*	10.8*	10.8*	8.5
4.5			20.5*	20.5*	14.4*	14.4*	11.9*	11.9*	10.2	10.8*	9.0
3.0					16.3*	16.3*	12.9*	12.9*	9.9	11.1*	9.2
1.5					16.8	17.6*	12.4	13.6*	9.7	11.4*	9.2
0			20.2*	20.2*	16.5	17.8*	12.1	13.9*	9.7	11.4*	8.9
-1.5	19.7*	19.7*	22.2*	22.2*	16.5	17.2*	12.1	13.5*	10.6	11.7*	8.4
-3.0	24.3*	24.3*	19.7*	19.7*	15.4*	15.4*			11.7*	11.7*	7.4
-4.5			15.0*	15.0*					11.0*	11.0*	6.0

Stick SME 2.80 m

Under-carriage m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		m
	Height	360°	Height	360°	Height	360°	Height	360°	Height	360°	
9.0									10.1*	10.1*	6.9
7.5							10.1*	10.1*	9.2*	9.2*	8.1
6.0							10.5*	10.5*	8.9*	8.9*	8.9
4.5			18.6*	18.6*	13.6*	13.6*	11.3*	11.3*	10.2*	10.2*	9.4
3.0					15.6*	15.6*	12.4*	12.4*	9.9	10.7*	9.7
1.5			13.9*	13.9*	16.9	17.1*	12.4	13.3*	9.6	11.1*	9.6
0			23.3*	23.3*	16.4	17.7*	12.1	13.8*	9.5	11.3*	9.4
-1.5	20.2*	20.2*	23.0*	23.0*	16.3	17.4*	12.0	13.6*	9.7	11.0*	8.8
-3.0	27.3*	27.3*	20.8*	20.8*	16.0*	16.0*	12.2	12.3*	11.2*	11.2*	7.9
-4.5	21.6*	21.6*	16.8*	16.8*	12.7*	12.7*			10.9*	10.9*	6.6

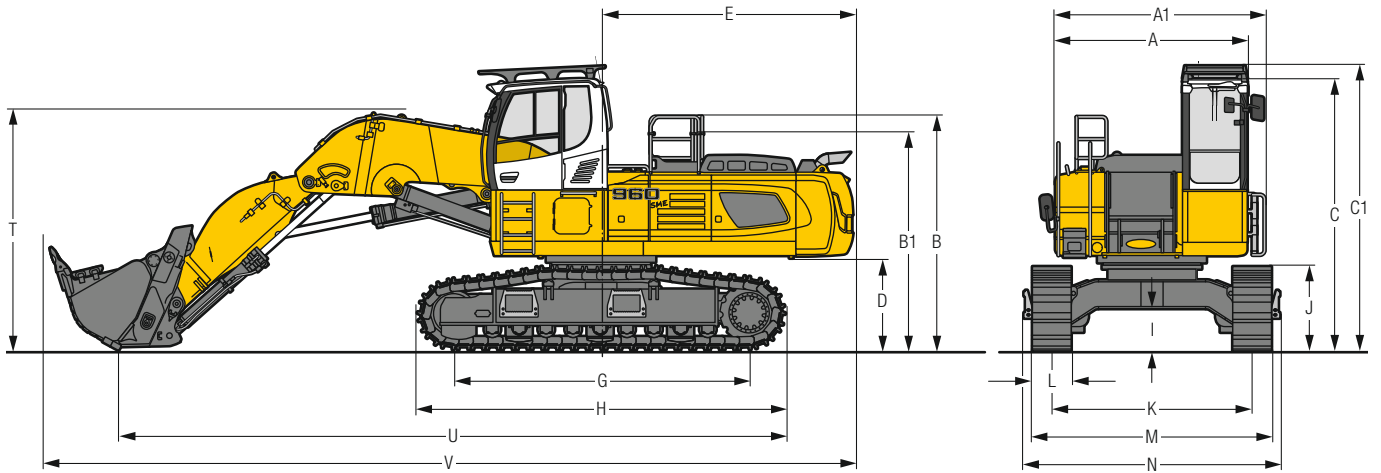
Height
 Can be slewed through 360°
 In longitudinal position of undercarriage
 Max. reach
 * Limited by hydr. capacity

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.

Determine maximum load lift from load lift chart displayed in the operator's cab or from load lift chart detailed in the operator's manual supplied with the machine.

Dimensions Front Shovel



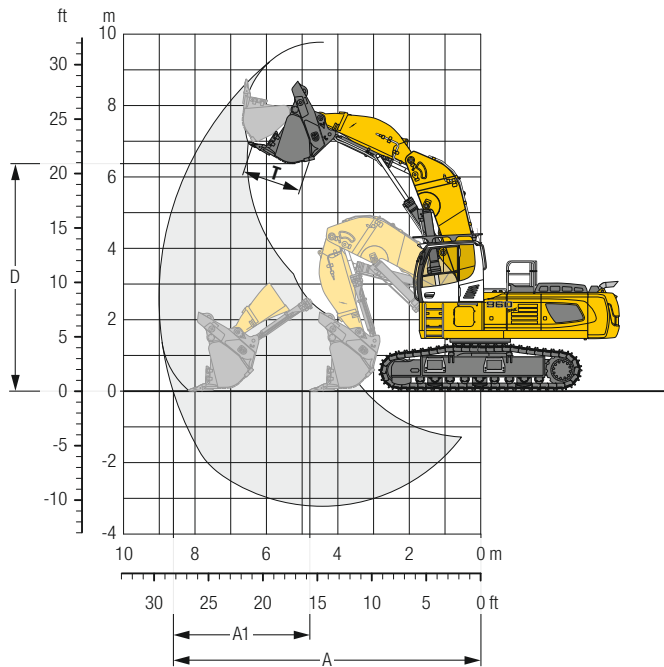
	S-HD	mm
A	Uppercarriage width	2,970
A1	Uppercarriage width with catwalks	3,030
B	Uppercarriage height	3,640
B1	Uppercarriage height (handrails folded)	3,390
C	Cab height	4,220
C1	Cab height with FOPS top guard	4,420
D	Counterweight ground clearance	1,440
E	Rear-end length	3,900
G	Wheelbase	4,575
H	Undercarriage length	5,695

	S-HD	mm
I	Undercarriage ground clearance	655
J	Track height	1,315
K	Track gauge	3,100
L	Track pad width	500 600 750
M	Width over tracks	3,710 3,710 3,850
N	Width over steps	3,970 3,970 3,970
T	Boom height	3,750
U	Length on ground	10,350
V	Overall length	12,450

Transport Dimensions removable elements disassembled

	Shovel Equipment mm		
Pad width	500	600	750
Transport width	3,970	3,970	3,970
Transport length	12,450		
Transport height	4,420		
Shovel	3.50 m ³		

Front Shovel



Digging Envelope

A Max. reach at ground level	m	8.60
A1 Max. crowd length	m	3.40
D Max. dumping height	m	6.35
T Bucket opening width	mm	1,650

Forces

Max. crowd force	kN	435
Max. crowd force at ground level	kN	275
Max. breakout force	kN	355

Operating Weight and Ground Pressure

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

Undercarriage	S-HD	
	Pad width	mm
Weight	kg	62,150 62,850
Ground pressure	kg/cm²	1.25 1.05

Front Shovels

Cutting width mm	Capacity ISO 7451 m ³	Weight kg	Wear kit level	S-HD-Undercarriage	
				Shovel Equipment	
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, accord. 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

Serial Equipment

Undercarriage

- Lashing eyes
- Sprocket with dirt ejector
- Track and carrier rollers, sealed and lifetime-lubricated
- Travel motor housing protection
- Undercarriage S-HD

Uppercarriage

- Access platforms without protruding parts
- Anti-skid surfaces
- Automatic swing brake lock
- Counterweight heavy 11.0 t
- Engine hood with gas spring opening
- Extended tool set including tool box
- Handrails
- Lockable fuel tank cap with padlock
- Lockable service doors
- Lockable storage box
- Main switch, manual, lockable
- Protection grid on radiator fan
- Sound insulation
- Swing-out radiators

Hydraulic System

- Dedicated swing circuit
- Filter with integrated fine filters
- Hydraulic pressure measuring ports
- Hydraulic tank shut-off valve
- Magnetic rod
- Pressure accumulator for controlled lowering of equipment with engine turned off

Engine

- Air filter with automatic dust ejector
- Automatic engine idling / speed increase, controlled via joystick sensors
- Common-Rail injection system
- Exhaust gas after-treatment system – EGR
- Fixed geometry turbocharger
- Fuel fine filter
- Fuel pre-filter and water separator
- Fuel priming pump
- Intercooler
- Power Pack EU Stage IIIA (for select markets)
- Stepless adjustable engine speed

Operator's Cab

- 2" seat belt with retractor
- 7" multifunction colour touchscreen
- Air conditioning, automatic, tri-zone, controlled via display
- Armrests adjustable in width, height and inclination
- Bottle holder
- Cab air filters housing, accessible from ground level
- Cab door sliding windows
- Cigarette lighter
- Coat hook
- Electric socket in cabin (12 V)
- Electric socket in cabin (24 V)
- Emergency hammer
- Engine oil level on touchscreen
- Footrest
- Fuel consumption on touchscreen
- Fuel level on touchscreen
- Interior lighting
- Laminated right hand side window
- LiDAT Plus (Liebherr data transfer system) *
- Mechanical hour meter, visible from ground level
- Movement priority between swing and boom, adjustable via touchscreen
- Rain hood over front window opening
- Rearview mirror
- Rear window emergency exit
- Roll-down sun blinds for windscreen and roof window
- Rubber floor mat, fixed on floor and removable
- Storage box
- Storage nets
- Storage spaces
- Tilttable console left
- Tinted windows
- Visco-elastic damping
- Windscreen wiper and washer
- Work mode selector

Equipment

- Anti-drift system boom cylinders
- Anti-drift system stick cylinder
- Boom bottom protection
- Boom cylinders regeneration
- Pipe fracture safety valves for boom cylinders
- Pivot points made of cast steel
- SAE split flanges on high pressure lines
- Stick bottom protection
- Stick cylinder regeneration

* optionally extendable after one year

Equipment Standard/Option

Undercarriage

Chain guide 3 pieces	+
Chain guide 4 pieces	+
Chain guide full length	+
Reinforced cover and base plate for undercarriage centre section	+
Steps	•
Track pads double grouser 500 mm, chamfered	+
Track pads double grouser 600 mm, chamfered	•
Track pads double grouser 750 mm, chamfered	+
Undercarriage protection plate for drop-ball application	+

Uppercarriage

Air pre-filter with cyclonical dust trap	+
Centralised lubrication system (automatic)	+
Centralised lubrication system (manual)	•
Catwalk tiltable front left	+
Catwalks tiltable left and right	+
Fixed cab riser 800 mm	+
Front right rearview mirror	•
Headlight on uppercarriage, lateral left, LED+, 1 piece	+1)
Headlight on uppercarriage, lateral right, LED+, 1 piece	+1)
Headlights on uppercarriage, front, LED, 2 pieces, protections included	•1)
Headlights on uppercarriage, front, LED+, 2 pieces, protections included	+1)
Headlights on uppercarriage, rear, LED+, 2 pieces	+1)
Lighting for tank area	+1)
Lighting for uppercarriage access	+1)
Pre-heating system for fuel	+
Radiator fine mesh protection grid	+
Reversible fan drive	+
Special painting	+
Swing ring and lubrication hoses protection	+
Tank refilling pump fuel	+

Hydraulic System

Bypass filter for hydraulic oil	+
Liebherr hydraulic oil	•
Liebherr hydraulic oil, adapted for extreme climate conditions	+
Liebherr hydraulic oil, biodegradable	+

Engine

Engine shut-down with overrun	+
Lighting for engine compartment	+1)

Operator's Cab

Acoustic travel alarm deactivatable	+
Auxiliary heater programmable	+
Bottom windscreen wiper	+
Cool box (12 V)	+
Dark tinted windows	+
Electrically adjustable and heated outside rear-view mirrors	+
Emergency stop in cab	+
FGPS front guard	+
FGPS front guard tiltable	+
Filter for hydraulic hammer return flow	+
Fire extinguisher	+
Follow me home	+
FOPS top guard	+
Handrests elevated for joysticks	+
Headlights on cab, front, LED, 2 pieces	•1)
Headlights on cab, front, LED+, 2 pieces	+1)
Headlights on cab roof, front, LED+, 2 pieces	+1)
High pressure circuit with Tool Control (20 attachment adjustments on display)	+
Impact resistant one-piece windscreen	+
Impact resistant roof window	+
Integral protection guard	+
Laminated roof window	•
Lighting for cabin access	+1)
Luminosity control (LED+ headlights)	+1)
Medium pressure circuit	+
Operator seat Comfort	+
Operator seat Premium	+
Operator seat Standard	•
Overload warning system	+
Radio Comfort	+
Radio pre-installation	•
Rear view monitoring camera	+
Retractable laminated two-piece windscreen	•
Right hand side view monitoring camera	+
Roof sun shield	+
Roof window wiper	+
Rotating beacon on cabin, LED, 1 piece	+
Shortcut button on joystick configurable	•
Sun visor	+
Windscreen bottom protection grid	+

Equipment

Boom cylinder rods protection	+
Bucket cylinder rod protection	+
Floating boom	+
Headlights on boom, LED, 2 pieces, protections included	•1)
Headlights on boom, LED+, 2 pieces, protections included	+1)
Mono boom SME 6.70 m	+
Pipe fracture safety valve for stick cylinder	+
Preparation for ripper tooth	+
Quick coupler SWA 77 hydraulic	+
Shovel boom 4.20 m	+
Shovel stick 2.78 m	+
Special painting	+
Stick SME 2.35 m	+
Stick SME 2.80 m	+

• = Standard, + = Option

¹⁾ Equipment not individually available, but only as predefined lighting packages
Non-exhaustive list, please contact us for further information.

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

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.

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