

Product Information

Tunneling Excavators

R 924

Compact

R 944 C

Litronic®

R 924 Compact

Operating Weight:
33,000 – 34,500 kg

Engine Output:
129 kW / 175 HP

Stage IIIA / Tier 3

Tunnel Height:
4.75 – 7.50 m

R 944 C Litronic

Operating Weight:
43,600 – 44,200 kg

Engine Output:
190 kW / 258 HP

Stage IIIA / Tier 3

Tunnel Height:
5.40 – 8.00 m



LIEBHERR

R 924 Compact Litronic

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Performances

Tunnel construction is one of the toughest environments for excavator operation that exists. The operation of a tunnel excavator becomes efficient when the machine, despite the harsh conditions, can cut out the tunnel profile required as rapidly as possible but in economical fashion. This means that a tunnel excavator must produce a high hydraulic capacity and, above all, be provided with operational fittings which are tailored to the particular application. The hydraulic system used with Liebherr tunnel excavators is optimized for milling. Liebherr tunnel excavators meet all the high demands imposed in tunnel construction in every respect, with both the basic machine and the attachment precisely matched to this particular type of work, and consistently designed to achieve real economical performance.

Reliability

Liebherr tunnel excavators are the result of decades of practical experience in the development of truly reliable special equipment for demanding situations. All the materials used have undergone intensive, long-term tests and meet high Liebherr quality standards even under the hardest conditions. In addition to being extremely robust, the attachment on Liebherr tunnel excavators is able to rotate $2 \times 45^\circ$. The mechanical quick coupling system is provided with a reinforced locking unit and a wear protection element on the hook side. The sophisticated concept and the tried and trusted quality make Liebherr tunnel excavators the absolute standard for reliability.

Safety

The special cab is safeguarded with FOPS and FGPS as standard. To prevent damage from falling rocks, all the hoses in exposed locations on the equipment fittings are additionally secured by protection plates. The bucket cylinder is also attached in a lower position, and a cover fitted to both the lifting rams protects the hoses running between them.

Comfort

Characteristic of the special cab on the Liebherr tunnel excavator are the ergonomic design and high standard of operating comfort and convenience. The windows on the right and at the rear are fitted with polycarbonate panes, resistant to scratches and impacts, and feature extremely good visibility properties. As an option, the cab is also available with polycarbonate window panes all round.

Tunneling version

Equipment

- Special tunnel boom with 2 x 45° tilting mechanism
- Optimal disposition and protection of hoses and pipes
- Liebherr quick coupler for a simpler tool changing
- Special position of cylinders to be better protected

Undercarriage

- Dozer blade with cylinder protection
- Deflector blades
- Travel drive protection
- 3 track guides at each track frame





Operator's cab

- Adjustable seat with synthetic leather seat cover, easy to clean
- Good visibility in height
- Integrated FOPS protection and FGPS in the front
- Electronic components with protection (display and keyboard)

Tunneling specifics

- Uppercarriage with steel structure
- Back-up warner
- Working headlights with protection
- Hydraulic system optimized for the cutting head application

Technical Data



Engine

Rating per ISO 9249	129 kW (175 HP) at 1,800 RPM
Torque	820 Nm at 1,500 RPM
Model	Liebherr D934 S
Type	4 cylinder in-line
Bore/Stroke	122/136 mm
Displacement	6.36 l
Engine operation	4-stroke diesel unit pump system turbo-charged after-cooled reduced emissions
Cooling system	water-cooled and integrated motor oil cooler
Air cleaner	dry-type air cleaner with pre-cleaner, primary and safety elements
Fuel tank	345 l
Electrical system	
Voltage	24 V
Batteries	2 x 135 Ah / 12 V
Starter	24 V / 7.8 kW
Alternator	three-phase current 28 V / 100 A
Engine idling	sensor controlled



Hydraulic Controls

Power distribution	via control valve with integrated safety valves
Servo circuit	
Attachment and swing	proportional via joystick levers
Travel	– with proportionally functioning foot pedals or adjusted with plugable levers – speed pre-selection
Additional functions	via foot pedals or joystick toggle switch for milling cutter/hammer, 2 x 45° rotator and dozer blade



Hydraulic System

Hydraulic pump	Positive Control Classic, regulation with Liebherr, variable displacement, swashplate double pump, proportional controller hydraulically steered
Max. flow	2 x 214 l/min.
Max. pressure	380 bar
Pump regulation	electro-hydraulic with electronic engine speed sensing regulation, pressure compensation, minimum flow adjustment, flow compensation, torque controlled swing drive priority
Hydraulic tank	147 l
Hydraulic system	max. 360 l
Hydraulic oil filter	1 full flow filter (20 µm) in return line with integrated fine filter area (5 µm) and an additional leakage filter
Cooling system	compact cooler, consisting of a fuel and water cooler, hydraulic oil cooler, after-cooler cores and hydrostatically driven fan
MODE selection	adjustment of engine and hydraulic performance via a mode pre-selector to match application
ECO	for especially economical and environmentally friendly operation
POWER	for maximum digging power and heavy duty jobs
LIFT	for lifting
FINE	for precision work and lifting through very sensitive movements
RPM adjustment	stepless adjustment of engine output via the rpm at each selected mode
Tool Control	10 preadjustable pump flows and pressures for add-on tools



Swing Drive

Drive	Liebherr swashplate motor
Transmission	Liebherr compact planetary reduction gear
Swing ring	Liebherr, sealed race ball bearing swing ring, internal teeth
Swing speed	0 – 12.7 RPM stepless
Swing torque	70.2 kNm
Holding brake	wet multi-disc (spring applied, pressure released)
Option	pedal controlled positioning brake



Operator's Cab

Cab	according to guidelines for tunnel application FOPS, FGPS and polycarbonate windows on attachment side
Operator's seat	shock absorbing suspension, adjustable to operator's weight, 6-way adjustable seat
Control system	integrated into adjustable seat consoles
Monitoring	menu driven query of current operating conditions via the LCD display. Automatic monitoring, display, warning (acoustical and optical signal) and saving machine malfunction data, for example, engine overheating, low engine oil pressure or low hydraulic oil level
Noise emission 2000/14/EC	L _{WA} (surround noise) = 102 dB(A)



Undercarriage

HD-SL	heavy duty, wide gauge and longer crawler length
Drive	Liebherr swashplate motors with integrated brake valves on both sides
Transmission	Liebherr planetary reduction gears
Travel speed	low range – 3.2 km/h high range – 5.3 km/h
Net drawbar pull on crawler	208 kN
Track components	D6C, maintenance-free
Track rollers / Carrier rollers	8/2
Track	sealed and greased
Track pads	double or triple grouser
Holding brake	wet multi-discs (spring applied, pressure released)
Brake valves	integrated into travel motor

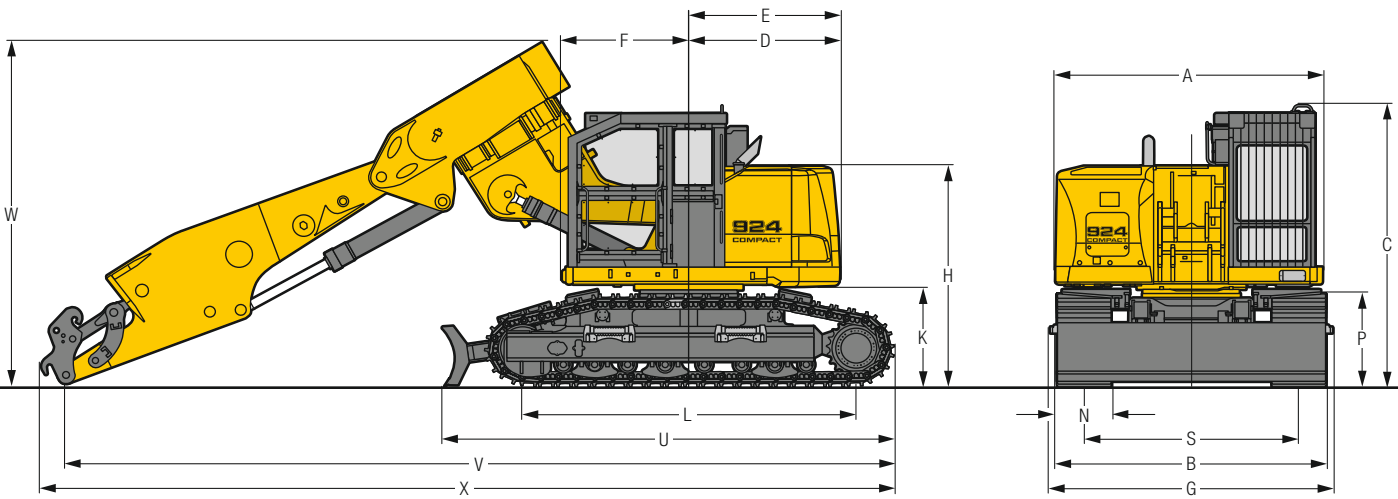
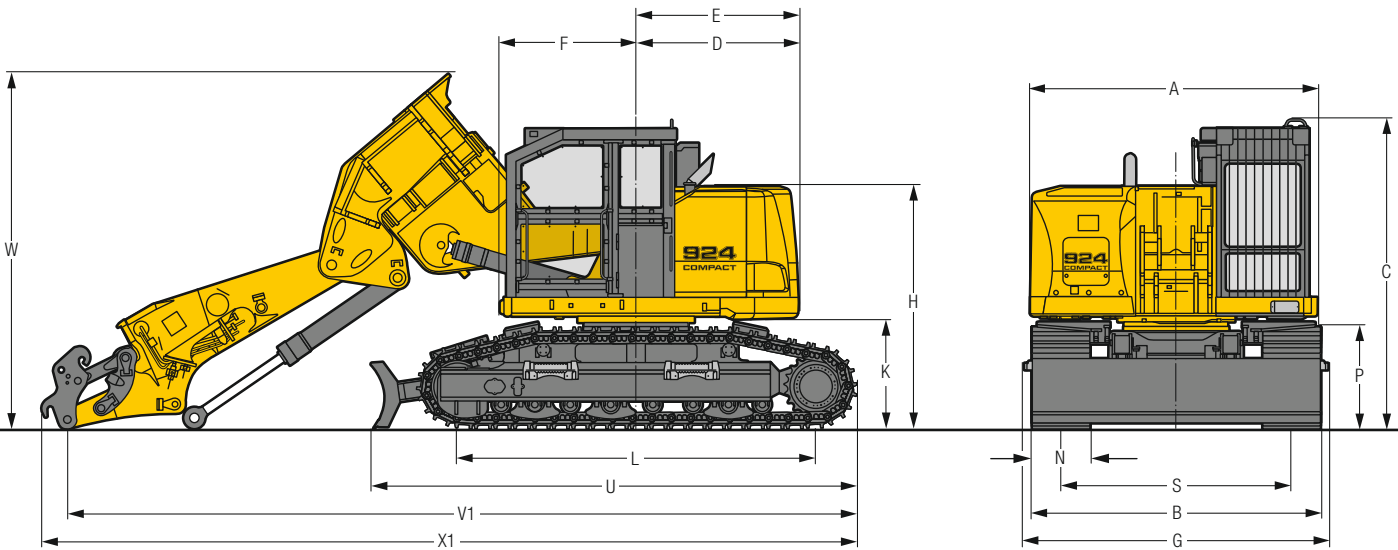


Attachment

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 splitflange connections
Basic boom	3.03 m or 3.30 m with 2 x 45° rotator
Stick	3.20 m or 4.20 m with integrated bucket tilt cylinder
Bucket	HD ripper bucket with cutting width 700 mm

Dimensions

R 924 Compact



	mm
A	2,990
C	3,230
D	1,690
E	1,690
F	1,415
H	2,525
K	1,145
L	3,750
P	1,065
S	2,400
U	5,070
N	600
B	3,000
G	3,160

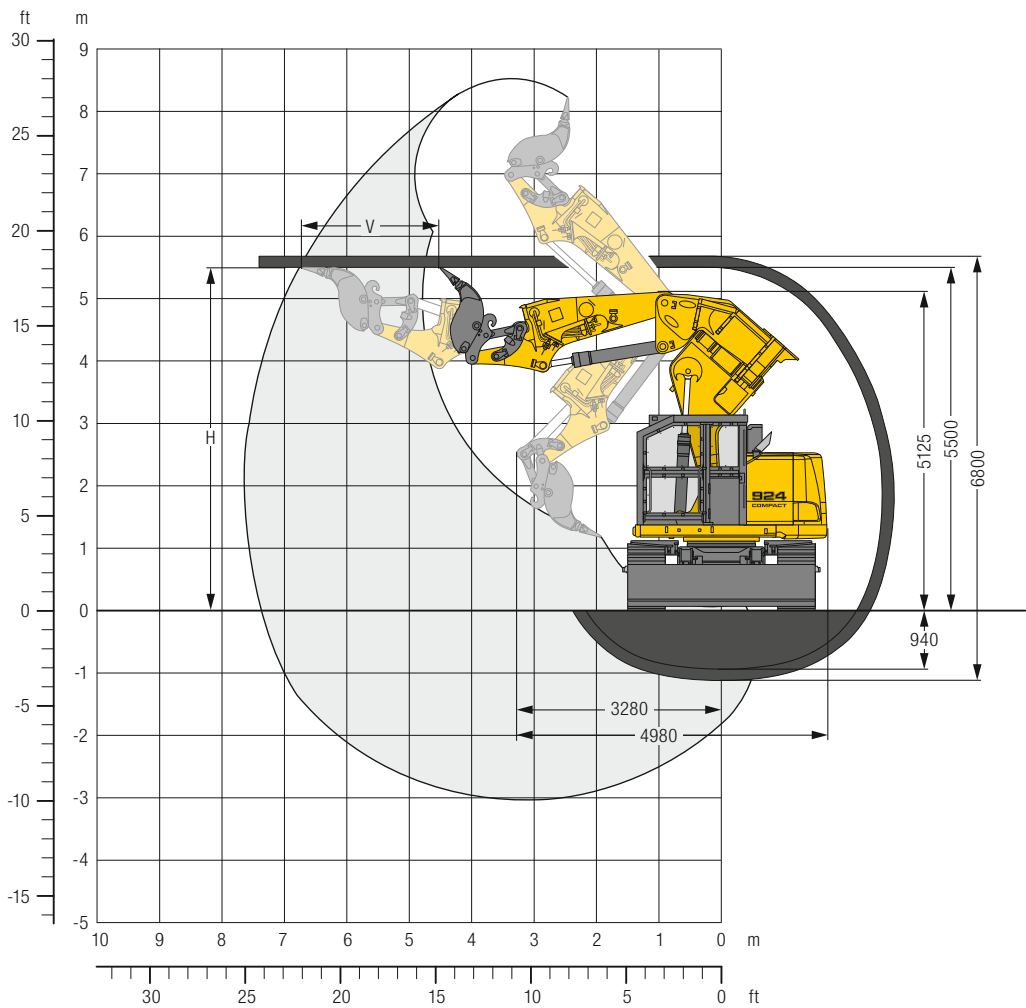
Boom 3.03 m with 2 x 45° rotator and stick 3.20 m		mm
V		8,080
V1		8,240
W		3,860
W1		3,710
X		8,360
X1		8,510

Boom 3.30 m with 2 x 45° rotator and stick 4.20 m		mm
V		9,300
W		4,000
X		9,600

Tunneling Excavator

with Boom 3.03 m, 2 x 45° Rotator and Stick 3.20 m

R 924 Compact



Digging Envelope

Basic boom bolted in position II of uppercarriage

Tunnel height H m	Advance V m
4.75	1.20
5.00	2.05
5.50	2.25
6.00	2.10

Operating Weight and Ground Pressure

The operating weight includes the basic machine with boom 3.03 m, 2 x 45° rotator, stick 3.20 m, quick coupler SW48 and bucket 0.16 m³ (700 kg).

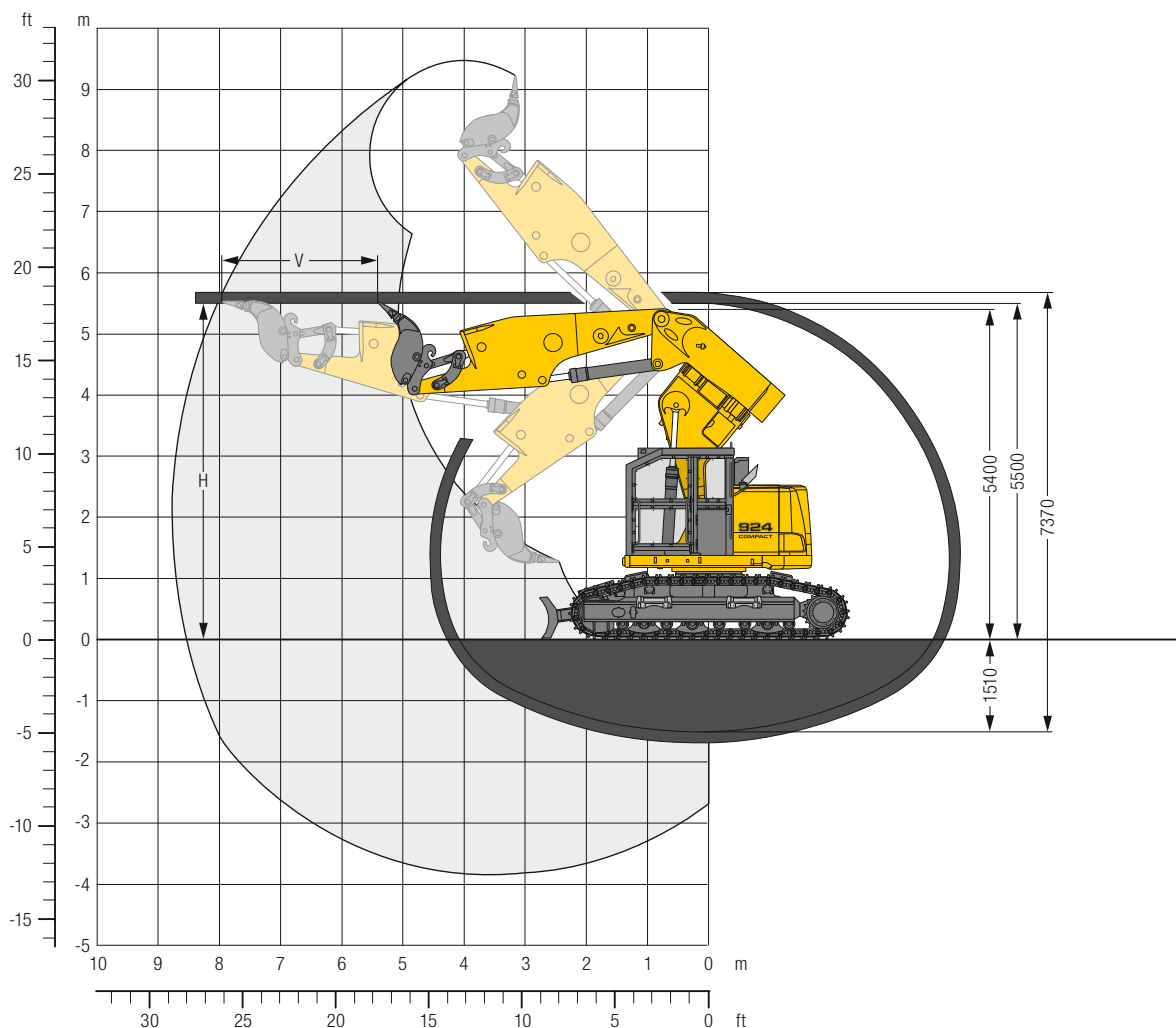
Undercarriage	HD-SL
Pad width	mm 600
Weight	kg 33,000
Ground pressure	kg/cm² 0.68

Digging Forces

without quick coupler	
Max. digging force ISO	kN 142
	t 14.5
Max. breakout force ISO	kN 145
	t 14.8

Tunneling Excavator

with Boom 3.30 m, 2 x 45° Rotator and Stick 4.20 m



R 924 Compact

Digging Envelope

Basic boom bolted in position II of uppercarriage

Tunnel height H m	Advance V m
5.50	2.50
6.00	2.40
6.50	2.20
7.00	2.10
7.50	1.90

Operating Weight and Ground Pressure

The operating weight includes the basic machine with boom 3.30 m, 2 x 45° rotator, stick 4.20 m, quick coupler SW48 and bucket 0.16 m³ (700 kg).

Undercarriage	HD-SL
Pad width	mm 600
Weight	kg 34,500
Ground pressure	kg/cm ² 0.71

Digging Forces

without quick coupler

Max. digging force ISO	kN 116
	t 11.8
Max. breakout force ISO	kN 144
	t 14.7

Technical Data



Engine

Rating per ISO 9249	190 kW (258 HP) at 1,800 RPM
Torque	1,225 Nm at 1,300 RPM
Model	Liebherr D936 L
Type	6 cylinder in-line
Bore/Stroke	122/150 mm
Displacement	10.5 l
Engine operation	4-stroke diesel unit pump system turbo-charged after-cooled reduced emissions
Cooling system	water-cooled and integrated motor oil cooler
Air cleaner	dry-type air cleaner with pre-cleaner, primary and safety elements
Fuel tank	580 l
Electrical system	
Voltage	24 V
Batteries	2 x 170 Ah/12 V
Starter	24 V/6.6 kW
Alternator	three-phase current 28 V/100 A
Engine idling	sensor controlled



Hydraulic Controls

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	– with proportionally functioning foot pedals or adjusted with plugable levers – speed pre-selection
Additional functions	via foot pedals or joystick toggle switch for milling cutter/hammer, 2 x 45° rotator and dozer blade



Hydraulic System

Hydraulic pump	
for attachment and travel drive	Liebherr, variable displacement, swashplate double pump
Max. flow	2 x 245 l/min. (+ 60 l/min. for milling cutter operation)
Max. pressure	380 bar
for swing drive	reversible, variable flow, swashplate pump, closed-loop circuit
Max. flow	149 l/min.
Max. pressure	350 bar
Pump regulation	electro-hydraulic with electronic engine speed sensing regulation, pressure compensation, minimum flow adjustment, flow compensation
Hydraulic tank	340 l
Hydraulic system	550 l
Hydraulic oil filter	1 full flow filter in return line with integrated fine filter area (5 µm)
Cooling system	compact cooler, consisting of a fuel and water cooler, hydraulic oil cooler, after-cooler cores and hydrostatically driven fan
MODE selection	adjustment of engine and hydraulic performance via a mode pre-selector to match application
ECO	for especially economical and environmentally friendly operation
POWER	for maximum digging power and heavy duty jobs
LIFT	for lifting
FINE	for precision work and lifting through very sensitive movements
RPM adjustment	stepless adjustment of engine output via the rpm at each selected mode



Swing Drive

Drive	Liebherr swashplate motor with integrated brake valves
Transmission	Liebherr compact planetary reduction gear
Swing ring	Liebherr, sealed race ball bearing swing ring, internal teeth. Lubrication via a grease distributor and a grease nipple
Swing speed	0 – 8.2 RPM stepless
Swing torque	84 kNm
Holding brake	wet multi-disc (spring applied, pressure released)
Option	pedal controlled positioning brake



Operator's Cab

Cab	according to guidelines for tunnel application FOPS, FGPS and polycarbonate windows on attachment side
Operator's seat	shock absorbing suspension, adjustable to operator's weight, 6-way adjustable seat
Control system	integrated into adjustable seat consoles
Monitoring	menu driven query of current operating conditions via the LCD display. Automatic monitoring, display, warning (acoustical and optical signal) and saving machine malfunction data, for example, engine overheating, low engine oil pressure or low hydraulic oil level
Noise emission	
2000/14/EC	L_{WA} (surround noise) = 105 dB(A)



Undercarriage

Drive	Liebherr swashplate motors with integrated brake valves on both sides
Transmission	Liebherr planetary reduction gears
Travel speed	low range – 2.8 km/h high range – 5.0 km/h
Net drawbar pull on crawler	246 kN
Track components	D7G, maintenance-free
Track rollers / Carrier rollers	9/2
Tracks	sealed and greased
Track pads	double or triple grouser
Holding brake	wet multi-discs (spring applied, pressure released)
Brake valves	integrated into travel motor

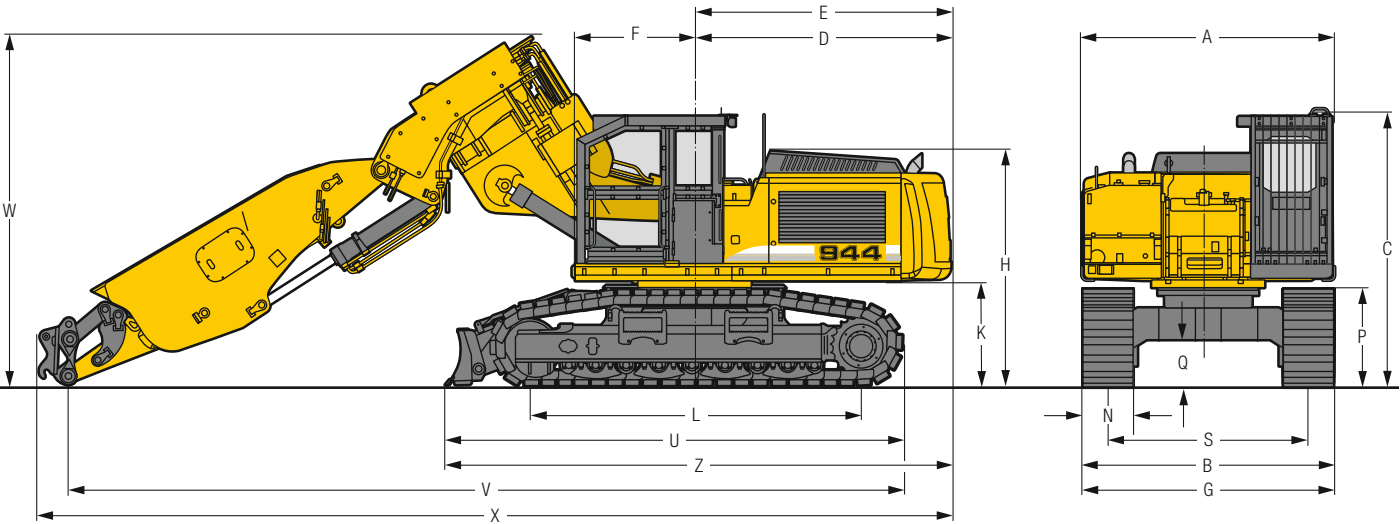
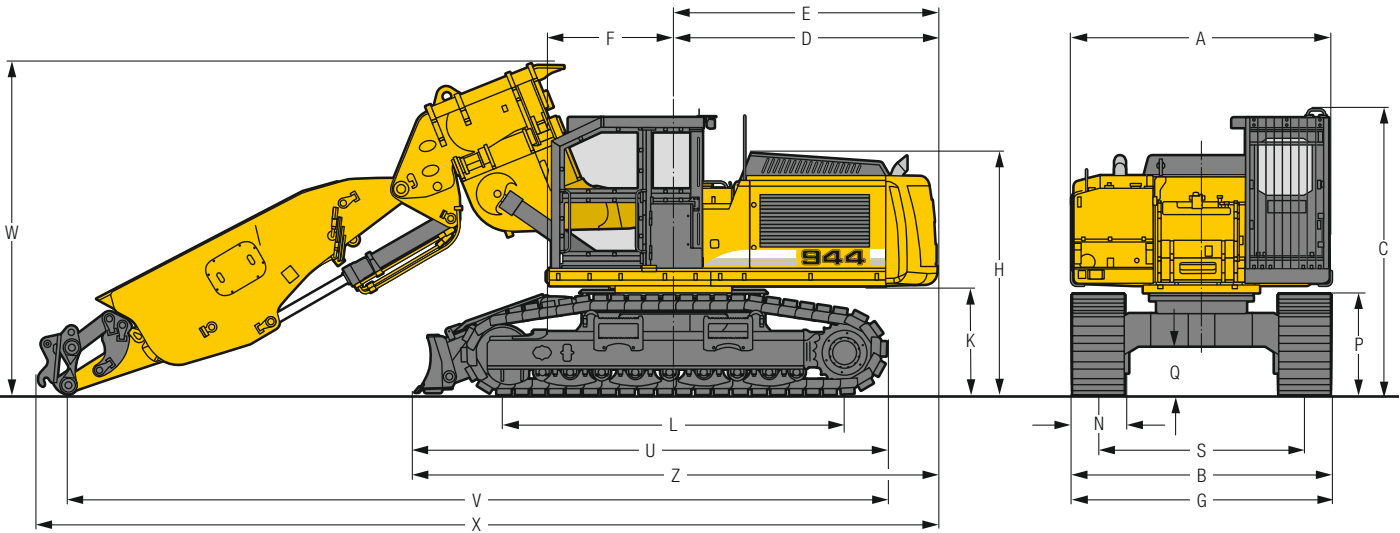


Attachment

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 splitflange connections
Basic boom	3.07 m or 3.70 m with 2 x 45° rotator
Stick	4.50 m with integrated bucket tilt cylinder
Bucket	HD ripper bucket with cutting width 700 mm

Dimensions

R 944 C



	mm
A	3,035
C	3,340
D	3,075
E	3,075
F	1,465
H	2,815
K	1,240
L	4,000
P	1,170
Q	555
S	2,400
U	5,500
Z	6,090
N	500 600
B	3,020 3,020
G	3,050 3,050
Z	6,090

Boom 3.07 m with 2 x 45° rotator and stick 4.50 m		mm
V		9,550
W		3,900
X		10,550

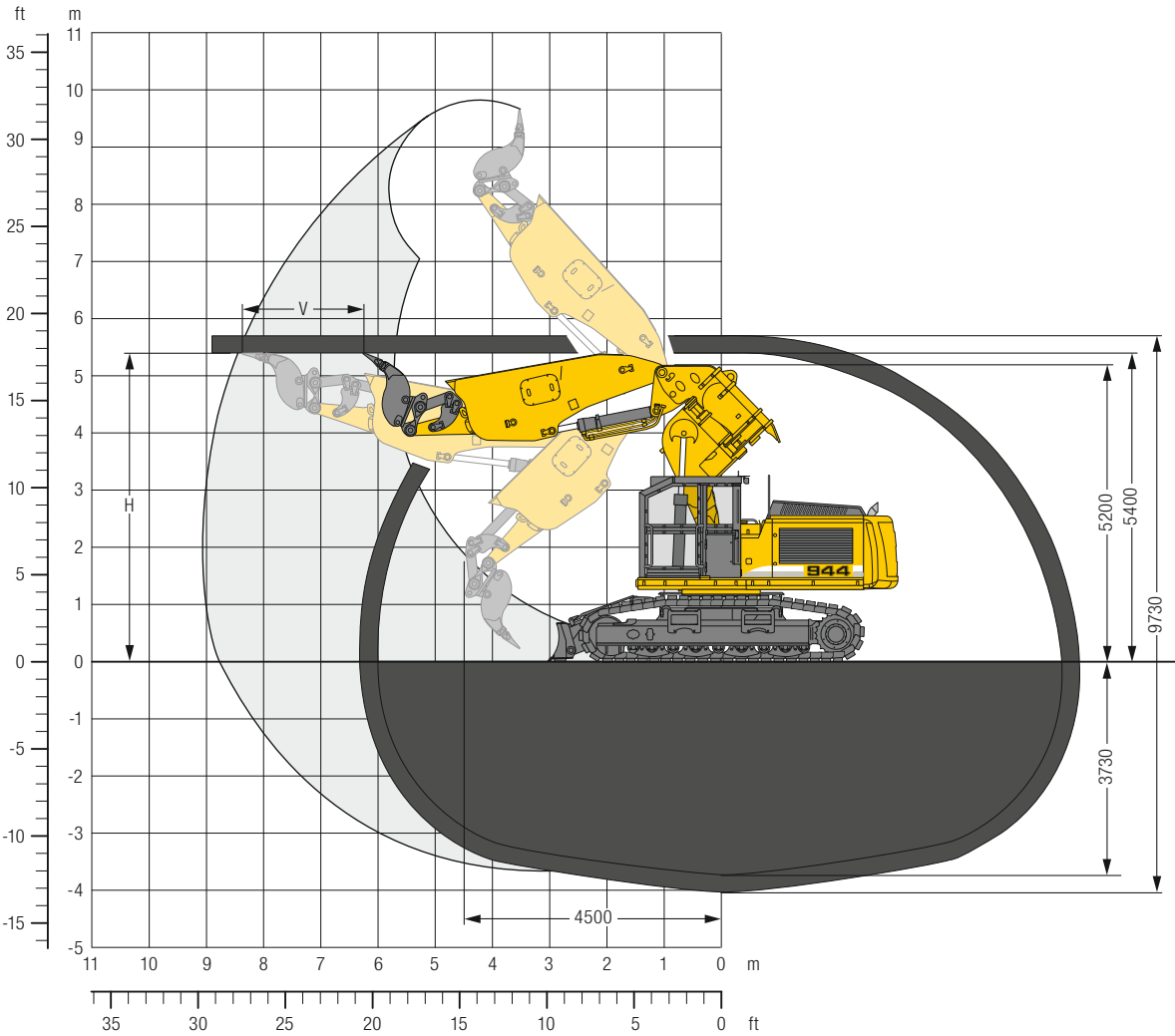
Boom 3.70 m with 2 x 45° rotator and stick 4.50 m		mm
V		10,000
W		4,200
X		11,000

R 944 C

Tunneling Excavator

with Boom 3.07 m, 2 x 45° Rotator and Stick 4.50 m

R 944 C



Digging Envelope

Basic boom bolted in position II of uppercarriage

Tunnel height H m	Advance V m
5.40	2.10
6.00	1.90
6.50	1.75
7.00	1.60

Digging Forces

without quick coupler	
Max. digging force ISO	kN 164
	t 16.7
Max. breakout force ISO	kN 191
	t 19.5

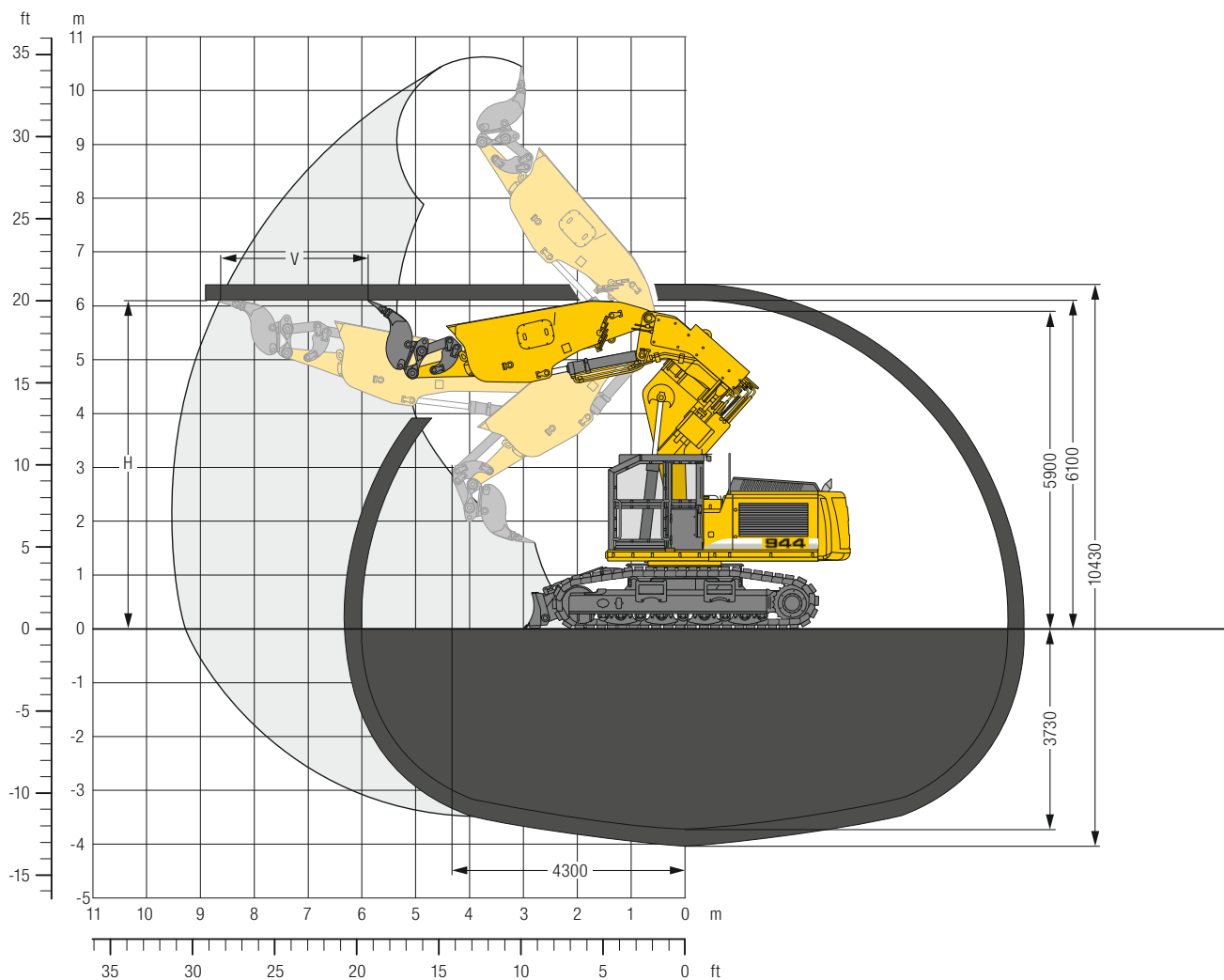
Operating Weight and Ground Pressure

The operating weight includes the basic machine with boom 3.07 m, 2 x 45° rotator, stick 4.50 m, quick coupler SW48 and bucket 0.16 m³ (700 kg).

Undercarriage	HD-S
Pad width	mm 500 600
Weight	kg 43,600 44,000
Ground pressure	kg/cm² 1.00 0.84

Tunneling Excavator

with Boom 3.70 m, 2 x 45° Rotator and Stick 4.50 m



R 944 C

Digging Envelope

Basic boom bolted in position II of uppercarriage

Tunnel height H m	Advance V m
6.10	2.70
6.50	2.60
7.00	2.40
7.50	2.20
8.00	2.00

Operating Weight and Ground Pressure

The operating weight includes the basic machine with boom 3.70 m, 2 x 45° rotator, stick 4.50 m, quick coupler SW48 and bucket 0.16 m³ (700 kg).

Undercarriage	HD-S	
Pad width	mm	500 600
Weight	kg	43,800 44,200
Ground pressure	kg/cm²	1.01 0.85

Digging Forces

without quick coupler	
Max. digging force ISO	kN 171
	t 17.4
Max. breakout force ISO	kN 191
	t 19.5

Equipment

Undercarriage

Chain guide 3 pieces	•
Chain scrapers	•
Dozer blade 3,000 mm with cylinder protection	•
Idler protection	•
Reinforced base panel for centre section	•
Track pads 600 mm	•
Track rollers, lifetime-lubricated	•
Tracks, sealed and greased	•
Travel drive protection	•
Two-stage travel motors	•

Uppercarriage

Alternator 100 A	•
Back-up alarm	•
Bottom and lateral protection for uppercarriage	•
Electrical device shut off	•
Engine hood with gas spring opening and mechanical locking	•
Fire extinguisher	•
Handrails	•
Maintenance-free HD-batteries	•
Non slip surfaces	•
Protection grid on radiator fan	•
Radiator protection grid	•
Sound insulation	•
Swing brake lock, maintenance-free	•
Tool kit	•
Foot pedal swing positioning brake	+
Special painting	+
Tank refilling pump fuel	+

Hydraulic System

Additional hydraulic circuits	•
Control kit for emergency towing	•
Electronic pump regulation	•
Filter with integrated fine filter area	•
Positive Control system	•
Pressure compensation	•
Pressure storage for controlled lowering of equipment with engine turned off	•
Pressure test ports for hydraulic	•
Shut-off valve between hydraulic tank and pumps	•
Stepless adjustment engine output	•
Work mode selector	•
Tool Control, 10 tool adjustments selectable over the display	•
Biodegradable hydraulic oil	+
Bypass filter for hydraulic oil	+
Control kit for rotary drive	+



Engine

Conform with stage IIIA/Tier 3 emission standard	•
Dry-type air cleaner with pre-cleaner, main and safety elements	•
Engine idling, automatic, sensor-controlled	•
Fuel water separator	•
Intercooler	•
Laminated radiator	•
Turbo charger	•
Unit pump system	•
Liebherr particle filter	+



Operator's Cab

6-way adjustable operator seat with synthetic leather seat cover	•
Additional headlights	•
Additional headlights cab, rear, LED, 2 pieces	•
Cab for tunneling application	•
Display cover	•
Fire extinguisher	•
Multifunction display	•
Polycarbonate window at attachment side and rear window	•
Rear window emergency exit	•
Seat belt	•
Structural design according to guidelines FOPS, FGPS	•
Closed cab (additional door and window) with windshield wiper	+
Structural design according to guidelines ROPS	+



Attachment

12 t lifting hook with safety link on bucket or on quick coupler	•
Cylinders with shock absorber	•
Hydraulic lines for additional tools	•
Protection for hoist cylinders hoses	•
Liebherr central lubrication system, fully-automatic (except connecting link for bucket kinematics)	•
Liebherr quick coupler, mechanical	•
Piston rod protection for hoist cylinder	•
ReGeneration plus	•
Working lights on boom and stick	•
SAE split flanges on all high pressure lines	•
Sealed pivots/shaft seal between bucket and stick	•
High pressure circuit	+
Liebherr bucket range	+
Quick couplers for tools	+
Special application buckets	+
Special painting	+

Undercarriage

Chain guide 4 pieces	•
Chain scrapers	•
Dozer blade 3,000 mm with cylinder protection	•
Idler protection	•
Track rollers, lifetime-lubricated	•
Tracks, sealed and greased	•
Travel drive protection	•
Two-stage travel motors	•

Uppercarriage

Alternator 100 A	•
Back-up alarm	•
Bottom and lateral protection for uppercarriage	•
Electrical device shut off	•
Engine hood with gas spring opening and mechanical locking	•
Fire extinguisher	•
Handrails	•
Maintenance-free HD-batteries	•
Non slip surfaces	•
Sound insulation	•
Swing brake lock, maintenance-free	•
Tool kit	•
Foot pedal swing positioning brake	+
Special painting	+
Tank refilling pump fuel	+

Hydraulic System

Additional hydraulic circuits	•
Control kit for emergency towing	•
Electronic pump regulation	•
Filter with integrated fine filter area	•
Minimum flow adjustment	•
Pressure compensation	•
Pressure storage for controlled lowering of equipment with engine turned off	•
Pressure test ports for hydraulic	•
Shut-off valve between hydraulic tank and pumps	•
Work mode selector	•
Biodegradable hydraulic oil	+
Bypass filter for hydraulic oil	+
Control kit for rotary drive	+
Hydraulic safeguard for overhead hammer work	+
Reversible fan	+
Swing brake torque reducer	+

Engine

Air pre-filter with dust trap	•
Conform with stage IIIA/ Tier 3 emission standard	•
Direct injection	•
Dry-type air cleaner with pre-cleaner, main and safety elements	•
Engine idling, automatic, sensor-controlled	•
Turbo charger	•
Liebherr particle filter	+

Operator's Cab

6-way adjustable operator seat with synthetic leather seat cover	•
Additional headlights	•
Additional headlights cab, rear, LED, 2 pieces	•
Cab for tunneling application	•
Display cover	•
Fire extinguisher	•
Polycarbonate window at attachment side and rear window	•
Rear window emergency exit	•
Storage space	•
Structural design according to guidelines FOPS, FGPS	•
Closed cab (additional door and window) with windshield wiper	+
Structural design according to guidelines ROPS	+

Attachment

12 t lifting hook with safety link on bucket or on quick coupler	•
Cylinders with shock absorber	•
Hydraulic lines for additional tools	•
Protection for hoist cylinders hoses	•
Liebherr central lubrication system, fully-automatic (except connecting link for bucket kinematics)	•
Piston rod protection for hoist cylinder	•
ReGeneration plus	•
SAE split flanges on all high pressure lines	•
Sealed pivots / shaft seal between bucket and stick	•
Working lights on boom and stick	•
High pressure circuit	+
Liebherr bucket range	+
Liebherr quick coupler, mechanical	+
Quick couplers for tools	+
Special application buckets	+
Special painting	+

• = Standard, + = Option

Non-exhaustive list, please contact us for further information.

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.

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.

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.

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.

Hans Liebherr founded the Liebherr family company in 1949. Since that time, the enterprise has steadily grown to a group of more than 130 companies with over 41,000 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