en **Operator's manual**

Hydraulic excavator

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ORIGINAL OPERATOR'S MANUAL

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1.1.2 Uppercarriage

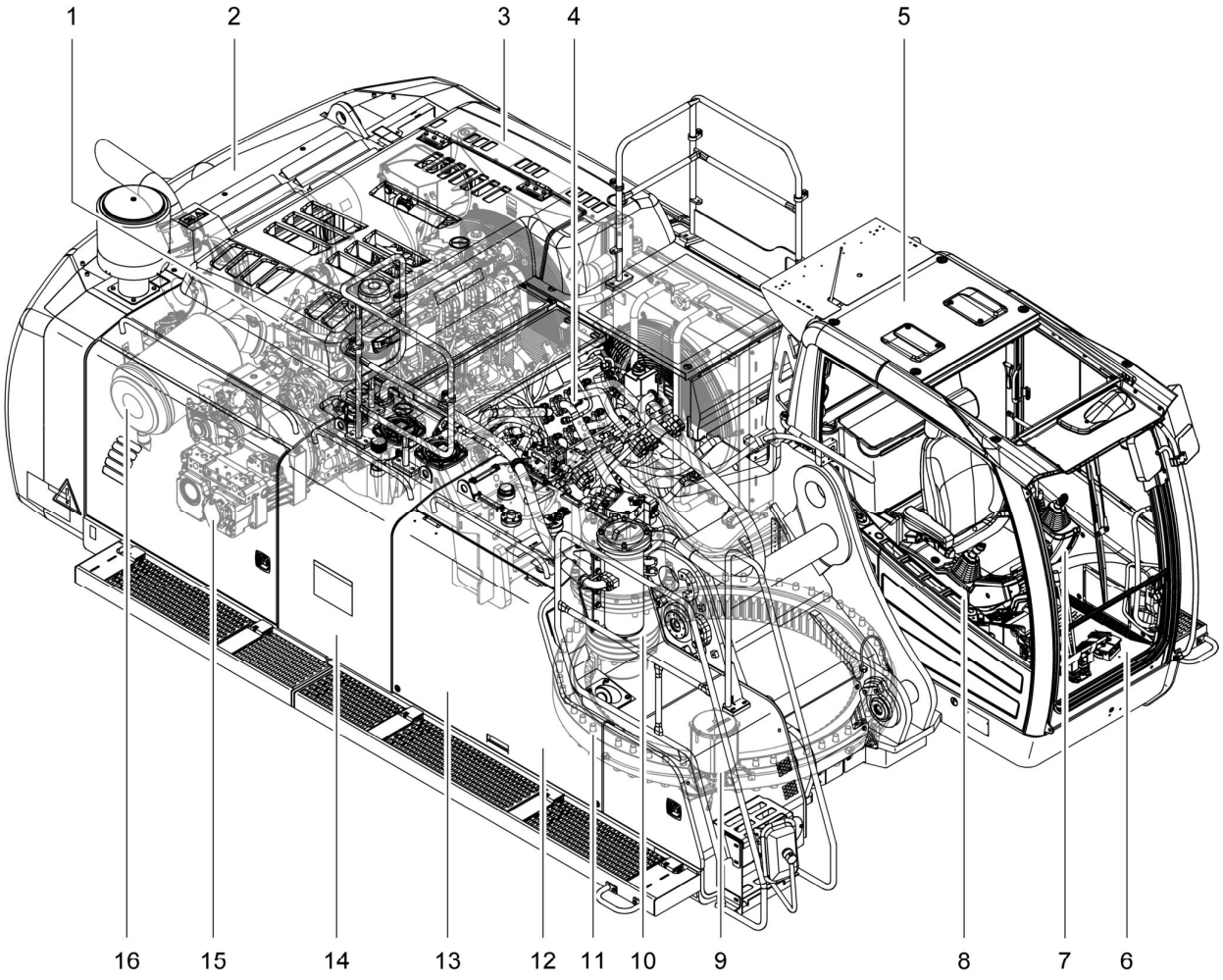

Fig. 4: Uppercarriage

1 Diesel engine
2 Counterweight
3 Radiator
4 Control valve block
5 Operator's cab
6 Operator's platform
7 Left console
8 Right console
9 Central lubrication system
10 Slewing gearbox
11 Slewing ring
12 Diesel exhaust fluid tank
13 Fuel tank
14 Hydraulic tank
15 Hydraulic pump
16 Air filter

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Technology Serving Productivity
Responsive and accurate, the R 956 crawler excavators are high performance excavators for mass excavation works or for digging in quarries. With its proven hydraulic design and variety of operating modes, the R 956 excavator can be used in all major worksites or quarries.

Liebherr Integration
All the major components are designed and manufactured within the Liebherr group. This includes components such as the heat engine, hydraulic pumps, electronic components (injection mapping, hydraulic control, control console) and of course the essential mechanical elements including cylinders, the slewing ring and work tools, resulting in an overall increase in productivity.

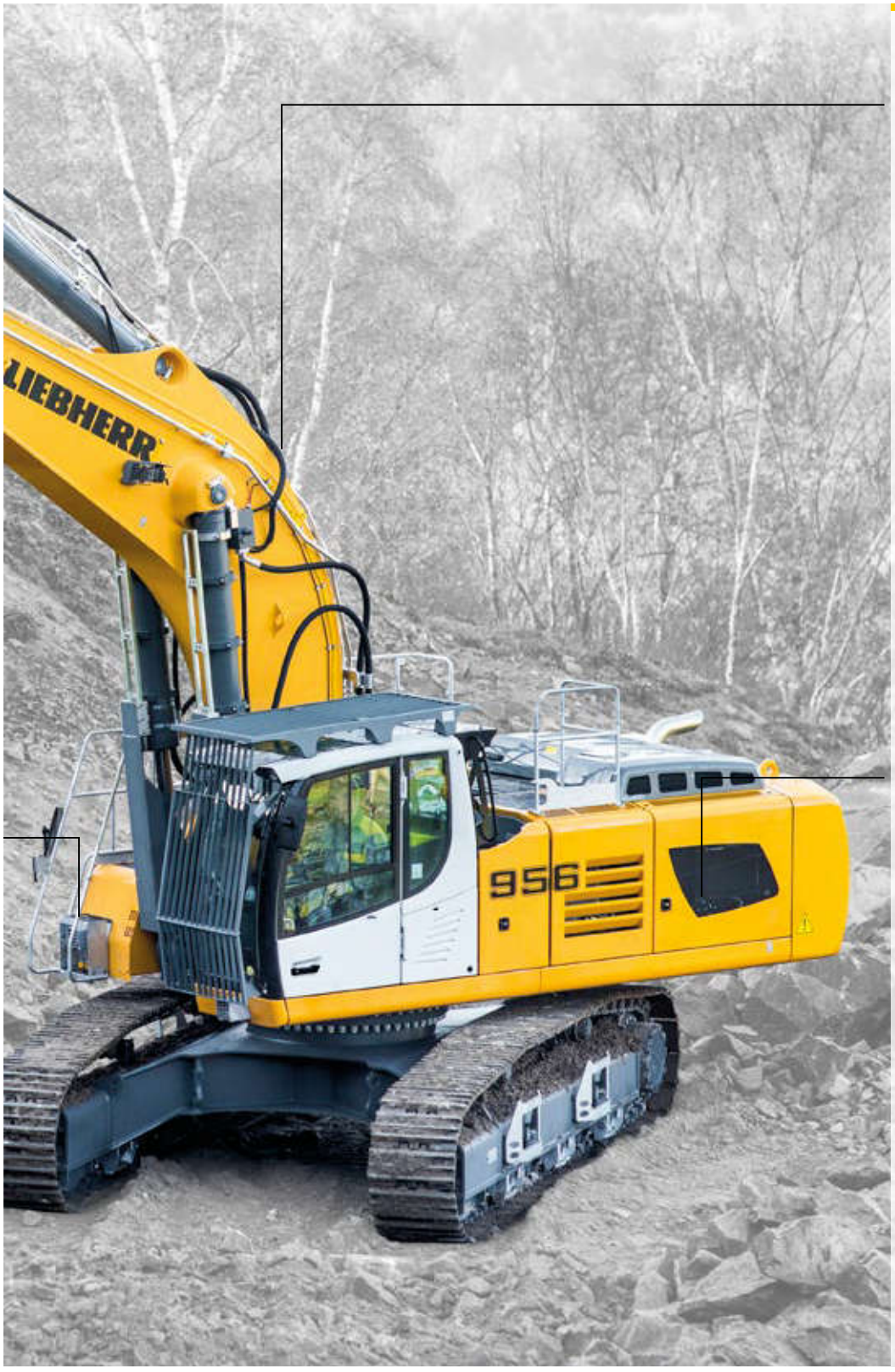
Regeneration Plus
The „Regeneration Plus“ function allows for the accelerated lowering of the boom, reduced losses of pressure and an improved work cycle. The optimization and combination of the „zero-pressure lowering of the boom“ and „Regeneration plus“ functions, together with the increased power of the hydraulics, provide increased performance and lower consumption.

Power and Speed
Thanks to their kinematics and hydraulic power, the R 956 crawler excavators develop increased breakout and digging forces. The generously sized cylinders allow you to increase the break-out performance in hard materials.
The mechanical link between the rotation engine and slewing ring gives the machine a high torque and swing speed, thus improving your operating cycles.

Liebherr Engine
- New Final Tier 4/Stage IV engine with SCR exhaust gas after-treatment system
- Designed specifically for construction applications
- Liebherr Common-Rail injection system for optimised output
- Automatic fuel-saving idling system
- Two-stage turbocharging with intercooler, for increased power at low revs and reduced fuel consumption

Choice of Work Mode
- E Mode – Economy: for economical and ecologically-friendly operation. Minor restriction of power without affecting the load lifting and excavating capacities
- P Mode – Power: for high excavation capacities and difficult applications. Pump flow and power are not limited
- S Mode – Sensitivity: for precision jobs and loading of materials
- P+ Mode – Full Power: especially designed for increased power; only recommended for extreme applications

Floating Boom Function
- Increased hydraulic flow for the other cylinders (stick and/or bucket for example)
- More power available, making it easier to extract materials and reduce work cycle times
- Increased service life when a hydraulic hammer is used



Visibility

- Rear camera integrated in the counterweight
- Two boom-mounted lights – standard
- Optimized design of the whole upercarriage providing the operator with a better field of vision

Operator's Cab

- Comfortable and ergonomic
- 7" high resolution color touchscreen for heightened readability
- Rear window with improved visibility

Lift Capacities

with Mono Boom 7.60 m, Counterweight 9.0 t and Track Pads 600 mm

Stick 2.35 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
LC	10.5															
	9.0							10.5*	10.5*					9.9*	9.9*	7.5
	7.5							10.5*	10.5*					8.6	9.2*	8.7
	6.0			18.2*	18.2*	13.3*	13.3*	10.7	11.2*	8.0	10.1*			7.3	8.9*	9.5
	4.5					13.7	15.5*	10.1	12.2*	7.7	10.5*			6.5	8.9*	10.0
	3.0					12.5	17.4*	9.5	13.2*	7.4	11.0*			6.1	9.1*	10.2
	1.5					12.0	16.7*	9.0	13.9*	7.1	11.2			6.0	9.4	10.2
	0					11.9	17.8*	8.8	14.0*	7.0	11.1			6.1	9.7	9.9
	−1.5			13.0*	13.0*	12.0	17.0*	8.8	13.7*	7.0	11.1*			6.6	10.3*	9.5
	−3.0			18.4*	18.4*	12.3	15.5*	9.0	12.5*					7.5	10.2*	8.7
	−4.5			15.4*	15.4*	12.7	12.9*							9.5	9.6*	7.5
	−6.0															
LC-V	10.5															
	9.0							10.6*	10.6*					9.8*	9.8*	7.5
	7.5							10.6*	10.6*					9.1*	9.1*	8.7
	6.0					13.5*	13.5*	11.3*	11.3*	8.8	10.2*			7.9	8.9*	9.5
	4.5					14.9	15.7*	11.0	12.3*	8.5	10.6*			7.2	8.9*	10.0
	3.0					13.8	17.5*	10.4	13.3*	8.1	11.1*			6.8	9.1*	10.2
	1.5					13.3	17.1*	10.0	13.9*	7.9	11.4*			6.7	9.6*	10.2
	0					13.3	17.7*	9.8	14.0*	7.7	11.5*			6.9	10.2*	9.9
	−1.5			14.5*	14.5*	13.3	16.9*	9.8	13.6*	7.8	11.0*			7.4	10.3*	9.5
	−3.0			18.2*	18.2*	13.6	15.3*	10.0	12.4*					8.5	10.1*	8.7
	−4.5			15.0*	15.0*	12.5*	12.5*							9.6*	9.6*	7.5
	−6.0															
HD	10.5															
	9.0							10.7*	10.7*					9.9*	9.9*	7.5
	7.5							10.5*	10.5*					9.0	9.2*	8.7
	6.0					13.3*	13.3*	11.2*	11.2*	8.4	10.1*			7.6	8.9*	9.5
	4.5					14.3	15.5*	10.6	12.2*	8.1	10.5*			6.9	8.9*	10.0
	3.0					13.2	17.4*	9.9	13.2*	7.8	11.0*			6.5	9.1*	10.2
	1.5					12.7	16.8*	9.5	13.9*	7.5	11.4*			6.3	9.5*	10.2
	0					12.6	17.8*	9.3	14.0*	7.3	11.5*			6.5	10.2*	9.9
	−1.5			13.2*	13.2*	12.7	16.9*	9.3	13.6*	7.3	11.1*			7.0	10.3*	9.5
	−3.0			18.4*	18.4*	12.9	15.4*	9.4	12.5*					8.0	10.2*	8.7
	−4.5			15.3*	15.3*	12.8*	12.8*							9.6*	9.6*	7.5
	−6.0															

Stick 2.90 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
LC	10.5															
	9.0							9.6*	9.6*					7.6*	7.6*	8.2
	7.5							9.8*	9.8*	8.3	9.4*			7.1*	7.1*	9.3
	6.0					12.3*	12.3*	10.5*	10.5*	8.1	9.5*			6.6	6.9*	10.0
	4.5					14.1	14.5*	10.2	11.6*	7.8	10.0*			6.0	6.8*	10.5
	3.0					12.9	16.6*	9.6	12.7*	7.4	10.6*	5.8	9.1	5.6	7.0*	10.7
	1.5					12.1	17.7*	9.1	13.5*	7.1	11.1*	5.7	9.0	5.5	7.3*	10.7
	0					11.9	17.9*	8.8	13.9*	6.9	11.0			5.6	7.9*	10.5
	−1.5			14.9*	14.9*	11.9	17.3*	8.7	13.8*	6.8	10.9			6.0	8.9*	10.0
	−3.0	17.0*	17.0*	19.0	20.0*	12.0	16.1*	8.8	12.9*	6.9	10.2*			6.7	9.6*	9.3
	−4.5	20.6*	20.6*	17.2*	17.2*	12.4	14.0*	9.1	11.0*					8.2	9.4*	8.2
	−6.0			12.4*	12.4*	9.7*	9.7*							8.2*	8.2*	6.6
LC-V	10.5													8.6*	8.6*	
	9.0							9.6*	9.6*					7.5*	7.5*	8.2
	7.5							9.8*	9.8*	9.0	9.3*			7.1*	7.1*	9.3
	6.0			16.5*	16.5*	12.5*	12.5*	10.6*	10.6*	8.8	9.6*			6.9*	6.9*	10.0
	4.5					14.7*	14.7*	11.2	11.7*	8.5	10.1*	6.6	7.2*	6.6	6.9*	10.5
	3.0					14.1	16.7*	10.5	12.8*	8.1	10.7*	6.5	9.4*	6.3	7.0*	10.7
	1.5					13.4	17.8*	10.0	13.6*	7.8	11.2*	6.3	9.6*	6.2	7.4*	10.7
	0					13.2	17.9*	9.7	13.9*	7.6	11.4*			6.3	8.0*	10.5
	−1.5			15.7*	15.7*	13.2	17.3*	9.6	13.7*	7.6	11.1*			6.7	9.0*	10.0
	−3.0	17.8*	17.8*	19.9*	19.9*	13.4	16.0*	9.8	12.8*	7.7	10.1*			7.6	9.6*	9.3
	−4.5	20.2*	20.2*	16.9*	16.9*	13.7*	13.7*	10.1	10.7*					9.3	9.3*	8.2
	−6.0					9.2*	9.2*							8.1*	8.1*	6.6
HD	10.5															
	9.0							9.6*	9.6*					7.6*	7.6*	8.2
	7.5							9.8*	9.8*	8.6	9.3*			7.1*	7.1*	9.3
	6.0					12.4*	12.4*	10.5*	10.5*	8.5	9.5*			6.9*	6.9*	10.0
	4.5					14.5*	14.5*	10.7	11.6*	8.1	10.0*			6.3	6.8*	10.5
	3.0					13.5	16.6*	10.0	12.7*	7.8	10.6*	6.1	9.4*	5.9	7.0*	10.7
	1.5					12.8	17.7*	9.5	13.6*	7.5	11.1*	6.0	9.6	5.8	7.3*	10.7
	0					12.5	17.9*	9.2	13.9*	7.2	11.4*			5.9	7.9*	10.5
	−1.5			15.0*	15.0*	12.5	17.3*	9.1	13.8*	7.2	11.2*			6.3	8.9*	10.0
	−3.0	17.1*	17.1*	20.0*	20.0*	12.7	16.1*	9.2	12.9*	7.3	10.2*			7.1	9.6*	9.3
	−4.5	20.5*	20.5*	17.1*	17.1*	13.1	13.9*	9.6	10.9*					8.7	9.4*	8.2
	−6.0			12.3*	12.3*	9.6*	9.6*							8.2*	8.2*	6.6

Stick 3.80 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
LC	10.5													5.9*	5.9*	8.0
	9.0									7.5*	7.5*			5.3*	5.3*	9.3
	7.5									8.3*	8.3*			5.0*	5.0*	10.3
	6.0							9.5*	9.5*	8.3	8.6*	6.3	8.1*	4.8*	4.8*	11.0
	4.5			18.0*	18.0*	13.0*	13.0*	10.6	10.6*	7.9	9.3*	6.1	8.5*	4.8*	4.8*	11.4
	3.0					13.5	15.3*	9.8	11.9*	7.5	10.0*	5.9	8.9*	4.9*	4.9*	11.6
	1.5					12.5	17.0*	9.2	13.0*	7.1	10.7*	5.7	9.0	4.9	5.1*	11.6
	0			9.5*	9.5*	12.0	17.8*	8.8	13.6*	6.9	11.0	5.5	8.8	4.9	5.5*	11.4
	−1.5	8.1*	8.1*	14.8*	14.8*	11.8	17.7*	8.6	13.8*	6.7	10.8	5.4	8.7	5.2	6.1*	10.9
	−3.0	14.3*	14.3*	18.5	21.6*	11.8	17.0*	8.6	13.4*	6.7	10.8*			5.7	7.0*	10.3
	−4.5	21.3*	21.3*	19.0	19.7*	12.1	15.4*	8.8	12.2*	6.9	9.5*			6.7	8.6*	9.3
	−6.0	20.6*	20.6*	16.0*	16.0*	12.6	12.6*	9.2	9.5*					8.4*	8.4*	7.9
LC-V	10.5													5.8*	5.8*	8.0
	9.0									7.9*	7.9*			5.2*	5.2*	9.3
	7.5									8.3*	8.3*			4.9*	4.9*	10.3
	6.0							9.5*	9.5*	8.7*	8.7*	6.9	8.3*	4.8*	4.8*	11.0
	4.5			18.5*	18.5*	13.2*	13.2*	10.7*	10.7*	8.7	9.3*	6.7	8.5*	4.8*	4.8*	11.4
	3.0					14.7	15.4*	10.8	12.0*	8.3	10.1*	6.5	8.9*	4.9*	4.9*	11.6
	1.5					13.7	17.1*	10.2	13.0*	7.9	10.7*	6.3	9.2*	5.2*	5.2*	11.6
	0			9.9*	9.9*	13.2	17.8*	9.8	13.7*	7.6	11.1*	6.1	9.4*	5.5*	5.5*	11.4
	−1.5	8.7*	8.7*	15.3*	15.3*	13.1	17.7*	9.6	13.8*	7.5	11.2*	6.1	9.3*	5.8	6.1*	10.9
	−3.0	14.9*	14.9*	20.6	22.0*	13.1	16.9*	9.6	13.3*	7.5	10.8*			6.4	7.1*	10.3
	−4.5	21.9*	21.9*	19.5*	19.5*	13.4	15.2*	9.8	12.1*	7.7	9.3*			7.5	8.8*	9.3
	−6.0	20.0*	20.0*	15.6*	15.6*	12.2*	12.2*	9.1*	9.1*					8.3*	8.3*	7.9
HD	10.5													5.9*	5.9*	8.0
	9.0									7.5*	7.5*			5.3*	5.3*	9.3
	7.5									8.3*	8.3*			5.0*	5.0*	10.3
	6.0							9.5*	9.5*	8.7*	8.7*	6.6	8.2*	4.8*	4.8*	11.0
	4.5			18.1*	18.1*	13.0*	13.0*	10.6*	10.6*	8.3	9.3*	6.4	8.5*	4.8*	4.8*	11.4
	3.0					14.1	15.3*	10.3	11.9*	7.9	10.0*	6.2	8.9*	4.9*	4.9*	11.6
	1.5					13.1	17.0*	9.7	13.0*	7.5	10.7*	6.0	9.2*	5.1*	5.1*	11.6
	0			9.6*	9.6*	12.6	17.8*	9.3	13.6*	7.2	11.1*	5.8	9.4	5.2	5.5*	11.4
	−1.5	8.2*	8.2*	14.9*	14.9*	12.4	17.7*	9.1	13.8*	7.1	11.2*	5.8	9.3*	5.5	6.1*	10.9
	−3.0	14.4*	14.4*	19.6	21.7*	12.5	17.0*	9.1	13.4*	7.1	10.8*			6.0	7.0*	10.3
	−4.5	21.4*	21.4*	19.7*	19.7*	12.7	15.4*	9.2	12.2*	7.3	9.4*			7.1	8.6*	9.3
	−6.0	20.5*	20.5*	15.9*	15.9*	12.5*	12.5*	9.4*	9.4*					8.4*	8.4*	7.9

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 825 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.

Lift Capacities

with Mono Boom 7.60 m, Counterweight 11.0 t and Track Pads 600 mm

Stick 2.35 m

Under-carriage	m	3,0 m		4,5 m		6,0 m		7,5 m		9,0 m		10,5 m				m
LC	10.5															
	9.0							10.5*	10.5*					9.9*	9.9*	7.5
	7.5							10.5*	10.5*					9.2*	9.2*	8.7
	6.0			18.2*	18.2*	13.3*	13.3*	11.2*	11.2*	9.0	10.1*			8.2	8.9*	9.5
	4.5					15.4	15.5*	11.3	12.2*	8.7	10.5*			7.4	8.9*	10.0
	3.0					14.2	17.4*	10.7	13.2*	8.4	11.0*			7.0	9.1*	10.2
	1.5					13.7	16.7*	10.3	13.9*	8.1	11.4*			6.9	9.5*	10.2
	0					13.6	17.8*	10.1	14.0*	8.0	11.5*			7.0	10.2*	9.9
	−1.5			13.0*	13.0*	13.7	17.0*	10.0	13.7*	8.0	11.1*			7.5	10.3*	9.5
	−3.0			18.4*	18.4*	13.9	15.5*	10.2	12.5*					8.6	10.2*	8.7
	−4.5			15.4*	15.4*	12.9*	12.9*							9.6*	9.6*	7.5
	−6.0															
LC-V	10.5															
	9.0							10.6*	10.6*					9.8*	9.8*	7.5
	7.5							10.6*	10.6*					9.1*	9.1*	8.7
	6.0					13.5*	13.5*	11.3*	11.3*	9.8	10.2*			8.9	8.9*	9.5
	4.5					15.7*	15.7*	12.3	12.3*	9.5	10.6*			8.1	8.9*	10.0
	3.0					15.5	17.5*	11.7	13.3*	9.1	11.1*			7.6	9.1*	10.2
	1.5					15.0	17.1*	11.2	13.9*	8.9	11.4*			7.5	9.6*	10.2
	0					14.9	17.7*	11.0	14.0*	8.7	11.5*			7.7	10.2*	9.9
	−1.5			14.5*	14.5*	15.0	16.9*	11.0	13.6*	8.8	11.0*			8.3	10.3*	9.5
	−3.0			18.2*	18.2*	15.3	15.3*	11.2	12.4*					9.5	10.1*	8.7
	−4.5			15.0*	15.0*	12.5*	12.5*							9.6*	9.6*	7.5
	−6.0															
HD	10.5															
	9.0							10.7*	10.7*					9.9*	9.9*	7.5
	7.5							10.5*	10.5*					9.2*	9.2*	8.7
	6.0					13.3*	13.3*	11.2*	11.2*	9.4	10.1*			8.6	8.9*	9.5
	4.5					15.5*	15.5*	11.8	12.2*	9.1	10.5*			7.7	8.9*	10.0
	3.0					14.9	17.4*	11.2	13.2*	8.8	11.0*			7.3	9.1*	10.2
	1.5					14.4	16.8*	10.8	13.9*	8.5	11.4*			7.2	9.5*	10.2
	0					14.3	17.8*	10.5	14.0*	8.3	11.5*			7.4	10.2*	9.9
	−1.5			13.2*	13.2*	14.3	16.9*	10.5	13.6*	8.3	11.1*			7.9	10.3*	9.5
	−3.0			18.4*	18.4*	14.6	15.4*	10.7	12.5*					9.0	10.2*	8.7
	−4.5			15.3*	15.3*	12.8*	12.8*							9.6*	9.6*	7.5
	−6.0															

Stick 2.90 m

Under-carriage	m	3,0 m		4,5 m		6,0 m		7,5 m		9,0 m		10,5 m				m
LC	10.5															
	9.0							9.6*	9.6*					7.6*	7.6*	8.2
	7.5							9.8*	9.8*	9.3	9.4*			7.1*	7.1*	9.3
	6.0					12.3*	12.3*	10.5*	10.5*	9.1	9.5*			6.9*	6.9*	10.0
	4.5					14.5*	14.5*	11.5	11.6*	8.8	10.0*			6.8	6.8*	10.5
	3.0					14.5	16.6*	10.8	12.7*	8.4	10.6*	6.7	9.4*	6.4	7.0*	10.7
	1.5					13.8	17.7*	10.3	13.5*	8.1	11.1*	6.5	9.6*	6.3	7.3*	10.7
	0					13.5	17.9*	10.0	13.9*	7.9	11.4*			6.4	7.9*	10.5
	−1.5			14.9*	14.9*	13.5	17.3*	9.9	13.8*	7.8	11.2*			6.9	8.9*	10.0
	−3.0	17.0*	17.0*	20.0*	20.0*	13.7	16.1*	10.0	12.9*	7.9	10.2*			7.7	9.6*	9.3
	−4.5	20.6*	20.6*	17.2*	17.2*	14.0*	14.0*	10.4	11.0*					9.3	9.4*	8.2
	−6.0			12.4*	12.4*	9.7*	9.7*							8.2*	8.2*	6.6
LC-V	10.5													8.6*	8.6*	
	9.0							9.6*	9.6*					7.5*	7.5*	8.2
	7.5							9.8*	9.8*	9.3*	9.3*			7.1*	7.1*	9.3
	6.0			16.5*	16.5*	12.5*	12.5*	10.6*	10.6*	9.6*	9.6*			6.9*	6.9*	10.0
	4.5					14.7*	14.7*	11.7*	11.7*	9.5	10.1*	7.2*	7.2*	6.9*	6.9*	10.5
	3.0					15.8	16.7*	11.8	12.8*	9.1	10.7*	7.3	9.4*	7.0*	7.0*	10.7
	1.5					15.1	17.8*	11.3	13.6*	8.8	11.2*	7.1	9.6*	7.0	7.4*	10.7
	0					14.9	17.9*	11.0	13.9*	8.6	11.4*			7.1	8.0*	10.5
	−1.5			15.7*	15.7*	14.9	17.3*	10.9	13.7*	8.6	11.1*			7.6	9.0*	10.0
	−3.0	17.8*	17.8*	19.9*	19.9*	15.0	16.0*	11.0	12.8*	8.7	10.1*			8.5	9.6*	9.3
	−4.5	20.2*	20.2*	16.9*	16.9*	13.7*	13.7*	10.7*	10.7*					9.3*	9.3*	8.2
	−6.0					9.2*	9.2*							8.1*	8.1*	6.6
HD	10.5															
	9.0							9.6*	9.6*					7.6*	7.6*	8.2
	7.5							9.8*	9.8*	9.3*	9.3*			7.1*	7.1*	9.3
	6.0					12.4*	12.4*	10.5*	10.5*	9.5	9.5*			6.9*	6.9*	10.0
	4.5					14.5*	14.5*	11.6*	11.6*	9.1	10.0*			6.8*	6.8*	10.5
	3.0					15.2	16.6*	11.3	12.7*	8.8	10.6*	7.0	9.4*	6.8	7.0*	10.7
	1.5					14.5	17.7*	10.8	13.6*	8.5	11.1*	6.8	9.6*	6.6	7.3*	10.7
	0					14.2	17.9*	10.5	13.9*	8.3	11.4*			6.8	7.9*	10.5
	−1.5			15.0*	15.0*	14.2	17.3*	10.4	13.8*	8.2	11.2*			7.2	8.9*	10.0
	−3.0	17.1*	17.1*	20.0*	20.0*	14.4	16.1*	10.5	12.9*	8.3	10.2*			8.1	9.6*	9.3
	−4.5	20.5*	20.5*	17.1*	17.1*	13.9*	13.9*	10.8	10.9*					9.4*	9.4*	8.2
	−6.0			12.3*	12.3*	9.6*	9.6*							8.2*	8.2*	6.6

Stick 3.80 m

Under-carriage	m	3,0 m		4,5 m		6,0 m		7,5 m		9,0 m		10,5 m				m
LC	10.5													5.9*	5.9*	8.0
	9.0									7.5*	7.5*			5.3*	5.3*	9.3
	7.5									8.3*	8.3*			5.0*	5.0*	10.3
	6.0							9.5*	9.5*	8.6*	8.6*	7.1	8.1*	4.8*	4.8*	11.0
	4.5			18.0*	18.0*	13.0*	13.0*	10.6*	10.6*	8.9	9.3*	6.9	8.5*	4.8*	4.8*	11.4
	3.0					15.2	15.3*	11.1	11.9*	8.5	10.0*	6.7	8.9*	4.9*	4.9*	11.6
	1.5					14.2	17.0*	10.5	13.0*	8.1	10.7*	6.5	9.2*	5.1*	5.1*	11.6
	0			9.5*	9.5*	13.6	17.8*	10.1	13.6*	7.9	11.1*	6.3	9.4*	5.5*	5.5*	11.4
	−1.5	8.1*	8.1*	14.8*	14.8*	13.4	17.7*	9.9	13.8*	7.7	11.2*	6.3	9.3*	6.0	6.1*	10.9
	−3.0	14.3*	14.3*	21.1	21.6*	13.5	17.0*	9.8	13.4*	7.7	10.8*			6.5	7.0*	10.3
	−4.5	21.3*	21.3*	19.7*	19.7*	13.7	15.4*	10.0	12.2*	7.9	9.5*			7.6	8.6*	9.3
	−6.0	20.6*	20.6*	16.0*	16.0*	12.6*	12.6*	9.5*	9.5*					8.4*	8.4*	7.9
LC-V	10.5													5.8*	5.8*	8.0
	9.0									7.9*	7.9*			5.2*	5.2*	9.3
	7.5									8.3*	8.3*			4.9*	4.9*	10.3
	6.0							9.5*	9.5*	8.7*	8.7*	7.8	8.3*	4.8*	4.8*	11.0
	4.5			18.5*	18.5*	13.2*	13.2*	10.7*	10.7*	9.3*	9.3*	7.6	8.5*	4.8*	4.8*	11.4
	3.0					15.4*	15.4*	12.0*	12.0*	9.3	10.1*	7.4	8.9*	4.9*	4.9*	11.6
	1.5					15.4	17.1*	11.4	13.0*	8.9	10.7*	7.1	9.2*	5.2*	5.2*	11.6
	0			9.9*	9.9*	14.9	17.8*	11.0	13.7*	8.6	11.1*	7.0	9.4*	5.5*	5.5*	11.4
	−1.5	8.7*	8.7*	15.3*	15.3*	14.8	17.7*	10.8	13.8*	8.5	11.2*	6.9	9.3*	6.1*	6.1*	10.9
	−3.0	14.9*	14.9*	22.0*	22.0*	14.8	16.9*	10.8	13.3*	8.5	10.8*			7.1*	7.1*	10.3
	−4.5	21.9*	21.9*	19.5*	19.5*	15.1	15.2*	11.0	12.1*	8.7	9.3*			8.5	8.8*	9.3
	−6.0	20.0*	20.0*	15.6*	15.6*	12.2*	12.2*	9.1*	9.1*					8.3*	8.3*	7.9
HD	10.5													5.9*	5.9*	8.0
	9.0									7.5*	7.5*			5.3*	5.3*	9.3
	7.5									8.3*	8.3*			5.0*	5.0*	10.3
	6.0							9.5*	9.5*	8.7*	8.7*	7.4	8.2*	4.8*	4.8*	11.0
	4.5			18.1*	18.1*	13.0*	13.0*	10.6*	10.6*	9.3*	9.3*	7.3	8.5*	4.8*	4.8*	11.4
	3.0					15.3*	15.3*	11.6	11.9*	8.9	10.0*	7.0	8.9*	4.9*	4.9*	11.6
	1.5					14.8	17.0*	11.0	13.0*	8.5	10.7*	6.8	9.2*	5.1*	5.1*	11.6
	0			9.6*	9.6*	14.3	17.8*	10.6	13.6*	8.2	11.1*	6.7	9.4*	5.5*	5.5*	11.4
	−1.5	8.2*	8.2*	14.9*	14.9*	14.1	17.7*	10.3	13.8*	8.1	11.2*	6.6	9.3*	6.1*	6.1*	10.9
	−3.0	14.4*	14.4*	21.7*	21.7*	14.1	17.0*	10.3	13.4*	8.1	10.8*			6.9	7.0*	10.3
	−4.5	21.4*	21.4*	19.7*	19.7*	14.4	15.4*	10.5	12.2*	8.3	9.4*			8.0	8.6*	9.3
	−6.0	20.5*	20.5*	15.9*	15.9*	12.5*	12.5*	9.4*	9.4*					8.4*	8.4*	7.9

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 825 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.

Product Information: Crawler Excavator

R 956

Litronic®

Generation
6

Motor
250 kW / 340 HP
Stage V

Operating Weight
Backhoe: 53,100 – 57,400 kg
Shovel: 56,750 – 57,300 kg

Bucket Capacity
Backhoe: 1.65 – 3.50 m^3
Shovel: 2.50 – 3.10 m^3

LIEBHERR

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

	Cutting width	Capacity ISO 7451	Weight	LC-Undercarriage (with track pads 600 mm) Stick length (m)			LC-V-Undercarriage (with track pads 600 mm) Stick length (m)			HD-Undercarriage (with track pads 600 mm) Stick length (m)		
	mm	m³	kg	2.35	2.90	3.80	2.35	2.90	3.80	2.35	2.90	3.80
	with counterweight 9.0 t											
STD[1]	1,350	1.65	2,100	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,550	2.00	2,250	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,750	2.35	2,450	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,950	2.70	2,650	▲	■	△	▲	▲	△	▲	▲	△
STD[1]	1,950	3.00	2,750	■	▲	△	▲	■	△	▲	■	△
STD[1]	2,100	3.30	2,850	▲	■	–	▲	▲	–	■	▲	–
HD[2]	1,350	1.65	2,350	▲	▲	▲	▲	▲	▲	▲	▲	▲
HD[2]	1,550	2.00	2,650	▲	▲	▲	▲	▲	▲	▲	▲	▲
HD[2]	1,750	2.35	2,850	▲	▲	■	▲	▲	■	▲	▲	■
HD[2]	1,950	2.70	3,100	▲	■	△	▲	▲	△	▲	■	△
HD[2]	1,950	3.00	3,200	■	■	–	▲	■	–	■	▲	–
	with counterweight 11.0 t											
STD[1]	1,350	1.65	2,100	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,550	2.00	2,250	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,750	2.35	2,450	▲	▲	▲	▲	▲	▲	▲	▲	▲
STD[1]	1,950	2.70	2,650	▲	▲	△	▲	▲	△	▲	▲	△
STD[1]	1,950	3.00	2,750	▲	▲	△	▲	▲	△	▲	▲	△
STD[1]	2,100	3.30	2,850	▲	■	–	▲	▲	–	▲	■	–
HD[2]	1,350	1.65	2,350	▲	▲	▲	▲	▲	▲	▲	▲	▲
HD[2]	1,550	2.00	2,650	▲	▲	▲	▲	▲	▲	▲	▲	▲
HD[2]	1,750	2.35	2,850	▲	▲	■	▲	▲	■	▲	▲	■
HD[2]	1,950	2.70	3,100	▲	▲	△	▲	▲	△	▲	▲	△
HD[2]	1,950	3.00	3,200	▲	■	–	▲	▲	–	▲	▲	–

* Indicated loads are based on ISO 10567, at maximum reach, and may be swung 360° on firm and even ground

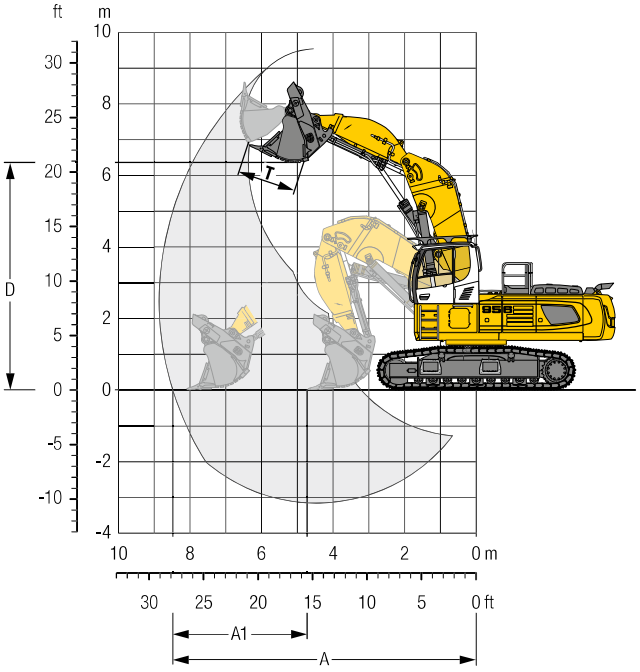
[1] Standard bucket with Liebherr teeth Z 70 (appropriate for materials up to classification 5, according to VOB, Section C, DIN 18300)

[2] HD bucket with Liebherr 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, ▲ = ≤ 1.65 t/m³, ■ = ≤ 1.5 t/m³, △ = ≤ 1.2 t/m³, – = not authorised

Front Shovel



Digging Envelope

A	**Max. reach at ground level**	**m**	8.50
A1	**Max. crowd length**	**m**	3.40
D	**Max. dumping height**	**m**	6.30
T	**Bucket opening width**	**mm**	1,640

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 3.10 m³ (5,650 kg), level II.

Undercarriage		**HD**	
Pad width	**mm**	500	600
Weight	**kg**	56,750	57,300
Ground pressure	**kg/cm²**	1.17	0.98

Front Shovels

Cutting width	**Capacity ISO 7451**	**Weight**	**Wear kit level**	**HD-Undercarriage**
mm	**m³**	**kg**		**Shovel Equipment**
1,850	2.50	4,700	II	▲
1,850	2.50	5,050	III	▲
2,150	3.10	5,150	I	■
2,150	3.10	5,650	II	■
2,150	3.10	6,050	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 ▲ = ≤ 2.0 t/m³, ■ = ≤ 1.8 t/m³

Stick 3.80 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m		12.0 m				m
LC	12.0					10.5*	10.5*									7.4*	7.4*	6.7
	10.5					10.7*	10.7*	10.1*	10.1*							6.1*	6.1*	8.6
	9.0					10.3*	10.3*	10.6*	10.6*	9.2	9.6*					5.4*	5.4*	9.9
	7.5					11.1*	11.1*	11.4*	11.4*	9.3	10.1*	6.7	7.5*			5.1*	5.1*	10.8
	6.0			16.9*	16.9*	14.6*	14.6*	11.9	12.2*	9.1	10.3*	6.8	8.9*			4.9*	4.9*	11.4
	4.5			21.5*	21.5*	15.5	16.1*	11.5	12.7*	9.0	10.5*	6.8	8.9*			4.8*	4.8*	11.8
	3.0	19.3*	19.3*	20.7*	20.7*	15.0	16.8*	11.2	13.0*	8.9	10.6*	6.6	8.8*	4.8	4.9*	4.8	4.9*	12.0
	1.5	15.6*	15.6*	21.7*	21.7*	14.8*	16.6*	11.1	12.9*	8.9	10.4*	6.4	8.7*			4.7	5.0*	12.0
	0	18.2*	18.2*	22.1	23.1*	15.0	16.6*	11.2	12.8*	8.4	10.4*	6.1	8.8*			4.8	5.3*	11.8
	−1.5	23.6*	23.6*	22.0	23.8*	14.5	16.8*	10.6	13.0*	7.9	10.8*	5.8	8.3*			5.1	5.2*	11.4
	−3.0	30.6*	30.6*	21.5	24.4*	14.0	17.5*	10.2	13.7*	7.5	10.3*	5.8	5.8*			4.1*	4.1*	10.8
	−4.5	38.2*	38.2*	21.5	24.3*	14.0	17.5*	9.8	12.4*	7.3	7.4*					3.2*	3.2*	9.8
	−6.0	33.3*	33.3*	20.5*	20.5*	12.9*	12.9*	6.6*	6.6*							4.7*	4.7*	7.9
LC-V	12.0					10.7*	10.7*									7.2*	7.2*	6.7
	10.5					10.7*	10.7*	10.2*	10.2*							6.0*	6.0*	8.6
	9.0					10.3*	10.3*	10.7*	10.7*	9.7*	9.7*					5.4*	5.4*	9.9
	7.5					11.3*	11.3*	11.4*	11.4*	9.9	10.1*	7.3	7.8*			5.1*	5.1*	10.8
	6.0			19.4*	19.4*	15.2*	15.2*	12.2*	12.2*	9.7	10.3*	7.5	8.9*			4.9*	4.9*	11.4
	4.5	18.0*	18.0*	21.5*	21.5*	16.2*	16.2*	12.1	12.7*	9.5	10.5*	7.4	8.9*			4.8*	4.8*	11.8
	3.0	19.9*	19.9*	20.7*	20.7*	15.7	16.8*	11.8	13.0*	9.3	10.6*	7.2	8.8*	5.0*	5.0*	4.9*	4.9*	12.0
	1.5	15.6*	15.6*	21.8*	21.8*	15.6	16.6*	11.7	12.9*	9.4	10.4*	7.0	8.7*			5.0*	5.0*	12.0
	0	18.6*	18.6*	23.1	23.2*	15.7	16.6*	11.8	12.8*	9.1	10.4*	6.7	8.8*			5.3*	5.3*	11.8
	−1.5	24.1*	24.1*	23.6	23.8*	15.8	16.9*	11.5	13.1*	8.6	10.8*	6.5	8.2*			5.1*	5.1*	11.4
	−3.0	31.2*	31.2*	23.5	24.5*	15.3	17.5*	11.2	13.7*	8.2	10.2*	5.3*	5.3*			4.0*	4.0*	10.8
	−4.5	38.0*	38.0*	23.6	24.2*	15.3	17.4*	10.8	12.1*	6.9*	6.9*					3.3*	3.3*	9.8
	−6.0	32.5*	32.5*	19.7*	19.7*	12.2*	12.2*	5.7*	5.7*							4.9*	4.9*	7.9
HD	12.0					10.5*	10.5*									7.3*	7.3*	6.7
	10.5					10.7*	10.7*	10.1*	10.1*							6.0*	6.0*	8.6
	9.0					10.3*	10.3*	10.6*	10.6*	9.5	9.6*					5.4*	5.4*	9.9
	7.5					11.2*	11.2*	11.4*	11.4*	9.6	10.1*	7.0	7.6*			5.1*	5.1*	10.8
	6.0			17.2*	17.2*	14.7*	14.7*	12.2*	12.2*	9.4	10.3*	7.1	8.9*			4.9*	4.9*	11.4
	4.5	18.5*	18.5*	21.5*	21.5*	16.0	16.2*	11.8	12.7*	9.2	10.5*	7.1	8.9*			4.8*	4.8*	11.8
	3.0	19.4*	19.4*	20.7*	20.7*	15.4	16.8*	11.5	13.0*	9.1	10.6*	6.9	8.8*	4.9*	4.9*	4.9*	4.9*	12.0
	1.5	15.6*	15.6*	21.7*	21.7*	15.2	16.6*	11.4	12.9*	9.2	10.4*	6.7	8.7*			5.0	5.0*	12.0
	0	18.3*	18.3*	22.6	23.2*	15.3	16.6*	11.6	12.8*	8.8	10.4*	6.4	8.8*			5.1	5.3*	11.8
	−1.5	23.7*	23.7*	23.1	23.8*	15.1	16.9*	11.1	13.0*	8.2	10.8*	6.1	8.3*			5.2*	5.2*	11.4
	−3.0	30.7*	30.7*	22.5	24.5*	14.7	17.5*	10.7	13.7*	7.8	10.3*	5.7*	5.7*			4.1*	4.1*	10.8
	−4.5	38.2*	38.2*	22.5	24.3*	14.6	17.5*	10.3	12.3*	7.3*	7.3*					3.3*	3.3*	9.8
	−6.0	33.2*	33.2*	20.3*	20.3*	12.8*	12.8*	6.4*	6.4*							4.8*	4.8*	7.9

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 with adjusting cylinder in optimal position. 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 825 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.

2 Safety warnings

2.1 Information on these instructions

2.1.1 Representation of warning messages

Warning symbol

	The warning symbol warns of potential dangers. Obey all measures marked with this symbol to avoid injury or death.

Tab. 4: Warning symbol

Grading of warning messages

The grading of warning messages is defined by following signal words:

DANGER
WARNING
CAUTION
NOTICE

Definition of warning levels

	**DANGER**	Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury.
	**WARNING**	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	**CAUTION**	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE	Indicates a hazardous situation which, if not avoided, could result in property damage.

Tab. 5: Warning levels

2.1.2 Graphic symbols in these instructions

Symbol	Meaning
	**Note** Identifies useful information and tips.

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– The spotter has the necessary education (theoretical and practical) for the following:
  • Spotting
  • Applying all necessary signal signs
– Is not under any physical or mental impairment that limits one of the prescribed requirements.
– Is not under the influence of alcohol.
– Is not under the influence of drugs.

2.4 Signs on the machine

2.4.1 Locations of signs

The machine is equipped with the following signs:
– Warning signs
– Information signs
– Identification plate

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Injuries

Objects in the operator's cab

– Remove objects that are not necessary for the work from the operator's cab.
– Stow and fasten objects that are necessary for the work before starting.
– Make sure that objects carried do not protrude into the operator’s workspace.

2.5.3 Height-adjustable operator's cab

Danger to life

Persons in the danger zone

– Make sure there are no persons in the danger zone under the operator's cab.
– Keep your distance from moving parts when the operator's cab is moving down.

Machine tipping

– On slopes, travel with lowered operator's cab.

Injuries

Falling from operator's cab

– Close cab door before raising and adjusting operator's cab.
– If operator's cab is raised: Make sure that cab door is closed.

Damage to operator's cab and machine

Collision with obstacles

– Make sure there are no obstacles in the range of movement of operator's cab.
– Exclusively adjust operator's cab when machine is at a standstill.
– Move operator's cab to upper park position before starting travel.
– Move slowly to end positions (upper or lower park position) using automatic mode.

2.5.4 Tip over protective structure (TOPS)

Danger to life

Damaged falling object protective structures

– Do not put machine into service with damaged falling object protective structures.
– Do not put machine into service with deformed falling object protective structures.
– Do not use falling object protective structures with structural changes.
– Do not use repaired falling object protective structures.
– Do not perform welding on falling object protective structures.
– Do not cut or saw falling object protective structures.
– Do not drill falling object protective structures.

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2.7.9 Load-lifting work

Danger to life

Machine tipping

- Make sure that machine is equipped for load-lifting work.
- Make sure that machine has safety equipment for load-lifting work.

Falling load

- Make sure that machine is equipped with line break safety valve on every hoist cylinder and stick cylinder.
- Make sure that the operator's cab contains a load chart.
- Exclusively use suitable slinging gear for load-lifting work.
- Exclusively tie down or loosen loads or stabilise them during transport with the help of another person.

2.8 Safe work

2.8.1 Hydraulic hammer

Danger to life

Unsuitable ground

- Make sure that machine does not sink.
- Check load capacity of ground.
- Remove obstacles from working area.

Incorrect use

- If machine is equipped with undercarriage with adjustable width: Extend side frames to the stop.

Damage to machine

Incorrect use of hydraulic hammer

- Exclusively use hydraulic hammers approved by Liebherr. Use of a hydraulic hammer not approved by Liebherr will invalidate warranty on structural elements of machine.
- Exclusively use hydraulic hammer to break stone, concrete and brittle materials.
- Do not break concrete or rock by moving hydraulic hammer into and out of material.
- Operate hydraulic hammer for no more than 15 seconds without interruption in one location.

Incorrect use

- When movements approach cylinder stops: Reduce speed of movements.

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Selecting menu via menu bar

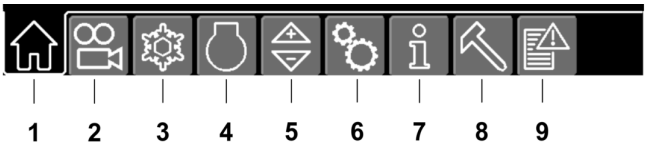


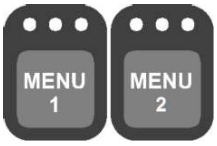
Fig. 60: Menu bar

1	*Start page* menu button	**6**	*Function settings* menu button
2	*Camera* menu button [6)]	**7**	*Information* menu button
3	*Automatic heating, automatic ventilation and automatic air conditioning system* menu button	**8**	*Tool Control* menu button
4	*Operating status* menu button	**9**	*Service codes* menu button
5	*System settings* menu button		

▶ Press menu button in menu bar.
▷ Symbol of selected menu has a black background.

Selecting menu via programmable keys

Programming key



▶ Select menu: Press menu button in menu bar.

▶ Press *MENU 1* key or *MENU 2* key until middle and right LEDs light up.

▶ Release key/button.
▷ Left LED lights up.
▷ Menu is saved to key.

Selecting menu via key

▶ Press *MENU 1* key or *MENU 2* key.
▷ Menu appears on the display.

3.2.2 Status symbols

The symbols in the status bar indicate the operating status. The displayed symbols depend on model and equipment of machine.

General symbols

Symbol	Meaning
	Confirmation required
	Confirmation fault

[6)] not valid for Rail machines.

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The fresh air supply is reduced.

The air in the operator's cab is recirculated.

DANGER
Limited visibility caused by fogged windows!
Danger to life, injuries, damage.

- ▶ Do not leave recirculated air mode switched on for long periods.
- ▶ Activate AUTO operating mode.

Defrosting operating mode

The fan runs on maximum power.

The front air outlet (by windscreen) is open, the other air outlets are closed.

The operator can regulate the temperature.

Setting air conditioning unit

- ▶ Set temperature and blower power: Press corresponding display button.
- ▶ Set air supply: Press corresponding display button.
  - ▷ Corresponding display button is displayed in green.

Activating and deactivating operating mode

- ▶ Activate mode: Press corresponding display button or corresponding key on control unit A.
  - ▷ Corresponding display button is displayed in green.
  - ▷ LEDs in corresponding key of control unit A light up.
- ▶ Deactivate mode: Press corresponding display button or corresponding key on control unit A.
  - ▷ Corresponding display button is displayed in white.
  - ▷ LEDs in corresponding key of control unit A light up.

3.2.6 *Operating status* menu

Menu call:  or  > 

Access path and display of this menu vary depending on machine configuration:

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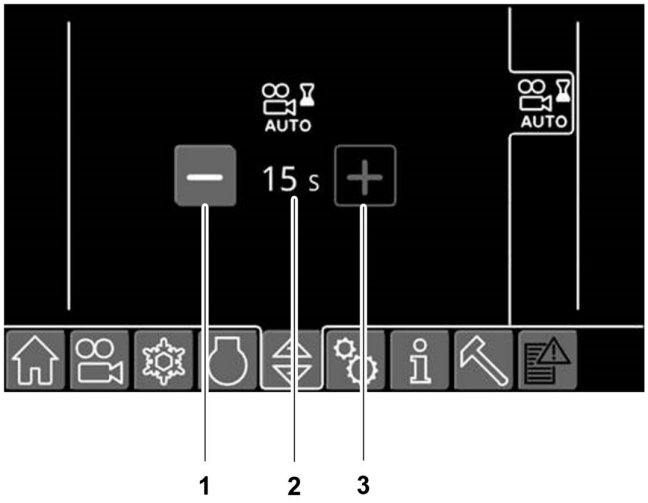

Fig. 173: Camera return time submenu

1 *Reducing return time* button
2 Return time
3 *Increasing return time* button

If the display is not used, it displays the *camera* menu after the return time has elapsed.

3.2.17 *Unit selection* submenu

Menu call: > SI or > > SI

Access path and display of this submenu vary depending on machine configuration:

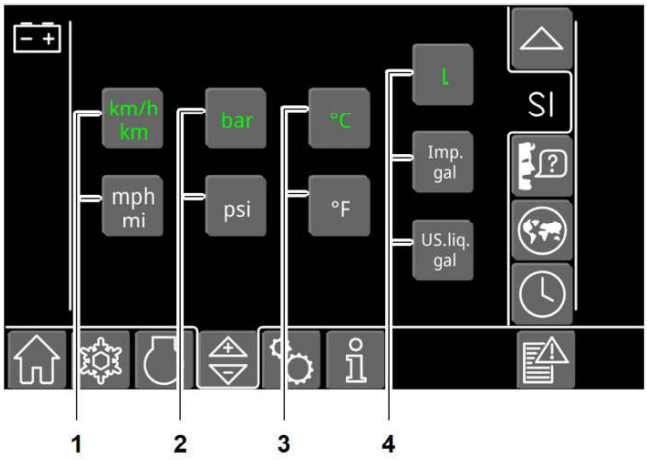

Fig. 174: Unit selection submenu

1 *Distance unit and speed unit* buttons
2 *Pressure unit* buttons
3 *Temperature unit* buttons
4 *Volume unit* buttons

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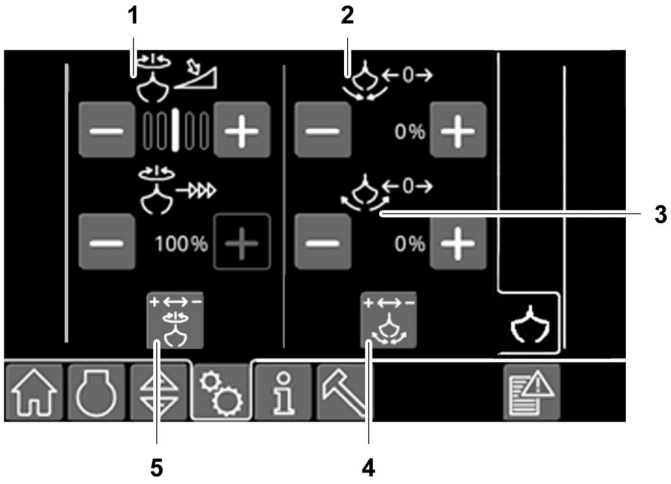
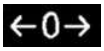


Fig. 207: Sensitivity of mini-joysticks for controlling working tool submenu

1 Turning working tool
2 Closing working tool
3 Opening working tool
4 Reversing control direction for opening working tool
5 Reversing control direction for turning direction of working tool



Setting start of movement of working attachment

Setting maximum speed for movement of working attachment

Setting progressivity of control for working attachment

Menu buttons on the display vary by machine configuration.

Menu button	Fine adjustment
	Turning working tool Closing working tool Opening working tool
	Laterally adjustable boom
	Height-adjustable boom
	Dozer blade
	Tiltrotator

Tab. 22: Sensitivity of mini-joysticks submenu

When indicator light **1** goes out:

▶ Turn battery main switch **3** to **OFF**.

▷ Machine's electrical system is voltage-free.

3.3.2 Entering and exiting machine

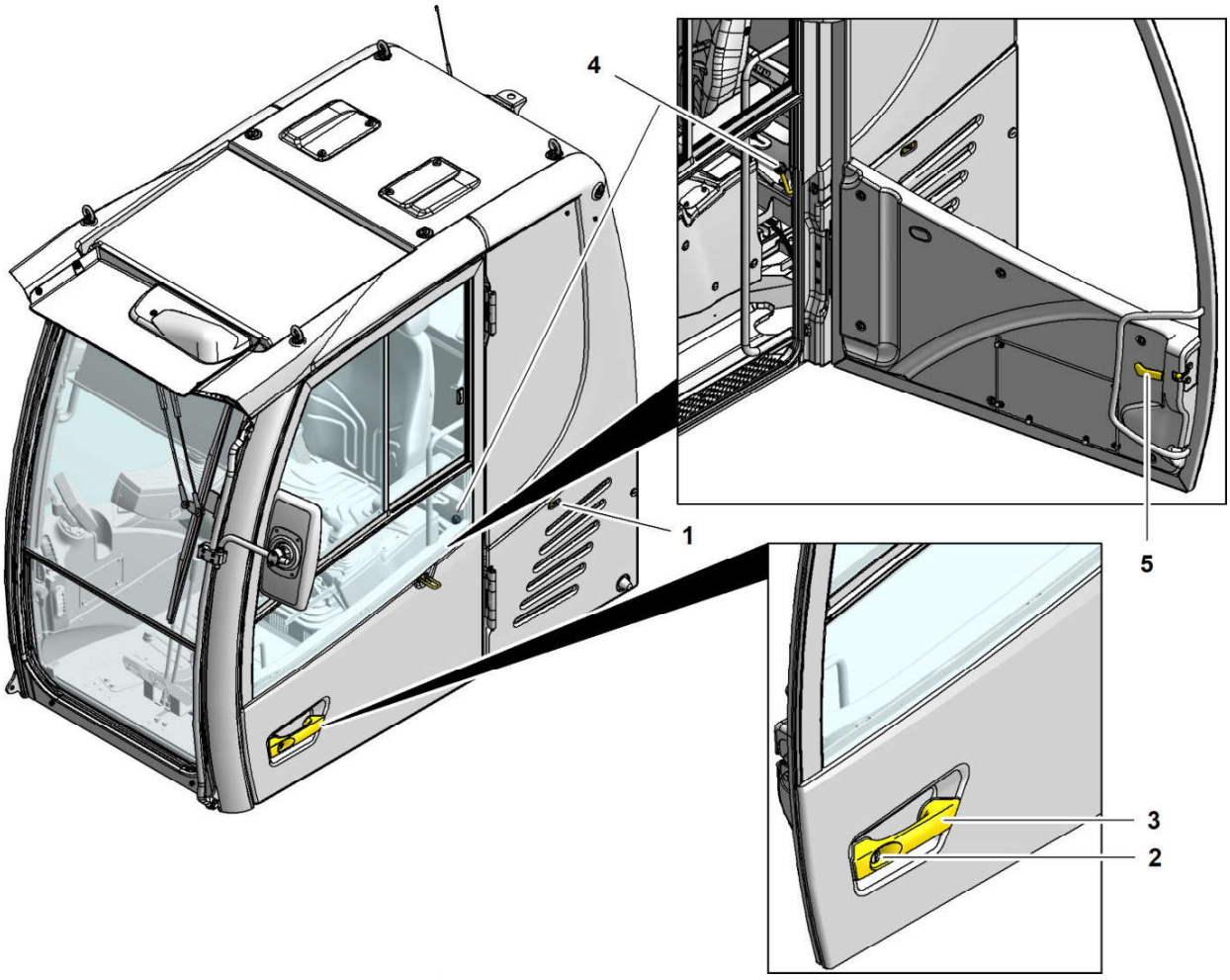


Fig. 249: Door of operator's cab

1	Locking mechanism	**3**	Handle	**5**	Handle
2	Door lock	**4**	Release lever		

WARNING
Incorrect entry and exit!
Fall.

▶ Enter and leave machine exclusively using climbing aids.

▶ Do not use control elements as handles.

▶ Never jump off machine.

Entering machine

▶ Face operator's cab.

Adjusting lumbar support

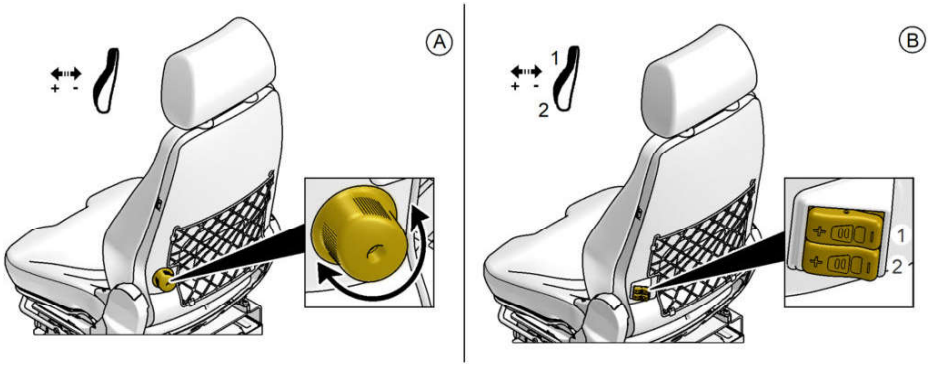


Fig. 267: Adjusting lumbar support

A Manual adjustment
B Pneumatic adjustment[11)]
1 *Upper back cushion* button
2 *Lower back cushion* button

Seat heating

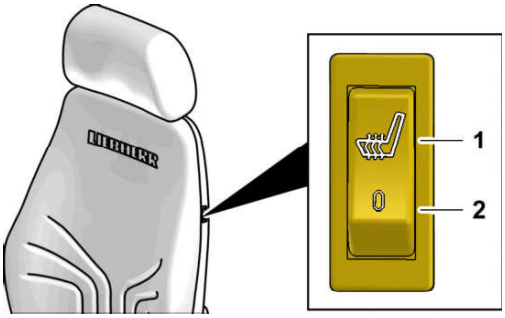


Fig. 268: Seat heating

1 Seat heating on
2 Seat heating off

Seat heating with seat air conditioning (option)

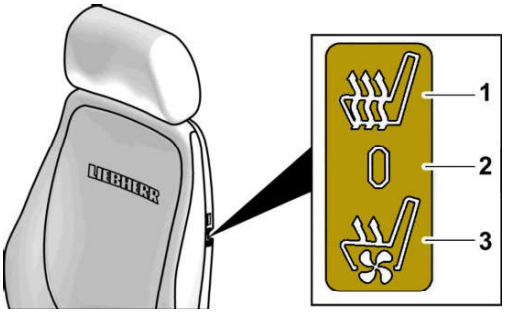


Fig. 269: Seat heating with seat air conditioning

1 Seat heating on
2 Seat heating and seat air conditioning off
3 Seat air conditioning on

[11)] Option

Checking alignment of right mirror

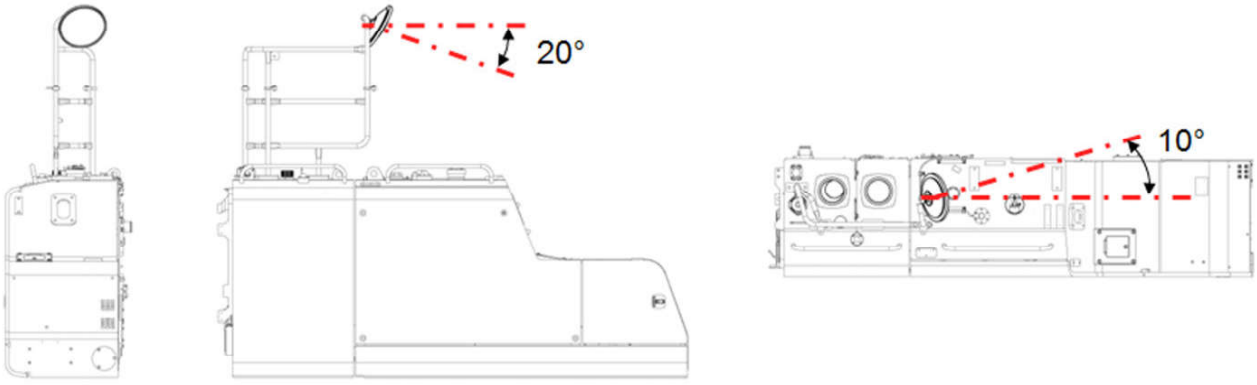


Fig. 284: Checking alignment of right mirror

▶ Check that angle values are correct.

If angle values are not correct:

▶ Adjust right mirror. (For more information see: Adjusting right mirror, page 127)

Adjusting right mirror

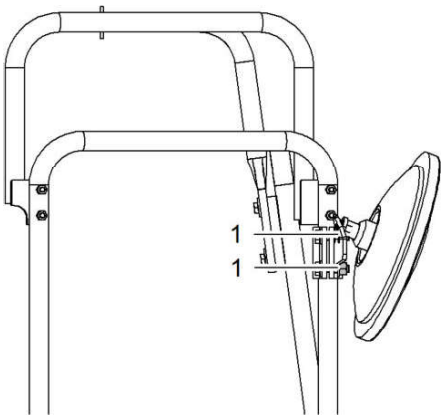


Fig. 285: Adjusting right mirror

1 Adjusting screw

Put mirror in topmost position. (see: fig. 285, page 127)

▶ Adjust height of right mirror: Loosen adjusting screws **1**.

The angles are guidelines and correspond to the default factory settings.

▶ Adjust alignment of right mirror: Operate swivel joint.

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Make sure the following preconditions are met:
- ❑ Diesel engine is shut off.
- ❑ Fuel used is approved.

- ▶ Unlock fuel tank cap.
- ▶ Unscrew fuel tank cap.
- ▶ Check condition of strainer and replace if necessary.
- ▶ Fill with fuel through strainer.
- ▶ Screw in fuel tank cap.
- ▶ Lock fuel tank cap.

3.4.3 Refuelling with the electric refuelling pump (option)

The electric refuelling pump is behind door of fuel tank.

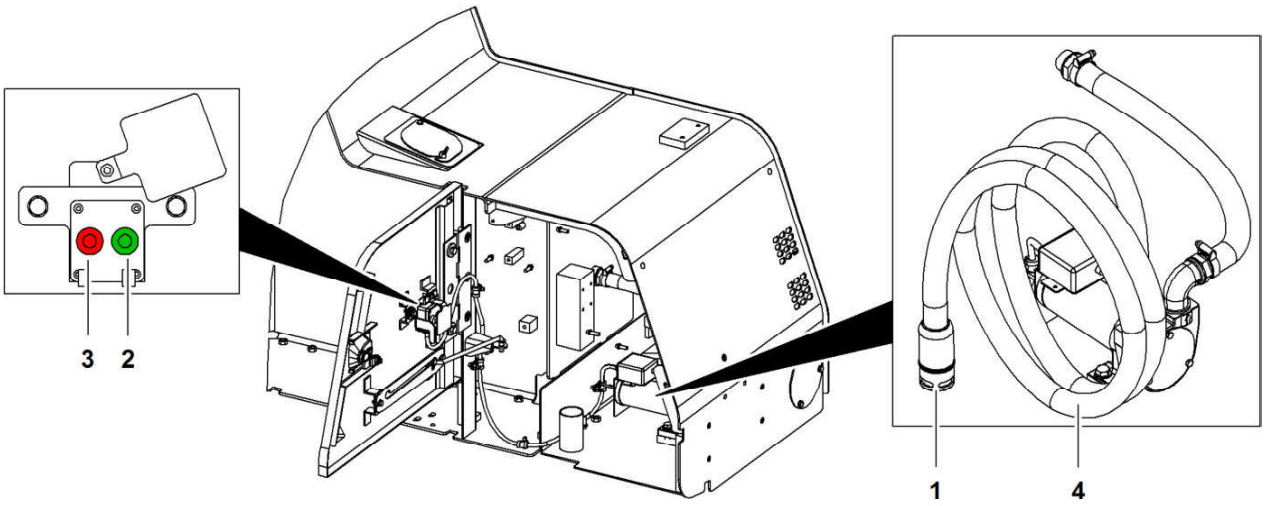


Fig. 309: Refuelling with electric refuelling pump

1 Foot valve
2 *Start* button
3 *Stop* button
4 Suction hose

Designation	Value
Flow rate	100 l/min
Maximum operating time	30 minutes
Maximum suction head	4 m

Tab. 30: Technical data of electric refuelling pump

DANGER
Explosion of highly flammable fuel!
Danger to life.

- ▶ Avoid naked flames.
- ▶ Do not smoke.

3.4.13 Automatic engine shut-off after idling (option)

Diesel engine is stopped automatically if following conditions are met:
– Diesel engine is idling.
– During the period for automatic engine shut-off no control element is activated.

Period for automatic engine shut-off is set to 5 minutes by default.

Automatic engine shut-off is indicated 20 seconds before shut-off by means of following elements:
– Warning sound sounds as intermittent sound in operator's cab.
– *Engine shut-off activated* status symbol appears on the display.

Deactivating automatic engine shut-off

▶ Activate a control element.

Setting period for automatic engine shut-off

▶ Set delay for automatic engine shut-off: Contact Liebherr customer service.

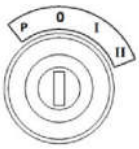
▶ Set time for automatic engine shut-off in dependence on water temperature between 1 and 17 minutes: Use *delay of engine shut-off in dependence on water temperature* menu.

3.4.14 Shutting off diesel engine

Shutting off diesel engine normally

▶ Move all control elements to their neutral position.

▶ Press *START STOP* key.
  ▷ Engine speed slowly falls to idle speed, subsequently diesel engine is shut off.
  ▷ If already at idle speed, diesel engine is shut off immediately.
  ▷ LEDs in *START STOP* key go out.



When diesel engine has been shut off:
▶ Set ignition key to **0**.

▶ Pull out ignition key.

Shutting off diesel engine with delay (option)

Before shut-off, diesel engine runs at idle speed for 30 seconds[14)] and *engine stop activated* status symbol appears on the display.

▶ Shut off diesel engine normally. (For more information see: Shutting off diesel engine normally, page 147)

▶ Remain in the operator's cab during the shut-off delay.

[14)] 60 seconds for R 976 and R 980

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Key	Status of LEDs	Slewing brake
	☀☀○	Applied
	☀○○	Released

Tab. 34: Automatic locking

Activating automatic locking

▶ Activate manual locking.

▶ Press *slewing brake* key for 2 seconds.

Deactivating automatic locking

▶ Press *slewing brake* key.
▷ LEDs in *slewing brake* key go out.

3.4.19 Turning alarm (option)

The turning alarm creates an acoustic warning signal. It sounds outside the machine.

The turning alarm is activated automatically as soon as the uppercarriage turns.

Deactivating turning alarm

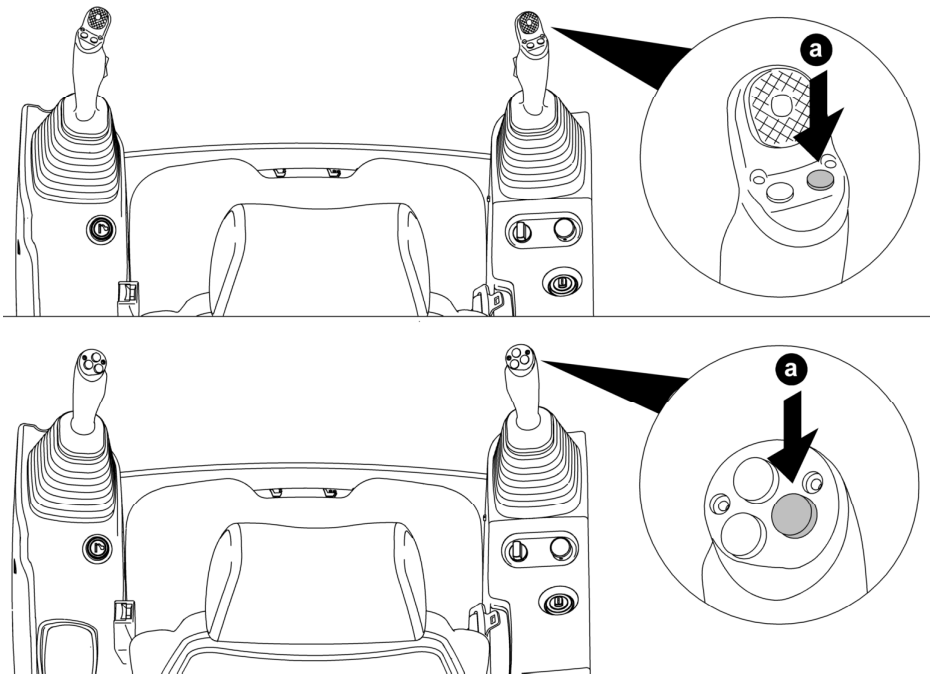

Fig. 353: Deactivating turning alarm

Make sure the following preconditions are met:
❑ Machine is not travelling.
❑ Uppercarriage is stationary.

Turning special working attachment

- ▶ Move special working attachment left **a**: Press and hold button **a** of left joystick.
- ▶ Move special working attachment right **b**: Press and hold button **b** of left joystick.

Controlling locking pins of the hydraulic quick coupler

- ▶ Extend locking pin of hydraulic quick coupler **2**: Press and hold button **a** of left joystick.
- ▶ Retract locking pin of hydraulic quick coupler **2**: Press and hold button **b** of left joystick.

3.4.24 Controlling special working attachment with mini-joystick (option)

Selecting special working attachment

If available:

- ▶ Select special working attachment from *Tool Control* menu on the display.

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Manually activating reversible fan drive

- ▶ Press *reversible fan drive* key on the control unit.
  - ▷ Direction of rotation of reversible fan drive is reversed.

Automatically activating reversible fan drive

The fan rotation direction can be reversed automatically at regular intervals. Manual activation continues to be possible.

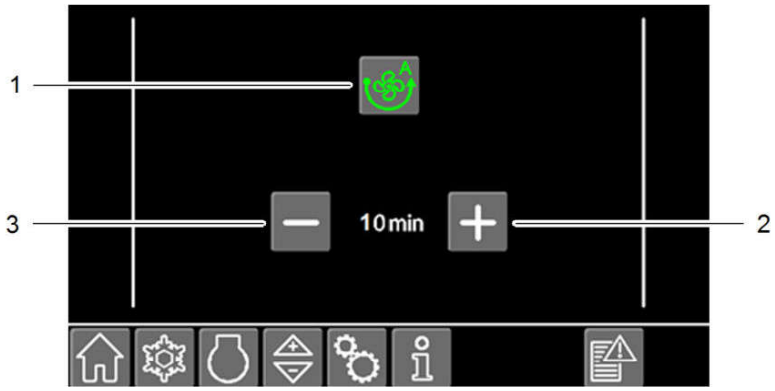

Fig. 415: Reversible fan drive menu

1 *Reversible fan drive* button

2 *Increasing operating interval of reversible fan drive* button

3 *Reducing operating interval of reversible fan drive* button

- ▶ Select *machine-specific settings* menu.
- ▶ Select *reversible fan drive* menu.
- ▶ Press *reversible fan drive* button **1**.
- ▶ Set operating interval of automatic reversible fan drive: Press *increasing operating interval of reversible fan drive* button **2** or *reducing operating interval of reversible fan drive* button **3**.

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3.6.4 Travelling under obstacles

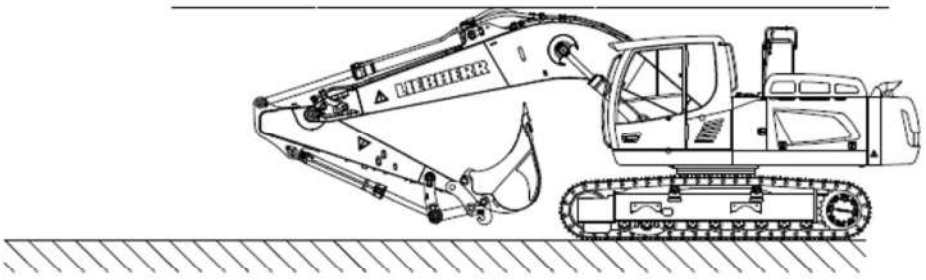

Fig. 437: Travelling under obstacles

During travel under obstacles, travel position of working attachment does not match the position described in “Travelling” chapter and working tool can block the view.

NOTICE
Impact of working tool on the ground! Impact of working attachment on the ground!
Damage to working tool and working attachment.

- ▶ If possible travel on level and firm ground.
- ▶ Travel slowly.
- ▶ Adapt height of working attachment to ground conditions.
- ▶ If necessary consult third person as spotter.

- ▶ Lower boom.
- ▶ Retract stick.
- ▶ Tilt bucket in.
- ▶ Activate creeper gear.
- ▶ Start travel.

3.6.5 Working on slope

The maximum inclination angle for working on slopes depends on the machine configuration.

DANGER
Machine tipping over!
Danger to life.

- ▶ Adhere to maximum inclination angle for working on slopes.
- ▶ Determine maximum inclination angle for working on slopes: Contact Liebherr customer service.

Make sure the following preconditions are met:
- ❑ Uppercarriage is positioned with front facing in direction of slope.
- ❑ Automatic uppercarriage locking is activated. (For more information see: Automatic locking, page 156)
- ❑ Maximum inclination angle during travel on slope is adhered to. (For more information see: 3.6.3 Travelling on slopes, page 185)

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- ▶ Make sure that rigger leaves the danger zone after attaching and releasing of load.
- ▶ Exclusively raise and lower loads vertically.
- ▶ Move loads close to the ground.

3.6.15 Lifting loads with quick coupler

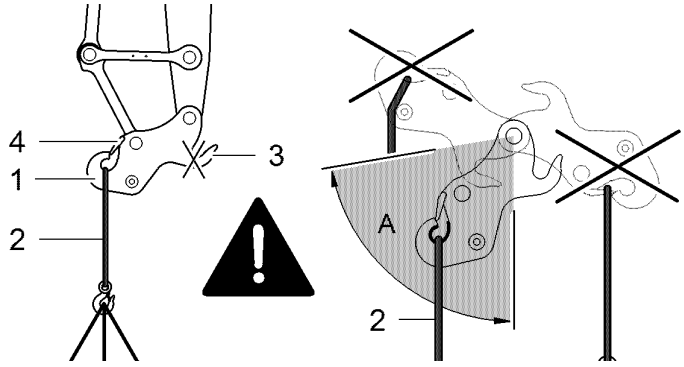

Fig. 448: Lifting loads with quick coupler

1 Load hook
2 Lifting accessory
3 Pick-up hook for working tool
4 Safety flap
A Permitted slewing range

The quick coupler has two load lift hooks **1** for load-lifting work.

The maximum load capacity value of each load lift hook **1** is specified on the quick coupler.

Preparing load-lifting work

- ▶ Remove working tool from quick coupler and secure it.
- ▶ Fully retract locking pin.
- ▶ Align opening of the load lift hooks **1** upward.
- ▶ Check function of the safety flaps **4**.

Lifting loads

DANGER
Machine tipping over or falling loads!
Danger to life.

- ▶ Make sure that no-one is in danger zone.
- ▶ Have load-lifting work carried out exclusively by trained personnel.
- ▶ Exclusively move quick coupler within the permitted slewing range **A**.

- ▶ Exclusively attach loads to load lift hooks **1**.
- ▶ Do not put load on safety flaps **4**.
- ▶ Observe maximum load lift of the load lift hooks **1**.
- ▶ Observe load lift chart in the operator's cab.
- ▶ Lift loads safely. (For more information see: 3.6.14 Lifting loads, page 196)

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3.8 Parking machine

DANGER
Machine tipping over!
Danger to life.

▶ Make sure that ground has suitable grip and firmness.

Note
Battery discharges during longer downtime.

▶ Check charging state of battery.

Note

▶ Exclusively park machine on slope as an exception.

3.8.1 Parking machine on level ground

If ambient temperature is below 0 °C:

▶ Avoid freezing onto the ground: Park machine on boards.

▶ Turn operator's cab over idler-wheels.

▶ Align uppercarriage parallel to undercarriage.

▶ Lock slewing brake.

▶ Lower working attachment to the ground.

▶ Shut off diesel engine.

▶ Make sure that ignition key is set to **I**.

▶ Make sure that safety lever or folding console is moved down.

▶ Depressurise hydraulic system: Operate joysticks and pedals carefully in all directions.

▶ Move safety lever or folding console up.

▶ Pull out ignition key.

▶ Lock all doors and flaps and remove key.

If machine will not be used for a long time:

▶ Set battery main switch to **0**.

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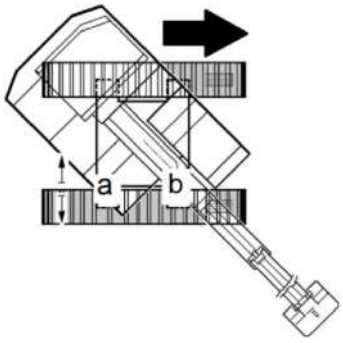
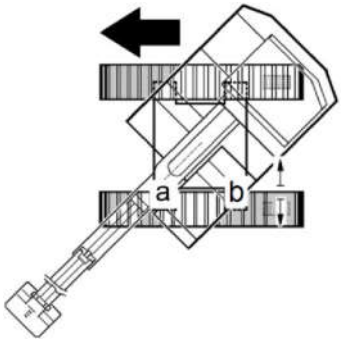
Extending left side frame

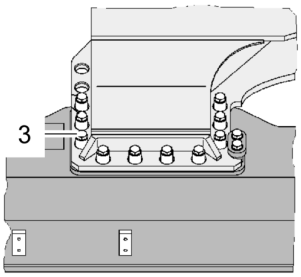
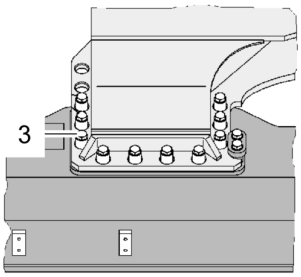


- ▶ Move working attachment over mounting point **b**: Turn uppercarriage.
- ▶ Extend working attachment and position it as close as possible to the ground.
- ▶ Extend left side frame at mounting point **a**: Move right travel lever backwards.
- ▶ Continue movement until left side frame is extended at mounting point **a** by 3 to 4 cm.
  ▷ Dimension **Xa** is increased by 3 to 4 cm.



- ▶ Move working attachment over mounting point **a**: Turn uppercarriage.
- ▶ Extend left side frame at mounting point **b**: Move right travel lever forwards.
- ▶ Continue movement until left side frame is extended at mounting point **b** by 6 to 8 cm.
  ▷ Dimension **Xb** is increased by 6 to 8 cm.
- ▶ Repeat extension processes in alternating order on side **a** and side **b**, always extending left side frame by 6 to 8 cm until it is at stop on both mounting points **a** and **b** at the same time.

Attaching extended side frame

Machine type	Position of mounting bolts	Number of mounting bolts	Features	Tightening torque
R936		Mounting bolts of side frames **3**: 4 x 10	M27 — strength class 10.9	1230 Nm
R 946 R 950 R 950 Tunnel R 956		Mounting bolts of side frames **3**: 4 x 10	M30 - strength class 10.9	1650 Nm

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3.10.7 After transport

Putting folding hand rails in working position

WARNING
Falling off machine!
Danger to life.

▶ Put folding railings in working position after transporting machine.

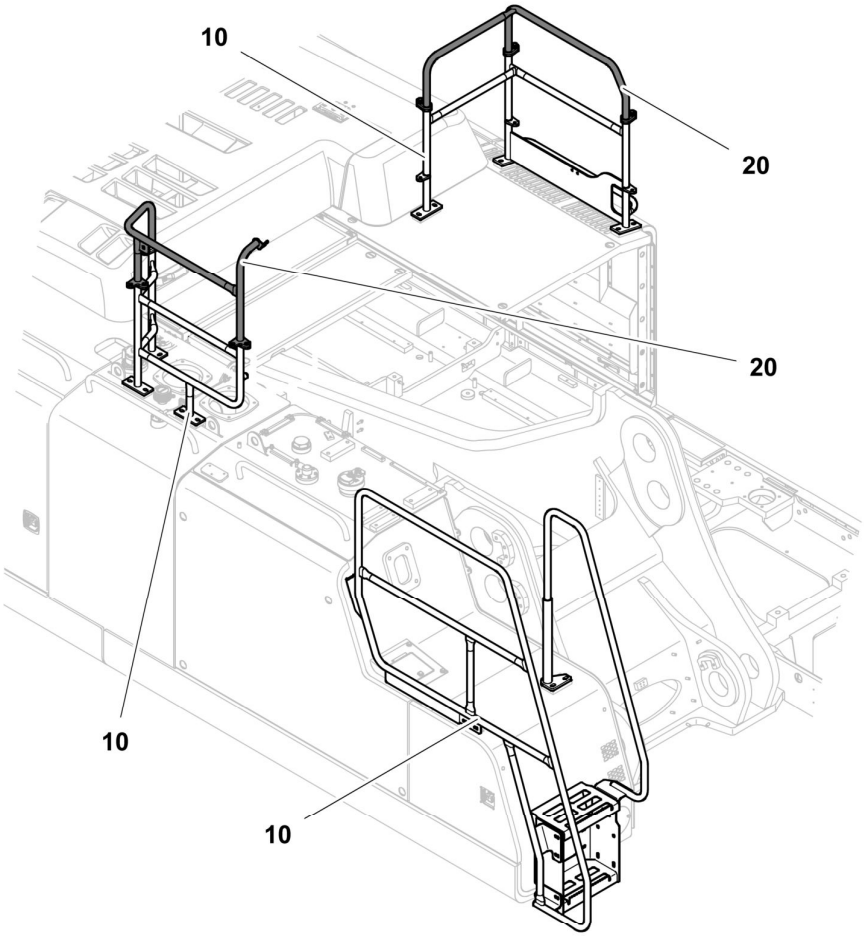

Fig. 484: Putting folding hand rails in working position

10 Fixed hand rail **20** Folding hand rail

Technical data of mounting bolts	Tightening torque
M12 — strength class 10.9	102 Nm

Tab. 48: Tightening torque of mounting bolts

▶ Tighten mounting bolts of folding hand rails **20** with prescribed tightening torque. (see: tab. 48, page 227)

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4 Malfunctions

Machine reports machines through following warnings:
- Warning symbols on the display
- Messages on the display
- Warning sounds in the operator's cab

Rectify malfunction:
- Identify meaning of warning.
- Identify effects and property of malfunction.
- Rectify cause of malfunction.

Contact Liebherr customer service:
- Specify machine type.
- Specify serial number.
- Specify year of manufacture.
- When work is performed on the machine:
  Make sure that the work is performed exclusively by trained staff.

4.1 Service code tables

4.1.1 Warning symbols

Warning symbols can be shown in any display menu.

Some warning symbols do not apply to all machines.

Symbol	Meaning	Effect	Remedy
	Hydraulic oil level too low	Damage to hydraulic system, automatic reduction of hydraulic power	Shut off diesel engine. Fill with hydraulic oil via collecting pipe. If symbol is still displayed, contact Liebherr customer service.
	Warning threshold: Hydraulic oil temperature too high	Damage to hydraulic system, automatic reduction of hydraulic power	Shut off diesel engine. Check contamination level of hydraulic oil cooler, clean if necessary. If symbol is still displayed, contact Liebherr customer service.
	Safety threshold: Hydraulic oil temperature too high		
	Oil temperature of pump distributor gear too high	Damage to hydraulic system, automatic reduction of hydraulic power	Shut off diesel engine. Check contamination level of pump distributor gear, clean if necessary. If symbol is still displayed, contact Liebherr customer service.

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Malfunction / error	Cause	Remedy
Bad track guidance; track is sagging badly. Track comes off or skips.	Excessive play in idler guide.	Contact Liebherr customer service.
	Track tension is too low.	Adjust track tension.
	Idler-wheel or sprocket wheel is worn.	Contact Liebherr customer service.
Correctly tensioned track quickly loses tension during operation.	Track tensioner cylinders are defective.	Contact Liebherr customer service.
	Grease fitting is leaking.	Contact Liebherr customer service.
Travel gear is blocked.	Travel gear is extremely dirty.	Clean travel gear.

4.2.4 Electrical system

Malfunction / error	Cause	Remedy
Charge indicator symbol is displayed after the engine starts.	V-belt is loose.	Tighten v-belt.
	V-belt has torn.	Replace v-belt.
	Alternator is defective.	Contact Liebherr customer service.
Batteries are not charged, or not charged sufficiently.	Batteries are faulty.	Replace batteries.
	Battery connections are loose.	Attach battery connections.
	Battery connections have oxidised.	Clean battery connections.
	Cables are loose.	Connect cables.
	Cables are damaged.	Replace cables.
Malfunction of control elements and display elements has occurred.	Cables are loose or damaged. Control is defective.	Contact Liebherr customer service.
	Fuse is defective.	Replace fuse.
Engine speed cannot be changed.	Sensor-controlled low idle automatic is switched on.	Switch off sensor-controlled low idle automatic or touch joystick.
Sensor controlled low idle automatic is not working. Engine speed does not drop automatically.	Control signal is faulty.	Contact Liebherr customer service.

4.2.5 Heating, ventilation and air conditioning unit

Malfunction / error	Cause	Remedy
Heating does not provide warm air	Stop valves of heating circuit on diesel engine shut.	Contact Liebherr customer service.
	Diesel engine not at operating temperature.	Bring engine to operating temperature.
Blower does not work	Power supply disconnected.	Contact Liebherr customer service.
	Fan motor defective.	Contact Liebherr customer service.

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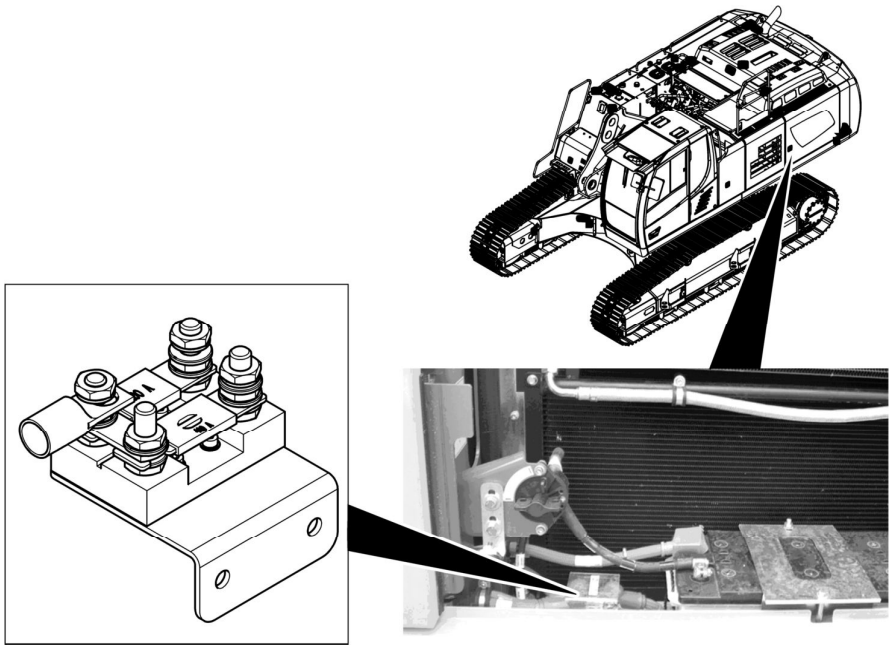

Fig. 568: Main fuses

	Current value [A]	Function
Main fuses		
F112	100	Power supply of electric cabinet E50
F153	400	Power supply for starter circuit

Tab. 55: Main fuses

▶ When replacing main fuses, tighten nut and locknut to 16 Nm.

Symbol	Meaning
	Hydraulic system
	Check oil level of the hydraulic tank
	Diesel engine
	Check oil level of the diesel engine
	Gearbox
	Check oil level of the gearbox
	Lubricating points
	Lubrication
h	Operating hours
	Observe instructions in the operator's manual

Tab. 59: Meaning of the symbols on the lubrication chart

5.3.11 Lubricants and care products for electrical and mechanical systems

Liebherr recommendation

Application	Product
Contact spray for slip rings	Cramolin
Lubricant for pistons, piston nuts and piston bearing installation on hydraulic cylinders	Gleitmo 800
Special corrosion inhibitor for installation spaces of sealing elements on hydraulic cylinders	Rostilo Tarp CFX Fuchs Lubritech
Assembly paste for installation of pumps and coupling	Optimol Paste White T

Tab. 90: Liebherr recommendation

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5.6.4 Cleaning the machine

In the following situations, thoroughly clean machine to remove all traces of contamination and dirt deposits:
– After each work deployment
– Before maintenance work
– Before repair work

NOTICE
Aggressive materials and working environment!
Corrosion damage to machine or impairment of function.

If machine has come into contact with aggressive materials or has been working in an aggressive working environment:
▶ Clean machine at end of work.

Regular cleaning prevents dirt and foreign particles from penetrating machine.

Clean machine immediately after following deployments:
– Working in salty environments (for example in contact with road salt, or by the sea)
– Working with alkalis or acids
– Working with aggressive materials (for example calcium compounds, cement)

NOTICE
Incorrect cleaning with high pressure water or steam cleaning!
Damage to electrical systems, cables and wire harnesses.

▶ Clean electrical systems, cables and wire harnesses with low pressure.

▶ Observe instructions of high pressure cleaner manufacturer.

NOTICE
Incorrect cleaning with high pressure water or steam cleaning!
Damage to paint.

▶ Do not clean machine with a high pressure cleaner for two months after first putting it into service (or after respraying).

▶ Observe instructions of high pressure cleaner manufacturer.

Cleaning outside of machine

Before cleaning

Before cleaning with water or a high-pressure cleaner, perform following activities in order to avoid water penetration.

▶ Turn ignition button to position **0**.

▶ Lubricate all bearings, pin connections and slewing ring, using central lubrication system, if available.

▶ Clean away oil, fuel or care products off connections and fittings.

If sensitive parts behind openings have to be protected from penetrating water:
▶ Cover or mask off openings.

Parts particularly at risk are:
– Electric motors

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Prepa-ration	Clean completely with high-pressure cleaner (with cleaning agent) and then rinse with clear water (no salt water or similar). Clean and decrease with solvent (caution with seals and other sensitive synthetic components). If necessary clean with oil-free compressed air. Remove non-adherent paint. Grind oxidised surfaces with abrasive paper (grain P60-P120) or mechanically with appropriate tool. Treat area to be treated with abrasive paper (grain P240). If necessary remove damaged seals and apply anew (acrylic sealing material). Repair deformations with polyester material.									
Coat: Primer	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**
	Repair primer (single-compo-nent primer)	50 µm	Polyur-ethane primer (+ hardener)	80 µm	Repair kit epoxy primer	125 µm	Epoxy primer (+ catalyser)	125 µm		
	Colour		**Colour**		**Colour**		**Colour**		**Colour**	
	RAL 1015		RAL 1013		Light grey		Light grey			
Coat: Top coat	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**	**Product**	**Thick-ness**
	Repair kit, polyur-ethane.	50 µm	Polyur-ethane paint (+ hardener)	50 µm	Repair kit, paint for mari-time applica-tions	100 µm	Paint for maritime applica-tions (+ hardener)	100 µm	High-tempera-ture-resistant paint	50 µm
	Colour				**Colour**				**Colour**	
	Liebherr yellow, Liebherr grey, white RAL 9002				Liebherr yellow, Liebherr grey, white RAL 9002				Black	

Tab. 99: Paint systems for repair work on exterior, interior and specific components of machine

Materials prescribed for coats

Repair systems can be applied with a roller, paintbrush or aerosol.

Spraying systems must be applied by means of paint spray gun.

Note

Adhere to technical documentation from manufacturer.

Product name	**Item code**	**Container**	**Colour**
Non-slip paint	10340720	5 kg	Black
	8503039	25 kg	
Extra-thick single-component paint, application via roller			
High-temperature-resistant paint	10023008	10 kg	Black
	11481057	Aerosol 400 ml	
Single-component paint; application via spray paint gun, roller and brush			

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Sample document

▶ Separate sample document from sample data sheet and store it.

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▶ Wait until regeneration has finished.

When regeneration is completed:
– *High exhaust temperature* status symbol disappears.
– *Manual activation of regeneration* key returns to its original state.

▶ Lower safety lever.
▷ Machine can be used as normal.

Activating manual regeneration after extended downtime

Manual regeneration is required at the specified intervals.

Fuel used	Maximum duration of the extended period without operation
DIN EN 590	12 months
ASTM D975 (89a)	3 months

Tab. 112: Manual regeneration after extended downtime

When maximum duration of extended downtime is reached:
▶ Activate the manual regeneration. (For more information see: Activating the manual regeneration, page 316)

Blocking regeneration

NOTICE
Incorrect blocking of regeneration!
Accelerated wear of diesel particulate filter.

▶ Exclusively block regeneration in enclosed space or if there is a fire hazard.

Blocking regeneration selectively

▶ Select *diesel particulate filter* menu.

▶ Press *selective blocking of regeneration* button.
▷ *Selective blocking of regeneration* button appears in green.
▷ *Manual activation of regeneration* button is inactive.
▷ *Regeneration of diesel particulate filter blocked* status symbol appears on the display.

▶ Release blocking of regeneration: Press *selective blocking of regeneration* button.
▷ *Selective blocking of regeneration* button appears in white.
▷ *Manual activation of regeneration* button is active.
▷ *Regeneration of diesel particulate filter blocked* status symbol disappears.

▶ Blocking of selective regeneration is automatically removed during shut-off.

Blocking regeneration permanently[31)]

▶ Select *diesel particulate filter* menu.

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5.10.3 Hydraulic tank: Draining water and sediments

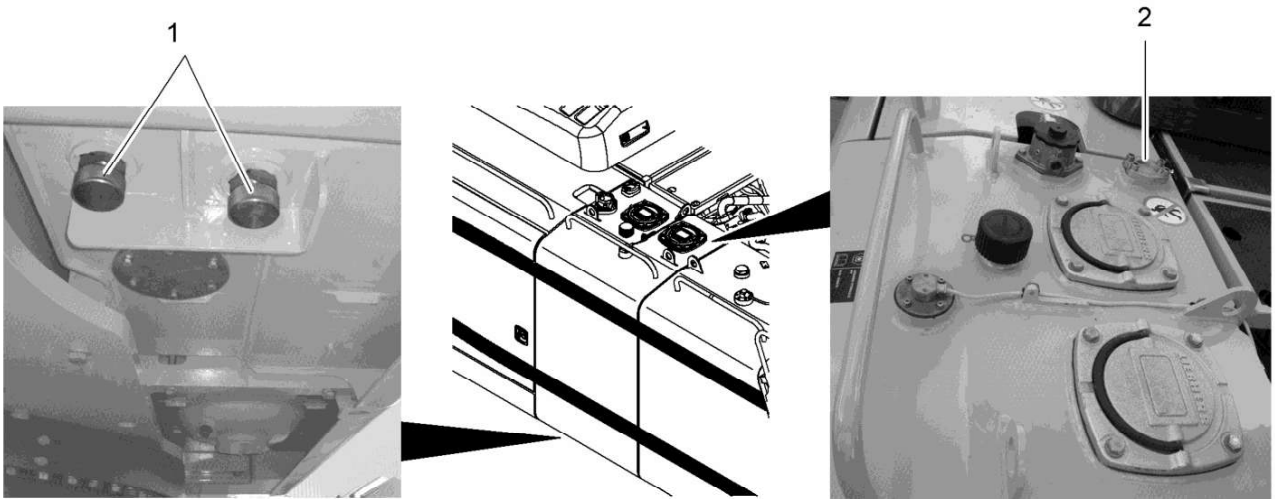

Fig. 636: Hydraulic tank

1 Drain valve **2** Collecting pipe

Note
If biodegradable hydraulic oil is used:

- ▶ After every diesel engine downtime exceeding 24 hours, drain water and sediment from hydraulic tank.

- ▶ Depressurise hydraulic system.
- ▶ Place suitable receptacle under hydraulic tank.
- ▶ Remove SAE dummy flange of collecting pipe **2**.
- ▶ Unscrew plugs of drain valves **1**.
- ▶ Attach drain hoses supplied with machine to drain valves **1** under hydraulic tank.
- ▶ Drain water and sediments until clean hydraulic oil emerges.
- ▶ Remove drain hoses.
- ▶ Screw in plugs of drain valves **1**.
- ▶ Mount SAE dummy flange of collecting pipe **2**.

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NOTICE
Missing or very worn teeth!
Damage to tooth adapters.

- ▶ Before working with bucket, make sure that every tooth adapter is equipped with tooth.
- ▶ Before working, check wear of teeth.

Removing tooth

- ▶ Clean tooth **5** and mounting system.
- ▶ Remove protection plug **4**.
- ▶ Turn securing pin **3** with a square wrench approximately 30° towards tooth **5**.
  ▷ Nose of securing pin **3** slips out of pin retention **2**.
- ▶ Use the hammer and punch to knock out securing pin **3**.
- ▶ Remove tooth **5**.
- ▶ Remove pin retention **2**.
- ▶ Clean tooth adapter **1**.
- ▶ Check tooth adapter **1** for wear.

If tooth adapter **1** is worn:
- ▶ Have tooth adapter **1** replaced.

Installing tooth

- ▶ Insert pin retention **2**.
- ▶ Place new tooth **5** on tooth adapter **1**.
- ▶ Push securing pin **3** all the way in.
- ▶ Turn securing pin **3** with a square wrench approximately 30° towards bucket.
  ▷ Nose of securing pin **3** engages in pin retention **2**.
- ▶ Insert protection plug **4** onto head of securing pin **3**.

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