en **Operator's manual**

Hydraulic excavator

Document ID

ORIGINAL OPERATOR'S MANUAL

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Manufacturer: Liebherr-France SAS
Type: R 934
Type no.: 1550
From Serial no.: 48712

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LFR/12251550/01/2021-01-26/en

1.1.3 Undercarriage

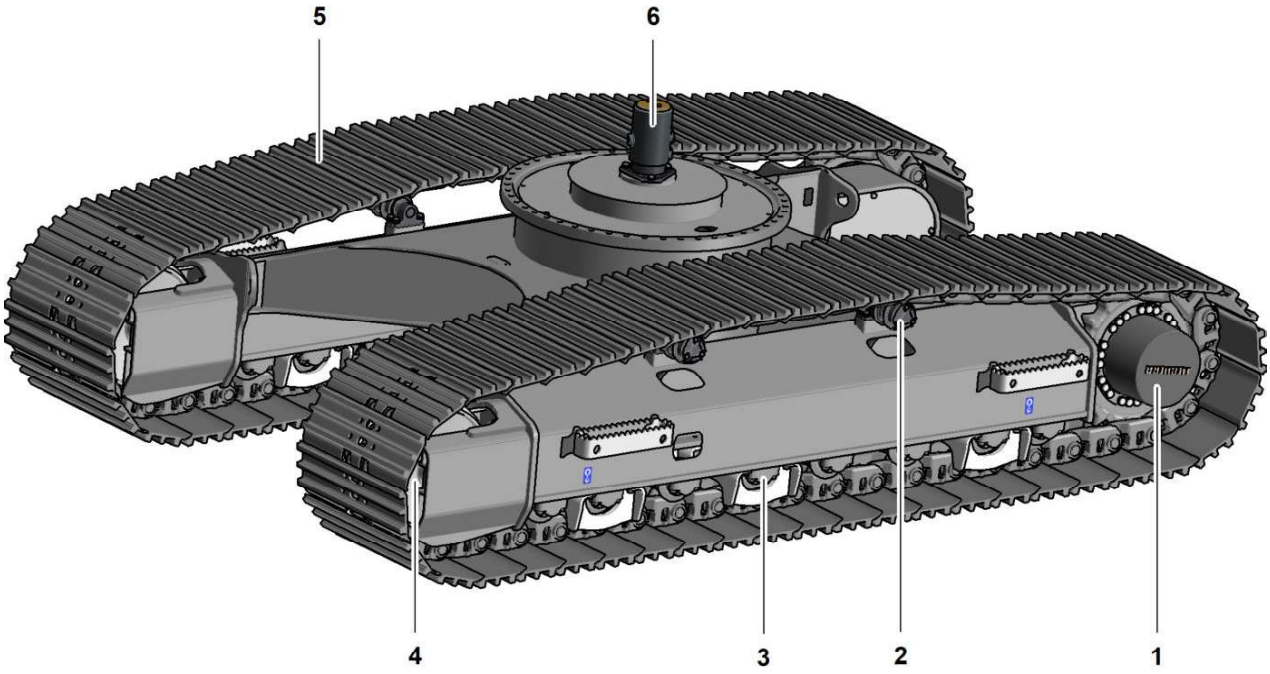

Fig. 4: Undercarriage

1	Travel gearbox and sprocket wheel	**3**	Track roller	**5**	Track
2	Carrier roller	**4**	Idler-wheel	**6**	Rotary connection

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Operator's Cab

Cab	ROPS safety cab structure (roll-over protection system according to ISO 12117-2:2008) with 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, laminated right hand side and roof windows, all windows tinted, separate extensible window shades for the sunroof window and windscreen, cigarette lighter and 24 V plug, 12 V plug, cup holder, mobile phone storage net
Operator's seat	Liebherr-Comfort seat, airsprung with automatic weight adjustment, vertical and longitudinal seat damping including consoles and joysticks. Seat and armrests adjustable separately and in combination (adjustable in width, height and inclination), seat heating as standard
Arm consoles	Oscillating consoles with seat, tiltable console left
Operation and displays	Large high-resolution operating unit, intuitive, colour display with touchscreen, video-compatible, numerous setting, control and monitoring options, e.g. air conditioning control, fuel consumption, machine and attachment parameters
Air-conditioning	Automatic air-conditioning, recirculated air function, fast de-icing and demisting at the press of a button, air vents can be operated via a menu. Recirculated 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 The air conditioning system contains fluorinated greenhouse gases
Refrigerant	R134a
Global warming potential	1,430
Quantity at 25 °C*	1,260 g
CO_2 equivalent	1.80 t
Vibration emission**	
Hand/arm vibrations	< 2.5 m/s², according with ISO 5349-1:2001
Whole-body vibrations	< 0.5 m/s²
Measuring inaccuracy	According with standard EN 12096:1997
Noise emission	
ISO 6396	L_{pA} (inside cab) = 72 dB(A)
2000/14/EC	L_{WA} (surround noise) = 105 dB(A)

Undercarriage

Versions	
NLC	Gauge 2,390 mm
LC	Gauge 2,590 mm
Drive	Liebherr swashplate motor with brake valves on both sides
Transmission	Liebherr planetary reduction gear
Maximum travel speed	Low range 3.3 km/h High range 5.4 km/h
Drawbar pull on crawler	325 kN
Track components	D7, D7G, maintenance-free
Track rollers/ Carrier rollers	9/2
Tracks	Sealed and greased
Track pads	Triple 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	Liebherr central lubrication system
Hydraulic connections	Pipes and hoses equipped with SAE split-flange connections
Buckets	Standard equipped with Liebherr tooth system

* Valid for standard machine without operator's cab elevation and without height adjustable cab
** For the risk assessment according to 2002/44/EC see ISO/TR 25398:2006

Lift Capacities

with Mono Boom 6.45 m, Counterweight 7.1 t and Track Pads 600 mm

Stick 2.60 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
NLC	7.5					9.2	9.2*							7.2	9.1*	6.9
	6.0					8.9	9.8*	6.2	8.9*					5.7	8.8*	7.9
	4.5			12.8	14.0*	8.4	10.9*	6.0	9.3*					5.0	8.0	8.5
	3.0			11.5	16.9*	7.9	12.2*	5.7	9.5					4.6	7.4	8.8
	1.5			10.8	16.5*	7.4	12.8	5.5	9.2					4.4	7.3	8.8
	0			10.6	18.0*	7.1	12.5	5.3	9.0					4.5	7.5	8.6
	−1.5	15.0*	15.0*	10.7	16.9*	7.1	12.4	5.3	9.0					4.9	8.2	8.0
	−3.0	18.4*	18.4*	10.9	14.8*	7.2	11.5*							5.8	9.2*	7.1
	−4.5			11.1*	11.1*									8.1	8.6*	5.7
	−6.0															
LC	7.5					9.2*	9.2*							7.8	9.1*	6.9
	6.0					9.7	9.8*	6.8	8.9*					6.2	8.8*	7.9
	4.5			14.0*	14.0*	9.2	10.9*	6.5	9.3*					5.4	8.0	8.5
	3.0			12.7	16.9*	8.6	12.2*	6.3	9.5					5.0	7.5	8.8
	1.5			12.0	16.5*	8.1	12.8	6.0	9.2					4.8	7.3	8.8
	0			11.8	18.0*	7.8	12.5	5.8	9.0					4.9	7.5	8.6
	−1.5	15.0*	15.0*	11.8	16.9*	7.8	12.5	5.8	9.0					5.3	8.2	8.0
	−3.0	18.4*	18.4*	12.0	14.8*	7.9	11.5*							6.3	9.2*	7.1
	−4.5			11.1*	11.1*									8.6*	8.6*	5.7
	−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
NLC	7.5													6.8	8.6*	7.2
	6.0					9.0	9.3*	6.3	8.6*					5.4	8.4*	8.2
	4.5			13.1	13.4*	8.5	10.5*	6.1	9.1*					4.7	7.7	8.7
	3.0			11.7	16.3*	7.9	11.8*	5.8	9.5	4.4	7.1			4.4	7.1	9.0
	1.5			10.8	18.0*	7.4	12.8	5.5	9.2	4.2	7.0			4.2	7.0	9.0
	0			10.6	18.1*	7.1	12.5	5.3	9.0					4.3	7.1	8.8
	−1.5	15.0*	15.0*	10.6	17.2*	7.0	12.3	5.2	8.9					4.6	7.7	8.3
	−3.0	19.7*	19.7*	10.7	15.3*	7.1	11.8*							5.4	9.1*	7.5
	−4.5	15.0*	15.0*	11.1	12.0*	7.4	9.0*							7.3	8.7*	6.1
	−6.0															
LC	7.5													7.3	8.6*	7.2
	6.0					9.3*	9.3*	6.8	8.6*					5.9	8.4*	8.2
	4.5			13.4*	13.4*	9.2	10.5*	6.6	9.1*					5.1	7.7	8.7
	3.0			12.9	16.3*	8.6	11.8*	6.3	9.5	4.8	7.2			4.7	7.1	9.0
	1.5			12.0	18.0*	8.1	12.8	6.0	9.2	4.6	7.0			4.6	7.0	9.0
	0			11.7	18.1*	7.8	12.5	5.8	9.0					4.7	7.2	8.8
	−1.5	15.0*	15.0*	11.7	17.2*	7.7	12.4	5.7	8.9					5.0	7.8	8.3
	−3.0	19.7*	19.7*	11.9	15.3*	7.8	11.8*							5.9	9.1*	7.5
	−4.5	15.0*	15.0*	12.0*	12.0*	8.1	9.0*							7.9	8.7*	6.1
	−6.0															

Stick 3.25 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
NLC	7.5							6.4	8.0*					6.2	8.1*	7.6
	6.0							6.3	8.1*					5.1	7.9*	8.5
	4.5			12.5*	12.5*	8.6	10.0*	6.1	8.7*	4.5	7.3			4.4	7.2	9.1
	3.0			11.9	15.5*	7.9	11.4*	5.7	9.4*	4.3	7.1			4.1	6.7	9.3
	1.5			10.9	17.5*	7.4	12.6*	5.4	9.1	4.2	7.0			3.9	6.6	9.4
	0			10.5	18.0*	7.0	12.4	5.2	8.9	4.1	6.8			4.0	6.7	9.1
	−1.5	14.5*	14.5*	10.4	17.4*	6.9	12.2	5.1	8.8					4.3	7.2	8.6
	−3.0	20.8	21.1*	10.5	15.8*	7.0	12.1*	5.2	8.8					4.9	8.3	7.8
	−4.5	16.6*	16.6*	10.9	12.9*	7.2	9.8*							6.4	8.6*	6.6
	−6.0															
LC	7.5							6.9	8.0*					6.7	8.1*	7.6
	6.0							6.8	8.1*					5.5	7.9*	8.5
	4.5			12.5*	12.5*	9.3	10.0*	6.6	8.7*	4.9	7.3			4.8	7.2	9.1
	3.0			13.1	15.5*	8.7	11.4*	6.2	9.4*	4.7	7.2			4.5	6.7	9.3
	1.5			12.0	17.5*	8.1	12.6*	5.9	9.2	4.6	7.0			4.3	6.6	9.4
	0			11.6	18.0*	7.7	12.4	5.7	8.9	4.5	6.9			4.4	6.7	9.1
	−1.5	14.5*	14.5*	11.5	17.4*	7.6	12.3	5.6	8.8					4.7	7.2	8.6
	−3.0	21.1*	21.1*	11.7	15.8*	7.6	12.1*	5.7	8.9					5.4	8.4	7.8
	−4.5	16.6*	16.6*	12.0	12.9*	7.9	9.8*							7.0	8.6*	6.6
	−6.0															

Stick 3.95 m

Under-carriage	m	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m				m
NLC	7.5							6.6	7.1*					5.5	6.4*	8.3
	6.0							6.4	7.3*	4.6	6.7*			4.5	6.3*	9.1
	4.5					8.7	9.0*	6.1	7.9*	4.5	7.3*			4.0	6.4*	9.6
	3.0	14.0*	14.0*	12.3	13.9*	8.1	10.5*	5.8	8.7*	4.3	7.1			3.7	6.1	9.9
	1.5	7.0*	7.0*	11.1	16.4*	7.4	11.9*	5.4	9.1	4.1	6.9			3.5	6.0	9.9
	0	9.9*	9.9*	10.4	17.6*	7.0	12.3	5.1	8.8	4.0	6.7			3.6	6.1	9.7
	−1.5	14.5*	14.5*	10.1	17.6*	6.7	12.1	5.0	8.6	3.9	6.6			3.8	6.4	9.2
	−3.0	20.1	20.4*	10.2	16.5*	6.7	12.0	4.9	8.6					4.2	7.3	8.4
	−4.5	19.5*	19.5*	10.4	14.3*	6.9	10.9*							5.3	8.4*	7.3
	−6.0			10.2*	10.2*									8.1*	8.1*	5.5
LC	7.5							7.1*	7.1*					5.9	6.4*	8.3
	6.0							6.9	7.3*	5.0	6.7*			4.9	6.3*	9.1
	4.5					9.0*	9.0*	6.6	7.9*	4.9	7.3*			4.3	6.4*	9.6
	3.0	14.0*	14.0*	13.5	13.9*	8.8	10.5*	6.3	8.7*	4.7	7.1			4.0	6.1	9.9
	1.5	7.0*	7.0*	12.2	16.4*	8.1	11.9*	5.9	9.1	4.5	6.9			3.9	6.0	9.9
	0	9.9*	9.9*	11.5	17.6*	7.7	12.4	5.6	8.8	4.3	6.7			3.9	6.1	9.7
	−1.5	14.5*	14.5*	11.3	17.6*	7.4	12.1	5.5	8.7	4.3	6.7			4.1	6.5	9.2
	−3.0	20.4*	20.4*	11.3	16.5*	7.4	12.1	5.4	8.6					4.7	7.3	8.4
	−4.5	19.5*	19.5*	11.6	14.3*	7.6	10.9*							5.8	8.4*	7.3
	−6.0			10.2*	10.2*									8.1*	8.1*	5.5

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 485 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.

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. 5: 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. 6: 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:
- Safety signs
- Information signs
- Identification plate

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Exceeding of total weight

- Make sure that total weight of machine (see identification plate) is not exceeded.
- Make sure that the machine does not exceed the total weight with heavy working tools.
- Make sure that the machine does not exceed the total weight after changing the working attachment.
- Make sure that the machine does not exceed the total weight with add-ons or after retrofitting.

2.5.6 Falling object protective structures (FOPS and FGPS)

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.

2.6 Emergency equipment on the machine

2.6.1 Emergency exit (standard)

Danger to life

Incorrect labelling

- Make sure that all information signs are present.
- Make sure that all information signs are legible.

Incorrect equipment

- Make sure that emergency hammer is present.
- Make sure that position of emergency hammer is known.

2.6.2 Fire extinguisher (option)

Danger to life

Incorrect behaviour

- Make sure that all fastening points of fire extinguishers on the machine are known.

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2.8.2 Heavy parts

Danger to life

Incorrect handling

- Exclusively use machine for load-lifting with sufficient loading capacity.
- Exclusively use suitable and functioning lifting accessories with sufficient loading capacity.
- Make sure there are no persons underneath raised loads.
- Exclusively task qualified and experienced persons with the attaching of loads.
- Exclusively task qualified and experienced persons with the directing of operators.
- Make sure that the spotter can be seen by the operator.
- Make sure that spotter and operator are in voice contact if necessary.

Injury

Incorrect protective equipment

- Put on gloves when handling wire ropes.

2.8.3 Regular checks

Danger to life

Incorrect performance of checks

- Make sure that safety checks are performed regularly on the machine.
- Make sure that all checks are performed by suitable, competent and authorised persons.
- Adhere to national regulations.

2.9 Modifications to the machine

2.9.1 Modifications, add-ons and retrofittings

Danger to life

Incorrect changes to the machine

- Have changes, add-ons or retrofittings that could affect safety approved by the manufacturer.
- Have installation and adjustment of safety equipment and safety valves approved by the manufacturer.
- Have welding work on load-bearing parts approved by the manufacturer.
- If attachment parts and add-on parts are not approved generally by Liebherr for installation or attachment: Do not attach or install attachment parts and add-on parts to machine without written approval from Liebherr.
- Send all technical documents required for approval to Liebherr.

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Symbol	Meaning
	Clamps locked
	Pipe-laying tool; control of press-in cylinder is running
	Pipe-laying tool; control of grapple is running

Tab. 13: Status symbols of working attachment and working tools

Rotary motion

Symbol	Meaning
	Slewing brake released
	Slewing brake released and uppercarriage rotating speed sensor defective
	Rotary motion error detected
	Rotary motion error not rectified after 100 h
	Slewing brake locked with button
	Slewing brake locked with joystick switch

Tab. 14: Status symbols of rotary motion

Travel mode

Symbol	Meaning
	Travel mode blocked

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2 *Increasing activation time for sensor-controlled low idle automatic* button
3 *Increasing idling time until automatic engine stop* button
5 *Reducing idling time until automatic engine stop* button

▶ Activate sensor-controlled low idle automatic: (For more information see: 3.4.12 Sensor-controlled low idle automatic, page 157)

▶ (For more information see: 3.4.13 Automatic engine stop after idling (option), page 159)

3.2.9 *Measurement displays* submenu

Menu call:  > 

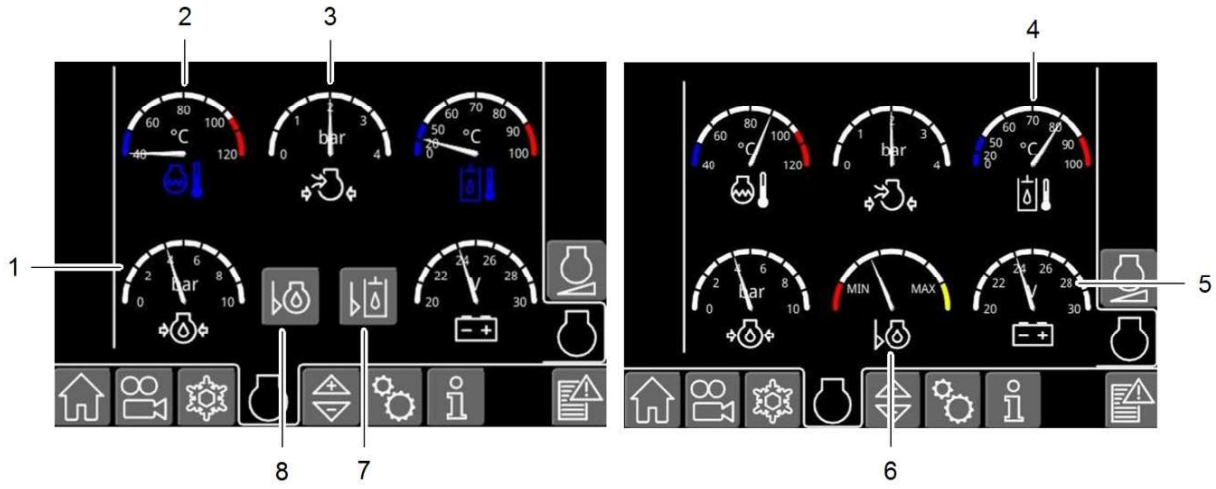

Fig. 143: Measurement displays submenu

1 Engine oil pressure
2 Coolant temperature
3 Intake air pressure
4 Hydraulic oil temperature
5 Battery voltage
6 Engine oil level[8)]
7 *Hydraulic oil level* button[7)]
8 *Engine oil level* button[8)]

3.2.10 *System settings* menu

Menu call: 

7) Available when diesel engine is shut off.
8) Available when diesel engine has been shut off for at least one hour and diesel engine is cold.

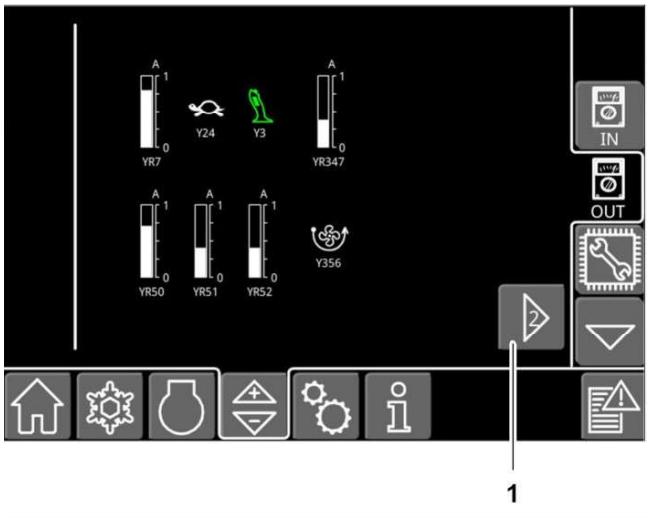

Fig. 166: Electrical outputs submenu

1 *Scroll* button

The *electrical outputs* submenu provides a quick overview for Liebherr customer service. It shows the operating status of the electrical outputs.

3.2.25 *Electrical inputs* submenu

Menu call:  >  > 

The display of this submenu varies depending on machine configuration:

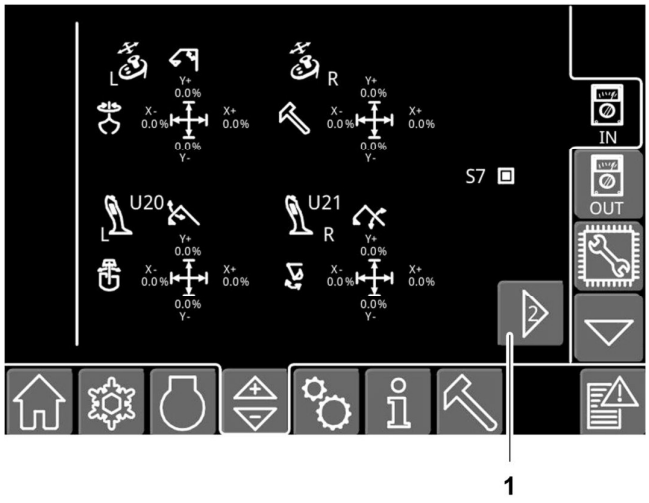

Fig. 167: Electrical inputs submenu

1 *Scroll* button

The *electrical inputs* submenu provides a quick overview for Liebherr customer service. It shows the operating status of the electrical inputs.

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▶ Activate asymmetrical mode: Press *symmetrical mode* button **4**.
▷ Symbol is displayed in white.

Symmetrical mode

The symmetrical mode is activated as standard.

▶ Activate symmetrical mode from asymmetrical mode: Press *symmetrical mode* button **4**.
▷ *Symmetrical mode* button **4** flashes 5 seconds.
▷ Symbols for turning working tool are displayed as yellow buttons.

▶ Press *increasing rotation* button or *reducing rotation* button.
▷ Settings of selected button apply to both control directions.
▷ *Symmetrical mode* button **4** is displayed in green.

Reversing direction of rotation

Make sure the following precondition is met:
❑ Controls are not actuated.

▶ Press *reversing direction of rotation* button **5**.
▷ *Reversing direction of rotation* button **5** is displayed in yellow.

▶ Press confirmation button.
▷ *Reversing direction of rotation* button **5** is displayed in green.
▷ Reversing control direction is active.

Factory settings

▶ Activate factory settings: Press *factory settings* button **3**.
▷ *Symmetrical mode* button **4** is displayed in green.
▷ Speed is set to maximum value.
▷ Progressivity is set to medium value.

3.2.33 *Movement restriction for boom and movement restriction for stick* submenu (option)

Menu call:  > 

The display of this submenu varies depending on machine configuration:

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Symbol	Description
	Grapple
	Pipe-laying tool
	Mowing bucket
	Tool
	Mill
	Pulveriser
	Plate vibrator
	Hammer with float position of the boom in mode 3
	Vibratory hammer

Tab. 26: Symbols for working tools, Tool Control

Symbols for properties

Symbol	Description
	Working tool in continuous mode
	Floating boom

Tab. 27: Symbols for properties, Tool Control

Adjusting seat position

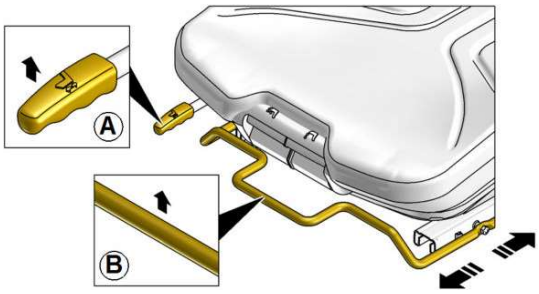

Fig. 251: Adjusting seat position

A Adjusting seat position without armrests

B Adjusting seat position with armrests

Adjusting armrests

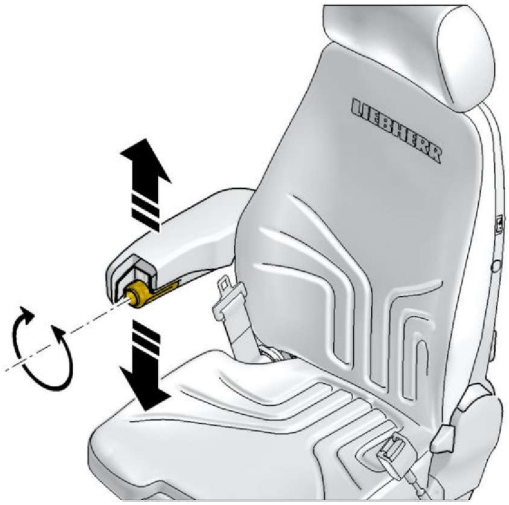

Fig. 252: Adjusting armrest angle

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3.3.10 Windscreen

DANGER
Limited visibility!
Injuries.

▶ Make sure that windscreen is not in intermediate position during work.

Lower windscreen

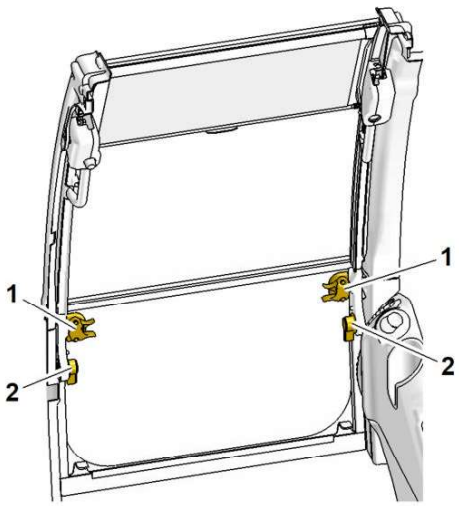

Fig. 282: Lower windscreen

1 Locking mechanism **2** Extender wheel

Opening lower windscreen

▶ Turn extender wheels **2** upwards simultaneously.

▶ Unlock lower windscreen: Press levers of locking mechanism **1** together simultaneously.

▶ Push lower windscreen upwards until it engages.

Closing lower windscreen

▶ Unlock lower windscreen: Press levers of locking mechanism **1** together simultaneously.

▶ Pull lower windscreen downwards until it engages.

▶ Simultaneously turn extender wheels **2** downwards.

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Adjusting side area camera

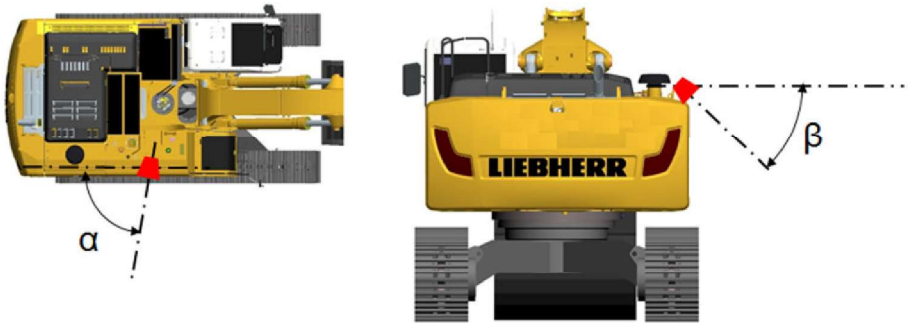

Fig. 298: Adjusting side area camera

Adjusting angle α

▶ Contact Liebherr customer service.

Adjusting angle β

▶ Contact Liebherr customer service.

Rear area camera

Checking red area covered by rear area camera

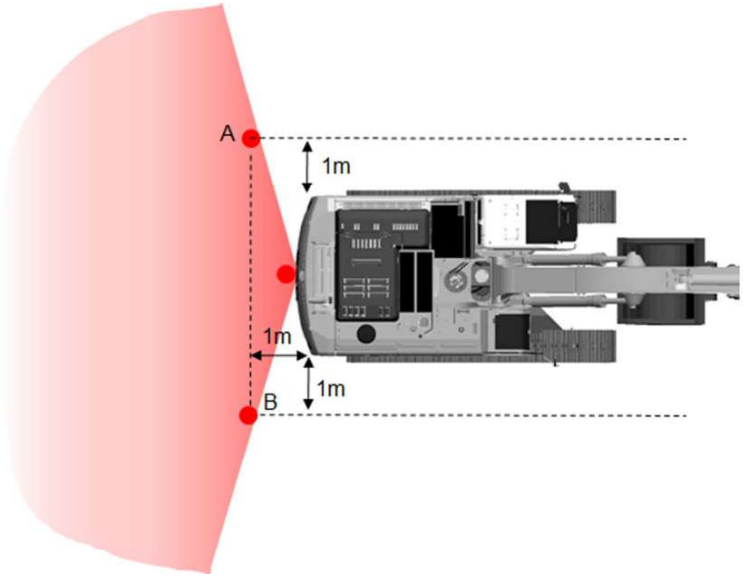

Fig. 299: Checking red area covered by rear area camera

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CAUTION
Corrosive diesel exhaust fluid!
Injuries.

▶ Do not inhale vapours.

If skin comes into contact with diesel exhaust fluid:
▶ Clean affected areas with plenty of water and soap.

If eyes come into contact with diesel exhaust fluid:
▶ Rinse eyes under running water for at least 15 minutes.

▶ Consult a doctor if irritation persists.

If diesel exhaust fluid was swallowed:
▶ Do not vomit.

▶ Rinse mouth and drink plenty of water.

▶ Consult a doctor immediately.

▶ Adhere to safety data sheet of diesel exhaust fluid.

NOTICE
Corrosive diesel exhaust fluid!
Damage to machine.

▶ After contact with diesel exhaust fluid clean affected areas with plenty of water and soap.

▶ Adhere to safety data sheet of diesel exhaust fluid.

Refuelling

Make sure the following preconditions are met:
❑ Strainer of diesel exhaust fluid tank is clean and in good condition.
❑ Diesel exhaust fluid used is approved. (For more information see: 5.3.2 Diesel exhaust fluids, page 273)

▶ Unscrew and remove plug **1**.

▶ Fill diesel exhaust fluid tank.

▶ Make sure that red balls in sight glass for maximum level of diesel exhaust fluid **2** do not cross **STOP** line.

▶ Screw in and tighten plug **1**.

Refuelling with filling pump (option)

24 V socket is available on uppercarriage. Position varies depending on machine configuration.

Note

▶ Further information on function of electric refuelling pump: Adhere to operator's manual from manufacturer.

3.4.5 Immobiliser

Two types of immobiliser are available:
– Code immobiliser

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Checking function of control elements

Low hydraulic oil temperatures lead to slower reaction times of the control elements.

Make sure the following preconditions are met:
- ❑ Coolant is at operating temperature.
- ❑ Hydraulic oil is at operating temperature.

▶ Drive machine onto open space.

▶ Carefully operate joysticks and pedals.

▶ Check function of slewing brake.

Checking function of diesel engine

▶ Check that coolant is at operating temperature.

▶ Check that engine oil pressure remains constant.

▶ Check that power and speed of diesel engine remain constant.

▶ Check that noise of diesel engine is normal.

▶ Check that exhaust gas is colourless.

If the diesel engine is not functioning correctly:

▶ Shut off diesel engine immediately.

3.4.12 Sensor-controlled low idle automatic

The sensor-controlled low idle automatic offers the following advantages:
- – Automatic reduction of engine speed when safety lever or folding console is up or when neither joysticks nor pedals are operated
- – Savings in fuel consumption
- – Noise reduction

With sensor-controlled low idle automatic activated, two speed steps appear in *start page* menu:
- – Current speed step **1**, indicated by white pointer
- – Saved speed step **2** with sensor-controlled low idle automatic switched on, indicated by blue pointer

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- ▶ Tilt bucket in or close grapple: Move right joystick **2** in direction **E**.
- ▶ Tilt bucket out or open grapple: Move right joystick **2** in direction **F**.

Combining controls

- ▶ Move joysticks diagonally.

3.4.18 Turning and braking uppercarriage

Turning uppercarriage

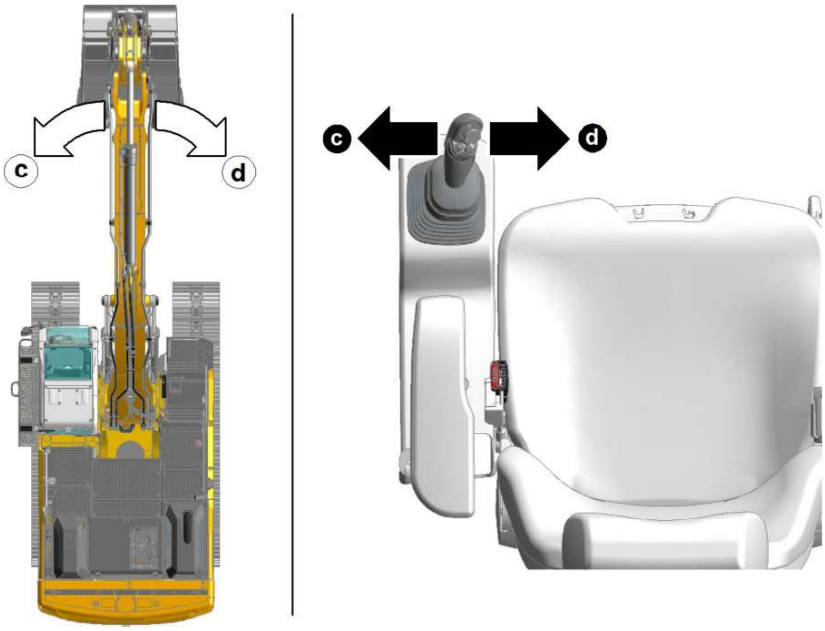

Fig. 357: Turning uppercarriage

- ▶ Turn uppercarriage left: Move left joystick in direction **c**.
- ▶ Turn uppercarriage right: Move left joystick in direction **d**.

Braking uppercarriage

- ▶ Brake uppercarriage: Release left joystick.
- ▶ Brake uppercarriage by maximum amount: Move left joystick in opposite direction.

Locking uppercarriage

Manual locking of slewing brake with key

The manual locking of the slewing brake with key is saved when the ignition is switched off.

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Controlling special working attachment with right mini-joystick

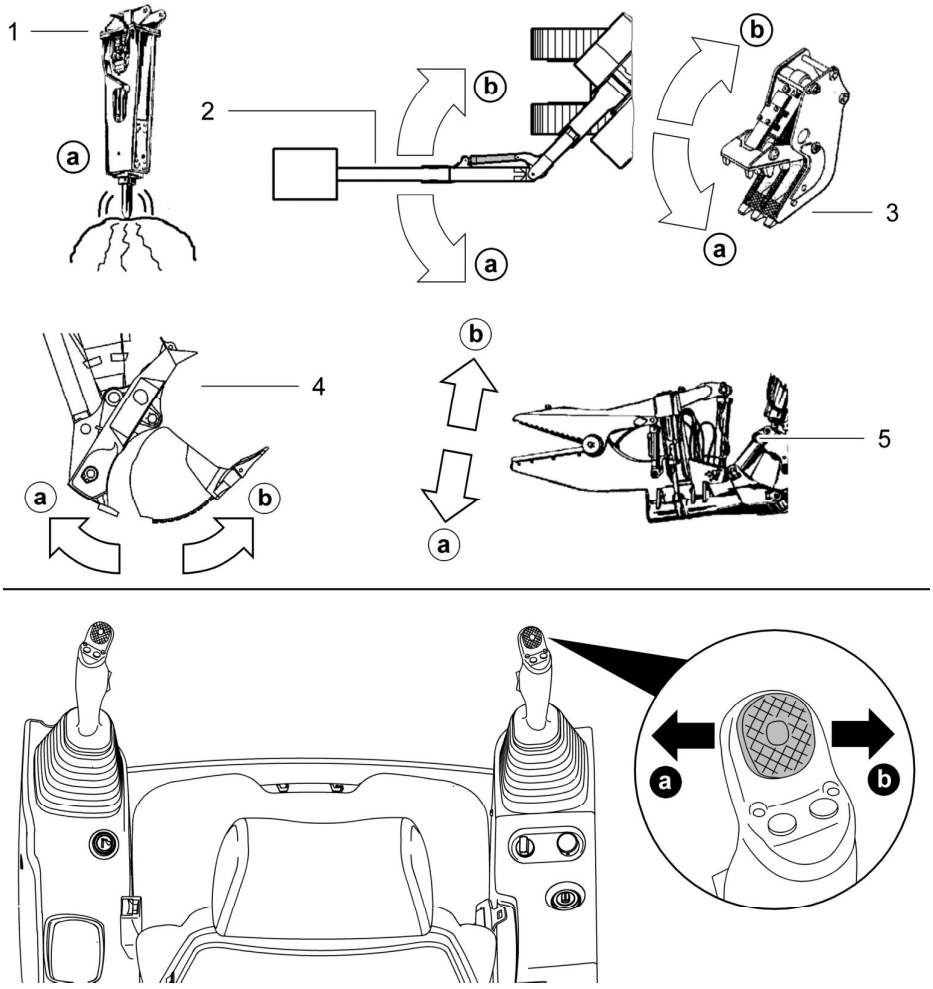

Fig. 383: Controlling special working attachment with right mini-joystick

1 Hydraulic hammer
2 Laterally adjustable boom
3 Concrete shear or pulveriser
4 Bottom dump shovel
5 Scrap shear

Controlling cylinder of the special working attachment

- ▶ Retract cylinder of special working attachment: Move right mini-joystick in direction **b**.
- ▶ Extend cylinder of special working attachment: Move right mini-joystick in direction **a**.

Controlling hydraulic hammer

- ▶ Move right mini-joystick in direction **a**.

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▶ Press confirmation button.
▷ LED 1 of corresponding key lights up.
▷ Button is displayed in green.

Fig. 413: Switch of left joystick

▶ Press left joystick switch up or down and hold.
▷ *Movement restriction for stick deactivated* status symbol appears on the display.

Permanently deactivating movement restriction for stick (option)

▶ Press *deactivating movement restriction for stick* button on the display.
▷ Corresponding button is displayed in yellow.

▶ Press confirmation button.
▷ Corresponding button is displayed in white.
▷ *Movement restriction for stick deactivated* status symbol appears on the display.

Reactivating movement restriction for stick

After selective deactivation

▶ Release switch on left joystick.

Menu call:  > 

▶ Press *deactivating movement restriction for stick* key again.

3.6.4 Travelling under obstacles

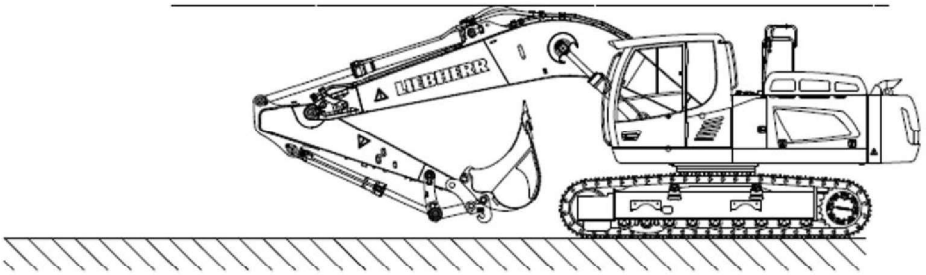

Fig. 443: Travelling under obstacles

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 in water

- ▶ Make sure that water level does not reach above axles of carrier rollers.

3.6.6 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.

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- ▶ Make sure that exclusively the rigger attaches and releases loads.
- ▶ 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

Preparing load-lifting work

DANGER
Falling load!
Danger to life.

- ▶ Do not use worn or damaged load lift hooks.
- ▶ Do not weld worn or damaged load lift hooks.

DANGER
Falling load!
Danger to life.

- ▶ Exclusively use suitable lifting accessory.

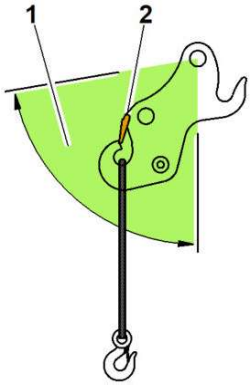

Fig. 452: Permitted slewing range

1 Permitted slewing range **2** Safety flap

- ▶ Remove working tool from quick coupler and secure.
- ▶ Fully retract locking pin.
- ▶ Move opening of load lift hooks into permitted slewing range **1**.
- ▶ Check function of the safety flaps **2**.

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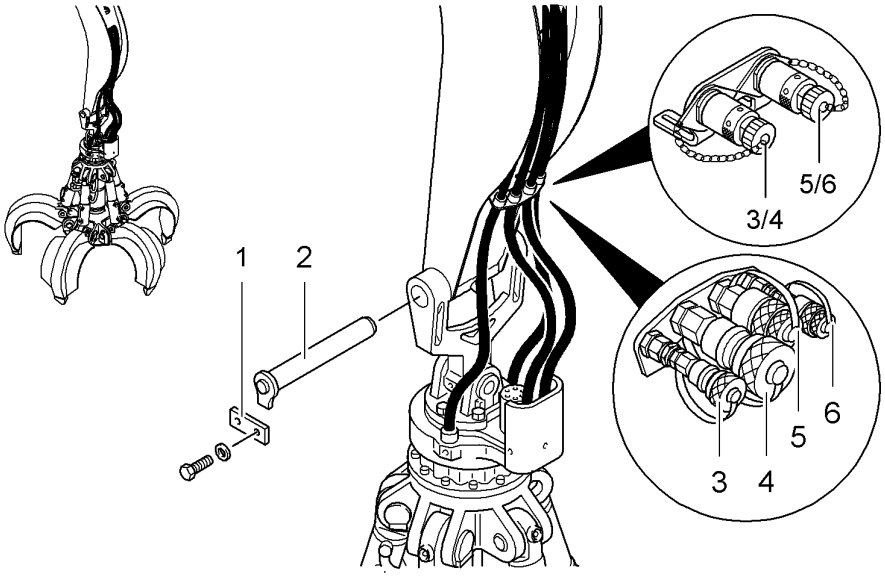

Fig. 459: Installing and removing grapple on industrial stick

1	Plate	**4**	Fitting
2	Pin	**5**	Fitting
3	Fitting	**6**	Fitting

WARNING
Swinging of working tool!
Danger to life.

▶ Maintain eye contact with spotter.

Make sure the following preconditions are met:
❑ Hydraulic hoses required for grapple operation are on the stick.
❑ Grapple is on the ground in upright position and with fully opened tines.

Installing grapple on industrial stick

▶ Position attachment so that bearings of stick are aligned with bearings of grapple.

▶ Insert pin **2** and secure with plate **1**.

▶ Depressurise hydraulic system. (For more information see: 5.10.1 Depressurising hydraulic system, page 324)

▶ Move safety lever or folding console up.

▶ Connect hydraulic hoses of opening and closing cylinders of grapple to fitting **4** and fitting **5**.

▶ For grapple with rotary actuator, connect hydraulic hoses of grapple rotator to fitting **3** and fitting **6**.

▶ Turn stopcocks on attachment to position **1**. This does not apply to machines with Likufix hydraulic coupling system.

Removing grapple on industrial stick

▶ Depressurise hydraulic system. (For more information see: 5.10.1 Depressurising hydraulic system, page 324)

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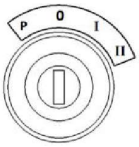

- Depressurise hydraulic hoses. (For more information see: 5.10.1 Depressurising hydraulic system, page 324)
- Set ignition key to **0**.
- Pull out ignition key.
- Move safety lever or folding console up.
- Close and lock all doors, covers and hoods on the machine.

Installing lifting accessory

DANGER
Eyelets or rings breaking!
Danger to life.

- Do not attach lifting accessory to eyelets or rings of counterweight.
- Do not attach lifting accessory to eyelets of working attachment.

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.

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NOTICE
Incorrect towing!
Damage.

- ▶ Exclusively tow small loads (compressor, generator or welding machine).
- ▶ Prevent towing device from getting tangled.
- ▶ Travel exclusively in a straight line.

- ▶ Mount towing device on tie-down points of middle part of undercarriage.
- ▶ Pretension towing device: Start slowly.
- ▶ Drive smoothly to the destination.

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Malfunction / error	Cause	Remedy
Diesel engine oil pressure too low	Oil level in oil pan too low	Fill with oil up to mark on dipstick.
	Oil too thin (oil diluted with fuel)	Drain oil and fill with prescribed oil.
	Oil pressure switch defective	Check oil pressure and replace defective oil pressure switch. Contact Liebherr customer service.
	Oil pressure regulating valve defective or contaminated	Contact Liebherr customer service.
	Excessive play or damages of bearings caused by worn bearings	Contact Liebherr customer service.
Engine oil in cooling system	Engine oil cooler or engine oil cooler housing leaking	Contact Liebherr customer service.
Coolant in diesel engine oil	O-rings of cylinder liner leaking	Contact Liebherr customer service.
	Diesel engine oil cooler or diesel engine oil cooler housing leaking	Contact Liebherr customer service.

4.2.2 Hydraulic system

Malfunction / error	Cause	Remedy
Unusual noises, noise level, hydraulic pumps are drawing in air	Stopcock of hydraulic tank closed, hydraulic oil level too low	Shut off engine immediately. Check stopcock and fill level.
Machine movements too slow	Selected speed step too low	Select higher speed step or different operating mode.
Selected operating modes do not achieve required performance.	Control defective	Contact Liebherr customer service.
Hydraulic oil temperature too high	Radiator contaminated	Clean radiator.
	Fan drive defective	Shut off engine. Contact Liebherr customer service.
Hydraulic oil level too low	Oil loss, leak on hydraulic system	Contact Liebherr customer service.
Control elements inactive	Slewing control of uppercarriage not functioning correctly.	Unscrew knurled screw of emergency solenoid valve as far as it will go.
	Servo control switched off, servo control in top position	Switch on servo control. Push down safety lever.
	Brake (slewing gear, travel drive) engaged	Release brake.
	Control defective	Contact Liebherr customer service.

4.2.3 Travel gear

Malfunction / error	Cause	Remedy
Oil escapes from the travel gearbox, track rollers, carrier rollers or idler-wheel.	Seal is damaged.	Contact Liebherr customer service.

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	Current value [A]	Function
K103	15	Beacon on operator's cab and beacon on counterweight
K105	15	Front roof lights and front uppercarriage head-lights
K106	15	Travel light
K107	20	Power supply bank1 A168
K108	5	Commissioning relay KL15 without S7
K110	15	Front roof light
K112	15	Voltage transformer 24 V / 12 V
K114	5	Warning buzzer
K116	20	Front windscreen wiper
K117	5	Operating hour meter
K118	5	Enabling engine start
K122	20	Roof glass panel windscreen wiper

Tab. 48: Fuses and relays in electric cabinet E75

Main fuses

The main fuses are on the partition behind the left middle side door.

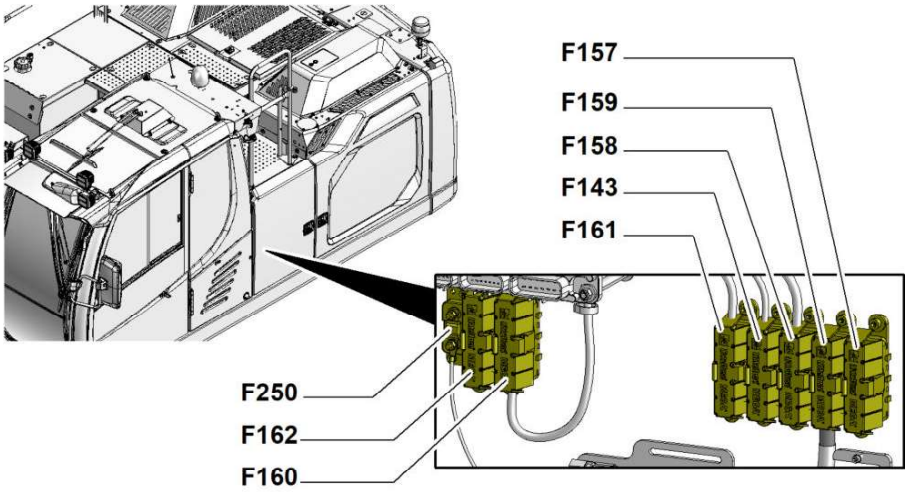

Fig. 530: Main fuses

	Current value [A]	Function
Main fuses		
F143	125	Heater flange
F157	400	Protection of start circuit
F158	125	Relay KL15

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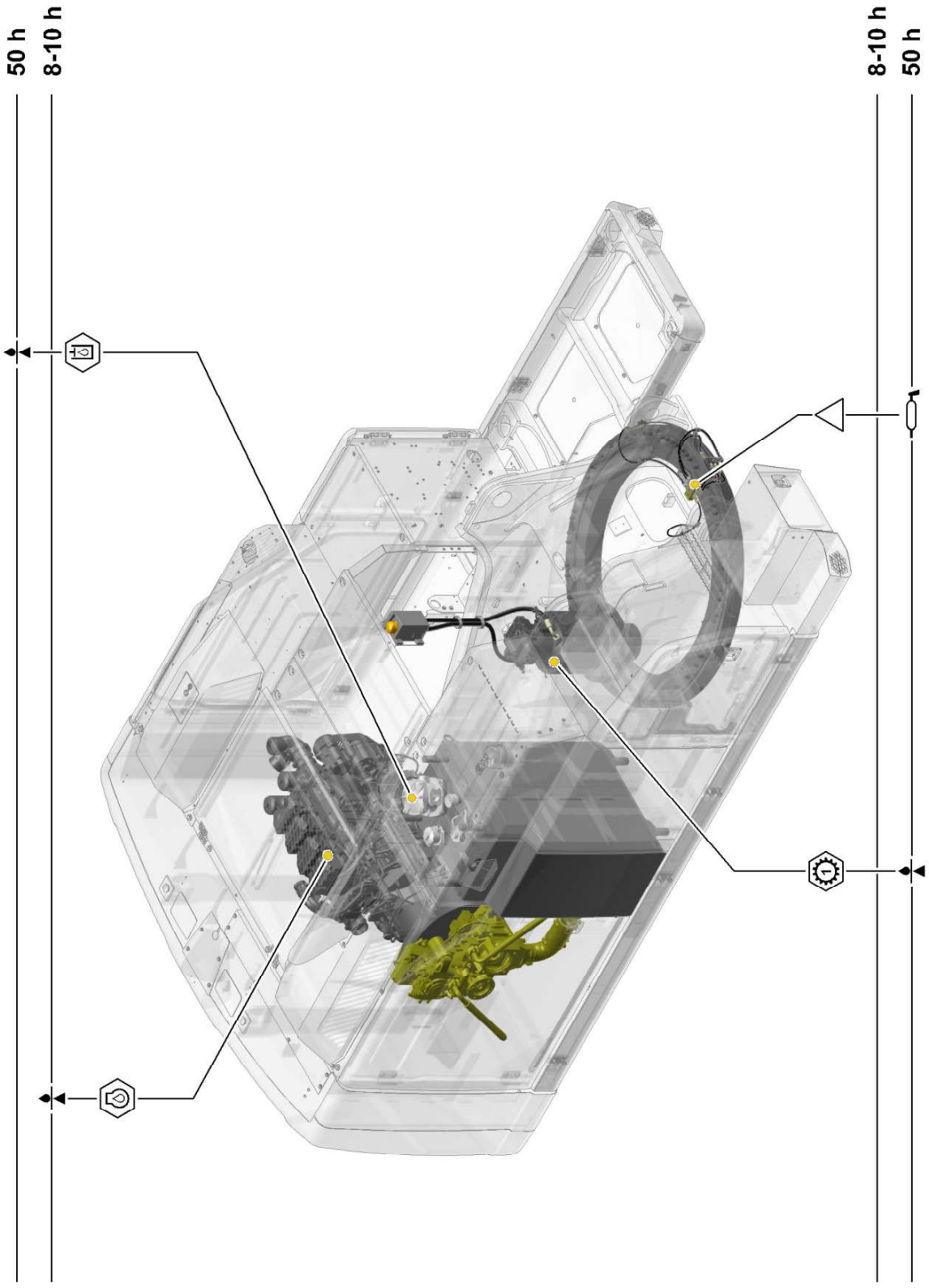

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Fig. 532: Lubrication chart for uppercarriage in case of manual lubrication

Oil analysis

		Dust intensive application	Normal operation
Normal application (oil analysis optional)	**Liebherr mineral oil**	Every 250 h, at least once a year	Every 1000 h, at least once a year
	Liebherr Hydraulic Basic 68		
	Liebherr Hydraulic Basic 100		
	Liebherr Hydraulic HVI		
Eco-friendly application (oil analysis mandatory)	**Liebherr-PAO biodegradable**	Upon handover, then every 250 h, at least once a year	Upon handover, then every 1000 h, at least once a year
	Liebherr Hydraulic Plus		
	Liebherr Hydraulic Plus Arctic		

Tab. 69: Oil analysis

Filter replacement

	Dust intensive application	Normal operation
Liebherr return filter	Every 250 h, also during every hydraulic oil change	Once after 500 h, then every 1000 h, also during every hydraulic oil change
Liebherr breather filter	Every 500 h, also during every hydraulic oil change	Every 2000 h, also during every hydraulic oil change
Liebherr bypass filter (option) [24)]	If necessary, every 2000 h	
Liebherr bypass filter (option) integrated in return [24)]	If necessary, every 2000 h	

Tab. 70: Filter replacement

[24)] A bypass filter is mandatory for eco-friendly application.

Objectives of visual inspection

If conducted correctly as per the specifications of the maintenance manual, the visual inspection prevents longer and unplanned outage times through early detection and removal of defects.

Advantages of a correctly performed visual inspection are:
– Conservation of value of machine.
– Quality assurance of maintenance process.
– Preventing subsequent damage
– Safe operation of machine

Make sure that following defects are detected:
– Contamination
– Damage
– Cracks
– Warping
– Leaks
– Loosened connections
– Chafe marks
– Wear
– Incorrect changes to the machine.

Requirements for staff and operating company

▶ Make sure that the staff is familiar with the design of the complete machine and components.

▶ Make sure that the staff is familiar with the prescribed inspection technology.

▶ Make sure that the staff has sufficient visual ability.

Application of visual inspection

Make sure the following preconditions are met:
❑ Complete machine has been cleaned carefully.
❑ Lighting conditions are sufficient.
❑ Accessibility and field of vision of complete machine is present.
❑ Inspection position and suitable distance assumed.

▶ Perform intervals and inspection scope as per maintenance and inspection schedule.

▶ Evaluate visual inspection.

▶ Create defect report if necessary.

5.5.2 Safety instructions

▶ Make sure that no one is standing near the machine during maintenance or repair.

▶ If necessary, secure a large area.

▶ Inform operating before starting maintenance and repair work.

▶ Appoint a supervisor.

If no other instructions have been made:
▶ Maintain machine on even, firm ground with working attachment lowered and diesel engine or electric motor switched off.

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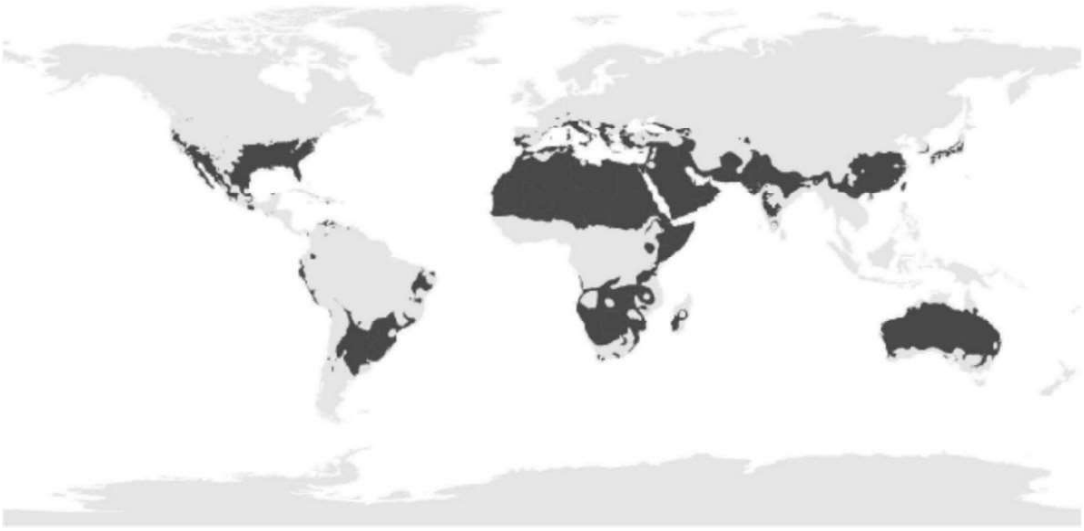

Fig. 555: Subtropical climate

Fig. 556: Tropical climate

Reference documents

Note

▶ Adhere to technical data sheets and safety data sheets of products.

Requirements and description

Conserving corrosion protection

The corrosion protection of the entire machine must be checked. In case of defects in the protection it must be renewed. The inspection interval must be specified according to following table.

Unprotected areas must be cleaned before treatment with protection products.

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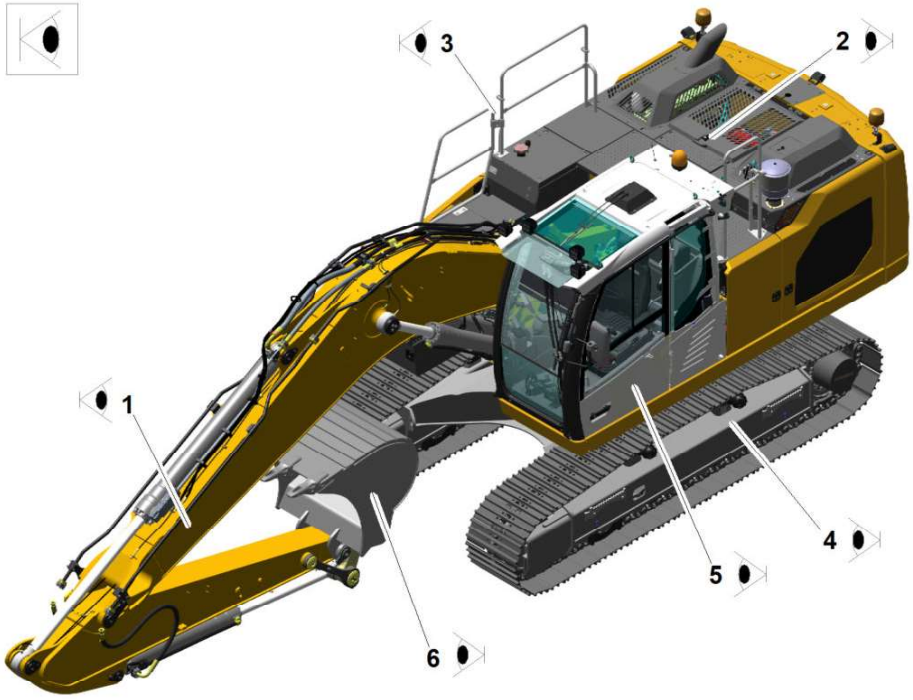

Fig. 558: Checking components for cracks

Position	Assembly	Visual inspection for defects
1	Steel frame of working attachment	Check bearing points, supports, holders, fastening elements, connections for damage, warping and cracks.
2	Steel frame of uppercarriage	
3	Steel frame of climbing aids and hand rails	
4	Steel frame of undercarriage	
5	Steel frame of operator's cab	
6	Steel frame of quick coupler and working tool	

Tab. 97: Visual inspection for defects

Visual inspection during maintenance work or inspection tour

▶ Perform visual inspection. (For more information see: Definition of visual inspection, page 286)

If defects occur in machine:

▶ Record any identified defects.

▶ Inform operating company of defects affecting safety.

▶ Repair identified defects. See service manual for procedure.

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Activating regeneration

DANGER
Hot exhaust gases!
Danger to life.

- ▶ Exclusively activate regeneration outdoors.
- ▶ Make sure that no flammable materials are in the vicinity.

Make sure following requirements are fulfilled:
- ❑ Fuel tank is full.
- ❑ Machine is stationary.
- ❑ Diesel engine is running and is warm.

▶ Move folding console up.

▶ Press *activating regeneration* button **1**.
- ▷ *Activating regeneration* button **1** is displayed in green on a black background.
- ▷ Diesel engine runs at a fixed engine speed.
- ▷ *High exhaust temperature* status symbol appears on the display:

▶ 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.

▶ Move folding console down.
- ▷ Machine can be used as normal.

5.8.9 Diesel exhaust fluid tank: Cleaning sieve

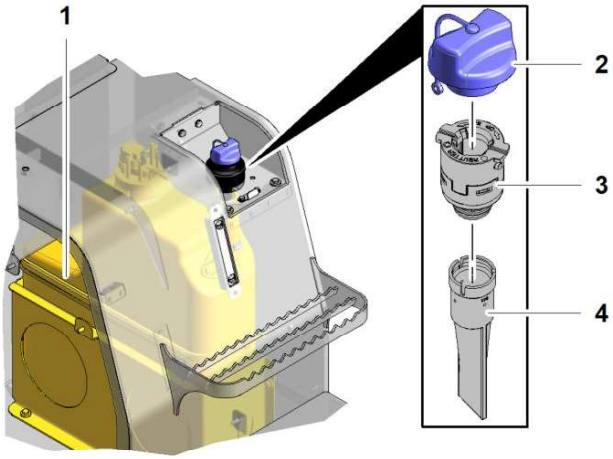

Fig. 572: Sieve in diesel exhaust fluid tank

1	Diesel exhaust fluid tank	**3**	Magnetic adapter
2	Plug	**4**	Screen filter

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Make sure following requirements are fulfilled:
- ❑ Machine is in maintenance position.
- ❑ Hydraulic oil used is approved. (For more information see: 5.3.6 Hydraulic oils, page 276)

▶ Check hydraulic oil temperature shown on display.

▶ Depressurise hydraulic system. (For more information see: 5.10.1 Depressurising hydraulic system, page 324)

▶ Remove cover of return filter **2**.

▶ Fill hydraulic tank via return filter **2** until required hydraulic oil level is reached. (see: tab. 99, page 326)

▶ Screw in breather filter **1**.

▶ Put on cover of return filter **2**.

If hydraulic oil is approximately 20 °C:

▶ Check hydraulic oil level. (For more information see: Checking hydraulic oil level, page 325)

5.10.3 Hydraulic tank: Draining water and sediments

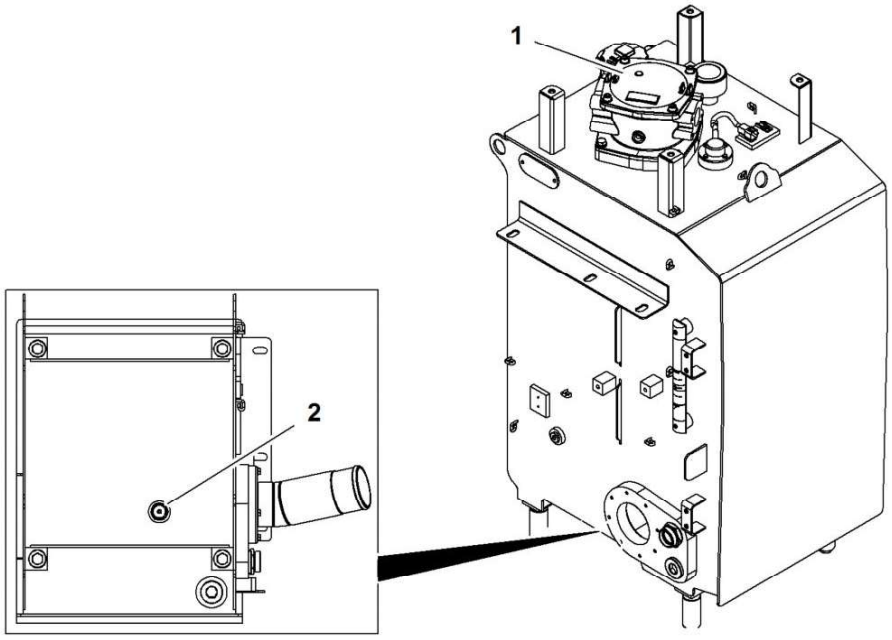

Fig. 580: Hydraulic tank

1 Return filter **2** Drain valve

Note
If biodegradable hydraulic oil is used:

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

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2	Condition of air discharges	**7**	*Increasing blower power* button	**12**	*Defrosting* button
3	*Increasing temperature* button	**8**	*Reducing blower power* button	**13**	*A/C* key
4	*Head area air supply* button	**9**	*AUTO* button	**14**	*Defrosting* key
5	*Torso area air supply* button	**10**	*A/C* button		

- ▶ Start diesel engine.
- ▶ Run machine warm. (For more information see: 3.4.9 Bringing machine to operating temperature, page 155)
- ▶ Open air outlets in operator's cab.

- ▶ Switch on automatic mode: Press *AUTO* button **9**.

- ▶ Switch on defrosting and defogging: Press *defrosting* button **12** or *defrosting* key **14**.

- ▶ Switch on recirculated air: Press *recirculated air* button **11**.
- ▶ Check for sufficient air outlet output.
- ▶ Clean air outlet if necessary.

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