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Operator's manual

Hydraulic excavator

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3.4.19	Controlling special working attachment with mini-joystick (option)	122
3.5	Shut-off functions	126
3.5.1	Overload warning system (option)	126
3.6	General working methods	128
3.6.1	Working without damaging machine	128
3.6.2	Putting machine in working position	130
3.6.3	Travelling on slopes	130
3.6.4	Working in water	131
3.6.5	Working on slope	132
3.6.6	Working with a backhoe bucket	132
3.6.7	Ground surface grading	133
3.6.8	Working with a hydraulic hammer	134
3.6.9	Working with the grapple	135
3.6.10	Working with the clamshell	136
3.6.11	Transferring loads	137
3.6.12	Loading a transport vehicle	138
3.6.13	Lifting loads	138
3.6.14	Lifting loads with quick coupler	139
3.6.15	Lifting loads with working tool with load lift hook (option)	140
3.7	Installing and removing working attachment	142
3.7.1	Installing and removing working attachment pins	142
3.7.2	Installing and removing bucket	142
3.7.3	Installing and removing bucket with special seal	144
3.7.4	Using quick coupler	145
3.7.5	Installing and removing grapple on stick	145
3.7.6	Installing and removing grapple on industrial stick	147
3.7.7	Installing and removing stick	149
3.7.8	Installing and removing boom	149
3.8	Parking machine	150
3.8.1	Parking machine on level ground	150
3.8.2	Parking machine on a slope	151
3.9	Transport	152
3.9.1	Driving machine onto low-loader	152
3.9.2	Lifting machine	154
3.9.3	Tying down machine	157

Crawler Excavator

R 924
Litronic®

Motor:
125 kW / 170 HP

Stage IIIA / Tier 3

Operating Weight:
23,650 – 24,600 kg

Bucket Capacity:
0.80 – 1.65 m³



LIEBHERR

A first class work space

In this cab, the operator benefits from a high-quality mechanical suspension seat, an enlarged space and a very comfortable working environment. Depending on the operator's needs, the "Comfort" seat can be selected as an option. This seat offers maximum comfort thanks to its air suspension, several horizontal and vertical settings, as well as its adjustable pneumatic lumbar support. It is especially designed to meet the most challenging comfort requirements of operators, in all working situations.

Low noise level and vibrations

To diminish fatigue at work and increase productivity, the acoustic power inside the operator's cab is one of the lowest on the market. The cab is mounted on viscoelastic rivets to fully absorb the excavator's vibrations. Furthermore, rubber flanges support the pipes and actively participate in reducing external noise.

Uncompromised visibility

The very large glazed surface area and minimal area of frames guarantee optimal visibility from the operator's platform, as well as a wide emergency exit from the rear window for the operator's safety and peace of mind.

Ergonomic proportional joysticks

The proportional joysticks are very finely tuned controls for the sensitive, accurate and fluid operation of the machine. This type of control is ideal for a machine used in a variety of applications.



Touch-screen display

- 7-inch touch-screen with colour display
- Wide range of adjustment, check, and monitoring possibilities
- Tough, reliable design (sealing tightness class IP 65)

Heightened visibility

- Optional rear view monitoring camera, for optimal visibility and heightened operating safety
- Optimized design of the whole uppercarriage providing the operator with an improved field of vision
- Front windshield fully retractable into the roof, with or without lower glass panel
- Secure emergency exit through the rear window

Optimal temperature

- Enhanced air-conditioning system, providing improved cooling performances
- Optional dark tinted windows

Lift Capacities

with Mono Boom 5.90 m and Counterweight 4.5 t

Stick 2.00 m

m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		Max. reach		m
7.5	S									6.6	6.7*	5.4
	LC									6.7*	6.7*	
6.0	S					5.6	6.5*			4.7	6.5*	6.7
	LC					6.2	6.5*			5.2	6.5*	
4.5	S			8.3	8.8*	5.4	7.1*			4.0	5.9	7.4
	LC			8.8*	8.8*	6.0	7.1*			4.4	6.4	
3.0	S			7.6	11.0*	5.2	7.9	3.8	5.7	3.6	5.4	7.8
	LC			8.6	11.0*	5.8	8.0*	4.2	6.1	4.0	5.8	
1.5	S			7.2	10.9*	5.0	7.7	3.7	5.6	3.5	5.2	7.8
	LC			8.2	10.9*	5.5	8.3	4.1	6.0	3.9	5.6	
0	S			7.2	11.8	4.8	7.5	3.6	5.5	3.6	5.4	7.6
	LC			8.1	12.5*	5.4	8.2	4.1	6.0	4.0	5.8	
-1.5	S	9.3*	9.3*	7.2	11.9	4.8	7.5			3.9	6.0	7.1
	LC	9.3*	9.3*	8.1	11.9*	5.4	8.2			4.4	6.5	
-3.0	S	13.8*	13.8*	7.3	10.5*	5.0	7.7			4.9	7.5	6.1
	LC	13.8*	13.8*	8.3	10.5*	5.5	7.8*			5.5	7.6*	
-4.5	S											
	LC											

Stick 2.50 m

m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		Max. reach		m
7.5	S					5.7	6.0*			5.6	6.0*	6.1
	LC					6.0*	6.0*			6.0*	6.0*	
6.0	S					5.7	6.0*			4.2	6.0*	7.2
	LC					6.0*	6.0*			4.7	6.0*	
4.5	S	11.6*	11.6*	7.9*	7.9*	5.5	6.6*	3.9	5.8	3.6	5.3	7.9
	LC	11.6*	11.6*	7.9*	7.9*	6.1	6.6*	4.3	6.1*	4.0	5.8	
3.0	S			7.8	10.1*	5.2	7.6*	3.8	5.7	3.3	4.9	8.2
	LC			8.7	10.1*	5.8	7.6*	4.2	6.1	3.6	5.3	
1.5	S			7.3	11.8*	4.9	7.6	3.6	5.5	3.2	4.8	8.3
	LC			8.2	11.8*	5.5	8.3	4.1	6.0	3.5	5.2	
0	S			7.1	11.7	4.8	7.5	3.6	5.4	3.2	4.9	8.1
	LC			8.0	12.4*	5.4	8.2	4.0	5.9	3.6	5.3	
-1.5	S	9.3*	9.3*	7.1	11.7	4.7	7.4	3.6	5.4	3.5	5.4	7.6
	LC	9.3*	9.3*	8.0	12.1*	5.3	8.1	4.0	5.9	3.9	5.8	
-3.0	S	13.9	15.2*	7.2	11.1*	4.8	7.5			4.2	6.5	6.7
	LC	15.2*	15.2*	8.1	11.1*	5.4	8.2			4.7	7.1	
-4.5	S	11.7*	11.7*	7.5	8.6*					6.2	7.2*	5.2
	LC	11.7*	11.7*	8.4	8.6*					6.9	7.2*	

Stick 3.00 m

m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		Max. reach		m
7.5	S									4.8	5.2*	6.7
	LC									5.2*	5.2*	
6.0	S					5.4*	5.4*	4.0	5.4*	3.8	4.9*	7.7
	LC					5.4*	5.4*	4.4	5.4*	4.2	4.9*	
4.5	S					5.5	6.1*	3.9	5.6*	3.3	4.9	8.4
	LC					6.1*	6.1*	4.3	5.6*	3.6	4.9*	
3.0	S			7.9	9.3*	5.2	7.1*	3.8	5.7	3.0	4.5	8.7
	LC			8.8	9.3*	5.8	7.1*	4.2	6.1*	3.3	4.9	
1.5	S			7.3	11.2*	4.9	7.6	3.6	5.5	2.9	4.4	8.8
	LC			8.3	11.2*	5.5	8.1*	4.0	6.0	3.2	4.7	
0	S	4.1*	4.1*	7.0	11.7	4.7	7.4	3.5	5.4	2.9	4.5	8.6
	LC	4.1*	4.1*	8.0	12.2*	5.3	8.1	3.9	5.8	3.3	4.9	
-1.5	S	8.9*	8.9*	6.9	11.6	4.6	7.3	3.5	5.3	3.2	4.8	8.1
	LC	8.9*	8.9*	7.9	12.2*	5.2	8.0	3.9	5.8	3.5	5.3	
-3.0	S	13.6	15.0*	7.0	11.5*	4.7	7.4			3.7	5.7	7.2
	LC	15.0*	15.0*	8.0	11.5*	5.3	8.1			4.1	6.2	
-4.5	S	13.3*	13.3*	7.2	9.6*					5.0	7.0*	5.9
	LC	13.3*	13.3*	8.2	9.6*					5.6	7.0*	

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

The load values are quoted in tons (t) at stick end (without bucket), and may be swung 360° on firm and even ground. Adjacent values are valid for the undercarriage when in the longitudinal position. Capacities are valid for 600 mm wide track pads. Indicated loads are based on ISO 10567 standard and do not exceed 75% of tipping or 87% of hydraulic capacity (indicated via *). Without bucket cylinder, link and lever the lift capacities will increase by 320 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.

- Exclusively use original Liebherr spare parts.

Requirement

The operator has following qualification and skills:

- Has completed the legally specified minimum age.
- Is physically and mentally capable of operating the machine safely.
 - Satisfactory eyesight
 - Satisfactory hearing ability
 - Quick reactions
- Has the authorisation necessary for operation of machine.
- Is able to estimate distance, height and gaps.
- The operator has the necessary education (theoretical and practical) for the following:
 - Handling the machine type
 - Attaching
 - Spotting
 - Handling fire extinguishing equipment
- Knows all means of escape in an emergency.
- 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.

2.3.5 Maintenance staff

Responsibility

The maintenance staff has following tasks:


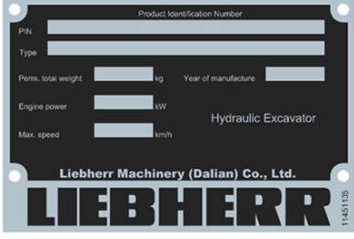
- Read operator's manual.
- Read supplied documentation.
 - Operator's manuals for components
 - Operator's manuals from third party manufacturers
 - Additional instructions
- Maintain machine for safe and reliable function.
- Perform all prescribed maintenance tasks.
- Wear personal protective equipment.
- Adhere to safety regulations at place of use.
- Report all changes to machine that affect safety to operating company.
- Exclusively perform retrofittings of machine after consultation with manufacturer.
- Exclusively use original Liebherr spare parts.

Requirement

The maintenance staff has following qualification and skills:

- Has completed the legally specified minimum age.
- Is physically and mentally capable of maintaining the machine.
 - Satisfactory eyesight
 - Satisfactory hearing ability
 - Quick reactions
- Has the authorisation necessary for maintenance of machine.
- Is able to estimate distance, height and gaps.
- Has knowledge of the machine and the hazards.
- Knows all procedures and precautions for maintenance.
- Has knowledge of handling special tools for maintenance and repair.

2.4.4 Type plates

	Sign	Description
50	 <p>The image shows a type plate for a Liebherr Hydraulic Excavator, specifically for the Chinese sales area. It contains fields for: Product Identification Number (产品识别号), PIN, Type (型号), Perm. total weight (额定总重) in kg, Engine power (发动机功率) in kW, and Max. speed (最大行驶速度) in km/h. The text '液壓挖掘機' (Hydraulic Excavator) and '利普海爾機械(大連)有限公司' (Liebherr Machinery (Dalian) Co., Ltd.) are also present, along with the 'LIEBHERR' logo.</p>	<p>Type plate (exclusive to Chinese sales area)</p> <p>Contains the following information:</p> <ul style="list-style-type: none"> - Machine identification number (PIN) - Type - Year of manufacture - Rated output of the diesel engine - Maximum speed - Operating weight - Manufacturer's address
50	 <p>The image shows a type plate for a Liebherr Hydraulic Excavator, specifically for the international sales area. It contains fields for: Product Identification Number, PIN, Type, Perm. total weight (kg), Year of manufacture, Engine power (kW), and Max. speed (km/h). The text 'Hydraulic Excavator' and 'Liebherr Machinery (Dalian) Co., Ltd.' are present, along with the 'LIEBHERR' logo.</p>	<p>Type plate (international sales area)</p> <p>Contains the following information:</p> <ul style="list-style-type: none"> - Machine identification number (PIN) - Type - Year of manufacture - Rated output of the diesel engine - Maximum speed - Operating weight - Manufacturer's address - EAC identification²⁾

Tab. 8: Type plates

2.5 Protective devices on the machine

2.5.1 Safety lever or folding console

Danger to life

Unwanted movements of machine

- Before leaving operator's seat pull up safety lever or folding console.
- Do not use safety lever as handle.
- Do not use control elements (for example folding console, joystick) as handle.

²⁾ In accordance with requirements of target country

Incorrect maintenance

- Make sure there are no persons in danger zone.
- Park machine and secure to prevent rolling or driving away.
- Park machine on level, firm ground.
- Park machine with lowered working attachment.
- When searching for leaks in the hydraulic system wear protective gloves.
- Exclusively search for leaks in the hydraulic system with cardboard or similar material.
- Do not weld or solder accumulators.
- Do not perform mechanical work on accumulators.
- Make sure that the permanent labelling of the accumulators (operating data) is kept visible.

Crushing injuries

Unexpected movements of machine

- Make sure there are no persons in danger zone.
- Park machine and secure to prevent rolling or driving away.

Unintended closing of access doors

- Secure access doors by inserting the securing mechanisms.

Incorrect lifting accessories

- Exclusively use undamaged lifting accessories.
- Make sure that load capacity value of lifting accessories is sufficient.

Incorrect work clothing

- Wear protective gloves when handling wire ropes.

Incorrect work equipment

- Exclusively align bores with suitable pin.

Burns

Incorrect maintenance






- Shut off engine before any maintenance or repair.

Hot pressurised engine cooling system

- Do not touch coolant and parts carrying coolant.
- Let the cover and parts carrying coolant cool down.





Incorrect heat protection

- Make sure that all holders and protective shields against vibration, chafing and heat build-up have been installed correctly.

Symbol	Meaning
	Safety element defective; strongly restricted operation of machine
	Element defective; restricted operation of machine
	Maintenance due
	Emergency mode of servo control active
	Unlocking with PIN code required


Tab. 9: General status symbols

Working attachment and working tools

Symbol	Meaning
	Overload warning
	Overload warning system not available
	Reversing control direction for opening and closing working tool
	Reversing control direction for turning working tool

Tab. 10: Status symbols of working attachment and working tool

Slewing brake

Symbol	Meaning
	Slewing brake released

3.2.10 Windscreen wiper interval submenu

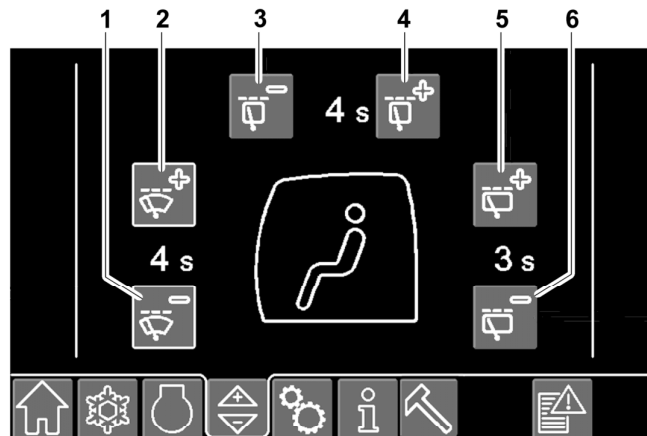


Fig. 100: Windscreen wiper interval submenu ¹⁰⁾

- | | |
|--|--|
| 1 Reducing windscreen wiper interval button | 4 Increasing roof glass panel windscreen wiper interval button |
| 2 Increasing windscreen wiper interval button | 5 Increasing rear windscreen wiper interval button |
| 3 Reducing roof glass panel windscreen wiper interval button | 6 Reducing rear windscreen wiper interval button |

3.2.11 Display brightness and display volume submenu

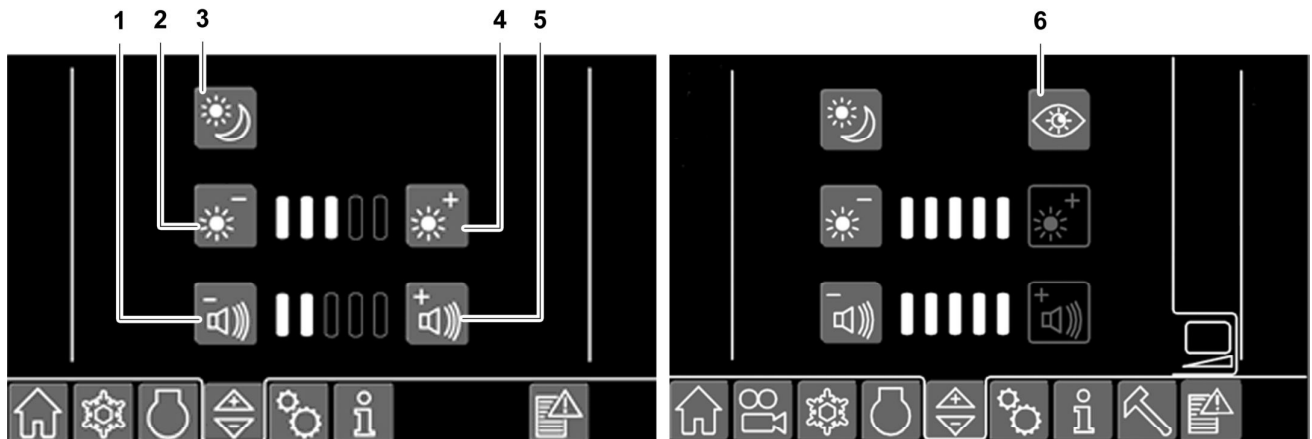


Fig. 101: Display brightness and display volume submenu

- | | | |
|---|--|---|
| 1 Reducing display volume button ¹¹⁾ | 3 Day/night mode button ¹¹⁾ | 5 Increasing display volume button ¹¹⁾ |
| 2 Reducing display brightness button | 4 Increasing display brightness button | 6 Night Shift mode button ¹¹⁾ |

¹⁰⁾ Quantity of windscreen wipers depending on machine type and equipment

¹¹⁾ Available depending on machine type

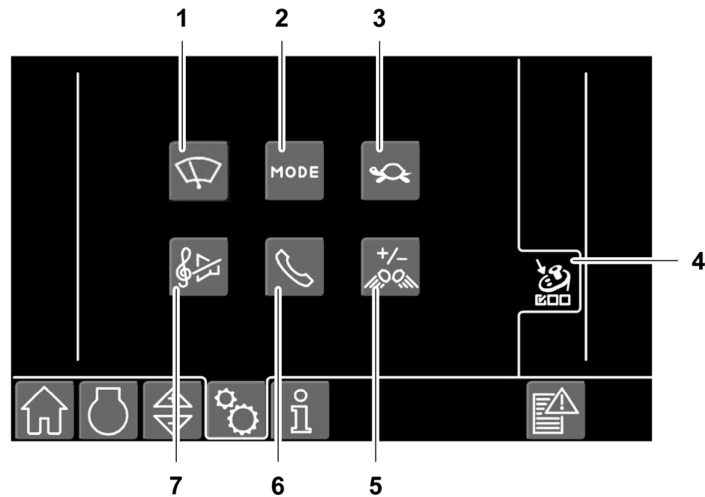


Fig. 129: Quick-selection button submenu

- | | | | |
|---|------------------------------------|---|---------------------------------|
| 1 | Windscreen wiper button | 5 | Brightness of headlights button |
| 2 | MODE button | 6 | Phone call button |
| 3 | Creeper gear button | 7 | Mute button |
| 4 | Quick-selection button menu button | | |

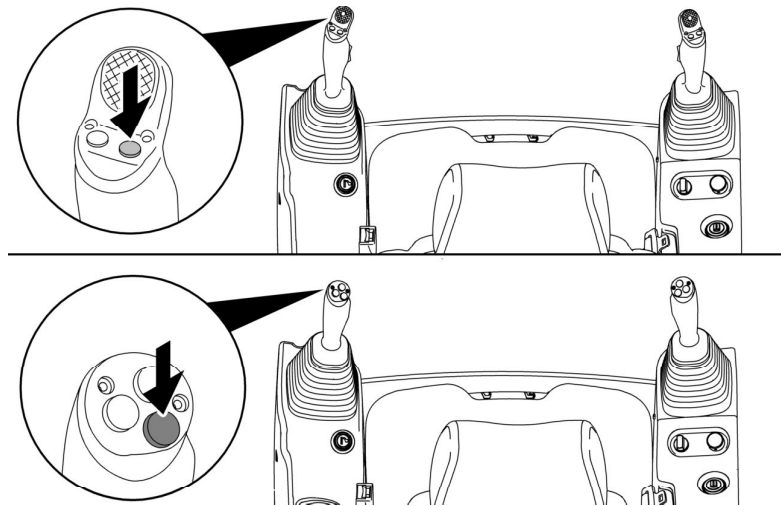


Fig. 130: Button a

- ▶ Assign function to button a: Press corresponding button on the display.
 - ▷ Setting is saved in active user profile.

Sensitivity of mini-joysticks submenu

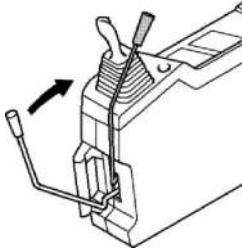
The display of this submenu varies depending on machine configuration.

3.3.5 Safety lever

The safety lever:

- interrupts all hydraulic functions,
- makes it possible to avoid all unintentional movements of the machine.

The engine can only be started when the safety lever is in the upper position.



Before starting work:

- ▶ Sit in the operator seat.
- ▶ Start the engine.
- ▶ Move the safety lever to the down position.
 - ▷ The joysticks and the pedals are working.
 - ▷ The slewing gear break returns to its previous state.

Before you stand up:

- ▶ Move the safety lever to the upper position.
 - ▷ The joysticks and the pedals are not working any more.
 - ▷ The slewing gear brake is activated and locked.

3.3.6 Operator's seat

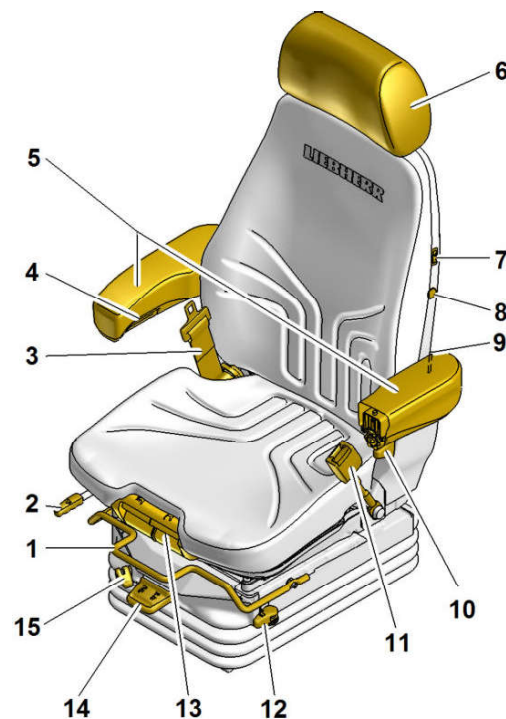


Fig. 163: Operator's seat

- | | | | |
|---|---------------------------------------|----|--------------------------------------|
| 1 | Adjusting seat position with armrests | 9 | Adjusting armrest height |
| 2 | Adjusting seat position | 10 | Adjusting backrest |
| 3 | Safety belt | 11 | Belt buckle |
| 4 | Adjusting armrest angle | 12 | Horizontal suspension ¹²⁾ |

See next page for continuation of the image legend

¹²⁾ Option

3.3.10 Sun blind

Sun blind on windscreen

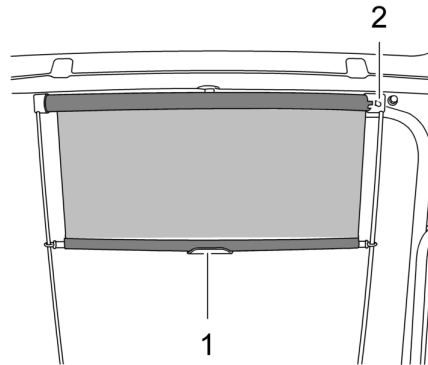


Fig. 181: Sun blind on windscreen

1 Tab

2 Roll up button

Rolling out sun blind on the windscreen

- ▶ Pull sun blind on windscreen down to desired position using tab 1.

Rolling up sun blind on the windscreen

- ▶ Push roll up button 2 upwards.

Sun blind on the roof glass panel

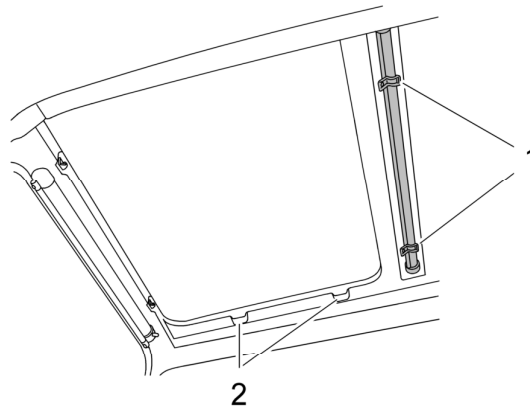


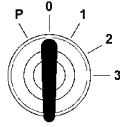
Fig. 182: Sun blind on the roof glass panel

1 Handle

2 Groove

Rolling out sun blind on the roof glass panel

- ▶ Pull sun blind forward on the roof glass panel using handles 1.
- ▶ Clip sun blind into grooves 2 on the roof glass panel.



- ▶ Warn bystanders before starting machine: Activate horn. (For more information see: [3.3.8 Horn, page 94](#))
- ▶ Set ignition key to 1.
 - ▷ Autocheck begins.
 - ▷ All LEDs briefly light up.
- ▶ During autocheck, check that the LEDs are functioning correctly.

If LEDs are defective:

- ▶ Have LEDs replaced.
- ▶ Turn ignition key to 3 and hold position until diesel engine starts.

Troubleshooting

Diesel engine does not start?

If two attempts to start fail, there is probably a malfunction of the diesel engine.

- ▶ Do not leave ignition key in position 3 for more than 20 seconds.
- ▶ Wait for at least 1 minute before the next attempt to start the diesel engine.
- ▶ Before starting diesel engine, always turn ignition key to 0.
- ▶ If there are two unsuccessful attempts to start the diesel engine, establish the cause of the fault and eliminate it.

Starting at low temperatures

At low outside temperatures, preglowing of the diesel engine is activated.



Engine preglowing activated status symbol appears on the display during preglowing of diesel engine.

When preglowing of the diesel engine is in progress:

- ▶ Do not start diesel engine.

When preglowing of diesel engine has finished:

- ▶ Start diesel engine.

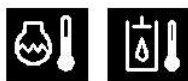
Starting at temperatures below -18 °C

- ▶ Equip machine with one or more starting aids optionally available from Liebherr.

3.4.7 Bringing machine to operating temperature

Make sure the following preconditions are met:

- Hydraulic oil is approved for ambient temperature range. (For more information see: [5.3.7 Hydraulic oils, page 193](#))
- ▶ Move safety lever up.
- ▶ Start diesel engine and run at idle speed for 15 seconds.
- ▶ Move safety lever down.
- ▶ Set engine speed no higher than half the maximum engine speed.
- ▶ Maintain engine speed and actuate working hydraulics until operating temperatures for coolant and hydraulic oil are reached.
 - ▷ Machine is ready for operation.



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Braking uppercarriage

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

Automatic locking of uppercarriage

Slewing brake is closed when engine is switched on again.

Slewing gear brake closes when uppercarriage is stationary or is just about to stop.

Slewing gear brake opens as soon as left joystick is moved.

3.4.16 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

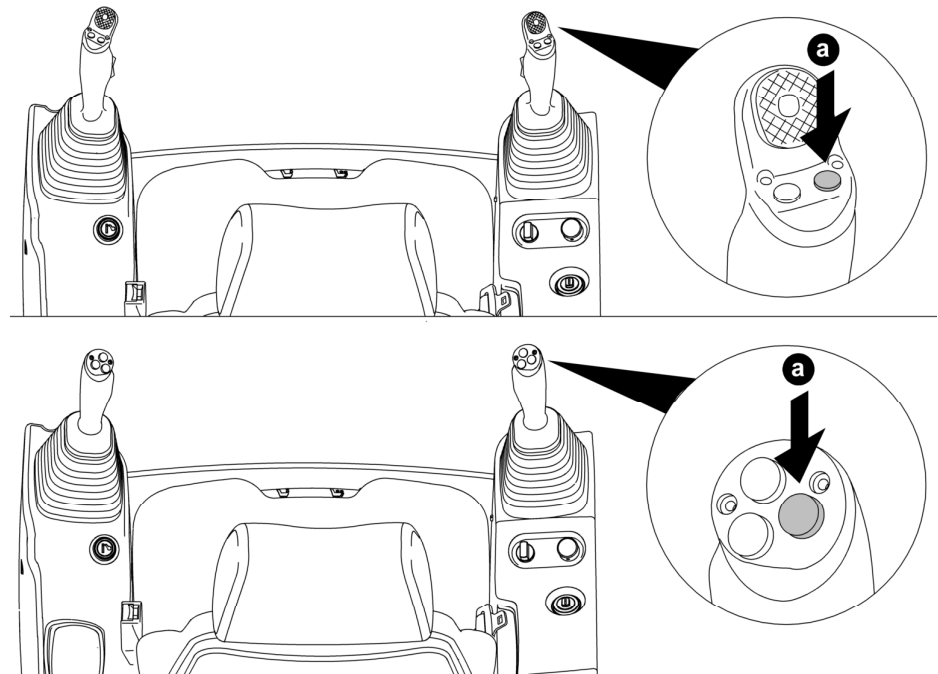


Fig. 230: Deactivating turning alarm

Make sure the following preconditions are met:

- Machine is not travelling.
- Uppercarriage is stationary.
- ▶ Press the right button of the right joystick.
 - ▷ *Confirmation required* status symbol appears on the display.

Working with activated overload warning system



Note

Earth-moving operations create increased pressure on the machine. When the overload warning system is activated, it can trigger repeatedly.

- ▶ Deactivate overload warning system for earth-moving operations.

If overload warning system triggers:

- ▶ Reduce reach.

or

Lower load to the ground without increasing reach.

Deactivating overload warning system



- ▶ Press *overload warning system* key.
 - ▷ *Confirmation required* status symbol appears on the display.
 - ▷ LEDs in *overload warning system* key flash.



- ▶ Press confirmation button within 5 seconds.
 - ▷ *Confirmation required* status symbol is hidden.
 - ▷ LEDs in *overload warning system* key go out.

Dumping the material

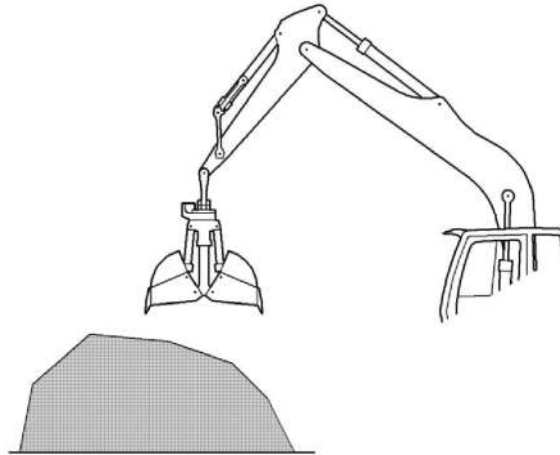


Fig. 265: Dumping the material



DANGER

Stability is at risk!
Fatal or serious injuries, damage.

- ▶ Do not extend the boom and stick too far.
- ▶ Do not swing heavy loads too far to the right or left.

- ▶ Position the working attachment at the dumping point.
- ▶ Open the clamshell.

3.6.11 Transferring loads



DANGER

Incorrect operation and unsuitable ground endanger the stability of the machine!
The machine can rock or tip over! The travel gear can sink into the ground!

- ▶ Check the ground has a sufficient load-bearing capacity.
- ▶ Carry out all movements with increased care.
- ▶ Move the attachment as close as possible to the machine and carry the load close to the ground if possible.
- ▶ Note the load lift chart.
- ▶ Pick up the load carefully.
- ▶ Keep the load close to the machine and move it close to the ground if possible.
- ▶ Make sure there is adequate safety clearance to the machine and the operator's cab (swinging grapple!).
- ▶ Carefully swing the attachment over the loading area of the transport vehicle or the unloading point.
- ▶ Put down the load (empty the grapple).

Installing grapple

- ▶ 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 233](#))
- ▶ Pull up safety lever or folding console.
- ▶ Connect hydraulic hoses of opening and closing cylinders of grapple to fitting **4** and fitting **6**.
- ▶ For grapple with rotary actuator, connect hydraulic hoses of grapple rotator to fitting **5** and fitting **7**.

If stopcocks **13** are available:

- ▶ Turn stopcocks **13** to position **1**.

Removing grapple

- ▶ Retract bucket cylinder to the stop.
- ▶ Pull locking pin **9** from link **12**.
- ▶ Depressurise hydraulic system. (For more information see: [5.10.1 Depressurising hydraulic system, page 233](#))
- ▶ Pull up safety lever or folding console.
- ▶ Disconnect hydraulic hoses of opening and closing cylinders of grapple from fitting **4** and fitting **6**.
- ▶ For grapple with rotary actuator, disconnect hydraulic hoses of grapple rotator from fitting **5** and fitting **7**.
- ▶ Prevent penetration by dust: Seal all unused openings.
- ▶ Wedge grapple.
- ▶ Remove plate **1** and remove pin **2** from bearing.
- ▶ Make it easier to pull out pin **2**: Lift attachment.

3.7.6 Installing and removing grapple on industrial stick

Two people are required for installing and removing a grapple.

3.9.3 Tying down machine

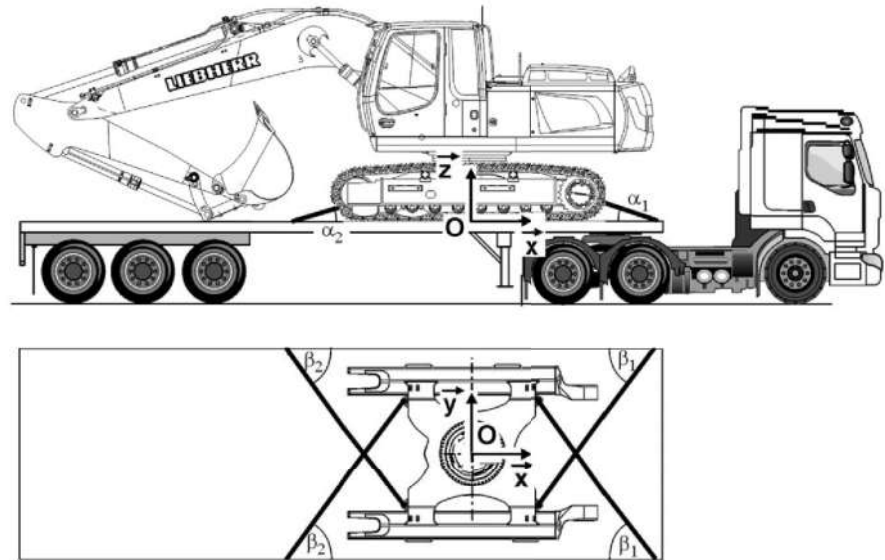


Fig. 280: Tying down machine

α Tie-down angle between lashing chain and horizontal level Oxy

β Tie-down angle between lashing chain and vertical level Oxy

Tie-down angle α	Tie-down angle β
$5^\circ < \alpha_1, \alpha_2 < 30^\circ$	$20^\circ < \beta_1, \beta_2 < 60^\circ$











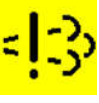

Tab. 30: Tie-down angle

Make sure the following preconditions are met:

- Tear-resistant, non-slip straps with a friction coefficient μ over 0.6 in line with standard EN 12195-1 have been placed on low-loader platform.
- Lashing chains ensure a lashing capacity of 10000 daN in accordance with standard EN 12195-3.
- Tie-down angles are adhered to. (see: tab. 30, page 157)



- ▶ Attach lashing chains to tie-down points of undercarriage that are indicated by *tie-down point* information signs.
- ▶ Arrange lashing chains crosswise.
- ▶ Attach lashing chains to tie-down points of low-loader.
- ▶ Tie down any removed components.

Symbol	Meaning	Effect	Remedy
	Grease container for bearing empty	Possible bearing damage	Fill grease container.
	Grease container for slewing ring toothing empty	Damage to slewing ring toothing	Fill grease container.
	Servo pressure switched off	Control of working attachment and uppercarriage not possible	Contact Liebherr customer service.
	Parameter setting error in the software	Starting of diesel engine not possible	Contact Liebherr customer service.
	Incorrect combination of machine and working attachment parameters	Limited machine function	Contact Liebherr customer service.
	Incorrect input of PIN code	Input of PIN code not possible	Enter correct PIN code.
	Hoist cylinder protection defective	Damage on the hoist cylinders	Contact Liebherr customer service.
	Stick cylinder protection defective	Damage to stick cylinder	Contact Liebherr customer service.
	Warning threshold: Diesel exhaust fluid level too low		Fill with diesel exhaust fluid. If symbol is still displayed, contact Liebherr customer service.
	Safety threshold: Diesel exhaust fluid level too low		Fill with diesel exhaust fluid. If symbol is still displayed, contact Liebherr customer service.
	MIL (Malfunction Indication Lamp), warning threshold: Exhaust values too high		Fill with diesel exhaust fluid. If symbol is still displayed, contact Liebherr customer service.
	MIL (Malfunction Indication Lamp), safety threshold: Exhaust values too high		Fill with diesel exhaust fluid. If symbol is still displayed, contact Liebherr customer service.

Tab. 32: Warning symbols

LMD11824096/01/2018-09-05/en

	Current value [A]	Function
F43	125	Diesel engine preglowing
F49	15	Front windscreen wiper
F50	15	Reserve
F51	15	Reserve
F52	5	LITU
F53	15	Reserve
F54	15	Reserve
F55	15	Reserve
F56	25	Reserve
F58	5	Travel alarm
F63	50	Moving off
F70	5	Warning sound in operator's cab
F72	10	Reserve
F100	15	Auxiliary headlight
F101	15	Auxiliary headlight
Relay		
K01	25	Working attachment headlights
K02	15	Front roof light
K03	15	Rear roof light
K04	15	Front windscreen wiper
K05	15	Reserve
K06	15	Beacon
K07	15	Horn
K09	15	Radio
K10	50	KL15
K11	5	Start 1
K12	50	Start 3
K13	120	Diesel engine preglowing
K14	15	Travel alarm
K15	15	Reserve
K16	15	Reserve
K17	25	Reserve
K18	15	Windscreen wipers
K19	15	Reserve
K20	15	Reserve
K22	5	Start 2
K23	5	Warning sound in operator's cab

LMD11824096/01/2018-09-05/en

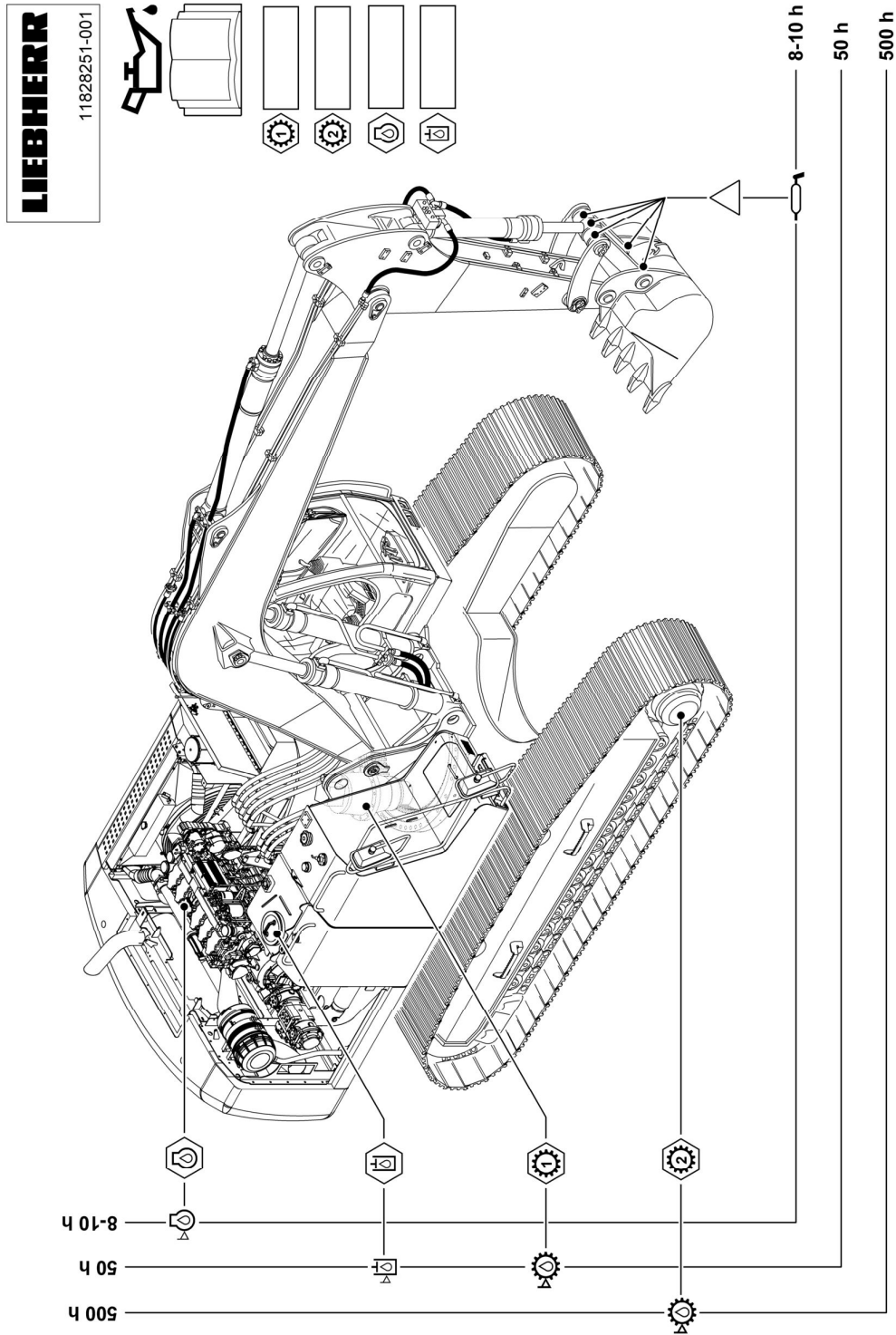


Fig. 351: Lubrication chart for central lubrication system¹⁷⁾

¹⁷⁾ Option

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5.4 Access points for maintenance work

5.4.1 Access points on uppercarriage

Overview

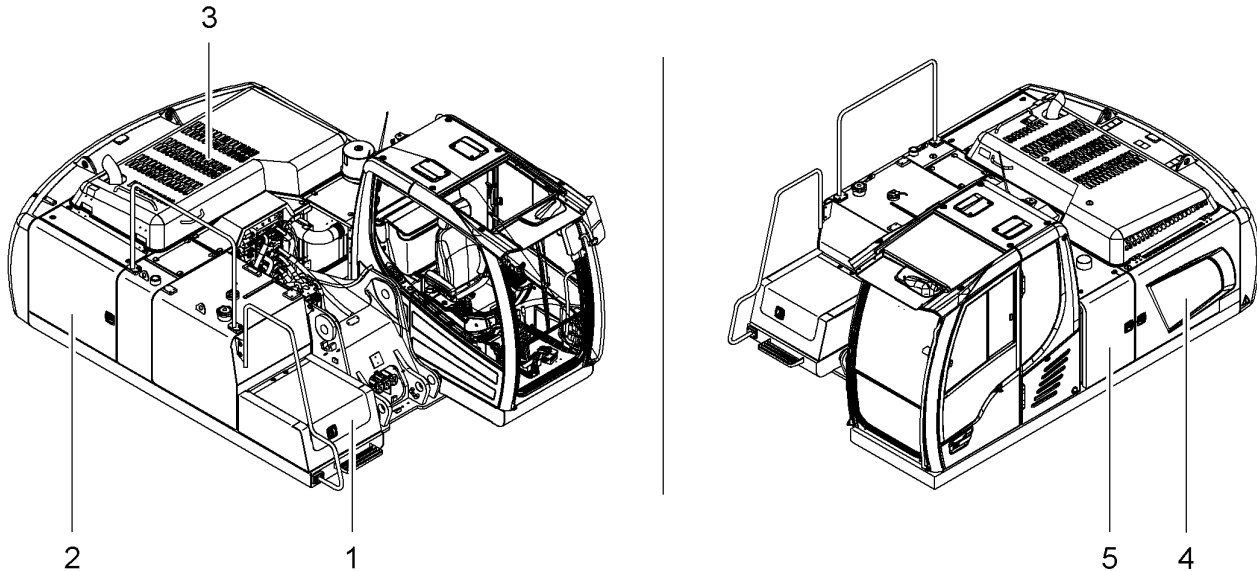


Fig. 362: Access points on uppercarriage

No.	Access point	Access to
1	Door to the fuel tank	Grease container, tool box, storage compartment
2	Right side door	Fuel fine filter, fuel pre-filter, hydraulic pumps, control oil unit
3	Motor bonnet	Diesel engine, radiator, coolant container
4	Side door rear left	Battery main switch, radiator
5	Side door, middle left	Air filter, main fuses, batteries

Tab. 59: Access points on uppercarriage

5.6.7 Corrosion protection

Item code: 11212565

Version: 002

Scope and purpose

This chapter on corrosion protection is aimed at all users of machines for earth-moving operations, material handling, mining and excavating work in rivers and in the offshore area. The complete machine must be inspected regularly in order to ensure maintenance of the corrosion protection. To ensure the service life of the components, this protection must be renewed regularly. In addition, depending on the type of corrosion protection of the machine, the environment (for example offshore area, industrial etc.) and specific applications (e.g. handling of fertiliser, salt etc.) the treatments must be performed more frequently and more consistently.

Operating conditions

In general the locally applicable legal regulations must be adhered to. The conditions for storing and application must be adapted to the locally applicable regulations and to the product data sheets. Personal protective equipment must correspond to the list in the safety data sheets. Before chemical products are used, the product data sheets (technical data sheets and safety data sheets) must be read in order to prevent accidents and be able to take appropriate measures in the event of an accident.

Different climatic conditions



Fig. 369: Icy climate

LMD11824096/01/2018-09-05/en

Top coats for maritime applications	10008569	16 l	Liebherr yellow
	10008570	16 l	Liebherr grey
	10008571	16 l	RAL 9002
	10008572	16 l	Special colour (to be specified)
Paint hardener for maritime applications	10008573	4 l	-
Two-component paints; can be diluted with thinner, item code: 10008574 - 5 l.			

Tab. 71: Spraying system for maritime applications

Product name	Item code	Container	Colour
Zinc repair spray	11491512	Aerosol 400 ml	Zinc
Zinc pigments (90 %) bound with resin; product is applied immediately to previously degreased and brushed metal.			

Tab. 72: Reworking system for zinc-plated parts (steps, ladders, railings, walkways etc.)

Product name	Item code	Container	Colour
Aluminium chrome spray	11491502	Aerosol 400 ml	Metallised aluminium
Aluminium pigments bound with resin; product is applied immediately to previously degreased and brushed metal.			

Tab. 73: Repair system for zinc-coated passivated parts (pipes, consoles, plates etc.)

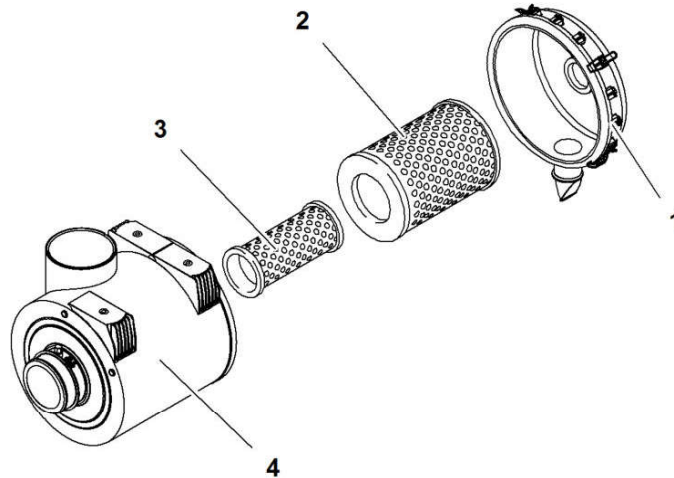


Fig. 383: Air filter

- | | | | |
|---|-----------------------|---|-------------------------|
| 1 | Cover | 3 | Safety filter cartridge |
| 2 | Main filter cartridge | 4 | Filter housing |

NOTICE

Cleaning with compressed air!
Damage to air filter.

- ▶ Do not clean inside of filter housing with compressed air.
-

Make sure the following preconditions are met:

- Diesel engine is shut off.
- ▶ Remove cover 1.
- ▶ Remove main filter cartridge 2.
- ▶ Clean inside of filter housing 4, seal and sealing surfaces with damp, lint-free cloth.
- ▶ Install new main filter cartridge 2.
- ▶ Make sure that new main filter cartridge 2 is correctly flush with sealing surfaces.
- ▶ Put on cover 1.

5.10.4 Return filter: Checking and cleaning magnetic rod

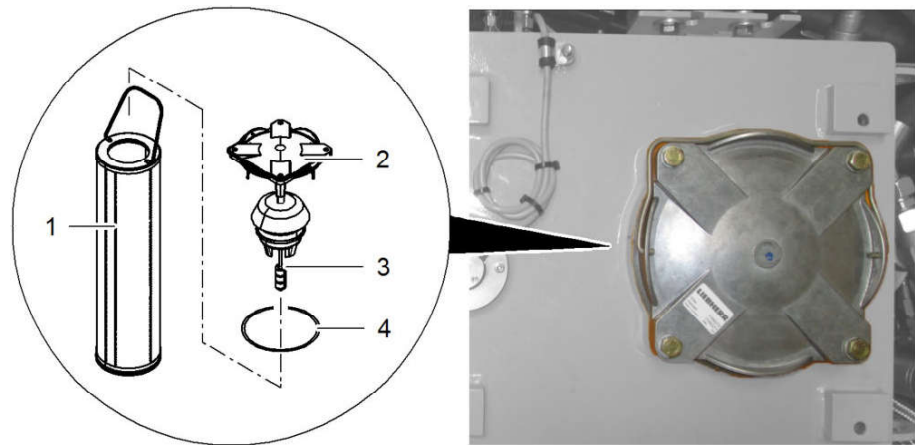


Fig. 392: Return filter

- | | | | |
|---|------------------|---|--------------|
| 1 | Filter cartridge | 3 | Magnetic rod |
| 2 | Cover | 4 | O-ring |

- ▶ Depressurise hydraulic system. (For more information see: [5.10.1 Depressurising hydraulic system, page 233](#))
- ▶ Remove cover 2 of return filter with magnetic rod 3.
- ▶ Clean magnetic rod 3 with lint-free cloth.
- ▶ Correctly position O-ring 4.
- ▶ Put on cover 2 of return filter with magnetic rod 3.

5.10.5 Hydraulic hoses: Checking condition and tightness

- ▶ Check condition and tightness of hydraulic hoses.

Damage includes:

- Cuts, cracks or abrasion points on outer layer of hydraulic hose that reach the inner layer
- Cracking caused by outer layer of hydraulic hose becoming brittle
- Deformations that do not correspond to normal shape of hydraulic hose (for example separation of layers or bubble formation)
- Deformation on hydraulic hose fitting
- Hydraulic hose slipping out of fitting
- Corrosion on hydraulic hose fitting

If hydraulic hoses are damaged or leaking:

- ▶ Have hydraulic hoses replaced by Liebherr customer service.

5.14 Operator's cab, heating and air conditioning

5.14.1 Filling with windscreen washer fluid

The windscreen washer fluid tank is located on the rear of the operator's cab.

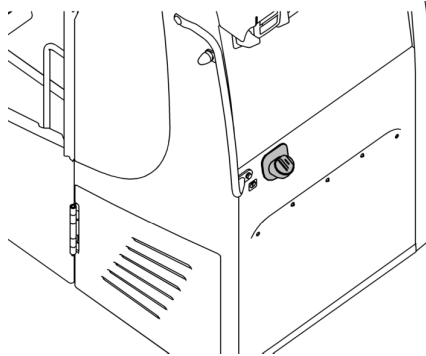


Fig. 400: Windscreen washer fluid tank

- ▶ Unscrew cover of windscreen washer fluid tank.
- ▶ Filling with windscreen washer fluid.
- ▶ Screw cover back onto windscreen washer fluid tank.

5.14.2 Switching on air conditioning unit

NOTICE

Long downtime of air conditioning unit!
Damage.

- ▶ Switch on air conditioning system in winter too.
-

Make sure the following preconditions are met:

- Diesel engine is started.
- ▶ Activate AUTO operating mode.
- ▶ Wait approximately 15 minutes.
- ▶ Deactivate AUTO operating mode.

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