en **Operator's manual**

Wheel loader

L 507-1259

From serial number 34508

Document ID

ORIGINAL OPERATOR'S MANUAL

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Manufacturer: Liebherr-Werk Bischofshofen GmbH
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From Serial no.: 34508

Conformity: CE

Contact

Address: Liebherr-Werk Bischofshofen GmbH
Dr. Hans Liebherr-Straße 4
A – 5500 Bischofshofen

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Description	Unit	Value
Angle of articulation to each side		30°
Pendulum angle of articulation to each side		5°

1.2.9 Working hydraulics

- Gear pump for supplying the working hydraulics and steering system
- Return suction filter in the hydraulic tank
- Single-lever control, hydraulic servo system

Lifting cycle:
- Lifting, neutral, lowering
- Float position using lockable control lever

Tilting cycle:
- Tilt out, neutral, tilt in

Description	Unit	Value
Maximum flow	l/min	79
Maximum operating pressure	bar	$230^{\pm 5}$

1.2.10 Lift arms

Powerful Z kinematics with one tilt cylinder and standard hydraulic quick coupler

Working cycle time at rated load

Description	Unit	Value
Lifting	s	4.2
Tilting out	s	1.5
Lowering (empty)	s	3.0

1.2.11 Driver's cab

Design:
- On elastic bearing on rear section, soundproof ROPS/FOPS cab
- Right door with vent opener
- Tinted windows of hardened single-pane safety glass
- Adjustable steering column is optionally available
- ROPS rollover protection in accordance with EN/ISO 3471/ EN 474-1
- FOPS stone impact protection in accordance with EN/ISO 3449/ EN 474-1

Driver’s seat

6-position, shock-absorbing driver's seat, adjustable to the driver's weight.

Alternative versions:
- Driver's seat with mechanical suspension
- Driver's seat with pneumatic suspension (optional)

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	Designation	Unit	Value
	Maximum payload on even terrain = 80% of the static tipping load when articulated (EN 474-3)	kg	2212
	Operating weight	kg	5400

Tab. 6: Attachment: Forklift

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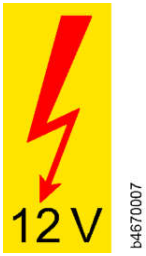

Fig. 28: System voltage decal

Indicates the electrical system's voltage.

Tightening torque decal

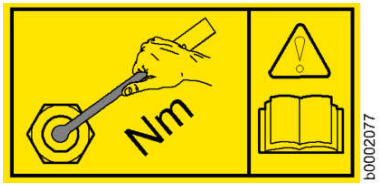

Fig. 29: Tightening torque decal

Indicates the tightening torque for the battery fastening specified in the operating manual.

Lashing point decal

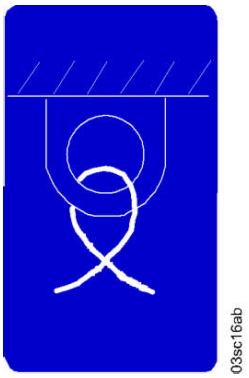

Fig. 30: Lashing point decal

Indicates the lashing points on the machine.

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- Arrange for the power to be switched off.
- Only get out of the machine when you are sure that the power line you have touched or damaged has been switched off.

6. Before driving or working with the machine, check that the accessories are safely stowed away.
7. When driving on public roads, paths and spaces, observe the traffic regulations, and make sure the machine is in a fit condition to use public roads if this is not already the case.
8. Always switch on the lights in darkness and poor visibility.
9. Do not take passengers on the machine.
10. Only work when seated and wearing a safety belt.
11. Report any malfunctions and make sure that any necessary repairs are completed immediately.
12. Check personally to ensure that no-one is endangered when the machine starts moving.
13. Before starting work, check the brake system as instructed in the **"operating manual"**.
14. Never get out of the driver's seat while the machine is still in motion.
15. Never leave the machine unattended with the engine running.
16. When driving the machine, lower the working attachment to the transport position and carry the load as close as possible to the ground.
17. Avoid movements which could cause the machine to tip over.
    If the machine does start to tip over or slide sideways, put down the attachment immediately and point the machine downhill.
    Wherever possible, work up or downhill and not sideways to the slope.
18. Drive carefully on rocky or slippery terrain and on slopes.
19. Only drive downhill within the permitted speed limit, otherwise you could lose control of the machine.
    The engine must be running at the rated speed and you should only reduce the travel speed using the pedals.
    Shift down to a lower gear before reaching the slope. Do not wait until you are actually on it.
20. When loading a truck, insist on the driver getting out of the operator's cab, even if it is protected against stone impact.
21. When performing work such as demolition work, clearance and crane operation, always use the protective equipment provided for these specific tasks.
22. Have someone direct you when vision is restricted and whenever else this is necessary.
    Only allow one person give you signals.
23. Only allow experienced personnel to sling loads and direct crane drivers.
    The person giving directions must remain in sight of the operator or at least be in spoken contact with the operator.

2.4.7 Safety instructions for driving on slopes

1. On downward slopes, always drive carefully and never at top speed, as you could otherwise lose control over the machine.

   Travel speeds:
   - Never exceed the speed limits specified in the **"operating manual"**.
   - Exceeding the maximum speed causes the permitted limits to be exceeded for all rotating parts, including the drive motor, the drive shaft, all gears including axles and ultimately the engine itself.
2. Therefore, before driving onto a slope, select a travel range (gear) in which you can safely negotiate the whole slope without endangering yourself, the machine and other people.
3. Also, take your foot off the accelerator pedal when driving onto a slope.

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3 Handling and operation

3.1 Control elements

3.1.1 Driver's cab

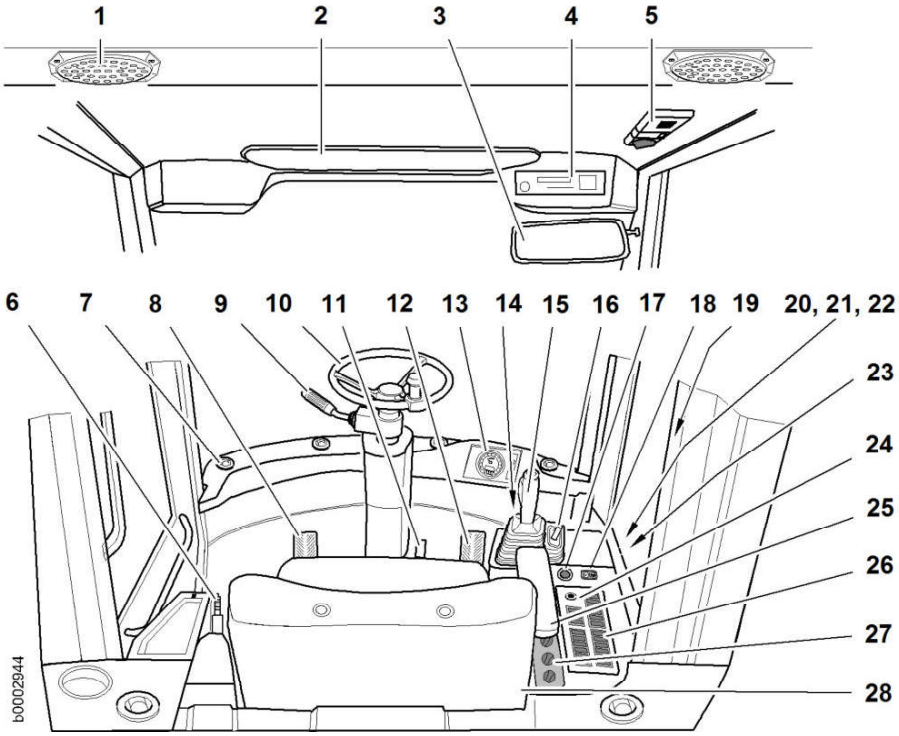

Fig. 48: Driver's cab

1 Radio speaker
2 Sun visor
3 Interior mirror
4 Radio installation
5 Interior lighting
6 Parking brake
7 Outlet nozzles, heater/ ventilation/air conditioning (optional)
8 Inch/brake pedal
9 Steering column switch
10 Steering wheel
11 Steering wheel adjustment lever
See next page for continuation of the image legend
15 Control lever
16 Additional control lever (optional)
17 Cigarette lighter socket
18 *Diesel particulate filter* switch/ button
19 Fire extinguisher (optional)
20 Fuse box
21 Control electronics
22 Control relay
23 Diagnostic plug
24 Starter switch
25 Adjustable arm rest

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Note
Observe the instructions and rules concerning use, safety and inspection on the label of the fire extinguisher.

- ▶ Find out about fire alarm and firefighting equipment on the site.
- ▶ Make sure you know where the fire extinguisher is located and how to use it.

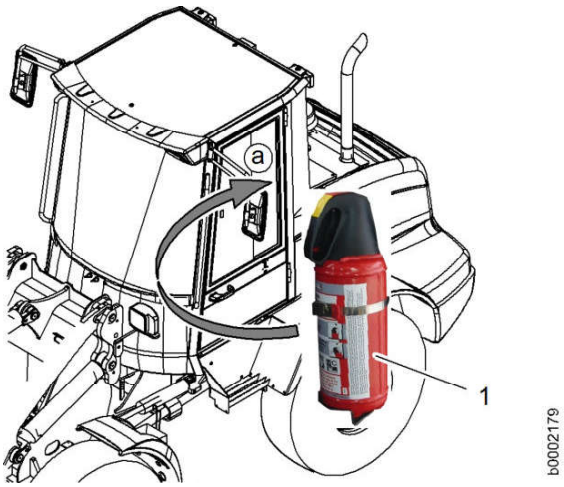

Fig. 63: Fire extinguisher

1 Fire extinguisher **a** Location

Retroactively installing fire extinguisher:
– Find out about the installation options: Contact Liebherr customer service.
– Observe the manufacturer's mounting instructions.

3.2.7 Driver's seat

The ergonomically designed driver's seat offers a high degree of comfort.

The adjustable seat allows the driver to move the seat into a position for maximum individual comfort.

Shock absorption:
– The driver's seat installed in the machine complies with ISO 7096.
– When the machine is used correctly, the vibrations transmitted by the driver's seat are less than or equal to the vibrations simulated in test conditions for the corresponding machine class in accordance with ISO 7096 class EM3.
– The vibration acceleration values (a_{ZW}), are measured in accordance with ISO 2631, Part 1, and thus meet the standards for protection against overall body vibrations in EN 474-1.

WARNING
There is a risk of injury if the driver's seat is not properly adjusted.

- ▶ Never adjust the driver's seat when the vehicle is moving.

Types of driver's seat:
– **Standard seat** = with mechanical suspension
– **Comfort seat** = with air suspension

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Note
The deletion procedure deletes all programmed keys.
After deletion, all the keys need to be reprogrammed.

▶ See the manufacturer's operating manual for a detailed description of the deletion procedure.

Security functions

If more than five keys with different codes are used in the ignition lock in the space of one minute, the immobiliser is activated for 15 minutes.

The immobiliser will not even accept valid keys during this time.

Tamper protection

The immobiliser cannot be deactivated by tampering with it.

Troubleshooting

Simple description of problems and how to solve them:

Cause:	Remedy:
Immobiliser does not work	- Use a programmed key
Keys cannot be programmed.	- No master key or wrong master key used previously - Master key left in ignition too long or not long enough - The key has no tag - Key not long enough in ignition for programming
Programmed keys cannot be deleted	- No master key or wrong master key used - Master key not long enough in ignition

Tab. 11

▶ See the manufacturer's operating manual for a detailed description.

Troubleshooting
If you are unable to solve the problem as described above, it must have a different cause.

▶ Contact Liebherr Customer Service

3.2.12 Steering column switch

The steering column switch consists of the following control elements for:
– Direction indicator lights
– High beam
– Horn and headlight flasher
– Front windscreen wiper
– Front windscreen washer system

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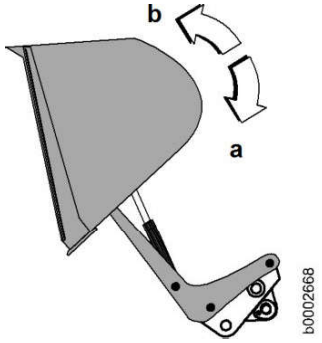
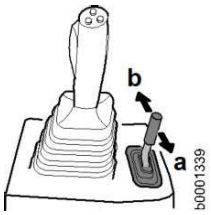
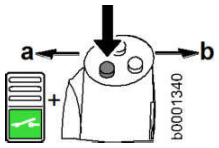
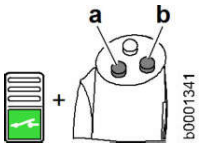
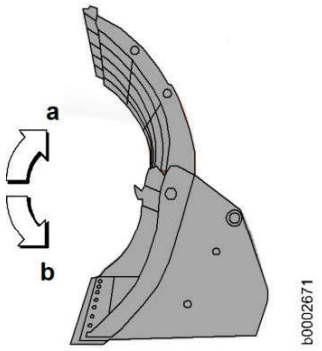
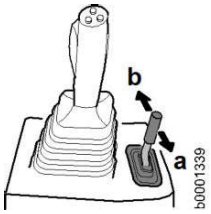
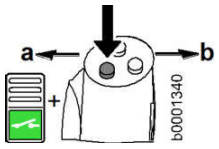
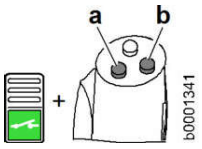
WARNING
Incorrect operation of the working attachment can lead to injuries.

- ▶ Observe the manufacturer's operating manual.
- ▶ Familiarise yourself with the working attachment in a secure area.

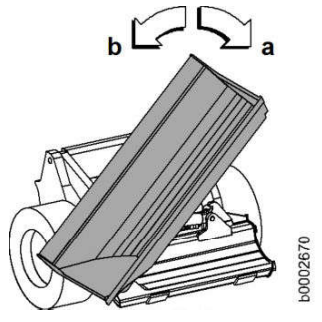
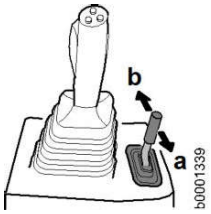
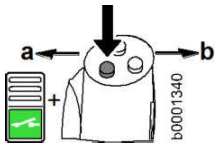
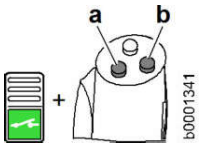
High dump bucket [A]	Control		
			

Tab. 16: High dump bucket control system

A) To avoid damaging the tilt cylinder, always use the high dump function to empty material.

Bucket with downholder	Control		
			

Tab. 17: Bucket with downholder control system

Side dump bucket	Control		
			

Tab. 18: Side dump bucket control system

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To switch off the windshield wiper:

▶ Press the switch **1** in position **a**.

3.2.23 Back-up alarm

This equipment is optional.

The back-up alarm system warns anyone standing behind the machine while it is reversing.

Versions:
– Audible back-up alarm
– Visible back-up alarm

The back-up alarms can also be installed in combination.

WARNING
There is a risk of accidents when reversing the machine due to impaired view.

▶ Make sure your view is unimpaired when reversing.

▶ Have someone direct you if necessary.

Audible back-up alarm

The back-up alarm is automatically activated when the machine is reversed.

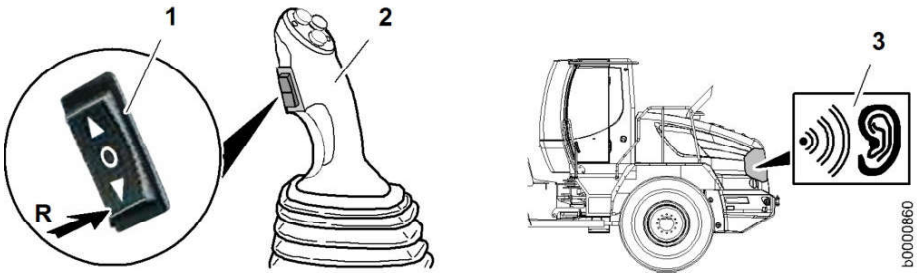

Fig. 107: Audible back-up alarm

1 *Travel direction* switch
2 Control lever
3 Back-up alarm
R Reverse travel direction

▶ Move the switch **1** to reverse travel direction.
▷ The back-up alarm installed in the engine compartment emits an audible warning signal (intermittent tone).

Deactivating the audible back-up alarm

WARNING
There is an increased risk of accidents if you deactivate the back-up alarm.

▶ Be especially careful when reversing.

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Driving

This section deals with the following topics:
– Setting off
– Driving with ride control
– Reversing

Setting off

Make sure that you have completed all the preparations for driving. (For more information see: Preparations for driving, page 109)

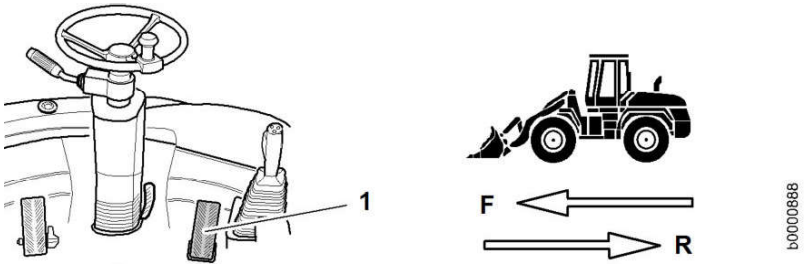

Fig. 122: Setting off

1 Accelerator pedal

▶ Press down the accelerator pedal **1** carefully.
▷ The machine starts moving.
▷ The travel speed and gear are shown in the display.

Driving with ride control

This equipment is optional.

If you travel long distances without ride control you may experience vibrations while driving.

The ride control system improves driver comfort in nearly all situations by reducing vibrations.

Therefore, the ride control system should be activated for all applications which require significant distances to be covered.

Activating ride control

Ride control can either be speed-dependent or constantly activated.

Functions:
– SPEED = speed-dependent
– ONOFF = constantly activated

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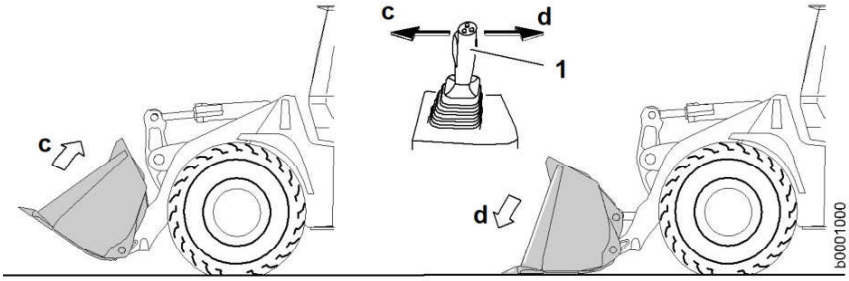

Fig. 136: Tilting the bucket in and out

1 Control lever

To tilt the bucket in:

▶ Move the control lever **1** in direction **c**.
▷ The bucket is tilted in.

To tilt the bucket out:

▶ Move the control lever **1** in direction **d**.
▷ The bucket is tilted out.

Moving the lift arms and the bucket simultaneously

The lift arms and bucket can be moved simultaneously by moving the control lever diagonally.

WARNING
Beware of accidents when raising or lowering the lift arms and bucket.

▶ Do not allow anyone into the danger area of the machine.

Raising the lift arms while tilting the bucket in or out

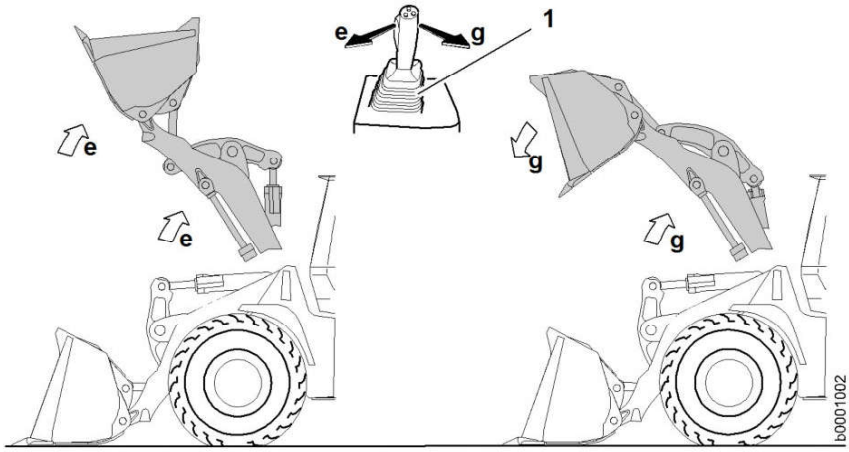

Fig. 137: Raising the lift arms and tilting the bucket in or out

1 Control lever

To raise the lift arms while tilting the bucket in:

▶ Move the control lever in direction **e**.
▷ The lift arms are raised while the bucket is tilted in.

3.4 Working methods

This section describes the routine working methods.

3.4.1 Picking up material

The following procedure is recommended to avoid any possible loss of traction.

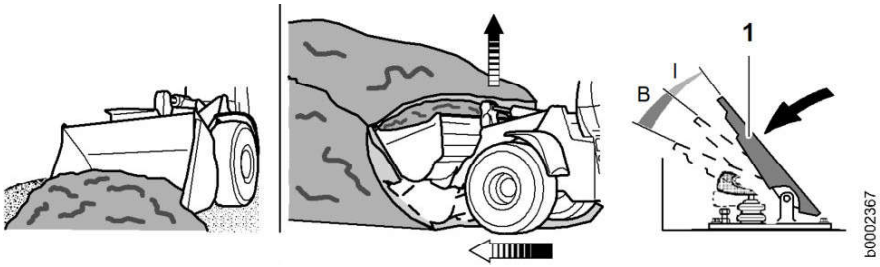

Fig. 150: Picking up material

1 Inch/brake pedal
I Inching
B Braking

- ▶ Do not work with a strong downwards pressure on the working attachment.
- ▶ To provide better support, gently tip the working attachment in and out while driving into the material.

Pressing the inch/brake pedal reduces tractive force, which makes loading easier.

- ▶ Also move the inch/brake pedal **1** within the range **I**.
  - ▷ The power of the travel hydraulics is reduced, thereby preventing the wheels from spinning.
  - ▷ The power of the working attachment is reduced.
  - ▷ The fuel consumption is reduced.

WARNING
There is a risk of the machine tipping over.
The machine might tip over when the lift arms are raised due to the shift in the centre of gravity.

- ▶ Observe the maximum permitted bulk material weight and the specified tipping loads.

- ▶ Tilt in the loaded working attachment as far as it will go and raise the lift arms.

3.4.2 Transporting and moving material

Ensure that the machine is stable and visibility is clear. The working attachment should be moved into the transport position when transporting and transferring materials.

Transport position

The transport position means
– The pivot point of the working attachment is approx. 40 cm above the ground.
– Attachment tilted in

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▶ Lower the lift arms to just above the ground.

▶ Turn off the engine.

▶ Switch on the ignition.

If the working attachment is operated with the additional control lever:

▶ Press and hold the button **1** while moving the additional control lever **7** in the direction of the arrow several times.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with comfort control:

▶ Press the switch **2** on the control unit.

▶ Press and hold the button **1** and, at the same time, press the button **3** and move the control lever **6** several times in the direction of the arrow.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with button control:

▶ Press the switch **2**.

▶ Press and hold the button **1** and while repeatedly pressing the buttons **4** and **5** on the control lever.
▷ The working attachment hydraulics have been depressurised.

Disconnecting the hydraulic lines

If the working attachment has its own hydraulic supply, the hydraulic lines must be disconnected.

WARNING
There is a risk of accidents from pressurised hydraulic lines!

▶ Depressurise the hydraulic circuits before connecting or disconnecting hydraulic couplings.

Make sure the following preconditions are met:
❑ The lift arms are lowered to just above the ground.
❑ Cylinders, valves, etc. on the working attachment are in the initial position or closed.
❑ The working attachment is tilted in.
❑ The hydraulics have been depressurised.

Note
Hydraulic oil is harmful to the environment.
Make sure that no hydraulic oil leaks into the ground.

▶ Dispose of any contaminated soil in accordance with the local regulations.

▶ Detach the hydraulic line from the installed working attachment.

▶ Seal the hydraulic line couplings with caps.

▶ Place the hydraulic lines in the hose retainer.

Unlocking and disconnecting the working attachment

Make sure that all hydraulic lines have been detached from the installed working attachment.

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3.7 Emergency operation

This section describes the emergency operations of the machine.

Emergency operations:
- Lowering the lift arms if the engine fails
- Towing the machine
- Emergency steering
- Jump starting

3.7.1 Lowering the lift arms if the engine fails

If the engine fails, lower the lift arms and depressurise the hydraulic system.

Lowering the lift arms and depressurising the hydraulics

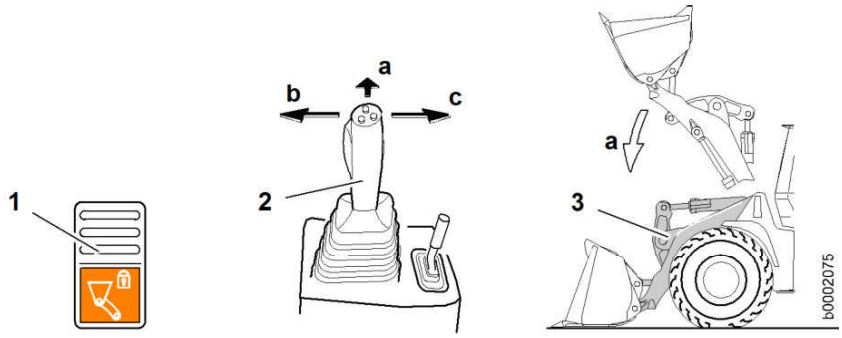

Fig. 180: Lowering the lift arms

1 *Working hydraulics lockout* button
2 Control lever
3 Lift arms

▶ Switch on the ignition.

▶ Press and hold the button **1** while moving the control lever **2** in direction **a** and lower the lift arms **3** to the ground.

▶ Press and hold the button **1** while moving the control lever **2** several times in directions **b** and **c**.
▷ The hydraulics have been depressurised.

Depressurising the hydraulics of the working attachment

If the working attachment has an independent hydraulic circuit, the hydraulic operating circuits must be depressurised.

Make sure that the lift arms are lowered.

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Servicecode	Effect	Cause	Remedy
E6004	Engine pressure symbol field (H4) lights up, STOP symbol field (H36) flashes, continuous warning buzzer sounds	Engine oil pressure too low	Check the oil level.
E6006	Air filter contamination symbol field (H7) lights up	Air filter contamination: vacuum switch actuated	Change the air filter.
E600A	Engine difficult to start	On-board power supply voltage is too low	Check fuse F200.

Service code	Index	Description	Component	Remedy
6E	0	Coolant temperature too high	Coolant temperature sensor	Clean the cooler.
AE	0	Fuel temperature too high	Fuel temperature sensor	Clean the fuel cooler.
7F853	0	Air filter contamination	Air filter	Change the air filter.
7F859	0	Water sensor activated	Fuel pre-filter	Drain water separator.
E88	16	Excessive ash in diesel particulate filter	Diesel particulate filter	Perform manual regeneration.
E87	16	Regeneration mode suppressed for too long	Diesel particulate filter	Perform manual regeneration.
E6F	14	Regeneration is necessary but regeneration mode is suppressed.	Diesel particulate filter	Allow regeneration and operate the machine in a safe range or perform manual regeneration.

Tab. 22: Service codes

4.1.4 Malfunction display service codes

Service code	Effect	Cause	Remedy
Err001	Data sector write error	Faulty data in memory, internal memory defective	Turn off the ignition, wait 5 seconds and turn it on again. If the service code frequently appears: Contact Liebherr customer service.
Err002	Data sector read error	Faulty data has been read, internal memory defective	Turn off the ignition, wait 5 seconds and turn it on again. If the service code frequently appears: Contact Liebherr customer service.
Err003	Value outside defined limits	Internal error	Turn off the ignition, wait 5 seconds and turn it on again. If the service code frequently appears: Contact Liebherr customer service.

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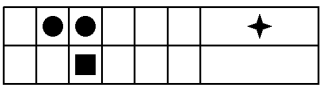
5 Maintenance

5.1 Maintenance and inspection schedule

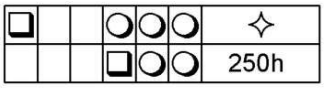
The following abbreviations are used in this section:
– h = service hours

Various symbols (solid or empty circles, boxes and stars) are used to indicate the maintenance tasks, which fall into two main types.



bsym0039

The symbols have the following meanings:
Table with solid circle, box or star
– Responsibility for carrying out the maintenance work lies with the machine operator or his maintenance personnel.
This affects the maintenance intervals every 10 and 50 service hours (h) and non-scheduled intervals.



bsym0040

The symbols have the following meanings:
Table with empty circle, box or star, or service hours (h)
– The maintenance and inspection work must be performed or supervised by authorised engineers from Liebherr or its authorised dealers.
This affects the maintenance interval: on delivery and every 500, 1000, 2000, 3000 service hours (h), and at unscheduled times.

A list of the spare parts needed for maintenance and inspection work is contained in the service package of the spare parts list.

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Machines filled at the factory with environmentally harmless hydraulic fluids have a sign to that effect (NOTICE) attached to the driver's cab and hydraulic tank.

Procedure for later conversion

NOTICE
Beware of damaging the machine's hydraulic system.
Mixing environmentally harmless hydraulic fluids with mineral oils produces a vigorous reaction that can damage the hydraulic system.

▶ Never mix environmentally harmless hydraulic fluid with mineral oil.

▶ If you intend to convert the machine to environmentally harmless hydraulic fluid, you **must** first consult Liebherr CUSTOMER SERVICE.

▶ It is essential that you order the **instruction sheet** and the **conversion guidelines** from Liebherr and that you observe them.

5.3.3 Diesel fuels

Specification


06sy02ab

Diesel fuels must comply with the minimum requirements of the following fuel specifications.

Specifications:
– DIN EN 590
– ASTM D 975 (89a)

Confirmation must be obtained from the fuel supplier in respect of the fuel specification, sulphur content, lubricity, cetane number.

Sulphur content of the diesel fuel, lubricity

Diesel fuels with a sulphur content of more than 15 mg/kg (15 ppm) are not permitted.

In terms of the HFFR test (Lubricity, corrected “wear scar diameter” [wsd 1.4] at 60 °C) lubricity may not exceed 460 µm. For more information see: Complicating factors

The necessary additives to the fuel must be added by the supplier. It is inadvisable for the customer to undertake adding any further additive.

Cetan number

A cetane number of at least 45 is required for fuels in accordance with ASTM D 975. A cetane number above 50 is preferable, especially at temperatures below 0 °C.

Diesel fuel at low temperatures (winter operation)

Paraffin crystals form in diesel fuel as the temperature falls; these increase the flow resistance in the fuel filter to such an extent that the fuel supply to the engine is no longer guaranteed.

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Note
The lubrication grease must be capable of being easily delivered throughout the entire ambient temperature range.

- ▶ Only use approved lubrication greases.
- ▶ In retrofitted central lubrication systems, pay attention to the specifications for the consistency of the lubrication grease.

Minimum quality requirements

Lubrication greases must fulfil the following minimum quality requirements.

Application	Specification	Designation
Standard	Soap-based (lithium complex)	KP 2 K (DIN 51502)
		NLGI grade: 2 (DIN 51818)
		VKA weld load: ≥ 6000 N (DIN 51350 / 4 – ASTM D 2596)
Cryogenic temperature	Soap-based (lithium complex)	KP 1 K (DIN 51502)
		NLGI grade: 1 (DIN 51818 / ASTM D 2596)
		VKA weld load: ≥ 5500 N (DIN 51350 / 4 – ASTM D 2596)

Tab. 48

Liebherr lubrication grease

Liebherr recommends the following lubrication greases to achieve optimum lubrication results and for additional corrosion protection.

Application	Recommended lubricant	Specification	Designation
Standard	Liebherr Universalfett 9900	Soap-based (lithium complex)	KPF 2 N - 25 (DIN 51502)
			NLGI grade: 2 (DIN 51818)
			VKA weld load: ≥ 6000 N (DIN 51350 / 4)
			with vapour phase anti-corrosion agent
Cryogenic temperature	Liebherr Universalfett Arctic	Soap-based (lithium complex)	KPFHC 1 N - 60 (DIN 51502)
			NLGI grade: 1 (DIN 51818)
			VKA weld load: ≥ 5500 N (DIN 51350 / 4)

Tab. 49

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NOTICE
There is a risk of damaging the engine and its electric components.
Moisture penetration can cause corrosion and electrical malfunctions.

▶ Do not expose devices such as the starter, alternator, sensors and engine control unit to water or steam jets.

Make sure that the following requirements are fulfilled:

❑ The machine is in maintenance position 1.
❑ The engine compartment hood is open.

▶ Carefully clean the engine.

5.6.4 Shutting down the machine for a lengthy period

If the machine is put out of service for a longer period without preservation, this must be put back into service at 14 day intervals (at maximum) in order to prevent, for the most part, increased corrosion and the resulting damage.

▶ All oil levels must be checked before putting into service.

▶ Carry out all daily prescribed maintenance work before putting back into service each time. Carry out all additional temporary maintenance work as per inspection plan, at the latest at the intended intervals.

▶ Put machine back into service and operate until the engine and hydraulics system have reached the prescribed operating temperature in the hydraulic tank and in the coolant circulation (see the section on operating the “display”).

▶ Activate all functions of the working and travel hydraulics and of the other hydraulic components, and alternately operate over a time-span of approx. 20 minutes. Hydraulic cylinders must each be extended and retracted over their full stroke length.

▶ When switching off the machine, retract all the hydraulic cylinders completely if possible, and fill up the fuel tank. If the surface is soft, put the machine on wooden blocks or similar, and secure against rolling.

▶ Battery main switch in the OFF position.

5.6.5 Deactivating the machine

To deactivate the machine:
▶ Contact Liebherr customer service.

5.6.6 Checking the machine for leaks

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 2.
❑ The service doors, hatches and hoods are open.

▶ Check the hydraulic system for leaks.

▶ Replace any damaged hydraulic seals.

▶ Tighten any loose hydraulic connections.

▶ (For more information see: 2.4.16 Safe maintenance of hydraulic hoses and hose lines, page 57)

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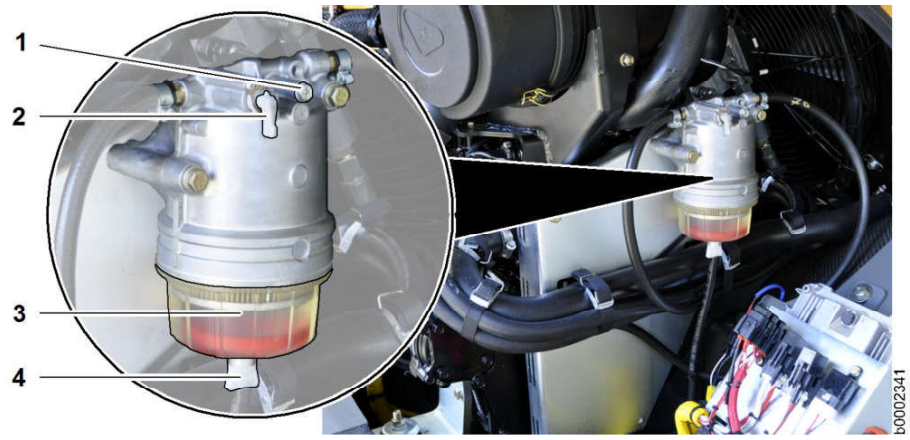

Fig. 221: Changing the fuel pre-filter

1	Bleeder screw	**3**	Filter housing
2	*Fuel line* shut-off valve	**4**	Drain valve

- ▶ Place a receptacle under the fuel pre-filter.
- ▶ Carefully clean the fuel pre-filter and the area around it.
- ▶ Close the *fuel line* shut-off valve **2**.
- ▶ Open the bleeder screw **1**.
- ▶ Open the drain valve **4**.
  ▷ Fuel flows out of the pre-filter until the pre-filter is empty.
- ▶ Unscrew the filter housing **3**.
- ▶ Remove the filter element.
- ▶ Clean the filter housing **3**.
- ▶ Check that the filter base is clean.

NOTICE
Beware of damage to the engine.

- ▶ Make sure no dirt gets into the clean side of the filter.

- ▶ Close the drain valve **4** and bleeder screw **1**.
- ▶ Install a new filter element.
- ▶ Lubricate the seal on the filter housing **3** with clean fuel.
- ▶ Open the *fuel line* shut-off valve **2**.

Note
The fuel system is self-bleeding.

- ▶ Turn the ignition to “ON” for 15 seconds to bleed the fuel system.

5.7.4 Changing the fuel fine filter

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The service access is open.
- ❑ You have a suitable receptacle ready.

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▷ (For more information see: Correcting the antifreeze concentration, page 221)

Correcting the antifreeze concentration

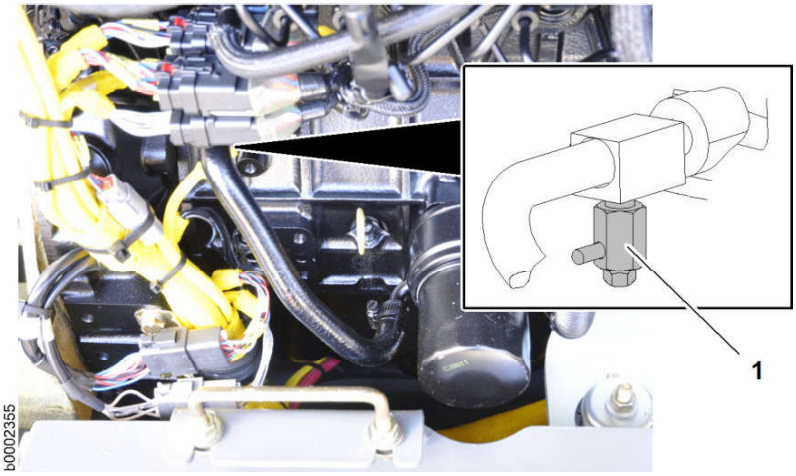

Fig. 232: Correcting the antifreeze concentration

1 Engine drainage

If the antifreeze concentration is too low:

▶ Drain off the coolant and top up with pure antifreeze according to the following diagram.

NOTICE
Beware of damaging the engine.
Too much antifreeze and corrosion inhibitor impairs the cooling effect.
This eventually causes damage to the engine.

▶ Never use more than 60% antifreeze and corrosion inhibitor.

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5.12 Electrical system

5.12.1 Checking the lights

Make sure the following preconditions are met:
- ❑ The machine is parked in a safe place.
- ❑ The electrical system of the machine is switched on.

All the lights can be tested without starting the machine.

WARNING
Beware of accidents when testing the lighting equipment with another person.

- ▶ Always maintain visual contact with the other person.
- ▶ Do not allow anyone into the danger area of the machine.

CAUTION
Beware of fires caused by the heat of the working floodlights.

- ▶ Observe the minimum interval of 1 m to persons and material.

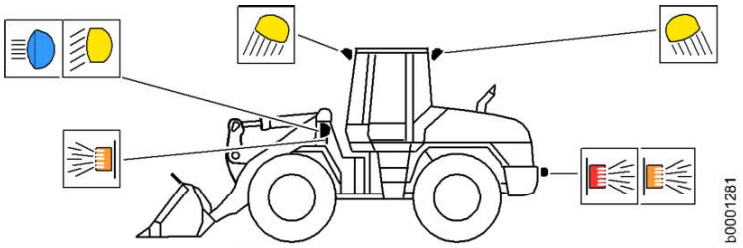

Fig. 245: Checking the lights

- ▶ Turn on all the lights. (For more information see: 3.2.13 Lighting, page 82)
- ▶ Check all the lights work properly.

When checking the brake lights:
- ▶ Press the inch/brake pedal.

If lights have to be adjusted or defective bulbs replaced:
- ▶ Contact Liebherr customer service.

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Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The service access is open.

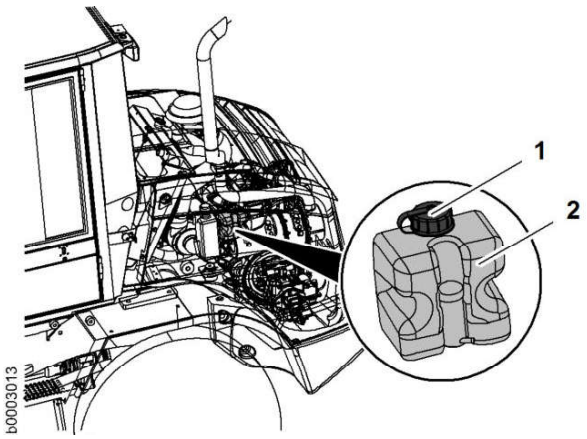

Fig. 258: Checking and topping up the windscreen washer reservoir

1 Cap **2** Reservoir

The filling quantity is approximately 3.5 l.

▶ Open the cap **1** on the reservoir **2**.

▶ Top up with standard windscreen washer fluid as necessary.

NOTICE
Ice can damage the windscreen washer system.
Icing up can damage the windscreen washer system and cause it to fail.

▶ You must protect the windscreen washer system using antifreeze.

▶ Use commercially available windscreen antifreeze.

▶ Top up with an appropriate quantity of antifreeze before the winter starts.

5.16.5 Lubricating the cab door hinges

Make sure that the machine is in maintenance position 1.

▶ Lubricate the door hinges with a grease gun.

5.16.6 Checking the seals on the driver's cab

Make sure that the machine is in maintenance position 1.

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