en **Operator's manual**

Wheel loader

L 508-1580

From serial number 34975

Document ID

ORIGINAL OPERATOR'S MANUAL

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Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 508
Type no.: 1580
From Serial no.: 34975

Conformity: CE

Contact

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

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Description	Unit	Value
Angle of articulation to each side		40°
Articulated joint angle of articulation to each side		10°

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, directly controlled

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	76.8
Maximum operating pressure	bar	230

1.2.10 Working attachment

Kinematic versions:
- Z kinematics with optimised parallel guidance and standard hydraulic quick-change device

Bearing points:
- Machine-turned thick-walled bushings with lubricant grooves

Working cycle time at rated load with Z kinematics:

Description	Unit	Value
Lifting	s	6.5
Tilting out	s	1.5
Lowering	s	4.0

1.2.11 Driver's cab

Design:
- 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
- On elastic bearing on rear section, soundproof ROPS/FOPS cab
- Cab door with fixed window pane, 180° opening angle
- Right hinged window with vent opener

Driver’s seat

Movable, shock-absorbing driver’s seat, adjustable to the driver’s weight

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2 Safety warnings, signs

Working on the machine poses safety risks to the operator, driver or maintenance personnel. You can prevent risks and accidents by regularly reading and observing the various safety instructions.

This is especially important for personnel who only occasionally work on the machine, for example, carrying out rigging or maintenance work.

The safety instructions listed below, if conscientiously followed, will ensure your own safety and that of others, and will prevent the machine from being damaged.

Whenever tasks which could cause danger to personnel or damage to the machine are described, the necessary safety precautions are explained in this manual.

2.1 How the warnings are marked

	This is the warning symbol. It warns you of potential injuries. To prevent injury or death, carry out all the measures identified by this warning symbol.

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The warning symbol always appears together with the signal words:
DANGER, WARNING, CAUTION

	**DANGER**	indicates a hazardous situation that will immediately lead to serious or fatal injury if it is not avoided.
	**WARNING**	indicates a hazardous situation that may lead to serious or fatal injury if it is not avoided.
	**CAUTION**	indicates a hazardous situation that may lead to minor or moderate injury if it is not avoided.
	ATTENTION	indicates a hazardous situation that may lead to damage if it is not avoided.

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2.1.1 Further markings

	**Note**	indicates useful tips and information.

Tab. 8

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Fig. 36: Fire extinguisher decal

Indicates that there is a fire extinguisher in the cab.

Lubrication chart decal

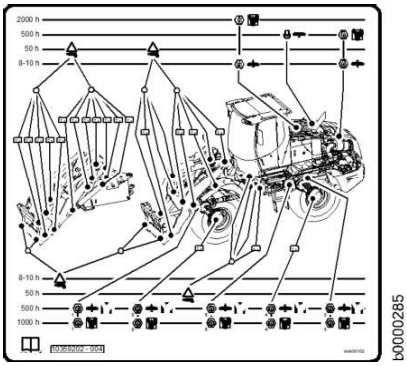

Fig. 37: Lubrication chart decal

Indicates the maintenance points and intervals for lubricants and consumables used by the machine.

Emergency exit decal

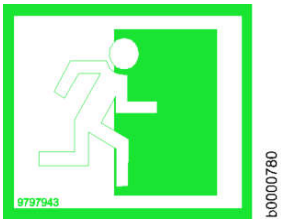

Fig. 38: Emergency exit decal

Indicates the emergency exit on the machine.

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20. Only carry out welding, burning and grinding work when it is expressly allowed, as otherwise you may cause fires or explosions.
21. Do not try to lift heavy parts. Only use suitable equipment with sufficient load capacity.

    Procedure:
    - When replacing individual parts and larger assemblies, carefully fasten and secure them to the lifting gear so that no danger can arise.
    - Only use suitable lifting gear in perfect order, and slinging equipment with sufficient load capacity.

    Keep out from under suspended loads.
22. Do not use ropes which are damaged or of insufficient load bearing capacity. Wear protective gloves when handling wire ropes.
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 him.
24. When carrying out fitting work above head height, use the safety climbing aids and working platforms provided or equivalent. Do not use parts of the machine for climbing. Wear a safety harness when working at height. Keep all handles, steps, rails, gangways, platforms and ladders free from dirt, snow and ice.
25. When working on the attachment (for example replacing teeth), make sure it is properly supported. Avoid direct metal-to-metal contact.
26. Never lie under the machine when it is raised using the working attachment, unless the undercarriage is securely supported using wooden beams.
27. Always support the machine on blocks, so that it cannot become unbalanced by any shift in weight. Avoid metal-to-metal contact.
28. Only trained specialist staff may perform work on the chassis, brake and steering systems.
29. If you have to repair the machine on a slope, secure the wheels with wedges. Move the working attachment to the maintenance position and engage the articulation lock.
30. Only personnel with the requisite skills and experience may work on hydraulic equipment.
31. Wear protective gloves when looking for leaks. Under pressure, a thin jet of liquid can pierce the skin.
32. Never release hydraulic lines or bolts before setting down the working attachment and shutting down the engine.
    Before starting any work on the hydraulic circuit, you must also press the working hydraulics lockout button and actuate all pilot control units (joystick and pedals) in both directions in order to reduce the control pressure and accumulated pressure in the operating circuits. You must then reduce the internal tank pressure.
33. Regularly check all hydraulic oil lines, hoses and bolted connections for leaks and visible damage. Repair all damage immediately. Oil escaping under pressure can cause injury and fires.
34. Before beginning repair work, depressurise the system sections and pressurised lines (hydraulics, compressed air) which are to be opened, as instructed in the assembly descriptions.
35. Lay and fit hydraulic and compressed air lines in the proper manner. Do not switch the connections. Fittings, as well as the length and quality of the hose lines, must match the manufacturer's requirements.
    Only use Liebherr spare parts.
36. Replace hydraulic hose lines at appropriate intervals, even if there are no apparent defects which may impair safety.
37. Work on the machine's electrical equipment may only be carried out by a qualified electrician or by instructed persons under the direction and supervision of a qualified electrician, in accordance with the recognised electrical engineering rules.

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Engaging the articulation lock

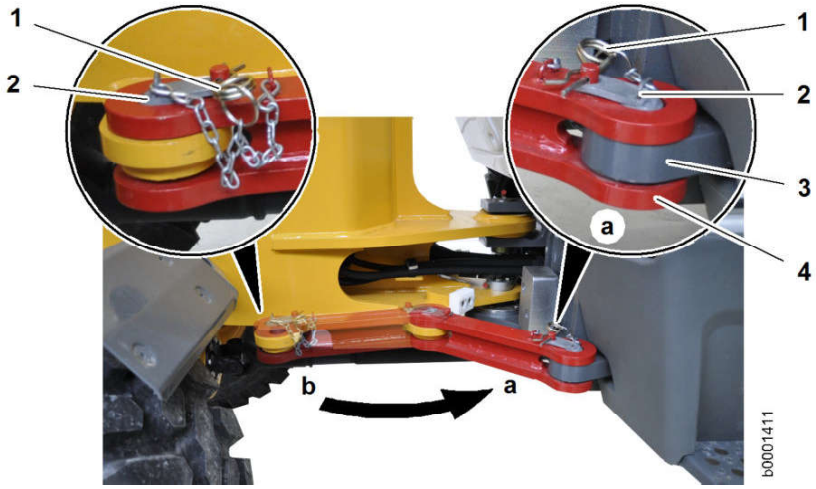

Fig. 50: Engaging the articulation lock

1	Spring clip	**4**	Locking bar
2	Pin	**a**	Articulation lock engaged
3	Bracket	**b**	Articulation lock released

- ▶ Remove the split pin **1**.
- ▶ Remove the pin **2**.
- ▶ Place the safety bar **4** in the holder **3**.
- ▶ Insert the pin **2** and secure it using the split pin **1**.

If the pin **2** cannot be inserted:

- ▶ Start the machine and use careful steering movement to place the safety bar **4** in the correct position.
- ▶ Turn off the engine.
- ▶ Insert the pin **2** and secure it using the split pin **1**.

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Adjusting the driver's seat horizontally

Standard seat / comfort seat

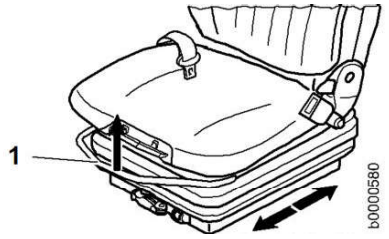

Fig. 68: Adjusting the driver's seat horizontally

1 Lever for *adjusting the driver's seat horizontally*

- ▶ Pull the lever **1** in the direction of the arrow.
- ▶ Adjust the driver's seat horizontally.
- ▶ Let go of the lever **1**.

Activating and deactivating the horizontal suspension on the driver's seat

Comfort seat

Under certain conditions, you can increase comfort by activating the horizontal suspension.

Advantage: The driver's seat can better absorb shocks in the direction of travel.

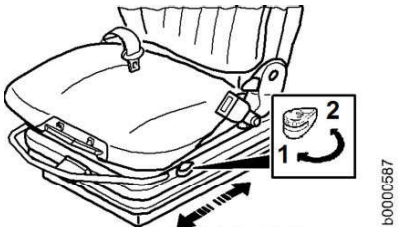

Fig. 69: Activating and deactivating the horizontal suspension on the driver's seat

1 Horizontal suspension OFF **2** Horizontal suspension ON

Seat heating

Comfort seat

This equipment is optional.

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3.2.15 Display

The display shows status icons and warning symbols for the machine.

Each symbol field is assigned a colour.

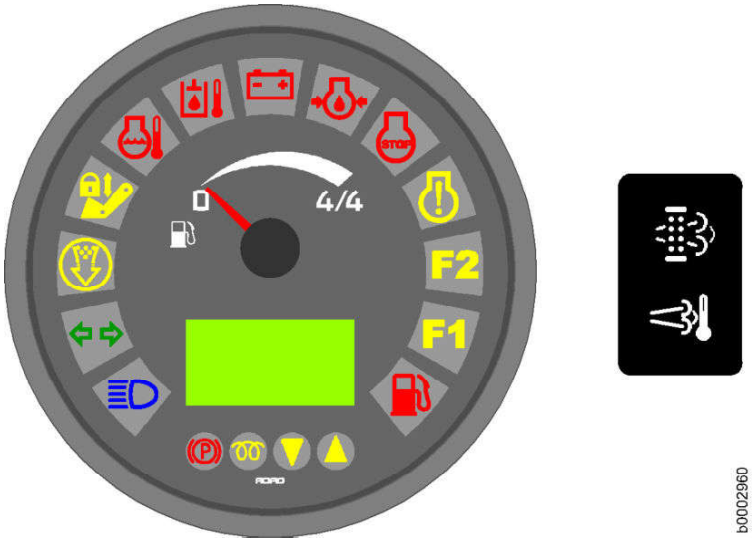

Fig. 83: Display

Machine status icons	Designation
	High beam
	Direction indicator
	Air filter contamination - The symbol field is also accompanied by an intermittent warning tone.
	Working hydraulics lockout
	Fixed gear 1 - Indicates that fixed gear 1 has been selected.
	Fixed gear 2 - Indicates that fixed gear 2 has been selected.
	Forward travel direction
	Reverse travel direction

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3.2.20 Interior and exterior mirrors

The driver's cab is equipped with one interior and two exterior mirrors.

Adjusting the mirrors

First make sure that the machine is in its operating position.

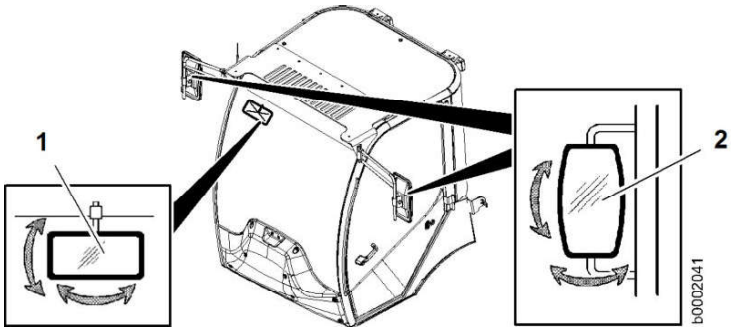

Fig. 94: Adjusting the mirror

1 Interior mirror **2** Exterior mirror

Note
Adjust the mirrors.

- ▶ Mirrors and other visual aids (such as the reversing camera) must always be adjusted to ensure the best possible all round vision. (For more information see: 3.2.20 Interior and exterior mirrors, page 91)

- ▶ All mirrors can be adjusted individually.

3.2.21 Sun visor

The driver's cab is equipped with a sun visor.

Adjusting the sun visor

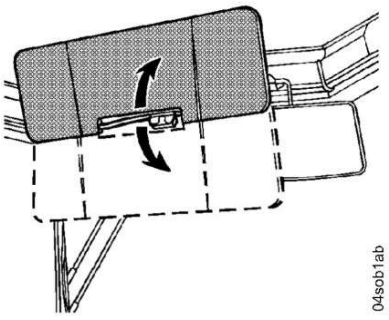

Fig. 95: Adjusting the sun visor

- ▶ Adjust the sun visor according to your individual requirements by pulling it up or down.

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When the engine starts, the following symbol fields should go out:
– Battery charge
– Engine oil pressure

When the symbol fields have gone out:
▶ Let the engine warm up at medium speed before you run it at full load.

3.3.3 Driving

Preparations for driving

Make sure that the following requirements are fulfilled:
❑ The machine is in the operating position. (For more information see: Putting the machine in the operating position, page 98)
❑ The mirrors and other visual aids (such as the reversing camera) are adjusted for the best possible all-round view. (For more information see: 2.4.20 See and be seen, page 56)
❑ All lighting equipment has been checked and properly adjusted.
❑ The engine has started.

Putting the working attachment into position

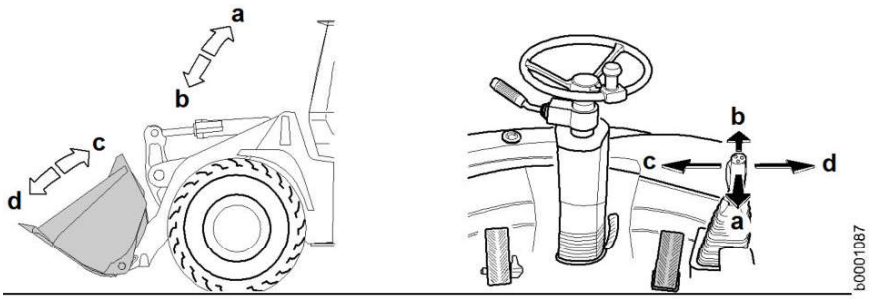

Fig. 108: Bucket position

▶ Raise or lower the lift arms as required.

▶ Move the bucket into position.

Selecting fixed gears

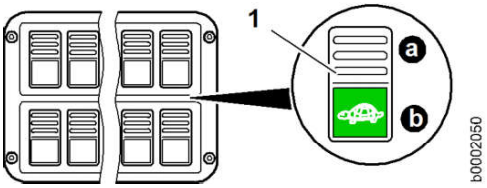

Fig. 109: Selecting fixed gears

1 *Fixed gear* switch
a Fixed gear **2**
b Fixed gear **1**

▶ Shift to the appropriate gear for the type of work.
▷ The fixed gear is shown on the display.

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Lowering the lift arms

There are two ways to lower the lift arms:
– Normal lowering function
– Quick drop function

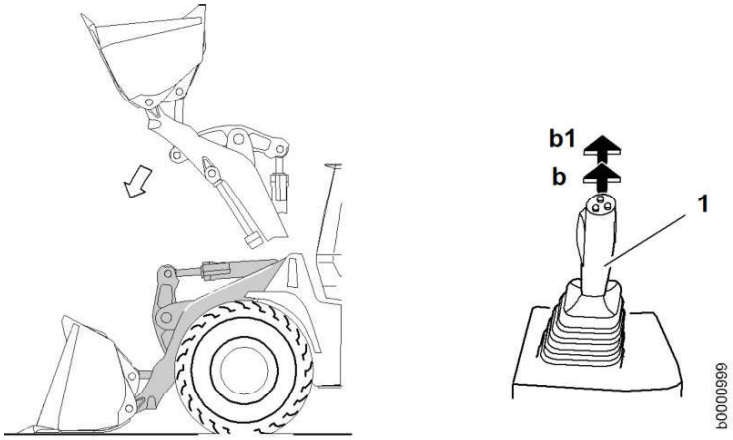

Fig. 124: Lowering the lift arms

1 Control lever

Normal lowering function:

▶ Move the control lever in direction **b** but only to the action point.
▷ The lift arms are lowered.

Quick drop function:

▶ Move the control lever in direction **b1** beyond the action point as far as it will go.
▷ The lift arms are quickly lowered.

Note
If the engine fails, lower the lift arms and reduce the hydraulic pressure.

▶ (For more information see: 3.7.1 Lowering the lift arms if the engine fails, page 138)

Tilting the bucket in and out

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

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

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Driving on slopes

Observe the safety instructions when driving on slopes. (For more information see: 2.4.7 Safety instructions for driving on slopes, page 48)

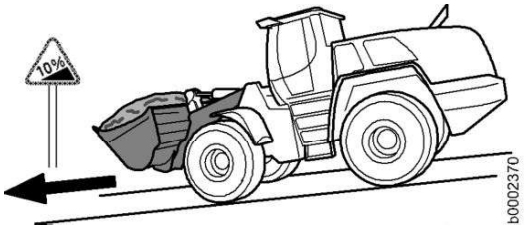

Fig. 138: Driving on slopes

WARNING
There is a risk of the machine tipping over.
The machine can tip over more easily when driving on slopes.

- ▶ Always keep the loaded working attachment low during transport.
- ▶ Do not suddenly change direction or brake abruptly.

- ▶ Ease off the accelerator pedal before driving onto the slope.
- ▶ Drive downhill carefully.

If necessary:
- ▶ Use the service brake.

If driving on a long, steep downhill slope:
- ▶ First switch to travel range **1** or fixed gear **1**.

Emptying the working attachment

Fig. 139: Emptying the working attachment

- ▶ Tilt out the working attachment.

NOTICE
There is a risk of damage to the machine.
Unnecessary jolting when tipping out and in against the working attachment arm stops can increase wear on the bolts and bearing bushings on the kinematics.

- ▶ Avoid unnecessary jolting.

If material adheres to the working attachment:
- ▶ Quickly tilt the working attachment in and out, briefly jolting against the working attachment arm stops.

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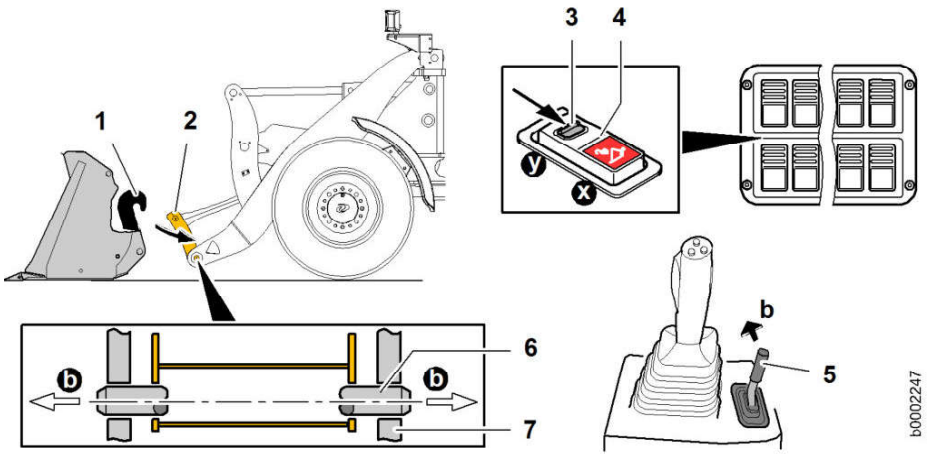

Fig. 155: Locking the working attachment

1 Working attachment holder
2 Quick-change device
3 Lockout
4 *Quick-change device* switch
5 Additional control lever
6 Locking pin
7 Working attachment

▶ Carefully move the quick-change device **2** into the working attachment holder **1**.

▶ Slightly raise and tilt in the working attachment.
▷ The working attachment latches into the quick-change device.

▶ Release the lockout **3** in the direction of the arrow while pressing the switch **4** in position **x**.
▷ A warning tone sounds.

▶ Push the additional control lever **5** in direction **b**.
▷ The locking pins **6** of the quick-change device **2** are extended.

When the pins are completely extended:

▶ Press the switch **4** in position **y**.
▷ The working attachment is locked.
▷ The warning tone stops.

Check that the working attachment is locked

The fact that you can change the attachment from the cab does not excuse you of the duty to check it afterwards. Every time you change the attachment, make a *visual inspection* and a *mechanical check* to make sure that the working attachment is correctly locked.

WARNING
Beware of the working attachment dropping.

▶ Do not carry out any working movements of the attachment before checking whether it is locked.

Visual inspection

Towing the machine

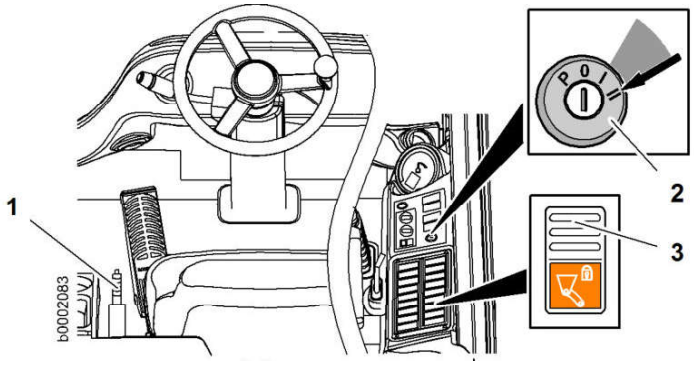

Fig. 169: Towing the machine

1 Parking brake
2 Starter switch
3 Button *working hydraulics lockout*

▶ Start the engine.

▶ Press the button **3** to lock the working hydraulics.

▶ Release the parking brake **1**.

▶ Carefully tow the machine out of the danger area.

▶ Tow with maximum 2 km/h.

When towing has been completed:

▶ Turn off the engine.

▶ Engage the parking brake.

▶ Take the travel drive out of free circulation mode. (see: fig. 168, page 140)
▷ The travel functions of the machine are operational again.

Towing with the engine not running

If the machine has suffered a serious breakdown such as engine failure, the steering function will be impaired.

The following precautions must be taken before towing the machine:

1. Shift the travel drive to free circulation. [16)]
2. Prepare a towing bar of sufficient strength.

Make sure that the parking brake is engaged.

Switching the travel drive to free circulation

CAUTION
There is a risk of accidents due to impaired braking.
The machine can only be slowed down further by using the brake pedal.

▶ Always drive carefully when towing.

[16)] When the travel drive is not in free circulation mode, the machine may not be towed further than 200m.

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Travel hydraulics / driving mode		
Malfunction/fault	**Cause**	**Remedy**
The machine will not move even though the engine is running and the travel direction can be preselected	Replenishing pressure too low	Check the replenishing pressure, carry out the test according to the testing and adjustment checklist
	Control pressure too low or not available	Check the control pressure, check the control valve, check the travel direction solenoid, carry out the test according to the testing and adjustment checklist
	High pressure too low	Check the towing bypass valve, carry out the test according to the testing and adjustment checklist
The hydraulic oil gets too hot	The hydraulic oil cooler is dirty	Clean hydraulic oil cooler
	V-belt of the fan blade is torn or slides	Check and adjust V-belt
	Hydraulic oil temperature switch B8 is defective or shorted to earth	Check the hydraulic oil temperature switch B8, check the wiring

Tab. 25: Troubleshooting the travel hydraulics / driving mode

Working hydraulics / working attachment		
Malfunction/fault	**Cause**	**Remedy**
The working attachment does not move when the control lever is operated	Lack of hydraulic oil	Check the oil level in the hydraulic fluid reservoir, top up if necessary
	Working hydraulics lockout is activated	Deactivating the working hydraulics lockout
	Fuse blown	Check fuse F28, replace if necessary

Tab. 26: Troubleshooting the working hydraulics / working attachment

Steering system		
Malfunction/fault	**Cause**	**Remedy**
No steering function	Lack of hydraulic oil	Check the oil level in the hydraulic fluid reservoir, top up if necessary
	Articulation lock is engaged	Move the locking bar to the top position

Tab. 27: Troubleshooting the steering system

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5.2 Filling quantities and lubrication chart

Specifications in the quantity column:
- The values stated for the filling quantities in the table are only guidelines.
- The dipstick and level markings are always mandatory.
- Each time the oil is replaced or topped up, check the level in the unit in question.

5.2.1 Recommended lubricants

Designation	Recommended lubricant	Symbol	Quantity
Diesel engine (with filter change)	Liebherr Motoroil 10W-40 low ash Liebherr Motoroil 5W-30 low ash	 b0000637	10.2 l
Hydraulic system	Liebherr Hydraulic Basic 68 Liebherr Hydraulic Basic 100 Liebherr Hydraulic HVI Liebherr Hydraulic Plus	 b0000636	
System capacity			90 l
Tank capacity			55 l
Brake system total capacity	Liebherr Hydraulic HVI, ISO VG 46 (32-68)	 bsym0027	0.8 l
Transmission	Liebherr Gear Basic 90LS	 b0000649	1.0 l
Front axle	Liebherr Gear Basic 90LS	 b0000649	6.0 l
Rear axle	Liebherr Gear Basic 90LS	 b0000649	6.0 l

Tab. 33: Recommended lubricants

5.2.2 Recommended operating fluids

Designation	Recommended operating fluid	Symbol	Quantity
Fuel tank	Conventional diesel fuel with a sulphur content of less than or equal to 0.0015 %	 bsym0057	50 l
Fuel reserve, approx.			10 l
Engine cooling system, total capacity	Liebherr Antifreeze Mix Liebherr Antifreeze Concentrate	 06sy04ab	12 l

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Product designation	Manufacturer
DCA 4 Diesel Coolant Additives	Fleetguard / Cummins Filtration
Caltex XLI / Delo XLI	Caltex (Asia)
Texaco XLI / Havoline XLI	Chevron (North and South America)
Havoline XLI	Arteco (Asia and Europe)

Tab. 41: Corrosion inhibitors without antifreeze

5.3.6 Hydraulic oil

The following oils may be used as hydraulic oils according to the following specifications.

Maximum water content of the hydraulic fluid: < 0.1 %

Liebherr hydraulic oil

Liebherr recommends the following hydraulic oils for the machine, according to the temperature range:

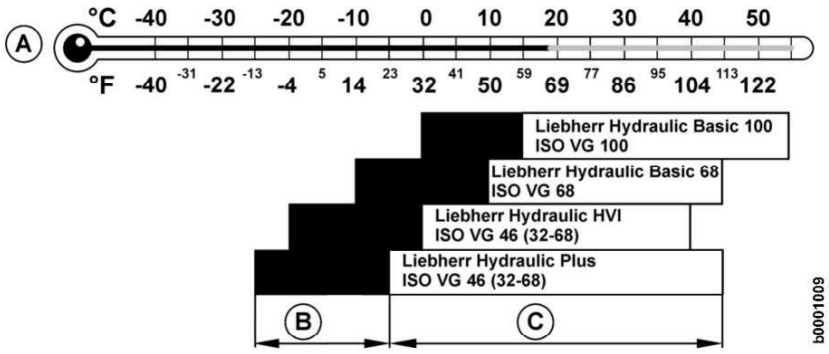

Fig. 186: Liebherr hydraulic oil, selection of viscosity class according to temperature

A Ambient temperature
B Cold start with warming-up procedure
C Operating range

Liebherr Hydraulic Plus is suitable as a bio oil as well as for long-term use.

If Liebherr oils cannot be purchased locally, you must use engine oils as described in the section on using “engine oil as hydraulic oil” (after consultation with customer service).

Using engine oil as hydraulic oil

When using non-Liebherr engine oils, we recommend that the customer first ask the oil manufacturer whether the product meets the following specifications.

Engine oils to be used as hydraulic oil must be selected according to the following specifications:

Single-grade oils (1)	API - CD / ACEA - E1
	(MB 226.0 and 227.0)

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▶ Open the lock with the ignition key.

▶ Fully open the engine compartment hood **2** with the handle **1**.
▷ The engine compartment hood is held in this position by two gas-filled springs **3**.

CAUTION
Beware of injury caused by the hood falling shut.

▶ Only open the hood when the gas-filled spring functions properly.

▶ Check the function.

Troubleshooting
If the gas-filled spring does not hold the hood open.

▶ Contact Liebherr customer service.

5.5.3 Turning off the battery main switch

The battery main switch is located on the left side of the engine compartment.

For certain maintenance jobs, the battery main switch must first be turned off.

Find out from the descriptions of the relevant maintenance tasks whether the battery main switch must be turned on or off.

Turn on the battery main switch after completing these maintenance tasks.

NOTICE
Beware of damage to the electrical system.

▶ Never turn off the battery main switch when the engine is running.

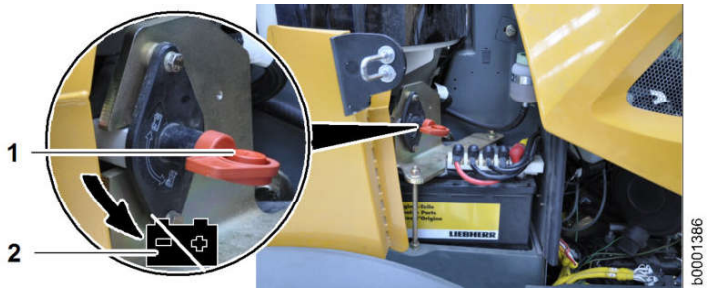

Fig. 198: Turning off the battery main switch

1 Battery main switch **2** OFF position

▶ Turn the battery main switch **1** to the OFF position **2**.

▶ Remove the key.

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CAUTION
Risk of injury from hot, pressurised oil!

▶ Release excess pressure by slowly unscrewing the filling plug.

▶ Slowly open the filling plug **1**.

▶ Insert the sampling hose into the differential up to 3 cm below the oil level.

▶ Fill the sample container using the hand pump.

▶ Close the filling plug **1** once more (torque: 50 Nm).

Coolant circulation

The coolant sample is taken from the cooler.

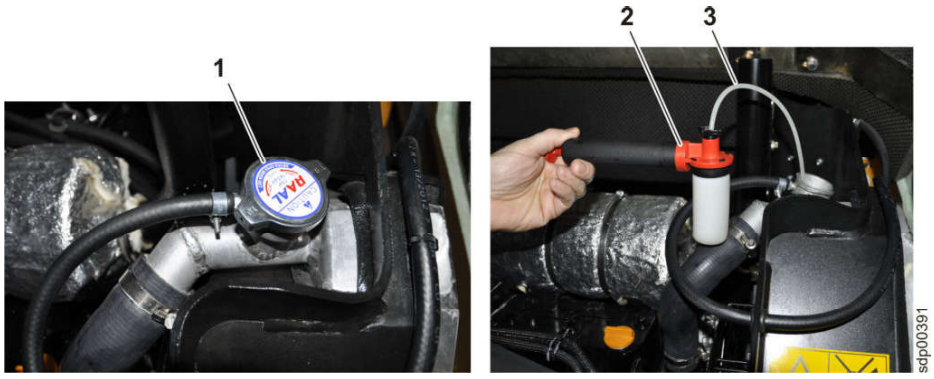

Fig. 203: Sampling point for coolant

1 Cap
2 Hand pump
3 Sampling hose

▶ Start the engine.

▶ Turn the heating system to the maximum temperature and wait for three minutes.
▷ The coolant is circulated.

▶ Put the machine in maintenance position 1.

▶ Turn off the engine.

CAUTION
Beware of injury due to coolant escaping under pressure

▶ The coolant temperature must not exceed 45 °C.

▶ Wear protective clothing and safety glasses.

▶ Carefully open the cap.

▶ Carefully open the cap **1**.

▶ Insert the sampling hose **3** and take a coolant sample.

▶ Close the cap **1**.

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5.8.2 Checking the coolant antifreeze and corrosion inhibitor concentration

Checking the antifreeze concentration

All year round, the coolant must contain at least 50% by volume of concentrated antifreeze, but not more than 60% by volume.

This protects against freezing down to around -37 °C.

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The service access is open.
- ❑ You have an optical density tester or antifreeze tester ready.

CAUTION
Beware of scalding due to coolant escaping under pressure
Do not open the cap on the filler neck until the engine has cooled down.

▶ Let the engine cool down.

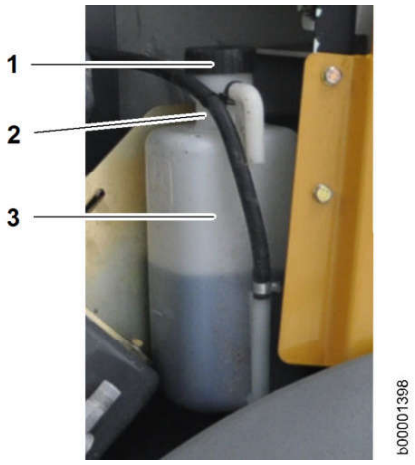

Fig. 214: Checking the antifreeze concentration

1 Cap
2 Filler neck
3 Coolant equalising reservoir

▶ Carefully open the cap **1** on the filler neck **2**.

▶ Take a sample of the coolant and check the antifreeze concentration using the test tool.

If the antifreeze concentration is too low:
▶ Refill with pure antifreeze until the required value is attained.
▷ (For more information see: Correcting the antifreeze concentration, page 202)

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▶ Start the machine.

▶ Select the forward travel direction and drive it forward at approximately 5 km/h.

▶ While the vehicle is moving, pull the *parking brake* lever **1** upwards.
▷ The symbol field **2** for the parking brake lights up.
▷ The machine must come to an abrupt halt.

Troubleshooting
If the braking effect is too slight or entirely absent:

▶ Contact Liebherr customer service.

5.11.3 Checking the oil level in the brake system equalising reservoir

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

NOTICE
To prevent damage to the brake system, use only suitable hydraulic oil (mineral oil).

▶ Make sure that only suitable oils are used for topping up (For more information see: 5.3.8 Brake oil, page 175)

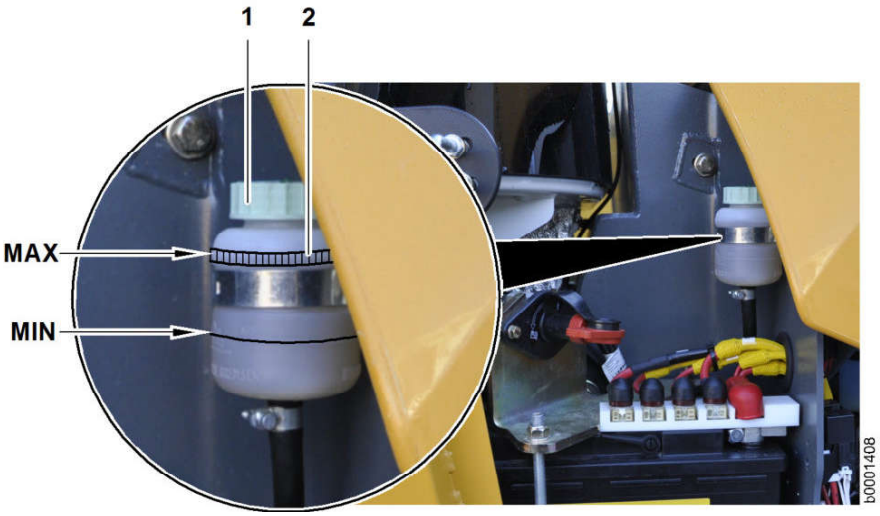

Fig. 227: Checking the oil level in the brake system equalising reservoir

1 Cover **2** Equalising reservoir

▶ Check the oil level in the equalising reservoir **2**.
▷ The oil level must be between the MIN and MAX markings.

If the oil level is too low:
▶ Screw the cap **1** back onto the equalising reservoir **2**.

▶ Fill up the oil to the MAX marking. (For more information see: 5.3.8 Brake oil, page 175)

▶ Clean the cover **1** and screw it back onto the equalising reservoir **2** tightly.

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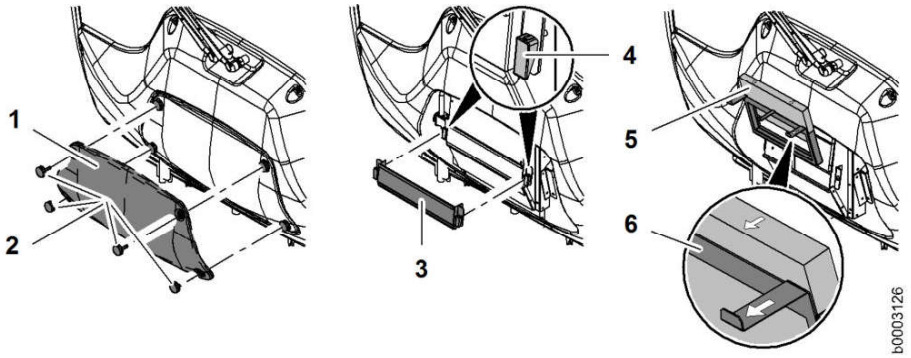

Fig. 238: Changing the fresh air filter

1	Cover	**4**	Fixing clips
2	Bolts	**5**	Fresh air filter
3	Retaining plate	**6**	Filter holder

- ▶ Unscrew the bolts **2** and remove the cover **1**.
- ▶ Lift up the fixing clips **4** to release them and remove the retaining plate **3**.
- ▶ Pull out the filter holder **6**.
- ▶ Take out the fresh air filter **5** and dispose of it.
- ▶ Carefully clean out any dust in the air filter duct. (The area behind the filter must be completely clean.)
- ▶ Put the new fresh air filter **5** into the filter holder **6** making sure the direction of the arrow is correct.
- ▶ Push in the filter holder **6**.
- ▶ Fit the retaining plate **3** and close the fixing clips **4**.
- ▶ Put on the cover **1** and screw in the bolts **2**.

5.16.3 Checking the condition and function of the safety belt

Make sure that the machine is in maintenance position 1.

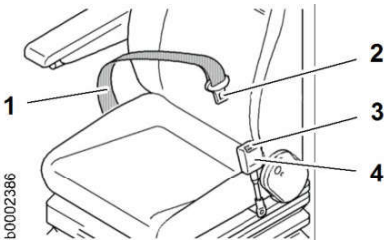

Fig. 239: Checking the condition and function of the safety belt

1	Strap	**3**	Unlock button
2	Lug	**4**	Belt lock

- ▶ Check the condition and function of the driver's safety belt.
- ▶ Replace damaged parts.

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