en **Operating manual**

Wheel loader

L 538-1268 (USA / CAN)

From serial number 31321

Document ID

ORIGINAL OPERATING MANUAL

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Product ID

Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 538 (USA / CAN)
Type no.: 1268
Serial no. from: 31321

Conformity: CE

Contact

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Description	Unit	Value
Track width	mm ft-in	1900 6‘ 3“
Automatic differential lockout	% %	45 45
Angle of articulation to each side	° °	10 10

1.2.7 Braking

The braking system complies with the roadworthiness certification regulations.

Service brake

Self-arrest of hydrostatic travel drive, acting on all four wheels, and additional pump accumulator brake system with wet disc brakes in the differential housing (two separate brake circuits).

Parking brake

Electrohydraulic spring accumulator disc brake on the front axle.

1.2.8 Steering

Type:

- Load sensing swash plate variable displacement pump with pressure cut-off and flow regulator.
- Central articulated joint with two dual-action steering cylinders with shock absorbers.

Emergency steering:

- Electrohydraulic emergency steering system

Description	Unit	Value
Angle of articulation to each side	° °	40 40

1.2.9 Working hydraulics

- Load sensing axial piston pump displacement pump with power controller and flow controller, pressure cut-off in control valve block.
- Hydraulic oil cooling with thermostatically controlled fan and oil cooler.
- Return filter in the hydraulic tank.
- Single-lever control, hydraulic servo system.

Lifting cycle:
- Lifting, neutral, lowering
- Float position using lockable control lever
- Optional automatic lift kick-out

Tilting cycle:
- Tilt out, neutral, tilt in

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– With ROPS/FOPS cab and driver

Note
The tyres and any additional attachments affect the operating weight and tipping load.

▶ Pay attention to the tyres and additional equipment.

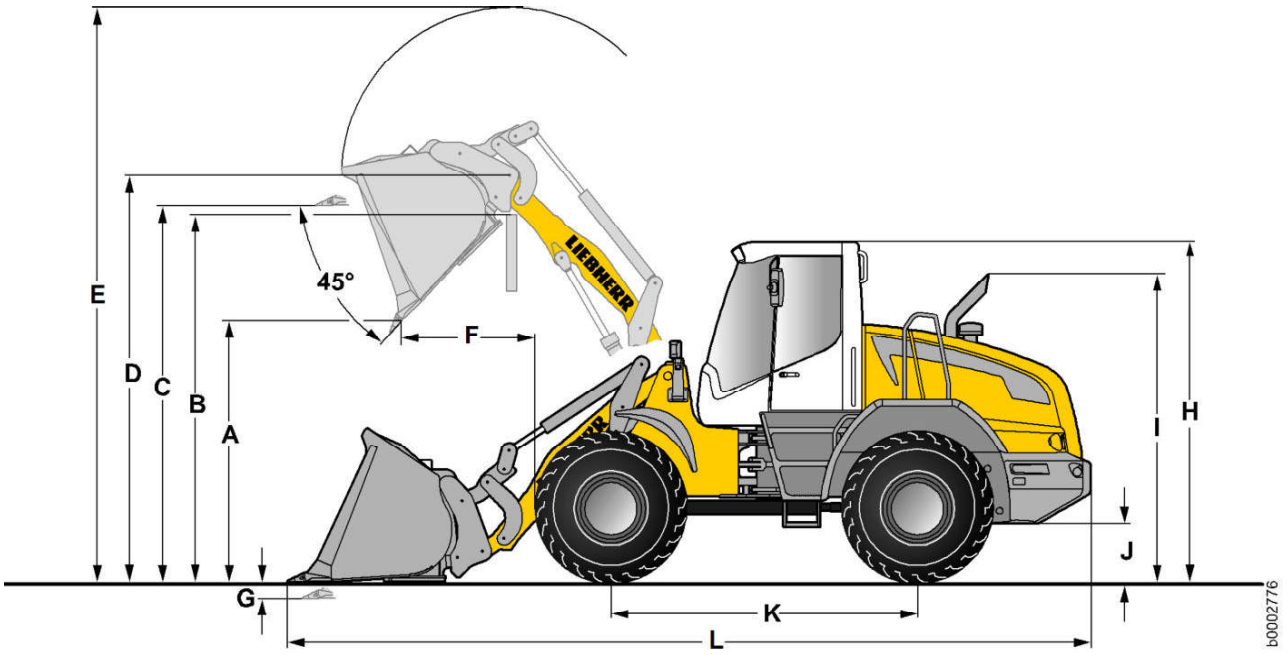

Fig. 5: Dimensions with parallel kinematics

	Designation	Unit	Rating	
	Hydraulic quick-change device		Yes	Yes
	Bucket type		A)	A)
	Cutting tool		B)	B)
	Lift arm length	mm in	2500 8‘ 2“	3000 9‘ 10“
	Bucket capacity as per ISO 7546 C)	m^3 yd^3	2.3 3.01	2.3 3.01
	Bucket width	mm in	2500 8‘ 2“	2500 8‘ 2“
	Specific material weight	t/m^3 lb/yd^3	1.8 3,000	1.8 3,000
A	Dump height at maximum lifting height	mm in	2750 9‘	3350 11‘
B	Dump height	mm in	3430 11‘ 3“	4040 13‘ 3“
C	Maximum bucket base height	mm in	3640 11‘ 11“	4260 14‘

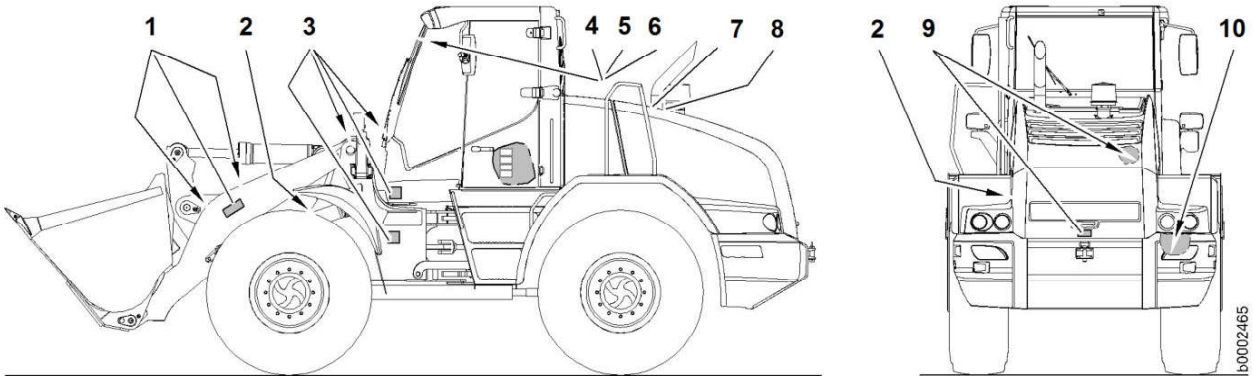

Fig. 14: Safety decals

1 *Working area* sign
2 *Oil pressure* decal
3 *Articulation area* decal
4 *Steering* sign
5 *Accident prevention* decal
6 *Safety belt* sign
7 *Danger of burns* decal
8 *Danger of scalding* decal
9 *Engine shutdown* decal
10 *Voltage* sign

Working area decal

Fig. 15: Working area decal

Warns of the risk of accidents, possibly resulting in severe or even fatal injuries.

Meaning: **Keep out of the danger area.**

Oil pressure decal

Fig. 16: Oil pressure decal

Warns of the risk of accidents, possibly resulting in severe or even fatal injuries.

Meaning: **There is a risk of accidents from pressurised hydraulic lines.**

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2.3.3 Type plate

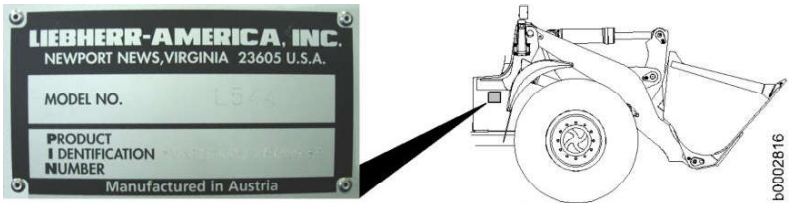

Fig. 44: Type plate

Information on the type plate:
- Model No.
- **P**roduct **I**ndentification **N**umber

2.4 Safety instructions

2.4.1 General safety instructions

1. Familiarise yourself with the **"operating manual"** before starting up the machine.
   Make sure that you are in possession of and have read and understood additional instructions applicable to any special equipment installed on your machine.
2. Only expressly authorised personnel may operate, service or repair the machine.
   Observe the legal minimum ages.
3. Only trained or instructed personnel may operate the machine. Clearly assign responsibility for operation, rigging, maintenance and repair work.
4. Clearly establish the driver's responsibilities (also with respect to traffic regulations) and authorise him to refuse to carry out unsafe instructions from third parties.
5. Personnel undergoing training, instruction or who are not yet fully qualified may only be allowed to work on the machine under constant supervision by an experienced person.
6. Now and again check that your personnel are working safely and are aware of possible dangers in observance of the **"operating manual"** .
7. Wear safe working clothes when working on the machine.
   Do not wear rings, wristwatches, ties, scarves, unbuttoned jackets, loose clothing or similar garments, as they can become caught in the machinery and cause injury.
   Certain tasks require safety goggles, safety boots, hard hats, gloves, reflective vests, ear protection etc.
8. Ask the site manager about any special safety regulations in force on the site.
9. Do not hold onto the steering column, the control panel or the control levers when getting on or off the machine.
   You might inadvertently trigger movements which could lead to accidents.
10. Never jump down from the machine. Use the steps, ladders and platforms provided for getting on and off.
11. Keep all handles, steps, rails, gangways, platforms and ladders free from oil, grease, mud snow and ice. This reduces the risk of slipping, tripping up or falling.

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2.4.16 Safe maintenance of hydraulic hoses and hose lines

1. Never attempt to repair hydraulic lines and hydraulic hoses.
2. All hoses, hose lines and threaded couplings must be checked regularly, at the very least once a year, for leaks and visible signs of damage.
   Replace damaged parts immediately. Oil escaping under pressure can cause injury and fires.
3. Even when properly stored and subjected to normal load, hoses and hose lines are subject to natural ageing. This limits their service life.
4. Improper storage, mechanical damage and excess strain are the main causes of damage.
5. Hose lines should not be used for longer than six years, including storage of no longer than two years (note the date of manufacture on the hoses).
6. Using the hoses close to their maximum strain can shorten their service life (e.g. high temperatures, frequent movement, extremely high impulse frequencies and multiple shift operation).
7. Hoses and hose lines must be replaced when inspections reveal the following.

   Criteria:
   - Damage to the outer layer penetrating to the inner layer (e.g. abrasion, cuts and cracks)
   - Embrittlement of the outer layer (cracks in the hose material)
   - Deformation of the natural shape of the hose or the hose line, both when pressurised and depressurised, or at bends, e.g. layer separation, blistering
   - Leaks
   - Failure to observe installation requirements
   - Damage or deformation of the hose fittings, which reduces the strength of the fittings or the connection between the fitting and the hose
   - Slippage of the hose out of the fitting
   - Corrosion of the fitting, impairing its function and strength
   - Exceeded storage time or service life
8. Only use genuine spare parts to replace hoses and hose lines.
9. Lay and fit hoses and hose lines in the proper manner. Do not switch the connections.

2.4.17 Roll-over protection structure (ROPS) and falling object protection structure (FOPS)

The machine is equipped with a cab that is designed to protect the driver in the event of rolling over (ROPS) and falling objects (FOPS).

Preventing accidents

Depending on the job and the way the machine is operated, hazards can arise even when the protective apparatus is intact. Avoid all unsafe working practices.

Note
Do not exceed the total machine weight

▶ When attaching tools and equipment, make sure that the total weight of the machine does not exceed the weight for which the roll-over protection system is certified. The roll-over protection structure cannot guarantee safety if the maximum permitted total machine weight (see type plate) is exceeded.

The following modifications to the machine can lead to the maximum total weight being exceeded:

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To open the hinged window partially:
▶ Turn the lever **3** upwards and move it to position **b**.
▷ The hinged window is partially open.

To open the hinged window all the way:
▶ Turn the lever **3** upwards.
▷ The gas-filled spring automatically opens the hinged window.

To close the hinged window again:
▶ Turn the lever **3** to the initial position **a**.

Opening the left hinged window

This equipment is optional.

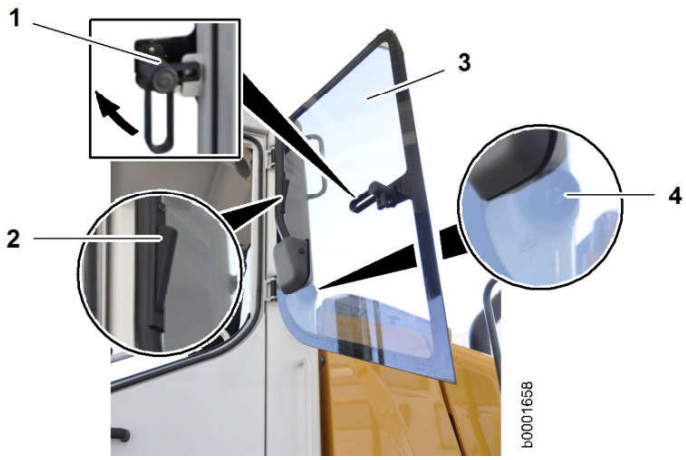

Fig. 53: Opening the left hinged window

1	*Window opener* lever	**3**	Hinged window
2	*Window retainer* lever	**4**	Window retainer

▶ Push up the lever **1**.

▶ Open the hinged window **3** and engage it in the window retainer **4**.

To close the hinged window again:
▶ Use the lever **2** to unlock the hinged window and push it all the way shut.

▶ Guide the lever **1** over the retainer and push lever down.
▷ Hinged window is closed.

3.2.5 Emergency exit

Fig. 54: Emergency exit

The right window (hinged window) is designed as an emergency exit and should be used as such in an emergency situation.

Premium seat

Fig. 73: Seat heating and seat climate control

0 Seat heating and seat climate control “OFF”
1 Seat heating “ON”
2 Seat climate control “ON”

Adjusting the head rest

This equipment is optional.

Standard seat / comfort seat / premium seat

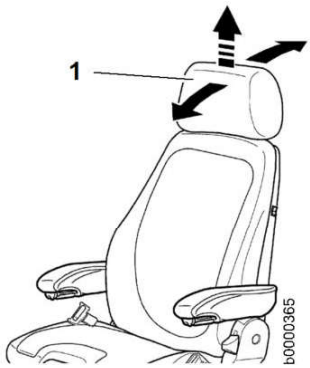

Fig. 74: Adjusting the head rest

1 Head rest

▶ Adjust the inclination and height of the head rest **1** by pulling or pushing it.

▶ To remove the head rest **1**, pull it sharply past the end limit.

Adjusting the left arm rest

This equipment is optional.

If needed, the arm rest can be swung back and the height individually adapted.

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Deleting programmed starting keys

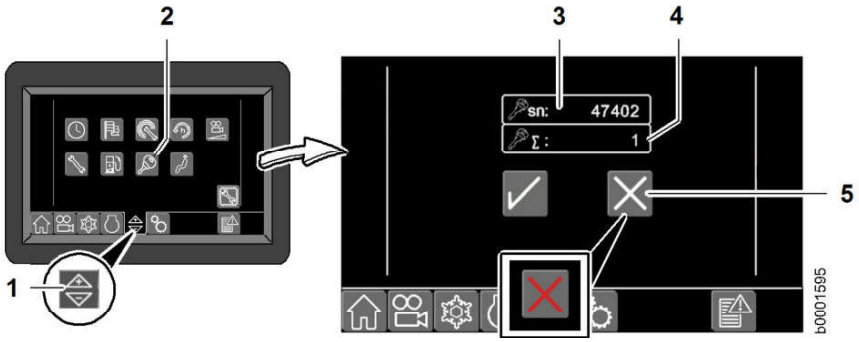

Fig. 85: Deleting programmed starting keys

1 *Settings* switching button
2 *Electronic drive interlock* button
3 *Master key serial number* display
4 Display *Number of already programmed keys (incl. master key)*
5 *Delete starting key* button

▶ Switch on the ignition using the starting key.

▶ Open the display screen with the selector button **1** and the button **2**.

▶ Press button **5**.
▷ Button **5** is red.
▷ All starting keys are deleted. The master key remains programmed.

Starting key serial number display

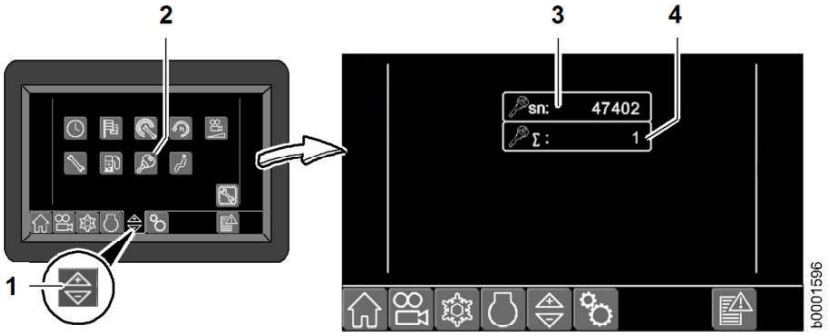

Fig. 86: Starting key serial number display

1 *Settings* switching button
2 *Electronic drive interlock* button
3 *Starting key serial number* display
4 Display *Number of already programmed keys (incl. master key)*

▶ Switch on the ignition using the starting key.

▶ Open the display screen with the selector button **1** and the button **2**.
▷ The serial number of the starting key and the number of programmed keys are displayed.

Troubleshooting

Simple description of problems and how to solve them:

15 *High exhaust temperature warning* symbol field
16 *Regenerate diesel particulate filter* symbol field
17 *Service notification* symbol field
32 *Engine oil pressure* symbol field
33 *Engine oil pressure* indicator

Machine status icons		
Symbol	**Field colour**	**Designation**
	Yellow	Neutral travel direction
	Yellow	Forward travel direction
	Yellow	Reverse travel direction
	Yellow	Working hydraulics lockout
	Yellow	Travel range A 1-3 - The machine automatically shifts to travel range **1**, **2** or **3**.
	Yellow	Travel range A 1-2 - The machine automatically shifts to travel range **1** or **2**.
	Yellow	Fixed gear 1 - Indicates that fixed gear 1 has been selected.
	Yellow	Service notification - Lights up when the machine is due for a service.
	Yellow	Preglow indicator lamp - Lights up when the ignition is ON and the temperature is below 5 °C (41 °F).
	Yellow	Air filter contamination
	Red	Parking brake - The travel direction cannot be selected when the parking brake is engaged.
	Red	Joystick steering (optional)
	Red	Fuel level - Lights up when the fuel tank is down to reserve level.

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Item	Designation
8	*Temperature up* button Can be set in manual heating and air conditioning mode from 0% to 100%. Can be set in automatic heating and air conditioning mode from 16 °C (61 °F) to 28 °C (82 °F). Shown on the display and by the LEDs on the control unit.
9	“Air distribution” indicator White bar – air distribution activated
10	*Head-level air distribution* button
11	*Mid-level air distribution* button
12	*Foot-level air distribution* button
13	*Blower speed up* button
14	Blower speed indicator
15	*Blower speed down* button

Tab. 25: Heater, air conditioning

Displaying units

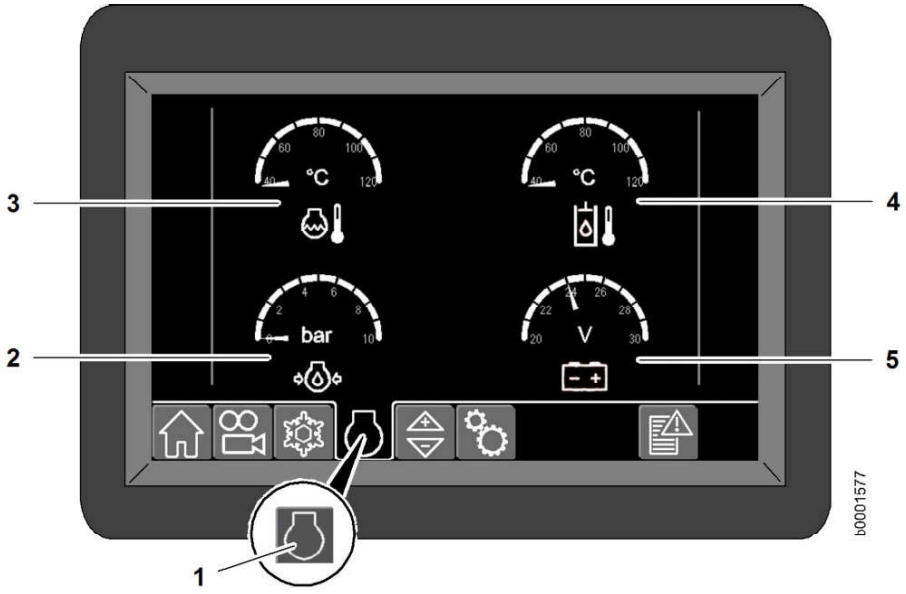

Fig. 104: Displaying units

Item	Designation
1	*Display units* selector button
2	Engine oil pressure indicator White symbol – normal mode Red symbol – engine oil pressure too low or too high

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Note
Detailed description of the central lubrication system

▶ (For more information see: 3.2.30 Liebherr automatic central lubrication system, page 155)

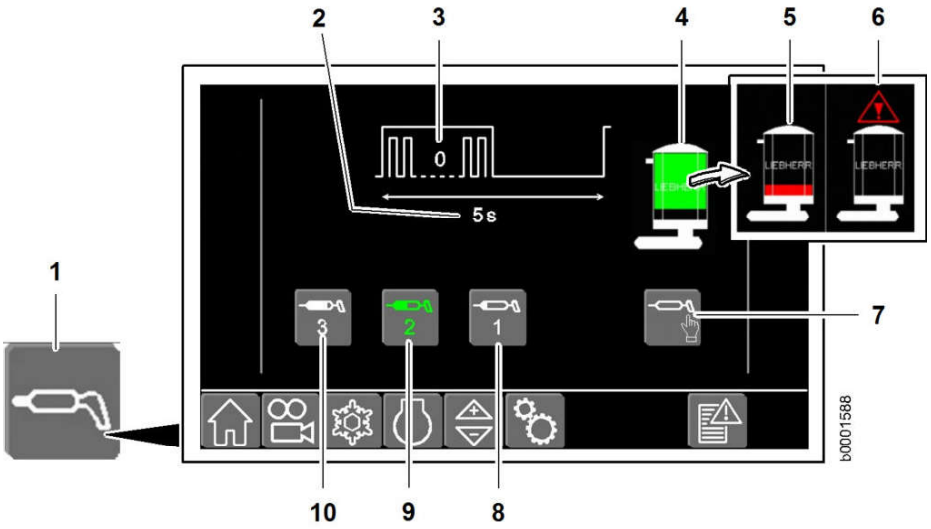

Fig. 119: Liebherr automatic central lubrication system

1	*Central lubrication system* selector button	**6**	*Filling level malfunction* indicator
2	Time until next lubrication (in seconds)	**7**	Non-scheduled lubrication
3	Remaining lubrication cycles	**8**	Central lubrication system mode 1 (light duty)
4	*Maximum filling level* indicator	**9**	Central lubrication system mode 2 (medium duty)
5	*Filling level low* indicator	**10**	Central lubrication system mode 3 (heavy duty)

▶ Press the selector button **1** to open the display screen.

▶ Use the buttons **8, 9** and **10** to set the lubrication intensity.
  ▷ Active settings are shown by a flashing green button.
  ▷ If the filling level is low **5**, the indicator flashes red.
  ▷ If a malfunction **6** occurs, a service code appears in the display.

▶ Use the button **7** to initiate an additional non-scheduled lubrication during the lubrication cycles.

Tachometer

This equipment is optional.

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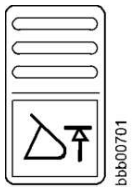
Lift kick-out switch

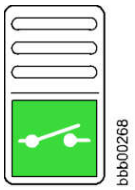


This equipment is optional.

Field colour *white*

Function ON:
- The *lift kick-out* symbol field lights up.
- The lift kick-out function is activated.

Comfort control or *button control* switch



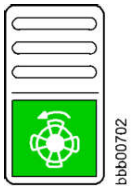
This equipment is optional.

Field colour *green*

Switches the comfort control or button control functions on or off.

Function ON:
- The *comfort control/button control* symbol field lights up.
- The comfort control/button control function is activated.

Reversible fan drive button



This equipment is optional.

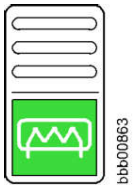
Field colour *green*

Switches the fan reversal function on or off.

Function ON:
- The *fan reversal* symbol field lights up.
- The fan reversal function is activated.

(For more information see: 3.2.32 Reversible fan drive, page 162)

Rear window heater and mirror heater (optional) switch

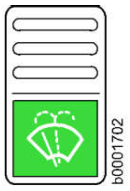


Field colour *green*

Switches the rear window heater and mirror heater (optional) on or off.

Function ON:
- *Rear window heater and mirror heater (optional)* symbol field lights up.
- The rear window heater and mirror heater (optional) are switched on.

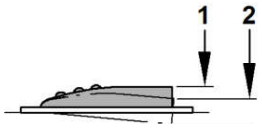
Rear window washer system switch



Field colour *green*

Switches the washer system for the rear window on and off.

Wiper function ON:
- Switch position **1**
- The rear window wiper is activated.



Washer function ON:
- Button function **2**
- Washer fluid is sprayed onto the rear window.
- The rear window wiper is activated.

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Comfort control

The comfort control is for activating a working attachment with its own hydraulic circuit (e.g. timber grabber).

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

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

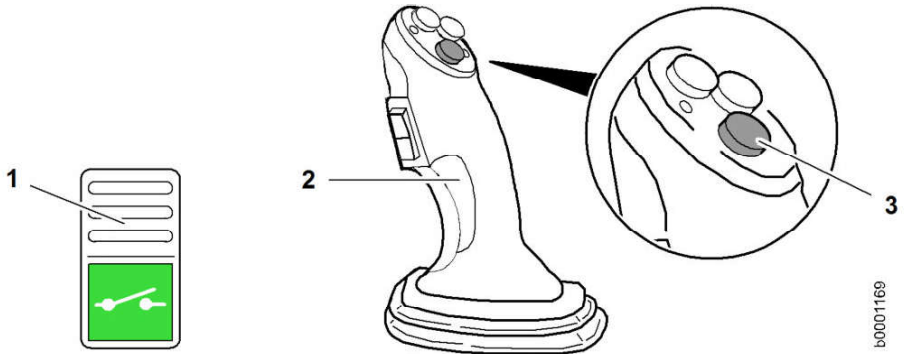

Fig. 175: Comfort control

1 *Comfort control* switch
2 Control lever
3 *Comfort control* button

- ▶ Press the switch **1**.
- ▶ Press the button **3** while using the control lever **2** to move the hydraulic working attachment (for example to open and close timber grabber).
  - ▷ The function for tilting the working attachment in and out with the control lever is deactivated.

To deactivate the additional hydraulic function:

- ▶ Release the button **3**.
  - ▷ The function for tilting the working attachment in and out with the control lever is re-activated.

Button control

The button control is for activating a working attachment with its own hydraulic circuit (e.g. timber grabber).

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

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

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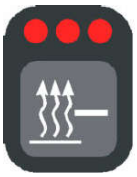

To decrease the temperature:
▶ Press the button at least once.
▷ The temperature is decreased.
▷ The LEDs light up according to the temperature level.

To speed up the cooling process:
▶ First ventilate the cab thoroughly.
▶ Select the lowest temperature level.
▶ Select the highest blower speed.
▶ If available, switch on the air conditioning as well.
▶ Close the cab doors and windows.

To speed up the warming process:
▶ Select the highest temperature level.
▶ Select the highest blower speed.

Air distribution in the driver's cab

To activate foot-level air distribution:
▶ Press the button.
▷ All the LEDs light up.
▷ Foot-level air distribution is activated.

To deactivate foot-level air distribution:
▶ Press the button again.
▷ All the LEDs go out.
▷ Foot-level air distribution is deactivated.

To activate mid-level air distribution:
▶ Press the button.
▷ All the LEDs light up.
▷ Mid-level air distribution is activated.

To deactivate mid-level air distribution:
▶ Press the button again.
▷ All the LEDs go out.
▷ Mid-level air distribution is deactivated.

To activate head-level air distribution:
▶ Press the button.
▷ All the LEDs light up.
▷ Head-level air distribution is activated.

To deactivate head-level air distribution:
▶ Press the button again.
▷ All the LEDs go out.
▷ Head-level air distribution is deactivated.

Re-heat mode

This is only available if an air conditioning system is installed. On cold, damp days, you can use the air conditioning system to dehumidify the cab.

To dehumidify the cab air:
▶ Switch on the air conditioning system in addition to the heater.
▷ This stops the windows from misting up.

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▷ The flashing light is switched off.

Flashing beacon on the rear of the machine

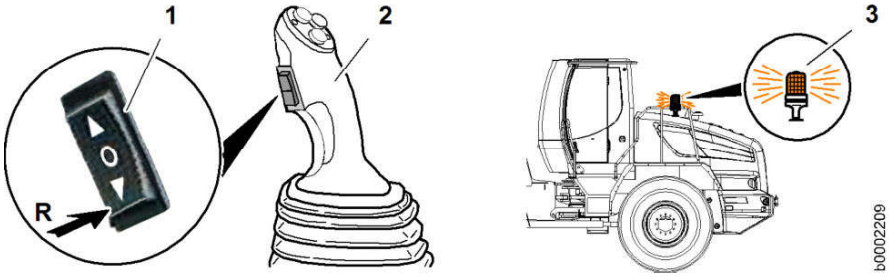

Fig. 209: Flashing beacon on the rear of the machine

1	*Travel direction* switch	**3**	Flashing beacon
2	Control lever	**R**	Reverse travel direction

▶ Move the switch **1** to reverse travel direction.
▷ "Reverse" travel direction symbol field in the display lights up.
▷ The flashing beacon **3** is active.

Flashing beacon on the driver's cab

Selectable functions:
- Flashing beacon active when travelling in reverse
- Flashing beacon in continuous operation
- Flashing beacon switched off

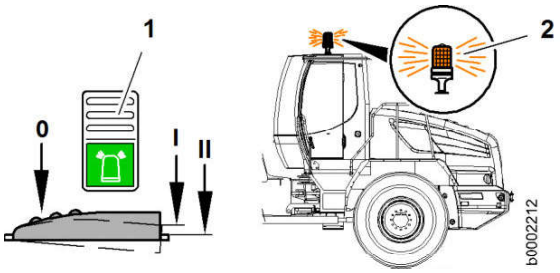

Fig. 210: Flashing beacon on the driver's cab'

1	*Flashing beacon switch*	**II**	Permanently on
I	Flashing beacon active when travelling in reverse	**0**	Flashing beacon deactivated

Flashing beacon active when travelling in reverse

▶ Move the switch **1** to position **I**.
▷ The indicator lamp on the switch lights up.
▷ The flashing beacon is active when travelling in reverse.

Flashing beacon in continuous operation

▶ Move the switch **1** to position **II**.
▷ The indicator lamp on the switch lights up.
▷ The flashing beacon is continuously active.

Switching off the flashing beacon

▶ Move the switch **1** to position **0**.
▷ The indicator lamp on the switch goes out.

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When the overspeed protection function is activated:
– The machine is automatically braked.
– A brief warning tone sounds.
– A error code and the warning symbol **1** or **2** appear on the display.

▶ Use the brake pedal to further reduce the speed.

Driving with the Vmax (speed restriction) function

The *Vmax* function is only available in fixed gear **1** and travel range **A1-2**. If the *Vmax* function is activated in travel range **A1-3** the machine automatically switches to travel range **A1-2**.

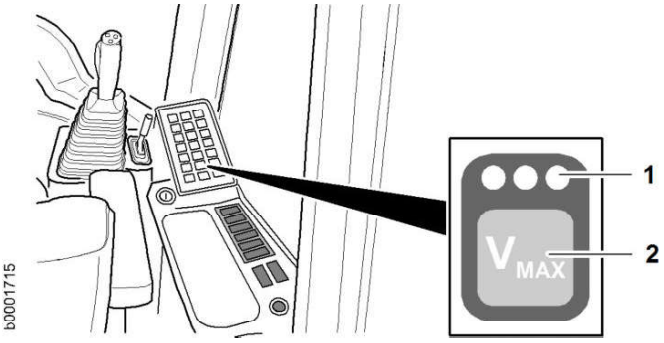

Fig. 222: Driving with Vmax (speed restriction)

1 LEDs **2** Button *Vmax*

Activation with the machine at a standstill:

▶ Press the button **2**.
▷ The LEDs **1** light up.
▷ The “Vmax” indicator appears in the display.
▷ The speed restriction of the vehicle is activated.
▷ The machine travels at the minimum speed when the accelerator pedal is depressed fully.

Activation with the machine moving:

▶ Drive at the required speed.

▶ Press the button **2**.
▷ The LEDs **1** light up.
▷ The “Vmax” indicator appears in the display.
▷ The speed restriction of the vehicle is activated.
▷ The machine travels at the set speed when the accelerator pedal is depressed fully.

To switch off Vmax (speed restriction):

▶ Press the button **2** again or change the travel range.
▷ The LEDs **1** go out.

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.

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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 214)

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.

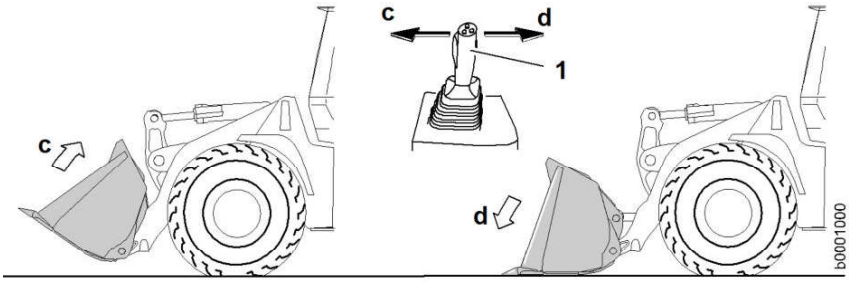

Fig. 236: Tilting the bucket in and out

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.

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NOTICE
Beware of damage to the engine.

If the symbol field **3** lights up yellow:
▶ Start the *regenerate diesel particle filter* function as soon as possible.

If the symbol field **3** changes to red and the symbol field **4** lights up:
▶ Engine power limit.

▶ Start manual regeneration mode as soon as possible.

If the symbol field **4** goes out and the symbol field **5** lights up at the same time:
▶ Manual regeneration of the diesel particulate filter is **no longer** possible.

▶ Turn off the engine.

▶ Contact Liebherr customer service.

Automatic regeneration mode

▶ Move the *regenerate diesel particulate filter* switch to position **I**.
▷ Automatic regeneration of the diesel particulate filter is selected.
▷ The lower idling speed is not increased during regeneration.
▷ The symbol field **2** (see: fig. 248, page 190) lights up at an exhaust temperature above 300 °C (572 °F) at the outlet of the exhaust pipe.

Automatic regeneration starts when the following two conditions are fulfilled:
▷ Load condition of the diesel particulate filter is too high
▷ Engine speed > 1200 rpm (1200 rpm)

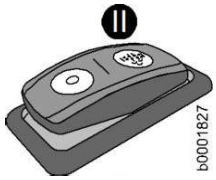
Note
If necessary, regeneration of the diesel particulate filter can be interrupted at any time.

▶ To do this, change to regeneration disabled mode.

Disabled regeneration mode

▶ Move the *regenerate diesel particulate filter* switch to position **0**.
▷ Regeneration of the diesel particulate filter is disabled.
▷ The machine can be operated without any loss of power until the symbol field **4** (see: fig. 248, page 190) lights up.

Manual regeneration mode



▶ Warm up the engine (so that the coolant temperature is above 85 °C (185 °F)).

▶ Park the machine on level ground.

▶ Allow the engine to run at lower idling speed.

▶ Engage the parking brake.

▶ Press the *regenerate diesel particulate filter* button in position **II** for 3 seconds.
▷ Regeneration of the diesel particulate filter is activated.
▷ The symbol field **2** (see: fig. 248, page 190) lights up at an exhaust temperature above 300 °C (572 °F) at the outlet of the exhaust pipe.
▷ The idling speed is increased without the driver having to use the accelerator pedal.
▷ Regeneration is completed when the engine returns to the lower idling speed and the symbol field **2** goes out.
▷ Regeneration can take up to 45 minutes.

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▶ Load long transport vehicles from front to back.

Working near overhead power lines

DANGER
Beware of current flash-overs when working close to overhead power lines.
There is a risk of fatal injury.

▶ Obtain the necessary information on safety clearances.

▶ Ensure that the electrical cables are not live.

Fig. 265: Working near overhead power lines

▶ Keep the machine and attachment a safe distance away from power lines.

▶ (For more information see: 2.4.6 Instructions for safe working, page 54)

Loading large rocks

Make sure that the loading surface of the transport vehicle can withstand the impact of large rocks.

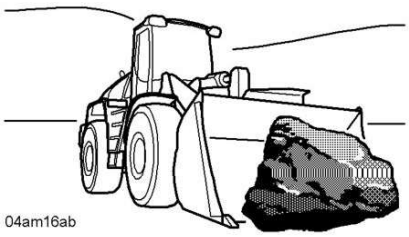

Fig. 266: Loading large rocks

▶ First put a load of smaller rocks into the transport vehicle.

▶ Carry on loading the transport vehicle.

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▶ Fix the lifting tackle to the slinging and lifting points **a, b, c, d** on the machine.

▶ Carefully lift the machine and load it.

Transporting the machine by lorry or rail

Observe the safety regulations when transporting the machine. (For more information see: 2.4.9 Transporting the machine safely, page 56)

Fig. 279: Transporting the machine by lorry or rail

The inclination of the ramp **W** may not exceed 30°.

Make sure that the following requirements are fulfilled:
- ❑ Wedges are available.
- ❑ Suitable tensioning ropes or chains are available to lash the machine down.
- ❑ A ramp is available for driving the machine onto the loading area.

Driving onto the loading area

WARNING
There is a risk of injury to the person giving directions.

To give directions safely:
▶ Take up a position outside the danger area of the machine.

▶ Stay in view of the operator or keep in spoken contact.

Make sure there is someone to give the driver the necessary signals.

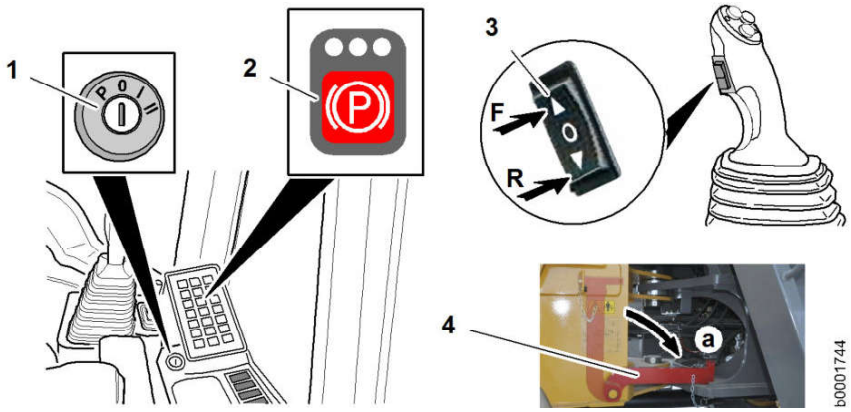

Fig. 280: Driving onto the loading area

1 Starter switch
2 *Parking brake* button
3 *Travel direction* switch
4 Articulation lock

a Articulation lock engaged
F Forward travel direction
R Reverse travel direction

▶ Start the engine.

▶ Release the parking brake.

▶ Select the travel direction.

If you activate the emergency steering function:

▶ Switch on the electrical system of the machine.

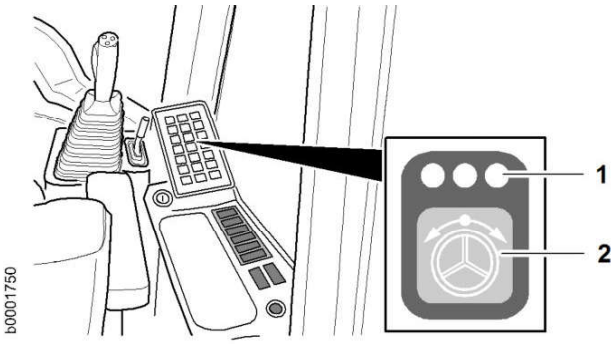

Fig. 293: Activating the emergency steering function

1 LED

2 *Emergency steering function* button

▶ Press the button **2** until the steering manoeuvre is complete.
  ▷ The LEDs **1** light up.
  ▷ “Emergency steering” symbol field in the display lights up.
  ▷ The emergency steering function can only be activated for 10 seconds in total.

When towing has been completed:

WARNING
Beware of accidents if the machine starts moving.

▶ Secure the machine against rolling away.

▶ Only authorised, qualified staff may adjust the parking brake.

▶ Take the travel drive out of free circulation mode. (see: fig. 289, page 219)

▶ Contact Liebherr customer service.

3.7.3 Emergency steering

If the steering pump fails while the machine is travelling, the emergency steering pump is automatically activated. This provides an emergency steering function for the machine for approximately 40 seconds.

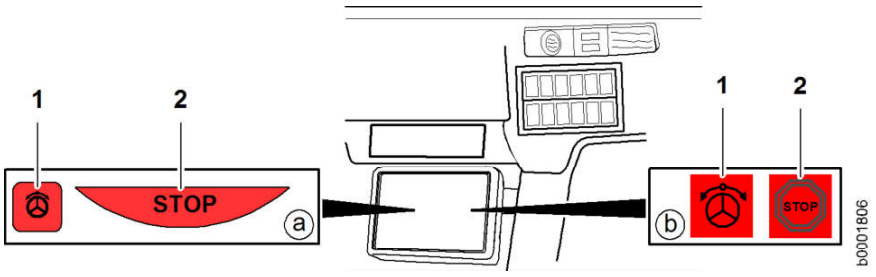

Fig. 294: Emergency steering

1 Emergency steering pump symbol field

a Display

See next page for continuation of the image legend

4.2 Problems - Cause - Remedy

4.2.1 Warning symbols

The following table contains explanations of warning symbols, causes and remedies.

Symbol in the display		Meaning	Cause	Remedy
LCD	Touchscreen			
		Engine oil pressure too low	Engine oil pressure too low	Switch off the machine, contact Liebherr customer service
		Coolant temperature too high	Coolant temperature over 100 °C (212 °F)	Clean the cooling system, contact Liebherr customer service
		Fuel level too low	Fuel tank is empty	Refuel
		Brake accumulator pressure too low	Service brake not working correctly	Contact Liebherr customer service
		Emergency steering pump check not successfully completed	Emergency steering check not successful	Contact Liebherr customer service
		Emergency steering glows when a steering pump fault occurs	Steering pump failed, steering only possible with the emergency steering pump	Contact Liebherr customer service
		Engine speed too high	Hydraulic oil temperature over 95 °C (203 °F)	Clean the cooling system, contact Liebherr customer service
		Battery not charging	Fault in the electrical system	Contact Liebherr customer service
		Switch off the machine	Fault on the machine	Contact Liebherr customer service
		Engine warning	Engine malfunction	Contact Liebherr customer service
		Diesel particulate filter warning	High load condition of the diesel particulate filter	Regenerating the diesel particulate filter
		Service notification	Machine service is due	Contact Liebherr customer service

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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	20.5 l 5.42 gal
Hydraulic system	Liebherr Hydraulic Basic 68 Liebherr Hydraulic Basic 100 Liebherr Hydraulic HVI Liebherr Hydraulic Plus	 b0000636	
System capacity			180 l 47.55 gal
Tank capacity			110 l 29.06 gal
Transmission	Liebherr Hydraulic-Gear ATF 5W-20	 b0000649	3.8 l 1 gal
Front axle differential	Liebherr Gear Basic 90LS	 b0000649	16.3 l 4.31 gal
Front axle wheel hubs	Liebherr Gear Basic 90LS	 b0000649	2.6 l 2.75 liq qt
Rear axle differential	Liebherr Gear Basic 90LS	 b0000649	15 l 3.96 gal
Rear axle wheel hubs	Liebherr Gear Basic 90LS	 b0000649	2.6 l 2.75 liq qt

Tab. 43: Recommended lubricants

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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. 51: 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:

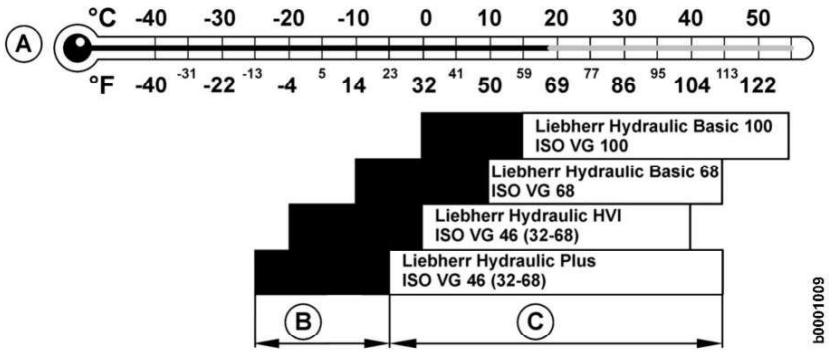

Fig. 309: Liebherr hydraulic oil, selection of viscosity class according to temperature

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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Opening the engine compartment hood

Open the hood if you need to access the following units or components:
- Engine
- Air filter
- Hydraulic pumps
- Battery
- Battery main switch

WARNING
Rotating parts and hot surfaces can cause injuries.
Beware of scalding when opening the engine compartment hood.

▶ Only open the hood when the engine is cooled and at a standstill.

Fig. 322: Opening the engine compartment hood

1 Engine compartment hood
2 Handle with lock
3 Gas-filled spring

▶ Open the lock with the ignition key.

▶ Open the engine compartment hood **1** using the handle **2** and raise it until it hits the stop.
▷ 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.

▶ Check that the gas-filled springs securely hold it open.

▶ Check the function.

Troubleshooting
If the correct function is not guaranteed, the cause must be rectified immediately.

▶ Contact Liebherr customer service.

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▷ The engine oil is circulated.

▶ Turn off the engine.

▶ Put the machine in maintenance position 1.

CAUTION
Beware of burns from hot surfaces on the exhaust system.

▶ Do not touch hot surfaces.

▶ Insert the sampling hose through the dipstick tube to 5 cm (1.97“ in) below the oil level **A**.

▶ Fill the sample container using the hand pump.

▶ Put the dipstick **1** back in again.

Coolant circuit

The coolant sample is taken from the cooler.

Fig. 327: Sampling point for coolant

▶ Start the engine.

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

▶ Turn off the engine.

▶ Put the machine in maintenance position 1.

CAUTION
Beware of injury due to coolant escaping under pressure

▶ The coolant temperature must not exceed 45 °C (113 °F).

▶ Wear protective clothing and safety glasses.

▶ Carefully open the cap.

▶ Carefully open the cap **1**.

▶ Insert the sampling hose and take an oil sample.

▶ Close the cap **1**.

Transmission

The coolant sample is taken from the transmission.

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▶ Turn the service cover **3** clockwise until it is locked.

▶ Close the safety clamp **1**.

Cleaning the dust discharge valve

Note
When using the machine in dusty conditions:

▶ Check and empty the dust discharge valve more often.

Fig. 337: Cleaning the dust discharge valve

1 Dust discharge valve

▶ Press the rubber seal on the dust discharge valve **1** several times to remove the dust from the service cap.

If the dust discharge valve is damaged or stays open:
▶ Replace the dust discharge valve.

5.7.8 Changing the air filter main element

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 1.
❑ The service access is open.
❑ The engine has cooled down.
❑ Appropriate protective equipment is used.

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5.9 Working hydraulics

5.9.1 Checking the oil level in the hydraulic tank

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

Checking the hydraulic oil level

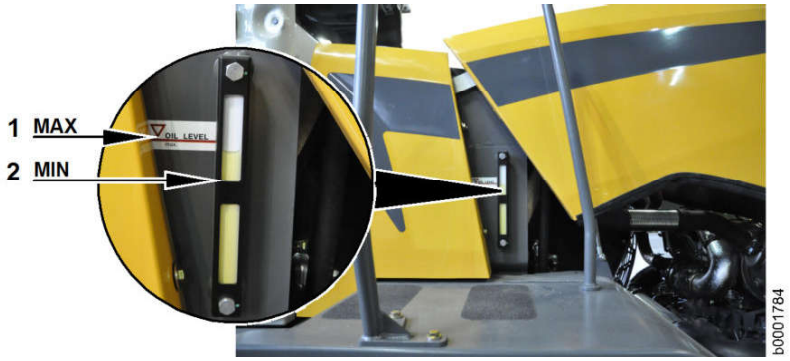

Fig. 348: Checking the hydraulic oil level

1 Maximum oil level **2** Minimum oil level

The red “OIL LEVEL - max.” **1** marking and the bottom edge of the **2** top sight glass show the target height of the oil level.

Note
Check the hydraulic oil level.

▶ Lower the lift arms until the lift cylinders are retracted.

▶ Check the oil level.

If the oil level is too low:
▶ Top up with hydraulic oil.

Topping up with hydraulic oil

Note
To top up with hydraulic oil:

▶ Lower the lift arms until the lift cylinders are retracted.

▶ Hydraulic oil may only be poured in through the return strainer.

▶ Oil specification: (For more information see: 5.3.6 Hydraulic oil, page 251)

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- ▶ Lubricate the lock **2** and locking mechanism **3** with Liebherr universal grease 9900.
- ▶ Lubricate the hinges of the covering with Ballistol spray (item code 10025514).

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