

en

Operator's manual

Wheel loader

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Contact

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Description	Unit	Value
Travel range 1 (can be limited)	km/h	10-19.0
Travel range 2 (can be limited)	km/h	20-29.0
Travel range 3 (can be limited)	km/h	30-40.0

1.2.7 Axles

- Four-wheel drive
- Axle ratio: planetary drives in wheel hubs

Front axle

Rigidly mounted planetary axle.

Description	Unit	Value
Track width	mm	2003
Automatic self-locking differential	%	45

Rear axle

Oscillating planetary axle.

Description	Unit	Value
Track width	mm	2003
Automatic self-locking differential	%	45
Angle of articulation to each side	°	13
Maximum obstacle height (standard tyres), with all four wheels on the ground.	mm	460

1.2.8 Braking

The brake systems comply with the roadworthiness certification regulations.

Service brake

- Self-arrest of travel drive, acting on all four wheels.
- Hydraulic pump accumulator brake system with wet disc brakes (two separate brake circuits)

Parking brake

Electrohydraulically actuated spring accumulator disc brake on the transmission.

1.2.9 Steering

Type:

- Load sensing swash plate variable displacement pump with pressure cut-off and flow regulator.

	Designation	Unit	Value		
	Tipping load when fully articulated (ISO 14397-1)	kg	11100	9200	9100
	Operating weight	kg	18700	18900	18950

Tab. 8: Complete machine with loading bucket (industrial lift arms)

- A) Industrial lift arms with parallel guidance including quick coupler
- B) Earth bucket with short, straight base for quick coupler
- C) Welded tooth holder with plug-in teeth
- D) High lift
- E) In practice, the bucket capacity can be around 10% greater than as calculated using the ISO 7546 standard. The bucket filling level depends on the type of material.

1.2.23 Working attachment: light material bucket

Values stated refer to machine:

- In standard version
- With 23.5R25 L3 tyres (For more information see: 1.2.18 Tyres, page 25)
- Including all lubricants
- With a full fuel tank
- With ROPS/FOPS cab and operator
- On level and stable ground



Note

Tyres and working attachments affect operating weight and tipping load.

► Note the information about the tyres and working attachment.

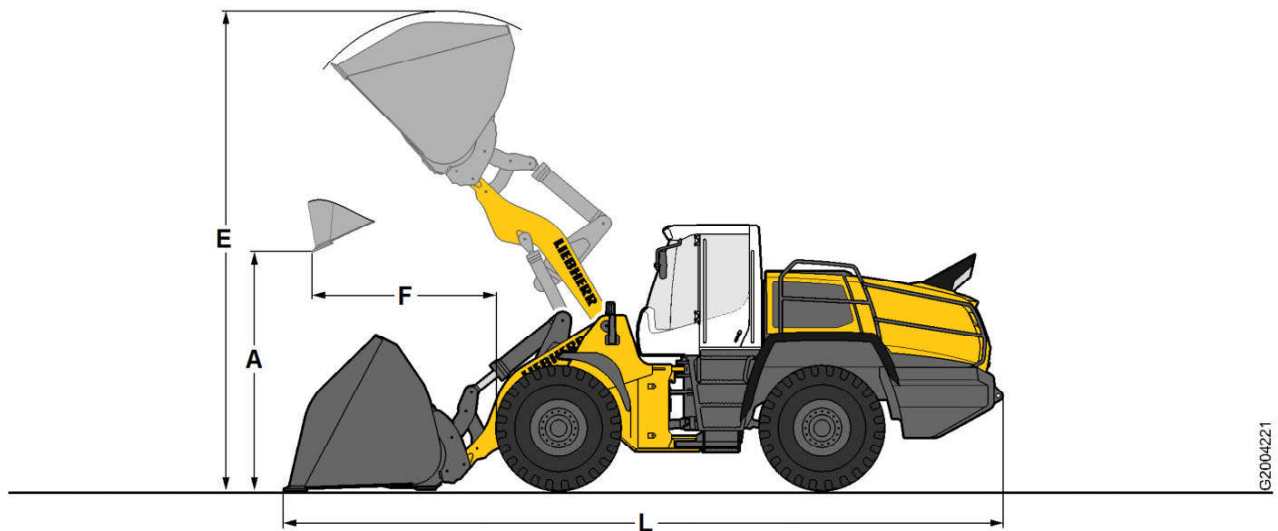


Fig. 7: Working attachment: light material bucket

	Designation	Unit	Value			
	Hydraulic quick coupler		Yes	Yes	Yes	Yes
	Load geometry		A)	A)	A)	A)

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- Hearing protection
- Breathing equipment
- Protective gloves
- Warning clothing (reflective, in signal colour)
- Safety boots
- Special protective clothing
 - To prevent burns
 - To prevent freezing
 - To prevent acid burns
 - To prevent stabbing and cutting injuries

2.3.2 Requirements for staff

Staff meet the following requirements:

- The machine is operated, maintained and repaired exclusively by authorised and trained persons.
- All persons operating, maintaining or repairing the machine have the required minimum age.
- Staff training involves theoretical information (technology and safety) and practical training on the machine.
- Staff have read and understood the operator's manual and supplied documentation.
- Experienced staff continuously supervise following staff.
 - Staff undergoing training
 - Staff undergoing education
 - Staff undergoing instruction
 - Staff undergoing a general apprenticeship
- Staff agree to work in safety-aware and risk-aware manner.

2.3.3 Operator

Responsibility

The operator is responsible for the following:

- The operator of the machine must ensure that no persons are in the operating area of the machine on the basis of a risk assessment conducted in respect of the operating site.
- If working attachments are used that deviate from the standard and result in limitations to the field of view, the operator must repeat the visual inspection.
- Make sure that only trained staff operate the machine.
- Make sure that exclusively trained staff maintain the machine.
- If an electric motor is used, ensure that only a qualified and competent person connects the machine to the mains supply.
- Check qualification of persons in handling the machine.
- Authorise activities of persons in handling the machine.
- Define competences and responsibilities for all persons involved in handling the machine.
- Have following staff continuously supervised by an experienced person.
 - Staff undergoing training
 - Staff undergoing education
 - Staff undergoing instruction
 - Staff undergoing a general apprenticeship
- Provide all persons tasked with handling the machine with the necessary protective equipment.
- Check safety-aware work of staff at regular intervals.
- Check danger-aware work of staff at regular intervals.

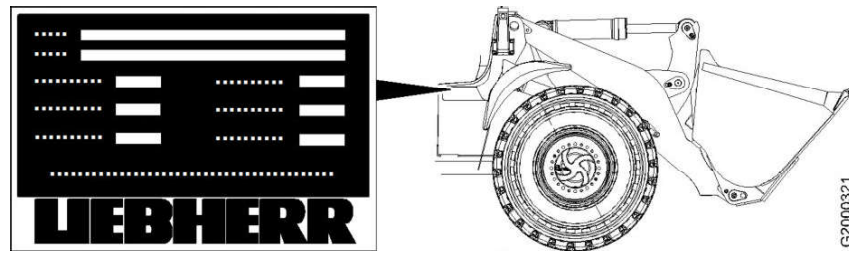


Fig. 52: Identification plate

2.5 Protective devices on the machine

2.5.1 Operator's cab

Danger to life

Unapproved working method

- Put on safety belt before starting work.
- Make sure that changes in the operator's cab (for example installation of accessories) do not restrict the operator's workspace.

Injuries

Objects in the operator's cab

- Remove objects that are not necessary for the work from the operator's cab.
- Stow and fasten objects that are necessary for the work before starting.
- Make sure that objects carried do not protrude into the operator's workspace.

2.5.2 Roll over protective structure (ROPS)

Danger to life

Damaged falling object protective structures

- Do not put machine into service with damaged falling object protective structures.
- Do not put machine into service with deformed falling object protective structures.
- Do not use falling object protective structures with structural changes.
- Do not use repaired falling object protective structures.
- Do not perform welding on falling object protective structures.
- Do not cut or saw falling object protective structures.
- Do not drill falling object protective structures.

Exceeding of total weight

- Make sure that total weight of machine (see identification plate) is not exceeded.

2.8.3 Regular checks

Danger to life

Incorrect performance of checks

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

2.9 Modifications to the machine

2.9.1 Modifications, add-ons and retrofittings

Danger to life

Incorrect changes to the machine

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

Incorrect welding work on the machine

- Only specialist staff may carry out welding.
- Only carry out welding, burning and grinding work on the machine if it is expressly permitted by the manufacturer.
- Before welding, burning and grinding, clean any dust and flammable materials from the machine and the area around it, and ensure adequate ventilation.
- Switch off ignition and battery main switch.
- Bring the ground of the welding machine as close as possible to the welding point.

Damage

- If attachment parts and add-on parts are supplied via the machine's hydraulic system: Make sure that different oil types are not mixed.

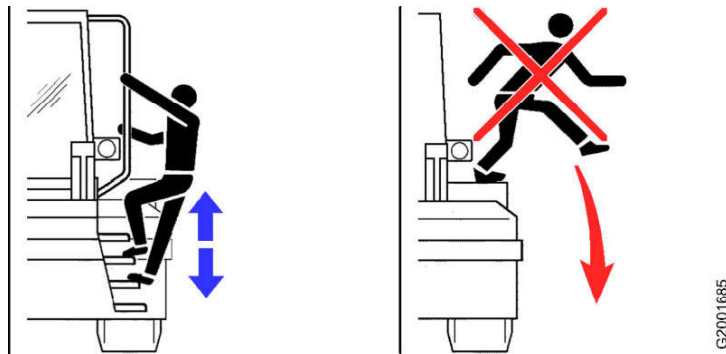


Fig. 62: Entering and leaving machine

Entering operator's cab

Make sure that following requirements are fulfilled:

- Diesel engine is switched off.

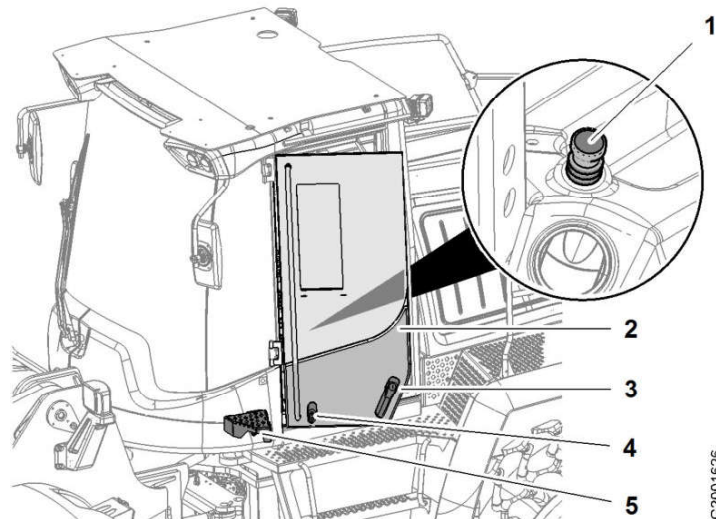


Fig. 63: Entering operator's cab

- | | | | |
|---|-------------------|---|-----------------|
| 1 | Door holder lever | 4 | Door holder bar |
| 2 | Cab door | 5 | Door holder |
| 3 | Door lock | | |

- ▶ Open the door lock 3 with the ignition key.
- ▶ To open the cab door: push in the door lock 3.
- ▶ Latch the cab door 2 into the door holder 5.
- ▶ Enter operator's cab.
- ▶ To unlatch the cab door: press the lever 1.
- ▶ Close cab door 2.

Leaving operator's cab

Make sure that following requirements are fulfilled:

- Diesel engine is switched off.

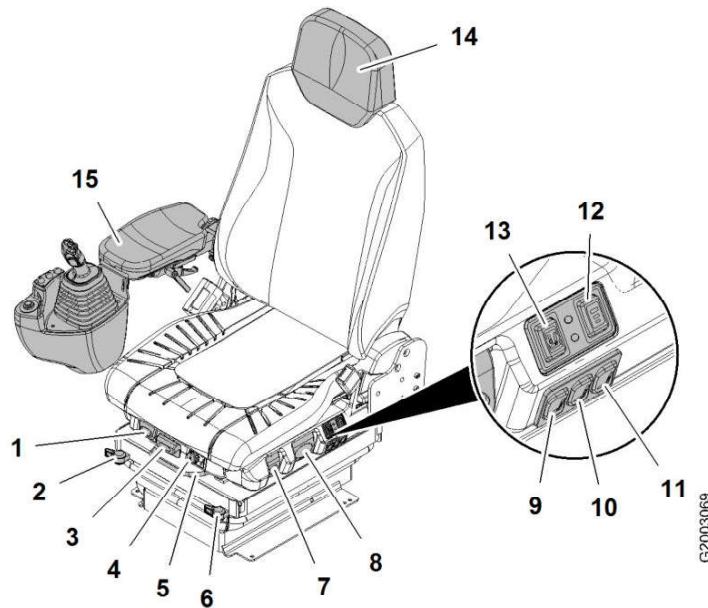
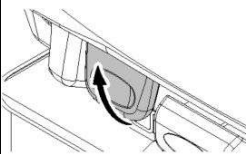
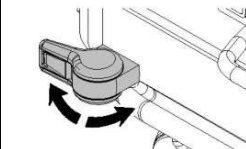
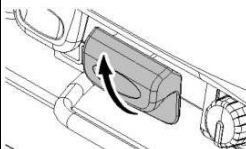
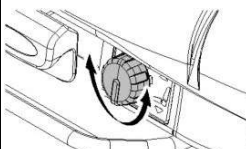
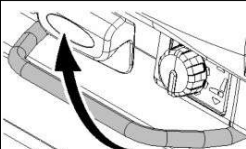


Fig. 95: Driver's seat: ISRI Premium

		Adjustment options
1		Inclination adjustment Pull up the lever and adjust the seat inclination by putting more or less weight on the front of the seat cushion.
2		Lateral absorption Turn the lever to the left or right to activate or deactivate lateral absorption.
3		Seat cushion depth adjustment Pull up the lever and move the seat cushion.
4		Height adjustment Turn the handle to adjust the seat height as required.
5		Horizontal adjustment Pull the lever all the way up and move the driver's seat.

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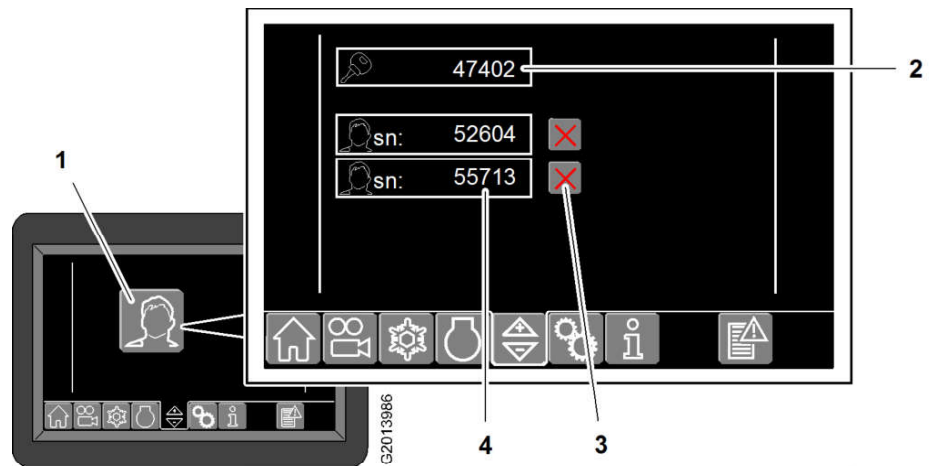


Fig. 124: Ignition key: Deleting saved functions

- | | | | |
|---|----------------------------------|---|-------------------------------------------|
| 1 | Driver identification button | 3 | Delete saved functions button |
| 2 | Master key serial number display | 4 | Ignition key with saved functions display |

- ▶ Switch on the ignition with the master key.
- ▶ Call up the display screen using button 1.
- ▶ Press the button 3.
 - ▷ The functions saved on the ignition key 4 are deleted.

3.2.13 Steering-column switch

The steering column switch consists of the following control elements for:

- Indicator lights
- High beam
- Horn and headlight flasher
- Front windscreen wiper
- Front windscreen washer system

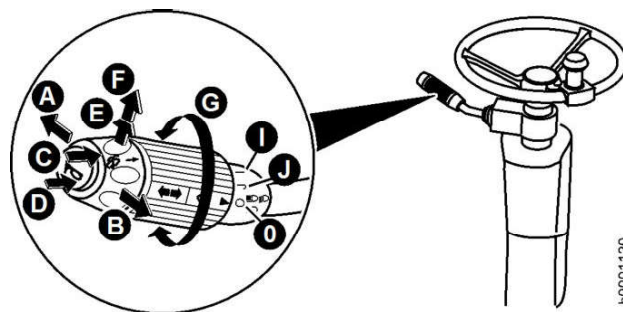


Fig. 125: Steering column switch

Functions of the steering column switch

- A - right indicator light
- B - left indicator light
- C - front windscreen washer system
- D - horn
- E - headlight flasher
- F - high beam
- G - front windscreen wiper knob
- I - horn
- J - horn

Visualisation of equipment position

Height and angle of equipment are displayed.

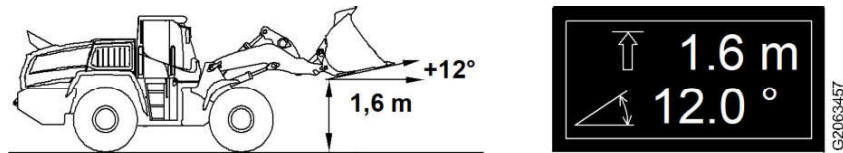


Fig. 156: Visualisation of equipment position

Menu: reversing camera

The reversing camera is included in the start page. The display is in full-screen mode when reversing.

Reversing camera: set permanent display



Fig. 157: Reversing camera: set permanent display

- | | | | |
|---|----------------------------|---|-------------------|
| 1 | Reversing camera button | 3 | Start page button |
| 2 | Full screen mode indicator | | |

- ▶ Press button 1.
 - ▷ The reversing camera is displayed in full screen mode when travelling forward and in reverse.



WARNING

Start page button flashes red!
Risk of serious injury and damage to the machine.

- ▶ Park the machine in a safe area immediately.
- ▶ (For more information see: [4.1.1 Service code indicator in the display, page 239](#))

If you want to quit full-screen mode:

- ▶ Press button 3.

Menu: heating, air conditioning

The heating heats the air according to the selected temperature setting.

Menu: function settings

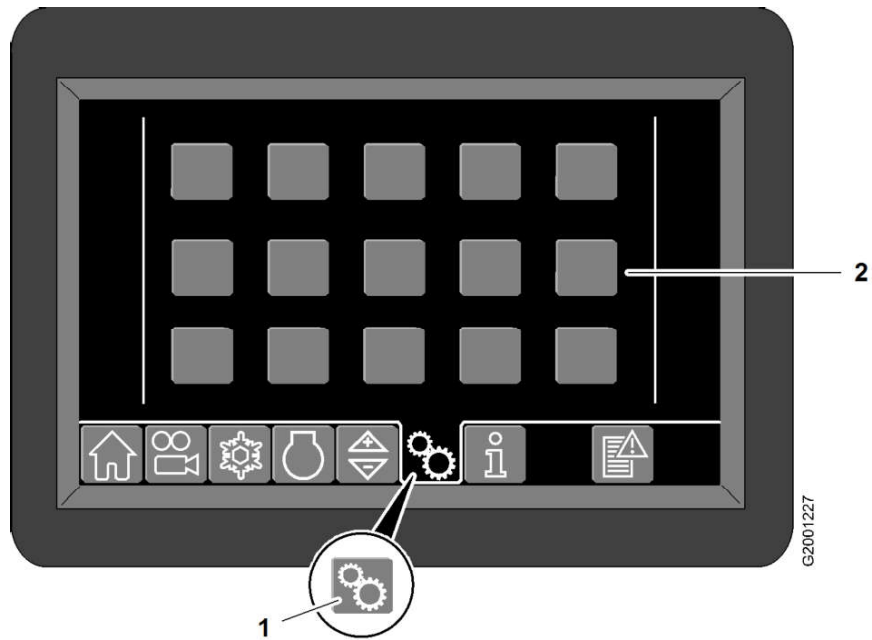


Fig. 170: Menu: function settings

- 1 Function settings button
- 2 Buttons

Buttons		Designation
		Working attachment calibration (For more information see: Working attachment calibration, page 112)
		Auto lift arm position (For more information see: Auto lift arm position, page 184)
		Auto lowering (For more information see: Auto lowering, page 185)
		Bucket return-to-dig (For more information see: Bucket return-to-dig, page 187)
	Adjusting ride control (For more information see: Adjusting ride control, page 114)	
	Central lubrication system (option) (For more information see: Central lubrication system, page 116)	
	Service management (For more information see: Service management, page 117)	
	Working attachment: tilt speed (For more information see: Working attachment: changing tilt speed, page 119)	

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Working headlight adaptive lighting

This equipment is optional.

Front working headlight and working headlight on front section are controlled based on lift arm position, articulation angle and travel speed.

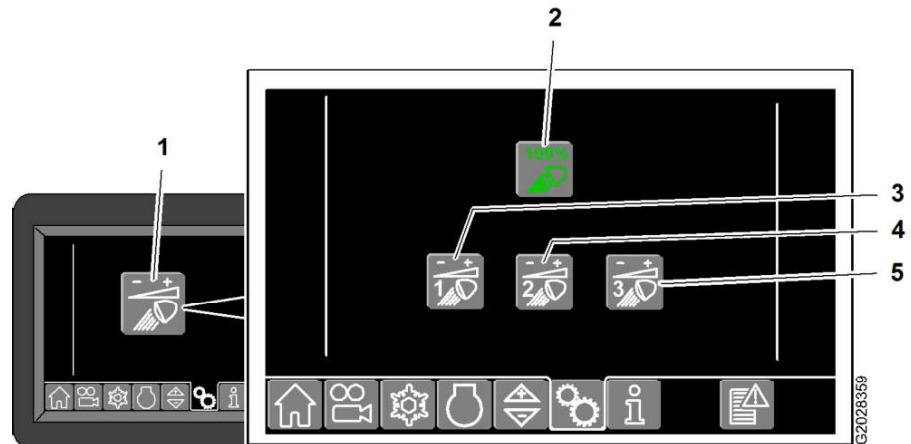


Fig. 203: Working headlight adaptive lighting

- | | | | |
|---|------------------------------|---|---------------------------|
| 1 | Adaptive lighting button | 4 | Brightness level 2 button |
| 2 | Brightness level 100% button | 5 | Brightness level 3 button |
| 3 | Brightness level 1 button | | |

- ▶ Call up the display screen using button 1.
- ▶ Brightness level 100%: press button 2.
- ▶ Adaptive lighting: press button 3, button 4 or button 5.

Stroke limit damping

This equipment is optional.

This function enables smoothly moving to the end position of the working attachment and lift arms.

- Bucket return-to-dig (For more information see: [Bucket return-to-dig](#), page 187)

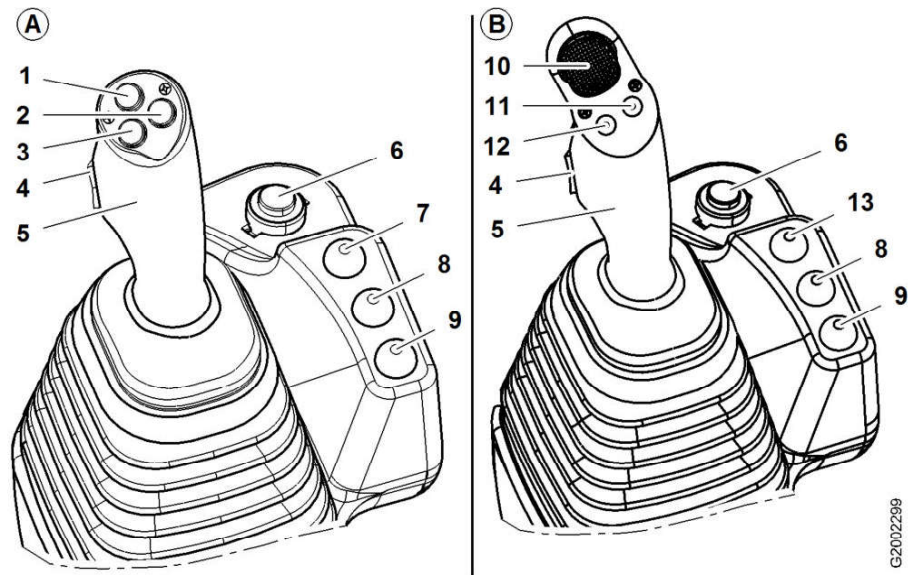


Fig. 219: Control lever

- | | | | |
|----------|------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------|
| A | Control lever | 7 | Option button |
| B | Control lever with mini-joystick (option) | 8 | Option button |
| 1 | Kick-Down button | 9 | Manual wipe button |
| 2 | Horn button | 10 | Mini joystick |
| 3 | Bucket return-to-dig or weighing device (option) button ⁴⁶⁾ | 11 | Bucket return-to-dig or horn or weighing device (option) button ⁴⁶⁾ ⁴⁷⁾ |
| 4 | Travel direction switch | 12 | Kick-Down button |
| 5 | Control lever | 13 | Horn button ⁴⁷⁾ |
| 6 | Starting switch | | |

Controlling the working attachment

Move the control lever to operate the working attachment.

⁴⁶⁾ If the bucket return-to-dig and weighing device (reset total) are installed together, the weighing device (reset total) is activated by the display.

⁴⁷⁾ If the bucket return-to-dig or weighing function and the horn are installed together, the horn is operated using this button **13**.

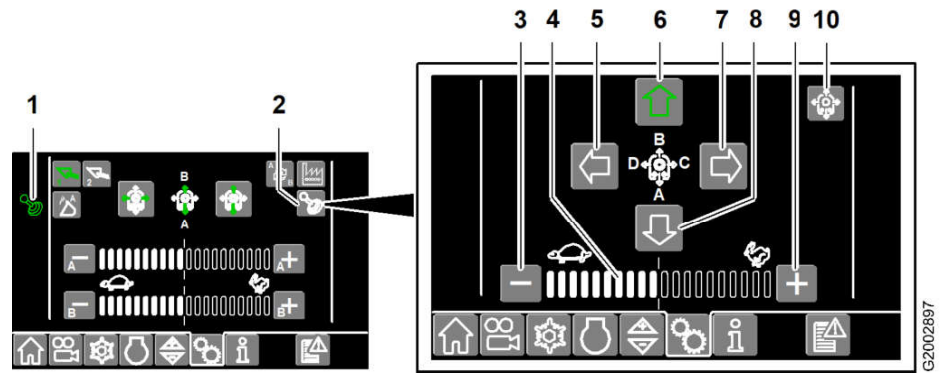


Fig. 239: Working attachment continuous mode

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Continuous mode (control lever lock) symbol</p> <p>2 Continuous mode (control lever lock) button</p> <p>3 Reduce continuous mode speed button.</p> <p>4 Continuous operation speed diagram</p> | <p>5-8 Control axis button ⁵³⁾</p> <p>9 Increase continuous operation speed button.</p> <p>10 Mini-joystick button ⁵⁴⁾</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- ▶ Press button **2**.
 - ▷ Continuous operation menu appears in the display.
- ▶ Select the desired control axis with button **5-8**.
 - ▷ The selected control axis flashes green.
 - ▷ The *continuous operation 1* symbol flashes.
- ▶ Press and hold the mini joystick for 3 seconds in the direction of the selected control axis.
 - ▷ A beep sounds and the *continuous operation 1* symbol changes stops flashing and lights up continuously.
 - ▷ The function for the working attachment is activated.

To change the speed of continuous operation:

- ▶ Press button **3** or **9**.
 - ▷ Continuous operation speed is reduced or increased and shown in diagram **4**.

To deactivate continuous operation:

- ▶ Move the mini joystick against the preset axis
or

Press the *working hydraulics lockout* button.

or

Press button **5-8**.

- ▷ Continuous operation is deactivated.
- ▷ The continuous operation symbol in the status symbol display flashes.

The preselected direction for continuous operation remains active until:

⁵³⁾ The entire selection is only available for biaxial mini-joystick.

⁵⁴⁾ Displayed as a monoaxial or biaxial mini-joystick

The following lubrication cycles are available:

- Light duty
- Medium duty
- Heavy duty



Note

If the lubrication cycles cannot be set:
The software prevents a mode change.

► Contact Liebherr customer service.

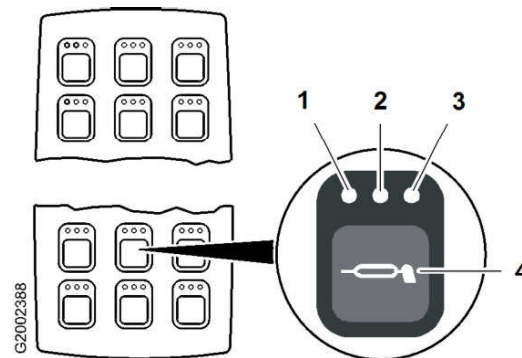


Fig. 272: Setting the lubrication cycles

- | | | | |
|---|---------------------------------------|---|--------------------------------------|
| 1 | LED lights up - light-duty operation | 3 | LED lights up - heavy-duty operation |
| 2 | LED lights up - medium-duty operation | 4 | Central lubrication system key |

Mode	LED	Lubrication cycle
Light duty	LED 1 lights up	Every 40 minutes
Medium duty	LED 2 lights up	Every 30 minutes
Heavy duty	LED 3 lights up	Every 20 minutes

Tab. 60: Setting the lubrication cycles

- Hold down the key 4 for at least 2 seconds.
 - ▷ Setting mode is active.
- Press key 4 briefly.
 - ▷ The next mode is displayed.
 - ▷ If the key is not pressed for 3 seconds, the currently selected mode is saved.

Lubrication procedure

After starting the diesel engine and releasing the parking brake, lubrication is activated.

The central lubrication system pumps the grease through the lubricant supply lines and distributors to the individual lubrication points.

LED	Function
One LED lights up.	Mode 1, 2 or 3 has been set

3.3 Operation

3.3.1 Putting into service - daily

Depending on where it is used (for example at a rubbish dump or sawmill), the machine may have to be cleaned every day before use.

Before starting up the machine, always make an inspection tour of it.



WARNING

Combustible deposits around the engine!
Injuries, fire.

- ▶ When working in a fire hazard zone: Clean the machine.



Note

The master control unit performs a safety check.

- ▶ After 8 hours of continuous operation, turn off and restart the diesel engine.

Putting the machine in the operating position

To put the machine into the operating position:

Make sure that following requirements are met:

- The daily maintenance tasks have been carried out.
- Battery main switch is on.
- The service hatches are closed.
- Articulation lock is released.

Testing



DANGER

Machine movements!
Danger to life.

- ▶ Make sure there are no persons in danger zone.
- ▶ Perform all work movements multiple times with no load.

If the working tool does not function correctly:

- ▶ Do not use working tool.
- ▶ Rectify cause of fault.

Refuelling with diesel

Make sure that following requirements are met:

- Machine is in operating position.
- The working attachment is lying flat on the ground.
- Diesel engine is switched off.
- Specified diesel fuel is available. (For more information see: [5.3.4 Diesel fuels, page 266](#))

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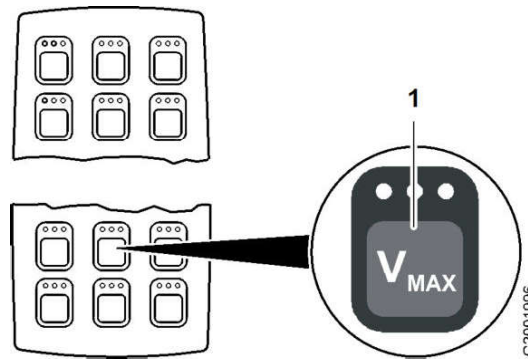


Fig. 297: Driving with Vmax (speed restriction)

1 Vmax key

- ▶ Drive at the required travel speed.
- ▶ Press key 1.
 - ▷ Vmax lights up in the display.
 - ▷ The speed restriction of the machine is activated.
 - ▷ The machine travels at the set travel speed when the travelling pedal is fully depressed.

Vmax To switch off (speed restriction):

- ▶ Press key 1 again.

Driving with ride control

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

The ride control system improves driving comfort by reducing the vibrations of the vehicle.



DANGER

Ride control deactivates pipe break protection!
Fatal injury.

- ▶ When performing lifting work which requires pipe break protection, deactivate ride control.

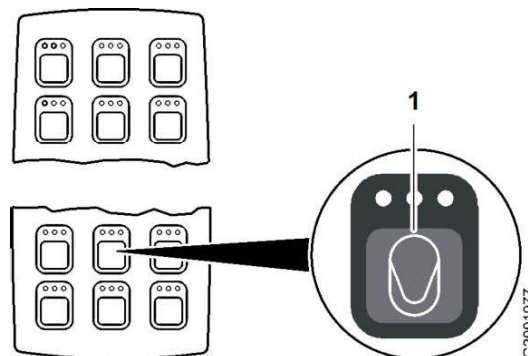


Fig. 298: Driving with ride control

1 Ride control key

- ▶ To activate ride control: press the bkey 1.

Raising the lift arms

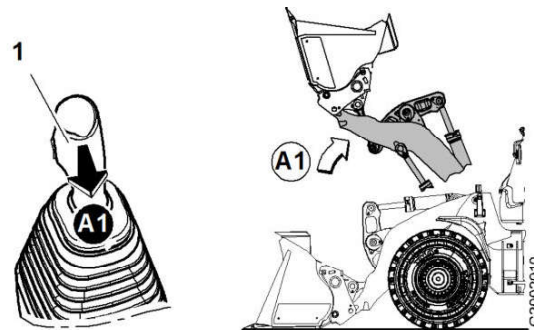


Fig. 310: Raising the lift arms

1 Control lever

- ▶ Move the control lever in direction **A1**.
 - ▷ The lift arms are raised.

Lower the lift arms

There are two ways to lower the lift arms:

- Normal lowering function
- Quick drop function

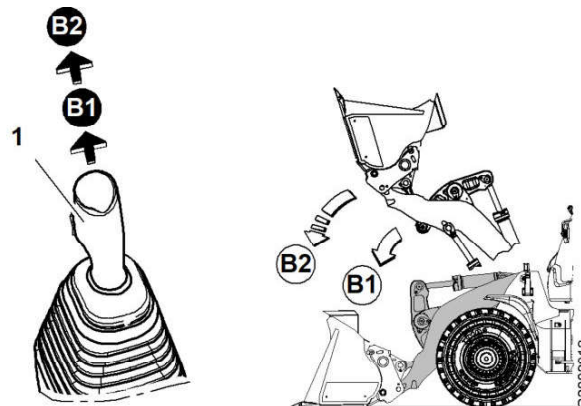


Fig. 311: Lower the lift arms

1 Control lever

Normal lowering function:

- ▶ Move the control lever to the action point in direction **B1**.
 - ▷ The lift arms are lowered.

Quick drop function:

- ▶ Move the control lever to the limit in direction **B2**.
 - ▷ The lift arms are quickly lowered.



Note

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

- ▶ (For more information see: [3.7.1 Lowering the lift arms if the diesel engine fails, page 231](#))

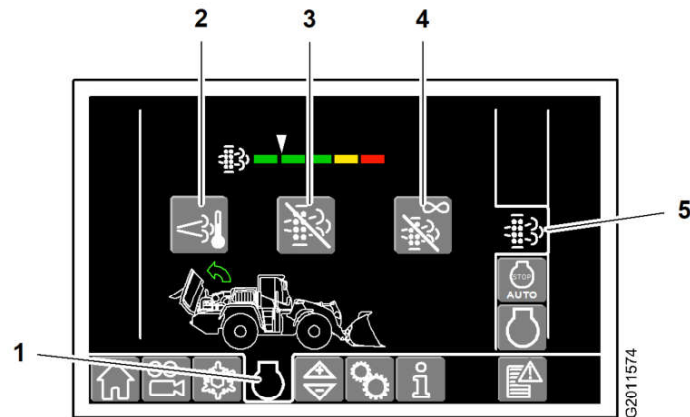


Fig. 331: Automatic regeneration mode

- | | | | |
|---|-----------------------------------|---|-----------------------------------------------|
| 1 | Operating status button | 4 | Regeneration mode permanently disabled button |
| 2 | Manual regeneration mode button | 5 | Regenerate diesel particulate filter button |
| 3 | Regeneration mode disabled button | | |

- ▶ Call up the display screen using button 5.
- ▶ Set button 2 to white.
 - ▷ Regeneration of the diesel particulate filter is permitted.
- ▶ Set button 3 to white.
- ▶ Set button 4 to white.
 - ▷ Automatic regeneration of the diesel particulate filter is selected.
 - ▷ Regeneration starts according to the operating status of the diesel particulate filter.

If regeneration must be stopped in an emergency:

- ▶ Suppress regeneration.

Regeneration mode disabled



Note

Regeneration mode for environments with a fire hazard.

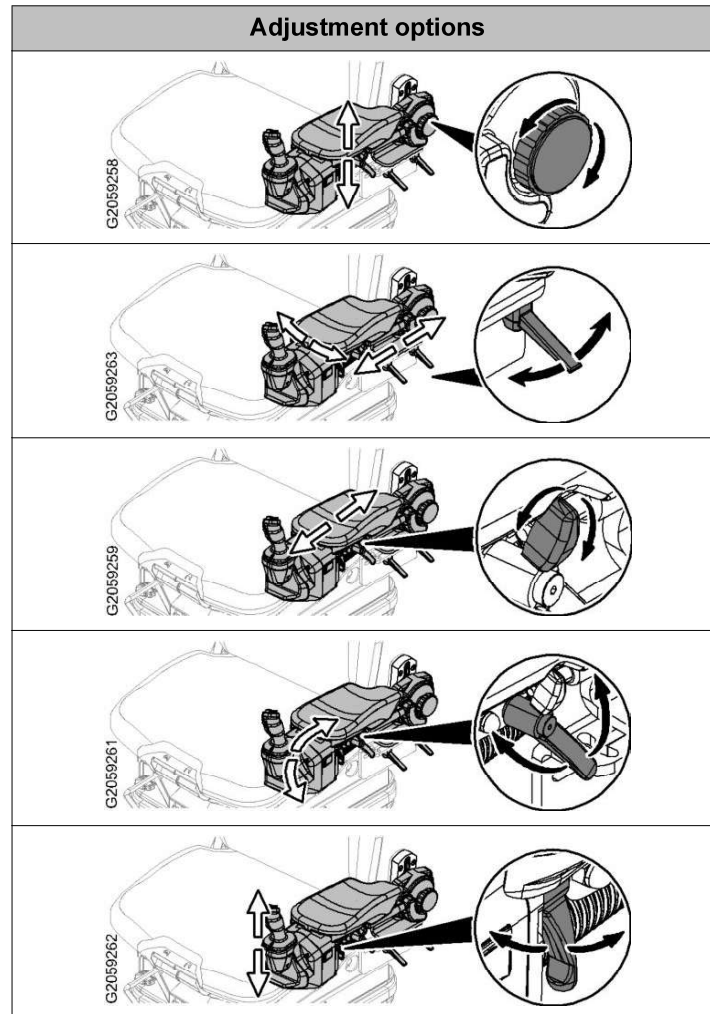
If the load condition of the diesel particulate filter is too high, the regeneration of the diesel particulate filter must be started manually in a fire resistant and protected environment.

In this regeneration mode, suppression of diesel particulate filter regeneration is deactivated the next time the engine is started.

**WARNING**

Uncontrolled operation of the joystick!
Risk of injury.

- Only carry out the adjustments when the engine is switched off.



Tab. 66: Adjusting the left armrest

Activating joystick steering

Make sure that following requirements are met:

- The diesel engine has started.
- The transmission warm-up phase is completed.
- The parking brake is engaged.
- The on-road travel function is not activated.
- All levers and pedals are in the neutral position.
- Joystick steering switch is at position 0. ⁵⁸⁾

⁵⁸⁾ Only for machines with steering wheel.

If material adheres to the working attachment:

- ▶ Loosen the adherent matter manually
- or

Quickly tilt the working attachment in and out, briefly jolting against the tilt-out stops of the bucket arm.



Note

Jolting against the tilt-out stops!

Jolting is only permissible when working with materials such as clay or compost.

Only use a **standard bucket** designed for a material weight greater than 1.3 t/m³ for jolting.

3.4.4 Handling materials with high dump buckets

The high dump bucket is used for loading light bulk material on trucks with high sides, wagons, silos etc. The special design achieves a greater dumping height. An appropriate working attachment must be fitted for other jobs that do not require a high dump function.

NOTICE

Unnecessary jolting of the working attachment!

Damage to the lift arms and lay the working attachment flat.

- ▶ Avoid unnecessary jolting.

Make sure that following requirements are met:

- Observe manufacturer's separate operating manual.
- The hydraulic lines of the high dump bucket are correctly connected.
- The functions have been checked.
- A high dump bucket with standard dump function has at most been tilted out until the bucket base is in a horizontal position.
- The tilt out duration for the high dump bucket is not less than 4 seconds.

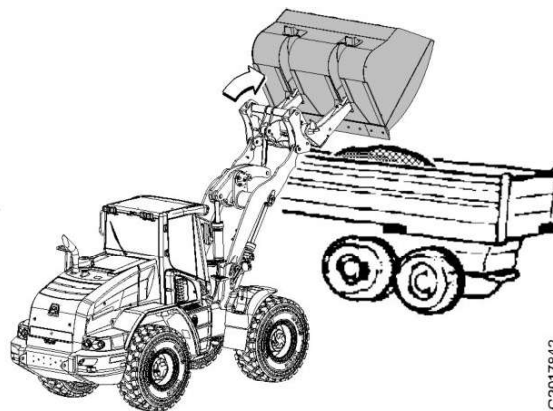


Fig. 358: Handling materials with high dump buckets

- ▶ Take up the bulk material with the high-dump function tilted in.
- ▶ Only use the high-dump function to empty the bulk material at the unloading site.
- ▶ If necessary, compress the material with the high-dump function tilted in.

Unlocking and disconnecting the working attachment

Make sure that following requirements are met:

- The hydraulic lines are detached from the working attachment.
- The working attachment is lying flat on the ground.



WARNING

Working attachment falling over!
Risk of injury.

- ▶ Make sure the working attachment is secured against falling over or rolling away.

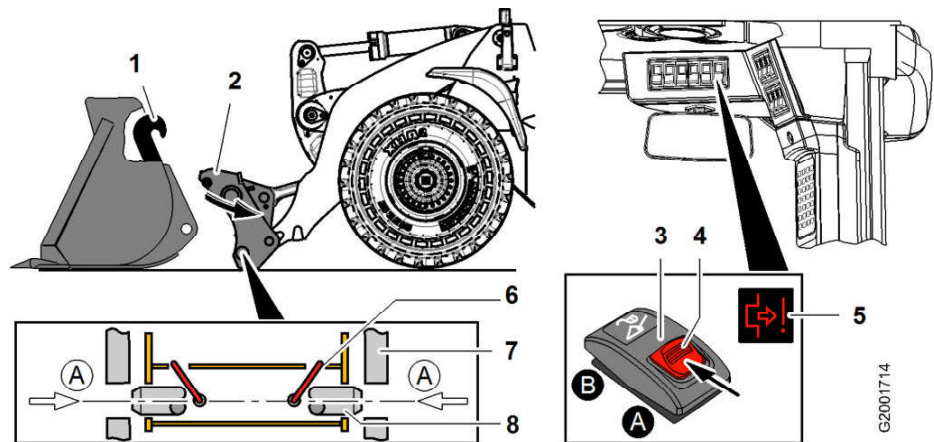


Fig. 373: Unlocking and disconnecting the working attachment

- | | |
|-----------------------------|---------------------------------|
| 1 Working attachment holder | 5 Quick coupler unlocked symbol |
| 2 Quick coupler | 6 Unlocked position indicator |
| 3 Quick coupler button | 7 Working attachment |
| 4 Lockout | 8 Locking pin |

- ▶ Set down the working attachment flat on firm, even ground.
- ▶ Secure the working attachment against falling over or rolling away.
- ▶ Release the lockout 4 in the direction of the arrow while pushing the button 3 to position A.
 - ▷ A warning tone sounds.
 - ▷ The locking pins 8 of the quick coupler 2 retract.
 - ▷ The symbol 5 appears in the display
 - ▷ The working attachment 7 is unlocked.

When the locking pins are completely retracted:

- ▶ Carefully move the quick coupler 2 out of the working attachment holder 1.
 - ▷ The working attachment 1 is disconnected.

If you are not going to install a working attachment:

- ▶ Press the button 3 in position B.
 - ▷ The locking pins 8 of the quick coupler 2 extend.
 - ▷ The warning tone stops.
 - ▷ The symbol 5 goes out in the display.

3.5.3 Fitting working attachments to the quick coupler

This equipment is optional.

3.7 Emergency modes

This section describes the emergency modes of the machine.

Emergency modes:

- Lowering the lift arms if the diesel engine fails
- Towing the machine
- Emergency steering procedure
- Jump starting procedure

3.7.1 Lowering the lift arms if the diesel engine fails

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

Lowering the lift arms and depressurising the hydraulics

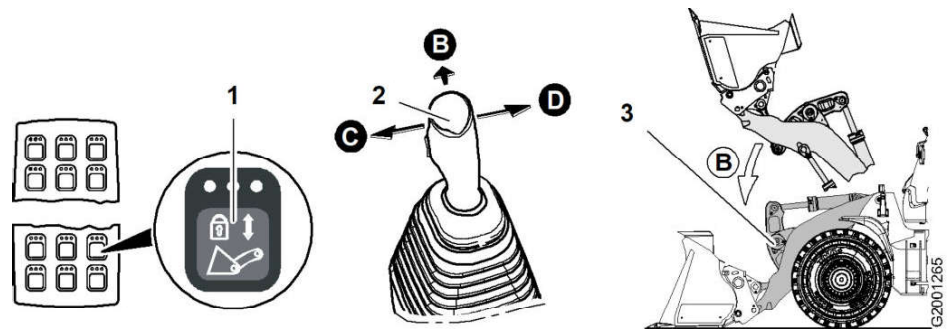


Fig. 383: Lower the lift arms

- | | | | |
|---|--------------------------------|---|-----------|
| 1 | Working hydraulics lockout key | 3 | Lift arms |
| 2 | Control lever | | |








- ▶ Switch on the ignition.
- ▶ Press and hold down the key 1 while moving the control lever 2 in direction B and lower the lift arms 3 to the ground.
- ▶ Press and hold down the key 1 while moving the control lever 2 several times in directions C and D.
 - ▷ The hydraulics are 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 following requirements are met:






- The lift arms have been lowered.

Symbol in the display	Meaning	Cause	Remedy
	Central lubrication system warning	Central lubrication system: grease reservoir level low	Top up the central lubrication system
	Malfunction in the central lubrication system	Central lubrication system: grease reservoir empty	Top up the central lubrication system
	Service notification	Machine due for servicing	Contact Liebherr customer service
	Air filter contamination	Air filter is dirty	Clean/replace air filter, contact Liebherr customer service
	Joystick steering malfunction	Joystick steering is not working	Reactivate joystick steering, contact Liebherr customer service
	Working hydraulics lockout safety shutdown	Error on the machine	Contact Liebherr customer service
	Diesel engine power reduction	Diesel engine malfunction	Contact Liebherr customer service

Tab. 67: Warning symbols

4.2.2 SCR system warning symbols

A warning tone sounds for every change to the status of the SCR system.

Symbol in the display	SCR system status	Limitation
	Diesel exhaust fluid filling level below 10% or SCR system malfunction	None
 	Diesel exhaust fluid filling level below 5% or SCR system malfunction	Power reduction to 80%
 	Diesel exhaust fluid filling level below 2.5% or SCR system malfunction	Power reduction to 20%




- ▶ Remove the cover 1.
- ▶ Identify the defective fuse using the table below.
- ▶ Take out the defective fuse and replace it with a new one.

**Note**

Check the fuses!

- ▶ Check the fuse in the FUSE-TEST slot.
- ▶ If the fuse is intact, the LED lights up.

Fuse	Value	Unit	Designation/function
F01	100	A	Main fuse
F02	100	A	Heater flange
F03	200	A	Emergency steering pump
F1	5	A	Input and output module 1
F2	5	A	Input module 1
F3	5	A	Spare
F4	5	A	Output module 1 BK2
F5	5	A	Cab access switch
F6	1	A	B785 humidity sensor
F7	2	A	B726 NOx sensor up
F8	2	A	B727 NOx sensor down
F9	2	A	B783 NH3 sensor
F10	2	A	LiDEC PS2
F11	5	A	Water valve Y770, Y774
F12	5	A	Spare
F13	5	A	Diesel engine diagnosis
F14	30	A	LiDEC PS1
F15	10	A	Output module 1 DO1
F16	10	A	Output module 1 DO2
F17	10	A	Output module 1 DO3
F18	10	A	Output module 1 DO4
F19	10	A	Output module 1 BK4
F20	1	A	A774 AdBlue tank
F21	7.5	A	M715 brake valve 1
F22	5	A	B730 oil level sensor
F23	10	A	Hazard warning lights
F24	10	A	Transmission terminal 30
F25	10	A	Hose heating E770, E771 SCR
F26	10	A	A709 SCR air pump

Designation	Recommended operating fluid	Symbol	Quantity
Diesel engine cooling system total capacity	Liebherr Antifreeze OS Mix	 06sy04ab	67 l
Windscreen washer system	Standard windscreen washer fluid or denatured alcohol	 b0000055	5.3 l
Air conditioning unit refrigerant	R134a CO ₂ equivalent	 G2036212	1.25 ^{+0.02} kg 1.79 t
Refrigerant oil for air conditioning compressor	ZXL 100 PG (PAG Oil)		210 cm ³

Tab. 77: Recommended operating fluids

5.2.3 Lubrication chart

The lubrication chart provides an overview of the location of the maintenance points on the machine and of the maintenance intervals.

Information on:

- Performance of maintenance tasks (For more information see: [5.1 Maintenance and inspection schedule, page 255](#))
- Lubricants and fuels (For more information see: [5.3 Lubricants and fuels, page 265](#))
- Filling quantities (For more information see: [5.2 Filling quantities and lubrication chart, page 260](#))

Minimum quality requirements

Specification
API: GL-5
MIL-L: 2105 D, PRF-2105 E

Tab. 98: Minimum quality requirements

When using oil from other manufacturers, you must obtain information from the **Liebherr Lubricant Hotline**.

5.3.11 Gear oil

Liebherr recommendation

Ambient temperature	Designation
-40 °C to +50 °C	Liebherr Gear MF 80W

Tab. 99: Liebherr recommendation

Minimum quality requirement

Specifications
ZF: TE-ML 03G, 03L

Tab. 100: Minimum quality requirement

When using oil from other manufacturers, you must obtain information from the **Liebherr Lubricant Hotline**.

5.3.12 Axle oil

Liebherr recommendation

Ambient temperature	Designation
-30 °C to 50 °C	Liebherr Gear Basic 90 LS

Tab. 101: Liebherr recommendation

Minimum quality requirement

Specifications
ZF: TE-ML 05C

Tab. 102: Minimum quality requirement

Only axle oils with a phosphorus content of at least **1900 mg/kg** may be used for wheel loaders.

5.6 Overall machine

5.6.1 Checking the machine is in the proper condition

Make sure that following requirements are fulfilled:

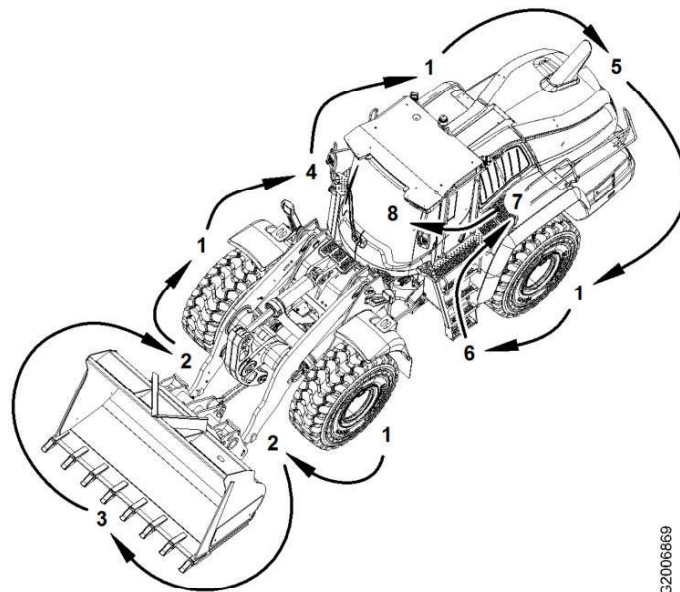
- The machine is parked in a safe place.



WARNING

Damaged components!
Risk of injury.

- ▶ Replace damaged components.
- ▶ Contact Liebherr customer service.



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Fig. 437: Checking the machine is in the proper condition

- ▶ Check that the machine is in the proper condition.

Position	Component	Check
1	Tyres	Check the tyres for loose wheel bolts, damage and stones in the tread.
2	Bucket bearings and lift arms	Check that the bucket bearings and lift arms are sufficiently lubricated and free of damage.
3	Working attachment	Check the working attachment for wear and damage.
4	Side window	Check that the side window is clean and free of damage.

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5.7 Drive group

5.7.1 Checking diesel engine oil level

There are two ways to check the oil level:

- Checking the oil level on the display
- Checking the oil level on the dipstick

Checking the oil level on the display

Make sure that following requirements are met:

- The diesel engine is level and has been switched off for 6 hours.
- Diesel engine has cooled down.

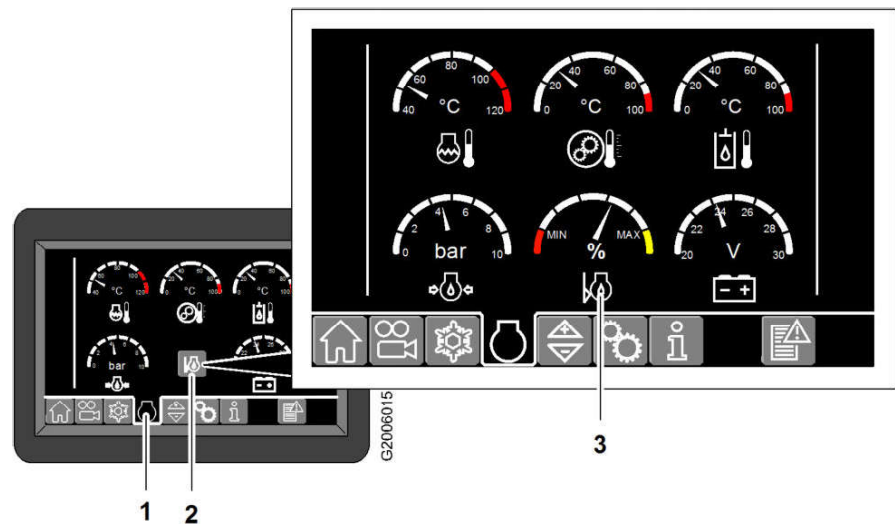


Fig. 446: Checking the oil level on the display

- | | | | |
|---|--------------------------------------|---|------------------------|
| 1 | Operating status button | 3 | Oil level check button |
| 2 | Check diesel engine oil level button | | |

- ▶ Switch on the ignition.
- ▶ Press button 1.
- ▶ Press button 2.
 - ▷ Oil level check 3 is displayed for 10 seconds.
 - ▷ The oil level in the oil level check 3 must be between MIN and MAX.

If the oil level is below MIN:

- ▶ Top up oil. (For more information see: [Topping up the oil, page 292](#))

Troubleshooting

If the oil level is above MAX:

- ▶ Contact Liebherr customer service.
-

Installing the main element

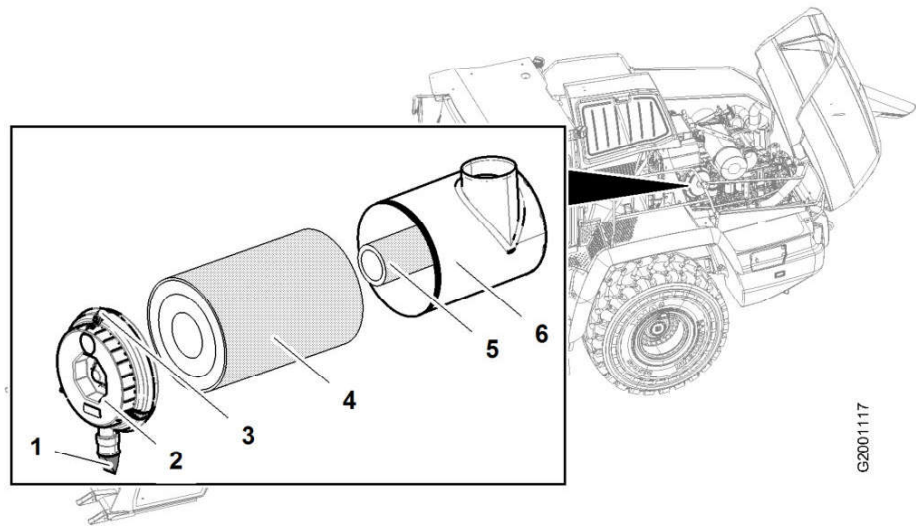


Fig. 457: Removing the main element

- | | | | |
|---|----------------------|---|----------------|
| 1 | Dust discharge valve | 4 | Main element |
| 2 | Service cover | 5 | Safety element |
| 3 | Fixing clips | 6 | Filter housing |

- ▶ Lightly oil the sealing face of the main element 4.
- ▶ Install the main element 4.
- ▶ Put the clean service cover 2, with the dust discharge valve 1 facing down, on the filter housing 6.
- ▶ Close the fixing clips 3.



Note

If the *air filter contamination* symbol lights up again a few operating hours after the main element has been cleaned:

- ▶ Change the main element.



Note

If the *air filter contamination* symbol remains lit after the main element has been changed:

- ▶ Change the safety element.

5.7.7 Air filter system: Changing the safety element

NOTICE

Always carry out maintenance correctly.
Damage to the engine.

- ▶ Do not clean the safety element.
- ▶ Only replace the safety element.

Example 2:

- ▶ Identified freezing point = -58 °C.
- ▶ Total capacity of the cooling system = 60 l.
 - ▷ Freezing point too low.
 - ▷ Amount of pure water to top up = 6.5 l.

Correcting the anti-freeze and corrosion agent concentration

- ▶ Place a receptacle under the machine.
- ▶ Unscrew the cap of the drain valve **3** (see: fig. 464, page 308) .
- ▶ Screw the drain hose onto the drain valve **3** (see: fig. 464, page 308) .
 - ▷ Coolant flows out.
- ▶ Drain off as much coolant as the amount to be topped up.
- ▶ Unscrew the drain hose from the drain valve **3** (see: fig. 464, page 308) .
- ▶ Screw the cap onto the drain valve **3** (see: fig. 464, page 308) .

NOTICE

Non-approved coolant!
Damage to the engine and cooling system.

- ▶ Only use coolant that meets the Liebherr specifications.
 - ▶ Do not mix coolants with and without silicates.
-

- ▶ Top up the equalising reservoir with the correct amount of pure anti-freeze and corrosion agent or pure water.
 - ▶ Close the cap **1** (see: fig. 464, page 308) of the equalising reservoir **2** (see: fig. 464, page 308) .
 - ▶ Start diesel engine.
 - ▶ Set the heater to the maximum temperature and blower speed.
 - ▶ Run machine for five minutes at upper diesel engine speed.
 - ▷ The coolant is circulated.
 - ▶ Turn off diesel engine.
 - ▶ Wait until the diesel engine has cooled down.
-



CAUTION

Hot, pressurised liquid!
Beware of burns.

- ▶ Let the engine cool down.
-
- ▶ Carefully open the cap **1** (see: fig. 464, page 308) of the equalising reservoir **2** (see: fig. 464, page 308) .
 - ▶ Check the concentration of anti-freeze and corrosion agent and correct it if necessary.
 - ▶ Close the cap **1** (see: fig. 464, page 308) of the equalising reservoir **2** (see: fig. 464, page 308) .

5.11 Brake system

5.11.1 Emergency actuation of parking brake: checking the seal

This equipment is optional.

Make sure that following requirements are met:

- Machine is in maintenance position 1.

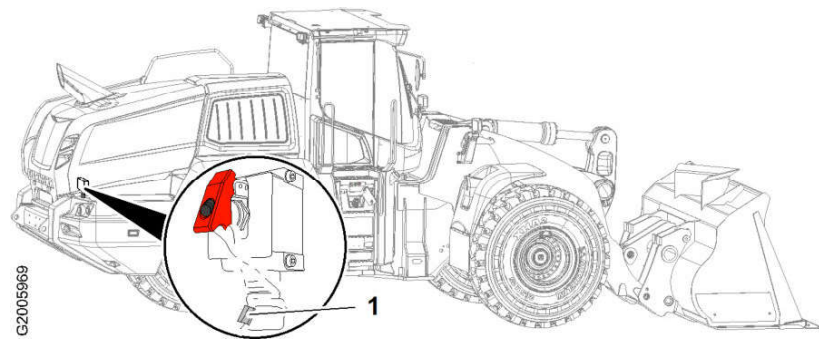


Fig. 474: Checking emergency actuation of parking brake

1 Seal

- ▶ Check that the seal is in perfect condition.

If the seal has been damaged or removed:

- ▶ Do not operate the machine.
- ▶ Contact Liebherr customer service.

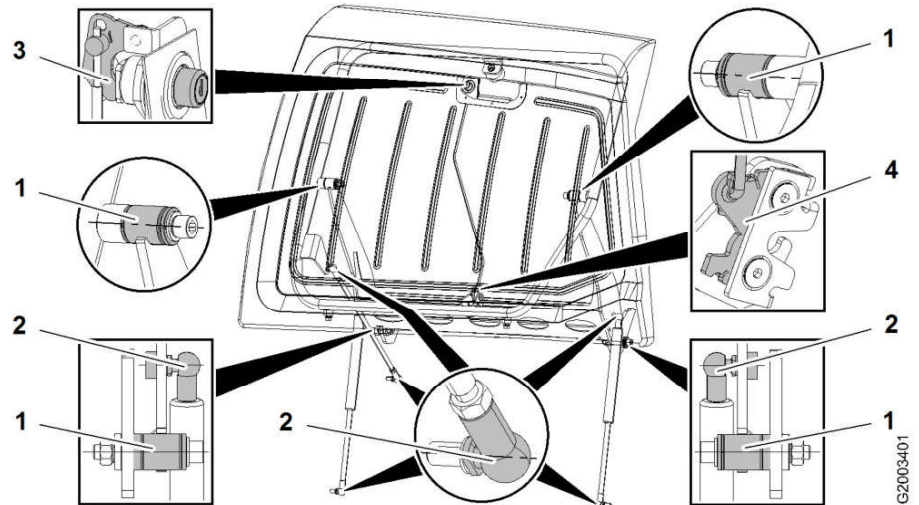


Fig. 483: Cooler hood: Lubricating moving parts with penetrating oil

- | | | | |
|---|-----------------|---|-------------------|
| 1 | Sliding bearing | 3 | Locking cylinder |
| 2 | Ball joint | 4 | Locking mechanism |

► Lubricate the sliding bearing 1, ball joint 2, locking cylinder 3 and locking mechanism 4 with Ballistol spray (item code 10025514).

► (For more information see: [Opening and closing the cooler hood, page 277](#))

5.15.3 Engine hood: Lubricating moving parts with penetrating oil

Make sure that the following requirements are fulfilled:

- The machine is in maintenance position 1.
- The service access is open.

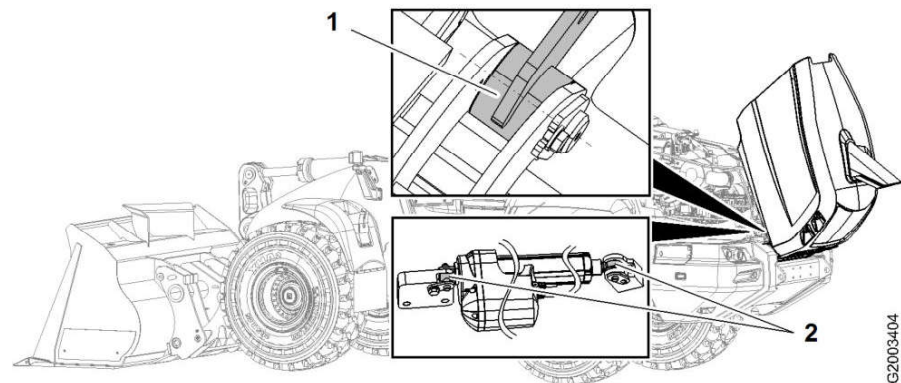


Fig. 484: Engine hood: Lubricating moving parts with penetrating oil

- | | | | |
|---|-----------------------|---|-----------------|
| 1 | Sliding bearings (2x) | 2 | Sliding bearing |
|---|-----------------------|---|-----------------|

► Lubricate the sliding bearings 1 and 2 with Ballistol spray (item code 10025514).

► (For more information see: [Opening and closing the engine bonnet, page 275](#))

5.17 Operator's cab, heating and air conditioning

5.17.1 Operator's cab: cleaning the fresh and recirculated air filters

Make sure that the following requirements are fulfilled:

- The machine is in maintenance position 1.
- The right cab access is extended.
- Suitable protective equipment is used.

Cleaning the fresh air filter

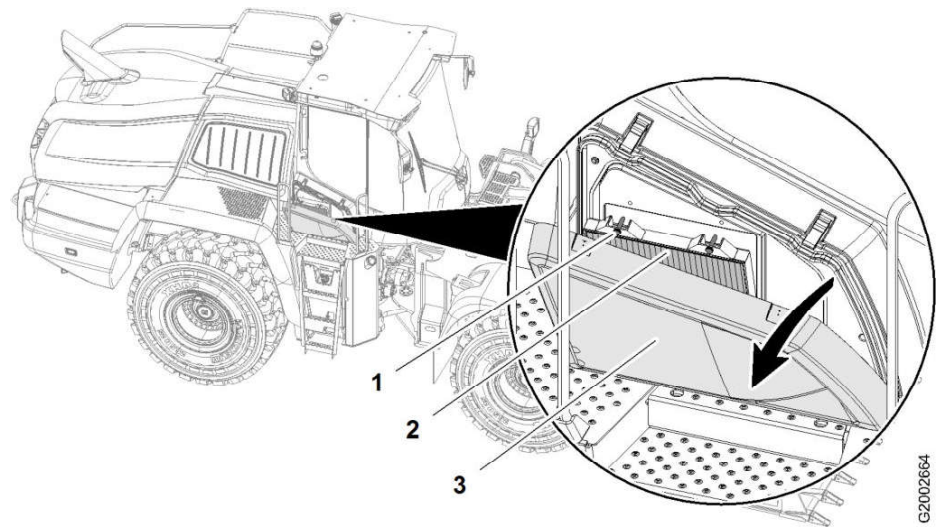


Fig. 493: Cleaning the fresh air filter

- | | | | |
|---|--------------------|---|-------|
| 1 | Knurled screw (2x) | 3 | Cover |
| 2 | Fresh air filter | | |

- ▶ Open the cover 3.
- ▶ Unscrew the knurled screw 1.
- ▶ Take out the fresh air filter 2.
- ▶ Clean (blow out) the fresh air filter 2.
- ▶ Put in the clean fresh air filter 2.
- ▶ Screw in the knurled screw 1.
- ▶ Close the cover 3.

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