en **Operator's manual**

Wheel loader

L 509-1112

From serial number 26361

Document ID

ORIGINAL OPERATOR'S MANUAL

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Contents

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A) The measuring uncertainty is defined in the EN 12096:1997 standard.

1.2.2 Sound emission

bpik0037 

The sound pressure level (Lpa) is determined according to ISO 6396. The measuring uncertainty is defined in this standard.

The sound output level (Lwa) is determined according to the directive 2000/14/EC. The measuring uncertainty is determined according to the ISO 4871 standard.

Sound pressure

Description	Unit	Value
ISO 6396 - L_{pA} (in driver's cab)	dB(A)	70

Sound output

You can read the level on the sign on the machine. (For more information see: 2.3.2 Information signs, page 38)

1.2.3 Engine

bpik0027 

Water-cooled diesel engine with turbocharger.

The exhaust emissions are below the threshold levels in EU directive 97/68/EC - Tier III A and Tier 3.

Description	Unit	Value
Diesel engine		TD 2011 L04W
Number of cylinders	pc.	4
Combustion method		Pump-line direct injection system (PLD)
Rated power according to ISO 9249 at 2,600 rpm	kW	60
Maximum torque at 1,600 rpm	Nm	257
Capacity	litres	3.62
Idle speed	rpm	min. 950 ±50 max. 3,070 ±50
Longitudinal / traverse inclinability	°	30

1.2.4 Electrical system

bpik0028 

Description	Unit	Value
Battery voltage	V	12

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	Description	Unit	Value
	Bucket width	mm	2330
	Specific material weight	t/m³	1.8
A	Dump height at maximum lifting height and 42° tilt-out angle	mm	2634
A1	Max. dumping height with open bucket	mm	3356
C	Maximum bucket base height	mm	3074
E	Maximum bucket top height	mm	4895
F	Reach at maximum lifting height and 42° tilt-out angle	mm	965
L	Overall length	mm	5835
W	Max. bucket opening	mm	1008
	Turning radius over bucket outer edge	mm	4280
	Tipping load when straight	kg	4227
	Articulated tipping load	kg	3846
	Operating weight	kg	6307

Tab. 7: Attachment – 4 in 1 bucket

1.2.21 Forklift attachment

The values stated refer to the machine:

- Including Michelin tyres 405/70R18
- Including all lubricants
- With a full tank
- With ROPS/FOPS cab and driver

Tyre sizes and additional attachments affect the operating weight and tipping load.

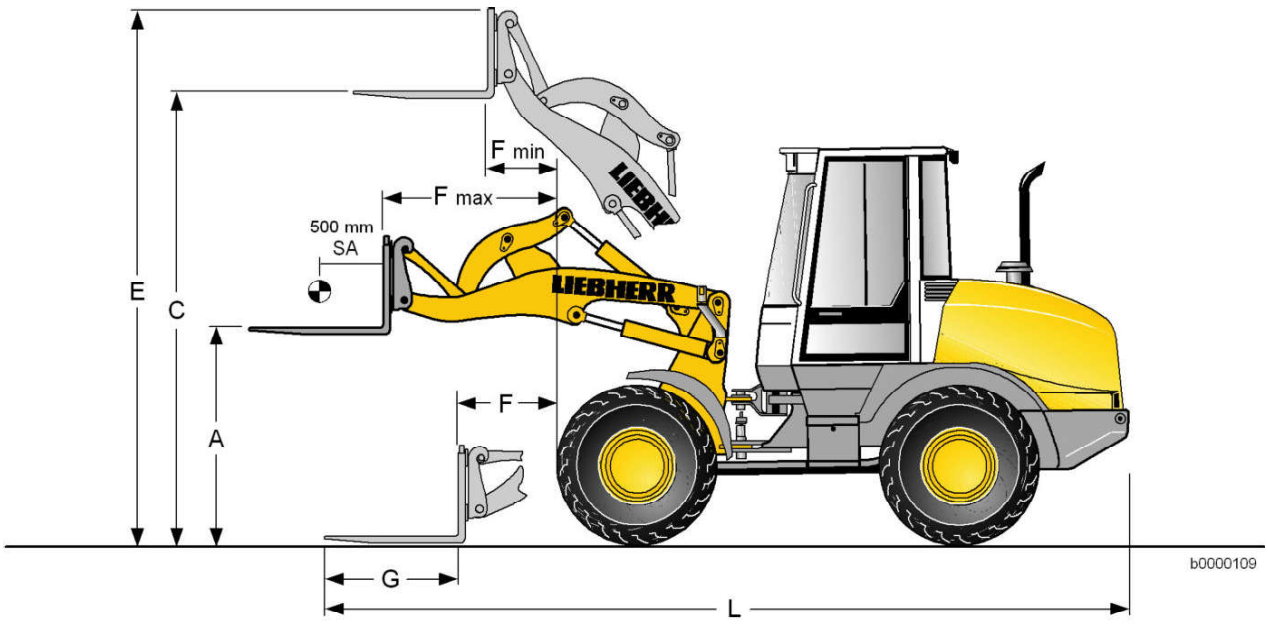

Fig. 23: Forklift attachment

Hydraulic fluid sign

Fig. 43: Hydraulic fluid sign

Indicates the oil with which the hydraulic system is filled.

Cooler sign

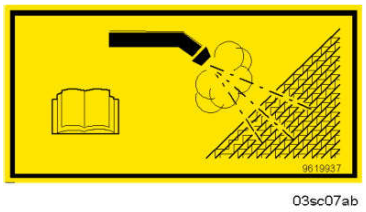

Fig. 44: Cooler sign

Indicates cleaning of the cooling system.

System voltage sign

This equipment is optional.

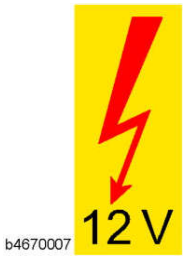

Fig. 45: System voltage sign

Indicates the electrical system's voltage.

Never use ether starting agent near head sources, naked lights (such as cigarettes) or in poorly ventilated spaces.

10. Do not use starting agents containing ethers to start diesel engines with preglow or flame glow systems.
    Otherwise there is a risk of **"Explosion"** !
11. Familiarise yourself with the location and use of fire extinguishers and find out about fire alarm and firefighting facilities on site.

2.4.4 Safety instructions for start-up

1. Each time you start up the machine, make a thorough tour of inspection.
2. Check the machine for loose bolts, cracks, wear, leaks and deliberate damage.
3. Never start up a damaged machine.
4. Make sure the damage is rectified immediately.
5. Ensure that all hoods and covers are closed and locked. Check that all the warning and instruction signs are in place.
6. Clean the windows and interior and exterior mirrors, and secure the doors and windows against inadvertent movement.
7. Make sure no-one is working on or underneath the machine. Warn any bystanders before you start up the machine.
8. After getting into the driver's cab, adjust the seat, the inside and outside mirrors, the control lever and the seat belt so that you can work comfortably.
9. Sound insulation equipment on the machine must be in place during operation.

2.4.5 Safety precautions during start-up

1. Before starting, check that all control lamps and instruments are working properly.
2. Move all control levers to neutral.
3. Before starting the engine, briefly sound the horn to warn anyone else in the vicinity of the machine.
4. Only start the machine when sitting in the driver's seat.
5. Unless otherwise instructed, start the engine in accordance with the instructions in the **"operating manual"** .
6. Start the engine and then check all display and monitoring equipment.
7. Only run the engine in enclosed spaces when there is sufficient ventilation.
   If necessary, open the windows and doors to ensure adequate fresh air.
8. Run the engine until both it and the hydraulic oil are at operating temperature.
   Low oil temperatures lead to sluggish performance.
9. Check that the attachment controls are working properly.
10. Carefully drive the machine to open ground and check the service brake, the steering, the signals and lighting.

2.4.6 Instructions for safe working

1. Before starting work, familiarise yourself with the features of the site, as well as any special regulations and warning signals.
   The working environment includes obstacles in the working area and on access roads, the firmness of the terrain and any protective barriers to prevent the public from entering the site.
2. Always keep a safe distance from overhangs, drops, slopes and unsafe terrain.
3. Be especially careful with variable terrain conditions, poor visibility and changeable weather.

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2.4.20 See and be seen

Field of view

As a machine driver, you gain most of your information visually when working. To minimise risks to yourself and others while travelling and working, you must have adequate vision. Use the visual aids attached to the machine, such as mirrors and cameras. Take account of restrictions to your field of vision or blind spots.

You must follow national regulations relating to vision from the cab. For countries in the European Economic Area, standard ISO 5006:2006 describes the methods for measuring and evaluating the machine driver's field of vision. The field of vision is tested using standard equipment. Changes to the machine, e.g. from attaching or converting components, must not impair the driver's vision. If changes worsen the field of view, a test according to ISO 5006:2006, or the regulations applicable to the place of work, must be performed. Depending on the test result, appropriate measures must be taken. The machine driver must be informed of these changes.

Measures before and during operation

- Ensure that persons establish contact with the machine driver before approaching the machine.
- Check that the visual aids function properly, are clean and adjusted correctly.
- Visual aids must be adjusted to ensure the best possible all round vision.
- Clean the visual aids and the cab windows immediately if dirt affects vision.
- Have faulty visual aids repaired or replaced straightaway.
- Do not use sun visors if they restrict vision.
- Observe your surroundings continuously to spot potential hazards in good time.
- Avoid reverse travel where at all possible.
- Try to maintain direct vision: plan work so that your view of the working area is not blocked.
- Where visibility is restricted or if the visual aids are faulty, always have someone direct you. Agree hand signals and, with difficult tasks, also keep in voice contact (e.g. via radio).
- Use lighting when visibility is poor and as required by regulations.

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The adjustable seat surface, back rest, suspension and arm rest mean that the driver can adjust the seat for maximum individual comfort.

Shock absorption:

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

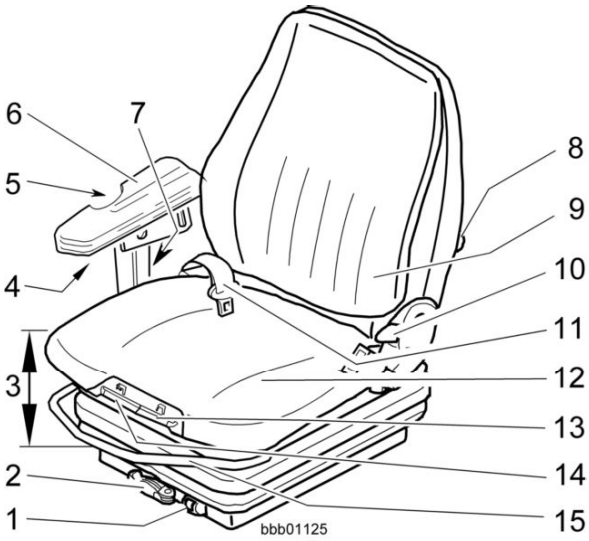

Fig. 78: Main components and adjustable elements of the driver' seat

1	Weight indicator	**9**	Back rest
2	Body weight adjustment knob	**10**	Lever for back rest inclination adjustment
3	Seat height adjuster	**11**	Seat belt
4	Locking screw for arm rest horizontal adjustment	**12**	Seat surface
5	Locking screw for arm rest inclination adjustment	**13**	Lever for seat surface inclination adjustment
6	Arm rest	**14**	Lever for seat surface horizontal adjustment
7	Locking screw for arm rest height adjustment	**15**	Lever for driver's seat horizontal adjustment
8	Lumbar support knob		

Adjusting the driver's seat

The seat can be adjusted to the driver's individual requirements to provide the highest possible degree of comfort.

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

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

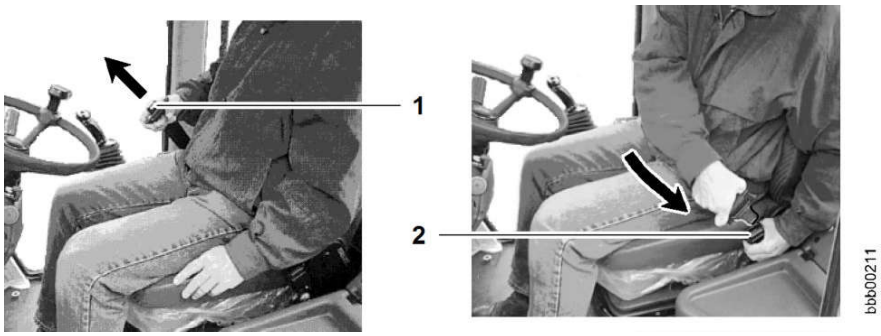

Fig. 98: Fastening the seat belt

1 Belt buckle **2** Snap lock

Note
The roller may lock if you pull out the belt suddenly.

▶ Pull the belt smoothly out of the roller.

▶ Pull the belt buckle **1** over your body at hip level and plug it into the snap lock **2**.

▶ Pull the belt to check that the buckle **1** is engaged in the snap lock **2**.

Releasing the seat belt

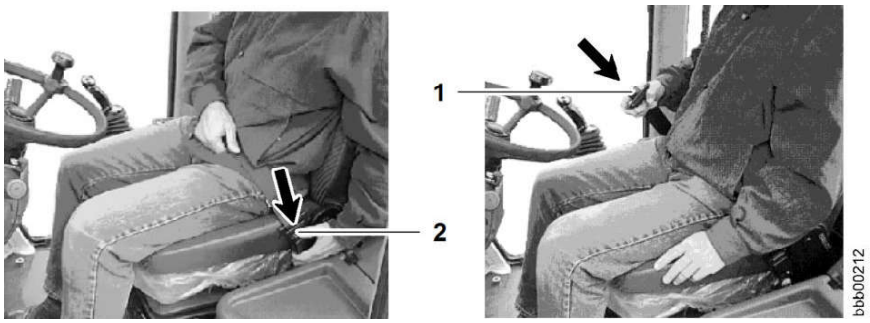

Fig. 99: Releasing the seat belt

1 Belt buckle **2** Snap lock

▶ Push down the lock button on the snap lock **2**.

▶ Let the belt slowly wind up the roller.

3.2.9 Steering column and steering wheel

The steering column with the steering wheel and steering column switch is integrated in the steering console.

Adjusting the steering column

This equipment is optional.

The steering wheel can be adjusted to suit the driver by adjusting the steering column.

The steering wheel can be adjusted progressively.

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3 Engine stop symbol field (not activated)
4 Joystick steering symbol field
5 Emergency steering symbol field (not activated)
6 Engine warning symbol field (not activated)
7 “Forward” travel direction symbol field
8 “Reverse” travel direction symbol field
9 Engine oil pressure symbol field
10 Working hydraulics lockout symbol field
11 Engine overheating symbol field
12 Hydraulic oil overheating symbol field
15 Travel range 2 symbol field
16 Travel range 1 symbol field
17 Travel direction symbol field “neutral”
18 Air filter contamination symbol field
19 Service hours segment display
20 Preglow monitor symbol field
21 Battery charge (charge control) symbol field
22 Symbol field - main beam
23 Direction indicator symbol field

Fuel level indicator


bbb00118

Fuel level indicator

Field colour - green (red in reserve range)

Shows the amount of fuel left in the tank.

Joystick steering indicator

This equipment is optional.

Joystick steering symbol field

Symbol field colour - red

Lights up during joystick steering operation.

“Forward” travel direction indicator

Forward travel direction symbol field

Symbol field colour - yellow

Indicates that forward travel has been selected.

Reverse travel direction indicator

Reverse travel direction symbol field

Symbol field colour - yellow

Indicates that reverse travel has been selected.

Engine oil pressure indicator


04ml25ab

Engine oil pressure symbol field

Symbol field colour - red

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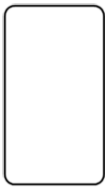
Dummy plug



Dummy plug

Reserved for additional functions.

3.2.17 LIEBHERR control lever

This section describes the design and function of the LIEBHERR control lever.

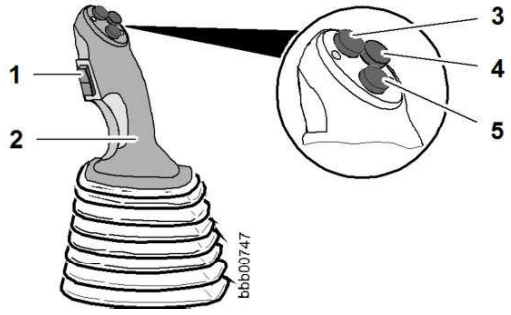


Fig. 164: LH control lever

1 LH control lever

2 Travel direction switch

3 Optional attachment button (option)

4 Optional attachment button (third control circuit - option)

5 Optional attachment button (fourth control circuit - option)

Use the LIEBHERR control lever (LH control lever) to control the travel direction and movements of the working attachment and optional attachments (optional).

Selecting a travel direction

The travel direction cannot be selected while the parking brake is engaged.

WARNING
Select a travel direction!

▶ When the travel direction is selected, the machine can also pull away without pressing the gas pedal.

3.2.24 Windscreen wiper and washer system

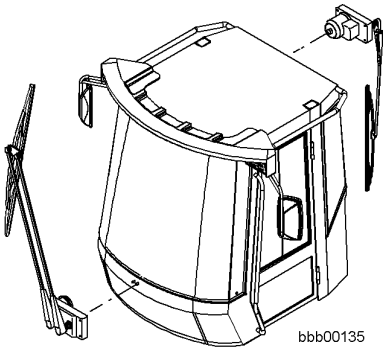


Fig. 182

The machine has an electric windscreen washer and wiper system for both the front and rear windscreens.

Essentially it consists of the controls, the windscreen wipers, the reservoir and pumps, and the outlet nozzles for the washing fluid.

The wiper and washer systems for the front and rear windscreen use a shared washer fluid reservoir.

Non-return valves are fitted in the washing fluid hoses to the outlet nozzles.

The switches for the front washer and wiper system are on the steering column switch.

The switches for the rear washer and wiper system are in the right-hand side console. There is a spring-action button for activating the washer pump.

Activating the windscreen wiper and washer system

Make sure that the electrical system is switched on before using the wiper and washer system.

CAUTION
Impaired vision can cause accidents.
A dirty front or rear windscreen is a safety hazard.

▶ Scrape snow and ice from the windscreen before driving.

Using the front windscreen wiper and washer system

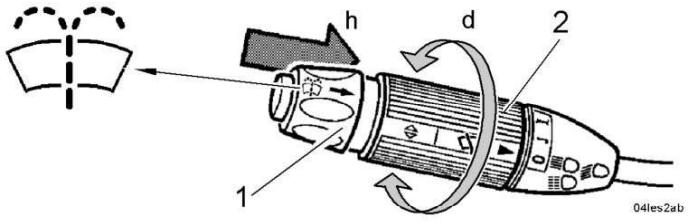


Fig. 183: Steering column switch

1 Button
2 Handle
d Windscreen wiper activation
h Windscreen wiper and washer system activation

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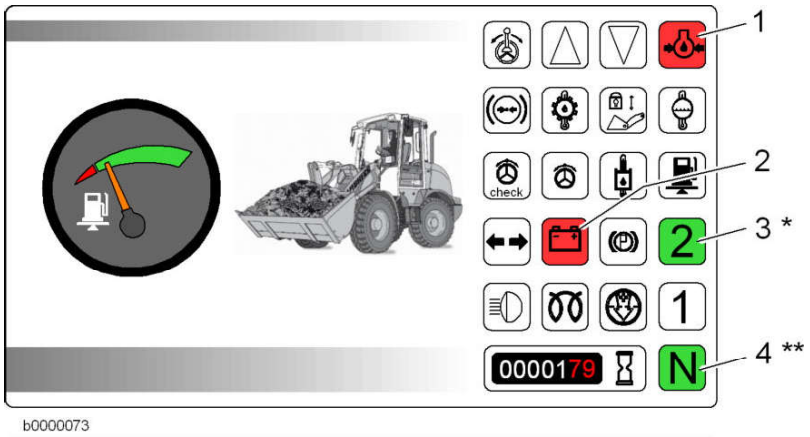

Fig. 201: Display unit lamp check complete

1	Engine oil pressure symbol field	**3**	Travel range 2 symbol field
2	Battery charge (charge control) symbol field	**4**	Travel direction “neutral” symbol field

▷ * Depending on the selected travel range, the symbol field for either travel range 1 or travel range 2 lights up.
▷ ** Depending on the selected travel direction, the symbol field for either travel direction “neutral” , “forward” or “reverse” lights up.

Preglowing the engine

Fig. 202: Ignition key contact and preglow positions

The preglow time depends on the outside temperature and the electrical starting conditions.

The minimum is 20 seconds and at extremely low temperatures it can be more than 120 seconds.

Note
If the engine is warm and at high ambient temperatures, you do not need to wait for the preglow time.

▶ Do not preglow the engine if it is already at operating temperature.

▶ Switch on the electrical system by turning the ignition key to position **I**.
▷ The following symbol fields must light up:

Service brake

If hydrostatic braking is not sufficient, you must brake the machine using the inch/brake pedal.

Braking with the inch/brake pedal

During braking, there are two actuation ranges for the inch/brake pedal:
– Range **I** for hydrostatic braking only.
– Range **B** for braking with the hydrostatic circuit and the service brake.

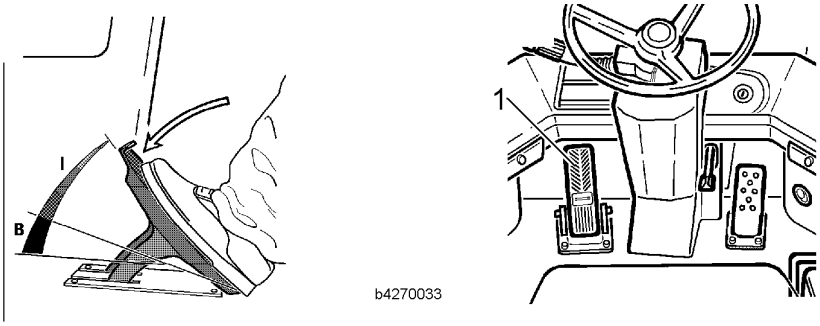

Fig. 221: Inch/brake pedal

1 Inch/brake pedal
I Inching range
B Service brake range

WARNING
If you brake the machine, you may suffer severe injuries if your seat belt is not properly fastened.

▶ It is essential that you fasten your seat belt before starting up the machine.

▶ For full braking in emergencies, push the inch/brake pedal all the way down.

▶ Braking with the hydrostatic circuit only: Press the inch/brake pedal **1** in range **I**.
or

To brake with the hydrostatic circuit and the service brake: Press the inch/brake pedal **1** in range **B**.
▷ The machine is braked accordingly.

Braking in emergencies

WARNING
If you brake the machine, you may suffer severe injuries if your seat belt is not properly fastened.

▶ It is essential that you fasten your seat belt before starting up the machine.

▶ For full braking in emergencies, push the inch/brake pedal all the way down.

▶ Press the inch/brake pedal **1** in range **B** as far as it will go.
▷ This brakes the machine suddenly.

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Fig. 242: Switches on the side console

1 Lift kick-out switch

▶ Press the switch **1** for lift kick-out.
▷ The lift kick-out function is now active.

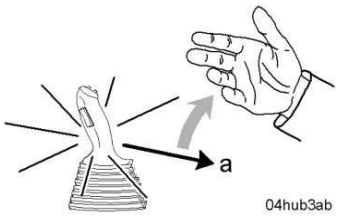

Fig. 243: LH control lever

▶ Move the LH control lever in direction **a** through the action point as far as it will go and then release it.
▷ The LH control lever is held in this position by magnetic force.

This means that the lift arm is only raised as far as the switching point for the lift kick-out.

The lifting procedure is automatically stopped at this point.

Lift kick-out for reduced dumping height

You can also use the proximity switch to set a reduced dumping height.

CAUTION
There is a risk of accidents when working close to a height limit.

▶ Work with extreme caution!

▶ Set the lift kick-out for a reduced dumping height.

Setting the lift kick-out for reduced dumping height

The proximity switch for the automatic lift kick-out is set at the factory.

If necessary, the proximity switch can be re-adjusted.

The procedure for re-adjusting the proximity switch is as follows.

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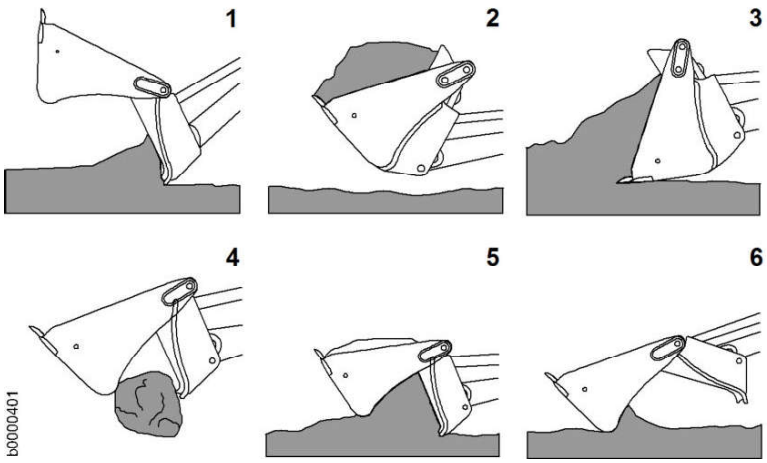

Fig. 255: Alternative applications

1	Clearing and scraping bulk materials	**4**	Grabbing unwieldy objects
2	Loading	**5**	Piling up materials when open
3	Digging	**6**	Levelling

The manufacturer will not be held liable for damage caused by improper use.

Function test

CAUTION
There is a risk of accidents if the hydraulic circuit is incorrectly connected.

▶ Carry out a function test.

Before starting work:

▶ Test the operation and function of the 4in1 bucket without loading and bulk materials.

Opening and closing the bucket

This section describes the various ways of opening and closing the 4in1 bucket

Alternative versions:
– Using the control lever for additional working functions
– Using comfort control
– Using control buttons

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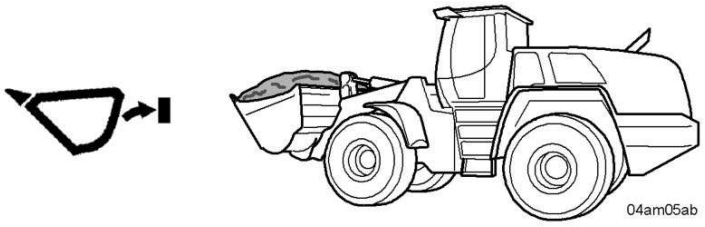

Fig. 268: Picking up and moving material

▶ Tilt in the loaded bucket as far as it will go and raise the lift arms.

3.4.2 Transporting and moving material

The bucket should be moved into the transport position to improve the machine's stability and to ensure good viewing conditions when transporting and transferring bulk materials.

Transport position

The transport position means
– Bucket pivot point approx. 40 cm above the ground
– Attachment tilted in

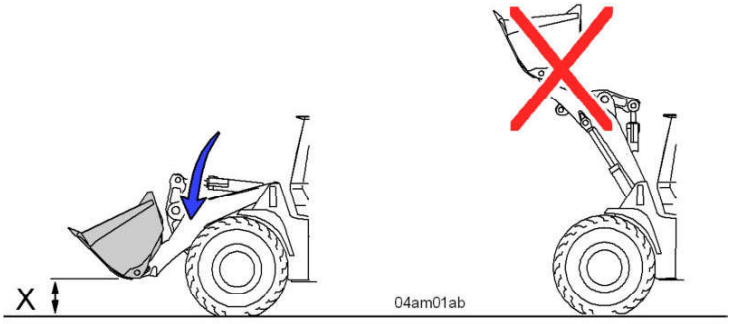

Fig. 269: Transport position

X Bucket pivot point approx. 40 cm

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

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

▶ Move the loaded bucket to the transport position.

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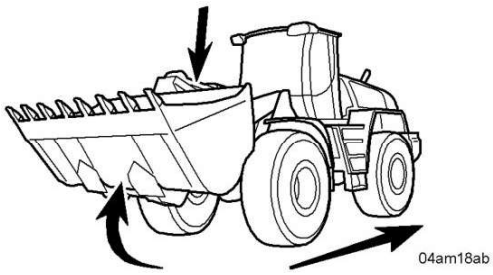

Fig. 288: Lift arm position.

▶ Lower the lift arm when driving back.

3.4.7 Excavation

Lifting out soft material

This is how to excavate soft material.

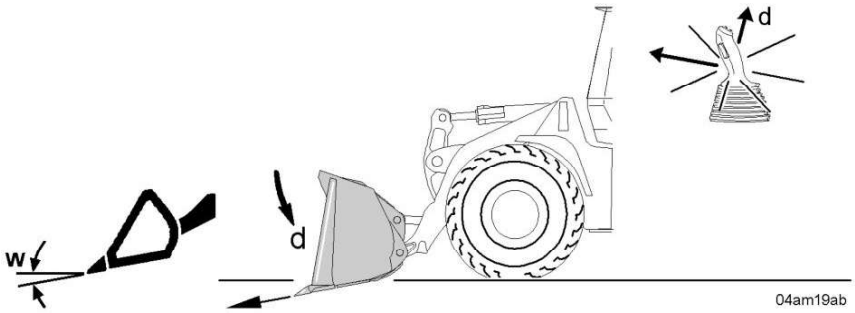

Fig. 289: Angle of penetration

▶ Lower the bucket to the ground.

▶ Set a small cutting angle **W** of no more than 10°.

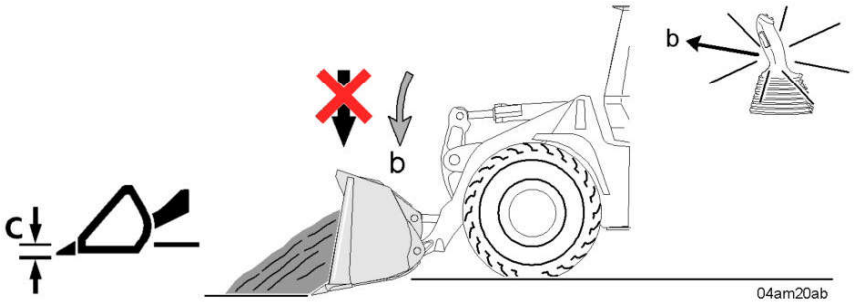

Fig. 290: Penetration depth

▶ When approaching with the machine, simultaneously press the lift arms down, until a sufficient penetration depth **C** is reached.

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

▶ Do not work with a strong downwards pressure on the bucket.

▶ Turn off the diesel engine.

▶ Switch on the ignition

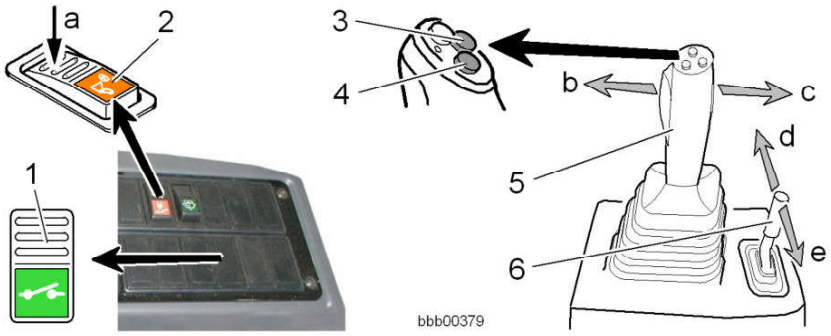

Fig. 308: Reducing the operating pressure

1	Comfort control switch	**4**	Button
2	Working hydraulics lockout switch	**5**	LH control lever
3	Button	**6**	Control lever for additional working functions

▶ Activate the comfort control switch.

▶ Press and hold down the working hydraulics lockout button **-a-**.

At the same time, perform the following:

– Press the button **3** while moving the LH control lever several times in directions **b** and **c**.
– Press the button **4** while moving the LH control lever several times in directions **b** and **c**.
– Move the control lever for additional functions in directions **d** and **e** several times.

▶ This reduces the hydraulic pressure of the working attachment.

Removing the working attachment from the quick-change device

Disconnecting hydraulic lines

If the working attachment has an independent hydraulic circuit, the hydraulic supply lines must be disconnected.

The procedure for disconnecting the hydraulic lines is as follows.

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

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

▶ Depressurise the hydraulics. (For more information see: Depressurising the operating circuits, page 180)

▶ Release the hydraulic lines and quick-release couplings from the machine.

▶ Make sure that no hydraulic oil leaks onto the ground.

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NOTICE
There is a danger of damage to the tilt cylinder resulting from movements of the lift arms without quick-change device or with the bucket attached.

- ▶ Do not completely lift up the lift arms and tilt out simultaneously.
- ▶ Attach the quick-change device or bucket immediately after removing the transport safety retainers.

- ▶ Check the function of the equipment after installation.

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Engine		
Malfunction/fault	**Cause**	**Remedy**
	Fuel not suitable for ambient temperature	Fill up with winter diesel for cold temperatures
	Fuel filter or fuel pre-filter contaminated	Replace the fuel filter and clean the fuel pre-filter
	Start/stop solenoid does not actuate	Check the fuses and replace if necessary
Engine is not operating at full power	Insufficient fuel supply to engine	Clean the fuel pre-filter Replace the fuel filter
	Insufficient air supply to engine	Check the air filter and replace it if necessary
	Maximum engine speed is not reached (speed adjuster lever is not at the full load position when the pedal is fully depressed)	Adjust the control cable
Engine gets hot	The radiator is dirty	Clean the radiator
	Engine cooling system thermostat defective	Contact Liebherr Customer Service
	Fan motor runs slowly or not at all	Contact Liebherr Customer Service
Battery charge indicator light does not go out	Engine idle speed too low after starting	Press the accelerator until the indicator lamp goes out
	Torn V-belt	Replace the V-belt

Tab. 16

Travel hydraulics / driving mode		
Malfunction/fault	**Cause**	**Remedy**
Travel direction cannot be preselected	Parking brake is applied	Release the parking brake and preselect the travel direction
	Fuse blown	Check fuse F15, replace if necessary
	Travel direction switch defective	Contact Liebherr Customer Service
The parking brake has been released but the parking brake indicator lamp does not go out	The parking brake switch is faulty	Check/adjust the switch and replace it if necessary
The machine will not move even though the engine is running and the travel direction can be preselected	Hydraulic oil is too viscous a) Oil is too cold b) The oil in use is unsuitable for the ambient temperature	 a) Let the machine warm up b) Use suitable oil
The hydraulic oil gets too hot	The hydraulic oil cooler is dirty	Clean the oil cooler
	Fan motor runs slowly or not at all	Contact Liebherr Customer Service

Tab. 17

LBH/11100144/12/09-2014/en

Customer:..... Machine type:.....Serial no.:.....Operating hours:.....Date:.....

Maintenance / inspection after service hours								Tasks to be performed	
On handover	All 8-10 h	All 50 h	All 500 h	All 1000 h	All 2000 h	All 3000 h	Other intervals	**By maintenance staff** ■ Once-only activity ● Repeat interval ✦ If necessary ❄ Annually before the winter **with authorised specialist staff** ☐ Once-only activity ❍ Repeat interval ✧ If necessary	
			❍	❍	❍	❍		Checking the air suction hoses for leaks and tight fitting	
			❍	❍	❍	❍		Checking the exhaust lines for leaks and tight fitting	
Diesel particulate filter (optional)									
		●	❍	❍	❍	❍	✦	Diesel particulate filter - draining the condensate separator	
				❍	❍	❍		Diesel particulate filter - changing the sintered metal filter	
					❍		✧	Cleaning the diesel particulate filter (or in the event of poor performance)	
Cooling system									
☐	●	●	❍	❍	❍	❍		Checking the coolant level	
			❍	❍	❍	❍	❄	Checking the coolant antifreeze and corrosion inhibitor concentration	
							✦	Cleaning the cooling system	
					❍			Replacing the coolant (at least every 2 years)	
Working hydraulics									
☐	●	●	❍	❍	❍	❍		Checking the oil level in the hydraulic tank	
							✧	Hydraulic tank - change the oil in the hydraulic system in accordance with oil quality and oil analysis (For more information see: 5.3.6 Hydraulic oil, page 223))	
				❍	❍	❍		Changing the hydraulic tank return suction filter insert	
					❍			Changing the hydraulic tank bleeder filter	
				❍	❍	❍		Lubricating the pilot control device solenoids, universal joints and tappets	
Steering system									
☐	●	●	❍	❍	❍	❍		Testing the steering	
☐		●	❍	❍	❍	❍		Lubricating the bearing points on the steering cylinders	
Brake system									
☐	●	●	❍	❍	❍	❍		Testing the service brake and parking brake	
				❍	❍	❍		Checking the gap and wear on the service brake linings	
☐		●	❍	❍	❍	❍		Checking the oil level in the equalising reservoir of the brake system	
Electrical system									
☐	●	●	❍	❍	❍	❍		Checking the indicator lamps and lighting	
				❍	❍	❍		Changing the travel direction rocker switch and cap (optional) on the control lever	
			❍	❍	❍	❍		Checking the batteries, fluid level and terminals	
Transmission									
☐			❍	❍	❍	❍		Checking the transmission oil level	
			☐	❍	❍	❍		Changing the transmission oil	

LBH/11100144/12/09-2014/en

Complicating factor		Oil quality	
	over 0.5% to 1%	not permis-sible	125 h

Tab. 29: Oil change intervals according to complicating factors

A) Service hours
B) TBN at least 13 mgKOH/g

Complicating factor		Oil quality
		E6
Operating conditions	**Sulphur content in the fuel**	**Interval A)**
Normal climate down to -10 °C	up to 0.005%	500 h
	over 0.005% to 0.05%	250 h
	over 0.0501% to 0.1%	125 h
below -10 °C	up to 0.005%	250 h
	over 0.005% to 0.05%	125 h
	over 0.0501% to 0.1%	not permis-sible

Tab. 30: Oil change intervals according to complicating factors

A) Service hours

5.3.5 Coolants for diesel engines

General recommendations

Antifreezes and corrosion inhibitors approved by Liebherr:
– Guarantee adequate protection from cold, corrosion and cavitation.
– Do not corrode seals and hoses.
– Do not foam.

Coolant is a mixture of water with corrosion inhibiting and antifreeze additives.

The cooling system only functions reliably under pressure. The cooling system must be clean and leak-tight. The cooling shut-off and working valves must work correctly. Maintain the required coolant level.

Coolants cause cavitation or corrosion damage in the cooling system if they contain unsuitable antifreeze and corrosion inhibitors or are incorrectly prepared. Insulating deposits that accumulate on components that conduct heat can lead to overheating and engine failure.

Emulsifying anti-corrosion oils are prohibited.

Water (fresh water)

Water that is colourless, clear, free of mechanical contamination, drinkable tap water featuring the following restricted analysis values is suitable.

Seawater, brackish water, brine and industrial wastewater are unsuitable.

LBH/11100144/12/09-2014/en

5.4 Preparatory tasks for maintenance

Before performing the various maintenance tasks, move the machine to maintenance position unless otherwise explicitly specified in the description.

The various maintenance tasks include:
– Lubricating the lift arms and attachment
– Checking the oil level or changing the oil in the engine, gears, axles, hydraulic tank, etc.
– Changing the filter
– Adjustment and repair work on the hydraulic system

On completion of servicing, the machine should be returned to the operating position. (For more information see: Operating position, page 117)

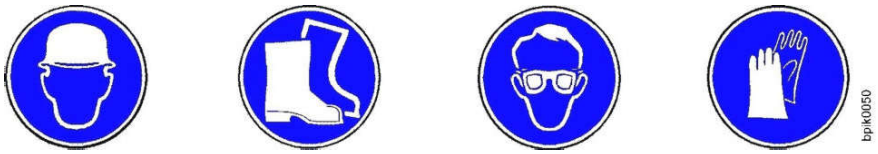

Fig. 352

Wear safety overalls for maintenance work.

Certain jobs not only require a hard hat and safety boots, but also goggles and safety gloves.

5.4.1 Safety precautions for maintenance

Always observe the accident prevention regulations during maintenance work.

(For more information see: 2.4.11 Measures for ensuring safe maintenance, page 54)

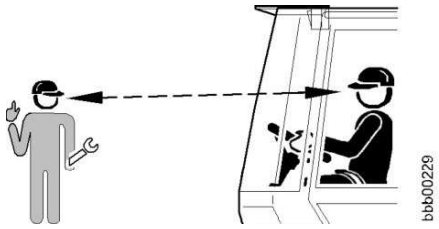

Fig. 353: Visual contact

Make sure that visual contact between the operator in the cab and maintenance personnel is always maintained.

WARNING
Risk of accidents for maintenance personnel.
The presence of unauthorised persons on the machine can place the maintenance personnel in extreme danger.

▶ Never enter a dangerous area of the machine without making your presence known.

LBH/11100144/12/09-2014/en

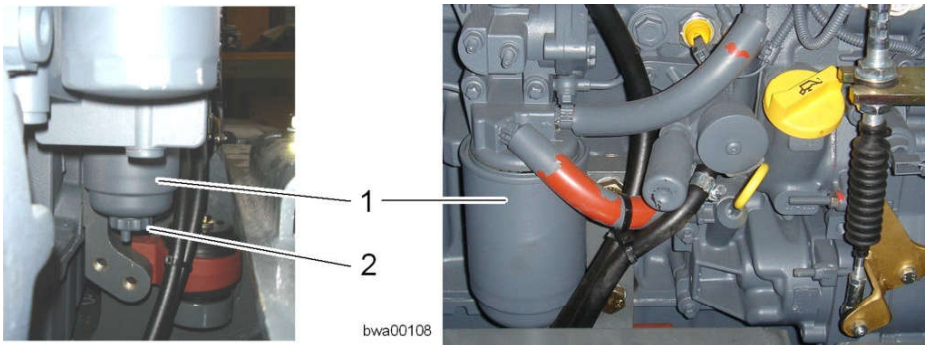

Fig. 363: Draining off condensate

- ▶ Place the receptacle under fuel filter **1**.
- ▶ Unscrew the drain plug **2** and collect the condensate in the receptacle until clean fuel begins to flow.
- ▶ Close the drain plug **2** again.
- ▶ Bleed the fuel system. (For more information see: 5.6.7 Bleeding the fuel system, page 241)
- ▶ Drain off the condensate, see also the Deutz operating manual.

5.6.7 Bleeding the fuel system

Make sure that:
- ❑ The machine is in maintenance position 1.
- ❑ The engine compartment hood is open.

DANGER
There is a risk of fire and explosions.
- ▶ Do not smoke.
- ▶ Avoid naked flames.
- ▶ Only work with the engine switched off and cooled down.

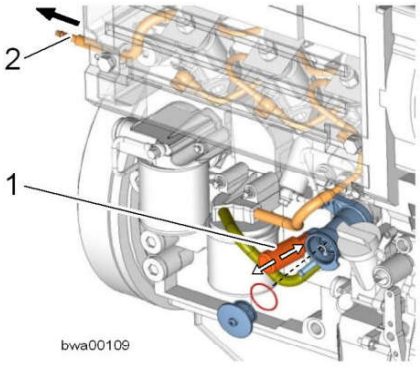

Fig. 364

- ▶ Continue pumping in the direction of the arrow **1** until you feel strong resistance and the pressure has increased.
  - ▷ The return line **2** must be filled.

LBH/11100144/12/09-2014/en

5.9 Working hydraulics

5.9.1 Checking the oil level in the hydraulic tank

Make sure that:
- ❑ The machine is cold.
- ❑ The machine is in maintenance position 1.
- ❑ The engine compartment hood is open.

WARNING
The hot exhaust system can cause injury.

▶ When performing checks or maintenance work, first check whether the exhaust system is hot.

Procedure

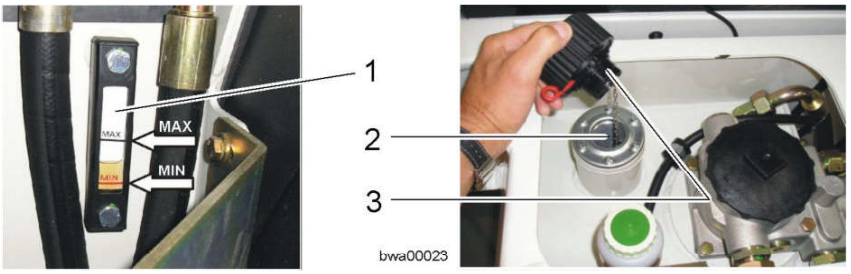

Fig. 375: Check the oil level

The red **MIN - MAX** maximum oil level marking shows the correct oil level.

▶ Check the oil level in the sight glass **1**.

If the oil level is too low:

▶ Top up with hydraulic oil.

The hydraulic oil may only be poured in through the filler strainer **2**.

▶ Remove the cooling system grille.

▶ Undo the bleeder filter **3**.

▶ Top up with hydraulic oil to within the **MIN - MAX** mark.

▶ Replace the bleeder filter **3** and screw it on.

▶ Fit the cooling system grille.

LBH/11100144/12/09-2014/en

5.14 Machine frame and ballast weight

5.14.1 Lubricating the articulation bearing and rear oscillating bearing

Make sure that:
- ❑ The machine is in maintenance position 1.
- ❑ The articulation lock is engaged.

Procedure

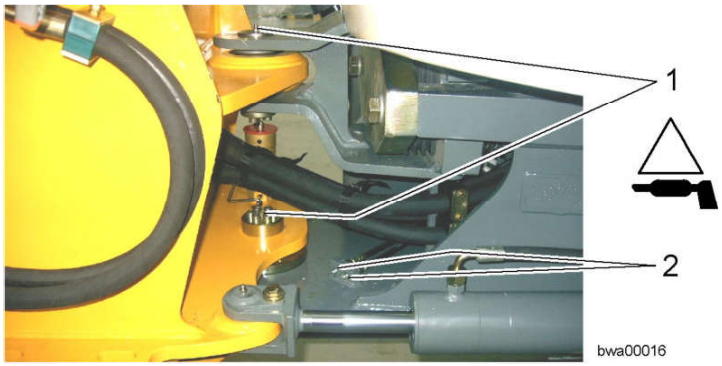

Fig. 389: Lubricating points on the articulation bearing and rear oscillating bearing

1	Articulation bearing lubrication points	**2**	Lubricating points on the rear oscillating bearing

▶ Lubricate the articulation bearing. Grease the lubrication points **1**.

▶ Lubricate the rear oscillating bearing. Grease the lubrication points **2**.

This equipment is optional.

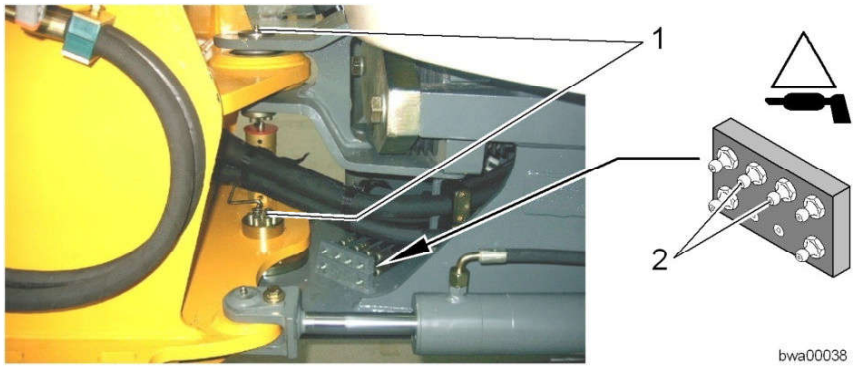

Fig. 390: Lubricating points on the articulation bearing and rear oscillating bearing

1	Articulation bearing lubrication points	**2**	Lubricating points on the rear oscillating bearing

▶ Lubricate the articulation bearing. Grease the lubrication points **1**.

▶ Lubricate the rear oscillating bearing. Greasing the lubrication points **2**.

LBH/11100144/12/09-2014/en

5.18 Cleaning the machine

5.18.1 Washing the machine

Make sure that the machine is in maintenance position 2.

CAUTION
Risk of accidents from the high-pressure jet of the high-pressure cleaner.

▶ Wear appropriate protective clothing and safety glasses.

Cleaning the machine

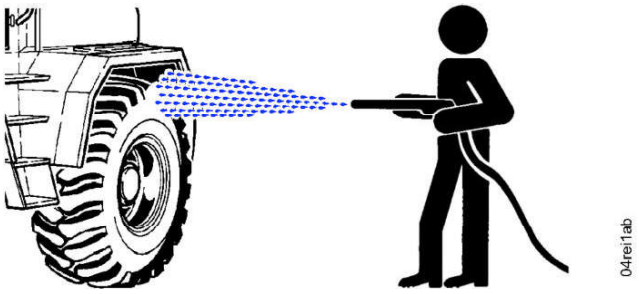

Fig. 406: Washing

Electrical devices such as the emergency steering pump, refuelling pump, sensors and electric components in the cab are not watertight.

Be careful when cleaning the machine with a high-pressure cleaner.

Every time you clean the machine with a high-pressure cleaner, regrease all lubrication points on the machine.

NOTICE
Freshly painted surfaces may be damaged.
High-pressure cleaning [more than 1379 kPa (13.8 bar)] can damage freshly painted surfaces.

▶ When a new machine is delivered, let the paint dry in the air for at least 30 days before you wash it or parts of it with a high-pressure cleaner.

▶ Until this 30 day period has passed, only use a low-pressure cleaner for washing.

NOTICE
Beware of damaging the soundproofing mats.
The soundproofing mats can be damaged if you clean them with high pressure.
Damaged soundproofing mats increase the sound output level above that guaranteed by the manufacturer.

▶ Do not expose soundproofing mats to water or steam jets.

LBH/11100144/12/09-2014/en