en **Operator's manual**

Wheel loader

Document ID

ORIGINAL OPERATOR'S MANUAL

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Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 509
Type no.: 1582
From Serial no.: 53995

Contact

Liebherr-Werk Bischofshofen GmbH
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1.2.5 Electrical system

Description	Unit	Value
Operating voltage	V	12
Number of batteries		1
Battery voltage	V	12
Battery capacity	Ah	100
Alternator	V / A	12 / 80
Starter	V / kW	12 / 3

1.2.6 Travel drive

Hydrostatic travel drive

Design: 2-level automated transmission, swash plate – variable displacement pump and axial piston motor in a closed circuit.

Filter: Return-suction filter for closed circuit.

Control: Travel drive controlled by accelerator pedal and tractive force control pedal (inch pedal). The tractive force control pedal facilitates continuous adjustment of tractive or thrust force at full engine speed Forward travel and reverse travel are selected using control lever.

Travel speeds

– For forward and reverse travel
– With standard tyres

Description	Unit	Value
Travel range 1	km/h	0-18.0
Travel range 2	km/h	0-38.0

1.2.7 Axles

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

Front axle

Description	Unit	Value
Wheel base (standard tyres)	mm	1630
Manually engageable differential lockout	%	100

Rear axle

– Kingpin steering

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	Designation	Unit	Value	
	Tipping load when straight	kg	4270	3740
	Tipping load when fully articulated (ISO 14397-1)	kg	3885	3400
	Operating weight	kg	6660	6875

Tab. 8: Working attachment: 4 in 1 bucket

A) Z-bar kinematics
B) Welded tooth holder with plug-in teeth
C) Standard lift arm length
D) High lift

1.2.23 Working attachment: forklift

Values stated refer to machine:

- with 405/70R18 L2 tyres (For more information see: 1.2.17 Tyres, page 24)
- Including all lubricants
- With a full fuel tank
- With ROPS/FOPS cab and operator
- On level and stable ground

Note
The tyres and working attachment affect the operating weight and tip load.

▶ Note the information about the tyres and working attachment.

▶ (For more information see: 3.3.9 Forklift, page 134)

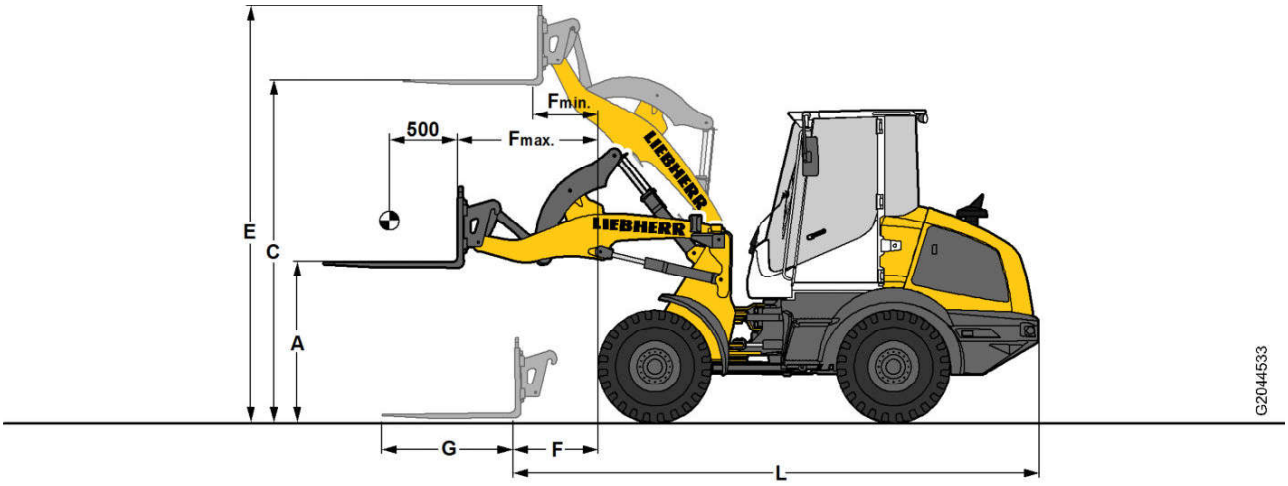

Fig. 9: Working attachment: forklift

	Designation	Unit	Value	
	Hydraulic quick coupler		Yes	Yes
	Load geometry		A)	A)
	Forklift type		FEM II	FEM II
	Lift arm length		B)	C)

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  - Is able to guide a load.
- Has the necessary authorisation for attaching loads.
- The slinger has the necessary education (theoretical and practical) for the following:
  - Selecting the suitable slinging gear
  - Attaching slinging gear
  - Securing to prevent unintended disengaging of slinging gear
  - Avoiding damage to slinging gear
  - Spotting
  - Applying all necessary signal signs
- Is not under any physical or mental impairment that limits one of the prescribed requirements.
- Is not under the influence of alcohol.
- Is not under the influence of drugs.

2.3.8 Spotter

Responsibility

The spotter is responsible for the following:
- Wear personal protective equipment.
- Forward signals from slinger to operator.
- If the spotter is the only person for this purpose: Give instructions to operator.
- The spotter must be in the field of view of operator or have voice contact with the operator.

Requirement

The spotter has following qualification and skills:
- Has completed the legally specified minimum age.
- Physically and mentally capable of spotting and providing signals:
  - Satisfactory eyesight
  - Satisfactory hearing ability
  - Quick reactions
  - Is able to estimate distance, height and gaps.
- The spotter has following skills:
  - Is able to operate radio units.
  - Is able to give clear instructions on radio units.
  - Is able to guide a load.
  - Is able to ensure safe movement of load and machine.
- Has the necessary authorisation for giving signal signs.
- The spotter has the necessary education (theoretical and practical) for the following:
  - Spotting
  - Applying all necessary signal signs
- Is not under any physical or mental impairment that limits one of the prescribed requirements.
- Is not under the influence of alcohol.
- Is not under the influence of drugs.

2.4 Signs on the machine

There are various types of sign attached to your machine.

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Following factors influence size of danger area:
- The travel speed and movement of the machine
- Working attachment installed
- Type of loading material
- Risk of loading material falling

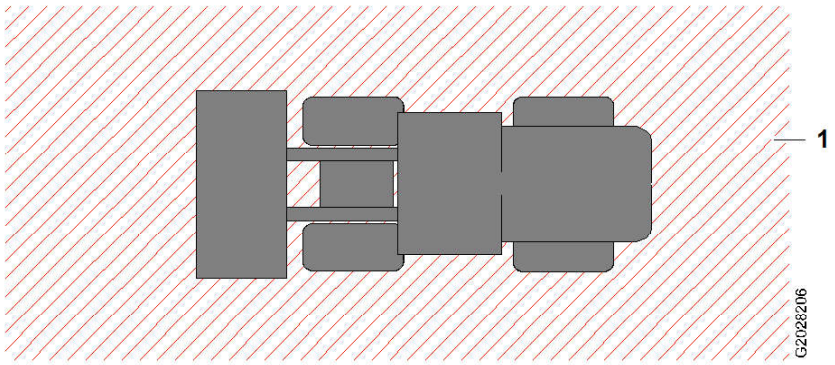

Fig. 49: Machine danger zone (view from above)

1 Danger zone

Danger to life

Unapproved presence in danger zone

- Make sure there is nobody in the danger area.

2.7.6 Visibility

Danger to life

Insufficient visibility

- If equipment is installed that deviates from the standard, the operator must re-evaluate the field of view and, if necessary, take measures.
- Make sure that persons approach the machine from the front and within operator's field of vision.
- Make sure that persons contact the operator before approaching the machine.
- Make sure that no obstacles impair visibility in the working area.
- Use viewing devices to observe environment of machine if necessary.
- Use viewing devices if necessary to observe areas around the machine that cannot be seen directly.
- Position working attachment so that sufficient visibility is ensured.
- Work with spotter if visibility is restricted.
- Agree on which hand signs to use.
- If necessary communicate via radio.
- Make sure that spotter is outside danger zone.
- In conditions of poor visibility use illumination in accordance with the applicable regulations.
- Work with extra care and attention in poor visibility and changing weather.
- Only use sun visors if field of vision is not restricted.

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Symbol	Designation	Symbol	Designation
	*Hazard warning system* switch		*Parking brake* button [B]
	*Quick coupler* button		*Working hydraulics lockout* button [C]
	*Travel range* button		*Diesel particulate filter* switch/ button
	*Mode button* (time, service code acknowledgement)		*Rear window washer system* button/switch
	*Rear window heater and exterior mirror heater* button		*Marker lights and low beam* switch [A]
	*Front working headlights* switch		*Rear working headlights* switch (option)
	*Float position* switch		*Ride control* button (option) [C]
	*Central lubrication system* button (option)		*Flashing beacon* switch (option) [A]
	*Bucket return-to-dig* switch (option)		*Lift kick-out* switch (option)
	*Visible reversing alarm* switch (option)		*Audible reversing alarm* switch (option)
	*Continuous mode* button (control lever lock) (option)		*Sweeper* switch (option)
	*Spreader* switch (option)		*Reversible fan drive* button (option) [C]
	V_{MAX} button (option)		*Tractive force adjustment* button (option) [C]
	*High Flow* button (option) [D]		

Tab. 15: Switches and buttons

A) The function can also be activated when the ignition key is taken out.
B) The parking brake is automatically activated when the diesel engine is started.
C) The setting remains stored after the ignition is switched off.
D) Function increases the flow rate of working hydraulics (for example, for snow blower).

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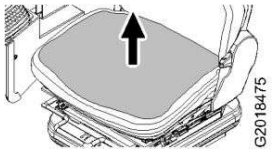
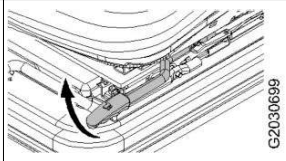
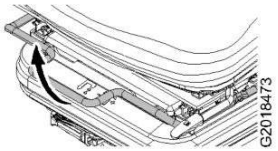
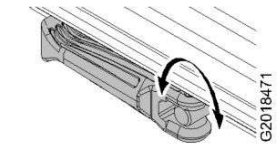
	Adjustment options	
4		**Height adjustment** Lift up the seat as necessary until you hear it catch. When you raise the driver's seat above the highest notch it sinks to the lowest position.
5		**Horizontal adjustment without control lever** Pull the lever all the way up and move the operator's seat.
6		**Horizontal adjustment with control lever** Pull the lever all the way up and move the operator's seat.
7		**Setting the driver’s weight** Turn the lever and set the driver’s weight. The set driver’s weight is shown in the sight glass.

Tab. 16: Driver’s seat: Grammer mechanical

Operator’s seat: Grammer comfort

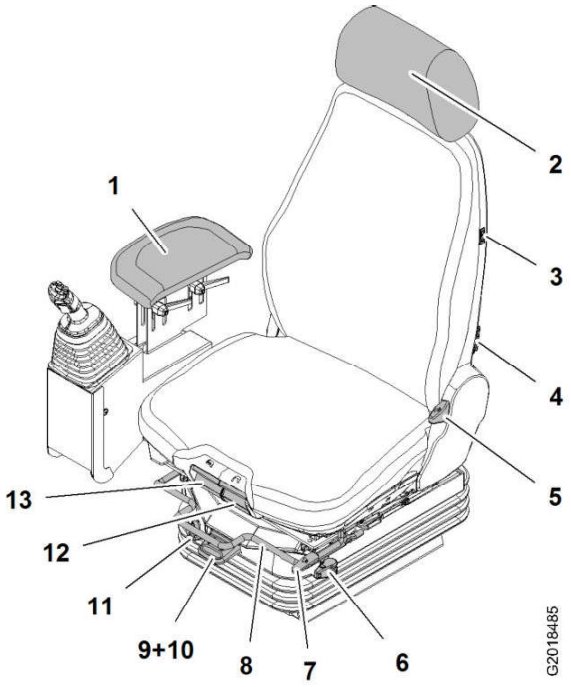


Fig. 101: Operator’s seat: Grammer comfort

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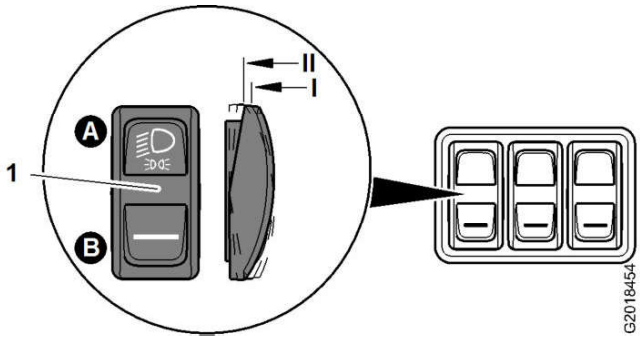

Fig. 126: Driving headlights, tail lights, marker lights (option) and licence plate lights (option)

1 *Marker lights and low beam* switch

▶ To switch on the marker lights, tail light and licence plate light: push the switch **1** to position **A** in position **I**.

▶ To switch on the low beam, tail light and licence plate light: push the switch **1** to position **A** in position **II**.

▶ To switch off lighting: push switch **1** to position **B**.

High beam

Make sure that following requirements are fulfilled:
❑ Low beam is activated.

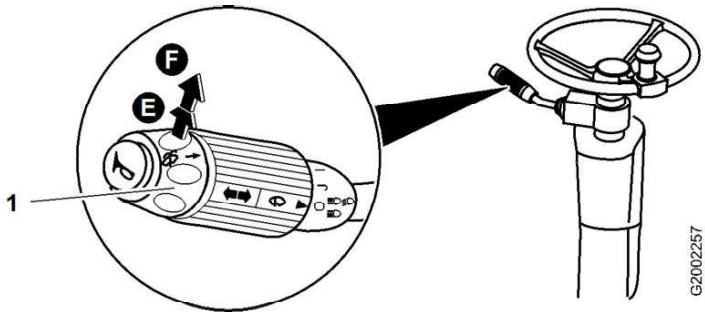

Fig. 127: High beam

1 Steering-column switch
E Headlight flasher
F High beam

▶ To switch on the high beam: push the steering-column switch **1** in direction **F**.
▷ *High beam* symbol is shown in display.

▶ To switch off high beam: press steering-column switch **1** again in direction **F**.
▷ *High beam* symbol is not shown in display.

Working headlights

The working headlights still work when the ignition key has been taken out.

WARNING
The working headlights can become hot!
Burns, fire.

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

Diesel particulate filter warning symbols	Designation
	“Regenerate diesel particulate filter” prompt – Goes on when condition of diesel particulate filter (soot particles) requires regeneration.
	Diesel engine warning – Goes on when exhaust counterpressure limit value in diesel particulate filter has been exceeded (excessive soot).
	Exhaust system malfunction – Goes on when an exhaust system malfunction occurs.

Tab. 25: Diesel particulate filter warning symbols

Reversing camera

This equipment is optional.

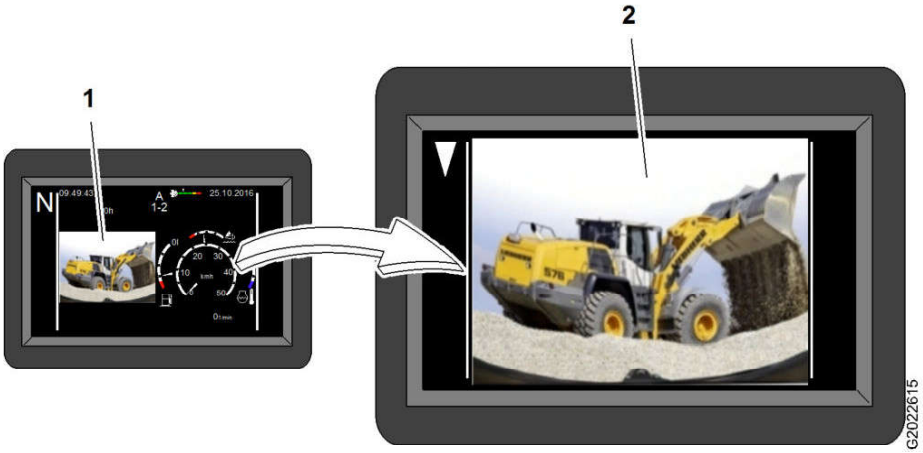

Fig. 196: Reversing camera

1 Reversing camera display

2 Reversing camera display (full screen)

▶ Select neutral or forward travel direction.
▷ The reversing camera is shown in the display **1**.

▶ Select reverse travel direction.
▷ The reversing camera is shown in the display **2**.

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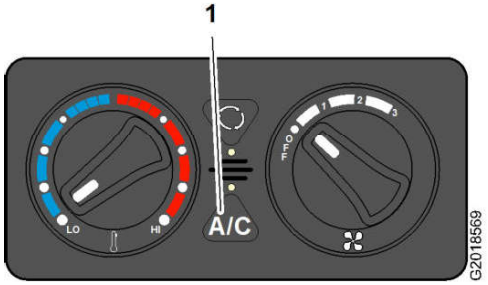

Fig. 219: Air conditioning mode

1 *Air conditioning unit* button

▶ To switch on the air conditioning: press the button **1**.

▶ To switch off the air conditioning: press the button **1** again.

Note

On cold, damp days, you can use air conditioning to dehumidify cab. Switch on the air conditioning in addition to the heating.

3.2.20 Rear window heater and exterior mirror heater (option)

This function is only available when ignition is on.

Switching rear window heater and exterior mirror heater on and off

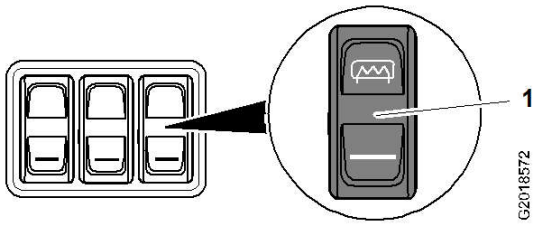

Fig. 220: Switching rear window heater and exterior mirror heater on and off

1 *Rear window heater*, *exterior window heater* button

▶ To switch on rear window heater and exterior mirror heater: press button **1**.

Note

Rear window heater and exterior mirror heater switch off automatically after 15 minutes.

3.2.21 Interior mirror, exterior mirrors and wide-angle mirrors (option)

The machine is equipped with one interior mirror, two exterior mirrors and two wide-angle mirrors (option).

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3.3 Operation

3.3.1 Daily start-up

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 hazard 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.

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- ▶ Remove coarse dirt from the machine and clean the tyre treads.
- ▶ Close all service hatches and lock them if possible.
- ▶ Travel with the working attachment lowered and tilted all the way back.
- ▶ Press the button **1** to lock the working hydraulics so that the attachment cannot be inadvertently actuated.
- ▶ Drive with appropriate care.
- ▶ Observe the highway code.

3.3.5 Shutting down the machine

Take the following precautions before you switch off the diesel engine and leave the machine.

- Lower working attachment. (For more information see: Lowering the working attachment, page 121)
- Turn off diesel engine. (For more information see: Switch off the diesel engine, page 121)
- Turn off battery main switch. (For more information see: Turning off the battery main switch, page 122)
- Secure machine. (For more information see: Securing the machine, page 123)

Lowering the working attachment

Make sure that following requirements are met:
❑ The working attachment is empty.

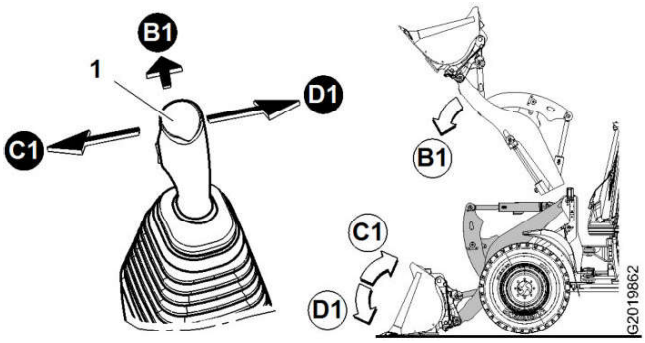

Fig. 258: Lowering the working attachment

1 Control lever

- ▶ Move the control lever **1** in direction **B1**.
  ▷ The lift arms are lowered.
- ▶ Lay the bucket down flat on the ground by moving the control lever **1** in direction **D1** or **C1**.

If a working attachment with a hydraulic function is installed.

- ▶ Tilt in, close or lock the working attachment, depending on its function.
- ▶ Lower the lift arms until the working attachment lies on the ground.

Switch off the diesel engine

Do not turn off the diesel engine until the machine has come to a complete halt.

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WARNING
Hot gas at the exhaust pipe!
Fire.

▶ Do not carry out regeneration in areas at risk of fire.

Note

If warning symbols are ignored for more than 20 hours, they are stored in engine control unit.

National authorities can evaluate stored records.

		Meaning	Notes
		Diesel particulate filter load condition	**A** *low – high* **B** *dirty* **C** *very dirty*
		High exhaust temperature	Regeneration is in progress, which means high exhaust temperatures are generated. Normal operation can continue. Do not turn off the diesel engine if possible. Automatic regeneration can be deactivated when working in fire hazard zones. Fuel can be saved by regeneration in the normal working cycle.
		Diesel particulate filter regeneration disabled	For use in fire hazard zones or during working cycles with very little engine load.
		Regenerate diesel particulate filter prompt	The diesel particulate filter is contaminated. Manual regeneration can be carried out. Leave the fire hazard zone. Start regeneration as soon as possible.
		Exhaust system malfunction	Malfunction in conjunction with exhaust system. After 36 hours: torque reduction to 75%. After 64 hours: torque reduction to 50% and reduction of engine speed to 60%. Turn off diesel engine. Contact Liebherr customer service.
 	 	Regenerate diesel particulate filter prompt	The diesel particulate filter is heavily contaminated. This results in reduced engine power. Carry out manual regeneration immediately. Leave the fire hazard zone before regeneration.

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3.4 Working methods

This section describes routine working methods.

The operator is responsible for:
– Properly picking up and carrying the load.
– Operating the machine safely at the workplace.

DANGER
Machine tipping!
Risk of fatal injury.

- ▶ Make sure that the ground surface has sufficient load capacity.
- ▶ Observe the maximum tipping load.
- ▶ Keep the load low during transportation.
- ▶ Do not change direction too quickly.
- ▶ Do not brake suddenly.

NOTICE
Improper material intake!
Damage to machine.

- ▶ Align bucket base parallel to ground.
- ▶ Reduce feed force with inching brake pedal.

3.4.1 Picking up material

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

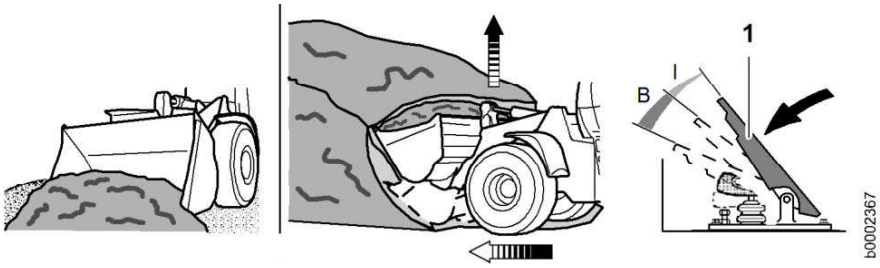

Fig. 316: Picking up material

1 Inching brake pedal
I Inching
B Braking

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

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

This is necessary when the machine is working on loose terrain and picking up solid or coarse material.

- ▶ Also move the inching brake pedal **1** within the range **I**.

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Excavating foundations

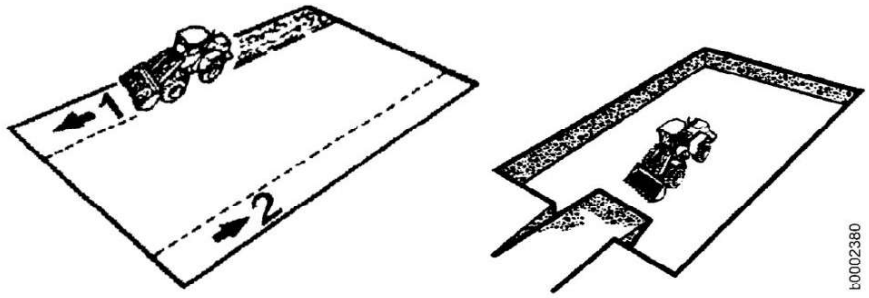

Fig. 333: Excavating foundations

▶ Make a first trench along the side of the pit.

When the first trench is down to a depth of approx. 1 m:

▶ Start a second trench along the opposite side.

▶ Excavate the middle area to the same depth as the two side trenches. Heap the material at one side.

When the foundations have been excavated to the required depth:

▶ Use the heaped material to create an exit ramp.

▶ Drive forwards out of the pit.

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DANGER
Beware of falling loads!
There is a risk of fatal injury.

- ▶ Align slinging gear vertically (maximum angle of incline = 10°).
- ▶ Make sure there is nobody in the danger zone under the suspended machine.

NOTICE
Improper lifting of the machine!
Damage to the machine.

- ▶ Ensure that the slinging gear is only in contact with the lifting points.

- ▶ Attach slinging gear with crossbar **2** as shown to the lifting points **1** on the machine.
- ▶ Carefully lift machine and load it.

Transporting the machine by lorry or rail

When transporting the machine, observe the general safety instructions as well as the regulations applicable in the specific country.

Find out about:
– Weight and main dimensions of the machine (For more information see: 1.2 Technical data, page 18) (For more information see: 2.4.3 Identification plate, page 46)

Fig. 341: Transporting the machine by lorry or rail

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

Make sure that following requirements are met:
❑ 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 the machine onto the loading area

Make sure that following requirements are met:
❑ A person is available to give direction signals.
❑ Free tyres of dirt, ice and snow.

DANGER
Person giving signals in the danger area!
Risk of fatal injury.

- ▶ Make sure there are no unauthorised persons in the danger area.
- ▶ Always maintain visual contact with the person giving the signals.

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Releasing the parking brake mechanically

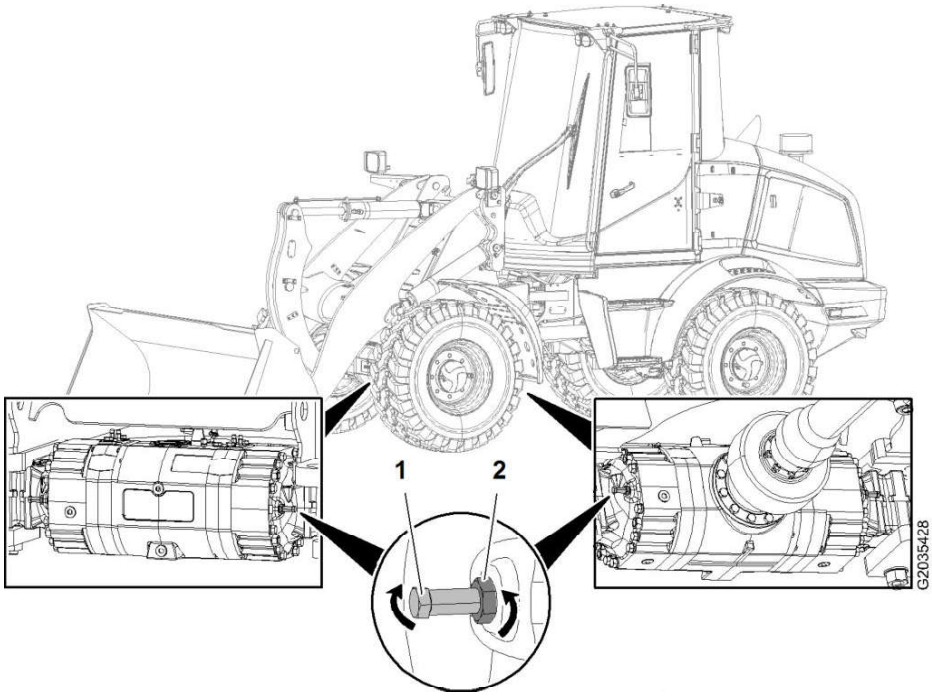

Fig. 352: Releasing the parking brake mechanically

1 Hex bolt (4x) **2** Counter nut (4x)

WARNING
Parking brake not working!
Risk of injury.

▶ Secure the machine against rolling away.

▶ Unscrew counter nut **2**.

▶ Screw in the hex head screws **1** by approximately 3.5 turns until you feel a slight resistance.

▶ Tighten the hex head screws **1** by a further turn one after the other.
▷ Parking brake is released.

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Malfunction	Cause	Remedy
The engine turns itself off.	Power supply interrupted	Contact Liebherr customer service.
	Leak or insufficient pressure in the low pressure fuel system	Check for leaks. Contact Liebherr customer service.
	Malfunction in the electronics	Check the error log of the engine control unit. Contact Liebherr customer service.
Low engine power (poor performance)	Problem in the fuel system (clogged, leaking)	Carry out a visual inspection and look for leaks. Change the fuel fine filter. Contact Liebherr customer service.
	Charge pressure too low	Tighten loose clips. Change the seals and hoses. Clean the air filter. Repair the turbocharger. Contact Liebherr customer service.
	Charge air temperature too high (engine control unit automatically reduces the power)	Clean the intercooler Check the fan power. Reduce the ambient temperature. Contact Liebherr customer service.
	Coolant temperature too high (engine control unit automatically reduces the power)	Check that the cooler is clean. Check the fan and the thermostat. Check the coolant level. Contact Liebherr customer service.
	Fuel temperature too high (engine control unit automatically restricts the power)	Contact Liebherr customer service.
	Working more than 1800 m above sea level	There is no remedy, the engine power is automatically restricted.
	Injection valves blocked or do not inject.	Contact Liebherr customer service.
	Engine compression too weak	Contact Liebherr customer service.
	Malfunction in the electronics	Check the error log of the engine control unit. Contact Liebherr customer service.
	Exhaust treatment system clogged	Contact Liebherr customer service.
Engine gets too hot (according to coolant temperature indicator).	Not enough coolant	Top up the coolant.
	Dirt or scale in the cooler, cooler dirty outside	Clean the cooler.
	Thermostat is defective	Check the thermostat and change it if necessary. Contact Liebherr customer service.
	Coolant temperature sensor defective	Check the sensor and change it if necessary. Contact Liebherr customer service.
	Fan speed too low (hydrostatic fan drive only)	Check the fan drive and change it if necessary. Contact Liebherr customer service.

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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	Other intervals	Additional labelling	**By maintenance staff** ■ Once-only activity ● Repeat interval ✦ If necessary ❄ Annually before the winter **By authorised specialist staff** ☐ Once-only activity ❍ Repeat interval ✧ If necessary **Additional labelling** Assistance required Have this task carried out exclusively by a certified electrician	Confirm tasks	See page
			❍	❍	❍			Coolant: checking the antifreeze and corrosion protection agent concentration.		
						✦		Clean the cooling system.		233
				❍	❍			Replace coolant in cooling system (at least once a year).		
Working hydraulics										
				❍	❍			Clean and lubricate the pilot control unit.		
Hydraulic components										
☐	●	●	❍	❍	❍			Check oil level in hydraulic tank.		234
			❍	❍	❍			Hydraulic tank: Drain off condensate and sediment.		
				❍	❍			Hydraulic tank: Change. the return suction filter cartridge		
					❍			Hydraulic tank: Change the breather filter.		
						✧		Hydraulic tank: perform oil analysis. (For more information see: Oil analysis, page 201)		
						✧		Hydraulic tank: change oil. (For more information see: Oil analysis, page 201)		
Steering system										
☐	●	●	❍	❍	❍			Steering: Check the function.		236
☐		●	❍	❍	❍			Steering cylinder: lubricate bearing.		236
Brake system										
			❍	❍	❍			Test service brake and parking brake.		
☐		●	❍	❍	❍			Check the oil level in the brake system.		238
				❍	❍			Service brake: Check the gap and wear on the brake linings		
					❍			Check the service brake discs for wear.		
Electrical system										
☐	●	●	❍	❍	❍			Check the function of the lighting and horn.		240
			❍	❍	❍			Batteries: Check the acid level and terminals.		
				❍	❍			Control lever: Change the travel direction switch rocker and cap		
Gearbox										
☐			❍	❍	❍			Transmission: Check the oil level.		
			☐	❍	❍			Transmission: Change the oil.		

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Ambient temperature	Designation
From -25 °C to 45 °C	Liebherr Hydraulic Plus

Tab. 58: Recommendation for hydraulic oils

Minimum quality requirement

Specification
EMT LH-00-Minimum-HYE

Tab. 59: Minimum quality requirement

When using hydraulic oils from other manufacturers, information on the oil change intervals must be obtained from the manufacturer or supplier.

Oil analysis

	Hydraulic oil	Interval
Normal use (oil analysis optional)	**Mineral oil**	
	Liebherr Hydraulic HVI	First after 1000 h, then every 1000 h, at least once a year
Bio use (oil analysis prescribed)	**Biodegradable**	
	Liebherr Hydraulic Plus	First after 1000 h, then every 1000 h, at least once a year

Tab. 60: Oil analysis

Oil change

Hydraulic oil	Without oil analysis	With oil analysis[39)]
Mineral oil		
Liebherr Hydraulic HVI	Every 3000 h	Every 6000 h
Biodegradable		
Liebherr Hydraulic Plus	Every 4000 h	Every 8000 h

Tab. 61: Oil change

5.3.9 Transmission

Liebherr recommendation

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

Tab. 62: Liebherr recommendation

39) If the result of the oil analysis is positive, the oil can continue being used. If the result of the oil analysis is negative, the oil must be changed.

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The type of damage determines whether the hydraulic line is renewed or whether the machine can be operated with the damaged hydraulic line.

The general safety instructions must be observed when working on the hydraulic system.

Make sure that following requirements are met:
❑ Machine is in maintenance position 2.

Minor damage to the hydraulic lines

Wear or damage to the outer jacket of the hydraulic line

Wear or damage to the outer jacket of the hydraulic line is caused by friction or contact with other components. As long as the steel fabric of the hydraulic line is not damaged or not visible, this is classified as minor damage.

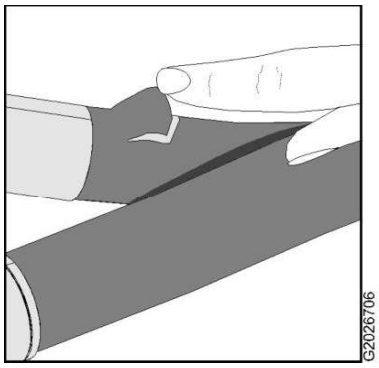

Fig. 378: Wear or damage to the outer jacket of the hydraulic line

▶ Document the damage and observe whether the condition deteriorates.

▶ Check the routing of the hydraulic line, contact Liebherr customer service if necessary.

If the condition deteriorates:
▶ Have the hydraulic lines replaced by Liebherr customer service.

Moist surfaces, no visible oil leak

Moist spots can be seen on the surface. An oil leak or oil drops are not visible. As long as you do not observe an obvious oil leak, it is classified as minor damage.

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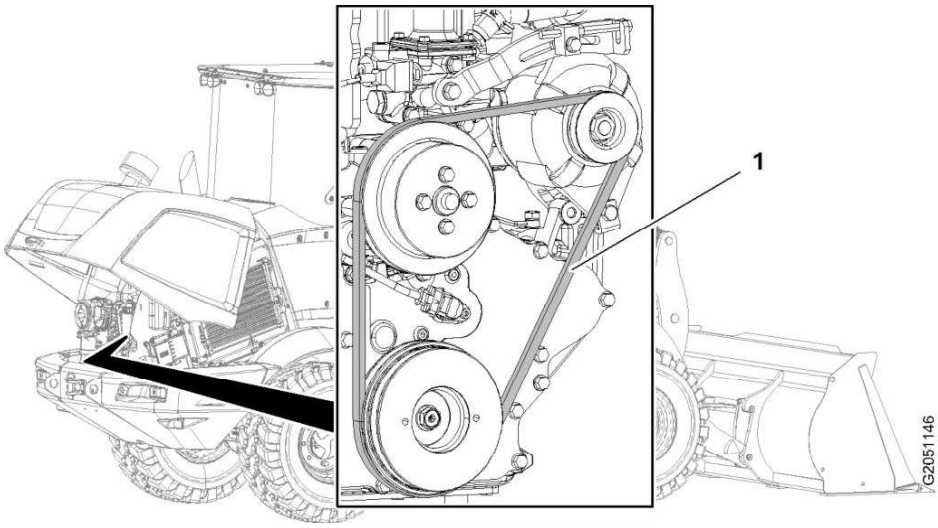

Fig. 388: Checking V-belt for damage

1 V-belt

▶ Check V-belt **1** for following damage:
- ▷ Rupture on V-belt profile
- ▷ Rubber knobs in V-belt base
- ▷ Accumulated dirt or grit
- ▷ Belt profile coming loose from belt base
- ▷ Cracks on V-belt back
- ▷ Cracks in V-belt profile

If V-belt is damaged:
▶ Have V-belt **1** replaced by Liebherr customer service.

Checking V-belt tension

Make sure that following requirements are fulfilled:
- ❑ Machine is in maintenance position 1.
- ❑ Diesel engine has cooled down.
- ❑ Service access is open.

Note

V-belt tension is set at factory and must be retightened when belt tension decreases.

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5.8 Cooling system

5.8.1 Checking coolant level in cooling system

Coolant level must be checked at two places:
– Check the coolant level in the cooler.
– Check the coolant level in the equalising reservoir.

Make sure that following requirements are fulfilled:
❑ Machine is in maintenance position 1.
❑ Service access is open.
❑ Diesel engine has cooled down.

Checking coolant level in radiator

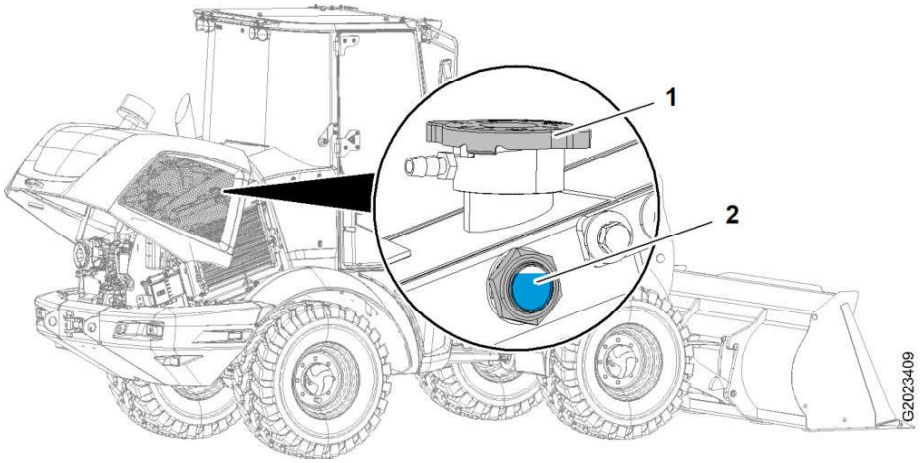

Fig. 400: Checking coolant level in radiator

1 Cooler cover **2** Cooler sight glass

CAUTION
Hot. pressurised liquid!
Beware of burns.

▶ Let the engine cool down.

CAUTION
Poorly accessible maintenance point!
Risk of injury.

▶ Use suitable climbing aids.

▶ Check the coolant level in the cooler through the sight glass **2**.

If no coolant is visible in the sight glass **2**:
▶ Carefully open the cover **1**.

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- ▶ Select reverse travel direction.
- ▶ Test the reversing light.

If lights have to be adjusted or defective bulbs replaced:

- ▶ Contact Liebherr customer service.
- ▶ To check horn, sound it using button on steering-column switch. (For more information see: 3.2.12 Steering-column switch, page 79)

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