en **Operator's manual**

Crawler loader

Document ID

ORIGINAL OPERATOR'S MANUAL

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Product ID

Manufacturer: Liebherr-Werk Telfs GmbH
Type: LR 636
Type no.: 1275
From Serial no.: 12777

Conformity: CE

Contact

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Hans Liebherr-Straße 35
A – 6410 Telfs

LWT/9087293/13/01.10.2019/en

– NRTC: Non-Road Transient test Cycle; ‘Transient test cycle’ means a test cycle with a sequence of normalized speed and torque values that vary on a second-by-second basis with time.

1.2.3 Sound emission

The sound emission values for the machine are provided in the Technical Data.

The sound power level (Lwa) is determined according to directive 2000/14/EC. The measurement uncertainty is determined according to Standard ISO 4871.

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

1.2.4 Maximum operating weight

The maximum operating weight of the machine may not be exceeded for reasons of machine safety and operating suitability.

If the maximum operating weight will be exceeded due to special retrofit installations (such as for land clearing work), request a written approval from Liebherr before installation.

The maximum permissible operating weight of the machine is: LR 636 = 24000 kg.

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Comfort

Comfort, Space and Ergonomics: All in One

The working area in the generation 6 Liebherr crawler loaders is characterized by the exceptional level of comfort offered to the operator. Comfort is provided by the generous space, ergonomic lay-out, quiet and with the best possible visibility, the Liebherr comfort cab provides the ideal conditions for concentrated work, without fatigue.

Technical Data LR 636

Dieselmotor

Liebherr Diesel engine	D 934 A7 Emission regulations according to 97/68/EC, 2012/46/EU Stage IV, EPA/CARB Tier 4f
Rated power (net)	
ISO 9249	135 kW/184 HP
SAE J1349	135 kW/184 HP
Maximum power (net)	
ISO 9249	160 kW/218 HP
SAE J1349	160 kW/214 HP
Rated speed	1.800 1/min.
Displacement	7.0 l / 427 in^3
Bore/stroke	122 mm (4.80 in)/150 mm (5.91 in)
Design	4 cylinder in-line engine, water-cooled, turbocharged, air-to-air intercooler
Injection system	Direct fuel injection, Common Rail, electronic control
Lubrication	Pressurized lube system, engine lubrication guaranteed for inclinations up to 45°, on all sides
Operating voltage	24 V
Alternator	140 A
Starter	7.8 kW/11 HP
Batteries	2 x 180 Ah/12 V
Air cleaner	Dry-type air cleaner with pre-cleaner and automatic dust ejector, main and safety elements with radial seal
Cooling system	Combination cooler with single cooling units for water, hydraulic oil and intake charge air
Cooling fan	Hydrostatically driven, thermostatically controlled

Hydraulics

Hydraulic system	LUDV-system
Pump type	Variable displacement pump (swash-plate design)
Pump flow max.	209 l/min./55.2 gpm/46.0 Imp.gpm
Pressure limitation	260 bar/3,770 psi
Filter system	Return filter with magnetic rod in hydraulic tank
Control	Single joystick implement control for all bucket functions, with magnetic detent functions for float position as well as for automatic bucket positioner and for automatic lift kickout

Travel Drive, Control

Transmission system	Closed-loop infinitely variable hydrostatic travel drive powered by two axial piston variable displacement pumps and two axial piston variable displacement motors in swash-plate design, each track is driven indepedently from each other
Travel speed*	Continuously variable
Speed range 1 (reverse):	0 – 4.0 km/h / 2.5 mph (4.5 km/h / 2.8 mph)
Speed range 2 (reverse):	0 – 6.5 km/h / 4.0 mph (8.0 km/h / 4.9 mph)
Speed range 3 (reverse):	0 – 11.0 km/h / 6.8 mph (11.0 km/h / 6.8 mph)
	*Travel speed ranges can be set on the travel joystick
Electronic control	Electronic engine speed sensing control (load-sensing feature) automatically adjusts travel speed and drawbar pull to match changing load conditions
Steering	Hydrostatic, unlimited manoeuvrability for full power turns and counterrotation
Service brake	Hydrostatic, dynamic braking effect from travel drive system
Parking/ emergency brake	Multi-disc brake, wear-free, automatically applied with neutral joystick position
Cooling system	Hydraulic oil cooler integrated into combination cooler
Filter system	Micro cartridge filters in replenishing circuit
Final drive	Combination spur gear with planetary gear, double sealed (duo cone seals) with electronic seal-integrity indicator
Control	Single joystick for all travel and steering functions, as well as for counterrotation

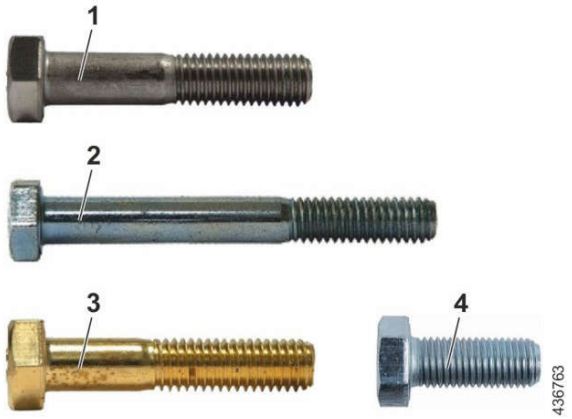
Operator's Cab

Cab	Resiliently mounted cab with positive pressure ventilation, can be tilted with hand pump 40° to the rear. With integrated ROPS Rollover Protective Structure (EN ISO 3471) and FOPS Falling Objects Protective Structure (EN ISO 3449).
Operator's seat	Air-suspended comfort seat, fully adjustable
Monitoring	Touch screen: display of current machine information, automatic monitoring of operating conditions. Individual setting of machine parameters

The prestressing forces and the tightening torques noted in the chart have been taken from the VDI (Association of German Engineers) guidelines 2230 of February 2003.

Assembly prestressing forces F_M and tightening torques M_A at 90% utilisation of the yield strength for shank bolts with standard or fine metric threads as per DIN ISO 262 (and DIN ISO 965-2); wrench sizes for hex head screw in accordance with DIN EN ISO 4014 to 4018, screws with external hexalobular driving feature according to DIN 34800 or socket head bolts according to DIN EN ISO 4762 and hole “middle” according to DIN EN 20273.

Note:
- Any tightening values noted in Liebherr service documentation drawings or documents must be adhered to and given preference over factory standards.
- For important screw connections, angle-controlled tightening can be advantageous. In this case, the necessary tightening values (joining moment, angle) must be determined by the technical customer service department for the individual case.
- When tightening in aluminium, with or without Helicoil insert and for weld nuts, the values for class 8.8 must be used. Any tightening values noted in Liebherr service documentation drawings or documents are binding, paramount and must be adhered to.

Metric standard thread and fine thread	Metric standard thread and fine thread
At least one element of the screwed connection (screws, washers, nuts, ...) with following surface: flZn = zinc coating (LH standard 10021432, LH standard 10215295 flZnnc-480h-L valid ≥M6)	**All elements of the screwed connection (screws, washers, nuts, ...) with following surface: black oxide or phosphated zinc plated (LH standard 10215295 Fe// ZnNi(12)5//Cn//T2)**
 **1**: Zinc coating	 **1**: Black oxide, phosphated, burnished **2**: Thick film passivation **3**: Yellow chromated **4**: Zinc plated Fe//ZnNi(12)5//Cn//T2

Tab. 4: Screw types

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In the event of danger to persons, the operator must stop the dangerous movement and give warning signs.

The operator must give warning signs (e.g. sounding the horn, light signals) in the event of danger to persons.

The operator must suspend operation if persons do not leave the hazard zone despite the warning.

The operator may only swing the work equipment over occupied operator platforms, operating stations and work stations of other equipment if these areas are secured against work equipment or loads falling by means of resistant protective roofs.

2.3.5 Operating conditions

Temperature range (ambient temperature)	-22 °C to +45 °C

Tab. 10: Operating conditions

Danger to life!

Operation in the event of thunderstorms or bad weather

- If possible, suspend operation prior to the onset of a thunderstorm or bad weather.
- Put the working attachment down on the ground as flat as possible.
- Properly secure the machine.
- Close the windows.
- Turn diesel engine off.
- Set the ignition key to **0**.
- Make sure there is nobody in the area around machine.

Lightning strike

- Remain in the operator's cab.
- Do not leave the machine until all components are de-energised.

Contact with high voltage wiring

- Do not move the machine or working attachment.
- Remain in the operator's cab.
- Do not leave the machine until all components are de-energised.
- Ensure that all persons keep their distance from the machine and the high voltage wiring.
- Allow the voltage to shut down.

Damage

Improper operation if operating conditions deviate from the intended use

- Equip the machine according to the operating conditions.

The following operating conditions deviate from the intended use:
- Dust-intensive applications
- Contaminated areas
- Lower or higher ambient temperatures

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Sign *Chain tension*

Fig. 22: Sign Chain tension

The sign is installed on the left and right on the track roller frame, on the cover near the grease cylinder.

Warns of danger of accidents leading to possible severe injuries.

Meaning: **When releasing the chain, keep your head away from the track roller frame. Sagging chain and spraying grease.**

Sign *Operator's cab tilt device*

Fig. 23: Sign Operator's cab tilt device

The sign is installed on the hydraulic tank near the hydraulic hand pump.

Warns of danger of accidents leading to possible death or severe injuries.

Meaning: **Do not stand under the tilted operator's cab unless the safety support bar is inserted. When the operator's cab is tilted, the machine may not be started or driven, the parking switch must remain in park position.**

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The sign is installed on the sight gauge of the hydraulic tank.

Indicates the minimum and maximum hydraulic oil level.

Windscreen washer fluid sign

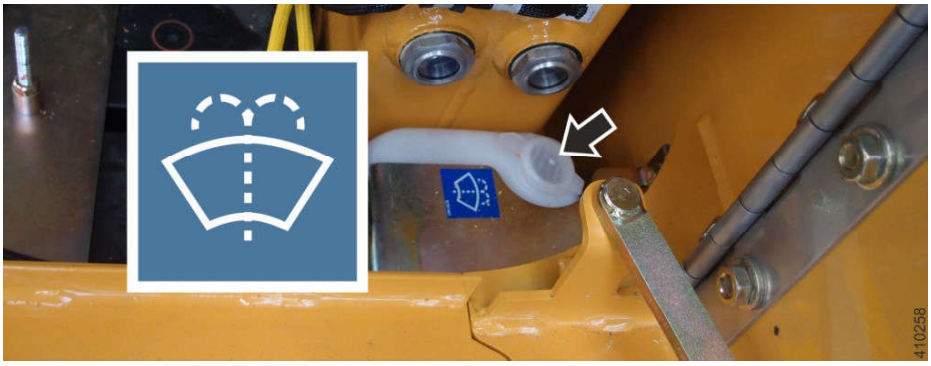

Fig. 43: Windscreen washer fluid sign

The sign is installed on the filler pipe of the windscreen washer tank.

Hydraulic oil sign

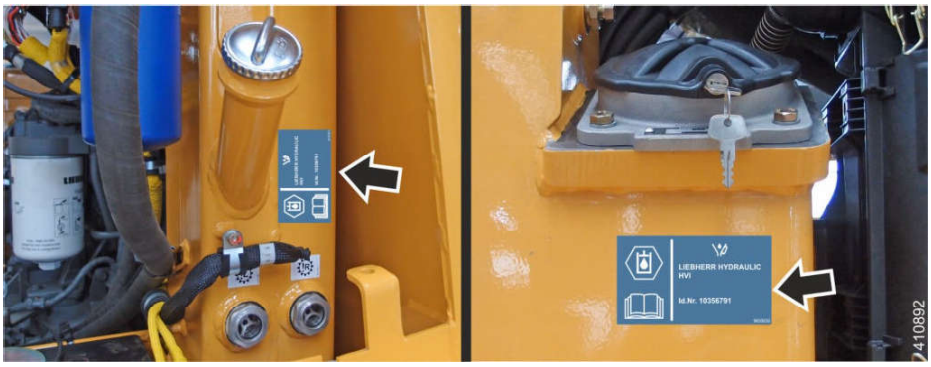

Fig. 44: Hydraulic oil sign

The sign is installed on the filler pipe of the return filter and the filler pipe of the slipring area compartment.

Indicates the filled Liebherr hydraulic oil.

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32. If machine must be repaired while parked on a slope, track chains or wheels must be blocked with chocks to prevent any movement. Bring working attachment into maintenance position.
33. Exclusively authorized personnel with specialized training and experience in hydraulics can work on hydraulic system.
34. Wear protective gloves when checking for leaks. Fluid escaping from a small hole can have enough pressure to penetrate skin.
35. Never loosen any hydraulic oil lines or fittings before attachment has been lowered and engine has been turned off. Then, with ignition key in contact position and parking switch in operating position, actuate all pilot controls (joysticks and pedals) in both directions to relieve servo pressure and back pressures in working circuits, and relieve internal tank pressure by releasing breather screw.
36. Regularly inspect all hydraulic oil lines, hoses and fittings for leaks and externally visible damage. Fix any defects immediately. Oil spray can lead to injuries and fires.
37. Before starting repair work, depressurise system sections and pressure lines to be opened (hydraulics, compressed air) in accordance with assembly descriptions.
38. Route and install hydraulic hoses and air pressure lines properly. Do not mix up connections. All fittings, including length and quality of hose lines must match specified requirements.
    Use exclusively Liebherr replacement parts.
39. Replace hydraulic hoses and lines in regular intervals, as stated, even if no safety relevant defects can be seen.
40. Exclusively qualified electricians or trained personnel under guidance and supervision of a licensed electrician can work on electrical equipment of machine, according to electro-technical rules and regulations.
41. Exclusively use Original fuses with correct amperage. In case of problems in electric energy supply, turn machine off immediately.
42. Inspect and check electronic equipment on machine regularly. Correct any defects, such as loose connections, burnt or chafed wiring or burnt out fuses and bulbs immediately.
43. If any work is necessary on energized, voltage carrying parts, a second person must be utilized to disconnect emergency off or master switch in case a problem arises. Rope off work area off with a red and white safety chain and a warning sign. Use exclusively insulated tools.
44. When working on high voltage carrying components, turn off power supply, then connect supply cable to ground and use a grounding rod to ground these parts, such as condensers.
45. Check all disconnected parts first if they are really free of voltage, ground them and then short circuit them. Insulate adjacent, voltage carrying parts.

2.6.11 Safety guidelines for welding work on machine

1. Adhere to following procedure for welding work on machine:
   - Switch off ignition.
   - Turn battery master switch off (if present).
   - Attach earth of welding unit as close as possible to welding location.
   - Only authorized expert personnel is permitted to carry out welding work.

2.6.12 Safety guidelines for working on attachment

1. Never work underneath attachment as long as it is not safely resting on ground or properly supported.

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3 Control, operation

3.1 Operating and control elements

3.1.1 Operator's cab

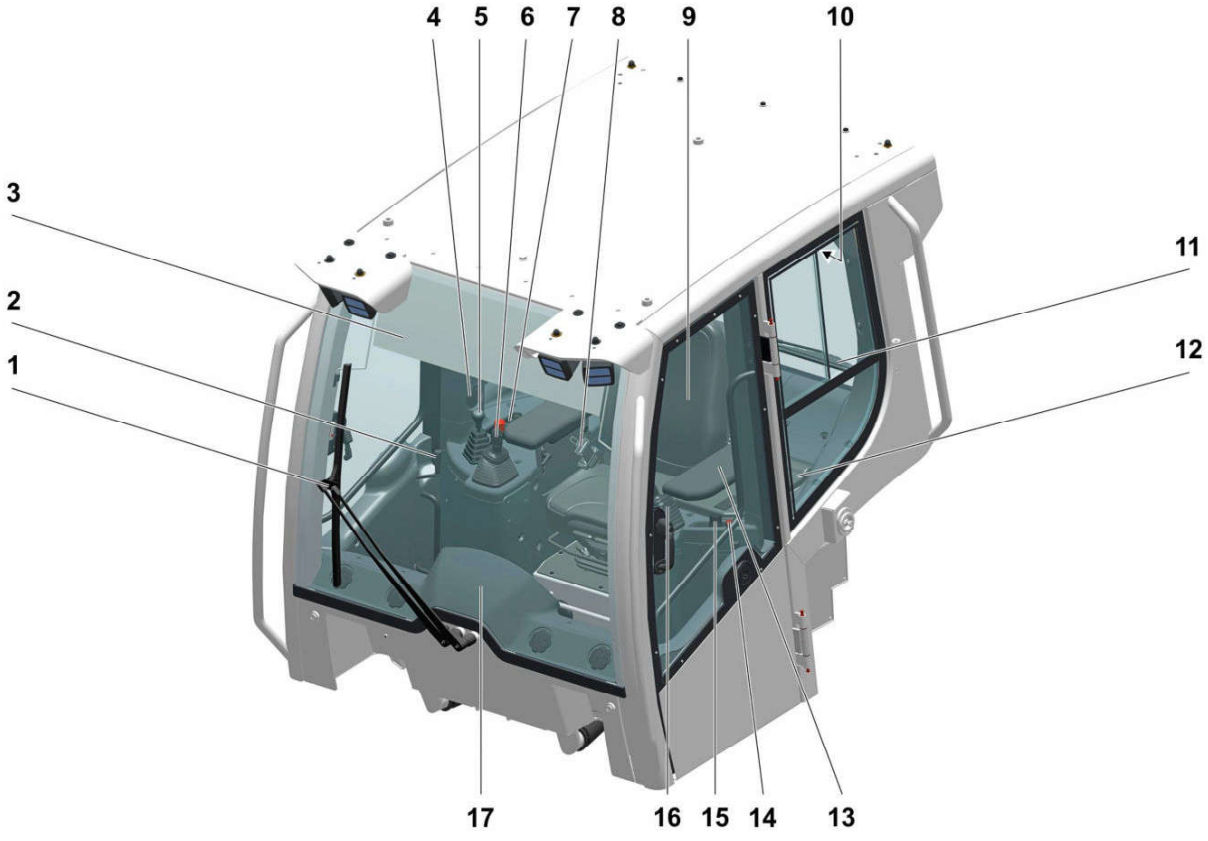

Fig. 51: Interior view of operator's cab

1	Windscreen wiper, windscreen	**7**	Start panel	**13**	Armrests
2	Door latch release	**8**	Safety belt	**14**	Parking switch
3	Sun blind	**9**	Operator's seat	**15**	Engine speed controller
4	Vents for heating	**10**	Heating and air conditioning control element	**16**	Travel joystick
5	Ripper lever (option)	**11**	Windscreen wiper, rear screen	**17**	Display unit
6	Bucket control lever	**12**	Compartment for documentation		

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6 Speed range

– Displays the speed range selected on the travel joystick.

7 Diesel exhaust fluid - tank content


410659

– Displays the contents of the diesel exhaust fluid tank. (For more information see: Warning and malfunction strategies, page 119)

NOTICE
Do not deplete the diesel exhaust fluid tank.

▶ When the diesel exhaust fluid symbol lights up, add diesel exhaust fluid to the diesel exhaust fluid tank immediately and do not delay it until later.

8 Forward travel speed

– Displays the maximum possible forward speed for the selected travel speed stage.

9 Date

– Displays the current date.
The date format can be changed.

11 Coolant temperature


408344

– Displays the coolant temperature in the diesel engine.

12 Speed unit

– Shows the preselected unit for the speed (km/h or mph).

13 Travel speed reverse

– Displays the maximum possible reverse speed for the selected travel speed stage.

14 Diesel engine rpm

– Displays the current diesel engine rpm.

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3	Temperature control minus symbol	**8**	Increase the blower force symbol
4	Selected inflow temperature display	**9**	Selected blower force symbol
5	Temperature control plus symbol	**10**	Reduce blower force symbol

Defrost mode


408298

To turn the defrost mode on and off.

– When the defrost mode is active, the symbol is shown in green.

Air conditioning


408320

To turn the air conditioning on and off.

Temperature control minus


408301

To decrease the temperature.

– Can be adjusted in 6 stages.

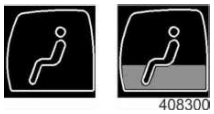
Temperature control plus


408303

To increase the temperature.

– Can be adjusted in 6 stages.

Air distribution display


408300

Shows the areas of air distribution.

– Air distribution active: Coloured in white
– Air distribution inactive: No colour

Air distribution floorboard area symbol


408304

To open and close the flap for the air distribution in the floorboard area.

Flap in the floorboard area open:
– Lower field in the area “Air distribution display” coloured in white.

Increase blower force


408295

To turn on the heating, air conditioning.

To increase the blower force.

– Can be adjusted in 6 stages.

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LiDAT Release of remote access

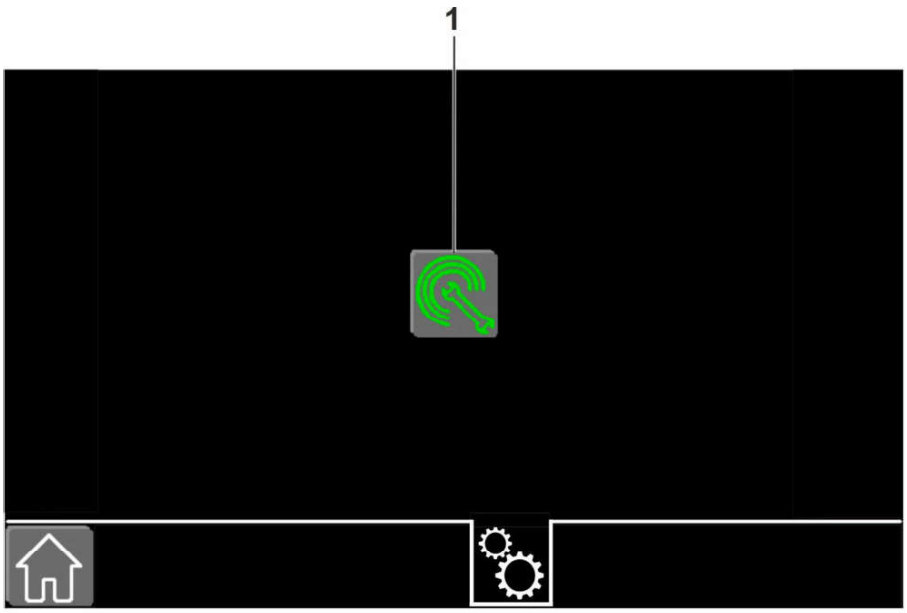

Fig. 161: LiDAT Release of remote access

1 Selection LiDAT Release of remote access

Turn the LiDAT release of remote access on and off by pressing symbol **1**.

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Information

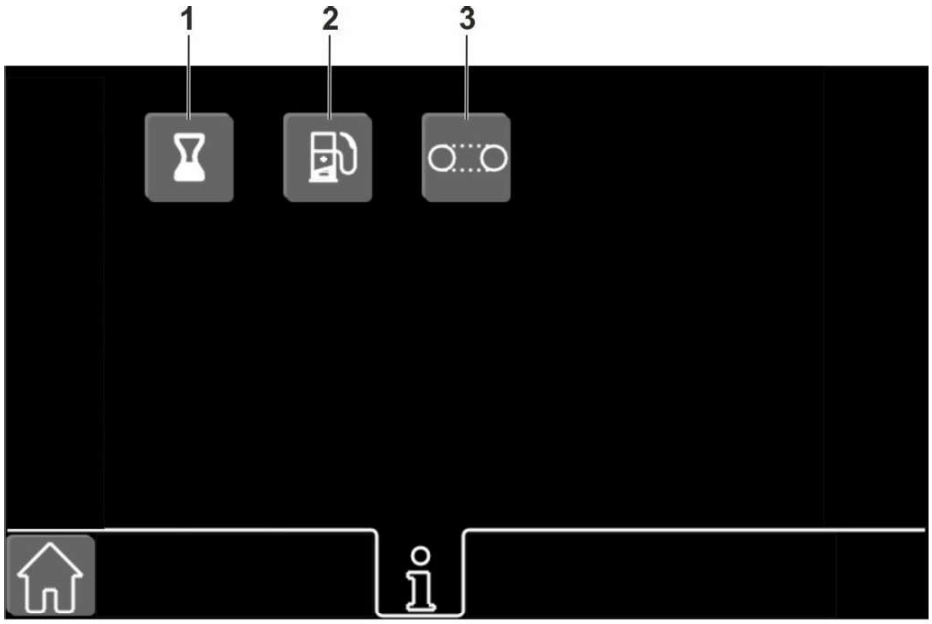

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Fig. 171: Operating page information

1 Time / route info
2 Fuel consumption and diesel exhaust fluid consumption
3 Undercarriage wear

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▷ Machine's electrical system is supplied with voltage.

Turning off battery main switch

NOTICE
Turning off of the power supply impermissibly!
Damage to the machine.

▶ Do not switch off the battery main switch until the indicator light has gone out.

Ensure that following requirements are met:
❑ Auxiliary heater [21)] is deactivated.

If the indicator light **1** has gone out:
▶ Set the battery main switch **3** to **OFF**.
▷ Machine's electrical system is de-energised.

3.2.2 Entering and exiting the machine

Ensure that following requirements are met:
❑ The steps and tracks have been cleaned.
❑ The steps and tracks have been checked for proper condition.

WARNING
Improper entering and exiting!
Falling.

▶ When entering and exiting the machine, maintain three-point contact.

▶ Exclusively enter and leave machine using access aids.

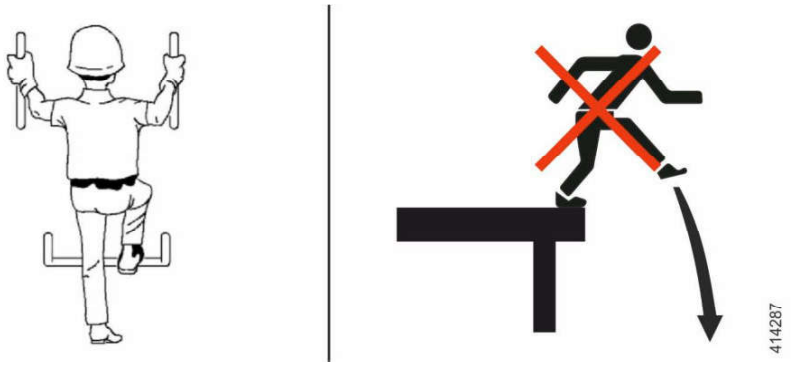

Fig. 183: Entering and exiting the machine

▶ Enter and exit the machine using ascending aids provided.

▶ Enter and exit the operator's cab through the left cab door.

3.2.3 Emergency exit

Always enter and leave the operator's cab through the left-hand operator's cab door.

[21)] Option

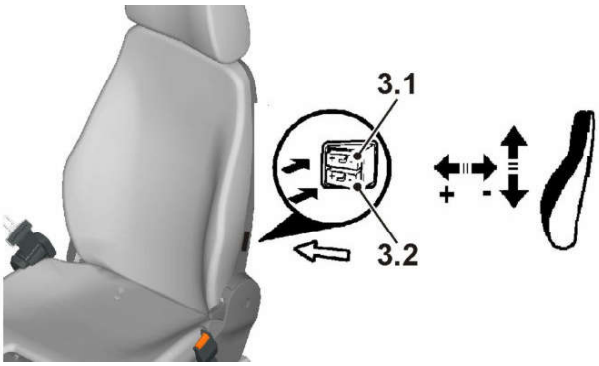

Fig. 202: Adjusting the lumbar support

3 *Lumbar support* button

To adjust the lumbar support:
▶ Move the button **3.1** or button **3.2** in direction “+” or “-”.

Note

When the curvature of the backrest cushion no longer changes by setting the switch to “+” then the maximum curvature of the backrest cushion is reached:
▶ Release the button **3**.

Adjusting the horizontal suspension

Fig. 203: Adjusting the horizontal suspension

5 *Horizontal suspension* lever

Impact loads in travel direction can be absorbed better through the horizontal suspension.

– Horizontal suspension OFF **1** position
– Horizontal suspension ON **2** position

▶ To turn the horizontal suspension on or off.
  ▷ After turning the horizontal suspension off, the locking lever must engage in the desired position.

To turn the horizontal suspension off:
▶ Push the operator's seat back until you can hear it engage.
  ▷ After it is locked, the operator's seat cannot be moved in any other position.

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- ▶ Pull the lever **2** up as far as it will go.
- ▶ Adjust the backrest to the desired incline.
- ▶ Release the lever **2**.

Adjusting the seat heater and seat climate control[23)]

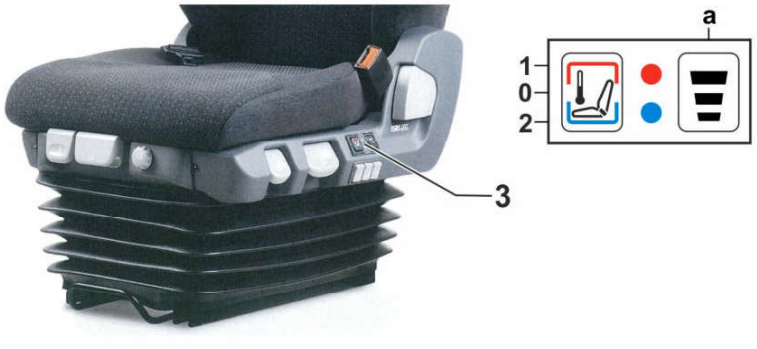

Fig. 219: Adjusting the seat heater and seat climate control

3 *Seat heater and seat climate control* switch

The active seat climate control ensures a dry seat surface.

Any body moisture in the contact area with the seat is removed. This provides a pleasantly cool and dry seat.

- ▶ To turn the seat heater and the seat climate control on, actuate the switch **2**.
  - ▷ Position **0**: Seat heater and seat climate control turned off
  - ▷ Position **1**: Seat heater switched on
  - ▷ Position **2**: Seat climate control switched off
- ▶ Use the switch **-a-** to set the seat heater and seat climate control to the desired output stage.

Adjusting the lumbar support

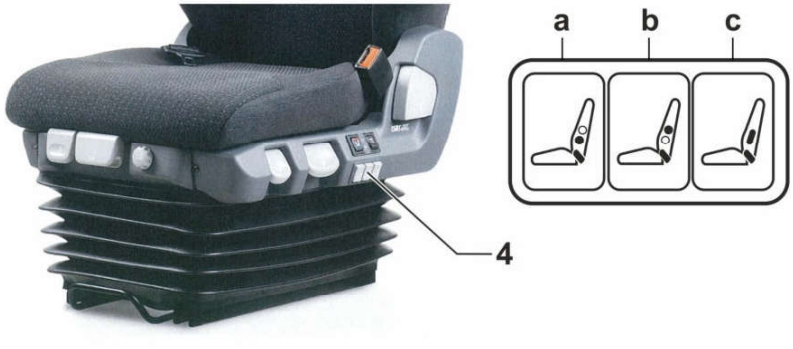

Fig. 220: Adjusting the lumbar support

4 *Lumbar support* switch **b** Upper air chamber

See next page for continuation of the image legend

[23)] Option

▷ Air is blown via vents into the operator's cab.

Warming up the operator's cab quickly

▶ Close the windows and doors.

▶ Turn the temperature dial **2** in a clockwise direction to the stop for the highest outflow temperature.

▶ Set the rotary switch for blower **1** to the highest blower stage.

Operation of the air conditioning unit

Turning on the air conditioning unit

Fig. 238: Start the diesel engine

The air conditioning unit only works if the diesel engine is running.

▶ Start the diesel engine.

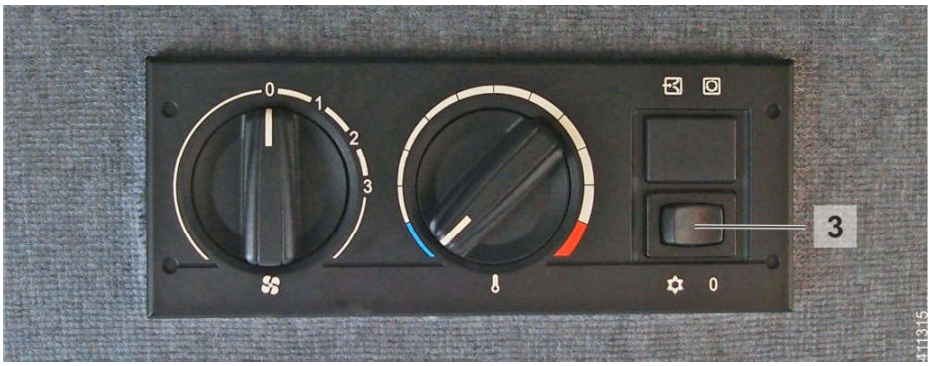

Fig. 239: Main switch for air conditioning unit

▶ Switch on the air conditioning unit using the battery main switch - air conditioning unit **3**.

3.3 Operation

3.3.1 Operating machine on a daily basis

Ensure that following requirements are met:
- ❑ The maintenance work is carried out for every 8-10 operating hours before putting the machine into service on a daily basis.
- ❑ Sufficient diesel fuel is available for the work each day. (For more information see: Refuelling with diesel, page 165)

Bringing the machine into operating position

Switching on the battery main switch

The battery main switch is located under the step on the left.

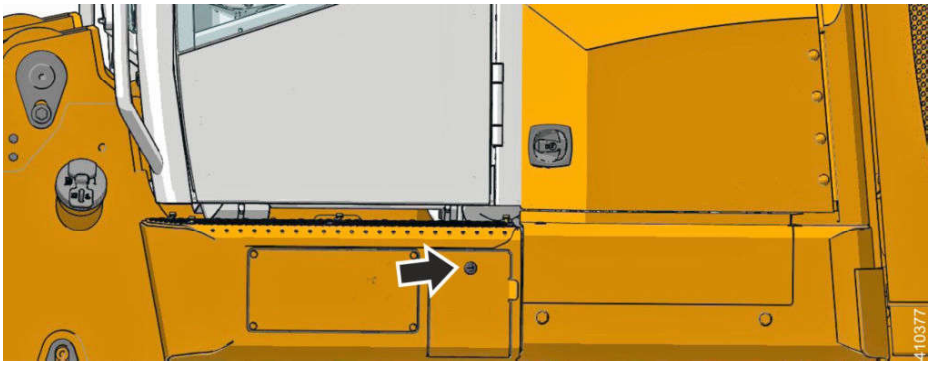

Fig. 255: Door step

▶ Open lid for battery main switch.

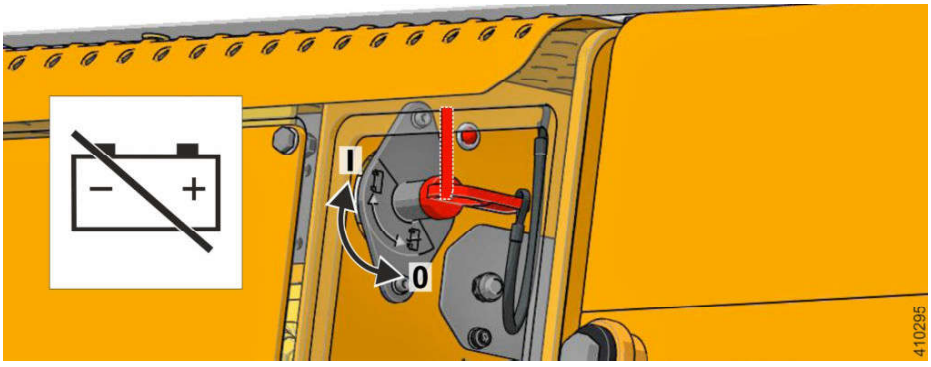

Fig. 256: Battery main switch

▶ Set the battery main switch to position “I”.
▷ The battery main switch is switched on.

3.3.2 Using the machine at low or high ambient temperatures

Note
Pay attention to the temperature application range for the lubricants filled in the machine!

▶ Fill the machine with lubricants and service fluids according to the temperature at the jobsite.

Your machine can be utilized up to an ambient temperature of -22 °C to 45 °C without additional working attachments and without restrictions.

From a constant ambient temperature below -22 °C or above 45 °C, special working attachments must be installed to ensure proper operation.

If the ambient temperature is below -22 °C or above 45 °C:
▶ Contact Liebherr customer service or the manufacturer.

3.3.3 Starting diesel engine

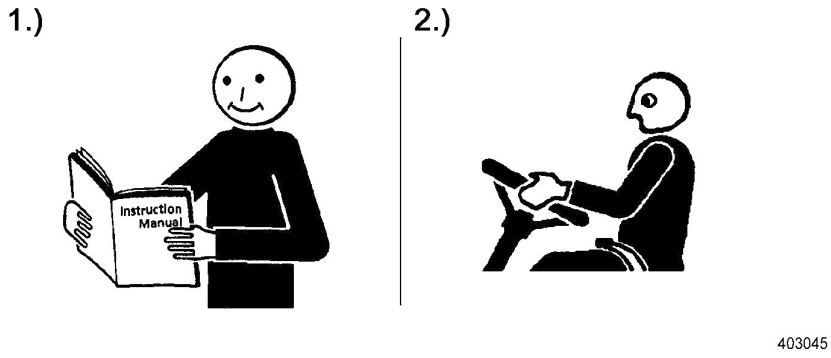

Fig. 274: Operator's manual

1 Read and understand **2** Drive and work

Operate the machine only if you have read and understood the operator's manual!

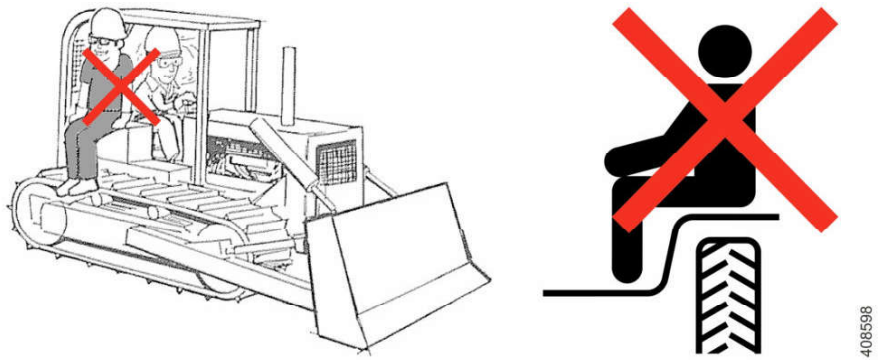

Fig. 275: Personnel transport prohibited

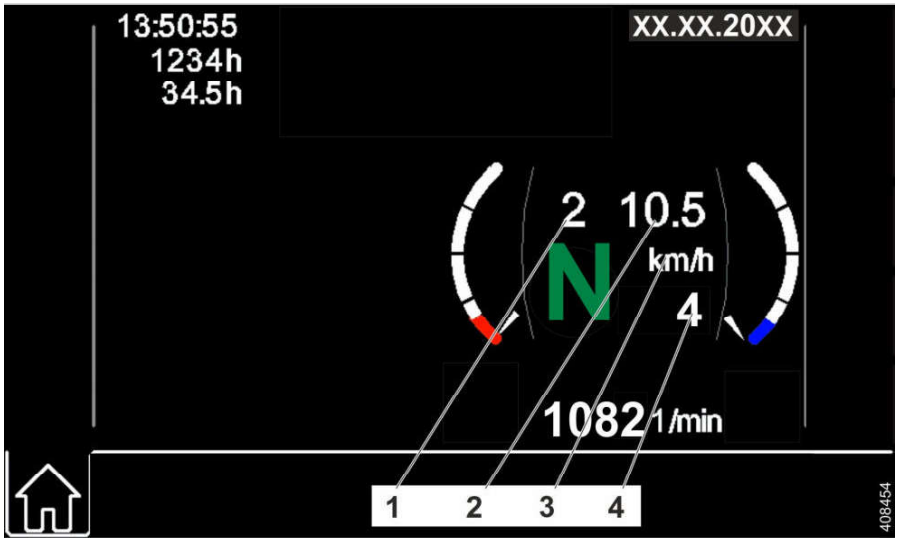

Fig. 289: Display unit km/h

1 Speed range
2 Forward travel speed
3 Speed unit
4 Travel speed reverse

▷ The selected travel speed as well as the obtainable speed are shown in the display unit in km/h.

Travel speed fine adjustment

The travel speed can be decreased or increased within the selected speed ranges **(I, II, III)** using the button **1** and the button **2** on the travel joystick in 0.5 km/h increments.

The travel speed can also be set separately for forward as well as for reverse travel. This function enables the operator to optimally match the machine speed to the operating conditions.

The fine adjustment has a memory function (save function). The speed range selected via the buttons on the travel joystick is retained even after the machine has been shut down.

Fig. 290: Travel speed button

▶ Press the button **1** or the button **2** on the travel joystick and set the desired speed.
▷ The speed is increased or decreased.

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Fig. 308: Starter switch - Park position

▶ Turn the starter switch to the park position.
  ▷ The interior light is operational.
  ▷ The engine compartment light is operational.

DANGER
Severe danger of accidents for maintenance personnel if a second person works on the machine without authorisation!

▶ Secure the machine to prevent unauthorized access by a second person!

When you leave the machine:
▶ Turn the starter switch to the stop position **“0”** and remove the key.

3.3.8 Working in water

NOTICE
Danger when exceeding maximum fording depth!
If the maximum fording depth is exceeded, the fan and as a result the cooler and the Diesel engine will be destroyed.

▶ Do not exceed the maximum fording depth (lower edge of the carrier roller **1**).

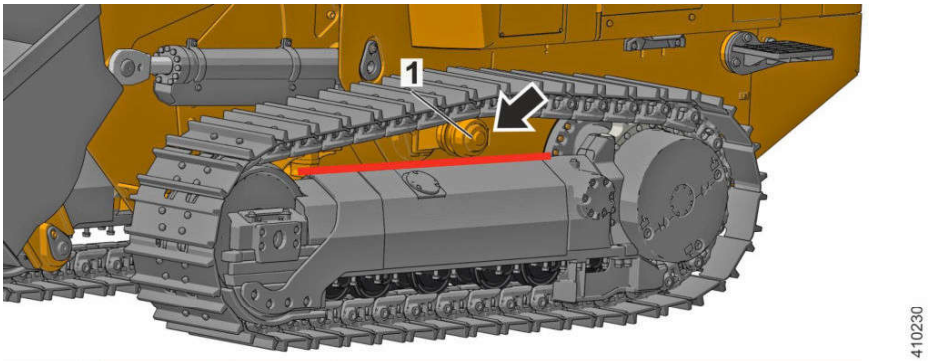

Fig. 309: Lower edge of the carrier roller

The lube points are degreased by moving in water.

▶ After working in water, grease all lube points.

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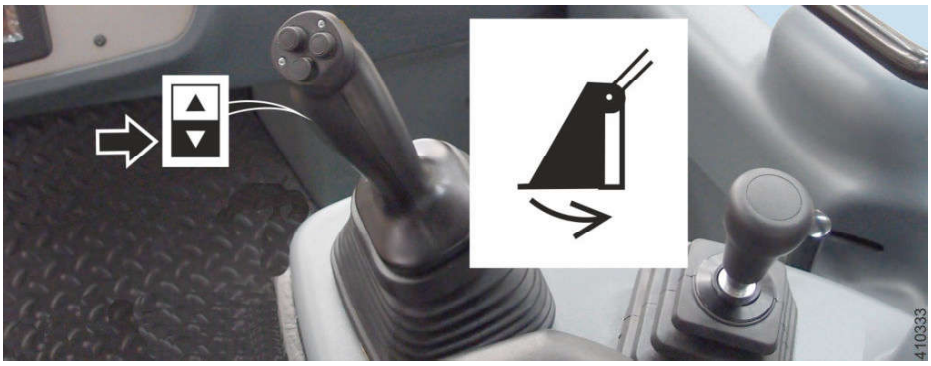

Fig. 329: Closing the bucket flap

▶ Push button on the bucket control lever on bottom.
▷ Bucket flap is closed.

Raising and lowering ripper

The ripper is actuated with the ripper lever which is located on the right of the operator's seat.

By deflecting the ripper lever to front or rear, the ripper is lowered or raised.

Depending on lever deflection, the ripper is brought to the desired working height at different speeds.

If the ripper lever is released, it returns by itself to neutral position. The ripper remains at the adjusted working height.

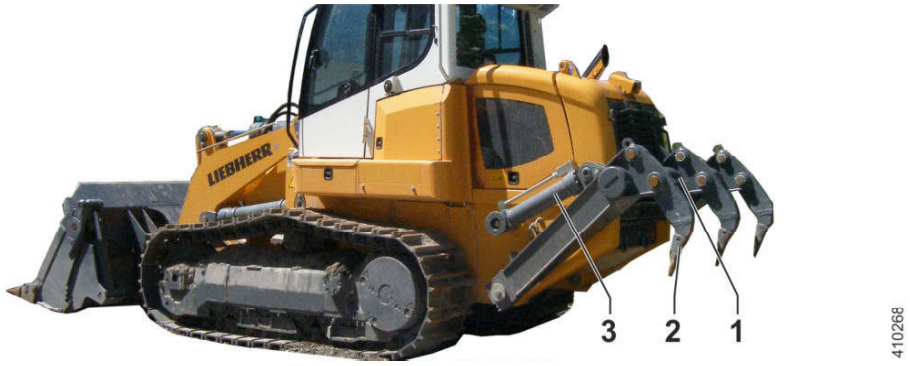

Fig. 330: Ripper

1 Pull bar
2 Ripper tooth
3 Hydraulic cylinder

WARNING
Risk of accidents due to raised components and loads!
Falling components and loads can result in severe bodily injuries or even death.

▶ Never work under raised components and loads if they are not properly supported or laying on the ground.

Standing under suspended loads is strictly prohibited!

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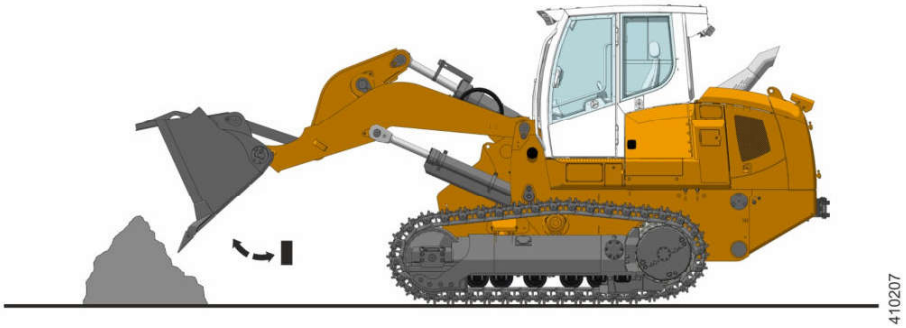

Fig. 349: Empty the bucket

▶ Tilt the bucket out.

NOTICE
Danger of damaging the machine!
Hitting the working attachment against the stops on the bucket arm unnecessarily when tilting the bucket out and in leads to accelerated wear of pins and bushings.

▶ Avoid hitting unnecessarily.

Release material stuck in the bucket:
▶ Tilt the bucket in and out quickly and momentarily hit the stops on the bucket arm.

3.4.4 Loading from a bank or wall

Material removal from a bank

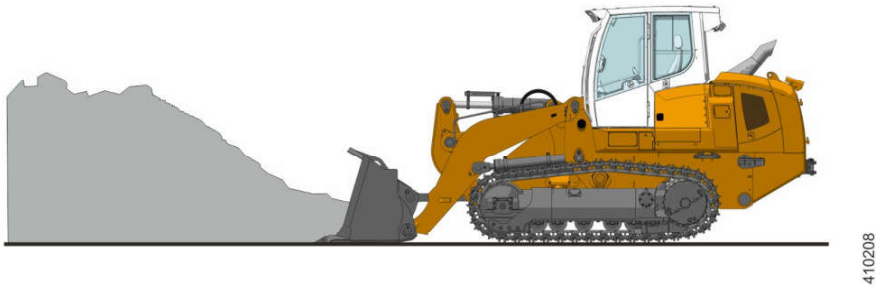

Fig. 350: Material removal from a bank

▶ Start at the bottom of the bank and continue upward.

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3.5 Install and remove the attachment

3.5.1 Installation guidelines for installation and removal of working attachment parts

Always use a suitable lifting device to install and remove the working attachments.

Clean all bearing points, pins, threads and similar items, and check them for damage.

Make sure that the following requirements are met:
- ❑ The working attachment is lowered.
- ❑ All control levers are in the neutral position.
- ❑ The parking switch is set to the park position.
- ❑ The diesel engine is turned off.

WARNING
Danger of accident due to suspended or raised load!
Suspended or falling loads can result in serious physical injuries or death.

▶ Never walk or stand under suspended loads.

▶ Before lifting working attachment parts, determine their weight and have the necessary attachment equipment available. See section (For more information see: 1 Product description, page 17) .

3.5.2 Install and remove the bucket

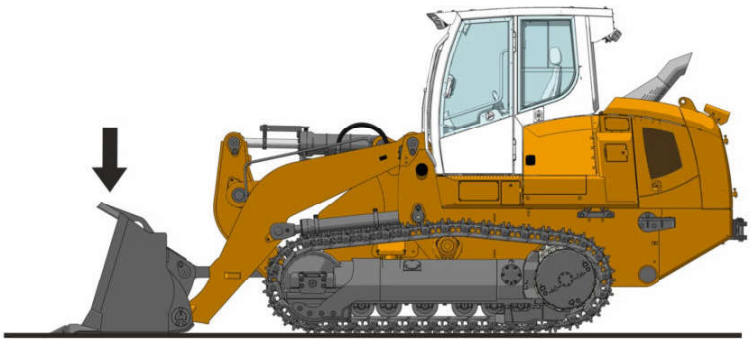

Fig. 368: Lower the working attachment

▶ Lower the bucket level to the ground.

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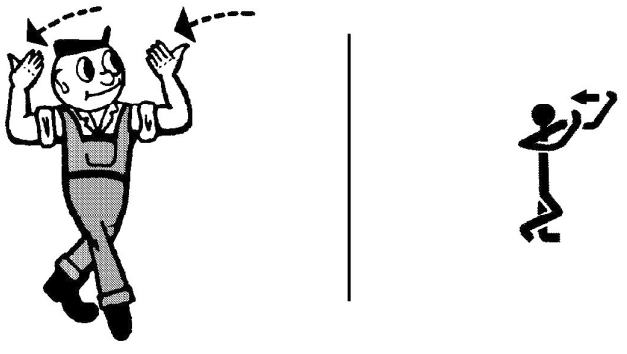

Fig. 388: Guide

▶ Make sure that guides are always positioned to the side of the machine!

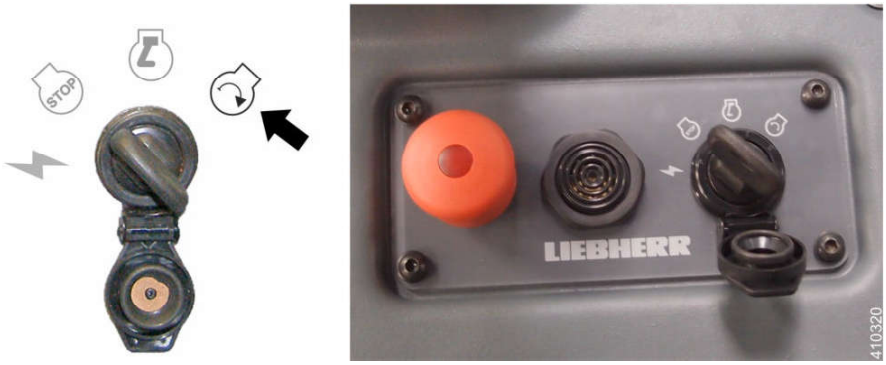

Fig. 389: Starting procedure

▶ Start the Diesel engine.

Fig. 390: Parking switch Operating position

▶ Switch the parking switch **1** to operating position.

DANGER
Danger of accidents due to careless driving!
Careless driving increases the dangers of accidents for loading personnel, the guide as well as for the operator of the machine.

▶ When loading the machine, always drive carefully!

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▶ Pull the sun gear out.

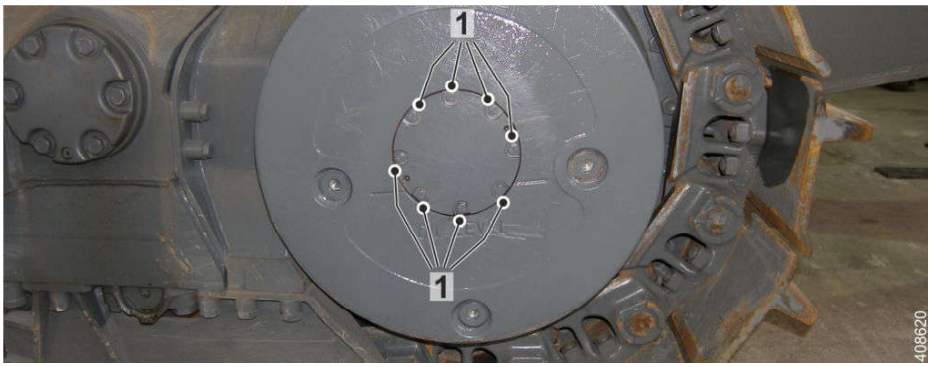

Fig. 407: Installing the gear cover

▶ Install the gear cover on the travel gearbox

DANGER
Uncontrolled rolling off of the machine due to released brakes!

▶ Carry out the towing procedure by taking the specified safety guidelines into account.

▶ Tow the machine.

Installing the sun gear

Make sure that the following requirements are met:
- ❑ Required tools to install the sun gear are on hand.
- ❑ The hydraulic lift with a lifting force of approximately 10 t is ready.
- ❑ Two new gear cover seals are on hand.
- ❑ “LOCTITE 243” screw adhesive is available.
- ❑ A torque wrench is available.

NOTICE
Dirt gets into the travel gearbox as a result of opening the gear cover!
The travel gearbox will be damaged.

▶ Ensure utmost cleanliness to prevent any dirt from getting into the travel gear.

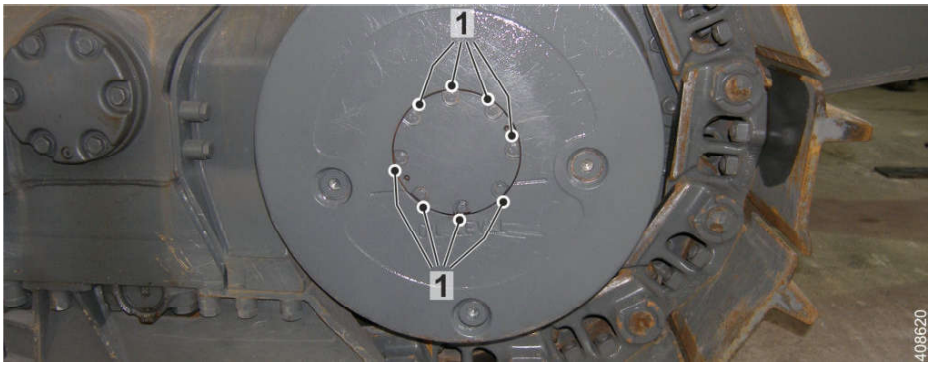

Fig. 408: Gear cover screws

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Malfunction / error	Cause	Remedy
Only low air flow in operator's cab	Fresh air filter dirty	Clean air intake openings, replace fresh air filter

4.2.6 Working attachments

Malfunction / error	Cause	Remedy
Cylinder slips under load	Piston seal in cylinder defective	Overhaul cylinder
Chain scrapes on push frame (crawler dozer)	Blade adjustment incorrect	Adjust correctly
Bearing clearance too high on attachment	Bearing points worn out	Replace bearing parts

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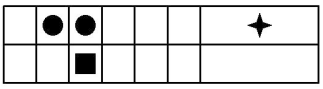
5 Maintenance

5.1 Maintenance and inspection schedule

Abbreviations used in this section: Bh or h = operating hours

Various marks (circle, box, star - filled and circle, box, start - empty) divide the maintenance work into two groups.



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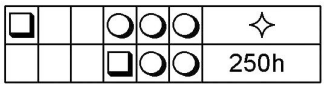
The marks mean:

Chart with circle, box, star - filled

In this case, the machine operator or maintenance personnel are solely responsible to carry out the maintenance work.

Affects maintenance intervals: Every 10 and 50 operating hours (h) and special intervals.



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The marks mean:

Chart with circle, box, star - empty

In this case, authorized Liebherr personnel or their contracted dealers must carry out or supervise the maintenance and inspection work.

Affects maintenance intervals: At delivery, then every 500, 1000 and 2000 operating hours (h) and special intervals.

A list of spare parts, which is required for the maintenance and inspection work is included in the “SERVICE PACKAGE” of the spare parts list.

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5.3 Lubricants and fuels

5.3.1 General information about lubricants and fuels

General Information

Observe the information about lubricants and fuels. Lubricate the machine and change the oils within the specified time frames. For further information, see: “lubrication chart” and “maintenance and inspection schedule”. Keep the work area clean for these tasks. This increases the reliability and service life of the machine.

- ▶ Carry out all work on the machine on level and solid ground.
- ▶ Turn the diesel engine off, remove the ignition key and turn the battery main switch to position 0 (off).
- ▶ Clean the grease fitting before lubrication.
- ▶ Before any maintenance and repairs, clean machine, especially connections and fittings to remove oil, fuel or cleaning substances. Do not use any aggressive cleaning agents. Use lint-free cleaning cloths.
- ▶ Carry out the oil change when the oil is at operating temperature, if possible.
- ▶ Check after every oil change or top-up the filling quantity (level) of corresponding aggregate (the specified filling quantities are reference values).
- ▶ Catch used lubricant and fuels in a suitable container and dispose of them in an environmentally friendly manner according to the valid guidelines.

General questions

The Liebherr Lubricant Hotline can be contacted by email should you have any general questions about lubricants and fuels.

Liebherr Lubricant Hotline (Email): lubricants@liebherr.com

Safety data sheets

Safety data sheets for lubricants and fuels are available online via the Liebherr lubricant portal.

Liebherr lubricant portal: lubricants.liebherr.com

Technical data sheets and specific Liebherr standards

For technical data sheets and specific Liebherr standards: contact Liebherr customer service.

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The selection of lube oil viscosity is made according to the SAE classification (Society of Automotive Engineers). The SAE classification provides no information about the quality of a lube oil. The ambient temperature is decisive in the correct selection of the SAE classification. The function of axles and gears can be adversely affected due to incorrect viscosity.

The temperature ranges given in the chart are reference values, which can be exceeded or fallen below for short periods.

5.3.8 Lube oils for travel gearbox

Quality

Recommended lubricant	Specification
Liebherr Hypoid 85W-140 EP	API: GL5
	MIL-L: 2105 D, PRF-2105 E
Liebherr Syntogear Plus 75W-90	API: GL4, GL-5, MT-1
	MIL-L: 2105 D, PRF-2105 E

Tab. 45: Lube oil specifications

If Liebherr oils are not available locally, oils according to the specification must be used instead (after consulting with the respective customer service).

Viscosity

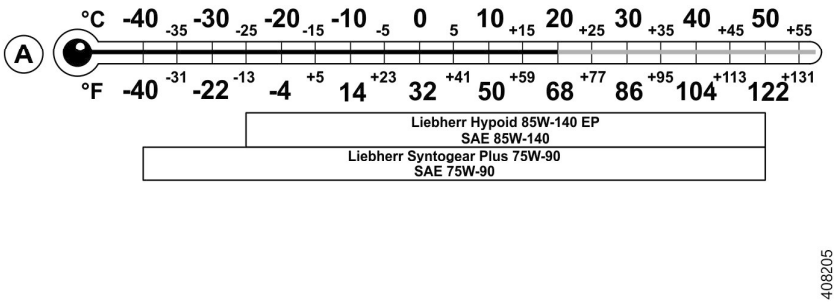

Fig. 457: Temperature dependent selection of SAE classification

A Ambient temperature

The lube oil viscosity is selected according to the SAE classification (Society of Automotive Engineers). The SAE classification provides no information about the quality of a lube oil. The ambient temperature is decisive in the correct selection of the SAE classification. The function of axles and transmission can be adversely affected due to incorrect viscosity.

The temperature ranges given in the chart are reference values which temperatures may be above or below for short periods.

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When the starting switch is set to zero position, the diesel exhaust fluid lines of the exhaust treatment system are automatically cleaned.

The light on the battery main switch console lights up red as long as the procedure is active.

The battery main switch may only be disconnected when the cleaning procedure is no longer active and the indicator light on the battery main switch console turns off.

NOTICE
The battery main switch is turned off during the active cleaning procedure of the exhaust treatment system!
Damage to the exhaust treatment system.

▶ Turn the battery main switch off only when the indicator light on the battery main switch console goes out.

Before leaving the machine, turn the battery main switch off.

When the red indicator light turns off:
▶ Set the battery main switch to position “0”.
▷ The battery main switch is turned off.

▶ Secure the machine to prevent unauthorized access. Pull out key from main switch.

Opening the engine compartment doors

When engine compartment door is open, access is provided to following aggregates and components:
– Diesel engine
– Cooling system

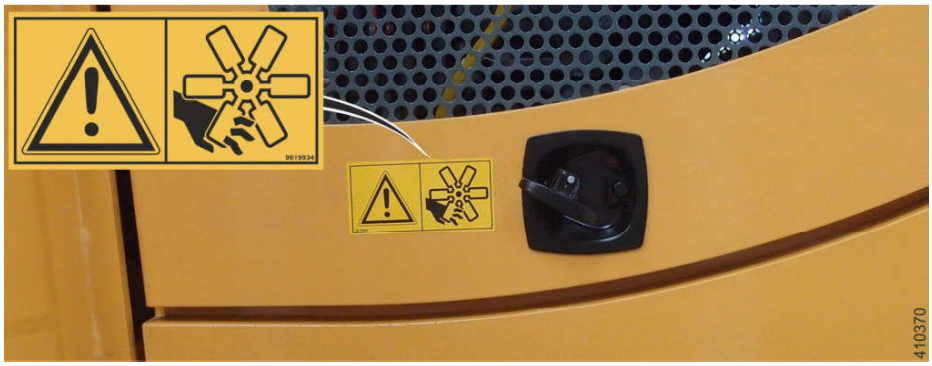

Fig. 473: Open only if the diesel engine is not running

WARNING
Rotating engine parts!
Clothing, hair or limbs may be caught by the fan blade or the V-belt and be pulled in. This may result in severe injuries.

▶ Only open the engine compartment doors and cooler guard when the diesel engine is not running.

5.9 Fuel system

5.9.1 Notes for work on the fuel system

Fig. 489: Danger of fire

WARNING
Diesel fuel is easily flammable!
Danger of fire and explosion.

- ▶ Do not smoke.
- ▶ Avoid open flames.
- ▶ Work only when the Diesel engine is turned off and cooled off.

5.9.2 Fuel preliminary filter: Drain the condensation

Make sure that the following prerequisites are met:
- ❑ The machine is in maintenance position.
- ❑ A sufficiently sized container is on hand.

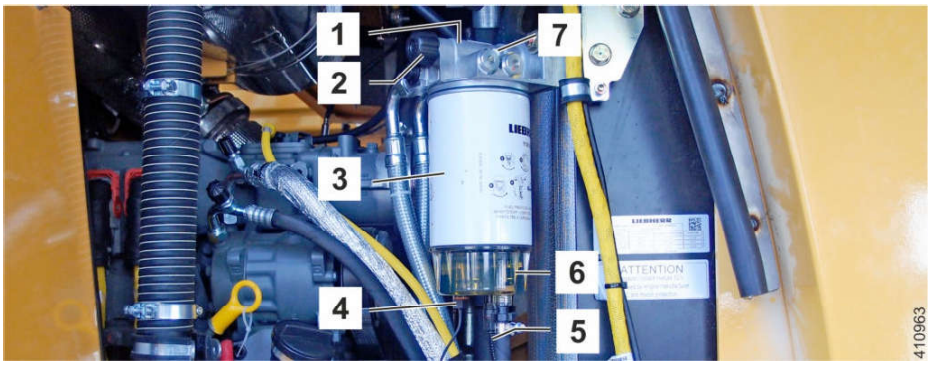

Fig. 490: Drain the fuel preliminary filter condensation

1 Filter head
2 Manual fuel pump
3 Fuel prefilter cartridge
4 Water probe plug
5 Drain valve
6 Water separator container
7 Breather screw

5.13 Splitterbox

5.13.1 Check the oil level

The dipstick **1** and the oil filler tube **2** are in the engine compartment on the right hand side of the engine.

Make sure that the following prerequisites are met:
- ❑ The machine is in maintenance position.
- ❑ Left engine compartment door is open.

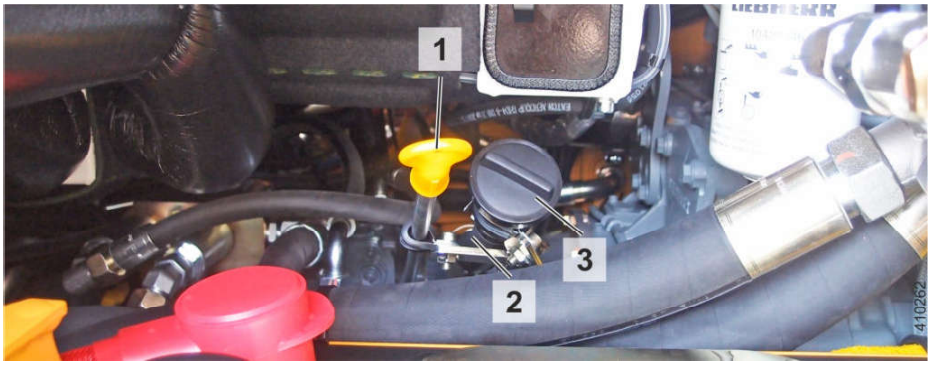

Fig. 504: Oil filler neck, dipstick

The oil level must be between the “MIN” and “MAX” marks.

▶ Pull out the dipstick **1**, wipe it off and reinsert it.

▶ Pull the dipstick **1** out again and check the oil level.

If the oil level is too low:

▶ Remove the oil filler cap **3** from the oil filler tube **2** and add oil.

▶ Clean the oil filler cap **3**.

▶ Set the oil filler cap **3** on the oil filler tube **2** and tighten.

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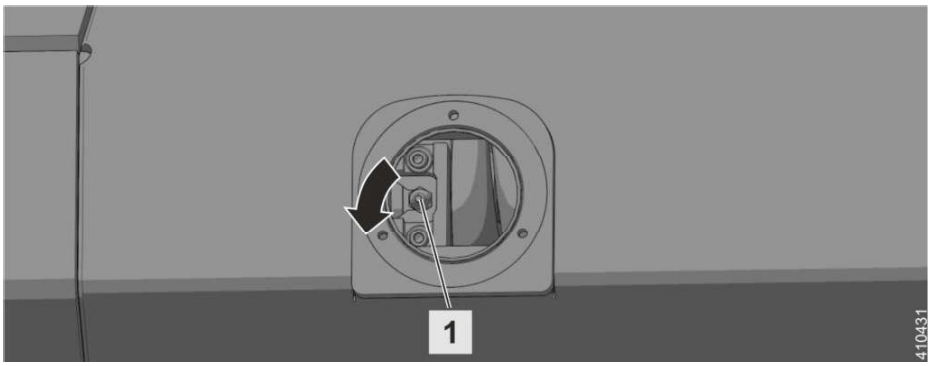

Fig. 515: Grease fitting

- ▶ Carefully unscrew the grease fitting **1** by a few threads.
  - ▷ Grease emerges from the ring groove of the fitting.

When the specified chain tension is reached:

- ▶ Tighten the grease fitting **1**.
- ▶ Move the machine forward and backward.
- ▶ Check the chain tension and correct, if necessary.
- ▶ Attach the cover **2** with hex head bolts **1**.

5.17.3 Grease the equalizer bar bearing

The center equalizer bar bearing is equipped with a grease fitting and must be greased as specified in the data in the Maintenance and Inspection schedule.

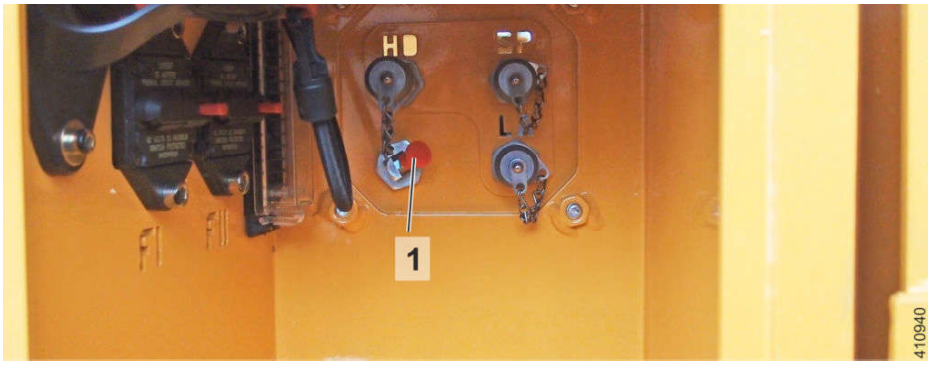

Fig. 516: Lube point - equalizer bar bearing

- ▶ Open the door of the battery master switch.
- ▶ Grease the lube point **1** with the manual grease pump.