Operating Manual

Wheel loader

WACKER NEUSON

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Preface

This operator's manual describes how to operate and service the loader. They provides operating and maintenance personnel with the necessary knowledge of the loader's functional characteristics in order to allow them to handle, properly service/inspect, clean and look after the loader safely and without danger, and to ensure that the technical safety regulations for the loader are complied with.

Observing the specifications in this operating manual assures:

- proper, safe and professional operation of the loader
- professional maintenance, cleaning and care for the loader
- compliance with the necessary technical safety regulations

If required, the user/operator should supplement the operating manual with instructions and regulations regarding environmental protection and national regulations relating to accident prevention.

NOTE
This operator‘s manual must always be kept either on the loader or at the point of use.

The operator‘s manual must be read and applied by all persons involved in work with or on the loader, for example with regard to:

- Operation including setup, remedying faults during operation, care, disposal of auxiliary materials and operating materials (lubricants, fluids and oils) as well as disposal of the entire loader
- Servicing (inspection, maintenance, care)
- Transport.

NOTE
This operator‘s manual does not contain instructions on how to carry out extensive servicing or repairs. This type of work must only be performed by qualified specialists.

Should you have questions about this operating manual, please contact your dealer..You are welcome to use the **WACKER NEUSON** Service.

2.1 Organizational measures

The following safety instructions are intended for the operator/user of the loader.

- The operator's manual must always be kept ready to hand at the site of use of the vehicle, e.g. in the designated stowage tray.
- In addition to the operator's manual, generally valid statutory and other binding rulings relating to road traffic regulations, compulsory insurance cover, accident prevention and protection of the environment must be observed, and users must be instructed to observe them. This applies in particular to the maximum speed, which depends on the particular model, and the permissible total weight of the loader.
- If necessary, personnel using the loader should be instructed to wear personal safety equipment. This applies particularly when handling potentially harmful substances at the site of use.
- The operator's manual should be supplemented with instructions including supervisory and reporting requirements in order to take into account special company-related requirements, e.g. in relation to the organization of work, work processes or personnel used.
- Personnel instructed to work on/with the loader must have read the operator's manual, in particular the section on basic safety instructions, before they start work. This applies particularly to personnel who only work occasionally with the vehicle, e.g. for set-up or maintenance purposes.
- All safety information and hazard warnings on the loader and in the operator's manual must be followed.
- All safety information and hazard warnings on the vehicle must be kept complete and in a legible state.
- In the event of any safety-related changes to the loader or to the way in which it operates, shut down the loader immediately and rectify the problem. Have this done by somebody else if you cannot do it yourself.
- No modifications must be made to the loader (including the attachment of components or removal/transfer of existing components) which could affect its safety without authorization from **WACKER NEUSON**. This also applies to the installation and adjustment of safety devices and safety valves as well as to the welding of load-bearing parts.

2.4.3 Electrical power

- Check the electrical equipment of the loader at regular intervals. Defects such as loose plug connections or burnt cables must be immediately rectified.
- Shut down the loader immediately if there are any defects in the electrical system.
- Only use original fuses with the required current rating

2.4.4 Fire hazard

WARNING
Hot parts of the machinery, e.g. the exhaust system, exhaust gases and the electrical system, represent particular dangers as they can cause explosions and fires.

► Keep a safe distance from flammable materials like hay and straw.
► Do not work in enclosed rooms which contain flammable materials, explosive vapors or dusts.
► Only park the loader in designated areas which are protected against the risk of fire.

2.4.5 Gas, dust, vapor, smoke

- Due to the exhaust gases which are emitted from the diesel engine, the loader must only be used in sufficiently well ventilated areas. Before starting up the vehicle in enclosed spaces, make sure that there is sufficient ventilation.
- Comply with the regulations which apply at the particular site of use.
- Do not carry out any welding, burning or grinding work unless it is expressly permitted. There must not be any risk of fire or explosion. Ensure that adequate ventilation is provided before carrying out welding, burning or grinding work and clean the loader and its surroundings of dust and combustible materials.
- Wear appropriate personal protection equipment (breathing filters, protective overalls) for protection against specific hazards, e.g. as a result of poisonous gases, corrosive vapors, poisonous surroundings of the vehicle (i.e. containing toxins) etc.

2.8.6 Seat belt

NOTE
Always fasten the seat belt when performing any work with the loader.

The loader is equipped with a seat belt on the driver's seat (Fig. 8).

Fig. 8
Seat belt

2.8.7 Emergency exit

NOTE
The cab has two doors. Use only the door on the left when entering and leaving the cab. The door on the right is only to be used as an emergency exit.

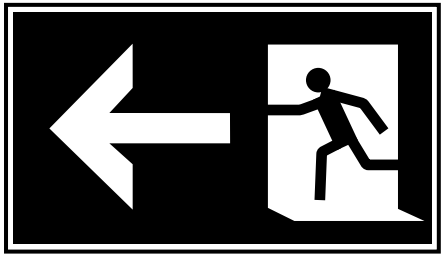


Fig. 9
Emergency exit

3.3 **Lifting diagram** (telescopable lift frame)

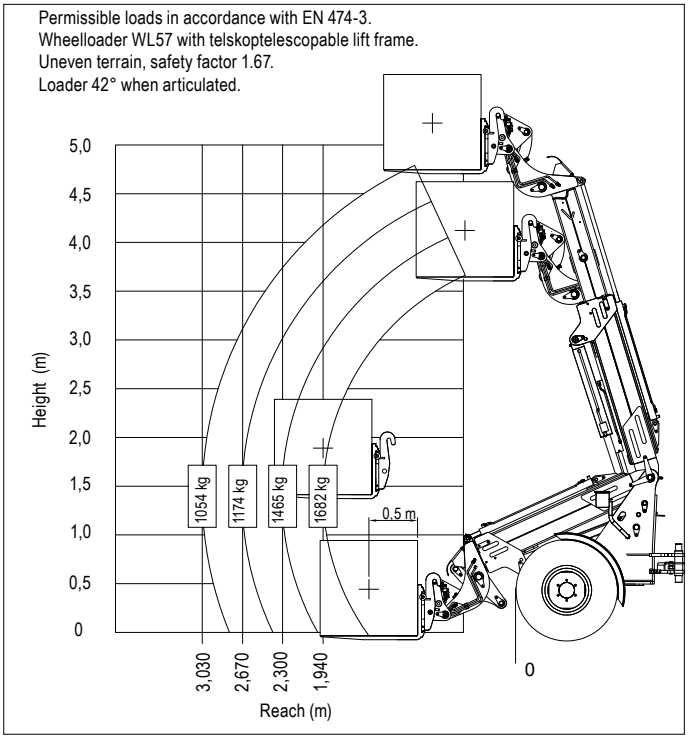


Fig. 11 Lifting diagram
(telescopable lift frame)

Item	Description
1	Steering wheel
2	Instrument panel
3	Steering wheel turning knob
4	Load indicator (loaders with telescoping lift frame only)
5	Toggle switches
6	Ignition switch
7	Accelerator
8	Operating lever for lift frame / traction drive
9	Operating lever for additional hydraulics

Item	Description
10	Operating lever for parking brake
11	Driver’s seat
12	Footrest
13	Braking-inching pedal
14	Operating lever for adjusting the steering column
15	Toggle switches
16	Operating lever for lighting, turn signals and horn

Item	Designation	Function	Symbol
1	Hydraulic locking toggle switch for attachments	Unlocking the auxiliary hydraulics for releasing the hydraulic lock for attachments	
2	Toggle switch for hazard warning lights	Switches hazard warning lights on/off	
3	Toggle switch, air conditioning system	Switches the air conditioning system on/off (additional equipment)	
4	Toggle switch, illumination system	Switches the lights for street driving on/off	
5	Toggle switch, pressure relief for additional hydraulics	Switch to relieve pressure on the additional hydraulics	
6	Toggle switch, float position / emergency lowering of the lift frame (needed if the loader is equipped with electrically unlockable lowering brake valves)	Switches on/off the float position of the lift frame for loaders with electrically unlockable lowering brake valves	
	Toggle switch, special equipment for lift frame vibration damping	Switches the lift frame vibration damping ON/OFF (optional equipment)	
7	Toggle switch, lift frame arrest	Switches the lift frame arrest ON/OFF	
8	Toggle switch for electrical connection on lift frame (additional equipment)	Switches the electrical connection on the lift frame on/off	
9	No function	Available for additional equipment	
10	No function	Available for additional equipment	

* The position of the switches can vary depending on the combination of different additional equipment

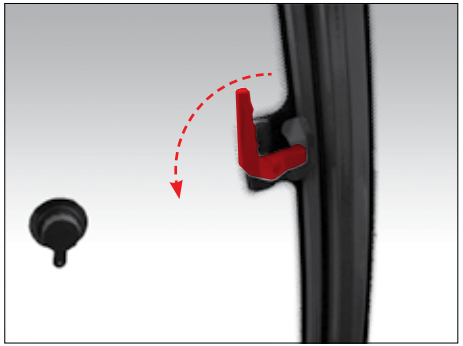


Fig. 27
Window lock

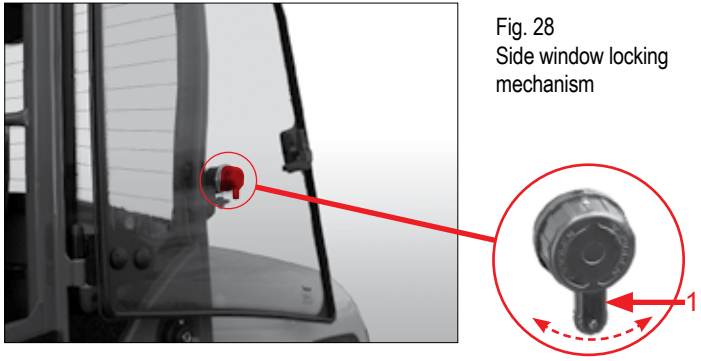


Fig. 28
Side window locking mechanism

The side windows can be opened and locked in this position. Open and close the side windows using the lever (Fig. – 27).

- Arrest the side window by locking it in the holder (Fig. – 28).
- Activate lever Item 1 to release the arrest (Fig. – 28).

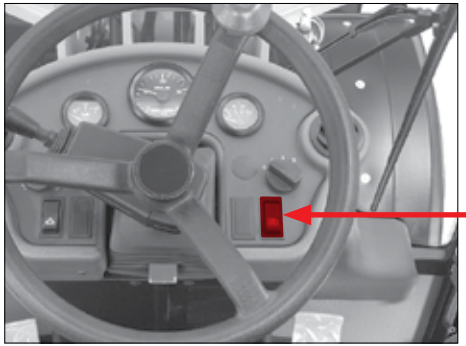


Fig. 36
Lighting / forward warning device

Iustration 1

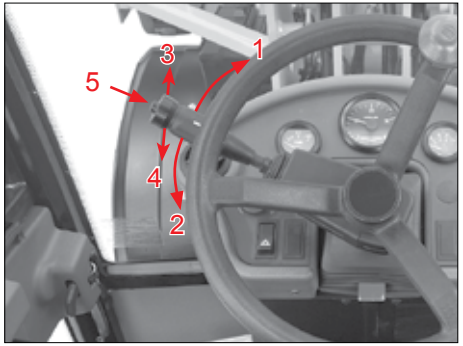


Illustration 2

Switch the lighting, turn signal and forward warning device functions on and off with the lever (Fig. 36/2).

1. Push the lever away from the operator:
– The right turn signal is activated.

2. Pull the lever towards the operator:
– The left turn signal is activated.

3. Push the lever upwards:
– Low beam is switched on.

4. Push the lever downwards:
– Main beam is switched on.

5. Push the horn symbol on the button:
– The forward warning device is activated.

If the engine does not start

NOTE
Risk of technical damage.
It is never possible to start the engine by towing the loader. This could damage the hydraulic system.

- Attempt to start the loader for a maximum of 20 seconds.
- Wait one minute.
- Repeat the starting process.
- If the engine will not start after two attempts, look for the cause in the malfunction table (»Troubleshooting and emergency maintenance«) or contact a specialist garage

NOTE
Risk of technical damage.
The engine can be damaged if it is run for long periods without a load.
► Avoid low-load operation (less than 20 % load)

Before every start of work

- Check the loader for visible defects before the start of every work shift.
- Check the functions of the control devices.
- Check the operation of the brakes and warning devices.
- Report any defects found to the supervisor and, at when changing shifts, to the next driver.
- Before entering the loader, carry out the “**Checks before entering**” (refer to the section “Entering”).

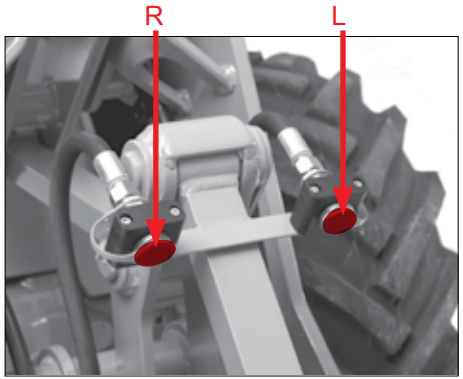
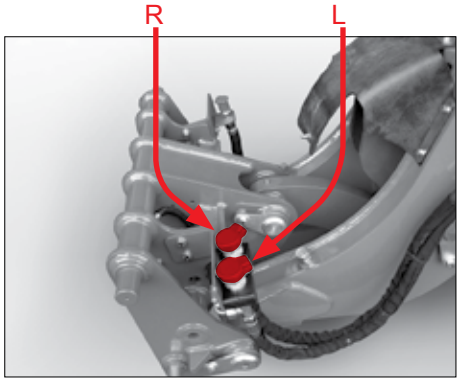


Fig. 51
Connections for the additional hydraulics

Loader standard version



Loader with telescopable lift frame

Detent mechanism for the control lever for the additional hydraulics

NOTE
Risk due to overheating of the hydraulic system.
► Make sure that the control lever for the additional hydraulics is always moved to the “zero position” when the detent mechanism is not required.

With the aid of this function you can operate the additional hydraulic connections (Fig. 51) in continuous use. This function is required for certain attachments which have a hydraulic fluid motor which requires continuous power (e.g. road sweeper). In this case you will then not need to continuously hold on to the control lever for the additional hydraulics item Z (Fig. 50).

- Move the control lever for the additional hydraulics over the resistance point forward until it engages:
– The detent mechanism is switched on.
- Move the control lever for the additional hydraulics back again over the resistance point:
– The detent mechanism is switched off.

Uncoupling attachments

CAUTION
Do not allow anybody to stand in the danger area - risks of accident.
► Make sure that nobody is in the danger area of the loader.
Risk of accident due to the uncoupled attachment tipping over.
► Close attachments with moving parts. Make sure that the attachment is standing securely. If necessary, secure the attachment with provided supports. Always set down the attachment on a level and secure surface.

ENVIRONMENTAL NOTE
Hydraulic fluid is harmful to the environment.
► When uncoupling the hydraulic connections, hold a container underneath the quick couplings of the additional hydraulics in order to catch any escaping hydraulic fluid. Dispose of this in accordance with the relevant environmental regulations.

1. Lower the attachment.
2. Press the „Relieve pressure“ button (Fig. - 56) to depressurise the lines for the additional hydraulics.
3. Pull apart the quick couplers.
4. Place the hydraulic hoses over the attachment.
5. Press and hold the switch (item 3) (Fig. 56) and move the control lever for the additional hydraulics to the rear (L).

– The locking pins (item 4) (Fig. 53) retract.

6. Lower the lift frame and tilt out the attachment. (This releases the receptacle frame Item 1 (Fig. – 53) from the mounting pocket Item 2 (Fig. – 53)).
7. If the receptacle frame is free, drive the loader back.

5.4.8 Pallet fork

- ► Avoid overloading the loader. Observe the maximum permitted payload.
- ► Operate the control lever slowly and cautiously

Proper use

The pallet fork attachment is used to lift, transport and set down loads. The pallet fork is not intended for any other use. The forks must always be used in pairs as delivered. The driver of the loader requires special training before he his allowed to use the pallet fork.

Attaching the pallet fork

Read the section entitled “Coupling attachments”

Operating element

Operate the pallet fork attachment with the control lever for the lift frame. Read the section entitled “Control lever for the lift frame”.

Operation

NOTE
Practice using the pallet fork before working with it for the first time.

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5.5 Optional equipment

30 km/h version

Loaders built for a maximum speed of more than 20 km/h have special requirements for users/operators regarding licence requirements and required insurance.
It is still possible that registration and a licence plate may be required when driving on public roads.
The operator is solely responsible for meeting these requirements/obligations.

Loader lift arm damping

NOTE
Risk of technical damage
Only switch the lift frame vibration damping on during transportation work!
For loading work, it must be switched off.

NOTE
Before switching on the vibration damping, raise the lift frame by approx. 30 cm, since it drops slightly when this function is activated. This ensures that a sufficient distance remains between the attachment and the ground.
Loaders built for a maximum speed of more than 20 km/h have lift frame vibration damping fitted as standard!

Optional multi- function lever for multiple functions

If the loader is equipped with an electrical socket **and** reversing valve, the functions will be activated by another multi- function lever (Fig. – 76).

1. Differential pawl
2. Reversing valve
3. No function (free for other additional functions)
4. Electrical socket

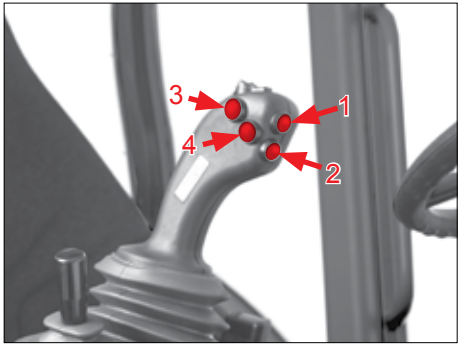
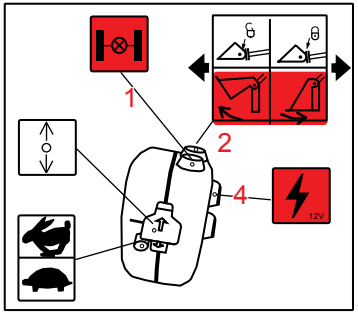


Fig. 76
Optional multi- function lever



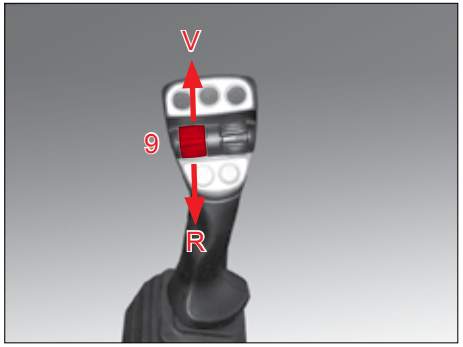


Fig. 82
Driving direction switch for optional multi-function lever

6.2 Transporting

Do not load or transport the loader unless all safety requirements have been met.
Loading and transportation of the loader must only be performed by experienced and trained specialist personnel. Responsibility for loading and transportation always lies with the hauler.

Loading the loader onto a transport vehicle

WARNING
Risk of accidents due to incorrect loading!
- ► Clean coarse dirt off the loader before it is loaded and transported.
- ► Only use a transport vehicle with a suitable load-bearing capacity (observe the operating weight of the loader).

Risk of accidents due to falling or slipping while loading the loader!
- ► Take special care when loading the loader and transporting it under snowy/icy conditions.

Proceed as follows to reduce the residual pressure in the hydraulic circuits (adhere to the order of the individual work steps):

1. Lower the lift frame as far as it will go.
2. Turn off the engine.
3. Immediately after turning off the engine, actuate all the control levers and pedals for the hydraulic system several times in all directions.
4. Relieve the hydraulic tank by opening the filler neck, illustration 1 (Fig. - 94).
5. Remove the preload from the drive‘s system by opening the return filter, illustration 2 (Fig. - 94).

Fig. 94
Reducing residual pressure

Illustration 1

Illustration 2

Weekly servicing

Carry out the following tasks:

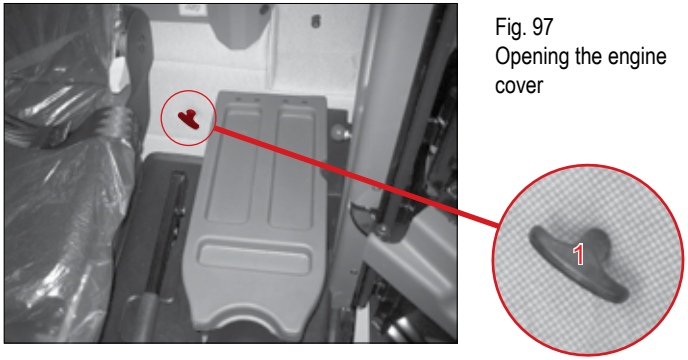
- Clean fuel filter for the presettling tank (if present)
- Check axles for leaks
- Check hydraulic fluid cooler and water radiator for leaks and dirt
- Check exterior condition of the radiators, i.e. the hoses
- Check the tension and condition of the fan belt
- Check the acid level of the battery
- Check the attachments
- Check the piston rods for the hydraulic cylinders
- Check the routing of the hoses and pipes
- Check the air filter hose
- Check the routing of the electrical wiring (rubbing/damage)
- Oil lubrication for all the levers
- Oil lubrication for all the cables and hinges
- Retighten all the screws
- Observe in particular the engine suspension and the axle mounting
- Perform the general safety check
- Check the sliding surfaces of the telescopic arm for damage and protect against corrosion with dry-sliding spray or grease

Work to be carried out	Operating hours: 250, 750, 1000, 1250, 1750, 2000, 2250, 2750, 3000, etc.	Operating hours: 1500, 2500, 3500, 4500, etc.	monthly	annually
Are all the grease nipples lubricated? Lubricate if necessary	X	X	X	X
Lubricate the propeller shafts (universal and slip joint)	X	X	X	X
Lubricate all the levers, cables and hinges with oil	X	X	X	X
Check all the oil levels	X		X	
Clean cab vent filter, replace as needed				X
Check according to the Ordinance on Industrial Safety and Health		X		X
(*) Required if there is a damage in the hydraulic system which is supposed to be caused by strong abrasive wear				

Valve clearance for Perkins 400 series: 0.2 mm inlet and outlet for a cold engine
Valve clearance for Perkins 1000 series: 0.2 mm inlet and 0.45 mm outlet for a cold engine
Valve clearance for Deutz 2011 series: 0.3 mm inlet and 0.5 mm outlet for a cold engine

– Unlock the engine cover lock by pulling the opener on the left behind the driver‘s seat Item 1 (Fig. – 97).
– Lift the engine cover. For lifting, use the handle to the right or the left of the engine cover Item 2 (Fig. – 97).

The engine cover lock automatically engages when the engine cover is closed.



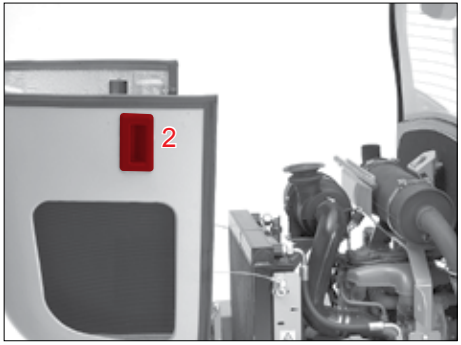


Fig. 97
Opening the engine cover

The engine oil filter is located on the left side of the engine (Fig. – 104).

1. Position a container for escaping oil underneath the engine oil filter.
2. Unscrew and detach the engine oil filter (item 1) (Fig. 105).
3. Clean the sealing surface of the filter holder (item 2) (Fig. 104).
4. Lightly oil the rubber seal of the new engine oil filter (item. 3) (Fig. 104).
5. Screw on the new engine oil filter until it makes good contact against the rubber seal.
6. Tighten the new engine oil filter a further half a turn by hand.
7. Check the oil level and top up with oil up to the “Maximum” marking if required.
8. Dispose of the old engine oil filter in accordance with the relevant environmental regulations.

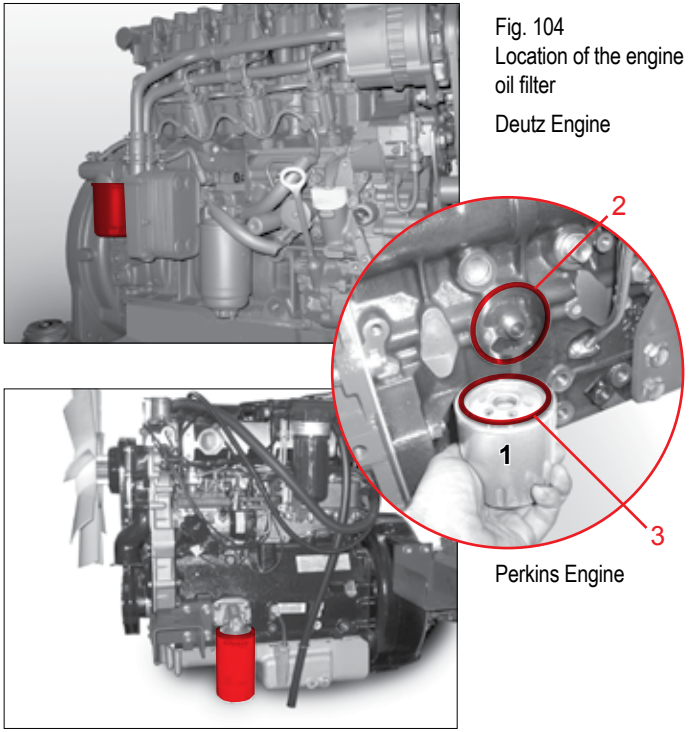


Fig. 104
Location of the engine oil filter

Deutz Engine

Perkins Engine

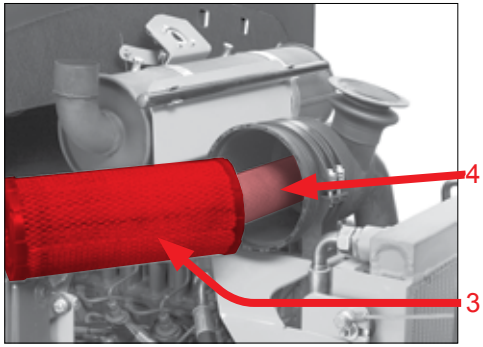


Fig. 111
Air filter elements

Checking / changing the safety air filter

NOTE
Risk of technical damage.
► Replace the safety filter as required, but certainly no later than after the fifth clean of the main filter.

Should it be apparent while servicing the dry air filter that a maintenance fault was present or that the main filter element is damaged, replace the safety filter element Item 4 (Fig. - 111).

1. Remove the three fasteners on the cover Item 2 (Fig. - 110).
2. Remove the cover Item 2 (Fig. - 110):
3. Pull out the main filter element Item 3 (Fig. - 111).
4. Pull out the safety filter element Item 4 (Fig. - 111).
5. Insert a new safety filter element.

Assembly takes place in the reverse order.

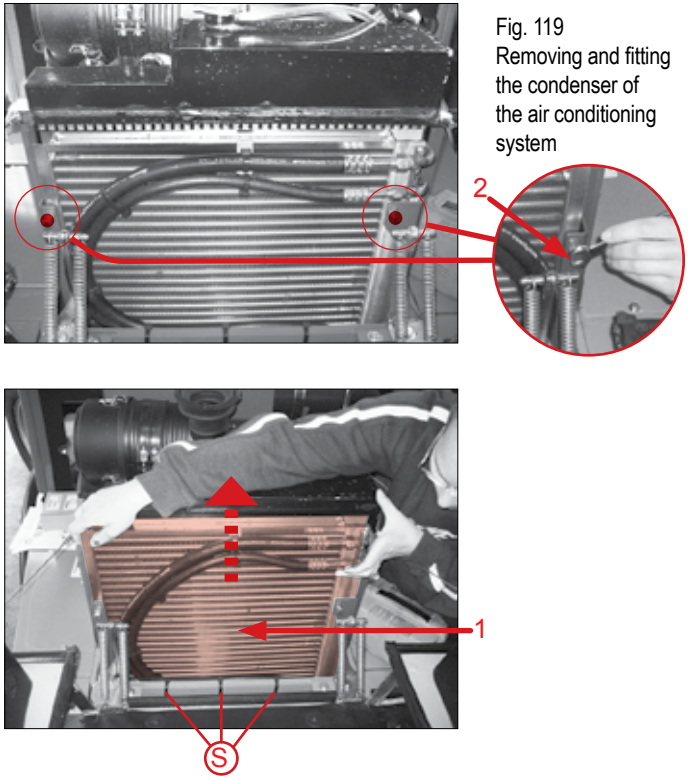


Fig. 119
Removing and fitting the condenser of the air conditioning system

10.7.6 Servicing the air conditioning system

Optional equipment!

WARNING

Danger of poisoning!

Open not include pipes, hoses or other components, the refrigerant.

- ► Avoid any contact with fluid coolant.
- ► Rinse skin and eyes immediately with clean water if they have been exposed to coolant.
- ► Do not do any welding work on components of the coolant circuit or in their immediate vicinity.

NOTE

Service and repair work require particular specialised skills and may only be performed in an authorised repair shop.

Clean the air conditioning condenser as described in the section “Cleaning the cooling system if the loader is equipped with air conditioning”.

10.7.8 Maintenance of the axles

NOTE
Risk of technical damage.
► The gearbox and the axles should be serviced at the inspection intervals stated in this operator's manual.

NOTE
The level check, filler and drain screws can be found in the same positions on the front axle and rear axle.

The axial piston pump with variable displacement of the driving hydraulics of the loader is mounted on the PTO gear. The PTO gear is connected to the rear axle of the loader. The front axle is driven via the drive shaft. The wheels are driven via two reduction gearing units on each axle.

Checking the axle oil level

NOTE
The axle (differential, axle tubes) shares a common oil supply. The PTO gear and the wheel reduction gearing units have their own oil supply.
You can check the oil level at the differential housing and at the wheel reduction gearing units.

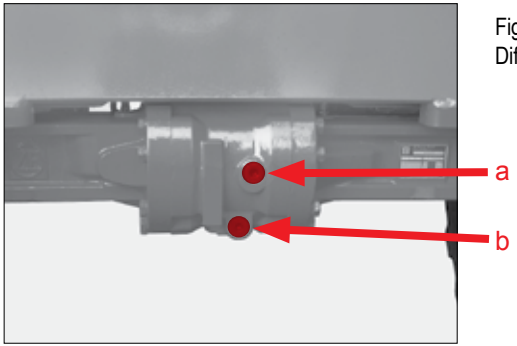


Fig. 126
Differenzial

10.7.11 Servicing the cab vent filter

NOTE
Change the cab air filter annually, or more frequently under dusty conditions.

The loader is equipped with a dry air filter for filtering the engine intake air for cab ventilation. The filter is located on the front of the cab above the middle joint of the loader (Fig. 130).

1. Remove the lid of the filter housing.
2. Remove the filter.
3. Insert a new filter.
4. Replace the lid of the filter housing.

Fig. 130
Cab vent filter

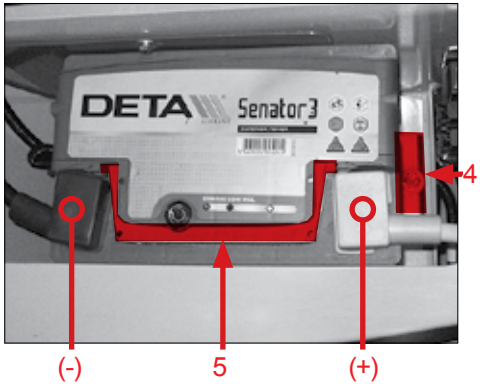


Fig. 137
Removing the battery

Removing the battery:

1. Park the loader on a horizontal surface and apply the parking brake.
2. Lower the lift frame all the way to the bottom.
3. Switch off the engine.
4. Before disconnecting the battery, switch off all electrical consumers and the battery disconnect switch, and remove the ignition key.
5. Open the engine hood.
6. Unscrew the cable from the negative terminal (marked with the “-” symbol in Fig. 137).
7. Unscrew the cable from the positive terminal (marked with the “+” symbol in Fig. 137).
8. Unscrew the battery holder. (item 4) (Fig. 137)..
9. Lift the battery by the handle (item 5) (Fig. 137).

To install the battery, follow these steps in the reverse order.

Repair personnel:

- Repair personnel must have specialized knowledge and experience of repairing this loader or comparable loaders.
- In the event that such specialized knowledge is lacking, the relevant personnel must immediately be trained by experienced repair personnel, e.g. **WACKER NEUSON** Service personnel.

Blocking the articulated joint:

- Always block the articulated joint with the buckling guard when carrying out repair work in the bending region.
- Remove the blocking after completing the repair work.

Pressurized units:

- Do not open defective pressurized units (e.g. pressure accumulators) - instead always replace them as a complete unit.

Disassembly/removal of components:

- Risk of burning due to hot parts or liquids. Do **not** disassemble or remove components when the loader is at operating temperature.
- Before starting work, depressurize pipe and hose connections, cylinders, coolers/radiators, hydraulic fluid tanks, pressure accumulators and other systems or units.
- Replace any damaged/defective components in good time.
- Carefully clean parts prior to disassembly/removal.
- Mark disassembled components in the correct sequence so that no mistakes are made subsequently during assembly.
- To prevent the ingress of dirt, carefully seal off any connections, bores or housings which are opened or which become exposed during disassembly/removal of a component.

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