

## 5 Maintenance





### 5.1 Important information on maintenance and service work

Operational readiness and the service life of your wheel loader are heavily dependent on maintenance.



#### **WARNING**

Crushing hazard. An unsecured or improperly supported loader unit may drop unintentionally.

-  Do not perform assembly and maintenance work if the loader unit is raised and not secured.
  -  Secure the loader unit with an appropriate prop or support to prevent it from being lowered unintentionally.
  -  Follow the safety instructions provided in chapter 2 "SAFETY INSTRUCTIONS" of this Operator's Manual.
  -  Also follow the specific instructions provided in the Operator's Manuals of the attachments.
- 

#### **NOTICE**

Daily and weekly service and maintenance work must be carried out by a specifically trained operator. All other maintenance work must be carried out only by the trained and qualified staff of your KramerAllrad sales partner.

-  - see *Maintenance plan (overview)* on page 5-36
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## 5.2 Fuel system

### General safety instructions for refueling

- Extreme caution is essential when handling fuel - high risk of fire!
- Never perform work on the fuel system in the vicinity of naked flames or sparks!
- Do not smoke when working on the fuel system or when refueling!
- Before refueling, switch off the engine and remove the starter key!
- Do not refuel in closed rooms!



#### Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner! Keep the machine clean to reduce the risk of fire and wipe away fuel spills immediately!

### Diesel fuel specification

Use only high-grade fuels

Grade	Cetane number	Use
No. 2-D according to EN 590 (EU) No. 2-D ASTM975-94 (USA)	Min. 45	For normal outside temperatures
No. 1-D according to EN 590 (EU) No. 1-D ASTM975-94 (USA)		For outside temperatures below 4 °C (39°F) or for operation above 1500 m (4921 ft.) altitude

### Stationary fuel pumps

#### General

Only refuel from stationary fuel pumps. Fuel from barrels or cans is usually contaminated. Even the smallest particles of dirt can cause.

- Increased engine wear.
- Malfunctions in the fuel system and
- Reduced effectiveness of the fuel filters

#### Refueling from barrels

If refueling from barrels cannot be avoided, note the following points:

- Barrels must neither be rolled nor tilted before refueling.
- Protect the suction pipe opening of the barrel pump with a fine-mesh strainer.
- Immerse it down to a max. 15 cm (5.9 in.) above the floor of the barrel.
- Only fill the tank using refueling aids (funnels or filler pipes) with integral microfilter.
- Keep all refueling containers clean at all times.

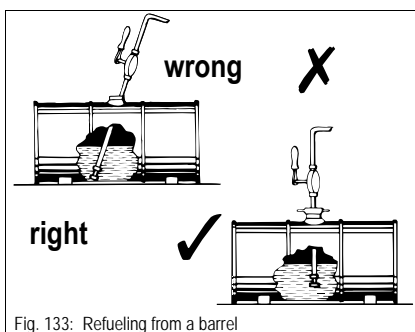
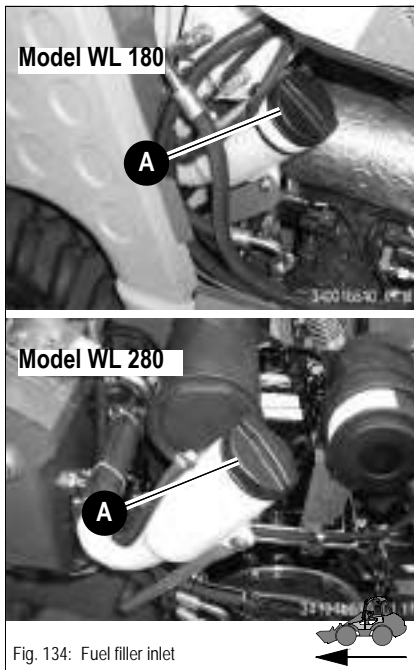


Fig. 133: Refueling from a barrel

## Refueling



Filler inlet **A** for the fuel tank is located under the engine cover, on the left in driving direction.



### WARNING

Fire and fume inhalation hazards.

- ☞ Do not refuel in closed rooms.
- ☞ Never perform maintenance or repair work on the fuel system in the vicinity of open flames or sparks.
- ☞ Never smoke when working on the fuel system or when refueling.
- ☞ Before refueling, stop the engine and remove the starter key.
- ☞ Wipe up any fuel spills immediately.
- ☞ Remove spilled fuel from the machine components and surfaces before use to reduce the risk of fire.



### Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner!



### Important

Do not run the fuel tank completely dry. Otherwise, air is drawn into the fuel system.

## Bleeding the fuel system



### Important

If the fuel tank has been run empty, or after having carried out maintenance work on the fuel system (filter replacement, water separator cleaned etc.), the fuel system bleeds itself automatically when starting the engine!

- It must not be bled manually.

## Checking/cleaning the water separator

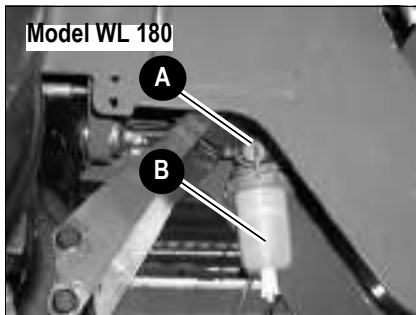


Fig. 135: Bleeding the fuel system

The water separator is located.

- ➔ at the rear right on the model WL 180 machine frame.
- ➔ at the rear in the engine vat on the model WL 280 machine frame.

### Drain the condensation water every 50 s/h (service hours)

- Switch off the engine.
- Apply the parking brake.
- Switch off the engine and remove the starter key.
- Place a container to collect the oil.
- Remove servicing lid (model WL 280 only).
- Close stop cock **A** on the water separator.
- Remove sight glass **B**.
- Drain the water and carefully clean the sight glass.
- Check the sealing ring for damage and replace it if necessary.
- Install sight glass **B**.
- Open stop cock **A** on the water separator.
- Start the diesel engine and check the water separator for leaks.
- Install servicing lid (model WL 280 only).



### Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner!

Have further repair work carried out by an authorized workshop.

### 5.3 Engine lubrication system



#### CAUTION

Burn hazard. Engine and exhaust components become very hot during operation.

- ☞ Wait at least 10 minutes after stopping the engine.
- ☞ Wear protective glasses, gloves, and clothing.

#### Checking the oil level



#### Important

Check the oil level every 10 service hours or once a day.  
We recommend checking it before starting the engine. After switching off a warm engine, wait at least 5 minutes before checking.

Proceed as follows:

- ☞ Park the machine on level ground.
- ☞ Switch off the engine! - see chapter 3 "Stopping and parking the machine" on page 3-30.
- ☞ Apply the parking brake.
- ☞ Open the engine cover.
- ☞ **Model WL 180 only:** Pull maintenance flap **B** and latch **A** to the right.
  - ☞ Fold back maintenance flap **B**.
- ☞ Oil dipstick **C**:
  - Pull it out
  - Wipe it with a lint-free cloth.
  - Push it back in as far as possible.
  - Withdraw it and read off the oil level.
- ☞ However if necessary, fill up the oil at the latest when the oil reaches the MIN mark on dipstick **C** - see Filling up engine oil on page 5-6

#### NOTICE

Possibility of equipment damage. If the engine oil level is too low or if an oil change is overdue, this can cause engine damage or loss of power.

- ☞ Have the oil changed by an authorized service facility.
- ☞ Observe the maintenance intervals - see Maintenance plan (overview) on page 5-36
- ☞ Have the oil changed by an authorized service center.

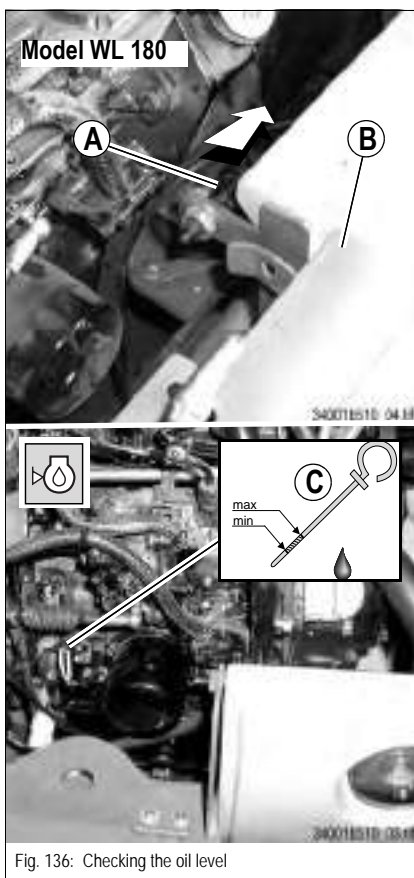


Fig. 136: Checking the oil level

### Filling up engine oil

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#### NOTICE

Possibility of engine damage from too much oil or incorrect engine oil.

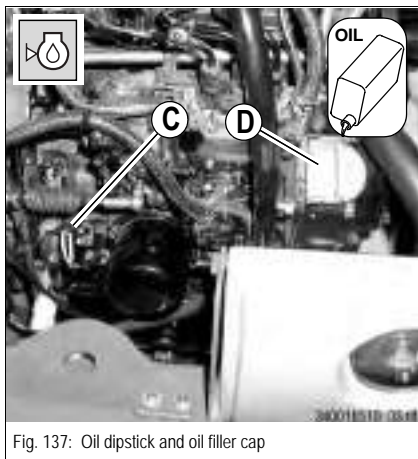
- ⚠ *Do not add engine oil above the MAX mark of oil dipstick 136/C.*
  - ⚠ *Use only the specified engine oil .*
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#### Environment

Use a suitable container to collect the engine oil as it drains and dispose of it in an environmentally friendly manner!

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#### Proceed as follows:

- Clean the area around oil filler cap **D** with a lint-free cloth.
- Open filler cap **D**.
- Raise oil dipstick **C** slightly to allow any trapped air to escape.
- Add engine oil.
- Wait a moment until all the oil has run into the oil sump.
- Check the oil level - see *Checking the oil level* on page 5-5.
- Add engine oil if necessary and check the oil level again.
- Close filler cap **D**.
- Push oil dipstick **C** back in as far as possible.
- Completely remove all oil spills from the engine.

## 5.4 Engine and hydraulics cooling system

The combined oil/water cooler is located in the engine compartment, on the right side of the engine. It cools the diesel engine, and the hydraulic oil of the drive and work hydraulics.

The expansion tank for the coolant is also located in the engine compartment on the right, in front of the battery.

### Checking / filling up coolant

- Dirt on the radiator fins reduces the radiator's heat dissipation capacity! To avoid this:
  - ☞ Clean the outside of the radiator at regular intervals. Refer to the maintenance plans in the appendix for the cleaning intervals
  - ☞ In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans
- An insufficient coolant level reduces the heat dissipation capacity as well and can lead to engine damage! Therefore:
  - ☞ Check the coolant level at regular intervals. Refer to the maintenance plans in the maintenance section for the intervals
  - ☞ If coolant must be added frequently, check the cooling system for leaks and/or contact your dealer!
  - ☞ Never fill in cold water/coolant if the engine is warm!
  - ☞ After filling the expansion tank, make a test run with the engine and check the coolant level again after switching off the engine
- The use of the wrong coolant can destroy the engine and the radiator. Therefore:
  - ☞ Add enough antifreeze compound to the coolant - but never more than 50 %. If possible use brand-name antifreeze compounds with anticorrosion additives
  - ☞ Observe the coolant compound table in the *Coolant compound table* on page 6-9
  - ☞ Do not use radiator cleaning compounds if an antifreeze compound has been added to the coolant - otherwise this causes sludge to form, which can damage the engine



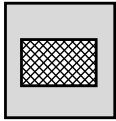
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### Environment

Use a suitable container to collect the coolant as it drains and dispose of it in an environmentally friendly manner!

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## Cleaning the radiator fins of the oil/water radiator: Specific safety instructions



### WARNING

Burn hazard. The coolant in the system is hot under normal operating conditions and under about 1 bar (15 psi) pressure. Engine and exhaust components become very hot during operation.

- ⚠ *Never open the coolant tank or drain coolant if the engine is hot.*
- ⚠ *Wait at least 15 minutes after stopping the engine.*
- ⚠ *Wear protective glasses, gloves and clothing.*

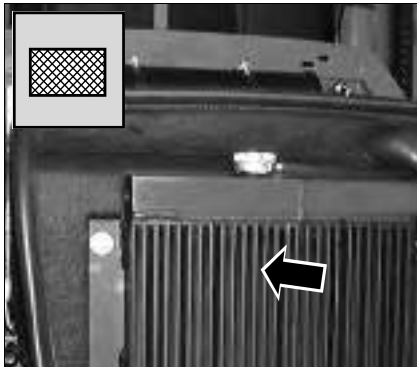


Fig. 138: Cleaning the radiator

- ⚠ *Park the wheel loader on level ground.*
- ⚠ *Lower the loader unit fully.*
- ⚠ *Apply the parking brake.*
- ⚠ *Switch off the engine and let it cool down.*
- ⚠ *Move the starter key.*
- ⚠ *Open the engine cover.*
- ⚠ *Clean the radiator fins by blowing compressed air outwards from the engine side.*

### NOTICE

Dirt on the radiator fins reduces the radiator's heat dissipation capacity and can cause damage to the engine and the hydraulic system.

- ⚠ *In order to ensure the radiator's optimal cooling capacity, clean the radiator fins with a compressed air gun. Take care not to damage the fins while cleaning them.*
- ⚠ *Check the radiator **once a day** for dirt and clean it if necessary.*
- ⚠ *Clean the radiator more frequently in dusty or dirty work conditions.*

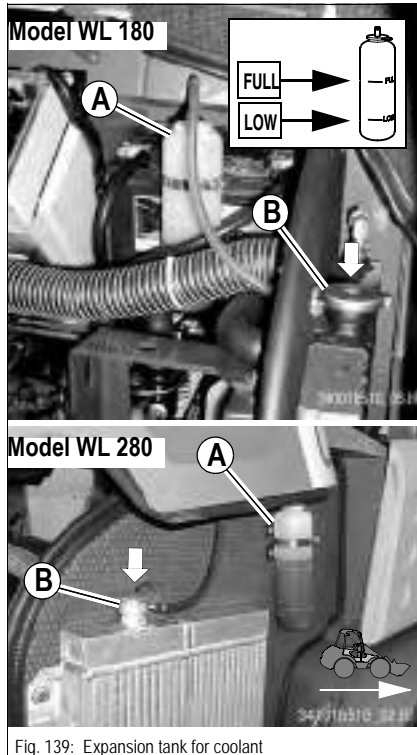


## Checking/filling up the coolant level



### Important

Check the coolant level every 10 service hours or once a day.  
We recommend checking it before starting the engine.



➤ Proceed as follows:

- Park the machine on level ground
- Switch off the engine! - see chapter 3 "Stopping and parking the machine" on page 3-30
- Apply the parking brake.
- Open the engine cover.
- Check the coolant level in the transparent expansion tank **A**.

**If the coolant level is below seam LOW of the expansion tank:**

➤ Add coolant.



### WARNING

Burn hazard. The coolant in the system is hot under normal operating conditions and under about 1 bar (15 psi) pressure.

- Never open the coolant tank or drain coolant if the engine is hot.
- Wait at least 15 minutes after stopping the engine.
- Wear protective glasses, gloves and clothing.
- Open filler cap **B** to the first notch and release the pressure.

➤ Reduce the overpressure in the radiator. To do this:  
Press filler cap **B** down.

➤ Open the cap to the first notch and fully release the pressure.

➤ Open filler cap **B**.

➤ Fill in coolant up to the lower edge of the filler inlet (radiator)

➤ Close filler cap **B**.

➤ Start the engine and let it warm up for about 5 - 10 minutes.

➤ Switch off the engine and check the coolant level again.

➡ The coolant level must be between the **LOW** and **FULL** tank seams

➤ If necessary, fill up coolant and repeat the procedure until the coolant level remains constant.

## 5.5 Air filter

### NOTICE

The filter cartridge will be damaged if it is washed or brushed out! Bear in mind the following to avoid premature engine wear!

- ☞ *Do not clean the filter cartridge.*
- ☞ *Replace the filter cartridge when the indicator comes on.*
- ☞ *Never reuse a damaged filter cartridge.*
- ☞ *Ensure cleanliness when replacing the filter cartridge!*

### Checking air filter contamination once a week

Maintenance display **B** on the filter housing monitors the filter cartridge.

- ☞ *Filter cartridge **D** must be replaced:*
  - If the **red** mark **C** in maintenance display **B** is visible
  - At the latest after 1500 service hours (however once a year)
- ➡ - see *Replacing the filter cartridge* on page 5-11



### Important

For **applications in especially dusty environment**, the air filter is fitted with an extra safety cartridge **F**. Do not clean the safety cartridge. Replace the safety cartridge every third time maintenance work is performed!

### NOTICE

Filter cartridge degradation. Filter cartridges degrade prematurely in environments with acidic air, such as acid production facilities, steel and aluminum mills, chemical plants, and other non-ferrous metal plants.

- ☞ *Replace filter cartridge **D** and safety cartridge **F** at the latest after 500 service hours!*
- ☞ - see *Replacing the filter cartridge* on page 5-11

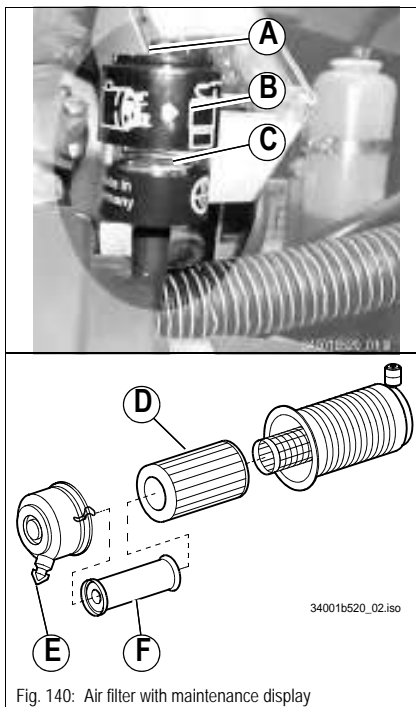


Fig. 140: Air filter with maintenance display

### Functional check of the dust valve once a week

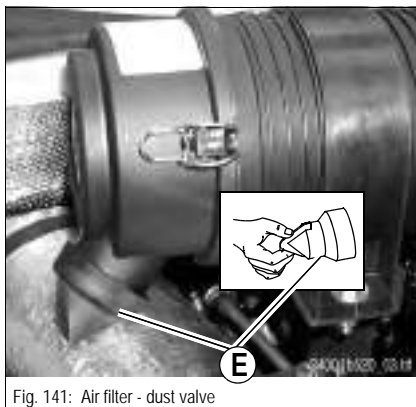


Fig. 141: Air filter - dust valve

- ☞ *Proceed as follows:*
  - Squeeze the discharge slot of dust valve **E**.
  - Remove hardened dust by compressing the upper area of the valve.
- ☞ *Clean the discharge slot if necessary.*

## Replacing the filter cartridge

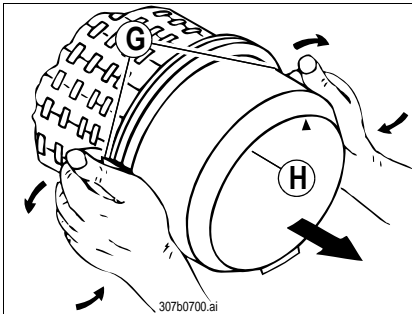


Fig. 142: Removing the lower housing section

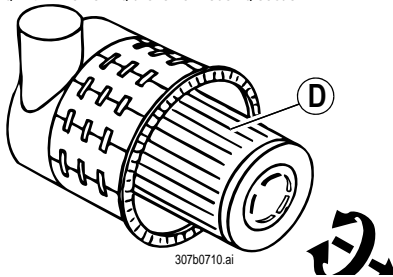


Fig. 143: Removing the filter element

### Change filter cartridge **D** as follows:

- Switch off the engine and remove the starter key.
- Prevent the machine from rolling away.
- - see chapter 3 "Stopping and parking the machine" on page 3-30
- Open the engine cover.
- Fold both bow clips **G** on lower housing section **H** to the outside.
- Remove lower housing section **H**.
- Carefully remove filter cartridge **D** with slightly turning movements.
- In addition, every 3rd time the filter is replaced, carefully remove the safety cartridge 140/F with slightly turning movements.

### NOTICE

Keep in mind the following to avoid premature engine wear:

- ☞ Make sure *all* contamination (dust) inside the upper and lower housing sections has been removed.
- ☞ Carefully insert new safety cartridge 140/F into the upper housing section **H**.
- ☞ Carefully insert new filter cartridge **D** into the upper housing section **H**.
- ☞ Clean the dust valve fig. 140/E.
- ☞ Position lower housing section **K** (make sure it is properly seated).
- ☞ Fold and close both bow hooks **G** on the notch of the upper housing section **H**.

### After replacing the filter:

- Press reset button **A** to reset red mark **C** in maintenance display **B**.

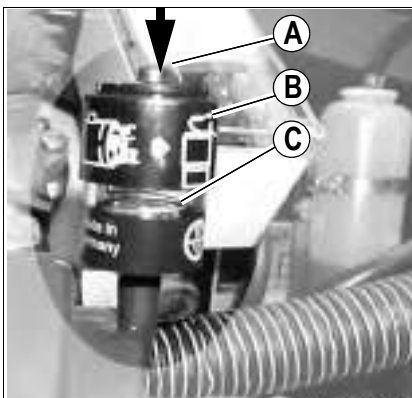


Fig. 144: Air filter with maintenance display

## 5.6 Checking and retightening the V-belt



### WARNING

Crushing, cutting, or burn hazards.

- ⚠ *Stop the engine and permit a cool down time. Wait until the engine is comfortable to touch.*
- ⚠ *Only check, retighten, or replace the V-belt when the engine is stopped.*
- ⚠ *Disconnect the battery or the battery master switch before proceeding with work on the V-belt.*

### NOTICE

Cracked and stretched V-belts cause engine damage.

- ⚠ *Replace the V-belt at least every two years.*
- ⚠ *Have the V-belt replaced by an authorized service facility.*

### Checking the V-belt

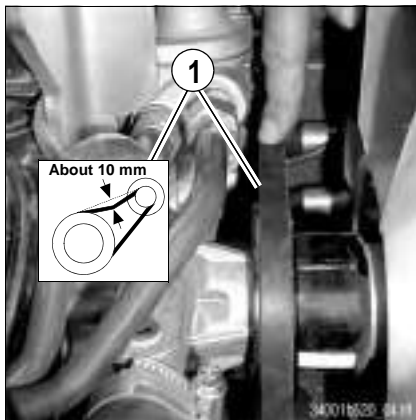


Fig. 145: Checking V-belt tension

- ⚠ *Switch off the engine*
- ⚠ *Prevent the machine from rolling away and remove the starter key*
  - ➔ - see chapter 3 "Stopping and parking the machine" on page 3-30
- ⚠ *Remove the V-belt cover (option).*
- ⚠ *Carefully inspect V-belt 1 for damage.*
- ⚠ *If the V-belt is damaged:*
  - ➔ Have the V-belt replaced by authorized staff
- ⚠ *Press with your thumb to check whether the V-belt can be deflected between the pulleys by no more than **about 10 mm (4.7 in.)**.*
- ⚠ *Retighten the V-belt if necessary.*

### Retightening the V-belt

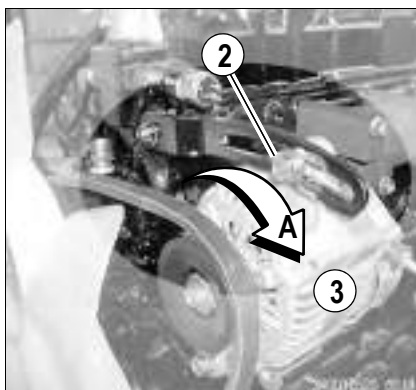



Fig. 146: Retightening the V-belt

- ⚠ *Slacken fastening screws 2 of alternator 3*
- ⚠ *Use a suitable tool to push the alternator in the direction of arrow A until the correct V-belt tension is obtained.*
- ⚠ *Keep the alternator in this position, and at the same time retighten fastening screws 2*
- ⚠ *Start the engine.*
- ⚠ *Check V-belt tension after about 15 minutes.*

## 5.7 Hydraulic system







### Specific safety instructions

- Release the pressure in all lines carrying hydraulic oil prior to any maintenance and repair work. To do this:
  - Lower all hydraulically controlled attachments to the ground.
  - Move all control levers of the hydraulic control valves several times.
- Apply the parking brake to prevent the machine from rolling away before you perform service and maintenance work.
- Hydraulic oil escaping under high pressure can penetrate the skin and cause serious injuries. Always consult a doctor immediately even if the wound seems insignificant - otherwise serious infections could set in!
- If the hydraulic oil in the sight glass is cloudy, this indicates that water or air has penetrated the hydraulic system. This can cause damage to the hydraulic pump!  
 Contact your WACKER NEUSON dealer immediately

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### NOTICE

Possible equipment damage. Contaminated hydraulic oil, lack of oil, or the wrong hydraulic oil can severely damage the hydraulic system. the hydraulic system!

-  Take care to avoid contamination when working!
-  Always fill in hydraulic oil using the filling screen!
-  Only use authorized oils of the same type - see chapter 5 "" on page 5-35
-  Always fill in hydraulic oil before the level gets too low.
-  If the hydraulic system is filled with biodegradable oil, then only use biodegradable oil of the same type for filling up - observe the sticker on the hydraulic oil tank!.
-  Contact customer service if the hydraulic system filter is contaminated with metal chip-pings. Otherwise, follow-on damage can result!



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### Environment

Collect drained hydraulic oil and biodegradable oil in a suitable container! Dispose of drained oil and used filters by an ecologically safe method. Always contact the relevant authorities or commercial establishments in charge of oil disposal before disposing of biodegradable oil.

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## Checking the hydraulic oil level

### NOTICE

Check the oil level only if the hydraulic oil is cold and the engine stopped.

#### Proceed as follows:

- Park the machine on level ground.
- Retract all hydraulic rams.
- Switch off the engine.
- Apply the parking brake.
- Open the engine cover.
- Check the hydraulic oil level in sight glass **A**.

#### If the oil level is lower than in fig. A:

- Fill up the hydraulic oil.

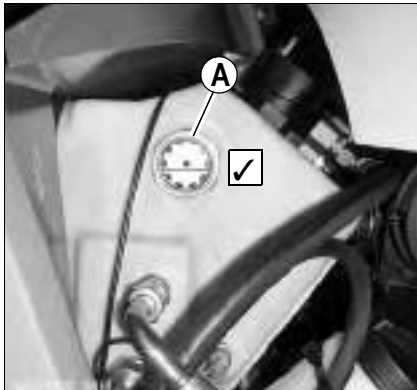


Fig. 147: Oil level sight glass on the hydraulic oil tank

## Filling up hydraulic oil

### NOTICE

Do not fill up the hydraulic oil unless the engine is switched off. Otherwise, hydraulic oil will run out of the filler opening on the hydraulic tank.

#### Fill up as follows:

- Park the machine on level ground.
- Retract all hydraulic rams.
- Switch off the engine.
- Apply the parking brake.
- Open the engine cover.
- Clean the area around the filler and breather filter **B** with a cloth.
- Open breather filter **B** by hand.

With the filter insert in place:

- Fill up the hydraulic oil
- Check the hydraulic oil level on oil level sight glass **A**.
- Add hydraulic oil if necessary and check again.
- Firmly close breather filter **B** by hand.

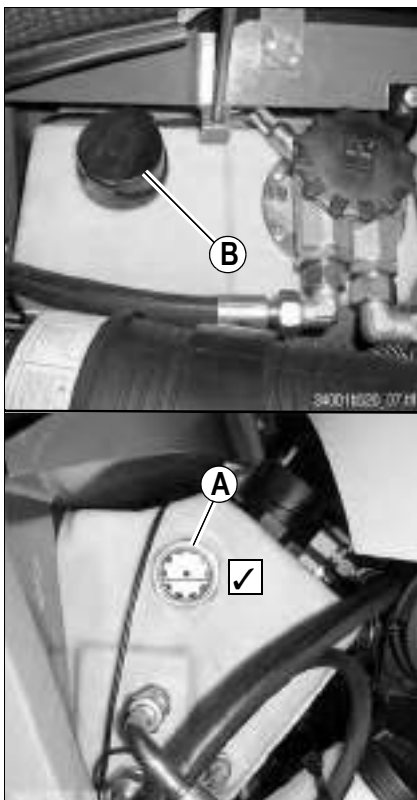


Fig. 148: Hydraulic oil tank

## Monitoring the hydraulic oil return filter

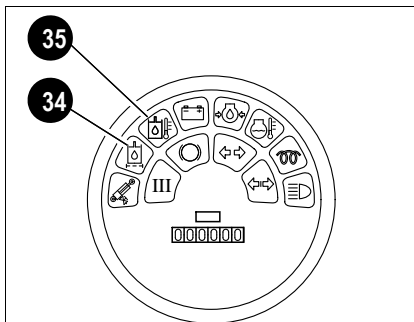


Fig. 149: Indicators (model WL 180)

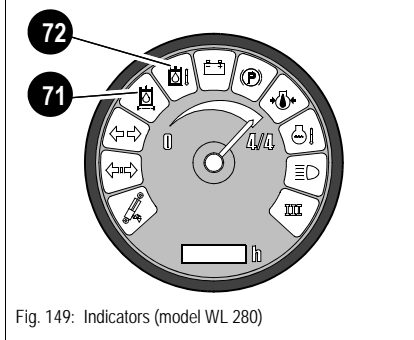


Fig. 149: Indicators (model WL 280)

On the instrument panel, the red indicator **34/71** monitors the return pressure and the return filter, and indicator **35/72** monitors oil temperature.

🔧 **The filter element must be replaced by an authorized workshop:**

- If indicator **34/71** comes on.
- The return pressure in the filter is too high or,
- If indicator **35/72** comes on (hydraulic oil operating temperature is too high).
- At the latest after 1500 service hours (once a year).

Indicator **34/71** on the instrument panel can come on in cold weather immediately after starting the engine. This is caused by increased oil viscosity. In this case:

🔧 **Set engine rpm so that indicator **34/71** on the instrument panel goes out.**

🔧 **Bear in mind the instructions concerning warmup**

- see chapter 3 "Starting / turning off the engine" on page 3-17

## Important information for the use of biodegradable oil

- Use only the biodegradable hydraulic fluids which have been tested and approved by WACKER NEUSON - see chapter 5 "Oil" on page 5-35. Always contact your WACKER NEUSON dealer for the use of other products which have not been recommended. In addition, ask the oil supplier for a written declaration of guarantee. This guarantee is applicable to damage occurring on the hydraulic components, which can be proved to be due to the hydraulic fluid.
- Use only biodegradable oil of the same type for filling up. In order to avoid misunderstandings, a label providing clear information is located on the hydraulic oil tank (next to the filler inlet) regarding the type of oil currently used! Replace missing labels! The joint use of two different biodegradable oils can affect the quality of one of the oil types. Therefore, make sure the remaining amount of initial hydraulic fluid in the hydraulic system does not exceed 8 % when changing biodegradable oil (manufacturer indications).
- Do not fill up with mineral oil - the content of mineral oil should not exceed 2 % in order to avoid foaming problems and to ensure biological degradability.
- When running the machine with biodegradable oil, the same oil and filter replacement intervals are valid as for mineral oil - see maintenance plans.
- Have the condensation water in the hydraulic oil tank drained by an authorized workshop every 500 service hours, in any case before the cold season. The water content must not exceed 0.1 % by weight.
- The instructions in this Operator's Manual concerning environmental protection are also valid for the use of biodegradable oil.
- If additional hydraulic attachments are mounted or operated, use the same type of biodegradable oil for these attachments to avoid mixtures in the hydraulic system.

## 5.8 Checking hydraulic pressure lines

### Specific safety instructions



#### WARNING

Pressurized hydraulic oil hazard. Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin and cause severe burns and injuries.

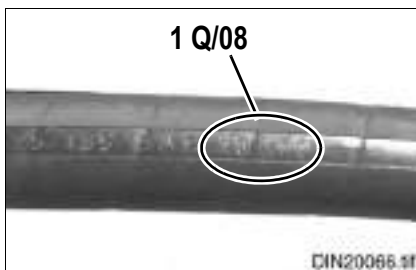
- ⚠ *Do not operate the machine with leaking or damaged hydraulic system components.*
- ⚠ *Use a piece of cardboard to diagnose the source of hydraulic leaks.*
- ⚠ *Hydraulic oil can be hot and can cause serious burns if contact is made with skin. If contact occurs with hot oil, seek immediate medical attention and treatment for the burn.*
- ⚠ *Wear safety glasses/goggles. If oil contacts the eye, flush immediately with clean water and seek emergency medical treatment.*
- ⚠ *Seek immediate medical attention if oil penetrates the skin. Oil can cause serious infections.*

In this respect, we recommend that you observe all the relevant safety regulations for hydraulic lines, as well as the safety regulations regarding accident prevention and occupational health and safety in your country. Also observe DIN 20066, part 5.

The date of manufacture (month or quarter and year) is indicated on the flexible line.

#### Example:

The indication "1 Q/08" means manufactured in the 1st quarter of 2008.

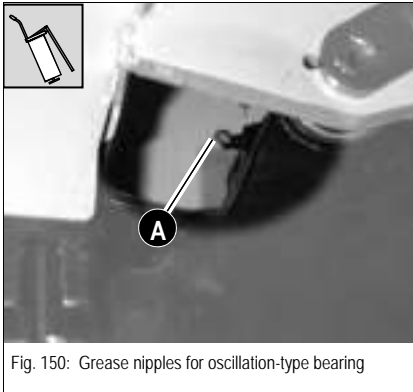




## 5.9 Lubrication work on the axles

Lubricate all lubrication points mentioned below with lithium-saponified brand-name grease - see on page 5-35


### Lubricating the rear axle oscillation-type bearing



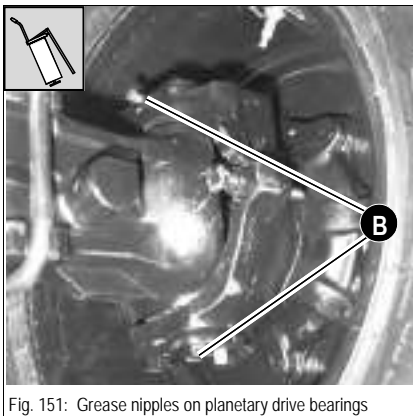
#### Important


The machine has an oscillation-type rear axle. Grease the bearing at the latest after every 50 service hours or once a week.

The grease nipple is located above the axle tube, on the left in driving direction.

 Lubricate grease nipple **A** of the oscillation-type bearing

### Lubricating the planetary drive steering joint bearings



 Lubricate grease nipples **B** (2x) on each planetary drive steering joint bearing **every 50 service hours** or once a week

## 5.10 Loader unit lubrication work

Lubricate the following lubrication points on the loader unit of the machine:

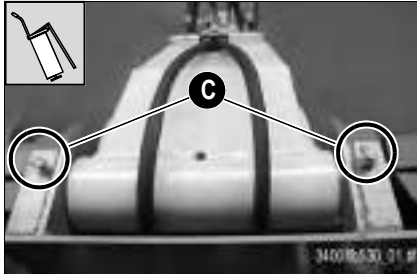


Fig. 152: Upper lubrication points on loader unit

- ☞ Lubricate grease nipples **C** (2 x) on the loader unit bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).

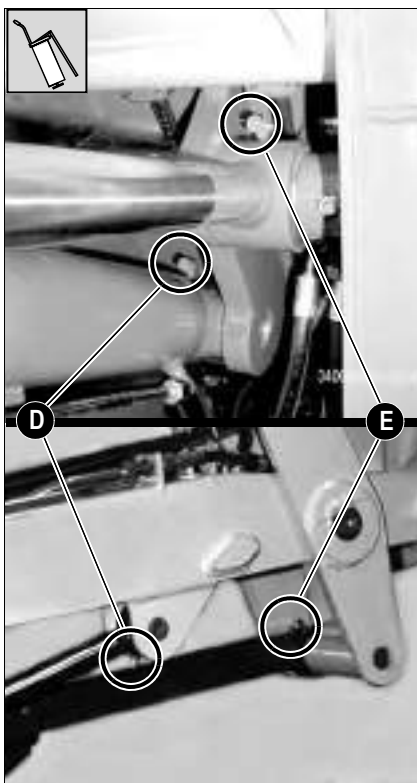


Fig. 153: Lubrication points for lift and tilt ram bearings

- ☞ Lubricate grease nipples **D** (2 x) on the lift ram bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).
- ☞ Lubricate grease nipples **E** (2 x) on the tilt ram bearing with grease **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).

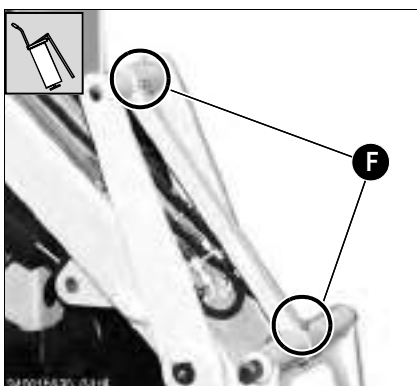


Fig. 154: Lubrication points on tilt rod bearing

- ☞ Lubricate grease nipples **F** (2 x) on the tilt rod bearing with grease **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).

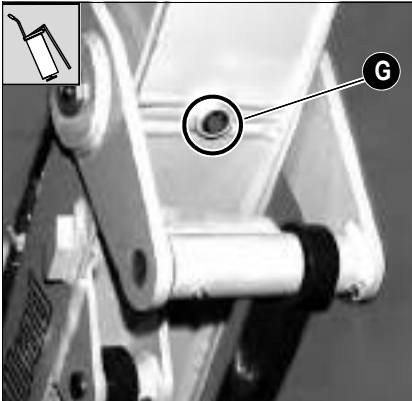


Fig. 155: Tilt lever bearing lubrication point

☞ Lubricate grease nipple **G** (1 x) on the tilt lever bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).

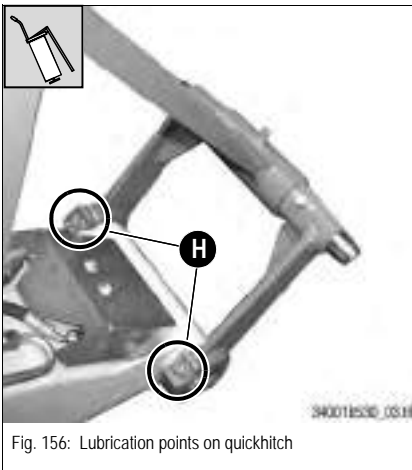


Fig. 156: Lubrication points on quickhitch

☞ Lubricate grease nipples **H** (2 x) on the quickhitch bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).

## 5.11 Maintenance of attachments



### Important

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments. Please observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments.

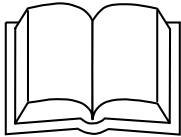
## 5.12 Tires



### CAUTION

Personal injury hazard. Improperly repaired tires or rims can cause accidents.

☞ All repair work on tires and rims may only be performed by an authorized Wacker Neuson service center.

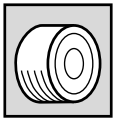


### Important

Regular inspections of the tires

- Improve operating safety
- Increase the service life of the tires
- Reduce machine downtimes
- Refer to the table in chapter "Specifications" on page 6-7 for the authorized tire types and the correct tire pressures. Machines are also delivered ex works with a tire table sticker on the front window or on the loader unit bulkhead.

## Daily tire checks



☞ *Perform the following maintenance work once a day:*

- Check tires for wear and measure tread depth.
- Check tire pressure.
- Check tires and rims for damage (cracks, ageing etc.) - also on the inside.
- Remove foreign bodies from the tire tread.
- Remove traces of oil and grease from the tires.

## Wheel change



### **WARNING**

Personal injury hazard. Using the wrong tires or wheels can increase the possibility of traffic accidents or work site accidents.

- 🔧 *Use only wheels and tires authorized for your machine - see "Tires" on page 6-7*
- 🔧 *Check the wheel nuts for tightness after every wheel or tire change*

---

### **NOTICE**

The wheels are heavy and can damage the threads on the wheel studs if they are handled incorrectly!

- 🔧 *Use suitable assembly tools, such as covering sleeves for the studs, a jack etc.*

---

#### **Removing the wheels**

🔧 *Proceed as follows:*

- Park the machine on level and firm ground and prevent it from rolling away - see chapter 3 "Stopping and parking the machine" on page 3-30
- Slightly loosen the wheel nuts of the wheel you want to remove
- Place a jack under the axle beam, making sure it is standing firmly
- Raise the side of the axle from which you want to remove the wheel
- Check the machine is standing firmly
- Completely remove the wheel nuts
- Remove the wheel

#### **Fitting the wheels**

🔧 *Proceed as follows:*

- Place the wheel onto the wheel studs
- Tighten all wheel nuts part-way
- Lower the raised axle
- Tighten the wheel nuts to the prescribed tightening torque  
- see *Specific tightening torques* on page 6-9

### 5.13 Electric system

#### Specific safety instructions

- The battery contains sulphuric acid! This acid must not be allowed to come into contact with the skin, the eyes, clothing or the machine.

Therefore when recharging or working near the battery:

- ☞ Always wear goggles and protective clothing with long sleeves.

#### **If acid is spilt:**

- ☞ Thoroughly rinse all affected surfaces immediately with plenty of water.
- ☞ Thoroughly wash any part of the body touched by the acid immediately with plenty of water and seek medical attention at once!
- Especially when charging batteries, as well as during normal operation of batteries, an oxyhydrogen mixture is formed in the battery cells - danger of explosion!
- Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low. The battery can rupture or explode!
- Avoid naked flames and sparks and do not smoke in the vicinity of open battery cells - otherwise the gas produced during normal battery operation can ignite!
- Use only 12 V power sources. Higher voltages will damage the electric components
- When connecting the battery leads, make sure the poles +/- are not inverted, otherwise sensitive electric components will be damaged.
- Do not interrupt voltage-carrying circuits at the battery terminals because of the danger of sparking!
- Never place tools or other conductive articles on the battery - danger of short circuit!
- Disconnect the negative (-) battery terminal from the battery before starting repair work on the electric system.
- Dispose of used batteries properly.

## Service and maintenance work at regular intervals



### Before driving the machine

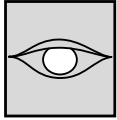
🔧 Check every time before driving the machine:

- Is the light system OK?
- Is the signalling and warning system OK?

### Every week

🔧 Check once a week:

- Electric fuses - see chapter 6 "Fuse no." on page 6-5.
- Cable and earth connections.
- Charge condition of battery - See *Checking/replacing the battery* on page 5-25.
- Condition of battery terminals.



## Cables, bulbs and fuses

Always observe the following instructions:

- Defective components of the electric system must always be replaced by an authorized expert. Bulbs and fuses may be changed by unqualified persons.
- When carrying out maintenance work on the electric system, pay particular attention to ensuring good contact in leads and fuses.
- Blown fuses indicate overloading or short circuits. The electric system must therefore be checked before installing the new fuse.
- Only use fuses with the specified load capacity (amperage) - see chapter 6 "Fuse no." on page 6-5.

## Alternator

Always observe the following instructions:

- Only test run the engine with the battery connected.
- When connecting the battery, make sure the poles (+/-) are not inverted.
- Always disconnect the battery before carrying out welding work or connecting a quick battery charger.
- Replace defective charge indicators immediately  
- see chapter 3 "Indicator (red) - alternator charge function 3-7" on page 3-4.

## Checking/replacing relays and fuses

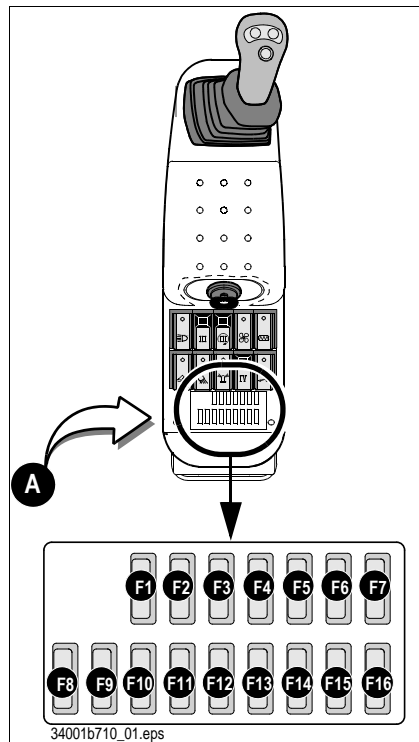


Fig. 157: Fuse box



Fig. 157: Relay slots

The fuse box is located at the rear of the control lever base.

### Checking/replacing fuses

#### NOTICE

Blown fuses indicate overloading or short circuits. The electric system must therefore be checked before installing the new fuse!

- ⚠ *Only use fuses with the specified load capacity (amperage) - see chapter 6 "Fuse box in control lever base" on page 6-5*
- ⚠ *- see chapter 6 "Main fuse box with relays (engine TNV 88)" on page 6-6*

#### Checking/replacing switching relays.

The switching relays are located underneath the switch panel on the control lever base, on the board.

- ⚠ *Switch off the engine and disconnect the battery leads.*
- ⚠ *Remove fastening screws A.*
- ⚠ *Raise the side console to the rear.*
- ⚠ *Relay descriptions and output indications*
  - ➡ *- see chapter 6 "Relays (engine TNV 88)" on page 6-6*



## Main fuse box



The main fuse box with the power relays and the preheating time control unit is located on the right in the engine compartment

Switch off the engine and disconnect the battery leads

➤ *Remove the fuse box cover*

➤ *Main fuse and relay descriptions and output indications - see chapter 6 "Main fuse box with relays (engine TNV 88)" on page 6-6*

## Checking/replacing the battery

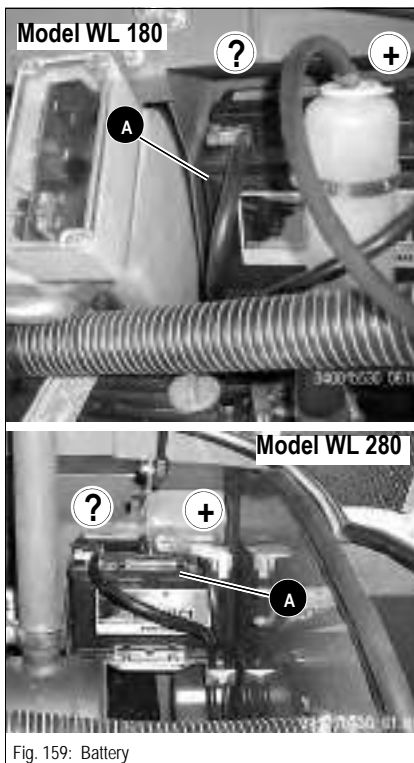


Fig. 159: Battery

Battery **A** is located in the engine compartment, on the right in driving direction. The battery is low in maintenance and no fluid needs to be refilled under normal operating conditions. However, have the battery checked at regular intervals to make sure the electrolyte level is between the MIN and MAX marks.



### WARNING

Battery acid hazard. The battery contains highly caustic sulphuric acid. This acid must not be allowed to come into contact with the skin, the eyes, clothing, or the machine.

➤ *When recharging and/or working near the battery, always wear goggles and protective clothing with long sleeves.*

➤ *If acid is spilled, thoroughly rinse affected skin immediately with clean water and seek medical attention immediately.*



### WARNING

Battery explosion hazard. Lead acid batteries can generate a potentially explosive hydrogen and oxygen mixture. Batteries can explode or rupture during jump starting, particularly if the electrolyte is low or has been frozen.

➤ *Avoid open flames and sparks in the vicinity of the battery. Do not smoke.*

➤ *Before jump starting, take the battery to the dealer for appraisal by a qualified technician.*

➤ *Replace a dead battery with a new one equivalent to the original.*

➤ *Always disconnect the negative terminal (-) from the battery before starting repair work on the electric system.*

### Replacing the battery

- Apply the parking brake.
- Switch off the engine and remove the starter key.
- Remove the key from the battery master switch (option).
- Remove the battery lead from the negative terminal (-).
- Remove the battery lead from the positive terminal (+).
- Remove the cover (moulding) on the left.
- Remove the battery brackets from the base.
- Replace the battery with a new one.
- Install the battery in the reverse order.

---

### NOTICE

When installing the battery leads,

- install the positive lead (+) first
- and then the negative lead (-)



### Important

The machine can be fitted with a battery master switch (option).  
- see chapter 3 "Battery master switch (option)" on page 3-42

---

## 5.14 General maintenance work

### Specific safety instructions

Cleaning the machine is divided into 3 separate areas:

- Inside the cab.
- Exterior of the machine.
- Engine compartment.

The wrong choice of cleaning equipment and agents can impair the operating safety of the machine on the one hand, and on the other undermine the health of the persons in charge of cleaning the machine. Therefore always observe the following instructions.

---

#### **NOTICE**

Machines with anticorrosion protection ("aggressive media") must be cleaned separately!

🔧 - see *Maintenance work "Aggressive Media" (option)* on page 5-30

---

### When using washing solvents

- Ensure adequate room ventilation.
- Wear suitable protective clothing.
- Do not use flammable liquids, such as fuel or diesel.

### When using compressed air

- Work carefully.
- Wear goggles and protective clothing.
- Do not aim the compressed air at the skin or at other people.
- Do not use compressed air for cleaning your clothing.

### When using a high-pressure cleaner or steam jet

- Electric components and damping material must be covered and not directly exposed to the jet.
- Cover the vent filter on the hydraulic oil tank and the filler caps for fuel, hydraulic oil etc.
- Protect the following components from moisture:
  - Engine
  - Electric components such as the alternator etc.
  - Control devices and seals.
  - Air intake filters etc.

### When using volatile and easily flammable anticorrosion agents and sprays

- Ensure adequate room ventilation.
- Do not use unprotected lights or naked flames.
- Do not smoke!

### Cleaning inside the cab

---

#### NOTICE

Possibility of equipment damage. Water under high pressure can penetrate into the electric system, cause short circuits, damage seals, and disable the controls. Do not use high-pressure cleaners, steam jets or high-pressure water to clean inside the cab.

---

We recommend using the following aids to clean the cab:

- Broom
- Vacuum cleaner
- Damp cloth
- Bristle brush
- Water with mild soap solution

### Cleaning the seat belt

- Clean the seat belt (which remains fitted in the machine) only with a mild soap solution; do not use chemical agents as they can destroy the fabric!



#### WARNING

Personal injury hazard. Dirt and water accumulating on the seat belt and in the winding mechanism may eventually deteriorate these components and impair winding.

☞ *Keep the seat belt and winding mechanism clean.*

☞ *Only wind the seat belt when it is dry.*

---

### Cleaning the exterior of the machine

The following articles are generally suitable:

- High-pressure cleaner
- Steam jet

## Cleaning the engine and the engine compartment



### WARNING

Cutting, crushing, or burn hazards.

☞ *Stop the engine before cleaning.*

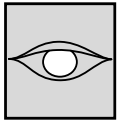
### NOTICE

Possibility of sensor damage. Water or steam jet cleaners can penetrate sensitive electronic components, leading to sensor failure and possible engine damage.

☞ *Allow the machine to cool completely before cleaning the engine with a water or steam jet.*

☞ *Do not point the jet directly at electric sensors such as the oil pressure switch.*

## Checking screw connections



All screw connections must be checked regularly, even if they are not listed in the maintenance plans.

Tighten loose connections immediately. Refer to chapter "Specifications" for the tightening torques.

## Checking pivots and hinges



All mechanical pivot points on the machine (e.g. door hinges, joints) and fittings (e.g. door holders) must be lubricated regularly, even if they are not listed in the lubrication plan.

## 5.15 Maintenance and service of the attachments



### Important

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments. Please observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments

## 5.16 Maintenance work “Aggressive Media” (option)

Your machine is specially protected against corrosion for work in aggressive media (e.g. a saline environment).

However, this anticorrosion protection is affected by external factors e.g. dirt, cleaning etc. This is why it only has ongoing effect if checked at regular intervals and renewed or reapplied as required.

If no anticorrosion protection is applied to your machine, for instance for work in a saline environment, we recommend retrofitting your machine with the “Aggressive Media” option by your sales partner.

### Anticorrosion protection applied in the factory

The following anticorrosive wax has been used in the factory:

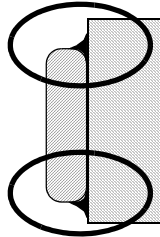
Designation: ANTICORIT BW 366 or U.S. Protect T

Manufacturer: FUCHS MINERALOELWERKE GmbH/Mannheim (Germany)

Complies with specification: TI 8030-015/K 19

MIL-C-16 173 C - grade 4

### Components coated with anticorrosive wax

Component	Remarks
All electric plug-and-socket, earthing and crimp connections	<b>Before applying the wax:</b> <ul style="list-style-type: none"> <li>• Apply contact spray to contact surfaces and connect the plug and socket connections again</li> <li>• Apply a particularly thick anticorrosion layer to the connecting parts of the fuel level transmitter</li> </ul>
<b>All parts of the machine, e.g.</b> Axles, gearbox, trim panels, servicing lids, loader unit, quickhitch	<b>Except:</b> <ul style="list-style-type: none"> <li>• Piston rods (chromium layer)</li> <li>• Cab, cab bearings</li> <li>• Engine cover, engine mounting</li> <li>• Air filter</li> <li>• Counterweight</li> <li>• Fastening surfaces for mounting parts on frame</li> <li>• Radiator and insulating mats</li> <li>• Mudguards, rubber and plastic parts</li> <li>• Light elements</li> </ul>
<b>Flange surfaces</b> 	<b>E.g. axles, engine and cab bearing:</b> <ul style="list-style-type: none"> <li>• Seal gaps with anticorrosion wax after assembly</li> </ul>

## Measures for maintaining anticorrosive protection

### Safety instructions

- When handling chemical substances of any kind, such as solvents, wax etc., observe the specific product-related safety regulations (safety data sheet)!
- When using volatile and easily flammable anticorrosive agents and solvents:
- Ensure adequate room ventilation!
- Do not use unprotected lights or naked flames!
- Do not smoke!
- Corrosion on electric connections or components can lead to dangerous operating malfunctions. Therefore check the electric functions of the machine with special care. Immediately take the machine out of service if you detect any defects and have defects rectified immediately.
- Perform work on the electric system only with the battery disconnected and the engine switched off!

### Cleaning

- If the machine is used in corrosive environment over a longer period of time, we recommend removing the floor mat in the cab to avoid collecting corrosive humidity.
- Thoroughly clean machines that are taken out of service over a longer period of time.
- Clean the machine at least once a week. In particular, remove corrosive deposits (such as salt crusts) as fast as possible.
- Clean the machine with cold running water preferably.

---

### NOTICE

Possibility of anticorrosive protection breakdown. Wax coating can be damaged by aggressive cleaning procedures.

🔧 *If cleaning the machine with a bristle brush, a steam jet, or a high-pressure cleaner, check the wax coating very carefully and have it renewed or reapplied as required.*

🔧 *If you replace components, check whether they are classified as in Components coated with anticorrosive wax on page 5-30 and whether they are subject to special treatment before assembly.*

---

## Applying the protective anticorrosion coating

Bear in mind the following instructions as you apply the anticorrosive wax:

---

### NOTICE

Carefully cover all fastening surfaces and **elements to which the anticorrosive protection may not be applied** - see *Components coated with anticorrosive wax* on page 5-30

---

- **ANTICORIT BW 366** or **U.S. Protect T** can be applied with a brush, by means of immersion or with all commercially available spray guns.
- **ANTICORIT BW 366** or **U.S. Protect T** protective coating can be removed with fuel, **RENOCLEAN E/K**, **FUCHS MULTICLEAN** or **Gunk® Purple Degreaser** as required.
- **ANTICORIT BW 366** or **U.S. Protect T** spots are difficult to remove on clothing.
- Affix a "Wet paint!" or a similar sign to newly coated machines.

## Treatment of oxidized surfaces

If in spite of all precautionary measures some components should be affected by corrosion (oxidized), proceed as follows depending on the affected component:

### Electric connections

- ☞ Remove the remaining protective wax in the oxidised area with fuel, **RENOCLEAN E/K**, **FUCHS MULTICLEAN** or **Gunk® Purple Degreaser**
- ☞ Treat all affected parts with an oxide solvent, such as **KONTAKT 60** or **Gunk® Electronic Cleaner**
- ☞ Rinse the area with e.g. **KONTAKT WL** or **CRC HF Contact Cleaner**
- ☞ Treat the contact surfaces of the connection with e.g. **KONTAKTSPRAY WD 40** or **Liquid Wrench® Super Lubricant**
- ☞ Establish the connection
- ☞ Apply/spray anticorrosion wax onto the electric connection from all sides

### Sheet-metal parts

- ☞ Remove the remaining protective wax in the oxidised area with fuel, **RENOCLEAN E/K**, **FUCHS MULTICLEAN** or **Gunk® Purple Degreaser**.
- ☞ Remove all remaining corrosion and paint coating from the affected area down to the bare material, otherwise the paint coating will not adhere properly!
- ☞ Clean the affected part with a cleaning solvent
- ☞ Apply a 2-component prime coating to the affected area and then a 2-component paint coating
- ☞ Preserve the area with anticorrosion wax



## 5.17 Fluids and lubricants














Component/ application	Engine/machine fluid	SAE grade Specification	Season/ temperature	Capacities <sup>1</sup>
Diesel engine	Engine oil <sup>2</sup>	SAE 10W; EO10 <sup>3</sup>	Below -5°C (23°F)	7.2 l (1.90 gal) (model WL 180)
		SAE 20W20; EO20 <sup>3</sup>	-10°C to +10°C (14°F to 50°F)	
		SAE 30; EO30 <sup>3</sup>	5°C to 30°C (41°F to 86°F)	8.6 l (2.27 gal) (model WL 280)
		HD-C 10W-40; EO1040B <sup>3</sup>	Year-round	
		HD-C 15W-40; EO1540B <sup>3</sup>		
Rear axle transfer gearbox	Gearbox oil <sup>4</sup>	80 W 90 API GL5 or SAE 90 LS (hypoid gear oil)	Year-round	0.3 l (0.08 gal)
Planetary drives - left and right, front and rear axle				0.6 l (0.16 gal) each (model WL 180) 0.5 l each (0.13 gal) (model WL 280)
Front and rear axle differentials				2.5 l (0.66 gal) each
Hydraulic oil tank	Engine oil <sup>2</sup>	SAE 5 W/30	Up to -25°C (-13°F)	About 40 l (10.57 gal) (model WL 180)
		SAE 5 W/40; EO 0540B <sup>3</sup>		
		SAE 10 W/40; EO 0540B <sup>3</sup>	Up to -15°C (5°F)	
		SAE 15 W/40; EO 1540B <sup>3</sup>	Up to -10°C (14°F)	
	Hydraulic oil <sup>5</sup>	HVLPD 46 (HYD0530 <sup>3</sup> ) (200 Hydraulic)	Year-round	About 65 l (17.17 gal) (model WL 280)
	Biodegradable oil	AVILUB Syntofluid 46		
		PANOLIN HLP Synth 46 (404 Biodegradeable Hydraulic 32/4)		
Grease nipples	Multipurpose grease	Lithium-saponified brand-name grease MPG-A <sup>3</sup> (Mobilgrease CM-P)	Year-round	As required
Battery terminals	Acid-proof grease	SP-B <sup>3</sup> (Mobilux EP2)	Year-round	As required
Mounting of pins, shafts etc.	Special grease	Optimoly paste *TA <sup>6</sup> White paste	Year-round	As required
Fuel tank	Diesel fuel <sup>7</sup>	Grade no. 2-D	Over 4°C (39°F)	About 30 l (7.93 gal) (model WL 180)
		Grade no. 1-D	Below 4°C (39°F)	About 62 l (16.38 gal) (model WL 280)
Engine and hydraulic oil cooler	Coolant	Water + antifreeze; SP-C <sup>3</sup>	Year-round	About 4.2 l (1.11 gal) (model WL 180) About 5.3 l (1.40 gal) (model WL 280)
Washer system	Cleaning agent	Water + antifreeze		About 1.5 l (0.40 gal)

1. The capacities indicated are approximative values; the oil level check alone is relevant for the correct oil level
2. MIL-L-2104C; API CD/CE/CF4; CCMC-D4
3. Abbreviation for lubricants (Hauptverband der Deutschen Bauindustrie e. V. - German construction engineering association)
4. MIL-L-2105B; API-GL5
5. DIN 51 524
6. 250 gr tube, order no.: 0 00 441 32 10
7. DIN 51 601, min 45 cetane

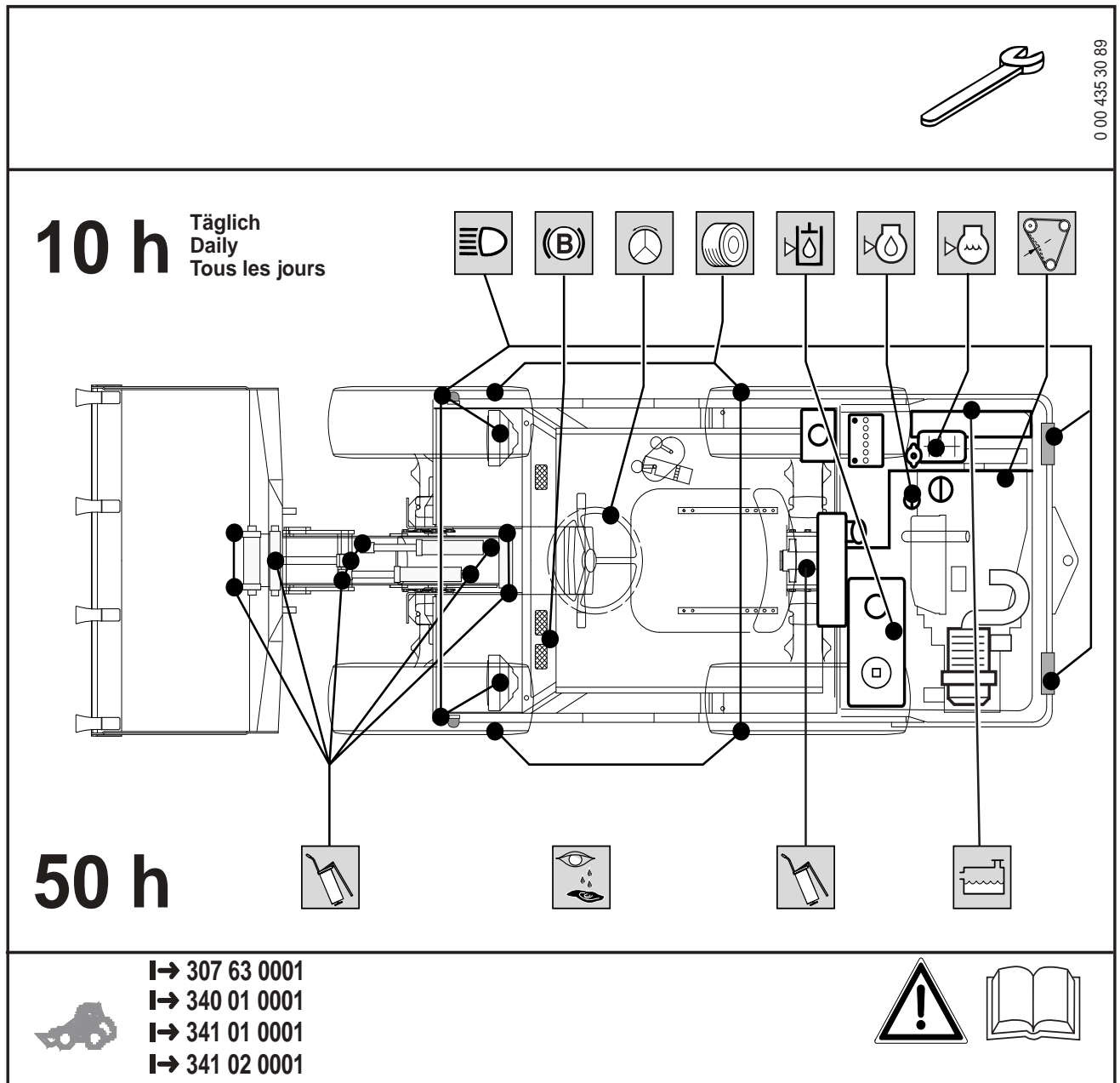
## 5.18 Maintenance label



**Location:** on inside of rear window


### Explanation of symbols on the maintenance label


Symbol	Explanation
	Attention!
	Before starting maintenance work, read the "Maintenance" chapter in the Operator's Manual!
	Perform a functional check of the light system!
	Check tires for damage, pressure and tread depth!
	Perform a functional check and synchronize the steering system!
	Perform a functional check of the brake system!
	Check hydraulic oil level. Fill up if necessary!
	Check engine oil level. Fill up if necessary!
	Check coolant level. Fill up if necessary!
	Check radiator for engine coolant and hydraulic oil for contamination. Clean if necessary!
	Check condition and initial tension of V-belt. Retighten or replace if necessary!
	Leakage check: Check for tightness, leaks and chafing: pipes, flexible lines and screw connections. Rectify if necessary!
	Lubrication service: Lubricate the assemblies concerned!

**Maintenance label**



5.19 Maintenance plan (overview)  Work description  For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.		Maintenance plan/service hours (s/h)					
		Maintenance work (once a day)	Delivery inspection	“A” every 50 s/h once a week	1st Inspection <sup>1</sup> at 100 s/h	“B” every 500 s/h <sup>2</sup> 2nd Inspection	“C” every 1500 s/h once a year
Oil and filter changes (  ):		Perform the following oil and filter changes (check oil levels after test run):					
• Engine oil					●	●	
• Engine oil filter					●	●	
• Fuel filter					●	●	
• Fuel/water separator						●	
• Air filter insert <sup>3,4</sup> replace safety cartridge every 3rd time the air filter insert is replaced						●	
• Gearbox oil in front and rear axle differentials and in rear axle gearbox					●	●	
• Gearbox oil in front and rear axle planetary drives (left and right)					●	●	
• Hydraulic oil <sup>5</sup>						●	
• Hydraulic oil filter insert					●	●	
• Hydraulic oil tank breather filter <sup>4</sup>						●	
• Heating: replace the dust filter						●	
Inspection work (  ):							
Check the following material. Refill if necessary:							
• Engine oil		●	●	●			
• Engine coolant <sup>6</sup> (also check antifreeze in autumn/winter and at temperatures below 4 °C!)		●	●	●	●	●	
• Hydraulic oil		●	●	●	●	●	
• Gearbox oil in front and rear axle differentials and in rear axle gearbox			●			●	
• Gearbox oil in front and rear axle planetary drives (left and right)			●			●	
• Check radiator for engine and hydraulic oil for contamination. Clean if necessary <sup>7</sup>				●		●	
• When using biodegradable oil: drain the condensation water in the hydraulic oil tank <sup>5</sup>						●	
• Clean dust valve on air filter housing <sup>3</sup>		●	●	●	●	●	
• V-belt: check condition and pre-tension. Retighten or replace if necessary			●	●	●	●	
• Check the fuel/water separator. Drain water if necessary <sup>8</sup>				●	●	●	
• Check valve tip clearance (engine timing). Set if necessary						●	

<b>5.19 Maintenance plan (overview)</b> <b>Work description</b> For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.		Maintenance plan/service hours (s/h)					
		Maintenance work (once a day)	Delivery inspection	"A" every 50 s/h once a week	1st Inspection <sup>1</sup> at 100 s/h	"B" every 500 s/h <sup>2</sup> 2nd Inspection	"C" every 1500 s/h once a year
<ul style="list-style-type: none"> <li>Battery: check charge condition</li> <li>Heating: clean dust filter, replace every 1500 s/h if necessary<sup>9</sup></li> <li>Check and set service and parking brake pads. Replace if necessary</li> <li>Tire check (damage, air pressure, tread depth)</li> </ul>		●	●	●	●	●	●
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary							
<ul style="list-style-type: none"> <li>Engine and engine bearing</li> <li>Steering system</li> <li>Hydraulic system</li> <li>Loader unit (pin locking)</li> <li>Axle mounting, axle suspension</li> <li>Counterweight (attachment)</li> <li>Fastening screws of cardan shafts</li> <li>Fastening screws of cab</li> <li>Wheel nuts</li> </ul>							
Electric system: check electric and earth connections, chafing on wiring harness, battery terminals			●		●	●	●
<b>Lubrication service (  ): <sup>10</sup></b> Lubricate the following assemblies/components:			●	●	●	●	●
<ul style="list-style-type: none"> <li>Rear axle oscillating bearing</li> <li>Front and rear axle planetary drive bearings (left and right)</li> <li>Loader unit - see <i>Loader unit lubrication work</i> on page 5-18</li> <li>Lift frame bearing</li> <li>Tilt rod bearing</li> <li>Tilt lever bearing</li> <li>Lift ram bearing</li> <li>Tilt ram bearing</li> <li>Quickhitch: bearing on lift frame</li> <li>Hinges, joints and fittings (e.g. door holder)</li> </ul>			●	●	●	●	●

5.19 Maintenance plan (overview)	Work description For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.	Maintenance plan/service hours (s/h)					
		Maintenance work (once a day)	Delivery inspection	"A" every 50 s/h once a week	1st Inspection <sup>1</sup> at 100 s/h	"B" every 500 s/h <sup>2</sup> 2nd Inspection	"C" every 1500 s/h once a year
		• Service and parking brake	•	•	•	•	•
		• Steering system	•	•	•	•	•
		• Lights and electric system	•	•	•	•	•
Leakage check (  ):	Check for tightness, leaks and chafing: pipes, flexible lines and screw connections of the following assemblies and components. Rectify if necessary:						
		• Air intake line (air filter - engine)	•	•	•	•	•
		• Engine lubrication (engine - filter)	•	•	•	•	•
		• Fuel lines	•	•	•	•	•
		• Cooling system (coolant and hydraulic oil)	•	•	•	•	•
		• Steering system (flexible lines and rams)	•	•	•	•	•
	Hydraulic system/loader unit (flexible lines and rams) <sup>11</sup>						
		•	•	•	•	•	•

1. Work to be carried out once after the first 100 s/h. This work must be carried out by an authorized workshop for warranty claims to be acknowledged.

2. Work after the first 500 s/h (2nd inspection) must be carried out by an authorized workshop for warranty claims to be acknowledged.

3. Replace filter insert as indicated on the filter housing, however at least once a year or every 1500 service hours.

4. When working in an acidic environment, replace the filter every 300 s/h.

5. When using biodegradable oil: drain the condensation water in the hydraulic oil tank every 500 s/h, in any case before the cold season.

6. Replace the engine coolant every other year!

7. Depending on operation and dust conditions, it can be necessary to clean the radiator more frequently.

8. Check every 50 s/h and drain the water.

9. Depending on operation and dust conditions, it can be necessary to replace the dust filter more frequently.

10. Lubricate attachment according to manufacturer's instructions!

11. Replace flexible lines every 6 years (UVV, DIN 20066 part 5).