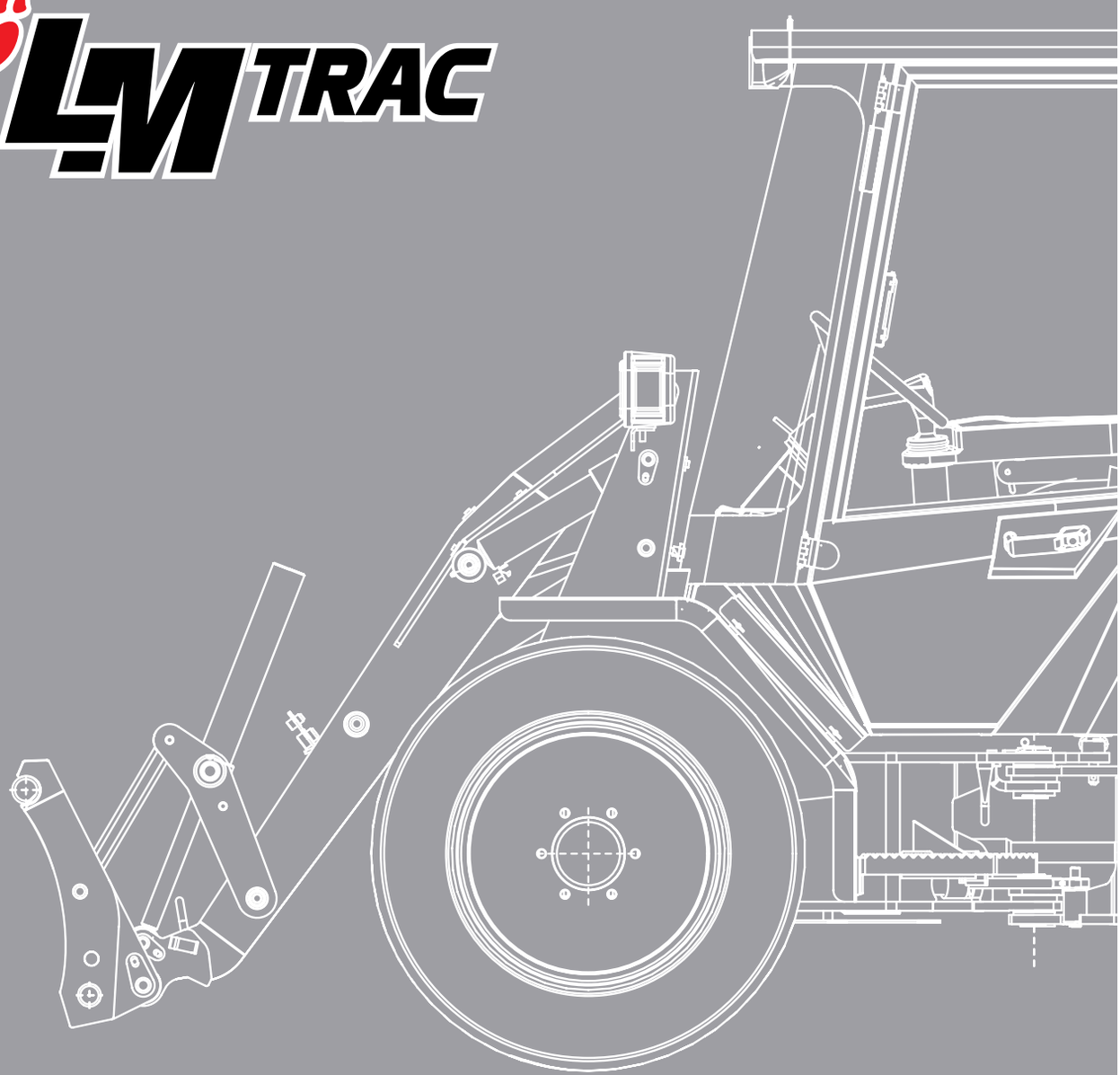
# OWNER'S MANUAL



## LM Trac 686

## 1.0 FOREWORD

Congratulations on purchasing the new LM Trac multi-purpose compact tractor. This machine is the result of Oy LAIMU Ab's innovative design and expertise.

The machine is manufactured from high-quality materials and the components used are supplied by reputable manufacturers. Strict quality standards and quality control criteria are observed in every step of design and manufacture.

This manual includes all the information you will need for the operation and maintenance of the machine, as well as giving instruction about safe working methods. This manual also includes tips for solving possible problems.

By observing the instructions and performing indicated maintenance work as scheduled, you will ensure a trouble-free and long operating life for your machine.

Pay particular attention to the safety instructions regarding operation and maintenance!

The driver of this machine must read and understand the instructions contained in this manual before using the machine. Also any person carrying out maintenance work on the machine must read and understand the instructions regarding maintenance work before commencing maintenance.

The user manual must be on board the machine at all times. If the manual is no longer readable or is lost, order a new one or the additional manuals that you need from your LM Trac dealer.

Due to our sustained and constant product development, we reserve the right to make structural and technical changes without prior notice.

For the above reason, it is possible that the machine does not correspond in full to the information provided in this manual.

Your LM Trac dealer can provide you with the latest data, and you can get a new updated version of the manual if necessary.

**Oy LAIMU Ab**

**Info!**



Great care has been taken to ensure the correctness of all information contained in this manual. We are not responsible for any direct or indirect damage caused by possible errors in this manual.

**Oy LAIMU Ab**

## 1.1 Machine specifications and type plates

Write the data in the rows below:

Owner: _____ _____

Address: _____ Tel:_____

Main machine:Serial number: _____ Model:_____

Engine: Serial number:_____ Model:_____

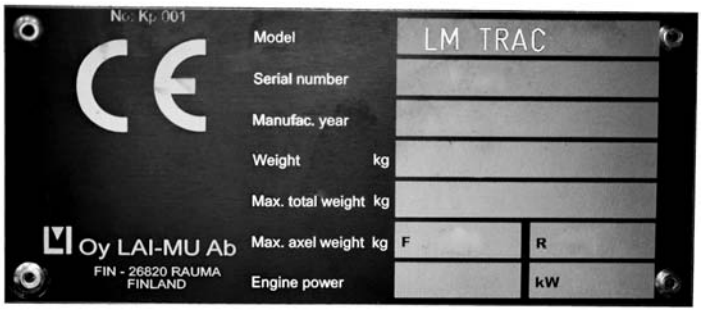
Retailer: _____ Tel:_____

Spare parts retailer: _____ Tel:_____

Service shop: _____ Tel:_____

The machine's type plate (A) is located below the door, on the left side of the machine's front frame.

Figure 1.


The type plate comprises:

the CE mark and

the machine's model, serial number, year of manufacture, weight, max. total weight, max. axle weights (front/rear) and engine power.

**The engine type plate.**

Figure 2.


The engine's type plate comprises the engine model and serial number.

## 1.2 User manual

This user manual comprises seven (7) different sections:

01 Introduction

– Table of contents

02 Safety

03 Machine structure

04 Cabin and controls

05 Driving and use

06 Maintenance

07 Technical specifications

The LM Trac machine embodies the latest technology and its operation and maintenance also set requirements for the machine operator and maintenance engineer. By reading and understanding the information contained in this manual, you will ensure the safe and technically correct operation and maintenance of this machine.

The aim has been to create a manual that is as clear as possible and every step has been taken to ensure the sufficiency and correctness of the information presented in the manual. However, due to the many different kinds of operating conditions and methods, it may possible that some vital piece of information has been accidentally left out or is incorrect. The machine's operator must take this into account and proceed accordingly.

This manual does not contain the operating and maintenance instructions for tools that can be connected to the machine. The operator must carefully read the safety, operation and maintenance instructions of the tools being used.

## 1.3 Safety and environmental protection

Great care has gone into ensuring that the machine we have manufactured is environmentally sound and safe. The operator is, however, solely responsible for using the machine with respect for the environment and its safety.

Read carefully section 02 of this manual, entitled ‘Safety’.

## 1.4 Structural changes

Any changes to be made to the structure and/or operating system of the machine always require written authorisation from Oy LAIMU Ab otherwise the warranty becomes void.

## 1.5 Liability for errors and warranty

The liability for errors/warranty of Oy LAIMU Ab does not cover damage that is demonstrably the result of actions that are contrary to the instructions provided in this manual.

**NOTES:**

# 2.0 SAFETY

All laws, decrees and regulations in effect must be observed in operating and maintaining the machine.

The safety and operating instructions in the manual must be followed!

The maintenance and adjustment instructions must be observed. Their observance ensures trouble-free and safe operation and long economic operating time.

In case of a failure that you cannot resolve and eliminate, please contact LM Trac Service.

Stop working immediately if there is the slightest chance of the failure causing a risk of injury or damage to the machine.

## 2.1 Markings and symbols

**Warning! Varoitus! Varning!**

**The Warning sign indicates a risk of injury and/or serious material damage and gives guidance on how to eliminate these risks.**

Note! Huomaa! Notera!

The Note sign is used to draw your attention to an issue or action that gives guidance on the safest and most economic operation of your machine.

**Info!**

*Info provides you with general information about observing official regulations in different contexts (waste disposal etc.) and protecting the machine and the environment during operation and maintenance, etc.*

## 2.2 Safety instructions

The best insurance against accidents is the observance of safety instructions.

Figure 3.


Pleas read and understand this section carefully before starting work with the machine. Every operator, regardless of past experience, must read and understand this section before using the machine. The machine's owner must inform operators about these instructions. Store the manual in its dedicated place.

### 2.2.1 Before use

- Study the machine and be aware of its limitations. Read the user manual before starting the machine.
- Follow all the warning and instruction labels found on the machine.
- Do not operate the machine under the influence of alcohol, medication or intoxicating substances. Fatigue can also be dangerous.

- Check the surroundings before working and installing additional equipment.
- Do not wear baggy, worn or excessively loose-fitting clothes. Clothes can get tangled in rotating parts or controls and cause accidents. Wear correct protective equipment, i.e. a helmet, safety boots, protective goggles, hearing protectors, work gloves, etc., as required by occupational safety regulations.
- Do not allow passengers inside the machine while working.
- Check for wear and the correct adjustment of mechanical parts. Replace worn and damaged parts immediately. Check the tightness of bolts and nuts regularly.
- Keep the machine clean. Accumulated soil, grease, dust and grass may ignite and cause accidents.
- Only use additional equipment and tools approved by Oy Lai-Mu Ab.
- Check before starting the machine that it has enough fuel and oil, and that it is lubricated and all maintenance procedures have been carried out.
- Do not alter the structure of the machine. It may lead to unpredictable safety risks.
- Do not let an inexperienced person operate the machine. The person lending the machine is responsible for possible damage and accidents.

### 2.2.2 During operation

- Enter and exit the machine is a safe way. Always use the hand grips and steps. Never grab the controls when entering the machine. Never jump up to or down from the machine.
- Start and operate the machine only from the driver's seat. Never stand up from the seat while the engine is running.
- Before starting the machine, check that all controls are in neutral position or off.
- Do not start the engine by shorting the starter connectors. Do not try to bypass the ignition switch, as the machine may start moving.
- Do not start the engine in a closed or poorly ventilated space. Exhaust gas is toxic.
- Ensure that all safety equipment and hatches are in place. Replace damaged or missing safety equipment.
- Prevent the machine from being tilted. Adjust your speed to the prevailing conditions and do not drive on slopes that are too steep.
- Keep the doors and hatches closed while driving. Do not steer the machine from outside the cabin.
- Use the controls in a safe manner. Press the accelerator pedal slowly to prevent jerky starting of the machine.
- Plan your route, avoid obstacles.
- Keep a safe distance from trenches and steep slopes. Be especially careful in rain and when driving on a wet or icy/snowy surface.
- Pay attention to other traffic. Watch where you are heading and use the roof beacon as required by local traffic legislation and decrees.
- Remember that the stability of the machine changes according to the load. Keep loads as low as possible.
- When driving downhill, let the power train do the braking. Avoid using the brake pedal to reduce your speed.
- Do not change your course or speed while driving on slopes.
- Keep hold of the steering wheel if the machine tilts, do not jump.
- Carefully follow the operating and safety instructions of tools.

- Never enter the area of the loader's steering joint while the engine is running.

### 2.2.3 After operation

- ► Park the machine on hard level terrain.
- ► Lower all tools onto the ground.
- ► Stop the engine.
- ► Remove the ignition key.
- ► Lock the doors.
- ► Open the main power switch.

## 2.3 During maintenance

- Park the machine on hard level terrain, lower all tools and stop the engine.
- Take into account that there may be residual pressure in the hydraulics system after the engine has stopped.
- If you disconnect hydraulic parts, first ensure that the oil has cooled down sufficiently to prevent burns.
- Open the connections carefully so that the oil does not discharge forcefully.
- Before maintaining the engine, exhaust piping, radiator or hydraulics, let the machine cool down completely.
- Always stop the engine before refuelling. Avoid splashing and over filling.
- Do not smoke during refuelling and battery maintenance! Ensure that no spark or naked flame gets near the fuel tank or battery. The battery releases flammable gas, especially during charging.
- Read "Using auxiliary battery" under 5.3.4 p. 37 before using auxiliary batteries in connection with start-up.
- Do not place metal objects on top of the battery terminals.
- Prevent short circuits and sparking, always disconnect the negative battery cable first and connect the positive cable first.
- Keep first aid equipment and a fire extinguisher at hand.
- Do not open the radiator or expansion tank cap before the liquid has cooled down. Unscrew the cap carefully and let the pressure discharge slowly.

**Warning! Varoitus! Varning!**

**A needle-sharp discharging hydraulic oil jet may be invisible and penetrate clothes and skin causing severe damage.**

Never check for leaks with your hands. Use a piece of cardboard or other material instead. Wear a face mask and work gloves. If oil gets under your skin, seek medical attention immediately. Oil may cause necrosis, serious infection and allergic reactions.

- The battery and its acid contain heavy metals. Dispose of batteries according to the regulations in effect.
- Observe all valid laws and regulations when disposing of oils, antifreeze, solvents, batteries and battery acid.
- Wear a face mask and safety goggles to protect your eyes and respiratory organs against dust and other particles.
- Never go underneath the machine until you are absolutely sure that it will stay in the raised position. Always use appropriate trestles or other reliable support systems.

- Lock the machine's body link with a locking pin or bar before raising the machine with lifting straps (body steered machines), for example.
- Do not lift the rolling rear axle from the middle (axle-equipped machines).
- Never go underneath a raised fork unless it is locked in place with a maintenance stand.

## 2.4 Labels and plates

- Follow all the instructions on the labels attached to the machine.
- Keep the labels and plates clean and in readable condition.
- Clean the labels with soap and water, dry with a soft cloth.
- Replace damaged or worn labels with new ones.
- If you replace components that carry labels, ensure that a new label is positioned in the same place.
- Stick new labels on a dry, clean and greaseless surface. The minimum temperature requirement is +10 °C.

Notes:

# 3.0 MACHINE STRUCTURE

It is vital to know the machine's structure in order to ensure safe and efficient operation and maintenance. This section covers the machine's structure, i.e. locations and names of the main components.

Detailed instructions for operation and maintenance are provided in sections Cabin and controls, Driving and use, and Maintenance.

## 3.1 Main components and external equipment

Figure 4.

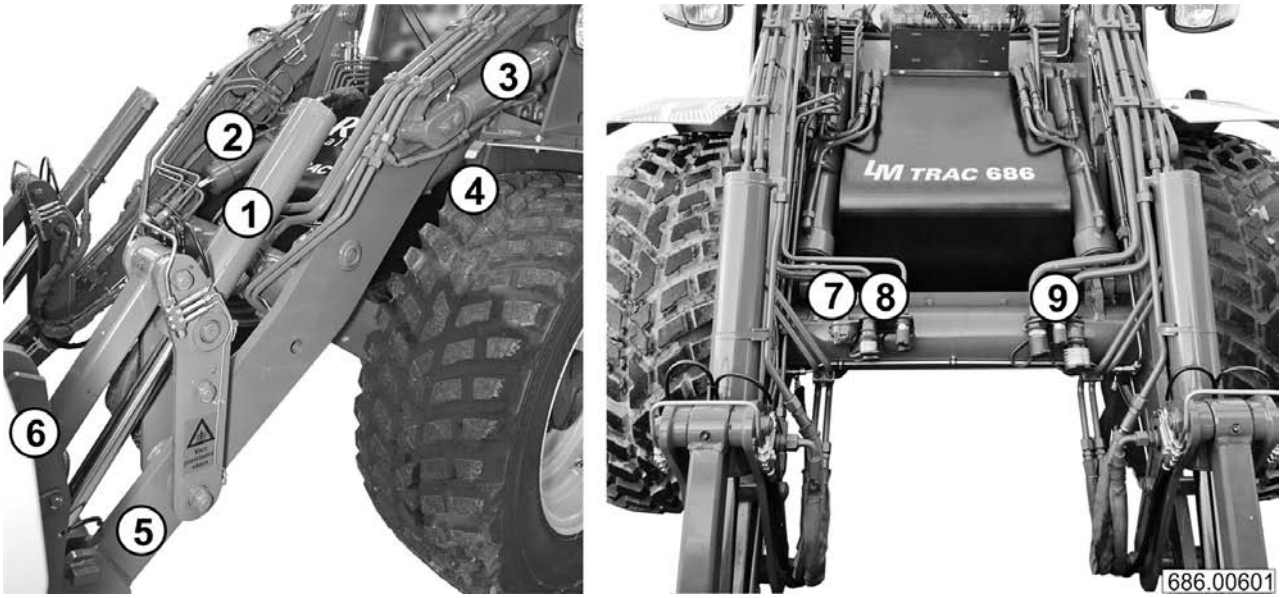

| | | |
|---|---|---|
| 1. Cabin | 2. Flashing beacon | 3. Rear working lights |
| 4. Engine and hydraulic pumps | 5. Rear lifter | 6. Main power switch |
| 7. Front fork maintenance stand | 8. Headlights | 9. Front lifter |
| 10. Exterior mirrors | 11. Front working lights | |

Figure 5.


| | |
|---|---|
| 1. Fuel tank | 2. Cabin fresh-air filter |
| 3. Central lubrication system (accessory) | 4. Batteries |
| 5. Rear lights | |

### 3.1.1 Front lifter

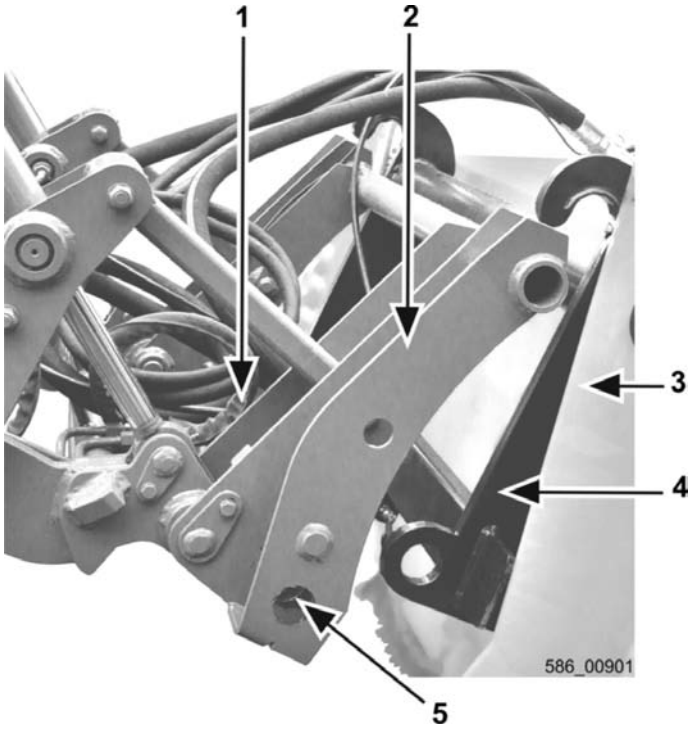
Figure 6.




| | | |
|---|---|---|
| 1. Ladle cylinders | 2. Lifting cylinders | 3. Stabilisation cylinders |
| 4. Fork supports | 5. Lifting forks | 6. Quick attachment device |
| 7. Electrical socket (12 V) | 8. Cylinder hydraulics quick connectors | 9. Engine hydraulics quick connectors + drain line |

**Quick attachment device**

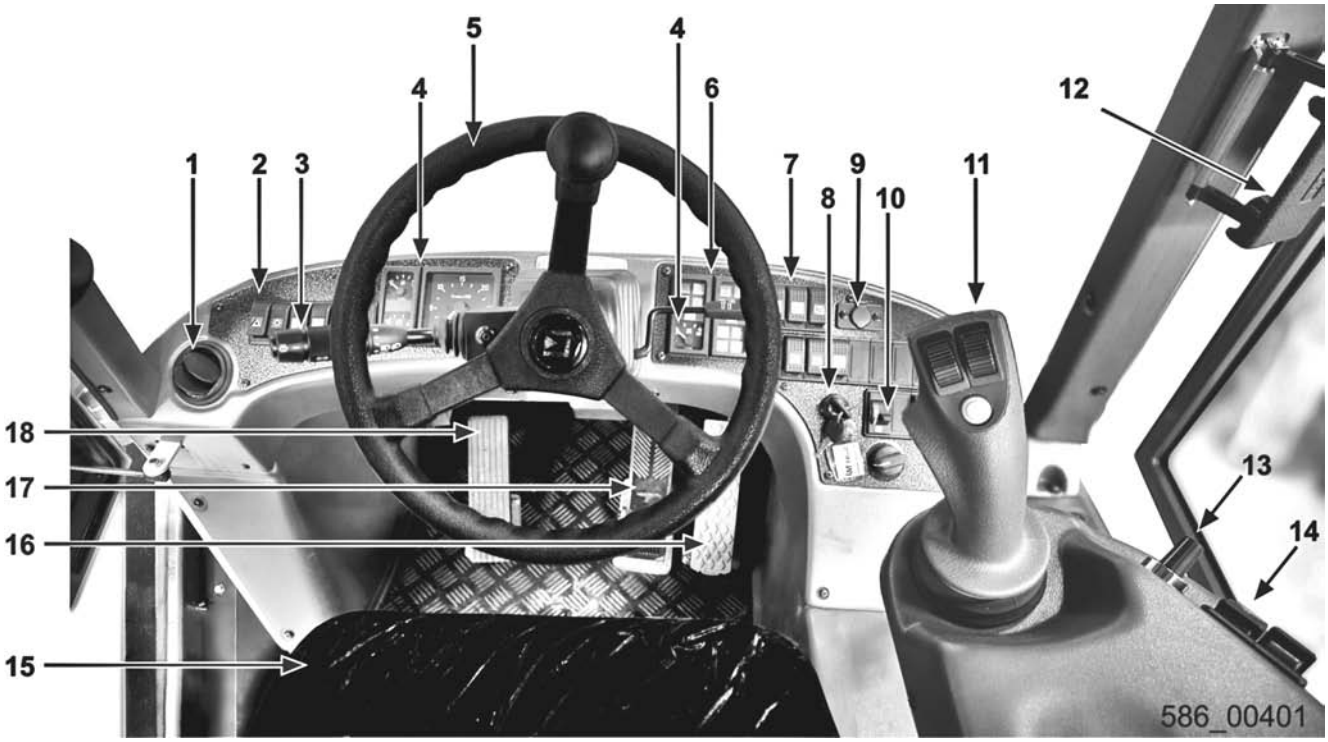
Figure 7.




| | | |
|---|---|---|
| 1. Locking cylinder for tool locking pins | | 2. Quick attachment device |
| 3. Tool | 4. Tool quick connection plate | 5. Locking pins |

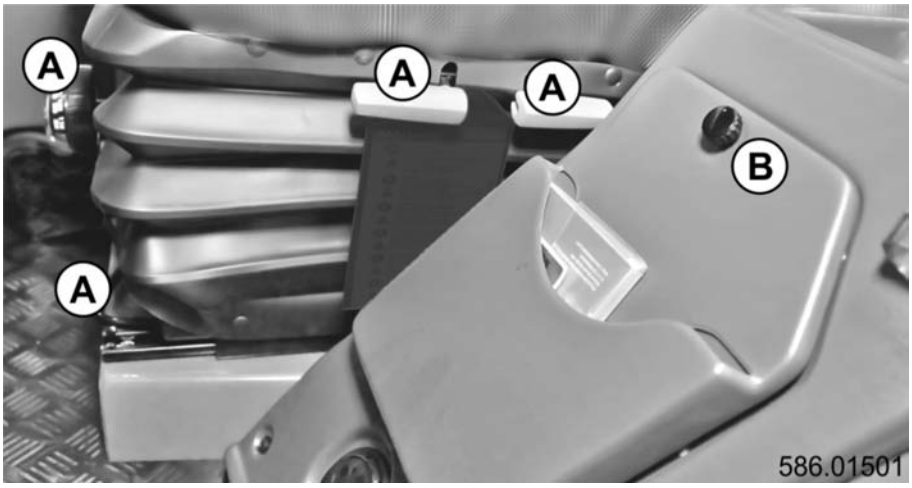
## 3.2 Cabin from inside

Figure 8.




| | | |
|---|---|---|
| 1. Vents | 2. Left switch panel | 3. Multi-function switch |
| 4. Instrument panel | 5. Steering wheel | 6. Indicator panel |
| 7. Right switch panel | 8. Ignition switch | 9. Power socket (12 V) |
| 10. Heater & air conditioning | 11. Fork operation lever (joystick) | 12. Cabin ventilation door/ emergency exit |
| 13. Engine hydraulics volume adjuster | 14. Engine hydraulics switches (ON/OFF) | 15. Seat |
| 16. Drive pedal | 17. Brake pedal | 18. Crawling pedal |

Figure 9.



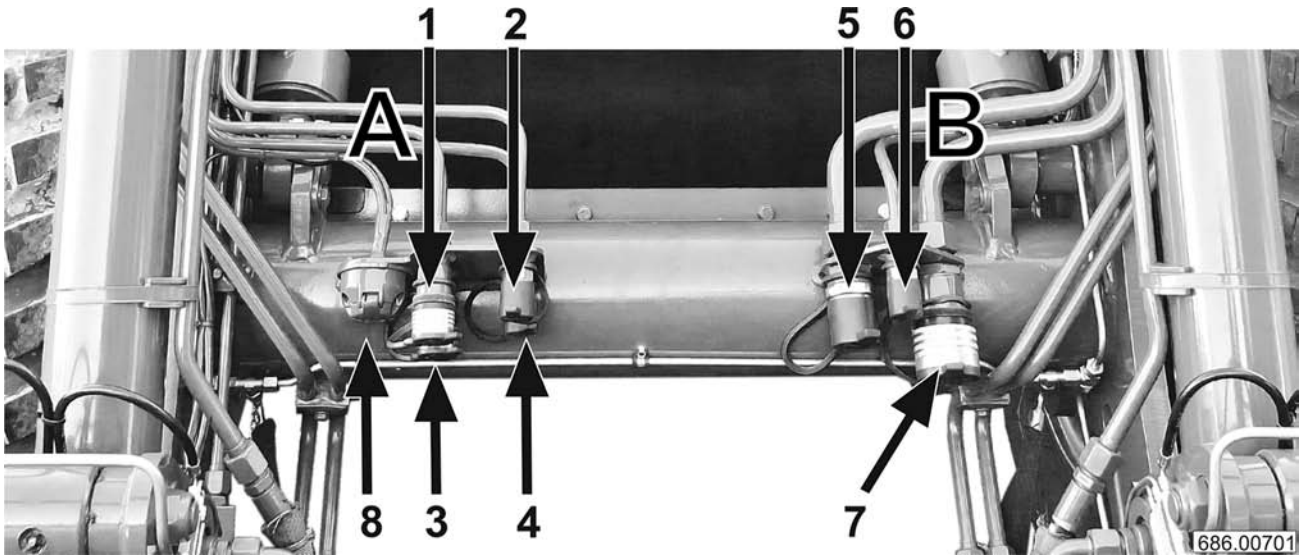

**A. Seat adjustments**

**B. Document case, with electrical switchboard, fuses and relays below.**

## 3.3 Hydraulic connectors (depending on the equipment of your machine)

**Front**

Figure 10.




| A = Cylinder hydraulics | B = Engine hydraulics |
|---|---|
| 1. ½" frame, quick connector for cylinder hydraulics (female) | 2. ½" nipple (quick connector for cylinder hydraulics) (male) |
| 3. ½" frame (quick connector for cylinder hydraulics) | 4. ½" nipple (quick connector for cylinder hydraulics) |
| 5. 1" nipple (quick connector for engine hydraulics) | 6. ½" nipple (quick connector for tank line) |
| 7. 1" frame (quick connector for engine hydraulics) | 8. Electrical socket (tool electricity) (12 V) |

**Rear left**

Engine hydraulics connectors (depending on the equipment of the machine):

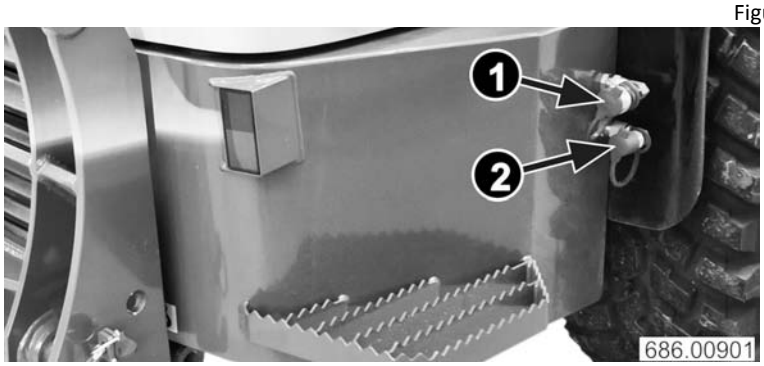
Figure 11.


| |
|---|
| 1. ½" nipple (overflow) (male) |
| 2. 1" frame (female) |
| 3. 1" nipple (male) |
| 4. Electrical socket (tool electricity) (12 V) |

**Rear right**

Cylinder hydraulics quick connectors (depending on the equipment of the machine):

Figure 12.



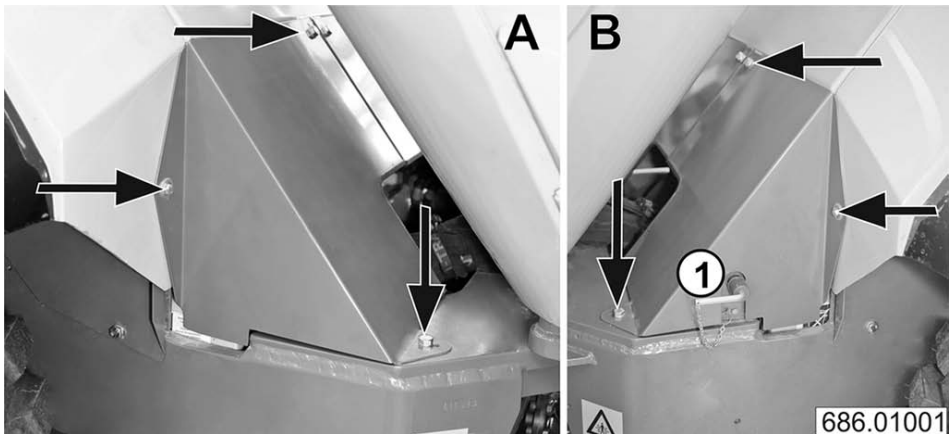

1. ½" frame
2. ½" nipple

## 3.4 Battery, main power switch

The batteries are located under the service hatches on both sides of the front section of the rear frame. Remove the fastening screws of the hatches (3+3 pcs) and lift the hatches off.

The batteries are maintenance-free and require no special service. Check however that the battery cables are properly attached, and that the cable connectors and the exterior of the batteries are clean. Also check that the batteries are firmly attached.

Figure 13.




1. Main power switch
2. Fuel tank, refuelling.

The main power switch (1) is located by the left maintenance hatch.

**Warning! Varoitus! Varning!**

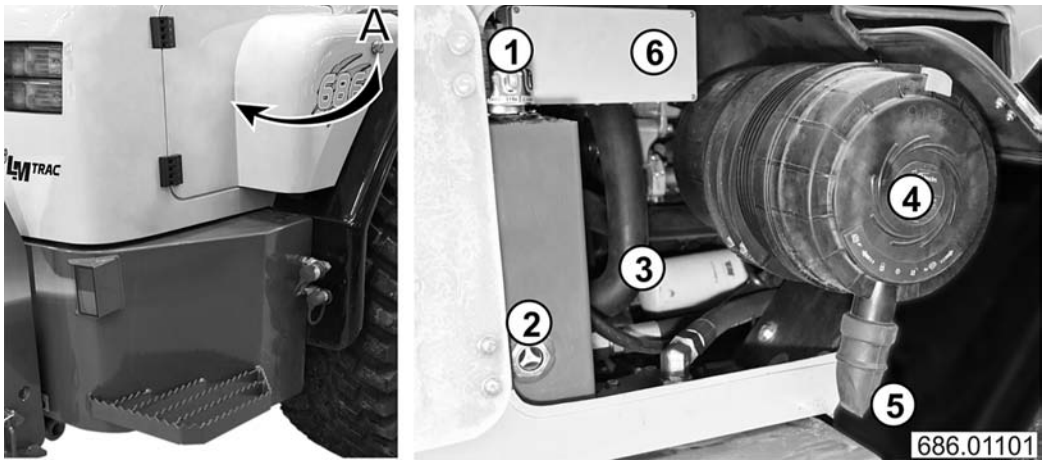
**The main power switch must not be switched to the OFF position while the engine is running!**

The main power switch may be used to disconnect all electrical connections between the battery and the machine.

Optional auxiliary power socket and connecting cable allow for reliable and easy supply of auxiliary power from another machine.

## 3.5 Engine compartment service hatch, right side

Figure 14.




Open the service hatch (A) in the right rear corner. The filler neck (1) for the hydraulic oil tank and the sight glass (2) are located behind the hatch, along with the oil filter (3), air filter (4) and its dust pocket, and the engine's switchboard (6).

* The fuse and relay box (6) includes relays and the following fuses:

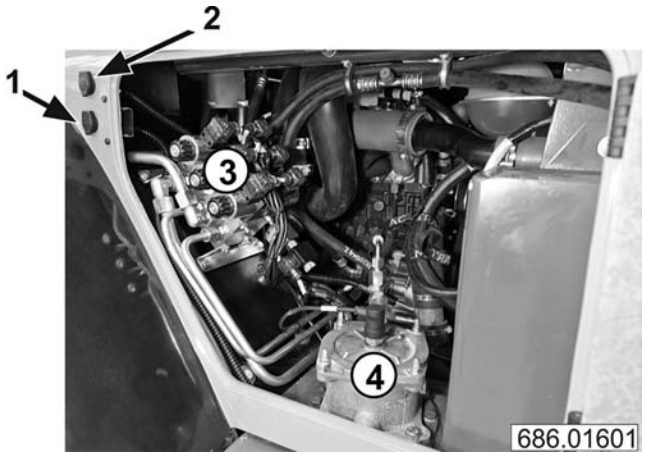
- Main power 80 A
- Ignition 50 A
- Preheating 50 A

The fuses are MAXI fuses.
**

## 3.6 Engine compartment service hatch, left side

The engine block heater socket (1) and hydraulic oil heater socket (2) can be found in front of the left-hand service hatch.

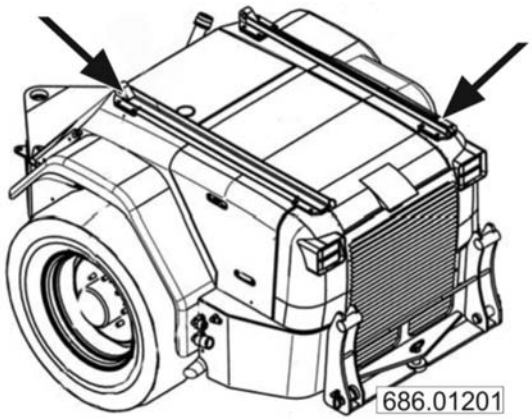
Figure 15.




Open the left service hatch The solenoid valves for the rear hydraulics (3) and the hydraulic return filter (4), for example, are located behind the hatch.

### 3.7 Tools/attachment rack installed on bonnet

Figure 16.




Various tools, such as platforms or tanks, may be installed on the bonnet. They are installed on separate attachment rails, or directly using the holes in the frame. Attachment rails are available from your nearest **Lai-Mu** retailer.

**Note** that a device installed on the bonnet limits access to the engine compartment, and it may need to be removed for maintenance.

**Warning! Varoitus! Varning!**

For lifting the attachment rack/tool, use sufficiently strong lifting equipment while taking the weight of the equipment into consideration. When installing the lifting equipment, note the location of the tool's centre of gravity, so that the attachment rack/tool is lifted and lowered as upright as possible. Proceed with caution!

### 3.8 Engine compartment

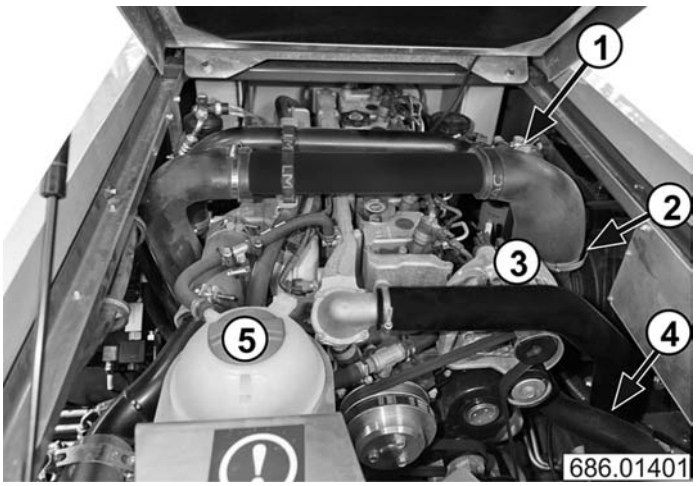
Figure 17.


Open the latch (1) and lift up the bonnet. The engine compartment is available for maintenance.

If accessories have been installed on the bonnet, they need to be removed for service work.

### 3.8.1 Engine compartment components

Figure 18.




1. Fuel filter
2. Engine oil dipstick
3. Alternator
4. Engine oil filter
5. Coolant expansion tank

**Coolant expansion tank**

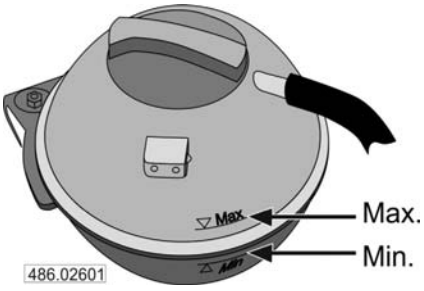
The coolant expansion tank is located under the bonnet.

**Warning! Varoitus! Varning!**

Take care when opening the expansion tank cap on a hot engine!

Hot liquid discharged with great pressure causes severe burns.

Figure 19.




The level of the coolant must be between the “MIN” and “MAX” lines when cold. Add coolant as necessary. Every autumn, ensure that the coolant is frost-proof.

The radiator and condenser cores are located behind the fan.

If necessary, clean the cores by blowing with compressed air outward from the engine side.

**Warning! Varoitus! Varning!**

Never point a strong pressure jet towards the radiator grilles.

### 3.8.2 Hydraulics components

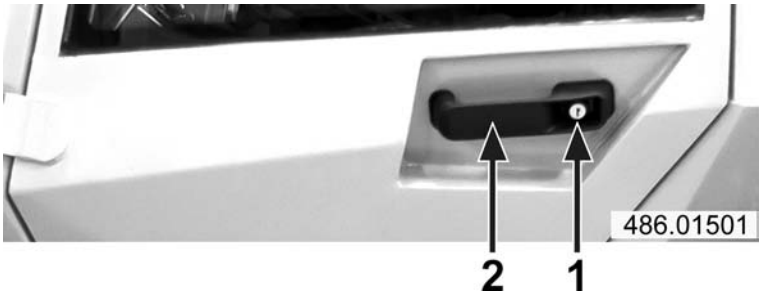
Figure 20.


1. Hydraulic pressure filter
2. Hydraulic return filter
3. Hydraulic pumps

# 4.0 CABIN AND CONTROLS

## 4.1 Doors and locks

Figure 21.




Open the door from the outside by pressing the opening button (1) and pulling the handle (2).

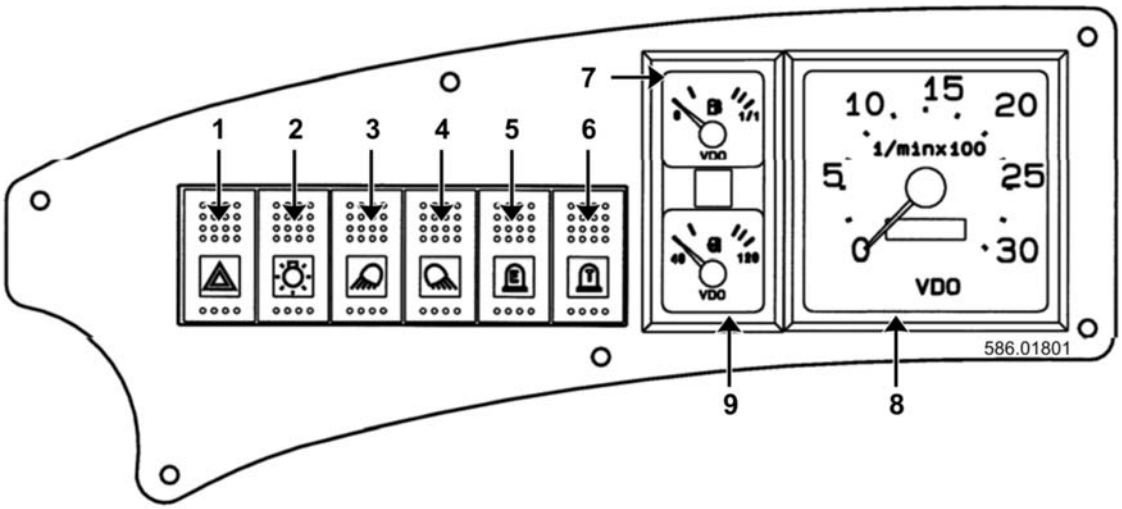
The door can be locked with the key.

Figure 22.


Open the door from the inside by lifting the lever (1)

## 4.2 Instrument panel, left

Figure 23.




| | | |
|---|---|---|
| 1. Warning flasher switch | 2. Parking/headlight switch | 3. Front working light switch |
| 4. Rear working light switch | 5. Front roof beacon switch (*) | 6. Rear roof beacon switch (*) |
| 7. Engine temperature gauge | 8. Fuel gauge | 9. Tachometer/operating hour counter |

**(*) Depending on the equipment level of the machine!**


**7. Fuel gauge.**

The fuel gauge displays the amount of fuel remaining in the fuel tank.


**8. Tachometer/operating hour counter.**

**A. Tachometer**

The tachometer displays the running speed of the engine (r/min). The numbers on the display are multiplied by a hundred. For example, 10 = 1,000 r/min.

**B. Operating hour counter**

The operating hour counter displays engine total running time. The display consists of hours and hour decimals.

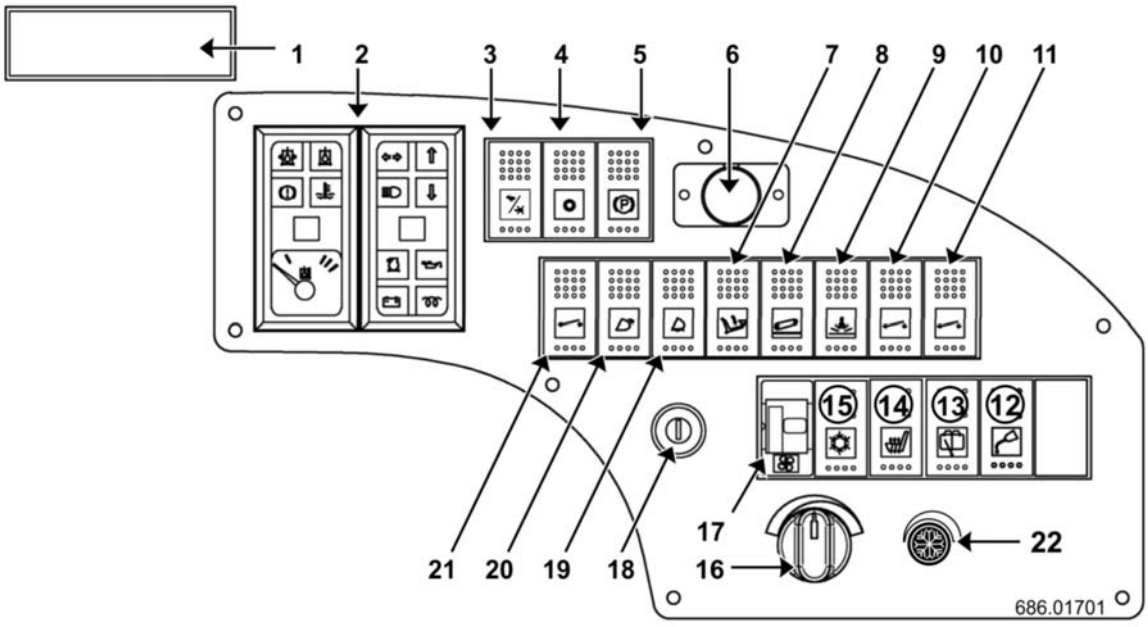

**9. Engine temperature gauge**

The engine temperature gauge displays the temperature of the engine coolant.

## 4.3 Dashboard, right

Note! The locations of the switches may vary depending on the equipment level of your machine!

Figure 24.




| | |
|---|---|
| 1. General alarm light | 2. Indicator panel |
| 3. Differential lock switch | 4. Light / heavy duty (PROGRAM) (*) |
| 5. Parking brake switch | 6. Power take-out socket (12 V) |
| 7. Rear lifter lift/lower switch (*) | 8. Rear lifter float switch (*) |
| 9. Rear cylinder hydraulics switch | 10. Rear tool power supply 1 (*) |
| 11. Rear tool power supply 2 (*) | 12. Central lubrication switch (*) |

| | |
|---|---|
| 13. Rear window wiper/washer switch (*) | 14. Seat/mirror heating switch (*) |
| 15. Air conditioning switch (*) | 16. Cabin heat control |
| 17. Heater fan switch | 18. Ignition switch |
| 19. Fork hydraulic flex switch | 20. Front tool quick-release lock switch |
| 21. Front tool power supply switch | 22. Cabin air conditioning control |

**(*) Depending on the equipment level of the machine!**

**1. General alarm indicator**

This amber light will blink if one of the following warnings is activated:

- Engine oil pressure
- Hydraulic pressure filter
- Hydraulic return filter
- Engine temperature
- Engine air filter
- Brake circuit pressure

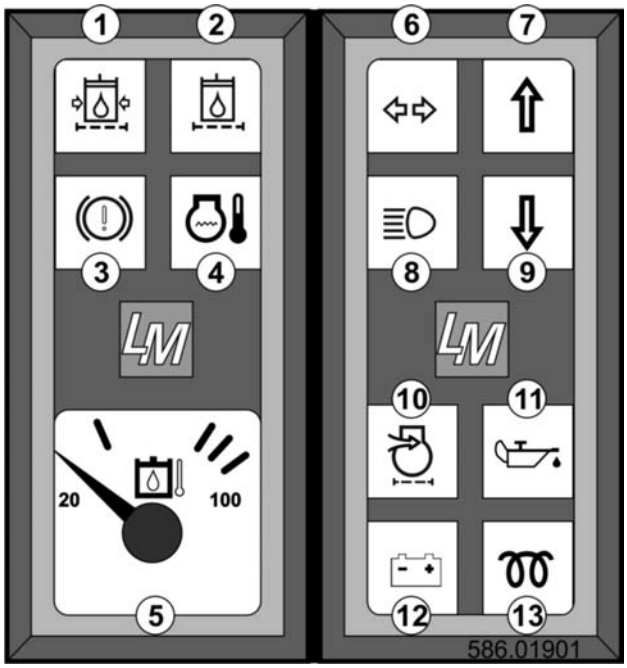
**Warning! Varoitus! Varning!**

When the amber alarm light blinks, discontinue using the machine immediately and turn off the engine!

Determine the cause of the alarm and perform the necessary maintenance before operating the machine.

**2. Indicator panel**

Figure 25.




| | |
|---|---|
| 1. Pressure filter (drive hydraulics) indicator | 2. Pressure filter (operating hydraulics) indicator |
| 3. Brake circuit pressure indicator | 4. Engine coolant indicator |
| 5. Hydraulic oil temperature gauge | 6. Turn signal indicator |
| 7. Running direction forward, indicator | 8. High beam indicator |
| 9. Running direction backward, indicator | 10. Not used |
| 11. Engine oil pressure indicator | 12. Charge indicator |
| 13. Glow indicator | |

## 4.4 Symbols and their meaning

Learn the symbols and their meanings to make the use of the machine easy.

**Warning flasher switch**

All of the machine's flashers can be switched on by pressing the lower part of the switch. The indicator on the switch flashes in time with the flashers.

**Parking/headlight switch**

The switch has 3 positions:

1. Top part pressed: Lights off
2. Centre position: Parking lights are on
3. Bottom part pressed: Headlights are on. Switching between low and high beam is done using the multi-purpose switch on the steering column.

The parking lights function even if the power is turned off. Remember to switch off the headlights before you stop the engine.

**Front working light switch**

The front working lights illuminate when the lower part of this switch is pressed. The indicator on the switch illuminates when the front working lights are on.

**Rear working light switch.**

The rear working lights illuminate when the lower part of this switch is pressed. The indicator on the switch illuminates when the rear working lights are on.

**Front roof beacon switch (if installed)**

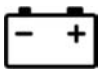
The beacon illuminates when the lower part of this switch is pressed. The indicator on the switch illuminates when the beacon is on.

**Rear roof beacon switch (if installed)**

The beacon illuminates when the lower part of this switch is pressed. The indicator on the switch illuminates when the beacon is on.

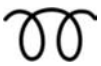
**Hydraulic oil temperature gauge**

This gauge displays the temperature of the hydraulic oil. Normal temperature during use is approx. 80 °C.



**Charge indicator**

This indicator illuminates when an error in the charging system occurs. The light illuminates when power is switched on, and turns off once the engine has started. If the indicator illuminates while driving, determine the cause.



**Glow indicator**

This indicator is lit when the automatic glow system is operational.

**Engine oil pressure indicator**

This indicator illuminates when the engine oil pressure falls too low. The light is lit when power is switched on, and turns off once the engine has started. If the indicator illuminates while driving, check the engine oil level.

**High beam indicator**

The blue indicator illuminates when the high beam headlights are switched on. You can switch between low beam and high beam using the multi-purpose switch on the steering column.

**Reverse indicator**

This indicator illuminates when REVERSE is selected

**Forward indicator**

This indicator illuminates when FORWARD is selected as the driving direction.

**Turn signal indicator**

This indicator flashes when the left or right turn signal is switched on. The turn signal can be switched on by using the multi-purpose switch on the steering column.

**Pressure filter indicator**

This indicator illuminates when the drive hydraulics pressure filter is clogged. Replace the filter as soon as possible.

**Return filter indicator**

This indicator illuminates if the work hydraulics return filter is clogged.

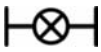
Replace the filter as soon as possible.

**Brake circuit pressure indicator**

This indicator illuminates if the brake circuit pressure falls too low. Determine and correct the cause for the pressure decrease before resuming work.

**Coolant indicator**

This indicator illuminates if the engine temperature rises too high. If the indicator illuminates while driving, check the reading of the engine temperature gauge (7). Determine and correct the cause for the overheating before resuming work.



**Differential lock switch**

This switch is used to switch the differential lock on the front axle on and off. When the lock is engaged, drive as straight as possible and avoid steep turns. The lock is not recommended for speeds over 10 km/h. The indicator on the switch illuminates when the differential lock is on.

PROGRAM

**PROGRAM Light / heavy duty**

Drive programme switch.
More instructions in section 5.8 Light / heavy duty on page 40.

**Parking brake switch**

The parking brake is switched on by means of spring force, and released by hydraulic pressure. The brake is always on when the engine is stopped. The indicator on the switch illuminates when the parking brake is on. Always apply the parking brake before stopping the engine.

**Power take-out socket**

The power take-out socket is of the plug type, and can be used to power a mobile phone, for example. The largest permitted current consumption is 10 A when the roof beacon is switched off.

**Front tool power supply switch**

This switch is used to connect power to the power take-out socket located on the front fork. Power is disconnected when the switch is released. The indicator on the switch illuminates when power is switched on.

**Front tool lock switch**

The front tool lock is opened and closed by holding the lower edge of the switch down and at the same time as using the hydraulic cylinder control (roll the joystick to the left).

**Fork flex switch**

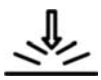
This switch is used to switch the fork flex on and off. Fork flex improves machine handling during transit when a heavy tool is attached to the fork. The flex must be switched off while working.

**Rear lifter switch**

This switch is used to raise and lower the rear lifter. The rear lifter will not rise if floating is switched on.

**Rear lifter float switch**

This switch is used to switch the rear lifter float on and off. Remember to switch off the float before lifting the rear lifter. The indicator on the switch illuminates when floating is switched on.



**Rear cylinder hydraulics switch**

This switch is used to route oil flow to the cylinder hydraulics quick connectors located at the back of the machine.


**Rear tool power supply 1**

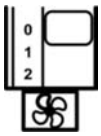
This switch is used to connect power to the first power take-out socket located at the rear of the machine. Power is disconnected when the switch is released.


**Rear tool power supply 2**

This switch is used to connect power to the second power take-out socket located at the rear of the machine. Power is disconnected when the switch is released.

**Ignition switch**

A more detailed explanation of ignition switch operation can be found under “Starting the engine”. See 5.3 on page 34.




**Fan switch**

The fan switch has 4 positions:

0) Off

1) Speed I

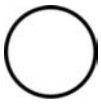
2) Speed II

3) Speed III

The highest speed is intended for quick cabin heating and windscreen defrosting. The lowest speed is usually used together with air conditioning to create the weakest possible draught.

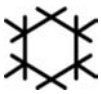
**Heater control**

This control is used to regulate the amount of water entering the heater core. Turning the knob to the right increases cabin temperature. Turning the knob all the way to the left closes water circulation into the heater core.



**Air conditioning control**

This control is used to adjust the power of the air conditioning. Do not operate the air conditioning at a too high power in order to avoid over-cooling the cabin.

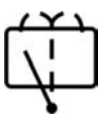


**Air conditioning switch**

This switch is used to switch the air conditioning on and off. The air conditioning only operates when the fan is on. Turn the ventilation vents to direct air upwards, away from the driver’s body.

**Seat/mirror heating switch**

This switch is used to switch the seat- and external mirror heating on and off. The indicator on the switch illuminates when the heating is switched on. Remember to turn off the heating when it is no longer required.



**Rear window wiper/washer**

The switch has three positions:

0) Off

1) Rear window wiper on

2) Rear window washer on

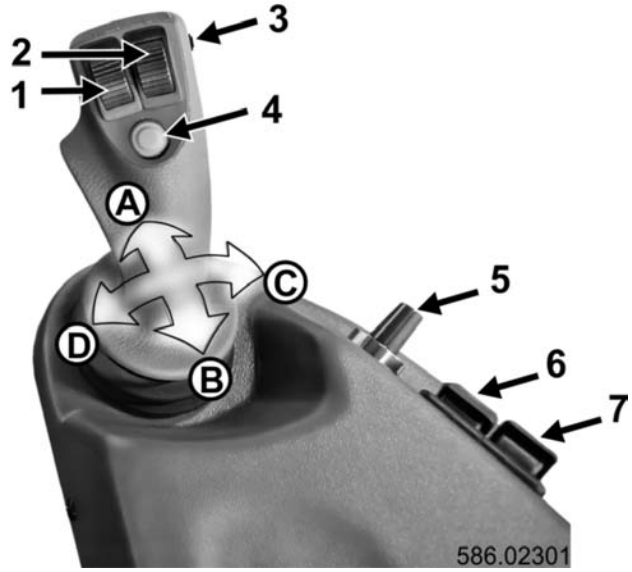
The switch returns to position 1 when released.


**Central hydraulic lubrication switch**

The operation of the central hydraulic lubrication system is explained in more detail in this manual, and in the manual supplied with the system.

## 4.5 Joystick and engine hydraulics switches

Figure 26.




**Joystick movements:**

**A. Forward: Fork lowering**

**B. Backward: Fork rising**

**C. Right: Ladle emptying**

**D. Left: Ladle filling**

**1. Cylinder hydraulic control.**

This action controls the rate of oil flow to the hydraulic cylinder, which control the forks quick release connectors. (Combined together with the locking switch = tool locked / tool open).

**2. Cylinder hydraulic control.**

This action controls the rate of oil flow to the hydraulic cylinders, which control the forks quick release connectors.

**3. Fork floating switch**

This switch is used to switch the floating of the fork on and off

**4. Driving direction switch**

Pressing the button always reverses the driving direction. A light on the instrument panel lights up and shows the direction of travel with an arrow, whenever someone selects a driving direction. Additional instructions are shown in the manual section “Driving and operating."

**Warning! Varoitus! Varning!**

Never switch on floating when the fork is up! A falling tool may cause a severe accident!

5. Engine hydraulics control

This rotating control (potentiometer) is used to adjust the oil flow to the tool connected to the engine hydraulics quick connectors at the front of the machine. Output can be steplessly adjusted between 10 and 100 l/min. Engine hydraulic power can be taken out from both the fork’s quick connectors and the quick connectors on the left side of the machine’s rear part. Output for the rear take-out cannot be adjusted.

**6. Engine hydraulics switch (front, ON/OFF/ON)**

This switch is used to route oil flow to the engine hydraulics quick connectors on the fork. For more information, see “Working with the multi-purpose machine.”

### 7. Engine hydraulics switch (rear, ON/OFF)

This switch is used to route oil flow to the engine hydraulics quick connectors located at the back of the machine. For more information, see “Working with the multi-purpose machine.”

## 4.6 Steering column multi-purpose lever/switch

Figure 27.


### Multi-purpose switch functions:

1. Horn
► Press the button at the end of the lever.
2. Right turn signal
► Lift up the lever. Remember to move the lever back to the centre position after the turn.
3. Left turn signal
► Pull down the lever. Remember to move the lever back to the centre position after the turn.
4. Windscreen washer.
► Switch on the windscreen washer by pressing the collar in the direction of the arrow.
5. Windscreen wiper.
► Switch on the windscreen wiper by turning the sleeve.
6. Low beam headlights.
► Switch on the low beam headlights by pulling the lever in the first position towards the steering wheel (I).
7. High beam headlights.
► Pull the lever one step towards the steering wheel to position II; the high beam headlights are switched on and a blue indicator light is lit on the dashboard.
8. Low beam/high beam.
► Switch between low beam and high beam by pulling the lever towards the steering wheel (point 8).

### Pedals

Figure 28.


### 1. Crawling pedal

The machine also features a crawling pedal that can be used to slow down the machine when a higher engine RPM is required (such as when sweeping streets or cutting down plants).

### 2. Brake pedal

The brake pedal is used when necessary.

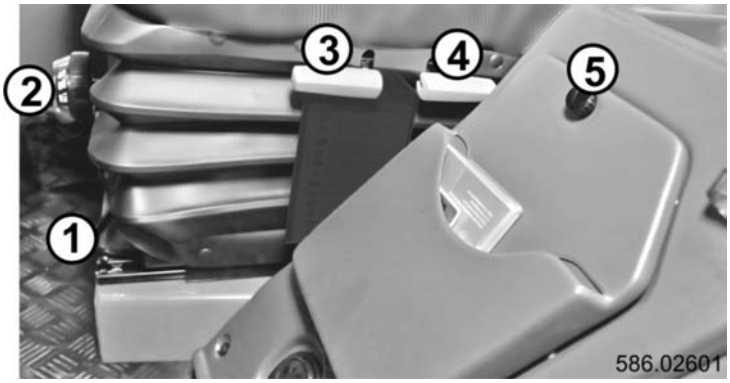
Combined use of the brake pedal and accelerator may be applied to move the machine with very high precision, such as when connecting a tool.

**3. Drive pedal**

Pressing the pedal increases engine RPM, causing the drive pump automation to adjust oil output to the drive motor. Drive speed may be adjusted steplessly both forward and back, with the engine RPM remaining at the highest torque point.

## 4.7 Seat and document compartment

Figure 29.




**Seat adjustments**

1. Longitudinal seat adjustment.
2. Seat flex adjustment.
3. Seat cushion front edge adjustment.
4. Seat cushion rear edge adjustment.

**Warning! Varoitus! Varning!**

Stop the machine before adjusting the seat.

**5 Document compartment**

Store the machine operating manual and documents in the document compartment located on the left side of the driver seat.

## 4.8 Electrical main switchboard

The electrical main switchboard is located below the document compartment. Open the document compartment fastener (5 in figure above) and twist open the compartment on its hinges. The machine's fuses and relays are located behind the cover. See "Fuses and relays" on page 71.

Figure 30.


1. Fuses
2. Relays

### Radio

Figure 31.


The radio is located on the ceiling panel, to the right of the driver. The radio is provided with its own user manual.

### Dome light

The dome light is located above the door, and its switch is located on the light itself. Remember to turn off the dome light before exiting the cabin.

### Heater vents

Figure 32.


### Air vents

The cabin has 7 air vents. The vents may be rotated, and their flaps may be turned to the desired position. The vents may also be closed.

### Recirculation vents

Figure 33.


The recirculation vents are located to the right of the driver's feet. The recirculation vents are normally kept closed. The vents are opened when quick heating of the cabin air is required.

The vents must be kept open whenever air conditioning is used.

### Right side window (emergency exit)

Figure 34.


The window may be opened to improve cabin ventilation. Open the window by pulling back on the handle (1), and press it to the right to lock the window in the open position. Close the side window in the reverse order. Ensure that the window is properly closed before leaving the cabin.

Note! Huomaa! Notera!

The right side window also functions as an emergency exit as follows:

- ► Pull out the hinge pin (3) by lifting it by the ring (2).
- ► Push the window fully open.

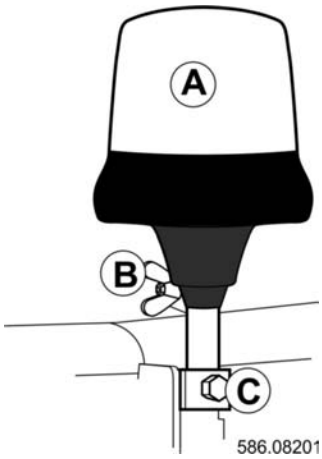
**Info!**

The emergency exit must always be in working order.

- ► Regularly check that the hinge pin can be easily removed by pulling on the ring.
- ► After inspection, remember to reinstall the hinge pin.
- ► Never block the emergency exit with extraneous items; it must always be unobstructed.
- ► Do not attach any extra accessories in this area (inside or outside the cabin).
- ► The edges of the emergency exit must not have any protruding parts that may stick to clothing when exiting through the emergency exit.

## 4.9 Flashing beacon

Figure 35.




You can remove the flashing beacon (A) from its stand by loosening the wing nut (B), or turn it down by loosening the fastener (C).

**Info!**

When using the flashing beacon, follow local traffic legislation.

# 5.0 DRIVING AND OPERATION

## 5.1 General

- Follow safe working methods and the instructions related to safety and operation provided in this manual.
- Never operate a machine that is not in working order. Before setting off, always check that the lights, indicators, gauges and controls are in flawless working condition and also operational while driving.
- Perform all maintenance on time following the instructions provided in this manual.
- Carefully read the paragraphs labelled “Warning” and “Note” before operating the machine.
- Familiarise yourself with the controls and the operation of the machine and tool before starting use.
- Perform daily maintenance according to the maintenance programme.

### 5.1.1 Running-in a new machine

Special attention should be paid to the running-in of a new machine, since it also affects the durability of the machine in the future. At the start of the running-in, apply a light and variable load to the machine. Flexible use and variable loads help the different machine parts even out.

- ► Warm the engine and hydraulics before loading them.
- ► Do not operate the engine at idle or full load for longer than 5 minutes.
- ► Avoid maintaining regular speed.
- ► Avoid rapid braking or changes in driving direction.
- ► Perform the first 50-hour service according to the instructions in this manual.

Note! Huomaa! Notera!

**Pay attention to the engine oil pressure and temperature while driving.**
**Regularly check the coolant and motor oil levels. Also pay attention to the attachment of screws, nuts and hoses, and any abrasions (wheels, exhaust, axles, water hoses, etc.). Tighten if necessary.**

## 5.2 Start-up preparations

### 5.2.1 Inspections before starting the machine

- ► Walk around the machine and visually check for damage, leaks (oil/fluid) and wear.
- ► Check engine oil level.
- ► Check coolant level.
- ► Clean the grille and radiator.
- ► Refuel as required.
- ► Check hydraulic oil level.
- ► Clean the air filter dust pocket.
- ► Check the operation of all warning lights, and the hour counter reading.
- ► Check the operation of headlights.
- ► Check the condition of the tyres and their inflation pressure, at least visually.
- ► Inspect the condition of the safety cabin.
- ► Inspect the condition of all labels.

### 5.2.2 Fuel types

Heating oil must not be used as fuel for the engine. If a tax-free fuel is used, it must be motor-grade.

Figure 36.


The fuel tank (volume approx. 95 l) is filled through the filler neck (A) on the right side of the machine.

The following lists examples of acceptable tax-free fuel types:

Table: 14

| Supplier | Grade |
|---|---|
| Fortum | Tempera Green (summer/winter grade)<br>Tempera 5G<br>Tempera 3G |
| Shell | Thermo City (summer grade)<br>Thermo City (winter grade)<br>Thermo City Premium (summer grade) |
| Esso | Essoheat LS<br>Essolene LS |
| Teboil | Hilight Motor (summer grade)<br>Hilight Motor (winter grade) |

**Info!**

The fuel tank is at an overpressure of 0.35 bar.

### 5.2.3 Seat adjustments

Note! Huomaa! Notera!

**Adjust the seat before starting the engine!**

**Standard seat**

Figure 37.

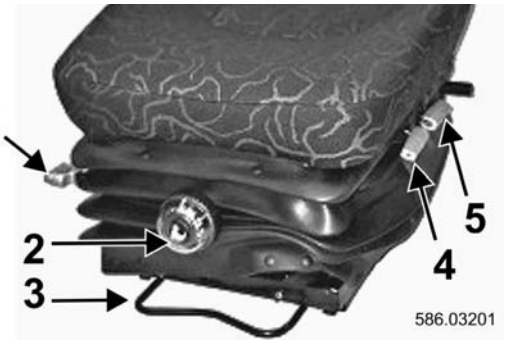



Table: 15

| | | |
|---|---|---|
| 1. Backrest tilt adjustment.<br>Lift the handle and tilt the backrest. | 2. Suspension stiffness adjustment.<br>Adjust the suspension by rotating. | 3. Longitudinal adjustment.<br>Lift the handle and adjust the longitudinal position. |

| | |
|---|---|
| 4. Seat cushion front edge adjustment.<br>Lift the handle and adjust the height of the seat cushion's front edge. | 5. Seat cushion rear edge adjustment.<br>Lift the handle and adjust the height of the seat cushion's rear edge. |

**Seat with air suspension**

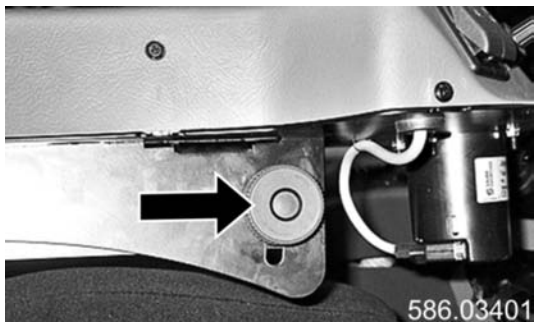
Figure 38.


Table: 6

| | | |
|---|---|---|
| 1. Backrest tilt adjustment.<br>Lift the lever and tilt the backrest. | 2. Suspension stiffness adjustment.<br>Adjust by pulling/pushing the knob. | 3. Longitudinal adjustment.<br>Lift the handle and adjust the longitudinal position. |
| 4. Seat cushion front edge adjustment.<br>Lift the handle and adjust the height of the seat cushion's front edge. | 5. Seat cushion rear edge adjustment.<br>Lift the handle and adjust the height of the seat cushion's rear edge. | |

**Elbow rest adjustment**

Figure 39.




By loosening the adjustment screw (pictured), you can steplessly adjust the height of the right elbow rest.

Remember to tighten the adjustment screw.

**Adjust mirrors**

Figure 40.

Adjust the external and internal mirrors before setting off.

## 5.3 Starting the engine

Note! Huomaa! Notera!

**Read all safety instructions.**
**Read all safety decals.**
**Never run the engine in a closed space.**
**Never start the engine while outside.**
**Always sit on the seat.**

Do not operate the starter for more than 30 seconds at a time. If the engine does not start within 30 seconds, wait 2 minutes before trying again.

### 5.3.1 Starter lock (= parking brake switch)

Figure 41.

Switch 5, See 4.3 on page 22.

**Info!**

The machine is equipped with a starter lock. The engine will not start if the parking brake is not on.

### 5.3.2 Starting

1. Check that the parking brake is engaged.
2. Check that all the controls are neutral or off (including engine hydraulics).

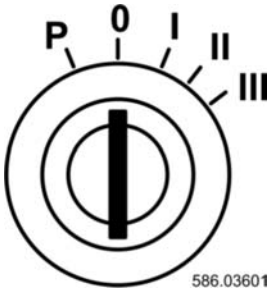
Figure 42.


3. Turn on the main power switch (A).
4. Turn on the power.
5. Check that the following warning lights turn on:

- Engine oil pressure
- Charge
- Parking brake
- Glow indicator

6. Wait for the glow indicator to turn off, press the accelerator half way down, and turn the ignition switch to the starting position.
7. Once the engine has started, release the ignition key and allow the accelerator to rise up fully.
8. Check that the engine oil pressure and charge indicators turn off. If a warning light remains on, stop the engine and determine the cause.

Figure 43.




**Ignition switch positions:**

**P.** Not used
**O.** Power off
**I.** Power on
**II.** Not used
**III.** Start

### 5.3.3 Cold-starting the engine

During cold weather, we recommend using either an engine block heater or another type of auxiliary heater.

Switch on the heater well in advance before starting the engine. Using a heater will significantly reduce engine wear during cold starts, and also improves cabin heating.

**Warning! Varoitus! Varning!**

**Using ether as a starting aid is expressly forbidden under any conditions.**

Perform items 1–5 under “Starting”.

2) If the engine does not start on the first go, disconnect and reconnect power to re-enable glow plug heating.

3) Perform items 5, 6, and 7 under “Starting”.

### 5.3.4 Using auxiliary battery

**Warning! Varoitus! Varning!**

**Battery gases may explode. Do not smoke near the battery and ensure no naked flames or sparks are present.**

Note! Huomaa! Notera!

**If the machine’s battery is frozen, do not try to start it with an auxiliary battery. Carefully follow the instructions provided.**

Provide auxiliary power using starter cables from the battery of another machine as follows:

1. Drive the assisting machine close enough to the multi-purpose machine to allow the cables to connect them. THE MACHINES MUST NOT TOUCH EACH OTHER.
2. Set all controls to neutral on both machines.
3. Use protective glasses and rubber gloves.
4. Use the red starter cable to connect the positive terminals of the auxiliary battery and the machine battery.
5. Connect the black starter cable to the negative terminal of the auxiliary battery.
6. Connect one end of the black cable to the frame of the multi-purpose machine.
7. Turn on the main power switch.
8. Start the engine of the assisting machine and let it run for a while.
9. Start the engine of the multi-purpose machine.
10. Detach the starter cables in reverse order (6, 5, and 4).

## 5.4 Warm-up operation

Carry out the following actions after starting the engine, but before starting work:

1. Let the engine run at increased idle for 2 minutes under normal temperature, and for about 5 minutes in cold weather (winter conditions).
2. Raise and lower the fork a few times in cold weather.
3. Do not drive/operate the machine until it is warm enough, that is, the engine runs steadily and the hydraulics operate normally.

## 5.5 Stopping the engine

Note! Huomaa! Notera!

**Always lower all tools and apply the parking brake before stopping the engine.**

1. Drive the machine onto hard, level terrain.
2. Lower all tools onto the ground and apply the parking brake.
3. Decrease the engine RPM to idle, and move all controls to neutral or off.
4. Let the engine run at idle for a few minutes to cool it down.
5. Turn the ignition key to the O position and remove the key.
6. Switch off the main power switch and place the key inside the cabin.
7. Lock the cabin door before leaving the machine.

## 5.6 Working with the multi-purpose machine

### 5.6.1 Driving

The functions related to driving the LM Trac 686 multi-purpose machine are managed using three pedals.

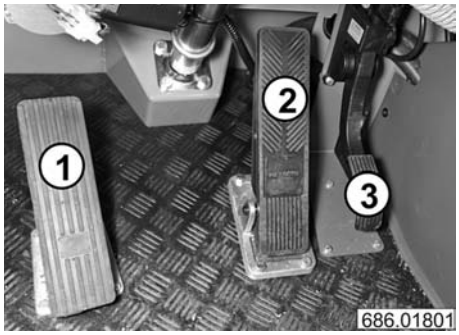



Figure 44.

**The drive pedal (3)** provides stepless adjustment of driving speed across the entire speed range, both forward and back.

Pressing the accelerator increases driving speed, while the engine RPM is kept at the highest torque point. This achieves the best possible fuel efficiency, and hydraulic output remains stable.

Lifting the accelerator reduces driving speed, and the hydrostatic power train also operates as a brake. Rapidly lifting the accelerator will therefore rapidly stop the machine. This means that by lifting the accelerator at different speeds, you can largely replace the brake pedal.

Adjust your driving speed to suit the situation and avoid rapidly lifting the accelerator (= braking forcefully).

**The brake pedal (2)** is usually only required to keep the machine stable on a slope.

**The crawl pedal (1)** can be used to reduce driving speed at high engine RPM.

This is useful when higher hydraulic output is temporarily required for the attached tools, for example. Press the accelerator (3) and the crawl pedal (1) simultaneously.

This adjusts the engine RPM with the accelerator, and the machine's driving speed with the crawl pedal. The driving speed of the machine is reduced when the crawl pedal is pressed.

Note! Huomaa! Notera!

**If high output and low speed is required for a longer time, we recommend switching the driving programme. See the instructions under "Light/heavy duty" in this manual. See 5.8 on page 42.**

### 5.6.2 Change of driving direction

Figure 45.


Driving direction can be changed by pressing the push button at the end of the joystick. The switch reverses the driving direction.

Note! Huomaa! Notera!

**Only change driving direction when the machine is stationary.**

Completely release the accelerator and lightly press on the brake before changing the driving direction. When the driving direction changes, immediately release the brake pedal and press the accelerator down to achieve the desired driving speed.

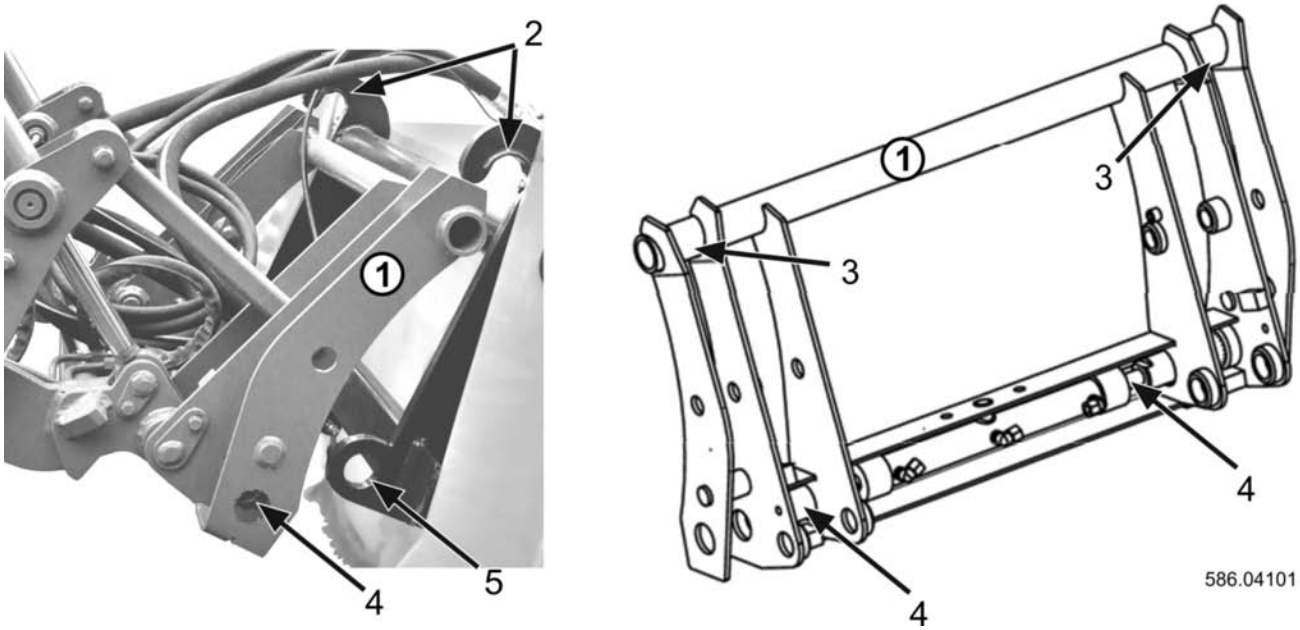
Setting the switch in the middle position enables the powertrain's neutral position.

## 5.7 Connecting tools

The machine fork is generally delivered with a "KUNTA 500" type quick tool attachment. Tool attachment of some other type is also available by order. The tool is electro-hydraulically locked from the cabin.

### 5.7.1 Connecting tools at front

Figure 46.




**Connect a front tool as follows:**

A. Lower the fork and turn the quick attachment plate (1) to the ladle emptying position.
B. Drive behind the tool and lift the fork so that the hooks on the tool (2) attach to the diagonal bar of the quick attachment plate (3).
C. Lift the fork up and turn the quick attachment plate to the ladle filling position, causing the locking pins (4) to enter the attachment holes (5) of the tool.

**Connect hydraulic hoses:**

**Warning! Varoitus! Varning!**

**Before setting off, ensure that the pins are properly in place.**

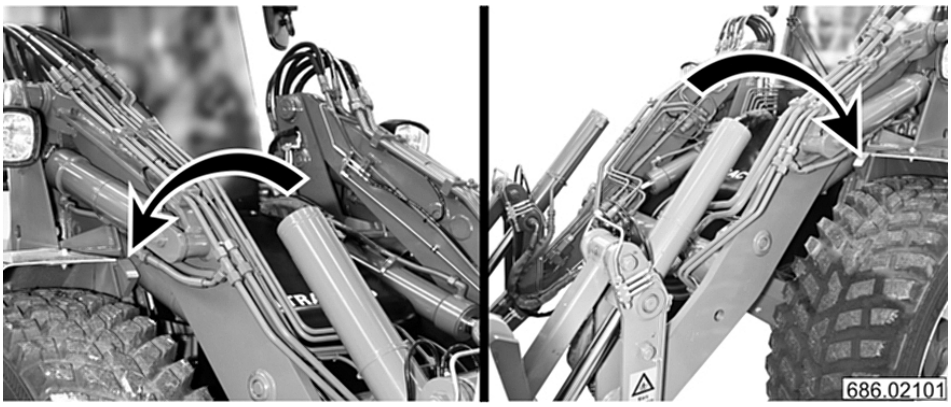
**Release a front-attached tool as follows:**

A. Lower the tool onto a level platform and press the tool lock switch, withdrawing the locking pins towards the centre line of the machine.
B. Turn the quick attachment plate in the ladle emptying position and lower the fork, releasing the tool hooks.
C. Reverse the machine away from the tool.

### 5.7.2 Ploughing supports

The ploughing supports (2 pcs) are intended to support the front fork when ploughing, for example.

Figure 47.




- ► Remove the R grommet of the ploughing support and pull the locking pin out so that you can move the ploughing support.
- ► Lower the fork to the most suitable working height for the tool.
- ► Lift the fork support to a suitable working height, and install the locking pin and R grommet.
- ► Do the same for the ploughing support on the other side (same height for both sides).

**Info!**

*The ploughing supports are adjustable to four different heights.*

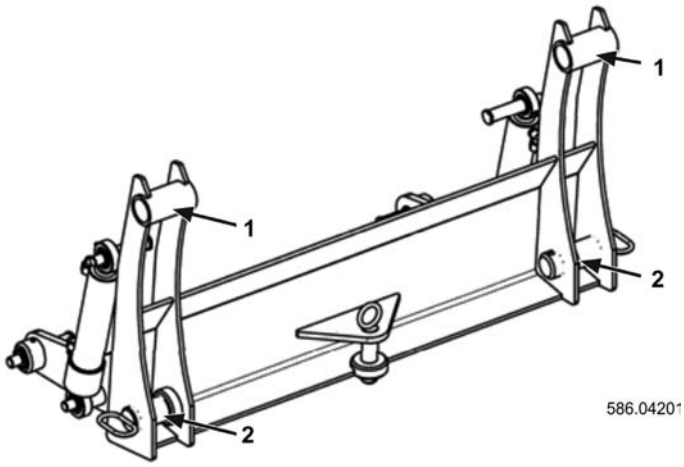
**Warning! Varoitus! Varning!**

**Never access areas under the fork unless the fork is supported with the maintenance stand! See 6.1.3 Front fork maintenance stand page 47.**

### 5.7.3 Connecting tools at back

An optional rear lifter is available for connecting tools. Tools are connected to the rear lifter manually, using separate pins.

Figure 48.




1. Tool hook attachment points.
2. Locking pins.

**Connect a rear tool as follows:**

A. Remove the locking pins (remove the ring pins and pull out the pins).
B. Lower the rear lifter fully and reverse the machine in front of the tool.
C. Lift up the lifter to attach the tool hooks to their correct locations (1).
D. Lift the rear lifter fully up and install the attachment pins.
E. Lock the pins in place with ring pins.

**Remove a rear tool as follows:**

A. Lower the tool onto level ground.
B. Remove the tool locking pins and fully lower the rear lifter.
C. Drive the machine away from the tool and install the locking pins on the lifter.
D. Lock the pins in place with ring pins.

### 5.7.4 Connecting/disconnecting hydraulic hoses

Figure 49.


- ► Lower the fork, and lower the tool in the quick attachment plate onto level ground.
- ► Turn off the engine.
- ► When connecting a hydraulic hose to a tool, remove the protective plug from the connector and ensure that the quick connectors (on both the machine and tool) are absolutely clean; if necessary, clean them before attaching.

- ► Pull back on the quick connector's locking ring, press the connector into place and let go of the lock ring to lock the connector into place.
- ► When removing the hydraulic hose of a tool, clean the top of the connector (if necessary), pull back on the locking ring, and remove the quick connector.
- ► Immediately reinstall clean protective plugs onto the connectors.
- ► Wipe off any excess hydraulic oil.

### 5.7.5 Trailer hitch

If the machine is equipped with a trailer hitch, a pulling tool or trailer may be attached to it. The trailer hitch has a ball with a diameter of 50 mm, or a trailer pin with a diameter of 30 mm.

Follow any traffic regulations concerning the trailer or equipment being towed.

Note! Huomaa! Notera!

**Remember to lock the knob with a ring pin before setting off.**

## 5.8 Light / heavy duty

By using the switch on the dashboard you can select a driving programme suited for your work. The driving programme affects the characteristics of the powertrain and diesel engine.

**Light duty**

The machine quickly accelerates to maximum speed. This feature can be used during transfer, ploughing and other work that do not require a high oil output from the operating hydraulics while working.

**Heavy duty**

This feature is used when the working hydraulics require a high amount of oil in relation to the driving speed. Such tasks include sweeping, cutting grass and plants, and snow-moving.

The crawl pedal achieves the same effect.

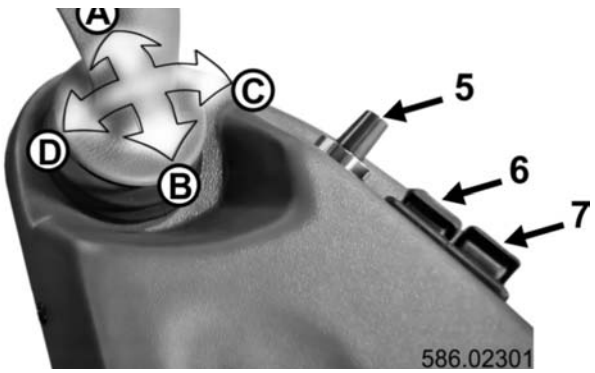
**Info!**

The maximum driving speed and pulling power are similar for both programmes.

## 5.9 Tools with hydraulic motor operation

Tools with hydraulic motor operation can be attached to the front and rear of the machine and on the bonnet. The hydraulic output of the tool installed at the rear cannot be adjusted. The hydraulic output of the tool installed at the front can be adjusted using the potentiometer (5) in the front elbow rest of the seat.

Figure 50.




The potentiometer values result in the following approximate output.

### 5.9.1 Adjustable hydraulic output for front output

| Potentiometer output | Output (approximate) |
|---|---|
| 1 | 10 l/min |
| 2 | 20 l/min |
| 3 | 30 l/min |
| 4 | 55 l/min |
| 5 | 80 l/min |
| 6 | 95 l/min |
| 7 | 110 l/min |
| 8 | 130 l/min |
| 9 | 145 l/min |
| 10 | 160 l/min |

Adjust output for the front tool according to the tool manual.

 Note! Huomaa! Notera!

**Always remember to check the highest allowed output from the tool manual or type plate.**
**Never exceed the highest allowed output, and always use the lowest possible value.**

# 6.0 MAINTENANCE

## 6.1 General

Correct, timely maintenance is one of the key requirements for the machine's operational reliability. The operator of the machine plays an essential role when it comes to maintenance, since all maintenance operations listed in this manual must be completed at regular hourly intervals.

The intervals for periodic maintenance listed in the table apply to machines operating under normal conditions. Machines under heavy load must be serviced more frequently.

► In this manual, this paragraph symbol indicates a requested work performance.

The work stages have been registered in their completion sequence.

### Warning! Varoitus! Varning!

**To avoid personnel injury, carry out the following procedures before starting maintenance:**

► Drive the machine onto durable, level terrain.
► Apply the parking brake.
► Lower all tools onto the ground and stop the engine.
► Disconnect the main breaker and remove the key from the ignition.
► Attach a tag to the steering wheel that forbids starting the machine.

### Note! Huomaa! Notera!

**If the maintenance work requires having the engine running and/or lifting the machine using a lifting jack or some other device, proceed as follows:**

**Lock the body link using a locking bar as follows:**

Figure 51.


1. Straighten the machine body and attach the locking bar to the front (A) and rear (B) attachment points.
2. Lock the bar in place with the ring pins.

### Note! Huomaa! Notera!

**Once maintenance is complete, remember to remove the locking bar from the body link!**

### Info!

*The locking bar of the body link is fastened to the left front mudguard inside the fork maintenance stand!*

### 6.1.1 Lifting the machine with a lifting jack or lifting slings, for example

**Warning! Varoitus! Varning!**

**Lock the body link using a locking bar**

**Info!**

*Only use suitable lifting tools with sufficient strength.*

When the machine has been lifted up, support it or its parts using approved stands with sufficient strength.

Never go under the machine before it has been secured in place in a safe manner that meets all applicable regulations.

### 6.1.2 Access

Some of the serviceable locations on the machine are placed behind hatches. Once maintenance work is complete, remember to close all hatches.

Figure 52.


Open the bonnet latch and lift up the bonnet (1). If accessories have been installed on the bonnet, they may need to be removed for service work. The bonnet is held up by two gas springs.

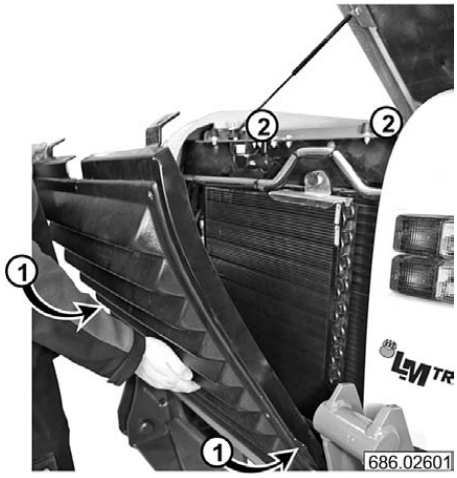
The grille (2) can also be removed when necessary:

Figure 53.


1. Right side engine compartment service hatch
2. Battery service hatch
3. Cabin air filter service hatch
4. Battery and hydraulics service hatch
5. Left side engine compartment service hatch

► If necessary, remove the radiator grille by unscrewing the two attachment screws (1) and lifting the grille off of the locking pins (2).

Figure 54.

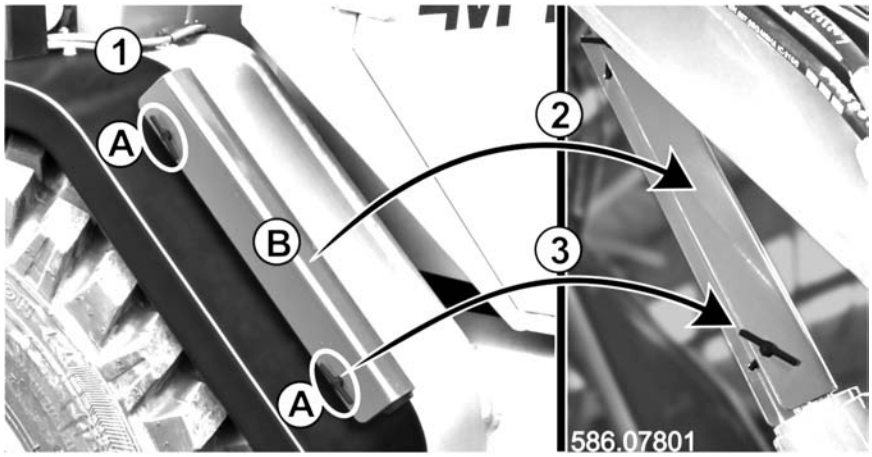



### 6.1.3 Front fork maintenance stand

**Warning! Varoitus! Varning!**

**Always install the front fork maintenance stand before accessing the underside of the fork in its upright position.**

Figure 55.




The fork maintenance stand (A) is attached to the left front mudguard.

1. Remove the maintenance stand by opening the two locking screws (A) and pulling the screws out.
2. When the fork is up, install the maintenance stand (B) on the piston shaft of the lifting cylinder.
3. Lock the stand in place with the locking screws.
4. Slowly lower the fork until it rests on the maintenance stand.

► Remove the maintenance stand in reverse order, and attach it to the correct storage location.

**Info!**

*A body link locking bar is located inside the maintenance stand! Remove it when using the maintenance stand and reinstall it before placing the maintenance stand back in its place (mudguard).*

Figure 56.

### 6.1.4 Towing the machine

**Warning! Varoitus! Varning!**

**TOWING THE MACHINE IS FORBIDDEN!**

**Info!**

*- If the machine must be transported, a transport platform must be used.*
*- The drive hydraulics will prevent the wheels from spinning while towing!*

**In case of emergency**, the machine may be **towed for a short distance (max. 10 m)**.

In this case, the following instructions must be closely followed:

- Towing speed **may not exceed 2 km/h**.
- Towing distance may **not exceed 10 m**.
- Before towing, the pumps and drive engine must be checked for defects. These components have parts that may cause additional damage if they are moved while damaged.

### 6.1.5 Lowering the fork in case of failure

If the fork is up but the engine cannot be started or there is no power, contact an authorised service location.

**Warning! Varoitus! Varning!**

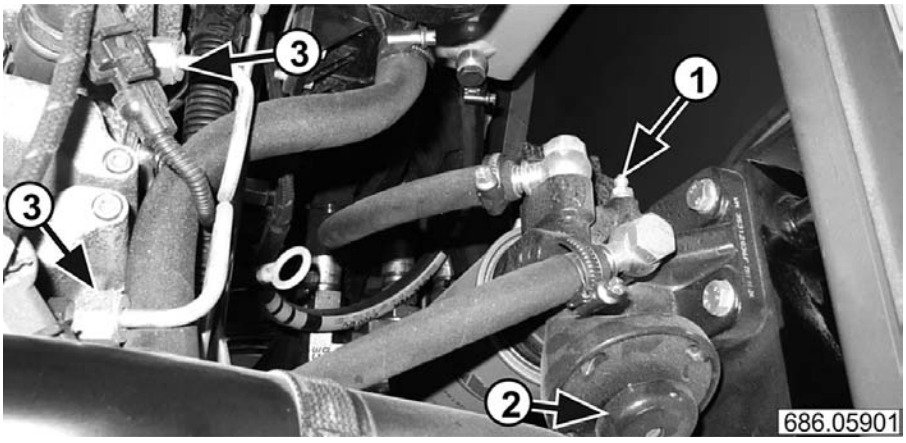
**Never access areas under the fork unless the fork is supported with the maintenance stand.**

### 6.1.6 Bleeding the engine

The fuel must be bled if the machine has run out of fuel or the fuel filter has been replaced.

Perform the bleeding as follows:

Figure 57.



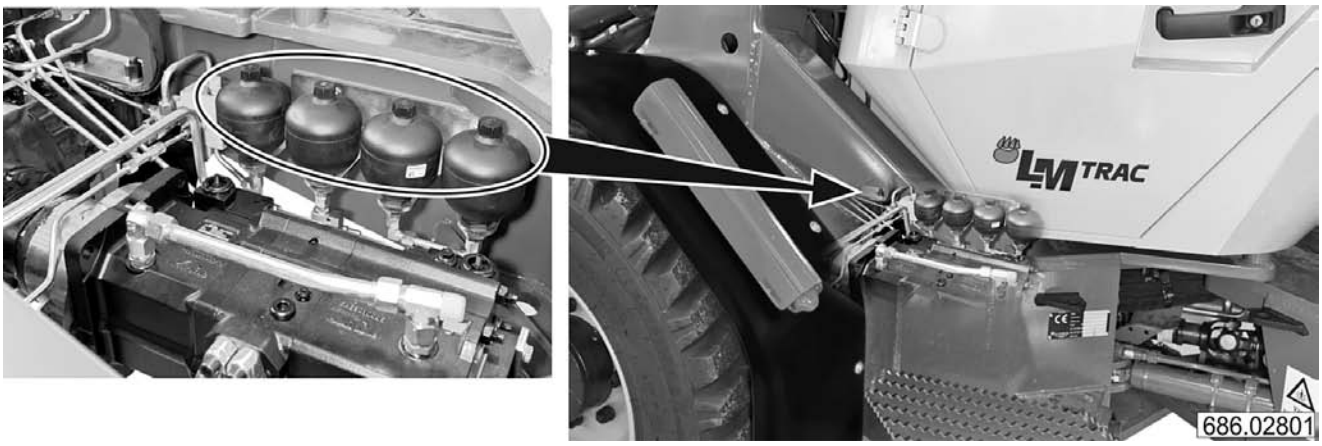

1. Loosen the bleed screw (1).
2. Use the manual pump (2) or run the engine with the starter until the fuel coming from the bleed screw (1) stops bubbling. Then, close the bleed screw (1) carefully.

If the engine starts poorly or runs unevenly, continue bleeding as follows:

3. Loosen at least three of the spray pipe connections (3).
4. Use the starter to turn the engine, until there are no air bubbles in the fuel leaking out of the spray pipes.
5. Carefully tighten all the loosened spray pipes.

### 6.1.7 Pressure accumulators

Figure 58.




The machine has four pressure accumulators for the breaks and the floating of the fork. These accumulators retain pressure even when the engine is stopped. This must be taken into account while servicing or repairing the machine.

**Warning! Varoitus! Varning!**

**Never open the hydraulic connections without first making sure that all the pressure accumulators are at zero pressure. If you are unsure about what you are doing, do not touch the hydraulic system pipes and hoses.**

### 6.1.8 Welding

If welding is required on the machine or a tool attached to it, proceed as follows:

1. Turn the main power switch to OFF.
2. Disconnect the wire connectors of the engine control unit.
3. Protect the hydraulic hoses and electrical wires against sparks, and take fire safety into account.
4. Attach the earthing electrode of the welding device as close to the welding point as possible.

### 6.1.9 Fire safety

The risk of fire can be reduced by keeping the machine clean under all circumstances.

► Remove all foreign material and dirt at the beginning of the workday. Pay special attention to cleaning the engine and exhaust systems.

The operator is responsible for the regular cleaning of the machine.

► Repair any leaks and immediately wipe off any spilled oil or fuel.

The fuel is inflammable and may cause a fire or an explosion.

**Info!**

*Do not refuel or service the fuel system while welding, or in the vicinity of open flames, burning cigarettes etc. Sparks or flames may cause an explosion of the gases erupting from the batteries.*

**Warning! Varoitus! Varning!**

**To avoid accidents, proceed as follows:**

- Always disconnect the negative battery cable first and re-connect it last.
- When using an auxiliary battery to start the machine, follow the instructions provided in this manual.
- Never short circuit the battery terminals with a metal object.
- Never weld, grind, or smoke near the batteries.
- Check electrical equipment for loose connections or damaged insulation.
- Repair or replace all loose or damaged parts.

## 6.2 Hazardous waste

Collect all hazardous waste generated during maintenance. Deliver waste oil, used filters and anti-freeze to a hazardous waste processing plant.

Oily rags must be disposed of in a safe manner following all applicable regulations.

Batteries contain corrosive acids and heavy metals; ensure that they are disposed of following all valid regulations.

Note! Huomaa! Notera!

**Never dispose of hazardous waste by allowing it to discharge into the soil or the sewage system!**

**Info!**

*Always ensure that hazardous waste is disposed of according to regulations. Take good care of the environment and avoid polluting it with foreign matter.*

## 6.3 Periodic maintenance table

Table: 6

| Location / maintenance task: | Maintenance interval (hours) | | | | | | Y |
|---|---|---|---|---|---|---|---|
| | 10 | 50 | 250 | 500 | 1,000 | 2,000 | 2 yrs |
| 1. Engine oil level check, See 6.5.1 on page 54. | X | | | | | | |
| 2. Engine coolant level check, See 6.5.2 on page 55. | X | | | | | | |
| 3. Tyre inflation pressure check, See 6.5.3 on page 55. | X | | | | | | |
| 4. Check for possible fluid leaks, See 6.5.4 on page 55. | X | | | | | | |
| 5. Washer fluid level check, See 6.5.5 on page 56. | X | | | | | | |
| 6. Hydraulic oil level check, See 6.5.6 on page 56. | X | | | | | | |
| 7. Lubrication of joints on lifter and stabiliser cylinders, See 6.5.7 on page 57. | X | | | | | | |
| 8. Lubrication of front fork and rear lifter joints, See 6.5.7 on page 57. | X | | | | | | |
| 9. Lubrication of ball joints on ladle cylinders and idlers, See 6.5.7 on page 57. | X | | | | | | |
| 10. Lubrication of tie rod joints, See 6.5.7 on page 57. | X | | | | | | |
| 11. Lubrication of ball joints on steering cylinder, See 6.5.7 on page 57. | X | | | | | | |
| 12. Lubrication of body link, See 6.5.7 on page 57. | X | | | | | | |
| 13. Cabin air filter cleaning, See 6.6.1 on page 58. | | X | | | | | |
| 14. Draining of fuel filter water trap, See 6.6.2 on page 58. | | X | | | | | |
| 15. Engine air filter cleaning, See 6.6.3 on page 59. | | X | | | | | |
| 16. Radiator/condenser core cleaning, See 6.6.4 on page 60. | | X | | | | | |
| 17. Alternator belt tension check, See 6.6.5 on page 60. | | X | | | | | |
| 18. Wheel fastener tightening torque check, See 6.6.6 on page 60. | | X | | | | | |
| 19. Brake pedal play check, See 6.7.1 on page 61. | | | X | | | | |
| 20. Pressure accumulator pressure check. See 6.7.2 on page 61. | | | | | | | |
| 21. Engine oil change and filter replacement, See 6.7.3 on page 61. | | (O) | X | | | | |
| 22. Engine air filter replacement, See 6.7.4 on page 62. | | | X | | | | |
| 23. Wheel hub oil level check, See 6.7.5 on page 63. | | | X | | | | |
| 24. Lubrication of articulated shaft universal joints, See 6.7.6 on page 64. | | | X | | | | |
| 25. Lubrication of articulated shaft support bearings, See 6.7.7 on page 64. | | | X | | | | |
| 26. Lubrication of rear axle rocker joint, See 6.7.8 on page 64. | | | X | | | | |
| 27. Differential oil level check, See 6.7.9 on page 64. | | | X | | | | |
| 28. Fuel filter replacement, See 6.7.10 on page 65. | | | X | | | | |
| 29. Check for leaks, tightening of joints and connectors, See 6.7.11 on page 65. | | | X | | | | |
| 30. Hydraulic oil return filter replacement, See 6.8.1 on page 66. | | (O) | | X | | | |
| 31. Differential and adapter oil change, See 6.9.1 on page 66. | | | | | X | | |
| 32. Wheel hub oil change, See 6.9.2 on page 67. | | | | | X | | |
| 33. Steering hydraulics filter replacement, See 6.9.3 on page 67. | | (O) | | | X | | |
| 34. Fuel tank cleaning, See 6.9.4 on page 67. | | | | | X | | |
| 35. Brake function check, See 6.9.5 on page 68. | | | | | X | | |
| 36. Engine air filter and safety element replacement, 6.9.6 p. 68 | | | | | X | | |
| 37. Pressure measurement and adjustment of steering hydraulics, See 6.9.7 on page 68. | | | | | X | | |
| 38. Pressure measurement and adjustment of operating hydraulics, See 6.9.8 on page 68. | | | | | X | | |
| 39. Hydraulic oil tank cleaning and oil replacement, See 6.9.9 on page 68. | | | | | X | | |
| 40. Cabin fresh air filter replacement, See 6.9.10 on page 69. | | | | | X | | |
| 41. Battery check, See 6.9.11 on page 69. | | | | | X | | |
| 42. Alternator wiring check, See 6.10.1 on page 70. | | | | | | X | |
| 43. Starter motor wiring check, See 6.10.2 on page 70. | | | | | | X | |
| 44. Cooling system cleaning and fluid replacement, See 6.11.1 on page 70. | | | | | | | X |

**Note!**

- The 10-hour service must be completed each day before starting the engine.
- The 50-hour service must be completed at least once a week.
- The 500-hour service must be completed at least once every 6 months.
- The 1,000-hour service must be completed at least once a year.
- 2 yrs refers to service that must be completed every two years, regardless of operating hours.

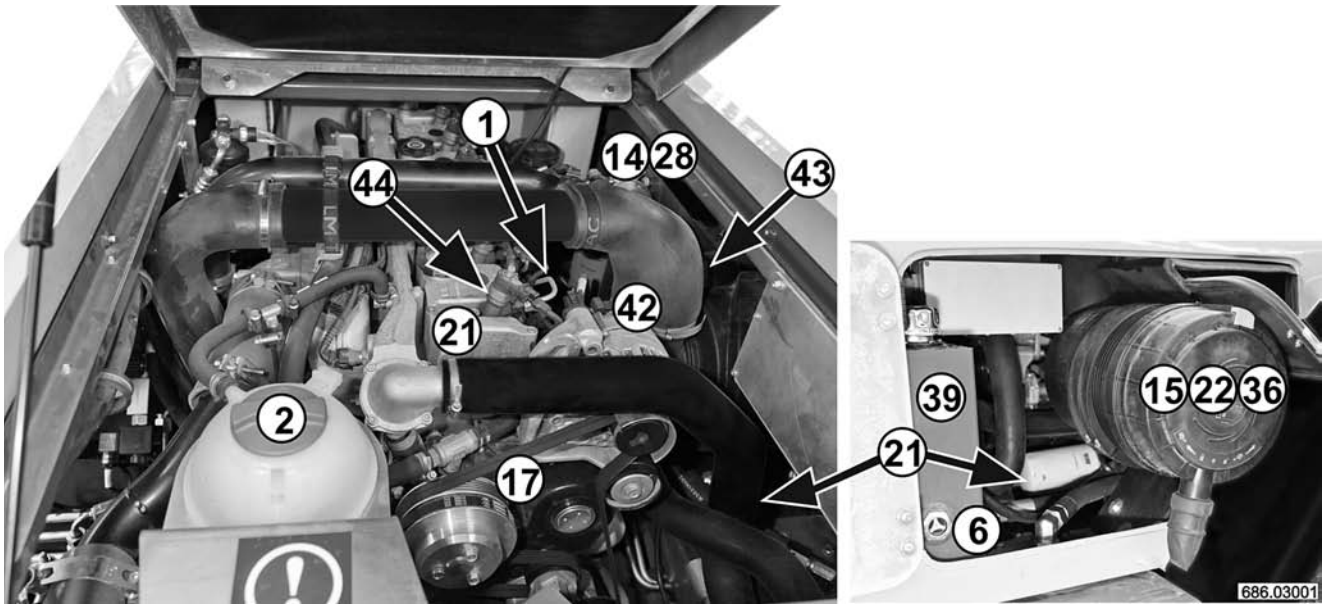
► (O) means that the service is first carried out after 50 hours of operation, and afterwards at the intervals marked with X.

The above intervals are based on normal operating conditions. When working under sub-optimal conditions, reduce the intervals accordingly.

### 6.3.1 Service locations in the engine compartment.

The reference numbers in the figure also refer to the locations in the maintenance table.

Figure 59.




1. Oil dipstick
2. Cooling system expansion tank.
6. Hydraulic oil check.
14. Draining of fuel filter water trap.
15. Engine air filter cleaning.
17. Checking tension of charging generator belt.
21. Engine oil change and filter replacement.
22. Air filter replacement.
28. Fuel filter replacement.
36. Engine air filter and safety element replacement.
42. Charging generator wiring check.
43. Starter wiring check.

### 6.3.2 All maintenance items

The reference numbers in the figure also refer to the locations in the maintenance table.

Figure 60.

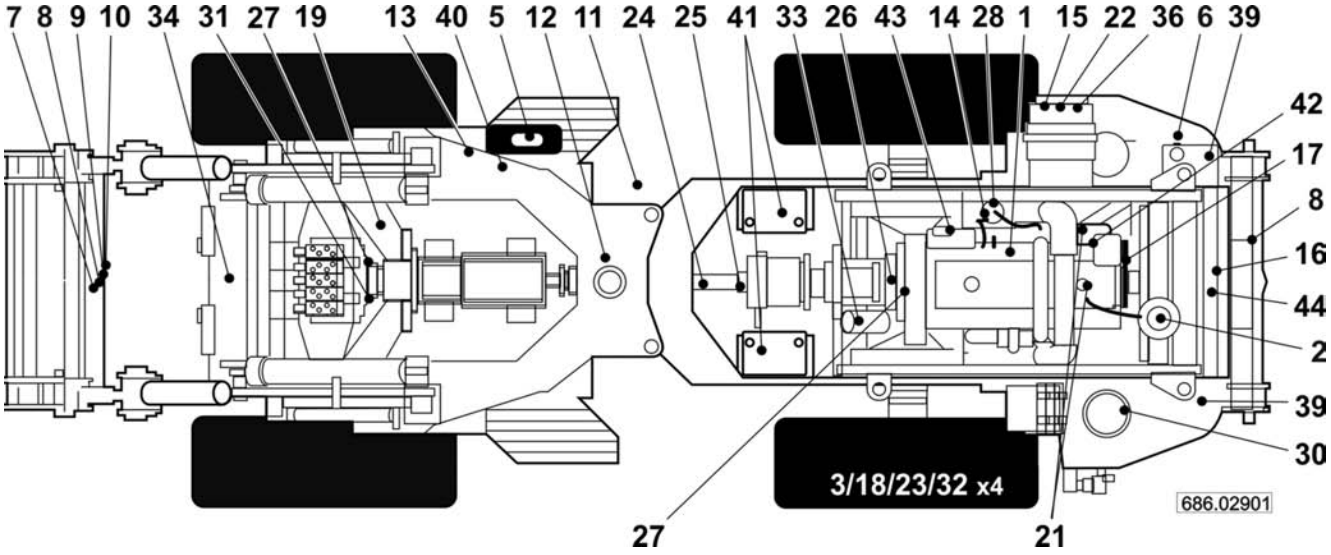



Table: 45

| | |
|---|---|
| 1. Engine oil level check | 24. Lubrication of articulated shaft universal joints, |
| 2. Engine coolant level check | 25. Lubrication of articulated shaft support bearings, |
| 3. Tyre inflation pressure check | 26. Lubrication of rear axle rocker joint, |
| 4. Check for any fluid leaks | 27. Differential oil level check, |
| 5. Washer fluid level check | 28. Fuel filter replacement, |
| 6. Hydraulic oil level check | 29. Check for leaks, tightening of joints and connectors |
| 7. Lubrication of joints on lifter and stabiliser cylinders | 30. Hydraulic oil return filter replacement, |
| 8. Lubrication of front fork and rear lifter joints | 31. Differential and adapter oil change |
| 9. Lubrication of ball joints on ladle cylinders and idlers | 32. Wheel hub oil change |
| 10. Lubrication of tie rod joints | 33. Steering hydraulics filter replacement |
| 11. Lubrication of ball joints on steering cylinder | 34. Fuel tank cleaning, |
| 12. Lubrication of body link, | 35. Brake function check, |
| 13. Cabin air filter cleaning | 36. Engine air filter and safety element replacement, |
| 14. Draining of fuel filter water trap | 37. Pressure measurement and adjustment of steering hydraulics |
| 15. Engine air filter cleaning | 38. Pressure measurement and adjustment of operating hydraulics |
| 16. Radiator/condenser core cleaning | 39. Hydraulic oil tank cleaning and oil replacement |
| 17. Alternator belt tension check | 40. Cabin fresh air filter replacement |
| 18. Wheel fastener tightening torque check | 41. Battery check |
| 19. Brake pedal play check, | 42. Alternator wiring check |
| 20. Pressure accumulator pressure check. | 43. Starter motor wiring check |
| 21. Engine oil change and filter replacement | 44. Cooling system cleaning and fluid replacement |
| 22. Engine air filter replacement | |
| 23. Wheel hub oil level check | |

## 6.4 Recommended lubricants and volumes

Table: 45

| Lubrication point | Volume | Quality recommendation | OE | Notes |
|---|---|---|---|---|
| Fuel tank | 95 l | DIN EN590 Diesel oil * | DIN EN 590 Diesel oil | Use either summer orwinter grade according to temperature |
| Cooling system | 18 l | Water/glycol 50/ 50% | Water/glycol 50/50% | Never use only water |
| Motor oil | 11 l | 10W/40 ACEA 6 | Q8 T905 10W/40 | Use 5W/30 at temperatures below -15°C |
| Hydraulic oil | 160 l | ISO-VG46 DIN 51524 part 1 DIN 51502 | Castrol AWH 46 | |
| Rear axle differential | 7.5 l | API GL5-LS | Castrol LS-90 | Oil must contain additives suitable for oil bath type brakes |
| Front axle differential | 7 l | API GL5-LS | Castrol LS-90 | |
| Wheel hubs (4 pcs) | 4 x 0.75 l | API GL5-LS | Castrol LS-90 | |
| Washer fluid | 3,8 l | Water/washer fluid 50/50% | Water/washer fluid 50/50% | Never use only water |
| Lubrication points | | Molybdenum sulphide grease | Castrol MS1 Grease | |

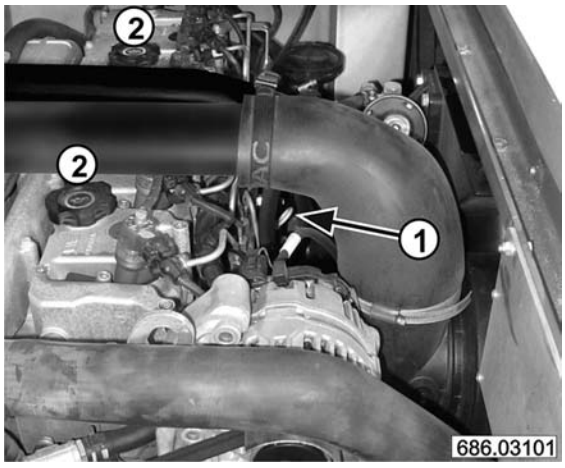
* See “Fuel Grades”; See 5.2.2 on page 34.

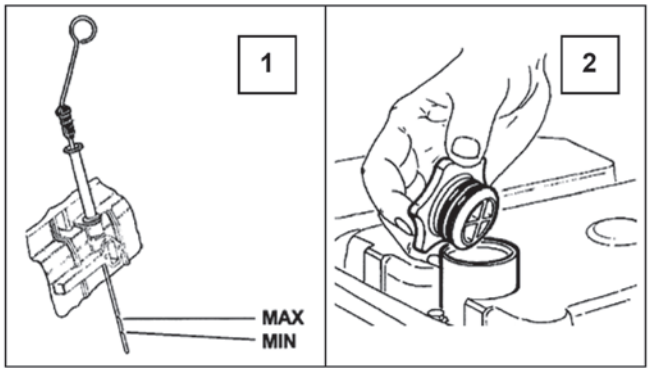
## 6.5 10-hour service

Perform the following maintenance procedures daily, before starting the engine.

### 6.5.1 Engine oil level check (1)

Figure 61.




1. Dipstick 2. Oil filler neck.

When checking the oil level, the machine must be on a level surface. The oil level must be between the marks on the dipstick.

1. Turn off the engine a few minutes before the check.
2. Pull out the dipstick (1), wipe it clean, and reinsert it for a moment.
3. Pull the dipstick out again and check that the oil level is between the “Max” and “Min” marks.

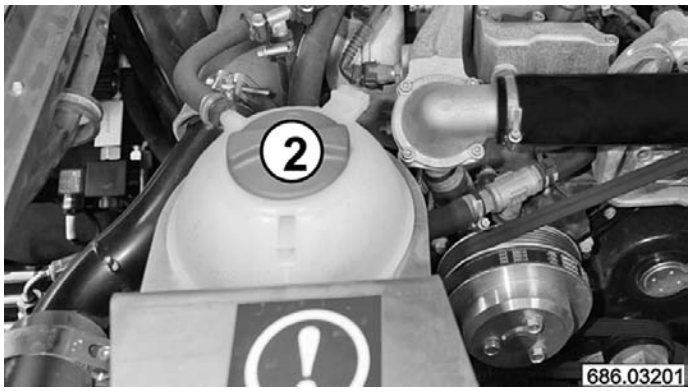
If necessary, add the recommended oil and recheck the oil level.

**Info!**

*The grade of the oil added must match the oil in the engine.*

### 6.5.2 Coolant level check (2)

Figure 62.

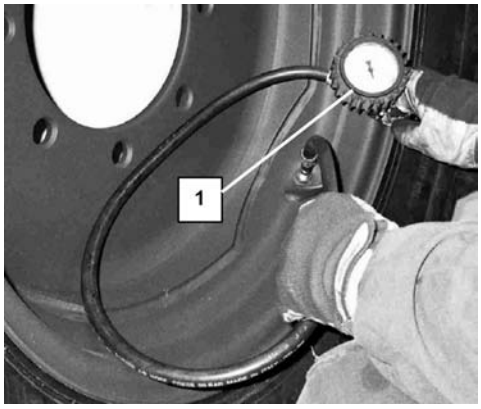




The level of the coolant must be between the “Min” and “Max” lines on the expansion tank (2) when cold. Add clean water as necessary. Remember to periodically check the freezing point of the coolant.

### 6.5.3 Tyre inflation pressure check (3)

A tyre pressure of 3,4 bar is used under normal conditions.

Figure 63.




1. Air pressure gauge

However, the tyre pressure may vary depending on the operation and operating conditions of the machine. The permitted tolerance is 1.2–3.75 bar.

### 6.5.4 Check for possible fluid leaks (4)

A daily visual check must be performed.

During periodic maintenance, check that all hoses and plugs are tight. If any leaks are detected, repair them before starting the machine.

Check:

- Engine compartment.
- Below the machine.
- Hydraulics device, etc.

Connections of fluid and hydraulic hoses, radiators/condensers, drain/ filler plugs etc.

### 6.5.5 Washer fluid level check (5)

The washing fluid tank is located on the right side of the machine by the cabin.

Figure 64.

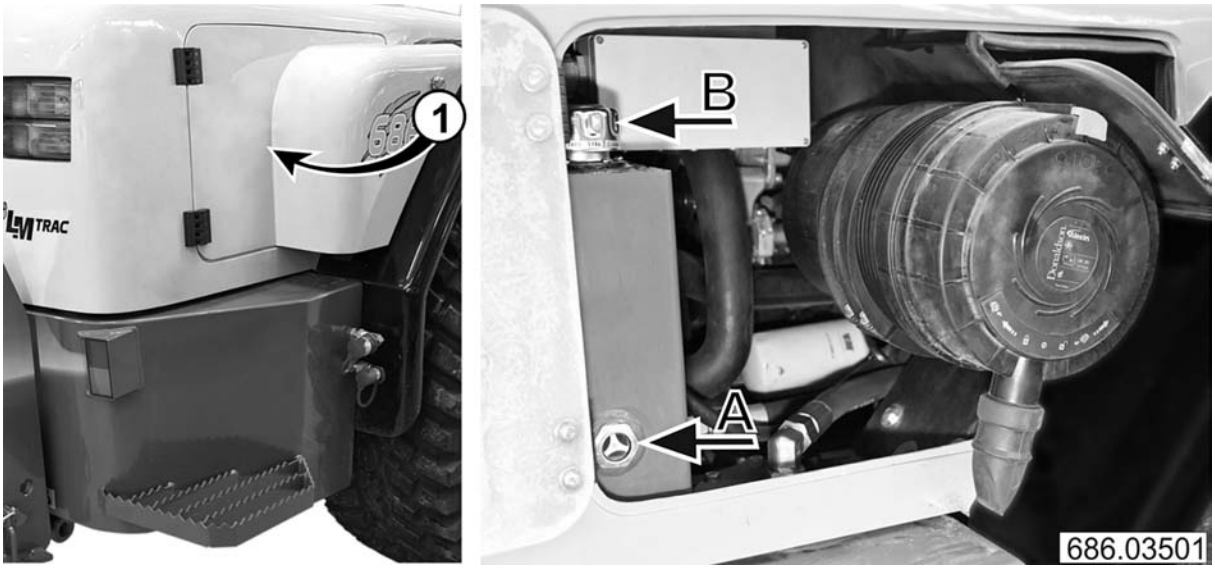

Always ensure that the tank has a sufficient level of fluid. Add washer fluid in the water. Ensure that the fluid does not freeze during the cold season.

### 6.5.6 Hydraulic oil level check (6)

The level of hydraulic oil can be checked using the hydraulic oil tank's sight glass behind the engine compartment's right-side maintenance hatch. The oil level must be visible on the sight glass.

When checking the oil level, the machine must be on level ground with the tools lowered, and the oil must be cool.

Figure 65.




A. Sight glass

B. Breather/filler cap

Oil can be added through the filler neck (B) on the tank, or through the leak oil connector at pressure.

When adding oil, ensure that the oil and the area around the filler neck are clean.

**Info!**

*The grade of the added oil must match the oil in the tank.*
*The hydraulic oil tank is at an overpressure of 0.35 bar*

### 6.5.7 Lubrication (7-12)

Even if the machine is equipped with central lubrication, always use a grease gun to lubricate the universal joints of the articulated shafts and the hinges of the sliding part (3+1 nipples) and all doors and hatches.

If the machine does not have central lubrication, all the grease nipples are lubricated using a grease gun.

**Lubrication using a grease gun:**

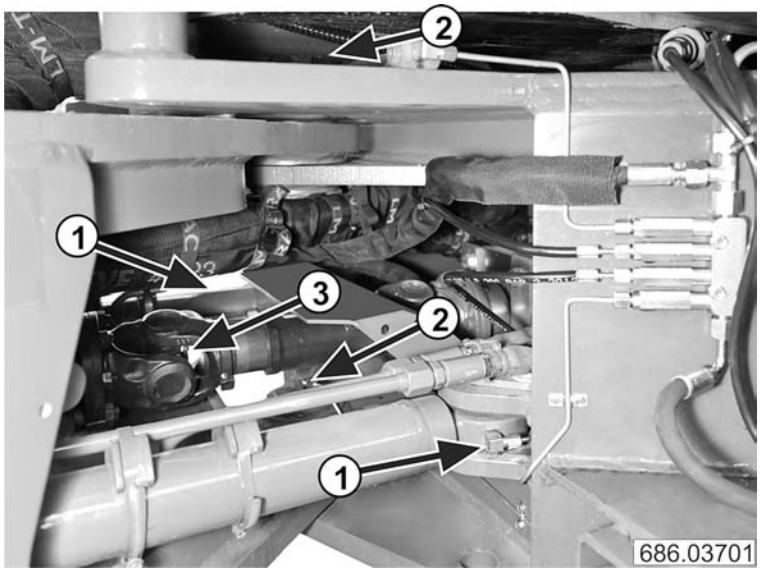
- ► Clean the grease nipples and the tip of the grease gun.
- ► Press the tip of the grease gun perpendicular to the grease nipple, and apply a suitable amount of lubricant. The articulated shaft universal joints should be lubricated until the lubricant is visible underneath all the joint cup seals.

**Lubricate the following points:**

Figure 66.


1. Ball joints for lifting and stabilisation cylinders (8 nipples).
2. Joint pins for front fork (and rear lifter) (10 nipples).
3. Ball joints for ladle cylinders (6 nipples).
4. Joint pins on idler and tie rod (8 nipples).

Figure 67.




1. Ball joints for steering cylinders (2 pcs) (2+2 nipples).
2. Grease nipples for the turning body links.
3. Lubrication of the articulated shaft universal joints and the sliding part (3+1 nipples).

**Info!**

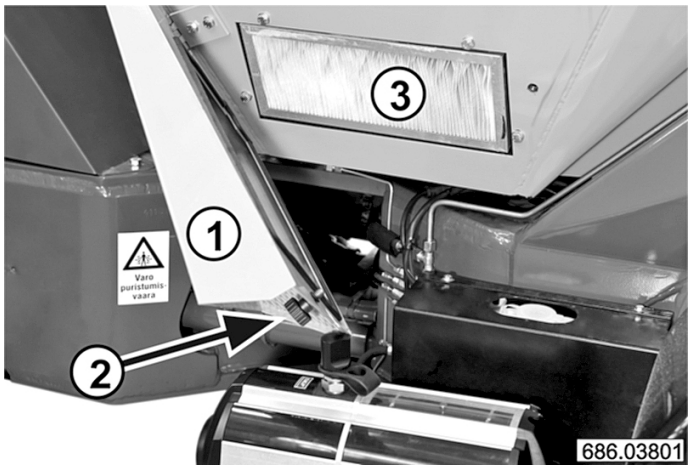
*Also lubricate all other locations with nipples, such as hinges.*

## 6.6 50-hour service

This service must be performed weekly, even if 50 hours of operation is not reached. The 50 h service also includes the tasks included in the 10-hour service.

### 6.6.1 Cabin air filter cleaning (13)

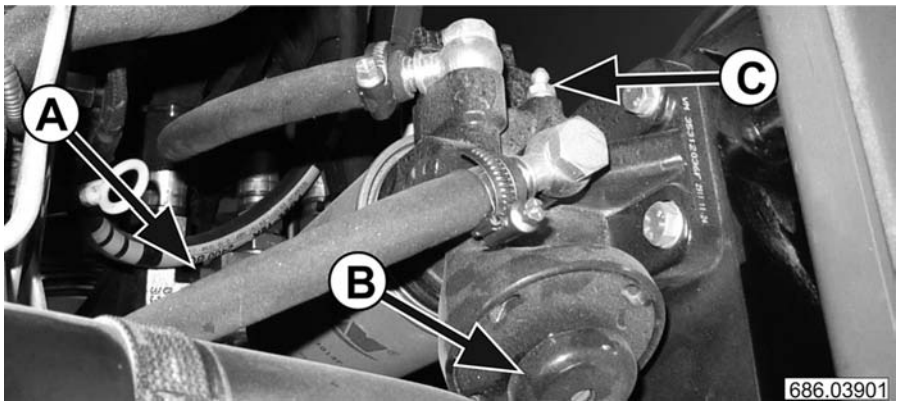
Figure 68.




- ► Open the fastener (2) and the air filter cover (1) on the right side of the cabin.
- ► Remove the air filter (3) and use compressed air to clean it.
- ► Clean from the inside out, and avoid rupturing the fibres on the filter.
- ► Check the condition of the filter and its seals. Replace the filter in case of damage.

### 6.6.2 Draining of fuel filter water trap (14)

Figure 69.




A. Drain tap

- ► Place a leak-tight container underneath the fuel filter and open the drain tap at the bottom of the filter.
- ► Close the tap when clean fuel (with no water) flows out.
- ► Use the manual pump (C) to pump fuel until the back pressure in the pump indicates that the filter is full of fuel.
- ► Start the engine.
- ► If necessary (the engine does not start or runs unevenly), bleed the engine system by opening the bleed screw (B) and operating the manual pump (C) until air-free fuel (does not bubble) comes out of the bleed screw. Additional bleeding instructions; See 6.1.6 on page 48.
- ► Start the engine and check for leaks.

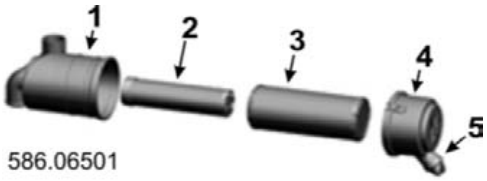
### 6.6.3 Engine air filter cleaning (15)


Figure 70.

The air filter is located behind the service hatch in the rear right corner of the rear frame. Open the service hatch.

Figure 71.

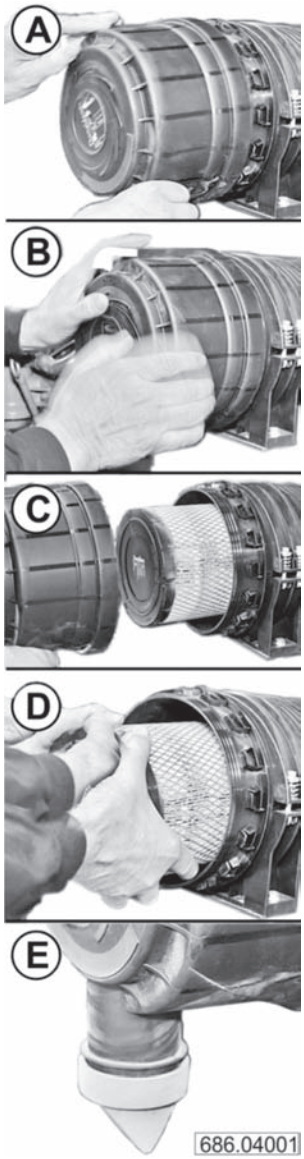
Filter parts:




1. Filter case. 2. Safety element. 3. Filter element. 4. Filter case cover. 5. Dust pocket.

To ensure a long operating life for a modern, turbo-charged engine, maintaining the good condition of the air filter is essential.

Figure 72.




Proceed as follows:

1. Stop the engine and remove the air filter's protective cover by removing the fasteners (A), rotating the cover, and pulling it out (B) and (C).
2. Pull out the filter element by rotating it (D).

► Inspect the filter element. If the element looks tidy and is in good condition, you can clean off the loose dust and dirt by lightly knocking on it. If the element is dirty or damaged, it must absolutely be replaced.

Note! Huomaa! Notera!

**If the filter element is damaged, the safety element must also be replaced.**

► Otherwise, check the condition of the safety element, but do not touch the safety element if it is in working order.

**Info!**

*Filter manufacturers do not recommend cleaning the filter element with compressed air, since compressed air can easily tear the fibres of the filter paper and ruin a good filter element without leaving a visual indication of this.*

► If you must use compressed air, use very low pressure and direct the air from the inside of the filter outwards. Limit air pressure to 2–3 bar, and do not press the air nozzle against the filter paper or too close to it.

► Inspect the condition of the filter element's rubber seals.

3. Clean the protective cover and the dust pocket (E) on the cover.

► Install the filter element and protective cover in the reverse order.

**Info!**

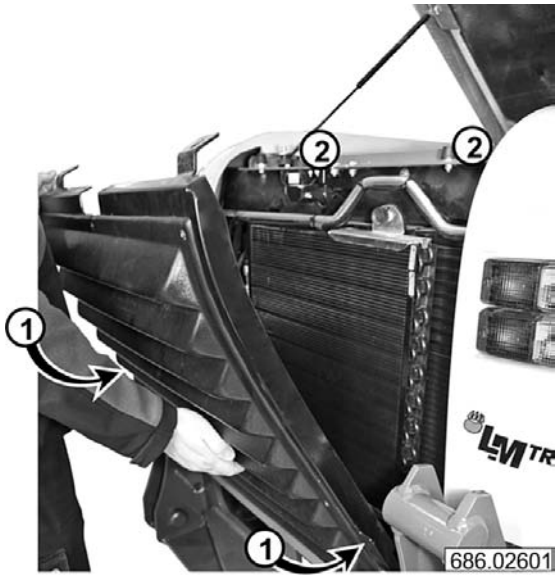
*The safety element must be replaced no later than when the main element has been cleaned five times.*

Note! Huomaa! Notera!

**Never run the engine without the air filter element.**

### 6.6.4 Radiator/condenser core cleaning (16)

The cores are located behind the engine. Remove the two attachment screws (1) of the rear grille and lift the grille off of the locking pins (2).




Note! Huomaa! Notera!

**Never use a pressure washer! It may damage the lamels of the core.**

If necessary, clean the cores using a suitable solvent and water and/or compressed air.

If necessary, you can open the cores carefully for the duration of the cleaning by opening the attachment screws.

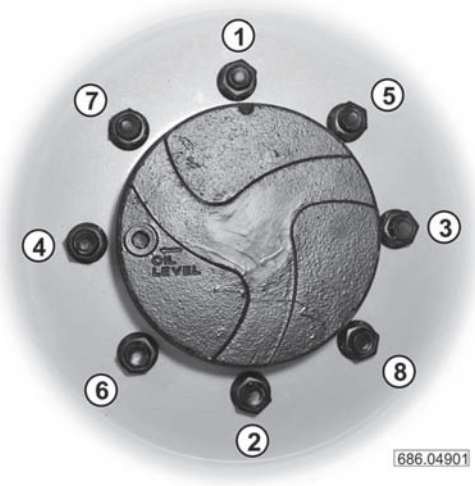
### 6.6.5 Alternator belt check (17)

► Inspect the alternator's multi-groove belt. If the belt is worn or oily, replace it with a new one.

**The multi-groove belt is equipped with an automatic belt tightener.**

### 6.6.6 Wheel fastener tightening torque check (18)

Figure 73.



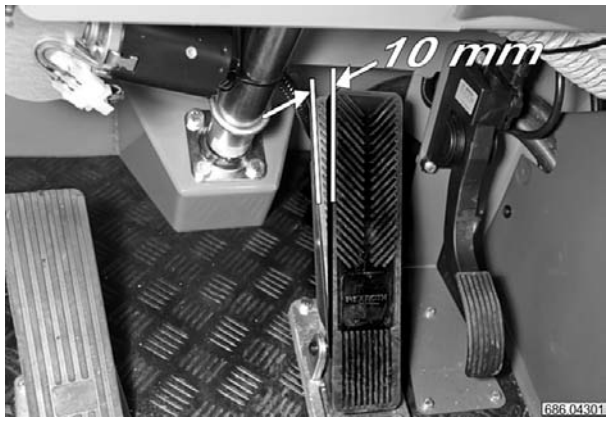

The tension of the wheel fasteners must be checked each day during the first 50 operating hours of the machine. The tightening torque is 240 Nm, and the tightening order is numbered in the figure.

## 6.7 250-hour service

Perform 10-hour and 50-hour service at the same time.

### 6.7.1 Brake pedal play check (19)

Figure 74.




The brake pedal must have approx. 10 mm of play. Adjust if necessary.

### 6.7.2 Pressure accumulator pressure check (20)

- ► Park the machine on level ground, do not apply the parking brake.
- ► Stop the engine and press the brake pedal enough times to turn on the brake pressure warning light.

There must be at least 4 pedal presses before the light turns on.

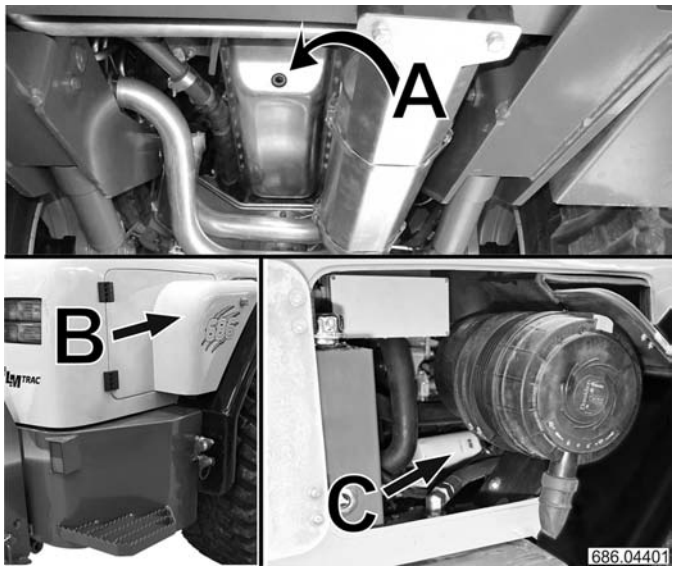
### 6.7.3 Engine oil change and filter replacement (21)

- Always replace the oil filter when changing the oil.
- Change the oil and filter after the first 50 operating hours.
- Carry out the next oil and filter changes every 250 hours.

**Oil change and filter replacement:**

- ► Turn the engine off and wait for the oil to cool down.
- ► Place a pan under the engine and remove the oil drain plug (A) from the oil pan.
- ► Open the engine compartment's right service hatch (B) and place a container under the oil filter (C).

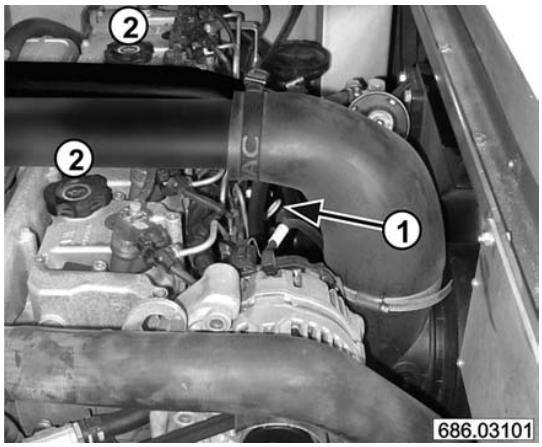
Figure 75.




- ► Remove the oil filter (C) using a filter wrench.
- ► Apply a thin coat of clean motor oil on the seal of the new filter, and install the filter.
- ► Tighten the filter by hand, as over-tightening will damage the filter.

► Once all the oil has been drained, install and tighten the drain plug.

Figure 76.



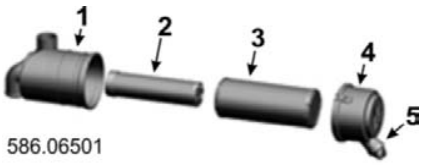

► Pour recommended motor oil into the engine through the oil filler neck (2) on the valve cover. See the Technical Specifications for amount and grade.
► Check oil level on dipstick (1)
► Start the engine and let it run at idle for approx. 1 minute.
► Stop the engine and recheck the oil level on the dipstick (1).
► Add oil as necessary.

**Info!**

*To save time, first start draining the motor oil, then replace the oil filter, and finally complete the oil change.*

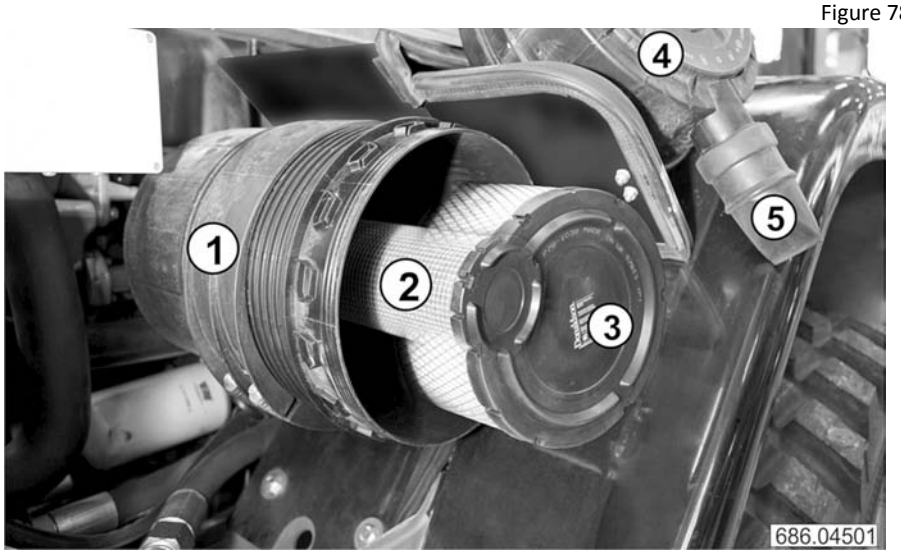
### 6.7.4 Engine air filter replacement (22)

Figure 77.




1. Filter case
2. Safety element
3. Filter element
4. Filter case cover
5. Dust pocket

Figure 78.




Proceed as follows:

1. Stop the engine, open the engine compartment's left service hatch and remove the air filter cover (4) by removing the fasteners, turning the cover and pulling it out.
2. Pull out the filter element by rotating it (3).

► Inspect the condition of the case and filter rubber seals. Replace if necessary.

3. Clean the cover (4) and the dust pocket (5) in the cover.

► Inspect the safety element (2). Replace the element, if it is dusty or damaged. If the safety element looks tidy and in order, do not remove it.

4. Install the filter element and protective cover in the reverse order.

**Info!**

*The safety element must be replaced latest when the filter element has been cleaned five times.*

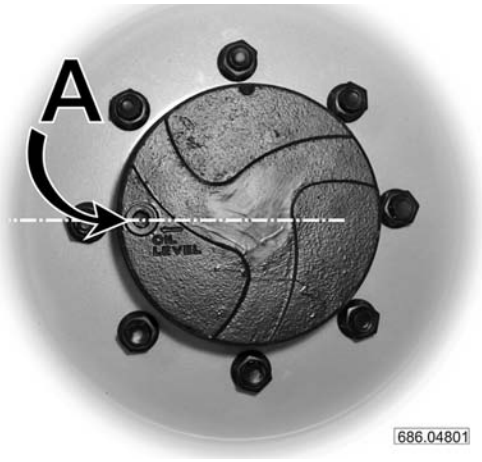
Note! Huomaa! Notera!

**Never run the engine without the air filter elements.**

### 6.7.5 Wheel hub oil level check (23)

► Park the machine on hard and level terrain.
► Lift the wheel enough to be able to rotate it.

Figure 79.




► Rotate the wheel until the inspection opening (A) is at the horizontal centre line of the hub.
► Open the plug of the inspection opening and check that the oil level is at the lower edge of the opening. Add recommended oil if necessary.
► Install and tighten the plug carefully.
► Check the oil level of all hubs in the same way.

### 6.7.6 Lubrication of articulated shaft universal joints (24)

Lubricate the universal joints (Figure 586.04401, points A)

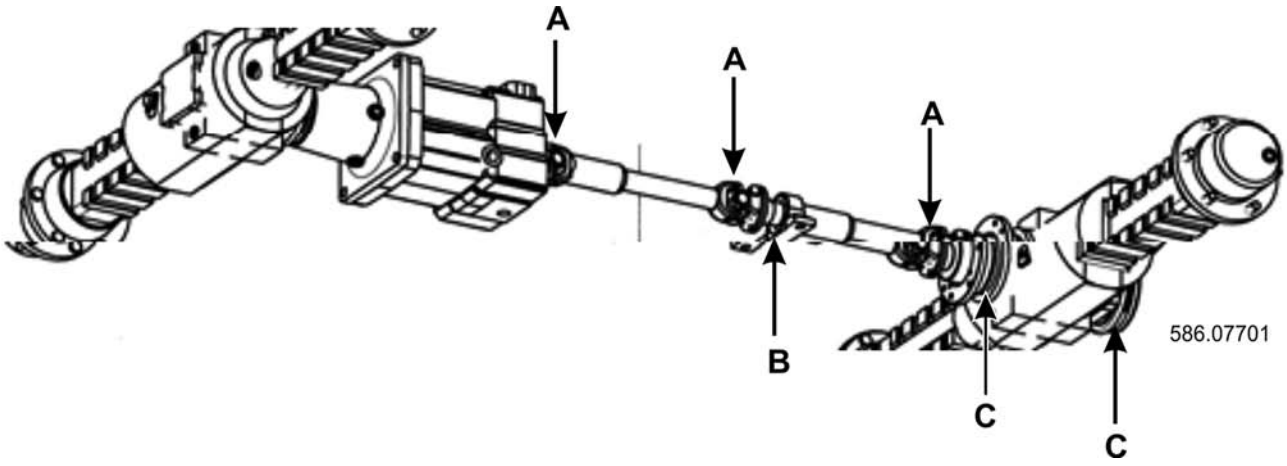
### 6.7.7 Lubrication of support bearing (25)

Lubricate the support bearing (Figure 586.04401, point B)

### 6.7.8 Lubrication of rear axle rocker joint (26)

Lubricate the rocker joints (Figure 586.04401, points C)

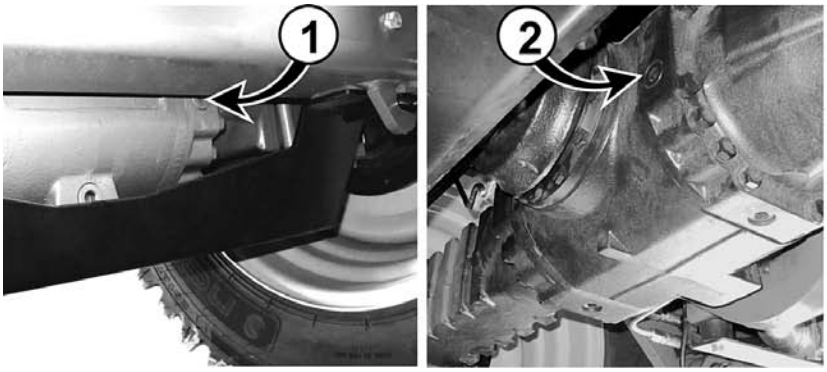
Figure 80.




### 6.7.9 Differential and adapter oil level check (27)

- Park the machine on level terrain.

Figure 81.



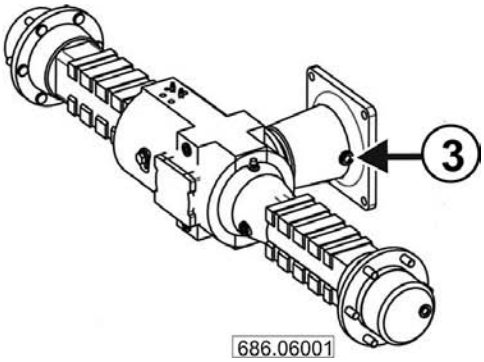
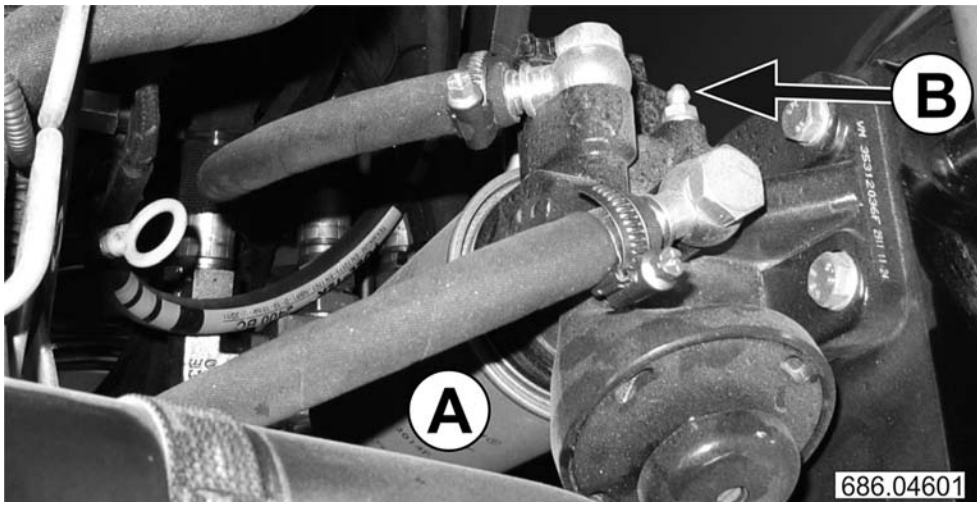




Figure 82.

- Open the oil check/filler plugs of the differential (1 front axle) (2 rear axle) and adapter (3) and check that the oil is at the level of the bottom edge of the plug opening.
- Add recommended oil if necessary.See 6.4 on page 54.
- Close the filler plug carefully.

### 6.7.10 Fuel filter replacement (28)

Figure 83.

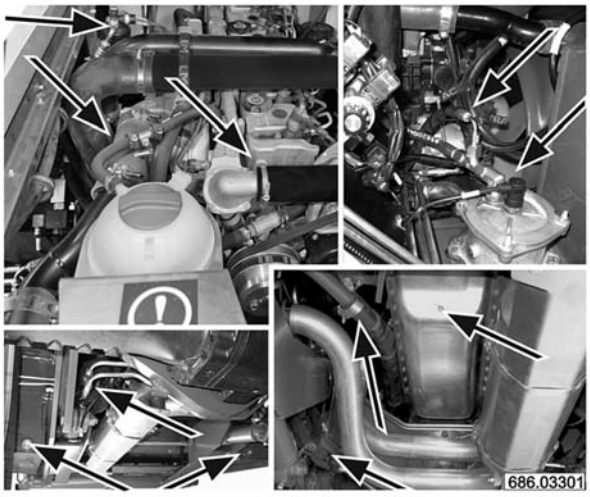



A. Fuel filter

- ► Park the machine on hard level terrain, and stop the engine.
- ► Place a pan under the fuel filter, and remove the filter using a filter wrench.
- ► Apply a thin coat of clean diesel fuel on the seal of the new filter, and install the filter. Tighten by hand, as over-tightening will damage the filter.
- ► Finally, bleed the fuel system.

### 6.7.11 Leak check (29)

Figure 84.




- ► Check the machine and all its pipes, hoses and connectors for leaks.
- ► Tighten loose hose ties and replace all damaged parts.

Contact authorised service if you discover leaks in the hydraulic pumps or motors. Leaks in the axles or the engine also necessitate contacting authorised service.

## 6.8 500-hour service

Perform 10-hour, 50-hour and 250-hour service at the same time.

### 6.8.1 Hydraulic oil return filter replacement (30)

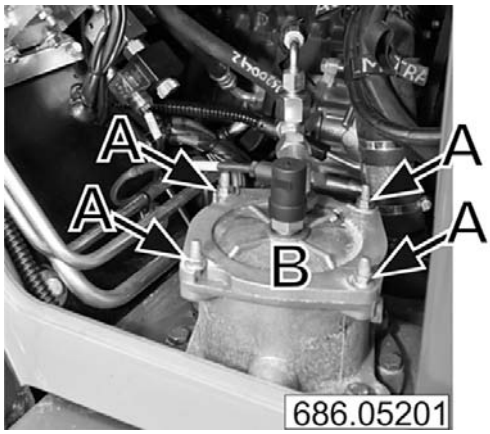
Figure 85.

The hydraulic oil return filters remove dirt from the oil returning to the hydraulic tank.

► Park the machine on hard level terrain. Lower all tools, apply the parking brake and prevent machine movement.

• The hydraulic return filter is behind the engine compartment's left service hatch.

Figure 86.




1. Loosen fasteners (A).
2. Turn the cover (B) clockwise and lift it up with the filter element.
3. Remove the old filter element.
4. Clean parts and seal surfaces.
5. Install a new filter element and O ring seal.
6. Install the filter element and cover.
7. Start engine and check for leaks.

## 6.9 1000-hour service

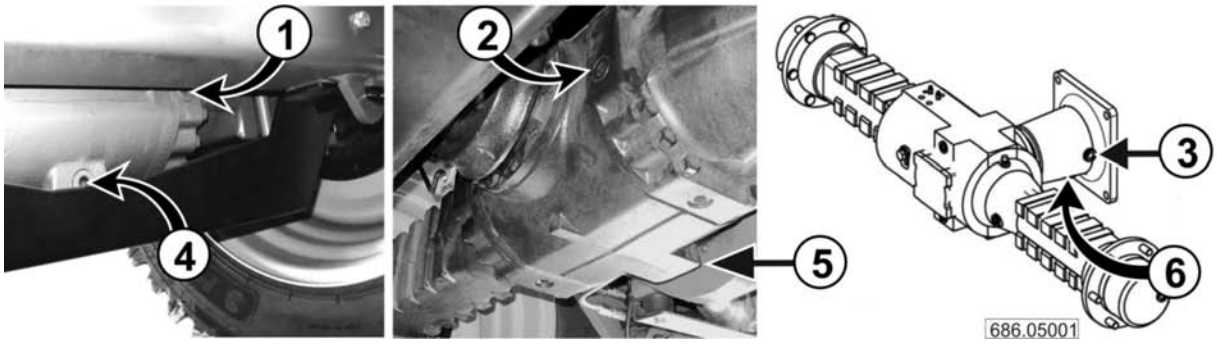
Perform 500-hour, 250-hour, 50-hour, and 10-hour service at the same time.

### 6.9.1 Differential and adapter oil change (31)

► Park the machine on hard level terrain. Lower all tools, apply the parking brake and prevent machine movement.

► Open filler/check plugs 1, 2 and 3. Open drain plugs 4, 5 and 6 and drain the oil into containers.

Figure 87.



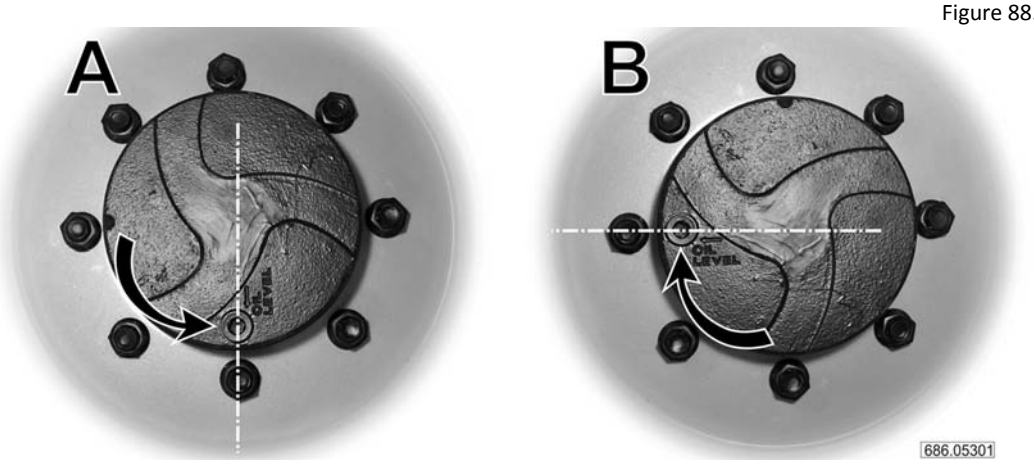

► Once all the oil has been drained, install the drain plugs (4, 5 and 6) carefully.

► Fill the differentials and adapter with the recommended oil up to the lower edges of the filler openings and reattach the plugs firmly.

### 6.9.2 Wheel hub oil change (32)

- ► Park the machine on hard and level terrain.
- ► Lift the wheel enough to be able to rotate it.

Figure 88.



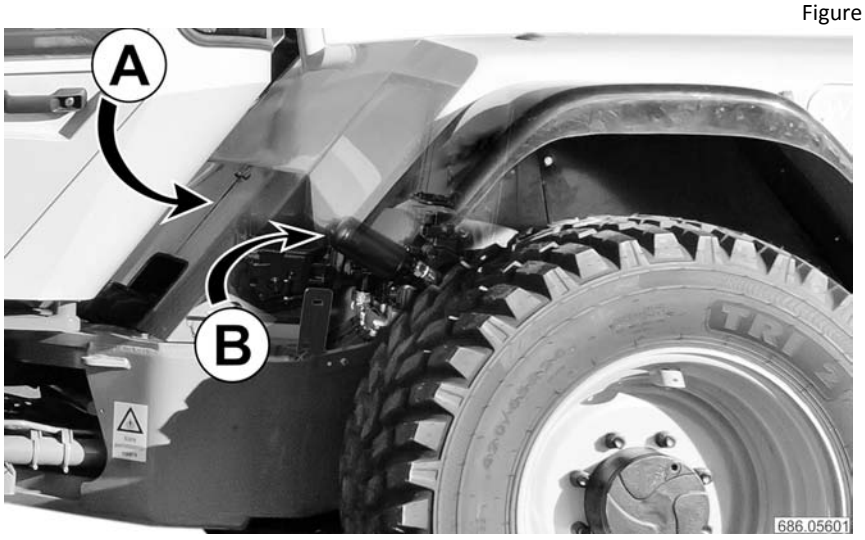

- ► Turn the inspection/drain/filler opening to face directly downwards (A).
- ► Open the plug and drain the oil into the container.
- ► Once all the oil has been drained, turn the opening to the horizontal centre line of the hub (B).
- ► Fill the hub with the recommended oil until the lower edge of the hole is reached, and close the plug firmly.
- ► Repeat the procedure for each hub.

### 6.9.3 Drive hydraulics pressure filter replacement (33)

The drive hydraulics pressure filter is located at the front of the machine in connection to the hydraulic pumps.

- ► Park the machine on hard level terrain, and place a container under the filter.
- ► Remove the protective hatches of the batteries (A).

Figure 89.




- ► Remove the filter cup (B) and the filter element.
- ► Wash the cup in diesel fuel, install a new element inside the cup, and reinstall the filter cup.

**Info!**

*Hydraulic oil is normally replaced together with filter replacement, See 6.9.9 on page 68.*

### 6.9.4 Fuel tank cleaning (34)

Condensed water from the fuel tank is removed through the plug at the bottom of the tank. The tank is located in front of the cabin, between the front fork.

- ► Place a pan underneath the tank and remove the plug. Close the plug once clean fuel flows out.

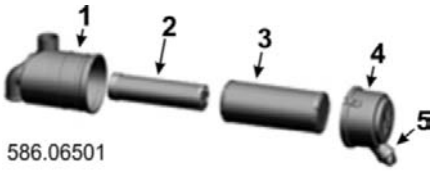
This work is best performed when the tank has a low amount of fuel in it.

### 6.9.5 Brake function check (35)

Check the function of the operating brake and parking brake. The machine must stay firmly in place at a 20% inclination with the parking brake applied.

### 6.9.6 Engine air filter and safety element replacement (36)

Figure 90.




1. Case 2. Safety element 3. Filter element 4. Cover 5. Dust pocket

- ► Stop the engine and remove the air filter cover (4).
- ► Remove the filter element and safety element (3 and 2), and clean the inside of the filter case (1) with a dry, lint-free cloth.
- ► Clean the dust pocket (4) and the filter case cover (5).
- ► Install the new safety element (2) and the new filter element (3).
- ► Close the air filter protective cover.

Note! Huomaa! Notera!

**Never run the engine without the air filter elements.**

### 6.9.7 Pressure measurement and adjustment of steering hydraulics (37)

The pressure measurement and adjustment of drive hydraulics must be performed by an authorised service workshop.

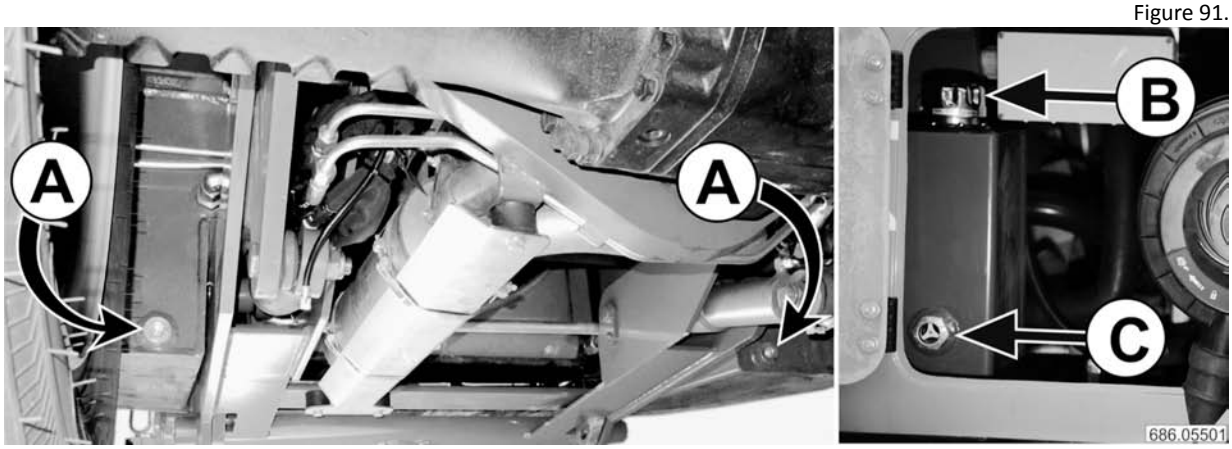
### 6.9.8 Pressure measurement and adjustment of operating hydraulics (38)

The pressure measurement and adjustment of work hydraulics must be performed by an authorised service workshop.

### 6.9.9 Hydraulic oil tank cleaning and oil replacement (39)

The cleanliness of the system and the oil are essential to the functionality of the hydraulic system. Ensure absolute cleanliness when working with hydraulics.

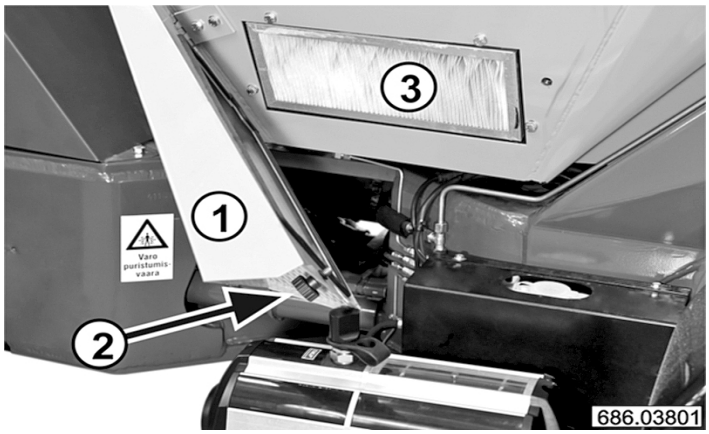
Figure 91.




1. Place pans under the hydraulic oil tank drain plugs (A).
2. Remove the drain plugs and drain out all the oil.
3. Close the drain plugs and tighten them carefully.
4. Open the service hatch and hydraulic oil tank breather cap (B) on the right side of the engine compartment, and pour the correct grade of oil through the filler neck until the oil level is visible in the sight glass (C).
5. Close the breather cap (B).
6. Start the engine and let it run for a few minutes.
7. Stop the engine and check the oil level, add oil as necessary.
8. Start the engine and check that all plugs and connections are tight.

### 6.9.10 Cabin fresh air filter replacement (40)

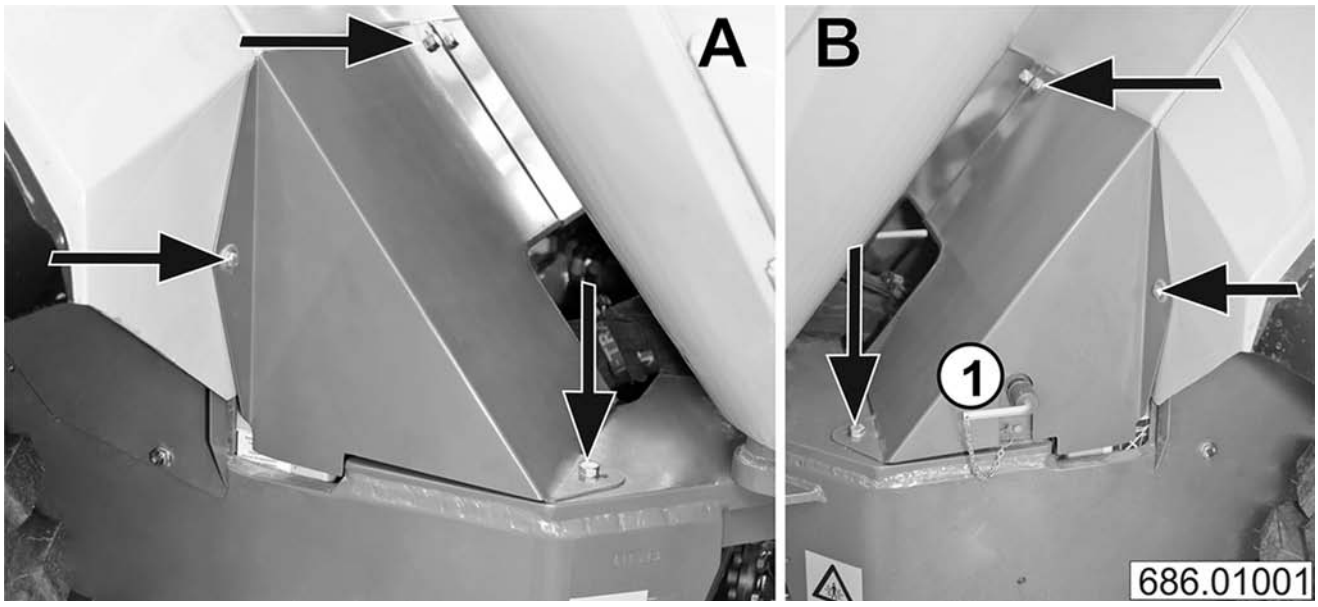
Figure 92.




- ► Open the hatch (1) below the right cabin side window by opening the attachment screw (2).
- ► Remove the filter (3) and dispose of it according to regulations.
- ► Install a new filter and close the hatch.

### 6.9.11 Battery check (41)

Figure 93.




The batteries (2 pcs) are located under the service hatches (A and B) in front of the machine frame.

The batteries are maintenance-free and require no special service.

- ► Remove the three fastening screws of the hatches (3+3) and lift the hatches off.
- ► Check that the battery cables are properly attached, and that the cable connectors and the battery casings are clean.
- ► Check that the batteries are firmly attached.
- ► Attach the service hatches.

**Info!**

*The main power switch may be used to disconnect all electrical connections between the battery and the machine.*

## 6.10 2,000-hour service

Perform 1,000-hour, 500-hour, 250-hour, 50-hour, and 10-hour service at the same time.

### 6.10.1 Alternator wiring check (42)

Inspect all the alternator wire connectors. Clean oxidised connectors and tighten loose connections. Replace damaged connectors.

Figure 94.


### 6.10.2 Starter motor wiring check (43)

The starter is located on the right side of the engine on the flywheel side.

Inspect all starter motor wire connectors. Clean oxidised connectors and tighten loose connections. Replace damaged connectors.

### 6.10.3 Nozzle inspection and cleaning (44)

The injectors' condition and opening pressure checks must be performed by authorised service.

## 6.11 2-year service

### 6.11.1 Cooling system cleaning and coolant replacement (45)

1. Place a sufficiently large pan below the engine's lower hose.
2. Remove the expansion tank cap and disconnect the lower hose from the engine.
3. Let the coolant flow into the pan and install the lower hose.
4. Fit the lower hose in place and fill the cooling system with a mixture of clean water and radiator flush. Follow the mixing instructions on the radiator flush packaging.
5. Start the engine and let it run at idle for approx. 20 minutes.
6. Stop the engine and remove the radiator flush solution through the lower hose.
7. Fit the lower hose (using a new hose clamp), and fill the cooling system with an anti-freeze mixture.
8. Start the engine and let it run for approx. 5 minutes.
9. Check the coolant level and add anti-freeze as necessary.
10. Ensure that there are no leaks.

## 6.12 Fuses and relays

The fuses and relays are located in the electrical switchboard below the document compartment.

The fuses are of MICRO type.

Figure 95.

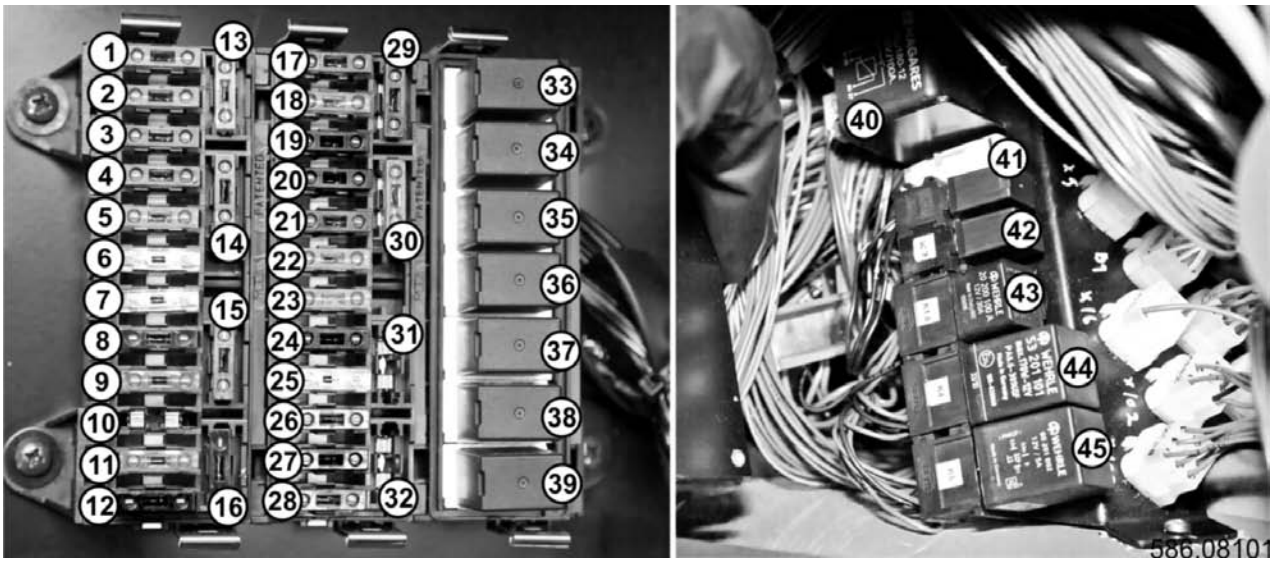



Table: 46

| Number | Circuit | Size | Number | Circuit | Size |
|---|---|---|---|---|---|
| 1 | Left parking/instrument light | 3 A | 24 | Mirror and seat heating | 15 A |
| 2 | Right parking light | 3 A | 25 | Fan/air conditioning | 20 A |
| 3 | Left low beam | 7,5 A | 26 | Ignition switch/glow excitation | 10 A |
| 4 | Right low beam | 7,5 A | 27 | Rear lifter/front switching valve/left cyl. hydr./rear tool electricity | 15 A |
| 5 | High beams | 10 A | 28 | Tachometer (30) | 7,5 A |
| 6 | Front working lights | 20 A | 29 | Fuel/temperature/tachometer (15) | 7,5 A |
| 7 | Rear working lights | 20 A | 30 | Radio memory | 7,5 A |
| 8 | Turn signals | 15 A | 31 | Not used | |
| 9 | Cabin temperature adjustment/Fan control | 10 A | 32 | Not used | |
| 10 | Not used | | | RELAYS | |
| 11 | Roof beacon/power take-out | 10 A | 33 | Rocker control relay | K15 |
| 12 | Safematic/brake light/dome light/radio stand-by (15) | 10 A | 34 | Central alarm activation relay | K13 |
| 13 | Emergency flashers | 10 A | 35 | Starter lock relay | K3 |
| 14 | Engine compartment light | 7,5 A | 36 | Front tool electricity (push-button) | K1.4 |
| 15 | Indicators | 3 A | 37 | Front tool electricity (rocker switch) | K1.3 |
| 16 | Lock/drive programme selection | 7,5 A | 38 | Pre-control | K1.2 |
| 17 | Parking brake | 15 A | 39 | Engine hydraulics lowering | K1.1 |
| 18 | Drive powertrain | 10 A | 40 | Main power relay | K2 |
| 19 | Pre-control main power | 15 A | 41 | Drive system relay | |
| 20 | Front socket/quick-release locks/fork floating and flexing | 15 A | 42 | Pre-control power cut-off relay | K7 |
| 21 | Engine stopper (15) | 20 A | 43 | Reversing lights | K1.6 |
| 22 | Windshield wiper/washer/horn | 10 A | 44 | Mist-off relay | K5 |
| 23 | Rear window wiper/washer | 3 A | 45 | Rocker relay | K9 |

**Only use the above fuse sizes!**

**The engine compartment** switchboard has the following fuses:
Main power 80A , Ignition 50A, Glow 50A (of MAXI type). See engine compartment service hatch, right side 3.5 p. 16, and in conjunction with main power switch.

## 6.13 Machine storage

### 6.13.1 Storing the multi-process machine for less than 2 months

No special actions are required, if:

- The machine has been regularly serviced.
- The machine is clean
- Coolant has a suitable freezing point for the ambient temperature.
- The fuel tank is full.
- Battery storage has been arranged.

### 6.13.2 Storing the multi-process machine for more than 2 months

The following procedures are required, if the machine is left in storage for over 2 months:

- ► Clean the machine inside and out, and perform general lubrication.
- ► Let the engine run until it reaches normal temperature, and drive the machine for a while.
- ► Change engine oil and replace filter.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Clean the fuel tank and fill it with clean diesel fuel that suits the ambient temperature. Run the engine for approx. 5 minutes.
- ► Clean the engine air filter case and element.
- ► Drain and rinse the cooling system, and fill it with the recommended anti-freeze mixture.
- ► Ensure that the batteries are fully charged. If the machine is stored in a cold environment, remove the batteries. Check the battery charge every 30 days.
- ► Store the machine in a dry, warm space, and protect it against sunlight. Lift the machine's wheels of the ground using proper stands to support it.
- ► To prevent rust, grease all exposed cylinder shafts.

## 6.14 Machine commissioning

### 6.14.1 After storage of less than 2 months

- ► Check that the batteries are fully charged.
- ► Check the oil and fluid amounts and tyre pressures.
- ► Perform general lubrication.
- ► Bleed the fuel system if necessary.
- ► Start the engine, but do not let it run above 1,000 r/min.
- ► Perform a test drive to ensure that all equipment works correctly.

### 6.14.2 After storage of more than 2 months

- ► Check tyre pressures.
- ► Remove the protective covers and lower the machine.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Check engine oil level.
- ► Check coolant level.
- ► Check that the batteries are fully charged.
- ► Connect battery cables and tighten properly.
- ► Check hydraulic oil level.
- ► Check condition and tension of V-belt.
- ► Start the engine, but do not let it run above 1,000 r/min.
- ► Ensure that all covers and hatches are in place and properly attached.

**Warning! Varoitus! Varning!**

**Before starting the engine, ensure that all controls are in neutral and that the parking brake is on.**
**Never run the engine in a closed space. Sufficient ventilation must be ensured under all conditions.**

# 7.0 TECHNICAL SPECIFICATIONS

## 7.1 Dimensions

Table 47:

| DIMENSIONS | [mm] | WEIGHTS | [kg] |
|---|---|---|---|
| Length, rear lifter | 5290 mm | Kerb weight | 5800 kg |
| Width (405/70 R24 tyres) | 1960 | Front axle weight | 2400 kg |
| Height | 2415 mm | Rear axle weight | 3400 kg |
| Wheelbase | 2450 mm | Largest permitted weight for front axle | 8500 kg |
| Turn radius, ext. | 3970 mm | Largest permitted weight for rear axle | 8500 kg |
| Ground clearance | 355 mm | | |

### 7.1.1 Engine, general

| | |
|---|---|
| Model: | VM Motori R756 IE3, Diesel |
| Cylinder diameter: | 94 mm |
| Stroke: | 107 mm |
| Number of cylinders: | 6 pcs |
| Displacement: | 4455 $cm^2$ |
| Nominal output: | 115 kW (156 hp) 2600 r/min |
| Maximum torque: | 500 Nm (1400 r/min) |
| Idle: | 800 ± 50 r/min |
| Weight | 335 kg (dry) |

### 7.1.2 Engine lubrication system

Gear-type pump and replaceable main flow filter.

| | |
|---|---|
| Oil filter: | Paper |
| Minimum oil pressure: | 1,4-1,8 bar |

### 7.1.3 Fuel system

| | |
|---|---|
| Fuel system: | Common Rail |
| Fuel | Diesel* |

* Heating oil must not be used as fuel.

### 7.1.4 Cooling system

Thermostat-controlled, overpressurised.

### 7.1.5 Drive hydraulics

Closed, load-sensing system with driving direction switching using an electric selection switch.

Load automation monitoring engine operation.

| | |
|---|---|
| Stepless speed range: | 0–40 km/h. |
| Drive pump: | Variable displacement axial piston pump |
| Drive engine: | Variable displacement axial piston engine |
| Pump output: | 195 l/min |
| Operating pressure: | 420 bar |

### 7.1.6 Work hydraulics

Load-sensing LS system.

| | |
|---|---|
| Pump: | Variable displacement axial piston pump |
| Valves: controlled | 5/6-stem (depending on model), electrically |
| Pump output: | 195 l/min |
| Maximum pressure: | 200 bar |

### 7.1.7 Steering hydraulics

Hydrostatic body steering. Steering system oil flow is taken from the operating hydraulic circuit using a priority valve.

Steering cylinders: 2 pcs

### 7.1.8 Other information concerning hydraulics

Hydraulic oil cooler in connection to engine radiator.

Oil volume: approx. 160 l

### 7.1.9 Brakes

Built-in wet multi-disc brakes on both the front and rear axles. The parking brake affects the front axle.

During normal operation, the hydrostatic powertrain is used for deceleration.

### 7.1.10 Axles

Front: unsuspended rigid axle.

Rear: unsuspended rocker axle.

### 7.1.11 Tyres

Standard tyres: 420/65 R24

Inflation pressure:

- Minimum allowed pressure:1,2 bar
- Maximum allowed pressure:3,75 bar

Tyre pressures may vary depending on use. A general pressure guideline is 3,4 bar both front and back, unless otherwise stated on the tool.

### 7.1.12 Electrical system

| | | | |
|---|---|---|---|
| Voltage: | 12 V | Starter: | 2.2 kW |
| AC alternator | 110A | Batteries: | 2 x 12V, 75 Ah |
| Earth: | Negative | Fuses: | See 5.12 / p. 62. |
| Headlight bulb: | H7/12V/55W | Working light bulb: | H3/12V/55W |
| Parking light bulb: | T4W/12V/4W | Turn indicator bulb: | P21W/12V/21W |
| Brake light bulb: | P21W/12V/21W | Warning light bulb: | H3/12V/55W |
| Engine compartment light bulb: | C5W/12V/5W | Cabin dome light bulb: | C10W/12V/10W |

### 7.1.13 Air conditioning (Accessory)

| | | |
|---|---|---|
| Coolant: | R 134 | |
| Fill: | 1.2 kg | |
| Compressor oil: | Seltec oil | ZXL100 PAG Oil |

## 8.0 Troubleshooting and repair

The following are a few instructions for troubleshooting. The list is only indicative and should not be considered a full troubleshooting diagram.

If the instructions below are not enough to rectify the problem, we recommend that you contact authorised service.

Always remember to check all fuses, oil levels and filters before contacting service or initiating repair.

### 8.1 Problem, cause, corrective action

Table 48:

| Problem | Cause | Corrective action |
|---|---|---|
| Engine does not start or starting is difficult: | Out of fuel or wrong fuel grade? | Refuel, use suitable fuel for the temperature. |
| | Air or water in the fuel system? | Drain water from the tank.<br>Check fuel pipe connections, repair as necessary.<br>Bleed the fuel system. |
| | Oil viscosity too high? | Use suitable oil for the temperature. |
| | Flat battery? | Charge or replace the battery. |
| | Fuse 21 or 26 out? | Replace the fuse. See instructions! |
| Low engine power: | Low on fuel? | Refuel. |
| | Clogged air filter? | Clean or replace the filter. |
| | Clogged fuel filter? | Replace the filter. |
| The engine stops: | Out of fuel? | Refuel and bleed the fuel system. |
| Abnormal exhaust gas colour: | Low-quality fuel? | Use correct type of fuel. |
| | Excess oil in the engine? | Drain out the excess oil! |
| Too high a coolant temperature: | Too little coolant? | Refill to the correct level. |
| | Clogged radiator fins? | Clean the fins. |
| | Dirty anti-freeze? | Flush the cooling system, replace fluid. |
| | Overload? | Reduce engine load. |
| | Low-quality fuel? | Use correct type of fuel. |
| Machine not moving at the desired speed: | Too little hydraulic oil? | Add oil to reach the correct level. |
| | Drive hydraulics filter clogged? | Replace the filter. |
| Machine not moving at all: | Fuse number 18 out? | Replace fuse! See instructions! |
| Machine not moving forward or in reverse: | Broken driving direction switch? | Let authorised service replace the switch and inspect the circuit. |
| Driving programme not changing: | Fuse number 16 out? | Replace fuse! See instructions! |
| Forks not moving: | Fuse number 19 out? | Replace fuse! See instructions! |
| Floating not working: | Fuse number 20 out? | Replace fuse! See instructions! |
| The rear lifter is not working: | Fuse number 27 out? | Replace fuse! See instructions! |
| Front cylinder hydraulics not working: | Tool electricity button faulty. | Let authorised service replace the button and inspect the circuit. |
| Rear cylinder hydraulics not working: | Fuse number 27 out? | Replace fuse! See instructions! |

## 9.0 Service memo

Always remember to write down completed service in the appropriate place in the service memo.

In the tables

The operating hours listed under periodic maintenance are the current readings for the machine's operating hour counter.

Also remember to complete the 10-hour and 50-hour service and the 2-year service on time.

Note! Huomaa! Notera!

**Timely and correct maintenance is a prerequisite for keeping your warranty in effect.**
**The periodic maintenance item table; See 6.3 / p. 51.!**
Copy the table and mark all performed maintenance procedures in it. Give a copy to the customer or attach it to the machine's documentation.

Table 49:

| 10-hour service/daily inspections and lubrication |
|---|
| Perform the 10-hour service/inspection daily and together with all periodic maintenance!<br>The inspections and lubrication points can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Perform the daily inspections and lubrication regularly to ensure a long and effective operating life for your machine. |

Table 50:

| 50 h service/every 50 h/min. once a week | Service done |
|---|---|
| Complete this service at 50-hour intervals, or at least once a week, together with the 10-hour service items.<br><br>When the machine's hour counter shows 50 hours, complete the 10 and 50 hour service and the items marked with O in the 50-hour column.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>This service is essential for the continued reliability of a new machine! | Date: _____<br><br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 51:

| Hour counter reading: 250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 250 hours!<br>Complete the service items for 10, 50, and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br><br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 52:

| Hour counter reading: 500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 500 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 53:

| Hour counter reading: 750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 750 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 54:

| Hour counter reading: 1000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1000 hours!<br>Complete the service items for 10, 50, 250, 500, and 1,000 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 55:

| Hour counter reading: 1250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1250 hours!<br>Complete the service items for 10, 50, and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 56:

| Hour counter reading: 1500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1500 hours!<br>Complete the service items for 10, 50, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 57:

| Hour counter reading: 1750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1750 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 58:

| Hour counter reading: 2000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2000 hours!<br>Complete the service items for 10, 50, 250, 500, 1,000, and 2,000 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 59:

| Hour counter reading: 2250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2250 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 60:

| Hour counter reading: 2500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2500 hours!<br>Complete the service items for 10, 50, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 61:

| Hour counter reading: 2750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2750 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 62:

| Hour counter reading: 3000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3000 hours!<br>Complete the service items for 10, 50, 250, 500, and 1,000 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 63:

| Hour counter reading: 3250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3250 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 64:

| Hour counter reading: 3500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2500 hours!<br>Complete the service items for 10, 50, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 65:

| Hour counter reading: 3750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3750 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 66:

| Hour counter reading: 4000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 4000 hours!<br>Complete the service items for 10, 50, 250, 500, and 1,000 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 67:

| Hour counter reading: 4250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 4250 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 68:

| Hour counter reading: 4500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 4500 hours!<br>Complete the service items for 10, 50, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 69:

| Hour counter reading: 4750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 4750 hours!<br>Complete the service items for 10, 50, and 250 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Table 70:

| Hour counter reading: 5000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 5000 hours!<br>Complete the service items for 10, 50, 250, 500, and 1,000 hours.<br>The work to be completed can be found in the maintenance table.<br><br>PLEASE NOTE!<br>Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine! | Date: _____<br>Counter reading: _____<br>Technician:<br><br>Stamp: |

Note! Huomaa! Notera!

**Remember to flush the cooling system and replace the coolant every two (2) years!**

Note! Huomaa! Notera!

**Even from this point on, ensure that your machine is periodically serviced according to this service programme. This ensures a good, productive operating life and high resale value for your machine.**

**Notes:**


LM TOOLS
LM CABINS
LM TRAC